BAE SYSTEMS

Avro RJ
General Data

PM 053 July 2009

Contents

BAE SYSTEMS

Introducing The Avro RJ

BAE SYSTEMS

The Avro RJ is a short haul jet offering quiet, efficient operations on sectors up to 1700 Nautical miles (3150Km).

The aircraft is a successor of the BAe146 which first flew in 1981 and entered service with Dan Air in 1983. 221 BAe146 were manufactured up to 1992 when production shifted to the Avro RJ. 170 Avro RJ's were manufactured before production was ceased in 2001.

The Avro RJ family of regional jets is available in three fuselage sizes spanning 70 to 112 seats.

Avro RJ70 - 70-82 Seats
Avro RJ85 - 85-100 Seats
Avro RJ100 100-112 Seats

With 100% commonality of engines, flight deck and systems across the family, the Avro RJ offers the ultimate in flexible fleet solutions.

Avro RJ70

Avro RJ85

Avro RJ100

BAe 146 and Avro RJ Operators

BAE SYSTEMS

The BAe146 together with its successor, the Avro RJ, is currently in service worldwide.

Many of the operators are regional affiliates of mainline carriers such as Lufthansa and British Airways.

Among the others are corporate and VIP operators such as Formula One and the Queen's flight.

Seven airlines operate a total of 28 dedicated Freighter and Quick Change variants.

Europe

Aegean Airlines
Albanian Airlines
Astra Airlines
BA Cityflyer
Belle Air
Brussels Airlines
Cityjet
FAAM
Formula One
Italitour Airlines
Malmo Aviation
Pan Air
SAS
The Queens Flight
TNT
WDL Aviation
Air Dolomiti
Alitalia / Air One
Atlantic Airways
BAE SYSTEMS
Blue 1
Casino Rodos
Eurowings
Ford Europe
Hemus Air
Lufthansa Cityline
Mistral Air
Romavia
Swiss
Titan Airways
Uzbekistan Airways

North America

Minden Air
Montex Drilling

South America

DAP Airways
Star Peru
TAM Bolivia

Africa & Middle East

Air Congo Int
Air Tourist Gabon
BDF
First Kuwaiti
Palm Aviation
Royal Jet
Syrian Pearl
Air Libya
Allegiance Air
Dubai Air Wing
Mahan Air
Presidential Flight
SA Airlink
Taban Air

Asia

Airfast Indonesia
Manunggal Air
MDLR
Nusantara Air Charter
Pelita Air Service
PT Aviastar Mandiri
Regional One
Riau Airlines

Australasia

Air National
Australian air Express
Cobham Aviation Services Australia

61 Operators, 248 Aircraft In Service

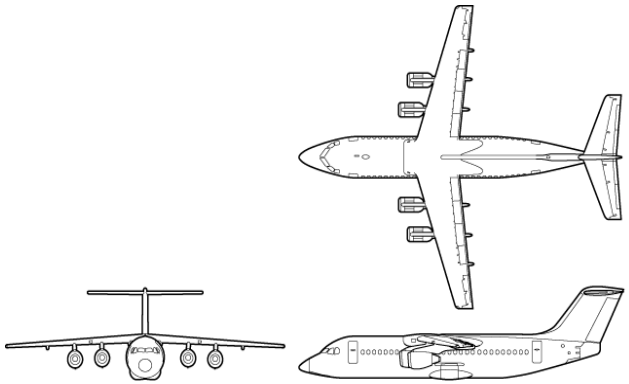
Source: Ascend Online Database June 2009, *italics indicate airline have acquired aircraft but not yet in service*

BAE SYSTEMS

Dimensions

Avro RJ Dimensions

BAE SYSTEMS



	Avro RJ70	Avro RJ85	Avro RJ100
Wing span	26.34 m (86ft 5 in)	26.34 m (86ft 5 in)	26.34 m (86ft 5 in)
Gross wing area	77.3 m² (832 ft²)	77.3 m² (832 ft²)	77.3 m² (832 ft²)
Overall length	26.16 m (85ft 10 in)	28.55m (93ft 8 in)	30.99 m (101ft 8 in)
Overall height	8.61 m (28ft 3 in)	8.61 m (28ft 3 in)	8.59 m (28ft 2 in)
Main gear track	4.72 m (15ft 6 in)	4.72 m (15ft 6 in)	4.72 m (15ft 6 in)
Wheel base	10.09 m (33ft1.5 in)	11.20 m (36ft 9 in)	12.52 m (41ft 1 in)
Passenger cabin			
Length	15.42 m (50ft 7 in)	17.81 m (58ft 5 in)	20.20 m (66ft 3 in)
Headroom	2.07 m (6ft 9.5 in)	2.07 m (6ft 9.5 in)	2.07 m (6ft 9.5 in)
Internal diameter	3.42 m (11ft 3 in)	3.42 m (11ft 3 in)	3.42 m (11ft 3 in)
Floor width	3.24 m (10ft 8 in)	3.24 m (10ft 8 in)	3.24 m (10ft 8 in)

BAE SYSTEMS

Passenger Cabin Features

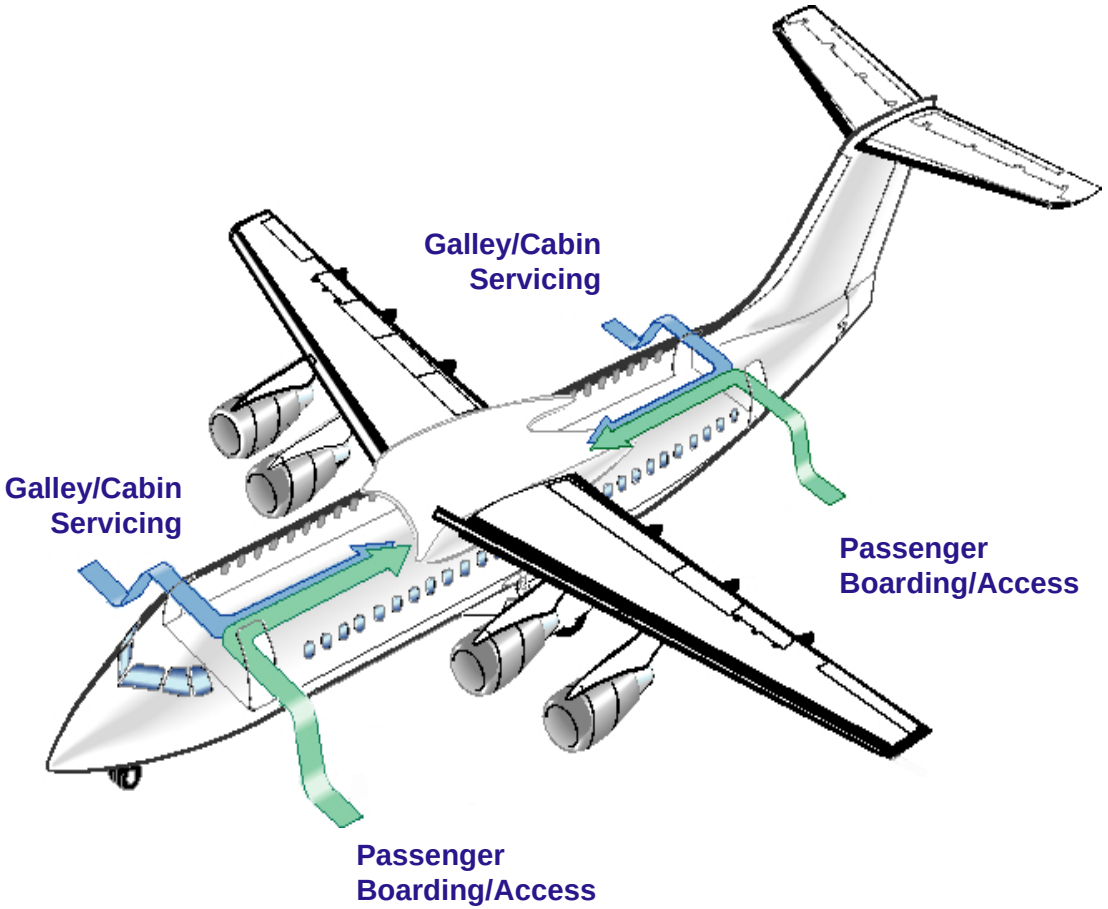
Four Door Access

BAE SYSTEMS

Uniquely in its class, the Avro RJ features four Type 1 exit doors.

Forward and aft service doors on the right hand side and passenger doors on the left hand side, ensure speedy turnrounds and offer the distinct benefit of multiple emergency exit possibilities for passengers.

Whilst integral airstairs can be fitted to provide independence at remote airfields, jetway compatibility facilitates efficient passenger handling at mainline destinations.



Cabin Interior

BAE SYSTEMS

The Avro RJ offers an outstanding interior standard for regional operations.

- Front and rear passenger doors
- Galley location options.
- Wide variety of seating capacities.
- 4, 5 or 6 abreast layout options.
- Front and rear under floor baggage holds.
- Large overhead bins

Cabin Versatility

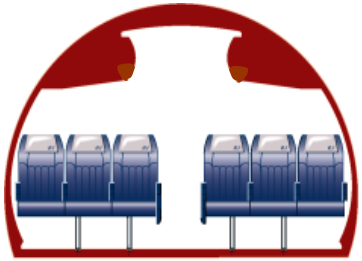
BAE SYSTEMS

The wide Avro RJ cabin permits numerous seat combinations providing excellent flexibility to match specific service levels in segregated markets.

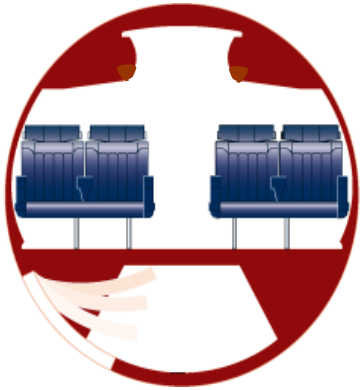
The basic economy class 6-abreast passenger seating matches 737 standards whilst 4-abreast and 5-abreast introduce premium class options.

Large underfloor holds, forward and aft of the wing, provide excellent volume for checked bags and additional cargo.

