

Antares (Taurus-2)



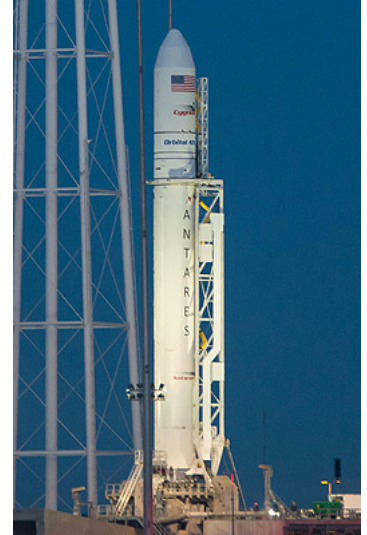
Antares-110 (A-One) [NASA]



Antares-120 (Cygnus CRS-1) [NASA]



Antares-130 (Cygnus CRS-3) [NASA]



Antares-230 (Cygnus CRS-5) [NASA]

Orbital has developed a medium-class launch vehicle, dubbed **Antares** (formerly **Taurus II**), to extend its family of small-class Pegasus, Taurus and Minotaur launchers. The Antares design adapts elements from these proven launch technologies along with hardware from one of the world's leading launch vehicle integrators to provide low-cost and reliable access to space for civil, commercial and military [Delta II-class](#) payloads.

The first stage structure is manufactured by ukrainian Yuzhnoe company and features two sub-cooled LOX and Kerosene fueled AJ26-62 (americanized Russian NK-33) engines of [N1/L3](#) heritage, built in the early 1970ies. The stage structure is based on the [Zenit](#) launch vehicle. The second stage is a Castor-30, which is based on a shortened [Castor-120](#) solid rocket motor. A Castor-30A second stage helps propel the first two Antares-110 rockets into orbit, then a higher-performing Castor-30B motor was used with the Antares-120 on the third and fourth flights in 2013. On the fifth flight, the stretched Castor-30XL upper stage was introduced on the Antares-130. The optional third stage called BTS (Bi-Propellant Third Stage, formerly ORK, Orbit Raising Kit) is based on the propulsion system of Orbital's Star-2 satellite bus. For high energy orbits a [Star-48BV](#) can be used as third stage.

An enhanced version called Antares-130 featuring a Castor-30XL upper stage will be used for later flights.

Antares is designed to achieve a 98% or greater launch reliability. It was developed, manufactured and launched using identical management approaches, engineering standards and production and test processes used in Orbital's other major launch vehicles.

The vehicle is launched from a new launch pad LA-0A at Wallops Island, where the former [Conestoga](#) launch pad was located.

The different variants are encoded by a three digit number:

1. digit = first stage (1 = AJ26-62 powered first stage, 2 = RD-181 powered first stage, 3 = RD-181 powered optimized first stage)
2. digit = second stage (1 = Castor-30A, 2 = Castor-30B, 3 = Castor-30XL)
3. digit = third stage (0 = none, 1 = BTS, 2 = Star-48BV)

In the aftermath of the explosion of the first Antares-130, Orbital decided to discontinue the AJ26-62 powered series due to reliability issues of the engine and to speed up the introduction of the re-engined Antares-200 series, now planned for early 2016. The re-engined version will use two RD-181 engines. This series will be replaced by the Antares-300 series, which will use the RD-181 engines at full thrust and will likely have an optimized tank and will use standard LOX instead of sub-cooled LOX.

