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# **Type Acceptance Report**

**TAR 1/21B/1**

**HAI Y12 IV**



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## Introduction

This report details the basis on which Type Acceptance Certificate No.1/21B/1 was granted in the Standard Category in accordance with NZCAR Part 21 Subpart B.

Specifically the report aims to:

- (a) Record the airworthiness certification standard used for type acceptance of the applicable model in New Zealand;
- (b) Summarise any outstanding requirements that must be complied with for the issue of a NZ Airworthiness Certificate to any models covered by the Type Acceptance Certificate.

## Foreign Type Certificate Details

Type Certificate:	A00006WI
Issued by:	Federal Aviation Administration
Manufacturer:	Hafei Aviation Industry Company Limited
Model:	Y12 IV
Engines:	2x Pratt & Whitney Canada PT6A-27
Propellers:	2x Hartzell HC-B3TN-3B/T10173(N)B-3
MCTOW	12,500 lb (5670 kg)
Noise Category:	FAR 36, including Amendments 36-1 through 36-20 [Takeoff noise level 82.9 db(A)]

The certification basis of the Y12 IV is FAR Part 23 effective February 1, 1965, including Amendments 23-1 through 23-42. This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41, as FAR 23 is the basic standard for Commuter Category Airplanes called up under Part 21 Appendix C. There are no non-compliances and no special conditions have been prescribed by the Director under §21.23.

## Type Acceptance Application

The application for New Zealand type acceptance was from the Australian agent for the Y12 aircraft, Aircraft Technical Marketing, dated July 2000.

Type Acceptance Certificate No.1/21B/1 was granted on 24 November 2000.

The Yunshuji-12 (transport aircraft 12) is an enlarged development of the Y-11, a 10-11 seat piston twin light transport powered by two AI-14 radial engines. The Y-12 prototype first flew in 1982, and there have been three series production versions:

- Y12 (I) – Initial version with 500 shp PT6A-11 engines, 93” diameter propellers, leading edge slats, seating for 17 passengers and a MTOW of 5000 kg.
- Y12 (II) – Later production version with higher-rated 600 shp PT6A-27 engines, plain leading edge, 98” diameter propellers and MTOW increased to 5300 kg. The UK CAA issued Type Certificate FA49 for this variant in 1990 and examples are in operation in Malaysia and Fiji.
- Y12 (IV) – Improved model with sweptback wingtips, redesigned seating for 18-19 passengers and max. weight increased to 5700 kg. The Canadian Aerospace Corporation markets a version of the aircraft under the Twin Panda name as a DHC-6 replacement.

The Y12 was originally produced by Harbin Aircraft Manufacturing Corporation (HAMC), and under Chinese commercial arrangements is marketed by the China Aviation Technology Import and Export Company (CATIC). HAMC has subsequently been reorganised in 1999 as Hafei Aviation Industry Co. Ltd (HAI), responsible for the Y12 and other sub-contract work.

## Type Data

The type data requirements of NZCAR Part 21B Para §21.43 have been satisfied by supply of the following documents:

- (1) Type certificate: FAA TC No. A00006WI for Harbin Y12 IV issued March 25, 1995  
FAA TCDS No. A00006WI at Revision 3 dated July 16, 1996
- (2) Airworthiness design requirements: Already held by the CAA
- (3) Certification compliance listing:  
Type Qualification for Y12IV Aircraft – Conformity Check List – April 23, 1994  
Flight Test Report No. Y12IV-FB-1051 – Takeoff Noise Certification Test  
HAMC Report Y11T-JS-413 – Fatigue Life Substantiation – Dec.2, 1988
- (4) Flight manual: HAMC Y12 IV Pilot’s Operating Handbook and CAAC Approved Aircraft Flight Manual – Y12 IV SJW1 – CAA Accepted as AIR 2699
- (5) Illustrated Parts Catalogue:  
HAMC Y12IV Illustrated Parts Catalog – Y12 IV SJW7 (Volumes 1-5)
- (6) Maintenance manual and service data for aircraft, engine and propeller:  
HAMC Y12IV Aircraft Maintenance Manual – Y12 IV SJW4 (Volumes 1-5)  
Maintenance Data already held by the CAA for the engine and propeller
- (7) Agreement from manufacturer to supply updates of data in (4), (5) and (6):  
Letter from Hafei Aviation Industry Co. Chief Designer dated May 18, 2000.
- (8) Other information:

HAMC ZHZ-904 – Control Procedure for Corrective and Preventive Actions  
 HAMC ZHZ-2002 – After-Sales Service Control Procedure for Delivered Aircraft  
 HAMC ZHZ-2004 – Preparation and Accomplishment of Aircraft SB and SL  
 HAMC ZHZ-2005 – The Disposal Procedure of Field-Feedback Quality

Information

HAMC ZHZ-2106 – Report Management Procedure of Fault, Failure and Defect

## Additional New Zealand Certification requirements

Compliance with the following additional NZ 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 26

#### Subpart B - Additional Airworthiness Requirements

##### Appendix B - All Aircraft

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
B.1	Marking of Doors and Emergency Exits	FAR §23.811(b) for Commuter Category
B.2	Crew Protection Requirements - CAM 8 Appdx. B # .35	Agricultural Aircraft – <i>Not Applicable</i>

##### Appendix C - Air Transport Aircraft - More than 9 Pax

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
C.1	Doors and Exits	FAR §23.807(b) and §23.807(d)(2)
C.2.1	Additional Emergency Exits - per FAR 23.807(b) @ 10.5.93 For 16-23 passengers must have one exit on the same side as the passenger door and two exits on the opposite side.	FAR §23.807(d)(1)(ii) – Main passenger/cargo door on the port side at Fr.16-20, Emergency exits on either side at Fr.9-11 and one at Fr.16-18 on the starboard side.
C.2.2	Emergency Exit Evacuation Equipment – Descent means	FAR §23.807(d)(1) – Y12 exits less than 2m from the ground
C.2.3	Emergency Exit Interior Marking - Size/self-illuminating	FAR §23.811(b) for Commuter Category
C.3.1	Landing Gear Aural Warning - Automatic Flap Linking	<i>Not Applicable</i> – Fixed undercarriage

### Civil Aviation Rules Part 91

#### Subpart F - Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
91.505	Shoulder Harness if Aerobatic; >10 pax; Flight Training	IPECO pilot seat includes shoulder belt – see Flight Manual § 7.15
91.507	Pax Information Signs - Smoking, safety belts fastened	Distributor advises these are fitted as standard <i>To be determined on an individual aircraft basis</i>
91.509 Min. VFR	(1) ASI (2) Machmeter (3) Altimeter (4) Magnetic Compass (5) Fuel Contents (6) Engine RPM (7) Oil Pressure * Fitted as standard – see Flight Manual Fig. 7-9a	FAR §23.1303(a) * #1 N/A FAR §23.1303(b) * #3 FAR §23.1303(c) FAR §23.1305(a) * #21 FAR §23.1305(d)(e) * #18 FAR §23.1305(b) * #19 (8) Coolant Temp (9) Oil Temperature (10) Manifold Pressure (11) Cylinder Head Temp. (12) Flap Position (13) U/c Position (14) Ammeter/Voltmeter N/A - Turbine engaged FAR §23.1305(c) * #19 N/A - Turbine engaged N/A - Turbine engaged FAR §23.699(a)(2) * #27 N/A – Fixed undercarriage FAR §23.1351(d) – Both fitted as standard – see FM Fig.7-9a #47
91.511 Night	(1) Turn and Slip (2) Position Lights Fitted as std – FM Fig. 7-9a #6 FAR §23.1385 – see FM §7.27	(3) Anti-collision Lights (4) Instrument Lighting FAR §23.1401 – See FM §7.27 FAR §23.1381 – See FM §7.27
91.517 IFR	(1) Gyroscopic AH (2) Gyroscopic DI (3) Gyro Power Supply (4) Sensitive Altimeter Fitted as std – FM Fig. 7-9a #2 Fitted as std – FM Fig. 7-9a #7 FAR §23.1331(a)(3) Encoding altimeter 101420-11934 fitted as standard	(5) OAT (6) Time in hr/min/sec (7) ASI/Heated Pitot (8) Rate of Climb/Descent Fitted as std – FM Fig.7-9a #10 Fitted as std – FM Fig.7-9a #31 Fitted as std – see FM §7.29 VSI fitted as standard – see Flight Manual Fig.7-9a #8
91.519	IFR Communication and Navigation Equipment	Standard IFR installation includes: Collins VHF-251 and HF-230 radios; Collins ADF-650A ADF and DME-451 DME; Collins VIR-351 VOR and MKR-350 Marker Beacon;
91.523 Emergency	(a) More Than 10 pax - First Aid Kits per Table 7 - Fire Extinguishers per Table 8	<i>To be determined on an individual aircraft basis</i> 2 hand-held fire extinguishers fitted as std – see FM

