

CH-47 IR SUPPRESSION

We are pleased to announce the U. S. Army Air Worthiness Release (AWR) of the Boeing-Davis-Honeywell Infrared Suppressor (IRS) for the Boeing CH-47F helicopter. The AWR clears the IRS to enter into operation on the F variant – a significant milestone in a development and qualification program which began in the spring of 2007. The AWR for the D variant is expected to be granted in the summer of 2009.

Background

Davis, Boeing, and Honeywell formed a teaming arrangement in 2005 to jointly develop an holistic IR suppression solution for the Chinook helicopter. In this relationship, Davis took responsibility for the engine exhaust IRS (the “B-kit”), Honeywell assessed engine performance impacts, and Boeing lead the platform integration (including the design of the backup structure “A-kit”) and addressed all secondary sources of IR signature. The U. S. Army is the lead customer and has taken responsibility for performing the qualification of the device.

Qualification Program

The qualification program has been conducted over the last 18 months and has resulted in the accumulation of over 150 flight hours to date. The program addressed system robustness, aircraft performance effects, and measured the IR signature with both IR cameras and captive seekers.

In addition, the added support structure in the aft section of the helicopter was analysed and tested to improve fatigue life both with and without the suppressor installed.

International Users

The CH-47 is in operation with several armed forces around the world, including the U.K., Holland, Canada, Australia, Spain, Japan, Italy, Korea, Singapore, and Greece. The grant of the AWR clears the way for these forces to acquire the technology. Boeing Integrated Defence Systems (IDS) will act as the Lead Systems Integrator (LSI) for the sale of the CH-47 IRS to the international community. Davis will subcontract to Boeing.

Production

In January 2009, Davis celebrated the delivery of the 50th IRS shipset for the CH-47. We have presently achieved a fabrication rate of five shipsets (ten IRS units) per month, with the capability to ramp that rate up to eight shipsets per month within our current facility. This will allow us to fill international user orders with normal lead times while simultaneously meeting U. S. Army production commitments.

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FOCUS

Davis has continued to focus on the development and fabrication of aircraft IR suppression technology. With the successful execution of the CH-47 IRS program for the U. S. Army we have proved that we have the expertise, technology, quality, and production scale to meet the requirements of one of the most demanding armed services in the world.

We continue to invest in research and development, design solutions to new platforms, and streamline for our fabrication processes. We have recently been contracted to develop IR suppressors for the AW129 and Beechcraft King Air 350 aircraft, and have started an internally funded development on the C-130 and C-27J.

Specialization in the field has uniquely positioned us to provide rapid development and fabrication of IR suppressors with the quality demanded by the aerospace industry.



CH-47 Boeing-Davis-Honeywell Suppressor

UPDATES

- Mike Kelly joined Davis as Director of U.S. Sales - Aerospace in January of 2006. Before joining Davis, Mike had a long and successful career in the aircraft gas turbine industry with Honeywell and Allied Signal.
- In April 2007 Davis completed the delivery of three AS332 IRS shipsets to Heli-One for integration on the Swedish Air Force Super Puma helicopters.
- In December 2008 we completed the delivery of 16 Bell 412 IRS shipsets to Presidential Airways.
- Three shipsets of the Mi-17 IR suppressor were delivered in January 2009.
- In February 2009 an order from US Helicopter for 11 IRS shipsets of the UH-1H was completed. As part of the order, the UH-1 IRS design was updated to improve manufacturability.
- We have delivered three of five prototype exhaust systems for the new Korean Utility Helicopter being built by KAI.



Davis UH-1H Centre Body Tailpipe (CBT)

CH-47 IR SUPPRESSION

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Davis CH-47 IRSS Production Facility

The CH-47 IRS (and all other aircraft IRS) fabrication is being performed at our 60,000 square foot manufacturing facility in Ottawa, Canada. Personnel and certifications include:

- over 70 metal technicians
- fully qualified welding staff
- Inconel and stainless steel welding to ASME Section 9
- Aluminum welding to ASME section 9 and CWB 47.2
- MIL Standard 2219 for Titanium welding
- Mild steel welding to CWB 47.1 W59 Division 3.

Our quality assurance process is certified to AS9100B and is regularly audited by major defence and aerospace contractors.

BEECHCRAFT KING AIR 350

We have been awarded a contract by a major U. S. defence integrator for the development and fabrication of an IR suppressor for the Beechcraft King Air 350 aircraft. The King Air 350 is a twin PT6A-60A engine turboprop aircraft which is often used for manned surveillance activities in war zones and volatile regions.

The program involves the following activities typical of an IRS retrofit: aircraft survey for IRS integration and baseline IR signature measurement, IRS design, analysis of engine bay flows and external flows around the aircraft, assessment of engine power penalty and drag, engine

test, flight prototype fabrication, qualification (in this case FAA STC); IRS equipped IR signature measurement, and production.

