

BEST PRACTICE GUIDE SOUND MIXING FOR BBC PROGRAMMES



Overview

Sound quality is one of the most common causes of complaints received by the BBC, mainly because viewers only notice the sound quality when it goes wrong. We don't want viewers switching off within the first 15 minutes because the sound is poorly mixed.

The BBC's aim is to create the best possible sound quality for its audiences. *If a programme generates a significant number of complaints we will ask for the sound to be re-mixed at Production's expense.*

There are practical steps which can be taken in order to mitigate complaints about sound levels. There are many problems affecting sound quality including, but not limited to:

- noisy location recordings
- mumbling actors
- loud background music & effects
- inconsistent dialogue levels between and within programmes
- quality of television set

We are all aware of these problems and many can be overcome in the mix. It is important that mixes not only balance the sounds within the programme, but also balance the sound levels across the channel so that no one programme differs significantly from another before or after.

It is essential to remember when mixing that the programme will be viewed in a variety of ways:

- at a decent volume on a large TV with additional speakers
- at relatively low level on a small flat screen TV
- on a laptop with/out headphones
- on a tablet with/out headphones
- on a smart phone with headphones

The mix should work well in all of these formats and at a variety of volumes, not just in the edit suite played on industry standard speakers at high volume. A good mix will be received well in these different environments.

1. Volume Surfing

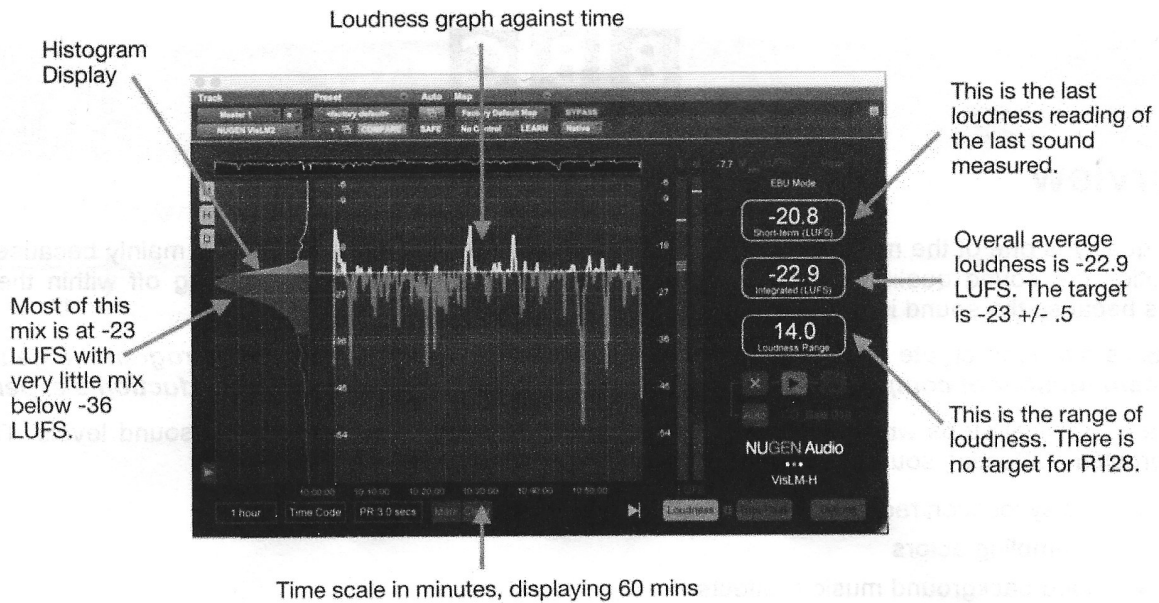
Two people walking through the countryside in *Countryfile* should sound the same as two people walking through the countryside in a drama. This is what the viewer expects. If the dialogue level is lower the viewer turns up the volume and then when a loud section of the mix happens (usually music) it becomes unbearably loud, so the viewer turns the volume down. This goes on throughout the programme and is what we will call "volume surfing" – constant increasing and decreasing of volume in order to raise the dialogue to an audible level and then reduce the loud sections to a comfortable listening level. TV sound is mixed to the EBU Recommendation EBU R128. This measures the entire mix and creates an average reading for how loud it is. The target is -23LU. A mix that has an average loudness of -23LU is fit for broadcast. This works well unless the mix is very dynamic in which case the average can still be -23LU but now the mix is made up of lots of loud sections offset by lots of quiet sections. This type of mix produces volume surfing. This happens more in drama because drama tends to have quiet intimate moments and loud, action-type moments.

