Version 17; Page 1 of 6. This chart shows the 757 total CubeSats deployed in orbit so far, for a total of 1937 Units. November 23, 2018. Bryan Klofas. bklofas@gmail.com. Green are University or Educational CubeSats; Red are Commercial or Private; Blue are Government CubeSats, either US or non-US.

Deployment	Satellite	Object	Size	Radio	Downlink	Satellite Service	Power	TNC	Protocol	Data Rate/Modulation	Antenna	Status	Updated
	AAU1 CubeSat	27846	1U	Wood & Douglas SX450	437.475 MHz	Amateur	500 mW	MX909	AX.25, Mobitex	9600 baud GMSK	dipole	Dead	April 2013
	DTUsat-1	27842	1U	RFMD RF2905	437.475 MHz	Amateur	400 mW	11111000	AX.25	2400 baud FSK	canted turnstile	DOA	April 2013
	CanX-1	27847	1U	Melexis	437.880 MHz	Amateur	500 mW		Custom	1200 baud MSK	crossed dipoles	DOA	April 2013
NLS-1/Eurockot	Cute-1	27844	1U	Alinco DJ-C4 (data)	$437.470~\mathrm{MHz}$	Amateur	350 mW	MX614	AX.25	1200 baud AFSK	monopole	Alive	April 2013
30 June 2003	(CO-55)	250.45	OTT	Maki Denki (beacon)	436.8375 MHz	Amateur	100 mW	PIC16LC73A	CW	50 WPM	monopole		1 11 0040
	QuakeSat-1 XI-IV	27845 27848	3U 1U	Tekk KS-960 Nishi RF Lab (data)	436.675 MHz 437.490 MHz	Amateur Amateur	2 W 1 W	BayPac BP-96A PIC16C622	AX.25 ¹	9600 baud FSK	turnstile	Dead Alive	April 2013
	(CO-57)	27848	10	Nishi RF Lab (data) Nishi RF Lab (beacon)	437.490 MHz 436.8475 MHz	Amateur Amateur	1 W 80 mW	PIC16C622 PIC16C716	AX.25 CW	1200 baud AFSK 50 WPM	dipole dipole	Alive	April 2013
	<u> </u>	20005	4.7.7										A 11 0010
SSETI	XI-V	28895	1U	Nishi RF Lab (data)	437.345 MHz	Amateur	1 W	PIC16C622	AX.25	1200 baud AFSK	dipole	Alive	April 2013
Express	(CO-58) NCube-2	200072	1U	Nishi RF Lab (beacon)	437.465 MHz 437.505 MHz	Amateur	80 mW	PIC16C716	CW	50 WPM 1200 baud AFSK	dipole	DOA	A:1 2019
27 Oct 2005	UWE-1	$\frac{28897^2}{28892}$	1U	PR430	437.505 MHz	Amateur Amateur	1 W	${ m H8S/2674R^3}$	AX.25 AX.25	1200 baud AFSK 1200/9600 baud AFSK	monopole end-fed dipole	Dead	April 2013 Apri 2013
3.5.37.0								,		,			
M-V-8	Cute-1.7+APD	28941	2U	Alinco DJ-C5	437.505 MHz	Amateur	300 mW 100 mW	CMX589A	AX.25/SRLL CW	1200 AFSK/9600 GMSK	dipole	Deorbited	April 2013
22 Feb 2006	(CO-56)			Telemetry (beacon)	437.385 MHz	Amateur		H8S/2328 ³		50 WPM	dipole		
Minotaur-1	GeneSat-1	29655	3U+	Microhard MHX-2400	2.4 GHz	Experimental	1 W	Integrated ⁴	Proprietary	10001 1 1 1 7 7 7 7	patch	Deorbited	April 2013
11 Dec 2006				Stensat (beacon) ⁵	437.067 MHz	Amateur	500 mW	PIC12C617	AX.25	1200 baud AFSK	monopole	<u> </u>	
	CSTB1	31122	1U	Yaesu VX-2R	400.0375 MHz	Experimental	300 mW	PIC	Proprietary	1200 baud AFSK	dipole	Dead	April 2013
	AeroCube-2	31133	1U	FreeWave FGRM	915 MHz	Experimental	2 W	Integrated ⁴	Proprietary	38.4 kbaud	patch	Dead	April 2013
Dnepr 2	CP4	31132	1U	TI CC1000/RF2117	437.325 MHz	Amateur	1 W	PIC18LF6720	AX.25	1200 baud FSK	dipole	Dead	April 2013
17 Apr 2007	Libertad-1 CAPE1	31128 31130	1U 1U	Stensat ⁶ TI CC1020 ⁷	437.405 MHz 435.245 MHz	Amateur Amateur	400 mW 1 W	PIC16LF452	AX.25 AX.25	1200 baud AFSK 9600 baud FSK	monopole dipole	Dead Dead	April 2013 April 2013
	CAPE1 CP3	31129	1U	TI CC1020 TI CC1000/RF2117	436.845 MHz	Experimental	1 W	PIC16LF 452 PIC18LF6720	AX.25 AX.25	1200 baud FSK	dipole	Dead	April 2013
	MAST ⁸	31126	3U	Microhard MHX-2400	2.4 GHz	Experimental	1 W	Intgrated ⁴	Proprietary	15 kbps	monopole	Dead	April 201
	Delfi-C3	32789	3U	Custom (transponder)	145.9-435.55 MHz	•	200 mW	N/A		40 kHz wide	turnstile	Alive	April 201
	(DO-64)	32189	30	Custom (transponder) Custom (beacon)	145.870 MHz	Amateur	400 mW	PIC18LF4680	Linear AX.25	1200 baud BPSK	turnstile	Alive	April 201
	Seeds-2	32791	1U	Musashino Electric (data)	437.485 MHz	Amateur	450 mW	F1C16LF4060	AX.25 AX.25	1200 baud AFSK	monopole	Alive	April 201
NLS-4/PSLV-C9	(CO-66)	32191	10	Musashino Electric (data) Musashino Electric (beacon)	437.485 MHz	Amateur	90 mW		CW	1200 baud Al SK	monopole	Anve	April 201
28 Apr 2008	CanX-2	32790	3U	Custom S-Band	2.2 GHz	Space Research	500 mW	Integrated	NSP	16-256kbps BPSK	patch	Active	April 2013
20 11p1 2000	AAUSAT-II	32788	1U	Holger Eckhardt (DF2FQ)	437.425 MHz	Amateur	610 mW	PIC18LF6680	AX.25	1200 baud MSK	dipole	Alive	April 2013
	Compass-1	32787	1U	Holger Eckhardt (data)	437.405 MHz	Amateur	300 mW	C8051F123, FX614	AX.25	1200 baud AFSK/MSK	dipole	Alive	April 2013
	1			BC549 (beacon)	$437.275~\mathrm{MHz}$	Amateur	200 mW	PIC12F629	CW	15 WPM [']	dipole		
	AeroCube-3	35005	1U	FreeWave FGRM	915 MHz	Experimental	2 W	Integrated	Proprietary	77 kbaud GFSK	patch	Deorbited	April 201
3.60	CP6	35003	1U	CC1000/RF2117	437.365 MHz	Amateur	1 W	PIC18LF6720	AX.25	1200 baud FSK	dipole	Deorbited	April 2013
Minotaur 1	HawkSat-1	35003	1U	Microhard MHX-425	437.345 MHz	Amateur	1 W	Integrated	Proprietary	1200 Dada I DIX	monopole	Deorbited	April 201
19 May 2009	PharmaSat	35002	3U+	Microhard MHX-2400	2.4 GHz	Experimental	1 W	Integrated	Proprietary	10 kbps	patch	Deorbited	April 201
				Stensat (beacon) ⁵	437.465 MHz	Amateur	500 mW	Integrated	AX.25	1200 baud AFSK	monopole	Alive Dead Alive Active Deorbited	
	BEESAT-1	35933	1U	STE BK-77B	436.000 MHz	Amateur ⁹	500 mW	CMX909B	Mobitex	4800/9600 baud GMSK	monopole	Alive	April 201
DOTTE COLL	UWE-2	35934	1U	Custom	437.385 MHz	Amateur	200 III VV	C11111000D	AX.25	1200 baud AFSK	dipole		April 2013
PSLV-C14/	ITUpSAT-1	35935	1U	Microhard MHX-425	437.325 MHz	Amateur	1 W	Integrated	Proprietary	19200 baud	dipole		April 2013
ISL01				BeeLine/CC1050	437.325 MHz	Amateur	350 mW		CW	,=00 ooud	monopole		1 2016
23 Sep 2009	SwissCube	35932	1U	Butler oscillator/RF5110G	437.505 MHz	Amateur	1 W	MSP430F1611	AX.25	1200 baud FSK	monopole	Active	April 2013
				RF2516 (beacon)	437.505 MHz	Amateur	100 mW	Integrated	CW	10 WPM	monopole		L
	Hayato	36573	1U	Custom	13.275 GHz	Earth exploration	100 mW	Integrated		10 kbps/1 Mbps BPSK	patch	Deorbited	April 2013
TT 0.1 THE	Waseda-SAT2	36574	1U	TXE430-301A	437.485 MHz	Amateur	150 mW	$H8/3052F^{3}$	AX.25	9600 baud FSK	monopole		April 2013
H-2A F17	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			TXE430-301A (beacon)	437.485 MHz	Amateur	100 mW	$H8/3052F^3$	CW	0000 0000	dipole	Deorbited	
20 May 2010	Negai-Star	36575	1U	Data	437.305 MHz	Amateur	150 mW		AX.25	1200 baud FSK	dipole		April 2013
				Beacon Radio	437.305 MHz	Amateur	100 mW		CW	50 WPM	dipole		
/	TIsat-1	36799	1U	Alinco DJ-C6	437.305 MHz	Amateur	500 mW	MSP430F169	AX.25	1200 baud AFSK	monopole	Active	April 2013
NLS-6/	11500	00.00	10	CC1010 (beacon)	437.305 MHz	Amateur	400 mW	MSP430F169	CW	15-110 WPM	monopole	1100110	119111 2010
PSLV-C15	StudSat	36796	1U	CC1020	437.505 MHz	Amateur	500 mW	$UC3A0512^{3}$	Custom AX.25	4800 baud FSK	monopole	Dead	April 2013
12 July 2010				MAX1472 (beacon)	$437.860~\mathrm{MHz}$	Amateur	10 mW	$UC3A0512^{3}$	CW	22 WPM	monopole		
	RAX-1	37223	3U	Lithium-1	437.505 MHz	Amateur	750 mW	Integrated	AX.25	9600 baud GMSK	turnstile	Dead	April 2013
	O/OREOS	37224	3U+	Microhard MHX-2400	2.4 GHz	Experimental	1 W	Integrated	Proprietary	Variable	patch		April 2013
STP-S26	O/ ORLEGS	01221	001	Stensat (beacon) ⁵	437.305 MHz	Amateur	500 mW	Integrated	AX.25	1200 baud AFSK	monopole	111110	11p111 2010
19 Nov 2010	NanoSail-D2 ¹⁰	37361	3U+	Microhard MHX-2400	2.4 GHz	Experimental	1 W	Integrated	Proprietary	Variable	patch	Deorbited	April 2013
				Stensat (beacon) ⁵	$437.270~\mathrm{MHz}$	Amateur	$500~\mathrm{mW}$	Integrated	AX.25	1200 baud AFSK	monopole		1
	Perseus (4)	37251+	1.5U	/		Government					dipole	Active Deorbited DOA Deorbited Deorbited Active Dead Alive Deorbited	April 2013
	QbX (2)	37249+	3U	TTC	450 MHz	Government	1 W			9600 baud GMSK	quadrafilar helix		April 2013
Falcon 9-002	SMDC-ONE	37246	3U	Pericle	UHF	Government	1 11			7000 Sada Girisii	turnstile	Deorbited	April 2013
8 Dec 2010	Mayflower	37252	3U	Microhard MHX-425	437.000 MHz		1 W	Integrated	Proprietary	Variable	dipole		April 2013
				Stensat (beacon) ⁵	$437.600~\mathrm{MHz}$	1	1 W	Integrated	AX.25	1200 baud AFSK			_
PSLV-C18	Jugnu	37839	3U	CC1070/RF5110G	437.505 MHz	Amateur	1 W		AX.25	2400 baud FSK	monopole	Alive	April 2013
12 Oct 2011	0 48.14	3.000		MAX1472 (beacon)	437.505 MHz	Amateur	10 mW		CW	20 WPM	monopole		11p111 2 010
	AubieSat-1	37854	1U	Melexis TH72011	437.475 MHz	Amateur	800 mW	ATmega1281 ³	CW	20 WPM	dipole	Alive	April 2013
ELaNa-3/	DICE (2)	37851+	1.5U	L3 Cadet	465 MHz	Meteorological	1 W	Integrated	Proprietary	2.6 Mbps OQPSK	dipole	Dead	Aug 2013
NPP	HRBE	37855	1U	CC1000	437.505 MHz	Amateur	850 mW	Integrated	AX.25	1200 baud FSK	monopole	Active	Aug 2013
28 Oct 2011	M-Cubed	37855	1U	Lithium-1	437.485 MHz	Amateur	1 W	Integrated	AX.25	1200 baud FSK	monopole	Alive	April 2013
	RAX-2	37853	3U	Lithium-1	437.345 MHz	Amateur	1 W	Integrated	AX.25	9600 baud GMSK	turnstile	Dead	Aug 2013
	Xatcobeo	38082	1U	GomSpace U482C	437.365 MHz	Amateur	500 mW	Integrated	AX.25/CW	1200 baud MSK/20 WPM		Active	Aug 2013
	ROBUSTA	90002	1U	MC12181/MAX2608	437.325 MHz	Amateur	800 mW				turnstile		April 2013
	e-st@r	38079	1U	BHX2-437-5	437.445 MHz			PIC18F4580 ³	AX.25	1200 Daiid AFSK	turnstile dipole		L Triblin Sarra
Vega VV01	Goliat					Amateur	500 mW	PIC18F4580 ³ PIC16	AX.25 AX.25	1200 baud AFSK 1200 baud AFSK	dipole		
4.4	1	38085	1U	Alinco DJ-C7	$437.485~\mathrm{MHz}$	Amateur Amateur	500 mW 500 mW					Dead	April 2013
13 Feb 2012			1U	Alinco DJ-C7 Microhard MHX-2420	437.485 MHz 2.4 GHz			PIC16	AX.25	1200 baud AFSK	dipole dipole	Dead Dead	April 2013
	PW-Sat	38085 38083	1U		2.4 GHz 145.900 MHz		500 mW 1 W 200 mW	PIC16 FX614/MSP430 Integrated Integrated	AX.25 AX.25/CW	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM	dipole dipole monopole	Dead Dead	April 2013 April 2013
	Masat-1	38085	1U 1U	Microhard MHX-2420 ISIS TRXUV Si4432	2.4 GHz 145.900 MHz 437.345 MHz	Amateur Amateur Amateur	500 mW 1 W 200 mW 100/400 mW	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F ³	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM	dipole dipole monopole patch dipole monopole	Dead Dead Dead Dead Active	April 2013 April 2013 April 2013 Aug 2013
		38085 38083	1U	Microhard MHX-2420 ISIS TRXUV	2.4 GHz 145.900 MHz	Amateur Amateur	500 mW 1 W 200 mW	PIC16 FX614/MSP430 Integrated Integrated	AX.25 AX.25/CW Proprietary AX.25/CW	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM	dipole dipole monopole patch dipole	Dead Dead Dead Dead Active Dead	April 2013 April 2013 April 2013 April 2013 April 2013
	Masat-1 UniCubeSat-GG SMDC-ONE (2)	38085 38083 38081 38766+	1U 1U 1U 1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF	Amateur Amateur Amateur Amateur Government	500 mW 1 W 200 mW 100/400 mW 500 mW	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F ³ Integrated	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK	dipole dipole monopole patch dipole monopole dipole turnstile	Dead Dead Dead Dead Active Dead	April 2013 April 2013 April 2013 April 2013 April 2013 April 2013
	Masat-1 UniCubeSat-GG	38085 38083 38081	1U 1U 1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz	Amateur Amateur Amateur Amateur Government Experimental	500 mW 1 W 200 mW 100/400 mW 500 mW	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F ³ Integrated Integrated	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud	dipole dipole monopole patch dipole monopole dipole turnstile patch	Dead Dead Dead Dead Active Dead	April 2013 April 2013 April 2013 April 2013 April 2013 April 2013
	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3)	38085 38083 38081 38766+ 38767+	1U 1U 1U 1U 1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz	Amateur Amateur Amateur Amateur Government Experimental Experimental	500 mW 1 W 200 mW 100/400 mW 500 mW 2 W 1.3 W	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F ³ Integrated Integrated Integrated	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK	dipole dipole monopole patch dipole monopole dipole turnstile patch patch	Dead Dead Dead Dead Active Dead Alive Active	April 2013 April 2013 April 2013 Aug 2013 April 2013 April 2013 April 2013
13 Feb 2012	Masat-1 UniCubeSat-GG SMDC-ONE (2)	38085 38083 38081 38766+	1U 1U 1U 1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz	Amateur Amateur Amateur Amateur Government Experimental Experimental Experimental	500 mW 1 W 200 mW 100/400 mW 500 mW 2 W 1.3 W 1 W	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated Integrated Integrated Integrated	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable	dipole dipole monopole patch dipole monopole dipole turnstile patch patch monopole	Dead Dead Dead Dead Active Dead Alive	April 2013 April 2013 April 2013 Aug 2013 April 2013 April 2013 April 2013
13 Feb 2012 ELaNa-6/NROL-36	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas	38085 38083 38081 38766+ 38767+ 38760	1U 1U 1U 1U 3U 1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz	Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 2 W 1.3 W 1 W 1 W	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated Integrated Integrated Integrated Integrated Integrated	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK	dipole dipole monopole patch dipole monopole dipole turnstile patch patch monopole monopole	Dead Dead Dead Dead Active Dead Alive Active	April 2013
13 Feb 2012	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE	38085 38083 38081 38766+ 38767+ 38760	1U 1U 1U 1U 3U 1U 3U 3U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.345 MHz	Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental	500 mW 1 W 200 mW 100/400 mW 500 mW 2 W 1.3 W 1 W 1 W 1 W	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK	dipole dipole monopole patch dipole monopole dipole turnstile patch patch monopole monopole monopole	Dead Dead Dead Dead Active Dead Alive Active Active	April 2013
13 Feb 2012 ELaNa-6/NROL-36	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5	38085 38083 38081 38766+ 38767+ 38760 38761 38763	1U 1U 1U 1U 3U 1U 3U 3U 1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.405 MHz	Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur Amateur Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 2 W 1.3 W 1 W 1 W 500 mW	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud FSK	dipole dipole monopole patch dipole monopole dipole turnstile patch patch monopole monopole dipole	Dead Dead Dead Dead Active Dead Alive Active Active Dead	April 2013
