



Starlink Supporting Winlink

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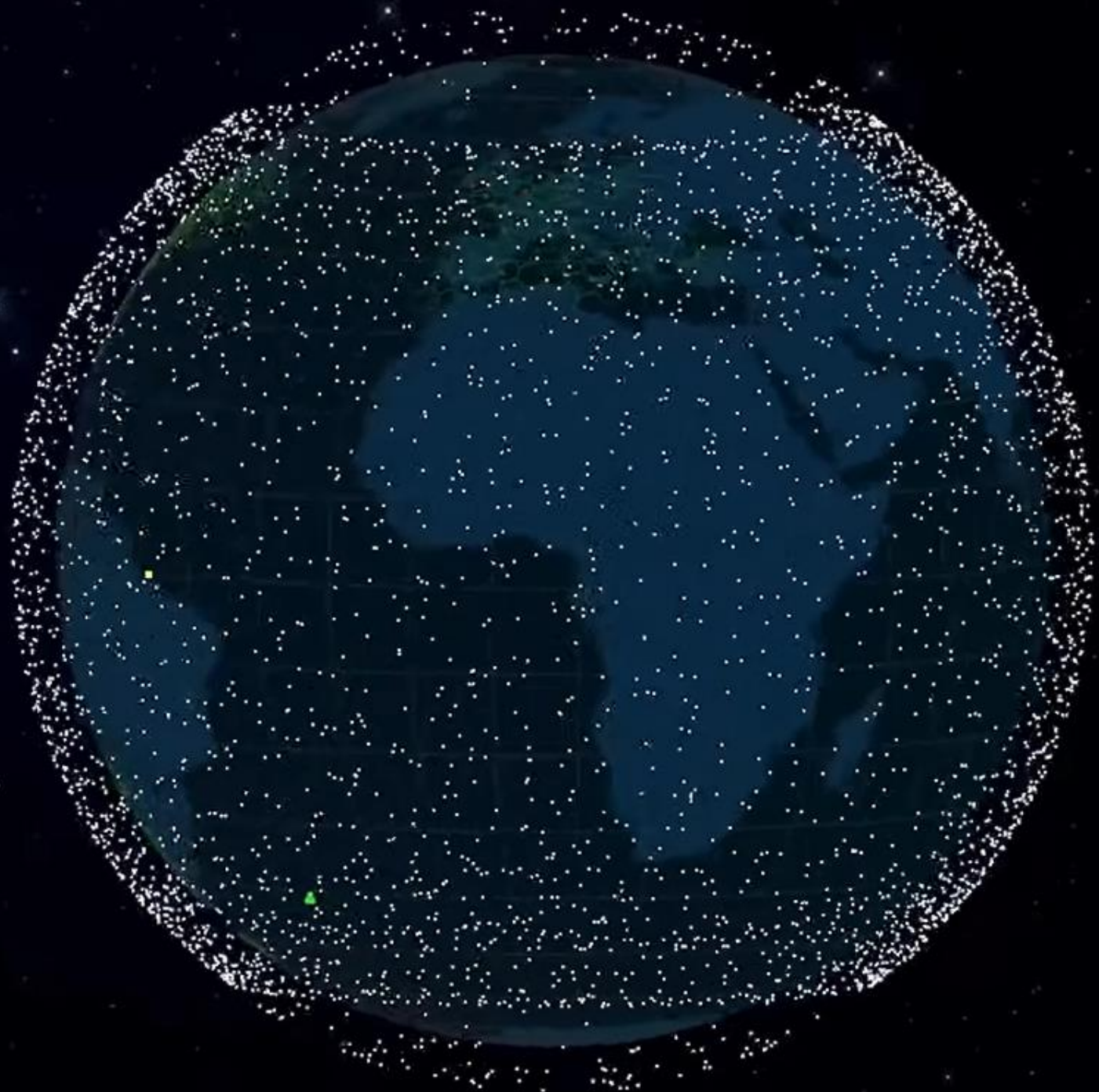
Starlink is just another ISP

- ▶ Starlink will supply satellite access to Telnet
- ▶ Telnet, an acronym for “Teletype Network,” is a network protocol used on the Internet or local area networks. It provides a bidirectional interactive text-oriented communication facility using a virtual terminal connection
- ▶ It's simple but unsecure, perfect for Winlink

