

TN72 Minor Change for CS-23 Aircraft

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1. Preface

1.1 Purpose

To document the Minor Change to install a TN72 GPS position source connected to a previously installed Trig TT21/22 or TT31 transponder.

1.2 Scope

This Minor Change applies to unpressurised single engine piston aeroplane.

The applicable aircraft are listed in Appendix 2.

1.3 Changes from Previous Issue

None, this is the first issue

1.4 Changes Forecast

None.

1.5 Document Cross-References

1.5.1 Internal Documents

01691-00	TN72 Installation Manual	Issue AI
00455-00	TT31 Transponder Installation Manual	Issue AR
00560-00	TT21/TT22 Transponder Installation Manual	Issue AQ
DEV/TN72/009	TN72 Declaration of Design Performance	Issue 2.0

1.5.2 External Documents

CS-23 (Amdt 5)	Certification Specifications for Normal, Utility, Aerobatic, and Commuter Category Aeroplanes	EASA
CAP747	Mandatory Requirements for Airworthiness	CAA
ED-23C	MOPS for airborne VHF Receiver - Transmitter	Eurocae
ETSO C199	ETSO for Traffic Awareness Beacon System (TABS)	EASA

1.5.3 Approval Traceability

Not applicable

1.6 Abbreviation and Acronyms

The following abbreviations and acronyms are used in this document:

ADS-B	Automatic Dependant Surveillance Broadcast
AFM	Aircraft Flight Manual

DC	Direct Current
DDP	Declaration of Design Performance
EASA	European Aviation Safety Agency
ETSO	European Technical Standards Order
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
MOPS	Minimum Operational Performance Standard
POH	Pilots Operating Handbook
TABS	Traffic Awareness Beacon System

2. Introduction

The TN72 TABS GPS Receiver is a TSO-C199 class B compliant GPS, suitable for use as an ADS-B position source for a Trig transponder. When installed in accordance with this minor change it forms part of a voluntary ADS-B Out system that is compatible with airborne traffic systems and surface surveillance equipment.

The TN72 is a remote unit which is mounted within the aircraft cabin or avionics bay with connections to aircraft power, data connection to the transponder and connection to a suitable GPS antenna.

The TN72 runs from either 14 volt nominal or 28 volt nominal DC power supply with no configuration changes required.

This minor change describes the process of installing a TN72 with a preinstalled Trig TT21/22 or TT31 transponder and TA70 GPS antenna. The installation of these items can be accomplished using CS-STAN and therefore is not covered under this minor change for simplicity.

3. Change Details

3.1 Description of Change

3.1.1 Installation Overview

This change involves installing and configuring a Trig Avionics TN72 GPS Position source connected to a Trig Avionics TT21/22 or TT31 transponder.

The installation will include physical mounting of the TN72, construction of a wiring loom, connection to a TA70 GPS antenna and configuration of the associated transponder.

3.2 Mechanical Details

The TN72 is a remote mount unit that is installed within the aircraft cabin or avionics bay. The TN72 features connections for power, data and GPS antenna.

The TN72 is compatible with any GPS antenna approved to ETSO C190 or C114a. For the purpose of this minor change, a separately installed Trig TA70 antenna will be used.

The TN72 has a total weight of 110 grams. The effect on weight and balance of the aircraft will be small due to the low weight of the transceiver equipment. After the installation a weight and balance check should be calculated or performed in accordance with the manufactures instructions.

3.3 Continued Airworthiness Instructions

Other than for periodic functional checks required by the regulations, the TN72 has been designed and manufactured to allow “on condition maintenance”. This means that there are no periodic service requirements necessary to maintain continued airworthiness, and no maintenance is required until the equipment does not properly perform its intended function. When service is required, a complete performance test as detailed in section 5.4 of these instructions should be accomplished following any maintenance action.

3.4 Installed Equipment Suitability

3.4.1 ETSO

The TN72 is certified to ETSO C199

3.4.2 Environmental

The environmental testing conducted for the TN72 is appropriate for this installation.

Key aspects of the TN72 environmental qualification are summarised here:

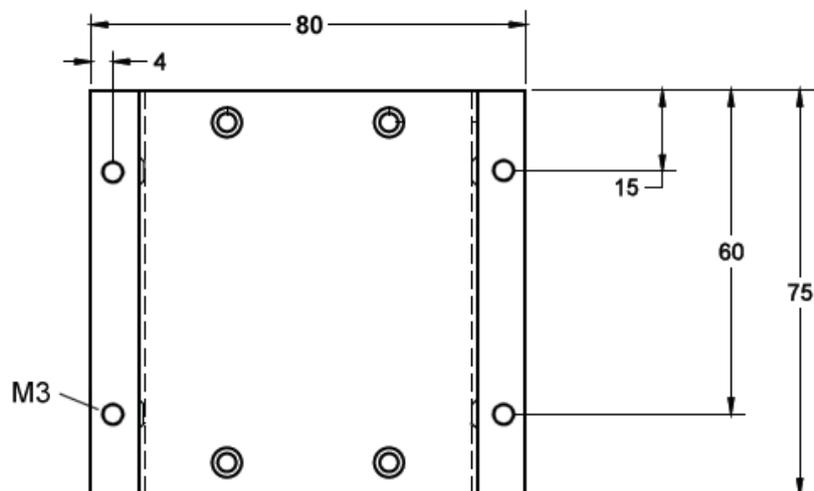
DO-160F reference	Qualification	Applicability
Temperature & Altitude	Category A2 and C1	Equipment intended for installation in a partially controlled temperature but pressurised location and installed is a non-pressurised but controlled temperature location.
Loss of Cooling	+70C without cooling air	Forced air cooling not required.
Temperature Variation	Category B	For a non temperature controlled or partially temperature controlled internal section of the aircraft.

