

Space Japan Milestone

Broadcasting Satellite System Corporation (B-SAT)

B-SAT aims at stable operation of broadcast satellites
and continuity of BS broadcasting services

Broadcasting Satellite System Corporation (B-SAT) received a preliminary license for broadcast operations of BSAT-3a (the post-BSAT-1a satellite) from the Ministry of Public Management, Home Affairs, Posts and Telecommunications on June 9, 2004. B-SAT will develop an active business as a consignee broadcaster aiming to launch the satellite and beginning satellite operation in 2007. This article outlines B-SAT's business goals, present business activities, and equipment, touching on B-SAT's history.

(1) Business goals

B-SAT was established in April 1993, mainly by NHK, WOWOW, and other organizations involved in Hi-Vision broadcasting, for the purpose of satellite procurement and satellite control. At that time, B-SAT's mission was to launch BSAT-1 satellites (post BS-3) and take over the BS analog services provided by BS-3. The present business goals are as follows.

- Broadcast satellite procurement
- Control and management of broadcast satellites
- Commissioned broadcasting operations
- Transfer and/or leasing of broadcast satellite transponders
- All operations and business related to the above broadcast satellite services

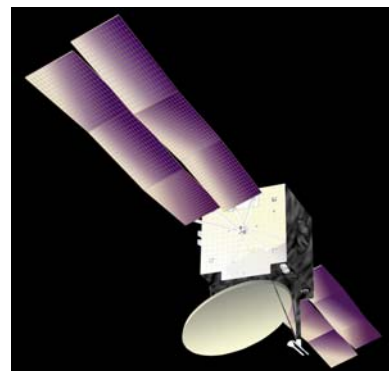
(2) Business activities

BSAT-1 business

BSAT-1a was launched as the main broadcasting satellite for BSAT-1 on April 17, 1997. It took over the BS analog broadcast services provided by BS-3 on August 1, 1997. As a backup, BSAT-1b was launched on April 29, 1998 and started operating on August 1, 1998. B-SAT's satellite control and management systems operate mainly out of Kawaguchi Satellite Control Center, with the Kimitsu Satellite Control Station acting as a backup. At present, the analog broadcasting of four channels, NHK BS-1 (ch 7), BS-2 (ch 11), Hi-Vision broadcasting (ch 9), and WOWOW (ch 5), is conducted using BSAT-1 satellites.



Broadcasting satellite BSAT-1



Broadcasting satellite BSAT-2

BSAT-2 business

In July 1998, B-SAT received a preliminary license for commissioned broadcasting operations of BSAT-2 as a consignee broadcaster transmitting the signals of BS digital broadcasting. Since then B-SAT has been preparing to procure BSAT-2 satellites for BS digital broadcasting and equipment for satellite control.

By international competitive bidding, B-SAT selected Orbital Sciences Corporation to manufacture BSAT-2 satellites. It also built more ground control equipment in Kawaguchi and Kimitsu Satellite Control Centers, completing them in June 2000. B-SAT also built uplink equipment for BS digital broadcasting in the NHK Broadcasting Center and at the site of NHK Shobu-Kuki Radio Transmitting Station. This work was completed in November 2000 through joint construction with NHK.

Although BSAT-2a was originally scheduled to be used for BS digital broadcast services, BSAT-1b was actually initially used instead from December 1, 2000, because the launch and manufacture of BSAT-2a were delayed. Later, BSAT-2a and 2c were successfully launched in March 2001 and June 2003, respectively, and BS digital services were shifted from BSAT-1b to BSAT-2a/2c.

At present, seven programs of digital Hi-Vision TV, three programs of digital SDTV (standard definition TV), and several programs of digital audio and data are being broadcast by 20 consignor broadcasters, using four transponders (ch 1, 3, 13, and 15) on BSAT-2a/2c. In addition, for BS digital broadcasting, B-SAT installed a service information (SI) collection and delivery system for electronic program guides (EPGs) for all channels and is now operating this system



Kawaguchi Satellite Control Center (main station)



Kimitsu Satellite Control Station
(unmanned backup station)



Uplink Center (main earth station: Shibuya)



Uplink Center (secondary earth station: Shobu)

because B-SAT was entrusted to do so by the consignor broadcasters.

Control of BS-3N

When the Kimitsu Control Center of the Telecommunications Advancement Organization of Japan (TAO) became unmanned in October 1998, B-SAT was commissioned by NHK and WOWOW to conduct BS-3N control operations. In November 1998, B-SAT started BS-3N control operations from Kawaguchi Satellite Control Center by remote control.

(3) Equipment

B-SAT's equipment is outlined in Tables 1 and 2.

Table 1 Satellites

	BSAT-1 satellites	BSAT-2 satellites
Size	Cylindrical type Diameter: 2.2 m Total length: 8 m	Cubic type Total length (solar panels are developed) BSAT-2a: 15.7 m, BSAT-2c: 11.5 m
Weight	720 kg (in orbit at the beginning of life)	BSAT-2a: 800 kg, BSAT-2c: 750 kg (in orbit at the beginning of life)
Transmitting output power	106 W	120 W
Orbital location	110 degrees east longitude	110 degrees east longitude
Design life	At least 10 years	At least 10 years
Posture stabilization	Spin-stabilized	Three-axis body stabilized
Manufacturer	Hughes (now Boeing)	Orbital Sciences
Launch rocket	Ariane 4	Ariane 5

Table 2 Earth stations

	For BSAT-1	For BSAT-2
Kawaguchi Satellite Control Center (main control earth station)	(for BSAT-1a) 9.2 m ϕ , 450 W	(for BSAT-2a) 9.2 m ϕ , 450 W
	(for BSAT-1b) 9.2 m ϕ , 450 W	(for BSAT-2c) 9.2 m ϕ , 450 W
	(for angle measurement, for common use) 9.2 m ϕ , 450 W	
Kimitsu Satellite Control Station (backup control earth station)	(for BSAT-1a) 6.4 m ϕ , 450 W	(for BSAT-2a) 6.4 m ϕ , 450 W
	(for BSAT-1b) 6.4 m ϕ , 450 W	(for BSAT-2c) 6.4 m ϕ , 450 W
Uplink Center (Shibuya) (main uplink earth station)	—	5.5 m ϕ , 140 W, 4 antennas
Uplink Center (Shobu) (secondary uplink earth station)	—	5.5 m ϕ , 140 W, 4 antennas