

# AIR SPACE USER CONSULTATION

<b>TITLE</b>	<b>KTR-2 Rocket Launch Campaign</b>
<b>SUBMITTED BY</b>	Southern Launch
<b>PURPOSE</b>	To seek air space users’ feedback on the Airspace Change Proposal for the KTR-2 rocket launch campaign from the Koonibba Test Range (KTR), South Australia.
<b>KEY ISSUES</b>	<ul style="list-style-type: none"> <li>• Access to the airspace by other users will be impacted</li> <li>• Southern Launch seeks to minimise the impact on efficiency of airspace use.</li> </ul>
<b>ATTACHMENTS</b>	Nil.

## Background

Southern Launch is an innovative space company headquartered in Adelaide, South Australia, that is developing the infrastructure to facilitate the launch of orbital and suborbital rockets. Individual staff members have over 30 years’ experience in handling, assembling and launching large suborbital rockets and other explosives for the Australian Defence Force, as well as extensive experience analysing and designing orbital and suborbital rocket launch systems.

Southern Launch is developing two rocket ranges in South Australia. The Whalers Way Orbital Launch Complex at the tip of the Eyre Peninsula to launch rockets into orbit out over the Great Australian Bight, and the yet to be publicly announced Koonibba Test Range (KTR) to launch rockets along parabolic trajectories so the payloads land back on the Earth for recovery and analysis. The KTR rocket range is located to the north of the Aboriginal community in Koonibba, South Australia, with rockets flown northwards into the adjacent national parks as shown in Figure 1.

The rockets to be launched during the KTR-2 campaign are the T-Minus Engineering DART (TED), a suborbital two-stage “boosted dart” where the first stage is a solid rocket motor and the second stage is a free flying dart with no propulsion. The rocket can reach altitudes above 100km.

Two TED rocket launches are planned with the first proposed to fly to 101km and assessed under the Australian Space Agency’s Space Act (2018), and the second to fly to 85km and be assessed by CASA. Southern Launch seeks to identify the timing and other operational parameters for both launches that minimize disruption and maximize airspace efficiency.

## Coordinates

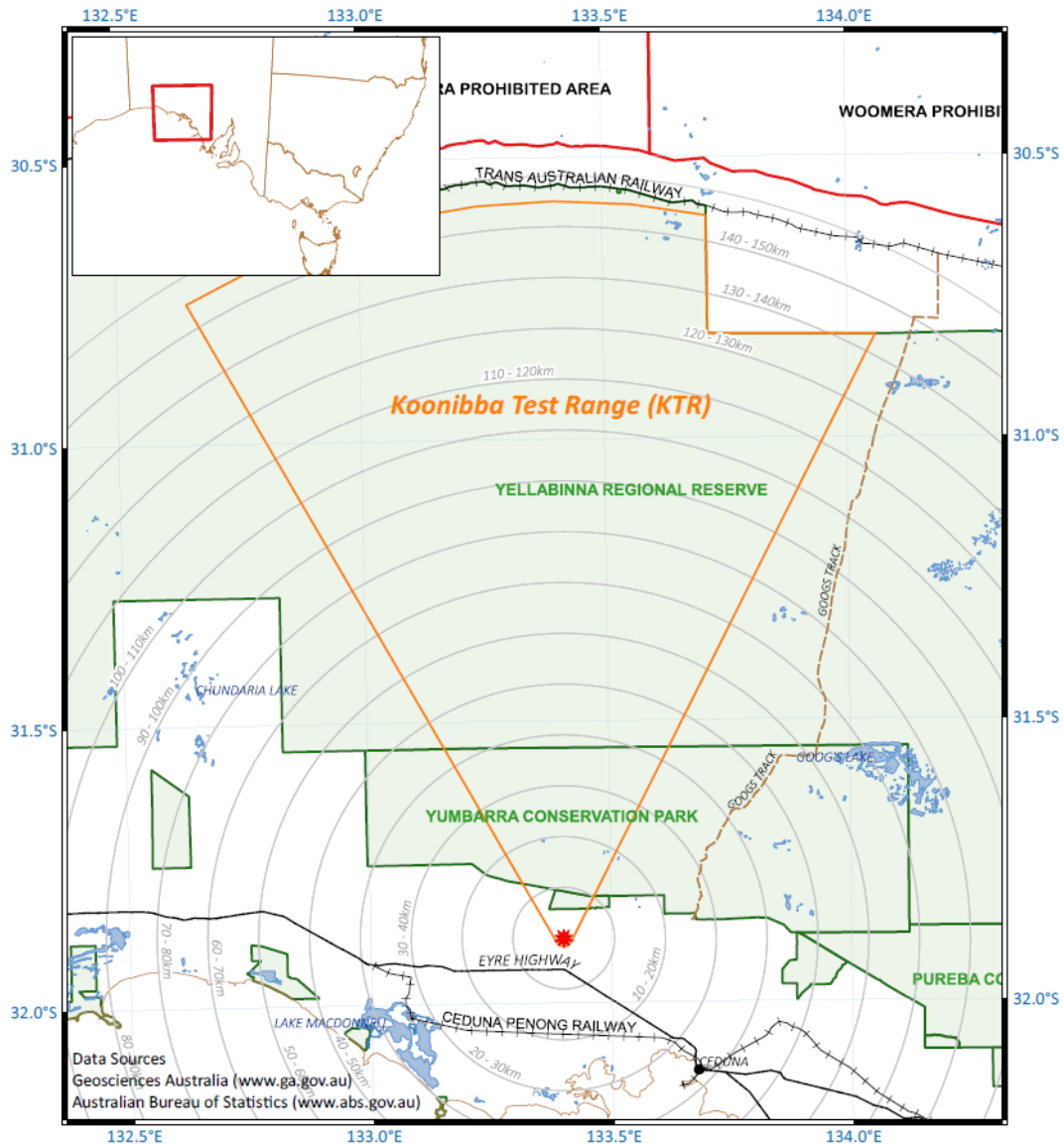
- Launch Pad: -31.8852, 133.4007
- Booster Impact: -31.8466, 133.400591
- Dart Impact: -30.994, 133.368

