Type Acceptance Report
TAR 98/05
PZL M18B "Dromader"
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Type Acceptance Report

Introduction
This report details the basis on which Type Acceptance Certificate No.98/05 was granted in the Restricted 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(s) in New Zealand;
(b) Summarise any outstanding requirements which 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

<table>
<thead>
<tr>
<th>Type Certificate:</th>
<th>Swiadectwo Typu Sprzetu Lotniczego Nr BB-120</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issued by:</td>
<td>Polish People’s Republic - Civil Aircraft Inspection Board</td>
</tr>
<tr>
<td>Type Certificate:</td>
<td>Import Aircraft Type Certificate Number A47EU</td>
</tr>
<tr>
<td>Issued by:</td>
<td>Department of Transportation - Federal Aviation Administration</td>
</tr>
<tr>
<td>Manufacturer:</td>
<td>Wytwórnia Sprzetu Komunikacyjnego &quot;PZL-Mielec&quot;</td>
</tr>
<tr>
<td>Model:</td>
<td>PZL M18B &quot;Dromader&quot;</td>
</tr>
<tr>
<td>Engines:</td>
<td>PZL-Kalisz ASz-62IR-M18</td>
</tr>
<tr>
<td>Propellers:</td>
<td>PZL-Warszawa AW-2-30</td>
</tr>
<tr>
<td>MCTOW</td>
<td>4200 kg (9260 lb.) Normal Category</td>
</tr>
<tr>
<td></td>
<td>5300 kg (11684 lb.) Restricted Category (Under BB-120)</td>
</tr>
<tr>
<td></td>
<td>11,700 lb Restricted Category (Under FAA STC No.SA01276AT)</td>
</tr>
<tr>
<td>Noise Category:</td>
<td>N/A</td>
</tr>
</tbody>
</table>

The certification basis of the PZL M18B under both Polish and US type certificates is FAR Part 23 at Amendment 23-16. On the FAA type certificate a series of FAR 23 paragraphs were excluded because they were considered inappropriate for the Restricted Category, Agricultural and Forest/Wildlife Conservation (Fire Fighting) Special Purposes. This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41, as FAR 23 is the basic standard for Normal Category Airplanes called up under 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 importer of the first aircraft, Patchett Ag-Air Limited, dated 11 September 1997. The First-of-Type example was s/n IZ026-29 registered ZK-RMC, which is to be used on a lime spraying contract.
Type Acceptance Certificate No.98/05 was granted on 22 October 1997.

The M18B model is an improved development of the M18/A “Dromader” with an enlarged and redesigned elevator, revised elevator control system spring and new aileron-rudder spring connection and landing flap travel increased to 30°. The M18A differs from the original M18 only in having an increased capacity fuel system and the addition of a mechanics cabin behind the pilot. A dual control training version is available as the M18AS, which has a second cockpit ahead of the standard pilot’s position.

**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:**
   - Polish Type Certificate Nr.BB-120 - PZL Mielec M18 Issued 27.9.78
   - Type Certificate Data Sheet BB-120 at Issue 11 dated February 8, 1996
   - FAA TCDS No.A47EU at Revision 6 dated September 30, 1996
   - Polish TC Nr.CB-116 PZL-Kalisz ASz-62IR Issued 15.II.78
   - Polish TCDS No.CB-116-5 ASz-61IR-16/M18 dated July 15, 1992
   - FAA TCDS No.E10NE PZL-Kalisz ASz-62IR-16/M18 at Rev.1 14.2.86
   - Polish TC Nr.DB-122 “PZL-Warszawa” AW-2 issued 2.04.79
   - Polish TCDS No.DB-122 AW-2 Issue 3 dated 28.06.1991
   - FAA STC No.SA01276AT Melex USA Issued February 27, 1997

2. **Airworthiness design requirements:** Already held by the CAA.

