

Year of Launch 2011			RAE Table of Earth Satellites							(Compiled 2011)		Page 1
Name [Launcher] Fragment	Cospar ID [Norad#] Launchsite Cospar ID	Launch date Lifetime and descent date [Norad#]	Shape and weight (kg) Descent date	Size (m) Lifetime	Date of orbital determination	Orbital Inclination (deg)	Nodal period (min)	Semi major axis (km)	Perigee height (km)	Apogee height (km)	Orbital eccentricity	Argument of perigee (deg)

Electro-L # (GOMS-2) [Zenit 3F]	2011 01 A [37344] BAI-IC45	2011 Jan 20.520 > million years	Box+ 2 panels 1701		2011 Jan 20.57	50.36	135.35	8733	296	4412	0.236	5
					2011 Jan 20.67	48.52	633.47	24433	356	35753	0.724	0
					2011 Jan 23.79	0.46	1434.17	42127	35627	35870	0.003	22
					2011 Jan 24.00	0.46	1424.03	41929	35288	35812	0.006	7
					2011 Feb 8.77	0.43	1435.72	42157	35756	35802	0.0005	85
					2011 Feb 12.66	0.42	1436.08	42165	35740	35832	0.001	78

Zenit 3F 2 nd stage	2011 01 B [37345]	2011 Jan 20.520			2011 Jan 20.83	51.34	92.60	6781	179	625	0.033	60
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Fregat upperstage	2011 01 C [37346]	2011 Jan 20.520	Spheres + nozzle 1100?	1.5 high 3.3 dia	2011 Jan 20.67	50.31	135.30	8731	296	4408	0.235	5
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Fragments 2011 01 D-H 5 pieces, 2 have decayed For orbital information see extra pages at end of year

NROL-49 (USA 224) [Delta-4 H]	2011 02 A [37348] VDB-LC6	2011 Jan 20.882			No TLE issued; orbits from amateur radio and visual observations.							
					2011 Jan 20.92	97.90	97.20	7003	241	1007	0.055	257
					2011 Jan 24.98	97.90	97.47	7016	252	1023	0.055	255
					2011 Apr 26.99	97.93	97.22	7004	262	990	0.052	319

D Delta-4H 2 nd stage (Centaur)	2011 02 B [NNA]	2011 Jan 20.882 < 0.1 day 2011 Jan 20.9	Cylinder 2100?	12.68 long 3.05 dia	Deorbited on 1 st orbit before being catalogued.						
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D Kounotori 2 (HTV-2)% (H-2B)	2011 03 A [37351] TAN	2011 Jan 22.234 66.103 days 2011 Mar 30.131	Cylinder 15876 12020 empty	10.06 long 4.27 dia	2011 Jan 22.34	51.65	89.40	6623	189	301	0.008	315
					2011 Jan 22.59	51.64	90.53	6679	295	307	0.0009	216
					2011 Jan 22.71	51.65	90.87	6696	310	324	0.001	274
					2011 Jan 26.32	51.64	91.05	6705	319	333	0.001	194
					2011 Jan 27.39	51.64	91.58	6731	350	355	0.0004	235
					2011 Jan 27.91	51.64	91.58	6731	350	355	0.0004	237
					2011 Mar 28.70	51.66	91.55	6729	345	356	0.0008	26
					2011 Mar 28.76	51.66	91.45	6724	340	350	0.0007	22
					2011 Mar 29.22	51.64	91.47	6725	345	347	0.0002	1
					2011 Mar 29.86	51.65	91.47	6725	346	348	0.0002	36

H-2B 2 nd stage	2011 48 B [NNA]	2011 Jan 22.234	Cone+Cyl 3000?	10.6 long 4 dia	Deorbited on 1 st orbit before being catalogued.						
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New generation weather satellite.
 % Kounotori 2 rendezvoused with ISS 2011 Jan 27; it was captured 2011 Jan 27.487 by Canadarm 2 and berthed 2011 Jan 27.619 to the Harmony earth facing port. Relocated to the Harmony zenith port 2011 Feb 18.488 till 18.705 to make room for the space shuttle Discovery. Moved back 2011 March 10.458 till 10.680 to the earth facing port. Unberthed from ISS 2011 Mar 28.341, released 2011 Mar 28.657 and it was de-orbited 2011 Mar 30.114 over the south Pacific Ocean.

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D Progress-M 09M * [Soyuz-U]	2011 04 A [37359] BAI-IC1	2011 Jan 28.063 88.495 days 2011 Apr 26.558	Cyl+beehive+ +spheroid+ 2 panels 7250?	7.5 long 2.72 maxdia 2.3 dia	2011 Jan 28.26 2011 Jan 29.95 2011 Jan 30.90 2011 Apr 23.24 2011 Apr 23.88 2011 Apr 24.83 2011 Apr 25.84 2011 Apr 26.17	51.64 51.64 51.65 51.64 51.64 51.64 51.64 51.64	90.12 91.58 91.58 91.30 90.98 90.83 90.67 90.67	6658 6731 6731 6717 6701 6694 6686 6686	261 350 350 331 300 285 269 269	299 354 354 346 346 346 346 345	0.003 0.0004 0.0004 0.001 0.003 0.005 0.006 0.006	4 247 248 259 269 271 276 276	
D Soyuz-U 3 rd stage	2011 04 B [37360]	2011 Jan 28.063 3 days 2011 Jan 31	Cylinder 2400?	8.1 long 2.66 dia	2011 Jan 28.25 2011 Jan 31.30	51.63 51.64	88.65 87.08	6587 6509	186 122	230 138	0.003 0.001	71 65	
GEO-IK 2 # [Rokot/Breeze-KM]	2011 05 B [37362] PLE	2011 Feb 1.583			2011 Feb 1.78	99.46	98.23	7053	355	993	0.045	99	
Rokot 3 rd stage (Breeze-KM)	2011 05 B [37363]	2011 Feb 1.583	Cylinder 1700	3 long 2.5 dia	2011 Feb 1.64	99.46	98.43	7062	318	1050	0.052	109	
NROL-66 (USA 225) (Rapid Pathfinder Program) [Minotaur 1]	2011 06 A [37364] VDB-SLC8	2011 Feb 6.518			No TLE issued								
Minotaur 1 4 th stage (Orion 38)	2011 06 B [37365]	2011 Feb 6.518			No TLE issued								
Fragments	2011 06 C 2011 06 D	[37366] [37367]			No TLE issued No TLE issued								
D r ATV-2 & (Johannes Kepler) [Ariane-5 ES] (V200)	2011 07 A [37368] KOU-ELA3	2011 Feb 16.910 125.035 days 2011 Jun 21.875	Cylinder + 4 panels 19958	10.77 long 4.48 dia 22.28 span	2011 Feb 16.913 2011 Feb 17.12 2011 Feb 17.44 2011 Feb 22.91 2011 Feb 24.05 2011 Feb 24.37 2011 Feb 24.49 2011 Feb 25.39	51.61 51.64 51.64 51.65 51.64 51.65 51.65 51.65	88.47 89.68 89.90 90.03 91.20 91.40 91.55 91.55	6577 6638 6648 6655 6712 6722 6729 6729	142 252 268 274 332 342 348 347	256 266 271 278 335 345 354 354	0.009 0.001 0.0003 0.0003 0.0002 0.0003 0.0004 0.0004	48 283 304 299 298 322 353 358	

2011 07 continued on next page

* Progress-M 09M docked 2011 Jan 30.110 with ISS (PIRS port); undocked 2011 Apr 22.

The Breeze-KM stage didn't perform its 2nd burn; leaving the satellite in an elliptical transfer orbit.

& ATV-2 docked 2011 Feb 24.666 with ISS (Zvezda aft port). ATV 2 raised orbit of ISS and undocked 2011 Jun 20.615

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					2011 Mar 19.50	51.64	91.60	6732	352	354	0.0001	50
					2011 Jun 2.49	51.65	91.38	6721	338	346	0.0006	3
					2011 Jun 3.52	51.65	91.47	6725	345	347	0.0001	288
					2011 Jun 13.54	51.64	91.83	6743	356	373	0.001	230
					2011 Jun 17.49	51.64	92.03	6753	365	384	0.001	295
					2011 Jun 18.45	51.64	92.18	6760	374	389	0.001	259
					2011 Jun 20.81	51.64	91.93	6748	354	385	0.002	277
					2011 Jun 21.69	51.64	91.98	6750	359	384	0.002	277
D Ariane 5 2 nd stage	2011 07 B [37369]	2011 Feb 16.910 < 1 day 2011 Feb 17	Drum-cone 2880	3.5 long 3.94 dia	2011 Feb 16.97	51.63	89.53	6630	249	254	0.0004	346
D STS-133 *	2011 08 A	2011 Feb 24.912	Deltawing	37.5 long	2011 Feb 24.94	51.64	88.37	6572	155	232	0.006	342
6M (Discovery F39)	[37371]	12.794 days		5.5 dia	2011 Feb 25.48	51.64	88.82	6594	199	233	0.003	331
R {Shuttle]	CC-LC39A	2011 Mar 9.706		23.8 span	2011 Feb 25.72	51.67	88.95	6602	208	237	0.002	333
					2011 Feb 26.23	51.64	88.97	6602	212	234	0.000	333
					2011 Feb 26.71	51.65	91.57	6730	349	354	0.0004	25
					2011 Mar 6.72	51.65	91.58	6730	348	356	0.0006	38
					2011 Mar 7.74	51.65	91.55	6729	344	357	0.001	26
					2011 Mar 9.15	51.64	91.25	6714	317	354	0.003	0
					2011 Mar 9.51	51.64	91.25	6714	317	354	0.003	2
Cosmos 2471 (Glonass-K)	2011 09 A [37372]	2011 Feb 26.130 1 million years	Box + 2 panels 934		2011 Feb 28.59	64.77	689.90	25863	19251	19719	0.009	137
[Soyuz 2-1b/Fregat]	PLE-LC43/4				2011 Mar 1.07	64.77	690.38	25875	19279	19715	0.008	137
					2011 Mar 2.56	64.77	676.15	25519	19128	19152	0.0005	230
Fregat 4 th stage	2011 09 B [37373]	2011 Feb 26.130 1 million years	Spheres + nozzle 1100?	1.5 high 3.3 dia	2011 Mar 2.42	64.77	676.15	25519	19128	19152	0.0005	229
					2011 Mar 2.53	64.77	690.37	25875	19278	19715	0.008	137
X-37B OTV2 (USA 226)	2011 10 A	2011 Mar 6.949	Cylindrical	8.84 long	No TLE issued. Orbits based on amateur observations.							
[Atlas V (501 #2)]	[37375]		+ wings	2.9 high	2011 Mar 13.70	42.86	91.10	6707	315	341	0.002	351
(AV-026)	CC-LC41		4990	4.5 span	2011 Mar 15.75	42.79	91.10	6707	318	339	0.002	4
					2011 Mar 18.70	42.78	91.10	6707	320	337	0.001	34
D Atlas-5 2 nd stage (Centaur)	2011 10 B [NNA]	2011 Mar 6.949	Cylinder 2100?	12.68 long 3.05 dia	De-orbited before being catalogued.							