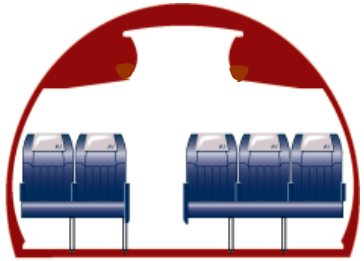
FIRST CLASS 4-abreast
53” double seats



ECONOMY CLASS
6-abreast
17” between seat arms



Outstanding underfloor holds

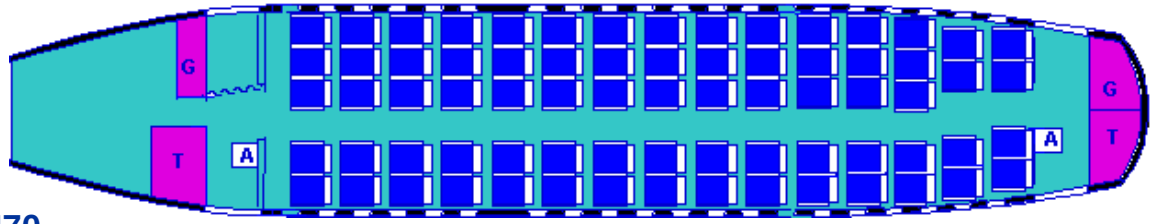


BUSINESS CLASS
5-abreast
19” between seat arms

Typical 5 - Abreast Configurations

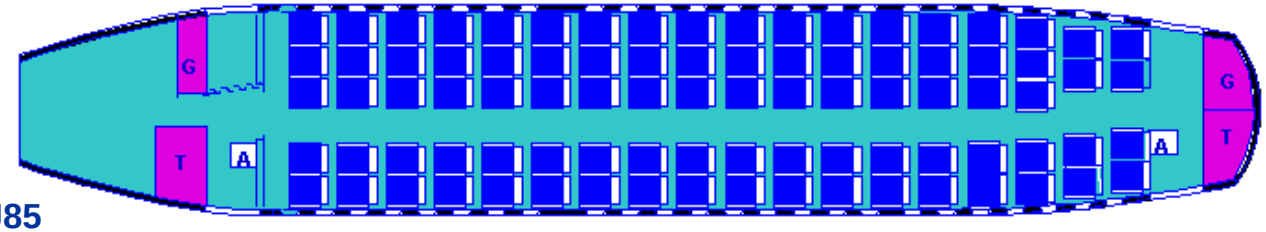
BAE SYSTEMS

73 seats five-abreast at 31" pitch



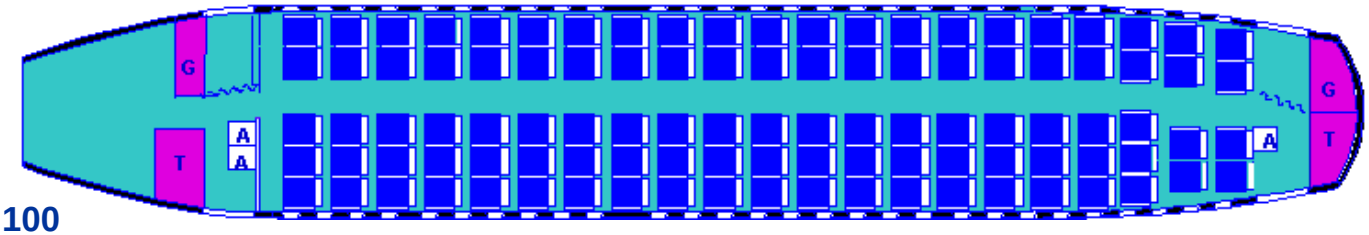
Avro RJ70

88 seats five-abreast at 31" pitch



Avro RJ85

103 seats five-abreast at 31" pitch

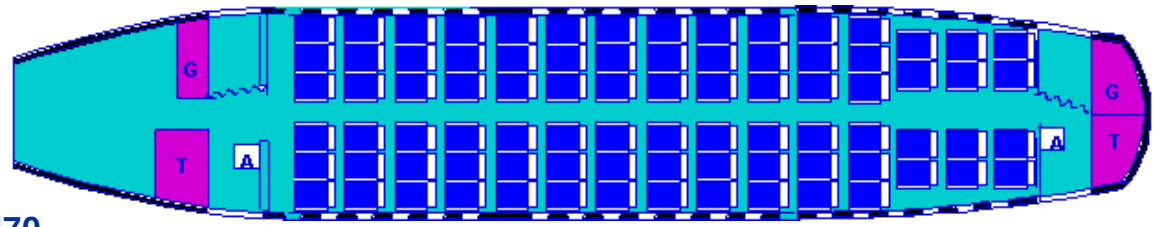


Avro RJ100

Typical 6 - Abreast Configurations

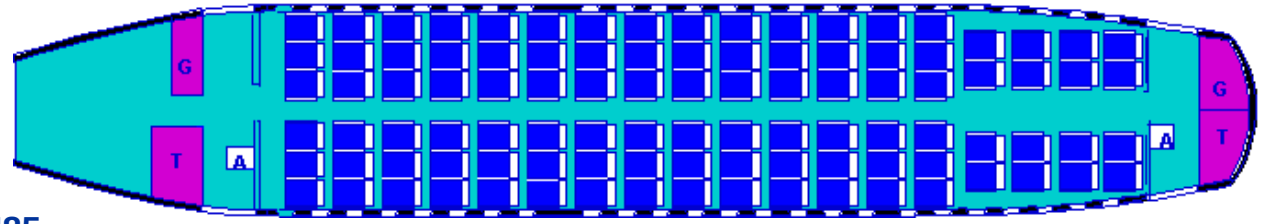
BAE SYSTEMS

84 seats six-abreast at 31" pitch



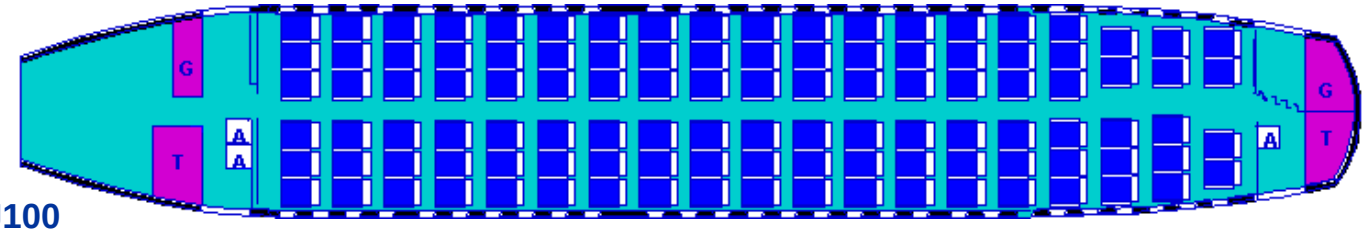
Avro RJ70

100 seats six-abreast at 31" pitch



Avro RJ85

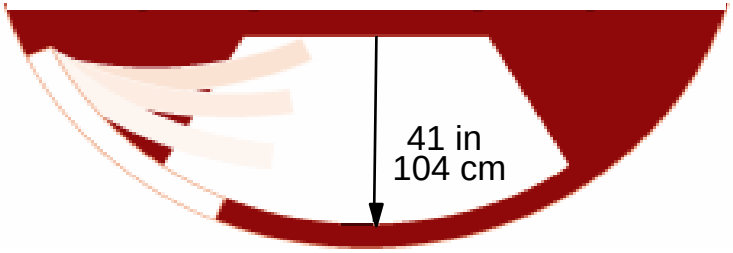
110 seats six-abreast at 34" pitch



Avro RJ100

Underfloor Holds

BAE SYSTEMS



The Avro RJ has two underfloor holds, each 41” high. The access doors open inwards.

- Forward hold door
1.09 m x 1.35 m
(43 in x 53 in)
Sill height 0.85 m (33 in)

- Rear hold door
1.04 m x 0.91m
(41 in x 36 in)
Sill height 0.88 m (35 in)

Hold capacities

- **Avro RJ70** **13.56 m^3 (479 $ft^{3)}$**
- **Avro RJ85** **18.25 m^3 (645 $ft^{3)}$**
- **Avro RJ100** **22.98 m^3 (812 $ft^{3)}$**

BAE SYSTEMS

Corporate Jet

The Avro RJ Corporate Jet

BAE SYSTEMS

The BAe 146 & Avro RJ are already in service with a number of civil and military operators around the world as VIP transports and corporate shuttle aircraft.

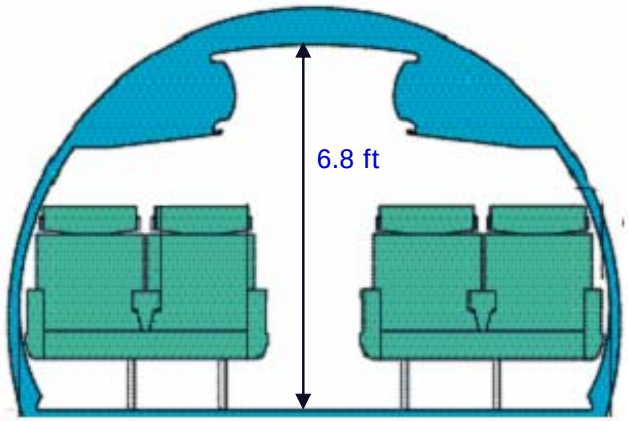
The aircraft performance and cabin size offers the potential buyer many advantages over the traditional small business jet.

- **Cabin volume over three times that of current largest business jets.**
- **Interior flexibility**
- **Excellent airfield performance**
- **Compliant with current and predicted noise and emission regulations.**
- **Independent from ground equipment - APU, integral airstairs and low level baggage holds.**
- **Low stall speeds, steep approach option and four engines offer enhanced levels of safety.**
- **Airline levels of customer support from global suppliers.**

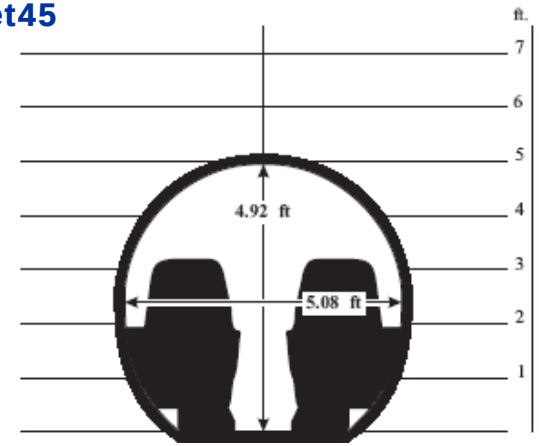
Superior Cabin Cross-Section

BAE SYSTEMS

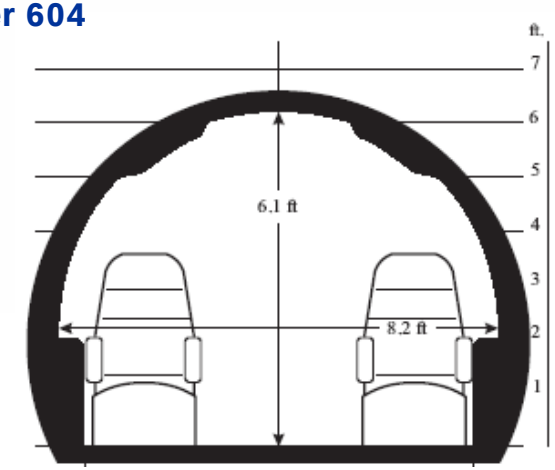
ABJ70



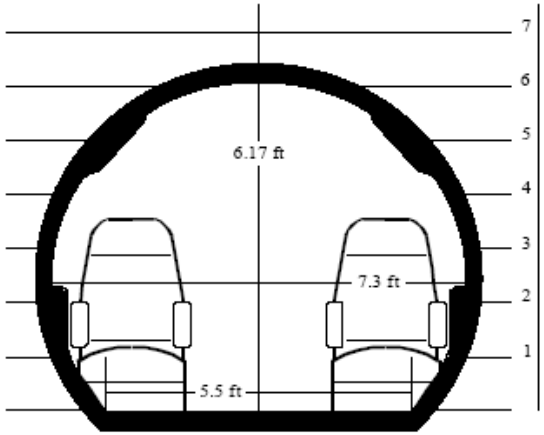
Learjet45



Challenger 604



Gulfstream IV

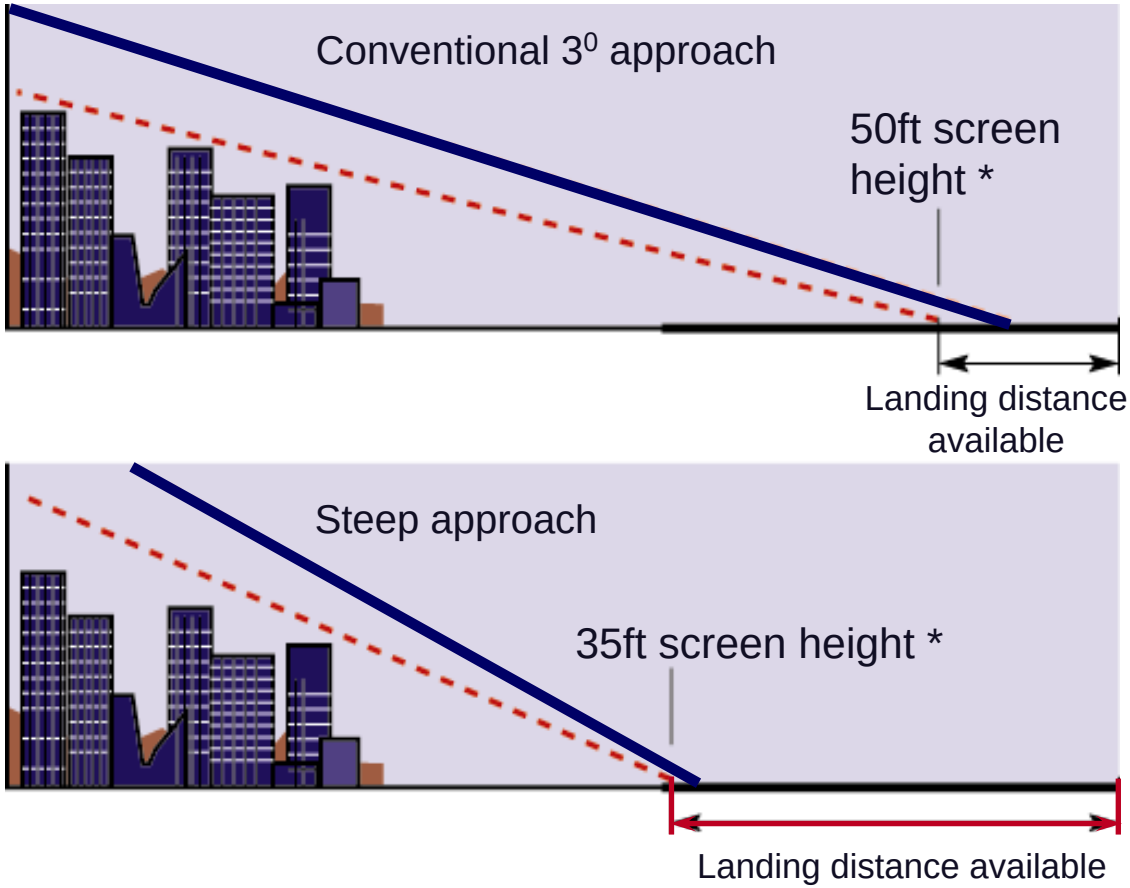


Operational Flexibility

BAE SYSTEMS

The outstanding performance, low environmental impact and optional steep approach capability of the Avro RJ allows unique access both to sensitive city centre airports and to remote, poorly equipped airfields with short strips.

This flexibility together with the enhanced safety features of the four engine layout is particularly attractive for operations in the VIP and corporate jet role .



** Subject to approval by local airworthiness authorities*

Corporate Jet Interiors

BAE SYSTEMS

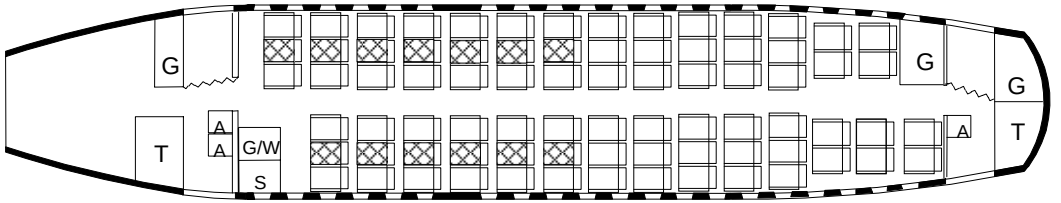
The spacious, adaptable cabin of the Avro RJ offers unique accommodation for a wide range of potential customised interiors which can be designed and installed by 3rd party specialist centres.

