2-way Voice and Data **Communications Over LEO**



Satellites

Baris DINC MoEP / TAMSAT December 2023



Amateur Satellite Organisation Turkiye

Content

- Who am I / who are we ?
- A brief history
- What is required ? How we do it ? Is it expensive ?
- Activities and the fun we had on satellites
- What's next ?





Who are we? (founding declaration of TAMSAT/MoEP)

Dear Radio Amateurs, esteemed Academicians, Students, Private Sector and Public Institutions Researchers Conducting R&D Studies in the Field of Space Science and Technology, dear young people, who first remember the words "The future is in the skies";

Today; Our country is one step closer to Space; March 25, 2010 is the day TAMSAT – Amateur Satellite Technologies Association was founded, but we have a long road of hundreds of steps ahead of us. Our association will provide research, development, application and training services regarding the project design, production and operation of amateur, scientific and similar satellites in our country; To present the projects it has carried out to the service of radio and radio amateurs and related users for amateur and scientific use, and to organize trainings and seminars to increase the number of young people with this knowledge and skills, to create research and development areas for the young people of our country on common issues of developing and widespread information technologies and amateur satellite systems. was established to ensure coordination and cooperation with national and international regulatory organizations when necessary. The achievement of this structure, the foundation of which was laid today, to its intended goals will accelerate with your contribution and support. We would like to see among us everyone who is interested in this subject, who is passionate about it, and who can spare some amateur time.

We wholeheartedly believe that, with your support, TAMSAT will achieve many successes in this newly opened horizon in our country.

"ALL TOGETHER FOR SUCCESS" Regards, A. Tahir DENGİZ, TA2T (SK) Chairman of the Executive Board 2010





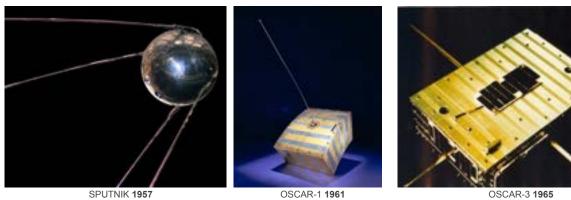
Radio Amateurs

it's not all about money

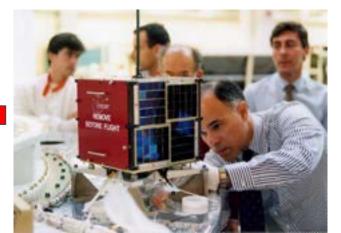
It's the hobby that takes you to your SPACE.....

Hi-story

OSCAR : Orbiting Satellite Carrying Amateur Radio



Launches (past and	(current)			
Name	Status +	Launched e	Country	•
OSCAR (OSCAR 1)	Decayed	1961-12-12	United States	
OSCAR II (OSCAR 2)	Decayed	1962-06-02	United States	
OSCAR III (OSCAR 3, EGRS-3)	Non-Operational	1965-03-09	United States	
DSCAR IV (OSCAR 4)	Decayed	1965-12-21	United States	
Australis-OSCAR 5 (OSCAR 5, AO-5, AO-A)	Non-Operatorial	1970-01-23	Australia	
AMSAT-OSCAR 6 (OSCAR 6, AO-6, AO-C, P2A)	Non-Operational	1972-10-15	United States	
AMSAT-OSCAR 7 (OSCAR 7, AO-7, AO-8, P28)	Semi-Operational	1974-11-15	United States	1974 - 19
AMSAT-OSCAR # (OSCAR 8, AO-8, AO-0, P2D)	Non-Operational	1978-03-05	United States	
Radio Sputnik 1 (RadioSkaf-1, RS-1)	Non-Operational	1978-10-26	Servicet Union	
Radio Sputnik 2 (RadioSkal-2, RS-2)	Non-Operational	1978-10-26	Soviet Union	
UoSwI-OSCAR 9 (UOSAT 1, UO-9)	Decayed	1961-10-06	100 United Kingdor	in i
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AMSAT-OSCAR 10 (Phase 38, AO-10, P38)	Non-Operational	1983-06-16	United States	



