TECHNICAL REPORT FOR THE MESHTASTIC PROJECT · ARGENTINA · 1-2 NOVEMBER 2026

354.3 km Meshtastic hop between ComarcaMesh and SOMesh

On the night of 1 to 2 November 2026 two regional Meshtastic networks in Argentina, 240 to 420 km apart, were joined by radio in two openings (20:36 to 23:43 on 1 Nov and 00:33 to 04:30 on 2 Nov), 7 h 04 min in total. Everything crossed through one router, PAT1, on a tower in Carmen de Patagones. The longest direct hop, 354.3 km to C-3A in Tres Arroyos, was recorded in both directions. MediumFast preset (LoRa SF9, 250 kHz, 915 MHz band).

LONGEST DIRECT HOP

354.3 km

PAT1 ↔ C-3A, in both directions

DIRECT HOPS BETWEEN NETWORKS

4

all with PAT1 at this end

NODES FROM THE OTHER NETWORK

70

656 packets

LINK TIME

7 h 04 min

two openings

Summary

On 1 November 2026 at 20:36:04 local time (UTC−3), 44 minutes after sunset, the meshbox station in Viedma received the first packet from a node of SOMesh, the Meshtastic network of Bahía Blanca. The link between the two networks stayed open until 23:43, closed for 50 minutes and reopened at 00:33 on 2 Nov; it closed at 04:30. In total 656 packets from 70 nodes of the Bahía Blanca region reached Viedma.

All of them crossed through one node: PAT1, a SenseCAP Solar P1 router installed the day before on a tower in Carmen de Patagones. Traceroutes show 4 direct radio hops between the networks, all with PAT1 at this end. The longest, 354.3 km to C-3A, a router on a 90 m tower in Tres Arroyos, appears in 22 hop records from 18 traceroutes, 4 of them with the hop in both directions. The best readings were −6.5 dB at PAT1 and −7 dB at C-3A.

With antennas 55 to 190 m above sea level the normal radio horizon on this path is about 90 km, and at mid-path the Earth bulges about 1,850 m above the straight line between the antennas. The path runs over the sea and the coastal plain, both openings came after sunset, and the weather models show a surface duct along the coast in those hours. We attribute the link to tropospheric ducting.

People used the link: 43 text messages on the public MediumFast channel (29 from the Bahía region and 14 from Viedma), from 12 people (5 and 7), plus 11 reactions. 9 messages were replies to a message from the other network.

Why we report it

- **Distance and preset.** A single hop of 354.3 km at 915 MHz with MediumFast (SF9, 250 kHz), between two fixed routers on towers, recorded in both directions within the same traceroutes.
- **Context.** The Meshtastic Range Tests page lists 331 km as the ground record (868 MHz, Very Long Slow, mountain to mountain with line of sight). In the sources we reviewed (section 9) we found no longer direct hop confirmed in both directions between fixed stations, and no documented single hop at 915 MHz longer than 254 km. Longer one-way receptions over the sea have been reported in Europe at 868 MHz (475 to 822 km), without independent verification, and ducted LoRa links of almost 600 km have been confirmed with radiosondes (SF12).
- **Two networks joined.** Two independent regional meshes exchanged traffic for 7 h 04 min, with packets that needed up to 6 hops to reach Viedma, and people talked across them.
- **Operational notes.** Hop limits needed across the bridge, zero-cost hops between favorite routers, NodeDB size on nRF52 routers, and a PKI case in which a node answered with a reply the requester could not decrypt (section 6).

- **Request.** We submit the PAT1-C-3A link for the ground records of the Range Tests page. All the data are attached and can be checked independently (section 10).

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1. Networks and station

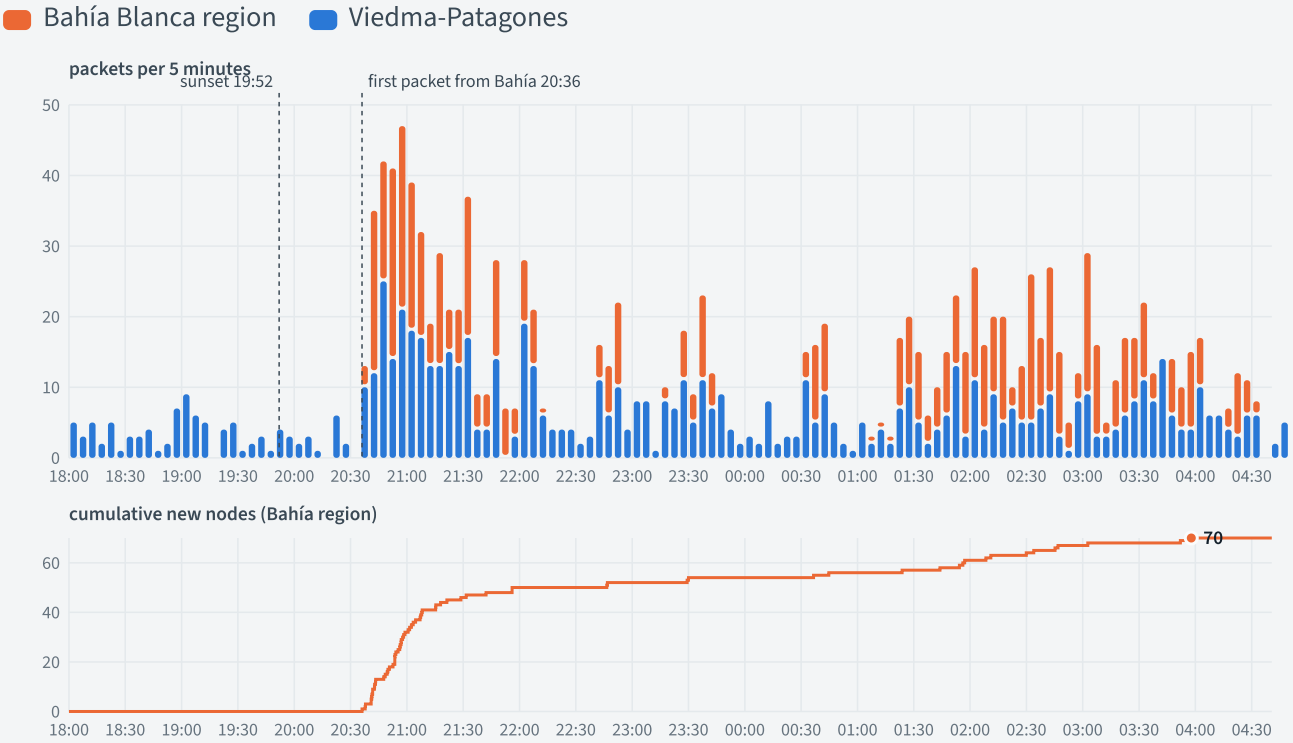
- **ComarcaMesh**, Viedma and Carmen de Patagones (Río Negro and Buenos Aires): public map comarcamesh.com.ar, served by meshbox (github.com/marcomagnaiot/meshbox), an open-source gateway and map that stores every packet with the receiving gateway, SNR, RSSI, hop limit and last relay byte.
- **SOMesh**, Bahía Blanca and region (Buenos Aires): public map somesh.com.ar.
- **PAT1** (`!65d34d89`): SenseCAP Solar Node P1, role ROUTER, on a tower in Carmen de Patagones, about 65 m above sea level (its GPS reports 55 m). Installed on 31 October 2026 at 13:10. In the 31 hours before the event it heard no node from the Bahía region.
- **MRCO** (`!a35b1d28`): Heltec V4, CLIENT_BASE, firmware 2.7.26, on a roof in Viedma 3 km from PAT1; the station's main gateway, over TCP.
- **MRCC** (`!ba0dedcc`): Heltec V3 on USB at the same station, second receiver.
- **C-3A** (`!826eb03a`): ROUTER on a 90 m tower at the Tres Arroyos cemetery, antenna about 190 m above sea level.
- **N-MH** (`!b03cb788`): Heltec V3, ROUTER, in Monte Hermoso, 25 m above sea level; the entry used most.
- All nodes on the default public channel with the MediumFast preset: LoRa SF9, 250 kHz, 915 MHz band. The nominal demodulation limit of SF9 is −12.5 dB SNR.

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2. Timeline

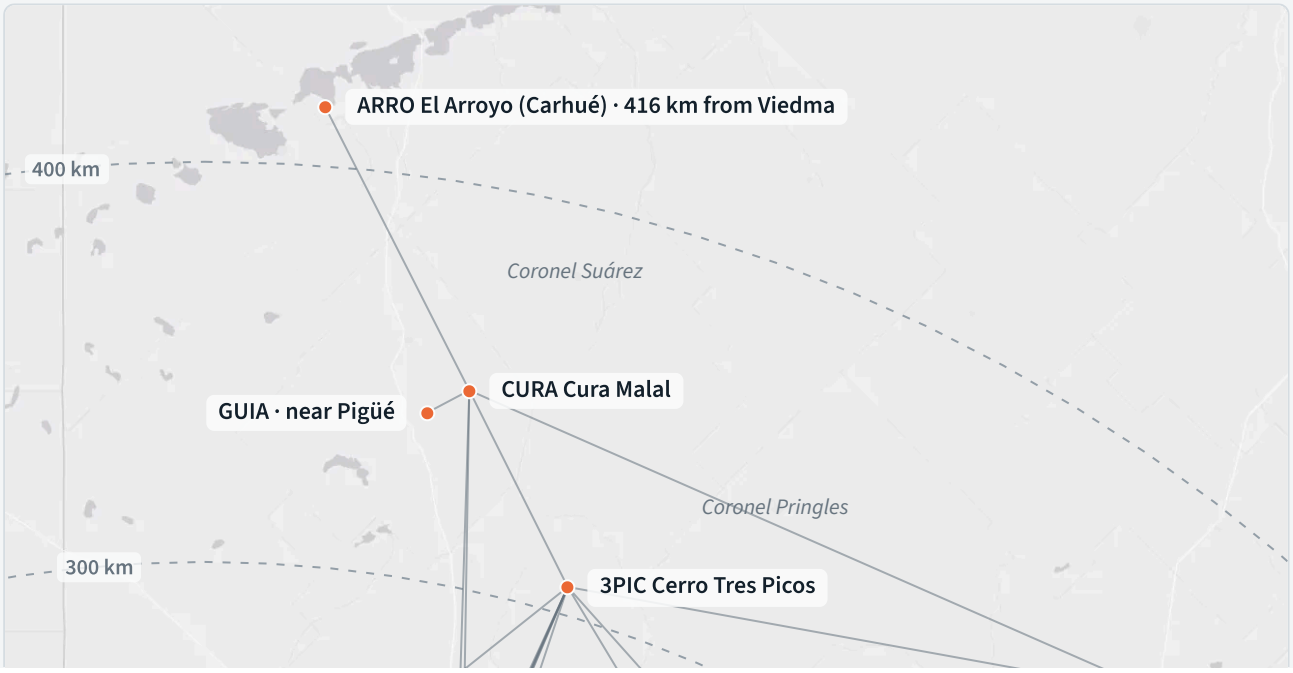
Sunset at Patagones: 19:52; end of civil twilight: 20:22. First packet from the Bahía region: 20:36:04, a position from `!af7ad5ca` (Bahía Blanca) with 5 hops. Openings: 20:36 to 23:43 on 1 Nov and 00:33 to 04:30 on 2 Nov, with 295 and 361 packets from the region. Between the openings nothing arrived for 50 minutes. There was also a pause of about 30 minutes inside the first opening (22:10 to

