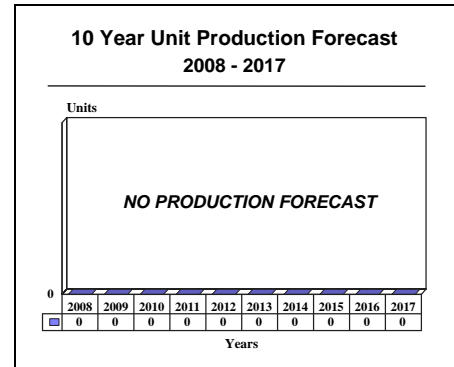


Jagdpanzer SK 105 - Archived 2/2009

Outlook

- Production remains dormant; Steyr-SSF no longer actively markets the SK 105/A2 light tank
- Steyr-SSF continues to offer modernization and retrofit packages for existing vehicles; the SK 105 remains in active service with seven nations
- Production forecast reflects the lack of solid prospects for SK 105/A2 sales during the forecast period



Orientation

Description. A light tank/tank destroyer.

Sponsor. Steyr-Daimler-Puch Spezialfahrzeug privately funded the initial development of this weapon system; the Austria Federal Ministry for National Defense sponsored the major portion of this program's development and serial production.

Licensees. None

Status. Development through serial production. The production line remains dormant following completion of the Brazilian export order in February 2001.

Total Produced. Through 2007, Steyr-SSF produced 660 SK 105 tanks.

Application. Armored mobile weapon systems, optimized for high-speed offensive and breakthrough operations, as well as for defensive fire support.

Price Range. In equivalent 2004 U.S. dollars (for the last year we can confirm any SK 105/A2 sales), the SK 105/A2 light tank carried a unit price of \$3.803 million.

Contractors

Prime

Steyr-Daimler-Puch Spezialfahrzeug GmbH	http://www.steyr-ssf.com , 2 Haidequerstrasse 3, PO Box 100, Vienna, 1111 Austria, Tel: + 43 760 64, Fax: + 43 769 81 49, Email: office@steyr-ssf.com, Prime
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Subcontractor

Compagnie Industrielle Des Lasers, CILAS	http://www.cilas.com , 8 avenue Buffon, BP 631, Orleans, 45063 France, Tel: + 33 02 38 64 15 55, Fax: + 33 02 38 76 02 49 (TCV29 Laser Rangefinder)
Diehl Defence	http://www.diehl-defence.de , Alte Nussdorfer Str. 13, Überlingen, 88662 Germany, Tel: + 49 075 51 8901, Fax: + 49 075 51 8928 22, Email: pr@diehl-va-systeme.de (SK 105 Track System)
ESW Extel Systems Wedel GmbH	http://www.esw-wedel.de , Industriestrasse 33, Wedel, 22876 Germany, Tel: + 49 4103 60 3671, Fax: + 49 4103 60 4503, Email: info@esw-wedel.de (WRSA Stabilization System)
Nexter Systems	http://www.nexter-group.fr , 11 Allée des Marronniers, Versailles, 78022 France, Tel: + 33 1 39 49 30 00, Fax: + 33 1 39 49 34 89, Email: presse@nexter-group.fr (105 G1 105mm Gun)
Voestalpine AG	http://www.voestalpine.com , Voest-Alpine Strasse 1, Linz, 4020 Austria,

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	Tel: + 43 732 6585 0, Fax: + 43 732 6585 9311, Email: presse@voestalpine.com (SK 105 Turret)
Zahnradfabrik Friedrichshafen AG	http://www.zf.com, Graf von Soden Platz 1, Friedrichshafen, 88046 Germany, Tel: + 49 07541 77 0, Fax: + 49 07541 77 908000, Email: postoffice@zf.com (6 HP 600 Automatic Gearbox)
NOTE(S): In October 2003, General Dynamics acquired Steyr-Daimler-Puch Spezialfahrzeug AG & Co KG. The firm, also known as Steyr-SSF, operates as a component of General Dynamics European Land Systems.	

Comprehensive information on Contractors can be found in Forecast International's "International Contractors" series. For a detailed description, go to www.forecastinternational.com (see Products & Samples/Governments & Industries) or call + 1 (203) 426-0800.

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

Technical Data

Crew. Three: commander, driver, gunner.

Armor. This light tank features conventional armor, effective against 20mm armor piercing (AP) rounds

over the frontal arc and 40mm AP rounds on the turret front. Appliqué armor can increase the level of protection to defeat 35mm Armor Piercing Discarding Sabot (APDS) rounds over the frontal arc.

Dimensions. The following data reflect the SK 105/A1; data for the SK 105/A2 is in parentheses where different.

