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Pilatus PC-9 – Archived 10/2010

Outlook

- The PC-9 is not currently in production, but it is available for order from Pilatus. The company reported no new orders for PC-9s in either 2007 or 2008
- The new PC-21 is the newest trainer developed by the Pilatus and makes the PC-9 largely superfluous in Pilatus lineup
- No new production of PC-9 currently forecast

Orientation

Description. Tandem-seat, single-engine, high-performance, turboprop-powered military flight training aircraft.

Sponsor. Pilatus Aircraft Ltd, Stans, Switzerland.

Licensee. Hawker de Havilland Ltd, Bankstown, NSW, Australia. Hawker de Havilland was responsible for final assembly, flight testing, and delivery checks, and also produced the aircraft's wings. Aerospace Technologies of Australia (ASTA) was responsible for the aircraft's fuselage.

Status. Production as required.

Total Produced. Through 2007, Pilatus and Hawker de Havilland delivered approximately 276 PC-9 aircraft.

Application. Military primary, intermediate, transition, aerobatic, and armament training.

Price Range. PC-9M estimated at \$6.0 million, fully equipped, in 2009 dollars.

Contractors

Prime

Pilatus Aircraft Ltd	http://www.pilatus-aircraft.com , PO Box 992, Stans, 6371 Switzerland, Tel: + 41 41 619 61 11, Fax: + 41 41 610 92 30, Prime
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Subcontractor

Hartzell Propeller Inc	One Propeller Pl, Piqua, OH 45356-2656 United States, Tel: + 1 (937) 778-4200, Fax: + 1 (937) 778-4321 (Four-Blade Propeller)
Honeywell Aerospace, Defense & Space Electronic Systems - Minneapolis	http://www51.honeywell.com/aero/ , 2600 Ridgway Pkwy, Minneapolis, MN 55413 United States, Tel: + 1 (612) 951-6444, Fax: + 1 (612) 951-6516 (Display)

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Martin-Baker Aircraft Co Ltd	http://www.martin-baker.com , Higher Denham, Near Uxbridge, UB9 5AJ Middlesex, United Kingdom, Tel: + 44 0 1895 832214, Fax: + 44 0 1895 832587, Email: information@martin-baker.co.uk (Ejection Seats)
Pratt & Whitney Canada	http://www.pwc.ca , 1000 Marie-Victorin Blvd, Longueuil, J4G 1A1 Quebec, Canada, Tel: + 1 (450) 677-9411, Fax: + 1 (450) 647-3620 (PT6A-62 Turboprop)

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

	<u>Metric</u>	<u>U.S.</u>
Dimensions		
Length overall	10.14 m	33.25 ft
Height overall	3.26 m	10.696 ft
Wingspan	10.19 m	33.5 ft
Weight		
Basic weight, empty (typical)	1,725 kg	3,803 lb
Max takeoff weight (utility)	3,200 kg	7,055 lb
Performance		
Max operating speed	593 kmph	320 kt
Max cruise speed	502 kmph	271 kt
Ceiling (with underwing stores)	12,191 m	40,000 ft
Range(a)	1,593 km	860 nm
Takeoff distance over 50 ft (15 m) obstacle (S/L)	397 m	1,300 ft
Landing distance over 50 ft (15 m) obstacle (S/L)	687 m	2,255 ft
Propulsion		
PC-9M	(1)	UTC Pratt & Whitney Canada PT6A-62 axial-centrifugal-flow turboprop engine, flat-rated to 708.4 kW (950 shp), driving a four-bladed, constant-speed, fully feathering Hartzell propeller.
PC-9 Mk II	(1)	PT6A-68 engine flat-rated to approximately 1,250 shp.

Armament

Three hardpoints under each wing, capable of carrying 250 kg (551 lb) inboard, 110 kg (242.5 lb) center, and 110 kg (242.5 lb) on outboard pair; maximum capacity of 1,040 kg (2,993 lb).

(a) Max range at cruise power at 5,000 m (16,400 ft), 5 percent plus 20-minutes' reserve.

Variants/Upgrades

PC-9/A. Pilatus designation for aircraft built under license in Australia for the Royal Australian Air Force.

PC-9B. Specially configured PC-9 for the target-towing role. In service with Swiss and German air forces.

PC-9M. Improved variant with modified single-engine/propeller control system to improve handling; increased-scale tailplane with larger dorsal strake for better longitudinal stability; reduced stick forces; new wing-root fairing to improve low-speed characteristics;

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new T-tab at tailplane rear to facilitate trimming; and exciter strips on wing leading edge for better stall characteristics. Optional Flight Vision 2000 HUD and an onboard oxygen-generating system are also offered.

T-6A. Modified Mk II variant selected in June 1995 for the USAF/USN JPATS requirement (see "Hawker Beechcraft T-6A Texan" report in this tab for details).

Program Review

Background. The piston-powered Pilatus PC-3 led directly to development of the PC-7 Turbo Trainer in the mid-1970s, and the latter became one of the three top turboprop-trainer aircraft in the world.