The plan is to deliver four IRS shipsets under the current order, starting in the Spring of 2010.



Beechcraft King Air 350

QUEEN'S UNIVERSITY

We are pleased to announce the beginning of a new four year program with Queen's University to perform research into the aerothermal performance of aircraft engine exhaust IR suppressor technology. The program is funded by Davis and the Canadian National Science and Engineering Research Council (NSERC) and continues the close working relationship between Queen's and Davis.

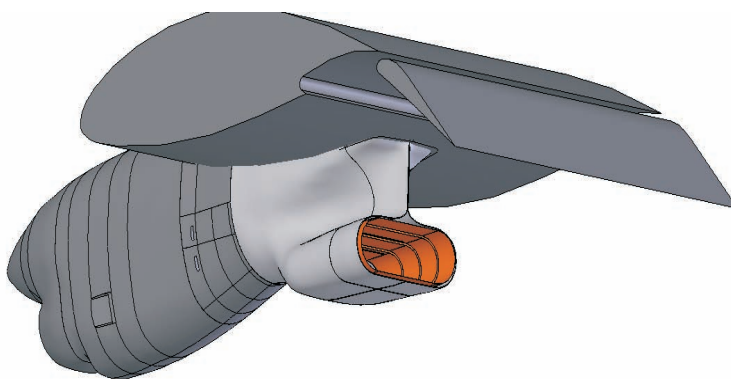
The research will be headed by Dr. Michael Birk, Head of the Mechanical Engineering Department at Queen's and will support five Master and PhD students.

C-130 AND C-27J

Davis has initiated an internally funded program to develop and field an IR suppressor for the C-130 and C-27J aircraft.

We have formed a teaming arrangement with Standard Aero, a leading overhaul, maintenance, and engine performance optimization company with expertise on the T56 and AE2100 engines.

The C-130/C-27J IR suppressor utilizes a cooled S-bend nozzle to reduce the temperature of the exhaust gas while diverting the exhaust jet away from the wing. The exhaust then flows into a film cooled tailpipe which together with the nozzle obstructs the view into the gas turbine engine machinery. An aerodynamic cowling covers the hot sections of the exhaust system while also minimizing drag. The entire IRS system



C-130J / C-27J IRSS Concept

is light weight and designed to ensure a minimal impact on all engine maintenance.

We are on schedule to prove device performance via engine test in the fall

of 2009, and then enter into detailed design and qualification. The Davis C-130/C-27J IRS provides significant weight savings and IR signature reduction over existing devices installed on the C-130.

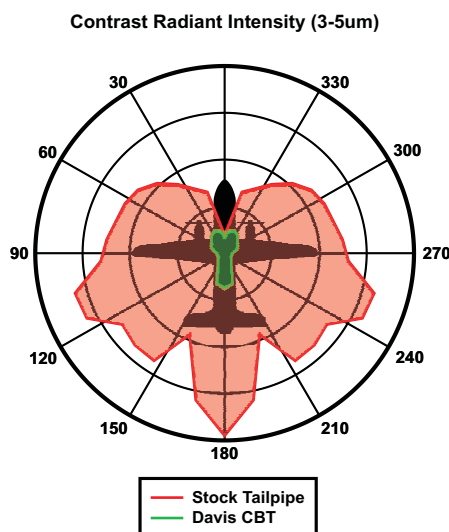
CASA CN-235 TRANSPORT



CN-235 Centre Body Tailpipe IRS
(engine cowling removed)

In July 2006 Davis completed the FAA certification of an IR suppressor for the CASA CN-235 aircraft. The CN-235 IRS utilizes the proven Centre Body Tailpipe (CBT) concept which provides effective IR signature reduction for all view angles around the aircraft. The device fits discretely within the existing engine cowling, and causes minimal aircraft performance effects, including low drag and engine power penalty.

The following polar plot illustrates the measured mid wave IR signature of both the baseline and suppressed CN-235 for a series of azimuth angles around the aircraft.



AGUSTA WESTLAND A129 HELICOPTER

Davis has been awarded a six year contract by Agusta Westland (AW) in Cascina Costa, Italy, for the development and fabrication of an IR suppressor for the A129 helicopter with the LHTEC T800 engine.



Agusta Westland A129 Attack Helicopter

AW is under contract with the Turkish SSM to deliver the A129 attack helicopter to the Turkish Land Forces (TLF) under the T129 ATAK program.

By the application of proven IR suppression technology, we have been able to commit to the delivery of a production representative flight prototype in 9 months from contract award.

The organization of the program is a model of how to develop a robust, well integrated, high performance IR suppressor: Davis customizes the engine exhaust IRS, which we have continuously improved over the past ten years, AW ensures seamless integration with the airframe, and LHTEC provides the engine test bed.