

HF EMERGENCY COMMUNICATIONS

Why HF Radio Matters Most When the Grid Goes Down



NVIS for your region. DX for the big picture.



NVIS · DX · NO INTERNET REQUIRED

KZ7K's Why HF Matters When the Grid Goes Down — qsojourney.com

The First Night of a Bad One

Power is out, cell towers went quiet when their batteries did, and the internet is a spinning icon.

1

How big is this?

My town? My county? Half the country?

2

When is power back?

Hours, days, or weeks?

3

Anyone working on it?

Crews, mutual aid, a plan?

You're bugging in, which is usually the right call. What you're missing is information.



THE PROBLEM

**Everyone inside the affected area is
blind the same way.**

The people who know are outside it, and HF reaches them with nothing in between.



Hurricane Helene, Western North Carolina, 2024

Not a drill or a movie plot. The first night of a bad one, for real.



“For several days, radio communications were the only means of passing information.”

ARRL NEWS, OCTOBER 2024

Landfall

Category 4 near Perry, Florida, on Sept. 26. Then catastrophic flooding inland; rainfall near Asheville was called a 1,000-year event.

The blackout

Power, cell, and roads went down together. Nearly a week later, cell dead zones still covered parts of the Carolinas.

Radio filled the gap

The Hurricane Watch Net fed reports to forecasters. Hams ran pop-up health-and-welfare nets, Winlink email, and repeaters on backup power.

One neighbor at a time

One ham read supply requests and road closures over the air and handed out radios to his neighbors.



Why HF Is Different

VHF and UHF borrow their range from infrastructure. HF doesn't.

	VHF / UHF	HF
Reach	Line of sight. A neighborhood or a town.	The next county or the other side of the planet.
Past the horizon	Needs a repeater, a linked system, or an internet gateway.	The ionosphere is the repeater.
Upkeep	Site power, batteries, links, and a road to the hill.	Nobody has to fuel it or drive up a mountain to fix it.
Wide-area event	Those pieces are the first to fail.	Doesn't care whether the grid is up.
Who carries it	Family and team handhelds, vehicle mobiles.	At least one HF station on battery.

Bottom line: keep the handhelds for family and team, and add at least one HF station on battery.



My Stations

Two radios in the shack, one in a go-box, and one in the Jeep. Each one has a job.



Shack: FTX-1 Optima

Sits on the 40 m NVIS net and bridges to the family on VHF/UHF.



Shack: IC-7300 Mark II

Watches 20 m for stations outside the event.



Go-box: second FTX-1

Everything I need when I have to leave the shack.



Jeep: FT-891

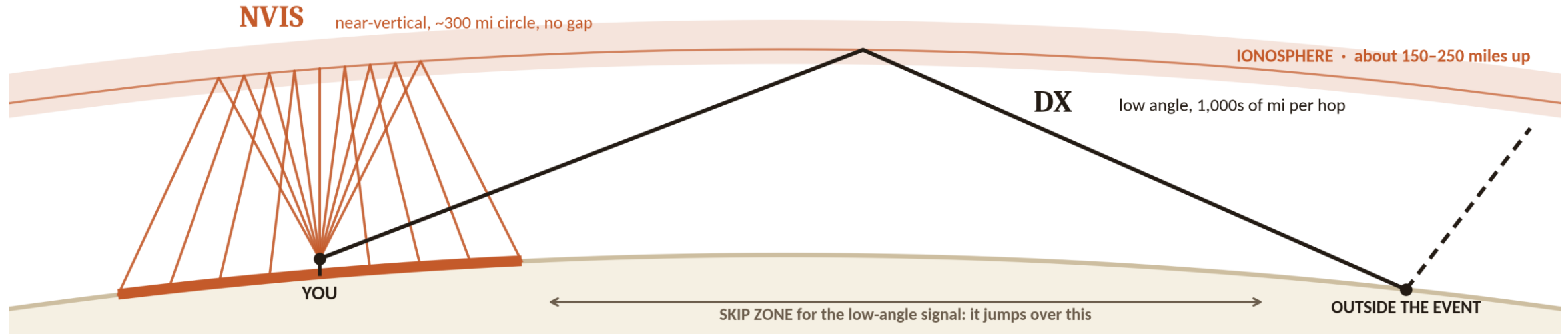
HF on the move, running off the vehicle.

One HF radio on battery is the minimum. Two lets you listen near and far at the same time.



HF Does Two Jobs

Same radio, two very different uses.



YOUR REGION

NVIS

~300 mi

RADIUS, NO SKIP ZONE

Goes almost straight up and comes back down in a circle around you.

EVERYTHING BEYOND IT

DX

1,000s of mi

PER HOP

Leaves at a low angle and skips to people outside the event.



NVIS: Your Region, No Skip Zone

The right band moves with the sun. The antenna is a horizontal wire 10 to 30 ft off the ground.

D

Day: 40 m

The critical frequency is at its highest, and absorption is lighter than on 80 m.

N

Night: 80 m

The critical frequency falls after dark, and 40 m starts skipping over nearby stations.