Quick Change Interiors

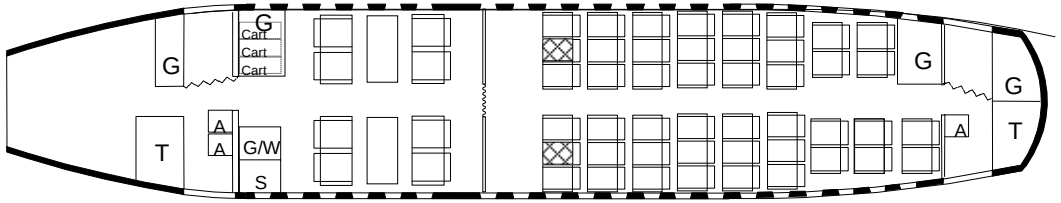
BAE SYSTEMS

A more economic alternative to a custom interior is the Quick Change interior which converts a passenger configuration to a mixed layout with a forward VIP configuration.

79 passeger seats @ 30/31” pitch



Quick change conversion



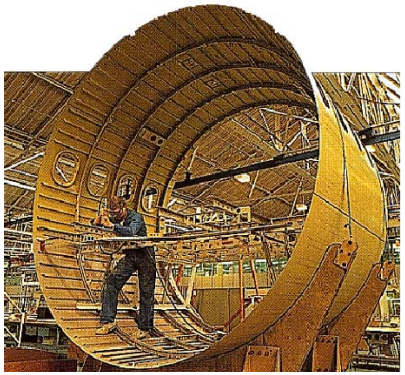
8 Seat VIP compartment
Plus
46 passeger seats @ 30/31” pitch

BAE SYSTEMS

Technical Overview

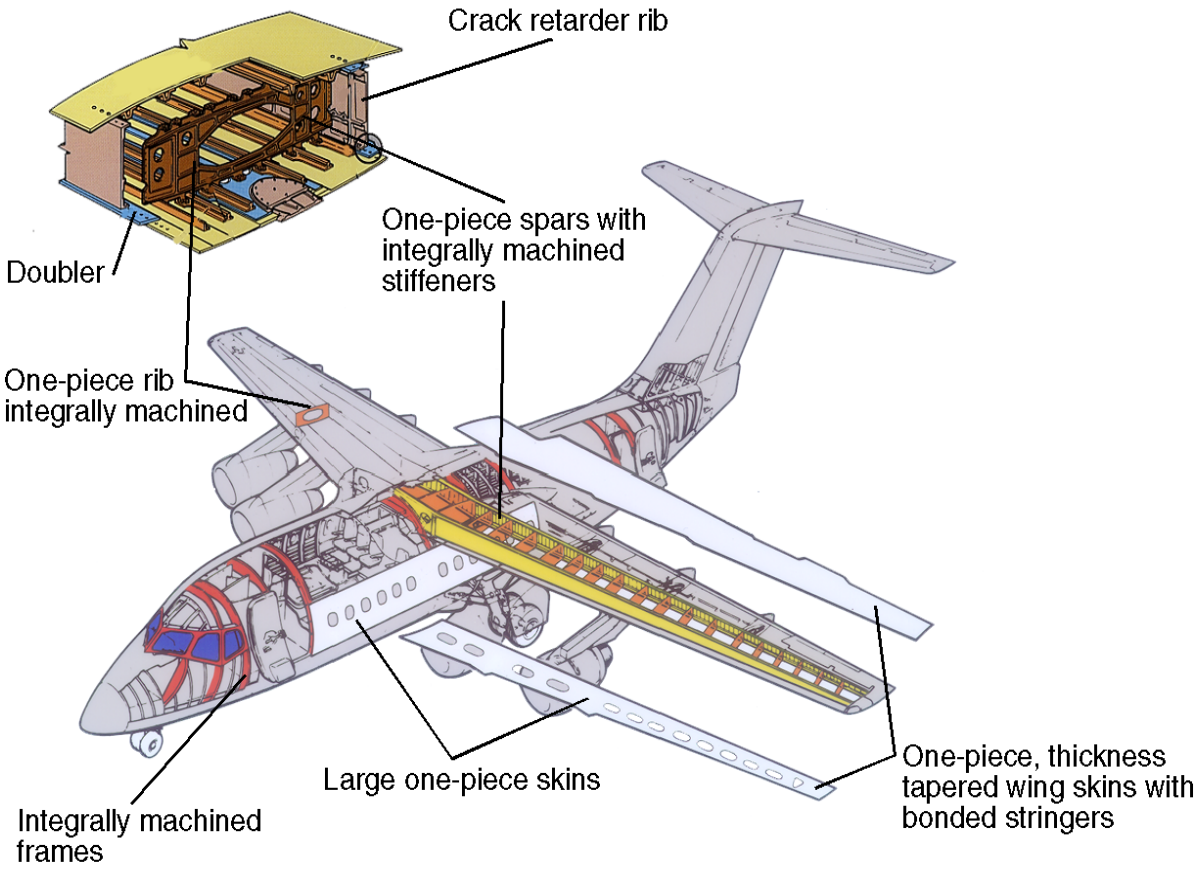
Structural Simplicity

BAE SYSTEMS



Structural simplicity of the Avro RJ airframe is based on the BAe146 and has been achieved using one piece components wherever possible. Integral machining of components such as wing spars and frames leads to enhanced structural efficiency.

The structures and systems, initially cleared to 40,000 cycles/hours on the BAe146 are currently being extended to 80,000 cycles/hours, further underscoring the quality of the original design



Well Equipped Flight Deck

BAE SYSTEMS

The Avro RJ features a spacious 2 - crew flight deck which features EFIS displays and digital avionics. Fleet aircraft vary but typically, the flight deck comprises:

Operational
– Honeywell DFGS autopilot
– Honeywell weather radar
– FADEC & auto throttle
– CAT3A ILS (opt.CAT3B)

Communications
– Dual VHF Comms (8.33 Khz)

Navigation
– Dual GNS-X nav management
– Dual Honeywell IRS
– Dual DME
– Dual VHF NAV (FM immune)
– Dual ADF
– Honeywell EGPWS

Surveillance
– Dual Mode ‘S’ transponders
– TCAS2 (Change 7)

Simple Flying Controls

BAE SYSTEMS

The design philosophy behind the Avro RJ flying control system takes into consideration the need for simple, yet effective, system layout.

Aileron and elevator control is fully manual, although hydraulically powered controls are used where appropriate.

The very efficient high lift wing renders leading edge devices unnecessary. The aircraft has one piece flaps with no cutouts for jet efflux.

- **Primary flying controls**
  - Fully manual aileron and elevator control
  - Hydraulically powered roll spoilers and rudder

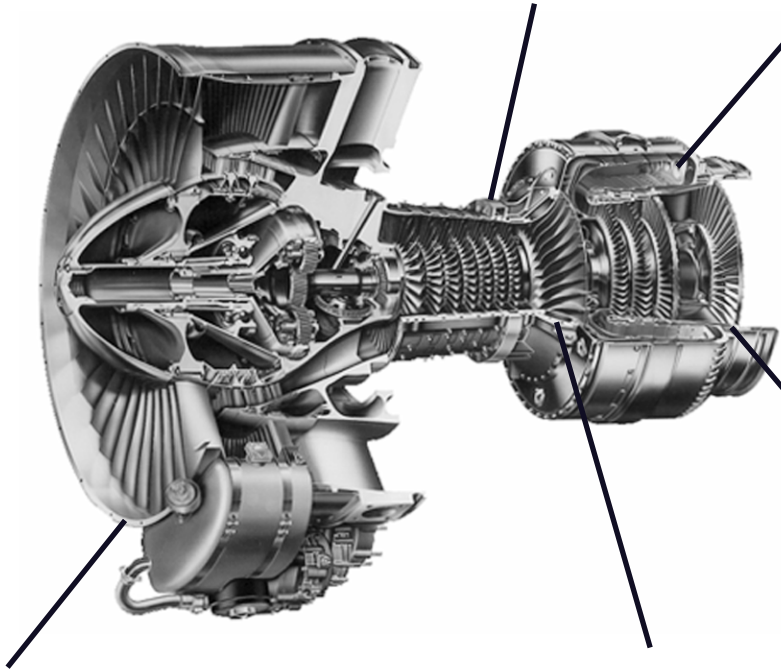
- **Secondary flying controls**
  - Hydraulic screw jack flap extension/retraction
  - Hydraulic, automatic lift spoiler deployment
  - Electrically controlled and monitored airbrake

Quiet, Efficient Powerplants

BAE SYSTEMS

The AVRO RJ is powered by four Honeywell LF507-1F high bypass engines of modular design. The engines feature low fuel burns, low noise levels, low emissions and the Avro RJ requires no reverse thrust. The engines are maintained using on condition maintenance principles. Ease of on-wing inspection is complemented by simplicity and speed of engine removal.

Engine data
Sea level
static thrust - 7000 lb (31.2 kN)
Flat rated to - ISA+8.3°C
Bypass ratio - 5.0:1



LF507-1F

Low Noise Characteristics

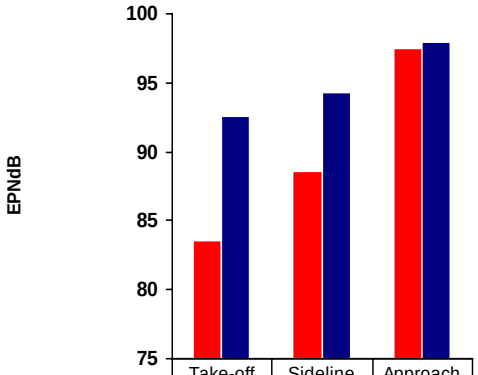
BAE SYSTEMS

Avro RJ certificated noise levels are among the quietest in their class.

Compared to ICAO Annexe 16/ FAR Pt 36 Stage 3 limits the aircraft's combined noise levels are 15.9 EPNdB lower. The Avro RJ is already compliant with proposed 'Chapter 4' requirements.

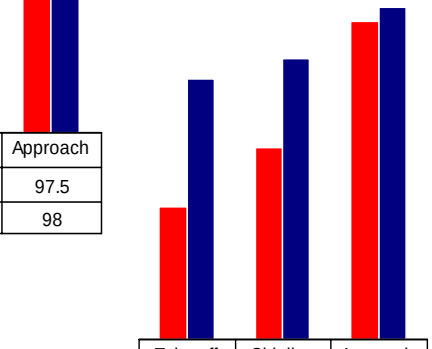
This is underscored by unique access to noise sensitive airports such as Bromma (Sweden), London City (UK), Salzburg & Innsbruck (Austria) and Berlin Tempelhof (Germany)

Avro RJ70



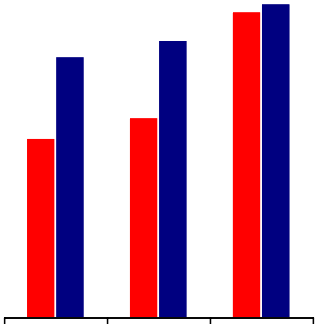
	Take-off	Sideline	Approach
Noise level	83.6	88.6	97.5
Stage 3 Limit	92.6	94.3	98

Avro RJ85



	Take-off	Sideline	Approach
Noise level	84.3	88.4	97.3
Stage 3 Limit	93.2	94.7	98.2

Avro RJ100



	Take-off	Sideline	Approach
Noise level	86.1	88.1	97.6
Stage 3 Limit	93.5	94.9	98.3

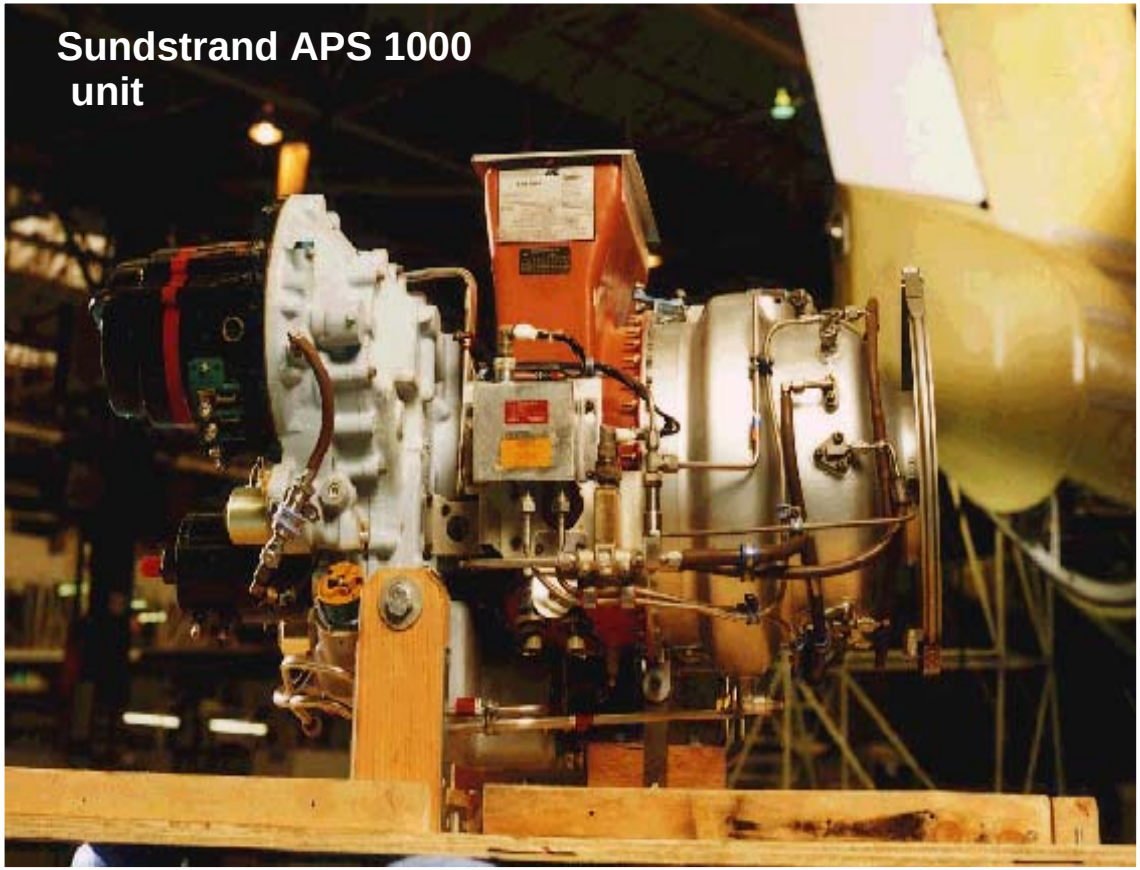
Auxiliary Power Unit

BAE SYSTEMS

Avro RJ aircraft are fitted with Honeywell GTCP36 or Sundstrand APS1000 units.