13 Feb 2012 ELaNa-6/NROL-36	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN	38085 38083 38081 38766+ 38767+ 38760 38761 38763 38762	3U 3U 3U 1U 2U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.345 MHz 437.405 MHz 437.525 MHz	Amateur Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur Amateur Amateur Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 2 W 1.3 W 1 W 1 W 500 mW 1 W	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 AX.25	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud FSK 9600 baud GFSK	dipole dipole monopole patch dipole monopole dipole turnstile patch patch monopole monopole dipole turnstile patch patch patch patch patch monopole monopole turnstile	Dead Dead Dead Dead Active Dead Alive Active Active Dead Active	April 2013
13 Feb 2012 ELaNa-6/NROL-36	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5	38085 38083 38081 38766+ 38767+ 38760 38761 38763	1U 1U 1U 1U 3U 1U 3U 3U 1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.405 MHz	Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur Amateur Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 2 W 1.3 W 1 W 1 W 500 mW	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud FSK	dipole dipole monopole patch dipole monopole dipole turnstile patch patch monopole monopole dipole	Dead Dead Dead Dead Active Dead Alive Active Active Dead	April 2013
13 Feb 2012 ELaNa-6/NROL-36	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re	38085 38083 38081 38766+ 38767+ 38760 38761 38763 38762 38764 38765	1U 1U 1U 1U 3U 1U 3U 1U 2U 3U 3U 3U 3U 3U 3U 3U 3U 3U 3U 3U 3U 3U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.405 MHz 437.525 MHz 2200 MHz 915 MHz	Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur Experimental Amateur Space Research Government	500 mW 1 W 200 mW 100/400 mW 500 mW 2 W 1.3 W 1 W 1 W 500 mW 1 W 1 W 1 W 1 W	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 AX.25 Proprietary	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud FSK 9600 baud GFSK 1 Mbps FSK 57.6 kbps FSK	dipole dipole monopole patch dipole monopole dipole turnstile patch monopole monopole monopole dipole turnstile patch dipole dipole turnstile dipole	Dead Dead Dead Dead Active Dead Alive Active Active Dead Active Doad Active Doad Active Doad	April 2013
13 Feb 2012 ELaNa-6/NROL-36	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA	38085 38083 38081 38766+ 38767+ 38760 38761 38763 38762 38764	3U 3U 3U 1U 2U 3U 3U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.345 MHz 437.405 MHz 2200 MHz 915 MHz 915 MHz	Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur Experimental Amateur Space Research Government Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 2 W 1.3 W 1 W 1 W 500 mW 1 W 1 W	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 AX.25 AX.25 AX.25 AX.25	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1 1200 baud FSK 9600 baud GFSK 1 Mbps FSK 57.6 kbps FSK	dipole dipole monopole patch dipole monopole dipole turnstile patch patch monopole monopole dipole turnstile patch patch patch dipole turnstile patch	Dead Dead Dead Dead Active Dead Alive Active Active Dead Active Active Active Active	April 2013
13 Feb 2012 ELaNa-6/NROL-36	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re	38085 38083 38081 38766+ 38767+ 38760 38761 38763 38762 38764 38765	1U 1U 1U 1U 3U 1U 3U 1U 2U 3U 3U 3U 3U 3U 3U 3U 3U 3U 3U 3U 3U 3U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data)	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.345 MHz 437.405 MHz 2200 MHz 915 MHz 915 MHz 2300 MHz 915 MHz	Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur Experimental Amateur Space Research Government	500 mW 1 W 200 mW 100/400 mW 500 mW 2 W 1.3 W 1 W 1 W 500 mW 1 W 1 W 2 W	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud FSK 9600 baud GFSK 1 Mbps FSK 57.6 kbps FSK	dipole dipole monopole patch dipole monopole dipole turnstile patch patch monopole monopole dipole turnstile patch patch patch monopole dipole turnstile patch dipole patch monopole	Dead Dead Dead Dead Active Dead Alive Active Active Dead Active Doad Active Doad Active Doad	April 2013
13 Feb 2012 ELaNa-6/NROL-36	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re FITSat-1	38085 38083 38081 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853	3U 1U 3U 3U 1U 2U 3U 3U 1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon)	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.405 MHz 437.525 MHz 2200 MHz 915 MHz 5.84 GHz 437.445 MHz 437.250 MHz	Amateur Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur Space Research Government Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 2 W 1.3 W 1 W 1 W 500 mW 1 W 1 W 2 W 1 W	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 AX.25 AX.25 CW	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1 Mbps FSK 57.6 kbps FSK 115.2 kbps FSK 1200 baud AFSK	dipole dipole monopole patch dipole monopole dipole turnstile patch patch monopole monopole dipole turnstile patch patch patch dipole turnstile patch	Dead Dead Dead Dead Dead Active Dead Alive Active Alive Active Dead Active Dead Active Dead Active Dead Active Dead Active Dead Active Doad Active Doad	April 2013
13 Feb 2012 ELaNa-6/NROL-36 13 Sep 2012	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re	38085 38083 38081 38766+ 38767+ 38760 38761 38763 38762 38764 38765	1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.405 MHz 437.525 MHz 2200 MHz 915 MHz 5.84 GHz 437.445 MHz 437.450 MHz 437.465 MHz	Amateur Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur Space Research Government Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 2 W 1.3 W 1 W 1 W 500 mW 1 W 1 W 2 W	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 Integrated	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 AX.25 AX.25 CW AX.25 CW	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1 Mbps FSK 57.6 kbps FSK 115.2 kbps FSK 1200 baud AFSK	dipole dipole monopole patch dipole monopole dipole turnstile patch monopole monopole dipole turnstile patch patch monopole dipole turnstile patch dipole turnstile patch dipole	Dead Dead Dead Dead Dead Active Dead Alive Active Active Dead Active Dead Active Dead Active Dead Active Dead Active Dead Active Doad Deorbited	April 2013 Aug 2013
13 Feb 2012 ELaNa-6/NROL-36	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re FITSat-1 TechEdSat-1 11	38085 38083 38081 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853	3U 1U 3U 3U 1U 2U 3U 3U 1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon)	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.405 MHz 437.525 MHz 2200 MHz 915 MHz 5.84 GHz 437.445 MHz 437.250 MHz	Amateur Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur Space Research Government Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 2 W 1.3 W 1 W 1 W 500 mW 1 W 1 W 2 W 1 W 1 W 1 W	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 AX.25 AX.25 CW	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1 Mbps FSK 57.6 kbps FSK 115.2 kbps FSK 1200 baud AFSK	dipole dipole monopole patch dipole monopole dipole turnstile patch patch monopole monopole dipole turnstile patch patch patch monopole dipole turnstile patch dipole patch monopole	Dead Dead Dead Dead Dead Active Dead Alive Active Alive Active Dead Active Dead Active Dead Active Dead Active Dead Active Dead Active Doad Active Doad	April 2013 Aug 2013
13 Feb 2012 ELaNa-6/NROL-36 13 Sep 2012 HTV-3/ISS	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re FITSat-1 TechEdSat-1 11	38085 38083 38081 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853	1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵ VX-3R	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.405 MHz 437.405 MHz 2200 MHz 915 MHz 5.84 GHz 437.445 MHz 437.450 MHz 437.450 MHz 437.450 MHz 437.450 MHz 437.450 MHz 437.450 MHz 437.465 MHz 437.465 MHz 437.485 MHz 437.505 MHz	Amateur Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 2 W 1.3 W 1 W 1 W 500 mW 1 W 1 W 2 W 1 W 1 W 1 W 1 W 1 W	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 Integrated PIC18F	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 AX.25 CW AX.25 CW AX.25 AX.25 FM PWM CW SSTV	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1 Mbps FSK 57.6 kbps FSK 115.2 kbps FSK 1200 baud AFSK	dipole dipole dipole monopole patch dipole monopole dipole turnstile patch monopole monopole dipole turnstile patch monopole dipole turnstile patch dipole turnstile patch dipole	Dead Dead Dead Dead Dead Active Dead Alive Active Active Dead Active Dead Active Dead Active Dead Active Dead Active Dead Active Doad Deorbited	April 2013 Aug 2013 Aug 2013 Aug 2013
13 Feb 2012 ELaNa-6/NROL-36 13 Sep 2012 HTV-3/ISS	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re FITSat-1 TechEdSat-1 11 F-1 WE-WISH	38085 38083 38081 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853 38854	3U 1U 3U 3U 1U 3U 3U 1U 1U 1U 1U 1U 1U 1U 1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵ VX-3R VX-3R	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.405 MHz 437.405 MHz 2200 MHz 915 MHz 5.84 GHz 437.445 MHz 437.450 MHz 437.465 MHz 437.465 MHz 437.465 MHz 437.485 MHz 437.505 MHz 437.505 MHz	Amateur Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 2 W 1.3 W 1 W 1 W 500 mW 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 Integrated PIC18F	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 Proprietary AX.25 CW AX.25 CW AX.25 AX.25 FM PWM CW	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1 Mbps FSK 57.6 kbps FSK 115.2 kbps FSK 1200 baud AFSK 1200 baud AFSK 1200 baud AFSK 1200 baud AFSK	dipole dipole dipole monopole patch dipole monopole dipole turnstile patch patch monopole monopole dipole turnstile patch monopole dipole turnstile patch dipole	Dead Dead Dead Dead Dead Active Dead Alive Active Alive Active Dead Active Dead Active Dead Active Dead Active Dead Active Doad Deorbited Deorbited	April 2013 Aug 2013 Aug 2013 Aug 2013
13 Feb 2012 ELaNa-6/NROL-36 13 Sep 2012 HTV-3/ISS	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re FITSat-1 TechEdSat-1 11 F-1	38085 38083 38081 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853 38854	3U 1U 3U 3U 1U 3U 3U 1U 1U 1U 1U 1U 1U 1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵ VX-3R VX-3R (data)	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.405 MHz 437.405 MHz 2200 MHz 915 MHz 5.84 GHz 437.445 MHz 437.450 MHz 437.450 MHz 437.450 MHz 437.450 MHz 437.450 MHz 437.450 MHz 437.465 MHz 437.465 MHz 437.485 MHz 437.505 MHz	Amateur Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 2 W 1.3 W 1 W 1 W 500 mW 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 Integrated PIC18F	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 AX.25 CW AX.25 CW AX.25 AX.25 FM PWM CW SSTV	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1 Mbps FSK 57.6 kbps FSK 115.2 kbps FSK 1200 baud AFSK 1200 baud AFSK 1200 baud AFSK 1200 baud AFSK	dipole dipole dipole monopole patch dipole monopole dipole turnstile patch monopole monopole dipole turnstile patch monopole dipole turnstile patch dipole dipole dipole dipole dipole monopole monopole monopole monopole monopole monopole	Dead Dead Dead Dead Dead Active Dead Alive Active Alive Active Dead Active Dead Active Dead Active Dead Active Dead Active Doad Deorbited Deorbited	April 2013 Aug 2013 Aug 2013 Aug 2013 Aug 2013
13 Feb 2012 ELaNa-6/NROL-36 13 Sep 2012 HTV-3/ISS	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re FITSat-1 TechEdSat-1 11 F-1 WE-WISH	38085 38083 38081 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853 38854 38855	3U 1U 3U 3U 1U 3U 3U 1U 1U 1U 1U 1U 1U 1U 1U 1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵ VX-3R VX-3R (data) (beacon)	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.405 MHz 437.405 MHz 2200 MHz 915 MHz 5.84 GHz 437.445 MHz 437.450 MHz 437.465 MHz 437.465 MHz 437.465 MHz 437.485 MHz 437.505 MHz 437.505 MHz	Amateur Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 2 W 1.3 W 1 W 1 W 500 mW 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 Integrated PIC18F	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 AX.25 CW AX.25 CW AX.25 AX.25 FM PWM CW SSTV	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1 Mbps FSK 57.6 kbps FSK 115.2 kbps FSK 1200 baud AFSK 1200 baud AFSK 1200 baud AFSK 1200 baud AFSK	dipole dipole dipole monopole patch dipole monopole dipole turnstile patch monopole monopole dipole turnstile patch monopole dipole turnstile patch dipole turnstile patch dipole dipole monopole monopole monopole monopole monopole monopole	Dead Dead Dead Dead Dead Active Dead Alive Active Alive Active Dead Active Dead Active Dead Active Dead Active Dead Active Doad Deorbited Deorbited Deorbited	April 201: April 201: April 201: Aug 2013 April 201: Aug 2013 Aug 2013 Aug 2013 Aug 2013
13 Feb 2012 ELaNa-6/NROL-36 13 Sep 2012 HTV-3/ISS 4 Oct 2012	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re FITSat-1 TechEdSat-1 11 F-1 WE-WISH RAIKO	38085 38083 38081 38766+ 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853 38854 38855	3U 3	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵ VX-3R VX-3R (data) (beacon) Custom Custom	2.4 GHz 145.900 MHz 437.345 MHz 437.345 MHz 437.305 MHz 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.405 MHz 437.45 MHz 2200 MHz 915 MHz 2200 MHz 915 MHz 437.45 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz	Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur Amateur Space Research Government Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 1.3 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 PIC16F1519 Integrated PIC18F PIC16F	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 AX.25 CW AX.25 CW AX.25 FM PWM CW SSTV CW	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud FSK 9600 baud GFSK 1100 baud FSK 1 Mbps FSK 57.6 kbps FSK 1200 baud AFSK	dipole dipole monopole patch dipole monopole dipole turnstile patch monopole monopole dipole turnstile patch monopole dipole turnstile patch dipole turnstile patch dipole dipole patch monopole monopole monopole monopole dipole patch monopole monopole	Dead Dead Dead Dead Dead Active Dead Alive Active Active Dead Active Dead Active Dead Active Dead Active Dead Active Dead Active DoA Deorbited Deorbited Deorbited	April 201: April 201: April 201: April 201: Aug 2013 April 201: Aug 2013 Aug 2013 Aug 2013 Aug 2013
