Type Acceptance Report

TAR 3/21B/12 – Revision 2

BRITTEN-NORMAN BN2 Series

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Executive Summary

New Zealand Type Acceptance has been granted to the Britten-Norman BN2A, BN2B and BN2T-4S Islander Series based on validation of UK CAA Type Certificate number UK.TC.A.00042. There are no special requirements for import.

Applicability is currently limited to the Models and/or serial numbers detailed in Section 2, which are now eligible for the issue of an Airworthiness Certificate in the Standard Category in accordance with NZCAR §21.191, subject to any outstanding New Zealand operational requirements being met. (See Section 5 of this report for a review of compliance of the basic type design with the operating Rules.) Additional variants or serial numbers approved under the foreign type certificate can become type accepted after supply of the applicable documentation, in accordance with the provisions of NZCAR §21.43(c).

NOTE: The information in this report was correct as at the date of issue. The report is generally only updated when an application is received to revise the Type Acceptance Certificate. For details on the current type certificate holder and any specific technical data, refer to the latest revision of the State-of-Design Type Certificate Data Sheet referenced herein.

1. Introduction

This report details the basis on which Type Acceptance Certificate No. 3/21B/12 was granted in the Standard Category in accordance with NZCAR Part 21 Subpart B.

Specifically the report aims to:

(a) Specify the foreign type certificate and associated airworthiness design standard used for type acceptance of the model(s) in New Zealand; and

(b) Identify any special conditions for import applicable to any model(s) covered by the Type Acceptance Certificate; and

(c) Identify any additional requirements which must be complied with prior to the issue of a NZ Airworthiness Certificate or for any subsequent operations.

The report notes the status of all models included under the State-of-Design type certificate which have been granted type acceptance in New Zealand, which are listed in Section 2. Appendix 1 details the type acceptance history under CAR Part 21B and which models were certificated prior to that under NZCAR Section B.9 and are now type accepted under the transitional arrangements of Part 21 Appendix A(c).

2. Aircraft Certification Details

(a) State-of-Design Type and Production Certificates:

Manufacturer: Britten-Norman Aircraft Limited

Supersedes:

Pilatus Britten-Norman Limited

Britten-Norman (Bembridge) Limited

Britten-Norman Limited

Type Certificate: UK.TC.A.00042
Issued by: Civil Aviation Authority – United Kingdom

Supersedes:

Type Certificate: EASA.A.388
Issued by: European Union Aviation Safety Authority

Production Approval: UK.21G.2523
Issued by: Civil Aviation Authority – United Kingdom

(b) Models Covered by the Part 21B Type Acceptance Certificate:

(i) **Models:** BN2A-20, BN2A-21, BN2B-20, BN2B-21

MCTOW: 6600 lb. [2994 kg]

Max. No. of Seats: 10

Noise Standard: ICAO Annex 16 Volume I

Engine: Lycoming IO-540-K1B5

Type Certificate: 1E4
Issued by: Federal Aviation Administration

Propeller: Hartzell HC-C2YK-2B/(C)8477(A)-4 or -6

Hartzell HC-C2YK-2C(U)(F)/(F)C8477(A)-4 or -6

Type Certificate: P-920
Issued by: Federal Aviation Administration

HC-C3YR-2UF/FC7693F – BN2B-20/21 (Mod NB-M-1772)

Type Certificate: P25EA
Issued by: Federal Aviation Administration

(ii) **Models:** BN2A-26, BN2A-27, BN2B-26, BN2B-27

MCTOW: 6600 lb. [2994 kg]

Max. No. of Seats: 10

Noise Standard: ICAO Annex 16 Volume I

Engine: Lycoming O-540-E4C5

Type Certificate: E-295
Issued by: Federal Aviation Administration

Propeller: Hartzell HC-C2YK-2B/(C)8477(A)-4 or -6

Hartzell HC-C2YK-2C(U)(F)/(F)C8477(A)-4 or -6

Type Certificate: P-920
Issued by: Federal Aviation Administration

HC-C3YR-2UF/FC8468-8R – BN2B-26/27 (Mod NB-M-1361)

Type Certificate: P25EA
Issued by: Federal Aviation Administration

(iii) **Model:** BN2T-4S

MCTOW: 8500 lb. [3855 kg]

Max. No. of Seats: 10

Noise Standard: ICAO Annex 16 Volume I

Engine: Rolls Royce 250-B17F/1

Type Certificate: E10CE
Issued by: Federal Aviation Administration

Propeller: Hartzell HC-C3YF-5F/FC7818K

Type Certificate: P25EA
Issued by: Federal Aviation Administration

Notes: 1. Refer to TCDS UK.TC.A.00042 for specific applicability of engine and propeller combinations to individual aircraft models.

