

CbarC



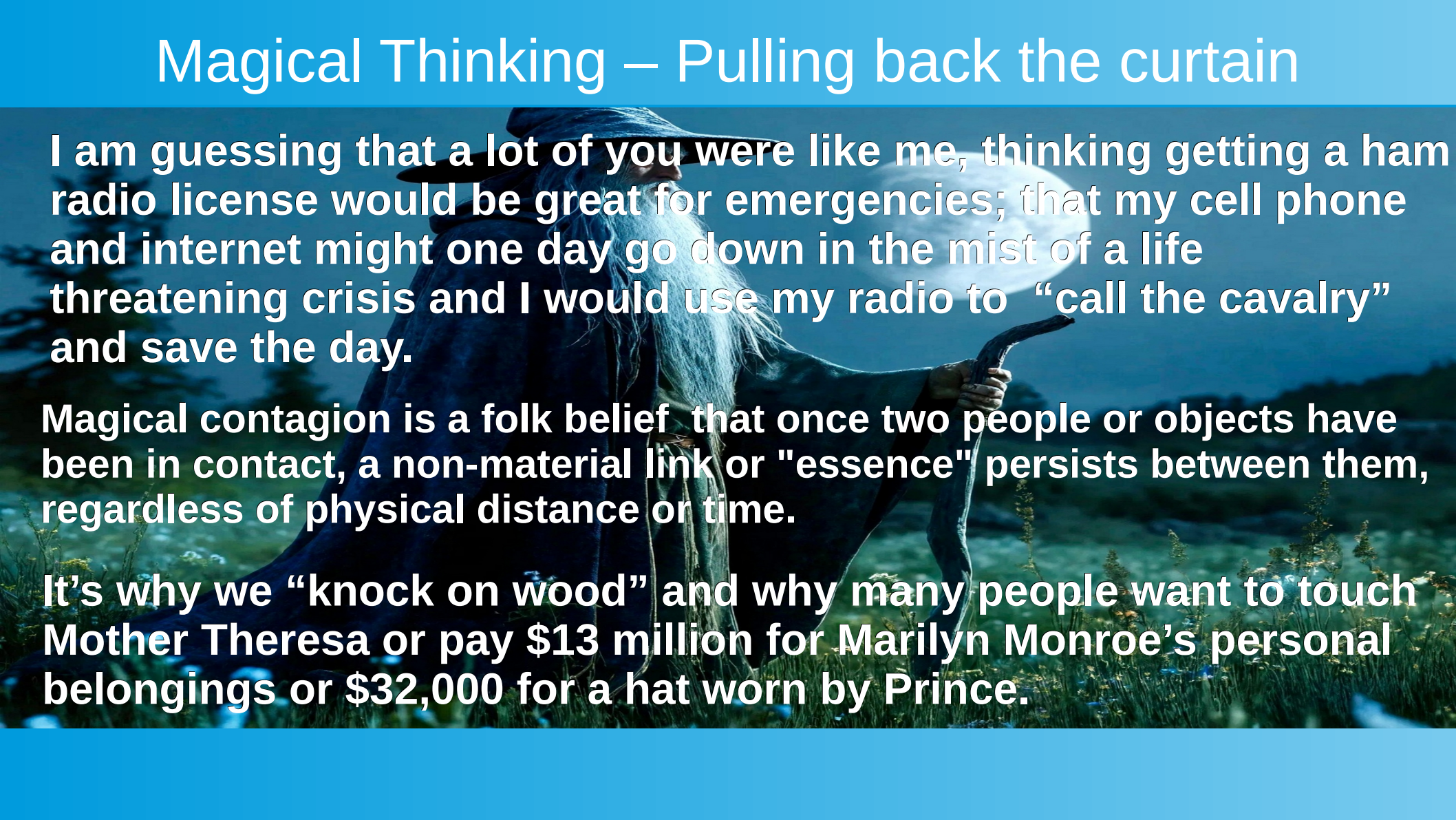
Ham operators don't ever really die; they just become better grounded!



Expect the best, plan for the worst,
and prepare to be surprised.

Denis Waitley

Magical Thinking – Pulling back the curtain



I am guessing that a lot of you were like me, thinking getting a ham radio license would be great for emergencies; that my cell phone and internet might one day go down in the mist of a life threatening crisis and I would use my radio to “call the cavalry” and save the day.

Magical contagion is a folk belief that once two people or objects have been in contact, a non-material link or "essence" persists between them, regardless of physical distance or time.

It's why we “knock on wood” and why many people want to touch Mother Theresa or pay \$13 million for Marilyn Monroe's personal belongings or \$32,000 for a hat worn by Prince.

When it matters most—Don't take anything for Granted

In a life threatening crisis taking things for granted along with magical thinking can cause you unnecessary suffering or even get you killed.

Tonight's presentation starts with the most likely major threat event in 2026, what EmComm is and what it is not and transitions to :

Fundamental understanding of modern day to day conveniences such as how the power for our homes gets delivered. How the vast cell phone and internet infrastructure functions is critical to deciding what actions to take when they stop working.

In memory of First Responder Clarence Dean



- **Date: January 17, 1994**
- **Location: Golden State Freeway (I-5) and Antelope Valley Freeway (I-14) interchange in Newhall Pass**
- **Cause: Rode off a collapsed connector bridge in the dark while heading to work early.**
- **Rushing to report for emergency duty at approximately 4:31 am.**

The threats we know about



A major earthquake on the southern San Andreas Fault—often called "The Big One"—is projected by scientists to potentially reach a magnitude 7.8 or greater, which releases roughly 45 times more energy (or strength) than the magnitude 6.7 Northridge earthquake of 1994.



Mitigation - Before the wolf comes

A "brick house" ham station is defined by redundancy, independence from the grid, and multi-band capability.

So you got your shack ready for future disasters.

Do you know who your local first responders are?

San Bernardino County Fire Protection District (County Fire) is the primary agency for fires and emergencies in unincorporated areas and the 24 contract cities it serves

Deus Ex Machina - Crestline Fire Station 25

Station 25 in Crestline operates as a 24-hour, full-time career staffed station under the San Bernardino County Fire Department.

Suppression Crew: The primary fire engine (Medic Engine 25) is staffed by a minimum of 3 to 4 personnel: typically one Fire Captain, one Fire Engineer, and one or two Firefighters.

EMS Crews: The station houses two ambulances, each staffed by two Paramedics (Ambulance Operators), operating on 24-hour shifts.

SBCFire



Fill out your
household
profile



My Info

24072 CRESTA DR, CRESTLINE, CA, 92325



Name: Gregory Newbrough

Email: ko6lvt@gmail.com

Phone: 858-229-3855

Time Zone: (UTC-08:00) Pacific Time

Edit

San Bernardino County Community Connect

Together, Building a Safer Community, Through Prevention, Preparedness & Response

Research your specific faults and dangers

Crestline

Cleghorn Fault (also known locally as the Silverwood Lake Fault) with an interval between major ruptures estimated at roughly 400 years

Direct Rupture: The fault dips steeply to the north and has a history of surface rupture in the Late Quaternary period. A major event could cause surface faulting, physically tearing through roads, utilities, and foundations that sit directly on the trace

Landslide Trigger: The steep terrain of the San Bernardino Mountains makes Crestline highly susceptible to earthquake-induced landslides. Even moderate shaking from the Cleghorn Fault could trigger significant slope failures, rockfalls, and debris flows, potentially blocking evacuation routes like Highway 138 or isolating neighborhoods.

San Bernardino Nat. Forest described by the Forest Service as USA's Most Urban Forest.



Annual estimates have placed visitor counts at over 2.4 million, with some reports indicating the forest receives more visitors annually than both **Yellowstone** and **Yosemite National Parks** combined.

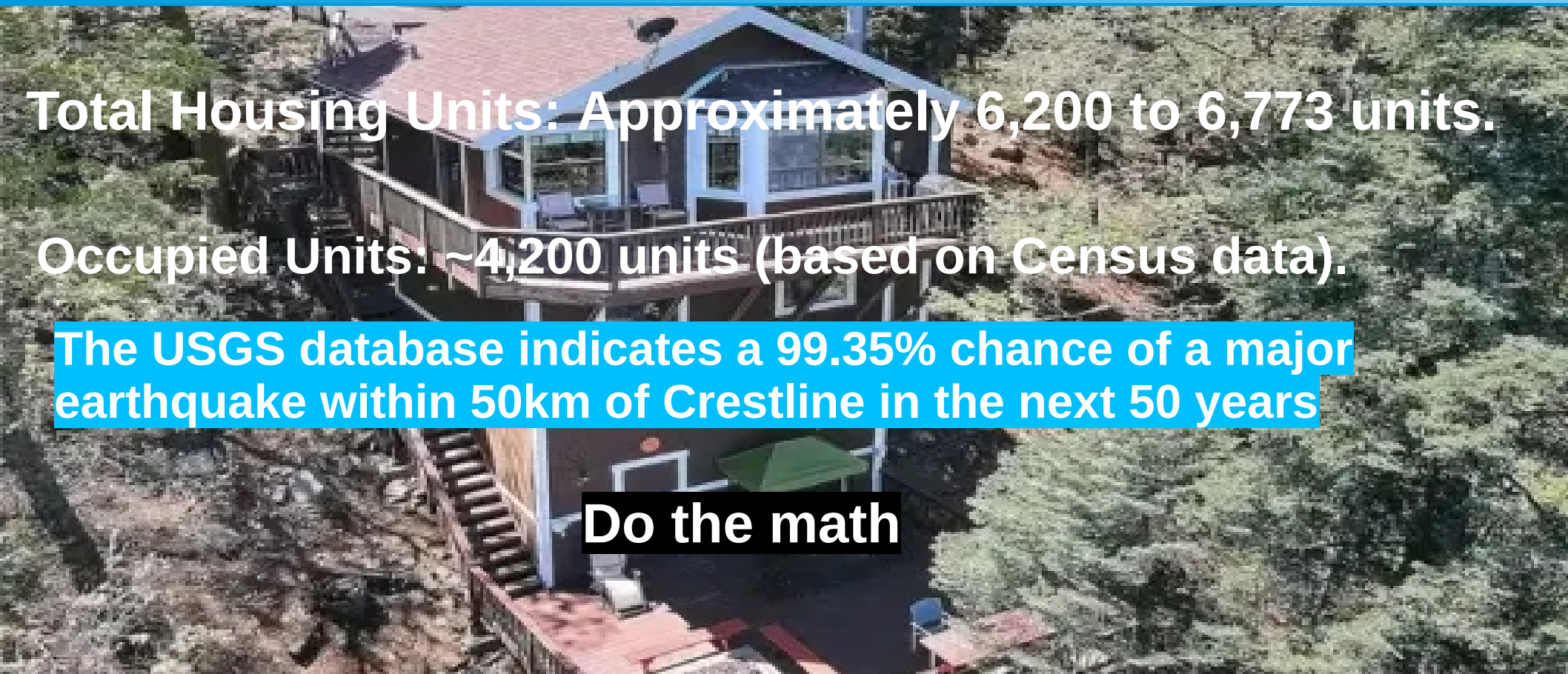
Crestline – Occupied homes

Total Housing Units: Approximately 6,200 to 6,773 units.

Occupied Units: ~4,200 units (based on Census data).

The USGS database indicates a 99.35% chance of a major earthquake within 50km of Crestline in the next 50 years

Do the math



Crestline - Utilities

Utility contact numbers

Southern California Edison (1-800-611-1911)

Southern California Gas (1-800-427-2200)

Frontier Telephone/Internet (1-800-921-8102)

Spectrum Telephone/Internet (1-844-923-0163)

Crestline Village Water District (1-909-338-1727)

CLAWA (1-909-338-1779)

VOE Water (1-909-338-2310)

2 Minutes away from 1800



Modern communication began with the electric telegraph in the 1830s and 1840s, marking the shift from physical message delivery to electronic signal transmission.

These 19th-century innovations laid the groundwork for subsequent technologies like **radio (late 1890s)**, television (1920s), and the internet (1983), which transformed global connectivity from slow, localized exchanges into instantaneous, worldwide networks.

Public Agency Professionals - FCC Part 90

Primary Mission: Life safety, law enforcement, and active disaster mitigation.

Technology: Land Mobile Radio (LMR) systems that use digital, trunked, and often encrypted channels to prevent scanner interception.

Infrastructure: Operates on government-owned repeater towers and commercial networks, frequently integrated with satellite backups and FirstNet.

Training & Governance: Strict adherence to the FEMA Incident Command System (ICS). Professionals possess official legal authority and jurisdictional responsibilities.

EmComm



What is EmComm ?

EmComm is an abbreviation for Emergency Communications, primarily referring to the use of amateur (ham) radio to provide communication services during crises, disasters, or when standard infrastructure fails.

What EmComm is not

Using ham radio for personal use during an emergency is **not** considered Emergency Communications (EmComm) because EmComm is defined as a voluntary, organized service where licensed operators **assist** public safety agencies or the community, rather than individuals contacting family or friends.

Consider using HamWatch...

Winlink Peer to Peer



EmComm - 2026

Amateur radio Emergency Communications (EmComm) is less frequently relied upon for primary and tactical response today. The nearly unanimous adoption and continuous federal expansion of FirstNet have fundamentally shifted the landscape of public safety communications.

Agencies no longer need hams to bridge communication gaps between different jurisdictions, as FirstNet and related Land Mobile Radio (LMR) bridging tools seamlessly connect multiple agencies.

EmComm Still Plays a Critical Role

Despite the dominance of FirstNet, amateur radio EmComm groups (such as ARES) are not obsolete; their role has simply evolved from a primary or alternate asset to an essential contingency and emergency backup:

- When Cellular Fails: During catastrophic natural disasters, fiber optic cuts, or prolonged power grid failures, cellular and satellite backhaul networks can still experience outages.**
- Last-Mile Logistics: Hams remain highly utilized for logistical support, such as passing health and welfare traffic, relaying information to shelters, and coordinating resources when infrastructure is completely destroyed.**

FirstNet Systems



FirstNet systems operate on dedicated, licensed frequencies coordinated to minimize interference.

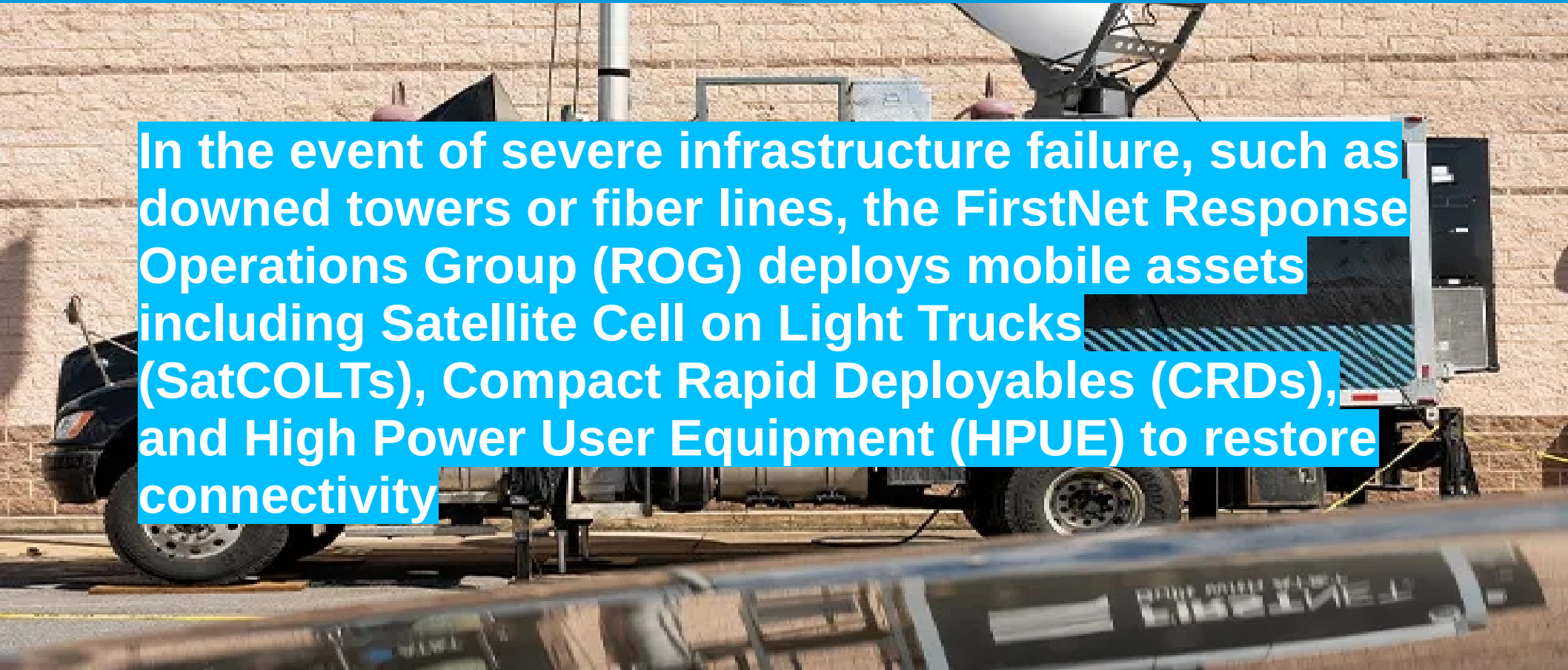
FirstNet Authority

The First Responder Network Authority, or the FirstNet Authority, is an independent agency within the U.S. Department of Commerce's National Telecommunications and Information Administration (NTIA) that oversees FirstNet, the nation's communications network dedicated to emergency responders and public safety.

Band 14 (758–769/788–799 MHz), is licensed to the First Responder Network Authority (FirstNet) for a nationwide high-speed data network used by police, fire, and EMS.

