



Two-seat AMX-T of Italy's 32° Stormo (Paul Jackson)

NEW/0528686

**Flight:** Litton Italia INS, with standby AHRS and Tacan, for Italian Air Force; VOR/ILS for Brazil. Data processing, with Microtecnica air data computer. BAE Systems MED 2067 video monitor display in rear cockpit of two-seater, for use by instructor/navigator as HUD monitor.

**Instrumentation:** Alenia computer-based weapon aiming and delivery, incorporating radar and Alenia stores management system; digital data displays (OMI/Alenia head-up, Alenia multifunction head-down, and weapons/nav selector). Provision for night vision goggles.

**Mission:** Italian aircraft of 3° Stormo equipped with Oude Delft Orpheus reconnaissance pods, and was an internal sensor suite being sought for deployment in 2001. This is believed to have been cancelled, but was to have comprised any one of three interchangeable Aeroletrônica (Brazil) pallet-mounted photographic systems installed internally in forward fuselage, complementing external IR/EO pod on centreline pylon. Each system fully compatible with aircraft, and not affecting operational capability. Camera bay in lower starboard side of fuselage, forward of mainwheel bay.

**Self-defence:** Elettronica active and passive ECM, including fin-mounted radar warning receiver.

**ARMAMENT:** One M61A1 multibarrel 20 mm cannon, with 350 rounds, in port side of lower forward fuselage of aircraft for Italian Air Force (one 30 mm DEFA 554 cannon on each side in aircraft for Brazilian Air Force).

Single stores attachment point on fuselage centreline, plus two attachments under each wing, and wingtip rails for two AIM-9L Sidewinder or similar IR air-to-air missiles (MAA-1 Piranha on Brazilian aircraft). Fuselage and inboard underwing points each stressed for loads of up to 907 kg (2,000 lb); outboard underwing points stressed for 454 kg (1,000 lb) each; wingtip stations stressed for 113 kg (250 lb) each. Twin carriers can be fitted to all five stations. Total external stores load 3,800 kg (8,377 lb). Attack weapons can include free-fall or retarded Mk 82/83/84 bombs, laser-guided bombs, cluster bombs, air-to-surface missiles (including area denial, anti-radiation and anti-shiping weapons), electro-optical precision-guided munitions and rocket launchers.

Exocet firing trials conducted 1991; Marte trials 1994; carriage trials of GBU-16 Paveway II LGB on Italian AMX in 1995 and aircraft used Elbit Opher LGB system during Operation Allied Force over Kosovo, May-July 1999.

DIMENSIONS, EXTERNAL:	
Wing span:	
excl wingtip missiles and rails	8.875 m (29 ft 1½ in)
over missiles	9.97 m (32 ft 8½ in)
Wing aspect ratio	3.8
Wing taper ratio	0.5
Length: overall	13.23 m (43 ft 5 in)
fuselage	12.55 m (41 ft 2 in)
Height overall	4.55 m (14 ft 11¼ in)

Tailplane span	5.20 m (17 ft 0¾ in)
Wheel track	2.15 m (7 ft 0¾ in)
Wheelbase	4.70 m (15 ft 5 in)
AREAS:	
Wings, gross	21.00 m² (226.0 sq ft)
Ailerons (total)	0.88 m² (9.47 sq ft)
Trailing-edge flaps (total)	3.86 m² (41.55 sq ft)
Leading-edge slats (total)	2.07 m² (22.28 sq ft)
Spoilers (total)	1.30 m² (13.99 sq ft)
Fin (exposed)	4.265 m² (45.91 sq ft)
Rudder	0.83 m² (8.93 sq ft)
Tailplane (total exposed)	5.10 m² (54.90 sq ft)
Elevators (total)	1.00 m² (10.76 sq ft)
WEIGHTS AND LOADINGS (all versions):	
Operational weight empty	7,000 kg (15,432 lb)
Max fuel weight: internal	2,720 kg (5,997 lb)
external	1,726 kg (3,805 lb)
Max external stores load	3,800 kg (8,377 lb)
T-O weight (clean)	9,694 kg (21,371 lb)
Typical mission T-O weight	10,750 kg (23,700 lb)
Max T-O weight	13,000 kg (28,660 lb)
Normal landing weight	7,000 kg (15,432 lb)
Combat wing loading (clean)	457.1 kg/m² (93.62 lb/sq ft)
Max wing loading	619.1 kg/m² (126.79 lb/sq ft)
Max power loading	265 kg/kN (2.60 lb/lb st)
PERFORMANCE (A at typical mission weight of 10,750 kg; 23,700 lb with 907 kg; 2,000 lb of external stores, B at max T-O weight with 2,721 kg; 6,000 lb of external stores, ISA in both cases):	
Max level speed: at S/L	M0.83
at 9,140 m (30,000 ft)	M0.86
Max rate of climb at S/L	3,124 m (10,250 ft)/min
Service ceiling	12,800 m (41,995 ft)
T-O run at S/L: A	631 m (2,070 ft)
B	982 m (3,220 ft)
T-O to 15 m (50 ft) at S/L: B	1,442 m (4,730 ft)
Landing from 15 m (50 ft) at S/L: B	753 m (2,470 ft)
Landing run at S/L	505 m (1,657 ft)
Attack radius, allowances for 5 min combat over target and 10% fuel reserves:	
lo-to-lo: A	300 n miles (556 km; 345 miles)
B	285 n miles (528 km; 328 miles)
hi-lo-hi: A	480 n miles (889 km; 553 miles)
B	500 n miles (926 km; 576 miles)
Ferry range with two 1,000 litre (264 US gallon; 220 Imp gallon) drop tanks, 10% reserves	1,800 n miles (3,333 km; 2,071 miles)
g limits	+7.33/-3
UPDATED	

## ATR

### AVIONS DE TRANSPORT REGIONAL INTEGRATED

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First Aerospatiale/Aeritalia (later Alenia) agreement July 1980; ATR programme started 4 November 1981; Groupement d'Intérêt Economique (50:50 joint management company) formally established 5 February 1982 to develop ATR series of transport aircraft. Assembly or licensed production by Xian Aircraft in a new factory at Shenzhen, near Hong Kong, was discussed, but not pursued; Xian already produces components for ATR. Fuselage and wing production remain subcontracted to Alenia Aeronautica and EADS France respectively.