Current Starlink Status

- ▶ Multiple versions of Starlink satellites, including v0.9, v1.0, v1.5, and V2 mini, now launching a larger V2 satellite (some call it V3)
 - ▶ Capable of terabyte speeds and throughput along with direct to cellular connections
 - ▶ Optical mesh networking between satellites
 - ▶ As of May 10, 2025, there are 7,135 Starlink satellites in orbit, with 7,105 of them operational, 1146 deorbited
 - ▶ 12,000 planned satellites, potentially expanding to 42,000
- ▶ In 2025, over 150 ground stations around the world
- ▶ In 2025, 37 POPs globally
- ▶ 5.4 million subscribers as of March 2025

| Feature | V2 Heavy | V2 Mini Satellite |
|------------------------------------|---------------|-------------------|
| User <u>Downlink</u> Bandwidth | 1 <u>Tbps</u> | ~200 Gbps |
| User Uplink Bandwidth | 160 Gbps | ~20 Gbps |
| Laser Bandwidth per Channel | ~800 Gbps | ~200 Gbps |
| Combined <u>Backhaul</u> Bandwidth | 4 <u>Tbps</u> | 1.3 <u>Tbps</u> |
| Satellites per Launch | 54 (Starship) | 23 (Falcon 9) |
| Mass | ~1900 kg | ~575 kg |