13 Feb 2012 ELaNa-6/NROL-36 13 Sep 2012 HTV-3/ISS 4 Oct 2012	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re FITSat-1 TechEdSat-1 11 F-1 WE-WISH RAIKO STRaND-1 AAUSAT3	38085 38083 38081 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853 38854 38855 38856 38856 388769 38859 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769	1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵ VX-3R VX-3R VX-3R (data) (beacon) Custom	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.600 MHz 437.405 MHz 437.405 MHz 2200 MHz 915 MHz 5.84 GHz 437.45 MHz 145.980 MHz 437.465 MHz 145.980 MHz 437.485 MHz 437.505 MHz	Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 13 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 PIC16F1519 Integrated PIC18F PIC16F	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 Proprietary AX.25 CW AX.25 CW AX.25 AX.25 CW AX.25 AX.25 AX.25 CW AX.25 AX.25 AX.25 CW AX.25 AX.25 AX.25 AX.25 CW AX.25 AX.25 AX.25 AX.25 CW AX.25 A	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1 Mbps FSK 57.6 kbps FSK 1200 baud AFSK	dipole dipole monopole patch dipole monopole dipole turnstile patch monopole monopole dipole turnstile patch patch monopole dipole turnstile patch dipole dipole turnstile patch monopole monopole monopole monopole monopole tipole dipole monopole monopole turnstile patch monopole turnstile turnstile turnstile turnstile	Dead Dead Dead Dead Dead Active Dead Alive Active Alive Active Dead Active Dead Active Dead Active Dead Active Doad Active Active Doad Active Active Active Doad Active	April 201: April 201: April 201: April 201: Aug 2013 April 201: Aug 2013
13 Feb 2012 ELaNa-6/NROL-36 13 Sep 2012 HTV-3/ISS 4 Oct 2012	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re FITSat-1 TechEdSat-1 11 F-1 WE-WISH RAIKO STRAND-1	38085 38083 38081 38766+ 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853 38854 38855 38856 38856	3U 3U 1U 2U 1U 1U 1U 1U 1U 1U 3U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵ VX-3R VX-3R VX-3R (data) (beacon) Custom Custom Custom Custom Custom Custom Chacon	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.645 MHz 2200 MHz 915 MHz 215 MHz 2200 MHz 215 MHz 216 MHz 217.445 MHz 437.450 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz	Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur Amateur Space Research Government Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 13 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 PIC16F1519 Integrated PIC18F PIC16F	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 Proprietary AX.25 CW AX.25 CW AX.25 AX.25 FM PWM CW SSTV CW HDLC CCSDS/CW AX.25	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1200 baud GFSK 1 Mbps FSK 57.6 kbps FSK 115.2 kbps FSK 1200 baud AFSK 1200 baud AFSK 20 WPM 30 kbps SSTV	dipole dipole monopole patch dipole monopole dipole turnstile patch monopole monopole dipole turnstile patch monopole dipole turnstile patch dipole turnstile patch monopole monopole monopole monopole monopole dipole turnstile patch monopole monopole dipole dipole dipole dipole turnstile dipole dipole monopole monopole monopole dipole dipole dipole dipole dipole	Dead Dead Dead Dead Dead Active Dead Alive Active Active Dead Active Dead Active Dead Active Dead Active Dead Active Dead Active Active DoA Deorbited Deorbited Deorbited Deorbited Active	April 2013 Aug 2013
13 Feb 2012 ELaNa-6/NROL-36 13 Sep 2012 HTV-3/ISS 4 Oct 2012 PSLV-C20 25 Feb 2013	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re FITSat-1 TechEdSat-1 11 F-1 WE-WISH RAIKO STRaND-1 AAUSAT3 OSSI-1	38085 38083 38081 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853 38854 38855 38856 38857 38858 38858 38858 38858 38858 38858 38858 38858 38858 38858 38858 38858	1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵ VX-3R VX-3R VX-3R (data) (beacon) Custom	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.600 MHz 437.405 MHz 2200 MHz 215 MHz 215 MHz 2200 MHz 215 MHz 216 MHz 37.445 MHz 437.450 MHz 437.505 MHz	Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur Amateur Space Research Government Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 1 W 1.3 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 PIC16F1519 Integrated PIC18F PIC16F	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 AX.25 CW AX.25 CW AX.25 FM PWM CW SSTV CW HDLC CCSDS/CW AX.25 CW AX.25 CCW CCSDS/CW AX.25 CW	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1200 baud GFSK 115.2 kbps FSK 15.2 kbps FSK 1200 baud AFSK	dipole dipole monopole patch dipole monopole dipole turnstile patch monopole monopole dipole turnstile patch patch monopole dipole turnstile patch dipole dipole turnstile patch monopole monopole monopole monopole monopole tipole dipole monopole monopole turnstile patch monopole turnstile turnstile turnstile turnstile	Dead Dead Dead Dead Dead Active Dead Alive Active Alive Active Dead Active Dead Active Dead Active Dead Active Doad Active Active Doad Active Active Active Doad Active	April 201 Aug 2013 Aug 2013 Aug 2013 Aug 2013 Aug 2013 Aug 2013
13 Feb 2012 ELaNa-6/NROL-36 13 Sep 2012 HTV-3/ISS 4 Oct 2012 PSLV-C20 25 Feb 2013 Bion-M1/Soyuz/	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re FITSat-1 TechEdSat-1 11 F-1 WE-WISH RAIKO STRaND-1 AAUSAT3	38085 38083 38081 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853 38854 38855 38856 38856 388769 38859 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769 388769	1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵ VX-3R VX-3R VX-3R (data) (beacon) Custom Custom Custom Custom Custom Custom Chacon	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.645 MHz 2200 MHz 915 MHz 215 MHz 2200 MHz 215 MHz 216 MHz 217.445 MHz 437.450 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz	Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur Amateur Space Research Government Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 13 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 PIC16F1519 Integrated PIC18F PIC16F	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 Proprietary AX.25 CW AX.25 CW AX.25 AX.25 FM PWM CW SSTV CW HDLC CCSDS/CW AX.25	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1200 baud GFSK 1 Mbps FSK 57.6 kbps FSK 115.2 kbps FSK 1200 baud AFSK 1200 baud AFSK 20 WPM 30 kbps SSTV	dipole dipole monopole patch dipole monopole dipole turnstile patch monopole monopole dipole turnstile patch monopole dipole turnstile patch dipole turnstile patch monopole monopole monopole monopole dipole turnstile patch monopole monopole dipole dipole dipole dipole turnstile dipole monopole monopole monopole monopole patch monopole monopole	Dead Dead Dead Dead Dead Active Dead Alive Active Alive Active Dead Active Dead Active Dead Active Dead Active Active Doad Active Active Active Doad Active Active Active Doad Active Active Doad Deorbited Deorbited Deorbited Deorbited Deorbited Deorbited	April 201 Aug 2013 Aug 2013 Aug 2013 Aug 2013 Aug 2013 Aug 2013
13 Feb 2012 ELaNa-6/NROL-36 13 Sep 2012 HTV-3/ISS 4 Oct 2012 PSLV-C20 25 Feb 2013 Bion-M1/Soyuz/ ISL02	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re FITSat-1 TechEdSat-1 11 F-1 WE-WISH RAIKO STRaND-1 AAUSAT3 OSSI-1	38085 38083 38081 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853 38854 38855 38856 38857 38858 38858 38858 38858 38858 38858 38858 38858 38858 38858 38858 38858	1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵ VX-3R VX-3R VX-3R (data) (beacon) Custom Custom SSC/SSTL ADF7021/AWT6388 ADF7021 ADF7021 (beacon)	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.405 MHz 437.405 MHz 2200 MHz 915 MHz 2200 MHz 915 MHz 437.445 MHz 437.450 MHz 437.505 MHz	Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur Amateur Space Research Government Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 13 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 PIC16F1519 Integrated PIC18F PIC16F	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 AX.25 Proprietary AX.25 CW AX.25 FM PWM CW SSTV CW HDLC CCSDS/CW AX.25 CW Custom	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1 Mbps FSK 57.6 kbps FSK 1200 baud AFSK	dipole dipole monopole patch dipole monopole dipole turnstile patch patch monopole monopole dipole turnstile patch patch monopole dipole turnstile patch dipole turnstile patch monopole monopole dipole turnstile patch dipole turnstile patch monopole dipole turnstile turnstile turnstile turnstile turnstile turnstile	Dead Dead Dead Dead Dead Active Dead Alive Active Alive Active Dead Active Dead Active Dead Active Dead Active Active Doad Active Active Active Doad Active Active Active Doad Active Active Doad Deorbited Deorbited Deorbited Deorbited Deorbited Deorbited	April 201 Aug 2013
13 Feb 2012 ELaNa-6/NROL-36 13 Sep 2012 HTV-3/ISS 4 Oct 2012 PSLV-C20 25 Feb 2013 Bion-M1/Soyuz/	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re FITSat-1 TechEdSat-1 11 F-1 WE-WISH RAIKO STRaND-1 AAUSAT3 OSSI-1 SOMP	38085 38083 38081 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853 38854 38855 38856 38857 38858	1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵ VX-3R VX-3R VX-3R (data) (beacon) Custom Custom SSC/SSTL ADF7021/AWT6388 ADF7021 ADF7021 (beacon) Si4420	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.405 MHz 437.405 MHz 2200 MHz 915 MHz 2200 MHz 915 MHz 437.445 MHz 437.450 MHz 437.450 MHz 437.450 MHz 437.465 MHz 145.980 MHz 437.505 MHz 437.425 MHz 437.485 MHz	Amateur Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 500 mW 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 PIC16F1519 Integrated PIC18F PIC16F	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 AX.25 CW AX.25 AX.25 FM PWM CW SSTV CW HDLC CCSDS/CW AX.25 CW Custom CW/AX.25	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1400 baud GFSK 15.2 kbps FSK 15.2 kbps FSK 1200 baud AFSK	dipole dipole monopole patch dipole monopole dipole turnstile patch patch monopole monopole dipole turnstile patch dipole turnstile patch dipole turnstile patch monopole monopole monopole monopole dipole turnstile patch monopole dipole turnstile patch monopole dipole dipole dipole dipole monopole turnstile turnstile turnstile turnstile turnstile	Dead Dead Dead Dead Dead Active Dead Alive Active Alive Active Dead Active Dead Active Dead Active Dead Active Doad Active Active Doad Active Active Doad Active Active Doad Deorbited	April 2013 Aug 2013
13 Feb 2012 ELaNa-6/NROL-36 13 Sep 2012 HTV-3/ISS 4 Oct 2012 PSLV-C20 25 Feb 2013 Bion-M1/Soyuz/ ISL02	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re FITSat-1 TechEdSat-1 11 F-1 WE-WISH RAIKO STRaND-1 AAUSAT3 OSSI-1 SOMP BEESAT-2	38085 38083 38081 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853 38854 38855 38856 38852 39090 39087 39131 39135	1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵ VX-3R VX-3R VX-3R (data) (beacon) Custom Custom SSC/SSTL ADF7021/AWT6388 ADF7021 ADF7021 (beacon) Si4420 STE BK-77B	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 437.000 MHz 437.600 MHz 437.600 MHz 437.405 MHz 2200 MHz 915 MHz 2200 MHz 915 MHz 37.425 MHz 437.45 MHz 437.465 MHz 437.505 MHz 437.425 MHz 437.485 MHz 437.485 MHz 437.485 MHz 437.485 MHz	Amateur Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 500 mW 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 PIC16F1519 Integrated PIC18F PIC16F PIC16F	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 AX.25 AX.25 Froprietary AX.25 CW AX.25 AX.25 CW AX.25 CW AX.25 AX.25 FM PWM CW SSTV CW HDLC CCSDS/CW AX.25 CW Custom CW/AX.25 Mobitex	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1200 baud GFSK 1 Mbps FSK 57.6 kbps FSK 15.2 kbps FSK 1200 baud AFSK	dipole dipole monopole patch dipole monopole dipole turnstile patch patch monopole monopole dipole turnstile patch patch monopole dipole turnstile patch dipole turnstile patch monopole monopole dipole turnstile patch dipole turnstile patch monopole dipole turnstile turnstile turnstile turnstile turnstile turnstile	Dead Dead Dead Dead Dead Dead Active Dead Alive Active Active Dead Active Dead Active Dead Active Dead Active Doad Active Active Doad Active Active Doad Active Active Doad Deorbited Deorbited Deorbited Deorbited Active Active Active Active Active Active Dead Active Active Active Active Active Active	April 2013 Aug 2013
