Saudi Arabian Airlines Flight to Maldives

by Richard Godfrey

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1. Introduction.

A number of eye witnesses on the island of Kuda Huvadhoo in the Maldives reported seeing a large low flying aircraft early in the morning of 8th March 2014. Blaine Gibson travelled to the island and interviewed the eye witnesses whose reports appeared credible. Several analysts reported that the aircraft was in fact MH370, which had disappeared the previous night somewhere over the Indian Ocean.

Don Thompson of the Independent Group investigated the sightings and found that a Saudi Arabian Airlines private VIP flight landed at Malé Velana Airport in the Maldives at 08:37 local time on 8th March 2014.

2. Aircraft.

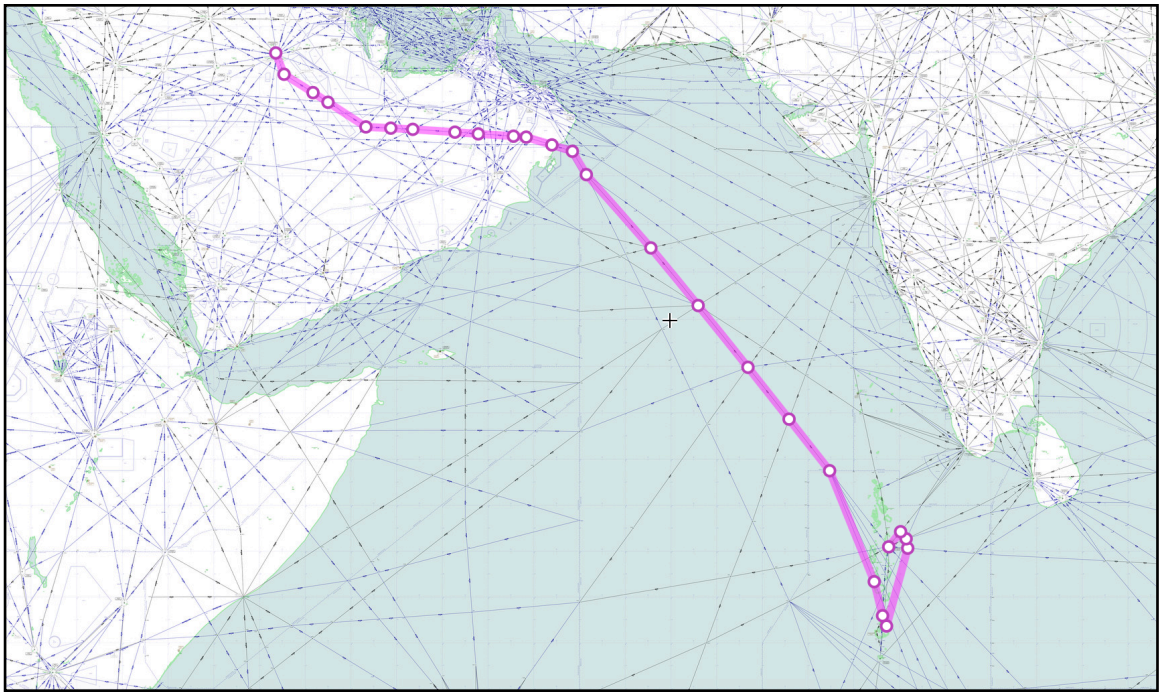
The Saudi Arabian Airlines aircraft was a Boeing 777-268ER registration HZ-AKF. This is the same type of aircraft as MH370.

3. Aircraft Flight Data.

The HZ-AKF flight originated in Riyadh, the capital of Saudi Arabia. As this was a private VIP flight there is no ADS-B data available. The flight entered the Mumbai Flight Information Region (FIR) at 00:15 UTC on 8th March 2014 at waypoint KITAL, contacted the tower at Velana Airport at 02:45 UTC and landed at 03:37 UTC (08:37 local time).