* Discovery with 6 astronauts (Lindsey, Boe, Drew, Bowen, Barrat and Stott) docked 2011 Feb 26.801 with ISS (PMA-2 Harmony node). It delivered the PMP (Permanent Multipurpose Module; ex 'Leonardo') to the nadir port of Unity. Unbearthed 2011 Mar 1.573 and firmly docked 2011 Mar 1.628; MPM is 6.4 m long and 4.57 m wide; weighing 14 tons at launch. Discovery undocked 2011 Mar 7.500 from ISS and landed for the final time at KSC. Total time in orbit is just over 365 days in 39 flights from 1984 to 2011.

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NROL-27 (USA 227) (Gryphon) [Delta-4M+4,2 #353]	2011 11 A [37377] CC-LC37B	2011 Mar 11.985 > million years			No TLE issued. Orbits based on amateur observations. 2011 Apr 9.49	4.93	1436.08	42165	35782	35791	0.0001	17
Delta-4M 2 nd stage	2011 11 B [37378]	2011 Mar 11.985	Cylinder 3490	12 long 2.44 dia	No TLE issued.							
D Soyuz-TMA 21 \$ 3M [Soyuz-FG]	2011 12 A [37382] BAI-LC1	2011 Apr 5.013 164.073 days 2011 Sep 16.086	Cyl+beehive+ +spheroid+ 2 panels 7250?	7.5 long 2.72 maxdia 2.3 dia	2011 Apr 5.19 2011 Apr 6.80 2011 Apr 7.51	51.64 51.65 51.65	89.73 92.55 91.53	6640 6729 6729	248 349 348	273 352 352	0.002 0.0002 0.0002	28 91 78
D Soyuz-FG 3 rd stage (Blok I)	2011 12 B [37383]	2011 Apr 5.013 2 days 2011 Apr 7	Cylinder 2400?	8.1 long 2.66 dia	2011 Apr 5.17 2011 Apr 7.25	51.62 51.61	88.70 87.42	6589 6525	192 143	228 150	0.003 0.0006	69 68
Beidou IGSO 3	2011 13 A [37384] XI-LC3	2011 Apr 9.866 > million years	Box+ 2 panels 2230 1130	1.70 high 18.10 span	2011 Apr 13.84 2011 Apr 14.38 2011 Apr 14.58 2011 Apr 19.81	55.29 55.27 55.24 55.29	1429.05 1436.80 1436.12 1435.90	42027 42179 42165 42161	35598 35721 35707 35694	35698 35880 35866 35871	0.001 0.002 0.002 0.002	333 172 184 184
CZ 3A 3 rd stage	2011 13 B [37385]	2011 Apr 9.866	Cylinder 3060	12.375 long 3.0 dia	2011 Apr 10.11 2011 Apr 12.42	55.10 55.26	613.65 610.13	23921 23830	192 146	34892 34756	0.725 0.726	175 175
NOSS 3-5 (A)* (NROL-34) [Atlas-5 411 AV-027]	2011 14 A [37386] VDB-SLC3E	2011 Apr 15.183			2011 Apr 19.04 2011 Apr 22.02	63.42 63.46	107.52 107.50	7490 7490	1015 1017	1208 1205	0.013 0.013	181 179
NOSS 3-5 (B)* (NROL-34)	2011 14 B [37391]	2011 Apr 15.183			2011 Apr 19.04 2011 Apr 22.02	63.42 63.45	107.52 107.50	7490 7490	1015 1017	1208 1205	0.013 0.013	181 178

\$ Soyuz-TMA 21 docked 2011 Apr 6.965 with ISS (Poisk port) with 2 cosmonauts (Samkutyaev, Borisenko) and 1 astronaut (Garan). Undocked 2011 Sep 16.110

* The Atlas-5 2nd stage was de-orbited before being catalogued. No TLE issued; orbit from amateur observations.

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Resourcesat 2 [PSLV-C16]	2011 15 A [37387] SRI-LC1	2011 Apr 20.196	Box + 2 panels 1206		No TLE issued. Orbits based on amateur observations. 2011 Apr 23.37	98.78	101.33	7201	821	823	0.0002	283
YouthSat #	2011 15 B [37388]	2011 Apr 20.196	Cube+2 panels 92	1.02x0.604 x1.34	2011 Apr 20.38	98.79	101.13	7191	803	821	0.001	302
X-SAT #	2011 15 C [37389]	2011 Apr 20.196	Box+2 panels 106	0.6 x 0.6 x 0.8	2011 Apr 20.45 2011 Apr 21.85	98.77 98.77	101.17 101.13	7193 7191	805 803	823 821	0.001 0.001	292 298
PSLV 4 th stage	2011 15 D [37390]	2011 Apr 20.196	Cylinder 2500	2.6 long 2.8 dia	2011 Apr 20.38	98.66	100.92	7181	789	816	0.002	354
Intelsat New Dawn \$ [Ariane-5 ECA] (# 30 V-201)	2011 16 A [37392] KOU-ELA3	2011 Apr 22.901 > million years	Box + 2 panels + 2 antennae 3000 1283 dry	4.9 x 2.5 x 3.1	2011 Apr 22.92 2011 Apr 25.41 2011 Apr 26.47 2011 Apr 28.30 2011 May 2.44 2011 May 4.88	6.00 4.07 2.20 0.61 0.05 0.05	635.23 747.25 1007.02 1197.35 1435.45 1436.07	24479 27277 33280 37352 42152 42164	248 6041 18040 26139 35748 35772	35952 35757 35763 35807 35799 35800	0.729 0.545 0.266 0.129 0.0006 0.0003	178 180 179 178 63 53
YAHSAT Y1A	2011 16 B [37393]	2011 Apr 22.901 > million years	Box + 2 panels + 4 antennae 5935	5.5 x 2.1 x 2.3 39.4 span	2011 Apr 23.14 2011 May 1.03 2011 May 5.88 2011 May 7.59 2011 May 19.76	5.99 0.05 0.04 0.04 0.02	632.30 1428.63 1435.90 1436.05 1436.13	24403 42019 42161 42164 42166	260 35484 35743 35776 35780	35789 35797 35822 35794 35794	0.728 0.004 0.0009 0.0002 0.0002	178 227 203 224 139
Ariane 5 2 nd stage	2011 16 C [37394]	2011 Apr 22.901	Drum-cone 2880	3.5 long 3.94 dia	2011 Apr 23.59	5.64	630.43	24355	240	35712	0.728	175
Sylda 5A upperpart	2011 16 D [37395]	2011 Apr 22.901	Barrel shaped 517	6.4 long 4.6 dia	2011 Apr 23.58	5.99	632.28	24403	255	35793	0.728	178

YouthSat was developed jointly between Indian and Russian students; X-SAT is Singapore's first national satellite.

\$ One solar panel failed to open.