Starlink Ground Station Connect to POP Stations

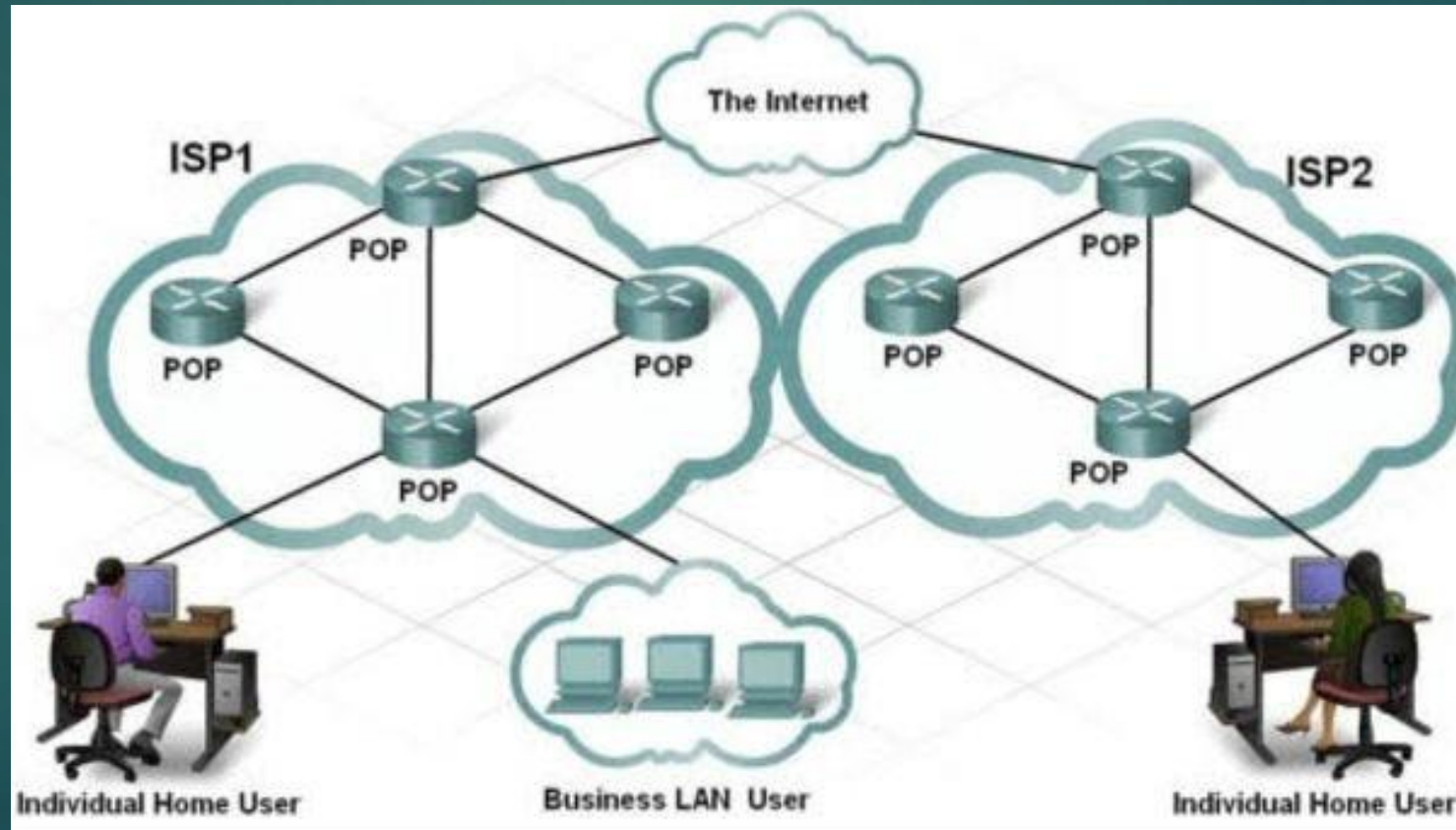


Internal Parabolic Ant



Point of Presence (POP)

Where your WAN Address Connects to the Internet



Starlink Subscriber Terminals

Starlink User Terminal models and hardware revisions

June 2024



REV1 - Original Starlink "Dishy"

rev1_pre_production
rev1_production
rev_rev1_proto3

Years in production: 2020 - 2021



High Performance

rev_hp1_proto0
rev_hp1_proto1
rev_hp1_proto2

Years in production: 2022 -



REV2 - Mass production "Dishy"

