



# NEWS

AIRCRAFT SERVICE EQUIPMENT

March 2008

*From the  
largest engine  
in the world  
to the world's  
largest fleet...*

For full details, see inside ►

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and demonstrating our rig for  
FedEx*

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Juniper rigs*

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*Probe and accessory list*

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*Full customer list & map*

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*CFM56-5B long engine  
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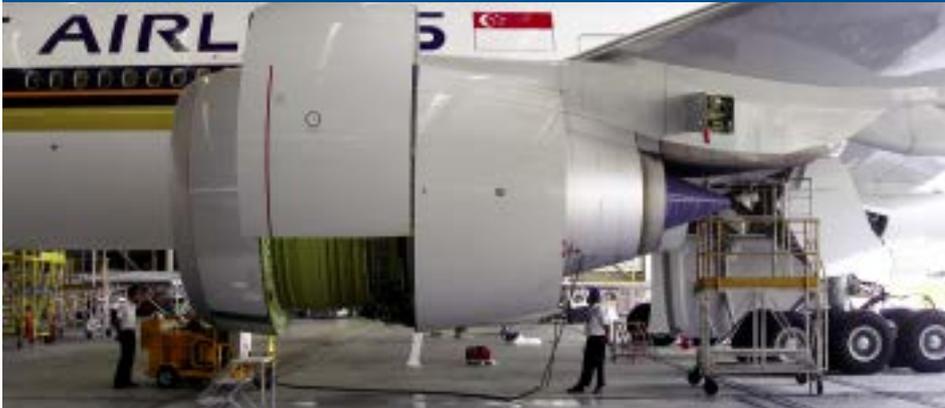
.....  
*Juniper on show Down Under*

.....  
*Coming, Mr President!*

.....  
*and more...*



# From the largest aircraft engine in the world to the world's largest fleet



Above: The Juniper 2x25 gallon rig performing a demonstration wash for Singapore Airlines on one of their GE90-115B engines.

**Using Juniper's unique water wash system, we feel confident in tackling most engines. From the world's largest - the GE90-115B - down to the CF34-8C. With the appropriate tooling in place no job is beyond us.**

There is increasing awareness worldwide of the need for the aviation industry to make engines more efficient and reduce emissions. Regular water washing is acknowledged within the industry as a cost effective and worthwhile weapon in this fight for increased efficiency - restoring lost EGT margins and helping prolong engine life.

GE is well aware of these benefits and has recommended the Juniper wash cart method of water washing in it's aircraft maintenance manuals. So when Singapore Airlines needed one of it's GE90-115B engines washing, Juniper was one of the obvious choices.

When carrying out a compressor wash on an engine, a licensed engineer is always required to motor over the engine, together with one or two aircraft mechanics to carry out disconnections or re-connections of PS3/P3B and PT25 lines to the FADEC unit,

no matter who's equipment is used. Singapore Airlines considered this the ideal opportunity to compare the Juniper wash cart method with other compressor washing services available.

In October of this year, at the invitation of Singapore Airlines, we used the 2 x 25 gallon compressor wash rig and our GE90-115B long engine probes to perform a successful demonstration wash on one of their Boeing 777s fitted with the GE90-115B engine at Changi Airport and the Airline's representatives were struck by how simple, effective and user-friendly the whole procedure was.

Meanwhile, having been impressed with a Juniper 2x25 gallon rig loaned from American Airlines, FedEx - operator of the world's largest fleet of civil aircraft - decided to contact Juniper direct and arrange a visit. Consequently, in early November 2007, a highly successful demonstration was carried out using the Juniper 2x25 gallon compressor wash rig at Memphis International Airport, FedEx headquarters, and an order is now in the pipeline for ten rigs together with all the appropriate tooling.



Demonstration wash at the FedEx Headquarters, Memphis International Airport



## Juniper breakthrough in service connectivity

**Juniper's engine hot water washing system, the 2 x 25 Gallon and 2 x 50 Gallon Compressor Washing Rigs, currently used by over 120 airlines worldwide, can now be adapted to accept aircraft ground power(115/200v, 3 phase, 400Hz).**

These units are available as either low maintenance and battery free - requiring the Airport's GPU to be set to 'bypass'- or with an on-board battery for connections without the 'bypass' option.

The Advantages of the our new electrical system are:

- More user friendly
- No more connection problems
- Can be connected wherever there is access to aircraft ground power
- Water tanks heated to 70°C within 1 hour
- Military and Commercial applications



## Accessory Inlet Kit

**Stand-alone modification to enable the connection of offboard nitrogen or compressed air - Now available**

Contact us for details...

# China



Training for Taikoo (Shandong) Aircraft Engineering Co.Ltd. at Yao Qiang International Airport, China Dec '06

# Training & Commissioning

# Japan



Steve Marshall of Juniper with the ANA team who visited the Juniper factory in the summer of 2005 at ANA's Haneda Airport Facility.

# Singapore



Singapore Airlines Training, Changi Airport Oct '07

# U.S.A.



FedEx demonstration, Memphis International Airport Nov '07

# Australia



Demonstrating the 2x25 universal rig in Australia June '07

# Ireland

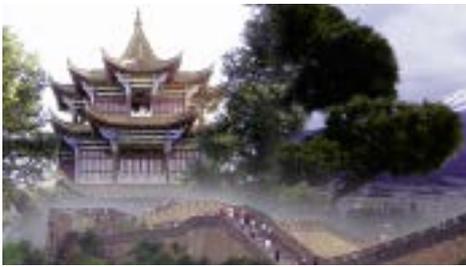


Commissioning the 2x25 gallon rig at the Lufthansa test cell, Dublin, Ireland

# Italy



Air One Training, Ciampino Airport, Italy May '07



# Juniper -

## Juniper at the CAAC



Delegates on the steps of the CAAC Conference centre, Beijing, China

**In June of 2006 we were presented with a wonderful opportunity to introduce Juniper to representatives from most of the major airlines in China.**

Juniper's presence at the CAAC (Civil Aviation Authority China) Conference at Beijing was strongly supported and encouraged by GE who recommend the Juniper water wash system.

During the conference, GE touched on the Juniper system within their own Company powerpoint presentation and then Steve Marshall, Juniper's MD, was introduced and invited by Zhang Yan of Beijing Power-Ring Tech & Trading Ltd. to expand on this with a well received presentation of his own.

The following day there was a further meeting with Beijing Power-Ring Tech & Trading Ltd. where an agreement was reached confirming them as Juniper's exclusive agents in China.



Evening Dinner as a guest of Beijing Power Ring Tech & Trading Ltd. after the conference.

## Accompanying our agents to Jinan



As a follow up to our visit in June 2006, we returned to China in December to accompany our agents Beijing Power Ring Tech & Trading Co. to Taikoo (Shandong) Aircraft Engineering Co. Ltd. at Yao Qiang International Airport, Jinan, as they have purchased the Juniper 2 x 25 gallon compressor washing rig (JMP/CFM56/D/4777/C200) together with tooling for the CFM56-3 engines. We commissioned the rig and gave training in it's operation.



## A bug in the system

Skymark Airlines in Tokyo, Japan had been having problems with grasshopper ingestion into their CFM56-7 engines and the company representative, Muneo Asami, visited the Juniper Factory in November '06 to see a demonstration of our 2 x 25 gallon compressor washing rig.



Muneo Asami of Skymark Airlines taking in the sights on his visit to Juniper.

As Juniper would be visiting China and Japan early in 2007, It was agreed that Steve Marshall would meet with Skymark Airlines at Tokyo's Haneda Airport to discuss their requirements and bring them up-to-date about the new 400Hz electrical system that allows direct connection to aircraft GPUs.

The meeting took place as planned, with the new electrical system and it's increased operational flexibility being particularly well received, as their hangar only has limited facilities and no suitable on-site power supply.

It was agreed that an order would be placed for the Juniper 2x25 gallon rig together with tooling for the CFM56-7 and CF6-80C2 engines.

# *in the Far East...*

## *ANA keep on trucking!*



*Steve Marshall with one of the customised vehicles, accompanied by Mr. Hironori Kanazu from our Japanese agents, ANA Trading Co.Ltd. (second from left) and some of the team from All Nippon Airways at their Haneda Airport facility*

**While in Japan Steve Marshall, Juniper's MD, took the opportunity to visit All Nippon Airways at Haneda Airport in Tokyo.**

ANA have recently purchased nine Juniper Compressor Wash Rigs (six 2x25 gallon and three 2x50 gallon rigs) following a visit to our Ash House facility in 2006 (see previous newsletter) and Steve was surprised to discover that they have ingeniously housed them in purpose built water wash vehicles which have been despatched to their facilities throughout Japan.

Each vehicle is equipped with an air compressor, generator, hose reels, spotlights and custom made storage for a range of Juniper's washing probes together with many other accessories to make the washing of engines at remote areas in most conditions much easier.



*Rear of one of the ANA vehicles.*

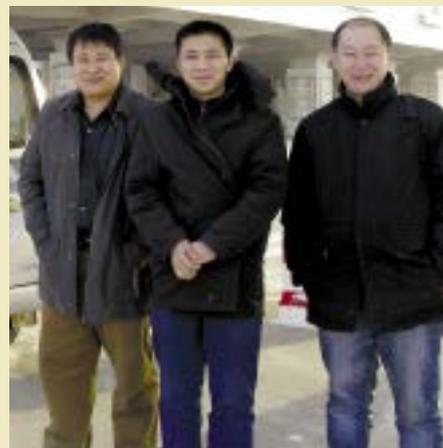
## *China Southern Airlines-*

### *A warm welcome on a cold day!*

**From Japan, Steve then visited China, and in the course of this visit paid a scheduled call on China Southern Airlines at their Harbin Headquarters accompanied by our Chinese agents, Beijing Power Ring Tech & Trading Ltd., to give a presentation of the Juniper compressor washing system.**

As luck would have it, one of their engineers, Mark, had prior experience of working with Juniper equipment during a recent stint working in Canada, and he was happy to enthusiastically endorse everything Steve said.

A particular difficulty in this part of the world are the very low temperatures for five months of the year, so Mark was delighted by the improved heating system on the 2x25 gallon rig. All in all, an excellent visit and a very positive response.



*Our agents from Beijing Power Ring Tech & Trading Ltd., Mr. Zhang Quan (left) and Mr. Chen Zhi Yu (right) with a representative of China Southern Airlines (centre) after the presentation in Harbin, where the temperature was -22°C!*

**Some of the  
commercial aviation  
companies Juniper  
now deals with:**

# Juniper -

Aer Lingus  
Air Algerie  
Air Arabia  
Air Astana  
Air Atlanta Aero Engineering  
Air Atlantique  
Air Berlin  
Air Bridge Carriers Ltd.  
Air Canada  
Air Deccan (India)  
Air Europa (Mallorca)  
Air France  
Air Hanson  
Air Jamaica  
Air Luxor SA  
Air Madrid  
Air Mexico  
Air New Zealand  
Air Pacific Ltd.  
Air Transat  
Air Transport International  
All Nippon Airways  
American Airlines  
Amiri Flight  
Amre Flight UAE  
Atlas Air  
Atlas Jet (Turkey)  
Austrian Airlines  
Bangkok Airways  
BASCO  
BH Air (Bulgaria)  
Britannia Airways  
Britannia Airways (Sweden)  
British Airways (Gatwick Airport)  
British Airways (Glasgow)  
British Airways (Heathrow Airport)  
British Midland International  
BWIA West Indies Airways Ltd.  
Carnival Airlines (USA)  
CCM Airlines  
China Southern Airlines  
Comair Ltd.  
Continental Airlines  
Copa Airlines Panama  
Cyprus Airlines  
Cyprus Airways  
DHL Air Ltd.  
El Al Israel Airlines  
Emerald Airways  
Emirates Airline  
Eurocypria Airlines  
Eva Air  
Evergreen Aviation tech Corp. Taiwan  
F.B.S. Ltd.  
FFV Aerotech  
Fields Aviation  
FMW Sweden  
F.R. Aviation  
Futura Internac (Mallorca)  
GAMCO - UAE  
GE  
Greenwich Caledonian  
Grove Park Maintenance (London)  
Hapag Lloyd  
Hunting Aviation  
Iberia Lineas Aereas De Espana  
Iberworld Airlines (Mallorca)  
Inter Airlines (Turkey)  
Inter Appro (France)  
Isle of Scilly Skybus Ltd.

Japan Airlines  
JEA  
Jet Airways (India) Ltd.  
Jet Blue  
JIT Aviation USA  
KLM  
Korean Air  
Kuwait Airways  
Lan Airlines S.A.  
Lanchile  
Lauda Air  
LOT Polish Airlines  
Lufthansa Cityline GMBH

Lufthansa (Frankfurt)  
Lufthansa (Stuttgart)  
Lufthansa Technik Philippines  
MNG Airlines Turkey  
Monarch Airlines  
MyTravel  
North West Airlines (Snecma)  
North West Airlines (Snecma) Mineapolis  
North West Airlines (Snecma) Tampa  
Nova Airlines  
Oman Air  
Onur Air  
Pakistan International Airways

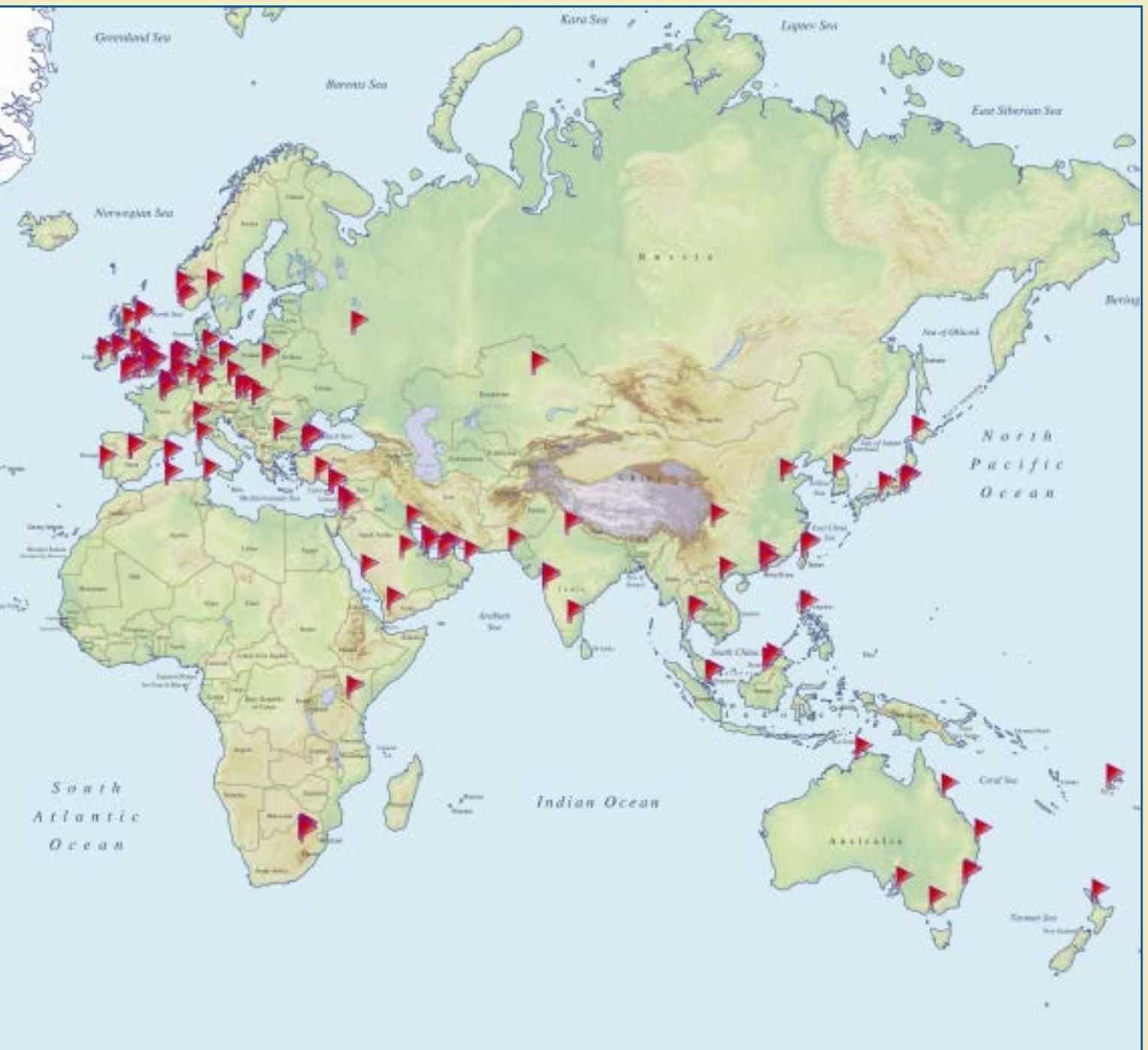


# ***Far and Wide***

Pegasus Hava  
Qantas Airways  
Qatar Airways  
Royal Air Maroc  
Royal Jordanian  
Ryanair  
Sabena  
Safair  
Sahara Airlines  
Saudi Airlines  
Saudi Airways  
Schreiner Airways  
Shenzhen Airlines

Sichuan Snecma China  
Singapore Airlines  
Skymark Airlines  
Slovak Airlines  
South African Airways  
Sun Country Airlines  
Sunstate Airlines  
Taikoo(Shandong) Aircraft Engineering Co. Ltd.  
Tam Linhas Aereas SA  
Thai Airways  
Trafficair  
Transavia  
Transocean Air

Turkish Airlines  
UAE  
US Airways  
Varig Airlines  
Vernair  
Vietnam Airlines  
Virgin Atlantic Airways  
Wencor West  
West Jet  
Westland Helicopters  
Wideroe  
Wizz Air  
Yemen Airways



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# First wash using the CFM56-5B long engine probes

Having visited My Travel at Manchester Airport a few days earlier to measure up and confirm procedures, Juniper returned in February 2007 to demonstrate their new CFM56-5B long engine probes during an engine water wash on an Airbus A321.

Although the wash was satisfactory, we felt that a few small modifications and some minor adjustments to the installation procedures would pay dividends, and having done this a highly successful further wash was carried out a few days later.



Juniper's new CFM56-5B long probes in position during the trial wash for My Travel.

# Jet2 - Newcastle

Juniper were contracted to carry out a hot water wash on a Boeing 737-300 for Jet2.com at Newcastle Airport on a remote and fairly inaccessible part of the airfield without adequate services.

Fortunately, Juniper's new 400Hz electrical system was developed for just this sort of situation and a GPU was used to heat the tanks and the wash was carried out successfully. Altogether, this was an excellent demonstration of the new heating system and Jet 2 were impressed enough to consider buying one of our 2 x 25 gallon compressor washing rigs.



# Foamer 50 demonstration for the Italian Airforce

In June of 2006 our Italian agents, Alfa Support, performed a demonstration wash on a Tornado aircraft for the Italian Airforce using Juniper's Foamer 50 and kindly sent

us these photos of the operation. The wash was a complete success and orders are in the pipeline..



# The Ash house production line!



Completed mobile compressor washing rigs at our Ash House factory after the final check awaiting packing and despatch.

# Virgin Atlantic



In May 2006 Virgin Atlantic Airlines invited Juniper to demonstrate the 2 x 25 gallon compressor washing rig performing a water wash on a CF6-80C2 engine fitted to one of their Boeing 747-400 fleet at Gatwick Airport.

The demonstration was a complete success and Virgin Atlantic have since ordered our 2 x 50 gallon rig together with tooling for the CF6-80C2 engines.

# Coming, Mr President

## Juniper washing rigs go right to the top!

Having encountered difficulties obtaining a suitable wash rig, Airlogic approached Juniper to supply one of their 2x25 gallon compressor washing rigs for the new Russian Presidential Fleet Aircraft, presently under construction.

To fulfill the conditions of this order, Juniper visited Aeroflot at Sheremetyevo International Airport, Moscow early in September 2007 to design new tooling for the Perm PS-90A engines fitted to the Ilyushin IL96 aircraft. As the Perm engines are similar to the Rolls Royce RB211-524 engines in that they cannot be opened up, we decided that the best way to tackle the wash efficiently was to use our recently developed long probe method and design tooling accordingly.

During this visit we were also asked to supply a hand-held washing lance for the aircraft's APU.

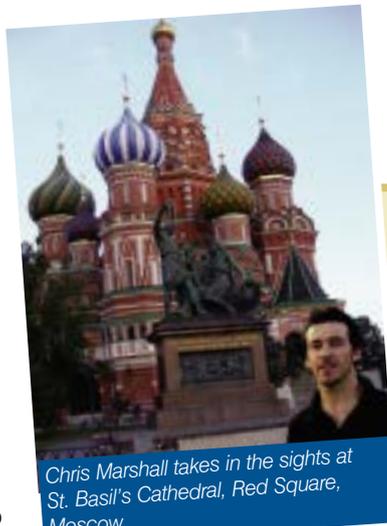
The following day we visited nearby Domodedovo International Airport to investigate the possibility of using the same long probes on the Perm D30-KU engines fitted to the Ilyushin IL62M aircraft. Unfortunately, due to the engine construction, washing using our long probes proved impossible and we proposed using a purpose built hand-held washing lance. We also



A Russian Ilyushin IL96 Aircraft on the Runway at Sheremetyevo international Airport

recommended using the washing lance designed for the IL96 on this aircraft's APU, as it would prove equally effective.

A successful visit resulted in the rig and all appropriate tooling being ordered and delivered.



Chris Marshall takes in the sights at St. Basil's Cathedral, Red Square, Moscow.

As a footnote to this story - In late 2006 we supplied four mobile compressor washing rigs to Westland Aircraft who had been awarded the contract to supply and service a fleet of EH101 medium range helicopters destined for American VIP and Presidential transport roles.

So - Juniper is now helping to keep two presidents environmentally friendly and airborne!

## CF34-8C/E Probes-

### A successful new addition to a growing range.



GE were keen to know if Juniper's CF34-10E engine probes would fit the CF34-8E engine and suggested that Juniper visit LOT in Poland in April 2007 to test them on one of their Embraer ERJ-170 aircraft.

As suspected, the probes didn't fit and returning to Juniper's Ash House facility, a completely new set were designed, manufactured and sent back for further trials. These worked perfectly.

In the meantime, Air One in Italy were having problems cleaning the CF34-8C engines fitted to their Bombardier CRJ900 aircraft and GE commissioned Juniper to demonstrate the new tooling for them at their base in Ciampino Airport, Rome. With a slight modification the probes were found to work perfectly on both the 8E and 8C variations of the engine, and the results were so positive that Air One has now ordered a 2x25 gallon rig complete with the new CF34-8C/E probes for themselves.

However, the story doesn't end there - the new tooling proved so successful, that GE asked for Juniper's demonstration rig and new tooling to be sent on to Saudi Airlines, who were having similar difficulties washing the engines on their fleet of Embraer 170 aircraft. They have since ordered two rigs complete with tooling.

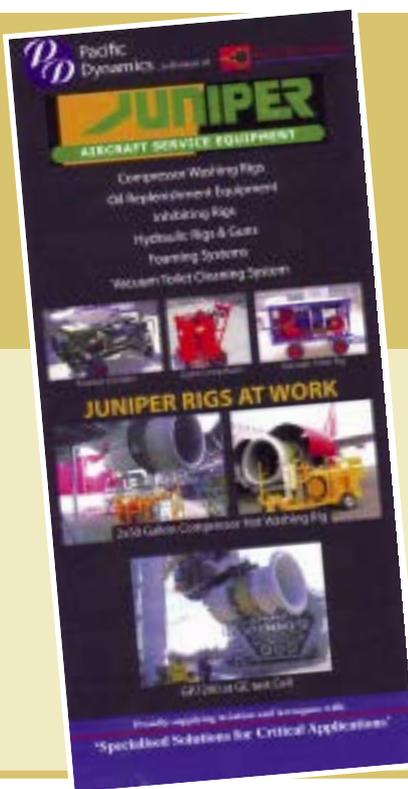
# LIST OF WASHING PROBES FOR USE WITH JUNIPER'S 2 X 25 AND 2 X 50 GALLON COMPRESSOR WASHING RIGS

(Each Juniper Part Number refers to a set of two probes)

Aircraft Type	Engine Probes	Juniper Part Number
Boeing 737-300-400 RE-Engined DC8, AWACS	CFM56-3	JMP/CFM56/D/4538
Airbus A320	CFM56-2 & 5A	JMP/CFM56/D/4435
Airbus A321	CFM56-5B (Long Probes Thrust Reversers closed) 89"	JMP/CFM56/D/6527
Airbus A320, A340	CFM56-5B/C	JMP/CFM56/D/4605
Boeing 737-700/800	CFM56-7	JMP/CFM56/D/4462
* Boeing 737-700/800	CFM56-7B (Long Probes Thrust Reversers closed)	JMP/CFM56/D/6645
(MDC)DC-10-10/DC-10-30	CF6-6D/6K/-50	JMP/CF6/D/4510
(MDC)DC-10-30	CF6-50	JMP/CF6/D/4966
Boeing 747/767	CF6-80C2	JMP/CF6/D/4037
(MDC)MD-11, Airbus A300, A310	CF6-80C2 D1F/A5F/A5/A3	JMP/CF6/D/6418
Airbus A310	CF6-80A2/A3	JMP/CF6/D/4247
Airbus A330	CF6-80C2/E1 (Long Probes Thrust Reversers closed) 98"	JMP/CF6/D/6511
Boeing 747/767	CF6-80E1	JMP/CF6/D/4947
Airbus A330	GE90 (Short Probes)	JMP/GE90/D/4081
Boeing 777	GE90 (Long Probes Thrust Reversers closed) 127½"	JMP/GE90/D/4599
Boeing 777-300ER	GE90-115B( Short Probes)	JMP/GE90-115B/D/4949
Boeing 777-300ER	GE90-115B (Long Probes Thrust Reversers closed)135"	JMP/GE90-115B/D/4948
Embraer 170 & 175 Bombardier CRJ700, CRJ900, CRJ1000 Bombardier Challenger, 870, 890	CF34-8C/E	JMP/CF34/D/6553
Embraer 190 & 195	CF34-10E	JMP/CF34/D/6000
Boeing 757	RB211-535E4	JMP/RB211/D/4153
Boeing 747-400	RB211-524 G&H (Long Probes Thrust Reversers closed)	JMP/RB211/D/4249
Airbus A320	V2500	JMP/V2500/D/4040
Airbus A320	V2500(Long Probes Thrust Reversers closed)160"	JMP/V2500/D/6561
(MDC)MD-90	V2525 D5	JMP/V2500/D/4703/MD
* (MDC)MD-90	V2525 D5 (Long Probes Thrust Reversers closed)	JMP/V2500/D/6562/MD
Airbus A340-600	TRENT 500	JMP/TRENT/D/6188
* Airbus A340-600	TRENT 500 (Long Probes Thrust Reversers closed)	JMP/TRENT/D/6615
Airbus A330	TRENT 772	JMP/TRENT/D/4702
* Airbus A330	TRENT 772 (Long Probes Thrust Reversers closed)185"	JMP/TRENT/D/6592
Boeing 777-200ER	TRENT 800	JMP/TRENT/D/6328
Boeing 767-200/300 Airbus A300/A310,(MDC)MD-11	P & W 4000-94" Fan (PW 4152/4158/4462)	JMP/PW4000/D/4856
* Boeing 767-200/300	P & W 4000-94"Fan (Long ProbesThrust Reversers closed) 85"	JMP/PW4000/D/6601
Airbus A330/200/300	P & W 4000-100"Fan	JMP/PW4000/D/6216
* (MDC)MD-80-88	P & W JT8D-219 (Long Probes Thrust Reversers closed) 201"	JMP/JT8D/D/6627
Boeing 747-200	P & W JT9D	JMP/JT9D/D/4154
BAE 146, RJ70/100	Allied Signal LF507	JMP/LF507/D/4809
* Ilyushin IL96	PERM PS-90A 185"	JMP/PERM/D/6581