B

In Between: 60 m

Channels at 100 W ERP: 5330.5, 5346.5, 5371.5, 5403.5 kHz (USB dial). Plus 5351.5–5366.5 kHz at 9.15 W ERP.

~300 mi

RADIUS IN EVERY DIRECTION

10–30 ft

HORIZONTAL WIRE, MOUNTED LOW

0

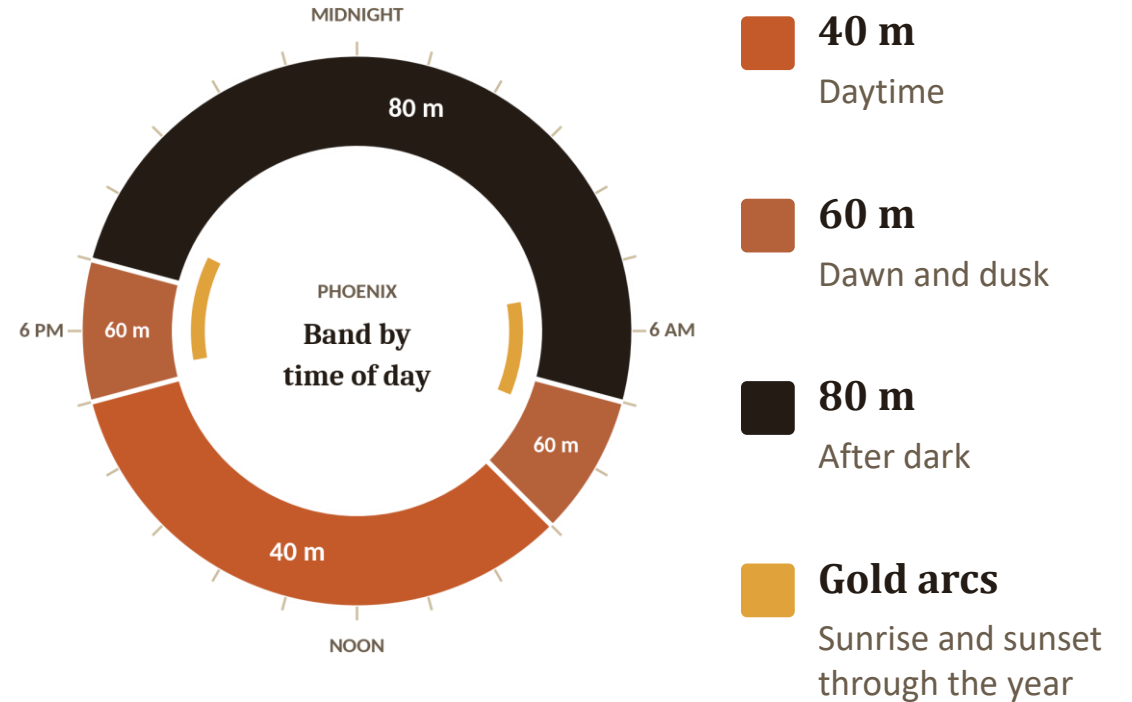
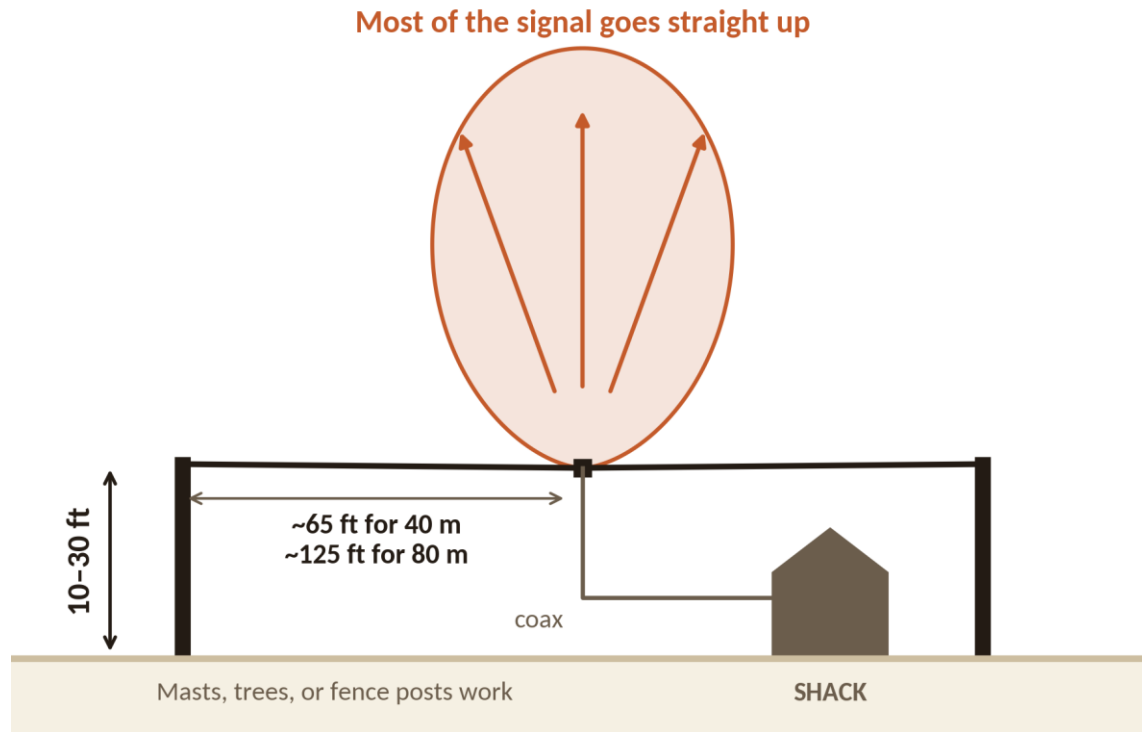
TOWERS, REPEATERS, OR INTERNET

Go deeper: bands, antennas, modes, and station builds are in my talk and post on HF NVIS Regional Nets.