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Progress-M 10M * [Soyuz-U]	2011 17 A [37396] BAI-IC1/5	2011 Apr 27.545	Cyl+beehive+	7.5 long	2011 Apr 27.63	51.61	88.68	6588	189	229	0.003	71	
			+spheroid+	2.72 maxdia	2011 Apr 27.87	51.64	89.42	6624	228	264	0.003	158	
			2 panels	2.3 dia	2011 Apr 29.52	51.65	91.47	6725	344	348	0.0002	153	
		7250?											
D Soyuz-U 3 rd stage	2011 17 B [37397]	2011 Apr 27.545 2 days 2011 Apr 29	Cylinder	8.1 long	2011 Apr 27.84	51.61	88.47	6577	182	215	0.002	51	
			2400?	2.66 dia	2011 Apr 29.37	51.61	87.47	6528	144	154	0.0008	58	
Meridian 4 {Soyuz 2-1a/Fregat}	2011 18 A [37398] PLE-LC43/4	2011 May 4.737	Box +2 panels		2011 May 4.79	62.80	725.98	26758	998	39760	0.724	285	
					2011 May 5.81	62.83	724.97	26733	973	39735	0.725	285	
					2011 May 25.68	62.83	717.77	26555	959	39395	0.724	285	
Fregat stage	2011 18 B [37399]	2011 May 4.737	Spheres + nozzle 1100?	1.5 high 3.3 dia	2011 May 4.92	62.80	719.33	26594	872	39559	0.727	284	
SBIRS GEO-1 # [Atlas 5 401] (AV-022)	2011 19 A [37481] CC-LC41	2011 May 7.757 > million years	Box + 2 panels		No TLE issued. Orbits based on amateur observations.								
					2011 May 8.00	21.64	631.18	24375	183	35809	0.731	178	
					2011 Jun 3.46	6.45	1436.05	42164	35777	35794	0.0002	0	
Atlas 5 2 nd stage (Centaur)	2011 19 B [37482]	2011 May 7.757 102 days 2011 Aug 17	Cylinder	12.68 long	2011 May 7.79	21.64	631.18	24375	183	35809	0.731	178	
			2100?	3.05 dia	2011 Aug 16.84	21.04	109.23	7570	96	2286	0.145	323	
D Fragment	2011 19 C	[37783]	2011 Aug 17	102 days	2011 Aug 17.44	20.93	94.32	6864	95	875	0.057	334	
D STS 134 \$ 6M (Endeavour F25) R {Shuttle}	2011 20 A [37577] CC-LC39A	2011 May 16.539 15.735 days 2011 Jun 1.274	Deltawing	37.5 long	2011 May 16.57	51.64	90.07	6656	231	324	0.007	180	
				5.5 dia	2011 May 16.81	51.64	91.07	6705	318	335	0.001	279	
				23.8 span	2011 May 17.49	51.64	91.18	6711	321	343	0.002	252	
					2011 May 18.24	51.65	91.42	6722	342	346	0.0003	285	
					2011 May 18.51	51.65	91.42	6722	342	346	0.0003	288	
					2011 May 29.55	51.65	91.40	6722	341	346	0.0004	333	
					2011 May 30.37	51.64	91.25	6715	334	338	0.0003	77	
					2011 May 30.55	51.64	91.35	6719	337	343	0.0004	349	
					2011 Jun 1.21	51.65	91.35	6720	338	343	0.0004	350	

* Progress-M 10M docked 2011 Apr 29.103 with ISS (Pirs port).

Space Based InfraRed System GEOSynchronous missile warning satellite.

\$ STS 134 docked 2011 May 18.426 with ISS (PMA 2-Harmony node) with six astronauts (Kelly, Johnson, Feustel, Chamitoff, Fincke and Vittori).
Installed the ELC 3 pallet with spare parts and the AMS (Alpha Magnetic Spectrometer) to the stations truss. Undocked 2011 May 30.247.

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Estrela do Sud 2 \$ (Telstar 14R) [Proton]	2011 21 A [37602] BAI-IC200/39	2011 May 20.802 > million years	Box + 2 panels 4970		2011 May 20.95	49.38	373.53	17181	344	21261	0.609	355
					2011 May 31.61	10.55	866.53	30108	11588	35871	0.403	1
					2011 Jun 1.68	9.88	986.68	32831	17075	35829	0.286	358
					2011 Jun 2.75	5.82	1000.85	33144	17737	35794	0.272	1
					2011 Jun 3.70	4.38	1069.73	34648	20703	35835	0.218	1
					2011 Jun 4.62	0.39	1385.87	41176	33832	35763	0.023	355
					2011 Jun 6.55	0.04	1434.45	42133	35747	35761	0.0002	289
					2011 Jun 7.47	0.04	1436.53	42174	35784	35806	0.0003	118
					2011 Jun 8.02	0.04	1435.25	42148	35752	35787	0.0004	98
					2011 Jun 12.22	0.03	1436.23	42167	35781	35797	0.0002	203
					2011 Jun 13.82	0.02	1436.07	42164	35780	35791	0.0001	181
2011 Jun 16.23												
Breeze-M stage	2011 21 B [37603]	2011 May 20.802	Stubby Cyl 1220	2.62 long ~2.4 dia	2011 May 21.49	13.48	747.00	27272	7723	34063	0.483	6
Breeze-M tank	2011 21 C [37604]	2011 May 20.802	Torus 1290	2.1 long 4.1 dia 0.8 cross	2011 Jun 15.35	49.37	373.17	17170	346	21237	0.608	7
GSAT 8 [Ariane-5 ECA] (V-202)	2011 22 A [37605] KOU-ELA3	2011 May 20.860 > million years	Box + 2 panels 3093	4.1x2.3 x3.4 37.40 span	2011 May 21.10	2.47	631.68	24387	241	35776	0.729	178
					2011 May 22.72	0.51	956.40	32155	15774	35780	0.311	174
					2011 May 23.87	0.07	1350.28	40468	32383	35796	0.042	82
					2011 May 26.69	0.07	1429.22	42030	35539	35764	0.003	73
					2011 May 31.83	0.08	1434.62	42136	35747	35768	0.0003	122
					2011 Jun 4.90	0.09	1436.22	42167	35782	35795	0.0002	196
2011 Jun 8.86	0.10	1436.12	42165	35780	35793	0.0002	211					
ST 2	2011 22 B [37606]	2011 May 20.860 > million years	Box+ 2 panels 5088	6.21 high 3.75 dia 31.6 span	2011 May 21.34	2.48	632.53	24409	240	35821	0.729	178
					2011 May 23.41	0.88	804.03	28643	8727	35801	0.473	178
					2011 May 26.08	0.02	1435.17	42147	35743	35792	0.0006	144
					2011 May 31.00	0.02	1436.12	42165	35741	35833	0.001	90
Ariane 5 2 nd stage	2011 22 C [37607]	2011 May 20.860	Drum-cone 2880	3.5 long 3.94 dia	2011 May 20.99	2.60	631.78	24390	235	35787	0.729	180
Sylda 5A upperpart	2011 22 D [37608]	2011 May 20.860	Barrel shaped 517	6.4 long 4.6 dia	2011 May 21.34	2.48	631.37	24379	239	35762	0.729	178

\$ One solar panel failed to open fully.

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3M Soyuz-TMA 2M \$ [Soyuz-FG]	2011 23 A [37633] BAI-IC1/5	2011 Jun 8.092	Cyl+beehive+	7.5 long	2011 Jun 8.10	51.73	88.47	6577	191	206	0.001	199
			+spheroid+	2.72 maxdia	2011 Jun 8.23	51.64	89.87	6646	247	289	0.003	48
			2 panels	2.3 dia	2011 Jun 9.83	51.64	91.45	6724	345	346	0.0001	312
			7250?		2011 Jun 10.49	51.64	91.45	6724	345	346	0.0001	330
D Soyuz-FG 3 rd stage (Blok I)	2011 23 B [37634]	2011 Jun 8.092	Cylinder	8.1 long	2011 Jun 8.22	51.65	88.83	6596	194	240	0.004	72
		3 days 2011 Jun 11	2400?	2.66 dia	2011 Jun 11.76	51.65	87.08	6509	128	133	0.0004	143
SAC-D (Aquarius) [Delta 2-7320-10C] (#354)	2011 24 A [37673] VDB-SLC2W	2011 Jun 10.597	Box +2 panels		2011 Jun 10.64	98.01	97.77	7030	650	653	0.0002	213
			1350		2011 Jun 10.71	98.01	97.82	7033	653	655	0.0002	112
Delta-2 2 nd stage	2011 24 B [37674]	2011 Jun 10.597	Cylinder	5.88 long 2.44 dia	2011 Jun 10.64	98.02	98.02	6804	194	657	0.034	288
D Rasad-1 (Observation-1) [Safir]	2011 25 A [37675] SEM	2011 Jun 15.396?			2011 Jun 15.49	55.70	89.85	6646	236	298	0.005	93
		21 days 2011 Jul 6	15.3		2011 Jul 5.99	55.66	87.50	6529	149	152	0.0003	191
D Safir stage	2011 25 B [37676]	2011 Jun 15.396?	Cylinder		2011 Jun 15.49	55.70	89.70	6639	228	292	0.005	74
		16 days 2011 Jul 1		1.25 dia	2011 Jun 30.77	55.67	87.62	6535	155	158	0.0003	76
Chinasat 10 [CZ-3BE #]	2011 26 A [37677] XI	2011 Jun 20.676			2011 Jun 20.83	26.30	757.90	27536	196	42119	0.761	180
		> million years	5100		2011 Jun 30.94	0.17	1436.05	42164	35774	35796	0.0003	267
					2011 Jul 4.27	0.17	1436.08	42165	35774	35797	0.0003	267
CZ-3BE 3 rd stage	2011 26 B [37678]	2011 Jun 20.676			2011 Jun 20.85	26.24	757.25	27520	188	42096	0.761	179
D Progress-M 11M * [Soyuz-U]	2011 27 A [37679] BAI-IC1/5	2011 Jun 21.610	Cyl+beehive+	7.5 long	2011 Jun 21.66	51.63	88.55	6581	188	218	0.002	83
		72 days	+spheroid+	2.72 maxdia	2011 Jun 21.93	51.64	90.58	6682	284	322	0.003	180
		2011 Sep 1	2 panels	2.3 dia	2011 Jun 23.64	51.64	92.17	6760	374	389	0.001	280
			7250?		2011 Jun 24.57	51.64	92.17	6760	373	389	0.001	284
					2011 Aug 27.54	51.64	92.08	6755	373	380	0.0005	207
					2011 Aug 27.69	51.64	91.92	6747	358	379	0.002	250
					2011 Sep 1.22	51.64	90.80	6741	342	383	0.003	321

2011 27 continued on next page

\$ Soyuz-TMA 2M docked 2011 Jun 9.888 with ISS (Rassvet port) with cosmonaut Volkov and astronauts Fossum and Furukawa.

First flight of the CZ-3BE, which has 4 lengthened liquid-fuelled strap-on boosters and an extended first stage compared to the CZ-3B.

