

## HFR5-V COCKPIT VOICE RECORDER (CVR) TECHNOLOGY ADVANTAGE

The HFR5-V CVR with DLR system is a crash-survivable recording device intended for installation in commercial air transport aircraft to accommodate mandatory cockpit voice recording. It simultaneously records four channels of audio present at its inputs. The audio input signals represent the cockpit acoustic environment and consist of one wide-band area channel and three narrow-band voice channels. In addition to the audio inputs, the HFR5-V CVR also records digital communications (datalink) data from a Communication Management Unit (CMU) or similar equipment (compliant to TSO-C177 Datalink Recording Requirements), timing correlation signals (e.g., GMT or FSK), and helicopter rotor speed, if available. The HFR5-V CVR retains the most recent 2 hours of recorded information in solid-state, crash-survivable memory. The recording includes all audio, datalink, and timing data described above. For automatic status reporting, the HFR5-V CVR also provides a Type 1 BITE Standard A interface to an Onboard Maintenance System (OMS) or similar equipment.

The HFR5-V CVR fully satisfies the Minimum Operational Performance Specification (MOPS) for Cockpit Voice Recorder Systems as stated in EUROCAE document ED-112. This industry document defines the requirements for a Cockpit Voice Recorder (CVR) utilizing solid-state memory as the recording medium. It also satisfies the recording requirements specified in the Minimum Aviation System Performance Specification for CNS/ATM Message Recording Systems, ED-93. The HFR5-V CVR complies with the interface characteristics defined in ARINC Characteristic 757-4.



## HFR5-D PRODUCT SPECIFICATION

### Hardware Description

The HFR5-V CVR with DLR consists of two shop-replaceable units (SRUs) and a standard ½ ATR Short chassis per ARINC404A. The two SRUs are: a System Controller card which includes an integrated Power Supply (SC/PS), and a Crash-Survivable Memory Unit (CSMU). The SC/PS is a single-circuit card which controls all states and modes of the system including the record, erase, and test functions. The SC/PS also provides all functional interfaces to external systems. The power supply portion of the SC/PS converts either 115 Vac (360-800Hz) or +28 Vdc aircraft power to secondary power for the SRUs and provides power on reset, power failure monitoring, and significant power hold-up capability. The CSMU is a solid state, non-volatile, mass memory system encased in a crash protected enclosure. The CSMU provides storage for all required input data as well as for ancillary system data. In addition to these SRUs, an Underwater Locator Beacon (ULB) is mounted to the front of the CSMU. As of early 2016, Honeywell is only providing new ULB's to the 90-Day minimum operating duration per TSO-C121b for all new HFR5 Recorders.

### Performance Summary

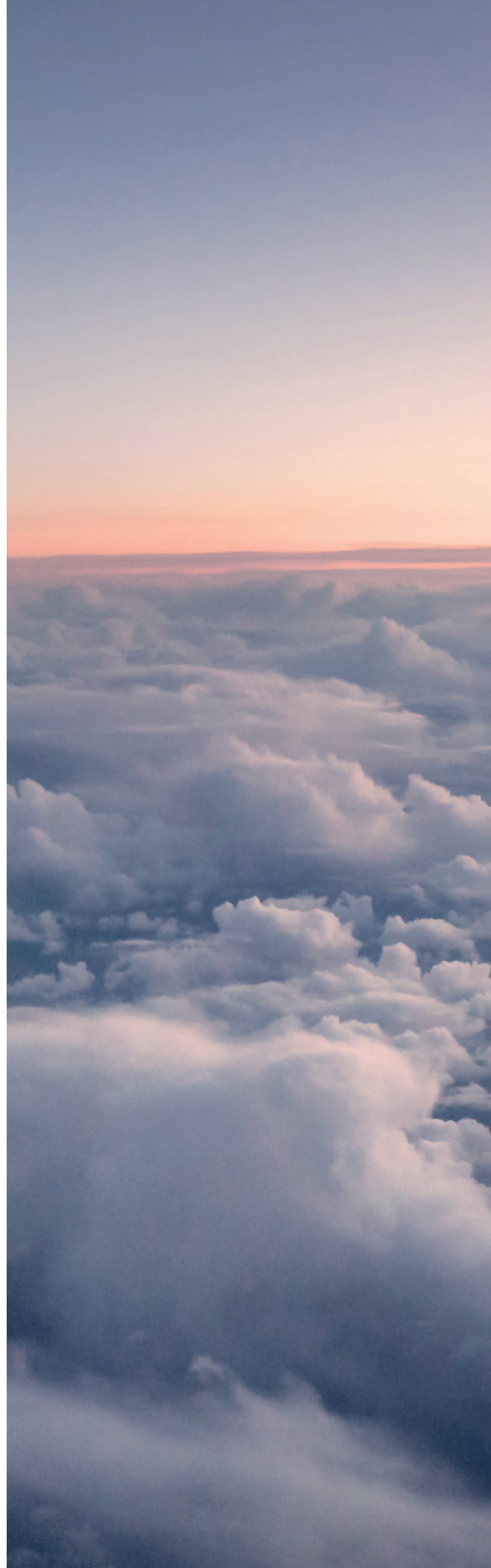
The HFR5-V CVR is designed to meet or exceed the minimum performance, environmental, and crash-survival requirements as specified in EUROCAE ED-112.