Humidity	Category A	Standard humidity environment.
Operational Shock & Crash Safety	Category B type 5	Equipment generally installed in fixed-wing aircraft or helicopters, VLA's and sailplanes tested for standard operational shock and crash safety.
Vibration	Aircraft zone 2; type 3, 4, 5 to category S level M, type 1 (Helicopters) to category U level G	Single engine fixed wing reciprocating or turboprop. Multi engine less than 5700Kg. Helicopters, reciprocating and turbojet engines. Equipment fitted to instrument panel, console or equipment rack.
Magnetic Effect	Category Z	Equipment and or its connecting cable harness may be mounted within 0.3m of magnetic compass. All verified during ETSO environmental qualification testing.
Power Input	Category BX	DC equipment intended for use on aircraft electrical system supplied by engine driven alternator or generator, where a battery of significant capacity is on the DC bus at all times.
Voltage Spike	Category B	Installation where a lower standard of protection is acceptable.
Audio Susceptibility	Category B	DC equipment intended for use on aircraft electrical system supplied by engine drive alternator or generator, where a battery of significant capacity is on the DC bus at all times.
Induced Signal Susceptibility	Category AC	Equipment intended for operation where interference-free operation is desirable and installed on aircraft whose primary power is constant frequency or DC.
RF Susceptibility	Category TT	Specified in the HIRF rules; representative of the internal EMI environment from aircraft equipment.
RF Emission	Category B	Basic emission control.

In each case the environmental qualification is appropriate to the installation in the instrument panel of a light piston engine aircraft with a DC electrical system.

3.5 Drawings

3.5.1 Mounting fixing



All dimensions in millimetres. The drawing is not to scale

3.6 Electrical Load Analysis

The TN72 will typically draw under 0.08 Amps in normal operation based on a 14v DC supply and 0.04 Amps in normal operation based on an 18v DC supply.

The TN72 wiring and circuit breaker rating to be used are specified in the accomplishment instructions.

The TN72 is considered to be non-essential for continued safe flight. It will be installed with a circuit breaker separate to that of the transponder that allows the unit to be powered off by the pilot. On this basis, it can be concluded that the 30 minute battery requirement of CAP747 GR6 will be satisfied.

3.7 Flight manual/POH Amendments

No AFM amendments are required as part of this Minor Change. A pilot operating booklet is provided with the associated transponder and this should be made available to the flight crew.

4. Preparation

4.1 Equipment and tools required

You will need the TN72 install kit and standard avionics workshop tooling. Depending on the transponder used, you will also require extra crimp pins to connect the new wiring loom to the existing transponder loom.

	Description	Trig Part No	Quantity
TT21/22	Crimp Terminal, Male, 22-24 AWG	00729-00	2
TT31	Crimp Terminal, Female, 18-24 AWG	00236-00	2

4.2 Aircraft Voltage

Ensure the aircraft voltage is between 11 and 33 volts.

4.3 TN72 Position

The TN72 unit can be installed in any orientation as long as it is secured with four screws and locking nuts to a solid piece of structure in a suitable location that meets the following criteria:

- Does not interfere with any primary flying controls.
- Will not be subject to any damage or displacement due to person entering/exiting the aircraft.
- Allows a suitable routing for any interconnecting wiring.
- Will not be subject to adverse weather conditions such as rain, snow or ice.



Example Location – Under panel



4.4 Protective devices

The live power supply must be protected by a 1 Amp circuit breaker of such a type that can be put offline by the pilot.



1 Amp Circuit breaker

4.5 Wiring

4.5.1 Power and Ground

Ensure there is space in the panel to fit the addition 1 Amp circuit breaker required. All power and ground wires should be of the size and type detailed in the wiring diagrams.

4.5.2 Wire Routing

Care must be taken to ensure surface damage does not occur to the wires during installation and that all wire looms are appropriately secured to prevent damage during its installed life. Ensure the loom does not chafe on any parts of the aircraft or interfere with any moving parts especially if you are using thin walled insulated wire to save on weight, such as MIL-22759/16, 17, 18 or 19.

4.5.3 Inspect the General Wiring

Inspect any existing wiring for the general condition and gauge. The power wires should be AWG 20 or heavier; the other signal wires carry only light currents and may be any gauge appropriate to the mechanical environment.

5. Accomplishment Instructions

5.1 TN72 Installation

5.1.1 Installing TN72 GPS Position Source

Once a suitable location has been decided as per section 4.4, secure the TN72 using suitable screws. You should use an appropriate locking nut or similar to ensure the TN72 does not come loose during normal aircraft vibrations.

Install the TN72 in accordance with the installation manual.