ATR marketing and support office opened in Washington 15 July 1986; ATR airline support centre in Singapore opened 18 November 1988; ATR Training Centre opened 1 July 1989; these functions taken over by AI(R) from 1996, but returned when this joint venture with BAe was dissolved on 1 July 1998. Phased production lines introduced in 1999 have reduced delivery times to three months from one year. The 600th ATR was delivered to Air Dolomiti on 28 April 2000.

The ATR family logged its 10 millionth flight on 10 October 2000. Sales by 17 June 2003 totalled 376 ATR 42s and 301 ATR 72s, or 677 in all, of which 369 ATR 42s and 287 ATR 72s had been delivered to 113 operators in 73 countries, including 2002 deliveries of five and 14 respectively. The company is planning to reach proposed ICAO Stage 4 noise levels which become effective on 1 January 2006. In 2002, ATR developed a modified internal door designed to resist unauthorised flight deck incursions, in

anticipation of the FAA's 9 April 2003 deadline for all airliners to be retrofitted to this standard. By mid-2002, ATR had received 100 firm orders for the modified door from American Eagle (first customer), Finnair, Jet Airways and Trans States Airlines. The new door is resistant to forcible impacts of up to 300J and penetration of 9 mm and 44 Magnum ammunition.

ATR's Asset Management arm is responsible for second-hand sales.

ATR expected to have become a single corporate entity by early 1999 but this did not materialise until 1 June 2001 with the formal establishment of ATR Integrated combining the activities of the two partners, still with GIE status and around 500 employees. Holding is 50 per cent each. Workforce 570 in June 2003.

UPDATED

## ATR 42

TYPE: Twin-turboprop airliner.  
 PROGRAMME:

DEVELOPMENT MILESTONES	
<b>42</b>	
Programme launched	4 Nov 81
First flight	16 Aug 84
Certification	24 Sep 85
First delivery	3 Dec 85
<b>42-500</b>	
Programme launched	14 Jun 93
First flight	16 Sep 94
Certification	28 Jul 95
First delivery	31 Oct 95

Joint launch by Aerospatiale (now in EADS) and Aeritalia (now Alenia) in November 1981, following June 1981 selection of P&WC PW120 turboprop as basic power plant; first flights of two prototypes 16 August 1984 (F-WEGA) and 31 October 1984 (F-WEGB); first flight production aircraft 30 April 1985; simultaneous certification to JAR 25 by France and Italy 24 September 1985, followed by USA (FAR Pt 25) 25 October 1985, Germany 12 February 1988, UK 31 October 1989; deliveries began 3 December 1985 to Air Littoral.

Series 500, with 'new look' interior, announced at Paris Air Show 14 June 1993; first flight F-WWEZ (c/n 443) 16 September 1994; French and UK certification 28 July 1995; first delivery (F-OHFF to Air Dolomiti) 31 October 1995. FAA certification 13 May 1996.

CURRENT VERSIONS: **ATR 42-300:** Initial version; phased out of production in 1996. Two Pratt & Whitney Canada PW120 turboprops, each flat rated at 1,342 kW (1,800 shp) for normal operation and 1,492 kW (2,000 shp) OEI; Hamilton Sundstrand 14SF four-blade constant-speed fully feathering and reversible-pitch propellers.

**ATR 42-320:** Identical to 42-300 except for optional PW121 engines for improved hot/high performance; OWE increased/payload decreased by 5 kg (11 lb). Phased out in 1996.

**ATR 42-400:** P&WC PW121A engines with six-blade Hamilton Sundstrand 568F propellers; maximum cruising speed 266 kt (493 km/h; 306 mph); maximum range 825 n miles (1,527 km; 949 miles) with full payload. First flight 12 July 1995 (F-WWEF/OK-AFE); two Srs 420s ordered for CSA, and both delivered 14 March 1996, having received DGAC certification on 27 February. No further civil aircraft.

**ATR 42-500:** Principal ATR 42 version from 1996. Compared with Series 300, has more powerful engines, reinforced wings to allow greatly increased cruising speed and higher weights; all systems improvements of ATR 72, including flight management computers; cockpit, elevators and fin from ATR 72-210; strengthened landing gear; electrically operated main doors; reinforced fuselage and wing centre-section.

Description applies to ATR 42-500, except where indicated.

**ATR 42 Tube (formerly Cargo QC):** Quick-change (1 hour) interior to hold nine containers. Available as new-build or retrofit. Conversion programme includes installation of 2.95 x 1.80 m (9 ft 8 in x 5 ft 11 in) cargo door and modification of cabin into an E-class cargo compartment with strengthening of floor to 400 kg/m² (82 lb/sq ft); total volume for cargo transport 56 m³ (1,978 cu ft); maximum payload 5,883 kg (12,970 lb); parallel cabin section 10.25 m (33 ft 7½ in) long, tapered section 4.47 m (14 ft 8 in) long, with positions for up to four spider nets. MTOW in this configuration 16,900 kg (37,258 lb), MLW 16,400 kg (36,156 lb), MZFW 15,540 kg (34,260 lb). Launch customer, DHL Aviation of South Africa, received first of two converted -300s in October 2000.





ATR 42-500 operated by Aerogaviota of Cuba

0527099

**ATR 42 Large Cargo Door:** As ATR 42 Tube, but with 2.79 x 2.95 m (9 ft 2 in x 9 ft 8 in) upward-opening cargo door in port front fuselage aft of cockpit to permit loading of four pallets or five LD3 containers. Weights as ATR 42 Tube. Conversions by Aeronavali in Italy; first retrofit (for Farnair Europe) was due late 2001.

**ATR 42 F:** Military/paramilitary freighter with modified interior, reinforced cabin floor, port-side cargo/airdrop door can be opened in flight; can carry 3,800 kg (8,377 lb) of cargo or 42 passengers over 1,250 n miles (2,315 km; 1,438 miles). One delivered to Gabon 1989.

**ATR Calibration:** Projected navaid calibration version.

**ATR 42L:** Projected freighter with lateral cargo door; available as ATR 42 Large Cargo Door (see above).

**ATR 42 Surveyor:** Maritime and rescue version; described separately.

**CUSTOMERS:** Total 376 firm orders, of which 369 delivered, by mid-June 2003. Four ordered and 10 delivered in 1998; 14 ordered and 12 delivered in 1999; six (plus four options) sold in 2000; five (all -500s) delivered in 2001 and five in 2002.