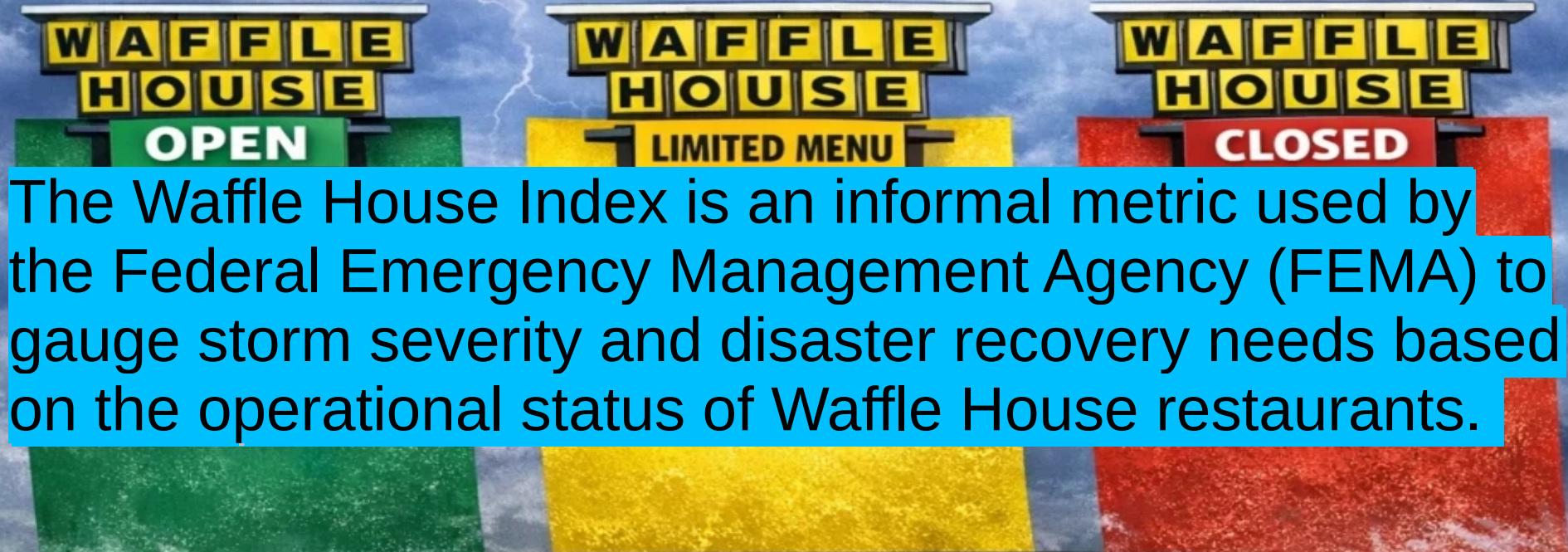
FirstNet Response Operations Group

In the event of severe infrastructure failure, such as downed towers or fiber lines, the FirstNet Response Operations Group (ROG) deploys mobile assets including Satellite Cell on Light Trucks (SatCOLTs), Compact Rapid Deployables (CRDs), and High Power User Equipment (HPUE) to restore connectivity



Waffle House Index

The Simple System That Measures Storm Impact



The Waffle House Index is an informal metric used by the Federal Emergency Management Agency (FEMA) to gauge storm severity and disaster recovery needs based on the operational status of Waffle House restaurants.

Nearest official Waffle House restaurants are located in Nevada (Las Vegas) and Arizona (Phoenix)

Ham Radio EmComm – FCC Part 97

Primary Mission: To serve as a secondary or tertiary communication pathway ("When All Else Fails") for government officials, hospitals, and relief NGOs.

Technology: Operates on amateur-allocated frequencies using standard analog and digital formats like DMR, APRS, and Winlink. Transmissions are never encrypted.

Infrastructure: Decentralized, utilizing personal gear, local volunteer-maintained repeaters with battery backups, and portable or mobile

Training & Governance: Regulated by FCC Part 97 Rules and Regulations. Operators typically coordinate through organizations like the Amateur Radio Emergency Service (ARES) or RACES, and many have completed ICS-100/200 courses to seamlessly integrate into professional Emergency Operations Centers (EOCs).

2026 - When All Else Fails, you need a computer

The amateur radio community is generally shifting its training toward digital messaging (like Winlink, JS8Call) and self-sufficient, off-grid deployments, ensuring they remain ready "when all else fails."



What could possibly go wrong in 60 seconds ??

The 1999 magnitude 7.4 earthquake, was the most damaging earthquake in Turkey, causing the death of 17,000 people and leaving more than 250,000 people homeless.

A magnitude 8.0 earthquake along the southern San Andreas Fault would likely cause shaking to last for nearly two minutes.

Ridgecrest July 2019

On July 4, 2019, a magnitude 6.4 earthquake struck near Ridgecrest in the Mojave Desert, approximately 11 miles east-northeast of the city and 109 miles north of San Bernardino

This earthquake was followed by a magnitude 7.1 temblor on July 5, 2019, which caused more substantial damage, including gas leaks and structural issues in the Ridgecrest area.

San Bernardino County – 2019 6.4 Earthquake Fire

If a natural gas line ruptures in San Bernardino during an 8.0 earthquake, the resulting fires will spread rapidly into a major conflagration due to simultaneous ignitions, loss of water pressure, blocked roads, and high winds. Up to 50% of post-earthquake fires are directly tied to broken gas infrastructure.

**BREAKING
NEWS**

Strongest Quake in SoCal Since 1999



2024 San Bernardino Hazard Mitigation Plan

Hazard Type	Probability	Location	Primary Impact	Secondary Impacts	Total Score	Consideration
Earthquake / Geologic Hazards	4	4	4	4	64.00	High
Flood	4	3	2	3	42.40	High
Wildfire	4	4	2	2	44.80	High
Cyber Threat	4	2	2	2	32.00	Medium
Extreme Heat	4	4	1	1	35.20	Medium
High						Medium
Mass Incid					20.00	Medium
Civil Unrest	2	2	1	1	11.20	Low
Drought	2	4	1	1	17.60	Medium
Hazardous Materials Release	2	2	2	2	16.00	Medium
Dam Foundation	1	4	3	2	12.60	Medium

All cities and counties in California must prepare a general plan, including a safety element that addresses various hazard conditions and other public safety issues.

Every day life revolves around our Cell Phones



Cell Phones



Cell phones are essentially two-way radios that transmit and receive information using radiofrequency (RF) energy

Cell phones cannot make regular calls or browse the web without internet, cell towers, or satellites.

How do cell towers work?

The process begins when a mobile device emits RF signals, which are captured by the tower's antennas mounted at height.

These signals are then converted into digital data and routed through fiber optic or microwave backhaul connections to a Mobile Switching Center (MSC).

The MSC directs the data to its destination, such as another phone or the internet, while incoming signals are processed in reverse to be transmitted back to the user's device.

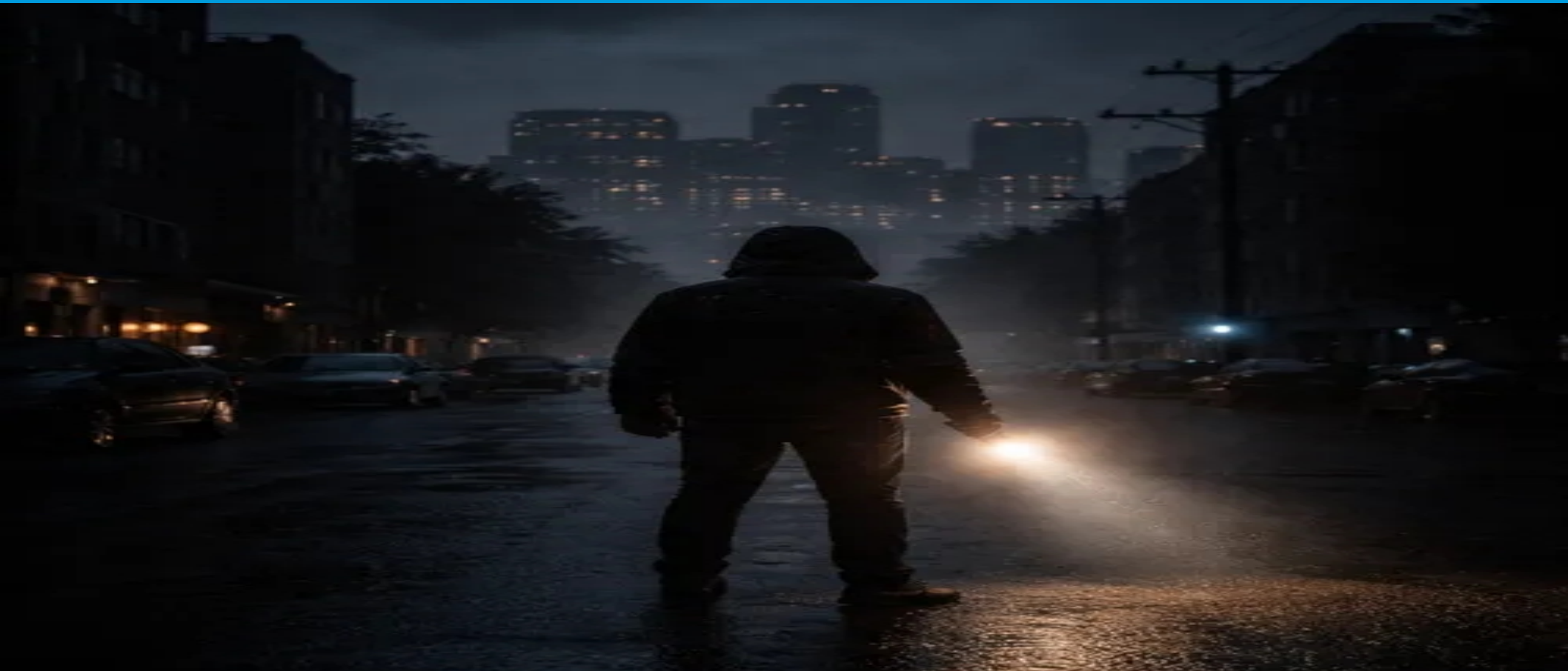
Primary Fiber Optic Data Center

Lumen: San Bernardino 1 Data Center is the primary fiber optic backhaul and colocation facility identified in San Bernardino, CA.

Located at 5705 Industrial Parkway, this 20,000 sqft facility provides diverse fiber connectivity, backhaul services, and access to alternate carrier networks for business applications.

Installation work covers approximately 6 miles in San Bernardino County from West Kenwood Avenue to North Industrial Parkway

Radios need power



California Electrical Grid

Electricity is generated by diverse sources and delivered through a high-voltage transmission network managed in real-time to match supply with demand. The California Independent System Operator (CAISO) manages roughly 80% of the state's grid, overseeing 26,000 miles of high-voltage lines

The grid operates on a strict, second-by-second balance because electricity cannot be stored in large quantities; **it must be consumed the instant it is generated.**

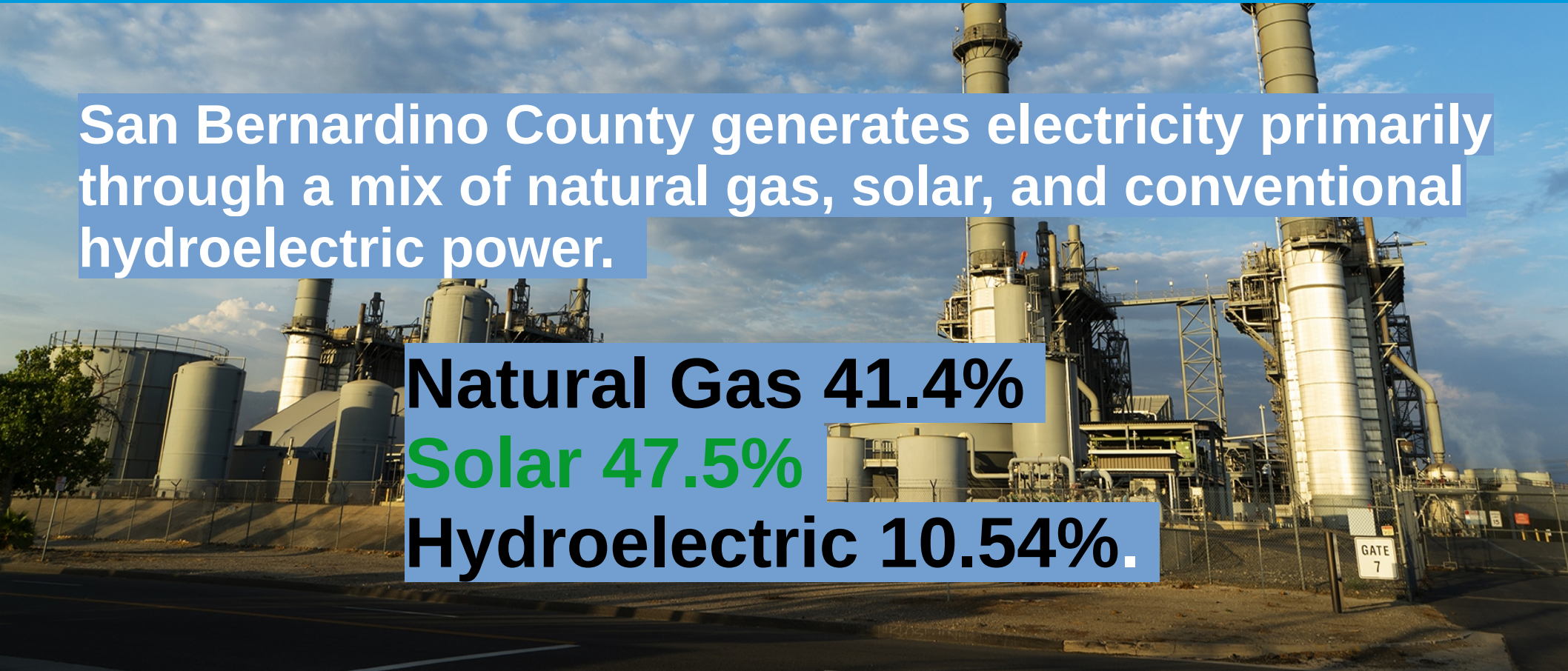
San Bernardino County – Electricity Production

San Bernardino County generates electricity primarily through a mix of natural gas, solar, and conventional hydroelectric power.

Natural Gas 41.4%

Solar 47.5%

Hydroelectric 10.54%.



San Bernardino County

Highest per capita electricity consumption in Southern California

San Bernardino county relies heavily on the California grid, which imports approximately 25% to 30% of its total electricity from out of state.

California

Oregon and Washington supply ~11.7% of the state's electricity, predominantly via hydroelectric power transmitted through high-voltage lines.

The Southwest accounts for about 18.4% of imports, bringing a diverse mix of natural gas, coal, nuclear, and renewable energy from Arizona, Nevada, New Mexico, Utah, and Colorado.

2026-First year Solor provides most electricity ...But



Power Plants create electricity using natural gas

San Bernardino City Natural Gas

SoCalGas owns and operates **one transmission line that transects the city.**

The pipeline traverses the city from west to east along Mill Street, turns south on Tippecanoe Ave, and turns to the east again at E. San Bernardino Ave. If these lines are damaged, there is a potential to interrupt the flow and delivery of natural gas throughout the city.

Stuff Happens

The Aliso Canyon gas leak, discovered on October 23, 2015, was the largest natural gas leak in U.S. history, releasing approximately 97,100 metric tons of methane from the Southern California Gas Company's (SoCalGas) storage facility near Porter Ranch, Los Angeles.

High Dessert Power Plant

The High Desert Power Plant, owned by MRP Generation Holdings, LLC, is the county's largest natural gas facility by a wide margin. Located in Victorville, it produces approximately 3.72 million megawatt hours of electricity annually, ranking it as the 3rd highest producing plant in the entire state of California

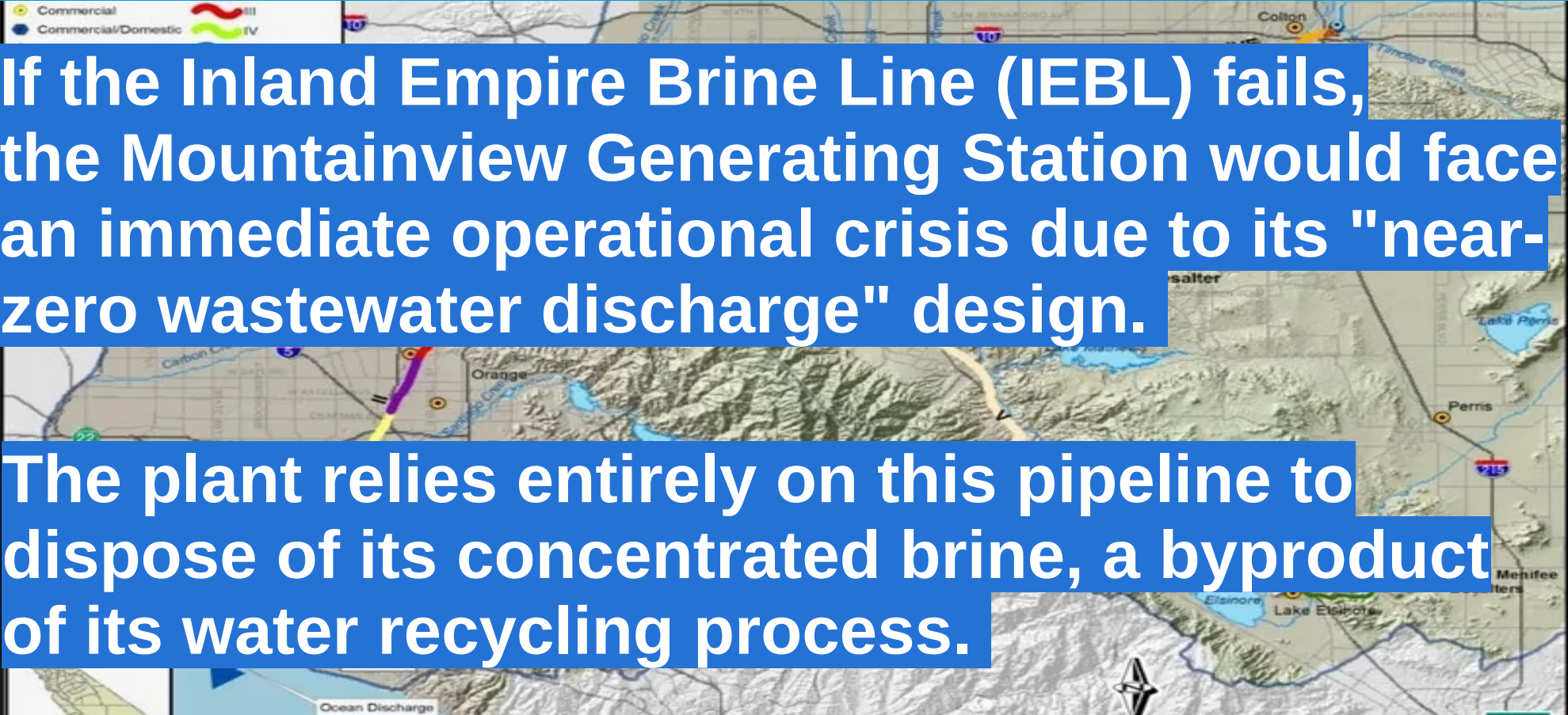


San Bernardino County – Agua Mansa

The Agua Mansa Power Plant in Colton, California, is a natural gas-fired facility located at 2040 W Agua Mansa Rd.



