



Helitune

Engineering Rotortuner Solutions



Rotortuner 6™

Rotor Track & Balance and Vibration Analysis System

The RT-6™ system is the latest offering from the world-famous Rotortuner range of products. It is a powerful new solution for “Dynamic Balancing – Computer based Tracking & Balancing System” as recommended by OEMs. The carry-on Rotor Track & Balance (RTB) and Vibration Analysis (VA) system has been purposely designed for airborne use, the equipment complies with EMC and Environmental elements of RTCA/DO-160.

Product Benefits

- Reduced flight times due to multiple, simultaneous data collections
- Reduced number of flights due to Minimum Flight Routine (MFR™) solutions algorithm
- Simple pre-programmable operator interface for minimal training requirement

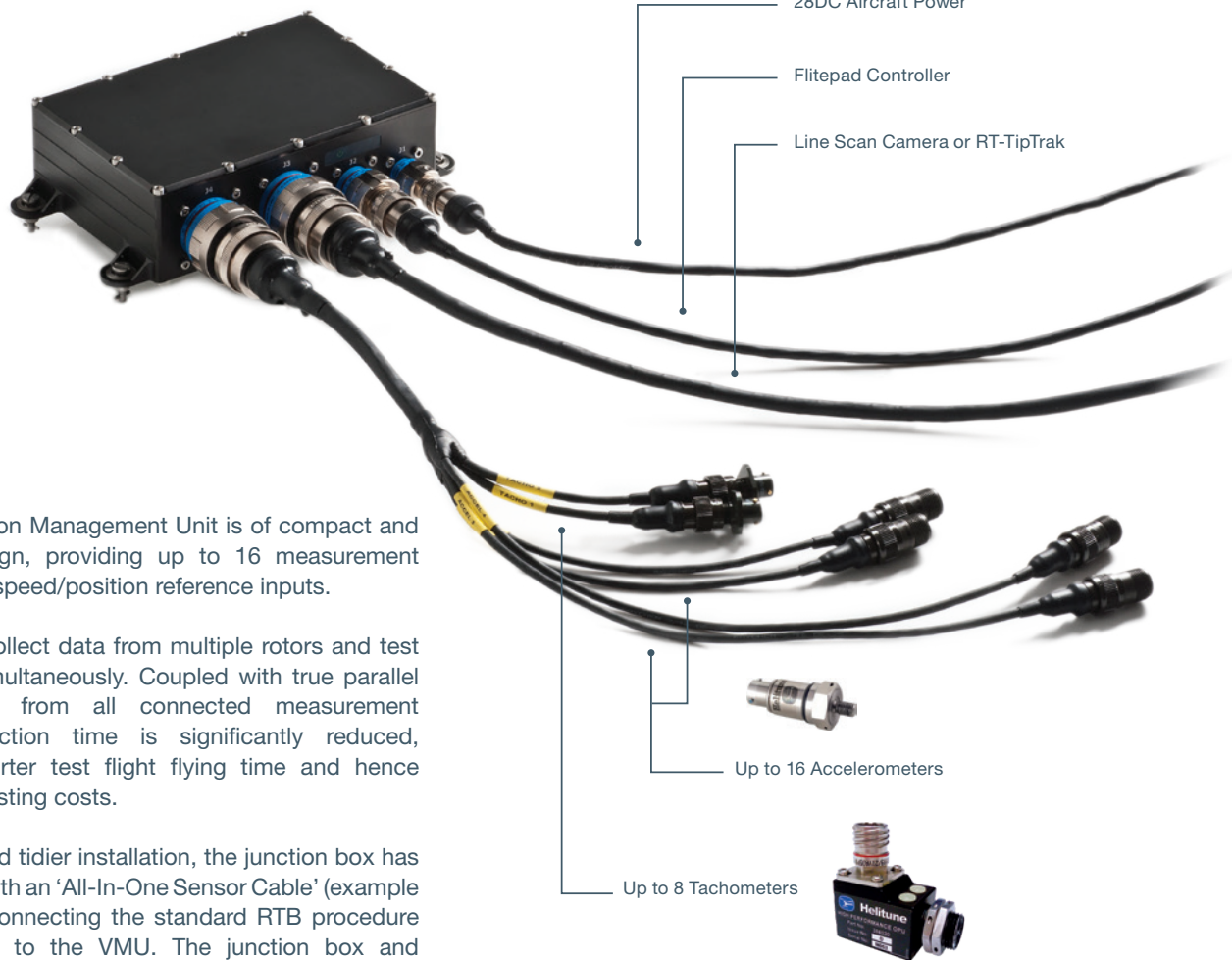
RT-6 provides capability for RTB, shaft balancing, high speed shaft monitoring, and non-specific vibration monitoring and analysis. Standard vibration spectrum (FFT) may also be measured for engines. It has been designed with ease-of-use and cost-effectiveness at its heart. Simultaneous and parallel data collection on all measurement

channels and speed reference channels, combined with the new RTB solution algorithm (MFR), reduce not only the flight time but also the number of flights required to complete the RTB & VA tasking.

