Type Acceptance Report

TAR 5/21B/1 – Revision 5

Maule M4/5/6/7/9 Series

TABLE OF CONTENTS

Executive Summary

New Zealand Type Acceptance has been granted to the Maule M4/5/6/7/9 Series based on validation of FAA Type Certificate number 3A23. There are no special requirements for import.

Applicability is currently limited to the Models and/or serial numbers detailed in Section 2, which are now eligible for the issue of an Airworthiness Certificate in the Standard Category in accordance with NZCAR §21.191, 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).

NOTE: The information in this report was correct as at the date of issue. The report is generally only updated when an application is received to revise the Type Acceptance Certificate. For details on the current type certificate holder and any specific technical data, refer to the latest revision of the State-of-Design Type Certificate Data Sheet referenced herein.

1. Introduction

This report details the basis on which Type Acceptance Certificate No. 5/21B/1 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 notes the status of all models included under the State-of-Design type certificate which have been granted type acceptance in New Zealand, which are listed in Section 2. Appendix 1 details the type acceptance history under CAR Part 21B and which models were certificated prior to that under NZCAR Section B.9 and are now type accepted under the transitional arrangements of Part 21 Appendix A(c).

2. Aircraft Certification Details

(a) State-of-Design Type and Production Certificates:

Original Company:	Maule Aircraft Corporation
TC Holder:	Maule Aerospace Technology, Inc. (from June 18, 1982)
Manufacturer:	Maule Air, Inc.
Type Certificate:	3A23
Issued by:	Federal Aviation Administration
Production Approval:	FAA PC No.11SO issued May 3, 1984 – See TCDS Note 7

(b) Models Covered by the Part 21B Type Acceptance Certificate:

(i) **Model:** M-4-210

MCTOW:	1043 kg [2300 lb.] – s/n 1075C, 1081C-1117C or per SL 952 kg [2100 lb.]
Max. No. of Seats:	4
Noise Standard:	Not Applicable
Engine:	Continental IO-360-A Continental IO-360-D – s/n 1086C and up FAA Type Certificate:
Propeller:	McCauley D2A3467/76C-2 (used on A engine) McCauley D2A34C67N/S76C-2 (used on A or D engine) FAA Type Certificate: P

(ii) **Model:** M-5-180C

MCTOW:	1043 kg [2300 lb.]
Max. No. of Seats:	4
Noise Standard:	FAR 36
Engine:	Continental O-360-C1F FAA Type Certificate: E-286
Propeller:	Hartzell HC-C2YR-1BF/F7666A FAA Type Certificate: P

(iii) **Model:** M-5-210C

MCTOW: 1134 kg [2500 lb.] – modified per SL#45 and SL#46
1043 kg [2300 lb.]

Max. No. of Seats: 4

Noise Standard: Not Applicable

Engine: Continental IO-360-D
FAA Type Certificate: E-286

Propeller: McCauley D2A34C67N/S76C-2
FAA Type Certificate: P

(iv) **Models:** M-5-235C, M-6-235, M-7-235

MCTOW:

M-5-235C: 1134 kg [2500 lb.] – floatplane and landplane s/n 7321C, 7347C, 7350C and up or modified per SL#4
1043 kg [2300 lb.]

M-6-235 and M-7-235: 1134 kg [2500 lb.] – landplane and skiplane
1247 kg [2750 lb.] – floatplane

Max. No. of Seats: 4 (5 optional from serial no. 7474C and up)

Noise Standard: FAR Part 36

Engine: Lycoming O-540-J1A5D, -J3A5, or -B4B5
FAA Type Certificate: E295

Lycoming IO-540-W1A5 or –W1A5D
FAA Type Certificate: 1E4

Propeller: Hartzell HC-C2YR-1BF/F8468A-6R or -3R or /F8477D-6
FAA Type Certificate: P-920