	<u>SI Units</u>	<u>U.S. Units</u>
Length	7.76 (8.73) m	25.46 (28.64) ft
Width	2.51 meters	8.23 ft
Height	2.53 (2.76) m	8.30 (9.06) ft
Combat weight	17.52 (20.7) tonnes	19.31 (22.82) tons
Fuel capacity	400 (420) liters	106.38 (111.7) gal

Performance. The maximum speed and range data reflect use on a paved road.

	<u>SI Units</u>	<u>U.S. Units</u>
Maximum speed	65.3 kmph	40.57 mph
Maximum range	520 km	322.92 stat mi
Step	80 cm	2.62 ft
Trench	2.41 m	7.91 ft
Slope	40%	40%
Gradient	75%	75%
Fording	1.1 m	3.61 ft

Engine. Steyr Model 7FA liquid-cooled, six-cylinder, supercharged diesel engine. This powerplant generates 238.72 kilowatts (320 hp), with a power-to-weight ratio of 13.63 kilowatts per tonne (16.57 hp/ton). The 24-volt electrical system features an SJ 30 three-phase 28-volt generator and voltage regulator from Extel Systems Wedel; two 12-volt/180 ampere-hour batteries are standard.

Gearbox. The earlier models featured the Zahnradfabrik Friedrichshafen S6-70/3 manually operated gearbox, with one reverse and six forward gear ratios. The S6-70/3 used a single dry-plate clutch and hydrostatic split torque-type steering.

All subsequent models feature the Zahnradfabrik Friedrichshafen 6 HP 600 automatic gearbox, with the same number of gear ratios.

Suspension and Running Gear. Torsion bar suspension, with five dual-tire roadwheels and three return rollers on each side; the drive sprockets mount to the rear. The first and last roadwheel stations mount hydraulic shock dampers. The hydraulic brake system is the disc type. Diehl Group/Tracks and Suspension Systems Division provides the complete track system, featuring rubber-block track shoes.

Armament

Main Armament. Nexter Systems (formerly Giat Industries) 105 G1 (an improved version of the

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CN-105-57) 105mm gun. This weapon feeds from twin 6-round magazines, located in the rear of the turret. Elevation (+12°), depression (-8°), and turret traverse are hydraulically powered in the basic SK 105; these functions are all-electric in the SK 105/A2. The SK 105/A2 also features a fully stabilized main gun system, using the WRSA system supplied by Extel Systems Wedel. The basic SK 105 carries 42 main armament rounds; the SK 105/A2 carries 38 rounds for the 105mm main gun.

Secondary Armament. One 7.62x51mm NATO (.308 Winchester) coaxially mounted MG 42/59 machine gun with 2,000 rounds of ammunition. Steyr produces the MG 42/59 under license from Beretta; the Beretta MG 42/59 is, in turn, a licensed copy of the Rheinmetall MG3. Each side of the turret mounts three electrically operated smoke grenade launchers.

Fire Control. The basic SK 105 features an oscillating turret, designated JT1. Voest Alpine produces the turret under license, based on the Fives-Cail Babcock FL-12.

The SK 105/A2 features a new-design fully stabilized oscillating turret, also broadly based on the FL-12. Due to the oscillating turret design, all sights are permanently boresighted to the main and secondary armament; the oscillating portion of the turret is fully stabilized in the SK 105/A2.

The SK 105/A2 also features a digital computer-based fire control system with two automatic and seven manual inputs. An infrared periscopic sight features six-power magnification and a 7° field of view. The fire control suite also features a Compagnie Industrielle des Lasers TCV29 laser rangefinder and an XSW-30-U 950-watt infrared searchlight. The commander's station has seven periscopes and a periscopic sight with variable 1.6 to 7.5 power magnification. The gunner's station also has two observation periscopes and a telescopic sight with eight-power magnification.

Variants/Upgrades

Variants. Steyr-SSF has produced the following SK 105 variants:

Designation	Description
Command Tank	Standard SK 105, mounting additional communications equipment. Botswana purchased two of this variant in 1999.
4KH7FA-FA Fahrerschulpanzer	Driver training conversion of standard SK 105. Each standard SK 105 can convert to this configuration in two hours.
4K7FA-SB20 Greif	Armored Recovery Vehicle (ARV) with a crew of four; entered production in 1976. A hydraulic crane, 20-tonne winch, and dozer blade are standard. It is in service with Argentina (9), Austria (39), Bolivia (2), Botswana (2), Brazil (1), Morocco (10), and Tunisia (3).
4KH7FA-AVE Pioneer	This engineer vehicle is essentially the Greif, with a different winch and a larger dozer blade. A hydraulically operated excavator mounts at the rear of the vehicle. It is in service with Austria (19) and Tunisia (2).