2. Refer to Advisory Circular 21-1 Appendix 2 for the New Zealand type acceptance status of any engines and propellers listed above.

3. Application Details and Background Information

The Britten-Norman BN-2A Islander was originally accepted into New Zealand under the provisions of NZCAR B.9. The first examples were c/n 164 ZK-DBV and c/n 168 ZK-DBW registered to Mount Cook Airlines in 1970. The first application for New Zealand type acceptance under CAR Part 21B was for the BN-2B from the importer of the first two examples, Milford Sound Flightseeing, dated 18 October 2002. The first-of-type aircraft were BN2B-27 c/n 2168, registered ZK-MFN, and BN2B-26 c/n 2197 registered ZK-ZQN. The BN-2 Islander series is a ten-seat twin-piston-engine high-wing all-metal utility aircraft with fixed undercarriage.

Type Acceptance Certificate No. 3/21B/12 was granted on 10 January 2003 to the Pilatus Britten-Norman BN2B Islander based on validation of UK CAA Type Certificate BA8. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import.

This report was raised to Revision 1 to change to the latest format and to note the change in State-of-Design jurisdiction to the EASA type certificate.

Revision 2 was issued to add the BN2T-4S variant and all the earlier versions covered by the type acceptance certificate, and note the change in State-of-Design jurisdiction to the UK CAA type certificate. Type acceptance was granted on 23 June 2023

Model History:
The BN2 islander was an all-new light aircraft designed for ease of manufacture and repair and to be rugged with good STOL performance. An unusual feature is that the fuselage is just wide enough for a bench seat, and access is by individual side entry doors. The first Model BN2 was certificated in the Transport Category by the UK CAA in 1967 with a MCTOW of 5700 lb., which was quickly increased to 6000 lb. as the BN2A. The first in a long series of developments under individual modifications occurred with the increase in MCTOW from 6000 to 6300 lb. for the BN2A-8, which involved fitting a cambered leading edge between the engines and fuselage. Further changes included tip tanks which increased the wingspan to 53 feet, and the use of 300 hp fuel-injected engines. The final increase in MCTOW was to 6600 lb. achieved with drooped wing flaps, which increases the lift over the centre section of the wing. These are the four definitive production configurations of the Islander; the BN2A-20 Series, with either 260 or 300 hp engines and with or without wing tip fuel tanks.

The BN2B was introduced in 1979 when Pilatus purchased the company as a new "face-lifted" model defined by modification NB/M/978 and involved some minor or cosmetic changes, the most noticeable being a revised instrument panel. In order to get some distinct difference for the new model the landing weight was increased to the same as the MAUW of 6600 lb. As a marketing policy this was not made available for the BN2A, although a retrofit was later developed. There are the same four basic versions: the BN2B-26 and BN2B-27 have 260 hp naturally aspirated engines and are identical except the latter has the wing tip fuel tanks per modification NB/M/364. (See Supplement 1 to FM/40.) The BN2B-20 and -21 are the two equivalent versions fitted with the fuel-injected 300 hp powerplant option, with and without tip tanks.

The BN2T is the turbine-engined version of the Islander developed in 1981 in response to the fuel crisis and the expected shortage of Avgas, based around the Allison 250-B17C engine de-rated to 320 hp. MAUW is increased to 7000 lb. A distinguishing feature of the BN2T are large wing fences, to improve stall recovery.