Due to the long standing conflict between Saudi Arabia and the Yemen, the Yemen airspace was avoided and a routing via Oman airspace was chosen instead.

A software that I have developed called GDTAAA was used to analyse the WSPRnet data for this flight and detect and track HZ-AKF. An overview of the flight path is shown in the Sky Vector chart below. On entering the Malé FIR at waypoint BIBGO the aircraft does not head directly to Velana Airport, but first flies to the southern end of the Maldives to waypoint ATVUN and overflies Kooddoo airport (VRMO) before returning northwards to land.



4. WSPRnet Data.

The WSPRnet data was downloaded from the WSPRnet website and is shown in the link below. The data has been post-processed as usual to include only WSPR links covering a distance greater than 1,000 km. Only WSPR links with a transmission power ≥ 10 dBm and in the frequency band between 3 MHz and 30 MHz have been used. For greater accuracy only WSPR links where both the transmission (Tx) and receiver (Rx) stations have a Maidenhead Grid locator of 6 characters have been included (with a precision of 2.5' Latitude and 5.0' Longitude).

The WSPRnet data has also been post-processed to determine the received power based on a conservative noise floor level of -150 dB. The path loss has been determined as Tx power minus Rx power. A distance algorithm and loss algorithm are calculated to determine the mean loss over the propagation distance. Signal level anomalies are calculated based on one standard deviation (SD), 0.5 SD and 0.25 SD. Results higher than the mean signal level plus 0.25 SD are deemed to be due to reflection and lower than the mean signal minus 0.25 SD are deemed to be due to scattering. These anomalies are collectively known as signal to noise ratio (SNR) anomalies. Reflection anomalies are shown with a solid line and scattering anomalies are shown with a dashed line in the charts on the following pages in red, orange or yellow according to the level of standard deviation from the mean (1.0 SD red, 0.5 SD orange and 0.25 SD yellow).

The transmitter sends the WSPR protocol which includes the exact frequency of the transmission typically in the 3 MHz to 30 MHz range. The receiver analyses the received signal and can detect if the frequency has drifted from the transmitted frequency by a value of between 1 Hz/min and 4 Hz/min. This drift value is captured in the WSPRnet database. A drift anomaly is simply where the received frequency drift value is non-zero and the signal has drifted by at least 1 Hz/min. Drift anomalies are marked with a solid green line.

https://www.dropbox.com/s/e3afcohirqesepw/wsprspots-2014-03-08%200000%20to%201200.xlsx?dl=0

This link contains all the WSPRnet data for the 8th March 2014 from 00:00 UTC for 12 hours. The file is 14.7 MB and contains 63,400 rows of data. This represents around 176 rows of data every two minutes. I have shared all the data I have used in this test to provide full transparency of the data sets used and encourage other analysts who wish to perform their own tests with the opportunity to compare results.

With SNR anomalies we are detecting changes in the signal level.

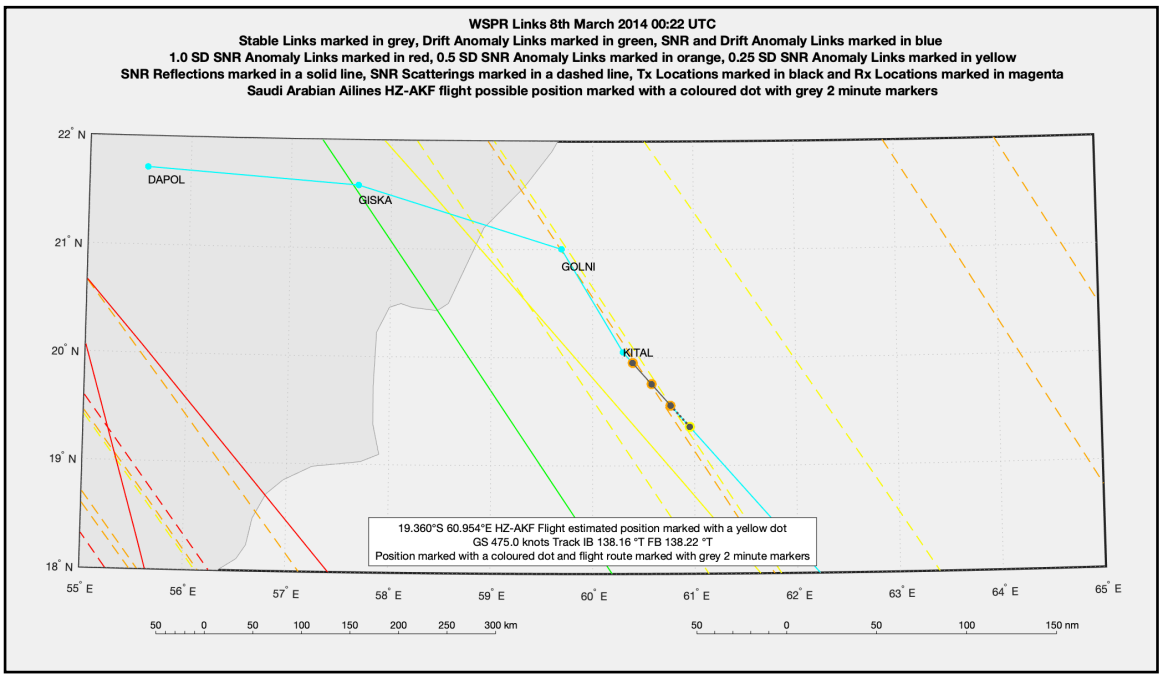
With drift anomalies we are detecting changes in the frequency domain.

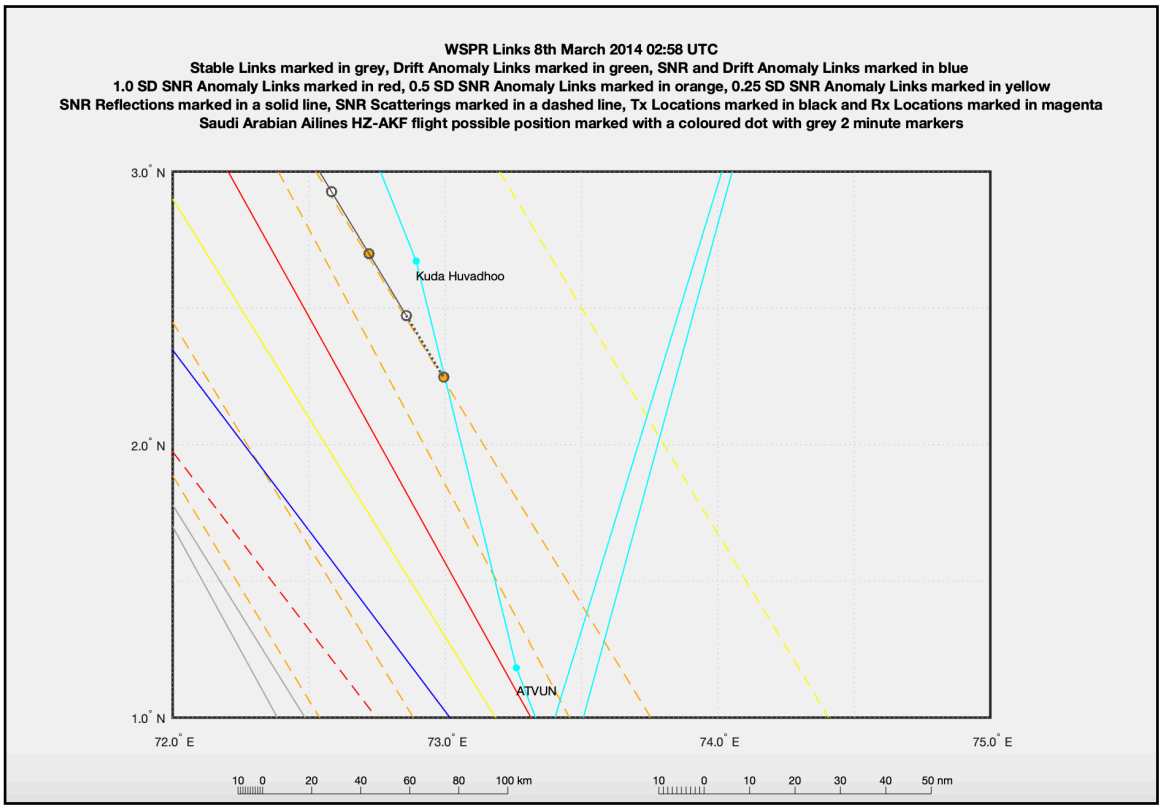
In the old days, systematic drift of the transmitter station frequency was due to component ageing or changes in temperature. Modern transmitters use a temperature compensated voltage controlled crystal oscillator and maintain a frequency quite precisely. If there is always a frequency drift on a particular WSPRnet link, then there is probably a failure in the transmitter. If there is a temporary frequency drift on a particular WSPRnet link, then there is probably a disturbance of the signal between transmitter and receiver.

