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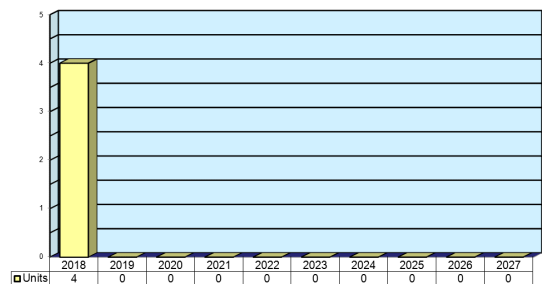
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Scipio

Outlook

- Production of the Scipio will cease with Brazil's final AMX fighter upgrade
- Brazil is procuring enough Scipios for 44 airframe upgrades, as well as enough to allow for spares
- Scipio production will end in 2018 instead of 2017, as Brazil has reduced the AMX upgrade budget

**Unit Production Forecast
2018-2027**



Orientation

Description. An airborne, multimode, I-/J-band (X-band) fire control radar.

Sponsor

Brazilian Air Force
Air Force Headquarters
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70045 Brasilia DF
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Licensee. The Scipio is a codevelopment of Galileo (now a part of Leonardo) and the Brazilian manufacturer Mectron.

Status. In production.

Application. Brazilian Air Force AMX aircraft in close support/ground attack roles. Reportedly, Scipio is also suitable for AV-8B, F-5, F-7M, and Mirage III/V/50 aircraft.

Price Range. Limited contract information has been released, making Scipio's unit price difficult to determine. Its price may be similar to that of the Grifo-X radar (\$851,000 in 2001 dollars), which has similar functions and has been installed on F-5E/F Tiger fighters.

Contractors

Prime

Leonardo Airborne & Space Systems	http://www.leonardocompany.com , Viale Europa s.n.c., Nerviano, Italy, Tel: + 39 0331 587330, Fax: + 39 0331 588106, Prime
SIATT	http://www.siatt.com.br , Centro Empresarial I, Sala 206, Est. Dr Altino Bondensan, 500, São José dos Campos, CEP 12247-016, Sao Paulo, Brazil, Tel: + 55 12 2012 0070, Email: contato@siatt.com.br , Second Prime

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

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Technical Data

Design Features. Scipio (SCP-01) is a lightweight (less than 72 kg), pulse-compression/pulse-Doppler airborne radar. It features a frequency-agile traveling wave tube (TWT) transmitter, a software-reconfigurable signal processor, and a color video output. The radar is integrated with the aircraft by means of a 1553 dual-redundant digital bus. In addition, Scipio has the ability to incorporate ground moving target indication (GMTI), terrain avoidance, and beacon modes.

Operational Characteristics. Little information has been released on the program. The following is a synopsis of the characteristics that have been revealed:

- X-band
- Air-to-air mode with look-down capabilities
- Air combat mode with automatic detection, designation, and tracking
- Sea mode for target detection and tracking for ASV operations
- Automatic multiple-target, track-while-scan mode
- Ground ranging and mapping for close air support
- Effective LPI approach and ECCM features
- MTBF of over 120 hours
- Extensive built-in test equipment



Platform for Scipio Radar System – The AMX Attack Jet

Source: Embraer

Program Review

Money Woes and Takeovers in Brazil

In 1987, Brazil's TECNASA received a contract to develop the Scipio radar in conjunction with the Italian firm Segnalamento Marittimo ed Aereo (SMA). The companies were expected to have the radar completed by 1994 and fitted to a Brazilian Air Force (Força Aérea Brasileira, or FAB) AMX aircraft by 1995.

The first Brazilian AMX aircraft was delivered in 1989, and by April 1992, 14 aircraft had been delivered to the FAB. Financial problems plagued the AMX production program throughout 1992 and early 1993, with the government unable to pay for the aircraft on the production line. Subsequently, these financial woes had

a knockdown effect on the subsystem sector, delaying Scipio production. In late 1993, a third production order was placed for 22 aircraft. This order ended the line in 1997, with 54 aircraft manufactured for Brazil. None of the AMX aircraft were fitted with Scipio, which was still under development. Among other activity in 1997, the Scipio contract was taken over by Tectelcom Aeroespacial.

By 2000, Mectron Engenharia had taken over the development of Scipio from Tectelcom Aeroespacial. The main reason cited for the cancellation was the consistent failure of Tectelcom to meet contract

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schedules. The part of the contract being executed by the Italian company Officine Galileo was retained.

