

Test Results On:

Involvement Surround Master v2

Compiled for publication on:

12th May 2022

Important Information:

The initial testing of the above equipment was performed externally by the units owner to ensure complete impartiality.

The test tones used during the tests were accurately created to the respective company's encode specifications, as commercially available tones were found limiting in one way or another.

The unit was switched to the correct mode (Involve/QS or SQ) during the respective system tests.

The slightly different shades of 'green' seen on the display pictures denotes the level of the particular audio being displayed:

Dark Green + Low Level. Light Green = High Level.

The Matrix Team

A Picture Paints A Thousand Words

theqmatrix.wordpress.com

Information On Tone Pictures

The pictures that are used in the test section show both sets of tones used for testing purposes. The picture is divided in two sections, the top is the Left Channel, the lower the Right, making the tones (L to R):

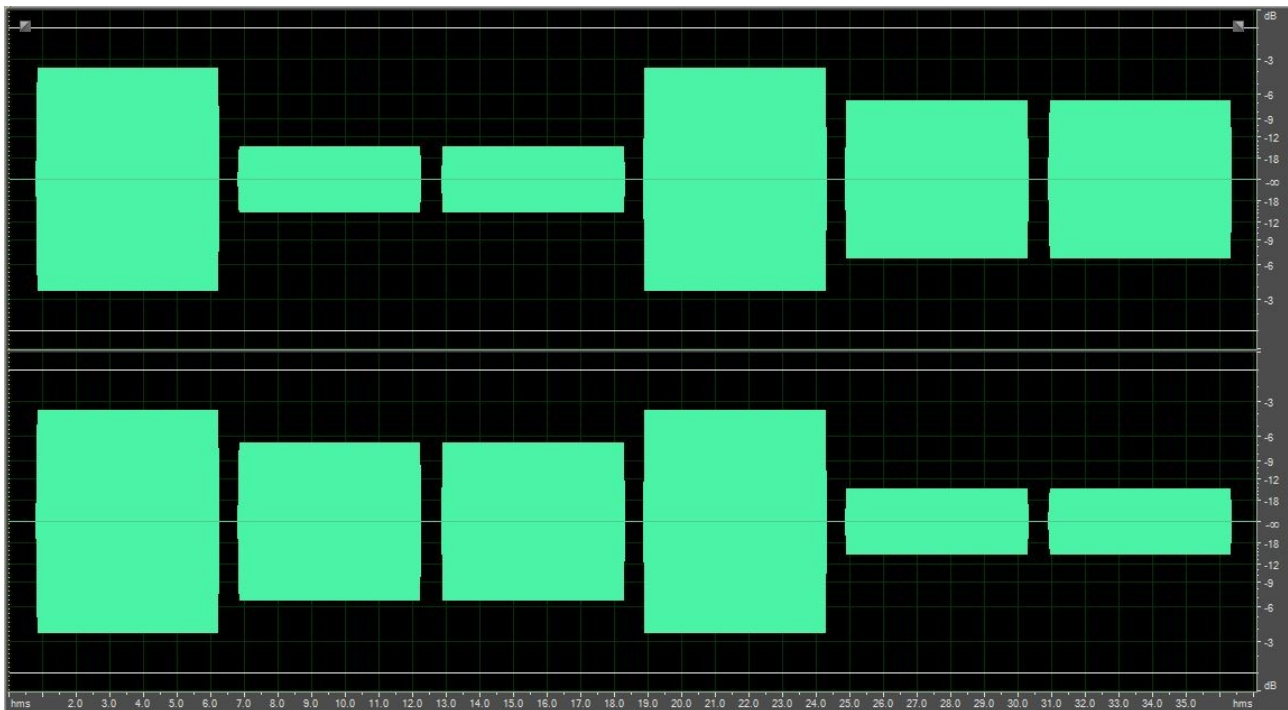
Front Centre, Front Right, Rear Right, Rear Centre, Rear Left, Front Left.

Throughout this document there will be three pictures ('Amplitude', 'Pan' & 'Phase') that show the results of the units decoding process. Additional notes may be included if something requires an explanation.

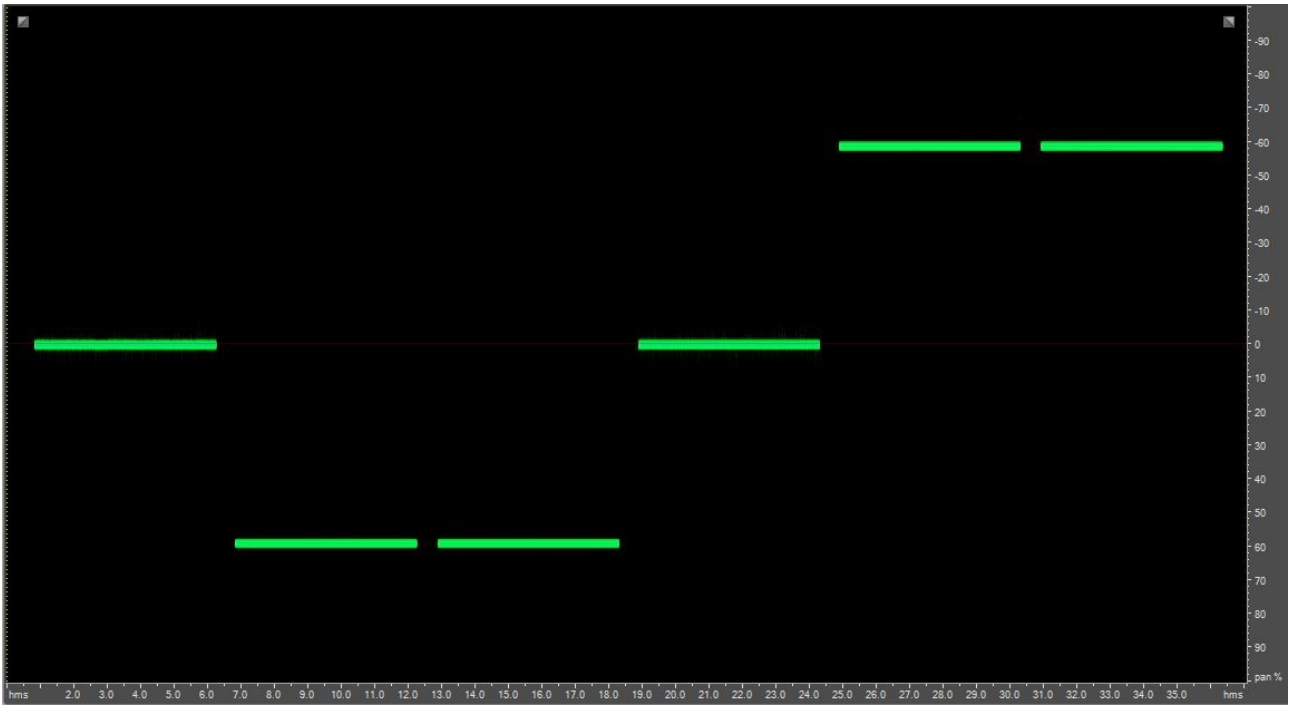
System encoded tones used for testing:

QS

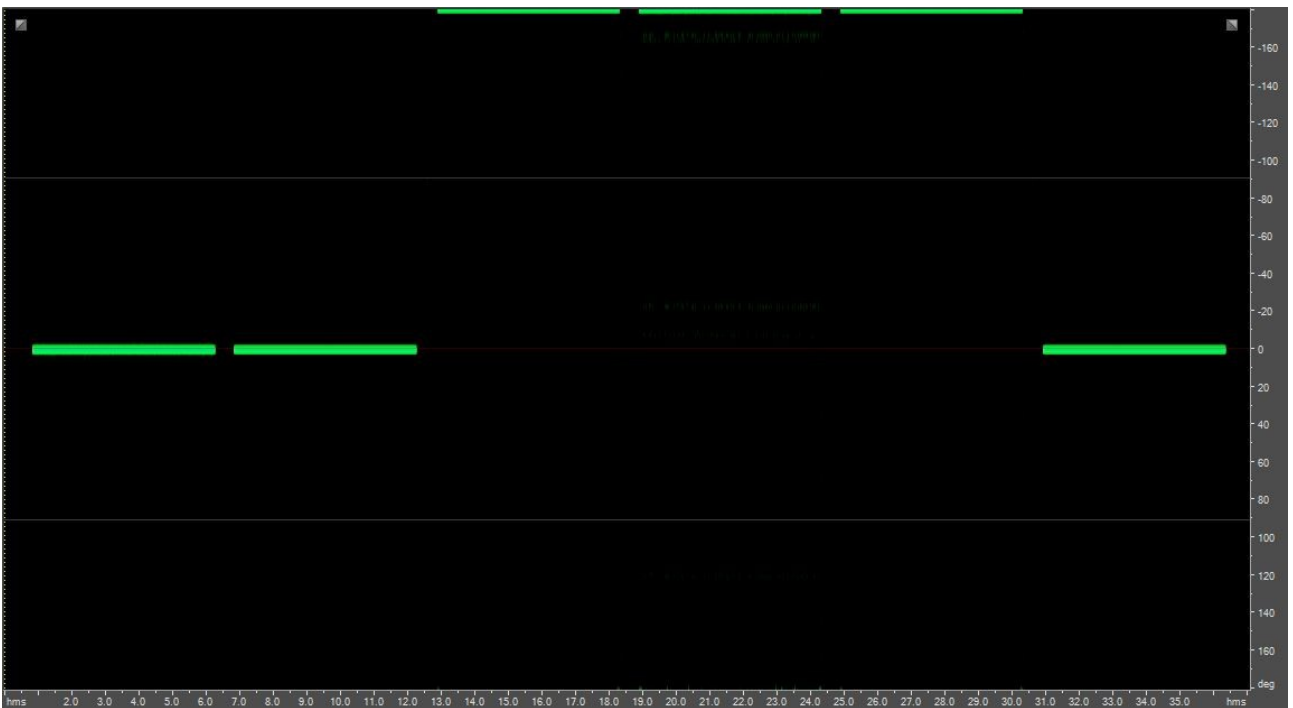
The three pictures of the QS tones used during testing:



Amplitude



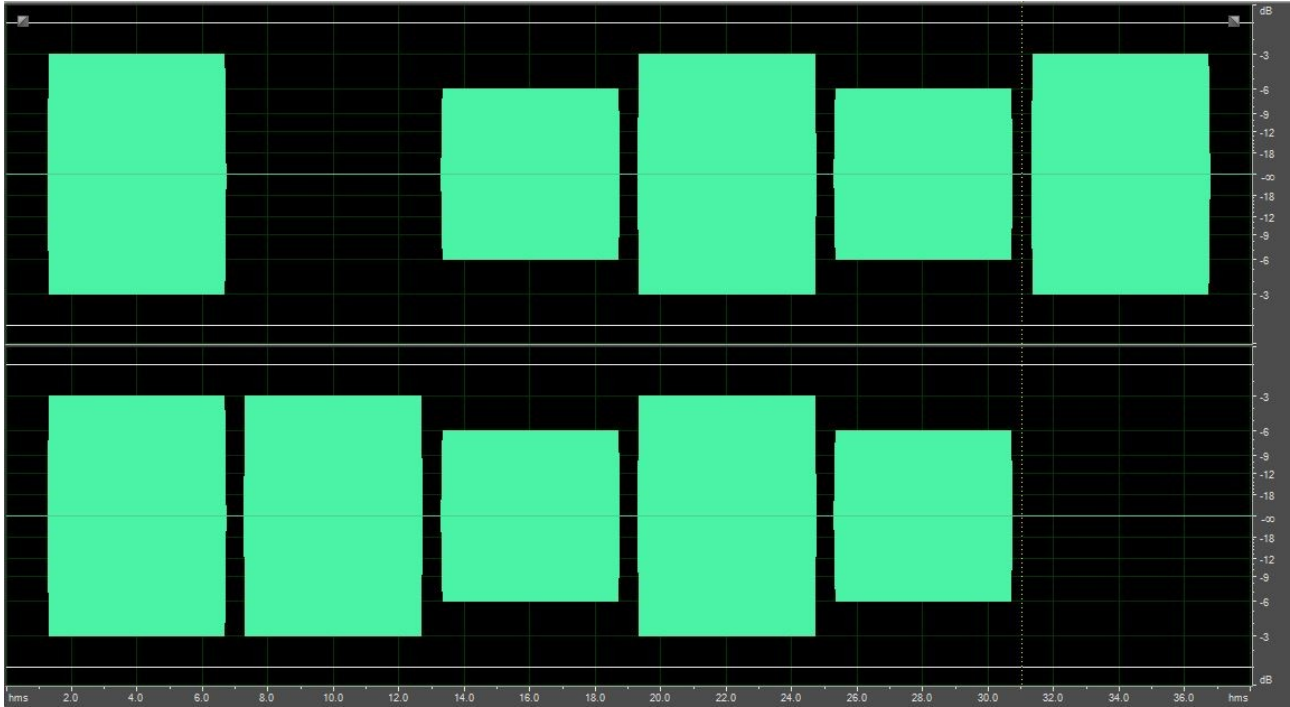
Pan



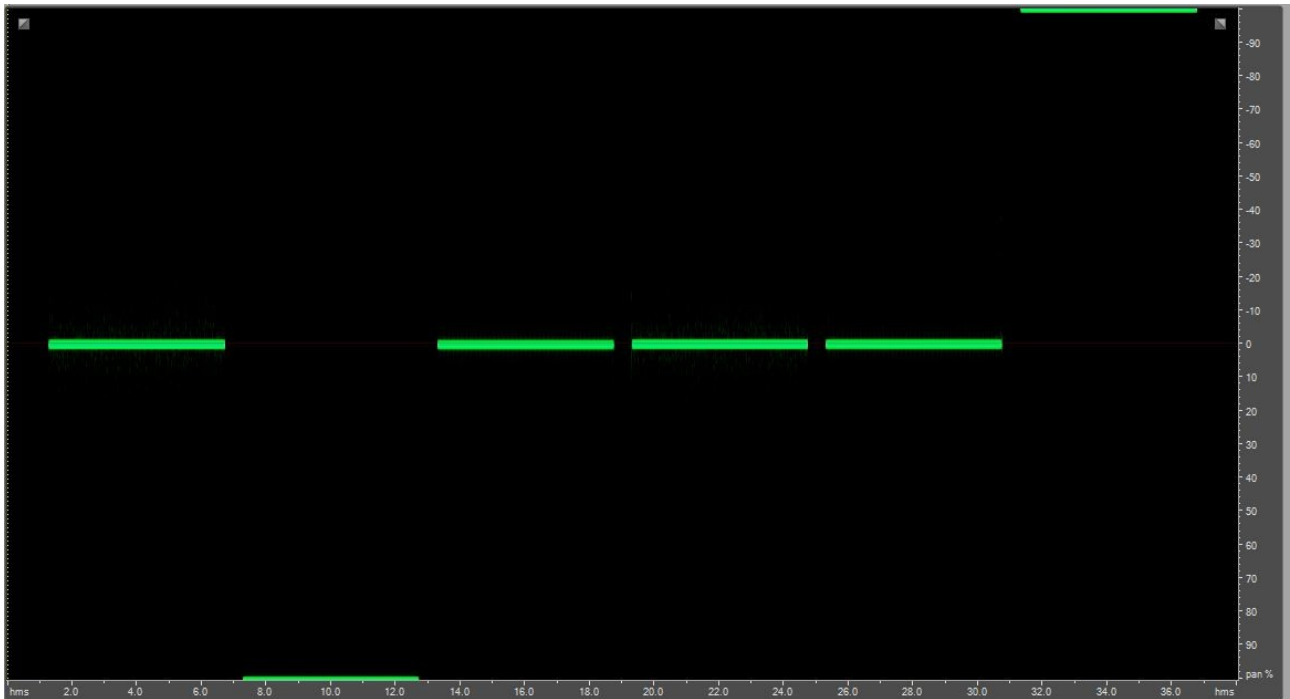
Phase

SQ

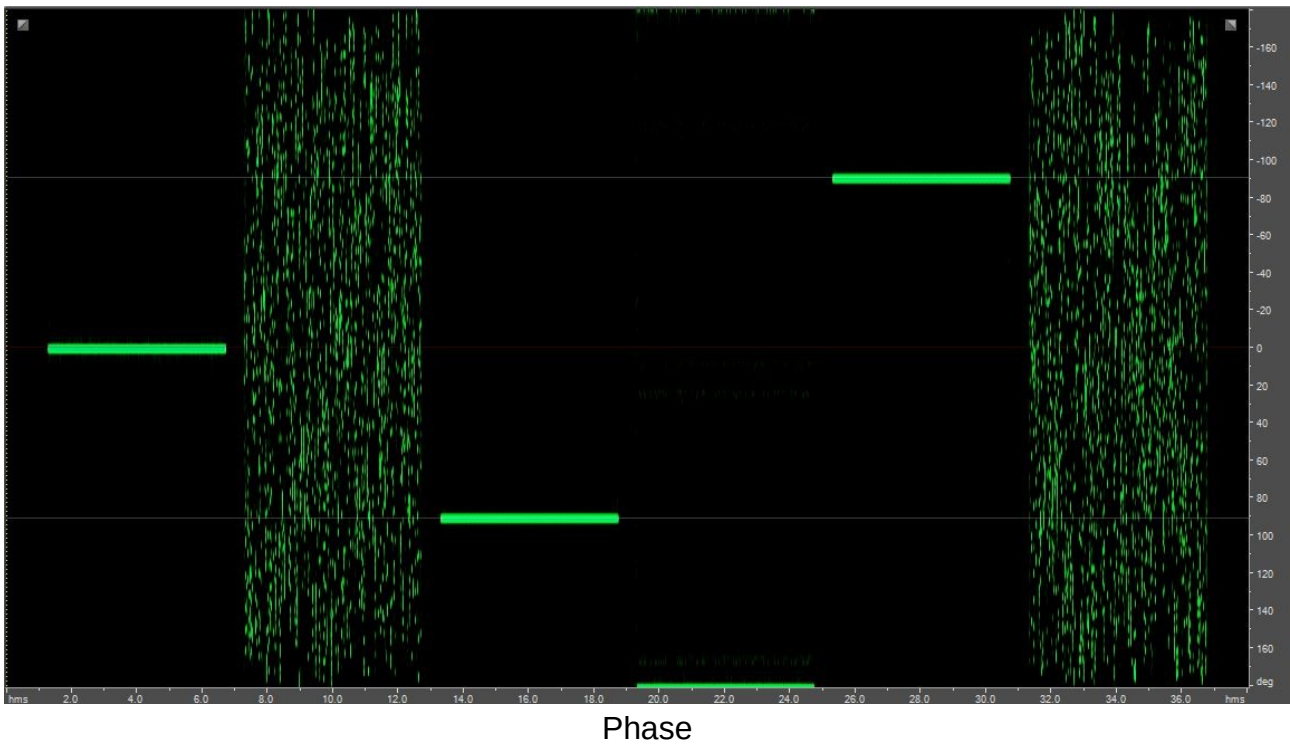
The three pictures of the SQ tones used during testing:



Amplitude



Pan



An important note about the lack of positional information for Front Left & Right on this SQ phase picture.

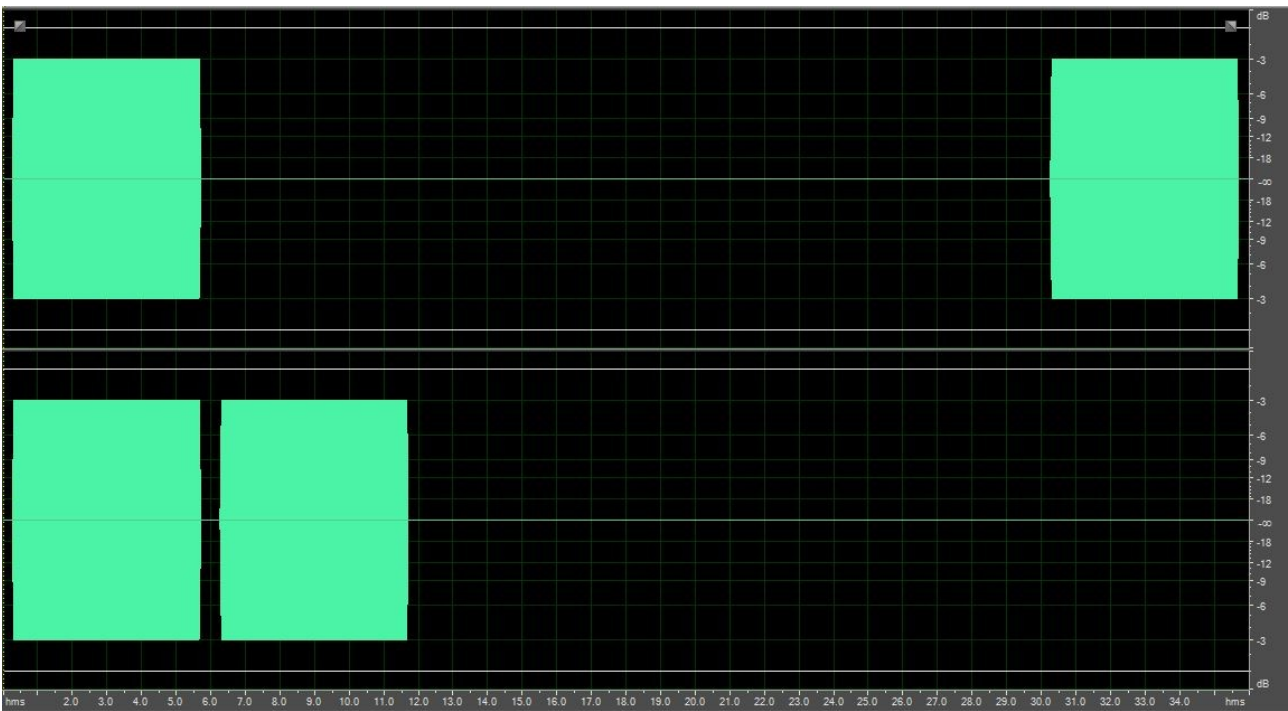
To be able to show the phase of a single tone, software requires both left and right channels to contain information. As SQ has no mix/blend on the front pair, the software is unable to create any viable result, hence the band of noise on both Front Left & Right.

The Object

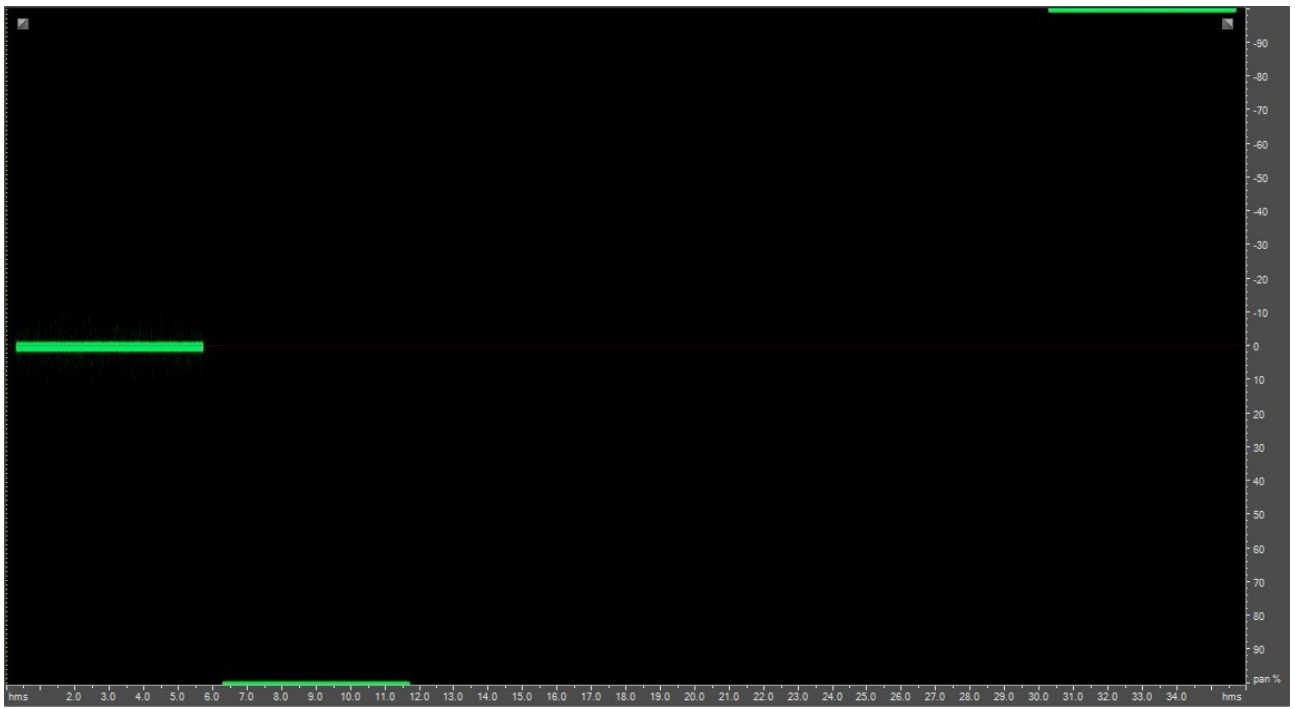
The object of a decoder is to return an encoded signal fed into its stereo input back to a copy of the original four channel source.