3. **Certification compliance listing:**
   - Compliance Checklist - FAR 23 - PZL M18 Dromader - January 1981
   - Compliance Checklist - FAR 23 Amendments 23-1 through 23-16 - PZL M18A Dromader - November 1986
   - Compliance Checklist - FAR 23 Amendments 23-1 through 23-16 - PZL M18B Dromader - January 1994
   - Compliance Table FAR Part 35 - AW-2-30 used with R9SM2 Governor Type supplied by PZL-Wroclaw - Fitted to ASz-61-IR engines in M-18 & AN-2 Aircraft

4. **Flight manual:**
   - PZL M18B "Dromader" equipped with Asz-61IR-M18 Engine
   - CAA Accepted as AIR 2595
   - PZL also supplied a copy of the Polish Flight Manual dated Dec.20, 95 - GICA Approved March 26, 97. The FAA manual was adopted because it contained performance information for the aircraft at overload weights, whereas this was contained in a separate supplement in the Polish manual. PZL Mielec advised the manuals were essentially identical in content except for the separation in the FAA manual between approved and unapproved sections.
(5) Illustrated Parts Catalogue: M18 Parts and Assemblies Catalog (3 Volumes)
ASz-62IR Aircraft Engine Catalogue of Parts and Assemblies
Propeller AW-2/-30 Catalogue of Spare Parts

(6) Maintenance manual and service data for aircraft, engine and propeller:
Airplane Description and Service Manual PZL M18 Dromader - Dec 1979
- includes GICA Approved Section III - Service Lives (Airframe 6000 hours)
List of Bulletins Issued for the M18 Airplane - Page 53 dated 28.02.97

Maintenance Instructions and Schedule of Periodic Inspections for ASz-62IR aircraft engine 16-th series - Edition 1, March 1975
Doc. WT-62.02.01K - ASz-62IR-16/M18 Operation Instructions
Doc. WT-62.03.01K - ASz-62IR-16/M18 Maintenance & Inspection Instructions
Doc. WT-62.04.01K - ASz-62IR-16/M18 Service Instructions (All 4 in one volume)

Propeller AW-2-30 Technical Description and Service Manual Doc. No.001
The Polish version of this Manual has been approved by the MINISTRY of TRANSPORTATION - Civil Aircraft Inspection Board on the 02.04.1979

(7) Agreement from manufacturer to supply updates of data in (4), (5) and (6):
CAA 2171 form from WSK PZL-Mielec Commercial Director dated 97.09.01

(8) Other information:
List of Type Certificates issued for “Dromader” aircraft models
Set of sample delivery documents for ASz-62IR-M18 engines

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, as noted:

Civil Aviation Rules Part 26
Subpart B - Additional Airworthiness Requirements
Appendix B - All Aircraft

<table>
<thead>
<tr>
<th>PARA</th>
<th>REQUIREMENT</th>
<th>MEANS OF COMPLIANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.1</td>
<td>Marking of Doors and Emergency Exits</td>
<td>Means of opening the exit were clearly marked</td>
</tr>
<tr>
<td>B.2</td>
<td>Crew Protection Requirements - Agricultural Aircraft</td>
<td>Certification against FAR 23.561(b) at Amendment 23-36</td>
</tr>
<tr>
<td></td>
<td>CAM 8 Appendix B Section .35</td>
<td>(See fax from PZL-Mielec ref. LTO/R/573/97)</td>
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</table>

Civil Aviation Rules Part 91
Subpart F - Instrument and Equipment Requirements

<table>
<thead>
<tr>
<th>PARA</th>
<th>REQUIREMENT</th>
<th>MEANS OF COMPLIANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>91.505</td>
<td>Shoulder Harness if Aerobatic; &gt;10 pax; Flight Training</td>
<td>Superseded by CAR §137.255</td>
</tr>
</tbody>
</table>
### Civil Aviation Rules Part 137

**Subpart F - Instruments and Equipment**

<table>
<thead>
<tr>
<th>PARA:</th>
<th>REQUIREMENT:</th>
<th>MEANS OF COMPLIANCE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>137.25</td>
<td>Shoulder harness for all crew seats</td>
<td>The aircraft has been certified against FAR 23.561(b) and 23.562 at Amendment 23-26, plus Australian requirements which specify a forward load of 25g. (See PZL Report No. M18/LTO-2/63/95 - Strength of the Seat - Safety Belts Group)</td>
</tr>
<tr>
<td>5</td>
<td>Appendix D specifies 12g design load</td>
<td></td>
</tr>
<tr>
<td>137.25</td>
<td>Additional instruments - slip indicator</td>
<td>Artificial Horizon fitted as standard</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>hopper located in front of the pilot</td>
</tr>
<tr>
<td>137.25</td>
<td>Additional equipment</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>hoppers/spray tanks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Placards</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Passenger locations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flight Limitations</td>
<td></td>
</tr>
</tbody>
</table>

