

# ARCHIVED REPORT

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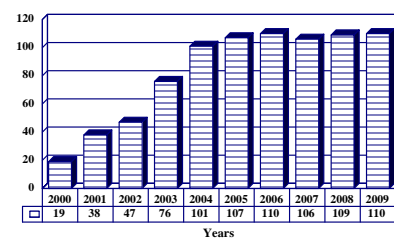
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## K9 155 mm Self-Propelled Howitzer - Archived 4/2000

### Outlook

- K9 in low-rate serial production
- A total of 823 systems forecast to be manufactured in the coming ten years
- Some modernization and retrofit potential

10 Year Unit Production Forecast  
2000 - 2009



### Orientation

**Description.** A tracked 155 millimeter self-propelled artillery system

**Sponsor.** The development and eventual procurement of the K9 is being sponsored by the Republic of Korea Ministry of National Defense, Agency for Defense Development, through the Republic of Korea Army.

**Contractors.** This self-propelled artillery system is being developed and is being manufactured by Samsung Shipbuilding and Heavy Industries, Seoul, Republic of Korea. Major subcontractors on the program include General Motors Corporation/Allison Transmission Division, Motoren- und Turbinen-Union and Tong Myung.

**Licensees.** None

**Status.** The development of this system is largely complete with the first prototype/developmental systems being tested and evaluated. The initial low rate serial production is ongoing.

**Total Produced.** As of January 1, 2000, three prototype/developmental XK9 systems had been manufactured.

**Application.** General mobile artillery support for the field army at the battalion level.

**Price Range.** While difficult to determine at this stage of the program, based on input from knowledgeable sources plus the comparison of similar technologies, we project the K9 unit price at \$3.505 million in equivalent 2000 United States dollars.

### Technical Data

**Crew.** The K9 has a crew of six: commander, layer, two loaders, radio operator and driver.

**Muzzle Brake.** The 155 mm 52 caliber cannon used on the K9 has a double-baffle type muzzle brake.

**Recoil System.** Hydropneumatic

**Breech Mechanism.** Not known at this time, although it is semi-automatic in operation.

**Ammunition.** This new self-propelled artillery system is compatible with all US/NATO standard 155 mm ammunition types. These include High Explosive, High Explosive Base Bleed, High Explosive Rocket Assisted

Projectile, carrier projectiles, smoke, illumination and chemical projectiles. In addition, the K9 is compatible

with all types of Extended Range Full Bore projectiles, including those with Base Bleed.

**Dimensions.** As of this writing, no detailed dimensional data of the K9 have been released. However, a number of sources state that the tracked K9 is similar in size and appearance to the British Artillery System 90 when fitted with a 52 caliber cannon. The overall length of the K9 is around 12 meters (39.36 feet), and the width is around 3.4 meters (11.15 feet). The overall height is around 3.28 meters (10.76 feet) and the combat weight is around 47 tonnes (51.81 tons).

**Performance.** As of this writing, no detailed performance data have been released for the K9. One source stated that the K9 has a 67 kilometer per hour (41.63 mile per hour) top speed and that the vehicle has a 30% slope and 60% gradient capability. The fuel capacity is reliably put at 847 liters (225.3 gallons) giving a range of around 360 kilometers (223.6 statute miles). The range of the 52 caliber cannon has been placed by most sources as being 40,000 meters (43,744 yards); this is with the Extended Range Full Bore/Base Bleed round. The burst rate of fire is three rounds in fifteen seconds, while the sustained rate of fire is around three rounds a minute for one hour.

**Engine.** The diesel engine used in the K9 is the Motoren- und Turbinen-Union MB 881 Ka 500 liquid cooled powerplant. This engine is rated at 745.7 kilowatts (1,000 horsepower) at an engine speed of 45 revolutions per second (2,700 revolutions per minute). One source states that the K9 is fitted with an unspecified auxiliary power unit, almost certainly diesel-powered. A 24 volt electrical system is used.

providing the Hydrogas suspension units through the Tong Myung licensee. The K9 has six dual-tired road wheels with the drive sprocket to the front and idler at the rear. One track return roller is on each side.

**Gearbox.** The K9 system is fitted with the Allison Transmission X1100-5A3 automatic gearbox with four forward and two reverse gear ratios.