rev2_proto1
rev2_proto2
rev2_proto3
rev2_proto4

Years in production: 2021 - 2022



Flat High Performance

rev_hp1_proto0
rev_hp1_proto1

Years in production: 2022 -



REV3 - Standard Actuated

rev3_proto0
rev3_proto1
rev3_proto2

Years in production: 2022 -



REV4 - Standard

rev4_proto3
rev4_proto4
rev4_prod1
rev4_prod2
rev4_prod3

Years in production: Q4 2023 -



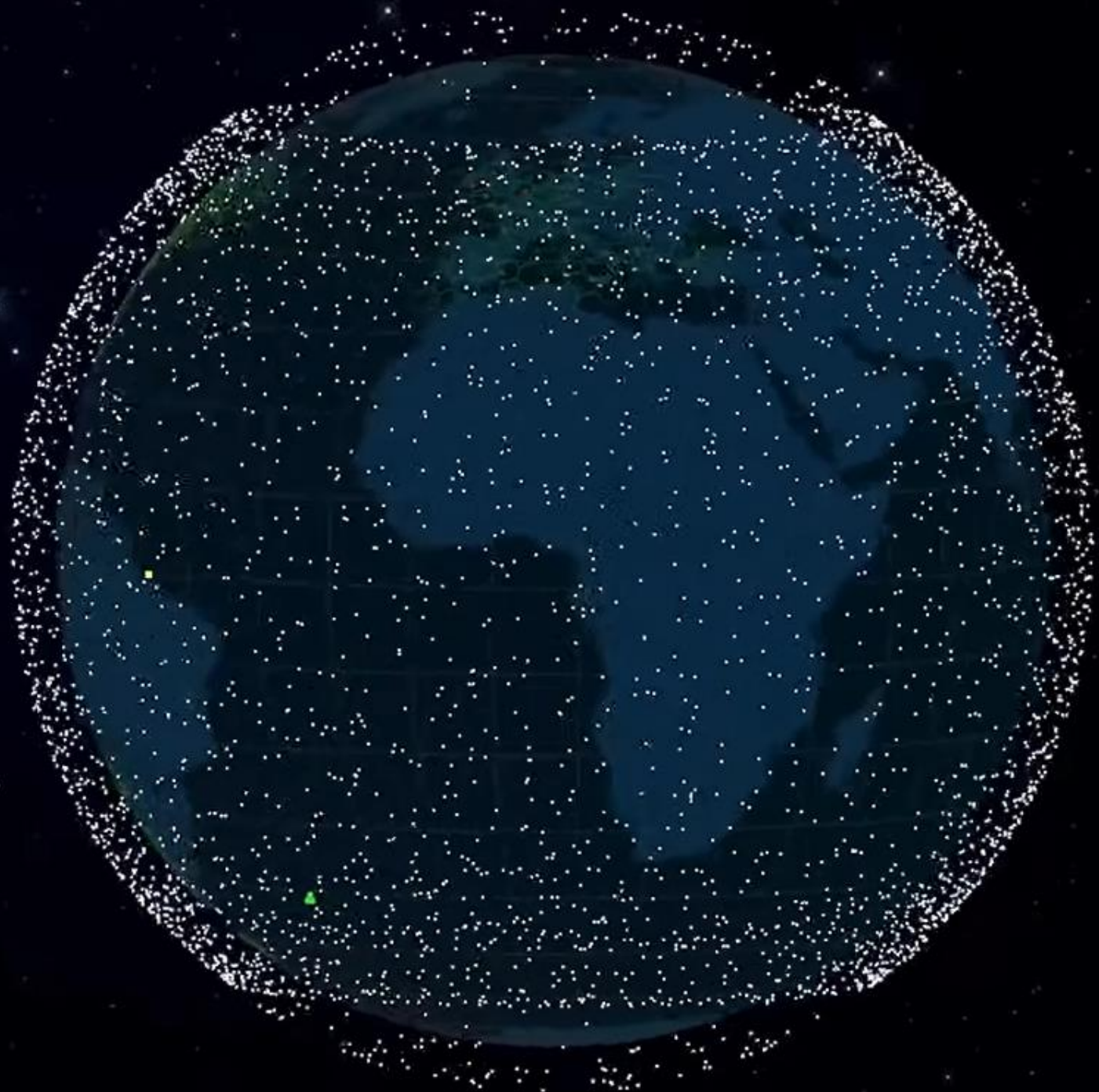
Mini

rev_mini1_prod1
rev_mini1_prod2

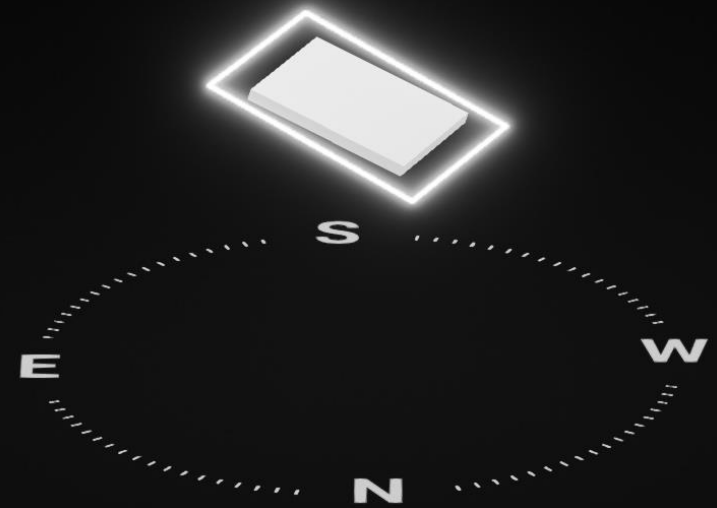
Years in production: Q2 2024 -

Where to Point Starlink

- ▶ Original Starlink (Dishy) aimed the dish for you
- ▶ Newer models recommend via an app where to manually aim
- ▶ Generally, away from the equator towards to poles, watch for obstructions
- ▶ Will work in any orientation but generally will get best results
 - ▶ Northern Hemisphere aim north
 - ▶ Southern Hemisphere aim south
 - ▶ This is so not to interfere with GEO stationary SATs
 - ▶ Along the Continental Coasts, may be best oriented towards the ocean
 - ▶ Above the Arctic Circle may point South
 - ▶ Below Antarctic Circle may point North
- ▶ An 8 to 14 degree tilt is best but will work fine laying flat especially while mobile



Setting up Starlink in
Seaside, required me to
aim it west and not
North



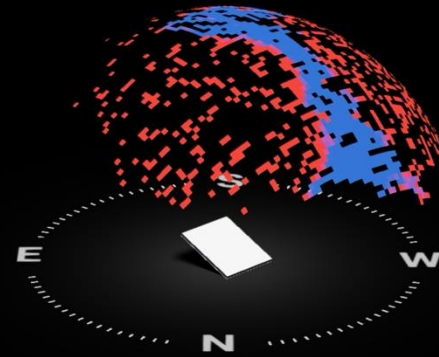


5:56

29%

Obstructions

50881784-02d27d19-18d92a42



● No data ● Clear view ● Obstructions



Starlink is calibrating and gathering data on obstructions. This usually takes about an hour.