**COSTS:** ATR 42-500 development cost US\$50 million; unit price US\$13.8 million (2000).

**DESIGN FEATURES:** Designed to JAR 25/FAR Pt 25; high wing of medium aspect ratio, with constant-chord centre section and tapered outer panels; T-type tail with tapered tailplane and sweptback fin and fillet; panner-mounted main landing gear.

Wing section Aerospatiale RA-XXX-43 (NACA 43 series derivative); thickness/chord ratio 18 per cent at root, 13 per cent at tip; constant-chord, no-dihedral centre-section with 2° incidence at root; outer panels 3° 6' sweepback at quarter-chord and 2° 30' dihedral.

**FLYING CONTROLS:** Conventional and manual. Lateral control assisted by single spoiler surface ahead of each outer flap; each aileron has electrically actuated trim tab; fixed incidence tailplane; horn-balanced rudder and elevators, each with electrically actuated trim tab; two-segment double-slotted flaps on offset hinges with Ratier-Figeac hydraulic actuators.

**STRUCTURE:** Two-spar fail-safe wings, mainly of aluminium alloy, with leading-edges of Kevlar/Nomex sandwich; wing top skin panels aft of rear spar are of Kevlar/Nomex with carbon reinforcement; flaps and ailerons have aluminium ribs and spars, with skins of carbon fibre/Nomex and carbon/epoxy respectively; fuselage is fail-safe stressed skin, mainly of light alloy except for Kevlar/Nomex sandwich nosecone, tailcone, wing/body fairings, nosewheel doors and main landing gear fairings; fin (attached to rearmost fuselage frame) and tailplane carbon structure; CFRP/Nomex sandwich rudder and elevators; dorsal fin of Kevlar/Nomex and GFRP/Nomex sandwich; engine cowlings of CFRP/Nomex and Kevlar/Nomex sandwich, reinforced with CFRP in nose and underside; propeller blades have metal spars and GFRP/polyurethane skins.

EADS France originally responsible for design and construction of wings and engine nacelles, flight deck and cabin layout, installation of power plant, flying controls, electrical and de-icing systems, and final assembly and flight testing of civil passenger versions; wing manufacture and testing reallocated to EADS Sogerma at Bordeaux from late 2001. Alenia Aeronautica builds fuselage and tail unit, installs landing gear, hydraulic system, air conditioning and pressurisation systems. ATR 42/72 manufactured at St Nazaire and Nantes (France), Pomigliano d'Arco and Capodichino (Italy), and assembled in Toulouse.

**LANDING GEAR:** Hydraulically retractable tricycle type, of Messier-Dowty trailing-arm design, with twin wheels and oleo-pneumatic shock-absorber on each unit. Nose unit retracts forward, main units inward into fuselage and large underfuselage fairing. Goodrich wheels and multiple-disc mainwheel brakes and Hydro-Aire anti-skid units. Mainwheel tubeless tyres, size 32x8.8R16 (10/12 ply), pressure 8.69 bar (126 lb/sq in) or H34x10.0R16 (14 ply). Nosewheel tubeless tyres, size 450x190-5 (10 ply), pressure 4.34 bar (63 lb/sq in) or 450x190R5 (10 ply). Minimum ground turning radius 17.37 m (57 ft 0 in).

**POWER PLANT:** Two 1,790 kW (2,400 shp) Pratt & Whitney Canada PW127E turboprops; ATR 72-210 nacelles;



Farnair ATR 42-500 with large cargo door  
NEW/0568396

six-blade Ratier-Figeac/Hamilton Sundstrand 568F propellers with new electronic control giving faster response and better synchrophasing (as for ATR 72-500 from 1996). Propeller brake on starboard engine to enable engine to be used as auxiliary power unit for internal air conditioning.

Fuel in two integral tanks in spar box, total capacity 5,736 litres (1,515 US gallons; 1,262 Imp gallons). Single pressure refuelling point in starboard wing leading-edge. Gravity refuelling points in wing upper surface. Oil capacity 40 litres (10.6 US gallons; 8.8 Imp gallons).

**ACCOMMODATION:** Crew of two on flight deck; folding seat for observer. Seating for 42 passengers at 84 cm (33 in) pitch; or 46, 48 (standard) or 50 passengers at 76 cm (30 in) pitch; compared with Series 300, ATR 42-500 has completely new interior with new ceiling and sidewalls, indirect lighting, more sound damping; call buttons and reading lights relocated; overhead bins lengthened to 2 m (6 ft 6 3/4 in) to accommodate skis, golf clubs and fishing equipment carried as hand baggage. Baggage volume increased by 40 per cent. Active noise control system, previously offered as an option, is no longer available. ATR 42-500s have structural acoustic treatment comprising reinforcement of seven fuselage frames adjacent propeller plane; dynamic vibration absorbers in this area; and internal aluminium skin damping material forward and aft of wing.

Passenger door, with integral steps, at rear of cabin on port side. Front baggage/cargo compartment between flight deck and passenger cabin, with access from inside cabin and separate loading door on port side; lavatory, galley, wardrobe and seat for cabin attendant at rear of passenger cabin, with service door on starboard side; rear baggage/cargo compartment aft of passenger cabin; additional baggage space provided by overhead bins and underseat stowage. Entire accommodation, including flight deck and

baggage/cargo compartments, pressurised and air conditioned. Emergency exit via rear passenger and service doors, and by window exits on each side at front of cabin.

**SYSTEMS:** Improved in parallel with development of ATR 72; following refers to baseline aircraft. Honeywell air conditioning and Softair pressurisation systems, utilising engine bleed air. Pressurisation system (nominal differential 0.41 bar; 6.0 lb/sq in) provides cabin altitude of 2,040 m (7,000 ft) at flight altitudes of up to 7,620 m (25,000 ft).

Two independent hydraulic systems, each at pressure of 207 bar (3,000 lb/sq in), driven by electrically operated Abex pump and separated by interconnecting valve controlled from flight deck; system flow rate 7.9 litres (2.09 US gallons; 1.74 Imp gallons)/min; one system actuates wing flaps, spoilers, propeller brake, emergency wheel braking and nosewheel steering; second system for landing gear and normal braking. Kléber-Colombes pneumatic system for de-icing of wing leading-edges, tailplane leading-edges and engine air intakes; noses of aileron and elevator horns have full-time electric anti-icing.