Hartzell HC-C3YR-1RF/F7693(F)-( )
FAA Type Certificate: P25EA

McCauley B3D32C414-C/G-82NDA-2 or -4
FAA Type Certificate: P58GL

McCauley B2D37C224-B/G-90RA-9
FAA Type Certificate: P7EA

(v) **Models:** MX-7-180A

MXT-7-180, -180A, -180B

MCTOW:	1134 kg [2500 lb.] – MX-7-180A/MXT-7-180A 1089 kg [2400 lb.] – MXT-7-180/MXT-7-180B
No. of Seats:	4 (5 optional some models)
Noise Standard:	FAR Part 36
Engine:	Lycoming O-360-C1F Lycoming O-360-C4F – MX-7-180A/MXT-7-180A FAA Type Certificate: E-286
Propeller:	Sensenich 76EM8S()-0-56 – MX-7-180A/MXT-7-180A FAA Type Certificate: P4EA
Propeller:	Hartzell HC-C2YR-1BF/7666A – MXT-7-180/MXT-7-180B FAA Type Certificate: P-920
	McCauley B3D32C414-C/G-82NDA-8 – MXT-7-180 FAA Type Certificate: P58GL

(vi) **Model:** M-9-235

MCTOW:	1270 kg [2800 lb.]
Max. No. of Seats:	5
Noise Standard:	FAR Part 36
Engine:	Lycoming IO-540-W1A5 FAA Type Certificate: 1E4
Propeller:	McCauley B3D32C414-[]/[]-82NDA-2 FAA Type Certificate: P58GL

Notes: 1. Refer to FAA TCDS 3A23 for specific applicability of engine and propeller combinations to individual aircraft models.

2. Refer to FAA TCDS 3A23 for model MCTOW variations due to specific serial number ranges or other (e.g. floatplane) configuration.

3. Refer to Advisory Circular 21-1 Appendix 2 for the New Zealand type acceptance status of any engines and propellers listed above.

3. Application Details and Background Information

There have been examples of the Maule in New Zealand prior to 1995 when Part 21 was introduced, and those particular models or serial number ranges were therefore deemed to have a type acceptance certificate under the transitional arrangements of Part 21 Appendix A(c). The first application for New Zealand type acceptance under Part 21B was for the Model MX-7-180B from the importer Mr Ian Wright, dated 5 June 2004. The first-of-type example was serial number 22001C, registered ZK-TDS. The Maule Series is a single-engine welded-steel-tube fuselage strut-braced fixed undercarriage high-wing four or five-seat light aircraft with STOL characteristics.

Type Acceptance Certificate Number 5/21B/1 was granted on 19th August 2004 to the Maule Model MX-7-180B based on validation of FAA Type Certificate 3A23. There are no special requirements for import into New Zealand.

This report was raised to Revision 1 to include the M-6-235 variant, under Work Request number 6/21B/4. The application was from the importer, H A and J L Robinson, dated 20th July 2005. The first-of-type example was serial number 7465C, registered ZK-MTP. Type acceptance was granted on 24 November 2005.

This report was raised to Revision 2 to include two new variants: the MXT-7-180 under Work Request number 7/21B/22. The application was from the manufacturer dated 21 November 2006 and the first-of-type example was serial number 14120C registered ZK-JQY; and the MX-7-180A under Work Request 7/21B/24. The application was from the importer Mr Shane Anderson dated 12 December 2006 and the first-of-type example was serial number 20052C registered ZK-MUL.

Revision 3 of this report adds the latest M-9-235 Model. The application was from the importer dated 7 August 2015 and the first-of-type example was serial no. 36001C registered ZK-VRF. (The M-9 is aerodynamically identical to the M-7 Series, except for reinforcements to the wing, landing gear, and fuselage attachment points, to permit operation at higher gross weight.) Type Acceptance was granted on 26 October 2015.

Revision 4 was issued to include the MXT-7-180A Star Rocket, which is a nosewheel landing gear version of the MX-7-180A. The first-of-type example was serial number 21025C registered as ZK-RLT. Type Acceptance was granted on 5 February 2018.

Revision 5 added the M-7-235 Super Rocket. The application was from the importer Southlink International Ltd and the first-of-type example was serial number 4034C registered ZK-SLI. Type Acceptance was granted on 26 July 2022.

Originally a homebuilt aircraft the first Maule production version was the 145 hp Model M-4. Although there are 48 variants of the Maule on the type certificate, all are essentially the same basic aircraft with different powerplants and detail variations in flaps, ailerons, wingspan, fuel tanks, fuselage and tail surfaces, depending on the installed power, number of seats and maximum takeoff weight. Versions are also available with the Allison 250 turbine engine and a nosewheel undercarriage.