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DSLWP-A (OSCAR 93, LO-93)	Non-Operational	2018-05-20	China China
DSLWP-B (OSCAR 94, LO-94)	Operational	2018-05-20	China .
For-1Cill (OSCAR 95, AO-95)	Operational	2018-12-03	Mill United States
ExpendSol-1 (VUsat-OSCAR 96, VO-96)	Operational	2018-12-03	III India
JY 15at (Jordan-OSCAR 97, JO-97)	Operational	2018-12-03	Jordan -
Origemi5at (Fuji-OSCAR 98, FO-98)	Decayed	2019-01-18	Japon
NEXUS (Fuji-OSCAR 99, FO-99)	Decayed	2019-01-18	Jupon
Exhal 2 (Qatar-OSCAR 100, QO-100)	Operational	2018-11-15	Cotor
Dwate-2 (Philippines-OSCAR 101, PO-101)	Operational	2018-10-29	Thilippines
CAS-78 (BIT Progress-OSCAR 102, BO-102)	Decayed	2019-07-25	China .
BricSat-2 (Navy-OSCAR 103, NO-103)	Decayed	2019-06-25	Mill United States
PSAT-2 (Navy-OSCAR 104, NO-104)	Decayed	2019-06-25	Index States
SMOD-P (Magyar-OSCAR 105, MO-105)	Decayed	2019-12-06	= Hungary
ATL-1 (Magyar-OSCAR 106, MO-106)	Decayed	2019-12-06	Hungary
SMOG-1 (Magyar-OSCAR 110, MO-110)	Operational	2021-03-22	Hungary
DRY-1 (DIY-OSCAR 111, DO-111)	Decayed	2021-03-22	TT: Argentina
MIR-Sal 1 (MIRSAT-OSCAR 112, MO-112)	Decayed	2021-06-03	Mauritus
CAMBAT XW-3 (HO-OSCAR 113, HO-113)	Operational	2021-12-26	China .
EASAT-2 (Spain-OSCAR 114, SO-114)	Operational	2022-01-13	T Spain
HADES (Spain-OSCAR 115, SO-115)	Operational	2022-01-13	Spain
Sanctilat-1 (Nepal-OSCAR 116, NO-116)	Operational	2022-01-13	E Nepal
GreenCube (haly-OSCAR 117, IO-117)	Operational	2022-07-13	E E taly
Fenglal Shernian 2 (CAS-SA, Fenglai-OSCAR 118, FO-118)	Operational	2022-12-09	China China
XiWang-4 (Hope-OSCAR 119, HO-119)	Operational	2022-11-12	China L





What we need



A \$20 handheld transceiver

For better and reliable communications

- A good antenna
- Antenna rotator to follow LEO sats
- Antenna Controller Software
- Doppler Controller Software
- Radio (legacy or SDR)
- Amplifiers/preamplifiers

The Antenna







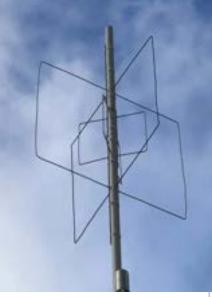


Sometimes, We go beyond mobility!