Main electrical system is 28 V DC, supplied by two Auxilec 12 kW engine-driven starter/generators and two Ni/Cd batteries (43 Ah and 15 Ah), with two solid-state static inverters for 115/26 V single-phase AC supply; 115/200 V three-phase supply from two 20 kVA frequency-wild engine-driven alternators for anti-icing of windscreen, flight deck side windows, stall warning and airspeed indicator pitots, propeller blades and control surface horns. Eros/Puritan oxygen system. Instead of APU, starboard propeller braked and engine run to give DC and 400 Hz power, air conditioning and hydraulic pressure.

**AVIONICS:** Rockwell Collins com/nav equipment. Improved in parallel with development of ATR 72; following refers to baseline aircraft.

**Comms:** CVR, PA system.

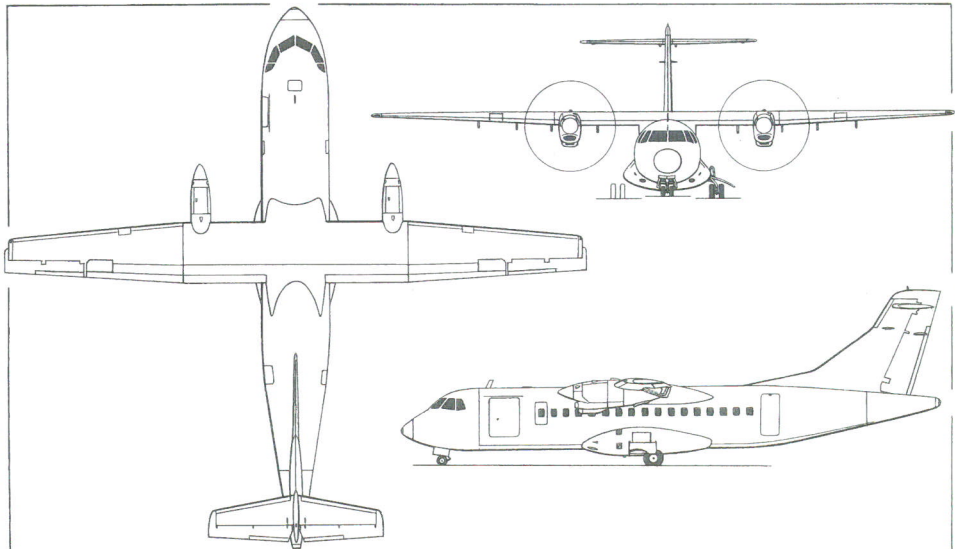
**Radar:** Honeywell P-660 weather radar.

**Flight:** Honeywell DFZ 600 AFCS; AZ-800 ADCs; AH 600 AHRS with avionics standard communication bus; Hamilton Sundstrand GPWS; L-3 digital FDR; Rockwell Collins DME; Honeywell FMZ-800 flight management system and dual GPS receivers installed in four Continental Airlines ATR 42s to allow autonomous approaches.

**Instrumentation:** EZ-820 electronic flight instrument system.

**DIMENSIONS, EXTERNAL:**

Wing span	24.57 m (80 ft 7 1/2 in)
Wing chord: at root	2.57 m (8 ft 5 1/4 in)
at tip	1.41 m (4 ft 7 1/2 in)
Wing aspect ratio	11.1
Length overall	22.67 m (74 ft 4 1/2 in)
Fuselage max width	2.865 m (9 ft 4 1/2 in)
Height overall	7.59 m (24 ft 10 1/4 in)
Elevator span	7.31 m (23 ft 11 3/4 in)
Wheel track (c/l of shock-struts)	4.10 m (13 ft 5 1/2 in)
Wheelbase	8.78 m (28 ft 9 3/4 in)
Propeller diameter	3.94 m (12 ft 11 in)
Distance between propeller centres	8.10 m (26 ft 7 in)
Propeller fuselage clearance	0.835 m (2 ft 8 3/4 in)
Propeller ground clearance	1.10 m (3 ft 7 1/4 in)
Passenger door (rear, port): Height	1.75 m (5 ft 9 in)
Width	0.64 m (2 ft 1 1/4 in)
Height to sill (at OWE)	1.375 m (4 ft 6 1/4 in)
Service door (rear, stbd): Height	1.22 m (4 ft 0 in)
Width	0.61 m (2 ft 0 in)
Height to sill	1.375 m (4 ft 6 1/4 in)
Cargo/baggage door (fwd, port): Height	1.575 m (5 ft 2 in)
Width	1.295 m (4 ft 3 in)
Height to sill (at OWE)	1.15 m (3 ft 9 1/4 in)



ATR 42 twin-turboprop regional transport (Jane's/Dennis Punnett)





ATR 42-500 in Air Littoral livery

NEW/0568395

Emergency exits (fwd, each): Height	0.91 m (3 ft 0 in)
Width	0.51 m (1 ft 8 in)
Crew emergency hatch (flight deck roof):	
Length	0.51 m (1 ft 8 in)
Width	0.48 m (1 ft 7 in)
DIMENSIONS, INTERNAL:	
Cabin: Length (excl flight deck, incl toilet and baggage compartments)	14.72 m (48 ft 3½ in)
Max width	2.57 m (8 ft 5¼ in)
Max width at floor	2.26 m (7 ft 5 in)
Max height	1.91 m (6 ft 3¼ in)
Floor area	31.0 m² (334 sq ft)
Volume	58.0 m³ (2,048 cu ft)
Baggage/cargo compartment volume:	
front (42-46 passengers)	6.0 m³ (212 cu ft)
front (48 passengers)	4.8 m³ (170 cu ft)
front (50 passengers)	3.6 m³ (127 cu ft)
rear	4.8 m³ (170 cu ft)
Containerised cargo volume:	
4 pallets	30.0 m³ (1,059 cu ft)
5 LD3	22.4 m³ (791 cu ft)
Bulk cargo volume:	
with 4 pallets	11.9 m³ (420 cu ft)
with 5 LD3	10.0 m³ (353 cu ft)
Gross usable cargo volume	56.0 m³ (1,978 cu ft)