The units supply bleed air for air conditioning up to 15,000 ft and electrical power for engine start, ground services and emergency power up to 25,000 ft.

In flight start is possible up to 20,000 ft altitude.



Landing Gear

BAE SYSTEMS

The Messier Dowty trailing link main landing gear provides smooth landings, minimum tyre wear and long overhaul intervals.

- **Twin wheel nose gear and main landing gear**
- **Wide track for stability and gravel runway operations**
- **Trailing link main gear**
- **Multi-disc carbon brakes with hydraulic back-up**
- **Electronic anti-skid**
- **Typical TBO - 15,000 landings**
- **Wheel change - 10 minutes**
- **Heat pack change - 20 minutes**

BAE SYSTEMS

Maintenance & Customer Support

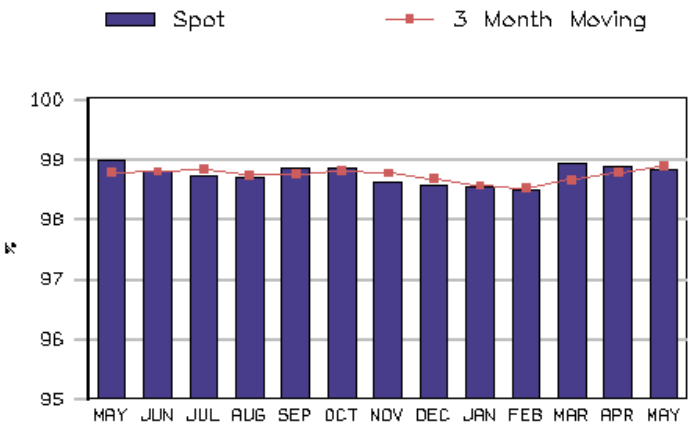
World Fleet Dispatch Reliability

BAE SYSTEMS

The Avro RJ worldwide fleet maintains an average dispatch reliability of over 98.7% in the demanding regional airline operating environment.

DR BASED ON WATOG CRITERIA:
JUNE 2008 TO MAY 2009

Mean: *98.74*



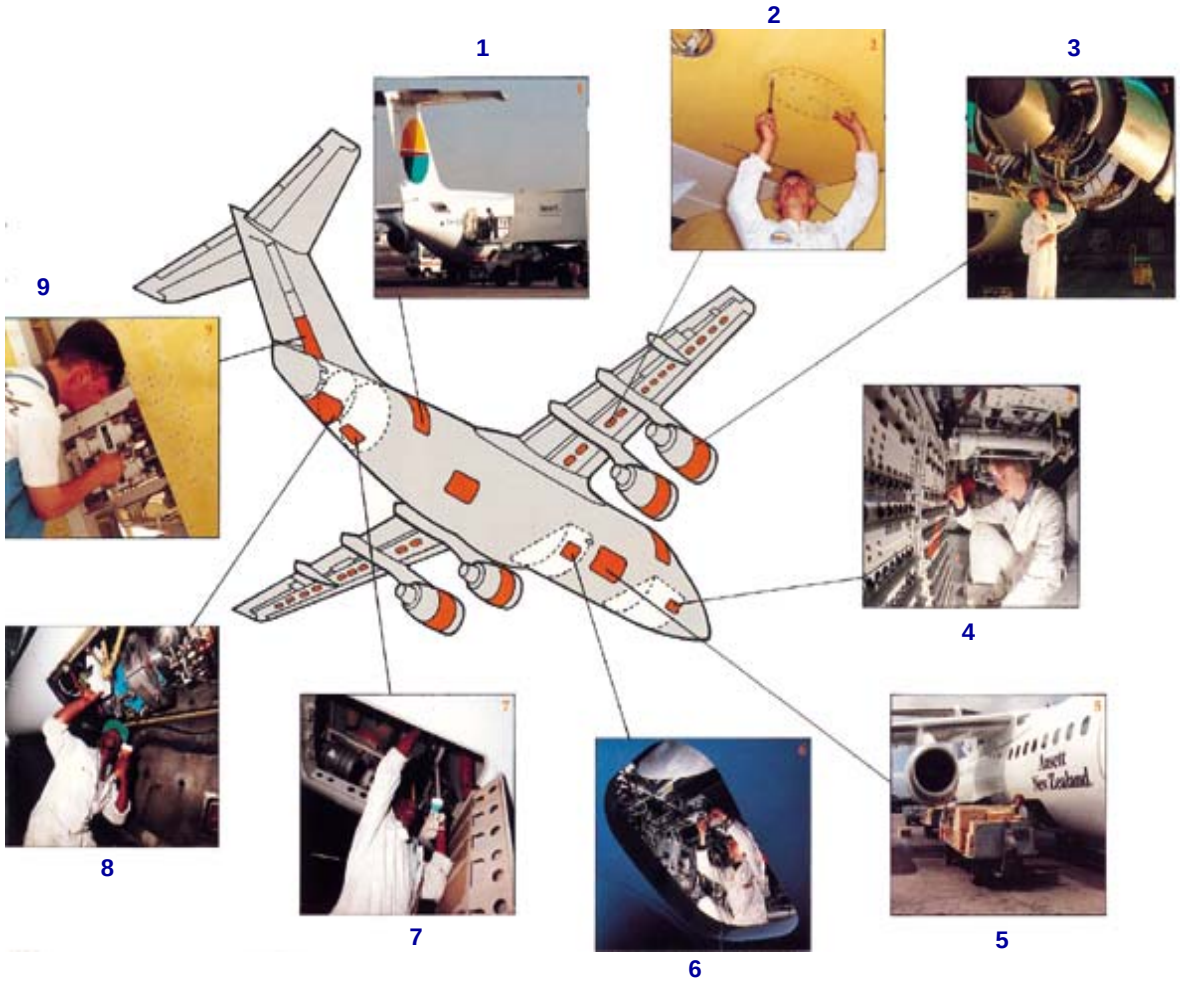
Note: Transwede & Malmo data for May 09 awaiting loading

Maintenance Access

BAE SYSTEMS

Routine inspection and maintenance of systems whose Line Replaceable Units are located in purpose-built equipment bays can be carried out via numerous access ports provided.

1. Service access
2. Fuel tank inspection
3. Engine cowlings
4. Avionics/electrics bay
5. Baggage holds
6. Hydraulics bay
7. Air conditioning packs bay
8. APU bay
9. Rudder control access



Avro RJ Maintenance Planning

BAE SYSTEMS

As part of the BAE Systems' commitment to continual product improvement, maintenance check intervals have recently undergone a 25% escalation. This means that A checks due at 500 Cycles are now delayed to 625 Cycles and C checks originally due at 4000 Cycles are now delayed to 5000 Cycles.

Maintenance plans have been developed for the Avro RJ based on MSG-3 logic. The plans can be tailored to suit individual operator's needs.

Nominal check intervals are currently:

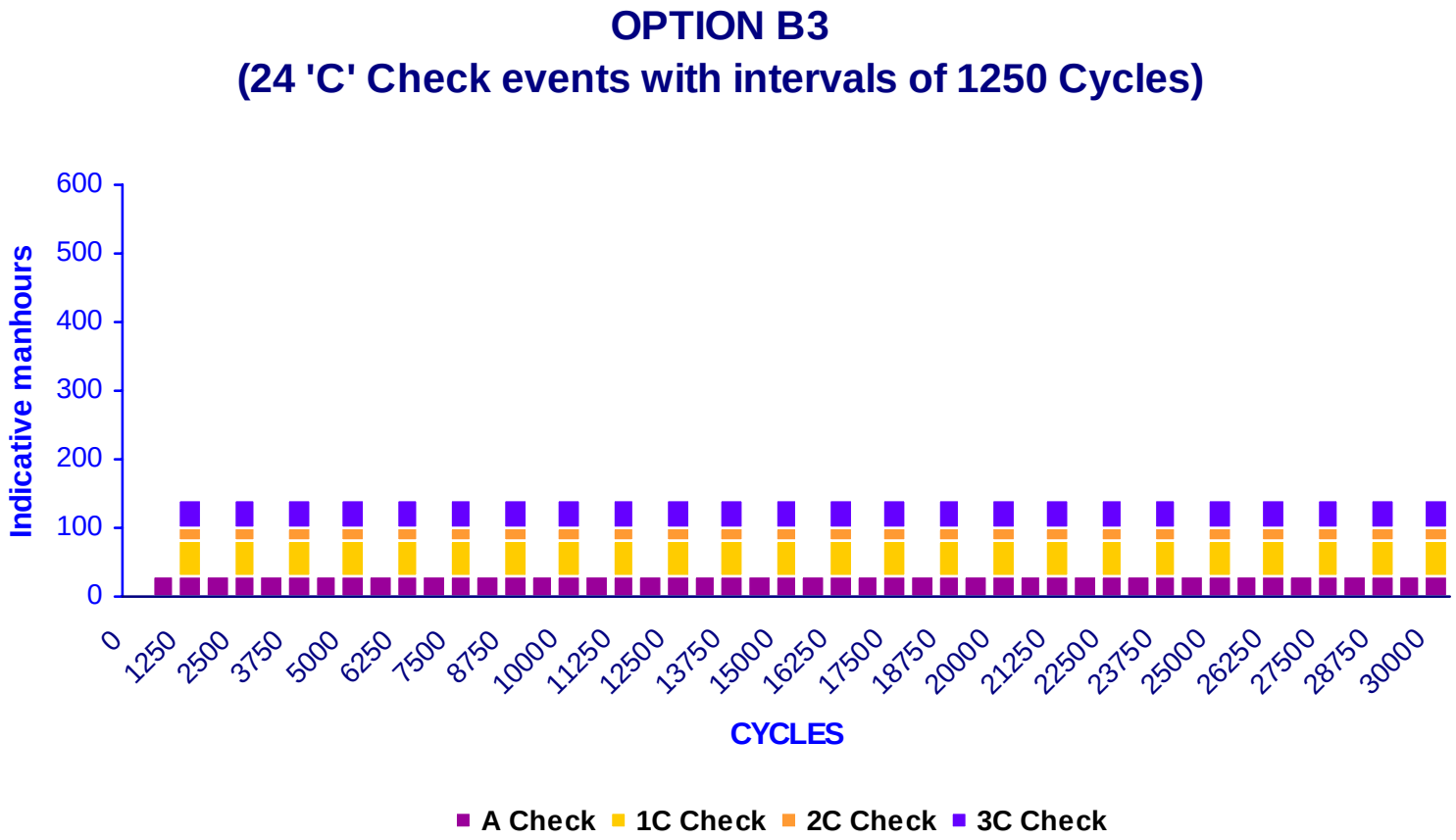
	Interval	Typical Elapsed
Daily check	Within 24hrs of 1st flight	-
Line check	70 Cycles	-
'A' Check	625 Cycles	1 day
'C' Check	5000 Cycles or 2.5 Yrs	21 days on block maintenance basis
Repeat S.I	Mainly 4 years	

The most common maintenance programmes are the B3, B4 & B5

B3	B4	B5
24 event equalised 'C' Check programme with Intervals of 1250 flights Or 6 months.	12 event equalised 'C' Check programme with Intervals of 2500 flights Or 1 year.	6 event equalised 'C' Check programme with Intervals of 5000 flights Or 2 years.