The BN2T-2 was developed as a high-weight version using a complete Trislander wing with revised wingtips. The B17C engine was re-rated to 370 hp and the MAUW was increased to 8500 lb. This was further developed into the BN2T-4 with the installation of more powerful 400 hp 250-B17F engines. The first variant was the BN2T-4R AEW Defender version, defined by NB/M/1359, which had a large bulbous nose to house a radar antenna. The BN2T-4S Defender 4000 defined by NB/M/1545 has a conventional streamlined nose and stretched fuselage. (A 30-inch plug inserted forward of the LHS passenger door.) The wing is modified with increased internal fuel capacity, and the tailplane and elevator have been extended in span by 2 feet.

4. NZCAR §21.43 Data Requirements

The type data requirements of NZCAR Part 21B Para §21.43 have been satisfied by supply of the following documents, or were already held by the CAA:

(1) State-of-Design Type certificate:

Type Certificate Number UK.TC.A.00042

Type Certificate Data Sheet number A.00042 Issue 1 dated 05 September 2022
- Model BN2 approved 14 August 1967
- Model BN2A approved 31 July 1968
- Model BN2A-20 approved 16 July 1973
- Model BN2A-21 approved 07 December 1973
- Model BN2A-26 approved 07 June 1974
- Model BN2A-27 approved 16 August 1974
- Model BN2B-20 approved 09 October 1979
- Model BN2B-21 approved 10 December 1979
- Model BN2B-26 approved 02 April 1979
- Model BN2B-27 approved 02 April 1979
- Model BN2T-4S approved 15 November 1995

Supersedes:

EASA Type Certificate EASA.A.388 at Issue 2 dated 23 November 2020

UK CAA TCDS No. BA8 at Issue 9 dated September 1993

(2) Airworthiness design requirements:

(i) Airworthiness Design Standards:
The certification basis of the BN2A and BN2B Series is BCAR Section D – Aeroplanes – Issue 6 dated 1 November 1963, sub-sections D1, D3 and D4; plus BCAR Section K – Light Aeroplanes – Issue 1 dated 15 September 1966, sub-sections K2, K5, K6 and K7, plus Chapter K4-2 paragraph 3.2.2 bird impact requirements. (For comparison purposes the FAA type certification basis is FAR 23 effective February 1, 1965, including Amendment 23-1, plus five paragraphs at Amendment 23-7 plus one paragraph at Amendment 23-23.)

For the BN2T-4 Series the certification basis was upgraded by the addition of paragraphs from BCAR 23, JAR 23, BCAR Blue Papers (8x), CAA Airworthiness Notices (21x), and CAA Specifications (4x), plus BCAR Section N Noise and BCAR Section R Radio. See the TCDS UK.TC.A.00042 for full details.

This is an acceptable certification basis in accordance with NZCAR Part 21B Paragraph §21.41, as the older superseded BCAR Sections D and K were the airworthiness design standards applicable at that time for small aeroplanes, and are considered equivalent under Part 21 Appendix C(2) and Advisory Circular 21-1A. Four non-compliances were accepted by the UK CAA. These have been previously reviewed in NZ for the BN2A, and no additional special conditions have been prescribed by the Director under §21.23.

(ii) Special Conditions:
Nil

(iii) Exemptions:
The UK CAA, and subsequently EASA, accepted four non-compliances against BCAR Section D – Aeroplanes Issue 6, as follows:

Chapter D3-9 paragraph 5.1 – Elevator and Aileron Circuit Stiffness – Elevator system stretch was only 2% above the requirement. Aileron stiffness was below the limit, but investigation of the lateral characteristics showed no adverse features which affected handling, stability or control.

Chapter D4-4 paragraph 3.2.2 – Installation of Flight Equipment Seat – The non-compliance arose from fitting seats of improved structural strength. Britten Norman contended that as no part of the aircraft was less stiff or weakened levels of safety were maintained or improved.

Chapter D4-5 paragraph 3.6.2 – Brake Pedal Foot Load – A test witnessed by the ARB showed a reasonable maximum foot load which was unlikely to be exceeded in all conditions was 112 lb. The brake limit load for design clearance purposes was therefore agreed by ARB at 180 lb.

Chapter D4-8 Appendix paragraph 8 – Control Circuit Static Frictions – Maximum static forces on the controls were above specified requirements, but aircraft characteristics were not affected by these increased frictions to a degree which would render the aircraft unacceptable.

(iv) Airworthiness Limitations:
Nil (See SB190 Corrosion Affecting Primary Structure [5-yearly inspection])

(3) Aircraft Noise and Engine Emission Standards:

(i) Environmental Standard:
BN-2B manufactured after 1 January 1980 are required to comply with the Standards of ICAO Annex 16, Volume I, Chapter 6. (Flight Manual FM/40 Section 2 Limitations states: "Compliance with BCAR Section N-Noise has been demonstrated at the maximum recommended normal climb power of 2500 RPM and full throttle.")

The BN2T-4S complies with ICAO Annex 16 Chapter 10.4a.

(ii) Compliance Listing:
TCDS for Noise UK.TC.A.00042 at Issue 1 dated 05 September 2022

Supersedes:
EASA TCDS for Noise number EASA.A.0388 at Issue 02 dated 20 October 2014

Model:	Engine:	Propeller:	MAUW:	Mod.s:	Noise Level:
BN2B-20	IO-540-K1B5	HC-C2YK-2 HC-C3YR-2UF	2994 kg	None	76.7 dB(A) 76.3 dB(A)
BN2B-26	O-540-E4C5	HC-C2YK-2 HC-C3YR-2UF	2994 kg	None	75.2 dB(A) 79.7 dB(A)
BN2T-4S	250-B17F/1	HC-C3YF-5F	3855 kg	None	80.0 dB(A)

(4) Certification Compliance Listing:

Type Record for the Britten-Norman "Islander". Includes:

- Design Certificates and Concessions
- Aircraft Data
- Aerodynamic and Aero-Elastic Data
- Weight Data
- Basic Stressing Data
- Strength Summary for Wing
- Strength Summary for Fuselage
- Strength Summary for Tail-Unit
- Strength Summary for Engine Mounting
- Strength Summary for Nacelle Structure & Undercarriage Extension Tube
- Strength Summary for Controls
- List of Approved Drawings
- Test Reports

Type Record Addendum No. 33 – BN.2B Islander – March 1979

Type Record Addendum No. A58 – Production BN2T-4S with Max. TOW 8500 lb to Modification NB/M/1545 App 2 Incorporating Modification NB/M/1324 Parts 1, 4, 5 & 6

Pilatus Britten-Norman BN2T-4S Islander – Compliance Check List Document No. PBN/BN2T-4S/CAA

(5) Flight Manual: Britten-Norman Islander – ARB-Approved Flight Manual FM/9 Model Designation: BN2A-2, BN2A-3, BN2A-20, BN2A-21 CAA Accepted as AIR 2073

Britten-Norman Islander – ARB-Approved Flight Manual FM/7 Model Designation: BN2A, BN2A-1, BN2A-6, BN2A-7, BN2A-8, BN2A-9, BN2A-26, BN2A-27 – CAA Accepted as AIR 2068

Britten-Norman Islander BN2B – C.A.A. Approved Flight Manual FM/41 – Model Designation: BN2B-20, BN2B-21 – CAA Accepted as AIR 3512

Britten-Norman Islander BN2B – C.A.A. Approved Flight Manual FM/40 – Model Designation: BN2B-26, BN2B-27 – CAA Accepted as AIR 2809

Pilatus Britten-Norman BN2T-4S – Pilot's Operating Handbook and CAA Approved Aircraft Flight Manual – Document Reference AFM/2T-4S – CAA Accepted as AIR 3986

(6) Operating Data for Aircraft, Engine and Propeller:

(i) Maintenance Manual:
BN2/BN2A/BN2B Islander Maintenance Manual – Ref. MM/1 (Vols 1 – 3)

BN2T-4S Islander Aircraft Maintenance Publication (AMP) – Ref. PN-A/AMP

BN2/BN2A/BN2B Islander Maintenance Schedule – Reference MS/1

Islander BN2T-4S Aircraft Maintenance Schedule Publication – PN-A / AMP-05

(ii) Current service Information:
Service Letter SL-00-001 – Britten-Norman List of technical Publication

Britten-Norman Service Bulletins – Table of Contents – FSI-SB-TOC

Britten-Norman Service Letters – Table of Contents – FSI-SL-TOC

(iii) Illustrated Parts Catalogue:
Islander Illustrated Parts Catalogue – Reference PC/1 (Vols 1 – 2)

