New method of measurement correction: The "Acoustic Brush"

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Foreword

Correction of measurements, especially environmental ones, has always been one of the main features of NoiseWorks.

The use of "Masks" is the preferred technique for eliminating unwanted events from a time history. The effectiveness of masks is beyond doubt, but the main drawback is that artificial elements are inserted into the time history. In the case of a full mask, this is an interruption of the time history, and in the case of a replacement or offset mask, this is an arbitrary value decided by the technician performing the operation.

The new correction tool (we call it Acoustic Brush) borrows from image editing applications the technique of cloning an area and using it to replace another.

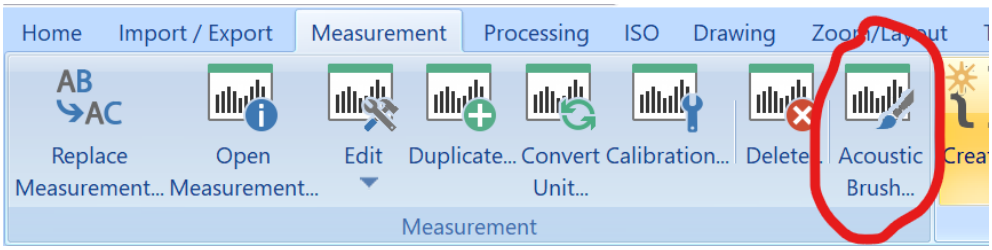
The advantage is that the unwanted element you want to eliminate is replaced by noise taken from the same context, normally just before or just after the event itself, which eliminates the unwanted part while maintaining the continuity of the time history.

Acoustic Brush

"Acoustic Brush" is a new technique introduced in NoiseWorks that allows you to eliminate unwanted events from environmental measurements.

The operation is performed in a dialog box and not directly on the page. You can start by selecting a Time History graph or Sonogram containing the measurement you want to correct; alternatively, you can select the measurement from a list.

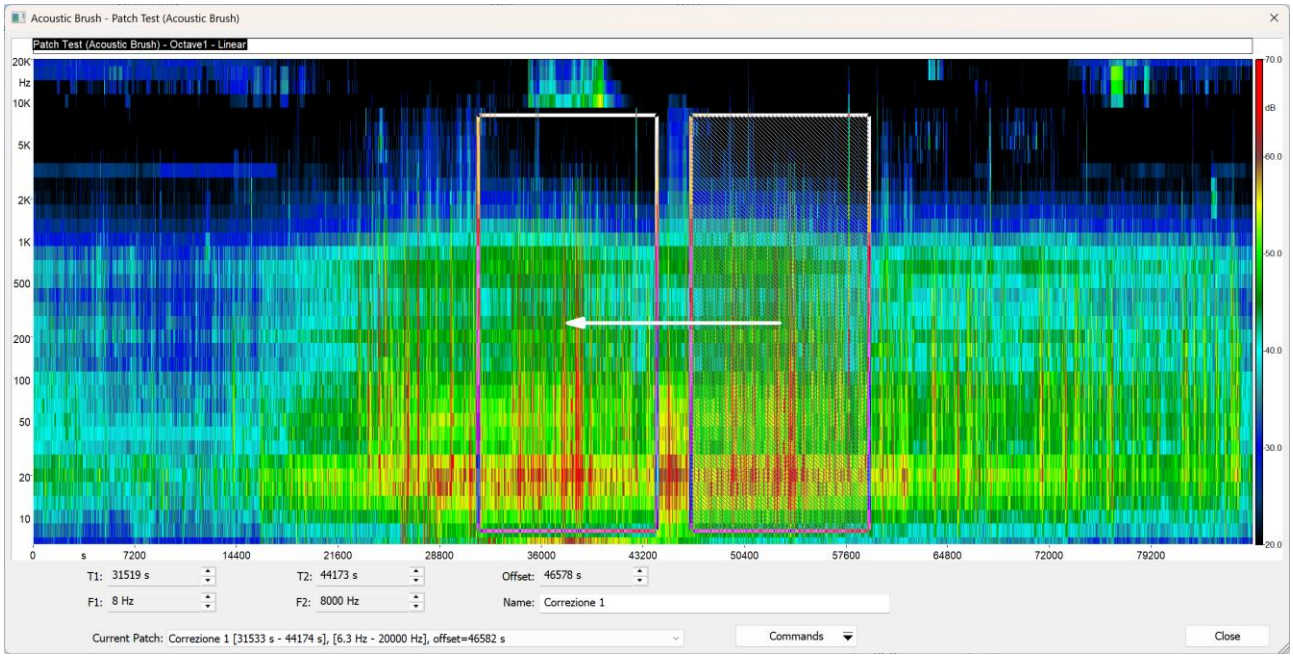
The command is found in the Measurements tab of the ribbon, as shown in the image below:



To avoid confusion or misuse, the operation is never performed on the original measurements. When starting from a new measurement, the channel displayed in the graph, or the first channel if the measurement is selected from the list, is duplicated in a new measurement containing two channels. Initially, both channels are identical and contain a copy of the original data. After performing a correction, the first channel continues to contain the original data, while the second contains the corrected data. This structure of the measurement containing the correction allows for an easy comparison of the situation before and after the correction. The data from the corrections performed are stored in this measurement and allow for modification later.

Acoustic Brush Window

An example of the Acoustic Brush Window is shown in the following image. The graphical display can be either a sonogram or a time history. If the measurement you are working on contains a multispectrum, the sonogram is always displayed.



At the bottom are the fields that display the data for the current correction. The T1, T2, F1, and F2 fields are the edges of the area you want to correct; the Offset field represents the distance from this area where the data is taken; finally, the name field allows you to assign a user-defined name to each correction.

Below is a combo box where you select the Current Brushstroke, and a button that opens the command menu.

To add a new Brushstroke, you must first identify the area containing the unwanted event by drawing a rectangle; then move the mouse to define the position from which the data will be taken.

You can edit a Brushstroke directly using the mouse. When a correction is displayed, click on one of the two rectangles and move it to a new position. Or move the mouse over one of the edges of the correction rectangle to change its area. The rectangle where the arrow points represent the correction area. You can also change the correction by clicking on the arrows next to the fields that display the edges of the Acoustic Brush area.

Video example

Result of the new method

Rather than words, let the images show what the result is that can be obtained with this new method.

In our example measurement, we identified two undesirable events. We made the corrections, and the results are clear!

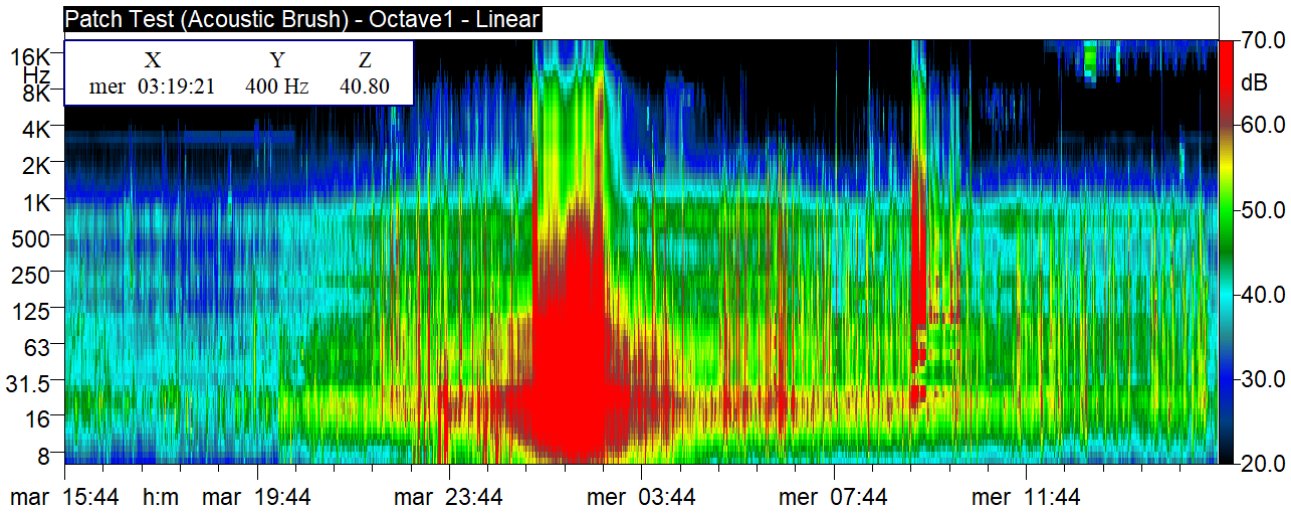


Figure 1 - Sonogram before Patch

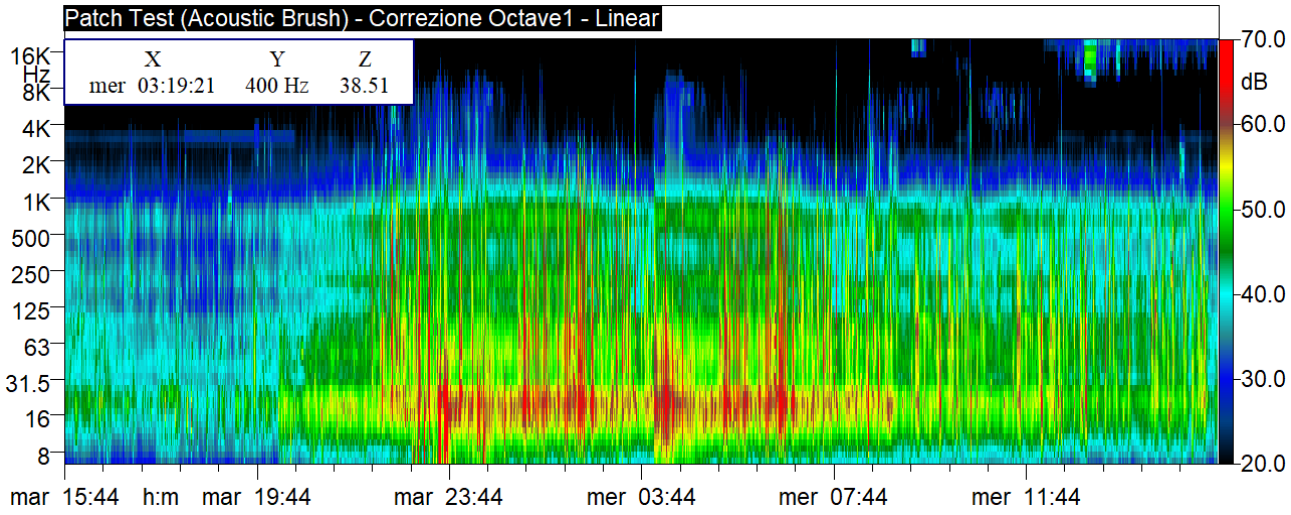


Figure 2 - Sonogram after Patch

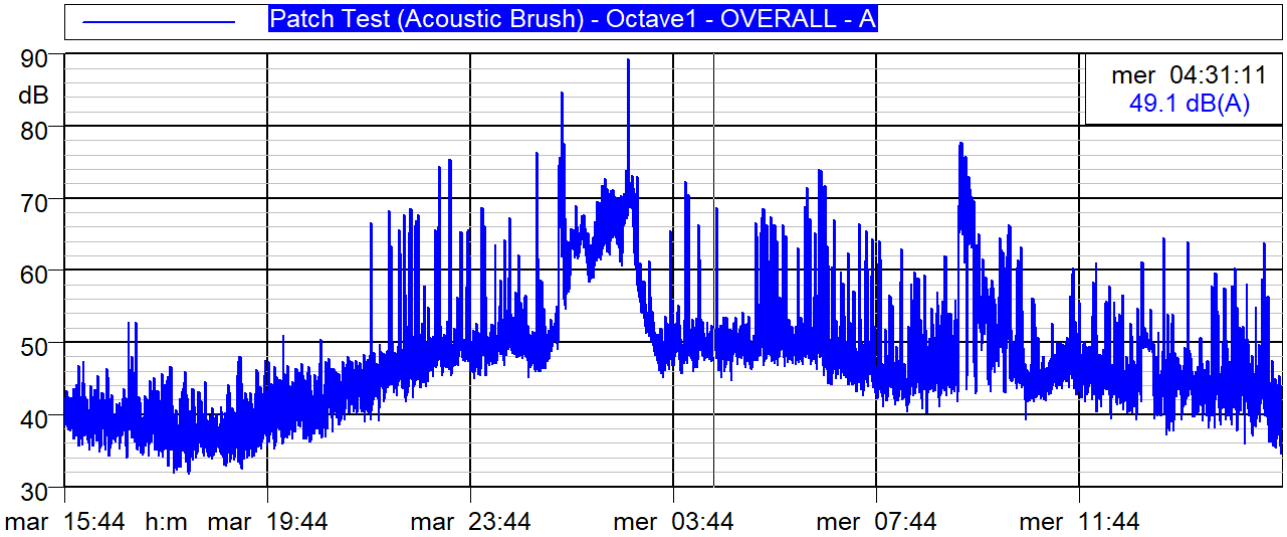


