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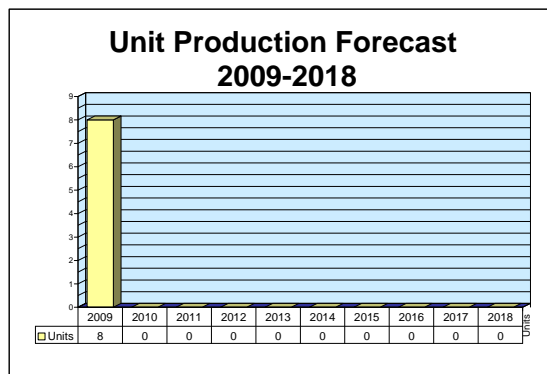
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Type 87 Twin 35mm Self-Propelled Anti-Aircraft Artillery System

Outlook

- Low-rate serial production continues, exclusively for JGSDF procurement
- Minimal modernization and retrofit potential during forecast period
- Production forecast reflects JGSDF procurement objective of 109 units through 2009



Orientation

Description. A tracked, self-propelled, anti-aircraft artillery system.

Sponsor. The Japanese Ministry of Defense, through the Japan Ground Self-Defense Force (JGSDF), sponsors the development and JGSDF procurement of the Type 87.

Licensees. None

Status. Development through low-rate serial production.

Total Produced. Through 2008, we estimate the contractor produced two prototypes and 101 production Type 87 systems.

Application. A mobile anti-aircraft artillery system, providing tactical air defense for maneuver units.

Price Range. In 2009 U.S. dollars, the complete Type 87 system reportedly maintains a unit price of \$10.1 million.

Contractors

Prime

Mitsubishi Heavy Industries (MHI) Ltd	http://www.mhi.co.jp , 16-5 Konan 2-chome, Minato-ku, Tokyo, 108-8215 Japan, Tel: + 81 3 6716 3111, Fax: + 81 3 6716 5800, Prime
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Subcontractor

Nihon Seiko Co Ltd	http://www.nihonseiko.co.jp , 3-2 Shimomiyabi-chu, Shinjuku-ku, Tokyo, 162-0822 Japan, Tel: + 81 3 3235 0021, Fax: + 81 3 5261 7335 (Licensed KDA 35mm Cannon)
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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. Four: commander, driver, gunner, and loader.

Cannon Type. Twin Oerlikon-Contraves model KDA.

Caliber. 35mm

Breech Mechanism. Positive lock, reciprocating bolt.

Recoil System. Hydromechanical

Ammunition. The 35mm KDA ordnance fires the following standard 35x228mm ammunition types:

- High-Explosive Incendiary (HE-I and HE-I-T)
- Semi-Armor Piercing High-Explosive Incendiary-Tracer (SAPHE-I-T)
- Target Practice (TP and TP-T)

Dimensions. The following data reflect the production-standard Type 87.

	<u>SI Units</u>	<u>U.S. Units</u>
Length	6.30 m	20.67 ft
Width	2.95 m	9.68 ft
Height	3.23 m	10.60 ft
Combat weight	41.7 tonnes	45.97 tons
Fuel capacity	950 liters	252.66 gal

Performance. The automotive performance data reflect use on a paved road.

	<u>SI Units</u>	<u>U.S. Units</u>
Maximum speed	53 kmph	32.91 mph
Maximum range	300 km	186.3 stat mi
Step	1.01 m	3.31 ft
Trench	2.70 m	8.86 ft
Slope	40%	40%
Gradient	60%	60%
Fording	99 cm	3.25 ft
Elevation	+85 deg	+85 deg
Depression	-10 deg	-10 deg
Traverse	60 deg	360 deg
Effective cannon range	4.0 km	4,374.44 yd
Effective radar range	10.0 km	10,936.11 yd
Rate of fire (per cannon)	550 round/min	550 round/min

Engine. Mitsubishi Type 10 ZF Type 22 air-cooled, supercharged 10-cylinder diesel engine. This power-plant generates 559.5 kilowatts (750 hp), with a power-to-weight ratio of 13.42 kilowatts per tonne (16.31 hp/ton).