### Appendix B - Overload Weight Determination

Original Load factor = +3.4g in normal category (+2.8 in restricted category)

Per Fig.2 of Appendix B maximum recommended % weight increase is 25%

MCTOW = 4200 kg ⇒ Recommended MTOW per Part 137 is 5325 kg

This is similar to that permitted under BB-120 in the Restricted Category or permitted by the FAA by STC also in the Restricted Category.

### Delivery Documentation

The aircraft is delivered with a comprehensive set of documentation, including:

- A full set of operating and maintenance manuals for the aircraft, engine and prop;
- Polish Export Certificates of Airworthiness for the aircraft, engine and propeller;
- Engine Acceptance Certificate;
- Aircraft Equipment Airworthiness Certificate - Prop;
- Fitness Certificates of Aviation Equipment - Magneto (2x), Carburettor, Constant Speed Unit, Fuel Pump, Starter, Dynamo, Oil Pump, Filter;
- Specification of Operation Equipment;
- Production Check Flight schedule;
- Airplane Depreservation and Assembly Instructions/as unpacked from the Carton;
- Ground Equipment and Spare Parts Illustrated Specification;
- PZL M18B “Dromader” Weighing Sheet;
- PZL M18 “Dromader” Aircraft Levelling;

### Outstanding Requirements

The following additional NZ requirements are not covered by the original certification requirements or the basic build standard of the aircraft and require compliance with before issue of an airworthiness certificate:
Civil Aviation Rules Part 91
Subpart F - Instrument and Equipment Requirements

<table>
<thead>
<tr>
<th>PARA:</th>
<th>REQUIREMENT:</th>
<th>MEANS OF COMPLIANCE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>91.529</td>
<td>ELT - TSO C91a after 1/4/97 (or replacement)</td>
<td>To be determined on an individual aircraft basis</td>
</tr>
<tr>
<td>A.15</td>
<td>ELT Installation Requirements</td>
<td>To be determined on an individual aircraft basis</td>
</tr>
</tbody>
</table>

Civil Aviation Rules Part 137
Appendix D - Instruments and Equipment Airworthiness Design Standards

<table>
<thead>
<tr>
<th>PARA:</th>
<th>REQUIREMENT:</th>
<th>MEANS OF COMPLIANCE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>D.5</td>
<td>Jettison Gear capable of discharge 80% in 5 seconds</td>
<td>No factory equipment has been shown to comply. Any jettison gear fitted to the aircraft for operation under Part 137 will need to be individually tested and approved.</td>
</tr>
<tr>
<td>D.6</td>
<td>Markings/Placards Hopper/Spray tank max. loadings</td>
<td>To be determined on an individual aircraft basis</td>
</tr>
<tr>
<td></td>
<td>Representative jettison times</td>
<td>To be determined on an individual aircraft basis</td>
</tr>
</tbody>
</table>

Summary
Type Acceptance Certificate No. 98/05 has been granted to the PZL M18B "Dromader" and it is now eligible for the issue of a New Zealand Airworthiness Certificate in accordance with CAR §21.177 in the Restricted Category per CAR §21.173(d), subject to the outstanding requirements noted above being met.

Type acceptance could be based on either the FAA type or the Polish type certificates, as both were issued using FAR 23 as the certification basis. Since the FAA Flight Manual has been adopted in NZ FAA Type Certificate A47E U has been specified as the basis for type acceptance under §21.43(1). The STC is not required for overweight operation in NZ, as that is permitted in accordance with the provisions of Part 137 Appendix B.

Attachments
The following documents form attachments to this report:
- Photographs of First-of-Type example, s/n IZ026-29 ZK-RMC
- Three-view drawing M18B "Dromader"
- Extracts from FAA Type Certificate Data Sheet No. A47EU

Sign off

David Gill
Airworthiness Engineer

Date: 26 November 1997