* Progress-M 11 M docked 2011 Jun 23.693 with ISS (Zvezda aft port) and undocked 2011 Aug 27.6

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D Soyuz-U 3 rd stage	2011 27 B [37680]	2011 Jun 21.610 2 days 2011 Jun 23	Cylinder 2400?	8.1 long 2.66 dia	2011 Jun 21.60 2011 Jun 22.89	51.62 51.62	88.67 88.15	6587 6561	192 171	225 194	0.003 0.002	96 77	
D Cosmos 2472 (Kobalt M) [Soyuz-U]	2011 28 A [37726] PLE-LC16/2	2011 Jun 27.667 119 days 2011 Oct 24			2011 Jun 27.66 2011 Jun 29.66 2011 Jun 29.77 2011 Jul 17.22 2011 Jul 17.36 2011 Jul 31.85 2011 Aug 1.17 2011 Aug 13.92 2011 Aug 14.18 2011 Aug 21.95 2011 Aug 22.08 2011 Aug 31.77 2011 Aug 31.95 2011 Sep 2.55 2011 Sep 13.82 2011 Sep 14.13 2011 Sep 22.85 2011 Sep 22.92 2011 Oct 1.78 2011 Oct 1.90 2011 Oct 12.54 2011 Oct 12.86 2011 Oct 24.81	81.39 81.49 81.39 81.38 81.38 81.38 81.39 81.38 81.39 81.37 81.38 81.36 81.37 81.37 81.37 81.35 81.37 81.37 81.36 81.37 81.36	88.65 89.83 90.07 89.82 90.07 89.87 90.68 89.85 89.03 88.75 89.05 88.62 89.00 89.18 88.70 89.17 88.82 89.28 88.93 89.33 88.88 89.52 88.92	6586 6645 6656 6644 6656 6646 6687 6645 6605 6591 6606 6585 6604 6613 6589 6612 6594 6617 6600 6620 6598 6619 6600	186 195 217 213 223 222 266 214 209 200 204 190 204 219 201 216 200 224 209 232 212 222 200	229 337 338 317 331 313 350 350 319 245 225 250 222 246 249 220 251 231 253 234 251 226 259 242	0.003 0.011 0.009 0.008 0.008 0.007 0.006 0.008 0.003 0.002 0.004 0.002 0.003 0.002 0.001 0.003 0.002 0.002 0.002 0.001 0.001 0.003 0.003	97 110 96 32 45 350 43 24 80 52 88 50 113 74 24 260 229 338 299 68 10 251 223	
D Soyuz-U 3 rd stage	2011 28 B [37727]	2011 Jun 27.667 4 days 2011 Jul 1	Cylinder 2400?	8.1 long 2.66 dia	2011 Jun 27.72 2011 Jul 1.34	81.39 81.38	88.85 87.35	6596 6522	185 135	250 152	0.005 0.001	87 70	
ORS-1 % [Minotaur-1]	2011 29 A [37728] WLI-LCOB	2011 Jun 30.131	Cylinder + 3 panels 434		No TLE issued								
Minotaur-1 4 th stage	2011 29 B [37729]	2011 Jun 30.131			No earlier TLE issued 2011 Jul 5.83	40.00	92.62	6781	399	406	0.0006	251	

% Operationally Responsive Space office satellite.

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Shi-Jian 11-03 [CZ-2C]	2011 30 A [37730]	2011 Jul 6.186			2011 Jul 6.23 2011 Jul 6.30	98.21 98.23	88.73 88.70	7077 7075	693 690	703 703	0.0007 0.001	257 258
CZ-2C 2 nd stage	2011 30 B [37731]	2011 Jul 6.186			2011 Jul 6.23	98.00	97.87	7035	612	702	0.006	15
Fragments	2011 30 C-F 4 pieces, all in orbit				For orbital information see extra pages at end of the year.							
D STS-135 * 4M (Atlantis F33) R {Shuttle]	2011 31 A [37736] CC-LC39A	2011 Jul 8.645 12.770 days 2011 Jul 21.415	Deltawing	37.5 long 5.5 dia 23.8 span	2011 Jul 8.69 2011 Jul 8.98 2011 Jul 9.46 2011 Jul 9.71 2011 Jul 10.58 2011 Jul 11.75 2011 Jul 19.35 2011 Jul 20.38 2011 Jul 20.65 2011 Jul 21.21	51.64 51.64 51.64 51.64 51.64 51.64 51.64 51.64 51.64 51.64	88.35 89.87 89.90 89.97 92.32 92.32 92.18 92.17 92.10 92.10	6571 6646 6648 6651 6766 6766 6760 6759 6756 6756	155 219 214 220 380 381 378 374 371 371	230 316 325 325 395 395 385 387 384 384	0.006 0.007 0.008 0.008 0.001 0.001 0.0005 0.001 0.001 0.001 0.001	342 219 222 225 311 314 4 11 341 343
PSSC-2 #	2011 31 B [37752]	2011 Jul 8.645	Box 3.2	12.8 x 12.8 x 25.6	2011 Jul 20.70	51.64	92.02	6752	365	381	0.001	308
Tianlian 1-02 [CZ-3C]	2011 32 A [37737] XI-LC2	2011 Jul 11.653 > million years			2011 Jul 11.41 2011 Jul 19.69 2011 Jul 23.55	18.04 1.07 1.07	759.80 1436.13 1436.10	27582 42166 42165	203 35775 35780	42204 35799 35793	0.761 0.0003 0.0001	180 112 68
CZ-3C 3 rd stage	2011 32 B [37738]	2011 Jul 11.653			2011 Jul 7.41	17.95	761.77	27630	213	42290	0.761	180

* Last shuttle flight. Atlantis docked 2011 Jul 10.630 with ISS (PMA-2 Harmony) with 4 astronauts (Ferguson, Hurley, Magnus, Walheim). Undocked 2011 Jul 19.270.

PicoSatellite Solar Cell (Testbed) 2 was launched 2011 Jul 20.299 from shuttle cargo bay.

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Globalstar 2 M083 [Soyuz 2-1a/Fregat]	2011 33 A [37739] BAI-IC31/6	2011 Jul 13.102	Trapezoidal	0.60 x 1.50	2011 Jul 13.16	51.98	103.48	7302	918	928	0.0007	317
			box + 2 panels 700 full 350 dry	x 1.60	2011 Jul 13.23	52.00	103.53	7304	919	932	0.0009	286
Globalstar 2 M088	2011 33 B [37740]	2011 Jul 13.102	Trapezoidal	0.60 x 1.50	2011 Jul 13.23	52.00	103.53	7304	919	932	0.0009	285
			box + 2 panels	x 1.60	2011 Jul 21.71	51.99	105.23	7384	995	1016	0.001	249
			700 full	12 span	2011 Jul 22.47	51.99	108.27	7525	1132	1161	0.002	133
			350 dry		2011 Jul 24.05	51.74	110.82	7673	1200	1330	0.009	240
					2011 Jul 24.67	51.98	111.12	7657	1275	1281	0.0004	2
					2011 Jul 26.06	51.98	113.40	7761	1362	1403	0.003	231
Globalstar 2 M091	2011 33 C [37741]	2011 Jul 13.102	Trapezoidal	0.60 x 1.50	2011 Jul 13.23	52.00	103.50	7303	917	932	0.001	285
			box + 2 panels	x 1.60	2011 Sep 18.06	51.99	105.25	7385	990	1023	0.002	140
			700 full	12 span	2011 Sep 19.01	51.99	108.28	7526	1119	1175	0.004	49
			350 dry		2011 Sep 21.57	51.99	111.17	7659	1259	1302	0.003	22
					2011 Sep 22.05	51.98	113.32	7757	1343	1414	0.005	61
					2011 Sep 23.55	52.00	114.00	7788	1407	1412	0.0003	61
Globalstar 2 M085	2011 33 D [37742]	2011 Jul 13.102	Trapezoidal	0.60 x 1.50	2011 Jul 13.23	52.00	103.48	7302	914	931	0.001	281
			+ 2 panels 700 full 350 dry	x 1.60								
Globalstar 2 M081	2011 33 E [37743]	2011 Jul 13.102	Trapezoidal	0.60 x 1.50	2011 Jul 13.23	51.99	103.53	7304	920	931	0.0008	270
			box + 2 panels	x 1.60	2011 Sep 18.66	51.99	105.72	7407	1003	1053	0.003	74
			700 full	12 span	2011 Sep 22.91	52.00	108.13	7519	1102	1179	0.005	121
350 dry												
Globalstar 2 M089	2011 33 F [37744]	2011 Jul 13.102	Trapezoidal	0.60 x 1.50	2011 Jul 13.23	51.99	103.48	7302	916	931	0.001	275
			box + 2 panels	x 1.60								
			700 full	12 span								
350 dry												
Soyuz 2-1a Fregat stage	2011 33 G [37745]	2011 Jul 13.102	Spheres + nozzle 1100?	1.5 high 3.3 dia	2011 Jul 13.23	52.00	103.50	7302	916	931	0.001	279