Modernization and Retrofit Overview. Steyr-SSF offers customers an upgrade program to retrofit basic SK 105 to the SK 105/A2 standard. An appliqué armor package (see **Technical Data**, above) is also available for retrofit. Major features of the SK 105/A2 retrofit package include:

- Repositioning the XSW-30-U searchlight to the right-front of the turret.
- New hydraulic bump stops.

- Increased capacity batteries.
- A Halon 1211-based fire extinguishing system.
- The complete SK 105/A2 fire control suite, with thermal sights or third-generation night vision devices.

Steyr-SSF also offers a desert-operations kit for the SK 105/A2, featuring a cyclone-type air filtration system, uprated engine cooling system, and sand shields.

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Program Review

Background. In the mid-1960s, Sauer Werke (later a component of Steyr-Daimler-Puch) developed the original version of this light tank, nicknamed Kürassier, based on a redesigned Sauer armored personnel carrier chassis.

Corporate Evolution

In October 2003, General Dynamics acquired Steyr-Daimler-Puch Spezialfahrzeug AG & Co KG. Also known as Steyr-SSF, this firm now operates as a component of General Dynamics European Land Systems Division.

Description. The all-welded steel hull features a conventional three-part hull arrangement, with the driver in the front, fighting compartment in the center, and the powerpack to the rear. The basic armor suite provides protection against 20mm Armor Piercing rounds over the frontal arc. The driver sits to the left front of the hull; the driver's station features periscopes and a single-piece hatch cover. The vehicle batteries and some ammunition storage are located to the right of the driver.

Optimized for Hull-Down Positions

The license-built JT1 turret (the French-designed Fives-Cail Babcock FL-12) weighs 4.5 tonnes (4.95 tons). This oscillating-type turret enables the main armament mount to be much closer to the turret roof than in more conventional installations, minimizing exposure when the tank operates from defilade ("hull-down") positions.

The main armament fires the same 105mm OCC105 F1 ammunition as the AMX 30 tank, but at a lower (800 meters per second) muzzle velocity. Standard ammunition types available are:

- High Explosive Anti-Tank (HEAT)
- High Explosive (HE)
- Smoke
- Target Practice (TP)

Addition of the French-made Armor Piercing Fin Stabilized Discarding Sabot (APFSDS) OFL105 F1

round increases the gun's effectiveness against modern composite armor.

The semi-automatic loader in the JT1 turret is a proven design, featuring two 6-round drums in the turret bustle. The action is semi-automatic after manual loading of the first round.

The vehicle provides individual nuclear, biological, and chemical (NBC) protection for each crewmember. Automatic firefighting equipment is standard, as is cold weather equipment, such as a diesel oil heater.

SK 105/A1: Prototype

The SK 105/A1 design differs from the basic model in that it includes an automatic gearbox and an advanced fire control system, including a new digital fire control computer, laser rangefinder, and new sights. However, this model never entered serial production; the SK 105/A2 superseded the SK 105/A1 design concept.

SK 105/A2: Production Model

In 1978, Steyr-SSF began development of an improved SK 105 model, prompted by advances in tank armor protection. While this model was to be interim to the proposed SK 105/A3, it ultimately became the series standard when the SK 105/A3 program failed to generate any interest.

The SK 105/A2 incorporates many of the proposed features of the SK 105/A3, including integration of a new design all-electric fully stabilized turret, based on the earlier JT1. In 1980, production of the new SK 105/A2 began; firing trials began in 1981. The SK 105/A2 is now the production standard of this system.

Still in Service

The Jagdpanzer SK 105 remains in service with seven nations. In late 2004, the Austrian Army (Österreichs Bundesheer) deployed six SK 105/A2 light tanks to Kosovo in support of Task Force Dulje. This multinational battalion-level force assigned to KFOR consisted of troops from Austria, Germany, and Switzerland.

Significant News

General Dynamics Posts 2007 Results – For 2007, General Dynamics reported sales of \$27.2 billion, up 13 percent from 2006 sales of \$24.1 billion. Net income for the year was \$2.1 billion, up 11 percent from the \$1.9 billion reported in 2006. The company's funded backlog for 2007 increased \$3.2 billion to a record \$46.8 billion.

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Revenue for the fourth quarter 2007 was \$7.5 billion, compared to fourth-quarter 2006 revenue of \$6.5 billion. General Dynamics' fourth quarter 2007 net income was \$579 million, compared to 2006 net income of \$408 million.