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:

(1) State-of-Design Type certificate:

FAA Type Certificate Number 3A23 issued August 10, 1961

FAA Type Certificate Data Sheet No. 3A23 at Revision 33 dated Feb 19, 2019
- Model M-4-210 approved September 23, 1964
- Model M-5-210C approved December 28, 1973
- Model M-5-235C approved April 6, 1976
- Model M-5-180C approved April 19, 1979
- Model M-6-235 approved June 25, 1981
- Model M-7-235 approved November 9, 1983
- Model MXT-7-180 approved November 9, 1990
- Models MX-7-180A and MXT-7-180A approved June 3, 1993
- Model MX-7-180B approved July 12, 1993
- Model M-9-235 approved April 9, 2012

(2) Airworthiness design requirements:

(i) Airworthiness Design Standards:
The certification basis of the Maule Series is Part 3, Civil Air Regulations, effective May 15, 1956 as amended by 3-1 through 3-5 and 3.705 as amended by 3-7, plus Part 23.955 in lieu of CAR 3.435 for specified models. This is an acceptable certification basis in accordance with NZCAR Part 21B Paragraph §21.41 and Advisory Circular 21-1B, because CAR 3 is the predecessor of FAR 23, which is the basic standard for Normal Category Airplanes 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:
For some specific models (including MX-7-180) the FAA established Special Certification Rules, which was the use or substitution of later Amendment date FAR 23 individual paragraphs. See the TCDS for affected models and details of the updated sections.

(iii) Equivalent Level of Safety Findings:
Nil

(iv) Airworthiness Limitations:
Nil

(3) Aircraft Noise and Engine Emission Standards:

(i) Environmental Standard:
The Maule Series has been certificated for noise under FAR Part 36. For models approved between 1976 and 2002, per §36.2 (prior to Amendment 36-24) the Part 36 amendment in effect on the approval date of each model was

used. After 2002, per §36.2 the Part 36 amendment in effect on the date of application was used. The applicable dates are located in the first line in each model's section on the TCDS. Some of these derivative models were able to show no acoustical change from a previously approved model.

(ii) Compliance Listing:
Draft Appendix F – Aircraft Noise Data for U.S. Certification Propeller Driven Small Airplanes (FAR Part 36, Appendix F):

Model M6-235 at 2500 lb MAUW 2400 RPM 81" dia: Noise Level = 71.3 Cdb(A)

Models MX-7-180A and MXT-7-180A at 2400 lb MAUW 2700 RPM 78" propeller diameter – Noise Level = 76.2 dB(A)

Model M-7-235: Noise Level FAR 36 = 72.3 dB(A) Hartzell -6R (78") 2-blade propeller; Noise Level = 68.0 dB(A) McCauley -4 (78") 3-blade propeller; Noise Level = 73.2 dB(A) McCauley -9 (81") 2-blade propeller

Model M-9-235 Noise Level per FAR 36 Appendix G = 79.6 dB(A)

(4) Certification compliance listing:

Maule Aerospace Technology Inc. Report 140:
Model M-6-235 Compliance Checklist

Maule Aerospace Technology Inc. Report 141:
Model M-7 Compliance Checklist

Maule Aerospace Technology Inc. Report 143:
Model MXT-7-180 Compliance Checklist

Maule Aerospace Technology Inc. Report 174:
Model MX-7-160/180A/180B Compliance Checklist

Maule Aerospace Technology Inc. Report 175:
Model MXT-7-160/180A Compliance Checklist

Maule Aerospace Technology Inc. Report 199 – Certification Plan for Maule Model M-9-235 Airplanes – FAA Project No. AT5400AT-A – Rev.G

(5) Flight manual:

FAA Approved Airplane Flight Manual for Maule M-4-210 Series (Includes Models M-4-210, M-4-210S, M-4-210C and M-4-210T) (s/n 7247C-7465C) – CAA Accepted as AIR 2294

FAA Approved Airplane Flight Manual for Maule M-5-180C (s/n 8001C and up) – CAA Accepted as AIR 2183

FAA Approved Airplane Flight Manual for Maule M-5-210C (s/n 6001C and up) – CAA Accepted as AIR 247

FAA Approved Airplane Flight Manual for Maule M-5-235C CAA Accepted as AIR 2066

FAA Approved Airplane Flight Manual for Maule M-6-235 (s/n 7247C-7465C) – CAA Accepted as AIR 2926

FAA Approved Airplane Flight Manual for Maule M-6-235 (s/n 7466C, 7468C-7473C) – CAA Accepted as AIR 2927

FAA Approved Airplane Flight Manual for Maule M-6-235 (s/n 7474C and up) – CAA Accepted as AIR 2928

(Maule operate a system whereby the same manual is used at different revision dates for separate serial number ranges.)

