
Type Acceptance Report

TAR 6/21B/17 – Revision 1

Schempp-Hirth Discus-2T

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Executive Summary

New Zealand Type Acceptance has been granted to the Schempp-Hirth Discus-2T Series based on validation of Type Certificate number EASA.A.050. 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(2).

1. Introduction

This report details the basis on which Type Acceptance Certificate No.6/21B/17 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. Foreign Type Certificate Details

Manufacturer: Schempp-Hirth Flugzeugbau GmbH

Type Certificate: EASA.A.050
Issued by: European Aviation Safety Agency

Model: Discus-2T

MCTOW 525 kg [1157 lb.] – with water ballast

Max. No. of Seats: 1

Noise Standard: LSL effective January 1st 1991 with changes dated April 6th, 1993

Model: Discus-2cT

MCTOW 565 kg [1245 lb.] – 18m span with water ballast
525 kg [1157 lb.] – 15m span with water ballast

Max. No. of Seats: 1

Noise Standard: LVL effective August 1st, 2004

Engine: Solo 2350

Type Certificate: Musterzulassungsschein Nr. 4603
Issued by: Luftfahrt-Bundesamt, Bundesrepublik Deutschland

Propeller: OE-FL 5.83/83 a5, V92

TCDS: Data Sheet Number OE-FL./83
Issued by: Luftfahrt-Bundesamt, Bundesrepublik Deutschland

3. Type Acceptance Certificate

The application for New Zealand type acceptance of the Discus-2T was taken to be from the local representative, Drake Aviation Limited dated 6 December 2005, although an application was also received from the manufacturer. The first-of-type example was serial number 23, registered ZK-GOE. The Discus-2T is a single-seat all composite construction midwing 15 metre-span powered sailplane with winglets and a T-tail.

Type Acceptance Certificate No. 6/21B/17 was granted on 22 December 2005 to the Schempp-Hirth Model Discus-2T based on validation of Type Certificate EASA.A.050. There are no special requirements for import into New Zealand.

This Report was raised to Revision 1 to include the Discus-2cT variant. The applicant was the agent, Mr R M Gaddes, and type acceptance was granted on 12 December 2006. The first-of-type example was serial number 36, registered ZK-GXM.

The Discus-2T is the non-self-launching powered variant of the Discus-2b (See TAR 0/21B/15) and is identical except for the “Turbo” sustainer engine system. This powerplant installation is used on a range of Schempp-Hirth powered gliders. The Discus-2cT is the similar powered variant of the Discus-2c. This is a version of the Discus-2 with a new 18m span wing and winglets, although 15m span tips with winglets is still an option.

4. Type Data

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:

- EASA Type Certificate EASA.A.050 issued 16 September, 2005
- EASA Type Certificate Data Sheet No. EASA.A.050 – Issue 1: 16 September 2005
 - Model Discus-2T LBA-approved 18 March 2002
 - Model Discus-2cT EASA-approved 16 September 2005

(2) Airworthiness design requirements:

The certification basis of the Discus-2T and Discus-2cT is the Joint Airworthiness Requirements for Sailplanes and Powered Sailplanes (JAR 22) effective on June 27th, 1989 (Change 4 of the English Original Issue), including Amendment 22/90/1. Additional requirements which the manufacturer elected to comply with were :

- NPA 22A, B, G-18 concerning powered sailplanes not capable of self-launching dated April 1990;
- Standards for structural substantiation of sailplanes and powered sailplane components consisting of glass or carbon fibre reinforced plastic, issued July 1991;
- Additional requirements for the installation of a water ballast system into the fin (for compensating the nose-heavy moment of water ballast in wing tanks). LBA-Reference I4 – I 413/89 dated October 25, 1989;
- Draft NPA 22 D-46 dated April 7, 1994 relating to JAR 22.785(e)(f) “Seat & Restrain System”;
- Draft NPA 22 D-64 (various dates) relating to JAR 22.788 “Head Rests”.

This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41, as JAR-22 is the basic standard for powered sailplanes called up under Advisory Circular 21-2b. There are no non-compliances and no additional special conditions have been prescribed by the Director under §21.23. The Discus-2T series is approved for Day-VFR operations. (Cloud flying and aerobatic flying according to the specifications in the Flight Manual, with restricted maximum mass and without water ballast for the Discus-2cT.)

(3) Certification compliance listing:

Nachweisliste (MZ) Compliance Checklist Discus-2T dated 10.01.2002

Nachweisliste (MZ) Compliance Checklist Discus-2cT dated 22.06.2005

One Exemption against JAR 22.207(a) was granted for the Discus-2T - Adequate stall warning is not given when the engine is extended but not running, because of the superimposition of vibration due to turbulence produced by the propeller. Therefore this configuration is not permitted for the approach, except in an emergency. (See Flight Manual §4.5.4.b))

One Equivalent Safety Finding was made for the Discus-2T (and Discus-2cT):
JAR 22.1093(a) – No pre-heater is fitted because the induction pipe is close to the warm cylinders and service experience with 170 aircraft has shown intake icing is not a problem.

One Equivalent Safety Finding was made for the Discus-2cT – JAR 22.207(a) and (c) – As per the exemption for the Discus-2T, an approach is not permitted with the engine extended but not running. In the aft c.g. condition the stall warning occurs at a speed higher than 1.1 V_{si} , but this was accepted because IAS values drop quickly and there is a clear stall warning buffet.

(4) Environmental Certification:

Discus-2T and Discus-2cT – At 300 m (984 ft) AGL the measured fly-over noise level is 57.7 dB(A) – See Flight Manual §5.3.3 Noise Data

(5) Flight manual: LBA-Approved Flight Manual for Powered Sailplane Discus-2T
CAA Accepted as AIR 2936

LBA-Approved Flight Manual for Powered Sailplane Discus-2cT
CAA Accepted as AIR 2985

(6) Illustrated Parts Catalogue: Not issued separately

(7) Maintenance manual and service data for aircraft:

Maintenance Manual for powered Sailplane Discus-2T – Edition June 2001
Maintenance Manual for powered Sailplane Discus-2cT – Edition January 2005
(Note: Both include Schempp-Hirth Repair Instructions for Sailplanes and Powered Sailplanes Constructed from Fiber Reinforced Plastic [FRP])

Summary of Technical Notes and LBA-ADs for Model Discus bT and TC A.050

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

CAA 2171 Schempp-Hirth Chief of Technical Office dated 30.11.2005 (Discus-2T)
CAA 2171 Schempp-Hirth Head of Technical Office dated 4.12.2006 (Discus-2cT)

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	<i>To be determined on an individual aircraft basis</i>
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 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	Shoulder Harness if Aerobatic; >10 pax; Flight Training	Four piece seat belt harness fitted – See Flight Manual §7.5
91.507	Pax Information Signs - Smoking, safety belts fastened	Not Applicable – Single-seat glider
91.509	Minimum Instruments and Equipment	Not Applicable – Powered aircraft only
91.511	Night VFR Instruments and Equipment	Not Applicable – Certificated for Day VFR flight only
91.513	VFR Communication Equipment	<i>Operational requirement – compliance as applicable</i>
91.517	IFR Instruments and Equipment	Not Applicable – Certificated for Day VFR flight only
91.519	IFR Communication and Navigation Equipment	Not Applicable – Certificated for Day VFR flight only
91.523	Emergency Equipment	N/A – Two-seat glider [Superseded by §104.101(5)]
91.529	ELT - TSO C91a after 1/4/97 (or replacement)	<i>Operational requirement – compliance as applicable</i>
91.531	Oxygen Indicators - Volume/Pressure/Delivery	<i>Operational requirement – compliance as applicable</i>
91.533	Oxygen for Non-Pressurised Aircraft (required for >30 min above FL100)	<i>Operational requirement – compliance as applicable</i> [Attachment points for oxygen bottle mounting brackets are provided behind the canopy. Drawings for installation of an O ₂ system can be obtained from the factory – See FM §7.13]
91.541	SSR Transponder and Altitude Reporting Equipment	<i>Operational requirement – compliance as applicable</i>
91.543	Altitude Alerting Device - Turbojet or Turbofan	Not Applicable – Certificated for Day VFR flight only
91.545	Assigned Altitude Indicator	Not Applicable – Certificated for Day VFR flight only
A.15	ELT Installation Requirements	<i>To be determined on an individual aircraft basis</i>

Civil Aviation Rules Part 104

Subpart C - Equipment and Maintenance Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
104.101	(1) Airspeed Indicator (2) Altimeter (Adjustable for barometric pressure) (3) Magnetic Compass (4) Safety Harness for each seat (5) A First Aid Kit (6) For powered gliders – (i) Fuel gauge for each main fuel tank (ii) Oil Pressure Gauge or warning device (iii) A tachometer or engine governor light (7) For IMC flight – (i) A variometer (ii) Turn & Slip/Artificial Horizon (iii) Radio transceiver	Required as Minimum Equipment – See TCDS Section #III.3 Required as Minimum Equipment – See TCDS Section #III.3 Required as Minimum Equipment – See TCDS Section #III.3 Required as Minimum Equipment – See TCDS Section #III.3 <i>Operational requirement – compliance as applicable</i> Required as Minimum Equipment – See TCDS Section #III.3 Not Applicable – Two-stroke engine (Pre-mix fuel-oil system) Required as Minimum Equipment – See TCDS Section #III.3 } This equipment must be fitted if the sailplane is used for cloud flying [See Flight Manual Section 2.12(b)]

Attachments

The following documents form attachments to this report:

Photographs first-of-type example Discus-2T serial number 23 ZK-GOE
Three-view drawing Schempp-Hirth Model Discus-2T
Three-view drawing Schempp-Hirth Model Discus-2cT
Copy of EASA Type Certificate Data Sheet Number EASA.A.050

Sign off

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David Gill
Team Leader Airworthiness

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Checked – AWE5 Chris Thomson
Date: 12 December 2006

Appendix 1

List of Type Accepted Variants:

<i>Model:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
Discus-2T	Drake Aviation Limited	6/21B/17	22 December 2005
Discus-2cT	R M Gaddes	7/21B/15	12 December 2006