13 Feb 2012 ELaNa-6/NROL-36 13 Sep 2012 HTV-3/ISS 4 Oct 2012 PSLV-C20 25 Feb 2013 Bion-M1/Soyuz/ ISL02	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re FITSat-1 TechEdSat-1 II F-1 WE-WISH RAIKO STRaND-1 AAUSAT3 OSSI-1 SOMP BEESAT-2 BEESAT-3	38085 38083 38081 38766+ 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853 38854 38855 38856 38852 39090 39087 39131 39135	1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵ VX-3R VX-3R (data) (beacon) Custom Custom Custom Custom Stensat (beacon) Stensat (beacon) Stensat (beacon) Stensat (beacon) Stensat (beacon) Custom Custom Si4420 STE BK-77B STE BK-77B	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz UHF 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.600 MHz 437.405 MHz 2200 MHz 915 MHz 2200 MHz 915 MHz 37.425 MHz 437.45 MHz 437.45 MHz 437.45 MHz 437.45 MHz 437.45 MHz 437.45 MHz 437.465 MHz 437.465 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.525 MHz 437.425 MHz 437.425 MHz 437.425 MHz 437.425 MHz 437.425 MHz 437.425 MHz 437.485 MHz 437.485 MHz 437.485 MHz 437.485 MHz 437.485 MHz 437.485 MHz 435.950 MHz 435.950 MHz	Amateur Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 500 mW 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 PIC16F1519 Integrated PIC18F PIC16F PIC16F	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 AX.25 AX.25 Froprietary AX.25 CW AX.25 AX.25 CW AX.25 CW AX.25 AX.25 FM PWM CW SSTV CW HDLC CCSDS/CW AX.25 CW Custom CW/AX.25 Mobitex	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1200 baud GFSK 1 Mbps FSK 57.6 kbps FSK 1200 baud AFSK	dipole dipole monopole patch dipole monopole dipole turnstile patch patch monopole monopole dipole turnstile patch dipole turnstile patch dipole turnstile patch monopole monopole monopole dipole turnstile patch dipole turnstile patch monopole dipole turnstile turnstile turnstile turnstile turnstile monopole monopole monopole monopole turnstile turnstile turnstile monopole monopole	Dead Dead Dead Dead Dead Dead Active Dead Alive Active Active Dead Active Dead Active Dead Active Dead Active Doad Active Doad Active Active Doad Active Active Doad Active Doad Deorbited Deorbited Deorbited Deorbited Active	April 201: April 201: April 201: April 201: Aug 2013 April 201: Aug 2013
13 Feb 2012 ELaNa-6/NROL-36 13 Sep 2012 HTV-3/ISS 4 Oct 2012 PSLV-C20 25 Feb 2013 Bion-M1/Soyuz/ ISL02	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re FITSat-1 TechEdSat-1 11 F-1 WE-WISH RAIKO STRAND-1 AAUSAT3 OSSI-1 SOMP BEESAT-2 BEESAT-3 Dove-2	38085 38083 38081 38766+ 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853 38854 38855 38856 38852 39090 39087 39131 39135 39136 39134 39132	1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵ VX-3R VX-3R VX-3R (data) (beacon) Custom Custom SSC/SSTL ADF7021/AWT6388 ADF7021 ADF7021 (beacon) Si4420 STE BK-77B Custom UHF MHX-2420 STE	2.4 GHz 145.900 MHz 437.345 MHz 437.345 MHz 915 MHz 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.600 MHz 437.455 MHz 2200 MHz 915 MHz 2200 MHz 915 MHz 37.455 MHz 2200 MHz 915 MHz 437.455 MHz 437.455 MHz 437.455 MHz 437.455 MHz 437.455 MHz 437.465 MHz 437.455 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.455 MHz 437.485 MHz 437.485 MHz 437.485 MHz 437.485 MHz 437.485 MHz 435.950 MHz 435.950 MHz 401.3 MHz 2.4 GHz	Amateur Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 100/400 mW 500 mW 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 2 W 10 mW 1 W 200 mW 1 W 200 mW 1 W 1 W 100 mW 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 PIC16F1519 Integrated PIC18F PIC16F PIC16F	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 AX.25 Proprietary AX.25 CW AX.25 FM PWM CW SSTV CW HDLC CCSDS/CW AX.25 CW Custom CW/AX.25 Mobitex Mobitex	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1200 baud GFSK 1200 baud FSK 9600 baud GFSK 1 Mbps FSK 57.6 kbps FSK 1200 baud AFSK 20 WPM 30 kbps SSTV 9600 baud FSK 2400 bps/30 WPM 9600 baud FSK 12 WPM 12 WPM 12 WPM 12 WPM 12 WPM/1200 baud FSK 4800 bps GMSK 4800 bps GMSK 4800 bps GMSK 2.4 kbps FSK variable	dipole dipole monopole patch dipole monopole dipole turnstile patch monopole monopole dipole turnstile patch monopole dipole turnstile patch dipole turnstile patch monopole monopole dipole turnstile patch monopole tipole dipole dipole turnstile turnstile monopole monopole turnstile dipole monopole turnstile dipole monopole turnstile dipole monopole turnstile turnstile monopole monopole patch	Dead Dead Dead Dead Dead Dead Active Dead Alive Active Active Dead Active Dead Active Dead Active Active Dead Active Active DoA Deorbited Deorbited Deorbited Deorbited Active Active Active Active Active Dead Active	April 2013 Aug 2013
13 Feb 2012 ELaNa-6/NROL-36 13 Sep 2012 HTV-3/ISS 4 Oct 2012 PSLV-C20 25 Feb 2013 Bion-M1/Soyuz/ ISL02	Masat-1	38085 38083 38081 38766+ 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853 38854 38855 38856 38856 39090 39087 39131 39135 39136 39134 39132	1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵ VX-3R VX-3R (data) (beacon) Custom Custom SSC/SSTL ADF7021/AWT6388 ADF7021 ADF7021 (beacon) Si4420 STE BK-77B STE BK-77B Custom UHF MHX-2420 Stensat (beacon) ⁵ Custom UHF MHX-2420 Custom UHF C	2.4 GHz 145.900 MHz 437.345 MHz 437.345 MHz 915 MHz 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.600 MHz 437.455 MHz 200 MHz 200 MHz 915 MHz 2100 MHz 37.455 MHz 2200 MHz 915 MHz 200 MHz 915 MHz 37.455 MHz 437.455 MHz 437.455 MHz 437.455 MHz 437.465 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.455 MHz 437.555 MHz 437.455 MHz 437.455 MHz 437.455 MHz 437.455 MHz 437.485 MHz 437.485 MHz 435.950 MHz 435.950 MHz 401.3 MHz 2.4 GHz 437.425 MHz	Amateur Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 100/400 mW 500 mW 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 2 W 10 mW 1 W 200 mW 1 W 200 mW 1 W 1 W 1 W 200 mW 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 Integrated PIC18F PIC16F PIC16F PIC18F PIC16F Integrated PIC18F PIC16F PIC16F Integrated PIC18F PIC16F Integrated PIC18F PIC16F Integrated PIC18F PIC16F Integrated Integrated Integrated	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 Proprietary AX.25 CW AX.25 CW AX.25 AX.25 CW AX.25 AX.25 FM PWM CW SSTV CW CUSTOM CUSTOM CUSTOM CUSTOM CUSTOM CW/AX.25 Mobitex Mobitex Proprietary AX.25	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud FSK 9600 baud GFSK 1200 baud FSK 1200 baud AFSK 15.2 kbps FSK 1200 baud AFSK	dipole dipole monopole patch dipole monopole dipole turnstile patch monopole monopole dipole turnstile patch monopole dipole turnstile patch dipole dipole turnstile patch monopole monopole dipole turnstile patch monopole dipole turnstile patch monopole turnstile monopole monopole turnstile dipole turnstile turnstile monopole turnstile dipole monopole turnstile turnstile monopole	Dead Dead Dead Dead Dead Dead Active Dead Alive Active Active Dead Active Dead Active Dead Active Dead Active Dead Active Active DoA Deorbited Deorbited Deorbited Active Active Active Deorbited	April 2013 Aug 2013
13 Feb 2012 ELaNa-6/NROL-36 13 Sep 2012 HTV-3/ISS 4 Oct 2012 PSLV-C20 25 Feb 2013 Bion-M1/Soyuz/ ISL02	Masat-1 UniCubeSat-GG SMDC-ONE (2) AeroCube-4 (3) Aeneas CSSWE CP5 CXBN CINEMA Re FITSat-1 TechEdSat-1 11 F-1 WE-WISH RAIKO STRAND-1 AAUSAT3 OSSI-1 SOMP BEESAT-2 BEESAT-3 Dove-2	38085 38083 38081 38766+ 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853 38854 38855 38856 38852 39090 39087 39131 39135 39136 39134 39132	1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵ VX-3R VX-3R VX-3R (data) (beacon) Custom Custom SSC/SSTL ADF7021/AWT6388 ADF7021 ADF7021 (beacon) Si4420 STE BK-77B Custom UHF MHX-2420 STE	2.4 GHz 145.900 MHz 437.345 MHz 437.345 MHz 915 MHz 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.600 MHz 437.455 MHz 2200 MHz 915 MHz 2200 MHz 915 MHz 37.455 MHz 2200 MHz 915 MHz 437.455 MHz 437.455 MHz 437.455 MHz 437.455 MHz 437.455 MHz 437.465 MHz 437.455 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.455 MHz 437.485 MHz 437.485 MHz 437.485 MHz 437.485 MHz 437.485 MHz 435.950 MHz 435.950 MHz 401.3 MHz 2.4 GHz	Amateur Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur Amateur Space Research Government Amateur Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 100/400 mW 500 mW 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 2 W 10 mW 1 W 200 mW 1 W 200 mW 1 W 1 W 100 mW 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 Integrated PIC18F PIC16F PIC16F PIC24 AT90CAN128 CMX909B CMX909B Integrated	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 Proprietary AX.25 CW AX.25 AX.25 FM PWM CW SSTV CW HDLC CCSDS/CW AX.25 CW Custom CW/AX.25 Mobitex Mobitex Proprietary AX.25 AX.25 AX.25	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1200 baud GFSK 1200 baud FSK 9600 baud GFSK 1 Mbps FSK 57.6 kbps FSK 1200 baud AFSK 20 WPM 30 kbps SSTV 9600 baud FSK 2400 bps/30 WPM 9600 baud FSK 12 WPM 12 WPM 12 WPM 12 WPM 12 WPM/1200 baud FSK 4800 bps GMSK 4800 bps GMSK 4800 bps GMSK 2.4 kbps FSK variable	dipole dipole monopole patch dipole monopole dipole turnstile patch monopole monopole dipole turnstile patch monopole dipole turnstile patch dipole turnstile patch monopole monopole dipole turnstile patch monopole tipole dipole dipole turnstile turnstile monopole monopole turnstile dipole monopole turnstile dipole monopole turnstile dipole monopole turnstile turnstile monopole monopole patch	Dead Dead Dead Dead Dead Dead Active Dead Alive Active Active Dead Active Dead Active Dead Active Active Dead Active Active DoA Deorbited Deorbited Deorbited Deorbited Active Active Active Active Active Dead Active	April 2013 Aug 2013
ELaNa-6/NROL-36 13 Sep 2012 HTV-3/ISS 4 Oct 2012 PSLV-C20 25 Feb 2013 Bion-M1/Soyuz/ ISL02 19 April 2013	Masat-1	38085 38083 38081 38766+ 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853 38854 38855 38856 38856 39090 39087 39131 39135 39136 39134 39132	1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵ VX-3R VX-3R (data) (beacon) Custom STensat (beacon) Custom Custom Custom Custom STENSTE ADF7021 ADF7021 ADF7021 ADF7021 (beacon) Si4420 STE BK-77B Custom UHF MHX-2420 Stensat (beacon) ⁵ Stens	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.600 MHz 437.45 MHz 2200 MHz 915 MHz 2200 MHz 915 MHz 2200 MHz 915 MHz 437.45 MHz 437.45 MHz 437.45 MHz 437.45 MHz 437.45 MHz 437.45 MHz 437.465 MHz 437.485 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.45 MHz 437.485 MHz 437.485 MHz 437.485 MHz 435.950 MHz 435.950 MHz 435.950 MHz 401.3 MHz 2.4 GHz 437.425 MHz 437.425 MHz	Amateur Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur Amateur Space Research Government Amateur	500 mW 1 W 200 mW 100/400 mW 500 mW 13 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 Integrated PIC18F PIC16F PIC16F PIC24 AT90CAN128 CMX909B CMX909B Integrated Integrated Integrated Integrated Integrated	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 Proprietary AX.25 CW AX.25 CW AX.25 AX.25 CW AX.25 AX.25 FM PWM CW SSTV CW CUSTOM CUSTOM CUSTOM CUSTOM CUSTOM CW/AX.25 Mobitex Mobitex Proprietary AX.25	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1200 baud GFSK 1200 baud GFSK 1200 baud AFSK 15.2 kbps FSK 1200 baud AFSK 20 WPM 30 kbps SSTV 9600 baud FSK 12 WPM 23 kbps BPSK 12 WPM/1200 baud FSK 4800 bps GMSK 4800 bps GMSK 4800 bps GMSK 2.4 kbps FSK variable 1200 baud FSK	dipole dipole monopole patch dipole monopole dipole turnstile patch monopole monopole dipole turnstile patch patch dipole turnstile patch dipole dipole turnstile patch monopole monopole monopole dipole turnstile patch monopole dipole turnstile patch monopole monopole monopole monopole turnstile dipole turnstile turnstile dipole monopole turnstile turnstile monopole turnstile monopole	Dead Dead Dead Dead Dead Dead Active Dead Alive Active Active Dead Active Dead Active Dead Active Dead Active Dead Active Active DoA Deorbited Deorbited Deorbited Active Active Active Deorbited	April 2013 Aug 2013
13 Feb 2012 ELaNa-6/NROL-36 13 Sep 2012 HTV-3/ISS 4 Oct 2012 PSLV-C20 25 Feb 2013 Bion-M1/Soyuz/ ISL02 19 April 2013 Antares Demo	Masat-1	38085 38083 38081 38766+ 38766+ 38767+ 38760 38761 38763 38762 38764 38765 38853 38854 38855 38856 38856 39131 39135 39136 39134 39132	1U	Microhard MHX-2420 ISIS TRXUV Si4432 AstroDev Custom Pericle FreeWave MM2 CC1101 MHX-425 Stensat (beacon) ⁵ Lithium-1 CC1000/RF2117 Lithium-1 Emhiser Helium-100 High-speed Custom Custom (data) Custom (beacon) Stensat (beacon) ⁵ VX-3R VX-3R (VX-3R VX-3R (data) (beacon) Custom Custom SSC/SSTL ADF7021/AWT6388 ADF7021 ADF7021 (beacon) Si4420 STE BK-77B STE BK-77B Custom UHF MHX-2420 Stensat (beacon) ⁵ Stensat (beacon) ⁵ Stensat (beacon) ⁵ Iridium Q9602 Iridium Q9602	2.4 GHz 145.900 MHz 437.345 MHz 437.305 MHz 915 MHz 915 MHz 437.000 MHz 437.600 MHz 437.600 MHz 437.45 MHz 2200 MHz 915 MHz 2200 MHz 915 MHz 2200 MHz 915 MHz 37.45 MHz 437.45 MHz 437.45 MHz 437.45 MHz 437.45 MHz 437.465 MHz 437.485 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.505 MHz 437.45 MHz 437.485 MHz 437.425 MHz 437.425 MHz 437.425 MHz	Amateur Amateur Amateur Amateur Amateur Government Experimental Experimental Amateur Experimental Amateur Amateur Space Research Government Amateur Experimental Experimental Experimental	500 mW 1 W 200 mW 100/400 mW 500 mW 1 W 1.3 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 2 W 10 mW 1 W 200 mW 1 W 200 mW 1 W 1 W 1 W 200 mW 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1 W 1	PIC16 FX614/MSP430 Integrated Integrated dsPIC33F³ Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated Integrated PIC18LF6720 Integrated FPGA Integrated PIC16F886 PIC16F1519 PIC16F1519 PIC16F156F PIC16F PIC16F PIC24 AT90CAN128 CMX909B CMX909B Integrated Integrated Integrated Integrated Integrated Integrated Integrated	AX.25 AX.25/CW Proprietary AX.25/CW Custom/CW AX.25/CW Proprietary Proprietary Proprietary AX.25 AX.25 AX.25 AX.25 Proprietary AX.25 CW AX.25 AX.25 FM PWM CW SSTV CW HDLC CCSDS/CW AX.25 CW Custom CW/AX.25 Mobitex Mobitex Proprietary AX.25 AX.25 Proprietary	1200 baud AFSK 1200 baud AFSK/20 WPM Variable 1200 baud BPSK/12 WPM GFSK/120 CPM 9600 baud GFSK 38.4 kbaud 500 kbps FSK Variable 1200 baud FSK 9600 baud GFSK 1200 baud GFSK 1200 baud GFSK 1200 baud GFSK 1200 baud AFSK 20 WPM 30 kbps SSTV 9600 baud FSK 12 WPM 23 kbps BPSK 12 WPM/1200 baud FSK 4800 bps GMSK 4800 bps GMSK 4800 bps GMSK 2.4 kbps FSK variable 1200 baud FSK 1200 baud FSK 340 byte packet	dipole dipole monopole patch dipole monopole dipole turnstile patch monopole monopole dipole turnstile patch patch monopole dipole turnstile patch dipole dipole turnstile patch monopole monopole dipole turnstile patch monopole dipole turnstile patch monopole monopole monopole monopole turnstile turnstile dipole monopole turnstile turnstile monopole turnstile turnstile monopole monopole patch monopole monopole monopole patch monopole patch monopole patch	Dead Dead Dead Dead Dead Active Dead Alive Active Active Dead Active Dead Active Dead Active Dead Active DoA Deorbited Deorbited Deorbited Active Active Deorbited	April 2013 Aug 2013