The 24-volt electrical system supports vehicle operations. Unconfirmed reports suggest the vehicle may mount an auxiliary power unit.

Gearbox. Mitsubishi MT 75A manual gearbox, with one reverse and five forward gear ratios. The driver

employs double differential steering to control the vehicle.

Suspension and Running Gear. Adjustable hydro-pneumatic suspension, with five dual-tired roadwheels on each side. There are no track return rollers. The drive sprocket mounts to the rear. The driver and commander can adjust the suspension from their respective crew stations.

Fire Control. The Type 87 features an all-weather capability. Major components include search-and-track

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radar, an optical tracking system, a laser rangefinder, and possibly a low-light electro-optic viewing system.

Variants/Upgrades

Variants. None. The Type 87 is a variant of the Type 74 tank.

Modernization and Retrofit Overview. Not applicable at this time; we expect no significant modernization and retrofit activity for this system during the forecast period.



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Source: Japan Ministry of Defense

Program Review

Background. The Japan Ground Self-Defense Force (JGSDF) air defense studies of the 1970s led to a licensed-production agreement with Oerlikon-Contraves for the model KDA 35mm anti-aircraft ordnance in 1979. Earlier, in 1978, the JGSDF had awarded Mitsubishi a contract worth \$4.09 million for the development of a new twin 35mm anti-aircraft artillery system, designated the AW-X.

Mitsubishi delivered the initial fire control system in 1980. The JGSDF awarded the individual development and production contracts for the prototype turret, turret stabilization, and drive system development in 1981; full-scale engineering development began in 1983. Mitsubishi delivered the first two prototype systems in late 1984 and early 1985. Following extensive

contractor and service evaluations, initial low-rate serial production began in late 1989. The JGSDF then designated the new weapon system the Type 87.

Description. The Type 87 mounts on the chassis of an existing Type 74 tank.

Japan's Answer to the Gepard

Generally similar in concept to the Swiss-German Gepard, the Type 87 features an all-weather capability with a single dual-mode (acquisition/tracking) radar and advanced fire control suite. The Nihon Seiko Company produces the Oerlikon KDA ordnance under license. Elevation (+85 degrees), depression (-10 degrees), and turret traverse (360 degrees) are electro-hydraulic.

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Urgent JGSDF Procurement

The Japan Defense Agency (now the Japan Ministry of Defense) originally held a procurement objective of 180 self-propelled air defense systems during the FY80 through FY84 timeframe. This objective reflected an urgent JGSDF requirement for a medium-caliber rapid-fire anti-aircraft artillery system to complement its short-range air defense (SHORAD) network of surface-to-air missiles. The JGSDF met its objective of forming eight anti-aircraft defense groups by the end of 1984; by 1989, these eight groups were to field the Type 87.

Requirements vs. Fiscal Realities

Despite the perceived urgency of the JGSDF requirement for the Type 87, budgetary constraints forced delays and reductions in the Type 87 program. Research indicates that the JGSDF now maintains a procurement objective of 109 systems, plus the initial two prototypes. At the current production rate, we expect Mitsubishi will complete the Type 87 serial run in 2009.

Related News

Japan's Former Prime Minister Speaks on the U.S., Japan, and China – Former Prime Minister of Japan and Diet Member Shinzo Abe recently spoke at the Brookings Institution in Washington, DC. Forecast International was invited to attend. At the event, Abe reflected on Secretary of State Hillary Clinton's visit to Japan on her first trip overseas after taking office, a visit that demonstrated the importance of the Pacific Rim to national interests.

Abe commented, "She [Clinton] said, in Tokyo, that she wanted to strengthen the [U.S./Japan] alliance. I agree. We must work on that. She also said that she wanted to tackle not only bilateral issues but also global issues. She then went on to say that cooperation would be required between the U.S.-Japan alliance and China to tackle issues of global concern. I could not agree more. These three nations, the U.S., Japan and China, three of the largest economies in the world, must join hands whenever necessary, and with greater frequency than ever before, to tackle issues of global magnitude."

