
STANDARD MINOR MODIFICATION – PILOT AWARE INSTALLATION

Introduction

This leaflet contains the required information to permit straightforward fitment of a “PilotAware” device in a BMAA aeroplane as a fixed installation i.e. aerials mounted permanently on aircraft and/or PilotAware box secured permanently onto the aircraft.

This leaflet permits only certain ways of installing the device. This is because these ways are known to be straightforward, risk and hassle free. This doesn’t mean that there aren’t other ways of fitting a PilotAware, but if you wish to do it in another way, this must be done through a more conventional mod application and more information than is required here may be requested by the BMAA technical office.

Notwithstanding the simple approach taken by this TIL, it is the aircraft owner’s responsibility to ensure that all materials used in a modification are of adequate quality, that proper aircraft engineering standards are applied, that this modification does not create any safety problem when combined with any other modification to the aircraft, and that no relevant information has been withheld from the BMAA or inspector.

Note that the installation is only approved on a no-hazard basis, and does not check the functionality or reliability of the PilotAware.

Permitted Options

- 1 PilotAware type
 - 1.1 The PilotAware Classic and Rosetta may be fixed, or removable from the aircraft.
- 2 Antenna type
 - 2.1 P3i Antenna
 - 2.2 ADS-B Antenna
 - 2.3 GPS Antenna
- 3 Power Supply
 - 3.1 The PilotAware may be powered by an external battery and/or the aircraft power supply via a suitable voltage regulator.
- 4 PilotAware Location
 - 4.1 The PilotAware is to be located inside the aircraft and out of the airflow.

Essential Safety Checks

- 1 PilotAware
 - 1.1 When installing a PilotAware, on no account should primary structure be cut, drilled or altered in any way. If in doubt, ask.
 - 1.2 The PilotAware (including any mounting brackets) must be weighed.
 - 1.3 A load test, using scales or a spring balance to 9 times the instrument weight forwards, 4.5 times the instrument weight up and down, 3 times the instrument weight to port and starboard must be carried out.
 - 1.4 If the PilotAware box or aerials are removable, and not positively restrained, or if it is mounted on a windscreen sucker mount, there must also be a retaining lanyard attached to both the aircraft and the PilotAware, to stop it becoming a hazard if it comes loose.

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This must be short enough to prevent it snagging the pilots as they enter or leave the cockpit.

- 1.5 When panel-mounting the PilotAware, if a new cutout is required, this is only acceptable if the panel is not load bearing primary structure. If unsure, make certain first and cut later. There must be enough space around the instruments so that there is adequate mechanical strength left in the panel to carry the additional weight. Obviously this means that with a thick metal panel the PilotAware can be far closer to other instruments than with a thick GRP panel for example (instruments with backing plates that are screwed into the panel are unlikely to have a significant weakening effect). In addition to the load test of check 1.3, test the panel in the area of the PilotAware with 9 times the combined weight of the PilotAware and its adjacent instruments forward (spread the load over an area when performing this test). If there is any question as to whether the whole panel can cope with the additional weight, repeat the test with 9 times the combined weight of all the instruments.
- 2 Cabling
 - 2.1 If powered via the auxiliary power supply socket it is the pilot's responsibility to secure the cable and ensure that it cannot pose a danger to the control of the aircraft, since any such cable is not considered part of the modification.
 - 2.2 If wired directly into the aircraft's electrical system, the PilotAware must be connected to its power supply via an in-line fuse and a switch (such that it is easy for the pilot to turn off the power supply to the installed instrument in flight). The fuse rating must be between 1.5 and 2 times the maximum current draw of the PilotAware, and placarded on, or adjacent to, the fuse holder. The switch can be a separate switch or the supply can be routed via the master switch. In the case of a separate switch, it must be clearly placarded with its function (for example 'PilotAware') and its sense (on/off), which must be down for off. Cables between the PilotAware and the power supply must be firmly secured
 - 2.3 Any cables bridging de-riggable parts of the aircraft must have quick release fasteners at the join.
 - 2.4 No holes must be drilled in any primary structure for cables to pass through.
 - 2.5 No holes must be cut in the sail for cables to pass through.
 - 2.6 Cables, if passing through the wing, must be routed so that they cannot snag any flying controls.
- 3 Antenna
 - 3.1 The antennas must be fitted in accordance with the PilotAware installation instructions.
 - 3.2 No holes must be drilled in any metal or composite primary structures for mounting the antenna. If unsure consult the BMAA.
- 4 Mobile Device or Tablet
 - 4.1 Must be approved unless temporary i.e. mounted on map board. If mounted with an external mount such as a Ram Mount or other quick release device then it will require approval using Standard Minor Modification 109.
https://www.bmaa.org/files/til_109_gps_or_pda.pdf
- 5 Aircraft Weight and Balance
 - 5.1 The last weight report must be checked and the PilotAware added to the equipment inventory and the weight and position from datum added to the subsequent changes section.

