

Normal cruising speed 180 kt (333 km/h; 207 mph)  
 Stalling speed, power off:  
   flaps up 62 kt (115 km/h; 71 mph)  
   flaps down 54 kt (100 km/h; 62 mph)  
 Max rate of climb at S/L 314 m (1,030 ft)/min

Service ceiling 5,940 m (19,500 ft)  
 T-O run 274 m (900 ft)  
 T-O to 15 m (50 ft) 549 m (1,800 ft)  
 Landing from 15 m (50 ft) 427 m (1,400 ft)  
 Landing run 229 m (750 ft)

Range with max fuel 1,251 n miles (2,317 km; 1,440 miles)  
 Endurance 6 h 24 min  
 g limits +3.86/-1.96  
**UPDATED**

## BEDE

### BEDECORP LLC

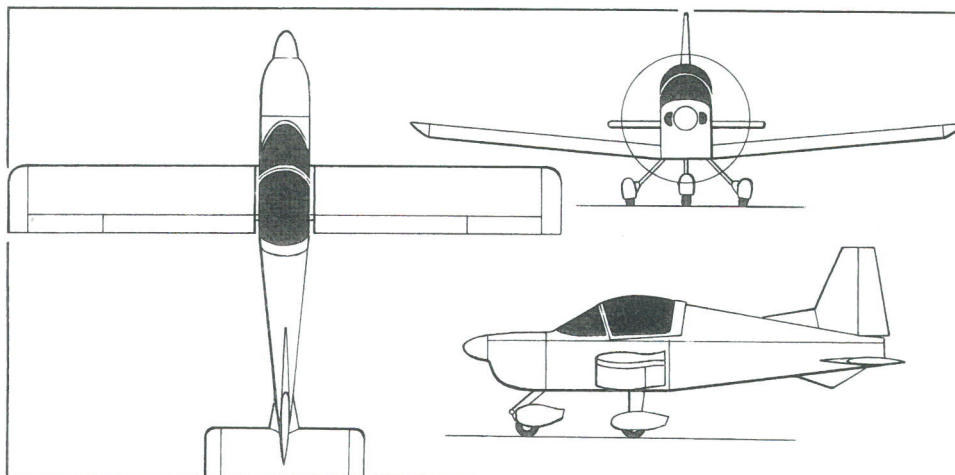
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 PRESIDENT: James 'Jim' R Bede

Bedecorp specialises in design of high-performance aircraft for private ownership; civilian version of a previous product, BD-10, was transferred to Vortex Aircraft Company as the Phoenix. In June 2000, Bede announced it was working on the BD-17 Nugget, an all-metal low-wing single-seater and is actively marketing the BD-6 development of the BD-4; details of the BD-6 appeared in *Jane's* 1977-78 edition. The earlier BD-4 is also available in kit form from Tennessee Valley Aviation Products; Bedecorp offers plans for both.

In May 2001, Jim Bede announced he was considering a further update of his 30-year-old BD-5 design.

In mid-2003, Bedecorp revealed that it is working on the BD-18 two-place derivative of the BD-17 Nugget.

**UPDATED**



Bede BD-17 Nugget single-seat kitbuilt (*Jane's*/James Goulding)

0121112

### BEDE BD-17 NUGGET and BD-18 NUGGET

TYPE: Single-seat sportplane kitbuilt; tandem-seat sportplane kitbuilt.

PROGRAMME: Announced June 2000; prototype (N624BD) completed by end of that year and first flew 11 February 2001. Certification programme under way. Public debut at Sun 'n' Fun, April 2001.

CURRENT VERSIONS: **BD-17**: Single-seat version, as described.

**BD-18**: Two-seat derivative, announced mid-2003. First flight was scheduled for June 2003 but slipped. Construction as BD-17.

CUSTOMERS: At least 17 BD-17 kits sold and four aircraft registered by August 2003; three of which were completed by that time.

COSTS: BD-17 US\$19,990, BD-18 US\$28,500, both less engine (2003).

DESIGN FEATURES: Intended to be extremely easy to build, with approximately 110 parts. Optional folding wings. Constant-chord wings. Fin fillet.

Wing section (BD-18) NACA 64416A (mod).

FLYING CONTROLS: Conventional and manual. No flaps on prototype BD-17; production kits have flaps. BD-18 maximum flap deflection 30°.

STRUCTURE: All-metal honeycomb sandwich. Honeycomb fuselage covered with 5 mm (0.20 in) aluminium sheet; control surfaces of urethane foam. Constant-chord wings have extruded tube spar.

LANDING GEAR: Fixed; choice of tricycle or tailwheel layout. Speed fairings optional. Scotch ply main legs. Differential braking. Prototype BD-17 has 5.00-5 mainwheel tyres and 25 cm (10 in) nosewheel tyre.

POWER PLANT: **BD-17**: Power plants in the range 33.6 to 59.7 kW (45 to 80 hp) being considered; prototype has 44.7 kW (60 hp) HKS-700 two-cylinder four-stroke engine. Fuel capacity 76 litres (20.0 US gallons; 16.7 Imp gallons).

**BD-18**: Power plants in the range 59.7 to 89.5 kW (80 to 120 hp) recommended, though engines as large as 134 kW (180 hp) are being considered. Prototype has 59.7 kW (80 hp) Jabiru 2200. Fuel capacity 163 litres (43.0 US gallons; 35.8 Imp gallons).

ACCOMMODATION: Pilot only in BD-17, pilot and passenger side-by-side in BD-18, rearward-sliding canopy.

All data provisional.

DIMENSIONS, EXTERNAL:

Wing span: BD-17	6.55 m (21 ft 6 in)
BD-18	7.77 m (25 ft 6 in)
Wing chord, constant: BD-17	0.76 m (2 ft 6 in)
BD-18	1.03 m (3 ft 4 1/2 in)
Wing aspect ratio: BD-17	8.6
BD-18	7.7
Length overall: BD-17	5.51 m (18 ft 1 in)
BD-18	5.97 m (19 ft 7 in)
Height overall: both	2.36 m (7 ft 9 in)

DIMENSIONS, INTERNAL:

Cockpit max width: BD-17	1.17 m (3 ft 10 in)
BD-18	1.19 m (3 ft 11 in)

AREAS:

Wings, gross: BD-17	4.97 m² (53.5 sq ft)
BD-18	7.86 m² (84.6 sq ft)

WEIGHTS AND LOADINGS (BD-17 with 89.4 kW; 120 hp engine):

Weight empty: BD-17	236 kg (520 lb)
BD-18	261 kg (575 lb)
Max T-O weight: BD-17	430 kg (950 lb)
BD-18	567 kg (1,250 lb)

PERFORMANCE (estimated; BD-17 with 89.4 kW; 120 hp engine):

Never-exceed speed (VNE)	169 kt (313 km/h; 195 mph)
Cruising speed: BD-17	129 kt (238 km/h; 148 mph)
BD-18	137 kt (254 km/h; 158 mph)

Stalling speed, flaps up:

BD-17, BD-18	55 kt (102 km/h; 63 mph)
flaps down: BD-17	48 kt (89 km/h; 55 mph)
BD-18	47 kt (87 km/h; 54 mph)

Max rate of climb at S/L: BD-17	290 m (950 ft)/min
BD-18	442 m (1,450 ft)/min

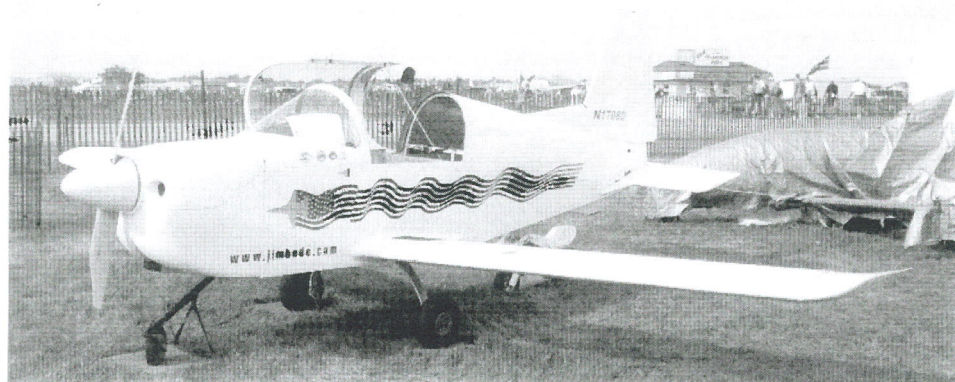
T-O run: BD-17	213 m (700 ft)
BD-18	168 m (550 ft)

Landing run: BD-17	189 m (620 ft)
BD-18	165 m (540 ft)

Range, max fuel and reserves:

BD-17	825 n miles (1,528 km; 950 miles)
BD-18	912 n miles (1,689 km; 1,050 miles)

**UPDATED**



Prototype Bede BD-17 Nugget (Paul Jackson)

NEW/0561697

## BEECH

### RAYTHEON AIRCRAFT COMPANY

At the September 2002 NBAA Convention, held in Orlando, Florida, Raytheon Aircraft (under which heading further details will be found) announced its intention to revert to separate marketing of its Beech and Hawker lines of private and executive aircraft, reducing the emphasis on its corporate name.

Beech Aircraft Corporation founded in 1932 by Walter and Olive Ann Beech; trading name **Beechcraft**; became wholly owned subsidiary of Raytheon on 8 February 1980 and incorporated within Raytheon Aircraft Company upon its foundation on 15 September 1994. In 2003, the former Beechjet 400 was transferred to the Hawker marque.

**UPDATED**

### BEECH (3000) T-6 TEXAN II

Canadian Forces name: CT-156 Harvard II

TYPE: Basic turboprop trainer.

PROGRAMME: US version of Pilatus PC-9 Advanced Turbo Trainer (which see). For participation in USAF/USN Joint Primary Aircraft Training System (JPATS) competition, Beech and Pilatus reached agreement on joint approach in August 1990; Beech received two standard PC-9s from

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



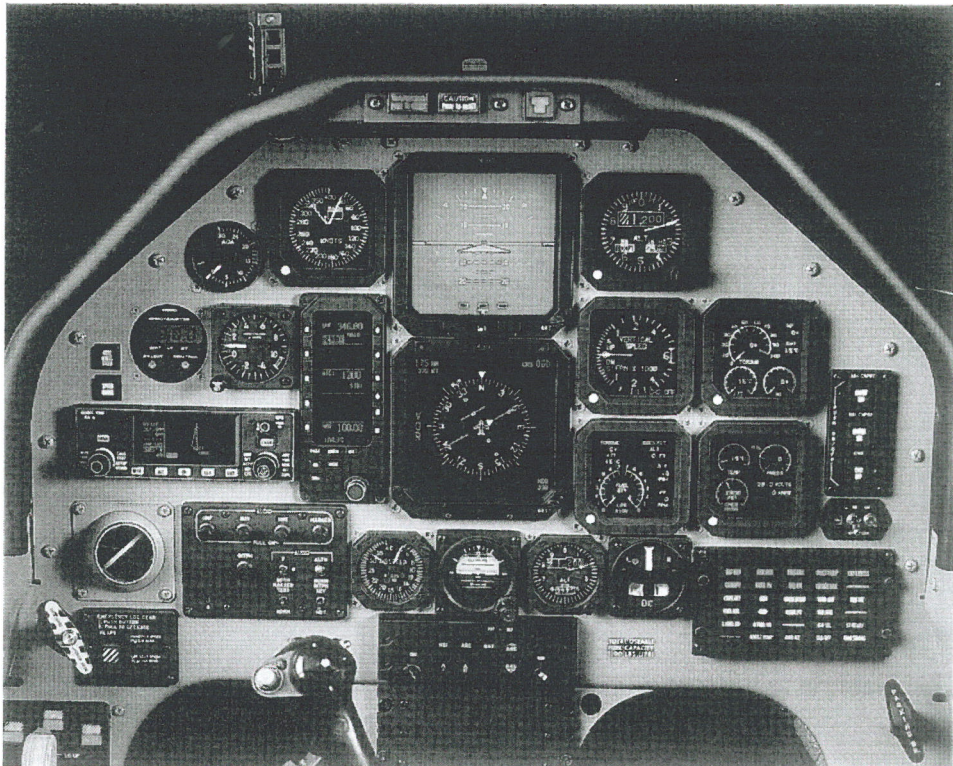
Pilatus, one of which (N26BA) converted as engineering development prototype and completed more than 260 hours' flight testing to reduce programme risk and develop engineering design baseline before return to Pilatus. Followed by two Beech-built production prototypes (Beech designation PD373; later, Beech 3000), first flights December 1992 (N8284M/PT-2) and July 1993 (N209BA/PT-3); PT-2 used to complete flight test programme and evaluate systems performance; PT-3 incorporated several improvements and was principal aircraft for USAF/USN flight evaluation; one prototype and four production aircraft completed more than 1,400 hours of flight testing to achieve FAA certification on 30 July 1999. Promotional name for the purposes of competition was **Beech Mk II**.

US FORCES' T-6A TEXAN II PROCUREMENT

FY	Lot	Qty	First Aircraft	Order	Delivery
95	1	1 <sup>1</sup>	95-3000	Jun 95	1999
95	2	3 <sup>2</sup>	95-3001	Jul 96	1999-2000
96	3	6	95-3004	Sep 96	2000
97	4	15	96-3010	Apr 97	2000
98	5	22	98-3025	Feb 98	2000-01
99	6	22	99-3547	May 99	2001-02
00	7	40 <sup>3</sup>	00-3569	Jun 00	2002-03
01	8	59 <sup>4</sup>	01-3598	Apr 01	2003-04
02	9	47 <sup>5</sup>	02-3633	Jan 02	2004
03	10	39 <sup>6</sup>	03-3673	Dec 02	2005
04	11	52 <sup>7</sup>	04-3708?		2006
05	12	53 <sup>7</sup>	05-3760?		2007
06	13	54 <sup>7</sup>	06-3813?		2008
Total		413			

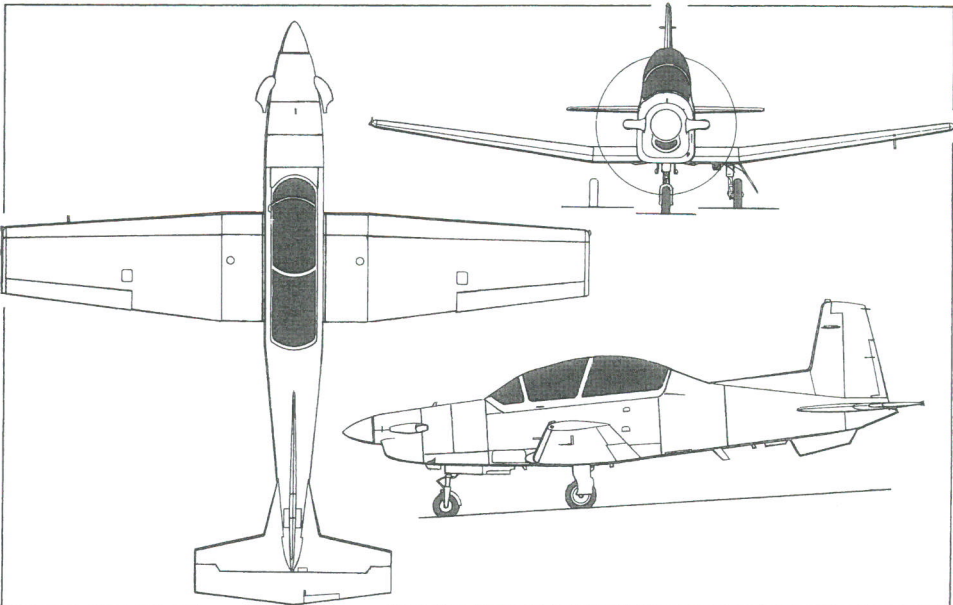
**Notes:** Serial number prefixes of early aircraft do not necessarily indicate year of order, as is usual in USAF. Early aircraft numbered 95-3000 to 3009, 96-3010 to 3013 and 97-3014 onwards  
<sup>1</sup> Manufacturing development aircraft  
<sup>2</sup> 95-3001 subsequently transferred to US Navy as 165958  
<sup>3</sup> Includes 11 aircraft for US Navy  
<sup>4</sup> Includes 24 aircraft for US Navy  
<sup>5</sup> First batch of multiyear purchase of 234 aircraft by USAF during FY02 to FY06; total includes seven additional aircraft for US Navy  
<sup>6</sup> Second batch of multiyear purchase by USAF; total includes four additional aircraft for US Navy  
<sup>7</sup> Planned procurement in remaining three years of multiyear purchase by USAF; US Navy aircraft will be additional

Selection as JPATS winner announced 22 June 1995; total requirement for 782 aircraft (454 USAF, 328 US Navy) by 2017; all to be built in USA; contract valued at US\$4.7 billion awarded February 1996; allocated designation T-6 Texan II (in advance of T-4 and T-5) to honour North American AT-6 Texan of Second World War era; Canadian name reflects British Commonwealth name for AT-6.  
 First metal cut February 1997; roll-out of manufacturing development aircraft (N23262/95-3000/PT-4) 29 June 1998; first flight 15 July 1998; first delivery (95-3003/PT-7) to Randolph AFB, June 1999, for technical evaluation; further two were to have followed in third quarter of 1999 for six month multiservice operational test and evaluation programme (by first two Lot-3 aircraft), but were delayed by engineering fault with PT6 engine. First handover was 95-3004 on 1 March 2000; first squadron of 12th FTW, the 559th FTS, began equipping on 23 May 2000.  
 Initial production rate 12 aircraft per year, rising to maximum of 59 by 2004; Milestone III authorisation to proceed with full-rate production granted by USAF on 3 December 2001. Early aircraft to 12th FTW at Randolph AFB for instructor training; IOC with USAF at Moody AFB, Georgia, in June 2001, with student pilot training beginning on 10 October; all USAF units to be fully equipped by 2011. First two aircraft for US Navy formally accepted at Wichita factory 31 August 2002; delivered to



Instrument panel of Beech T-6A Texan II

0131803



Beech T-6A Texan II primary trainer (Paul Jackson)

0051810

Pensacola, Florida, on 1 November 2002 and assigned to VT-10; IOC with Navy in 2003. FlightSafety selected on 21 April 1997 to provide associated ground training system at cost over 24 years of US\$500 million.  
**CURRENT VERSIONS:** **T-6A Texan II:** USAF/USN version, as described.  
**T-6A-1/CT-156 Harvard II:** Version for NATO Flying Training in Canada (NFTC) programme; generally similar to Texan II, but with blind-flying hood, dual VOR and ADF, and back-up VHF comm in place of UHF.  
**T-6B:** Trainer and light attack (**AT-6B**) derivative of T-6A announced at Farnborough International in July

2002. To incorporate revised cockpit management systems, with avionics suite provided by Flight Visions; latter includes FV-4000 modular mission display processor (MMDP), SparrowHawk HUD, stores management system and associated multifunction displays (MFDs) and six underwing pylons. Weaponry including guns, bombs and rockets will be available, permitting use in light attack/counter-insurgency role. FAA certification planned for mid-2004.  
**Beech/Pilatus PC-9 Mk II:** Designation of Greek aircraft; first 25 are in USAF/US Navy configuration, remaining 20 in Greek-specified New Trainer Aircraft (NTA) configuration, with weapon sighting system plus provision for carriage of weaponry and auxiliary fuel tanks on three stores stations beneath each wing. Weapons trials, including tests with gun and rocket armament, conducted at Eglin AFB, Florida, in first half of 2002. NTA variant is not to FAR Pt 23.  
**CUSTOMERS:** USAF initial operator is 12th Flying Training Wing at Randolph AFB, Texas; second is 479th Flying Training Group at Moody AFB, Georgia (49 aircraft during 2001-02); subsequent deliveries to 47th FTW, Laughlin AFB, Texas (96 aircraft during 2002-04, of which first four delivered 15 November 2002); 71st FTW, Vance AFB, Oklahoma (91 aircraft during 2005-06), 14th FTW, Columbus AFB, Mississippi (89 aircraft during 2006-08) and 80th FTW, Sheppard AFB, Texas (69 aircraft during 2008-09). Initial Navy aircraft included in Lot 7; deliveries to US Navy began 1 November 2002, with training scheduled to start in 2003; operating units will include TW-4 at Corpus Christi, Texas and TW-6 at Pensacola, Florida. US Navy aircraft allocated serial numbers 165958 to 166285.