¹ Used a modified Pacsat protocol on top of AX.25. Source code available upon request. ² This object separated from SSETI Express months later and is presumed to be NCube-2.

³ This is also the main satellite processor.

 $^{^4}$ The radio module accepts serial data and uses an internal TNC.

⁵ This beacon is based on a Atmel ATA8402.

⁶ No uplink commands received by spacecraft.

⁷ The CAPE1 team knew the receiver was dead before integration but had no time to fix it.

 $^{^{8}}$ One identical radio per satellite section, so three total radios onboard.

⁹ This satellite was not coordinated through the IARU.

 $^{^{10}\,\}mathrm{NanoSail\text{-}D2}$ was deployed from a P-POD inside FASTS at, a 180kg microsatellite.

¹¹ These satellites did not have command receivers.

Version 17; Page 2 of 6. This chart shows the 757 total CubeSats deployed in orbit so far, for a total of 1937 Units. November 23, 2018.

Bryan Klofas. bklofas@gmail.com. Green are University or Educational CubeSats; Red are Commercial or Private; Blue are Government CubeSats, either US or non-US.

Deployment	Satellite	Object		Radio	Downlink	Satellite Service	Power	TNC	Protocol	Data Rate/Modulation	Antenna	Status	Upd
Long March-2D/ Gaofen 1/	TurkSat-3USat	39152	3U	Custom Transponder BeeLine/Astrodev?	435.225 MHz 437.225 MHz	Amateur Amateur	1 W	N/A Integrated	N/A CW/AX.25	50 kHz 9600 baud FSK	monopole monopole	Dead	Aug
ISIL04 26 April 2013	CubeBug-1 NEE-01 Pegasus	39153 39151	2U 1U	Lithium-1 Custom	437.445 MHz 910 MHz	Amateur	1 W 1.9 W	Integrated	AX.25 SSTV/Audio	1200 baud AFSK	turnstile	Alive Dead	Aug Aug
ega VV02/ISL06	ESTCube-1	39161	1U	Data	437.505 MHz 437.250 MHz	Amateur	500 mW 100 mW		AX.25 CW	9600 baud FSK 18 WPM	monopole	Alive	Aug
7 May 2013	ArduSat-1	39413	1U	Beacon NanoCom U482C	437.250 MHz 437.000 MHz	Amateur Experimental	100 m W	NanoMind A712D ¹	CSP	9600 baud FM-MSK/20 WPM CW	monopole turnstile	Alive/Deorbited	Mar
HTV-4/ISS	ArduSat-X Pico Dragon	39414 39412	1U 1U	NanoCom U482C (data)	437.000 MHz 437.365 MHz	Experimental Amateur	1 W 800 mW	NanoMind A712D ¹	CSP AX.25	9600 baud FM-MSK/20 WPM CW 1200 baud AFSK	turnstile monopole	Deorbited Alive/Deorbited	Mar Mar
19 Nov 2013	TechEdSat-3P	39415	3U	(beacon) Stensat (beacon)	437.250 MHz 437.465 MHz	Amateur Experimental	100 mW	Integrated	CW AX.25	1200 baud AFSK	monopole monopole	,	Mai
				Iridium Q9602	1616 MHz	Experimental	1 W	Integrated	Proprietary		patch		
	COPPER TJ3Sat	39395 39385	1U 1U	AstroDev He-100 Stensat	437.290 MHz 437.320 MHz	Experimental Experimental	1 W 1 W	Integrated Integrated	AX.25 AX.25, CW	9600 baud FSK 1200 baud AFSK	dipole	DOA	Jan Dec
	Vermont Lunar Cube SwampSat	39407 39402	1U 1U	Helium-100	437.305 MHz 437.385 MHz	Experimental Experimental	1.5 W 1 W	Integrated	AX.25 AX.25		Crossed Dipoles	Alive	Jar Jar
	CAPE-2	39382	1U	CC1101 RadioMetrix Parrot repeater	437.325 MHz	Experimental	1 W 1 W	Integrated	TI	9600 baud FSK FM		Alive	Jul
	(LO-75) Ho'oponopono-2	39403	3U	Microhard MHX-2420	145.825 MHz 2.4 GHz	Experimental Experimental	1 W	Integrated	Parrot repeater Proprietary	57.6 kbps	patch	DOA	Jar
	PhoneSat-v2.4	39381	1U	AstroDev Ne-1 (beacon) StenSat	437.220 MHz 437.425 MHz	Experimental Experimental	1 W	dsPIC33F Integrated	AX.25	1200 baud AFSK	monopole monopole	Alive	Jai
RS-3/ELaNa-4 20 Nov 2013	Trailblazer DragonSat-1	39400 39383	1U 1U	AstroDev He-100 AstroDev He-100	437.425 MHz 145.870 MHz	Experimental Experimental	1 W 500 mW	Integrated Integrated	AX.25 AX.25	9600 baud FSK 9600 baud FSK	turnstile monopole	DOA DOA	Jai Jai
	KySat-2 ChargerSat-1	39384 39405	1U 1U	AstroDev Li-1 CC1100	437.405 MHz 437.405 MHz	Experimental Experimental	1.5 W 1 W	Integrated	AX.25	9600 baud FSK 9600 baud FSK	turnstile dipole	Alive	Ja: De
	NPS-SCAT	39389	1U	Microhard MHX-2400	2.4 GHz	Experimental	1 W	Integrated	Proprietary		patch	Alive	Ja
	Black Knight 1	39398	1U	CC1000 (beacon) ² MHX-425	437.525 MHz 437.345 MHz	Experimental Experimental	1 W 1 W	Integrated Integrated	AX.25 Proprietary	1200 baud FSK	dipole		
	ORSES ORSTECH (2)	39386 39387+	3U 3U			Government Government							
	Prometheus-1 (8) SENSE (2)	39406+ 39388+	1.5U 3U	Innoflight SCR-100	2.2 GHz	Government Government					patch	Alive	De
	FireFly Horus	39404 39397	3U 3U	L3 Cadet AstroDev	425 MHz 915 MHz	Government Government	1 W	Integrated	Proprietary	QPSK	dipole patch	Alive	Ja: De
	FUNcube-1	39444	1U	AMSAT	145.936 MHz	Amateur	300 mW	N/A		1200 baud BPSK	dipole	Active	Ja
	ZACube-1 HiNcube	39417 39445	1U 1U	CPUT UTRX	437.355 MHz 437.305 MHz	Amateur Amateur	1 W	Integrated	AX.25 AX.25	1200 baud AFSK/9600 baud FSK 9600 baud GMSK	dipole	Alive DOA	Ju Ja
	First-MOVE UWE-3	39438 39446	1U 1U	ISIS TRXUV	145.970 MHz 437.385 MHz	Amateur Amateur	230 mW	Integrated	AX.25 AX.25	1200 baud BPSK 9600 baud FSK	dipole	Alive	Ja Ja
	Velox-PII NEE-02 KRYSAOR	39438	1U		145.980 MHz	Amateur	230 mW	Integrated	AX.25 AX.25	1200 baud BPSK		Alive	Ja
	CubeBug-2	39441 39440	1U 2U	AstroDev Li-1	980 MHz 437.445 MHz	Amateur	1 W	Integrated	AX.25	1200/9600 baud AFSK/GFSK	turnstile	Alive	Ja
Dnepr/	KHUSAT (2) TRITON-1	39424+ 39427	3U 3U	Emhiser ISIS TRXUV	2.2 GHz 145.815 MHz	Space Research Amateur	1 W 230 mW	FPGA Integrated	Proprietary AX.25	1 Mbps FSK 9600 baud BPSK	patch dipole	Alive	Ja Ja
ISL03	Delfi-n3xt	39428	3U	ISIS TRXUV ISIS Custom	145.900 MHz 2.405 GHz	Amateur Amateur	230 mW 125 mW	Integrated	AX.25	9600 baud BPSK 20-500 kbps MSK	dipole patch	Alive	Fe
21 Nov 2013	OPTOS Dove-3	39420 39429	3U 3U+	D3-400-T	402 MHz 401.3 MHz	Earth-exploration Experimental	1.6 W			-	monopole	Active	Ja
	PUCP-SAT-1 ³	39442	1U	D3-8200-T Telemetry	8.1 GHz 145.840 MHz	Experimental Amateur	3 W 1.5 W		IP over DVB-S2 AX.25	1200 baud AFSK	patch dipole		Ja
		39442		Beacon	437.200 MHz	Amateur	10 mW	T 1	CW	12 WPM	dipole		Ja
	ICUBE-1 ³ HumSAT-D ³	39433	1U 1U	ISIS TRXUV NanoCom U482C	145.947 MHz 437.325 MHz	Amateur Amateur	230 mW 500 mW	Integrated	AX.25 CSP/CW	1200 baud BPSK 1200 baud MSK	turnstile	Active	Ja
	GomX-1 IPEX	39430 39471	2U 1U	NanoCom U482C	437.250 MHz 437.270 MHz	Amateur Experimental	3 W 1 W		CSP AX.25	4800 baud MSK 9600 baud FSK	turnstile dipole	Alive	Ma De
	MCubed-2	39469	1U	AstroDev Li-1	437.485 MHz	Experimental	1 W		AX.25 AX.25	9600 baud GMSK	monopole	Active	Ja
	CUNYSAT-1 FIREBIRD (2)	39470 39463+	1U 1.5U		437.505 MHz 437.405 MHz	Experimental Amateur	1.2 W 1 W				dipole	Active/DOA	Ja
OL-39/ELaNa-2 6 Dec 2013	Alice AeroCube-5 (2)	39467 39465+	3U 1.5U	Freewave FGRM	915 MHz	Government Experimental							
	SMDC-ONE (2)	39472+	3U	CC1101	915 MHz	Experimental Government	1.3 W	Integrated	Proprietary	500 kbps FSK	patch	Deorbited Alive/Deorbited Deorbited Deorbited DOA Alive DOA Alive DOA Alive DOA Alive DOA Alive DOA Alive DoA Active Alive Alive Alive Alive Alive Alive Alive Dobited Deorbited	
	TacSat-6 SNAP	39473 39468	3U 3U			Government Government							
	Flock-1 (28)	39513+	3U+	D3-400-T D3-8200-T	401.3 MHz	Earth exploration	1.6 W 3 W		IP over DVB-S2		monopole	Deorbited	Fe
0.1.4/700	UAPSAT	39568	1U		8.1 GHz 437.385 MHz	Earth exploration Amateur			AX.25		patch turnstile		Fe
Orb-1/ISS 28 Feb 2014	ArduSat-2	39571	2U	AstroDev Li-1 AstroDev Beryllium	400 MHz 2.4 GHz	Experimental Experimental	2 W 2.3 W				$rac{ ext{turnstile}}{ ext{patch}}$	<u>'</u>	Fe
	SkyCube LitSat-1	39567 39570	1U 1U	AstroDev C2	915 MHz 145.850 MHz	Government Amateur			AX.25 AX.25	57.6 kbps	dipole		Fe Fe
	LituanicaSAT-1	39569	1U		405 000 MII	Amateur	200 111			1000 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11. 1	Deorbited	Fe
H-2A F23/	INVADER (CO-77)	39577	1U	Custom Beacon	437.200 MHz 437.325 MHz	Amateur Amateur	800 mW 100 mW		AX.25 CW	1200 baud AFSK	dipole dipole	Deorbited	Fe
GPM 27 Feb 2014	KSAT-2	39578	1U	S-band Ku-band								Deorbited	Fe
	OPUSAT ITF-1	39575 39573	1U 1U	Custom Alinco DJ-C7	437.150 MHz 437.525 MHz	Amateur Amateur	300 mW	PIC16F877A	CW/AX.25 AX.25	1200 baud AFSK/9600 baud GMSK 1200 baud AFSK	monopole		Fe Fe
	SporeSat	39681	3U	StenSat	437.100 MHz		1 W	Integrated	AX.25	1200 baud AFSK	monopole	Deorbited	Αι
CRS-3/ ELaNa-5	TSAT PhoneSat-v2.5	39682 39684	2U 1U	GlobalStar STX2	1.6 GHz 437.425 MHz	Experimental ⁴	200 mW	PIC18F2620	Proprietary AX.25	36bytes/sec 1200 baud AFSK	Patch monopole		Αι
18 Apr 2014	ALL-STAR KickSat	39683 39685	3U 3U	Custom SDR	2401.7 MHz 437.505 MHz	Experimental	1 W		AX.25	1200 baud AFSK			Aı Aı
	AntelSat ⁵	40034	2U	Custom (beacon)	437.280 MHz	Amateur	200 mW		CW		N/A	Alive	Aı
				Custom (downlink) Custom (downlink)	437.575 MHz 2403 MHz	Amateur Amateur	1W 1W		AX.25 AX.25	1200 baud FSK/AFSK 500 kbps GFSK	monopole patch		
	AeroCube-6 ⁵ (2) Lemur-1 ⁵	40045+ 40044	0.5U 3U	AdvRadio CC1101 AstroDev Lithuim	915 MHz 402 MHz MHz	Experimental Experimental	1.3 W 2 W	Integrated Integrated	Proprietary	500 kbps FSK	patch		Aı
	TigriSat ⁶ Flock-1 (11)	40043 40027+	3U 3U+	D3-400-T	401.3 MHz	Earth exploration	1.6 W				monopole	Active	Aı
			6U	D3-400-T D3-8200-T AstroDev Lithium	8.1 GHz	Earth exploration Earth exploration Experimental	3 W 1 W	Intomat-1	IP over DVB-S2 AX.25	40 Mbps	patch/helix	Alive	
Dnepr/	Perseus (2)	40039+		Custom transmitter	401 MHz 26.8 GHz	Experimental	$500 \mathrm{mW}$	Integrated Integrated	DVB-S2	40 Mbps	Monopole Horn		Aı
Dnepr/ ISL07	QB50P1	40025	2U	ISIS TRXUV FUNcube-3	145.815 MHz 145.950 MHz	Amateur Amateur	200 mW 400 mW	Integrated	CW/AX.25	15 WPM/1200 baud BPSK Linear transponder	dipole dipole	Alive	Aı
ISL07	QB50P2	40032	2U	ISIS TRXUV AMSAT-Francophone	145.880 MHz 145.940 MHz	Amateur Amateur	200 mW	Integrated	CW/AX.25 FX25	15 WPM/1200 baud BPSK 9600 bps FSK	dipole dipole	Alive	Αι
ISL07		40030	1U 1U	Custom	2.401 GHz 437.675 MHz	Amateur Amateur	220 mW 600 mW		CW/FSK CW/AX.25	9600 baud FSK	dipole	Alive	Αι
ISL07	DTUSat-2 PolyITAN-1	40042	1U	ISIS TRXUV	145.980 MHz 145.825 MHz	Amateur Amateur	200 mW	Integrated	CW/AX.25 AX.25	15 WPM/1200 baud BPSK 1200 baud AFSK	dipole dipole	Alive	Aı Aı
ISL07	DTUSat-2 PolyITAN-1 Duchifat-1	40042			TIO.UAU IVIIIZ	Amateur	200 mW 1 W	Integrated	CW/AX.25	15 WPM/1200 baud BPSK	dipole	Alive	Αυ
ISL07	PolyITAN-1 Duchifat-1 NanoSatC-Br 1	40021	1U	ISIS TRXUV	145.865 MHz		4 4 4 4 7		CW/AX.25	15 WPM/1200 baud FSK	dipole		Aı Aı
ISL07 19 June 2014	PolyITAN-1 Duchifat-1	40021	1U 2U 3U	ISIS TRXUV	145.865 MHz 437.485 MHz 437.405 MHz	Amateur Amateur	1 VV		CCSDS			<u> </u>	
ISL07 19 June 2014 PSLV-C23	PolyITAN-1 Duchifat-1 NanoSatC-Br 1 PACE	40021 40024 40022	2U	ISIS TRXUV	437.485 MHz	Amateur	200 mW	Integrated	AX.25	1200 baud BPSK		Alive	Αι
ISL07 19 June 2014 PSLV-C23 30 June 2014	PolyITAN-1 Duchifat-1 NanoSatC-Br 1 PACE POPSAT-HIP-1	40021 40024 40022 40028	2U 3U	ISIS TRXUV	437.485 MHz 437.405 MHz 145.980 MHz 145.840 MHz	Amateur Amateur Amateur Amateur	200 mW	Integrated Integrated		1200 baud BPSK	dipole	Alive	
ISL07 19 June 2014 PSLV-C23	PolyITAN-1 Duchifat-1 NanoSatC-Br 1 PACE POPSAT-HIP-1 VELOX-1	40021 40024 40022 40028 40057	2U 3U 3U	ISIS TRXUV	437.485 MHz 437.405 MHz 145.980 MHz	Amateur Amateur Amateur	200 mW		AX.25		dipole dipole patch		
ISL07 19 June 2014 PSLV-C23 30 June 2014 Soyuz-2 8 July 2014 ISS	PolyITAN-1 Duchifat-1 NanoSatC-Br 1 PACE POPSAT-HIP-1 VELOX-1	40021 40024 40022 40028 40057	2U 3U 3U	ISIS TRXUV ISIS TRXUV FUNcube-2	437.485 MHz 437.405 MHz 145.980 MHz 145.840 MHz 145.915 MHz	Amateur Amateur Amateur Amateur Amateur	200 mW 200 mW 300 mW		AX.25	1200 baud BPSK 1200 baud BPSK	dipole		Au
ISL07 19 June 2014 PSLV-C23 30 June 2014 Soyuz-2 8 July 2014	PolyITAN-1 Duchifat-1 NanoSatC-Br 1 PACE POPSAT-HIP-1 VELOX-1 UKube-1	40021 40024 40022 40028 40057 40074	3U 3U 3U	ISIS TRXUV ISIS TRXUV FUNcube-2	437.485 MHz 437.405 MHz 145.980 MHz 145.840 MHz 145.915 MHz 2.401 GHz	Amateur Amateur Amateur Amateur Amateur	200 mW 200 mW 300 mW		AX.25 AX.25	1200 baud BPSK 1200 baud BPSK 2 Mbps QPSK	dipole patch	Alive	Au Au Ma Ma Ma

This is the main spacecraft processor.
 This beacon was built by Cal Poly based on CP2/3/6 heritage.
 These satellites were deployed from UniSat-5. Apparently Dove 4 (not listed) is still stuck inside UniSat-5 and did not deploy.
 TSAT used Mobile Satellite Service (ground to satellite) frequencies for inter-satellite communications, requiring an experimental license.

⁵ These CubeSats were deployed from UniSat-6 from a Cal Poly P-POD.

This satellite was deployed from UniSat-6 from a PEPPOD.
 Chasqui-1 was hand-deployed by Cosmonaut Oleg Artemyev during an ISS space walk.

⁸ This is the satellite's main Tyvak Intrepid processor.

Version 17; Page 3 of 6. This chart shows the 757 total CubeSats deployed in orbit so far, for a total of 1937 Units. November 23, 2018.