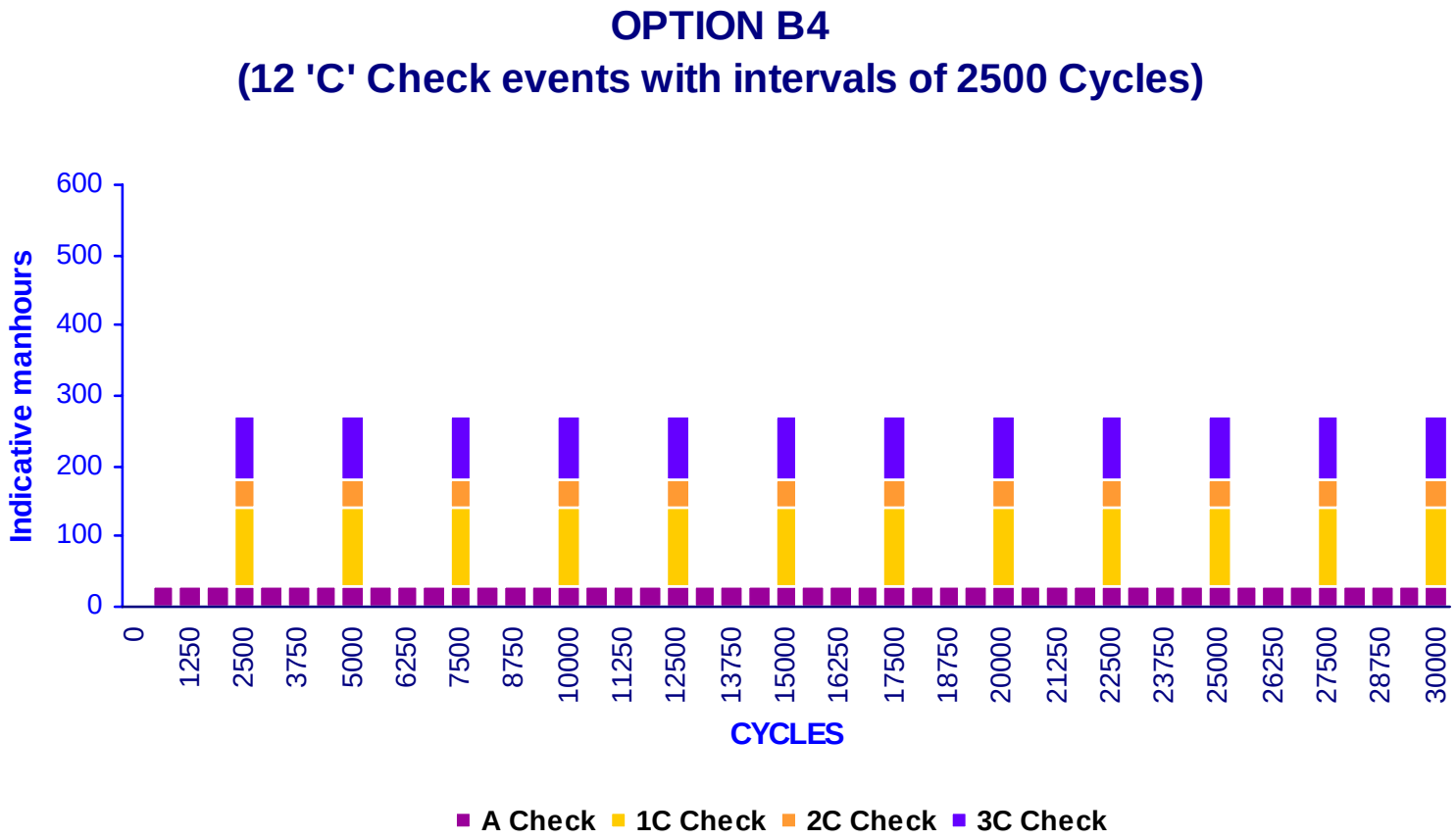
Maintenance Checks - B3 Schedule

BAE SYSTEMS



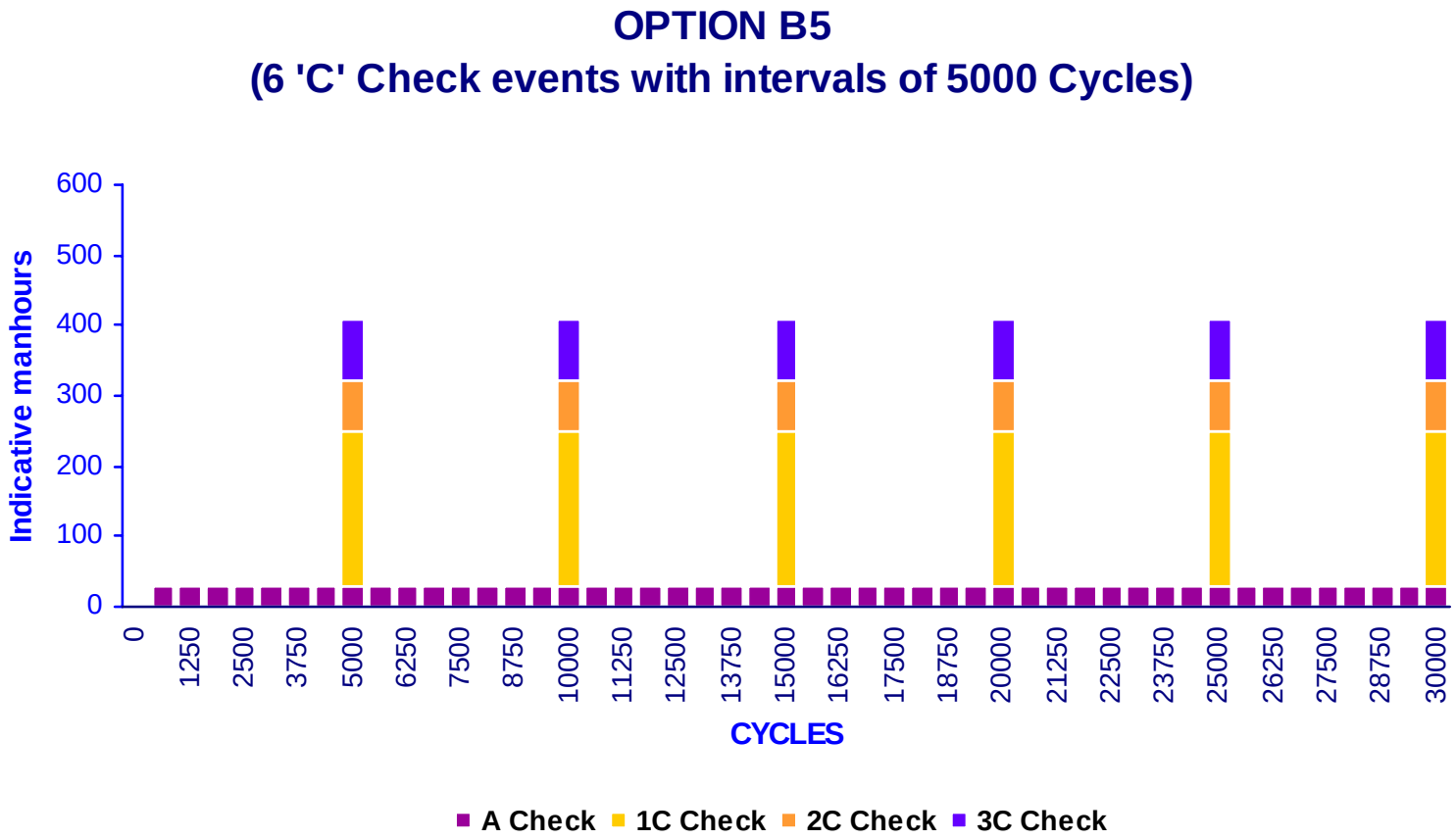
Maintenance Checks - B4 Schedule

BAE SYSTEMS



Maintenance Checks - B5 Schedule

BAE SYSTEMS



Airframe Maintenance - JetSpares

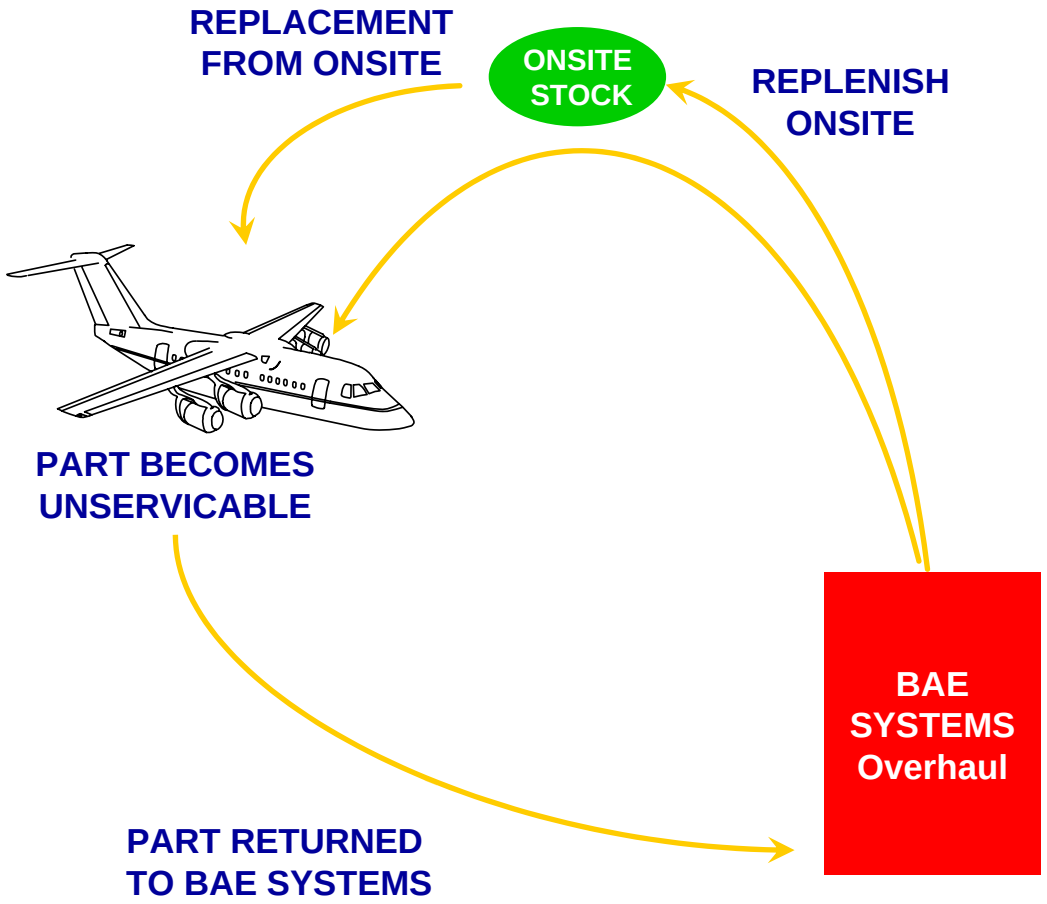
BAE SYSTEMS

Airframe rotable spares provisioning and repair and overhaul programmes for the Avro RJ can be tailored to the needs and capabilities of individual operators through fixed cost pay by the hour packages.

JetSpares Programme
The recommended programme, JetSpares, is backed by BAE SYSTEMS. This offers an airframe rotable component by the hour service with a minimum initial spares investment

The programme covers three distinct areas:

- Recommendation of on-site Stock.
- Repair and overhaul of airframe rotable components.
- An exchange service for all airframe rotable components.



Engine Maintenance - EMCPP

For a fixed hourly payment, Honeywell, the engine manufacturer, will undertake all engine maintenance on behalf of an operator over an agreed period (excluding line labour).

The criteria for acceptance of an engine into the program includes the operator's on-wing maintenance capability, a pre-enrolment inspection and the engine modification status.

Honeywell's Engine Maintenance Cost Protection Programme provides engine overhaul for a fixed hourly cost which is typically based upon the following operational elements:

- **Average sector length**
- **Engine thrust management techniques**
- **Operational environment**
- **Annual utilisation**

The plan covers parts and repair labour for scheduled and unscheduled maintenance and Category 1 and 2 Service Bulletins released after engine enrollment.

BAE SYSTEMS will assist Avro RJ operators in obtaining quotes from Honeywell.

Regional Aircraft Locations

BAE SYSTEMS

BAE Systems' Regional Aircraft division headquarters at Prestwick is home to Customer Support and Engineering.

Avro RJ training facilities are available via BAe Systems preferred supplier based at Woodford with spares stocks at Weybridge, close to London's international airports.

Additional support is provided from facilities in Washington DC.

Prestwick
Headquarters, Operations (Engineering and Support), Admin

Weybridge
European Logistics Centre (ELC) primary spares distribution centre

Hatfield
Asset Management

Washington
Asset Management

Berlin

Kuala Lumpur

BAE Systems Aircraft Asset Management

BAE SYSTEMS

- **Aircraft re-marketing**
- **Lease management and asset administration**
- **Technical services**
- **Advisory and consultancy**

BAE Systems Asset Management has successfully built upon the world class re-marketing and leasing skills developed over 15 years, in the successful BAE Systems Asset Management operation. Those years of experience in the commercial aircraft leasing sector are being very effectively provided to third party organisations requiring such leasing and re-marketing skills for all commercial aircraft types – from Turbo Props to Widebodies.

An established global presence with offices in Europe, USA and Asia enables us to stay in contact with our customers on a daily basis

We believe our extensive experience built through the development of our highly successful asset management business over 15 years puts us in a unique position to see the world through our client's eyes and understand what is important when faced with the many complex issues which can arise – from managing all aspects of aircraft leases, to scheduled or unscheduled returns and achieving the most effective aircraft re-marketing

WWW.BAEAM.COM

Spares Logistics

BAE SYSTEMS

Operators of BAE Systems Avro RJ aircraft enjoy the spares support of a major manufacturer supporting over 1100 aircraft in service worldwide.

Dedicated helpdesks manned round the clock provide fast response to AOG requests and the modern, well equipped warehouse facilities at Weybridge ensure efficient despatch of spares via London's Heathrow airport nearby.

- **Spares operations for the world-wide fleet of Avro RJ aircraft is provided by :**
  - Maintenance help desk manned 24 hours a day.
  - Spares Logistics Centre at Weybridge close to London Heathrow.
  - Additional spares store in Washington DC, USA.
- **Direct access to the inventory through the SPEC 2000 computer system and the internet.**

Structural Repair Agreement

BAE SYSTEMS

Included in the portfolio of services provided by Regional Aircraft's Customer Support organisation is a Structural Repair Agreement.

