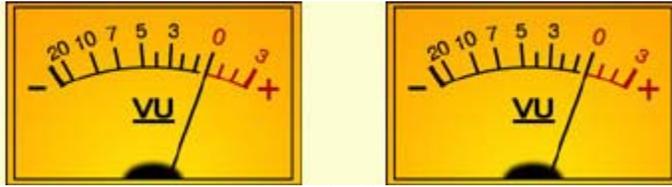


HANDS ON INFO

VTR Audio Line Up

There can be a lot of confusion surrounding the set up of audio with respect to both analogue and digital video tape recorders. This is mainly for the analogue interfaces and the meter 0 reference points. To simplify the situation, the subject should be broken down in to two areas.

(i) **Firstly**, the reference level (line up level) you wish to record on to tape. This is normally stated as a frequency at a specific level i.e. 1kHz @ 0Db. This is important for inter-changeability of information from facility to facility and machine to machine. Most analogue broadcast VTR's come set up from the factory at 4Db's equals the 0 position on the VU meter scale. Betacam SP BVW series machines can show a Peak display by switching the meter to Db scale, where the reference level is shown as -9Db's.



Analogue VTR; Moving coil VU meters showing 0VU or machine reference level. Please note; these meters show average levels, and therefore it is difficult to gauge peaks.

Most digital broadcast VTR's reference points come set up at -20Db's on the full scale and 0Db's on the fine.



Digital VTR full scale meters; showing -20Db's

Please notice the dash on the right hand side of each level to show the unity point.

This marker is removed if the machine is set to any other reference level and is a useful indicator that the machine is factory set.



Digital VTR fine scale meter; showing machine reference level at 0Db's.

The reason for the 0 position is it is the optimised level to record to tape (best signal to noise) and this position gives the required headroom. The full scale position of -20Db's is the actual level the machine uses internally. Headroom is the recording level above optimum the tape can handle without distortion. This has different effects at the limits, for analogue and digital. Analogue starts to distort where the sine wave is squared off and the playback starts to sound raspy. In digital the point of 0 on the full scale is the point there is no more data bits left to describe the level increase. Total distortion is now reached, like hitting a brick wall.

(ii) The other area of line up is the level you wish to present to your machine to record the reference level in (i). This is normally flat, in that the level at the input / output is the level recorded on to tape.

Again, Analogue and digital VTR's have different traits.

Analogue machines tend to come with +4Db's as standard for their I/O's.

Where as digital machines come with +4Db's at their analogue I/O's and flat at their AES/EBU and SDI inputs (i.e. -20Db's).

Analogue inputs with impedance switching.

The machine input stage will be weighted for a specific impedance or load. Most are Switchable in the analogue domain for either Low (mic attenuated -60Db's), Hi (Dbu's into 10K ohms) and 600 Ohms (Dbm's). The quick way to tell is to place a known reference level in to the VTR and observe the meter scale. It should land on the -4, 0 or +4 marker. If not try setting the corresponding input switch to the other position. Try not to switch to Low as this will boost the level by a factor of 20 times. If the level is still incorrect, try swapping out the cable. Line ups should be checked with a known good test generator; if one is not available, most digital VTR's have an inbuilt generator of their own. A Peak Programme Meter is also a good piece of test gear to have as they are calibrated to read 0Dbm's at the scale reading of 4.



Peak Programme Meter: showing PPM 5 which is equal to +4Dbm's

So the basics of VTR audio set is to find out what level all your audio and video recorders out put reference level to. You may find if you have a lot of audio post equipment that this is 0Db's and it is easier the few VTR's to this interface level. You then need to find out the level on tape you record reference to for exchange with other users. i.e. broadcasters.

0Dbu's into 0 meter reading (fine) to -18 meter reading (full). This is the EBU standard for digital VTR's. This is the analogue set up of the European standard.

The digital interfacing remains unchanged but the meters are re-aligned to reflect the new reference level.

When purchasing a digital VTR, Visual Impact Engineering will modify to EBU or other specification, if ordered. A charge of one hours labour will be applied if a unit is sent back for modification.

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