Type Acceptance Report

TAR 3/21B/13 – Revision 1

SCHEMPP-HIRTH DUO DISCUS T

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Executive Summary

New Zealand Type Acceptance has been granted to the Schempp-Hirth Duo Discus T Series based on validation of EASA Type Certificate number EASA.A.074. 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(b).

1. Introduction

This report details the basis on which Type Acceptance Certificate No. 3/21B/13 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:	Schempp-Hirth Flugzeugbau GmbH
Model:	Duo Discus T
Type Certificate:	EASA.A.074
Issued by:	European Aviation Safety Agency
	(Previously covered by LBA Type Certificate Nr. 890)
MCTOW	700 kg [1543 lb.] – with Water Ballast 750 kg [1654 lb.] – with MB 890-6
Max. No. of Seats:	2
Noise Standard:	Aircraft Noise Protection Requirements (LSL)
Engine:	Solo Type 2350 D
Propeller:	OE-FL 5.110/83 av

3. Type Acceptance Application

The application for New Zealand type acceptance was from the local agent, Sailplane Services Ltd, dated 23 October 2002. The application was supported by a package of data provided directly from the manufacturer. The first-of-type examples were serial numbers 59 and 60, registered as ZK-GPX and ZK-GTN respectively. The Duo Discus T is a non-self launching powered version of the two-seat Standard Class Duo Discus, which was type accepted under TAR 98/02. (The glider may be flown with its power plant temporarily removed or inoperative, in accordance with the directions given in the Flight Manual.)

Type Acceptance Certificate Number 3/21B/13 was granted on 2 December 2002 to the Schempp-Hirth Duo Discus T based on validation of LBA Type Certificate number 890. There are no special requirements for import into New Zealand.

This report was raised to Revision 1 to include the latest production version Duo Discus T with MB 890-7, which uses different revision status manuals. The opportunity was also taken to record the change to EASA type certificate responsibility. The application was from the manufacturer dated 1 December 2010 and the first-of-type was serial number 222, registered ZK-GXT. Type Acceptance of this variant was granted on 9 December 2010.

There have been two major modifications introduced to the Duo Discus in production, which result in different marketing names. MB 890-6 introduced substantial changes with the use of predominately CFRP for the wing; provision for the installation of winglets; new extended main landing gear strut; and changes to the airbrake system to link with the landing flap. The commercial designation is the Duo Discus (x)T. MB890-7 adds a 10cm longer front fuselage with a redesign of the cockpit area; installation of a battery mounting in the vertical fin; modified Schempp-Hirth airbrakes; and a new engine control unit TB06. The sales code for this configuration is Duo Discus (xL)T.

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) Type certificate:

LBA Type Certificate Nr. 890 for Duo Discus T – Date of Issue 21.12.2001
Powered Sailplane Data Sheet No. 890 – Issue 1 dated December 21, 2001

Now superseded by:

EASA Type Certificate Data Sheet EASA.A.074 Issue 05 dated 25 November 2009
- Model Duo Discus T LBA approved 21 December 2001
- Duo Discus (x)T [MB 890-6] EASA approved 24 October 2006
- Duo Discus (xL)T [MB 890-7] EASA approved 14 March 2008

LBA Type Certificate Nr. 4603 for Solo 2350 D Flugmotor – Issued 18.12.2001
Geräte-Kennblatt (TCDS) Nr. 4603 Solo 2350 series – Ausgabe 5 18.Dezember 01

Propeller data sheet no. OE-FL./83 – Edition 7 – Dec 07, 2001

(2) Airworthiness design requirements:

(i) Airworthiness Design Standards:

The certification basis of the Duo Discus T is the Joint Airworthiness Requirements for Sailplanes and Powered Sailplanes (JAR-22), effective on 28.October 1995 (Change 5 of the English Original issue.). Additional requirements were the LBA Standards for the Structural Substantiation of Sailplane and Powered Sailplane Components consisting of Glass or Carbon fiber Reinforced Plastic, Issue of July 1991; and Additional Requirements for the installation of a water ballast system into the fin for compensating the nose-heavy moment of seat load and of water ballast in wing tanks. (I4 – I413/89 dated October 25, 1989); plus Draft NPA 22 D-46 dated April 7, 1994, relating to JAR 22.785(e)(f) "Seat and Restraint System" and Draft NPA 22 D-64 dated October 2, 1997, relating to JAR 22.788 "Head Rests". One special compliance was established on the basis of an equivalent level of safety for JAR 22.1093(a). This is commonly granted to powered gliders with 2-stroke engines, and was reviewed and accepted by the CAA.

This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41, as JAR-22 is an acceptable certification basis for sailplanes and powered sailplanes in accordance with Advisory Circular 21-1A. There are no non-compliances and no additional special conditions have been prescribed by the Director under §21.23. The Duo Discus T is approved for Day VFR flight only.

(ii) Special Conditions:

Nil

(iii) Equivalent Level of Safety Findings:

JAR 22.207(c) – With the C.G. in the rearward position the stall warning begins above 1.1 $V_{S1,}$ because the pitot pressure in the tailplane is affected by the fuselage wake at high AOA. However this is acceptable because IAS values drop quickly and still give the pilot a good warning that the stall is approaching.

Substantiation Report JAR 22.1093 Equivalent Level of Safety – No carburettor heat is provided, on the basis sufficient heating is accomplished due to the proximity of the cylinders, and the satisfactory field experience of over 500 gliders equipped with this type of two-cycle engine.

(iv) Airworthiness Limitations:

See Maintenance Manual §3.3 Special Inspections of the Airframe

(3) Aircraft Noise and Engine Emission Standards:

(i) Environmental Standard:

The Flight Manual states the Noise Certificate is based on the German Aircraft Noise Protection Requirements (LSL), Revision of January 1, 1991, and includes the supplement dated April 6, 2000. (EASA TCDS states none.)

(ii) Compliance Listing:

At 300 m (984 ft) AGL, the measured fly-over noise level of the Duo Discus T" is 57.3 dB(A) – See Flight Manual Section 5.3.3

(4) Certification Compliance Listing:

Nachweisliste (Mz) Compliance Checklist – Geräte-Nr.: 890 – Schempp-Hirth Type: Duo Discus T dated 26.7.2001
Nachweisliste (Mz) Duo Discus T – Modification Bulletin 890-6 dated 19.01.2006
(Mz) – Duo Discus xT, 700 kg – MB 890-6 with CFR-wing dated 10.7.06
Nachweisliste (Mz) – Duo Discus T – Technical Note No. 890-7 dated 28.02.2006
(Mz) – Duo Discus xT, 750 kg – MB 890-6 with CFR-wing (Issue 3) dated 18.6.07
Nachweisliste (Mz) – Duo Discus (xL)T, 750 kg – MB 890-7 dated 12.11.2007

(5) Flight manual: LBA-Approved Flight Manual for Powered Sailplane Duo Discus T Issue of May 2000 – CAA Accepted as AIR 2806

LBA Approved Flight Manual for Powered Sailplane Duo Discus (xL)T – Issued October 2007 – (Serial No. 175 and on when in compliance with MB-No.890-7) – CAA Accepted as AIR 3173

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

(i) Maintenance Manual:
Maintenance Manual for Powered Sailplane Duo Discus T – Edition: June 2000 (Includes Repair Instructions)

Maintenance Manual for Powered Sailplane Duo Discus (xL)T – Edition: October 2007 (S/N 175 and on when in compliance with MB-No.890-7)

Manual for the SOLO type 2350 D – Edition 1 dated July 30th 2001

Repair – Manual and Manual for folding-propeller OE-FL 5,110/83 av

(ii) Current service Information:
Summary of Schempp-Hirth TN and LBA-ADs – Model: Duo Discus T