FAA Approved Airplane Flight Manual for Maule MXT-7-180 CAA Accepted as AIR 2988

FAA Approved Airplane Flight Manual for Maule MXT-7-180A CAA Accepted as AIR 3661

FAA Approved Airplane Flight Manual for Maule MX-7-180A CAA Accepted as AIR 2989

FAA Approved Airplane Flight Manual for Maule MX-7-180B CAA Accepted as AIR 2872

FAA Approved Airplane Flight Manual for Maule M-7-235 CAA Accepted as AIR 3496

FAA Approved Airplane Flight Manual for Maule M-9-235 CAA Accepted as AIR 3340

(6) Operating Data for Aircraft:

(i) Maintenance Manual:
Maintenance Manual for Maule MX-7-180B Star Rocket

Maintenance Manual for Maule M-6-235 Super Rocket

Maintenance Manual for Maule M-7-235 Super Rocket

Maintenance Manual for Maule MXT-7-180 Star Rocket Trigear

Maintenance Manual for Maule MX-7-160 and MX-7-180A Sportplane

Maintenance Manual for Maule MXT-7-160/180A Sportplane Trigear

Maintenance Manual and Instructions for Continued Airworthiness for Maule M-9-235 – P/N TLC-M-9-235

(ii) Current service Information:
Service Bulletins and Service Letters

These are available on the manufacturer website at www.mauleairinc.com

(iii) Illustrated Parts Catalogue:
Parts Catalog (covers all models)

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

CAA 2171 from Engineering Manager, Shirley Maule, dated 2 August 2004

Manuals are now available through ATP at https://www.aviationhub.aero/

(8) Other information:

Maule – Required Equipment List (R.E.L.) at Rev.78 dated 23 January 2019

Maule – Optional Equipment List (O.E.L.) at Rev.86 dated 23 April 2019

5. New Zealand Operational Rule Compliance

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		Seat belt/3-Point Harness Fitted as Std – See R.E.L. #25	
91.507	Pax Information Signs – Smoking, safety belts fastened		Not Applicable – Less than 10 passenger seats	
91.509 Min. VFR	(1) ASI	CAR §3.655(a)(1) – Fitted as Standard – See R.E.L. #15	(7) Oil Pressure	CAR §3.655(b)(1)(ii) Fitted as Std in Maule Cluster Gauge
	(2) Machmeter	N/A – No mach number limitations	(8) Coolant Temp	N/A – Air cooled engine
	(3) Altimeter	CAR §3.655(a)(2) – Fitted as Standard – See R.E.L. #14	(9) Oil Temperature	CAR §3.655(b)(1)(iii) Fitted as Std in Maule Cluster Gauge
	(4) Magnetic Compass	CAR §3.655(a)(3) – Fitted as Standard – See R.E.L. #13	(10) Manifold Pressure	CAR §3.655(b)(2)(iii) Fitted as Std – See R.E.L. #17
	(5) Fuel Contents	CAR §3.655(b)(1)(i) –Fitted as Std in Maule Cluster Gauge	(11) Cylinder Head Temp.	CAR §3.655(b)(2)(i) Fitted as Std in Maule Cluster Gauge
	(6) Engine RPM	CAR §3.655(b)(1)(v) Fitted as Standard – See R.E.L. #20	(12) Flap Position	Notched lever
			(13) U/c Position	N/A – Fixed undercarriage
			(14) Ammeter/Voltmeter	CAR §3.687 – Ammeter in Maule Cluster Gauge
91.511 Night	(1)Turn and Slip	Optional Fit – See O.E.L. #5C	(3) Anti-collision Lights	Optional Fit – See O.E.L. #1
	(2) Position Lights	Fitted as Std – See R.E.L.#28	(4) Instrument Lighting	Fitted as Std – See R.E.L.#11
91.513	VFR Communication Equipment		See O.E.L. #2A/B/C for standard radio equipment options	
91.517 IFR	(1) Gyroscopic AH	Optional Fit – See O.E.L. #4B	(5) OAT	Optional Fit – See O.E.L. #6C
	(2) Gyroscopic DI	Optional Fit – See O.E.L. #4A	(6) Time in hr/min/sec	Optional Fit – See O.E.L. #6B
	(3) Gyro Power Supply	Optional Fit – See O.E.L. #3D	(7) ASI/Heated Pitot	Optional Fit – See O.E.L. #7A
	(4) Sensitive Altimeter	Fitted as Standard	(8) Rate of Climb/Descent	Optional Fit – See O.E.L. #5B
91.519	IFR Communication and Navigation Equipment		See O.E.L. #2 for standard navigation equipment options	
91.523	Emergency Equipment: (a) More Than 10 pax – First Aid Kits per Table 7 – Fire Extinguishers per Table 8 (b) More than 20 pax – Axe readily acceptable to crew (c) More than 61 pax – Portable Megaphones per Table 9		***To be determined on an individual aircraft basis if used on Air Transport operations*** Not Applicable – Less than 20 passenger seats Not Applicable – Less than 61 passenger seats	
91.529	ELT – TSO C91a after 1/4/97 (or replacement)		ELT Fitted as Standard – See R.E.L. #30	
91.531	Oxygen Indicators – Volume/Pressure/Delivery		Oxygen system not fitted as standard	
91.533	Oxygen for Non-Pressurized Aircraft >30 min above FL100 – Supplemental for crew, 10% Pax – Therapeutic for 3% of Pax Above FL100 – Supplemental for all Crew, Passengers Therapeutic for 1% of Pax, 20l PBE for each crew member		***Operational Requirement – Compliance as applicable*** Portable and Long Range Portable Oxygen Systems are available as optional equipment – See O.E.L. #7K/L	
91.541	SSR Transponder and Altitude Reporting Equipment		See O.E.L. #2K for transponder options	
91.543	Altitude Alerting Device – Turbojet or Turbofan		Not Applicable – Not turbo jet or turbofan powered	
91.545	Assigned Altitude Indicator		***Operational Requirement – Compliance 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/Restraints – Shoulder harness flight-crew seats		3-Point diagonal harness fitted as standard for all seats
135.357	Additional Instruments (Powerplant and Propeller)		Has all instruments required under FAR §23.1305
135.359	Night Flight	Landing light, Pax compartment	***Operational Requirement – Compliance as applicable***
135.361	IFR Operations	Speed, Alt, spare bulbs/fuses	***Operational Requirement – Compliance as applicable***
135.363	Emergency Equipment (Part 91.523 (a) and (b))		***Operational 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

NOTES: 1. A Design Rule reference in the Means of Compliance column indicates the Design Rule was exactly equivalent to the CAR requirement, and compliance is achieved for the basic aircraft type design by certification against the original Design Rule.

2. The CAR Compliance Tables above were correct at the time of issue of the Type Acceptance Report. The Rules may have changed since that date and should be checked individually.

3. Some means of compliance above are specific to a particular model/configuration. Compliance with Part 91/119 operating requirements should be checked in each case, particularly oxygen system capacity and emergency equipment.

Attachments

The following documents form attachments to this report:

Three-view drawing Maule Model M-6-235 "Super Rocket"
Maule Drawing 1550F – Maule MXT-7-160/180 Plan and Elevation