To help readers understand how successful, or not, this has taken place, visual representations of the master tones used to create the system tones are included here to enable comparisons between the decode result, and the original:

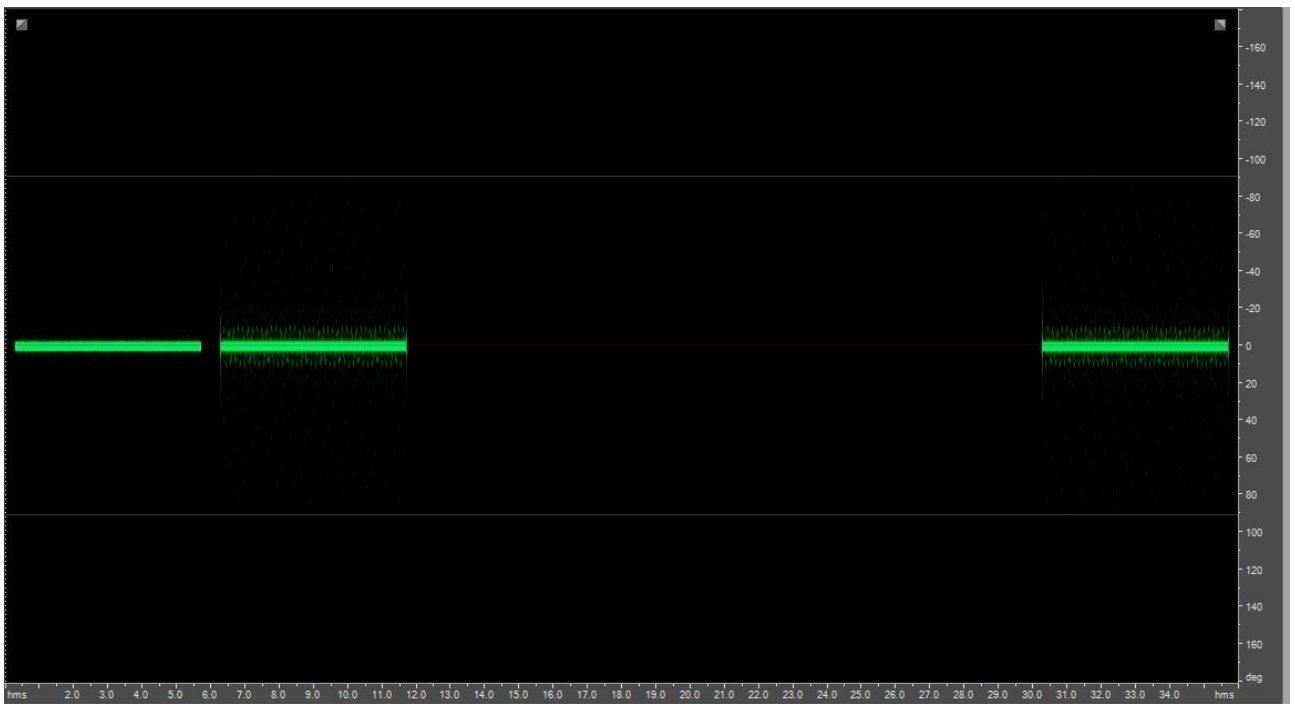
Front



Amplitude

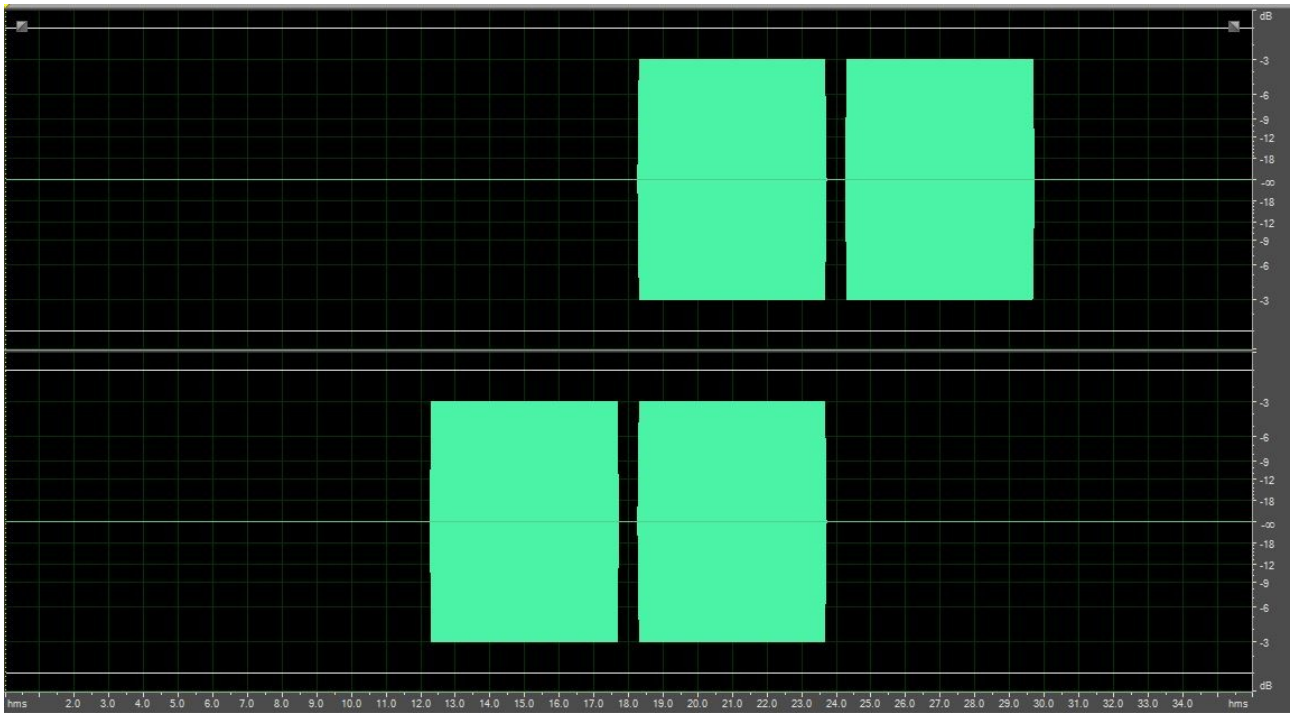


Pan

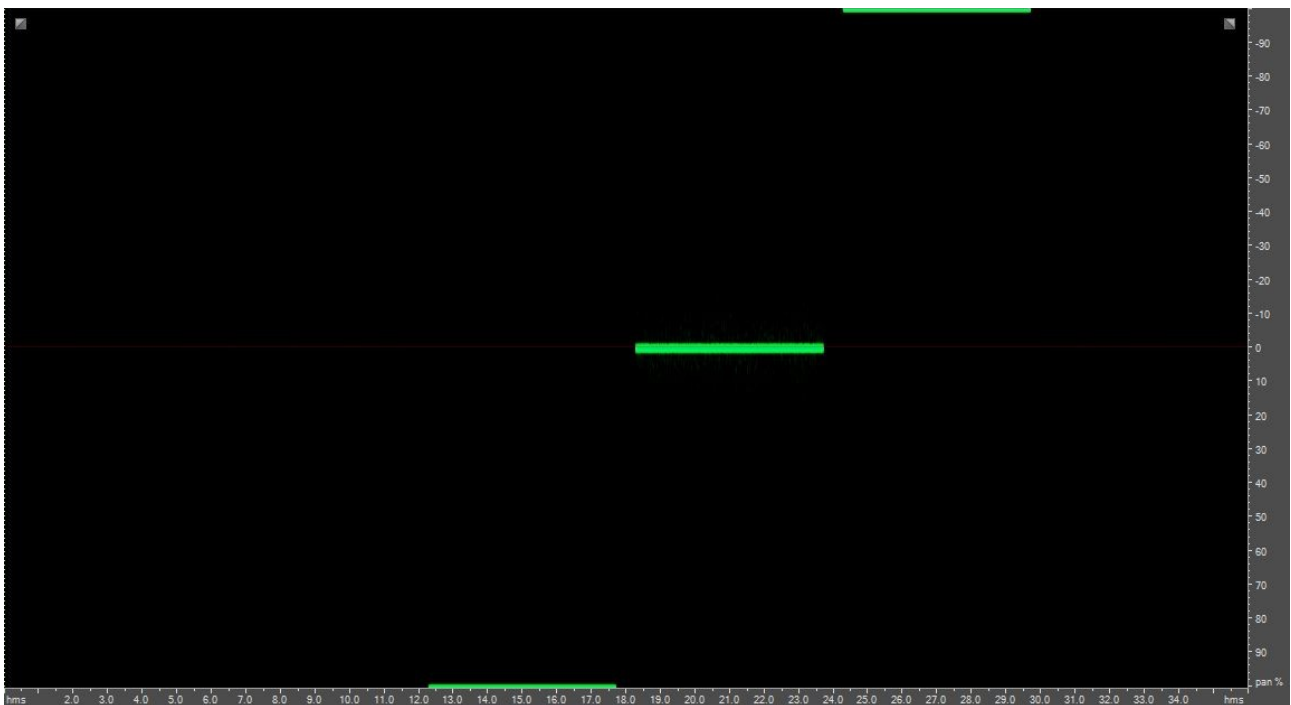


Phase

Rear

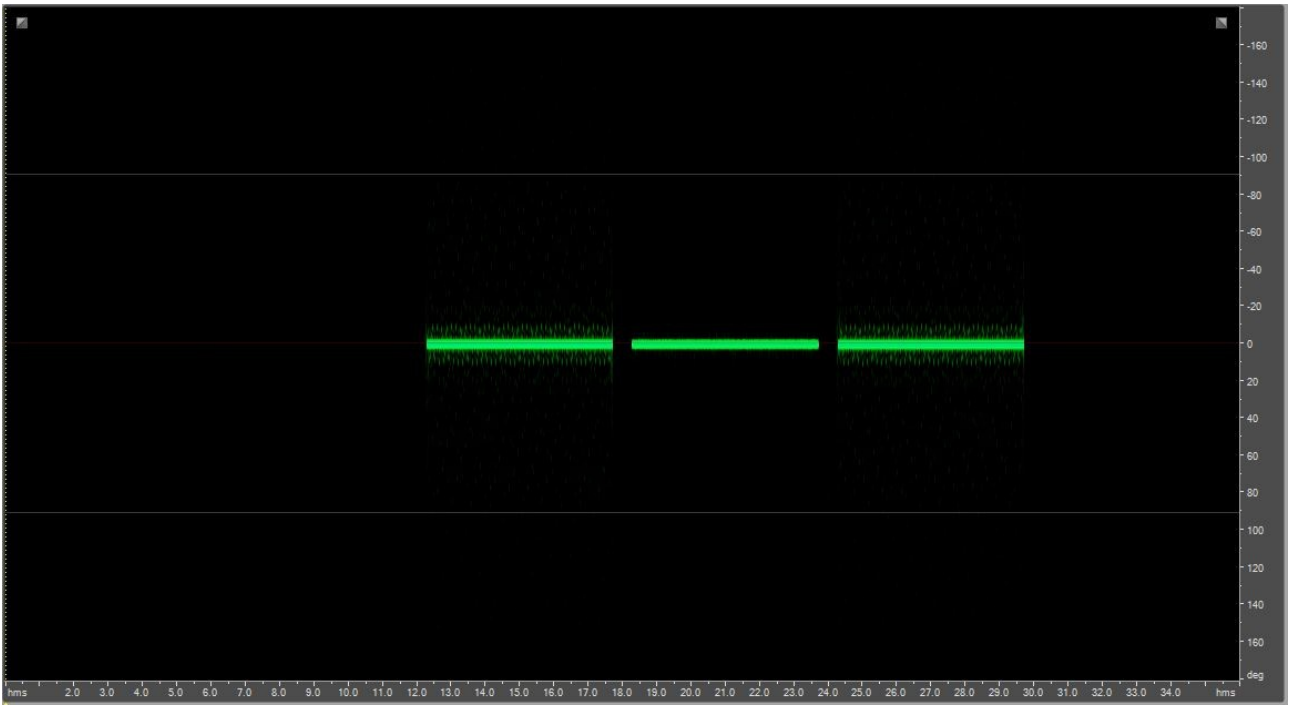


Amplitude



Pan

8



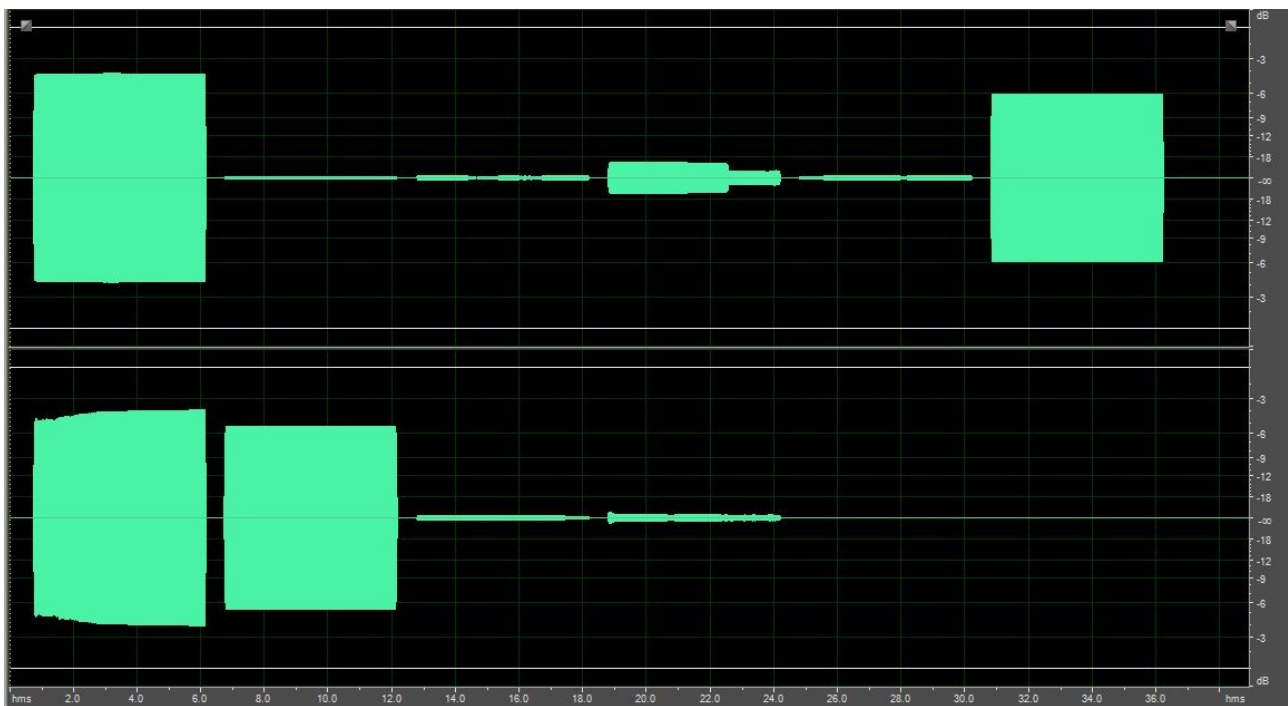
Phase

The Test Results

The following show the output of the “Involve Surround Master v2” after being fed the above, system dependant, test tones.