This is an optional arrangement whereby, for a fixed annual subscription, BAE SYSTEMS will provide a range of services in the event of in-service damage to an Avro RJ.

- **On-site structural damage assessment of customer aircraft**
- **Temporary repair scheme or service concession prior to provision of final repair solution**
- **Customer repair drawings, repair instructions and on-site structural assessments on demand from the customer.**
- **Provision of responses to airframe structural technical queries**
- **Assistance in use of the airframe structural documentation**
- **Provision of CAA approved repair schemes by way of a repair drawing or repair instruction**

Field Service Representation

To assist with the entry into service of the Avro RJ, experienced Field Service Representatives are available to assist new operators.

These personnel become resident with the airline assisting the technical staff as they familiarise themselves with the aircraft and guiding them as they interface with various parts of the BAE Systems Regional Aircraft Customer Support organisation.

- **Participation in daily meetings with airline**
- **Troubleshooting**
- **Reviewing and progressing outstanding issues.**
- **Liaising with BAE SYSTEMS customer support.**
- **Setting up lines of communication.**
- **Building relationships with key vendors.**
- **Ensuring BAE Systems is aware of any AOG.**

Customer Training

BAE SYSTEMS

Pilot ground training, cabin crew, engineering and management familiarisation training courses are provided at BAE Systems preferred supplier at Manchester.

Avro RJ simulator time can be purchased through our joint venture company CST-AVRO based in Berlin, Germany

Typical customer training programmes

- **Pilots** - 10 days ground school,
  - 9 off 4 hour simulator sessions
- **Cabin crew** - 3 days
- **B1 Maintenance** - 30 days (Airframe, engine, electrical power, avionics, LRU's)
- **B2 Maintenance** -23 days (Electrical power, avionics)

* Course prices available on application

Operations Support

BAE SYSTEMS

In addition to pilot training, BAE SYSTEMS can provide ongoing support to customer's operations. advising and assisting with the introduction of new destinations, challenging airfields and operational issues.

BAE SYSTEMS has also partnered with the European Aeronautical Group for the provision of Avro RJ software services, in particular Airfield Performance data. EAG provide a range of navigational and flight planning services from their base in Stockholm, Sweden.

BAE SYSTEMS TOGETHER WITH ITS PARTNER EAG CAN PROVIDE

- **Weight and balance material including loading aids**
- **Analysis of specific operational issues**
- **Airfield performance data and software**

Vendor Support

BAE SYSTEMS

The approach to vendor issues by BAE Systems' Regional Aircraft division is encapsulated in its RACAP programme (Regional Aircraft Cost Advantage Programme).

The RACAP team is a multidisciplinary group representing a broad range of specialities across the business. The team is tasked with continuous review of cost drivers and aircraft delay causes and the identifying of solutions which will improve these indicators.Vendor liaison forms a key part of this initiative.

- **Cost reduction team based at Prestwick (RACAP team)**
- **Data feedback from operators continuously analysed and published.**
- **Regular liaison with major vendors.**
- **Continuous maintenance planning development to extend service intervals**

Technical Support

A wide range of other Technical Support services is available from BAE Systems covering simple technical queries to assistance with Maintenance Planning.

An extensive library of customised Technical Manuals can be provided in various hard copy and electronic formats.

- **Maintenance planning**
- **Continued Airworthiness support**
- **Technical queries**
  - **Repair Design Office**
  - **AOG technical support**
- **Modifications and Service Bulletins**
- **Maintenance and Operators manuals**
- **Illustrated parts catalogues**
- **Publishing & graphic design**
- **CD-ROM and On-line publications (via ISDN, Intranet and Internet)**

BAE SYSTEMS

Avro RJ Performance

Performance Characteristics

BAE SYSTEMS

The Avro RJ design yields unique qualities of handling, manoeuvrability and airfield access. The high wing and four engine configuration is complemented by tail mounted air brakes and optional steep approach mods, to extend the aircraft's potential into airfields formerly accessible to turboprop aircraft alone.

- **35000 ft Cruise ceiling ***
- **M0.72 Max operating speed (JAR)**
- **Low approach speeds**
- **Steep approach capability**
- **Three engine ferry**

* Max cruise ceiling of 31000ft on some early Avro RJ aircraft

Basic Data - Avro RJ70

BAE SYSTEMS

Typical design weights*

	Kg	lb
Maximum Take-off Weight		
• standard	38,102	84,000
• maximum	43,029	95,000
• unpaved	39,009	86,000
Maximum Landing Weight	37,875	83,500
Maximum Zero Fuel Weight		
• standard	32,423	71,500
• maximum	33,393	74,500
Typical Operating Weight Empty**		
• 5 abreast	23,900	52,690
• 6 abreast	24,100	53,131

Payloads

Maximum structural payload	9,433	21,810
80 Passengers @ 95 Kg	7,600	16,755

* Design weights and payloads will vary with aircraft serial number
** Based on typical in-service aircraft (including crew & catering)

Basic Data - Avro RJ85

BAE SYSTEMS

Typical design weights*

	Kg	lb
Maximum Take-off Weight		
• standard	42,185	93,000
• maximum	43,999	97,000
• unpaved	39,009	86,000
Maximum Landing Weight	38,556	85,000
Maximum Zero Fuel Weight	35,834	79,000
Typical Operating Weight Empty**		
• 5 abreast	24,600	54,234
• 6 abreast	24,820	54,719

Payloads

Maximum structural payload	11,234	24,766
100 Passengers @ 95 Kg	9,500	20,943

* Design weights and payloads will vary with aircraft serial number
** Based on typical in-service aircraft (including crew & catering)

Basic Data - Avro RJ100

BAE SYSTEMS

Typical design weights*

	Kg	lb
Maximum Take-off Weight		
• standard	44,226	97,500
• maximum	46,040	101,500
Maximum Landing Weight	40,143	88,500
Maximum Zero Fuel Weight		
• standard	37,422	82,500
• maximum	37,875	83,500
Typical Operating Weight Empty**		
• 5 abreast	25,600	56,438
• 6 abreast	25,670	56,593

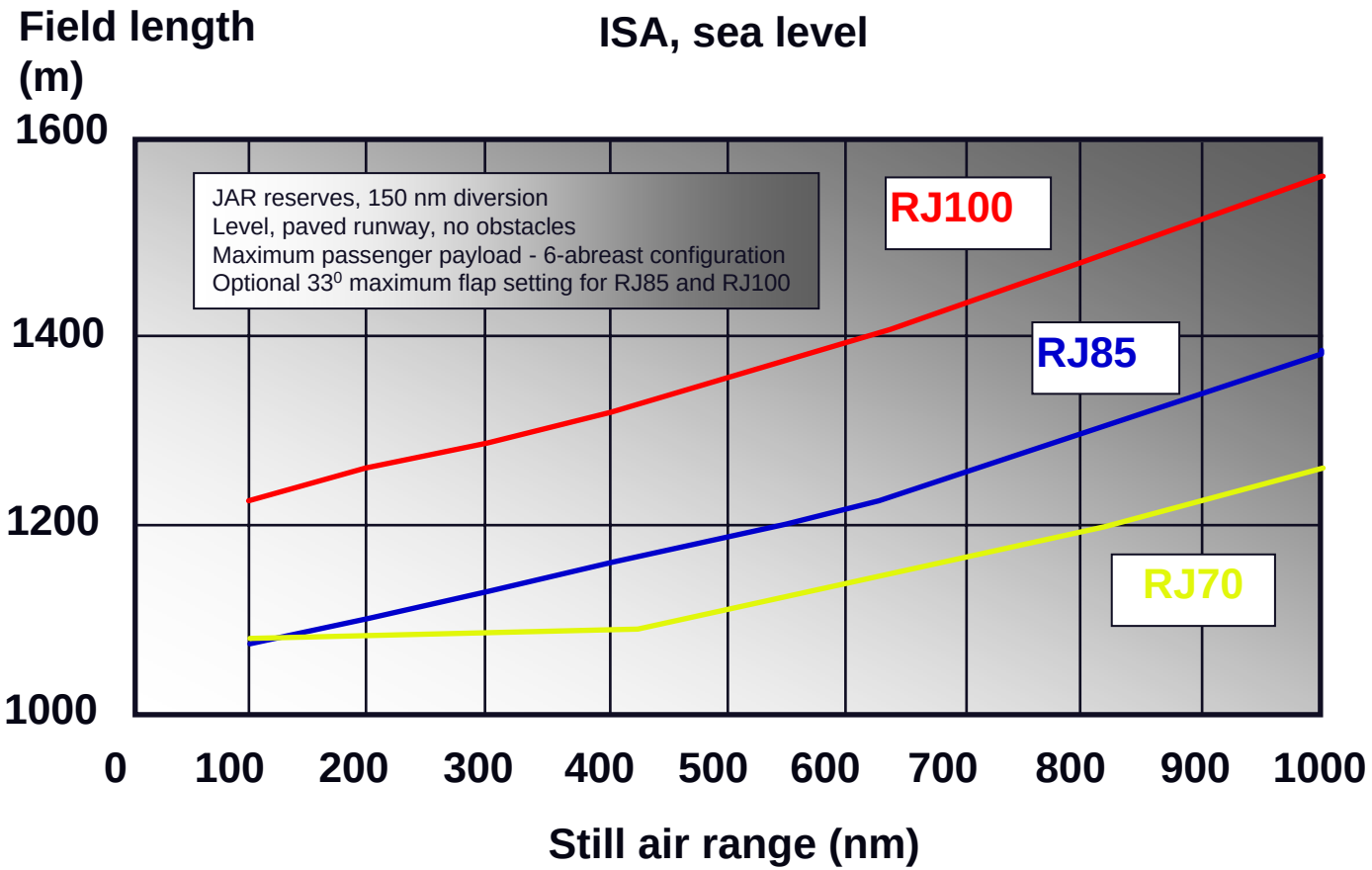
Payloads

Maximum structural payload	12,275	27,063
112 Passengers @ 95 Kg	10,640	23,460

* Design weights and payloads will vary with aircraft serial number
** Based on typical in-service aircraft (including crew & catering)