Setting Up for NVIS

A low horizontal wire, and the right band for the hour.



Rule of thumb: use the highest band that still reaches your closest stations. The clock is a starting point; listen to who you can hear.



What NVIS Tells You

The regional questions, answered by stations within a few hundred miles.



How far does the damage go?

Is the town 80 miles away powered, or dark like you?



What is open?

Roads, fuel, and stores within driving distance.



Where is help?

Shelters, distribution points, or an EOC operating nearby.



How is your group?

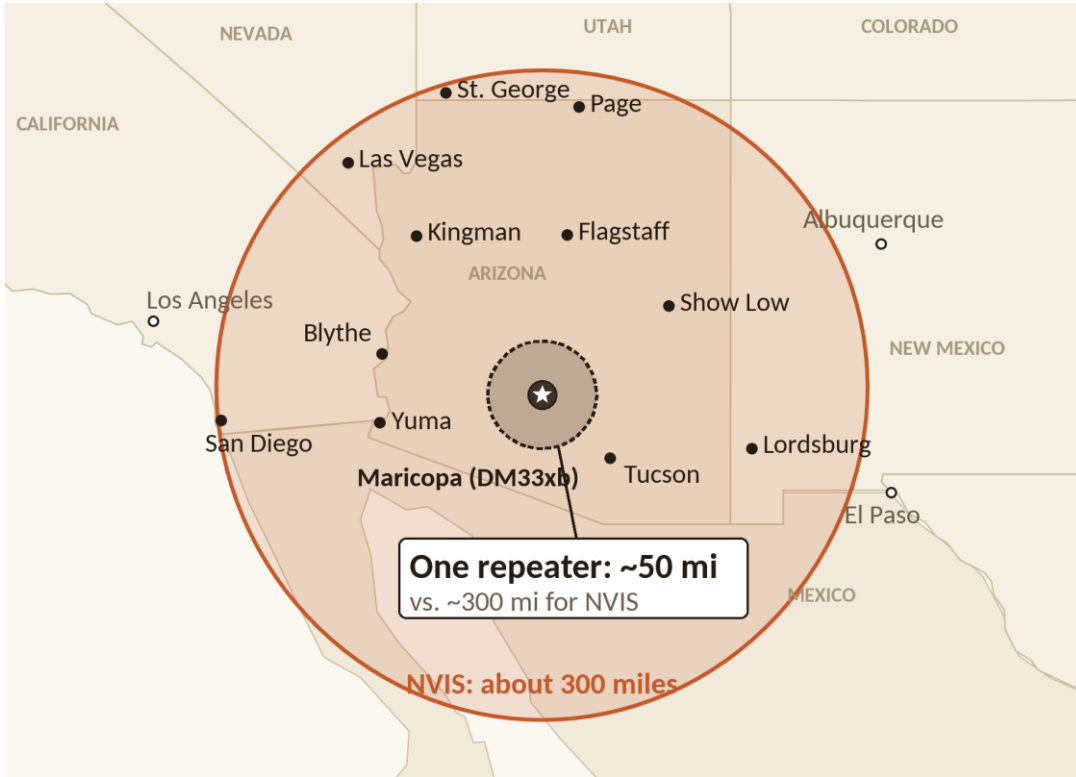
Status checks with your team, your club, or your ARES district.

Nothing in between: NVIS gets you these answers with no tower, no repeater, and no internet.



What 300 Miles Looks Like From Maricopa

One HF station at grid DM33xb, a low wire, and nothing in between.



If Phoenix and Tucson are dark...

but Flagstaff and Yuma are fine, I already know a lot about the shape of the event.

