

MH370 Flight Path Analysis Case Study

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1. Introduction.

MH370 is one of the greatest aviation mysteries of all time. Malaysian Airlines flight MH370 was operated by a Boeing 777-200ER aircraft with the registration 9M-MRO. The aircraft departed Kuala Lumpur International Airport, Malaysia on 7th March 2014 at 16:41:43 UTC (8th March 2014 00:41:43 local time) and was scheduled to arrive in Beijing Capital International Airport, China at 06.30 local time after 5 hours 34 minutes flying time. There were 227 passengers and 12 crew on board from 14 different nations including 153 passengers from China and 38 passengers and 12 crew from Malaysia.

This work is dedicated to the families and friends of those lost in this tragic incident.

At 17:19:26 UTC Malaysian Air Traffic Control (ATC) at the Lumpur Radar station contacted MH370 with a routine message: “Malaysian Three Seven Zero contact Ho Chi Minh one two zero decimal niner good night.” Captain Zaharie Shah responded at 17:19:30 UTC: “Good night Malaysian Three Seven Zero.” At 17:20:36 UTC, just 66 seconds later, the Mode S transponder symbol of MH370 dropped off the Malaysian ATC radar display. MH370 had gone ‘dark’ and disappeared into the night sky diverting back over Malaysia to the Malacca Strait according to primary civilian and military radar data.

In previous case studies we have successfully detected and tracked both large and small aircraft, such as Emirates flight EK421, which was a Boeing 777-300ER [1], a small aircraft such as a Diamond DA40 [2], a private jet, which was a Cessna 551 Citation II/SP [3], an Alouette II helicopter SE313B [4] and Qatar Airways flight QTR901, a Boeing 777-300ER [5].

This case study examines the use of radio waves from the Weak Signal Propagation Reporter (WSPR) and the historic database called WSPRnet. WSPR data can be used as a multi-static passive radar system to detect and track aircraft, where WSPR links between radio transmitters and receivers align with the aircraft position along a great circle path. Signal level and signal frequency modulations can result, when an aircraft flight path intersects with the propagation path of a WSPR link. Together with the Boeing aircraft performance data, the MAS Operations fuel and engineering data, the weather data enroute, the Inmarsat satellite data and the drift analysis of the 41 items of possible MH370 floating debris that have been recovered from around the Indian Ocean, a comprehensive picture of the final hours of flight MH370 can be collated.

The purpose of detecting and tracking MH370 across the Indian Ocean is to ensure the reliability of the flight path analysis during the 7 hours 46 minutes the aircraft was in the air and therefore the accuracy of the end point position, where MH370 ran out of fuel after 7 hours 35 minutes and then subsequently crashed around 11 minutes later. The alignment of the WSPR analysis with the analyses from Boeing, Inmarsat and the drift analysis from the University of Western Australia is a significant multi-disciplinary outcome, which all point to the same crash area. There have been 41 items of confirmed or possible MH370 floating debris recovered from round the Indian Ocean.

Flight MH370 was diverted to the Indian Ocean, where it crashed after fuel exhaustion on 8th March 2014 at some point after the last satellite signal was received at 00:19:37 UTC. At the time of writing of this case study, MH370 still has not been found despite extensive surface and underwater searches. Around 10 million commercial passengers fly every day and the safety of the airline industry relies on finding the cause of every aircraft accident.

2. Summary of Results.

The last known position of MH370, based on the Butterworth primary civilian radar, was 5.589118°N 99.165228°E at 18:01 UTC. The regional radar data contains 1,394 regular estimates of latitude and longitude at approximately 3 second intervals from 16:41:43 UTC to 18:00:51 UTC from four radar stations with two small gaps. A single additional latitude and longitude position was reported at 18:22:12 UTC but discounted due to the large gap to the penultimate radar position and possible inaccuracy due to the long range.

From this point at 18:01 UTC onwards there are 67 positions, comprising a total of 125 anomalous WSPR links, which intersect with the MH370 flight path at the estimated position of MH370.

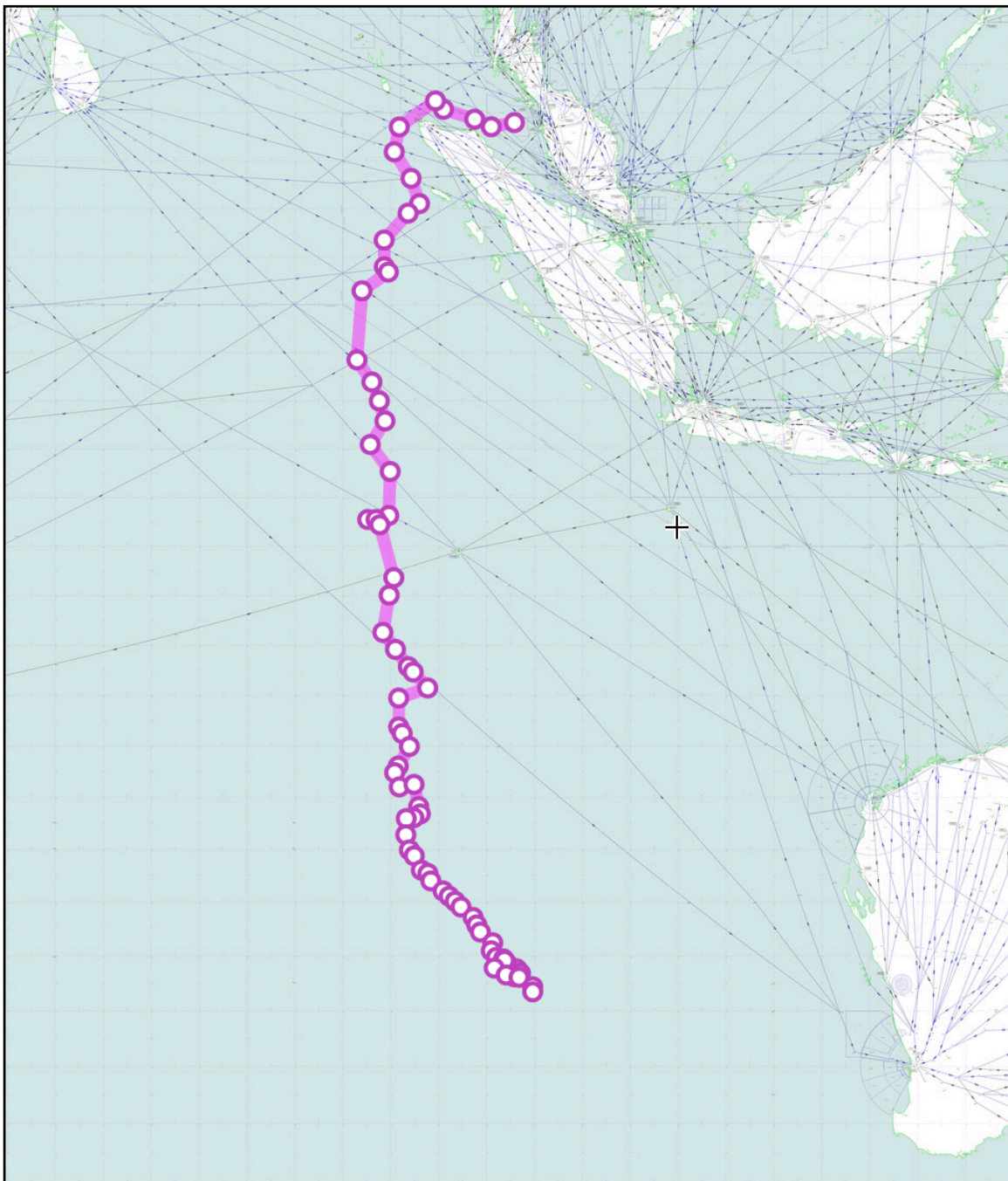


Figure 1: Sky Vector MH370 estimated Flight Path Overview Map.

The location of anomalous WSPR links aligned with all 7 positions, where the MH370 flight path crossed the arcs defined by the distance from the Inmarsat satellite calculated from the Burst Timing Offset (BTO) data. The anomalous WSPR links also aligned with 2 further positions, where the MH370 estimated track aligned with the calculation from the Inmarsat satellite Burst Frequency Offset (BFO) data. MH370 was thought to have most likely crashed close to the 7th Arc as defined by the last Inmarsat satellite BTO data. This position aligns with the point of fuel exhaustion. We know from the Inmarsat BFO data at 00:19:29 UTC and 00:19:37 UTC as well as the WSPR data at 00:20 UTC, that MH370 was in an accelerating descent of -14,517 fpm on a track of 99.6°T at a ground speed of 435.1 knots. Ian Holland of the DSTG, Australia in his paper titled "MH370 Burst Frequency Offset Analysis and Implications on Descent Rate at End-of-Flight" dated 15th January 2018 showed the rate of descent was at least -13,800 fpm, but could be up to -25,300 fpm depending on the final track and was accelerating at around 0.68 g [6].

This WSPR results at 00:26 UTC indicate a possible recovery from this descent, with a position indicator at the intersection of 3 anomalous WSPR links from 3 different transmitters and 3 different receivers at a position of 29.128°S 99.934°E, which is 44.27 nmi from the 7th Arc on a track of 124.4°T. At 00:28 UTC there was a potential progress indicator with 4 WSPR anomalous links but all from the same transmitter W4MO and all on a similar bearing.

A single anomalous WSPR signal is termed a progress indicator, as it only indicates possible progress. Multiple WSPR signals that are all aligned on the same bearing do not give a position, and are also referred to as a progress indicator. There is always the chance that WSPR signals may have been disturbed by other air traffic between the transmitter, aircraft and the receiver. This chance is significantly reduced when multiple anomalous WSPR links intersect at a significant angle at the same point and at the same time, which is termed a position indicator.

A SNR anomaly is defined as a deviation by ≥ 0.75 standard deviation from the mean taken over a 6 hour time period based on the test datum ± 3 hours. If there are less than 5 results in the result set, then the time period is extended to ± 3 days but at the same ± 3 hours each day. A drift anomaly is defined as a temporary non-zero drift. A permanent or almost permanent non-zero drift is discarded as a possible transmitter problem.

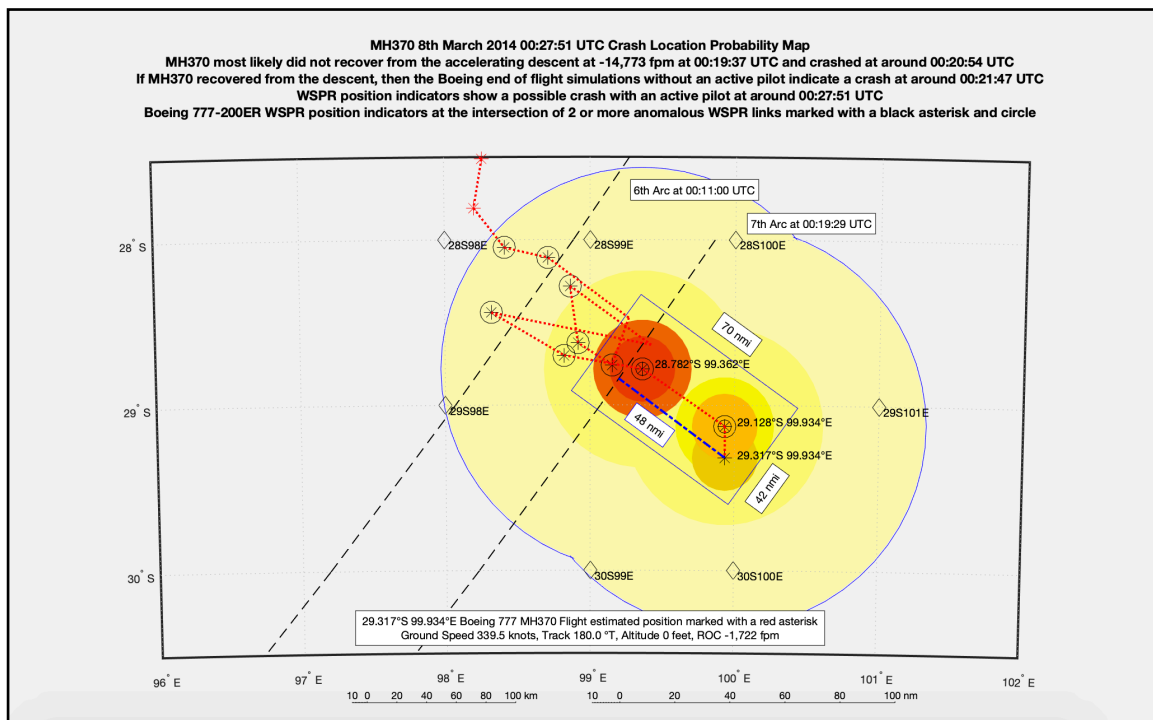


Figure 2: MH370 Crash Location Probability Map.

Boeing performed 10 end of flight simulations with various criteria of starting altitude, ground speed, autopilot disengagement timing at 1st engine flameout or 2nd engine flameout, alternate electrical configuration and turbulence setting. In 5 cases (Case 3, 4, 5, 6 and 10) the aircraft recovered from a rate of descent of over -15,000 fpm. In Case 5 the aircraft only recovered after the 11th swoop right at the end.

The average for Case 3, 4, 6 and 10 was a glide range of 58.5 nmi and glide duration of 471.8 seconds [7]. The average flight duration from the point of first reaching a rate of descent of -15,000 fpm was a further 129.5 seconds. This would imply a crash at around 00:21:46 UTC. With an active pilot, this time could be extended to 00:27:51 UTC and the ground speed reduced to a more reasonable ground speed of 163 knots on impact with a descent rate of -1,722 fpm, without lowering the flaps, assuming a 19° glide slope and average altitude recovery of 19,636 feet after the first descent from 40,000 feet (or for Case 6 from a start altitude of 35,000 feet).

Significantly, if an active pilot recovered from the high descent rate of -14,773 fpm and then controlled the aircraft on a glide slope with flaps partially lowered to attempt a ditching across the waves at a more normal landing speed of 135 knots, then the aircraft could have remained relatively intact.

The surface wind at 29.128°S 99.934°E on 8th March 2014 at 00:00 UTC was 17.8 knots from 150°T. The wind was a fresh breeze and the wave height would be just over 1.1 m, with small waves becoming longer and with numerous white caps.

The 41 floating debris items recovered show however a complete break up of the aircraft with parts from both the exterior and interior of the aircraft. There were items externally from the nose, wings, engines and tail, as well as items internally from cabin dividers, flooring, seat back video trim, clothing, shoes and hand luggage.

A crash location around 29.0°S 99.5°E is within the area defined by Prof. Pattiaratchi and Prof. Wijeratne of the University of Western Australia in their drift analysis, which was between 28°S and 33°S along the 7th Arc [8]. When Captain Sullenberger performed a controlled ditching on the Hudson River at 124.2 knots, there was a complete absence of floating debris from any part of the aircraft. Of course, the Hudson River does not experience the same wave height as the Indian Ocean and a Boeing 777-200ER is a larger aircraft than an Airbus A320-214.

The average weight of the 41 items of floating debris recovered is 4.9 kg. The zero fuel weight of the Boeing 777-200ER was 174,369 kg. This implies up to around 36,000 items of debris, which in turn implies a severe impact. If an attempt to ditch the aircraft was made in order to reduce the amount of floating debris, then it appears the bid is likely to have failed.

3. Background.

3.1 Weak Signal Propagation Reporter (WSPR).

The WSPR protocol was invented by Prof. Joe Taylor and is used to confirm a radio wave propagation between appropriately equipped transmitters and receivers. Propagation distances over 19,000 km are common place in the WSPRnet database. WSPR signals are sent every two minutes and are synchronised with GPS to start one second after every even UTC minute. The transmission of the WSPR protocol takes 110.484 seconds. The WSPRnet historic database is publicly available and goes back to 2008.

Each WSPR transmission contains the call sign of the transmitter, the location of the transmitter using a Maidenhead Grid code and the power level of the transmission. The receiver station augments this data with the call sign of the receiver, the location of the receiver using a Maidenhead Grid code, the received frequency, the frequency drift and the Signal to Noise Ratio (SNR) of the received signal. The Maidenhead Grid code is a 4 character code in the first transmission and a 6 character code in the second transmission. A 4 character code has a precision better than ± 120 km and a 6 character code is better than ± 5.2 km. Neither has the precision required to determine the great circle path between transmitter and receiver for the purpose of detecting and tracking aircraft. We therefore decided to build a database with transmitter and receiver antenna locations, where the precision of the latitude and longitude is given to 6 decimal places (better than ± 1 m).

3.2 WSPR based Aircraft Detection and Tracking.

Signal level and signal frequency modulations can result, when an aircraft flight path intersects with the propagation path of a WSPR link. This is evident from anomalies in either the reported SNR or the frequency drift over a short time period. Commercial aircraft typically cruise at altitudes up to 43,000 feet (13.1 km), whereas typical multi-hop ionospheric propagation extends to an altitude of at least around 100 km and usually much higher. Generally the E-layer starts at around 85 km and the F-layer ends at around 600 km above the Earth's surface. Only a small proportion of the ionospheric propagation path will be disturbed by an aircraft. The signal level and frequency level disturbances can result from forward or back scatter at the target aircraft.

Typical multi-hop ionospheric propagation ranges vary between 1,500 km and 3,000 km per hop. Depending on the ray take off angle, less than 10% of the propagation path will be within aircraft altitudes. A 3D intersection calculation is required to see if the aircraft track actually intersects with the WSPR propagation path. The great circle path of an aircraft is usually calculated using the WGS84 geodetic model of the Earth as an oblate spheroid and WSPR links are calculated with a spherical model of the Earth. We use Proplab Pro V3.2 software for High Frequency (HF) radio propagation ray tracing produced by Solar Terrestrial Dispatch, which is a useful tool for tracing multi-hop ionospheric WSPR propagations. We use Matlab software for mapping the aircraft track and the anomalous WSPR links relevant to the aircraft detection and tracking. We use an online Vincenty calculator to determine the initial and final bearings of propagation paths between transmitter, aircraft and receiver. The software system has several components and is collectively known as the Global Tracking and Detection of Aircraft Anywhere Anytime (GDTAAA).

3.3 Antenna Location Source Data.

The best source data for antenna location is the radio amateur who implemented the antenna. Some radio amateurs have more than one antenna and use more than one location. Some antennas are static and other antennas are mobile, having been implemented as portable devices or on vehicles, ships or balloons. Some antennas are connected by repeater or relay to a remote location. Care was taken to check the antenna location in 2014 matched the grid locator in the historic WSPRnet database from 7th/8th March 2014, as some of the amateur radio operated have since moved to a new location.

4. Method.

In the timeframe of interest for the MH370 flight path analysis, between 7th March 2014 17:52 UTC and 8th March 2014 00:34 UTC, there were 202 WSPR data sets every 2 minutes. In total there were 75,822 WSPR links globally, between 10,799 distinct transmitter receiver pairs. There were 2,401 WSPR links crossing the target area around the MH370 estimated position each 2 minutes defined by a moving grid with a latitude of $\pm 1.0^\circ$ and a longitude of $\pm 2.0^\circ$.

The ground speed and track of MH370 are calculated every two minutes and updated from the distance covered in two minutes as indicated by the WSPR position and progress data. The true air speed and heading are calculated, given the wind speed and direction for that position, altitude and time. The Mach setting was calculated from the True Air Speed (TAS) and the static outside air temperature for that position, altitude and time.

The wind and air temperature data are derived from the NOAA GDAS historic database and interpolated over a 1° latitude x 1° longitude position grid, 5 pressure altitude levels between 350 hPa (nominally 26,631 feet), 300 hPa (nominally 30,065 feet), 250 hPa (nominally 33,999 feet), 200 hPa (nominally 38,661 feet), 150 hPa (nominally 44,645 feet), for each latitude from 15°N to 40°S , each longitude from 80°E to 105°E and for each 3 hour time period from 7th March 2014 18:00 UTC to 8th March 2014 03:00 UTC. This resulted in 5,824 x 4 measurements of wind speed, wind direction, air temperature and ∂SAT at each position (latitude, longitude, altitude) and time.

The fuel consumption in each engine is calculated each minute from the actual aircraft weight, delta static outside air temperature, Mach setting and MAS Engineering data for the two engines installed on 9M-MRO. The two engines had slightly different fuel consumptions, where the right engine was estimated to flame out at 00:07:17 UTC and the left engine at 00:16:38 UTC, assuming no fuel rebalancing between the right and left fuel tanks.

The MH370 estimated position was updated ever two minutes to align with the WSPR data. A total of 987 WSPR links are analysed that crossed within a radius of the MH370 estimated position defined by the distance covered from the last known position at the maximum possible ground speed.

We use the <http://wsprrocks/livequeries/> front end, which exposes the WSPRnet database for SQL based queries. The WSPRnet data for any particular two minute timeframe is downloaded and exported to a spreadsheet. A sample SQL WSPR Download script is shown in Appendix A.

We then augment the spreadsheet by adding the transmitter and receiver antenna latitudes and longitudes. These positions are derived from the master antenna locations database. A sample Matlab Call Sign script is shown in Appendix B. We then process all the WSPR links in the target area and this script generates a set of function calls. A sample Matlab Target Area script is shown in Appendix C. These function calls, which each define a WSPR link are imported into the Matlab Mapping script. This script can display either a local view in the target area or a global view of the WSPR links. In the local view, the MH370 track and the relevant waypoints and Inmarsat satellite arcs are also depicted. A sample Matlab Mapping script is shown in Appendix D.

Finally we analyse each WSPR link over a time frame of ± 3 hours to see if there is either a SNR anomaly or a drift anomaly or both. A sample SQL WSPR Anomaly Checking script is shown in Appendix E.

A plausibility check is performed on the anomalous WSPR links using the Proplab Pro V3.2 software. The propagation path between transmitter and aircraft as well as aircraft and receiver is analysed using the International Reference Ionosphere (IRI) 2007 model as well as a topographic model of the Earth. The transmission frequency is checked to be within the Maximum Usable Frequency (MUF) and a multi-hop ionospheric path is confirmed at an Elevation Angle (EA) to be within the specified range. The EA is sometimes called the take off angle.

5. Worked Example.

At 22:42 UTC MH370 is estimated to be at a position of 20.788°S 94.319°E at the intersection of the 5th Arc and the anomalous WSPR link between the transmitter OX3XR and N2NOM with a SNR showing a deviation from the mean by a factor of 2.31 standard deviations (SD) over a ± 3 hour timeframe. At 22:44 UTC there is a further progress indicator with a SNR anomaly of 0.86 SD and again at 22:48 UTC a SNR anomaly of 2.65 SD. By 22:50 UTC the estimated position of MH370 is 21.882°S 94.456°E.

The worked example at 22:52 UTC starts from this previous position at 22:50 UTC. The first step is using the SQL WSPR Download script for 22:52 UTC, which produces 286 rows of data. The Matlab Call Sign script is run to augment this data with the latitude and longitude of each transmitter and receiver. This also shows that there are no call signs missing in the call sign database. The Matlab Target Area script is run for the target area defined by a bottom left hand corner at 22°S 93°E to a top right corner at 20°S 97°E. This produces 28 rows of data as shown in Table 1 below.

WSPR_Link_GCV9_Function('0','1','51.27083333','6.79166664','52.33746900','-2.27851600','DF2JP','G1ZRN');
WSPR_Link_GCV9_Function('1','1','50.78080100','0.10020200','49.52370266','8.24777591','G3JKF','DK6UG');
WSPR_Link_GCV9_Function('1','0','51.35188900','-0.15826000','44.39583336','26.20833333','G4FKK','YO3ITD');
WSPR_Link_GCV9_Function('1','0','52.40423508','0.27702300','51.43750003','6.95833330','G4KPX','DC0DX/A');
WSPR_Link_GCV9_Function('1','0','52.40423508','0.27702300','51.35416669','8.12500000','G4KPX','DL1DBC');
WSPR_Link_GCV9_Function('1','1','52.40423508','0.27702300','51.80847356','4.70791832','G4KPX','PA3ABK/2');
WSPR_Link_GCV9_Function('1','1','50.86820200','-0.13595600','26.96563955','-82.32011327','G4WCP','W4AC');
WSPR_Link_GCV9_Function('0','1','50.93750007','-1.29166669','49.52370266','8.24777591','G6RRL','DK6UG');
WSPR_Link_GCV9_Function('1','1','51.50048800','-0.31508400','26.96563955','-82.32011327','G8VDQ','W4AC');
WSPR_Link_GCV9_Function('1','0','36.33690300','139.01551900','32.72916672','-95.04166670','JH1GYE','KD6RF');
WSPR_Link_GCV9_Function('1','1','36.33690300','139.01551900','29.72522500','-95.39439000','JH1GYE','KE5HPY');
WSPR_Link_GCV9_Function('1','0','-38.11628400','145.16138100','-31.85416666','115.79166660','VK3DXE','VK6ZRY');
WSPR_Link_GCV9_Function('1','1','27.10306700','-82.39671500','52.47916670','-2.04166674','W4MO','2E0DSS');
WSPR_Link_GCV9_Function('1','0','27.10306700','-82.39671500','53.47916670','-2.54166672','W4MO','2E1CJF');
WSPR_Link_GCV9_Function('1','1','27.10306700','-82.39671500','57.52083330','-4.37500000','W4MO','GM4SFW');
WSPR_Link_GCV9_Function('1','1','27.10306700','-82.39671500','38.35372470','-78.45945496','W4MO','K4RCG');
WSPR_Link_GCV9_Function('1','0','27.10306700','-82.39671500','53.47916670','-1.12500003','W4MO','M5ADA');
WSPR_Link_GCV9_Function('1','1','27.10306700','-82.39671500','51.20351600','-0.33178500','W4MO','M6NNB');
WSPR_Link_GCV9_Function('1','0','27.10306700','-82.39671500','48.68750005','15.62499994','W4MO','OE3VMS');
WSPR_Link_GCV9_Function('1','1','27.10306700','-82.39671500','55.24975200','12.30082000','W4MO','OZ7IT');
WSPR_Link_GCV9_Function('1','1','27.10306700','-82.39671500','52.23807201','6.85770275','W4MO','PI4THT');
WSPR_Link_GCV9_Function('1','0','27.10306700','-82.39671500','59.47916670','17.70833327','W4MO','SM3ULC');
WSPR_Link_GCV9_Function('1','0','27.10306700','-82.39671500','44.77083339','-63.70833334','W4MO','VE1AIM');
WSPR_Link_GCV9_Function('1','1','27.10306700','-82.39671500','39.46108700','-76.80855118','W4MO','W3GXT');
WSPR_Link_GCV9_Function('0','0','39.56250004','-104.87500004','32.97916674','-97.12500003','W5OLF','AD4PT');
WSPR_Link_GCV9_Function('1','1','34.77307873','-86.69914586','40.11087200','-88.19699300','WD0UG','K9AN');
WSPR_Link_GCV9_Function('1','1','34.77307873','-86.69914586','44.37883000','-88.18698700','WD0UG','KB9VLR');
WSPR_Link_GCV9_Function('1','1','36.19872900','-79.83413800','38.35372470','-78.45945496','WD4ELG','K4RCG');

Table 1: Worked Example at 22:52 UTC showing all WSPR Links in the vicinity of MH370.

The Matlab Mapping script is run with the 28 rows shown in Table 1, which are function calls imported into the Matlab Mapping script and use the Matlab WSPR_Link_GCV9_Function shown in Appendix F.

There is one function call for each WSPR link. The function call depicts each WSPR link on either a local or global Mercator projection of the world. The WSPR links are shown as great circle paths using a spherical model of the earth.

The function call defines the colour of the WSPR links which are initially set to red where the location of both the transmitter and receiver antenna are known precisely, orange where only one is known precisely and the other is calculated from the 6 character Maidenhead grid locator and grey if both are calculated from the 6 character Maidenhead grid locator. This process allows for the correction of the antenna location, if there was a less precise location on a particular anomalous WSPR link of interest.

The 28 links are depicted in Figure 3 below.

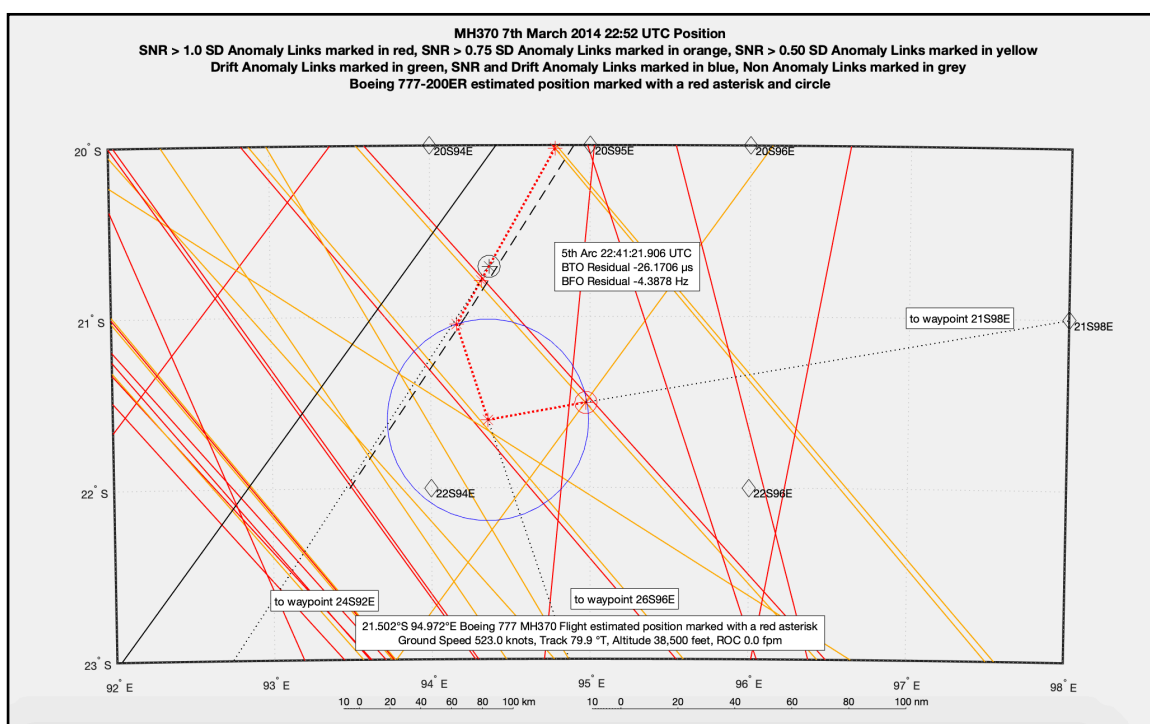


Figure 3: Worked Example at 22:52 UTC showing all WSPR Links in the vicinity of MH370.

The next step is to analyse the links within possible range marked with a blue circle and defined by the maximum distance MH370 could fly since the previous known position.

WSPR_Link_GCV9_Function('1','1','50.78080100','0.10020200','49.52370266','8.24777591','G3JKF','DK6UG');
WSPR_Link_GCV9_Function('1','0','51.35188900','-0.15826000','44.39583336','26.20833333','G4FKK','YO3ITD');
WSPR_Link_GCV9_Function('1','0','52.40423508','0.27702300','51.43750003','6.95833330','G4KPX','DCODX/A');
WSPR_Link_GCV9_Function('1','1','52.40423508','0.27702300','51.80847356','4.70791832','G4KPX','PA3ABK/2');
WSPR_Link_GCV9_Function('0','1','50.93750007','-1.29166669','49.52370266','8.24777591','G6RRL','DK6UG');
WSPR_Link_GCV9_Function('1','0','36.33690300','139.01551900','32.72916672','-95.04166670','JH1GYE','KD6RF');
WSPR_Link_GCV9_Function('1','0','-38.11628400','145.16138100','-31.85416666','115.79166660','VK3DXE','VK6ZRY');
WSPR_Link_GCV9_Function('1','0','27.10306700','-82.39671500','59.47916670','17.70833327','W4MO','SM3ULC');
WSPR_Link_GCV9_Function('1','1','34.77307873','-86.69914586','44.37883000','-88.18698700','WD0UG','KB9VLR');

Table 2: Worked Example at 22:52 UTC showing WSPR Links within the possible range.

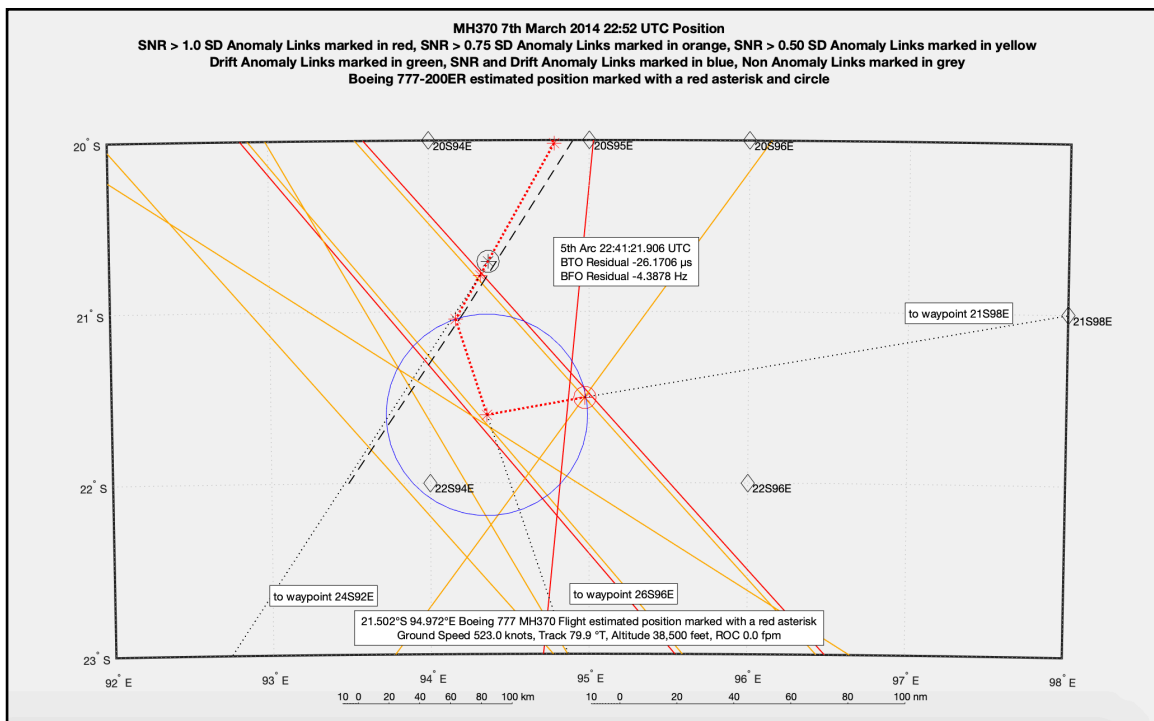


Figure 4: Worked Example at 22:52 UTC showing all WSPR Links within the possible range.

Each WSPR link is then analysed to see if there was a SNR or drift anomaly over a ± 3 hour time period. There are 3 SNR anomalies with deviations of 2.68 SD, 1.23 SD and 0.85 SD that intersect close to the edge of the blue circle.

A summary of the 9 WSPR links in the timeframe analysis is shown in Table 3 below. The details of each of the 9 WSPR links in the timeframe analysis are shown in Appendix G.

WSPR Link	Results	Timeframe	Action	SND %SD	Drift	Drift Type	Anomaly Type	Colour
WSPR_Link_GCV9_Function('1','1','50.78080100','0.10020200','49.52370266','8.24777591','G3JF','DK6UG');	15 \pm 3 hours		Accepted	-54	0		None	Yellow
WSPR_Link_GCV9_Function('1','0','51.35188900','0.15826000','44.39583336','26.20833333','G4FKK','YO3ITD');	14 \pm 3 hours		Accepted	37	-1	Temporary	Drift	Green
WSPR_Link_GCV9_Function('1','0','52.40423508','0.27702300','51.43750003','6.95833330','G4KPK','DCODX/A');	3 \pm 3 days \pm 3 hours		Discarded				None	Grey
WSPR_Link_GCV9_Function('1','1','52.40423508','0.27702300','51.80847356','4.70791832','G4KPK','PA3ABK/2');	37 \pm 3 hours		Accepted	-21	0		None	Grey
WSPR_Link_GCV9_Function('0','1','50.93750007','1.29166669','49.52370266','8.24777591','G6RRL','DK6UG');	11 \pm 3 hours		Accepted	268	0		SNR	Red
WSPR_Link_GCV9_Function('1','0','36.33690300','139.01551900','32.72916672','95.04166670','JH1GYE','KD6RF');	22 \pm 3 hours		Accepted	-123	0		SNR	Red
WSPR_Link_GCV9_Function('1','0','38.11628400','145.16138100','31.85416666','115.79166660','VK3DXE','VK6ZRY');	10 \pm 3 hours		Accepted	-51	-2	Permanent	None	Yellow
WSPR_Link_GCV9_Function('1','0','27.10306700','82.39671500','59.47916670','17.70833327','W4MO','SM3ULC');	3 \pm 3 days \pm 3 hours		Discarded				None	Grey
WSPR_Link_GCV9_Function('1','1','34.77307873','-86.69914586','44.37883000','-88.18698700','WD0UG','KB9VLR');	12 \pm 3 hours		Accepted	-85	-2	Permanent	SNR	Orange

Table 3: Worked Example at 22:52 UTC showing WSPR Links analysis results.

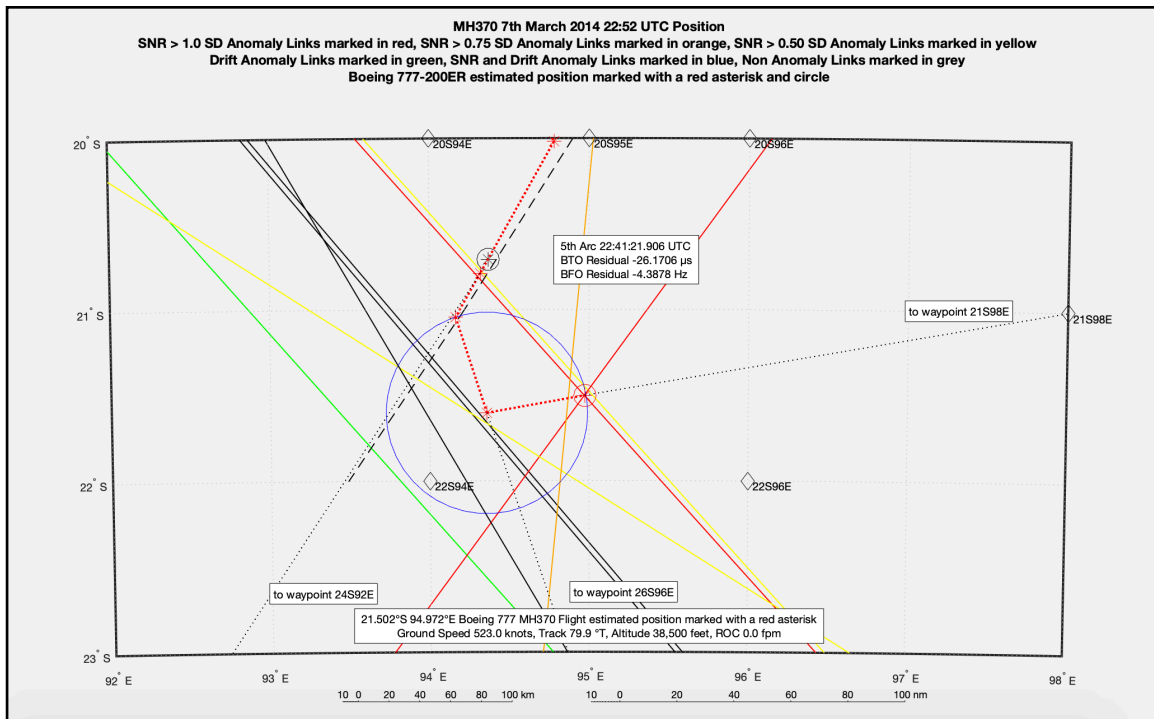


Figure 5: Worked Example at 22:52 UTC showing WSPR Links analysis results.

There are 3 anomalous WSPR links intersecting within the possible range and this point defines the new MH370 position at 22:52 UTC at 21.502°S 94.972°E. The ground speed of 523.0 knots and track of 79.9°T are calculated from the previous known position and the alignment to the geographical waypoint 21S98E is noted.

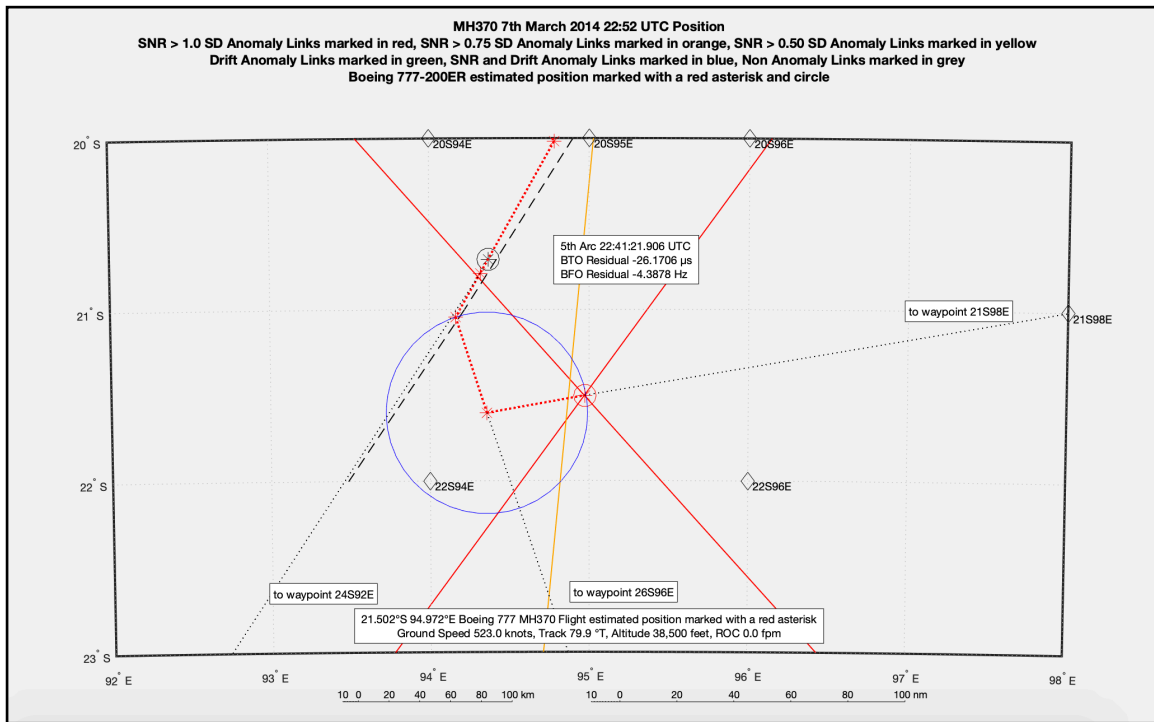


Figure 6: Worked Example at 22:52 UTC showing 3 WSPR Links anomalies.

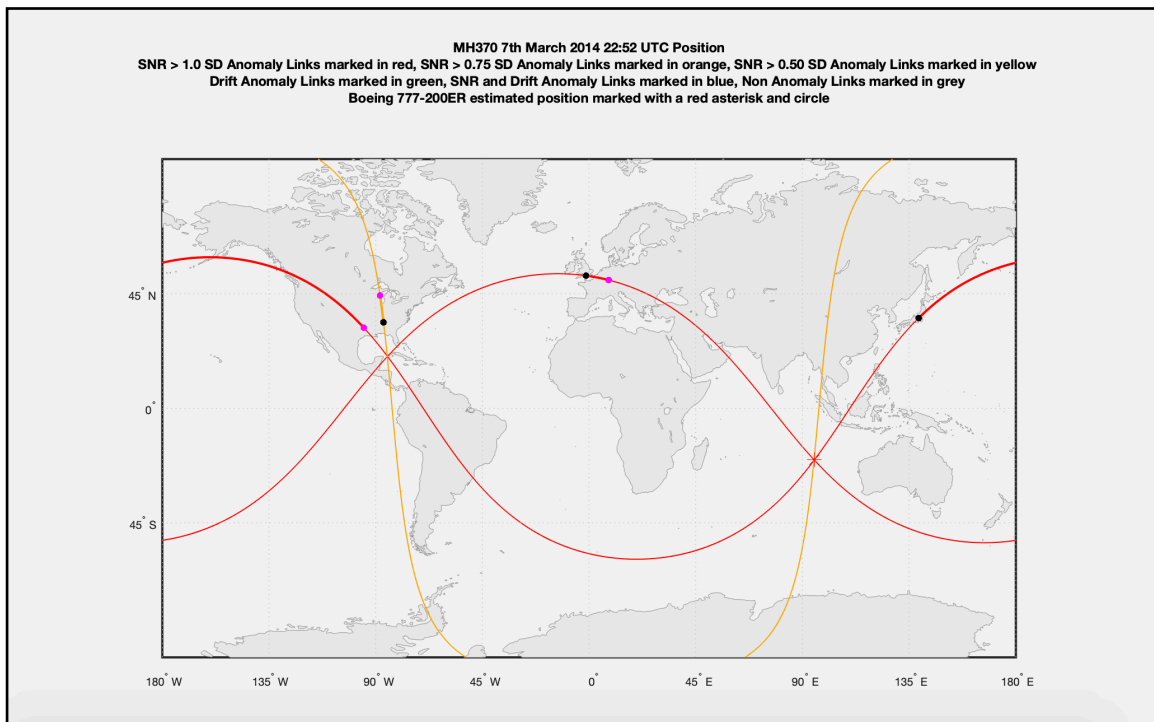


Figure 7: Worked Example at 22:52 UTC showing 3 WSPR Links anomalies in a global view.

The WSPR link with the identifier 186192616 between the transmitter G6RRL, the receiver DK6UG and the MH370 position at 21.502°S 94.972°E is analysed using Proplab Pro V3.2. This link showed a SNR anomaly of 2.68 SD. The aircraft is located within the grey zone. The grey zone or twilight zone at dawn and dusk is known to enhance propagation.

The Proplab Pro V3.2 analysis is used as a plausibility check to ensure the maximum usable frequency is not exceeded and the elevation angle is within expectations.

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
107	186192616	2014-03-07 22:52:00	G6RRL	IO90iw	DK6UG	JN49cm	3594078	33	-22	0	693	99	3	2.21_r2286	0

Table 4: Worked Example at 22:52 UTC showing WSPR Link ID 186192616.

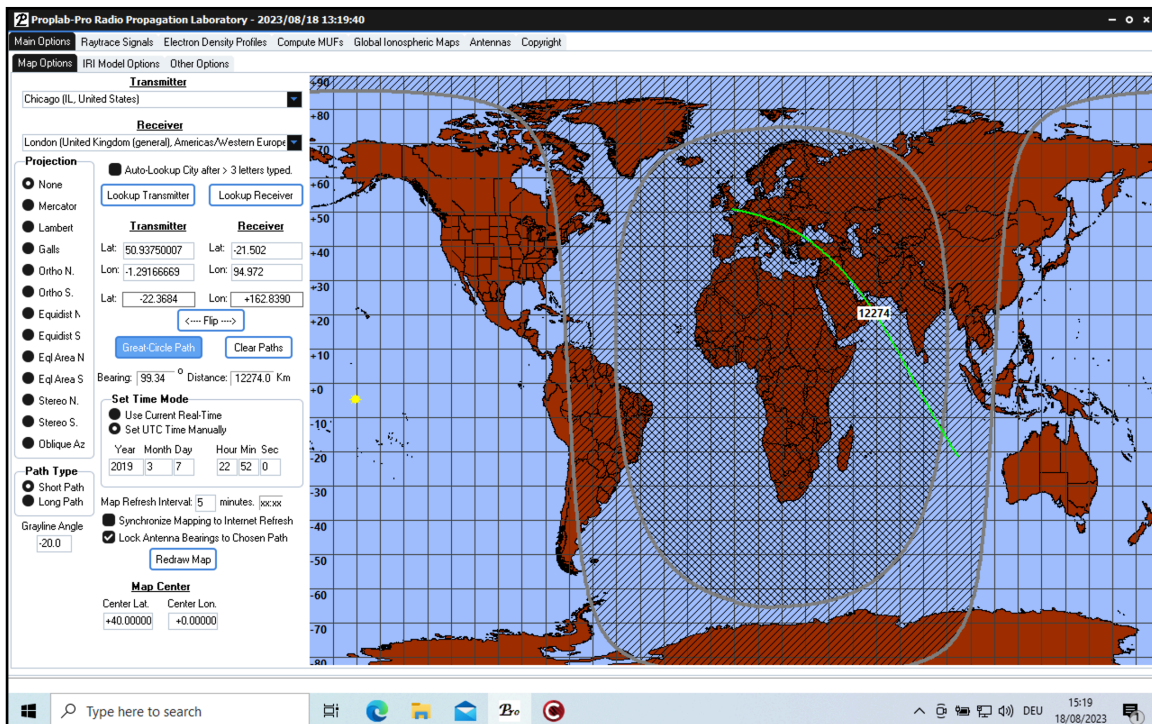


Figure 8: Worked Example at 22:52 UTC showing WSPR Link ID 186192616.

The WSPR link ID 186192616 was transmitted at 3.594078 MHz and was within the maximum usable frequency at 7th March 2014 22:52 UTC of around 6.75 MHz. The elevation angle is 1.981° and within the specified elevation angle of around 3.5°. The ionospheric propagation from transmitter to MH370 required 5 hops reaching a maximum height of around 235 km above the Earth's surface.

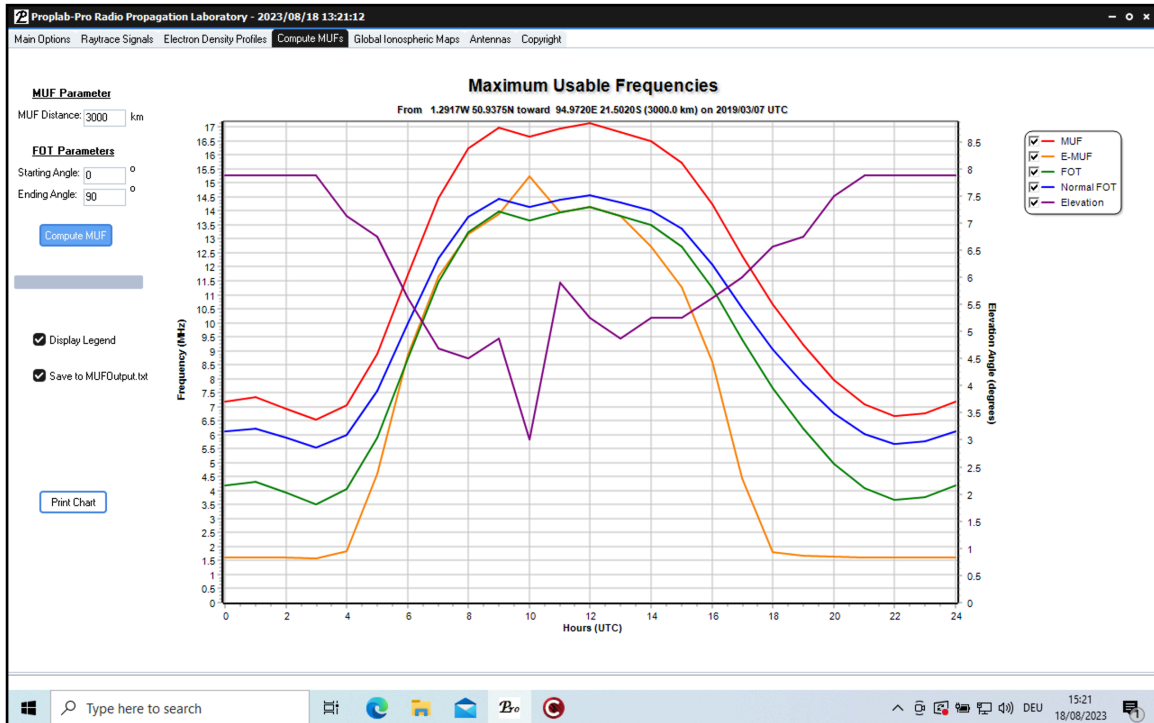


Figure 9: Worked Example at 22:52 UTC showing WSPR Link ID 186192616 MUF and EA.

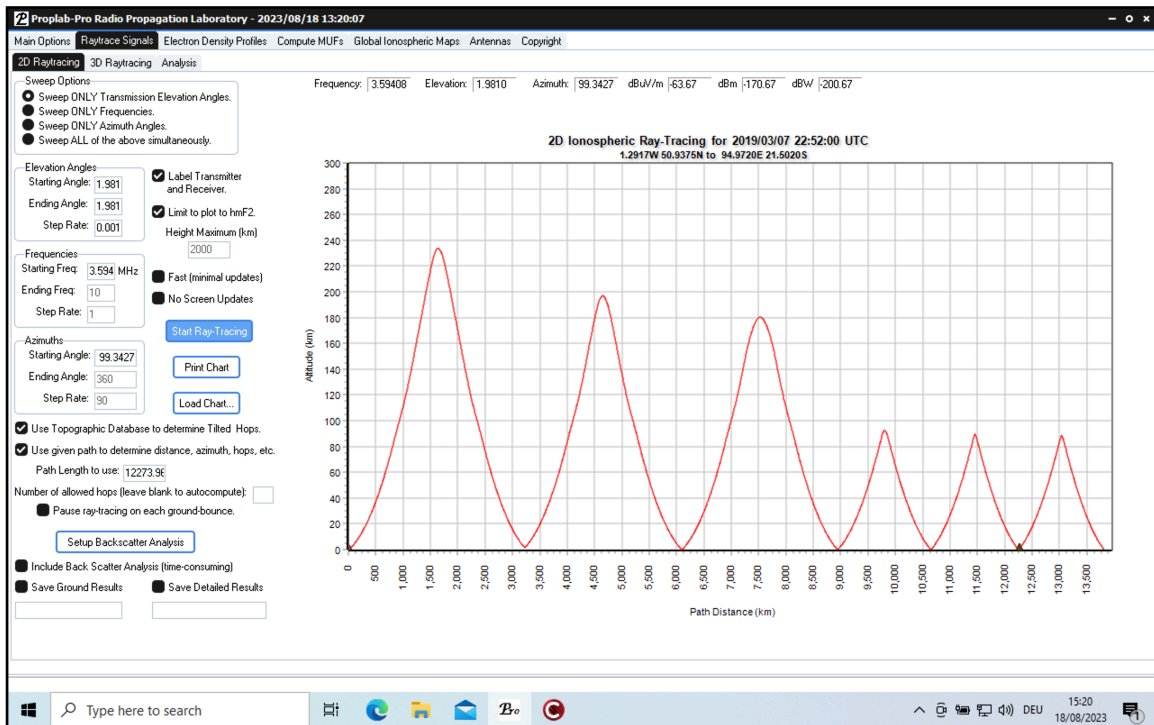


Figure 10: Worked Example at 22:52 UTC showing WSPR Link ID 186192616 Ray Tracing Results.

6. Results.

MH370 passed Penang Airport at around 17:52 UTC where the WSPR based tracking starts. MH370 was still being tracked by military and civilian primary radar, although it had gone 'dark'. The Copilot's mobile phone was detected by the BBFARLIM2 base station at Bandar Baru Air Itam on Penang Island at 17:52:27 UTC. Just after 18:01 UTC as MH370 approached Pulau Perak the aircraft turned toward waypoint DUAMO in Indonesia. At 18:14 UTC on approaching the Indonesian coast MH370 turned North West and tracked the coastline towards waypoint MEKAR.

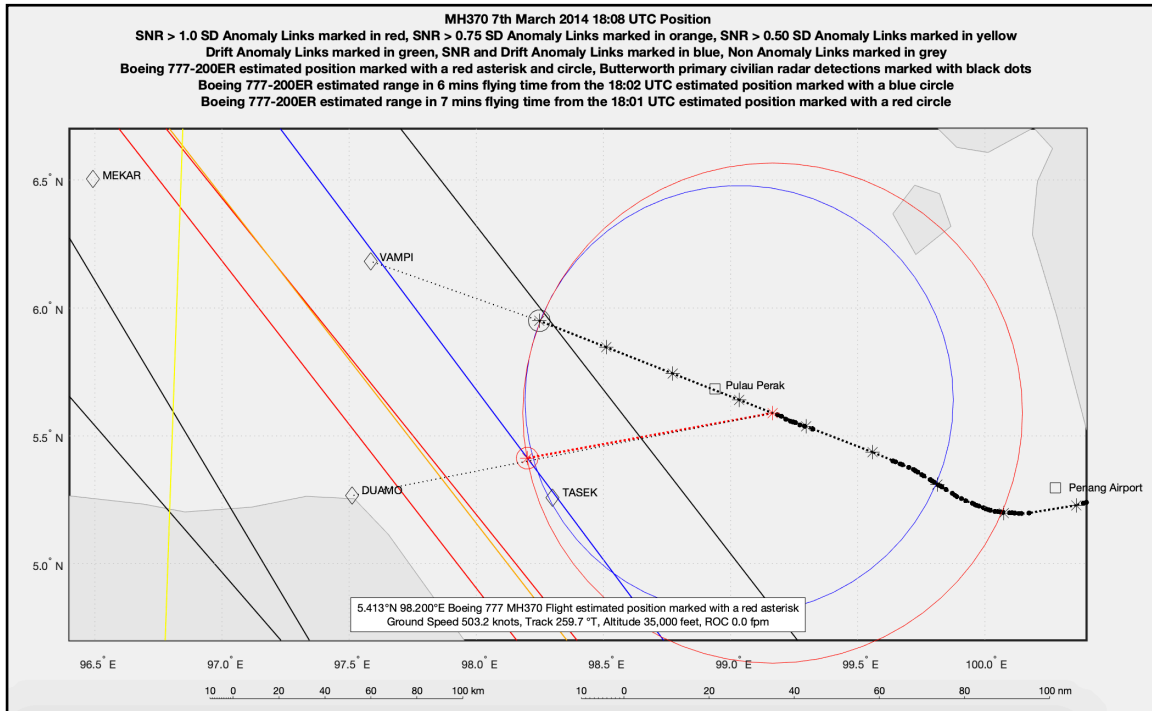


Figure 11: MH370 estimated position at 18:08 UTC.

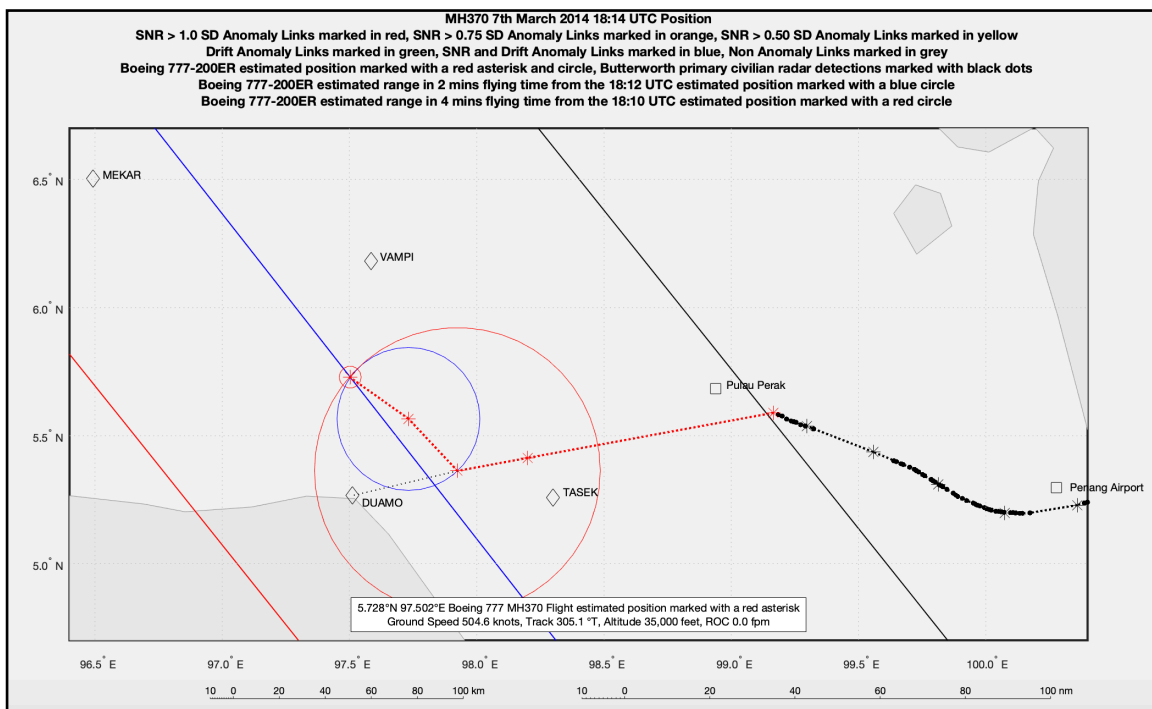


Figure 12: MH370 estimated position at 18:14 UTC.

At 18:24 UTC MH370 was tracking towards waypoint SANOB. At 18:28:15 UTC MH370 crosses the 1st Arc as defined by the Inmarsat satellite BTO data. MH370 appears to slow down from the previous ground speed of 502.0 knots to 432.2 knots. The altitude at this point is assumed to be around 35,000 feet, which is the last known altitude prior to diversion. The actual altitude may well have changed and it is conceivable that an interim altitude of 34,500 feet or 35,500 feet was adopted to avoid other air traffic in the vicinity.

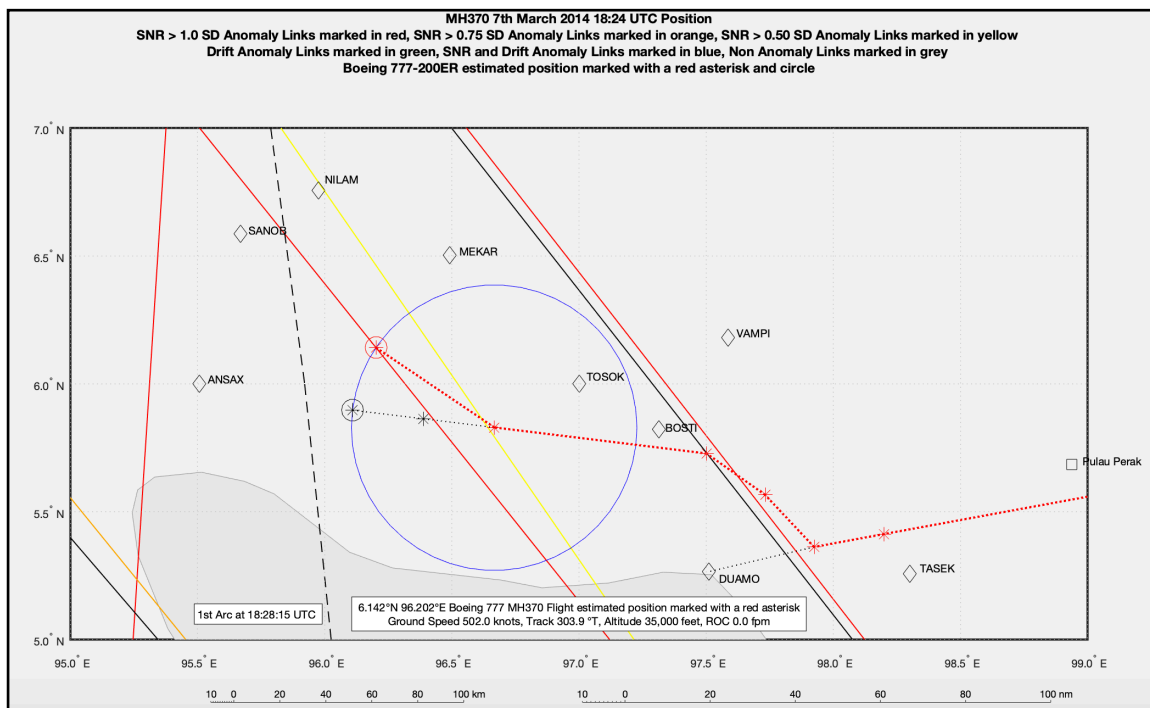


Figure 13: MH370 estimated position at 18:24 UTC.

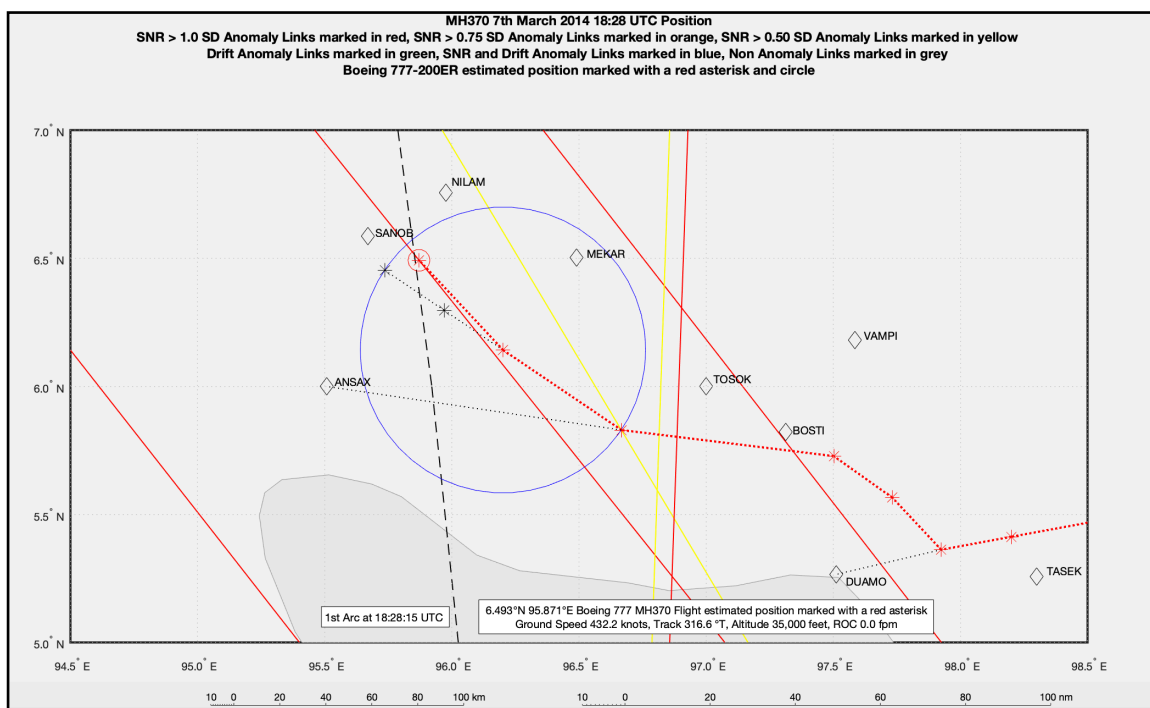


Figure 14: MH370 estimated position at 18:28 UTC.

At 16:42 UTC just after MH370 took off, there were 18 other flights in the vicinity. All the 6 flights heading out over the Malacca Strait were at flight levels between FL229 and FL 350. By the time MH370 reached the area close to Penang Airport (VPG) at 17:52 UTC there were only 3 other flights heading out over the Malacca Strait at flight levels between FL300 and FL350. An interim flight level of FL345 or FL355 would suffice in order to avoid other air traffic. The data is sourced from the ADS-B data for the region between 7th March 2014 15:39 UTC and 21:38 UTC.

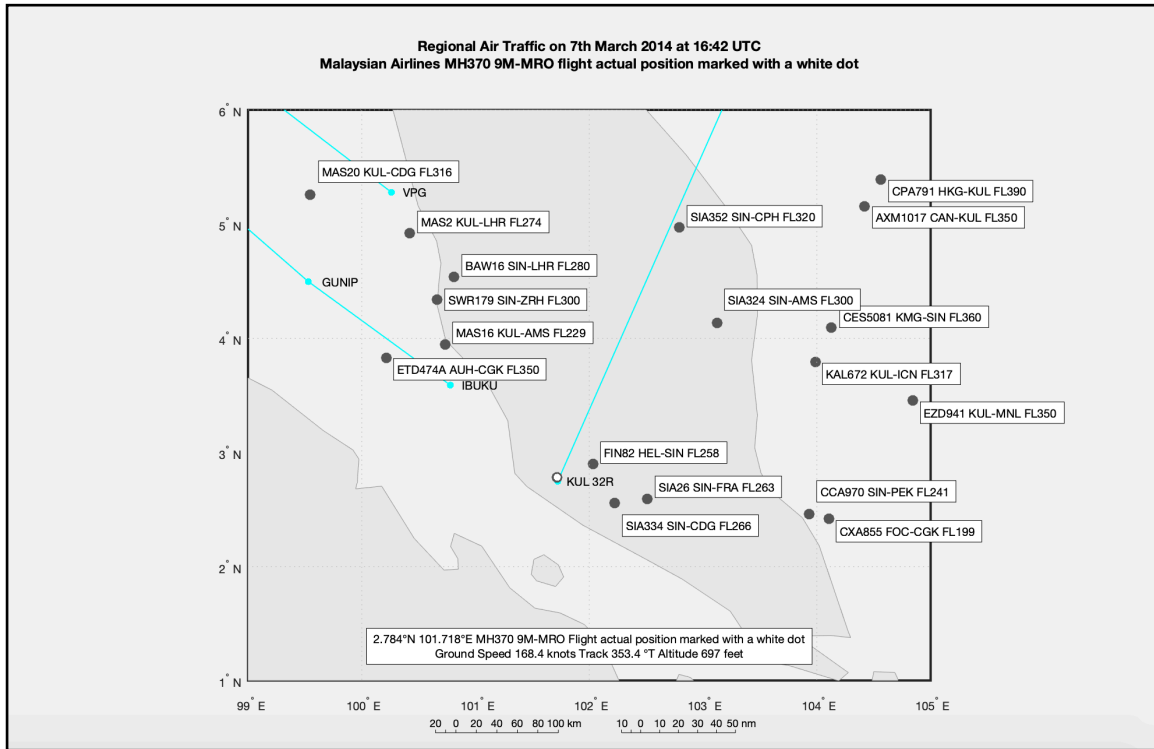


Figure 15: Regional Air Traffic when MH370 had just taken off at 16:42 UTC.

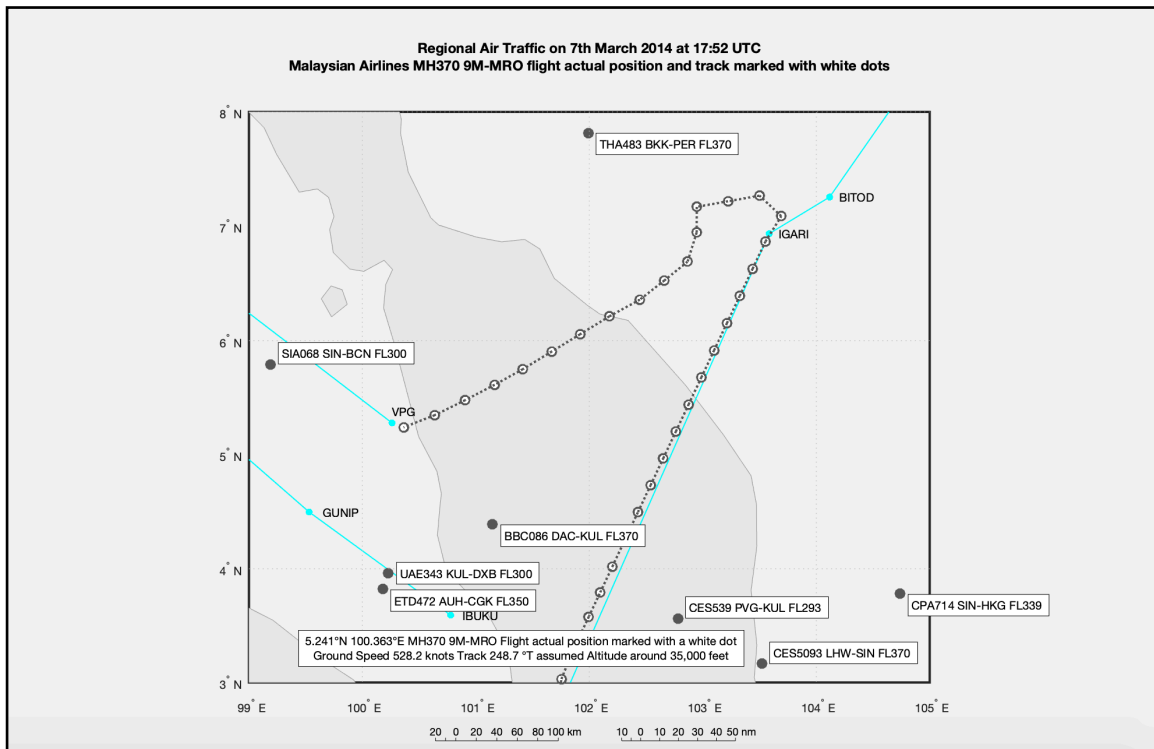


Figure 16: Regional Air Traffic when MH370 reached the Penang Airport (VPG) area at 17:52 UTC.

As MH370 passes the 1st Arc the BTO residual was $-1.0368 \mu\text{s}$ (a horizontal error of approximately 207 m) and the BFO residual was -0.0030 Hz based on a turn onto a track of 300.2°T . The BTO tolerance is around $\pm 50 \mu\text{s}$ (99% confidence level), which translates into a horizontal error of $\pm 10 \text{ km}$. The BFO tolerance is around $\pm 7 \text{ Hz}$, which translates into a track error of $\pm 13.2^\circ$ or a rate of climb/descent error of $\pm 313 \text{ fpm}$. At 18:40 UTC during the first SATCOM call the BFO residual was 1.5182 Hz . The BFO data shows a constant flight path (51 data points, mean BFO 87.8235 Hz , standard deviation 1.2603 Hz).

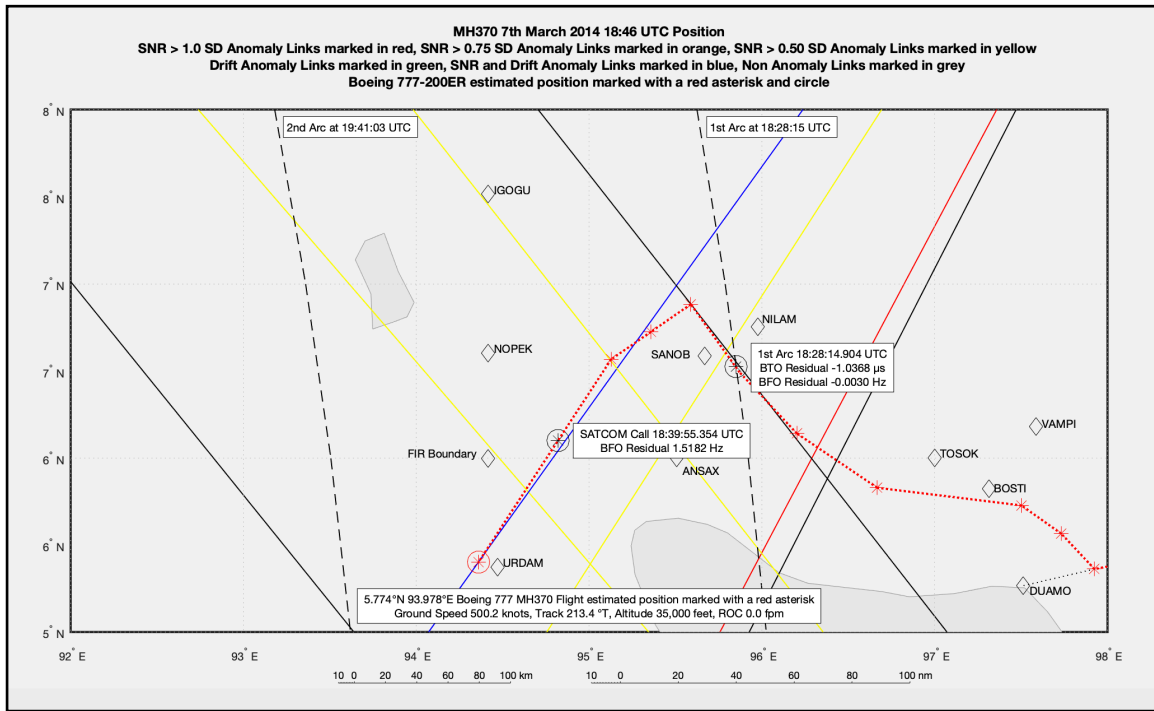


Figure 17: MH370 estimated position at 18:46 UTC.

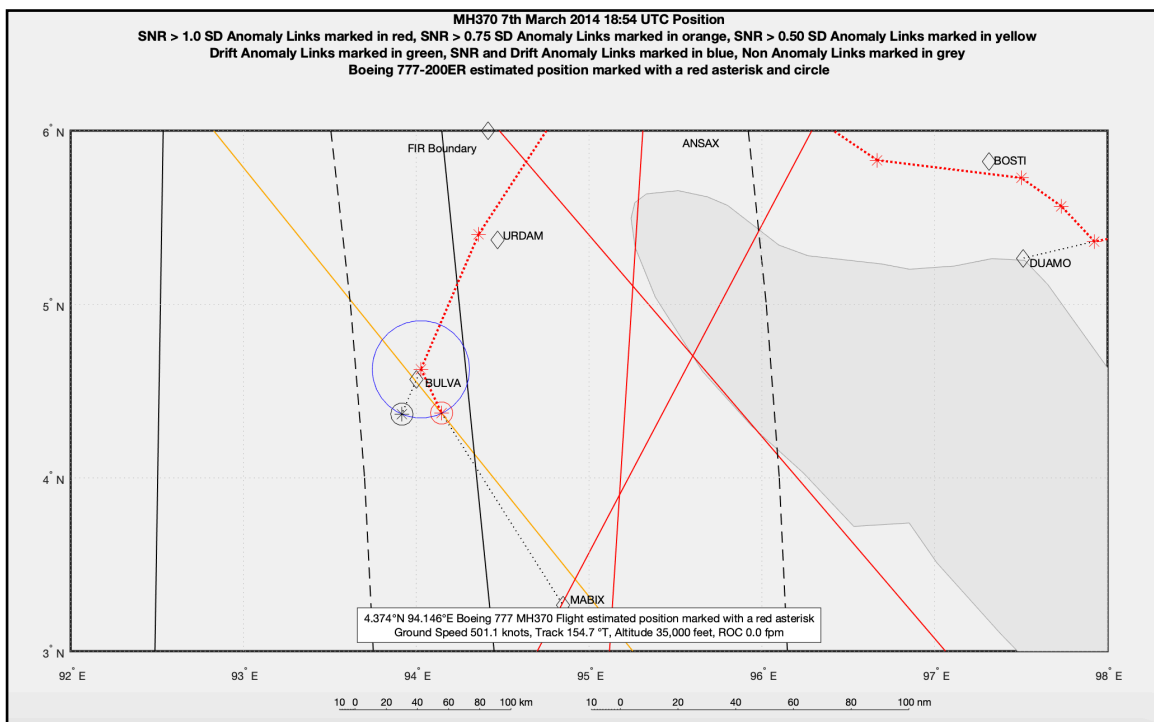


Figure 18: MH370 estimated position at 18:54 UTC.

By 19:16 UTC MH370 had tracked around Indonesia using waypoints DUAMO, ANSAX, SANOB, URDAM, BULVA and MABIX. At 19:16 UTC MH370 turned towards the FIR boundary at 2°S 92°E where the Melbourne FIR meets the Colombo FIR and the Jakarta FIR. At 19:28 UTC MH370 turns towards waypoint BASEV. Every turn is toward a waypoint and it appears that every waypoint was carefully selected not to follow a flight route, but only to cross over a flight route. The pilot was knowledgeable of all the regional waypoints and carefully planned a flight path avoiding other traffic and busy flight routes.

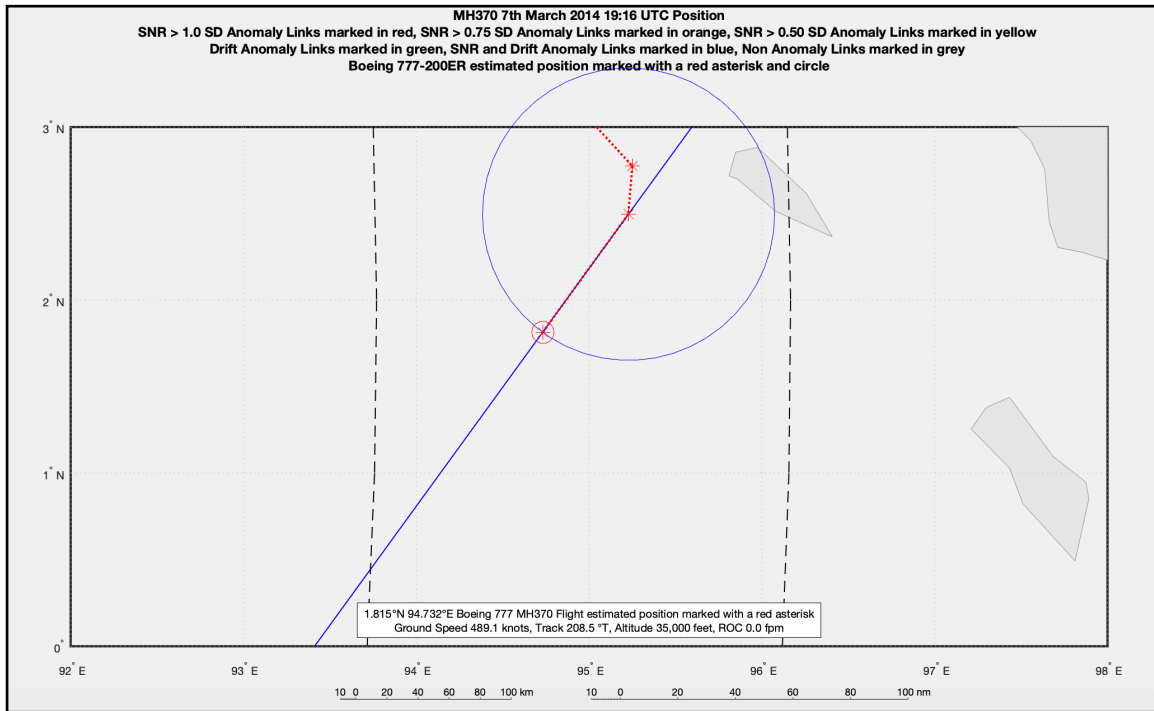


Figure 19: MH370 estimated position at 19:16 UTC.

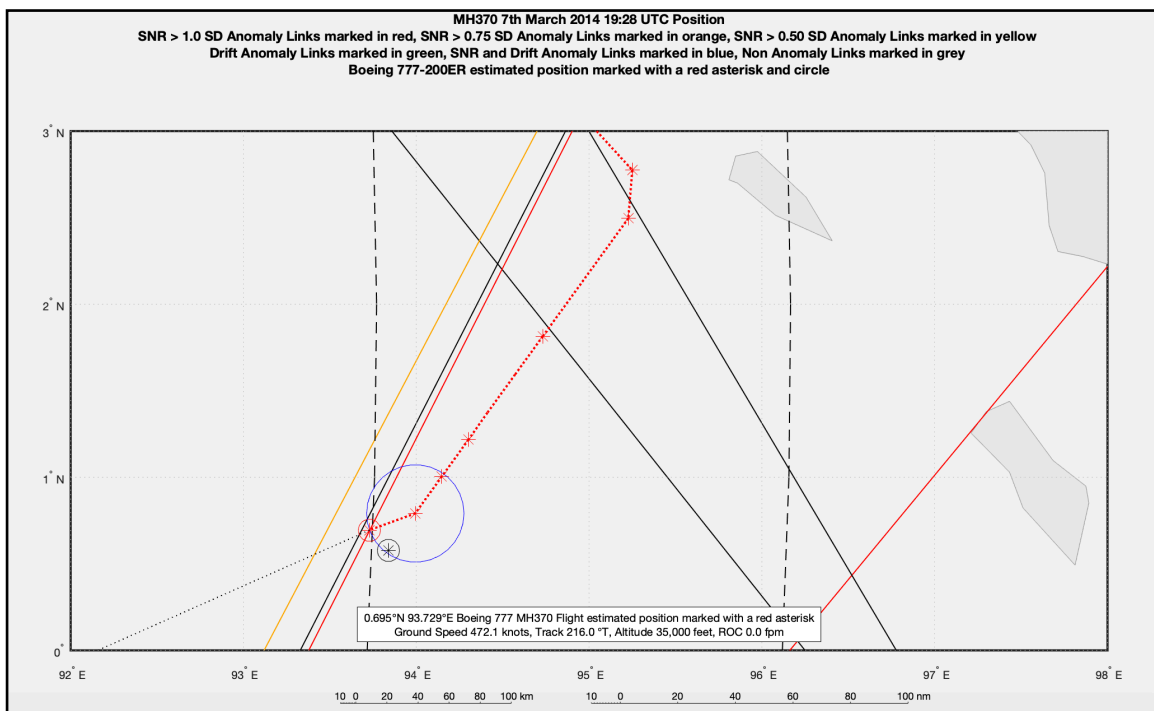


Figure 20: MH370 estimated position at 19:28 UTC.

At 19:38 UTC MH370 turns towards waypoint TATOD, between Cocos Island and Christmas Island. At 19:40 UTC MH370 is heading again towards the FIR boundary waypoint at 2°S 92°E. The pilot appears to have been extremely cautious not to be detected and if by chance there was a detection, then to at least mislead everyone as to the intended destination.

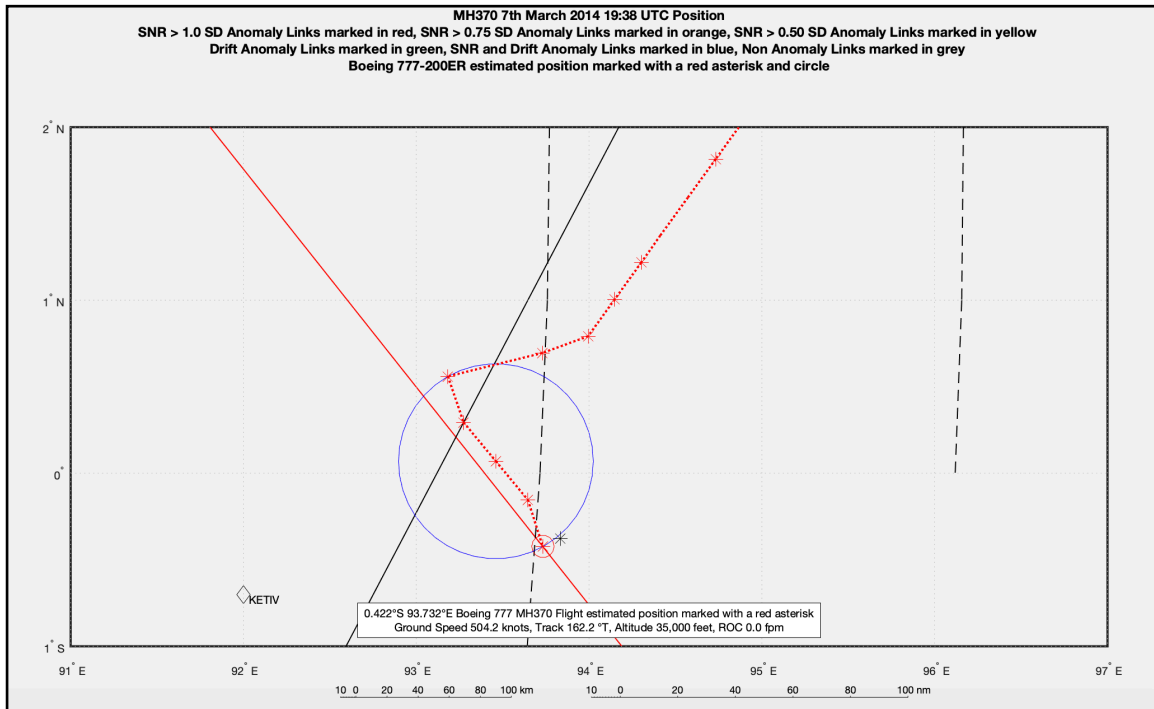


Figure 21: MH370 estimated position at 19:38 UTC.

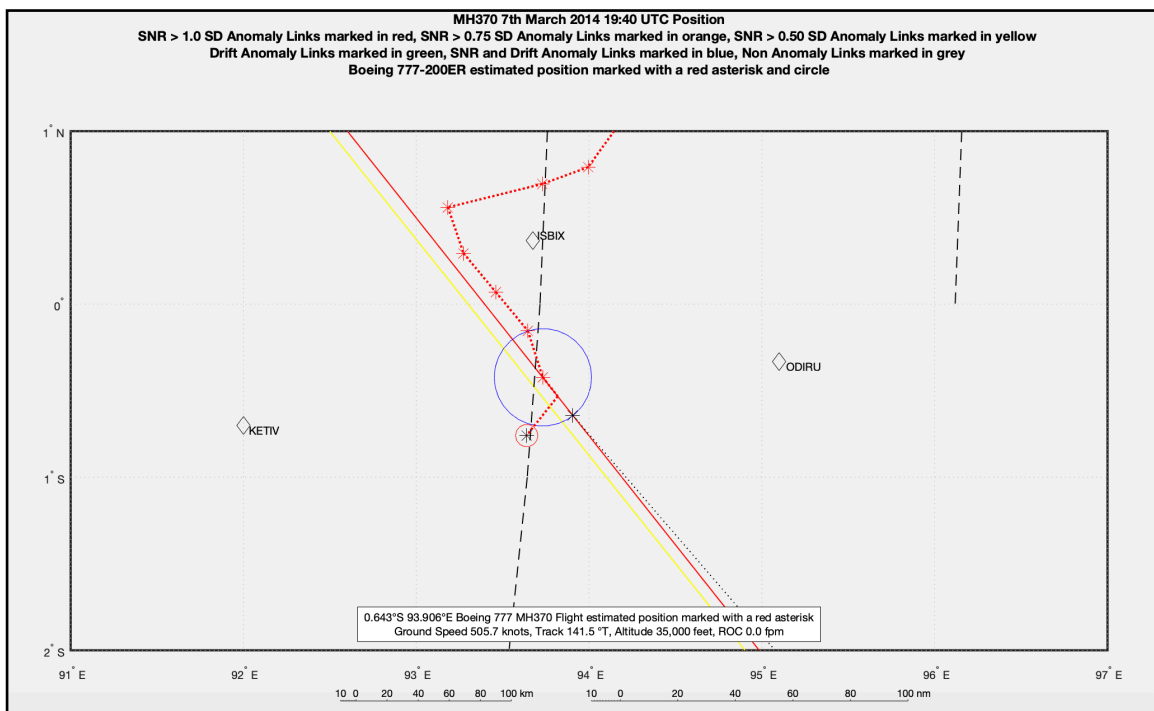


Figure 22: MH370 estimated position at 19:40 UTC.

At 19:48 UTC MH370 is heading again towards the FIR boundary waypoint at 2°S 92°E. The Inmarsat satellite data is matched at the 2nd Arc at 19:41:03 UTC. At 20:16 UTC MH370 is close to waypoint PIPOV and crossing the flight route N663 which runs via waypoints MUTMI and PIPOV. There are two anomalous WSPR links intersecting at this location.

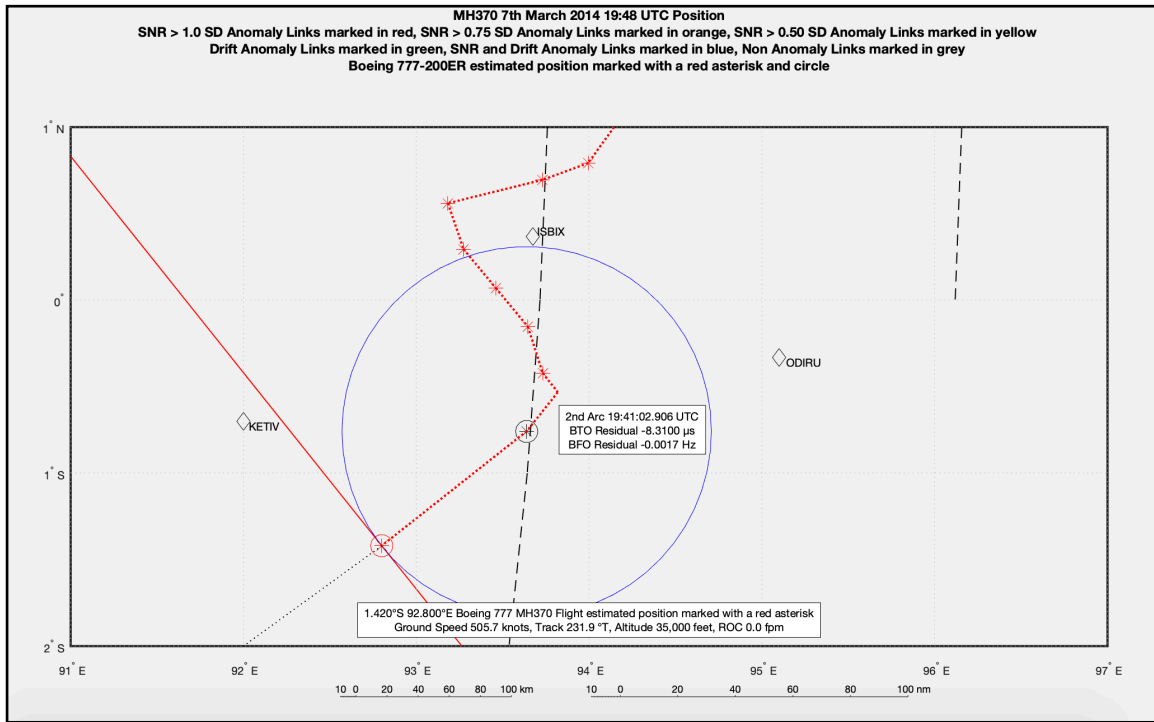


Figure 23: MH370 estimated position at 19:48 UTC.

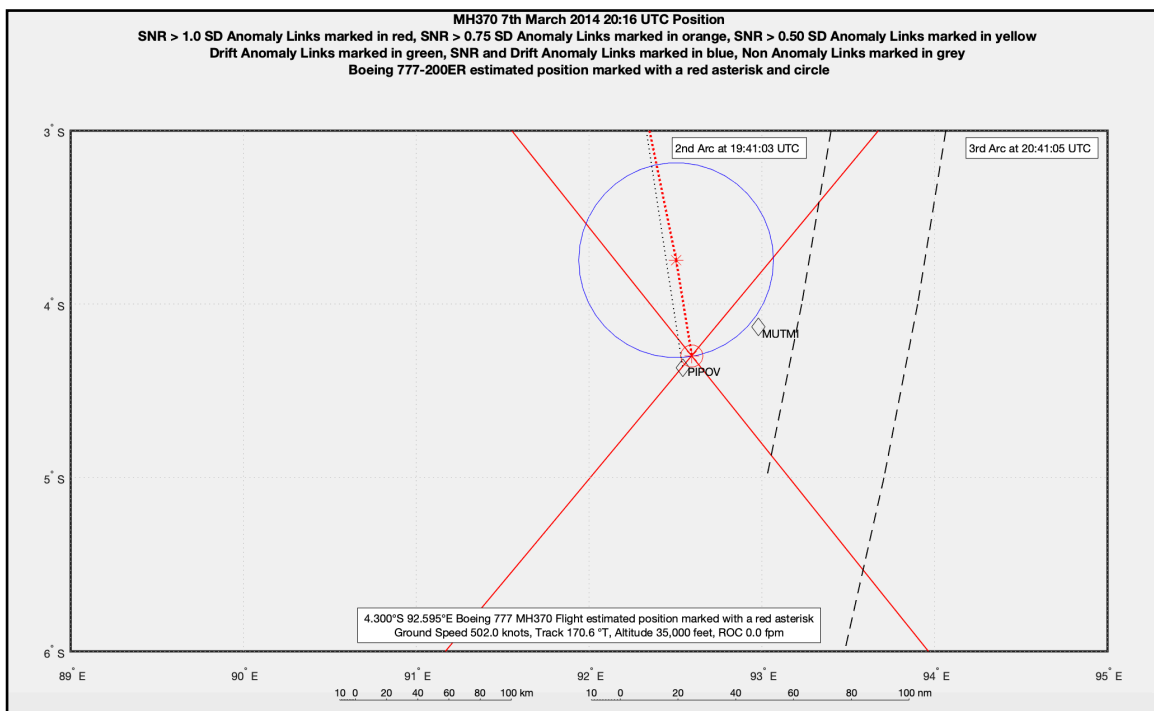


Figure 24: MH370 estimated position at 20:16 UTC.

At 20:24 UTC MH370 had just passed waypoint PIPOV and tracking towards waypoint POROR. At this juncture MH370 is within 4 minutes flying time from another aircraft SQ478 flying from Singapore to Johannesburg. SQ478 was at 36,000 feet and MH370 was possibly at an interim altitude such as 34,500 feet. SQ478 did not report any near miss and there was obviously sufficient horizontal and vertical separation between the aircraft.

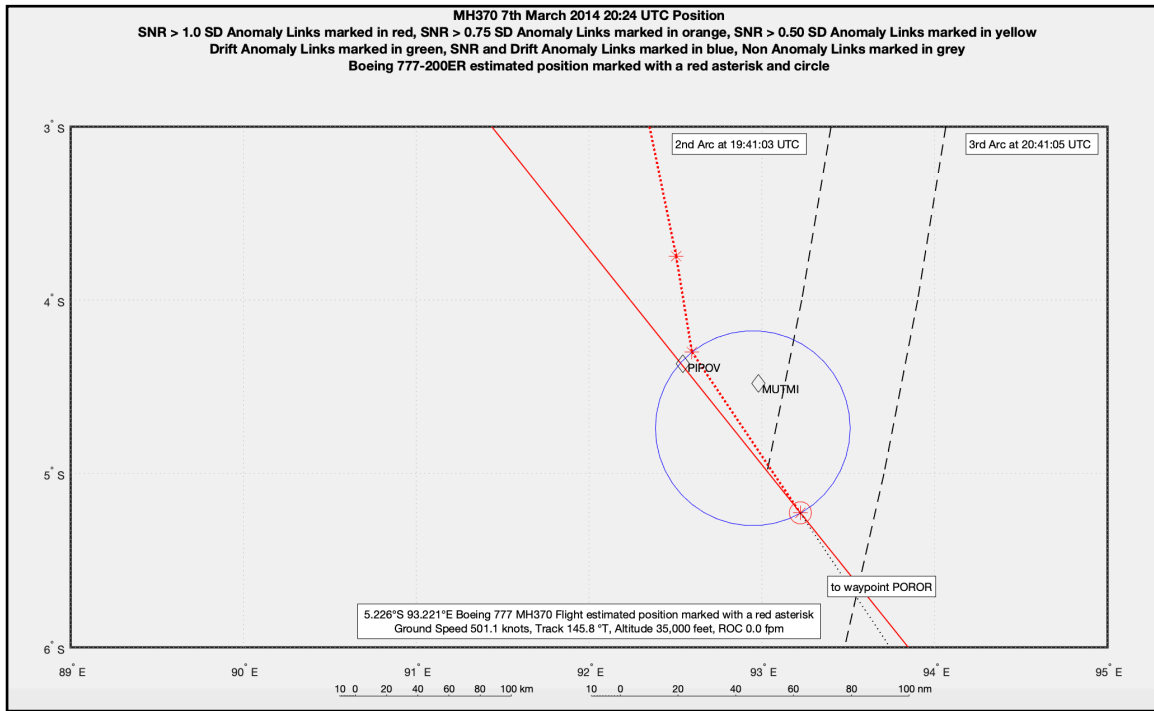


Figure 25: MH370 estimated position at 20:24 UTC.

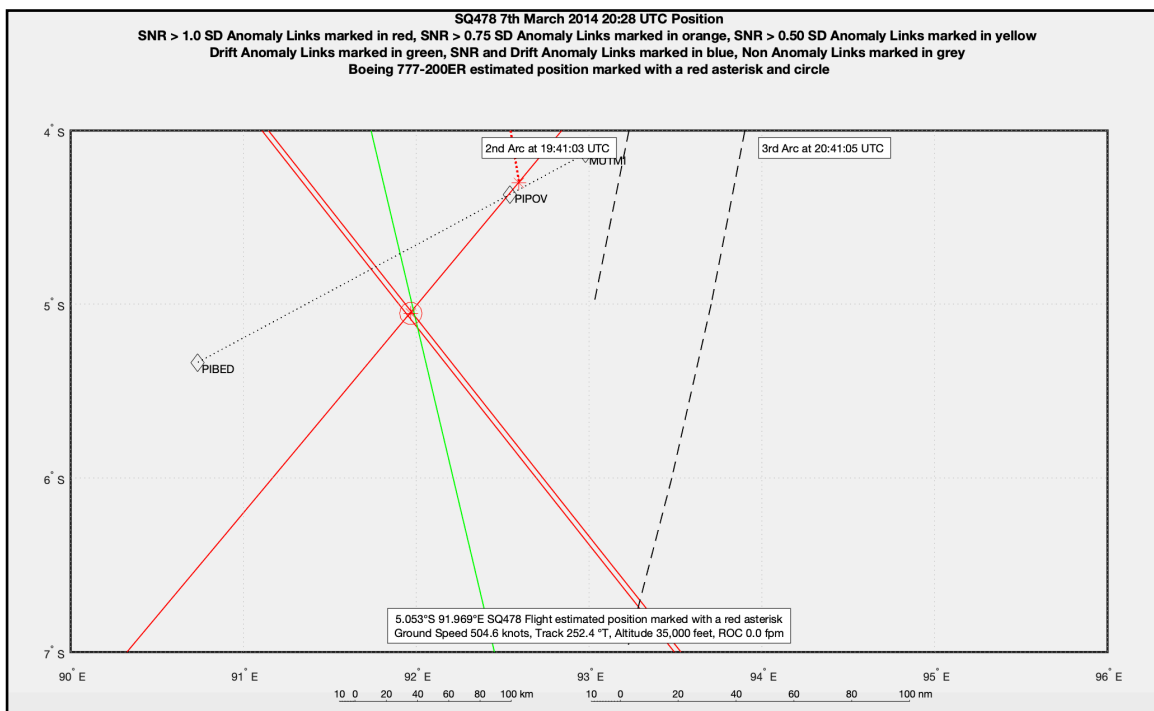


Figure 26: SQ478 estimated position at 20:28 UTC.

At 20:30 UTC MH370 is heading toward waypoint POLUM. At 20:36 UTC MH370 is heading toward waypoint RUNUT. The anomalous SNR WSPR link is marked with a red line and the track to the next waypoint is marked with a black dotted line.

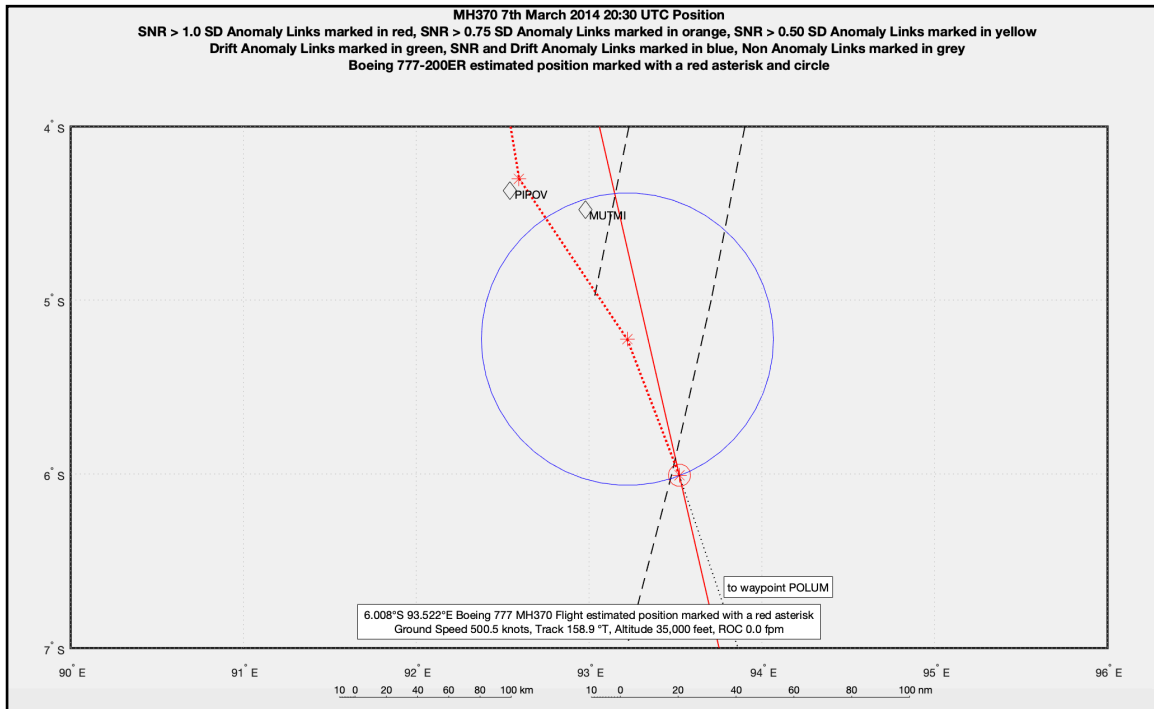


Figure 27: MH370 estimated position at 20:30 UTC.

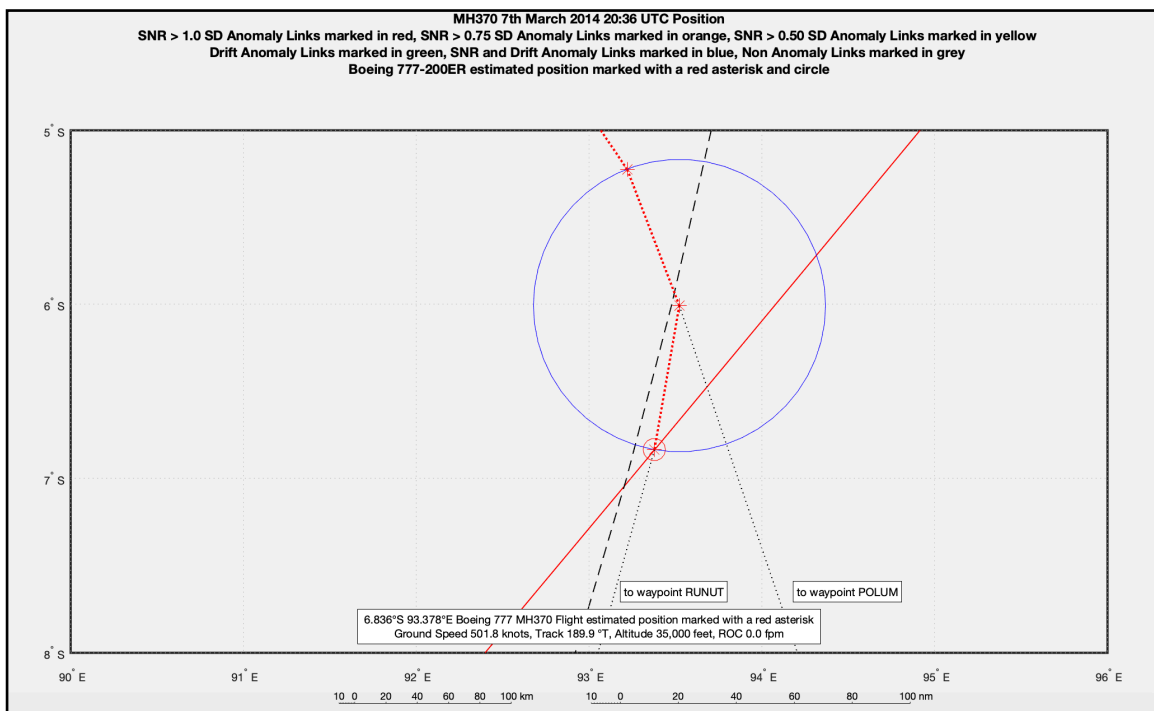


Figure 28: MH370 estimated position at 20:36 UTC.

At 20:44 UTC MH370 is heading toward waypoint SOLIT and then waypoint BEBIM. The Inmarsat satellite data is matched at the 3rd Arc. At 20:54 UTC MH370 is close to flight route M641 which runs towards the Cocos Islands. The pilot appears to be continually changing direction but always towards waypoints and always to cross flight routes, but not to precisely follow flight routes.

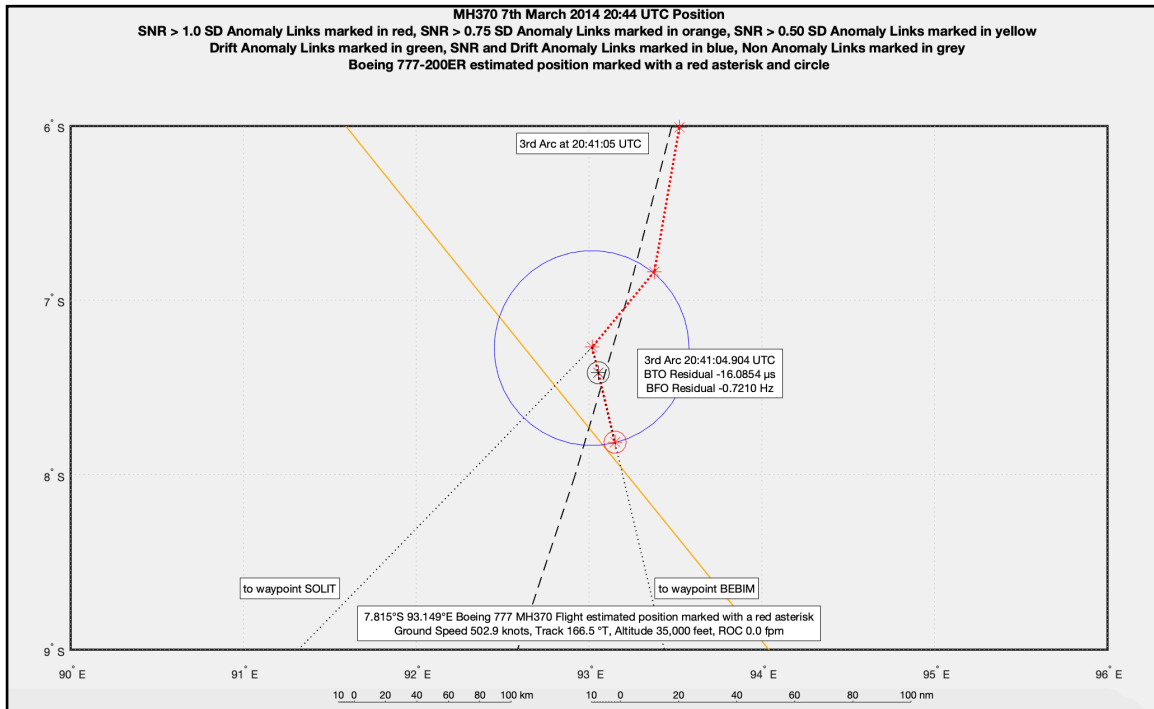


Figure 29: MH370 estimated position at 20:44 UTC.

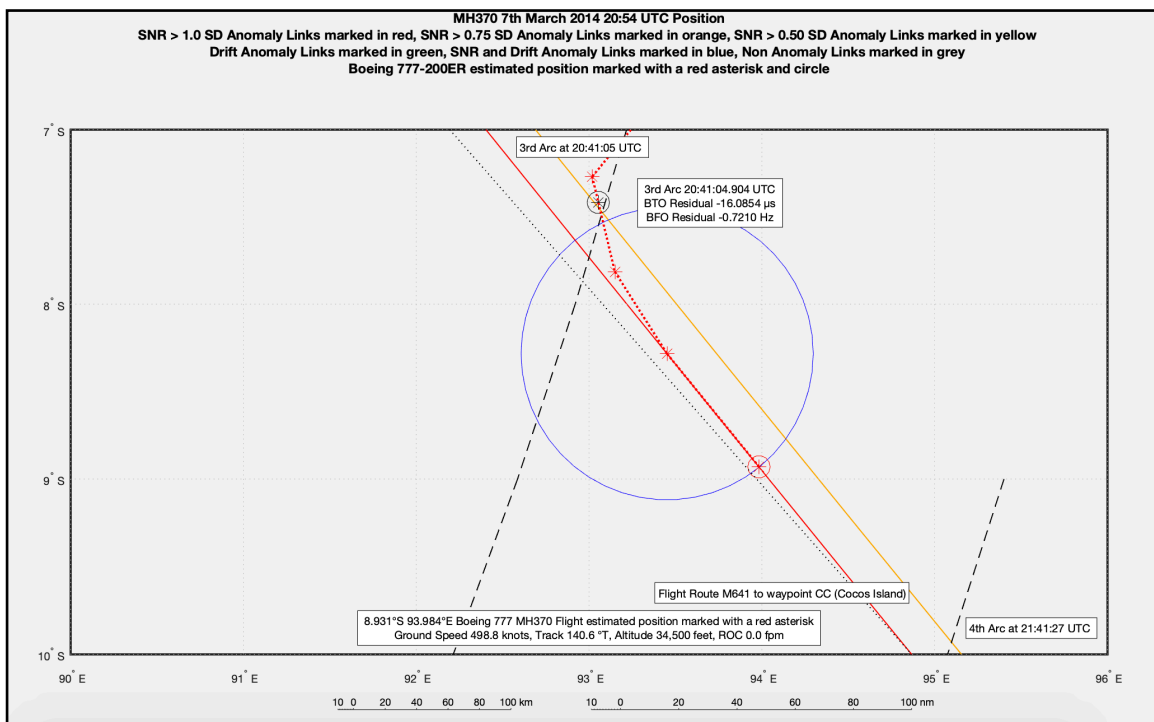


Figure 30: MH370 estimated position at 20:54 UTC.

At 21:10 UTC MH370 is close to waypoint BEBIM and again heading towards waypoint RUNUT. Another aircraft is detected (marked in blue) on a direct flight route from Colombo to Sydney via waypoint 07S88E to 14S101E and would typically be at either FL350 or FL370. This would support the hypothesis that the pilot of MH370 selected an interim flight level such as 34,500 feet in order to avoid other traffic. At 21:14 UTC MH370 turns towards waypoint UVUBI. There is an intersection of two anomalous WSPR signals at this point. MH370 slows from 500.2 knots to 482.6 knots and it appears there may be a step climb taking place.

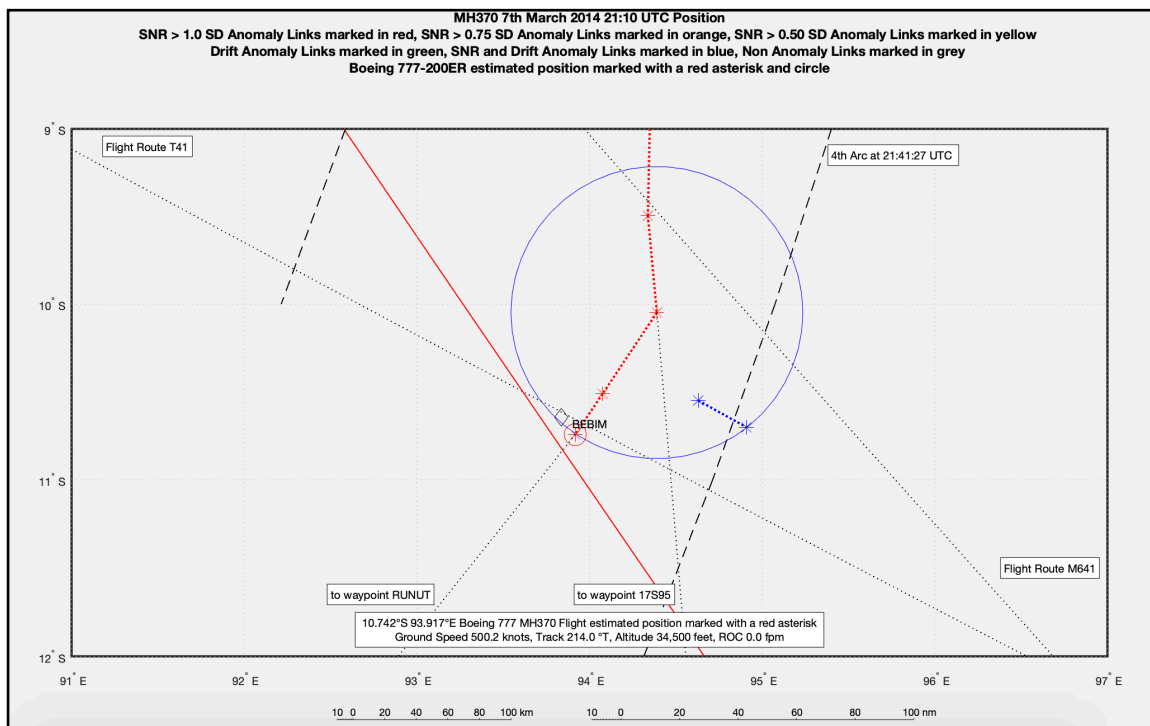


Figure 31: MH370 estimated position at 21:10 UTC.

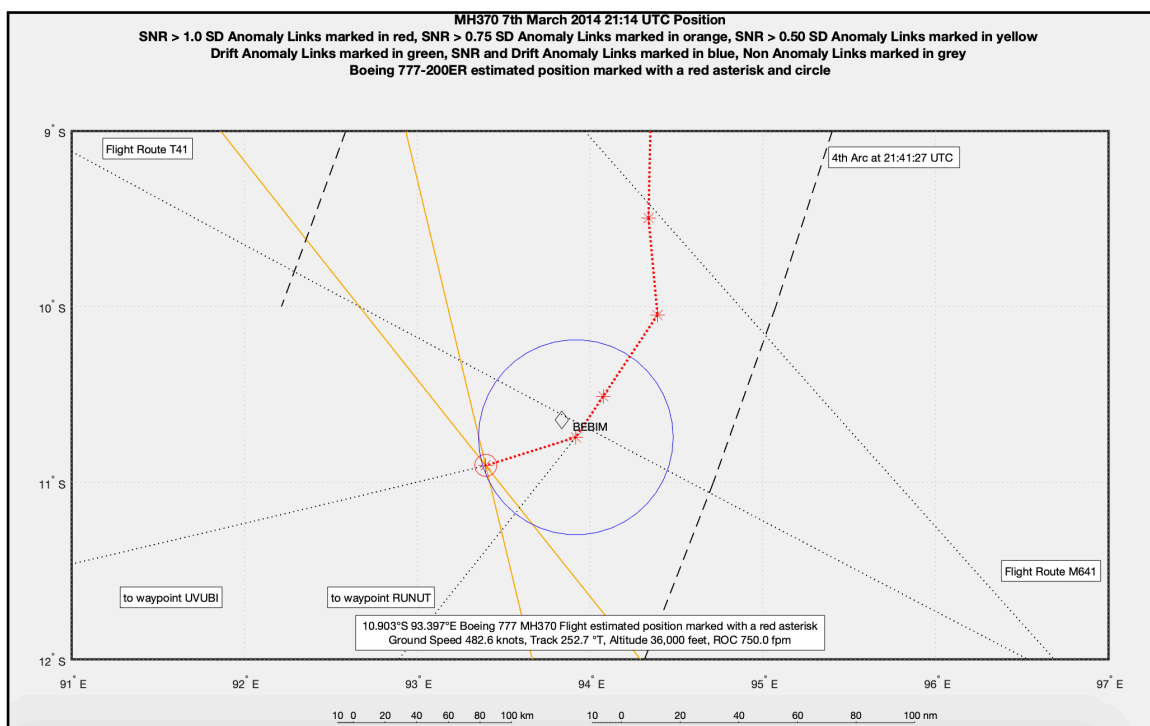


Figure 32: MH370 estimated position at 21:14 UTC.

Waypoint RUNUT is the most southerly aeronautical waypoint in this part of the Indian Ocean region. At 21:16 UTC MH370 turns towards the geographical waypoint 16S097E. There is again an intersection of two anomalous WSPR signals at this point. MH370 slows to 461.9 knots confirming a step climb is being executed. The duration and temporary speed reduction indicate a step climb of around 4,000 feet, for example from FL345 to FL385 (38,500 feet). At 21:38 UTC MH370 turns again towards the geographical waypoint 14S093E. There is again an intersection of two anomalous WSPR signals at this point.

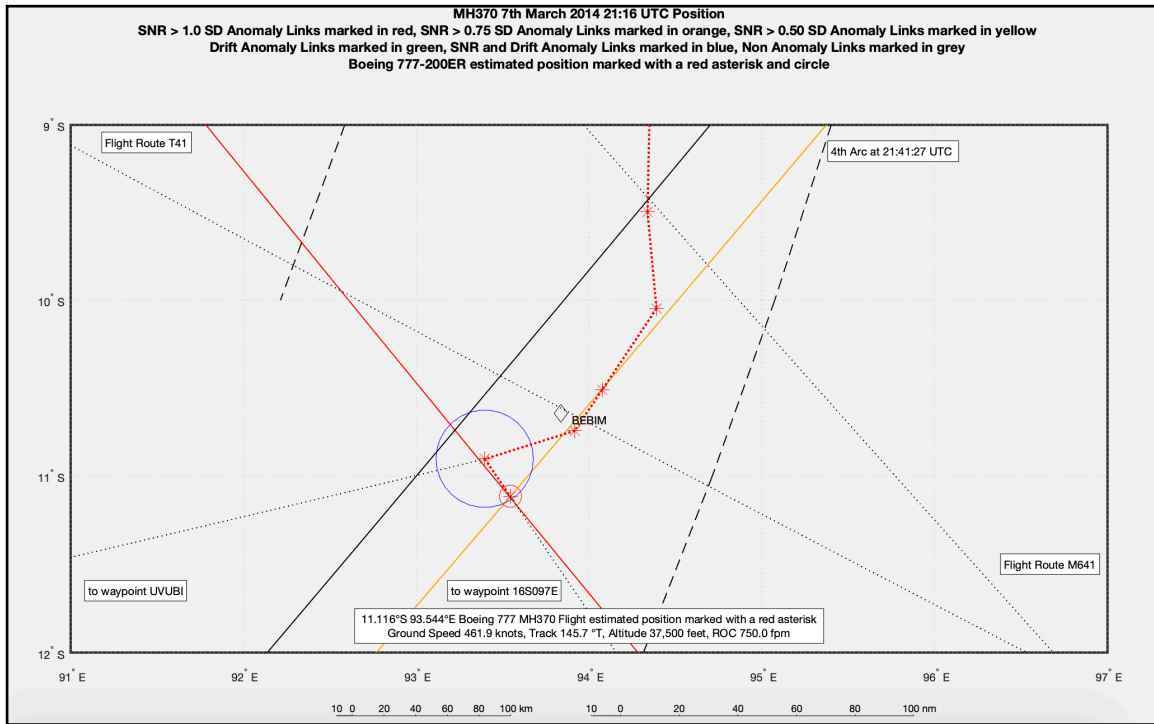


Figure 33: MH370 estimated position at 21:16 UTC.

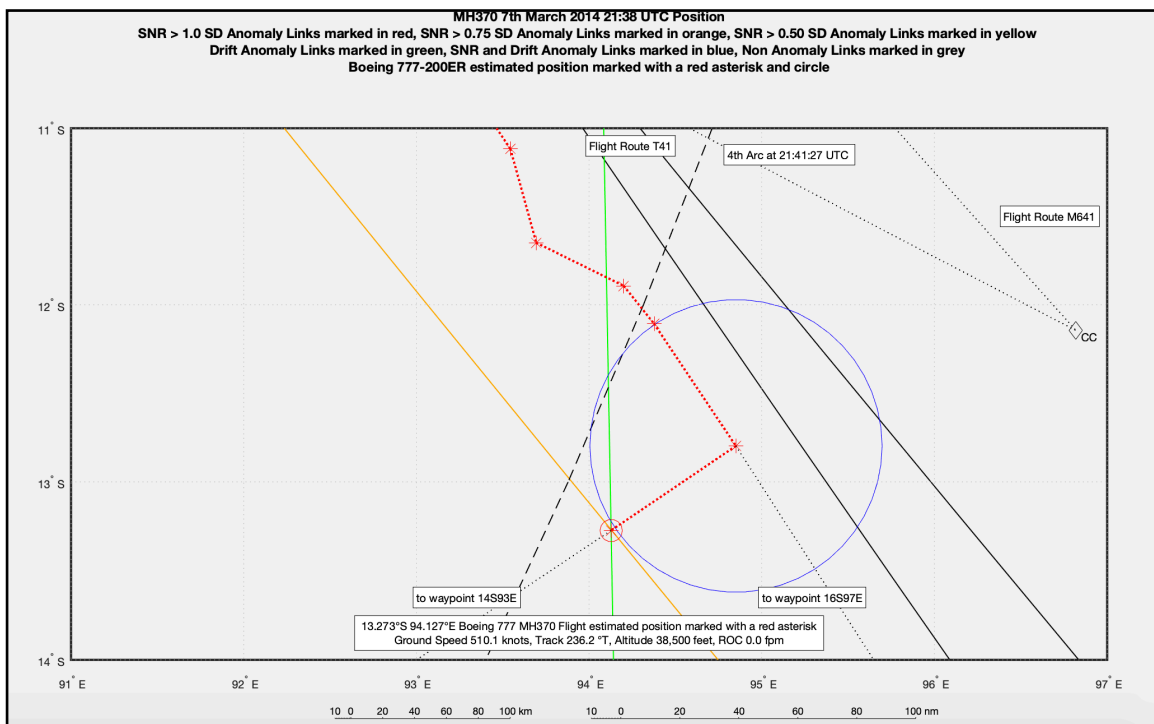


Figure 34: MH370 estimated position at 21:38 UTC.

At 21:44 UTC MH370 turns towards the geographical waypoint 16S095E. The Inmarsat satellite data is matched at the 4th Arc. At 21:50 UTC MH370 is detected by a WSPR SNR anomaly with a 2.16 standard deviation (SD) from the mean over ± 3 hours and is tracking towards waypoint 18S91E. It appears that the goal of the pilot is not to go as far as possible, but to lose the aircraft in a location that is not easily predictable. If you fly in a straight line as far as you can into the southern Indian Ocean, your final location is predictable. We have looked in these predictable straight line flight path locations and not found MH370.

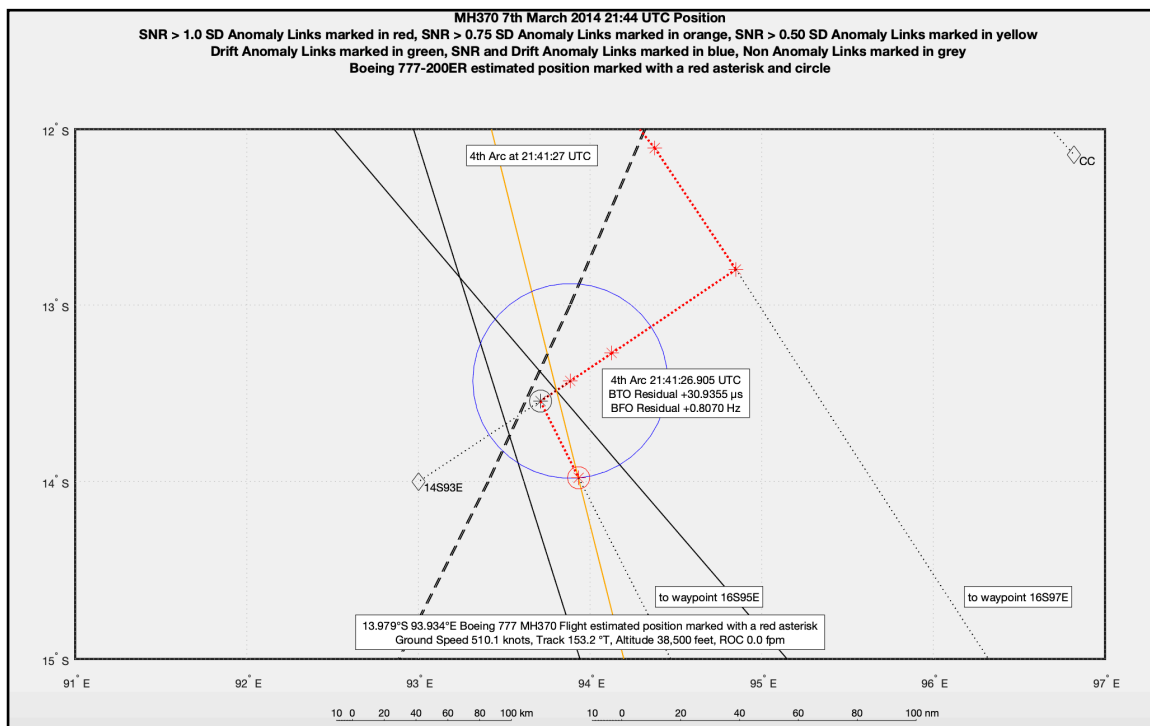


Figure 35: MH370 estimated position at 21:44 UTC.

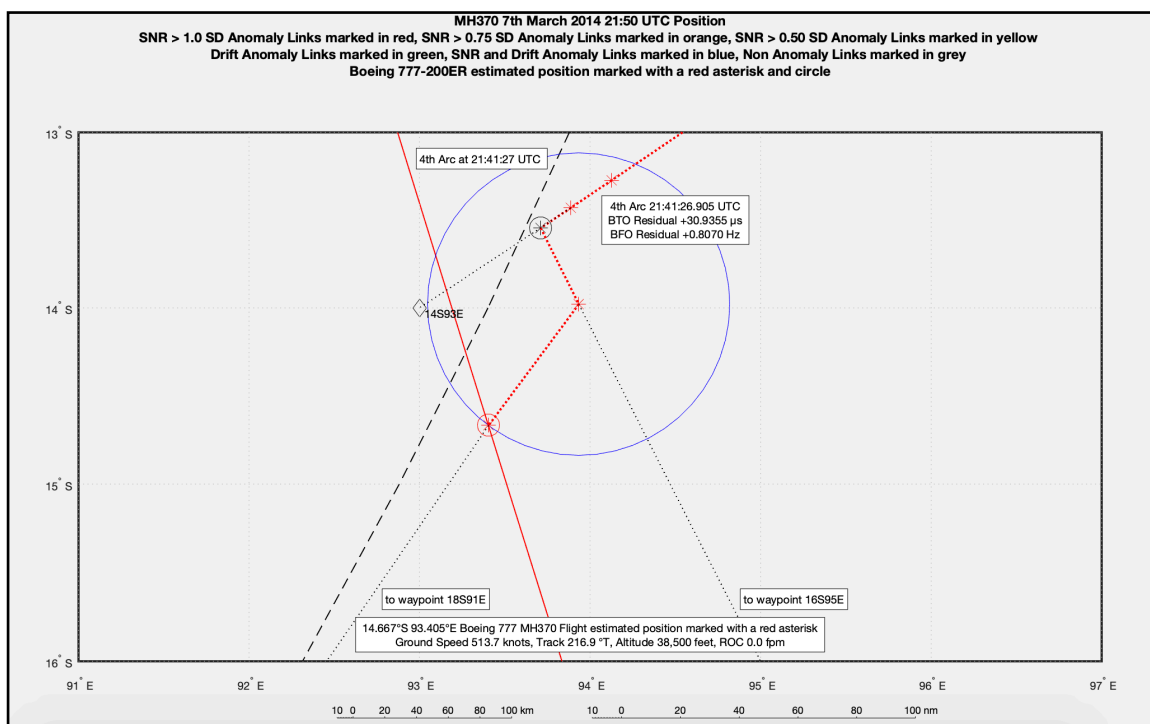


Figure 36: MH370 estimated position at 21:50 UTC.

At 21:56 UTC MH370 is detected by a WSPR SNR anomaly with a 0.86 SD from the mean over \pm 3 hours and is tracking towards waypoint 20S95E. At 22:02 UTC MH370 is detected by a WSPR SNR anomaly with a 1.06 SD and another with 0.92 SD and is tracking towards waypoint 20S97E.

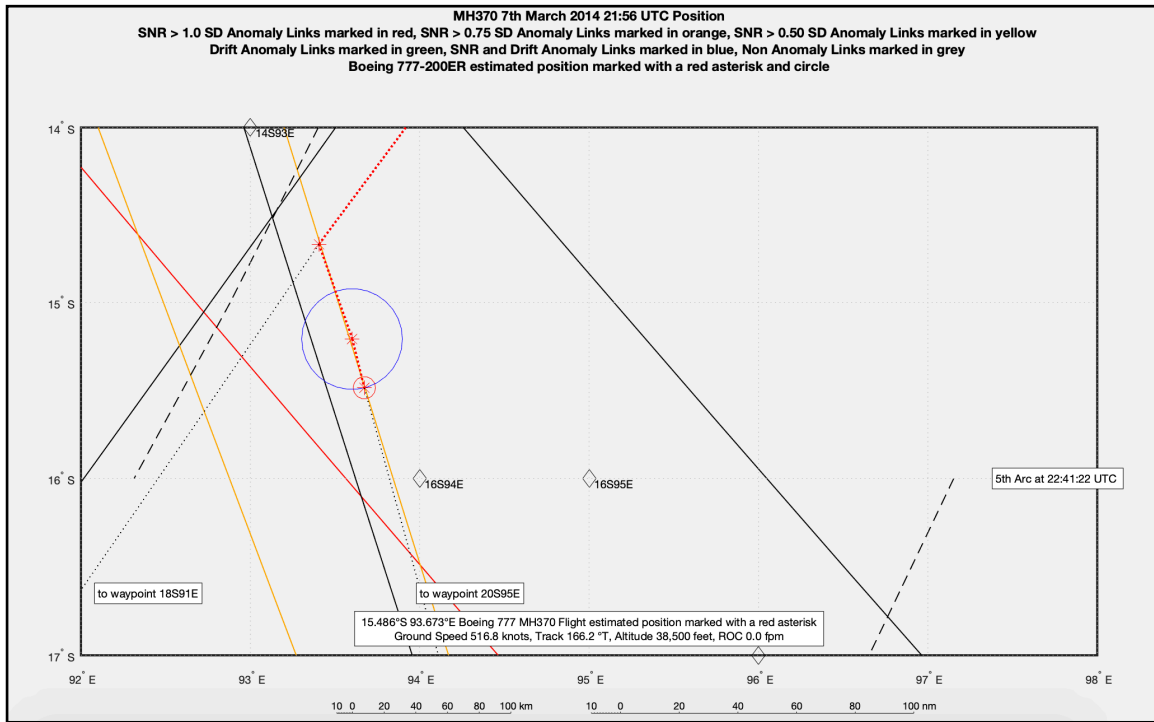


Figure 37: MH370 estimated position at 21:56 UTC.

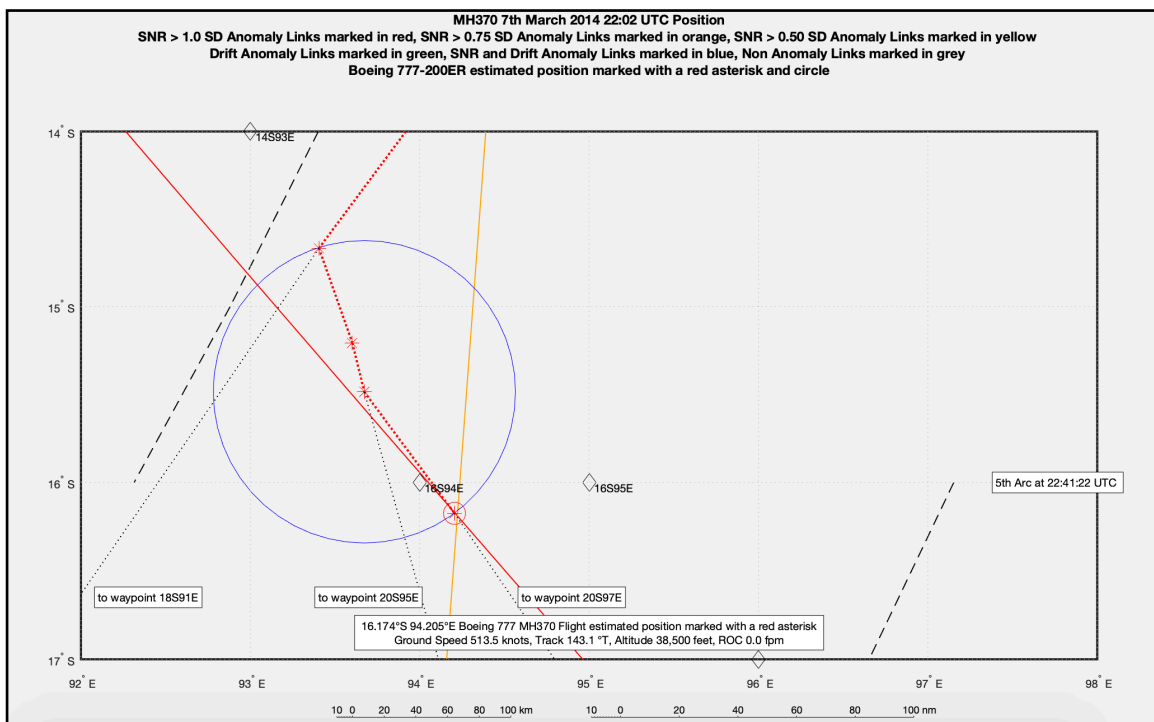


Figure 38: MH370 estimated position at 22:02 UTC.

At 22:08 UTC MH370 is detected by a WSPR SNR anomaly with a 1.14 SD and is tracking towards waypoint 20S97E. At 22:10 UTC MH370 is detected by a WSPR SNR anomaly with a 1.41 SD and is tracking towards waypoint 22S99E.

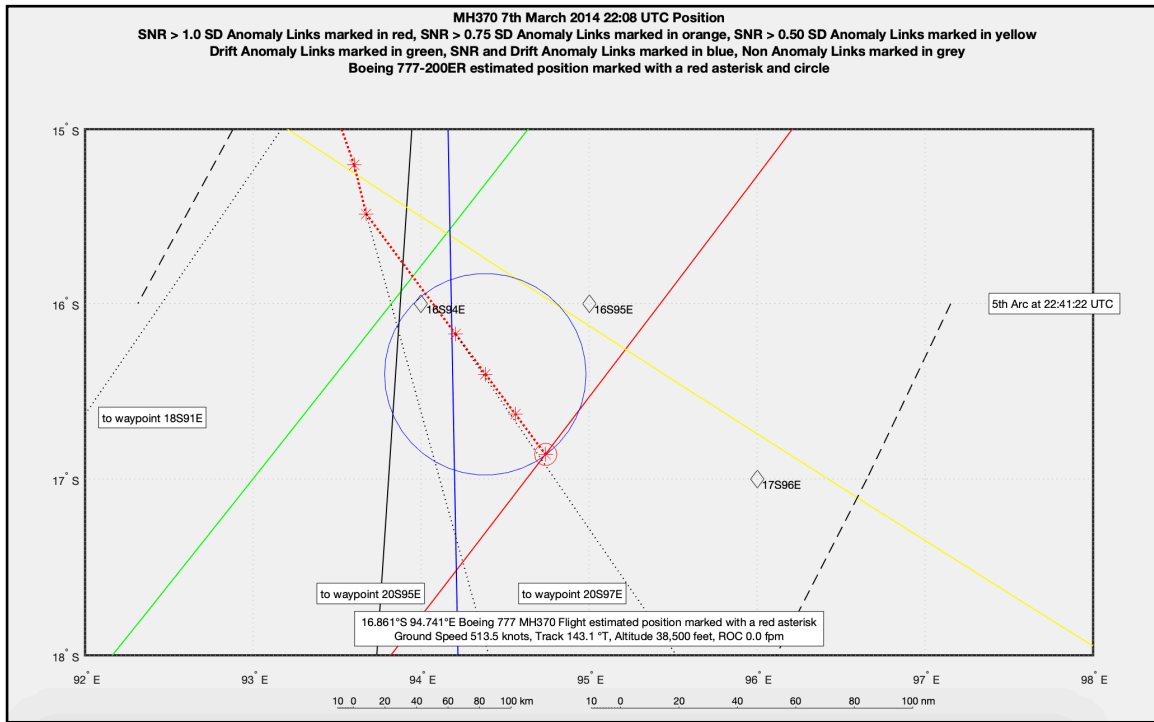


Figure 39: MH370 estimated position at 22:08 UTC.

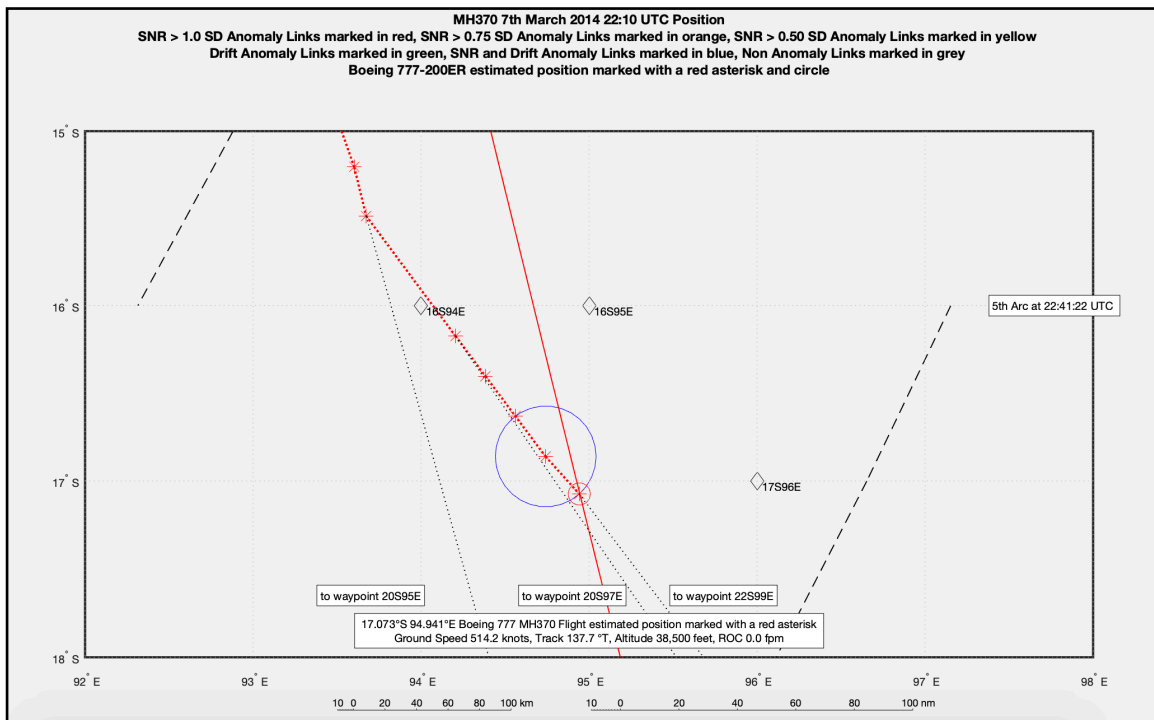


Figure 40: MH370 estimated position at 22:10 UTC.

At 22:16 UTC MH370 is detected by a WSPR SNR anomaly with a 0.94 SD and is tracking towards waypoint 20S96E. MH370 passes over the Flight Route L894 which runs from waypoint RUNUT to waypoint POLUM and is used for flights to/from Perth. There are no more flight routes to cross south of this point. The flight routes between South Africa and Australia are much further south and out of range. At 22:22 UTC MH370 is detected by a WSPR SNR anomaly with a 1.76 SD and two others with 0.73 SD and 0.66 SD and is tracking towards waypoint 19S90E.

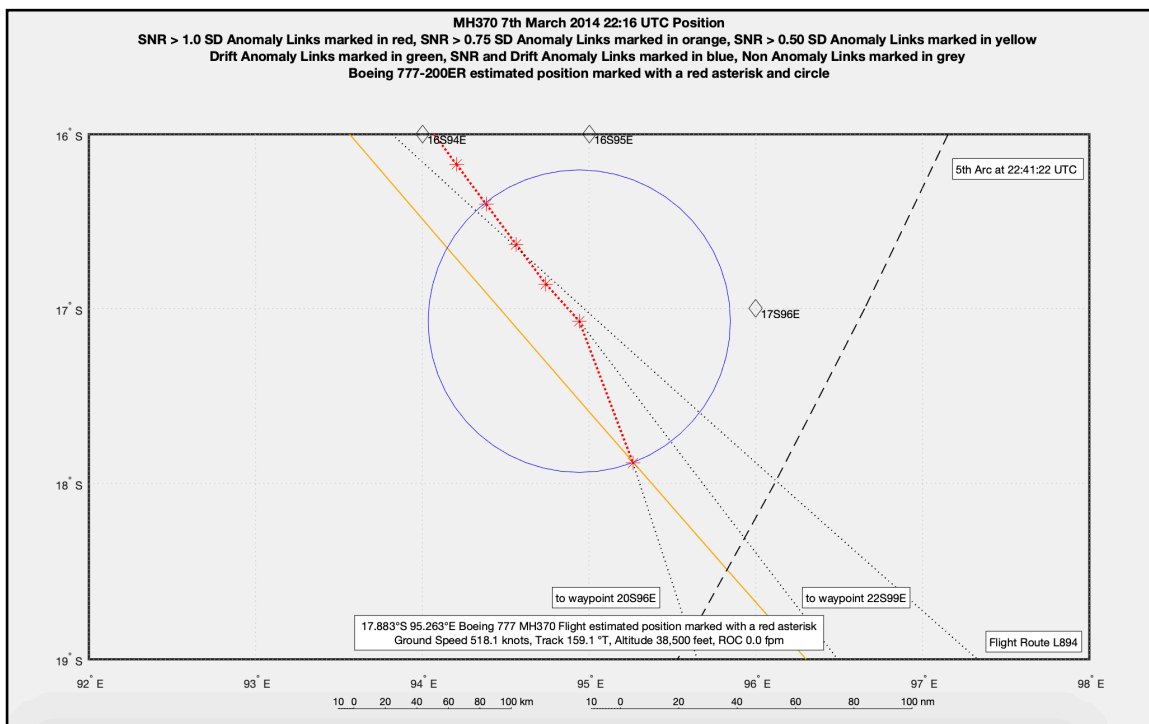


Figure 41: MH370 estimated position at 22:16 UTC.

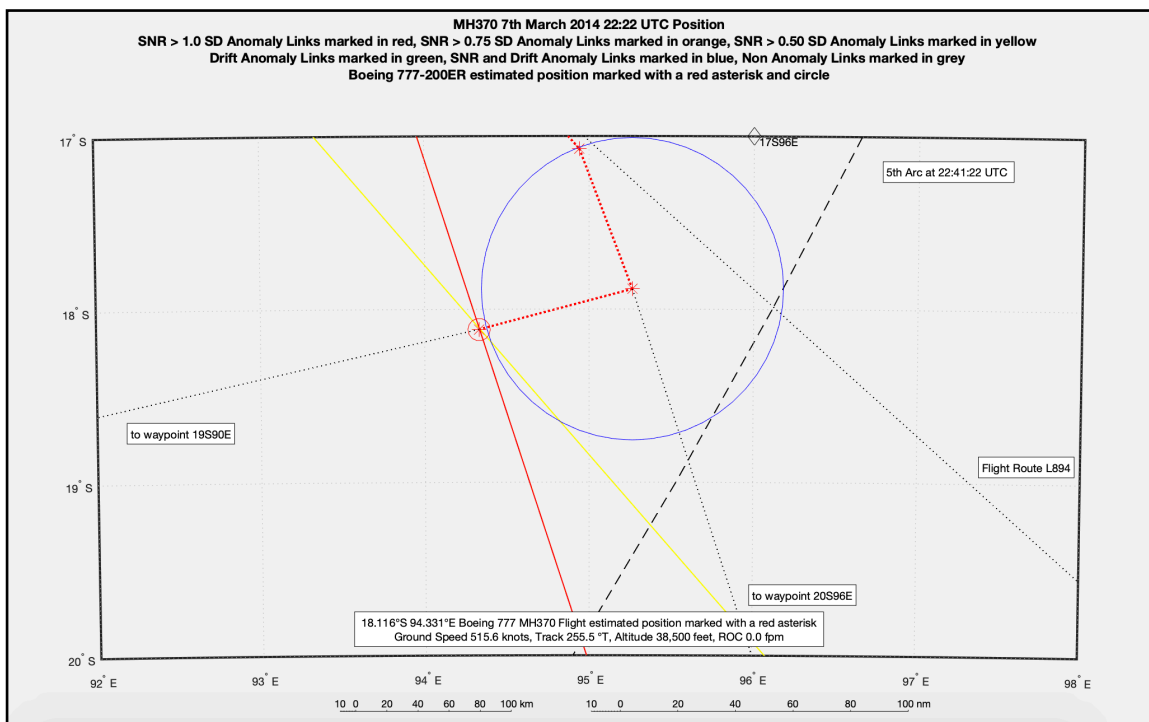


Figure 42: MH370 estimated position at 22:22 UTC.

At 22:30 UTC MH370 is detected by a WSPR SNR anomaly with a 1.13 SD and is tracking towards waypoint 22S94E. At 22:32 UTC MH370 is detected by a WSPR SNR anomaly with a 1.15 SD and is tracking towards waypoint 22S96E.

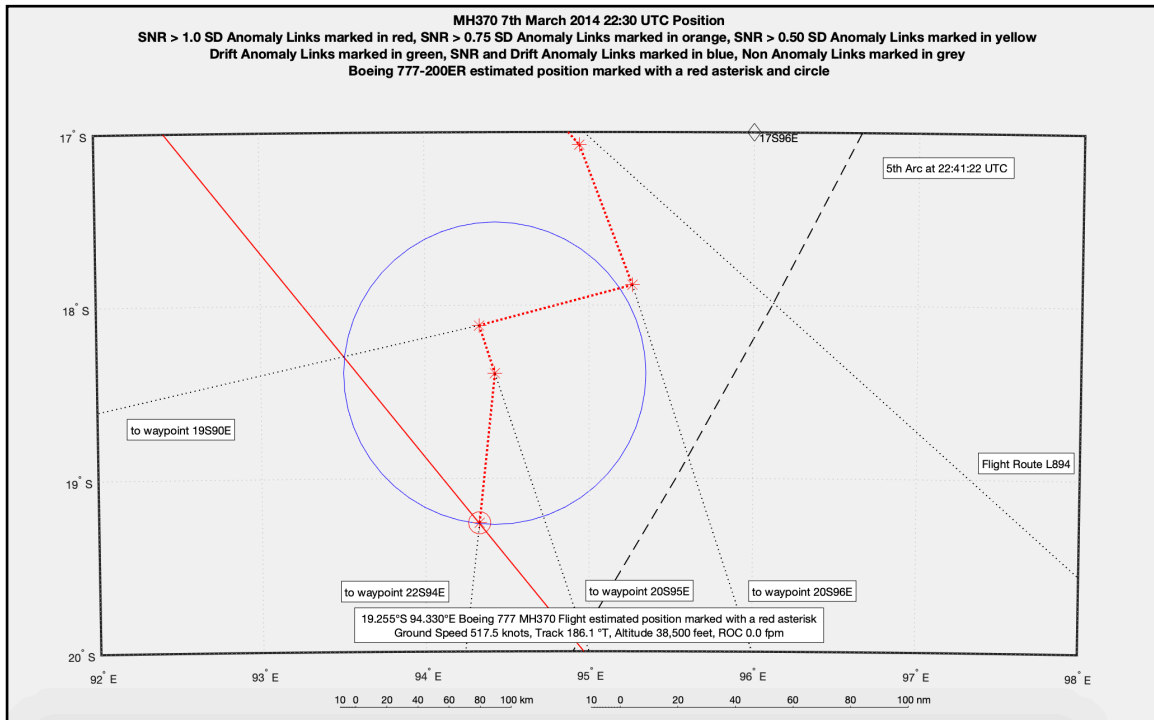


Figure 43: MH370 estimated position at 22:30 UTC.

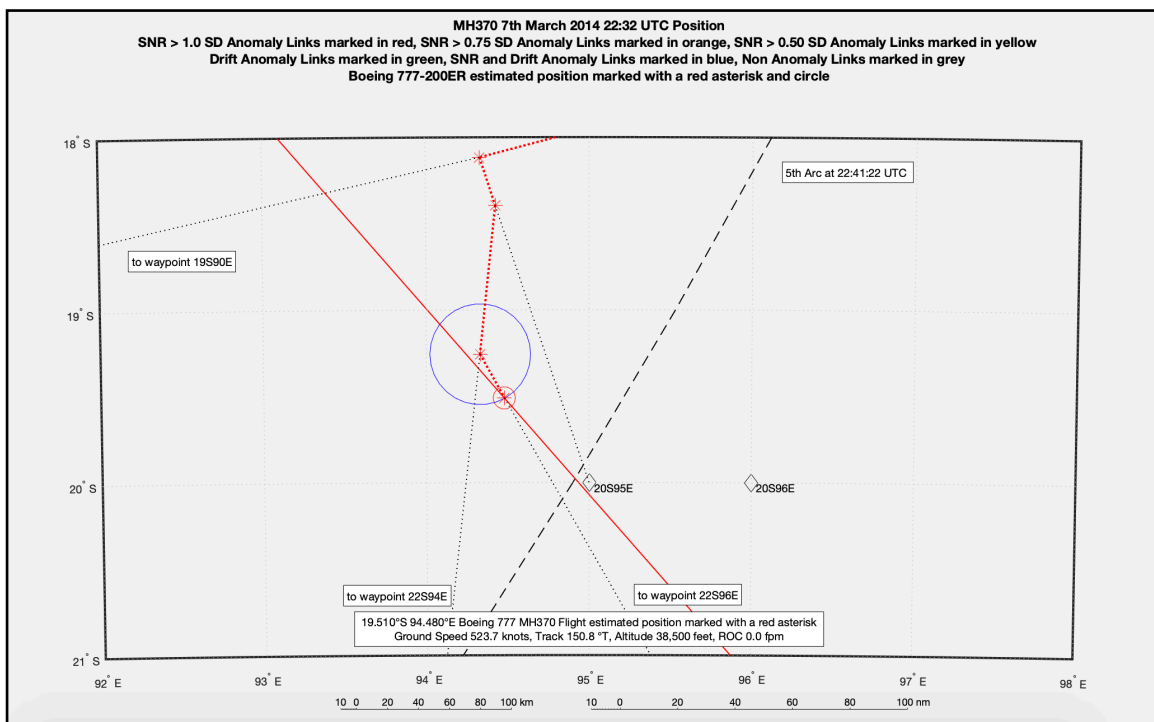


Figure 44: MH370 estimated position at 22:32 UTC.

At 22:36 UTC MH370 is detected by a WSPR SNR anomaly with a 2.80 SD and is tracking towards waypoint 22S96E. At 22:42 UTC MH370 is detected by a WSPR SNR anomaly with a 2.31 SD and is tracking towards waypoint 24S92E. The Inmarsat data is matched at the 5th Arc. At this stage the pilot no longer had sufficient fuel to reach Australia, but could still have turned back and reached Cocos Island. The pilot continues to change course every few minutes. The pilot possibly thinks that the Australian Over-the-Horizon Radar (OTHR) system JORN might have been tracking MH370. JORN was not operational at the time of the aircraft's disappearance.

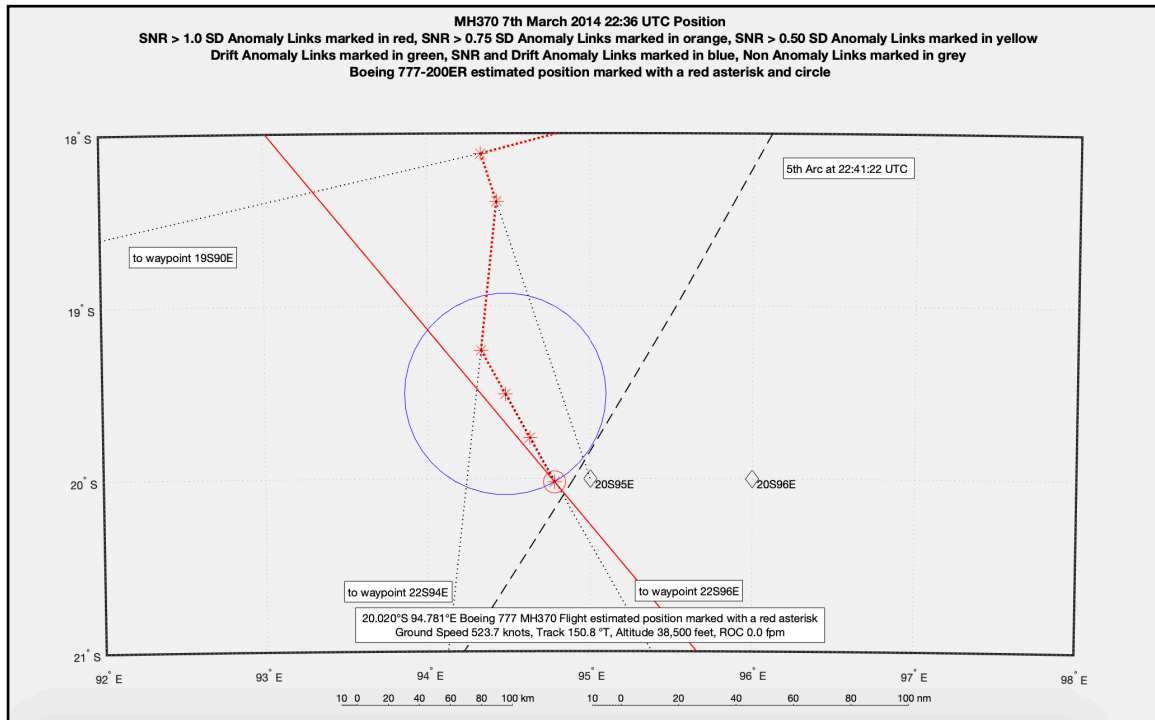


Figure 45: MH370 estimated position at 22:36 UTC.

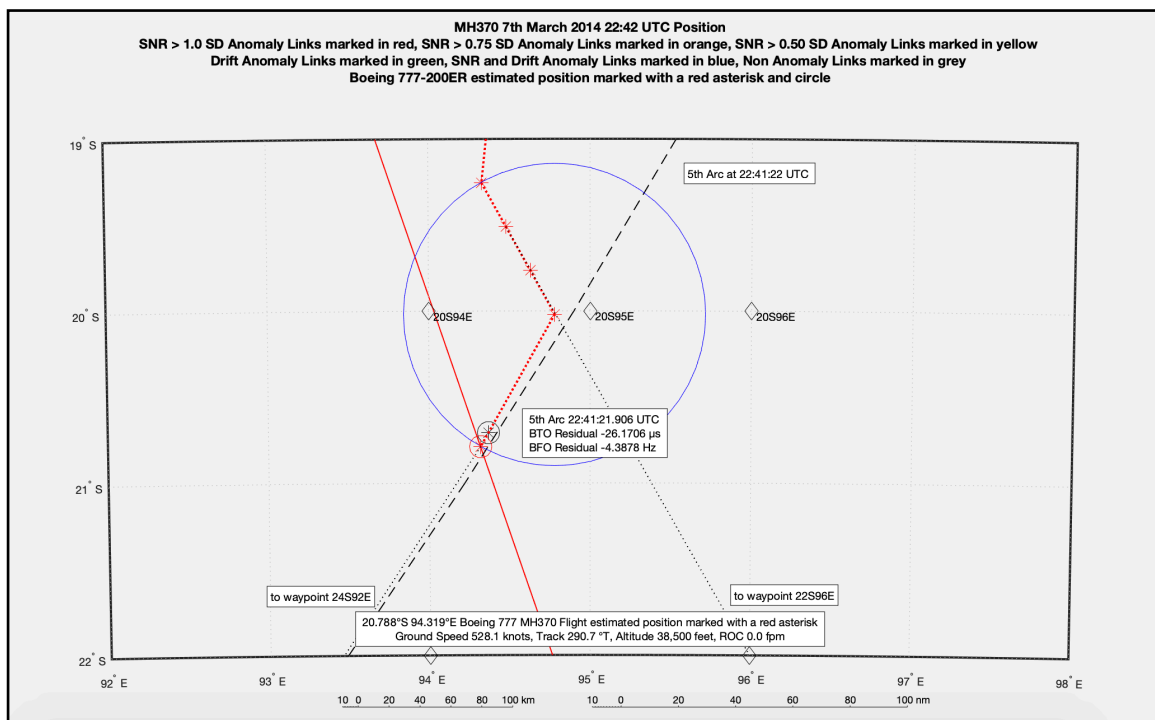


Figure 46: MH370 estimated position at 22:42 UTC.

At 22:44 UTC MH370 is detected by a WSPR SNR anomaly with a 0.86 standard deviation (SD) and is tracking towards waypoint 24S92E. At 22:48 UTC MH370 is detected by a WSPR SNR anomaly with a 2.65 SD and is tracking towards waypoint 26S96E.

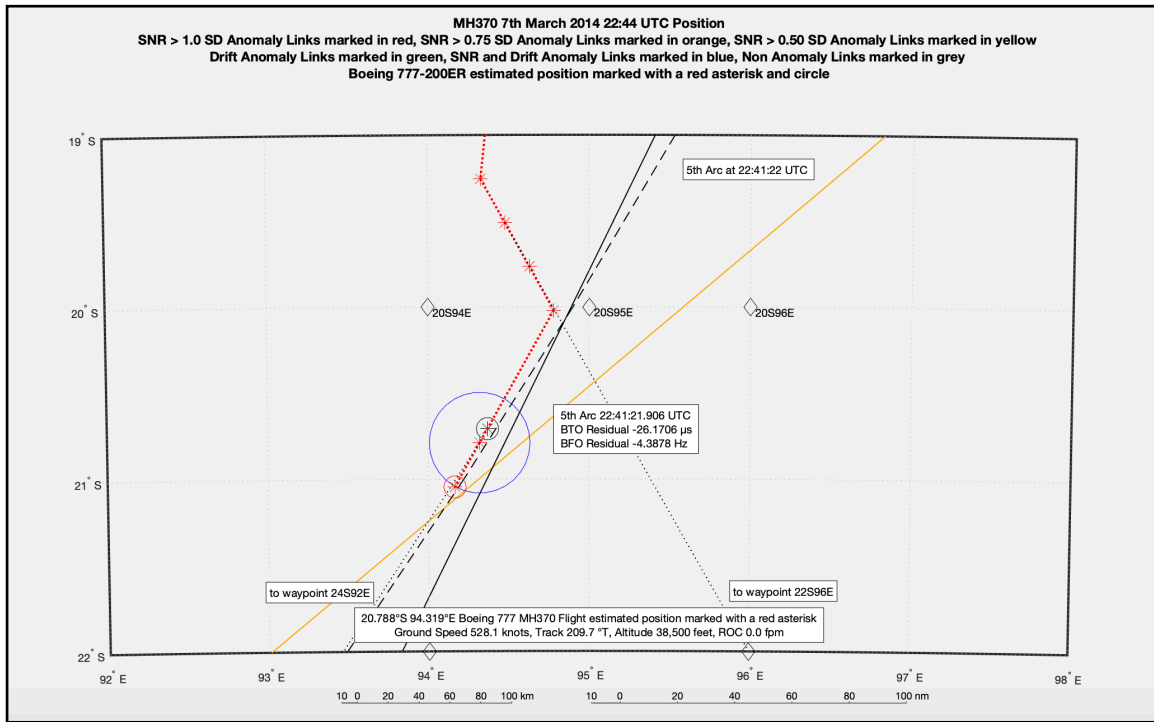


Figure 47: MH370 estimated position at 22:44 UTC.

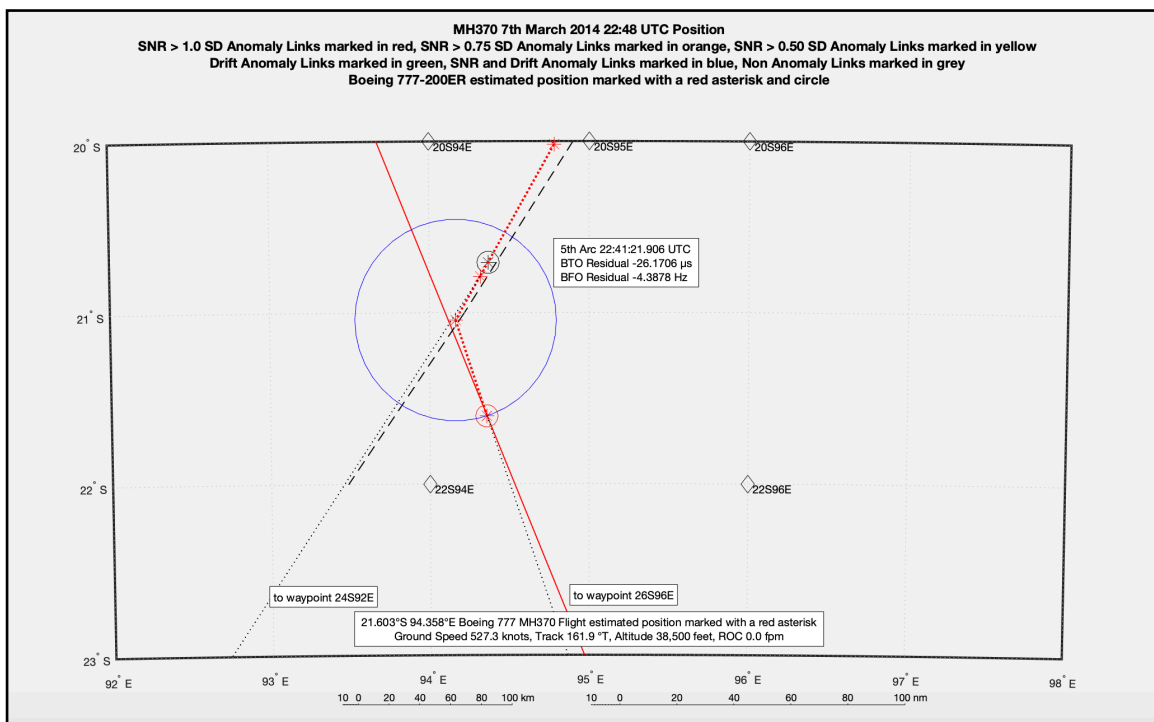


Figure 48: MH370 estimated position at 22:48 UTC.

At 22:52 UTC MH370 is detected by 3 WSPR SNR anomalies with 2.68, 1.23 and 0.85 SD and is tracking towards waypoint 21S98E. This point was subject of the worked example in section 5 above. At 22:58 UTC MH370 is detected by 2 WSPR SNR anomalies with 1.47 and 1.12 SD and is tracking towards waypoint 26S96E again.

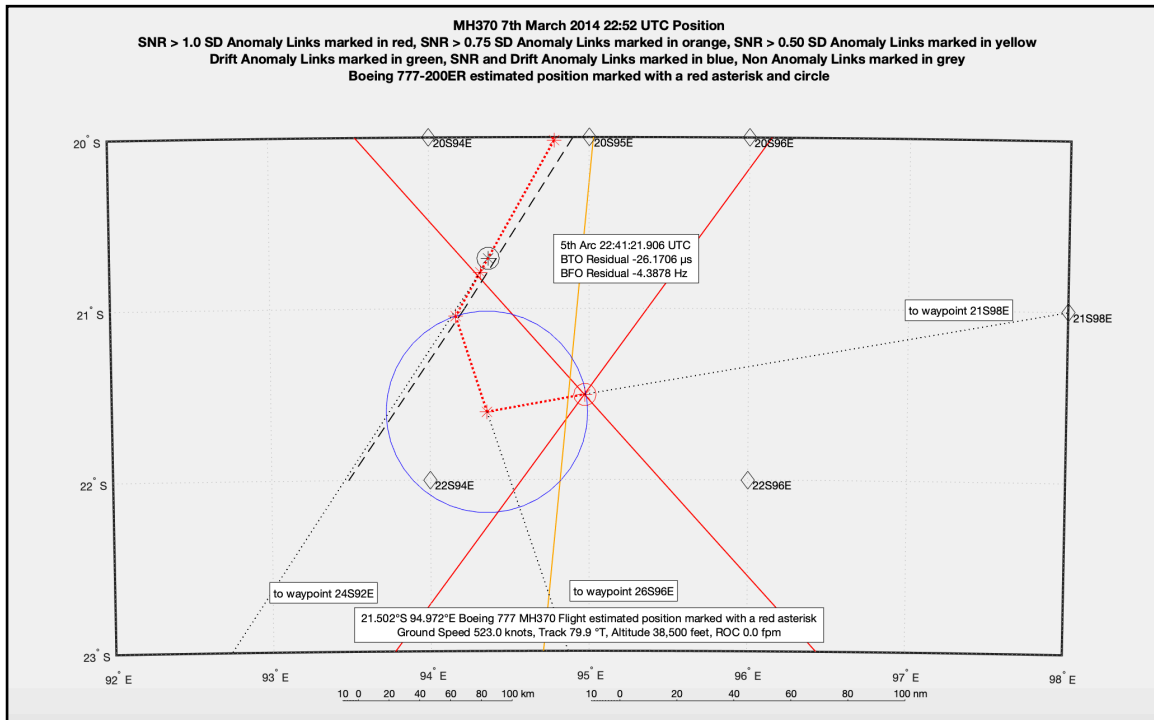


Figure 49: MH370 estimated position at 22:52 UTC.

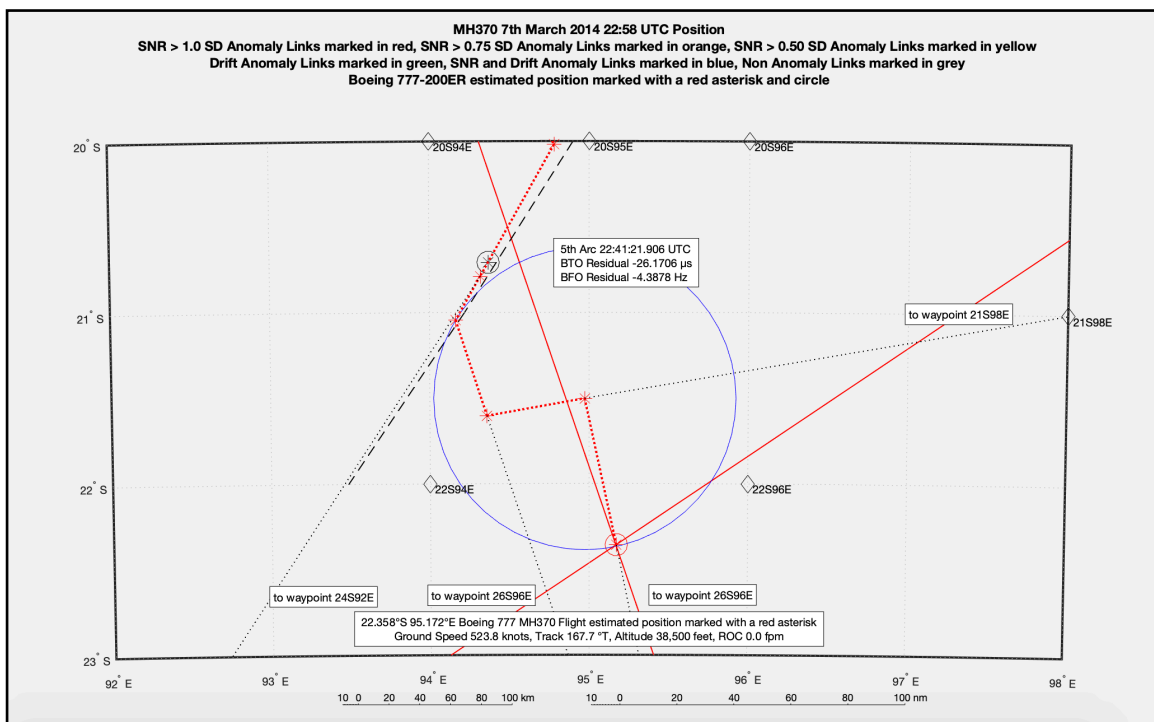


Figure 50: MH370 estimated position at 22:58 UTC.

At 23:00 UTC MH370 is detected by a WSPR SNR anomaly with 1.45 SD and is tracking towards waypoint 26S96E. At 23:02 UTC MH370 is detected by a WSPR SNR anomaly with 1.34 SD and is tracking towards waypoint 24S92E.

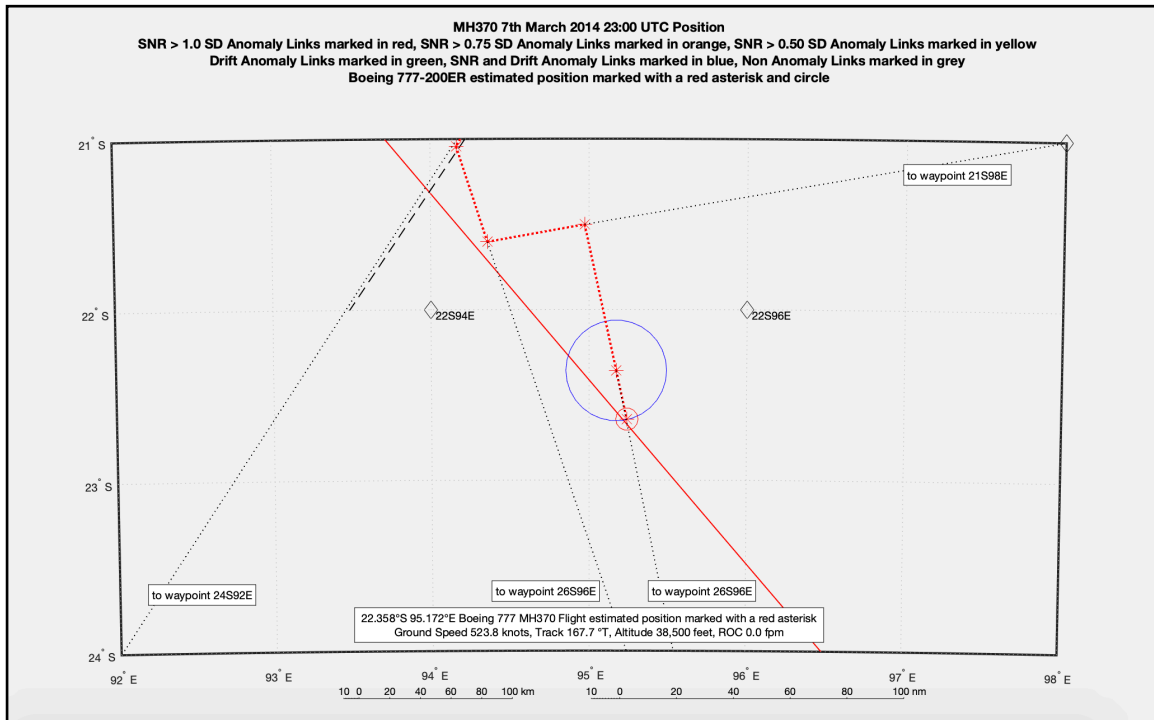


Figure 51: MH370 estimated position at 23:00 UTC.

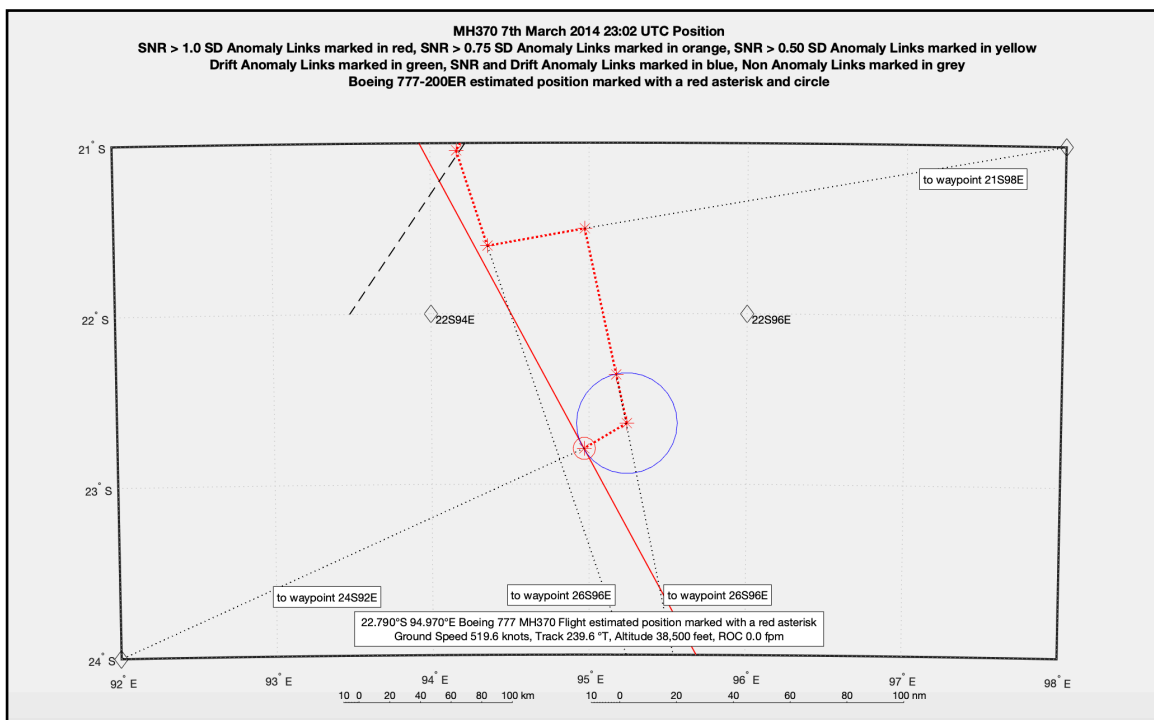


Figure 52: MH370 estimated position at 23:02 UTC.

At 23:04 UTC MH370 is detected by 3 WSPR SNR anomalies with 2.39, a drift of -1 Hz/min and another SNR anomaly of 0.94 SD and is tracking towards waypoint 23S92E. At 23:08 UTC MH370 is detected by 3 WSPR SNR anomalies with 2.27 and another SNR anomaly of 1.04 SD with a drift of -1 Hz/min and is tracking towards waypoint 38S94E.

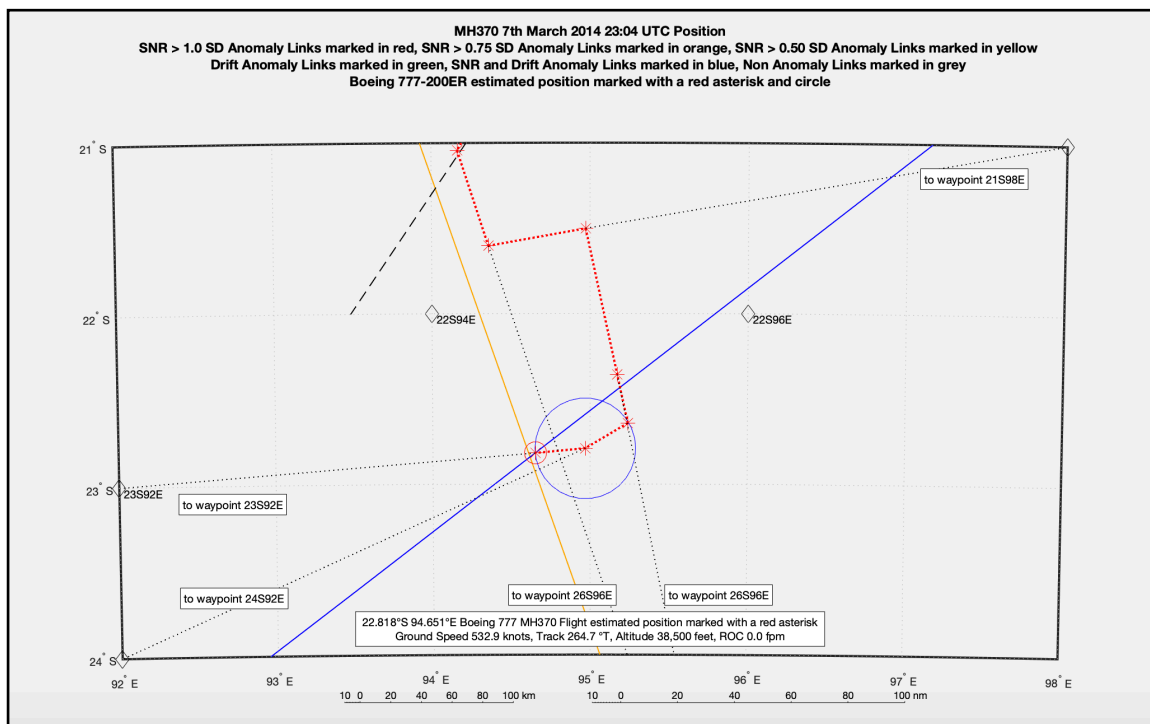


Figure 53: MH370 estimated position at 23:04 UTC.

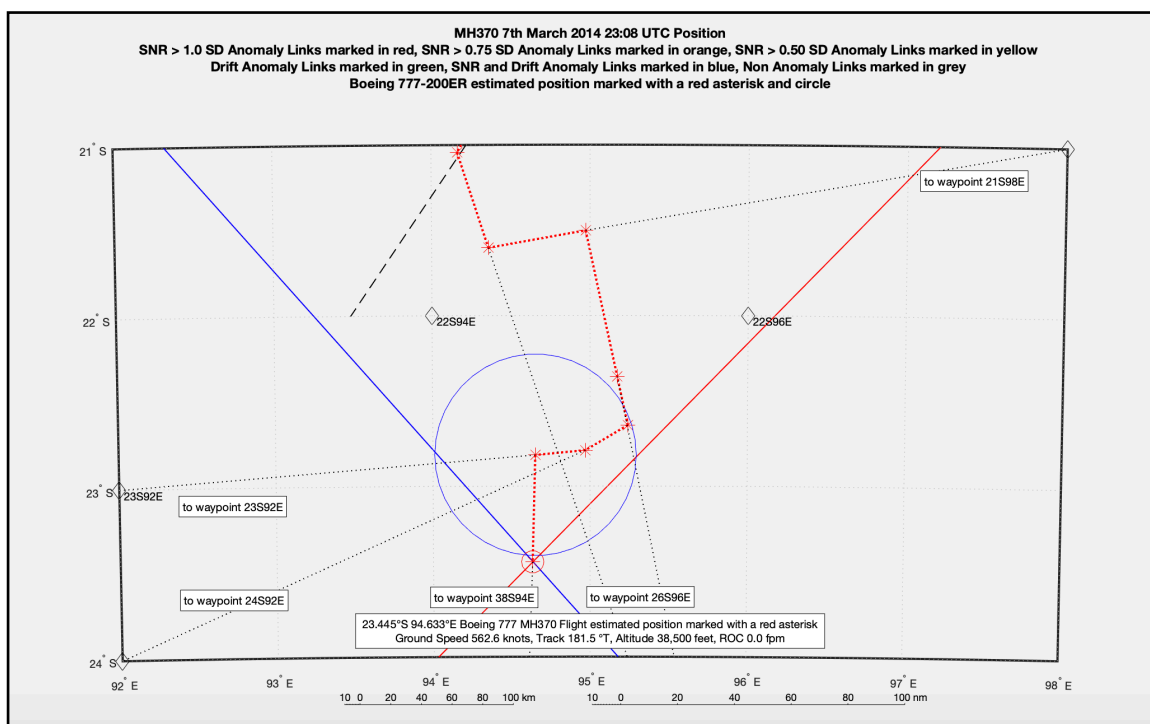


Figure 54: MH370 estimated position at 23:08 UTC.

At 23:12 UTC MH370 is detected by 3 WSPR SNR anomalies with 1.09, 1.04 and 0.95 SD as well as a drift of +1 Hz/min close to the turning point and is tracking towards waypoint 28S96E. At 23:14 UTC MH370 is detected by a WSPR SNR anomaly with a 2.41 SD and is tracking towards waypoint 30S101E. The Inmarsat data is matched during the SATCOM call at 23:14:01 UTC. At this point the estimated remaining fuel is 5,329 kg, with a range of around 922 km and is insufficient to reach either the Cocos Islands (1,348 km) or Learmonth Airport, Western Australia (1,967 km).

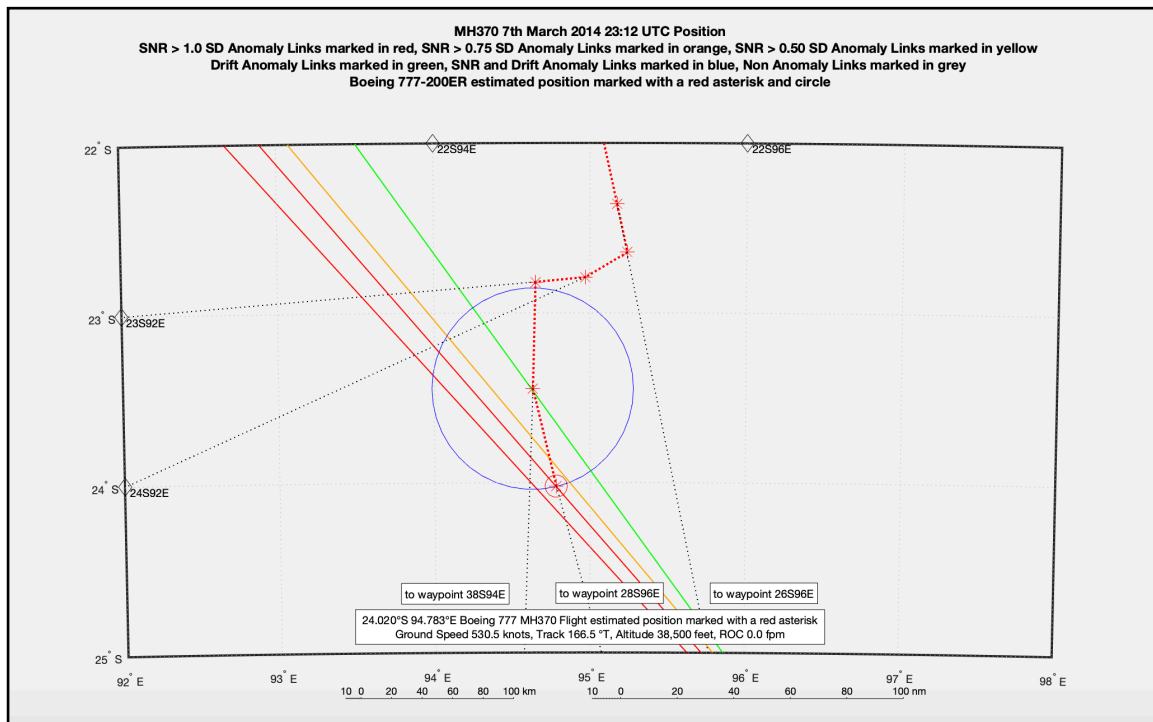


Figure 55: MH370 estimated position at 23:12 UTC.

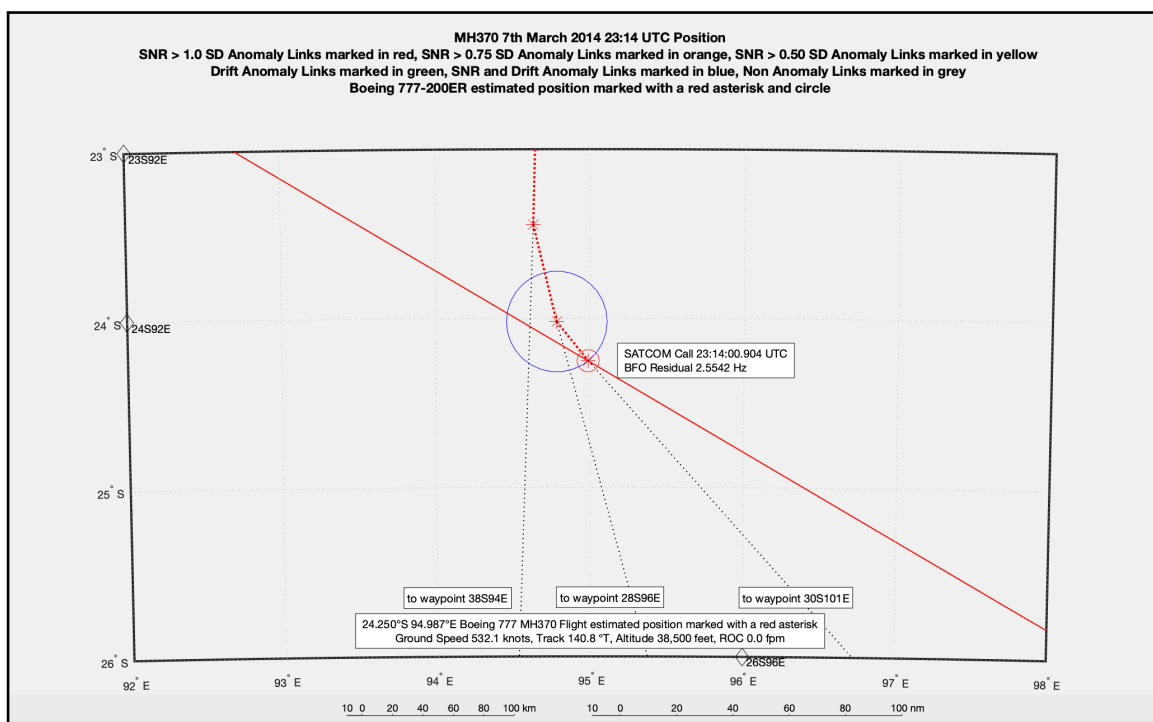


Figure 56: MH370 estimated position at 23:14 UTC.

At 23:18 UTC MH370 is detected by 3 WSPR anomalies with 2 SNR anomalies of 1.01 and 0.89 standard deviation (SD) from the mean over ± 3 hours as well as a drift anomaly at -1 Hz/minute and is tracking towards waypoint 26S96E again. At 23:20 UTC MH370 is detected by 5 WSPR SNR anomalies with a 1.33, 1.32, 1.11, 1.07 and 1.03 SD and is tracking towards waypoint 26S98E. The aircraft's ground speed slows by 33.7 knots over a 4 minute period indicative of a step climb of 2,000 feet to FL405 (40,500 feet). The change in ground speed cannot be explained by a change in the wind speed or wind direction.

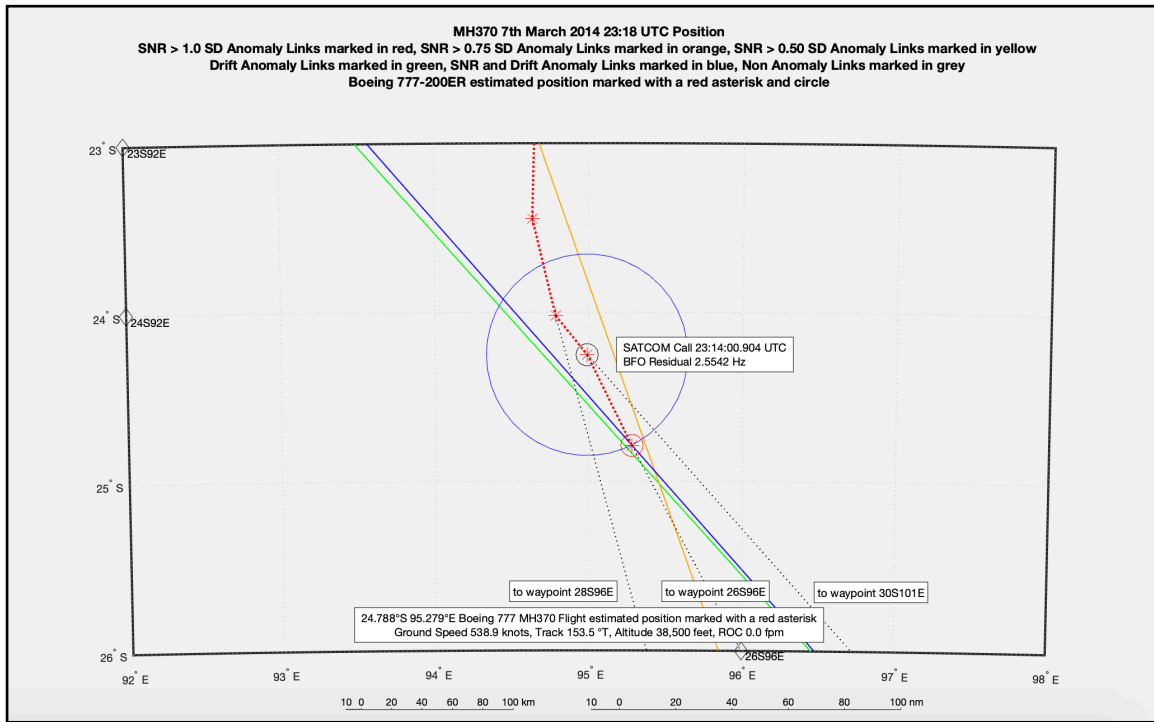


Figure 57: MH370 estimated position at 23:18 UTC.

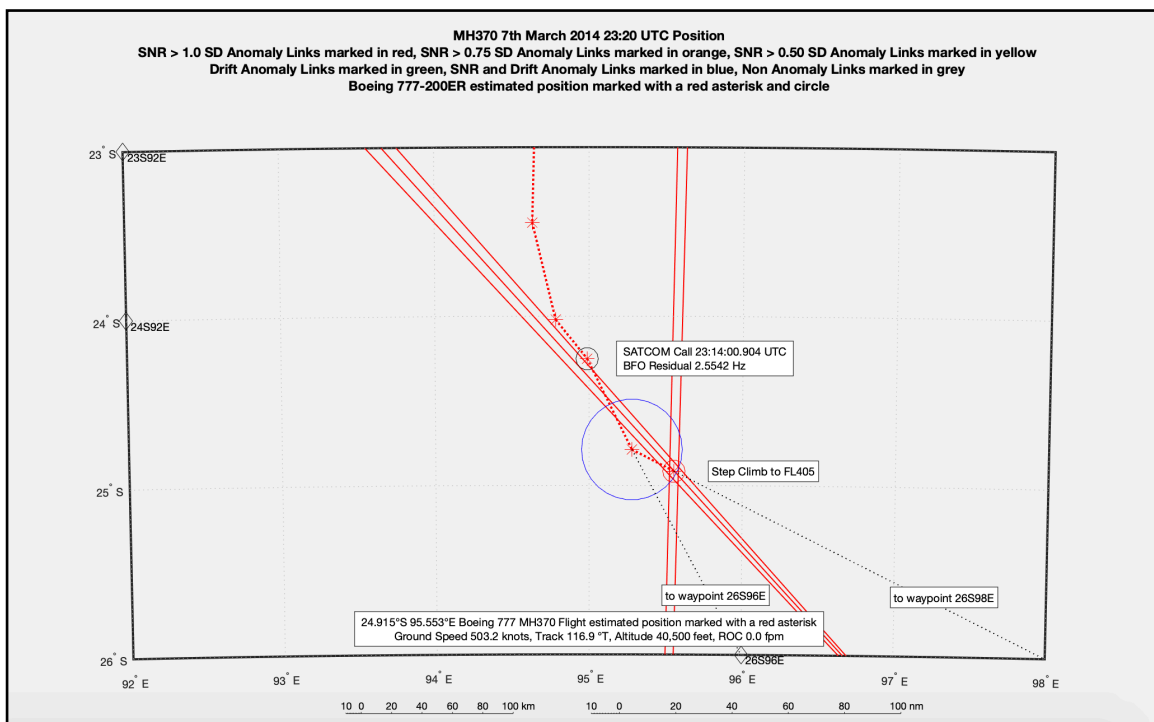


Figure 58: MH370 estimated position at 23:20 UTC.

At 23:22 UTC MH370 is detected by 5 WSPR SNR anomalies with a 1.38, 1.35, 1.07, 0.83 and 0.83 SD and is tracking towards waypoint 26S96E again. At 23:26 UTC MH370 is detected by 2 WSPR SNR anomalies with a 1.64 and 1.61 SD and is tracking towards waypoint 27S98E.

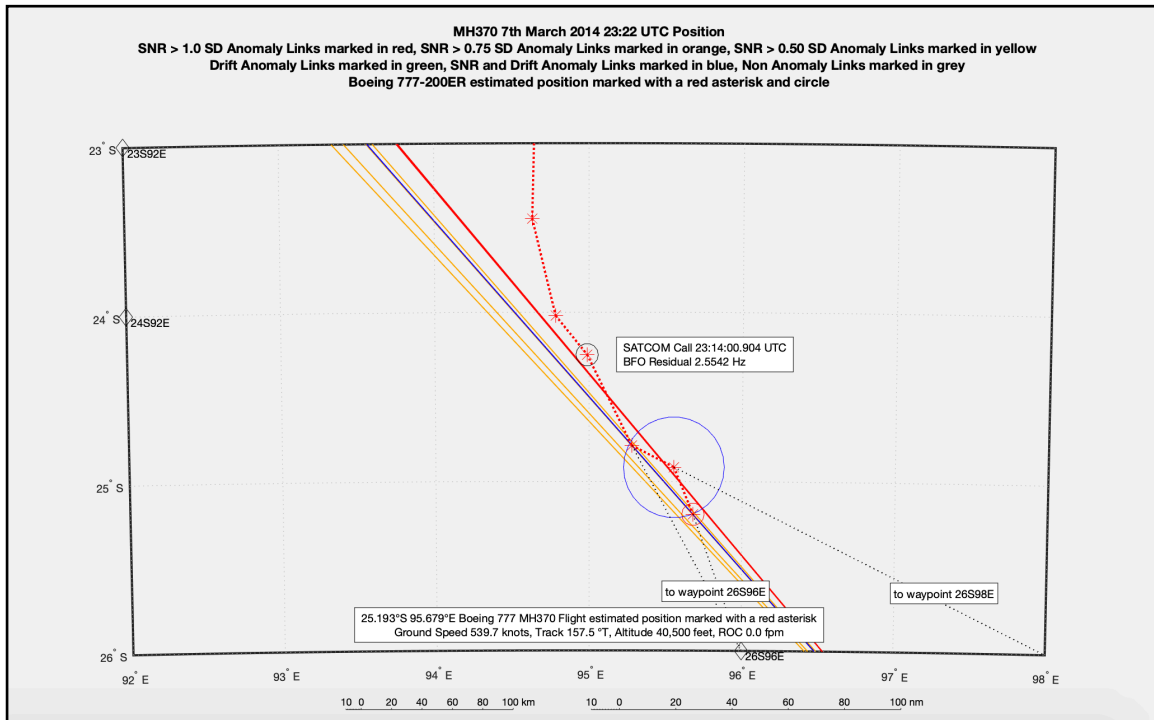


Figure 59: MH370 estimated position at 23:22 UTC.

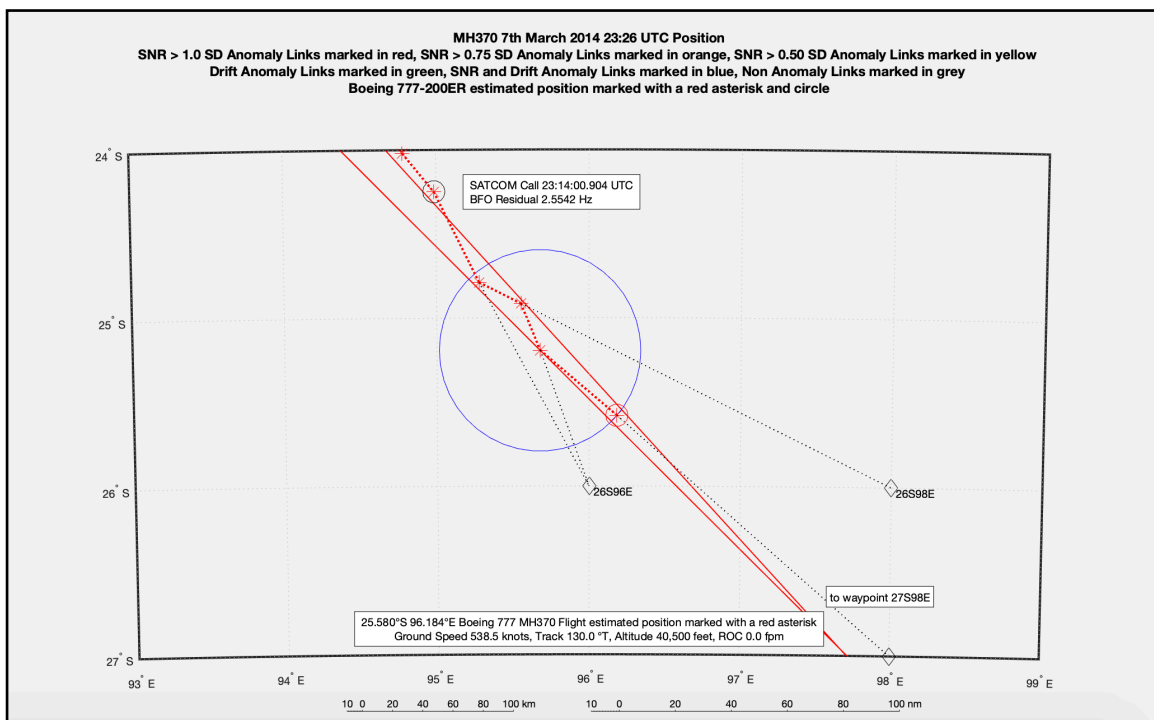


Figure 60: MH370 estimated position at 23:26 UTC.

At 23:28 UTC MH370 is detected by 3 WSPR SNR anomalies with a 2.00, 1.50 and 1.43 SD and is tracking towards waypoint 27S98E. At 23:30 UTC MH370 is detected by 2 WSPR SNR anomalies with a 1.48 and 1.24 SD and is tracking towards waypoint 27S98E.

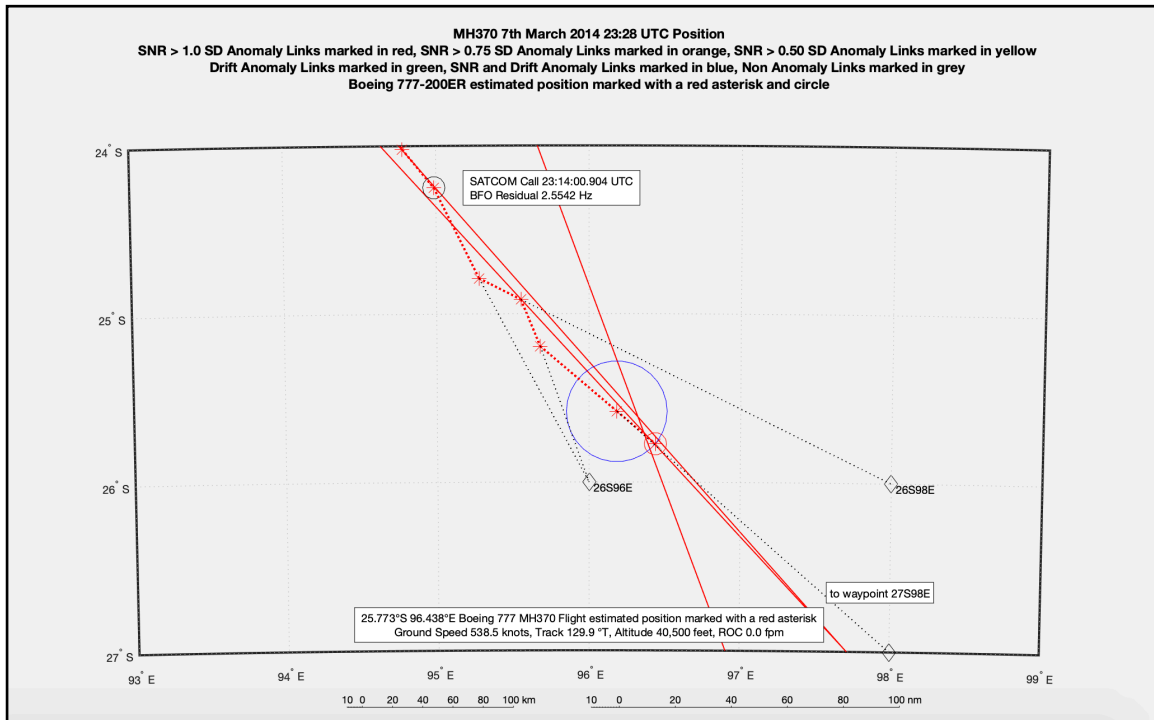


Figure 61: MH370 estimated position at 23:28 UTC.

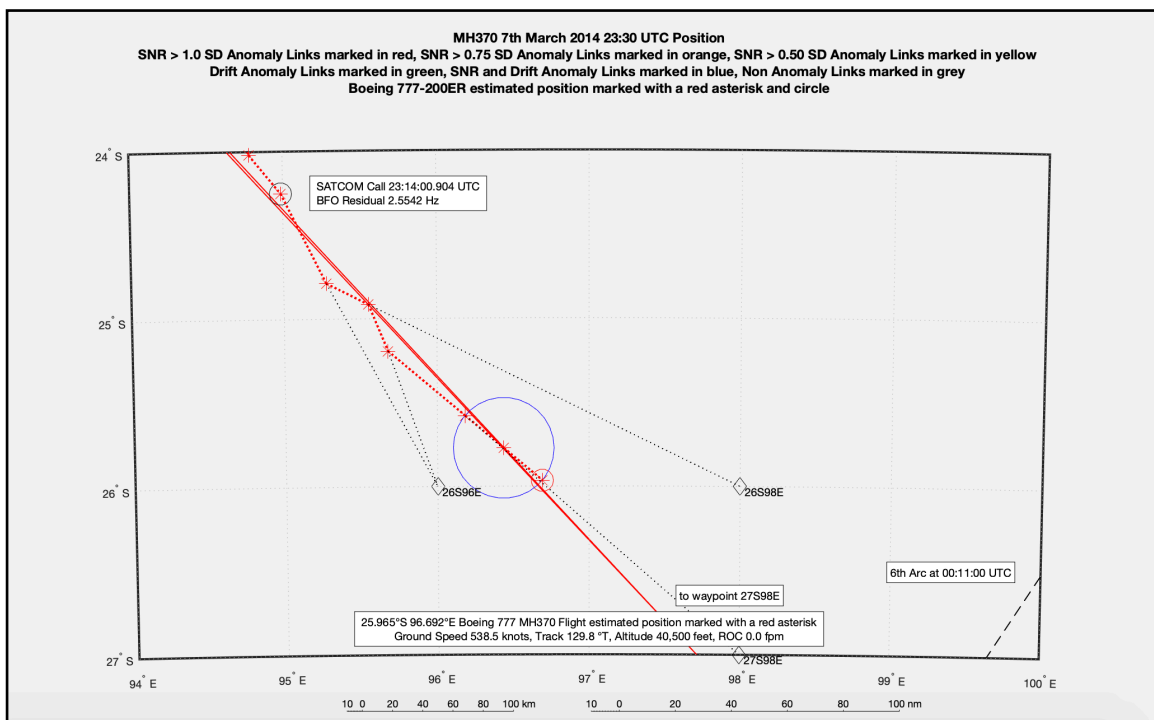


Figure 62: MH370 estimated position at 23:30 UTC.

At 23:32 UTC MH370 is detected by 2 WSPR SNR anomalies with a 2.08 and 1.89 SD and is tracking towards waypoint 27S98E. At 23:36 UTC MH370 is detected by a WSPR SNR anomaly with a 1.51 SD and is tracking towards waypoint 27S98E.

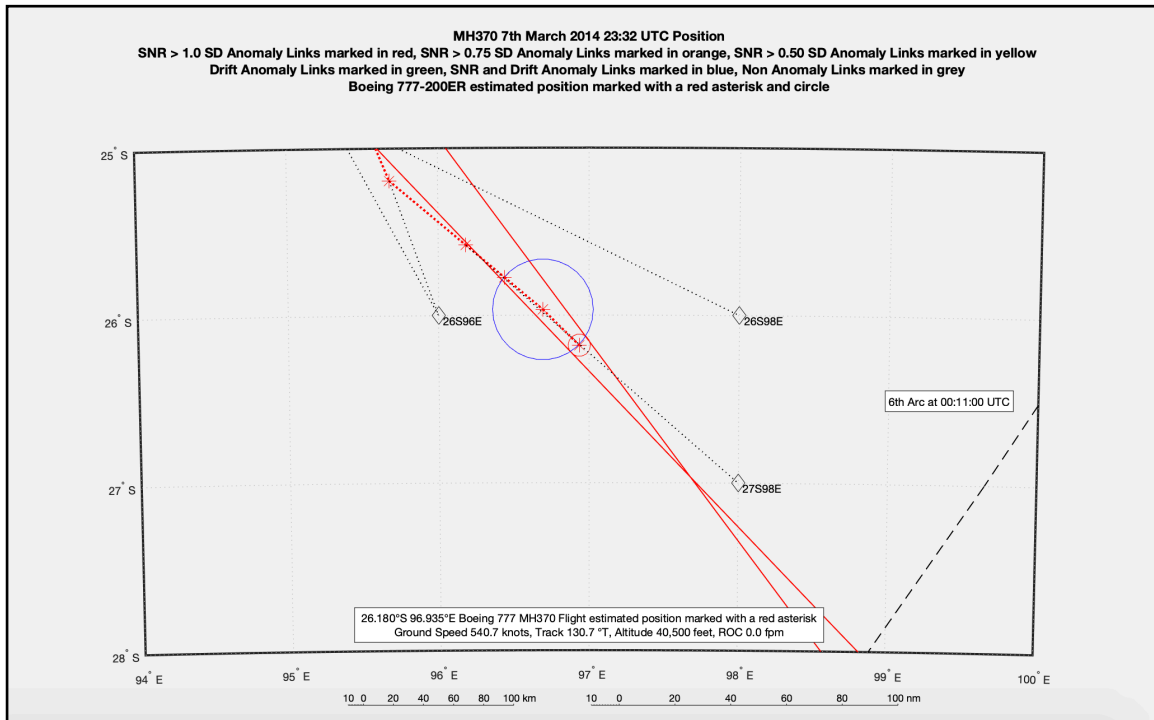


Figure 63: MH370 estimated position at 23:32 UTC.

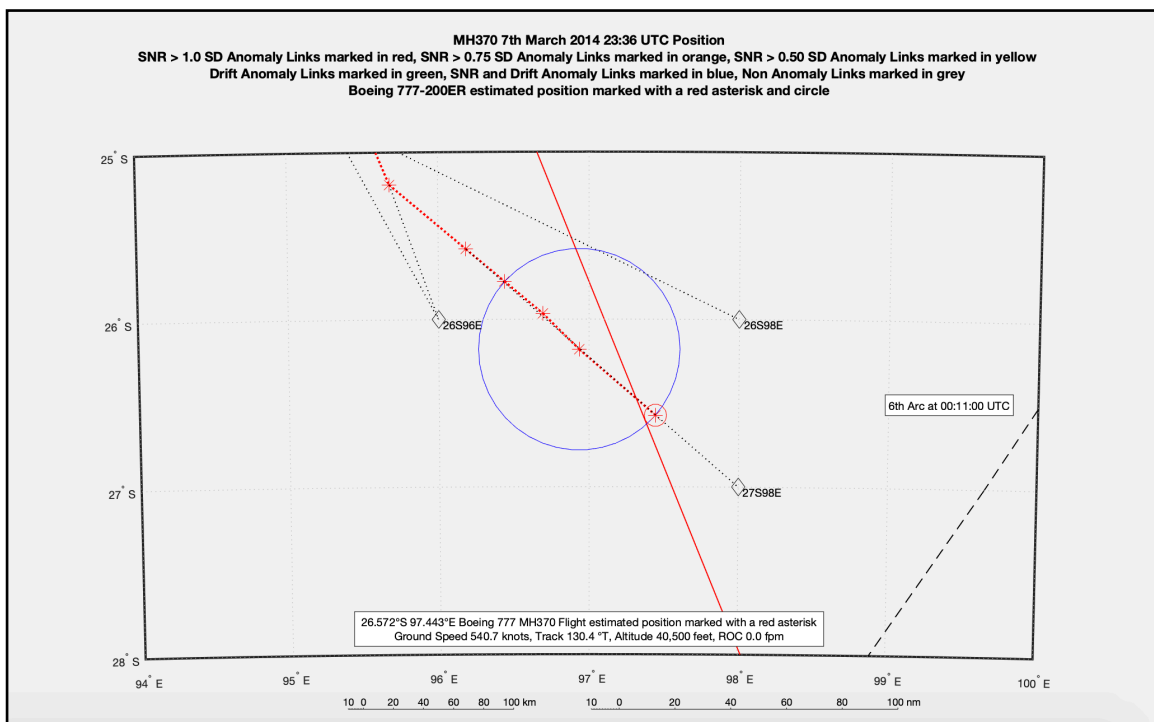


Figure 64: MH370 estimated position at 23:36 UTC.

At 23:38 UTC there was a position indicator at the intersection of 4 WSPR SNR anomalous links with standard deviations (SD) of 1.97, 1.76, 1.69 and 1.66 from the mean over ± 3 hours and MH370 is tracking towards waypoint 30S99E. At 23:40 UTC there was a position indicator at the intersection of 3 WSPR SNR anomalous links with 1.54, 1.08 and 0.81 SD as well as 1 WSPR drift anomaly of -1 Hz/minute and MH370 is still tracking towards waypoint 30S99E.

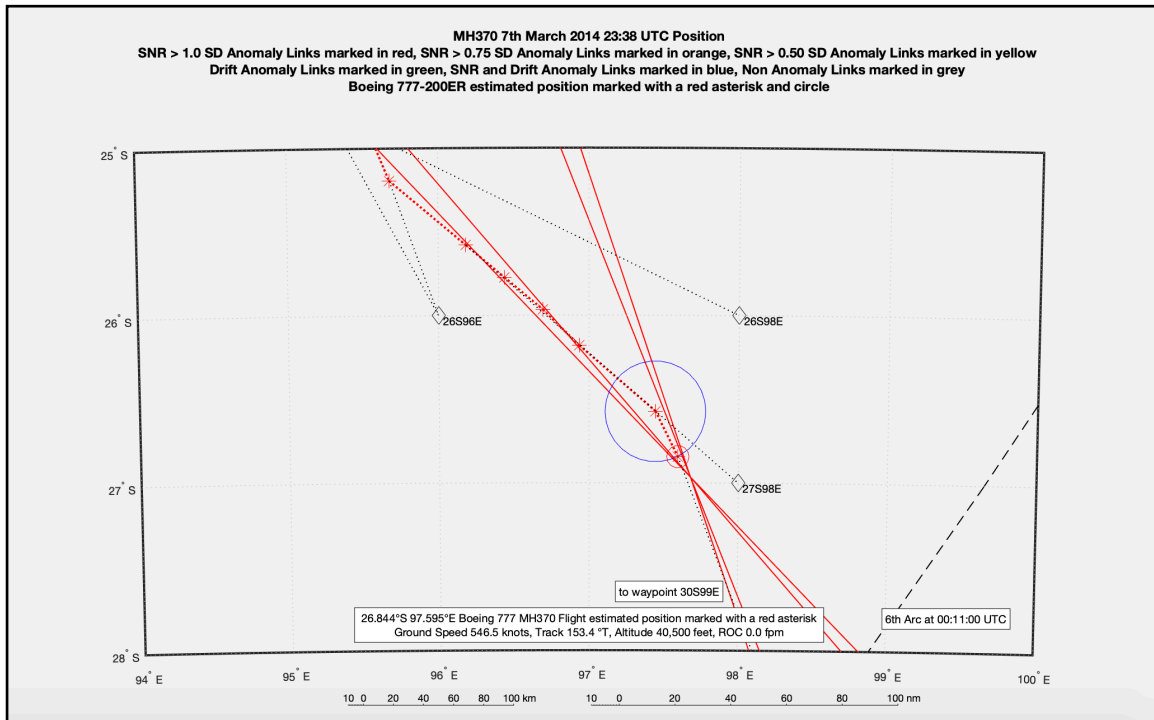


Figure 65: MH370 estimated position at 23:38 UTC.

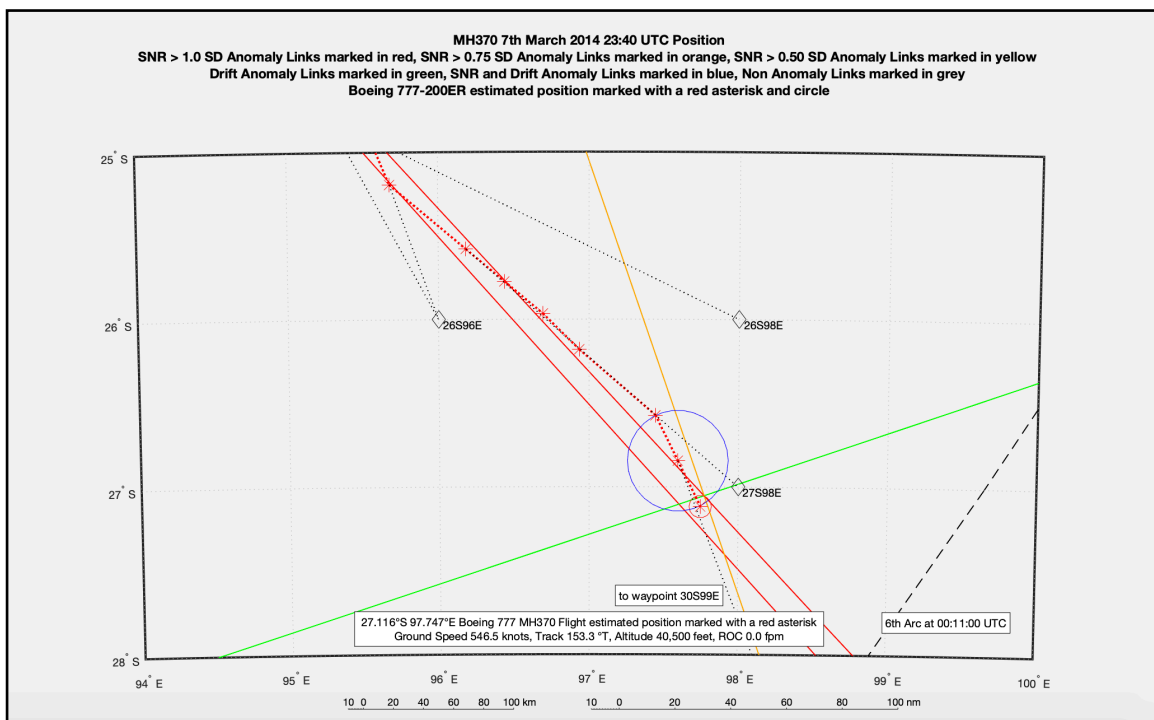


Figure 66: MH370 estimated position at 23:40 UTC.

At 23:44 UTC there was a progress indicator with 1 WSPR dual SNR and drift anomalous link with 0.82 and -1 Hz/minute. At the same time there were 3 WSPR SNR anomalous links with 1.43, 0.76 and a third again with a 0.76 SD. MH370 is tracking towards waypoint 28S99E. At 23:46 UTC there was a progress indicator with 2 WSPR SNR anomalous links with 1.80 and 0.93 SD and MH370 is tracking towards waypoint 29S98E.

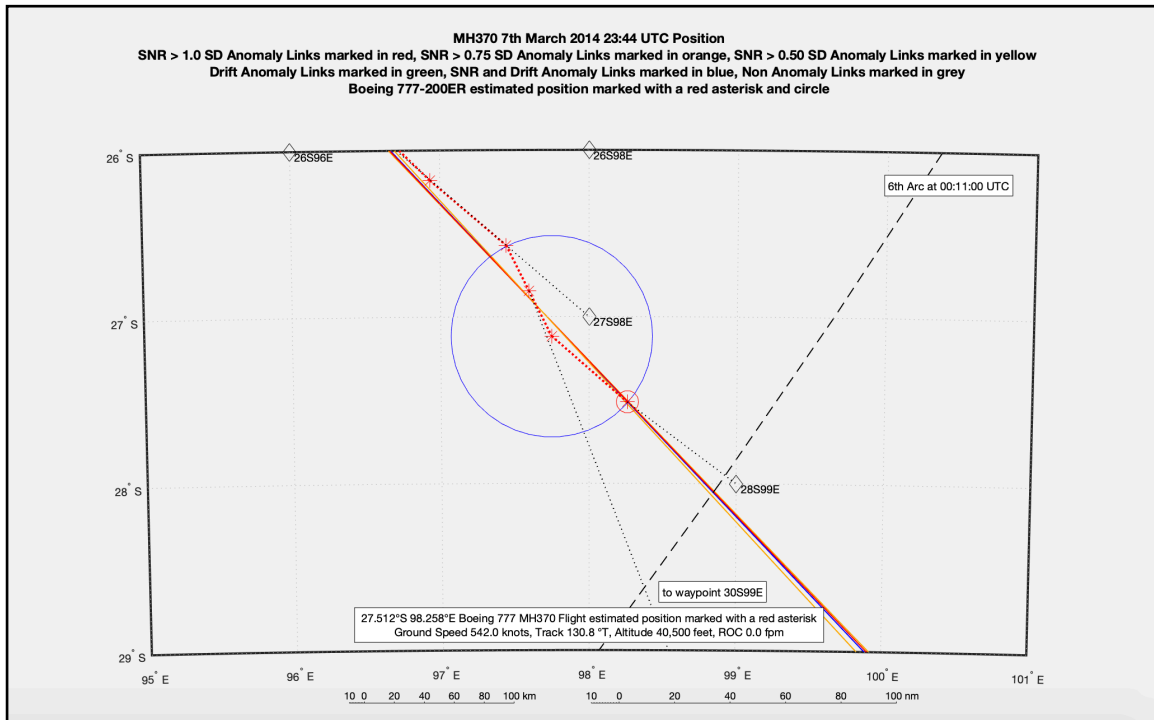


Figure 67: MH370 estimated position at 23:44 UTC.

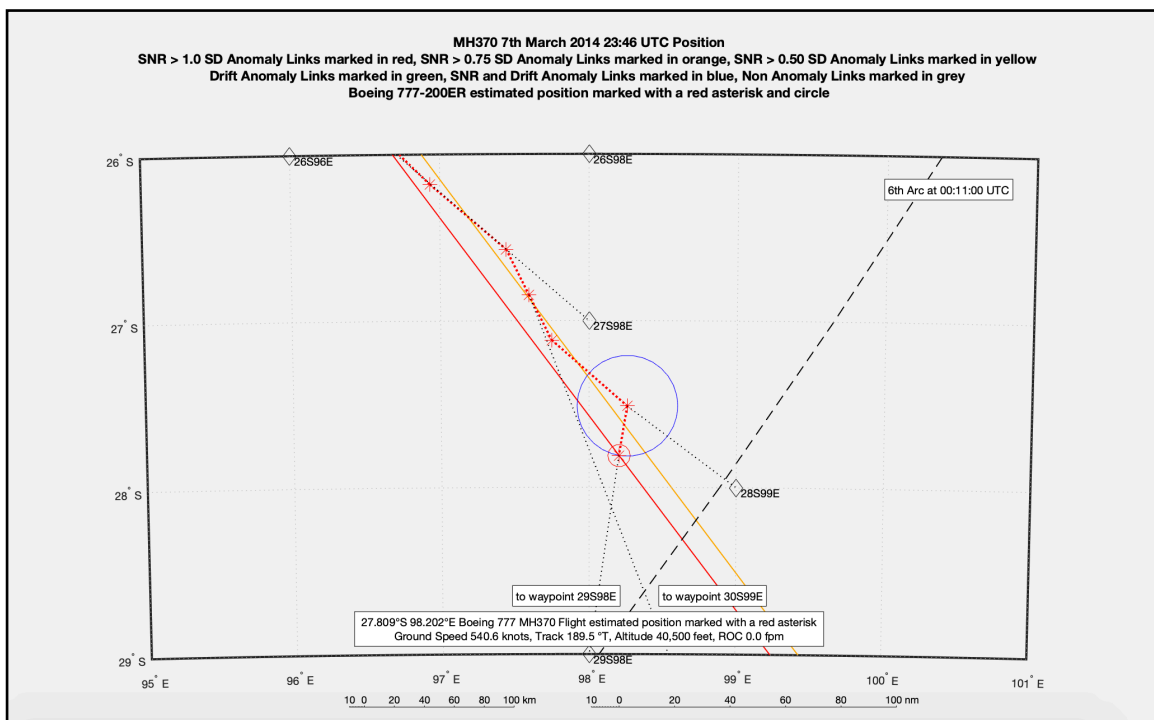


Figure 68: MH370 estimated position at 23:46 UTC.

At 23:48 UTC there was a position indicator at the intersection of 3 WSPR SNR anomalous links with 1.89, 1.56 and 0.98 SD and MH370 is tracking towards waypoint 30S100E. At 23:50 UTC there was a position indicator at the intersection of 5 WSPR SNR anomalous links with 2.02, 1.51, 1.05, 1.04 and 0.90 SD and MH370 is tracking towards waypoint MERIB, which is close to Perth, Australia.

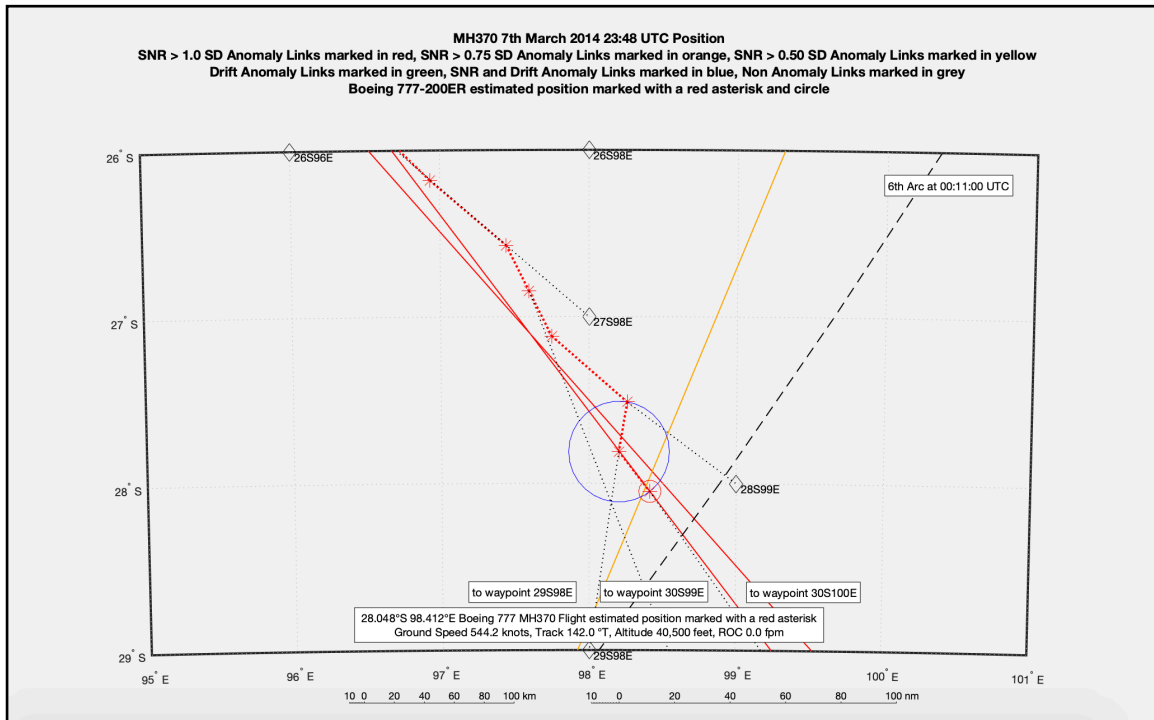


Figure 69: MH370 estimated position at 23:48 UTC.

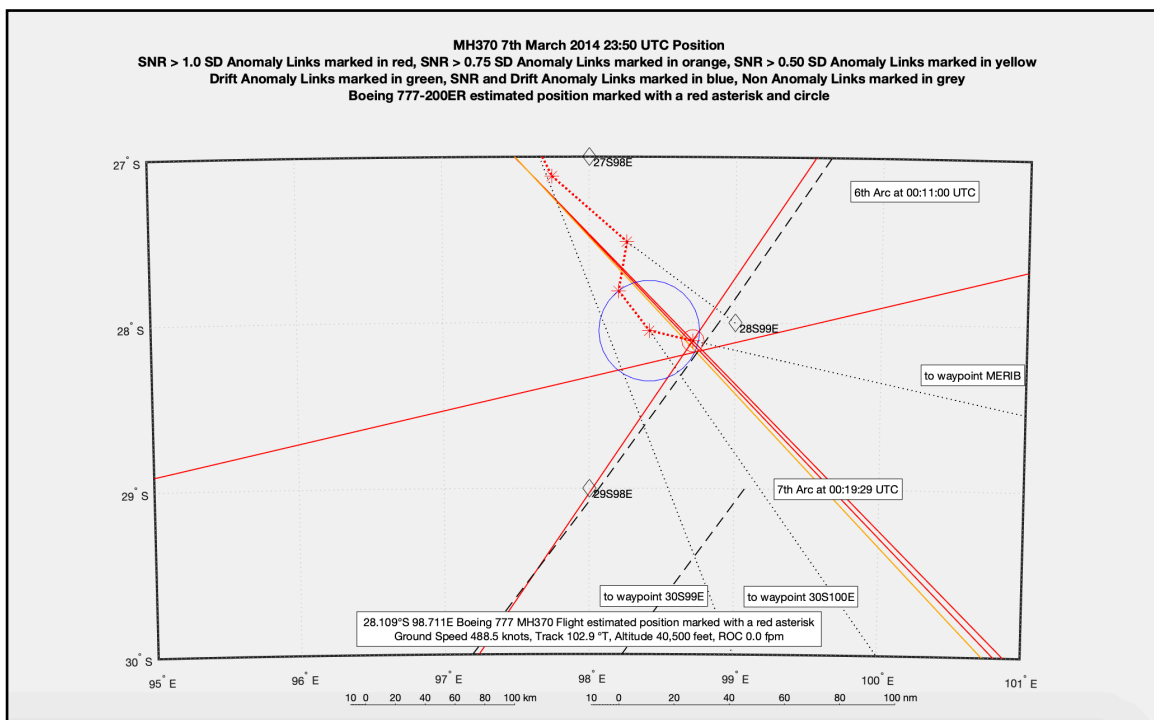


Figure 70: MH370 estimated position at 23:50 UTC.

At 23:54 UTC there was a progress indicator with 1 WSPR SNR anomalous link with 0.94 SD and MH370 is tracking towards waypoint 29S100E. At 23:56 UTC there was a position indicator at the intersection of 2 WSPR SNR anomalous links with 1.93 and 1.58 SD and MH370 is tracking towards waypoint 32S98E. One possible explanation of the number of turns is that the pilot was intermittently using the TCAS System to see what other traffic was in the vicinity. The pilot would be detected by any other aircraft within range as soon as the TCAS system was switched on and therefore wanted to always be on a different track in case the position and track were reported.

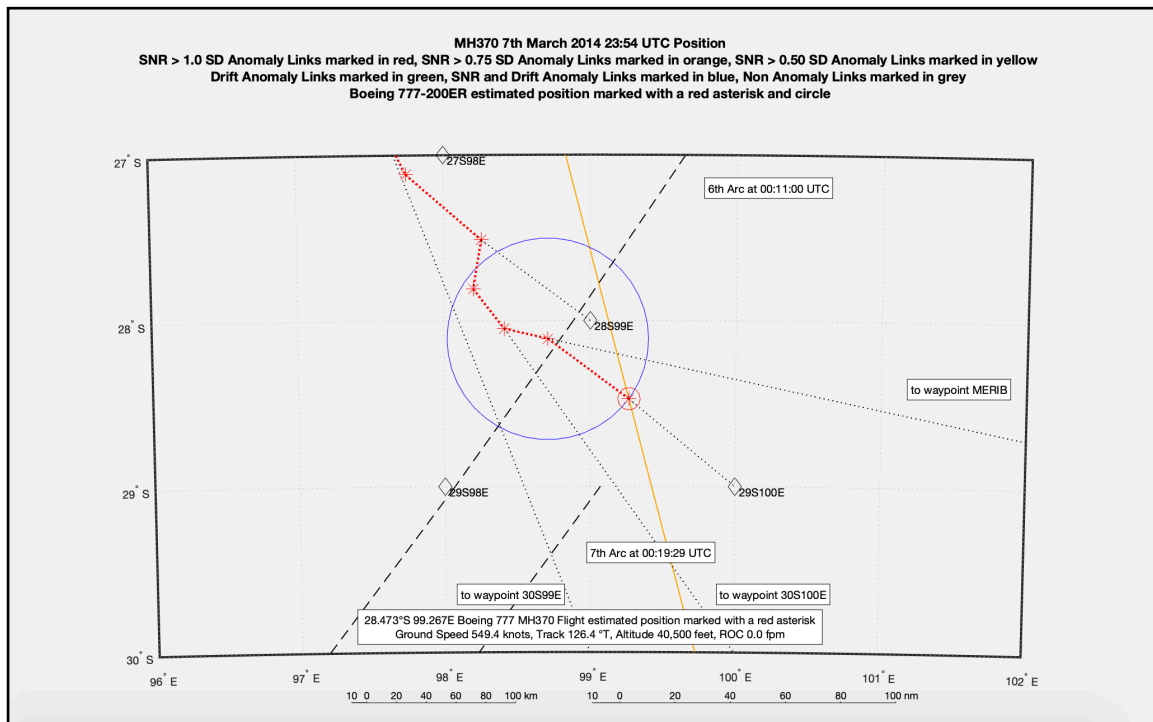


Figure 71: MH370 estimated position at 23:54 UTC.

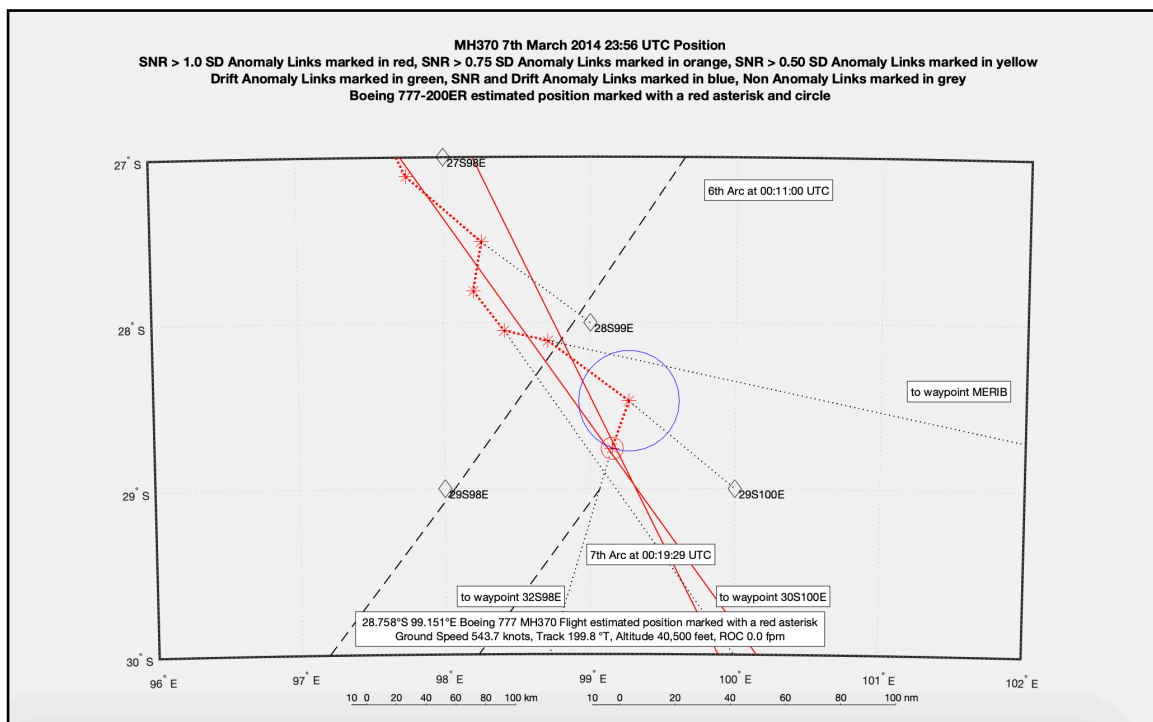


Figure 72: MH370 estimated position at 23:56 UTC.

At 23:58 UTC there was a position indicator at the intersection of 2 WSPR SNR anomalous links with 2.00 and 1.22 SD and indications are that MH370 is starting to circle. At this stage there was an estimated 432.1 kg of fuel remaining with a fuel range of 70.4 nmi until the right engine flame out and 132.6 nmi until the left engine flame out. At 00:00 UTC there was a position indicator at the intersection of 2 WSPR SNR anomalous links with 1.94 and 1.59 SD.

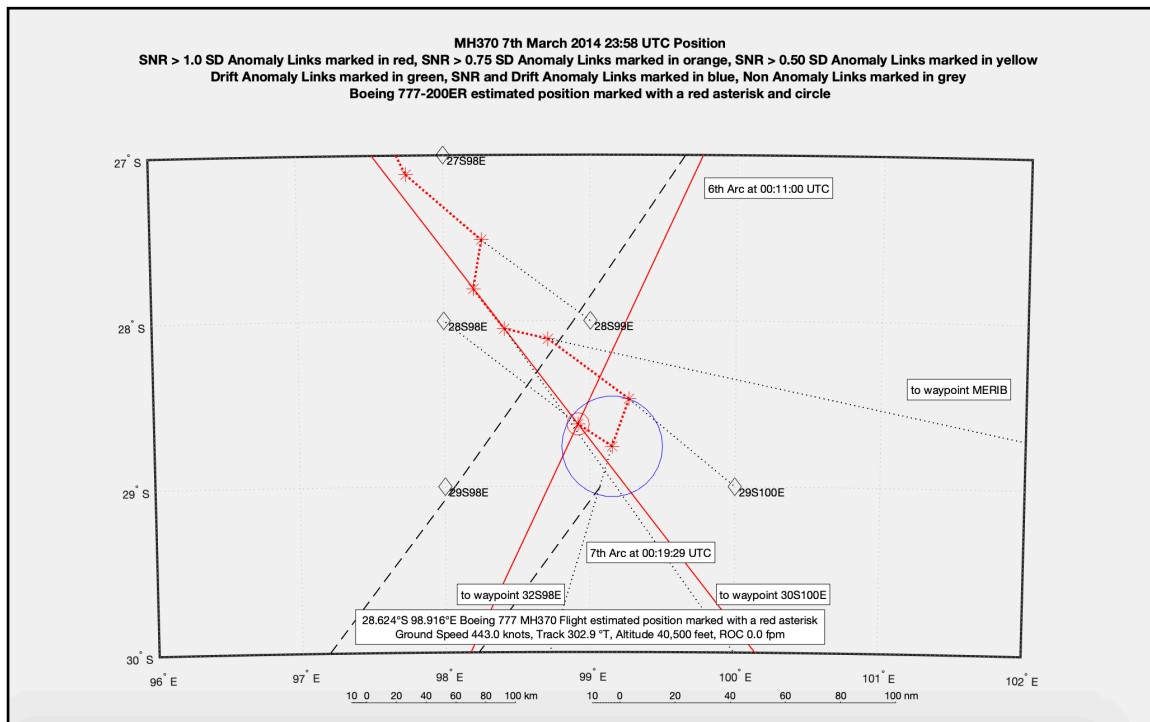


Figure 73: MH370 estimated position at 23:58 UTC.

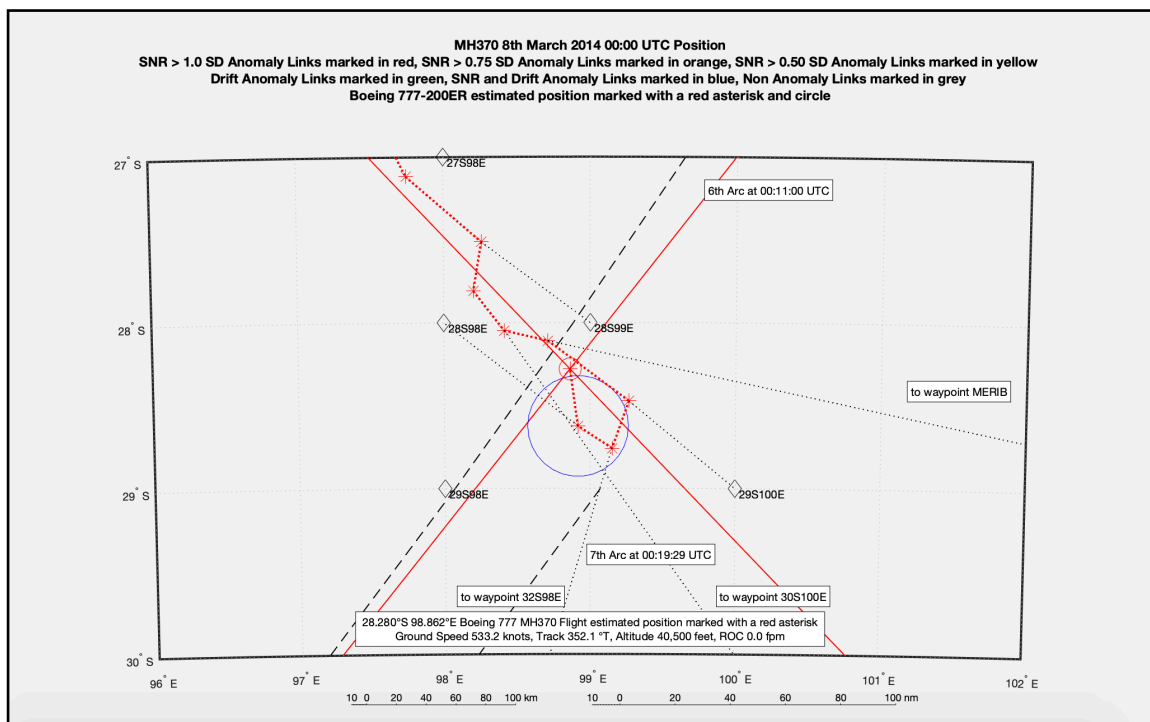


Figure 74: MH370 estimated position at 8th March 2014 00:00 UTC.

At 00:04 UTC there was a progress indicator with 6 WSPR SNR and drift anomalous links with 2.04, 1.43, 1.43, 1.03 SD as well as -2 Hz/minute, 0.96 and 0.95 SD. At 00:12 UTC there was a progress indicator with 2 WSPR SNR anomalous links with 2.31 and 1.44 SD. The Inmarsat data is matched at the 6th Arc. The right engine flameout is estimated at 00:07:27 UTC and the left engine flame out at 00:16:38 UTC.

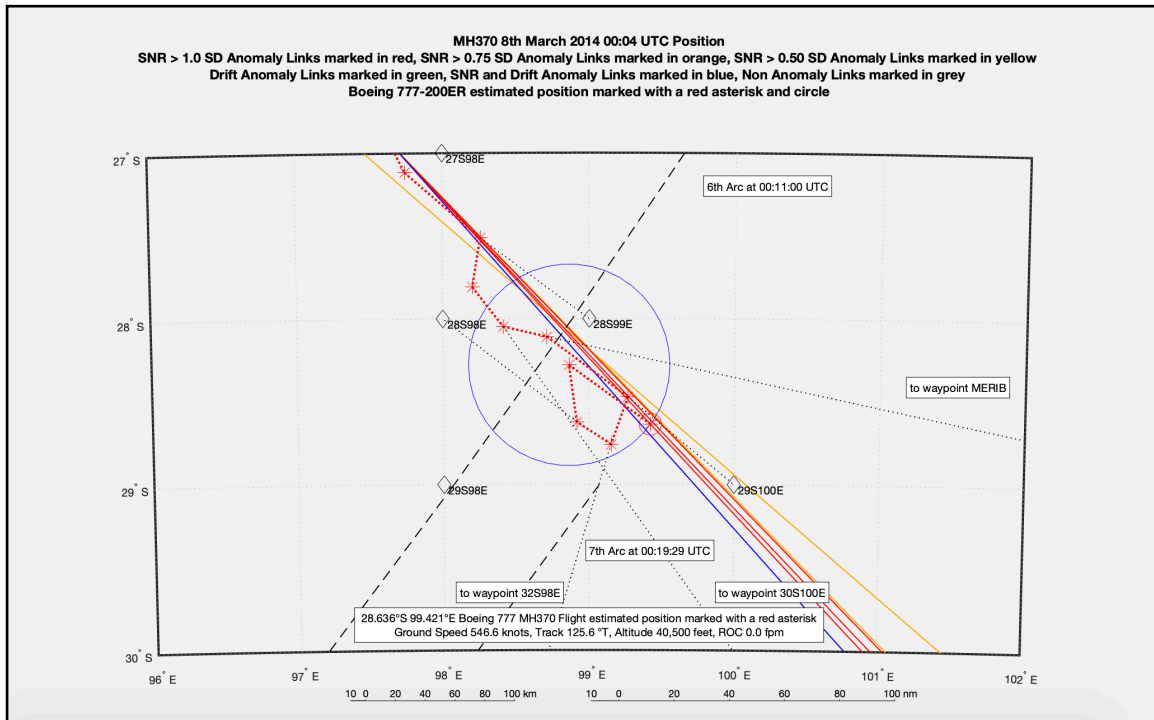


Figure 75: MH370 estimated position at 8th March 2014 00:04 UTC.

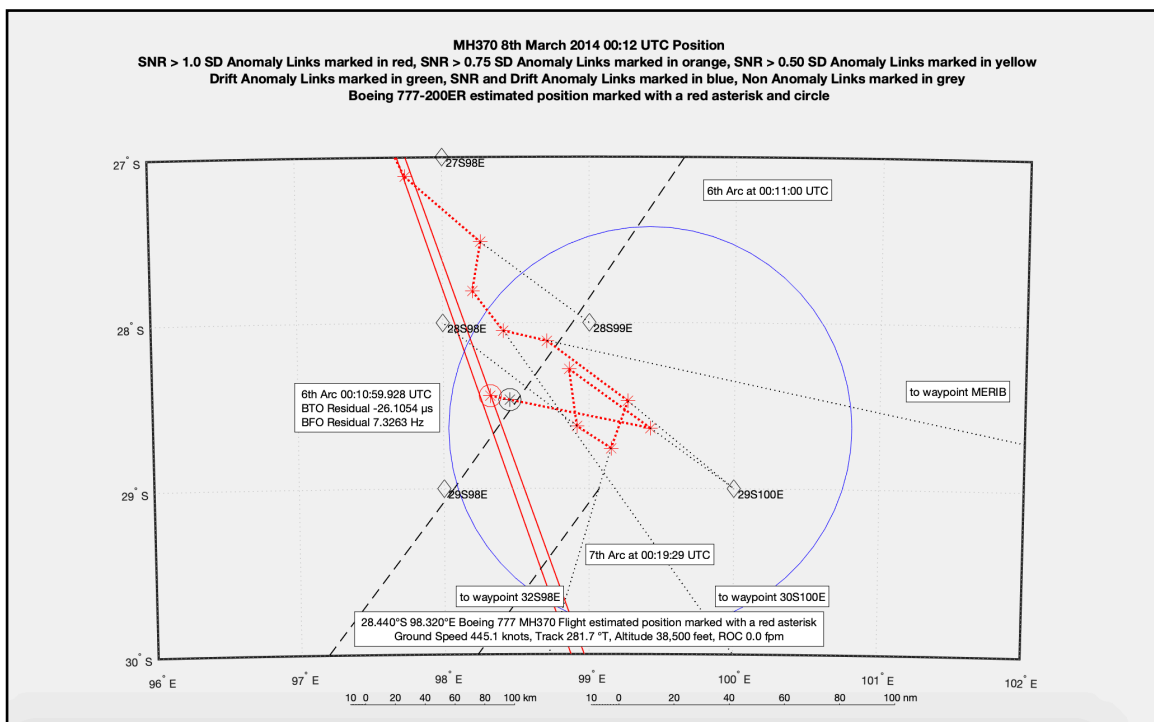


Figure 76: MH370 estimated position at 00:12 UTC.

At 00:16 UTC there was a position indicator at the intersection of 2 WSPR SNR anomalous links with 1.41 and 1.13 SD. At 00:20 UTC there was a position indicator at the intersection of 2 WSPR SNR anomalous links with 1.64 and 1.19 SD. The Inmarsat data is matched at the 7th Arc at both 00:19:29 UTC and 00:19:37 UTC (Note: The BFO residual at the 7th Arc has been zeroised to obtain the rate of descent).

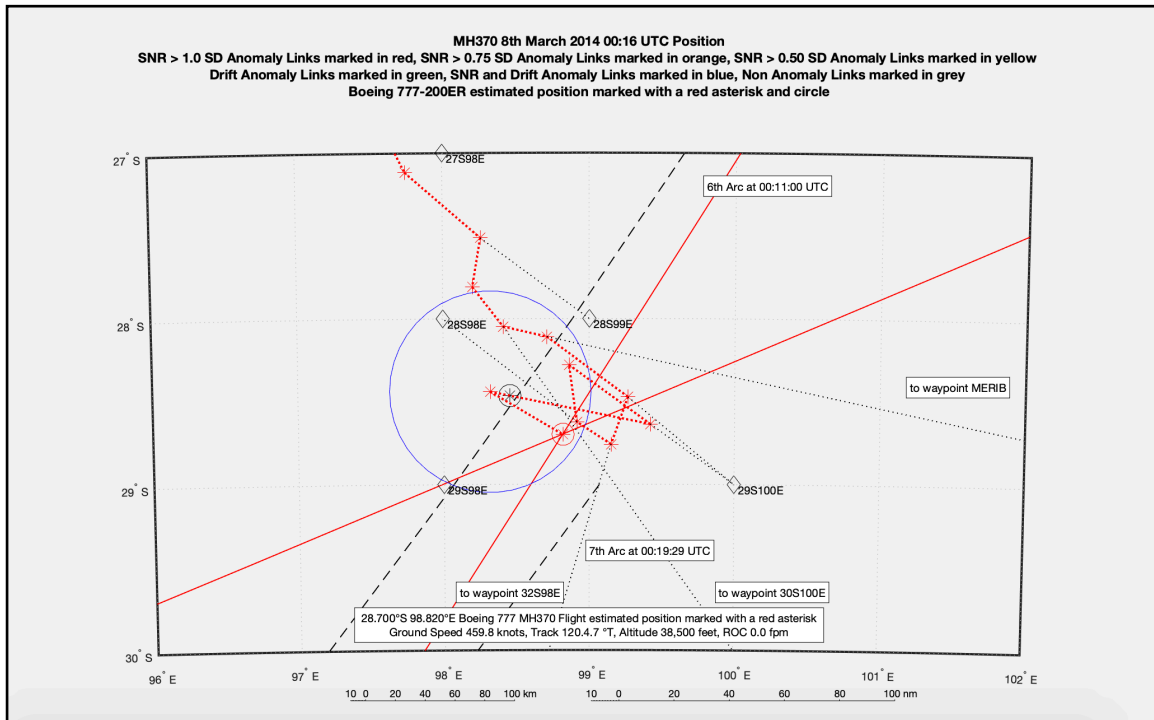


Figure 77: MH370 estimated position at 00:16 UTC.

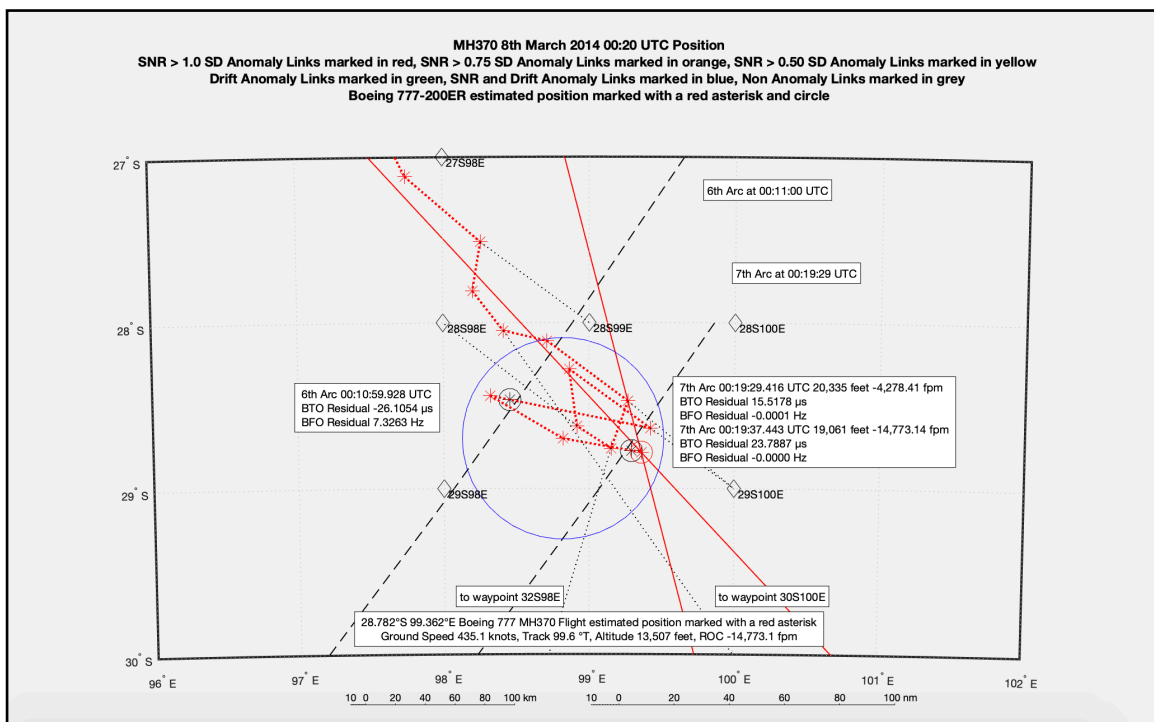


Figure 78: MH370 estimated position at 00:20 UTC.

The IFE signal was not received at 00:21:06 UTC because either the IFE was switched off or the IFE and SDU were no longer powered by the APU or both. At 00:26 UTC there was a position indicator at the intersection of 3 independent WSPR SNR anomalous links with 1.67, 1.46 and 1.15 SD from 3 separate transmitters to 3 separate receivers (NH7SR - KE7KRF, KK4U - YV4GJN, HB9CZF - W4MO). This result indicates a possible recovery from the accelerating rate of descent of -14,773 fpm at 00:19:37 UTC. At 00:28 UTC there was a progress indicator with 4 WSPR SNR anomalous links but all from the same transmitter W4MO.

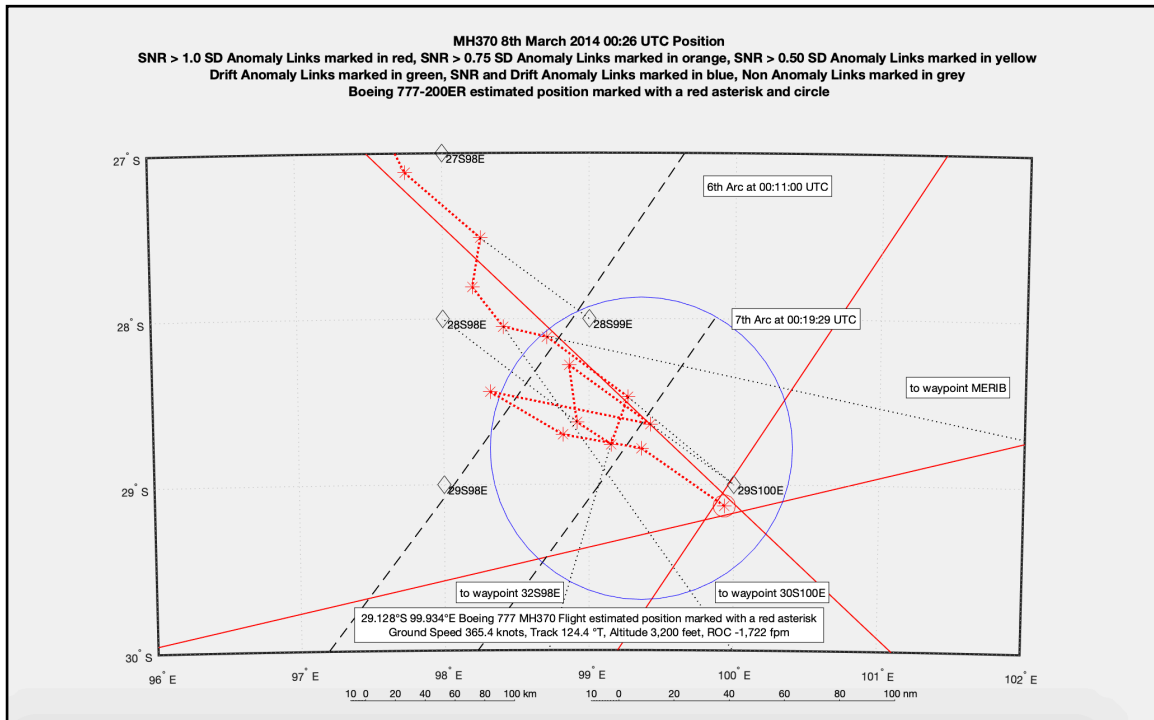


Figure 79: MH370 estimated position at 00:26 UTC.

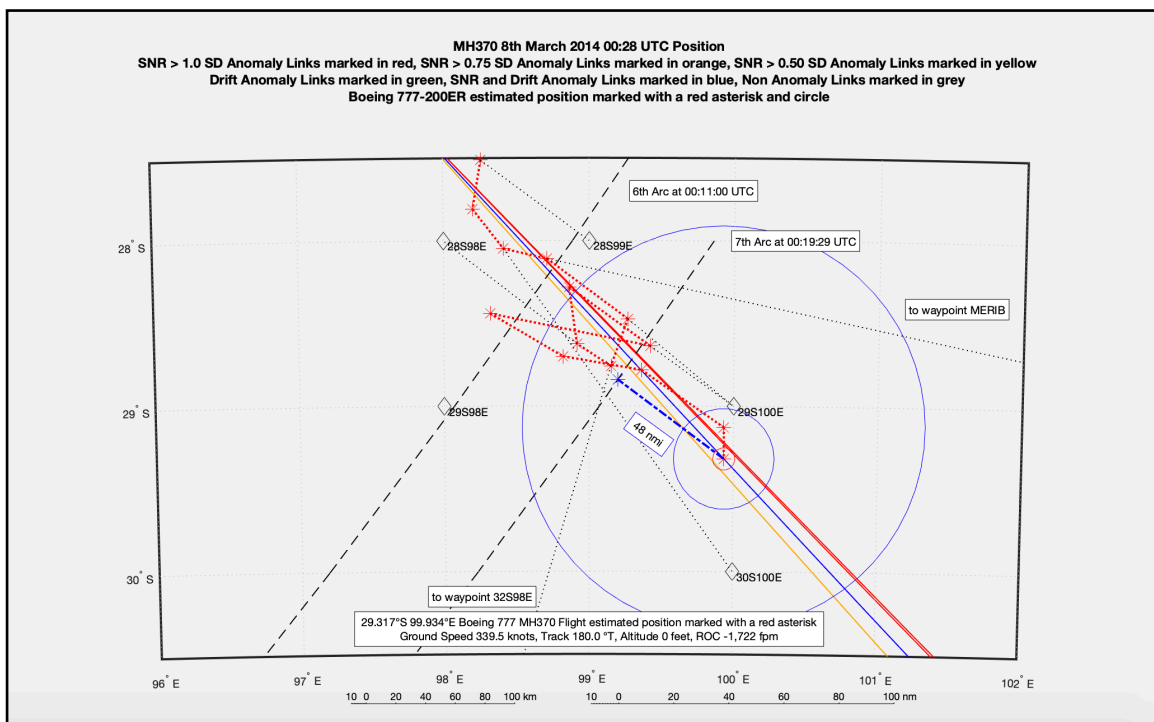


Figure 80: MH370 estimated position at 00:28 UTC.

Boeing performed 10 end of flight simulations with various criteria of starting altitude, ground speed, autopilot disengagement timing at 1st engine flameout or 2nd engine flameout and turbulence setting. In 5 cases (Case 3, 4, 5, 6 and 10) the aircraft recovered from a rate of descent of over -15,000 fpm. In Case 5 the aircraft only recovered after the 11th swoop right at the end.

The average for Case 3, 4, 6 and 10 was a glide range of 58.5 nmi and glide duration of 471.8 seconds. The average flight duration from the point of first reaching a rate of descent of -15,000 fpm was a further 129.5 seconds. This would imply a crash at around 00:21:46 UTC. With an active pilot this time could be extended to 00:27:51 UTC, depending on the horizontal ground speed and assuming a 19° glide slope and average altitude recovery of 19,636 feet after the first descent from 40,000 feet (for Case 6 the start altitude was 35,000 feet).

There were no further WSPR anomalies that align to a possible flight path of MH370 at 00:30 UTC, 00:32 UTC and 00:34 UTC. A wide scale search at 00:34 UTC revealed only one WSPR anomaly at 30.300°S 99.650°E just inside the outer edge of the least likely search area marked in a pale yellow colour. This anomaly was discarded because it was 60.7 nmi further south than the last anomaly at 00:28 UTC on a bearing of 194.1°T, requiring an average ground speed of 607 knots to reach this position and another recovery from a high descent rate.

The crash location probability map is centred on the estimated position of MH370 at 00:20 UTC, with a possible position at 00:26 UTC and a less likely position at 00:28 UTC. There are 9 anomalous WSPR position indicators within the coloured area marked on the crash location probability map. The key areas are bounded by a rectangle 70 nmi x 42 nmi (10,084 km²).

The approximate depths at each point are:

1. 2,939 m at 28.672°S 99.362°E.
2. 3,768 m at 29.128°S 99.934°E.
3. 3,879 m at 29.317°S 99.934°E.

Table 5 on the next 4 pages lists all 67 positions and 125 anomalous WSPR links used to define the MH370 flight path and crash location. The details of each of the 125 anomalous links over a ± 3 hour timeframe can be found in Appendix H.

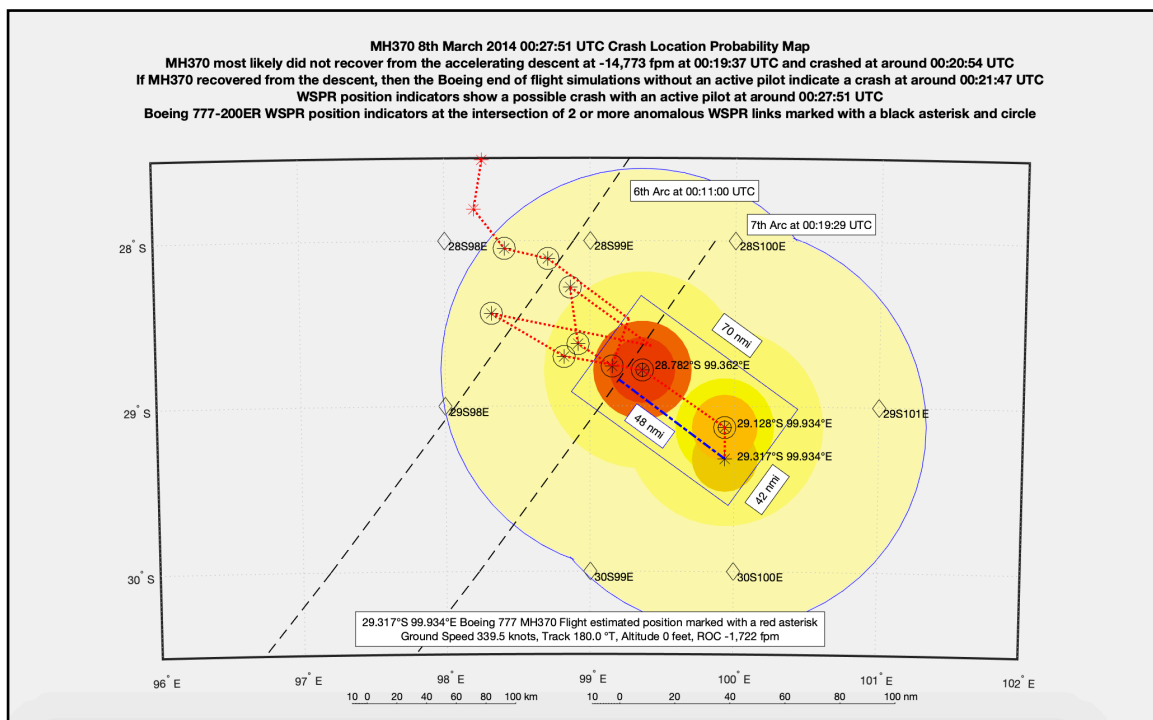


Figure 81: MH370 estimated crash location at 00:27:51 UTC.

ID	Tx	Rx	Date	UTC	File Links	Type	Latitude	Longitude	Sky Vector
1			07/03/2014	1801		00	5.589117920	99.165228400	053521S0990955E
2	DC5BN	2E0DSS	07/03/2014	1808	DC5BN2E0DSS1808	21	5.413	98.200	052447S0981200E
3	G8VDQ	DO6RPS	07/03/2014	1814	G8VDQDO6RPS1814	21	5.728	97.502	054341N0973007E
4	G8YTR	DL8YCA	07/03/2014	1824	G8YTRDL8YCA1824	11	6.142	96.202	060831N0961207E
5	DL8SEL	G8YTR	07/03/2014	1828	DL8SELG8YTR1828	11	6.493	95.871	062935N0955216E
6	HS0ZKM	KC6KGE	07/03/2014	1846	HS0ZKMKC6KGE1846	21	5.402	94.360	052407N0942136E
7	DF2JP	G3SXH	07/03/2014	1854	DF2JPG3SXH1854	01	4.374	94.146	042226N0940846E
8	N7SCQ	CX2ABP	07/03/2014	1916	N7SCQCX2ABP1916	21	1.815	94.732	014854N0944355E
9	HS0ZKM	K7UEB/20	07/03/2014	1928	HS0ZKMK7UEB/201928	11	0.695	93.729	004142N0934344E
10	G8VDQ	G0MQW	07/03/2014	1938	G8VDQG0MQW1938	11	-0.422	93.732	002519S0934353E
11	G8VDQ	G0MQW	07/03/2014	1940	G8VDQG0MQW1940	11	-0.643	93.906	003835S0935422E
12	G4FKK	ON7KB	07/03/2014	1948	G4FKKON7KB1948	11	-1.420	92.800	012512S0924800E
13	G4ZXE	ON7KB	07/03/2014	2016	G4ZXEON7KB2016	11	-4.300	92.595	041800S0923504E
14	KC6KGE	AG6IF	07/03/2014	2016	KC6KGEAG6IF2016	11			
15	OK2SAM	ON7KB	07/03/2014	2024	OK2SAMON7KB2024	11	-5.226	93.221	051334S0931316E
16	W3CSW	N2NOM	07/03/2014	2030	W3CSWN2NOM2030	11	-6.008	93.522	060029S0933119E
17	N7SCQ	ZP5BAB	07/03/2014	2036	N7SCQP5BAB2036	11	-6.836	93.758	065010S0934529E
18	ON7KO	G4ZXE	07/03/2014	2044	ON7KOG4ZXE2044	10	-7.815	93.149	074854S0930856E
19	ON7KO	G4ZXE	07/03/2014	2054	ON7KOG4ZXE2054	11	-8.931	93.984	085552S0935902E
20	US3IRX	OZ7IT	07/03/2014	2110	US3IRXOZ7IT2110	11	-10.742	93.917	104431S0935501E
21	K4RCG	W4AC	07/03/2014	2114	K4RCGW4AC2114	10	-10.903	93.397	105411S0932349E
22	OK2SAM	M0BLP	07/03/2014	2114	OK2SAMM0BLP2114	10			
23	G4ZXE	G4FKK	07/03/2014	2116	G4ZXEG4FKK2116	11	-11.116	93.544	110658S0933238E
24	KI7CI	JG1TWP/1	07/03/2014	2116	KI7CIJG1TWP/12116	10			
25	ON7KB	DK4TJ	07/03/2014	2138	ON7KBDK4TJ2138	10	-13.273	94.127	131623S0940737E
26	WA8RC	AI4RY	07/03/2014	2138	WA8RCAI4RY2138	31			
27	W4MO	K4RCG	07/03/2014	2144	W4MOK4RCG2144	10	-13.979	93.934	135844S0935602E
28	W3GXT	W4AC	07/03/2014	2150	W3GXTW4AC2150	11	-14.667	93.405	144001S0932418E
29	KC3AVT	W4AC	07/03/2014	2156	KC3AVTW4AC2156	01	-15.486	93.673	152910S0934023E
30	G3SXH	DK6UG	07/03/2014	2202	G3SXHDK6UG2202	11	-16.174	94.205	161026S0941218E
31	VA3ROM	KB9AMG	07/03/2014	2202	VA3ROMKB9AMG2202	10			
32	JH1GYE	WA5NGP	07/03/2014	2208	JH1GYEWA5NGP2208	11	-16.861	94.741	165140S0944428E

Table 5: WSPR Anomalous Links and MH370 Positions.

ID	Tx	Rx	Date	UTC	File Links	Type	Latitude	Longitude	Sky Vector
33	K4RCG	W4AC	07/03/2014	2210	K4RCGW4AC2210	11	-17.073	94.941	170423S0945628E
34	DH5RAE	OE1MSB	07/03/2014	2216	DH5RAEOE1MSB2216	10	-17.709	95.545	174232S0953242E
35	W4MO	KC3AVT	07/03/2014	2222	W4MOKC3AVT2222	11	-18.116	94.331	180658S0941952E
36	OK2SAM	PI4THT	07/03/2014	2230	OK2SAMPI4THT2230	11	-19.255	94.330	191518S0941948E
37	G3NZP	DH5RAE	07/03/2014	2232	G3NZPDH5RAE2232	11	-19.510	94.480	193036S0942848E
38	G4KPX	DL1DBC	07/03/2014	2236	G4KPXDL1DBC2236	11	-20.020	94.781	200112S0944652E
39	OX3XR	N2NOM	07/03/2014	2242	OX3XRN2NOM2242	11	-20.788	94.319	204717S0941908E
40	KI7CI	KB4RG	07/03/2014	2244	KI7CIKB4RG2244	10	-21.044	94.164	210238S0940950E
41	W3HH	W3BI	07/03/2014	2248	W3HHW3BI2248	11	-21.603	94.358	213611S0942129E
42	G6RRL	DK6UG	07/03/2014	2252	G6RRLDK6UG2252	11	-21.502	94.972	213007S0945819E
43	JH1GYE	KD6RF	07/03/2014	2252	JH1GYEKD6RF2252	11			
44	WD0UG	KB9VLR	07/03/2014	2252	WD0UGKB9VLR2252	10			
45	KI6STW	KB4RG	07/03/2014	2258	KI6STWKB4RG2258	11	-22.358	95.172	222129S0951019E
46	W3HH	OX3XR	07/03/2014	2258	W3HHOX3XR2258	11			
47	G4KPX	PA3ABK/2	07/03/2014	2300	G4KPXPA3ABK/22300	11	-22.643	95.239	223835S0951420E
48	KB1CHU	W4MO	07/03/2014	2302	KB1CHUW4MO2302	11	-22.790	94.970	224724S0945812E
49	K4RCG	OX3XR	07/03/2014	2304	K4RCGOX3XR2304	10	-22.818	94.651	224905S0943904E
50	KI7CI	WA5NGP	07/03/2014	2304	KI7CIWA5NGP2304	21			
51	AD4PT	W7ZWW	07/03/2014	2308	AD4PTW7ZWW2308	11	-23.445	94.633	232642S0943759E
52	G8VDQ	YO3ITD	07/03/2014	2308	G8VDQYO3ITD2308	20			
53	W4AC	2E0DSS	07/03/2014	2312	W4AC2E0DSS2312	11	-24.020	94.783	240112S0944659E
54	VK3DXE	ZL1AML	07/03/2014	2314	VK3DXEZL1AML2314	11	-24.250	94.987	241500S0945913E
55	G8VDQ	W4MO	07/03/2014	2318	G8VDQW4MO2318	31	-24.788	95.279	244717S0951644E
56	K4RCG	OX3XR	07/03/2014	2318	K4RCGOX3XR2318	01			
57	ON7KB	W4MO	07/03/2014	2318	ON7KBW4MO2318	21			
58	W4AC	M6NNB	07/03/2014	2320	W4ACM6NNB2320	11	-24.915	95.553	245454S0953311E
59	W4AC	OE6PWD	07/03/2014	2320	W4ACOE6PWD2320	11			
60	W4AC	ON4SAR	07/03/2014	2320	W4ACON4SAR2320	11			
61	W9HLY	K4EH	07/03/2014	2320	W9HLYK4EH2320	11			
62	W9HLY	KB1MVX	07/03/2014	2320	W9HLYKB1MVX2320	11			
63	W4MO	2E0DSS	07/03/2014	2322	W4MO2E0DSS2322	10	-25.193	95.679	251135S0954044E
64	W4MO	DK6UG	07/03/2014	2322	W4MODK6UG2322	10			

Table 5: WSPR Anomalous Links and MH370 Positions (continued).

ID	Tx	Rx	Date	UTC	File Links	Type	Latitude	Longitude	Sky Vector
65	W4MO	M5ADA	07/03/2014	2322	W4MOM5ADA2322	11			
66	W4MO	OE3VMS	07/03/2014	2322	W4MOOE3VMS2322	10			
67	W4MO	OE6PWD	07/03/2014	2322	W4MOOE6PWD2322	10			
68	W4MO	ON7KB	07/03/2014	2322	W4MOON7KB2322	21			
69	W4MO	PI4THT	07/03/2014	2322	W4MOPI4THT2322	11			
70	G8VDQ	W4AC	07/03/2014	2326	G8VDQW4AC2326	11	-25.580	96.184	253448S0961102E
71	HB9CZF	W4AC	07/03/2014	2326	HB9CZFW4AC2326	11			
72	W3HH	W3CSW	07/03/2014	2328	W3HHW3CSW2328	11	-25.773	96.438	254623S0962617E
73	W4AC	2E0DSS	07/03/2014	2328	W4AC2E0DSS2328	11			
74	W4AC	M6NNB	07/03/2014	2328	W4ACM6NNB2328	11			
75	DK0SC	W4AC	07/03/2014	2330	DK0SCW4AC2330	11	-25.965	96.692	255754S0964131E
76	G4ANN	W4AC	07/03/2014	2330	G4ANNW4AC2330	11			
77	DG7RJ	W4AC	07/03/2014	2332	DG7RJW4AC2332	11	-26.180	96.935	261048S0965606E
78	OZ7IT	W4AC	07/03/2014	2332	OZ7ITW4AC2332	11			
79	WA3DNM	W4MO	07/03/2014	2336	WA3DNMW4MO2336	11	-26.572	97.443	263419S0972635E
80	W4AC	DG7RJ	07/03/2014	2338	W4ACDG7RJ2338	11	-26.844	97.595	265038S0973542E
81	W4AC	M5ADA	07/03/2014	2338	W4ACM5ADA2338	11			
82	W4AC	W3GXT	07/03/2014	2338	W4ACW3GXT2338	11			
83	W4AC	WA3DNM	07/03/2014	2338	W4ACWA3DNM2338	11			
84	2E0DSS	W4MO	07/03/2014	2340	2E0DSSW4MO2340	11	-27.116	97.747	270658S0974449E
85	AA7FV	W4MO	07/03/2014	2340	AA7FVW4MO2340	31			
86	G8VDQ	W4AC	07/03/2014	2340	G8VDQW4AC2340	11			
87	KZ3X	OX3XR	07/03/2014	2340	KZ3XOX3XR2340	01			
88	W4AC	DK0SC	07/03/2014	2344	W4ACDK0SC2344	21	-27.512	98.258	273043S0981529E
89	W4AC	DK6UG	07/03/2014	2344	W4ACDK6UG2344	01			
90	W4AC	M6NNB	07/03/2014	2344	W4ACM6NNB2344	11			
91	W4AC	ON7KB	07/03/2014	2344	W4ACON7KB2344	01			
92	GM4SFW	W4MO	07/03/2014	2346	GM4SFWW4MO2346	11	-27.809	98.202	274832S0981207E
93	G4JVF	W4MO	07/03/2014	2348	G4JVFW4MO2348	11	-28.048	98.412	280253S0982443E
94	OZ7IT	W4MO	07/03/2014	2348	OZ7ITW4MO2348	11			
95	WD4LHT	K9AN	07/03/2014	2348	WD4LHTK9AN2348	10			

Table 5: WSPR Anomalous Links and MH370 Positions (continued).

ID	Tx	Rx	Date	UTC	File Links	Type	Latitude	Longitude	Sky Vector
96	NH7SR	WA5NGP	07/03/2014	2350	NH7SRWA5NGP2350	11	-28.109	98.711	280632S0984240E
97	W4MO	DG7RJ	07/03/2014	2350	W4MODG7RJ2350	11			
98	W4MO	M6NNB	07/03/2014	2350	W4MOM6NNB2350	11			
99	W4MO	ON4SAR	07/03/2014	2350	W4MOON4SAR2350	10			
100	WB8ELK	VE6PDQ/1	07/03/2014	2350	WB8ELKVE6PDQ/12350	11			
101	W3CSW	N2NOM	07/03/2014	2354	W3CSWN2NOM2354	10	-28.473	99.267	282823S0991601E
102	N1NCO	OH7AZL	07/03/2014	2356	N1NCOOH7AZL2356	11	-28.758	99.151	284529S0990904E
103	W4AC	VE1AIM	07/03/2014	2356	W4ACVE1AIM2356	11			
104	K9AN	VE4KE	07/03/2014	2358	K9ANVE4KE2358	11	-28.624	98.916	283726S0985458E
105	W4MO	OZ7IT	07/03/2014	2358	W4MOOZ7IT2358	11			
106	G8VDQ	W4MO	08/03/2014	0000	G8VDQW4MO0000	11	-28.280	98.862	281648S0985143E
107	WD4LHT	KV0S	08/03/2014	0000	WD4LHTKV0S0000	11			
108	IK1NET	W4MO	08/03/2014	0004	IK1NETW4MO0004	01	-28.636	99.421	283810S0992516E
109	W4AC	2E0DSS	08/03/2014	0004	W4AC2E0DSS0004	11			
110	W4AC	DK6UG	08/03/2014	0004	W4ACDK6UG0004	01			
111	W4AC	M6NNB	08/03/2014	0004	W4ACM6NNB0004	11			
112	W4AC	ON4SAR	08/03/2014	0004	W4ACON4SAR0004	11			
113	W4AC	PI4THT	08/03/2014	0004	W4ACPI4THT0004	21			
114	KZ3X	OX3XR	08/03/2014	0012	KZ3XOX3XR0012	11	-28.440	98.320	282624S0981912E
115	W3GXT	W4AC	08/03/2014	0012	W3GXTW4AC0012	11			
116	JH1GYE	VE6PDQ	08/03/2014	0016	JH1GYEVE6PDQ0016	11	-28.700	98.820	284200S0984912E
117	W3HH	KK5MR	08/03/2014	0016	W3HHKK5MR0016	11			
118	W3CSW	N2NOM	08/03/2014	0020	W3CSWN2NOM0020	11	-28.782	99.362	284655S0992143E
119	W4MO	2E0DSS	08/03/2014	0020	W4MO2E0DSS0020	11			
120	HB9CZF	W4MO	08/03/2014	0026	HB9CZFW4MO0026	11	-29.128	99.934	290741S0995602E
121	KK4U	YV4GJN	08/03/2014	0026	KK4UYV4GJN0026	11			
122	NH7SR	KE7KRF	08/03/2014	0026	NH7SRKE7KRF0026	11			
123	W4MO	2E0DSS	08/03/2014	0028	W4MO2E0DSS0028	21	-29.317	99.934	291901S0995602E
124	W4MO	DK6UG	08/03/2014	0028	W4MODK6UG0028	11			
125	W4MO	M6NNB	08/03/2014	0028	W4MOM6NNB0028	11			
126	W4MO	PI4THT	08/03/2014	0028	W4MOPI4THT0028	01			

Table 5: WSPR Anomalous Links and MH370 Positions (continued).

7. Reproducibility.

The code, data and associated files can be made available free of charge to bona fide academic researchers, who wish to reproduce the results in their own environments. The code package of Matlab scripts and data is 687 files (22.6 MB). The case study comprises 2,434 files (710.8 MB).

Applications are invited via either the website invitation page at <https://www.mh370search.com/invitation/> or email richard@mh370search.com.

Applicants will be required to give their full name, street address, academic affiliation and a valid email that aligns with their proper name. Data is available in both Microsoft Windows Excel and Apple Mac Numbers data format. Code is only available in Matlab format. Delivery is via Dropbox.

8. Discussion of Results.

Part of the crash area shown in Figure 81 has been searched before by Ocean Infinity on 10th May 2018. The search width either side of the 7th Arc was around 22 nmi at this latitude. As no points of interest were found during the previous search, it is therefore reasonable to start with that part of the new search area further out than 22 nmi from the 7th Arc and not previously scoured by the Autonomous Underwater Vehicles (AUVs) from Ocean Infinity.

In Figure 82 the track of the Ocean Infinity vessel Seabed Constructor is marked in red and the points where the ship stopped to launch or collect AUVs are marked with black and white dots. The bathymetric data is only partially available for this location and there is an underwater sea mount in the vicinity of the 7th Arc marked with a dotted yellow line. The depths in the areas coloured orange are down to 3,000 m depth, coloured yellow are down to 3,500 m depth and coloured blue are down to 4,000 m depth.

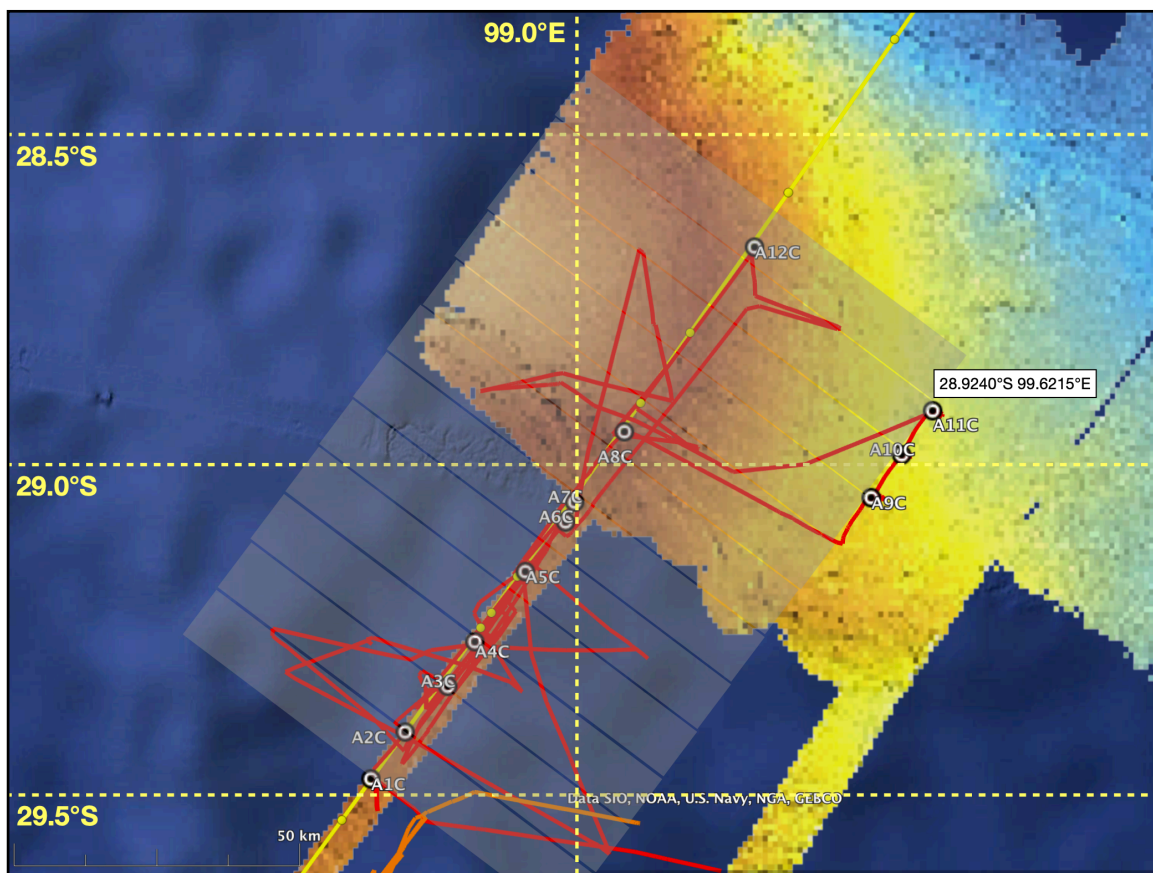


Figure 82: Previous Search Area covered by Ocean Infinity on 10th May 2018.

A .kml file of the search area is available for download at the following link:

https://www.dropbox.com/scl/fi/9in2j4oealrbqc8wg8huk/MH370_Search_Area.kml?rlkey=65doypmdfym2m9z0ewqy25hew&dl=0

The .kml file can be viewed with Google Earth as shown in Figure 83. The Altitude Mode is specified as relative to sea level. The World Geodetic System 1984 (WGS84) is specified for the .kml output. This results in a small area of sea being displayed in Google Earth around an underwater sea mount, which is shown more clearly in Figure 84.

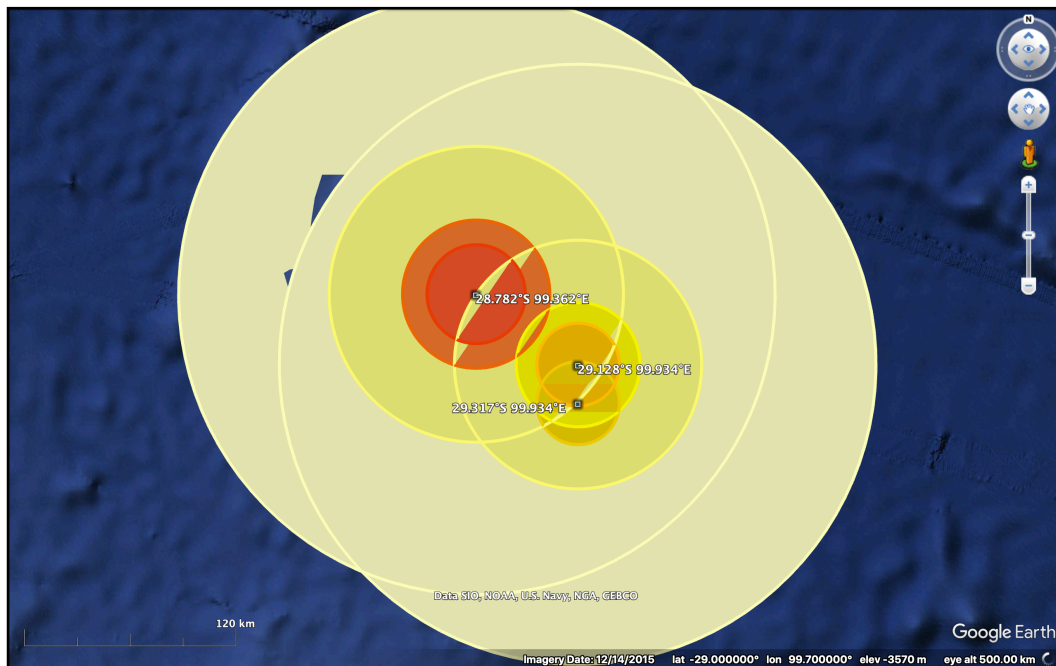


Figure 83: Google Earth View of proposed MH370 Search Area .

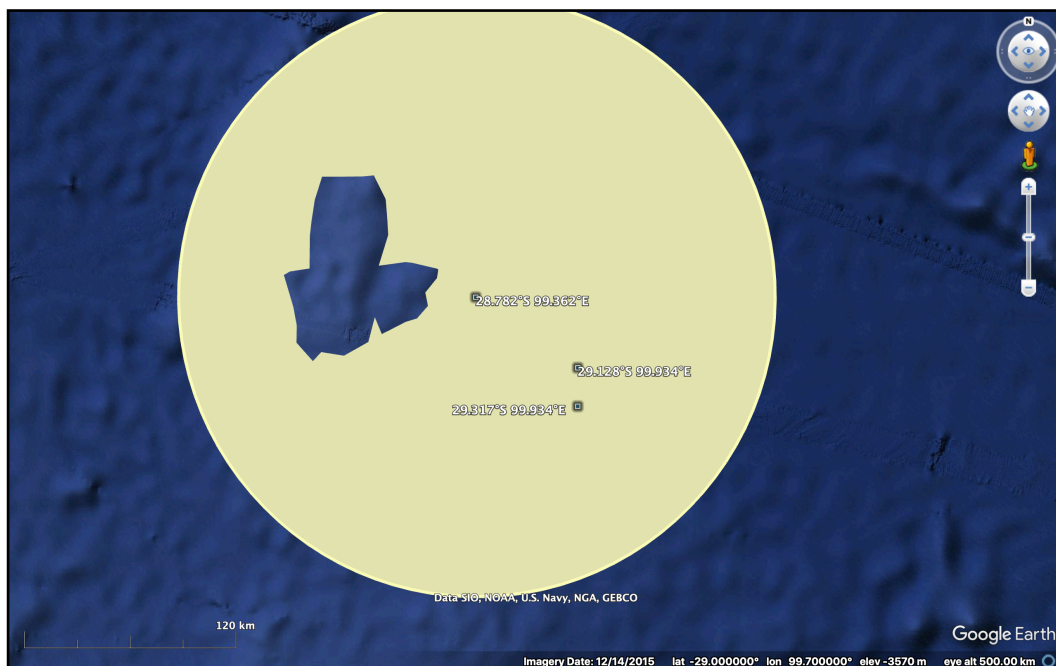


Figure 84: Google Earth View of Sea Mount in the MH370 Search Area .

There are 16 WSPR anomalies with a SNR of more than two standard deviations from the mean over a ± 3 hour timeframe. These are mostly when MH370 was turning or circling. In nearly all cases either the transmitter or MH370 or both were on the grey line. HF ionospheric transmissions experience better propagation at either dawn or dusk in the twilight or grey zone. The propagation distances from transmitter to aircraft and back to the receiver are shown in Table 6 below and range from 12,157 km to 38,026 km. An example propagation path is shown in Figure 85. The transmitter W3HH, receiver W3CSW and MH370 are all on the grey line.

ID	UTC	Tx	Rx	AC Lat	AC Lon	AC Alt	AC Trk	AC	Scatter	SNR SD %	Signal	Action	Route	Great Circle Distance (km)	Tx to AC Take Off IB	Tx to AC Landing FB	Tx to C Landing FB Rev	AC to Rx Take Off IB	Comment
1	19:48	G4FKK	ON7KB	-1.420	92.800	34,500	231.9	Straight	Back	-221	Enhanced	Reflection	Europe-Asia-Indian Ocean-Asia-Europe	20357	88.426	141.261	321.261	321.254	Tx Grey Line
2	21:10	US3IRX	OZ7IT	-10.742	93.917	34,500	214.0	Turning	Back	-217	Enhanced	Reflection	Asia-Indian Ocean-Asia-Europe	18992	123.135	145.399	325.399	325.464	Night
3	21:50	W3GXT	W4AC	-14.867	93.405	38,500	216.9	Turning	Back	-216	Enhanced	Reflection	USA-Artic-Europe-Asia-Indian Ocean-Asia-Europe-Artic-USA	17097	21.567	162.921	342.921	343.266	Tx and AC Grey Line
4	22:36	G4KXP	DL1DBC	-20.020	94.781	38,500	150.8	Turning	Back	-280	Enhanced	Reflection	Europe-Asia-Indian Ocean-Asia-Europe	23543	98.944	140.019	320.019	320.006	Tx Grey Line
5	22:42	OX3XR	NZNM	-20.788	94.319	38,500	290.7	Turning	Back	231	Diminished	Deflection	Artic-Europe-Asia-Indian Ocean-Asia-Europe-Artic-USA	32024	43.732	161.169	341.169	341.387	Tx and AC Grey Line
6	22:48	W3HH	W3BI	-21.603	94.358	38,500	161.9	Turning	Back	265	Diminished	Deflection	USA-Artic-Europe-Asia-Indian Ocean-Asia-Europe-Artic-USA	36812	22.285	159.107	339.107	338.360	Tx and AC Grey Line
7	22:52	G6RRL	DK6UG	-21.502	94.972	38,500	79.9	Turning	Back	268	Diminished	Deflection	Europe-Asia-Indian Ocean-Asia-Europe	23835	99.160	137.955	317.955	317.938	AC Grey Line
8	23:04	K7CI	WASNGP	-22.818	94.651	38,500	264.7	Turning	Back	239	Diminished	Deflection	USA-Pacific Ocean-Asia-Indian Ocean-Asia-Pacific Ocean-USA	34813	289.525	232.364	52.364	51.566	AC Grey Line
9	23:08	AD4PT	WZ7WW	-23.445	94.633	38,500	181.5	Turning	Back	-227	Enhanced	Reflection	USA-Pacific Ocean-Asia-Indian Ocean-Asia-Pacific Ocean-USA	34339	310.590	224.001	44.001	44.655	AC Grey Line
10	23:14	OK3DXE	ZL1AML	-24.250	94.987	38,500	140.8	Turning	Back	241	Diminished	Deflection	Australia-Indian Ocean-Australia-New Zealand	12517	272.966	300.418	120.418	120.463	AC Grey Line
11	23:28	W3HH	W3CSW	-25.773	96.438	40,500	129.9	Straight	Back	200	Diminished	Deflection	USA-Artic-Europe-Asia-Indian Ocean-Asia-Europe-Artic-USA	38026	18.303	162.250	342.250	340.018	Tx and AC Grey Line
12	23:32	DG7RJ	W4AC	-26.180	96.935	40,500	130.7	Straight	Back	-208	Enhanced	Reflection	Europe-Asia-Indian Ocean-Asia-Europe-Atlantic Ocean-USA	31704	111.099	136.180	316.180	331.147	AC Grey Line
13	23:50	W4MO	DG7RJ	-28.109	98.711	40,500	102.9	Turning	Forward	-202	Enhanced	Reflection	USA-Pacific Ocean-Indian Ocean-Asia-Europe	31940	35.093	324.537	144.537	135.303	Tx and AC Grey Line
14	23:58	W4MO	OZ7IT	-28.624	98.916	40,500	320.9	Circling	Forward	200	Diminished	Deflection	USA-Pacific Ocean-Indian Ocean-Asia-Europe	32165	30.957	328.559	148.559	142.230	Tx and AC Grey Line
15	00:04	W4AC	2E0DSS	-28.636	99.421	40,500	125.6	Circling	Forward	204	Diminished	Deflection	USA-Pacific Ocean-Indian Ocean-Asia-Europe	32994	36.745	322.593	142.593	136.808	Tx and AC Grey Line
16	00:12	KZ3X	OX3XR	-28.440	98.320	40,500	281.7	Circling	Back	-231	Enhanced	Reflection	USA-Artic-Europe-Asia-Indian Ocean-Asia-Europe-Artic	34097	22.171	160.885	340.885	340.448	Tx and AC Grey Line

Table 6: WSPR Anomalous Links with greater than 2.0 SD SNR anomalies.

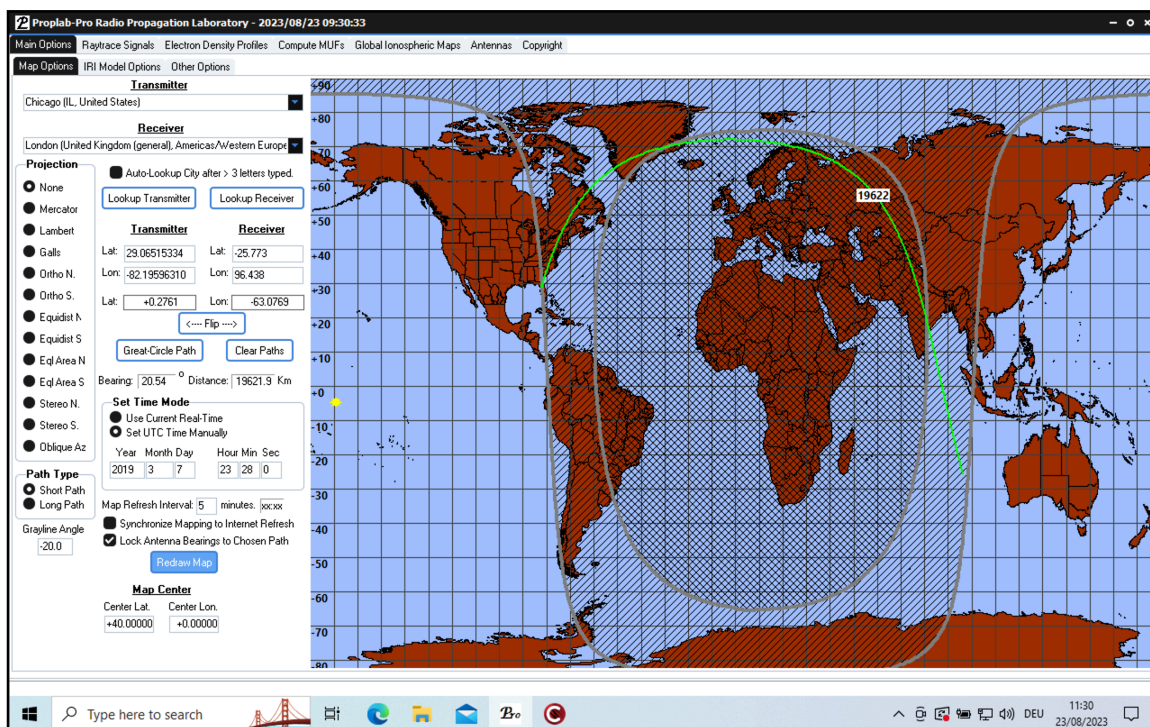


Figure 85: Propagation Path between W3HH to W3CSW to MH370 at 23:28 UTC.

The MH370 positions where the 16 WSPR anomalies with a SNR of more than two standard deviations from the mean over a ± 3 hour timeframe are shown in Figure 86 below. The starting point is the last known point from the Butterworth primary civilian radar. The MH370 estimated positions crossing each of the seven Arcs defined by the Inmarsat satellite BTO data are also included.

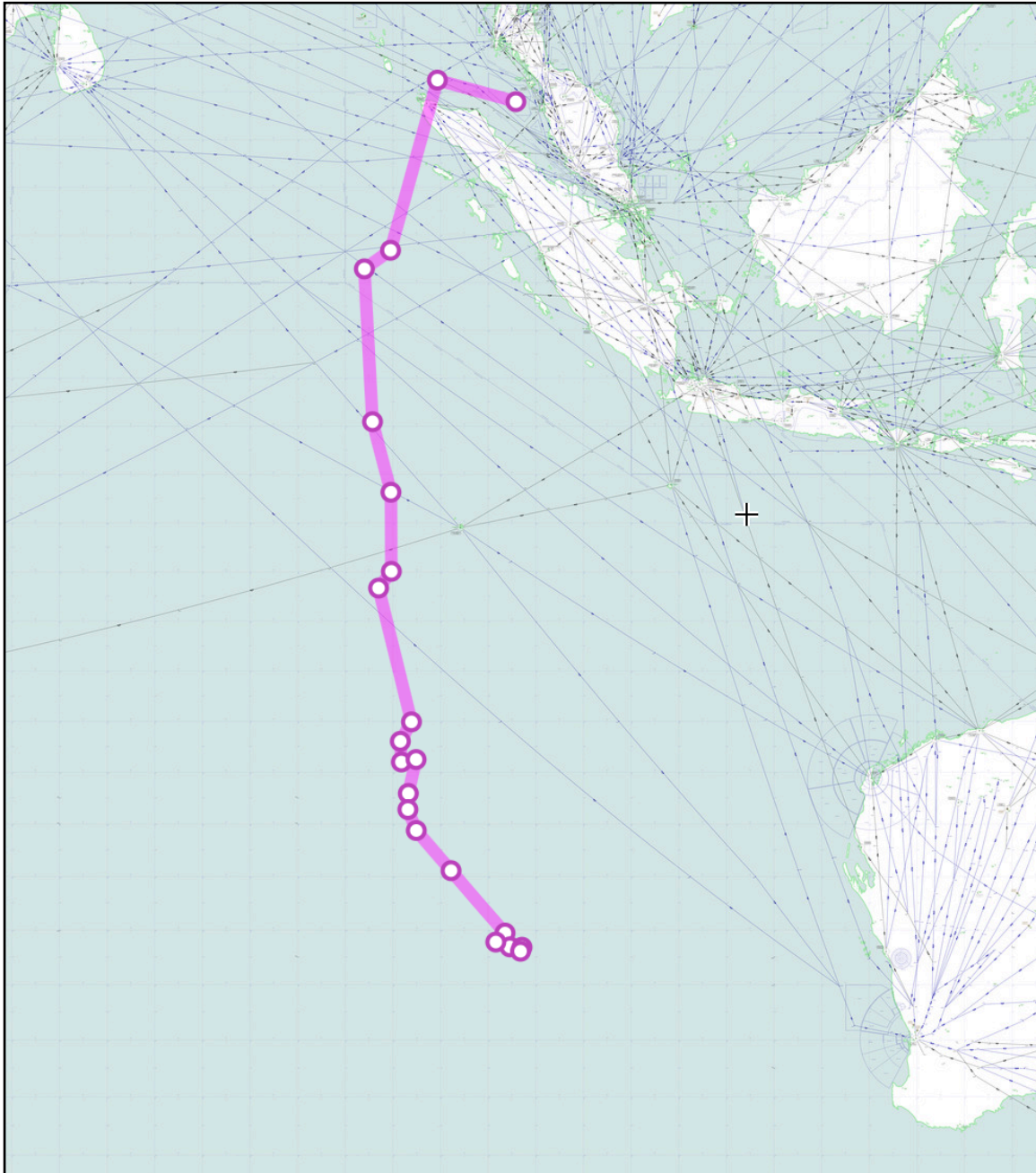


Figure 86: Sky Vector of MH370 positions with WSPR SNR anomalies greater than 2.0 SD.

From the Inmarsat satellite data we know that the Satellite Data Unit (SDU) experienced a power up reboot starting at 18:25:27.421 UTC and which was completed at 18:28:14.904 UTC. When the BTO data settled at 18:28:05.904 UTC, Boeing calculated the remaining fuel at this point in time was 73,908 lbs or 33,524 kg assuming a flight level of FL300, Mach 0.838 and TAS 494 knots.

The estimated fuel range at 18:28 UTC assuming a constant flight at Mach 0.838, flight level FL350 and based on the winds encountered on a 180°T track was 5,117 km centred on a position at 6.493°N 95.871°E. However the WSPR analysis indicates that there was neither a constant straight line flight path, nor a constant flight level. On the contrary, there were a large number of turns and two step climbs at around 21:14 UTC and 23:18 UTC, which will have significantly changed the fuel range. By 21:14 UTC at a position of 14.0°S 93.945°E close to waypoint 14S93E the estimated fuel range was 2,149 km. By 23:30 UTC at a position of 26.0°S 96.731558°E close to waypoint 26S96E the estimated fuel range was 619 km.

Towards the end of flight the pilot circled twice over the end location, which will have again required further fuel. One possible explanation of the circling is that the pilot was checking for any shipping in the vicinity. There was no cloud cover at this location and time according to the GDAS cloud cover map. There was substantial cloud cover further south and west, which may also be a reason for selecting this end location around 29.0°S 99.5°E. The pilot may have been checking for any shipping that might observe the crash of MH370.

A map showing the MH370 flight paths from the preliminary WSPR findings dated 30th November 2021, as compared with the report dated 8th September 2022 and the results presented in this case study is shown in Figure 87 below. The technique was continually refined and improved after feedback from various persons and entities and as a result of a large number of trials and case studies conducted. Major improvements resulted from a tighter definition of a WSPR link anomaly and the more precise antenna database. Both the presence and absence of anomalous WSPR links in the target area are included in the analysis. The aircraft performance, WSPR detection, waypoint navigation and Inmarsat data all align.

The fuel range at 18:28 UTC of 5,117 km from a position estimated at 6.493°N 95.871°E, reducing to a fuel range of 2,149 km at 21:44 UTC and further reducing to a fuel range of 619 km at 23:30 UTC is also depicted in Figure 87 marked with a red line.

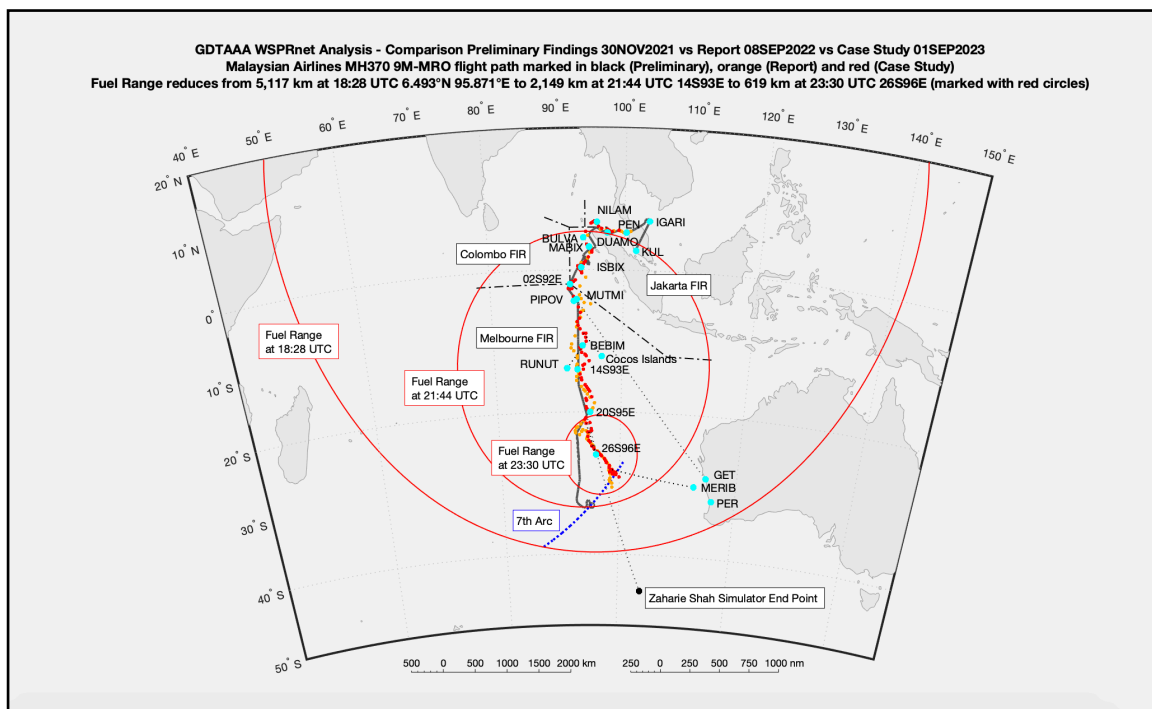


Figure 87: Comparison of WSPR Preliminary Findings, Report and Case Study.

There were 36 SDU Logons in the last 24 hours of 9M-MRO operations, covering both the MH371 and MH370 flights. Out of these 36, there were 22 normal SDU Logons with processing lasting an average of 75 seconds.

There were 3 time periods in this 24 hours where the SDU was powered down completely:

- (a) For an outage of up to 3h 48m 30s ending at 07/03/2014 12:50:19 UTC.
- (b) For an outage of up to 1h 17m 39s ending at 07/03/2014 18:25:27 UTC.
- (c) For an outage of up to 8m 29s ending at 08/03/2014 00:19:29 UTC.

The Logon process time following a power outage is quite different from the normal time of 75 seconds. The SDU Logon took 235.495 seconds at 12:50:19 UTC, 167.483 seconds at 18:25:27 UTC and was incomplete after only 8.991 seconds at 00:19:29 UTC.

There are four information steps in the Logon process:

- (a) Confirmation of the 9M-MRO identification.
- (b) Confirmation of the Flight Number e.g. MH370.
- (c) Confirmation of the Aircraft Time e.g. 16:00 UTC.
- (d) Confirmation of the In Flight Entertainment (IFE) Logon.

The final Logon at 15:59:55 UTC to the IOR satellite prior to the departure of MH370 from Kuala Lumpur completed all the information steps taking a little longer than the average process time at 84 seconds.

The Logon process at 12:50:19 UTC missed out steps (b) and (c). The Logon process at 18:25:27 UTC missed out steps (a), (b) and (c). The Logon process at 00:19:29 UTC missed out all the information steps.

The Electrical Load Management System (ELMS) provides load management and protection to ensure power is available to critical and essential equipment. If the electrical loads exceed the power available, ELMS automatically sheds AC loads by priority until the loads are within the capacity of the airplane or ground power generators.

Each engine has an Integrated Drive Generator (IDG). Each IDG has automatic control and system protection functions. The Auxiliary Power Unit (APU) generator is electrically identical to the IDG generators. The APU generator can power either or both main busses, and may be used in flight as a replacement to an IDG source.

If both IDGs and the APU generator are inoperative, a backup generator powers essential airplane equipment. To reduce electrical loading on the backup generator, the following systems are inoperative: TCAS, SATCOM and Right HF radio.

It is possible that the backup generator configuration was selected at diversion and the TCAS and SDU were switched off until the backup generator configuration was deselected at 18:25:27 UTC. This selection can be made on the overhead control panel in the cockpit. The TCAS can also separately be switched off from the overhead circuit breaker panel in the cockpit. The circuit breaker for the SDU is in the Main Equipment Center (MEC) and not in the cockpit.

<https://www.dropbox.com/s/cl/fi/0flhdblfqiml2z2x4rho9/Electrical-Systems-Power-Distribution.png?rlkey=k4jyaxpgbdl38hjdwhpfh3qsi&dl=0>

9. Conclusion.

This case study uses ground breaking WSPR technology to detect and track flight MH370. This WSPR technology has been developed over the last 3 years and therefore the results presented in this paper represent credible new evidence in the search for MH370.

From a known radar position at 18:01 UTC, the case study presents 67 positions for MH370 over the next 6 hours 27 minutes of flight, as detected by a total of 125 anomalous WSPR links.

The results of this case study align with the analyses by Boeing, Inmarsat and the drift analysis by the University of Western Australia of the MH370 floating debris that has been recovered from around the Indian Ocean.

Dr. Robert Westphal, an expert in passive radar systems, first proposed the idea of using WSPR transmissions to detect and track MH370 in July 2020. Dr. Westphal presented his ideas in a paper titled "Geocaching in the Ionosphere" to the HamSCI conference in 2021. Dr. Westphal had previously written a paper in 2015 proposing using GPS satellite signals as a passive radar system and holds several related patents. The idea of using amateur radio signals as a passive radar system to detect and track aircraft was first proposed in a NATO paper written by the Finnish Air Defence Academy in 2016.

Prof. Simon Maskell is developing a variant of the algorithm developed by DSTG and presented in their paper titled "Bayesian Methods in the Search for MH370" and dated 30th November 2015, but modified to incorporate the WSPR data. The plan is that the paper will be independently reviewed and that the results will be presented in a separate paper in due course.

10. Acknowledgements.

This study would not have been possible without the data supplied to the WSPRnet database by the following radio amateur call signs from all over the world.

Call Sign	Detections	Type
W4AC	32	Tx and Rx
W4MO	30	Tx and Rx
2E0DSS	8	Tx and Rx
G8VDQ	8	Tx
ON7KB	7	Tx and Rx
DK6UG	6	Rx
M6NNB	6	Rx
OX3XR	6	Tx and Rx
K4RCG	5	Tx and Rx
G4ZXE	4	Tx and Rx
N2NOM	4	Rx
OZ7IT	4	Tx and Rx
PH4TH	4	Rx
W3CSW	4	Tx and Rx
W3HH	4	Tx
DG7RJ	3	Tx and Rx
JH1GYE	3	Tx
KI7CI	3	Tx
OK2SAM	3	Tx
ON4SAR	3	Rx
W3GXT	3	Tx and Rx
WA5NGP	3	Rx
DH5RAE	2	Tx and Rx
DK0SC	2	Tx and Rx
G0MQW	2	Rx
G3SXH	2	Tx and Rx
G4FKK	2	Tx and Rx
G4KPX	2	Tx
G8YTR	2	Tx and Rx
HB9CZF	2	Tx
HS0ZKM	2	Tx
K9AN	2	Tx and Rx
KB4RG	2	Rx
KC3AVT	2	Tx and Rx
KC6KGE	2	Tx and Rx
KZ3X	2	Tx
M5ADA	2	Rx
N7SCQ	2	Tx
NH7SR	2	Tx
OE6PWD	2	Rx
ON7KO	2	Tx
W9HLY	2	Tx
WA3DNM	2	Tx and Rx
WD4LHT	2	Tx
AA7FV	1	Tx
AD4PT	1	Tx
AG6IF	1	Rx
A14RY	1	Rx

Call Sign	Detections	Type
CX2ABP	1	Rx
DC5BN	1	Tx
DF2JP	1	Tx
DK4TJ	1	Rx
DL1DBC	1	Rx
DL8SEL	1	Tx
DL8YCA	1	Rx
DO6RPS	1	Rx
G3NZP	1	Tx
G4ANN	1	Tx
G4JVF	1	Tx
G6RRL	1	Tx
GM4SFW	1	Tx
IK1NET	1	Tx
JG1TWP/1	1	Rx
K4EH	1	Rx
K7UEB/20	1	Rx
KB1CHU	1	Tx
KB1MVX	1	Rx
KB9AMG	1	Rx
KB9VLR	1	Rx
KD6RF	1	Rx
KE7KRF	1	Rx
KI6STW	1	Tx
KK4U	1	Tx
KK5MR	1	Rx
KV0S	1	Rx
M0BLP	1	Rx
N1NCO	1	Tx
OE1MSB	1	Rx
OE3VMS	1	Rx
OH7AZL	1	Rx
PA3ABK/2	1	Rx
US3IRX	1	Tx
VA3ROM	1	Tx
VE1AIM	1	Rx
VE4KE	1	Rx
VE6PDQ	1	Rx
VE6PDQ/1	1	Rx
VK3DXE	1	Tx
W3BI	1	Rx
W7ZWW	1	Rx
WA8RC	1	Tx
WB8ELK	1	Tx
WD0UG	1	Tx
YO3ITD	1	Rx
YV4GJN	1	Rx
ZL1AML	1	Rx
ZP5BAB	1	Rx

Particular thanks for the help and advice from Rob DJ4FF, Karl DL2NGT, Dominik HB9CZF, Christian DL3MBG and Phil VK7JJ.

Thanks to all the people at WSPRnet.org, WSPR.live, WSPR.rocks, QRZ.com, QRZCQ.com, HamCall.net, DXMAPS.com, kiwisdr.com, RepeaterBook.com and VOACAP.com and the radio amateur registration authorities in a number of countries.

11. References.

[1] Richard Godfrey, Dr. Hannes Coetzee (2022) Emirates Flight EK421 GDTAAA WSPRnet Analysis - Case Study.

<https://www.dropbox.com/s/z3cfnj7qee30ke0/Emirates%20Flight%20EK421%20GDTAAA%20WSPRnet%20Analysis%20-%20Case%20Study%20-%2023rd%20June%202022.pdf?dl=0>

[2] Richard Godfrey, Dr. Hannes Coetzee (2022) Roanoke Flight N395JP GDTAAA WSPRnet Analysis - Case Study.

<https://www.dropbox.com/s/h0raiqmhcamma06/Roanoke%20Flight%20N395JP%20GDTAAA%20WSPRnet%20Analysis%20-%20Case%20Study%20-%2013th%20July%202022.pdf?dl=0>

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Case 3

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Case 4

<https://www.dropbox.com/scl/fi/a65k59pd4bmnk8ua9aqsp/Case-04.csv?rlkey=dp2sncut8epjdtqubp4vmk4i2&dl=0>

Case 6

<https://www.dropbox.com/scl/fi/tve2u4gfbkmibpyrl8ny/Case-06.csv?rlkey=pjs9wwbqy9kblwmupwn08dqow&dl=0>

Case 10

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12. List of Appendices.

A. Sample SQL Script for WSPR Download.

B. Sample Matlab Script for Call Sign processing.

C. Sample Matlab Script for Target Area processing.

D. Sample Matlab Script for Local or Global Mapping.

E. Sample SQL Script for WSPR Anomaly Checking.

F. Matlab Function Call WSPR_Link_GCV9_Function for Mapping.

G. Worked Example WSPR Link Timeframe Analysis.

H. Anomalous WSPR Link Timeframe Analysis.

A. Sample SQL Script for WSPR Download.

```
select
    id, time, tx_sign, tx_loc, rx_sign, rx_loc, frequency, power, snr, drift, distance,
azimuth, band, version, code
from wspr.rx where
    time = '2014-03-08 00:34:00'
order by tx_sign, rx_sign
limit 2000
```

B. Sample Matlab Script for Call Sign processing.

```
load("WSPR_0034.UTC.mat");
load("call_sign.mat");

call_sign_sz = size(call_sign);
s = call_sign_sz(1);

WSPR_sz = size(WSPR);
t = WSPR_sz(1);

%Missing Call Signs
sz = [200 3];
varT = {'string','string','string'};
call_signs_missing = table('Size',sz,'VariableTypes',varT);

cs_i = 1;

for m=1:t

    tx_sign = string(WSPR{m,4});

    n = 1;

    while n < s
        token = string(call_sign{n,"CallSign"});
        if token == tx_sign
            break
        end
        n=n+1;
    end

    if n >= s
        tx_loc = string(WSPR{m,5});
        call_signs_missing(cs_i,1) = {"Tx Call Sign"};
        call_signs_missing(cs_i,2) = {tx_sign};
        call_signs_missing(cs_i,3) = {tx_loc};
        cs_i = cs_i + 1;
    end

    tx_lat=double(call_sign{n,3});
    tx_lon=double(call_sign{n,4});
    tx_status=single(call_sign{n,5});

    WSPR{m,"tx_lat"}=tx_lat;
    WSPR{m,"tx_lon"}=tx_lon;
    WSPR{m,"tx_status"}=tx_status;

end

for m=1:t

    rx_sign = string(WSPR{m,6});

    n = 1;

    while n < s
        token = string(call_sign{n,"CallSign"});
```

```

    if token == rx_sign
        break
    end
    n=n+1;
end

if n >= s
    rx_loc = string(WSPR{m,7});
    call_signs_missing(cs_i,1) = {"Rx Call Sign"};
    call_signs_missing(cs_i,2) = {rx_sign};
    call_signs_missing(cs_i,3) = {rx_loc};
    cs_i = cs_i + 1;
end

rx_lat=double(call_sign{n,3});
rx_lon=double(call_sign{n,4});
rx_status=single(call_sign{n,5});

WSPR{m,"rx_lat"}=rx_lat;
WSPR{m,"rx_lon"}=rx_lon;
WSPR{m,"rx_status"}=rx_status;

end

writetable(call_signs_missing,"Call Signs Missing.xlsx");

```

C. Sample Matlab Script for Target Area processing.

```
% Target Area (2° latitude x 4° longitude)
start_lat = -30.0;
start_lon = 98.0;

% Earth Reference Sphere
s = referenceSphere('Earth');
R=6378137;
s.LengthUnit = 'meter';
s.Radius=R;

%Targets
sz = [100 1];
varT = {'string'};
targets = table('Size',sz,'VariableTypes',varT);

target_i = 1;

for wspr_i = 1:m

    slat = WSPR{wspr_i,"tx_lat"};
    slon = WSPR{wspr_i,"tx_lon"};
    elat = WSPR{wspr_i,"rx_lat"};
    elon = WSPR{wspr_i,"rx_lon"};

    %Great Circle Tracks Short Path
    [arclen,az] = distance(slat,slon,elat,elon,s);

    %Great Circle Tracks Long Path
    arclenlp=40075016-arclen;
    azlp = azimuth(elat,elon,slat,slon,s)-180;

    %Great Circle Tracks Short Path Track Points
    [litrk,lntrk] = track1(slat,slon,az,arclen,s,'degrees',300);

    for p_i = 1:300
        if round(litrk(p_i),0) == start_lat
            if round(lntrk(p_i),0) == start_lon
                break
            end
        end
    end

    if p_i < 300
        s1 = "WSPR_Link_GCV9_Function(";
        s2 = WSPR{wspr_i,"tx_status"};
        s3 = ", ";
        s4 = WSPR{wspr_i,"rx_status"};
        s5 = ", ";
        s6 = num2str(WSPR{wspr_i,"tx_lat"},'%0.8f');
        s7 = ", ";
        s8 = num2str(WSPR{wspr_i,"tx_lon"},'%0.8f');
        s9 = ", ";
        s10 = num2str(WSPR{wspr_i,"rx_lat"},'%0.8f');
        s11 = ", ";
        s12 = num2str(WSPR{wspr_i,"rx_lon"},'%0.8f');
        s13 = ", ";
        s14 = WSPR{wspr_i,"tx_sign"};
    end
end
end
```

```

s15 = '';
s16 = WSPR{wspr_i,"rx_sign"};
s17 = '';
sp_s = {s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11 + s12 + s13 + s14 + s15 + s16 + s17};
targets(target_i,1) = sp_s;
target_i = target_i + 1;
end

for p_i = 1:300
    if round(lttrk(p_i),0) == start_lat
        if round(lntrk(p_i),0) == start_lon + 1
            break
        end
    end
end

if p_i < 300
    s1 = "WSPR_Link_GCV9_Function(";
    s2 = WSPR{wspr_i,"tx_status"};
    s3 = '';
    s4 = WSPR{wspr_i,"rx_status"};
    s5 = '';
    s6 = num2str(WSPR{wspr_i,"tx_lat"},'%0.8f');
    s7 = '';
    s8 = num2str(WSPR{wspr_i,"tx_lon"},'%0.8f');
    s9 = '';
    s10 = num2str(WSPR{wspr_i,"rx_lat"},'%0.8f');
    s11 = '';
    s12 = num2str(WSPR{wspr_i,"rx_lon"},'%0.8f');
    s13 = '';
    s14 = WSPR{wspr_i,"tx_sign"};
    s15 = '';
    s16 = WSPR{wspr_i,"rx_sign"};
    s17 = '';
    sp_s = {s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11 + s12 + s13 + s14 + s15 + s16 + s17};
    targets(target_i,1) = sp_s;
    target_i = target_i + 1;
end

for p_i = 1:300
    if round(lttrk(p_i),0) == start_lat
        if round(lntrk(p_i),0) == start_lon + 2
            break
        end
    end
end

if p_i < 300
    s1 = "WSPR_Link_GCV9_Function(";
    s2 = WSPR{wspr_i,"tx_status"};
    s3 = '';
    s4 = WSPR{wspr_i,"rx_status"};
    s5 = '';
    s6 = num2str(WSPR{wspr_i,"tx_lat"},'%0.8f');
    s7 = '';
    s8 = num2str(WSPR{wspr_i,"tx_lon"},'%0.8f');
    s9 = '';
    s10 = num2str(WSPR{wspr_i,"rx_lat"},'%0.8f');
    s11 = '';
    s12 = num2str(WSPR{wspr_i,"rx_lon"},'%0.8f');

```



```

s13 = '';
s14 = WSPR{wspr_i,"tx_sign"};
s15 = '';
s16 = WSPR{wspr_i,"rx_sign"};
s17 = '';
sp_s = {s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11 + s12 + s13 + s14 + s15 + s16 + s17};
targets(target_i,1) = sp_s;
target_i = target_i + 1;
end

for p_i = 1:300
    if round(lttrk(p_i),0) == start_lat
        if round(lntrk(p_i),0) == start_lon + 3
            break
        end
    end
end

if p_i < 300
    s1 = "WSPR_Link_GCV9_Function(";
    s2 = WSPR{wspr_i,"tx_status"};
    s3 = '';
    s4 = WSPR{wspr_i,"rx_status"};
    s5 = '';
    s6 = num2str(WSPR{wspr_i,"tx_lat"},'%0.8f');
    s7 = '';
    s8 = num2str(WSPR{wspr_i,"tx_lon"},'%0.8f');
    s9 = '';
    s10 = num2str(WSPR{wspr_i,"rx_lat"},'%0.8f');
    s11 = '';
    s12 = num2str(WSPR{wspr_i,"rx_lon"},'%0.8f');
    s13 = '';
    s14 = WSPR{wspr_i,"tx_sign"};
    s15 = '';
    s16 = WSPR{wspr_i,"rx_sign"};
    s17 = '';
    sp_s = {s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11 + s12 + s13 + s14 + s15 + s16 + s17};
    targets(target_i,1) = sp_s;
    target_i = target_i + 1;
end

for p_i = 1:300
    if round(lttrk(p_i),0) == start_lat + 1
        if round(lntrk(p_i),0) == start_lon
            break
        end
    end
end

if p_i < 300
    s1 = "WSPR_Link_GCV9_Function(";
    s2 = WSPR{wspr_i,"tx_status"};
    s3 = '';
    s4 = WSPR{wspr_i,"rx_status"};
    s5 = '';
    s6 = num2str(WSPR{wspr_i,"tx_lat"},'%0.8f');
    s7 = '';
    s8 = num2str(WSPR{wspr_i,"tx_lon"},'%0.8f');
    s9 = '';
    s10 = num2str(WSPR{wspr_i,"rx_lat"},'%0.8f');

```

```

s11 = '';
s12 = num2str(WSPR{wspr_i,"rx_lon"},'%0.8f');
s13 = '';
s14 = WSPR{wspr_i,"tx_sign"};
s15 = '';
s16 = WSPR{wspr_i,"rx_sign"};
s17 = '';
sp_s = {s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11 + s12 + s13 + s14 + s15 + s16 + s17};
targets(target_i,1) = sp_s;
target_i = target_i + 1;
end

for p_i = 1:300
    if round(lttrk(p_i),0) == start_lat + 1
        if round(lntrk(p_i),0) == start_lon + 1
            break
        end
    end
end

if p_i < 300
    s1 = "WSPR_Link_GCV9_Function(";
    s2 = WSPR{wspr_i,"tx_status"};
    s3 = '';
    s4 = WSPR{wspr_i,"rx_status"};
    s5 = '';
    s6 = num2str(WSPR{wspr_i,"tx_lat"},'%0.8f');
    s7 = '';
    s8 = num2str(WSPR{wspr_i,"tx_lon"},'%0.8f');
    s9 = '';
    s10 = num2str(WSPR{wspr_i,"rx_lat"},'%0.8f');
    s11 = '';
    s12 = num2str(WSPR{wspr_i,"rx_lon"},'%0.8f');
    s13 = '';
    s14 = WSPR{wspr_i,"tx_sign"};
    s15 = '';
    s16 = WSPR{wspr_i,"rx_sign"};
    s17 = '';
    sp_s = {s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11 + s12 + s13 + s14 + s15 + s16 + s17};
    targets(target_i,1) = sp_s;
    target_i = target_i + 1;
end

for p_i = 1:300
    if round(lttrk(p_i),0) == start_lat + 1
        if round(lntrk(p_i),0) == start_lon + 2
            break
        end
    end
end

if p_i < 300
    s1 = "WSPR_Link_GCV9_Function(";
    s2 = WSPR{wspr_i,"tx_status"};
    s3 = '';
    s4 = WSPR{wspr_i,"rx_status"};
    s5 = '';
    s6 = num2str(WSPR{wspr_i,"tx_lat"},'%0.8f');
    s7 = '';
    s8 = num2str(WSPR{wspr_i,"tx_lon"},'%0.8f');

```

```

s9 = '';
s10 = num2str(WSPR{wspr_i,"rx_lat"}, '%.8f');
s11 = '';
s12 = num2str(WSPR{wspr_i,"rx_lon"}, '%.8f');
s13 = '';
s14 = WSPR{wspr_i,"tx_sign"};
s15 = '';
s16 = WSPR{wspr_i,"rx_sign"};
s17 = '';
sp_s = {s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11 + s12 + s13 + s14 + s15 + s16 + s17};
targets(target_i,1) = sp_s;
target_i = target_i + 1;
end

```

```

for p_i = 1:300
    if round(lttrk(p_i),0) == start_lat + 1
        if round(lntrk(p_i),0) == start_lon + 3
            break
        end
    end
end
end

```

```

if p_i < 300
    s1 = "WSPR_Link_GCV9_Function(";
    s2 = WSPR{wspr_i,"tx_status"};
    s3 = '';
    s4 = WSPR{wspr_i,"rx_status"};
    s5 = '';
    s6 = num2str(WSPR{wspr_i,"tx_lat"}, '%.8f');
    s7 = '';
    s8 = num2str(WSPR{wspr_i,"tx_lon"}, '%.8f');
    s9 = '';
    s10 = num2str(WSPR{wspr_i,"rx_lat"}, '%.8f');
    s11 = '';
    s12 = num2str(WSPR{wspr_i,"rx_lon"}, '%.8f');
    s13 = '';
    s14 = WSPR{wspr_i,"tx_sign"};
    s15 = '';
    s16 = WSPR{wspr_i,"rx_sign"};
    s17 = '';
    sp_s = {s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11 + s12 + s13 + s14 + s15 + s16 + s17};
    targets(target_i,1) = sp_s;
    target_i = target_i + 1;
end

```

```

%Great Circle Tracks Long Path Track Points
[ltrk,lntrk] = track1(elat,elon,azlp,arclenlp,s,'degrees',300);

```

```

for p_i = 1:300
    if round(lttrk(p_i),0) == start_lat
        if round(lntrk(p_i),0) == start_lon
            break
        end
    end
end
end

```

```

if p_i < 300
    s1 = "WSPR_Link_GCV9_Function(";
    s2 = WSPR{wspr_i,"tx_status"};

```

```

s3 = "", "";
s4 = WSPR{wspr_i, "rx_status"};
s5 = "", "";
s6 = num2str(WSPR{wspr_i, "tx_lat"}, '%.8f');
s7 = "", "";
s8 = num2str(WSPR{wspr_i, "tx_lon"}, '%.8f');
s9 = "", "";
s10 = num2str(WSPR{wspr_i, "rx_lat"}, '%.8f');
s11 = "", "";
s12 = num2str(WSPR{wspr_i, "rx_lon"}, '%.8f');
s13 = "", "";
s14 = WSPR{wspr_i, "tx_sign"};
s15 = "", "";
s16 = WSPR{wspr_i, "rx_sign"};
s17 = "");";
lp_s = {s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11 + s12 + s13 + s14 + s15 + s16 + s17};
targets(target_i, 1) = lp_s;
target_i = target_i + 1;
end

for p_i = 1:300
    if round(lttrk(p_i, 0) == start_lat
        if round(lntrk(p_i, 0) == start_lon + 1
            break
        end
    end
end

if p_i < 300
    s1 = "WSPR_Link_GCV9_Function(";
    s2 = WSPR{wspr_i, "tx_status"};
    s3 = "", "";
    s4 = WSPR{wspr_i, "rx_status"};
    s5 = "", "";
    s6 = num2str(WSPR{wspr_i, "tx_lat"}, '%.8f');
    s7 = "", "";
    s8 = num2str(WSPR{wspr_i, "tx_lon"}, '%.8f');
    s9 = "", "";
    s10 = num2str(WSPR{wspr_i, "rx_lat"}, '%.8f');
    s11 = "", "";
    s12 = num2str(WSPR{wspr_i, "rx_lon"}, '%.8f');
    s13 = "", "";
    s14 = WSPR{wspr_i, "tx_sign"};
    s15 = "", "";
    s16 = WSPR{wspr_i, "rx_sign"};
    s17 = "");";
    lp_s = {s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11 + s12 + s13 + s14 + s15 + s16 + s17};
    targets(target_i, 1) = lp_s;
    target_i = target_i + 1;
end

for p_i = 1:300
    if round(lttrk(p_i, 0) == start_lat
        if round(lntrk(p_i, 0) == start_lon + 2
            break
        end
    end
end

if p_i < 300

```

```

s1 = "WSPR_Link_GCV9_Function(";
s2 = WSPR{wspr_i,"tx_status"};
s3 = ", ";
s4 = WSPR{wspr_i,"rx_status"};
s5 = ", ";
s6 = num2str(WSPR{wspr_i,"tx_lat"},'%0.8f');
s7 = ", ";
s8 = num2str(WSPR{wspr_i,"tx_lon"},'%0.8f');
s9 = ", ";
s10 = num2str(WSPR{wspr_i,"rx_lat"},'%0.8f');
s11 = ", ";
s12 = num2str(WSPR{wspr_i,"rx_lon"},'%0.8f');
s13 = ", ";
s14 = WSPR{wspr_i,"tx_sign"};
s15 = ", ";
s16 = WSPR{wspr_i,"rx_sign"};
s17 = ");";
lp_s = {s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11 + s12 + s13 + s14 + s15 + s16 + s17};
targets(target_i,1) = lp_s;
target_i = target_i + 1;
end

for p_i = 1:300
    if round(lttrk(p_i),0) == start_lat
        if round(lntrk(p_i),0) == start_lon + 3
            break
        end
    end
end

if p_i < 300
    s1 = "WSPR_Link_GCV9_Function(";
    s2 = WSPR{wspr_i,"tx_status"};
    s3 = ", ";
    s4 = WSPR{wspr_i,"rx_status"};
    s5 = ", ";
    s6 = num2str(WSPR{wspr_i,"tx_lat"},'%0.8f');
    s7 = ", ";
    s8 = num2str(WSPR{wspr_i,"tx_lon"},'%0.8f');
    s9 = ", ";
    s10 = num2str(WSPR{wspr_i,"rx_lat"},'%0.8f');
    s11 = ", ";
    s12 = num2str(WSPR{wspr_i,"rx_lon"},'%0.8f');
    s13 = ", ";
    s14 = WSPR{wspr_i,"tx_sign"};
    s15 = ", ";
    s16 = WSPR{wspr_i,"rx_sign"};
    s17 = ");";
    lp_s = {s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11 + s12 + s13 + s14 + s15 + s16 + s17};
    targets(target_i,1) = lp_s;
    target_i = target_i + 1;
end

for p_i = 1:300
    if round(lttrk(p_i),0) == start_lat + 1
        if round(lntrk(p_i),0) == start_lon
            break
        end
    end
end

```

```

if p_i < 300
    s1 = "WSPR_Link_GCV9_Function(";
    s2 = WSPR{wspr_i,"tx_status"};
    s3 = ", ";
    s4 = WSPR{wspr_i,"rx_status"};
    s5 = ", ";
    s6 = num2str(WSPR{wspr_i,"tx_lat"},'%0.8f');
    s7 = ", ";
    s8 = num2str(WSPR{wspr_i,"tx_lon"},'%0.8f');
    s9 = ", ";
    s10 = num2str(WSPR{wspr_i,"rx_lat"},'%0.8f');
    s11 = ", ";
    s12 = num2str(WSPR{wspr_i,"rx_lon"},'%0.8f');
    s13 = ", ";
    s14 = WSPR{wspr_i,"tx_sign"};
    s15 = ", ";
    s16 = WSPR{wspr_i,"rx_sign"};
    s17 = ");";
    lp_s = {s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11 + s12 + s13 + s14 + s15 + s16 + s17};
    targets(target_i,1) = lp_s;
    target_i = target_i + 1;
end

```

```

for p_i = 1:300
    if round(lttrk(p_i),0) == start_lat + 1
        if round(lntrk(p_i),0) == start_lon + 1
            break
        end
    end
end
end

```

```

if p_i < 300
    s1 = "WSPR_Link_GCV9_Function(";
    s2 = WSPR{wspr_i,"tx_status"};
    s3 = ", ";
    s4 = WSPR{wspr_i,"rx_status"};
    s5 = ", ";
    s6 = num2str(WSPR{wspr_i,"tx_lat"},'%0.8f');
    s7 = ", ";
    s8 = num2str(WSPR{wspr_i,"tx_lon"},'%0.8f');
    s9 = ", ";
    s10 = num2str(WSPR{wspr_i,"rx_lat"},'%0.8f');
    s11 = ", ";
    s12 = num2str(WSPR{wspr_i,"rx_lon"},'%0.8f');
    s13 = ", ";
    s14 = WSPR{wspr_i,"tx_sign"};
    s15 = ", ";
    s16 = WSPR{wspr_i,"rx_sign"};
    s17 = ");";
    lp_s = {s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11 + s12 + s13 + s14 + s15 + s16 + s17};
    targets(target_i,1) = lp_s;
    target_i = target_i + 1;
end

```

```

for p_i = 1:300
    if round(lttrk(p_i),0) == start_lat + 1
        if round(lntrk(p_i),0) == start_lon + 2
            break
        end
    end
end

```

```

end
end

if p_i < 300
    s1 = "WSPR_Link_GCV9_Function(";
    s2 = WSPR{wspr_i,"tx_status"};
    s3 = ", ";
    s4 = WSPR{wspr_i,"rx_status"};
    s5 = ", ";
    s6 = num2str(WSPR{wspr_i,"tx_lat"},'%0.8f');
    s7 = ", ";
    s8 = num2str(WSPR{wspr_i,"tx_lon"},'%0.8f');
    s9 = ", ";
    s10 = num2str(WSPR{wspr_i,"rx_lat"},'%0.8f');
    s11 = ", ";
    s12 = num2str(WSPR{wspr_i,"rx_lon"},'%0.8f');
    s13 = ", ";
    s14 = WSPR{wspr_i,"tx_sign"};
    s15 = ", ";
    s16 = WSPR{wspr_i,"rx_sign"};
    s17 = ");";
    lp_s = {s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11 + s12 + s13 + s14 + s15 + s16 + s17};
    targets(target_i,1) = lp_s;
    target_i = target_i + 1;
end

for p_i = 1:300
    if round(lttrk(p_i),0) == start_lat + 1
        if round(lntrk(p_i),0) == start_lon + 3
            break
        end
    end
end

if p_i < 300
    s1 = "WSPR_Link_GCV9_Function(";
    s2 = WSPR{wspr_i,"tx_status"};
    s3 = ", ";
    s4 = WSPR{wspr_i,"rx_status"};
    s5 = ", ";
    s6 = num2str(WSPR{wspr_i,"tx_lat"},'%0.8f');
    s7 = ", ";
    s8 = num2str(WSPR{wspr_i,"tx_lon"},'%0.8f');
    s9 = ", ";
    s10 = num2str(WSPR{wspr_i,"rx_lat"},'%0.8f');
    s11 = ", ";
    s12 = num2str(WSPR{wspr_i,"rx_lon"},'%0.8f');
    s13 = ", ";
    s14 = WSPR{wspr_i,"tx_sign"};
    s15 = ", ";
    s16 = WSPR{wspr_i,"rx_sign"};
    s17 = ");";
    lp_s = {s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11 + s12 + s13 + s14 + s15 + s16 + s17};
    targets(target_i,1) = lp_s;
    target_i = target_i + 1;
end

end

writetable(targets,"WSPR Targets.xlsx");

```


D. Sample Matlab Script for Local or Global Mapping.

```
figure('Name','GDTAAA Flight Path Analysis','Position',[50,50,1200,800]);

glob = '0';

if glob == '1'
    LatLimit=[-80 80];
    LonLimit=[-180 180];
    h=worldmap(LatLimit,LonLimit);
    setm(h,'MLabelParallel',-80.0);
else
    LatLimit=[-23.0 -20.0];
    LonLimit=[92.0 98.0];
    h=worldmap(LatLimit,LonLimit);
    setm(h,'MLabelParallel',-23.0);
    setm(h,'PLabelLocation',[-23.0, -22.0, -21.0, -20.0]);
    setm(h,'MLabelLocation',[92.0, 93.0, 94.0, 95.0, 96.0, 97.0, 98.0]);
end

landareas = shaperead('landareas.shp','UseGeoCoords',true);
geoshow(landareas,'FaceColor',[.9 .9 .9],'EdgeColor',[.6 .6 .6]);

if glob == '0'
    scaleruler on
    h=handlem('scaleruler1');
    setm(h,'XLoc',-0.150e+06);
    setm(h,'YLoc',-25.900e+05);
    setm(h,'MajorTick',0:20:100);
    setm(h,'MinorTick',0:1:10);
    setm(h,'MajorTickLength',1);
    setm(h,'MinorTickLength',0.5);
    setm(h,'TickDir','up');
    scaleruler('units','nm');
    h=handlem('scaleruler2');
    setm(h,'XLoc',0.020e+06);
    setm(h,'YLoc',-25.900e+05);
    setm(h,'MajorTick',0:20:100);
    setm(h,'MinorTick',0:1:10);
    setm(h,'MajorTickLength',km2nm(1));
    setm(h,'MinorTickLength',km2nm(0.5));
    setm(h,'TickDir','up');
end

% WSPR Links

% WSPR_Link_GCV9_Function('0','1','51.27083335','6.79166664','52.33746900','-2.27851600','DF2JP','G1ZRN');
% WSPR_Link_GCV9_Function('4','1','50.78080100','0.10020200','49.52370266','8.24777591','G3JKF','DK6UG');
% WSPR_Link_GCV9_Function('1','0','50.78080100','0.10020200','50.97916674','-1.37500002','G3JKF','G8JNJ/A');
% WSPR_Link_GCV9_Function('3','0','51.35188900','-0.15826000','44.39583336','26.20833333','G4FKK','YO3ITD');
% WSPR_Link_GCV9_Function('0','0','52.40423508','0.27702300','51.43750003','6.95833330','G4KPX','DCODX/A');
% WSPR_Link_GCV9_Function('1','0','52.40423508','0.27702300','51.35416669','8.12500000','G4KPX','DL1DBC');
% WSPR_Link_GCV9_Function('0','0','52.40423508','0.27702300','51.80847356','4.70791832','G4KPX','PA3ABK/2');
% WSPR_Link_GCV9_Function('1','1','50.86820200','-0.13595600','26.96563955','-82.32011327','G4WCP','W4AC');
% WSPR_Link_GCV9_Function('1','1','50.93750007','-1.29166669','49.52370266','8.24777591','G6RRL','DK6UG');
% WSPR_Link_GCV9_Function('1','1','51.50048800','-0.31508400','26.96563955','-82.32011327','G8VDQ','W4AC');
% WSPR_Link_GCV9_Function('1','1','36.33690300','139.01551900','32.72916672','-95.04166670','JH1GYE','KD6RF');
% WSPR_Link_GCV9_Function('1','1','51.39158150','-2.95518072','49.52370266','8.24777591','MONDE','DK6UG');
% WSPR_Link_GCV9_Function('4','0','-38.11628400','145.16138100','-31.85416666','115.79166660','VK3DXE','VK6ZRY');
% WSPR_Link_GCV9_Function('1','1','27.10306700','-82.39671500','52.47916670','-2.04166674','W4MO','2E0DSS');
% WSPR_Link_GCV9_Function('1','0','27.10306700','-82.39671500','53.47916670','-2.54166672','W4MO','2E1CJF');
% WSPR_Link_GCV9_Function('1','1','27.10306700','-82.39671500','32.78086100','34.99031300','W4MO','4X1RF');
% WSPR_Link_GCV9_Function('1','1','27.10306700','-82.39671500','49.52370266','8.24777591','W4MO','DK6UG');
% WSPR_Link_GCV9_Function('1','0','27.10306700','-82.39671500','50.60416670','-3.87500000','W4MO','G4DND');
% WSPR_Link_GCV9_Function('1','1','27.10306700','-82.39671500','57.52083330','-4.37500000','W4MO','GM4SFW');
% WSPR_Link_GCV9_Function('1','0','27.10306700','-82.39671500','44.85416673','7.54166661','W4MO','IK1NET');
% WSPR_Link_GCV9_Function('1','1','27.10306700','-82.39671500','38.35372470','-78.45945496','W4MO','K4RCG');
% WSPR_Link_GCV9_Function('1','0','27.10306700','-82.39671500','53.47916670','-1.12500003','W4MO','M5ADA');
% WSPR_Link_GCV9_Function('1','1','27.10306700','-82.39671500','51.20351600','-0.33178500','W4MO','M6NNB');
% WSPR_Link_GCV9_Function('1','0','27.10306700','-82.39671500','48.68750005','15.62499994','W4MO','OE3VMS');
```

```
% WSPR_Link_GCV9_Function('1','1','27.10306700','-82.39671500','51.18750001','4.20833333','W4MO','ON4SAR');
% WSPR_Link_GCV9_Function('1','1','27.10306700','-82.39671500','55.24975200','12.30082000','W4MO','OZ7IT');
% WSPR_Link_GCV9_Function('1','1','27.10306700','-82.39671500','52.23807201','6.85770275','W4MO','PI4THT');
% WSPR_Link_GCV9_Function('0','0','27.10306700','-82.39671500','59.47916670','17.70833327','W4MO','SM3ULC');
% WSPR_Link_GCV9_Function('1','0','27.10306700','-82.39671500','44.77083339','-63.70833334','W4MO','VE1AIM');
% WSPR_Link_GCV9_Function('1','1','27.10306700','-82.39671500','39.46108700','-76.80855118','W4MO','W3GXT');
% WSPR_Link_GCV9_Function('0','0','39.56250004','-104.87500004','32.97916674','-97.12500003','W5OLF','AD4PT');
% WSPR_Link_GCV9_Function('1','1','34.77307873','-86.69914586','40.11087200','-88.19699300','WD0UG','K9AN');
WSPR_Link_GCV9_Function('1','0','34.77307873','-86.69914586','44.37883000','-88.18698700','WD0UG','KB9VLR');
% WSPR_Link_GCV9_Function('1','1','36.19872900','-79.83413800','38.35372470','-78.45945496','WD4ELG','K4RCG');
```

```
if glob == '0'
```

```
% Waypoints
```

```
geoshow(5.29674258,100.27632618,'Marker','square','color','k','MarkerSize',12);
textm(5.30,100.33,'Penang Airport');
```

```
geoshow(5.68424584,98.93855228,'Marker','square','color','k','MarkerSize',12);
textm(5.70,98.98,'Pulau Perak');
```

```
geoshow(6.18200000,97.58550000,'Marker','diamond','color','k','MarkerSize',12);
textm(6.20,97.62,'VAMPI');
```

```
geoshow(6.50366667,96.49133333,'Marker','diamond','color','k','MarkerSize',12);
textm(6.52,96.53,'MEKAR');
```

```
geoshow(5.25833333,98.30016667,'Marker','diamond','color','k','MarkerSize',12);
textm(5.28,98.34,'TASEK');
```

```
geoshow(5.26600000,97.51133333,'Marker','diamond','color','k','MarkerSize',12);
textm(5.24,97.55,'DUAMO');
```

```
geoshow(6.75633333,95.97650000,'Marker','diamond','color','k','MarkerSize',12);
textm(6.80,96.00,'NILAM');
```

```
geoshow(5.82366667,97.31366667,'Marker','diamond','color','k','MarkerSize',12);
textm(5.83,97.34,'BOSTI');
```

```
geoshow(6.00016667,95.50800000,'Marker','diamond','color','k','MarkerSize',12);
textm(5.93,95.54,'ANSAX');
```

```
geoshow(6.58600000,95.66900000,'Marker','diamond','color','k','MarkerSize',12);
textm(6.60,95.36,'SANOB');
```

```
geoshow(6.00016667,97.00000000,'Marker','diamond','color','k','MarkerSize',12);
textm(6.03,97.03,'TOSOK');
```

```
geoshow(7.51716667,94.41650000,'Marker','diamond','color','k','MarkerSize',12);
textm(7.54,94.45,'IGOGU');
```

```
geoshow(6.60400000,94.41650000,'Marker','diamond','color','k','MarkerSize',12);
textm(6.63,94.45,'NOPEK');
```

```
geoshow(6.00000000,94.41650000,'Marker','diamond','color','k','MarkerSize',12);
textm(5.90,93.95,'FIR Boundary');
```

```
geoshow(5.37266667,94.47200000,'Marker','diamond','color','k','MarkerSize',12);
textm(5.40,94.50,'URDAM');
```

```
geoshow(4.56650000,94.00016667,'Marker','diamond','color','k','MarkerSize',12);
textm(4.55,94.05,'BULVA');
```

```
geoshow(3.26616667,94.84883333,'Marker','diamond','color','k','MarkerSize',12);
textm(3.30,94.89,'MABIX');
```

```
geoshow(-0.70000000,92.00000000,'Marker','diamond','color','k','MarkerSize',12);
textm(-0.73,92.03,'KETIV');
```

```

geoshow(0.36700000,93.67500000,'Marker','diamond','color','k','MarkerSize',12);
textm(0.40,93.70,'ISBIX');

geoshow(-0.33016667,95.10100000,'Marker','diamond','color','k','MarkerSize',12);
textm(-0.36,95.14,'ODIRU');

geoshow(-2.00000000,92.00000000,'Marker','diamond','color','k','MarkerSize',12);
textm(-2.03,92.03,'FIR Boundary 02S92E');

geoshow(-1.99983333,89.96150000,'Marker','diamond','color','k','MarkerSize',12);
textm(-1.96,89.99,'ELATI');

geoshow(-4.36833333,92.54166667,'Marker','diamond','color','k','MarkerSize',12);
textm(-4.39,92.57,'PIPOV');

geoshow(-4.48000000,92.97833333,'Marker','diamond','color','k','MarkerSize',12);
textm(-4.51,93.00,'MUTMI');

geoshow(-5.33666667,90.73316667,'Marker','diamond','color','k','MarkerSize',12);
textm(-5.37,91.00,'PIBED');

geoshow(-12.14533333,96.81950000,'Marker','diamond','color','k','MarkerSize',12);
textm(-12.18,96.85,'CC');

geoshow(-10.64433333,93.83533333,'Marker','diamond','color','k','MarkerSize',12);
textm(-10.68,93.90,'BEBIM');

geoshow(-14.0,93.0,'Marker','diamond','color','k','MarkerSize',12);
textm(-14.03,93.03,'14S93E');

geoshow(-16.0,95.0,'Marker','diamond','color','k','MarkerSize',12);
textm(-16.03,95.03,'16S95E');

geoshow(-16.0,94.0,'Marker','diamond','color','k','MarkerSize',12);
textm(-16.03,94.03,'16S94E');

geoshow(-17.0,96.0,'Marker','diamond','color','k','MarkerSize',12);
textm(-17.03,96.03,'17S96E');

geoshow(-20.0,95.0,'Marker','diamond','color','k','MarkerSize',12);
textm(-20.03,95.03,'20S95E');

geoshow(-20.0,96.0,'Marker','diamond','color','k','MarkerSize',12);
textm(-20.03,96.03,'20S96E');

geoshow(-20.0,94.0,'Marker','diamond','color','k','MarkerSize',12);
textm(-20.03,94.03,'20S94E');

geoshow(-22.0,94.0,'Marker','diamond','color','k','MarkerSize',12);
textm(-22.03,94.03,'22S94E');

geoshow(-22.0,96.0,'Marker','diamond','color','k','MarkerSize',12);
textm(-22.03,96.03,'22S96E');

geoshow(-21.0,98.0,'Marker','diamond','color','k','MarkerSize',12);
textm(-21.03,98.03,'21S98E');

```

%Arcs

```

waypoints = [10.0,95.204601; 9.0,95.430192];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [9.0,95.430192; 8.0,95.624242];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [8.0,95.624242; 7.0,95.787636];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [7.0,95.787636; 6.0,95.921108];

```

```

[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [6.0,95.921108; 5.0,96.025255];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [5.0,96.025255; 4.0,96.100549];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [4.0,96.100549; 3.0,96.147336];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [3.0,96.147336; 2.0,96.165852];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [2.0,96.165852; 1.0,96.156217];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [1.0,96.156217; 0.0,96.118440];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);

textm(6.9,95.9,'1st Arc at 18:28:15 UTC ','EdgeColor','k','BackgroundColor','w','HorizontalAlignment','left');

waypoints = [10.0,92.719602; 9.0,92.967769];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [9.0,92.967769; 8.0,93.180803];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [8.0,93.180803; 7.0,93.359809];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [7.0,93.359809; 6.0,93.505697];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [6.0,93.505697; 5.0,93.619204];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [5.0,93.619204; 4.0,93.700905];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [4.0,93.700905; 3.0,93.751222];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [3.0,93.751222; 2.0,93.770435];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [2.0,93.770435; 1.0,93.758682];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [1.0,93.758682; 0.0,93.715965];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [0.0,93.715965; -1.0,93.642149];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-1.0,93.642149; -2.0,93.536956];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-2.0,93.536956; -3.0,93.399966];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-3.0,93.399966; -4.0,93.230606];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-4.0,93.230606; -5.0,93.028139];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);

textm(-3.1,92.50,'2nd Arc at 19:41:03 UTC ','EdgeColor','k','BackgroundColor','w','HorizontalAlignment','left');

```

```

waypoints = [-1.0,94.295993;-2.0,94.195528];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-2.0,94.195528;-3.0,94.064163];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-3.0,94.064163; -4.0,93.901368];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-4.0,93.901368; -5.0,93.706464];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-5.0,93.706464; -6.0,93.478606];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-6.0,93.478606; -7.0,93.216772];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-7.0,93.216772; -8.0,92.919740];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-8.0,92.919740; -9.0,92.586062];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-9.0,92.586062; -10.0,92.214036];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);

```

textm(-7.1,92.60,'3rd Arc at 20:41:05 UTC ', 'EdgeColor','k','BackgroundColor','w','HorizontalAlignment','left');

```

waypoints = [-9.0,95.400910; -10.0,95.074252];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-10.0,95.074252; -11.0,94.712797];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-11.0,94.712797; -12.0,94.314850];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-12.0,94.314850; -13.0,93.878443];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-13.0,93.878443; -14.0,93.401296];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-14.0,93.401296; -15.0,92.880756];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-15.0,92.880756; -16.0,92.313720];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);

```

textm(-13.15,93.0,'4th Arc at 21:41:27 UTC ', 'EdgeColor','k','BackgroundColor','w','HorizontalAlignment','left');

```

waypoints = [-16.0,97.152797; -17.0,96.653230];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-17.0,96.653230; -18.0,96.113237];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-18.0,96.113237; -19.0,95.529978];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-19.0,95.529978; -20.0,94.900162];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-20.0,94.900162; -21.0,94.219947];
[Ittrk,Intrk] = track('gc',waypoints,'degrees');
geoshow(Ittrk,Intrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);
waypoints = [-21.0,94.219947; -22.0,93.484818];

```

```

[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','LineStyle','--','color','k','LineWidth',1);

textm(-19.2,95.6,'5th Arc at 22:41:22 UTC ','EdgeColor','k','BackgroundColor','w','HorizontalAlignment','left');

waypoints = [-23.0,102.224997; -24.0,101.644677];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','LineStyle',':','color','b','LineWidth',2);
waypoints = [-24.0,101.644677; -25.0,101.023959];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','LineStyle',':','color','b','LineWidth',2);
waypoints = [-25.0,101.023959; -26.0,100.359782];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','LineStyle',':','color','b','LineWidth',2);
waypoints = [-26.0,100.359782; -27.0,99.648631];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','LineStyle',':','color','b','LineWidth',2);
waypoints = [-27.0,99.648631; -28.0,98.886445];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','LineStyle',':','color','b','LineWidth',2);
waypoints = [-28.0,98.886445; -29.0,98.068491];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','LineStyle',':','color','b','LineWidth',2);
waypoints = [-29.0,98.068491; -30.0,97.189202];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','LineStyle',':','color','b','LineWidth',2);
waypoints = [-30.0,97.189202; -31.0,96.241966];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','LineStyle',':','color','b','LineWidth',2);
waypoints = [-31.0,96.241966; -32.0,95.218821];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','LineStyle',':','color','b','LineWidth',2);
waypoints = [-32.0,95.218821; -33.0,94.110040];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','LineStyle',':','color','b','LineWidth',2);
waypoints = [-33.0,94.110040; -34.0,92.903528];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','LineStyle',':','color','b','LineWidth',2);

textm(-23.0,103.0,'6th Arc ','EdgeColor','k','BackgroundColor','w','HorizontalAlignment','left');

```

% Flight Track Points

```

geoshow(5.58911792,99.16522840,'Marker','*','color','r','MarkerSize',12);
geoshow(5.413,98.200,'Marker','*','color','r','MarkerSize',12);
geoshow(5.36239182,97.92430148,'Marker','*','color','r','MarkerSize',12);
geoshow(5.566,97.732,'Marker','*','color','r','MarkerSize',12);
geoshow(5.728,97.502,'Marker','*','color','r','MarkerSize',12);
geoshow(5.830,96.667,'Marker','*','color','r','MarkerSize',12);
geoshow(6.142,96.202,'Marker','*','color','r','MarkerSize',12);

geoshow(6.525,95.850,'Marker','*','color','k','MarkerSize',12);
geoshow(6.525,95.850,'Marker','o','color','k','MarkerSize',20);
str={' 1st Arc 18:28:14.904 UTC ',' ...
      ' BTO Residual -1.0368 μs ', ...
      ' BFO Residual -0.0030 Hz '};
textm(6.52,96.35,str,'EdgeColor','k','BackgroundColor','w','HorizontalAlignment','center');

geoshow(6.88431518,95.58854742,'Marker','*','color','r','MarkerSize',12);
geoshow(6.726,95.358,'Marker','*','color','r','MarkerSize',12);
geoshow(6.56757525,95.12760184,'Marker','*','color','r','MarkerSize',12);

geoshow(6.10148080,94.82016820,'Marker','*','color','k','MarkerSize',12);
geoshow(6.10148080,94.82016820,'Marker','o','color','k','MarkerSize',20);
str={' SATCOM Call 18:39:55.354 UTC ',' ...
      ' BFO Residual 1.5182 Hz '};
textm(6.10,95.42,str,'EdgeColor','k','BackgroundColor','w','HorizontalAlignment','center');

geoshow(5.402,94.360,'Marker','*','color','r','MarkerSize',12);
geoshow(4.627,94.027,'Marker','*','color','r','MarkerSize',12);
geoshow(4.374,94.146,'Marker','*','color','r','MarkerSize',12);

```

```

geoshow(3.603,94.489,'Marker','k','color','r','MarkerSize',12);
geoshow(2.775,95.250,'Marker','k','color','r','MarkerSize',12);
geoshow(2.4965,95.227,'Marker','k','color','r','MarkerSize',12);
geoshow(1.815,94.732,'Marker','k','color','r','MarkerSize',12);
geoshow(1.218,94.302,'Marker','k','color','r','MarkerSize',12);
geoshow(1.00487505,94.14794281,'Marker','k','color','r','MarkerSize',12);
geoshow(0.79174251,93.99390559,'Marker','k','color','r','MarkerSize',12);
geoshow(0.695,93.729,'Marker','k','color','r','MarkerSize',12);
geoshow(0.560,93.183,'Marker','k','color','r','MarkerSize',12);
geoshow(0.294,93.274,'Marker','k','color','r','MarkerSize',12);
geoshow(0.070,93.460,'Marker','k','color','r','MarkerSize',12);
geoshow(-0.15400077,93.64599824,'Marker','k','color','r','MarkerSize',12);
geoshow(-0.422,93.7315,'Marker','k','color','r','MarkerSize',12);

geoshow(-0.758,93.639,'Marker','k','color','k','MarkerSize',12);
geoshow(-0.758,93.639,'Marker','o','color','k','MarkerSize',20);
str={' 2nd Arc 19:41:02.906 UTC ', ...
    ' BTO Residual -8.3100  $\mu$ s ', ...
    ' BFO Residual -0.0017 Hz '};
textm(-0.75,94.25,str,'EdgeColor','k','BackgroundColor','w','HorizontalAlignment','center');

geoshow(-1.420,92.800,'Marker','k','color','r','MarkerSize',12);
geoshow(-1.626,92.516,'Marker','k','color','r','MarkerSize',12);
geoshow(-1.676,92.241,'Marker','k','color','r','MarkerSize',12);
geoshow(-2.105,91.880,'Marker','k','color','r','MarkerSize',12);
geoshow(-2.645,91.725,'Marker','k','color','r','MarkerSize',12);
geoshow(-2.70,92.00,'Marker','k','color','r','MarkerSize',12);
geoshow(-2.648,92.277,'Marker','k','color','r','MarkerSize',12);
geoshow(-3.747,92.504,'Marker','k','color','r','MarkerSize',12);
geoshow(-4.300,92.595,'Marker','k','color','r','MarkerSize',12);
geoshow(-5.226,93.221,'Marker','k','color','r','MarkerSize',12);
geoshow(-6.008,93.522,'Marker','k','color','r','MarkerSize',12);
geoshow(-6.836,93.378,'Marker','k','color','r','MarkerSize',12);
geoshow(-7.269,93.018,'Marker','k','color','r','MarkerSize',12);

geoshow(-7.41664131,93.05347689,'Marker','k','color','k','MarkerSize',12);
geoshow(-7.41664131,93.05347689,'Marker','o','color','k','MarkerSize',20);
str={' 3rd Arc 20:41:04.904 UTC ', ...
    ' BTO Residual -16.0854  $\mu$ s ', ...
    ' BFO Residual -0.7210 Hz '};
textm(-7.42,93.70,str,'EdgeColor','k','BackgroundColor','w','HorizontalAlignment','center');

geoshow(-7.81494345,93.14918533,'Marker','k','color','r','MarkerSize',12);
geoshow(-8.285,93.452,'Marker','k','color','r','MarkerSize',12);
geoshow(-8.931,93.984,'Marker','k','color','r','MarkerSize',12);
geoshow(-8.939,94.350,'Marker','k','color','r','MarkerSize',12);
geoshow(-9.495,94.338,'Marker','k','color','r','MarkerSize',12);
geoshow(-10.048,94.390,'Marker','k','color','r','MarkerSize',12);
geoshow(-10.511,94.075,'Marker','k','color','r','MarkerSize',12);
geoshow(-10.74237833,93.91715046,'Marker','k','color','r','MarkerSize',12);
geoshow(-10.903,93.397,'Marker','k','color','r','MarkerSize',12);
geoshow(-11.116,93.544,'Marker','k','color','r','MarkerSize',12);
geoshow(-11.649,93.694,'Marker','k','color','r','MarkerSize',12);
geoshow(-11.893,94.2005,'Marker','k','color','r','MarkerSize',12);
geoshow(-12.107,94.376,'Marker','k','color','r','MarkerSize',12);
geoshow(-12.797,94.850,'Marker','k','color','r','MarkerSize',12);
geoshow(-13.273,94.127,'Marker','k','color','r','MarkerSize',12);
geoshow(-13.43120922,93.88537951,'Marker','k','color','r','MarkerSize',12);

geoshow(-13.54561623,93.71016665,'Marker','k','color','k','MarkerSize',12);
geoshow(-13.54561623,93.71016665,'Marker','o','color','k','MarkerSize',20);
str={' 4th Arc 21:41:26.905 UTC ', ...
    ' BTO Residual +30.9355  $\mu$ s ', ...
    ' BFO Residual +0.8070 Hz '};
textm(-13.50,94.50,str,'EdgeColor','k','BackgroundColor','w','HorizontalAlignment','center');

geoshow(-13.979,93.934,'Marker','k','color','r','MarkerSize',12);
geoshow(-14.667,93.405,'Marker','k','color','r','MarkerSize',12);
geoshow(-15.206,93.602,'Marker','k','color','r','MarkerSize',12);
geoshow(-15.486,93.673,'Marker','k','color','r','MarkerSize',12);
geoshow(-16.174,94.205,'Marker','k','color','r','MarkerSize',12);
geoshow(-16.40302944,94.38314466,'Marker','k','color','r','MarkerSize',12);

```



```

geoshow(-16.63190256,94.56170633,'Marker','*', 'color','r','MarkerSize',12);
geoshow(-16.86061673,94.74069188,'Marker','*', 'color','r','MarkerSize',12);
geoshow(-17.073,94.941,'Marker','*', 'color','r','MarkerSize',12);
geoshow(-17.883,95.263,'Marker','*', 'color','r','MarkerSize',12);
geoshow(-18.116,94.331,'Marker','*', 'color','r','MarkerSize',12);
geoshow(-18.394,94.426,'Marker','*', 'color','r','MarkerSize',12);
geoshow(-19.255,94.330,'Marker','*', 'color','r','MarkerSize',12);
geoshow(-19.510,94.480,'Marker','*', 'color','r','MarkerSize',12);
geoshow(-19.76486807,94.63047087,'Marker','*', 'color','r','MarkerSize',12);
geoshow(-20.01960198,94.78142055,'Marker','*', 'color','r','MarkerSize',12);

geoshow(-20.706691,94.367932,'Marker','*', 'color','k','MarkerSize',12);
geoshow(-20.706691,94.367932,'Marker','o','color','k','MarkerSize',20);
str={' 5th Arc 22:41:21.906 UTC ', ...
    ' BTO Residual -26.1706  $\mu$ s ', ...
    ' BFO Residual -4.3878 Hz '};
textm(-20.71,94.80,str,'EdgeColor','k','BackgroundColor','w','HorizontalAlignment','left');

geoshow(-20.788,94.319,'Marker','*', 'color','r','MarkerSize',12);
geoshow(-21.04384104,94.16382653,'Marker','*', 'color','r','MarkerSize',12);
geoshow(-21.603,94.358,'Marker','*', 'color','r','MarkerSize',12);

```

% Current Position Limit Markers

```

geoshow(-21.502,94.972,'Marker','o','color','r','MarkerSize',20);
geoshow(-21.603,94.358,'Marker','o','color','b','MarkerSize',180);

```

end

% Current Position Marker

```

geoshow(-21.502,94.972,'Marker','*', 'color','r','MarkerSize',12);

```

if glob == '0'

% Flight Track Lines

```

waypoints = [5.47472811,100.89183367;5.25434271,100.45004693];
[ltrk,lntk] = track('gc',waypoints,'degrees');
geoshow(ltrk,lntk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

```

```

waypoints = [5.25434271,100.45004693;5.25196956,100.43974800];
[ltrk,lntk] = track('gc',waypoints,'degrees');
geoshow(ltrk,lntk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

```

```

waypoints = [5.25196956,100.43974800;5.24822535,100.42924017];
[ltrk,lntk] = track('gc',waypoints,'degrees');
geoshow(ltrk,lntk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

```

```

waypoints = [5.24822535,100.42924017;5.24507545,100.41926510];
[ltrk,lntk] = track('gc',waypoints,'degrees');
geoshow(ltrk,lntk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

```

```

waypoints = [5.24507545,100.41926510;5.24237736,100.40907553];
[ltrk,lntk] = track('gc',waypoints,'degrees');
geoshow(ltrk,lntk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

```

```

waypoints = [5.24237736,100.40907553;5.24015961,100.39950012];
[ltrk,lntk] = track('gc',waypoints,'degrees');
geoshow(ltrk,lntk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

```

```

waypoints = [5.24015961,100.39950012;5.23658986,100.38767545];
[ltrk,lntk] = track('gc',waypoints,'degrees');
geoshow(ltrk,lntk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

```

```

waypoints = [5.23658986,100.38767545;5.22853875,100.35940772];

```

```

[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

waypoints = [5.22853875,100.35940772;5.19844115,100.17349006];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

waypoints = [5.19844115,100.17349006;5.19671047,100.14368928];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

waypoints = [5.19671047,100.14368928;5.19657320,100.13370932];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

waypoints = [5.19657320,100.13370932;5.19812122,100.11737592];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

waypoints = [5.19812122,100.11737592;5.19926161,100.10670992];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

waypoints = [5.19926161,100.10670992;5.19917267,100.09739918];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

waypoints = [5.19917267,100.09739918;5.19896331,100.07529101];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

waypoints = [5.19896331,100.07529101;5.21452286,100.00331029];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

waypoints = [5.21452286,100.00331029;5.24653523,99.92479600];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

waypoints = [5.24653523,99.92479600;5.27526160,99.87200435];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

waypoints = [5.27526160,99.87200435;5.30975116,99.81418601];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

waypoints = [5.30975116,99.81418601;5.34376189,99.75938739];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

waypoints = [5.34376189,99.75938739;5.36851655,99.71900578];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

waypoints = [5.36851655,99.71900578;5.39885124,99.64895222];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

waypoints = [5.39885124,99.64895222;5.43673126,99.55760530];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

waypoints = [5.43673126,99.55760530;5.53749203,99.29607774];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','k','LineWidth',2,'LineStyle',':');

waypoints = [5.58911792,99.16522840;5.413,98.200];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [5.413,98.200;5.36239182,97.92430148];

```

```

[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [5.36239182,97.92430148;5.26600000,97.51133333];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','k','LineWidth',1,'LineStyle',':');

waypoints = [5.36239182,97.92430148;5.566,97.732];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [5.566,97.732;5.728,97.502];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [5.728,97.502;5.830,96.667];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [5.830,96.667;6.142,96.202];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [6.142,96.202;6.493,95.871];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [6.493,95.871;6.88431518,95.58854742];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [6.88431518,95.58854742;6.726,95.358];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [6.726,95.358;6.56757525,95.12760184];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [6.56757525,95.12760184;5.402,94.360];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [5.402,94.360;4.627,94.027];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [4.627,94.027;4.374,94.146];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [4.374,94.146;4.12097938,94.26492017];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [4.374,94.146;3.603,94.489];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [3.603,94.489;2.775,95.250];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [2.775,95.250;2.4965,95.227];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [2.4965,95.227;1.815,94.732];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [1.815,94.732;1.59448304,94.57193986];

```

```

[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [1.59448304,94.57193986;1.37395309,94.41191378];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [1.37395309,94.41191378;1.218,94.302];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [1.218,94.302;1.00487505,94.14794281];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [1.00487505,94.14794281;0.79174251,93.99390559];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [0.79174251,93.99390559;0.695,93.729];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [0.695,93.729;0.560,93.183];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [0.560,93.183;0.294,93.274];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [0.294,93.274;0.070,93.460];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [0.070,93.460;-0.15400077,93.64599824];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-0.15400077,93.64599824;-0.422,93.7315];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-0.422,93.7315;-0.5325,93.81875];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-0.5325,93.81875;-0.75778425,93.63885080];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-0.75778425,93.63885080;-1.420,92.800];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-1.420,92.800;-1.626,92.516];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-1.626,92.516;-1.676,92.241];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-1.676,92.241;-2.105,91.880];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-2.105,91.880;-2.645,91.725];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-2.645,91.725;-2.70,92.00];

```

```

[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-2.70,92.00;-2.648,92.277];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-2.648,92.277;-3.747,92.504];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-3.747,92.504;-4.300,92.595];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-4.300,92.595;-5.226,93.221];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-5.226,93.221;-6.008,93.522];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-6.008,93.522;-6.836,93.378];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-6.836,93.378;-7.269,93.018];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-7.269,93.018;-7.81494345,93.14918533];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-7.81494345,93.14918533;-8.285,93.452];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-8.285,93.452;-8.931,93.984];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-8.931,93.984;-8.939,94.350];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-8.939,94.350;-9.495,94.338];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-9.495,94.338;-10.048,94.390];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-10.048,94.390;-10.511,94.075];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-10.511,94.075;-10.74237833,93.91715046];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-10.74237833,93.91715046;-10.903,93.397];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-10.903,93.397;-11.116,93.544];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-11.116,93.544;-11.649,93.694];

```

```

[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-11.649,93.694;-11.893,94.2005];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-11.893,94.2005;-12.107,94.376];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-12.107,94.376;-12.797,94.850];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-12.797,94.850;-13.273,94.127];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-13.273,94.127;-13.54561623,93.71016665];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-13.54561623,93.71016665;-13.979,93.934];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-13.979,93.934;-14.667,93.405];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-14.667,93.405;-15.206,93.602];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-15.206,93.602;-15.486,93.673];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-15.486,93.673;-16.174,94.205];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-16.174,94.205;-16.40302944,94.38314466];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-16.40302944,94.38314466;-16.86061673,94.74069188];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-16.86061673,94.74069188;-17.073,94.941];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-17.073,94.941;-17.883,95.263];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-17.883,95.263;-18.116,94.331];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-18.116,94.331;-18.394,94.426];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-18.394,94.426;-19.255,94.330];
[lttrk,lntrk] = track('gc',waypoints,'degrees');
geoshow(lttrk,lntrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');

waypoints = [-19.255,94.330;-19.510,94.480];

```

```
[litrk,litrk] = track('gc',waypoints,'degrees');
geoshow(litrk,litrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');
```

```
waypoints = [-19.510,94.480;-20.01960198,94.78142055];
[litrk,litrk] = track('gc',waypoints,'degrees');
geoshow(litrk,litrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');
```

```
waypoints = [-20.01960198,94.78142055;-20.788,94.319];
[litrk,litrk] = track('gc',waypoints,'degrees');
geoshow(litrk,litrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');
```

```
waypoints = [-20.788,94.319;-21.04384104,94.16382653];
[litrk,litrk] = track('gc',waypoints,'degrees');
geoshow(litrk,litrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');
```

```
waypoints = [-21.04384104,94.16382653;-21.603,94.358];
[litrk,litrk] = track('gc',waypoints,'degrees');
geoshow(litrk,litrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');
```

```
waypoints = [-21.603,94.358;-21.502,94.972];
[litrk,litrk] = track('gc',waypoints,'degrees');
geoshow(litrk,litrk,'DisplayType','line','color','r','LineWidth',2,'LineStyle',':');
```

% Waypoint Tracks

```
waypoints = [-21.502,94.972;-21.0,98.0];
[litrk,litrk] = track('gc',waypoints,'degrees');
geoshow(litrk,litrk,'DisplayType','line','color','k','LineWidth',1,'LineStyle',':');
```

```
textm(-21.00,97.00,'to waypoint 21S98E','EdgeColor','k','BackgroundColor','w','HorizontalAlignment','left');
```

```
waypoints = [-21.603,94.358;-26.0,96.0];
[litrk,litrk] = track('gc',waypoints,'degrees');
geoshow(litrk,litrk,'DisplayType','line','color','k','LineWidth',1,'LineStyle',':');
```

```
textm(-22.65,94.90,'to waypoint 26S96E','EdgeColor','k','BackgroundColor','w','HorizontalAlignment','left');
```

```
waypoints = [-20.788,94.319;-24.0,92.0];
[litrk,litrk] = track('gc',waypoints,'degrees');
geoshow(litrk,litrk,'DisplayType','line','color','k','LineWidth',1,'LineStyle',':');
```

```
textm(-22.65,93.00,'to waypoint 24S92E','EdgeColor','k','BackgroundColor','w','HorizontalAlignment','left');
```

% Footer Label

```
str={' 21.502°S 94.972°E Boeing 777 MH370 Flight estimated position marked with a red asterisk ', ...
[' Ground Speed 523.0 knots, Track 79.9 °T, Altitude 38,500 feet, ROC 0.0 fpm ']];
textm(-22.85,95.0,str,'EdgeColor','k','BackgroundColor','w','HorizontalAlignment','center');
```

end

% Title

```
titstring1=' ';
titstring2=' ';
titstring3=' MH370 7th March 2014 22:52 UTC Position ';
titstring4=' SNR > 1.0 SD Anomaly Links marked in red, SNR > 0.75 SD Anomaly Links marked in orange, SNR > 0.50 SD Anomaly Links marked in yellow ';
titstring5=' Drift Anomaly Links marked in green, SNR and Drift Anomaly Links marked in blue, Non Anomaly Links marked in grey ';
titstring6=' Boeing 777-200ER estimated position marked with a red asterisk and circle ';
titstring7=' ';
titstring8=' ';
titstring9=' ';
```

```
title({titstring1;titstring2;titstring3;titstring4;titstring5;titstring6;titstring7;titstring8;titstring9},'fontsize',12,'fontweight','bold');
```

E. Sample SQL Script for WSPR Anomaly Checking.

```
select
    id, time, tx_sign, tx_loc, rx_sign, rx_loc, frequency, power, snr, drift, distance,
azimuth, band, version, code
from wspr.rx where
    time between '2014-03-07 21:34:00' and '2014-03-08 03:34:00'
    and tx_sign = 'AD4PT'
    and rx_sign = 'N6RY'
    and band = '21'
order by time
limit 2000
```


F. Matlab Function Call WSPR_Link_GCV9_Function for Mapping.

```
function [slat,slon,arclen,az] = WSPR_Link_GCV9_Function(tc,rc,sslat, sslon, selat,  
selon,tx_sign,rx_sign)
```

```
warning('off');
```

```
start = -85.0;  
finish = 85.0;
```

```
rev='0';
```

```
% Earth Reference Sphere  
s = referenceSphere('Earth');  
R=6378137;  
s.LengthUnit = 'meter';  
s.Radius=R;
```

```
az=0;
```

```
slat=str2double(sslat);  
slon=str2double(sslon);  
elat=str2double(selat);  
elon=str2double(selon);
```

```
if and(slat>start, slat<=finish)
```

```
% LineColour
```

```
if tc == '0'  
    if rc == '1'  
        LineColour = [1,0.65,0];  
    else  
        LineColour = [0,0,0];  
    end  
elseif tc == '1'  
    if rc == '1'  
        LineColour = [1,0,0];  
    else  
        LineColour = [1,0.65,0];  
    end  
elseif tc == '2'  
    LineColour = [0,0,1];  
elseif tc == '3'  
    LineColour = [0,1,0];  
elseif tc == '4'  
    LineColour = [1,1,0];  
else  
    error(LineColour);  
    return;  
end
```

```

%Great Circle Tracks
[arclen,az] = distance(slat,slon,elat,elon,s);

% az

arclenlp=40075016-arclen;
azlp = azimuth(elat,elon,slat,slon,s)-180;

[ltrk,ltrk] = track1(slat,slon,az,arclen,s,'degrees',100);
geoshow(ltrk,ltrk,'DisplayType','line','color',LineColour,'LineWidth',2,'LineStyle','-');

[ltrk,ltrk] = track1(elat,elon,azlp,arclenlp,s,'degrees',300);
geoshow(ltrk,ltrk,'DisplayType','line','color',LineColour,'LineWidth',1,'LineStyle','-');

geoshow(slat,slon,'Marker','.', 'color','k','MarkerSize',16);
geoshow(elat,elon,'Marker','.', 'color','m','MarkerSize',16);

end

```

G. Worked Example WSPR Link Timeframe Analysis.

(in alphanumeric order of the Transmitter and Receiver call signs and hour of detection)

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186190476	2014-03-07 22:38:00	G3JKF	JO00bs	DK6UG	JN49cm	3594150	37	-5	0	592	100	3	2.21_r2286	0
2	186191134	2014-03-07 22:42:00	G3JKF	JO00bs	DK6UG	JN49cm	3594150	37	-6	0	592	100	3	2.21_r2286	0
3	186191992	2014-03-07 22:48:00	G3JKF	JO00bs	DK6UG	JN49cm	3594150	37	-13	0	592	100	3	2.21_r2286	0
4	186192650	2014-03-07 22:52:00	G3JKF	JO00bs	DK6UG	JN49cm	3594150	37	-3	0	592	100	3	2.21_r2286	0
5	186193474	2014-03-07 22:58:00	G3JKF	JO00bs	DK6UG	JN49cm	3594150	37	-4	0	592	100	3	2.21_r2286	0
6	186194501	2014-03-07 23:04:00	G3JKF	JO00bs	DK6UG	JN49cm	3594150	37	-3	0	592	100	3	2.21_r2286	0
7	186195432	2014-03-07 23:10:00	G3JKF	JO00bs	DK6UG	JN49cm	3594173	37	-3	0	592	100	3	2.21_r2286	0
8	186196701	2014-03-07 23:18:00	G3JKF	JO00bs	DK6UG	JN49cm	3594173	37	0	0	592	100	3	2.21_r2286	0
9	186197498	2014-03-07 23:24:00	G3JKF	JO00bs	DK6UG	JN49cm	3594173	37	-3	0	592	100	3	2.21_r2286	0
10	186198079	2014-03-07 23:28:00	G3JKF	JO00bs	DK6UG	JN49cm	3594173	37	-3	0	592	100	3	2.21_r2286	0
11	186199099	2014-03-07 23:34:00	G3JKF	JO00bs	DK6UG	JN49cm	3594173	37	-7	0	592	100	3	2.21_r2286	0
12	186200012	2014-03-07 23:38:00	G3JKF	JO00bs	DK6UG	JN49cm	3594173	37	-9	0	592	100	3	2.21_r2286	0
13	186200877	2014-03-07 23:44:00	G3JKF	JO00bs	DK6UG	JN49cm	3594173	37	-3	0	592	100	3	2.21_r2286	0
14	186201978	2014-03-07 23:50:00	G3JKF	JO00bs	DK6UG	JN49cm	3594173	37	-4	0	592	100	3	2.21_r2286	0
15	186203248	2014-03-07 23:58:00	G3JKF	JO00bs	DK6UG	JN49cm	3594173	37	-4	0	592	100	3	2.21_r2286	0
									Mean	-4.6667					
									SD	3.1091					
									AD	-1.6667					
									AD%	-54					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186191093	2014-03-07 22:42:00	G4FKK	IO91wi	YO3ITD	KN34cj	7040052	33	-6	0	2097	101	7	2.11_r2263	0
2	186192608	2014-03-07 22:52:00	G4FKK	IO91wi	YO3ITD	KN34cj	7040048	33	-9	-1	2097	101	7	2.11_r2263	0
3	186194499	2014-03-07 23:04:00	G4FKK	IO91wi	YO3ITD	KN34cj	7040052	33	-9	0	2097	101	7	2.11_r2263	0
4	186196013	2014-03-07 23:14:00	G4FKK	IO91wi	YO3ITD	KN34cj	7040050	33	-8	0	2097	101	7	2.11_r2263	0
5	186197890	2014-03-07 23:26:00	G4FKK	IO91wi	YO3ITD	KN34cj	7040052	33	-9	0	2097	101	7	2.11_r2263	0
6	186199815	2014-03-07 23:38:00	G4FKK	IO91wi	YO3ITD	KN34cj	7040052	33	-12	0	2097	101	7	2.11_r2263	0
7	186201107	2014-03-07 23:46:00	G4FKK	IO91wi	YO3ITD	KN34cj	7040052	33	-6	0	2097	101	7	2.11_r2263	0
8	186203222	2014-03-07 23:58:00	G4FKK	IO91wi	YO3ITD	KN34cj	7040052	33	-10	0	2097	101	7	2.11_r2263	0
9	186207550	2014-03-08 00:26:00	G4FKK	IO91wi	YO3ITD	KN34cj	7040052	33	-7	0	2097	101	7	2.11_r2263	0
10	186208814	2014-03-08 00:34:00	G4FKK	IO91wi	YO3ITD	KN34cj	7040049	33	-9	0	2097	101	7	2.11_r2263	0
11	186210532	2014-03-08 00:46:00	G4FKK	IO91wi	YO3ITD	KN34cj	7040053	33	-10	0	2097	101	7	2.11_r2263	0
12	186211717	2014-03-08 00:54:00	G4FKK	IO91wi	YO3ITD	KN34cj	7040051	33	-6	-1	2097	101	7	2.11_r2263	0
13	186214388	2014-03-08 01:14:00	G4FKK	IO91wi	YO3ITD	KN34cj	7040050	33	-1	-1	2097	101	7	2.11_r2263	0
14	186216773	2014-03-08 01:32:00	G4FKK	IO91wi	YO3ITD	KN34cj	7040051	33	-10	-1	2097	101	7	2.11_r2263	0
								Mean	-8.0000						
								SD	2.6890						
								AD	1.0000						
								AD%	37						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186177821	2014-03-07 21:40:00	G4KPX	JO02dj	DC0DX/A	JO31lk	475618	0	-26	0	469	100	0	4.0 r3015	0
2	186180717	2014-03-07 21:48:00	G4KPX	JO02dj	DC0DX/A	JO31lk	475618	0	-29	0	469	100	0	4.0 r3015	0
3	186192571	2014-03-07 22:52:00	G4KPX	JO02dj	DC0DX/A	JO31lk	475619	0	-23	0	469	100	0	4.0 r3015	0
								Mean	-26.0000						
								SD	3.0000						
								AD	-3.0000						
								AD%	-100						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186158662	2014-03-07 19:56:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-21	0	308	100	0	2.11_r2263	0
2	186160136	2014-03-07 20:04:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-23	0	308	100	0	2.11_r2263	0
3	186161677	2014-03-07 20:12:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-19	0	308	100	0	2.11_r2263	0
4	186162966	2014-03-07 20:20:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-19	0	308	100	0	2.11_r2263	0
5	186164557	2014-03-07 20:28:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-19	0	308	100	0	2.11_r2263	0
6	186166177	2014-03-07 20:36:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-19	0	308	100	0	2.11_r2263	0
7	186169159	2014-03-07 20:52:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-25	0	308	100	0	2.11_r2263	0
8	186173554	2014-03-07 21:16:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-17	0	308	100	0	2.11_r2263	0
9	186175120	2014-03-07 21:24:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-13	0	308	100	0	2.11_r2263	0
10	186176647	2014-03-07 21:32:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-14	0	308	100	0	2.11_r2263	0
11	186177917	2014-03-07 21:40:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-18	0	308	100	0	2.11_r2263	0
12	186180738	2014-03-07 21:48:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-21	0	308	100	0	2.11_r2263	0
13	186185112	2014-03-07 22:04:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-19	0	308	100	0	2.11_r2263	0
14	186186534	2014-03-07 22:12:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-16	0	308	100	0	2.11_r2263	0
15	186187834	2014-03-07 22:20:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-20	0	308	100	0	2.11_r2263	0
16	186188938	2014-03-07 22:28:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-23	0	308	100	0	2.11_r2263	0
17	186190276	2014-03-07 22:36:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-16	0	308	100	0	2.11_r2263	0
18	186192721	2014-03-07 22:52:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-15	0	308	100	0	2.11_r2263	0
19	186193990	2014-03-07 23:00:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-23	0	308	100	0	2.11_r2263	0
20	186195146	2014-03-07 23:08:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-17	0	308	100	0	2.11_r2263	0
21	186196266	2014-03-07 23:16:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-14	0	308	100	0	2.11_r2263	0
22	186197462	2014-03-07 23:24:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-10	0	308	100	0	2.11_r2263	0
23	186198961	2014-03-07 23:32:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-11	0	308	100	0	2.11_r2263	0
24	186200398	2014-03-07 23:40:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-10	0	308	100	0	2.11_r2263	0
25	186201668	2014-03-07 23:48:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-13	0	308	100	0	2.11_r2263	0
26	186203036	2014-03-07 23:56:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-10	0	308	100	0	2.11_r2263	0
27	186204246	2014-03-08 00:04:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-18	0	308	100	0	2.11_r2263	0
28	186205306	2014-03-08 00:12:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-16	0	308	100	0	2.11_r2263	0
29	186206699	2014-03-08 00:20:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-16	0	308	100	0	2.11_r2263	0
30	186207951	2014-03-08 00:28:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-17	0	308	100	0	2.11_r2263	0
31	186209211	2014-03-08 00:36:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-16	0	308	100	0	2.11_r2263	0
32	186213745	2014-03-08 01:08:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-12	0	308	100	0	2.11_r2263	0
33	186214711	2014-03-08 01:16:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-11	0	308	100	0	2.11_r2263	0
34	186215719	2014-03-08 01:24:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-19	0	308	100	0	2.11_r2263	0
35	186216800	2014-03-08 01:32:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-20	0	308	100	0	2.11_r2263	0
36	186217845	2014-03-08 01:40:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-15	0	308	100	0	2.11_r2263	0
37	186218942	2014-03-08 01:48:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-18	0	308	100	0	2.11_r2263	0
								Mean	-16.8378						
								SD	3.9265						
								AD	-0.8378						
								AD%	-21						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version
1	186188233	2014-03-07 22:22:00	G6RRL	IO90iw	DK6UG	JN49cm	3594082	33	-4	0	693	99	3	2.21_r2286
2	186189710	2014-03-07 22:32:00	G6RRL	IO90iw	DK6UG	JN49cm	3594081	33	-12	0	693	99	3	2.21_r2286
3	186192616	2014-03-07 22:52:00	G6RRL	IO90iw	DK6UG	JN49cm	3594078	33	-22	0	693	99	3	2.21_r2286
4	186194484	2014-03-07 23:04:00	G6RRL	IO90iw	DK6UG	JN49cm	3594077	33	-8	0	693	99	3	2.21_r2286
5	186195696	2014-03-07 23:12:00	G6RRL	IO90iw	DK6UG	JN49cm	3594076	33	-6	0	693	99	3	2.21_r2286
6	186197307	2014-03-07 23:22:00	G6RRL	IO90iw	DK6UG	JN49cm	3594075	33	-9	0	693	99	3	2.21_r2286
7	186198808	2014-03-07 23:32:00	G6RRL	IO90iw	DK6UG	JN49cm	3594075	33	-4	0	693	99	3	2.21_r2286
8	186200229	2014-03-07 23:40:00	G6RRL	IO90iw	DK6UG	JN49cm	3594074	33	-8	0	693	99	3	2.21_r2286
9	186202149	2014-03-07 23:52:00	G6RRL	IO90iw	DK6UG	JN49cm	3594074	33	-7	0	693	99	3	2.21_r2286
10	186203661	2014-03-08 00:00:00	G6RRL	IO90iw	DK6UG	JN49cm	3594074	33	-7	0	693	99	3	2.21_r2286
11	186204473	2014-03-08 00:06:00	G6RRL	IO90iw	DK6UG	JN49cm	3594073	33	-5	0	693	99	3	2.21_r2286
								Mean	-8.3636					
								SD	5.0847					
								AD	13.6364					
								AD%	268					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186185841	2014-03-07 22:08:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	11	0	8326	54	28	2.11_r2263	0
2	186187617	2014-03-07 22:18:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	9	0	8326	54	28	2.11_r2263	0
3	186189183	2014-03-07 22:28:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	10	0	8326	54	28	2.11_r2263	0
4	186190346	2014-03-07 22:36:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	4	0	8326	54	28	2.11_r2263	0
5	186191486	2014-03-07 22:44:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	1	0	8326	54	28	2.11_r2263	0
6	186192574	2014-03-07 22:52:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126133	37	10	0	8326	54	28	2.11_r2263	0
7	186195680	2014-03-07 23:12:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	1	0	8326	54	28	2.11_r2263	0
8	186197623	2014-03-07 23:24:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	2	0	8326	54	28	2.11_r2263	0
9	186199237	2014-03-07 23:34:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	2	0	8326	54	28	2.11_r2263	0
10	186200921	2014-03-07 23:44:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	5	0	8326	54	28	2.11_r2263	0
11	186202933	2014-03-07 23:56:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	10	0	8326	54	28	2.11_r2263	0
12	186205921	2014-03-08 00:16:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	5	0	8326	54	28	2.11_r2263	0
13	186207367	2014-03-08 00:24:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	11	0	8326	54	28	2.11_r2263	0
14	186208984	2014-03-08 00:34:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126133	37	8	0	8326	54	28	2.11_r2263	0
15	186210181	2014-03-08 00:42:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	-2	0	8326	54	28	2.11_r2263	0
16	186211262	2014-03-08 00:50:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	-1	0	8326	54	28	2.11_r2263	0
17	186212984	2014-03-08 01:02:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	4	0	8326	54	28	2.11_r2263	0
18	186215300	2014-03-08 01:20:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	-4	0	8326	54	28	2.11_r2263	0
19	186216228	2014-03-08 01:28:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	-2	0	8326	54	28	2.11_r2263	0
20	186217288	2014-03-08 01:36:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	-1	0	8326	54	28	2.11_r2263	0
21	186218521	2014-03-08 01:44:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126133	37	5	0	8326	54	28	2.11_r2263	0
22	186219503	2014-03-08 01:52:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	5	0	8326	54	28	2.11_r2263	0
									Mean	4.2273					
									SD	4.6897					
									AD	-5.7727					
									AD%	-123					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186160575	2014-03-07 20:08:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097175	37	-23	-1	2749	276	14	0.8_r3058	0
2	186164555	2014-03-07 20:28:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097176	37	-22	-1	2749	276	14	0.8_r3058	0
3	186174325	2014-03-07 21:20:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097024	37	-12	-1	2749	276	14	0.8_r3058	0
4	186176522	2014-03-07 21:32:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097025	37	-11	-2	2749	276	14	0.8_r3058	0
5	186180260	2014-03-07 21:46:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097025	37	-15	-2	2749	276	14	0.8_r3058	0
6	186184221	2014-03-07 22:00:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097024	37	-20	-2	2749	276	14	0.8_r3058	0
7	186186441	2014-03-07 22:12:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097024	37	-18	-2	2749	276	14	0.8_r3058	0
8	186188796	2014-03-07 22:26:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097025	37	-12	-1	2749	276	14	0.8_r3058	0
9	186190576	2014-03-07 22:38:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097024	37	-9	-1	2749	276	14	0.8_r3058	0
10	186192696	2014-03-07 22:52:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097024	37	-13	-2	2749	276	14	0.8_r3058	0
									Mean	-15.5000					
									SD	4.9272					
									AD	-2.5000					
									AD%	-51					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186190800	2014-03-07 22:40:00	W4MO	EL87tc	SM3ULC	JO89ul	14097123	33	-14	1	7977	32	14	2.11_r2263	0
2	186192673	2014-03-07 22:52:00	W4MO	EL87tc	SM3ULC	JO89ul	14097123	33	-24	0	7977	32	14	2.11_r2263	0
3	186193839	2014-03-07 23:00:00	W4MO	EL87tc	SM3ULC	JO89ul	14097122	33	-15	0	7977	32	14	2.11_r2263	0
								Mean	-17.6667						
								SD	5.5076						
								AD	6.3333						
								AD%	115						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186157819	2014-03-07 19:52:00	WD0UG	EM64	KB9VLR	EN54vj	10140163	30	-11	-3	1107	355	10	2.0_r1714	0
2	186159654	2014-03-07 20:02:00	WD0UG	EM64	KB9VLR	EN54vj	10140163	30	-6	-1	1107	355	10	2.0_r1714	0
3	186163580	2014-03-07 20:22:00	WD0UG	EM64	KB9VLR	EN54vj	10140162	30	-11	-1	1107	355	10	2.0_r1714	0
4	186172767	2014-03-07 21:12:00	WD0UG	EM64	KB9VLR	EN54vj	10140160	30	-6	-2	1107	355	10	2.0_r1714	0
5	186184744	2014-03-07 22:02:00	WD0UG	EM64	KB9VLR	EN54vj	10140160	30	-7	-1	1107	355	10	2.0_r1714	0
6	186188196	2014-03-07 22:22:00	WD0UG	EM64	KB9VLR	EN54vj	10140161	30	-7	-4	1107	355	10	2.0_r1714	0
7	186189900	2014-03-07 22:32:00	WD0UG	EM64	KB9VLR	EN54vj	10140161	30	-10	-1	1107	355	10	2.0_r1714	0
8	186192732	2014-03-07 22:52:00	WD0UG	EM64	KB9VLR	EN54vj	10140161	30	-5	-2	1107	355	10	2.0_r1714	0
9	186194065	2014-03-07 23:02:00	WD0UG	EM64	KB9VLR	EN54vj	10140161	30	-5	-2	1107	355	10	2.0_r1714	0
10	186197349	2014-03-07 23:22:00	WD0UG	EM64	KB9VLR	EN54vj	10140162	30	-11	-4	1107	355	10	2.0_r1714	0
11	186200624	2014-03-07 23:42:00	WD0UG	EM64	KB9VLR	EN54vj	10140161	30	-3	-2	1107	355	10	2.0_r1714	0
12	186203905	2014-03-08 00:02:00	WD0UG	EM64	KB9VLR	EN54vj	10140162	30	-6	-3	1107	355	10	2.0_r1714	0
								Mean	-7.3333						
								SD	2.7414						
								AD	-2.3333						
								AD%	-85						

H. Anomalous WSPR Link Timeframe Analysis.

(in alphanumeric order of the Transmitter and Receiver call signs and hour of detection)

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186194966	2014-03-07 23:08:00	2E0DSS	IO82xl	W4MO	EL87	14097065	33	-21	0	7030	281	14	2.21_r2286	0
2	186200146	2014-03-07 23:40:00	2E0DSS	IO82xl	W4MO	EL87	14097065	33	-11	0	7030	281	14	2.21_r2286	0
3	186208633	2014-03-08 00:32:00	2E0DSS	IO82xl	W4MO	EL87	14097065	33	-13	0	7030	281	14	2.21_r2286	0
4	186212543	2014-03-08 01:00:00	2E0DSS	IO82xl	W4MO	EL87	14097065	33	-14	0	7030	281	14	2.21_r2286	0
5	186220003	2014-03-08 01:56:00	2E0DSS	IO82xl	W4MO	EL87	14097066	33	-20	0	7030	281	14	2.21_r2286	0
								Mean	-15.8000						
								SD	4.4385						
								AD	-4.8000						
								AD%	-108						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186196090	2014-03-07 23:14:00	AA7FV	DM42pg	W4MO	EL87	14097189	33	-13	0	2712	94	14	2.21_r2286	0
2	186200184	2014-03-07 23:40:00	AA7FV	DM42pg	W4MO	EL87	14097189	33	-9	-1	2712	94	14	2.21_r2286	0
3	186205705	2014-03-08 00:14:00	AA7FV	DM42pg	W4MO	EL87	14097188	33	-12	0	2712	94	14	2.21_r2286	0
4	186213832	2014-03-08 01:10:00	AA7FV	DM42pg	W4MO	EL87	14097189	33	-10	0	2712	94	14	2.21_r2286	0
5	186217776	2014-03-08 01:40:00	AA7FV	DM42pg	W4MO	EL87	14097189	33	-9	0	2712	94	14	2.21_r2286	0
6	186222554	2014-03-08 02:14:00	AA7FV	DM42pg	W4MO	EL87	14097189	33	-7	1	2712	94	14	2.21_r2286	0
								Mean	-10.0000						
								SD	2.1909						
								AD	-1.0000						
								AD%	-46						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186177065	2014-03-07 21:34:00	AD4PT	EM12kk	W7ZWW	CN85rh	14097125	37	-18	0	2569	310	14	2.0_r1714	0
2	186178465	2014-03-07 21:42:00	AD4PT	EM12kk	W7ZWW	CN85rh	14097126	37	-18	0	2569	310	14	2.0_r1714	0
3	186182802	2014-03-07 21:52:00	AD4PT	EM12kk	W7ZWW	CN85rh	14097127	37	-15	0	2569	310	14	2.0_r1714	0
4	186184348	2014-03-07 22:00:00	AD4PT	EM12kk	W7ZWW	CN85rh	14097128	37	-16	0	2569	310	14	2.0_r1714	0
5	186186176	2014-03-07 22:10:00	AD4PT	EM12kk	W7ZWW	CN85rh	14097129	37	-16	0	2569	310	14	2.0_r1714	0
6	186187980	2014-03-07 22:20:00	AD4PT	EM12kk	W7ZWW	CN85rh	14097129	37	-15	0	2569	310	14	2.0_r1714	0
7	186189607	2014-03-07 22:30:00	AD4PT	EM12kk	W7ZWW	CN85rh	14097129	37	-15	0	2569	310	14	2.0_r1714	0
8	186190592	2014-03-07 22:38:00	AD4PT	EM12kk	W7ZWW	CN85rh	14097130	37	-15	0	2569	310	14	2.0_r1714	0
9	186191885	2014-03-07 22:46:00	AD4PT	EM12kk	W7ZWW	CN85rh	14097131	37	-12	0	2569	310	14	2.0_r1714	0
10	186193638	2014-03-07 22:58:00	AD4PT	EM12kk	W7ZWW	CN85rh	14097130	37	-15	0	2569	310	14	2.0_r1714	0
11	186195213	2014-03-07 23:08:00	AD4PT	EM12kk	W7ZWW	CN85rh	14097131	37	-10	0	2569	310	14	2.0_r1714	0
12	186196442	2014-03-07 23:16:00	AD4PT	EM12kk	W7ZWW	CN85rh	14097131	37	-18	0	2569	310	14	2.0_r1714	0
13	186197571	2014-03-07 23:24:00	AD4PT	EM12kk	W7ZWW	CN85rh	14097131	37	-18	0	2569	310	14	2.0_r1714	0
								Mean	-15.4615						
								SD	2.4019						
								AD	-5.4615						
								AD%	-227						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186088393	2014-03-07 15:10:00	DC5BN	JO43rh	2E0DSS	IO82xl	14097180	37	3	1	776	268	14	2.0_r1714	0
2	186095682	2014-03-07 15:38:00	DC5BN	JO43rh	2E0DSS	IO82xl	14097183	37	4	0	776	268	14	2.0_r1714	0
3	186102877	2014-03-07 16:02:00	DC5BN	JO43rh	2E0DSS	IO82xl	14097181	37	3	0	776	268	14	2.0_r1714	0
4	186108444	2014-03-07 16:22:00	DC5BN	JO43rh	2E0DSS	IO82xl	14097180	37	7	1	776	268	14	2.0_r1714	0
5	186114499	2014-03-07 16:44:00	DC5BN	JO43rh	2E0DSS	IO82xl	14097180	37	9	1	776	268	14	2.0_r1714	0
6	186120045	2014-03-07 17:04:00	DC5BN	JO43rh	2E0DSS	IO82xl	14097180	37	5	1	776	268	14	2.0_r1714	0
7	186125686	2014-03-07 17:26:00	DC5BN	JO43rh	2E0DSS	IO82xl	14097179	37	10	1	776	268	14	2.0_r1714	0
8	186131313	2014-03-07 17:48:00	DC5BN	JO43rh	2E0DSS	IO82xl	14097179	37	-16	0	776	268	14	2.0_r1714	0
9	186136587	2014-03-07 18:08:00	DC5BN	JO43rh	2E0DSS	IO82xl	14097179	37	-20	1	776	268	14	2.0_r1714	0
10	186141406	2014-03-07 18:30:00	DC5BN	JO43rh	2E0DSS	IO82xl	14097178	37	-23	1	776	268	14	2.0_r1714	0
								Mean	-1.8000						
								SD	12.6561						
								AD	18.2000						
								AD%	144						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186136229	2014-03-07 18:08:00	DF2JP	JO31jg	G3SXH	IO80	1838021	33	-17	0	695	267	1	2.0_r1714	0
2	186137937	2014-03-07 18:16:00	DF2JP	JO31jg	G3SXH	IO80	1838021	33	-19	0	695	267	1	2.0_r1714	0
3	186140378	2014-03-07 18:26:00	DF2JP	JO31jg	G3SXH	IO80	1838021	33	-20	0	695	267	1	2.0_r1714	0
4	186141844	2014-03-07 18:32:00	DF2JP	JO31jg	G3SXH	IO80	1838020	33	-18	1	695	267	1	2.0_r1714	0
5	186142956	2014-03-07 18:38:00	DF2JP	JO31jg	G3SXH	IO80	1838020	33	-17	0	695	267	1	2.0_r1714	0
6	186144839	2014-03-07 18:46:00	DF2JP	JO31jg	G3SXH	IO80	1838021	33	-15	0	695	267	1	2.0_r1714	0
7	186146270	2014-03-07 18:54:00	DF2JP	JO31jg	G3SXH	IO80	1838020	33	-11	0	695	267	1	2.0_r1714	0
8	186147756	2014-03-07 19:00:00	DF2JP	JO31jg	G3SXH	IO80	1838020	33	-15	0	695	267	1	2.0_r1714	0
9	186148776	2014-03-07 19:06:00	DF2JP	JO31jg	G3SXH	IO80	1838021	33	-12	0	695	267	1	2.0_r1714	0
10	186151045	2014-03-07 19:16:00	DF2JP	JO31jg	G3SXH	IO80	1838020	33	-9	0	695	267	1	2.0_r1714	0
11	186152940	2014-03-07 19:26:00	DF2JP	JO31jg	G3SXH	IO80	1838021	33	-9	0	695	267	1	2.0_r1714	0
12	186154243	2014-03-07 19:34:00	DF2JP	JO31jg	G3SXH	IO80	1838020	33	-16	0	695	267	1	2.0_r1714	0
13	186156273	2014-03-07 19:44:00	DF2JP	JO31jg	G3SXH	IO80	1838020	33	-12	0	695	267	1	2.0_r1714	0
14	186157168	2014-03-07 19:50:00	DF2JP	JO31jg	G3SXH	IO80	1838021	33	-14	0	695	267	1	2.0_r1714	0
15	186158891	2014-03-07 19:58:00	DF2JP	JO31jg	G3SXH	IO80	1838020	33	-12	0	695	267	1	2.0_r1714	0
16	186160694	2014-03-07 20:08:00	DF2JP	JO31jg	G3SXH	IO80	1838021	33	-12	0	695	267	1	2.0_r1714	0
17	186162164	2014-03-07 20:16:00	DF2JP	JO31jg	G3SXH	IO80	1838020	33	-14	0	695	267	1	2.0_r1714	0
18	186163435	2014-03-07 20:22:00	DF2JP	JO31jg	G3SXH	IO80	1838020	33	-16	0	695	267	1	2.0_r1714	0
19	186165012	2014-03-07 20:30:00	DF2JP	JO31jg	G3SXH	IO80	1838021	33	-14	0	695	267	1	2.0_r1714	0
20	186165953	2014-03-07 20:36:00	DF2JP	JO31jg	G3SXH	IO80	1838020	33	-17	0	695	267	1	2.0_r1714	0
21	186169144	2014-03-07 20:52:00	DF2JP	JO31jg	G3SXH	IO80	1838020	33	-10	0	695	267	1	2.0_r1714	0
22	186172856	2014-03-07 21:12:00	DF2JP	JO31jg	G3SXH	IO80	1838020	33	-9	0	695	267	1	2.0_r1714	0
23	186174262	2014-03-07 21:20:00	DF2JP	JO31jg	G3SXH	IO80	1838020	33	-9	0	695	267	1	2.0_r1714	0
24	186176297	2014-03-07 21:30:00	DF2JP	JO31jg	G3SXH	IO80	1838021	33	-12	0	695	267	1	2.0_r1714	0
25	186177508	2014-03-07 21:38:00	DF2JP	JO31jg	G3SXH	IO80	1838020	33	-14	0	695	267	1	2.0_r1714	0
26	186178583	2014-03-07 21:44:00	DF2JP	JO31jg	G3SXH	IO80	1838021	33	-15	0	695	267	1	2.0_r1714	0
27	186183165	2014-03-07 21:54:00	DF2JP	JO31jg	G3SXH	IO80	1838020	33	-13	0	695	267	1	2.0_r1714	0
									Mean	-13.7407					
									SD	3.1573					
									AD	-2.7407					
									AD%	-87					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186165656	2014-03-07 20:34:00	DG7RJ	JN58th	W4AC	EL86	14097186	33	-22	0	8169	291	14	2.21_r2286	0
2	186171487	2014-03-07 21:04:00	DG7RJ	JN58th	W4AC	EL86	14097186	33	-22	0	8169	291	14	2.21_r2286	0
3	186173309	2014-03-07 21:14:00	DG7RJ	JN58th	W4AC	EL86	14097186	33	-18	0	8169	291	14	2.21_r2286	0
4	186186540	2014-03-07 22:12:00	DG7RJ	JN58th	W4AC	EL86	14097186	33	-20	0	8169	291	14	2.21_r2286	0
5	186188616	2014-03-07 22:24:00	DG7RJ	JN58th	W4AC	EL86	14097186	33	-25	0	8169	291	14	2.21_r2286	0
6	186194259	2014-03-07 23:02:00	DG7RJ	JN58th	W4AC	EL86	14097186	33	-27	0	8169	291	14	2.21_r2286	0
7	186195956	2014-03-07 23:14:00	DG7RJ	JN58th	W4AC	EL86	14097186	33	-27	0	8169	291	14	2.21_r2286	0
8	186198720	2014-03-07 23:32:00	DG7RJ	JN58th	W4AC	EL86	14097186	33	-14	0	8169	291	14	2.21_r2286	0
9	186200213	2014-03-07 23:40:00	DG7RJ	JN58th	W4AC	EL86	14097186	33	-24	0	8169	291	14	2.21_r2286	0
10	186203910	2014-03-08 00:02:00	DG7RJ	JN58th	W4AC	EL86	14097186	33	-22	0	8169	291	14	2.21_r2286	0
11	186205417	2014-03-08 00:12:00	DG7RJ	JN58th	W4AC	EL86	14097186	33	-21	0	8169	291	14	2.21_r2286	0
								Mean	-22.0000						
								SD	3.8471						
								AD	-8.0000						
								AD%	-208						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186162803	2014-03-07 20:18:00	DH5RAE	JN68qv	OE1MSB	JN88df	1838151	37	-6	0	227	108	1	0.8_r3058	0
2	186165050	2014-03-07 20:30:00	DH5RAE	JN68qv	OE1MSB	JN88df	1838151	37	-8	0	227	108	1	0.8_r3058	0
3	186167383	2014-03-07 20:42:00	DH5RAE	JN68qv	OE1MSB	JN88df	1838151	37	-11	0	227	108	1	0.8_r3058	0
4	186169998	2014-03-07 20:56:00	DH5RAE	JN68qv	OE1MSB	JN88df	1838151	37	-3	0	227	108	1	0.8_r3058	0
5	186172192	2014-03-07 21:08:00	DH5RAE	JN68qv	OE1MSB	JN88df	1838151	37	-7	0	227	108	1	0.8_r3058	0
6	186172765	2014-03-07 21:12:00	DH5RAE	JN68qv	OE1MSB	JN88df	1838151	37	-2	0	227	108	1	0.8_r3058	0
7	186174269	2014-03-07 21:20:00	DH5RAE	JN68qv	OE1MSB	JN88df	1838151	37	-1	0	227	108	1	0.8_r3058	0
8	186176765	2014-03-07 21:34:00	DH5RAE	JN68qv	OE1MSB	JN88df	1838151	37	-1	0	227	108	1	0.8_r3058	0
9	186178729	2014-03-07 21:44:00	DH5RAE	JN68qv	OE1MSB	JN88df	1838151	37	-3	0	227	108	1	0.8_r3058	0
10	186183579	2014-03-07 21:56:00	DH5RAE	JN68qv	OE1MSB	JN88df	1838151	37	5	0	227	108	1	0.8_r3058	0
11	186185446	2014-03-07 22:06:00	DH5RAE	JN68qv	OE1MSB	JN88df	1838151	37	-1	0	227	108	1	0.8_r3058	0
12	186187128	2014-03-07 22:16:00	DH5RAE	JN68qv	OE1MSB	JN88df	1838151	37	1	0	227	108	1	0.8_r3058	0
13	186189525	2014-03-07 22:30:00	DH5RAE	JN68qv	OE1MSB	JN88df	1838151	37	-1	0	227	108	1	0.8_r3058	0
								Mean	-2.9231						
								SD	4.1925						
								AD	-3.9231						
								AD%	-94						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	185897451	2014-03-06 21:32:00	DK0SC	JN59mf	W4AC	EL86	14097108	37	-16	0	8093	291	14	2.21_r2286	0
2	186172496	2014-03-07 21:10:00	DK0SC	JN59mf	W4AC	EL86	14097108	37	-18	0	8093	291	14	2.21_r2286	0
3	186176045	2014-03-07 21:30:00	DK0SC	JN59mf	W4AC	EL86	14097107	37	-16	0	8093	291	14	2.21_r2286	0
4	186189409	2014-03-07 22:30:00	DK0SC	JN59mf	W4AC	EL86	14097109	37	-15	0	8093	291	14	2.21_r2286	0
5	186198561	2014-03-07 23:30:00	DK0SC	JN59mf	W4AC	EL86	14097109	37	-21	0	8093	291	14	2.21_r2286	0
6	186725024	2014-03-09 20:56:00	DK0SC	JN59mf	W4AC	EL86	14097109	37	-13	0	8093	291	14	2.21_r2286	0
7	186730783	2014-03-09 21:26:00	DK0SC	JN59mf	W4AC	EL86	14097108	37	-14	-1	8093	291	14	2.21_r2286	0
8	186735126	2014-03-09 21:50:00	DK0SC	JN59mf	W4AC	EL86	14097107	37	-17	0	8093	291	14	2.21_r2286	0
9	186751827	2014-03-09 23:12:00	DK0SC	JN59mf	W4AC	EL86	14097108	37	-20	0	8093	291	14	2.21_r2286	0
10	186754940	2014-03-09 23:30:00	DK0SC	JN59mf	W4AC	EL86	14097108	37	-11	0	8093	291	14	2.21_r2286	0
11	186769440	2014-03-10 00:42:00	DK0SC	JN59mf	W4AC	EL86	14097110	37	-3	0	8093	291	14	2.21_r2286	0
								Mean	-14.9091						
								SD	4.9082						
								AD	6.0909						
								AD%	124						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	188318569	2014-03-07 15:36:00	DL8SEL	JO31vl	G8YTR	IO90lv	10140175	23	-25	-1	619	267	10	0.8_r3058	0
2	188318602	2014-03-07 15:52:00	DL8SEL	JO31vl	G8YTR	IO90lv	10140175	23	-26	-1	619	267	10	0.8_r3058	0
3	188318653	2014-03-07 16:20:00	DL8SEL	JO31vl	G8YTR	IO90lv	10140176	23	-21	-1	619	267	10	0.8_r3058	0
4	188319086	2014-03-07 18:12:00	DL8SEL	JO31vl	G8YTR	IO90lv	10140174	23	-24	-1	619	267	10	0.8_r3058	0
5	188319124	2014-03-07 18:20:00	DL8SEL	JO31vl	G8YTR	IO90lv	10140175	23	-21	-2	619	267	10	0.8_r3058	0
6	188319142	2014-03-07 18:28:00	DL8SEL	JO31vl	G8YTR	IO90lv	10140174	23	-18	-1	619	267	10	0.8_r3058	0
7	188319165	2014-03-07 18:36:00	DL8SEL	JO31vl	G8YTR	IO90lv	10140175	23	-22	-1	619	267	10	0.8_r3058	0
8	188319208	2014-03-07 18:52:00	DL8SEL	JO31vl	G8YTR	IO90lv	10140176	23	-22	-2	619	267	10	0.8_r3058	0
9	188319223	2014-03-07 19:04:00	DL8SEL	JO31vl	G8YTR	IO90lv	10140177	23	-19	-2	619	267	10	0.8_r3058	0
								Mean	-22.0000						
								SD	2.6458						
								AD	-4.0000						
								AD%	-151						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186163588	2014-03-07 20:22:00	G3NZP	IO91wc	DH5RAE	JN68qv	1838129	27	-19	0	994	99	1	0.8_r3058	0
2	186165275	2014-03-07 20:32:00	G3NZP	IO91wc	DH5RAE	JN68qv	1838129	27	-13	0	994	99	1	0.8_r3058	0
3	186173436	2014-03-07 20:52:00	G3NZP	IO91wc	DH5RAE	JN68qv	1838129	27	-17	0	994	99	1	0.8_r3058	0
4	186173447	2014-03-07 21:02:00	G3NZP	IO91wc	DH5RAE	JN68qv	1838129	27	-18	0	994	99	1	0.8_r3058	0
5	186174844	2014-03-07 21:22:00	G3NZP	IO91wc	DH5RAE	JN68qv	1838129	27	-12	0	994	99	1	0.8_r3058	0
6	186176630	2014-03-07 21:32:00	G3NZP	IO91wc	DH5RAE	JN68qv	1838129	27	-19	0	994	99	1	0.8_r3058	0
7	186178181	2014-03-07 21:42:00	G3NZP	IO91wc	DH5RAE	JN68qv	1838129	27	-12	0	994	99	1	0.8_r3058	0
8	186182660	2014-03-07 21:52:00	G3NZP	IO91wc	DH5RAE	JN68qv	1838129	27	-14	0	994	99	1	0.8_r3058	0
9	186184689	2014-03-07 22:02:00	G3NZP	IO91wc	DH5RAE	JN68qv	1838129	27	-15	0	994	99	1	0.8_r3058	0
10	186186587	2014-03-07 22:12:00	G3NZP	IO91wc	DH5RAE	JN68qv	1838129	27	-17	0	994	99	1	0.8_r3058	0
11	186188250	2014-03-07 22:22:00	G3NZP	IO91wc	DH5RAE	JN68qv	1838129	27	-17	0	994	99	1	0.8_r3058	0
12	186189895	2014-03-07 22:32:00	G3NZP	IO91wc	DH5RAE	JN68qv	1838129	27	-20	0	994	99	1	0.8_r3058	0
13	186215423	2014-03-08 01:22:00	G3NZP	IO91wc	DH5RAE	JN68qv	1838129	27	-6	0	994	99	1	0.8_r3058	0
14	186216829	2014-03-08 01:32:00	G3NZP	IO91wc	DH5RAE	JN68qv	1838129	27	-4	0	994	99	1	0.8_r3058	0
								Mean	-14.5000						
								SD	4.7998						
								AD	5.5000						
								AD%	115						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186171176	2014-03-07 21:02:00	G3SXH	IO80fr	DK6UG	JN49cm	1838043	30	-23	0	847	95	1	2.21_r2286	0
2	186174760	2014-03-07 21:22:00	G3SXH	IO80fr	DK6UG	JN49cm	1838043	30	-23	0	847	95	1	2.21_r2286	0
3	186178298	2014-03-07 21:42:00	G3SXH	IO80fr	DK6UG	JN49cm	1838043	30	-26	0	847	95	1	2.21_r2286	0
4	186184636	2014-03-07 22:02:00	G3SXH	IO80fr	DK6UG	JN49cm	1838043	30	-22	0	847	95	1	2.21_r2286	0
5	186197694	2014-03-07 23:26:00	G3SXH	IO80fr	DK6UG	JN49cm	1838043	30	-26	0	847	95	1	2.21_r2286	0
6	186203734	2014-03-08 00:02:00	G3SXH	IO80fr	DK6UG	JN49cm	1838042	30	-28	0	847	95	1	2.21_r2286	0
7	186207240	2014-03-08 00:24:00	G3SXH	IO80fr	DK6UG	JN49cm	1838043	30	-27	0	847	95	1	2.21_r2286	0
8	186210341	2014-03-08 00:44:00	G3SXH	IO80fr	DK6UG	JN49cm	1838043	30	-21	0	847	95	1	2.21_r2286	0
9	186212836	2014-03-08 01:02:00	G3SXH	IO80fr	DK6UG	JN49cm	1838042	30	-25	0	847	95	1	2.21_r2286	0
								Mean	-24.5556						
								SD	2.4037						
								AD	-2.5556						
								AD%	-106						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186170820	2014-03-07 21:00:00	G4ANN	IO91wd	W4AC	EL86	14097117	23	-25	1	7271	282	14	2.21_r2286	0
2	186184216	2014-03-07 22:00:00	G4ANN	IO91wd	W4AC	EL86	14097118	23	-23	1	7271	282	14	2.21_r2286	0
3	186198564	2014-03-07 23:30:00	G4ANN	IO91wd	W4AC	EL86	14097118	23	-27	1	7271	282	14	2.21_r2286	0
4	186201809	2014-03-07 23:50:00	G4ANN	IO91wd	W4AC	EL86	14097118	23	-20	1	7271	282	14	2.21_r2286	0
5	186738736	2014-03-09 22:10:00	G4ANN	IO91wd	W4AC	EL86	14097118	23	-15	1	7271	282	14	2.21_r2286	0
6	186746501	2014-03-09 22:40:00	G4ANN	IO91wd	W4AC	EL86	14097118	23	-17	1	7271	282	14	2.21_r2286	0
7	186772113	2014-03-10 01:00:00	G4ANN	IO91wd	W4AC	EL86	14097118	23	-14	1	7271	282	14	2.21_r2286	0
8	186777886	2014-03-10 01:40:00	G4ANN	IO91wd	W4AC	EL86	14097117	23	-16	0	7271	282	14	2.21_r2286	0
9	186780435	2014-03-10 02:00:00	G4ANN	IO91wd	W4AC	EL86	14097118	23	-20	0	7271	282	14	2.21_r2286	0
								Mean	-19.6667						
								SD	4.5826						
								AD	7.3333						
								AD%	160						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186116561	2014-03-07 16:52:00	G4FKK	IO91wi	ON7KB	JO21ei	7040048	33	-6	0	312	88	7	0.8_r3058	0
2	186120023	2014-03-07 17:04:00	G4FKK	IO91wi	ON7KB	JO21ei	7040047	33	-5	0	312	88	7	0.8_r3058	0
3	186121736	2014-03-07 17:12:00	G4FKK	IO91wi	ON7KB	JO21ei	7040048	33	-8	0	312	88	7	0.8_r3058	0
4	186128020	2014-03-07 17:34:00	G4FKK	IO91wi	ON7KB	JO21ei	7040048	33	-6	0	312	88	7	0.8_r3058	0
5	186130940	2014-03-07 17:46:00	G4FKK	IO91wi	ON7KB	JO21ei	7040047	33	-3	0	312	88	7	0.8_r3058	0
6	186132788	2014-03-07 17:54:00	G4FKK	IO91wi	ON7KB	JO21ei	7040048	33	-4	0	312	88	7	0.8_r3058	0
7	186146297	2014-03-07 18:54:00	G4FKK	IO91wi	ON7KB	JO21ei	7040046	33	-2	0	312	88	7	0.8_r3058	0
8	186149186	2014-03-07 19:06:00	G4FKK	IO91wi	ON7KB	JO21ei	7040047	33	-7	0	312	88	7	0.8_r3058	0
9	186153443	2014-03-07 19:30:00	G4FKK	IO91wi	ON7KB	JO21ei	7040047	33	-3	0	312	88	7	0.8_r3058	0
10	186155519	2014-03-07 19:40:00	G4FKK	IO91wi	ON7KB	JO21ei	7040047	33	-7	0	312	88	7	0.8_r3058	0
11	186157125	2014-03-07 19:48:00	G4FKK	IO91wi	ON7KB	JO21ei	7040048	33	0	0	312	88	7	0.8_r3058	0
12	186160581	2014-03-07 20:08:00	G4FKK	IO91wi	ON7KB	JO21ei	7040048	33	-6	0	312	88	7	0.8_r3058	0
13	186162341	2014-03-07 20:16:00	G4FKK	IO91wi	ON7KB	JO21ei	7040049	33	-9	0	312	88	7	0.8_r3058	0
14	186164073	2014-03-07 20:26:00	G4FKK	IO91wi	ON7KB	JO21ei	7040049	33	-6	0	312	88	7	0.8_r3058	0
15	186165628	2014-03-07 20:34:00	G4FKK	IO91wi	ON7KB	JO21ei	7040049	33	-8	0	312	88	7	0.8_r3058	0
16	186168823	2014-03-07 20:50:00	G4FKK	IO91wi	ON7KB	JO21ei	7040051	33	-10	0	312	88	7	0.8_r3058	0
17	186172137	2014-03-07 21:08:00	G4FKK	IO91wi	ON7KB	JO21ei	7040050	33	-6	0	312	88	7	0.8_r3058	0
18	186174113	2014-03-07 21:18:00	G4FKK	IO91wi	ON7KB	JO21ei	7040049	33	-9	0	312	88	7	0.8_r3058	0
								Mean	-5.8333						
								SD	2.6402						
								AD	-5.8333						
								AD%	-221						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186186508	2014-03-07 22:12:00	G4JVF	IO93if	W4MO	EL87	14097106	23	-25	0	7064	281	14	2.21_r2286	0
2	186187789	2014-03-07 22:20:00	G4JVF	IO93if	W4MO	EL87	14097107	23	-23	0	7064	281	14	2.21_r2286	0
3	186189823	2014-03-07 22:32:00	G4JVF	IO93if	W4MO	EL87	14097110	23	-24	0	7064	281	14	2.21_r2286	0
4	186201432	2014-03-07 23:48:00	G4JVF	IO93if	W4MO	EL87	14097110	23	-28	0	7064	281	14	2.21_r2286	0
5	186219429	2014-03-08 01:52:00	G4JVF	IO93if	W4MO	EL87	14097112	23	-22	0	7064	281	14	2.21_r2286	0
								Mean	-24.4000						
								SD	2.3022						
								AD	3.6000						
								AD%	156						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186156997	2014-03-07 19:48:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-27	0	550	99	0	2.0_r1714	0
2	186160063	2014-03-07 20:04:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-32	0	550	99	0	2.0_r1714	0
3	186161660	2014-03-07 20:12:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-27	0	550	99	0	2.0_r1714	0
4	186163199	2014-03-07 20:20:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-26	0	550	99	0	2.0_r1714	0
5	186164686	2014-03-07 20:28:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-23	0	550	99	0	2.0_r1714	0
6	186166245	2014-03-07 20:36:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-21	0	550	99	0	2.0_r1714	0
7	186170568	2014-03-07 21:00:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-27	0	550	99	0	2.0_r1714	0
8	186173518	2014-03-07 21:16:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-22	0	550	99	0	2.0_r1714	0
9	186176601	2014-03-07 21:32:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-21	0	550	99	0	2.0_r1714	0
10	186178121	2014-03-07 21:40:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-23	0	550	99	0	2.0_r1714	0
11	186180543	2014-03-07 21:48:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-26	0	550	99	0	2.0_r1714	0
12	186186710	2014-03-07 22:12:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-26	0	550	99	0	2.0_r1714	0
13	186187896	2014-03-07 22:20:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-27	0	550	99	0	2.0_r1714	0
14	186189220	2014-03-07 22:28:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-21	0	550	99	0	2.0_r1714	0
15	186190392	2014-03-07 22:36:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-16	0	550	99	0	2.0_r1714	0
16	186192739	2014-03-07 22:52:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-26	0	550	99	0	2.0_r1714	0
17	186193752	2014-03-07 23:00:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-21	0	550	99	0	2.0_r1714	0
18	186195126	2014-03-07 23:08:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-28	0	550	99	0	2.0_r1714	0
19	186196447	2014-03-07 23:16:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-24	0	550	99	0	2.0_r1714	0
20	186197439	2014-03-07 23:24:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-23	0	550	99	0	2.0_r1714	0
21	186198986	2014-03-07 23:32:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-23	0	550	99	0	2.0_r1714	0
22	186200344	2014-03-07 23:40:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-25	0	550	99	0	2.0_r1714	0
23	186201687	2014-03-07 23:48:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-27	0	550	99	0	2.0_r1714	0
24	186203048	2014-03-07 23:56:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-28	0	550	99	0	2.0_r1714	0
25	186204227	2014-03-08 00:04:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-28	0	550	99	0	2.0_r1714	0
26	186205524	2014-03-08 00:12:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-28	0	550	99	0	2.0_r1714	0
27	186206848	2014-03-08 00:20:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-22	0	550	99	0	2.0_r1714	0
28	186208027	2014-03-08 00:28:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-26	0	550	99	0	2.0_r1714	0
29	186209243	2014-03-08 00:36:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-25	0	550	99	0	2.0_r1714	0
30	186211536	2014-03-08 00:52:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-22	0	550	99	0	2.0_r1714	0
31	186212671	2014-03-08 01:00:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-25	0	550	99	0	2.0_r1714	0
32	186213508	2014-03-08 01:08:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-22	0	550	99	0	2.0_r1714	0
33	186214751	2014-03-08 01:16:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-23	0	550	99	0	2.0_r1714	0
34	186216910	2014-03-08 01:32:00	G4KPX	JO02dj	DL1DBC	JO41bi	475617	0	-28	0	550	99	0	2.0_r1714	0
								Mean	-24.6765						
								SD	3.1015						
								AD	-8.6765						
								AD%	-280						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186160136	2014-03-07 20:04:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-23	0	308	100	0	2.11_r2263	0
2	186161677	2014-03-07 20:12:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-19	0	308	100	0	2.11_r2263	0
3	186162966	2014-03-07 20:20:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-19	0	308	100	0	2.11_r2263	0
4	186164557	2014-03-07 20:28:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-19	0	308	100	0	2.11_r2263	0
5	186166177	2014-03-07 20:36:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-19	0	308	100	0	2.11_r2263	0
6	186169159	2014-03-07 20:52:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-25	0	308	100	0	2.11_r2263	0
7	186173554	2014-03-07 21:16:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-17	0	308	100	0	2.11_r2263	0
8	186175120	2014-03-07 21:24:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-13	0	308	100	0	2.11_r2263	0
9	186176647	2014-03-07 21:32:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-14	0	308	100	0	2.11_r2263	0
10	186177917	2014-03-07 21:40:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-18	0	308	100	0	2.11_r2263	0
11	186180738	2014-03-07 21:48:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-21	0	308	100	0	2.11_r2263	0
12	186185112	2014-03-07 22:04:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-19	0	308	100	0	2.11_r2263	0
13	186186534	2014-03-07 22:12:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-16	0	308	100	0	2.11_r2263	0
14	186187834	2014-03-07 22:20:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-20	0	308	100	0	2.11_r2263	0
15	186188938	2014-03-07 22:28:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-23	0	308	100	0	2.11_r2263	0
16	186190276	2014-03-07 22:36:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-16	0	308	100	0	2.11_r2263	0
17	186192721	2014-03-07 22:52:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-15	0	308	100	0	2.11_r2263	0
18	186193990	2014-03-07 23:00:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-23	0	308	100	0	2.11_r2263	0
19	186195146	2014-03-07 23:08:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-17	0	308	100	0	2.11_r2263	0
20	186196266	2014-03-07 23:16:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-14	0	308	100	0	2.11_r2263	0
21	186197462	2014-03-07 23:24:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-10	0	308	100	0	2.11_r2263	0
22	186198961	2014-03-07 23:32:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-11	0	308	100	0	2.11_r2263	0
23	186200398	2014-03-07 23:40:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-10	0	308	100	0	2.11_r2263	0
24	186201668	2014-03-07 23:48:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-13	0	308	100	0	2.11_r2263	0
25	186203036	2014-03-07 23:56:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-10	0	308	100	0	2.11_r2263	0
26	186204246	2014-03-08 00:04:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-18	0	308	100	0	2.11_r2263	0
27	186205306	2014-03-08 00:12:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-16	0	308	100	0	2.11_r2263	0
28	186206699	2014-03-08 00:20:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-16	0	308	100	0	2.11_r2263	0
29	186207951	2014-03-08 00:28:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-17	0	308	100	0	2.11_r2263	0
30	186209211	2014-03-08 00:36:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-16	0	308	100	0	2.11_r2263	0
31	186213745	2014-03-08 01:08:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-12	0	308	100	0	2.11_r2263	0
32	186214711	2014-03-08 01:16:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-11	0	308	100	0	2.11_r2263	0
33	186215719	2014-03-08 01:24:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-19	0	308	100	0	2.11_r2263	0
34	186216800	2014-03-08 01:32:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-20	0	308	100	0	2.11_r2263	0
35	186217845	2014-03-08 01:40:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-15	0	308	100	0	2.11_r2263	0
36	186218942	2014-03-08 01:48:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-18	0	308	100	0	2.11_r2263	0
37	186220186	2014-03-08 01:56:00	G4KPX	JO02dj	PA3ABK/2	JO21it	475617	0	-26	0	308	100	0	2.11_r2263	0
								Mean	-16.9730						
								SD	4.1532						
								AD	6.0270						
								AD%	145						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186148140	2014-03-07 19:02:00	G4ZXE	IO81qk	G4FKK	IO91wi	7040058	37	3	0	174	92	7	2.0_r1714	0
2	186150504	2014-03-07 19:14:00	G4ZXE	IO81qk	G4FKK	IO91wi	7040058	37	1	0	174	92	7	2.0_r1714	0
3	186152543	2014-03-07 19:24:00	G4ZXE	IO81qk	G4FKK	IO91wi	7040057	37	5	0	174	92	7	2.0_r1714	0
4	186154163	2014-03-07 19:32:00	G4ZXE	IO81qk	G4FKK	IO91wi	7040057	37	2	0	174	92	7	2.0_r1714	0
5	186156086	2014-03-07 19:44:00	G4ZXE	IO81qk	G4FKK	IO91wi	7040056	37	3	0	174	92	7	2.0_r1714	0
6	186157921	2014-03-07 19:52:00	G4ZXE	IO81qk	G4FKK	IO91wi	7040055	37	1	0	174	92	7	2.0_r1714	0
7	186160055	2014-03-07 20:04:00	G4ZXE	IO81qk	G4FKK	IO91wi	7040055	37	4	0	174	92	7	2.0_r1714	0
8	186163774	2014-03-07 20:24:00	G4ZXE	IO81qk	G4FKK	IO91wi	7040055	37	-4	0	174	92	7	2.0_r1714	0
9	186165272	2014-03-07 20:32:00	G4ZXE	IO81qk	G4FKK	IO91wi	7040055	37	1	0	174	92	7	2.0_r1714	0
10	186167003	2014-03-07 20:40:00	G4ZXE	IO81qk	G4FKK	IO91wi	7040055	37	-2	0	174	92	7	2.0_r1714	0
11	186170338	2014-03-07 20:58:00	G4ZXE	IO81qk	G4FKK	IO91wi	7040055	37	-3	0	174	92	7	2.0_r1714	0
12	186171883	2014-03-07 21:06:00	G4ZXE	IO81qk	G4FKK	IO91wi	7040055	37	-2	0	174	92	7	2.0_r1714	0
13	186173688	2014-03-07 21:16:00	G4ZXE	IO81qk	G4FKK	IO91wi	7040044	37	-5	0	174	92	7	2.0_r1714	0
14	186175519	2014-03-07 21:26:00	G4ZXE	IO81qk	G4FKK	IO91wi	7040044	37	-4	0	174	92	7	2.0_r1714	0
								Mean	0.0000						
								SD	3.2817						
								AD	5.0000						
								AD%	152						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186132792	2014-03-07 17:54:00	G4ZXE	IO81qk	ON7KB	JO21ei	7040163	37	-1	0	486	88	7	0.8_r3058	0
2	186141190	2014-03-07 18:30:00	G4ZXE	IO81qk	ON7KB	JO21ei	7040079	37	-4	0	486	88	7	0.8_r3058	0
3	186148363	2014-03-07 19:02:00	G4ZXE	IO81qk	ON7KB	JO21ei	7040081	37	-5	0	486	88	7	0.8_r3058	0
4	186150892	2014-03-07 19:14:00	G4ZXE	IO81qk	ON7KB	JO21ei	7040080	37	-3	0	486	88	7	0.8_r3058	0
5	186152724	2014-03-07 19:24:00	G4ZXE	IO81qk	ON7KB	JO21ei	7040080	37	-1	0	486	88	7	0.8_r3058	0
6	186156082	2014-03-07 19:44:00	G4ZXE	IO81qk	ON7KB	JO21ei	7040079	37	-4	0	486	88	7	0.8_r3058	0
7	186157968	2014-03-07 19:52:00	G4ZXE	IO81qk	ON7KB	JO21ei	7040080	37	-5	0	486	88	7	0.8_r3058	0
8	186160132	2014-03-07 20:04:00	G4ZXE	IO81qk	ON7KB	JO21ei	7040079	37	-1	0	486	88	7	0.8_r3058	0
9	186162347	2014-03-07 20:16:00	G4ZXE	IO81qk	ON7KB	JO21ei	7040080	37	-8	0	486	88	7	0.8_r3058	0
10	186163887	2014-03-07 20:24:00	G4ZXE	IO81qk	ON7KB	JO21ei	7040080	37	-3	0	486	88	7	0.8_r3058	0
11	186165423	2014-03-07 20:32:00	G4ZXE	IO81qk	ON7KB	JO21ei	7040080	37	-3	0	486	88	7	0.8_r3058	0
12	186167029	2014-03-07 20:40:00	G4ZXE	IO81qk	ON7KB	JO21ei	7040080	37	-6	0	486	88	7	0.8_r3058	0
13	186168830	2014-03-07 20:50:00	G4ZXE	IO81qk	ON7KB	JO21ei	7040080	37	-4	0	486	88	7	0.8_r3058	0
14	186170392	2014-03-07 20:58:00	G4ZXE	IO81qk	ON7KB	JO21ei	7040080	37	-7	0	486	88	7	0.8_r3058	0
15	186171771	2014-03-07 21:06:00	G4ZXE	IO81qk	ON7KB	JO21ei	7040080	37	-7	0	486	88	7	0.8_r3058	0
16	186173730	2014-03-07 21:16:00	G4ZXE	IO81qk	ON7KB	JO21ei	7040069	37	-4	0	486	88	7	0.8_r3058	0
17	186175309	2014-03-07 21:26:00	G4ZXE	IO81qk	ON7KB	JO21ei	7040069	37	-7	0	486	88	7	0.8_r3058	0
								Mean	-4.2941						
								SD	2.2013						
								AD	3.7059						
								AD%	168						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186188233	2014-03-07 22:22:00	G6RRL	IO90iw	DK6UG	JN49cm	3594082	33	-4	0	693	99	3	2.21_r2286	0
2	186189710	2014-03-07 22:32:00	G6RRL	IO90iw	DK6UG	JN49cm	3594081	33	-12	0	693	99	3	2.21_r2286	0
3	186192616	2014-03-07 22:52:00	G6RRL	IO90iw	DK6UG	JN49cm	3594078	33	-22	0	693	99	3	2.21_r2286	0
4	186194484	2014-03-07 23:04:00	G6RRL	IO90iw	DK6UG	JN49cm	3594077	33	-8	0	693	99	3	2.21_r2286	0
5	186195696	2014-03-07 23:12:00	G6RRL	IO90iw	DK6UG	JN49cm	3594076	33	-6	0	693	99	3	2.21_r2286	0
6	186197307	2014-03-07 23:22:00	G6RRL	IO90iw	DK6UG	JN49cm	3594075	33	-9	0	693	99	3	2.21_r2286	0
7	186198808	2014-03-07 23:32:00	G6RRL	IO90iw	DK6UG	JN49cm	3594075	33	-4	0	693	99	3	2.21_r2286	0
8	186200229	2014-03-07 23:40:00	G6RRL	IO90iw	DK6UG	JN49cm	3594074	33	-8	0	693	99	3	2.21_r2286	0
9	186202149	2014-03-07 23:52:00	G6RRL	IO90iw	DK6UG	JN49cm	3594074	33	-7	0	693	99	3	2.21_r2286	0
10	186203661	2014-03-08 00:00:00	G6RRL	IO90iw	DK6UG	JN49cm	3594074	33	-7	0	693	99	3	2.21_r2286	0
11	186204473	2014-03-08 00:06:00	G6RRL	IO90iw	DK6UG	JN49cm	3594073	33	-5	0	693	99	3	2.21_r2286	0
								Mean	-8.3636						
								SD	5.0847						
								AD	13.6364						
								AD%	268						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186127704	2014-03-07 17:34:00	G8VDQ	IO91um	DO6RPS	JO42ic	3594041	37	-23	0	622	80	3	0.8_r3058	0
2	186130169	2014-03-07 17:44:00	G8VDQ	IO91um	DO6RPS	JO42ic	3594047	37	-21	1	622	80	3	0.8_r3058	0
3	186132600	2014-03-07 17:54:00	G8VDQ	IO91um	DO6RPS	JO42ic	3594050	37	-20	0	622	80	3	0.8_r3058	0
4	186137651	2014-03-07 18:14:00	G8VDQ	IO91um	DO6RPS	JO42ic	3594054	37	-17	1	622	80	3	0.8_r3058	0
5	186139964	2014-03-07 18:24:00	G8VDQ	IO91um	DO6RPS	JO42ic	3594054	37	-20	0	622	80	3	0.8_r3058	0
6	186142372	2014-03-07 18:34:00	G8VDQ	IO91um	DO6RPS	JO42ic	3594054	37	-21	0	622	80	3	0.8_r3058	0
7	186144238	2014-03-07 18:44:00	G8VDQ	IO91um	DO6RPS	JO42ic	3594054	37	-17	0	622	80	3	0.8_r3058	0
8	186146251	2014-03-07 18:54:00	G8VDQ	IO91um	DO6RPS	JO42ic	3594055	37	-22	0	622	80	3	0.8_r3058	0
9	186148494	2014-03-07 19:04:00	G8VDQ	IO91um	DO6RPS	JO42ic	3594055	37	-21	0	622	80	3	0.8_r3058	0
10	186150501	2014-03-07 19:14:00	G8VDQ	IO91um	DO6RPS	JO42ic	3594054	37	-19	1	622	80	3	0.8_r3058	0
11	186152402	2014-03-07 19:24:00	G8VDQ	IO91um	DO6RPS	JO42ic	3594054	37	-20	0	622	80	3	0.8_r3058	0
12	186154346	2014-03-07 19:34:00	G8VDQ	IO91um	DO6RPS	JO42ic	3594055	37	-20	0	622	80	3	0.8_r3058	0
13	186156192	2014-03-07 19:44:00	G8VDQ	IO91um	DO6RPS	JO42ic	3594054	37	-19	0	622	80	3	0.8_r3058	0
14	186160147	2014-03-07 20:04:00	G8VDQ	IO91um	DO6RPS	JO42ic	3594054	37	-18	0	622	80	3	0.8_r3058	0
15	186161851	2014-03-07 20:14:00	G8VDQ	IO91um	DO6RPS	JO42ic	3594054	37	-17	0	622	80	3	0.8_r3058	0
16	186165889	2014-03-07 20:34:00	G8VDQ	IO91um	DO6RPS	JO42ic	3594055	37	-19	0	622	80	3	0.8_r3058	0
									Mean	-19.6250					
									SD	1.7842					
									AD	-2.6250					
									AD%	-147					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186116492	2014-03-07 16:52:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-21	0	46	265	10	2.0_r1714	0
2	186118471	2014-03-07 16:58:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-17	0	46	265	10	2.0_r1714	0
3	186120323	2014-03-07 17:06:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-16	0	46	265	10	2.0_r1714	0
4	186122186	2014-03-07 17:12:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-22	0	46	265	10	2.0_r1714	0
5	186125761	2014-03-07 17:26:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-18	0	46	265	10	2.0_r1714	0
6	186127557	2014-03-07 17:32:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-16	0	46	265	10	2.0_r1714	0
7	186129153	2014-03-07 17:40:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-17	0	46	265	10	2.0_r1714	0
8	186132561	2014-03-07 17:52:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-23	0	46	265	10	2.0_r1714	0
9	186134492	2014-03-07 18:00:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-18	0	46	265	10	2.0_r1714	0
10	186139357	2014-03-07 18:20:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-25	0	46	265	10	2.0_r1714	0
11	186147467	2014-03-07 18:58:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-26	0	46	265	10	2.0_r1714	0
12	186155238	2014-03-07 19:38:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-25	0	46	265	10	2.0_r1714	0
13	186155548	2014-03-07 19:40:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-26	0	46	265	10	2.0_r1714	0
									Mean	-20.7692					
									SD	3.9403					
									AD	4.2308					
									AD%	107					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186116492	2014-03-07 16:52:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-21	0	46	265	10	2.0_r1714	0
2	186118471	2014-03-07 16:58:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-17	0	46	265	10	2.0_r1714	0
3	186120323	2014-03-07 17:06:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-16	0	46	265	10	2.0_r1714	0
4	186122186	2014-03-07 17:12:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-22	0	46	265	10	2.0_r1714	0
5	186125761	2014-03-07 17:26:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-18	0	46	265	10	2.0_r1714	0
6	186127557	2014-03-07 17:32:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-16	0	46	265	10	2.0_r1714	0
7	186129153	2014-03-07 17:40:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-17	0	46	265	10	2.0_r1714	0
8	186132561	2014-03-07 17:52:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-23	0	46	265	10	2.0_r1714	0
9	186134492	2014-03-07 18:00:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-18	0	46	265	10	2.0_r1714	0
10	186139357	2014-03-07 18:20:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-25	0	46	265	10	2.0_r1714	0
11	186147467	2014-03-07 18:58:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-26	0	46	265	10	2.0_r1714	0
12	186155238	2014-03-07 19:38:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-25	0	46	265	10	2.0_r1714	0
13	186155548	2014-03-07 19:40:00	G8VDQ	IO91um	G0MQW	IO91ml	10140149	37	-26	0	46	265	10	2.0_r1714	0
								Mean	-20.7692						
								SD	3.9403						
								AD	5.2308						
								AD%	133						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186164120	2014-03-07 20:26:00	G8VDQ	IO91um	W4AC	EL86	14097053	37	-18	0	7251	282	14	2.21_r2286	0
2	186165451	2014-03-07 20:32:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-13	0	7251	282	14	2.21_r2286	0
3	186166896	2014-03-07 20:40:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-11	0	7251	282	14	2.21_r2286	0
4	186169105	2014-03-07 20:52:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-13	0	7251	282	14	2.21_r2286	0
5	186170775	2014-03-07 21:00:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-14	0	7251	282	14	2.21_r2286	0
6	186171816	2014-03-07 21:06:00	G8VDQ	IO91um	W4AC	EL86	14097053	37	-12	0	7251	282	14	2.21_r2286	0
7	186172974	2014-03-07 21:12:00	G8VDQ	IO91um	W4AC	EL86	14097052	37	-11	0	7251	282	14	2.21_r2286	0
8	186173913	2014-03-07 21:18:00	G8VDQ	IO91um	W4AC	EL86	14097053	37	-14	0	7251	282	14	2.21_r2286	0
9	186177492	2014-03-07 21:38:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-12	0	7251	282	14	2.21_r2286	0
10	186177998	2014-03-07 21:40:00	G8VDQ	IO91um	W4AC	EL86	14097053	37	-12	0	7251	282	14	2.21_r2286	0
11	186183927	2014-03-07 21:58:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-16	0	7251	282	14	2.21_r2286	0
12	186184211	2014-03-07 22:00:00	G8VDQ	IO91um	W4AC	EL86	14097053	37	-10	0	7251	282	14	2.21_r2286	0
13	186185520	2014-03-07 22:06:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-11	0	7251	282	14	2.21_r2286	0
14	186186509	2014-03-07 22:12:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-8	0	7251	282	14	2.21_r2286	0
15	186187397	2014-03-07 22:18:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-13	0	7251	282	14	2.21_r2286	0
16	186187849	2014-03-07 22:20:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-11	0	7251	282	14	2.21_r2286	0
17	186188831	2014-03-07 22:26:00	G8VDQ	IO91um	W4AC	EL86	14097055	37	-8	0	7251	282	14	2.21_r2286	0
18	186189715	2014-03-07 22:32:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-7	-1	7251	282	14	2.21_r2286	0
19	186190623	2014-03-07 22:38:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-15	0	7251	282	14	2.21_r2286	0
20	186191808	2014-03-07 22:46:00	G8VDQ	IO91um	W4AC	EL86	14097055	37	-12	0	7251	282	14	2.21_r2286	0
21	186192712	2014-03-07 22:52:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-14	0	7251	282	14	2.21_r2286	0
22	186193893	2014-03-07 23:00:00	G8VDQ	IO91um	W4AC	EL86	14097055	37	-20	0	7251	282	14	2.21_r2286	0
23	186194857	2014-03-07 23:06:00	G8VDQ	IO91um	W4AC	EL86	14097055	37	-16	0	7251	282	14	2.21_r2286	0
24	186196670	2014-03-07 23:18:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-15	-1	7251	282	14	2.21_r2286	0
25	186197805	2014-03-07 23:26:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-19	0	7251	282	14	2.21_r2286	0
26	186198711	2014-03-07 23:32:00	G8VDQ	IO91um	W4AC	EL86	14097055	37	-14	0	7251	282	14	2.21_r2286	0
27	186200173	2014-03-07 23:40:00	G8VDQ	IO91um	W4AC	EL86	14097055	37	-7	0	7251	282	14	2.21_r2286	0
28	186201125	2014-03-07 23:46:00	G8VDQ	IO91um	W4AC	EL86	14097055	37	-11	0	7251	282	14	2.21_r2286	0
29	186202337	2014-03-07 23:52:00	G8VDQ	IO91um	W4AC	EL86	14097055	37	-14	0	7251	282	14	2.21_r2286	0
30	186203513	2014-03-08 00:00:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-23	0	7251	282	14	2.21_r2286	0
31	186205403	2014-03-08 00:12:00	G8VDQ	IO91um	W4AC	EL86	14097055	37	-8	0	7251	282	14	2.21_r2286	0
								Mean	-12.9677						
								SD	3.7460						
								AD	6.0323						
								AD%	161						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186166896	2014-03-07 20:40:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-11	0	7251	282	14	2.21_r2286	0
2	186169105	2014-03-07 20:52:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-13	0	7251	282	14	2.21_r2286	0
3	186170775	2014-03-07 21:00:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-14	0	7251	282	14	2.21_r2286	0
4	186171816	2014-03-07 21:06:00	G8VDQ	IO91um	W4AC	EL86	14097053	37	-12	0	7251	282	14	2.21_r2286	0
5	186172974	2014-03-07 21:12:00	G8VDQ	IO91um	W4AC	EL86	14097052	37	-11	0	7251	282	14	2.21_r2286	0
6	186173913	2014-03-07 21:18:00	G8VDQ	IO91um	W4AC	EL86	14097053	37	-14	0	7251	282	14	2.21_r2286	0
7	186177492	2014-03-07 21:38:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-12	0	7251	282	14	2.21_r2286	0
8	186177998	2014-03-07 21:40:00	G8VDQ	IO91um	W4AC	EL86	14097053	37	-12	0	7251	282	14	2.21_r2286	0
9	186183927	2014-03-07 21:58:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-16	0	7251	282	14	2.21_r2286	0
10	186184211	2014-03-07 22:00:00	G8VDQ	IO91um	W4AC	EL86	14097053	37	-10	0	7251	282	14	2.21_r2286	0
11	186185520	2014-03-07 22:06:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-11	0	7251	282	14	2.21_r2286	0
12	186186509	2014-03-07 22:12:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-8	0	7251	282	14	2.21_r2286	0
13	186187397	2014-03-07 22:18:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-13	0	7251	282	14	2.21_r2286	0
14	186187849	2014-03-07 22:20:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-11	0	7251	282	14	2.21_r2286	0
15	186188831	2014-03-07 22:26:00	G8VDQ	IO91um	W4AC	EL86	14097055	37	-8	0	7251	282	14	2.21_r2286	0
16	186189715	2014-03-07 22:32:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-7	-1	7251	282	14	2.21_r2286	0
17	186190623	2014-03-07 22:38:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-15	0	7251	282	14	2.21_r2286	0
18	186191808	2014-03-07 22:46:00	G8VDQ	IO91um	W4AC	EL86	14097055	37	-12	0	7251	282	14	2.21_r2286	0
19	186192712	2014-03-07 22:52:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-14	0	7251	282	14	2.21_r2286	0
20	186193893	2014-03-07 23:00:00	G8VDQ	IO91um	W4AC	EL86	14097055	37	-20	0	7251	282	14	2.21_r2286	0
21	186194857	2014-03-07 23:06:00	G8VDQ	IO91um	W4AC	EL86	14097055	37	-16	0	7251	282	14	2.21_r2286	0
22	186196670	2014-03-07 23:18:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-15	-1	7251	282	14	2.21_r2286	0
23	186197805	2014-03-07 23:26:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-19	0	7251	282	14	2.21_r2286	0
24	186198711	2014-03-07 23:32:00	G8VDQ	IO91um	W4AC	EL86	14097055	37	-14	0	7251	282	14	2.21_r2286	0
25	186200173	2014-03-07 23:40:00	G8VDQ	IO91um	W4AC	EL86	14097055	37	-7	0	7251	282	14	2.21_r2286	0
26	186201125	2014-03-07 23:46:00	G8VDQ	IO91um	W4AC	EL86	14097055	37	-11	0	7251	282	14	2.21_r2286	0
27	186202337	2014-03-07 23:52:00	G8VDQ	IO91um	W4AC	EL86	14097055	37	-14	0	7251	282	14	2.21_r2286	0
28	186203513	2014-03-08 00:00:00	G8VDQ	IO91um	W4AC	EL86	14097054	37	-23	0	7251	282	14	2.21_r2286	0
29	186205403	2014-03-08 00:12:00	G8VDQ	IO91um	W4AC	EL86	14097055	37	-8	0	7251	282	14	2.21_r2286	0
								Mean	-12.7931						
								SD	3.7548						
								AD	-5.7931						
								AD%	-154						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186184285	2014-03-07 22:00:00	G8VDQ	IO91um	W4MO	EL87	14097062	37	-9	0	7169	283	14	2.21_r2286	0
2	186185395	2014-03-07 22:06:00	G8VDQ	IO91um	W4MO	EL87	14097065	37	-9	0	7169	283	14	2.21_r2286	0
3	186186506	2014-03-07 22:12:00	G8VDQ	IO91um	W4MO	EL87	14097067	37	-4	0	7169	283	14	2.21_r2286	0
4	186187516	2014-03-07 22:18:00	G8VDQ	IO91um	W4MO	EL87	14097068	37	-11	0	7169	283	14	2.21_r2286	0
5	186187786	2014-03-07 22:20:00	G8VDQ	IO91um	W4MO	EL87	14097068	37	-6	0	7169	283	14	2.21_r2286	0
6	186188687	2014-03-07 22:26:00	G8VDQ	IO91um	W4MO	EL87	14097070	37	-13	0	7169	283	14	2.21_r2286	0
7	186189819	2014-03-07 22:32:00	G8VDQ	IO91um	W4MO	EL87	14097071	37	-7	0	7169	283	14	2.21_r2286	0
8	186190439	2014-03-07 22:38:00	G8VDQ	IO91um	W4MO	EL87	14097071	37	-20	0	7169	283	14	2.21_r2286	0
9	186191630	2014-03-07 22:46:00	G8VDQ	IO91um	W4MO	EL87	14097072	37	-14	0	7169	283	14	2.21_r2286	0
10	186195594	2014-03-07 23:12:00	G8VDQ	IO91um	W4MO	EL87	14097072	37	-16	0	7169	283	14	2.21_r2286	0
11	186196684	2014-03-07 23:18:00	G8VDQ	IO91um	W4MO	EL87	14097071	37	-14	-1	7169	283	14	2.21_r2286	0
12	186197842	2014-03-07 23:26:00	G8VDQ	IO91um	W4MO	EL87	14097071	37	-11	0	7169	283	14	2.21_r2286	0
13	186200157	2014-03-07 23:40:00	G8VDQ	IO91um	W4MO	EL87	14097072	37	-10	0	7169	283	14	2.21_r2286	0
14	186201134	2014-03-07 23:46:00	G8VDQ	IO91um	W4MO	EL87	14097072	37	-17	0	7169	283	14	2.21_r2286	0
15	186202106	2014-03-07 23:52:00	G8VDQ	IO91um	W4MO	EL87	14097071	37	-12	0	7169	283	14	2.21_r2286	0
16	186203505	2014-03-08 00:00:00	G8VDQ	IO91um	W4MO	EL87	14097071	37	-24	0	7169	283	14	2.21_r2286	0
17	186205277	2014-03-08 00:12:00	G8VDQ	IO91um	W4MO	EL87	14097071	37	-6	0	7169	283	14	2.21_r2286	0
18	186206308	2014-03-08 00:18:00	G8VDQ	IO91um	W4MO	EL87	14097073	37	-9	0	7169	283	14	2.21_r2286	0
19	186207553	2014-03-08 00:26:00	G8VDQ	IO91um	W4MO	EL87	14097073	37	-16	0	7169	283	14	2.21_r2286	0
20	186208634	2014-03-08 00:32:00	G8VDQ	IO91um	W4MO	EL87	14097073	37	-14	0	7169	283	14	2.21_r2286	0
21	186209728	2014-03-08 00:40:00	G8VDQ	IO91um	W4MO	EL87	14097073	37	-10	0	7169	283	14	2.21_r2286	0
22	186211364	2014-03-08 00:52:00	G8VDQ	IO91um	W4MO	EL87	14097071	37	-14	0	7169	283	14	2.21_r2286	0
23	186212126	2014-03-08 00:58:00	G8VDQ	IO91um	W4MO	EL87	14097071	37	-16	0	7169	283	14	2.21_r2286	0
24	186216060	2014-03-08 01:26:00	G8VDQ	IO91um	W4MO	EL87	14097072	37	-22	0	7169	283	14	2.21_r2286	0
25	186216828	2014-03-08 01:32:00	G8VDQ	IO91um	W4MO	EL87	14097073	37	-24	0	7169	283	14	2.21_r2286	0
26	186217771	2014-03-08 01:40:00	G8VDQ	IO91um	W4MO	EL87	14097073	37	-15	0	7169	283	14	2.21_r2286	0
27	186219428	2014-03-08 01:52:00	G8VDQ	IO91um	W4MO	EL87	14097072	37	-17	0	7169	283	14	2.21_r2286	0
28	186220215	2014-03-08 01:58:00	G8VDQ	IO91um	W4MO	EL87	14097072	37	-11	0	7169	283	14	2.21_r2286	0
29	186221605	2014-03-08 02:06:00	G8VDQ	IO91um	W4MO	EL87	14097073	37	-18	0	7169	283	14	2.21_r2286	0
30	186223140	2014-03-08 02:18:00	G8VDQ	IO91um	W4MO	EL87	14097073	37	-18	0	7169	283	14	2.21_r2286	0
31	186223485	2014-03-08 02:20:00	G8VDQ	IO91um	W4MO	EL87	14097072	37	-21	0	7169	283	14	2.21_r2286	0
								Mean	-13.8065						
								SD	5.2499						
								AD	10.1935						
								AD%	194						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186184285	2014-03-07 22:00:00	G8VDQ	IO91um	W4MO	EL87	14097062	37	-9	0	7169	283	14	2.21_r2286	0
2	186185395	2014-03-07 22:06:00	G8VDQ	IO91um	W4MO	EL87	14097065	37	-9	0	7169	283	14	2.21_r2286	0
3	186186506	2014-03-07 22:12:00	G8VDQ	IO91um	W4MO	EL87	14097067	37	-4	0	7169	283	14	2.21_r2286	0
4	186187516	2014-03-07 22:18:00	G8VDQ	IO91um	W4MO	EL87	14097068	37	-11	0	7169	283	14	2.21_r2286	0
5	186187786	2014-03-07 22:20:00	G8VDQ	IO91um	W4MO	EL87	14097068	37	-6	0	7169	283	14	2.21_r2286	0
6	186188687	2014-03-07 22:26:00	G8VDQ	IO91um	W4MO	EL87	14097070	37	-13	0	7169	283	14	2.21_r2286	0
7	186189819	2014-03-07 22:32:00	G8VDQ	IO91um	W4MO	EL87	14097071	37	-7	0	7169	283	14	2.21_r2286	0
8	186190439	2014-03-07 22:38:00	G8VDQ	IO91um	W4MO	EL87	14097071	37	-20	0	7169	283	14	2.21_r2286	0
9	186191630	2014-03-07 22:46:00	G8VDQ	IO91um	W4MO	EL87	14097072	37	-14	0	7169	283	14	2.21_r2286	0
10	186195594	2014-03-07 23:12:00	G8VDQ	IO91um	W4MO	EL87	14097072	37	-16	0	7169	283	14	2.21_r2286	0
11	186196684	2014-03-07 23:18:00	G8VDQ	IO91um	W4MO	EL87	14097071	37	-14	-1	7169	283	14	2.21_r2286	0
12	186197842	2014-03-07 23:26:00	G8VDQ	IO91um	W4MO	EL87	14097071	37	-11	0	7169	283	14	2.21_r2286	0
13	186200157	2014-03-07 23:40:00	G8VDQ	IO91um	W4MO	EL87	14097072	37	-10	0	7169	283	14	2.21_r2286	0
14	186201134	2014-03-07 23:46:00	G8VDQ	IO91um	W4MO	EL87	14097072	37	-17	0	7169	283	14	2.21_r2286	0
15	186202106	2014-03-07 23:52:00	G8VDQ	IO91um	W4MO	EL87	14097071	37	-12	0	7169	283	14	2.21_r2286	0
16	186203505	2014-03-08 00:00:00	G8VDQ	IO91um	W4MO	EL87	14097071	37	-24	0	7169	283	14	2.21_r2286	0
17	186205277	2014-03-08 00:12:00	G8VDQ	IO91um	W4MO	EL87	14097071	37	-6	0	7169	283	14	2.21_r2286	0
18	186206308	2014-03-08 00:18:00	G8VDQ	IO91um	W4MO	EL87	14097073	37	-9	0	7169	283	14	2.21_r2286	0
19	186207553	2014-03-08 00:26:00	G8VDQ	IO91um	W4MO	EL87	14097073	37	-16	0	7169	283	14	2.21_r2286	0
20	186208634	2014-03-08 00:32:00	G8VDQ	IO91um	W4MO	EL87	14097073	37	-14	0	7169	283	14	2.21_r2286	0
21	186209728	2014-03-08 00:40:00	G8VDQ	IO91um	W4MO	EL87	14097073	37	-10	0	7169	283	14	2.21_r2286	0
22	186211364	2014-03-08 00:52:00	G8VDQ	IO91um	W4MO	EL87	14097071	37	-14	0	7169	283	14	2.21_r2286	0
23	186212126	2014-03-08 00:58:00	G8VDQ	IO91um	W4MO	EL87	14097071	37	-16	0	7169	283	14	2.21_r2286	0
24	186216060	2014-03-08 01:26:00	G8VDQ	IO91um	W4MO	EL87	14097072	37	-22	0	7169	283	14	2.21_r2286	0
25	186216828	2014-03-08 01:32:00	G8VDQ	IO91um	W4MO	EL87	14097073	37	-24	0	7169	283	14	2.21_r2286	0
26	186217771	2014-03-08 01:40:00	G8VDQ	IO91um	W4MO	EL87	14097073	37	-15	0	7169	283	14	2.21_r2286	0
27	186219428	2014-03-08 01:52:00	G8VDQ	IO91um	W4MO	EL87	14097072	37	-17	0	7169	283	14	2.21_r2286	0
28	186220215	2014-03-08 01:58:00	G8VDQ	IO91um	W4MO	EL87	14097072	37	-11	0	7169	283	14	2.21_r2286	0
29	186221605	2014-03-08 02:06:00	G8VDQ	IO91um	W4MO	EL87	14097073	37	-18	0	7169	283	14	2.21_r2286	0
30	186223140	2014-03-08 02:18:00	G8VDQ	IO91um	W4MO	EL87	14097073	37	-18	0	7169	283	14	2.21_r2286	0
								Mean	-13.5667						
								SD	5.1641						
								AD	0.4333						
								AD%	8						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186189147	2014-03-07 22:28:00	G8VDQ	IO91um	YO3ITD	KN34cj	7040057	37	-11	-1	2112	102	7	2.11_r2263	0
2	186195161	2014-03-07 23:08:00	G8VDQ	IO91um	YO3ITD	KN34cj	7040059	37	-11	-1	2112	102	7	2.11_r2263	0
3	186199819	2014-03-07 23:38:00	G8VDQ	IO91um	YO3ITD	KN34cj	7040060	37	-19	0	2112	102	7	2.11_r2263	0
4	186203229	2014-03-07 23:58:00	G8VDQ	IO91um	YO3ITD	KN34cj	7040060	37	-14	0	2112	102	7	2.11_r2263	0
5	186204849	2014-03-08 00:08:00	G8VDQ	IO91um	YO3ITD	KN34cj	7040059	37	-13	-1	2112	102	7	2.11_r2263	0
6	186210909	2014-03-08 00:48:00	G8VDQ	IO91um	YO3ITD	KN34cj	7040060	37	-16	0	2112	102	7	2.11_r2263	0
7	186212178	2014-03-08 00:58:00	G8VDQ	IO91um	YO3ITD	KN34cj	7040058	37	-14	0	2112	102	7	2.11_r2263	0
8	186213733	2014-03-08 01:08:00	G8VDQ	IO91um	YO3ITD	KN34cj	7040060	37	-13	0	2112	102	7	2.11_r2263	0
9	186216198	2014-03-08 01:28:00	G8VDQ	IO91um	YO3ITD	KN34cj	7040060	37	-19	0	2112	102	7	2.11_r2263	0
10	186217522	2014-03-08 01:38:00	G8VDQ	IO91um	YO3ITD	KN34cj	7040058	37	-13	1	2112	102	7	2.11_r2263	0
11	186221696	2014-03-08 02:08:00	G8VDQ	IO91um	YO3ITD	KN34cj	7040060	37	-12	0	2112	102	7	2.11_r2263	0
								Mean	-14.0909						
								SD	2.8091						
								AD	-3.0909						
								AD%	-110						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186100401	2014-03-07 15:54:00	G8YTR	IO90lv	DL8YCA	JO43aq	10140106	33	-26	0	691	60	10	2.12_r3617	0
2	186103227	2014-03-07 16:04:00	G8YTR	IO90lv	DL8YCA	JO43aq	10140105	33	-23	0	691	60	10	2.12_r3617	0
3	186105194	2014-03-07 16:10:00	G8YTR	IO90lv	DL8YCA	JO43aq	10140105	33	-24	0	691	60	10	2.12_r3617	0
4	186106528	2014-03-07 16:16:00	G8YTR	IO90lv	DL8YCA	JO43aq	10140105	33	-24	0	691	60	10	2.12_r3617	0
5	186110909	2014-03-07 16:32:00	G8YTR	IO90lv	DL8YCA	JO43aq	10140105	33	-23	0	691	60	10	2.12_r3617	0
6	186116177	2014-03-07 16:50:00	G8YTR	IO90lv	DL8YCA	JO43aq	10140106	33	-24	0	691	60	10	2.12_r3617	0
7	186139948	2014-03-07 18:24:00	G8YTR	IO90lv	DL8YCA	JO43aq	10140105	33	-25	0	691	60	10	2.12_r3617	0
8	186141382	2014-03-07 18:30:00	G8YTR	IO90lv	DL8YCA	JO43aq	10140105	33	-22	0	691	60	10	2.12_r3617	0
9	186144289	2014-03-07 18:44:00	G8YTR	IO90lv	DL8YCA	JO43aq	10140105	33	-21	0	691	60	10	2.12_r3617	0
10	186145637	2014-03-07 18:50:00	G8YTR	IO90lv	DL8YCA	JO43aq	10140105	33	-22	0	691	60	10	2.12_r3617	0
11	186147266	2014-03-07 18:58:00	G8YTR	IO90lv	DL8YCA	JO43aq	10140105	33	-21	0	691	60	10	2.12_r3617	0
12	186148890	2014-03-07 19:06:00	G8YTR	IO90lv	DL8YCA	JO43aq	10140105	33	-20	0	691	60	10	2.12_r3617	0
								Mean	-22.9167						
								SD	1.7816						
								AD	2.0833						
								AD%	117						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186169995	2014-03-07 20:56:00	GM4SFW	IO77tm	W4MO	EL87	14097046	30	-15	0	6797	277	14	2.21_r2286	0
2	186175712	2014-03-07 21:28:00	GM4SFW	IO77tm	W4MO	EL87	14097045	30	-12	0	6797	277	14	2.21_r2286	0
3	186187267	2014-03-07 22:16:00	GM4SFW	IO77sn	W4MO	EL87	14097175	30	-14	-1	6792	277	14	2.21_r2286	0
4	186188333	2014-03-07 22:24:00	GM4SFW	IO77sn	W4MO	EL87	14097176	30	-16	0	6792	277	14	2.21_r2286	0
5	186189989	2014-03-07 22:34:00	GM4SFW	IO77sn	W4MO	EL87	14097179	30	-11	0	6792	277	14	2.21_r2286	0
6	186192812	2014-03-07 22:54:00	GM4SFW	IO77sn	W4MO	EL87	14097181	30	-17	-1	6792	277	14	2.21_r2286	0
7	186201147	2014-03-07 23:46:00	GM4SFW	IO77sn	W4MO	EL87	14097182	30	-24	0	6792	277	14	2.21_r2286	0
8	186204108	2014-03-08 00:04:00	GM4SFW	IO77tm	W4MO	EL87	14097184	30	-13	0	6797	277	14	2.21_r2286	0
9	186211165	2014-03-08 00:50:00	GM4SFW	IO77sn	W4MO	EL87	14097186	30	-20	0	6792	277	14	2.21_r2286	0
10	186212547	2014-03-08 01:00:00	GM4SFW	IO77tm	W4MO	EL87	14097186	30	-25	-1	6797	277	14	2.21_r2286	0
11	186219431	2014-03-08 01:52:00	GM4SFW	IO77sn	W4MO	EL87	14097187	30	-13	0	6792	277	14	2.21_r2286	0
12	186220751	2014-03-08 02:00:00	GM4SFW	IO77sn	W4MO	EL87	14097187	30	-12	0	6792	277	14	2.21_r2286	0
13	186223488	2014-03-08 02:20:00	GM4SFW	IO77sn	W4MO	EL87	14097188	30	-15	-1	6792	277	14	2.21_r2286	0
								Mean	-15.9231						
								SD	4.4993						
								AD	8.0769						
								AD%	180						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186166164	2014-03-07 20:36:00	HB9CZF	JN47ch	W4AC	EL86	14097096	30	-17	-1	7969	289	14	2.21_r2286	0
2	186169912	2014-03-07 20:56:00	HB9CZF	JN47ch	W4AC	EL86	14097096	30	-14	-1	7969	289	14	2.21_r2286	0
3	186173705	2014-03-07 21:16:00	HB9CZF	JN47ch	W4AC	EL86	14097096	30	-18	-1	7969	289	14	2.21_r2286	0
4	186175269	2014-03-07 21:26:00	HB9CZF	JN47ch	W4AC	EL86	14097096	30	-15	-2	7969	289	14	2.21_r2286	0
5	186177203	2014-03-07 21:36:00	HB9CZF	JN47ch	W4AC	EL86	14097093	30	-7	-1	7969	289	14	2.21_r2286	0
6	186183567	2014-03-07 21:56:00	HB9CZF	JN47ch	W4AC	EL86	14097093	30	-11	-1	7969	289	14	2.21_r2286	0
7	186185525	2014-03-07 22:06:00	HB9CZF	JN47ch	W4AC	EL86	14097096	30	-14	-1	7969	289	14	2.21_r2286	0
8	186187223	2014-03-07 22:16:00	HB9CZF	JN47ch	W4AC	EL86	14097096	30	-13	-1	7969	289	14	2.21_r2286	0
9	186191811	2014-03-07 22:46:00	HB9CZF	JN47ch	W4AC	EL86	14097099	30	-19	-1	7969	289	14	2.21_r2286	0
10	186197812	2014-03-07 23:26:00	HB9CZF	JN47ch	W4AC	EL86	14097094	30	-22	-1	7969	289	14	2.21_r2286	0
								Mean	-15.0000						
								SD	4.2687						
								AD	7.0000						
								AD%	164						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186183432	2014-03-07 21:56:00	HB9CZF	JN47ch	W4MO	EL87	14097099	30	-13	-1	7892	290	14	2.21_r2286	0
2	186185421	2014-03-07 22:06:00	HB9CZF	JN47ch	W4MO	EL87	14097107	30	-13	-1	7892	290	14	2.21_r2286	0
3	186187262	2014-03-07 22:16:00	HB9CZF	JN47ch	W4MO	EL87	14097110	30	-14	-1	7892	290	14	2.21_r2286	0
4	186191634	2014-03-07 22:46:00	HB9CZF	JN47ch	W4MO	EL87	14097116	30	-20	-1	7892	290	14	2.21_r2286	0
5	186197847	2014-03-07 23:26:00	HB9CZF	JN47ch	W4MO	EL87	14097111	30	-21	-1	7892	290	14	2.21_r2286	0
6	186207557	2014-03-08 00:26:00	HB9CZF	JN47ch	W4MO	EL87	14097115	30	-21	-1	7892	290	14	2.21_r2286	0
7	186210433	2014-03-08 00:46:00	HB9CZF	JN47ch	W4MO	EL87	14097117	30	-22	-1	7892	290	14	2.21_r2286	0
8	186214591	2014-03-08 01:16:00	HB9CZF	JN47ch	W4MO	EL87	14097111	30	-16	-1	7892	290	14	2.21_r2286	0
9	186216063	2014-03-08 01:26:00	HB9CZF	JN47ch	W4MO	EL87	14097115	30	-17	-1	7892	290	14	2.21_r2286	0
10	186220009	2014-03-08 01:56:00	HB9CZF	JN47ch	W4MO	EL87	14097109	30	-15	-1	7892	290	14	2.21_r2286	0
11	186221608	2014-03-08 02:06:00	HB9CZF	JN47ch	W4MO	EL87	14097115	30	-13	-1	7892	290	14	2.21_r2286	0
12	186222830	2014-03-08 02:16:00	HB9CZF	JN47ch	W4MO	EL87	14097115	30	-19	-1	7892	290	14	2.21_r2286	0
									Mean	-17.0000					
									SD	3.4641					
									AD	4.0000					
									AD%	115					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186116899	2014-03-07 16:54:00	HS0ZKM	OK03gr	K7UEB/20	DN06tb	14097160	37	-25	1	12310	28	14	3.00_r2326	0
2	186124629	2014-03-07 17:22:00	HS0ZKM	OK03gr	K7UEB/20	DN06tb	14097153	37	-27	0	12310	28	14	3.00_r2326	0
3	186142754	2014-03-07 18:36:00	HS0ZKM	OK03gr	K7UEB/20	DN06tb	14097156	37	-27	0	12310	28	14	3.00_r2326	0
4	186144899	2014-03-07 18:46:00	HS0ZKM	OK03gr	K7UEB/20	DN06tb	14097153	37	-25	0	12310	28	14	3.00_r2326	0
5	186148043	2014-03-07 19:02:00	HS0ZKM	OK03gr	K7UEB/20	DN06tb	14097153	37	-25	0	12310	28	14	3.00_r2326	0
6	186153337	2014-03-07 19:28:00	HS0ZKM	OK03gr	K7UEB/20	DN06tb	14097153	37	-22	0	12310	28	14	3.00_r2326	0
7	186154374	2014-03-07 19:34:00	HS0ZKM	OK03gr	K7UEB/20	DN06tb	14097153	37	-20	0	12310	28	14	3.00_r2326	0
8	186157823	2014-03-07 19:52:00	HS0ZKM	OK03gr	K7UEB/20	DN06tb	14097154	37	-26	1	12310	28	14	3.00_r2326	0
9	186166073	2014-03-07 20:36:00	HS0ZKM	OK03gr	K7UEB/20	DN06tb	14097153	37	-26	0	12310	28	14	3.00_r2326	0
								Mean	-24.7778						
								SD	2.3333						
								AD	-2.7778						
								AD%	-119						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186115302	2014-03-07 16:48:00	HS0ZKM	OK03gr	KC6KGE	DM05gd	14097110	37	-19	0	13138	37	14	0.8_r3058	0
2	186119146	2014-03-07 17:02:00	HS0ZKM	OK03gr	KC6KGE	DM05gd	14097114	37	-26	1	13138	37	14	0.8_r3058	0
3	186144772	2014-03-07 18:46:00	HS0ZKM	OK03gr	KC6KGE	DM05gd	14097111	37	-25	-1	13138	37	14	0.8_r3058	0
4	186391388	2014-03-08 16:08:00	HS0ZKM	OK03gr	KC6KGE	DM05gd	14097113	37	-22	1	13138	37	14	0.8_r3058	0
5	186393380	2014-03-08 16:16:00	HS0ZKM	OK03gr	KC6KGE	DM05gd	14097113	37	-19	1	13138	37	14	0.8_r3058	0
6	186395509	2014-03-08 16:26:00	HS0ZKM	OK03gr	KC6KGE	DM05gd	14097114	37	-18	1	13138	37	14	0.8_r3058	0
7	186397452	2014-03-08 16:36:00	HS0ZKM	OK03gr	KC6KGE	DM05gd	14097114	37	-18	-1	13138	37	14	0.8_r3058	0
8	186399302	2014-03-08 16:44:00	HS0ZKM	OK03gr	KC6KGE	DM05gd	14097113	37	-19	-1	13138	37	14	0.8_r3058	0
9	186400963	2014-03-08 16:52:00	HS0ZKM	OK03gr	KC6KGE	DM05gd	14097114	37	-21	1	13138	37	14	0.8_r3058	0
10	186403129	2014-03-08 17:02:00	HS0ZKM	OK03gr	KC6KGE	DM05gd	14097113	37	-20	-1	13138	37	14	0.8_r3058	0
11	186430823	2014-03-08 19:04:00	HS0ZKM	OK03gr	KC6KGE	DM05gd	14097115	37	-24	1	13138	37	14	0.8_r3058	0
								Mean	-21.0000						
								SD	2.8636						
								AD	4.0000						
								AD%	140						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186189980	2014-03-07 22:34:00	IK1NET	JN34su	W4MO	EL87	14097129	30	-10	0	7939	291	14	2.21_r2286	0
2	186191636	2014-03-07 22:46:00	IK1NET	JN34su	W4MO	EL87	14097131	30	-17	0	7939	291	14	2.21_r2286	0
3	186199215	2014-03-07 23:34:00	IK1NET	JN34su	W4MO	EL87	14097130	30	-13	0	7939	291	14	2.21_r2286	0
4	186201140	2014-03-07 23:46:00	IK1NET	JN34su	W4MO	EL87	14097131	30	-18	0	7939	291	14	2.21_r2286	0
5	186204067	2014-03-08 00:04:00	IK1NET	JN34su	W4MO	EL87	14097131	30	-19	0	7939	291	14	2.21_r2286	0
								Mean	-15.4000						
								SD	3.7815						
								AD	3.6000						
								AD%	95						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186185841	2014-03-07 22:08:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	11	0	8326	54	28	2.11_r2263	0
2	186187617	2014-03-07 22:18:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	9	0	8326	54	28	2.11_r2263	0
3	186189183	2014-03-07 22:28:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	10	0	8326	54	28	2.11_r2263	0
4	186190346	2014-03-07 22:36:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	4	0	8326	54	28	2.11_r2263	0
5	186191486	2014-03-07 22:44:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	1	0	8326	54	28	2.11_r2263	0
6	186192574	2014-03-07 22:52:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126133	37	10	0	8326	54	28	2.11_r2263	0
7	186195680	2014-03-07 23:12:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	1	0	8326	54	28	2.11_r2263	0
8	186197623	2014-03-07 23:24:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	2	0	8326	54	28	2.11_r2263	0
9	186199237	2014-03-07 23:34:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	2	0	8326	54	28	2.11_r2263	0
10	186200921	2014-03-07 23:44:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	5	0	8326	54	28	2.11_r2263	0
11	186202933	2014-03-07 23:56:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	10	0	8326	54	28	2.11_r2263	0
12	186205921	2014-03-08 00:16:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	5	0	8326	54	28	2.11_r2263	0
13	186207367	2014-03-08 00:24:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	11	0	8326	54	28	2.11_r2263	0
14	186208984	2014-03-08 00:34:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126133	37	8	0	8326	54	28	2.11_r2263	0
15	186210181	2014-03-08 00:42:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	-2	0	8326	54	28	2.11_r2263	0
16	186211262	2014-03-08 00:50:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	-1	0	8326	54	28	2.11_r2263	0
17	186212984	2014-03-08 01:02:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	4	0	8326	54	28	2.11_r2263	0
18	186215300	2014-03-08 01:20:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	-4	0	8326	54	28	2.11_r2263	0
19	186216228	2014-03-08 01:28:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	-2	0	8326	54	28	2.11_r2263	0
20	186217288	2014-03-08 01:36:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	-1	0	8326	54	28	2.11_r2263	0
21	186218521	2014-03-08 01:44:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126133	37	5	0	8326	54	28	2.11_r2263	0
22	186219503	2014-03-08 01:52:00	JH1GYE	PM96mi	KD6RF	CM97cq	28126134	37	5	0	8326	54	28	2.11_r2263	0
									Mean	4.2273					
									SD	4.6897					
									AD	-5.7727					
									AD%	-123					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186187590	2014-03-07 22:18:00	JH1GYE	PM96mi	VE6PDQ	DO34ir	28126131	37	-14	0	7778	36	28	3.00_r2485	0
2	186206131	2014-03-08 00:16:00	JH1GYE	PM96mi	VE6PDQ	DO34ir	28126129	37	-9	0	7778	36	28	3.00_r2485	0
3	186209988	2014-03-08 00:42:00	JH1GYE	PM96mi	VE6PDQ	DO34ir	28126130	37	-11	0	7778	36	28	3.00_r2485	0
4	186211058	2014-03-08 00:50:00	JH1GYE	PM96mi	VE6PDQ	DO34ir	28126129	37	-12	0	7778	36	28	3.00_r2485	0
5	186212908	2014-03-08 01:02:00	JH1GYE	PM96mi	VE6PDQ	DO34ir	28126129	37	-14	0	7778	36	28	3.00_r2485	0
								Mean	-12.0000						
								SD	2.1213						
								AD	-3.0000						
								AD%	-141						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186185742	2014-03-07 22:08:00	JH1GYE	PM96mi	WA5NGP	EM10cn	28126129	37	-12	0	10505	46	28	2.0_r1714	0
2	186187569	2014-03-07 22:18:00	JH1GYE	PM96mi	WA5NGP	EM10cn	28126131	37	-7	0	10505	46	28	2.0_r1714	0
3	186199055	2014-03-07 23:34:00	JH1GYE	PM96mi	WA5NGP	EM10cn	28126129	37	-12	1	10505	46	28	2.0_r1714	0
4	186200954	2014-03-07 23:44:00	JH1GYE	PM96mi	WA5NGP	EM10cn	28126131	37	-12	0	10505	46	28	2.0_r1714	0
5	186202843	2014-03-07 23:56:00	JH1GYE	PM96mi	WA5NGP	EM10cn	28126132	37	-10	1	10505	46	28	2.0_r1714	0
6	186205976	2014-03-08 00:16:00	JH1GYE	PM96mi	WA5NGP	EM10cn	28126130	37	-3	1	10505	46	28	2.0_r1714	0
7	186207380	2014-03-08 00:24:00	JH1GYE	PM96mi	WA5NGP	EM10cn	28126129	37	0	0	10505	46	28	2.0_r1714	0
8	186208790	2014-03-08 00:34:00	JH1GYE	PM96mi	WA5NGP	EM10cn	28126129	37	-5	1	10505	46	28	2.0_r1714	0
9	186209974	2014-03-08 00:42:00	JH1GYE	PM96mi	WA5NGP	EM10cn	28126128	37	-8	0	10505	46	28	2.0_r1714	0
10	186211174	2014-03-08 00:50:00	JH1GYE	PM96mi	WA5NGP	EM10cn	28126126	37	-8	0	10505	46	28	2.0_r1714	0
11	186212939	2014-03-08 01:02:00	JH1GYE	PM96mi	WA5NGP	EM10cn	28126129	37	-6	0	10505	46	28	2.0_r1714	0
								Mean	-7.5455						
								SD	3.9080						
								AD	4.4545						
								AD%	114						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186331932	2014-03-07 20:04:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-30	0	3341	23	10		0
2	186331863	2014-03-07 20:44:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-19	0	3341	23	10		0
3	186331806	2014-03-07 21:10:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-19	0	3341	23	10		0
4	186331785	2014-03-07 21:20:00	K4RCG	FM08xl	OX3XR	GP44de	10140228	37	-15	0	3341	23	10		0
5	186331758	2014-03-07 21:32:00	K4RCG	FM08xl	OX3XR	GP44de	10140228	37	-15	0	3341	23	10		0
6	186331722	2014-03-07 21:48:00	K4RCG	FM08xl	OX3XR	GP44de	10140228	37	-13	0	3341	23	10		0
7	186331677	2014-03-07 22:04:00	K4RCG	FM08xl	OX3XR	GP44de	10140228	37	-9	0	3341	23	10		0
8	186331562	2014-03-07 23:04:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-7	0	3341	23	10		0
9	186331543	2014-03-07 23:18:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-15	0	3341	23	10		0
10	186331523	2014-03-07 23:34:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-11	0	3341	23	10		0
11	186331493	2014-03-07 23:46:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-13	0	3341	23	10		0
12	186331458	2014-03-08 00:02:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-9	0	3341	23	10		0
13	186331431	2014-03-08 00:16:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-8	0	3341	23	10		0
14	186331397	2014-03-08 00:46:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-8	0	3341	23	10		0
15	186331376	2014-03-08 01:00:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-7	0	3341	23	10		0
16	186331364	2014-03-08 01:12:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-8	0	3341	23	10		0
17	186331323	2014-03-08 01:52:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-10	0	3341	23	10		0
18	186331306	2014-03-08 02:04:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-9	0	3341	23	10		0
								Mean	-12.5000						
								SD	5.8234						
								AD	-5.5000						
								AD%	-94						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186331863	2014-03-07 20:44:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-19	0	3341	23	10		0
2	186331806	2014-03-07 21:10:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-19	0	3341	23	10		0
3	186331785	2014-03-07 21:20:00	K4RCG	FM08xl	OX3XR	GP44de	10140228	37	-15	0	3341	23	10		0
4	186331758	2014-03-07 21:32:00	K4RCG	FM08xl	OX3XR	GP44de	10140228	37	-15	0	3341	23	10		0
5	186331722	2014-03-07 21:48:00	K4RCG	FM08xl	OX3XR	GP44de	10140228	37	-13	0	3341	23	10		0
6	186331677	2014-03-07 22:04:00	K4RCG	FM08xl	OX3XR	GP44de	10140228	37	-9	0	3341	23	10		0
7	186331562	2014-03-07 23:04:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-7	0	3341	23	10		0
8	186331543	2014-03-07 23:18:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-15	0	3341	23	10		0
9	186331523	2014-03-07 23:34:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-11	0	3341	23	10		0
10	186331493	2014-03-07 23:46:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-13	0	3341	23	10		0
11	186331458	2014-03-08 00:02:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-9	0	3341	23	10		0
12	186331431	2014-03-08 00:16:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-8	0	3341	23	10		0
13	186331397	2014-03-08 00:46:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-8	0	3341	23	10		0
14	186331376	2014-03-08 01:00:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-7	0	3341	23	10		0
15	186331364	2014-03-08 01:12:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-8	0	3341	23	10		0
16	186331323	2014-03-08 01:52:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-10	0	3341	23	10		0
17	186331306	2014-03-08 02:04:00	K4RCG	FM08xl	OX3XR	GP44de	10140229	37	-9	0	3341	23	10		0
								Mean	-11.4706						
								SD	3.9705						
								AD	3.5294						
								AD%	89						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186138595	2014-03-07 18:18:00	K4RCG	FM08xl	W4AC	EL86	14097136	37	1	0	1414	201	14	2.21_r2286	0
2	186141290	2014-03-07 18:30:00	K4RCG	FM08xl	W4AC	EL86	14097135	37	3	0	1414	201	14	2.21_r2286	0
3	186144268	2014-03-07 18:44:00	K4RCG	FM08xl	W4AC	EL86	14097135	37	6	0	1414	201	14	2.21_r2286	0
4	186147696	2014-03-07 19:00:00	K4RCG	FM08xl	W4AC	EL86	14097135	37	5	0	1414	201	14	2.21_r2286	0
5	186150579	2014-03-07 19:14:00	K4RCG	FM08xl	W4AC	EL86	14097135	37	3	0	1414	201	14	2.21_r2286	0
6	186152938	2014-03-07 19:26:00	K4RCG	FM08xl	W4AC	EL86	14097135	37	2	0	1414	201	14	2.21_r2286	0
7	186157207	2014-03-07 19:50:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	4	1	1414	201	14	2.21_r2286	0
8	186159639	2014-03-07 20:02:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	1	1	1414	201	14	2.21_r2286	0
9	186163454	2014-03-07 20:22:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	8	1	1414	201	14	2.21_r2286	0
10	186164782	2014-03-07 20:30:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	1	1	1414	201	14	2.21_r2286	0
11	186167222	2014-03-07 20:42:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	2	1	1414	201	14	2.21_r2286	0
12	186168753	2014-03-07 20:50:00	K4RCG	FM08xl	W4AC	EL86	14097127	37	6	0	1414	201	14	2.21_r2286	0
13	186171122	2014-03-07 21:02:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	1	1	1414	201	14	2.21_r2286	0
14	186173284	2014-03-07 21:14:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	5	1	1414	201	14	2.21_r2286	0
15	186174747	2014-03-07 21:22:00	K4RCG	FM08xl	W4AC	EL86	14097127	37	3	1	1414	201	14	2.21_r2286	0
16	186178318	2014-03-07 21:42:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	8	1	1414	201	14	2.21_r2286	0
17	186183253	2014-03-07 21:54:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	2	1	1414	201	14	2.21_r2286	0
18	186184755	2014-03-07 22:02:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	-1	1	1414	201	14	2.21_r2286	0
19	186186190	2014-03-07 22:10:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	-2	1	1414	201	14	2.21_r2286	0
20	186189416	2014-03-07 22:30:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	2	1	1414	201	14	2.21_r2286	0
21	186195120	2014-03-07 23:08:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	2	0	1414	201	14	2.21_r2286	0
22	186197821	2014-03-07 23:26:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	-4	0	1414	201	14	2.21_r2286	0
									Mean	2.6364					
									SD	2.9688					
									AD	-2.3636					
									AD%	-80					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186150579	2014-03-07 19:14:00	K4RCG	FM08xl	W4AC	EL86	14097135	37	3	0	1414	201	14	2.21_r2286	0
2	186152938	2014-03-07 19:26:00	K4RCG	FM08xl	W4AC	EL86	14097135	37	2	0	1414	201	14	2.21_r2286	0
3	186157207	2014-03-07 19:50:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	4	1	1414	201	14	2.21_r2286	0
4	186159639	2014-03-07 20:02:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	1	1	1414	201	14	2.21_r2286	0
5	186163454	2014-03-07 20:22:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	8	1	1414	201	14	2.21_r2286	0
6	186164782	2014-03-07 20:30:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	1	1	1414	201	14	2.21_r2286	0
7	186167222	2014-03-07 20:42:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	2	1	1414	201	14	2.21_r2286	0
8	186168753	2014-03-07 20:50:00	K4RCG	FM08xl	W4AC	EL86	14097127	37	6	0	1414	201	14	2.21_r2286	0
9	186171122	2014-03-07 21:02:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	1	1	1414	201	14	2.21_r2286	0
10	186173284	2014-03-07 21:14:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	5	1	1414	201	14	2.21_r2286	0
11	186174747	2014-03-07 21:22:00	K4RCG	FM08xl	W4AC	EL86	14097127	37	3	1	1414	201	14	2.21_r2286	0
12	186178318	2014-03-07 21:42:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	8	1	1414	201	14	2.21_r2286	0
13	186183253	2014-03-07 21:54:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	2	1	1414	201	14	2.21_r2286	0
14	186184755	2014-03-07 22:02:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	-1	1	1414	201	14	2.21_r2286	0
15	186186190	2014-03-07 22:10:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	-2	1	1414	201	14	2.21_r2286	0
16	186189416	2014-03-07 22:30:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	2	1	1414	201	14	2.21_r2286	0
17	186195120	2014-03-07 23:08:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	2	0	1414	201	14	2.21_r2286	0
18	186197821	2014-03-07 23:26:00	K4RCG	FM08xl	W4AC	EL86	14097126	37	-4	0	1414	201	14	2.21_r2286	0
								Mean	2.3889						
								SD	3.1086						
								AD	4.3889						
								AD%	141						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	185682697	2014-03-06 01:58:00	K9AN	EN50wc	VE4KE	EO01te	28126099	30	-19	-2	1464	331	28	2.11_r2263	0
2	185894962	2014-03-06 21:18:00	K9AN	EN50wc	VE4KE	EO01te	28126088	30	-20	0	1464	331	28	2.11_r2263	0
3	185915111	2014-03-06 23:06:00	K9AN	EN50wc	VE4KE	EO01te	28126088	30	-16	0	1464	331	28	2.11_r2263	0
4	185920324	2014-03-06 23:38:00	K9AN	EN50wc	VE4KE	EO01te	28126087	30	-19	0	1464	331	28	2.11_r2263	0
5	185929388	2014-03-07 00:38:00	K9AN	EN50wc	VE4KE	EO01te	28126087	30	-19	0	1464	331	28	2.11_r2263	0
6	186170235	2014-03-07 20:58:00	K9AN	EN50wc	VE4KE	EO01te	28126091	30	-17	0	1464	331	28	2.11_r2263	0
7	186180309	2014-03-07 21:46:00	K9AN	EN50wc	VE4KE	EO01te	28126090	30	-17	0	1464	331	28	2.11_r2263	0
8	186190670	2014-03-07 22:38:00	K9AN	EN50wc	VE4KE	EO01te	28126091	30	-16	0	1464	331	28	2.11_r2263	0
9	186203244	2014-03-07 23:58:00	K9AN	EN50wc	VE4KE	EO01te	28126092	30	-13	0	1464	331	28	2.11_r2263	0
10	186458122	2014-03-08 21:22:00	K9AN	EN50wc	VE4KE	EO01te	28126087	30	-10	0	1464	331	28	2.11_r2263	0
11	186464096	2014-03-08 21:58:00	K9AN	EN50wc	VE4KE	EO01te	28126088	30	-13	0	1464	331	28	2.11_r2263	0
12	186464839	2014-03-08 22:04:00	K9AN	EN50wc	VE4KE	EO01te	28126086	30	-13	0	1464	331	28	2.11_r2263	0
13	186479292	2014-03-08 23:18:00	K9AN	EN50wc	VE4KE	EO01te	28126088	30	-21	0	1464	331	28	2.11_r2263	0
14	186479585	2014-03-08 23:20:00	K9AN	EN50wc	VE4KE	EO01te	28126087	30	-20	0	1464	331	28	2.11_r2263	0
15	186485476	2014-03-08 23:58:00	K9AN	EN50wc	VE4KE	EO01te	28126090	30	-19	-1	1464	331	28	2.11_r2263	0
16	186492352	2014-03-09 00:38:00	K9AN	EN50wc	VE4KE	EO01te	28126088	30	-27	-1	1464	331	28	2.11_r2263	0
17	186729371	2014-03-09 21:18:00	K9AN	EN50wc	VE4KE	EO01te	28126088	30	-17	-1	1464	331	28	2.11_r2263	0
18	186737105	2014-03-09 22:00:00	K9AN	EN50wc	VE4KE	EO01te	28126085	30	-18	0	1464	331	28	2.11_r2263	0
19	186747984	2014-03-09 22:48:00	K9AN	EN50wc	VE4KE	EO01te	28126085	30	-19	0	1464	331	28	2.11_r2263	0
								Mean	-17.5263						
								SD	3.7174						
								AD	-4.5263						
								AD%	-122						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186184562	2014-03-07 22:02:00	KB1CHU	FN42pb	W4MO	EL87	14097075	30	-9	-1	1970	219	14	2.21_r2286	0
2	186189168	2014-03-07 22:28:00	KB1CHU	FN42pb	W4MO	EL87	14097088	30	-5	-2	1970	219	14	2.21_r2286	0
3	186194276	2014-03-07 23:02:00	KB1CHU	FN42pb	W4MO	EL87	14097083	30	-3	-1	1970	219	14	2.21_r2286	0
4	186208635	2014-03-08 00:32:00	KB1CHU	FN42pb	W4MO	EL87	14097084	30	-14	-1	1970	219	14	2.21_r2286	0
5	186212809	2014-03-08 01:02:00	KB1CHU	FN42pb	W4MO	EL87	14097085	30	-11	-2	1970	219	14	2.21_r2286	0
6	186216151	2014-03-08 01:28:00	KB1CHU	FN42pb	W4MO	EL87	14097093	30	-14	-4	1970	219	14	2.21_r2286	0
7	186220216	2014-03-08 01:58:00	KB1CHU	FN42pb	W4MO	EL87	14097093	30	-6	-4	1970	219	14	2.21_r2286	0
								Mean	-8.8571						
								SD	4.3753						
								AD	-5.8571						
								AD%	-134						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186148079	2014-03-07 19:02:00	KC3AVT	FM19la	W4AC	EL86	14097138	37	-2	0	1502	204	14	2.21_r2286	0
2	186150097	2014-03-07 19:12:00	KC3AVT	FM19la	W4AC	EL86	14097138	37	-2	0	1502	204	14	2.21_r2286	0
3	186151839	2014-03-07 19:20:00	KC3AVT	FM19la	W4AC	EL86	14097138	37	-1	0	1502	204	14	2.21_r2286	0
4	186153481	2014-03-07 19:30:00	KC3AVT	FM19la	W4AC	EL86	14097138	37	-1	0	1502	204	14	2.21_r2286	0
5	186155997	2014-03-07 19:44:00	KC3AVT	FM19la	W4AC	EL86	14097137	37	0	1	1502	204	14	2.21_r2286	0
6	186157664	2014-03-07 19:52:00	KC3AVT	FM19la	W4AC	EL86	14097138	37	-4	0	1502	204	14	2.21_r2286	0
7	186159375	2014-03-07 20:00:00	KC3AVT	FM19la	W4AC	EL86	14097138	37	-5	0	1502	204	14	2.21_r2286	0
8	186162150	2014-03-07 20:16:00	KC3AVT	FM19la	W4AC	EL86	14097138	37	-2	0	1502	204	14	2.21_r2286	0
9	186164784	2014-03-07 20:30:00	KC3AVT	FM19la	W4AC	EL86	14097138	37	-7	1	1502	204	14	2.21_r2286	0
10	186167691	2014-03-07 20:44:00	KC3AVT	FM19la	W4AC	EL86	14097139	37	1	0	1502	204	14	2.21_r2286	0
11	186169915	2014-03-07 20:56:00	KC3AVT	FM19la	W4AC	EL86	14097138	37	-2	1	1502	204	14	2.21_r2286	0
12	186174751	2014-03-07 21:22:00	KC3AVT	FM19la	W4AC	EL86	14097139	37	-10	0	1502	204	14	2.21_r2286	0
13	186178321	2014-03-07 21:42:00	KC3AVT	FM19la	W4AC	EL86	14097140	37	-5	0	1502	204	14	2.21_r2286	0
14	186183586	2014-03-07 21:56:00	KC3AVT	FM19la	W4AC	EL86	14097140	37	0	0	1502	204	14	2.21_r2286	0
15	186186532	2014-03-07 22:12:00	KC3AVT	FM19la	W4AC	EL86	14097140	37	1	0	1502	204	14	2.21_r2286	0
16	186188453	2014-03-07 22:24:00	KC3AVT	FM19la	W4AC	EL86	14097140	37	-2	0	1502	204	14	2.21_r2286	0
								Mean	-2.5625						
								SD	2.9882						
								AD	-2.5625						
								AD%	-86						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186123062	2014-03-07 17:16:00	KC6KGE	DM05gd	AG6IF	DM13II	10140256	30	-11	0	289	129	10	2.12_r3617	0
2	186125713	2014-03-07 17:26:00	KC6KGE	DM05gd	AG6IF	DM13II	10140256	30	-12	0	289	129	10	2.12_r3617	0
3	186127362	2014-03-07 17:32:00	KC6KGE	DM05gd	AG6IF	DM13II	10140256	30	-11	0	289	129	10	2.12_r3617	0
4	186129202	2014-03-07 17:40:00	KC6KGE	DM05gd	AG6IF	DM13II	10140255	30	-14	0	289	129	10	2.12_r3617	0
5	186131221	2014-03-07 17:48:00	KC6KGE	DM05gd	AG6IF	DM13II	10140255	30	-11	0	289	129	10	2.12_r3617	0
6	186133483	2014-03-07 17:56:00	KC6KGE	DM05gd	AG6IF	DM13II	10140255	30	-16	0	289	129	10	2.12_r3617	0
7	186134856	2014-03-07 18:02:00	KC6KGE	DM05gd	AG6IF	DM13II	10140255	30	-11	0	289	129	10	2.12_r3617	0
8	186137201	2014-03-07 18:12:00	KC6KGE	DM05gd	AG6IF	DM13II	10140255	30	-13	0	289	129	10	2.12_r3617	0
9	186139006	2014-03-07 18:20:00	KC6KGE	DM05gd	AG6IF	DM13II	10140256	30	-11	0	289	129	10	2.12_r3617	0
10	186140699	2014-03-07 18:28:00	KC6KGE	DM05gd	AG6IF	DM13II	10140255	30	-16	0	289	129	10	2.12_r3617	0
11	186142383	2014-03-07 18:34:00	KC6KGE	DM05gd	AG6IF	DM13II	10140255	30	-14	0	289	129	10	2.12_r3617	0
12	186143951	2014-03-07 18:42:00	KC6KGE	DM05gd	AG6IF	DM13II	10140255	30	-15	0	289	129	10	2.12_r3617	0
13	186146003	2014-03-07 18:52:00	KC6KGE	DM05gd	AG6IF	DM13II	10140255	30	-17	0	289	129	10	2.12_r3617	0
14	186147819	2014-03-07 19:00:00	KC6KGE	DM05gd	AG6IF	DM13II	10140256	30	-13	0	289	129	10	2.12_r3617	0
15	186149615	2014-03-07 19:10:00	KC6KGE	DM05gd	AG6IF	DM13II	10140256	30	-13	0	289	129	10	2.12_r3617	0
16	186151953	2014-03-07 19:20:00	KC6KGE	DM05gd	AG6IF	DM13II	10140256	30	-15	0	289	129	10	2.12_r3617	0
17	186153256	2014-03-07 19:28:00	KC6KGE	DM05gd	AG6IF	DM13II	10140256	30	-17	0	289	129	10	2.12_r3617	0
18	186154852	2014-03-07 19:36:00	KC6KGE	DM05gd	AG6IF	DM13II	10140255	30	-20	0	289	129	10	2.12_r3617	0
19	186156735	2014-03-07 19:46:00	KC6KGE	DM05gd	AG6IF	DM13II	10140255	30	-12	0	289	129	10	2.12_r3617	0
20	186157962	2014-03-07 19:52:00	KC6KGE	DM05gd	AG6IF	DM13II	10140256	30	-13	0	289	129	10	2.12_r3617	0
21	186158966	2014-03-07 19:58:00	KC6KGE	DM05gd	AG6IF	DM13II	10140256	30	-14	0	289	129	10	2.12_r3617	0
22	186160402	2014-03-07 20:06:00	KC6KGE	DM05gd	AG6IF	DM13II	10140256	30	-18	0	289	129	10	2.12_r3617	0
23	186162381	2014-03-07 20:16:00	KC6KGE	DM05gd	AG6IF	DM13II	10140255	30	-18	0	289	129	10	2.12_r3617	0
24	186163538	2014-03-07 20:22:00	KC6KGE	DM05gd	AG6IF	DM13II	10140255	30	-13	0	289	129	10	2.12_r3617	0
25	186164638	2014-03-07 20:28:00	KC6KGE	DM05gd	AG6IF	DM13II	10140256	30	-11	0	289	129	10	2.12_r3617	0
26	186166141	2014-03-07 20:36:00	KC6KGE	DM05gd	AG6IF	DM13II	10140256	30	-16	0	289	129	10	2.12_r3617	0
27	186167747	2014-03-07 20:44:00	KC6KGE	DM05gd	AG6IF	DM13II	10140256	30	-14	0	289	129	10	2.12_r3617	0
28	186173990	2014-03-07 21:18:00	KC6KGE	DM05gd	AG6IF	DM13II	10140259	30	-12	0	289	129	10	2.12_r3617	0
29	186175060	2014-03-07 21:24:00	KC6KGE	DM05gd	AG6IF	DM13II	10140257	30	-15	0	289	129	10	2.12_r3617	0
30	186177061	2014-03-07 21:34:00	KC6KGE	DM05gd	AG6IF	DM13II	10140257	30	-12	0	289	129	10	2.12_r3617	0
31	186178881	2014-03-07 21:44:00	KC6KGE	DM05gd	AG6IF	DM13II	10140257	30	-15	0	289	129	10	2.12_r3617	0
32	186182522	2014-03-07 21:50:00	KC6KGE	DM05gd	AG6IF	DM13II	10140257	30	-12	0	289	129	10	2.12_r3617	0
33	186183961	2014-03-07 21:58:00	KC6KGE	DM05gd	AG6IF	DM13II	10140257	30	-15	0	289	129	10	2.12_r3617	0
									Mean	-13.9394					
									SD	2.3841					
									AD	4.0606					
									AD%	170					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186158894	2014-03-07 19:58:00	KI6STW	CM97bk	KB4RG	EL09wn	28126109	30	-17	-1	2362	105	28	2.12_r3617	0
2	186162579	2014-03-07 20:18:00	KI6STW	CM97bk	KB4RG	EL09wn	28126110	30	-12	-1	2362	105	28	2.12_r3617	0
3	186170151	2014-03-07 20:58:00	KI6STW	CM97bk	KB4RG	EL09wn	28126109	30	-12	0	2362	105	28	2.12_r3617	0
4	186187512	2014-03-07 22:18:00	KI6STW	CM97bk	KB4RG	EL09wn	28126109	33	-10	0	2362	105	28	2.12_r3617	0
5	186190493	2014-03-07 22:38:00	KI6STW	CM97bk	KB4RG	EL09wn	28126109	33	-10	0	2362	105	28	2.12_r3617	0
6	186193406	2014-03-07 22:58:00	KI6STW	CM97bk	KB4RG	EL09wn	28126109	33	-6	0	2362	105	28	2.12_r3617	0
7	186196624	2014-03-07 23:18:00	KI6STW	CM97bk	KB4RG	EL09wn	28126109	33	-10	0	2362	105	28	2.12_r3617	0
8	186203292	2014-03-07 23:58:00	KI6STW	CM97bk	KB4RG	EL09wn	28126108	33	-11	0	2362	105	28	2.12_r3617	0
9	186209518	2014-03-08 00:38:00	KI6STW	CM97bk	KB4RG	EL09wn	28126109	33	-6	0	2362	105	28	2.12_r3617	0
10	186212197	2014-03-08 00:58:00	KI6STW	CM97bk	KB4RG	EL09wn	28126109	33	-10	-1	2362	105	28	2.12_r3617	0
11	186217597	2014-03-08 01:38:00	KI6STW	CM97bk	KB4RG	EL09wn	28126109	33	-10	0	2362	105	28	2.12_r3617	0
									Mean	-10.3636					
									SD	2.9757					
									AD	-4.3636					
									AD%	-147					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186138508	2014-03-07 18:18:00	KI7CI	DM09ch	JG1TWP/1	PM95rq	14097146	40	-28	0	8382	304	14	2.11_r2263	0
2	186142988	2014-03-07 18:38:00	KI7CI	DM09ch	JG1TWP/1	PM95rq	14097145	40	-17	0	8382	304	14	2.11_r2263	0
3	186145506	2014-03-07 18:50:00	KI7CI	DM09ch	JG1TWP/1	PM95rq	14097145	40	-25	0	8382	304	14	2.11_r2263	0
4	186147710	2014-03-07 19:00:00	KI7CI	DM09ch	JG1TWP/1	PM95rq	14097144	40	-26	0	8382	304	14	2.11_r2263	0
5	186149208	2014-03-07 19:08:00	KI7CI	DM09ch	JG1TWP/1	PM95rq	14097144	40	-26	0	8382	304	14	2.11_r2263	0
6	186151366	2014-03-07 19:18:00	KI7CI	DM09ch	JG1TWP/1	PM95rq	14097144	40	-26	0	8382	304	14	2.11_r2263	0
7	186153551	2014-03-07 19:30:00	KI7CI	DM09ch	JG1TWP/1	PM95rq	14097144	40	-28	0	8382	304	14	2.11_r2263	0
8	186155857	2014-03-07 19:42:00	KI7CI	DM09ch	JG1TWP/1	PM95rq	14097144	40	-21	0	8382	304	14	2.11_r2263	0
9	186158178	2014-03-07 19:54:00	KI7CI	DM09ch	JG1TWP/1	PM95rq	14097145	40	-26	0	8382	304	14	2.11_r2263	0
10	186168116	2014-03-07 20:46:00	KI7CI	DM09ch	JG1TWP/1	PM95rq	14097142	40	-24	0	8382	304	14	2.11_r2263	0
11	186171404	2014-03-07 21:04:00	KI7CI	DM09ch	JG1TWP/1	PM95rq	14097141	40	-25	0	8382	304	14	2.11_r2263	0
12	186173672	2014-03-07 21:16:00	KI7CI	DM09ch	JG1TWP/1	PM95rq	14097140	40	-27	0	8382	304	14	2.11_r2263	0
13	186175662	2014-03-07 21:28:00	KI7CI	DM09ch	JG1TWP/1	PM95rq	14097140	40	-24	0	8382	304	14	2.11_r2263	0
14	186177216	2014-03-07 21:36:00	KI7CI	DM09ch	JG1TWP/1	PM95rq	14097140	40	-23	0	8382	304	14	2.11_r2263	0
								Mean	-24.7143						
								SD	2.9202						
								AD	2.2857						
								AD%	78						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186178727	2014-03-07 21:44:00	KI7CI	DM09ch	KB4RG	EL09wn	28126137	40	8	0	2255	112	28	2.12_r3617	0
2	186182897	2014-03-07 21:52:00	KI7CI	DM09ch	KB4RG	EL09wn	28126137	40	5	0	2255	112	28	2.12_r3617	0
3	186184943	2014-03-07 22:04:00	KI7CI	DM09ch	KB4RG	EL09wn	28126137	40	11	1	2255	112	28	2.12_r3617	0
4	186186458	2014-03-07 22:12:00	KI7CI	DM09ch	KB4RG	EL09wn	28126136	40	5	0	2255	112	28	2.12_r3617	0
5	186189709	2014-03-07 22:32:00	KI7CI	DM09ch	KB4RG	EL09wn	28126136	40	9	0	2255	112	28	2.12_r3617	0
6	186191328	2014-03-07 22:44:00	KI7CI	DM09ch	KB4RG	EL09wn	28126136	40	5	0	2255	112	28	2.12_r3617	0
7	186192897	2014-03-07 22:54:00	KI7CI	DM09ch	KB4RG	EL09wn	28126136	40	3	0	2255	112	28	2.12_r3617	0
8	186194388	2014-03-07 23:04:00	KI7CI	DM09ch	KB4RG	EL09wn	28126137	40	10	0	2255	112	28	2.12_r3617	0
9	186198336	2014-03-07 23:30:00	KI7CI	DM09ch	KB4RG	EL09wn	28126136	40	8	0	2255	112	28	2.12_r3617	0
10	186200161	2014-03-07 23:40:00	KI7CI	DM09ch	KB4RG	EL09wn	28126137	40	5	0	2255	112	28	2.12_r3617	0
11	186202242	2014-03-07 23:52:00	KI7CI	DM09ch	KB4RG	EL09wn	28126137	40	1	0	2255	112	28	2.12_r3617	0
12	186205689	2014-03-08 00:14:00	KI7CI	DM09ch	KB4RG	EL09wn	28126137	40	11	0	2255	112	28	2.12_r3617	0
13	186206969	2014-03-08 00:22:00	KI7CI	DM09ch	KB4RG	EL09wn	28126137	40	7	0	2255	112	28	2.12_r3617	0
14	186208531	2014-03-08 00:32:00	KI7CI	DM09ch	KB4RG	EL09wn	28126136	40	9	0	2255	112	28	2.12_r3617	0
15	186209578	2014-03-08 00:40:00	KI7CI	DM09ch	KB4RG	EL09wn	28126136	40	9	0	2255	112	28	2.12_r3617	0
16	186211358	2014-03-08 00:52:00	KI7CI	DM09ch	KB4RG	EL09wn	28126137	40	8	0	2255	112	28	2.12_r3617	0
17	186213159	2014-03-08 01:04:00	KI7CI	DM09ch	KB4RG	EL09wn	28126137	40	10	0	2255	112	28	2.12_r3617	0
18	186214611	2014-03-08 01:16:00	KI7CI	DM09ch	KB4RG	EL09wn	28126137	40	11	0	2255	112	28	2.12_r3617	0
									Mean	7.5000					
									SD	2.9155					
									AD	2.5000					
									AD%	86					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186182892	2014-03-07 21:52:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126100	40	-2	0	2221	109	28	2.0_r1714	0
2	186184926	2014-03-07 22:04:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126099	40	-10	-1	2221	109	28	2.0_r1714	0
3	186186419	2014-03-07 22:12:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126099	40	-3	1	2221	109	28	2.0_r1714	0
4	186187833	2014-03-07 22:20:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126099	40	-2	-1	2221	109	28	2.0_r1714	0
5	186189837	2014-03-07 22:32:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126097	40	0	0	2221	109	28	2.0_r1714	0
6	186191334	2014-03-07 22:44:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126100	40	-3	-1	2221	109	28	2.0_r1714	0
7	186192987	2014-03-07 22:54:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126099	40	-1	0	2221	109	28	2.0_r1714	0
8	186194379	2014-03-07 23:04:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126100	40	-2	0	2221	109	28	2.0_r1714	0
9	186195580	2014-03-07 23:12:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126102	40	-3	0	2221	109	28	2.0_r1714	0
10	186197260	2014-03-07 23:22:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126101	40	-1	0	2221	109	28	2.0_r1714	0
11	186198589	2014-03-07 23:30:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126098	40	0	0	2221	109	28	2.0_r1714	0
12	186200139	2014-03-07 23:40:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126098	40	-2	0	2221	109	28	2.0_r1714	0
13	186202171	2014-03-07 23:52:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126099	40	-8	0	2221	109	28	2.0_r1714	0
14	186203857	2014-03-08 00:02:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126099	40	-5	0	2221	109	28	2.0_r1714	0
15	186205712	2014-03-08 00:14:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126099	40	-3	-1	2221	109	28	2.0_r1714	0
16	186206971	2014-03-08 00:22:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126099	40	2	-1	2221	109	28	2.0_r1714	0
17	186208600	2014-03-08 00:32:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126096	40	2	0	2221	109	28	2.0_r1714	0
18	186209599	2014-03-08 00:40:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126096	40	3	0	2221	109	28	2.0_r1714	0
19	186211477	2014-03-08 00:52:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126095	40	1	0	2221	109	28	2.0_r1714	0
20	186213233	2014-03-08 01:04:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126097	40	4	0	2221	109	28	2.0_r1714	0
21	186214687	2014-03-08 01:16:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126096	40	4	0	2221	109	28	2.0_r1714	0
22	186216079	2014-03-08 01:26:00	KI7CI	DM09ch	WA5NGP	EM10cn	28126096	40	5	1	2221	109	28	2.0_r1714	0
									Mean	-1.0909					
									SD	3.7277					
									AD	8.9091					
									AD%	239					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186206840	2014-03-08 00:20:00	KK4U	EM83av	YV4GJN	FK50	10140191	37	-12	0	3014	146	10	2.0_r1714	0
2	186207647	2014-03-08 00:26:00	KK4U	EM83av	YV4GJN	FK50	10140192	37	-10	0	3014	146	10	2.0_r1714	0
3	186210370	2014-03-08 00:44:00	KK4U	EM83av	YV4GJN	FK50	10140152	37	-16	0	3014	146	10	2.0_r1714	0
4	186212633	2014-03-08 01:00:00	KK4U	EM83av	YV4GJN	FK50	10140153	37	-14	0	3014	146	10	2.0_r1714	0
5	186215167	2014-03-08 01:20:00	KK4U	EM83av	YV4GJN	FK50	10140153	37	-15	0	3014	146	10	2.0_r1714	0
6	186216711	2014-03-08 01:32:00	KK4U	EM83av	YV4GJN	FK50	10140153	37	-18	0	3014	146	10	2.0_r1714	0
								Mean	-14.1667						
								SD	2.8577						
								AD	-4.1667						
								AD%	-146						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186333729	2014-03-06 23:10:00	KZ3X	FN10wh	OX3XR	GP44de	10140283	30	-14	0	3089	23	10		0
2	186333718	2014-03-06 23:22:00	KZ3X	FN10wh	OX3XR	GP44de	10140283	30	-12	0	3089	23	10		0
3	186333699	2014-03-06 23:34:00	KZ3X	FN10wh	OX3XR	GP44de	10140283	30	-11	-1	3089	23	10		0
4	186333666	2014-03-06 23:50:00	KZ3X	FN10wh	OX3XR	GP44de	10140283	30	-9	0	3089	23	10		0
5	186333654	2014-03-07 00:00:00	KZ3X	FN10wh	OX3XR	GP44de	10140283	30	-11	0	3089	23	10		0
6	186333620	2014-03-07 00:22:00	KZ3X	FN10wh	OX3XR	GP44de	10140283	30	-10	0	3089	23	10		0
7	186331503	2014-03-07 23:40:00	KZ3X	FN10wh	OX3XR	GP44de	10140285	30	-13	0	3089	23	10		0
8	186331475	2014-03-07 23:52:00	KZ3X	FN10wh	OX3XR	GP44de	10140284	30	-13	0	3089	23	10		0
9	186331463	2014-03-08 00:00:00	KZ3X	FN10wh	OX3XR	GP44de	10140283	30	-8	0	3089	23	10		0
10	186331437	2014-03-08 00:12:00	KZ3X	FN10wh	OX3XR	GP44de	10140283	30	-3	0	3089	23	10		0
								Mean	-10.4000						
								SD	3.2042						
								AD	-7.4000						
								AD%	-231						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186333729	2014-03-06 23:10:00	KZ3X	FN10wh	OX3XR	GP44de	10140283	30	-14	0	3089	23	10		0
2	186333718	2014-03-06 23:22:00	KZ3X	FN10wh	OX3XR	GP44de	10140283	30	-12	0	3089	23	10		0
3	186333699	2014-03-06 23:34:00	KZ3X	FN10wh	OX3XR	GP44de	10140283	30	-11	-1	3089	23	10		0
4	186333666	2014-03-06 23:50:00	KZ3X	FN10wh	OX3XR	GP44de	10140283	30	-9	0	3089	23	10		0
5	186333654	2014-03-07 00:00:00	KZ3X	FN10wh	OX3XR	GP44de	10140283	30	-11	0	3089	23	10		0
6	186333620	2014-03-07 00:22:00	KZ3X	FN10wh	OX3XR	GP44de	10140283	30	-10	0	3089	23	10		0
7	186331503	2014-03-07 23:40:00	KZ3X	FN10wh	OX3XR	GP44de	10140285	30	-13	0	3089	23	10		0
8	186331475	2014-03-07 23:52:00	KZ3X	FN10wh	OX3XR	GP44de	10140284	30	-13	0	3089	23	10		0
9	186331463	2014-03-08 00:00:00	KZ3X	FN10wh	OX3XR	GP44de	10140283	30	-8	0	3089	23	10		0
10	186331437	2014-03-08 00:12:00	KZ3X	FN10wh	OX3XR	GP44de	10140283	30	-3	0	3089	23	10		0
								Mean	-10.4000						
								SD	3.2042						
								AD	2.6000						
								AD%	81						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186202838	2014-03-07 23:56:00	N1NCO	FN42gl	OH7AZL	KP33on	10140201	37	-17	0	6257	32	10	2.0_r1714	0
2	186204761	2014-03-08 00:08:00	N1NCO	FN42gl	OH7AZL	KP33on	10140201	37	-22	0	6257	32	10	2.0_r1714	0
3	186206149	2014-03-08 00:16:00	N1NCO	FN42gl	OH7AZL	KP33on	10140201	37	-23	0	6257	32	10	2.0_r1714	0
4	186212257	2014-03-08 00:58:00	N1NCO	FN42gl	OH7AZL	KP33on	10140201	37	-23	0	6257	32	10	2.0_r1714	0
5	186216682	2014-03-08 01:32:00	N1NCO	FN42gl	OH7AZL	KP33on	10140201	37	-21	0	6257	32	10	2.0_r1714	0
6	186221366	2014-03-08 02:06:00	N1NCO	FN42gl	OH7AZL	KP33on	10140201	37	-22	0	6257	32	10	2.0_r1714	0
								Mean	-21.3333						
								SD	2.2509						
								AD	-4.3333						
								AD%	-193						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186125639	2014-03-07 17:26:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126094	30	-21	1	10588	131	28	2.21_r2286	0
2	186126891	2014-03-07 17:30:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126096	30	-25	1	10588	131	28	2.21_r2286	0
3	186133442	2014-03-07 17:56:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126092	30	-26	-1	10588	131	28	2.21_r2286	0
4	186138347	2014-03-07 18:16:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126094	30	-24	-2	10588	131	28	2.21_r2286	0
5	186138995	2014-03-07 18:20:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126090	30	-25	0	10588	131	28	2.21_r2286	0
6	186140551	2014-03-07 18:26:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126094	30	-24	1	10588	131	28	2.21_r2286	0
7	186143659	2014-03-07 18:40:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126093	30	-22	-1	10588	131	28	2.21_r2286	0
8	186145804	2014-03-07 18:50:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126096	30	-23	0	10588	131	28	2.21_r2286	0
9	186146976	2014-03-07 18:56:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126095	30	-25	-1	10588	131	28	2.21_r2286	0
10	186149031	2014-03-07 19:06:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126095	30	-24	0	10588	131	28	2.21_r2286	0
11	186149756	2014-03-07 19:10:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126096	30	-25	1	10588	131	28	2.21_r2286	0
12	186151215	2014-03-07 19:16:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126095	30	-24	-1	10588	131	28	2.21_r2286	0
13	186151702	2014-03-07 19:20:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126091	30	-23	1	10588	131	28	2.21_r2286	0
14	186152895	2014-03-07 19:26:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126094	30	-22	1	10588	131	28	2.21_r2286	0
15	186153769	2014-03-07 19:30:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126096	30	-22	0	10588	131	28	2.21_r2286	0
16	186154746	2014-03-07 19:36:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126095	30	-19	-1	10588	131	28	2.21_r2286	0
17	186155321	2014-03-07 19:40:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126092	30	-20	0	10588	131	28	2.21_r2286	0
18	186156452	2014-03-07 19:46:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126095	30	-18	1	10588	131	28	2.21_r2286	0
19	186157295	2014-03-07 19:50:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126097	30	-20	0	10588	131	28	2.21_r2286	0
20	186158645	2014-03-07 19:56:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126093	30	-19	-1	10588	131	28	2.21_r2286	0
21	186159304	2014-03-07 20:00:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126093	30	-18	1	10588	131	28	2.21_r2286	0
22	186160469	2014-03-07 20:06:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126096	30	-19	1	10588	131	28	2.21_r2286	0
23	186162137	2014-03-07 20:16:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126093	30	-21	-1	10588	131	28	2.21_r2286	0
24	186162989	2014-03-07 20:20:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126093	30	-21	1	10588	131	28	2.21_r2286	0
25	186164084	2014-03-07 20:26:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126097	30	-22	0	10588	131	28	2.21_r2286	0
26	186165025	2014-03-07 20:30:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126099	30	-19	0	10588	131	28	2.21_r2286	0
27	186166183	2014-03-07 20:36:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126094	30	-18	-1	10588	131	28	2.21_r2286	0
28	186166969	2014-03-07 20:40:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126094	30	-18	1	10588	131	28	2.21_r2286	0
29	186167881	2014-03-07 20:46:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126098	30	-23	1	10588	131	28	2.21_r2286	0
30	186168979	2014-03-07 20:50:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126099	30	-24	0	10588	131	28	2.21_r2286	0
31	186169813	2014-03-07 20:56:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126098	30	-19	-1	10588	131	28	2.21_r2286	0
32	186170560	2014-03-07 21:00:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126094	30	-18	0	10588	131	28	2.21_r2286	0
33	186171657	2014-03-07 21:06:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126097	30	-18	0	10588	131	28	2.21_r2286	0
34	186172570	2014-03-07 21:10:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126099	30	-18	0	10588	131	28	2.21_r2286	0
35	186173616	2014-03-07 21:16:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126098	30	-19	-1	10588	131	28	2.21_r2286	0
36	186174512	2014-03-07 21:20:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126094	30	-18	0	10588	131	28	2.21_r2286	0
37	186175458	2014-03-07 21:26:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126097	30	-18	0	10588	131	28	2.21_r2286	0
38	186176113	2014-03-07 21:30:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126099	30	-18	0	10588	131	28	2.21_r2286	0
39	186177134	2014-03-07 21:36:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126098	30	-16	-1	10588	131	28	2.21_r2286	0
40	186177905	2014-03-07 21:40:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126094	30	-16	0	10588	131	28	2.21_r2286	0
41	186180280	2014-03-07 21:46:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126098	30	-23	1	10588	131	28	2.21_r2286	0
42	186182565	2014-03-07 21:50:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126100	30	-22	1	10588	131	28	2.21_r2286	0
43	186184369	2014-03-07 22:00:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126096	30	-23	1	10588	131	28	2.21_r2286	0
44	186185314	2014-03-07 22:06:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126099	30	-21	0	10588	131	28	2.21_r2286	0
45	186187093	2014-03-07 22:16:00	N7SCQ	CM98ck	CX2ABP	GF15wc	28126096	30	-22	-1	10588	131	28	2.21_r2286	0
									Mean	-20.9556					
									SD	2.7216					
									AD	3.0444					
									AD%	112					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186131899	2014-03-07 17:50:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126117	30	-26	0	9799	126	28	0.8_r3058	0
2	186135804	2014-03-07 18:06:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126117	30	-21	0	9799	126	28	0.8_r3058	0
3	186138215	2014-03-07 18:16:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126117	30	-23	0	9799	126	28	0.8_r3058	0
4	186139185	2014-03-07 18:20:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126117	30	-21	0	9799	126	28	0.8_r3058	0
5	186140434	2014-03-07 18:26:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126117	30	-22	0	9799	126	28	0.8_r3058	0
6	186142596	2014-03-07 18:36:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126117	30	-16	0	9799	126	28	0.8_r3058	0
7	186143419	2014-03-07 18:40:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126118	30	-21	0	9799	126	28	0.8_r3058	0
8	186144720	2014-03-07 18:46:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126118	30	-22	0	9799	126	28	0.8_r3058	0
9	186146894	2014-03-07 18:56:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126117	30	-22	0	9799	126	28	0.8_r3058	0
10	186147718	2014-03-07 19:00:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126117	30	-20	0	9799	126	28	0.8_r3058	0
11	186148769	2014-03-07 19:06:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126117	30	-23	0	9799	126	28	0.8_r3058	0
12	186150910	2014-03-07 19:16:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126117	30	-19	0	9799	126	28	0.8_r3058	0
13	186151797	2014-03-07 19:20:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126118	30	-20	0	9799	126	28	0.8_r3058	0
14	186152792	2014-03-07 19:26:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126118	30	-16	0	9799	126	28	0.8_r3058	0
15	186153700	2014-03-07 19:30:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126118	30	-16	0	9799	126	28	0.8_r3058	0
16	186154747	2014-03-07 19:36:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126118	30	-19	0	9799	126	28	0.8_r3058	0
17	186155254	2014-03-07 19:40:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126118	30	-18	0	9799	126	28	0.8_r3058	0
18	186156630	2014-03-07 19:46:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126118	30	-18	0	9799	126	28	0.8_r3058	0
19	186157195	2014-03-07 19:50:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126118	30	-19	0	9799	126	28	0.8_r3058	0
20	186158387	2014-03-07 19:56:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126118	30	-20	0	9799	126	28	0.8_r3058	0
21	186159267	2014-03-07 20:00:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126118	30	-18	0	9799	126	28	0.8_r3058	0
22	186160352	2014-03-07 20:06:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126118	30	-21	0	9799	126	28	0.8_r3058	0
23	186161255	2014-03-07 20:10:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126118	30	-22	0	9799	126	28	0.8_r3058	0
24	186162141	2014-03-07 20:16:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126118	30	-20	0	9799	126	28	0.8_r3058	0
25	186162897	2014-03-07 20:20:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126118	30	-18	0	9799	126	28	0.8_r3058	0
26	186164140	2014-03-07 20:26:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126118	30	-19	0	9799	126	28	0.8_r3058	0
27	186164936	2014-03-07 20:30:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126118	30	-16	0	9799	126	28	0.8_r3058	0
28	186166102	2014-03-07 20:36:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126119	30	-14	0	9799	126	28	0.8_r3058	0
29	186166841	2014-03-07 20:40:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126119	30	-15	0	9799	126	28	0.8_r3058	0
30	186167949	2014-03-07 20:46:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126119	30	-18	0	9799	126	28	0.8_r3058	0
31	186168658	2014-03-07 20:50:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126119	30	-20	0	9799	126	28	0.8_r3058	0
32	186169822	2014-03-07 20:56:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126120	30	-21	0	9799	126	28	0.8_r3058	0
33	186170586	2014-03-07 21:00:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126119	30	-21	0	9799	126	28	0.8_r3058	0
34	186171710	2014-03-07 21:06:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126120	30	-18	0	9799	126	28	0.8_r3058	0
35	186172469	2014-03-07 21:10:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126119	30	-24	0	9799	126	28	0.8_r3058	0
36	186173643	2014-03-07 21:16:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126120	30	-20	0	9799	126	28	0.8_r3058	0
37	186174350	2014-03-07 21:20:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126120	30	-20	0	9799	126	28	0.8_r3058	0
38	186175381	2014-03-07 21:26:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126120	30	-17	0	9799	126	28	0.8_r3058	0
39	186175999	2014-03-07 21:30:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126120	30	-18	0	9799	126	28	0.8_r3058	0
40	186177258	2014-03-07 21:36:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126120	30	-17	0	9799	126	28	0.8_r3058	0
41	186177822	2014-03-07 21:40:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126120	30	-16	0	9799	126	28	0.8_r3058	0
42	186180101	2014-03-07 21:46:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126120	30	-17	0	9799	126	28	0.8_r3058	0
43	186182410	2014-03-07 21:50:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126120	30	-17	0	9799	126	28	0.8_r3058	0
44	186183372	2014-03-07 21:56:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126120	30	-16	0	9799	126	28	0.8_r3058	0
45	186184193	2014-03-07 22:00:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126120	30	-17	0	9799	126	28	0.8_r3058	0
46	186185222	2014-03-07 22:06:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126120	30	-18	0	9799	126	28	0.8_r3058	0
47	186186074	2014-03-07 22:10:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126120	30	-22	0	9799	126	28	0.8_r3058	0
48	186187066	2014-03-07 22:16:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126120	30	-24	0	9799	126	28	0.8_r3058	0
49	186187673	2014-03-07 22:20:00	N7SCQ	CM98ck	ZP5BAB	GG14hc	28126120	30	-25	0	9799	126	28	0.8_r3058	0
								Mean	-19.4082						
								SD	2.7304						
								AD	-5.4082						
								AD%	-198						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186183640	2014-03-07 21:58:00	NH7SR	BL11ch	KE7KRF	DM51kw	28126110	37	-26	0	4938	66	28	2.0_r1714	0
2	186185969	2014-03-07 22:10:00	NH7SR	BL11ch	KE7KRF	DM51kw	28126110	37	-23	0	4938	66	28	2.0_r1714	0
3	186189262	2014-03-07 22:30:00	NH7SR	BL11ch	KE7KRF	DM51kw	28126110	37	-15	0	4938	66	28	2.0_r1714	0
4	186190587	2014-03-07 22:38:00	NH7SR	BL11ch	KE7KRF	DM51kw	28126110	37	-21	0	4938	66	28	2.0_r1714	0
5	186193625	2014-03-07 22:58:00	NH7SR	BL11ch	KE7KRF	DM51kw	28126110	37	-23	0	4938	66	28	2.0_r1714	0
6	186195254	2014-03-07 23:10:00	NH7SR	BL11ch	KE7KRF	DM51kw	28126110	37	-24	0	4938	66	28	2.0_r1714	0
7	186199715	2014-03-07 23:38:00	NH7SR	BL11ch	KE7KRF	DM51kw	28126110	37	-20	0	4938	66	28	2.0_r1714	0
8	186201760	2014-03-07 23:50:00	NH7SR	BL11ch	KE7KRF	DM51kw	28126109	37	-25	0	4938	66	28	2.0_r1714	0
9	186202928	2014-03-07 23:56:00	NH7SR	BL11ch	KE7KRF	DM51kw	28126109	37	-12	0	4938	66	28	2.0_r1714	0
10	186203152	2014-03-07 23:58:00	NH7SR	BL11ch	KE7KRF	DM51kw	28126109	37	-13	0	4938	66	28	2.0_r1714	0
11	186204540	2014-03-08 00:06:00	NH7SR	BL11ch	KE7KRF	DM51kw	28126110	37	-17	0	4938	66	28	2.0_r1714	0
12	186207572	2014-03-08 00:26:00	NH7SR	BL11ch	KE7KRF	DM51kw	28126110	37	-11	0	4938	66	28	2.0_r1714	0
13	186208745	2014-03-08 00:34:00	NH7SR	BL11ch	KE7KRF	DM51kw	28126110	37	-20	0	4938	66	28	2.0_r1714	0
14	186209395	2014-03-08 00:38:00	NH7SR	BL11ch	KE7KRF	DM51kw	28126110	37	-19	0	4938	66	28	2.0_r1714	0
									Mean	-19.2143					
									SD	4.9331					
									AD	-8.2143					
									AD%	-167					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186168965	2014-03-07 20:50:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126121	37	-17	1	6019	67	28	2.0_r1714	0
2	186170173	2014-03-07 20:58:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126121	37	-18	0	6019	67	28	2.0_r1714	0
3	186173626	2014-03-07 21:16:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126121	37	-16	0	6019	67	28	2.0_r1714	0
4	186182540	2014-03-07 21:50:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126115	37	-20	-1	6019	67	28	2.0_r1714	0
5	186183897	2014-03-07 21:58:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126115	37	-16	1	6019	67	28	2.0_r1714	0
6	186191615	2014-03-07 22:46:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126116	37	-17	0	6019	67	28	2.0_r1714	0
7	186193454	2014-03-07 22:58:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126116	37	-15	0	6019	67	28	2.0_r1714	0
8	186195438	2014-03-07 23:10:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126119	37	-16	0	6019	67	28	2.0_r1714	0
9	186196511	2014-03-07 23:18:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126116	37	-19	0	6019	67	28	2.0_r1714	0
10	186198593	2014-03-07 23:30:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126115	37	-14	-1	6019	67	28	2.0_r1714	0
11	186200034	2014-03-07 23:38:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126114	37	-20	0	6019	67	28	2.0_r1714	0
12	186201813	2014-03-07 23:50:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126115	37	-21	0	6019	67	28	2.0_r1714	0
13	186202840	2014-03-07 23:56:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126117	37	-10	1	6019	67	28	2.0_r1714	0
14	186203178	2014-03-07 23:58:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126117	37	-14	0	6019	67	28	2.0_r1714	0
15	186207543	2014-03-08 00:26:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126115	37	-19	0	6019	67	28	2.0_r1714	0
16	186208783	2014-03-08 00:34:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126114	37	-13	0	6019	67	28	2.0_r1714	0
17	186209414	2014-03-08 00:38:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126113	37	-12	0	6019	67	28	2.0_r1714	0
18	186210596	2014-03-08 00:46:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126112	37	-9	0	6019	67	28	2.0_r1714	0
19	186211736	2014-03-08 00:54:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126112	37	-13	0	6019	67	28	2.0_r1714	0
20	186212324	2014-03-08 00:58:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126115	37	-11	0	6019	67	28	2.0_r1714	0
21	186213697	2014-03-08 01:08:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126114	37	-24	0	6019	67	28	2.0_r1714	0
22	186222819	2014-03-08 02:16:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126119	37	-20	-1	6019	67	28	2.0_r1714	0
23	186222989	2014-03-08 02:18:00	NH7SR	BL11ch	WA5NGP	EM10cn	28126118	37	-26	-1	6019	67	28	2.0_r1714	0
									Mean	-16.5217					
									SD	4.3051					
									AD	4.4783					
									AD%	104					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186137823	2014-03-07 18:14:00	OK2SAM	JN99du	M0BLP	JO02ad	10140228	27	-24	0	1299	288	10	2.11_r2263	0
2	186140072	2014-03-07 18:24:00	OK2SAM	JN99du	M0BLP	JO02ad	10140227	27	-22	0	1299	288	10	2.11_r2263	0
3	186156289	2014-03-07 19:44:00	OK2SAM	JN99du	M0BLP	JO02ad	10140229	27	-27	0	1299	288	10	2.11_r2263	0
4	186158181	2014-03-07 19:54:00	OK2SAM	JN99du	M0BLP	JO02ad	10140229	27	-28	0	1299	288	10	2.11_r2263	0
5	186163780	2014-03-07 20:24:00	OK2SAM	JN99du	M0BLP	JO02ad	10140229	27	-27	0	1299	288	10	2.11_r2263	0
6	186165712	2014-03-07 20:34:00	OK2SAM	JN99du	M0BLP	JO02ad	10140229	27	-25	0	1299	288	10	2.11_r2263	0
7	186167752	2014-03-07 20:44:00	OK2SAM	JN99du	M0BLP	JO02ad	10140229	27	-25	0	1299	288	10	2.11_r2263	0
8	186169645	2014-03-07 20:54:00	OK2SAM	JN99du	M0BLP	JO02ad	10140229	27	-26	0	1299	288	10	2.11_r2263	0
9	186171483	2014-03-07 21:04:00	OK2SAM	JN99du	M0BLP	JO02ad	10140229	27	-26	0	1299	288	10	2.11_r2263	0
10	186173211	2014-03-07 21:14:00	OK2SAM	JN99du	M0BLP	JO02ad	10140229	27	-23	0	1299	288	10	2.11_r2263	0
11	186175040	2014-03-07 21:24:00	OK2SAM	JN99du	M0BLP	JO02ad	10140229	27	-21	0	1299	288	10	2.11_r2263	0
								Mean	-24.9091						
								SD	2.2115						
								AD	-1.9091						
								AD%	-86						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186125200	2014-03-07 17:24:00	OK2SAM	JN99du	ON7KB	JO21ei	10140198	27	-20	0	995	285	10	0.8_r3058	0
2	186132854	2014-03-07 17:54:00	OK2SAM	JN99du	ON7KB	JO21ei	10140197	27	-21	0	995	285	10	0.8_r3058	0
3	186146356	2014-03-07 18:54:00	OK2SAM	JN99du	ON7KB	JO21ei	10140198	27	-18	0	995	285	10	0.8_r3058	0
4	186148648	2014-03-07 19:04:00	OK2SAM	JN99du	ON7KB	JO21ei	10140198	27	-14	0	995	285	10	0.8_r3058	0
5	186150665	2014-03-07 19:14:00	OK2SAM	JN99du	ON7KB	JO21ei	10140198	27	-20	0	995	285	10	0.8_r3058	0
6	186152541	2014-03-07 19:24:00	OK2SAM	JN99du	ON7KB	JO21ei	10140198	27	-10	0	995	285	10	0.8_r3058	0
7	186154264	2014-03-07 19:34:00	OK2SAM	JN99du	ON7KB	JO21ei	10140198	27	-17	0	995	285	10	0.8_r3058	0
8	186155972	2014-03-07 19:44:00	OK2SAM	JN99du	ON7KB	JO21ei	10140198	27	-16	0	995	285	10	0.8_r3058	0
9	186158097	2014-03-07 19:54:00	OK2SAM	JN99du	ON7KB	JO21ei	10140198	27	-11	0	995	285	10	0.8_r3058	0
10	186159996	2014-03-07 20:04:00	OK2SAM	JN99du	ON7KB	JO21ei	10140197	27	-20	0	995	285	10	0.8_r3058	0
11	186161785	2014-03-07 20:14:00	OK2SAM	JN99du	ON7KB	JO21ei	10140198	27	-9	0	995	285	10	0.8_r3058	0
12	186163676	2014-03-07 20:24:00	OK2SAM	JN99du	ON7KB	JO21ei	10140198	27	-7	0	995	285	10	0.8_r3058	0
									Mean	-15.2500					
									SD	4.9198					
									AD	-8.2500					
									AD%	-168					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186172745	2014-03-07 21:10:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-20	0	840	293	3	0.6	0
2	186178156	2014-03-07 21:40:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-23	0	840	293	3	0.6	0
3	186182641	2014-03-07 21:50:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-24	0	840	293	3	0.6	0
4	186186357	2014-03-07 22:10:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-20	0	840	293	3	0.6	0
5	186189631	2014-03-07 22:30:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-25	0	840	293	3	0.6	0
6	186191059	2014-03-07 22:40:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-28	0	840	293	3	0.6	0
7	186192489	2014-03-07 22:50:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-21	0	840	293	3	0.6	0
8	186194004	2014-03-07 23:00:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-20	0	840	293	3	0.6	0
9	186195522	2014-03-07 23:10:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-23	0	840	293	3	0.6	0
10	186197065	2014-03-07 23:20:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-23	0	840	293	3	0.6	0
11	186198664	2014-03-07 23:30:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-25	0	840	293	3	0.6	0
12	186202024	2014-03-07 23:50:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-22	0	840	293	3	0.6	0
13	186205250	2014-03-08 00:10:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-24	0	840	293	3	0.6	0
14	186208398	2014-03-08 00:30:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-23	0	840	293	3	0.6	0
15	186209910	2014-03-08 00:40:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-20	0	840	293	3	0.6	0
16	186211280	2014-03-08 00:50:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-21	0	840	293	3	0.6	0
17	186212734	2014-03-08 01:00:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-21	0	840	293	3	0.6	0
18	186214045	2014-03-08 01:10:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-25	0	840	293	3	0.6	0
19	186215395	2014-03-08 01:20:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-20	0	840	293	3	0.6	0
20	186216668	2014-03-08 01:30:00	OK2SAM	JN99du	PI4THT	JO32kf	3594150	27	-22	0	840	293	3	0.6	0
								Mean	-22.5000						
								SD	2.2124						
								AD	2.5000						
								AD%	113						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186154062	2014-03-07 19:32:00	ON7KB	JO21ei	DK4TJ	JO31fc	10140209	33	-20	0	148	100	10	2.0_r1714	0
2	186157842	2014-03-07 19:52:00	ON7KB	JO21ei	DK4TJ	JO31fc	10140211	33	-17	0	148	100	10	2.0_r1714	0
3	186168905	2014-03-07 20:50:00	ON7KB	JO21ei	DK4TJ	JO31fc	10140211	33	-21	0	148	100	10	2.0_r1714	0
4	186175498	2014-03-07 21:26:00	ON7KB	JO21ei	DK4TJ	JO31fc	10140210	33	-21	0	148	100	10	2.0_r1714	0
5	186177665	2014-03-07 21:38:00	ON7KB	JO21ei	DK4TJ	JO31fc	10140209	33	-22	0	148	100	10	2.0_r1714	0
								Mean	-20.2000						
								SD	1.9235						
								AD	1.8000						
								AD%	94						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186164185	2014-03-07 20:26:00	ON7KB	JO21ei	W4MO	EL87	14097029	33	-5	1	7487	286	14	2.21_r2286	0
2	186170170	2014-03-07 20:58:00	ON7KB	JO21ei	W4MO	EL87	14097030	33	-11	1	7487	286	14	2.21_r2286	0
3	186171726	2014-03-07 21:06:00	ON7KB	JO21ei	W4MO	EL87	14097027	33	-7	1	7487	286	14	2.21_r2286	0
4	186185439	2014-03-07 22:06:00	ON7KB	JO21ei	W4MO	EL87	14097160	33	-3	0	7487	286	14	2.21_r2286	0
5	186186867	2014-03-07 22:14:00	ON7KB	JO21ei	W4MO	EL87	14097163	33	-10	0	7487	286	14	2.21_r2286	0
6	186194285	2014-03-07 23:02:00	ON7KB	JO21ei	W4MO	EL87	14097167	33	-19	0	7487	286	14	2.21_r2286	0
7	186196685	2014-03-07 23:18:00	ON7KB	JO21ei	W4MO	EL87	14097168	33	-4	-1	7487	286	14	2.21_r2286	0
8	186198110	2014-03-07 23:28:00	ON7KB	JO21ei	W4MO	EL87	14097167	33	-13	0	7487	286	14	2.21_r2286	0
9	186199688	2014-03-07 23:38:00	ON7KB	JO21ei	W4MO	EL87	14097167	33	-10	0	7487	286	14	2.21_r2286	0
								Mean	-9.1111						
								SD	5.0360						
								AD	-5.1111						
								AD%	-101						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186133918	2014-03-07 17:58:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040109	37	-8	1	476	276	7	2.0_r1714	0
2	186141803	2014-03-07 18:32:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-3	0	476	276	7	2.0_r1714	0
3	186145906	2014-03-07 18:52:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-5	0	476	276	7	2.0_r1714	0
4	186147668	2014-03-07 19:00:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-3	1	476	276	7	2.0_r1714	0
5	186150462	2014-03-07 19:12:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-5	0	476	276	7	2.0_r1714	0
6	186152304	2014-03-07 19:22:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-5	0	476	276	7	2.0_r1714	0
7	186158596	2014-03-07 19:56:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-6	0	476	276	7	2.0_r1714	0
8	186160753	2014-03-07 20:08:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-5	0	476	276	7	2.0_r1714	0
9	186162625	2014-03-07 20:18:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-6	0	476	276	7	2.0_r1714	0
10	186167811	2014-03-07 20:44:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-7	0	476	276	7	2.0_r1714	0
11	186169567	2014-03-07 20:54:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-8	0	476	276	7	2.0_r1714	0
12	186173384	2014-03-07 21:14:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-6	0	476	276	7	2.0_r1714	0
								Mean	-5.5833						
								SD	1.6214						
								AD	1.4167						
								AD%	87						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186133918	2014-03-07 17:58:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040109	37	-8	1	476	276	7	2.0_r1714	0
2	186141803	2014-03-07 18:32:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-3	0	476	276	7	2.0_r1714	0
3	186145906	2014-03-07 18:52:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-5	0	476	276	7	2.0_r1714	0
4	186147668	2014-03-07 19:00:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-3	1	476	276	7	2.0_r1714	0
5	186150462	2014-03-07 19:12:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-5	0	476	276	7	2.0_r1714	0
6	186152304	2014-03-07 19:22:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-5	0	476	276	7	2.0_r1714	0
7	186158596	2014-03-07 19:56:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-6	0	476	276	7	2.0_r1714	0
8	186160753	2014-03-07 20:08:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-5	0	476	276	7	2.0_r1714	0
9	186162625	2014-03-07 20:18:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-6	0	476	276	7	2.0_r1714	0
10	186167811	2014-03-07 20:44:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-7	0	476	276	7	2.0_r1714	0
11	186169567	2014-03-07 20:54:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-8	0	476	276	7	2.0_r1714	0
12	186173384	2014-03-07 21:14:00	ON7KO	JO21ce	G4ZXE	IO81qk	7040110	37	-6	0	476	276	7	2.0_r1714	0
								Mean	-5.5833						
								SD	1.6214						
								AD	2.4167						
								AD%	149						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186175423	2014-03-07 21:26:00	OX3XR	GP44de	N2NOM	FN22bg	10140104	33	-23	0	2881	224	10	2.11_r2263	0
2	186177859	2014-03-07 21:40:00	OX3XR	GP44de	N2NOM	FN22bg	10140103	33	-21	0	2881	224	10	2.11_r2263	0
3	186183035	2014-03-07 21:54:00	OX3XR	GP44de	N2NOM	FN22bg	10140105	33	-22	0	2881	224	10	2.11_r2263	0
4	186185284	2014-03-07 22:06:00	OX3XR	GP44de	N2NOM	FN22bg	10140105	33	-21	0	2881	224	10	2.11_r2263	0
5	186189114	2014-03-07 22:28:00	OX3XR	GP44de	N2NOM	FN22bg	10140102	33	-25	0	2881	224	10	2.11_r2263	0
6	186191217	2014-03-07 22:42:00	OX3XR	GP44de	N2NOM	FN22bg	10140103	33	-33	0	2881	224	10	2.11_r2263	0
7	186192784	2014-03-07 22:54:00	OX3XR	GP44de	N2NOM	FN22bg	10140101	33	-20	0	2881	224	10	2.11_r2263	0
8	186194660	2014-03-07 23:06:00	OX3XR	GP44de	N2NOM	FN22bg	10140102	33	-25	0	2881	224	10	2.11_r2263	0
9	186196099	2014-03-07 23:14:00	OX3XR	GP44de	N2NOM	FN22bg	10140103	33	-31	0	2881	224	10	2.11_r2263	0
10	186200888	2014-03-07 23:44:00	OX3XR	GP44de	N2NOM	FN22bg	10140101	33	-28	0	2881	224	10	2.11_r2263	0
11	186204533	2014-03-08 00:06:00	OX3XR	GP44de	N2NOM	FN22bg	10140103	33	-21	0	2881	224	10	2.11_r2263	0
12	186206760	2014-03-08 00:20:00	OX3XR	GP44de	N2NOM	FN22bg	10140105	33	-23	0	2881	224	10	2.11_r2263	0
13	186208148	2014-03-08 00:30:00	OX3XR	GP44de	N2NOM	FN22bg	10140103	33	-25	-1	2881	224	10	2.11_r2263	0
14	186211893	2014-03-08 00:56:00	OX3XR	GP44de	N2NOM	FN22bg	10140105	33	-23	0	2881	224	10	2.11_r2263	0
15	186213526	2014-03-08 01:08:00	OX3XR	GP44de	N2NOM	FN22bg	10140105	33	-24	0	2881	224	10	2.11_r2263	0
									Mean	-24.3333					
									SD	3.7544					
									AD	8.6667					
									AD%	231					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186168759	2014-03-07 20:50:00	OZ7IT	JO65df	W4AC	EL86	14097167	37	-3	0	7940	290	14	2.21_r2286	0
2	186176052	2014-03-07 21:30:00	OZ7IT	JO65df	W4AC	EL86	14097166	37	-5	-1	7940	290	14	2.21_r2286	0
3	186183271	2014-03-07 21:54:00	OZ7IT	JO65df	W4AC	EL86	14097167	37	-5	-1	7940	290	14	2.21_r2286	0
4	186185529	2014-03-07 22:06:00	OZ7IT	JO65df	W4AC	EL86	14097167	37	-8	-1	7940	290	14	2.21_r2286	0
5	186187410	2014-03-07 22:18:00	OZ7IT	JO65df	W4AC	EL86	14097167	37	-9	-1	7940	290	14	2.21_r2286	0
6	186189721	2014-03-07 22:32:00	OZ7IT	JO65df	W4AC	EL86	14097166	37	-9	0	7940	290	14	2.21_r2286	0
7	186194255	2014-03-07 23:02:00	OZ7IT	JO65df	W4AC	EL86	14097167	37	-11	0	7940	290	14	2.21_r2286	0
8	186198719	2014-03-07 23:32:00	OZ7IT	JO65df	W4AC	EL86	14097167	37	-16	0	7940	290	14	2.21_r2286	0
									Mean	-8.2500					
									SD	4.0970					
									AD	7.7500					
									AD%	189					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186168856	2014-03-07 20:50:00	OZ7IT	JO65df	W4MO	EL87	14097051	37	-5	-1	7851	291	14	2.21_r2286	0
2	186185451	2014-03-07 22:06:00	OZ7IT	JO65df	W4MO	EL87	14097178	37	-6	-1	7851	291	14	2.21_r2286	0
3	186187599	2014-03-07 22:18:00	OZ7IT	JO65df	W4MO	EL87	14097181	37	-8	-1	7851	291	14	2.21_r2286	0
4	186189835	2014-03-07 22:32:00	OZ7IT	JO65df	W4MO	EL87	14097183	37	-6	0	7851	291	14	2.21_r2286	0
5	186191390	2014-03-07 22:44:00	OZ7IT	JO65df	W4MO	EL87	14097183	37	-8	0	7851	291	14	2.21_r2286	0
6	186194288	2014-03-07 23:02:00	OZ7IT	JO65df	W4MO	EL87	14097184	37	-13	0	7851	291	14	2.21_r2286	0
7	186195600	2014-03-07 23:12:00	OZ7IT	JO65df	W4MO	EL87	14097184	37	-8	1	7851	291	14	2.21_r2286	0
8	186201435	2014-03-07 23:48:00	OZ7IT	JO65df	W4MO	EL87	14097187	37	-28	0	7851	291	14	2.21_r2286	0
9	186206958	2014-03-08 00:22:00	OZ7IT	JO65df	W4MO	EL87	14097187	37	-20	0	7851	291	14	2.21_r2286	0
10	186208638	2014-03-08 00:32:00	OZ7IT	JO65df	W4MO	EL87	14097188	37	-23	0	7851	291	14	2.21_r2286	0
								Mean	-12.5000						
								SD	8.2226						
								AD	15.5000						
								AD%	189						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186136927	2014-03-07 18:10:00	US3IRX	KN88xh	OZ7IT	JO65df	7040183	37	-13	0	1912	303	7	2.21_r2286	0
2	186145678	2014-03-07 18:50:00	US3IRX	KN88xh	OZ7IT	JO65df	7040183	37	-12	0	1912	303	7	2.21_r2286	0
3	186148247	2014-03-07 19:02:00	US3IRX	KN88xh	OZ7IT	JO65df	7040183	37	-11	0	1912	303	7	2.21_r2286	0
4	186149846	2014-03-07 19:10:00	US3IRX	KN88xh	OZ7IT	JO65df	7040183	37	-13	0	1912	303	7	2.21_r2286	0
5	186152217	2014-03-07 19:22:00	US3IRX	KN88xh	OZ7IT	JO65df	7040183	37	-16	0	1912	303	7	2.21_r2286	0
6	186155831	2014-03-07 19:42:00	US3IRX	KN88xh	OZ7IT	JO65df	7040183	37	-9	0	1912	303	7	2.21_r2286	0
7	186157232	2014-03-07 19:50:00	US3IRX	KN88xh	OZ7IT	JO65df	7040183	37	-11	0	1912	303	7	2.21_r2286	0
8	186158984	2014-03-07 19:58:00	US3IRX	KN88xh	OZ7IT	JO65df	7040183	37	-10	0	1912	303	7	2.21_r2286	0
9	186161194	2014-03-07 20:10:00	US3IRX	KN88xh	OZ7IT	JO65df	7040183	37	-9	0	1912	303	7	2.21_r2286	0
10	186163247	2014-03-07 20:20:00	US3IRX	KN88xh	OZ7IT	JO65df	7040183	37	-6	0	1912	303	7	2.21_r2286	0
11	186164898	2014-03-07 20:30:00	US3IRX	KN88xh	OZ7IT	JO65df	7040182	37	-3	0	1912	303	7	2.21_r2286	0
12	186167289	2014-03-07 20:42:00	US3IRX	KN88xh	OZ7IT	JO65df	7040182	37	-10	0	1912	303	7	2.21_r2286	0
13	186172081	2014-03-07 21:08:00	US3IRX	KN88xh	OZ7IT	JO65df	7040181	37	-1	0	1912	303	7	2.21_r2286	0
14	186172683	2014-03-07 21:10:00	US3IRX	KN88xh	OZ7IT	JO65df	7040181	37	1	0	1912	303	7	2.21_r2286	0
15	186175864	2014-03-07 21:28:00	US3IRX	KN88xh	OZ7IT	JO65df	7040181	37	-9	0	1912	303	7	2.21_r2286	0
16	186177581	2014-03-07 21:38:00	US3IRX	KN88xh	OZ7IT	JO65df	7040181	37	-10	0	1912	303	7	2.21_r2286	0
								Mean	-8.8750						
								SD	4.5442						
								AD	-9.8750						
								AD%	-217						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186151033	2014-03-07 19:16:00	VA3ROM	EN58jk	KB9AMG	EN52tx	28126135	27	-29	0	610	174	28	2.0_r1714	0
2	186170591	2014-03-07 21:00:00	VA3ROM	EN58jk	KB9AMG	EN52tx	28126134	27	-27	0	610	174	28	2.0_r1714	0
3	186172650	2014-03-07 21:10:00	VA3ROM	EN58jk	KB9AMG	EN52tx	28126135	27	-28	0	610	174	28	2.0_r1714	0
4	186184608	2014-03-07 22:02:00	VA3ROM	EN58jk	KB9AMG	EN52tx	28126135	27	-26	0	610	174	28	2.0_r1714	0
5	186199174	2014-03-07 23:34:00	VA3ROM	EN58jk	KB9AMG	EN52tx	28126136	27	-26	0	610	174	28	2.0_r1714	0
								Mean	-27.2000						
								SD	1.3038						
								AD	-1.2000						
								AD%	-92						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186160575	2014-03-07 20:08:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097175	37	-23	-1	2749	276	14	0.8_r3058	0
2	186164555	2014-03-07 20:28:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097176	37	-22	-1	2749	276	14	0.8_r3058	0
3	186174325	2014-03-07 21:20:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097024	37	-12	-1	2749	276	14	0.8_r3058	0
4	186176522	2014-03-07 21:32:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097025	37	-11	-2	2749	276	14	0.8_r3058	0
5	186180260	2014-03-07 21:46:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097025	37	-15	-2	2749	276	14	0.8_r3058	0
6	186184221	2014-03-07 22:00:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097024	37	-20	-2	2749	276	14	0.8_r3058	0
7	186186441	2014-03-07 22:12:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097024	37	-18	-2	2749	276	14	0.8_r3058	0
8	186188796	2014-03-07 22:26:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097025	37	-12	-1	2749	276	14	0.8_r3058	0
9	186190576	2014-03-07 22:38:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097024	37	-9	-1	2749	276	14	0.8_r3058	0
10	186192696	2014-03-07 22:52:00	VK3DXE	QF21nv	VK6ZRY	OF78vd	14097024	37	-13	-2	2749	276	14	0.8_r3058	0
								Mean	-15.5000						
								SD	4.9272						
								AD	-2.5000						
								AD%	-51						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186194907	2014-03-07 23:06:00	VK3DXE	QF21nv	ZL1AML	RF73gb	28126012	37	7	-3	2587	96	28	2.11_r2263	0
2	186196157	2014-03-07 23:14:00	VK3DXE	QF21nv	ZL1AML	RF73gb	28126012	37	-10	-2	2587	96	28	2.11_r2263	0
3	186210198	2014-03-08 00:42:00	VK3DXE	QF21nv	ZL1AML	RF73gb	28126154	37	9	-3	2587	96	28	2.11_r2263	0
4	186211289	2014-03-08 00:50:00	VK3DXE	QF21nv	ZL1AML	RF73gb	28126154	37	8	-3	2587	96	28	2.11_r2263	0
5	186214037	2014-03-08 01:10:00	VK3DXE	QF21nv	ZL1AML	RF73gb	28126156	37	10	-3	2587	96	28	2.11_r2263	0
6	186215616	2014-03-08 01:22:00	VK3DXE	QF21nv	ZL1AML	RF73gb	28126156	37	9	-3	2587	96	28	2.11_r2263	0
7	186216659	2014-03-08 01:30:00	VK3DXE	QF21nv	ZL1AML	RF73gb	28126156	37	8	-2	2587	96	28	2.11_r2263	0
8	186220165	2014-03-08 01:56:00	VK3DXE	QF21nv	ZL1AML	RF73gb	28126156	37	5	-3	2587	96	28	2.11_r2263	0
								Mean	5.7500						
								SD	6.5411						
								AD	15.7500						
								AD%	241						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186198601	2014-03-07 23:30:00	W3CSW	FM19kd	N2NOM	FN22bg	10140271	33	5	0	363	16	10	2.11_r2263	0
2	186200616	2014-03-07 23:42:00	W3CSW	FM19kd	N2NOM	FN22bg	10140269	33	8	0	363	16	10	2.11_r2263	0
3	186202536	2014-03-07 23:54:00	W3CSW	FM19kd	N2NOM	FN22bg	10140267	33	9	0	363	16	10	2.11_r2263	0
4	186204169	2014-03-08 00:04:00	W3CSW	FM19kd	N2NOM	FN22bg	10140269	33	4	0	363	16	10	2.11_r2263	0
5	186206787	2014-03-08 00:20:00	W3CSW	FM19kd	N2NOM	FN22bg	10140272	33	-8	0	363	16	10	2.11_r2263	0
6	186208927	2014-03-08 00:34:00	W3CSW	FM19kd	N2NOM	FN22bg	10140270	33	-9	0	363	16	10	2.11_r2263	0
								Mean	1.5000						
								SD	7.9687						
								AD	9.5000						
								AD%	119						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186134595	2014-03-07 18:02:00	W3CSW	FM19kd	N2NOM	FN22bg	28126169	33	-17	0	363	16	28	2.11_r2263	0
2	186141840	2014-03-07 18:32:00	W3CSW	FM19kd	N2NOM	FN22bg	28126169	33	-18	0	363	16	28	2.11_r2263	0
3	186148059	2014-03-07 19:02:00	W3CSW	FM19kd	N2NOM	FN22bg	28126169	33	-15	0	363	16	28	2.11_r2263	0
4	186151423	2014-03-07 19:18:00	W3CSW	FM19kd	N2NOM	FN22bg	28126170	33	-18	0	363	16	28	2.11_r2263	0
5	186154261	2014-03-07 19:34:00	W3CSW	FM19kd	N2NOM	FN22bg	28126172	33	-14	0	363	16	28	2.11_r2263	0
6	186157310	2014-03-07 19:50:00	W3CSW	FM19kd	N2NOM	FN22bg	28126173	33	-20	0	363	16	28	2.11_r2263	0
7	186159711	2014-03-07 20:02:00	W3CSW	FM19kd	N2NOM	FN22bg	28126173	33	-13	0	363	16	28	2.11_r2263	0
8	186161985	2014-03-07 20:14:00	W3CSW	FM19kd	N2NOM	FN22bg	28126173	33	-18	0	363	16	28	2.11_r2263	0
9	186164886	2014-03-07 20:30:00	W3CSW	FM19kd	N2NOM	FN22bg	28126174	33	-20	0	363	16	28	2.11_r2263	0
10	186168315	2014-03-07 20:48:00	W3CSW	FM19kd	N2NOM	FN22bg	28126175	33	-13	0	363	16	28	2.11_r2263	0
11	186170571	2014-03-07 21:00:00	W3CSW	FM19kd	N2NOM	FN22bg	28126175	33	-19	0	363	16	28	2.11_r2263	0
12	186173317	2014-03-07 21:14:00	W3CSW	FM19kd	N2NOM	FN22bg	28126175	33	-16	0	363	16	28	2.11_r2263	0
								Mean	-16.7500						
								SD	2.5271						
								AD	3.2500						
								AD%	129						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186198601	2014-03-07 23:30:00	W3CSW	FM19kd	N2NOM	FN22bg	10140271	33	5	0	363	16	10	2.11_r2263	0
2	186200616	2014-03-07 23:42:00	W3CSW	FM19kd	N2NOM	FN22bg	10140269	33	8	0	363	16	10	2.11_r2263	0
3	186202536	2014-03-07 23:54:00	W3CSW	FM19kd	N2NOM	FN22bg	10140267	33	9	0	363	16	10	2.11_r2263	0
4	186204169	2014-03-08 00:04:00	W3CSW	FM19kd	N2NOM	FN22bg	10140269	33	4	0	363	16	10	2.11_r2263	0
5	186206787	2014-03-08 00:20:00	W3CSW	FM19kd	N2NOM	FN22bg	10140272	33	-8	0	363	16	10	2.11_r2263	0
6	186208927	2014-03-08 00:34:00	W3CSW	FM19kd	N2NOM	FN22bg	10140270	33	-9	0	363	16	10	2.11_r2263	0
								Mean	1.5000						
								SD	7.9687						
								AD	-7.5000						
								AD%	-94						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186174016	2014-03-07 21:18:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	-2	0	1558	204	14	2.21_r2286	0
2	186175276	2014-03-07 21:26:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	-3	0	1558	204	14	2.21_r2286	0
3	186176884	2014-03-07 21:34:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	1	0	1558	204	14	2.21_r2286	0
4	186182370	2014-03-07 21:50:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	6	0	1558	204	14	2.21_r2286	0
5	186187867	2014-03-07 22:20:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	2	0	1558	204	14	2.21_r2286	0
6	186191817	2014-03-07 22:46:00	W3GXT	FM19ol	W4AC	EL86	14097124	37	0	0	1558	204	14	2.21_r2286	0
7	186196369	2014-03-07 23:16:00	W3GXT	FM19ol	W4AC	EL86	14097124	37	-4	0	1558	204	14	2.21_r2286	0
8	186197509	2014-03-07 23:24:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	0	0	1558	204	14	2.21_r2286	0
9	186199069	2014-03-07 23:34:00	W3GXT	FM19ol	W4AC	EL86	14097124	37	2	0	1558	204	14	2.21_r2286	0
10	186202354	2014-03-07 23:52:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	0	0	1558	204	14	2.21_r2286	0
11	186203542	2014-03-08 00:00:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	2	0	1558	204	14	2.21_r2286	0
12	186205408	2014-03-08 00:12:00	W3GXT	FM19ol	W4AC	EL86	14097124	37	5	0	1558	204	14	2.21_r2286	0
								Mean	0.7500						
								SD	2.9580						
								AD	-4.2500						
								AD%	-144						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186145623	2014-03-07 18:50:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	-3	0	1558	204	14	2.21_r2286	0
2	186149056	2014-03-07 19:06:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	-2	0	1558	204	14	2.21_r2286	0
3	186150565	2014-03-07 19:14:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	0	0	1558	204	14	2.21_r2286	0
4	186152058	2014-03-07 19:22:00	W3GXT	FM19ol	W4AC	EL86	14097124	37	0	0	1558	204	14	2.21_r2286	0
5	186154099	2014-03-07 19:32:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	-2	0	1558	204	14	2.21_r2286	0
6	186155418	2014-03-07 19:40:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	2	0	1558	204	14	2.21_r2286	0
7	186158753	2014-03-07 19:58:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	3	0	1558	204	14	2.21_r2286	0
8	186160804	2014-03-07 20:08:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	2	0	1558	204	14	2.21_r2286	0
9	186162146	2014-03-07 20:16:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	-2	0	1558	204	14	2.21_r2286	0
10	186164124	2014-03-07 20:26:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	3	0	1558	204	14	2.21_r2286	0
11	186169657	2014-03-07 20:54:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	-4	0	1558	204	14	2.21_r2286	0
12	186172497	2014-03-07 21:10:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	-1	0	1558	204	14	2.21_r2286	0
13	186174016	2014-03-07 21:18:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	-2	0	1558	204	14	2.21_r2286	0
14	186175276	2014-03-07 21:26:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	-3	0	1558	204	14	2.21_r2286	0
15	186176884	2014-03-07 21:34:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	1	0	1558	204	14	2.21_r2286	0
16	186182370	2014-03-07 21:50:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	6	0	1558	204	14	2.21_r2286	0
17	186187867	2014-03-07 22:20:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	2	0	1558	204	14	2.21_r2286	0
18	186191817	2014-03-07 22:46:00	W3GXT	FM19ol	W4AC	EL86	14097124	37	0	0	1558	204	14	2.21_r2286	0
19	186196369	2014-03-07 23:16:00	W3GXT	FM19ol	W4AC	EL86	14097124	37	-4	0	1558	204	14	2.21_r2286	0
20	186197509	2014-03-07 23:24:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	0	0	1558	204	14	2.21_r2286	0
21	186199069	2014-03-07 23:34:00	W3GXT	FM19ol	W4AC	EL86	14097124	37	2	0	1558	204	14	2.21_r2286	0
22	186202354	2014-03-07 23:52:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	0	0	1558	204	14	2.21_r2286	0
23	186203542	2014-03-08 00:00:00	W3GXT	FM19ol	W4AC	EL86	14097123	37	2	0	1558	204	14	2.21_r2286	0
24	186205408	2014-03-08 00:12:00	W3GXT	FM19ol	W4AC	EL86	14097124	37	5	0	1558	204	14	2.21_r2286	0
									Mean	0.2083					
									SD	2.6862					
									AD	-5.7917					
									AD%	-216					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186188803	2014-03-07 22:26:00	W3HH	EL89vb	KK5MR	EM13wc	10140297	30	-17	0	1398	292	10	2.10_r2179	0
2	186191963	2014-03-07 22:48:00	W3HH	EL89vb	KK5MR	EM13wc	10140297	30	-15	0	1398	292	10	2.10_r2179	0
3	186193678	2014-03-07 22:58:00	W3HH	EL89vb	KK5MR	EM13wc	10140297	30	-12	0	1398	292	10	2.10_r2179	0
4	186205972	2014-03-08 00:16:00	W3HH	EL89vb	KK5MR	EM13wc	10140298	30	-12	0	1398	292	10	2.10_r2179	0
5	186207855	2014-03-08 00:28:00	W3HH	EL89vb	KK5MR	EM13wc	10140298	30	-14	0	1398	292	10	2.10_r2179	0
6	186209485	2014-03-08 00:38:00	W3HH	EL89vb	KK5MR	EM13wc	10140297	30	-17	0	1398	292	10	2.10_r2179	0
7	186212338	2014-03-08 00:58:00	W3HH	EL89vb	KK5MR	EM13wc	10140297	30	-17	0	1398	292	10	2.10_r2179	0
8	186214927	2014-03-08 01:18:00	W3HH	EL89vb	KK5MR	EM13wc	10140297	30	-13	0	1398	292	10	2.10_r2179	0
9	186217298	2014-03-08 01:36:00	W3HH	EL89vb	KK5MR	EM13wc	10140298	30	-12	0	1398	292	10	2.10_r2179	0
10	186218531	2014-03-08 01:44:00	W3HH	EL89vb	KK5MR	EM13wc	10140298	30	-13	0	1398	292	10	2.10_r2179	0
11	186219480	2014-03-08 01:52:00	W3HH	EL89vb	KK5MR	EM13wc	10140298	30	-17	0	1398	292	10	2.10_r2179	0
12	186221025	2014-03-08 02:02:00	W3HH	EL89vb	KK5MR	EM13wc	10140297	30	-18	0	1398	292	10	2.10_r2179	0
13	186222201	2014-03-08 02:12:00	W3HH	EL89vb	KK5MR	EM13wc	10140297	30	-18	0	1398	292	10	2.10_r2179	0
14	186223292	2014-03-08 02:20:00	W3HH	EL89vb	KK5MR	EM13wc	10140297	30	-16	0	1398	292	10	2.10_r2179	0
15	186224463	2014-03-08 02:28:00	W3HH	EL89vb	KK5MR	EM13wc	10140298	30	-11	0	1398	292	10	2.10_r2179	0
16	186225696	2014-03-08 02:36:00	W3HH	EL89vb	KK5MR	EM13wc	10140298	30	-12	0	1398	292	10	2.10_r2179	0
17	186227041	2014-03-08 02:46:00	W3HH	EL89vb	KK5MR	EM13wc	10140298	30	-15	0	1398	292	10	2.10_r2179	0
18	186228025	2014-03-08 02:54:00	W3HH	EL89vb	KK5MR	EM13wc	10140298	30	-13	0	1398	292	10	2.10_r2179	0
19	186229490	2014-03-08 03:06:00	W3HH	EL89vb	KK5MR	EM13wc	10140298	30	-16	0	1398	292	10	2.10_r2179	0
									Mean	-14.6316					
									SD	2.3383					
									AD	-2.6316					
									AD%	-113					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186331580	2014-03-07 22:58:00	W3HH	EL89vb	OX3XR	GP44de	10140298	30	-25	0	4456	20	10		0
2	186331510	2014-03-07 23:38:00	W3HH	EL89vb	OX3XR	GP44de	10140298	30	-24	0	4456	20	10		0
3	186331492	2014-03-07 23:46:00	W3HH	EL89vb	OX3XR	GP44de	10140298	30	-26	0	4456	20	10		0
4	186331448	2014-03-08 00:08:00	W3HH	EL89vb	OX3XR	GP44de	10140298	30	-22	0	4456	20	10		0
5	186331389	2014-03-08 00:50:00	W3HH	EL89vb	OX3XR	GP44de	10140298	30	-21	0	4456	20	10		0
6	186331380	2014-03-08 00:58:00	W3HH	EL89vb	OX3XR	GP44de	10140298	30	-16	0	4456	20	10		0
7	186331342	2014-03-08 01:36:00	W3HH	EL89vb	OX3XR	GP44de	10140299	30	-20	0	4456	20	10		0
8	186331333	2014-03-08 01:44:00	W3HH	EL89vb	OX3XR	GP44de	10140299	30	-18	0	4456	20	10		0
9	186331320	2014-03-08 01:52:00	W3HH	EL89vb	OX3XR	GP44de	10140299	30	-20	0	4456	20	10		0
								Mean	-21.3333						
								SD	3.2787						
								AD	3.6667						
								AD%	112						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186161543	2014-03-07 20:12:00	W3HH	EL89vb	W3BI	FN20en	10140282	30	-18	0	1412	23	10	2.0_r1714	0
2	186163052	2014-03-07 20:20:00	W3HH	EL89vb	W3BI	FN20en	10140283	30	-14	0	1412	23	10	2.0_r1714	0
3	186165529	2014-03-07 20:32:00	W3HH	EL89vb	W3BI	FN20en	10140282	30	-13	0	1412	23	10	2.0_r1714	0
4	186169312	2014-03-07 20:52:00	W3HH	EL89vb	W3BI	FN20en	10140282	30	-14	0	1412	23	10	2.0_r1714	0
5	186177014	2014-03-07 21:34:00	W3HH	EL89vb	W3BI	FN20en	10140282	30	-6	0	1412	23	10	2.0_r1714	0
6	186178248	2014-03-07 21:42:00	W3HH	EL89vb	W3BI	FN20en	10140282	30	-13	0	1412	23	10	2.0_r1714	0
7	186185350	2014-03-07 22:06:00	W3HH	EL89vb	W3BI	FN20en	10140282	30	-11	0	1412	23	10	2.0_r1714	0
8	186187612	2014-03-07 22:18:00	W3HH	EL89vb	W3BI	FN20en	10140283	30	-11	0	1412	23	10	2.0_r1714	0
9	186188677	2014-03-07 22:26:00	W3HH	EL89vb	W3BI	FN20en	10140282	30	-7	0	1412	23	10	2.0_r1714	0
10	186192167	2014-03-07 22:48:00	W3HH	EL89vb	W3BI	FN20en	10140282	30	-22	0	1412	23	10	2.0_r1714	0
11	186194738	2014-03-07 23:06:00	W3HH	EL89vb	W3BI	FN20en	10140282	30	-13	0	1412	23	10	2.0_r1714	0
12	186196451	2014-03-07 23:16:00	W3HH	EL89vb	W3BI	FN20en	10140282	30	-9	0	1412	23	10	2.0_r1714	0
13	186198227	2014-03-07 23:28:00	W3HH	EL89vb	W3BI	FN20en	10140283	30	-12	0	1412	23	10	2.0_r1714	0
14	186200018	2014-03-07 23:38:00	W3HH	EL89vb	W3BI	FN20en	10140283	30	-5	0	1412	23	10	2.0_r1714	0
15	186201331	2014-03-07 23:46:00	W3HH	EL89vb	W3BI	FN20en	10140283	30	-4	0	1412	23	10	2.0_r1714	0
16	186203024	2014-03-07 23:56:00	W3HH	EL89vb	W3BI	FN20en	10140283	30	-10	0	1412	23	10	2.0_r1714	0
17	186204684	2014-03-08 00:08:00	W3HH	EL89vb	W3BI	FN20en	10140282	30	-8	-1	1412	23	10	2.0_r1714	0
18	186207890	2014-03-08 00:28:00	W3HH	EL89vb	W3BI	FN20en	10140283	30	-12	0	1412	23	10	2.0_r1714	0
19	186209507	2014-03-08 00:38:00	W3HH	EL89vb	W3BI	FN20en	10140282	30	-4	0	1412	23	10	2.0_r1714	0
20	186211197	2014-03-08 00:50:00	W3HH	EL89vb	W3BI	FN20en	10140283	30	-6	0	1412	23	10	2.0_r1714	0
21	186212278	2014-03-08 00:58:00	W3HH	EL89vb	W3BI	FN20en	10140283	30	-3	0	1412	23	10	2.0_r1714	0
22	186213607	2014-03-08 01:08:00	W3HH	EL89vb	W3BI	FN20en	10140283	30	-8	0	1412	23	10	2.0_r1714	0
23	186214856	2014-03-08 01:18:00	W3HH	EL89vb	W3BI	FN20en	10140282	30	-7	0	1412	23	10	2.0_r1714	0
24	186216312	2014-03-08 01:28:00	W3HH	EL89vb	W3BI	FN20en	10140283	30	-6	0	1412	23	10	2.0_r1714	0
25	186217447	2014-03-08 01:36:00	W3HH	EL89vb	W3BI	FN20en	10140283	30	-14	0	1412	23	10	2.0_r1714	0
26	186218412	2014-03-08 01:44:00	W3HH	EL89vb	W3BI	FN20en	10140283	30	-10	0	1412	23	10	2.0_r1714	0
								Mean	-10.0000						
								SD	4.5343						
								AD	12.0000						
								AD%	265						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186198233	2014-03-07 23:28:00	W3HH	EL89vb	W3CSW	FM19kd	10140288	30	-15	0	1214	21	10	2.12_r3617	0
2	186199920	2014-03-07 23:38:00	W3HH	EL89vb	W3CSW	FM19kd	10140287	30	-4	0	1214	21	10	2.12_r3617	0
3	186201321	2014-03-07 23:46:00	W3HH	EL89vb	W3CSW	FM19kd	10140288	30	-4	0	1214	21	10	2.12_r3617	0
4	186202964	2014-03-07 23:56:00	W3HH	EL89vb	W3CSW	FM19kd	10140288	30	-6	0	1214	21	10	2.12_r3617	0
5	186204724	2014-03-08 00:08:00	W3HH	EL89vb	W3CSW	FM19kd	10140288	30	-3	0	1214	21	10	2.12_r3617	0
6	186206079	2014-03-08 00:16:00	W3HH	EL89vb	W3CSW	FM19kd	10140288	30	-7	0	1214	21	10	2.12_r3617	0
7	186207919	2014-03-08 00:28:00	W3HH	EL89vb	W3CSW	FM19kd	10140288	30	0	0	1214	21	10	2.12_r3617	0
									Mean	-5.5714					
									SD	4.7208					
									AD	9.4286					
									AD%	200					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186172367	2014-03-07 21:08:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-12	0	7021	42	14	2.0_r1714	0
2	186174261	2014-03-07 21:20:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-23	0	7021	42	14	2.0_r1714	0
3	186176552	2014-03-07 21:32:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-15	0	7021	42	14	2.0_r1714	0
4	186185191	2014-03-07 22:04:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-18	0	7021	42	14	2.0_r1714	0
5	186186787	2014-03-07 22:14:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-17	0	7021	42	14	2.0_r1714	0
6	186188014	2014-03-07 22:22:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-16	0	7021	42	14	2.0_r1714	0
7	186191613	2014-03-07 22:44:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-17	0	7021	42	14	2.0_r1714	0
8	186192974	2014-03-07 22:54:00	W4AC	EL86lux	2E0DSS	IO82xl	14097078	30	-13	0	7021	42	14	2.0_r1714	0
9	186194463	2014-03-07 23:04:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-24	0	7021	42	14	2.0_r1714	0
10	186195719	2014-03-07 23:12:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-24	0	7021	42	14	2.0_r1714	0
11	186196863	2014-03-07 23:20:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-20	0	7021	42	14	2.0_r1714	0
12	186198026	2014-03-07 23:28:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-12	0	7021	42	14	2.0_r1714	0
13	186199846	2014-03-07 23:38:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-15	0	7021	42	14	2.0_r1714	0
14	186200801	2014-03-07 23:44:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-19	0	7021	42	14	2.0_r1714	0
15	186204383	2014-03-08 00:04:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-28	0	7021	42	14	2.0_r1714	0
								Mean	-18.2000						
								SD	4.7988						
								AD	9.8000						
								AD%	204						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186164707	2014-03-07 20:28:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-23	0	7021	42	14	2.0_r1714	0
2	186166448	2014-03-07 20:38:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-20	0	7021	42	14	2.0_r1714	0
3	186168228	2014-03-07 20:46:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-19	0	7021	42	14	2.0_r1714	0
4	186170479	2014-03-07 20:58:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-25	0	7021	42	14	2.0_r1714	0
5	186172367	2014-03-07 21:08:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-12	0	7021	42	14	2.0_r1714	0
6	186174261	2014-03-07 21:20:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-23	0	7021	42	14	2.0_r1714	0
7	186176552	2014-03-07 21:32:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-15	0	7021	42	14	2.0_r1714	0
8	186185191	2014-03-07 22:04:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-18	0	7021	42	14	2.0_r1714	0
9	186186787	2014-03-07 22:14:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-17	0	7021	42	14	2.0_r1714	0
10	186188014	2014-03-07 22:22:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-16	0	7021	42	14	2.0_r1714	0
11	186191613	2014-03-07 22:44:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-17	0	7021	42	14	2.0_r1714	0
12	186192974	2014-03-07 22:54:00	W4AC	EL86lux	2E0DSS	IO82xl	14097078	30	-13	0	7021	42	14	2.0_r1714	0
13	186194463	2014-03-07 23:04:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-24	0	7021	42	14	2.0_r1714	0
14	186195719	2014-03-07 23:12:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-24	0	7021	42	14	2.0_r1714	0
15	186196863	2014-03-07 23:20:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-20	0	7021	42	14	2.0_r1714	0
16	186198026	2014-03-07 23:28:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-12	0	7021	42	14	2.0_r1714	0
17	186199846	2014-03-07 23:38:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-15	0	7021	42	14	2.0_r1714	0
18	186200801	2014-03-07 23:44:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-19	0	7021	42	14	2.0_r1714	0
19	186204383	2014-03-08 00:04:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-28	0	7021	42	14	2.0_r1714	0
								Mean	-18.9474						
								SD	4.6245						
								AD	5.0526						
								AD%	109						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186164707	2014-03-07 20:28:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-23	0	7021	42	14	2.0_r1714	0
2	186166448	2014-03-07 20:38:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-20	0	7021	42	14	2.0_r1714	0
3	186168228	2014-03-07 20:46:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-19	0	7021	42	14	2.0_r1714	0
4	186170479	2014-03-07 20:58:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-25	0	7021	42	14	2.0_r1714	0
5	186172367	2014-03-07 21:08:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-12	0	7021	42	14	2.0_r1714	0
6	186174261	2014-03-07 21:20:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-23	0	7021	42	14	2.0_r1714	0
7	186176552	2014-03-07 21:32:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-15	0	7021	42	14	2.0_r1714	0
8	186185191	2014-03-07 22:04:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-18	0	7021	42	14	2.0_r1714	0
9	186186787	2014-03-07 22:14:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-17	0	7021	42	14	2.0_r1714	0
10	186188014	2014-03-07 22:22:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-16	0	7021	42	14	2.0_r1714	0
11	186191613	2014-03-07 22:44:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-17	0	7021	42	14	2.0_r1714	0
12	186192974	2014-03-07 22:54:00	W4AC	EL86lux	2E0DSS	IO82xl	14097078	30	-13	0	7021	42	14	2.0_r1714	0
13	186194463	2014-03-07 23:04:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-24	0	7021	42	14	2.0_r1714	0
14	186195719	2014-03-07 23:12:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-24	0	7021	42	14	2.0_r1714	0
15	186196863	2014-03-07 23:20:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-20	0	7021	42	14	2.0_r1714	0
16	186198026	2014-03-07 23:28:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-12	0	7021	42	14	2.0_r1714	0
17	186199846	2014-03-07 23:38:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-15	0	7021	42	14	2.0_r1714	0
18	186200801	2014-03-07 23:44:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-19	0	7021	42	14	2.0_r1714	0
19	186204383	2014-03-08 00:04:00	W4AC	EL86lux	2E0DSS	IO82xl	14097077	30	-28	0	7021	42	14	2.0_r1714	0
								Mean	-18.9474						
								SD	4.6245						
								AD	-6.9474						
								AD%	-150						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186170458	2014-03-07 20:58:00	W4AC	EL86ux	DG7RJ	JN58th	14097079	30	-26	0	8078	44	14	2.11_r2263	0
2	186174406	2014-03-07 21:20:00	W4AC	EL86ux	DG7RJ	JN58th	14097078	30	-27	0	8078	44	14	2.11_r2263	0
3	186185137	2014-03-07 22:04:00	W4AC	EL86ux	DG7RJ	JN58th	14097077	30	-23	0	8078	44	14	2.11_r2263	0
4	186187006	2014-03-07 22:14:00	W4AC	EL86ux	DG7RJ	JN58th	14097078	30	-25	0	8078	44	14	2.11_r2263	0
5	186193062	2014-03-07 22:54:00	W4AC	EL86ux	DG7RJ	JN58th	14097078	30	-26	0	8078	44	14	2.11_r2263	0
6	186199816	2014-03-07 23:38:00	W4AC	EL86ux	DG7RJ	JN58th	14097077	30	-29	0	8078	44	14	2.11_r2263	0
7	186200752	2014-03-07 23:44:00	W4AC	EL86ux	DG7RJ	JN58th	14097077	30	-25	0	8078	44	14	2.11_r2263	0
								Mean	-25.8571						
								SD	1.8645						
								AD	3.1429						
								AD%	169						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186172345	2014-03-07 21:08:00	W4AC	EL86ux	DK0SC	JN59mf	14097090	30	-19	0	8001	43	14	2.21_r2286	0
2	186174602	2014-03-07 21:20:00	W4AC	EL86ux	DK0SC	JN59mf	14097090	30	-17	0	8001	43	14	2.21_r2286	0
3	186191530	2014-03-07 22:44:00	W4AC	EL86ux	DK0SC	JN59mf	14097090	30	-17	0	8001	43	14	2.21_r2286	0
4	186200748	2014-03-07 23:44:00	W4AC	EL86ux	DK0SC	JN59mf	14097089	30	-14	-1	8001	43	14	2.21_r2286	0
5	186203023	2014-03-07 23:56:00	W4AC	EL86ux	DK0SC	JN59mf	14097090	30	-13	0	8001	43	14	2.21_r2286	0
									Mean	-16.0000					
									SD	2.4495					
									AD	-2.0000					
									AD%	-82					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186174441	2014-03-07 21:20:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-6	0	7797	44	14	2.21_r2286	0
2	186176590	2014-03-07 21:32:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-8	0	7797	44	14	2.21_r2286	0
3	186182766	2014-03-07 21:52:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-2	0	7797	44	14	2.21_r2286	0
4	186184965	2014-03-07 22:04:00	W4AC	EL86ux	DK6UG	JN49cm	14097076	30	-3	0	7797	44	14	2.21_r2286	0
5	186186762	2014-03-07 22:14:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-9	0	7797	44	14	2.21_r2286	0
6	186188186	2014-03-07 22:22:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-8	0	7797	44	14	2.21_r2286	0
7	186190017	2014-03-07 22:34:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-5	0	7797	44	14	2.21_r2286	0
8	186191346	2014-03-07 22:44:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-7	0	7797	44	14	2.21_r2286	0
9	186192860	2014-03-07 22:54:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-11	0	7797	44	14	2.21_r2286	0
10	186194412	2014-03-07 23:04:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-12	0	7797	44	14	2.21_r2286	0
11	186195612	2014-03-07 23:12:00	W4AC	EL86ux	DK6UG	JN49cm	14097076	30	-12	0	7797	44	14	2.21_r2286	0
12	186196951	2014-03-07 23:20:00	W4AC	EL86ux	DK6UG	JN49cm	14097076	30	-8	0	7797	44	14	2.21_r2286	0
13	186199830	2014-03-07 23:38:00	W4AC	EL86ux	DK6UG	JN49cm	14097076	30	-11	0	7797	44	14	2.21_r2286	0
14	186200874	2014-03-07 23:44:00	W4AC	EL86ux	DK6UG	JN49cm	14097075	30	-11	0	7797	44	14	2.21_r2286	0
15	186202858	2014-03-07 23:56:00	W4AC	EL86ux	DK6UG	JN49cm	14097076	30	-11	0	7797	44	14	2.21_r2286	0
16	186204044	2014-03-08 00:04:00	W4AC	EL86ux	DK6UG	JN49cm	14097075	30	-5	0	7797	44	14	2.21_r2286	0
								Mean	-8.0625						
								SD	3.1931						
								AD	-3.0625						
								AD%	-96						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186170207	2014-03-07 20:58:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-14	0	7797	44	14	2.21_r2286	0
2	186174441	2014-03-07 21:20:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-6	0	7797	44	14	2.21_r2286	0
3	186176590	2014-03-07 21:32:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-8	0	7797	44	14	2.21_r2286	0
4	186182766	2014-03-07 21:52:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-2	0	7797	44	14	2.21_r2286	0
5	186184965	2014-03-07 22:04:00	W4AC	EL86ux	DK6UG	JN49cm	14097076	30	-3	0	7797	44	14	2.21_r2286	0
6	186186762	2014-03-07 22:14:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-9	0	7797	44	14	2.21_r2286	0
7	186188186	2014-03-07 22:22:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-8	0	7797	44	14	2.21_r2286	0
8	186190017	2014-03-07 22:34:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-5	0	7797	44	14	2.21_r2286	0
9	186191346	2014-03-07 22:44:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-7	0	7797	44	14	2.21_r2286	0
10	186192860	2014-03-07 22:54:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-11	0	7797	44	14	2.21_r2286	0
11	186194412	2014-03-07 23:04:00	W4AC	EL86ux	DK6UG	JN49cm	14097077	30	-12	0	7797	44	14	2.21_r2286	0
12	186195612	2014-03-07 23:12:00	W4AC	EL86ux	DK6UG	JN49cm	14097076	30	-12	0	7797	44	14	2.21_r2286	0
13	186196951	2014-03-07 23:20:00	W4AC	EL86ux	DK6UG	JN49cm	14097076	30	-8	0	7797	44	14	2.21_r2286	0
14	186199830	2014-03-07 23:38:00	W4AC	EL86ux	DK6UG	JN49cm	14097076	30	-11	0	7797	44	14	2.21_r2286	0
15	186200874	2014-03-07 23:44:00	W4AC	EL86ux	DK6UG	JN49cm	14097075	30	-11	0	7797	44	14	2.21_r2286	0
16	186202858	2014-03-07 23:56:00	W4AC	EL86ux	DK6UG	JN49cm	14097076	30	-11	0	7797	44	14	2.21_r2286	0
17	186204044	2014-03-08 00:04:00	W4AC	EL86ux	DK6UG	JN49cm	14097075	30	-5	0	7797	44	14	2.21_r2286	0
								Mean	-8.4118						
								SD	3.4106						
								AD	2.5882						
								AD%	76						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186166613	2014-03-07 20:38:00	W4AC	EL86lux	M5ADA	IO93kl	14097090	30	-22	0	7062	41	14	3.0.1_r255	0
2	186168066	2014-03-07 20:46:00	W4AC	EL86lux	M5ADA	IO93kl	14097090	30	-24	0	7062	41	14	3.0.1_r255	0
3	186170443	2014-03-07 20:58:00	W4AC	EL86lux	M5ADA	IO93kl	14097090	30	-28	0	7062	41	14	3.0.1_r255	0
4	186174403	2014-03-07 21:20:00	W4AC	EL86lux	M5ADA	IO93kl	14097089	30	-21	0	7062	41	14	3.0.1_r255	0
5	186176594	2014-03-07 21:32:00	W4AC	EL86lux	M5ADA	IO93kl	14097090	30	-24	0	7062	41	14	3.0.1_r255	0
6	186182649	2014-03-07 21:52:00	W4AC	EL86lux	M5ADA	IO93kl	14097090	30	-17	0	7062	41	14	3.0.1_r255	0
7	186184949	2014-03-07 22:04:00	W4AC	EL86lux	M5ADA	IO93kl	14097089	30	-23	0	7062	41	14	3.0.1_r255	0
8	186189954	2014-03-07 22:34:00	W4AC	EL86lux	M5ADA	IO93kl	14097090	30	-25	0	7062	41	14	3.0.1_r255	0
9	186191322	2014-03-07 22:44:00	W4AC	EL86lux	M5ADA	IO93kl	14097090	30	-28	0	7062	41	14	3.0.1_r255	0
10	186196953	2014-03-07 23:20:00	W4AC	EL86lux	M5ADA	IO93kl	14097089	30	-25	0	7062	41	14	3.0.1_r255	0
11	186198129	2014-03-07 23:28:00	W4AC	EL86lux	M5ADA	IO93kl	14097090	30	-24	0	7062	41	14	3.0.1_r255	0
12	186199940	2014-03-07 23:38:00	W4AC	EL86lux	M5ADA	IO93kl	14097089	30	-31	0	7062	41	14	3.0.1_r255	0
13	186202800	2014-03-07 23:56:00	W4AC	EL86lux	M5ADA	IO93kl	14097090	30	-28	0	7062	41	14	3.0.1_r255	0
								Mean	-24.6154						
								SD	3.6180						
								AD	6.3846						
								AD%	176						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186172262	2014-03-07 21:08:00	W4AC	EL86ux	M6NNB	IO91ue	14097096	30	-23	0	7167	43	14	2.11_r2263	0
2	186174535	2014-03-07 21:20:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-20	0	7167	43	14	2.11_r2263	0
3	186182691	2014-03-07 21:52:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-21	0	7167	43	14	2.11_r2263	0
4	186185088	2014-03-07 22:04:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-23	0	7167	43	14	2.11_r2263	0
5	186188041	2014-03-07 22:22:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-23	0	7167	43	14	2.11_r2263	0
6	186189982	2014-03-07 22:34:00	W4AC	EL86ux	M6NNB	IO91ue	14097098	30	-24	0	7167	43	14	2.11_r2263	0
7	186191348	2014-03-07 22:44:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-23	0	7167	43	14	2.11_r2263	0
8	186194445	2014-03-07 23:04:00	W4AC	EL86ux	M6NNB	IO91ue	14097098	30	-25	0	7167	43	14	2.11_r2263	0
9	186196906	2014-03-07 23:20:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-20	0	7167	43	14	2.11_r2263	0
10	186198184	2014-03-07 23:28:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-29	0	7167	43	14	2.11_r2263	0
11	186199981	2014-03-07 23:38:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-27	0	7167	43	14	2.11_r2263	0
12	186200850	2014-03-07 23:44:00	W4AC	EL86ux	M6NNB	IO91ue	14097096	30	-29	0	7167	43	14	2.11_r2263	0
13	186204017	2014-03-08 00:04:00	W4AC	EL86ux	M6NNB	IO91ue	14097096	30	-29	0	7167	43	14	2.11_r2263	0
								Mean	-24.3077						
								SD	3.2758						
								AD	4.6923						
								AD%	143						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186172262	2014-03-07 21:08:00	W4AC	EL86ux	M6NNB	IO91ue	14097096	30	-23	0	7167	43	14	2.11_r2263	0
2	186174535	2014-03-07 21:20:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-20	0	7167	43	14	2.11_r2263	0
3	186182691	2014-03-07 21:52:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-21	0	7167	43	14	2.11_r2263	0
4	186185088	2014-03-07 22:04:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-23	0	7167	43	14	2.11_r2263	0
5	186188041	2014-03-07 22:22:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-23	0	7167	43	14	2.11_r2263	0
6	186189982	2014-03-07 22:34:00	W4AC	EL86ux	M6NNB	IO91ue	14097098	30	-24	0	7167	43	14	2.11_r2263	0
7	186191348	2014-03-07 22:44:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-23	0	7167	43	14	2.11_r2263	0
8	186194445	2014-03-07 23:04:00	W4AC	EL86ux	M6NNB	IO91ue	14097098	30	-25	0	7167	43	14	2.11_r2263	0
9	186196906	2014-03-07 23:20:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-20	0	7167	43	14	2.11_r2263	0
10	186198184	2014-03-07 23:28:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-29	0	7167	43	14	2.11_r2263	0
11	186199981	2014-03-07 23:38:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-27	0	7167	43	14	2.11_r2263	0
12	186200850	2014-03-07 23:44:00	W4AC	EL86ux	M6NNB	IO91ue	14097096	30	-29	0	7167	43	14	2.11_r2263	0
13	186204017	2014-03-08 00:04:00	W4AC	EL86ux	M6NNB	IO91ue	14097096	30	-29	0	7167	43	14	2.11_r2263	0
									Mean	-24.3077					
									SD	3.2758					
									AD	-4.3077					
									AD%	-132					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186172262	2014-03-07 21:08:00	W4AC	EL86ux	M6NNB	IO91ue	14097096	30	-23	0	7167	43	14	2.11_r2263	0
2	186174535	2014-03-07 21:20:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-20	0	7167	43	14	2.11_r2263	0
3	186182691	2014-03-07 21:52:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-21	0	7167	43	14	2.11_r2263	0
4	186185088	2014-03-07 22:04:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-23	0	7167	43	14	2.11_r2263	0
5	186188041	2014-03-07 22:22:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-23	0	7167	43	14	2.11_r2263	0
6	186189982	2014-03-07 22:34:00	W4AC	EL86ux	M6NNB	IO91ue	14097098	30	-24	0	7167	43	14	2.11_r2263	0
7	186191348	2014-03-07 22:44:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-23	0	7167	43	14	2.11_r2263	0
8	186194445	2014-03-07 23:04:00	W4AC	EL86ux	M6NNB	IO91ue	14097098	30	-25	0	7167	43	14	2.11_r2263	0
9	186196906	2014-03-07 23:20:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-20	0	7167	43	14	2.11_r2263	0
10	186198184	2014-03-07 23:28:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-29	0	7167	43	14	2.11_r2263	0
11	186199981	2014-03-07 23:38:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-27	0	7167	43	14	2.11_r2263	0
12	186200850	2014-03-07 23:44:00	W4AC	EL86ux	M6NNB	IO91ue	14097096	30	-29	0	7167	43	14	2.11_r2263	0
13	186204017	2014-03-08 00:04:00	W4AC	EL86ux	M6NNB	IO91ue	14097096	30	-29	0	7167	43	14	2.11_r2263	0
								Mean	-24.3077						
								SD	3.2758						
								AD	4.6923						
								AD%	143						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186172262	2014-03-07 21:08:00	W4AC	EL86ux	M6NNB	IO91ue	14097096	30	-23	0	7167	43	14	2.11_r2263	0
2	186174535	2014-03-07 21:20:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-20	0	7167	43	14	2.11_r2263	0
3	186182691	2014-03-07 21:52:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-21	0	7167	43	14	2.11_r2263	0
4	186185088	2014-03-07 22:04:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-23	0	7167	43	14	2.11_r2263	0
5	186188041	2014-03-07 22:22:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-23	0	7167	43	14	2.11_r2263	0
6	186189982	2014-03-07 22:34:00	W4AC	EL86ux	M6NNB	IO91ue	14097098	30	-24	0	7167	43	14	2.11_r2263	0
7	186191348	2014-03-07 22:44:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-23	0	7167	43	14	2.11_r2263	0
8	186194445	2014-03-07 23:04:00	W4AC	EL86ux	M6NNB	IO91ue	14097098	30	-25	0	7167	43	14	2.11_r2263	0
9	186196906	2014-03-07 23:20:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-20	0	7167	43	14	2.11_r2263	0
10	186198184	2014-03-07 23:28:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-29	0	7167	43	14	2.11_r2263	0
11	186199981	2014-03-07 23:38:00	W4AC	EL86ux	M6NNB	IO91ue	14097097	30	-27	0	7167	43	14	2.11_r2263	0
12	186200850	2014-03-07 23:44:00	W4AC	EL86ux	M6NNB	IO91ue	14097096	30	-29	0	7167	43	14	2.11_r2263	0
13	186204017	2014-03-08 00:04:00	W4AC	EL86ux	M6NNB	IO91ue	14097096	30	-29	0	7167	43	14	2.11_r2263	0
								Mean	-24.3077						
								SD	3.2758						
								AD	4.6923						
								AD%	143						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	185675623	2014-03-06 01:06:00	W4AC	EL86ux	OE6PWD	JN77rb	14097085	30	-27	0	8396	44	14	4.0 r3015	0
2	185678357	2014-03-06 01:24:00	W4AC	EL86ux	OE6PWD	JN77rb	14097085	30	-24	0	8396	44	14	4.0 r3015	0
3	185679363	2014-03-06 01:32:00	W4AC	EL86ux	OE6PWD	JN77rb	14097086	30	-25	0	8396	44	14	4.0 r3015	0
4	185684819	2014-03-06 02:14:00	W4AC	EL86ux	OE6PWD	JN77rb	14097085	30	-22	0	8396	44	14	4.0 r3015	0
5	185919625	2014-03-06 23:34:00	W4AC	EL86ux	OE6PWD	JN77rb	14097085	30	-24	0	8396	44	14	4.0 r3015	0
6	185943331	2014-03-07 02:20:00	W4AC	EL86ux	OE6PWD	JN77rb	14097085	30	-23	0	8396	44	14	4.0 r3015	0
7	186196831	2014-03-07 23:20:00	W4AC	EL86ux	OE6PWD	JN77rb	14097085	30	-27	0	8396	44	14	4.0 r3015	0
8	186737973	2014-03-09 22:06:00	W4AC	EL86ux	OE6PWD	JN77rb	14097085	30	-27	0	8396	44	14	4.0 r3015	0
9	186752328	2014-03-09 23:16:00	W4AC	EL86ux	OE6PWD	JN77rb	14097085	30	-26	0	8396	44	14	4.0 r3015	0
								Mean	-25.0000						
								SD	1.8708						
								AD	2.0000						
								AD%	107						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186172154	2014-03-07 21:08:00	W4AC	EL86ux	ON4SAR	JO21ce	14097107	30	-19	0	7472	43	14	0.8_r3058	0
2	186174456	2014-03-07 21:20:00	W4AC	EL86ux	ON4SAR	JO21ce	14097107	30	-28	0	7472	43	14	0.8_r3058	0
3	186176534	2014-03-07 21:32:00	W4AC	EL86ux	ON4SAR	JO21ce	14097107	30	-21	0	7472	43	14	0.8_r3058	0
4	186182929	2014-03-07 21:52:00	W4AC	EL86ux	ON4SAR	JO21ce	14097107	30	-23	0	7472	43	14	0.8_r3058	0
5	186185121	2014-03-07 22:04:00	W4AC	EL86ux	ON4SAR	JO21ce	14097107	30	-23	0	7472	43	14	0.8_r3058	0
6	186186892	2014-03-07 22:14:00	W4AC	EL86ux	ON4SAR	JO21ce	14097107	30	-22	0	7472	43	14	0.8_r3058	0
7	186188126	2014-03-07 22:22:00	W4AC	EL86ux	ON4SAR	JO21ce	14097106	30	-20	0	7472	43	14	0.8_r3058	0
8	186191500	2014-03-07 22:44:00	W4AC	EL86ux	ON4SAR	JO21ce	14097107	30	-22	0	7472	43	14	0.8_r3058	0
9	186196985	2014-03-07 23:20:00	W4AC	EL86ux	ON4SAR	JO21ce	14097106	30	-18	0	7472	43	14	0.8_r3058	0
10	186199693	2014-03-07 23:38:00	W4AC	EL86ux	ON4SAR	JO21ce	14097106	30	-22	0	7472	43	14	0.8_r3058	0
11	186200895	2014-03-07 23:44:00	W4AC	EL86ux	ON4SAR	JO21ce	14097106	30	-20	0	7472	43	14	0.8_r3058	0
12	186204100	2014-03-08 00:04:00	W4AC	EL86ux	ON4SAR	JO21ce	14097105	30	-18	0	7472	43	14	0.8_r3058	0
									Mean	-21.3333					
									SD	2.7414					
									AD	-3.3333					
									AD%	-122					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186164728	2014-03-07 20:28:00	W4AC	EL86ux	ON4SAR	JO21ce	14097107	30	-27	0	7472	43	14	0.8_r3058	0
2	186166568	2014-03-07 20:38:00	W4AC	EL86ux	ON4SAR	JO21ce	14097107	30	-21	0	7472	43	14	0.8_r3058	0
3	186170428	2014-03-07 20:58:00	W4AC	EL86ux	ON4SAR	JO21ce	14097107	30	-23	0	7472	43	14	0.8_r3058	0
4	186172154	2014-03-07 21:08:00	W4AC	EL86ux	ON4SAR	JO21ce	14097107	30	-19	0	7472	43	14	0.8_r3058	0
5	186174456	2014-03-07 21:20:00	W4AC	EL86ux	ON4SAR	JO21ce	14097107	30	-28	0	7472	43	14	0.8_r3058	0
6	186176534	2014-03-07 21:32:00	W4AC	EL86ux	ON4SAR	JO21ce	14097107	30	-21	0	7472	43	14	0.8_r3058	0
7	186182929	2014-03-07 21:52:00	W4AC	EL86ux	ON4SAR	JO21ce	14097107	30	-23	0	7472	43	14	0.8_r3058	0
8	186185121	2014-03-07 22:04:00	W4AC	EL86ux	ON4SAR	JO21ce	14097107	30	-23	0	7472	43	14	0.8_r3058	0
9	186186892	2014-03-07 22:14:00	W4AC	EL86ux	ON4SAR	JO21ce	14097107	30	-22	0	7472	43	14	0.8_r3058	0
10	186188126	2014-03-07 22:22:00	W4AC	EL86ux	ON4SAR	JO21ce	14097106	30	-20	0	7472	43	14	0.8_r3058	0
11	186191500	2014-03-07 22:44:00	W4AC	EL86ux	ON4SAR	JO21ce	14097107	30	-22	0	7472	43	14	0.8_r3058	0
12	186196985	2014-03-07 23:20:00	W4AC	EL86ux	ON4SAR	JO21ce	14097106	30	-18	0	7472	43	14	0.8_r3058	0
13	186199693	2014-03-07 23:38:00	W4AC	EL86ux	ON4SAR	JO21ce	14097106	30	-22	0	7472	43	14	0.8_r3058	0
14	186200895	2014-03-07 23:44:00	W4AC	EL86ux	ON4SAR	JO21ce	14097106	30	-20	0	7472	43	14	0.8_r3058	0
15	186204100	2014-03-08 00:04:00	W4AC	EL86ux	ON4SAR	JO21ce	14097105	30	-18	0	7472	43	14	0.8_r3058	0
								Mean	-21.8000						
								SD	2.8586						
								AD	-3.8000						
								AD%	-133						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	185669892	2014-03-06 00:22:00	W4AC	EL86ux	ON7KB	JO21ei	14097054	30	-25	0	7478	43	14	0.8_r3058	0
2	185670648	2014-03-06 00:28:00	W4AC	EL86ux	ON7KB	JO21ei	14097053	30	-26	0	7478	43	14	0.8_r3058	0
3	185671934	2014-03-06 00:38:00	W4AC	EL86ux	ON7KB	JO21ei	14097053	30	-28	-1	7478	43	14	0.8_r3058	0
4	185674624	2014-03-06 00:58:00	W4AC	EL86ux	ON7KB	JO21ei	14097055	30	-28	0	7478	43	14	0.8_r3058	0
5	185893779	2014-03-06 21:12:00	W4AC	EL86ux	ON7KB	JO21ei	14097051	30	-27	0	7478	43	14	0.8_r3058	0
6	185908006	2014-03-06 22:24:00	W4AC	EL86ux	ON7KB	JO21ei	14097051	30	-25	0	7478	43	14	0.8_r3058	0
7	185919640	2014-03-06 23:34:00	W4AC	EL86ux	ON7KB	JO21ei	14097051	30	-22	0	7478	43	14	0.8_r3058	0
8	186176586	2014-03-07 21:32:00	W4AC	EL86ux	ON7KB	JO21ei	14097053	30	-25	-1	7478	43	14	0.8_r3058	0
9	186185013	2014-03-07 22:04:00	W4AC	EL86ux	ON7KB	JO21ei	14097052	30	-21	1	7478	43	14	0.8_r3058	0
10	186200853	2014-03-07 23:44:00	W4AC	EL86ux	ON7KB	JO21ei	14097050	30	-28	0	7478	43	14	0.8_r3058	0
11	186744550	2014-03-09 22:30:00	W4AC	EL86ux	ON7KB	JO21ei	14097052	30	-21	0	7478	43	14	0.8_r3058	0
12	186746804	2014-03-09 22:42:00	W4AC	EL86ux	ON7KB	JO21ei	14097052	30	-28	0	7478	43	14	0.8_r3058	0
13	186748969	2014-03-09 22:54:00	W4AC	EL86ux	ON7KB	JO21ei	14097052	30	-20	0	7478	43	14	0.8_r3058	0
14	186757942	2014-03-09 23:50:00	W4AC	EL86ux	ON7KB	JO21ei	14097051	30	-31	0	7478	43	14	0.8_r3058	0
15	186769011	2014-03-10 00:40:00	W4AC	EL86ux	ON7KB	JO21ei	14097051	30	-28	0	7478	43	14	0.8_r3058	0
								Mean	-25.5333						
								SD	3.2484						
								AD	2.4667						
								AD%	76						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186174637	2014-03-07 21:20:00	W4AC	EL86ux	PI4THT	JO32kf	14097084	30	-27	0	7617	41	14	0.6	0
2	186176750	2014-03-07 21:32:00	W4AC	EL86ux	PI4THT	JO32kf	14097084	30	-16	0	7617	41	14	0.6	0
3	186183002	2014-03-07 21:52:00	W4AC	EL86ux	PI4THT	JO32kf	14097083	30	-20	0	7617	41	14	0.6	0
4	186185201	2014-03-07 22:04:00	W4AC	EL86ux	PI4THT	JO32kf	14097084	30	-13	0	7617	41	14	0.6	0
5	186187032	2014-03-07 22:14:00	W4AC	EL86ux	PI4THT	JO32kf	14097083	30	-18	0	7617	41	14	0.6	0
6	186190177	2014-03-07 22:34:00	W4AC	EL86ux	PI4THT	JO32kf	14097084	30	-14	0	7617	41	14	0.6	0
7	186195864	2014-03-07 23:12:00	W4AC	EL86ux	PI4THT	JO32kf	14097082	30	-23	0	7617	41	14	0.6	0
8	186197067	2014-03-07 23:20:00	W4AC	EL86ux	PI4THT	JO32kf	14097082	30	-21	0	7617	41	14	0.6	0
9	186200053	2014-03-07 23:38:00	W4AC	EL86ux	PI4THT	JO32kf	14097082	30	-19	0	7617	41	14	0.6	0
10	186201050	2014-03-07 23:44:00	W4AC	EL86ux	PI4THT	JO32kf	14097082	30	-17	0	7617	41	14	0.6	0
11	186204435	2014-03-08 00:04:00	W4AC	EL86ux	PI4THT	JO32kf	14097083	30	-14	-2	7617	41	14	0.6	0
								Mean	-18.3636						
								SD	4.2491						
								AD	-4.3636						
								AD%	-103						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186170107	2014-03-07 20:58:00	W4AC	EL86ux	VE1AIM	FN84ds	14097090	30	-20	0	2579	35	14	2.0_r1714	0
2	186172324	2014-03-07 21:08:00	W4AC	EL86ux	VE1AIM	FN84ds	14097089	30	-15	0	2579	35	14	2.0_r1714	0
3	186174467	2014-03-07 21:20:00	W4AC	EL86ux	VE1AIM	FN84ds	14097089	30	-22	0	2579	35	14	2.0_r1714	0
4	186176442	2014-03-07 21:32:00	W4AC	EL86ux	VE1AIM	FN84ds	14097088	30	-23	0	2579	35	14	2.0_r1714	0
5	186191295	2014-03-07 22:44:00	W4AC	EL86ux	VE1AIM	FN84ds	14097085	30	-9	0	2579	35	14	2.0_r1714	0
6	186192905	2014-03-07 22:54:00	W4AC	EL86ux	VE1AIM	FN84ds	14097085	30	-20	0	2579	35	14	2.0_r1714	0
7	186194369	2014-03-07 23:04:00	W4AC	EL86ux	VE1AIM	FN84ds	14097085	30	-19	0	2579	35	14	2.0_r1714	0
8	186195579	2014-03-07 23:12:00	W4AC	EL86ux	VE1AIM	FN84ds	14097084	30	-14	0	2579	35	14	2.0_r1714	0
9	186196847	2014-03-07 23:20:00	W4AC	EL86ux	VE1AIM	FN84ds	14097083	30	-13	0	2579	35	14	2.0_r1714	0
10	186199694	2014-03-07 23:38:00	W4AC	EL86ux	VE1AIM	FN84ds	14097083	30	-19	0	2579	35	14	2.0_r1714	0
11	186200720	2014-03-07 23:44:00	W4AC	EL86ux	VE1AIM	FN84ds	14097082	30	-22	0	2579	35	14	2.0_r1714	0
12	186202867	2014-03-07 23:56:00	W4AC	EL86ux	VE1AIM	FN84ds	14097083	30	-26	0	2579	35	14	2.0_r1714	0
13	186204148	2014-03-08 00:04:00	W4AC	EL86ux	VE1AIM	FN84ds	14097082	30	-20	0	2579	35	14	2.0_r1714	0
								Mean	-18.6154						
								SD	4.6644						
								AD	7.3846						
								AD%	158						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186170467	2014-03-07 20:58:00	W4AC	EL86ux	W3GXT	FM19ol	14097077	30	-2	0	1480	19	14	2.0_r1714	0
2	186174532	2014-03-07 21:20:00	W4AC	EL86ux	W3GXT	FM19ol	14097077	30	-4	0	1480	19	14	2.0_r1714	0
3	186176538	2014-03-07 21:32:00	W4AC	EL86ux	W3GXT	FM19ol	14097077	30	0	0	1480	19	14	2.0_r1714	0
4	186192932	2014-03-07 22:54:00	W4AC	EL86ux	W3GXT	FM19ol	14097077	30	-1	0	1480	19	14	2.0_r1714	0
5	186194425	2014-03-07 23:04:00	W4AC	EL86ux	W3GXT	FM19ol	14097077	30	0	0	1480	19	14	2.0_r1714	0
6	186195628	2014-03-07 23:12:00	W4AC	EL86ux	W3GXT	FM19ol	14097076	30	2	0	1480	19	14	2.0_r1714	0
7	186197040	2014-03-07 23:20:00	W4AC	EL86ux	W3GXT	FM19ol	14097076	30	1	0	1480	19	14	2.0_r1714	0
8	186199769	2014-03-07 23:38:00	W4AC	EL86ux	W3GXT	FM19ol	14097076	30	-7	0	1480	19	14	2.0_r1714	0
9	186202997	2014-03-07 23:56:00	W4AC	EL86ux	W3GXT	FM19ol	14097076	30	3	0	1480	19	14	2.0_r1714	0
10	186204009	2014-03-08 00:04:00	W4AC	EL86ux	W3GXT	FM19ol	14097076	30	-3	0	1480	19	14	2.0_r1714	0
								Mean	-1.1000						
								SD	2.9981						
								AD	5.9000						
								AD%	197						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	185667967	2014-03-06 00:10:00	W4AC	EL86ux	WA3DNM	FM29	14097078	30	-2	0	1543	24	14	2.11_r2263	0
2	185672087	2014-03-06 00:38:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-1	0	1543	24	14	2.11_r2263	0
3	185678428	2014-03-06 01:24:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-1	0	1543	24	14	2.11_r2263	0
4	185679405	2014-03-06 01:32:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-3	0	1543	24	14	2.11_r2263	0
5	185682221	2014-03-06 01:54:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	3	0	1543	24	14	2.11_r2263	0
6	185888572	2014-03-06 20:42:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-3	0	1543	24	14	2.11_r2263	0
7	185895312	2014-03-06 21:20:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-2	0	1543	24	14	2.11_r2263	0
8	185899962	2014-03-06 21:48:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-5	0	1543	24	14	2.11_r2263	0
9	185906502	2014-03-06 22:14:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	2	0	1543	24	14	2.11_r2263	0
10	185907963	2014-03-06 22:24:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-9	0	1543	24	14	2.11_r2263	0
11	185909926	2014-03-06 22:36:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-2	0	1543	24	14	2.11_r2263	0
12	185911737	2014-03-06 22:46:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-8	0	1543	24	14	2.11_r2263	0
13	185913683	2014-03-06 22:58:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-2	0	1543	24	14	2.11_r2263	0
14	185915213	2014-03-06 23:08:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-4	0	1543	24	14	2.11_r2263	0
15	185919695	2014-03-06 23:34:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	2	0	1543	24	14	2.11_r2263	0
16	185921458	2014-03-06 23:46:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	0	0	1543	24	14	2.11_r2263	0
17	185924506	2014-03-07 00:06:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-1	0	1543	24	14	2.11_r2263	0
18	185927997	2014-03-07 00:28:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	0	0	1543	24	14	2.11_r2263	0
19	185930708	2014-03-07 00:46:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	4	0	1543	24	14	2.11_r2263	0
20	185932249	2014-03-07 00:58:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-2	0	1543	24	14	2.11_r2263	0
21	185934933	2014-03-07 01:16:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	2	0	1543	24	14	2.11_r2263	0
22	185936230	2014-03-07 01:26:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-1	0	1543	24	14	2.11_r2263	0
23	185937729	2014-03-07 01:38:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	1	0	1543	24	14	2.11_r2263	0
24	185938686	2014-03-07 01:46:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-2	0	1543	24	14	2.11_r2263	0
25	185940382	2014-03-07 01:58:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	3	0	1543	24	14	2.11_r2263	0
26	185941611	2014-03-07 02:08:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	0	0	1543	24	14	2.11_r2263	0
27	185943178	2014-03-07 02:20:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	2	0	1543	24	14	2.11_r2263	0
28	185944175	2014-03-07 02:28:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	2	0	1543	24	14	2.11_r2263	0
29	185945320	2014-03-07 02:36:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	2	0	1543	24	14	2.11_r2263	0
30	186196988	2014-03-07 23:20:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-3	0	1543	24	14	2.11_r2263	0
31	186199912	2014-03-07 23:38:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-8	0	1543	24	14	2.11_r2263	0
32	186202834	2014-03-07 23:56:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-1	0	1543	24	14	2.11_r2263	0
33	186204096	2014-03-08 00:04:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-6	0	1543	24	14	2.11_r2263	0
34	186459246	2014-03-08 21:30:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-8	0	1543	24	14	2.11_r2263	0
35	186487324	2014-03-09 00:10:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-3	0	1543	24	14	2.11_r2263	0
36	186488943	2014-03-09 00:20:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-4	0	1543	24	14	2.11_r2263	0
37	186491236	2014-03-09 00:32:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-4	0	1543	24	14	2.11_r2263	0
38	186497744	2014-03-09 01:10:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-3	0	1543	24	14	2.11_r2263	0
39	186498986	2014-03-09 01:18:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	0	0	1543	24	14	2.11_r2263	0
40	186721151	2014-03-09 20:38:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-15	0	1543	24	14	2.11_r2263	0
41	186723854	2014-03-09 20:50:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-7	0	1543	24	14	2.11_r2263	0
42	186725895	2014-03-09 21:00:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-5	0	1543	24	14	2.11_r2263	0
43	186727846	2014-03-09 21:10:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-6	0	1543	24	14	2.11_r2263	0
44	186731199	2014-03-09 21:28:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-6	0	1543	24	14	2.11_r2263	0
45	186738189	2014-03-09 22:06:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-4	0	1543	24	14	2.11_r2263	0
46	186740224	2014-03-09 22:18:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-6	0	1543	24	14	2.11_r2263	0
47	186750414	2014-03-09 23:04:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-1	0	1543	24	14	2.11_r2263	0
48	186752461	2014-03-09 23:16:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-3	0	1543	24	14	2.11_r2263	0
49	186754395	2014-03-09 23:28:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	2	0	1543	24	14	2.11_r2263	0
50	186757967	2014-03-09 23:50:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-1	0	1543	24	14	2.11_r2263	0
51	186759173	2014-03-09 23:58:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	0	0	1543	24	14	2.11_r2263	0
52	186764701	2014-03-10 00:10:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-2	0	1543	24	14	2.11_r2263	0
53	186765716	2014-03-10 00:18:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	3	0	1543	24	14	2.11_r2263	0
54	186768992	2014-03-10 00:40:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	0	0	1543	24	14	2.11_r2263	0
55	186770578	2014-03-10 00:50:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	0	0	1543	24	14	2.11_r2263	0
56	186772349	2014-03-10 01:02:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-2	0	1543	24	14	2.11_r2263	0
57	186775046	2014-03-10 01:20:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	-1	0	1543	24	14	2.11_r2263	0
58	186776683	2014-03-10 01:32:00	W4AC	EL86ux	WA3DNM	FM29	14097077	30	2	0	1543	24	14	2.11_r2263	0
									Mean	-2.0172					
									SD	3.6006					
									AD	5.9828					
									AD%	166					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186174662	2014-03-07 21:22:00	W4MO	EL87tc	2E0DSS	IO82xl	14097194	33	-10	1	7017	42	14	2.0_r1714	0
2	186176244	2014-03-07 21:30:00	W4MO	EL87tc	2E0DSS	IO82xl	14097195	33	-8	1	7017	42	14	2.0_r1714	0
3	186178647	2014-03-07 21:44:00	W4MO	EL87tc	2E0DSS	IO82xl	14097074	33	-11	-1	7017	42	14	2.0_r1714	0
4	186184008	2014-03-07 21:58:00	W4MO	EL87tc	2E0DSS	IO82xl	14097071	33	-11	-1	7017	42	14	2.0_r1714	0
5	186188013	2014-03-07 22:22:00	W4MO	EL87tc	2E0DSS	IO82xl	14097063	33	-14	0	7017	42	14	2.0_r1714	0
6	186192759	2014-03-07 22:52:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-11	1	7017	42	14	2.0_r1714	0
7	186193992	2014-03-07 23:00:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-16	0	7017	42	14	2.0_r1714	0
8	186197366	2014-03-07 23:22:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-10	1	7017	42	14	2.0_r1714	0
9	186198844	2014-03-07 23:32:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-13	1	7017	42	14	2.0_r1714	0
10	186201926	2014-03-07 23:50:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-15	1	7017	42	14	2.0_r1714	0
11	186203313	2014-03-07 23:58:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-23	1	7017	42	14	2.0_r1714	0
12	186206796	2014-03-08 00:20:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-5	0	7017	42	14	2.0_r1714	0
13	186207814	2014-03-08 00:28:00	W4MO	EL87tc	2E0DSS	IO82xl	14097059	33	-6	1	7017	42	14	2.0_r1714	0
14	186210739	2014-03-08 00:48:00	W4MO	EL87tc	2E0DSS	IO82xl	14097059	33	-17	1	7017	42	14	2.0_r1714	0
15	186211862	2014-03-08 00:56:00	W4MO	EL87tc	2E0DSS	IO82xl	14097058	33	-20	1	7017	42	14	2.0_r1714	0
16	186214490	2014-03-08 01:14:00	W4MO	EL87tc	2E0DSS	IO82xl	14097058	33	-24	1	7017	42	14	2.0_r1714	0
17	186215744	2014-03-08 01:24:00	W4MO	EL87tc	2E0DSS	IO82xl	14097058	33	-22	1	7017	42	14	2.0_r1714	0
18	186218721	2014-03-08 01:46:00	W4MO	EL87tc	2E0DSS	IO82xl	14097058	33	-12	1	7017	42	14	2.0_r1714	0
19	186219849	2014-03-08 01:54:00	W4MO	EL87tc	2E0DSS	IO82xl	14097058	33	-14	1	7017	42	14	2.0_r1714	0
20	186220929	2014-03-08 02:02:00	W4MO	EL87tc	2E0DSS	IO82xl	14097058	33	-21	1	7017	42	14	2.0_r1714	0
									Mean	-14.1500					
									SD	5.5656					
									AD	-9.1500					
									AD%	-164					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186176244	2014-03-07 21:30:00	W4MO	EL87tc	2E0DSS	IO82xl	14097195	33	-8	1	7017	42	14	2.0_r1714	0
2	186178647	2014-03-07 21:44:00	W4MO	EL87tc	2E0DSS	IO82xl	14097074	33	-11	-1	7017	42	14	2.0_r1714	0
3	186184008	2014-03-07 21:58:00	W4MO	EL87tc	2E0DSS	IO82xl	14097071	33	-11	-1	7017	42	14	2.0_r1714	0
4	186188013	2014-03-07 22:22:00	W4MO	EL87tc	2E0DSS	IO82xl	14097063	33	-14	0	7017	42	14	2.0_r1714	0
5	186192759	2014-03-07 22:52:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-11	1	7017	42	14	2.0_r1714	0
6	186193992	2014-03-07 23:00:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-16	0	7017	42	14	2.0_r1714	0
7	186197366	2014-03-07 23:22:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-10	1	7017	42	14	2.0_r1714	0
8	186198844	2014-03-07 23:32:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-13	1	7017	42	14	2.0_r1714	0
9	186201926	2014-03-07 23:50:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-15	1	7017	42	14	2.0_r1714	0
10	186203313	2014-03-07 23:58:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-23	1	7017	42	14	2.0_r1714	0
11	186206796	2014-03-08 00:20:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-5	0	7017	42	14	2.0_r1714	0
12	186207814	2014-03-08 00:28:00	W4MO	EL87tc	2E0DSS	IO82xl	14097059	33	-6	1	7017	42	14	2.0_r1714	0
13	186210739	2014-03-08 00:48:00	W4MO	EL87tc	2E0DSS	IO82xl	14097059	33	-17	1	7017	42	14	2.0_r1714	0
14	186211862	2014-03-08 00:56:00	W4MO	EL87tc	2E0DSS	IO82xl	14097058	33	-20	1	7017	42	14	2.0_r1714	0
15	186214490	2014-03-08 01:14:00	W4MO	EL87tc	2E0DSS	IO82xl	14097058	33	-24	1	7017	42	14	2.0_r1714	0
16	186215744	2014-03-08 01:24:00	W4MO	EL87tc	2E0DSS	IO82xl	14097058	33	-22	1	7017	42	14	2.0_r1714	0
17	186218721	2014-03-08 01:46:00	W4MO	EL87tc	2E0DSS	IO82xl	14097058	33	-12	1	7017	42	14	2.0_r1714	0
18	186219849	2014-03-08 01:54:00	W4MO	EL87tc	2E0DSS	IO82xl	14097058	33	-14	1	7017	42	14	2.0_r1714	0
19	186220929	2014-03-08 02:02:00	W4MO	EL87tc	2E0DSS	IO82xl	14097058	33	-21	1	7017	42	14	2.0_r1714	0
									Mean	-14.3684					
									SD	5.6294					
									AD	-8.3684					
									AD%	-149					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186164708	2014-03-07 20:28:00	W4MO	EL87tc	2E0DSS	IO82xl	14097194	33	-14	1	7017	42	14	2.0_r1714	0
2	186167081	2014-03-07 20:40:00	W4MO	EL87tc	2E0DSS	IO82xl	14097192	33	-15	1	7017	42	14	2.0_r1714	0
3	186169177	2014-03-07 20:52:00	W4MO	EL87tc	2E0DSS	IO82xl	14097192	33	-17	1	7017	42	14	2.0_r1714	0
4	186171251	2014-03-07 21:02:00	W4MO	EL87tc	2E0DSS	IO82xl	14097192	33	-14	1	7017	42	14	2.0_r1714	0
5	186172558	2014-03-07 21:10:00	W4MO	EL87tc	2E0DSS	IO82xl	14097196	33	-11	1	7017	42	14	2.0_r1714	0
6	186174662	2014-03-07 21:22:00	W4MO	EL87tc	2E0DSS	IO82xl	14097194	33	-10	1	7017	42	14	2.0_r1714	0
7	186176244	2014-03-07 21:30:00	W4MO	EL87tc	2E0DSS	IO82xl	14097195	33	-8	1	7017	42	14	2.0_r1714	0
8	186178647	2014-03-07 21:44:00	W4MO	EL87tc	2E0DSS	IO82xl	14097074	33	-11	-1	7017	42	14	2.0_r1714	0
9	186184008	2014-03-07 21:58:00	W4MO	EL87tc	2E0DSS	IO82xl	14097071	33	-11	-1	7017	42	14	2.0_r1714	0
10	186188013	2014-03-07 22:22:00	W4MO	EL87tc	2E0DSS	IO82xl	14097063	33	-14	0	7017	42	14	2.0_r1714	0
11	186192759	2014-03-07 22:52:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-11	1	7017	42	14	2.0_r1714	0
12	186193992	2014-03-07 23:00:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-16	0	7017	42	14	2.0_r1714	0
13	186197366	2014-03-07 23:22:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-10	1	7017	42	14	2.0_r1714	0
14	186198844	2014-03-07 23:32:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-13	1	7017	42	14	2.0_r1714	0
15	186201926	2014-03-07 23:50:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-15	1	7017	42	14	2.0_r1714	0
16	186203313	2014-03-07 23:58:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-23	1	7017	42	14	2.0_r1714	0
17	186206796	2014-03-08 00:20:00	W4MO	EL87tc	2E0DSS	IO82xl	14097060	33	-5	0	7017	42	14	2.0_r1714	0
18	186207814	2014-03-08 00:28:00	W4MO	EL87tc	2E0DSS	IO82xl	14097059	33	-6	1	7017	42	14	2.0_r1714	0
19	186210739	2014-03-08 00:48:00	W4MO	EL87tc	2E0DSS	IO82xl	14097059	33	-17	1	7017	42	14	2.0_r1714	0
20	186211862	2014-03-08 00:56:00	W4MO	EL87tc	2E0DSS	IO82xl	14097058	33	-20	1	7017	42	14	2.0_r1714	0
21	186214490	2014-03-08 01:14:00	W4MO	EL87tc	2E0DSS	IO82xl	14097058	33	-24	1	7017	42	14	2.0_r1714	0
22	186215744	2014-03-08 01:24:00	W4MO	EL87tc	2E0DSS	IO82xl	14097058	33	-22	1	7017	42	14	2.0_r1714	0
23	186218721	2014-03-08 01:46:00	W4MO	EL87tc	2E0DSS	IO82xl	14097058	33	-12	1	7017	42	14	2.0_r1714	0
24	186219849	2014-03-08 01:54:00	W4MO	EL87tc	2E0DSS	IO82xl	14097058	33	-14	1	7017	42	14	2.0_r1714	0
25	186220929	2014-03-08 02:02:00	W4MO	EL87tc	2E0DSS	IO82xl	14097058	33	-21	1	7017	42	14	2.0_r1714	0
								Mean	-14.1600						
								SD	5.0306						
								AD	-4.1600						
								AD%	-83						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186169280	2014-03-07 20:52:00	W4MO	EL87tc	DG7RJ	JN58th	14097194	33	-24	1	8073	44	14	2.11_r2263	0
2	186171243	2014-03-07 21:02:00	W4MO	EL87tc	DG7RJ	JN58th	14097194	33	-25	1	8073	44	14	2.11_r2263	0
3	186176293	2014-03-07 21:30:00	W4MO	EL87tc	DG7RJ	JN58th	14097196	33	-22	0	8073	44	14	2.11_r2263	0
4	186178837	2014-03-07 21:44:00	W4MO	EL87tc	DG7RJ	JN58th	14097074	33	-21	-1	8073	44	14	2.11_r2263	0
5	186183967	2014-03-07 21:58:00	W4MO	EL87tc	DG7RJ	JN58th	14097071	33	-21	-1	8073	44	14	2.11_r2263	0
6	186186105	2014-03-07 22:10:00	W4MO	EL87tc	DG7RJ	JN58th	14097066	33	-18	-1	8073	44	14	2.11_r2263	0
7	186189517	2014-03-07 22:30:00	W4MO	EL87tc	DG7RJ	JN58th	14097062	33	-25	0	8073	44	14	2.11_r2263	0
8	186190819	2014-03-07 22:40:00	W4MO	EL87tc	DG7RJ	JN58th	14097060	33	-20	1	8073	44	14	2.11_r2263	0
9	186193891	2014-03-07 23:00:00	W4MO	EL87tc	DG7RJ	JN58th	14097060	33	-19	1	8073	44	14	2.11_r2263	0
10	186197134	2014-03-07 23:22:00	W4MO	EL87tc	DG7RJ	JN58th	14097060	33	-21	0	8073	44	14	2.11_r2263	0
11	186201759	2014-03-07 23:50:00	W4MO	EL87tc	DG7RJ	JN58th	14097060	33	-14	1	8073	44	14	2.11_r2263	0
12	186203351	2014-03-07 23:58:00	W4MO	EL87tc	DG7RJ	JN58th	14097059	33	-24	1	8073	44	14	2.11_r2263	0
13	186208047	2014-03-08 00:28:00	W4MO	EL87tc	DG7RJ	JN58th	14097060	33	-20	0	8073	44	14	2.11_r2263	0
14	186212039	2014-03-08 00:56:00	W4MO	EL87tc	DG7RJ	JN58th	14097060	33	-25	1	8073	44	14	2.11_r2263	0
15	186219854	2014-03-08 01:54:00	W4MO	EL87tc	DG7RJ	JN58th	14097060	33	-19	1	8073	44	14	2.11_r2263	0
16	186223741	2014-03-08 02:22:00	W4MO	EL87tc	DG7RJ	JN58th	14097060	33	-15	1	8073	44	14	2.11_r2263	0
								Mean	-20.8125						
								SD	3.3708						
								AD	-6.8125						
								AD%	-202						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186176278	2014-03-07 21:30:00	W4MO	EL87tc	DK6UG	JN49cm	14097194	33	-3	1	7793	44	14	2.21_r2286	0
2	186178675	2014-03-07 21:44:00	W4MO	EL87tc	DK6UG	JN49cm	14097073	33	-1	-1	7793	44	14	2.21_r2286	0
3	186183668	2014-03-07 21:58:00	W4MO	EL87tc	DK6UG	JN49cm	14097069	33	-4	-1	7793	44	14	2.21_r2286	0
4	186186219	2014-03-07 22:10:00	W4MO	EL87tc	DK6UG	JN49cm	14097064	33	-3	-1	7793	44	14	2.21_r2286	0
5	186188182	2014-03-07 22:22:00	W4MO	EL87tc	DK6UG	JN49cm	14097062	33	-1	0	7793	44	14	2.21_r2286	0
6	186189396	2014-03-07 22:30:00	W4MO	EL87tc	DK6UG	JN49cm	14097060	33	-6	0	7793	44	14	2.21_r2286	0
7	186190949	2014-03-07 22:40:00	W4MO	EL87tc	DK6UG	JN49cm	14097059	33	-5	1	7793	44	14	2.21_r2286	0
8	186192602	2014-03-07 22:52:00	W4MO	EL87tc	DK6UG	JN49cm	14097059	33	-5	0	7793	44	14	2.21_r2286	0
9	186193824	2014-03-07 23:00:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	-4	1	7793	44	14	2.21_r2286	0
10	186197105	2014-03-07 23:22:00	W4MO	EL87tc	DK6UG	JN49cm	14097059	33	0	1	7793	44	14	2.21_r2286	0
11	186198889	2014-03-07 23:32:00	W4MO	EL87tc	DK6UG	JN49cm	14097059	33	3	1	7793	44	14	2.21_r2286	0
12	186201850	2014-03-07 23:50:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	-6	1	7793	44	14	2.21_r2286	0
13	186203135	2014-03-07 23:58:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	-2	0	7793	44	14	2.21_r2286	0
14	186204983	2014-03-08 00:10:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	-5	1	7793	44	14	2.21_r2286	0
15	186207924	2014-03-08 00:28:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	1	1	7793	44	14	2.21_r2286	0
16	186210829	2014-03-08 00:48:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	-9	1	7793	44	14	2.21_r2286	0
17	186211785	2014-03-08 00:56:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	-3	1	7793	44	14	2.21_r2286	0
18	186213337	2014-03-08 01:06:00	W4MO	EL87tc	DK6UG	JN49cm	14097057	33	-3	1	7793	44	14	2.21_r2286	0
19	186214441	2014-03-08 01:14:00	W4MO	EL87tc	DK6UG	JN49cm	14097057	33	-3	1	7793	44	14	2.21_r2286	0
20	186215799	2014-03-08 01:24:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	-1	1	7793	44	14	2.21_r2286	0
21	186218728	2014-03-08 01:46:00	W4MO	EL87tc	DK6UG	JN49cm	14097059	33	-10	1	7793	44	14	2.21_r2286	0
22	186219898	2014-03-08 01:54:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	-14	1	7793	44	14	2.21_r2286	0
23	186220902	2014-03-08 02:02:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	-21	1	7793	44	14	2.21_r2286	0
24	186223578	2014-03-08 02:22:00	W4MO	EL87tc	DK6UG	JN49cm	14097059	33	2	1	7793	44	14	2.21_r2286	0
								Mean	-4.2917						
								SD	5.1960						
								AD	-5.2917						
								AD%	-102						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186164669	2014-03-07 20:28:00	W4MO	EL87tc	DK6UG	JN49cm	14097196	33	-7	1	7793	44	14	2.21_r2286	0
2	186166828	2014-03-07 20:40:00	W4MO	EL87tc	DK6UG	JN49cm	14097193	33	-7	1	7793	44	14	2.21_r2286	0
3	186169324	2014-03-07 20:52:00	W4MO	EL87tc	DK6UG	JN49cm	14097193	33	5	1	7793	44	14	2.21_r2286	0
4	186171030	2014-03-07 21:02:00	W4MO	EL87tc	DK6UG	JN49cm	14097194	33	-5	1	7793	44	14	2.21_r2286	0
5	186172574	2014-03-07 21:10:00	W4MO	EL87tc	DK6UG	JN49cm	14097196	33	-2	1	7793	44	14	2.21_r2286	0
6	186174694	2014-03-07 21:22:00	W4MO	EL87tc	DK6UG	JN49cm	14097194	33	-7	1	7793	44	14	2.21_r2286	0
7	186176278	2014-03-07 21:30:00	W4MO	EL87tc	DK6UG	JN49cm	14097194	33	-3	1	7793	44	14	2.21_r2286	0
8	186178675	2014-03-07 21:44:00	W4MO	EL87tc	DK6UG	JN49cm	14097073	33	-1	-1	7793	44	14	2.21_r2286	0
9	186183668	2014-03-07 21:58:00	W4MO	EL87tc	DK6UG	JN49cm	14097069	33	-4	-1	7793	44	14	2.21_r2286	0
10	186186219	2014-03-07 22:10:00	W4MO	EL87tc	DK6UG	JN49cm	14097064	33	-3	-1	7793	44	14	2.21_r2286	0
11	186188182	2014-03-07 22:22:00	W4MO	EL87tc	DK6UG	JN49cm	14097062	33	-1	0	7793	44	14	2.21_r2286	0
12	186189396	2014-03-07 22:30:00	W4MO	EL87tc	DK6UG	JN49cm	14097060	33	-6	0	7793	44	14	2.21_r2286	0
13	186190949	2014-03-07 22:40:00	W4MO	EL87tc	DK6UG	JN49cm	14097059	33	-5	1	7793	44	14	2.21_r2286	0
14	186192602	2014-03-07 22:52:00	W4MO	EL87tc	DK6UG	JN49cm	14097059	33	-5	0	7793	44	14	2.21_r2286	0
15	186193824	2014-03-07 23:00:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	-4	1	7793	44	14	2.21_r2286	0
16	186197105	2014-03-07 23:22:00	W4MO	EL87tc	DK6UG	JN49cm	14097059	33	0	1	7793	44	14	2.21_r2286	0
17	186198889	2014-03-07 23:32:00	W4MO	EL87tc	DK6UG	JN49cm	14097059	33	3	1	7793	44	14	2.21_r2286	0
18	186201850	2014-03-07 23:50:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	-6	1	7793	44	14	2.21_r2286	0
19	186203135	2014-03-07 23:58:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	-2	0	7793	44	14	2.21_r2286	0
20	186204983	2014-03-08 00:10:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	-5	1	7793	44	14	2.21_r2286	0
21	186207924	2014-03-08 00:28:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	1	1	7793	44	14	2.21_r2286	0
22	186210829	2014-03-08 00:48:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	-9	1	7793	44	14	2.21_r2286	0
23	186211785	2014-03-08 00:56:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	-3	1	7793	44	14	2.21_r2286	0
24	186213337	2014-03-08 01:06:00	W4MO	EL87tc	DK6UG	JN49cm	14097057	33	-3	1	7793	44	14	2.21_r2286	0
25	186214441	2014-03-08 01:14:00	W4MO	EL87tc	DK6UG	JN49cm	14097057	33	-3	1	7793	44	14	2.21_r2286	0
26	186215799	2014-03-08 01:24:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	-1	1	7793	44	14	2.21_r2286	0
27	186218728	2014-03-08 01:46:00	W4MO	EL87tc	DK6UG	JN49cm	14097059	33	-10	1	7793	44	14	2.21_r2286	0
28	186219898	2014-03-08 01:54:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	-14	1	7793	44	14	2.21_r2286	0
29	186220902	2014-03-08 02:02:00	W4MO	EL87tc	DK6UG	JN49cm	14097058	33	-21	1	7793	44	14	2.21_r2286	0
30	186223578	2014-03-08 02:22:00	W4MO	EL87tc	DK6UG	JN49cm	14097059	33	2	1	7793	44	14	2.21_r2286	0
								Mean	-4.2000						
								SD	5.0337						
								AD	-4.2000						
								AD%	-83						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186178571	2014-03-07 21:44:00	W4MO	EL87tc	K4RCG	FM08xl	14097084	33	-1	-1	1328	17	14	2.21_r2286	0
2	186190818	2014-03-07 22:40:00	W4MO	EL87tc	K4RCG	FM08xl	14097070	33	-5	1	1328	17	14	2.21_r2286	0
3	186192582	2014-03-07 22:52:00	W4MO	EL87tc	K4RCG	FM08xl	14097071	33	5	1	1328	17	14	2.21_r2286	0
4	186193954	2014-03-07 23:00:00	W4MO	EL87tc	K4RCG	FM08xl	14097070	33	-4	0	1328	17	14	2.21_r2286	0
5	186197228	2014-03-07 23:22:00	W4MO	EL87tc	K4RCG	FM08xl	14097071	33	-23	1	1328	17	14	2.21_r2286	0
6	186198983	2014-03-07 23:32:00	W4MO	EL87tc	K4RCG	FM08xl	14097071	33	-10	1	1328	17	14	2.21_r2286	0
7	186201847	2014-03-07 23:50:00	W4MO	EL87tc	K4RCG	FM08xl	14097071	33	-7	1	1328	17	14	2.21_r2286	0
8	186203107	2014-03-07 23:58:00	W4MO	EL87tc	K4RCG	FM08xl	14097071	33	-21	1	1328	17	14	2.21_r2286	0
9	186205145	2014-03-08 00:10:00	W4MO	EL87tc	K4RCG	FM08xl	14097071	33	-7	1	1328	17	14	2.21_r2286	0
10	186206756	2014-03-08 00:20:00	W4MO	EL87tc	K4RCG	FM08xl	14097071	33	-4	1	1328	17	14	2.21_r2286	0
11	186207801	2014-03-08 00:28:00	W4MO	EL87tc	K4RCG	FM08xl	14097070	33	-6	1	1328	17	14	2.21_r2286	0
								Mean	-7.5455						
								SD	8.1285						
								AD	-6.5455						
								AD%	-81						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186154174	2014-03-07 19:32:00	W4MO	EL87tc	KC3AVT	FM19la	14097197	33	-15	0	1414	19	14	0.9_r3827	0
2	186159940	2014-03-07 20:02:00	W4MO	EL87tc	KC3AVT	FM19la	14097198	33	-11	1	1414	19	14	0.9_r3827	0
3	186161647	2014-03-07 20:12:00	W4MO	EL87tc	KC3AVT	FM19la	14097199	33	-7	1	1414	19	14	0.9_r3827	0
4	186166984	2014-03-07 20:40:00	W4MO	EL87tc	KC3AVT	FM19la	14097198	33	-5	1	1414	19	14	0.9_r3827	0
5	186169344	2014-03-07 20:52:00	W4MO	EL87tc	KC3AVT	FM19la	14097197	33	-3	1	1414	19	14	0.9_r3827	0
6	186171185	2014-03-07 21:02:00	W4MO	EL87tc	KC3AVT	FM19la	14097198	33	-13	1	1414	19	14	0.9_r3827	0
7	186172714	2014-03-07 21:10:00	W4MO	EL87tc	KC3AVT	FM19la	14097200	33	-10	1	1414	19	14	0.9_r3827	0
8	186176326	2014-03-07 21:30:00	W4MO	EL87tc	KC3AVT	FM19la	14097200	33	-10	1	1414	19	14	0.9_r3827	0
9	186186125	2014-03-07 22:10:00	W4MO	EL87tc	KC3AVT	FM19la	14097069	33	-8	-1	1414	19	14	0.9_r3827	0
10	186188216	2014-03-07 22:22:00	W4MO	EL87tc	KC3AVT	FM19la	14097066	33	-1	0	1414	19	14	0.9_r3827	0
11	186189583	2014-03-07 22:30:00	W4MO	EL87tc	KC3AVT	FM19la	14097064	33	-9	0	1414	19	14	0.9_r3827	0
								Mean	-8.3636						
								SD	4.1779						
								AD	-7.3636						
								AD%	-176						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186178649	2014-03-07 21:44:00	W4MO	EL87tc	M5ADA	IO93kl	14097085	33	-15	-1	7057	41	14	3.0.1_r255	0
2	186183863	2014-03-07 21:58:00	W4MO	EL87tc	M5ADA	IO93kl	14097082	33	-14	-1	7057	41	14	3.0.1_r255	0
3	186188066	2014-03-07 22:22:00	W4MO	EL87tc	M5ADA	IO93kl	14097075	33	-19	0	7057	41	14	3.0.1_r255	0
4	186190893	2014-03-07 22:40:00	W4MO	EL87tc	M5ADA	IO93kl	14097072	33	-22	0	7057	41	14	3.0.1_r255	0
5	186192671	2014-03-07 22:52:00	W4MO	EL87tc	M5ADA	IO93kl	14097072	33	-23	1	7057	41	14	3.0.1_r255	0
6	186197239	2014-03-07 23:22:00	W4MO	EL87tc	M5ADA	IO93kl	14097072	33	-15	1	7057	41	14	3.0.1_r255	0
7	186198944	2014-03-07 23:32:00	W4MO	EL87tc	M5ADA	IO93kl	14097071	33	-19	1	7057	41	14	3.0.1_r255	0
8	186203079	2014-03-07 23:58:00	W4MO	EL87tc	M5ADA	IO93kl	14097071	33	-23	1	7057	41	14	3.0.1_r255	0
9	186211930	2014-03-08 00:56:00	W4MO	EL87tc	M5ADA	IO93kl	14097071	33	-23	1	7057	41	14	3.0.1_r255	0
10	186218693	2014-03-08 01:46:00	W4MO	EL87tc	M5ADA	IO93kl	14097072	33	-22	0	7057	41	14	3.0.1_r255	0
11	186219815	2014-03-08 01:54:00	W4MO	EL87tc	M5ADA	IO93kl	14097072	33	-22	1	7057	41	14	3.0.1_r255	0
12	186221059	2014-03-08 02:02:00	W4MO	EL87tc	M5ADA	IO93kl	14097072	33	-12	1	7057	41	14	3.0.1_r255	0
13	186223642	2014-03-08 02:22:00	W4MO	EL87tc	M5ADA	IO93kl	14097072	33	-20	1	7057	41	14	3.0.1_r255	0
								Mean	-19.1538						
								SD	3.8911						
								AD	-4.1538						
								AD%	-107						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186183734	2014-03-07 21:58:00	W4MO	EL87tc	M6NNB	IO91ue	14097090	33	-11	-1	7163	43	14	2.11_r2263	0
2	186186133	2014-03-07 22:10:00	W4MO	EL87tc	M6NNB	IO91ue	14097085	33	-14	-1	7163	43	14	2.11_r2263	0
3	186188039	2014-03-07 22:22:00	W4MO	EL87tc	M6NNB	IO91ue	14097082	33	-18	0	7163	43	14	2.11_r2263	0
4	186189559	2014-03-07 22:30:00	W4MO	EL87tc	M6NNB	IO91ue	14097081	33	-17	0	7163	43	14	2.11_r2263	0
5	186190883	2014-03-07 22:40:00	W4MO	EL87tc	M6NNB	IO91ue	14097080	33	-20	1	7163	43	14	2.11_r2263	0
6	186192566	2014-03-07 22:52:00	W4MO	EL87tc	M6NNB	IO91ue	14097080	33	-22	1	7163	43	14	2.11_r2263	0
7	186197149	2014-03-07 23:22:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-16	0	7163	43	14	2.11_r2263	0
8	186198847	2014-03-07 23:32:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-21	1	7163	43	14	2.11_r2263	0
9	186201792	2014-03-07 23:50:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-24	1	7163	43	14	2.11_r2263	0
10	186205144	2014-03-08 00:10:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-14	1	7163	43	14	2.11_r2263	0
11	186207945	2014-03-08 00:28:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-25	1	7163	43	14	2.11_r2263	0
12	186210779	2014-03-08 00:48:00	W4MO	EL87tc	M6NNB	IO91ue	14097080	33	-14	1	7163	43	14	2.11_r2263	0
13	186211998	2014-03-08 00:56:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-16	1	7163	43	14	2.11_r2263	0
14	186218647	2014-03-08 01:46:00	W4MO	EL87tc	M6NNB	IO91ue	14097080	33	-23	1	7163	43	14	2.11_r2263	0
15	186219891	2014-03-08 01:54:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-17	1	7163	43	14	2.11_r2263	0
16	186220969	2014-03-08 02:02:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-27	1	7163	43	14	2.11_r2263	0
17	186223640	2014-03-08 02:22:00	W4MO	EL87tc	M6NNB	IO91ue	14097080	33	-25	1	7163	43	14	2.11_r2263	0
								Mean	-19.0588						
								SD	4.7232						
								AD	-5.0588						
								AD%	-107						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186183734	2014-03-07 21:58:00	W4MO	EL87tc	M6NNB	IO91ue	14097090	33	-11	-1	7163	43	14	2.11_r2263	0
2	186186133	2014-03-07 22:10:00	W4MO	EL87tc	M6NNB	IO91ue	14097085	33	-14	-1	7163	43	14	2.11_r2263	0
3	186188039	2014-03-07 22:22:00	W4MO	EL87tc	M6NNB	IO91ue	14097082	33	-18	0	7163	43	14	2.11_r2263	0
4	186189559	2014-03-07 22:30:00	W4MO	EL87tc	M6NNB	IO91ue	14097081	33	-17	0	7163	43	14	2.11_r2263	0
5	186190883	2014-03-07 22:40:00	W4MO	EL87tc	M6NNB	IO91ue	14097080	33	-20	1	7163	43	14	2.11_r2263	0
6	186192566	2014-03-07 22:52:00	W4MO	EL87tc	M6NNB	IO91ue	14097080	33	-22	1	7163	43	14	2.11_r2263	0
7	186197149	2014-03-07 23:22:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-16	0	7163	43	14	2.11_r2263	0
8	186198847	2014-03-07 23:32:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-21	1	7163	43	14	2.11_r2263	0
9	186201792	2014-03-07 23:50:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-24	1	7163	43	14	2.11_r2263	0
10	186205144	2014-03-08 00:10:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-14	1	7163	43	14	2.11_r2263	0
11	186207945	2014-03-08 00:28:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-25	1	7163	43	14	2.11_r2263	0
12	186210779	2014-03-08 00:48:00	W4MO	EL87tc	M6NNB	IO91ue	14097080	33	-14	1	7163	43	14	2.11_r2263	0
13	186211998	2014-03-08 00:56:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-16	1	7163	43	14	2.11_r2263	0
14	186218647	2014-03-08 01:46:00	W4MO	EL87tc	M6NNB	IO91ue	14097080	33	-23	1	7163	43	14	2.11_r2263	0
15	186219891	2014-03-08 01:54:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-17	1	7163	43	14	2.11_r2263	0
16	186220969	2014-03-08 02:02:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-27	1	7163	43	14	2.11_r2263	0
17	186223640	2014-03-08 02:22:00	W4MO	EL87tc	M6NNB	IO91ue	14097080	33	-25	1	7163	43	14	2.11_r2263	0
								Mean	-19.0588						
								SD	4.7232						
								AD	5.9412						
								AD%	126						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186183734	2014-03-07 21:58:00	W4MO	EL87tc	M6NNB	IO91ue	14097090	33	-11	-1	7163	43	14	2.11_r2263	0
2	186186133	2014-03-07 22:10:00	W4MO	EL87tc	M6NNB	IO91ue	14097085	33	-14	-1	7163	43	14	2.11_r2263	0
3	186188039	2014-03-07 22:22:00	W4MO	EL87tc	M6NNB	IO91ue	14097082	33	-18	0	7163	43	14	2.11_r2263	0
4	186189559	2014-03-07 22:30:00	W4MO	EL87tc	M6NNB	IO91ue	14097081	33	-17	0	7163	43	14	2.11_r2263	0
5	186190883	2014-03-07 22:40:00	W4MO	EL87tc	M6NNB	IO91ue	14097080	33	-20	1	7163	43	14	2.11_r2263	0
6	186192566	2014-03-07 22:52:00	W4MO	EL87tc	M6NNB	IO91ue	14097080	33	-22	1	7163	43	14	2.11_r2263	0
7	186197149	2014-03-07 23:22:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-16	0	7163	43	14	2.11_r2263	0
8	186198847	2014-03-07 23:32:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-21	1	7163	43	14	2.11_r2263	0
9	186201792	2014-03-07 23:50:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-24	1	7163	43	14	2.11_r2263	0
10	186205144	2014-03-08 00:10:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-14	1	7163	43	14	2.11_r2263	0
11	186207945	2014-03-08 00:28:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-25	1	7163	43	14	2.11_r2263	0
12	186210779	2014-03-08 00:48:00	W4MO	EL87tc	M6NNB	IO91ue	14097080	33	-14	1	7163	43	14	2.11_r2263	0
13	186211998	2014-03-08 00:56:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-16	1	7163	43	14	2.11_r2263	0
14	186218647	2014-03-08 01:46:00	W4MO	EL87tc	M6NNB	IO91ue	14097080	33	-23	1	7163	43	14	2.11_r2263	0
15	186219891	2014-03-08 01:54:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-17	1	7163	43	14	2.11_r2263	0
16	186220969	2014-03-08 02:02:00	W4MO	EL87tc	M6NNB	IO91ue	14097079	33	-27	1	7163	43	14	2.11_r2263	0
17	186223640	2014-03-08 02:22:00	W4MO	EL87tc	M6NNB	IO91ue	14097080	33	-25	1	7163	43	14	2.11_r2263	0
								Mean	-19.0588						
								SD	4.7232						
								AD	4.9412						
								AD%	105						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186172674	2014-03-07 21:10:00	W4MO	EL87tc	OE3VMS	JN78tq	14097197	33	-22	1	8329	43	14	2.11_r2263	0
2	186174773	2014-03-07 21:22:00	W4MO	EL87tc	OE3VMS	JN78tq	14097196	33	-24	1	8329	43	14	2.11_r2263	0
3	186178684	2014-03-07 21:44:00	W4MO	EL87tc	OE3VMS	JN78tq	14097074	33	-20	-1	8329	43	14	2.11_r2263	0
4	186183996	2014-03-07 21:58:00	W4MO	EL87tc	OE3VMS	JN78tq	14097071	33	-21	-1	8329	43	14	2.11_r2263	0
5	186186195	2014-03-07 22:10:00	W4MO	EL87tc	OE3VMS	JN78tq	14097066	33	-23	-1	8329	43	14	2.11_r2263	0
6	186188190	2014-03-07 22:22:00	W4MO	EL87tc	OE3VMS	JN78tq	14097063	33	-20	0	8329	43	14	2.11_r2263	0
7	186192698	2014-03-07 22:52:00	W4MO	EL87tc	OE3VMS	JN78tq	14097060	33	-24	1	8329	43	14	2.11_r2263	0
8	186193992	2014-03-07 23:00:00	W4MO	EL87tc	OE3VMS	JN78tq	14097060	33	-27	0	8329	43	14	2.11_r2263	0
9	186197257	2014-03-07 23:22:00	W4MO	EL87tc	OE3VMS	JN78tq	14097061	33	-24	1	8329	43	14	2.11_r2263	0
10	186198814	2014-03-07 23:32:00	W4MO	EL87tc	OE3VMS	JN78tq	14097060	33	-24	1	8329	43	14	2.11_r2263	0
11	186204992	2014-03-08 00:10:00	W4MO	EL87tc	OE3VMS	JN78tq	14097060	33	-21	1	8329	43	14	2.11_r2263	0
12	186210768	2014-03-08 00:48:00	W4MO	EL87tc	OE3VMS	JN78tq	14097061	33	-21	0	8329	43	14	2.11_r2263	0
13	186212027	2014-03-08 00:56:00	W4MO	EL87tc	OE3VMS	JN78tq	14097060	33	-22	1	8329	43	14	2.11_r2263	0
14	186213420	2014-03-08 01:06:00	W4MO	EL87tc	OE3VMS	JN78tq	14097060	33	-21	1	8329	43	14	2.11_r2263	0
15	186218689	2014-03-08 01:46:00	W4MO	EL87tc	OE3VMS	JN78tq	14097061	33	-22	1	8329	43	14	2.11_r2263	0
16	186219746	2014-03-08 01:54:00	W4MO	EL87tc	OE3VMS	JN78tq	14097060	33	-23	1	8329	43	14	2.11_r2263	0
								Mean	-22.4375						
								SD	1.8608						
								AD	-1.4375						
								AD%	-77						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186166950	2014-03-07 20:40:00	W4MO	EL87tc	OE3VMS	JN78tq	14097194	33	-24	1	8329	43	14	2.11_r2263	0
2	186169273	2014-03-07 20:52:00	W4MO	EL87tc	OE3VMS	JN78tq	14097194	33	-20	1	8329	43	14	2.11_r2263	0
3	186172674	2014-03-07 21:10:00	W4MO	EL87tc	OE3VMS	JN78tq	14097197	33	-22	1	8329	43	14	2.11_r2263	0
4	186174773	2014-03-07 21:22:00	W4MO	EL87tc	OE3VMS	JN78tq	14097196	33	-24	1	8329	43	14	2.11_r2263	0
5	186178684	2014-03-07 21:44:00	W4MO	EL87tc	OE3VMS	JN78tq	14097074	33	-20	-1	8329	43	14	2.11_r2263	0
6	186183996	2014-03-07 21:58:00	W4MO	EL87tc	OE3VMS	JN78tq	14097071	33	-21	-1	8329	43	14	2.11_r2263	0
7	186186195	2014-03-07 22:10:00	W4MO	EL87tc	OE3VMS	JN78tq	14097066	33	-23	-1	8329	43	14	2.11_r2263	0
8	186188190	2014-03-07 22:22:00	W4MO	EL87tc	OE3VMS	JN78tq	14097063	33	-20	0	8329	43	14	2.11_r2263	0
9	186192698	2014-03-07 22:52:00	W4MO	EL87tc	OE3VMS	JN78tq	14097060	33	-24	1	8329	43	14	2.11_r2263	0
10	186193892	2014-03-07 23:00:00	W4MO	EL87tc	OE3VMS	JN78tq	14097060	33	-27	0	8329	43	14	2.11_r2263	0
11	186197257	2014-03-07 23:22:00	W4MO	EL87tc	OE3VMS	JN78tq	14097061	33	-24	1	8329	43	14	2.11_r2263	0
12	186198814	2014-03-07 23:32:00	W4MO	EL87tc	OE3VMS	JN78tq	14097060	33	-24	1	8329	43	14	2.11_r2263	0
13	186204992	2014-03-08 00:10:00	W4MO	EL87tc	OE3VMS	JN78tq	14097060	33	-21	1	8329	43	14	2.11_r2263	0
14	186210768	2014-03-08 00:48:00	W4MO	EL87tc	OE3VMS	JN78tq	14097061	33	-21	0	8329	43	14	2.11_r2263	0
15	186212027	2014-03-08 00:56:00	W4MO	EL87tc	OE3VMS	JN78tq	14097060	33	-22	1	8329	43	14	2.11_r2263	0
16	186213420	2014-03-08 01:06:00	W4MO	EL87tc	OE3VMS	JN78tq	14097060	33	-21	1	8329	43	14	2.11_r2263	0
17	186218689	2014-03-08 01:46:00	W4MO	EL87tc	OE3VMS	JN78tq	14097061	33	-22	1	8329	43	14	2.11_r2263	0
18	186219746	2014-03-08 01:54:00	W4MO	EL87tc	OE3VMS	JN78tq	14097060	33	-23	1	8329	43	14	2.11_r2263	0
								Mean	-22.3889						
								SD	1.8830						
								AD	1.6111						
								AD%	86						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	185904741	2014-03-06 22:04:00	W4MO	EL87tc	OE6PWD	JN77rb	14097102	33	-26	1	8392	44	14	4.0 r3015	0
2	185908324	2014-03-06 22:26:00	W4MO	EL87tc	OE6PWD	JN77rb	14097103	33	-25	1	8392	44	14	4.0 r3015	0
3	185910326	2014-03-06 22:38:00	W4MO	EL87tc	OE6PWD	JN77rb	14097103	33	-29	1	8392	44	14	4.0 r3015	0
4	185917591	2014-03-06 23:22:00	W4MO	EL87tc	OE6PWD	JN77rb	14097103	33	-27	1	8392	44	14	4.0 r3015	0
5	185925791	2014-03-07 00:14:00	W4MO	EL87tc	OE6PWD	JN77rb	14097104	33	-28	1	8392	44	14	4.0 r3015	0
6	185927724	2014-03-07 00:26:00	W4MO	EL87tc	OE6PWD	JN77rb	14097103	33	-19	1	8392	44	14	4.0 r3015	0
7	185937869	2014-03-07 01:40:00	W4MO	EL87tc	OE6PWD	JN77rb	14097104	33	-24	1	8392	44	14	4.0 r3015	0
8	186188038	2014-03-07 22:22:00	W4MO	EL87tc	OE6PWD	JN77rb	14097071	33	-25	0	8392	44	14	4.0 r3015	0
9	186197184	2014-03-07 23:22:00	W4MO	EL87tc	OE6PWD	JN77rb	14097069	33	-23	0	8392	44	14	4.0 r3015	0
10	186223654	2014-03-08 02:22:00	W4MO	EL87tc	OE6PWD	JN77rb	14097068	33	-27	1	8392	44	14	4.0 r3015	0
								Mean	-25.3000						
								SD	2.8694						
								AD	-2.3000						
								AD%	-80						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186178877	2014-03-07 21:44:00	W4MO	EL87tc	ON4SAR	JO21ce	14097102	33	-17	-1	7467	43	14	0.8_r3058	0
2	186183844	2014-03-07 21:58:00	W4MO	EL87tc	ON4SAR	JO21ce	14097099	33	-13	-1	7467	43	14	0.8_r3058	0
3	186186119	2014-03-07 22:10:00	W4MO	EL87tc	ON4SAR	JO21ce	14097094	33	-22	-1	7467	43	14	0.8_r3058	0
4	186188123	2014-03-07 22:22:00	W4MO	EL87tc	ON4SAR	JO21ce	14097092	33	-16	0	7467	43	14	0.8_r3058	0
5	186189270	2014-03-07 22:30:00	W4MO	EL87tc	ON4SAR	JO21ce	14097090	33	-20	0	7467	43	14	0.8_r3058	0
6	186190988	2014-03-07 22:40:00	W4MO	EL87tc	ON4SAR	JO21ce	14097089	33	-26	0	7467	43	14	0.8_r3058	0
7	186192513	2014-03-07 22:52:00	W4MO	EL87tc	ON4SAR	JO21ce	14097089	33	-24	1	7467	43	14	0.8_r3058	0
8	186197147	2014-03-07 23:22:00	W4MO	EL87tc	ON4SAR	JO21ce	14097089	33	-14	1	7467	43	14	0.8_r3058	0
9	186198764	2014-03-07 23:32:00	W4MO	EL87tc	ON4SAR	JO21ce	14097088	33	-21	1	7467	43	14	0.8_r3058	0
10	186201785	2014-03-07 23:50:00	W4MO	EL87tc	ON4SAR	JO21ce	14097088	33	-24	1	7467	43	14	0.8_r3058	0
11	186203267	2014-03-07 23:58:00	W4MO	EL87tc	ON4SAR	JO21ce	14097088	33	-20	0	7467	43	14	0.8_r3058	0
12	186207985	2014-03-08 00:28:00	W4MO	EL87tc	ON4SAR	JO21ce	14097088	33	-20	1	7467	43	14	0.8_r3058	0
13	186210762	2014-03-08 00:48:00	W4MO	EL87tc	ON4SAR	JO21ce	14097088	33	-23	1	7467	43	14	0.8_r3058	0
14	186218761	2014-03-08 01:46:00	W4MO	EL87tc	ON4SAR	JO21ce	14097088	33	-25	0	7467	43	14	0.8_r3058	0
								Mean	-20.3571						
								SD	4.0688						
								AD	3.6429						
								AD%	90						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186170961	2014-03-07 21:02:00	W4MO	EL87tc	ON7KB	JO21ei	14097169	33	-28	1	7473	43	14	0.8_r3058	0
2	186178833	2014-03-07 21:44:00	W4MO	EL87tc	ON7KB	JO21ei	14097047	33	-23	-1	7473	43	14	0.8_r3058	0
3	186185902	2014-03-07 22:10:00	W4MO	EL87tc	ON7KB	JO21ei	14097039	33	-27	-1	7473	43	14	0.8_r3058	0
4	186189410	2014-03-07 22:30:00	W4MO	EL87tc	ON7KB	JO21ei	14097034	33	-27	0	7473	43	14	0.8_r3058	0
5	186197267	2014-03-07 23:22:00	W4MO	EL87tc	ON7KB	JO21ei	14097033	33	-21	1	7473	43	14	0.8_r3058	0
								Mean	-25.2000						
								SD	3.0332						
								AD	-4.2000						
								AD%	-138						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186172667	2014-03-07 21:10:00	W4MO	EL87tc	OZ7IT	JO65df	14097199	33	-4	1	7845	37	14	2.21_r2286	0
2	186174675	2014-03-07 21:22:00	W4MO	EL87tc	OZ7IT	JO65df	14097197	33	-5	1	7845	37	14	2.21_r2286	0
3	186178670	2014-03-07 21:44:00	W4MO	EL87tc	OZ7IT	JO65df	14097077	33	-1	-1	7845	37	14	2.21_r2286	0
4	186183747	2014-03-07 21:58:00	W4MO	EL87tc	OZ7IT	JO65df	14097073	33	-2	-1	7845	37	14	2.21_r2286	0
5	186186012	2014-03-07 22:10:00	W4MO	EL87tc	OZ7IT	JO65df	14097069	33	-6	0	7845	37	14	2.21_r2286	0
6	186188053	2014-03-07 22:22:00	W4MO	EL87tc	OZ7IT	JO65df	14097066	33	2	0	7845	37	14	2.21_r2286	0
7	186189531	2014-03-07 22:30:00	W4MO	EL87tc	OZ7IT	JO65df	14097064	33	0	0	7845	37	14	2.21_r2286	0
8	186190778	2014-03-07 22:40:00	W4MO	EL87tc	OZ7IT	JO65df	14097063	33	-3	0	7845	37	14	2.21_r2286	0
9	186192620	2014-03-07 22:52:00	W4MO	EL87tc	OZ7IT	JO65df	14097063	33	-1	1	7845	37	14	2.21_r2286	0
10	186193979	2014-03-07 23:00:00	W4MO	EL87tc	OZ7IT	JO65df	14097063	33	-4	1	7845	37	14	2.21_r2286	0
11	186197169	2014-03-07 23:22:00	W4MO	EL87tc	OZ7IT	JO65df	14097062	33	-5	1	7845	37	14	2.21_r2286	0
12	186201758	2014-03-07 23:50:00	W4MO	EL87tc	OZ7IT	JO65df	14097060	33	-22	1	7845	37	14	2.21_r2286	0
13	186203112	2014-03-07 23:58:00	W4MO	EL87tc	OZ7IT	JO65df	14097060	33	-20	1	7845	37	14	2.21_r2286	0
								Mean	-5.4615						
								SD	7.2642						
								AD	14.5385						
								AD%	200						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186178915	2014-03-07 21:44:00	W4MO	EL87tc	PI4THT	JO32kf	14097079	33	-13	-1	7612	41	14	0.6	0
2	186183991	2014-03-07 21:58:00	W4MO	EL87tc	PI4THT	JO32kf	14097076	33	-10	-1	7612	41	14	0.6	0
3	186186364	2014-03-07 22:10:00	W4MO	EL87tc	PI4THT	JO32kf	14097071	33	-11	0	7612	41	14	0.6	0
4	186188285	2014-03-07 22:22:00	W4MO	EL87tc	PI4THT	JO32kf	14097069	33	-15	0	7612	41	14	0.6	0
5	186189638	2014-03-07 22:30:00	W4MO	EL87tc	PI4THT	JO32kf	14097067	33	-17	0	7612	41	14	0.6	0
6	186191063	2014-03-07 22:40:00	W4MO	EL87tc	PI4THT	JO32kf	14097066	33	-15	1	7612	41	14	0.6	0
7	186192773	2014-03-07 22:52:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-20	0	7612	41	14	0.6	0
8	186194007	2014-03-07 23:00:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-23	1	7612	41	14	0.6	0
9	186197395	2014-03-07 23:22:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-12	1	7612	41	14	0.6	0
10	186199032	2014-03-07 23:32:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-21	1	7612	41	14	0.6	0
11	186202028	2014-03-07 23:50:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-21	1	7612	41	14	0.6	0
12	186203371	2014-03-07 23:58:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-17	1	7612	41	14	0.6	0
13	186208074	2014-03-08 00:28:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-22	1	7612	41	14	0.6	0
14	186210965	2014-03-08 00:48:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-25	1	7612	41	14	0.6	0
15	186215905	2014-03-08 01:24:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-24	1	7612	41	14	0.6	0
16	186218837	2014-03-08 01:46:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-21	1	7612	41	14	0.6	0
17	186219962	2014-03-08 01:54:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-17	1	7612	41	14	0.6	0
18	186221127	2014-03-08 02:02:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-18	1	7612	41	14	0.6	0
19	186223848	2014-03-08 02:22:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-20	1	7612	41	14	0.6	0
								Mean	-18.0000						
								SD	4.4472						
								AD	4.0000						
								AD%	90						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186178915	2014-03-07 21:44:00	W4MO	EL87tc	PI4THT	JO32kf	14097079	33	-13	-1	7612	41	14	0.6	0
2	186183991	2014-03-07 21:58:00	W4MO	EL87tc	PI4THT	JO32kf	14097076	33	-10	-1	7612	41	14	0.6	0
3	186186364	2014-03-07 22:10:00	W4MO	EL87tc	PI4THT	JO32kf	14097071	33	-11	0	7612	41	14	0.6	0
4	186188285	2014-03-07 22:22:00	W4MO	EL87tc	PI4THT	JO32kf	14097069	33	-15	0	7612	41	14	0.6	0
5	186189638	2014-03-07 22:30:00	W4MO	EL87tc	PI4THT	JO32kf	14097067	33	-17	0	7612	41	14	0.6	0
6	186191063	2014-03-07 22:40:00	W4MO	EL87tc	PI4THT	JO32kf	14097066	33	-15	1	7612	41	14	0.6	0
7	186192773	2014-03-07 22:52:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-20	0	7612	41	14	0.6	0
8	186194007	2014-03-07 23:00:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-23	1	7612	41	14	0.6	0
9	186197395	2014-03-07 23:22:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-12	1	7612	41	14	0.6	0
10	186199032	2014-03-07 23:32:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-21	1	7612	41	14	0.6	0
11	186202028	2014-03-07 23:50:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-21	1	7612	41	14	0.6	0
12	186203371	2014-03-07 23:58:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-17	1	7612	41	14	0.6	0
13	186208074	2014-03-08 00:28:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-22	1	7612	41	14	0.6	0
14	186210965	2014-03-08 00:48:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-25	1	7612	41	14	0.6	0
15	186215905	2014-03-08 01:24:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-24	1	7612	41	14	0.6	0
16	186218837	2014-03-08 01:46:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-21	1	7612	41	14	0.6	0
17	186219962	2014-03-08 01:54:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-17	1	7612	41	14	0.6	0
18	186221127	2014-03-08 02:02:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-18	1	7612	41	14	0.6	0
19	186223848	2014-03-08 02:22:00	W4MO	EL87tc	PI4THT	JO32kf	14097065	33	-20	1	7612	41	14	0.6	0
								Mean	-18.0000						
								SD	4.4472						
								AD	-6.0000						
								AD%	-135						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186190800	2014-03-07 22:40:00	W4MO	EL87tc	SM3ULC	JO89ul	14097123	33	-14	1	7977	32	14	2.11_r2263	0
2	186192673	2014-03-07 22:52:00	W4MO	EL87tc	SM3ULC	JO89ul	14097123	33	-24	0	7977	32	14	2.11_r2263	0
3	186193839	2014-03-07 23:00:00	W4MO	EL87tc	SM3ULC	JO89ul	14097122	33	-15	0	7977	32	14	2.11_r2263	0
								Mean	-17.6667						
								SD	5.5076						
								AD	6.3333						
								AD%	115						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186186996	2014-03-07 22:14:00	W9HLY	EN70mt	K4EH	EM73	14097051	30	3	0	815	181	14	2.21_r2286	0
2	186192837	2014-03-07 22:54:00	W9HLY	EN70mt	K4EH	EM73	14097052	30	3	0	815	181	14	2.21_r2286	0
3	186196971	2014-03-07 23:20:00	W9HLY	EN70mt	K4EH	EM73	14097052	30	0	0	815	181	14	2.21_r2286	0
4	186199002	2014-03-07 23:32:00	W9HLY	EN70mt	K4EH	EM73	14097051	30	1	0	815	181	14	2.21_r2286	0
5	186203305	2014-03-07 23:58:00	W9HLY	EN70mt	K4EH	EM73	14097052	30	3	0	815	181	14	2.21_r2286	0
6	186205816	2014-03-08 00:14:00	W9HLY	EN70mt	K4EH	EM73	14097052	30	0	0	815	181	14	2.21_r2286	0
								Mean	1.6667						
								SD	1.5055						
								AD	1.6667						
								AD%	111						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	185634293	2014-03-05 20:28:00	W9HLY	EN70mt	KB1MVX	EM73	14097012	30	-12	0	815	181	14	2.11_r2263	0
2	185642870	2014-03-05 21:30:00	W9HLY	EN70mt	KB1MVX	EM73	14097013	30	-15	0	815	181	14	2.11_r2263	0
3	185645193	2014-03-05 21:46:00	W9HLY	EN70mt	KB1MVX	EM73	14097011	30	-18	0	815	181	14	2.11_r2263	0
4	185652264	2014-03-05 22:36:00	W9HLY	EN70mt	KB1MVX	EM73	14097012	30	-26	0	815	181	14	2.11_r2263	0
5	185653897	2014-03-05 22:48:00	W9HLY	EN70mt	KB1MVX	EM73	14097011	30	-17	0	815	181	14	2.11_r2263	0
6	185660367	2014-03-05 23:14:00	W9HLY	EN70mt	KB1MVX	EM73	14097010	30	-22	0	815	181	14	2.11_r2263	0
7	185666778	2014-03-06 00:00:00	W9HLY	EN70mt	KB1MVX	EM73	14097011	30	-16	0	815	181	14	2.11_r2263	0
8	185668461	2014-03-06 00:12:00	W9HLY	EN70mt	KB1MVX	EM73	14097011	30	-26	-1	815	181	14	2.11_r2263	0
9	186193017	2014-03-07 22:54:00	W9HLY	EN70mt	KB1MVX	EM73	14097013	30	-5	0	815	181	14	2.11_r2263	0
10	186196977	2014-03-07 23:20:00	W9HLY	EN70mt	KB1MVX	EM73	14097014	30	4	0	815	181	14	2.11_r2263	0
11	186199033	2014-03-07 23:32:00	W9HLY	EN70mt	KB1MVX	EM73	14097011	30	5	0	815	181	14	2.11_r2263	0
12	186459211	2014-03-08 21:28:00	W9HLY	EN70mt	KB1MVX	EM73	14097014	30	7	0	815	181	14	2.11_r2263	0
13	186461637	2014-03-08 21:42:00	W9HLY	EN70mt	KB1MVX	EM73	14097013	30	-11	0	815	181	14	2.11_r2263	0
14	186465634	2014-03-08 22:08:00	W9HLY	EN70mt	KB1MVX	EM73	14097014	30	-4	0	815	181	14	2.11_r2263	0
15	186480712	2014-03-08 23:26:00	W9HLY	EN70mt	KB1MVX	EM73	14097014	30	2	0	815	181	14	2.11_r2263	0
16	186482599	2014-03-08 23:38:00	W9HLY	EN70mt	KB1MVX	EM73	14097014	30	5	0	815	181	14	2.11_r2263	0
17	186726372	2014-03-09 21:02:00	W9HLY	EN70mt	KB1MVX	EM73	14097019	30	-6	0	815	181	14	2.11_r2263	0
18	186728525	2014-03-09 21:12:00	W9HLY	EN70mt	KB1MVX	EM73	14097017	30	3	0	815	181	14	2.11_r2263	0
19	186730656	2014-03-09 21:24:00	W9HLY	EN70mt	KB1MVX	EM73	14097017	30	-2	0	815	181	14	2.11_r2263	0
20	186733343	2014-03-09 21:38:00	W9HLY	EN70mt	KB1MVX	EM73	14097017	30	1	0	815	181	14	2.11_r2263	0
21	186735437	2014-03-09 21:50:00	W9HLY	EN70mt	KB1MVX	EM73	14097018	30	-4	0	815	181	14	2.11_r2263	0
22	186738054	2014-03-09 22:06:00	W9HLY	EN70mt	KB1MVX	EM73	14097018	30	-1	0	815	181	14	2.11_r2263	0
23	186747215	2014-03-09 22:44:00	W9HLY	EN70mt	KB1MVX	EM73	14097016	30	0	0	815	181	14	2.11_r2263	0
24	186751045	2014-03-09 23:06:00	W9HLY	EN70mt	KB1MVX	EM73	14097015	30	-1	0	815	181	14	2.11_r2263	0
25	186760159	2014-03-10 00:04:00	W9HLY	EN70mt	KB1MVX	EM73	14097016	30	1	0	815	181	14	2.11_r2263	0
								Mean	-6.3200						
								SD	10.0529						
								AD	-10.3200						
								AD%	-103						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186196250	2014-03-07 23:16:00	WA3DNM	FM29fw	W4MO	EL87	14097096	37	1	0	1548	209	14	2.21_r2286	0
2	186198108	2014-03-07 23:28:00	WA3DNM	FM29fw	W4MO	EL87	14097096	37	1	0	1548	209	14	2.21_r2286	0
3	186199474	2014-03-07 23:36:00	WA3DNM	FM29fw	W4MO	EL87	14097096	37	-1	0	1548	209	14	2.21_r2286	0
4	186200776	2014-03-07 23:44:00	WA3DNM	FM29fw	W4MO	EL87	14097096	37	1	0	1548	209	14	2.21_r2286	0
5	186202109	2014-03-07 23:52:00	WA3DNM	FM29fw	W4MO	EL87	14097096	37	0	0	1548	209	14	2.21_r2286	0
6	186203904	2014-03-08 00:02:00	WA3DNM	FM29fw	W4MO	EL87	14097096	37	5	0	1548	209	14	2.21_r2286	0
7	186208636	2014-03-08 00:32:00	WA3DNM	FM29fw	W4MO	EL87	14097097	37	4	0	1548	209	14	2.21_r2286	0
8	186210065	2014-03-08 00:42:00	WA3DNM	FM29fw	W4MO	EL87	14097097	37	4	0	1548	209	14	2.21_r2286	0
9	186211153	2014-03-08 00:50:00	WA3DNM	FM29fw	W4MO	EL87	14097096	37	4	0	1548	209	14	2.21_r2286	0
10	186212129	2014-03-08 00:58:00	WA3DNM	FM29fw	W4MO	EL87	14097096	37	5	0	1548	209	14	2.21_r2286	0
11	186218404	2014-03-08 01:44:00	WA3DNM	FM29fw	W4MO	EL87	14097096	37	7	0	1548	209	14	2.21_r2286	0
									Mean	2.8182					
									SD	2.5226					
									AD	3.8182					
									AD%	151					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186168370	2014-03-07 20:48:00	WA8RC	EN72jh	AI4RY	EM72go	14097104	23	-4	0	1080	181	14	0.8_r3058	0
2	186170214	2014-03-07 20:58:00	WA8RC	EN72jh	AI4RY	EM72go	14097108	23	-7	0	1080	181	14	0.8_r3058	0
3	186172131	2014-03-07 21:08:00	WA8RC	EN72jh	AI4RY	EM72go	14097107	23	-9	-1	1080	181	14	0.8_r3058	0
4	186175719	2014-03-07 21:28:00	WA8RC	EN72jh	AI4RY	EM72go	14097110	23	-4	0	1080	181	14	0.8_r3058	0
5	186177509	2014-03-07 21:38:00	WA8RC	EN72jh	AI4RY	EM72go	14097106	23	-3	-1	1080	181	14	0.8_r3058	0
6	186185811	2014-03-07 22:08:00	WA8RC	EN72jh	AI4RY	EM72go	14097107	23	1	-1	1080	181	14	0.8_r3058	0
7	186187398	2014-03-07 22:18:00	WA8RC	EN72jh	AI4RY	EM72go	14097106	23	-5	0	1080	181	14	0.8_r3058	0
8	186189080	2014-03-07 22:28:00	WA8RC	EN72jh	AI4RY	EM72go	14097104	23	-5	-1	1080	181	14	0.8_r3058	0
									Mean	-4.5000					
									SD	2.9277					
									AD	-1.5000					
									AD%	-51					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186168642	2014-03-07 20:50:00	WB8ELK	EM64oj	VE6PDQ/1	DO33fl	14097121	23	-23	-1	2981	324	14	3.00_r2485	0
2	186172583	2014-03-07 21:10:00	WB8ELK	EM64oj	VE6PDQ/1	DO33fl	14097122	23	-29	-1	2981	324	14	3.00_r2485	0
3	186180257	2014-03-07 21:46:00	WB8ELK	EM64oj	VE6PDQ/1	DO33fl	14097123	23	-26	0	2981	324	14	3.00_r2485	0
4	186184231	2014-03-07 22:00:00	WB8ELK	EM64oj	VE6PDQ/1	DO33fl	14097121	23	-20	-1	2981	324	14	3.00_r2485	0
5	186185129	2014-03-07 22:04:00	WB8ELK	EM64oj	VE6PDQ/1	DO33fl	14097121	23	-25	-1	2981	324	14	3.00_r2485	0
6	186185925	2014-03-07 22:10:00	WB8ELK	EM64oj	VE6PDQ/1	DO33fl	14097124	23	-24	0	2981	324	14	3.00_r2485	0
7	186195410	2014-03-07 23:10:00	WB8ELK	EM64oj	VE6PDQ/1	DO33fl	14097124	23	-20	-1	2981	324	14	3.00_r2485	0
8	186197569	2014-03-07 23:24:00	WB8ELK	EM64oj	VE6PDQ/1	DO33fl	14097123	23	-17	-1	2981	324	14	3.00_r2485	0
9	186200937	2014-03-07 23:44:00	WB8ELK	EM64oj	VE6PDQ/1	DO33fl	14097121	23	-18	-1	2981	324	14	3.00_r2485	0
10	186201210	2014-03-07 23:46:00	WB8ELK	EM64oj	VE6PDQ/1	DO33fl	14097120	23	-17	0	2981	324	14	3.00_r2485	0
11	186201894	2014-03-07 23:50:00	WB8ELK	EM64oj	VE6PDQ/1	DO33fl	14097122	23	-16	-1	2981	324	14	3.00_r2485	0
12	186211286	2014-03-08 00:50:00	WB8ELK	EM64oj	VE6PDQ/1	DO33fl	14097120	23	-21	0	2981	324	14	3.00_r2485	0
13	186213839	2014-03-08 01:10:00	WB8ELK	EM64oj	VE6PDQ/1	DO33fl	14097122	23	-22	-1	2981	324	14	3.00_r2485	0
14	186221307	2014-03-08 02:04:00	WB8ELK	EM64oj	VE6PDQ/1	DO33fl	14097125	23	-20	-1	2981	324	14	3.00_r2485	0
15	186224870	2014-03-08 02:30:00	WB8ELK	EM64oj	VE6PDQ/1	DO33fl	14097123	23	-25	-1	2981	324	14	3.00_r2485	0
16	186227449	2014-03-08 02:50:00	WB8ELK	EM64oj	VE6PDQ/1	DO33fl	14097123	23	-21	-1	2981	324	14	3.00_r2485	0
									Mean	-21.5000					
									SD	3.6515					
									AD	-5.5000					
									AD%	-151					

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186157819	2014-03-07 19:52:00	WD0UG	EM64	KB9VLR	EN54vj	10140163	30	-11	-3	1107	355	10	2.0_r1714	0
2	186159654	2014-03-07 20:02:00	WD0UG	EM64	KB9VLR	EN54vj	10140163	30	-6	-1	1107	355	10	2.0_r1714	0
3	186163580	2014-03-07 20:22:00	WD0UG	EM64	KB9VLR	EN54vj	10140162	30	-11	-1	1107	355	10	2.0_r1714	0
4	186172767	2014-03-07 21:12:00	WD0UG	EM64	KB9VLR	EN54vj	10140160	30	-6	-2	1107	355	10	2.0_r1714	0
5	186184744	2014-03-07 22:02:00	WD0UG	EM64	KB9VLR	EN54vj	10140160	30	-7	-1	1107	355	10	2.0_r1714	0
6	186188196	2014-03-07 22:22:00	WD0UG	EM64	KB9VLR	EN54vj	10140161	30	-7	-4	1107	355	10	2.0_r1714	0
7	186189900	2014-03-07 22:32:00	WD0UG	EM64	KB9VLR	EN54vj	10140161	30	-10	-1	1107	355	10	2.0_r1714	0
8	186192732	2014-03-07 22:52:00	WD0UG	EM64	KB9VLR	EN54vj	10140161	30	-5	-2	1107	355	10	2.0_r1714	0
9	186194065	2014-03-07 23:02:00	WD0UG	EM64	KB9VLR	EN54vj	10140161	30	-5	-2	1107	355	10	2.0_r1714	0
10	186197349	2014-03-07 23:22:00	WD0UG	EM64	KB9VLR	EN54vj	10140162	30	-11	-4	1107	355	10	2.0_r1714	0
11	186200624	2014-03-07 23:42:00	WD0UG	EM64	KB9VLR	EN54vj	10140161	30	-3	-2	1107	355	10	2.0_r1714	0
12	186203905	2014-03-08 00:02:00	WD0UG	EM64	KB9VLR	EN54vj	10140162	30	-6	-3	1107	355	10	2.0_r1714	0
								Mean	-7.3333						
								SD	2.7414						
								AD	-2.3333						
								AD%	-85						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186168931	2014-03-07 20:50:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-14	0	1275	337	10		0
2	186170127	2014-03-07 20:58:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-16	0	1275	337	10		0
3	186172677	2014-03-07 21:10:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-14	0	1275	337	10		0
4	186174422	2014-03-07 21:20:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-12	0	1275	337	10		0
5	186175754	2014-03-07 21:28:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-14	0	1275	337	10		0
6	186177689	2014-03-07 21:38:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-13	0	1275	337	10		0
7	186180625	2014-03-07 21:48:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-16	0	1275	337	10		0
8	186184330	2014-03-07 22:00:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-11	0	1275	337	10		0
9	186185648	2014-03-07 22:08:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-9	0	1275	337	10		0
10	186187249	2014-03-07 22:16:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-14	0	1275	337	10		0
11	186188986	2014-03-07 22:28:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-11	0	1275	337	10		0
12	186193417	2014-03-07 22:58:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-12	0	1275	337	10		0
13	186194673	2014-03-07 23:06:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-11	0	1275	337	10		0
14	186196142	2014-03-07 23:14:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-18	0	1275	337	10		0
15	186197928	2014-03-07 23:26:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-19	0	1275	337	10		0
16	186199623	2014-03-07 23:36:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-9	0	1275	337	10		0
17	186201553	2014-03-07 23:48:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-17	0	1275	337	10		0
18	186203650	2014-03-08 00:00:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-10	0	1275	337	10		0
19	186204787	2014-03-08 00:08:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-11	0	1275	337	10		0
20	186206868	2014-03-08 00:20:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-13	1	1275	337	10		0
21	186209675	2014-03-08 00:40:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-6	0	1275	337	10		0
22	186211257	2014-03-08 00:50:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-15	0	1275	337	10		0
23	186213721	2014-03-08 01:08:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-13	0	1275	337	10		0
24	186215188	2014-03-08 01:20:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-14	0	1275	337	10		0
25	186216649	2014-03-08 01:30:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-12	0	1275	337	10		0
26	186218021	2014-03-08 01:40:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-19	0	1275	337	10		0
27	186221325	2014-03-08 02:04:00	WD4LHT	EL89tp	K9AN	EN50wc	10140230	30	-11	0	1275	337	10	3.0.1_r246	0
28	186222294	2014-03-08 02:12:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-21	0	1275	337	10		0
29	186225050	2014-03-08 02:32:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-19	0	1275	337	10		0
30	186226654	2014-03-08 02:44:00	WD4LHT	EL89tp	K9AN	EN50wc	10140229	30	-15	0	1275	337	10		0
								Mean	-13.6333						
								SD	3.4490						
								AD	3.3667						
								AD%	98						

row	id	time	tx_sign	tx_loc	rx_sign	rx_loc	frequency	power	snr	drift	distance	azimuth	band	version	code
1	186172437	2014-03-07 21:10:00	WD4LHT	EL89tp	KV0S	EM38	10140254	30	-15	1	1387	318	10	4.0 r3015	0
2	186177758	2014-03-07 21:38:00	WD4LHT	EL89tp	KV0S	EM38	10140255	30	-14	0	1387	318	10	4.0 r3015	0
3	186184349	2014-03-07 22:00:00	WD4LHT	EL89tp	KV0S	EM38	10140255	30	-11	0	1387	318	10	4.0 r3015	0
4	186196156	2014-03-07 23:14:00	WD4LHT	EL89tp	KV0S	EM38	10140256	30	-10	0	1387	318	10	4.0 r3015	0
5	186197953	2014-03-07 23:26:00	WD4LHT	EL89tp	KV0S	EM38	10140256	30	-11	0	1387	318	10	4.0 r3015	0
6	186199635	2014-03-07 23:36:00	WD4LHT	EL89tp	KV0S	EM38	10140256	30	-13	0	1387	318	10	4.0 r3015	0
7	186203689	2014-03-08 00:00:00	WD4LHT	EL89tp	KV0S	EM38	10140256	30	-6	0	1387	318	10	4.0 r3015	0
8	186206883	2014-03-08 00:20:00	WD4LHT	EL89tp	KV0S	EM38	10140255	30	-10	0	1387	318	10	4.0 r3015	0
9	186208339	2014-03-08 00:30:00	WD4LHT	EL89tp	KV0S	EM38	10140255	30	-2	1	1387	318	10	4.0 r3015	0
10	186211284	2014-03-08 00:50:00	WD4LHT	EL89tp	KV0S	EM38	10140255	30	-12	1	1387	318	10	4.0 r3015	0
11	186212603	2014-03-08 01:00:00	WD4LHT	EL89tp	KV0S	EM38	10140256	30	-8	0	1387	318	10	4.0 r3015	0
12	186215324	2014-03-08 01:20:00	WD4LHT	EL89tp	KV0S	EM38	10140256	30	-14	1	1387	318	10	4.0 r3015	0
13	186216647	2014-03-08 01:30:00	WD4LHT	EL89tp	KV0S	EM38	10140256	30	-13	1	1387	318	10	4.0 r3015	0
14	186218005	2014-03-08 01:40:00	WD4LHT	EL89tp	KV0S	EM38	10140257	30	-13	1	1387	318	10	4.0 r3015	0
15	186219669	2014-03-08 01:52:00	WD4LHT	EL89tp	KV0S	EM38	10140257	30	-15	0	1387	318	10	4.0 r3015	0
16	186222332	2014-03-08 02:12:00	WD4LHT	EL89tp	KV0S	EM38	10140257	30	-19	1	1387	318	10	4.0 r3015	0
17	186225222	2014-03-08 02:32:00	WD4LHT	EL89tp	KV0S	EM38	10140257	30	-16	1	1387	318	10	4.0 r3015	0
18	186226700	2014-03-08 02:44:00	WD4LHT	EL89tp	KV0S	EM38	10140256	30	-16	0	1387	318	10	4.0 r3015	0
19	186228059	2014-03-08 02:54:00	WD4LHT	EL89tp	KV0S	EM38	10140257	30	-15	0	1387	318	10	4.0 r3015	0
									Mean	-12.2632					
									SD	3.9418					
									AD	-6.2632					
									AD%	-159					