Align Starlink



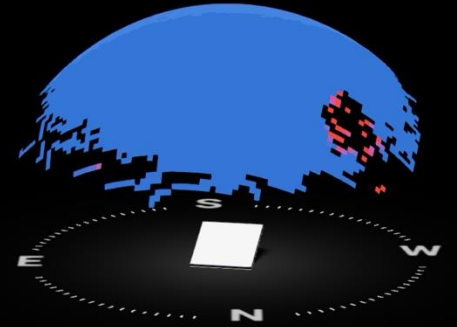
Check for obstructions

8:47

35%

Obstructions

50881784-02d27d19-18d92a42



● No data ● Clear view ● Obstructions



Your Starlink has an unobstructed view of sky. Starlink's obstruction map will become more accurate as it collects more data.

Align Starlink



Check for obstructions

Starlink works
laying flat and in
any direction, but
will work best
when installed
with a slope and
pointed in the
suggested
direction



Service Plans

- ▶ Go to www.starlink.com for latest information and rates
- ▶ Fixed, Roam & Maritime Plans, NO LONG-TERM CONTRACTS
- ▶ Residential & Business
- ▶ Demand or Congestion Charges – and Wait Lists
- ▶ Roam Plan can Pause and Un-Pause Service
- ▶ Service Quality
 - ▶ Priority and Non Priority
 - ▶ Best Effort – up to service, ISP does its best effort up to a service or throughput, i.e, service up to 1Gbps
 - ▶ Access – paying for access, no guarantee of service or throughput
 - ▶ SLA – Service Level Agreement – Contract Speed and specific grade of service and repair...You purchase 1 Gbps symmetrical service minimum i.e. STARSHIELD for US DOD
- ▶ Go to www.starlink.com for latest information and rates

Mini Antenna Power Requirements

12v – 48v DC

- ▶ Runs at 20-25 watts with snow melt off, max is about 40 watts
- ▶ AC power supply provides 30v at 2 amps = 60 watts
- ▶ Found it best if minimum voltage is not less than 13v, drop out and antenna failures occur with lower voltage
- ▶ Best to use shorter power cables, OEM 15m power cable works best with 20v or higher
- ▶ USB-C PD (power delivery) 20v at 5 amps min = 100 watts with smart USB-C cord

EDUP Starlink Mini
CAT 5 POE
150 W Gig E
DC up to 48V/3A for
StarLink





EDUP Starlink Mini PoE Injector & 12V Starlink Adapter Splitter for Starlink Mini, Soldering-Type RJ45 150W GigE Passive PoE, ESD Protection DC 9-36V to 48V/3A Power Supply for Starlink Mini Dishy

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Size: **Starlink mini**

Starlink V2

\$107.99

Starlink V3

\$116.99

Starlink mini

\$159.99

\$159⁹⁹

\$1.99 delivery **June 23 - July 2** to [Honolulu 96816](#). [Details](#)

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Questions/Answers & FAQ

- ▶ Weather resistance with moisture tight plug
- ▶ Provides CG-NAT service(like cellular service), no port forwarding
- ▶ If you need port forwarding, must use a service capable of port forwarding or an external router using the pass-through Starlink setting (turns the internal router & WIFI off) or VPN service
- ▶ Able to use Starlink WIFI with DMR Repeater (CAT-5) using an external router with port forwarding (port forwarding not needed w/cBridge)
- ▶ Starlink speed is generally faster when bypassing Starlink router and using a 3rd party external router

Questions/Answers & FAQ

- ▶ If terrestrial Internet service is available, terrestrial service is probably the better option over Starlink
- ▶ As a backup or if you need service in a rural area not serviced by terrestrial Internet service, Starlink is a game changer.
- ▶ If you are a traveling roamer like a boater, RVer or camper...Starlink is a game changer.
- ▶ Plan changes that adjust to service coverage & demands will be often with Starlink. You will need to evaluate plan options often.
- ▶ Currently \$10-10GB, \$50-50GB, & \$165 unlimited Roaming Plans that can be paused
- ▶ The business strategy of Elon Musk and Starlink, “would rather have 100 subscribers paying \$200 per month than 200 subscribers paying \$100 per month”. Plans adjust by regions, number of users, and ability to pay.

