



Prototype Aeroprakt-28 on the US civil register (Paul Jackson)

0525069

production version has NACA 633-618 laminar flow aerofoil.

FLYING CONTROLS: Manual. Conventional ailerons, slotted flaps and rudder; single-piece, mass-balanced elevator. Flight-adjustable trim tabs on fin and rudder. Flap deflections 0, 14, 33 and 40°.

STRUCTURE: Composites cabin with riveted 2024-T3 aluminium monocoque rear fuselage; tailplane, of composites ribs and skin built on metal spar, is reinforced version of A-20 unit; aluminium rudder structure with Stitts Poly-Fiber covering. Aluminium wings with fabric-covered ailerons. Composites engine cowlings and wheel fairings. Aluminium 6061-T256 mainwheel legs.

LANDING GEAR: Tailwheel type; fixed. Mainwheels size 6.00-6; tailwheel 260x85. Speed fairings on each main unit. Citroen motorcar shock-absorbers.

POWER PLANT: Two 59.6 kW (79.9 hp) Rotax 912 UL flat-fours. Fuel capacity 180 litres (47.5 US gallons; 39.6 Imp gallons) in mid-wing tanks. US versions have 73.5 kW (98.6 hp) Rotax 912 ULS engines and total of 91 litres (24.0 US gallons; 20.0 Imp gallons). Aeroprakt three-blade ground-adjustable pitch propellers.

ACCOMMODATION: Up to four persons in side-by-side pairs. Two door/windcreens open forwards on centreline hinges.

DIMENSIONS, EXTERNAL:

Wing span	12.10 m (39 ft 8½ in)
Wing chord, constant	1.40 m (4 ft 7 in)
Wing aspect ratio	8.8
Length overall	7.045 m (23 ft 1¼ in)
Height overall	2.33 m (7 ft 7¾ in)
Tailplane span	1.17 m (3 ft 10 in)

Wheel track	3.60 m (11 ft 9¼ in)
Wheelbase	4.90 m (16 ft 1 in)
Propeller diameter	1.85 m (6 ft 0¼ in)

AREAS:

Wings, gross	16.70 m² (179.8 sq ft)
--------------	------------------------

WEIGHTS AND LOADINGS:

Weight empty	530 kg (1,168 lb)
Max T-O weight	950 kg (2,094 lb)
Max wing loading	56.9 kg/m² (11.65 lb/sq ft)
Max power loading	7.98 kg/kW (13.10 lb/hp)

PERFORMANCE:

Max level speed	130 kt (240 km/h; 149 mph)
Max cruising speed	81 kt (150 km/h; 93 mph)
Stalling speed	41 kt (75 km/h; 47 mph)
Max rate of climb at S/L	300 m (984 ft)/min
T-O run	95 m (315 ft)
Landing run	110 m (360 ft)
Range with max fuel	809 n miles (1,500 km; 932 miles)
Endurance	10 h

VERIFIED

AEROPRAKT-36**US marketing name:** Super Vulcan**TYPE:** Tandem-seat ultralight twin/kitbuilt.**PROGRAMME:** Promoted at AirVenture, Oshkosh, July 2003. Development of Aeroprakt-26 Vulcan.**DESIGN FEATURES:** Generally as for A-26, but with two 73.5 kW (98.6 hp) Rotax 912S flat-four engines and tankage for 869 n mile (1,609 km; 1,000 mile) range.**STRUCTURE:** Composites fuselage and metal wings, ailerons and flaps.**ACCOMMODATION:** Two in tandem. Cockpit enclosure replaceable by stub windscreen for open-cockpit flying. Rear baggage compartment with 56 cm (1 ft 6 in) square external door, starboard.

NEW ENTRY

ANTONOV**AVIATIONSKY NAUCHNO-TEKHNIЧЕСКИЙ КОМПЛЕКС ИМЕНИ О К АНТОНОВА (Aviation Scientific-Technical Complex named for O K Antonov)**

ulitsa Tupoleva 1, 03062 Kiev

Tel: (+38 044) 442 70 98

Fax: (+38 044) 443 00 05

e-mail: info@antonov.com

GENERAL DESIGNER AND PRESIDENT, MEDIUM TRANSPORT**AIRCRAFT INTERNATIONAL CONSORTIUM:** Pyotr Balabuyev**GENERAL DIRECTOR, MEDIUM TRANSPORT AIRCRAFT****INTERNATIONAL CONSORTIUM:** Leonid Terentyev**CHIEF DESIGNER:** Anatoly Vovnyanko**DEPUTY CHIEF DESIGNER:** Genrich G Ongirsky**PUBLIC RELATIONS OFFICER:** Andrey Sovenko

Antonov OKB was founded in 1946 by Oleg Konstantinovich Antonov, who died 4 April 1984, aged 78. More than 22,000 aircraft of over 100 types and versions of Antonov design have been built; more than 1,500 have been exported, to 42 countries. Other production includes trolley-buses, trams and racing bicycles. Current projects include the An-148 twin-turboprop airliner. Antonov received Aviation Register approval on 30 December 1992 to develop civil aircraft. It also operates its own cargo airline with a fleet of one An-225, eight An-124s, one An-22, three An-12s, two An-32Ps, two An-24s and one each An-26 and An-74. Plans for privatisation of the state-owned Antonov have been in preparation since 1997. Company parents the Medium Transport Aircraft International Consortium created by Russia and Ukraine in February 1996 and formally established on 18 May 1999.

Production plants associated with ANTK Antonov include Aviastar, Aviakor, AAK Progress, KiGAZ, Kharkov Air Carrier, Polyot (Omsk) and TAPO.

UPDATED

ANTONOV An-38**TYPE:** Twin-turboprop transport.

PROGRAMME: Requirement for 25-30 seat development of An-28 emerged during 1989 sales tour of India. Development of all-new An-38 approved by Soviet Ministry of Aviation, late 1990. Details announced, and model displayed, at 1991 Paris Air Show; initial batch of six built at production factory, NAPO, Novosibirsk, Russia: one prototype (01001; first flight 23 June 1994, with TPE331 engines), four trials aircraft and one (01002) for static testing at Kiev; certification to AP-25 granted 22 April 1997. In December 1995, Antonov and NAPO formed joint venture company, Siberian Antonov Aircraft, to produce, market and provide after-sales service for the An-38. Indian demonstration tour undertaken in July and August 1997, followed by appearance at Aero India in December 1998 and February 2001.

Production at NAPO was suspended between 2000 and 2003, but in March 2003 an agreement was signed by the



Antonov An-38-100 operated by the NAPO plant's own airline (Paul Jackson)

NEW/0554451

plant, Moscow Leasing Company and Volgograd-SpetzAvia for resumption with a batch of five.

CURRENT VERSIONS: **An-38-100:** With Honeywell TPE331 engines. First and second (01003; exhibited Moscow 1997) flying aircraft to this standard. Trials of international navigation avionics completed March 2000.

An-38-110: Reduced avionics fit in comparison with -100.

An-38-120: Enhanced avionics fit in comparison with -100; equipment includes VOR/DME, Opal-B voice recorder and SPPZ-2000 ground proximity warner. NAPO-Aviation's aircraft to this standard.

An-38-200: With Omsk MKB 'Mars' TVD-20-03 engines. Third and fourth prototypes were planned to this standard when engine development complete; however, minor problems with Aerosila AV-36M propeller delayed programme, but maiden flight achieved (at NAPO) 11 December 2001. Equipment standard as for An-38-120, but with addition of TCAS-2000 traffic collision avoidance system. State Tests were completed on 28 November 2002.

An-38K: Convertible version of An-38-100; large upward-hinging side door at rear on port side; able to carry four LD-3 (KMP-500) or five LD-3K containers (= konteynery); cargo handling equipment removable for conversion to 30-passenger transport.

Versions with RKBK TVD-1500 engines said to be under construction in 2000, but none had emerged by mid-2002. All versions can be equipped for aerial photography (An-38F: *fotografiya*), survey (An-38GF: *geofizicheskyy*), forest patrol (An-38D: *desantnyi*), VIP transport, ambulance (An-38S: *sanitarnyy*); six stretchers, nine seated, with attendant) and fishery/ice patrol duties (An-38LR: *ledovoi razvedki*). An assault transport, also designated An-38D, capable of carrying 22 paratroops, 26 troops or 3 tonnes of cargo, was revealed to be in the design stage in August 2001; -100 or -200 engine options will be available.

CUSTOMERS: Eight Srs 100s produced by mid-2000: two prototypes (one at Antonov; one at NAPO), one static test airframe and five with airlines (Vostok, three; Alrosa,

two); by mid-2003, no further production had been undertaken. Two Vostok aircraft to Malaysia during 2001 for use by Layang Layang Aerospace for tourist flights, cargo transport and aerial photography.

First three (subsequently increased to eight) An-38-100s ordered for Vostok Airlines and received by mid-1995 for one year of intensive trials before passenger certification. Second firm customer is Chukotavia (10; although initial batch is two); letters of intent from Petropavlovsk-Kamchatsky, Merninsky, Novosibirsky, Ulyanovsky and Nikolaevsk-na-Amur. In 1999-2000, second prototype was being operated by NAPO-Aviatrans, the airline of the NAPO aircraft factory. In 1998, Siberia Airlines was considering purchase of two. Alrosa-Avia of Zhukovskiy has ordered five for diamond mining support, of which first in service by early 2000; second followed in July 2000. Indian Air Force interest expressed in initial six to 10; estimated market for 40 with Indian regional airlines (2001), of which 20 covered by letters of intent. Interest in -200 from Vietnam Airlines, which in 2001 signed lease for NAPO's own -120. First customer for Srs 200 is expected to be Kemerovo Airlines, which required two for delivery in late 2003.

NAPO anticipates sales of 170 by 2010.

COSTS: An-38-100 basic price US\$4 million (2000); An-38-200 US\$3.5 million (2003).

DESIGN FEATURES: Developed from PZL Mielec (Antonov) An-28 to replace An-24s, Let L 410s and Yak-40s. New high-efficiency engines; lengthened passenger cabin; optional weather radar and automatic flight control system; improved sound and vibration insulation; reduced external noise; wheel or ski landing gear; rear cargo door and cargo handling system; able to operate from unpaved runways; operating temperatures from -45 to +45°C, including 'hot-and-high' conditions. Service life 30,000 hours. Maintenance requirement 4 man-hours/flying hour.

FLYING CONTROLS: Conventional and manual. Single-slotted mass and aerodynamically balanced ailerons (port aileron has trim tab), designed to droop with large, hydraulically actuated, two-segment double-slotted flaps; electrically

actuated trim tabs in each elevator have manual back-up; twin rudders each with electrically actuated trim tab; automatic leading-edge slats over full span of wing outboard of engines; slab-type spoiler forward of each aileron and each outer flap segment at 75 per cent chord.

LANDING GEAR: Tricycle type; fixed. Mainwheels 610x320-330; nosewheel 600x320-254.

POWER PLANT: Two Honeywell TPE331-14GR-801E turboprops, each 1,118 kW (1,500 shp), driving Hartzell HC-B5MA five-blade propellers rotating at 1,522 rpm; or two Omsk MKB 'Mars' TVD-20 turboprops, each 1,029 kW (1,380 shp), driving Aerosila AV-36M quiet, constant-speed reversible-pitch propellers rotating at 1,827 rpm.

ACCOMMODATION: Two crew side by side on flight deck; passenger cabin equipped normally with 26 seats, basically three abreast, with centre aisle; 27 seats at 75 cm (29½ in) pitch optional; ambulance version for six stretchers, eight seated casualties and medical attendant, executive versions with eight to 10 seats and forest surveillance/paradrop version for 26 smoke-jumpers or trainee paratroops (reduced to 22 with full kit) available; seats and baggage compartment can be folded quickly against cabin wall to provide clear space for 2,500 kg (5,510 lb) of freight. Maximum practical cargo dimensions in combi variant are 1.40 m (4 ft 7 in) height and 1.05 m (3 ft 5¼ in) width with seats removed or 0.95 m (3 ft 1½ in) with seats stowed against walls. Door with airstairs on port side, with service door opposite; emergency exit each side. Optional cargo door under upswept rear fuselage slides forward under cabin for direct loading/unloading of freight.

AVIONICS: Russian or Western equipment; latter comprises Bendix/King Silver Crown range; former listed below.

Comms: SO-72 transponder.

Radar: A813Ts weather radar.

Flight: BSFK-1 navigation system; VEM-72PB-3A altimeter and A-037 radar altimeter; twin US-450K airspeed indicators; SAU-28 AFCS; M3 GPS; VMD-94 DME; SPPZ-200 GPWS; TCAS-2000 TCAS; and KURS-93M autoland.

EQUIPMENT: Hand-operated travelling overhead winch in cabin; capacity 500 kg (1,102 lb).