Figure 3 - Time history before Patch

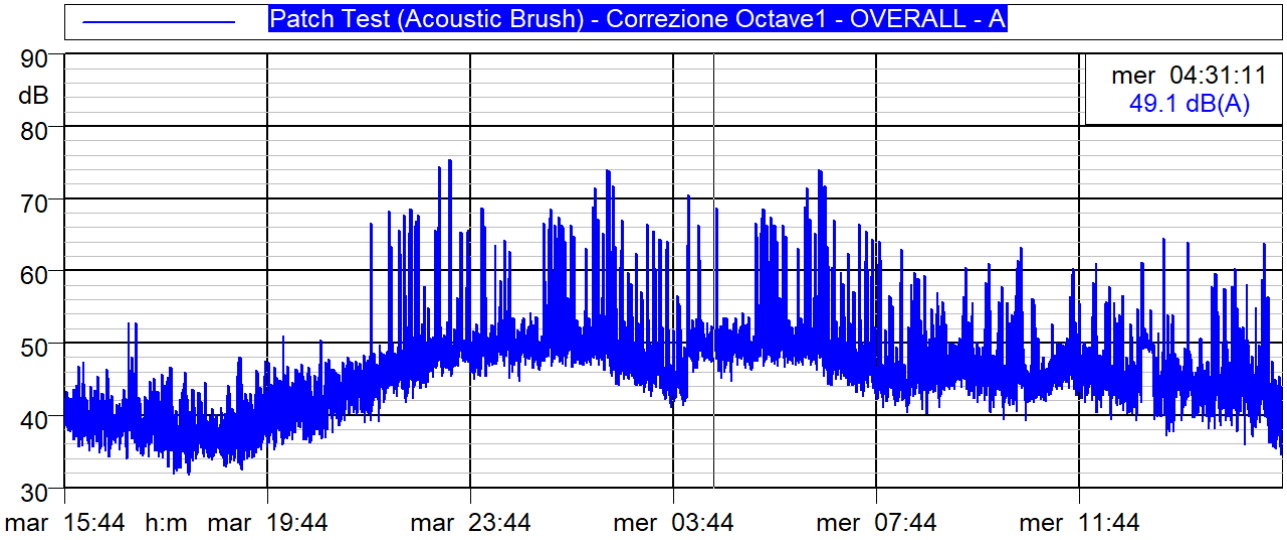


Figure 4 - Time history after Patch

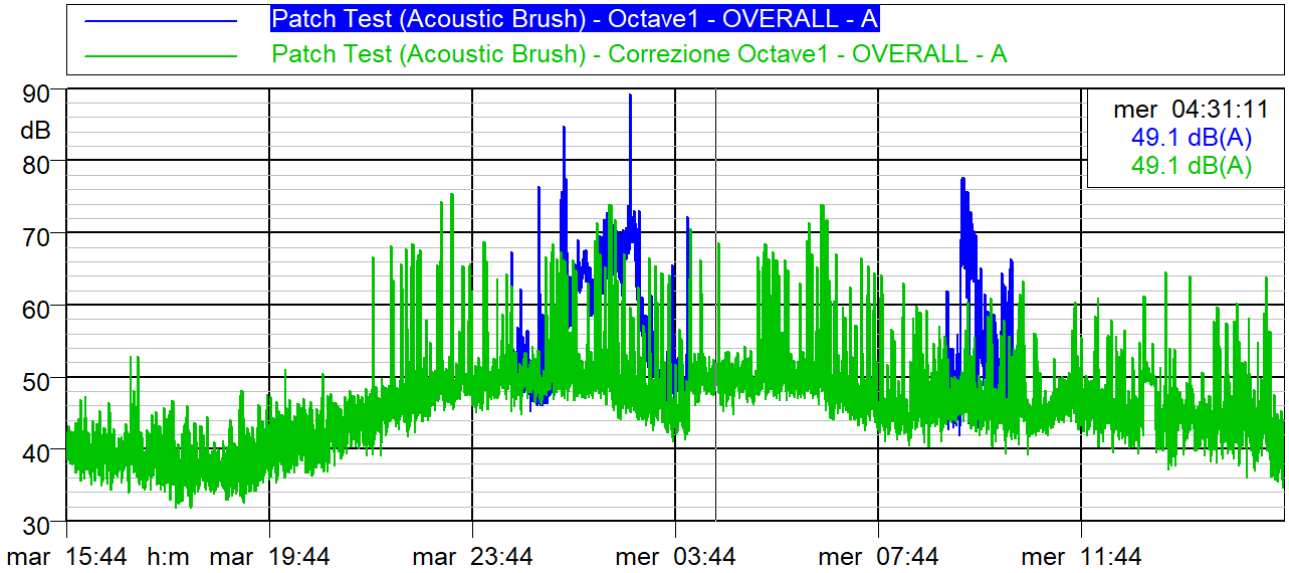


Figure 5 - Time history with before and after overlapping