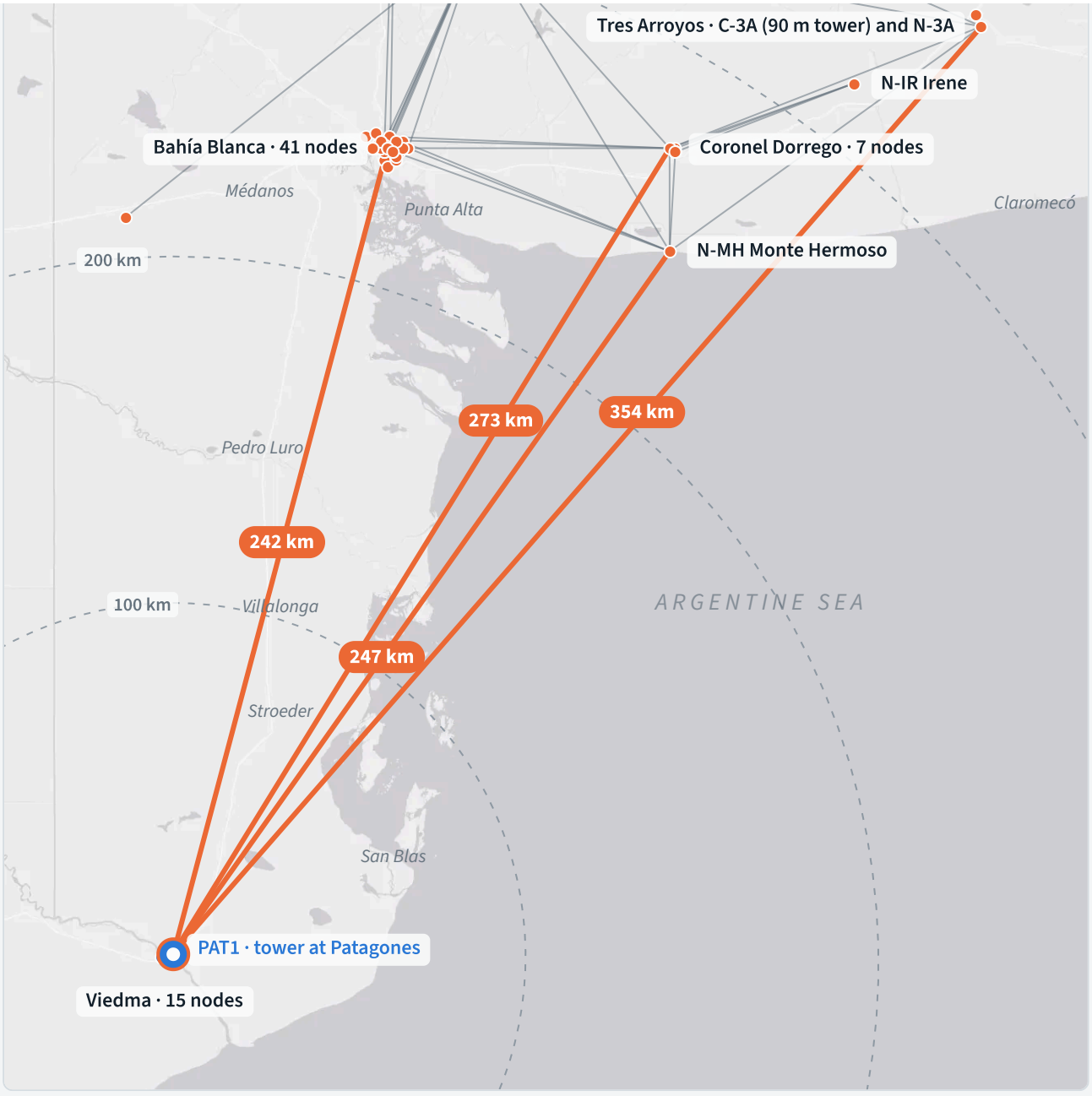
22:40). The last packet, at 04:30:41, was N-MH's answer to a traceroute from MRCO. After it, MRCO's two traceroutes to C-3A (04:31 and 04:33) went unanswered, and the station heard no answer to the three that a Viedma node (VDM) sent to nodes in the region between 05:21 and 06:05.



Unique packets recorded by the station (all gateways) and new nodes from the Bahía region. Local time (UTC−3).

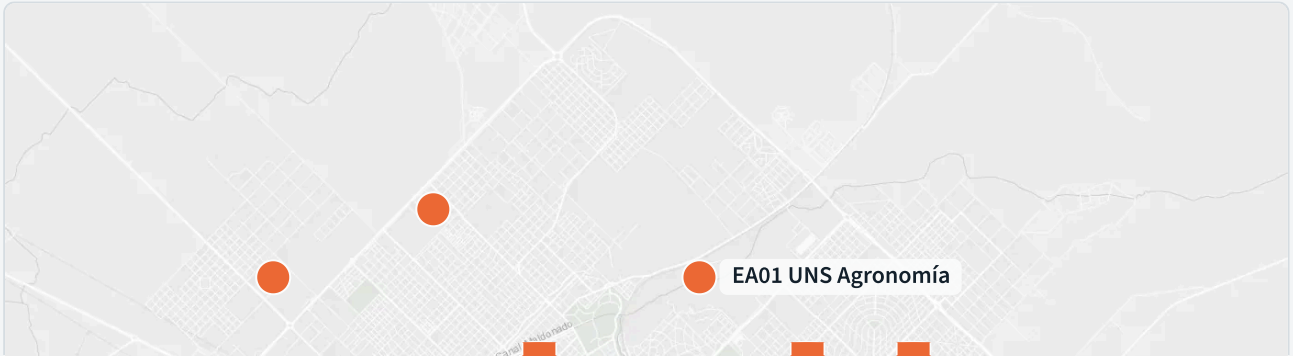
3. Map

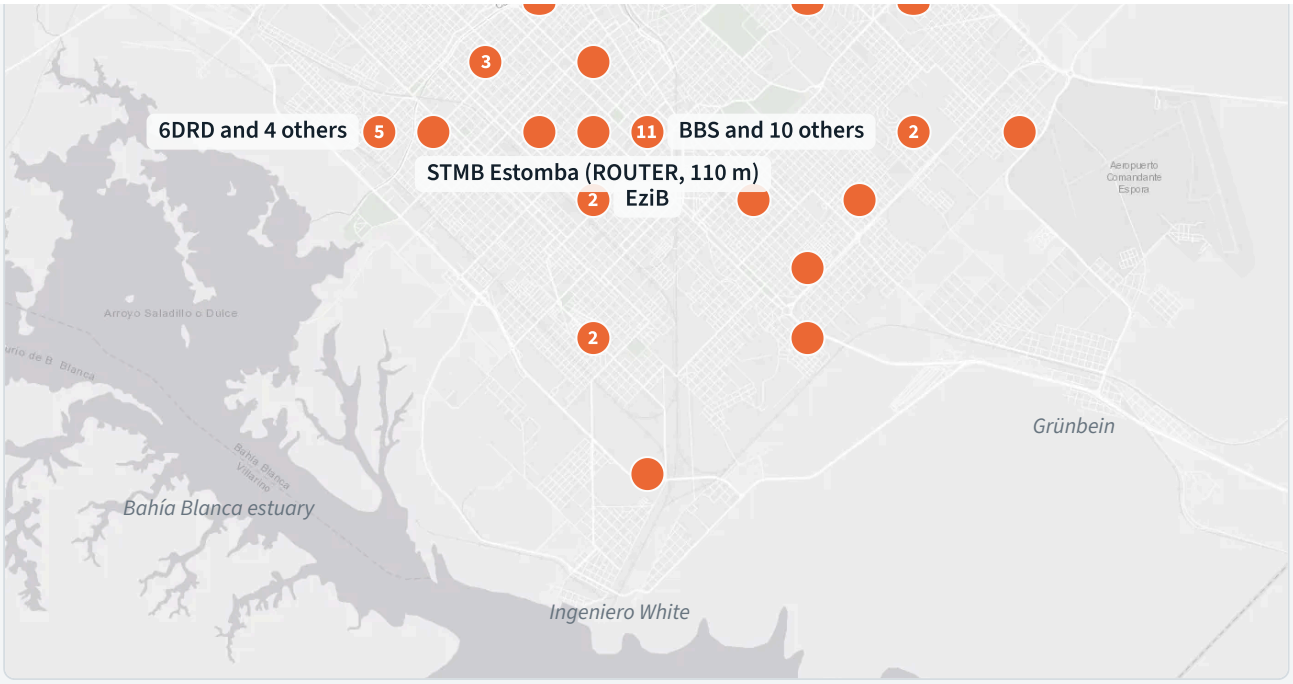




PAT1 · Viedma-Patagones · Bahía Blanca region · Direct hop between the networks · Other hops in the traceroutes

Rings at 100, 200, 300 and 400 km from PAT1. Positions rounded to 0.01° (about 1.1 km). Positions that never reached the station by radio, C-3A among them, come from the SOMesh public map. Base map: Esri World Light Gray Canvas (Esri, HERE, Garmin, © OpenStreetMap).





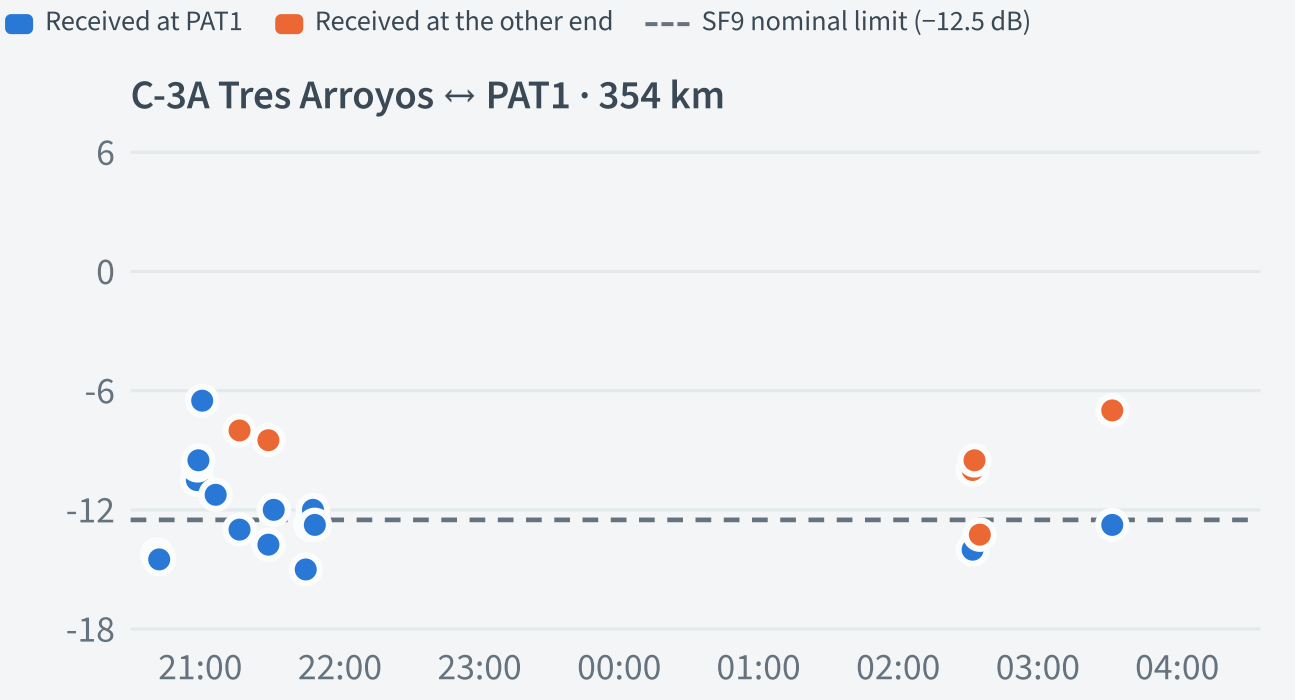
Bahía Blanca: SOMesh nodes that reached Viedma. The number is how many share the same position cell (many report a reduced-precision position).