(iii) Illustrated Parts Catalogue:
N/A – None published

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

Letter from Chief technical office Dipl. Ing. H. Trieber dated September 26, 2002
CAA 2171 (Duo Discus xLT) from Schempp-Hirth dated 1 December 2010

(8) Other information:

Modification Bulletin No. 890-6
Modification Bulletin No. 890-7

Summary of Schempp-Hirth Modification Bulletins – Model: Duo Discus T

5. 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	***To be determined on an individual aircraft basis***
B.2	Crew Protection Requirements – CAM 8 Appdx. B # .35	N/A – Agricultural Aircraft only

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	JAR 22.1307 – Four-piece safety harness (symmetrical) is required minimum equipment in both cockpits- See FM §2.12
91.507	Pax Information Signs - Smoking, safety belts fastened	N/A – Single-seat glider
91.509	Minimum Instruments and Equipment	Not Applicable to a powered glider
91.511	Night VFR Instruments and Equipment	N/A – Certificated for Day VFR flight only
91.517	IFR Instruments and Equipment	N/A – Certificated for Day VFR flight only
91.519	IFR Communication and Navigation Equipment	N/A – Certificated for Day VFR flight only
91.523	Emergency Equipment	N/A – Superseded by §104.101(5)
91.529	ELT - TSO C91a after 1/4/97 (or replacement)	***To be determined on an individual aircraft basis***
91.531	Oxygen Indicators - Volume/Pressure/Delivery	Drawings for the installation of oxygen systems may be obtained from the manufacturer – *See Flight Manual §7.13*
91.533	Oxygen for Non-Pressurised Aircraft	***Operational requirement – compliance as applicable***
91.541	SSR Transponder and Altitude Reporting Equipment	***Operational requirement – compliance as applicable***
91.543	Altitude Alerting Device - Turbojet or Turbofan	N/A – Not turbojet or turbofan powered
91.545	Assigned Altitude Indicator	N/A – Certificated for Day VFR flight only
A.15	ELT Installation Requirements	The installation of an Emergency Locator Transmitter is possible in the region of the rear seat on either seat pan mounting flange, or beside the top of the main wheel housing. It must comply with the instructions provided by Schempp-Hirth – *See Flight Manual §7.13*

Civil Aviation Rules Part 104

Subpart C - Equipment and Maintenance Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
104.101	(1) Airspeed Indicator	Required as Minimum Equipment – See TCDS Section A.III.3
	(2) Altimeter (Adjustable for barometric pressure)	Required as Minimum Equipment – See TCDS Section A.III.3
	(3) Magnetic Compass	Required as Minimum Equipment – See TCDS Section A.III.3
	(4) Safety Harness for each seat	Required as Minimum Equipment – See TCDS Section A.III.3
	(5) A First Aid Kit	***Operational requirement – compliance as applicable***
	(6) For powered gliders –	
	(i) Fuel gauge for each main fuel tank	Required as Minimum Equipment – See TCDS Section A.III.3
	(ii) Oil Pressure Gauge or warning device	N/A – Two-stroke engine
	(iii) A tachometer or engine governor light	Engine Control Unit indicates RPM and Engine Time – Required as Minimum Equipment – See TCDS Section A.III.3
	(1) For IMC –	
	(i) A variometer	⎫
	(ii) Turn & Slip/Artificial Horizon	⎬ N/A – The Duo Discus T with MB 890-7 is approved for cloud
	(iii) Radio transceiver	⎭ flying, when appropriately equipped

Attachments

The following documents form attachments to this report:

Three-view drawing Schempp-Hirth Model Duo Discus T
Copy of Type Certificate Data Sheet EASA.A.074

Sign off

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David Gill	Checked – Peter Gill
Team Leader Airworthiness	Airworthiness Engineer

Appendix 1

List of Type Accepted Variants:

Model:	*Applicant:*	*CAA Work Request:*	*Date Granted:*
Duo Discus T	Sailplane Services Ltd	3/21B/12	2 December 2002
Duo Discus (xL)T	Schempp-Hirth Flugzeugbau	11/21B/17	9 December 2010