Inland Empire Brine Line



The map shows the IEBL pipeline route, highlighted in red and yellow, starting from the Mountainview Generating Station area and extending southwards. The route passes through or near several locations including Colton, Orange, and Perris. A legend in the top left corner identifies symbols for 'Commercial' (yellow circle), 'Commercial/Domestic' (blue circle), and the pipeline itself (red and yellow lines). The map also shows major highways like I-10 and I-215, and geographical features like Carbon Creek and Lake Perris. A north arrow is located in the bottom right corner.

If the Inland Empire Brine Line (IEBL) fails, the Mountainview Generating Station would face an immediate operational crisis due to its "near-zero wastewater discharge" design.

The plant relies entirely on this pipeline to dispose of its concentrated brine, a byproduct of its water recycling process.

San Bernardino Solar - Dagget



Dagget Solar and Storage site, located 4 miles east of Daggot (approximately 10 miles east of Barstow) powers approximately 181,000 to 200,000 homes annually.

Today's Comms run on Fiber Optics

San Bernardino County's fiber optic infrastructure is moderately fragile. While the glass fibers are physically durable and flexible, an 8.0 magnitude earthquake would cause severe, widespread damage.

Ground ruptures along active fault lines and soil liquefaction would break cables, while secondary hazards like power grid failures and landslides would cause prolonged network outages.

Replacing damaged cable

Major U.S. Manufacturers: Companies like Corning (headquartered in New York) and CommScope (based in North Carolina) are the largest producers of optical fiber globally and heavily supply the North American market.

Regional Suppliers: California-based manufacturers like Shaxon (based in Orange, CA) also supply custom fiber assemblies directly to the Southern California region.



Current San Bernardino County Communication Breakdown

Cellular Network Users

Every person above the age of 12 has a cell phone...2 1/4 million in San Bernardino County, add in businesses, government, etc..

Internet Users

San Bernardino County Households (2024) 687,092
An average household size of 3.0 to 3.2 people.

Spectrum: Estimated 40-50% of connected households.

AT&T Fiber: Estimated 20-30% of connected households.

Frontier: Estimated 10% of connected households

T-Mobile & Verizon 5G Home: Estimated 5% of connected households

Starlink: Estimated 5% of connected households

Cellular Frequency Bands

The two main types of cellular frequency bands used by carriers in the United States are the low-frequency bands and the high-frequency bands. Low-frequency bands, such as 700 MHz, provide better coverage and can penetrate buildings and obstacles more effectively. High-frequency bands, such as 2.5 GHz, offer higher capacity and faster data speeds but have shorter range and are easily blocked by obstacles.

Verizon – Low Freq – 750 MHz (Band 13)

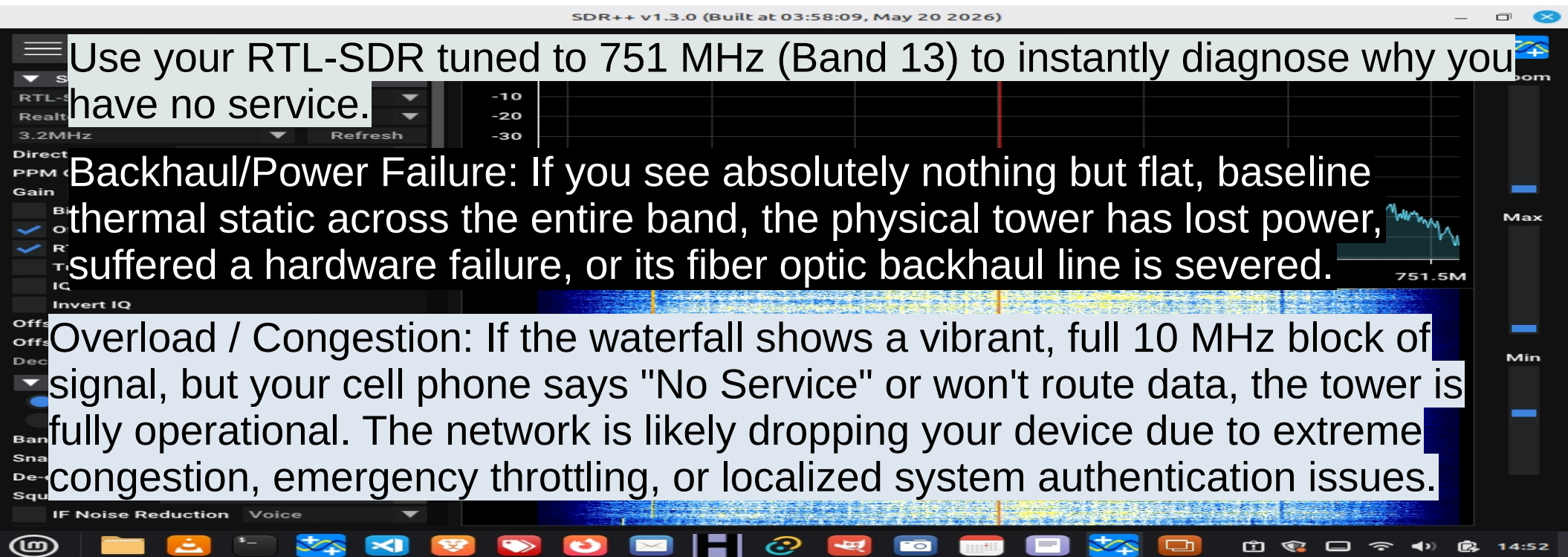
T-Mobile - Low Freq – 600 MHz (Band 71)

AT&T Low Freq – 700 MHz (Band 12)

RTL-SDR – Is my Verizon cell tower transmitting?



Band 13 (750 MHz): This is Verizon's primary low-frequency band.

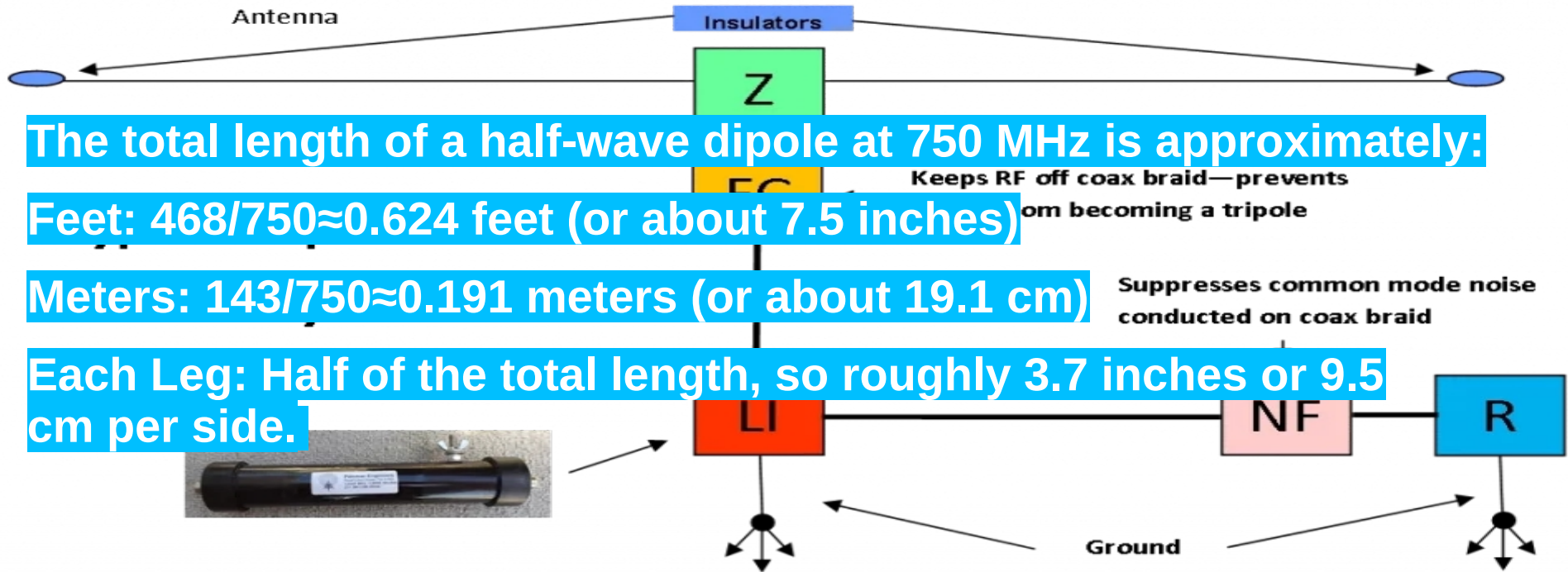


Use your RTL-SDR tuned to 751 MHz (Band 13) to instantly diagnose why you have no service.

Backhaul/Power Failure: If you see absolutely nothing but flat, baseline thermal static across the entire band, the physical tower has lost power, suffered a hardware failure, or its fiber optic backhaul line is severed.

Overload / Congestion: If the waterfall shows a vibrant, full 10 MHz block of signal, but your cell phone says "No Service" or won't route data, the tower is fully operational. The network is likely dropping your device due to extreme congestion, emergency throttling, or localized system authentication issues.

750 MHz Dipole



Z = Impedance Transformer

FC = Feed line Choke

LI = Line Isolator

NF = Coax Noise Filter

R = Radio System

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NOAA Weather Radio - Not just weather

The service operates as an "all-hazards" network, meaning it interrupts routine programming to broadcast alerts for:

- Natural disasters: Such as tornadoes, severe thunderstorms, flash floods, earthquakes, avalanches, and volcanic activity.
- Technological/Environmental hazards: Including chemical releases, oil spills, and nuclear power plant emergencies.
- Public safety threats: Such as AMBER alerts, civil emergencies, evacuation orders, and 911 telephone outages.
- NOAA is not the primary agency responsible for broadcasting volcanic eruption alerts

SAME – Specific Area Message Encoding

In the most sophisticated alerting system, NOAA Weather Radio Specific Area Message Encoding (SAME), digital coding is employed to activate only those special receivers programmed for specific emergency conditions in specific area, typically a county. SAME can activate specially equipped radio and cable television receivers and provide a short text message that identifies the location and type of emergency. SAME is the primary activator for the FCC Emergency Alert System EAS

You can obtain your SAME code numbers by dialing: 888-NWR-SAME (888-697-7263) – Voice & TTY/TTD Accessible

When Yellowstone Erupts



Warning Signs: Scientists would detect significant precursors, such as intense earthquake swarms or rapid ground deformation, weeks, months, or years in advance.

Volcano Notification Service (VNS)

Receive Notifications or Change My Settings:

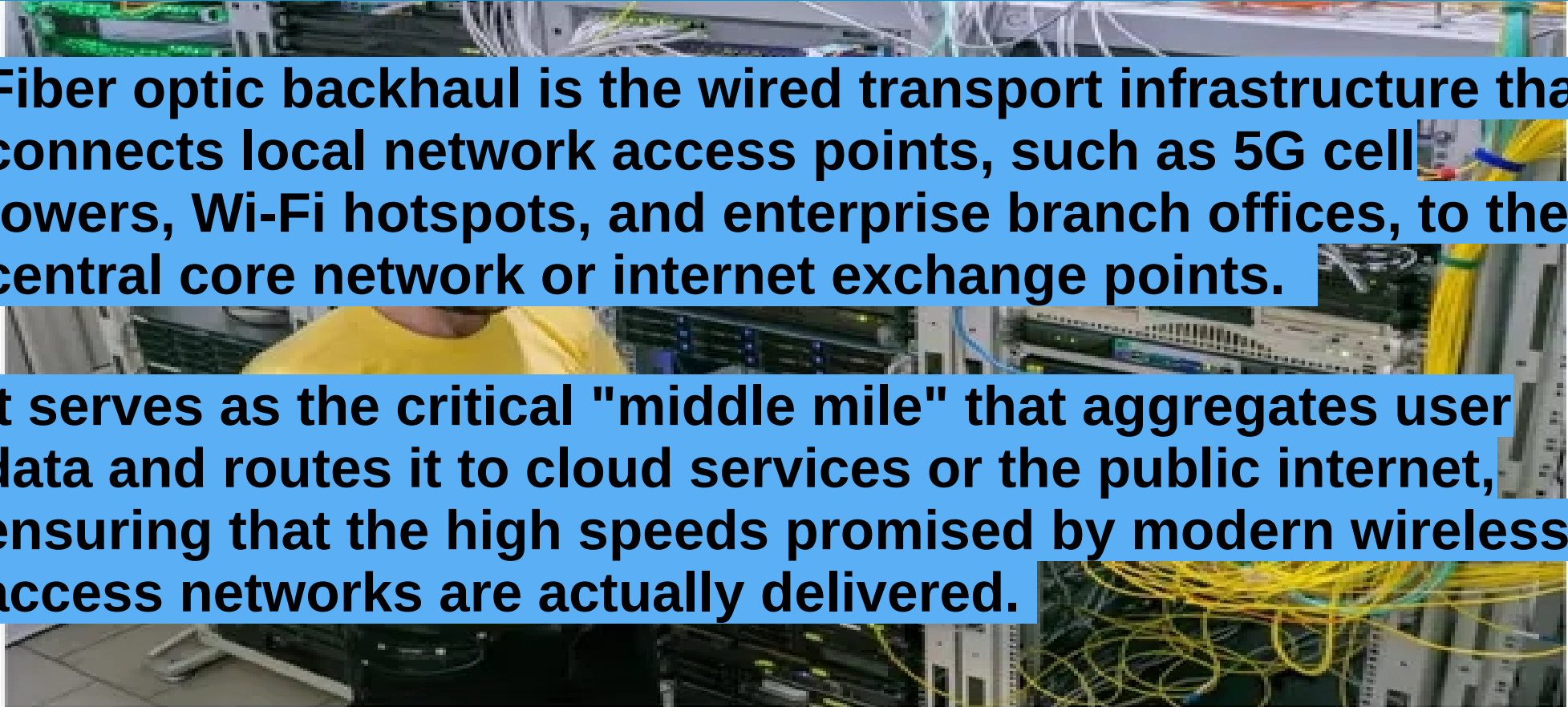
Dipole - FM radio station listening

Because the FM band is relatively wide, builders typically target the center frequency of 98 MHz or 100 MHz for optimal average performance.

Target Length: At 98 MHz, the total length is approximately 4.77 feet (1.45 meters), meaning each of the two elements should be roughly 2.39 feet (73 cm).

Broadbanding: Using slightly thicker wire or tubing increases the antenna's bandwidth, allowing it to maintain a low Standing Wave Ratio (SWR) across the entire 88–108 MHz spectrum without needing to be cut for a specific station.

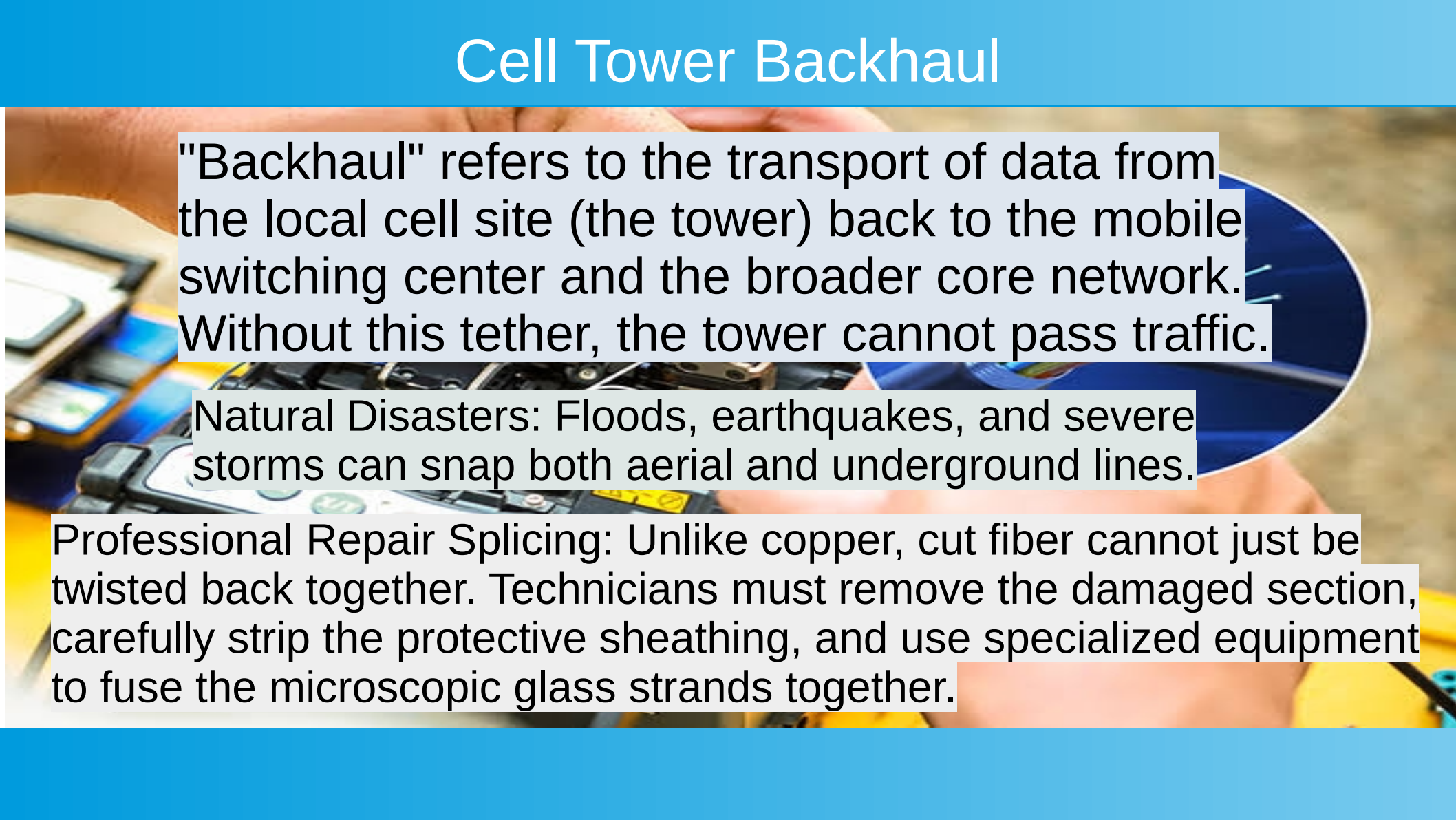
Fiber Optic Backhaul



Fiber optic backhaul is the wired transport infrastructure that connects local network access points, such as 5G cell towers, Wi-Fi hotspots, and enterprise branch offices, to the central core network or internet exchange points.