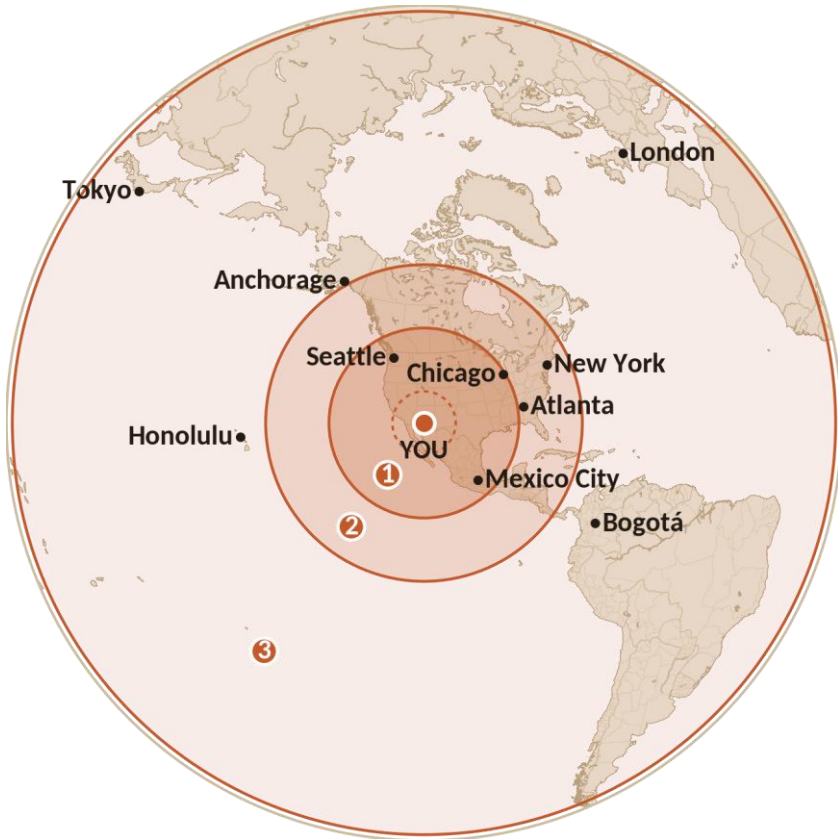
And I learned it without a single piece of infrastructure.

The circle takes in nearly all of Arizona, plus Las Vegas and San Diego at the edge. The dashed circle is one mountaintop repeater: about 50 miles.



Borrowing Eyes Outside the Footprint

If your whole region is dark, go long and talk to someone whose lights are on.



1

Neighboring states

~500 to 1,500 mi • 40 m at night, 20 m by day

How far does the outage spread, and did it reach them?

2

Across the country

1,500 to 2,500 mi • 20 and 17 m in daylight

How is national news covering it? What is the federal response? One event or several?

3

Other continents

Beyond 2,500 mi • 20, 17, 15 m, plus 10 m when it opens

If it leads the news in Europe or Japan, that tells you its scale. Cycle 25 is past peak, so 20 m is the workhorse.



Polling Other Regions: Listen First

Receiving barely touches the battery, and it tells you who is out there before you say a word.

1



Listen before you transmit

Run FT8 or JS8Call in receive. The decodes show which regions are reaching you, with no internet needed.

7.074 · 14.074

FT8 DIAL, MHZ

2



Check WWV

Time, propagation, and the space weather report at :18 past the hour.

5 · 10 · 15

MHZ, PLUS 2.5 AND 20

3



Find the nets on the problem

The Hurricane Watch Net and the Maritime Mobile Service Net carry real traffic. Listen and log; stay off unless you have traffic.

14.325 / 7.268

HWN DAY / NIGHT · MMSN 14.300

Receive first: an HF radio on receive draws about an amp, so you can listen for days on one battery.



Polling Other Regions: Then Transmit

Say where you are, ask exactly what you need to know, and write down the answer.

4

ASK A SPECIFIC QUESTION



“This is KZ7K in Maricopa, Arizona. No power, phone, or internet here. What is the news reporting about the outage in the Southwest?”

5

Ask more than one region

One station is a data point. Three that agree is information.

6

Go digital if voice fails

JS8Call gets through below the noise.
Winlink reaches a gateway outside the event.

7

Write it down

Time, frequency, call sign, location, and what they said. The poll sheet has a box for each.

Keep it short: say your piece, get the answer, and clear. Every transmission costs battery.



Check What You Hear

Rumors travel fast on a dark night. Sort every report before you pass it on.



CONFIRMED

Three regions agree

Stations in different regions report the same thing, each from their own source.

WHAT TO DO

Pass it on as confirmed, and say where it came from.



UNCONFIRMED

One source

One station, or several stations repeating the same broadcast or post.

WHAT TO DO

Log it, ask another region, and label it unverified if you relay it.



RUMOR

No source

Nobody can say where it came from. It starts with "I heard that..."

WHAT TO DO

Don't relay it. Ask where they heard it, and move on.

Always ask "Where did you hear that?" A broadcast, an agency, and their own eyes are three very different sources.



What to Ask For

Work through these with every station you reach outside the event.

1 Scope

Which states, cities, regions?
How many people?

2 Cause

Storm, grid failure, cyber, or
something else?

3 Restoration

What are utilities and carriers
saying?

4 Response

FEMA, Guard, state agencies?
Shelters, water, fuel?

5 Outside help

Crews, mutual aid, convoys on
the way? When?

6 Roads & supplies

Closures? Where are fuel,
water, groceries?

7 Comms nearby

Cell and internet next door?
Active repeaters and nets?

8 What's next

Weather, follow-on storms,
advisories?

Why the cause matters: a storm, a grid failure, and a cyber attack each point to a very different restoration time.



Print the Poll Sheet

One page per contact, with room to log the station and write down each answer.

