UNITED KINGDOM
CIVIL AVIATION AUTHORITY

BA 27
Issue 4
January 2002
JETSTREAM 4100

TYPE CERTIFICATE DATA SHEET NO. BA27

This data sheet which is part of CAA Type Certificate No. BA27, prescribes conditions and limitations under which the product, for which the type certificate was issued, meets the airworthiness requirements of the Civil Aviation Authority.

TYPE CERTIFICATE HOLDER: **BAE SYSTEMS**
Prestwick International Airport
Ayrshire
Scotland
KA9 2RW

MANUFACTURER: **BAE Systems (Formally Jetstream Aircraft Limited)**

AIRCRAFT TYPE/
MODEL NUMBER(S): **JETSTREAM 4100**

In this case, the CAA Type Certification has been granted on the basis of a recommendation from the Joint Airworthiness Authorities (JAA) following an investigation carried out in accordance with the JAA Joint Certification Procedures. Accordingly, the attached JAA Data Sheet No. JAA/25/92-002 Issue 7 dated January 2002 has been accepted by the CAA for the Jetstream 4100.

- END -

JOINT AVIATION AUTHORITIES

JAA DATA SHEET FOR NATIONAL TYPE CERTIFICATES

BAE SYSTEMS JETSTREAM 4100

This TCDS presents the conditions and limitations under which the JAA Type Certification airworthiness requirements have been met. It can be used by each JAA Airworthiness Authority either directly as written or as the basis for use in compiling their own TCDS as appropriate.

Type Design Organisation

BAE Systems
Prestwick Airport
Ayrshire – Scotland
KA9 2RW

Model JS4100 (Transport Aircraft), Approved 23rd November 1992

Type Design Standard: Type Build Standard for Type Acceptance in JAA Countries Doc. No. JS-4100/TBS.JAA/2.

Dimensions

Span	18.42m	(60ft 5.3in)
Length	19.33m	(63ft 5.0in)
Height	5.61m	(18ft 5.0in)
Wing Area	32.38m²	(348.5ft²)

Standard Mean Cord

The Standard Mean Cord (SMC) is 1.77m (5ft 9.69in). The leading edge of the SMC is 7.79m (25ft 7.02in) aft of Stn.0.

Engines

Left: TPE 331-14GR Garrett single shaft turbo-propeller, reduction gear ratio 22.97:1 output shaft rotates clockwise when viewed from rear.

Right: TPE 331-14HR reduction gear ratio 22.93:1 output shaft rotates anti-clockwise when viewed from rear.

Engines Limits

Pre Mod JM 41300:-

Maximum permissible torque for take-off and continuous operation is 100%. This equates to 1119 KW (1500 SHP) at 100% rotational speed.

Maximum permissible engine rotational speed for normal operation is 101%.

Post Mod JM 41300:-

Maximum permissible torque for take-off and continuous operation is 100%. This equates to 1230 KW (1650 SHP) at 100% rotational speed.

Maximum permissible engine rotational speed for normal operation is 101%.

For detailed engine limitations see Aircraft Flight Manual J41.01.

Fuel and Additives

The approved fuel for use on the aircraft is:

Kerosene Type:	UK:	DERD 2453 (AVTUR/FSII)* DERD 2494 (AVTUR)
	USA:	ASTM D 1655 Type Jet A or Jet A-1 MIL-T-83133 Grade JP-8*
	NATO:	F34* F35
	CANADA:	CAN/CGSB-3.23-M86 (FSII) CAN/CGSB-3.23-M86

(Post Modification JK 42781)

Wide-cut Type:	UK:	DERD 2454 (AVTAG/FSII)*
	USA:	ASTM D 1655 (JET B) MIL-T-5624 (JP-4)*
	CANADA:	CAN/CGSB-3.22-M86 (FSII)* CAN/CGSB-3.22-M86
	NATO:	NATO F40 *

Each of the following additives is approved for use with the fuel and must be to the latest standard of the relevant specification. Fuels marked with an asterisk(*) already contain fuel system icing inhibitor and further additions to those fuels are not permitted.

i) Icing Inhibitor:

UK: DERD 2451 (AL-31)

USA: MIL-I-27686
ASTM D 1655

NATO: S748

Concentration may not exceed 0.15% by volume.

ii) Biocide:

Biobor JF Biocide in concentration not greater than 270 parts per million (20 ppm of elemental boron).

