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Notes on Platform-5 OWL

Left. Platform-5 with the OWL on top. Right. OWL flight model with antennas restrained.

Launched 11/11/2023 18:49:00 UTC on Transporter-9 from VSFB on SpaceX Falcon 9
Deployed 11/11/2023 19:44:53 UTC from EXOpod NOVA deployer
Catalog Number 58339
International ID 2023-174CM

The function or payloads of this spacecraft have not been publicly disclosed.

Platform-5 Structure (possible components used)

3U structure	https://www.endurosat.com/products/3u-cubesat-structure/
Solar Panels	https://www.endurosat.com/products/3u-deployable-solar-array/
EPS	https://www.endurosat.com/products/eps-i-plus/
UHF COM	https://www.endurosat.com/products/uhf-transceiver-ii/
UHF ANT	https://www.endurosat.com/products/uhf-antenna-iii/
S-band COM	https://www.endurosat.com/products/s-band-transceiver/ or https://www.endurosat.com/products/s-band-transmitter/
S-band ANT	https://www.endurosat.com/products/s-band-antenna-wideband/

Platform-5 Telecommunications (satnogs)

S-band Transmitter	TM 2277.50 MHz	FM
UHF Transceiver	TM 401.360 MHz TC 402.860 MHz	GMSK 4800 Baud AX.25
OWL Beacon	TM 137.10 MHz	LoRa, CR:5, SF:10, BW: 125 kHz

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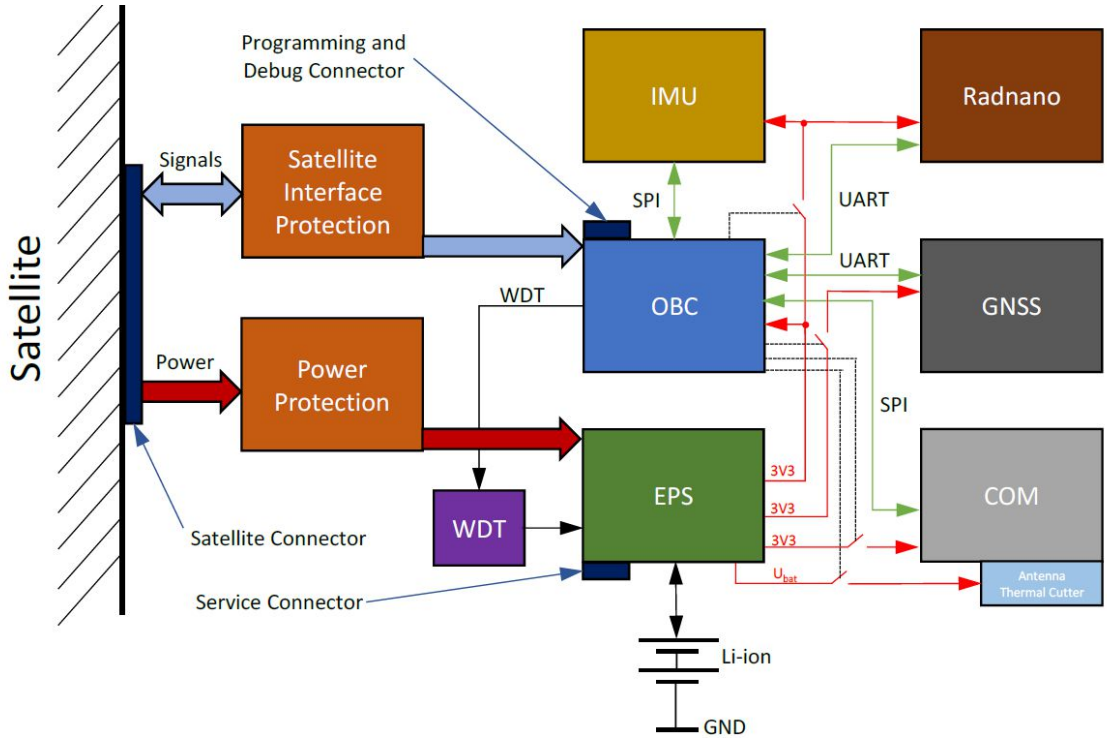
Orbital Whereabout Locator (OWL)

OWL made by C3S
OWL Brochure
OWL Datasheet



OWL components (possible components used)

GNSS uBlox M8 and Patch antenna

TID Total Irradiation Dosimeter RadNano 27G

IMU Inertial Measurement Unit 3-axis MEMS gyroscope

EPS custom – Lion battery,

OBC custom – serial ports,

COMS 137.1 MHz LoRa, CR:5, SF:10, BW: 125 kHz, +20 dBm

ANT omnidirectional 2 element V-dipole antenna

OWL operation

The two elements of the V-antennas are released by the thermal cutter cutting their restraining cords after a programmable time delay which is initiated by the OWL's own deployment detection switch ("DSW Tuna" button on OWL front panel). This occurs when the host satellite is deployed from its POD.