Beech T-6A Texan II of 12th Flying Training Wing at Randolph AFB (Paul Jackson)

NEW/0554434



Chilean Air Force signed a letter of intent in late 1996 for future purchase of 16 to 25 Beech Mk IIs, but has still to place firm order.

Bombardier Services of Canada ordered 24 T-6A-1s in December 1997 for its NPTC programme for delivery to No. 2 FTS at Moose Jaw between April and December 2000; first delivery (156103) 29 February 2000; NPTC inaugurated 6 July 2000; all 24 aircraft handed over by end 2000. Further two aircraft ordered in mid-2002 for delivery in 2003. On 9 October 1998, Greek Air Force announced selection of T-6 and ordered 45, to be delivered between 2000 and 2003; option held on further five. First delivery (001) 17 July 2000 to 361 Squadron at Kalamata; training of student pilots began September 2001.

Raytheon holds marketing rights to PC-9 Mk II in all countries except Switzerland.

#### T-6A TEXAN II DELIVERIES

CY	USAF	USN	NATO/Canada <sup>1</sup>	Greece	Total
1999	1				1
2000	19		24	6	49
2001	37			10	47
2002	40	7 <sup>2</sup>		13	60
<b>Total</b>	<b>97</b>	<b>7</b>	<b>24</b>	<b>29</b>	<b>157</b>

<sup>1</sup> Known locally as CT-156 Harvard II

<sup>2</sup> Includes one ex-USAF, also counted earlier

**COSTS:** Programme US\$7 billion, of which US\$362 million contracted by March 1998 for first 47 aircraft, comprising one manufacturing development aircraft and 46 production aircraft in five lots. Flyaway cost US\$5.41 million over 740 aircraft (1998). Contracts for first 168 aircraft and associated ground training systems amount to US\$852.6 million. Lot 10 batch of 35 aircraft cost US\$169.9 million, including associated training devices and manuals. Contract for two additional NPTC aircraft plus support valued at approximately US\$11.6 million.

**DESIGN FEATURES:** Certified to FAR Pt 23 in Aerobatic category, including 15s inverted flying and 5s intentional zero g. Prohibited manoeuvres are slow roll, stall turn (hammerhead), vertical roll, sustained vertical nose-down and knife-edge.

Approximately 90 per cent redesign of PC-9. Initial improvements in T-6 prototypes comprised new aft fuselage for improved flying qualities; new canopy shape for pressurisation and strengthening for birdstrike resistance; new engine cowlings; single-point refuelling; zero/zero ejection seats; cockpit redesign to accommodate 95 per cent of body sizes; laser-initiated canopy fracture system; improved seat mountings; increased engine power, plus digital engine control to replicate jet response; continuous inertial particle separator for engine intake; HFC air conditioning; addition of large aft-fuselage avionics bay; and digital avionics with active matrix LCDs.

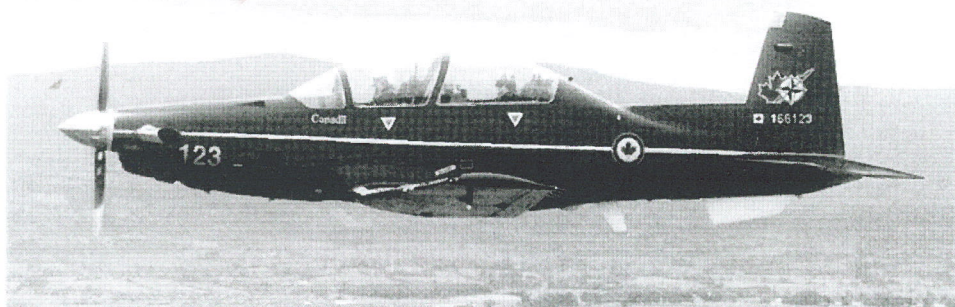
Following JPATS selection, further changes involved OBOGS; maintenance-free hydraulic accumulator; redesigned hydraulics system, wheels and brakes for simpler maintenance; improved corrosion protection; 18,720 hour fatigue life in JPATS mission profiles; 4 m (13 ft)/s landing sink rate provision; removable vertical stabiliser for improved maintenance; on-condition hot section inspections; and 4,500 hour engine TBO. NATO T-6As in Canada additionally provided with cold weather start capability.

**FLYING CONTROLS:** Conventional and manual. Selectable trim aid device (TAD) by Aeromach Labs automatically trims rudder in conjunction with throttle position to minimise effect of torque. Flight-adjustable rudder and elevator tabs; aileron trim by biased centring spring. Stall strip on starboard wing. Control deflections include rudder  $\pm 24^\circ$ ; elevators  $18^\circ$  up/ $16^\circ$  down; ailerons  $20^\circ$  up/ $11^\circ$  down; and flaps  $23^\circ$  for take-off,  $50^\circ$  for landing. Airbrake maximum deflection of  $67^\circ$   $30'$ .

**STRUCTURE:** Generally all-metal; durability and damage-tolerant (DADT) structure includes wing and tailplane leading-edges reinforced for bird resistance; 18,000 hour service life. Avionics bay behind rear cockpit; forward-hinged door each side. Airframe built entirely in USA.

**LANDING GEAR:** Goodrich wheels and brakes. Capable of withstanding sink rates up to 4 m (13 ft)/s. Mainwheels 20x4.4 (14 ply (tubeless)); nosewheel 16x4.4 (8 ply) tubeless. Otherwise generally as for PC-9.

**POWER PLANT:** One 1,274 kW (1,708 shp) Pratt & Whitney Canada PT6A-68 turboprop flat rated at 820 kW (1,100 shp) max continuous (104 per cent), driving a Hartzell HC-E4A-2/E9612 four-blade, fully-feathering propeller at a constant 2,000 rpm. Raytheon/P&WC power management unit provides jet-type linear throttle response. T-6A has integral 348 litre (92.0 US gallons; 76.6 Imp gallon) tank in each wing leading-edge; tanks freely interconnected; total fuel capacity 697 litres (184 US gallons; 153 Imp gallons), of which 681 litres (180 US gallons; 150 Imp gallons) are usable. AT-6B fuel capacity 852 litres (225 US gallons; 187 Imp gallons). AT-6B has provision for two underwing auxiliary fuel tanks, each 265 litres (70.0 US gallons; 58.3 Imp gallons). Pressure refuelling/defuelling point in lower



Beech CT-156 Harvard II in Canadian markings (CAF)

0527091

fuselage, adjacent to port wingroot; gravity refuelling points at three quarters' span in each wing upper surface. Oil capacity 17 litres (4.5 US gallons; 3.75 Imp gallons). **ACCOMMODATION:** Two pilots in stepped cockpits on Martin-Baker Mk 16LA zero/zero ejection seats. Limited HOTAS controls in T-6A; full multifunction HOTAS in AT-6B. Three-piece, Pilkington Aerospace acrylic starboard-hinged canopy; integral windscreen 19 mm ( $\frac{3}{4}$  in) thick for resistance to strike by 1.8 kg (4 lb) bird at 270 kt (500 km/h; 311 mph); other panels 9 mm ( $\frac{1}{2}$  in) thick. ATK canopy fracturing initiation unit and Teledyne McCormick fracturing system. Accommodation pressurised and air conditioned; warm air canopy defrosting/demisting. Baggage compartment in rear fuselage, behind avionics bay; upward-hinged door port side.

**SYSTEMS:** Generally as PC-9. Dowty Aerospace hydraulics; Enviro Systems air conditioning unit; Litton OBOGS. Cockpit pressurisation system has 0.24 bar (3.5 lb/sq in) max differential. Battery 28 V. Goodrich emergency power system.

**AVIONICS:** Honeywell primary contractor.

**Comms:** VHF/UHF transceiver, plus back-up VHF with separate antenna; intercom and interphone. MST 67A Mode S transponder. Back-up UHF in Canadian aircraft. T-6A's radio management unit replaced in AT-6B by up-front control panel below HUD.

**Flight:** Dual VNS-41 navigation systems (including VN-411B receivers) for VOR, localiser, glideslope and marker beacon functions through common antenna. DFS-43A ADF (DF-431 receiver and AT-434 loop/sense antenna); KLN 90 GPS (combined INS-GPS in AT-6B); and Rockwell Collins 252-channel DM-441B DME. Litef fibre optic gyro for AHRS. Goodrich collision warning system. Flight data recorder. Extended ADF navigation in Canadian aircraft. Integrated radar altimeter in AT-6B.

**Instrumentation:** Two independent EFIS 50 127 mm (5 in) square active matrix LCDs, plus control panel, in each cockpit (or one, plus 127 x 102 mm; 5 x 4 in MFD in AT-6B); attitude director indicator portion of EFIS provides primary attitude display, turn rate, mode selection annunciation, localiser/glideslope deviation as appropriate; horizontal situation indicator for primary heading display, primary navigation display, course select indication, navigation source annunciation, DME, localiser and glideslope deviation, remote map presentation and selected heading reference marker. Additional three 76 mm (3 in) square MFDs per cockpit provide engine and auxiliary instrument information, including fuel state and pressurisation (engine MFD being replaced in AT-6B by 152 x 203 mm; 6 x 8 in MFD). Standby instrumentation comprises airspeed, attitude, turn-and-slip and magnetic compass (electromechanical in T-6A, digital in AT-6B). Korry Electronics warning panels. Flight Visions Sparrowhawk HUD and second 152 x 203 mm (6 x 8 in) active matrix, liquid crystal MFD (with moving map provision) in T-6B version. AT-6B is compatible with Gen 4 NVGs. Provision for three-screen EFIS version, with HUD and integrated display panel for advanced training.

**Mission:** Dual-mission computers, FN Herstal weapons control system and Avimo gunsight in AT-6B. Provision for laser range-finder.

**ARMAMENT:** AT-6B version has three hardpoints under each wing. Typical loads include (a) two HMP 0.5 in machine gun pods; (b) two external fuel tanks; (c) six BDU-33 25 lb practice bombs; (d) two BDU-33s, two HMPs and two LAU-68 seven-round rocket pods; and (e) two Mk 82 500 lb bombs.

**DIMENSIONS, EXTERNAL:** As for PC-9M

<b>AREAS:</b>	
Wings, gross	16.29 m <sup>2</sup> (175.3 sq ft)
<b>WEIGHTS AND LOADINGS:</b>	
Weight empty	2,136 kg (4,709 lb)
Baggage capacity	36 kg (80 lb)
Max fuel weight	499 kg (1,100 lb)
Max underwing stores (AT-6B)	1,415 kg (3,120 lb)
Max T-O and landing weight	2,948 kg (6,500 lb)
Max ramp weight	2,971 kg (6,550 lb)
Max zero-fuel weight	2,495 kg (5,500 lb)
Max wing loading	181.0 kg/m <sup>2</sup> (37.08 lb/sq ft)
Max power loading	3.60 kg/kW (5.91 lb/shp)

#### PERFORMANCE:

Never-exceed speed (VNE)	350 kt (648 km/h; 402 mph)
Max level speed: at altitude	316 kt (585 km/h; 364 mph)
at low level	270 kt (500 km/h; 311 mph) IAS
Max operating Mach No.	0.67
Manoeuvring speed	236 kt (437 km/h; 272 mph)
Max cruising speed at 2,285 m (7,500 ft)	230 kt (426 km/h; 265 mph)
Approach speed	100 kt (185 km/h; 115 mph) IAS
Stalling speed, power off:	
flaps up	82 kt (152 km/h; 95 mph)
flaps down	74 kt (137 km/h; 86 mph)
Max rate of climb at S/L	1,372 m (4,500 ft)/min
Max certified altitude	9,450 m (31,000 ft)
T-O run	437 m (1,435 ft)
T-O to 15 m (50 ft)	654 m (2,145 ft)
Landing from 15 m (50 ft)	1,030 m (3,380 ft)
Landing run	739 m (2,425 ft)
Range at altitude	850 n miles (1,574 km; 978 miles)
Endurance at max cruising speed	3 h
g limits	+7/-3.5

UPDATED

#### BEECH BONANZA A36

**TYPE:** Six-seat utility transport.

**PROGRAMME:** Descended from Model 35 of 1945 (10,403 built in V tail configuration), but now has little more than the name in common; further 1,911 late Model 33s built as Bonanzas, earlier version being Debonair. Model 36 certified 1 May 1968; developed from Bonanza E33A; A36 certified 24 October 1969 and introduced 1970; current subvariant announced 3 October 1983, succeeding model powered by 212.5 kW (285 hp) Continental IO-520-BB; certified in FAA Utility category.

**CURRENT VERSIONS:** **Bonanza A36:** Standard version. Features introduced for 2001 model year include dual Garmin GNS 430 nav/comm/GPS.

**Centennial of Flight Special Edition:** Limited edition produced in 2003 to commemorate 100 years of powered flight; features include Beechcraft 'B' logo embroidered on interior furnishings; two fine silver/24-carat gold Kitty Hawk Commemorative Centennial of Flight medallions mounted on a brushed silver plaque on the centre console; and exterior paint design featuring ChromaAir colour-shift trim, US Centennial of Flight Commission logo on the engine cowling, and 'B' logo ghosted in pearlescent paint on the fin. First aircraft (c/n E-3514/N36BX) sold to Randy Vinson of Abilene, Texas, at EAA AirVenture, Oshkosh, in July 2003.

*Description applies to A36, except where otherwise stated.*

**Bonanza B36TC:** Described separately.

**CUSTOMERS:** Total 3,530 Bonanza 36/A36s delivered by September 2003, including 89 in 1995, 83 in 1996, 85 in 1997, 71 in 1998, 77 in 1999, 85 in 2000, 63 in 2001, 51 in 2002, and 39 in the first nine months of 2003.

**COSTS:** US\$579,400 basic; US\$596,000 typically equipped (2001).

**DESIGN FEATURES:** Conventional low-wing cabin monoplane. Tapered wings with leading-edge gloves; tapered tailplane and sweptback fin.

Beech modified NACA 23016.5 wing section at root, modified 23012 at tip; dihedral  $6^\circ$ ; incidence  $4^\circ$  at root and  $1^\circ$  at tip.

**FLYING CONTROLS:** Conventional and manual. Electrically actuated trim tab in each elevator; ground-adjustable tabs in ailerons and rudder; single-slotted, three-position flaps.

**STRUCTURE:** Light alloy, with two-spar wing torsion box and stressed-skin tail surfaces. Conventional construction.

**LANDING GEAR:** Electrically retractable tricycle type, with steerable nosewheel. Mainwheels retract inward into wings, nosewheel rearward. Beech oleo-pneumatic shock-absorbers in all units. Cleveland mainwheels, size 6.00-6, and tyres, size 7.00-6 (6 ply), pressure 2.28 to 2.76 bar (33 to 40 lb/sq in). Cleveland nosewheel and tyre, size 5.00-5 (4 ply), pressure 2.76 bar (40 lb/sq in). Cleveland ring disc hydraulic brakes. Parking brake. Magic Hand landing gear system optional.

**POWER PLANT:** One 224 kW (300 hp) Teledyne Continental IO-550-B Raytheon Special Edition flat-six engine, driving a Hartzell three-blade constant-speed metal propeller. The engine is equipped with an altitude-





First Centennial of Flight Special Edition Beech A36 Bonanza departing Oshkosh after hand-over to Mr Randy Vinson (Paul Jackson) NEW/0568420

compensating fuel pump which automatically makes the fuel/air mixture leaner and richer during climb and descent respectively. Usable fuel capacity 280 litres (74.0 US gallons; 61.6 Imp gallons).

ACCOMMODATION: Enclosed cabin seating four to six persons on individual seats. Pilot's seat is vertically adjustable. Dual controls standard. Two rear removable seats and two folding seats permit rapid conversion to utility configuration. Optional club seating with rear-facing third and fourth seats, executive writing desk, refreshment cabinet, headrests for third and fourth seats, reading lights and fresh air outlets for fifth and sixth seats. Double doors of bonded aluminium honeycomb construction on starboard side facilitate loading of cargo. As an air ambulance, one stretcher can be accommodated with ample room for a medical attendant and/or other passengers. Extra windows provide improved view for passengers.

SYSTEMS: Optional 12,000 BTU refrigeration-type air conditioning system comprises evaporator located beneath pilot's seat, condenser on lower fuselage, and engine-mounted compressor. Air outlets on centre console, with two-speed blower. Electrical system supplied by 28 V 100 A alternator, 24 V 15.5 Ah battery; optional standby generator. Hydraulic system for brakes only. Standby vacuum pump standard. Pneumatic system for instrument gyros optional. Oxygen system and electric propeller de-icing optional.

AVIONICS: Comms: Dual Garmin GNS 430 nav/comms with GI 106 indicators or one each GNS 430 and GNS 530; Bendix/King KT 76C transponder; PS Engineering PMA7000M-S audio control system.

Flight: Bendix/King encoding altimeter; KFC 225 AFCS; KI 256 flight command indicator/gyro horizon; KCS 55A compass; Goodrich WX-500 Stormscope; Shadin ADC 200+ fuel and air data computer.

