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SONY'S NEW DFP-3000 CINEMA PROCESSOR

DIGITAL PROCESSING REACHES ITS SECOND GENERATION

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JOHN F. ALLEN

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In recent years, cinema sound processors have evolved from the familiar analog based circuits to digital circuits. While the term "processor" is still used, it would seem more appropriate to call the new digital processors "computers", as they function by performing calculations in the digital domain. Digital processors provide many advantages. For the cinema world, perhaps the most important is stability. Analog processors are sometimes known to drift. In my own experience, I have often encountered drifts in output levels from 1/2 to 2 dB in various channels of an analog processor over a period of six months. Since the output levels of a digital processor are controlled by software, their output levels remain very stable over longer periods of time. With no analog controls to drift, and barring a software glitch, digital processors stay put. This is very important in multi-channel sound systems. As the various channels of an analog processor all drift at different rates and sometimes in different directions, the balance of the sound system deteriorates.

Another major benefit gained by digital processors is lower cost. It's difficult to be certain, but I would expect that a full featured analog processor could cost at least 50 percent more than a digital version. One reason for this is that an analog processor requires a circuit for each and every function the unit must perform. A digital processor typically employs devices called DSP's or Digital Signal Processors. These handy things can be programmed to do many different things in different places. Plug one in at an early stage and it may do the noise reduction. At a later stage, another DSP might be a matrix

decoder or an equalizer. This simplifies the design and construction of a digital processor.

Perhaps one of the most attractive features of digital processors is the ease of modification. As processing improvements are developed and new features or formats are added, a digital processor simply requires a software upgrade or perhaps plugging in a new integrated circuit.

By necessity, all the digital soundtrack formats are converted to analog sound signals by digital processors. Typically these analog signals are fed to a main cinema processor (be it analog based or digital), before going on to the amplifiers and speaker systems. Other manufacturers have offered combined processors that perform all the analog as well as the digital processing functions for their respective formats. Up to now, Sony has only offered separate processors for analog films and the decoding of the SDDS digital soundtracks.

This has now changed. At last year's Showest, the company unveiled a prototype of a second generation digital cinema sound processor: the DFP-3000. (DFP = Digital Film Processor). This unit combines full six or eight-channel SDDS decoding with a complete selection of analog soundtrack decodings, as well as two eight-channel auxiliary inputs for other digital or even 70 mm formats. Because this unit incorporates a few new features not seen before, I thought it was worth writing about. The first thing one notices about the DFP-3000 is its appearance. It's considerably smaller than Sony's earlier units. With a depth of 15 inches, this processor will fit in existing cabinets without protruding out the back. The front panel is simple and attractive, with lighted format selector buttons, eight channels of light-emitting-diode metering of audio levels as well as a Liquid Crystal Display (LCD).

During operation, one of the new features of this processor is plainly visible. When playing an SDDS film, its title is read within the digital soundtrack data and displayed on the LCD panel. Next to the title we may also see a number such -3.0 or -1.9. This number is one of the most important and innovative new features being introduced with this processor. It's called fader memory. When the DFP-3000 reads the film's title, it remembers where the fader was set the last time that title was played and adjusts the sound level to that setting. This is extremely helpful in dealing with loud trailers. The operator simply laces up a new show and sets the fader to a lowered setting, say -5.0 for the trailers. When the actual feature starts, the fader is once again adjusted by the operator to the normal feature setting of 0.0. The DFP-3000 will then automatically run all subsequent performances at those fader settings. If one discovers that there is an

extremely loud trailer or, miracle of miracles, a trailer recorded at the same level as a feature, the fader can be adjusted accordingly for that one trailer and the processor will remember.

For films not released with the SDDS soundtrack, including analog films, there is a fader offset feature that allows an operator to set different fader settings for each format. While this particular feature is not new, when combined with the fader memory function, it becomes part of a powerful set of operating tools that help ensure better presentations.

A look at the rear panel reveals an output specifically designated for the booth monitor. This speeds rack wiring. There is also a hearing impaired output as well as a computer interface. Like Sony's original DFP-2000, the new DFP-3000 is most easily serviced with a personal computer. The new processor can also be serviced by scrolling through menus on the front panel display.

Because the SDDS soundtrack is placed along both edges of a film, a penthouse reader is required. The original SDDS readers were almost as large as a 70 mm magnetic penthouse. This was due in part to the flywheel and the length of the film-path required to produce a smooth film movement past the digital pickups. The connecting cable was about an inch in diameter.

The new reader for the DFP-3000 might justifiably be called revolutionary as it does not use a flywheel. Variations in film speed and thus consistent audio data pickup are corrected digitally. This has resulted in a greatly simplified reader construction, a simpler film threading and, of course, a lower cost. Rather than a one inch reader cable, the new reader's cable is small, flexible and connected with a nine pin DB connector. The film-path is now so short that the new reader needs to be mounted about three inches above the projector.

Getting such a sound reader to work was not an easy task. This one of the primary reasons that Sony's introduction of this processor took so long. However, Sony claims the new reader actually outperforms the original when reading through damaged film and splices. As of this writing, Sony is using the experiences gained from the first installations to further refine the operating software and the setup software. Ultimately, Sony plans to offer setup software that will work with both the DFP-3000 as well as the original DFP-1000 and DFP-2000 processors.

In the final analysis, the verdict for any audio product comes down to sound quality. Having now used this processor in our sound systems, I found the audio quality as clear

and clean as it gets. But then, that's what I expected from Sony. In my opinion, the introduction of the Sony DFP-3000 changes the cinema sound landscape. This processor is a formidable and credible competitor.

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