



IN THIS ISSUE:

- Studio Insulation
- Home-Brew Multi-Media
- Interview:
AMPEX ATR-100 Part II

● When I received the December issue of this magazine, I immediately read with great interest the terrific article by Mort Goldberg on tape editing, which brought back many memories, fond ones as well as some of the exact opposite nature. Hopefully, you will permit a small side excursion from the more usual visual material found in this corner.

The last word in Mort's story on tape editing is also the last word anyone should remember if he or she intends to become a truly professional tape editor—*practice*—and that should really be written with a capital P. That's how he gained his well-earned reputation as "the fastest hands in the East" (and for all we knew it could have also included the rest of the

country, too). The techniques he discussed are some that he learned and developed to perfection along with a good ear, a precise sense of timing, and a fast pair of hands.

Recollection brought back times when Mort was working on tapes for the news department during innumerable crises, both the world-wide kind and those associated with broadcast time pressures. There were times when the small tape room adjacent to the master news studio was turned into the center for all incoming and outgoing material. One tape machine was recording incoming line and telephone reports while the second was being used for editing previously taped information while the third machine was playing the already taped and edited

program to air. The news man in the studio was getting copy ready to broadcast or put down on tape for editing into the program. The phone rang constantly, and the beeper was kept ever on the alert to mix with whatever came in on the phone line. And this was during a normal crisis. When it got really busy.

During conventions, and campaigns, and space shots, and disasters, and elections, and wars (even if they were not officially called that), and whatever else happened which was worthy of reporting, a small team of expert tape editors was used to man the news tape room. Documentary material and delayed programs that were updated for the other time zones were de-fluffed and cleaned up and readied for either broadcast or future use. During slow times in between hectic periods there were some practice sessions, if you can call them that, when the "er" and "ah" sounds taken out of interviews and speeches by the thousands were spliced together in what resembled a long strip of splicing tape on one side. When played back, the tape sounded like a kid with a new toy machine gun.

EQUALIZATION AND FILTERING

Equalization and filtering were very important in many instances. Phone lines are made very cleverly. They have a narrow frequency range around the 3,000 Hz point with some peaking in that area. This is the neighborhood in which the ear is most sensitive. It helps tremendously to use this knowledge when the recorded material is of poor quality. Although equalizing the voice can help clarity, it is also obvious that there is a similar quality change in the background sound. In most cases this may not matter much, but where the edited material has to fit into some other tape, the variation is important. As Mort indicated, a change in the background sound (including quality) is readily detectable, especially since the ears are doing all the work. (When some visuals such as film or even slides are used in conjunction with the sound, it probably matters less.)

One way to cover, or mask, the edit point is to insert one of those "er" or "ah" sounds, or a cough, or a car or fog horn, or a drum beat . . . something which is "natural" to the real background. It's amazing how the ear, or the brain, will accept this interruption and possibly not realize that the background has changed slightly.

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sound with images (cont.)

Some masking is also possible with the continuous loop trick by adding an almost indistinguishable background sound to the whole section of tape.

On several occasions, the technique of "blending" or "mixing" two identical tapes to make an edit came in handy when working on music tapes sent in for broadcasting from N.Y. to the network. Shortening selections by removing a chorus was a neat trick in itself, but there were times when it was necessary to edit a solo quarter note to an eighth note. You might think it would be easy to step up the speed of the note (from $7\frac{1}{2}$ to 15 in./sec., for example), measure the length of the note, cut it in half, then dub back down to normal speed.

On the face of it, this might seem acceptable. It's not, really. First, you must realize that the note has certain transients at the impact or start of the note and again at the end. There are also tonal quality changes, depending on the instrument and the natural harmonics. Just cutting out half the note from the center might sound okay to the untrained ear, but it's for the trained professional musician that the edit should really be made if it is to be acceptable to the professional tape

editor. Cutting the tape physically can result in an *almost* imperceptible change in tone, or level, in the note or an *almost* inaudible "pop." By using the "blending" trick, the tape is kept in motion at the time of the "edit," eliminating the chance of a "pop" and allowing the engineer to adjust correctly for even the minutest level difference.

JOEL TALL

Back in those days there was another member of the tape editing team working with the News Department. In fact, he was the proverbial leader of the team in the sense that he outranked the others in terms of experience and seniority. He worked with scissors like other tape editors at that time and then decided to find a better way. He did. He invented the editing block. His name is on all of them. He called it the EDITall block. His name is Joel Tall. He's considered by many to be the father of audio tape editing. (He fathered the block in about the late '40s.)