EQUIPMENT: Standard equipment includes LCD digital chronometer, EGT and OAT gauges, rate of climb indicator, turn co-ordinator, 3 in horizon and directional gyros, four fore- and aft-adjustable and reclining seats, armrests, headrests, single diagonal strap shoulder harness with inertia reel for all occupants, pilot's storm window, ultraviolet-proof windscreen and windows, sun visors,

large cargo door, emergency locator transmitter, stall warning device, alternate static source, heated pitot, rotating beacon, three-light strobe system, carpeted floor, super soundproofing, control wheel map lights, entrance door courtesy light, internally lit instruments, coat hooks, glove compartment, in-flight storage pockets, approach plate holder, utility shelf, cabin dome light, reading lights, instrument post lights, control wheel map light, electroluminescent subpanel lighting, landing light, taxiing light, full-flow oil filter, three-colour polyurethane exterior paint, external power socket, static wicks and towbar.

Optional equipment includes dual controls, leather seats, co-pilot's wheel brakes, air conditioning, fifth passenger seat, fresh air vent blower and ground com switch.

DIMENSIONS, EXTERNAL:

Wing span	10.21 m (33 ft 6 in)
Wing chord: at root	2.13 m (7 ft 0 in)
at tip	1.07 m (3 ft 6 in)
Wing aspect ratio	6.2
Length overall	8.38 m (27 ft 6 in)
Height overall	2.62 m (8 ft 7 in)
Tailplane span	3.71 m (12 ft 2 in)
Wheel track	2.92 m (9 ft 7 in)
Wheelbase	2.39 m (7 ft 10 1/4 in)
Propeller diameter: A36	2.03 m (6 ft 8 in)
A36AT	1.93 m (6 ft 4 in)
Forward cockpit door: Height	0.91 m (3 ft 0 in)
Width	0.94 m (3 ft 1 in)
Baggage compartment door: Height	0.61 m (2 ft 0 in)
Width	0.99 m (3 ft 3 in)
Rear passenger/cargo door: Height	0.89 m (2 ft 11 in)
Width	1.14 m (3 ft 9 in)

DIMENSIONS, INTERNAL:

Cabin (aft of firewall, incl extended baggage compartment): Length	3.84 m (12 ft 7 in)
Max width	1.07 m (3 ft 6 in)
Max height	1.27 m (4 ft 2 in)
Volume	3.9 m <sup>3</sup> (136 cu ft)

AREAS:

Wings, gross	16.80 m <sup>2</sup> (181.0 sq ft)
Ailerons (total)	1.06 m <sup>2</sup> (11.40 sq ft)

Trailing-edge flaps (total)	1.98 m <sup>2</sup> (21.30 sq ft)
Fin	0.93 m <sup>2</sup> (10.00 sq ft)
Rudder, incl tab	0.52 m <sup>2</sup> (5.60 sq ft)
Tailplane	1.75 m <sup>2</sup> (18.82 sq ft)
Elevators, incl tabs	1.67 m <sup>2</sup> (18.00 sq ft)

WEIGHTS AND LOADINGS:

Weight empty, standard:

A36, A36AT	1,052 kg (2,320 lb)
Basic operating weight	1,148 kg (2,530 lb)
Baggage capacity	181 kg (400 lb)
Max T-O weight: A36	1,655 kg (3,650 lb)
A36AT	1,633 kg (3,600 lb)
Max ramp weight: A36	1,661 kg (3,663 lb)
A36AT	1,639 kg (3,613 lb)
Payload with max fuel	313 kg (689 lb)
Max wing loading: A36	98.5 kg/m <sup>2</sup> (20.17 lb/sq ft)
A36AT	97.1 kg/m <sup>2</sup> (19.89 lb/sq ft)
Max power loading: A36	7.40 kg/kW (12.17 lb/hp)
A36AT	7.59 kg/kW (12.46 lb/hp)

PERFORMANCE:

Max level speed (min weight)

	184 kt (340 km/h; 212 mph)
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Max cruising speed (mid-cruise weight):

2,500 rpm at FL60	176 kt (326 km/h; 202 mph)
2,300 rpm at FL80	167 kt (309 km/h; 192 mph)
2,100 rpm at FL60	160 kt (296 km/h; 184 mph)
2,100 rpm at FL100	153 kt (283 km/h; 176 mph)

Stalling speed, power off:

flaps up	68 kt (126 km/h; 78 mph) IAS
30° flap	59 kt (109 km/h; 68 mph) IAS

Max rate of climb at S/L

	368 m (1,208 ft)/min
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Service ceiling

	5,640 m (18,500 ft)
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T-O run:

flaps up: A36	360 m (1,185 ft)
A36AT	450 m (1,475 ft)
12° flap: A36	296 m (970 ft)
A36AT	402 m (1,320 ft)

T-O to 15 m (50 ft):

flaps up: A36	640 m (2,100 ft)
A36AT	662 m (2,170 ft)
12° flap: A36	583 m (1,913 ft)
A36AT	618 m (2,025 ft)

Landing from 15 m (50 ft)

	442 m (1,450 ft)
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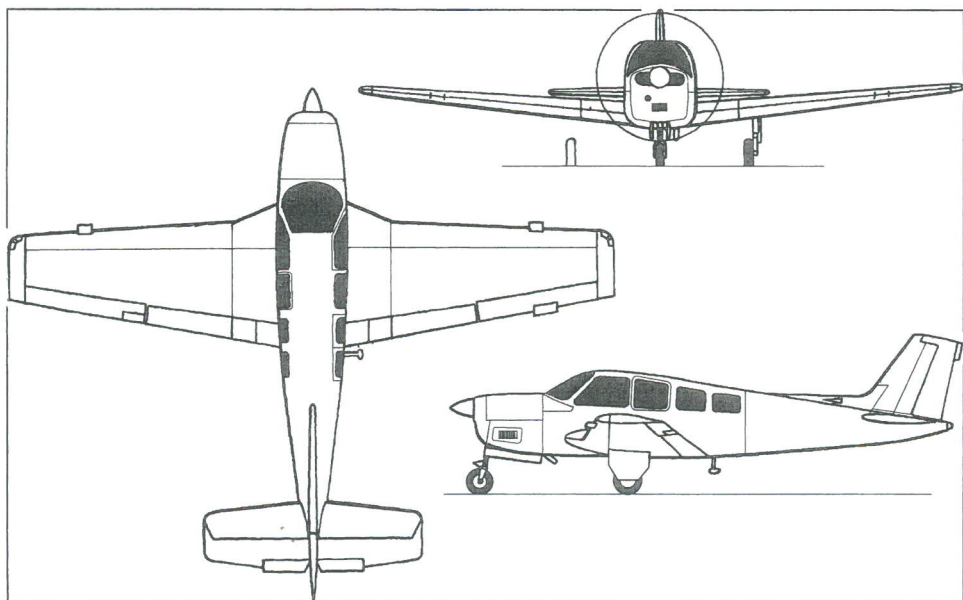
Landing run

	280 m (920 ft)
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Range with max usable fuel, with allowances for engine start, taxi, T-O, climb and 45 min reserves at econ cruise power:

2,500 rpm at FL120	875 n miles (1,621 km; 1,008 miles)
2,300 rpm at FL120	903 n miles (1,672 km; 1,039 miles)
2,100 rpm at FL50	916 n miles (1,696 km; 1,054 miles)
Ferry range	930 n miles (1,722 km; 1,070 miles)

UPDATED



Beech Bonanza A36 four/six-seat utility aircraft (James Goulding) NEW/0568990

**BEECH TURBO BONANZA B36TC**

TYPE: Six-seat utility transport.

PROGRAMME: Derived from A36 (see previous entry). Certified as A36TC 7 December 1978; 271 A36TCs delivered; improved B36TC introduced 1982 following type certification on 15 January 1982.

CURRENT VERSIONS: **Bonanza B36TC:** Standard version, as described. New (2001) features as for A36.

**Bonanza B36TC Jaguar Special Edition:** Discontinued. Description in 2001-02 edition.

CUSTOMERS: Total of 695 A/B36TCs registered by November 2002, including 14 per year in 1993-97, 22 in 1998, 20 in 1999, 18 in 2000, 26 in 2001 and five in 2002; none further in the first nine months of 2003.

COSTS: US\$648,400 basic; US\$665,000 typically equipped (2001).



DESIGN FEATURES: Compared with A36TC, B36TC has greater span; wing section NACA 23010.5 at tip; 0° incidence at tip; greater fuel capacity.

Data below summarise differences from A36TC:

POWER PLANT: One 223.7 kW (300 hp) Teledyne Continental TSIO-520-UB Raytheon Special Edition turbocharged flat-six engine, driving a three-blade constant-speed Hartzell metal propeller. Fixed engine cowl flaps. Two fuel tanks in each wing leading-edge, with total usable capacity of 386 litres (102 US gallons; 84.9 Imp gallons). Refuelling points above tanks. Oil capacity 11.5 litres (3.0 US gallons; 2.5 Imp gallons).

SYSTEMS: Air conditioning optional.

EQUIPMENT: EGT gauge not available. Turbine inlet temperature gauge is standard.

DIMENSIONS, EXTERNAL:

Wing span	11.53 m (37 ft 10 in)
Wing chord at tip	0.91 m (3 ft 0 in)
Wing aspect ratio	7.6
Propeller diameter	1.98 m (6 ft 6 in)

AREAS:

Wings, gross	17.47 m <sup>2</sup> (188.1 sq ft)
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WEIGHTS AND LOADINGS:

Weight empty, standard	1,116 kg (2,460 lb)
Basic operating weight	1,241 kg (2,737 lb)
Max T-O and landing weight	1,746 kg (3,850 lb)
Max ramp weight	1,753 kg (3,866 lb)
Payload with max fuel	233 kg (514 lb)
Max wing loading	99.9 kg/m <sup>2</sup> (20.47 lb/sq ft)
Max power loading	7.81 kg/kW (12.83 lb/hp)

PERFORMANCE (speeds at mid-cruise weight):

Max level speed at FL220	213 kt (394 km/h; 245 mph)
Cruising speed at FL250	
at 79% power	200 kt (370 km/h; 230 mph)
at 75% power	195 kt (361 km/h; 224 mph)
at 69% power	188 kt (348 km/h; 216 mph)
at 56% power	173 kt (320 km/h; 199 mph)

Stalling speed, power off:

flaps up	65 kt (120 km/h; 75 mph) IAS
30° flap	57 kt (106 km/h; 66 mph) IAS

Max rate of climb at S/L

	321 m (1,053 ft)/min
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Service ceiling

	over 7,620 m (25,000 ft)
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T-O run, 15° flap

	311 m (1,020 ft)
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T-O to 15 m (50 ft), 15° flap

	649 m (2,130 ft)
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Landing from 15 m (50 ft)

	516 m (1,692 ft)
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Landing run

	298 m (980 ft)
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Range at FL250 with max fuel, allowances for engine

start, taxi, T-O, cruise climb, descent, and 45 min

reserves at 50% power:

at 79% power	956 n miles (1,770 km; 1,100 miles)
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at 75% power	984 n miles (1,822 km; 1,132 miles)
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at 69% power	1,022 n miles (1,893 km; 1,176 miles)
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at 56% power	at 6,100 m (20,000 ft)
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	1,087 n miles (2,013 km; 1,250 miles)
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Ferry range	1,169 n miles (2,165 km; 1,345 mph)
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UPDATED

## BEECH BARON 58

TYPE: Six-seat utility twin.

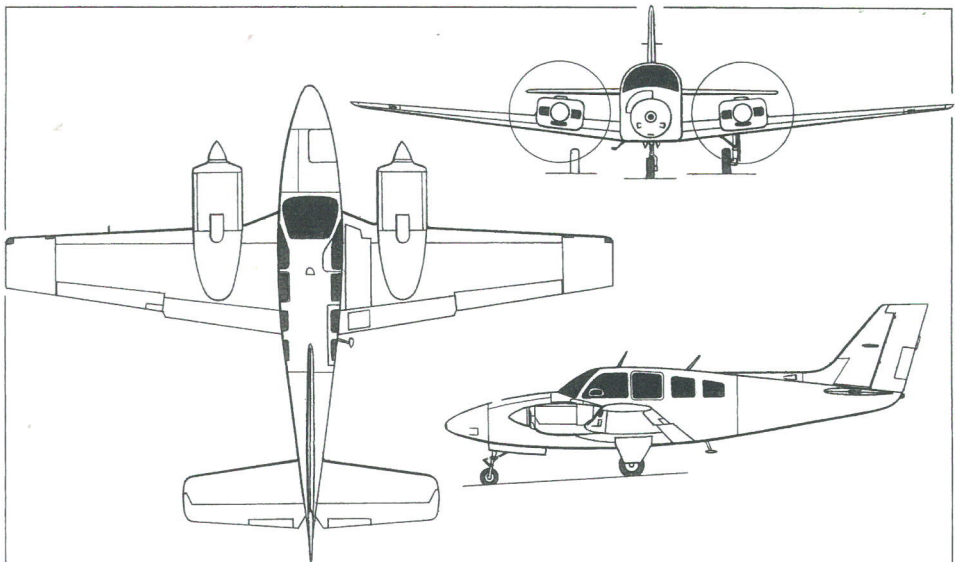
PROGRAMME: Prototype Beech 55 Baron flew 29 February 1960; total 3,728 built, not including 94 Model 56 Turbo Barons. Model 58 derived from E55 with 25 cm (10 in) fuselage stretch, plus internal rearrangement to lengthen cabin by 76 cm (30 in); certified in FAA Normal category 19 November 1969; marketing began in following month. Raytheon delivered 2,000th standard Model 58 (N558TH) in July 2001. Beech 58P Pressurised Baron and 58TC turbocharged version no longer produced.

CURRENT VERSIONS: **Baron 58:** Standard version, as described. Features introduced for 2001 model year include dual Garmin GNS 530 nav/comm/GPS.

**Baron 58 Jaguar Special Edition:** Discontinued.

CUSTOMERS: Operators include several commercial aviation flying schools. Total 2,707 Baron 58s delivered by September 2003, including 29 in 1995, 44 in 1996, 35 in 1997, 42 in 1998, 47 in 1999, 50 in 2000, 47 in 2001, 27 in 2002, and 17 in the first nine months of 2003. (Incorporates 497 of 58P and 151 of 58TC versions.)

COSTS: US\$1,010,400 basic; US\$1,058,030 typically equipped (2001).



Beech Baron 58 (two Teledyne Continental IO-550-C piston engines) (Jane's/Dennis Punnett) NEW/0568989



Beech Baron cabin (Paul Jackson) NEW/0568418

DESIGN FEATURES: Conventional low-wing monoplane, ultimately derived from Beech Bonanza. Tapered wing with leading-edge gloves inboard of engines; sweptback fin.

Wing section NACA 23015.5 at root, 23010.5 at tip; dihedral 6°; incidence 4° at root and 0° at tip.

FLYING CONTROLS: Conventional and manual. Manually operated trim tabs in elevators, rudder and port aileron; electrically operated single-slotted flaps. Control surface movements: ailerons ±20°; elevator ±30°–15°; rudder ±25°; flap settings 15° for approach, 28° maximum.

STRUCTURE: Light alloy with two-spar wing box; elevators have smooth magnesium alloy skins.

LANDING GEAR: Electrically retractable tricycle type. Main units retract inward into wings, nosewheel aft. Beech oleo-pneumatic shock-absorbers in all units. Steerable nosewheel with shimmy damper. Cleveland wheels, with mainwheel tyres size 6.50-8 (8 ply) tubeless, pressure 3.59 to 3.96 bar (52 to 56 lb/sq in) or 19.5×6.75-8 (10 ply) tubeless. Nosewheel tyre size 5.00-5 (6 ply) tubeless, pressure 3.79 to 4.14 bar (55 to 60 lb/sq in) or 15×6.0-6 (4 ply) tubeless. Cleveland ring disc hydraulic brakes. Heavy-duty brakes optional. Parking brake.

POWER PLANT: Two 224 kW (300 hp) Teledyne Continental IO-550-C Raytheon Special Edition flat-six engines, each driving a Hartzell three-blade constant-speed fully feathering metal propeller. The standard fuel system has a usable capacity of 628 litres (166 US gallons; 138 Imp gallons). Optional 'wet wingtip' installation also available, increasing usable capacity to 734 litres (194 US gallons; 161.5 Imp gallons).

ACCOMMODATION: Standard version has four individual seats in pairs in enclosed, soundproofed, heated and ventilated cabin, with door on starboard side for pilot(s). Single diagonal strap shoulder harness with inertia reel standard

on all seats. Pilot's vertically adjusting seat is standard. Co-pilot's vertically adjusting seat, folding fifth and sixth seats, or club seating comprising folding fifth and sixth seats and aft-facing third and fourth seats, are optional. Adjustable rudder pedals (retractable on starboard side). Executive desk available as option with club seating. Baggage compartment in nose. Double passenger/cargo doors on starboard side of cabin (split vertically: forward-hinged at front, aft portion rear-hinged) provide access to space for baggage or cargo behind the third and fourth seats. Pilot's storm window. Openable windows adjacent the third and fourth seats are used for ground ventilation and as emergency exits. Windscreen defrosting standard.

SYSTEMS: Cabin heated by Janitrol 50,000 BTU heater, which serves also for windscreen defrosting. Oxygen system of 1,389 litres (49 cu ft) or 1,814 litres (64 cu ft) capacity optional. Electrical system includes two 28 V 100 A engine-driven alternators with alternator failure lights and two 12 V 25 Ah batteries. Two 100 A alternators optional. Hydraulic system for brakes only. Pneumatic pressure system for air-driven instruments, and optional wing and tail unit de-icing system. Oxygen system, cabin air conditioning and windscreen electric anti-icing optional.

AVIONICS: As for Beech A36 Bonanza, plus radar.

Radar: Honeywell RDR 2000 VP colour weather radar.

EQUIPMENT: Standard equipment includes ultraviolet-proof windscreen and cabin windows, super soundproofing, heated pitot head, instrument panel floodlights, navigation and position lights, steerable taxiing light, dual landing lights, heated fuel vents, heated fuel and stall warning vanes and external power socket.

Options include alternate static source, internally illuminated instruments, strobe lights, electric windscreen anti-icing, wing ice detection light, static wicks, leather seat trim, cabin club seating, cockpit relief tube, cabin fire extinguisher and ventilation blower.