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GSAT-12 [PSLV XL]	2011 34 A [37746] SRI-LC2	2011 Jul 14.471 > million years	Box + 2 panels 1406		2011 Jul 15.61 2011 Jul 27.05	17.82 0.17	373.85 1431.73	17191 42080	277 35685	21346 35717	0.613 0.0004	179 321
PSLV XL 4 th stage	2011 34 B [37747]	2011 Jul 14.471	Cylinder 2500	2.6 long 2.8 dia	2011 Jul 15.61	17.95	307.48	16995	274	20959	0.609	178
SES 3 [Proton/Breeze-M] (# 365)	2011 35 A [37748] BAI-LC200/39	2011 Jul 15.970 > million years	Box + 2 panels + 2 dishes 3112	span 2.29 dia	2011 Jul 16.12 2011 Jul 16.70 2011 Jul 18.19 2011 Jul 18.93 2011 Jul 20.36 2011 Jul 25.68 2011 Jul 26.32 2011 Jul 28.54 2011 Jul 28.73 2010 Jul 29.82	45.55 24.67 14.76 5.33 2.20 0.08 0.07 0.07 0.06 0.06	624.62 698.85 797.13 1036.20 1214.65 1431.70 1432.63 1434.93 1435.02 1436.10	24205 26087 28479 33920 37711 42079 42097 42142 42144 42165	401 3683 8447 19325 26906 35619 35783 35744 35746 35784	35252 35733 35753 35758 35758 35781 35783 35783 35784 35788	0.720 0.614 0.479 0.242 0.117 0.002 0.002 0.0005 0.0004 0.00004	1 0 0 0 358 39 51 41 45 232
Kazsat 2	2011 35 B [37749]	2011 Jul 15.970 > million years	1270		2011 Jul 16.59 2011 Jul 26.84 2011 Jul 27.93 2011 Aug 1.75 2011 Aug 17.03 2011 Aug 19.91 2011 Aug 20.80 2011 Aug 23.93	24.68 0.11 0.12 0.12 0.04 0.02 0.03 0.03	699.28 1428.40 1432.18 1434.67 1436.03 1435.55 1436.28 1436.07	26098 42014 42088 42137 42164 42154 42168 42164	3694 35405 35504 35588 35749 35802 35763 35781	35744 35866 35916 35929 35821 35816 35816 35790	0.614 0.005 0.005 0.004 0.0009 0.0006 0.0006 0.0001	0 193 192 193 204 207 205 179
Breeze-M tank	2011 35 C [37750]	2011 Jul 15.970	Torus 1290	2.1 long 4.1 dia 0.8 cross	2011 Jul 17.34	45.71	440.12	19166	341	25235	0.649	359
Breeze-M stage	2011 35 D [37751]	2011 Jul 15.970	Stubby Cyl 1220	2.62 long ~2.4 dia	2011 Jul 16.59 2011 Jul 18.72	24.88 0.33	693.82 1277.13	25961 38993	3451 29610	35715 35618	0.621 0.077	0 204
Fragment	2011 35 E [37762]				2011 Jul 26.33	24.65	698.92	26089	3688	35732	0.614	3
GPS 2F 2 (USA 232) [Delta 4M+2,4] (# 355)	2011 36 A [37753] CC-LC37B	2011 Jul 16.278 1 million years	Box + 2 panels		2011 Jul 16.12 2011 Jul 16.39 2011 Jul 19.94 2011 Aug 24.86	43.37 55.03 55.03 55.02	359.47 728.77 729.17 717.97	16747 26826 26836 26560	249 20430 20451 20178	20488 20465 20464 20185	0.604 0.0006 0.0002 0.0001	202 211 202 190
Delta 4 2 nd stage	2011 36 B [37754]	2011 Jul 16.278			2011 Jul 16.39 2011 Jul 16.92	54.81 54.79	755.22 757.12	27471 27517	20463 20463	21722 21814	0.023 0.025	33 33

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Spektr R [Zenit 3F/Fregat SB]	2011 37 A [37755] BAI-IC45/1	2011 Jul 18.105	Box+ 2 panels + dish 3627	10 dia	2011 Jul 18.25 2011 Aug 4.20	51.60 55.84	4798.58 12437.28	176265 177819	1045 4578	332728 338302	0.957 0.938	278 308
Fregat SB stage *	2011 37 B [37756]	2011 Jul 18.105	Spheres + nozzle 1100?	1.5 high 3.3 dia	2011 Jul 18.34	51.46	128.70	8444	428	3703	0.194	302
Fragments	2011 37 C-G	4 pieces, all in orbit				For orbital information see extra pages at end of the year.						
Beidou IGSO 4 [CZ-3A]	2011 38 A [37763] XI-LC3	2011 Jul 26.905 > million years	Box +2 panels + dish		2011 Jul 27.16 2011 Aug 4.72	55.11 55.22	629.87 1436.02	24341 42163	196 35669	35728 35870	0.730 0.002	175 187
CZ-3A 3 rd stage	2011 38 B [37764]	2011 Jul 26.905	Cylinder 3060	12.375 long 3.0 dia	2011 Jul 27.16	54.88	630.40	24354	243	35708	0.728	175
Shijian 11-04 [CZ-2C]	2011 39 A [37765] JIUQ-Left	2011 Jul 29.321			2011 Jul 29.38 2011 Jul 29.43	98.13 98.13	98.27 98.37	7055 7059	641 645	711 715	0.005 0.005	128 121
CZ-2C 2 nd stage	2011 39 B [37766]	2011 Jul 29.321			2011 Jul 29.44	98.11	98.70	7075	689	704	0.001	250
Fragments	2011 39 C-F	4 pieces, all in orbit				For orbital information see extra pages at end of the year.						
Juno \$ [Atlas-V 551] (AV 029)	2011 40 A [37773] CC-LC41	2011 Aug 5.684 heliocentric	Hexagonal box + 3 panels + dish 3625	4 high 20 span	2011 Aug 5.67 Heliocentric orbit	28.76	88.52	6579	170	231	0.005	277
Atlas-V 2 nd stage (Centaur)	2011 40 B [37774]	2011 Aug 5.684	Cylinder 2100?	12.68 long 3.05 dia	2011 Aug 5.93	46.14	14399.93	196065	13228	366145	0.900	219

* A propellant drop tank has been added to the standard Fregat stage to create Fregat SB.

\$ Jupiter probe. Earth fly-by 2013 Oct 9; Jupiter orbit insertion 2016 Jul

Name [Launcher] Fragment	Cospar ID [Norad#] Launchsite Cospar ID	Launch date Lifetime and descent date [Norad#]	Shape and weight (kg) Descent date	Size (m) Lifetime	Date of orbital determination	Orbital Inclination (deg)	Nodal period (min)	Semi major axis (km)	Perigee height (km)	Apogee height (km)	Orbital eccentricity	Argument of perigee (deg)
Astra-1N [Ariane-5 ECA] (V 203)	2011 41 A [37775] KOU-ELA3	2011 Aug 6.953 > million years	Box + 2 panels + 4 dishes 5350	6.5 x 2.8 x 3.2 39.8 span	2011 Aug 7.19	1.97	631.12	24373	266	35723	0.727	178
					2011 Aug 8.51	1.11	727.08	26785	5014	35798	0.575	179
					2011 Aug 9.52	0.34	954.03	32103	15654	35794	0.314	179
					2011 Aug 10.84	0.05	1168.27	36744	24940	35791	0.148	180
					2011 Aug 12.47	0.14	1430.15	42048	35550	35790	0.003	0
					2011 Aug 16.49	0.12	1434.00	42124	35709	35781	0.0009	27
					2011 Aug 17.61	0.13	1434.10	42126	35714	35780	0.0008	39
2011 Aug 23.86	0.11	1436.08	42164	35783	35789	0.00007	232					
BSAT-3C	2011 41 B [37776]	2011 Aug 6.953 > million years	Box + 2 panels + 2 dishes 2910	5.3 x 2.0 x 1.9 18.9 span	2011 Aug 7.19	1.97	630.93	24368	265	35713	0.727	179
					2011 Aug 8.99	0.64	855.13	29844	11182	35748	0.412	177
					2011 Aug 10.77	0.35	1002.95	33191	17876	35748	0.269	174
					2011 Aug 12.62	0.05	1369.17	40844	33197	35734	0.031	154
					2011 Aug 16.67	0.05	1435.13	24146	35737	35797	0.0007	60
2011 Aug 18.80	0.03	1436.07	42164	35783	35789	0.00007	97					
Ariane 5 2 nd stage	2011 41 C [37777]	2011 Aug 6.953	Drum-cone 2880	3.5 long 3.94 dia	2011 Aug 7.20	1.98	632.07	24397	266	35771	0.728	178
Sylda 5A upperpart	2011 41 D [37778]	2011 Aug 6.953	Barrel shaped 517	6.4 long 4.6 dia	2011 Aug 7.25	1.63	629.17	24323	255	35632	0.727	167
Paksat 1R [CZ-3B]	2011 42 A [37779] XI	2011 Aug 11.677 > million years	Box + 2 panels 4990		2011 Aug 11.44	24.82	752.97	27417	197	41879	0.760	179
					2011 Aug 20.80	25.19	701.55	26154	129	39422	0.751	186
					2011 Aug 26.60	0.17	1438.42	42210	35819	35844	0.0003	119
					2011 Sep 11.09	0.13	1437.30	42188	35799	35820	0.0002	95
					2011 Sep 13.08	0.13	1436.12	42165	35765	35808	0.0005	343
CZ-3B 3 rd stage	2011 42 B [37780]	2011 Aug 11.677	Cylinder 3060	12.38 long 3.0 dia	2011 Aug 11.96	24.95	751.35	27377	191	41807	0.760	180
Haiyang 2A (Ocean 2A) [CZ-4B]	2011 43 A [37781] WUZ	2011 Aug 15.956			2011 Aug 16.08	99.38	113.20	7288	904	915	0.0008	195
					2011 Aug 16.79	99.36	113.22	7289	906	915	0.0006	221
CZ-4B 3 rd stage	2011 43 B [37782]	2011 Aug 15.956	Cylinder 1730?	4.93 long 2.9 dia	2011 Aug 16.07	99.47	100.25	7149	631	910	0.019	21