It serves as the critical "middle mile" that aggregates user data and routes it to cloud services or the public internet, ensuring that the high speeds promised by modern wireless access networks are actually delivered.

Cell Tower Backhaul



"Backhaul" refers to the transport of data from the local cell site (the tower) back to the mobile switching center and the broader core network. Without this tether, the tower cannot pass traffic.

Natural Disasters: Floods, earthquakes, and severe storms can snap both aerial and underground lines.

Professional Repair Splicing: Unlike copper, cut fiber cannot just be twisted back together. Technicians must remove the damaged section, carefully strip the protective sheathing, and use specialized equipment to fuse the microscopic glass strands together.

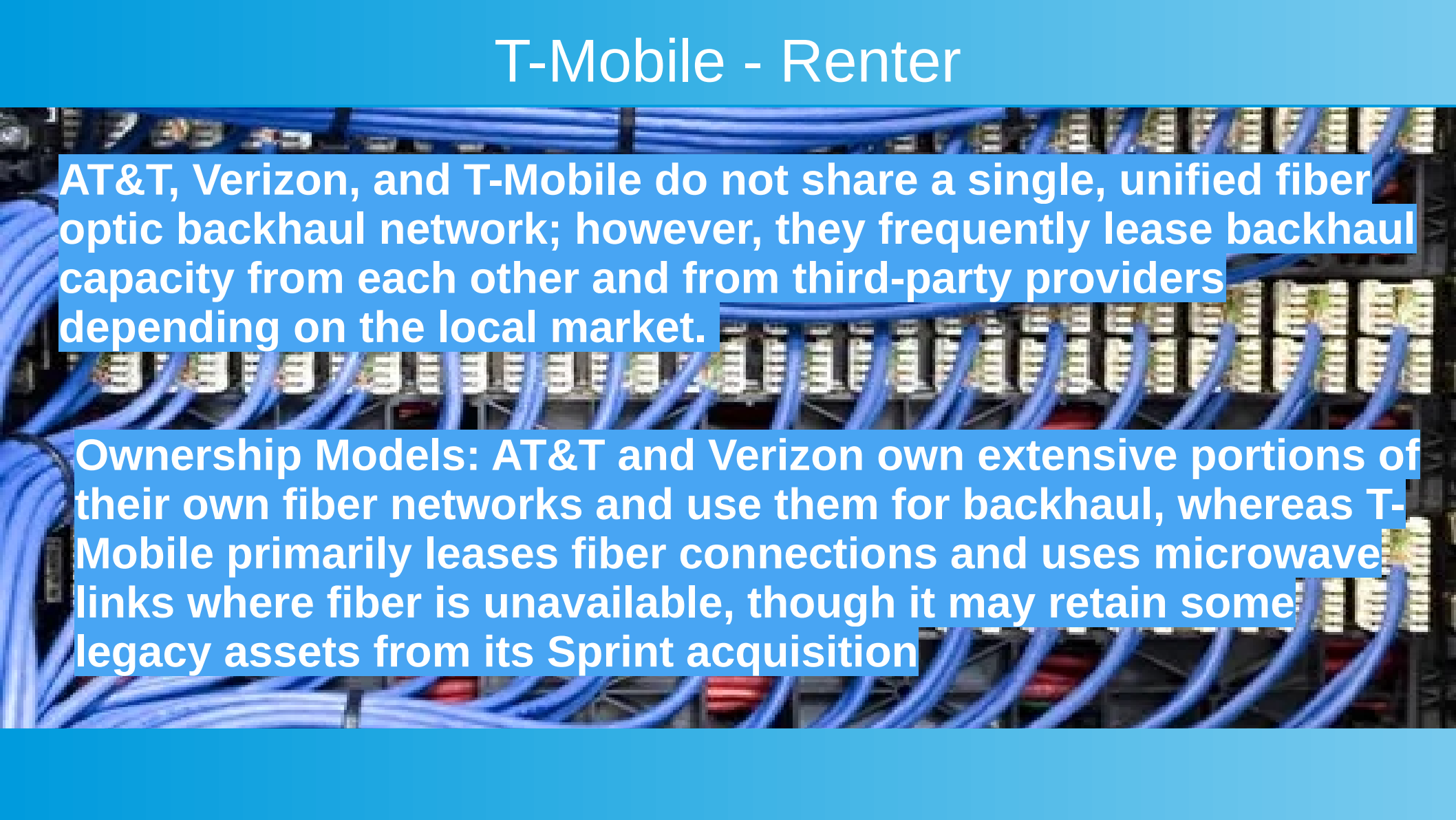
Carrier Tower sharing

T-Mobile, Verizon, and AT&T frequently share the same physical cell tower structures (mast/poles) in San Bernardino County, but they never share the same active equipment.

Most physical cell towers are owned by independent tower companies (like American Tower or Crown Castle), not the carriers themselves. These companies lease space on the same structure to multiple carriers to maximize efficiency.

Even when they are on the exact same tower, each carrier installs and operates their own distinct antennas, transmitters, radios, and frequency bands.

T-Mobile - Renter



AT&T, Verizon, and T-Mobile do not share a single, unified fiber optic backhaul network; however, they frequently lease backhaul capacity from each other and from third-party providers depending on the local market.

Ownership Models: AT&T and Verizon own extensive portions of their own fiber networks and use them for backhaul, whereas T-Mobile primarily leases fiber connections and uses microwave links where fiber is unavailable, though it may retain some legacy assets from its Sprint acquisition

San Bernardino County Internet

San Bernardino sits at a major geographic bottleneck. Its fiber transit corridors connect the massive Los Angeles sub-market to Phoenix, Las Vegas, and beyond. This "inland empire" routing channels regional and transcontinental data through the valley before it scales the mountain passes.

The I-10 / I-215 Junction: This is the nexus of regional fiber transit in San Bernardino. These interstate rights-of-way house massive conduits linking LA's financial hubs directly to telecommunication gateways in Arizona.

State Route 18: The main vein linking the valley floor to Crestline and Big Bear. It carries both last-mile and middle-mile connections up the mountain, acting as a critical corridor transit point.

San Bernardino County Internet

San Bernardino County primarily functions as a fiber transit corridor rather than a termination point. Major fiber optic routes pass through the Cajon Pass and San Geronimo Pass to connect the Inland Empire to the Los Angeles basin and points east (Las Vegas, Phoenix).

While the county hosts private data centers (such as those operated by the county government and private entities in Ontario and San Bernardino), these facilities typically backhaul traffic to Los Angeles for peering rather than exchanging it locally.

Choke Points - Population

The combined population of Los Angeles, Orange, Riverside, and San Bernardino counties is approximately 17.26 million residents.

Los Angeles County: ~9.69 million

Orange County: ~3.15 million

Riverside County: ~2.56 million

San Bernardino County: ~2.22 million

Will the sky fall ?



Beach front property joke

It is scientifically **impossible** for an earthquake to split California in half or cause the state to fall into the ocean. The San Andreas Fault is a right-lateral strike-slip boundary, meaning the Pacific Plate and North American Plate slide horizontally past each other rather than pulling apart

8.0 Earthquake - 15 ft uplift

The maximum vertical obstacle a standard 4x4 Ford F-150 can clear is determined by its 9.4 inches of ground clearance.

The M1 Abrams tank can climb a vertical wall up to 4.08 feet (1.24 meters) high.

EMS, Repair crews will be blocked by impassable roads, abandoned vehicles, collapsed bridges, fires and rubble.

Somewhat “Good News”

A magnitude 9.0 earthquake is unlikely to originate from the San Andreas Fault in California.

Geological constraints limit the San Andreas to a maximum theoretical magnitude of approximately 8.2 to 8.3, as the fault is not long or deep enough to generate a 9.0 event.

The Bad News for San Bernardino County

In a high-magnitude scenario, Interstate 15 (the main route to Las Vegas) could see the roadway sliced and shifted by up to **15 feet, rendering it impassable.**

Interstate 10, which crosses the San Andreas Fault in over a dozen spots, would likely be **destroyed at those intersections.** California's aqueducts, which transport 88% of Los Angeles' water supply, cross the San Andreas Fault. If these aqueducts are severed or destroyed alongside the highways that service them, Southern California could face an **immediate and prolonged water shortage.**

Where does my drinking water come from?

The Crestline Village Water District sources its water from two primary types of sources:

Local Ground Water: A limited amount is obtained from separate wells within the district.

Imported Surface Water: This is purchased from the Crestline-Lake Arrowhead Water Agency, which buys surface water at Silverwood Lake, treats it, and pumps it up the mountain.

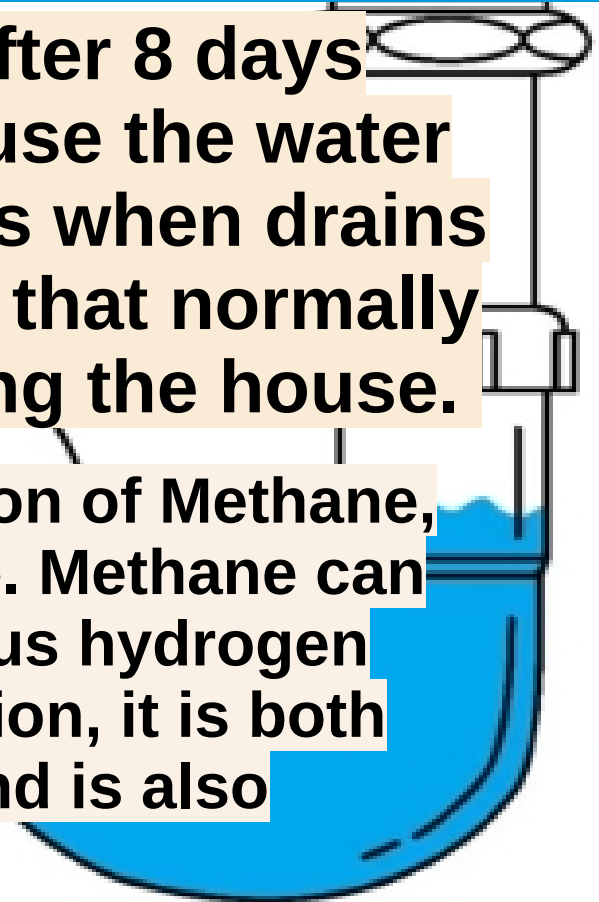
Having a radio won't much matter if you are dead of thirst in 5 days.

8 Days

Sewer gas can leak into homes after 8 days without water. This occurs because the water seal in plumbing traps evaporates when drains are unused, removing the barrier that normally prevents toxic gases from entering the house.

Sewer gas is made up of a combination of Methane, hydrogen sulfide, and carbon dioxide. Methane can cause asphyxiation, and while gaseous hydrogen sulfide is unlikely to cause asphyxiation, it is both colorless, making it hard to detect, and is also potentially highly combustible.

P-



Hollywood – Lack of Comprehension



Leave the World Behind

Late in the night, the television switches to displaying an Emergency Action Notification from the Emergency Alert System on all channels.

The next morning, Rose is frustrated that the internet connection and TV are still down, which has prevented her from watching the series finale of Friends.

Reality Check



**NO
WARNINGS**

Grid Down

SWIFT 911TM Telephone Emergency Notification System (TENS)
EMERGENCY NOTIFICATION



Integrated Public Alert and Warning System



Emergency Alert System (EAS)



Wireless Emergency Alerts (WEA)



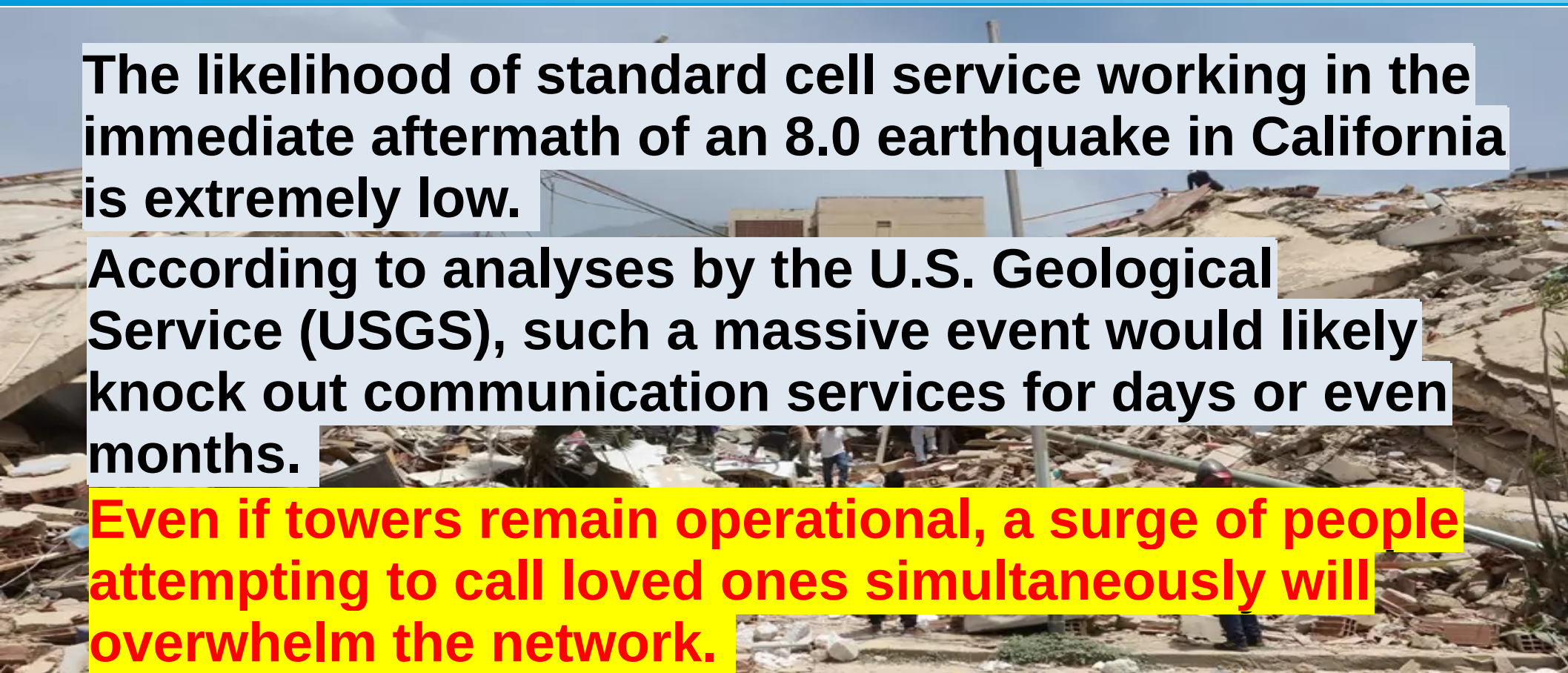
Wildfires & Floods

Reality check – Months without cell service

The likelihood of standard cell service working in the immediate aftermath of an 8.0 earthquake in California is extremely low.

According to analyses by the U.S. Geological Service (USGS), such a massive event would likely knock out communication services for days or even months.

Even if towers remain operational, a surge of people attempting to call loved ones simultaneously will overwhelm the network.



San Bernardino County Risks

- Earthquakes
- Severe Weather
- Human-Caused
- Wildfires
- Coronal Mass Ejections



San Bernardino City Faults

Major fault zones in the region include:

- **the San Andreas Fault, which runs through the northeast portion of the city;**
- **the San Jacinto Fault, which runs through the eastern portion of the city;**
- **the Elsinore Fault, located approximately 25 miles southwest of the city;**
- **and the Cucamonga Fault, located approximately 10 miles northwest of the city.**

Cajon Pass Stress Level – 1000 year high

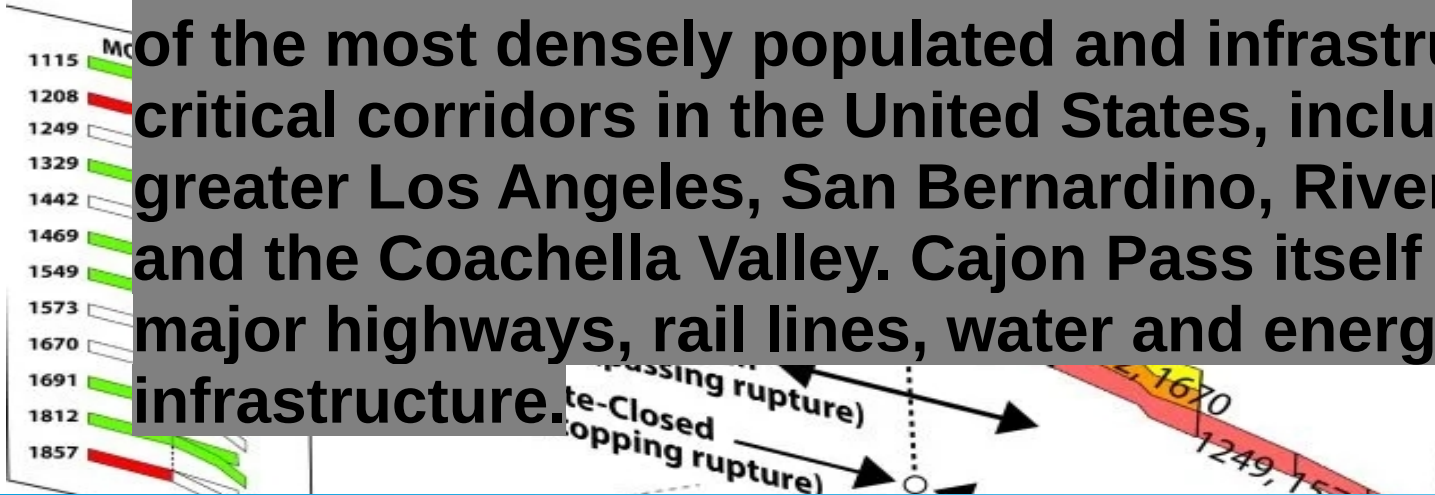
A new study has identified Cajon Pass as a critical “earthquake gate” between two of Southern California’s most active fault systems, with researchers finding stress levels along the San Andreas and San Jacinto faults have reached their **highest levels in the past 1,000 years.**

Victor Valley News - June 18 2026

June 2016 – What is this Gate thing?