DIMENSIONS, EXTERNAL:

Wing span	22.065 m (72 ft 4¾ in)
Length overall	15.67 m (51 ft 5 in)
Height overall	5.05 m (16 ft 6¾ in)
Span over tailfins	5.14 m (16 ft 10½ in)
Wheel track	3.515 m (11 ft 6½ in)
Wheelbase	6.345 m (20 ft 9¾ in)
Distance between propeller centres	5.58 m (18 ft 3¾ in)
Propeller diameter: Hartzell	2.85 m (9 ft 4 in)
AV-36	2.65 m (8 ft 8¾ in)
Cargo ramp:	
Length	2.40 m (7 ft 10½ in)
Width: at floor	1.40 m (4 ft 7 in)
at rear	1.00 m (3 ft 3¼ in)
Passenger door: Width	0.70 m (2 ft 3½ in)
Height	1.55 m (5 ft 1 in)

DIMENSIONS, INTERNAL:

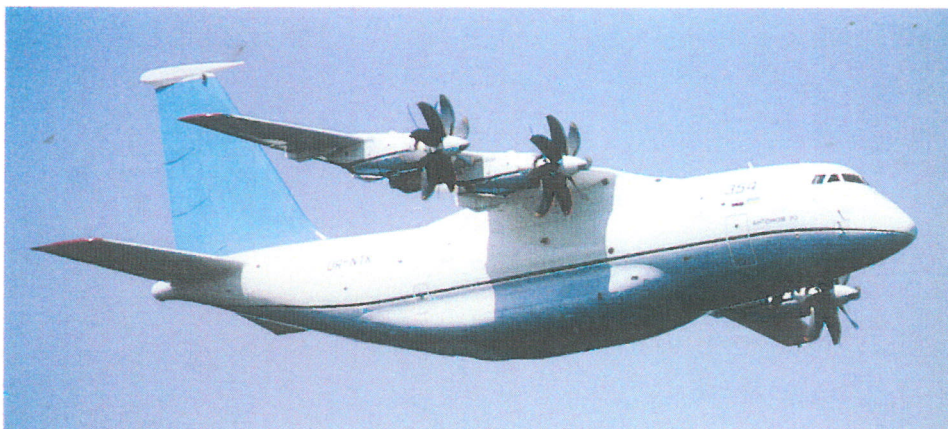
Cargo hold: Length, excl ramp	7.83 m (25 ft 8¼ in)
Width: max	1.74 m (5 ft 8½ in)
at floor	1.55 m (5 ft 1 in)
Max height	1.70 m (5 ft 7 in)
Volume, incl ramp	24.7 m³ (872 cu ft)

WEIGHTS AND LOADINGS (A: An-38-100, B: An-38-200, K: An-38K):

Weight empty: A	5,300 kg (11,684 lb)
Max payload: A	2,500 kg (5,510 lb)
B	2,800 kg (6,173 lb)
K	3,200 kg (7,055 lb)
Max fuel: A	2,210 kg (4,872 lb)
Max T-O weight: A	9,500 kg (20,943 lb)
B	9,930 kg (21,891 lb)

PERFORMANCE (estimated, with TPE331 engines):

Max level speed	219 kt (405 km/h; 252 mph)
Nominal cruising speed:	
A, B	205 kt (380 km/h; 236 mph)
Nominal max cruising altitude: A, B	4,200 m (13,780 ft)



Second prototype Antonov An-70 strategic transport (Paul Jackson)

NEW/0554452

T-O run: A	350 m (1,150 ft)
K	480 m (1,575 ft)
Landing run: A	270 m (885 ft)
K	440 m (1,445 ft)
Balanced field length: A	895 m (2,940 ft)
B	1,050 m (3,445 ft)
Range at FL100, no reserves:	
with max fuel: A	378 n miles (700 km; 435 miles)
B	421 n miles (780 km; 484 miles)
with max fuel (1,300 kg; 2,866 lb payload):	
A	944 n miles (1,750 km; 1,087 miles)
B	961 n miles (1,780 km; 1,106 miles)

UPDATED

ANTONOV An-70

TYPE: Strategic transport.

PROGRAMME: Development began 1975 to replace some An-12s remaining in air force service from 2002-2003; announced by *Izvestia* 20 December 1988; at 1991 Paris Air Show Antonov OKB reported prototype being assembled at Kiev; funding by Russian (80 per cent) and Ukrainian governments under agreement of 24 June 1993; preliminary details released and model displayed at Moscow Aero Engine and Industry Show April 1992; prototype first flight (01-01) 16 December 1994 (was also delivery flight to Gostomel test airfield); this aircraft lost during fourth sortie following in-flight collision with chase An-72 on 10 February 1995; second prototype (without nose-mounted instrumentation boom) produced by upgrading of static test airframe (for which replacement under construction in 2000); rolled out 24 December 1996; first flight (01-02/UR-NTK) 24 April 1997; international debut at Moscow Air Show, August 1997; handed over to Russian Air Forces' test centre at Akhtubinsk, August 1998. Had flown one-third of planned 780-sortie test programme by January 2000; high AoA trials mid-2000; first stage of State testing completed October 2000, confirming safety in all flight regimes. Crash-landed and fuselage broken into two parts immediately after take-off from Omsk on 27 January 2001 following double engine failure. Airframe transferred to Polet aircraft plant and repaired at cost of US\$3 million; reflown 5 June 2001; certification rescheduled to first quarter of 2002; appeared at MAKS '01, Moscow, August 2001.

Bilateral agreement between Russia and Ukraine revised 18 May 1999, and underlined decision taken to order first 10 (and 50 engines) before planned production at Aviant plant, Kiev, from 1999 and Aviacor plant, Samara, from 2000; each plant building initial batch of five, which to enter service by 2003. Russian production specification issued 4 December 1999; Russian government decree of 4 October 2000 covers purchase of 164 An-70s, but, at same time, Samara regional government announced that local manufacturers were withdrawing from An-70 project. Ukrainian government resolution guaranteeing An-70

purchase passed 12 October 2000; total of 65 to be obtained by 2018. First five for Ukraine ordered from Aviant on 2 April 2001. However, in September 2001, Polyot was allocated Russian An-70 final assembly, augmented by Novosibirsk's NAPO and Voronezh's VASO. Aviacor no longer involved. Russian share of series production is 72 per cent; Ukraine 28 per cent. Assembly of first Polet-built An-70 formally began on 10 October 2002.

By September 2002, An-70 had flown 550 hours in 440 sorties towards anticipated late 2003 completion of State Tests, but unofficial reports were by that time citing alleged discovery of 382 deficiencies, of which 95 rated essential for pre-delivery rectification. These included engine reliability, the prototype having suffered 52 in-flight shutdowns during its 440 sorties. Russian Air Forces' disinclination to fund An-70 was being discussed in November 2002, and C-in-C voiced outright rejection of purchase at January 2003 press conference, claiming An-70 unsuitable for its intended task of replacing An-12, and pledging support for rival Tupolev Tu-330. By April 2003 however, it was reported unofficially that Air Forces' support had been resumed, but with proviso of rewritten TTZ (tactical and technical specification) detailing changes to avionics and equipment and extending development period.

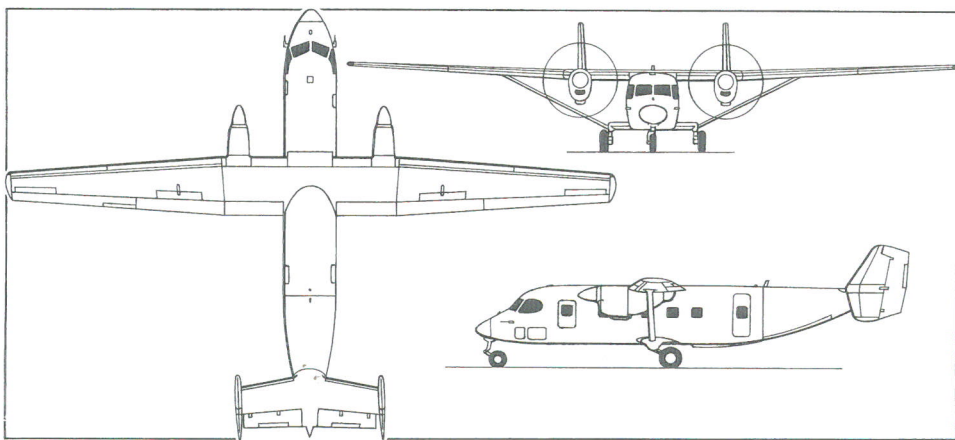
Faced with shortfall in Russian financial support, Ukrainian government considered unilateral financial support in 2003 national budget, allowing production launch, but decided against the proposal in November 2002, although continued flight testing did receive official funds. Trials at Feodosia test centre included February 2003 air-drop within 18 seconds of four pallets totalling 34.5 tonnes; operations planned from airstrips with bearing strength of between 6 and 9 kgf/cm² (85 to 128 lbf/sq in).

Offered as alternative to Airbus A400M FLA; Germany and Ukraine agreed in December 1997 to explore possible industrial collaboration and German government strongly promoted the An-7X as the basis of the FLA, though this was rejected by other FLA partners and the Luftwaffe. Aircraft evaluated by DaimlerChrysler Aerospace, which determined that it could be modified to meet FLA requirement. Aim of wide co-operation between Russian, Ukrainian and West European aircraft industries (in effect bid to meet European FLA requirement) stated in February 1998 in joint declaration by Russian and Ukrainian Presidents. Certification is planned to FAR Pt 25 and equivalents. Antonov obviated effects of intermittent official funding by investing income from its own An-124 charter operations.

Medium Transport Aircraft International Consortium (MTA; also known as Medium-Size Transport Plane consortium or AirTruck) formed February 1996 to co-ordinate development, certification, sales and after-service, comprising four Ukrainian and six Russian companies: ANTK Antonov (designer and component manufacturer), ZMKB Progress (engine designer), Aviant (airframe manufacturer) and Motor Sich (engine manufacturer) from Ukraine; and Aviacor (airframe manufacturer), Ufa (engine manufacturer), Aviapribor (flight control system manufacturer), Elektroavtomatika (avionics), Leninet (airborne monitoring and diagnostic system) and Aerosila (propfan) from Russia. See 'Structure'.

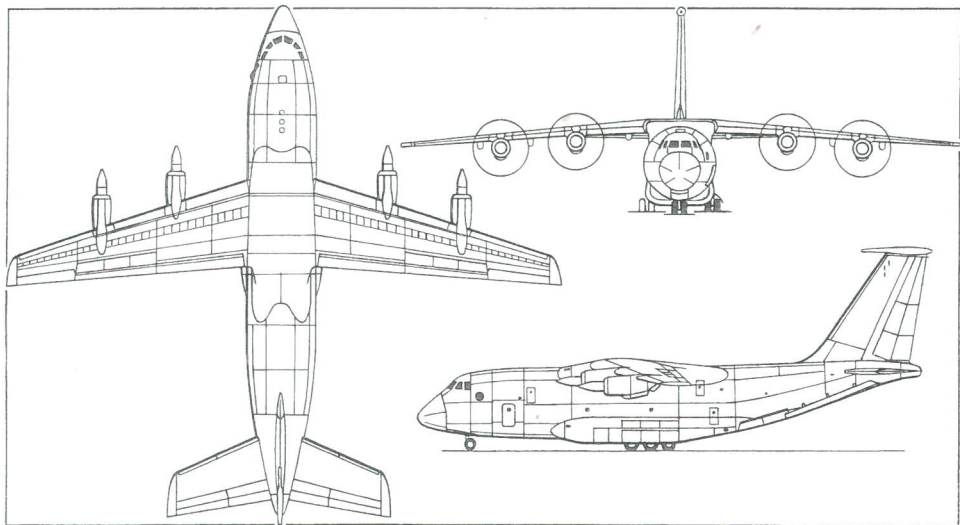
Third aircraft to fly will be An-70T commercial variant, construction of which announced mid-1998; first flight anticipated 2002, but failed to take place and nothing further heard of programme during that year. In September 2000, Volga-Dnepr airline pledged to fund An-70 production if military contracts not forthcoming. Fourth batch (of seven) D-27 engines, authorised in 2000, includes those for An 70T prototype.

CURRENT VERSIONS: **An-70:** Military STOL transport; proposed production version. Stated to have double the payload of Lockheed Martin C-130J, with similar STOL and rough-field performance, yet only 40 kt (74 km/h; 46 mph) slower than the Boeing C-17A Globemaster III, which carries 15 per cent more payload.



Antonov An-38-100 27-seat transport (Jane's/Mike Keep)

0051508



Antonov An-70 strategic transport (Jane's/James Goulding)

0130863

Detailed description applies to baseline An-70.

An-70-100: Proposed military STOL transport, as An-70 but with two-crew cockpit.

An-77: Proposed military STOL transport for export customers; as An-70-100 but with cockpit for two or three crew. Runway length of 1,900 m (6,235 ft) required with 35,000 kg (77,161 lb) payload for 2,051 n mile (3,800 km; 2,361 mile) range.

An-70T: Commercial transport, generally as An-70, with improved runway capability but no requirement for STOL. Two or three crew. To carry 35,000 kg (77,161 lb) payload 2,051 n miles (3,800 km; 2,361 miles) from 1,900 m (6,235 ft) runway, or 20,000 kg (44,092 lb) for 2,915 n miles (5,400 km; 3,555 miles) from 1,300 m (4,265 ft) runway. Stated to have load-carrying capability of Il-76, but runway requirements of An-74. Promoted as Il-76/An-12 replacement. Certification planned to FAR Pt 25 and equivalents. First fuselage delivered to Samara from Kiev November 1999.

An-70T-100: Development of An-70T with two D-27 propfans, two crew and revised landing gear, to carry 30,000 kg (66,138 lb) payload 540 n miles (1,000 km; 621 miles) from 2,500 m (8,205 ft) runway, or 10,000 kg (22,046 lb) for 1,187 n miles (2,200 km; 1,367 miles) from 1,300 m (4,265 ft) runway. Promoted as An-12 and An-74 replacement

An-70T-200: Powered by two Kuznetsov NK-93 turbofans.

An-70T-300: With two CFM56-5C4 turbofans.

An-70T-400: With four CFM56-5C4 turbofans.

An-70TK: Convertible cargo/passenger transport for 30,000 kg (66,138 lb) of freight or 150 passengers, with seats in removable modules.

An-7X: Designation for provisional variant offered to meet multinational FLA requirement at 40 per cent of anticipated A400M cost. AirTruck GmbH formed 20 May 1999 by eight supporting German companies (Aerodata, ASL Aircraft Services, Autoflug, BGT, R-R Deutschland, ESG, Liebherr and VDO) to promote An-7X in conjunction with MTA consortium.

Antonov-supplied (on 29 January 1999) data evaluated by DaimlerChrysler Aerospace, which assessed technical risk as minor and performance to be compliant; however, specific fuel consumption targets not met, concern expressed over noise, and power plant felt to need Western FADEC. Further recommendation s include wiring insulation change to meet Western standards; landing gear modifications; addition of in-flight refuelling and fuel-dumping; completely revised NVG-compatible, two-crew cockpit; permanently installed cargo system; and minor flying control and manufacturing changes.