DIMENSIONS, EXTERNAL:

Wing span	11.53 m (37 ft 10 in)
Wing chord: at root	2.13 m (7 ft 0 in)
at tip	0.90 m (2 ft 11½ in)
Wing aspect ratio	7.2
Length overall	9.09 m (29 ft 10 in)
Height overall	2.97 m (9 ft 9 in)
Tailplane span	4.85 m (15 ft 11 in)
Wheel track	2.92 m (9 ft 7 in)
Wheelbase	2.72 m (8 ft 11 in)
Propeller diameter	1.96 m (6 ft 5 in)
Rear passenger/cargo doors:	
Max height	0.89 m (2 ft 11 in)
Width	1.14 m (3 ft 9 in)
Baggage door (fwd): Height	0.56 m (1 ft 10 in)
Width	0.64 m (2 ft 1 in)

DIMENSIONS, INTERNAL:

Cabin (incl rear baggage area):	
Length	3.84 m (12 ft 7 in)
Max width	1.07 m (3 ft 6 in)
Max height	1.27 m (4 ft 2 in)
Floor area	3.72 m <sup>2</sup> (40.0 sq ft)
Volume	3.9 m <sup>3</sup> (136 cu ft)
Baggage compartment: nose	0.51 m <sup>3</sup> (18.0 cu ft)

AREAS:

Wings, gross	18.51 m <sup>2</sup> (199.2 sq ft)
Ailerons (total)	1.06 m <sup>2</sup> (11.40 sq ft)
Trailing-edge flaps (total)	1.98 m <sup>2</sup> (21.30 sq ft)
Fin	1.46 m <sup>2</sup> (15.67 sq ft)
Rudder, incl tab	0.81 m <sup>2</sup> (8.75 sq ft)
Tailplane	4.95 m <sup>2</sup> (53.30 sq ft)
Elevators, incl tabs	1.84 m <sup>2</sup> (19.80 sq ft)

WEIGHTS AND LOADINGS:

Weight empty	1,633 kg (3,600 lb)
Basic operating weight	1,756 kg (3,871 lb)



Beech Baron 58 six-seat twin (Paul Jackson)

NEW/0568419



Baggage capacity: cabin	181 kg (400 lb)
nose	136 kg (300 lb)
Max T-O weight	2,495 kg (5,500 lb)
Max ramp weight	2,506 kg (5,524 lb)
Payload with max fuel	213 kg (470 lb)
Max landing weight	2,449 kg (5,400 lb)
Max wing loading	134.8 kg/m <sup>2</sup> (27.61 lb/sq ft)
Max power loading	5.58 kg/kW (9.17 lb/hp)
PERFORMANCE (cruising speeds at average cruise weight):	
Max level speed at S/L	208 kt (386 km/h; 239 mph)
Max cruising speed, 2,500 rpm at FL50	203 kt (376 km/h; 234 mph)
Cruising speed, 2,500 rpm at FL80	192 kt (356 km/h; 221 mph)
Econ cruising speed, 2,100 rpm at FL120	162 kt (300 km/h; 186 mph)
Stalling speed, power off:	
flaps up	84 kt (156 km/h; 97 mph) IAS
flaps down	75 kt (139 km/h; 86 mph) IAS
Max rate of climb at S/L	529 m (1,735 ft)/min
Rate of climb at S/L, OEI	119 m (390 ft)/min
Service ceiling	6,305 m (20,680 ft)
Service ceiling, OEI	2,220 m (7,280 ft)
T-O run	427 m (1,400 ft)
T-O to 15 m (50 ft)	701 m (2,300 ft)
Landing from 15 m (50 ft)	747 m (2,450 ft)
Landing run	434 m (1,425 ft)
Range with 628 litres (166 US gallons; 138 Imp gallons) usable fuel, power/altitude settings as above, with allowances for engine start, taxi, T-O, climb and 45 min reserves at econ cruise power:	
at max cruising speed	860 n miles (1,593 km; 990 miles)
at cruising speed	974 n miles (1,804 km; 1,121 miles)
at econ cruising speed	1,313 n miles (2,432 km; 1,511 miles)
Ferry range	1,569 n miles (2,905 km; 1,805 miles)

UPDATED

## BEECH KING AIR C90B

TYPE: Business twin-turboprop.

PROGRAMME: King Air 90 first flew 21 November 1963. C90B announced at NBAA Convention, October 1991; superseded King Air 90, A90, B90, C90, C90-1, C90A; introduced four-blade McCauley propellers, special interior soundproofing, updated and redesigned interior, updated cockpit features and interior noise and vibration levels substantially reduced. A model delivered on 24 June 1996 to Jeld-Wen of Klamath Falls, Oregon, was the 5,000th King Air of all versions to be produced.

CURRENT VERSIONS: C90B: Standard version from 1991, but engineering designation remains 90A.

Detailed description applies to C90B.

King Air 200 and 350: Described in following entries.

CUSTOMERS: Total 1,689 commercial and 226 military King Air 90/A90/B90/C90/C90-1/C90A/C90B/C90SE delivered by September 2003, including 40 C90Bs and (now discontinued) C90SEs in 1995, 38 C90Bs in 1996, 41 C90Bs in 1997, 37 C90Bs in 1998, 41 C90Bs in 1999, 46 C90Bs in 2000, 41 C90Bs in 2001, 21 C90Bs in 2002, and 10 C90Bs in the first nine months of 2003. 1,600th delivered to Larry V Plummer at Camarillo, California, September 2000.

COSTS: C90B US\$2.867 million (2001).

DESIGN FEATURES: Conventional low-wing, twin-engined monoplane. Wing section NACA 23014.1 (modified) at root, 23016.22 (modified) at outer end of centre-section, 23012 at tip; dihedral 7°; incidence 4° 48' at root, 0° at tip; tailplane 7° dihedral.

FLYING CONTROLS: Conventional and manual. Trim tabs on port aileron, in both elevators and rudders; single-slotted aluminium flaps.

STRUCTURE: Generally light alloy; magnesium ailerons. Internal corrosion-proofing.

LANDING GEAR: Hydraulically retractable tricycle type. Nosewheel retracts rearward, mainwheels forward into engine nacelles. Mainwheels protrude slightly beneath nacelles when retracted, for safety in a wheels-up

emergency landing. Fully castoring steerable nosewheel with shimmy damper. Beech oleo-pneumatic shock-absorbers. Goodrich mainwheels with tyres size 8.50-10 (8 ply) tubeless, pressure 3.79 bar (55 lb/sq in). Goodrich nosewheel with tyre size 6.50-10 (6 ply) tubeless, pressure 3.59 bar (52 lb/sq in). Goodrich heat-sink and air-cooled multidisc hydraulic brakes. Parking brake. Minimum ground turning radius 10.82 m (35 ft 6 in).

POWER PLANT: Two 410 kW (550 shp) Pratt & Whitney Canada PT6A-21 turboprops, each driving a Hartzell four-blade constant-speed fully feathering propeller. Propeller auto ignition system, environmental fuel drain collection system, magnetic chip detector, automatic propeller feathering and propeller synchrophaser standard. Fuel in two tanks in engine nacelles, each with usable capacity of 231 litres (61.0 US gallons; 50.8 Imp gallons), and auxiliary bladder tanks in outer wings, each with capacity of 496 litres (131 US gallons; 109 Imp gallons). Total usable fuel capacity 1,454 litres (384 US gallons; 320 Imp gallons). Refuelling points in top of each engine nacelle and in wing leading-edge outboard of each nacelle. Oil capacity 13.2 litres (3.5 US gallons; 2.9 Imp gallons) per engine.

ACCOMMODATION: Two four-way adjustable seats side by side in cockpit with dual controls standard. Normally, four reclining seats in main cabin, in two pairs facing each other fore and aft. Standard furnishings include cabin forward partition, with fore and aft partition and coat rack, hinged nose baggage compartment door, seat belts and inertia reel shoulder harnesses for all seats. Standard accommodation for six passengers, four in club arrangement, one on sideways-facing seat adjacent door, and one on lavatory/seat in baggage area. Baggage racks at rear of cabin on starboard side, with lavatory on port side. Door on port side aft of wing, with built-in airstairs. Emergency exit on starboard side of cabin. Entire accommodation pressurised, heated and air conditioned. Electrically heated windshield, windshield defroster and windshield wipers standard.

SYSTEMS: Pressurisation by dual engine bleed air system with pressure differential of 0.34 bar (5.0 lb/sq in). Cabin heated by 45,000 BTU dual engine bleed air system and auxiliary electrical heating system. Hydraulic system for landing gear actuation. Electrical system includes two 28 V 300 A starter/generators, 24 V 34 Ah air-cooled Ni/Cd battery with failure detector. Oxygen system, 623 litres (22 cu ft) or 1,814 litres (64 cu ft) capacity, optional. Vacuum system for flight instruments. Automatic pneumatic de-icing of wing/fin/tailplane leading-edges standard. Engine and propeller anti-icing systems standard. Engine fire detection and extinguishing system optional.

AVIONICS: Standard Rockwell Collins Pro Line II package with two-tube EFIS-84 in sectional instrument panel.

Comms: Dual VHF-22A transceivers with CTL-22 controls; dual TDR-64 transponders; dual DB Systems Model 415 audio systems; dual Lockheed Martin Fairchild CVR A1005; dual Flite-Tronics PC-250 inverters; edgelight radio panel; ELT; avionics master switch; ground clearance switch on com 1; control wheel push-to-talk switches; dual hand microphones and cockpit speakers; dual Telex headsets.

Radar: WXR-270 colour weather radar.

Flight: Dual VIR-32 VOR/LOC/GLS/MKR receivers with CTL-32 controls; ADF-60A with CTL-62 control; DME-42 with IND-42 indicator; RMI-30; dual MCS-65 compass systems. Goodrich WX-1000+ Stormscope optional. APS-65H autopilot/flight director with EADI-84 and EHSI.

Instrumentation: EFIS-84; ALT-50A radio altimeter; pilot's encoding altimeter; dual 2 in electric turn and bank indicators; co-pilot's 75 mm (3 in) horizon indicator; co-pilot's HSI. Dual blind-flying instrumentation with dual instantaneous VSIs; standby magnetic compass; digital OAT gauge; LCD digital chronometer clock; vacuum gauge; de-icing pressure gauge; cabin rate of climb indicator; cabin altitude and differential pressure indicator; flight hour recorder; automatic solid-state warning and annunciator panel. Primary and secondary instrument lighting systems.

EQUIPMENT: Standard equipment includes fresh air outlets; oxygen outlets with overhead-mounted diluter demand masks with microphones; removable low-profile lavatory with shoulder harness and lap belt; two cabin tables; cabin fire extinguisher; wing ice lights; dual landing lights; nosewheel taxiing light; flush position lights; dual rotating beacons; rheostat-controlled white cockpit lighting; wingtip recognition lights; wingtip and tail strobe lights; and vertical tail illumination lights.

Optional equipment includes electric flushing lavatory; engine fire detection system; oxygen bottle; cabinet with three drawers and stereo tape deck storage; and pilot-to-cabin paging with four stereo speakers.

DIMENSIONS, EXTERNAL:

Wing span	15.32 m (50 ft 3 in)
Wing chord: at root	2.15 m (7 ft 0½ in)
at tip	1.07 m (3 ft 6 in)
Wing aspect ratio	8.6
Length overall	10.82 m (35 ft 6 in)
Height overall	4.34 m (14 ft 3 in)
Tailplane span	5.26 m (17 ft 3 in)
Wheel track	3.89 m (12 ft 9 in)
Wheelbase	3.73 m (12 ft 3 in)
Propeller diameter	2.29 m (7 ft 6 in)
Propeller ground clearance	0.34 m (1 ft 1½ in)
Passenger door: Height	1.30 m (4 ft 3½ in)
Width	0.69 m (2 ft 3 in)
Height to sill	1.22 m (4 ft 0 in)

DIMENSIONS, INTERNAL:

Pressurised area: Length	5.43 m (17 ft 10 in)
Cabin: Length	3.78 m (12 ft 5 in)
Max width	1.37 m (4 ft 6 in)
Max height	1.45 m (4 ft 9 in)
Floor area	6.50 m <sup>2</sup> (70.0 sq ft)
Volume	6.4 m <sup>3</sup> (227 cu ft)
Baggage compartment volume, rear	1.4 m <sup>3</sup> (48 cu ft)

AREAS:

Wings, gross	27.31 m <sup>2</sup> (293.9 sq ft)
Ailerons (total)	1.29 m <sup>2</sup> (13.90 sq ft)
Trailing-edge flaps (total)	2.72 m <sup>2</sup> (29.30 sq ft)
Fin	2.20 m <sup>2</sup> (23.67 sq ft)
Rudder, incl tab	1.30 m <sup>2</sup> (14.00 sq ft)
Tailplane	4.39 m <sup>2</sup> (47.25 sq ft)
Elevators, incl tabs (total)	1.66 m <sup>2</sup> (17.87 sq ft)

WEIGHTS AND LOADINGS:

Weight empty	3,040 kg (6,702 lb)
Basic operating weight, typical	3,180 kg (7,010 lb)
Max fuel weight	1,167 kg (2,573 lb)
Max T-O weight	4,581 kg (10,100 lb)
Max ramp weight	4,608 kg (10,160 lb)
Max landing weight	4,354 kg (9,600 lb)
Max wing loading	167.8 kg/m <sup>2</sup> (34.36 lb/sq ft)
Max power loading	5.59 kg/kW (9.18 lb/shp)

PERFORMANCE:

Max level speed	249 kt (461 km; 286 mph)
Max cruising speed at AUW of 3,855 kg (8,500 lb):	
at FL160	247 kt (457 km/h; 284 mph)
at FL210	243 kt (450 km/h; 280 mph)
at FL240	239 kt (442 km/h; 275 mph)
Approach speed	101 kt (187 km/h; 116 mph)
Stalling speed, power off:	
wheels and flaps up	88 kt (163 km/h; 101 mph) IAS
flaps down	78 kt (144 km/h; 90 mph) IAS
Max rate of climb at S/L	610 m (2,003 ft)/min
Rate of climb at S/L, OEI	151 m (494 ft)/min
Service ceiling	9,150 m (30,000 ft)
Service ceiling, OEI	3,990 m (13,100 ft)
T-O run	620 m (2,035 ft)
T-O to 15 m (50 ft)	826 m (2,710 ft)
Accelerate/stop distance	1,113 m (3,650 ft)
Landing from 15 m (50 ft) at max landing weight, with propeller reversal	698 m (2,290 ft)
Landing run at max landing weight, with propeller reversal	384 m (1,260 ft)
Range with max fuel at max cruising speed, incl allowance for starting, taxi, take-off, climb, descent and 45 min reserves at max range power, ISA:	
at FL160	930 n miles (1,722 km; 1,070 miles)
at FL210	1,080 n miles (2,000 km; 1,242 miles)
at FL240	1,165 n miles (2,157 km; 1,343 miles)
Max range at econ cruising power, allowances as above:	
at FL160	1,115 n miles (2,065 km; 1,283 miles)
at FL210	1,280 n miles (2,370 km; 1,473 miles)
at FL240	1,340 n miles (2,481 km; 1,542 miles)
at FL290	1,400 n miles (2,592 km; 1,611 miles)

UPDATED

## BEECH KING AIR B200

Israel Defence Force name: Tsotit (Thrush)

Swedish Air Force designation: Tp 101

TYPE: Utility turboprop twin.

PROGRAMME: Design of Super King Air 200 began October 1970; 'Super' prefix deleted from all 200, 300 and 350 series King Airs in 1996; first flight (c/n BB1) 27 October 1972; certified to FAR Pt 23 plus icing requirements of FAR Pt 25, 14 December 1973; design of B200 (prototype c/n BB343) began March 1980; production started May 1980; FAA certification 13 February 1981; on sale March 1981.

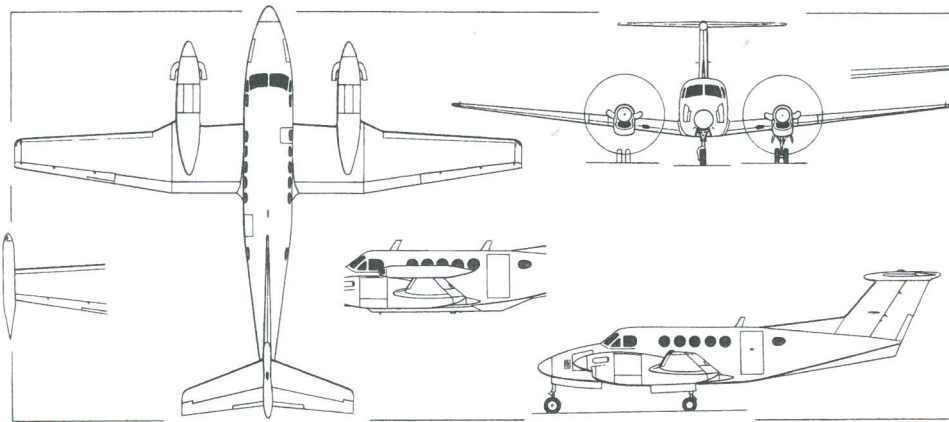
CURRENT VERSIONS: King Air B200: Baseline version.



Beech King Air C90 business twin-turboprop (Paul Jackson)

NEW/0568417





Beech King Air B200 twin-turboprop transport, with scrap views of wingtip tanks and centre-fuselage of photo survey aircraft for IGN (*Jane's/Dennis Punnett*)  
NEW/0559361

Detailed description applies to B200.

**King Air B200C:** As B200 but with 1.32 x 1.32 m (4 ft 4 in x 4 ft 4 in) cargo door. Two, identified as military C-12R/AP, ordered by US Army on behalf of Greece, January 2000; special missions fit includes cameras for geophysical survey, removable for VIP transport; delivered mid-2002.

**King Air B200T:** Standard provision for removable tip tanks, adding total 401 litres (106 US gallons; 88.25 Imp gallons), making total 2,460 litres (650 US gallons; 541 Imp gallons). Span without tip tanks 16.92 m (55 ft 6 in). Total 38 built up to 1993. Four ordered by US Army Missile Command in October 1998 for delivery by June 2000; however, these appear to be part of batch of five for Israel Defence Force, also completed in June 2000 and increasing production total to 43. Further three built in 2002 for undisclosed customer; total 46, all converted on production line from B200s.

**King Air B200CT:** Combines tip tanks and cargo door as standard. Four built by 1983 for Chile (one) and Peru (Navy, three). All converted on production line from King Air 200. Israel Defence Force/Air Force ordered five, of which first was delivered on 4 September 2002, with deliveries completed in June 2003. All B200T/CTs converted on production line from King Air 200s.

**Maritime patrol B200T:** Production discontinued.

**Beech 200 HISAR:** Radar surveillance platform. Launched 1997; based on Beech 200T airframe; demonstrator (N4277E) undertook 16-country tour in 1997-98. First international sale to Traffic 2000 of Germany, November 1997, for North Sea environmental monitoring. Ventral radome for Hughes Integrated Synthetic Aperture Radar (HISAR) suitable for border surveillance, remote sensing, pollution monitoring, EEZ patrol and agricultural monitoring. Equipment operator's console in cabin.

**C/RC/JC-12:** Military versions; described separately.

**King Air 300LW:** Production discontinued.

**King Air 350:** Described separately.

**CUSTOMERS:** Deliveries by 30 September 2003 totalled 1,878 for commercial and private orders, plus 397 military versions (described in previous *Jane's All the World's Aircraft*) to US armed forces and foreign customers. Total of 23 King Air B200s delivered in 1994, 28 in 1995, 33 in 1996, 45 in 1997, 45 in 1998, 55 in 1999, 59 in 2000, 46 in 2001, 26 in 2002, and 17 in the first nine months of 2003.