Earthquake rupture extent for Cajon Pass events

If a rupture crossed Cajon Pass and involved both the San Andreas fault and the San Jacinto fault, it would be far more serious than an earthquake limited to one fault. The area at risk includes some of the most densely populated and infrastructure-critical corridors in the United States, including greater Los Angeles, San Bernardino, Riverside, and the Coachella Valley. Cajon Pass itself carries major highways, rail lines, water and energy infrastructure.



Cell phone Cyber Attacks

The risk of cyber attacks disabling cell phone communication is a growing critical infrastructure threat.

Nation-state actors and cybercriminals can overload networks, jam emergency dispatch, or infiltrate provider systems.

For example, a massive covert SIM farm dismantled by the U.S. Secret Service was capable of disabling cell towers and blacking out urban networks.

Internet-facing Rockwell Automation devices

4,400+ Internet-Exposed Rockwell PLCs

A coordinated cyberattack targeted operational technology at more than 30 community water systems in Minnesota between Sunday, July 26, and Monday, July 27, 2026.

Allen-Bradley
MicroLogix

Anonymous

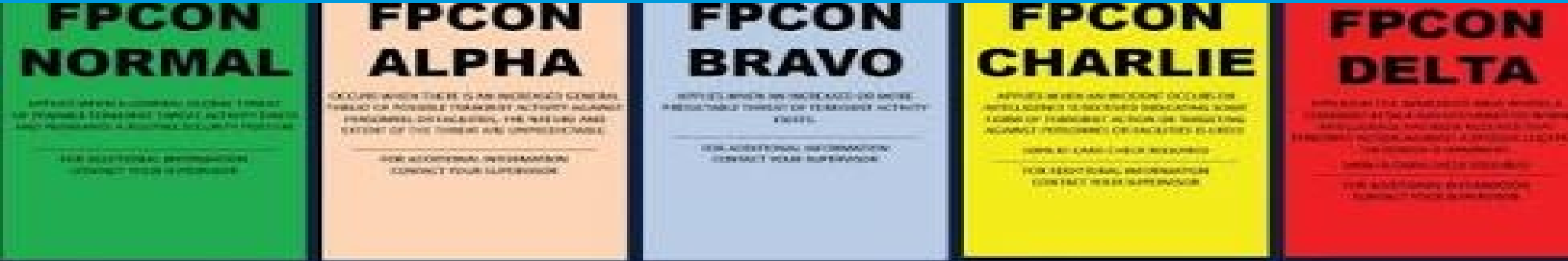
ANONYMOUS IS NOT A SINGLE CENTRALIZED ORGANIZATION, BUT RATHER A DECENTRALIZED, FLUID ONLINE COLLECTIVE WHERE ANYONE CAN CLAIM TO ACT UNDER THE NAME. OVER THE YEARS, FLUID CELLS OF PARTICIPANTS USING THE MONIKER HAVE LAUNCHED COORDINATED CYBERATTACKS, DATA LEAKS, AND REAL-WORLD PROTESTS TARGETING GOVERNMENTS, CORPORATIONS, AND EXTREMIST GROUPS.

More Data Centers – More Cyber Attacks

San Bernardino County is emerging as a strategic hub for AI data center development, driven by land availability and industrial infrastructure, though the region faces significant regulatory and utility cost hurdles.

While the city of San Bernardino itself hosts facilities like the Lumen San Bernardino 1 Data Center at 5705 Industrial Parkway, the broader county is seeing active planning for larger-scale projects in cities like Adelanto, Victorville, and Ontario.

FPCON Delta



Force Protection Delta (FPCON) is the highest and most restrictive level in the United States military, applied in the immediate area where a terrorist attack has occurred or when intelligence indicates that terrorist action against a specific location or person is imminent.

DID
YOU
KNOW

?

Linux is safer than Windows

Windows holds approximately 96% of the desktop market, making it the primary target for cybercriminals; over 95% of malware is designed specifically for Windows.

Linux uses an open-source model with strict user privileges, meaning malware cannot easily gain system-wide control without explicit root access, whereas Windows often allows applications broader permissions.

Linux's diverse distribution ecosystem and community-driven patching make universal exploits more difficult to develop.

Coronal Mass Ejection

Coronal Mass Ejections (CMEs) do not directly knock out cell phone signals or destroy your phone's inner parts, but they can cause indirect outages by crippling the power grids and satellites that mobile networks rely on.

Cell networks use ultra-high frequencies (usually 700 MHz to 3 GHz+). Solar flares and CMEs primarily disrupt high-frequency shortwave radio bands between 3 and 30 MHz,

Carrington Event

The Carrington Event was the most intense geomagnetic storm in recorded history, peaking on 1–2 September 1859 during solar cycle 10.



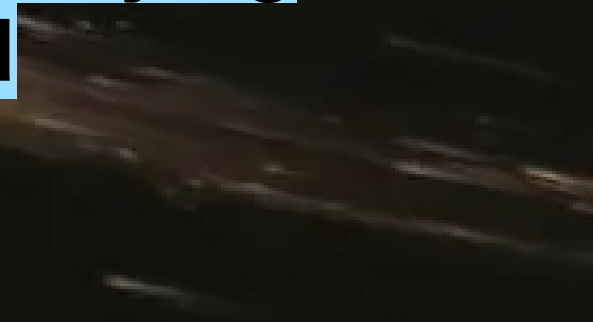
Carrington Event

Estimates from Lloyd's of London and the National Research Council suggest a modern Carrington-class event could cost the U.S. between \$600 billion and \$2.6 trillion, potentially causing long-term blackouts due to the destruction of high-voltage transformers that take months or years to replace.

Starlink

2020- 40 Starlink satellites doomed by geomagnetic storm

Starlink satellites are not hardened against physical impact from space debris or Coronal Mass Ejections (CMEs), relying instead on orbital avoidance and atmospheric reentry for safety.



Restoring Service

A total collapse often requires a complex "black start" procedure to safely restart power plants and gradually restore service, as generators cannot simply be turned on instantly without external power.

Stop Thinking in terms of “Days”

Restoring the Southern California electrical grid after a nuclear detonation would take months to several years, depending on the severity of the Electromagnetic Pulse (EMP) and blast damage.

Large replacement power transformers are extremely scarce, take 1 to 4 years to manufacture, and the U.S. is heavily dependent on overseas suppliers.

Presentation – Leaving Normal Now

“Normal” Pre-Disaster Baseline Defined



EmComm - Amateur Radio



“Always remember, that our Government has granted the radio amateurs more powers than any other country in the world, and in times of stress, it is up to the amateurs to show of what stuff they are made by cooperating with our officials to the fullest extent of their powers.”

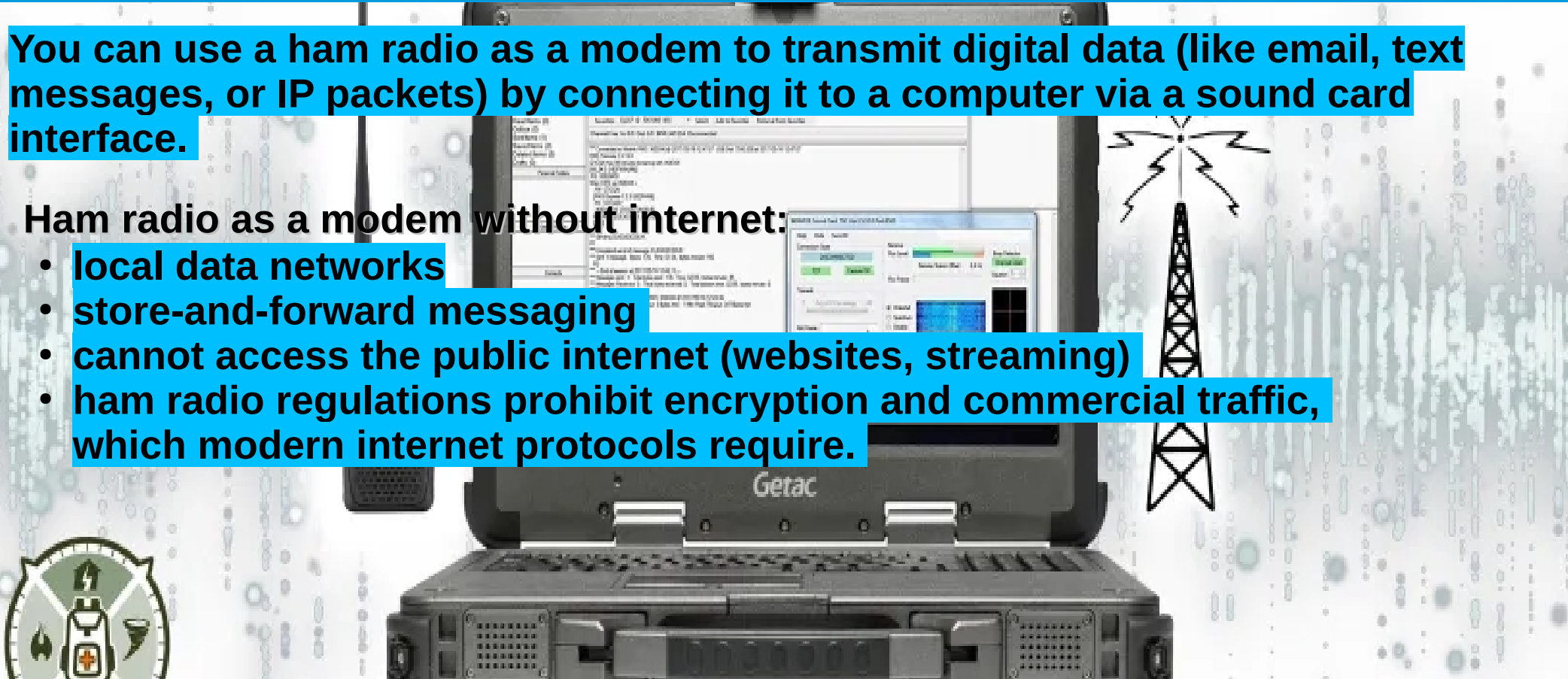
The Electrical Experimenter, vol. 5, no. 1, May 1917

Using a ham radio as a modem

You can use a ham radio as a modem to transmit digital data (like email, text messages, or IP packets) by connecting it to a computer via a sound card interface.

Ham radio as a modem without internet:

- **local data networks**
- **store-and-forward messaging**
- **cannot access the public internet (websites, streaming)**
- **ham radio regulations prohibit encryption and commercial traffic, which modern internet protocols require.**

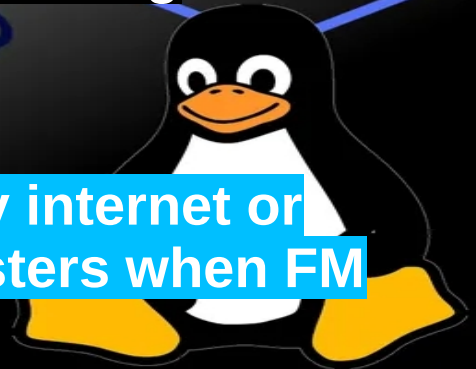


Durable Messaging

✓ Winlink provides distinct advantages over traditional FM voice transmissions by enabling error-free digital data transfer, structured message formats, and infrastructure-independent connectivity.

Asynchronous Operation: Winlink uses a store-and-forward protocol, allowing operators to send messages to a gateway and retrieve them later, whereas FM requires both parties to be actively listening simultaneously.

Peer-to-Peer Resilience: Winlink supports peer-to-peer (P2P) communication between two stations without any internet or repeater infrastructure, ensuring reliability during disasters when FM repeaters may lose power or connectivity.



Ham Radio – Getting EmComm Training



Official Organizations

Amateur Ham Radio



Government



ARRL



In today's Amateur Radio, disaster work is a highly organized and worthwhile part of day-to-day operation, implemented principally through the Amateur Radio Emergency Service (ARES) and the National Traffic System (NTS), both sponsored by ARRL.

ARES is activated by the local ARRL Emergency Coordinator (EC) or an Assistant Emergency Coordinator (AEC)

San Bernardino County – ECS merged ARES

In San Bernardino County, the Amateur Radio Emergency Service (ARES) supports emergency response primarily through its **integration into the Emergency Communications Service (ECS)**.



Unlike some jurisdictions where ARES operates as a standalone volunteer group, San Bernardino County formally merged ARES and RACES (Radio Amateur Civil Emergency Service) into the ECS in 1999 to create a unified, professional support unit for the San Bernardino County Fire Department and the Office of Emergency Services (OES).

US Radio Communication Orgs



Amateur Radio Emergency Service (ARES) is an organization of amateur operators sponsored by the American Radio Relay League (ARRL).



Radio Relay International provides radio operator certification and organizes radio networks and volunteers to respond to emergencies as outlined in a National Response Plan.



Radio Amateur Civil Emergency Service (RACES) is a standby replacement radio service regulated by the Federal Communications Commission. Operations under the RACES rules requires preregistration with a local civil defense organization.

ARES



Amateur Radio Emergency Service (ARES) is a nationwide corps of volunteer FCC-licensed amateur radio operators who provide emergency communications support when traditional infrastructure fails.

Radio Relay International



Operating primarily in North America with affiliates in Europe, Asia, and Oceania, RRI functions as a survivable, decentralized communication network designed to maintain connectivity during disasters when standard infrastructure fails.

Radio Relay International -History



In July 2016, the ARRL board of directors ordered the restructuring of NTS area and region volunteer organization, eliminating elected management.

Radio Relay International - History



This disenfranchisement and related developments led to the establishment of Radio Relay International (RRI) as an independent organization with a dedicated purpose and clear principles, transparent and accountable governance, an elected management structure, and devoted operators.

RRI Withdraws from NTS – Uses DTN

In July, 2016, all digital operations in the Central and Western (formerly Pacific) Areas as well as a portion of the Eastern Area withdrew from affiliation with the ARRL, effectively eliminating the National Traffic System Digital (NTSD) subsystem. In August, 2016, all regional hub operations were reconstituted as a new Digital Traffic Network (DTN). In September, 2016, the DTN affiliated with the Radio Relay International (RRI) organization as part of a reconstitution of the entire traffic handling system at the region and above levels.

RRI/ARRL – Bifurcated System



Impact on NTSD and Digital Operations

The split resulted in a bifurcated system where traditional manual nets (voice and CW) largely remained under the ARRL banner, while the digital infrastructure migrated to RRI.

Operational Independence: RRI developed its own training programs, National Response Plan, and communication facilities independent of ARRL management.

RRI/ARRL – Restoration July 2025



Restoration of Leadership: In July 2025, the ARRL Board of Directors unanimously passed a motion to rescind the 2016 decision and reinstate the Area Staff Chairs for the Eastern, Central, and Western Areas.

Joint Appointments: Interim Area Chairs have been appointed representing both ARRL and RRI, signaling a return to a collaborative management structure for the National Traffic System.

RRI/ARRL – 2026 Relationship



Joint Governance: The ARRL Board reinstated Area Chairs for the NTS, with interim appointments representing both ARRL and RRI to oversee the national network. Elections completed in Nov 2025 for 3 year terms.

Standard Harmonization: RRI eliminated its "RRC" radiogram codes to harmonize with ARRL's traditional "ARL" nomenclature, ensuring interoperability in traffic handling.

Joint Appointments: Interim Area Chairs have been appointed representing both ARRL and RRI, signaling a return to a collaborative management structure for the NTS. Elections have not been confirmed.

RACES

Radio Amateur Civil Emergency Service

Activated only by a local, state, or federal emergency management authority during specific emergencies or when the President invokes the War Powers Act.



MARS

U.S. Army Military Auxiliary Radio System (AMARS)

MARS is an elite group of dedicated citizen volunteers who support the Department of Defense (DoD) in a variety of circumstances, including complex catastrophes and cyber denied or impaired conditions.

In 2015, the Navy-Marine Corps MARS program was phased out, with its operational mission transitioning to the Army and Air Force MARS branches to better align with national mission requirements, particularly as Army MARS became the lead for contingency communications.



Skywarn



SKYWARN is a volunteer program run by the National Weather Service (NWS) that consists of trained storm spotters who observe and report severe weather in real-time.

AUXCOM



AUXCOMM (Auxiliary Communications) is an all-inclusive term developed by the Cybersecurity and Infrastructure Security Agency (CISA) in 2009 to describe organizations and personnel that provide voluntary emergency communications support to public safety and government agencies.

CISA

Cybersecurity and Infrastructure Security Agency (CISA)

CISA leads the national effort to defend critical infrastructure against the threats of today, while working with partners across all levels of government and in the private sector to secure against the evolving risks of tomorrow.

CISA is responsible for protecting the Nation's critical infrastructure from physical and cyber threats.



SATURN



SATERN (Salvation Army Team Emergency Radio Network) is a global network of volunteer amateur radio operators and communications specialists that provides critical emergency communications for The Salvation Army during disasters.