Assembly of 75 An-7Xs for Luftwaffe would be at Lemwerder, Germany. If rejected by Germany, An-7X programme to continue in readiness for alternative export prospects for non-STOL version.

An-170: Heavy transport derivative carrying 45,000-50,000 kg (99,210-110,230 lb) of cargo.

An-171: Proposed stretched version with increased wing span and more powerful engines; design work under way by 2001.

Adaptation of military An-70 for tanker, AEW, SAR (An-70PS), naval patrol, and of An-70T or An-70T-100 for firefighting, ecological monitoring and ambulance duties being studied.

CUSTOMERS: Requirements originally expressed by Russian Air Forces for up to 500 and by Ukrainian Air Force for 100. This modified by 1999 to 164 for Russia and 65 for Ukraine, with in-service date of. 2002. German requirement potentially for 75 aircraft. By mid-1999 potential civil operators had signed documents of intent for some 100 further aircraft. Chinese interest reported in 2000. Czech Republic reportedly finalising a contract for three in 2002, delivery to be from Omsk at one per year,

beginning 2005. Hungarian and Indian interest reported in late 2002, the latter considering licensed production.

COSTS: Military version US\$60 million (2002), but estimated in 2003 that this could be reduced to "under US\$40 million". Civil An-70T to cost 20 to 30 per cent less than military variant. Total of US\$3,500 million reportedly spent on development by late 2002, of which Russian defence ministry then owed Antonov US\$49 million; further US\$86 million (of which US\$61 million due from Russia) required to complete development and flight testing. Engines cost US\$75 million up to 2002, and further US\$30 million allegedly required to address recorded malfunctions during testing.

DESIGN FEATURES: First aircraft to fly powered only by propfans. Slightly larger than projected European FLA transport, much smaller than US Boeing C-17A; conventional high-wing configuration, with wings and tail surfaces slightly sweptback; supercritical wing section; anhedral from roots; loading ramp/doors under upswept rear fuselage with adjustable sill height and built-in cargo handling system; horizontal tail surfaces on rear fuselage; propfans mounted conventionally on wing leading-edge; propeller wash doubles wing lift during take-off and landing. Multiple-section control surfaces provide redundancy in event of battle damage or physical obstruction. Claimed features include independent operational capability at non-equipped airfields for 30 days. Design life 15,000 cycles and 45,000 flying hours in 25 years. Operable 3,500 hours per year, with eight to 10 man-hours of maintenance per flying hour. Cost-effective with only 200 flying hours per month.

FLYING CONTROLS: Prototypes have fly-by-wire system with three digital and six analogue channels; primary controls are quadruplex; back-up by unique fly-by-hydraulics system, in which pilot or autopilot inputs are relayed (via conventional 'mini-wheels') to actuators by commands in hydraulic control channels, unaffected by electromagnetic interference. Production aircraft will have a four-channel, all-digital primary FCS, rather than the hybrid digital/analogue system of the prototypes. Secondary FCS controls two independent flap systems, leading-edge slats and blown flaps. Three-section double-winged rudder. Double-slotted trailing-edge blown Fowler flaps in two sections on each wing; forward element maximum deflection 60°, rear element 80°; intermediate settings (forward element) 5, 10, 15, 20, 25, 30, 35, 40 and 50°. Three-section spoilers forward of each outer flap. Leading-edge has flaps inboard; slats centre and outboard. Two-section, double-hinged elevators forward section maximum deflections +28/-20°, rear section +50/-40°, to enhance low-speed authority; horizontal stabilisers are fitted with automatic leading-edge slats.

STRUCTURE: Approximately 28 per cent of airframe, by weight, made of composites, including complete tail unit, ailerons and flaps. Fuselage stringer/skin joints are spot-welded and hot-bonded, manually.

Single source for all major components, Russian assembly by Polyot, which also to build cargo hold; NAPO producing the centre section; VASO, the wing (which previously assigned to Chkalov plant at Tashkent, Uzbekistan). Aviant at Kiev to assemble Ukrainian aircraft and build flight deck, empennage and engine nacelles.

LANDING GEAR: Twin-wheel nose unit; each main unit has three pairs of wheels in tandem, retracting into large fairing on side of cabin; can operate from unpaved surfaces of bearing ratio 8 kg/cm² (114 lb/sq in). All tyres 1,120x450. Steel-steel brakes. Nosewheel turning angle ±55° for taxiing; nosewheel turning radius 16.3 m (53½ ft); wingtip turning radius 29.5 m (97½ ft); required taxiway width for 180° turn 27.4 m (90 ft).

POWER PLANT: Four ZMKB Progress/Ivchenko D-27 propfans, each 10,290 kW (13,800 shp). Aerosyla Stupino

SV-27 contrarotating propellers, each with eight composites blades in front and six at rear. Reversible-pitch blades of scimitar form, with electric anti-icing. Export versions proposed with CFM56-5C4 turbofans.

ACCOMMODATION: Three flight crew (two pilots and flight engineer or 'tactical pilot') plus loadmaster; navigation station on captain's left is optionally operated by fourth member of flight crew; provision for converting cockpit for two-crew operation, with co-pilot operating flight engineer's station; seats in forward fuselage for two cargo attendants; freight loaded via rear ramp using four built-in, powered hoists (each of 3 tonne capacity) reaching out 6.6 m (22 ft) from aircraft. Hoists can be combined for heavier loads. Freight can be carried on PA-5.6 rigid pallets, PA-3, PA-4 and PA-6.8 flexible pallets, in UAK-2.5, UAK-5 and UAK-10 containers; unpackaged freight, wheeled and tracked vehicles, food and perishables can be carried; seats for 300 troops, or 206 stretchers, can be installed using optional, prefabricated (10 section) upper deck or optional, easily removable seven-section upper deck (each segment holding 1.5 tonnes) in cargo hold; vehicles, freight and paratroops can be airdropped; maximum single airdrop item weight 20,000 kg (44,092 lb); crew door at front of cabin on port side; two upper deck doors each side, front and rear; cargo hold pressurised and air conditioned.

SYSTEMS: Aircraft systems automated to simplify operation and decrease probability of crew errors. Electronpribor engine control system; Leninet monitoring and information system.

AVIONICS: Integrated by Aviapribor, Leninet and Elektroavtomatika. Flight data, navigation and radio-navigation systems to ARINC 700 requirements; digital multiplex data interface equivalent to Western MIL-STD-1553B.

Comms: Integrated system by Gorskisi.

Flight: Ring laser INS; SKI-77 HUD; flight management system; designed for operation in adverse weather and for landing in ICAO Cat. II and IIIa conditions. BASK-70 onboard diagnostic system collects data from subsystems, registering and analysing 8,000 in-flight parameters.

Instrumentation: Ten-screen EFIS by Elektroavtomatika comprises six main screens, each 200 x 200 mm (7¾ x 7¾ in), facing pilots and two each at navigation and flight engineer's stations, plus smaller secondary LCD screens and roof-mounted HUDs for pilot and co-pilot on production aircraft.

EQUIPMENT: Four electric hoists in hold.

DIMENSIONS, EXTERNAL:

Wing span	44.06 m (144 ft 6¼ in)
Length overall	40.73 m (133 ft 7½ in)
Fuselage diameter	4.80 m (15 ft 9 in)
Height overall	16.38 m (53 ft 9 in)
Wheel track (bogie centres)	5.21 m (17 ft 1 in)
Wheelbase: front mainwheels	16.65 m (54 ft 7½ in)
centre mainwheels	18.47 m (60 ft 7¼ in)
rear mainwheels	20.43 m (67 ft 0¼ in)
Propeller diameter	4.50 m (14 ft 9 in)
Propeller ground clearance (outer)	3.00 m (9 ft 10 in)
Rear-loading aperture: Height	4.10 m (13 ft 5½ in)
Width	4.00 m (13 ft 1½ in)

DIMENSIONS, INTERNAL:

Cargo hold:

Floor length: excl ramp	19.10 m (62 ft 8 in)
incl loadable ramp	22.40 m (73 ft 6 in)
incl unusable ramp	30.60 m (100 ft 4¼ in)
Max width	4.80 m (15 ft 9 in)
Max width at floor	4.00 m (13 ft 1½ in)
Height: max	4.10 m (13 ft 5½ in)
min	4.00 m (13 ft 1½ in)
Floor area, incl ramp	89.0 m ² (958 sq ft)
Volume: pressurised	400.0 m ³ (14,126 cu ft)
total	425.0 m ³ (15,008 cu ft)

WEIGHTS AND LOADINGS:

Weight empty	72,800 kg (160,500 lb)
Normal payload (incl 5,000 kg; 11,025 lb on ramp)	35,000 kg (77,161 lb)
Normal payload from unpaved runway	30,000 kg (66,138 lb)
Payload: max	47,000 kg (103,615 lb)
restricted runway option	35,000 kg (77,161 lb)
600 m runway option	20,000 kg (44,092 lb)
Max T-O weight	130,000 kg (286,600 lb)
Max power loading	3.16 kg/kW (5.19 lb/shp)

PERFORMANCE (estimated):

Cruising speed: long range	405 kt (750 km/h; 466 mph)
max short range	432 kt (800 km/h; 497 mph)
Nominal cruising height	9,100-11,000 m (29,860-36,080 ft)
Runway length required: for normal operation:	
T-O	1,800 m (5,905 ft)
Landing	2,200 m (7,220 ft)
Range (runway length A: 1,800 m; 5,905 ft, B: 700 m; 2,300 ft)	
with 47 tonnes:	
A	1,619 n miles (3,000 km; 1,864 miles)
B	not an option
with 35 tonnes:	
A	2,699 n miles (5,000 km; 3,106 miles)
B	not an option

with 30 tonnes:	
A	3,239 n miles (6,000 km; 3,728 miles)
B	647 n miles (1,200 km; 745 miles)
with 20 tonnes:	
A	3,563 n miles (6,600 km; 4,101 miles)
B	1,619 n miles (3,000 km; 1,864 miles)
with max fuel: all options	
	4,319 n miles (8,000 km; 4,971 miles)

UPDATED

ANTONOV An-72 and An-74**NATO reporting name: Coaler**

TYPE: Twin-jet freighter.

PROGRAMME: Originated as private venture military transport based on stillborn An-60 64-73 seat civil airliner designed to meet 1967 specification. Revised design, following issue of military requirement in 1968, included relocation of engines above wings; chief designer Yuri G Orlov. Two static test airframes; first of four prototype An-72s, built at Kiev, flew (SSSR-197744) 31 August 1977. Production order placed in December 1980 for improved An-72A version; manufacture transferred to Kharkov, Ukraine, where first production An-72 flew 22 December 1985; An-74 also produced at Kharkov from December 1989. An-74 announced February 1984; An-72P maritime patrol version demonstrated 1992. Production of An-74 also started by Polyot Industrial Association at Omsk, Russia, in 1993 (assisted by Progress at Arsenyev); first Polyot aircraft (RA-74050) was flown 25 December 1993. Development of An-74-200 and An-74TK-200 by Antonov started 1995; An-74TK certified by Aeronautical Register (now Interstate Aviation Committee) on 2 August 1991.

CURRENT VERSIONS: **An-72A** ('Coaler-C'): STOL transport for military use. Compared with An-72 ('Coaler-A') prototypes, wing span increased by 6.00 m (19 ft 8½ in), fuselage length by 1.50 m (4 ft 11 in), fuel load by 2,500 kg (5,512 lb). An-72 prototype 003/SSSR-19795 converted to An-72A ('Arctic') and first flew (SSSR-780334) 29 September 1983. Additionally, on production version, tail unit and engine air intake de-icing improved over An-72; Buran radar in enlarged radome; advanced navigation aids, including inertial navigation system; provision for wheel/ski landing gear.

An-72P: Maritime patrol version; delivered to Ukraine during 1990s. Renewed interest from prospective North African and Middle East air forces in 2003.

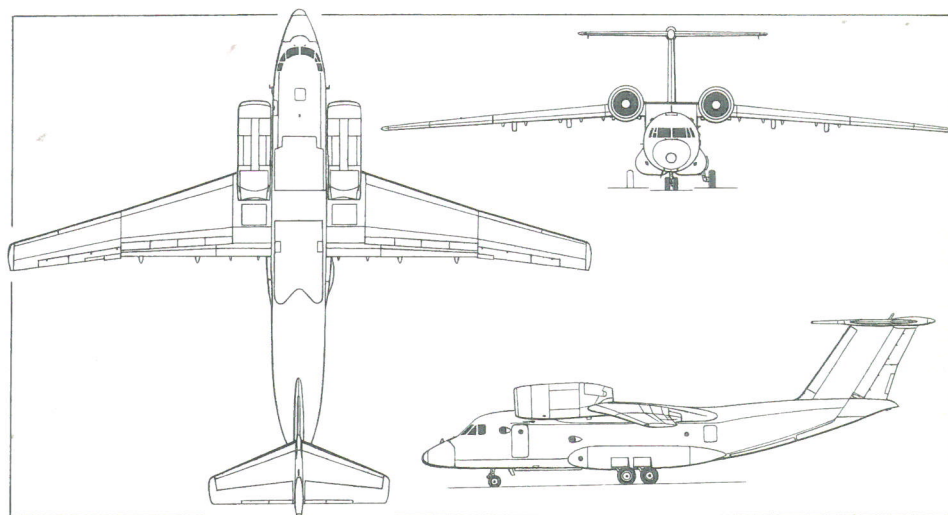
An-72R: One (SSSR-783573), at Akhtubinsk operational research centre, appears to have a large, flat, side-looking airborne radar (SLAR) built into each side of its upswept rear fuselage, possibly for standoff battlefield surveillance. Engineering designation **An-88**. First noted 1995, but possibly by then out of service.