A little of what he learned about tape recording, he put into a book that was published more than twenty years ago, and which went out of print less than ten years ago. In this book, some of the material he discussed relates to the characteristics of hearing and how it is possible to take advan-

tage of these to "fool" the ear, or "un-fool" it. (He has been asked several times to be the expert "friend-of-the-court" where tape was involved in a legal case.)

Joe found that aural persistence is about 0.04 seconds, much less than it is for the eyes. He also found that it varies with frequency, being greater at mid-range than at either lower or higher frequencies. Another phenomenon that came up in his work had to do with shocking the ear on hearing a sudden, new, or strange sound.

VERTICAL CUT

When Joe edited tape with a vertical cut, he found that there was a definite click at both the in-cut and the out-cut at 100 Hz. At higher frequencies, the click sound seemed to decrease. At the 45 degree cut he put on his editing block, there was no click. A similar effect is also heard when an editor puts two words unnaturally close together. Actually, it could be shown that there was no click on the tape. It was a sound that the ear seemed to hear, but it could not be edited out by cutting. This had to be recognized before the tape was overcut. The way to eliminate the false sound is to add a bit of space with background sound. Opening the edit with about $\frac{1}{2}$ in. of tape seems to let the ear "lose" the "click."

Joe has retired from day-to-day work, but he is still active in the audio field. He's working on a new book, and just applied for another patent on a modification to his editing block. The new item will now include a slot at 85 degrees. The 45-degree cut is fine for mono tapes or stereo, but with more than two tracks, a diagonal cut can make an edit on one of the tracks and will ruin the others. The front and back of the cut cannot be apart by more than about 0.03 seconds. At the 90 degree cut, which would be acceptable for sound, there is that "pop," or "click," either due to the magnetic oxide collected at the cut, or to the magnetization of the razor blade, or to the fact that the level of the background recording bias could jump severely from one side of the cut to the other side of the edit.

After extensive travel and discussion with engineers in various countries, Joe figured the 85-degree cut would solve the sound and the "click" problems. At that angle, tracks are cut within acceptable limits, and the bias current is averaged. With the time lag at 15 in./sec. being 0.01 sec. and at $7\frac{1}{2}$ in./sec. being 0.02 sec., the audio tracks are not damaged.

SEPARATE REEL

In his December article, Mort says

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that he puts his out-takes on a separate reel to save for future use. Take this recommendation seriously. It will come in handy for words, coughs, sounds, and background noise. Letting it run off on the floor during editing puts the out-takes under foot. Tape that has been jumbled up and wrinkled just doesn't sound right.

Joe, in his book, makes the recommendation that the tape editor not work under strain of any kind. The sound equipment should be the best, the surroundings as favorable as they can be, for the best editing results. Auditory fatigue can cause a shift in pitch perception, and the missing of short sounds, rendering a good editor incapable of proper judgment and resulting in faulty splices. Sometimes, during news crises, conditions for editing were not optimum, but Joe, and Mort, worked wonders—both during long and fatiguing hours. But Joe is right, when it is not necessary to edit under those circumstances—don't!

A few personal random thoughts . . . Use 1.5 mil tape when there will be editing with a razor blade. The thinner material does not cut well, rolls, and stretches easily so that the sound can become very distorted at the edit points. Use a sharp razor (the single-edged type, please, or you'll get the nickname "Four Fingers"). One way to pick up a little bit of time in the playing time of any material is to wrap a layer or two of splicing tape around the capstan. This trick will not change the speed of the machine, but by making the capstan shaft bigger in diameter will cause the tape to be pulled through a bit faster. There is a limit to capability of this technique; be sure the sticky tape does not catch on the back of the audio tape or you could be in trouble.

If the edit cuts you're about to make seem almost futile or impossible to do, do not use the only copy you have of a one-and-only recording. This is nothing short of dumb if you can't re-fix the original tape. All you will be doing in this foolhardiness is proving the Murphy Law that if something can get loused up—it will! Finally, just remember that the edit block was invented to make editing easier (not for the benefit of the single edge blade industry) but it takes common sense, careful listening, and lots and lots of practice. Good tape editing is something like a good reinforcement system; you shouldn't be able to tell that it's there at all. You should learn not only the *tricks* of the trade, but the *trade* itself.

Thanks for letting me recollect a few memories. It sure was a pleasure working with those greats back when . . . ■

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