## Date and Time of Launch 1

- Planned for Sunday 29 November 2020
- Considered back-up launch dates are the 27, 28, 30 of November 2020 and 1 and 2 December 2020
- NOTAM for a window of 4hrs, falling between 06:00 ACST (19:30 GMT) and 10:00 ACST (23:30 GMT) on day of launch.

## Date and Time of Launch 2

- Planned for Monday 30 November 2020
- Considered back-up launch dates are the 28, 29 of November 2020 and 1 and 2 December 2020
- NOTAM for a window of 4hrs, falling between 16:00 ACST (05:30 GMT) and 20:00 ACST (09:30 GMT) on day of launch.

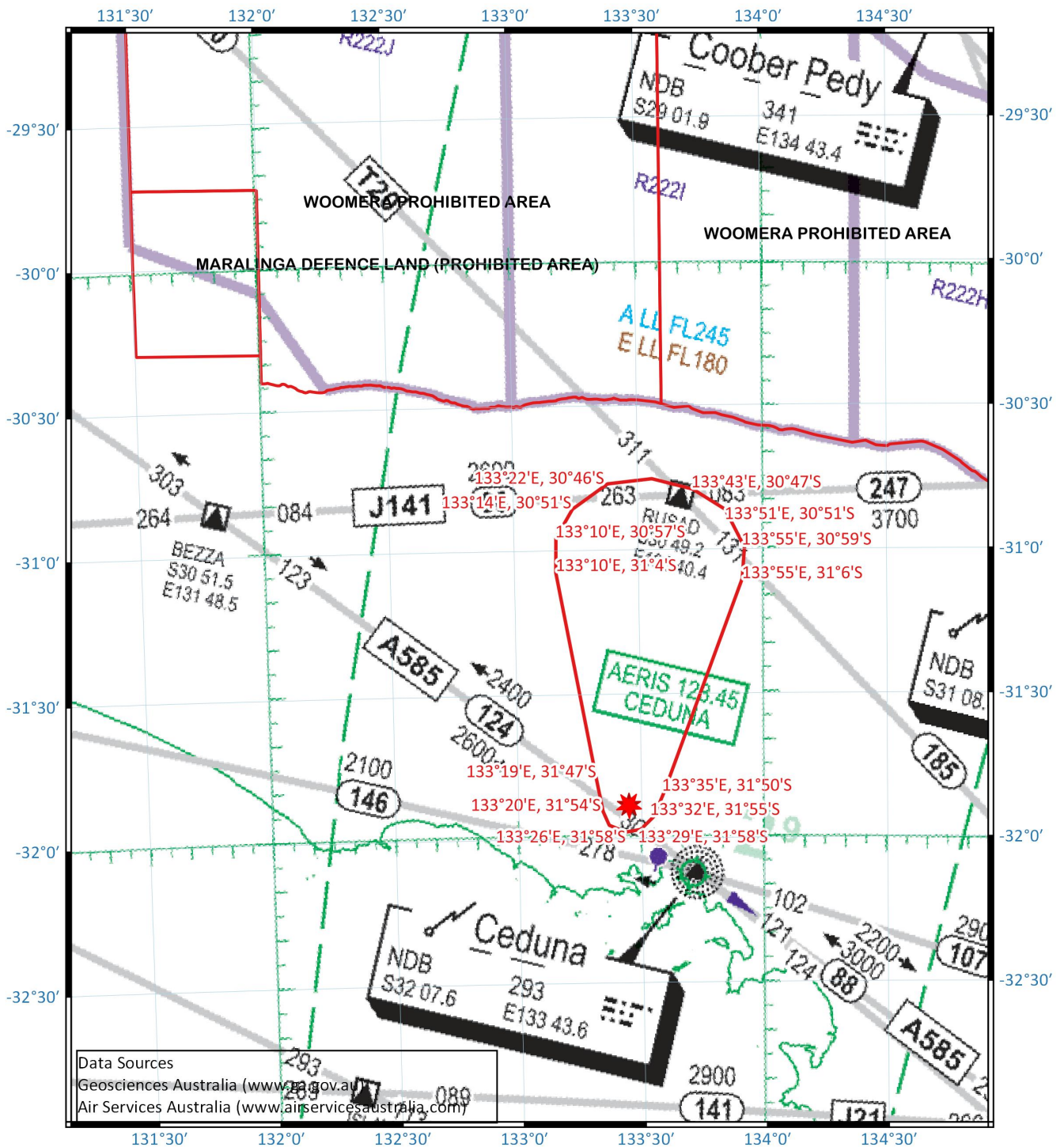


**Figure 1: Koonibba Test Range and Surrounds**

Ceduna Aerodrome is the closest aerodrome to the range, located 41km to the south-east of the Koonibba Range Head.

**Temporary Restricted Area (TRA) and other mitigation**

Southern Launch has submitted an Airspace Change Proposal (ACP) to CASA’s Office of Airspace Regulation (OAR) to enable the establishment of a protective airspace solution. The launch will exceed the vertical limits of the FIR (see trajectory section below) and the residual airspace risk posed by the activity is likely to require a TRA. However, the OAR will consult with airspace users later regarding the TRA and other risk mitigation measures to be employed once more comprehensive analysis of the ACP has been completed. A diagram of Southern Launch’s preliminary proposal for a TRA is reproduced below (Figure 2).



- Key:**
- Black: Nominal Trajectory (ground trace)
  - Purple: Buffers as per FAA regulations
  - Red (bright): Proposed Lateral limits
  - Red (dull): Woomera Protected Area
  - Grey: Flight Routes

**Figure 2: Preliminary proposed TRA**

Southern Launch is working closely with CASA OAR and Airservices to minimise the potential effect on other airspace users. On the day of launch, the duration of any TRA enforcement will be reduced to as reasonably practicable and safe.