Illustrated Parts Database Publication for BN2T-4S Islanders – PN-A / IPDP

(7) Agreement from manufacturer to supply updates of data in (5), and (6):

CAANZ has a current publications subscription from Britten-Norman Limited

(8) Other information:

Modification NB-M-984 – Islander designated BN-2B-26
Modification NB-M-985 – Islander designated BN-2B-27

Dispatch Deviation Guide Islander BN2A/BN2B – Document number DDG/01
BN2/BN2A/BN2B Islander Master Minimum Equipment List – Doc. MMEL/1

Dispatch Deviation Guide Islander BN2T-4S – Document number DDG/2T-4S
BN2T-4S Islander Master Minimum Equipment List – Doc. No. MMEL/2T-4S

Design Office Report ELA-C4006 – Electrical Load Analysis for C4006

5. New Zealand Operational Rule Compliance

Compliance with the retrospective airworthiness requirements of NZCAR Part 26 has been assessed as they are a prerequisite for the grant of an airworthiness certificate.

Civil Aviation Rules Part 26

Subpart B – Additional Airworthiness Requirements

Appendix B – All Aircraft

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
B.1	Marking of Doors and Emergency Exits	***To be determined on an individual aircraft basis***
B.2	Crew Protection Requirements – CAM 8 Appdx. B # .35	Not Applicable – Agricultural Aircraft only

Compliance with the following additional NZ operating requirements has been reviewed for the BN-2B Series and were found to be covered by either the original certification requirements or the basic build standard of the aircraft, except as noted:

Civil Aviation Rules Part 91

Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:		MEANS OF COMPLIANCE:	
91.505	Seating and Restraints – Safety belt/Shoulder Harness		BCAR K 6-1 3.3.1	
91.507	Pax Information Signs – Smoking, safety belts fastened		Not Applicable – Less than 10 passenger seats (Under BCAR K 6-1 4.7 – May be omitted as crew/passenger compartments are not separately enclosed)	
91.509	Minimum VFR			
	(1) ASI	BCAR K 6-1 3.1.1 – See Flight Manual Fig.2 Item 30	(8) Coolant Temp	N/A – Air-cooled engine
			(9) Oil Temperature	BCAR K 6-1 3.2.1(b) – See Flight Manual Fig.2 Item 46
	(2) Machmeter	N/A – No Mach No. limitations		
	(3) Altimeter	BCAR K 6-1 3.1.2	(10) Manifold Pressure	BCAR K.6-1 3.2.2(d) – See Flight Manual Fig.2 Item 41
	(4) Magnetic Compass	BCAR K 6-1 3.1.3 – See Flight Manual Fig.2 Item 5	(11) Cylinder Head Temp.	BCAR K.6-1 3.2.2(b) – See Flight Manual Fig.2 Item 45
	(5) Fuel Contents	BCAR K 6-1 3.2.1(c) – See FM Fig.2 Items 11 and 17	(12) Flap Position	BCAR K 4-8 2.2.4(d) – See Flight Manual Fig.2 Item 9
	(6) Engine RPM	BCAR K 6-1 3.2.2(a) – See Flight Manual Fig.2 Item 42	(13) U/c Position	N/A – Fixed undercarriage
	(7) Oil Pressure	BCAR K 6-1 3.2.1(a) – See Flight Manual Fig.2 Item 47	(14) Ammeter/Voltmeter	BCAR K6-12 8.8 – See Flight Manual Fig.2 Items 19 and 20
91.511	Night VFR Instruments and Equipment		(3) Anti-collision Lights	***Operational requirement – compliance as applicable***
	(1)Turn and Slip	BCAR K 6-1 5.1.3 – See Flight Manual Fig.2 Item 27	(4) Instrument Lighting	BCAR K 6-1 5.1.2 – See Flight Manual Fig.2 Item 68
	(2) Position Lights	BCAR K 6-1 5.1.1 – See Flight Manual Fig.2 Item 69		
91.513	VFR Communication Equipment		***Operational requirement – compliance as applicable***	
91.517	IFR Instruments and Equipment		(5) OAT	Fitted as Standard – See Flight Manual Fig.2 Item 7
	(1) Gyroscopic AH	BCAR K 6-1 5.3.2 – See Flight Manual Fig.2 Item 33	(6) Time in hr/min/sec	BCAR K 6-1 5.3.7 – See Flight Manual Fig.2 Item 76
	(2) Gyroscopic DI	BCAR K 6-1 5.3.3 – See Flight Manual Fig.2 Item 34	(7) ASI/Heated Pitot	Fitted as Standard – See Flight Manual Fig.2 Item 71
	(3) Gyro Power Supply	BCAR K 6-1 5.3.4		
	(4) Sensitive Altimeter	BCAR K 6-1 5.3.5 – See Flight Manual Fig.2 Item 35	(8) Rate of Climb/Descent	BCAR K 6-1 5.3.6 – See Flight Manual Fig.2 Item 36
91.519	IFR Communication and Navigation Equipment		***Operational requirement – compliance as applicable***	
91.523	Emergency Equipment: (a) More Than 9 pax – First Aid Kits per Table 7 – Fire Extinguishers per Table 8 (b) More than 20 pax – Axe readily accessible to crew (c) More than 61 pax – Portable Megaphones per Table 9		 ***Operational requirement – compliance as applicable*** ***Operational requirement – compliance as applicable*** Not Applicable – Less than 10 passenger seats Not Applicable – Less than 10 passenger seats	
91.529	ELT – TSO C126 406 MHz after 22/11/2007		***Operational requirement – compliance as applicable***	
91.531	Oxygen Indicators – Volume/Pressure/Delivery		***Operational requirement – compliance as applicable***	
91.533	Oxygen for non-Pressurised Aircraft:		Oxygen system not fitted as standard	
91.541	SSR Transponder and Altitude Reporting Equipment		***Operational requirement – compliance as applicable***	
91.543	Altitude Alerting Device – Turbojet or Turbofan		Not Applicable – Not turbojet or turbofan powered	
91.545	Assigned Altitude Indicator		***Operational requirement – compliance as applicable***	
A.15	ELT Installation Requirements		***To be determined on an individual aircraft basis***	