HF Outside-Info Poll Sheet

What to ask a station outside the affected area

CONTACT

Date / Time (UTC):
Call sign:
Their location:

Band / Freq:
Mode:

1

1. Scope

Which states, cities, or regions are affected? Roughly how many people?

2. Cause

Storm, grid failure, cyber attack, or something else?

2

...

CROSS-CHECK

Confirmed by other regions (calls):
Confirmed / Rumor

3

1

Contact log

Time, band, call sign, mode, and location.

2

All eight questions

With write-in lines for each answer.

3

Cross-check box

Confirmed by which regions, or rumor.

Go-box ready

Print a stack and keep it with the radio.

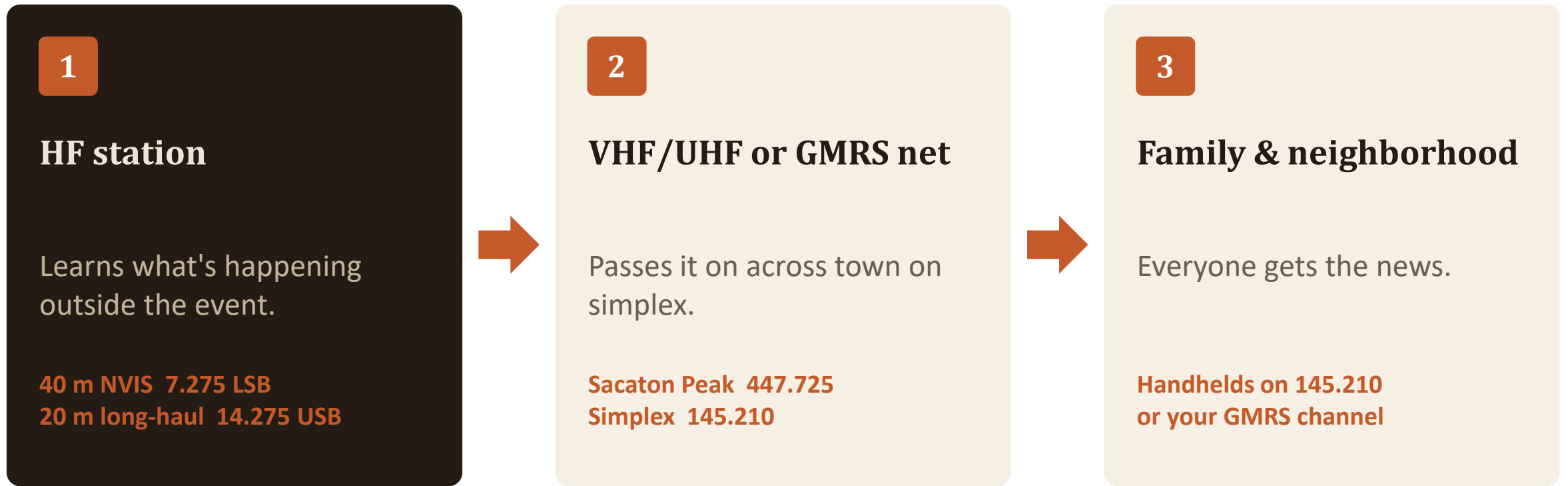
Free PDF: it's on the blog post next to the frequency card. Scan the QR code at the end of this talk.

KZ7K's Why HF Matters When the Grid Goes Down — qsojourney.com

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Then Bring It Home

Whatever you learn on HF, pass it down to the people around you.