#### Physical Characteristics

Dimensions	½ ATR Short per ARINC 404A
Weight	10.8 lb maximum, 8.6 lb typical
Connector	DPXB-57-34P-0001

#### Performance Characteristics

Input voltage	115 Vac, 360-800 Hz or +28 Vdc
Power	12 W maximum, 8 W typical
Number of audio channels	3 narrow band voice, 1 wide band area
Signal to noise and distortion ratio (S/N+D)	24.0 dB minimum (full bandwidth)
Speech Transmission Index (STI)	0.75 minimum (voice), 0.85 minimum (area)
Bandwidth	150 to 3500 Hz (voice), 150 to 6500 Hz (area)
Power on to recording delay	250 milliseconds maximum
Recording duration	2 hours
Datalink capabilities	1 channel ARINC-429 Hi or Low Speed, Full Duty Cycle, 2 hours duration



Environment	DO-160E Section	Category	Comments
Temperature and Altitude	4.0		
Temperature Test	4.5	F2	
In-Flight Loss Of Cooling	4.5.5	N/A	There is no cooling supplied to the UUT, thus this test is not required
Altitude Test	4.6.1	F2	+55,000 ft
Decompression Test	4.6.2	A2	+55,000 ft
Overpressure Test	4.6.3	A2	Test Pressure = 26.9 psia
Temperature Variation	5.0	A	10°C per minute
Humidity	6.0	B	Severe humidity environment
Operational Shocks and Crash Safety	7.0	E	Operational lowfrequency and crash safety
Vibration	8.0	R,H	Random - Curve C, & C1 sinusoidal
Explosion Proofness	9.0	E	Not hermetically sealed
Waterproofness	10.0	W	Subject to falling water (condensation)
Fluids Susceptibility	11.0	F	
Sand and Dust	12.0	S	Subject to blowing dust
Fungus Resistance	13.0	F	Demonstrated by analysis
Salt Fog	14.0	S	Subject to a corrosive atmosphere
Magnetic Effect	15.0	A	Deflection between 0.3 m and 1.0 m
Power Input	16.0	A(WF) Z	AC Power DC Power
Voltage Spike	17.0	A	High degree of damage protection
Audio Frequency Conducted Susceptibility	18.0	K(WF) K	AC Power with higher voltage distortion DC Power
Induced Signal Susceptibility	19.0	ZC, ZW	Interference-free operation required over wide frequency range (DC and variable)
Radio Frequency Susceptibility (Radiated and Conducted)	20.0	RR	Bench testing allowed to meet HIRF associated with normal environment
Emission of Radio Frequency Energy	21.0	M	Apertures are EM significant
Lighting Induced Transient Susceptibility	22.0	A3G33	Pin Injection waveform set A level 3, Cable bundle waveforms set G level 33 multiple strokes / multiple bursts
Lightning Direct Effects	23.0	X	Not applicable
Icing	24.0	X	Not applicable
Electrostatic Discharge (ESD)	25.0	A	Equipment installed, repaired, or operated in an aerospace environment
Fire, Flammability	26.0	C	



## Cockpit Voice Recorder Remote Microphone

Optionally, the cockpit area microphone is provided for installation remote from the microphone monitor and is configured for mounting to a flat surface.

For more information on Honeywell's HFR5 Recorders please contact your Honeywell sales representative or call +1 800 601 3099 or +1 602 365 3099.

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