While Pilatus' success became noteworthy during the late 1970s and early 1980s, the market for trainers was changing rapidly. New high-performance fighter and light attack aircraft were entering the world's inventory at a frenzied pace. Consequently, training programs were restructured, sometimes eliminating one or more types. Traditionally, training began in a general aviation piston single (*ab initio*), and then transitioned to the primary trainer, usually a dedicated piston or turboprop aircraft. An intermediate stage, typically in a first-generation turbojet, then led to the final, advanced stage in another turbojet/turbofan aircraft. The market began to recognize the need to reduce the number of stages and aircraft to reduce both cost and time to qualification. Thus, Pilatus initiated design studies of the PC-9 trainer during the early 1980s, and the program was officially announced in January 1984.

The PC-9 is powered by the PT6A-62 engine, and its max takeoff weight is 299.37 kilograms (660 lb) greater than that of the PC-7. Other important differences from the PC-9's predecessor include a lengthened nose and a longer cockpit and canopy. While visible differences between the PC-9 and PC-7 do not appear to be great, the former is, in fact, an all-new design rather than a reworked variant of its predecessor. The PC-9 provides the ability to go from an *ab initio* trainer to an advanced trainer, skipping an intermediate stage. For example, Saudi Arabia uses the PC-9 and then transitions to the Hawk for advanced training, eliminating a traditional step.

BAE and Pilatus Link for AST 412

British Aerospace and Pilatus teamed in 1984 to promote the PC-9 as the RAF's 150-unit Jet Provost

trainer replacement for the AST 412 competition. In that competition, however, the Shorts/Embraer team won the award with a modified variant of the EMB 312 Tucano.

Despite the RAF's selection of the Tucano, the BAE/Pilatus team remained intact, and BAE played a major role in organizing a 30-unit sale to Saudi Arabia in 1985 as part of the Al Yamamah deal, which also involved Tornados and Hawks. Pilatus began production of an initial 10-unit batch of PC-9s in 1985, and subsequently logged a four-unit sale to Burma. First deliveries were made in 1986.

RAAF Order

In December 1985, Australia chose the PC-9 as its new basic trainer and ordered 67 units. The first two were delivered from the Pilatus line, and the Swiss manufacturer then shipped six units in kit form to Australia for local assembly. Nine more followed with an increased Australian content. Hawker de Havilland was prime contractor, with Aerospace Technologies of Australia (fuselage fabrication) and HdH Victoria (airfoil manufacture) the major subcontractors. HdH completed deliveries of Australian-built aircraft in 1992.

711 JPATS Required

The Joint Primary Aircraft Training System (JPATS) requirement is for 711 trainers to replace the U.S. Navy's T-34Cs and the Air Force's T-37s. Pilatus and Beech teamed in 1990 to propose a variant of the PC-9, with the new variant eventually designated T-6A, and this was selected as the finalist in June 1995. The T-6A is covered in a separate report under its current maker, Hawker Beechcraft.

Pilatus has since announced a much upgraded PC-21 model, incorporating some of the features of the PC-9M.

Funding

There is no information available on Pilatus development funding. Forecast International estimates PC-9 engineering and development costs at \$50 million.

Pilatus PC-9

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Early	1980s	Initial design studies
Jan	1984	PC-9 announced
Mar	1984	BAE/Pilatus team for AST 412 competition
May	1984	Prototype first flight
Sep	1985	30-unit Saudi order announced
Dec	1985	RAAF contract for 67 units announced
Early	1986	Initial production deliveries
Dec	1987	Deliveries of HdH-built PC-9 begin
Dec	1992	PC-9 Mk II production prototype first flight
Jun	1995	PC-9 Mk II/T-6A selected as JPATS finalist
	2000	PC-9 line believed closed down
	2002	Ireland orders eight PC-9Ms
Dec	2003	Bulgaria orders six PC-9Ms

Worldwide Distribution/Inventories

(July 2009)

Operator	Designation	Quantity
Australia Air Force	PC-9	65
Bulgaria Air Force	PC-9M	6
Croatia Air Force	PC-9M	17
Ireland Air Force	PC-9	8
Mexico Air Force	PC-9M	2
Myanmar Air Force	PC-9	10
Oman Air Force	PC-9	12
Saudi Arabia Air Force	PC-9	48
Slovenia Army	PC-9	2
Slovenia Army	PC-9M	9
Switzerland Air Force	PC-9	11
Thailand Air Force	PC-9	24
Note: In addition, approximately 15 have been sold to civil/commercial customers.		

Forecast Rationale

Pilatus did not announce any new orders for the PC-9 in either 2007 or 2008. The aircraft is still available for order, but production appears to have ended. Bulgaria said at one time that it intended to acquire about six additional PC-9s, but no order has been reported to date.

Pilatus announced in February 2006 that it had received an order for 10 PC-7 Mk II trainers from Malaysia. The Mk II shares the fuselage of the PC-9, and the primary difference between the two aircraft is the Mk II's derated PT6A-25C turboprop, which gives it slightly

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reduced performance in exchange for lower operating costs. Pilatus delivered four of the 10 Mk IIs ordered by Malaysia in 2006 and completed the order during 2007.

customers seeking attrition replacements or to expand existing fleets, but the newer, more flexible PC-21 is likely to be the choice of future customers.

Pilatus appears ready to restart production of the PC-9 should orders arrive. It may sell additional units to

Ten-Year Outlook

No production forecast.

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