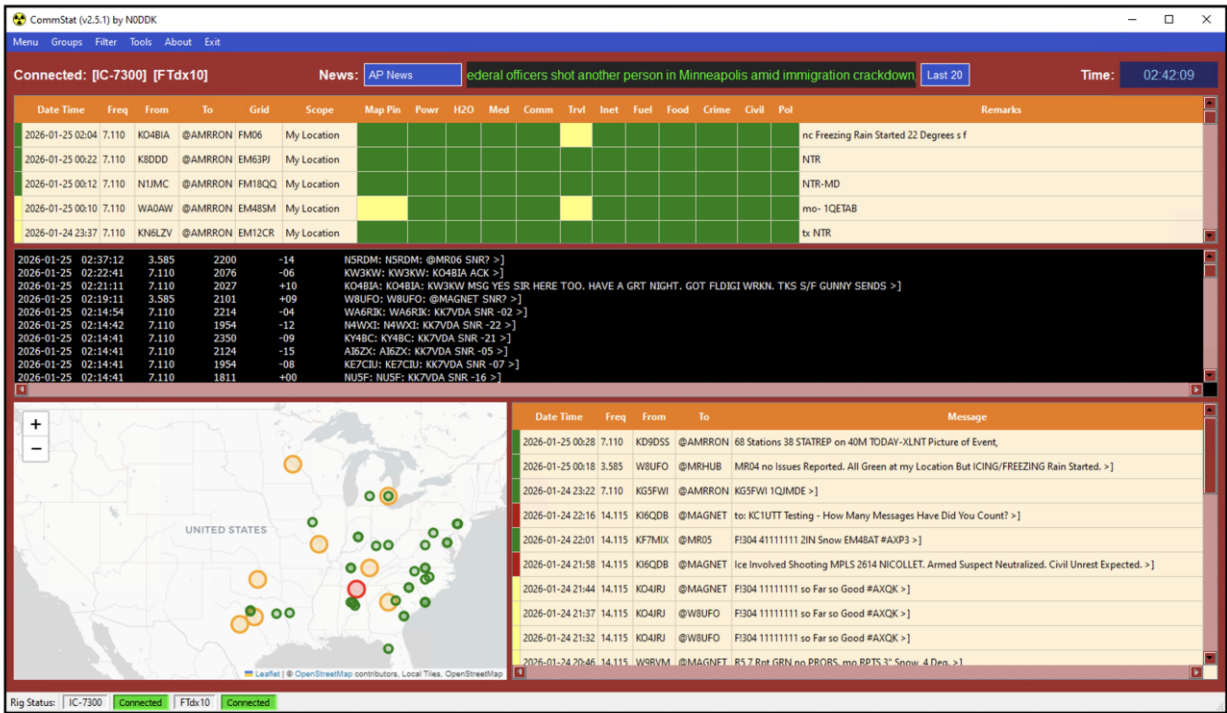


One HF station can be the news source for a whole neighborhood. Club plan: no answer on Sacaton in 10 minutes, go to 145.210.



CommStat: Your Group's Status Board

A JS8Call companion app that turns ordinary JS8Call traffic into one screen for your group.



Status reports by grid

Who is fine, who needs help, color coded by category.

Live traffic

What's going on as stations report in.

Map of stations

Where the trouble is and how far it reaches.

Group messaging

One message reaches the whole group.

No internet needed. It runs on JS8Call over the radio, on a PC, tablet, or Raspberry Pi. Practice on regular nets so it's second nature.



Reading CommStat at a Glance

Three places to look: the board, one report up close, and the message panel.

1

Date Time	Freq	From	To	GID	TID	Grid	Scope	Map	Powr	H2O	Med	Comm	Trvl	Inet	Fuel	Food	Crime	Civil	Wthr
Oct-19 00:00	0.000	KZ7K	@MR09	12910	R43	DM33	MY QTH												
Oct-19 00:00	0.000	N4TGO	@AMRRON	12909	R10	EN36IR	MY QTH												
Oct-19 00:11	7.115	AL1Q	@MAGNET	12908	R09	DN48RE	MY QTH												
Oct-19 15:39	7.110	KN4LEX	@AMRRON	12907	Q39	EN78UJ	MY QTH												
Oct-19 15:10	7.110	KG4AQH	@AMRRON	12906	Q10	FM03CD	MY QTH												
Oct-19 15:08	7.110	KG4AQH	@AMRRON	12905	Q08	FM03CD	MY QTH												
Oct-19 14:38	7.115	KB9IME	@MAGNET	12904	P38	EN54RR	MY QTH												
Oct-19 14:31	7.110	K8DD	@AMRRON	12903	P31	EM63PJ	MY QTH												
Oct-19 14:03	7.115	W7EDC	@MAGNET	12902	P03	CN85KH	MY QTH												
Oct-19 13:56	0.000	KT5DC	@MR06	12901	N56	EM08TN	MY QTH												
Oct-19 13:55	0.000	KT5DC	@MR06	12900	N55	EM08TN	MY QTH												
Oct-19 13:24	7.110	KQ4LWP	@AMRRON	12899	N24	FM08WG	MY QTH												
Oct-19 12:29	7.110	KD9DSS	@AMRRON	12898	M29	EM68	MY QTH												
Oct-19 12:03	7.110	KM4MGC	@AMRRON	12897	M03	EM76ED	MY QTH												
Oct-19 11:41	7.115	N6KYL	@MAGNET	12896	L41	CM950D	MY QTH												
Oct-19 11:39	0.000	KF0CTR	@MAGNET	12895	L39	EM48TN	MY QTH												
Oct-19 11:38	0.000	KF0CTR	@AMRRON	12893	L38	EM48TN	MY QTH												
Oct-19 11:16	7.115	K7ETC	@MR08	12892	L16	DM38ST	MY QTH												
Oct-19 10:55	3.588	W3DOF	@AMRRON	12890	K55	FM28FH	MY QTH												
Oct-19 10:06	14.078	OE6PJD	@COMMSTAT	12889	K06	JN77UC	MY QTH												
Oct-19 08:58	0.000	W4WYD	@MAGNET	12888	I58	EM56UI	MY QTH												
Oct-19 08:32	7.078	KG7MRB	@MAGNET	12887	I32	CN88WW	MY QTH												
Oct-19 05:35	0.000	N4TGO	@AMRRON	12886	F35	EN36IR	MY QTH												

The main board

One row per station. Green is fine; the outlined yellow cell flags a concern.

2

Map

Power

Water

Med

Comms

Travel

Inet

Fuel

Food

Crime

Civil

Weather

+

-



Canada Alberta: 4 dead 39 injured in explosion at Canadian military training base. <https://abcnews.com/International/multiple-people-killed-dozens-injured-explosion-canadian-military/story?id=137359465>

One report, up close

Yellow is a concern, gray is unknown, and the remarks say why.