Fuel Capacity

Fuel Capacity	UK gal	US gal	Litres	kg	lb
Usable	727	874	3306	2639	5819
Unusable	4	5	19	15	33
Total	731	879	3325	2654	5852

Oil

The specification of approved engine oil is:-

Type II:- MIL-L-23699C NATO 0-156

Approved brands of oil are listed in the Flight Manual.
Mixing of brands is not permitted.

The oil system capacity of each engine tank is 5.68 litres, (1.25 galls), (6.0 US quarts).

Propellers

Pre-Mod JM 41300:-

McCauley 5 bladed, constant speed variable pitch 114 in dia propellers, type B5JFR36C1101/114GCA-0 and C5JFR36C1102/L114GCA-0 rotating clockwise and anti-clockwise respectively when viewed from the rear.

Post Mod JM 41300:-

McCauley 5 bladed, constant speed variable pitch 114 in dia propellers, type B5JFR36C1103/114HCA-0 and C5JFR36C1104/L114HCA-0 rotating clockwise and anti-clockwise respectively when viewed from the rear.

Notes:-

1) Modification JK 42618 permits Post Modification JM 41300 propellers to be fitted to aircraft with 1500 shp engines at MTOW of 24000lb.

2) Modification JK 42794 permits Pre Modification JM 41300 propellers to be fitted to aircraft with 1500 shp engines at MTOW of 24000lb.

Propeller Limits

Continuous ground operation between 82% and 90% and below 68% rpm is prohibited.

Continuous ground operation is prohibited except for take-off, when the torque is greater than 60% in winds greater than 15 kts, unless the wind is from within $\pm$ 45° of the nose of the aircraft.

For detailed propeller limitations see Aircraft Flight Manual J41.01.

Airspeed Limits (CAS)

V_{MO}/M_{MO} (Maximum Operating)

V_{MO} = 250 KIAS
M_{MO} = 0.52 (above 17,400 ft altitude)

V_A (Manoeuvring Speed)

V_A = 180 KIAS

V_{FE} (Flap Speeds)

V_{FE} 9° Flap = 170 KIAS (Pre Mod JK 42584)
V_{FE} 9° Flap = 200 KIAS (Pre Mod JK 42584)
V_{FE} 15° Flap = 160 KIAS
V_{FE} 25° Flap = 140 KIAS

V_{LO} (RET) [Landing Gear Operating (Retraction) Speeds]
V_{LO} (EXT) [Landing Gear Operating (Extension) Speeds]
V_{LE} [Landing Gear Extended Speeds]

V_{LO} (RET) = 160 KIAS

V_{LO} (EXT) = V_{LE} = 170 KIAS (Pre Mod JK 42584)
V_{LO} (EXT) = V_{LE} = 170 KIAS (Flaps 0°) (Post Mod JK 42584)
V_{LO} (EXT) = V_{LE} = 200 KIAS (Flaps 9°) (Post Mod JK 42584)

CG Datum

The CG Datum is defined as fuselage station zero (Stn 0). This point is 3.58m (11ft 8in) forward of the weighing point which is marked by a screw on the bottom of the fuselage on the aircraft centre-line at Stn. 140.

CG Range

Pre Mod JM 41300:-

Weight lb	Fuselage Station Inches		
	Fwd Limit U/C UP	Fwd Limit U/C DOWN	Aft Limit U/C UP/DOWM
13000	308.35	310.00	322.00
16150	308.35	310.00	-
16834	-	-	329.10
18500	-	-	329.80
23000	321.38	322.54	329.80

Note: Straight line variations between weights and fuselage stations.

Post Mod JM 41300 or JK 42794:-

Weight lb	Fuselage Station Inches		
	Fwd Limit U/C UP	Fwd Limit U/C DOWN	Aft Limit U/C UP/DOWN
13000	308.35	310.00	322.00
16150	308.35	310.00	-
16834	-	-	329.10
18500	-	-	329.80
20700	316.82	318.15	329.80
24000	319.61	320.75	329.80

Note: Straight line variations between weights and fuselage stations.