2. Loudness Range Reporting

The BBC now requires evidence of the loudness range throughout the programme so that even sound levels can be ascertained. There are several different types of software on the market which measure the overall loudness of the show and which create a graph of loudness over time as well as a histogram of the total loudness range. For this document the BBC has used Vislm (pronounced Viz-L-M) but this does not indicate

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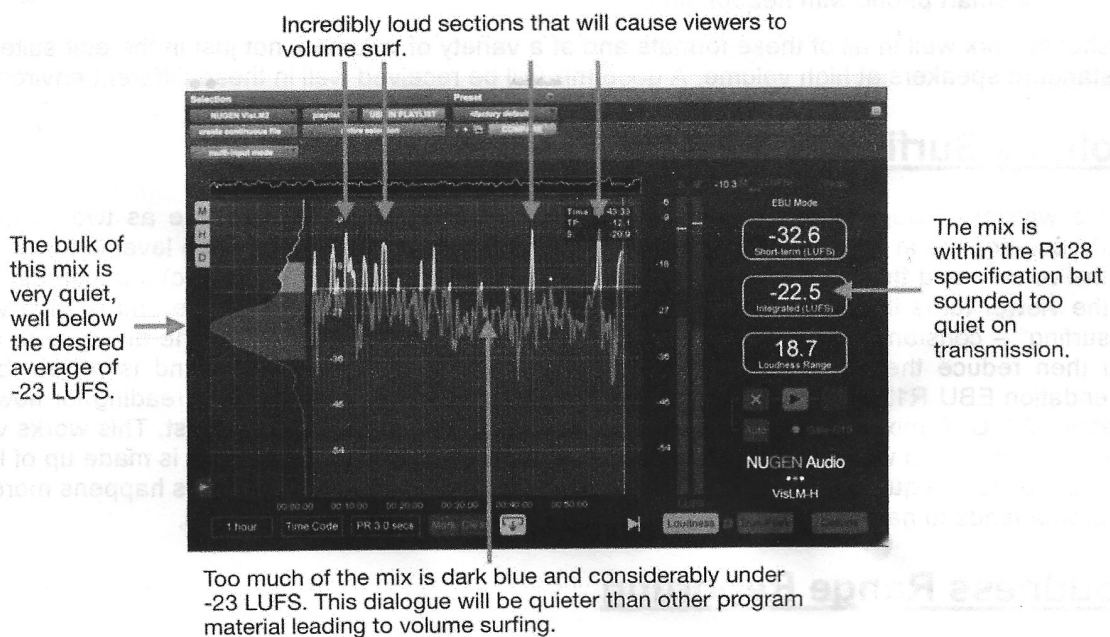
the BBC believes it is the only option. It is used here as an example of how the software works. The VisLM screen looks like this:



The above example is the read out of a BBC One drama. There are loud sections but these are rarely louder than -18 and the majority of the mix sits a little over -23 and a little under -23. The light blue is above and the dark blue is below the average level. There will often be more below the line than above because drama programmes don't contain continuous dialogue.

This is generated by running the mix through the software. It takes about 20 mins for a 60 minute drama. A screenshot of the results can then be taken.

The histogram on the left shows how often the mix is at different levels of loudness. The graph represents a mix that sits well on the channel with similar dialogue levels compared to other programmes. This is the target the BBC wants to aim for. Compare the above illustration with the one below for a different BBC drama. Despite the fact that these are very different types of show, they need to sound similar to the viewer.



Much of this programme is dark blue below the line with only the occasional peak moving into the light blue area. This is why volume surfing happens: the viewer turns up the volume in order to get the dialogue to the same level as other dialogue on the channel. The loud sections become even louder and the viewer turns the volume down. The histogram shows where the bulk of the sound in the mix lies at about -30LU. This is very low in comparison to other shows on the channel. If a print out of the programme resembles these peaks there is potentially an issue **which must be addressed before the programme is delivered.**

This drama generated a number of complaints from viewers. It is within the letter of R128 and has therefore delivered to the BBC specification. However, as can be seen, this does not mean that there are no issues with the audio levels. Not all deliveries to the R128 spec sound the same. This is why it's essential to be attentive to the sound levels using specialist software **and not just focus and rely on the number that's within the R128 range.**

3. Music

BBC research has demonstrated that reducing music levels a little in the mix allows people across the audience demographic to hear dialogue better, including those with certain types of hearing loss.

When the final mix is complete the BBC recommends taking the music down 4db. This can make an enormous difference to the audience and can usually be achieved without affecting the creative intention. Viewers never complain that quiet background music ruined a drama, but there is often a production tendency to comment during a mix "I think we could go a little louder with the music here...".

Background music will always have an impact on the clarity of the narrative if the music levels are too high but it is perfectly possible to have a scene in a night club which is both effective and realistic without the levels going through the roof. Be careful with percussive sounds or lyrics under dialogue. It is important to be aware of the dangers and implications of making scenes loud/er without due consideration of the overall sound levels.

4. Listening Back

When mixing it is essential to check the mix back via a domestic TV speaker repeatedly and **throughout the process**, not just at the very end. If you wait until then it will be too late. The sound should be played at an appropriate level on the TV. You need to be able to hear when dialogue is quiet and needs attention. If the TV is too loud then everything will sound fine. The reference level we suggest is to play 20db Pink Noise through the TV and then adjust the volume to get 65db on a loudness meter with a C weighting. ***You should use the downloadable continuity and programme promotion examples to edit into the front of your programme as a reference guide.*** The level on the TV can then be set correctly and you will be able to hear if the programme matches the rest of the material on the channel.

Please be aware when mixing in Surround Sound (5.1), the stereo mix should be created automatically from the 5.1 mix using the audio down mix metadata.

Note: The stereo mix is *not* sent to the HD channels and the consumer receiver produces the stereo for viewers who do not use surround sound audio systems.

5. Make Use of the Sound Engineer's Expertise and Experience

Sound Engineers are experts in their field and have worked on a wide variety of genres and projects. Ask for their opinion when you want to use challenging sound sequences. Make use of their expertise so you can make an impact in emotive scenes without compromising sound levels and quality. Ramping up the sound to make an impact without due consideration of how this will be experienced on transmission is not an acceptable way to create the effect you want and will alienate your audience, regardless of whether they have a hearing impairment.