Eqpmt.	(b) More than 20 pax - Axe readily acceptable to crew (c) More than 61 pax - Portable Megaphones per Table 9	<i>N/A – maximum 19 passengers</i> <i>N/A – Less than 61 passengers</i>
91.529	ELT - TSO C91a after 1/4/97 (or replacement)	<i>To be determined on an individual aircraft basis</i>
91.531	Oxygen Indicators - Volume/Pressure/Delivery	<i>Operational requirement - To be determined as required</i>
91.533 Unpress. A/c	>30 min above FL100 - Supplemental for crew, 10% Pax - Therapeutic for 3% of Pax Above FL100 - Supplemental for all Crew, Pax - Therapeutic for 1% of Pax - 120I PBE for each crew member	Not fitted as standard (Maximum operating altitude specified in Flight Manual Limitations Section is 23,000 ft.) Portable Oxygen System available as an option – see Flight Manual Supplement No.6
91.541	SSR Transponder and Altitude Reporting Equipment	Collins TDR-950 fitted as standard equipment [KT76A Optional]
91.543	Altitude Alerting Device - Turbojet or Turbofan	<i>N/A – Turboprop powered</i>
91.545	Assigned Altitude Indicator	<i>Operational requirement - To be determined as required</i>
A.15	ELT Installation Requirements	<i>To be determined on an individual aircraft basis</i>

## Civil Aviation Rules Part 125

### Subpart F - Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
125.355	Seating and Restraints	FAR §23.785
125.357	Additional Instruments (Powerplant and Propeller)	FAR §23.1305 at Amendment 42 effective February 4, 1991
125.359	Night Flight	Landing light, Pax compartment
125.361	IFR Operations	Speed, Alt, spare bulbs/fuses
125.361	SE IFR Requirements – If Applicable	<i>N/A – Only applicable to single-engined aircraft</i>
125.363	Emergency Equipment (Part 91.523 (a) and (b))	<i>To be determined on an individual aircraft basis</i>
125.365	Public Address and Crew Member Intercom System	AUD-251A intercom fitted as standard – Passenger Address currently standard equipment on the Y12 II Model <i>To be determined on an individual aircraft basis</i>
125.367	Cockpit Voice Recorder	Fairchild A100A CVR available as optional fit – See FMS No.17
125.369	Flight Data Recorder	Not fitted as standard equipment or presently available as an option <i>To be determined on an individual aircraft basis</i>
125.371	Additional Attitude Indicator	<i>N/A – Turboprop powered</i>
125.373	Weather Radar	<i>N/A – MCTOW less than 5700 kg. [RDR-1400C optional fit]</i>
125.375	Ground Proximity Warning System	<i>N/A – MCTOW less than 5700 kg.</i>
125.377	HUMS	<i>N/A – Only applicable to single-engined aircraft</i>

## Summary

Type Acceptance Certificate No. 1/21B/1 has been granted to the Harbin Model Y12 IV and serial numbers 008 and up, per the FAA type certificate, are now eligible for the issue of a New Zealand Airworthiness Certificate in the Standard Category in accordance with CAR §21.177, subject to any outstanding operational requirements noted above being met.

## Attachments

The following documents form attachments to this report:

- Three-view drawing Harbin Model Y12 IV
- Copy of FAA Type Certificate/Type Certificate Data Sheet A00006WI



**Sign off**

David Gill  
Team Leader Airworthiness

Date: 24 November 2000