An-72S: Military VIP version with appropriate 'Salon' interior.

An-72V: Export version; two crew only.

An-72-100: Civilianised An-72, certified 1997; upgraded avionics.

An-74: Designation refers, generally, to all civilian versions (as under). Airframe identical with An-72 except for two blister windows at rear of flight deck and front of cabin on port side. Convertible in field for ambulance, firefighting and other duties. Proving trials 1985-86. First preproduction An-74 (SSSR-58642) first flew at Kharkov on 26 June 1986; further five development aircraft built by 1989, these having smaller radomes. Maiden flight of production An-74 (c/n 0706) December 1989; features include new APU, Buran-74 radar in larger radome and improved navigation aids. Type certificate awarded August 1991; initially operated by Yakutsk division of Aeroflot.



Antonov An-74 ('Coaler-B') STOL transport (two ZMKB Progress/Ivchenko D-36 turbofans)
(Jane's/Dennis Punnett)

An-74-200: Freight version with D-36 Series 3A engines of unchanged rating; increased payload and maximum T-O weight. Able to carry four YAK-2.5 containers. Crew of four/five.

An-74T-200A ('Coaler-B'): Transport (transportnyi) version with longer hold; payload 10,000 kg (22,045 lb); loading winch; roller conveyors in floor; crew of two. Range with maximum payload up to 728 n miles (1,350 km; 838 miles), with 3,500 kg (7,716 lb) payload 2,159 n miles (4,000 km; 2,485 miles).

An-74TK-200 ('Coaler-B'): Convertible transport/passenger aircraft (transportnyi konvertiruyemnyi) with twin seats for 52 passengers that fold against cabin walls, and with baggage racks, buffet/galley and lavatory. Alternative all-cargo or all-passenger or combi layouts. Typical combi options include 12 passengers plus 6,000 kg (13,228 lb) of freight and 20 plus 4,500 kg (9,921 lb). Built-in loading equipment. Crew of two. Range with 10,000 kg (22,045 lb) payload, 1 hour reserve, 430 n miles (800 km; 497 miles).

An-74TK-200D Salon: Business transport for 10 to 16 passengers, with increased cabin comfort. Equipment includes telephone, fax, video, bar, refrigerator, galley and separate rest area. Optional compartment for car at rear. Power plant and weights as basic An-74. Crew of four/five.

An-74TK-100 ('Coaler-B'): As An-74T-200, with navigator station (crew of four).

An-74TK-100: As An-74TK-200, with navigator and flight engineer stations (crew of four). Russian type certificate issued 4 August 1995.

An-74TK-100C: One VIP/medical evacuation aircraft (RA-74005) delivered to Gazprom on 26 February 2002. Air Ambulance Technology (Austrian) equipment. Designation remains '-100C' in both Cyrillic and Roman alphabets.

An-74TK-300: Described separately.

An-74-400: Stretched version; under development by 1998; to be offered in passenger and cargo versions.

An-76: Engineering designation for military An-72Ps.

An-79: US military sources use this designation for a version of An-72 transport.

An-174: Proposed stretched An-74TK-300; described separately.

An-71: AEW version; last described in 1997-98 *Jane's*.

An-71P: Radio relay version for Soviet anti-aircraft defence. Three development aircraft converted from

An-72s before cancellation. Engineering designation **An-76**.

CUSTOMERS: More than 160 An-72/74s (including 96 military) built before An-74 production additionally established at Omsk; 20 in Russian Air Forces; four in Peruvian Air Force; 26 in Ukrainian Air Force; others in Kazakhstan and Moldova. Order placed by Iran in 1997 for 12 An-74TKs for Presidential Guard; other recent deliveries to Laotian government, Ukraine Border Guard, MChS Rossii, Vitair and Gazpromavia. By mid-2000, civil operators included five with 12 An-72s and 17 with 37 An-74s. No new civil deliveries reported in 1998; two An-74TK-200s built at Kharkov in 1999; 'more than 200' built by 2003. Indian interest being pursued in 2000; Chinese interest reported late 2001; Dominican Republic civil aviation interest in 2002. Omsk received order for one for MChS Rossii and one of required three for FPS (border guard) to be delivered in 2001; by late 2000, Omsk had delivered total of only four aircraft since 1993 and had further three in various stages of completeness.

COSTS: US\$9 million (Omsk, 2000).

DESIGN FEATURES: Primary role as STOL replacement for turboprop An-26, with emphasis on freight carrying. High-wing, T-tail configuration, with upswept rear fuselage for freight access. Ejection of exhaust efflux over upper wing surface and down over large multislot flaps gives considerable increase in lift; high-set engines avoid foreign object ingestion; special ramp/door as An-26; low-pressure tyres and multiwheel landing gear for operation from unprepared strips, ice or snow; sweptback fin and rudder.

Wing leading-edge sweepback 17°; anhedral approximately 10° on outer wings; normal T-O flap setting 25 to 30°, maximum deflection 60°.

FLYING CONTROLS: Conventional and assisted. Power-actuated ailerons, with two tabs in port aileron, one starboard; double-hinged rudder, with tab in lower portion of two-section aft panel; during normal flight only lower rear rudder segment is used; both rear segments used in low-speed flight; forward segment is actuated automatically to offset thrust asymmetry; horn-balanced and mechanically actuated, aerodynamically balanced elevators, each with two tabs; hydraulically actuated full-span wing leading-edge flaps outboard of nacelles; trailing-edge flaps double-slotted in exhaust efflux, triple-slotted between nacelles and outer wings; four-section spoilers forward of triple-slotted flaps; two outer sections on each side raised before landing, remainder opened automatically on touchdown by sensors actuated by weight on main landing gear; inverted leading-edge slat on tailplane linked to wing flaps.

STRUCTURE: All-metal; multispar wings mounted above fuselage; wing skin, spoilers and flaps of titanium aft of engine nacelles; circular semi-monocoque fuselage, with rear ramp/door; tapered fairing forward of T tail fin/tailplane junction, blending into ogival rear fairing.

LANDING GEAR: Hydraulically retractable tricycle type, primarily of titanium. Rearward-retracting steerable twin-wheel nose unit. Each main unit comprises two trailing-arm legs in tandem, each with a single wheel, retracting inward through 90° so that wheels lie horizontally in bottom of fairings, outside fuselage pressure cell. Oleopneumatic shock-absorber in each unit. Low-pressure tyres, size 720x310 on nosewheels, 1,050x400 on mainwheels. Hydraulic disc brakes. Telescopic strut hinges downward, from rear of each side fairing, to support fuselage during direct loading of hold with ramp/door under fuselage.

POWER PLANT: Two ZMKB Progress/Ivchenko D-36 high-bypass ratio turbofans (Srs 2A in An-74; Srs 3A in An-74-200, T-100/200 and TK-100/200), each 63.74 kN (14,330 lb st). Integral fuel tanks between spars of outer wings. Thrust reversers standard.

ACCOMMODATION: Pilot and co-pilot/navigator side by side on flight deck of basic An-72, plus flight engineer, with



Antonov An-74TK-200 of the Iranian Presidential Guard (Jane's/Robert Hewson)

NEW/0554427



Antonov An-74TK-200 convertible passenger/cargo aircraft (Paul Jackson)

0121014

provision for fourth person. Heated windows. Two windscreen wipers. Flight deck and cabin pressurised and air conditioned. Main cabin designed primarily for freight, including four YAK-2.5 containers or four PAV-2.5 pallets each weighing 2,500 kg (5,511 lb); An-72 has folding seats along sidewalls and removable central seats for 68 passengers. It can carry 57 parachutists, and has provision for 24 stretcher patients, 12 seated casualties and an attendant in ambulance configuration. An-74 can carry eight mission staff in combi role, with tables and bunks. Bulged observation windows on port side for navigator and hydrologist. Provision for wardrobe and galley. Movable bulkhead between passenger and freight compartments, with provision for 1,500 kg (3,307 lb) of freight in rear compartment. Reinforced, movable bulkhead in combi versions protects passengers from shifting cargo in the event of sudden deceleration.

Downward-hinged and forward-sliding rear ramp/door for loading trucks and tracked vehicles, and for direct loading of hold from trucks. It is openable in flight, enabling freight loads of up to 7,500 kg (16,535 lb), with a maximum of 2,500 kg (5,511 lb) per individual item, to be airdropped by parachute extraction system. In normal freight role, 1,000 kg (2,204 lb) of payload can be placed on ramp. Maximum size of containers up to 1.90 x 2.44 x 1.46 m (6 ft 3 in x 8 ft x 4 ft 9 1/2 in), pallets up to 1.90 x 2.42 x 1.46 m (6 ft 3 in x 7 ft 11 in x 4 ft 9 1/2 in). Main crew and passenger door at front of cabin on port side. Emergency exit and servicing door at rear of cabin on starboard side.

SYSTEMS: Air conditioning system, altitude limit 10,000 m (32,810 ft), with independent temperature control in flight deck and main cabin areas; used to refrigerate main cabin when perishable goods carried. Maximum cabin pressure differential 0.49 bar (7.1 lb/sq in). Hydraulic system for landing gear, flaps and ramp. Electrical system powers auxiliary systems, flight deck equipment, lighting and mobile hoist. Thermal de-icing system for leading-edges of wings and tail unit (including tailplane slat), engine air intakes and cockpit windows. Provision for TA-12 APU in starboard landing gear fairing. This can be used to heat cabin; under cold ambient conditions, servicing personnel can gain access to major electric, hydraulic and air conditioning components without stepping outside.

AVIONICS: Comms: HF com, VHF com/nav. 'Odd Rods' IFF standard.

Radar: Navigation/weather radar in nose.
Flight: ADF. Compatible with DME, Tacan, VOR, ILS and SP systems. Doppler-based automatic navigation system, linked to onboard computer, is preprogrammed before take-off on push-button panel to right of map display.

Instrumentation: Failure warning panels above windscreen display red lights for critical failures, yellow lights for non-critical failures, to minimise time spent on monitoring instruments and equipment.

An-74 has enhanced avionics, including GPS, GPWS and TCAS 2000 in latest production. Five-screen 'glass cockpit' with twin HUDs under development by 2003.

EQUIPMENT: Removable mobile winch, capacity 2,500 kg (5,511 lb), assists loading. Cargo straps and nets stowed in lockers on each side of hold when not in use. Provision for roller conveyors in floor.

DIMENSIONS, EXTERNAL:	
Wing span	31.89 m (104 ft 7 1/2 in)
Wing aspect ratio	10.3
Length overall	28.07 m (92 ft 1 1/4 in)
Fuselage: Max diameter	3.10 m (10 ft 2 in)
Height overall	8.65 m (28 ft 4 1/2 in)
Wheel track	4.09 m (13 ft 5 in)
Wheelbase	8.68 m (28 ft 5 1/2 in)
Min loading clearance beneath rear fuselage	2.80 m (9 ft 2 1/2 in)
Distance between engine centrelines	4.15 m (13 ft 7 1/2 in)
Crew/passenger door: Height	1.65 m (5 ft 5 in)
Width	0.90 m (2 ft 11 1/2 in)
Rear-loading door: Length	7.10 m (23 ft 3 1/2 in)

Width	2.40 m (7 ft 10 1/2 in)
Height to sill	1.54 m (5 ft 0 3/4 in)
DIMENSIONS, INTERNAL:	
Cabin: Length: excl ramp: An-74	9.50 m (31 ft 2 in)
An-74T	10.50 m (34 ft 5 1/2 in)
incl ramp: An-74T	14.30 m (46 ft 11 in)
Width: at floor level	2.15 m (7 ft 0 1/2 in)
max	2.50 m (8 ft 2 1/2 in)
Height	2.20 m (7 ft 2 1/2 in)
Floor area: An-74T	22.5 m² (242 sq ft)
Ramp area	8.2 m² (88.3 sq ft)
Volume: An-74T (total)	73.3 m³ (2,589 cu ft)

AREAS:	
Wings, gross	98.53 m² (1,060.6 sq ft)
WEIGHTS AND LOADINGS (A: An-72, C: An-74, D: An-74 Salon, E: An-74-200, F: An-74T-200 and An-74TK-200):	
Weight empty: A	19,050 kg (42,000 lb)
F	21,820 kg (48,105 lb)
Max fuel: A	12,950 kg (28,550 lb)
C, D, E, F	13,200 kg (29,100 lb)
Max payload: C, D	7,500 kg (16,535 lb)
A, E, F	10,000 kg (22,045 lb)
Max T-O weight:	
from 1,800 m (5,905 ft) runway:	
A	34,500 kg (76,060 lb)
from 1,500 m (4,920 ft) runway:	
A	33,000 kg (72,750 lb)
from 600-800 m (1,970-2,630 ft) runway:	
A	27,500 kg (60,625 lb)
C, D	34,800 kg (76,720 lb)
E, F	36,500 kg (80,468 lb)
Max landing weight: A, F	33,000 kg (72,750 lb)
Max wing loading: A	349.8 kg/m² (71.62 lb/sq ft)
Max power loading: A	271 kg/kN (2.65 lb/lb st)

PERFORMANCE (An-72. A: at T-O weight of 33,000 kg; 72,750 lb. B: at T-O weight of 27,500 kg; 60,625 lb on 1,000 m; 3,280 ft unprepared runway. C, D, E, F, An-74 series as above):	
Max level speed at 10,000 m (32,810 ft):	
A	380 kt (705 km/h; 438 mph)
Max level speed at 10,100 m (33,135 ft):	
C, D, E, F	377 kt (700 km/h; 434 mph)
Cruising speed at 10,000 m (32,810 ft):	
A, B	297-324 kt (550-600 km/h; 342-373 mph)
Approach speed: A	97 kt (180 km/h; 112 mph)
Service ceiling: A	10,700 m (35,100 ft)
B	11,800 m (38,720 ft)
F	10,100 m (33,140 ft)
Service ceiling, OEI: A	5,100 m (16,740 ft)
B	6,800 m (22,300 ft)