Mectron then received a \$19 million contract for Scipio development and production. The development portion of the contract was worth \$4 million, and the remaining \$15 million was to be used to begin production of 54 Scipio radar systems. Mectron reported in late 2002 that development was proceeding well and that deliveries of the first production models were expected by mid-2003. At the time, two systems had been assembled and tested, with one fitted to an Embraer aircraft for flight tests. A third system had also been built, and a fourth was in the process of being assembled. The fourth unit was to be used as a reference model for production.

In April 2003 it was reported that shortfalls in the Brazilian budget had resulted in a re-ordering of the FAB's procurement priorities. The modernization of the AMX attack jet was now third in line, after the procurement of 76 ALX Super Tucanos and the modernization of Brazil's F-5 fleet.

Export Hopes Dashed

There were also hopes for a Scipio export order in late 1999 when Venezuela ordered the AMX-T. The country ordered an initial quantity of eight aircraft, with a 12-unit follow-on procurement likely. Scipio appeared to be a strong radar contender, but in 2002, Venezuela selected the IAI Elta EL/M-2032 radar for its AMX-T aircraft.

The Italian Air Force, which also has a fleet of AMX attack aircraft, initially intended to fit the Scipio system on its aircraft. Later, Italy decided to equip its AMX fleet with a radar system based on the Elta EL/M-2001B.

Contract Signed, but No Money

In August 2004, a \$400 million contract was signed for the modernization of Brazil's AMX fighters. A major part of the modernization effort would be the fitting of the Scipio SCP-01 radar on the AMX. Galileo Avionica stated that 60 SCP-1 Scipio radars would be produced.

However, even though the contract was awarded, no funds were made available. Three years later, in August 2007, Embraer received the first AMX jet from the FAB for the upgrade program. In April 2009, Selex noted that Mectron was responsible for some line replaceable units (LRUs) and that Mectron would be able to contribute radar support.

Further Upgrade of Brazil's AMX

In January 2011, Embraer and the Brazilian Air Force – FAB (Comando da Aeronáutica, or COMAER) signed a contract to overhaul 43 AMX jet fighters. According to Embraer, this deal complemented the previous contract signed in 2003 to modernize AMX fighters.

Embraer reports that with the new contract, the company will be able to more adequately prepare and ready the aircraft for their subsequent modernization, which will be conducted under an ongoing contract. The new contract ensured a more efficient and steady flow for the overall upgrade process, expediting the aircraft's return to operation.

In January 2011, *Defense News* reported that work on the earlier contract was ongoing.

Embraer reports that the original modernization contract focuses on an upgrade of the electronic systems of the AMX jets, called the A-1 by the FAB. This new agreement covers a structural overhaul and the repair and substitution of outdated equipment.

Contracts/Orders & Options

Contractor	Award (\$ millions)	Date/Description
Mectron	19.0	2000 – Award for the development and initial production of 54 Scipio radar systems.
Embraer	400	Aug 2004 – The Galileo Avionica/Mectron SCP-01 multimode radar is to replace a rangefinding system; 60 radars are to be produced. Contract also covers midlife upgrade of A-1A and A-1B AMX light attack/trainer aircraft.
Embraer	Undisclosed	Jan 2011 – Contract from the Brazilian Air Force to overhaul 43 of the FAB's AMX light jet fighters.

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Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Nov	1989	Start of Brazilian AMX deliveries
	1997	AMX production completed for Italy and Brazil
	1997	Contract for Scipio taken over by Tectelcom Aeroespacial
	2000	Mectron Engenharia assumes development of Scipio
Aug	2004	Contract awarded to Embraer for the midlife upgrade of AMX aircraft
Aug	2007	Embraer receives first AMX aircraft from FAB for update
Jan	2011	Embraer awarded contract to overhaul 43 AMX aircraft for FAB
	2018	Estimated completion of Brazilian AMX upgrade program

Worldwide Distribution/Inventories

Brazil is the only known customer of the Scipio radar.

Forecast Rationale

Brazilian Air Force AMX fighters (called A-1s in Brazil) are the only aircraft known to fly with the Scipio radar. An upgrade of these aircraft, including an electronics modernization, is ongoing, but it looks as if the related contract will be the last one involving the Scipio.

Scipio production was expected to conclude in 2017, but a reduction in Brazil's defense budget has caused the forecast end date to be pushed back to 2018.

There was hope that the Scipio could draw sales in association with the Latin America-specification Yak-130. Mectron, the Brazilian producer of the radar, had signed a deal that would make the Scipio a part of the aircraft's default electronics package. However, it does not appear that any sales of this version of the Yak-130 will occur.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program		High Confidence				Good Confidence			Speculative			
	Thru 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total
Leonardo Airborne & Space Systems												
Scipio <> Brazil <> Air Force <> AMX												
	43	4	0	0	0	0	0	0	0	0	0	4
Total	43	4	0	0	0	0	0	0	0	0	0	4