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Deployment	Satellite	Object	Size	Radio	Downlink	Satellite Service	Power	TNC	Protocol	Data Rate/Modulation	Antenna	Status	Upda
CRS-5/ISS ¹ 5 Feb 2015	AESP-14	40389	1U		437.600 MHz	Amateur	500 mW		AX.25	9600 baud GFSK	dipole	DOA	Mar 2
$\frac{\text{5 Feb 2015}}{\text{CRS-5/ISS}^1}$	Flock-1d' (2)		3U+	D3-400-T	401.3 MHz	Earth exploration	1.6 W				monopole	Active	Mar 2
3 March 2015				D3-8200-T	8.1 GHz	Earth exploration	3 W		IP over DVB-S2	40 Mbps	patch/helix		
	Flock-1b $(22)^2$	40451+	3U+	D3-400-T D3-8200-T	401.3 MHz 8.1 GHz	Earth exploration Earth exploration	1.6 W 3 W		IP over DVB-S2	40 Mbps	monopole patch/helix	Active	Mar 2
${ m Orb} ext{-}2/{ m ISS}$	MicroMAS LambdaSat	40457 40458	3U 1U	L3 Cadet StenSat	465 MHz 437.462 MHz	Meterological Amateur	1 W 1 W	Integrated	Proprietary AX.25	3 Mbps 1200 baud AFSK	dipole dipole	Alive Active	Mar 2
6 March 2015		40450		Iridium	437.402 WIIIZ		1 W	Integrated	Proprietary	1200 baud AFSK	patch	Active	
	TechEdSat-4 GEARRSAT		3U 3U	Iridium GlobalStar STX2	1616 MHz	Experimental Experimental	400 mW	Integrated Integrated	Proprietary Proprietary	9600 baud CDMA	patch patch		Mar Mar
	LightSail-A	40661	3U	27/1	437.435 MHz	Amateur	1.5 W	Integrated	AX.25	9600 baud FSK	dipole	Deorbited	_ ^
	OptiCube $(3)^3$ AeroCube-8 A&B (2)	40653+ 40659+	3U 1.5U	N/A AdvRadio CC1101	N/A 915 MHz	N/A Experimental	N/A 1.2 W	N/A	N/A	N/A 500 kbps FSK	N/A patch	N/A Active	Apr Apr
ELaNa-11/AFSPC-5/	GEARRS-2	40657	3U	GlobalStar STX2	1616 MHz 437.475 MHz	Experimental	400 mW	Integrated	Proprietary	9600 baud CDMA	patch		Apr
ULTRASat 20 May 2015	USS Langley BRICSat-P	40652 40655	3U 1.5U	Astrodev He-100	437.975 MHz	Amateur Amateur	300 mW	Integrated	AX.25 APRS	9600 baud FSK 1200 baud AFSK	monopole	DOA Dead	Apr Apr
	P-SAT	40654	1.5U	ADF7012 Byonics MTT4B	437.350 MHz 145.825 MHz	Amateur Amateur	500 mW 300 mW	ATMega8 Integrated	AX.25 AX.25 APRS	2.5 kHz PSK-31 1200 baud AFSK	monopole monopole	Alive	Apr
				ADF7012	435.350 MHz	Amateur	500 mW	ATMega8	AX.25	2.5 kHz PSK-31	monopole		
PSLV-C28 10 July 2015	DeOrbitSail	40719	3U		145.975 MHz	Amateur			AX.25	1200 baud BPSK	monopole	Alive	Apr
10 041, 2010	Arkyd-3-Reflight	40742	3U	Microhard MHX-2420	2.4 GHz	Experimental	1 W	Integrated	Proprietary FHSS	19.2 kbps	microstrip		Apr
CRS-6/ISS 13 July 2015	Flock-1e (14)		3U+	D3-400-T D3-8200-T	401.3 MHz 8.2 GHz	Earth exploration Earth exploration	1.6 W 3 W		IP over DVB-S2	100 Mbps	monopole patch/helix	Active	Apr
15 July 2015	Centennial-1	40743	1U	Astrodev He-100	437.615 MHz	Experimental	3 W	Integrated	AX.25	1200 baud GFSK	Monopole Monopole		Apr
HTV-5/ISS ⁴ 17 Sept 2015	SERPENS S-CUBE	40897 40898	3U 3U		437.365 MHz	Amateur			CSP	1200 baud MSK		Deorbited	
Long March 6													Apr
19 Sept 2015	NUDT-PhoneSat	40900	3U										Apr
Long March 11	STU-2A STU-2B	40928 40927	3U 2U	NanoCom AX100 NanoCom AX100	435.645 MHz 437.645 MHz				CSP CSP	4800/9600 baud GMSK 4800/9600 baud GMSK			Apr Apr
25 Sept 2015	STU-2C	40926	2U	NanoCom AX100	435.645 MHz				CSP	4800/9600 baud GMSK			Apr
PSLV-C30/ISL13 28 Sept 2015	Lemur-2 (4)	40932+	3U	AstroDev Li-1	401 MHz 2.02 GHz	Space operation Earth exporation	1 W 2 W	Integrated	AX.25	9600 baud MSK 1 Mbps QPSK	turnstile patch	Alive	Apı
20 Sept 2019	AAUSAT5	40948	1U	ADF7021/AWT6388	437.425 MHz	Amateur	1 W		CSP	4800 bps GMSK/30 WPM CW	dipole	Deorbited	Apı
$\mathrm{HTV} ext{-}5/\mathrm{ISS}^4$	GOMX-3	40949	3U	NanoCom AX100	437.250 MHz	Amateur Earth Exporation	1 W 2W	Integrated	CSP	1200-9600 baud GMSK	turnstile	Alive	Apı
5 Oct 2015	Flock-2b (12) ⁵	40950+	3U+	Syrlinks EWC27 D3-400-T	8.1 GHz 401.3 MHz	Earth exploration	1.6 W	Integrated CC1110	Proprietary	3 Mbps OQPSK 4800 baud GMSK	patch monopole	Active	Apı
		1000	1 277	D3-8200-T	8.2 GHz	Earth exploration	3 W		IP over DVB-S2	80 Mbps	patch/helix	Alt	
	AeroCube-5c	40965	1.5U	Freewave FGRM AdvRadio	915 MHz 915 MHz	Experimental Experimental	1.3 W	Integrated	Proprietary	500 kbps FSK	patch patch	Alive	Apı
	AeroCube-7A OCSD	40966	1.5U	Freewave FGRM SDRadio	915 MHz 915 MHz	Experimental Experimental	1.3 W	Integrated	Proprietary	500 kbps FSK	patch patch	Alive	Apı
	OCSD			Laser	1064 nm	N/A	6 W			$40~\mathrm{Mbps}$	patch		
NROL-55/GRACE/ ELaNa-12	Fox-1A BisonSat	40967 40968	1U 1U	FM Transponder Astrodev He-100	145.980 MHz 437.375 MHz	Amateur Amateur	800 mW 1 W	N/A MSP430	N/A AX.25	FM 9600 baud	dipole dipole	Active Alive	Apı Apı
8 Oct 2015	ARC1	40969	1U	CC1101	437.565 MHz	Amateur	1 W	Integrated	AX.25	9600 baud FSK	monopole	DOA	Apı
	SNAP-3 (3) LMRST-Sat	40970+ 40971	3U 3U	AstroDev He-100	462.0 MHz	Meterological satellite	1 W	Integrated	AX.25	9600 baud FSK	dipole	DOA	Apı
	Drogg Cook o (2)	40973+	Ranging transponder 8.45 GHz Space Research 1 mW N/A N/A	patch	Alive								
	PropCube (2) SINOD-D (2)	40973+	1U 2U								dipole	DOA	Apr Apr
PSLV-C29/	Velox-II	41171	6U	I DCAN	145.930 MHz					1200 baud BPSK	dipole	Alive	Aug
ISILaunch-05 16 Dec 2015	Galassia	41170	2U	Inmarsat BGAN NanoCom U482	1650 MHz 436.400 MHz	Experimental	1 W	Integrated	CSP	1200 baud FSK	helix turnstile	Active	Aug
10 Dec 2015	Athenoxat-1	41168	3U	Custom ⁶	$145 \text{ MHz} \pm 0.9 \text{ MHz} $ 437.485 MHz	Amateur	50 mW	N/A	N/A	CW 2400 baud MSK	dipole		May
CRS-4/ISS/AGS4	Bevo-2 ⁷			AstroDev He-100	437.325 MHz		2.5 W	T4 4 - J	AX.25		1:1-	Alive	T T
29 Jan 2016		41314	3U			Amateur		Integrated		38.4 kbps FSK	dipole		May
Soyuz/Sentinel-1B/	OUFTI-1	41458	1U	ADF7021 ADF7021	145.950 MHz 145.980 MHz	Amateur Amateur	1 W 100 mW	MSP430 MSP430	AX.25 CW	9600 baud FSK/D-STAR 11 WPM	monopole monopole	Active	May
VS-14 22 Apr 2016	est@r-II AAUSAT4	41459	1U 1U	Radiometrix ADF7021/AWT6388	437.485 MHz 437.425 MHz	Amateur	500 mW 900 mW	PIC16 AT90CAN128	AX.25 CSP/CW	1200 baud AFSK/CW 2400 baud FSK/30 WPM	dipole	Alive Active	May
Soyuz		41460		ADF 1021/AW 10388		Amateur	900 mw	A190CAN128	CSF/CW	,	dipole		May
28 Apr 2016	SamSat-218D	41466	3U		145.870 MHz	Amateur				CW		DOA	May
	MinXSS Cadre	41474 41475	3U 3U	AstroDev Li-1 AstroDev Li-1	437.350 MHz 437.485 MHz	Amateur Amateur	2 W 2 W	Integrated Integrated	AX.25 AX.25	9600 baud FSK 9600 baud FSK	monopole dipole	Active	Jur Jur
				Indigo	3.404 GHz	Amateur	1 W	ProASIC3		1 Mbps OQPSK	patch		
Cygnus OA-4/ISS	STMSat-1 NODES (2)	41476 41477+	1U 1.5U	AstroDev Li-1	437.800 MHz 437.1 MHz	Amateur Amateur	1 W	Integrated	SSTV AX.25	9600 baud FSK	dipole monopole	Active	Jur Jur
ELaNa-9				StenSat	437.1 MHz	Amateur	1 W	Integrated	AX.25	1200 baud AFSK	monopole		
16 May 2016	Flock-1e (8)	41479+	3U+	MHX2420	2.4 GHz 401.3 MHz	Amateur Earth Exploration	1 W 1 W	Integrated CC1110	Proprietary Proprietary	4800 baud GMSK	patch monopole	Active	Jur
	Lemur-2 (4)	41485+	3U	AstroDev Li-1	8.2 GHz 401 MHz	Earth Exploration Experimental	2 W 2 W		IP over DVB-S2	100+ Mbps 9600 baud GMSK	helix dipole		Jur
	Demui-2 (4)	41400+	30	SAT-SDR-2	2.02 GHz	Experimental	2 W			1 Mbaud QPSK	patch		Jui
Cygnus OA-6/ISS ⁸	Flock-1e (16)	41563+	3U+		401.3 MHz	Earth Exploration	1 W	CC1110	Proprietary	4800 baud GMSK	monopole	Active	Jur
30 May 2016 Cygnus OA-6 ⁸	Lemur-2 (4)	41485+	3U	AstroDev Li-1	8.2 GHz 401 MHz	Earth Exploration Experimental	2 W		IP over DVB-S2	100+ Mbps 9600 baud GMSK	helix		Jul
22 June 2016	.,			SAT-SDR-2	2.02 GHz	Experimental	2 W			1 Mbaud QPSK	patch		
PSLV-C34/	SathyabamaSat SWAYAM	41600 41607	2U 1U	Custom	145.980 MHz 437.025 MHz	Amateur Amateur	200 mW 1 W	_	COEP	2400 baud BPSK 1200 baud AFSK/CW	dipole	Alive Alive	Aug
CartoSat-2	BEESAT-4 ⁹	41619	1U	STE BK-77B	435.950 MHz	Amateur	500 mW	CMX909B	Mobitex	4800 bps GMSK	monopole	Alive	Fel
22 June 2016	Flock-2p (12)	41606+	3U+		401.3 MHz 8.2 GHz	Earth Exploration Earth Exploration	1 W 2 W	CC1110	Proprietary IP over DVB-S2	4800 baud GMSK 200+ Mbps	monopole helix	Active	Au
Long March-7	Aoxiang Zhixing-1	41625	12U			1				A		Deorbited	Fel
25 June 2016					145 050 3 577		FO TTT		A ST OF	00001 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1. 1		
ong March-2D/ISL08 15 Aug 2016	CubeCat-2	41732	6U		145.970 MHz 2401 MHz	Amateur Amateur	50 mW		AX.25	9600 baud BPSK 100 kbps GMSK	dipole patch	Alive	Feb
PSLV-C35	AlSat-1N	41789	3U	STRaNDceiver	437.650 MHz	Amateur	1 W		AX.25	9600 baud FSK	monopole	Alive	Fel
26 Sep 2016 Long March-11 ¹⁰	CanX-7 Xiaoxiang-1 (TY1)	41788	3U 6U		S-band 437.525 MHz	Ameter					patch		Aug
9 Nov 2016	Lishui 1-01		3U		451.323 NHZ	Amateur							Feb
	RAVAN	41849	3U	AstroDev Li-1	450.0 MHz	Experimental	2 W	Integrated	AX.25	GMSK	monopole	Active	Feb
WorldView-4	OptiCube-4 ³	41851	2U	GlobalStar GSP-7120 N/A	1615 MHz N/A	Experimental N/A	400 mW N/A	N/A	N/A	QPSK N/A	patch N/A	N/A	Feb
11 Nov 2016	AeroCube-8 C&D (2) Prometheus-2 (2)	41852+ 41854+	1.5U 1.5U	AdvRadio	915 MHz	Experimental Government	1.3 W	Integrated	,	1 Mbps	patch helix	,	Feb Feb
	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	41854+	1.5U		920 MHz	Experimental Experimental	17 mW				patch		Dec
	CELTEE	11000											

These three satellites were brought up to the ISS on SpaceX CRS-5, launched on 10 Jan 2015. AESP was deployed by itself on 5 Feb 2015 by the J-SSOD, and the two Doves were deployed out of a single NRCSD on 3 March 2015.

² A total of 28 Dove satellites were expected to be released, but the NRCSD failed partway through the deployment. 6 Dove satellites were returned to earth on SpaceX CRS-5. ³ Some primary and backup CubeSats were not ready for this launch, so these optical calibration CubeSats are just mass models with different coatings on the outside.

⁴ All satellites on these two deployments we brought to the station by the HTV-5, launched on 19 August 2015. SERPENS and S-CUBE were deployed by the J-SSOD deployer in mid September, the other satellites were deployed from the NRCSD in the beginning of October.

 $^{^{5}}$ Two Flock-2b satellites were stuck in a NRCSD deployer and brought back down to earth.

 $^{^6}$ This was a three-frequency TEC experiment.

⁷ Bevo-2 was deployed from an ISIPod inside AggieSat-4, which was deployed from the ISS by the Space Station Integrated Kinetic Launcher for Orbital Payload Systems (SSIKLOPS).

⁸ The Cygnus OA-6 launch on 23 March 2016 contained 16 Dove CubeSats, deployed via NRCSDs from the Kibo airlock on 30 May 2016. After the Cygnus was filled with trash and undocked from the ISS, it deployed 4 Lemur-2 CubeSats on 22 June 2016 before

burning up. A 5th Lemur-2 CubeSat did not deploy successfully and also burned up. ¹⁰ BEESAT-4 was deployed on 9 Sept 2016 from the BIROS satellite, a 130-kg imaging satellite.

¹⁰ A 2U CubeSat (CAS-2T) was bolted to the upper stage of this rocket, and contained an amateur radio linear transponder.

Version 17; Page 4 of 6. This chart shows the 757 total CubeSats deployed in orbit so far, for a total of 1937 Units. November 23, 2018.

Bryan Klofas. bklofas@gmail.com. Green are University or Educational CubeSats; Red are Commercial or Private; Blue are Government CubeSats, either US or non-US.

Deployment	Satellite	Object	Size	Radio	Downlink	Satellite Service	Power	TNC	Protocol	Data Rate/Modulation	Antenna	Status	Updated
HTV-6/ISS 19 Dec 2016	$STARS-C^1$	41895	3U		437.405 MHz 437.245 MHz	Amateur	800 mW 100 mW		AX.25 CW	1200 baud AFSK	monopole	Alive	Jan 2017
Long March-2D	BY70-1 ²	41909	2U	Custom SDR	436.200 MHz	Amateur Amateur	500 mW	Integrated	CSP	9600 baud BPSK	monopole dipole	Deorbited	Feb 2017
28 Dec 2016	21101	11000		FM-Codec2 Transponder	436.200 MHz	Amateur	500 mW	N/A	N/A	9600 baud BPSK	dipole	Boorbrood	100 2011
Kuaizhou-1A	Xingyun Shiyan-1	41915	2U										Feb 2017
9 Jan 2017	Caton-1 ITF-2	41913	2U 1U	TXE430MFMCW-310A	437.525 MHz	Amateur		HVU-301	AX.25	1200 baud AFSK/CW	patch/monopole	Alive	Feb 2017 Feb 2017
	WASEDA-SAT3	41932	1U	1 AE450101F MC W-510A	437.290 MHz	Amateur	800 mW	11 V U-301	AX.25 AX.25	1200 baud AFSK/CW	dipole	DOA	Feb 2017 Feb 2017
HTV-6/ISS	FREEDOM	41930	1U	Iridium	1620 MHz	900 W		Integrated			patch	Deorbited	Feb 2017
16 Jan 2017	EGG AOBA-Velox III	41934 41935	3U 2U	Iridium 9603	1620 MHz 437.375 MHz	800 mW Amateur		Integrated	AX.25	1200 baud AFSK	patch dipole	Alive	Feb 2017 Feb 2017
	TuPOD ³	41936	3U	Hope RFM22B	437.425 MHz	Amateur	100 mW	Integrated		1200 baud GMSK	dipole	Alive	Feb 2017
	Nayif-1	42017	1U	FunCube	145.940 MHz	Amateur	300 mW	DT / A	AX.25	1200 baud BPSK	dipole	Active	Feb 2017
	Al-Farabi-1	42016	2U	FunCube	145.960 MHz 435.500 MHz	Amateur	300 mW	N/A	N/A Mobitex	Linear Transponder 4800 baud GMSK	dipole monopole		Feb 2017
PSLV-C37/	DIDO-2	4200	3U+								P		Feb 2017
Cartosat-2D/ ISL17	BGUSat PEASSS	41999	3U 3U										Feb 2017 Feb 2017
15 Feb 2017	Lemur-2 (8)	41991+	3U	AstroDev Li-1	401 MHz	Earth Exploration	2 W			9600 baud GMSK	dipole	Active	Feb 2017
	Dll - 2 (00)	41050	911.	SAT-SDR-2	2.02 GHz	Earth Exploration	2 W	001110	Durandatana	1 Mbaud QPSK	patch	A -+:	E-1-0017
	Flock-3p (88)	41950+	3U+	LST MRB1	401.3 MHz 8.2 GHz	Earth Exploration Earth Exploration	1 W 2 W	CC1110	Proprietary IP over DVB-S2	4800 baud GMSK $200+$ Mbps	monopole helix	Active	Feb 2017
	TechEdSat-5	42066	3.5U	Iridium Q9602	1616 MHz	Experimental	1 W	Integrated	Proprietary		patch	Deorbited	Apr 2018
HTV-6/ISS				Cricket Wireless	2410 MHz								
6 March 2017	Lemur-2 (4)	42059+	3U	ISM AstroDev Li-1	2457 MHz 401 MHz	Earth Exploration	2 W			9600 baud GMSK	dipole	Active	Apr 2018
	Echia 2 (1)	12000		SAT-SDR-2	2.02 GHz	Earth Exploration	2 W			1 Mbaud QPSK	patch	Ticorve	11p1 2010
Long March-7	SilkRoad-1 01	42903	3U										Aug 2017
20 April 2017					10= 1000				1	2000		·	
	SOMP-2 (DE02) HAVELSAT (TR02)	42701 42700	2U 2U	Astrodev He-100	437.405 MHz 436.845 MHz	Amateur Amateur	1 W	Integrated	AX.25 AX.25/CW	9600 baud GMSK 9600 baud GMSK	Monopole	DOA Alive	Aug 2017 Aug 2017
	Columbia (US04) ⁴	42702	2U	AstroDev Li-1	437.055 MHz	Amateur	1 W	Integrated	AX.25	9600 baud GMSK	dipole	Alive	Aug 2017
	SG-Sat CXBN-2	42703 42704	1U 2U	Astrodev Li-1 Astrodev Li-1	437.450 MHz 437.075 MHz	Amateur Amateur	1 W 1 W	Integrated Integrated	AX.25 AX.25	9600 baud FSK 9600 baud FSK	turnstile turnstile		Aug 2017 Aug 2017
	IceCube (Earth 1)	42704	3U	L3 Cadet	460 MHz	Meteorological Meteorological	1 W	Integrated	Proprietary	1.5 Mbps	dipole		Aug 2017 Aug 2017
	PHOENIX (TW01)	42706	2U		436.915 MHz	Amateur	1 W	J	AX.25	9600 baud GMSK	dipole	Alive	Aug 2017
	X-CubeSat (FR01)	42707	2U	FM Transponder	437.020 MHz 436.880 MHz	Amateur Amateur			FX25 N/A	1200 baud AFSK ${ m N/A}$	dipole dipole	Alive	Aug 2017 Aug 2017
	qbee (SE01)	42708	2U	NanoCom AX100	435.800 MHz	Amateur		Integrated	AX.25/CSP	9600 baud GFSK	turnstile	Alive	Aug 2017
	ALTAIR-1 SHARC	42711	6UL ⁵	,	2250 MHz 1.6 GHz	Experimental	1 W 1 W	T., 4 4 - 1	Doggoodita		patch		Aug 2017
	LINK (KR01)	42712 42714	5UL ⁵ 2U	EyeStar-D2	436.030 MHz	Amateur	1 W	Integrated	Propreitary AX.25	9600 baud BPSK	patch dipole	Alive	Aug 2017 Aug 2017
	ZA-AeroSat (AZ01)	42713	2U	CPUT VUTRX	437.200 MHz	Amateur	2 W	Integrated	AX.25	9600 baud GMSK		Alive	Aug 2017
	CSUNSat 1 UPSat (GR02)	42715 42716	2U 2U	AstroDev Li-2 CC1120/RF5110G	437.400 MHz 435.765 MHz	Amateur Amateur	1 W	Integrated STM32F4	AX.25 AX.25/CW	9600 baud GMSK 9600 baud GFSK/20 WPM	dipole monopole	Active	Aug 2017 Aug 2017
Atlas-5/CRS-7	SpaceCube (FR05)	42717	2U	001120/10101100	436.880 MHz	Amateur	1 ***	51111021 4	FX25	1200 baud AFSK	Попороге		Aug 2017
ISS/QB50-ISS	Hoopoe (IL01)	42718	2U	ISIS TRXVU	437.740 MHz	Amateur	500 mW		AX.25	9600 baud BPSK	monopole	Alive	Aug 2017
16 May 2017	Challenger (US01) NJUST-1 (CN03)	42721 42722	2U 2U		437.510 MHz 436.570 MHz	Amateur Amateur			AX.25 AX.25	9600 baud GMSK 9600 baud BPSK		Alive Alive	Aug 2017 Aug 2017
	UNSW-EC0 (AU02)	42723	2U	NanoCom U482C	436.525 MHz	Amateur		Integrated	CSP	4800 baud GMSK	turnstile	Alive	Aug 2017
	DUTHSat (GR01) LilacSat-1 (CN02)	42724 42725	2U 2U	ISIS TRXVU Custom SDR ²	436.420 MHz 436.510 MHz	Amateur Amateur	500 mW	Integrated Integrated	AX.25 CSP	9600 baud BPSK 9600 baud BPSK	dipole monopole	Alive Active	Aug 2017 Aug 2017
	Liiacsat-1 (CN02)	42720	20	FM-Codec2 Transponder	436.510 MHz	Amateur	500 mW	N/A	N/A	9600 baud BPSK	dipole	Active	Aug 2017
	nSIGHT-1 (AZ02)	42726	2U	CPUT VUTRX	435.900 MHz	Amateur	2W	Integrated	AX.25	9600 baud GMSK		Alive	Aug 2017
	QBITO (ES01) Aalto-2 (FI01)	42728 42729	2U 2U	CC1125	436.810 MHz 437.335 MHz	Amateur Amateur	1 W	MSP430	AX.25 CW/AX.25	9600 baud GFSK 9600 baud GFSK	turnstile turnstile	Alive	Aug 2017 Aug 2017
	SUSat (AU01)	42730	2U	Custom	436.775 MHz	Amateur	500 mW		CSP	9600 baud GMSK		DOA	Aug 2017
	SNUSAT-1b (KR03) INSPIRE-2 (AU03)	42733 42731	2U 2U	ISIS TRXUV	435.950 MHz 436.330 MHz	Amateur Amateur	1 W	Integrated	AX.25 CSP	9600 baud BPSK 9600 baud MSK	turnstile	Active	Aug 2017 Aug 2017
	PolyITAN-2 (UA01)	42732	2U	Custom	436.600 MHz	Amateur	1 W	Integrated	AX.25	9600 baud BPSK	monopole	Alive	Aug 2017
	SNUSAT-1 (KR02)	42727	2U	N C AV100	435.950 MHz	Amateur		T 1	AX.25	9600 baud BPSK	4 4 1	A 1:	Aug 2017
	ExAlta-1 (CA03) Aoxiang-1 (CN04)	42734 42735	3U 2U	NanoCom AX100 NanoCom U482C	436.705 MHz 436.150 MHz	Amateur Amateur		Integrated	CSP AX.25	4800 baud GMSK 9600 baud BPSK	turnstile turnstile	Alive Alive	Aug 2017 Aug 2017
	BeEagleSat (TR01)	42736	2U	Astrodev He-100	436.370 MHz	Amateur	1 W	Integrated	AX.25/CW	9600 baud GMSK	Monopole	Alive	Aug 2017
	Atlantis (US02) ⁴	42737	2U	AstroDev Li-1	437.055 MHz	Amateur	1 W	Integrated	AX.25	9600 baud GMSK	dipole	Alive	Aug 2017
	Lemur-2 (8)	42771+	3U	AstroDev Li-1 SAT-SDR-2	401 MHz 2.02 GHz	Earth Exploration Earth Exploration	2 W 2 W			9600 baud GMSK 1 Mbaud QPSK	dipole patch	Active	Aug 2017
	SUCHAI	42787	1U	NanoCom U482C	437.225 MHz	Amateur	1 W	Integrated	AX.25/CW	1200 baud MSK/20 WPM	dipole	Alive	Aug 2017
	ROBUSTA-1B	42792	1U 3U	CC110F	437.325 MHz 437.220 MHz	Amateur	1 W		AX.25	1200 baud AFSK	din al-	Alive	Aug 2017
	Aalto-1	42775	30	CC1125 CC2500	437.220 MHz 2402 MHz	Amateur Amateur	1 W 1.3 W	MSP430	AX.25/CW	9600 baud GFSK 500 kbaud GMSK	dipole patch	Alive	Aug 2017 Aug 2017
	skCUBE	42789	1U	Custom	437.100 MHz	Amateur	1 W	MSP430	AX.25/CW	9600 baud GMSK/20 WPM	dipole	Active	Aug 2017
	Diamond (3)	42783+	3U	Custom	2401 MHz	Amateur	250 mW			240 kbps GMSK	patch		Aug 2017
PSLV-C38/ QB50-PSLV/	LituanicaSAT-2 (LT01)	42768	3U	NanoAvionics SatCOM UHF	437.275 MHz	Amateur	2 W	Integrated	AX.25	9600 baud FSK	dipole	Alive	Aug 2017
ISILaunch-19	NUDTSat (BE06)	42788	2U	NanaCam II492C	436.270 MHz 437.240 MHz	Amateur	1 W	Internated	AX.25	9600 band BPSK	dinala	Alive	Aug 2017
23 June 2017	VZLUSat-1 (CZ02) DragSail (DE04)	42790 42777	2U 3U	NanoCom U482C	437.240 MHz 437.300 MHz	Amateur Amateur	1 VV	Integrated	AX.25 AX.25	9600 baud FSK 1200 baud AFSK	dipole	Alive DOA	Aug 2017 Aug 2017
					2402 MHz	Amateur							
	UCLSat (GB03) PEGASUS (AT03)	42765 42784	2U 2U	STACIE	435.975 MHz 436.670 MHz	Amateur Amateur	1 W	Integrated	AX.25 TT-64	9600 baud GMSK 9600 baud GFSK	dipole	Alive Alive	Aug 2017 Aug 2017
	URSA MAIOR (IT02)	42776	3U		435.950 MHz	Amateur			AX.25	9600 baud FSK	dipole	Alive	Aug 2017
	InflateSail (GB06)	42770	3U 3U	ISIS TRXVU	436.060 MHz	Amateur	500 mW 1 W	Integrated	AX.25	1200 baud BPSK 4800 baud FSK/20 WPM	4	Alive	Aug 2017
	D-SAT CICERO-6	42794 42793	6U	Endeavour UHF	437.505 MHz 400.03 MHz	Amateur Experimental	1 W 1 W	Integrated Integrated	CSP/CW	9600 baud GMSK	turnstile dipole	Active	Aug 2017 Aug 2017
	Tyvak-53b	42795	3U			_							Aug 2017
CRS-11/ISS	$BIRDS^6(5)$	42820	1U	TXE430MFMCW-301A	437.372 MHz	Amateur	800 mW	CMX 868	AX.25/CW	9600 baud GMSK	dipole	Alive	Aug 2017
7 July 2017	. ,								,				
	CICERO (3) Corvus-BC (2)	42846+	6U 6U	Endeavour UHF AstroDev Li-1	400.03 MHz 400.175 MHz	Experimental	1 W 2 W	Integrated Integrated		9600 baud GMSK 38400 baud GMSK	dipole monopole	DOA Dead	Aug 2017 Apr 2018
	(-)	3 -0 1		Globalstar	$1615~\mathrm{MHz}$	Experimental	750 mW	Integrated	Proprietary	QPSK	patch		
	Lemur-2 (8)	42837+	3U	Ka-TX AstroDev Li-1	26.8 GHz 401 MHz	Experimental Earth Exploration	2 W	Integrated	IP over DVB-S2	37 Mbps 9600 baud GMSK	horn dipole	Active	Aug 2017
Soyuz-2.1a/	Demui-2 (8)	42001+	30	SAT-SDR-2	401 MHz 2.02 GHz	Earth Exploration Earth Exploration	2 W 2 W			9600 baud GMSK 1 Mbaud QPSK	patch	Active	Aug 2017
Kanopus-V-IK/ ISILaunch-11	NanoACE		3U	Endeavour UHF	399.96 MHz	Experimental	2 W			9600 baud GMSK	dipole	DO:	Aug 2017
14 July 2017	MKA-N (2) Mayak		6U 3U									DOA DOA	Aug 2017 Aug 2017
	Iskra-MAI-85		3U									DOA	Aug 2017
	UTE-UESOR Flock 2k (48) ⁷	42850+	1U 3U+	LST	401.3 MHz	Earth-Exploration	1 W	Integrated	Proprietary	4800 baud GMSK	monopole	Dead Active	Aug 2017 Aug 2017
	1 10CK 2K (40)	44000+	3∪+	MRB1	401.3 MHz 8220 MHz	Earth-Exploration Earth-Exploration	1 W 1 W	integrated	IP over DVB-S2	4800 baud GMSK 70 Msps/200+ Mbps	monopole helical	Active	Aug 2017
1 STARS-C was a	tether experiment with th	na 9II and	1II soct	tions connected by 100 meter		_	W and date	a transceiver					

¹ STARS-C was a tether experiment, with the 2U and 1U sections connected by 100 meters of tether. Each end contained a CW and data transceiver on separate frequencies.

² BY70-1 and LilacSat-1 radios are almost identical. They contain a FM to Codec2-BPSK transponder. Analog FM audio on the VHF uplink frequency is digitized to Codec2 and transmitted via 9600 baud BPSK on UHF. ³ This CubeSat is basically a TubeSat deployer, with TANCREDO-1 and OSNSAT inside. They were deployed shortly after TuPOD deployed from the ISS.

⁴ Columbia and Atlantis are identical satellites.

⁵ ALTAIR-1 and SHARC were long CubeSats, which fit by themselves in the NanoRacks CubeSat Deployer (NRCSD) 6U ISS Deployer, which is about 72 cm long.

⁶ The BIRDS Project is organized by Kyushu Institute of Technology with five identical CubeSats from universities in Japan, Ghana, Mongolia, Nigeria and Bangladesh.

One of the Flock 2k CubeSats from Planet was never heard from in space. Additionally, a Lemur CubeSat was deployed at the wrong time and placed in a wrong orbit by the upper stage.

Version 17; Page 5 of 6. This chart shows the 757 total CubeSats deployed in orbit so far, for a total of 1937 Units. November 23, 2018.

Bryan Klofas. bklofas@gmail.com. Green are University or Educational CubeSats; Red are Commercial or Private; Blue are Government CubeSats, either US or non-US.