5.1.2 Wiring Loom

Manufacture the connectors and wiring looms in accordance with the appropriate wiring diagrams in section 5.2.

The power wires should be AWG 20 or heavier; the other signal wires carry only light currents and may be any gauge appropriate to the mechanical environment.

Shielded wiring can be used if deemed appropriate the particular installation.

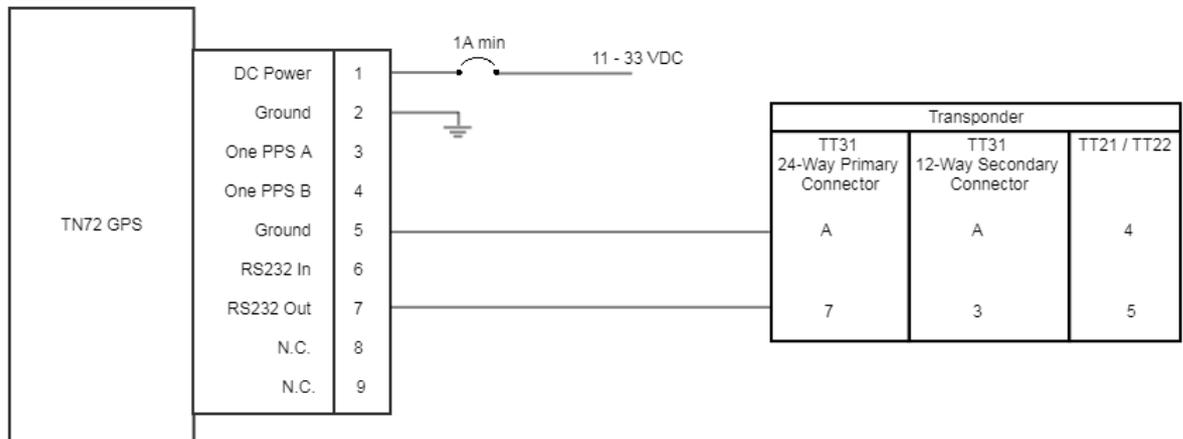
Aircraft standard wire should be used for the installation. For example, wire that meets MIL-W-22759/1 to 23, 32 to 35 specifications would be acceptable for this installation. Common wire types include MIL-W-22759/34 or Raychem 55 wire. Shielded wires should be to MIL-W-27500.

When installing the TN72 to a TT31 either the primary 24 way or the secondary 12 way connection can be used.

5.2 Wiring Diagrams

Figure 1 – TN72 System Interconnect 11

Figure 1 – TN72 System Interconnect



Antenna Connection

Install the TA70 antenna in accordance with its fitting instructions. This should be accomplished using either a separate minor change or CS-STAN CS-SC004a.

Install the antenna cable as per the TN72 installation manual.

5.3 Post Installation Checks

5.3.1 Continuity Check

Perform a continuity check on all the newly installed wiring to ensure the correct connections have been made.

5.3.2 Secure Looms

Ensure all the wiring is suitably secured and does not interfere with any flying controls. Make sure the wiring cannot be damaged or chaffed due to aircraft vibrations.

5.3.3 Initial Power On

Apply power. The TN72 has no indicators of function on the unit and so functionality cannot be determined visually. The circuit breaker should remain untripped.

5.3.4 TT21/22 Setup

Enter the setup menu by holding down the “Fn” button while powering the transponder on then press “Ent” when instructed.

Setup the parameters as follows:

VFR Flight ID, Mode S Address	As per aircraft
VFR Squawk	As per customer preference
Maximum Airspeed, Aircraft Category	As per aircraft
Squat Switch Type	Auto on GPS data
TIS Output	None
GPS Source	C199 TABS
GPS Interface Speed	9600
Aircraft Length, Aircraft Width, GPS Reference Position Offset,	
1090MHz Receiver Installed	As per aircraft
UAT Receiver Installed	No

Press “Fn” to skip the voltage check and altimeter calibration. Power cycle the transponder when instructed.

Refer to the Installation and Operation manuals for further information on each setup parameter.

5.3.5 TT31 Setup

Enter the setup menu by holding down the “Func” button while powering the transponder on, press “Ent” when instructed.

Setup the parameters as follows:

VFR Flight ID, Mode S Address	As per aircraft
VFR Squawk	As per customer preference
Maximum Airspeed, Aircraft Category	As per aircraft
Squat Switch Type	Auto on GPS data
ARINC TIS Output	None

If connection the TN72 on the primary connector use the following setting, otherwise leave at current values.

Serial Input 1	GPS - C199 TABS
Serial Output 1	Leave at current setting
Interface 1 Speed	9600

If connection the TN72 on the secondary connector use the following setting, otherwise leave at current values.

Serial Input 2	GPS - C199 TABS
Serial Output 2	Leave at current setting
Interface 2 Speed	9600

Aircraft Length, Aircraft Width,

GPS Reference Position Offset,

1090MHz Receiver Installed	As per aircraft
UAT Receiver Installed	No
Audio Volume, LCD Dimmest Point,	As per customer preference
LCD Brightness	

Press “Func” to skip the external interface, altitude encoder and temperature checks. Confirm that the correct channel shows “GPS: *”. Press “Func” to skip forward and power cycle the transponder when instructed.