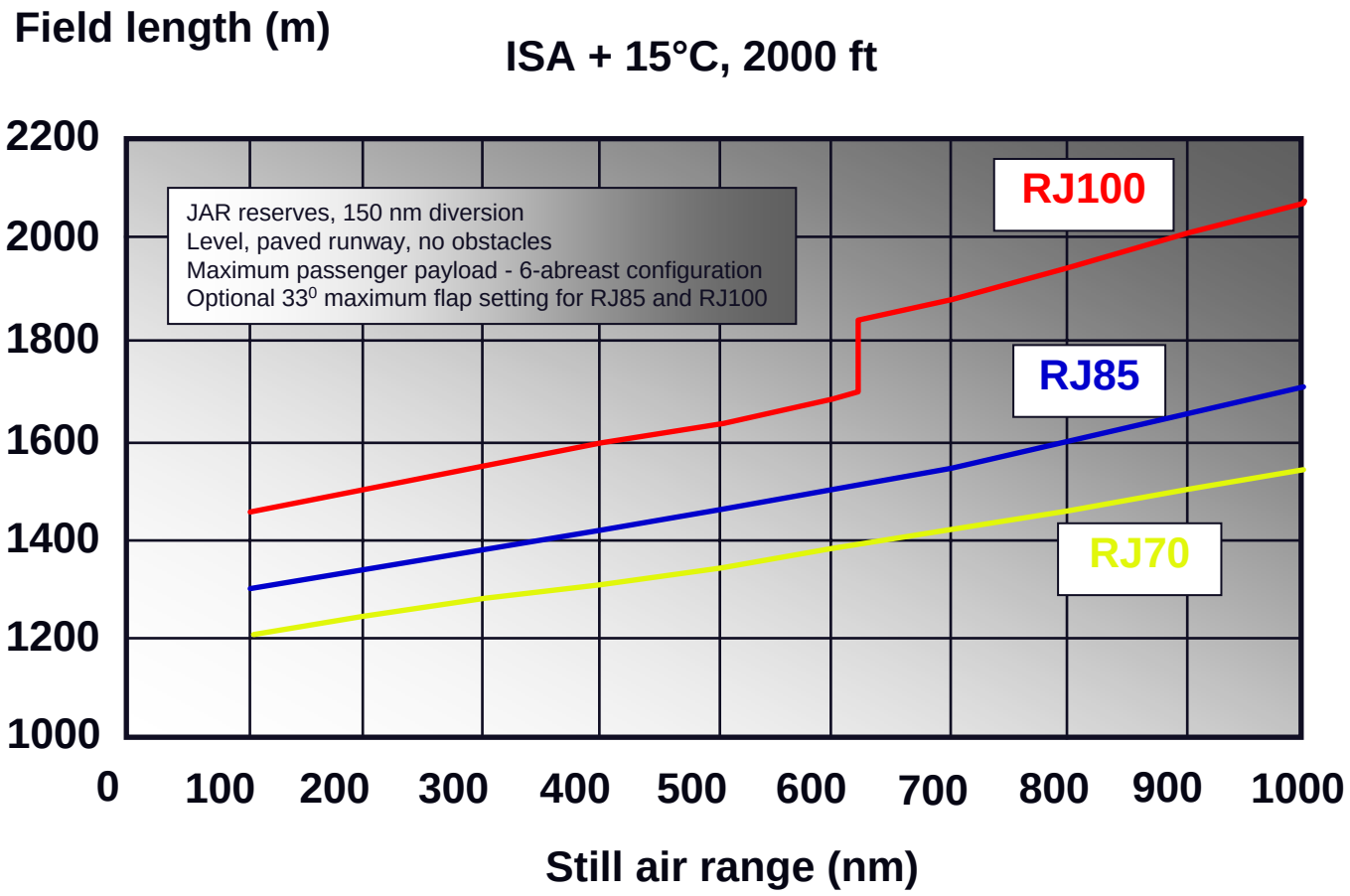
Avro RJ Take-Off Performance

BAE SYSTEMS



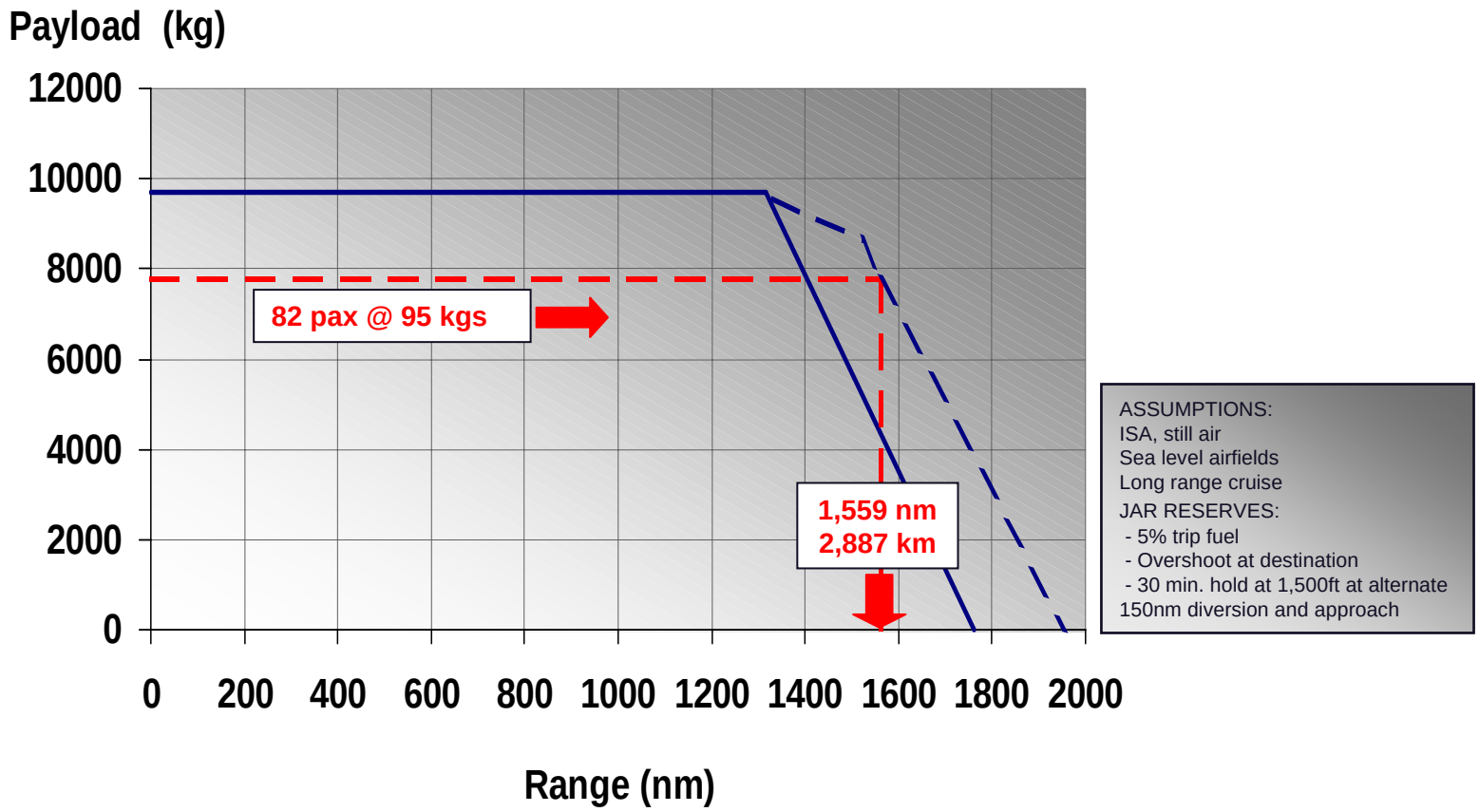
Avro RJ Take-Off Performance

BAE SYSTEMS



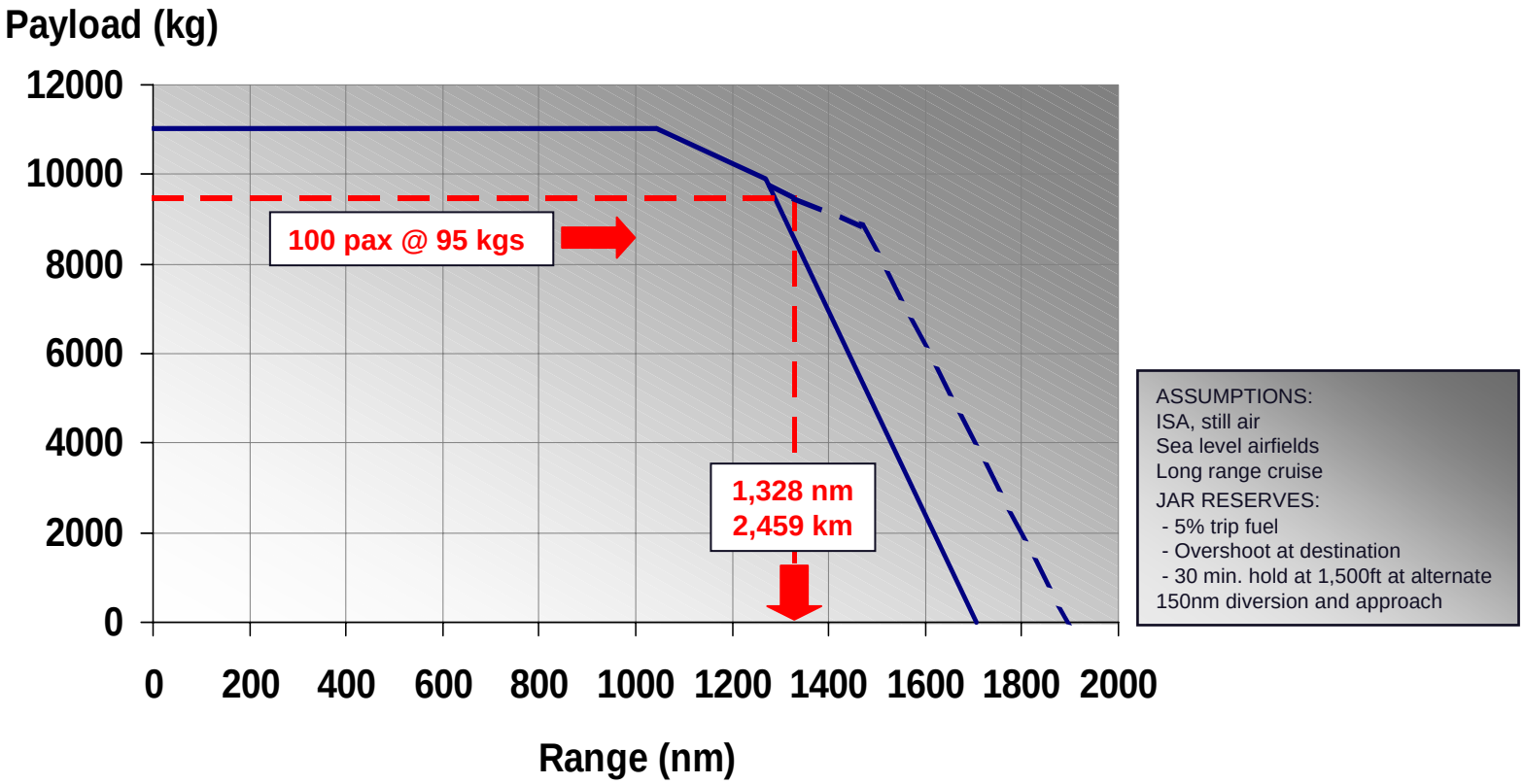
Avro RJ70 Payload Range

BAE SYSTEMS



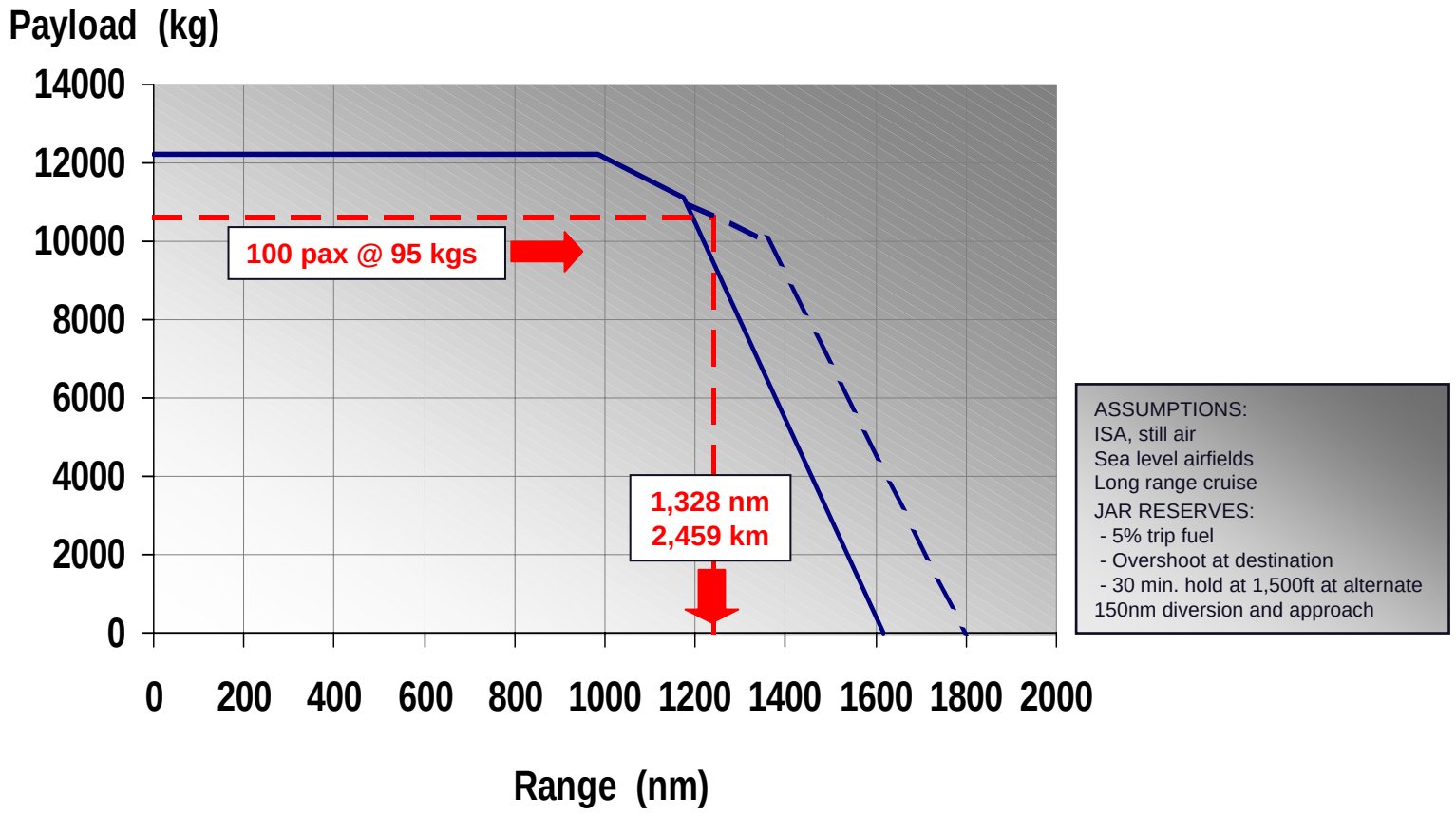
Avro RJ85 Payload Range

BAE SYSTEMS



Avro RJ100 Payload Range

BAE SYSTEMS



Avro RJ Operating Environment

BAE SYSTEMS

The Avro RJ has been designed to operate in demanding conditions which combined with its superior airfield performance make it suitable for operators across the world.

Flight Envelope

Maximum altitude	35,000ft*
Temperature range	Minimum BCAR Arctic (-50°C at sea level to -65°C at 35,000ft) Maximum ISA+35°C
Vmo	RJ70 & RJ85 300 kt IAS RJ100 305 kt IAS
Mmo	JAR M0.72 FAR M0.73

Runway Wind Capabilities

Maximum demonstrated crosswind	35 kts
Maximum demonstrated tailwind	Normal take-off & landing 15 kts Steep approach 5 kts
ILS/Autoland capabilities	Headwind 25 kts Crosswind 15 kts Tailwind 10 kts

Avro RJ Landing Performance

BAE SYSTEMS

	Sea level RJ70	RJ85	RJ100
Normal approach			
dry	1,082m/ 3,550ft	1,137m/ 3,730ft	1,211m/ 3,973ft
wet	1,245m/ 4,085ft	1,308m/ 4,291ft	1,392m/ 4,556ft
Steep approach (35ft screen height)			
dry	1,000m/ 3,281ft	1,060m/ 3,478ft	1,067m/ 3,501ft
wet	1,162m/ 3,812ft	1,230m/ 4.035ft	1,249m/ 4,097ft

	2,000ft RJ70	RJ85	RJ100
Normal approach			
dry	1,129m/ 3,704ft	1,187m/ 3,894ft	1,261m/ 4,137ft
wet	1,298m/ 4,258ft	1,365m/ 4,477ft	1,450m/ 4,757ft
Steep approach (35ft screen height)			
dry	1,046m/ 3,432ft	1,109m/ 3,638ft	1,117m/ 3,665ft
wet	1,215m/ 3,986ft	1,287m/ 4,222ft	1,306m/ 4,284ft

Based on maximum 6 abreast payloads; 95 kg passenger weight; 400 nm sector;
JAR reserves; 150 nm diversion

BAE SYSTEMS

Avro RJ Economics

Economic Analysis

BAE SYSTEMS

The Avro RJ costs presented in this section are based on standard industry assumptions and cover the major direct cost elements. The purchase prices, aircraft lease rates and hull values quoted are for budgetary purposes only.