National Traffic System (NTS)



The National Traffic System (NTS) is an organized network of amateur radio operators, sponsored by the ARRL, designed to relay formal written messages (radiograms) across the United States and Canada. Its primary goal is to move messages from origin to destination within 24 hours, ensuring reliable communication during emergencies when normal infrastructure may be disrupted.

National Traffic System (NTS)



The National Traffic System (NTS) is a field organization of the American Radio Relay League (ARRL). Messages are sent in the standard ARRL Radiogram format. During normal times messages are routine greetings like “Happy Birthday.” The Radiograms are relayed through amateur radio operators within a series of formal networks. The message is eventually delivered to the intended person, amateur or not, by any means necessary, including telephone or regular email.

Radiogram

THE AMERICAN RADIO RELAY LEAGUE RADIOGRAM VIA AMATEUR RADIO									
NUMBER 1	PRECEDENCE R	HR G	STATION OF ORIGIN K4IWW	CHECK 12	PLACE OF ORIGIN CARY NC	TIME FILED	DATE DEC 20		
TO JOHN Q PUBLIC 1234 MAPLE AVE ANYTOWN NC 27000						THIS RADIO MESSAGE WAS RECEIVED AT AMATEUR STATION _____ PHONE _____ NAME _____ STREET ADDRESS _____ CITY AND STATE _____			
TELEPHONE NUMBER 919 555 1234									
ARRIVE		7PM		DEC		24		X	
LOOKING		FORWARD		TO		SEEING		YOU	
X		LOVE							
BETTY M PUBLIC									
REC'D	FROM W3YVQ	DATE DEC 22	TIME 1845	SENT	TO DELIVERED	DATE DEC 22	TIME 1905		
THIS MESSAGE WAS RECEIVED BY THE STATION WHERE THE RADIOGRAM WAS SENT. THE STATION WHERE THE RADIOGRAM WAS RECEIVED IS NOT RESPONSIBLE FOR THE DELIVERY OF THE MESSAGE. THE MESSAGE IS HANDLED SOLELY FOR THE BENEFIT OF THE STATION WHERE IT WAS RECEIVED. THE STATION WHERE IT WAS RECEIVED IS NOT RESPONSIBLE FOR THE DELIVERY OF THE MESSAGE. THE MESSAGE IS HANDLED SOLELY FOR THE BENEFIT OF THE STATION WHERE IT WAS RECEIVED.				THE AMERICAN RADIO RELAY LEAGUE, INC., IS THE NATIONAL ORGANIZATION OF THE SOCIETY OF LICENSED RADIO AMATEURS. THE LEAGUE IS A 501(C)(3) NON-PROFIT ORGANIZATION. THE LEAGUE'S PURPOSE IS TO PROMOTE THE INTERESTS OF THE RADIO AMATEUR COMMUNITY AND TO PROVIDE A MEANS FOR THE EXCHANGE OF INFORMATION AND IDEAS AMONG RADIO AMATEURS. THE LEAGUE IS NOT A POLITICAL OR RELIGIOUS ORGANIZATION. THE LEAGUE'S PURPOSE IS TO PROMOTE THE INTERESTS OF THE RADIO AMATEUR COMMUNITY AND TO PROVIDE A MEANS FOR THE EXCHANGE OF INFORMATION AND IDEAS AMONG RADIO AMATEURS.					
FORMED IN 1914									

Form: Copyright 1995, American Radio Relay League. Used with permission

Radiogram ICS213

GENERAL MESSAGE (ICS 213)		
1. Incident Name (Optional):		
2. To (Name and Position):		
3. From (Name and Position):		
4. Subject:	5. Date:	6. Time:
7. Message:		
8. Approved by: Name: Signature: Position/Title:		
9. Reply:		
10. Replied by: Name: Position/Title: Signature:		
ICS 213	Date/Time:	

The Radiogram-ICS213 is a messaging format that integrates the NIMS ICS Form 213 (General Message) standard with the traditional ARRL/RRI Radiogram structure to ensure interoperability between amateur radio networks and emergency management agencies. Developed primarily by Radio Relay International (RRI) in cooperation with the Winlink Development Team

CbarC 146.850 (+) 146.2 Repeater



During an official emergency declaration, the ARES CbarC repeater does not unilaterally self-activate. Members must wait for an official activation from ARES/RACES or Emergency Management before transmitting on the 146.850 MHz frequency.



W6JBT repeater

The Citrus Belt Amateur Radio Club (W6JBT) is not explicitly listed as an official ARES station , but it has strong ties to the organization. The club's membership application allows members to identify as part of ARES, and the club specializes in Public Service/Emergency communications, which is a core function of ARES. Additionally, the club operates repeaters and offers emergency communication support for state, county, and city levels, aligning with ARES activities.

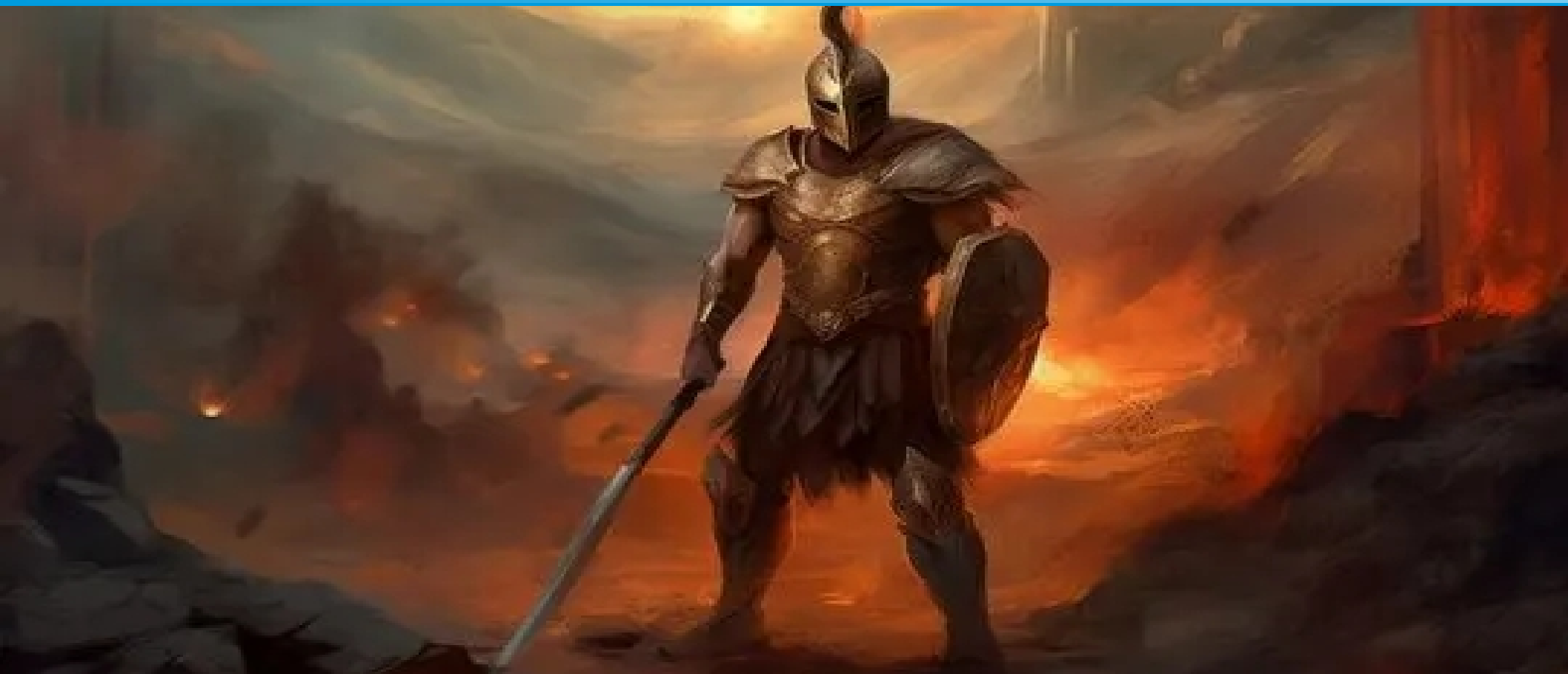
NTS - San Bernardino County Nets (2 meter)

146.385 MHz (+) PL 146.2: This is the Keller Peak Repeater, serving as the Official Emergency Communication Repeater for the Inland Empire. It hosts several local nets including the Southern California Net (SCN/V) on Mondays, Wednesdays, and Fridays at 9:00 PM local time.



National Traffic System Net: Meets at 9:00 PM on Mondays, Wednesdays, and Fridays, as well as during emergencies, typically routed through the Inland Empire repeater systems.

Seeking ARES – God of War ?

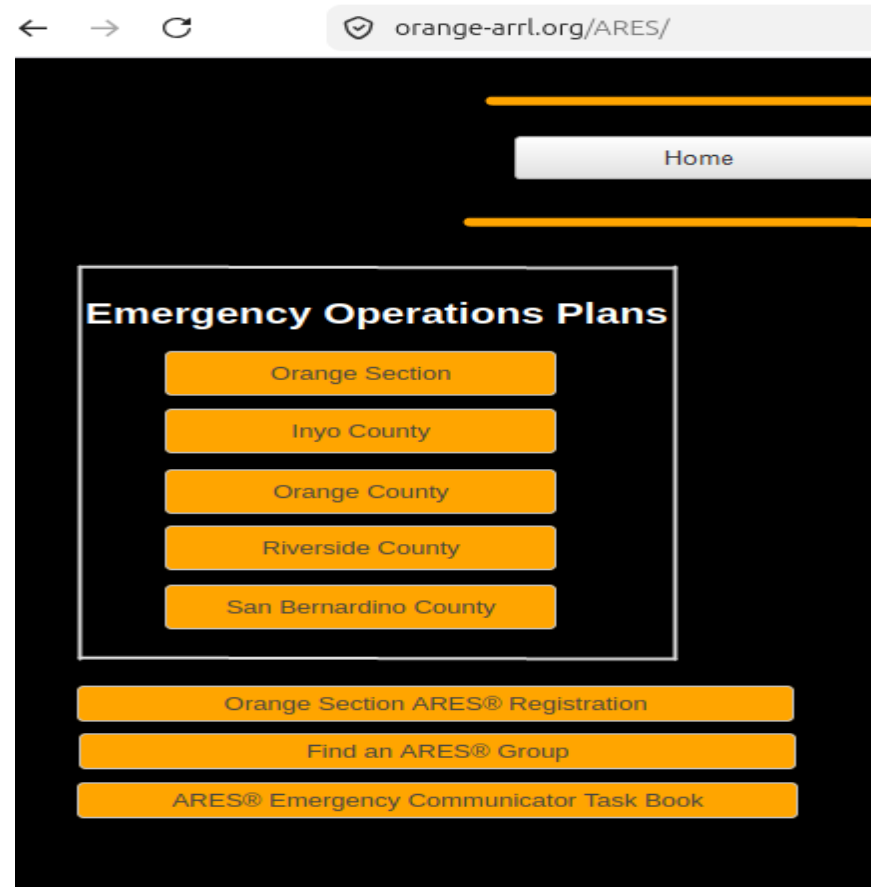


ARES Registration

Crestline is in ARRL Orange District

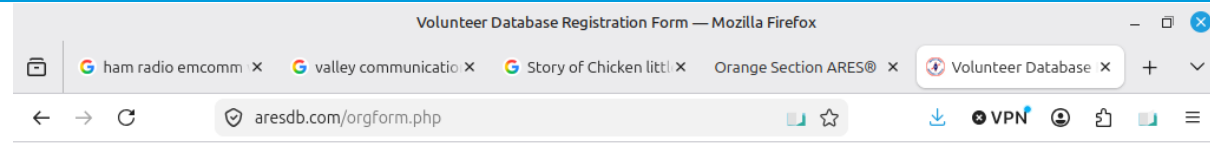
Go to the Orange Section website
(www.orange-arrrl.org)

Select Orange Section ARES Registration



ARES Registration (cont)

Choose your orgs from
dropdowns



According to our records, SAN BERNARDINO county (zip code 92325), which is in the ORG ARRL Section. You may select to register with one of these organizations in your section:

Mountain Top ARES (ORG) ▼

Please select the second group to register with:

San Bernardino County (ORG) ▼

Please select the third group to register with:

Riverside County Mountain District (ORG) ▼

SUBMIT ENTRY

The listed groups are the only ones registered in each ARRL Section. If you do not see your local group, please contact the responsible individual and suggest that they sign up for this service. It is free of charge to all Amateur Radio ARES/RACES/ACS/Skywarn groups. Please come back to sign up when your group is registered.



ARES Registration (cont)

Fill out your info

Volunteer Database Registration Form — Mozilla Firefox

ham radio emcomm × valley communicatio × Story of Chicken littl × Orange Section ARES® × Volunteer Database ×

aresdb.com/entryform.php

Please fill out the form below to register with:

Mountain Top ARES

San Bernardino County

Riverside County Mountain District

CONTACT INFORMATION

Your Callsign:

Password (To modify your information):

Re-Enter Password (To confirm):

Your Name (Ex. Public, John Q):

Street Address:

City:

State (US) or Province (Canada):

Zip or Postal Code:

11:53

ARES Registration- Confirmation Email

After submitting , you will receive a confirmation email

 webmaster@aresdb.com
webmaster@aresdb.com

 Reply

 Forward

 Archive

 Jun

To KO6LVT@Gmail.com

Registration info for KO6LVT

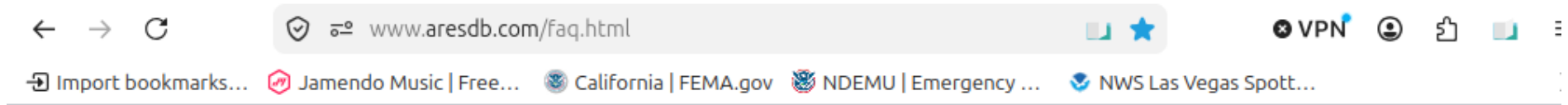
KO6LVT, thank you for registering at www.aresdb.com.

Please remember to update your record with your current availability or other applicable data as it changes.

Thanks again for registering! ***Automated Message***

ARESDb.com

To Register for ARES go to
<http://aresdb.com>



WWW.ARESDB.COM FAQ

OK, what's this site for? What can it do?

The site can be used to register for any of several amateur radio emergency communications programs - ARES, RACES, ACS, AUXCOMM, SKYWARN, etc. It can also be used to search registered members for matching capabilities and email or text those members for general communications or alerting purposes.

Mountain Top ARES Requirements

Certifications

Members must have ICS certifications for the following FEMA courses:

IS-100

IS-200

IS-700

IS-800

ARES Level 1 Requirements

ARES® TRAINING LEVEL			
Level 1			
This is the primary level for those who choose a non-leadership role as well as those new to Amateur Radio or emergency communications. This introductory training is conducted by the local ARES group to meet its needs and those of its served agency or partners. This training could be formal or informal and would introduce the ARES participant to the fundamentals of emergency communications and provide instructions on how participants are to conduct themselves while serving in the field or otherwise activated. Participants are encouraged to complete Level 1 and advance to level 2 as soon as practical. R = Required, O = Optional, E = Encouraged			
TASK	R-O-E	COMPLETION DATE	EC Sign Off
Education			
ICS-100.c- Intro to Incident Command System*	O		
ICS-700.b Introduction to National Incident Mgt. System*	O		
SKYWARN - Spotter Basic Training (Biennially)	O		
ARRL EC-001 Introduction to Emergency Communications	O		
Comment: *Sets initial baseline requirements. Will likely be insufficient for deployment at an incident.			
Participation			
Obtain Task Book	R		
Join an ARES® group	R		
Comment:			
Proficiency/Skill			
Obtain Technician class or higher Amateur Radio License	R		
Comment:			

This is an entry level for those who choose a non-leadership role as well as those new to Ham Radio or emergency communications. This introductory training is conducted by the local ARES group to meet their needs and those of their served agency or partners.

This introduces ARES participants to the fundamentals of emergency communications and provides instruction on how participants are to conduct themselves while serving in the field or otherwise activated.

ARES – 2025 Plan Basic

This is an entry level for those who choose a non-leadership role as well as those new to Amateur Radio or emergency communications. This introductory training is conducted by the local ARES group to meet their needs and those of their served agency or partners.

This training includes **FEMA IS-100, IS-200, IS-700 and IS-800 and the ARRL ARES Basic EmComm course.**

Members should also have completed the ARES Position Task Book (PTB) for level 1. This introduces ARES participants to the fundamentals of emergency communications and provides instruction on how participants are to conduct themselves while serving in the field or otherwise activated.

ARES Task Book

ARES® EMERGENCY COMMUNICATOR INDIVIDUAL TASK BOOK

Task Book
Assigned To:

Name: Gregory Newbrough _____ Call: KO6LVT _____

ARES® Group: _____

Phone Number: _____ Email: _____

Task Book
Initiated By:

ARES® Leader's Name: _____ Call: _____

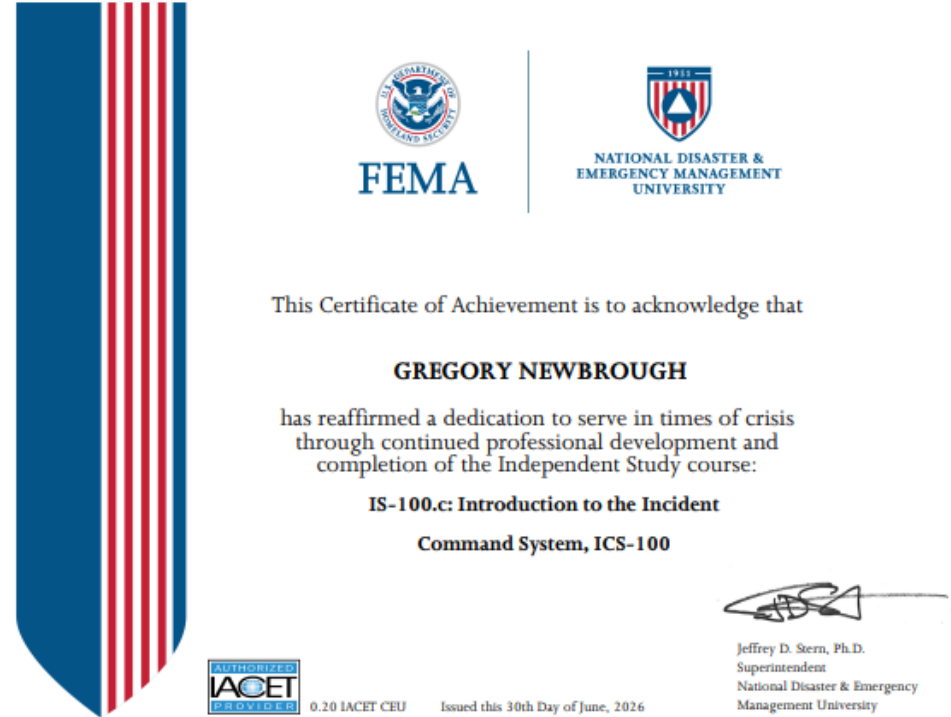
Title: _____ ARES Group: _____

Ver. 2.1.0

Basic (Level 1): The introductory level. It establishes core requirements like completing an introductory amateur radio course, basic ICS training, and demonstrating the ability to program and operate your radio effectively.

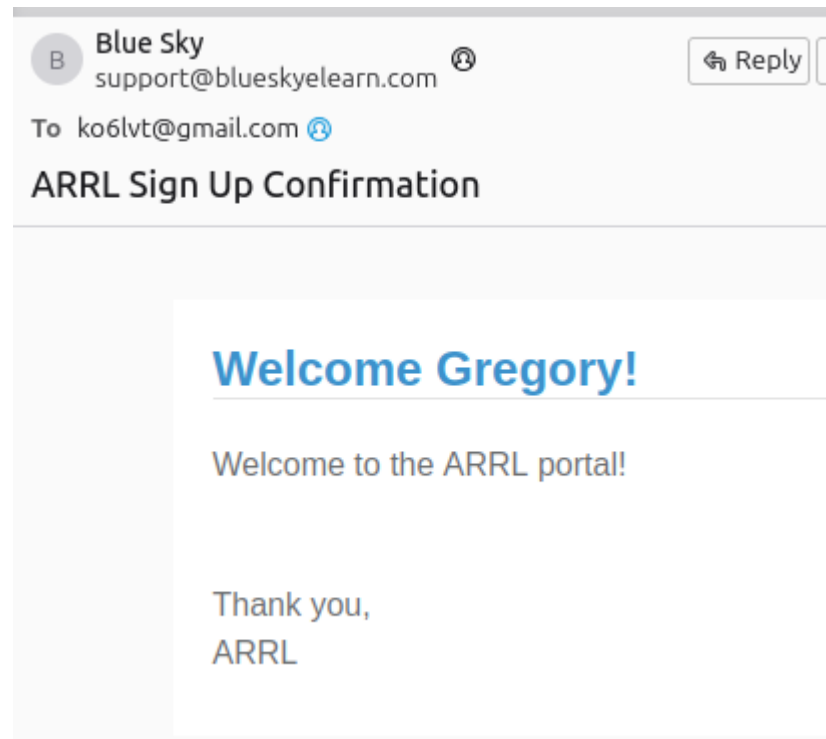
IS-100.C Intro Incident Command System (ICS)

ICS 100, Introduction to the Incident Command System, introduces the Incident Command System (ICS) and provides the foundation for higher level ICS training.

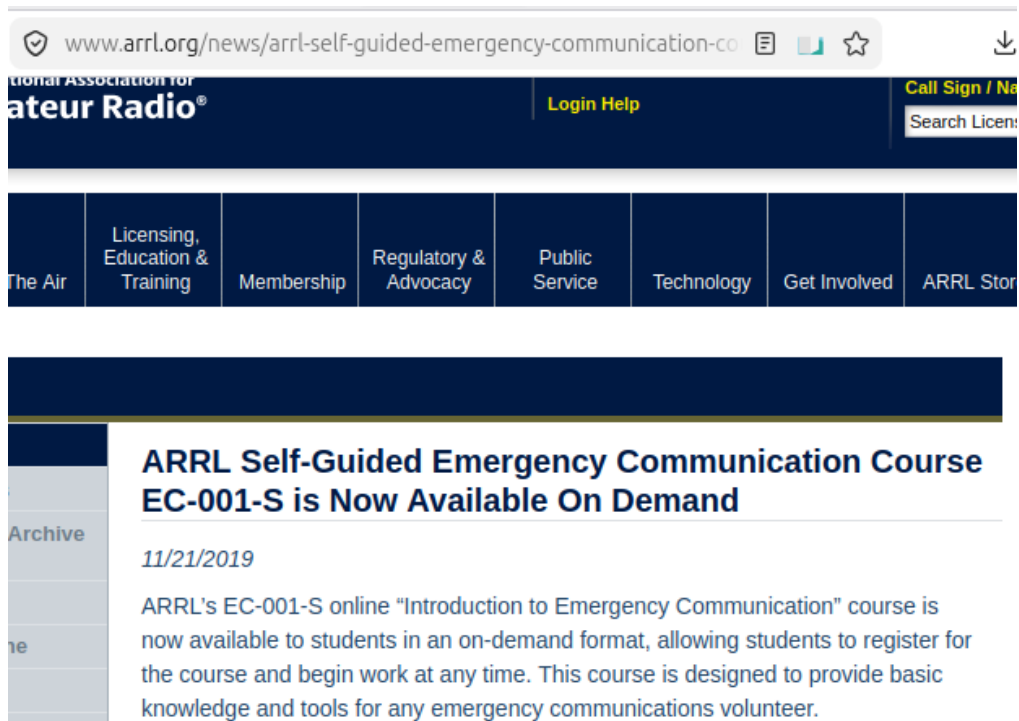


ARRL Learn

You need to be logged into the Learning Center and be a current ARRL member to access the registration. Click the event and click the blue "Register" button. When you are on the specific event page, you will see a ribbon reading "Registered" across the top right hand corner of the box.



ARRL EC 100 – Intro to Emergency Communications



The screenshot shows the ARRL website with the URL www.arrl.org/news/arrl-self-guided-emergency-communication-co in the browser address bar. The page features a dark blue header with the ARRL logo and navigation links. Below the header is a horizontal menu with categories: The Air, Licensing, Education & Training, Membership, Regulatory & Advocacy, Public Service, Technology, Get Involved, and ARRL Store. The main content area displays a news article titled "ARRL Self-Guided Emergency Communication Course EC-001-S is Now Available On Demand" dated 11/21/2019. The article text states: "ARRL's EC-001-S online 'Introduction to Emergency Communication' course is now available to students in an on-demand format, allowing students to register for the course and begin work at any time. This course is designed to provide basic knowledge and tools for any emergency communications volunteer."

ARRL Self-Guided Emergency Communication Course
EC-001-S is Now Available On Demand

11/21/2019

ARRL's EC-001-S online "Introduction to Emergency Communication" course is now available to students in an on-demand format, allowing students to register for the course and begin work at any time. This course is designed to provide basic knowledge and tools for any emergency communications volunteer.

ARRL's EC-001-S
online does not seem to
be available to "free"
ARRL members.

Trying to justify the
\$59/yr member dues...

Skywarn Training

Step-by-Step Training Guide

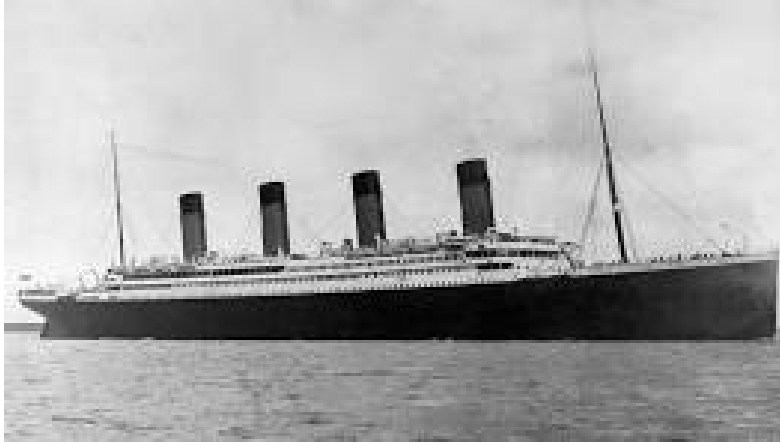
Create a Free Account: Go to the MetEd Registration Page to sign up for a free student account.

Take Course 1: Complete the module called "SKYWARN® Spotter: Role of the Skywarn Spotter". This covers the basics of what a spotter does and how to stay safe.

Take Course 2: Complete the module called "SKYWARN® Spotter: Convective Basics". This teaches you how storms work and how to identify features like wall clouds and shelf clouds.



History of Ham Radio Licensing



The U.S. government began to regulate amateur radio after the April 15, 1912 sinking of the Titanic

Amateur operators ("hams") used spark transmitters with wide bandwidths, which created static and noise that made it difficult for the Titanic's operators to send distress signals or for nearby ships to receive them.

Novice operators on the U.S. East Coast intercepted and relayed false news, such as a fabricated message claiming all passengers were safe and the ship was being towed to Halifax, which caused public panic and delayed accurate reporting.

Radio Act of 1912

The ham radio interference, false information and confusion about the actual Titanic sinking led to the passage of the Radio Act of 1912,

- which required federal licensing for all operators,**
- established 24-hour radio monitoring for ships,**
- and restricted amateur transmissions to specific frequencies to prevent future interference with maritime distress calls.**

2026-Health of ARES

**Is ARES a Ghost ship with no captain and
no one awake in port to answer any Mayday**



Is the Caverly Coming?

A dramatic scene featuring several soldiers on horseback, silhouetted against a bright, hazy sunset. They are positioned in a field, with a large American flag flying prominently on the left. The soldiers are wearing top hats and carrying rifles, suggesting a historical military context. The overall atmosphere is one of anticipation and solemnity.

The Caverly isn't coming. It falls to you

FEMA - 2026



FEMA

FEMA is operating with significantly reduced capacity in 2026, having lost approximately 14% of its workforce since January 2025 and facing a \$646 million budget cut proposed by the current administration. The agency is currently overburdened, attempting to manage a backlog of over 300,000 projects across 600 open disaster declarations with fewer staff, while its Disaster Relief Fund was recently drained to emergency levels following a 76-day government shutdown.



FEMA

Staffing and Operational Crises

The reduction in personnel includes the potential non-renewal of contracts for thousands of workers in the CORE division (Cadre of On-Call Response and Recovery), which comprises about 40% of FEMA's workforce. This downsizing occurred despite a prior Government Accountability Office finding that the agency was already short by more than 6,000 employees relative to its staffing targets.

Consequently, national readiness is weakened, with over 700 major disasters remaining open and active, forcing responders to be diverted from recovery efforts to handle new emergencies.

FACTS

During the 2025 Los Angeles fires, the current administration threatened to withhold disaster aid unless the state enacted voter ID laws and allowed FEMA to take over water management policy.

In August 2025, the current administration threatened to withhold at least \$1.9 billion in FEMA disaster preparedness funding from states and local governments that support boycotts of Israel or Israeli firms, requiring applicants to certify they do not support severing commercial relations with Israel.

Related Reading



Public Service Communications Manual

published by
The American Radio Relay League

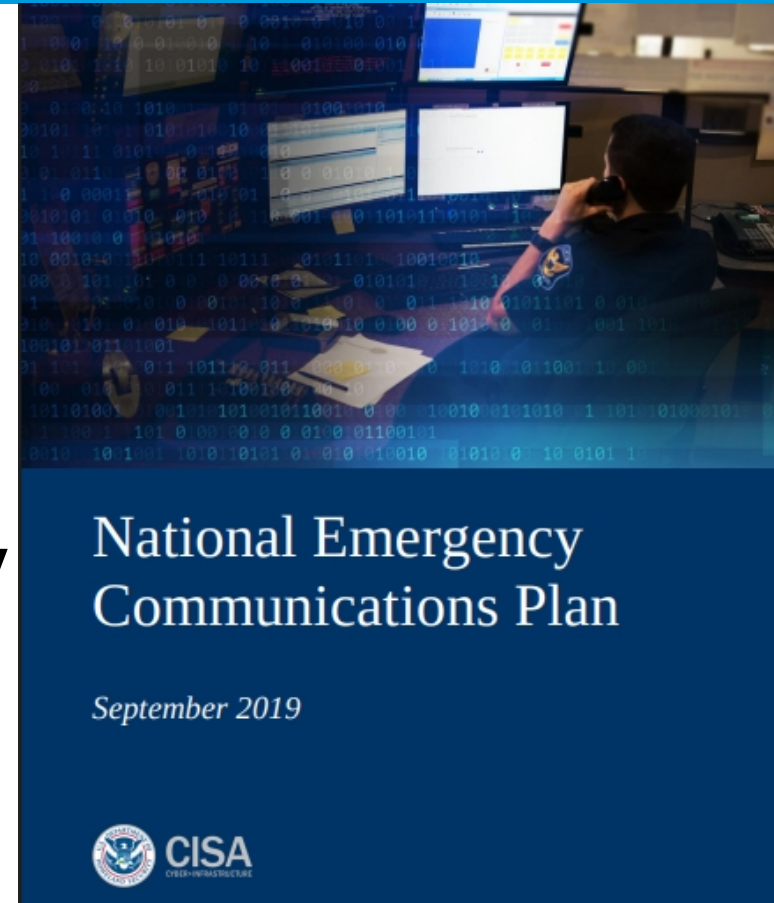


Radio Relay
International

PUBLIC SERVICE COMMUNICATIONS FOR THE 21ST CENTURY

National Emergency Comms Plan

The National Emergency Communications Plan (NECP) is the Nation's roadmap to ensuring emergency communications interoperability at all levels of government



ARRL Public Service Communications Manual



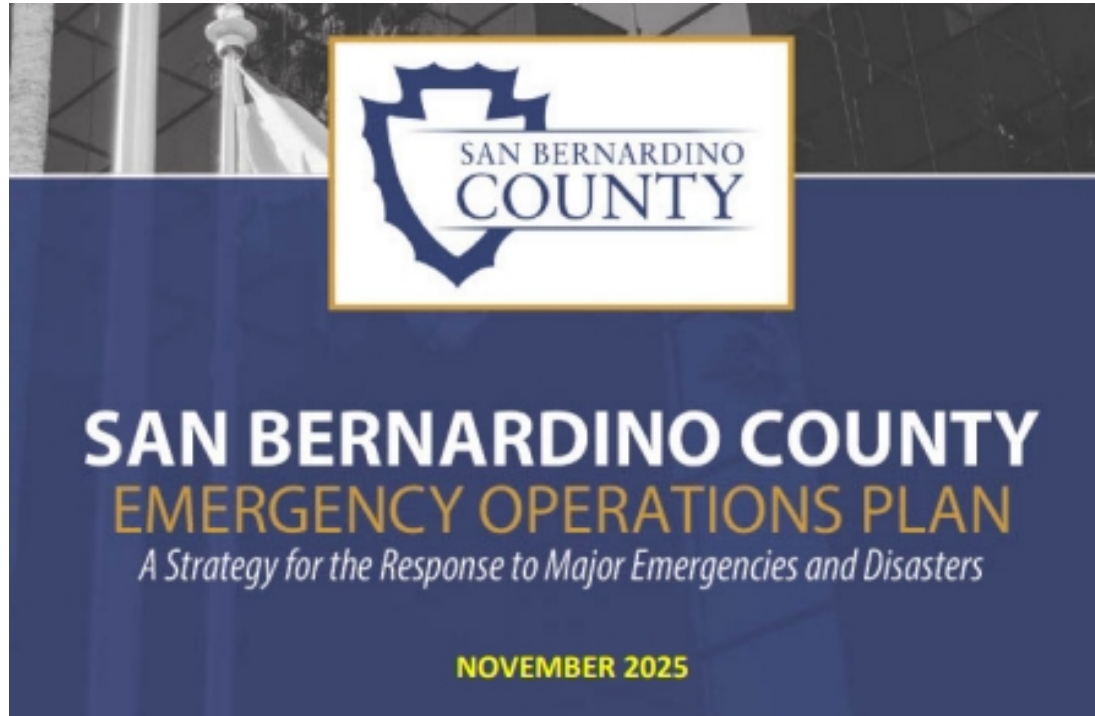
The ARRL Public Service Communications Manual (PSCM) is the official guide created by the American Radio Relay League (ARRL) to organize and manage emergency ham radio communications. It sets the rules for how amateur radio operators help their communities during disasters, major accidents, or public gatherings. You can read the foundational outline of the ARRL Public Service Communications Manual on pwcares.org. (61 pages)

RRI Public Service Communications



Radio Relay International (RRI) outlines its disaster response mission in the document titled Public Service Communications for the 21st Century. The framework integrates amateur radio with modern tools like the Digital Traffic Network (DTN) and the Winlink SMS Gateway to provide survivable emergency communications. (16 pages)

San Bernardino County EOP



ECS – Volunteer radio operator

To join the San Bernardino County Emergency Comm Service (ECS) as a volunteer radio operator, you must apply through the San Bernardino County Office of Emergency Services (OES)

Submit an Application: Complete the official volunteer paperwork hosted online through the San Bernardino County Government Jobs portal.

Clear the Background Check: Successfully pass a Department of Justice (DOJ) and FBI background screening, along with a reference review.

ECS – Volunteer Radio Operator (cont)

Register as a Disaster Worker: Formally sign up as a State of California Disaster Service Worker (DSW) via Cal OES.

Complete Initial Training: Acquire your mandatory safety and emergency management training certificates within your first 60 days in the program.

Cellular Network Disaster Response

Valley Communication Center

If cellular networks go completely dark, San Bernardino County relies on alternative systems to manage the disaster and assist the public:

Emergency Communication Services (ECS): This is a dedicated team of over 200 trained volunteers managed by San Bernardino County Fire. They use HAM radio (amateur radio) frequencies to send critical messages across the county when normal infrastructure fails.