Refer to the Installation and Operation manuals for further information on each setup parameter.

5.4 Test

5.4.1 Equipment Function

Verify that the proper mechanical and electrical connections have been made.

With the aircraft positioned with a clear view of the sky, power the transponder and TN72 and set the transponder to ALT mode and allow two minutes to for a GPS position to be established. Press the

“Fn” or “Func” key until “ADS-B POSN” is shown and verify that the latitude and longitude shown are correct for the current aircraft location. Check that the transponder is displaying GND on screen, indicating that the automatic air / ground determination has been successful.

Pull the isolating circuit breaker to the TN72. Ensure that the “No ADS-B position” warning is shown within 20 seconds. Check that ALT is displayed on the screen within one minute, indicating that the transponder has reverted to airborne mode.

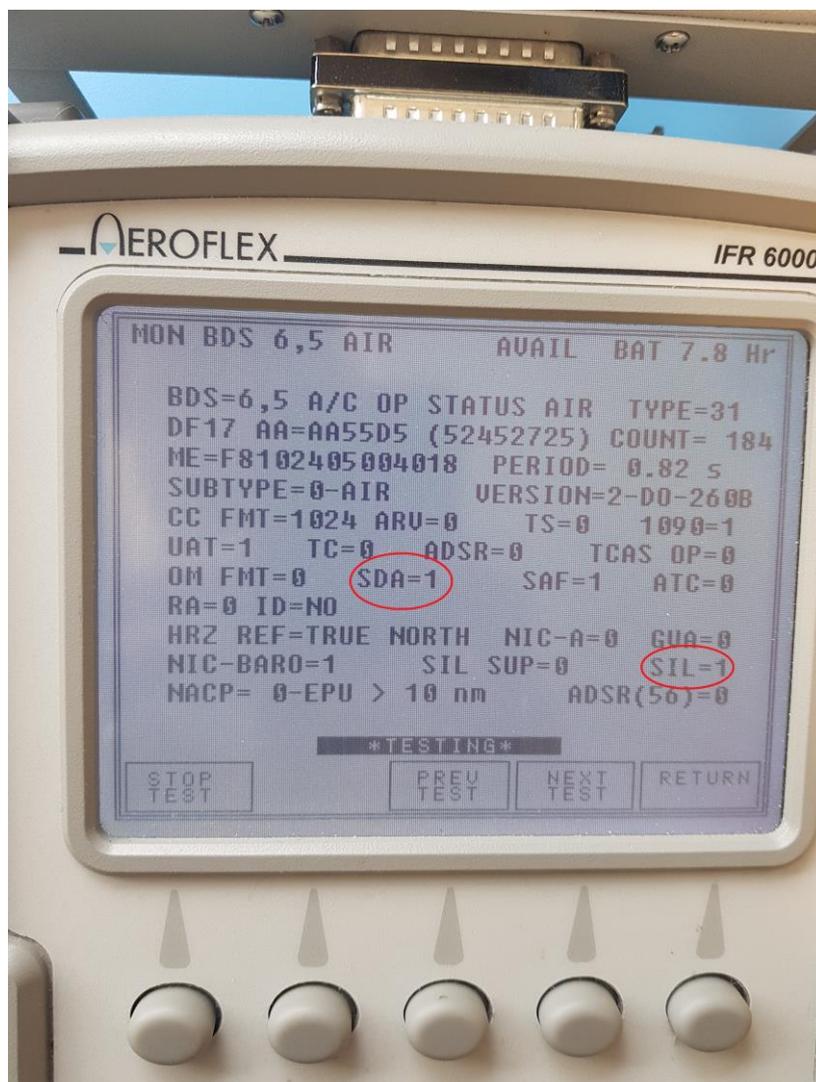
Reset the circuit breaker and ensure the position returns within two minutes.

5.4.2 Interference Effects

With the TN72 powered on, operate each of the other electrically operated aircraft systems to determine that no significant interference effects are present.

5.4.3 Ramp Test

Using an IFR 6000 or other suitable transponder test set, confirm that the transponder gives an ADS-B position comparable to the actual position and a SIL and SDA value of 1 during operation.



6. Compliance Statement

CS 23 Amdt 1 Para	Requirement	Compliance	References
23.1301 (a)	Installed equipment to be of a design appropriate to its intended function.	TN72 is approved under ETSO C199. Review of certification basis in DDP completed.	TN72 DDP.
23.1301 (b)	Be labeled as to its identification, function or operating limitations.	All controls are present. No limitations are recorded. ETSO compliance is shown on the product identification label.	TN72 Installation Manual.
23.1301 (c)	Be installed according to specified limitations	Review of environmental testing, deviations and limitations in DDP completed.	TN72 DDP.
23.1301 (d)	Function properly when installed.	System tested by ground and flight tests on completion	Section 5.4, Post installation checks
23.1309 (a)	System must not adversely affect existing systems	The TN72 does not interface with and is physically separate from other aircraft systems apart from the transponder. Failure of the TN72 will not result in failure of the transponder. TN72 system integrity is commensurate with a minor failure condition and unit failure does not affect the correct function of other existing systems. EMI tests carried out post-installation.	Section 5.2, Wiring Diagram. Section 5.4, Post installation checks
23.1351(a)	Electrical system capacity	1 amp circuit breaker used supplying a maximum load of 0.1 amps. Wire gauge 20 appropriate. Effects on battery endurance will be negligible and the TN72 is not required equipment and can be powered off.	Section 3.6, Electrical load analysis TN72 Installation Manual.
23.1357	Circuit Protective Devices	New circuit breaker used.	Section 4.8 of accomplishment instructions.
23.1431(a)	Environmental conditions must be considered.	Section 3.4.2, review of environmental testing.	TN72 DDP.