3

Date Time	Freq	From	To	GID	TID	12 Messages	FILTER
Oct-19 18:30	0.000	KG6M...	@MAGNET	2153	T30	US issues rare Middle East red alert warning to its citizens in the region. https://...	
Oct-19 17:11	0.000	W0IFM	@EXERCISE	2152	S04	RFI REPLY - Hatteras Island, NC Weather and Surf As of 17:05Z www.drivenc.gov shows...	
Oct-19 17:02	7.107	K9DGY	@GHOSTNET	2151	S02	GHOSTNET QUERY. UNVERIFIED. NOT FOR RELAY AS FACT. [U] Social media rumor, 19 OCT: ...	
Oct-19 14:56	0.000	KD9DSS	@EXERCISE	2149	P55	RFI - RFI 2 Island road status: Impact Observation: An observing station reports ...	
Oct-19 03:05	7.107	K9DGY	@GHOSTNET	2147	C59	QST KENYA EBOLA NEW CASE #8: Kenya Ministry of Health confirms total infections rise...	
Oct-19 02:44	0.000	N1ROG	@MAGNET	2145	C44	Latest MAGNET S2 SnapShot: https://magnethf.com/magnet-s2-snapshot-261018-1800z/	
Oct-19 00:46	0.000	KD9DSS	@CDMNET	2143	A46	RFI REPLY - Testing only please ignore as we work on the rfi process ----- RFI...	
Oct-19 00:26	7.110	VE5KTG	@AMRRON	2139	A24	Tragic training accident CFB Wainwright, multiple fatalities/injured in explosion an...	
Oct-18 21:16	7.107	K9DGY	@GHOSTNET	2136	W15	QST ITALY DIESEL BLOCKADES JN71. SOUTHERN ITALY TRUCKER AND FARMER PROTESTS OVER ...	

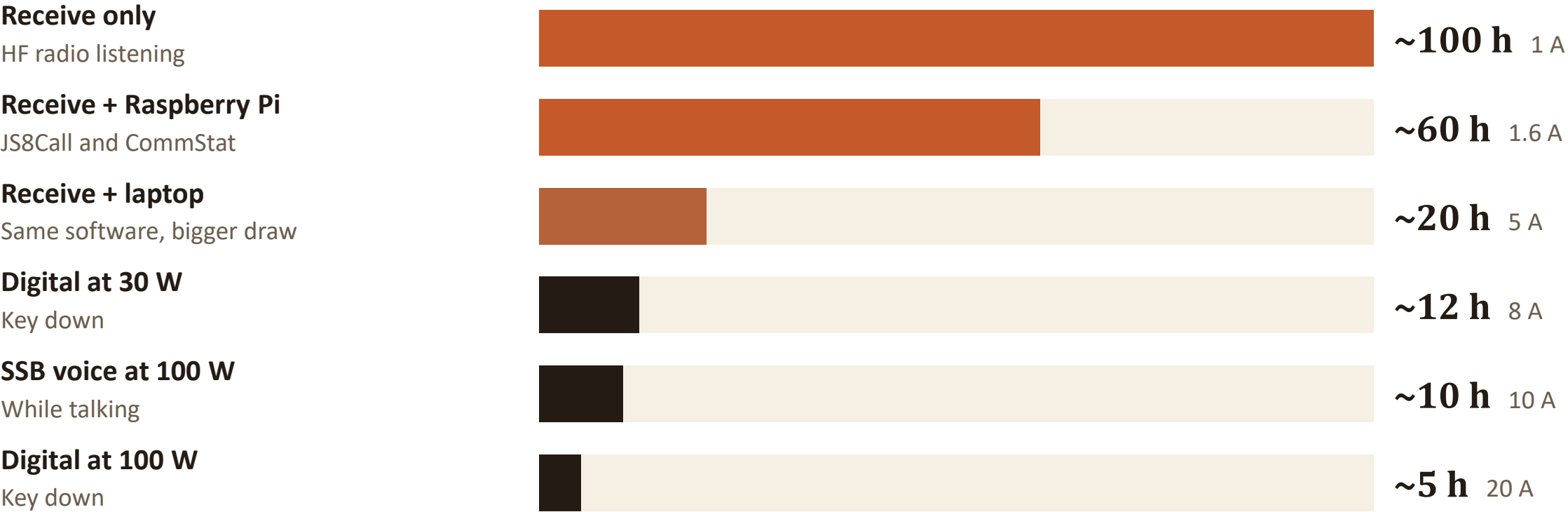
Group messages

News relays, requests for info (RFI), and replies, labeled verified or not.



Power Budget: What One Battery Buys You

Approximate hours from one 100 Ah LiFePO4 battery (about 1,280 Wh). Check your own radio's manual.



Listening is cheap. The laptop and the transmitter drain the battery. Keep transmissions short, and use a Pi instead of a laptop.



The Minimum HF Kit

What lives in the go-box so you can do everything in this talk.



HF radio

100 W with SSB, plus a VHF/UHF or GMRS radio for the family.



Battery

100 Ah LiFePO4, fused, with a way to charge it.



Wire antenna

NVIS dipole or end-fed, rope, and a throw line.



Tuner and coax

A tuner if the wire needs it, coax, and spare connectors.