Sign off

……..
David Gill
Team Leader Aircraft Inspection

……..
Checked – John Marshall
Airworthiness Inspector

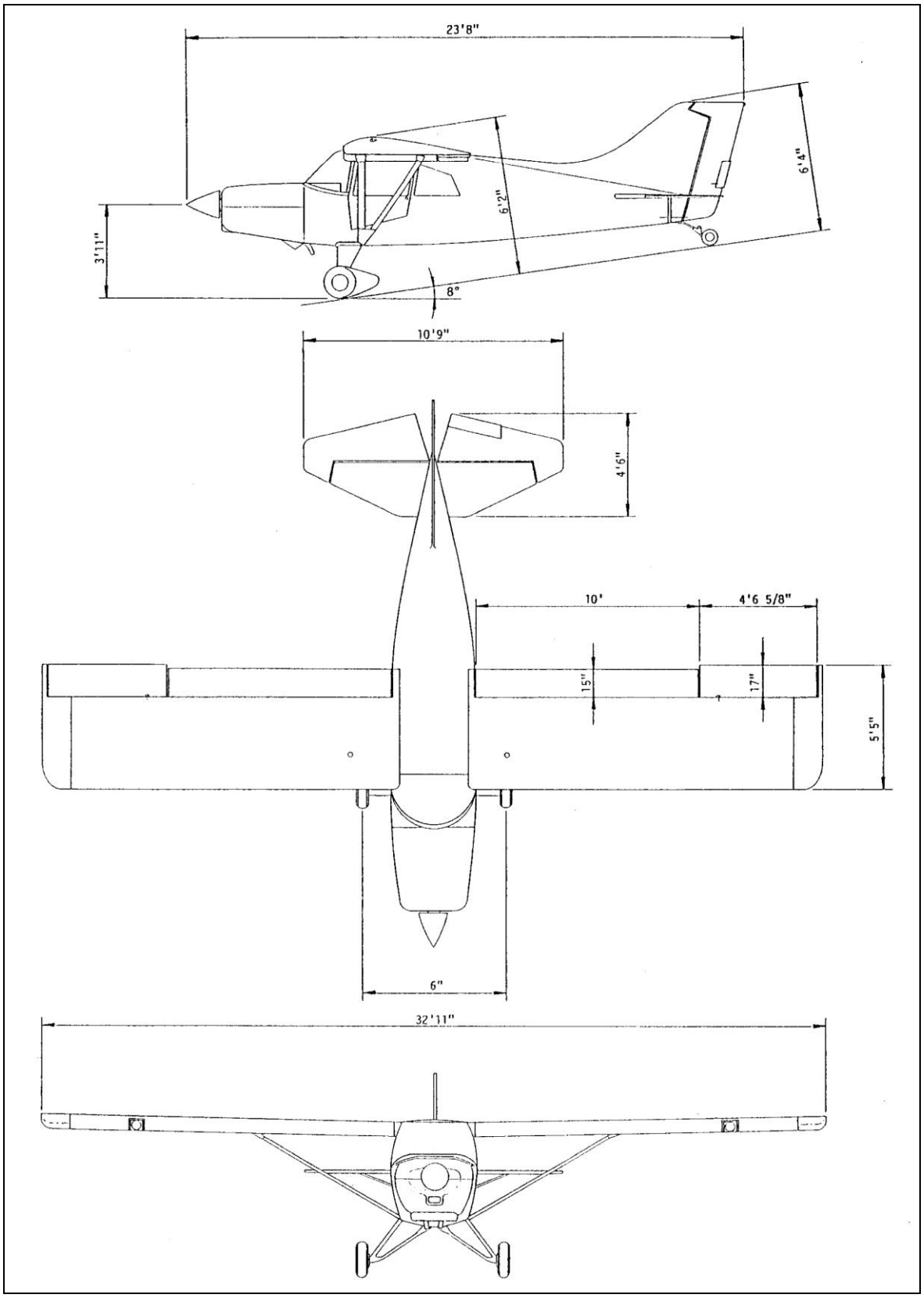
Appendix 1

List of Type Accepted Variants:

Model:	*Applicant:*	*CAA Work Request:*	*Date Granted:*
M-4-210C		AC 21-1.2/NZCAR Part 21 Appendix A(c)	
M-5-180C, M-5-210C, M-5-235C		AC 21-1.2/NZCAR Part 21 Appendix A(c)	
MX-7-180B	I G Wright	5/21B/1	11 August 2004
M-6-235	H A and J L Robinson	6/21B/4	24 November 2005
MXT-7-180	Maule Aerospace Technology Inc.	7/21B/22	21 December 2006
MX-7-180A	S P Anderson	7/21B/24	12 January 2007
M-9-235	E Aharoni	16/21B/5	26 October 2015
MXT-7-180A	A Rossaak	18/21B/27	5 February 2018
M-7-235	Southlink International Ltd	22/21B/20	26 July 2022

Appendix 2

3-View drawing Maule Model M-6-235:



3-View Drawing Maule Model MXT-7-180: