



- A company focused on the business of the measurement and control of pressure and related parameters



- UK based but with manufacturing and sales/service Subsidiary organisations around the world



- Products manufactured for a wide range of applications in many differing markets
- Large percentage of turnover associated with the aircraft industry, both for sensors and test
- This discussion centres around our ground support instrumentation, specifically Air Data Test





- The pitot static systems on aircraft need to be verified as to their correct operation
- This can vary from simple leak testing through function tests up to full calibration
- Druck manufactures several testers, varying in precision, complexity and price





- These test instruments can be workshop ATE based or rugged flightline units



- Both military and commercial aircraft users employ these instruments for test



## RELATIONSHIP WITH BOEING

**GE**  
**Druck**

- Druck have supplied in excess of 50 ADTS 405 air data testers to Boeing over the past 8? Years
- Druck have supplied hydraulic pressure sensors to Boeing for the B777 aircraft.
- Druck have supplied oxygen pressure sensors to Boeing for various aircraft.
- We look forward to an on - going business relationship between our two companies.



## **AIR DATA TEST SETS**

### **Military Sales - U.S. Army and Navy**



US Army



US Navy



British  
RAF



One man  
operation  
from the  
flight deck



Reduces time  
and potential  
mistakes on  
pitot static  
testing



ADTS 405F  
in use on  
military aircraft



Note:  
Multiple  
Ps & Pt  
operation





**GE**  
**Druck**





## Current International Military Users of the ADTS 405

Australia	- RAAF	New Zealand	- Airforce
Belgium	- Army Air Corps	Saudi Arabia	-Tornado Support
Canada	- Airforce CF18 & Hawk	Singapore	- Airforce via FMS
Denmark	- Transport	Spain	- Navy
Dubai	- Air Wing	Sweden	- FFV
Holland	- Royal NL Navy	Switzerland	- Pilatus
Holland	- Airforce via FMS	Taiwan	- Airforce via FMS
India	- Bangalore	Turkey	- Airforce via FMS
Israel	- Air Force, via FMS	UK	- RAF, and RN
Italy	- Army Esercito	USA	- Army & Airforce
Japan	- SD Agency	USA	- Coastguard
Jordan	- Airforce via FMS	USA	- Navy/Marines



## **AIR DATA TEST SETS**

### **Commercial Sales - Users**

#### **Manufacturers**

Boeing - Airbus (ATEC 6) - Bombardier - Dassault - Gulfstream - Embraer - BAE - Eurocopter - Sikorski - Learjet - Cessna - Beechcraft

#### **Airlines**

American Airlines - Delta - Continental - Southwest - Air Canada - SAS - Air France - bmi - China Airlines - ANA - Maersk - Czech Airlines - LOT - China Eastern - Saudiar.

#### **Overhaul Bases**

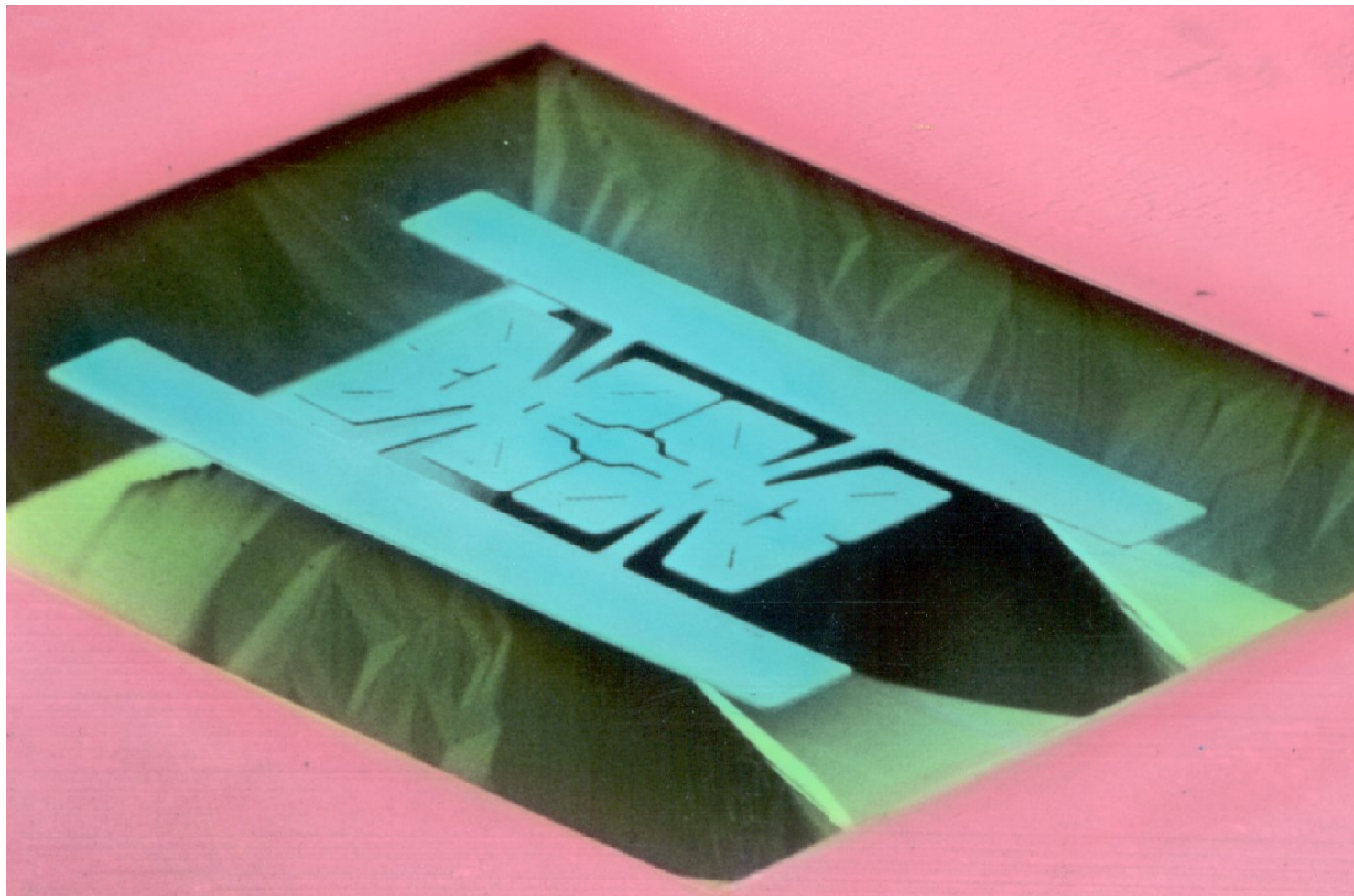
FLS Aerospace - Air Rod - Ameco - Denel (Atlas) - Duncan Aviation - FFV - Jet Aviation - Sogerma

Total ADTS 405F manufactured (Civil) 1165 (Apr 2001)



# RESONANT PRESSURE TRANSDUCER - RPT

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# ADTS 505





## ADTS 505

### Features

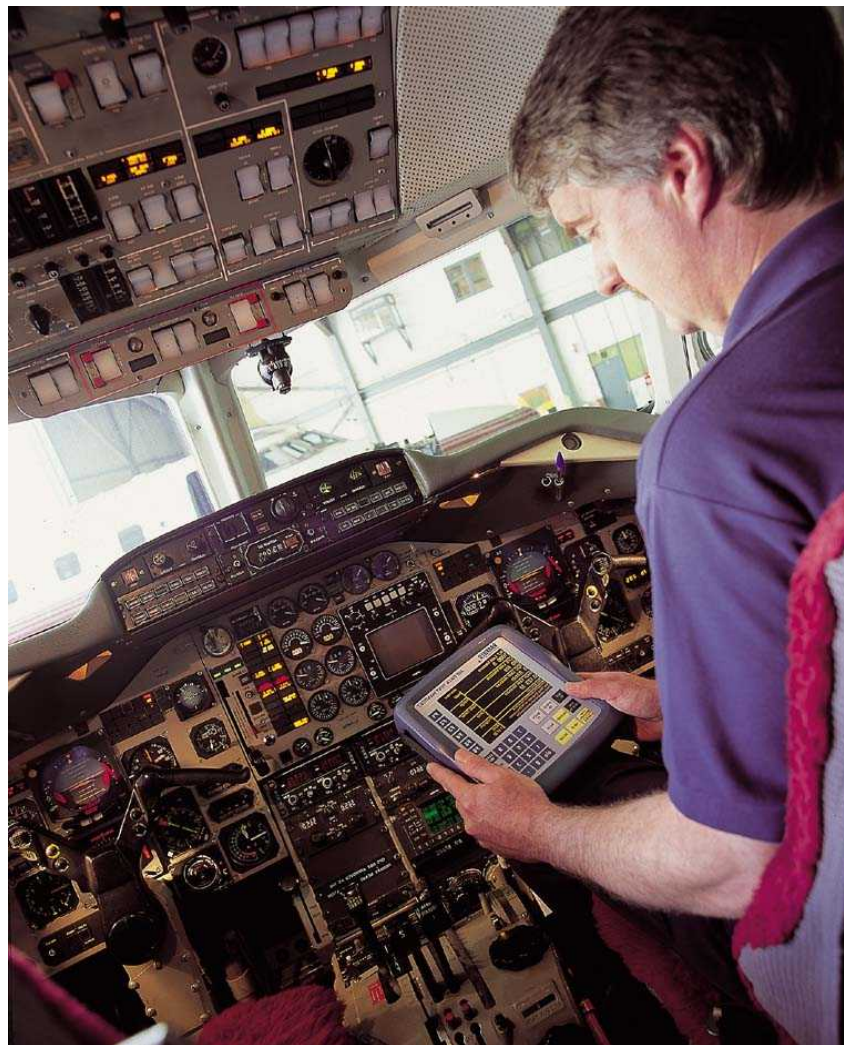
- New package - lightweight carried by one person
- New control system piezo proportional valves
- New ¼ VGA super bright display
- New low cost industrial Pressure and Vacuum Pumps
- Operation locally - or via optional remote hand terminal.
- RVSM accuracy (0.1mba for one year) - based on RPT
- Airspeed channel utilises differential Qc PDCR sensor
- No computer interfaces - maintain 405 supremacy





# ADTS 505 REMOTE TERMINAL

GE  
Druck





# ADTS 505 SALES

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ADTS 505 Customers		Mar-02
User	Location	Country
Ansett	Melbourne	Australia
Qantas	Melbourne	Australia
Virgin Blue	Melbourne	Australia
Air Radio Services	Vienna	Austria
Tyrolean Airlines	Vienna	Austria
Chengdu Aircraft Ind.	Chengdu	China
China Northern Airline	Shenyang	China
China Northwest Airline	Xi'an	China
Xi'an Metallurgical Institute	Xi'an	China
Gameco	Guangzhou	China
Datang Telecom Tech.	Beijing	China
Czech Airlines	Prague	Czech Rep.
Maersk Air	Copenhagen	Denmark
Scandinavian Avionics Services	Copenhagen	Denmark
Cessna	Le Bouget	France
BCA	Lyon	France
Air France	Orly, Paris	France
Aviation Assistance	Greven, Ruhr	Germany
Fairchild Dornier	Wessling	Germany
WDL Aviation	Koln	Germany
ACM Air charter	Baden Airport	Germany
Cronus	Athens	Greece
Shannon Aerospace	Shannon Airport	Ireland
Israeli Air Force	Tel Aviv	Israel
JAS	Tokyo	Japan
Tokyo Aircraft Industries	Tokyo	Japan
Airbaltic Corporation	Riga	Latvia
Cargolux	Luxembourg	Luxembourg
Wideroe	Bodo	Norway

Region Air	Changi	Singapore
CASA	Madrid	Spain
Jet Aviation	Geneva	Switzerland
Pegasus	Istambul	Turkey
British Airways	Gatwick	UK
Multiflight	Leeds/Bradford Airport	UK
Manx Airways	Isle-of-Man	UK
Northern Executive Aviation	Manchester	UK
Air Hanson	Stanstead	UK
British Midland bmi	East Midlands Airport	UK
British Regional	Gatwick	UK
Cranfield Aerospace	Bedfordshire	UK
Channel Express	Exeter	UK
Atlantic Aviation	Coventry	UK
KLM UK	Norwich	UK
Signature Aircraft Eng.	Leeds/Bradford Airport	UK
FLS Aerospace	Stanstead	UK
Adam Aircraft Industries	Colorado	USA
Air Response North Inc.	Englewood Ca	USA
America West Airlines	Phoenix Az	USA
Aviation Develop. Corp.	Montgomery Al	USA
Bay Avionics	Oakland Ca	USA
Dept. of Justice (DEA)	Ft. Worth Tx.	USA
Georgia Pacific Corp.	Atlanta Ga.	USA
Gulfstream Aerospace	Long Beach Ca	USA
Hillenbrand Industries	Batesville In.	USA
FAA	Oaklahoma City Ok.	USA
FAA	Atlanta Ga.	USA
Kaman Helicopters	Bloomfield, Ct.	USA
Kohlman Systems Res.	Lawrence Ks.	USA
Learjet Inc.	Wichita Ks.	USA
Mountain Air Cargo	Denver NC.	USA
North American Jet	Wheeling Il.	USA
Pats Inc. Delaware	Georgetown De.	USA
Piedmont Hawthorne	Rochester NY.	USA
Raytheon Aerospace	Madison Ms.	USA







## REQUIREMENTS FOR RVSM (Reduced Vertical Separation Minima)

- The new RVSM requirement calls for greater accuracy
- The existing 2000 ft separation being reduced to 1000 ft
- The Druck ADTS 405F offers altitude accuracy of 0.1 mba:

@ Sea level - 3 ft

@ 30,000 ft - 7 ft

@ 60,000 ft - 29 ft

- RVSM already implemented over the North Atlantic - 1998
- Coming soon
  - In Europe - 2002
  - Pacific Area - 2003
  - USA - 2005



# RVSM TESTING

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- Altitude range in question 29,000 to 41,000 ft
- JAA calls for Altimetry System Error (ASE) not to exceed 25 m (80 ft), or 200 ft with 3 standard deviations
- ASE includes all errors; avionics, environmental effects on avionics, airframe variability and static source error caused by operating conditions
- Considering only instrument errors, allowing error of 80 ft, test unit should be 4 times better (accepted ratio)
- Druck maintains 0.1 mbar absolute  $P_{static}$  accuracy. This relates to 7 ft at 29,000 and 12 ft at 41,000
- Druck therefore does achieve the necessary precision for RVSM testing



# THE DRUCK AVIATION GROUND TEST EQUIPMENT (AGSE)

**GE  
Druck**

- Remember, we have a range of instruments varying in Price and Performance
- From simple leak testing to system integrated components for complex ATE testing.





## PRODUCTS FOR AVIATION GROUND SUPPORT

- ADTS 405 - Laboratory LRU testing
- ADTS 401/403 - Laboratory LRU testing
- Ruska 7710 - Laboratory LRU testing
- ADTS 405F - Flightline aircraft testing
- ADTS 505 - Civil flightline aircraft testing
- ADTS 500 - Pitot static leak tester
- DPI 314 - Engine Pressure Ratio (EPR) testing
- DPI 740 - Barometric reference for altimeter setting
- DPI 610 Aero - Low cost pitot static leak tester
- DPI 515/Rus. 7000 - Laboratory pitot- static testing
- DPI 705 - Tyre leak testing
- Ruska 2468 - Primary Standard



# THE DRUCK LABORATORY

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- Druck Ltd has a UK approved UKAS laboratory - our calibrations are based on this laboratory
- Our audited uncertainty is 50 ppm on pitot static range pressure instruments
- We utilise the Ruska 2465 deadweight gauge as our Standard





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Druck



BARFIELD INC.