Solar panel

Keeps the battery topped up when the grid doesn't.



Pi or laptop

For JS8Call, Winlink, and CommStat. Count it in the power budget.



Headphones

Pull weak stations out of the noise and keep the house quiet.



Paper

Frequency card, poll sheets, a logbook, and pencils.

Pack it now, then run the whole thing off the battery for a weekend before you ever need it.



Frequency Card

Every frequency in this talk on one page. The printable version is on the blog post.

OUR CLUB: MARA AND CFAR PACE

PRIMARY

Sacaton Peak 447.725

N7ULY, -5 MHz, PL 100.0

ALTERNATE

Simplex 145.210

No tone, no offset

CONTINGENCY

7.275 LSB · 14.275 USB

HF phone, region and long-haul

EMERGENCY

7.115 · 14.115

HF digital, region and long-haul

LISTEN FOR NEWS

HURRICANE WATCH NET

14.325 · 7.268

Day · night

MARITIME MOBILE NET

14.300

Daytime

WWV

2.5 · 5 · 10 · 15 · 20

MHz. Space weather at :18

FT8 (WHO CAN I HEAR?)

3.573 · 7.074 · 14.074

USB dial, MHz

NVIS AND DIGITAL

JS8CALL

3.578 · 7.078 · 14.078

USB dial, MHz

60 M CHANNELS

5330.5 · 5346.5

5371.5 · 5403.5 kHz USB, 100 W ERP

60 M BAND

5351.5–5366.5 kHz

9.15 W ERP, General and up

NVIS BANDS

40 m day · 80 m night

60 m in between



The Rules Still Apply

Licensing and Part 97 don't take a day off.

1

General class or higher

Techs can listen anywhere and have some 10 m voice. 40, 20, and 17 m voice are General and up. Get licensed now; nobody runs exam sessions in a grid-down event.

2

Normal Part 97 rules

Asking for news is ordinary operating. The emergency provision is for immediate danger to life or property, not a pass because the internet is down.

3

Stay off emergency nets

If a net is handling emergency traffic, keep its frequency clear.



Not General Yet? You Can Still Listen

Receiving needs no license at all, and Techs have a few HF privileges of their own.



Shortwave receiver

A portable receiver with SSB hears ham nets, WWV, and international broadcasters covering the event.

USE IT FOR

News broadcasts and net traffic



SDR and a wire

An SDR with HF coverage and a laptop decodes FT8, JS8Call, and CommStat traffic in receive.

USE IT FOR

Seeing who is on the air, and your group's status



Technician privileges

Voice on 10 m (28.300–28.500 MHz) when it opens, data on 10 m, and CW on parts of 80, 40, and 15 m.

USE IT FOR

Regional contacts when 10 m is open

Then get your General: nobody runs exam sessions in a grid-down event.



Practice It Before You Need It

This is a skill like any other. Build it while the internet still works to check your answers.

THE TWO-HOUR DRILL

Unplug and see what you can learn

Pick a weekend. Disconnect from the internet. Give yourself two hours with nothing but the HF radio.

- Which regions could you hear?
- What news did you pick up?
- Who answered?

LISTEN TO A REAL ONE

The Hurricane Watch Net

Next time a hurricane threatens the Gulf, tune in from wherever you are and notice how much information moves through it.

14.325 MHz

DAYTIME

7.268 MHz

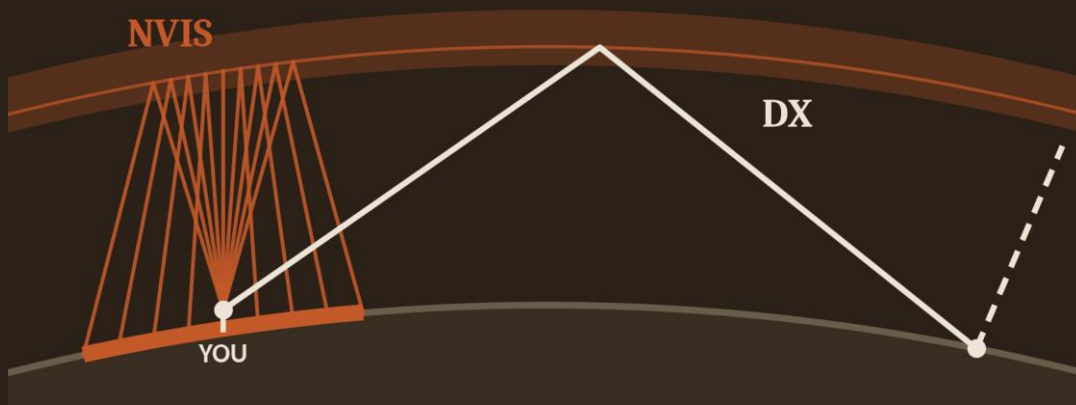
NIGHT



THE TAKEAWAY

NVIS for the region. DX for the big picture.

Together they turn a dark house into a station that knows what's happening.



READ THE FULL WRITE-UP

Scan for the blog post

Everything in this presentation, plus the printable poll sheet and links to the related guides on QSO Journey.

qsojourney.com/hf-radio-shtf-nvis-dx/?talk=1