23.1431(b)	Not adversely affect simultaneous operation of other radio or electronic systems or units.	EMI tests carried out post-installation.	Section 5.4, Post installation checks
23.1529	Instructions for Continued Airworthiness	Other than for periodic functional checks required by the maintenance program, the TN72 GPS Position Source has been designed and manufactured to allow “on condition maintenance”. This means that there are no periodic service requirements necessary to maintain continued airworthiness, and no maintenance is required until the equipment does not properly perform its intended function.	Section 3.3 Continued Airworthiness Instructions.
CAP747, GR6	Battery duration not less than 30 minutes	The TN72 has a maximum load of 0.1 amps. Effects on battery endurance will be negligible and the TN72 is not required equipment and can be powered off.	TN72 Installation Manual.

7. Appendix 1

TN72 Instructions for Continued Airworthiness
<p>1. Description</p> <p>This document describes the necessary maintenance requirements and instructions necessary to ensure the continued airworthiness of the aircraft following the embodiment of the Minor Change to add the TN72 GPS Receiver.</p>
<p>2. Operation</p> <p>There are no specific operation instructions for the TN72 as all operation is automatic and handled by the associated transponder. Details of transponder operation can be found in the relevant transponder operating manual.</p> <ul style="list-style-type: none">• 00454-00 TT31 Operating Manual• 00559-00 TT21/22 Operating Manual
<p>3. Servicing</p> <p>There are no periodic service requirements necessary to maintain continued airworthiness of the TN72 GPS Receiver.</p>
<p>4. Maintenance Instructions</p> <p>Please refer to your national approved aircraft maintenance program for any periodic functional checks that must be carried out on the transponder system.</p> <p>Other than for periodic functional checks required by the regulations, there are no periodic maintenance requirements necessary to maintain continued airworthiness.</p> <p>If a service is required, a complete performance test as detailed in section 5.4 of these instructions should be accomplished following any maintenance action.</p>
<p>5. Install and Removal Instructions</p> <p>Please refer to Trig Avionics TN72 Installation Manual;</p> <ul style="list-style-type: none">• 01691-00 Installation Manual section Installation
<p>6. Required Tools and Test Equipment</p> <ul style="list-style-type: none">• None
<p>7. Airworthiness Limitations</p> <p>There are no Airworthiness Limitations applicable to the Trig Avionics Minor Change to install a TN72 GPS Receiver.</p>

8. Appendix 2

Applicable aircraft types

Type Certificate Holder CESSNA AIRCRAFT COMPANY

Type Certificate Number FR 38, US A13EU, US A4EU, US A26EU, US A42EU, US A18EU, FR 43

Type Cessna F150/F152 Series

Model F152

Model FA150K

Model FA150L

Model FA150M

Model FA152

Model FRA150L

Model FRA150M

Model F150F

Model F150G

Model F150H

Model F150J

Model F150K

Model F150L

Model F150M

Type Cessna F172 Series

Model F172G

Model F172H

Model F172K

Model F172L

Model F172M

Model F172N

Model F172P

Model FP172D

Model F172D

Model F172E

Model F172F

Type Cessna F177RG

Model F177RG

Type Cessna F182 Series

Model F182P

Model F182Q

Model FR182

Type Cessna FR172 Series

Model FR172E

Model FR172F

Model FR172G

Model FR172H

Model FR172J

Model FR172K

Type Certificate Holder BRITTEN-NORMAN AIRCRAFT LTD.

Type Certificate Number EASA.A.388, AAN 9405.1, AAN 10101, AAN 11529, AAN 10918, AAN 12401,
AAN 11105, AAN 11108

Type BN2 Islander Series Aircraft

Model BN2A-9

Model BN2B-20

Model BN2B-21

Model BN2

Model BN2A

Model BN2A-10

Model BN2A-2

Model BN2A-20

Model BN2A-21

Model BN2A-23

Model BN2A-26

Model BN2A-27

Model BN2A-3

Model BN2A-6

Model BN2A-8

Model BN2B-26

Model BN2B-27

Type Certificate Holder AQUILA AVIATION INTERNATIONAL GMBH

Type Certificate Number EASA.A.527

Type AQUILA AT01

Model AQUILA AT01-100

Model AQUILA AT01

Type Certificate Holder AVIAT AIRCRAFT INC

Type Certificate Number EASA.IM.A.294, US A8SO

Type Husky A-1

Model A-1

Model A-1A

Model A-1B

Model A-1C-180

Type Pitts S-1/-2

Model S-1S

Model S-2A

Model S-2B

Model S-2C

Model S-2S

Type Certificate Holder CIRRUS DESIGN CORPORATION

Type Certificate Number EASA.IM.A.007

Type Cirrus SR-20, SR-22

Model SR20

Model SR22

Model SR22T

Type Certificate Holder DIAMOND AIRCRAFT INDUSTRIES

Type Certificate Number EASA.A.005, EASA.A.513, EASA.A.439, EASA.A.065, EASA.A.066