AREAS:	
Wings, gross	54.50 m² (586.6 sq ft)
Ailerons (total)	3.12 m² (33.58 sq ft)
Flaps (total)	11.00 m² (118.40 sq ft)
Spoilers (total)	1.12 m² (12.06 sq ft)
Fin, excl dorsal fin	12.48 m² (134.33 sq ft)
Rudder, incl tab	4.00 m² (43.05 sq ft)
Tailplane	11.73 m² (126.26 sq ft)
Elevators (total, incl tabs)	3.92 m² (42.19 sq ft)

WEIGHTS AND LOADINGS:	
Operating weight empty	11,250 kg (24,802 lb)
Max fuel weight	4,500 kg (9,921 lb)
Max payload	5,450 kg (12,015 lb)*
Max ramp weight	18,770 (41,380 lb)
Max T-O weight	18,600 kg (41,005 lb)
Max landing weight	18,300 kg (40,345 lb)
Max zero-fuel weight	16,700 kg (36,817 lb)*
Max wing loading	341.3 kg/m² (69.90 lb/sq ft)
Max power loading	5.20 kg/kW (8.54 lb/shp)

\* Optional increase of 300 kg (661 lb)

PERFORMANCE:	
Max cruising speed at FL170 at 97% MTOW	300 kt (556 km/h; 345 mph)
Time to climb to FL170	9.9 min
Service ceiling OEI, ISA +10°C, 97% MTOW	5,485 m (18,000 ft)
T-O distance: ISA, S/L	1,165 m (3,825 ft)
ISA +10°C at 915 m (3,000 ft) S/L for 300 n mile (556 km; 345 mile) stage with 48 passengers	1,163 m (3,815 ft)
FAR landing field length:	
S/L at landing weight with 48passengers	1,040 m (3,415 ft)
S/L at MLW	1,126 m (3,695 ft)
Runway CAN for flexible runway, category B	10
Range with max fuel	1,600 n miles (2,963 km; 1,841 miles)
Max range with 48 passengers	840 n miles (1,555 km; 966 miles)

OPERATIONAL NOISE LEVELS:	
Flyover	76.6 EPNdB
Sideline	80.7 EPNdB
Approach	92.4 EPNdB

UPDATED

### ATR 42 MP SURVEYOR

TYPE: Maritime surveillance twin-turboprop.  
PROGRAMME: Variant of ATR 42 airliner developed by Alenia Aeronautica. Exhibited in model form at Dubai Air Show, November 1995. Initially designated **SAR 42** and **ATR 42MP**. First airframe modified by Officine Aeronavali's Capodichino plant; maiden flight (CMX62166) in Surveyor configuration, but without equipment installed, 1 February 1999, was also delivery to Alenia at Caselle for systems integration. Italian civil certification received 24 October 1999; first delivery 14 December 1999.

CURRENT VERSIONS: Other missions include exclusive economic zone protection, environmental protection, law enforcement, medical evacuation and VIP/troop/cargo/corporate/humanitarian transport.

**ATR 42 MP Surveyor:** Basic model, as described.  
CUSTOMERS: Two ordered by Guardia di Finanza (Italian customs service) 1996 and first aircraft (MM62165) delivered that November but in normal transport

configuration for training; converted to operational version in 2000; is model ATR 42-400 for first two aircraft; future aircraft based on 42-500.

Italian Guardia Costiera (Coast Guard) ordered one plus another option for unarmed version; first delivery (MM62170 '10-01') 30 May 2001; second aircraft due for delivery 2003.

Data as ATR 42, except particulars below.

POWER PLANT: Two 1,611 kW (2,160 shp) Pratt & Whitney Canada PW127E turboprops driving Ratier-Figeac/Hamilton Sundstrand 568F six-blade propellers.

ACCOMMODATION: Flight crew of two, plus three mission operators in modified cabin. Rest/debrief area towards rear of cabin; galley/lavatory facilities at rear. Observers' stations with bubble windows one each side of fuselage aft of wing. Rear door modified for in-flight opening; civil-style freight door in forward port side. SAR package behind rest area.

AVIONICS: *Comms:* VHF/UHF transceiver, AM-FM, VHF/FM/HF com transceiver, transponder/IFF, interphone and optional secure datalink.

*Radar:* Raytheon SV 2022 360° search radar; weather radar from ATR 42 retained.

*Flight:* ADS, VOR, DME, ADF, optional Tacan, FMS, IRS, INS/GPS, radio altimeter, direction-finder.

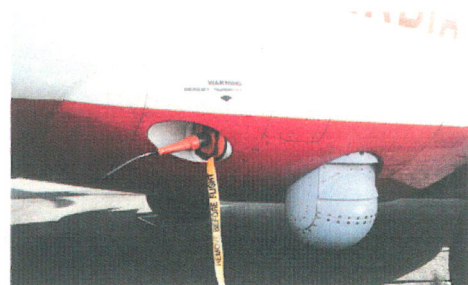
*Mission:* Galileo Avionica Airborne Tactical Observation and Surveillance system (ATOS) comprises mission management system; communications subsystem; L-3 Wescam turret beneath starboard landing gear panner containing Galileo FLIR; daylight TV sensor; Spectrolab SX16E searchlight and Thiokol LUU-2B/B flare launcher all mounted in pod on starboard side of forward fuselage; Elettronica ALR-733 ESM. MIL-STD-1553B, RS-422 and ARINC 429 databus system. Two multifunction operator consoles with 48 cm (19 in) display, 25 cm (10 in) sensor display, keyboard, trackball, joystick and colour printer on starboard side; communications console. Provision for future growth of sensor suite.

EQUIPMENT: SAR equipment includes searchlight, loudspeakers and flare launcher. IR/UV scanner and optional SLAR and MVR for pollution detection.

ARMAMENT: Optional FN Herstal HPM twin machine gun pod on port side of forward fuselage.

