WORLD METEOROLOGICAL ORGANIZATION

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COMMISSION FOR BASIC SYSTEMS
OPEN PROGRAMME AREA GROUP
ON INTEGRATED OBSERVING SYSTEMS

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EXPERT TEAM ON AIRCRAFT-BASED OBSERVING SYSTEMS
FIRST SESSION

ITEM: 3.1

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STATUS OF THE AIRCRAFT-BASED OBSERVATIONS PROGRAMS

Reports of Operational National & Regional Programs

(*Submitted by Doug Body, Australia)*

SUMMARY AND PURPOSE OF DOCUMENT

Provides a status report on the national/regional AMDAR Program of Australia

ACTION PROPOSED

The Session is invited to review and discuss the content of the document.

Appendices

1. Program Metadata

PROGRESS AND ACTIVITY REPORT

Current Status

1. The current Australian operational AMDAR fleet, as of August 2013, is shown in the table below. The 117 aircraft Australian AMDAR fleet contributes 12,400 observations per day to the Global AMDAR program.

Airline	Country of Airline	Aircraft Type	No. of Aircraft	Optimised	AMDAR Software	Format on GTS
Qantas	Australia	B747-4nn	11	No	AAA v1	FM42
		B767-336	5	No	AAA v1	FM42
		B737-838	59	Yes	AAA v3	FM42
Jetconnect	New Zealand	B737-838	8	Yes	AAA v3	FM42
Jetstar Airways	Australia	A320	21	No	AAA v3	FM42
Jetstar Asia	Singapore	A320	11	No	AAA v3	FM42
Air Vanuatu	Vanuatu	A737-838	1	Yes	AAA v3	FM42
Sky Traders	Australia	A319	1	No	AAA v3	FM42

Development & Other Activities

2. Fleet Expansion & Consolidation

The AMDAR fleet has had a net expansion of 12 aircraft since September 2012, with 7 new Qantas 737s, 6 Jetstar Airways A320s and 6 Jetstar Asia A320s, but 5 less Qantas 747s and 2 less Qantas 767s. The fleet additions represent some new aircraft (737s) and some turning on of AMDAR software on existing craft. The fleet reductions reflect Qantas' phasing out of its older aircraft in favour of A380 and A330 aircraft.

Budgetary considerations will likely limit any significant future AMDAR fleet expansion. The Bureau is currently considering turning off some of the non-optimisable aircraft.

3. WVSS-II Project

While we have an airline partner willing to participate, the cost of obtaining the STC for 737-800 has proved prohibitive to progress this year.

4. Problems with B737 Teledyne Avionics Software Upgrade

In early March 2013, Qantas proceeded with an upgrade of the Teledyne Avionics software, which enabled them to improve their in-flight monitoring of aircraft systems. However, this caused the AMDAR software on these aircraft to:-

- ignore uplink requests to change reporting behaviour (that is, they became effectively un-optimisable)
- not report any AMDAR data on a majority of flights
- when they did report, the aircraft implement a version of the "ascent observation rules" (reporting every 50 hPa or every minute, whichever is reached first) for the duration of the flight.

Qantas was able to develop a fix, which will be rolled out over August 2013. However, the fix circumvents, rather than solves the problem. The cause is apparently an issue with the Teledyne Avionics software and has been reported to the manufacturer but no date for a resolution has been promised.