Maximum Weights

Pre Mod JM 41300:-

Taxi and Ramp	10483 kg	23110 lb
Take-off	10433 kg	23000 lb
Landing	10115 kg	22300 lb
Zero Fuel	9389 kg	20700 lb
Jacking Weight	8981 kg	19800 lb

Post Mod JM 41300 or JK 42794:-

Taxi and Ramp	10936 kg	24110 lb
Take-off	10886 kg	24000 lb
Landing	10569 kg	23300 lb
Zero Fuel	9707 kg	21400 lb
Jacking Weight	8981 kg	19800 lb

Maximum Baggage/Cargo

544 kg (1200 lb) in the rear baggage bay.
159 kg (350 lb) in the ventral pod.
45 kg (100 lb) in the forward right hand stowage.
23 kg (50 lb) in the forward left hand stowage.

Hydraulic Fluid

Type	MIL-H-5606 UK DEF STAN 91-48	NATO H-515
Maximum Capacity	24.4L	

Minimum Crew

For all flights: pilot, co-pilot.

Maximum No. of Passengers

30

Maximum No. of Occupants

34 including crew.

Passenger Emergency Exits

1 x Type I	Port Forward
1 x Type II	Stbd Aft
2 x Type III	Overwing Port and Stbd

Maximum Operating Altitude

26,000 ft

25,000 ft when modifications JK 43414A and JK 43414B are embodied.

Levelling Means

Levelling beams are mounted at stn. 327 on the passenger seat rails. See Weight and Balance Manual.

Flying Control Surface Angular Travel

Rudder	± 24°
Trim Tab	9.24° Right, 8.25° Left
Ailerons	21.4° Up, 14.15° Down
Trim Tab	18.21° Up, 17.75° Down
Elevators	28° Up, 17° Down
Trim Tab	Port: Up 5.58° - Down 8.4°
	Stbd: Up 5.47° - Down 8.67°

Flap total angle of travel: 25°

All measured perpendicular to the hinge line.

The rigging instructions including tolerances are given in the Manufacturer's Maintenance Manual.

Undercarriage

Type	Hydraulically retractable tricycle
Track	6.096m (20 ft)
Wheelbase	7.315m (24 ft)

Number of wheels in nose-wheel unit: 2
Number of wheels in each main wheel unit: 2
Maximum tyre pressures (unloaded):
Nose-wheel tyres : 2.90 bars (42 psi)
Main wheel tyres : 8.28 bars (120 psi) (pre mod JM 41300)
8.62 bars (125 psi) (post mod JM 41300)

Load Classification Number

The Load Classification Number is 15.41.

Certification Basis

NOTES: (A) Reference date of application for JAA Certification:
24 May 1989.

1) Joint Type Certification Basis

JAR-25 as follows:

JAR-25-Large Aeroplanes Change 12	10 May 1988
Amendment (OP) 88/1	18 October 1988
JAR-1 Definitions Change 4	1 June 1987

Special Conditions:

JS41/01	-	NPA 25F-179 Rev 4 May 1989: Battery duration during Operation without normal electrical power (CRI F1).
JS41/02	-	NPA 25D-181 dated June 1988: Terminology “Resistant to Fire”. (CRI A7).
JS41/03	-	NPA 25D, F-191 Rev 2 dated May 1989: Miscellaneous electrical requirements. (CRI F2).
JS42-04	-	NPA 25C-205 dated June 1990: Unified discrete gust requirement and associated means of compliance. (CRI C1).
JS41/05	-	Special Condition relating to protection from external High Intensity Radiated Fields (HIRF). (CRI F3).
JS41/06	-	Special Condition relating to protection from the effects of lightning strikes. (CRI F4).
JS41/07	-	Special Condition on rapid decompression. (CRI C4).
JS41/08	-	NPA 25C, D-211 dated April 1989: Improved Seat Safety Standards. (CRI C6).

Post Type Certification;

JS41/09	-	Automatic Reserve Performance (ARP) – Performance credit for discontinued approach. (CRI B4. Closed 12 August 1994).
JS41/10	-	Performance Certification for category II operations (CRI B6. Closed 07 April 1995).
JS41/11	-	Aircraft Inflatable Restraint Systems (CRI C12. Closed 07 August 2000).
JS41/12	-	Enhanced Ground Proximity Warnings (CRI F13. Closed 08 January 2001).
JS41/13	-	Steep Approach and Landing Systems (CRI B9. Closed 26 January 2001)

2) BAe Elect to Comply Airworthiness Standards

Compliance has been shown with the following additional requirements and ACJ's.

- NPA 25B-182 dated 7 May 1987: Propeller Position at Minimum Control Speed.

- NPA 25B-190 dated 19 November 1986: High Speed Characteristics.