WEIGHTS AND LOADINGS:

Typical operating weight empty	13,275 kg (29,266 lb)
Max payload	3,425 kg (7,551 lb)
Optional auxiliary fuel	650 kg (1,433 lb)
Max T-O weight	18,600 kg (41,005 lb)



ATR 42 MP starboard landing gear pannier, showing emergency locator beacon ejection system and sensor turret (Paul Jackson)

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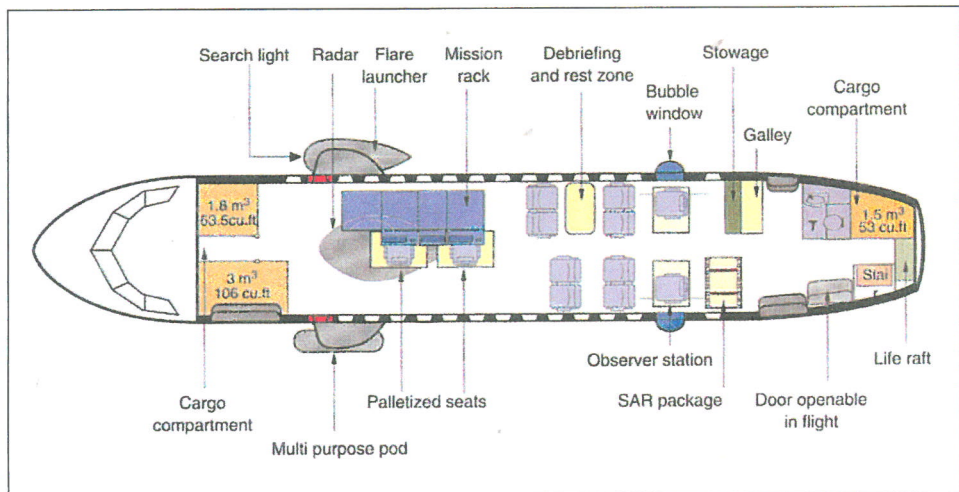


First of two ATR 42 Surveyors for the Italian Coast Guard (Paul Jackson)

NEW/0568394

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[jawa.janes.com](http://jawa.janes.com)





Typical internal and external features of the ATR 42 Surveyor 0085584

Max landing weight	18,300 kg (40,345 lb)
Zero-fuel weight: typical	13,200 kg (29,101 lb)
max	16,700 kg (36,817 lb)
PERFORMANCE (at max T-O weight except where indicated):	
Max cruising speed at FL160 at 97% MTOW	281 kt (520 km/h; 323 mph)
Typical patrol speed at FL20 at 90% MTOW:	
for max range	189 kt (350 km/h; 217 mph)
for max endurance	135 kt (250 km/h; 155 mph)
Service ceiling, OEI, at 97% MTOW	3,960 m (13,000 ft)
T-O distance at S/L, ISA	1,050 m (3,445 ft)
Landing distance at MLW, S/L, ISA	1,150 m (3,775 ft)
Ferry range	2,019 n miles (3,740 km; 2,323 miles)
Endurance on station: at 200 n mile (370 km; 230 mile)	8 h
radius	3 h 30 min
at 600 n mile (1,111 km; 690 mile) radius	UPDATED

## ATR 72

TYPE: Twin-turboprop airliner.  
PROGRAMME:

### DEVELOPMENT MILESTONES

<b>72</b>	
Programme launched	15 Jan 86
First flight	27 Oct 88
Certification	25 Sep 89
First delivery (Kar Air)	27 Oct 89
<b>72-500</b>	
First flight	19 Jan 96
Certification	14 Jan 97
First delivery (American Eagle)	31 Jul 97

Stretched version of ATR 42; announced at 1985 Paris Air Show; launched 15 January 1986; three development aircraft built: first flights 27 October 1988 (F-WWEY), 20 December 1988 (F-WWEZ, c/n 108) and 18 April 1989 (OH-KRA, c/n 126); French and US certification 25 September and 15 November 1989 respectively; deliveries, to Kar Air of Finland, began 27 October 1989 (OH-KRB); UK certification 30 July 1993.

CURRENT VERSIONS: **ATR 72-200:** Initial production version; two Pratt & Whitney Canada PW124B turboprops, each rated at 1,611 kW (2,160 shp) for normal take-off and 1,790 kW (2,400 shp) with ATPCS; Hamilton Sundstrand 14SF-11 four-blade propellers. Also cargo version, capable of carrying 13 small containers. Now discontinued.

**ATR 72-210:** Improved hot/high performance version with PW127 engines rated at 1,849 kW (2,480 shp) and Hamilton Sundstrand 247F propellers with composites blades on steel hubs; ATPCS power 2,059 kW (2,760 shp); carries 17 to 19 more passengers than standard ATR 72 in WAT-limited conditions; French and US certification 15 and 18 December 1992, German on 24 February 1993; first delivery December 1992.

**ATR 72-500:** Launched as ATR 72-210A. Improved hot/high performance version with PW127 engines, six-blade propellers and redesigned interior. First flight 19 January 1996; DGAC certification achieved 14 January 1997; first delivery (to American Eagle) 31 July 1997.

Description applies to ATR 72-500, except where indicated.

**ATR 72 Tube:** Cargo version (formerly Cargo QC) similar to ATR 42 Tube; maximum payload 9,180 kg (20,238 lb) and total cargo volume 75.5 m³ (2,666 cu ft). Door size as ATR 42 Tube, six spider nets standard. Parallel section length 14.75 m (48 ft 4 1/4 in). MTOW in this configuration 22,500 kg (49,604 lb), MLW 22,350 kg (49,273 lb), MZFW 20,500 kg (45,195 lb).

**ATR 72 Large Cargo Door:** As ATR 72 Tube; 1.80 x 2.95 m (5 ft 11 in x 9 ft 8 in) upward-opening cargo door in port front fuselage behind cockpit to permit loading

of seven LD3 containers or five ULD pallets. Space for 5.8 m³ (205 cu ft) cargo in tapered rear fuselage section. Weights as ATR 72 Tube. First retrofit (to c/n 108) completed for Farnair by AeronaVali (subsidiary of Alenia Aeronautica) in June 2002.

**ATR 72 ASW:** Projected anti-submarine warfare version, based on ATR 42 but also offering 1,270 kg (2,800 lb) payload including torpedoes, depth charges and anti-ship missiles. None yet built.

CUSTOMERS: Total 301 ATR 72s ordered up to 17 June 2003, at which time 287 delivered. Deliveries in 1998 totalled 21 and in 1999 numbered 23. Orders in 2000 totalled 18 plus six options; 15 (all -500s) delivered in 2001 and 14 in 2002.

DESIGN FEATURES: As ATR 42 (which see), but with more power, more fuel, greater wing span/area, and longer fuselage for up to 74 passengers.

FLYING CONTROLS: As for ATR 42 but vortex generators ahead of ailerons and aileron horn balances shielded by wingtip extensions; vortex generators under leading-edge of elevators.

