

Waves Dorrough Meters Collection

The modelling of 'classic' hardware metering may be seen as a step too far in the bounds of plug-ins but good and accurate metering is often lacking in the DAW environment.

These catch **ROB JAMES's** eye in peripheral vision.



One of my earliest audio memories is of watching the converging green meter bars on my first tape recorder, a Stella (Philips) 4-track. Excursions into the red optically filtered area meant you were getting dangerously close to distortion and overlapping bars guaranteed it. When I subsequently encountered a VU meter the experience was frustrating since this did not provide a reliable means of assessing whether a recording would distort or not. I also discovered *Studio Sound* magazine which introduced me to the concept of the PPM. Broadcasters needed a reliable means of measuring peaks to avoid knocking transmitters off the air and the PPM provided this.

Fast forward a few years to a BBC training course at Wood Norton and my most abiding recollection is of lining up a valve PPM. If you've never encountered one, these used a movement with a right-hand mechanical zero so the rise time was determined by the spring and needle inertia. Anyway, the PPM was a revelation and I've been arguing about the relative merits of VUs and PPMs ever since. Both have shortcomings and neither is fast enough to display the short transients that can play havoc with a digital recording or give any real indication of perceived loudness.

Nowadays, fast accurate peak metering is commonplace but loudness is much more difficult due to the response curve of human hearing. For example, if 1/3-octave noise signals are band-limited at 100Hz and 10kHz they can be almost 15dB higher in level than noise centred on 4kHz but all will sound just as loud. The BBC used to try to get around this PPM limitation by issuing sound balancers with a list of audio sources and the levels they should be allowed to peak to. E.g. an announcer should peak no more than PPM 5, harpsichord — PPM 3-4, and so on.

In the early 1960s Mike Dorrough worked as a sound mixer for a recording company and during this time developed a multiband (or 'Discriminate') audio processing system. This technology was effective in making things louder for a given peak level without excessive damage to fidelity. Needless to say this was something advertisers and producers found highly desirable. On the other hand, Broadcasters had problems at programme junctions with commercials sounding louder than the programmes. In a classic



case of 'poacher turned gamekeeper', Dorrough designed a new 'loudness meter' combining the best features of PPM and VU with improvements to ballistics made possible by LED displays and microprocessors.

The Dorrough meter's Peak measurement is represented by a single LED, usually to be found ahead of the rest, with a ballistic roughly analogous to a momentary oscilloscope trace peak. The effective integration time is around 100 times faster than a PPM. Damping is added to avoid oscillation and persistence of vision means that this speed is useable with an LED display. Meanwhile, the Average or 'Persistence' bargraph has an integration time roughly double that of a VU. Average reference level is set at 65% of full scale with the individual Peak reading LED at full-scale. Thus the meter combines the peak and quasi-average value of the composite waveform, relative to the effective loudness of the programme material in a single display. The Dorrough meter quickly established itself in many audio fields and is a common sight in TV sound galleries, radio control rooms and recording studios.

Modelled in association with Dorrough, Waves has now brought a faithful reproduction of hardware metering to the desktop in the shape of the Dorrough Collection (US\$500 Native). The Collection includes models of the Dorrough 280D/240D, 380D/340D, and 40AES/EBU. They are useful in many situations: as input meters for setting optimal recording levels, in group and auxiliary masters meters to optimise loudness, and as master output meters where the relationship between peak and loudness is perhaps most important.

Buttons at top-left of the plug-in, not present on the hardware units, offer three different display styles, Horizontal (280D/240D), Vertical (380D/340D), and Arc (40AES/EBU) in three selectable sizes each;

small, large and extra large (well, it is a model of an American meter...) The scale covers a 40dB range in 1dB steps. Three reference levels are button selectable -14dB, -18dB (EBU) or -20dB (AES) although the accuracy of these obviously depends on meticulous alignment of your studio hardware. To compensate for audio output delays in certain DAWs, delay can be added up to 50,000 samples in 500 sample steps.

Mimicking the hardware units, three groups of buttons control operational behaviour. The buttons have internal 'LEDs' and two further LEDs indicate Overs, when more than three consecutive samples are above 0dBFS, and Phase when an excessive phase error is detected. Three Peak buttons determine the Peak LED behaviour: Auto holds the highest value for three seconds; Hold retains the highest peak for an indefinite period; and Reset resets to the current value. In the next block, Overs, Display switches the display to show the number of Overs detected, counting from right to left — so -6dB means 6 Overs detected. Reset returns the count to zero.

The last three buttons, Meter Mode, select between Phase, Sum/Diff and Left/Right. On stereo material there is much to be said for using Sum and Difference since this gives a clear indication of stereo content and mono compatibility and is also useful for



diagnosing out-of-phase elements in the mix. Phase can also be used for this but Sum and Diff is more versatile. I would love to have seen the 'Dorrough Window' mode included, which expands the scale to 0.1dB increments for precision alignment purposes, and also the 60dB scale option.

In operation I soon learned to interpret the display in terms of what I was hearing and by the end of the review period the Dorrough had achieved the essential trick of catching my eye in peripheral vision. A bit like the rear view mirror in a car, you don't notice how much you use it until it is suddenly not there. Although I used all three shapes, the arc is definitely my favourite.

Waves has done a fine job of reproducing the look and feel of the Dorrough. Metering isn't the be-all and end-all of level control and ears remain the most important arbiters but, and it's a big but, this kind of metering is essential to get the best out of current delivery systems. Since you get as many iterations as your DSP will run for a reasonable price, the Dorrough Collection is something of a no-brainer. ■

PROS

Classic hardware metering as plug-in; maximise loudness while keeping record levels under control; objective loudness comparison.

CONS

Uses valuable screen real-estate; no 'Dorrough Window'; no 60dB scale version.

Contact

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