Antonov/Aviastar An-124/225

Outlook

- Russian government has announced plans to fund production of 20 new An-124s for Russian Air Force
- Antonov requires at least 40 orders to break even and justify costs of restarting production
- Russia's United Aircraft Corporation and Ukraine's Antonov plan a joint venture to produce new An-124s, but evidence of progress on restarting production was lacking at end of 2010

Orientation

Description. Four- and six-engine, intercontinental-range, heavy-lift military and commercial cargo transports.

Sponsor. Sponsored by former Soviet Ministries of Defense, Transport, and Aviation Industries.

Status. The An-124 line closed in late 2004.

Total Produced. One An-225, 55 An-124s.

Application. Transport of containerized and palletized military and commercial cargo, large military and commercial vehicles, and engineering equipment such as mining machinery, refinery towers, large pumps, and compressor sets.

Price Range. An-124, approximately $200 million in 2010 dollars.

Contractors

Prime

Aviastar-SP	http://www.aviastar-sp.ru, Prospekt Antonova, 1, Ulyanovsk, 432072 Russian Federation, Tel: + 7 8422 281022, Fax: + 7 8422 210039, Prime

Subcontractor

Gidroagregat JSC	78, Communisticheskaya St, Pavlovo, Nizhegorodsky Region, 606130 Russian Federation, Tel: + 7 8317161516, Fax: + 7 8317134260 (Autopilot Servo, E-H, 2-Channel; Booster & Hydraulic, E-H, 1-Channel)
TsSKB Progress, Progress Central Specialized Design Bureau	http://www.samspace.ru, 18 ulitsa Pskovskaya, Samara, 443009 Russian Federation, Tel: + 7 8462 55 13 61, Fax: + 7 8462 97 18 86, Email: mail@progress.samara.ru (D-18T Engine)

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

Antonov/Aviastar An-124/225

Technical Data

(An-124/AN-225)

Design Features. Shoulder-wing designs with double-bubble-type fuselage cross-section. An-124 has single swept vertical stabilizer and conventional cruciform horizontal stabilizers, each with a twin-section elevator. An-225 has a double-tail section with two section rudders and three-section elevators inboard of the fins. Nose, cockpit, and fuselage cross-sections of the two aircraft are identical. Nose section hinges upward under hydraulic actuation. An-225 fuselage stretched about 15 meters. An-124 and An-225 wings are identical but for a new center section to the An-225 to accommodate two additional D-18T engines. Five-axle, twin-wheel main gear units on each side of lower fuselage; seven-axle units on An-225.

	Metric	U.S.
Dimensions		
Overall length	69.10/84.00 m	226.70/275.59 ft
Overall height	20.78/18.10 m	68.175/59.38 ft
Wing span	73.30/88.40 m	240.48/290.02 ft
Weight		
Max TOW	405,000/602,000 kg	892,863/1,327,169 lb
Max payload	150,000/250,000 kg	330,690/551,150 lb
Fuel load	230,000/320,000 kg	507,058/705,472 lb
Capacities		
Fuel	284,328/395,584 liters	75,120/104,514 gal
Performance		
Max cruise speed	865/850 kmph	467/458 kt
Range with max fuel	16,500 km/N/A	8,900 km/N/A
Range with max payload	4,500 km/N/A	2,430 km/N/A

Propulsion

An-124 Ruslan	(4)	MKB Perm Progress/Lotarev D-18T, three-spool, high bypass ratio.
An-225 Mriya	(6)	D-18T turbofan engines.

Seating/Accommodation

An-124: Crew of six (pilot, copilot, two flight engineers, navigator, and communications officer). Aft of cockpit and just ahead of wing carry-through structure on the upper deck are all personal-care facilities and provisions for relief crew of six. Area aft of wing carry-through structure on upper deck accommodates 88 passengers.
An-225: Same cockpit and crew amenities station complement as offered by the An-124. Passenger compartment can hold only 70 passengers because of the larger size of the center wing box.

N/A = Not Available.

Variants/Upgrades

An-124. Similar to the Lockheed C-5A/B in configuration, payload, range, and mission, the An-124 was the world's largest aircraft when it first flew in 1982. The aircraft has since set many records, eclipsing most heavy-lift records held previously by the C-5A Galaxy. About 55 were built, with most serving with various republic armed forces, the Russian Space Agency Glavkosmos, and Aeroflot. Several are on commercial lease in the West. An-124s are used to ferry military and space equipment such as intercontinental ballistic missiles (ICBMs), tanks, artillery, other aircraft, and palletized cargo, as well as engineered equipment for use in Russian oil, gas, pipeline, power, and construction industries. The aircraft began commercial and military operations in 1986. Production shut down in 2004.