\* Denotes probes in development

For details of **Spray Rings** for Hercules C130 and P3 Orion Aircraft, **Washing Wands & Lances** for Puma, Seaking and other helicopters, please contact us direct.



# The Avalon Airshow Down Under

Juniper was well represented at the prestigious Australian Airshow at Avalon Airport early in 2007 thanks to the hard work of our long-standing Australian agent John Burleigh.

John's company, Pacific Dynamics, has recently merged with Defcon Technologies, another Sydney based company, and John will continue to service his existing contacts from within the new organisation.

**STOP PRESS:** Three of the new 2x25 gallon universal rigs have been ordered by the RAAF for use on P3 Orion aircraft at RAAF Edinburgh, South Australia.

# Juniper to the rescue!

Tricky test cell installation for Japanese manufacturing giant

INC Engineering, engineers for the massive Engine manufacturer IHI Corporation in Japan, had placed an order with T&E Co. Ltd. for one of Juniper's 2x25 gallon compressor washing rigs intended for installation in their engine test cell. There would be particular problems to overcome with this installation and Juniper were contacted for their advice.

As Steve Marshall, Juniper's MD was due to visit Japan, it was decided that he would call on INC Engineering accompanied by Mr. Teruhisa Ogawa of T&E Co. Ltd. and assess what was required.

Back at Ash House, the necessary modifications were completed and the rig despatched to INC, where it has now been successfully installed at IHI.



Mr Teruhisa Ogawa from T&E Co. Ltd. with colleagues from INC Engineering

Steve Marshall Managing Director

**A.T.Juniper (Liverpool) Limited**  
 Marshall Works, 5-17 Bleasdale Road, Allerton, Liverpool L18 5JB  
 Tel: +44(0)151 733 1553 Fax: +44(0)151 734 3166

Also at:  
 Ash House, Prenton Way, North Cheshire Trading Estate,  
 Prenton, Wirral CH43 3DU

Email: juniperliverpooltd@compuserve.com  
 Web: www.juniper-liverpool.com

