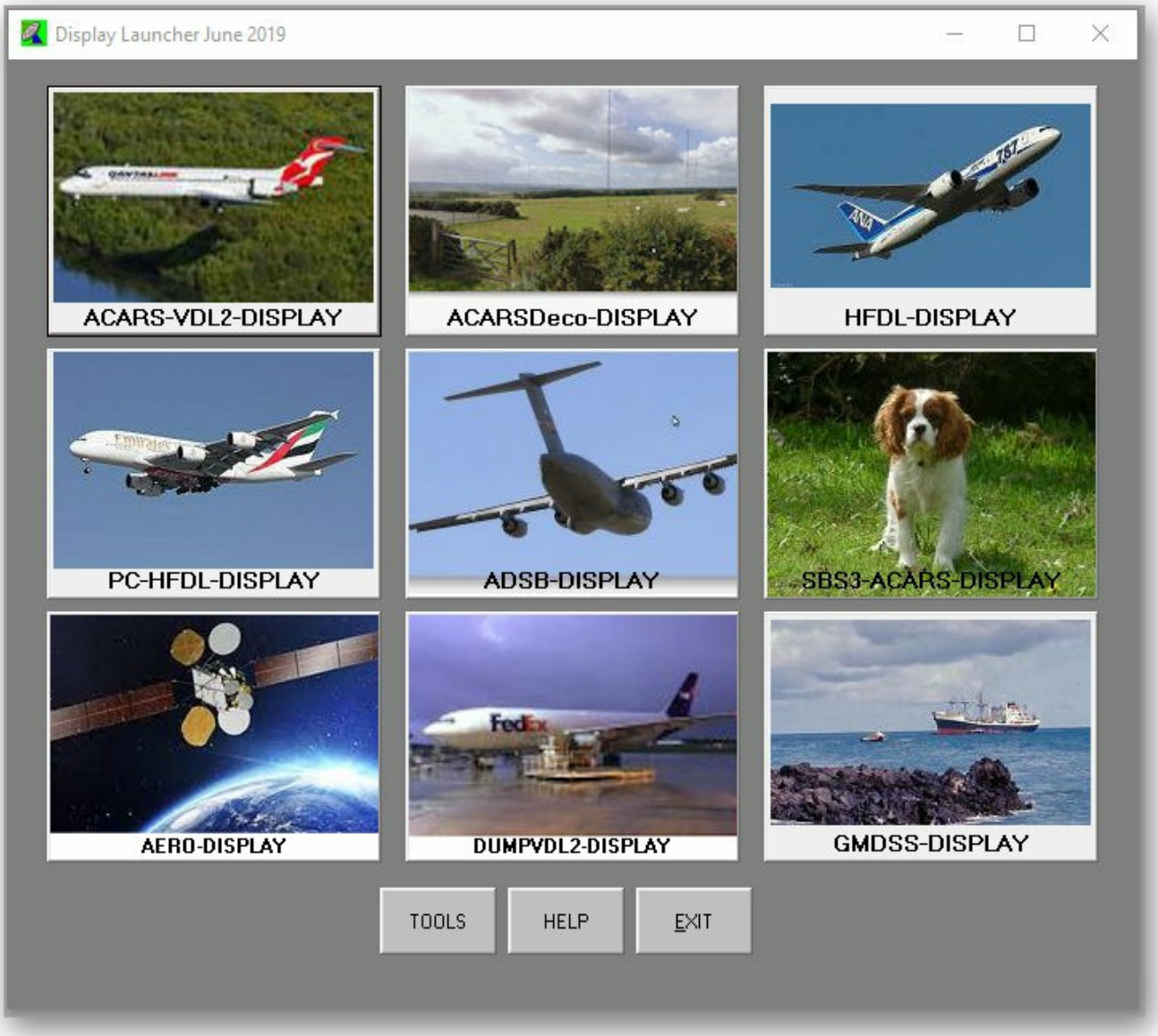



**Display Launcher Oct 2019** The package includes the following programs:-

1. PC-HFDL-Display - Which extracts the output from PC-HFDL log files and displays it on a grid.
2. ACARS-VDL2-Display - Which extracts data from MultiPSK Pro QSO files in VHF Acars modes.
3. HFDL-Display - Which extracts data from MultiPSK Pro QSO files in HF Acars mode.
4. GMDSS-Display - Which extracts shipping data from MultiPSK Pro QSO files in GMDSS mode.
5. SBS3-ACARS-Display - Extracts ACARS TCPIP data from the Kinetics SBS-3 receiver.
6. ADSB-Display - Extracts ADS-B (Mode-S) data from ADSBScope
7. ACARSDeco-Display - Extracts ACARS data from ACARSDeco2
8. AERO-Display - Extracts L-Band ACARS from MultiPSK pro QSO files.
9. DumpVDL2-Display - Extracts VDL2 data from DumpVDL2 on a Linux machine.
10. Tools - Includes utilities to extract aircraft routing data from the PP flight routes forum .sqb files into 'Flights.txt' for use with the above aviation programs. Also utilities to extract aircraft data into 'Aircraft.txt' from the Basestation.sqb file for use with ADSB, ACARS, HFDL and VDL2 traffic. And to extract aircraft data from Basestation.sqb to update the data files in AcarsDeco2.

## This package includes completely new versions of all utilities.

The units to extract MultiPSK data for ACARS and VDL2 have now been merged into a single unit which can accept data from either ACARS or VDL2 or both for up to 6 copies of MultiPSK, see the appropriate pages.

A completely new module AERO-Display has been added which allows display of L-Band ACARS messages from the Inmarsat satellites to be displayed on the grids using the AERO option in the latest versions of MultiPSK.

Totally new is the module DumpVDL2-Display which takes the output of the Linux program DumpVDL2 by Tomasz Lemiech and displays it on a grid similar to the various modules which use MultiPSK data with the exception that the data from DumpVDL2 must be passed either via a LAN connection to the Linux PC, or by copying the DumpVDL2 log to a USB key and using that as input.

I have attempted to make all of the grids for displaying aircraft data very similar over all the modules, including improvements to the clock and to the Google Earth displays (where aircraft tracks are now shown as lines with an aircraft icon pointing in the direction of the plot at one end of the line).

The ability to use DX Atlas as the mapping program has now been added to both GMDSS and PCHFDL Display. DX Atlas is of course a commercial program, so this option is only available to users with the program.

Aircraft not in the DB are now indicated in red in the grid and an 'In DB' column added which gives Yes or No for this entry.

Please note that I have changed all modules to remove any preceding zeros in flight numbers and in the Flights.txt file, e.g. QF0001 will appear in all cases as QF1 this is because, even in the same airline, not all aircraft equipment is coded in an identical fashion, so some might show as QF0001 and others as QF001

The MultiPSK aviation modules for ACARS-VDL2, HFDL and GMDSS have all been rewritten to read their data from the MultiPSK\QSO folder log files rather than using the TCP/IP streams which were somewhat liable to errors. Since Patrick rewrote MultiPSK's QSO system to allow the QSO file to have a 'Regular back-up at 1 minute intervals' the logs are correctly written every minute, so the above 3 modules now read these logs at 1 minute intervals in the same manner as the PC-HFDL logs have always been read.

To accomplish this, it is therefore necessary for all users to use MultiPSK v4.34.1.4 or later and to set up the QSO files to be read at 1 min intervals (20 second intervals for the AERO option if reading multiple frequencies). It is also necessary to set up the paths to MultiPSK\QSO files In the Options menu of each of the above modules.

The ACARS-VDL2-Display and AERO-Display modules now use Tomasz Lemiech's 'libacars.dll' file and its associated modules. This enables the program to decode .ADS .AT1 and .CR1 sections of code within ACARS messages if they exist thus giving a greater amount of detail than was available from the 'human readable' sections of the messages. I have also added code to read the destination or origin of these ACARS messages where they are in the format such as MELCAYA - Melbourne airport.

Any queries or suggestions, please contact me at - virtualtrains@tpg.com.au

## Notes about this new version  Display-Launcher Sept 2019

## Installation - Windows 7 or 8.1 or 10

1. Unzip to a temporary folder and run the Installer
2. If you wish, make a desktop icon pointing to Display-Launcher.exe
3. Click on the above icon and you are off and running.
4. Read the Help file…….

## DESCRIPTION OF FOLDERS:-

1. GOOGLE - This folder will hold .kml files when you select an option to display position reports on Google Earth. Each .kml has a sequentially numbered file name so you can go back and check displays at a later date. If you use the Google Earth view option frequently, this folder might get very large, so you should clear unwanted entries from time to time.

2. LOGS - Some of the utilities save log files of data received from MultiPSK in this folder. The AllHeard.csv file is also held in this folder.

3. REPORTS - Here you can save Grids at any time during the day and name them as you wish, these can be reloaded for further checking at a later time.

4. GMDSS - Each ship copied by GMDSS-Display is added to the GMDSS\Ship Data\ShipData.txt file the first time it is heard.

CoastStations.txt and MMSI Country Codes.txt - Up to date lists of coast radio stations and country codes for use with GMDSS-Display.

The GMDSS\Ship Logs folder contains files listing Coast Stations heard and Coast Stations called each day.

5. TEMPLATES - This folder contains various files and databases used by the utilities. Do not edit or delete any of these files unless the entries below say it may be edited.

A) Files with the word 'Start' in them are templates used to produce .kml files for use with Google Earth.

B) Airlines.txt - A tab delimited list of 3 then 2 letter airline flight prefixes followed by the airline name - used by all the ACARS utilities, both HF and VHF - you may edit this file

C) Flights.txt - A list of airline Flight numbers and routes in 3 letter IATA format. As extracted from the Yahoo PP-Logs-and-Routes forum files section - users who prefer the 4 letter ICAO format may extract this themselves using the utility in the Tools section. The provided Flights.txt also includes several hundred routes I have added myself from this year's Qantas timetable and other sources

D) Aircraft.txt lists all aircraft in the format :- ICAO hex, Rego., Aircraft Type, Airline

This contains a list of most airliners likely to be using Mode-S, HFDL, Acars & VDL2 this list is extracted from my recent Basestation.sqb file . A tool is provided to extract suitable data from your Basestation.sqb file if you have one which includes aircraft not in this file.

6. INVALIDREGO.txt - This file can be used to correct registrations which are incorrect in some modes, e.g. U.S. Military aircraft in HFDL mode use rego like 60021B instead of 86-0021. Also you might see aircraft chartered with temporary calls like OO-TNF which was actually G-GDFE. Users may edit this file.

7. Aircraft-User.txt - is a file which the user can add extra data of their own to rather than resorting to editing the main Aircraft.txt file. This file is read during the program start-up following the reading of the Aircraft.txt file.

8. Flights-user.txt - like the above Aircraft-User.txt file, this is a user editable addition to the Flights.txt file to which you can add your own data.

# HFDL-Display for MultiPSK

This utility reads the HFDL QSO file from MultiPSK (PRO version only) and displays the aircraft details from each message received on a spread-sheet type grid. The utility is capable of reading the output from 4 copies of MultiPSK simultaneously, giving the possibility of monitoring four ground station freqs at once.

## RUNNING THE PROGRAM

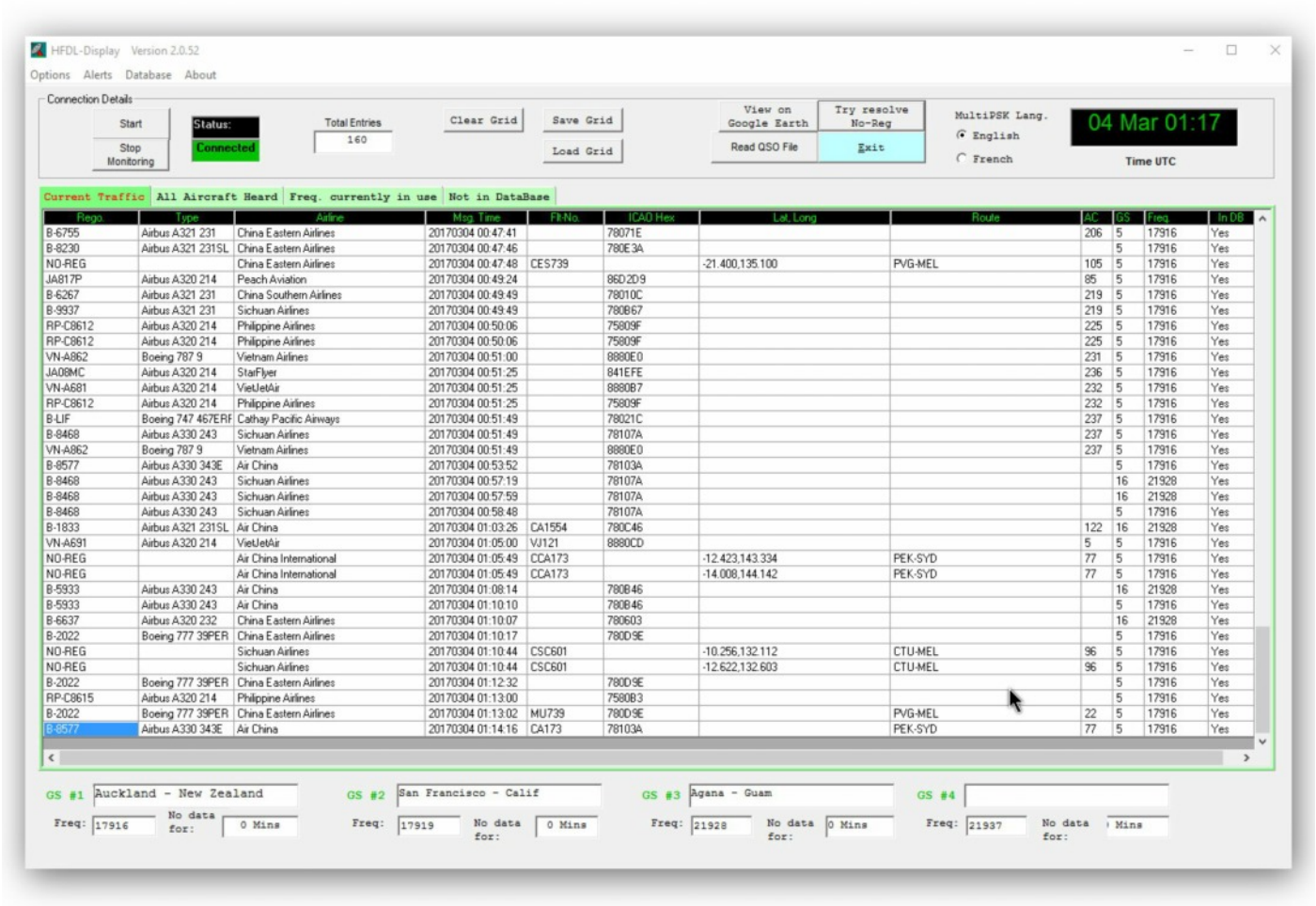
1. If you only have 1 receiver, then run MultiPSK as usual and select HFDL from the Pro menu.

2. Tune your receiver to one of the HFDL freqs. And make sure that the buttons SPDU, MPDU, LPDU and HFNPDU are depressed in MultiPSK and that the paths to the MultiPSK QSO logs are set in the Options menu.

3. Run HFDL-Display and click Start in HFDL-Display and the messages from MultiPSK should appear in the HFDL-Display window.

4. If you have multiple copies of MultiPSK then you can set up to 4 of them so that each reads a different frequency. As each new aircraft is heard, it is added to the file 'Logs\AllHeard.csv' and it appears on the grid on the 'All Aircraft Heard' tab. This list is further described in a following page.

The screen should now look like the following:-



# ACARS-VDL2-Display for MultiPSK

This utility reads the ACARS(VHF) and VDL2 output from MultiPSK (PRO version only) and displays the aircraft details from each message received on a spread-sheet type grid. The utility is capable of reading the output from 6 copies of MultiPSK simultaneously, giving the possibility of monitoring say 4 ACARS freqs and 2 VDL2 freqs simultaneously if you have a SDR receiver like the SDRPlay RSP2 or similar.

**RUNNING THE PROGRAM (First time)**

1. Go to the options menu on the main screen and enter the paths to each copy of MultiPSK you are using. I suggest you install a single copy of MultiPSK in a folder named MultiPSK1 and then copy this folder up to 6 times, naming them MultiPSK2, MultiPSK3 etc and if using Virtual Audio Cards, associate VAC1 with MultiPSK1 and so on. This makes it easier to set things up.

2. Enter the frequencies of your normal ACARS and VDL2 stations in the boxes at the base of the main screen.

3. You may also 'Select site for photos' from the options menu, this allows you to see aircraft photos of any Rego. You click on from a selection of air-photo web sites. You can also select whether you save the ACARS text from VDL2 messages which contain ACARS text. This is shown on the ACARS text tab on the main screen. You may wish to ignore this text to save processing time/memory.

All of the above settings are saved in Display-Launcher\AV2_Options.txt so you only need to do this once.

**RUNNING THE PROGRAM**

1. If you only have 1 receiver, then run MultiPSK as usual and select ACARS(VHF) or VDL2 from the Pro menu.

2. Tune your receiver to one of the ACARS or VDL2 freqs. Then click the 'Start' button in ACARS-VDL2-Display and the status box should show 'Connected' and the program will read the MultiPSK\QSO folder logs every minute or so to grab new data and all traffic will appear in the ACARS-Display window.

3. If you have multiple receivers then run multiple copies of MultiPSK, do as above and as long as you have set up the correct paths in the ACARS-VDL2-Display/Options menu, then data will flow as above. Ensure that you enter the correct freqs for each RX in the boxes at the bottom of the screen.

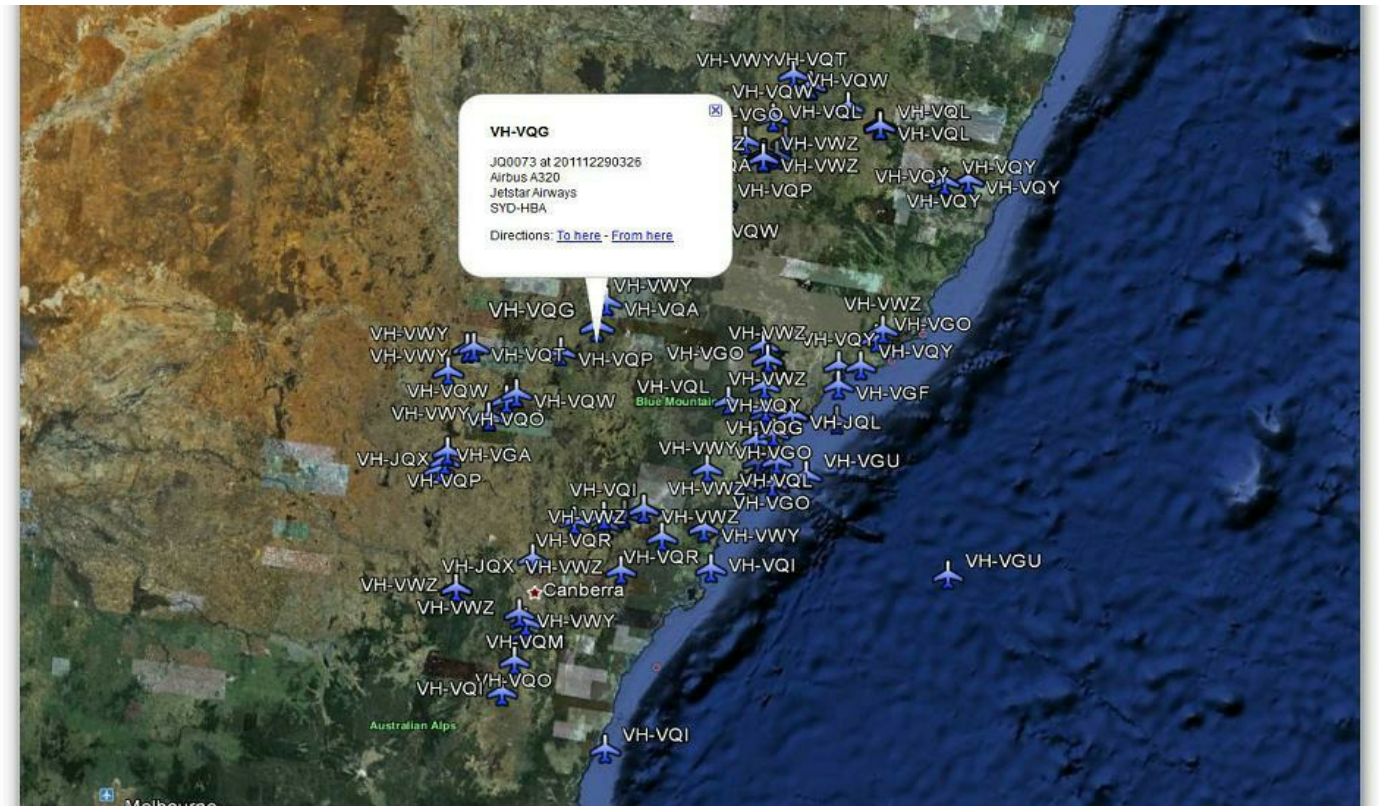
Note: Clicking on any aircraft rego. In the first column will take you to the web site selected in the Options menu and show you full details and usually a photo of the aircraft in question, along with details of the route being flown.

The buttons 'Show ACARS text' and 'Show VDL2 text' display ACARS text contained within the messages, these messages are decoded using libacars to show the content of encoded messages such as .ADS .AT1 and .CR1 types giving a lot of extra details about the flights concerned.

As each message is received, it is searched for the aircraft's IATA code, Flight No. and Registration. The details are supplemented from the databases and added to the spreadsheet grid, along with other details from the message and the Position of the aircraft if this is included in the message.

The databases of IATA and ICAO codes, aircraft registrations and routes are held in the Templates sub folder in text files which the user can edit. The main Aircraft.txt file was extracted from my 'Basestation.sqb' file. If you have your own Basestation.sqb file, then there is a utility under 'Tools' on the startup screen which can be used to extract your own data.

If you have a number of Position entries in the spreadsheet, you can view them on Google Earth by simply clicking the 'View on Google Earth' button and they will appear as under. Clicking the icon for an aircraft will display the details from the entry. Where there several entries for the same aircraft they will be displayed as a coloured line track.




The program runs using UTC time.

At 2400 UTC, the program should save the grid automatically and clear the grid to start a new days traffic. If you have to close your system down, then restart it in the same 24 hour period, it will automatically read your MultiPSK/QSO log files and repopulate the grid before reading any new data. New messages will then be added to the bottom of the grid.

The messages in VDL-2 format only show the aircraft's registration and/or flight number if they include ACARS data, otherwise the only identification is the ICAO hex code. The program therefore needs a valid Aircraft.txt file in the Templates folder. The Aircraft.txt contents are in the format:-

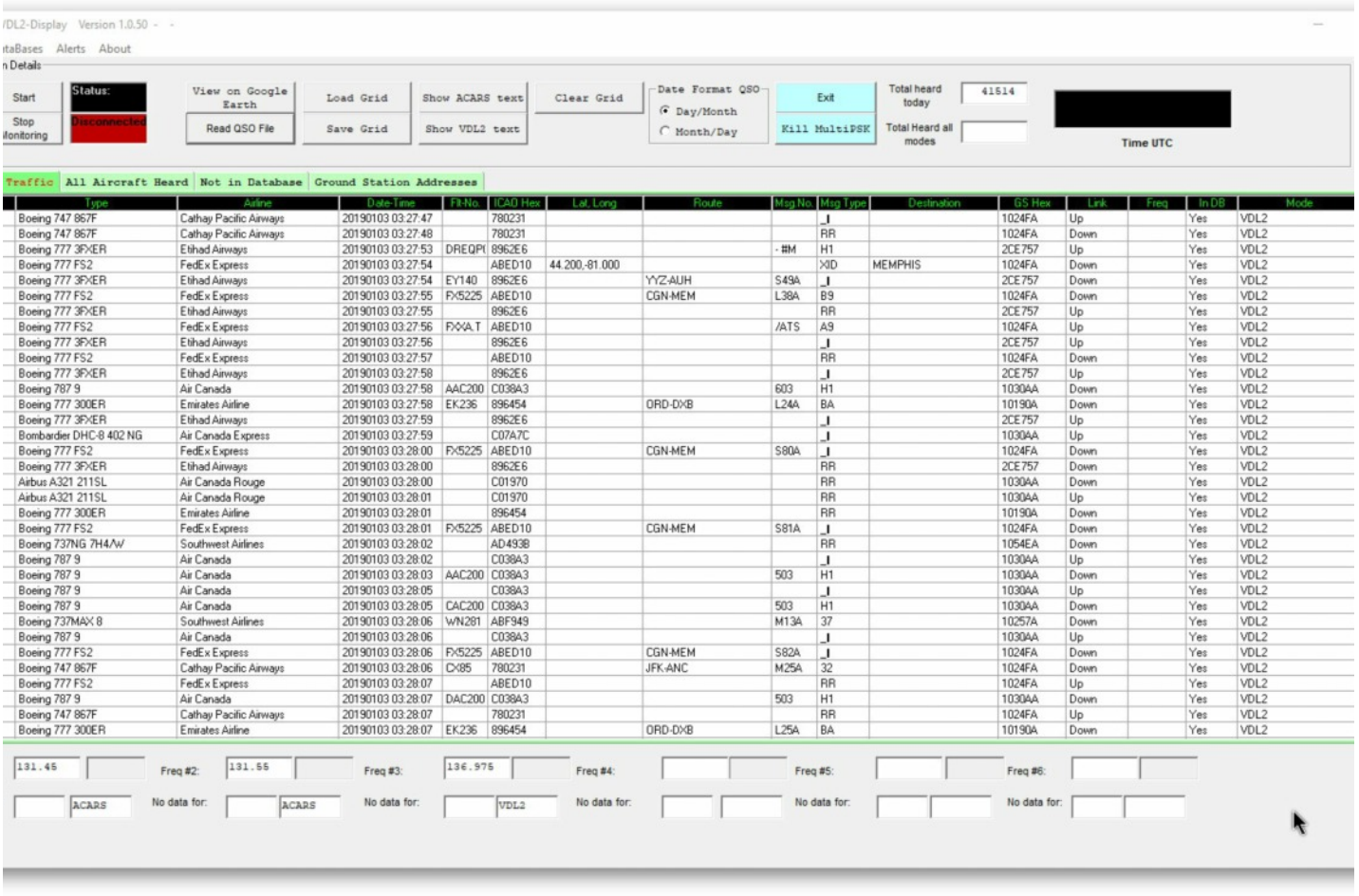
ICAO, Registration, Aircraft Type, Airline, e.g. 7C6D22,VH-VUC,Boeing 737-8FE/W,Virgin Australia

I have included such a file with the program, which covers commercial aircraft seen worldwide. For those users with a suitable Basestation.sqb file, the Tools button on the main Display-Launcher form includes utilities to extract all of the aircraft from this file into Aircraft.txt

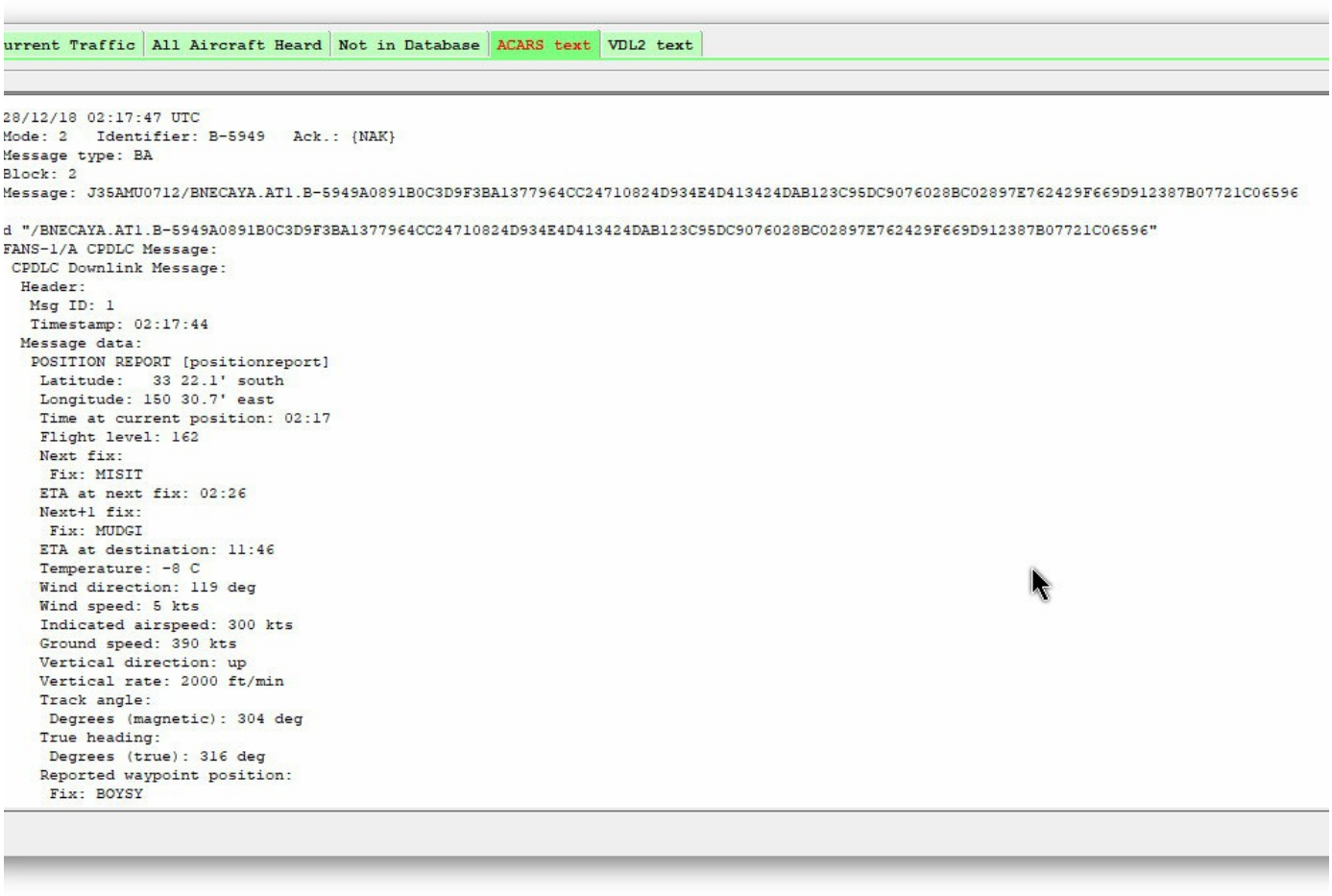
Similarly you may need to update the Flights.txt file to include route details for flights in your own area.

The column 'Destination' uses the file IATA.csv to convert 4 letter airport codes into understandable destinations where these are shown in the message, e.g. YSSY is shown as Sydney Intl. Please note that these airport names are truncated in some cases, you can edit the file to expand them if you wish, but there are just too many to do the whole thing by hand.

Note: All VDL-2 transmissions worldwide were originally sent on 136.975 MHz - in some areas with a lot of traffic on this channel, 136.875 MHz and 136.775 MHz have recently also come into use, mainly in Europe and others are also being seen, so for this reason I have modified the program to allow for up to 6 copies of MultiPSK to be checked, each on a different frequency.



MultiPSK does not decode the data strings within the ACARS sections of ACARS and VDL2 messages. Recently, Tomasz  Lemiech has released new software libacars.dll with permission for it to be used within other programs providing the various files he included with it are all included. All of his files are now included with Display-Launcher and they are linked into the ACARS-VDL2-Display module and allow for all .ADS, .CR1 and .AT1 messages (both uplink and downlink messages) to be decoded where they appear in ACARS or VDL2 messages. These decodes are displayed on the ACARS text and VDL2 text tabs of my program as under:-




As you can see, these decodes show a lot more detail of the flight than the basic ACARS text shows.

I intend to include the possibility of decoding the ACARS data streams from some other modes in later versions of my program.

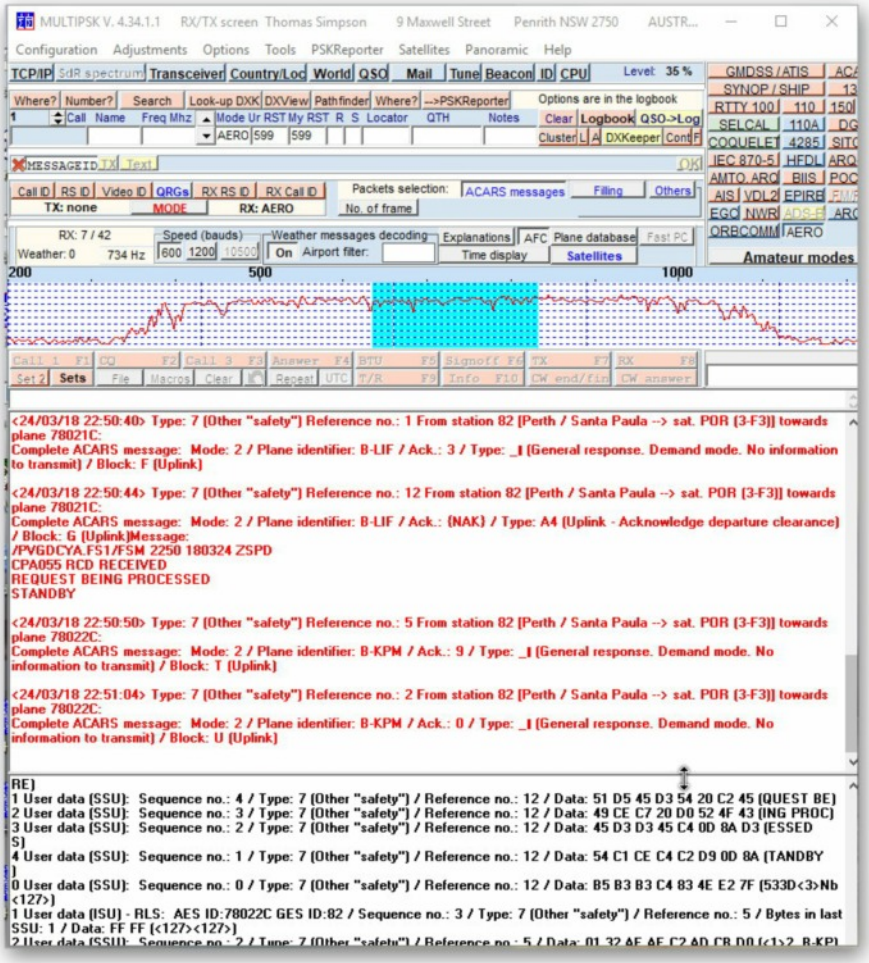
# AERO-Display

This module allows for the display of ACARS messages received with MultiPSK from L-Band satellite transmissions via the Inmarsat satellites to be displayed on a grid. These transmissions are in the 1545Mhz band and require a suitable satellite antenna and LNA to receive them. I use a ‘Patch’ antenna from Outernet but I believe this is no longer available along with a Nooelec LNA specific to the 1545MHz band. Other patch antennae should be available if you try Google and there are alternative antenna models available for this band.

You should also note that Inmarsat are in the midst of changing the satellites they use for ACARS traffic, they currently use satellites 3F5, 3F3, 3F2 and 3F1, these will move to 4F3, 4F1, 3F5, 4AF respectively within 2018. A timetable is available from the Inmarsat site.

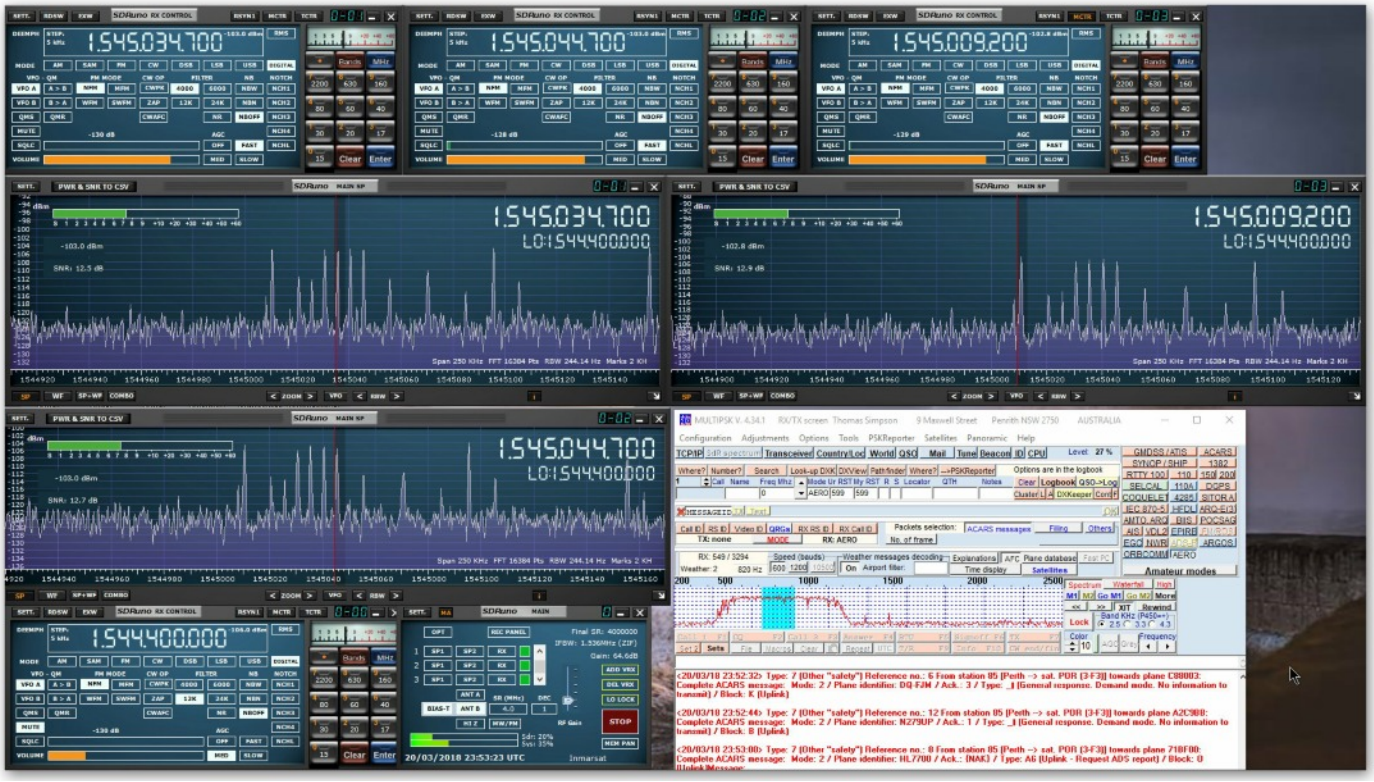
I use the SDRPlay RSP2 receiver with SDRUno software to receive this traffic set to ‘Digital’ with a bandwidth of 4000 Hz and a sample rate of 4MHz, which allows me to cover the whole band used for ACARS. This RX also has a Bias-T output which will power the LNA over the co-ax cable. Any other RX with similar specification should be usable (e.g. Airspy with SDR# software ). The output from the RSP2 is routed via Virtual Audio Cable to MultiPSK - I currently run 3 copies of MultiPSK and have the SDRUno software set to cover the frequencies 1545.010, 1545.035 and 1545.045 and these are fed via 3 VACs to 3 copies of MultiPSK, however depending upon your PC, the software is capable of handling up to 10 copies of MultiPSK simultaneously.

Set each copy of MultiPSK in its ‘Configuration’ screen so that its ‘Sound Card (Input)’ is linked to the corresponding ‘Output’ device of the VRX chosen in the RSP2. I have set my MultiPSKs up in 3 folders named MultiPSK-1,2 and 3 - then use VAC1,2 and 3 for the sound cards to avoid confusion.

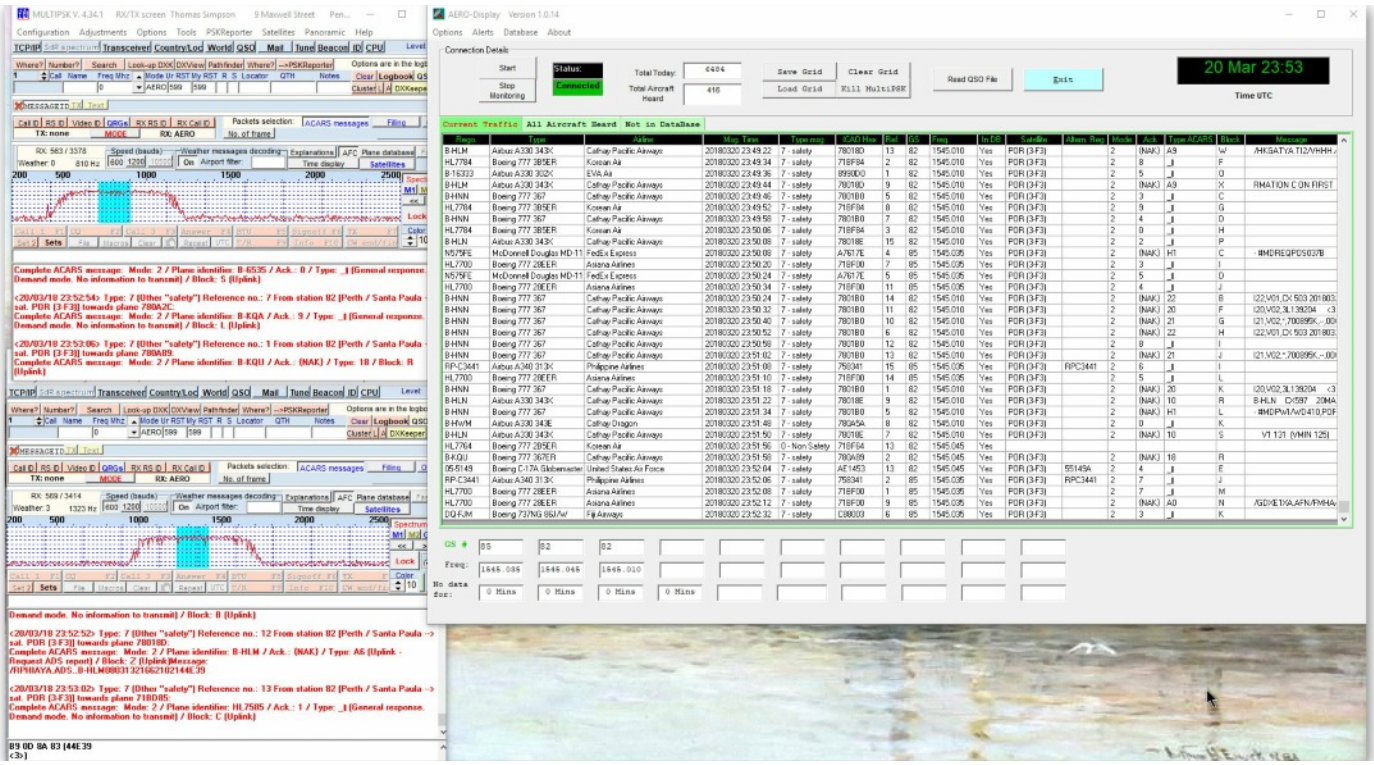


Each copy of MultiPSK should be set up as in the illustration above, with AERO selected, also make sure AFC is selected and Spectrum is shown. Speed is normally 600bauds, however some freqs do use 1200bauds. To use with AERO-Display, you must set the MultiPSK QSO setting to ‘Regular Backup 20 seconds’ using the buttons in the bottom left of the QSO screen.

Tune your radio so that the Spectrum display is similar to the above and the blue region should move to the centre of the curve. You may find that as your RX heats up that you need to retune it by a few Hz to keep receiving traffic.



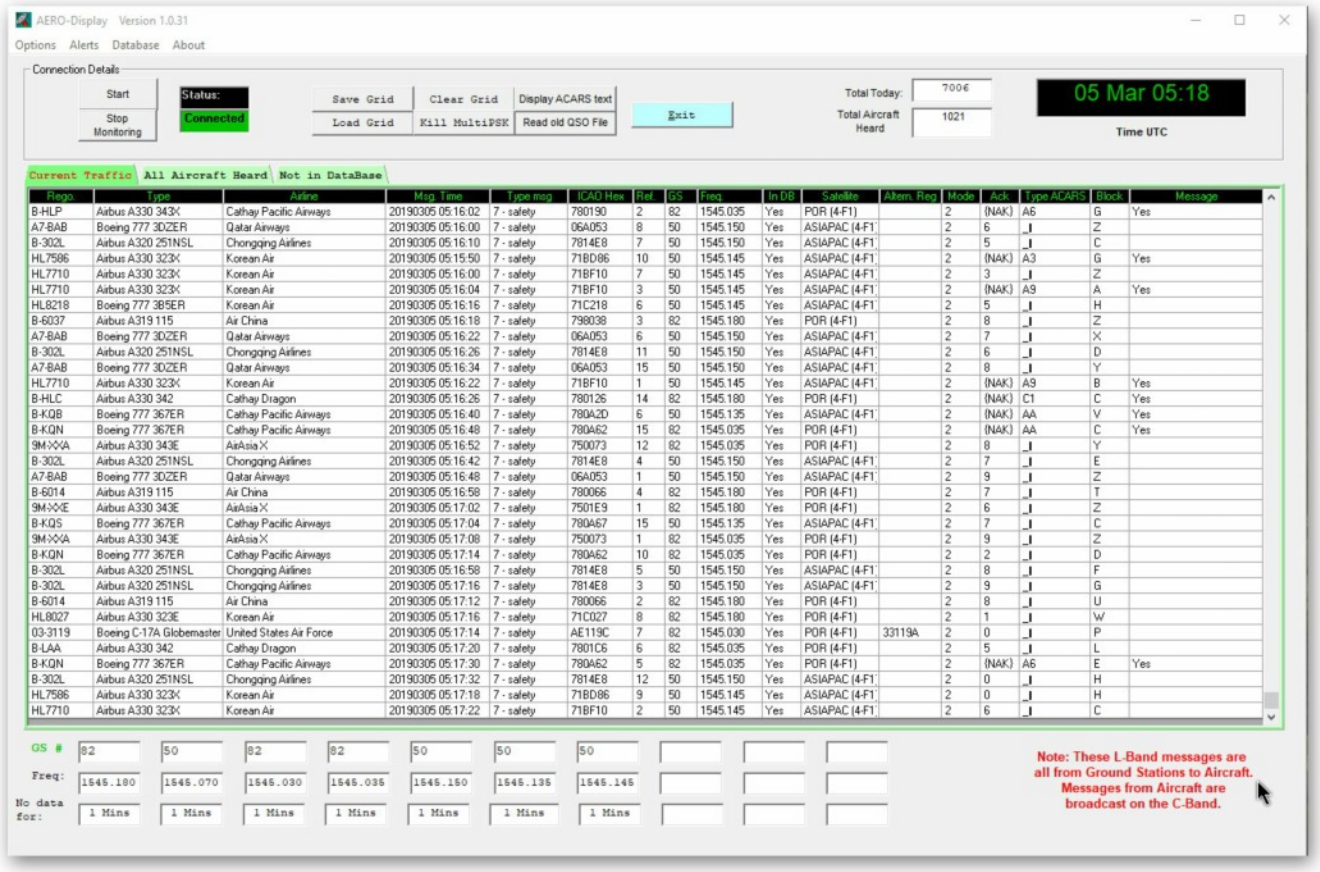
The above shows SDRUno receiving 3 ACARS frequencies along with one instance of MultiPSK. The next picture shows the data on the AERO-Display grid along with the other 2 copies of MultiPSK - I use two 27”



Monitors to get enough screen space for all of this detail, 3 monitors would probably be better and allow for easy viewing of more copies of MultiPSK.

Most of the columns in the grid are identical to the other modes available in Display-Launcher except that there are columns to show ACARS messages received (you may need to stretch the window to see all of this column), and a new column ‘Altern.Reg’ - this column displays the aircraft registration received in the ACARS message where it is not the same as the one in the Aircraft.txt database. This mainly occurs with USAF (and Australian air force) aircraft where the database shows the full tail number, e.g. 05-5149 and the ACARS messages shows it as 55149A, similarly some civil registrations like RP-C3441 appears as RPC3441.

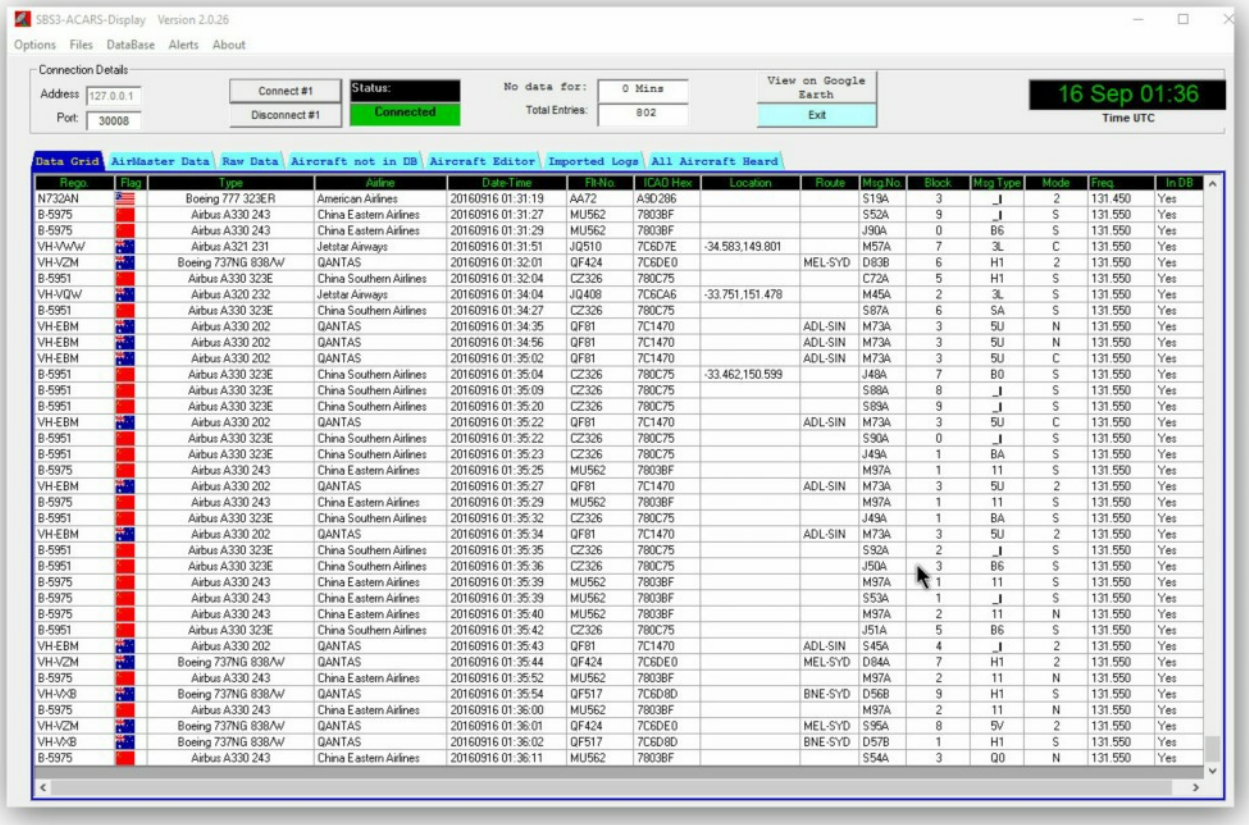
Before starting the program for the first time the user must go to the Options menu and enter the path to the QSO folder for each of the copies of MultiPSK he is using. Also each of the ACARS frequencies being used have to be entered manually in the Freq. row at the bottom of the screen. (It is not possible to read the frequencies from the RX automatically). The details are however saved for subsequent use of the program.




The button ‘Display ACARS text’ displays the text part of each message which includes readable ACARS text and where possible messages decoded through ‘libacars’.

# SBS3-ACARS-Display

The Kinetics SMS-3 receiver outputs ACARS data as a TCP-IP stream through port 30008. This program works like the other ACARS display modules, but displays a Freq. Column as well as the SBS-3 is capable of reading 4 ACARS channels at once and does send the Freq. Data through the TCPIP stream.



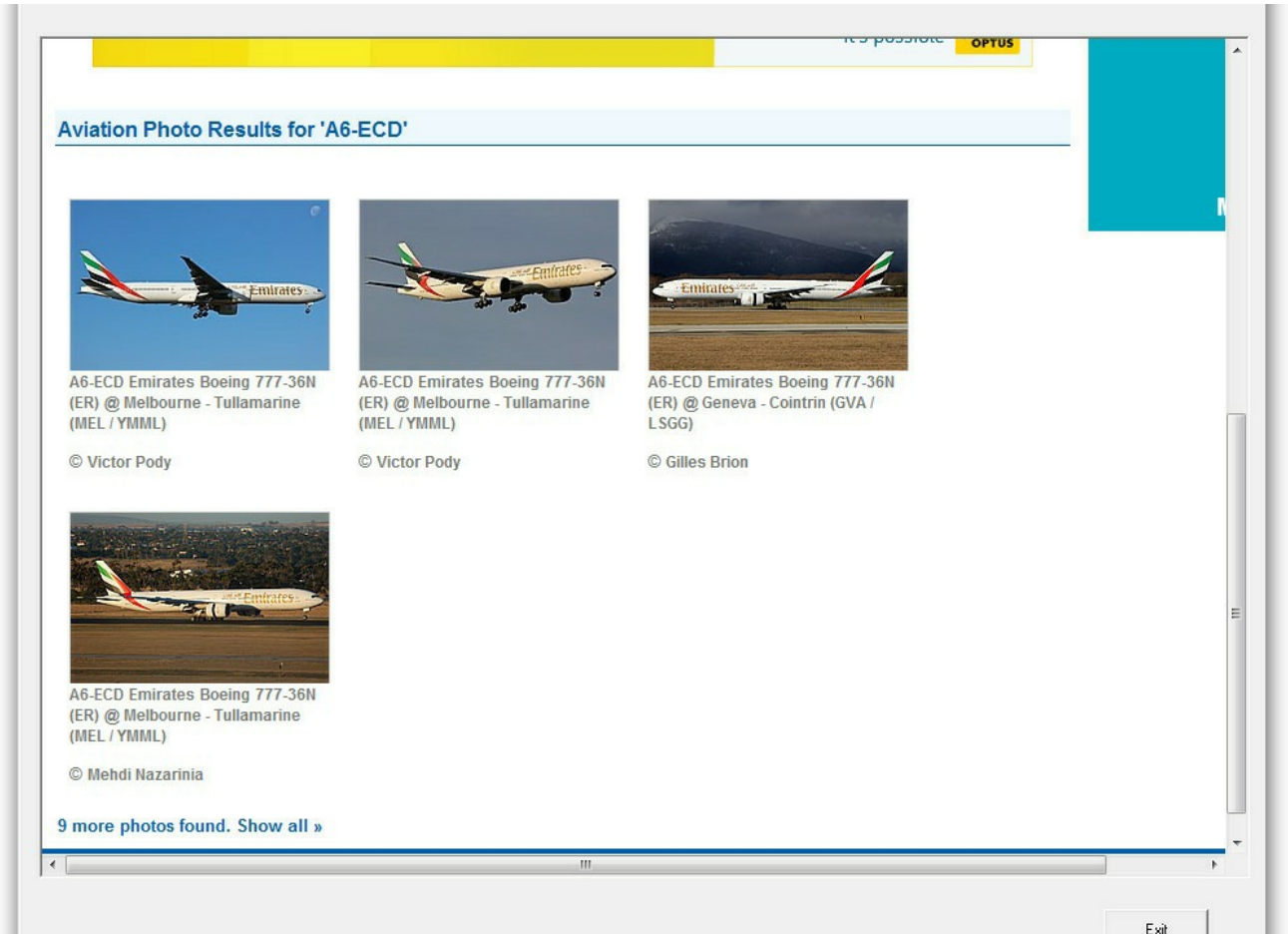

| Rego. | Flag | Type | Airline | Date-Time | Flt-No. | ICAO Hex | Location | Route | Msg.No. | Block | Msg Type | Mode | Freq. | In DB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N732AN | | Boeing 777 323ER | American Airlines | 20160916 01:31:19 | AA72 | A9D286 | | | S19A | 3 | _I | 2 | 131.450 | Yes |
| B-5975 | | Airbus A330 243 | China Eastern Airlines | 20160916 01:31:27 | MU562 | 7803BF | | | S52A | 9 | _I | S | 131.550 | Yes |
| B-5975 | | Airbus A330 243 | China Eastern Airlines | 20160916 01:31:29 | MU562 | 7803BF | | | J90A | 0 | B6 | S | 131.550 | Yes |
| VH-VWW | | Airbus A321 231 | Jetstar Airways | 20160916 01:31:51 | JQ510 | 7C6D7E | -34.583,149.801 | | M57A | 7 | 3L | C | 131.550 | Yes |
| VH-VZM | | Boeing 737NG 838/W | QANTAS | 20160916 01:32:01 | QF424 | 7C6DE0 | | MEL-SYD | D83B | 6 | H1 | 2 | 131.550 | Yes |
| B-5951 | | Airbus A330 323E | China Southern Airlines | 20160916 01:32:04 | CZ326 | 780C75 | | | C72A | 5 | H1 | S | 131.550 | Yes |
| VH-VQW | | Airbus A320 232 | Jetstar Airways | 20160916 01:34:04 | JQ408 | 7C6CA6 | -33.751,151.478 | | M45A | 2 | 3L | S | 131.550 | Yes |
| B-5951 | | Airbus A330 323E | China Southern Airlines | 20160916 01:34:27 | CZ326 | 780C75 | | | S87A | 6 | SA | S | 131.550 | Yes |
| VH-EBM | | Airbus A330 202 | QANTAS | 20160916 01:34:35 | QF81 | 7C1470 | | ADL-SIN | M73A | 3 | 5U | N | 131.550 | Yes |
| VH-EBM | | Airbus A330 202 | QANTAS | 20160916 01:34:56 | QF81 | 7C1470 | | ADL-SIN | M73A | 3 | 5U | N | 131.550 | Yes |
| VH-EBM | | Airbus A330 202 | QANTAS | 20160916 01:35:02 | QF81 | 7C1470 | | ADL-SIN | M73A | 3 | 5U | C | 131.550 | Yes |
| B-5951 | | Airbus A330 323E | China Southern Airlines | 20160916 01:35:04 | CZ326 | 780C75 | -33.462,150.599 | | J48A | 7 | B0 | S | 131.550 | Yes |
| B-5951 | | Airbus A330 323E | China Southern Airlines | 20160916 01:35:09 | CZ326 | 780C75 | | | S88A | 8 | _I | S | 131.550 | Yes |
| B-5951 | | Airbus A330 323E | China Southern Airlines | 20160916 01:35:20 | CZ326 | 780C75 | | | S89A | 9 | _I | S | 131.550 | Yes |
| VH-EBM | | Airbus A330 202 | QANTAS | 20160916 01:35:22 | QF81 | 7C1470 | | ADL-SIN | M73A | 3 | 5U | C | 131.550 | Yes |
| B-5951 | | Airbus A330 323E | China Southern Airlines | 20160916 01:35:22 | CZ326 | 780C75 | | | S90A | 0 | _I | S | 131.550 | Yes |
| B-5951 | | Airbus A330 323E | China Southern Airlines | 20160916 01:35:23 | CZ326 | 780C75 | | | J49A | 1 | BA | S | 131.550 | Yes |
| B-5975 | | Airbus A330 243 | China Eastern Airlines | 20160916 01:35:25 | MU562 | 7803BF | | | M97A | 1 | 11 | S | 131.550 | Yes |
| VH-EBM | | Airbus A330 202 | QANTAS | 20160916 01:35:27 | QF81 | 7C1470 | | ADL-SIN | M73A | 3 | 5U | 2 | 131.550 | Yes |
| B-5975 | | Airbus A330 243 | China Eastern Airlines | 20160916 01:35:29 | MU562 | 7803BF | | | M97A | 1 | 11 | S | 131.550 | Yes |
| B-5951 | | Airbus A330 323E | China Southern Airlines | 20160916 01:35:32 | CZ326 | 780C75 | | | J49A | 1 | BA | S | 131.550 | Yes |
| VH-EBM | | Airbus A330 202 | QANTAS | 20160916 01:35:34 | QF81 | 7C1470 | | ADL-SIN | M73A | 3 | 5U | 2 | 131.550 | Yes |
| B-5951 | | Airbus A330 323E | China Southern Airlines | 20160916 01:35:35 | CZ326 | 780C75 | | | S92A | 2 | _I | S | 131.550 | Yes |
| B-5951 | | Airbus A330 323E | China Southern Airlines | 20160916 01:35:36 | CZ326 | 780C75 | | | J50A | 3 | B6 | S | 131.550 | Yes |
| B-5975 | | Airbus A330 243 | China Eastern Airlines | 20160916 01:35:39 | MU562 | 7803BF | | | M97A | 1 | 11 | S | 131.550 | Yes |
| B-5975 | | Airbus A330 243 | China Eastern Airlines | 20160916 01:35:39 | MU562 | 7803BF | | | S53A | 1 | _I | S | 131.550 | Yes |
| B-5975 | | Airbus A330 243 | China Eastern Airlines | 20160916 01:35:40 | MU562 | 7803BF | | | M97A | 2 | 11 | N | 131.550 | Yes |
| B-5951 | | Airbus A330 323E | China Southern Airlines | 20160916 01:35:42 | CZ326 | 780C75 | | | J51A | 5 | B6 | S | 131.550 | Yes |
| VH-EBM | | Airbus A330 202 | QANTAS | 20160916 01:35:43 | QF81 | 7C1470 | | ADL-SIN | S45A | 4 | _I | 2 | 131.550 | Yes |
| VH-VZM | | Boeing 737NG 838/W | QANTAS | 20160916 01:35:44 | QF424 | 7C6DE0 | | MEL-SYD | D84A | 7 | H1 | 2 | 131.550 | Yes |
| B-5975 | | Airbus A330 243 | China Eastern Airlines | 20160916 01:35:52 | MU562 | 7803BF | | | M97A | 2 | 11 | N | 131.550 | Yes |
| VH-VXB | | Boeing 737NG 838/W | QANTAS | 20160916 01:35:54 | QF517 | 7C6D8D | | BNE-SYD | D56B | 9 | H1 | S | 131.550 | Yes |
| B-5975 | | Airbus A330 243 | China Eastern Airlines | 20160916 01:36:00 | MU562 | 7803BF | | | M97A | 2 | 11 | N | 131.550 | Yes |
| VH-VZM | | Boeing 737NG 838/W | QANTAS | 20160916 01:36:01 | QF424 | 7C6DE0 | | MEL-SYD | S95A | 8 | 5V | 2 | 131.550 | Yes |
| VH-VXB | | Boeing 737NG 838/W | QANTAS | 20160916 01:36:02 | QF517 | 7C6D8D | | BNE-SYD | D57B | 1 | H1 | S | 131.550 | Yes |
| B-5975 | | Airbus A330 243 | China Eastern Airlines | 20160916 01:36:11 | MU562 | 7803BF | | | S54A | 3 | Q0 | N | 131.550 | Yes |

To run the program, start the SBS-3 and choose your ACARS frequencies on the Built-in radio control panel and ensure that the ACARS data is being processed. Then start SBS3-ACARS-Display and click Connect. This should respond with ‘Connected’ and the raw ACARS data should appear in the top window and the details in the bottom grid.

Although the program adds the Date/Time in UTC time, please note that it calculates this based on the Local Time of your PC, but can’t automatically distinguish between Daylight Saving and Standard time, so you must select in the Options menu whether you are currently using Daylight Saving time or not. This is saved and only needs to be rechecked when your local time changes.

Another feature I have added is the ability to click on any aircraft registration in the first column and you will automatically be linked to an internet site (assuming your PC is connected to the internet) which will display further details of the aircraft and also photographs where available.

Currently this links to Planespotters.net which seems to include more aircraft than some other sites, however after 40 links you do have to set up a free account to avoid your having to sign in from time to time. There is now an option in the ‘Options’ menu to select from 3 different sites.




From v1.0.32,

1. The buttons to Clear Grid etc have been moved to the Files menu.

2. A new window to display the incoming data in AirMaster format similar to ACARSD has been added.

3. The raw data and the AirMaster data is saved automatically in the logs folder.

4. Option to save list of aircraft not in database.

5. All windows are automatically cleared at 0000z for start of new day.

6. Aircraft not in DB are added to the end of it with code of ‘FFFFFF’ and with maker ‘Unknown’ and type ‘zzzz’

7. An Aircraft Editor has been added to allow manual editing of the database.

8. A new tab and menu item have been added to allow import of raw data from either a previous days logs or from the Kinetic\Basestation\ACARS logs (assuming you have set up Basestation to save ACARS logs).

9. A new tool to allow the import of Aircraft data from Basestation.sqb is included. This puts a file named Aircraft.csv into the Display-Launcher folder. You may add this to the Aircraft.csv file in the Templates folder, (I use Ultra-Edit to do this, sorting the file, and selecting remove duplicates).

# PC-HFDL-Display

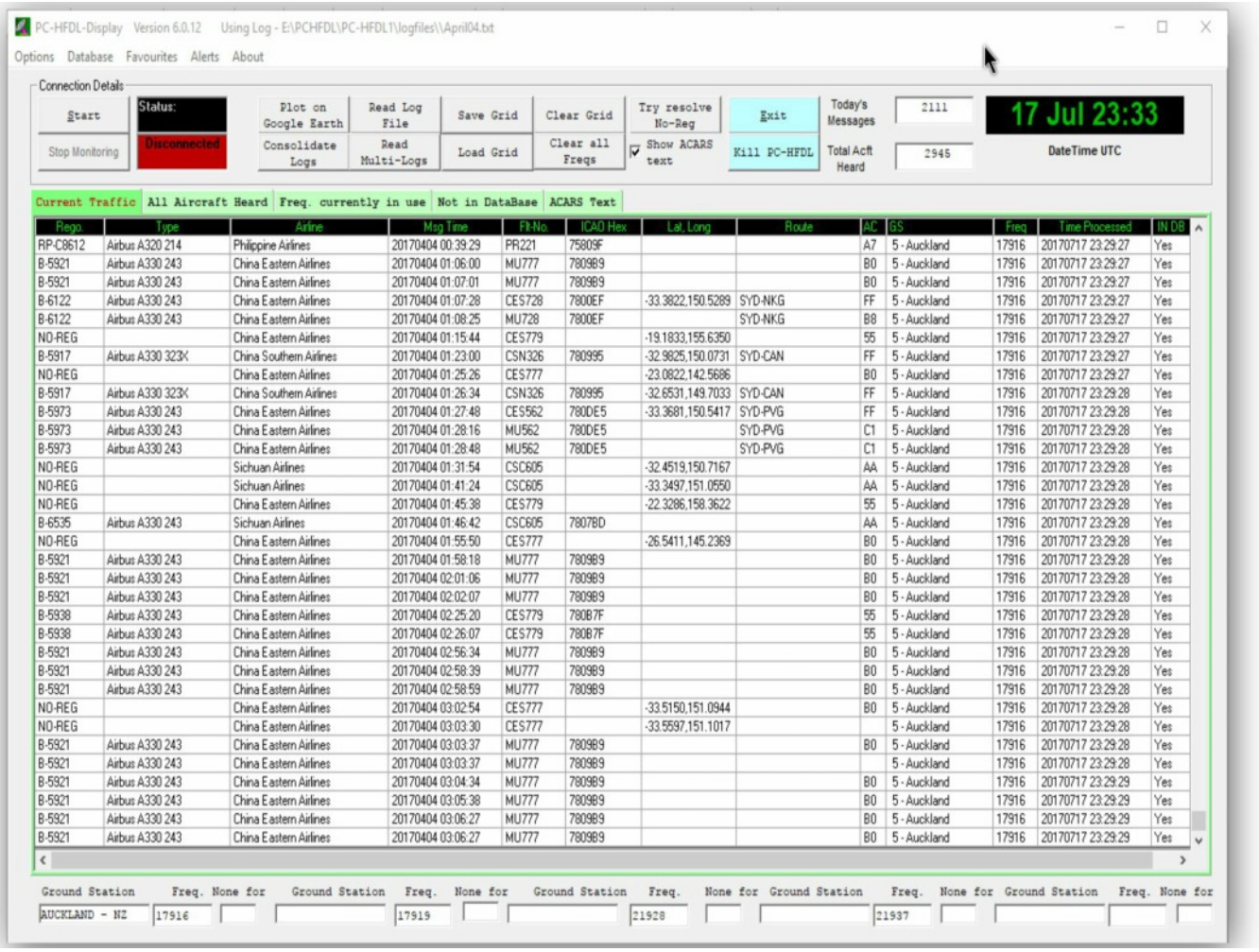
This utility reads the log output from PC-HFDL logfiles and displays the aircraft details of each one heard. The package uses the database of aircraft 'Aircraft.txt' in the Templates folder. It was extracted from my Basestation.sqb file I use with the SBS-3, users can extract their own list from their own Basestation.sqb file if it is different to the one supplied using the option in the 'Tools' area on the main screen. The other databases are a list of airlines named Airlines.txt which shows - Airline 3 letter code, Airline 2 letter code, Airline name. This list is tab separated and will not change very often. Plus a database of routes, users may edit these as they require.

## STARTING THE PROGRAM

Before running PC-HFDL_Display you should ensure that PC-HFDL is running and tune your RX to your strongest local HFDL Ground Station. The first time you run the program, go to the Options menu and select the path(s) to your PC-HFDL logs (if you have multiple receivers, you may run up to 25 copies of PC-HFDL and this program can be set up to check the logs from all instances simultaneously).

**NOTE:** As PC-HFDL-Display extracts data from the PC-HFDL log files, PC-HFDL must be set up by going to the System-Options/Logfile Configuration and ticking the HFDL logging to disk box or this program will not work.

In PC-HFDL, all the boxes in the Display frame must be ticked except H Acars, V Acars and Hex.



1. **Start** - Starts PC-HFDL-Display monitoring the PC-HFDL log file(s) - You have the option to start from the beginning of the day's logs (which might take a considerable time to load), or to start from NOW, I.e. Processing will only occur from the time you click the Start button.

2. **Stop Monitoring -** Stops the program monitoring the logs

3. **Plot on Google Earth** - To use this option, click the 'Plot on Google Earth' button and GE will be started automatically and the display appears as under.


You can choose between Red or Blue aircraft icons which display single aircraft plots, coloured lines trace the route of the aircraft where there are multiple plots and red pins indicate Airinc Ground Stations. Click on icons or lines for more details.

4. **Read Log File** - Allows you to re-enter log file data from an earlier date.You must stop monitoring and clear the grid before you read in a historic log file.

5. **Clear Grid** - Clears all entries from the grid

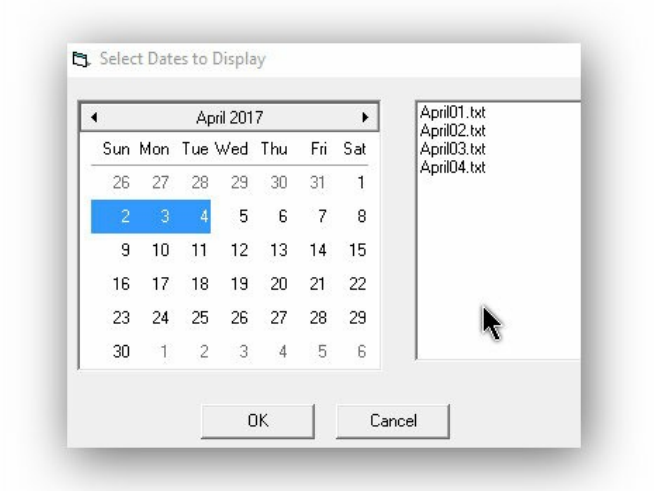
6. **Consolidate Logs** - This option saves each entry as it is received from multiple copies of PC-HFDL and is saved in the Logs folder. This consolidated log will be named the same as the other logs, e.g. June15.txt - This consolidated log may be used as the input log for PlanePlotter. Each entry is prefixed with a Change of Ground station header so it should not confuse Plane Plotter.

**7. Try Resolve NO-REG** - Many messages from aircraft are received with no registration or ICAO hex codes, only a flight number. These are displayed with the registration shown as 'NO-REG'. This option attempts to resolve the registration by checking other entries nearby with the same Flight number and adding any missing data.

**8. Save/Load/Clear Grid** - Should be self evident.

**9. Clear all Freqs -** Will clear all the 'Freq.' boxes at the base of the screen.

**10. Read Multi-Logs -** Allows you to input multiple logs into a single grid and sort them as you wish. This button brings up the following window:-




Here you can select the dates you require to view, they need not be consecutive and can cover month ends, e.g. Mar 31, Apr 1 etc. The names of logs you wish to view are then shown in the list box on the right. On clicking OK all the logs (from up to 25 copies of PC-HFDL) are then read and the data placed in the grid, they will be sorted by the 'Msg Time' column but you can sort on any column once the reading has finished by clicking the grid heading.

**11. Kill PC-HFDL -** I have added this new button, when pressed it closes down ALL running copies of pchfdl.exe currently in memory. This will save you having to close up to 25 copies of PC-HFDL one after the other manually.

**The 5 window tabs on the main screen show:-**

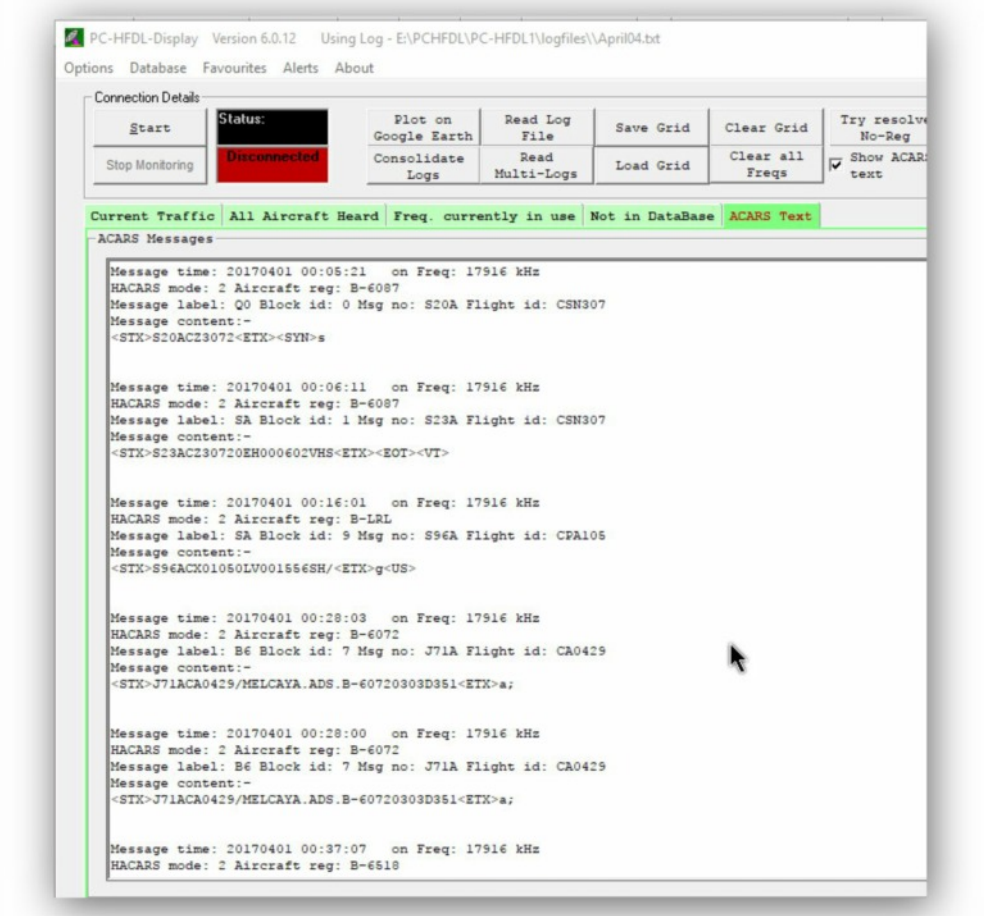
1. Data from PC-HFDL, this will be the same as currently appears on the PC-HFDL screen which may be minimized.

2. A list of Rego. Or ICAO codes heard but not in the database.

3. A list of current frequencies in operation taken from the squitter messages.

4. A grid showing each aircraft heard - time is UTC - grid may be sorted on any column by clicking the title Bar.

5. ACARS Text - If you select the 'Show ACARS text' box then each HFDL message containing ACARS text is shown on this tab. The text can be saved with the 'Save ACARS' button on this tab. It is saved in the Display-Launcher\Reports folder with a name like ACARS-17Apr2017.txt




This version of the program is almost completely rewritten. The grid now contains extra columns:-
AC - This is the decimal value of the Aircraft ID found in the log file (usually in hex)
GS - This is the Ground Station number it was heard on with its name.
Freq - Frequency heard on - it is up to the user to enter the frequencies in the boxes provided as I can't read your receivers frequencies.

Note: Each Ground Station gives new aircraft an ID number between 1 and 254 (255 indicates a Log On/Log Off by an aircraft and does not identify any particular aircraft).
It should also be noted that ID numbers are frequency specific, so if Auckland is working on 13315khz and 10084khz the ID numbers given out are from different lists, I.e. Aircraft ID 123 on 13315 is NOT the same aircraft as 123 on 10084.

The grid may be saved at any time for inspection, it can also be loaded back into the program if you clear the existing grid. Once you restart the program, the existing logs for the day are read back in and you may continue using the program.

If the No Data For… box turns red it indicates the GS is no longer being copied and it would be a good time to change freq.

**Tips**

1. PC-HFDL must be set up as follows:-

a. Logfile Configuration - HFDL Logging to Disk must be ticked

b. **ALL** of the boxes under 'Display' in PC-HFDL must be ticked except H Acars, V.Acars and HEX.

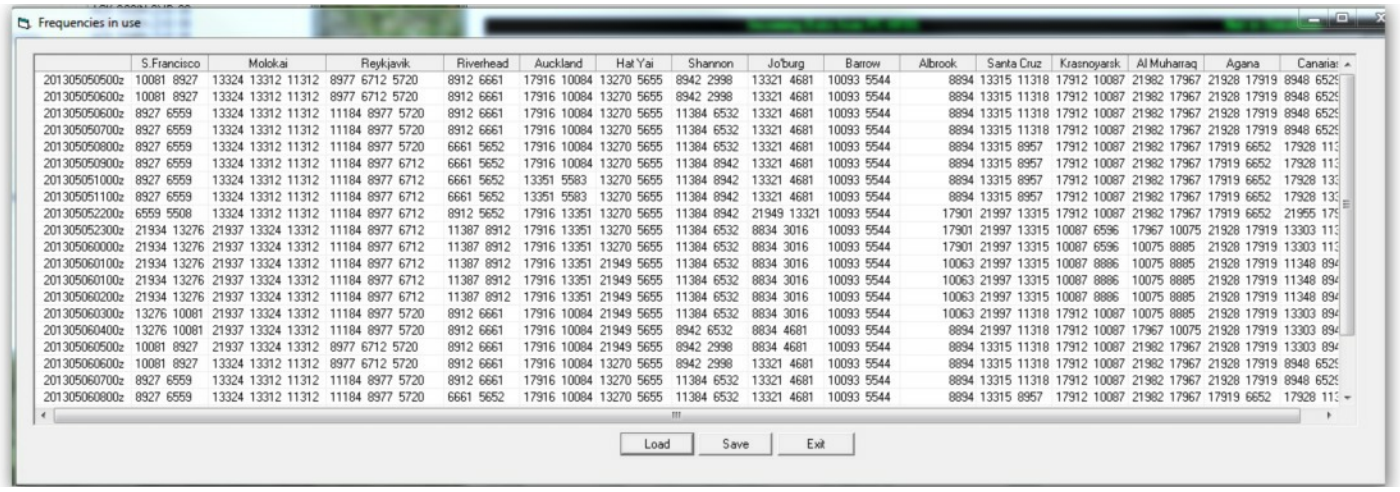
2. If it is necessary to run PCHFDL_Display, then stop it, then start it again. It might take a very long time to catch up with the data. Thus it is much faster to Save Grid before you stop the program, then when you restart it, use the Load Grid button to load the saved grid, this loads your data instantly, then click the START button and choose to only use new data from 'NOW'. This will be appended to the end of the grid you have just loaded.

3. At midnight UTC, your grid will be saved as e.g. PCHFDL_Display\Logs\June24-Grid.csv, you can open this file with a text editor or spreadsheet program for further investigation.

4. As each ‘unknown’ entry is placed on the list, the data from the window is appended to a file e.g. PCHFDL_Display\Logs\June24-Unknown.log which might make it easier for users to find the Unknown entries than having to search through very long log files.

## Show Frequencies in use

This option keeps a log of frequencies used by Ground stations. As each squitter is received the data is added to the window ‘Frequencies currently in use’, this data is now saved hourly to a file with the name Reports\FreqsInUse.csv  this file builds every day, if it gets too large rename it to something like FreqsInUse-May and a new FreqsInUse.csv will be built.
On the Database menu is ‘Show Freqs Used’. Select this menu item and a blank window opens. Use the ‘Load’ button to populate this grid with the days freqs as under:

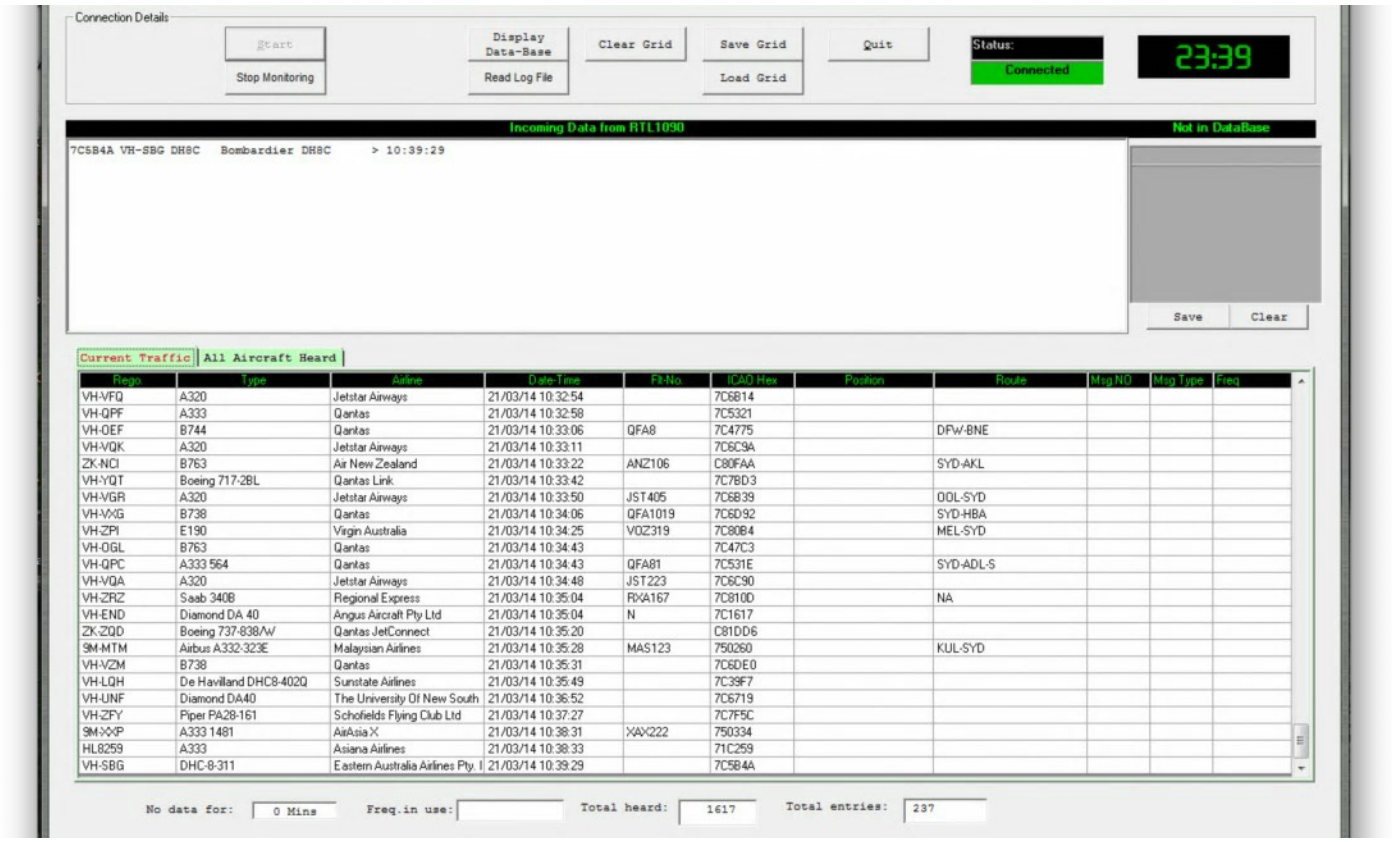



The grid can be saved into Excel or similar spreadsheet program with the Save button and further processed.

# ADSB-Display

ADSB-Display is a module for displaying Aircraft details received using ADSBScope. ADSBScope is a freeware program which can be used by various SDR radios such as a RTL-dongle via either RTL1090, ADSBSharp or SDR# with the ADSB plug-in. ADSBScope decodes the data from these programs and displays the traffic on a map, however it has very limited data on each aircraft.

ADSB-Display reads the ADSBScope log files and extracts the data from then and produces a grid as shown below by extracting the aircraft data from the Templates\Aircraft.txt file:-

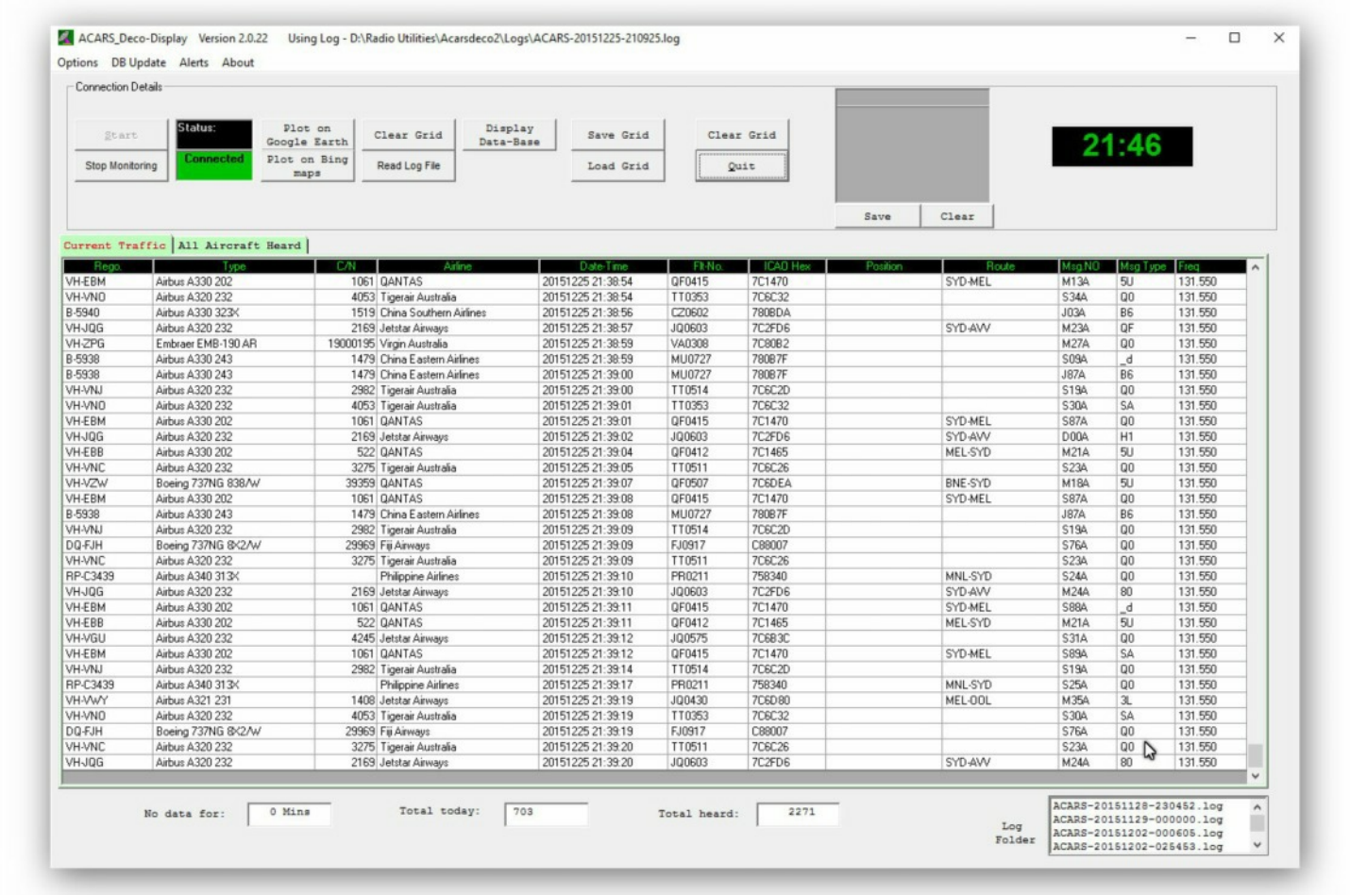



Each new aircraft heard is added to the Logs\AllHeard.csv file.

You will not see any position reports in this mode as ADSBscope does not log these.

# ACARSDeco-Display

I have recently been experimenting with  RTL-Dongles which can be used with the program ACARSDeco2 by 'Sergsero' to decode ACARS traffic. This command line program when correctly set up gives excellent results in decoding ACARS.




Unfortunately although ACARSDeco2 can decode up to 3 ACARS frequencies simultaneously, dongles can only cover around 2.35 MHz at a time, so although it is fine here in Sydney where only 131.55 and 131.45 MHz are currently in use, it can't cover the European frequency range which goes from 131 to around 137 MHz. It does not appear to be possible to run multiple copies of ACARSDeco2 on the same PC, so maybe it is necessary to run on multiple PCs. I will see if I can work out some method of combining data from 2 PCs at a later date.

ACARSDeco2 comes with a basic set of data in its download package in the folder 'datasets' however I have included an up to date set of files in this package which you should use to replace the original files.

ACARSDeco2 runs from a batch file which the user may modify with Notepad to suit his/her own PC, however for use with ACARSDeco-Display, the batch file MUST include a '–logfile' setting to tell ACARSDeco2 where to store its logfiles because this is the data which my program uses to parse for the required data. The following is my batch file (But note that apart from the word 'pause' the remainder is all on one line):-

acarsdeco2.exe --gain 38.0 --freq-correction 59 --freq 131450000 --freq 131550000 --http-port 8090 --net 30009 --logfile "d:\Radio Utilities\Acarsdeco2\Logs\ACARS"

Pause

This batch file will run acarsdeco2.exe on a RTL dongle with the gain set to 38, the freq correction of 59 and listening to freqs of 131.45 and 131.55 MHz sending to the log file in the path shown.

The log files are renamed each time ACARSDeco2 is restarted, with a format like:-

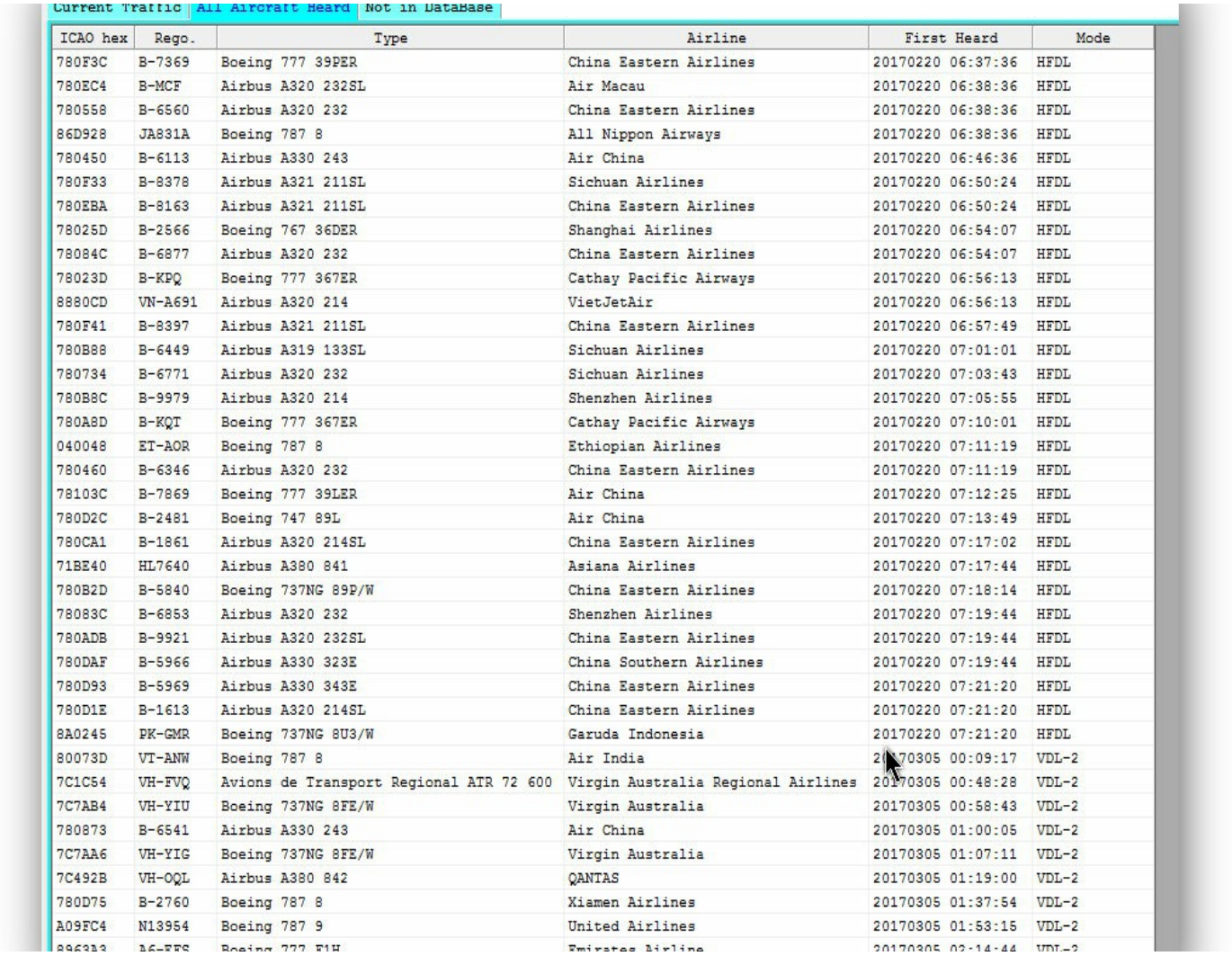
‘ACARS-20151128-000002.log’

ACARSDeco-Display always uses the latest log in the list. And moves on to the new log at 0001 UTC each day automatically.

# The Logs\AllHeard.csv File

As each aircraft is heard, the file AllHeard.csv is searched for it, and if it has not been previously logged in the current mode (e.g. ACARS, VDL-2, HFDL or Mode-S), then it is added to the log. Even if you are running multiple receivers the data from each is added to the single AllHeard.csv file.

The AllHeard aircraft file is loaded into each loaded module of Display-Launcher and can be viewed from the All Aircraft Heard tab (however the version on any one particular module is only updated from those aircraft heard on that module, e.g. if you are looking at ADSB-Display, then it is only updated with Mode-S traffic on screen, however the underlying database is updated from all running modules. Some modules have a DB Update menu item and this will update everything for you.



Current Traffic | All Aircraft Heard | Not in DataBase

| ICAO hex | Rego. | Type | Airline | First Heard | Mode |
|---|---|---|---|---|---|
| 780F3C | B-7369 | Boeing 777 39PER | China Eastern Airlines | 20170220 06:37:36 | HFDL |
| 780EC4 | B-MCF | Airbus A320 232SL | Air Macau | 20170220 06:38:36 | HFDL |
| 780558 | B-6560 | Airbus A320 232 | China Eastern Airlines | 20170220 06:38:36 | HFDL |
| 86D928 | JA831A | Boeing 787 8 | All Nippon Airways | 20170220 06:38:36 | HFDL |
| 780450 | B-6113 | Airbus A330 243 | Air China | 20170220 06:46:36 | HFDL |
| 780F33 | B-8378 | Airbus A321 211SL | Sichuan Airlines | 20170220 06:50:24 | HFDL |
| 780EBA | B-8163 | Airbus A321 211SL | China Eastern Airlines | 20170220 06:50:24 | HFDL |
| 78025D | B-2566 | Boeing 767 36DER | Shanghai Airlines | 20170220 06:54:07 | HFDL |
| 78084C | B-6877 | Airbus A320 232 | China Eastern Airlines | 20170220 06:54:07 | HFDL |
| 78023D | B-KPQ | Boeing 777 367ER | Cathay Pacific Airways | 20170220 06:56:13 | HFDL |
| 8880CD | VN-A691 | Airbus A320 214 | VietJetAir | 20170220 06:56:13 | HFDL |
| 780F41 | B-8397 | Airbus A321 211SL | China Eastern Airlines | 20170220 06:57:49 | HFDL |
| 780B88 | B-6449 | Airbus A319 133SL | Sichuan Airlines | 20170220 07:01:01 | HFDL |
| 780734 | B-6771 | Airbus A320 232 | Sichuan Airlines | 20170220 07:03:43 | HFDL |
| 780B8C | B-9979 | Airbus A320 214 | Shenzhen Airlines | 20170220 07:05:55 | HFDL |
| 780A8D | B-KQT | Boeing 777 367ER | Cathay Pacific Airways | 20170220 07:10:01 | HFDL |
| 040048 | ET-AOR | Boeing 787 8 | Ethiopian Airlines | 20170220 07:11:19 | HFDL |
| 780460 | B-6346 | Airbus A320 232 | China Eastern Airlines | 20170220 07:11:19 | HFDL |
| 78103C | B-7869 | Boeing 777 39LER | Air China | 20170220 07:12:25 | HFDL |
| 780D2C | B-2481 | Boeing 747 89L | Air China | 20170220 07:13:49 | HFDL |
| 780CA1 | B-1861 | Airbus A320 214SL | China Eastern Airlines | 20170220 07:17:02 | HFDL |
| 71BE40 | HL7640 | Airbus A380 841 | Asiana Airlines | 20170220 07:17:44 | HFDL |
| 780B2D | B-5840 | Boeing 737NG 89P/W | China Eastern Airlines | 20170220 07:18:14 | HFDL |
| 78083C | B-6853 | Airbus A320 232 | Shenzhen Airlines | 20170220 07:19:44 | HFDL |
| 780ADB | B-9921 | Airbus A320 232SL | China Eastern Airlines | 20170220 07:19:44 | HFDL |
| 780DAF | B-5966 | Airbus A330 323E | China Southern Airlines | 20170220 07:19:44 | HFDL |
| 780D93 | B-5969 | Airbus A330 343E | China Eastern Airlines | 20170220 07:21:20 | HFDL |
| 780D1E | B-1613 | Airbus A320 214SL | China Eastern Airlines | 20170220 07:21:20 | HFDL |
| 8A0245 | PK-GMR | Boeing 737NG 8U3/W | Garuda Indonesia | 20170220 07:21:20 | HFDL |
| 80073D | VT-ANW | Boeing 787 8 | Air India | 20170305 00:09:17 | VDL-2 |
| 7C1C54 | VH-FVQ | Avions de Transport Regional ATR 72 600 | Virgin Australia Regional Airlines | 20170305 00:48:28 | VDL-2 |
| 7C7AB4 | VH-YIU | Boeing 737NG 8FE/W | Virgin Australia | 20170305 00:58:43 | VDL-2 |
| 780873 | B-6541 | Airbus A330 243 | Air China | 20170305 01:00:05 | VDL-2 |
| 7C7AA6 | VH-YIG | Boeing 737NG 8FE/W | Virgin Australia | 20170305 01:07:11 | VDL-2 |
| 7C492B | VH-OQL | Airbus A380 842 | QANTAS | 20170305 01:19:00 | VDL-2 |
| 780D75 | B-2760 | Boeing 787 8 | Xiamen Airlines | 20170305 01:37:54 | VDL-2 |
| A09FC4 | N13954 | Boeing 787 9 | United Airlines | 20170305 01:53:15 | VDL-2 |
| 8963B3 | A6-EES | Boeing 777 F1H | Emirates Airline | 20170305 02:14:44 | VDL-2 |

Each column can be sorted by clicking on the title bar of the column.

# Alerts

Most of the modules in Display-Launcher now include an Alert system and an Alert Editor on the Menu bar.

You may use the Alert Editor (or any text editor such as Notepad or Wordpad) to type, for aircraft, a list of ICAO Hex codes which must be saved in the Display-Launcher folder as Alert.txt (the Alert Editor automatically saves to this file when you click on OK.

E.g. a list like :-

7c6db9

7c6c27

7c6c32

You may also use the “?” Questionmark symbol as a wildcard to replace any character in the code, e.g. 7C???? Will alert you for any Australian registered aircraft heard, whereas 7C6??? Will alert for codes beginning 7C6, note that there must always be 6 characters.

Will bring up an alert screen when any one of the above is heard in any of the aircraft modules.

A similar file named ShipAlert.txt may be provided for GMDSS-Display where the list is in the form of MMSI codes.

As above the “?” Is the wildcard, so 565?????? Will alert on any Singapore registered ship and you must always show 9 characters for ship MMSI codes.

# GMDSS-Display for MultiPSK

This utility reads the GMDSS output from the MultiPSK (PRO version only) QSO files and displays the ship/shore station details of each message received in a spread-sheet grid. The utility is capable of reading the output from 4 copies of MultiPSK simultaneously, giving the possibility of monitoring multiple frequencies at once.

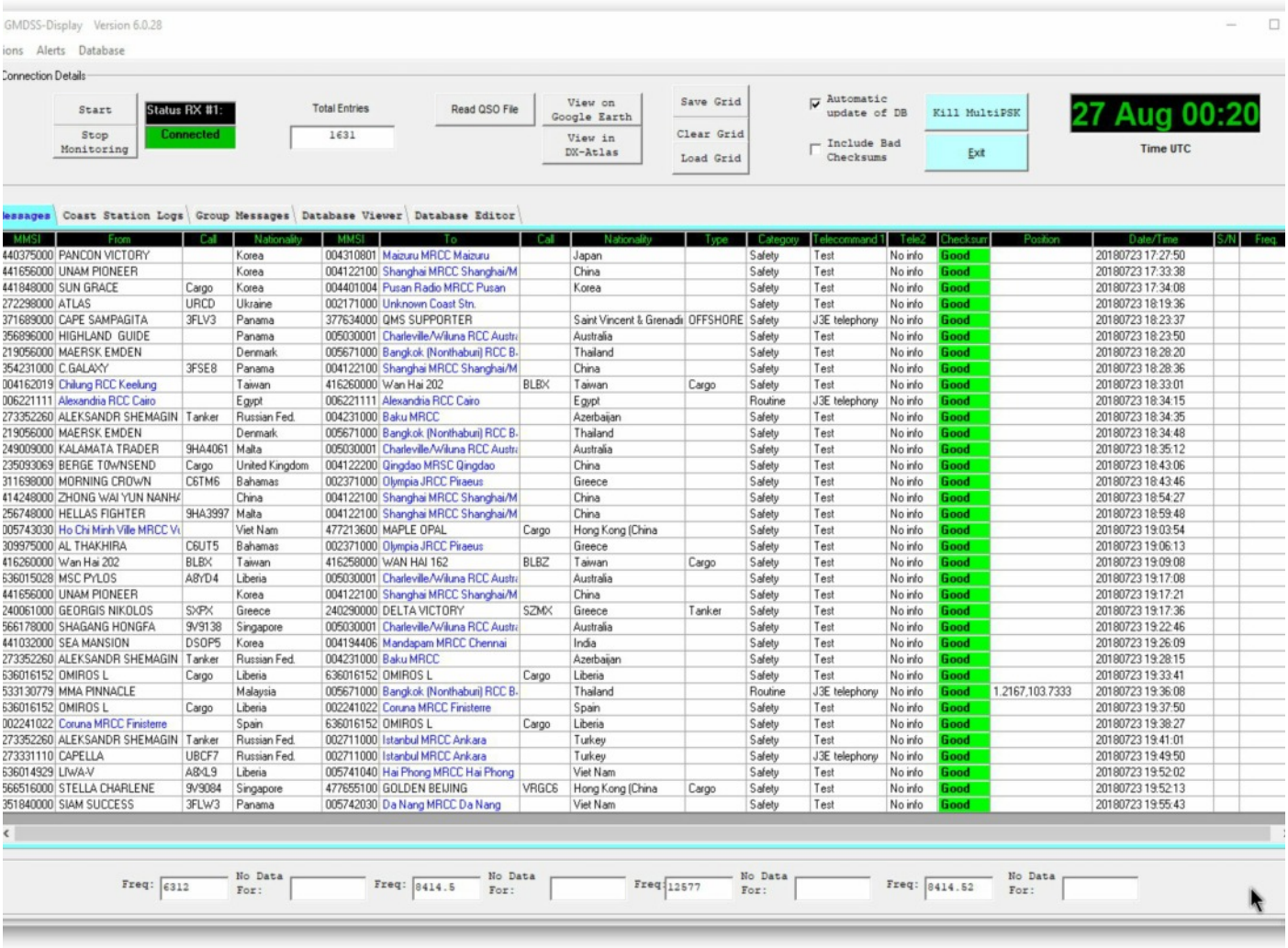
**RUNNING THE PROGRAM**

1. If you only have 1 receiver, then run MultiPSK as usual and select GMDSS from the Pro menu. Ensure that Options/Timestamp is turned off.

2. Tune your receiver to one of the GMDSS freqs. And make sure that the buttons HF and AFC are depressed in MultiPSK and that the QSO option is set to 'Regular Backup 20 sec' this ensures that the QSO file is always up to date.

3. Run GMDSS-Display and click Start and the messages from MultiPSK should appear in the grid of GMDSS-Display. You may now minimize the MultiPSK screen if you wish, all traffic will appear in the GMDSS-Display window.

4. If you have multiple receivers or a receiver capable of covering a large bandwidth such as the SDRPlay RSP2 which will cover 10MHz and can be set in the SDRUno software to have 4 VRX covering a number of the GMDSS frequencies and the corresponding copies of MultiPSK, do as above for each, enter each receiver's frequency in the corresponding 'Freq:' box at the bottom of the screen.



As each message is received, it is searched for the code of the Coast Station and for the ship's code and the details are added to the spreadsheet grid, along with other details from the message and the Position of the vessel if this is included in the message.

The lists of MMSI Country codes and of Coast Station codes are held in the GMDSS\Ship Data sub folder. These are both text files which the user can edit. However note that the Coast Station codes have a comma between the code and station name, whereas the Country Codes need a TAB between. The first number on the first line of each file is the number of entries in the file, so if you add 5 entries, you will need to increment this number by 5 or the last 5 items will not work in the program. Similarly if you delete entries, you must decrement the figure.

In the past, MultiPSK searched the ITU database for the ships name and added it to the incoming message, but this is no longer possible, ITU no longer allows 3rd party programs to interrogate its database. Similarly, MarineTraffic.com and VesselFinder.com tend to block automated extraction of data from their systems. Therefore, ships not in the database are now handled as follows:-

1. MMSI not in database - the MMSI is sent to the APRS.FI site and if it is found there, it is added to the grid along with details of the message. Ship data is also added to the second panel of the DataBase Editor screen. Users can click the 'Add All to DataBase' button to add all data in this panel to the main DataBase file.
2. If the MMSI is not found at APRS.FI it is added to the first panel in the DB editor screen as 'Unlisted', clicking on the MMSI in this screen will open the Browser window and clicking the 'Open vesselfinder.com' button will open your default browser and display vessel details if found. You will have to manually copy this data into the DB Editor screen. You can edit multiple 'unlisted' entries in this manner. When you finish, select each one you have found, then right click it and it will be moved to the 2nd panel. After which clicking the 'Add all to DataBase' will add the item to the DB.
3. If you still have 'Unlisted' MMSI items, you can then try the 'Open MarineTraffic.com' button which will take you to their site from which you can select the 'Vessels' menu and enter the MMSI manually in their search box and press Enter. If found then proceed as above to enter the data. The MarineTraffic.com screen is now very messy but does include data and photos of many vessels. It is unfortunate that all the main sites are now fully commercial - no more free lunches …

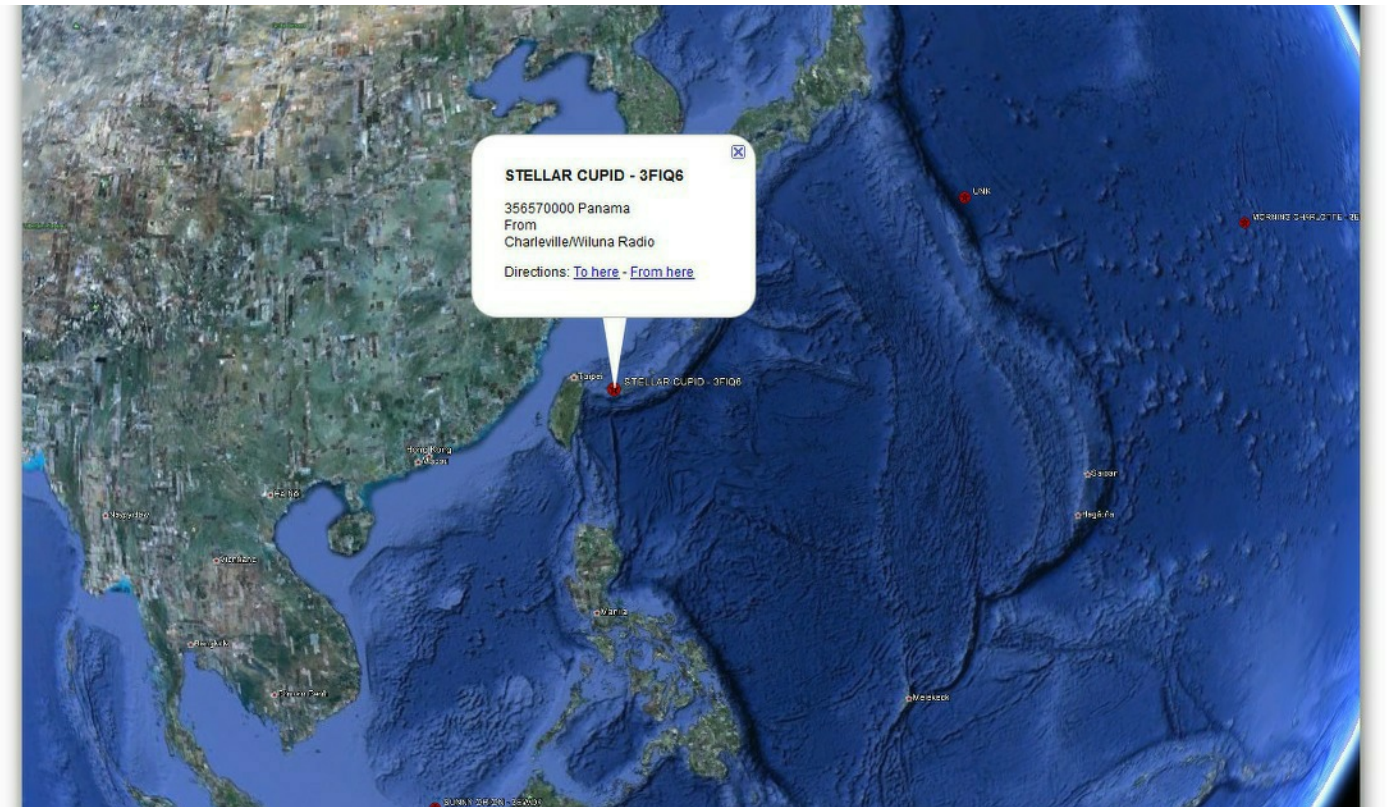
The previous option to just click on any ship's MMSI in the incoming message grid and see a photo of the ship no longer works because of the above, however you can manually open the browser and select the MarineTraffic.com site to look for photos.

## Tabs on main screen

1. Messages - Is the main message grid
2. Coast Station Logs - Has 2 grids, the first one displays those Coast Stations heard calling in the current session. The second one displays those Coast Stations called by ships (or other Coast Stations) in the current session.
3. Group Messages - Displays the text of broadcast messages transmitted by Coast Stations in the current session.
4. Database Viewer - Has 2 grids, the first one will display the whole ShipData.txt file database which lists all ships currently in the DB. This is a view only database, but you can search it for ships. It may also be sorted by columns by clicking for instance on the Ships Name column.
   The second grid is a list of all Coast Stations heard, when first heard and on what frequency. So a CS might be listed several times with different frequencies. This list is updated each time a new CS is heard for the first time.
5. Database Editor - See top of this page for instructions for searching for unlisted MMSI codes and adding them to the ShipData.txt file.
6. Also on the main screen are check boxes 'Automatic update of DB' this is set on by default as this allows for automatic updating by checking the APRS.FI site for unknown codes, but you can turn this off if you work offline or do not wish to use this feature.
   The other one is 'Include bad checksums' which then lists everything heard in the grid, but is not a good idea as this will fill your grid with possibly invalid data as a single character in the MMSI which is incorrect will give a completely wrong ships name or coast station.

.

If you have a number of Position entries in the spreadsheet, you can view them on Google Earth by simply clicking the ‘View on Google Earth’ button and they will appear as under. Clicking the icon for a ship will display the details from the entry:-




NOTES:- The program runs with UTC time.

At 2400 UTC, the program will save the grid automatically and clear the grid to start a new days traffic, if this does not work, you can save it manually. Daily logs are saved in GMDSS-Display\Logs with names like January26Grid.csv - You can load these into the grid with the Load button.

If you have to close your system down, then restart it in the same 24 hour period, you can save the grid before closing down, then reload the grid and continue from where you left off. New messages will be added to the bottom of the grid.

Users with multiple copies of MultiPSK can disconnect from any copy at any time if using the program for some other purpose.

A new column S/N has been introduced, this gives the Signal/Noise ration from MultiPSK during reception of this message.

The Freqs in the boxes under the grid have to be entered manually and are not saved, they are just there as a reminder as to which RX you are using.

The Read QSO button enables you to re-read a MultiPSK QSO from the QSO folder (assuming you are saving these files in MultiPSK).

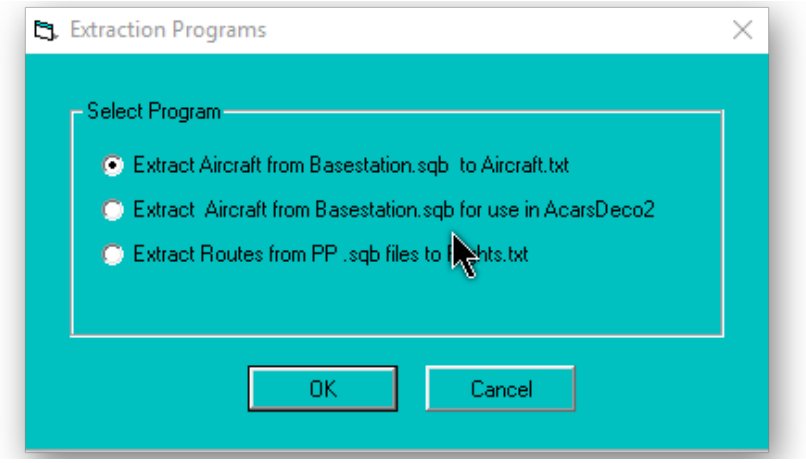
# Tools

The Tools button on the startup-screen now covers 3 tools:-

1. **Extract aircraft from Basestation.sqb to Aircraft.txt -** You may use the copy of any Basestation.sqb file used with the Kinetics SBS-1 or SBS-3 radios, or if you are a user of PBLink you may use the Basestation.sqb file supplied with that program.

2. **Extract aircraft from Basestation.sqb for use in AcarsDeco2** - AcarsDeco2 ships with 2 files in its 'datasets' folder named Aircrafts_p.txt and Aircrafts_s.txt - these quickly get out of date, this utility allows you to extract uptodate data from your Basestation.sqb file to use instead.

3. **Extract Routes** - Allows users to extract route data from the PlanePlotter group route .sqb files on Yahoo. However note that most of the routes are for European airlines so users in other areas will have to add their own data if they can obtain it.




All 3 buttons bring up much the same screen with an empty box for you to enter your Database path, click on the '….' button to search for your database, and clicking on it will extract the data from your .sqb file and place either Aircraft.txt or the aircrafts_p.txt and aircrafts_s.txt files into the 'TempAC' folder or in the case of the export of flights.txt into the 'TempRoutes' folder. Once you are satisfied that these .txt files are OK, you can then transfer them to their correct folders, i.e. Templates for the aircraft.txt and flights.txt files and into your ACARSDeco2\datasets folder for the other files if you use them.

Be careful to ensure that these extracted files are correct as I have found that on some PCs these tools do not work due I think to the file dhRichClient3.dll being overwritten by a 3rd party program with a different version of this file. When this happens, the .sqb files are not correctly decoded.

GENERAL NOTES:-

PC-HFDL v2.042 can be downloaded from the files section of the HFDL Yahoo group, the latest System Table and HFDL.xls files may also be downloaded from the same site. PC-HFDL is shareware and requires a PayPal contribution of $35 being sent to the author Charles Brain at chbrain @ diron.co.uk

MultiPSK PRO version may be downloaded from http://f6cte.free.fr/index_anglais.htm - although the initial download is free and you can use the HAM modes, to use it with ACARS, HFDL, GMDSS or VDL2 you need the PRO version which also requires a payment of 30 Euros.

ACARSDeco2 can be downloaded from:-
https://forum.planefinder.net/threads/acarsdeco2-up-to-3-channels-acars-sdr-receiver-for-rtl2832-dongle.157/ the link to the zip file is at the foot of the first message on that page.

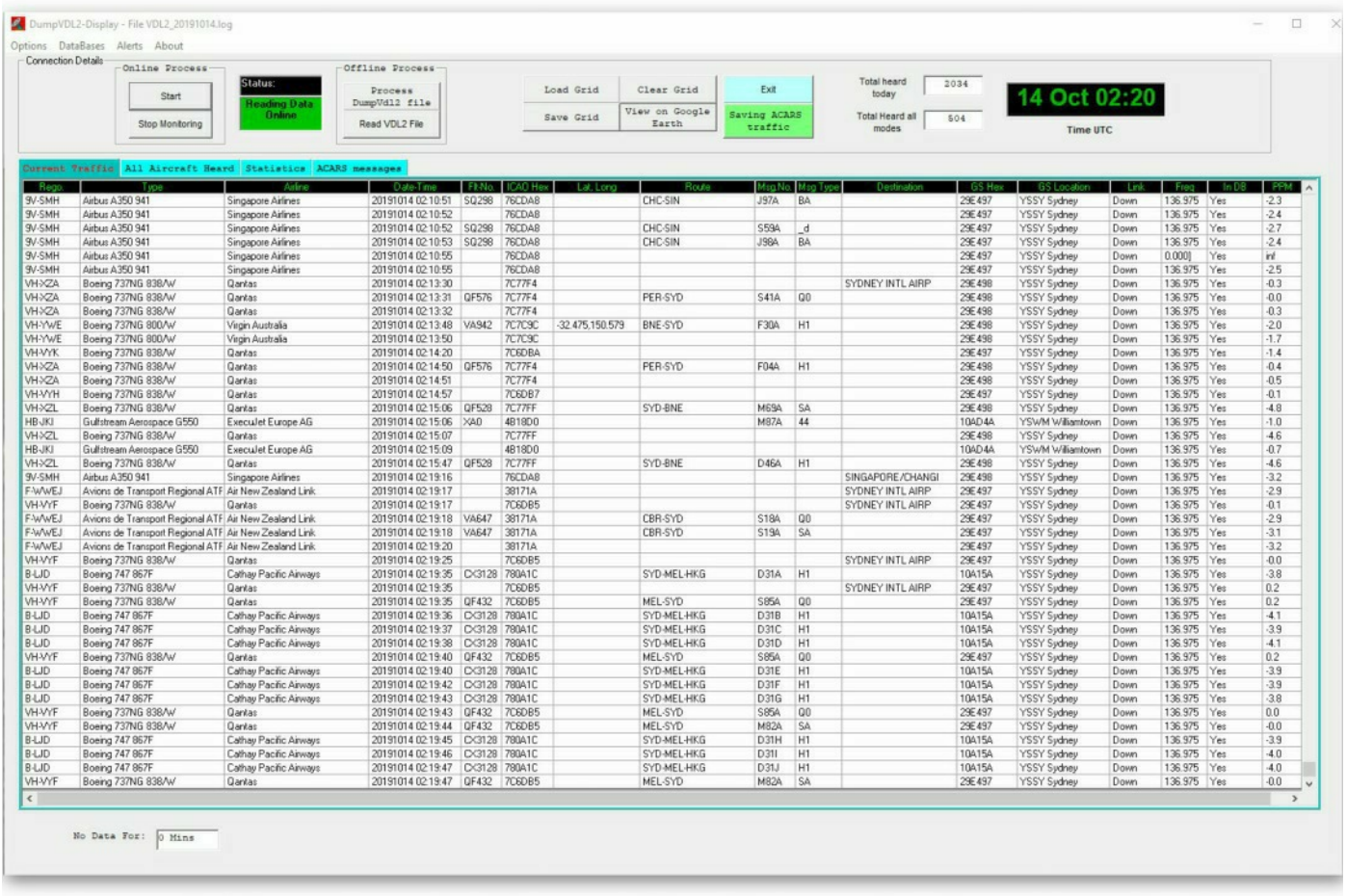
# DumpVDL2-Display Help

This is a stand-alone version of the DumpVDL2-Display option included with Display-Launcher, it is somewhat different to the other options because it processes data on a Windows PC which has been captured on a Linux machine. DumpVDL2 is an excellent VDL2 decoder by Tomasz Lemiech which runs on a Linux PC. To move the data between the machines, the Linux machine must have some link from it to the Windows PC, probably the easiest way to do this is to install 'Samba' on the Linux machine, this utility can be configured to display the DumpVDL2/Logs folder in the Windows Explorer program window, on mine it appears as:- " >This PC > logs(\\MIKE-LENOVO-V11\home\mike\dumpvdl2)". It should also be possible to just copy the log file on the Linux PC to a USB key and move it to the Windows PC but I have not tried this.

**DumpVDL2-Display has 2 modes of operation.**

1. It can be used like the various MultiPSK options to read the data on-line from the log file as it is being received (providing the above direct link via LAN/Samba is set up) but this does tie up the 2 PCs all day along with adding traffic to your LAN and I have noticed that it is possible to lose the odd block of data if the LAN is also being used for other purposes such as downloading traffic from the Internet etc at the same time.

2. It can be used once a day to process a whole day's data by downloading the Log file and processing it




The above illustrates the main W10 window. Once the path via the LAN/Samba has been set up in the options menu, the program expects the latest daily log file to be named like 'VDL2_20190904.log' and upon clicking the 'Start' button it will commence reading the log file. When it commences, the box 'Reading Data Online' will appear with an orange background. This indicates that the program is reading all the data from 0000 UTC to the current time. Once all that data has been processed, the background turns to green, indicating the program is now processing data as it is being received. You can click the 'Stop monitoring' button at any time and it will pause processing until you click the 'Start' button again and it will continue

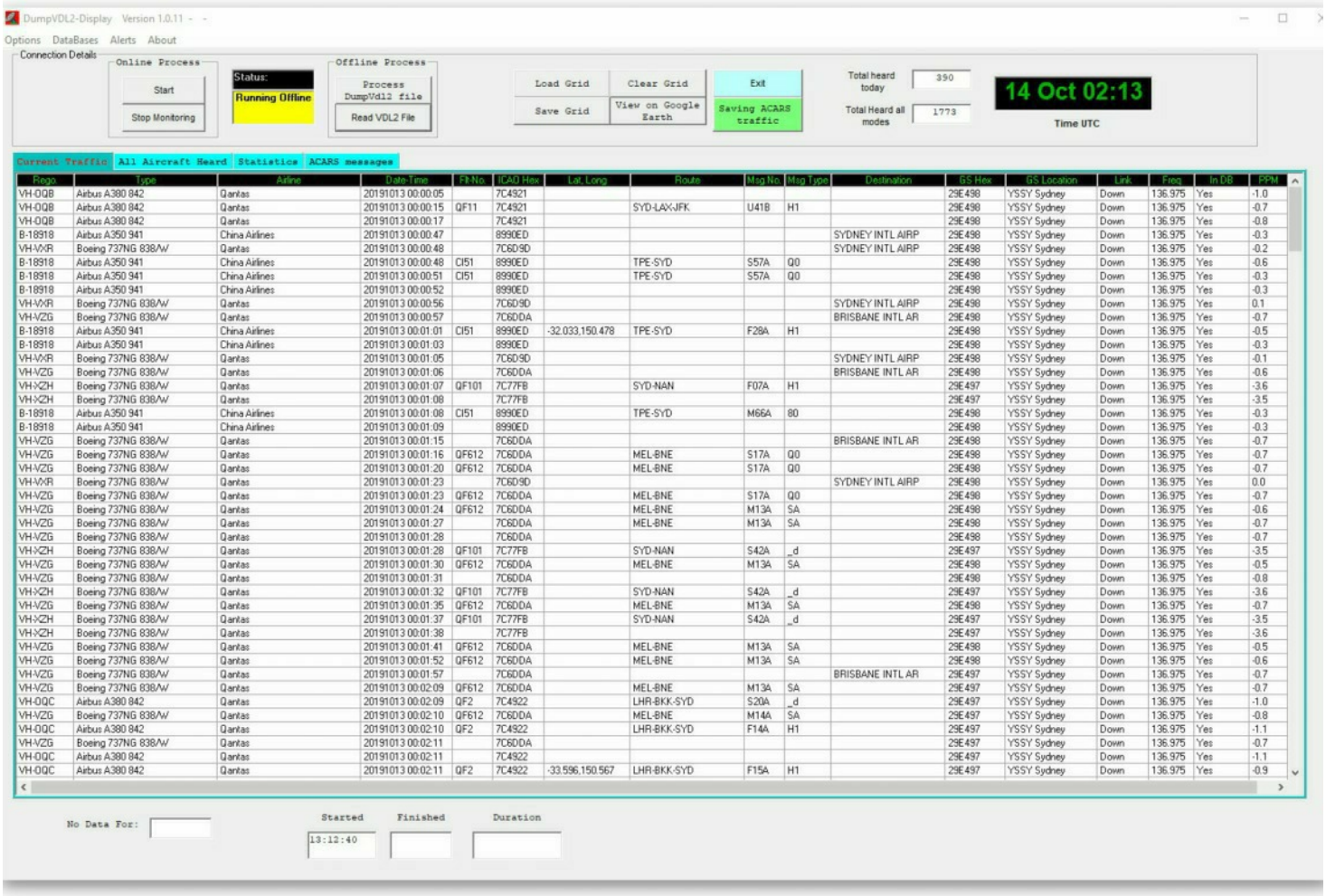
monitoring traffic from the time you hit the ‘Stop’ button. At midnight UTC, the grid will be saved in the ‘Logs’ folder and if you are also saving ACARS traffic, the ACARS messages will be saved as a text file in the ‘Reports’ folder.

## Using the program in ‘Off-line’ mode.

You can download the DumpVDL2 Log file using Windows Explorer etc and save it anywhere, the Logs folder under Display-Launcher will do as an example. These logs from a Linux machine need to be converted from the ‘Unix’ format to ‘DOS’ format for use in Windows. To do this, use the button ‘Process DumpVDL2 file’, this replaces all the Line Feed characters in the log with ‘carriage return/line feed’ and also adds start of message/end of message codes (ZCZC/NNNN) to each message (this makes it much easier for the program to separate messages while processing). The file is saved with a name like “Processed_vdl2_20191029.log”, the original log file is unchanged.

Once the file has been converted, click the ‘Read VDL2 file’ button and select the file from the file list you are presented with and the program will run through and process the whole day’s traffic. This might take some time for a long file. The Status: box will show ‘Running Offline’ on a yellow background.

Note: I do not believe there are any limits to the size of log file which can be processed, but this may depend upon your PC. Certainly on a Pentium i7 machine with 32 gigs of RAM I was able to process a file containing 356,000 messages in 2hrs 30mins. However, trying to do this on a small laptop could well cause problems.




The above illustrates the program in off-line mode and it is also saving the ACARS texts from the original log file. When you process an offline file like this one, the start/end times are shown at the bottom along with the duration once it finishes. Note that the ACARS tab is removed from the grid when you are not saving separate ACARS messages.

## Other buttons on the main screen.

1. Load Grid, Save Grid and Clear Grid are self explanatory. You can save the grid at any time as a .csv file and restore it later as required. Note that if you save the grid in this manner, when reloading it, no processing is carried out, so nothing appears in the 'Statistics' screen.

2. View on Google Earth - Selecting this option will display the positions of all aircraft in the grid which have valid positions shown in the 'Lat. Long' column of the grid in Google Earth (Providing you have that program installed on your PC). If multiple positions are available, then the program attempts to plot the plane's route, but note that if a plane is flying multiple flights on the same day, you might get some invalid plots.

3. Saving ACARS traffic/NOT saving ACARS traffic - is a toggle button which has a green background while ACARS traffic is actually being saved, clicking the button will turn the background to red and it will stop saving the ACARS messages. The 'ACARS messages' tab will also be removed from the grid.

**Menu items.**

1. **Options menu** - DumpVDL2 Log Path - you must enter the path via the LAN to your Log folder on your Linux PC. This can either be the full path, or you may be able to use the 'Map a network drive' option in Windows Explorer to set up a dummy drive name such as 'Z:' for this link.

2. Select site for photos - gives you the option to select a site which will display a photo and details of an aircraft if you click on the first 'Rego.' Column of the grid. Try each of these to see which one suits your requirements.

3. PDF reader path - allows you to show the path of a PDF reader which will allow you to read the Help file from within the program. NOTE: the latest version of Adobe Reader does NOT allow you to read the Help file from within the program, I use Foxit Reader here to get around this.

4. Show Paths - Just displays the paths you have selected above.

5. **Databases** - Update databases - If you have made changes to Aircraft.txt or Flights.txt while the program is running, e.g. by adding a new aircraft to it. This option will update the data being used by the program from this point in time. i.e. it will not update earlier entries in the grid, to do that you have to exit from the program and re-run it.

6. Update GS database - Sergio Sarabia publishes a VDL2_Ground_Stations.txt file from time to time on both the MultiPSK and acars-vdl2 forums - however the entries are too long to fit into the grid on this program, so use this option to convert this file to the format used here. Upon running this option the file GS.txt in the Templates folder will be updated to the latest version.

7. **Alerts** - Edit Alerts - this brings up a small window into which you can enter 6 character ICAO hex codes of aircraft you are interested in. You can also use question mark character '?' as a wild-card in this list. If any required aircraft is heard, a red bordered window appears listing the hex code and what time it was heard.

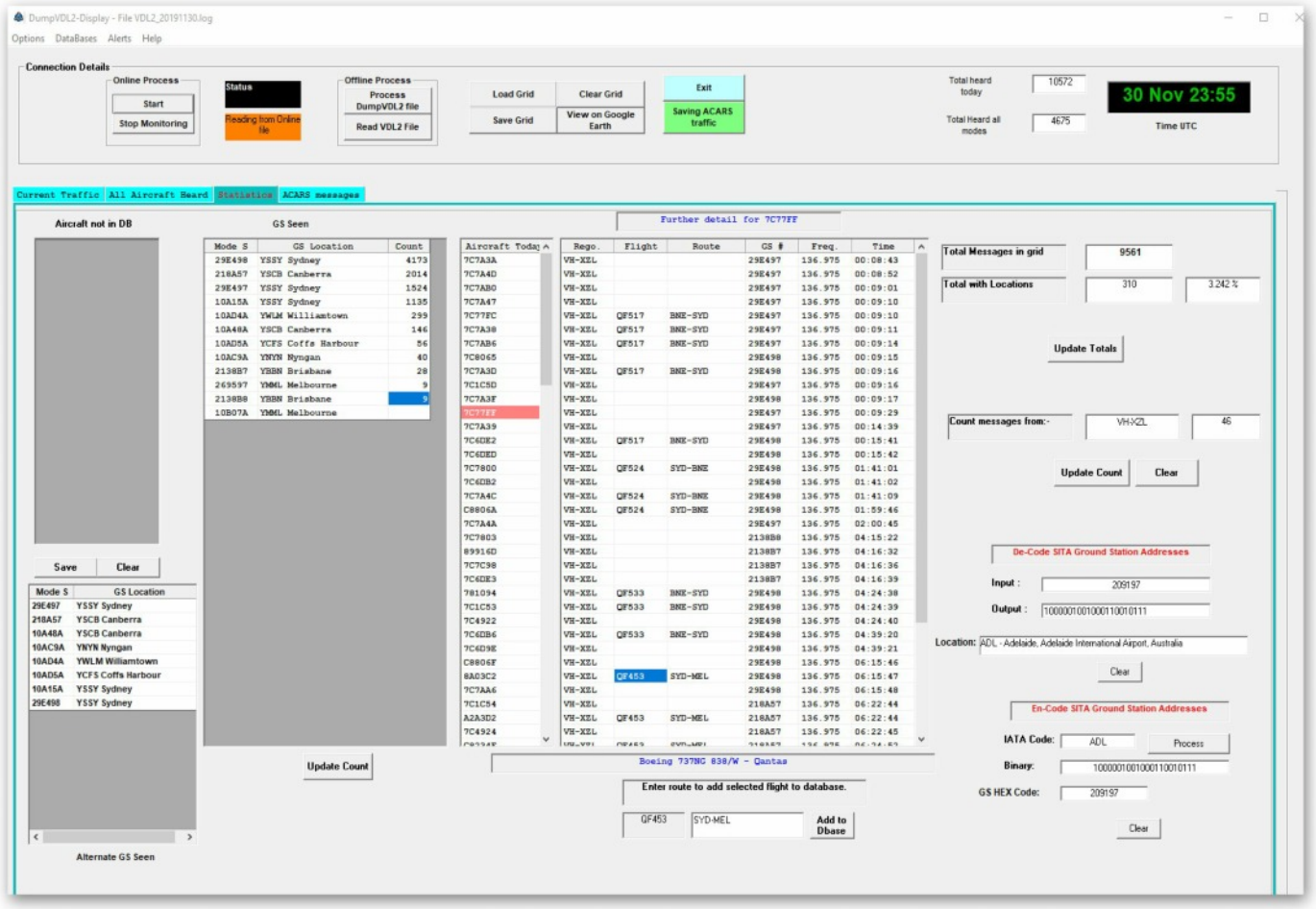
8. **Help** - gives usual about details. As well as allowing you to read the Help file

## Tabs on the main screen.

**Current Traffic** - This tab displays all the main traffic as it is received, or alternatively it displays the data from a file you are reading with the 'Read VDL2 file' button. Clicking on any aircraft registration call in the first column will open your browser and display a photo of the aircraft in question. The grid can be sorted on any column by clicking the column header, clicking a second time will change the sort direction. Note: If you wish to spend some time sorting on various columns, I recommend you click the 'Stop Monitoring' button while doing this, then revert to sorting on Date/Time before restarting monitoring with the Start button.

**All Aircraft Heard** - This tab opens up a display of all aircraft you have ever heard while using Display-

Launcher, the date/time you first heard it and the mode it is using. A separate entry is there for each mode, so the same aircraft can appear multiple times. The grid can be sorted on any column by clicking the column header, clicking a second time will change the sort direction.




The Statistics window is split into 5 list-boxes as under:-

1. **Aircraft not in DB** - This is just a list of ICAO hex numbers of aircraft not in the database. If you can discover the details of the aircraft, then you can manually edit the file 'Templates\Aircraft.txt' for future use.

2. **List of GS seen** - This lists the hex of the GS, its location and how many times heard in the current session. By clicking on 'Count' you can reorder the list in accordance with the number of times heard. If the GS name field is blank then this is an unknown GS not in the database.

3. **List of Alternate GS Seen** - This just lists all GS included in the 'Alternate Ground Stations:' sections of messages received. May show up some unknown GS etc.

4. **List of Aircraft heard** - This lists hex of all aircraft heard in the current session. Clicking on any of the hex numbers will display the details of the aircraft in the next column.

5. **Details of selected aircraft** - This list shows you details of the aircraft you have selected in column 3. Including the Rego., Flights, Route, GS # and Freq. and time in use. The entries are in time order, so from this list it is possible to plot the ground stations used for a given route and can help in working out unknown GS. If the flight is shown, but no route is known, click on the route number, in this example VA1592 and your browser will be opened to the 'FlightRadar24' web site 'Route search' page and if the flight is know it should show you the route details. You can then enter it in the box below to update your DB.

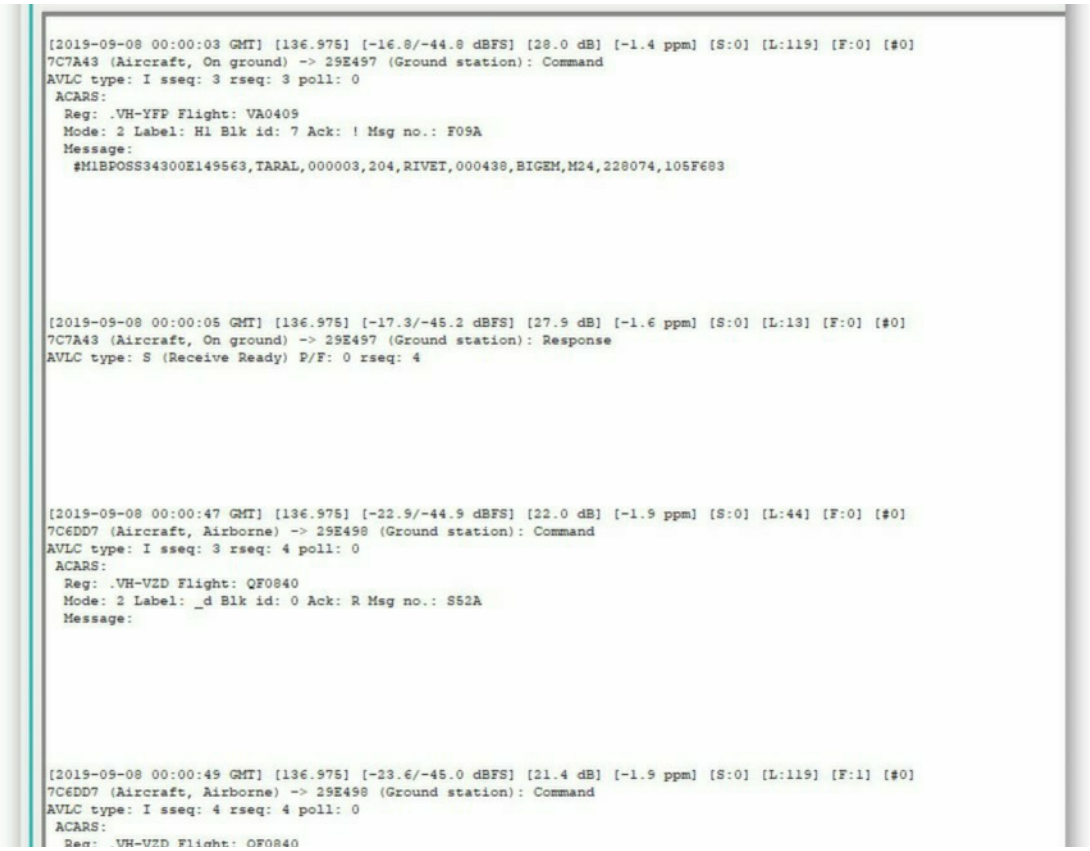
6. **Route update** - Once you find details of the route, you can enter it here in the format NTL-MEL and click the 'Add to Dbase' button. The flight details will then be appended to the Templates\Flights.txt file. I have found that after updating the flights regularly over 1 month that I no longer get many unknown flights so no longer have to do this very often.

7. On the right of the Statistics screen you can find the total messages received and what percentage of them include location data (usually less than 5% at my location). You can also click on an aircraft rego. In the preceding list and if you click on the 'Update Count' button you will see how many messages refer to it. Alternatively you can type any rego. Into this box.

8. I have also included an option to De-Code SITA ground station codes in this column. Just type the 6 character SITA GS code (all SITA codes start with '2') and the location will automatically be displayed. The code to decode is based on the work done by Eric Cottrell.

9. Another new option is the ability to enter a 3 character IATA code for an airport and the SITA GS code for that airport will be displayed. This calculation is based on the above decode method, but please note the final character will always appear as '7' as used as the final character in the main address of GS using 136.975 Mhz, but depending upon location and number of GS in the area, it can be any valid character.

**ACARS messages**




This tab (which only appears if you have toggled the ACARS button to save ACARS messages) just displays all ACARS text from VDL2 messages which include such text. There is a ‘Search’ box at the bottom of the screen to enable you to quickly search for messages of interest. This is quicker than having to search through the whole Log file. The ACARS messages are automatically saved into the ‘Reports’ folder.

**PPM Column on main screen**

This is a new column which displays the PPM variation of each message from the set frequency. You can sort this column by clicking on the column header so that you can find the overall variation in values from various aircraft. Saving the grid to Excel will allow you to do more statistical checking

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