San Bernardino ECS Simplex

Valley Communication Center

First Ward (SBC 1): 144.310 MHz Simplex

Second Ward (SBC 2): 144.315 MHz Simplex

Third Ward (SBC 3): 144.320 MHz Simplex

Fourth Ward (SBC 4): 144.325 MHz Simplex

Fifth Ward (SBC 5): 144.330 MHz Simplex

Sixth Ward (SBC 6): 144.335 MHz Simplex

Seventh Ward (SBC 7): 145.510 MHz Simplex

San Bernardino ECS Simplex

Valley Communication Center

Patton State Hospital

Patton State Hospital sits entirely within the city limits of San Bernardino and is located in the city's 2nd Ward.

Second Ward (SBC 2): 144.315 MHz Simplex



San Bernardino ECS Repeaters

Valley Communication Center

146.820 MHz (Minus offset, no PL tone / CSQ)

146.850 MHz (Minus offset, 146.2 Hz PL tone)

146.940 MHz (Minus offset, 91.5 Hz PL tone)



San Bernardino ECS P25

Valley Communication Center

For official communication back to the Emergency Operations Center (EOC), public safety agencies switch to specialized 700/800 MHz digital P25 trunked channels. Ham operators are restricted to their licensed amateur bands and pass message traffic across to these official nets.



San Bernardino County Radio Towers

Site hardening that ham radio repeaters do not have

Microwave Networking: Tower sites, including the High Desert Public Safety Operations Center, feature microwave relay systems that allow radio traffic to automatically re-route if a primary link goes down, maintaining uninterrupted communications.

Structural Fortification: Towers and associated dispatch facilities are built with blast- and bullet-resistant components, and are strategically located to survive regional threats like wildfires or floods

ARRL Director of Emergency Management



ARRL Director of Emergency Management Josh Johnston, KE5MHV. Johnston is from Ozone, Arkansas, and comes to ARRL with 16 years of experience as the Director of Johnson County (Arkansas) Department of Emergency Management. He holds an Extra class Amateur Radio license as well as being an **ARES®** Emergency Coordinator

ARRL Orange Section Manager

Orange Section



Inyo, Orange, Riverside and San Bernardino Counties

Robert L Turner, W6RHK
PO Box 973
Perris, CA 92572
951-236-8975

e-mail: W6RHK@ARRL.org

Main Webpage: <https://www.ORANGE-ARRL.org>
See also <https://www.arrl.org/Groups/view/orange>

ARRL Orange Assistant Section Manager



Gordon West, WB9NOA

**I am on the air, Monday thru Fridays,
8:30am - 9:00am, California time, with
my net on 40 meters, 7250 kHz. Locally,
call me on 144.330 MHz, tone of 173.8
Hz. Visitors are always welcomed to the
WB6NOA Shack**

ARRL Orange Assistant Emergency Coordinator



Bob Smith KO6BOB

**Assistant Section
Emergency Coordinator
(ASEC), San Bernardino
County**

Email: KO6BOB@gmail.com

Bob lives in Yermo, CA

ARRL Orange Affiliated Club Coordinator



Clint Bradford, K6LCSC
He is really into Satellites!

clintbradford@mac.com

Clint lives in Yuropa Valley

NTS - Orange Section Traffic Manager



As of June 2026, the current Section Traffic Manager (STM) for the Orange ARRL Section, which includes San Bernardino County, is

Grant S. Gemel (KK6AHZ)

19080 Madrone St

Hesperia, CA 9234₅

EmComm – San Bernardino County Fire



Dan Munsey is the Fire Chief and Fire Warden of the San Bernardino County Fire Protection District in California, a position he has held since November 20, 2019. He oversees the largest fire protection district in the United States, which spans over 20,000 square miles—an area larger than nine individual states combined—and serves approximately 2.2 million residents

San Bernardino County Chief Radio Officer



Keith Morris KC6ZGG serves as the Chief Radio Officer for the San Bernardino County Office of Emergency Services (OES) in California.

He directs, coordinates, trains, and supports auxiliary volunteer radio operators.

Keith lives in Victorville.

SHTF Frequencies

Unofficial Emergency Frequencies

Band	Frequency	License	Range	Details
MURS	151.940	None	2 Miles	Channel 3-Good for your grandma
CB	27.065	None	4 Miles	Channel 9-Good for on the road
CB	27.185	None	4 Miles	Channel 19-Road updates but works for emergencies.
GMRS	462.675	No test FCC License	3 Miles	Repeater CTSS 141.3
2M Simplex	146.520	5 Miles	FCC Tech License	Good for Emergencies
70cm Simplex	446.000	5 miles	FCC Tech	Good for urban(Buildings)
80M	3.975	25 Miles	FCC General	LSB - Needs 140ft for dipole
40M	7.250 MHz	25 Miles	FCC General	LSB-Needs 70ft for dipole
20M	14.300 MHz	50 Miles	FCC General	USB-Needs 35ft for dipole
JS8Call-40M	7.078 MHz	100 Miles	FCC General	With relay-1000+ miles
JS8Call-20M	14.070 MHz	100 Miles	FCC General	With relay-1000+ miles

Nets

MAARC Weekly Net: The Mountain Area Amateur Radio Community hosts a weekly net on Tuesdays at 19:45 hours (7:45 PM) on the Crestline Repeater (146.850 MHz, - offset, 146.2 PL)

Daily Tech Net: Runs Monday through Friday at 07:00 AM on the local Crestline Repeater Mountain Area Amateur Radio Community

San Bernardino County RACES/ARES HF Net: Operates on 3.987.50 MHz LSB ARES/RACES

Redlands Emergency Communications Group (ARES affiliated): Hosts an ARES/RACES net on Mondays at 20:30 (8:30 PM) on 147.975 MHz Redlands Emergency Communications Group - QSL.net.

FEMA Tactical Address - ETO-09

FEMA Region VIII (Eight)	MT, ND, SD, WY, UT, CO	ETO-08
FEMA Region IX (Nine)	CA, NV, AZ, HI, AS, GU, MH, MP, PW, UM	ETO-09
FEMA Region X (Ten)	AK, WA, OR, ID	ETO-10

Frequencies - FEMA

P25 digital frequencies in the 400 MHz (UHF – 70cm) band are capable of encryption, but they are not encrypted by default.

Primary FEMA P25 Channels

406.2625 MHz: Channel 1/2

407.0625 MHz: Channel 3/4

407.6625 MHz: Channel 5/6 (Tone: 421 NAC)

409.0625 MHz: Channel 7/8 (Tone: 421 NAC)

410.4625 MHz: Channel 9/10 (Tone: 421 NAC)

407.450 MHz: Channel 11/12

Frequencies - FEMA

P25 means the signal is digital and unencrypted.

P25e means the frequency uses partial/mixed encryption.

P25E means it is fully encrypted and cannot be monitored.

To determine if a specific P25 400 MHz frequency in your area is encrypted:

Search the RadioReference Database for your specific county or agency.

Check the "Mode" column for the uppercase E (fully encrypted) or lowercase e (part-time encrypted).

Winlink Gateways - DM14if

Gateway Call Sign	Frequency (MHz)	Mode / Baud	Notes & Location
W6CDI-10	145.010	VARA FM (Wide/ Narrow)	San Bernardino Area / Local Hub
K6SBD-10	145.050	VARA FM (Wide/ Narrow)	San Bernardino Microwave Society / Mountain Peak
N6SBC-10	144.930	VARA FM	Regional EmComm Node
KK6YV-10	145.610	VARA FM / Packet	High Desert / Victorville Link

Considerations

How long can you operate with no electricity coming from the grid?

Can your shack and gear survive a major earthquake?

Is it prepared for a wildfire?

Is your gear hardened against Cyber Attacks?

Considerations (Cont..)

Do you have redundancy backups (1 is none)

Are your EmComm radios programmed for local use?

Do you have a top off cycle (30 day)

Considerations (Cont..)

Do you know where and how you get your grid electricity from?

Do you know how\where the water utility delivers your drinking water?

Do you know where your cell towers are?

Durable Messaging – Digital Networks

If no one is actively listening, your ham radio message is effectively lost. Unlike digital networks that store and forward messages, amateur radio operates in real-time on open frequencies, meaning there is no automatic logging or retry mechanism for missed transmissions.



JS8Call provides durable, resilient messaging over HF radio by combining ultra-weak-signal decoding (down to -24 dB SNR) with a store-and-forward network architecture. Unlike real-time-only modes, it ensures message delivery even when the destination station is offline or propagation is poor.

3-3-3 Rule

The 3-3-3 rule for radio is a universal communication protocol used during emergencies to establish contact when traditional infrastructure (like cell towers or the internet) is unavailable.



3-3-3 Rule

Every 3 hours: Turn on and monitor your radio at the top of every third hour (Noon, 3:00 p.m., 6:00 p.m., 9:00 p.m., Midnight, 3:00 a.m., 6:00 a.m., and 9:00 a.m.) based on your local time.

For 3 minutes: Listen and/or transmit for 3 minutes to see if anyone is trying to reach you or to check in. If you have plenty of battery or are trying to establish a connection, you can listen for up to 15 minutes.

On Channel 3: Tune your radio to Channel 3. On GMRS and FRS walkie-talkies, this is typically Channel 3

Questions?



Ham Radio – Saving the human race



Will ham radio
save mankind
during a
***Zombie
Apocalypse?***

Author

KO6LVT

July 4, 2026

Links – qrp1.com/emcomm.html

qrp1.com/emcomm.html

RP1 (tr)uSDX Toughbook Digital EmComm About



*Citrus Belt
Amateur Radio Club*

Presentation

- [SlideShow](#)
- [UCERF3](#)
- [SanBerdo EOP](#)
- [FEMA Emergency Plan](#)



ARES

- [Latest Plan](#)
- [Application](#)
- [Frequencies](#)
- [Orange Section](#)

That's All Folks

The End

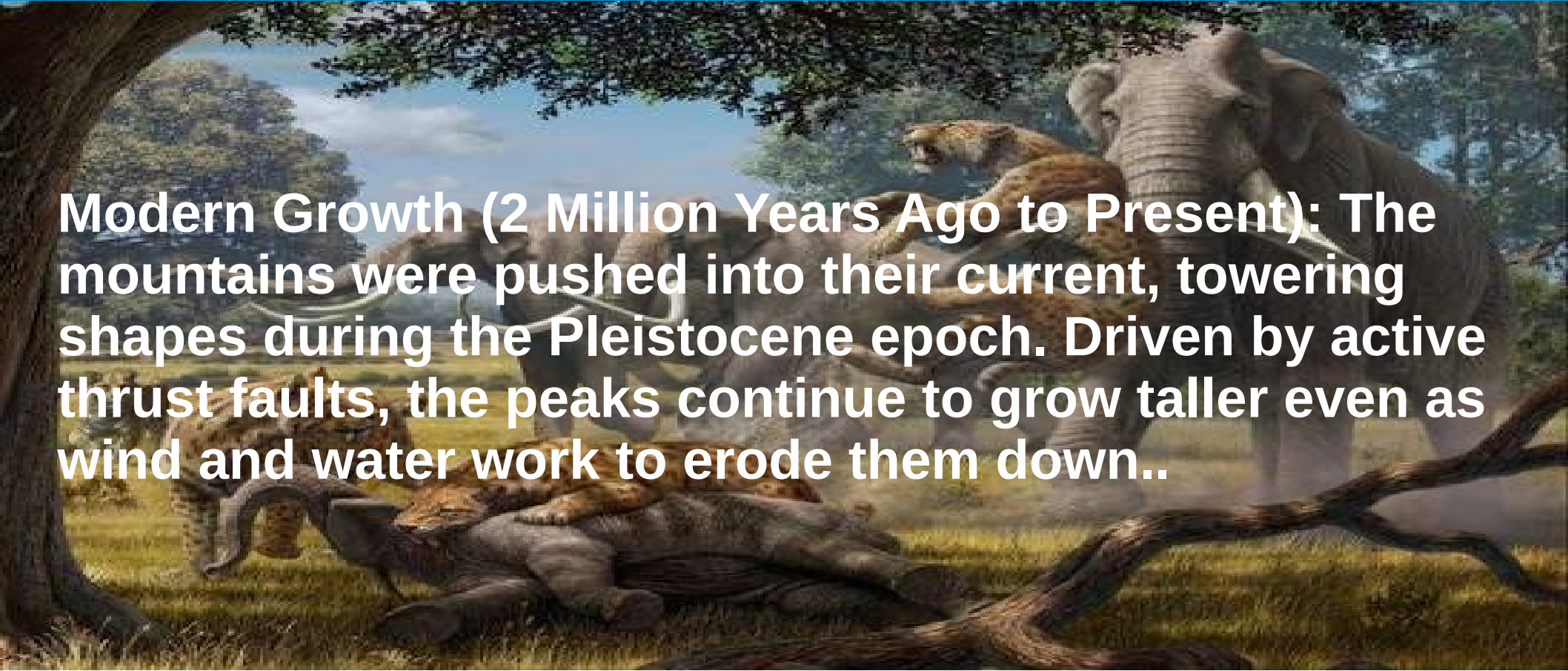
CbarC



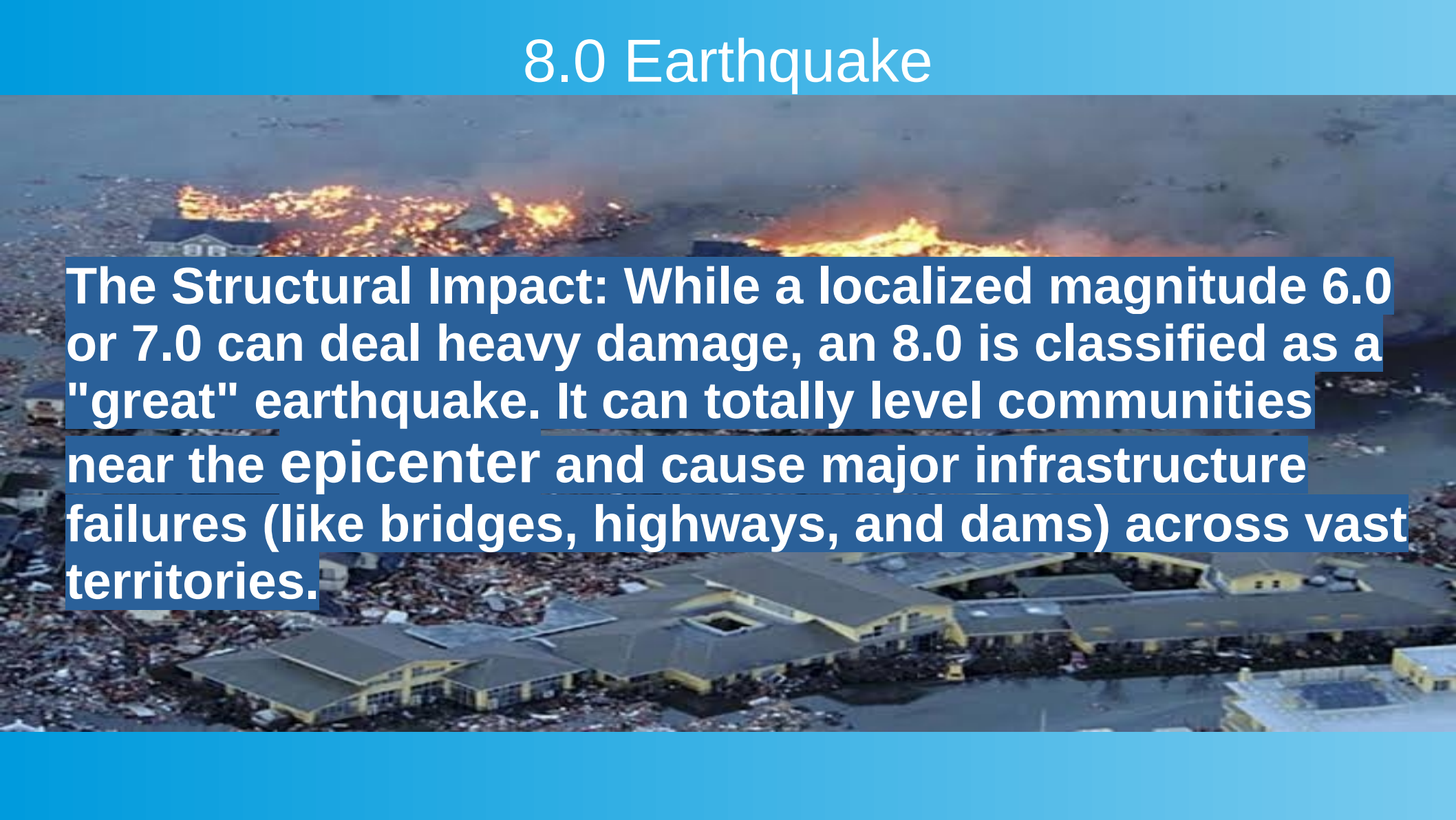
Ham operators don't ever really die; they just become better grounded!

How Long ago?

Modern Growth (2 Million Years Ago to Present): The mountains were pushed into their current, towering shapes during the Pleistocene epoch. Driven by active thrust faults, the peaks continue to grow taller even as wind and water work to erode them down..



8.0 Earthquake

An aerial photograph showing the aftermath of a major earthquake. The foreground shows a large, multi-story building complex, possibly a school or government building, that has been severely damaged and partially collapsed. Debris is scattered all over the ground. In the background, there are large fires burning, with bright orange flames and thick black smoke rising into the air. The sky is hazy and grey, suggesting a lot of dust or smoke in the atmosphere. The overall scene depicts a city in a state of total devastation.

The Structural Impact: While a localized magnitude 6.0 or 7.0 can deal heavy damage, an 8.0 is classified as a "great" earthquake. It can totally level communities near the epicenter and cause major infrastructure failures (like bridges, highways, and dams) across vast territories.

Things can go dark quickly

A sudden loss of a major transmission line or an interrupted fuel shipment creates an immediate deficit.

Because neighboring grids prioritize local demand during crises, emergency imports may not be available, necessitating rapid load-shedding to prevent blackouts.

Communication Infrastructure “Choke Points”

Communication infrastructure choke points are critical, narrow nodes in a network where multiple data paths converge, creating a single point of failure or a mandatory gateway that can restrict, monitor, or block traffic.

These points are strategically important because controlling or disrupting them allows for significant impact on connectivity, security, and trade.