French Institut Géographique National has three B200Ts fitted with twin Wild RC-10 Superaviogon camera installations and Doppler navigation; maximum endurance 10 hours 20 minutes; high flotation landing gear; special French certification for maximum T-O weight 6,350 kg (14,000 lb) and maximum landing weight 6,123 kg (13,500 lb). Egyptian government acquired one King Air 200 in 1978 for water, uranium and other natural resources exploration over Sinai and Egyptian deserts as follow-up to satellite surveys; fitted with remote sensing gear, specialised avionics and special cameras. Navaid checking versions supplied to Taiwan government (one) and Malaysian government (two). Other special missions aircraft delivered to Taiwan Ministry of Interior May 1979; Royal Hong Kong Auxiliary Air Force (later Government Air Service) (two) 1986 and 1987; four King Air 200s operated by Swedish Air Force since 1988 as **Tp 101**.

King Air B200 selected by UK Serco Group plc for Royal Air Force Cranwell Multi-Activity Contract (MAC) and Multi-Engine Pilot Training Interim Solution (replacing BAe Jetstreams); first two (of seven) delivered 12 December 2003, with remainder scheduled for delivery by March 2004.

**COSTS:** B200 US\$3.839 million; B200C US\$4.814 million (all 2001).

**DESIGN FEATURES:** Generally as for earlier versions. Wing aerofoil NACA 23018 to 23016.5 over inner wing, 23012 at tip; dihedral 6°; incidence 3° 48' at root, -1° 7' at tip; swept vertical and horizontal tail.

**FLYING CONTROLS:** Conventional and manual. Trim tabs in port aileron and both elevators; anti-servo tab in rudder; single-slotted trailing-edge flaps; fixed tailplane.

**STRUCTURE:** Two-spar light alloy wing; safe-life semi-monocoque fuselage.

**LANDING GEAR:** Hydraulically retractable tricycle type, with twin wheels on each main unit. Single wheel on steerable nose unit, with shimmy damper. Main units retract forward, nosewheel rearward. Beech oleo-pneumatic shock-absorbers. Goodrich mainwheels and tyres size 18x5.5 (10 ply) tubeless, pressure 7.25 bar (105 lb/sq in). Oversize and/or 10 ply mainwheel tyres optional. Goodrich nosewheel size 6.50x10 (8 ply) tubeless, with tyre size 22x6.75-10, pressure 3.93 bar (57 lb/sq in). Goodrich hydraulic multiple-disc brakes. Parking brake.

**POWER PLANT:** Two 634 kW (850 shp) Pratt & Whitney Canada PT6A-42 turboprops, each driving a Hartzell four-blade, constant-speed, reversible-pitch, metal propeller with autofeathering and synchrophasing. Bladder fuel cells in each wing, with main system capacity of 1,461 litres (386 US gallons; 321.5 Imp gallons) and auxiliary system capacity of 598 litres (158 US gallons; 131.5 Imp gallons). Total usable fuel capacity 2,059 litres (544 US gallons; 453 Imp gallons). Two refuelling points in upper surface of each wing. Wingtip tanks optional, providing an additional 401 litres (106 US gallons; 88.3 Imp gallons) and raising maximum usable capacity to 2,460 litres (650 US gallons; 541 Imp gallons). Oil capacity 29.5 litres (7.8 US gallons; 6.5 Imp gallons).

**ACCOMMODATION:** Pilot only, or crew of two side by side, on flight deck, with full dual controls and instruments as standard. Seven cabin seats standard, each equipped with seat belts and inertia reel shoulder harness; optional seats in baggage compartment raise passenger capacity to nine. Partition with sliding door between cabin and flight deck, and partition at rear of cabin. Door at rear of cabin on port side, with integral airstair. Large cargo door optional. Inward-opening emergency exit on starboard side over wing. Lavatory and stowage for baggage in rear fuselage. Maintenance access door in rear fuselage; radio compartment access doors in nose. Cabin is air conditioned and pressurised, with electric heat panels to warm cabin before engine starting.

**SYSTEMS:** Cabin pressurisation by engine bleed air, with a maximum differential of 0.44 bar (6.5 lb/sq in). Cabin air conditioner of 32,000 BTU capacity. Auxiliary electric cabin heating. Oxygen system for flight deck, and 623 litre (22 cu ft) oxygen system for cabin, with automatic drop-down face masks; 2,182 litre (77 cu ft) system optional. Dual vacuum system for instruments. Hydraulic system for landing gear retraction and extension, pressurised to 171 to 191 bar (2,475 to 2,775 lb/sq in). Separate hydraulic system for brakes. Electrical system has two 300 A 28 V starter/generators and a 24 V 34 Ah air-cooled Ni/Cd battery with failure detector. AC power provided by dual 300 VA inverters. Engine fire detection system standard; engine fire extinguishing system optional. Pneumatic de-icing of wings and tailplane standard. Anti-icing of engine

air intakes by hot air from engine exhaust, electrothermal anti-icing for propellers.

**AVIONICS:** Standard Rockwell Collins Pro Line II package. Pro Line 21 available as option from 2003.

**Comms:** Cockpit-to-cabin paging standard. Bendix/King KHF 950 transceiver, Fairchild A-100A cockpit voice recorder standard, Wulfsberg Flitefone optional.

**Radar:** Rockwell Collins WXR-270 colour weather radar standard, WXR-840 or WXR-850 turbulence detecting radar optional.

**Flight:** Collins APS-65H autopilot/flight director, Universal UNS-1D and UNS-1K navigation management systems, with GPS optional.

**Instrumentation:** Rockwell Collins EFIS-84/B-14, pilot's ALT-80A encoding altimeter; dual maximum allowable airspeed indicators, and flight director standard. Options include Rockwell Collins three-tube EFIS-85B with MFD.

**EQUIPMENT:** Standard/optional equipment generally as for King Air C90B except fluorescent cabin lighting, one-place couch with storage drawers, flushing chemical toilet, cabin electric heating, cockpit/cabin partition with sliding doors, and airstair door with hydraulic snubber and courtesy light, standard. FAR Pt 135 operational configuration includes cockpit fire extinguisher and 2.2 m³ (77 cu ft) oxygen bottle with cockpit oxygen pressure indicator as standard. A range of optional cabin seating and cabinetry configurations is available, including quick-removable fold-up seats.

#### DIMENSIONS, EXTERNAL:

Wing span	16.61 m (54 ft 6 in)
Wing chord: at root	2.18 m (7 ft 1 1/4 in)
at tip	0.90 m (2 ft 11 1/2 in)
Wing aspect ratio	9.8
Length overall	13.36 m (43 ft 10 in)
Height overall	4.52 m (14 ft 10 in)
Tailplane span	5.61 m (18 ft 5 in)
Wheel track	5.23 m (17 ft 2 in)
Wheelbase	4.56 m (14 ft 11 1/2 in)
Propeller diameter	2.39 m (7 ft 10 in)
Propeller ground clearance	0.43 m (1 ft 4 3/4 in)
Distance between propeller centres	5.23 m (17 ft 2 in)
Passenger door: Height	1.31 m (4 ft 3 1/2 in)
Width	0.68 m (2 ft 2 3/4 in)
Height to sill	1.17 m (3 ft 10 in)
Cargo door (optional): Height	1.32 m (4 ft 4 in)
Width	1.24 m (4 ft 1 in)
Nose avionics service doors (port and stbd):	
Max height	0.57 m (1 ft 10 1/2 in)
Width	0.63 m (2 ft 1 in)
Height to sill	1.37 m (4 ft 6 in)
Emergency exit (stbd): Height	0.66 m (2 ft 2 in)
Width	0.50 m (1 ft 7 3/4 in)

#### DIMENSIONS, INTERNAL:

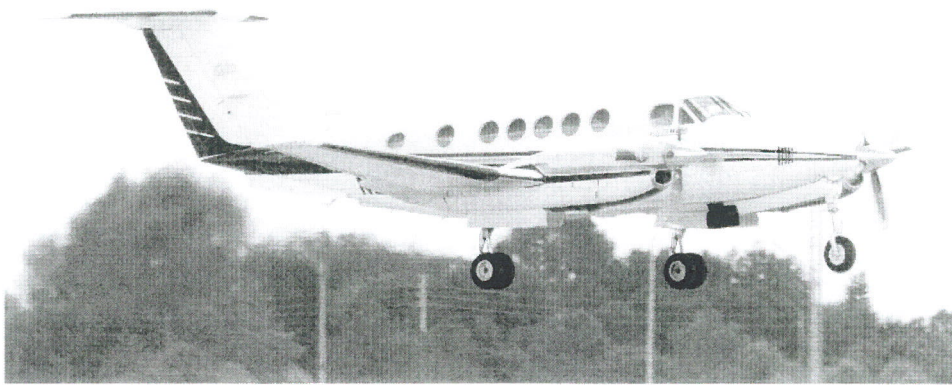
Cabin:	
Length: between pressure bulkheads	6.71 m (22 ft 0 in)
aft of cockpit divider	5.08 m (16 ft 8 in)
Max width	1.37 m (4 ft 6 in)
Max height	1.45 m (4 ft 9 in)
Floor area	7.80 m² (84 sq ft)
Volume	11.1 m³ (392 cu ft)
Baggage hold, rear of cabin:	
Volume	1.5 m³ (54 cu ft)

#### AREAS:

Wings, gross	28.15 m² (303.0 sq ft)
Ailerons (total)	1.67 m² (18.00 sq ft)
Trailing-edge flaps (total)	4.17 m² (44.90 sq ft)
Fin	3.46 m² (37.20 sq ft)
Rudder, incl tab	1.40 m² (15.10 sq ft)
Tailplane	4.52 m² (48.70 sq ft)
Elevators, incl tabs (total)	1.79 m² (19.30 sq ft)

#### WEIGHTS AND LOADINGS:

Weight empty	3,716 kg (8,192 lb)
Basic operating weight (one pilot)	3,910 kg (8,620 lb)
Baggage capacity	249 kg (550 lb)
Max fuel	1,653 kg (3,645 lb)
Max T-O and landing weight	5,670 kg (12,500 lb)
Max ramp weight	5,710 kg (12,590 lb)



Beech King Air B200 (*Paul Jackson*)

NEW/0568416



Max zero-fuel weight 4,990 kg (11,000 lb)  
 Max wing loading 201.4 kg/m<sup>2</sup> (41.25 lb/sq ft)  
 Max power loading 4.48 kg/kW (7.35 lb/shp)

PERFORMANCE:

Never-exceed speed (VNE) 259 kt (480 km/h; 298 mph) IAS  
 Max operating Mach No. 0.52  
 Max level speed at FL250, average cruise weight 292 kt (541 km/h; 336 mph)  
 Max cruising speed:  
 at FL280 288 kt (533 km/h; 331 mph)  
 at FL330 279 kt (517 km/h; 321 mph)  
 at FL350 273 kt (506 km/h; 314 mph)  
 Econ cruising speed at FL270, average cruise weight, normal cruise power 222 kt (411 km/h; 255 mph)  
 Stalling speed: flaps up 99 kt (183 km/h; 114 mph) IAS  
 flaps down 75 kt (139 km/h; 86 mph) IAS  
 Max rate of climb at S/L 747 m (2,450 ft)/min  
 Rate of climb at S/L, OEI 226 m (740 ft)/min  
 Service ceiling over 10,670 m (35,000 ft)  
 Service ceiling, OEI 6,675 m (21,900 ft)  
 T-O run, 40% flap 567 m (1,860 ft)  
 T-O to 15 m (50 ft), 40% flap 786 m (2,580 ft)  
 Landing from 15 m (50 ft):  
 without propeller reversal 867 m (2,845 ft)  
 with propeller reversal 632 m (2,075 ft)  
 Landing run 536 m (1,760 ft)  
 Range with max fuel, NBAA IFR reserves, 100 n mile (185 km; 115 mile) alternate:  
 max cruise power:  
 at FL330 1,673 n miles (3,098 km; 1,925 miles)  
 at FL350 1,772 n miles (3,281 km; 2,039 miles)  
 max range power:  
 at FL330 1,807 n miles (3,346 km; 2,079 miles)  
 at FL350 1,825 n miles (3,379 km; 2,100 miles)

UPDATED

### BEECH KING AIR 350

US Army designation: C-12S

JGSDF designation: LR-2

TYPE: Utility turboprop twin.

PROGRAMME: Replaced King Air 300 (1991-92 *Jane's*); first flight (N120SK) September 1988; introduced at NBAA Convention 1989; certified to FAR Pt 23 (commuter category); first delivery 6 March 1990; Russian certification to AP 23 in November 1995; FAA approval for operation from unprepared runways granted during 1997.

CURRENT VERSIONS: **King Air 350:** Baseline version.

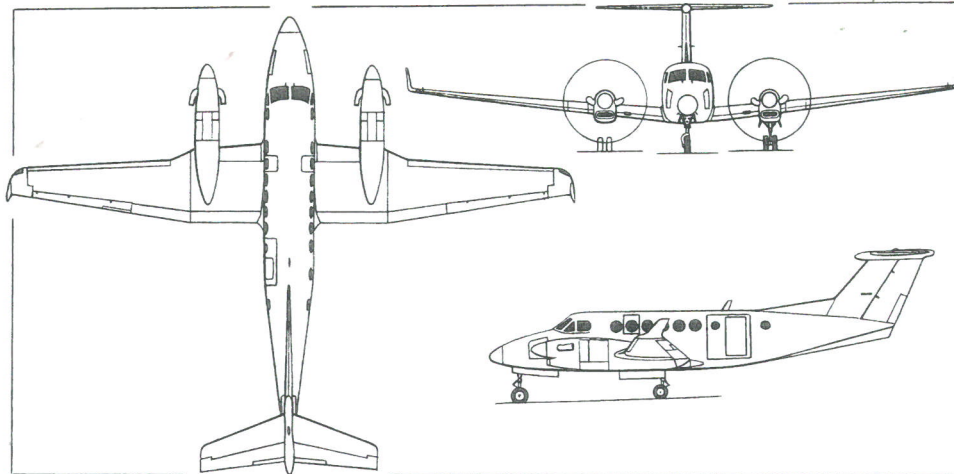
Detailed description applies to King Air 350.

**King Air 350C:** Has 132 × 132 cm (52 × 52 in) freight door with built-in airstair passenger door.

**King Air 350 Special Mission:** Version available from last half of 2004 for homeland security, aerial photography and airways and ground-based navaid checking. Max take-off and landing weight 7,484 kg (16,500 lb), maximum ramp weight 7,530 kg (16,600 lb), max zero-fuel weight 5,897 kg (13,000 lb); provision for HISAR and SeaVue reconnaissance systems; wing fuel lockers; mission endurance seven hours.

Australian Army received King Air 350 VH-HPJ in 1998 as follow-on (to Douglas C-47 Dakota) test platform for Ingara SAR/MTI radar in ventral panner; installation by Hawker Pacific.

**RC-350 Guardian:** Elint version, converted from 350 prototype 1991 by Beech Aircraft Corporation; mission avionics include Raytheon AN/ALQ-142 ESM, Watkins-Johnson 9195C communications interceptor, Honeywell laser INS, GPS receiver and Cubic secure digital datalink;



Beech King Air 350 (*Jane's*/Dennis Punnett)

0085295

can loiter on station at 10,670 m (35,000 ft) for more than 6 hours; can locate/monitor radar emitters in 20 MHz to 18 GHz range, and intercept communications within 20 to 1,400 MHz bandwidths. Wingtip pods house AN/ALQ-142 antennas; underfuselage bulge contains antenna for comint system.

**LR-2:** Japan Ground Self-Defence Force funded two in FY97 for liaison and reconnaissance (undisclosed sensor in ventral radome). Total requirement for 20, of which third funded in 1999, fourth in FY00, fifth in FY01 and sixth in FY02. First delivery (23051) 22 January 1999; initial operator is the HQ Flight of 1st Helicopter Brigade at Kisarazu.

**C-12S:** US Army version with quick-change cargo capability and seating for up to 15 passengers. By late 2000, no aircraft of this type had been identified in service.

CUSTOMERS: Total 377 King Air 350s and 350Cs delivered by September 2003; first 350C delivery in 1990 to Rossing Uranium, Namibia; 15 King Air 350 deliveries 1995, 27 in 1996, 30 in 1997, 42 in 1998, 45 in 1999, 46 in 2000, 32 in 2001, 24 in 2002, and 15 in the first nine months of 2003. Recent customers include the Royal Australian Air Force, which signed a lease contract on 20 November 2002 for seven King Air 350s for delivery from June 2003, to be operated by 32 Squadron for the RAAF School of Navigation at East Sale, replacing H.S. 748s and King Air 200s.

COSTS: 350 US\$5.404 million; 350C US\$5.848 million (both 2001).

DESIGN FEATURES: Compared with King Air 300, fuselage stretched 0.86 m (2 ft 10 in) by plugs 0.37 m (1 ft 2½ in) forward of main spar and 0.49 m (1 ft 7½ in) aft; wing span increased by 0.46 m (1 ft 6 in) with NASA winglets 0.61 m (2 ft 0 in) high; two additional cabin windows each side. Can depart with full payload and full tanks. Raisbeck dual aft body strakes (DABS), standard on production aircraft from c/n FL-312 (N3165M) in first quarter 2001, reduce drag, improve handling and stability and relax or eliminate restrictions on operations with inoperative yaw damper.

FLYING CONTROLS: Automatic cable tensioner in aileron circuit and larger elevator bobweight; larger rudder anti-servo tab; ailerons and rudder cleaned up.

STRUCTURE: As for B200.

LANDING GEAR: As for B200.

POWER PLANT: Two 783 kW (1,050 shp) Pratt & Whitney Canada PT6A-60A turboprops, each driving a Hartzell

four-blade, constant-speed, fully feathering, reversible-pitch, metal propeller. Bladder cells and integral tanks in each wing, with usable capacity of 1,438 litres (380 US gallons; 316.5 Imp gallons); auxiliary tanks inboard of engine nacelles, capacity 601 litres (159 US gallons; 132.5 Imp gallons). Total fuel capacity 2,040 litres (539 US gallons; 449 Imp gallons). No provision for wingtip tanks. Oil capacity 30.2 litres (8.0 US gallons; 6.7 Imp gallons).

ACCOMMODATION: Double club seating for eight passengers; optionally two more seats in rear of cabin and one passenger on side-facing lavatory seat making maximum 11 passengers; certified for maximum 17 occupants including crew. Ultra Electronics UltraQuiet active noise control system installed as standard from 1998.

SYSTEMS: As for B200, except for automatic bleed air-type heating and 22,000 BTU cooling system with high-capacity ventilation system; 2,182 litre (77 cu ft) oxygen system standard; hydraulic landing gear retraction and extension; two 300 A 28 V starter/generators with triple bus electrical distribution system. Ultra Electronics Ltd UltraQuiet active noise control system introduced as standard from 1998, comprising 12 loudspeakers, 24 microphones and a high-speed digital processor which cancel propeller noise and reduce in-flight cabin sound level to less than 80 dB(A).

AVIONICS: Rockwell Collins Pro Line II as core system, with three- or five-tube EFIS, TWR-850 Doppler weather radar and Universal UNS-1K or UNS-1D FMS both with 12-channel GPS. Pro Line 21 option available from 2003.

EQUIPMENT: Generally as for B200.

DIMENSIONS, EXTERNAL: As for B200 except:

Wing span over winglets	17.65 m (57 ft 11 in)
Wing aspect ratio	10.8
Length overall	14.22 m (46 ft 8 in)
Height overall	4.37 m (14 ft 4 in)
Propeller diameter	2.67 m (8 ft 9 in)
Propeller ground clearance	0.29 m (11½ in)
Emergency exit (each side of cabin, above wing):	
Height	0.66 m (2 ft 2 in)
Width	0.50 m (1 ft 7¼ in)

DIMENSIONS, INTERNAL:

Cabin (excl cockpit): Length	5.94 m (19 ft 6 in)
Max width	1.37 m (4 ft 6 in)
Height	1.45 m (4 ft 9 in)
Volume	10.05 m <sup>3</sup> (355 cu ft)
Baggage hold volume	1.6 m <sup>3</sup> (55 cu ft)



Beech King Air 350 (*Paul Jackson*)

NEW/0568415



Beech King Air 350, cutaway drawing key

- 1 Starboard navigation light (green) and strobe and recognition lights (white)
- 2 Flight deck glare shield
- 3 Composites wingtip fairing
- 4 Starboard winglet
- 5 Static dischargers
- 6 Overwing fuel filler
- 7 Outboard integral fuel tank
- 8 Outer leading-edge tank
- 9 Aileron hinge control, cable actuated
- 10 Fixed tab
- 11 Starboard aileron
- 12 Main wing panel centre fuel cell
- 13 Onboard leading-edge tank and filler
- 14 Main wing panel inboard fuel cell
- 15 Starboard outboard slotted flap segment
- 16 Outboard flap screw-jack and guide rail, cable driven via central electric motor
- 17 Nacelle fuel tank
- 18 Starboard engine nacelle
- 19 Hinged cowling panels
- 20 Exhaust stubs
- 21 Engine air intake
- 22 Spinner
- 23 Hartzell four-blade, constant-speed, fully feathering and reversible propeller
- 24 Glass fibre radome
- 25 Weather radar scanner
- 26 Scanner mounting bulkhead
- 27 Landing and taxiing lights
- 28 Nosewheel steering link, hydraulically actuated
- 29 Torque scissor links
- 30 Aft-retracting nosewheel
- 31 Shock absorber leg strut
- 32 Nosewheel doors
- 33 Breaker strut
- 34 Phot head, port and starboard
- 35 Nosewheel hydraulic jack
- 36 Condenser blower, ground running
- 37 Evaporator and fan on starboard side
- 38 Fuselage nose section frame structure
- 39 Avionics racks
- 40 Front pressure bulkhead
- 41 Access hatches, port and starboard
- 42 Marker beacon antenna
- 43 Rudder pedals
- 44 Control column handwheel
- 45 Instrument panel
- 46 Instrument panel shroud
- 47 Windscreen wipers
- 48 Electrically heated windscreen panels
- 49 Overhead switch panel
- 50 Cockpit bulkhead with sliding doors
- 51 Co-pilot's seat
- 52 Direct vision opening side window panel
- 53 Captain's seat
- 54 Portable fire extinguisher beneath seat
- 55 Cockpit bulkhead stowage units
- 56 Cabin conditioned air delivery duct
- 57 Refreshment cabinet
- 58 Aft-facing individual passenger seat
- 59 Wingroot leading-edge fairing
- 60 Centre-section main spar carry-through

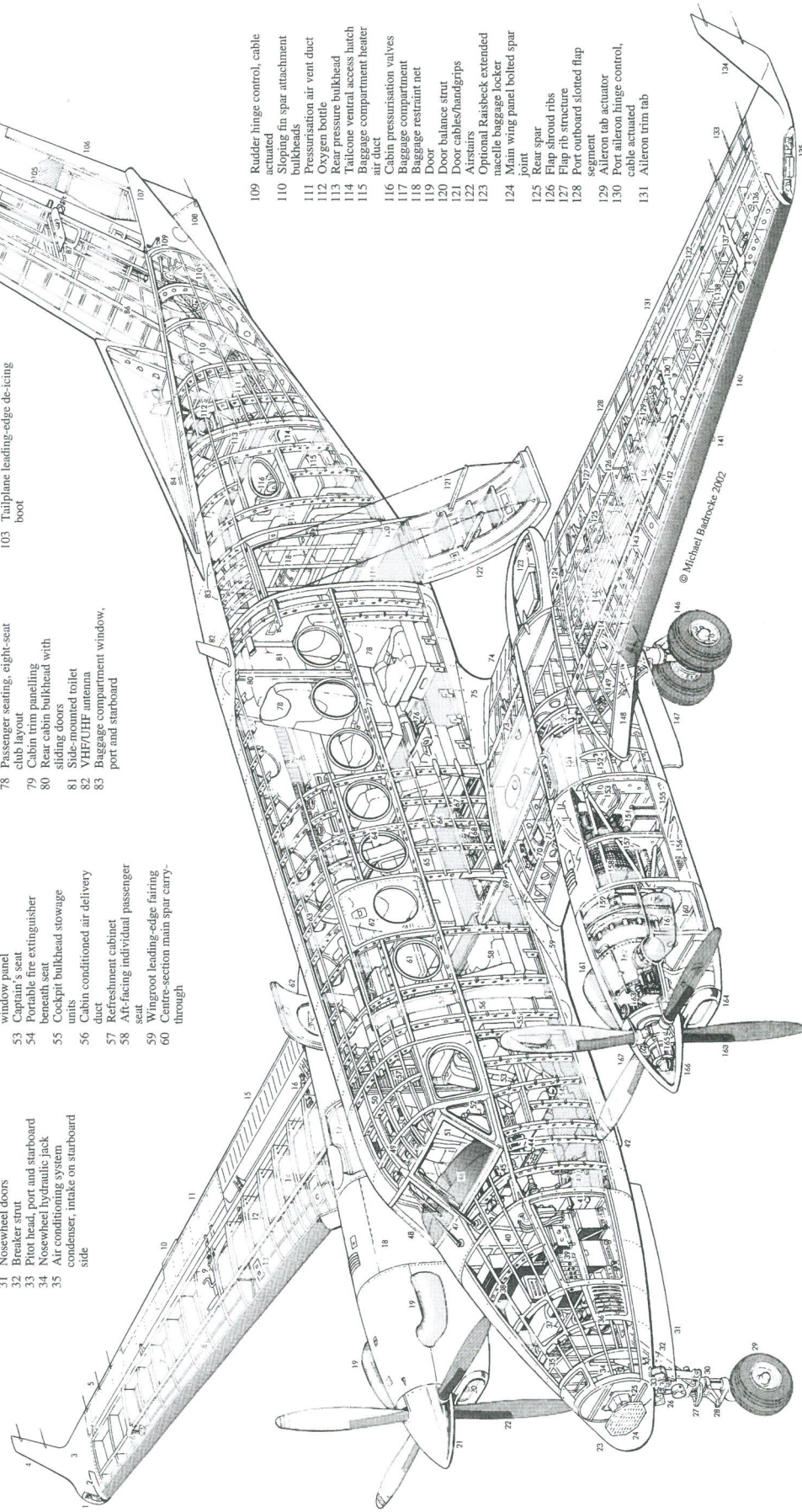
- 84 Fin root fillet
- 85 ELT antenna
- 86 Fin two-spar torsion box structure
- 87 VOR antenna
- 88 Fin rib structure
- 89 Leading-edge bullet fairing
- 90 Fin/tailplane spar joint
- 91 Upper anti-collision beacon
- 92 Starboard tailplane structure
- 93 Elevator trim tab actuator
- 94 Starboard elevator
- 95 Elevator hinge control, cable actuated
- 96 Fin/tailplane trailing-edge fairing
- 97 Tail navigation light
- 98 Elevator trim tabs
- 99 Port elevator bonded structure
- 100 Elevator mass balance
- 101 Port tailplane two-spar torsion box structure
- 102 Logo light
- 103 Tailplane leading-edge de-icing boot

- 104 Rudder
- 105 Bonded rudder structure
- 106 Rudder trim tab
- 107 Detachable vented tailcone
- 108 Ventral fin
- 132 Port aileron rib structure
- 133 Static dischargers
- 134 Port winglet
- 135 Port navigation (red) and strobe and navigation lights, (white)
- 136 Outer wing panel dry bay
- 137 Wingtip fuel tank
- 138 Port outboard integral fuel tank
- 139 Wing rib structure
- 140 Leading-edge de-icing boot
- 141 Stall warning vane
- 142 Leading-edge fuel tank

- 143 Wing main spar
- 144 Main wing panel mid and inboard fuel cells
- 145 Main landing gear leg pivot mounting
- 146 Twin mainwheels, forward retracting
- 147 Mainwheel doors, composites structure
- 148 Outer wing panel leading-edge root extension
- 149 Mainwheel leg drag/breaker strut
- 150 Hydraulic retraction jack
- 151 Port nacelle fuel tank
- 152 Nacelle structure
- 153 Firewall
- 154 Engine accessory equipment
- 155 Inake bypass air spill duct
- 156 Ventral oil cooler
- 157 Engine beater struts
- 158 Annular engine air intake
- 159 Main engine anti-vibration mounting
- 160 Particle separator intake air duct
- 161 Exhaust stubs, port and starboard
- 162 Pratt & Whitney Canada PT6A-60A turboprop governor
- 163 Constant-speed propeller
- 164 Engine air intake, exhaust gas hot air de-icing mechanism
- 165 Propeller hub pitch change mechanism
- 166 Spinner
- 167 Port Hartzell four-blade propeller
- 168 Propeller blade root de-icing

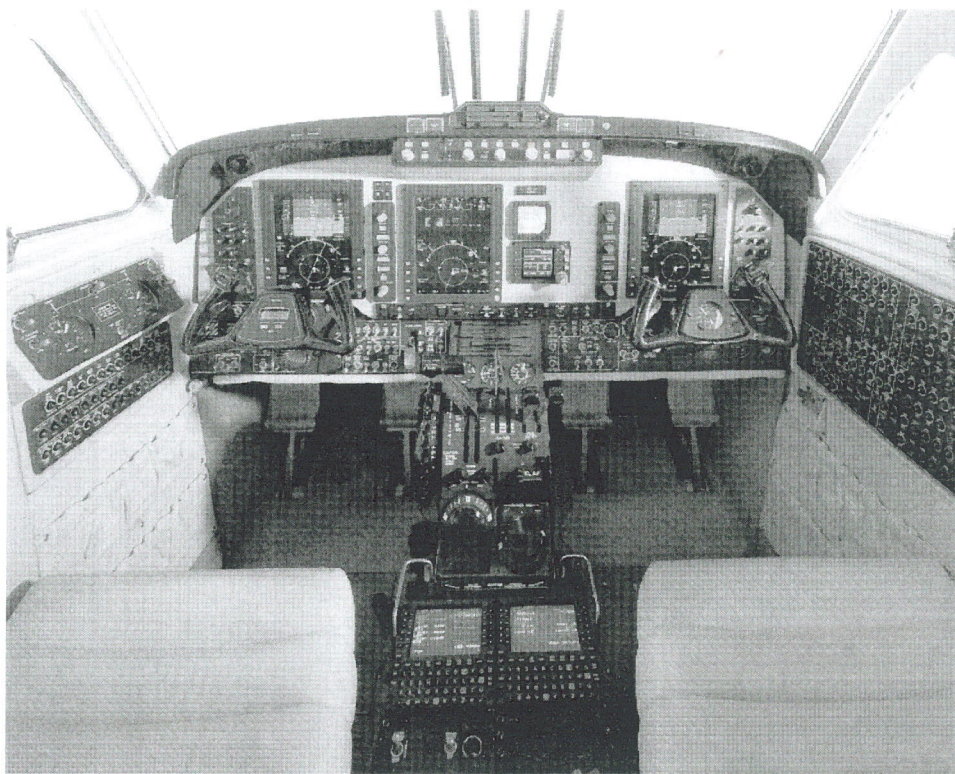
- 61 Folding table, four places
- 62 Emergency exit hatches, port and starboard
- 63 Cabin roof frame structure
- 64 Cabin window panels
- 65 Stowage cabinet
- 66 Centre fuselage frame structure
- 67 Flap drive electric motor
- 68 Aileron cable quadrant
- 69 Main spar/fuselage attachment joint
- 70 Hydraulic reservoir and power pack, landing gear operation
- 71 Engine bleed-air pre-cooler via leading-edge ram air intake
- 72 Centre-section fuel cell
- 73 Inboard flap screw-jack and guide rail
- 74 Port inboard flap segment
- 75 Wingroot trailing-edge fillet
- 76 Underfloor rear cabin heater unit
- 77 Fuselage main longeron
- 78 Passenger seating, eight-seat club layout
- 79 Cabin trim panelling
- 80 Rear cabin bulkhead with sliding doors
- 81 Side-mounted toilet
- 82 VHF/UHF antenna
- 83 Baggage compartment window, port and starboard

- 109 Rudder hinge control, cable actuated
- 110 Sloping fin spar attachment bulkheads
- 111 Pressurisation air vent duct
- 112 Oxygen bottle
- 113 Rear pressure bulkhead
- 114 Tailcone ventral access hatch
- 115 Baggage compartment heater air duct
- 116 Cabin pressurisation valves
- 117 Baggage compartment
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- 120 Door balance strut
- 121 Door cables/handgrips
- 122 Airstairs
- 123 Optional Raisbeck extended nacelle baggage locker
- 124 Main wing panel bolted spar joint
- 125 Rear spar
- 126 Flap shroud ribs
- 127 Flap rib structure
- 128 Port outboard slotted flap segment
- 129 Aileron tab actuator
- 130 Port aileron hinge control, cable actuated
- 131 Aileron trim tab



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Rockwell Collins Pro Line 21 avionics option for King Air 350

NEW/0568414

<b>AREAS:</b>	
Wings, gross	28.80 m <sup>2</sup> (310.0 sq ft)
<b>WEIGHTS AND LOADINGS:</b>	
Weight empty	4,132 kg (9,110 lb)
Basic operating weight (one pilot)	4,317 kg (9,518 lb)
Max fuel weight	1,638 kg (3,611 lb)
Max T-O and landing weight	6,804 kg (15,000 lb)
Max ramp weight	6,849 kg (15,100 lb)
Max zero-fuel weight	5,670 kg (12,500 lb)
Max wing loading	236.2 kg/m <sup>2</sup> (48.39 lb/sq ft)
Max power loading	4.35 kg/kW (7.14 lb/shp)
<b>PERFORMANCE:</b>	
Max level speed	315 kt (584 km/h; 363 mph)
Max cruising speed, AEW of 5,896 kg (13,000 lb):	
at FL280	308 kt (570 km/h; 354 mph)
at FL330	297 kt (550 km/h; 342 mph)
at FL350	290 kt (537 km/h; 334 mph)
Cruising speed, normal cruising power, AEW of 5,896 kg (13,000 lb):	
at FL240	301 kt (558 km/h; 347 mph)
at FL350	281 kt (521 km/h; 324 mph)
Cruising speed, max range power, AEW of 5,896 kg (13,000 lb):	
at FL180	210 kt (389 km/h; 242 mph)
at FL350	240 kt (445 km/h; 276 mph)
Stalling speed at max landing weight, flaps and wheels down	81 kt (150 km/h; 94 mph)
Max rate of climb at S/L	832 m (2,731 ft)/min
Rate of climb at S/L, OEI, AEW of 6,350 kg (14,000 lb)	236 m (775 ft)/min
Service ceiling	above 10,670 m (35,000 ft)
Service ceiling, OEI	6,555 m (21,500 ft)
T-O balanced field length	1,006 m (3,300 ft)
Landing from 15 m (50 ft)	821 m (2,695 ft)
Landing run	441 m (1,450 ft)
Range with 2,040 litres (539 US gallons; 449 Imp gallons) usable fuel, allowances for start, T-O, climb and descent plus 45 min reserves:	
max cruising power:	
at FL330	1,790 n miles (3,315 km; 2,060 miles)
at FL350	1,829 n miles (3,387 km; 2,105 miles)
max range power, allowances as above:	
at FL330	1,463 n miles (2,709 km; 1,684 miles)
at FL350	1,554 n miles (2,878 km; 1,788 miles)

UPDATED

**BEECH 1900D**

US Army designation: C-12J

TYPE: Twin-turboprop airliner.

PROGRAMME: Original Beech 1900 first flew on 3 September 1982; three prototypes followed by 74 1900Cs and 174 wet-wing 1900C-1s by late 1991. Most recent 1900D announced at US Regional Airlines Association meeting 1989; development of 1900C; prototype (converted from 1900C-1 N5584B) first flight 1 March 1990; certification to FAR Pt 23 Amendment 34 received March 1991; full certification with supplements received, and deliveries (to Mesa Airlines) began, November 1991; contract signed February 1997 with Xian Aircraft Company of People's Republic of China for supply to Raytheon of 800 metal-bonded subassemblies for 1900D, to be delivered between 1997 and 2001; 500th Model 1900 delivered in March

1997; 400th Model 1900D (N44640) rolled out 21 March 2000. Beech also offers special mission versions for signals intelligence, maritime patrol and similar duties. Production ended in late 2002.

CURRENT VERSIONS: 1900D: As described.

**1900D Executive:** Features custom-designed executive interior ranging from twin double-club to corporate shuttle configuration; refreshment bar, entertainment system and flight phones optional.

**C-12J:** US Air Force ordered six Beech 1900C-1s (see 1991-92 *Jane's*) in 1986, of which four currently assigned to 3rd, 46th and 51st (two) Wings for support, and two with US Army (HQ Europe and 78th Aviation Battalion in Japan). In March 1997, Army received a further Beech 1900D (96-0112) for Chemical and Biological Defense Command at Aberdeen Proving Ground. C-12 designation more properly belongs to King Air.