Name [Launcher] Fragment	Cospar ID [Norad#] Launchsite Cospar ID	Launch date Lifetime and descent date [Norad#]	Shape and weight (kg) Descent date	Size (m) Lifetime	Date of orbital determination	Orbital Inclination (deg)	Nodal period (min)	Semi major axis (km)	Perigee height (km)	Apogee height (km)	Orbital eccentricity	Argument of perigee (deg)
EduSAT * [Dnepr]	2011 44 A [37788] YAS	2011 Aug 17.300	Cube 10		2011 Aug 17.35 2011 Aug 18.64	98.26 98.26	97.50 98.12	7017 7047	581 640	696 697	0.008 0.004	355 345
NigeriaSat 2	2011 44 B [37789]	2011 Aug 17.300	7-sided box 300	1.061 high 0.815 width 0.899 length	2011 Aug 17.48	98.28	99.00	7089	697	724	0.002	216
NigeriaSat X	2011 44 C [37790]	2011 Aug 17.300	Cube 100		2011 Aug 17.41 2011 Aug 17.82	98.27 98.26	98.28 98.28	7055 7055	653 656	700 697	0.003 0.003	347 342
Rasat #	2011 44 D [37791]	2011 Aug 17.300	Cube 113	0.7 x 0.7 x 0.554	2011 Aug 17.41 2011 Aug 17.83	98.28 98.26	98.40 98.40	7061 7061	664 667	701 698	0.003 0.002	344 334
Aprizesat 5	2011 44 E [37792]	2011 Aug 17.300	Cube 11		2011 Aug 17.41	98.27	97.80	7032	609	698	0.006	356
Aprizesat 6	2011 44 F [37793]	2011 Aug 17.300	Cube 11		2011 Aug 17.41	98.28	97.98	7040	626	697	0.005	353
Sich 2	2011 44 G [37794]	2011 Aug 17.300	Box +4 panels 169		2011 Aug 17.42	98.26	98.63	7072	684	702	0.001	294
Dnepr 3 rd stage &	2011 44 H [37795]	2011 Aug 17.300	Cylinder	3.05 dia	2011 Aug 17.35	98.22	104.92	7369	689	1292	0.041	190
Fragments	2011 44 J 2011 44 K	[37796] [37797]			2011 Aug 17.42 2011 Aug 17.41	98.26 98.26	98.78 98.37	7079 7059	692 656	710 706	0.001 0.004	246 26

* EduSAT is a microsatellite from Roma University.

Rasat is a Turkish Earth observation satellite.

& The BPA-2 experiment is bolted to the Dnepr stage.

Name [Launcher] Fragment	Cospar ID [Norad#] Launchsite Cospar ID	Launch date Lifetime and descent date [Norad#]	Shape and weight (kg) Descent date	Size (m) Lifetime	Date of orbital determination	Orbital Inclination (deg)	Nodal period (min)	Semi major axis (km)	Perigee height (km)	Apogee height (km)	Orbital eccentricity	Argument of perigee (deg)
Express AM-4 [Proton-M/Breeze-M]	2011 45 A [37798]	2011 Aug 17.893	Box +2 panels 5775		2011 Aug 18.20 2011 Aug 19.71	49.48 51.33	221.35 368.87	12121 17038	145 1004	11340 20314	0.0462 0.567	9 24
Breeze-M stage *	2011 45 B [37799]	2011 Aug 17.893	Stubby Cyl 1220	2.62 long ~2.4 dia	2011 Aug 19.54 2011 Aug 22.72	51.18 51.32	362.67 368.85	16846 17037	697 1002	20239 20315	0.580 0.567	22 25
Breeze-M tank	2011 45 C [37800]	2011 Aug 17.893	Torus 1290	2.1 long 4.1 dia 0.8 cross	2011 Aug 19.62	49.47	220.85	12103	145	11303	0.461	10
GRAIL A # [Delta 2 7920-H 10C]	2011 46 A [37801] CC-LC17B	2011 Sep 10.547	Box +2 panels 307 (full) 201 (dry)	1.09 high 0.95 wide 0.76 deep 2x 1.88 m2	2011 sep 10.59 Towards the moon	28.50	87.72	6540	162	162	0.00002	263
GRAIL B #	2011 46 B [37802]	2011 Sep 10.547	Box +2 panels 307 (full) 201 (dry)	1.09 high 0.95 wide 0.76 deep 2x 1.88 m2	2011 sep 10.59 Towards the moon	28.50	87.72	6540	162	162	0.00002	263
Delta 2 2 nd stage	2011 46 C [37803]	2011 Sep 10.547	Cylinder 919	5.88 long 2.44 dia	2011 sep 10.59 Heliocentric orbit?	28.50	87.72	6540	162	162	0.00002	263
Chinasat 1A \$ (Fenghuo 2) [CZ 3B/E]	2011 47 A [37804] XI	2011 Sep 18.690 > million years	Box + 2 panels 5320 full 2220 empty	2.36 x 2.10 x 3.60	2011 Sep 18.49 2011 Sep 28.63	27.11 0.57	631.42 1436.10	24381 42165	186 35781	35818 35791	0.731 0.0001	179 137
CZ 3B/E 3 rd stage	2011 47 B [37805]	2011 Sep 18.690	Cylinder 3060	12.38 long 3.0 dia	2011 Sep 18.49	26.93	631.30	24377	191	35806	0.730	179

* The Breeze-M stage malfunctioned between the 4th and 5th burn, leaving the satellite in a lower than planned orbit.

GRAIL (Gravity Recovery And Interior Laboratory) A & B were launched towards the Sun-Earth Lagrange-1 point and will finally get in orbit around the moon 2011 Dec 31 (A) and 2012 Jan 1 (B) in a 11.5 hour polar orbit. Over the next two months, flight controllers will carefully maneuver the two satellites into the same circular orbit at an altitude of about 55 km, with distances of 74 to 225 km between the spacecraft.

\$ Military communication satellite.

Name [Launcher] Fragment	Cospar ID [Norad#] Launchsite Cospar ID	Launch date Lifetime and descent date [Norad#]	Shape and weight (kg) Descent date	Size (m) Lifetime	Date of orbital determination	Orbital Inclination (deg)	Nodal period (min)	Semi major axis (km)	Perigee height (km)	Apogee height (km)	Orbital eccentricity	Argument of perigee (deg)
Cosmos 2473 (Garpun/Harpoon) [Proton-M/Breeze-M]	2011 48 A [37806] BAI-IC81/24	2011 Sep 20.949			2011 Sep 21.10	48.61	631.08	24372	403	35584	0.722	0
					2011 Sep 27.80	0.07	1426.68	41980	35562	35641	0.0009	305
					2011 Sep 29.11	0.07	1428.23	42011	35563	35682	0.001	297
					2011 Sep 29.72	0.08	1428.73	42021	35604	35680	0.0009	345
					2011 Oct 2.98	0.08	1431.78	42080	35658	35746	0.001	300
					2011 Oct 3.82	0.08	1433.57	42115	35708	35765	0.0007	278
					2011 Oct 4.64	0.08	1434.07	42125	35711	35782	0.0008	281
					2011 Oct 5.55	0.09	1434.67	42137	35737	35779	0.0005	258
					2011 Oct 6.89	0.09	1434.83	42140	35736	35787	0.0006	250
					2011 Oct 7.55	0.09	1435.17	42147	35737	35799	0.0007	257
Breeze-M stage	2011 48 B [37807]	2011 Sep 20.949	Stubby Cyl 1220	2.62 long ~2.4 dia	2011 Sep 28.60	48.61	631.12	24373	401	35587	0.722	2
					2011 Sep 29.51	0.18	1381.17	41083	33760	35648	0.023	96
Breeze-M tank	2011 48 C [37808]	2011 Sep 20.949	Torus 1290	2.1 long 4.1 dia 0.8 cross	2011 Sep 28.60	48.61	631.12	24373	401	35587	0.722	2
SES 2 (+CHIRP)# [Ariane 5 ECA]	2011 49 A [37809] KOU-ELA3	2011 Sep 22.901 > million years	Box +2 panels 3152	1.75 x 1.70 x 1.80	2011 Sep 22.38	1.95	631.90	24383	263	35765	0.728	178
					2011 Sep 23.91	1.13	743.95	27197	5864	35774	0.550	179
					2011 Sep 25.83	0.37	1021.75	33604	18686	35765	0.254	181
					2011 Sep 27.30	0.19	1272.88	38906	29279	35776	0.083	174
					2011 Sep 29.11	0.18	1423.70	41922	35414	35673	0.003	350
					2011 Sep 29.19	0.17	1432.92	42103	35670	35777	0.001	326
					2011 Oct 2.72	0.04	1435.35	42150	35765	35778	0.0002	298
2011 Oct 4.43	0.05	1436.12	42165	35779	35795	0.0002	78					
Arabsat 5C	2011 49 B [37810]	2011 Sep 22.901 > million years	Box +2 panels 4630		2011 Sep 22.38	1.96	631.70	24388	261	35757	0.728	178
					2011 Sep 28.88	0.08	1440.03	42242	35808	35918	0.001	350
					2011 Oct 6.78	0.07	1439.95	42240	35802	35921	0.001	352
Ariane-5 2 nd stage	2011 49 C [37811]	2011 Sep 22.901	Drum-cone 2880	3.5 long 3.94 dia	2011 Sep 23.00	1.95	631.92	24393	252	35777	0.728	178
Sylda upperpart	2011 49 D [37812]	2011 Sep 22.901	Barrel shaped 517	6.4 long 4.6 dia	2011 Sep 23.00	1.99	629.57	24333	252	35656	0.727	181

US Airforce's experimental Commercially Hosted InfraRed Payload).