STRUCTURE: Generally as for ATR 42, but new wings outboard of engine nacelles have CFRP front and rear spars, self-stiffening CFRP skin panels and light alloy ribs, resulting in weight saving of 120 kg (265 lb); sweepback on outer panels 2° 18' at quarter-chord. Trials of an all-composites tail assembly were conducted in 1997 and the structure incorporated in all production aircraft from 1998. The major airframe inspection period for the ATR 72 was

increased on 2 October 1997 from 24,000 to 36,000 cycles, with a corresponding reduction in maintenance cost, bringing it in line with the ATR 42 family.

LANDING GEAR: Messier-Hispano-Bugatti units with Dunlop wheels (tyres size H34x10.0R16 (14 ply), pressure 7.86 bar; 114 lb/sq in) and structural carbon brakes; nosewheel tyre as ATR 42. Minimum ground turning radius 19.76 m (64 ft 10 in).

POWER PLANT: **ATR 72-500:** Two Pratt & Whitney Canada PW127F turboprops, each rated at 1,864 kW (2,500 shp) for normal flight and 2,051 kW (2,750 shp) for take-off, driving Ratier-Figeac/Hamilton Sundstrand 568F six-blade, all-composites propellers. Fuel capacity 6,337 litres (1,674 US gallons; 1,394 Imp gallons), comprising ATR 42 tanks, plus additional 637 litres (168 US gallons; 140 Imp gallons) in outer wings; pressure refuelling point in starboard main landing gear fairing.

ACCOMMODATION: Basic 68 passengers at 79 cm (31 in) seat pitch; other seating configurations range from 64 seats at 81 cm (32 in) to 72 seats at 76 cm (30 in); plus second cabin attendant's seat. Single baggage compartment at rear of cabin; two at front. Forward door, with a service door opposite on starboard side. Service door on each side at rear, that on port side replaced by a passenger door when cargo door is fitted at front. Two additional emergency exits (one each side); both rear doors also serve as emergency exits. Increased-capacity air conditioning system.

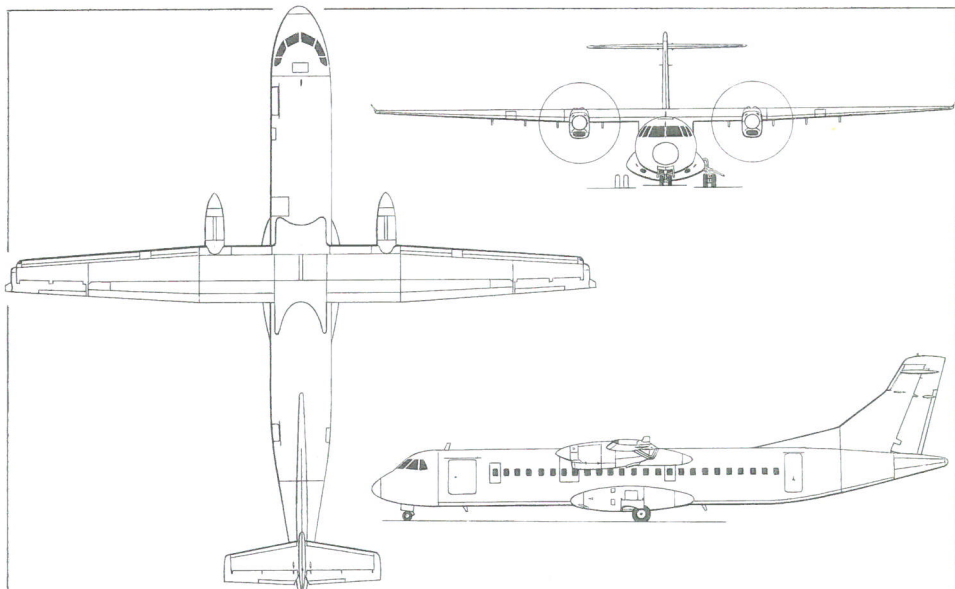
AVIONICS: More advanced avionics of ATR 72-500 have been transferred into ATR 42-500.

DIMENSIONS, EXTERNAL: As ATR 42 except:

Wing span	27.05 m (88 ft 9 in)
Wing chord at tip	1.59 m (5 ft 2 1/2 in)
Wing aspect ratio	12.0
Length overall	27.17 m (89 ft 1 1/4 in)
Height overall	7.65 m (25 ft 1 1/4 in)
Wheelbase	10.77 m (35 ft 4 in)
Passenger door (fwd, port): Height	1.575 m (5 ft 2 in)
Width	1.295 m (4 ft 3 in)
Height to sill	1.12 m (3 ft 8 in)

DIMENSIONS, INTERNAL:

Cabin: Length (excl flight deck, incl toilet and baggage compartments)	19.21 m (63 ft 0 1/4 in)
Cross-section	as for ATR 42
Floor area	41.7 m² (449 sq ft)
Volume	76.0 m³ (2,684 cu ft)
Baggage/cargo compartment volume:	
front (68 passengers with front cargo door)	
5.8 m³ (205 cu ft)	
rear	4.8 m³ (170 cu ft)
Containerised cargo volume:	
5 pallets	42.6 m³ (1,504 cu ft)
7 LD3	31.4 m³ (1,109 cu ft)



ATR 72-200 (two Pratt & Whitney Canada PW124B turboprops) (Jane's/Dennis Punnett)



ATR-72-500 in the livery of Atlantic Southeast Airlines

NEW/0568393



Bulk cargo volume:	
with 5 pallets	13.3 m³ (470 cu ft)
with 7 LD3	11.7 m³ (413 cu ft)
Gross usable cargo volume	75.5 m³ (2,666 cu ft)
AREAS: As ATR 42 except:	
Wings, gross	61.0 m² (656.6 sq ft)
Ailerons (total)	3.75 m² (40.36 sq ft)
Flaps (total)	12.28 m² (132.18 sq ft)
Spoilers (total)	1.34 m² (14.42 sq ft)
WEIGHTS AND LOADINGS:	
Operating weight empty	12,950 kg (28,550 lb)
Max fuel weight	5,000 kg (11,023 lb)
Max payload: standard	7,050 kg (15,543 lb)
optional	7,350 kg (16,204 lb)
Max T-O weight: standard	22,000 kg (48,501 lb)
optional	22,500 kg (49,604 lb)
Max ramp weight: standard	22,170 kg (48,876 lb)
optional	22,670 kg (49,979 lb)
Max landing weight: standard	21,850 kg (48,171 lb)
optional	22,350 kg (49,273 lb)