The size of antenna matters









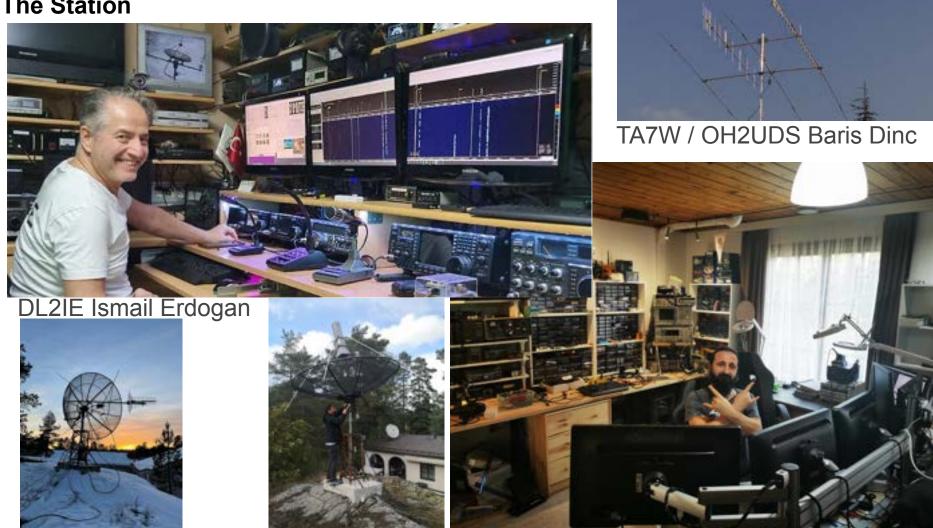




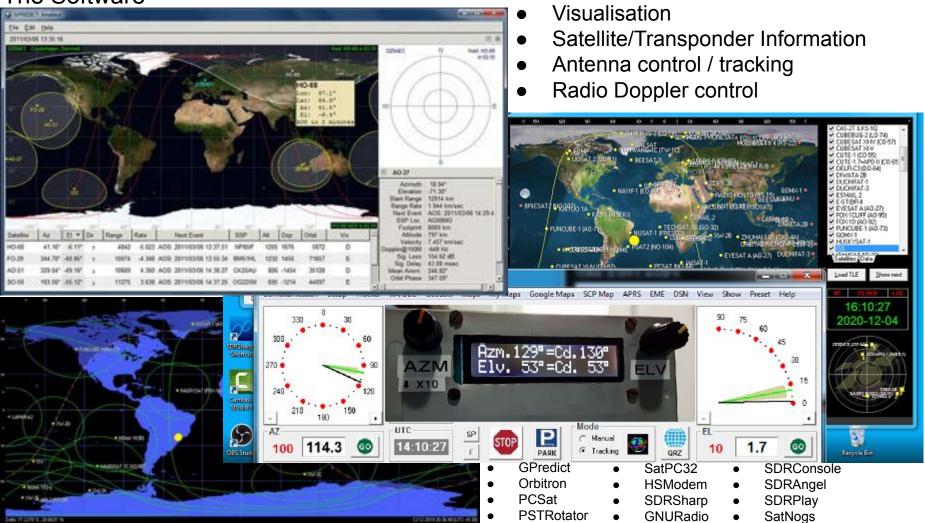
The Radio/Transceiver



The Station



The Software





Currently most Active Satellites

	1			1	1		· · · · · · · · · · · · · · · · · · ·
AO-7	(Phase-2B)	CO-55	(CUTE-I)	CubeBug-2	(LO-74)	CAS-3G	(DCBB,KAITUO-1B)
AO-7	(Phase-2B)	CO-57	(XI-IV)	AO-73	(FUNcube-1)	CAS-3H	(LilacSat-2)
UO-11	(UoSAT-2)	CO-58	(XI-V)	BugSat-1		AAUSAT-4	
AO-27	(EYESAT-A)	CO-65	(CUTE1.7+APDII)	TigriSat		CAS-2T	
FO-29	(JAS-2)	STARS	(KUKAI mother)	-			
			(CAS-3A	(XW-2A)	AISTECHSAT-2	
GO-32	(TechSat-1B)	STARS	(KUKAI daughter)				
				CAS-3B	(XW-2B)	UWE-4	
ISS		HO-68	(XW-1,CAS-1)	CAS-3C	(XW-2C)		
					(////-20)	CAPE-3	
ISS		STRaND-1		CAS-3D	(XW-2D)		
				-		UVSQ-Sat	
NO-44	(PCSAT-1)	Triton-1		CAS-3E	(XW-2E)		
SO-50	(SaudiSat-1c)	GOMX-1		CAS-3F	(XW-2F)	Z-Sat	
]L			

QO-100 Es'Hail-2 SAT

https://www.amsat.org/two-way-satellites/

ISS - Astronaut Contact





TEŞEKKÜR BELGESİ

AMATÖR UYDU TEKNOLOJILERI DERNEĞİ (TAMSAT)

Meteoroloji Genel Müdürlüğü organizasyonunda Uluslararası Uzay İstasyonundan astronot Victur J. Glover ile 09 Aralık 2020 tarihinde başarılı şekilde gerçekleştirilen amatlır telsiz görüpmesine desteklerinizden dolayı teşekkür eder, haşarılarınıran devamını dilerim.

Dr. Beikie PAK DE beiter

De Bekir PAKDEMIRLI Term vs Orman Bakant

Cubesat Training



PICTURES OF MARS (Imagined and drawn by KIDS and sent to Space by the Team)



20201213 2010 0 20201213 2006 0

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FOXHUNTING on the Satellites

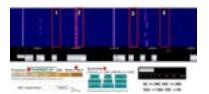


Fox Hunting on QO-100

15-16 MAY 2021











Virtual Mars Missions and Video Messages over Satellites



BURAK-1 MISSION MISSION INSTRUCTIONS

Video Mail Transmission Start (From Earth to Mars)

Arrival Time of the Signal to Mars (Time Delay: 14 Minute)

Resulation/Video Duration 1080p-60 Second

Thanks to all the radio amateurs who supported this educational work.

MARS on EARTH PROJECT (MoEP) VIRTUAL MARS MISSION DEEP SPACE NETWORK

www.marsonearthproject.org





We meet on satellite every Sunday...

Frequency 10.489.777.000 her pazar TSI : 21:00

Important Note: Turkiye is one of the few countries that 2.4 GHz band is not an HamRadio band in ITU/IARU countries

What Next?

戰



97 Dijital Role 628 Kamera 43 Sunucu 6148 Sensör 12 Santral 410 Erişim Noktası

300 MBps 100 MBps

1.4

"İstikbal Göklerdedir" K.ATATÜRK