An-124-200. Subject of joint study with General Electric for variant powered by CF6-80 turbofans.

An-124-210. Powered by Rolls-Royce RB211-524H-Ts, the An-124-210 would have featured new Honeywell avionics. This version was proposed

for the U.K.'s Short-Term Strategic Aircraft (STSA) requirement. The RAF instead leased Boeing C-17s.

An-124-300. Proposed stretched (by 19.3 ft), re-engined variant featuring wingspan increase (of 21.5 ft) and payload capacity of 330,000 pounds on 4,380-nautical-mile stage lengths. Aircraft would have incorporated some design features of larger An-225. Never launched.

An-124-100M-150. Planned new variant with improved engines and greater payload. It features payload increase from 120 tonnes to 150 tonnes, a max takeoff weight increase from 392 to 420 tonnes, a range increase (with 120 tonnes of cargo) to 6,500 kilometers, and a reduction in crew from six to four; and includes a digital anti-skid braking system and monographite wheel brake disks. Service life is designed to rise to 80,000 hours from the original model's 60,000.

The Progress design bureau is upgrading the D-18T series 3 engine, which would power the new model, to improve its reliability, service life, and gas-dynamic stability.

An-225. A basic 3-meter (9.8-ft) fuselage stretch of the An-124, with stretched wings to accommodate an extra pair of engines. The An-225 was first shown in Kiev in December 1988. The design was launched in 1985 to meet a requirement to carry the Soviet shuttle orbiter Buran in one piece. Additional justification was its ability to quickly transport large sections of the Energiya heavy-lift expendable launch vehicle and large engineered equipment to remote sites. In 1989, the first and only An-225 set 106 world and class records, including maximum takeoff weight (508,200 kg) and payload (156,300 kg).

Program Review

Background. In terms of payload capacity, the An-124 and An-225 outmatch anything the West has produced. Both aircraft were designed and built for a range of military, commercial, and government uses. However, they have only marginal utility outside Russia, as their capacities are not generally required for fast services, and operating costs are very high.

International Charter Missions

Antonov Airlines was contracted to fly Australian-built automobiles to New Zealand in 1991, and has also delivered frozen beef to Europe, with return shipments of machinery. In 1990, Air Foyle UK became the exclusive sales agent for An-124 services, and it later agreed to assume management of all An-124 commercial cargo services, with Antonov providing crew and maintenance.

In 1991, U.K.-based HeavyLift Airlines entered a joint venture with Volga-Dnepr and An-124 manufacturer Aviastar to offer charter services. This deal ended in 2000, but in 2001 HeavyLift and Air Foyle formed Air Foyle HeavyLift in a joint venture.

Following the 1991 Gulf War, Air Foyle-operated An-124s carried firefighting and construction equipment to Kuwait. Air Foyle also obtained approval to fly An-124 charters into the United States.

Aeroflot Russian International Airlines and Russia's Parliament also set up a new carrier, Air Troika, for An-124 charter operations. Air Troika participated in the post-war Kuwaiti rebuilding process.

In perhaps the most visible commercial charter success, Airbus hired an An-124 to ship several large A340 airframe subassemblies from Canadair to Airbus facilities in Toulouse.

More recently, the aircraft has been chartered by the U.S. Air Mobility Command (AMC) to fly outsized cargo missions. In 2003 alone, the AMC contracted out $29 million in An-124 charter work to Volga-Dnepr.

In other activity, Volga-Dnepr Airlines and ANTK Antonov recently secured a contract with NATO to provide strategic lift services using a fleet of up to six leased An-124s. The initial contract for the Strategic Airlift Interim Solution program covers a three-year period. The aircraft will fly a guaranteed 2,000 hours each year.

Astronomical Operating Costs

The An-124 reportedly costs about 25 percent more to operate per hour than the C-5, and the difference is even greater when compared with late-model Western commercial transports. These costs do not account for the much larger flight crew of the An-124. The aircraft is expensive to operate, particularly at a time of high fuel prices, because of the inefficient Progress D-18T engines. Commercial charter rates were running around $20,000 per hour as of mid-2007.

The An-225 reportedly costs $35,000 to $40,000 per hour to operate.

New An-124-102 Modifications Considered

The Agentstvo Voyennykh Novostey military news agency reported in August 2008 that proposals have been made to build the An-124-102, a new modification of the An-124-100 that would offer a 2-meter-taller

freight compartment. The agency did not indicate whether building the new variant would require new production or could be accomplished by rebuilding/refurbishing existing airframes.

Funding

The An-124 and An-225 were developed by the Soviet Ministries of Defense and Aviation Industries. Although precise figures are unavailable, the estimated development cost of the An-124 is $7 billion in equivalent U.S. 1994 dollars; the An-225 cost approximately $3.12 billion to develop. The cost of restarting production of the An-124 line is estimated at $500 million.

