

## Breathe New Life into SD Video



**The SM03 video enhancer can process your NTSC/PAL video to look almost as good as high definition.**

## Do you need to:

**Copy NTSC/PAL VHS tapes to a more modern medium with 'better than VHS' quality.**

**Improve the quality of analogue laserdisc video.**

**Enhance low contrast or very high dynamic range images.**

**Reduce noise in video images.**

**Accept out of specification/high jitter video and correct the video timing errors.**

**Pre-process SD video to remove artifacts and noise that can use up valuable bandwidth when compressing the image.**

**Process SECAM video.**

## The SM03 has applications in:

**Security/CCTV camera installations.**

**Subsea/pipeline inspection.**

**Microscopy.**

**Remote video inspection.**

**Analogue tape archiving.**

**Industrial imaging.**

The SM03 incorporates a proprietary 3D comb filter which separates the composite NTSC or PAL video into its component colour and brightness components. On the left (below) is a conventional video decoder – the image is 'soft' and lacking detail and the '2002' shows what is called dot crawl, which detracts from the image quality and also uses up bandwidth when being compressed. On the right you can see the more detailed image the SM03 comb filter produces, without any dot crawl.



The SM03 also has a special mode that can be used to recover 'lost' information in analogue tape recordings that use the 'colour under' method of recording (e.g. U-matic and VHS).

This high frequency information (image detail) has usually been discarded in the playback process because it is not possible to differentiate it from colour information. The SM03 has a special mode that can recognise the high frequency detail and provide 'better than VHS' quality playback of analogue tape recordings.

# Who are SingMai?

SingMai, based in Ayr, Scotland, are experts in the processing of video images. All of our products are designed and manufactured in the U.K.

Our products are sold to over 20 countries worldwide. Some of our customers include: Rhode and Schwarz (Germany), L3 (Canada), Lockheed/NASA (USA) and BYD (China).



**SingMai Electronics Ltd.**

**Unit 1, North Harbour Industrial Estate,  
Ayr, U.K., KA8 8BN  
Tel: +44 (0) 1292 501970  
email: [sales@singmai.com](mailto:sales@singmai.com)  
URL: [www.singmai.com](http://www.singmai.com)**



The original image on the left (above) is a view through a tunnel. The bright tunnel opening means that any other details are 'crushed' into the blacks. On the right is the histogram equalised image from the SM03 – now all the details on the walls of the tunnel can be seen.

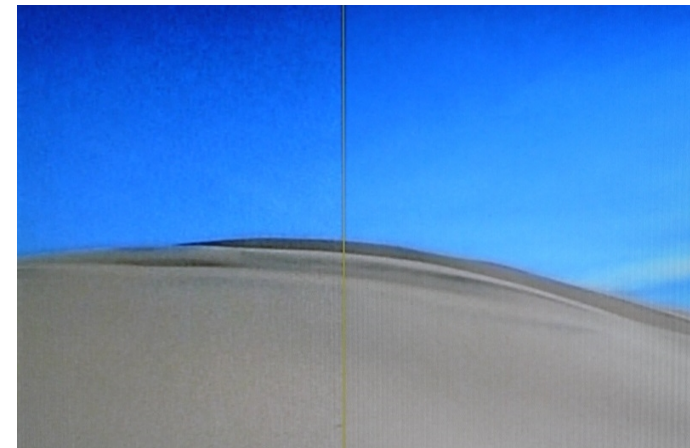
Below, on the left, is an image corrupted by 'salt and pepper' (impulse) type noise. On the right is the processed image from the SM03 using its adaptive median filter.



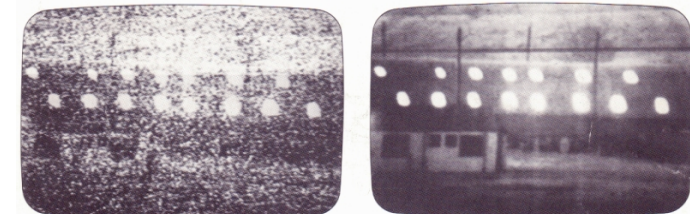
Every video image has some noise in it. Noise both detracts from the image quality, but also can detrimentally affect later processing such as scaling and de-interlacing as well as using bandwidth up when compressing the video for storage or transmission.

The SM03 has sophisticated noise reduction techniques to reduce hum (produced during long cable runs for example), 'salt and pepper' noise caused by interference and 'white' noise.

The left of the image below is the original image which shows a moderate level of background noise, and the right of the image shows the noise reduced image produced by the SM03.



The SM03 can also process images with very high levels of noise, such as in the image intensifier image shown below.



BEFORE

AFTER