Civil Aviation Rules Part 135

Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:		MEANS OF COMPLIANCE:
135.355	Seating & Restraints – Shoulder harness flight-crew seats		BCAR K 6-1 3.3.1 and BCAR K 6-1 4.5
135.357	Additional Instruments (Powerplant and Propeller)		Certificated to FAR §23.1305
135.359	Night Flight	Landing light, Pax compartment	***Operational requirement – compliance as applicable***
135.361	IFR Operations	Speed, Alt, spare bulbs/fuses	***Operational requirement – compliance as applicable***
135.363	Emergency Equipment (Part 91.523 (a) and (b))		***Operational requirement – compliance as applicable***
135.367	Cockpit Voice Recorder		Not Applicable – Only for 2-crew helicopters
135.369	Flight Data Recorder		Not Applicable – Less than 10 passenger seats
135.371	Additional Attitude Indicator		Not Applicable – Not turbo jet or turbofan powered

NOTES: 1. A Design Rule reference in the Means of Compliance column indicates the Design Rule was directly equivalent to the CAR requirement, and compliance is achieved for the basic aircraft type design by certification against the original Design Rule.

2. The CAR Compliance Tables above were correct at the time of issue of the Type Acceptance Report. The Rules may have changed since that date and should be checked individually.

3. Some means of compliance above are specific to a particular model/configuration. Compliance with Part 91/119 operating requirements should be checked in each case, particularly oxygen system capacity and emergency equipment.