T-O run: A	930 m (3,055 ft)
B	620 m (2,035 ft)
T-O to 10.7 m (35 ft): A	1,170 m (3,840 ft)
B	830 m (2,725 ft)
Landing run: A	465 m (1,525 ft)
B	420 m (1,380 ft)

Max length of runway required:	
C, D	1,200-1,800 m (3,940-5,905 ft)
E, F	1,400-2,150 m (4,595-7,055 ft)

Range, 45 min reserves:	
A with max payload	430 n miles (800 km; 497 miles)
A with 7,500 kg (16,535 lb) payload	1,080 n miles (2,000 km; 1,240 miles)
A with max fuel	2,590 n miles (4,800 km; 2,980 miles)
B with 5,000 kg (11,020 lb) payload	430 n miles (800 km; 497 miles)
B with max fuel	1,760 n miles (3,250 km; 2,020 miles)
F with 10,000 kg (22,046 lb) payload	809 n miles (1,500 km; 932 miles)
F with 5,000 kg (11,023 lb) payload	1,943 n miles (3,600 km; 2,236 miles)

Range, 1 hour reserves:	
C, F with 7,500 kg (16,535 lb) payload	944 n miles (1,750 km; 1,087 miles)
E with 7,500 kg (16,535 lb) payload	1,160 n miles (2,150 km; 1,336 miles)
C, E with 5,000 kg (11,020 lb) payload	1,511 n miles (2,800 km; 1,739 miles)
F with 5,000 kg (11,020 lb) payload	1,403 n miles (2,600 km; 1,615 miles)
C with max fuel and 800 kg (1,763 lb) payload	2,375 n miles (4,400 km; 2,734 miles)
D with max fuel and 16 passengers	2,429 n miles (4,500 km; 2,796 miles)
E with max fuel and 2,500 kg (5,511 lb) payload	2,294 n miles (4,250 km; 2,640 miles)
F with max fuel and 5,000 kg (11,020 lb) payload	2,321 n miles (4,300 km; 2,671 miles)

Endurance: F 6 h 50 min
UPDATED

ANTONOV An-74-300 and An-174

TYPE: Twin-jet freighter.

PROGRAMME: First variant, An-74TK-300, announced mid-1998. Model of An-174 shown at Paris, June 1999. Prototype An-74TK-300 modified by KhGAP from An-72 c/n 1910; work began December 1999; first official flight (UR-74300) 20 April 2001; international debut at Paris Salon, June 2001; certification trials completed July 2002 after 219 sorties; AP-25 certificate approved 9 September 2002.

CURRENT VERSIONS: Both are An-74 derivatives in which podded, underslung engines of increased power replace the normal An-72/74 installation.

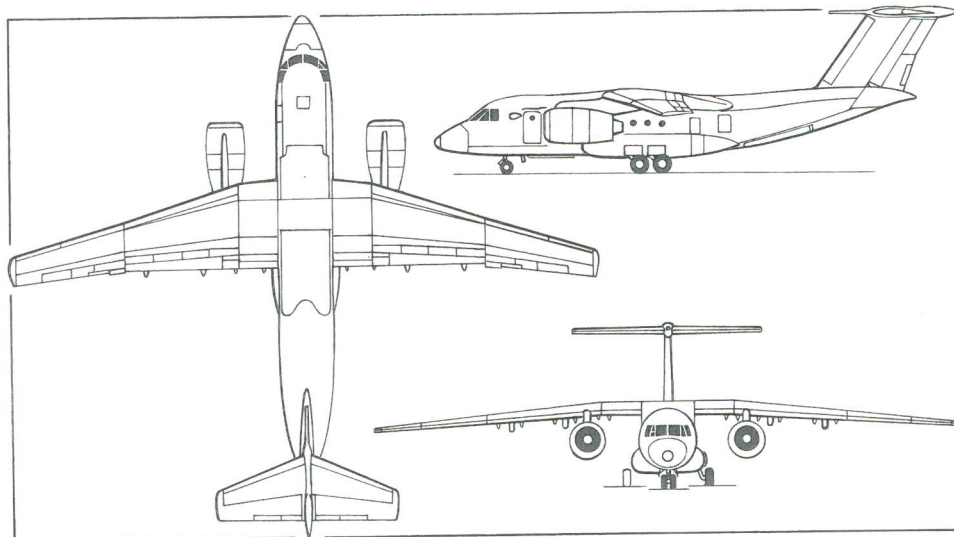
An-74T-300: Baseline transport for 52 passengers. As described.

An-74TK-300: Combi version. Internal dimensions as for An-74T-100/200.

An-74MP-300: Proposal announced 2002. Maritime patrol version of An-74TK-300; also capable of carrying 22 paratroops, or 44 soldiers or 16 stretchers. Provision for GSh-23L gun, rockets and 100 kg bombs.

An-174: Stretched version with 6 m (19 1/2 ft) fuselage extension provided by plugs fore and aft of wing. Progress D-436T1 engines, each 74.3 kN (16,700 lb st). Studies had begun by 1998. Potential replacement for An-12. Also known as **An-74-400**.

CUSTOMERS: Initial orders for two (including freighter) from undisclosed Russian airlines; MoU for 25 from Aeroflot, signed June 2002; Chinese interest in two aircraft reported late 2002.



Antonov An-74T-300 STOL transport (Jane's/James Goulding)

0079288



Prototype An-74-300 in Antonov house colours (Paul Jackson)

NEW/0554453



Model of Antonov An-174 stretched version of An-74-300 (Paul Jackson)

0121103

COSTS: US\$12 million to US\$14 million (2003).

DESIGN FEATURES: Revised engine installation decreases T-O run, despite loss of Coanda effect; new power plants reduce maintenance requirements and fuel consumption (up to 29 per cent); new position simplifies access. Compared to An-74T-200's range with 45 min reserves, An-74T-300 offers additional 372 n miles (690 km; 428 miles) with 10,000 kg (22,046 lb) payload and 518 n miles (960 km; 596 miles) with 5,000 kg (11,023 lb). Cruising speed (at nominal 10,600 to 11,000 m; 34,780 to 36,420 ft) also noticeably improved.

Cabin enlarged by repositioning of partitions; integral airstairs; upgraded air conditioning; improved instrumentation, including provision for LCDs.

POWER PLANT: Two 63.7 kN (14,330 lb st) Progress D-36-4A turbofans.

AVIONICS: Comms: SO-72M transponder, Arlekin-DA HF radio, twin Orlan-85ST VHF, Lainer-MVL PA system, Opal-B CVR, Cospas ELT.

Radar: Buran-74T weather radar.

Flight: NVS-74TM Malva navigation system, SH-3301 GPS, twin A-073 radar altimeters, twin KURS-93M VOR/ILS, twin SD-75 DME, Veer-M Shoran, twin ARK-22 ADF and TCAS 2000.

DIMENSIONS, EXTERNAL: Generally as for An-74.

DIMENSIONS, INTERNAL (VIP version):

Cabin: Length	10.49 m (34 ft 5 in)
Width	2.20 m (7 ft 2½ in)
Height	2.50 m (8 ft 2½ in)
Volume	54.0 m³ (1,907 cu ft)

AREAS:

Wings, gross	98.62 m² (1,061.5 sq ft)
--------------	--------------------------

WEIGHTS AND LOADINGS:

Max payload	10,000 kg (22,045 lb)
Max fuel weight	13,210 kg (29,123 lb)
Max T-O weight	37,500 kg (82,673 lb)
Max landing weight	33,000 kg (72,752 lb)

PERFORMANCE:

Max level speed	405 kt (750 km/h; 466 mph)
Max cruising speed	391 kt (725 km/h; 450 mph)
Service ceiling	10,100 m (33,140 ft)
Balanced field length	1,900 m (6,235 ft)
Range: with 10,000 kg (22,046 lb) payload	809 n miles (1,500 km; 932 miles)

with 52 passengers

1,889 n miles (3,500 km; 2,174 miles)

ferry 2,807 n miles (5,200 km; 3,231 miles)

UPDATED

ANTONOV An-124

NATO reporting name: Condor

TYPE: Outsize freighter.

PROGRAMME: Bureau design number 305; originally designated An-40. Prototype (SSSR-680125) first flew 26 December 1982; second aircraft registered SSSR-680210 but static test airframe only. First production aircraft (SSSR-82002 *Ruslan*, named after

giant hero of Russian folklore immortalised by Pushkin) exhibited 1985 Paris Air Show; lifted payload of 171,219 kg (377,473 lb) to 10,750 m (35,269 ft) on 26 July 1985, exceeding by 53 per cent C-5A Galaxy's record for payload lifted to 2,000 m and setting 20 more records. Entered service January 1986; set closed-circuit distance record 6 to 7 May 1987 by flying 10,880.625 n miles (20,150.921 km; 12,521.201 miles) in 25 hours 30 minutes.

Deliveries to VTA (Russian Air Forces transport arm), to replace An-22, began 1987; in September 1990, during Gulf crisis, an An-124 carried 451 Bangladeshi refugees from Amman to Dacca, after being fitted with chemical toilets, a 570 litre (150 US gallon; 125 Imp gallon) drinking water tank and foam rubber cabin lining in lieu of seats. Carried heaviest single commercial load transported by air: 135.2 tonnes in 1993; and heaviest commercial shipment moved in one flight; 146 tonnes in 1994.

Service life extension programme begun by Aviastar on first of 17 Antonov Airlines and Volga-Dnepr aircraft in 2000; includes new avionics; upgraded crew rest compartment; and cargo floor and loading equipment strengthening. First, RA-82078 of Volga-Dnepr, redelivered 14 March 2000. Continued production apparently was assured at Ulyanovsk (Aviastar plant) by Volga-Dnepr's requirement for expansion by one or two An-124s per year; company plans to register two future aircraft in UK, following JAR 25 certification. However, Volga-Dnepr dispute with Ulyanovsk local government resulted in termination of further orders in October 2002. Local sources, quoted in February 2003, estimated An-124 production at Aviastar would not resume for five years, but in June 2003 this was said to have restarted following resolution of the dispute.

CURRENT VERSIONS: An-124: Baseline transport.

Detailed description applies to above version.

An-124-100: Commercial transport; civil type certificate granted by AviaRegistr of Interstate Aviation Committee of Russian Federation and Associated States

(CIS) on 30 December 1992. Civil-operated An-124s are now to this standard. Maximum T-O weight restricted to 392,000 kg (864,200 lb) and maximum payload to 120,000 kg (264,550 lb).

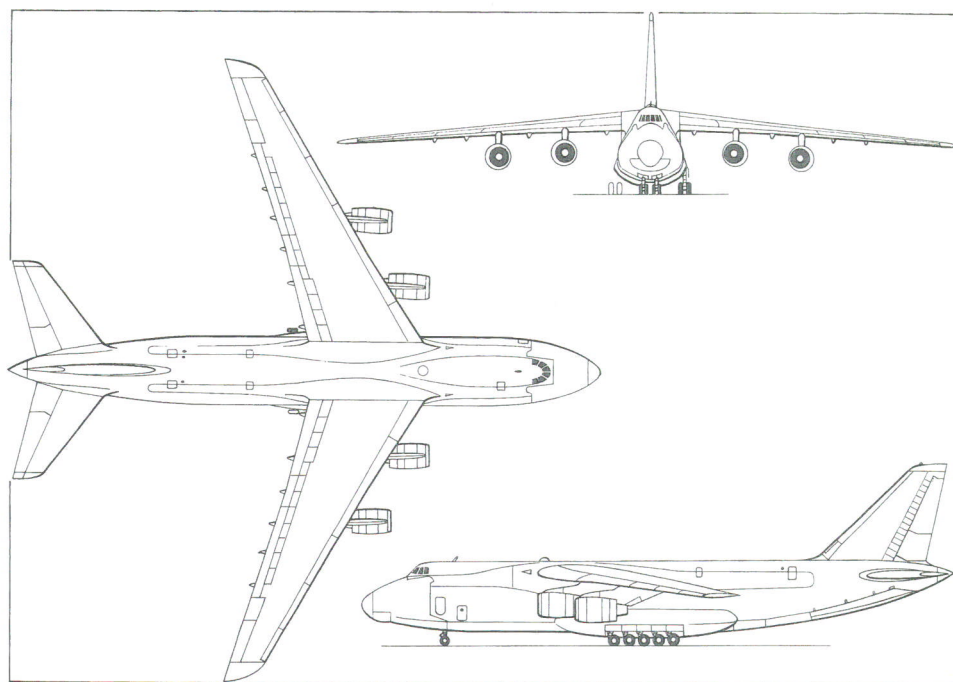
An-124-100M: As An-124-100, but with Western avionics, including Litton LTN-92 INS, Rockwell Collins GPS, ACARS, weather radar and TCAS-2. Series 3 versions of D-18T engine, offering 6,000 hour overhaul interval and 24,000 hour total life. Crew reduced to four by removal of radio operator and navigator. Prototype (RA-82079) completed at Ulyanovsk late 1995, but not flown until June 2000; delivered Volga-Dnepr 3 August 2000. Service life extension to 24,000 hours formally certified on 22 February 2001. Version offered to RAF in 1999 as alternative to An-124-210 (which see). Final details were agreed in November 2001 for upgrades of remainder of Volga-Dnepr, plus Antonov Airlines fleets. New deliveries also in hand.

An-124-102: Flight deck EFIS equipped, with dual sets of CRTs. Crew reduced to three (two pilots and flight engineer).

An-124-130: Under study in 1996 with General Electric CF6-80 turbofans. Prototype reportedly will be 36th Ulyanovsk aircraft.

An-124-200: Proposed version with GE CF6-80C2 engines, each 263 kN (592,000 lb st).

