

by Doug McKenzie

Years ago when the use of SMPTE time-code as a frame-addressing and interlocking-device for audio and video media became available and practical, it was not realized but perhaps only imagined now extensive the use of this technology would be in the recording and rerecording of sound for major television and film productions.

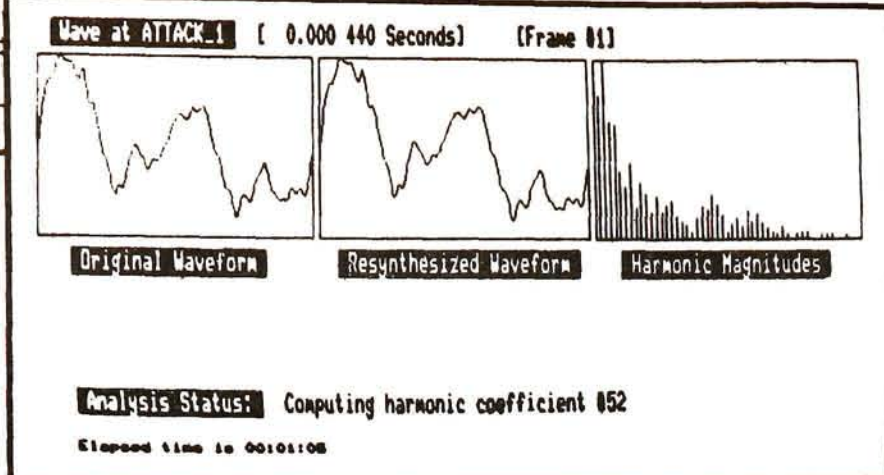
Today we are witnessing the rapid evolution of sound techniques and processes by the adaptation of this technology to many demanding productions for television, in film theatres, IMAX theatres and even in EXPO pavilions.

There is indeed, a "new age" dawning in the field of sound production; through technological development and consumer demand, this is a force to be reckoned with. I am convinced that the "evolution", will be smooth and, for most, painless, if the sound specialists can maintain or adopt a healthy attitude towards the traditional techniques and creative processes of film sound editing and mixing. Coincidentally, the producer, in approaching the new systems, must be open-minded and prepared to follow important guidelines set forth by the sound consultants which will ensure quality and efficiency. It must be pointed out that we are not advocating change for change itself, but rather, answering the call for improved efficiency in both turn-around time and cost and meeting the demands for "hi-fidelity" stereo sound tracks. This demand arises from a number of sources and trends in the industry which have already greatly impacted the production business.

The trends seem to centre around several common "buzz" words in the industry these days such as: stereo T.V., digital sound, computer interface, automated mixing, satellite broadcast, simul-cast, home video cassette, compact disc, video disc and many more. In short, the consumer is demanding better sound both at home from his television and video systems and in the theatre. The sound production and delivery system on a given film is now critical to the "box office success" of the property. We are also witness to the birth of a new music industry wherein artists are signed to both audio and visual agreements and spinoffs are considered from the outset. While the current trend in rock videos is highly successful in an entertainment and promotional sense, it too will evolve into sophisticated and complete visual music specials suitable for broadcast or disc spinoffs. These new music productions will require highly sophisticated multitrack sound-processes combining both musical and natural effects sounds mixed with consideration to picture perspective.

Such at least has been the case for us in several music productions for television. For instance, with the recent *Supertramp* special, we interlocked two 24 track recorders loaded

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with 46 tracks of musical elements, recorded live at the C.N.E. in Toronto, to a 3/4" picture reference and mixed stereo music tracks with allowance for perspective within the shots used in the final conformed version of the show. These mixes were recorded into the correct "show position" on yet another multi-track recorder which then contained open tracks later used for the addition of extra audience and backgrounds and some dialogue. From this conformed multitrack "pile up" reel, we were able to derive all of the final mix versions required for the show which were then restriped directly to the C format master video on our 1" playback machine.

Another rather unique example of the flexibility and sophistication of this system can be examined in the process used to edit and mix the 70 mm, 6 channel IMAX film, *Skyward*. Here again, stereo tracks were initially cut on the bench using 35mm mag film then transferred to VHS digital cassette with a simultaneous SMPTE time-code transfer for address and locking. These sound effects were then interlocked individually to a pre-coded 24-track master-reel and the digital sound was converted to analogue and transferred to an appropriate track. The assembly of effects tracks was accomplished in components called "show modules" each comprising up to two minutes of the full twenty-minute show-length. This system best complied with the staged development of the edit and better prepared us all for the inevitable "last minute changes" in the picture cut. When the picture was finally locked, we then began the process of initially conforming the 24-track, or in some cases up to 40-track, modules into the correct show position while simultaneously pre-mixing the effects into a 20-22 track configuration in order to create a more controlled and manageable situation for mixing.

The procedure was not only to utilize such high quality and automated recording systems, but by the capability of the system to adapt to any given situation, we were afforded the opportunity to do in the mixing process what seems most

logical when mixing an IMAX film, in an IMAX theatre. At this point, the technical team installed a complete 36-track automated mixing system on a carefully constructed platform in the optimum listening position inside the Cinesphere IMAX theatre at Ontario Place in Toronto. Twin 24 track playback/record units were installed as source and pre-mix machines and for the final six-channel mix on an eight-track recorder. As in the assembly stage, all recorders were aligned for 30 IPS record/playback. In order to facilitate such an installation, several "black boxes" were designed and built at Master's including a custom six-channel monitoring-package and a joystick-panning device which provided computer automated surround panning by virtue of its interface to a group of the console's VCAs (Voltage Controlled Amplifiers). Monitor outputs were tied directly into the house system which had undergone subtle adjustments to compensate for the predictable response and sub-woofer assignment of the actual performance IMAX theatre under construction in Japan. Our picture reference was a 3/4" video cassette which was video-projected onto the 60' screen from the rear of the theatre creating a very suitable, 20' image and allowing for shuttle speed up to 40 times play speed. For reference of the mix to full picture, an interlock system was created between our time code synchronizers and the 70 mm projector system in the booth.

While the foregoing examples speak well of the sophistication and flexibility of the system, it is important to realize the day-to-day practical applications in less-involved productions such as television variety and drama series, documentaries, industrial and corporate videos and commercials. In these cases, due to the speed and operator ease of the facilities, we have commonly found that there is a time-and-cost-saving when compared to film-sound processes. While this is particularly true of productions originating on tape, it is also apparent on a film project which is destined for delivery on tape and film. In order to comply

with the traditional film approach and meet time-schedules invariably determined by air-dates unnervingly close to projected completion dates, our facilities are divided into four basic production areas. In this sense the processes of effects editing, Foley recording, music scoring/editing and ADR can happen congruently in preparation for the final mix. As each of these elements is prepared, an individual multitrack tape of up to 24 tracks is created and, correspondingly, is locked later in the mix theatre where four or five machines containing these elements are referenced to the 3/4" picture master.

Our systems utilize the BTX Shadow synchronizer, which enables two machines to have a master-slave relationship with "chase lock" capabilities. The shadow, then, and in turn its slave, is interfaced through its RS 232 serial port, to what is the heart of our system, the I.B.M. PC controller/editor. The I.B.M. system is, in fact, a custom software-package developed by Master's Workshop over the last two years which will soon be released for worldwide distribution by the BTX Corporation as their "top of the line" editing system. The "ShadowMaster" system, through both its control screen with colour graphics and its edit decision/management screen, enables the control of four machines with full display of all-slave status, master-slave offset and code positions, sync indicators, address start memories, time-code calculations and editing events. The edit decision/management system and screen allows for the compilation of up to 2550 events per file divided into ten groups of 255, that can be stored and recalled from disk. These files could contain the event information in categories such as dialogue, specifics, backgrounds, movements, etc.

Another exciting aspect of this technology, one which is commonly used in the Hollywood film industry today, is computer-automated mixing. The most common automation system, which we happen to use, converts fader movement and mute functions into DC voltage which, in turn, is converted into computer data and stored on an open track of the multitrack. There is no actual audio flow through the fader, rather the DC voltage controls a voltage-controlled amplifier which passes the signal. As the computer, in this case an on-board computer, is requested to do so, the data in storage will re-enact the entire mix in terms of fader moves and mutes right down to the most subtle adjustment. Individual elements can be updated at any point and the mix can be built in stages affording the mixers many "sets of hands."

The list of applications goes on and on and clearly the computer-software-based system is proving to be incredibly versatile as new production challenges confront us. To the producer who is struggling with the fears of tape as an inferior medium for sound post-production, I hope this will serve as a suitable introduction into the field. To the audio specialist or studio-owner contemplating a move towards the art of tape post-production, I hope you will be encouraged by our example.