Attachments

The following documents form attachments to this report:

Copy of Type Certificate Data Sheet UK.TC.A.00042

Sign off

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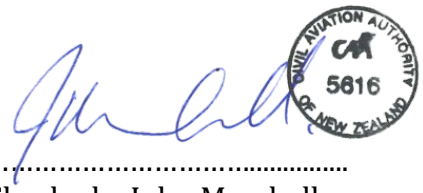
David Gill
Team Leader Aircraft Inspection



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Checked – John Marshall
Airworthiness Inspector

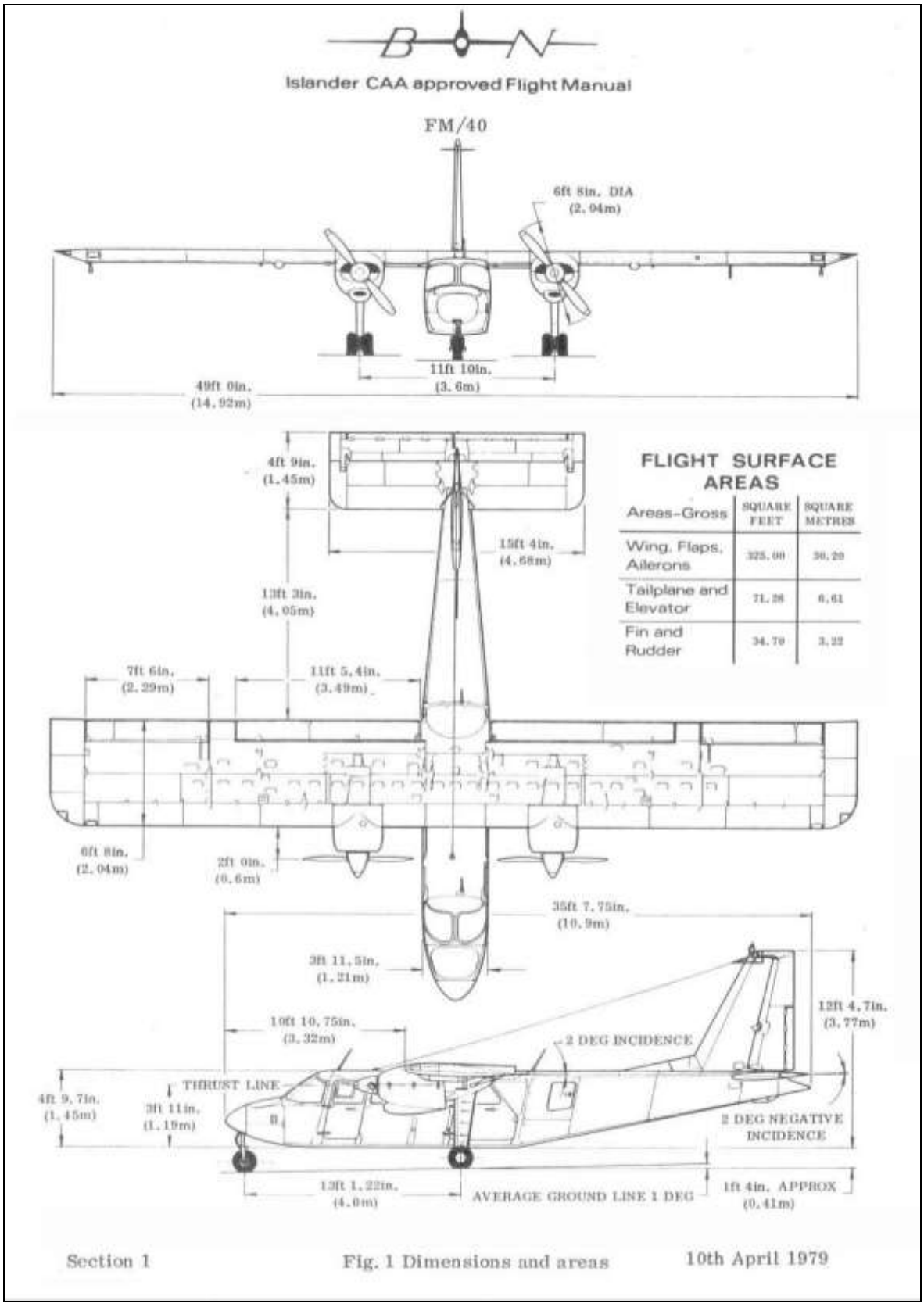
Appendix 1

List of Type Accepted Variants:

Model:	*Applicant:*	*CAA Work Request:*	*Date Granted:*
BN2A Series	AC 21-1.2/NZCAR Part 21 Appendix A(c)		
BN2B Series	Milford Sound Flightseeing	3/21B/12	6 March 2003
BN2T-4S	Britten-Norman Aircraft Limited	23/21B/16	23 June 2023