Type DA 42

Model DA 42

Model DA 42 M

Model DA 42 M-NG

Model DA 42 NG

Model DA 62

Type DA 42 M (Restricted)

Model DA 42 M (Restricted)

Model DA 42 M-NG (Restricted)

Type DV 20

Model DV 20

Model DV 20 E

Type H 36

Model H 36 "Dimona"

Model HK 36 "Super Dimona"

Model HK 36 R "Super Dimona"

Model HK 36 TC

Model HK 36 TS

Model HK 36 TTC

Model HK 36 TTC-ECO

Model HK 36-TTS

Type HK 36 TTC-ECO

Model HK 36 TTC-ECO

Type Certificate Holder E.I.S. AIRCRAFT GMBH

Type Certificate Number DE TC 666, DE TC 695, DE 1014, DE TC 755

Type Fournier RF 3

Model Fournier RF 3

Model Fournier RF 4

Model Fournier RF 4 D

Type Fournier RF 5

Model Fournier RF 5

Model Fournier RF 5 B "Sperber"

Type RS 180

Model RS 180

Type SFS 31 "Milan"

Model SFS 31 "Milan"

Type Certificate Holder EVEKTOR, SPOL. S R.O.

Type Certificate Number EASA.A.029, EASA.A.046, EASA.A.592

Type EV-97 VLA

Model EV-97 VLA

Type L 13 Vivat

Model L 13 SDL Vivat

Model L 13 SDM Vivat

Model L 13 SE Vivat

Model L 13 SEH Vivat

Model L 13 SL Vivat

Model L 13 SW Vivat

Type SportStar RTC

Model SportStar RTC

Type Certificate Holder EXTRA

Type Certificate Number EASA.A.362

Type EA 300

Model EA 300

Model EA 300/200

Model EA 300/L

Model EA 300/LC

Model EA 300/LT

Model EA 300/S

Model EA 300/SC

Type Certificate Holder FUJI HEAVY INDUSTRIES LTD.

Type Certificate Number JP 20-10, JP 22-2, JP 22-6

Type FA-200

Model FA-200-160

Model FA-200-180

Model FA-200-180AO

Type Certificate Holder GROB AIRCRAFT AG

Type Certificate Number EASA.A.075, EASA.A.565, DE TC 817, EASA.A.364

Type G 120

Model G 120A

Model G 120A-I

Type G 120TP

Model G 120TP-A

Type G109

Model G109

Model G109 B

Type Grob G 115

Model G 115

Model G 115A

Model G 115B

Model G 115C

Model G 115C2

Model G 115D

Model G 115D2

Model G 115E

Model G 115EG

Model G 115TA

Type Certificate Holder HB-FLUGTECHNIK GMBH

Type Certificate Number EASA.A.434, EASA.A.433

Type HB 21

Model HB 21

Model HB 21 V1

Model HB 21 V2

Model HB 21/2400

Model HB 21/2400 B

Type HB 23/2400

Model HB 23/2400

Model HB 23/2400 SP

Model HB 23/2400 Scanliner

Model HB 23/2400 V2

Type Certificate Holder M & D FLUGZEUGBAU GMBH

Type Certificate Number EASA.A.252

Type AVO 68 - v "Samburo"

Model AVO 68 - R "Samburo"

Model AVO 68 - R 100 "Samburo"

Model AVO 68 - R 115 "Samburo"

Model AVO 68 - s "Samburo"

Model AVO 68 - v "Samburo"

Type Certificate Holder PILATUS AIRCRAFT LTD.

Type Certificate Number CH F 56-10

Type PC-6

Model PC-6

Model PC-6-H1

Model PC-6-H2

Model PC-6/350

Model PC-6/350-H1

Model PC-6/350-H2

Model PC-6/A

Model PC-6/A-H1

Model PC-6/A-H2

Model PC-6/A1-H2

Model PC-6/A2-H2

Model PC-6/B-H2

Model PC-6/B1-H2

Model PC-6/B2-H2

Model PC-6/B2-H4

Model PC-6/C-H2

Model PC-6/C1-H2

Type Certificate Holder PZL WARSZAWA-OKECIE S.A.

