

SATCOMBw/Bundeswehrsats

Outlook

- First Bundeswehrsats launched in October 2009; second launched in May 2010
- Bundeswehrsats system declared operational in July 2010
- No further production is expected during the next 10 years
- German government is major shareholder in the selected contractor base

Orientation

Description. Bundeswehrsats is a constellation of two small, geosynchronous, military communications satellites with a network of mobile and static ground terminals.

Sponsor. The German Ministry of Defense (Deutsche Bundeswehr).

Status. Phase 2 implemented. Phase 2 preferred bidder chosen in 2007. Note that these phases are referred to as "steps" or "stages" by some sources. Satellites now operational.

Total Produced. Two. All contracts for terminals have been fulfilled, with more than 40 such units constructed: 14 multichannel, 26 single channel.

Application. Secure, dedicated satellite communications for the German armed forces (Bundeswehr), with network including aircraft, ships, vehicles, and fixed or transportable ground terminals.

Price Range. The Phase 1 contract awarded to ND Satcom was valued at approximately EUR35 million. A total of EUR935 million has been budgeted through 2013 for Phase 2. The final cost may total about EUR1.1 billion (\$1.3 billion).

Contractors

Prime

Astrium, Space Division	http://www.astrium.eads.net/en , 31, Ave des Cosmonautes, ZI du Palays, Toulouse, 31402 France, Tel: + 33 5 62 19 62 19, Fax: + 33 5 61 54 57 10, Prime
VEGA Group plc	8th floor, Vista Office Centre, Hounslow, TW4 6JQ United Kingdom, Tel: + 44 2082 304050, Fax: + 44 2082 304040, Email: aviationsales@vega.co.uk , Program Participant (Adaptation and Maintenance of Mission Control System)

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Subcontractor

General Dynamics C4 Systems, Gilbert Factory	http://www.gdc4s.com , 1721 W. Elliot Rd, Gilbert, AZ 85233 United States, Tel: + 1 (480) 892-8200 (SHF/UHF Systems)
Thales Alenia Space	http://www.thaleson-line.com/space , 26 ave JF Champollion, BP 1187, Toulouse, 31037 France, Tel: + 33 05 34 35 36 37, Fax: + 33 05 61 44 49 90 (Spacebus 3000B Satellite Bus)

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Technical Data

Design Features. The Bundeswehrrsat is built on a satellite bus provided by subcontractor Alcatel Alenia Space. Alcatel Alenia supplied a Spacebus 3000 satellite bus to prime contractor EADS Astrium. The Spacebus 3000 is one of the largest commercial communications satellites ever developed. It is a three-axis stabilized geosynchronous platform that accommodates payloads of up to 6.5 kW and 500 kilograms, for a satellite launch mass of up to 4,100 kilograms. The Spacebus 3000 is a 50-volt power bus that features four silicon panel solar arrays for up to

8.7 kW of power at end of life. Onboard propulsion is chemical bi-propellant with plasma, ion capability.

SHF/UHF systems were developed by General Dynamics C4 Systems. Bundeswehrrsat features 2.4-meter and 4.6-meter tactical and fixed VertexRSI antennas and radio equipment. It is capable of transmitting and receiving operation in C-band, X-band, and Ku-band frequencies. The Bundeswehrrsat's antennas support an array of broadband services, including video, Internet, and Bundeswehr military Intranet access.

Program Review

Background. The Bundeswehrrsat represents Germany's first dedicated military communications satellite, as well as the latest in a line of similar programs. This program presents two considerable differences from past attempts: it is unilateral, and it seems likely to succeed. The high priority of the program suggests that the Bundeswehr has become frustrated with the additional considerations of a multinational effort and has foregone the benefits of cooperative approaches in favor of expediency. Additionally, Germany has recently appeared to be spending more money on defense; the 2008 defense budget request included a 19.6 percent increase over 2007, to around \$38.4 billion.

Definition and Phase 1. ND Satcom AG was contracted to perform the definition study for the Bundeswehrrsat program and used this momentum to win a contract for work and equipment required for Phase 1. Originally, 26 mobile single-band ground terminals (running at 128 kbps) were offered, but reports indicate that only 24 were produced. This phase sought to work as much as possible with existing technology; legacy terminals were integrated, and the system is operational even without Phase 2 in place.