The maintenance costs represent a reasonable budgetary provision for a typical airline fleet operation. However, the size of the fleet, average sector length, operating environment, level of in - house expertise, subcontract and internal labour rates will all have an impact on the actual costs experienced.

Cost Assumptions Avro RJ70

BAE SYSTEMS

Aircraft ownership		
	A/C Lease rate	$60,000/Month
	Spares	15% of aircraft value
	Insurance	0.9% of hull value
Variable costs		
	Fuel price	$2.50/USg
	Aircraft utilisation	2500 BH/Annum
FLIGHT CREW	Captain's salary	$85,000/Annum
	1st Officer's salary	$45,000/Annum
	Flight crew hours	600/Annum
CABIN CREW (Pax aircraft only)	Salary	$27,000/Annum
	Cabin crew hours	1000/Annum
	Cabin crew on board	2
MAINTENANCE		
	Airframe	$113/FH + $258/FC
	Engine	$320/FH + $128/FC
	APU	$24/APUH
	Landing fees	$10/Tonne of MTOW
	Eurocontrol	$50 National unit rate

Avro RJ70 Cost Matrix

BAE SYSTEMS

Aircraft type - Avro RJ70

Sectors		Sector data					Ownership costs			Variable costs						Total cost		
From	To	Dist Km	Block hours	Flight hours	Fuel Kg	Pax on board	Aircraft $	Spares $	Hull Insurance $	Fuel $	Fl.crew $	C.Crew $	Maint $	L.fees $	Nav Chge $	DOC $	DOC $/BH	DOC Cents/ASK
AAA	BBB	100	0.42	0.29	789	53	120	12	10	651	90	23	519	431	46	1902	4565	23.20
AAA	BBB	200	0.57	0.44	1123	53	163	16	13	927	123	31	588	431	93	2384	4208	14.54
AAA	BBB	300	0.68	0.56	1434	53	197	20	16	1183	148	37	641	431	139	2812	4115	11.43
AAA	BBB	400	0.82	0.69	1675	53	235	24	19	1382	177	44	702	431	186	3200	3918	9.75
AAA	BBB	500	0.95	0.83	1891	53	274	28	22	1560	206	51	763	431	232	3567	3754	8.70
AAA	BBB	600	1.08	0.96	2125	53	312	31	25	1753	235	59	824	431	279	3949	3645	8.03
AAA	BBB	700	1.22	1.09	2376	53	350	35	28	1960	264	66	885	431	325	4344	3571	7.57
AAA	BBB	800	1.35	1.23	2627	53	389	39	31	2167	293	73	946	431	371	4740	3511	7.23
AAA	BBB	900	1.47	1.34	2879	53	422	43	34	2375	318	79	999	431	418	5119	3490	6.94
AAA	BBB	1000	1.60	1.48	3132	53	461	46	37	2584	347	86	1060	431	464	5517	3448	6.73
AAA	BBB	1100	1.73	1.61	3386	53	499	50	40	2794	376	94	1121	431	511	5915	3413	6.56
AAA	BBB	1200	1.87	1.74	3641	53	538	54	43	3004	404	101	1182	431	557	6314	3383	6.42
AAA	BBB	1300	2.00	1.88	3897	53	576	58	46	3215	433	108	1243	431	603	6714	3357	6.30
AAA	BBB	1400	2.13	2.01	4154	53	614	62	50	3427	462	115	1304	431	650	7115	3335	6.20
AAA	BBB	1500	2.25	2.13	4411	53	648	65	52	3639	488	122	1357	431	696	7498	3333	6.10
AAA	BBB	1600	2.38	2.26	4670	53	686	69	55	3853	516	129	1418	431	743	7901	3315	6.02
AAA	BBB	1700	2.52	2.39	4929	53	725	73	58	4067	545	136	1479	431	789	8303	3299	5.96
AAA	BBB	1800	2.65	2.53	5189	53	763	77	62	4281	574	143	1540	431	836	8707	3286	5.90
AAA	BBB	1900	2.78	2.66	5449	53	802	81	65	4496	603	150	1601	431	882	9110	3273	5.85
AAA	BBB	2000	2.90	2.78	5711	53	835	84	67	4712	628	157	1654	431	928	9497	3275	5.79

Cost Assumptions Avro RJ85

BAE SYSTEMS

Aircraft ownership		
	A/C Lease rate	$85,000/Month
	Spares	15% of aircraft value
	Insurance	0.9% of hull value
Variable costs		
	Fuel price	$2.50/USg
	Aircraft utilisation	2500 BH/Annum
FLIGHT CREW	Captain's salary	$85,000/Annum
	1st Officer's salary	$45,000/Annum
	Flight crew hours	600/Annum
CABIN CREW (Pax aircraft only)	Salary	$27,000/Annum
	Cabin crew hours	1000/Annum
	Cabin crew on board	2
MAINTENANCE		
	Airframe	$113/FH + $258/FC
	Engine	$320/FH + $128/FC
	APU	$24/APUH
	Landing fees	$10/Tonne of MTOW
	Eurocontrol	$50 National unit rate

Avro RJ85 Cost Matrix

BAE SYSTEMS

Aircraft type - Avro RJ85

Sectors		Sector data					Ownership costs			Variable costs						Total cost		
From	To	Dist Km	Block hours	Flight hours	Fuel Kg	Pax on board	Aircraft $	Spares $	Hull Insurance $	Fuel $	Fl.crew $	C.Crew $	Maint $	L.fees $	Nav Chge $	DOC $	DOC $/BH	DOC Cents/ASK
AAA	BBB	100	0.42	0.29	787	65	170	21	17	649	90	23	519	440	47	1976	4743	19.76
AAA	BBB	200	0.57	0.44	1122	65	231	29	23	926	123	31	588	440	94	2484	4383	12.42
AAA	BBB	300	0.70	0.58	1435	65	286	35	28	1184	152	38	649	440	141	2952	4218	9.84
AAA	BBB	400	0.83	0.71	1680	65	340	42	34	1386	181	45	710	440	188	3365	4038	8.41
AAA	BBB	500	0.97	0.84	1907	65	394	49	39	1573	209	52	771	440	235	3763	3892	7.53
AAA	BBB	600	1.10	0.98	2152	65	449	56	45	1776	238	59	832	440	281	4175	3796	6.96
AAA	BBB	700	1.23	1.11	2411	65	503	62	50	1989	267	67	893	440	328	4600	3729	6.57
AAA	BBB	800	1.37	1.24	2671	65	558	69	55	2204	296	74	953	440	375	5025	3676	6.28
AAA	BBB	900	1.50	1.38	2931	65	612	76	61	2418	325	81	1014	440	422	5450	3633	6.06
AAA	BBB	1000	1.63	1.51	3193	65	666	83	66	2634	354	88	1075	440	469	5876	3598	5.88
AAA	BBB	1100	1.77	1.64	3455	65	721	89	72	2851	383	95	1136	440	516	6303	3568	5.73
AAA	BBB	1200	1.90	1.78	3718	65	775	96	77	3068	412	103	1197	440	563	6730	3542	5.61
AAA	BBB	1300	2.03	1.91	3983	65	830	103	82	3286	441	110	1258	440	610	7159	3521	5.51
AAA	BBB	1400	2.17	2.04	4248	65	884	110	88	3505	469	117	1319	440	657	7589	3502	5.42
AAA	BBB	1500	2.30	2.18	4515	65	938	116	93	3725	498	124	1380	440	704	8019	3487	5.35
AAA	BBB	1600	2.43	2.31	4783	65	993	123	99	3946	527	131	1441	440	750	8451	3473	5.28
AAA	BBB	1700	2.57	2.44	5051	65	1047	130	104	4167	556	139	1502	440	797	8882	3461	5.22
AAA	BBB	1800	2.68	2.56	5321	65	1095	136	109	4390	581	145	1555	440	844	9295	3464	5.16
AAA	BBB	1900	2.82	2.69	5591	65	1149	143	114	4613	610	152	1616	440	891	9729	3454	5.12
AAA	BBB	2000	2.95	2.83	5863	65	1204	149	119	4837	639	159	1677	440	938	10163	3445	5.08

Cost Assumptions Avro RJ100

BAE SYSTEMS

Aircraft ownership		
	A/C Lease rate	$95,000/Month
	Spares	15% of aircraft value
	Insurance	0.9% of hull value
Variable costs		
	Fuel price	$2.50/USg
	Aircraft utilisation	2500 BH/Annum
FLIGHT CREW	Captain's salary	$85,000/Annum
	1st Officer's salary	$45,000/Annum
	Flight crew hours	600/Annum
CABIN CREW (Pax aircraft only)	Salary	$27,000/Annum
	Cabin crew hours	1000/Annum
	Cabin crew on board	3
MAINTENANCE		
	Airframe	$113/FH + $258/FC
	Engine	$320/FH + $128/FC
	APU	$24/APUH
	Landing fees	$10/Tonne of MTOW
	Eurocontrol	$50 National unit rate

Avro RJ100 Cost Matrix

BAE SYSTEMS

Aircraft type - Avro RJ100

Sectors		Sector data					Ownership costs			Variable costs						Total cost		
From	To	Dist Km	Block hours	Flight hours	Fuel Kg	Pax on board	Aircraft $	Spares $	Hull Insurance $	Fuel $	Fl.crew $	C.Crew $	Maint $	L.fees $	Nav Chge $	DOC $	DOC $/BH	DOC Cents/ASK
AAA	BBB	100	0.42	0.29	833	73	190	18	15	687	90	34	519	460	48	2062	4949	18.41
AAA	BBB	200	0.57	0.44	1192	73	258	25	20	983	123	46	588	460	96	2600	4587	11.61
AAA	BBB	300	0.70	0.58	1522	73	319	31	25	1256	152	57	649	460	144	3092	4417	9.20
AAA	BBB	400	0.83	0.71	1781	73	380	37	29	1469	181	68	710	460	192	3525	4230	7.87
AAA	BBB	500	0.97	0.84	2029	73	441	42	34	1674	209	78	771	460	240	3950	4086	7.05
AAA	BBB	600	1.10	0.98	2289	73	502	48	39	1889	238	89	832	460	288	4384	3986	6.52
AAA	BBB	700	1.23	1.11	2559	73	562	54	43	2111	267	100	893	460	336	4827	3914	6.16
AAA	BBB	800	1.35	1.23	2831	73	616	59	47	2336	293	109	946	460	384	5250	3889	5.86
AAA	BBB	900	1.48	1.36	3104	73	676	65	52	2561	321	120	1007	460	432	5695	3839	5.65
AAA	BBB	1000	1.62	1.49	3377	73	737	71	57	2786	350	131	1068	460	480	6140	3798	5.48
AAA	BBB	1100	1.75	1.63	3652	73	798	77	61	3013	379	142	1129	460	528	6587	3764	5.35
AAA	BBB	1200	1.88	1.76	3928	73	859	83	66	3241	408	153	1190	460	576	7035	3735	5.23
AAA	BBB	1300	2.00	1.88	4204	73	912	88	70	3469	433	162	1243	460	624	7461	3730	5.12
AAA	BBB	1400	2.13	2.01	4482	73	973	94	75	3698	462	173	1304	460	672	7910	3708	5.04
AAA	BBB	1500	2.27	2.14	4762	73	1034	99	80	3929	491	184	1365	460	720	8361	3689	4.98
AAA	BBB	1600	2.40	2.28	5043	73	1094	105	84	4161	520	194	1426	460	768	8813	3672	4.92
AAA	BBB	1700	2.53	2.41	5325	73	1155	111	89	4394	549	205	1487	460	816	9266	3657	4.87
AAA	BBB	1800	2.65	2.53	5608	73	1208	116	93	4627	574	215	1540	460	864	9698	3659	4.81
AAA	BBB	1900	2.78	2.66	5892	73	1269	122	98	4861	603	225	1601	460	912	10152	3647	4.77
AAA	BBB	2000	2.92	2.79	6178	73	1330	128	102	5097	632	236	1662	460	960	10608	3637	4.74

BAE SYSTEMS REGIONAL AIRCRAFT

Asset Management
1, Bishops Square
St Albans Road West
Hatfield, Herts AL10 9NE, UK
Tel: +44 (0) 1707 271777
Fax: +44 (0) 1707 255555

Headquarters and Customer Support
Prestwick International Airport
Ayrshire
Scotland KA9 2RW UK
Tel: +44 1292 675000
Fax: +44 1292 675700

Washington office:
13850 McLearen Road
Herndon, Virginia 20171, USA
Tel: +1 703 736 1080
Fax: +1 703 736 4209