**CUSTOMERS:** Total 65 delivered in 1995, 69 in 1996, 42 in 1997, 45 in 1998, 24 in 1999, 54 in 2000, 11 each in 2001 and 2002, and one in the first six months of 2003. Purchasers include the Algerian Air Force, which ordered 12 in 2000 in sigint configuration, equipped with Northrop Grumman Systems radar and FLIR; and Air New Zealand, which ordered 16 in April 2001 for delivery to its regional subsidiary Eagle Airways at the rate of one per month from mid-2001. Last of these, ZK-EAP (c/n UE-439) delivered 29 November 2002 as final new-build Beech 1900, although deliveries continued of earlier 'white tail' aircraft. Total 690 Beech 1900s of all variants (including prototypes) built between 1982 and 2002.

COSTS: US\$4.995 million (2001).

**DESIGN FEATURES:** Flat floor with stand-up headroom; cabin volume increased by 28.5 per cent compared to 1900C; winglets add better hot-and-high performance; tailplane and fin swept; each tailplane carries small fin (taillet) on underside near tip; auxiliary horizontal fixed tail surface (stabilon) each side of rear fuselage improves centre of gravity range; twin ventral strakes improve directional stability and turbulence penetration; small horizontal vortex generator on fuselage ahead of wingroots.

Wing aerofoil NACA 23018 (modified) at root, 23012 (modified) at tip; dihedral 6°; incidence 3° 29' at root, -1° 4' at tip; no sweepback at quarter-chord.

**FLYING CONTROLS:** Conventional and manual. Automatic cable tensioner in aileron circuit; trim tabs in elevators, rudder and port aileron; primary and secondary controls routed separately to improve protection from possible engine-failure damage; single-slotted trailing-edge flaps in two sections on each wing.

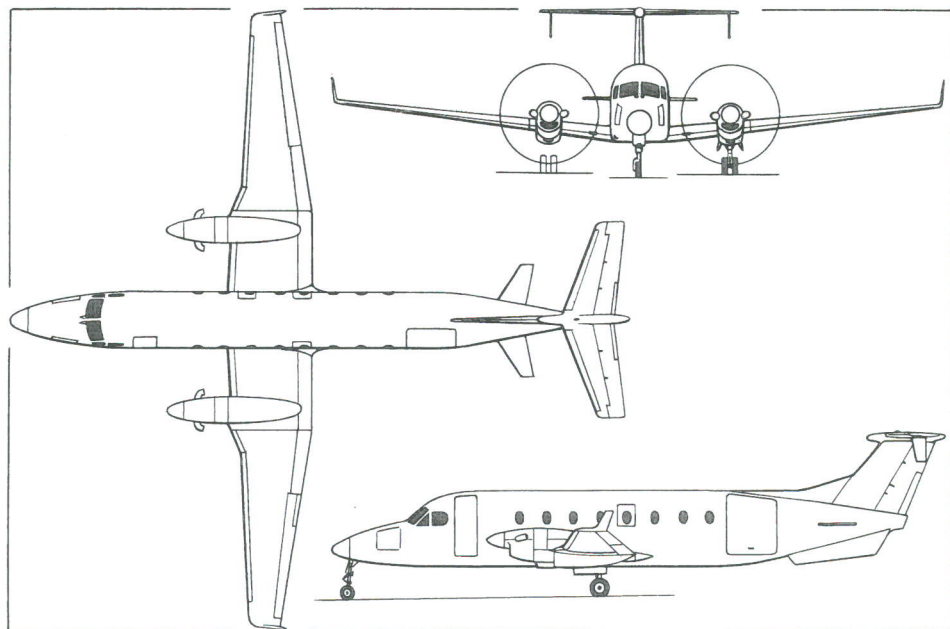
**STRUCTURE:** Generally of light alloy. Wing has continuous main spar with fail-safe structure riveted and bonded; fuselage pressurised and mainly bonded.

**LANDING GEAR:** Hydraulically retractable tricycle type; main units retract forward and nose unit rearward; Beech oleo-pneumatic shock-absorber in each unit. Twin Goodyear wheels on each main unit, size 6.50x10, with Goodyear tyres size 22x6.75-10 (10 ply) tubeless, pressure 6.69 bar (97 lb/sq in); Goodyear steerable nosewheel size 6.50x8, with Goodyear tyres size 19x6.75-8 (10 ply) tubeless, pressure 4.14 bar (60 lb/sq in). Nosewheel power steering optional. Goodyear multiple-disc hydraulic brakes. Optional Beech Hydro-Aire anti-skid units, power steering and brake de-icing. Ground turning radius based on wingtip clearance 12.55 m (41 ft 2 in).

**POWER PLANT:** Two Pratt & Whitney Canada PT6A-67D turboprops, each flat rated at 954 kW (1,279 shp) and driving a Hartzell four-blade constant-speed fully feathering reversible-pitch composites propeller. Wet wing fuel storage (two integral tanks per wing) with a total capacity of 2,528 litres (668 US gallons; 556 Imp gallons), of which 2,519 litres (665 US gallons; 554 Imp gallons) usable. Refuelling point in each wing leading-edge, inboard of engine nacelle. Oil capacity (total) 29.5 litres (7.8 US gallons; 6.5 Imp gallons).

**ACCOMMODATION:** Crew of one (FAR Pt 91) or two (FAR Pt 135) on flight deck, with standard accommodation in cabin of commuter version for 19 passengers in single airline-standard seats on each side of centre aisle. Forward carry-on baggage lockers, underseat baggage stowage, rear baggage compartment. Forward door, incorporating airstairs, on port side. Upward-hinged rear cargo door, also on port side. Three emergency exits over wing (two starboard, one port). Accommodation air conditioned, heated, ventilated and pressurised. Ultra Electronics UltraQuiet active noise cancellation system optional. Executive and corporate shuttle options seat between 10 and 18 passengers with options for forward and rear compartments, combination lavatory/passenger seat and two beverage bars at cabin compartment division. Club, double club and triple club seating optional. Customised interiors to customer's choice, including King Air 350 cockpit seats and passenger/cargo combi interiors. Oxygen system, capacity 4,308 litres (152 cu ft) standard, with outlets for all cabin occupants.

**SYSTEMS:** Bleed air cabin heating and pressurisation, maximum differential 0.35 bar (5.1 lb/sq in), maintaining sea level cabin environment to 3,350 m (11,000 ft), and 2,745 m (9,000 ft) cabin to 7,620 m (25,000 ft). Air cycle and vapour cycle air conditioning. Hydraulic system, pressure 207 bar (3,000 lb/sq in), for landing gear

Beech 1900D regional transport (*Jane's/Dennis Punnett*)



actuation. 28 V electrical system includes two 300 A engine-driven starter/generators, one 34 Ah Ni/Cd battery and two 400 Hz solid-state invertors supplying 115 V DC and 26 V AC power for avionics and instruments. Constant flow oxygen system of 4,420 litre (156 cu ft) capacity standard. Engine inlet screen anti-ice protection, exhaust heated engine inlet lips, fuel vent heating, electric propeller and windscreen de-icing systems standard. Brake de-icing optional. Pneumatic de-icing boots on wings, tailplane, tailsets and stabilons. Self-monitoring continuous detection loop and one-shot fire extinguisher in each engine nacelle.

AVIONICS: Comms: Rockwell Collins Pro Line II digital technology radios; cabin briefer; cockpit voice recorder.

Flight: Dual flight directors; GPWS; provision for TCAS1. GPS and Collins TWR-850 colour weather radar optional.

Instrumentation: Rockwell Collins EFIS-84 four-tube EFIS. Primary display consists of multicolour CRT panels, remote display processor unit and system control units; CRT displays provide conventional electronic attitude director indicator (EADI) and electronic horizontal situation indicator (EHSI) functions.

DIMENSIONS, EXTERNAL:

Wing span over winglets	17.67 m (57 ft 11¼ in)
Wing chord: at root	2.18 m (7 ft 1¾ in)
at tip	0.91 m (3 ft 0 in)
Wing aspect ratio	10.9
Length overall	17.63 m (57 ft 10 in)
Height overall	4.57 m (14 ft 11¾ in)
Tailplane span	5.63 m (18 ft 5¾ in)
Wheel track	5.23 m (17 ft 2 in)
Wheelbase	7.25 m (23 ft 9½ in)
Propeller diameter	2.78 m (9 ft 1½ in)
Propeller ground clearance	0.35 m (1 ft 1¾ in)
Distance between propeller centres	5.23 m (17 ft 2 in)
Passenger door: Height	1.63 m (5 ft 4¼ in)
Width	0.64 m (2 ft 1¾ in)
Cargo door: Height	1.45 m (4 ft 9 in)
Width	1.32 m (4 ft 4 in)
Emergency exits (each): Height	0.80 m (2 ft 7½ in)
Width	0.51 m (1 ft 8 in)
Turning radius	12.56 m (41 ft 2½ in)

DIMENSIONS, INTERNAL:

Cabin (incl flight deck and rear baggage compartment):	
Length	12.03 m (39 ft 5½ in)
Max width	1.37 m (4 ft 6 in)
Max height	1.80 m (5 ft 10¾ in)
Floor area	15.3 m² (165 sq ft)
Pressurised volume	26.0 m³ (918 cu ft)
Volume of passenger cabin	18.1 m³ (640 cu ft)
Baggage volume, cabin: forward	0.34 m³ (12.0 cu ft)
underseat	0.91 m³ (32.0 cu ft)
rear	5.0 m³ (175 cu ft)

AREAS:

Wings, gross	28.80 m² (310.0 sq ft)
Ailerons (total)	1.67 m² (18.00 sq ft)



Beech 1900D (two P&WC PT6A turboprops) (Paul Jackson)

NEW/0568413

Trailing-edge flaps (total)	4.17 m² (44.90 sq ft)	T-O field length, T-O flap setting	1,139 m (3,737 ft)
Fin	4.86 m² (52.30 sq ft)	Landing from 15 m (50 ft) at max landing weight	829 m (2,720 ft)
Rudder (incl tab)	1.40 m² (15.10 sq ft)		
Tailsets (total)	0.63 m² (6.80 sq ft)		
Tailplane	6.32 m² (68.00 sq ft)		
Elevator (incl tab)	1.79 m² (19.30 sq ft)		
Stabilons (total)	1.44 m² (15.50 sq ft)		

WEIGHTS AND LOADINGS:

Basic operating weight	4,831 kg (10,650 lb)
Max fuel (usable)	2,022 kg (4,458 lb)
Max baggage	939 kg (2,070 lb)
Max ramp weight	7,738 kg (17,060 lb)
Max T-O weight	7,688 kg (16,950 lb)
Max landing weight	7,530 kg (16,600 lb)
Max zero-fuel weight	6,804 kg (15,000 lb)
Payload with max fuel	947 kg (2,087 lb)
Max wing loading	267 kg/m² (54.68 lb/sq ft)
Max power loading	4.03 kg/kW (6.63 lb/shp)

PERFORMANCE:

Max cruising speed at AUW of 6,804 kg (15,000 lb):	
at FL80	272 kt (504 km/h; 313 mph)
at FL160	284 kt (526 km/h; 327 mph)
at FL250	277 kt (513 km/h; 319 mph)
Unstick speed, T-O flap setting	105 kt (195 km/h; 121 mph) IAS
Approach speed at max landing weight	117 kt (217 km/h; 135 mph)
Stalling speed at max T-O weight:	
wheels and flaps up	101 kt (187 km/h; 116 mph)
wheels down, T-O flap setting	90 kt (167 km/h; 104 mph)
Stalling speed at max landing weight, wheels and flaps down	84 kt (156 km/h; 97 mph)
Max rate of climb at S/L	800 m (2,625 ft)/min
Rate of climb at S/L, OEI	206 m (676 ft)/min
Service ceiling	10,058 m (33,000 ft)
Max certified operating altitude	7,620 m (25,000 ft)
Service ceiling, OEI	5,334 m (17,500 ft)

BEECH 390 PREMIER I

TYPE: Light business jet.

PROGRAMME: Design started early 1994 as PD374 (later PD390) and approved early 1995; originated in former Beech design offices, but was first aircraft to carry only the Raytheon name; brief details of 'new light business jet' revealed June 1995; launched at National Business Aircraft Association Convention in Las Vegas 26 September 1995 with full-scale fuselage/cabin mockup; wind-tunnel tests of one-eighth model conducted early 1996 at Boeing, Boeing V/STOL, NASA-Lewis and Wichita State University facilities; to compete with Cessna CitationJet.

First forward fuselage completed in February 1997 and mated to aft fuselage in April 1998; roll-out (N390RA, c/n RB-1) 19 August 1998; first flight 22 December 1998. Second aircraft (N704T) first flown 4 June 1999, followed by third (N390TC), first with complete interior, on 17 September 1999; public debut (N390TC) at National Business Aviation Association Convention at Atlanta, Georgia, October 1999; more than 720 flight test hours accumulated by 23 December 1999, at which time eight production aircraft were in final assembly; static testing of wing to 150 per cent of design load completed on 17 December 1999; four aircraft undertook 1,400 hour flight test programme culminating in FAA FAR Pt 23 certification on 23 March 2001, followed by German certification on 3 September 2001; FAA RVSM approval



Beech Premier I light business jet

NEW/0568421



granted in May 2003; certified in Bermuda, Denmark, Mexico, Israel, South Africa and Switzerland in 2002, and in China in November 2003. Deliveries began with three aircraft in third quarter of 2001: RB-4, -6 and -7 to Tyrose Investments, Raytheon and Town & Country Food Markets, respectively. 100th Premier I production fuselage completed 24 July 2003. Target production rate 60 per year from 2003.

**CUSTOMERS:** More than 300 orders received by October 2001 from customers in 27 countries, of which some 100 were from outside the USA and 51 from Europe, representing a backlog until 2005. Total of 65 delivered by September 2003, including 29 in 2002; 49 scheduled for delivery in 2003, of which 18 delivered in the first nine months of the year. Customers include Raytheon Travel Air, the fractional ownership subsidiary of Raytheon Aircraft, which has ordered 71 for delivery beginning 2001; the Jordan Grand Prix racing team, which has ordered one; and Aviation Leasing Group (ALG Transportation Inc) of London, which ordered three in August 2000, two of which will be used by the Civil Aviation Training Centre (CATC) in Thailand for training student pilots for Thai Airways International and other Pacific Rim carriers.

**COSTS:** US\$5.3 million. Estimated direct operating cost US\$680 per hour (60th 2001).

**DESIGN FEATURES:** Conventional small business jet, developed with assistance of CATIA programmes. Rear-mounted engines, T tail and wing mounted below fuselage for additional cabin space. Sweepback 20° at 25 per cent chord; 2° 30' dihedral; tailplane sweepback 25° at 25 per cent chord.

**FLYING CONTROLS:** Conventional and manual. Activation via pushrods and cables. Pitch trim via electrically actuated, variable incidence tailplane and mechanically driven geared tab on each elevator; electrically actuated trim tab on each aileron; electrically actuated rudder trim tab. Electrically signalled, hydraulically powered, three-segment spoilers on upper surface of each wing augment aileron roll control; outboard and middle panels provide roll, airbrake and post-landing lift-dump functions; inboard panel provides lift-dump function only. 75 per cent span, four-segment, electrically controlled Fowler flaps, deflections 0, 10, 20 and 30°. Rudder boost, for asymmetric thrust and yaw damper, standard.

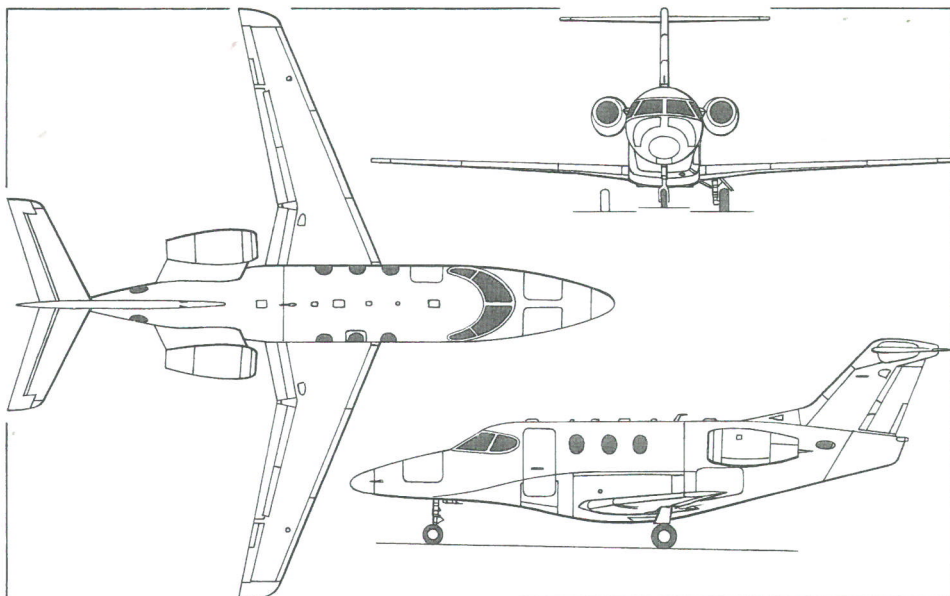
**STRUCTURE:** Fuselage of graphite/epoxy laminate and honeycomb composites, formed by Cincinnati Milacron Viper automatic fibre-placement machines over aluminium mandrel, placing fibres at speeds up to 46 m (150 ft) per minute, enabling entire fuselage to be completed in one week; elimination of all internal frames, and skin thickness of 20 mm (0.78 in), increase cabin volume by 13 per cent and afford a weight saving of some 20 per cent over conventional alloy construction. Wing of aluminium alloy with six-spar wing box, manufactured using high-speed equipment capable of machining more than 93 m<sup>2</sup> (1,000 sq ft) of material per minute, and automatic riveting machines; with exception of three small bays along trailing-edge, entire wing is used for fuel storage. Ailerons and flaps of graphite/epoxy composites; fin has aluminium alloy spars and ribs with graphite/epoxy honeycomb skin; tailplane has one-piece, composites forward-and-rear spar with alloy centre rib, composites mid- and tip ribs and Nomex composites skin.

**LANDING GEAR:** Hydraulically actuated, retractable tricycle type with free-fall emergency extension system; single wheel on each unit. Mainwheel size 22×8.2 (12 ply); nosewheel 18×4.4 (6 ply). Mainwheels retract inwards; nosewheel forwards. Steerable nosewheel, maximum pedal-commanded deflection ±35°, increasing to ±45° with differential braking and asymmetric thrust. Hydraulic disc brakes with electric anti-skid system.

**POWER PLANT:** Two pod-mounted Williams FJ44-2A turbofans, each rated at 10.23 kN (2,300 lb st). Fuel contained in integral wing tanks, each of four sections, plus inboard collector tank; total usable capacity 2,040 litres (539 US gallons; 449 Imp gallons), with gravity filling point on each wing. Single-point pressure refuelling/defuelling optional.