The former prime minister reminded the audience that his first foreign trip was a fence-mending trip from Japan to China. "My trip laid the foundation for a bilateral relationship that is win-win for both sides. The Japanese and the Chinese are now enriching what we call our 'mutually beneficial strategic relationship.' I think that I did a job that was vital because, as I said just now, China must work with us.

"That being said, I must touch on the Chinese military buildup. I will not go into detail, as you have many experts at Brookings. I will say very little, for example, on their aircraft-carrier programs, or about what they are doing in the Pakistani port town of Gwadar. Look at the Chinese defense budget, which has been showing continuous double-digit growth for more than 20 years. The Chinese maintained initially that it was only to increase the salaries of soldiers. But this has not been verified."

Prime Minister Abe went on to say that "I would like you to join me in saying to the Chinese that what matters is transparency, transparency, and transparency. At any rate, for its neighbors, China poses great uncertainties. Its defense programs, economic management, environmental damage, and its society, which is being shaken by the mounting frustration of the poor segment of its population, are all reasons for concern. That is why Japan and the U.S. must invest more into our time-honored alliance bound by the same set of common values, especially when our great neighbor China is undergoing such a shaky, transformative period of growth." (FI, 4/09)

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Funding

The Japan Ministry of Defense, through the Japan Ground Self-Defense Force (JGSDF), funds the development and JGSDF procurement of the Type 87.

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Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1972	Japanese air defense study establishes AW-X requirement
	1978	Engineering development
	1981	Start of licensed production of Oerlikon KDA ordnance
	1982-1989	Mitsubishi completes fabrication of two turrets for trials
		Testing and evaluation
Late	1989	Initial low-rate serial production
	2009	Serial production ongoing, exclusively for JGSDF procurement

Worldwide Distribution/Inventories

Export Potential. None. The Japanese Constitution forbids the export of armaments. Consequently, the Type 87 has no export market impact.

Country. Japan (two prototypes, 101 production systems).

Forecast Rationale

Low-rate serial production of the Type 87 twin 35mm self-propelled, anti-aircraft artillery system is reportedly ongoing, exclusively for the Japan Ground Self-Defense Force (JGSDF) revised procurement objective of 109 units. This revised objective will enable the JGSDF to fully equip five of its eight anti-aircraft defense groups. At the current production rate, the Forecast International Weapons Group expects Mitsubishi Heavy Industries to complete the production run in 2009.

A Robust System

Open-source reporting suggests the JGSDF has found the Type 87 to be a robust, trouble-free system. This is due in no small part to the integration of proven components, such as the 35mm KDA ordnance and the Type 74 tank chassis. Although the JGSDF will likely integrate upgraded fire control and automotive components at some point, we do not expect any significant modernization and retrofit programs to emerge during the forecast period.

Outside the International Market

As Japanese law precludes the export of military hardware, the Type 87 has no export potential. Consequently, the weapon system has no direct impact on the international market. This may actually be a blessing in disguise for the Japanese contractors, as the traditionally high unit prices of Japanese weapons systems would quickly price the Japanese players out of the international market.

Only Game in Town?

Our **Ten-Year Outlook** reflects what we expect to be the final year of the Type 87 serial production run, exclusively for JGSDF procurement. Without additional JGSDF procurement, the Type 87 production line faces shutdown after 2009.

Beyond the current forecast period, we expect the center of gravity for the Type 87 program to shift to the modernization and retrofit of systems currently in JGSDF service. The Type 87 will likely remain a primary component of Japan's SHORAD network throughout the forecast period.

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Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program		High Confidence				Good Confidence			Speculative			Total
	Thru 2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
Mitsubishi Heavy Industries (MHI) Ltd												
Type 87												
	103	8	0	0	0	0	0	0	0	0	0	8
Total	103	8	0	0	0	0	0	0	0	0	0	8