**Fire Control.** The K9 has been designed from the outset with a rapid target engagement and disengagement (shoot and scoot) capability. The K9 is autonomous in operation. A modular azimuth position system is fitted in conjunction with another automatic navigation and positioning system in the automatic fire control suite.

**Suspension and Running Gear.** The K9 is fitted with a hydropneumatic type suspension system with Air Log

## Variants/Upgrades

**Variants.** No variants are known to be planned for this new artillery system at this time.

production. However, in order to maintain its effectiveness, some modernization and/or retrofit programs will most likely be developed for the K9 system.

**Modernization and Retrofit Overview.** Not applicable at this time as this artillery system has yet to enter serial

## Program Review

**Background.** Beginning in the early eighties, the Republic of Korea decided to modernize the self-propelled portion of its artillery park with a new 155 millimeter self-propelled howitzer. To this end, Samsung Shipbuilding and Heavy Industries obtained a license from United Defense (then BMY Combat Systems) to manufacture the M109A2 under license. Subsequently, a total of 1,038 M109A2 systems were manufactured under license in a program that ended in the late nineties.

was the rapidly growing acceptance of the Extended Range Full Bore technology pioneered by the late Doctor G. V. Bull. To this end, even as the serial production of the M109A2 was ongoing, the Koreans began the development of a new self-propelled artillery system with a 52 caliber cannon. Any details regarding the timeline or any other aspect of the development of the new self-propelled artillery system had yet to be released as of the time of this research. The initial development was undertaken by the Republic of Korea's Ministry of National Defense through the Agency for Defense Development; Samsung Shipbuilding and Heavy Industries is the associated contractor. The Koreans revealed the program to the world in mid-1996, calling the system XK9; the "X" has since been dropped from the name. It is possible that a

However, the M109A2, with its 39 caliber M185 cannon, was becoming deficient in terms of range performance even in the early eighties; 45 caliber cannon were already in production and the development of 52 caliber cannon was ongoing. Concurrent to this

type designation will eventually be given to the K9 which is called the Thunder.

**Description.** As of early 2000, only a moderate amount of detailed information had been released on the K9. Some of the technical details of the system, especially regarding the dimensions and fire control are still not known. The K9 is stated by some observers as being based on the M109A2, while others state that it is

based on the Artillery System 90. The powerpack and driver are at the front of the vehicle with the turret of the new artillery system positioned to the rear. A rapid engagement capability is built into the system, enhanced by an automatic ammunition handling and loading system. One source states that the K9 can engage a target within 15 seconds of target designation. The K9 entered serial production in 1999 with the first service deliveries expected in the immediate future.

## Funding

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The Republic of Korea Ministry of National Defense, Agency for Defense Development, through the Republic of Korea Army is funding the development and procurement of the K9.

## Recent Contracts

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Not available as contractual information is not released.

## Timetable

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This timetable is for the K9 program only.

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Mid	1980s	Development and design initiated
June	1996	Program revealed
Through	1998	Development and testing of prototypes ongoing
Late	1998	Procurement of first 68 K9 systems announced
	1999	Serial production began
Early	2000	Final testing of prototypes ongoing as serial production for service deliveries is under way

## Worldwide Distribution

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**Export Potential.** Presently, we forecast no export for the K9, at least for several years. However, the Republic of Korea has become much more aggressive in the international armored vehicle market of late, and this trend is expected to now include the K9.

**Countries.** **Republic of Korea** (three prototype/developmental systems with first service deliveries imminent)

## Forecast Rationale

As of early 2000, the first service deliveries of the K9 are imminent. This new 155 millimeter self-propelled howitzer will greatly enhance the capability of the South Korean artillery park and is expected to become a mainstay therein.

The information that our latest research into the K9 program (including the desired procurement objective) has uncovered prompts us to forecast a total procurement of around a thousand systems. However, this number could be reduced due to the increased capability of the new system.

## Ten-Year Outlook

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### ESTIMATED CALENDAR YEAR PRODUCTION

Ordnance	(Engine)		High Confidence Level				Good Confidence Level				Speculative			Total 00-09
			through 99	00	01	02	03	04	05	06	07	08	09	
SAMSUNG AEROSPACE LIMITED														
K9 <sup>(a)</sup>	UNKNOWN		3	19	38	47	76	101	107	110	106	109	110	823
Total Production			3	19	38	47	76	101	107	110	106	109	110	823

(a) The through 1999 production includes the initial developmental and operational test systems, three in number.