Type Certificate Number EASA.A.061, EASA.A.444, EASA.A.091

Type PZL-104 Wilga Series

Model PZL-104 Wilga 32

Model PZL-104 Wilga 32A

Model PZL-104 Wilga 35

Model PZL-104 Wilga 35A

Model PZL-104 Wilga 80

Model PZL-104M Wilga 2000

Model PZL-104MA Wilga 2000

Model PZL-104MF Wilga 2000

Model PZL-104MN Wilga 2000

Type PZL-106 BT TURBO KRUK Series

Model PZL-106 BT-601 TURBO KRUK

Model PZL-106 BTU-34 TURBO KRUK

Type PZL-KOLIBER Series

Model PZL-110 KOLIBER

Model PZL-KOLIBER 150

Model PZL-KOLIBER 150A

Model PZL-KOLIBER 160A

Type Certificate Holder SLINGSBY ADVANCED COMPOSITES

Type Certificate Number EASA.A.390

Type T67

Model T67A

Model T67B Firefly

Model T67C Firefly

Model T67M Firefly

Model T67M-MKII Firefly

Model T67M200 Firefly

Model T67M260 Firefly

Model T67M260-T3A Firefly

Type Certificate Holder SOCATA

Type Certificate Number EASA.A.377, EASA.A.379, EASA.A.378

Type MS 880 and Rallye 100 Series

Model MS 880 B

Model MS 880 B-D

Model MS 881

Model MS 883

Model MS 884

Model MS 885

Model MS 886

Model MS 887

Model Rallye 100 S

Model Rallye 100 S-D

Model Rallye 100 ST

Model Rallye 100 ST-D

Model Rallye 110 ST
Model Rallye 150 ST
Model Rallye 150 ST-D
Model Rallye 150 SV
Model Rallye 150 SVS
Model Rallye 150 T
Model Rallye 150 T-D
Model Rallye 180 T
Model Rallye 180 T-D
Model Rallye 180 TS

Type MS 890 and Rallye 235 Series

Model MS 890 A
Model MS 890 B
Model MS 892 A.150
Model MS 892 B.150
Model MS 892 E-D.150
Model MS 892 E.150
Model MS 893 A
Model MS 893 B
Model MS 893 E
Model MS 893 E-D
Model MS 894 A
Model MS 894 C
Model MS 894 E
Model RALLYE 235 A
Model RALLYE 235 C
Model RALLYE 235 E
Model RALLYE 235 E-D
Model RALLYE 235 F

Type TB Series

Model TB 10
Model TB 20
Model TB 200
Model TB 21
Model TB 9

Type Certificate Holder STEMME AG

Type Certificate Number EASA.A.054

Type Stemme S10

Model Stemme S10

Model Stemme S10-V

Model Stemme S10-VT

Model Stemme S12

Type Certificate Holder SYMPHONY AIRCRAFT INDUSTRIES

Type Certificate Number EASA.IM.A.031

Type OMF-100

Model OMF-100-160

Type Certificate Holder TECHNOFLUG LEICHTFLUGZEUGBAU

Type Certificate Number DE TC 880

Type CARAT

Model CARAT

Type Certificate Holder TRUE FLIGHT HOLDINGS LLC

Type Certificate Number US A16EA, US A11EA

Type AA-5

Model AA-5

Model AA-5A

Model AA-5B

Model AG-5B

Type AA-1

Model AA-1

Model AA-1A

Model AA-1B

Model AA-1C

Type Certificate Holder COMMANDER AIRCRAFT CORPORATION

Type Certificate Number US A12SO

Type Commander 112/114 Series

Model 112

Model 112B

Model 112TC

Model 112TCA

Model 114

Model 114A

Model 114B

Model 114TC

Type Certificate Holder COSTRUZIONI AERO. TECNAM

Type Certificate Number EASA.A.006

Type P2002

Model P2002-JF

Model P2002-JR

Type Certificate Holder BEECHCRAFT CORPORATION

Type Certificate Number US 5A4, US A23CE, US A29CE, US A30CE, US A1CE

Type 50 (Twin Bonanza)

Model 50

Model B50

Model C50

Model D50

Model D50A

Model D50B

Model D50C

Model D50E

Model D50E-5990

Model E50

Model F50

Model G50

Model H50

Model J50

Type 58

Model 58P

Model 58PA

Model 58TC

Model 58TCA

Type 76 (Duchess)

Model 76

Type 77 (Skipper)

Model 77

Type Hawker Beechcraft 19, 23, 24

Model 19A

Model 23

Model A23

Model A23-19

Model A23-24

Model A23A

Model A24

Model A24R

Model B19
Model B23
Model B24R
Model C23
Model C24R
Model M19A

Type Certificate Holder DIAMOND AIRCRAFT IND. INC
Type Certificate Number EASA.IM.A.223, EASA.IM.A.022, EASA.IM.A.629

Type DA 20
Model DA 20-A1
Model DA 20-C1

Type DA 40
Model DA 40
Model DA 40 D
Model DA 40 F
Model DA 40 NG

Type DA 62
Model DA 62

Type Certificate Holder MAULE AEROSPACE TECHNOLOGY
Type Certificate Number EASA.IM.A.018

Type Maule
Model Bee Dee M-4
Model M-4
Model M-4-180V
Model M-4-210
Model M-4-210C
Model M-4-220
Model M-4-220C
Model M-4-220S
Model M-4C
Model M-4S
Model M-4T
Model M-5-180C
Model M-5-210C
Model M-5-235C
Model M-6-235
Model M-7-235
Model M-7-235B

Model MT-7-235
Model MX-7-180
Model MX-7-180A
Model MX-7-180B
Model MX-7-180C
Model MX-7-235
Model MXT-7-160
Model MXT-7-180
Model MXT-7-180A

Type Certificate Holder MOONEY AVIATION COMPANY, INC.