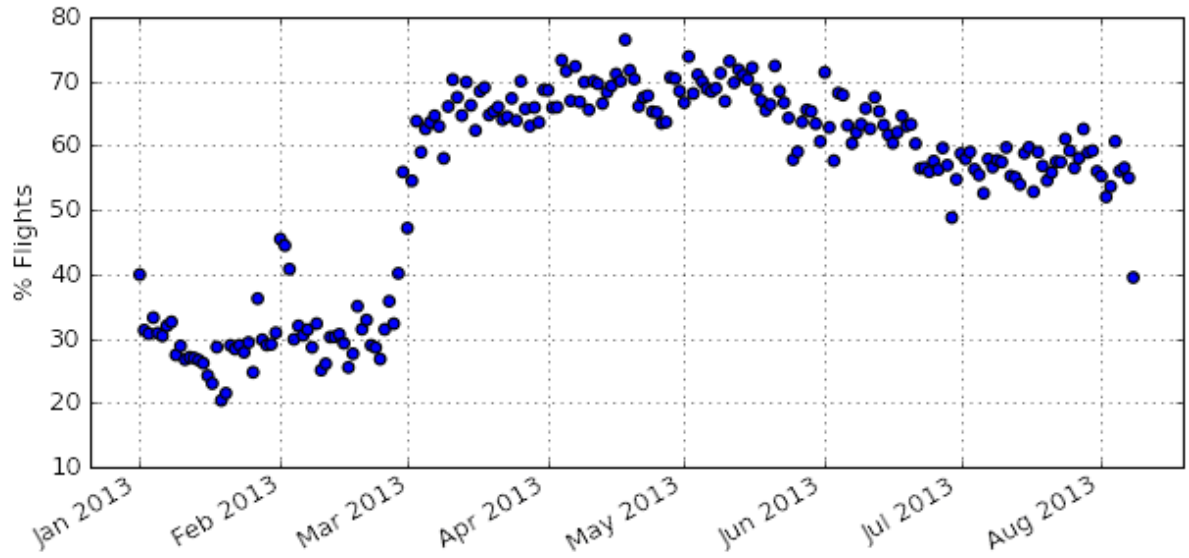

Figure 1: % Flights with Data or Optimisation Issues

Future Plans

5. A330-300 and A380-800 AMDAR software development

With the phasing out by Qantas of their 747-4nns for International routes in favour of A380-800s and 767s in favour of A330-200S and A330-300s for International and Domestic routes, the Bureau is investigating having AMDAR software developed for these platforms.

6. Uplinking to Jetstar Fleet

It is still a future plan to negotiate uplinking access to the Jetstar and Jetstar Asia fleets. The installed software already has the facility to respond to uplinks, but the necessary communications access has not been negotiated with the respective airlines. Uplinking would allow optimisation of data.

APPENDIX 1

PROGRAM METADATA

Operational Fleet

Airline	Country of Airline	Aircraft Type	Number of Aircraft	AMDAR Software	Format On GTS
Qantas	Australia	B747-4nn	11	AAA v1	FM42
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		B737-838	59	AAA v3	FM42
Jetconnect	New Zealand	B737-838	8	AAA v3	FM42
Jetstar Airways	Australia	A320	21	AAA v3	FM42
Jetstar Asia	Singapore	A320	11	AAA v3	FM42
Air Vanuatu	Vanuatu	A737-838	1	AAA v3	FM42
Sky Traders	Australia	A319	1	AAA v3	FM42

Program Coverage

Airport Country	Airport Name	Airport ID (IATA)	Profiles per week taken(possible)
Australia	Ayers Rock Connellan	AYQ	5 (6)[A]
Australia	Alice Springs	ASP	11 (16)[A]
Australia	Brisbane Intl	BNE	191 (343)[A]
Australia	Gold Coast	OOL	110 (114)[A]
Australia	Cairns Intl	CNS	85 (92)[A]
Australia	Hamilton Island	HTI	6 (10)[A]
Australia	Mount Isa	ISA	16 (18)[A]
Australia	Mackay	MKY	9 (14)[A]
Australia	Ballina Byron Gateway	BNK	5 (10)[A]
Australia	Proserpine Whitsunday Coast	PPP	3 (5)[A]
Australia	Broome Intl	BME	15 (18)[A]
Australia	Sunshine Coast Airport	MCY	23 (24)[A]
Australia	Townsville	TSV	43 (49)[A]
Australia	Casey Base, Antarctica		0.25[CD]
Australia	Christmas Creek Station	CXQ	5 (7)[A]
Australia	Christmas Island	XCH	4[C]
Australia	Avalon	AVV	17 (19)[A]
Australia	Hobart	HBA	36 (40)[A]
Australia	Launceston	LST	25 (26)[A]
Australia	Melbourne (Tullamarine) Intl	MEL	268 (368)[A]
Australia	Newman	ZNE	33 (44)[A]
Australia	Adelaide Intl	ADL	95 (140)[A]
Australia	Darwin Intl	DRW	60 (67)[A]
Australia	Karratha	KTA	52 (69)[A]
Australia	Kalgoorlie Boulder	KGI	16 (21)[A]
Australia	Port Hedland Intl	PHE	34 (41)[A]
Australia	Perth Intl	PER	127 (275)[A]
Australia	Canberra	CBR	38 (55)[A]