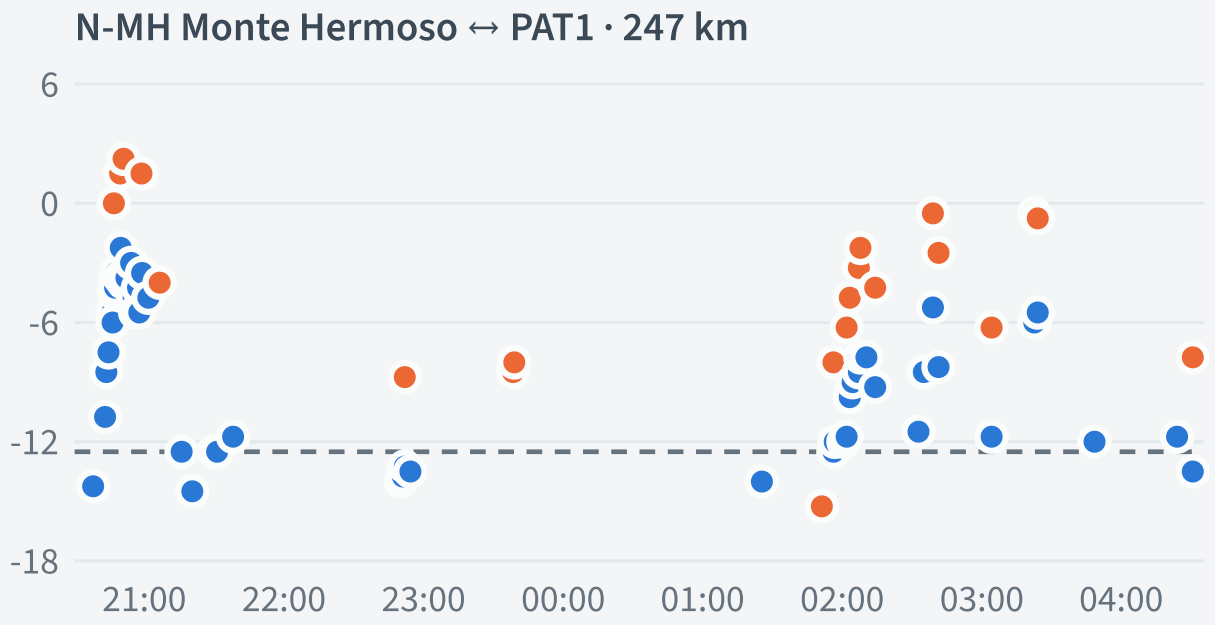
4. Direct hops between the networks

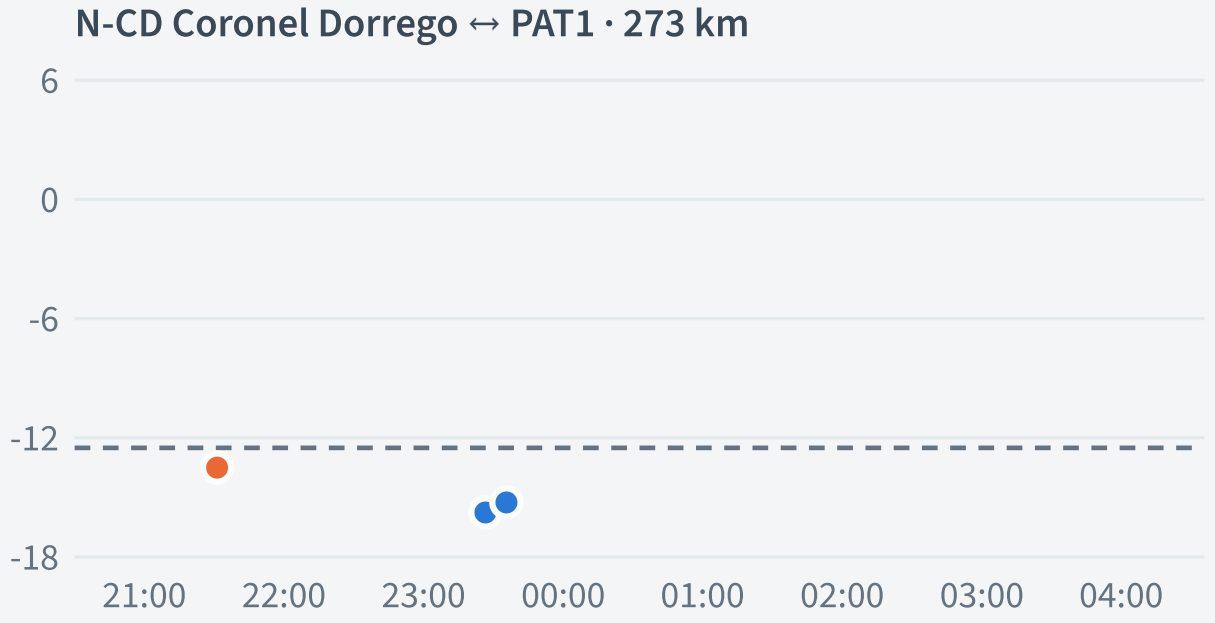
A traceroute lists every node that relayed it, and each SNR is measured by the node that received that hop, so two consecutive entries are a direct radio hop. Across all traceroutes, the hops between a node of Viedma-Patagones and one of the Bahía region always had PAT1 at this end.

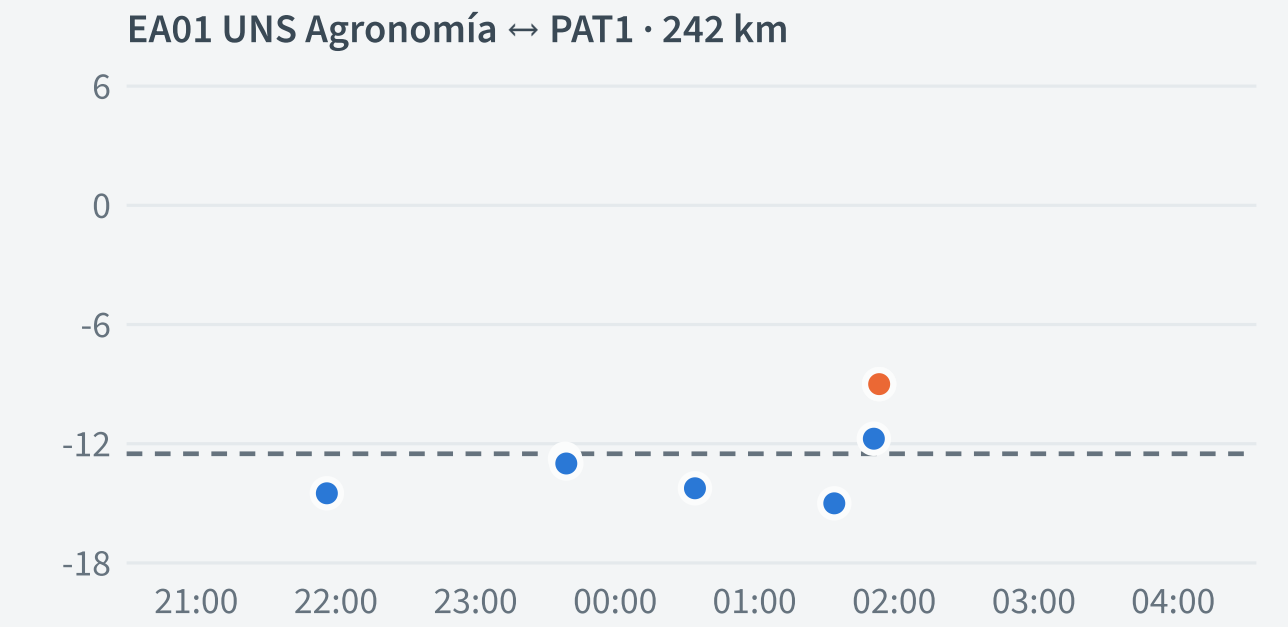
Node on the other side	Distance to PAT1	Records	SNR at PAT1 best / median	SNR at the other end best / median	First-last
C-3A Tres Arroyos cemetery, 90 m tower; position from the SOMesh map	354.3 km	22	−6.5 dB / −12.75 dB	−7 dB / −9 dB	20:41-03:31
N-CD Coronel Dorrego; position received by radio (118 m)	272.6 km	3	−15.25 dB / −15.5 dB	−13.5 dB / −13.5 dB	21:31-23:35

Node on the other side	Distance to PAT1	Records	SNR at PAT1 best / median	SNR at the other end best / median	First-last
N-MH Monte Hermoso; position received by radio (25 m)	247.2 km	71	−2.25 dB / −8.5 dB	2.25 dB / −4 dB	20:37-04:30
EA01 Bahía Blanca, UNS Agronomía; position received by radio (54 m)	242.5 km	8	−9 dB / −13 dB	−9 dB / −9 dB	21:56-01:53




N-MH Monte Hermoso ↔ PAT1 · 247 km
6
0
-6
-12
-18
21:00
22:00
23:00
00:00
01:00
02:00
03:00
04:00


N-CD Coronel Dorrego ↔ PAT1 · 273 km
6
0
-6
-12
-18
21:00
22:00
23:00
00:00
01:00
02:00
03:00
04:00



SNR of each hop between PAT1 and the other side, from the traceroutes. Several readings are near or below the nominal SF9 limit.

Monte Hermoso was the main entry: 71 records between 20:37 and 04:30, with readings up to +2.25 dB, close to free-space propagation at that distance. At 21:02 a SOMesh user wrote on the channel that this node had WiFi switched off. None of the 866 receptions of packets from the region carried the via_mqtt flag: everything arrived over the air.

5. The 354.3 km hop: PAT1 ↔ C-3A

End	Position	Locator	Antenna	Source of the position
PAT1 `!65d34d89`	`-40.80216, -62.98292`	`FE89me`	tower, 55-65 m ASL	received by radio
C-3A `!826eb03a`	`-38.403168, -60.259756`	`FF91uo`	90 m tower, about 190 m ASL	SOMesh public map (node broadcast)

Great-circle distance 354.3 km, bearing 42° from PAT1. The path crosses about 198 km of sea and low coast before the plain that leads to Tres Arroyos.

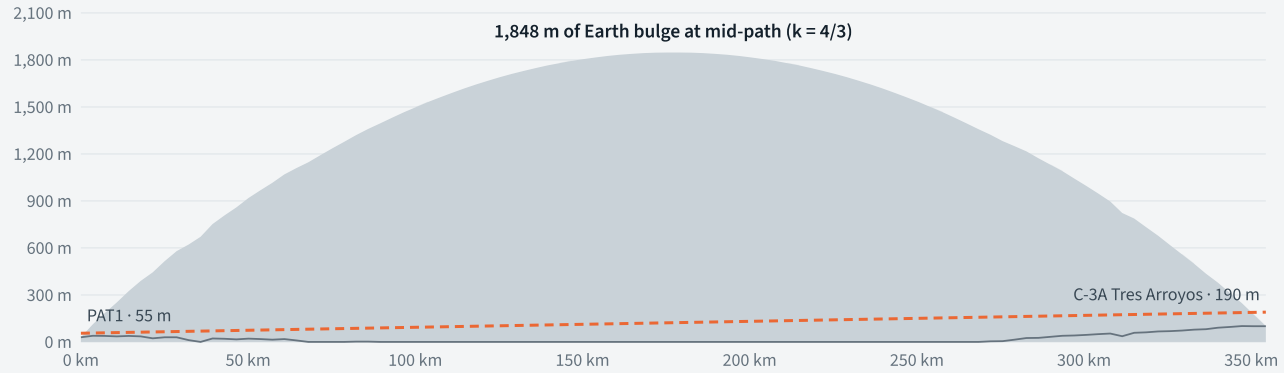
Traceroutes with the hop

Local time	Requester → target	Hop and SNR at the receiver
`20:41 on 1 Nov`	● **BBSD** → ● **MRCC**	C-3A → PAT1: −14.25 dB (towards)

Local time	Requester → target	Hop and SNR at the receiver
20:42 on 1 Nov	BBSD → BASE	C-3A → PAT1: −14.5 dB (towards)
20:58 on 1 Nov	BBSD → nlm2	C-3A → PAT1: −10.5 dB (towards)
20:58 on 1 Nov	VDM → N-MH	C-3A → PAT1: −9.75 dB (back)
20:59 on 1 Nov	BBSD → 5VBA	C-3A → PAT1: −9.5 dB (towards)
21:00 on 1 Nov	7EEA → VDM	C-3A → PAT1: −6.5 dB (towards)
21:06 on 1 Nov	VDM → N-MH	C-3A → PAT1: −11.25 dB (back)
21:16 on 1 Nov	VDM → N-CD	PAT1 → C-3A: −8 dB (towards) C-3A → PAT1: −13 dB (back)
21:29 on 1 Nov	BASE → N-3A	PAT1 → C-3A: −8.5 dB (towards) C-3A → PAT1: −13.75 dB (back)
21:31 on 1 Nov	ZERO → MIKE	C-3A → PAT1: −12 dB (towards)
21:45 on 1 Nov	plgm → MIKE	C-3A → PAT1: −15 dB (towards)
21:47 on 1 Nov	BBSD → nlm1	C-3A → PAT1: −12.75 dB (towards)
21:48 on 1 Nov	BBSD → nlm1	C-3A → PAT1: −12 dB (towards)
21:49 on 1 Nov	plgm → pic1	C-3A → PAT1: −12.75 dB (towards)
02:31 on 2 Nov	MRCO → C-3A	PAT1 → C-3A: −10 dB (towards) C-3A → PAT1: −14 dB (back)
02:32 on 2 Nov	MRCO → C-3A	PAT1 → C-3A: −9.5 dB (towards)
02:35 on 2 Nov	MRCC → HamB	PAT1 → C-3A: −13.25 dB (towards)
03:31 on 2 Nov	MRCO → C-3A	PAT1 → C-3A: −7 dB (towards) C-3A → PAT1: −12.75 dB (back)

At 02:31 on 2 Nov C-3A answered a traceroute from MRCO along the shortest path, MRCO → PAT1 → C-3A, with the direct hop in both directions in the same traceroute.

Profile and link budget



Terrain (Copernicus DEM) added to the Earth's curvature with normal refraction (k = 4/3). The dotted line joins the two antennas.

- **Radio horizon** with k = 4/3: 4.12 × (√55 + √190) ≈ 87 km (90 km with PAT1 at 65 m). The hop is about four times longer.
- **Curvature**: at mid-path the Earth is about 1,850 m above the straight line between the antennas.
- **Free-space budget**, assuming 22 dBm, 3 dBi antennas and a 6 dB noise figure in 250 kHz (noise floor −114 dBm): path loss 142.7 dB and expected SNR about −0.6 dB. The best reading, −6.5 dB, is about 6 dB below free space.

Position of C-3A

C-3A never sent a position or a NodeInfo that reached the station, so its position comes from the SOMesh public map, which receives the node's own broadcasts: shortName C-3A, role ROUTER, -38.403168, -60.259756, recorded from the map's public feed on 2 November at 01:50 local time (file `somesh_snapshot` in the data package). The point is on the cemetery tower; SOMesh gave the tower height. For the 49 nodes of the Bahía region whose position reached the station by radio and that also appear on the SOMesh map, 46 positions are identical to the metre and the largest difference is 7 m. An error of 1 km in this position would change the distance by at most 1 km.

At 03:32:08 on 2 Nov C-3A answered a position request from MRCO within 3 seconds, but the answer was encrypted end to end with PKI (channel hash 0, 104 bytes). C-3A knows MRCO's public key, while the station never received C-3A's NodeInfo and does not have its key, so the content could not be read. It was the only answer to 3 position requests. We then asked C-3A for its NodeInfo (2 requests from 04:28, with a NodeInfo request added to meshbox 0.9.7 for this case). It answered at 04:29:28, after 6 seconds, again PKI-encrypted (117 bytes). As long as C-3A holds MRCO's key and MRCO lacks C-3A's, every direct answer

from C-3A to MRCO arrives encrypted; C-3A's public key can only come from one of its NodeInfo broadcasts, which travel unencrypted, or from its owner.

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6. Entry point and hop counts

Each reception stores the last byte of the node that relayed the packet (`relay_node`). Of the 656 receptions at MRCO of packets from the region, 654 carried `0x89`, the last byte of PAT1; the other 2 came through pic1 (1) and BASE (1), nodes in Viedma. MRCC received 210: 190 relayed by MRCO (0x28) and 20 relayed by MRC2 (0x90). The 29 packets that reached MRCO with a single hop (17 from N-MH, 3 from C-3A, 3 from N-CD, 2 from VHG, 2 from BVCD, 1 from NJPC and 1 from 9DHM) had been heard directly by PAT1. NJPC, VHG, BVCD and 9DHM is not a direct hop in any traceroute; it may come from a zero-cost hop through a favorite router.

Receiver	Hops used	Receptions
MRCO (roof, Viedma)	1	29
MRCO (roof, Viedma)	2	266
MRCO (roof, Viedma)	3	320
MRCO (roof, Viedma)	4	28
MRCO (roof, Viedma)	5	13
MRCC (USB, Viedma)	2	10
MRCC (USB, Viedma)	3	149
MRCC (USB, Viedma)	4	43
MRCC (USB, Viedma)	5	6
MRCC (USB, Viedma)	6	2

Hops used = `hop_start − hop_limit`. Routers do not decrement the hop limit when they relay for a favorite router, so this number can be lower than the real one. Traceroutes, which name each node, are the reference for direct hops.

- **Hop limits.** A client in Bahía Blanca needs four or five relays to reach Viedma (for example STMB, 3PIC, N-MH, PAT1, MRCO). With the default hop limit of 3 its packets do not arrive; most of what we received left with limits of 5 to 7. The

same holds the other way: at 01:54:55 on 2 Nov MRCO sent a traceroute with a hop limit of 3 to ElArroyoMesh (`!1a23caeb`), 416 km away on a farm near Carhué, and repeated it at 01:55:57 with a limit of 7. The only answer arrived 13 s after the second request, with 5 relays on the way out and 5 on the way back.

- **Favorites.** Since firmware 2.7.11 a router does not decrement the hop limit when it relays a packet from a favorite router (2.7.18 also accepts CLIENT_BASE). Marking the chain STMB, 3PIC, N-MH, PAT1 and MRCO as favorites of each other would let a client in Bahía reach Viedma with the default limit.
- **NodeDB.** PAT1, an nRF52 device, keeps 80 nodes. With both networks joined that limit is reached quickly; favorites are never evicted.
- **PKI.** As shown above, C-3A answered a position request with a PKI reply that MRCO could not decrypt, because MRCO never received C-3A's NodeInfo. Over a link that opens for a few hours, nodes can end up with keys known in only one direction. meshbox 0.9.7 added a NodeInfo request for this case, to be used in the next opening.

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7. Traffic between people

43 text messages on the public MediumFast channel (29 from the Bahía region and 14 from Viedma), from 12 people (5 and 7), plus 11 reactions. 9 messages were replies to a message from the other network.

From MRCO, the station's roof node, 5 messages went to the channel and 7 direct messages to 5 nodes of the Bahía region; 2 came back with the recipient's acknowledgement. 3 direct messages arrived from 2 nodes there. The fastest human answer to a direct message from MRCO took about 2 minutes. Separately, MRCO sent 8 queries to the Bahía Blanca BBS (Sentinel BBS), which answered 6 times automatically; those and the BBS's 6 channel notices are not counted above. MRCC, on USB at the station, only received. Message contents of direct messages are not included in this report or in the data.

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8. Propagation

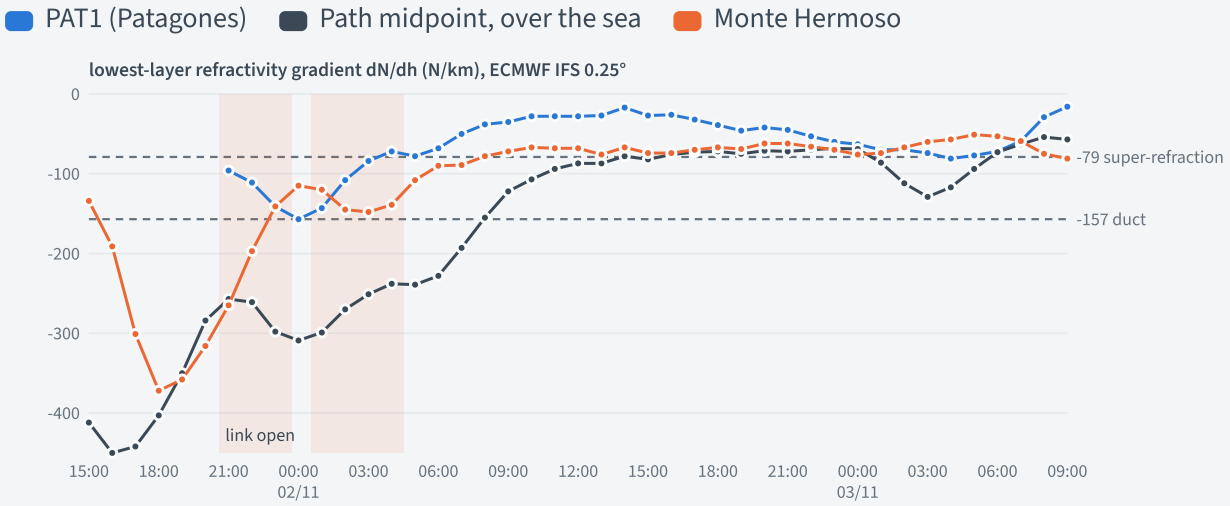
On the afternoon of 01/11 west to north-west wind carried warm, dry air off the land (Bahía Blanca airport 26-27 °C, dew point 6-7 °C) over a sea at 14.4-14.9 °C. At the path midpoint ECMWF has 19.5 °C and 58 % at 2 m under 22.8 °C and 33 % at 59 m, which gives −403 N/km at 18:00; humidity accounts for −18 of the −23 N difference. The midpoint stays in duct (≤ −157 N/km) from 15:00 on 01/11 to 07:00 on 02/11, and GFS and GEM also show a surface duct over the sea in the evening (−416 and −386 N/km at 18:00).

The 20:36 opening came after the land end changed at dusk: the boundary layer over PAT1 fell from 2425 m at 16:00 to 125 m at 20:00 (ECMWF 9 km), Viedma cooled from 22 °C at 18:00 to 15 °C at 21:00 under a clear sky, and PAT1 is in super-refraction from 21:00 (−96 N/km). Monte Hermoso was in duct until 22:00 and in super-refraction from 23:00 (−141 N/km); the first window closed at 23:43. The 50 minute gap to 00:33 is too short for hourly and 3-hourly model output to resolve; ECMWF shows no break over the sea, while GFS weakens there at 23:00-01:00 (−93 N/km at 00:00).

After midnight the high-pressure regime firmed up. Pressure rose 3-4 hPa between 18:00 and 03:00 (Bahía Blanca 1007 to 1011 hPa, Viedma 1006 to 1009 hPa), ECMWF has sinking air at 700 hPa over the midpoint from 22:00 to 04:00 (−0.02 to −0.07 m/s) and the 700 hPa humidity fell from 69 % at 21:00 to 16 % at 03:00. The midpoint duct peaked around midnight (−309 N/km at 00:00, −251 at 03:00), PAT1 reached −157 N/km at 00:00 and Monte Hermoso recovered to −148 N/km at 03:00. Tropocast (GDPS 00 UTC) raises the PAT1-C-3A path mean from 50 at 00:00 to 64 at 03:00 and 73 at 06:00, consistent with the reopening at 00:33.

The second window closed at 04:30:41 with a packet that crossed the Monte Hermoso-PAT1 hop, the main entry of the night. Around that hour ECMWF and GFS weaken both land ends of that hop while the sea stays in duct: ECMWF takes PAT1 out of super-refraction from 04:00 (−72 N/km, with the threshold at −79) and weakens Monte Hermoso from −148 N/km at 03:00 to −108 at 05:00, and GFS weakens PAT1 from −110 to −52 N/km and Monte Hermoso from −178 to −63 N/km between 04:00 and 05:00. ICON does not show that weakening, and the hourly ECMWF values between 03:00 and 06:00 are interpolated. Tropocast kept rising until 06:00 (73) and did not mark the closure. The southerly wind reached Viedma at 06:00 (SAVV METAR, 200° at 7 kt, 9 °C), an hour and a half after the closure, so it does not explain it on its own.

ECMWF ends the sea duct near 07:00 on 02/11 with west to south-west wind of 20-28 km/h, and brings the southerly wind with colder air to Patagones at 06:00, the same hour as in the Viedma METAR. For the night of 02-03/11 a migratory high of about 1017 hPa near 42°S 58-60°W brings east to north-east wind (18-27 km/h over the sea, 11-19 km/h on the coast). No model has a surface duct at the coast or over the sea (ECMWF midpoint −129 to −54 N/km), while GEM puts −274 to −166 N/km in a layer at about 241-384 m above sea level after midnight. Tropocast (path mean 70-82 at 00:00-06:00) and Hepburn (3-6) are favourable; that layer is close to the height of C-3A (about 190 m) and above PAT1 (55-65 m), so a repeat of the direct hop is possible but the surface data support it less than on 01-02/11.



Model data (ECMWF IFS 0.25° through Open-Meteo), not observations. Shaded: hours when the link was open. A gradient below −157 N/km is a duct; between −79 and −157 N/km, super-refraction.

Tropocast index on the PAT1-C-3A path

Local time	At PAT1	Path mean	Path max	Model run
01/11 15:00	17.1	37.8	54.5	2026-11-01T12:00:00Z
01/11 18:00	13.9	36.6	57.9	2026-11-01T12:00:00Z
01/11 21:00	30.9	48.3	64.1	2026-11-02T00:00:00Z
02/11 00:00	56.0	50.0	64.0	2026-11-02T00:00:00Z
02/11 03:00	56.8	63.5	84.9	2026-11-02T00:00:00Z
02/11 06:00	53.6	72.7	87.8	2026-11-02T00:00:00Z
02/11 09:00	18.2	54.8	84.6	2026-11-02T00:00:00Z

Local time	At PAT1	Path mean	Path max	Model run
02/11 12:00	12.6	40.9	65.4	2026-11-02T00:00:00Z
02/11 15:00	8.9	31.9	55.6	2026-11-02T00:00:00Z
02/11 18:00	15.3	32.5	47.6	2026-11-02T00:00:00Z
02/11 21:00	44.4	47.9	56.2	2026-11-02T00:00:00Z
03/11 00:00	69.1	69.7	74.3	2026-11-02T00:00:00Z
03/11 03:00	72.6	76.6	78.5	2026-11-02T00:00:00Z
03/11 06:00	79.6	82.3	87.5	2026-11-02T00:00:00Z
03/11 09:00	62.2	74.4	85.4	2026-11-02T00:00:00Z

Tropocast index (0-100), computed from the refractivity profile of the Canadian GDPS model; it is a comparative score, not a probability of reception.

Mid-path conditions, hour by hour

Local time	T 2 m	RH 2 m	T / RH 925 hPa	Wind 10 m	Boundary layer	dN/dh (N/km)	State
01/11 18:00	19.5 °C	58 %	17.9 °C / 37 %	24 km/h WNW	110 m	-403	duct
01/11 19:00	19.0 °C	60 %	17.8 °C / 39 %	17 km/h WNW	75 m	-350	duct
01/11 20:00	18.0 °C	64 %	17.7 °C / 41 %	7 km/h WSW	45 m	-284	duct
01/11 21:00	17.0 °C	69 %	17.6 °C / 42 %	9 km/h SSE	115 m	-257	duct
01/11 22:00	16.0 °C	74 %	17.4 °C / 40 %	14 km/h SE	120 m	-261	duct
01/11 23:00	15.0 °C	80 %	17.2 °C / 37 %	17 km/h ESE	135 m	-298	duct
02/11 00:00	14.4 °C	84 %	17.1 °C / 33 %	18 km/h E	105 m	-309	duct
02/11 01:00	14.6 °C	84 %	17.2 °C / 29 %	13 km/h E	70 m	-299	duct
02/11 02:00	15.2 °C	82 %	17.4 °C / 24 %	8 km/h NNE	55 m	-270	duct

Local time	T 2 m	RH 2 m	T / RH 925 hPa	Wind 10 m	Boundary layer	dN/dh (N/km)	State
02/11 03:00	15.7 °C	79 %	17.4 °C / 21 %	11 km/h NNW	65 m	-251	duct
02/11 04:00	15.7 °C	76 %	17.2 °C / 21 %	14 km/h NW	125 m	-238	duct
02/11 05:00	15.5 °C	73 %	16.8 °C / 23 %	17 km/h WNW	135 m	-239	duct
02/11 06:00	15.3 °C	71 %	16.5 °C / 25 %	20 km/h W	235 m	-228	duct
02/11 07:00	15.1 °C	69 %	16.2 °C / 26 %	24 km/h W	230 m	-193	duct
02/11 08:00	14.9 °C	68 %	16.0 °C / 27 %	26 km/h WSW	270 m	-155	super-refract
02/11 09:00	14.7 °C	68 %	15.5 °C / 28 %	28 km/h WSW	300 m	-122	super-refract

Synoptic situation

- 01/11 18:00: weak pressure field over the path (1006-1009 hPa) between the western edge of the South Atlantic high (1025 hPa at 38°S 40°W, grid edge) and low pressure over central and northern Argentina (about 1006 hPa between 28 and 34°S at 62-64°W); deep low south of Patagonia (985 hPa near 56°S).
- 01/11 evening: west to north-west wind at 925 hPa over the coast (24-30 km/h at the midpoint, 18:00-23:00); light wind at the coastal airports after 20:00 (2-8 kt at Bahía Blanca and Viedma, CAVOK), while over the sea ECMWF turns the 10 m wind to east-south-east at 9-18 km/h between 21:00 and 00:00.
- 01/11 18:00 to 02/11 03:00: pressure rising 3-4 hPa on the coast (METAR Bahía Blanca 1007 to 1011 hPa, Viedma 1006 to 1009 hPa).
- Subsidence evidence (ECMWF, midpoint): vertical velocity at 700 hPa −0.07 to −0.02 m/s (negative = sinking) from 22:00 to 04:00; relative humidity at 700 hPa from 69 % (21:00) to 16 % (03:00) and at 925 hPa from 42 % to 21 %. At 925 hPa the temperature stayed at 17.4-17.6 °C while the 2 m air over the sea was 14.4-15.7 °C.
- 02/11 early morning: southerly wind reaches PAT1 (ECMWF 199° 23 km/h at 06:00) with colder air at 925 hPa (15.9 °C at 03:00, 10.3 °C at 09:00).

- 02/11 21:00: closed migratory high 1017 hPa near 42°S 60°W (2° grid), 1017 hPa near 42°S 58°W at 03:00 on 03/11; 500 hPa height over 40°S 62°W from 5613 m (02/11 00:00) to 5654 m (03/11 00:00).
- Night of 02-03/11: east to north-east wind over the path, warming at 925 hPa (midpoint 12.8 °C at 21:00 to 15.2 °C at 06:00) over a surface layer of 13.0 °C and 86 %; 700 hPa humidity at the midpoint rises to 89 % by 03:00 (mid-level moisture arriving), with no clear subsidence signal there (700 hPa vertical velocity 0.01 m/s).

Caveats

- All gradients are model values (short-range forecasts from the cited runs), not measurements; no radiosonde or refractometer covers the path on 01-02/11.
- ECMWF IFS 0.25 is stored every 3 hours; Open-Meteo interpolates it to hourly, so hourly changes within 3 h windows are interpolated.
- The 2 m to 1000 hPa layer is 35-140 m thick and depends on the model 1000 hPa height; at Coronel Dorrego (113 m) and Tres Arroyos (100 m) the 1000 hPa level is below or too close to the ground, so those points have no ECMWF surface-layer value and are described with 925 hPa or with other models.
- Grid points: ECMWF uses -39.5, -61.5 for the midpoint and -39.0, -61.25 for Monte Hermoso; coastal cells mix land and sea.
- Observed night temperatures at Bahía Blanca airport were 4-5 °C below ECMWF, so real surface inversions inland were probably stronger than modelled.
- Tropocast, Hepburn and the GEM column all come from the Canadian GDPS model; they are not independent confirmations.
- Hepburn values are read from map colours (one class step of uncertainty near colour borders and coastlines); the Hepburn run is from 01/11 12 UTC.
- The Tropocast index is a comparative score, not a probability of reception.

Sources

- Open-Meteo Forecast API, ECMWF IFS 0.25 (ecmwf_ifs025): surface and pressure levels at the 6 points: `https://api.open-meteo.com/v1/forecast` (2026-11-01 18 UTC (short-range forecast, steps 0-39; the 2026-11-02 00 UTC run was not yet published on Open-Meteo at 04:33 local))

- Open-Meteo Forecast API, ECMWF IFS HRES 9 km (ecmwf_ifs): 2 m and boundary layer height: `https://api.open-meteo.com/v1/forecast` (2026-11-01 18 UTC (short-range forecast, steps 0-39; the 2026-11-02 00 UTC run was not yet published on Open-Meteo at 04:33 local))
- Open-Meteo Forecast API, GFS (gfs_seamless): `https://api.open-meteo.com/v1/forecast` (GFS 0.25, run 02/11 00 UTC)
- Open-Meteo Forecast API, ICON (icon_seamless): `https://api.open-meteo.com/v1/forecast` (DWD ICON, run 02/11 00 UTC)
- Open-Meteo Forecast API, GEM (gem_seamless, GDPS 15 km, with 1015/985/970 hPa): `https://api.open-meteo.com/v1/forecast` (ECCC GDPS, latest run on Open-Meteo at 02/11 03:47 local (run time not exposed))
- Open-Meteo Forecast API, best_match: `https://api.open-meteo.com/v1/forecast` (Open-Meteo blend)
- Open-Meteo Historical Forecast API, ECMWF IFS 0.25: `https://historical-forecast-api.open-meteo.com/v1/forecast` (stitched first hours of successive runs, 01-02/11)
- Open-Meteo Marine API, sea surface temperature (13 points): `https://marine-api.open-meteo.com/v1/marine` (Open-Meteo marine (best match))
- Open-Meteo, ECMWF IFS 0.25 on a 2 degree grid (28-56°S, 40-80°W): MSLP, 500 hPa height, 700/850 hPa vertical velocity, 700 hPa humidity: `https://api.open-meteo.com/v1/forecast` (2026-11-01 18 UTC (short-range forecast, steps 0-39; the 2026-11-02 00 UTC run was not yet published on Open-Meteo at 04:33 local))
- Open-Meteo model metadata (run times): `https://api.open-meteo.com/data/{model}/static/meta.json` (-)
- Tropocast.eu vector grids, index 0-100, model full (and surface/elevated for some hours): `https://tropocast.eu/api/v1/tropo/vector/{hour}.json?model=full&area=world&source=gdps&run=...` (ECCC GDPS 01/11 12 UTC (fh 6-24) and 02/11 00 UTC (fh 0-42))
- Tropocast.eu metadata and archive metadata: `https://tropocast.eu/api/v1/tropo/metadata?model=full&area=world&source=gdps` (published run 02/11 00 UTC)
- Hepburn Tropo Index, Central South America maps: `https://www.dxinfocentre.com/tropo_sam.html` (GDPS 01/11 12 UTC (maps of 01/11 17:49 UTC))
- METAR (Bahía Blanca, Viedma, Mar del Plata, Tandil, Santa Rosa, Neuquén, Trelew): `https://aviationweather.gov/api/data/metar`

(observations)

- University of Wyoming radiosonde archive: `https://weather.uwyo.edu/wsgi/sounding` (observations (only 87623 Santa Rosa 01/11 12 UTC available))
- METAR, second download after the closure (same 11 airports): `https://aviationweather.gov/api/data/metar` (observations up to 02/11 09 UTC (06:00 local); observaciones/metar_aviationweather_0650.*)

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9. Comparison with published links

Published LoRa and Meshtastic links, excluding balloons and aircraft. The Meshtastic records on the official page are mountain-to-mountain links with line of sight and slow presets. PAT1's hops were low, beyond the horizon and with MediumFast, which has about 13.5 dB less margin than Very Long Slow and about 5 dB less than LongFast. The European reports are one-way direct receptions, with positions reported by the nodes themselves and no independent verification.

Link	Distance	Band and settings	Type	Source
PAT1-C-3A, Tres Arroyos (this event)	**354.3 km**	915 MHz, MediumFast (SF9, 250 kHz)	duct; 18 traceroutes, 4 with the hop in both directions; antennas at 55 and 190 m ASL	this report
PAT1-N-CD, Coronel Dorrego (this event)	**272.6 km**	915 MHz, MediumFast (SF9, 250 kHz)	duct; antennas at 55 and 118 m ASL	this report
Meshtastic, official ground record: Snežnik (Slovenia) to a repeater in the northern Apennines (Italy), MartinR7 and alleg, 23/9/2024	331 km	868 MHz, Very Long Slow (SF12, 62.5 kHz)	mountain to mountain, line of sight; traceroute and messages both ways	meshtastic.org
Meshtastic, previous official record: Hailstone Butte	254 km	915 MHz, LongFast	mountain to mountain; one end portable	meshtastic.org

Link	Distance	Band and settings	Type	Source
(Alberta) to West Butte (Montana), kboxlabs, July 2023		(SF11, 250 kHz)		
Meshtastic report: Glasgow to near Brussels, May 2026	821.9 km	868 MHz, LongFast	North Sea, one way; commenters attribute it to a node on an aircraft	Reddit
Meshtastic report: Monte Cesen (Venetian Prealps) to Brindisi, 4/6/2025	≈756 km	868 MHz, MediumFast (SF9, 250 kHz)	Adriatic; one-way direct reception (NeighborInfo, −14.5 dB)	LoRa Italia
Meshtastic report: north-east Scotland to near Eindhoven, May 2025	≈720 km	868 MHz	North Sea; annotated map only	Reddit
Meshtastic report: Birmingham to near Brussels, 24/4/2026	474.8 km	868 MHz, LongFast	North Sea; 6 one-way direct receptions, −16 to −19.8 dB	Reddit
Meshtastic report: beach in Sardinia (portable node) to Cinisi, Sicily, 8/7/2026	≈355-370 km	868 MHz	Tyrrhenian Sea; direct one way, return through 2 relays; the author suspects an artifact	GitHub
LoRa, TROPPO study (Zennaro et al.), San Pietro (Sardinia) to Barcelona, 3/2/2020	573 and 584 km	SF12, 125 kHz	duct confirmed by radiosonde	arXiv 2004.02802
LoRaWAN, buoy off Sesimbra (Portugal) to a gateway in the Canary Islands, 2023	1,336 km	868 MHz	sea level, 3 uplinks	The Things Network

The official page publishes no admission criteria and has not changed since September 2024. The search, on 2 November 2026, covered the open web in 14 languages, including forums and Reddit (through archived copies); it did not cover Discord, Telegram or Facebook. Distances marked ≈ come from published

maps. We found no Meshtastic or LoRa link over 250 km documented in South America.

10. Data and how to check them

The folder `data` that accompanies this report has the records behind every number here, in CSV and JSON: nodes with the source of each position, all traceroutes and each of their hops, the direct hops between the networks, packet headers and every reception with SNR, RSSI, hop limit and relay byte, the original MeshPacket protobufs of the public broadcasts, the public channel messages, the requests sent by the station, the two openings and the SOMesh map recording. `verify.py` (Python, standard library) recomputes the direct hops, the openings, the entry point and the position checks; `SHA256SUMS.txt` has the checksums. The public maps of both networks, comarcamesh.com.ar and somesh.com.ar, show the same nodes.

All traceroutes involving the Bahía region

Local time	Route (SNR at each receiver; orange: hop between the networks)	End to end
01/11 20:37:58	TOWARD ● plgm → 3.75 dB → ● STMB → 5.25 dB → ● 3PIC → −10.25 dB → ● N-MH → **−14.25 dB · 247 km** → ● PAT1 → 7.75 dB → ● 5VBA BACK ● 5VBA → −9.5 dB → ● MRCO → *not recorded further* → ● plgm	241 km
01/11 20:41:20	TOWARD ● BBSD → 5 dB → ● STMB → 4.25 dB → ● 3PIC → −9.5 dB → ● C-3A → **−14.25 dB · 354 km** → ● PAT1 → 10.25 dB → ● MRCO → 11.25 dB → ● MRCC BACK ● MRCC → 11.5 dB → ● MRCO → *not recorded further* → ● BBSD	241 km
01/11 20:42:15	TOWARD ● BBSD → 5.5 dB → ● STMB → 6.75 dB → ● 3PIC → −9.25 dB → ● C-3A → **−14.5 dB · 354 km** → ● PAT1 → 10.5 dB → ● BASE BACK ● BASE → −6.25 dB → ● MRCO → *not recorded further* → ● BBSD	241 km
01/11 20:43:07	TOWARD ● BBSD → 2.25 dB → ● STMB → 3.75 dB → ● 3PIC → −11.25 dB → ● N-MH → **−10.75 dB · 247 km** → ● PAT1	241 km

Local time	Route (SNR at each receiver; orange: hop between the networks)	End to end
	→ −5.75 dB → MIKE BACK MIKE → −6.75 dB → PAT1 → 10.25 dB → MRCO → *not recorded further* → BBSD	
01/11 20:43:41	TOWARD BBSD → 6.25 dB → STMB → −14 dB → N-CD → 9.75 dB → N-MH → **−8.5 dB · 247 km** → PAT1 → 10 dB → MRCO → 11 dB → MRCC BACK MRCC → 11.5 dB → MRCO → *not recorded further* → BBSD	241 km
01/11 20:44:32	TOWARD plgm → 5.5 dB → STMB → 7.25 dB → 3PIC → −10.5 dB → N-MH → **−7.5 dB · 247 km** → PAT1 → 8 dB → 5VBA BACK 5VBA → −10.75 dB → MRCO → *not recorded further* → plgm	241 km
01/11 20:46:11	TOWARD BBSD → 6.5 dB → STMB → 6.75 dB → 3PIC → −9.25 dB → N-MH → **−5.5 dB · 247 km** → PAT1 → 10.5 dB → pic1 BACK pic1 → −9.25 dB → MRCO → *not recorded further* → BBSD	241 km
01/11 20:46:20	TOWARD 7EEA → −1.75 dB → BVCD → −12.75 dB → N-MH → **−6 dB · 247 km** → PAT1 → 11 dB → BASE BACK BASE → −5.25 dB → MRCO → *not recorded further* → 7EEA	274 km
01/11 20:46:51	TOWARD VDM → −0.75 dB → PAT1 → **0 dB · 247 km** → N-MH → −10.25 dB → 3PIC BACK 3PIC → −10.25 dB → N-MH → **−4.5 dB · 247 km** → PAT1 → 10 dB → MRCO → *not recorded further* → VDM	309 km
01/11 20:47:23	TOWARD BBSD → −11.5 dB → EziB → −10.5 dB → CCJB → −9.25 dB → 3PIC → −11.25 dB → N-MH → **−4.25 dB · 247 km** → PAT1 → 10 dB → RCVI BACK RCVI → 10.25 dB → PAT1 → 9.75 dB → MRCO → *not recorded further* → BBSD	241 km
01/11 20:47:50	TOWARD BBSD → 6 dB → STMB → −15 dB → N-MH → **−3.5 dB · 247 km** → PAT1 → −6 dB → MIKE BACK MIKE → −9.75 dB → PAT1 → 11 dB → MRCO	241 km

Local time	Route (SNR at each receiver; orange: hop between the networks)	End to end
	→ *not recorded further* → ● BBSD	
01/11 20:49:33	TOWARD ● VDM → −11.5 dB → ● PAT1 → **1.5 dB · 247 km** → ● N-MH → −10.25 dB → ● EA01 → 8.25 dB → ● 3PIC BACK ● 3PIC → −9.25 dB → ● N-MH → **−3.75 dB · 247 km** → ● PAT1 → 9.75 dB → ● MRCO → *not recorded further* → ● VDM	309 km
01/11 20:49:49	TOWARD ● ZERO → 9.75 dB → ● STMB → −12 dB → ● N-MH → **−2.25 dB · 247 km** → ● PAT1 → 10 dB → ● MRCO BACK return not recorded	241 km
01/11 20:50:59	TOWARD ● VDM → −10.25 dB → ● PAT1 → **2.25 dB · 247 km** → ● N-MH → 9.5 dB → ● N-CD → −1.75 dB → ● 3PIC → 6 dB → ● STMB → 8.25 dB → ● ZERO BACK ● ZERO → 9.5 dB → ● STMB → 10.5 dB → ● EA01 → −7.5 dB → ● N-MH → **−4 dB · 247 km** → ● PAT1 → 10.75 dB → ● MRCO → *not recorded further* → ● VDM	242 km
01/11 20:52:15	TOWARD ● BBSD → 7 dB → ● STMB → −11.25 dB → ● N-MH → **−3.75 dB · 247 km** → ● PAT1 → 9.75 dB → ● RCVI BACK ● RCVI → 10.25 dB → ● PAT1 → 10.25 dB → ● MRCO → *not recorded further* → ● BBSD	241 km
01/11 20:54:20	TOWARD ● HamL → 10.5 dB → ● HamB → −7.25 dB → ● 3PIC → −10 dB → ● N-MH → **−3 dB · 247 km** → ● PAT1 → −2 dB → ● VDM → 10.5 dB → ● MIKE BACK ● MIKE → 11 dB → ● BASE → −5.5 dB → ● MRCO → *not recorded further* → ● HamL	238 km
01/11 20:55:23	TOWARD ● VHG → −10 dB → ● N-MH → **−4.75 dB · 247 km** → ● PAT1 → 9.5 dB → ● MRCO → 10.5 dB → ● MRCC BACK ● MRCC → 11 dB → ● MRCO → *not recorded further* → ● VHG	243 km
01/11 20:56:03	TOWARD ● HamL → −13.25 dB → ● EA01 → −8 dB → ● N-MH → **−5.5 dB · 247 km** → ● PAT1 → 10.25 dB → ● MRCO BACK return not recorded	237 km
01/11 20:57:12	TOWARD ● BBSD → 5.25 dB → ● STMB → 7.5 dB → ● 3PIC → −11.75 dB → ● N-MH → **−4.25 dB · 247 km** → ● PAT1 → 3 dB → ● nlm2 BACK ● nlm2 → −0.5 dB → ● PAT1 → 9.25 dB → ● MRCO	—

Local time	Route (SNR at each receiver; orange: hop between the networks)	End to end
	→ *not recorded further* → BBSD	
01/11 20:57:46	TOWARD BBSD → 6 dB → STMB → −13.75 dB → N-MH → **−5.5 dB · 247 km** → PAT1 → 2 dB → VDM BACK VDM → −1.75 dB → PAT1 → 10 dB → MRCO → *not recorded further* → BBSD	242 km
01/11 20:58:26	TOWARD BBSD → 5.75 dB → STMB → −11.25 dB → CURA → −12 dB → C-3A → **−10.5 dB · 354 km** → PAT1 → 5.25 dB → nlm2 BACK nlm2 → 10.75 dB → pic1 → −8.75 dB → MRCO → *not recorded further* → BBSD	—
01/11 20:58:43	TOWARD VDM → −2 dB → PAT1 → **1.5 dB · 247 km** → N-MH BACK N-MH → −13.75 dB → C-3A → **−9.75 dB · 354 km** → PAT1 → 10 dB → MRCO → *not recorded further* → VDM	249 km
01/11 20:59:02	TOWARD ZERO → 9.75 dB → STMB → 7 dB → 3PIC → −14 dB → N-MH → **−3.5 dB · 247 km** → PAT1 → −13.75 dB → MIKE BACK MIKE → −7.75 dB → PAT1 → 10.75 dB → MRCO → *not recorded further* → ZERO	241 km
01/11 20:59:05	TOWARD BBSD → 5.75 dB → STMB → 7.5 dB → 3PIC → −12.25 dB → C-3A → **−9.5 dB · 354 km** → PAT1 → 7.75 dB → 5VBA BACK 5VBA → −10 dB → MRCO → *not recorded further* → BBSD	241 km
01/11 21:00:45	TOWARD 7EEA → −5 dB → N-CD → −11 dB → C-3A → **−6.5 dB · 354 km** → PAT1 → 3.75 dB → VDM BACK VDM → 11 dB → BASE → −7 dB → MRCO → *not recorded further* → 7EEA	274 km
01/11 21:01:43	TOWARD HamL → 11 dB → HamB → −7.25 dB → 3PIC → −13.75 dB → N-MH → **−4.75 dB · 247 km** → PAT1 → 3.75 dB → VDM BACK VDM → 0.25 dB → PAT1 → 10.25 dB → MRCO → *not recorded further* → HamL	238 km

Local time	Route (SNR at each receiver; orange: hop between the networks)	End to end
01/11 21:06:32	TOWARD VDM → −12 dB → PAT1 → **−4 dB · 247 km** → N-MH BACK N-MH → −11.25 dB → VHG → −4 dB → 3PIC → −13.25 dB → C-3A → **−11.25 dB · 354 km** → PAT1 → 10.5 dB → MRCO → *not recorded further* → VDM	249 km
01/11 21:15:59	TOWARD ZERO → 9.75 dB → STMB → −12 dB → N-MH → **−12.5 dB · 247 km** → PAT1 → 10.5 dB → BASE BACK BASE → −7.5 dB → MRCO → *not recorded further* → ZERO	241 km
01/11 21:16:49	TOWARD VDM → −2.25 dB → PAT1 → **−8 dB · 354 km** → C-3A → −1.75 dB → N-CD BACK N-CD → 9 dB → N-MH → −15 dB → STMB → −12.25 dB → CURA → −10.75 dB → C-3A → **−13 dB · 354 km** → PAT1 → 10.5 dB → MRCO → *not recorded further* → VDM	275 km
01/11 21:20:36	TOWARD BBSD → 3 dB → STMB → −10.25 dB → N-MH → **−14.5 dB · 247 km** → PAT1 → 10.75 dB → BASE BACK BASE → −6.5 dB → MRCO → *not recorded further* → BBSD	241 km
01/11 21:29:09	TOWARD BASE → −6 dB → MRCO → 10.5 dB → PAT1 → **−8.5 dB · 354 km** → C-3A → 11 dB → N-3A BACK N-3A → 11 dB → C-3A → **−13.75 dB · 354 km** → PAT1 → 10 dB → MRCO → *not recorded further* → BASE	358 km
01/11 21:29:34	TOWARD ZERO → −5.5 dB → 4665 → 9.75 dB → Dani → −2 dB → 3PIC → −12.5 dB → C-3A → −11.75 dB → N-MH → **−12.5 dB · 247 km** → PAT1 → 7.75 dB → 5VBA BACK 5VBA → −9.75 dB → MRCO → *not recorded further* → ZERO	241 km
01/11 21:31:18	TOWARD VDM → −3 dB → PAT1 → **−13.5 dB · 273 km** → N-CD → −4 dB → 208 BACK 208 → 11.25 dB → BVCD → −7.5 dB → N-MH → **−12.5 dB · 247 km** → PAT1 → 10.5 dB → MRCO → *not recorded further* → VDM	274 km

Local time	Route (SNR at each receiver; orange: hop between the networks)	End to end
01/11 21:31:27	TOWARD ZERO → 9.75 dB → STMB → 6.25 dB → 3PIC → −12.75 dB → C-3A → **−12 dB · 354 km** → PAT1 → −3.5 dB → MIKE BACK MIKE → −8 dB → PAT1 → 11 dB → MRCO → *not recorded further* → ZERO	241 km
01/11 21:38:04	TOWARD GUIA → −6.75 dB → CURA → 3 dB → 3PIC → −9.75 dB → N-MH → **−11.75 dB · 247 km** → PAT1 → 6 dB → 5VBA BACK 5VBA → −13.25 dB → MRCO → *not recorded further* → GUIA	343 km
01/11 21:45:18	TOWARD plgm → 5.5 dB → STMB → 6.5 dB → 3PIC → 2 dB → N-CD → −5.5 dB → C-3A → **−15 dB · 354 km** → PAT1 → −7.5 dB → MIKE BACK MIKE → −8.75 dB → PAT1 → 10.5 dB → MRCO → *not recorded further* → plgm	241 km
01/11 21:47:13	TOWARD BBSD → 6 dB → STMB → 6.5 dB → 3PIC → −10.25 dB → C-3A → **−12.75 dB · 354 km** → PAT1 → −10 dB → nlm1 BACK nlm1 → −2 dB → PAT1 → 10 dB → MRCO → *not recorded further* → BBSD	—
01/11 21:48:23	TOWARD BBSD → 4.25 dB → STMB → 6.5 dB → 3PIC → −9.75 dB → C-3A → **−12 dB · 354 km** → PAT1 → −9.25 dB → nlm1 BACK nlm1 → 11.75 dB → rock → 10.5 dB → PAT1 → 9.75 dB → MRCO → *not recorded further* → BBSD	—
01/11 21:49:13	TOWARD plgm → 7 dB → STMB → −1.5 dB → 3PIC → −9.25 dB → C-3A → **−12.75 dB · 354 km** → PAT1 → 10.5 dB → pic1 BACK pic1 → −5.75 dB → MRCO → *not recorded further* → plgm	241 km
01/11 21:56:02	TOWARD EduP → −13.25 dB → EA01 → −8.75 dB → Fran BACK Fran → −4.5 dB → NJK5 → 8.5 dB → EA01 → **−14.5 dB · 242 km** → PAT1 → 10.75 dB → MRCO → *not recorded further* → EduP	—

Local time	Route (SNR at each receiver; orange: hop between the networks)	End to end
01/11 22:50:11	TOWARD ● BBSD → 6.25 dB → ● EA01 → −15.25 dB → ● N-MH → **−14 dB · 247 km** → ● PAT1 → 10.25 dB → ● MRCO → 11 dB → ● MRC2 BACK ● MRC2 → 11.25 dB → ● MRCO → *not recorded further* → ● BBSD	—
01/11 22:51:10	TOWARD ● ZERO → 9.75 dB → ● STMB → 3 dB → ● 3PIC → −13.25 dB → ● N-MH → **−13.75 dB · 247 km** → ● PAT1 → 10.5 dB → ● MRCO BACK return not recorded	241 km
01/11 22:51:58	TOWARD ● MRCO → 10.75 dB → ● PAT1 → **−8.75 dB · 247 km** → ● N-MH → 9.5 dB → ● N-CD → −5.5 dB → ● 3PIC → 1.5 dB → ● STMB → 8.75 dB → ● ZERO BACK ● ZERO → 9.5 dB → ● STMB → 1.5 dB → ● 3PIC → −0.5 dB → ● N-CD → 8.75 dB → ● N-MH → **−13.25 dB · 247 km** → ● PAT1 → 10.75 dB → ● MRCO	241 km
01/11 22:54:18	TOWARD ● BBSD → 11.25 dB → ● plgm → 7.25 dB → ● STMB → 3 dB → ● 3PIC → −0.25 dB → ● N-CD → 3.75 dB → ● N-IR → 10.75 dB → ● 208 BACK ● 208 → 11 dB → ● N-IR → 5.25 dB → ● N-CD → 9.25 dB → ● N-MH → **−13.5 dB · 247 km** → ● PAT1 → 10.25 dB → ● MRCO → *not recorded further* → ● BBSD	84 km
01/11 23:26:36	TOWARD ● BBSD → 7 dB → ● Dani → −4.5 dB → ● 3PIC → −11.25 dB → ● N-CD → **−15.75 dB · 273 km** → ● PAT1 → 9.75 dB → ● MRCO → 10.75 dB → ● MRCC BACK ● MRCC → 10.75 dB → ● MRCO → *not recorded further* → ● BBSD	241 km
01/11 23:35:42	TOWARD ● BBSD → 7.25 dB → ● STMB → −3.5 dB → ● N-MH → 10.25 dB → ● N-CD → **−15.25 dB · 273 km** → ● PAT1 → −6 dB → ● VDM BACK ● VDM → −8 dB → ● PAT1 → 10 dB → ● MRCO → *not recorded further* → ● BBSD	242 km
01/11 23:38:26	TOWARD ● MRCO → 10 dB → ● PAT1 → **−8.5 dB · 247 km** → ● N-MH → −6.25 dB → ● STMB → 5.25 dB → ● NJK5	241 km

Local time	Route (SNR at each receiver; orange: hop between the networks)	End to end
	BACK NJK5 → 7.25 dB → EA01 → **−12.75 dB · 242 km** → PAT1 → 9.5 dB → MRCO	
01/11 23:39:01	TOWARD VDM → −10 dB → PAT1 → **−8 dB · 247 km** → N-MH → −6.5 dB → STMB → 1.5 dB → NJK5 BACK NJK5 → −6.5 dB → QTH → −0.75 dB → EA01 → **−13 dB · 242 km** → PAT1 → 10.5 dB → MRCO *→ not recorded further →* VDM	241 km
02/11 00:34:21	TOWARD BBSD → 5.75 dB → EA01 → **−14.25 dB · 242 km** → PAT1 → −5 dB → MIKE BACK MIKE → −7.5 dB → PAT1 → 10.25 dB → MRCO *→ not recorded further →* BBSD	241 km
02/11 01:25:24	TOWARD BBSD → −2.5 dB → 4665 → −10.5 dB → plgm → 5 dB → STMB → −10.5 dB → N-MH → **−14 dB · 247 km** → PAT1 BACK PAT1 → 10.25 dB → MRCO *→ not recorded further →* BBSD	240 km
02/11 01:34:14	TOWARD BBSD → 3 dB → EA01 → **−15 dB · 242 km** → PAT1 → 8.25 dB → 359f BACK 359f → 1.5 dB → PAT1 → 10.5 dB → MRCO *→ not recorded further →* BBSD	241 km
02/11 01:51:13	TOWARD MRCO → 11 dB → PAT1 → **−15.25 dB · 247 km** → N-MH → 10 dB → N-CD → 6.25 dB → N-IR BACK N-IR → 7.75 dB → BVCD → 11.25 dB → N-CD → −1.5 dB → EA01 → **−11.75 dB · 242 km** → PAT1 → 10.25 dB → MRCO	320 km
02/11 01:53:34	TOWARD MRCO → 9.5 dB → PAT1 → **−9 dB · 242 km** → EA01 → −9.25 dB → CURA BACK CURA → −11.25 dB → C-3A → 5.5 dB → N-CD → −7.25 dB → STMB → 11.25 dB → EA01 → **−9 dB · 242 km** → PAT1 → 10 dB → MRCO	350 km
02/11 01:56:10	TOWARD MRCO → 10.5 dB → PAT1 → **−8 dB · 247 km** → N-MH → −9 dB → STMB → 4.75 dB → 3PIC → 3.25 dB → CURA → 5.25 dB → ARRO BACK ARRO → 2 dB → CURA → 2.75 dB → 3PIC	416 km

Local time	Route (SNR at each receiver; orange: hop between the networks)	End to end
	→ −4 dB → VHG → −10.5 dB → N-MH → **−12.5 dB · 247 km** → PAT1 → 10.25 dB → MRCO	
02/11 01:56:47	TOWARD HamL → 11 dB → HamB → −6.5 dB → 3PIC → −1.5 dB → N-CD → 9.5 dB → N-MH → **−12 dB · 247 km** → PAT1 BACK PAT1 → 10.25 dB → MRCO → *not recorded further* → HamL	236 km
02/11 02:00:35	TOWARD BBSD → 6.25 dB → STMB → −0.5 dB → MAPU → −11.25 dB → N-CD → 9 dB → N-MH → **−12 dB · 247 km** → PAT1 → −5.5 dB → MIKE BACK MIKE → −7 dB → PAT1 → 10 dB → MRCO → *not recorded further* → BBSD	241 km
02/11 02:01:54	TOWARD MRCO → 10.5 dB → PAT1 → **−6.25 dB · 247 km** → N-MH → −10.25 dB → STMB → 6 dB → 3PIC → −1.25 dB → 9DHM BACK 9DHM → −2.5 dB → 3PIC → −12 dB → C-3A → −9.75 dB → N-MH → **−11.75 dB · 247 km** → PAT1 → 9.75 dB → MRCO	212 km
02/11 02:03:15	TOWARD MRCO → 11 dB → PAT1 → **−4.75 dB · 247 km** → N-MH → 11 dB → N-CD → −5.25 dB → C-3A → 11 dB → N-3A BACK N-3A → 10.5 dB → C-3A → −9.75 dB → N-MH → **−9.75 dB · 247 km** → PAT1 → 10.75 dB → MRCO	358 km
02/11 02:04:29	TOWARD BBSD → 5 dB → STMB → 10.5 dB → QTH → −8.5 dB → HamB → 10.75 dB → HamL BACK HamL → 11 dB → HamB → −7.5 dB → NJPC → 1 dB → STMB → −5.25 dB → N-MH → **−9 dB · 247 km** → PAT1 → 10.5 dB → MRCO → *not recorded further* → BBSD	4 km
02/11 02:07:10	TOWARD MRCO → 10.75 dB → PAT1 → **−3.25 dB · 247 km** → N-MH → −7.75 dB → STMB → −7.5 dB → CURA → −10 dB → GUIA BACK GUIA → −10.75 dB → CURA → −7.75 dB → C-3A → −3.25 dB → N-CD → 9 dB → N-MH → **−8.5 dB · 247 km** → PAT1 → 9.75 dB → MRCO	343 km

Local time	Route (SNR at each receiver; orange: hop between the networks)	End to end
02/11 02:07:52	TOWARD MRCO → 11 dB → PAT1 → **−2.25 dB · 247 km** → N-MH → 10.25 dB → N-CD BACK N-CD → 9 dB → N-MH → **−7.75 dB · 247 km** → PAT1 → 10 dB → MRCO	275 km
02/11 02:10:26	TOWARD BBSD → 6 dB → STMB → 2.75 dB → jjm2 BACK jjm2 → 11 dB → cjjm → 8.5 dB → STMB → −1 dB → N-CD → 9.5 dB → N-MH → **−7.75 dB · 247 km** → PAT1 → 10 dB → MRCO *→ not recorded further →* BBSD	5 km
02/11 02:14:10	TOWARD MRCO → 11 dB → PAT1 → **−4.25 dB · 247 km** → N-MH → −14 dB → BVCD → 5.75 dB → GPS BACK GPS → 0.25 dB → BVCD → −8.75 dB → N-MH → **−9.25 dB · 247 km** → PAT1 → 10 dB → MRCO	274 km
02/11 02:31:56	TOWARD MRCO → 11 dB → PAT1 → **−10 dB · 354 km** → C-3A BACK C-3A → **−14 dB · 354 km** → PAT1 → 10.25 dB → MRCO	357 km
02/11 02:32:45	TOWARD MRCO → 10.5 dB → PAT1 → **−9.5 dB · 354 km** → C-3A BACK C-3A → −8.75 dB → N-MH → **−11.5 dB · 247 km** → PAT1 → 10.25 dB → MRCO	357 km
02/11 02:35:05	TOWARD MRCC → −12 dB → PAT1 → **−13.25 dB · 354 km** → C-3A → 3.5 dB → N-CD → −6.75 dB → 3PIC → −6.25 dB → HamB BACK HamB → −6.25 dB → 3PIC → −9.5 dB → N-MH → **−8.5 dB · 247 km** → PAT1 → 10 dB → MRCO *→ not recorded further →* MRCC	237 km
02/11 02:39:01	TOWARD MRCO → 10 dB → PAT1 → **−0.5 dB · 247 km** → N-MH → −8.5 dB → STMB → 10 dB → QTH → −10.25 dB → mk1 → −14.25 dB → MRM BACK MRM → −14.75 dB → chup → −2.75 dB → STMB → −4.25 dB → N-MH → **−5.25 dB · 247 km** → PAT1 → 10 dB → MRCO	—
02/11 02:41:26	TOWARD MRCO → 9.5 dB → PAT1 → **−2.5 dB · 247 km** →	241 km

Local time	Route (SNR at each receiver; orange: hop between the networks)	End to end
	N-MH → 11.5 dB → N-CD → 1 dB → STMB → −8 dB → BBSD BACK BBSD → 11 dB → plgm → 5.25 dB → STMB → −6.25 dB → N-MH → **−8.25 dB · 247 km** → PAT1 → 10 dB → MRCO	
02/11 03:04:11	TOWARD MRCO → 10 dB → PAT1 → **−6.25 dB · 247 km** → N-MH BACK N-MH → **−11.75 dB · 247 km** → PAT1 → 10.5 dB → MRCO	249 km
02/11 03:22:32	TOWARD MRC2 → −12.25 dB → PAT1 → **−0.5 dB · 247 km** → N-MH → −9.25 dB → STMB → −8 dB → BBSD BACK BBSD → 2.75 dB → Dani → −1 dB → 3PIC → −12.75 dB → N-MH → **−6 dB · 247 km** → PAT1 → 10.75 dB → MRCO → *not recorded further* → MRC2	—
02/11 03:24:06	TOWARD MRC2 → −12.75 dB → PAT1 → **−0.75 dB · 247 km** → N-MH → −10.25 dB → STMB → 9.75 dB → QTH BACK QTH → 10 dB → STMB → −4.75 dB → N-MH → **−5.5 dB · 247 km** → PAT1 → 10 dB → MRCO → *not recorded further* → MRC2	—
02/11 03:31:57	TOWARD MRCO → 10 dB → PAT1 → **−7 dB · 354 km** → C-3A BACK C-3A → **−12.75 dB · 354 km** → PAT1 → 10 dB → MRCO	357 km
02/11 03:48:25	TOWARD BBSD → 5.5 dB → STMB → 3.5 dB → N-MH → **−12 dB · 247 km** → PAT1 → −6.25 dB → MRCB BACK MRCB → 10.75 dB → MRCO → *not recorded further* → BBSD	241 km
02/11 04:23:55	TOWARD BBSD → −2 dB → 4665 → 10.75 dB → Dani → −2.25 dB → 3PIC → 1.75 dB → N-CD → 9 dB → N-MH → **−11.75 dB · 247 km** → PAT1 → 10.75 dB → rock BACK rock → 10.75 dB → pic1 → −6.75 dB → MRCO → *not recorded further* → BBSD	—
02/11 04:30:41	TOWARD MRCO → 10.75 dB → PAT1	249 km

Local time	Route (SNR at each receiver; orange: hop between the networks)	End to end
	→ −7.75 dB · 247 km → N-MH BACK N-MH → −13.5 dB · 247 km → PAT1 → 10.25 dB → MRCO	

11. Notes

- Times are local, UTC−3, unless marked UTC. The data were exported at 06:48 on 2 Nov.
- Distances: great circle on a sphere of 6,371 km, from the positions each node reports. Reduced-precision positions (13-14 bits) can be off by 1.5 to 3 km, under 1.5 % of these distances.
- Weather: model data and forecasts listed in section 8; no radiosonde soundings exist for the area and those hours.
- MQTT: some receptions in the data have source `mqtt` because MRCO also publishes what it hears to the station's own broker. The `via_mqtt` flag, which marks packets injected into the radio network from the internet, is 0 for every packet from the Bahía region.
- Privacy: the data do not include the content of direct messages or the headers of direct messages between third parties; the station's own receivers have their positions rounded to 0.01°.
- Thanks to SOMesh Bahía Blanca, whose public map supplied the positions that never reached Viedma, and to everyone on both networks who answered on the channel that night.

ComarcaMesh, Viedma-Patagones Meshtastic network · data from the meshbox station in Viedma · 1-2 November 2026.

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