- NPA 25B-193 dated December 1988: Landing distance, second method.

- NPA 25D-210 dated December 1988: ACJ's associated with the adoption of FAR amendments 25-61/25-66.

- NPA 25C-213 dated 4 April 1992: Discrete source damage due to rotor burst.

Post Type Certification:

- NPA 25B, D, G-244 (March 1992) Accelerate Stop Distances (CRI B5. Closed 19 August 1993). The brake qualification requirements of the NPA was covered under CRI B3 'Worn Brakes' as part of the Type Certification of the Aircraft, by compliance with CAA Specification No.17, which can be accepted as an alternative to JAA INT/POL/25/6.

- NPA-AWO-3 (March 1992) All Weather Operations – Category 2 Operations (CRI A1- Post Type Certification).

- NPA 25B-215 October 1994 – Re-Certification of operational speeds in accordance with Vslg principals (CRI B8 Closed. 26 January 1996).

- FAA AC 20-138 Certification of Stand Alone Global Positioning System (CRI F11. Closed 29 September 1995).

3) Equivalent Safety Findings

Equivalent Safety Findings exist with respect to the following requirements of the JAR:-

3.1 JAR 25.729(e)(2) Landing gear aural warning (CRI D4).
3.2 JAR 25.783(f) External doors, means of preventing pressurisation (CRI D6).
3.3 JAR 25.815 Width of aisle (CRI D1).
3.4 JAR 25.1182(a) Fire protection of nacelle Zone 5 (CRI E3).

Post Type Certification:

3.5 JAR 25.729(e)(4) Landing Gear Aural Warnings (CRI D7. Closed 27 September 1993).

4) Exemptions

Exemptions have been granted against the following requirements of the JAR:-

Exemption JS41/01 - The JS41 Bulkheads/Structure in front of the forward left and right hand seat are Exempted from complying with the HIC of JAR 25.56(c)(5). This Exemption is valid until 1st January 1997 unless previously revoked.

Exemption JS41/02 Standby Compass Deviation.
The JS41 Standby Compass was exempted from complying with the requirements of JAR 25.1327(b). This exemption was valid until 30th June 1996 unless previously revoked. This exemption is no longer required as all aircraft are compliant (CRI F12 Issue 2. Closed 30 April 1996).

5) Environmental Standards

ICAO Annex 16 Volume 1, Second Edition Part II Chapter 3 and Volume 2, First Edition Part II Chapter 2 for noise and engine emissions respectively.

Note: The TPE 331-14GR and –14HR engines comply with the applicable fuel venting and engine emission requirements by design.

Authorised Operations

The JS4100 is certificated to operate in the following conditions subject to the condition that the aeroplane complies with the relevant national legislation concerning the level of equipment required and its availability:-

1) Day or night
2) VFR
3) IFR in and out of controlled airspace
4) Icing conditions
5) Extended overwater operations [Notes: a) this does not include ETOPS b) the JS4100 has not demonstrated compliance with JAR 25.801 Ditching].
6) CAT I
7) CAT II (Approved April 1995).

Certification Maintenance Requirements

JS4100 Certification Maintenance Requirements (CMR's) are listed in the JS4100 Manufacturers Maintenance Manual, Chapter 5.

Required Equipment

The basic required equipment as prescribed in the applicable airworthiness regulations (See Certification Basis) must be installed in the aircraft for certification. All of the required equipment that must be installed as well as optional equipment installations approved by the JAA are contained in the Jetstream 4100 Equipment Register AWR/063/JM41. The Illustrated Parts Catalogue also contains all equipment approved for installation in the aeroplane.

Service Information

The following publications provide the necessary information to enable the BAe JS4100 aircraft to be operated and maintained satisfactorily.

Aircraft Flight Manual Doc. No. J41-01.

Manufacturers Operations Manual. SA4.4100/MOM/-

Jetstream 4100 Maintenance Review Board Report.
Doc. No. J4100/MRB/1.

Manufacturers Maintenance Manual.
SA4.4100/AMM/-

Structural Repair Manual. SA4.4100/SRM/400

Wiring Diagrams Manual. SA4.4100/WM/-

Illustrated Parts Catalogue. SA4.4100/IPC/-

Weight and Balance Manual. SA4.4100/WBM/-

Master Minimum Equipment List. SA4.4100/MMEL/400.

Service Bulletins – approved under the authority of UK CAA Approval Number DAI/9386/92.