Timetable

Month	Year	Major Development
Mid-	1970s	Antonov launches design of An-124
Dec	1978	First flight of pre-production prototype with five main propulsion engines
Dec	1982	First flight of production prototype powered by D-18T turbofans
Jun	1985	Ruslan shown for the first time in public at the Paris Air Show
	1985	Antonov launches design of the An-225
	1986	Start of commercial An-124 service
	1987	Start of An-124 deliveries to the Soviet Air Force
Dec	1988	First flight of An-225
May	2001	Flight of updated An-225
	2004	An-124 line closed

Worldwide Distribution/Inventories

Operator	Designation	Quantity
Aeroflot Russian Airlines	An-124	1
Libyan Air Cargo	AN-124	1
Polet Aviakompania	An-124	8
Russia Air Force	AN-124	20
Russia State Airlines 224th Flight Unit	An-124	5
Russia State Transport Company (Rossiya)	An-124	1
Volga-Dnepr Airlines	An-124	10

Russian Air Force An-124s and the An-225 are also leased to other Russian government ministries and organizations. Many Air Force aircraft are on loan to various operators, such as Air Troika, to raise capital.

Note: 12 An-124s are in storage; five have been lost or written off.

Forecast Rationale

There have been a number of plans announced in recent years to restart production of the An-124 Ruslan transport. The existing fleet of aircraft flown in commercial freight operations by Volga-Dnepr Airlines and Polet, among others, has been in high demand. Volga-Dnepr, a Russian cargo hauler, wants to add aircraft to its fleet, but the An-124 production line closed in 2004 after only 56 aircraft (including one An-225) were built. The Russian Air Force maintains a fleet of around 20 aircraft. The remaining aircraft still in

operation serve as commercial freighters carrying outsized cargo, the only sector of the cargo market that justifies the high operating costs of this aircraft.

Volga-Dnepr has a requirement for 40 new aircraft, and Polet for 15. Ukraine's Antonov Airlines is prepared to order nine.

One plan to restart production involved a new joint venture between Volga-Dnepr and the Ukraine's Motor Sich known as Cargo Aircraft Managing Company. The plan calls for the aircraft to be produced at Aviastar-SP's facilities, with technical help from Antonov. Volga-Dnepr has a 59 percent stake in the new company, and Motor Sich, 41 percent. The new venture requires about $500 million in financing to get the project up and running, according to Alexei Isaikin, head of Volga-Dnepr. However, the partners have yet to announce that any financing has been found for the project.

Russia's United Aircraft Corporation and Ukraine's Antonov plan a joint venture to produce new An-124s, but concrete evidence of progress on restarting production was lacking at the end of 2010.

Obtaining financing to restart production was considered a huge obstacle even before the worldwide financial crisis. The original construction of the An-124 was driven by the military needs of the Soviet Union, or rather, the need to provide Soviet forces with a counterpart to the U.S. Air Force's C-5 Galaxy transport. The development program did not depend on commercial demand at the time. That is no longer the case. Volga-Dnepr may need additional An-124s, but the company's cargo business alone is not large enough to account for the number of orders needed to justify the cost of reopening the line (estimated at 40-50 aircraft). And the rest of the worldwide market for this niche aircraft is just not big enough.

Russian president Dimitri Medvedev was reported in January 2010 to have ordered the procurement of 20 new An-124s for the Russian Air Force, but it is not clear whether this will result in the Russian government paying the full cost of restarting production. Earlier, in November 2009, Medvedev had suggested that Russian industry could partner with a Western manufacturer to design and build a new version of the An-124.

Russian media reported in July 2007 that RuAF leaders do not believe that there is a military need for the An-124 under the country's current defense strategy. The RuAF has 21 aircraft in its inventory, but only nine are reported to be operational. The service needs to upgrade its transport fleet, but a newer, smaller aircraft would be more useful than the An-124. Medvedev's desire to fund new An-124s represents a major change in direction from RuAF policy.

It is possible that the An-124 program will eventually move ahead, but Forecast International is not forecasting further production of the An-124 at this point. As with many Russian programs, the announcement of a program moving ahead is often more wishful thinking than a reflection of reality. If funding is allocated and concrete steps made to begin producing aircraft, the forecast will change.

In cooperation with Antonov Airlines, U.K.-based Air Foyle HeavyLift began operating the sole An-225 three years ago. Rising interest has been reported over completing the second An-225. This would cost about $200 million. Aviastar believes it may receive outside funding for the project should traffic demand pick up significantly, but we are not forecasting production of any additional An-225s.

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