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- 5.2 For a 3-axis microlight aircraft, the inspector must calculate, from the known weight and position of the new instrument the empty CG change, and satisfy themselves that this will not in any condition make the aircraft go outside the permitted CG limits. If a W&CG report is not held for the aircraft, one must be prepared or BMAA HQ contacted for the file copy (Note: it is an ANO requirement that whenever an aircraft is weighed, details of the weighing are included in the aircraft logbook).
- 5.3 The inspector must make an amended weight and balance entry in the aircraft logbook.
- 6 Radio Interference
- 6.1 If a radio is fitted, check that the PilotAware does not cause excessive interference. A small increase in the use of the radio's squelch control to suppress PilotAware 'noise' is acceptable, but if the squelch cannot completely remove the interference, or the quality of received transmissions is significantly affected by the PilotAware, remedial action is required. A common source of 'noise' is a USB connector/charger, so it is advisable to check this first if a problem is found.

What to do once you have fitted your PilotAware

In conjunction with your inspector, fill in the form on pages 4, 5 & 6 of this TIL, and return it to the BMAA. The BMAA will return this form to you, with the full modification approval number shown at the bottom of the page. This mod number must then be entered in the aircraft logbook.

It is acceptable to send in the form with your permit renewal form.

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BMAA – STANDARD MINOR MODIFICATION CHECKLIST: TIL 121

Reg: G-	Aircraft type:	Serial No:
Owners name:		Owners BMAA No:

Installation Details

Pilot Aware Model	Classic/Rosetta*
PilotAware Location	
Antenna Locations: P3i Antenna ADS-B Antenna	
GPS Type	
GPS Antenna Location	
Powersupply – If USB, is powersocket approved (Approval Number).	
Mobile Device or Tablet - Make and Model	
Mobile Device or Tablet Installation	Permanent/Removable*
Mobile Device or Tablet modification approval details. (mod number, factory installed etc.	

* Delete as appropriate

Safety Checks

CHECK	ACTION	COMMENTS	INSP INITIALS
<i>1 All PilotAware types</i>			
1.1	No primary structure drilled or altered		
1.2	PilotAware inside aircraft & outside airflow		
1.3	Installation load tested		
1.4	Aircraft within weight & CG limits – amended weight & balance entry in aircraft logbook		
<i>2 Permanent-mount PilotAware</i>			
2.1	Mounted in instrument panel - not primary structure		
2.2	Instrument panel strength (see section 1.5 of Essential Safety Checks)		

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CHECK	ACTION	COMMENTS	INSP INITIALS
<i>3 PilotAware powered by aircraft power supply</i>			
3.1	Circuit protected by appropriate fuse		
3.2	Fuse rating placarded		
3.3	Power to PilotAware can be switched off by pilot in flight (master switch acceptable)		
3.4	Switch function clearly placarded		
3.5	Switch down for off and placarded as such		
<i>4 Antenna installations</i>			
4.1	No holes in structural components i.e. aluminium or composite skins (consult BMAA if unsure).		
4.2	Antenna orientated as per installation instructions		
4.3	Secure and clear of propeller & exhaust		
4.4	Minimum 6" ground clearance (if under pod)		
4.5	Not in front of pitot, venturi or static source		
4.6	Ground plane secure (if applicable)		
<i>5 General installation checks</i>			
5.1	Multi-strand cable used - adequate cable flexibility and current capacity		
5.2	All cable terminations properly made - no exposed conductor		
5.3	Cables and other components properly secured		
5.4	Quick-release fasteners used for de-riggable parts of airframe		
5.5	No holes or cuts made in airframe		

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<i>6 Operation Checks</i>			
6.1	No excessive interference on any other electrical items on aircraft including EFIS, radio or transponder, check with engine off and engine running at all allowable power settings. (The owner or his agent are responsible for all aircraft and engine operations. The inspector is not authorised to start or run the engine.)		
6.2	Compass not affected		
<i>7 Additional Information</i>			
7.1	Attach clear photographs showing Pilotaware installation		
7.2	Attach clear photographs showing installed components e.g. Antennas		

Note: PilotAware Installation accepted as non-required equipment (effectiveness not checked or assured)

OWNER'S DECLARATION

I declare that the foregoing information is correct to the best of my knowledge and I will not change the installation design once approved.

Signed:

Name.

Date:

INSPECTOR'S DECLARATION

I declare that the foregoing information is correct and the installation is fit to be flown.

Signed:

Name.

Insp No:

Date:

This form must be sent with payment as per current fees in MF or www.bmaa.org, and BMAA Aircraft Ownership Trustee Grid (if applicable) to*:- technical.office@bmaa.org

BMAA Office Approval:	(signed)	(Name)
Mod No.: G-____ / TIL121 / 20 __ / _____		(Date)

**Whilst waiting for this form to be returned by the BMAA the aircraft may be flown for upto one calendar month from the Inspection date above. Once this form is returned to you signed please enter the full modification approval number above in your aircraft logbook and retain this sheet with your aircraft records.*