On days when no launch activity is planned the TRA will be cancelled by 23:00 ACST (12:30 GMT) the day prior.

### **Trajectories**

For Launch 1 the nominal trajectory of the rocket launch will take the dart to an apogee of 101km and it will fall to the ground approximately 30km to the north of the launch pad in the Yellabinna Regional Reserve.

For Launch 2 the nominal trajectory of the rocket launch will take the dart to an apogee of 85km and it will fall to the ground approximately 70km to the north of the launch pad in the Yellabinna Regional Reserve.

Both launches will release small payloads from the dart near the apogee and these will also fall in the same area. One of the payloads shall descend under parachute and is expected to drift up to 20km depending on the wind. Both boosters will reach an apogee of between 8 to 10km altitude and fall to the ground approximately 4.5km north of the launch pad.

Simulations have been conducted using the industry standard ASTOS software considering all sources of dispersion and determined that all components of the rocket system and its payloads shall stay within the proposed TRA.

### **Consultation and Approvals**

The KTR is being developed in close consultation with:

- South Australian Regional Air Space Procedures Advisory Committee (SA RAPAC)
- Civil Aviation Safety Authority
- Airservices Australia
- Australian Space Agency
- SA State Government
- Department of Environment & Water
- Yumbarra Conservation Park Co-Management Board
- Far West Coast Aboriginal Corporation
- Regional Development Australia – Whyalla Eyre Peninsula
- Defence SA
- SafeWork SA
- SA Country Fire Service
- South Australia Police (SAPOL)

Approvals to operate have been received from:

- District Council of Ceduna
- Department of Environment & Water
- Koonibba Community Aboriginal Corporation
- Local land owners

Air Space users are required to provide feedback to [admin@southernlaunch.space](mailto:admin@southernlaunch.space) by 19 November 2020.