The Flitepad® Hand-Held Terminal is a powerful, flight qualified, and ruggedised touch-screen tablet PC which can be operated with the gloved hand. Its large storage capacity means that all aircraft data, for multiple aircraft types and tail numbers, can be stored on the Flitepad.

The RT-6 may be connected with either loose wiring or prefixed wiring where installed. Many of the components used with earlier RT-2000 and RT-5JS+ systems are compatible with and transferable to the RT-6 system, making an easy and cost effective upgrade option.

Vibration Management Unit (VMU)



The RT-6 Vibration Management Unit is of compact and lightweight design, providing up to 16 measurement channels and 8 speed/position reference inputs.

The VMU can collect data from multiple rotors and test components simultaneously. Coupled with true parallel data collection from all connected measurement channels, collection time is significantly reduced, resulting in shorter test flight flying time and hence reduced flight testing costs.

For a quicker and tidier installation, the junction box has been replaced with an 'All-In-One Sensor Cable' (example shown above) connecting the standard RTB procedure sensors directly to the VMU. The junction box and standard sensor cable can be used for more in-depth investigation and analysis work if required.

As an option, the system can be provided with the ability to increase its data collection capacity. This can easily be achieved by system expansion or daisy chaining VMUs together. The operator has access to the extra capability instantly and through the same Flitepad interface.

The VMU can be optionally fitted with internal inertial sensors and a GPS receiver for increased data analysis capabilities. The VMU is EMC and Environmentally compliant with DO-160G.



Flitepad

Flitepad®

RT-6 is controlled by the new, in-house design, Hand-Held Terminal. Flitepad is a ruggedised, touch-screen tablet PC designed for airborne applications (RTCA/DO-160G compliant). It is readable in full sunlight and operable with gloved hands.

Flitepad has a database for storage of aircraft data and can be synchronised with an RT-Vision™ Ground Station. RT-Vision can also access the Flitepad database to provide the full RT-Vision data analysis functionality.

The icon-driven Graphic User Interface is easily recognisable, allowing ease of use and a standardised interface for all international versions. The Flitepad can be pre-programmed with the data collection and solutions configuration to simplify the process, so that minimal 'button presses' are needed. Only very basic training is required to operate the equipment, reducing reliance on input from engineering or RTB experts.

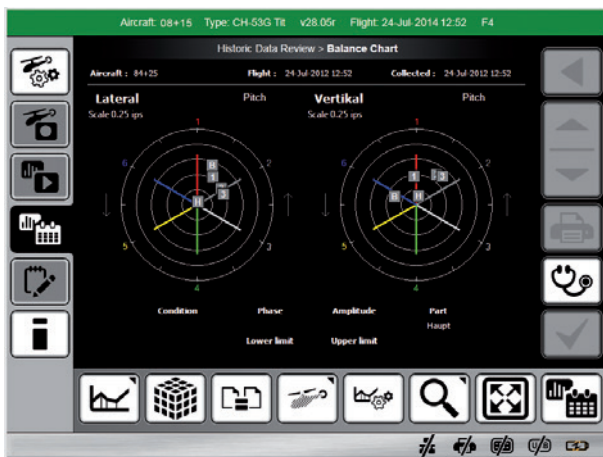
Data can be transferred from the Flitepad to a remote PC or to the RT-Vision Ground Station.



Minimum Flight Routine

RT-6 benefits from Helitune's latest solution algorithm "Minimum Flight Routine" (MFR). MFR utilises a complete aircraft adjustments matrix, specific to the aircraft type being tested, to calculate the most effective combination of adjustments possible.

The MFR algorithm has been proven to reduce the average number of flights required for RTB exercises by more than one third. Combined with the Flitepad Hand-Held Terminal, the data collection process and obtaining adjustment solutions is a simple task that removes the need for RTB engineering experts to collect, analyse and interpret data.



Display of main rotor balance points in all flight conditions

Adjustment Type	Point	Change	Total
Pitch	Wess 3	-2.00	+1.00
Pitch	Getb 5	-2.00	+5.00
Pitch	Blau 6	-2.00	+10.00
Tab	Wess 3	+3.00	-3.00
Tab	Gruen 4	-3.00	-10.00
Tab	Getb 5	+4.00	+17.00

Pitch (Clicks):
 "+" : laenger
 "-" : kuerzer
 Tab (mm):
 "+" : rauf
 "-" : runter