Deployment SS Hand Deploy	Satellite Tomsk-TPU-120	42910	Size 3U	Radio	Downlink 437.025 MHz	Satellite Service	Power	TNC	Protocol	Data Rate/Modulation	Antenna	Status	Nov
17 Aug 2017	Tanyusha (2)	42911+	3U		437.050 MHz						dipole		Nov 5
JPSS-1/	EagleSat-1 RadFXSat ¹	43018	1U 1U	Wood Douglas FM Transponder	437.645 MHz 145.960 MHz	Amateur Amateur	800 mW	N/A	AX.25 N/A	1200 baud AFSK FM	dipole	Active	Apr 2
ELaNa-14 18 Nov 2017	MakerSat-0 ² Buccaneer RRM	43016 43014	1U 3U+	EyeStar-S2 AstroDev He-100	1615 MHz	Experimental	1 W	Integrated	Proprietary		patch dipole	Alive	Apr 5
10 1101 2011	MiRaTA 3U	43015	3U	L3 Cadet	465 MHz	Meterological	1 W	Integrated	Proprietary	3 Mbps	dipole	Alive	Apr :
	ASTERIA EcAMSat	43020 43019	6U 6U	Vulcan Microhard MHX-2400	2.4 GHz		1 W	Integrated	Proprietary	Variable	patch	Active Alive	Apr Apr
paceX CRS-12/	Dellingr/RBLE	43021	6U	Stensat SRB-51-01 (beacon) L3 Cadet	437.100 MHz 465 MHz	Amateur Meterological	500 mW 1 W	Integrated Integrated	AX.25 Proprietary	1200 baud AFSK 3 Mbps	monopole dipole	Alive	Apr
ELaNa-22/ NRCSD-13	TechEdSat-6	43026	3.5U	Iridium Q9602	1616 MHz	Experimental	1 W	Integrated	Proprietary	о изорь	patch	Alive	Apr
21 Nov 2017				Cricket Wireless ISM	2410 MHz 2457 MHz						patch patch		
	OSIRIS 3U	43027	3U	CUBIT AstroDev Li-1	437.505 MHz	Amateur	1 W	Integrated	AX.25	38400 baud FSK	dipole		Apr
	ISARA	43050	3U	AdvRadio	915 MHz		1.3 W	Integrated	Description	1 Mbps	patch		Apı
				SDRadio ISARA	915 MHz 26 GHz		1.3 W 250 mW	Integrated	Proprietary	$500 \text{ kbps FSK} $ N/A^3	patch Reflectarray		
04.07	PropCube-2	43052	1U	Intrepid UHF Quasonix NanoTX	915 MHz 2340 MHz	Experimental ⁴ Experimental ⁴	$rac{2 ext{ W}}{2 ext{ W}}$			9600 baud GMSK 1 Mbps BPSK	dipole patch		Apr
OA-8/ ENRCSD	Lemur-2 (8)	43041+	3U	AstroDev Li-1 SAT-SDR-2	401 MHz 2.02 GHz	Earth Exploration Earth Exploration	2 W 2 W			9600 baud GMSK 1 Mbaud QPSK	dipole patch	Active	Ap
6 Dec 2017	AeroCube-7 B&C (2)	43042	1.5U	Freewave FGRM	915 MHz	Experimental		Intomotod	Dromminton		patch	Alive	Ap
	OCSD			SDRadio Laser	915 MHz 1064 nm	Experimental N/A	1.3 W 6 W	Integrated	Proprietary	500 kbps FSK 40 Mbps	patch		
	Asgardia-1	43049	2U	EyeStar D2 EyeStar S2	1620 MHz 1616 MHz	Experimental Experimental	1 W 800 mW	Integrated Integrated	Globalstar Globalstar	7 kbps 72 bps BPSK	patch patch		Ap
	CHEFSat	43044	3U	TOTO EDWITT	ADE FOR MIL		200 111	T	AVIOR	agon I I DDGV		D 1	Ap
	PICSAT CANYVAL-X Jerry	43131	3U 1U	ISIS TRXUV NanoCom	435.525 MHz 437.200 MHz	Amateur Amateur	200 mW	Integrated Integrated	AX.25 CSP	9600 baud BPSK 9600 baud	dipole turnstile	Dead	Ap Ap
	CANYVAL-X Tom		2U	NanoCom	437.200 MHz S-band	Amateur		Integrated	CSP	9600 baud 100 kbps	turnstile patch		Ap
	CNUSAIL-1 KAUSAT-5	43133	3U 3U	ISIS TRXVU	437.100 MHz 437.465 MHz	Amateur Amateur	500 mW	Integrated	AX.25	9600 baud BPSK 9600 baud FSK	dipole	DOA	Ap
	SIGMA (KHUSAT-3)		3U		435.780 MHz					9600 baud BPSK			Ap
	STEP CUBE LAB Flock-3P' (4)	43138 43119+	1U 3U+	LST	437.485 MHz 401.3 MHz	Amateur Earth-Exploration	1 W	Integrated	Proprietary	4800 baud GMSK	turnstile monopole	Active	Ap Ap
	Lemur-2 (4)	43123+	3U	MRB1 AstroDev Li-1	8220 MHz 401 MHz	Earth-Exploration Earth Exploration	1 W 2 W		IP over DVB-S2	70 Msps/200+ Mbps 9600 baud GMSK	helical dipole	Active	Ap
PSLV-C40/ CartoSat-2	DemoSat-2		3U	SAT-SDR-2 GomSpace AX100	2.02 GHz 401.6 MHz	Earth Exploration Experimental	2 W 1 W			1 Mbaud QPSK 115.2 kbps GMSK	patch monopole		Ap
12 Jan 2018		49199		SC2400	$2390~\mathrm{MHz}$	Experimental	3 W	T	D	8 Mbps QPSK	patch	A 1*	
	MicroMAS-2A Tyvak-61C	43132 43144	3U 3U	L3 Cadet	465 MHz	Meterological	1 W	Integrated	Proprietary	3 Mbps	monopole	Alive	Ap Ap
	SpaceBEE (4) Fox-1D (AO-92)	43139+ 43137	0.25U 1U	FM Transponder	137.95 MHz 145.880 MHz	Experimental ⁵ Amateur	100 mW 800 mW	N/A	N/A	FM	dipole dipole	Active	Ap
	Corvus-BC3	43118	6U	AstroDev Li-1 Globalstar	400.175 MHz 1615 MHz	Experimental Experimental	1 W 750 mW	Integrated Integrated	Proprietary	19200 baud FSK QPSK	monopole patch	Active	Ap
	4 1 1 64	40100	av.	Ka-band	$26.8~\mathrm{GHz}$	Experimental	$600~\mathrm{mW}$	Integrated	IP over DVB-S2	300 + Mbps	horn		
	Arkyd-6A	43130	6U	CC1101 BitBeam BBSDR	401.5 MHz 8475 MHz	Experimental Experimental	2.5 W 2.5 W	Integrated		40 kbps MSK	turnstile patch	Active	Ap
	CICERO-7	43143	6U	Endeavor UHF X-band	400.03 MHz		1 W	Integrated		9600 baud GMSK 2 Mbps	dipole patch		Ap
	KIPP	43157	3U		401 MHz 10.7 GHz	Space Operations Fixed-Satellite					dipole	Alive	Ap
	Xiaoxiang-2 (TY2)	43155	6U		435.350 MHz	Amateur				9600 baud GMSK	patch		Ap
ong March 11					2403 MHz 5833 MHz	Amateur Amateur				5 Mbps OFDM 5 Mbps OFDM	patch patch		
19 Jan 2018	QTT-1 (TY6)	43158	6U		436.100 MHz 2415 MHz	Amateur Amateur				9600 baud GMSK 5 Mbps OFDM	patch	Active Alive Dead Doad Active Active Active Active Active	Ap
	Then Enle:	42156	011	Tolomorkum	5667 MHz	Amateur				5 Mbps OFDM	patch		Α
	Zhou Enlai	43156	2U	Telemetry FM Repeater	437.350 MHz 436.950 MHz	Amateur Amateur							Ap
RocketLab	Dove Pioneer	43163	3U+	LST MRB1	401.3 MHz 8220 MHz	Earth-Exploration Earth-Exploration	1 W 1 W	Integrated	Proprietary IP over DVB-S2	4800 baud GMSK 70 Msps/200+ Mbps	monopole helical	Active	Ap
20 Jan 2018	Lemur-2 (2)	43165+	3U	AstroDev Li-1	401 MHz	Earth Exploration	2 W		II OVEL DVD-52	9600 baud GMSK	dipole	Active	Ap
Soyuz-2.1a/	Lemur-2 (4)	43182+	3U	SAT-SDR-2 AstroDev Li-1	2.02 GHz 401 MHz	Earth Exploration Earth Exploration	2 W 2 W			1 Mbaud QPSK 9600 baud GMSK	patch	Active	Ap
Kanopus-V 1 Feb 2018	D-Star ONE ⁶	43188		SAT-SDR-2	2.02 GHz 435.525 MHz	Earth Exploration	2 W 800 mW		D-Star	1 Mbaud QPSK	patch dipole		
1 160 2010	GomX-4 (2)	43196+	6U	NanoCom AX100	455.525 WIIIZ	Amateur	000 III VV	Integrated	CSP		turnstile		Ap
ong March 2D 2 Feb 2018	FMN-1	43192	2U	NanoCom SR2000 FM Transponder & data	435.350 MHz	Amateur		Integrated	CSP AX.25	6 Mbps 9600 baud BPSK	patch		Ap
	Shaonian Xing	43199	3U										Aŗ
SS-520-5 3 Feb 2018	TRICOM-1R	43201	3U	CPUT UTRX	460 MHz					1200 baud AFSK	turnstile		Ap
tlas-5/InSight	MarCo (2)	43458+7	6U	Iris Deep Space Transponder	8450 MHz	Space research	4 W	Integrated	CCSDS	62.5bps to 8Mbps	patch/Reflectarray	Active	No
5 May 2018 RemoveDebris ⁸	DS-1	43621	2U	SSTL Custom	S-band					250 kbps GMSK	patch		No
20 June 2018	DS-2	43680	2U	SSTL Custom	S-band					250 kbps GMSK	patch		No
	CubeRRT	43546	6U	L3 Cadet GlobalStar GSP-1720	465 MHz 1615 MHz	Experimental Experimental	2 W	Integrated	Proprietary	3 Mbps 9.6 kbps OQPSK	dipole patch		No
	EQUiSat HaloSat	43552 43549	1U 6U	XDL Micro L3 Cadet	435.550 MHz 460 MHz	Amateur	500 mW			9600 baud 4FSK 3 Mbps	dipole dipole	Alive Active	No No
	MemSat		1U	AstroDev Li-2 StenSat	437.350 MHz 437.350 MHz	Experimental				9600 baud BPSK 9600 baud BPSK	dipole	232.0	No
ygnus OA-9/ NRCSD/	RadSat-g		3U	AstroDev Li-2	437.350 MHz 437.425 MHz	Experimental Experimental	1.1 W	Integrated	AX.25	19.2 kbps GMSK	monopole	DOA	No
ELaNa-23	RainCube	43548	6U	Endeavour UHF Endeavour S-band							dipole patch	Alive	No
13 July 2018	TEMPEST-D	43547	6U	miniKaAR-C L3 Cadet	35.75 GHz 465 MHz	Space Research Experimental				3 Mbps	Fold-out dish dipole	Alive	No
				GlobalStar GSP-1720	1615 MHz	Experimental	2 W	Integrated	Proprietary	9.6 kbps OQPSK	patch	111110	
	EnduroSat One Radix	43551	1U 6U	EnduroSat UHF Type II GomSpace 100UL	437.050 MHz 401.3 MHz	Amateur Experimental	500 mW		AX.25	9600 baud GFSK	turnstile dipole		No No
	Lomin 2 (4)	43558+	3U	Lasercomm AstroDev Li-1	1550 nm 401 MHz	N/A Earth Exploration	2 W			9600 baud GMSK	dinala	Λ at:	NT -
	Lemur-2 (4)	45008+	ე ე ∪	AstroDev Li-1 SAT-SDR-2	401 MHz 2.02 GHz	Earth Exploration Earth Exploration	2 W 2 W			9600 baud GMSK 1 Mbaud QPSK	dipole patch	Active	No
Cygnus OA-9/ External/	Aerocube 12 (2)	43556+	3U	AdvRadio	915 MHz	Experimental	1.3 W	Integrated		1 Mbps MSK	patch	Active	No

² MakerSat-0 did not have any uplink capability.

³ ISARA was a tech demo for proving the antenna design, and only contained a CW modulator. Measuring the difference between a known patch antenna and the reflectarray showed the antenna provided around 33 dB of gain, see SSC18-VI-03.

⁴ PropCube-2 filed for an Experimental license after launch, which still has not been granted. FCC id 0281-EX-ST-2018.

⁵ The Experimental license was denied by the FCC, but these satellites were launched anyways.

⁶ This satellite was a copy of the satellite lost on the Meteor-M Fregat launch from Vostochny Cosmodrome on 28 Nov 2017. This satellite also has four identical D-Star transceivers, two for telemetry and two as an Amateur radio transponder.

⁷ While the twin MarCO CubeSats are in the database, they are in a heliocentric orbit. JSpOC only tracks satellites around earth. This is the first non-LEO CubeSat.

⁸ RemoveDebris is a 40kg SmallSat that was deployed from the ISS via the NanoRacks Kaber platform. It was brought up to the ISS on SpaceX/CRS-14 on 2 Apr 2018. The two 2U CubeSats were debris targets for this mission.

Version 17; Page 6 of 6. This chart shows the 757 total CubeSats deployed in orbit so far, for a total of 1937 Units. November 23, 2018. Bryan Klofas. bklofas@gmail.com. Green are University or Educational CubeSats; Red are Commercial or Private; Blue are Government CubeSats, either US or non-US.

Deployment	Satellite	Object	Size	Radio	Downlink	Satellite Service	Power	TNC	Protocol	Data Rate/Modulation	Antenna	Status	Update
	BHUTAN-1 ¹	43591	1U	Radiometrix BiM1H	145.825 MHz	Amateur	500 mW	TinyTrak4	AX.25	1200 baud AFSK	monopole	Active	Nov 201
Cygnus OA-9/				Addnics UHF	$437.375~\mathrm{MHz}$	Amateur	800 mW		CW/AX.25	20 WPM/9600 baud GMSK	monopole		
J-SSOD	MAYA-1 ¹	43590	1U	Radiometrix BiM1H	145.825 MHz	Amateur	500 mW	TinyTrak4	AX.25	1200 baud AFSK	monopole	Active	Nov 2018
10 Aug 2018				Addnics UHF	437.375 MHz	Amateur	800 mW		CW/AX.25	20 WPM/9600 baud GMSK	monopole		
10 Aug 2010	UiTMSat-1 ¹	43589	1U	Radiometrix BiM1H	145.825 MHz	Amateur	500 mW	TinyTrak4	AX.25	1200 baud AFSK	monopole	Active	Nov 2018
				Addnics UHF	437.375 MHz	Amateur	800 mW		CW/AX.25	20 WPM/9600 baud GMSK	monopole		
SS Hand Deploy	Tanyusha (2)	43597+	3U		437.050 MHz						dipole	Alive	Nov 2018
15 Aug 2018	SiriusSat (2)	43595+	1U		$435.570 \mathrm{MHz}$						dipole	Alive	Nov 2018
	$STARS-Me^2$	43640	2U		437.245 MHz	Amateur				1200 baud AFSK	monopole	Alive	Nov 2018
ISS/H-2B F7/	SPATIUM 1	43638	2U		400 MHz						monopole	DOA	Nov 2018
HTV-7					$467~\mathrm{MHz}$					Spread spectrum	monopole		
6 Oct 2018	RSP-00	43639	1U		145.890 MHz	Amateur			CW/AX.25	1200 baud AFSK	dipole	DOA	Nov 2018
					436.930 MHz	Amateur				38400 baud QPSK	dipole		
	CubeBel-1	43666	2U		436.990 MHz	Amateur				9600 baud GMSK	monopole	Alive	Nov 2018
Long March 2C/	Xiaoxiang 1-02 (TY1-02)		6U								turnstile		Nov 2018
CFOSAT	Tongchuan 1 (TY4-02)		6U		$435.925~\mathrm{MHz}$	Amateur				9600 baud GMSK	turnstile		Nov 2018
29 Oct 2018	Tianfuguoxing-1 (TY1-03)		6U								turnstile		Nov 2018
	Changshagaoxin (TY4-01)	43669	6U		$435.925~\mathrm{MHz}$	Amateur				9600 baud GMSK	turnstile		Nov 2018
H-2A F40/	Stars-AO	43679	1U		437.400 MHz	Amateur			CW/AX.25	1200 baud AFSK	monopole	Alive	Nov 2018
GOSAT-2					437.200 MHz	Amateur				115.2 kbps GMSK	monopole		
29 Oct 2018	AUTcube-2		1U		437.385 MHz	Amateur	800 mW			9600 baud GMSK	dipole	DOA	Nov 2018
	CICERO-10	43690	6U	Endeavor UHF	400.03 MHz		1 W	Integrated		9600 baud GMSK	dipole		Nov 2018
				X-band						$2~\mathrm{Mbps}$	patch		
RocketLab	IRVINE01	43693	1U	Intrepid UHF	437.800 MHz	Amateur			AX.25	9600 baud FSK	dipole	Alive	Nov 2018
11 Nov 2018	Proxima (2)	43694+	1.5U								patch		Nov 2018
	Lemur 2 (2)	43695+	3U	AstroDev Li-1	401 MHz	Earth Exploration	2 W			9600 baud GMSK	dipole	Active	Nov 2018
				SAT-SDR-2	$2.02~\mathrm{GHz}$	Earth Exploration	$2~\mathrm{W}$			1 Mbaud QPSK	patch		