Name [Launcher] Fragment	Cospar ID [Norad#] Launchsite Cospar ID	Launch date Lifetime and descent date [Norad#]	Shape and weight (kg) Descent date	Size (m) Lifetime	Date of orbital determination	Orbital Inclination (deg)	Nodal period (min)	Semi major axis (km)	Perigee height (km)	Apogee height (km)	Orbital eccentricity	Argument of perigee (deg)
IGS 6A [H-2A]	2011 50 A [37813] TAN	2011 Sep 23.192			No TLE issued							
H-2A 2 nd stage	2011 50 B [37814]	2011 Sep 23.192			No TLE issued							
Fragments	2011 50 C 2011 50 D	[37815] [37833]			2011 Oct 3.87 2011 Oct 4.27	97.63 97.65	96.18 96.22	6954 6956	563 563	588 592	0.002 0.002	353 353
Atlantic Bird 7 [Zenit 3SL]	2011 51 A [37816] ODS	2011 Sep 24.846 > million years	box +2 panels		2011 Sep 24.89 2011 Sep 26.30 2011 Sep 27.61 2011 Sep 29.50 2011 Sep 30.64 2011 Oct 2.64 2011 Oct 4.90	0.06 0.02 0.07 0.08 0.05 0.05 0.04	655.62 784.58 1122.40 1391.50 1431.90 1433.28 1436.07	24999 28179 35776 41287 42083 42110 42164	1617 8002 23188 34201 35617 35658 35782	35625 35599 35607 35617 35791 35804 35789	0.680 0.490 0.174 0.017 0.002 0.002 0.00008	357 13 344 342 145 153 186
Zenit 3SL 3 rd stage (Block DM-SL)	2011 51 B [37817]	2011 Sep 24.846			2011 Sep 24.89	0.03	655.70	25001	1616	35629	0.680	241
Tacsat 4 [Minotaur 4+]	2011 52 A [37818] KOD	2011 Sep 28.659			2011 Sep 27.73 2011 Sep 28.37 2011 Sep 28.54 2011 Oct 3.15 2011 Oct 5.48	63.38 63.60 63.64 63.64 63.63	231.15 234.43 235.15 238.58 238.88	12477 12594 12620 12743 12753	355 597 647 658 748	11842 11835 11836 12071 12001	0.460 0.446 0.443 0.448 0.441	211 211 211 210 211
Minotaur 4+ 4 th stage	2011 52 B [37819]	2011 Sep 28.659			2011 Sep 27.73	63.39	228.73	12390	189	11833	0.470	211
Tiangong 1 * [CZ 2F T1]	2011 53 A [37820] JIUQ	2011 Sep 29.553			2011 Sep 29.72 2011 Sep 29.78 2011 Sep 30.80	42.78 42.78 42.78	89.80 89.93 91.43	6644 6650 6723	198 194 335	332 348 354	0.010 0.012 0.001	131 132 40
CZ 2F T1 2 nd stage	2011 53 B [37821]	2011 Sep 29.553			2011 Sep 29.72	42.78	89.77	6641	198	328	0.001	130
D Separation motor Covers	2011 53 C-F	4 pieces, all have decayed										

For orbital information see extra pages at end of the year.

* First Chinese spacestation module.

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Name [Launcher] Fragment	Cospar ID [Norad#] Launchsite Cospar ID	Launch date Lifetime and descent date [Norad#]	Shape and weight (kg) Descent date	Size (m) Lifetime	Date of orbital determination	Orbital Inclination (deg)	Nodal period (min)	Semi major axis (km)	Perigee height (km)	Apogee height (km)	Orbital eccentricity	Argument of perigee (deg)	
QuetzSat 1 [Proton-M/Breeze-M]	2011 54 A [37826] BAI	2011 Sep 29.772 > million years			2011 Sep 30.80	49.50	316.92	15398	329	17710	0.564	354	
					2011 Oct 5.72	0.07	1434.55	42135	35716	35796	0.0009	21	
					2011 Oct 11.40	0.07	1436.07	42164	35761	35810	0.0006	50	
					2011 Oct 22.36	0.03	1436.08	42165	35776	35797	0.0002	22	
Breeze-M stage	2011 54 B [37827]	2011 Sep 29.772	Stubby Cyl 1220	2.62 long ~2.4 dia	2011 Sep 30.40	18.60	745.23	27229	5909	35791	0.549	0	
Breeze-M tank	2011 54 C [37828]	2011 Sep 29.772	Torus 1290	2.1 long 4.1 dia 0.8 cross									
Cosmos 2474 (Glonass) [Soyuz-2-1b/Fregat]	2011 55 A [37829] PLE	2011 Oct 2.844			2011 Oct 2.91	64.82	676.32	25523	19126	19162	0.0007	199	
					2011 Oct 3.38	64.79	675.92	25513	19110	19158	0.0009	234	
					2011 Oct 3.85	64.81	675.95	25514	19118	19152	0.0007	228	
					2011 Oct 7.67	64.80	673.05	25441	18974	19150	0.003	237	
Fregat stage	2011 55 B [37830]	2011 Oct 2.844			2011 Oct 9.99	64.80	671.85	25411	18913	19151	0.005	235	
					2011 Oct 2.91	64.78	688.55	25830	19235	19667	0.008	115	
Intelsat 18 [Zenit-3SLB / Block DM-SLB]	2011 56 A [37834] BAI	2011 Oct 5.875 > million years	Box +2 panels		2011 Oct 6.40	19.50	737.33	27036	5534	35780	0.559	0	
					2011 Oct 9.24	10.11	870.42	30198	11869	35770	0.396	359	
					2011 Oct 10.45	3.08	1157.05	36509	24488	35772	0.155	0	
					2011 Oct 12.69	0.76	1345.65	40375	32216	35777	0.044	0	
					2011 Oct 14.63	0.01	1431.50	42075	35616	35777	0.002	92	
					2011 Oct 16.69	0.02	1434.47	42133	35730	35779	0.0006	135	
Block DM-SLB stage	2011 56 B [37835]	2011 Oct 5.875			2011 Oct 19.58	0.02	1436.07	42164	35778	35793	0.0002	301	
					2011 Oct 21.18	0.02	1436.08	42165	35779	35793	0.0002	290	
					2011 Oct 6.40	19.48	731.68	26897	5269	35768	0.567	0	
W3C [CZ-3B]	2011 57 A [37836] XI	2011 Oct 7.347 > million years	Box +2 panels		2011 Oct 7.15	26.09	631.17	24374	187	35804	0.731	179	
					2011 Oct 8.46	14.59	718.63	26577	4596	35800	0.587	180	
					2011 Oct 9.73	6.55	895.92	30785	13006	35807	0.370	180	
					2011 Oct 10.67	2.33	1149.70	36354	24150	35801	0.160	179	
					2011 Oct 13.84	0.02	1430.03	42046	35598	35746	0.002	249	
CZ-3B 3 rd stage	2011 57 B [37837]	2011 Oct 7.347			2011 Oct 17.99	0.05	1436.08	42165	35777	35795	0.0002	114	
					2011 Oct 7.89	26.11	626.42	24252	159	35587	0.730	180	

Year of Launch 2011		RAE Table of Earth Satellites										(Compiled 2011)	Page 20
Name [Launcher] Fragment	Cospar ID [Norad#] Launchsite Cospar ID	Launch date Lifetime and descent date [Norad#]	Shape and weight (kg) Descent date	Size (m) Lifetime	Date of orbital determination	Orbital Inclination (deg)	Nodal period (min)	Semi major axis (km)	Perigee height (km)	Apogee height (km)	Orbital eccentricity	Argument of perigee (deg)	
Megha-Tropiques [PSLV C-18]	2011 58 A [37838] SRI	2011 Oct 12.229	Box +2 panels 1000		2011 Oct 12.77 2011 Oct 19.64	19.79 19.97	101.35 102.10	7201 7236	779 848	866 867	0.006 0.001	18 61	
Jugnu *	2011 58 B [37839]	2011 Oct 12.229	Box 3	0.10 x 0.10 x 0.34	2011 Oct 12.78	19.98	102.10	7236	848	867	0.001	347	
Vesselsat 1 *	2011 58 C [37840]	2011 Oct 12.229	Cube 28.7		2011 Oct 12.56	19.97	102.08	7236	847	867	0.001	350	
SRMSAT *	2011 58 D [37841]	2011 Oct 12.229	Box 10.9	0.341x0.341 x 0.385	2011 Oct 12.78	19.97	102.12	7237	850	867	0.001	345	
PSLV 4 th stage	2011 58 E [37842]	2011 Oct 12.229	Cylinder 920 empty 2500 full	2.65 long 1.335 dia	2011 Oct 12.77	19.96	101.98	7231	838	866	0.002	9	
ViaSat 1 [Proton-M/Breeze-M]	2011 59 A [37843] BAI-LC39	2011 Oct 19.784 > million years	Box +2 panels 6740		2011 Oct 19.94	49.76	234.33	12591	324	12101	0.468	352	
Breeze-M stage	2011 59 B [37844]	2011 Oct 19.784	Stubby Cyl 1220	2.62 long ~2.4 dia	2011 Oct 20.50	30.40	672.72	25432	2327	35780	0.658	0	
Breeze-M tank	2011 59 C [37845]	2011 Oct 19.784	Torus 1290	2.1 long 4.1 dia 0.8 cross	2011 Oct 20.39	32.34	684.15	25719	2396	36285	0.659	3	
Galileo PFM [Soyuz-2-1b]	2011 60 A [37846] KOU-S	2011 Oct 21.438	Box +2 panels 700		2011 Oct 21.20	54.68	846.95	29653	23239	23310	0.001	217	
Galileo FM 2	2011 60 B [37847]	2011 Oct 21.438	Box +2 panels 700		2011 Oct 20.14 2011 Oct 28.84	54.66 54.69	846.68 845.85	29647 29627	23242 23230	23294 23268	0.0009 0.0006	220 172	
Fregat-MT stage	2011 60 C [37848]	2011 Oct 21.438			2011 Oct 21.20	54.67	855.82	29859	23249	23712	0.008	255	

* Jugnu is from Indian Institute of Technology at Kanpur; VesselSat-1 is from Luxembourg and SRMSat is from SRM University, India.