Questions/Answers Regarding Snow Melt

- ▶ If power consumption is not factor and you have unlimited power source, select **snow melt** in **Automatic Mode**
- ▶ If in mobile operation, leave **snow melt** in **Automatic Mode**
- ▶ If power consumption is a factor and cold weather, snow, ice, sleet or rain is not a factor, **turn snow melt off**
- ▶ Starlink antennas do not have a heater, they increase phase array power to melt snow/ice
- ▶ Starlink antennas do not have temp gage, they measure S/N ratio and as it degrades it increases power, this process also improves mobile operations w/snow melt in auto mode

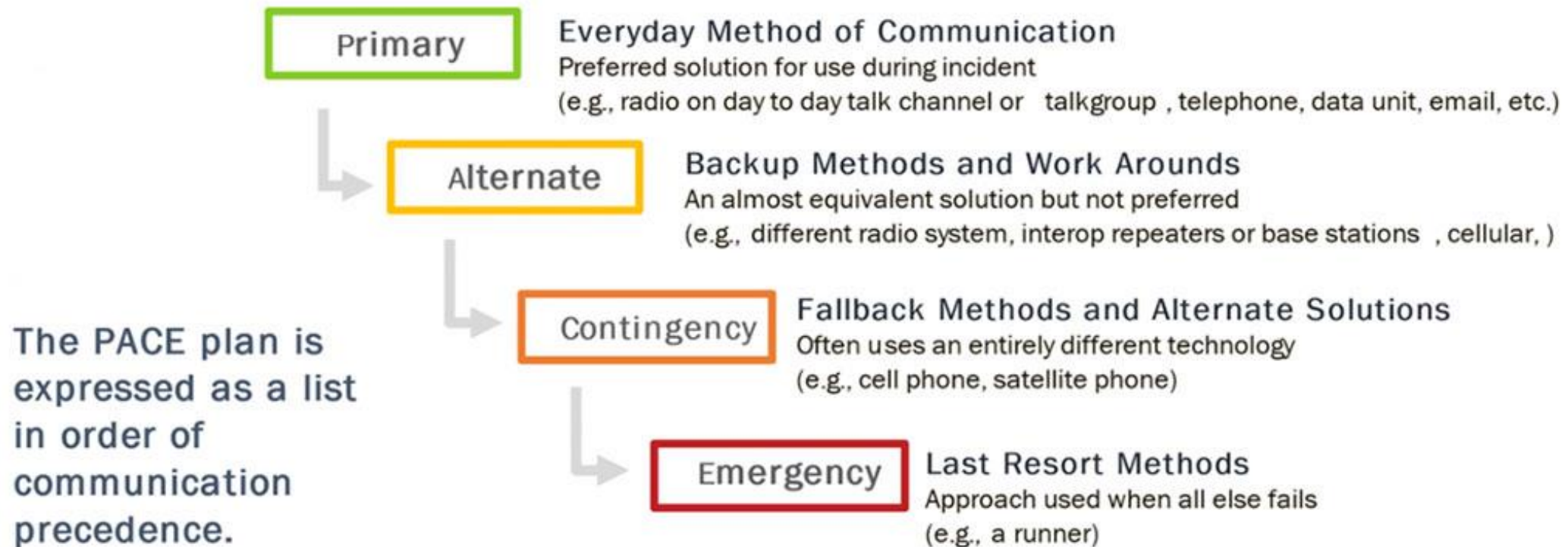
Questions/Answers & FAQ

How to minimize Starlink Mini total usage per month?

- ▶ Reduce or delay auto update services on devices connected
 - ▶ Firmware/OS updates
 - ▶ Synchronizing files, photos with cloud servers
 - ▶ Do these activities while on unlimited data plans
- ▶ Minimize speed test while connected to Starlink
- ▶ Use “Sleep Schedule” overnight when not using
- ▶ Watch videos at a lower quality setting i.e. reducing 4k to 720p
- ▶ Turn YouTube autoplay off

Why is Starlink so Vital to Hams

PACE IN REVIEW...



Questions/Answers & FAQ

- ▶ I use a PACE Plan for all critical functions
- ▶ Primary, Alternate, Contingency, Emergency
 - ▶ Communications (different smart phones with different service providers, radio RF (HF & VHF/UHF) SAT Service (InReach & Starlink). Also, out of state emergency contact/notification
 - ▶ Energy
 - ▶ Commercial power, Roof PV w/Powerwall Battery Backup, Generator, Powerwerks Box & portable batteries
 - ▶ Gasoline & Propane
 - ▶ Food/Water
 - ▶ Personal storage, coordinate additional resources with family
 - ▶ Shelter
 - ▶ Home, other family homes on same island, neighbor island family homes, mainland family homes, mainland RV

Starlink Supporting Winlink Q & A

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