Type Acceptance Report

TAR 8/21B/18

BELL 47J-2 Series

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Executive Summary

New Zealand Type Acceptance has been granted to the Bell 47J-2/A based on validation of FAA Type Certificate number 2H1. There are no special requirements for import.

Applicability is currently limited to the Models and/or serial numbers detailed in Appendix 1, which are now eligible for the issue of an Airworthiness Certificate in the Standard Category in accordance with NZCAR §21.177, 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).

1. Introduction

This report details the basis on which Type Acceptance Certificate No.8/21B/18 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.

2. ICAO Type Certificate Details

Manufacturer:	Bell Helicopter Textron	
Type Certificate:	2H1	
Issued by:	Federal Aviation Administration	
Model(s):	47J-2	47J-2A
MCTOW	2850 lb.	2950 lb.
Max. No. of Seats:	4	
Noise Standard:	Not Applicable	
Engine:	Lycoming VO-540-B1B or –B1B3	
	Type Certificate: E-304	
	Issued by: Federal Aviation Administration	

3. Type Acceptance Details

The application for New Zealand type acceptance of the Bell 47J-2 was from the importer, Kiwi Kopters Tauranga Ltd dated 12 December 2007. The first-of-type example was serial number 1865, registered ZK-HGI. The Bell 47J is a four-seat skid-equipped light transport helicopter of conventional configuration with two-blade teetering rotor system.

Type Acceptance Certificate No. 8/21B/18 was granted on 12 February 2008 to the Bell 47J-2 and 47J-2A based on validation of FAA Type Certificate 2H1. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand.

The 47J was a 4-seat utility version of the Bell 47G, using an extended cabin with the pilot seated centrally in the front and a three-passenger bench seat in the rear. The new stressed-skin tail boom off the Model 47H replaced the old welded steel-tube boom and the engine compartment was fully-enclosed. The 47J-2 was a development of the 47J, with metal main rotor blades, fixed stabilizer, VO-540 engine and blue tinted windows. The 47J can be converted into the 47J-2 in accordance with Bell Service Instruction No. 350 S.I.

This particular helicopter has been registered before as ZK-HGO, but was de-registered in 1985 and type acceptance had lapsed. There have also been two previous examples of the Bell 47J-2A on the NZ Register, ZK-HCP and ZK-HCU. In Australia serial number 1865 had been converted to the Bell 47J-2/A2 configuration in accordance with Rotor & Wing Engineering Order 121, which basically involved the installation of a VO-435-B1A engine.

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) ICAO Type certificate:

FAA Type Certificate Number 2H1
FAA Type Certificate Data Sheet no. 2H1 at Revision 13 dated February 18, 2005
– Model 47J-2 approved January 14, 1960
– Model 47J-2A approved March 4, 1964

FAA Type Certificate Data Sheet no. E-304 at Revision 7 dated March 11, 1986
– Model VO-540-B1B approved October 15, 1959
– Model VO-540-B1B3 approved December 6, 1960

(2) Airworthiness design requirements:

(i) Airworthiness Design Standards:
The certification basis of the Bell 47J Series is CAR 6 effective January 6, 1951, including Amendments 6-1 through 6-6, plus structural loading conditions for skid landing gear dated 11-12-74. This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41 and Advisory Circular 21-1A, as CAR 6 is the predecessor to FAR 27, which is the basic standard for Normal Category Rotorcraft called up under Part 21 Appendix C. There are no non-compliances and no additional special conditions have been prescribed by the Director under §21.23.

(ii) Special Conditions:
FAA Letter dated 27 April 1971 with attachment "Structural Loading Conditions for Skid landing Gear". (This is a different date to that referenced on the TCDS, but the FAA advised the content was the same.)

(iii) Equivalent Level of Safety Findings:
Nil

(iv) Airworthiness Limitations:
See TCDS Note 6 and Bell Information Letter 47-00-7.

(3) Environmental Certification:

Not applicable

(4) Certification Compliance Listing:

Bell Rpt 47-030-050 – Basic Design Criteria Model 47J (HUL-1) & 47K (HTL-7)

Bell Report No. 47-030-051 – Structural Analysis of Fuselage & Skid Gear Model 47J (HUL-1) and Model 47K (HTL-7) at Revision H (47J, 47J-2, 47K, 47J-2A)

(5) Flight Manual: FAA-Approved Flight Manual Model 47J-2 dated January 13, 1960
CAA Accepted as AIR 3023

FAA-Approved Flight Manual Model 47J-2A dated March 4, 1964
CAA Accepted as AIR 3024

(6) Operating Data for Aircraft:

(i) Maintenance Manual:
47J-2 & 47J-2A-M&O – Maintenance and Overhaul Instructions

(ii) Current service Information:
Bell Alert Service Bulletins, Service Information Letters and Technical Bulletins are available on their website at http://www.bellcustomer.com/files/#downloads.

