



## FÉDÉRATION AÉRONAUTIQUE INTERNATIONALE

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### FAI AEROMODELLING COMMISSION (CIAM) ELECTRONIC DEVICES IN COMPETITIONS WORKING GROUP (EDIC-WG)

#### References:

FAI web site: [www.fai.org](http://www.fai.org)

CIAM website: [www.fai.org/aeromodelling](http://www.fai.org/aeromodelling)

**To:** CIAM web site under AMRT Approvals  
CIAM Technical Secretary  
F5 Sub Committee

**Copy:** Manufacturer Concerned

**Date:** 15 May 2021

#### CIAM APPROVAL FOR F5J ALTIMETER/MOTOR RUN TIMER (AMRT)

**Approval Reference:** AMRT039  
**Manufacturer:** HEPF Modellbau  
**Manufacturer Contact:** [info@hepf.at](mailto:info@hepf.at)  
**Device Name/s:** HEPF AMS (Altitude Motor Switch)



- (i) This document gives formal approval from the above date for the AMRT equipment described below to be used for competitions under the Sporting Code Section 4: Aeromodelling – Class F5J – Electric Thermal Duration Gliders. Paragraph 5.5.11.1.3. / h) / iii) Firmware with implemented emergency motor run can be used at FAI World Cup and Open International events, but not at Category One events.
- (ii) This document is the initial approval for this type of AMRT and only applies to the functions relevant to the F5J competition class rules.
- (iii) Tests undertaken by EDIC-WG (or such representative as it may appoint), are specifically concerned with the functions relevant to the F5J competition class rules. Other functions of the equipment are not part of this approval and the relevance of this document does not extend beyond the specific validation and certification purposes mentioned above.
- (iv) This document does not constitute a guarantee of compatibility of the device listed above with any associated devices with which it may be interconnected.
- (v) This document does not constitute any guarantee and/or statement by EDIC-WG, CIAM and/or FAI as to the reliability of the device listed above.
- (vi) This approval is not concerned with National and other regulations relating to electronic equipment and compliance with such regulations is not the responsibility of the FAI.
- (vii) This approval is not concerned with, and the FAI has no responsibility for, matters related to: (a) intellectual property and intellectual property rights and/or, (b) relations of the manufacturer listed above with any other entities except with FAI and its agents or as they affect the FAI, its agents and this approval.

## EQUIPMENT

### 1 HARDWARE

#### 1.1 Equipment Name

##### 1.1.1 HEPF AMS

##### 1.1.2 Jetibox, Graupner Smart Box



## 1.2 Hardware Version

The equipment name defines the hardware version for both the AMRT and the Display.

## 1.3 External Features

The AMRT module is a heatshrink encased circuit board assembly. A male 3-pin JR connector to the receiver and a female 3-pin JR connector to the ESC. An additional 3 pin male under the shrink tube to connect the external display For AMRT use the Rx and ESC connections are used.

*Where the device may be subject to verification by competition organisers, the user will be required to have a suitable cable available for connecting to the test equipment and may not wish to remove the cable from the AMRT. An additional cable terminated with a JR socket is therefore required.*

The connected display is acting as a passive device only and all content shown is controlled by AMRT firmware with help of 4 buttons on the display device.

This also allows to select the firmware out of 3 for boot mode.

## 1.4 Pressure Altitude Sensor

The MEMS pressure sensor module LPS22HB manufactured by STMicro is fitted to AMRTs.

# 2 FIRMWARE

## 2.1 Firmware Version

HEPF AMS F1.04 S1.04

The firmware incorporates 3 different program code routines to enable operation in 2 AMRT modes and 1 open mode, the selected routine for booting being used upon each restart until changed.

<b>Bootmode</b>	<b>used for</b>
<i>default</i>	non contest variant
<i>F5J Contest/F</i>	FAI cat1
<i>F5J Contest/S</i>	FAI cat2 with restart
<i>ERES Contest</i>	national ERES contests

## 2.2 Pressure to ISA Height Conversion

The firmware uses a high precision computation to perform the pressure to ISA height calculation. Calibration factors provided by the pressure sensor manufacturer are incorporated in the calculation.

## 2.3 Temperature Compensation

The firmware incorporates temperature compensation processing in accordance with the pressure sensor manufacturer's recommendations.

## 2.4 Dynamic Response

Oversampling of pressure sensor data and subsequent processing is complies with the requirements specified in Sporting Code Section 4 Vol EDIC

## 2.5 Motor Emergency Restart

The firmware version starting with S allows motor emergency restart which results in setting height reading to "---.-".

### 3 CONDITIONS OF APPROVAL

- 3.1.1 This Approval is only applicable to devices of the type described and manufactured to the same production standards as the example evaluated.
- 3.1.2 This Approval is not applicable to any device which has been subject to repair or modification by person(s) other than the original manufacturer or his authorised agent.
- 3.1.3 The use of an extension cable to permit remote connection of the display unit is permitted subject to the AMRT device being accessible as required by the F5J class rules.

#### 3.2 Withdrawal of Approval

If after this Approval has been issued, inconsistencies of performance are found in further examples of the device(s), Approval may be withdrawn upon notice to the manufacturer.

#### 3.3 Changes to F5J Class Rules

If the F5J class rules are amended in any manner that affects the technical specification of the AMRT, the validity of this Approval will be subject to review.

#### 3.4 Expiry of Approval

This Approval remains active until it is either superseded or withdrawn. A list of all currently active Approvals can be obtained from the FAI CIAM website.

### 4 PRODUCTION STATUS

At the date of this Approval, the HEPF AMS and the Jetibox Mini are in current production. As GRAUPNER is not existing anymore the Smart Box is discontinued.

### 5 MANUFACTURER'S CHANGES

The manufacturer must make notification of any changes to hardware and/or firmware to the Chairman of EDIC-WG so that a decision can be made on any further testing that might be required to maintain CIAM Approval of the AMRT. This includes changes that are applicable to any additional functions of the device(s) that do not necessarily form part of the F5J requirements.



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