Type Certificate Number US 2A3, EASA.IM.A.266, US A6SW

Type M20

Model M20
Model M20A
Model M20B
Model M20C
Model M20D
Model M20E
Model M20F
Model M20G
Model M20J
Model M20K
Model M20L
Model M20M
Model M20R
Model M20S

Type M22

Model M22

Type Certificate Holder PIPISTREL D.O.O. AJDOVSCINA

Type Certificate Number EASA.A.573

Type Virus SW 121

Model Virus SW 121

Type Certificate Holder QUEST AIRCRAFT DESIGN LLC

Type Certificate Number EASA.IM.A.632

Type Kodiak 100 Series

Model Kodiak 100

Type Certificate Holder ZLIN AIRCRAFT A.S.

Type Certificate Number EASA.A.353, EASA.A.443, EASA.A.027, EASA.A.028, EASA.A.108

Type ZLIN Z 26 Series

Model Z 126

Model Z 126 T

Model Z 226 A

Model Z 226 B

Model Z 226 M

Model Z 226 MS

Model Z 226 T

Model Z 326

Model Z 326 A

Model Z 326 M

Model Z 526

Model Z 526 A

Model Z 526 AFS

Model Z 526 AFS-V

Model Z 526 F

Model Z 526 L

Model Z 526 M

Model Z 726

Model Z 726 K

Type ZLIN Z 37 T Series

Model Z 137 T

Model Z 37 T

Type ZLIN Z 42 Series

Model Z 142

Model Z 142 C

Model Z 242 L

Model Z 42 M

Model Z 42 MU

Type ZLIN Z 43 Series

Model Z 143 L

Model Z 143 LSi

Model Z 43

Type ZLIN Z 50 Series

Model Z 50 L

Model Z 50 LA

Model Z 50 LS

Model Z 50 LX

Model Z 50 M

Type Certificate Holder PIPER AIRCRAFT, INC.

Type Certificate Number

US 1A10, US 1A15, US 2A13, EASA.IM.A.234, US A1EA, US A20SO, US A3SO,
EASA.IM.A.239, US A7SO, EASA.IM.A.090, US A9SO, US A10SO, US A18SO,
EASA.IM.A.232

Type PA-23

Model PA-23-235

Model PA-23-250

Model PA-E23-250

Type PA-24 (Comanche)

Model PA-24

Model PA-24-250

Model PA-24-260

Model PA-24-400

Type PA-28

Model PA-28-140 (Cherokee Cruiser)

Model PA-28-150 (Cherokee)

Model PA-28-151 (Cherokee Warrior)

Model PA-28-160 (Cherokee)

Model PA-28-161

Model PA-28-161 (Warrior II)

Model PA-28-161 (Warrior III)

Model PA-28-180 (Archer)

Model PA-28-180 (Cherokee)

Model PA-28-181 (Archer II)

Model PA-28-181 (Archer III)

Model PA-28-201T (Turbo Dakota)

Model PA-28-235 (Cher.Pathfinder)

Model PA-28-236 (Dakota)

Model PA-28R-180 (Arrow)

Model PA-28R-200 (Arrow II)

Model PA-28R-200 (Arrow)

Model PA-28R-201 (Arrow III)

Model PA-28R-201T (Turbo Arrow III)

Model PA-28RT-201 (Arrow IV)

Model PA-28RT-201T (Turbo Arrow IV)

Model PA-28S-160 (Cherokee)

Model PA-28S-180 (Cherokee)

Type PA-30, PA-39, PA-40

Model PA-30

Model PA-39

Model PA-40

Type PA-31 (Navajo)

Model PA-31

Model PA-31-300

Model PA-31-325

Model PA-31-350 (Chieftain)

Type PA-32

Model PA-32-260 (Cherokee Six 260)

Model PA-32-300 (Cherokee Six 300)

Model PA-32-301 (Saratoga)

Model PA-32-301FT (Piper 6X)

Model PA-32-301T (Turbo Saratoga)

Model PA-32-301XTC (Piper 6XT)

Model PA-32R-300 (Lance)

Model PA-32R-301 (Saratoga II HP)

Model PA-32R-301 (Saratoga SP)

Model PA-32R-301T (Saratoga II TC)

Model PA-32R-301T (Turbo SaratogaSP)

Model PA-32RT-300 (Lance II)

Model PA-32RT-300T (Turbo Lance II)

Model PA-32S-300 (Cher.Six Seaplane)

Type PA-34

Model PA-34-200 (Seneca)

Model PA-34-200T (Seneca II)

Model PA-34-220T (Seneca III)

Model PA-34-220T (Seneca IV)

Model PA-34-220T (Seneca V)

Type PA-36 (Normal category)

Model PA-36-285 (Normal category)

Model PA-36-300 (Normal category)

Model PA-36-375 (Normal category)

Type PA-36 (Restricted category)

Model PA-36-285 (Restricted)

Model PA-36-300 (Restricted)

Model PA-36-375 (Restricted)

Type PA-38

Model PA-38-112

Type PA-44

Model PA-44-180 (Seminole)

Model PA-44-180T (Turbo Seminole)

Type Certificate Holder CUB CRAFTERS, Inc.

Type Certificate Number EASA.IM.A.638

Type CC19-180

Model CC19-180