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It has two operational modes, depending on the source of power: nominal mode when powered by the host satellite and safe mode when powered by its own battery (18-20 hours lifetime).

The host satellite can forward telemetry data to OWL through a bi-directional UART which also allows the host satellite to query some parameters from OWL such as position data received by the GNSS.

The OWL inserts all the information into an 87-byte beacon message that is periodically downlinked to ground stations, independently from the host satellite.

Left: Possible Platform-5 with OWL on top, deployable solar panels at the front and a S-band antennae on the side.

Right: Flight model of OWL

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137.10 MHz OWL packet received at my location on 2 July 2024 UTC

```
00:37:45 [SX12x8] RSSI:          -132.500000 dBm
[SX12x8] SNR:         -14.500000 dB
[SX12x8] Frequency error:  -3784.310791 Hz
00:37:45 Packet (87 bytes):
00:37:45 02000000ac34f0010807027853ffffffffffff700000041109ecc2e1009
0015301a4002901d2008d2636fc2de2e00a7e1cc3d8185302005eba0a00549103000
1000000000000000000032804000000610400000003d9be
```

Platform-5 OWL Beacon Format – 87-byte packet				
Parameter	Byte	LE Data	BE Value	
Fixed	1 - 4	02000000	2	
MET	5 - 7	ac34f0	1285744	Mission Elapsed Time in Seconds?
Fixed	8	01	1	
Data	9 - 22	0807 0278 53ff ffff ffff ff70 0000		TBA
Fixed	23	04		
GPS WN	24 25	1109	2321	WN
GPS SOW	26 - 29	ecc2e100	14795500	SOW x 100 July 1 2024 17:05:37
Data	30 - 85	9001 5301 a400 2901 d200 8d26 36fc 2de2 e00a 7e1c c3d8 1853 0200 5eba 0a00 5491 0300 0100 0000 0000 0000 0000 0328 0400 0000 6104 0000 0003	 272387 1121	TBA Packet Sequence Number? Radnano Sequence Number?
Unique	86 - 87	d9be		CRC? Fletcher checksum?

The GPS timecode and data are updated at an unknown rate during the day.

These packets are also received by TinyGS stations around the world.

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UHF AX.25 Beacon Frame (SatNOGS)

8A A6 8E A6 60 62 E0 A0 98 60 60 60 6A E1 03 F0 00 11 01 82 43 32 3C 00 00 00 E0 FF 00 00 08 00 00 00 88 82 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Source Callsign	PL0005
Destination Callsign	ESGS01
Source SSID	0
Destination SSID	0
Control	3
PID	240
Payload	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
AX.25 Frame Decoder	https://notblackmagic.com/bitsnpieces/ax.25/

S-band

No information found as to what this link is used for.

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References:
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https://www.facebook.com/EnduroSat
https://c3s.hu/
https://db.satnogs.org/satellite/PRZP-7386-5227-9698-5175#transmitters
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https://www.linkedin.com/posts/endurosat_platform-5-activity-7129860834108788736-t70r/
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https://x.com/EnduroSat/status/1703717897720275351

OWL
Orbital Whereabout Locator https://owl.c3s.space/
Platform-5 OWL https://owl.c3s.space/2023/11/27/vireo_harwins_gecko/
Platform-5 OWL https://www.linkedin.com/pulse/owl-efficient-cubesat-identification-mission-tracking-c3sspace-plryf/

https://pbs.twimg.com/media/GJxvD8OX0AAI6rH?format=jpg&name=medium

https://pbs.twimg.com/media/GJxvD8OX0AAI6rH?format=jpg&name=medium

https://pbs.twimg.com/media/GJxvD8OX0AAI6rH?format=jpg&name=mediumhttps://pbs.twimg.com/media/GJxvUdvX0AEJOov?format=jpg&name=large

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