Version	Stage 1	Stage 2	Stage 3
Antares-110 (ex <i>Taurus-2</i> (1))	Stage 1 / 2 × AJ26-62 (NK-33)	Castor-30A	-
Antares-120 (ex <i>Taurus-2</i> (2))	Stage 1 / 2 × AJ26-62 (NK-33)	Castor-30B	-
Antares-121 (ex <i>Taurus-2</i> (2) BTS)	Stage 1 / 2 × AJ26-62 (NK-33)	<i>Castor-30B</i>	<i>BTS / 3 × IHI BT-4</i>
Antares-122	Stage 1 / 2 × AJ26-62 (NK-33)	<i>Castor-30B</i>	<i>Star-48BV</i>
Antares-130 (ex <i>Taurus-2e</i>)	Stage 1 / 2 × AJ26-62 (NK-33)	Castor-30XL	-
Antares-131 (ex <i>Taurus-2e</i> BTS)	Stage 1 / 2 × AJ26-62 (NK-33)	<i>Castor-30XL</i>	<i>BTS / 3 × IHI BT-4</i>
Antares-132 (ex <i>Taurus-2h</i>)	Stage 1 / 2 × AJ26-62 (NK-33)	<i>Castor-30XL</i>	<i>Star-48BV</i>
Antares-220	Stage 1 / 2 × RD-181	Castor-30B	-
Antares-221	Stage 1 / 2 × RD-181	Castor-30B	BTS / 3 × IHI BT-4
Antares-222	Stage 1 / 2 × RD-181	Castor-30B	Star-48BV
Antares-230	Stage 1 / 2 × RD-181	Castor-30XL	-
Antares-231	Stage 1 / 2 × RD-181	Castor-30XL	BTS / 3 × IHI BT-4
Antares-232	Stage 1 / 2 × RD-181	Castor-30XL	Star-48BV
Antares-320	Stage 1 (opt.) / 2 × RD-181	Castor-30B	-
Antares-321	Stage 1 (opt.) / 2 × RD-181	Castor-30B	BTS / 3 × IHI BT-4
Antares-322	Stage 1 (opt.) / 2 × RD-181	Castor-30B	Star-48BV
Antares-330	Stage 1 (opt.) / 2 × RD-181	Castor-30XL	-
Antares-331	Stage 1 (opt.) / 2 × RD-181	Castor-30XL	BTS / 3 × IHI BT-4
Antares-332	Stage 1 (opt.) / 2 × RD-181	Castor-30XL	Star-48BV

Performance (kg)	LEO	LPEO	SSO	GTO	GEO	MolO	IP
Antares-110					-	-	-
Antares-120	4600		1500	-	-	-	-
Antares-121	4750		2900	-	-	-	-
Antares-122	-	-	-		-		900
Antares-130	5100			-	-	-	-
Antares-131	5600		3600	-	-	-	-
Antares-132	-	-	-	1800	-		1110
Antares-230	~6250			-	-	-	-
Antares-231				-	-	-	-
Antares-232	-	-	-	~2750	-		~1800

No.	TNo	Type	Date	LS	Fai	Payload
1	1	Antares-110	21.04.2013	WI	LA-0A	Cygnus Mass Simulator / Dove 1 / PhoneSat v1a / PhoneSat v1b / PhoneSat v2a
2	2	Antares-110	18.09.2013	WI	LA-0A	Cygnus D1
3	1	Antares-120	09.01.2014	WI	LA-0A	Cygnus CRS-1 / Flock-1 1, ..., 28 / ArduSat 2 / LituanicasAT 1 / LitSat 1 / SkyCube / UAPSat 1
4	2	Antares-120	13.07.2014	WI	LA-0A	Cygnus CRS-2 / Flock-1b 1, ..., 28 / TechEdSat 4 / MicroMAS / GEARRS 1 / Lambdasat
5	1	Antares-130	28.10.2014	WI	LA-0A F	Cygnus CRS-3 / Flock-1d 1, ..., 26 / Arkyd 3 / RACE / GOMX 2
6	1	Antares-230	18.10.2016	WI	LA-0A	Cygnus CRS-5 / Lemur-2 14, ..., 17
7	2	Antares-230	12.11.2017	WI	LA-0A	Cygnus CRS-8 / EcAMSat / TechEdSat 6 / Lemur-2 50, ..., 57 / ISARA / CHEFSat / Asgardia 1 / PropCube 2

planned launches

8	3	Antares-230	xx.05.2018	WI	LA-0A	Cygnus CRS-9 / CubeRT / HaloSat / RainCube / SORTIE / TEMPEST-D / CanOP / RadSat-g / EQuiSat
9	4	Antares-230	xx.11.2018	WI	LA-0A	MemSat / EnduroSat One / Cygnus CRS-10 / CAPSat / TJREVERB / SASSI² / Cysat 1 / TechEdSat 8 / VCC A, B, C / SPACE-HAUC / SOCRATES / UNITE
10	5	Antares-230	xx.xx.20xx	WI	LA-0A	Cygnus CRS-xx
xx	x	Antares-230	xx.xx.20xx	WI	LA-0A	Cygnus CRS-xx
xx	x	Antares-230	xx.xx.20xx	WI	LA-0A	Cygnus CRS-xx
xx	x	Antares-230	xx.xx.20xx	WI	LA-0A	Cygnus CRS-xx
xx	x	Antares-230	xx.xx.20xx	WI	LA-0A	Cygnus CRS-xx
xx	x	Antares-230	xx.xx.20xx	WI	LA-0A	Cygnus CRS-xx
xx	x	Antares-230	xx.xx.20xx	WI	LA-0A	Cygnus CRS-xx

† = deployed via [ISS](#) airlock

Failures:

5: Rocket exploded ~ 6 seconds after launch

Launch sites:

WI = Mid-Atlantic Regional Spaceport (MARS), Wallops Island, Virginia, USA / LA-0A