(iii) Illustrated Parts Catalogue:
47J-2 & 47J-2A-IPB – Illustrated Parts Breakdown

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

Email from Bell Commercial Publications Distribution Centre dated 19 Feb 2008

(8) Other information:

Bell Report No. 47-947-083 – Detail Specification for Bell Model 47J-2

5. Additional New Zealand Requirements

Compliance with the retrospective airworthiness requirements of NZCAR Part 26 is a prerequisite for the grant of a type acceptance 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

Appendix E – Helicopters

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
E.1	Doors and Exits	Complies by inspection
E.2.1	Emergency Exit Marking	CAR 6.357(3)

Compliance with the following additional NZ operating requirements has been reviewed 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		CAR 6.605(b) – (safety belt P/N 47-706-651 installed in accordance with Service Instruction 305SI)	
91.507	Pax Information Signs – Smoking, safety belts fastened		Not Applicable – Less than 10 passenger seats	
91.509	Minimum Instruments and Equipment			
	(1) ASI	CAR 6.603(a) *	(8) Coolant Temp	N/A – Air-cooled engine
	(2) Machmeter	N/A	(9) Oil Temperature	CAR 6.604(a)(3) *
	(3) Altimeter	CAR 6.603(b) *	(10) Manifold Pressure	CAR 6.604(b)(3) *
	(4) Magnetic Compass	CAR 6.603(c) *	(11) Cylinder Head Temp.	CAR 6.604(b)(1) *
	(5) Fuel Contents	CAR 6.604(a)(1) *	(12) Flap Position	N/A – Helicopter
	(6) Engine RPM	CAR 6.604(a)(4) *	(13) U/c Position	N/A – Fixed skid landing gear
	(7) Oil Pressure	CAR 6.604(a)(2) *	(14) Ammeter/Voltmeter	***Compliance as applicable***
	* – Fitted as Standard – See Detailed Specification, Bell Report 46-947-083 and Appendix I Standard Equipment List			
91.511	Night VFR Instruments and Equipment			
	(1)Turn and Slip	***Compliance as applicable***	(3) Anti-collision Lights	CAR 6.637
	(2) Position Lights	CAR 6.632	(4) Instrument Lighting	CAR 6.630
	Approved for night flying if Bell Night Flying Kit No. 47-708-515 installed in accordance with Service Instruction 297SI			
91.513	VFR Communication Equipment		***Operational requirement – To be determined as applicable***	
91.517	IFR Instruments and Equipment		N/A – Basic helicopter is limited to day VFR conditions	
91.519	IFR Communication and Navigation Equipment		N/A – Basic helicopter is limited to day VFR conditions	
91.523	Emergency Equipment:			
	(a) More Than 9 pax - First Aid Kits per Table 7		Not Applicable – Less than 10 passenger seats	
	- Fire Extinguishers per Table 8		Not Applicable – Less than 10 passenger seats	
	(b) More than 20 pax - Axe readily accessible to crew		Not Applicable – Less than 20 passenger seats	
	(c) More than 61 pax - Portable Megaphones per Table 9		Not Applicable – Less than 61 passenger seats	
91.529	ELT - TSO C91a or C126 after 1/4/97 (or replacement)		***To be determined on an individual aircraft basis***	
91.531	Oxygen Indicators - Volume/Pressure/Delivery		Not fitted as Standard	
91.533	Oxygen for Non-Pressurised Aircraft:		***Operational requirement – To be determined as applicable***	
91.541	SSR Transponder and Altitude Reporting Equipment		***Operational requirement – To be determined as applicable***	
91.543	Altitude Alerting Device - Turbojet or Turbofan		Not Applicable – Not turbojet or turbofan powered	
91.545	Assigned Altitude Indicator		N/A – Basic helicopter is limited to day VFR conditions	
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 and Restraints – Shoulder harness flight-crew seats		See under §91.505
135.357	Additional Instruments (Powerplant and Propeller)		Basic instruments required under FAR §27.1305 are fitted
135.359	Night Flight	Landing light, Pax compartment	***Operating Requirement – Compliance as applicable***
135.361	IFR Operations	Speed, Alt, spare bulbs/fuses	N/A – Basic helicopter is limited to day VFR conditions
135.363	Emergency Equipment (Part 91.523 (a) and (b))		***Operating Requirement – Compliance as applicable***
135.367	Cockpit Voice Recorder		N/A – Only for 2-crew helicopters with more than 10 pax
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

Attachments

The following documents form attachments to this report:

Photographs first-of-type example Bell 47J-2 s/n 1865 ZK-HGI
Bell Drawing No. 47-976-032 – Helicopter Assembly Model 47J
Copy of FAA Type Certificate Data Sheet Number 2H1

Sign off

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David Gill
Team Leader Airworthiness

Checked – AWE Peter Gill
Date: 16 April 2008

Appendix 1

List of Type Accepted Variants:

Model:	*Applicant:*	*CAA Work Request:*	*Date Granted:*
47J-2 and 47J-2A	Kiwi Kopters Tauranga Ltd	8/21B/18	12 February 2008