An-124-210: Joint proposal with Air Foyle to meet UK's Short Term Strategic Airlifter (STSA) requirement: 273 kN (60,600 lb st) Rolls-Royce RB211-524H-T engines and Honeywell avionics. Weight empty 184,000 kg (405,650 lb); payload and MTOW as An-124-100. Range (30 min reserves plus 5 per cent) 2,267 n miles (4,200 km; 2,609 miles) with 120,000 kg (264,550 lb) max payload; 3,855 n miles (7,140 km; 4,436 miles) with 80,000 kg (176,375 lb); or 7,424 n miles (13,750 km; 8,543 miles) with max fuel. JAR 25 runway length 2,300 m (7,545 ft). Three flight crew. STSA competition was abandoned in August 1999, then reinstated and won by Boeing C-17A.



Antonov An-124 (four ZMKB Progress/Ivchenko D-18T turbofans) (Jane's/James Goulding)

An-124FFR: Water-bomber project, able to drop 200 tonnes of fire retardants including 70 tonnes in centre fuel tank. Convertible to freighter.

An-124 Turboprop: Retrofit with four Aviadvigatel NK-93 propfans considered by Volga-Dnepr in 1997.

An-124-100VS: Russian government approval given late 1998 to modify two An-124s to carry the Vozdushny Start booster, capable of placing a 1,630 kg (3,593 lb) satellite into 200 km (124 mile) orbit. ORIL launch system has development cost of US\$130 million (2000) and will cost up to US\$20 million per launch; An-124 upgrades are US\$13 million each. Booster is extracted from An-124's rear by parachute before rocket ignition. Alternative (Anglicised) designation **An-124AL**. Aircraft include RA-82010. IOC expected by early 2003, but not confirmed by mid-2003.

Aircraft transferred from Russian Air Forces to Ulyanovsk for modification, last arriving on 8 February 2001; first aircraft's public debut was at Ulyanovsk on 24 August 2001; second was due for completion before end of 2001; operated by Polet alongside further two ex-military transfers.

An-124-300: Proposed stretched version under study in 2003. Fuselage lengthened by 5.90 m (19 ft 4½ in), by plugs fore and aft of wing, to give 1,300 m³ (45,900 cu ft) cargo volume; wing centre section increased in width to provide additional fuel volume and increase span to 79.90 m (262 ft 1½ in). Payload options to include 150,000 kg (330,700 lb) over 4,373 n miles (8,100 km; 5,033 miles) and 120,000 kg (263,550 lb) over 5,399 n miles (10,000 km; 6,213 miles). Engines may be of Western origin.

CUSTOMERS: Manufactured at Kiev by Aviant and (beginning with eighth production aircraft, SSSR-82005, in late 1985) by Aviastar at Ulyanovsk; 55 completely or substantially built by late 1995, comprising 19 at Kiev (including prototype, but not test airframe) and 36 at Ulyanovsk; by June 2000, only 18 and 34, respectively, had flown. Production at Kiev temporarily halted by 1991 after 16 aircraft and briefly resumed with two more in 1993-94. Ulyanovsk has continued throughout, producing 33 by 1995; in 2001, No. 35 was scheduled for delivery to Polet in 2002, but its arrival had not been reported by mid-2003. In early 2002, further two aircraft under construction at Aviastar for Volga-Dnepr, first of which (prospective RA-82081) formally ordered (company's 10th) on 24 July 2002, for delivery in 2004.

First international commercial operator was Air Foyle of Luton, UK, which wet leases from Antonov OKB; others previously available to HeavyLift (UK) from Volga-Dnepr (Russia), for charter operations until partnership dissolved in 2000 and Air Foyle HeavyLift joint venture launched in October 2001. Operators in 2002 comprised Antonov Airlines (eight), Polet (six), Volga-Dnepr (nine), Russian Air Forces (11) and Libyan Cargo Airlines (two, delivered 2001 and 20 September 2002). Further 11 Russian Air Forces aircraft stored pending possible resale (of which one to Polet in 2003); four destroyed; one (prototype) in storage, completing total of 52 aircraft flown up to 2001; the 19th and last Aviant aircraft was due for completion in 2003.

COSTS: US\$40 million (2001).

DESIGN FEATURES: World's largest production aircraft; upward-hinged visor-type nose and rear fuselage ramp/



Antonov An-124 heavy freight transport (Paul Jackson)

NEW/0554454

door for simultaneous front and rear loading/unloading; titanium floor throughout constant-section main hold, which is lightly pressurised, with a fully pressurised cabin for passengers above; landing gear for operation from unprepared fields, hard packed snow and ice-covered swampland; steerable nosewheels and mainwheels permit turns on 45 m (148 ft) wide runway.

Service life initially 7,500 hours; contract for extension to 12,000 hours signed between Volga-Dnepr and Antonov, July 2000; aircraft delivered from 2000 have 24,000 hour airframe and engine life.

Supercritical wings, with anhedral; sweepback approximately 35° on inboard leading-edge, 32° outboard; all tail surfaces sweptback.

FLYING CONTROLS: All surfaces hydraulically actuated; manual control of automatic control systems, control surface actuators, control system manual linkage and trimming system. Two-section ailerons, three-section single-slotted Fowler flaps (two outer, one inner) and six-section full-span leading-edge flaps on each wing; small slot in outer part of two inner flap sections each side to optimise aerodynamics; 12 spoilers on each wing, forward of trailing-edge flaps (four lateral control spoilers outboard; four glissage spoilers; and four airbrakes inboard); no wing fences, vortex generators or tabs; hydraulic flutter dampers on ailerons; rudder and each elevator in two sections, without tabs but with hydraulic flutter dampers; fixed incidence tailplane; control runs (and other services) channelled along fuselage roof.

STRUCTURE: Basically conventional light alloy, but 5,500 kg (12,125 lb) of composites make up more than 1,500 m² (16,150 sq ft) of surface area, giving weight saving of more than 2,000 kg (4,410 lb); each wing has one-piece root-to-tip upper surface extruded skin panel, strip of carbon fibre skin panels on undersurface forward of control surfaces, and glass fibre tip; front and rear of each flap guide fairing of glass fibre, centre portion of carbon fibre; central frames of semi-monocoque fuselage each comprise four large forgings; fairings over intersection of fuselage double-bubble lobes in line with wing, from rear of flight deck to plane of fin leading-edge, primarily of glass fibre, with central, and lower underwing, portions of carbon fibre;

other glass fibre components include tailplane tips, nosecone, tailcone and most bottom skin panels forming blister underfairing between main landing gear legs; carbon fibre components include strips of skin panels forward of each tail control surface, nose and main landing gear doors, some service doors, and clamshell doors aft of rear-loading ramp.

LANDING GEAR: Hydraulically retractable nosewheel type, made by Hydromash, with 24 wheels. Two independent forward-retracting and steerable twin-wheel nose units, side by side. Each main gear comprises five independent inward-retracting twin-wheel units; front two units on each side steerable. Each mainwheel bogie enclosed by separate upper and lower doors when retracted. Nosewheel doors and lower mainwheel doors close when gear extended. All wheel doors of carbon fibre. Main gear bogies retracted individually for repair or wheel change. Mainwheel tyres size 1,270x510. Nosewheel tyres size 1,120x450.

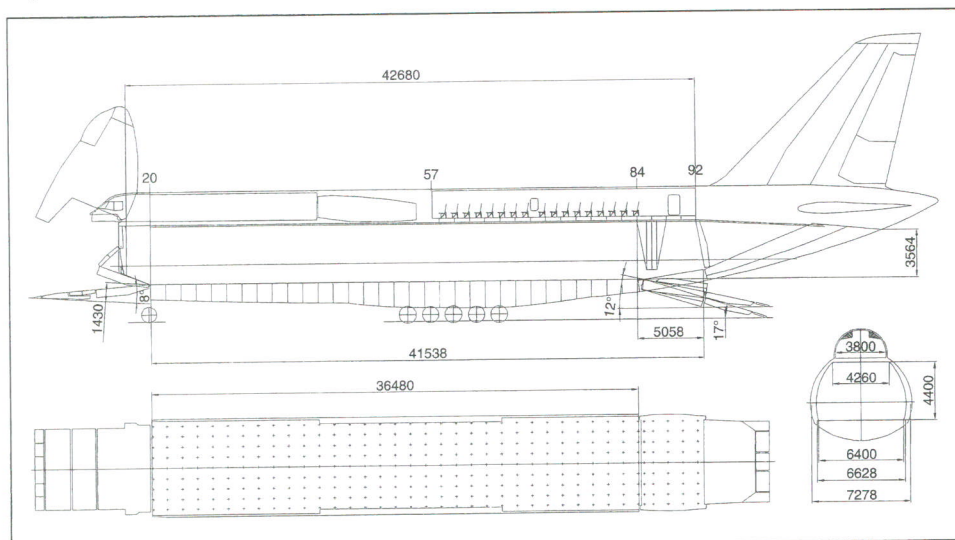
Aircraft can 'kneel', by retracting nosewheels and settling on two extendable 'feet', giving floor of hold a 3.5° slope to assist loading and unloading. Process takes 3 minutes to lower aircraft and 6½ minutes to raise. Rear of cargo hold lowered by compressing main gear oleos. Carbon brakes normally toe-operated, via rudder pedals. For severe braking, pedals depressed by toes and heels. Turning radius (outboard wheels) 19.6 m (64 ft 4 in).

POWER PLANT: Four ZMKB Progress/Ivchenko D-18T turboprops, each 229 kN (51,590 lb st); thrust reversers standard. Optional hush kit certified to ICAO Chapter 3 in mid-1997. Engine cowlings of glass fibre; pylons have carbon fibre skin at rear end. All fuel in 10 integral tanks in wings, total capacity 348,740 litres (92,128 US gallons; 76,714 Imp gallons), not all of which is utilised in civil versions.

ACCOMMODATION: Crew and passenger accommodation on upper deck; freight and/or vehicles on lower deck. Flight crew of six, in pairs, on flight deck, with place for loadmaster in lobby area (10 to 12 cargo handlers and servicing staff carried on commercial flights). Pilot and co-pilot on fully adjustable seats, which rotate for improved access. Two flight engineers, on wall-facing seats on starboard side, have complete control of master fuel cocks, detailed systems instruments, and digital integrated data system with CRT monitor. Behind pilot are navigator and communications specialist, on wall-facing seats. Between flight deck and wing carry-through structure, on port side, are toilets, washing facilities, galley, equipment compartment, and two cabins for up to six relief crew, with table and facing bench seats convertible into bunks.

Aft of wing carry-through is passenger cabin for 88 persons. Hatches in upper deck provide access to wing and tail unit for maintenance when workstands not available. Flight deck and passenger cabin each accessible from cargo hold by hydraulically folding ladder, operated automatically with manual override. Rearward-sliding and jettisonable window each side of flight deck. Primary access to flight deck via airstair door, with ladder extension, forward of wing on port side. Smaller door forward of this and slightly higher. Door from main hold aft of wing on starboard side. Upper deck doors at rear of flight deck on starboard side and at rear of passenger cabin on each side. Emergency exit from upper deck aft of wing on each side.

Hydraulically operated visor-type upward-hinged nose takes 7 minutes to open fully, with simultaneous extension of folding nose loading ramp. When open, nose is steadied by reinforcing arms against wind gusts. No hydraulic, electrical or other system lines broken when nose is open. Radar wiring passes through tube in hinge. Hydraulically



Principal cargo hold dimensions (in millimetres) of the Antonov An-124

0079287

For details of the latest updates to *Jane's All the World's Aircraft* online and to discover the additional information available exclusively to online subscribers please visit
jawa.janes.com

operated rear-loading doors take 3 minutes to open, with simultaneous extension of three-part folding ramp. This can be locked in intermediate position for direct loading from truck. Aft of ramp, centre panel of fuselage undersurface hinges upward; clamshell door to each side opens downward.

Completely unobstructed lower deck freight hold has titanium floor, attached 'mobile' to lower fuselage structure to accommodate changes of temperature, with rollgangs and retractable attachments for cargo tie-downs. Load limits per tie-down fitting: 12,000 kgf (26,455 lbf) on main floor; 5,000 kgf (11,023 lbf) on rear ramp. Narrow catwalk along each sidewall facilitates access to, and mobility past, loaded freight. Payloads include largest CIS main battle tanks, complete missile systems, 12 standard ISO containers, oil well equipment and earth movers; HeavyLift/Volga-Dnepr aircraft previously transported Airbus wings in Europe. No personnel carried normally on lower deck in flight, because of low pressurisation, but can accommodate 360 troops (not including 88 on upper deck), plus two lavatories and oxygen bottles. Military aircraft equipped to airdrop up to 16 pallets, each of up to 4,500 kg (9,920 lb); or 268 paratroops in two passes. Medical evacuation capability is 288 stretchers and 28 attendants.

SYSTEMS: Automatic flight control system includes control loading for elevator and ailerons; stability augmentation for elevator and rudder; elevator trim and balance; elevator and rudder gear ratio system; and flight limit condition restriction for elevator. Entire interior of aircraft is pressurised and air conditioned. Maximum pressure differential 0.55 bar (7.8 lb/sq in) on upper deck, 0.25 bar (3.55 lb/sq in) on lower deck. Four independent hydraulic systems. Quadruple redundant fly-by-wire flight control system, with mechanical emergency fifth channel to hydraulic control servos. Special secondary bus electrical system. Landing lights under nose and at front of each main landing gear fairing. APU in rear of each landing gear fairing for engine starting, can be operated in the air or on the ground to open loading doors for airdrop from rear or normal ground loading/unloading, as well as for supplying electrical, hydraulic and air conditioning systems. Bleed air anti-icing of wing leading-edges. Electro-impulse de-icing of fin and tailplane leading-edges.

AVIONICS: Radar: Two dielectric areas of nose visor enclose forward-looking weather radar and downward-looking ground-mapping/nav radar.

Flight: Hemispherical dielectric fairing above centre-fuselage for satellite nav receiver; quadruple INS; Loran and Omega.