Phase 1 is now complete, using leased commercial communications satellites.

Phase 2. Phase 2 called for the production and launch of two small geosynchronous satellites, implemented incrementally through 2010. A third satellite has been discussed to be used as an in-orbit spare. Only two are required, and at this time only two have been contracted. Each satellite has an expected service life of 15 years. This constellation includes Germany's first dedicated military communications satellites. The satellite network features two distinct terminal systems: NATO-compatible transceivers acting as network nodes for mobile and fixed data network services and a smaller, portable terminal to be used for broadband services.

A team led by EADS Astrium Services was selected for Phase 2 development of the Bundeswehrrsat in July 2006. The \$1.3 billion program is managed by MilSat Services GmbH, a joint venture between Astrium Services (74.9 percent) and SES Astra subsidiary ND Satcom (25.1 percent) of Friedrichshafen, Germany. MilSat Services was responsible for development and integration of overall

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systems, which include the two military communications satellites and linked ground terminals. MilSat Services is contracted to provide launch services for the Bundeswehrrsat and provide commercial transmission capabilities via a subcontract for capacity on Intelsat satellites. The German Aerospace Center acts as a subcontractor for operation of the satellites and provision of dedicated data transmission services.

General Dynamics Selected for Bundeswehrrsat SHF/UHF Systems

General Dynamics C4 Systems, a business unit of General Dynamics located in Scottsdale, Arizona, was awarded a \$30 million contract for design and development of VertexRSI antennas and radio equipment for the Bundeswehrrsat program by MilSat Services. The award stipulates production and aftermarket support, with options through 2014. GDC4 was to provide 2.4-meter tactical antennas, 4.6-meter tactical antennas, and fixed antenna stations, in addition to other radio equipment. The equipment acquisition is part of Phase 2 development of the Bundeswehrrsat.

VEGA to Support Operation of Bundeswehrrsat/SATCOMBw

VEGA Group plc supported the operations of the Bundeswehrrsat satellite communications system, following the award of two contracts worth a total of EUR1.2 million. Under a December 2007 contract to the German Aerospace Center, VEGA IT GmbH, the German subsidiary of VEGA Group plc, managed the adaptation and maintenance of the mission control system and provided subsystem operations engineering support. The contracts ran until the end of 2009, and included options to extend work through 2010.

On October 1, 2009, COMSATBw-1 was launched from Europe's Spaceport in Kourou, French Guiana, on board an Ariane 5. COMSATBw-2 was also launched from Kourou on board an Ariane 5, on May 21, 2010. The system was handed over to the German armed forces and declared operational in July 2010.



Artist's Impression of the Bundeswehrrsats in Orbit

Source: EADS Astrium

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Apr	2002	ND Satcom begins production of Phase 1 components
May	2004	Bidding for Phase 2 complete
Early	2007	EADS/ND Satcom (MilSat Services) selected for Phase 2
Oct	2009	COMSATBw-1 launched on board Ariane 5
May	2010	COMSATBw-2 launched on board Ariane 5
Jul	2010	COMSATBw system declared operational

SATCOMBw/Bundeswehrsats**Forecast Rationale**

The Bundeswehrsats/SATCOMBw is a high-priority program for the Bundeswehr. As a dedicated military communications satellite, the Bundeswehrsats provides the German military with its own global broadband communications network. Previously, the Bundeswehr relied on leasing capacity on existing commercial communications satellites. Both Bundeswehrsats satellites have been delivered, which means the production phase of this program has come to an end.

The unilateral development of the Bundeswehrsats illustrates the importance of the program to the German military. It breaks from the traditional approach of engaging in multinational European efforts for military

satellite development. Furthermore, the German government is either a major shareholder or regulating body of the contractor and subcontractor base. The German military is clearly intent on ensuring the Bundeswehrsats receives the financial and material support it needs.

The first Bundeswehrsats was launched in October 2009, with the second launched in May 2010. Astrium handed over the system to the German armed forces in July 2010, when it was declared operational. The satellites are expected to have a lifespan of 15 years, so no further production is expected during the forecast period.

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