A frequency drift anomaly is due to a Doppler shift or phase shift in the signal. Forward and back scatter of a radio wave from an aircraft creates a Doppler shift. Forward scatter is due to the geometry of the aircraft which is large in comparison to the wave length of the radio wave and due to the fact that the aircraft is moving through the air at speed. Back scatter is due to the wake vortex and a series of small Doppler shifts due to water vapour variations. Phase shift can be due to reflection at an aircraft or refraction in the water vapour variations in the wake vortex. A drift anomaly is the detection of a frequency change due to a Doppler or phase shift. A SNR anomaly is signal level noise. A drift anomaly is frequency or phase noise.

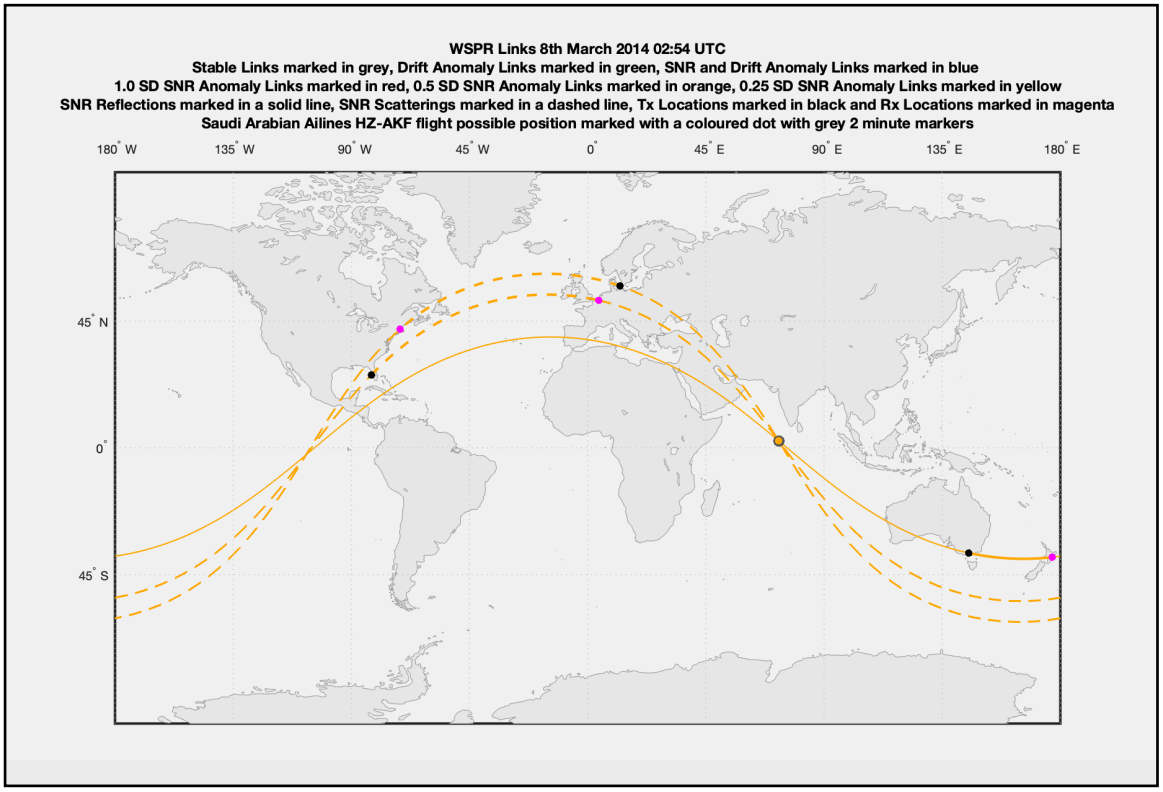
5. GDTAAA and WSPRnet Results.

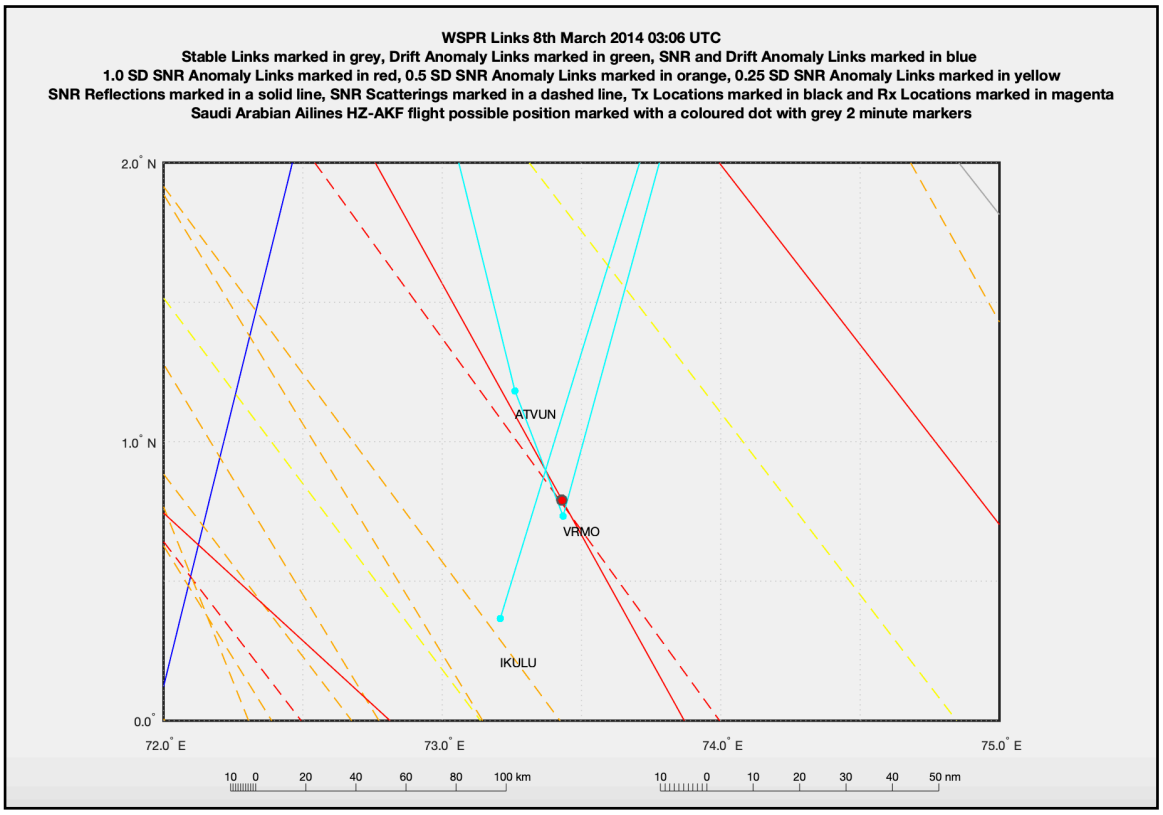
The flight is detected passing waypoint KITAL by the GDTAAA software between 00:16 UTC and 00:22 UTC in 4 successive WSPRnet data points. The detected aircraft was flying at 475 knots on Flight Route L894 as shown in the first chart below. HZ-AKF was then tracked all the way from waypoint KITAL to the Maldives. The arrival overhead Kuda Huvadhoo is shown in the second chart below.



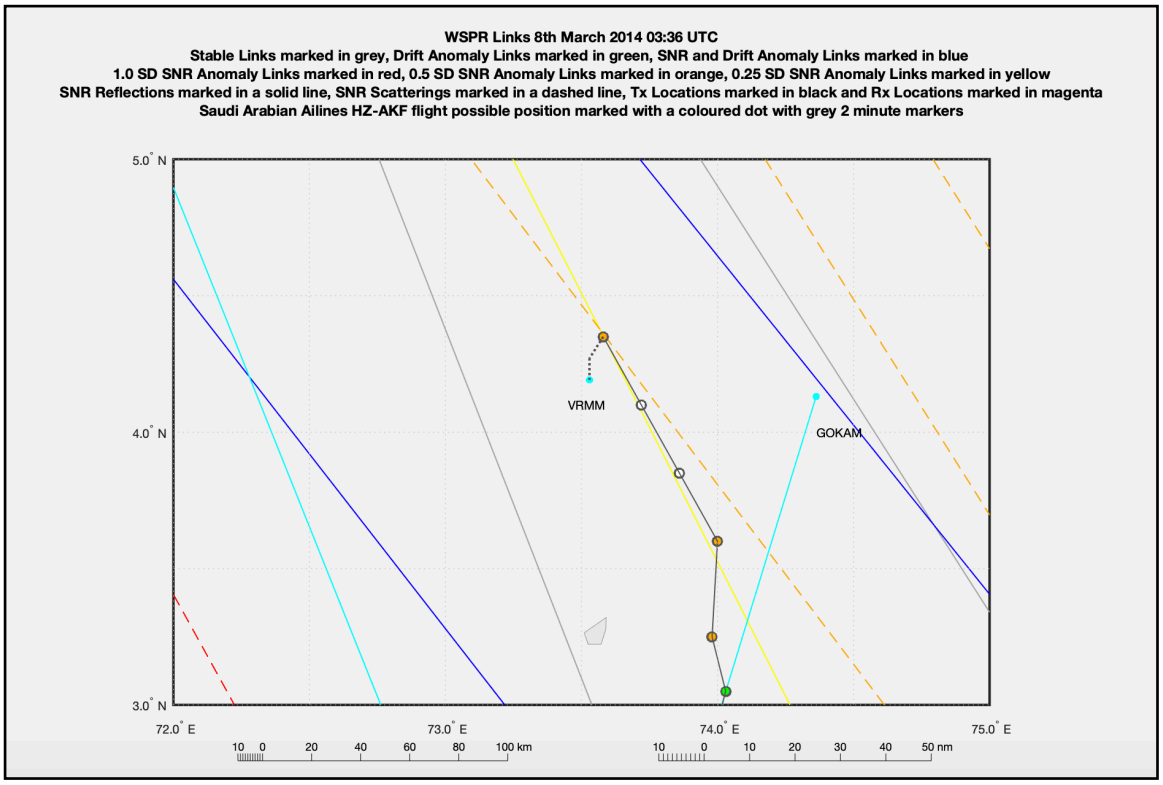


The aircraft maintains a ground speed of 475 knots and arrives overhead Kuda Huvadhoo at 02:55 UTC (07:55 local time). There is a position indicator where the WSPRnet data picks up an aircraft close to Kuda Huvadhoo at 02:54 UTC with 3 WSPRnet signals as shown in the chart below. The WSPRnet links are EL87tcJO21ce, JO65dfFN42gl and QF21nvRF80km. HZ-AKF was then tracked southwards to waypoint ATVUN and then to Kooddoo airport (VRMO) passing overhead at 03:06 UTC (08:06 local time).





