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# A fresh approach to replays

**B**efore starting our broadcast equipment company, I volunteered at my community television station in Bloomington, Minnesota, where my business partner and I maintain strong personal relationships. One of our favourite memories was running the homemade replay server that made us the only community station with four independent angles.

11 years since the beginning of our company and six years after shipping our first multi-channel playback server for television automation, we began the journey toward meeting our favourite station's needs for a replay system. It seemed to us that if there was a replay system which offered good functionality, was easy to use, and cost a third of the price of existing technologies then the chances are that broadcasters as well as local television, stadiums and arenas would want to buy it, and that demand would be global. So we set about designing the system which is now in service and available: Zeplay.

We imagined Zeplay being used by one person, just as we did when we ran replays. This meant that we needed a built-in multiviewer, as well as a dedicated controller that did not require the operator to look down so they could concentrate on the game.

Zeplay includes four HD-SDI encoders, all at 100Mb/s each, with industry standard formats and 40 hours of RAID protected game time, or 160 total hours. To match the inputs, Zeplay has an equal number of outputs, both on the built-in multiviewer as well as on the HD-SDI outputs.

We also created a 'playbar' which is a simple timeline, into which the operator can mark and tag interesting moments of action, called 'plays'.

Zeplay never destroys game footage, so these markers are simply guides. The operator is always free to instantly move to any part of the game.

With all of this information, the built-in sequence - or some say highlight - editor becomes very powerful. Zeplay makes building packages easy with cross fades, multi-angle aware editing, splits, and speed changing tools. During sequence playback you can push and skip clips, as well as dynamically change the speed of playback. If that's not enough, exporting specified plays to a craft editor is a breeze and bringing them back in is just as simple. At the end of the game Zeplay has a dedicated 'melter', which allows the operator to sort the clips for archiving and exports them either to a conventional melt roll or to an external disk for storage.

Along with the challenge of building a broadcast reliable server capable of the most challenging, real-time operation imaginable, listening and



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learning from operators has been one of the most rewarding experiences of our company's history. Expectations and opinions about workflow are so thoroughly dominated by the status quo, we often found ourselves spending considerable time teasing out the core motivation behind requests. Some of it was to avoid confusion; others were insights we had not thought of. A considerable amount of feedback had more to do with existing limitations that Zeplay did not have. Communicating the design advantages of what we had come up with proved challenging. Two examples come to mind.

First, Zeplay never over-writes game footage. This means that one can mark any number of plays or create any amount of sequences. There is no guard band and no limit to how far an operator can let a clip play out.

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Second, ZEPLAY records and plays all four angles at the same time. The operator has no blind backside and can see all angles instantly. The implications of this feature, which seemed obvious to us at the time we designed it, were lost on us when we presented it to operators and the market in general. Potential customers kept saying "Wait a minute, it records and plays all four at the same time?"

What we did not see was that people had become used to a single operator being basically limited to showing one of two angles on the initial play, even though they were recording four. ZEPLAY's setup means that a single operator can realistically be expected to manage four camera angles, at the same time. There was no need to swap back and forth and there was no need for a 'program' or a 'preview'. Suddenly, for angles of replay on the first run were possible, just like at our old station.

We think that ZEPLAY hits all the challenges we set for ourselves. It handles and delivers broadcast grade HD, it's very east to use, and if you are already a talented replay operator, it will make you look even better.

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