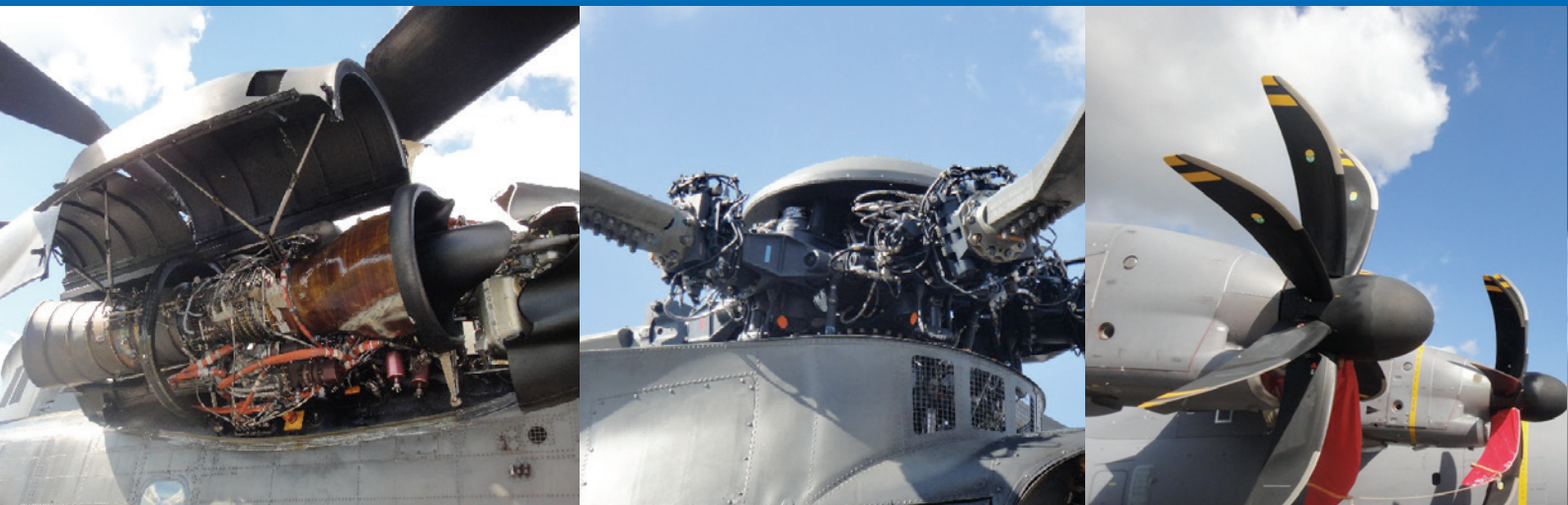
Display of MFR solution for adjustments



RT-TipTrak™

RT-TipTrak™ has been developed as an on-board, internally or externally mounted device, for measuring blade height and lead/lag data. Housed in a light alloy casing and containing no moving parts, RT-TipTrak complies with EMC and Environmental requirements of DO-160E.

Advanced blade recognition technology and 14-bit resolution means that the RT-TipTrak will reliably track the blades at the extremes of daylight environmental conditions such as low light and 'Blue Sky', considered unsuitable by other devices. This capability negates the need for blade tip targets or any contrast enhancements such as blade painting. RT-TipTrak benefits from internal heating to prevent misting or ice accretion.



VMU	
Inputs	8/16 measurement channels plus 4/8 speed sensors (expandable)
Digital interfaces	Ethernet, USB, serial ports, ARINC429, discrete I/O
GPS/INS	Optional
Dimensions (LxWxH)	180 x 120 x 56mm
Weight	1.4Kg
Operating Temperature	-40°C to +70°C
Flitepad®	
Display	8.4" 800 x 600 SVGA LED backlit TFT touchscreen. 800cd/m2 typ
Battery Type/Life	Lithium-ion 2hrs
IP	IP65 standard (IP20 for printer)
Processor	Intel® Atom™ E3930 1.6GHz 4GB DDR3 (other options available)
HDD	32GB (Solid state)
Printer	Thermal
Operating System	Windows 10 Embedded (option for Linux, QNX)
Dimensions (LxWxH)	258 x 179 x 53mm without printer, 258 x 218 x 105mm with printer
Weight	1.9Kg (without printer)
Operating Temperature	-20°C to +55°C
System	
Power Input	18 - 36V DC (MIL-STD-704F), DO-160 Section 16
Rotor Blade Tracking	60RPM to 1200RPM (RT-TipTrak) @ ±2mm Accuracy (Typical)
Rotor Balancing Speed	Up to 60,000RPM (1/Rev Reference)
Engine Vibration Checks	Standard steady-state engine vibration measurements (FFT)
Storage Temperature	-55°C to +85°C

Application software:

Airbus: AS315/316, AS330, AS332, AS350, AS355, AS532, AS555, AS365, BK117, BO105, H120, H130, H135, H145, H155, SA315, SA330, UH Tiger **Bell:** 204, 205, UH1, 212, 206, 412, 407, 427, AH-1F **Boeing:** AH64A, CH46, CH47 **Denel:** Rooivalk **Enstrom:** 280, 480 **Kamov:** KA32 **Kopter:** SKYe SH09 **Mil:** MI-8, MI-17 **Leonardo:** AW109, AW119, AW129, AW139, AW169, AW189, Lynx, Super Lynx, AW101 **MD:** MD500, MD520, MD530, MD600, MD900 **Robinson:** R-22, R-44 **Sikorsky:** H60, S-61, H70, S-76, CH-53, HS-3, S-300, S-333, S-434, Sea King **TAI:** T129

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Helitune's Quality Management System is certified to BS EN ISO9001 and AS9100

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