

TerraNotes

Current TerraStation II version: v7.525

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Greetings once more and we hope this second newsletter of the CoVid era continues to find you healthy and safe. While our staff continues working from home support calls and other enquiries are still being handled as efficiently as possible. While there does appear to be some light at the end of the tunnel regarding a return to more normal work conditions, it continues to be advisable to communicate by email with us as much as possible, as we have more people monitoring it.

Best regards

The TERRASCIENCES team.

TCL Enhancements

A couple of TCL programming notes. Firstly we have add the following command to the plot control commands:

SET PLOT NAME_EXTRA - allows you to have more flexibility when plot file generation is set to automatically use well name and scale to generate the output plot fie. For example...

```
SET PLOT SCALE 200
SET PLOT FORMAT PDF
SET PLOT ILG 'c:\terra\ts_v8_dev\userdata\simple composite.ilg'
USE WELL 22-8 WILKERSON
SET PLOT NAME_EXTRA Basic
CREATE PLOT
SET PLOT ILG 'c:\terra\ts_v8_dev\userdata\detailed composite.ilg'
SET PLOT NAME_EXTRA 'Detailed'
CREATE PLOT
```

Without the PLOT NAME_EXTRA commands adding the words 'Basic' and 'Detailed' to each plot filename, the first plot created would be replaced by the second plot, as they would have the same name.

Secondly, there are two new functions – SEQNUM and WCOUNT. These are intended to allow more control within multi well runs.

WCOUNT – returns the number of wells in the collection being processed.

SEQNUM – returns which well is currently being processed.

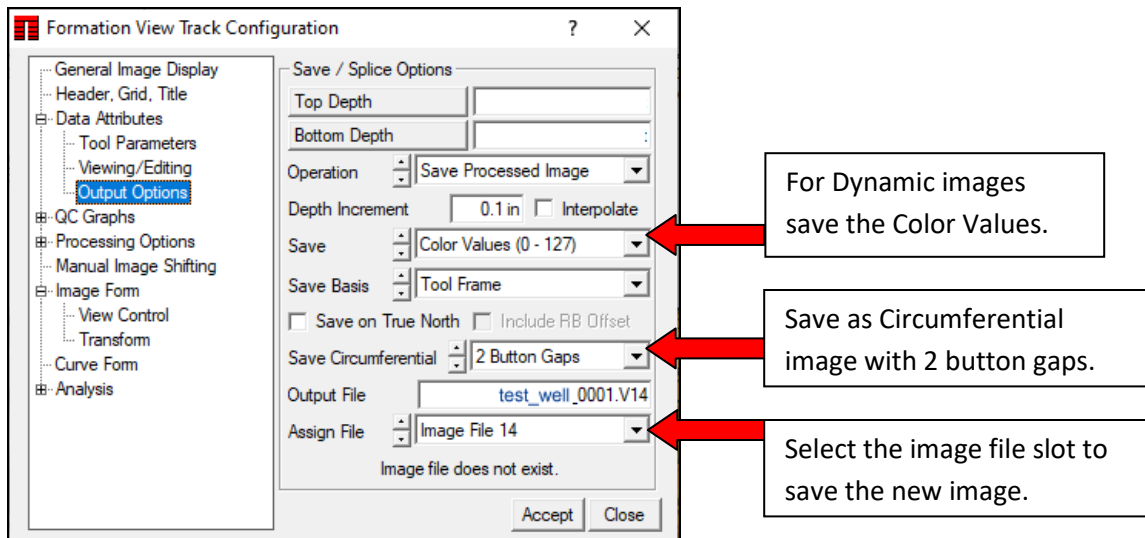
A simple example of use might be:

```
DECLARE WELLS
DECLARE CURWELL
WELLS = @WCOUNT()
CURWELL = @SEQNUM
IF (CURWELL = WELLS)
  PRINT This is the end of the processing
END
ENDIF
```

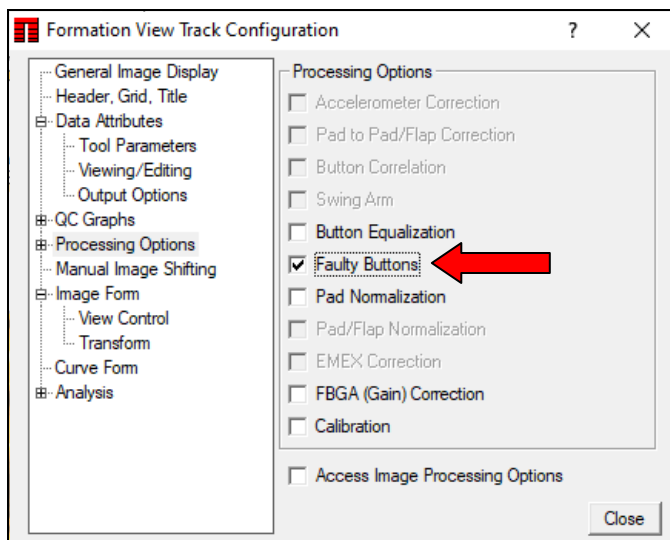
Borehole Imaging – Gap Infilling for Pad Based Images

While we are not big believers in ‘manufacturing data’ on images, we have added a simple capability to ‘infill’ the gap between pads. The process involves two steps:

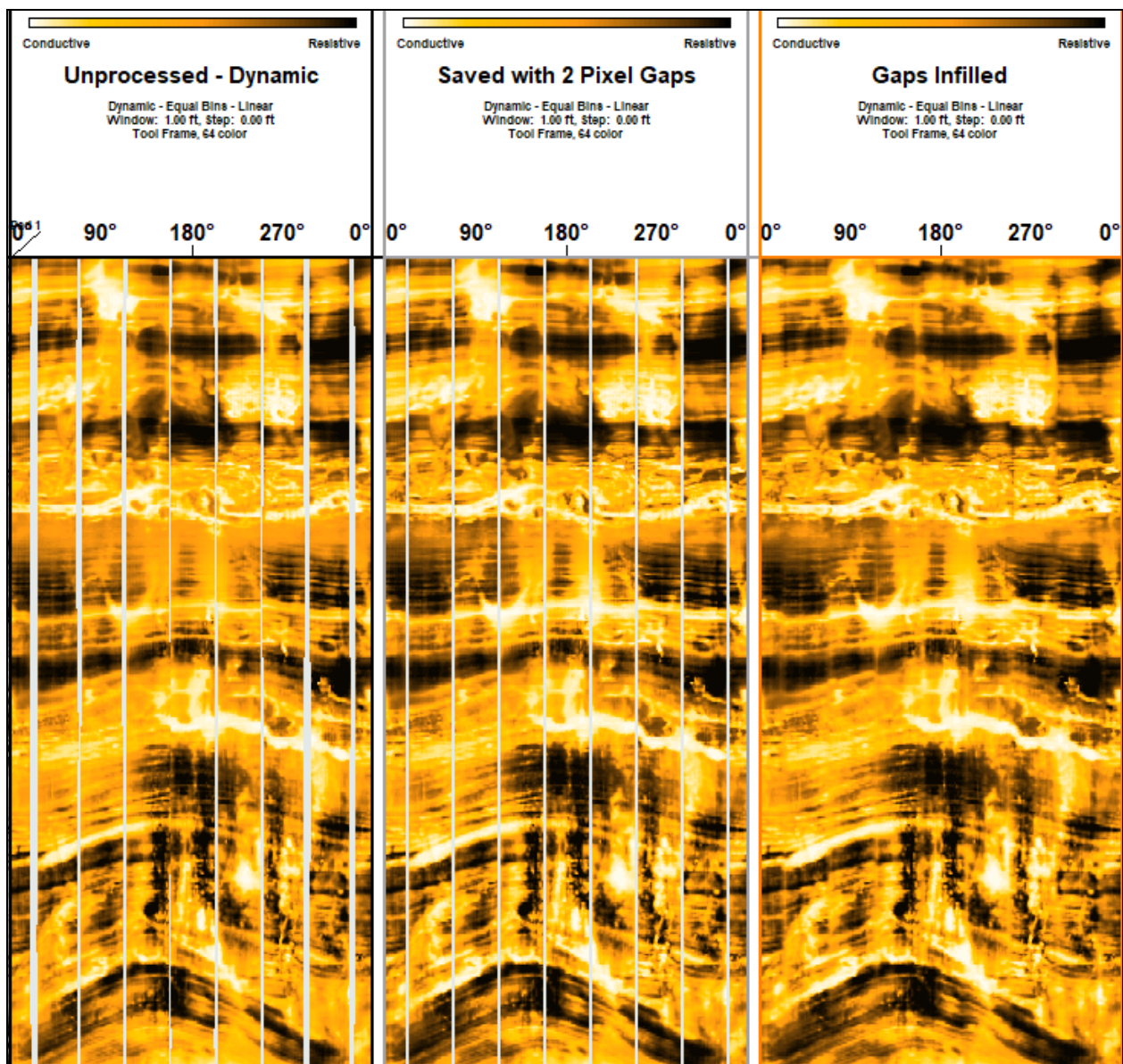
a) On the **Data Attributes -> Output Options** panel, save the original image to a new file and select to save it as a Circumferential Image with **2 Button Gaps**.



b) Display the new image with gaps filled. Do this by setting the **Processing Options -> Faulty Buttons** check box to on.



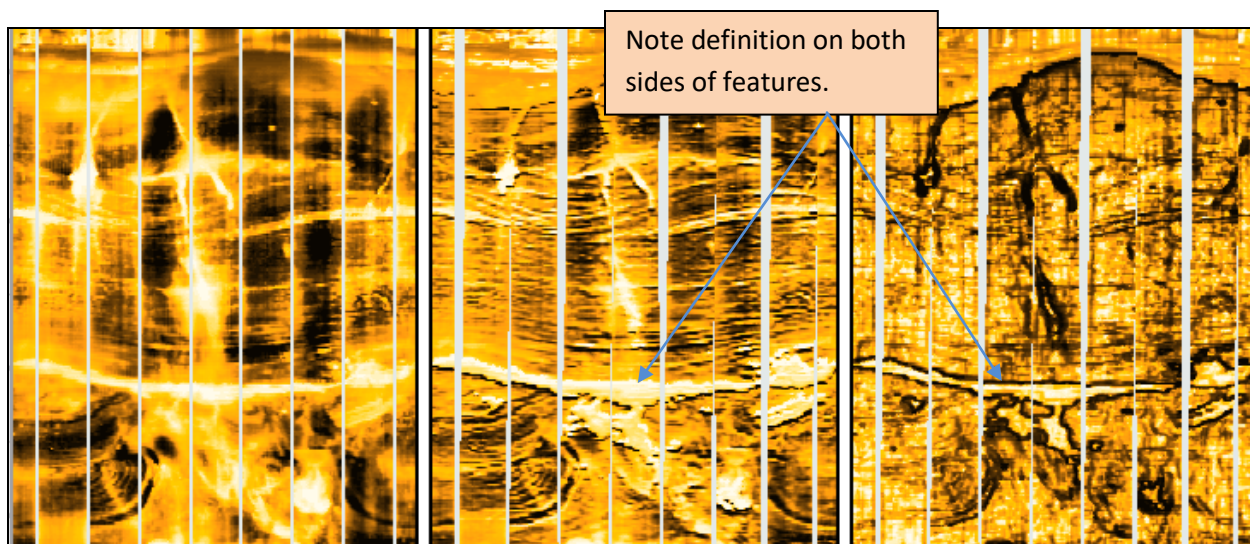
Below is an example showing the image at each step in the process. The original dynamic image is on the left, the dynamic image saved as a circumferential image with 2 button gaps is in the middle, and the final image has those gaps filled by the ‘faulty button’ algorithm.



Borehole Imaging Edge Enhancement Filters

There are a couple of new image filters under the **Image Form** filter selection at the top right of the panel. They are called **3 x 3 range filter** and **3 x 3 std dev filter**. If you do not see them in the filter list then you may be using an older version of the fvfilter.v70 file in your 'userdata' folder. Either delete or rename this file and the software will then use the default file which contains these new filter definitions. The filters are very similar in effect in most cases. They are intended to help enhance grain boundaries and other features in the image. This can help in vug identification for example.

An example below shows the effect compared to the unfiltered dynamic image (left), a standard horizontal edge detector(middle), and the 3x3 range filtered image (right).



IMAGELog - Track Header Interrogation

We have added information to the bottom status line of the window, such that when you move the cursor into the track header of a track, certain information about the track is displayed on the header. This is particularly aimed at providing the pick data set identifier or the lithology/facies data set identifier of the data being displayed in that track. It is useful when you may have several pick sets in use on the same display and are not sure which pick set is being displayed in a particular track. For example...



Here the cursor was moved on to a Tadpole track header. That track is using Pick Set A as its data source, but also has the data filtered by dip to allow only values between 0 and 60 degrees, and pick quality cutoff range set to 0.5 to 1.0

Universal Time loading and using in IMAGELog.

We have recently added support for a special date/time string representation in the curve listing track of IMAGELog. This is designed to deal with something called Universal Time. It is basically a count, in seconds, from a fixed date and time. That fixed date and time is midnight, Jan 1, 1970 GMT. In the example below the curve is called UT (it is described as Posix Time) and has a unit of seconds (s).

DLIS Curve Data Block Listing - REPORT ONLY								
Block Name	Curve Name	Curve Units	Curve Dimension	Block Top (ft)	Block Bottom	Block Increment	Curve Description	Number Points
1	0 4 1	MD	ft				Depth	212916
1		ET	s				Elapsed Time	2138
2	AmpMrgS1		Dim: 128				FV S1 HS BHC Merged Tx12	2117
3	AmpMrgS2		Dim: 128				FV S2 HS BHC Merged Tx12	2117
4	CalMrgS1		Dim: 128				FV S1 HS Caliper Image (Radius)	2121
5	RPM	rpm					RPM_Filtered	2137
6	ROP	ft/hr					ROP	2137
7	UT	s					Posix Time	2138
8	XPSD		Dim: 128				Acceleration X PSD	2014
9	YPSD		Dim: 128				Acceleration Y PSD	2014
10	ZPSD		Dim: 128				Acceleration Z PSD	2014

IN the DLIS reader when you select this curve to be stored, the software will actually create a two element array curve, and store the day count from the reference date and time in the first array element and the time count in seconds for that day in the second element.

If you were to look at the data in the Table Editor of TerraStation after loading it, you would see something like this...

Note that the units for the curve are changed to “day-sec” by the DLIS reader.

You can see that the first element (the day counter) remains the same then changes when it happens to hit midnight. At the same depth, the seconds counter for that date resets to 1 and then begins to increase again (there are 86400 seconds in a day). Note the fact that the seconds do not increase regularly is expected as the speed of the logging run likely has variations in it.

We can display this data in IMAGELog in a Curve Listing track that has special formatting options available.

Well Name:		
M. Depth [Raw];1 ft	UT [Raw];1 day-sec (1)	UT [Raw];1 day-sec (2)
14475.8	18213.000000	86389.000000
14476.3	18213.000000	86391.000000
14476.8	18213.000000	86394.000000
14477.3	18213.000000	86397.000000
14477.8	18213.000000	86399.000000
14478.3	18214.000000	1.00000000
14478.8	18214.000000	2.00000000
14479.3	18214.000000	5.00000000
14479.8	18214.000000	6.00000000
14480.3	18214.000000	8.00000000
14480.8	18214.000000	10.00000000
14481.3	18214.000000	12.00000000

In IMAGELog add a new track and make it a **Curve Displays -> Curve Listing** track type.

Select to display the **UT** curve.

Change the **Format Control** setting to one of the time based ones shown at the bottom of the selection list for this item. Here is an example of a template showing the simple display on the left, followed by a more complex display of the data to the right of the depth track. It uses a combination of two curve listing tracks and a blank track (the pink area).

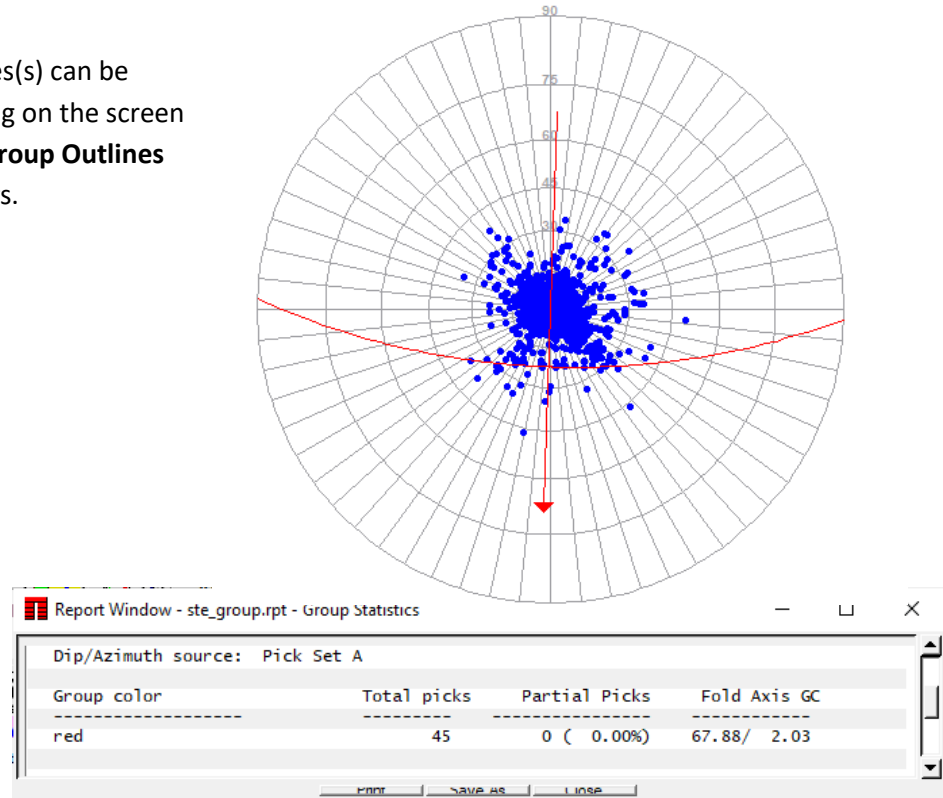
You also have control of how frequently the data is displayed in the track, and whether the data is displayed vertically (is in the date display in the pink colored area) or horizontally.

UT	M.Depth (ft)	Universal Time	
		2019-11-13	23:59:46
2019-11-13 23:59:46			
2019-11-14 00:00:08	XX480		00:00:08
2019-11-14 00:00:27			00:00:27
2019-11-14 00:00:44	XX490		00:00:44
2019-11-14 00:01:01			00:01:01
2019-11-14 00:01:19	XX500	2019-11-14	00:01:19
2019-11-14 00:01:38			00:01:38
2019-11-14 00:01:56	XX510		00:01:56

Dip Analysis - Great circle direction indication

When identifying groups of data on a stereonet there is now an arrow drawn that shows the great circle dip and azimuth to give better visual feedback.

Note that the group outlines(s) can be switched off by right-clicking on the screen and selecting **Draw/Hide Group Outlines** from the menu that appears.



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