"General Dynamics generated solid returns in the fourth quarter of 2007," said General Dynamics Chairman and Chief Executive Officer Nicholas D. Chabreja. "Highlights of the quarter included significant revenue and earnings growth in the Combat Systems group on strong combat-vehicle sales, including Abrams tank modernization and Stryker production, as well as significant sales and earnings increases in the Aerospace group."

Chabreja reported the status of other company segments: "Marine Systems once again improved margin rates, on a modest increase in sales volume, contributing to another year of strong performance across the corporation. Notably, total backlog in the Information Systems and Technology segment grew \$300 million on the strength of \$3 billion in orders, reflecting a book-to-bill ratio of 1.2."

INDUSTRY SEGMENT SALES

Aerospace had 2007 sales of \$4.8 billion, compared with 2006 sales of 4.1 billion. Operating income rose to \$810 million compared with \$644 million in 2006.

Combat Systems posted 2007 sales of \$7.8 billion, compared with \$6.0 billion in 2006. Operating income rose to \$916 million for the year, compared with \$677 million in 2006.

The Marine segment remained stable at \$5.0 billion in 2007. Year 2007 operating income rose to \$421 million, compared with \$375 million in 2006.

The Information Systems and Technology segment reported sales of \$9.60 billion, compared with \$9.0 billion in 2006. Operating income rose to \$1.0 billion for the year, compared with \$976 million in 2006. (FI, 1/08)

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Funding

Steyr-Daimler-Puch Spezialfahrzeug initially funded the SK 105 program as a private venture. The Austrian Federal Ministry for National Defense subsequently provided developmental and production funding for the SK 105 program.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1965	Sauer Werke initiates development
	1967	First SK 105 prototype rolled out
	1972	Initial production deliveries
Early	1980s	Development of SK 105/A2 begins
	1997	Export sale to Botswana
	1999	Botswana order complete; production dormant
Feb	2000	Brazil places order, production restarted
	2001	Brazilian order complete; production dormant
	2008	Production remains dormant; available for new orders

Worldwide Distribution/Inventories

Export Potential. The SK 105 has done rather well on the export market. Before 1988, the fact that Austria could not possess or operate missiles of any type (including MILAN and TOW anti-tank missiles) severely hindered SK 105 marketing. Changes in this legal restriction could resurrect the SK 105 program, should Steyr-SSF opt to retrofit the SK 105 as an anti-tank or air-defense missile platform.

Jagdpanzer SK 105

Countries. **Austria** (286 units in service); export sales confirmed to **Argentina** (112), **Bolivia** (34), **Botswana** (50), **Brazil** (17), **Morocco** (111), and **Tunisia** (42).

Forecast Rationale

The Jagdpanzer SK 105 light tank/tank destroyer production line remains dormant. Steyr-SSF has not received any orders for new-production SK 105 vehicles since completing the orders for Botswana and Brazil in February 2001.

While Steyr-SSF no longer actively promotes the SK 105 on the international market, the contractor reportedly continues to offer modernization and retrofit packages for existing vehicles.

Still Soldiering On

The SK 105 remains in service with seven nations. In late 2004, the Austrian Army (Österreichs Bundesheer) deployed six SK 105/A2 light tanks to Kosovo in support of Task Force Dulje. This multinational battalion-level force assigned to KFOR consisted of troops from Austria, Germany, and Switzerland

New Sales Potential?

Despite the availability of much more modern designs, the relatively low-cost SK 105 might still be a viable weapon system. Before 1988, the fact that Austria could not possess or operate missiles of any type (including MILAN and TOW anti-tank missiles) severely hindered SK 105 marketing. Changes in this legal restriction could resurrect the SK 105 program, should Steyr-SSF opt to retrofit the SK 105 as an anti-tank or air-defense missile platform.

End in Sight?

Our 10-year production outlook reflects a lack of solid prospects for SK 105/A2 sales during the forecast period. If no new orders materialize by the midterm of the forecast period, we will consider the SK 105 program to be obsolete and effectively terminated. In the meantime, we will monitor the program for any new signs of life.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

Vehicle	(Engine)	thru 07	High Confidence Level				Good Confidence Level				Speculative			Total 08-17
			08	09	10	11	12	13	14	15	16	17		
STEYR-SSF GMBH														
SK 105A1/2	MODEL 7FA	660	0	0	0	0	0	0	0	0	0	0	0	0
Total Production		660	0	0	0	0	0	0	0	0	0	0	0	0



Austrian Army SK 105/A2 Light Tank

Source: Austrian Army

Jagdpanzer SK 105



Austrian Army SK 105/A2 Light Tank

Source: Austrian Army



Business End of an Austrian Army SK 105/A2 Light Tank

Source: Austrian Army