Instrumentation: Conventional flight deck equipment, including automatic flight control system panel at top of glareshield, weather radar screen and moving map display forward of throttle and thrust reverse levers on centre console. No electronic flight displays. Dual attitude indicator/flight director and HSIs, and vertical tape engine instruments.

EQUIPMENT: Two electric travelling cranes in roof of hold, each with two lifting points, offer total lifting capacity of 20,000 kg (44,092 lb). First trial of 30,000 kg (66,139 lb) system in December 1999; development then launched of 40,000 kg (88,185 lb) lifting system. Two winches each pull a 3,000 kg (6,614 lb) load. Small two-face mirror, of V form, enables pilots to adjust their seating position until their eyes are reflected in the appropriate mirror, which ensures optimum field of view from flight deck.

DIMENSIONS, EXTERNAL:

Wing span	73.30 m (240 ft 5 1/4 in)
Wing aspect ratio	8.6
Length overall	69.10 m (226 ft 8 3/4 in)
Fuselage max width	7.28 m (23 ft 10 1/2 in)
Height overall	21.08 m (69 ft 2 in)
Wheel track	8.00 m (26 ft 3 in)
Wheelbase (centre row mainwheels)	22.90 m (75 ft 1 1/2 in)

Sill height:

front door: normal	up to 2.79 m (9 ft 1 3/4 in)
kneeling	1.43 m (4 ft 8 1/4 in)
rear door, normal	up to 2.85 m (9 ft 4 1/4 in)

DIMENSIONS, INTERNAL:

Cargo hold:

Length at floor:	
excl ramps	36.48 m (119 ft 8 1/4 in)
incl rear ramp	41.54 m (136 ft 3 1/2 in)
max	42.68 m (140 ft 0 1/4 in)
Width: at floor	6.40 m (21 ft 0 in)
max	6.63 m (21 ft 9 in)
at ceiling	4.26 m (13 ft 11 1/4 in)
Max height	4.40 m (14 ft 5 1/4 in)
Floor area, incl ramp	2,650 m ² (2,852 sq ft)
Volume, incl ramp	1,160 m ³ (40,965 cu ft)
Passenger cabin: Width at floor	3.80 m (12 ft 5 1/2 in)

AREAS:

Wings, gross 628.0 m² (6,760.0 sq ft)

WEIGHTS AND LOADINGS (A: basic An-124, B: An-124-100):

Operating weight empty: A	175,000 kg (385,800 lb)
Max payload (incl rear ramp): A	150,000 kg (330,700 lb)
B	120,000 kg (264,550 lb)
Max load on rear ramp: A and B	10,000 kg (22,046 lb)
Max fuel weight (An-124-210)	214,000 kg (471,790 lb)
Max T-O weight: A	405,000 kg (892,875 lb)
B	392,000 kg (864,200 lb)
Max ramp weight: B	398,000 kg (877,425 lb)

Max landing weight: B	330,000 kg (727,500 lb)
Max zero-fuel weight: A	325,000 kg (716,500 lb)
Max wing loading: A	644.9 kg/m ² (132.09 lb/sq ft)
Max power loading: A	441 kg/kN (4.32 lb/lb st)

PERFORMANCE:

Max cruising speed: A 467 kt (865 km/h; 537 mph)

Normal cruising speed at FL328-394:

A 432-459 kt (800-850 km/h; 497-528 mph)

Airdropping speed range 127-216 kt (235-400 km/h; 146-249 mph)

Approach speed:

A 124-140 kt (230-260 km/h; 143-162 mph)

Max certified altitude 12,000 m (39,380 ft)

T-O balanced field length at max T-O weight:

A 3,000 m (9,840 ft)

T-O run: A 2,520 m (8,270 ft)

Landing run at max landing weight: A 900 m (2,955 ft)

Range: with max payload:

A 2,430 n miles (4,500 km; 2,795 miles)

B 2,591 n miles (4,800 km; 2,982 miles)

with 80,000 kg (176,375 lb) payload:

A, B 4,535 n miles (8,400 km; 5,219 miles)

with 40,000 kg (88,184 lb) payload:

A, B 6,479 n miles (12,000 km; 7,456 miles)

ferry, with max fuel:

A, B 8,477 n miles (15,700 km; 9,755 miles)

OPERATIONAL NOISE LEVELS:

Stated to meet ICAO requirements

UPDATED

ANTONOV An-140

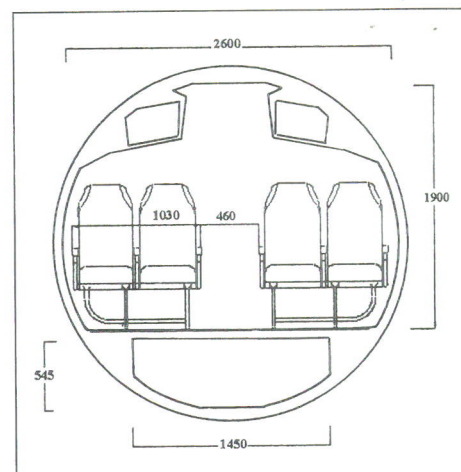
TYPE: Twin-turboprop airliner.

PROGRAMME: Announced at Paris in June 1993 as An-24 replacement; preliminary design finalised April 1994; two prototypes with TV3-117 engines and static test airframe constructed at Kiev; rolled out 6 June 1997; first flight (UR-NT0) at Kiev-Svyatoshino (landing at Gostomel flight test centre, as base for certification trials) 17 September 1997; second airframe (0102) for static tests; second flying prototype (UR-NTP) rolled out 11 December 1997 and flew 26 December. Third (0104; first production), with full systems, due to fly at Kharkov, early 1999, and undertake electromagnetic compatibility and climatic tests but maiden sortie delayed until 11 October 1999; this aircraft (UR-PWO) flew 41 sorties towards certification.

Certification programme of 940 hours began August 1998 and completed in late 1999; included cold trials at Arkhangelsk (by UR-NT0 between 29 March and 1 May 1999, and by UR-NTP in Yakutia for 10 days in January 2000) and hot-and-high trials in Uzbekistan and Kyrgyzstan (by UR-NTP, concluding 3 September 1999). Following first series of flight testing, tailplanes of prototypes modified to obviate propwash-induced vibration, gaining 6° dihedral and shortened elevator horn balance. An-140's 1,000th hour flown (by UR-NTP) on 12 January 2000. Trials concluded on 26 March 2000 after 1,286 hours in 1,138 sorties. Certification in Russia (AP-25) and Ukraine was achieved on 25 April 2000 coincident with that of TV3-117VMA-SBM1 engine and AV-140 propeller. Meets FAR Pt 25 airworthiness, Pt 34 emissions and Pt 36 noise requirements.

Series production began 1999 at KhGAPP, Kharkov (where wings for prototypes were built) and at Aviacor, Samara, Russian Federation. Aviacor production intended to be 10 in 2000 (first in July) and to reach 30 per year by 2001, but reduced to combined total of eight in 2000-01; five under assembly at Aviacor by May 2000, but none yet ordered and maiden flight of first slipped to late 2000. This also failed to be achieved, and first aircraft was still on production line in 2003. KhGAPP has capacity for 40 per year, initial batch comprising seven. First Kharkov production aircraft delivered March 2002 and made type's Western debut at Farnborough in July 2002.

Production share agreement of 1998 assigns empennage to Antonov; engine nacelles, wing and associated control surfaces to KhGAPP; landing gear to Aviagregat at Samara



Cross-section of the An-140 cabin; dimensions in millimetres (Paul Jackson) 0052938

and Youzhmash at Dnepropetrovsk; and fuselage to Aviacor (incorporating Avio Interiors fittings from Italy).

Agreement signed February 1996 for assembly by HESA at rate of 12 a year from 1999, progressing to local parts manufacture, in new plant at Esfahan, Iran, with Ukrainian assistance; first two kits shipped to Iran by late 2000; initial aircraft first flown 7 February 2001. Iranian type certificate issued 14 April 2003.

CURRENT VERSIONS: An-140: Initial aircraft only; replaced in 2003 by -100.

An-140T: Proposed 6 tonne freighter with large door, port side, rear. Convertible An-140TK will be similar, but with 5 tonne payload and up to 50 passengers.

An-140VIP: Executive version; range 2,159 n miles (4,000 km; 2,485 miles).

An-140-100: Improved version; wing span increased by 1.00 m (3 ft 3 3/4 in) giving 21,500 kg (47,399 lb) MTOW and further 162 n miles (300 km; 186 miles) of range. Standard version from 2003. (Series 100 originally proposed in 1997 as 68-seat version with 3.80 m; 12 ft 5 1/2 in fuselage stretch.) As described.

An-142: Under development for 2001 first flight; forward-retracting rear loading ramp similar to An-26. No further reports.

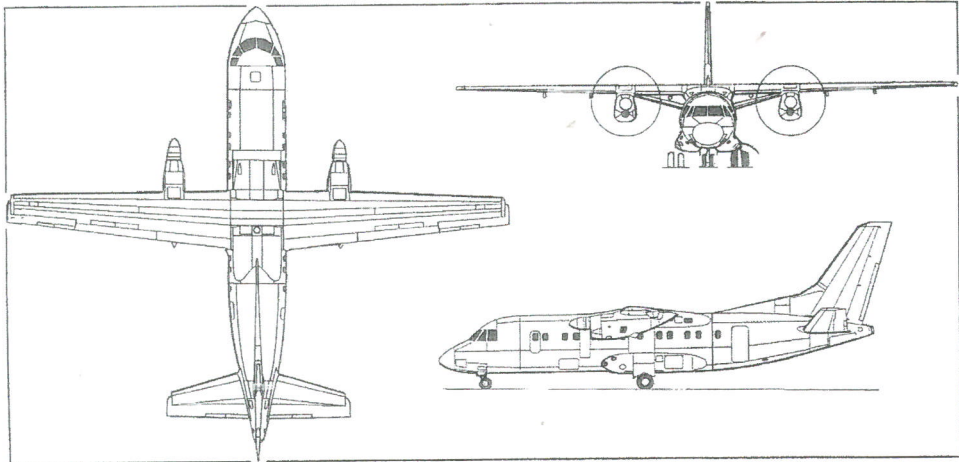
IR-AN-140: Licence-built by HESA in Iran.

An-140 Military: Patrol, surveillance, photographic and similar variants proposed for military operators.

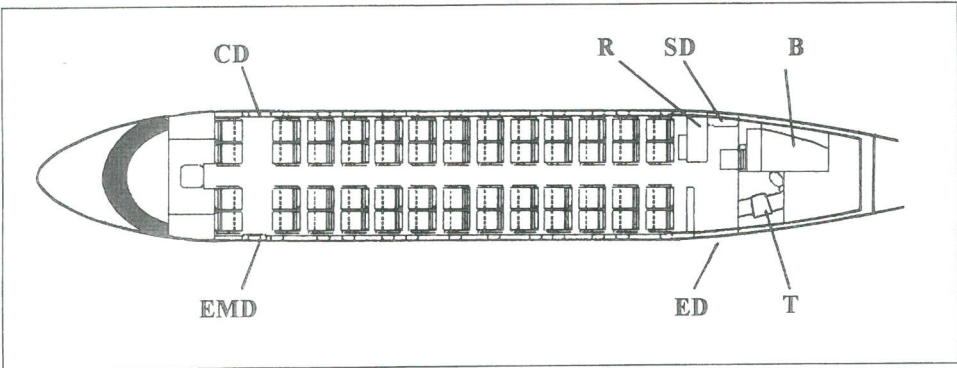
CUSTOMERS: Air Ukraine letter of intent for up to 40 by 2010 signed 17 September 1997 (first flight); initial four firm conversions made June 1999 (for manufacture at Kharkov), specifying deliveries from 2000; however, initial recipient from Ukrainian production was Ikar Airlines, with five on order from January 2000 contract, first being UR-PWO, delivered in 2001, following testing at Antonov; this soon disposed of, however. First order for 15 placed by republic of Sakha-Yakutia, Russian Federation, mid-1998, requiring 10 to be delivered to Sakha Airlines from Samara production in 2000-04. First Samara-built aircraft destined for Samara Airlines in first quarter of 2002, but had not been received by mid-2003. Aerofoil letter of intent for 50 PW127-powered An-140As signed mid-1999 (specifying Samara production). Tyumenaviatrans reportedly holds option on 25 An-140s, but this had been relegated to expression of interest (also from Polar Airlines and Mirny) when An-140 toured Siberia in early 2000. Odessa Airlines ordered five from Kharkov production, of which first (UR-14001, the former UR-PWO) entered revenue-earning service on 29 March 2002, having been handed over to Ukrtransleasing on 4 March. Second and third Kharkov aircraft delivered to Aeromost (airline formed July 2002 by Kharkov plant and originally named Aeromist) on 3 and 22 August 2002. Third operator of Kharkov aircraft was Motor Sich, which



Second production Antonov An-140 twin-turboprop transport from Kharkov assembly (Jane's/Robert Hewson) NEW/0554428



Antonov An-140-100 short-range transport (Jane's/James Goulding) NEW/0554426



Antonov An-140 cabin seating for 52 passengers (Paul Jackson)
B: baggage, CD: cargo door, ED: entrance door, EMD: emergency door, R: refreshments, SD: service door, T: lavatory 0051523

received UR-14005 on 23 May 2003. Volga-Dnepr signed letter of intent in October 2002 for five from Kharkov, due 2003-04, while Buryatia Airlines (two) and Sibaviatrans (three) placed orders in December 2002, and Sakha/Yakutia followed with four in January 2003. Five ordered by Air Libya in June 2003. Launch order for IR.AN-140 is 20 for Iran Asseman Airlines; Iran Air also will be operator; Iranian licence initially for 80 aircraft, but interest reported, late 1998, in building further 160. Estimated sales of 645 by 2011, including 430 to Russia and 70 to Ukraine.