Max zero-fuel weight: standard	20,000 kg (44,092 lb)
optional	20,500 kg (45,195 lb)
Max wing loading: standard	360.7 kg/m² (73.87 lb/sq ft)
optional	368.9 kg/m² (75.55 lb/sq ft)
Max power loading: standard	5.36 kg/kW (8.81 lb/shp)
optional	5.49 kg/kW (9.01 lb/shp)
PERFORMANCE:	
Max cruising speed at FL160, at 97% MTOW:	
standard	276 kt (511 km/h; 318 mph)
optional	275 kt (509 km/h; 316 mph)
Econ cruising speed at FL230, at 95% MTOW	
standard	248 kt (459 km/h; 285 mph)
Service ceiling	7,620 m (25,000 ft)
Service ceiling, OEI, ISA + 10°C, 97% MTOW	
standard	4,330 m (14,200 ft)
T-O balanced field length:	
at S/L, ISA: basic	1,223 m (4,015 ft)
optional	1,290 m (4,235 ft)
at FL30, ISA +10°C, at T-O weight, 68 passengers,	
both	1,300 m (4,265 ft)

Landing field length at S/L, at MLW: basic	
optional	1,048 m (3,438 ft)
optional	1,067 m (3,500 ft)
Runway ACN for flexible runway, category B	13
Still air range, reserves for 87 n mile (161 km; 100 mile) diversion and 45 min:	
max payload: basic	715 n miles (1,324 km; 822 miles)
optional	890 n miles (1,648 km; 1,024 miles)
max fuel and zero payload	
optional	1,956 n miles (3,622 km; 2,251 miles)
OPERATIONAL NOISE LEVELS:	
Flyover	79.7 EPNdB
Sideline	83.2 EPNdB
Approach	92.2 EPNdB
	UPDATED

## BELL/AGUSTA

### BELL/AGUSTA AEROSPACE COMPANY (BAAC)

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EXECUTIVE MANAGING DIRECTORS:

  Don Barbour (BA609 Programme)

  Antonio Giovannini (AB139 Programme)

PARTICIPATING COMPANIES:

  Bell Helicopter Textron: see under USA

  Agusta: see under Italy

Bell and Agusta announced on 8 September 1998 that they had agreed to establish a joint venture to manage development of two new aircraft: the BA609 tiltrotor, previously a Bell and Boeing programme, and the AB139, a new helicopter announced on the same day. Following approval of both boards, a definitive agreement was signed on 6 November 1998. Bell is the majority shareholder and will undertake final assembly for AB139s delivered to North America. Agusta, which has built Bell helicopters under licence since 1952, is investing and participating in development of the BA609, manufacturing some components and assembling those sold in Europe and certain other parts of the world. Additionally, Agusta is responsible for the AB139's development and certification, with participation by Bell. A military version was revealed in July 2000. Flight testing of the AB139 began in February 2001, followed by the BA609 in March 2003.

UPDATED

### BELL/AGUSTA AB139

TYPE: Medium utility helicopter.

PROGRAMME: Announced at Farnborough Air Show, 8 September 1998, as joint venture between Agusta and Bell; to complement, rather than replace, Bell 412. Full-scale mockup unveiled at Paris Air Show 12 June 1999. Agusta responsible for development, certification to JAR/FAR 29 and transition to production, with participation by Bell on a 75:25 per cent work-share basis; final assembly by Agusta at Vergiate, and by Bell (possibly at Mirabel, Canada) for American and Pacific Rim customers. No designated "prototype"; first preproduction aircraft (01, later I-ACOI) undertook maiden flight on 3 February 2001 followed by second aircraft (02, later I-ATWO) on 4 June 2001 and third (03, later I-EPIC) on 22 October 2001; Assembly of first production aircraft began in late November 2001; this (I-ANEW) demonstrated at Farnborough in July 2002. Three preproduction aircraft and one tie-down helicopter (TDH) undertook flight test programme leading to Italian certification on 20 June 2003, following 1,600 hour ground and flight test programme (including those flown by first preproduction aircraft which was lost in crash on 22 April 2002) and 750 hours completed on the TDH. Full-scale mockup of AB139 Military unveiled at Farnborough International 2000 in July 2000; development may follow certification of civilian version, but not being actively promoted in mid-2003.

Risk-sharing collaborators include GKN Westland (tail rotor drive train), Honeywell (avionics), Kawasaki (transmission input module), Liebherr Germany (landing gear and air conditioning system), Pratt & Whitney Canada (power plant) and PZL Świdnik (airframe components).

CURRENT VERSIONS: **AB139:** Commercial law enforcement and SAR version, *as described*.

**AB139 Military:** Proposed multirole military helicopter with provision for armoured crew seats, electronic warfare protection, IR suppressors, two internal pintle-mounted machine guns and easily removable stub-wing weapons supports for gun pods, rocket launchers and AAMs.

CUSTOMERS: More than 80 ordered by 25 customers by June 2003. Launch customer Bristow Helicopters of UK announced order for two on 26 September 2000 for delivery in 2003. Hawker Pacific ordered four on 12 February 2001 for corporate, utility and offshore operations in the Arabian Gulf. Recent customers include the government of Namibia, which has ordered two for VIP and multimission duties, and Evergreen International, which ordered two in June 2003. Selected for US Coast Guard 'Deepwater' programme vertical take-off/landing recovery and surveillance (VRS) requirement, with first delivery expected in 2012. Anticipated market for 900 over 20 years, some 55 per cent for military use; 34 per cent of sales projected in Europe, 23 per cent in Middle East, 18 per cent in Far East, 13 per cent in South America and 12 per cent in North America. Target of 20 deliveries by end of 2004.

COSTS: Commercial version US\$7 million (2002).

DESIGN FEATURES: Design goals include high manoeuvrability and agility, low pilot workload, night/all-weather operation, low acoustic and infra-red emissions and mission flexibility for commercial and military operators. Intended for offshore support, medevac, corporate/VIP transport, SAR and military operations. Able to operate at maximum T-O weight from Class A helipads at 945 m



First production Bell/Agusta AB139

NEW/0529862