Appendix 2

Three-view drawing Britten-Norman BN2B Islander:



Three-view drawing Britten-Norman BN2T-4S Islander:

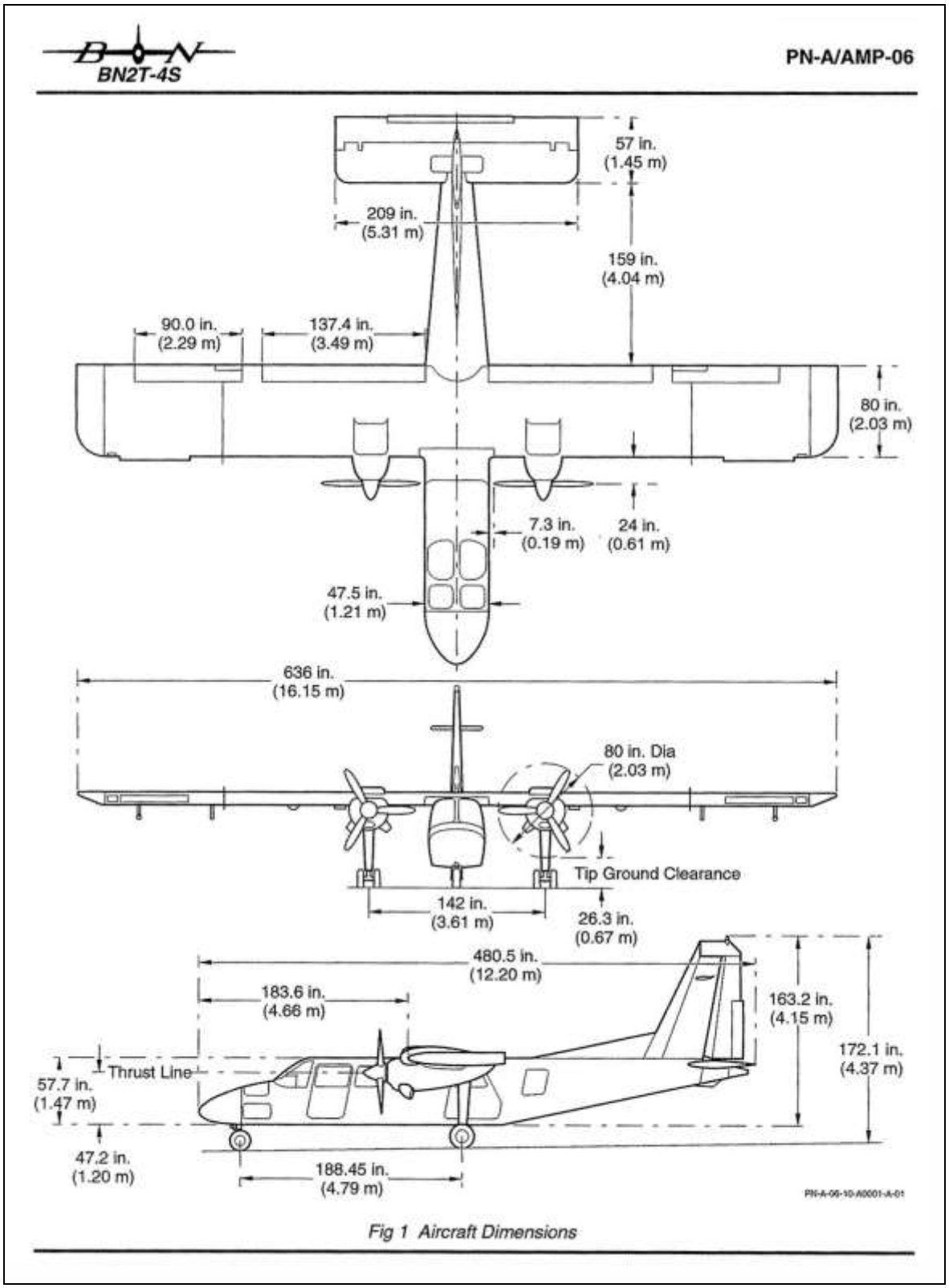


Fig 1 Aircraft Dimensions