Australia	Sydney Intl	SYD	370 (553) [A]
Australia	Newcastle	NTL	32 (38) [A]
Cambodia	Phnom Penh Intl	PNH	3 (3)
Cambodia	Siem Reap	REP	2 (2)
Chile	Arturo Merino Benitez Intl	SCL	2 (4)
China	Baiyun Intl	CAN	2 (2)
China	Shantou	SWA	2 (2)
China	Haikou	HAK	3 (3)
China	Xiaoshan	HGH	2 (2)
Fiji	Nadi Intl	NAN	2 (2)
Hong Kong	Hong Kong Intl	HKG	13 (14) [B]
Indonesia	Bali Intl	DPS	18 (26) [B]
Indonesia	Juanda International Airport	SUB	1 (5) [B]
Indonesia	Soekarno Hatta Intl	CGK	20 (20)
Indonesia	Polonia Intl	MES	5 (5)
Japan	Narita Intl	NRT	3 (14) [B]
Japan	Kansai Intl	KIX	3 (3)
Malaysia	Kuala Lumpur Intl	KUL	22 (22)
Malaysia	Penang Intl	PEN	4 (4)
Myanmar	Yangon Intl	RGN	2 (2)
New Caledonia	La Tontouta	NOU	4 (4) [A]
New Zealand	Auckland Intl	AKL	90 (100) [A]
New Zealand	Christchurch Intl	CHC	48 (49) [A]
New Zealand	Dunedin	DUD	3 (3) [A]
New Zealand	Queenstown	ZQN	12 (14) [A]
New Zealand	Wellington Intl	WLG	55 (58) [A]
Philippines	Ninoy Aquino Intl	MNL	13 (13)
Singapore	Singapore Changi Intl	SIN	135 (161) [A]
South Africa	OR Tambo Intl	JNX	11 (23) [A]
Taiwan	Chiang Kai Shek Intl	TPE	5 (5)
Thailand	Suvarnabhumi Intl	BKK	15 (15)
Thailand	Phuket Intl	HKT	13 (12)
Vanuatu	Santo-Pekoa Itl	SON	1 (2) [A]
Vanuatu	Port Vila Bauerfield	VLI	22(24) [A]
Vietnam	Tansonnhat Intl	SGN	2 (8) [B]

[A] Less profiles taken due to Optimisation.
[B] Less profiles taken due to Configuration
[C] Data from VH-VHD from 1-31st January 2013
[D] Antarctic flights only take place during Southern Hemisphere summer. The value of 0.25 profiles/week reflects an approximate 12 month average.

Notes

a) Data from 1/5/2013 until 31/7/2013, then averaged to profiles/week.
b) Using uplinking and the AMDAR Data Optimization System means that AMDAR data is not collected for all ascent/descent profiles.

Program Potential Coverage

Airport Country	Airport Name	Airport ID (IATA)	Profiles per week
United States	Dallas Fort Worth Intl	DFW	14
United States	John F Kennedy Intl	JFK	7
United States	Los Angeles International	LAX	37
United States	Honolulu Intl	HNL	1

Notes

a) Data from 1/5/2013 until 31/7/2013, then averaged to profiles/week
b) Profiles are currently limited by configuration due to budgetary limitations and the likelihood that these locations are well covered by the US AMDAR programme

Program Potential International Coverage

Airport Country	Airport Name	Airport ID (IATA)	Airline & Fleet (Aircraft model)	Profiles per week
United States	Honolulu	NHL	Jetstar A330-200 Qantas A330-300	24
China	Shanghai	PVG	Qantas A330-200	14
China	Hong Kong	HKG	Qantas A380-800/ Qantas A330-300	14/28
United Arab Emirates	Dubai	DXB	Qantas A380-800	28

Notes

a) Data compiled by examining airline schedules for August 2013 and averaging to profiles/week
b) Aircraft would require software to be developed and installed.