Year of Launch 2011			RAE Table of Earth Satellites					(Compiled 2011)					Page 21
Name [Launcher] Fragment	Cospar ID [Norad#] Launchsite Cospar ID	Launch date Lifetime and descent date [Norad#]	Shape and weight (kg) Descent date	Size (m) Lifetime	Date of orbital determination	Orbital Inclination (deg)	Nodal period (min)	Semi major axis (km)	Perigee height (km)	Apogee height (km)	Orbital eccentricity	Argument of perigee (deg)	
NPP * [Delta-2 (7920-10)]	2011 61 A [37849] VDB-SLC-W2	2011 Oct 28.408	Box + panel 2270 full 2128 dry	3.96 long 2.59x2.59	2011 Oct 28.87 2011 Nov 1.81	98.71 98.71	101.25 101.30	7196 7199	816 817	819 823	0.0002 0.0004	118 41	
AubieSat 1	2011 61 B [37850]	2011 Oct 28.408	Cube	0.10 x 0.10 x 0.10	2011 Oct 29.63	101.70	97.45	7016	459	815	0.025	290	
Explorer 1 (Prime)	2011 61 C [37851]	2011 Oct 28.408	Cube	0.10 x 0.10 x 0.10	2011 Oct 29.87	101.71	97.45	7015	458	815	0.025	289	
M-Cubed	2011 61 D [37852]	2011 Oct 28.408	Cube	0.10 x 0.10	2011 Oct 29.94	101.70	97.45	7016	458	816	0.026	289	
RAX 2	2011 61 E [37853]	2011 Oct 28.408	Box	0.10 x 0.10 x 0.30	2011 Oct 29.87	101.70	97.45	7015	458	816	0.026	289	
DICE 1	2011 61 F [37854]	2011 Oct 28.408	Box	0.10 x 0.10 x 0.15	2011 Oct 29.87	101.70	97.43	7015	456	816	0.026	289	
DICE 2	2011 61 G [37855]	2011 Oct 28.408	Box	0.10 x 0.10 x 0.15	2011 Oct 29.87	101.71	97.45	7015	456	817	0.026	289	
Delta-2 2 nd stage %	2011 61 H [37856]	2011 Oct 28.408	Cylinder 919	5.88 long 2.44 dia	2011 Oct 28.52	107.33	93.72	6835	182	731	0.04	334	
Progress-M 13M # [Soyuz-U]	2011 62 A [37857] BAI-LC1/5	2011 Oct 30.091	Cyl+beehive+ +spheroid+ 2 panels 7250?	7.5 long 2.72 maxdia 2.3 dia	2011 Oct 30.87 2011 Nov 1.94	51.64 51.64	89.75 89.80	6641 6643	247 254	277 275	0.002 0.002	129 123	
D Soyuz-U 3 rd stage	2011 62 B [37858]	2011 Oct 30.091 2 days 2011 Nov 1	Cylinder 2400?	8.1 long 2.66 dia	2011 Oct 30.91 2011 Oc 31.83	51.64 51.63	88.48 87.95	6578 6552	181 163	216 184	0.003 0.002	85 97	

* NPOESS (National Polar-orbiting Operational Environmental Satellite System) Preparatory Project

% After releasing NPP the Delta-2 2nd stage manoeuvred and released the microsats in 3 shifts (BCD-E-FG) and then manoeuvred to 107 degrees orbit.

Progress-M 12M was lost 2011 Aug 24 in a launch failure. Progress-M 13 M docked 2011 Nov 2 with ISS (PIRS port).

Name [Launcher] Fragment	Cospar ID [Norad#] Launchsite Cospar ID	Launch date Lifetime and descent date [Norad#]	Shape and weight (kg) Descent date	Size (m) Lifetime	Date of orbital determination	Orbital Inclination (deg)	Nodal period (min)	Semi major axis (km)	Perigee height (km)	Apogee height (km)	Orbital eccentricity	Argument of perigee (deg)
Shenzou 8 * [CZ-2F]	2011 63 A [37859] JIUQ	2011 Oct 31.915	Cylindrical Instrument/ propulsion + 2 panels; Dome-shaped Descent mod; Cylindrical Orbital mod 8082	2.941 long 2.5 dia 2.8 basedia 17 span 2.5 high 2.52basedia 2.8 long 2.25 dia	2011 Nov 1.61	42.79	90.27	6666	261	314	0.004	138
CZ-2F 2 nd stage	2011 63 B [37860]	2011 Oct 31.915	Cylinder 4950?	~14.2 long 3.35 dia	2011 Nov 1.46	42.78	89.55	6631	196	308	0.008	134
Fragment	2011 63 C [37861]	[37861]	1 piece, in orbit		2011 Nov 1.47	42.64	91.07	6705	209	444	0.018	116

* Shenzhou 8 is an unmanned Chinese spacecraft and docked 2011 Nov ?? with Tiangong 1 (2011 53 A).

Year of Launch 2009

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(Compiled 2010)

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Cospar ID	[Norad#]	Descent date	Lifetime	Date of orbital determination	Orbital Inclination (deg)	Nodal period (min)	Semi major axis (km)	Perigee height (km)	Apogee height (km)	Orbital eccentricity	Argument of perigee (deg)
Electro-L Zenit-3F 2 nd stage fragments; 5 pieces, 2 have decayed											
2011 01 D	[37347]			2011 Feb 7.89	50.37	135.25	8728	297	4403	0.235	40
D 2011 01 E	[37354]	2011 Mar 5	38 days	2011 Jan 26.80	51.36	95.13	6903	190	859	0.048	95
				2011 Mar 5.12	51.31	87.85	6546	145	190	0.003	243
D 2011 01 F	[37355]	2011 Feb 15	20 days	2011 Jan 26.84	51.36	94.62	6879	173	827	0.048	85
				2011 Feb 14.92	51.32	88.28	6568	141	237	0.007	155
D 2011 01 G	[37356]	2011 Feb 15	20 days	2011 Jan 26.84	51.32	94.55	6875	172	821	0.047	86
				2011 Feb 15.79	51.25	87.60	6535	121	191	0.005	159
D 2011 01 H	[37357]	2011 Mar 6	39 days	2011 Jan 26.80	51.33	95.08	6902	190	855	0.048	95
				2011 Mar 5.93	51.30	88.78	6593	152	277	0.009	244
CZ-2C fragments, 4 pieces, all in orbit											
2011 30 C	[37732]			2011 Jul 7.08	98.02	101.42	7204	696	954	0.018	169
2011 30 D	[37733]			2011 Jul 7.08	98.49	101.20	7194	696	935	0.017	168
2011 30 E	[37734]			2011 Jul 7.06	98.02	99.55	7116	664	810	0.010	223
2011 30 F	[37735]			2011 Jul 7.06	98.43	99.48	7112	659	808	0.011	226
Fregat SB stage fragments; 5 pieces, all in orbit.											
2011 37 C	[37757]			2011 Jul 20.74	51.43	92.73	6787	172	645	0.035	87
2011 37 D	[37758]			2011 Jul 20.61	51.41	90.37	6671	176	410	0.018	90
2011 37 E	[37759]			2011 Jul 20.62	51.43	92.95	6798	175	664	0.036	99
2011 37 F	[37760]			2011 Jul 20.62	51.38	92.92	6796	173	662	0.036	87
2011 37 G	[37761]			2011 Jul 20.62	51.39	92.93	6797	174	661	0.036	100
CZ-2C fragments; 4 pieces, all in orbit											
2011 39 C	[37767]			2011 Jul 29.51	97.93	101.23	7196	693	941	0.018	172
2011 39 D	[37768]			2011 Jul 29.58	98.33	101.18	7193	694	935	0.017	170
2011 39 E	[37769]			2011 Jul 29.78	98.32	99.48	7112	659	809	0.011	226
2011 39 F	[37770]			2011 Aug 1.90	97.87	99.62	7119	659	821	0.011	214
CZ-2F T1 2 nd stage separation motor covers; 4 pieces, all have decayed.											
D 2011 53 C	[37822]	2011 Oct 1	3 days	2011 Sep 30.04	42.96	91.17	6711	190	474	0.021	144
				2011 Oct 1.11	42.96	89.60	6633	170	339	0.013	152
D 2011 53 D	[37823]	2011 Oct 1	3 days	2011 Sep 30.05	42.60	91.68	6735	192	522	0.024	125
				2011 Oct 1.00	42.60	90.75	6890	186	437	0.019	133
D 2011 53 E	[37824]	2011 Oct 2	4 days	2011 Sep 30.05	42.56	91.82	6742	183	544	0.027	120
				2011 Oct 1.94	42.65	89.65	6635	170	344	0.013	140
D 2011 53 F	[37825]	2011 Oct 1	3 days	2011 Sep 29.92	42.91	91.12	6708	188	470	0.021	148
				2011 Oct 1.04	42.94	89.32	6620	166	316	0.011	156

Year of Launch 2011	FAILURES		RAE Table of Earth Satellites					(Compiled 2011)					Page F1
Name [Launcher] Fragment	Cospar ID [Norad#] Launchsite	Launch date Lifetime and descent date	Shape and weight (kg) Descent date	Size (m) Lifetime	Date of orbital determination	Orbital Inclination (deg)	Nodal period (min)	Semi major axis (km)	Perigee height (km)	Apogee height (km)	Orbital eccentricity	Argument of perigee (deg)	
Glory	2011 F1 VDB-IC576E	2011 Mar 4.423	Octagonal cyl + 2 panels 525	1.9 high 1.4 dia	Payload fairing came not free from the rocket and satellite fell back In southern Pacific Ocean.								
Shijian 11-04 [CZ-2C]	2011 F2 JIUQ	2011 Aug 18.395			Probably the 2 nd stage didn't separate and ignite.								
Progress-M-12M [Soyuz-U]	2011 F3 BAI-LC1	2011 Aug 24.542 2 panels	Cyl+beehive+ +spheroid+ 2.3 dia 7250?	7.5 long 2.72 maxdia	Soyuz-U upper stage shut down 5m20s after launch causing the Progress to crash in Siberia.								