Type Acceptance Report

TAR 6/21B/2

Commander 112A

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Executive Summary

New Zealand Type Acceptance has been granted to the Commander 112/114 Series based on validation of FAA Type Certificate number A12SO. 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/2 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 also notes the status of all models included under the foreign type certificate which have been granted type acceptance in New Zealand. Models covered by the type acceptance certificate issued under Part 21B are listed in Section 2 of this report. Models which were accepted prior to that under NZCAR Section B.9 are listed in Appendix 1.

2. Foreign Type Certificate Details

Manufacturer:	Rockwell International
TC Holder:	Gulfstream American Corporation (since February 3, 1981) Gulfstream Aerospace Corporation (since November 29, 1982) Commander Aircraft Company (since December 27, 1988) Commander Premier Aircraft Corporation (Since October 2005)
Model(s):	112
Type Certificate:	A12SO
Issued by:	Federal Aviation Administration
MCTOW	2550 lb. (1156 kg.) – Serial numbers 3 through 125 [Take-off weight may be increased to 2650 lb. with SL-112-4 complied with.] 2650 lb. (1202 kg.) – Serial numbers 126 through 489

Max. No. of Seats: 4

Noise Standard: FAR Part 36 effective February 3, 1975

Engine: Lycoming IO-360-C1D6

Type Certificate: 1E10
Issued by: Federal Aviation Administration

Propeller: Hartzell HC-E2YR-1B/F7666A

Type Certificate: P9EA
Issued by: Federal Aviation Administration

3. Type Acceptance Certificate

The application for New Zealand type acceptance of the Model 112 was from the importer Mr J C Verleun, dated 6 July 2005. The first-of-type example was serial number 488, registered ZK-JCV. The Commander Series is a retractable four-seat all-metal low-wing touring aircraft with single four (Model 112) or six cylinder (Model 114) piston engines.

Type Acceptance Certificate No. 6/21B/2 was granted on 17 February 2006 to the Model 112 based on validation of FAA Type Certificate A12SO. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand.

The Commander 112/114 Series designed by Rockwell International was an all-new design light aircraft of conventional construction and configuration which first flew in 1970, although certification was delayed by the loss of the prototype due to structural failure of the tail unit. MAUW of the Model 112 was increased from s/n 126 onwards, along with other improvements, and these aircraft were known commercially as the 112A.

The Rockwell singles were the first new aircraft to be type certificated to FAR Amendment 7. This introduced extensive changes including fatigue assessment, lightning protection and occupant head strike protection.

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:

FAA Type Certificate Number A12SO

FAA Type Certificate Data Sheet no. A12SO at Revision 21 dated August 4, 1995
– Model 112 approved June 1, 1972
– Model 114 approved March 8, 1976

(2) Airworthiness design requirements:

The certification basis of the Commander 112/114 Series is FAR 23 effective February 1, 1965, including Amendments 1 through 7. This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41 and Advisory Circular 21-1A, as FAR 23 is the basic standard for Normal 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.

(3) Certification compliance listing:

Report 600 – Model 112 – Structural Substantiation Report – Loads
Report 601 – Model 112 – Structural Substantiation Report – Test Proposals
Report 602 – Model 112 – Structural Substn. – Static Test Results and Analysis
Report 603 – Models 111 & 112 – Fatigue Evaluation Report – March 17, 1972
Report 604 – Model 112 – Main Landing Gear Stress Analysis
Report 608 – Model 112 – Electrical Load Analysis
Report 609 – Models 112 & 112B – Prestolite 12-Volt, 70 Amp. Alternator Test
Report 618 – Models 111 & 112 – Flutter Analysis
Report 620 – Model 112 – Company Flight Test Report
Report 621 – Model 112 – Nose Landing Gear Stress Analysis
Report 648 – Model 112 – Flight Tests at 2659lb Gross Weight
Report 657 – Model 112 – Normal Climb, Cruise and Range Performance
Report 652 – Model 112 – Utility Category Loads for 2488 lb Gross Weight
Report 654 – Model 112 – Miscellaneous Flight Test and Performance Data
Type Inspection Report Part II – Model 112 – FAA Project CA124050-D
TIR Part II – Model 112 – Increase Gross Weight to 2650lb

(4) Environmental Certification:

No data in the Flight Manual

(5) Flight manual: FAA Approved Airplane Flight Manual Model 112 (serial number 126 and subsequent) P/N M112002-1 – CAA Accepted as AIR 2925

(6) Illustrated Parts Catalogue:

Model 112/B/TC/TCA IPC – P/N M112002-4 Issued 24/2/78 Revised 1/10/82

(7) Maintenance manual and service data for aircraft:

Model 112/B/TC/TCA Maintenance Manual – P/N M112001-2 changed 7/01/80

Commander 112/B/TC/TCA Airframe and Powerplant Annual and/or Periodic Recommendation Inspection Guides – PN-1G 11201

Model 112 Service Information Index

(8) Agreement from manufacturer to supply updates of data in (4), (5) and (6):

Email from Carl Gull, Commander Premier Corporation dated 7 December 2005

(9) Other information:

Memo dated 8/8/01 – Revision Level of All Current Technical and Service Pub.s

Rockwell International Drawing 4000 Rev.E – Airplane Complete 112

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

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		Shoulder harness with inertial reel fitted as standard in front seats, optional for rear seats	
91.507	Pax Information Signs - Smoking, safety belts fastened		Not Applicable – Less than 10 passenger seats	
91.509 Min. VFR	(1) ASI (2) Machmeter (3) Altimeter (4) Magnetic Compass (5) Fuel Contents (6) Engine RPM (7) Oil Pressure	FAR §23.1303(a) – Std.Eqpt * N/A – No Mach limitations FAR §23.1303(b) – Std.Eqpt. * FAR §23.1303(c) – Std.Eqpt. * FAR §23.1305(a) – Std.Eqpt. * FAR §23.1305(d) – Std.Eqpt. * FAR §23.1305(b) – Std.Eqpt. *	(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 – Air-cooled engines FAR §23.1305(c) – Std.Eqpt.* FAR §23.1305(h) – Std.Eqpt * FAR §23.1305(f) – Std.Eqpt * FAR §23.699(a)(2) – Std.Eqpt.* FAR §23.729(e) – Std.Eqpt. * FAR §23.1351(d) – Both Std *
91.511 Night	(1)Turn and Slip (2) Position Lights	Fitted as Standard * FAR §23.1385 – Std. Eqpt.*	(3) Anti-collision Lights (4) Instrument Lighting	FAR §23.1401 – Std. Eqpt. * FAR §23.1381 – Std. Eqpt. *
91.517 IFR	(1) Gyroscopic AH (2) Gyroscopic DI (3) Gyro Power Supply (4) Sensitive Altimeter	Fitted as Standard * Fitted as Standard * Fitted as Standard * Fitted as Standard *	(5) OAT (6) Time in hr/min/sec (7) ASI/Heated Pitot (8) Rate of Climb/Descent	***Operational requirement*** Fitted as Standard * ***Operational requirement*** Fitted as Standard *
91.519	IFR Communication and Navigation Equipment		***Operational requirement – To be determined as applicable***	
	* See Instrument Panel Diagram Figures 3-5 through 3-7 in the Manufacturers Data Part III Systems			
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		 Not Applicable – Less than 10 passenger seats Not Applicable – Less than 10 passenger seats Not Applicable – Less than 20 passenger seats 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		***Operational requirement – To be determined 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 and Restraints – Shoulder harness flight-crew seats		FAR §23.785 Amendment 7
135.357	Additional Instruments (Powerplant and Propeller)		Certificated to FAR Part 23, including §23.1305
135.359	Night Flight	Landing light, Pax compartment	***Operating Requirement – Compliance as applicable***
135.361	IFR Operations	Speed, Alt, spare bulbs/fuses	***Operating Requirement – Compliance as applicable***
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 112A serial number 488 ZK-JCV
Three-view drawing Rockwell Commander Model 112
Copy of FAA Type Certificate Data Sheet Number A12SO

Sign off

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David Gill
Team Leader Airworthiness

Checked – AWE3
Date: 31 March 2006

Appendix 1

List of Type Accepted Variants:

Model:	*Applicant:*	*CAA Work Request:*	*Date Granted:*
114	AC 21-1.2/NZCAR Part 21 Appendix A(c)		
112 (s/n 126-489)	J C Verleun	6/21B/2	31 March 2006