The units output was captured using a multi-channel input audio card, which was installed in a PC.

QS Front

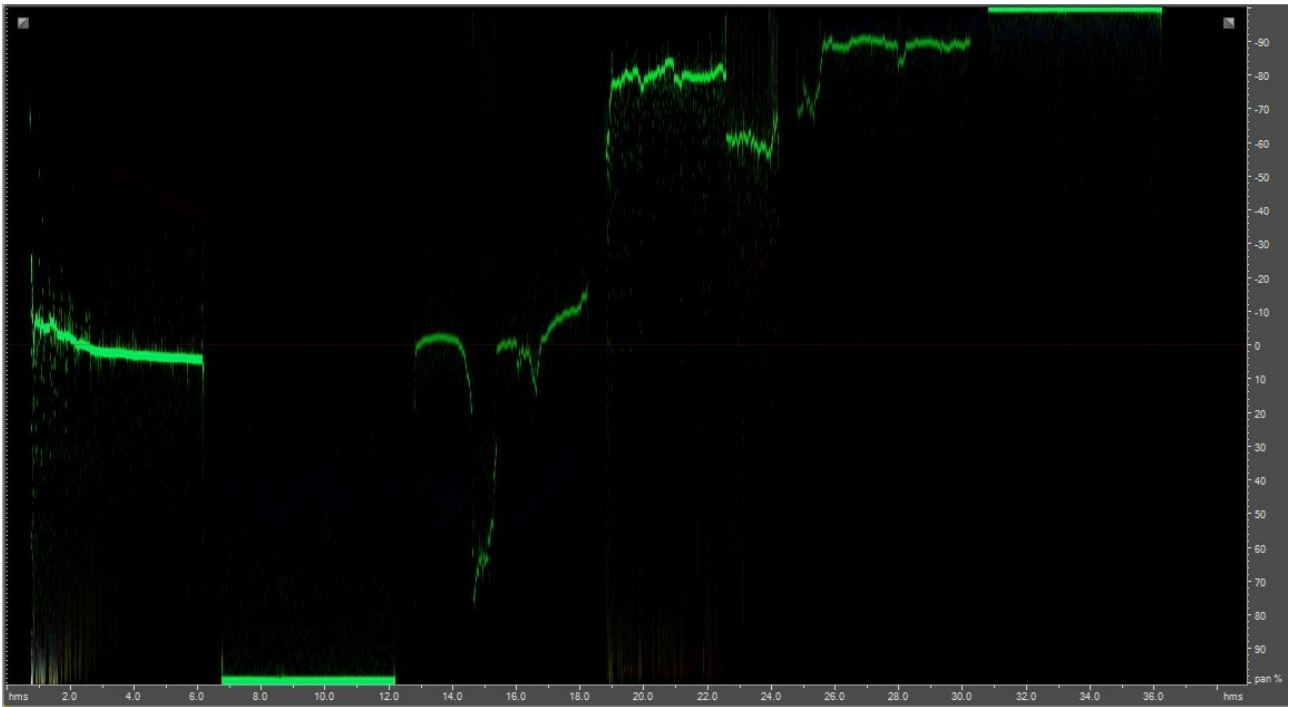


Amplitude

There are two obvious issues noticeable looking at the amplitude of the tones. The relates to the initial 'Front Centre' tone. The right hand channel has a slow build-up to the normalised level.

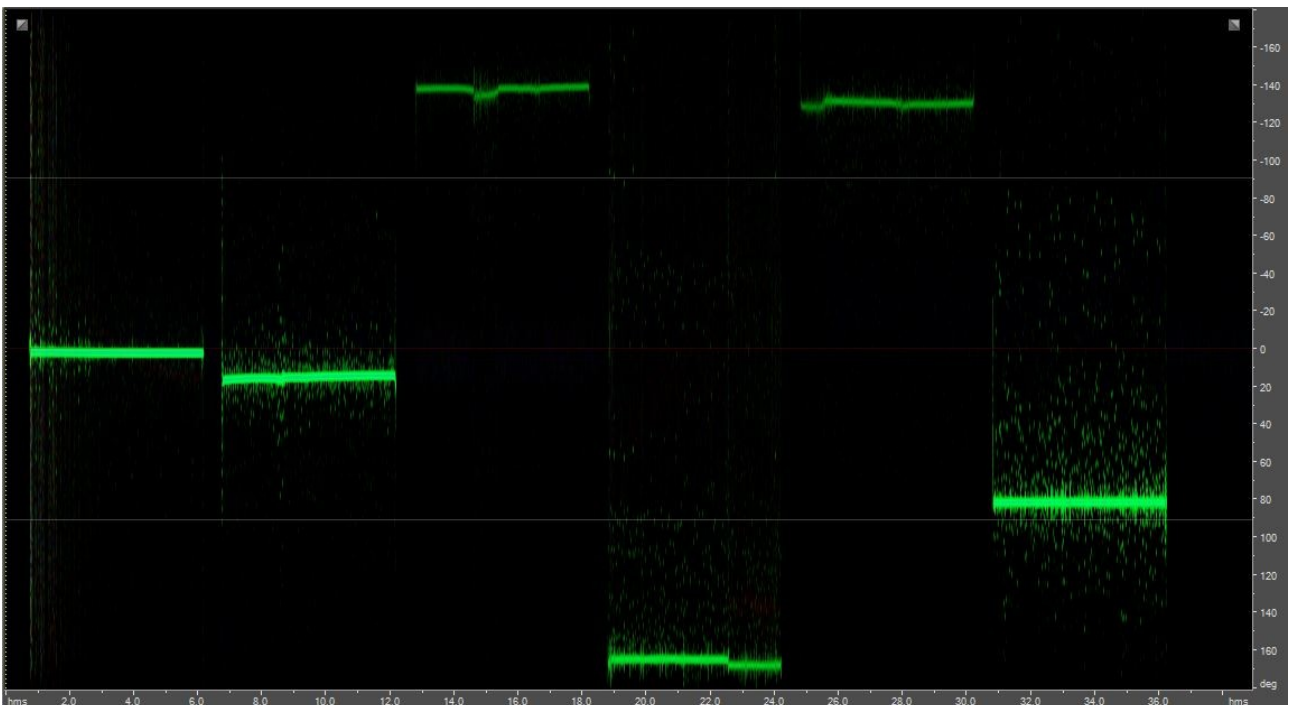
What is odd here is that the next tone (front right) is unaffected. Possibly an issue dealing with creation of centre images?

The other is an issue with the Rear Centre tone. There is a high level of the Rear Left tone showing whereas the Rear Right shows a good level reduction.



Pan

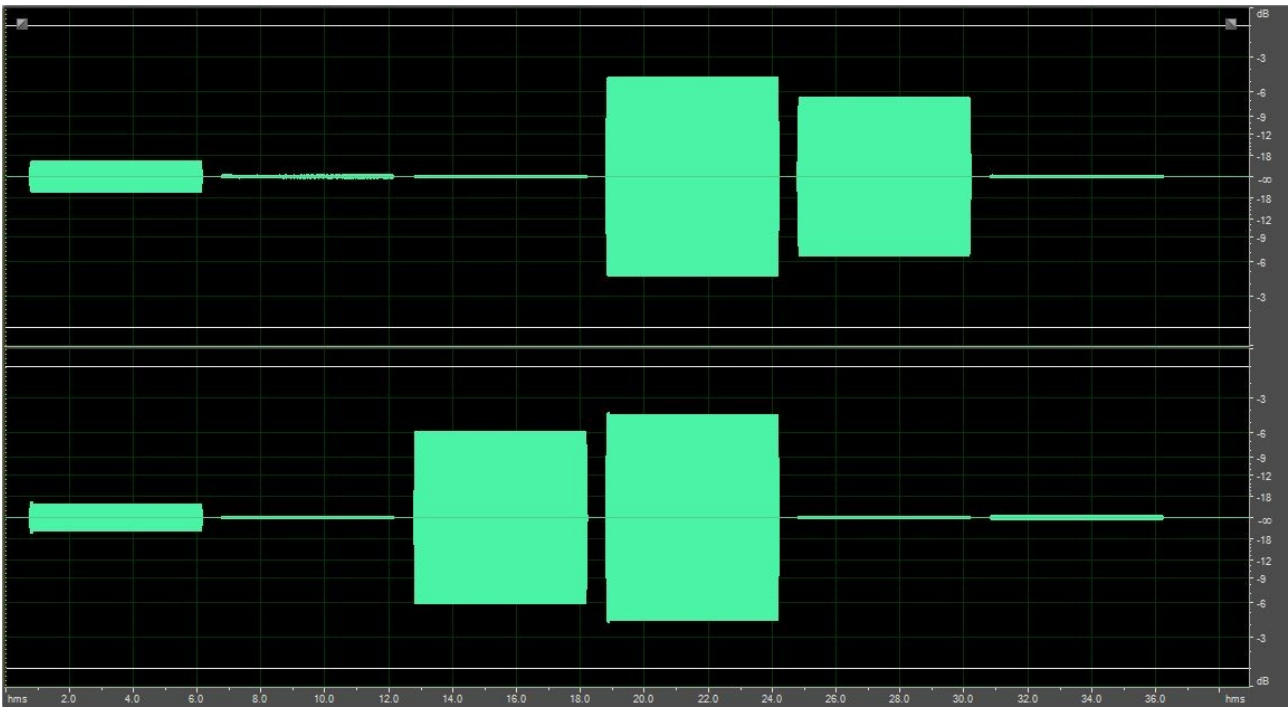
Here we see how the issue noted on the Front Centre tone causes the tone to drift from front to centre. The Rear Centre issue shows how the Rear information wanders across the stereo stage, with Rear Centre being louder on the fronts.