**ACCOMMODATION:** Crew of one or two, with dual controls standard; six passengers in cabin, comprising four in standard club seating arrangement with tracking, swivelling and reclining capability and stowable writing tables and two on fixed forward-facing seats to rear; lavatory at rear, doubling as flight-accessible baggage compartment, maximum capacity 64 kg (140 lb). Refreshment/hang-up baggage cabinet on forward starboard side of cabin. Airstair door on port side to rear of flight deck; single plug-type emergency exit on starboard side. Three cabin windows on each side. Accommodation is air conditioned and pressurised. Externally accessible, unpressurised main baggage compartment to rear of cabin, with upward-opening door on port side, can accommodate large items such as skis; heating optional; forward baggage compartment in nose on port side with swing-up door.

**SYSTEMS:** Pressurisation system, maximum differential 0.58 bar (8.4 lb/sq in), maintains 2,440 m (8,000 ft) cabin altitude to 12,500 m (41,000 ft). Vapour cycle, ozone-safe R134a air conditioning system. Hydraulic system, maximum pressure 207 bar (3,000 lb/sq in), for landing gear, brakes, anti-skid and spoilers. Electrical system comprises two 28 V 300 A engine-driven starter/



Beech Premier I (two Williams FJ44 turbofans) (James Goulding)

0126960

generators, 24 V 40 Ah lead/acid main battery, 24 V 5 Ah standby battery and 28 V external power receptacle; system is configured so that load-shedding is primarily automatic in the event of failure of any or all main electrical power sources. Oxygen system, capacity 1,134 litres (40 cu ft) standard, 2,182 litres (77 cu ft) optional, with diluter-demand masks for crew and continuous flow masks for passengers. Engine bleed-air anti-icing for wing leading-edges and nacelle inlets; electromagnetic expulsion de-icing (EMED) for tailplane leading-edges, automatically activated by dual nose-mounted, heated, ice detectors; electrically heated windscreens (with silicone coating for rain dispersal), pitot tubes and AoA probes.

**AVIONICS:** Rockwell Collins Pro Line 21 EFIS avionics suite as core system.

**Comms:** Dual Rockwell Collins VHF-422A transceivers, TDR-94 Mode S transponders and DB Model 438 audio systems; single CTL-23 nav/com tuning unit; four-speaker cabin paging unit.

**Radar:** Rockwell Collins WXR-800 colour weather radar.

**Flight:** Dual Rockwell Collins AHC-3000 AHRS, ADC-3000 air data computers, CDU-3000 control/display units and VIR-432 nav receivers; IAPS-3000 lightweight, integrated avionics processing system; FGC-3000 flight guidance system, FMS-3000 flight management system with database, ADF-462, DME-442, GPS-4000, ALT-4000 radio altimeter and MDC-3000 maintenance diagnostic computer.

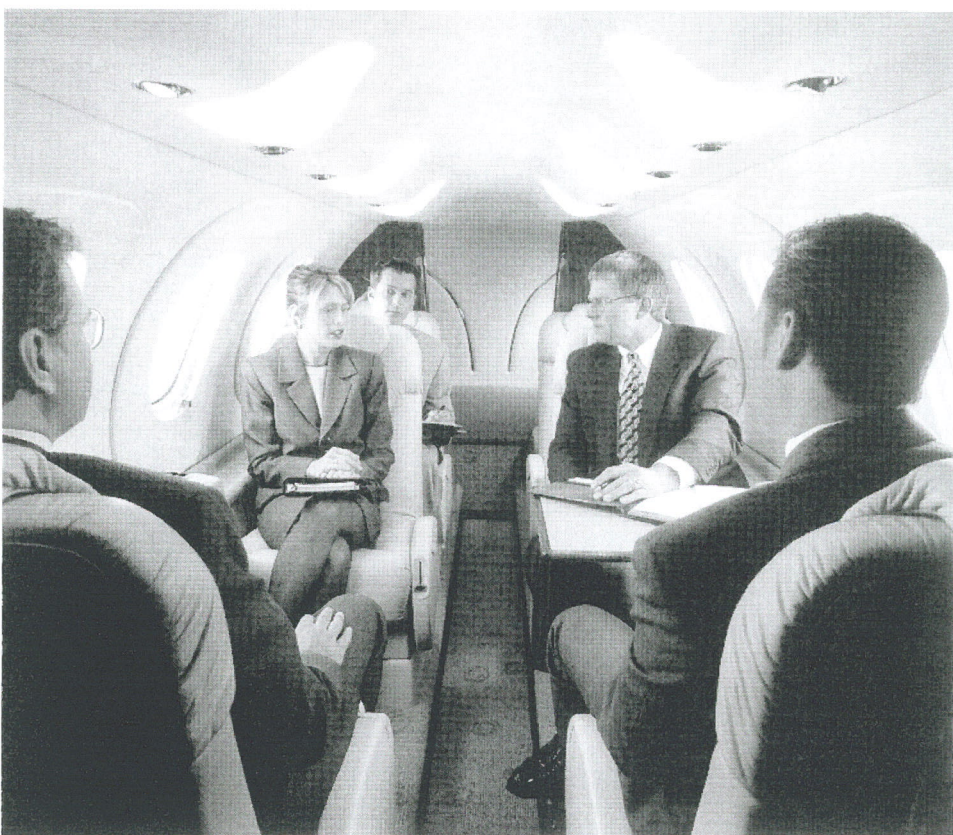
**Instrumentation:** Rockwell Collins AFD-3010 integrated EFIS comprising two 254 × 203 mm (10 × 8 in) active matrix LCD adaptive flight displays providing PFD and MFD functions, with CRT HSI and back-up electromechanical rate/sensor/attitude instrument and ASI on right side; second PFD optional, but not mandatory for RVSM compliance.

#### DIMENSIONS, EXTERNAL:

Wing span	13.56 m (44 ft 6 in)
Wing aspect ratio	8.0
Length overall	14.02 m (46 ft 0 in)
Height overall	4.67 m (15 ft 4 in)
Tailplane span	4.90 m (16 ft 1 in)
Wheel track	2.79 m (9 ft 2 in)
Wheelbase	5.36 m (17 ft 7 in)
Crew/passenger door: Height	1.27 m (4 ft 2 in)
Width	0.64 m (2 ft 1½ in)

#### DIMENSIONS, INTERNAL:

<b>Cabin:</b>	
Length: between pressure bulkheads	5.69 m (18 ft 8 in)
excl flight deck	4.11 m (13 ft 6 in)
excl flight deck and lavatory	3.40 m (11 ft 2 in)
Width: max	1.68 m (5 ft 6 in)
at floor	1.22 m (4 ft 0 in)
Max height	1.65 m (5 ft 5 in)
Volume excl lavatory	8.9 m <sup>3</sup> (315 cu ft)
<b>External baggage compartment volume:</b>	
main	1.25 m <sup>3</sup> (44 cu ft)
forward (nose)	0.28 m <sup>3</sup> (10.0 cu ft)



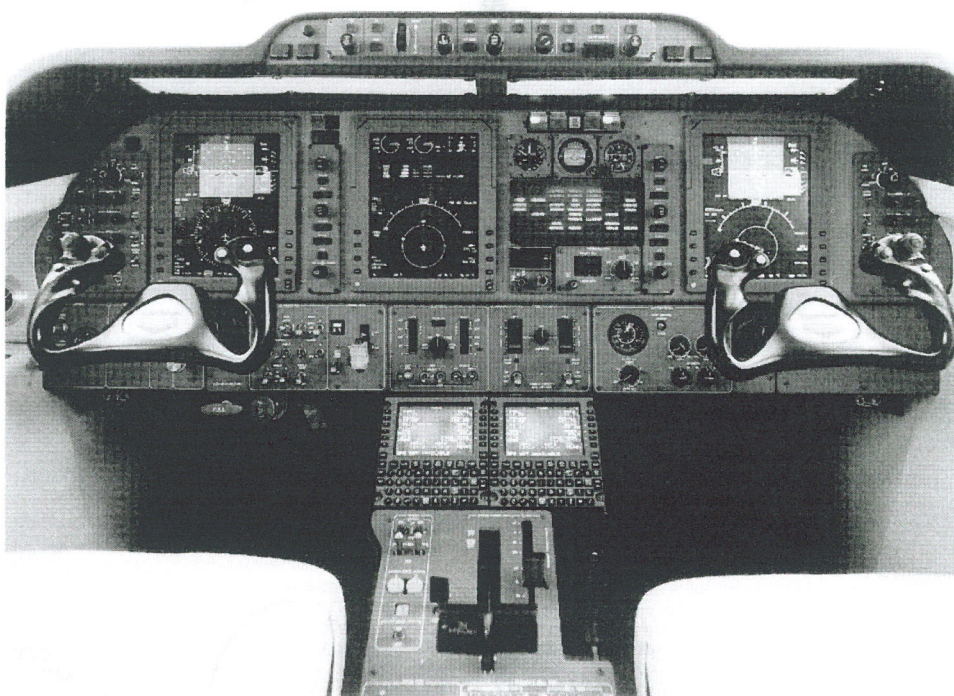
Beech Premier I cabin

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<b>AREAS:</b>	
Wings, gross	22.95 m <sup>2</sup> (247.0 sq ft)
Horizontal tail surfaces (total)	4.65 m <sup>2</sup> (50.00 sq ft)
Vertical tail surfaces (total)	4.78 m <sup>2</sup> (51.5 sq ft)
<b>WEIGHTS AND LOADINGS:</b>	
Basic operating weight	3,781 kg (8,335 lb)
Baggage capacity: main	181 kg (400 lb)
forward (nose)	68 kg (150 lb)
internal: forward	27 kg (60 lb)
rear (lavatory)	64 kg (140 lb)
Max fuel weight (usable)	1,665 kg (3,670 lb)
Max-T-O weight	5,670 kg (12,500 lb)
Max ramp weight	5,710 kg (12,590 lb)
Max landing weight	5,262 kg (11,600 lb)
Max zero-fuel weight	4,536 kg (10,000 lb)
Max wing loading	247.1 kg/m <sup>2</sup> (50.61 lb/sq ft)
Max power loading	277 kg/kN (2.72 lb/lb st)
<b>PERFORMANCE:</b>	
Max operating speed:	
S/L to FL270	320 kt (593 km/h; 368 mph)
above FL270	M0.80
Max cruising speed at FL330	451 kt (835 km/h; 519 mph)
Max operating altitude	12,500 m (41,000 ft)
T-O field length	1,157 m (3,795 ft)
Landing run	966 m (3,170 ft)
Range with single pilot, four passengers, NBAA IFR reserves	1,460 n miles (2,703 km; 1,680 miles)
g limits	+3.2/-1.28
<b>UPDATED</b>	

Beech Premier I flight deck  
0126961



## BELL

### BELL HELICOPTER TEXTRON INC (Subsidiary of Textron Inc)

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During 1970-81, Bell Helicopter Textron was unincorporated division of Textron Inc; became wholly owned subsidiary of Textron Inc from 3 January 1982. Bell Helicopter Textron Canada (see Canadian section) formed at Montréal/Mirabel under contract with Canadian government October 1983; transfer to Mirabel, completed January 1987, of Bell 206B JetRanger and 206L LongRanger production. Production of Bell 212/412 transferred mid-1988 and early 1989 respectively; Bell 230, 430, 427 and 407 programmes also undertaken in Canada, although some of these now terminated.

Bell and Boeing collaborate in design and manufacture of V-22 Osprey tiltrotor aircraft, as described in the following entry. New 41,800 m<sup>2</sup> (450,000 sq ft) factory at Amarillo International Airport, Texas, completed in 1999 as a Tiltrotor Assembly Centre (TAC) for the V-22 and the commercial BA609; latter tiltrotor, previously also a joint venture with Boeing, became a solely Bell programme on 1 March 1998 and is now (with the AB139) the core of a joint venture effort undertaken in conjunction with Agusta of Italy; an agreement establishing the Bell/Agusta Aerospace Company was signed in November 1998.

Bell helicopters built in USA detailed here. Those currently built in Canada listed under Canada; other models built under licence by Dirgantara in Indonesia and Agusta in Italy; KAI is co-producing Bell 427 as SB 427 in Republic of Korea; Bell Helicopter Asia (Pte) Ltd is wholly owned Singapore-based company for marketing and support in Southeast Asia.

In 2002, Bell USA delivered one new V-22 Osprey, plus 22 upgraded OH-58s to US DoD, plus 16 Huey II upgrades to foreign order; Canadian shipments added 102 light helicopters, including 10 TH-67s to US Army and five Bell 412s to Saudi Arabia.

**UPDATED**

### BELL 449 SUPERCobra and KING COBRA US Navy/Marine Corps designations: AH-1W and AH-1Z

TYPE: Attack helicopter.

PROGRAMME: Prototype Bell 209, derived from single-engined UH-1, first flew as tandem-seat combat aircraft on 7 September 1965. Built for US armed forces and export and under licence in Japan, as described in previous editions of *Jane's*. Universally known as HueyCobra.

First twin-engined Cobra was AH-1J SeaCobra, delivered from mid-1970; AH-1T Improved SeaCobra followed from 1977. All surviving US Marine Corps AH-1J SeaCobras withdrawn and 44 (including one

ground-based trainer) AH-1T Improved SeaCobras converted to AH-1W to augment new production.

**CURRENT VERSIONS:** **AH-1W SuperCobra:** Bell flew AH-1T powered by two GE T700-GE-700; first flight of improved AH-1T+, including GE T700-GE-401 engines, 16 November 1983. USMC received 169 new-build examples as well as two maintenance trainers; 10 supplied to Turkey and 63 to Taiwan. Missions of AH-1W include anti-armour, escort, multiple-weapon fire support, armed reconnaissance, search and target acquisition.

**AH-1W Upgrades:** Following abandonment of the proposed Integrated Weapon System (IWS) project in July 1995 and the Marine Observation and Attack Aircraft programme which was intended to provide a replacement for both the AH-1W SuperCobra and the UH-1N Iroquois, the US Marine Corps has opted for a two-stage upgrade of the AH-1W, allowing it to be retained in the active inventory until about 2030. Phase 1 concerned installation of a Night Targeting System (NTS), under which USMC AH-1Ws fitted with the Israeli Tamam laser NTS for dual TOW/Hellfire day, night and adverse weather capability.

Conversion of a prototype (162533) was authorised in December 1991, with an initial batch of 25 sets being built by Tamam for delivery from January 1993; joint production with Kollsman was approved in May 1994. A total of 250 sets was required by the USMC, with further sets produced for Turkey and Taiwan. Deliveries of modified aircraft to operational units of the USMC began in June 1994.

A further improvement programme, involving installation of an Embedded Global Positioning System/Inertial Navigation System (EGI), has been undertaken. Two prototype conversions (162532 and 163936) were delivered to test units for trials in November 1995 and March 1996, with EGI installed on new-build aircraft from Lot 9 onwards, as well as older AH-1Ws as a retrofit programme.

Phase 2 entails installation of the Bell 680 four-blade rotor, offering a 70 per cent reduction in vibration; formerly designated **AH-1W (4BW)**, but now known as **AH-1Z**. Initial trials of the four-blade rotor system were undertaken with AH-1W 161022; bench testing of the new drive system began in second quarter of 1999 and was completed in first quarter of 2000. Bell also demonstrated 30-minute run-dry capability of new intermediate and tail rotor gearboxes in March 2000. The AH-1Z will be fitted with a new four-blade, all-composites, hingeless/bearingless rotor system; four-blade composites tail rotor; a new transmission rated at 1,957 kW (2,625 shp); endplates on horizontal tail surfaces and new wing assemblies able to carry twice the number of anti-armour missiles, as well as more fuel and additionally permitting concurrent carriage of two air-to-air self-defence missiles.

Lockheed Martin selected to develop and manufacture AN/AAQ-30 Hawkeye advanced target sighting system (TSS), with work on US\$8 million, 54 month, engineering development and integration programme beginning in July 1998. TSS features imaging technology by Wescam of Canada and Lockheed Martin's Sniper third-generation FLIR, as well as colour TV camera, laser ranger, spot-tracker and designator.

Also to feature on the AH-1Z are 'glass cockpits'; Northrop Grumman (formerly Litton Industries) has been selected as prime contractor for this aspect of the upgrade. Digital transfer of information on tactical situation, weaponry and flight data will enable crew interchangeability and allow AH-1Z to be flown from either front or rear seat. Major subcontractors include Rockwell Collins, which will supply active matrix liquid crystal displays (AMLCDs); Smiths Industries (fire-control system); Meggitt Avionics (standby air data and inertial sensing devices); and BAE Systems (air data computers). Other elements of the upgrade include new stores management system, onboard systems monitoring, mission data loader, HOTCC (hands on throttle, collective and cyclic) controls, airborne target handover system and a new EW suite.

A US\$310 million cost-plus-fixed-fee contract was awarded to Bell in November 1996, for design, development, fabrication, installation, test and delivery of three engineering development AH-1W SuperCobra Upgrade Aircraft. Assembly of first AH-1Z begun at Hurst, Texas, in April 1999, by which time 85 per cent of drawings had been released, with design work due for completion by end of 1999. Initial AH-1Z (162549, c/n 59001) completed final assembly in second quarter of 2000 and moved to Bell Flight Research Center at Arlington, Texas, for installation of instrumentation and functional testing that included restrained ground running which was completed in October 2000. Formal roll-out at Arlington on 20 November 2000, with first flight following on 7 December; subsequently redesignated as NAH-1Z and may eventually adopt new identity of 166477. Second development aircraft (163933/166478, c/n 59002) was due to fly in 2001, but handling quality problems that emerged early in flight test programme necessitated redesign of horizontal stabiliser assembly and caused delay; this eventually flew for first time on 4 October 2002, having been forestalled by third development aircraft (162532/166479, c/n 59003), which made its maiden flight on 26 August 2002. By mid-November 2002, all three aircraft had accumulated 390 flight hours, demonstrating 160 kt (296 km/h; 184 mph) cruise and 220 kt (407 km/h; 253 mph) maximum speed. Programme includes flight test and evaluation at Patuxent River, Maryland, to where first AH-1Z was airlifted by C-5 Galaxy on 31 March 2001. Weapons testing will take place at Yuma Proving Ground, Arizona with other trials at China Lake, California. Operational Test and Evaluation (OT&E) due to begin in fourth quarter of FY03 and will mostly be conducted at Patuxent River. Testing of full-scale AH-1Z structural test article at Arlington began in April 2000; on 22 November 2002, significant milestone passed with completion of 20,000 hour fatigue life demonstration, but further fatigue and static loads evaluation to follow, with airframe also earmarked for survivability assessment on completion of test duty. Finalisation of the cockpit upgrade design occurred in FY99, with first order for remanufacture due to be placed in FY04. IOC scheduled for 2007, with peak production rate requiring 24 AH-1Ws to be upgraded annually. Initial deliveries will be to HMT-303 at Camp Pendleton, California.