COSTS: US\$7 million (2000).
DESIGN FEATURES: Light transport, designed to be capable of autonomous operation from airfields with unprepared runways at all altitudes and in all weathers, providing airline-standard comfort. International certification and various engine options to maximise sales prospects. Conventional high-wing monoplane; tapered wing with unswept leading-edge; sweptback fin and tailplane, latter with 6° dihedral; engines mounted underwing. Maintenance target of 6.5 mmh/fh. Service life 50,000 landings/50,000 hours/25 years.

FLYING CONTROLS: Conventional and manual. Control surfaces all horn balanced; ailerons with trim tab in each (two-section tab starboard); elevator with two-section tab each side; rudder with large single tab. Two-section flaps in each wing; two-section spoilers ahead of each outboard flap section.

STRUCTURE: Largely of aluminium, with some titanium.
LANDING GEAR: Retractable tricycle type by Pivdennyi; twin Rubin wheels on each unit; nosewheels retract forward, mainwheels into fairings each side of lower fuselage. Mainwheels size 810x320-330; nosewheels 600x220-250. Rubin braking system. Able to operate from gravel or unpaved fields.

POWER PLANT: Two 1,839 kW (2,466 shp) AI-30 Series 1 turboprops (Klimov TV3-117VMA-SBM1 built under licence at Zaporozhye, Ukraine, by Motor-Sich), driving AV-140 feathering and reversible propellers; optionally, two 1,864 kW (2,500 shp) Pratt & Whitney Canada PW127A turboprops, driving Hamilton Sundstrand 247F propellers. FED fuel-management system; Star engine control system.

ACCOMMODATION: Flight crew of two, plus cabin attendant; basic seating for 52 passengers, four-abreast with centre aisle, at 78 cm (31 in) pitch, or 48 at 81 cm (32 in) pitch. Main passenger door with airstairs, at rear of cabin on port side, with service door opposite; emergency exit port side at front of cabin; cargo door starboard side, front. Coat stowage, galley and lavatory at rear of cabin. Baggage/freight compartment at rear of cabin, plus forward underfloor freight hold, with door on port side. Cargo door on starboard side, forward part of cabin floor reinforced, and detachable equipment provided, enabling 1,650 to 3,650 kg (3,638 to 8,046 lb) of palletised cargo and 36 to 20 passengers to be carried with forward rows of seats

removed. Overhead baggage lockers. Accommodation air conditioned and pressurised.
SYSTEMS: Motor-Sich AI-9-3B 16 kW APU in rear fuselage. FED hydraulic system; Nauka air conditioning. Kommunar anti-icing and air conditioning control systems. Auxilec generators; Eros oxygen system.

Avionika SAU 28-02 digital flight control system offered for new installation, or retrofit for operation with existing analogue avionics.

AVIONICS: Comms: Arlekin-D-A HF/ radio, twin Orlan-85ST VHF, Lainer-MVL PA system, Opal-B CVR, R-855A1 emergency VHF/UHF, SO-72M transponder, Satori ELT96 ELT. Muza-A entertainment system.

Radar: Buran A-140 weather radar
Flight: ARK-25 ADF, Veer-M Shoran, Kurs-93M VOR/ILS, RMI-3 RMI, SN-3301 GPS, VNIIRA-Navigator VND-94 VOR, A037 D1 radio altimeter and SSPZ-2000 GPWS.

DIMENSIONS, EXTERNAL:

Wing span: An-140	24.505 m (80 ft 4 1/4 in)
An-140-100	25.505 m (83 ft 8 1/4 in)
Length overall	22.605 m (74 ft 2 in)
Height overall	8.23 m (27 ft 0 in)
Wheel track (c/l shock-absorbers)	3.18 m (10 ft 5 1/4 in)
Wheelbase	8.125 m (26 ft 7 3/4 in)
Propeller diameter (AI-30)	3.66 m (12 ft 0 in)

Distance between propeller centres	8.20 m (26 ft 10 1/4 in)
Main cabin door: Height	1.605 m (5 ft 3 1/4 in)
Width	0.98 m (3 ft 3 in)
Emergency exit: Height	1.20 m (3 ft 11 1/4 in)
Width	0.515 m (1 ft 8 1/4 in)
Service door: Height	1.28 m (4 ft 2 1/4 in)
Width	0.63 m (2 ft 0 3/4 in)
Cargo door: Height	1.34 m (4 ft 4 3/4 in)
Width	1.00 m (3 ft 3 3/4 in)
Underfloor freight hold door: Height	0.90 m (2 ft 11 1/4 in)
Width	1.02 m (3 ft 4 1/4 in)

DIMENSIONS, INTERNAL:

Cabin: Length:	
excl flight deck, galley/lavatory area	10.50 m (34 ft 5 1/4 in)
incl galley/lavatory and baggage	14.30 m (46 ft 11 in)
Max width	2.60 m (8 ft 6 1/4 in)
Max height	1.90 m (6 ft 2 3/4 in)
Volume	65.5 m³ (2,313 cu ft)
Aft baggage compartment: Volume	6.0 m³ (212 cu ft)
Underfloor freight hold: Length	3.98 m (13 ft 0 3/4 in)
Max width	1.45 m (4 ft 9 in)
Max height	0.545 m (1 ft 9 3/4 in)
Volume	3.0 m³ (106 cu ft)
Overhead baggage lockers: Volume (total)	2.4 m³ (85 cu ft)

WEIGHTS AND LOADINGS (An-140-100):

Weight empty	12,810 kg (28,241 lb)
Baggage capacity	1,840 kg (4,057 lb)
Max payload	6,000 kg (13,227 lb)
Max fuel weight	4,440 kg (9,788 lb)
Max T-O weight	21,500 kg (47,399 lb)
Max power loading	5.85 kg/kW (9.61 lb/shp)

PERFORMANCE (An-140-100):

Max cruising speed	290 kt (537 km/h; 334 mph)
Econ cruising speed	243 kt (450 km/h; 280 mph)
Landing speed	109 kt (202 km/h; 125 mph)
Nominal cruising altitude	FL200
Max certified altitude	7,600 m (24,940 ft)
T-O run	880 m (2,890 ft)
Landing run	530 m (1,740 ft)

Range, no reserves:

with 6,000 kg (13,227 lb) payload	701 n miles (1,300 km; 807 miles)
with 52 passengers	1,263 n miles (2,340 km; 1,454 miles)
with 42 passengers	1,646 n miles (3,050 km; 1,895 miles)
ferry	1,987 n miles (3,680 km; 2,286 miles)

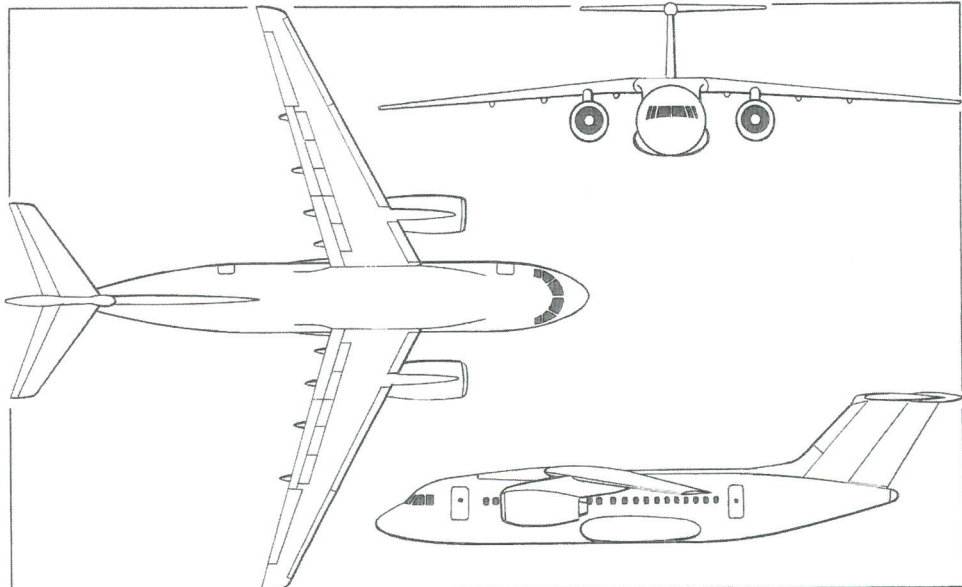
UPDATED

ANTONOV An-148

TYPE: Regional jet airliner.
PROGRAMME: In September 2001, Antonov revealed that it was working on the design of an 80-seat, twin-jet (Progress D-36-5AF), 1,349 n mile (2,500 km; 1,553 mile) range airliner. Configuration is similar to the An-74T-300; stretched and shrunk versions are also planned.

The first of three (two flying; one static) Antonov-built prototypes was stated to be under construction at Kharkov by early 2002, with series manufacture planned to be by KhGAPP at Kharkov and Ulan-Ude's UUAP; Antonov and UUAP signed agreement for licensed production in February 2002. Ukrainian participants include Motor Sich and ZhEDB Progress.

Fuselage removed from jigs 28 February 2003. First flight planned for late 2003, followed by AP-25 certification in 2004 and deliveries in 2005.



General arrangement of the Antonov An-148 (James Goulding) NEW/0569766

CURRENT VERSIONS: **An-148:** Baseline version; 75 passengers and range of 1,349 n miles (2,500 km; 1,553 miles), or 2,753 n miles (5,100 km; 3,169 miles) with reduced payload.

An-148-100: Stretched version for 90 to 100 passengers.

An-148C: Cargo version.

An-148D: Long-range (*dalnyy*) version; 40 to 55 passengers over 3,779 n miles (7,000 km; 4,349 miles); additional fuel tanks in cabin.

An-148SD: Extra-long-range (*sverkhdalnyy*); range 5,939 n miles (11,000 km; 6,835 miles).

An-148T: Military transport with rear loading ramp.

An-148VIP: Executive transport; between 10 and 30 passengers; range 5,399 n miles (10,000 km; 6,213 miles). **CUSTOMERS:** Volga-Dnepr letter of intent for three signed October 2002, anticipating delivery in 2005-06. Aeroflot lease agreement for 30 An-74s will be transferred to An-148.

COSTS: US\$15 million to US\$20 million (2002 estimate).

DESIGN FEATURES: Generally as for Antonov An-74. Wing developed by KhGAPP.

POWER PLANT: Two progress (ZMKB) D436-148 turboprops, each of 58.8 kN (13,227 lb st)

AVIONICS: Two-crew cockpit with five-screen display by Aviapribor.



Model of Antonov An-148 regional airliner (Yefim Gordon)

0525943

DIMENSIONS, EXTERNAL:

Wing span	28.91 m (94 ft 10 1/4 in)
Length overall	29.13 m (95 ft 6 1/4 in)
Height overall	8.20 m (26 ft 10 1/4 in)

PERFORMANCE (estimated):

Cruising speed	440 kt (815 km/h; 506 mph)
Cruising altitude	12,500 m (41,000 ft)

UPDATED

AVIAIMPEX

AVIAIMPEX JSC

Kiev

CHIEF DESIGNER: Mikhail Yu Kuchin

YANHOL PROJECT CHIEF: Sergey Tyurin

Aviation division of TVT Corporation formed to introduce helicopter design and production to Ukraine. Initial liaison with Aerokopter Ltd of Poltava (formed 14 December 1999); however, on 3 May 2000 Aerokopter design bureau divided and both elements became autonomous.

Future plans include an eight-seat, turbine-powered helicopter.

VERIFIED

AVIAIMPEX YANHOL

English name: Angel

TYPE: Three-seat helicopter.

PROGRAMME: Presented to the media on 31 August 2001, when prototype structurally complete. First flight planned for June 2002 (no confirmation received), followed by deliveries in 2003. By May 2002, Aviaimpex had revealed plans for gunship and UAV versions.

CUSTOMERS: Options placed on 400 (mostly in two-seat configuration) by early 2002, including Ukrainian Defence Ministry (reportedly 100 for pilot training), Internal Affairs Ministry (patrol), Georgian government and several city administrations, including Moscow Mayor's Office.

DESIGN FEATURES: Pod-and-boom configuration, with T tail and landing skids. Three-blade main and two-blade tail rotors.

COSTS: US\$120,000 in Ukraine; US\$150,000 export (2002). Operating cost US\$70 per hour (2002).

POWER PLANT: Two Rotax 912 ULS flat-four piston engines, each 73.5 kW (98.6 hp).



Aviaimpex Yanhol light helicopter (Yefim Gordon)

0525944

WEIGHTS AND LOADINGS:

Max payload	350 kg (772 lb)
Max T-O weight	870 kg (1,918 lb)

PERFORMANCE:

Max cruising speed	89 kt (165 km/h; 103 mph)
Range with max fuel	183 n miles (340 km; 211 miles)

UPDATED

AVIANT

AVIANT, KIEVSKY GOSUDARSTVENNY AVIATSIONNY ZAVOD (Aviant, Kiev State Aviation Plant)

prospekt Pobedy 100/1, 03062 Kiev

Tel: (+38 044) 441 52 01

Fax: (+38 044) 442 43 85

e-mail: aviant@carrier.kiev.ua

GENERAL DIRECTOR: Vasily K Tselykh

MARKETING DIRECTOR: Fedir I Hnatenko

The Kiev Aviation Plant has effectively terminated work on the Antonov An-32 twin-turboprop transport and An-124 heavy transport. However, it built two prototypes of the An-70 four-propfan transport and shares in production with Aviacor at Samara. The two firms will also manufacture the Tupolev Tu-334 twin-turboprop transport. Overhauls An-24/26, An-32 and An-124 aircraft. Non-aviation activities include manufacture of trolley-buses, pressure chambers and customer goods. Recently contributed to manufacture of prototype Aviaimpex Yanhol helicopter prototype.

Aviant previously built 3,320 An-2s (1947-59), An-8s (1956-59), 1,028 An-24s (1959-78), 1,402 An-26s (1969-85), 123 An-30s (1973-79), 361 An-32s and 17 An-124s.

UPDATED



Tupolev Tu-334 under construction at Aviant (Yefim Gordon)

NEW/0525945