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

References:
FAI web site: www.fai.org
CIAM website: www.fai.org/aeromodelling

To: CIAM web site under AMRT Approvals
CIAM Technical Secretary
F1 Sub Committee

Copy: Manufacturer Concerned

Date: 28 December 2021

CIAM APPROVAL FOR F1 ALTIMETER

Approval Reference:	**AMRT002**
Manufacturer:	**vanW Electronics**
Manufacturer Contact:	**all-tee@ziggo.nl**
Device Name/s:	**All-Tee**

(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 F1 – Free Flight.

(ii) This document is the initial approval for this type of AMRT and only applies to the functions relevant to the F competition class rules.

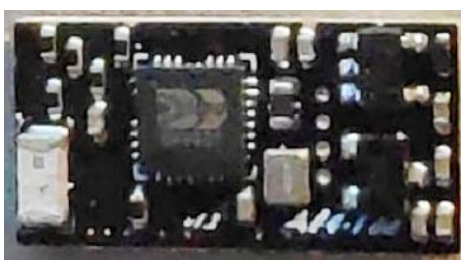
(iii) Tests undertaken by EDIC-WG (or such representative as it may appoint), are specifically concerned with the functions relevant to the F1 competition class rules.
Other functions of the equipment are not part of this approval and the relevance of this document does not extend beyond the specific 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

All-Tee (altimeter) and All-Tee app (Android app)

1.2 Hardware Version

1.2

The hardware version is printed in silkscreen on the All-Tee´s circuit board.

PCB solder mask colour is black.

1.3 External Features

The All-Tee module is a heat shrink encased single circuit board of 17 x 9 x 6 mm weighting 0.8 grams with two cables (black and red) and 4-pole JST connector which plugs into the All-Tee's JST socket. The 4-pole connector can be used for firmware upgrades. The module is equipped with integrated Bluetooth 2.0 for data transfer with the All-Tee app. Bluetooth can be switched on or off by swiping a magnet over the module. Three coloured led´s are integrated to signal status (battery status, memory status, functioning of memory and pressure sensor, Bluetooth connection) and maximum recorded altitude (red flashes x100m, yellow flashes x 10m and green flashes x1m. A push button is integrated to trigger maximum altitude read out (short press) or flush the memory (long press). Start of recording is triggered by a height relative to ground level of over 5 meters, where the heights leading up to the trigger level are also recorded. Recording is halted whenever the height does not change more than expected noise levels over three consecutive periods of 10 seconds.
The modules are individually programmed with the user's FAI-ID number and is reported to the All-Tee's app via Bluetooth. This number is additionally printed on the module. The ID cannot be changed. If the user uses more than one All-Tee, then a suffix is added to the FAI ID number on the label.

1.2 Pressure height sensor

The sensor is the LPS27HHW by STmicroelectronics with a resolution of 10 cm, absolute pressure accuracy of 0.5 hPa, low noise (7 Pa), embedded calibration and temperature compensation. The sensor is potted in gel and therefore water resistant. The sensor is covered with a porous felt to limit air turbulence over the sensor and avoid light induced height fluctuations caused by the pressure sensor light sensitivity.

1.3 Flight time accuracy

The time base is a quartz-crystal with 10 ppm accuracy.

1.4 Pre-flight check by timekeeper

The timekeeper can check the FAI ID printed on the All-Tee module and can check if the recording memory has been cleared from previously recorded data (led blinks green). If height data are still present, the led will blink red and the user must clear the memory by either using the integrated push button or the Android app. FAI-ID and memory status can be marked on the scorecard prior to flight.

1.5 ANDROID APP / SOFTWARE

The All-Tee app allows full graphing possibilities to evaluate the time versus height data. The app connects to the All-tee module via Bluetooth. Upon connection, the FAI-ID, battery voltage and

firmware number are shown. Buttons provide connection to All-tee module, download of height data, clearing of memory and starting the graphing functionality. All downloaded data are stored on the Android device for further graphing analysis such as: set of zero-time, set of zero height, set of ambient temperature, cropping of the graph, independent X and Y zooming, variometer analysis, estimated flight to ground using average global sink rate, local sink rate (time window definable).

1.5.1 App SW Version

1.4

The App Software is not part of this approval and is just referenced here

2 FIRMWARE.

2.1 Firmware Version

1.0

Provided the user has a USB to RS232 converter and Windows based PC, firmware upgrades can be performed.

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. The calibration values are factory stored in the sensor and used by firmware.

2.3 Recording Frequency and Capacity

Five measurements per second (fixed). Up to 3.5 hours of recording capacity.

2.4 Temperature Compensation

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

2.5 Dynamic Response

Oversampling of pressure sensor data and subsequent processing does not contribute any significant degradation of dynamic response in the context of the F1 competition application. The oversampling guarantees low noise levels of +/- 10cm still in air.

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.

3.2 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 F1 Class Rules

If the F1 class rules are amended in any manner that affects the technical specification of the altimeter, 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 issue of this Approval, the All-Tee and All-Tee app are in current production.

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 altimeter. This includes changes that are applicable to any additional functions of the device that do not necessarily form part of the F1 requirements.

Manfred Lex
Chairman FAI-CIAM EDIC Working Group

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