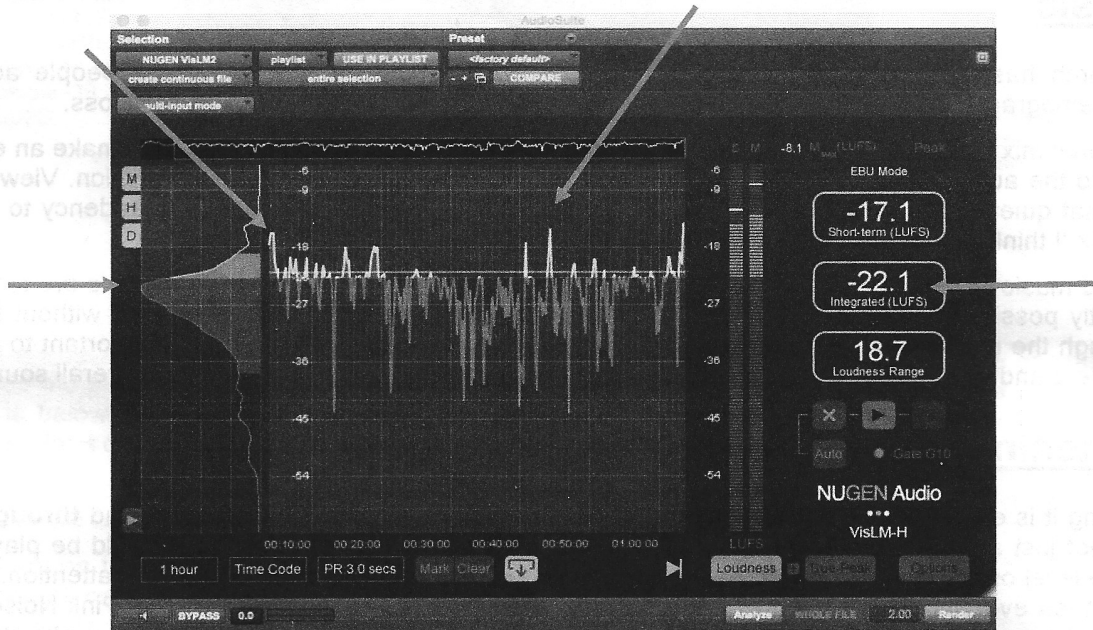
The ideal approach is to consider your programme in relation to the channel it will be broadcast on, the TX time, the genre and the audience demographic. The audience for 19:30 on BBC One is very different to 21:00 on BBC Two but we need to ensure the mixes are consistent and don't favour one demographic over the other. The sound engineer/mixer should consider the placing of their programme within the context of mixed genre TV channels and mix the sound accordingly, recognising that continuity announcements and promotions are placed between most programmes. By doing this the programme should sit comfortably within the evening's output during transmission.

6. Examples of Sound Mixes

The following two programmes have not generated complaints about background music or dialogue clarity. The R128 value, the only figure needed to pass QC, is the -22.1LU figure in the middle on the right.

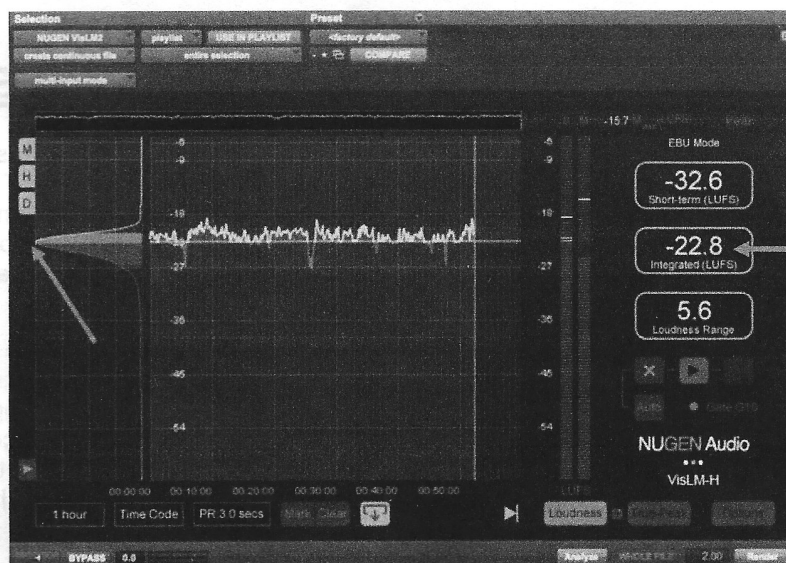
6.1. A Dialogue-Heavy Drama

The peaks are not overly loud but they are loud enough to ensure dramatic impact. They won't cause viewers to turn the sound down because they don't last very long and they haven't pulled the average of the overall mix down. The mix has a good average loudness and the bulk of the sound is a -23, making this show sound the same as other shows which transmitted that evening.



6.2. An Early Peak Factual Programme

This example demonstrates a good average and a very narrow range of loudness. This mix will sit well on the channel.



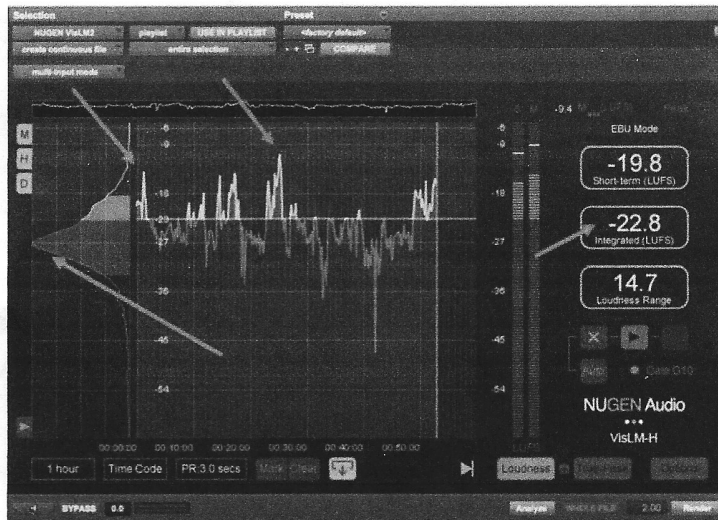
Below are two examples of mixes that have generated complaints about dialogue clarity and background music. Again, the R128 value, the only figure needed to pass QC, is the -22.8LU figure in the middle on the right.

6.3. A Peak Time Drama

This example shows very loud peaks for long periods of time and includes over a minute of loud, orchestral music followed by very quiet sections.

It has a very loud start causing some viewers to turn the volume down. This was followed by a voice over which was considerably quieter than VO in other programmes that evening. This caused volume surfing.

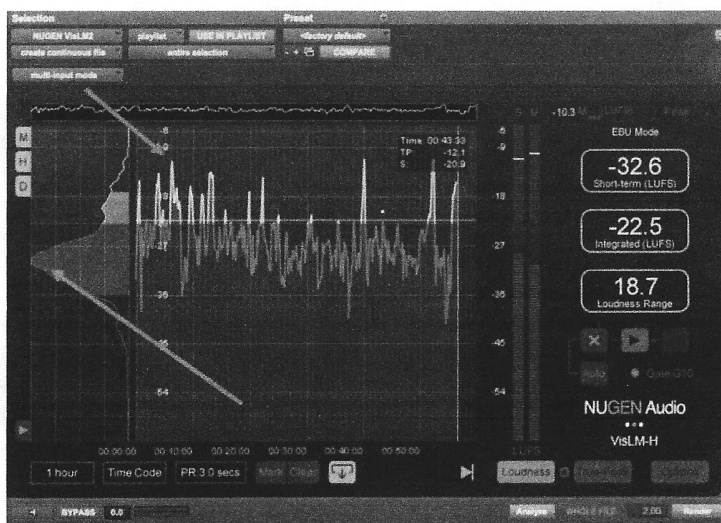
Although the R128 Value is -22.8LU and therefore within the delivery spec, you can see that **most of the mix is at -27LU which is much lower than we should be aiming for.**



6.4. A Peak Time Drama

Again, the R128 Value is -22.5LU and therefore within delivery spec. However, you can see that most of the mix is at -30 and this is much lower than we should be aiming for.

In this example, the existence of lots of loud sections followed by quiet ones caused volume surfing.



Normalised examples of programme and continuity levels can be downloaded from [here](#)

Questions about this guide or sound issues should be addressed to Dina Ata – dina.ata01@bbc.co.uk