HZ-AKF then turns northward tracking along the Maldives toward waypoint GOKAM and then to Malé Velana Airport (VRMM) arriving at 08:37 local time.



The WSPRnet database was searched between 01:00 UTC (06:00 local time) and 03:36 UTC (08:36 local time) for any other aircraft detections close to Kuda Huvadhoo. There are no other position indicators close to Kuda Huvadhoo although there are a number of progress indicators in the vicinity.

The following table shows all flights arriving, departing or overflying the Maldives between 05:00 local time and 09:00 local time on the 8th March 2014. There were only 2 flights overhead Kuda Huvadhoo in this time frame, a local twin turboprop DH8C at 06:30 local time and the Saudi Arabian Airlines Boeing 777 private VIP flight at 07:55 local time. There were 2 other flights later at 09:19 and 09:25 local time.

Flight	Aircraft	Type	ATD/Exit (Local Time)	ATA/Entry (Local Time)	From	To	Via	Entry Waypoint	Exit Waypoint	Overhead Kuda Huvadhoo
Q2 116	DH8C	Local	06:08	07:16	MLE	GAN				06:30
VIP	B777	Arrival		08:37	RUH	MLE				07:55
Q2 116	DH8C	Local	07:46	09:41	GAN	MLE	FVM			09:19
MJ 707	A320	Overflight Entry		08:40	CMB	SEZ		ANIVE	ELKEL	09:25
FZ 563	B738	Arrival		06:25	DXB	MLE				None
LV 189	B763	Arrival		06:39	PEK	MLE				None
QR 672	A320	Arrival		07:08	DOH	MLE				None
UL 101	A343	Arrival		07:59	CMB	MLE				None
EK 658	B773	Arrival		08:10	DXB	MLE				None
Private	G550	Arrival		08:30	MOW	MLE				None
VP 640	AT45	Local	07:08	08:56	DMV	MLE				None
Q2 275	DH8C	Local	08:17	09:54	MLE	KDO				None
EK 425	B777	Overflight Exit	05:31		PER	DXB		AKDOB	BIBGO	None
Q2 551	A320	Departure	07:54		MLE	MAA				None
FY 564	B738	Departure	08:50		MLE	DXB				None

6. Summary.

GDTAAA output using the WSPRnet data has been used to track a private VIP flight from Saudi Arabian Airlines to the Maldives. No ADS-B data is available for this flight.

Eyewitness sightings by islanders on Kuda Huvadhoo of a low flying aircraft at various times between 06:00 and 08:00 local time on the morning of 8th March 2014 may be a Maldives DH8C en-route from Malé to Gan at 06:30 local time followed by the Saudi Arabian Airlines Boeing 777-286 en-route from Riyadh to Malé at 07:55 local time.

Charitha Pattiaratchi, Professor of coastal oceanography at the University of Western Australia told AirlineRatings.com that MH370 could not have crashed in the Maldives because the “debris would have ended up in Somalia” and other northeast African states six months before the first piece was recovered at Reunion Island.

Reports that MH370 was sighted over the Maldives appear to be false and contradict both the Inmarsat Satellite data, the timing of the arrival of MH370 floating debris found on the shores of the Indian Ocean. The fact that another Boeing 777-200ER was sighted over the Maldives at 07:55 local time by locals supports the conclusion that the Saudi Arabian Airlines aircraft was confused for MH370.