Phase

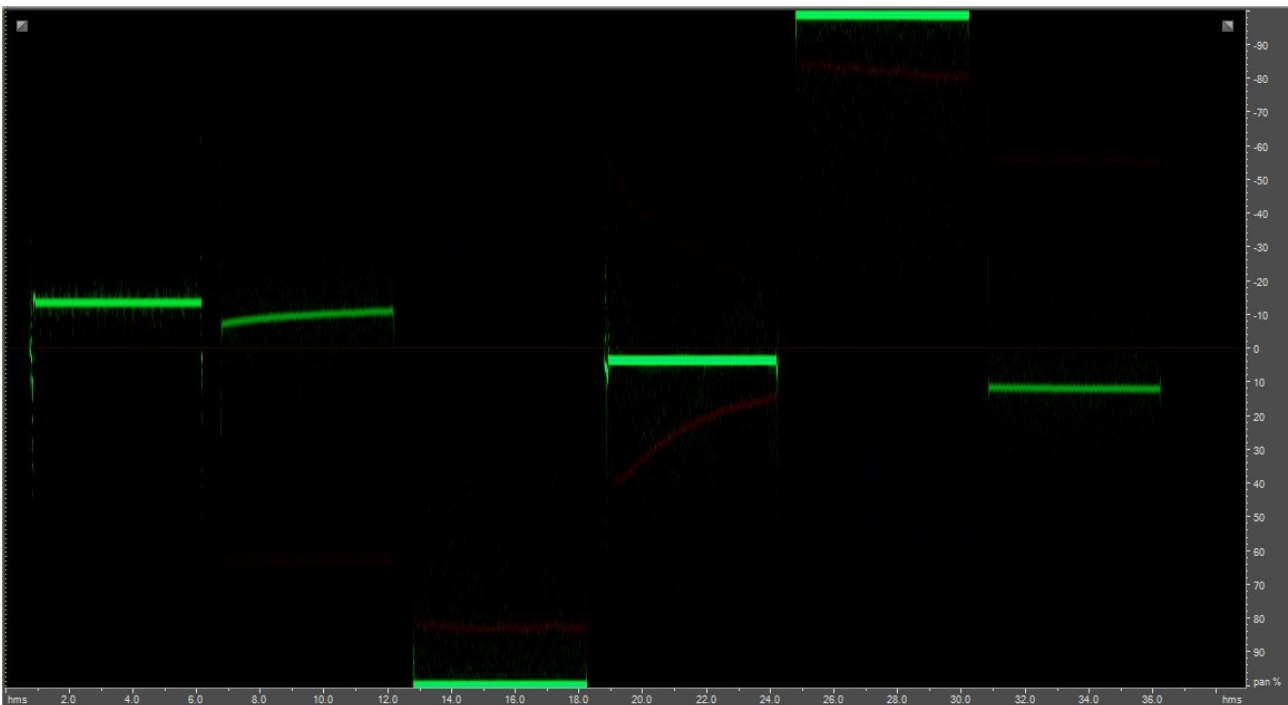
All of the front channels should be based at zero degrees, because the fronts in QS are not phase manipulated, which brings to question why Front Left is at +80 degrees. Not acceptable.

QS Rear



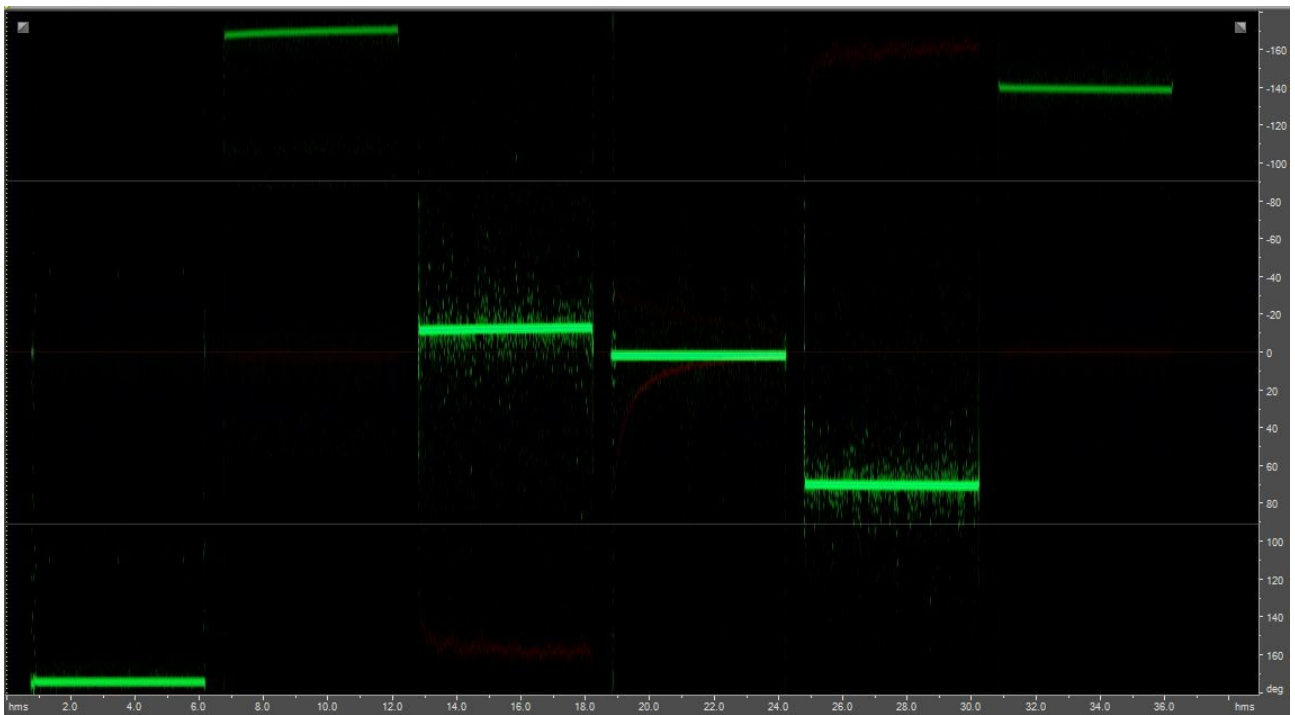
Amplitude

Front Centre rejection is quite poor. Also rear level restoration is not well controlled. A variety of design issues can cause this.



Pan

All seems as to be expected, the increased level of the (unwanted) Front Centre is quite noticeable, being biased to the Left Channel



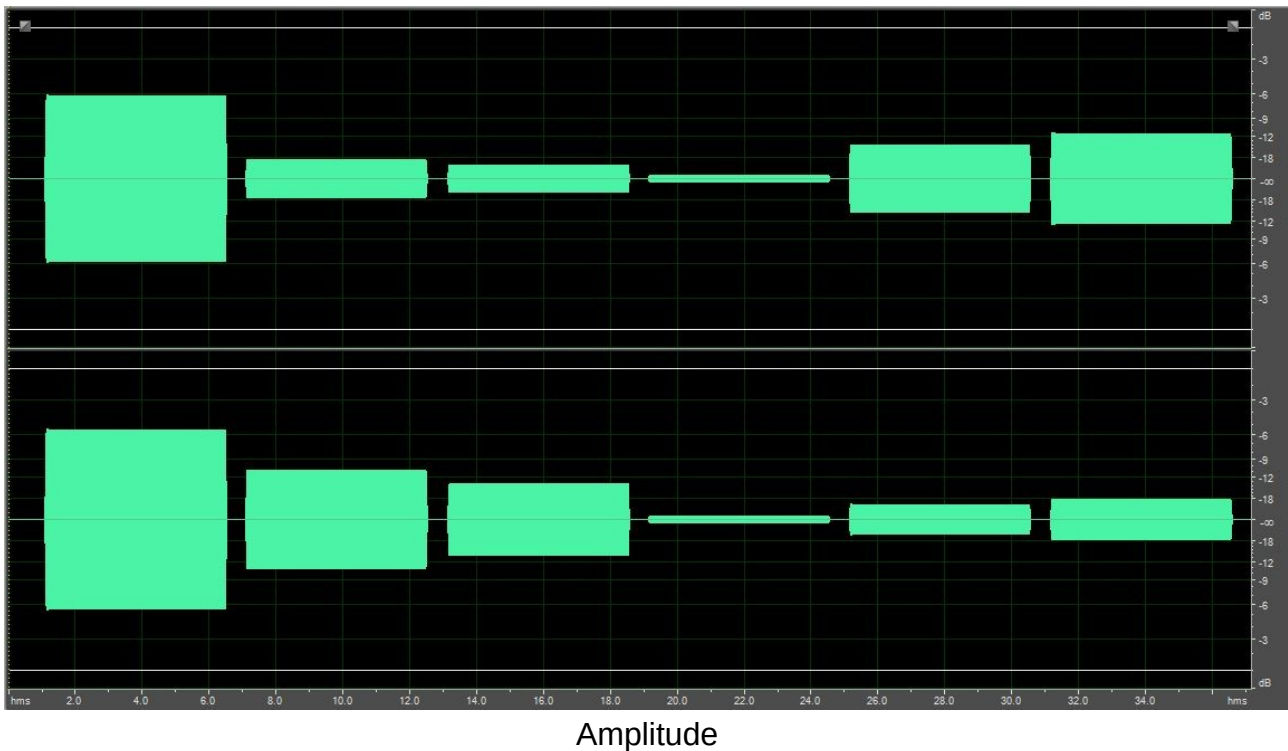
Phase

Things are not correct with the phase of the three wanted tones. Rear Centre is spot on at zero degrees, with Rear Right at an acceptable +20 degree.

But the Rear Left being at +60/70 degrees shows problems.

Adding this information with the error noted on the Amplitude section would suggest there being an issue in the decode section.

SQ Front



There a couple of issues noticeable here.

The first is a very visible reduction of the stereo stage (Left to Right).

The other is the very poor reduction in the unwanted rear information. It does look as though the only attempt to reduce the rear channels is to use front channel blending, as performed in the early commercially available decoders.

This was called 10/40 blend.

There is no noticeable “decoding” being performed.



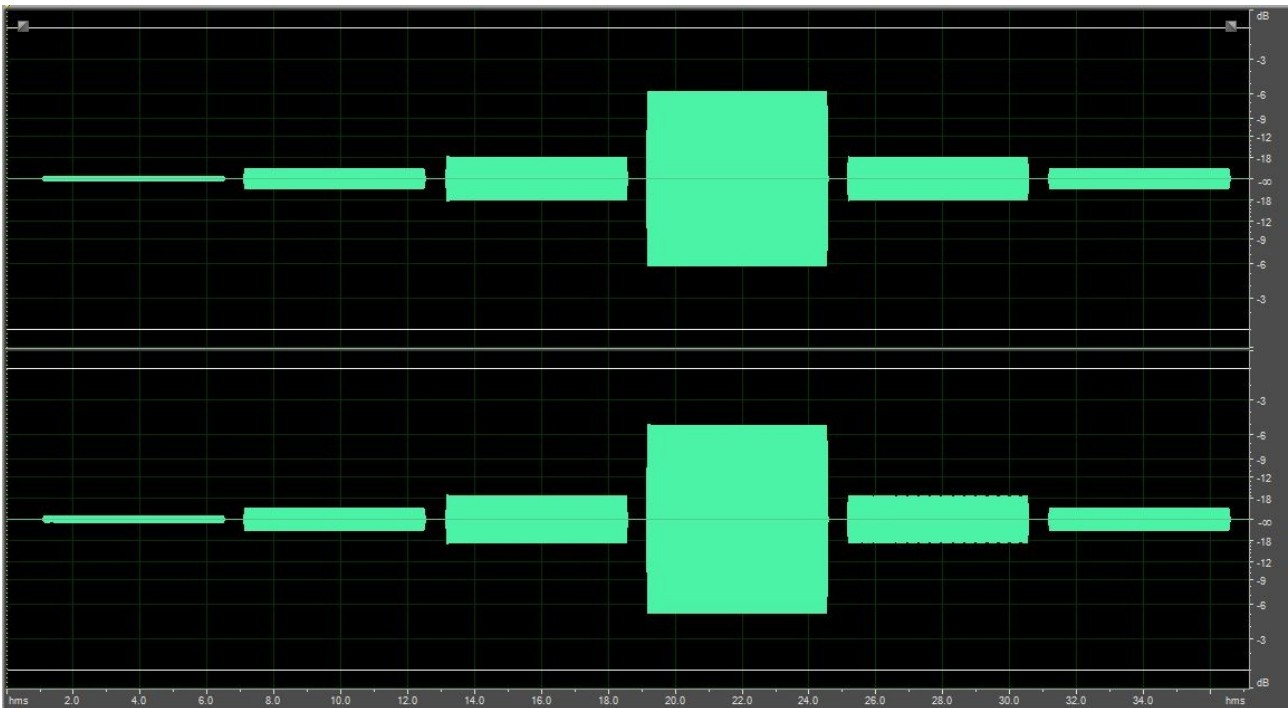
Pan

This shows further evidence of the reduction in the stereo stage (Left to Right)



Phase

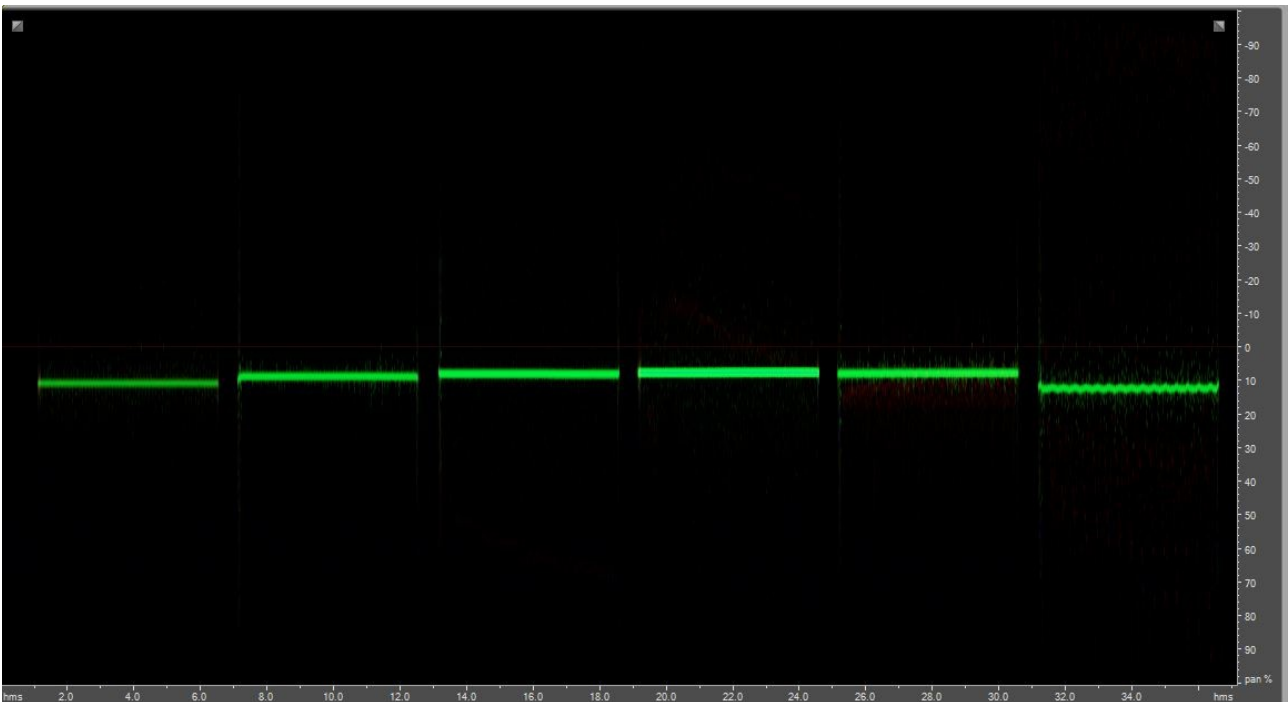
SQ Rear



Amplitude

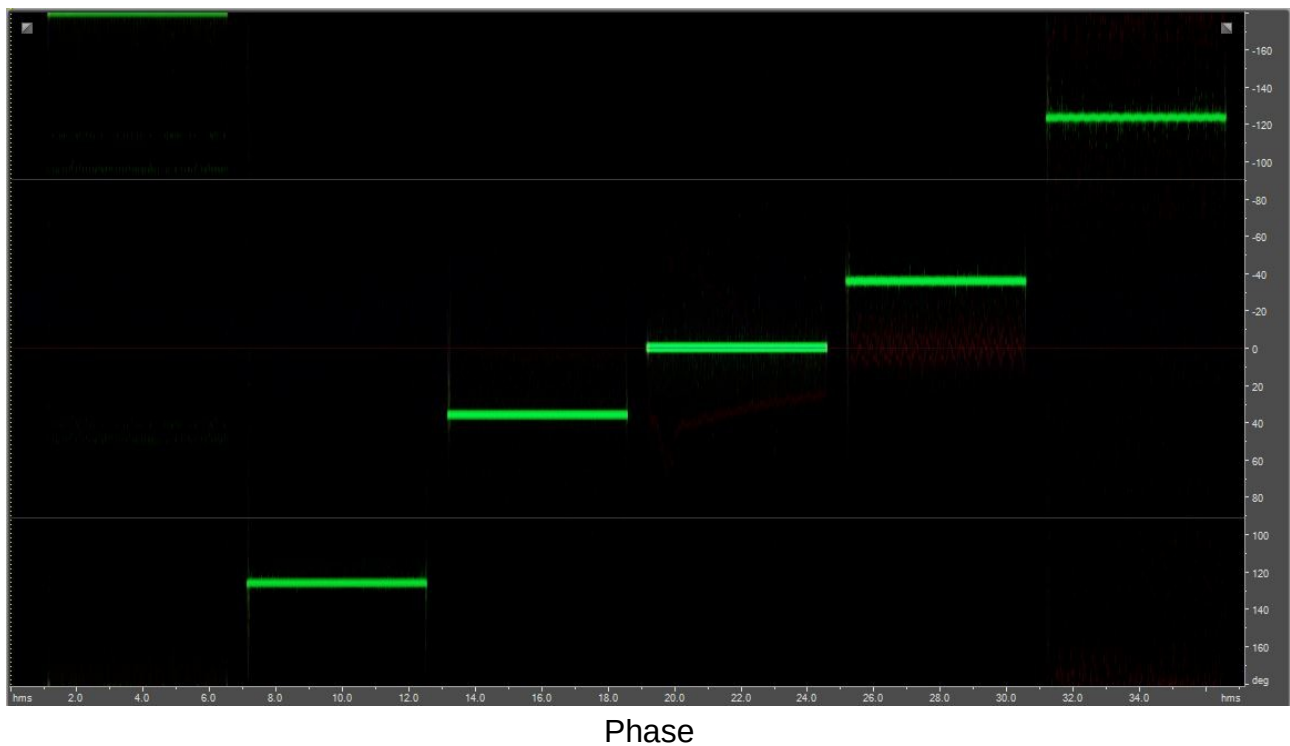
The issues are quite marked here, with the Rear L/R information being reduced, being over powered by the Centre Rear.

More importantly there is no sign of any attempt to decode the rear channels.



Pan

The “Pan” picture shows nothing is correct. As previously mentioned on the SQ Front tests, this pan measurement of the rears could point to the use of 10/40 blend.



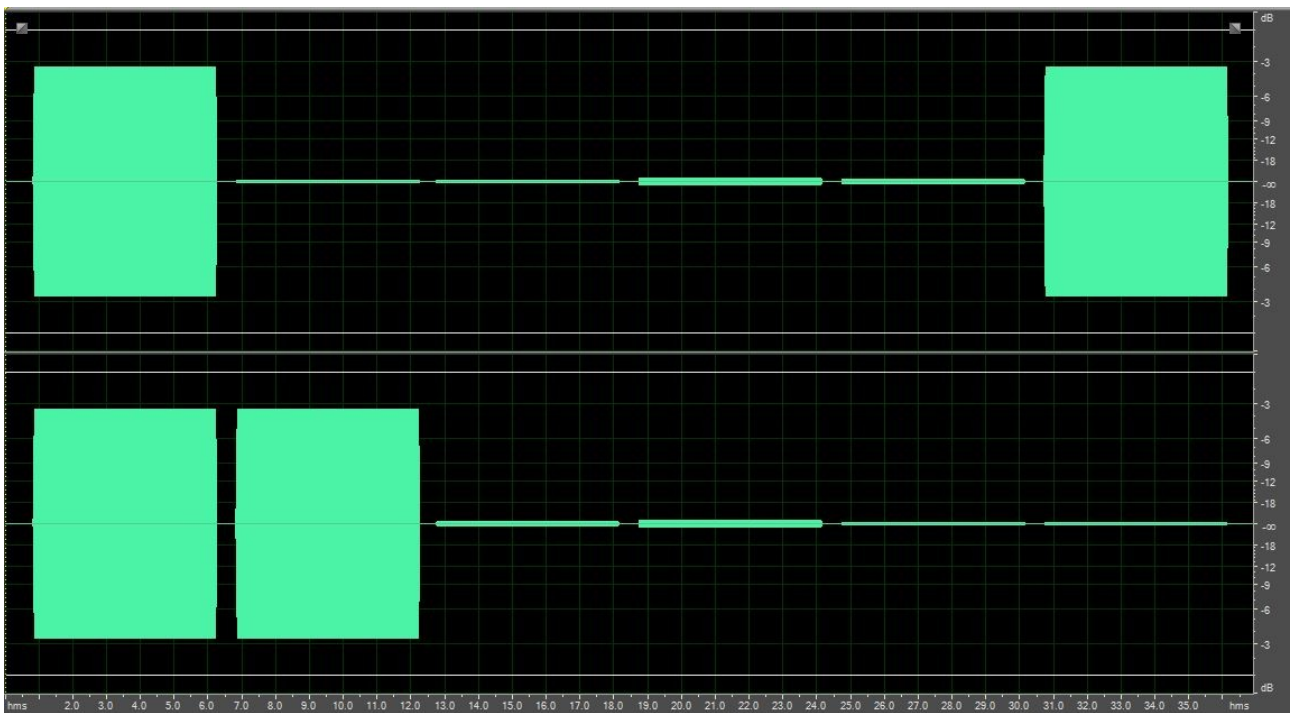
The Phase picture shows both the rear information, and the leaked front information have been subjected to stereo stage width reduction.

It is also easy to see the phase response of both Rear Left and Rear Right are exactly as they were when part of the SQ master file used to input into the decoder. There is one thing that becomes obvious when looking at the information contained within the audio captures is that there is no proof of any electronic SQ decoding apart from basic 10/40 style channel blending as used in the original non-logic decoders.

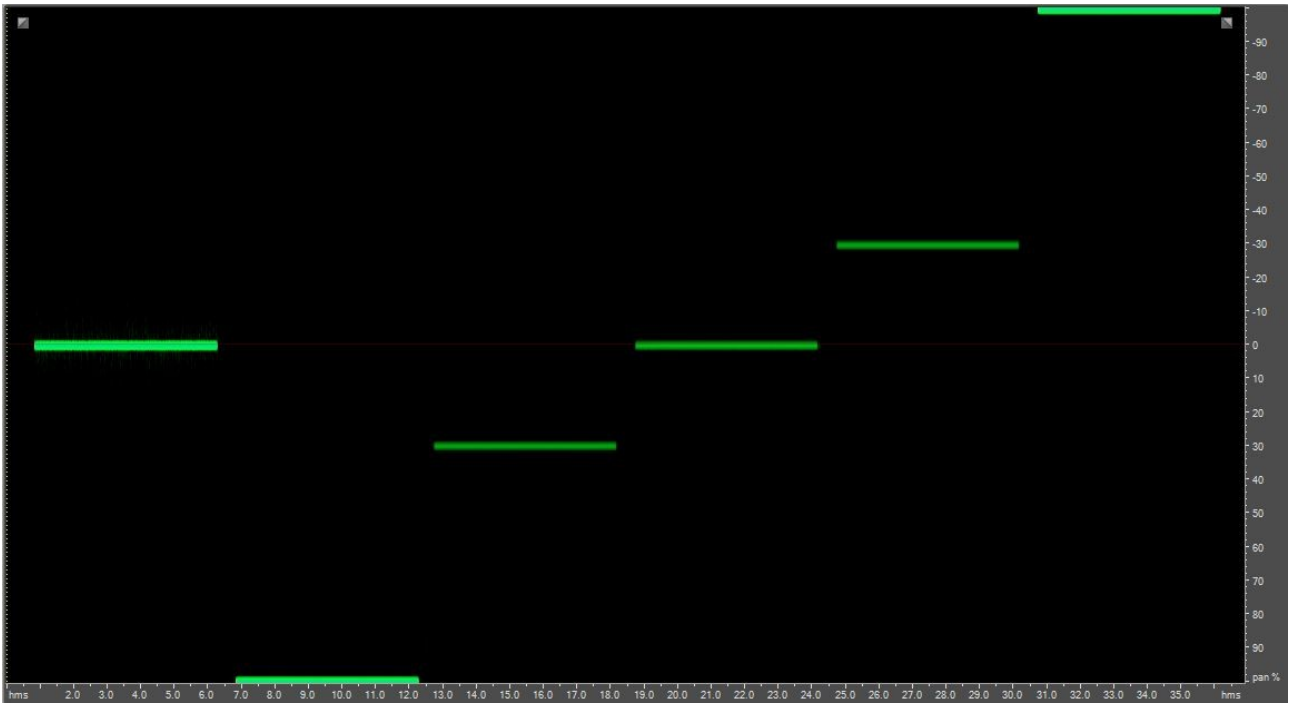
To show the viability of accurate matrix decoding using technology not available during the 1970's, we have included test results from our developmental work, completed during 2021, to create optimal decoding results for as many of the matrix's as possible.

The main impetus for this project was to provide the ability to accurately decode encoded material where the master four channel tape no longer exist, especially for the major music companies, and organisations like the BBC.

QS Front



Amplitude

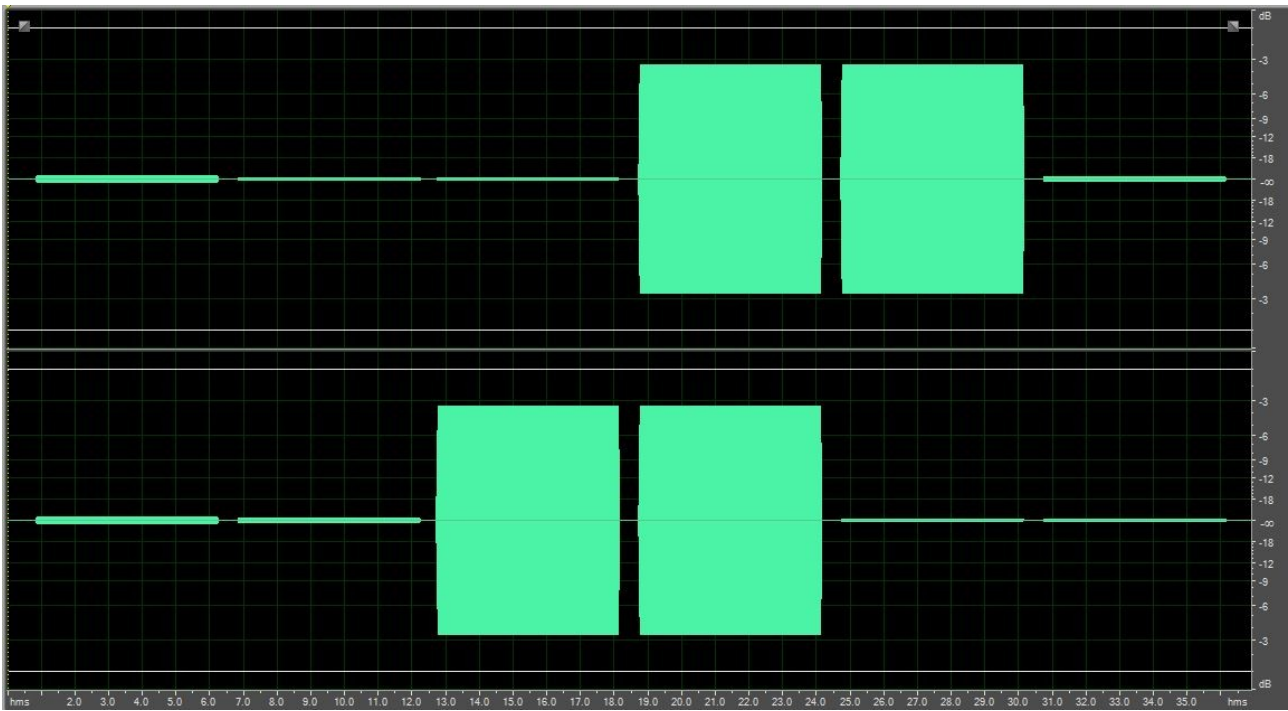


Pan

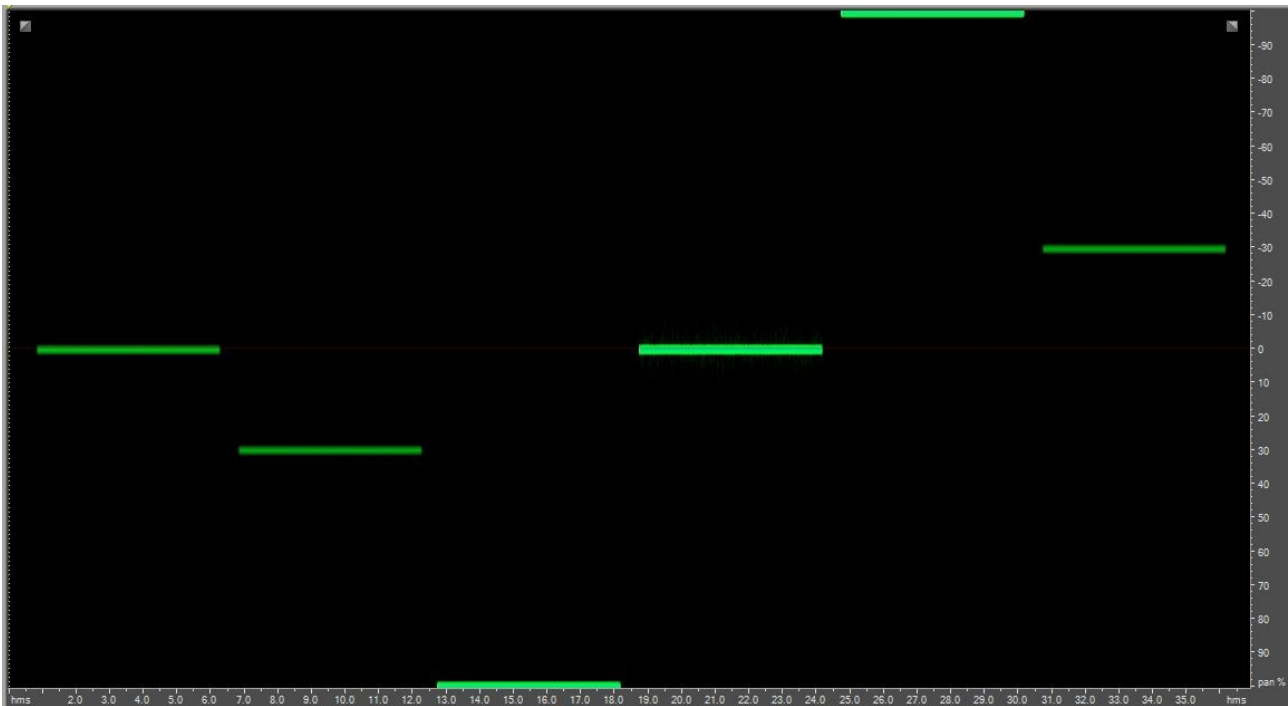


Phase

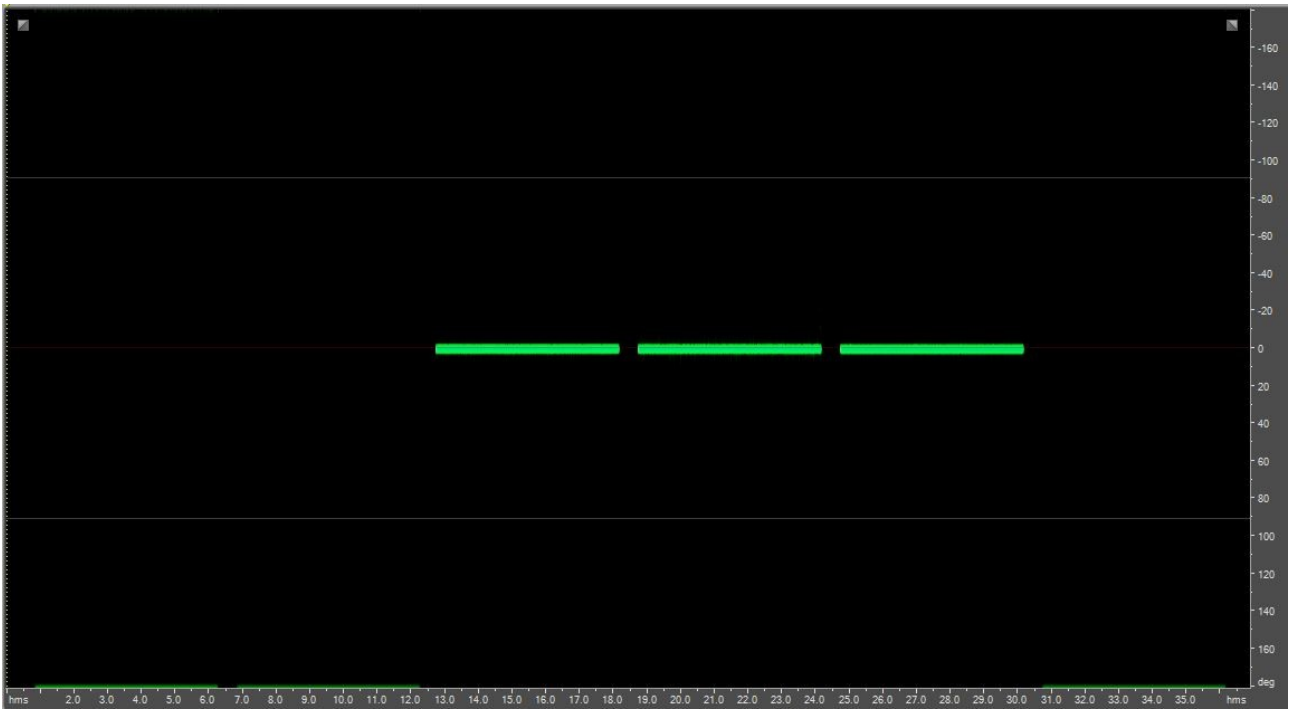
QS Rear



Amplitude



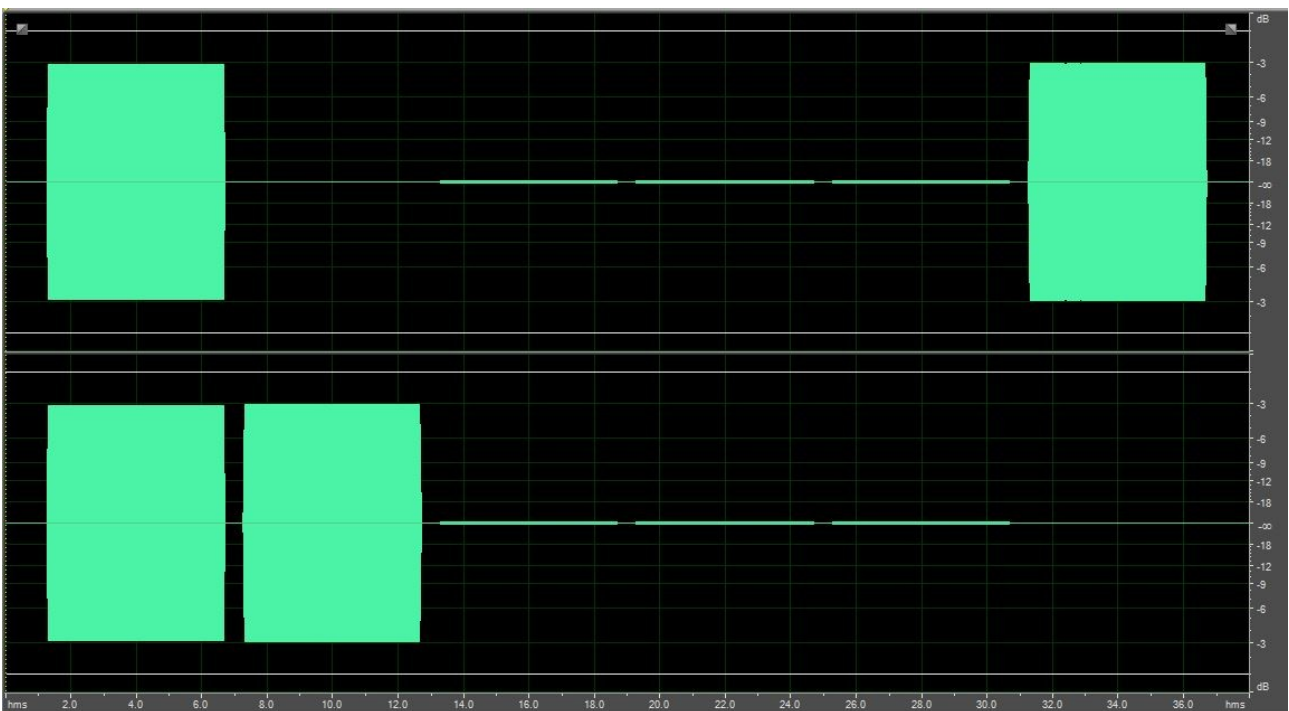
Pan



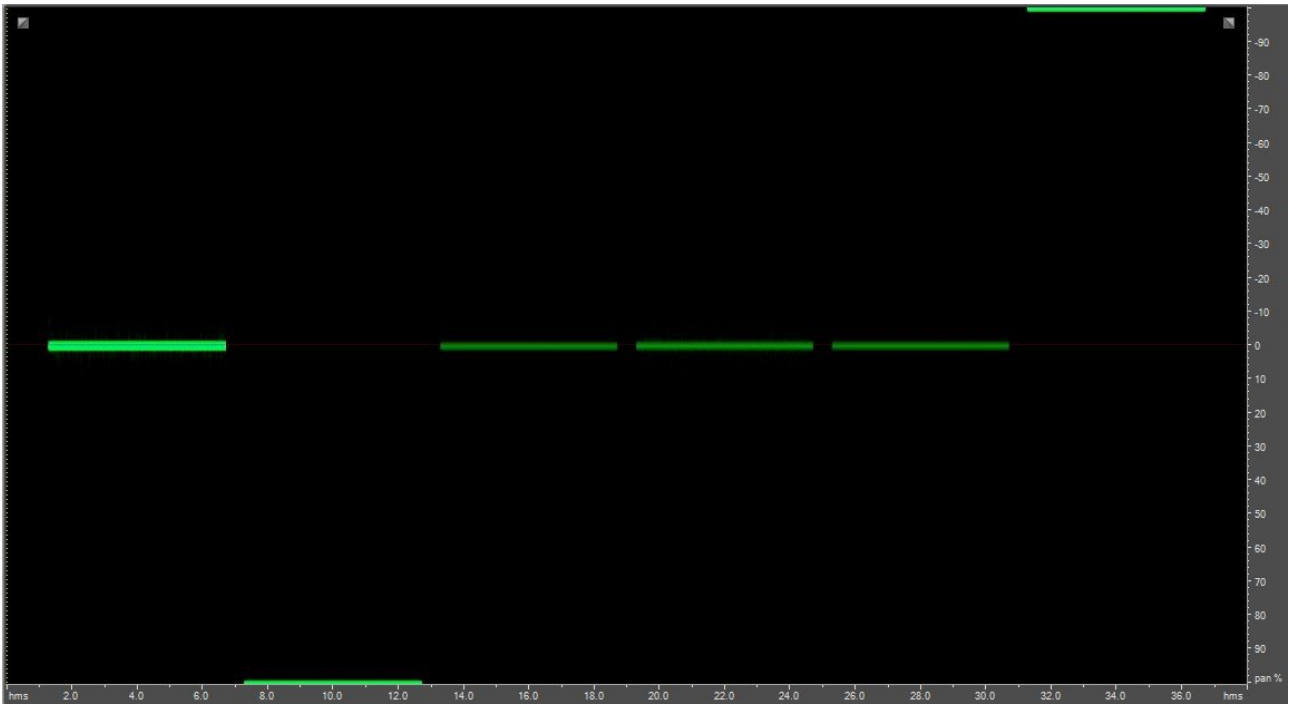
Phase

All theoretical ideals have been realised in this **QS** process

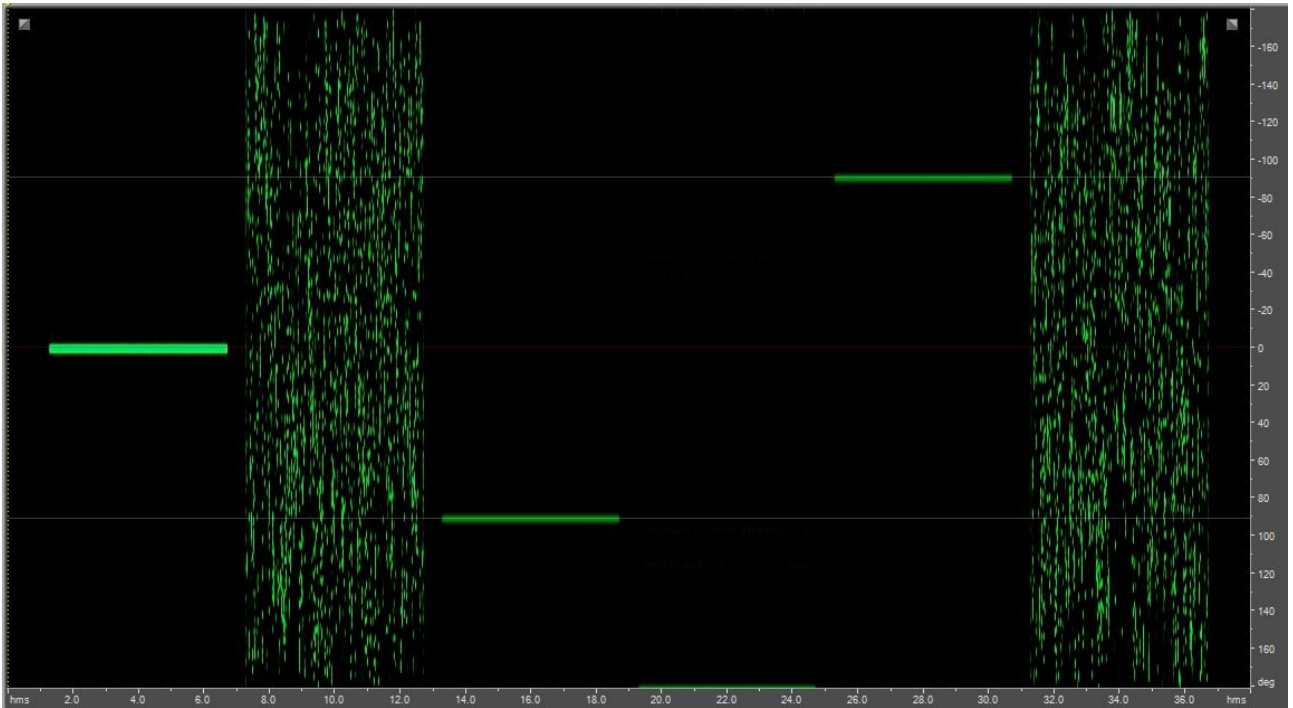
SQ Front



Amplitude

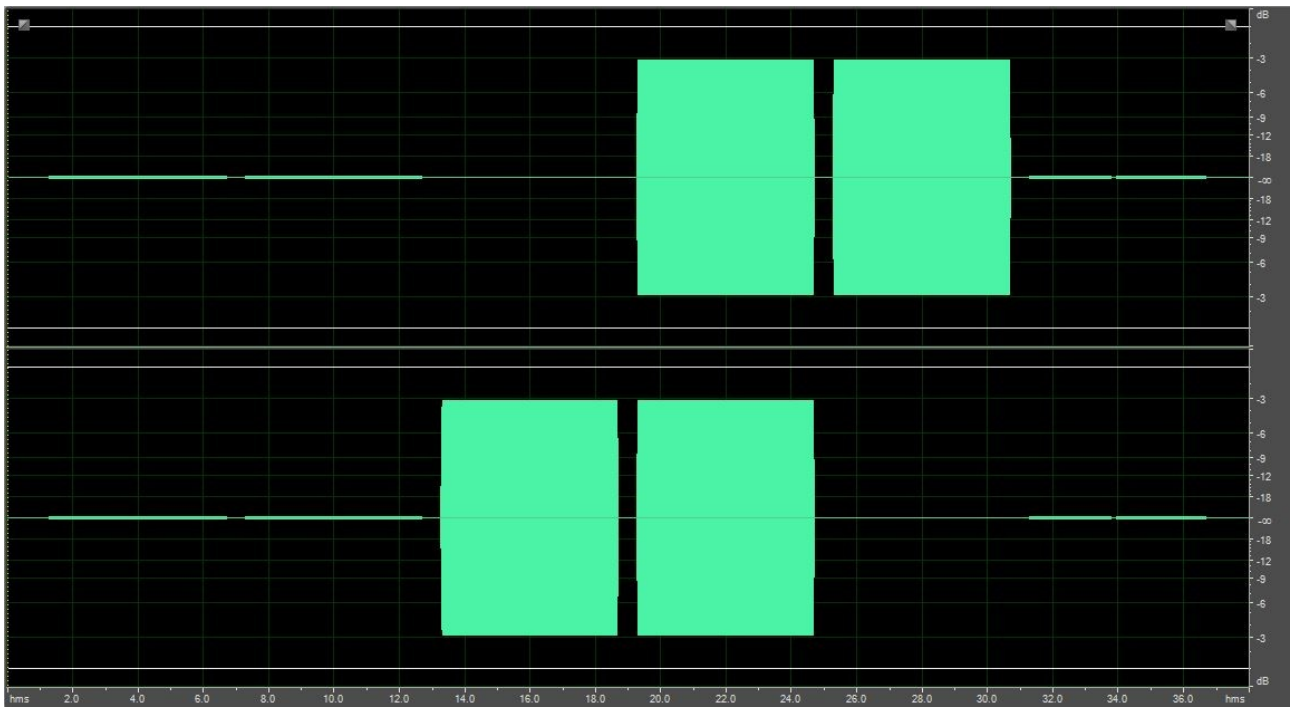


Pan

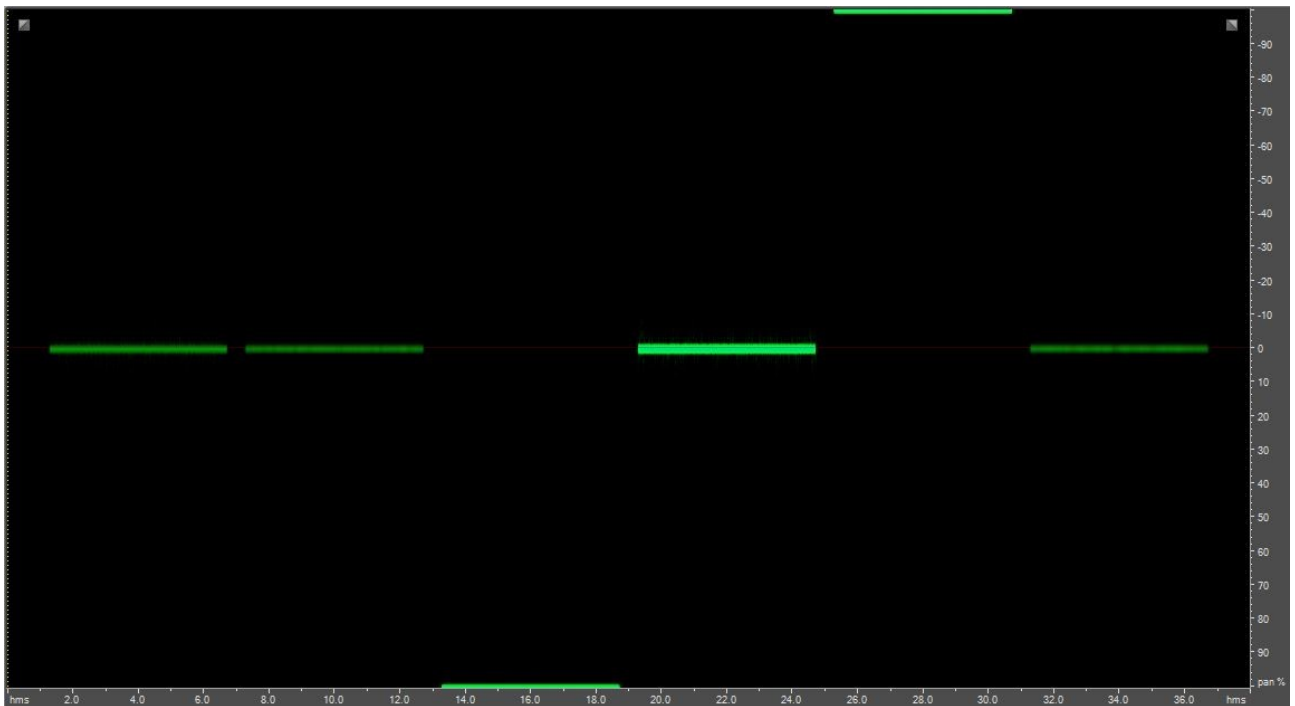


Phase

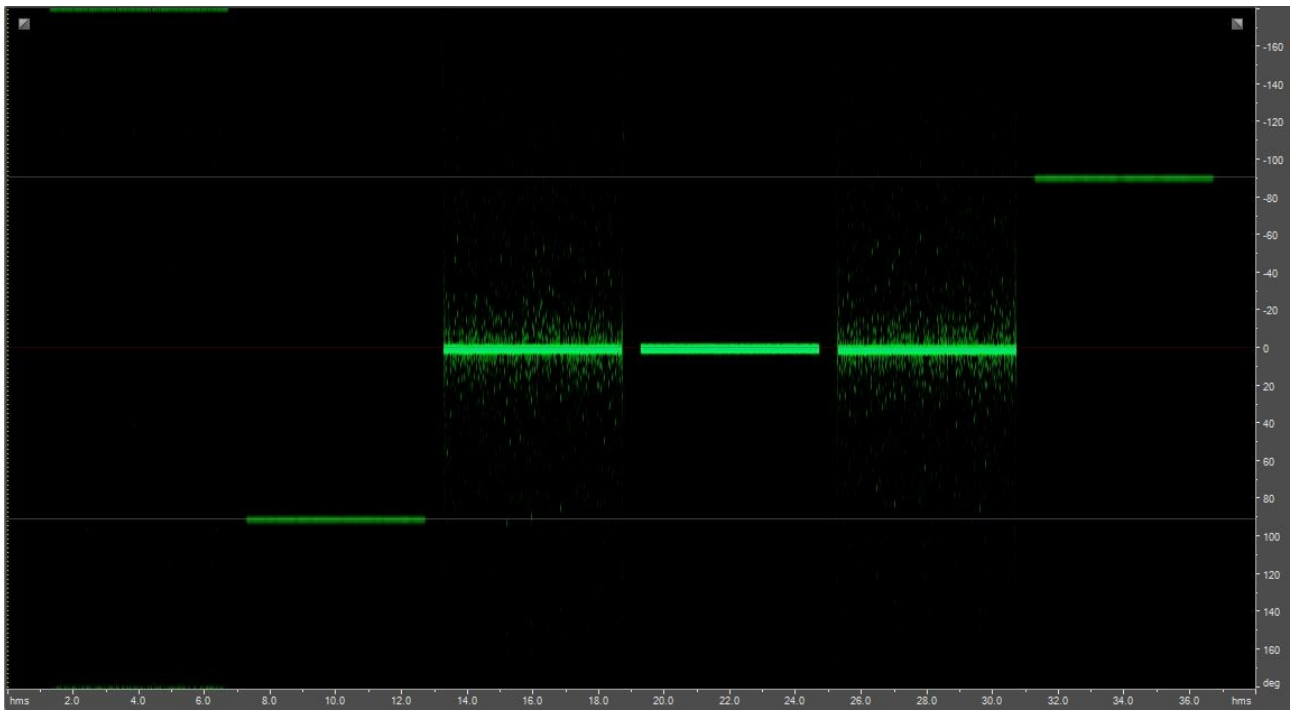
SQ Rear



Amplitude



Pan



Phase

All theoretical ideals have been realised in this **SQ** process

The Matrix Team

A Picture Paints A Thousand Words

theqmatrix.wordpress.com