Streamlining Live Event Control with ProPlex Timecode Tools

By: Loren Barton

Originally developed for film and broadcast, Linear Timecode (LTC) encodes time data as an audible signal that can be stored as an audio track. In live production, it has become the common language for syncing lighting, video, effects, audio, and automation systems. While newer protocols exist, LTC remains a reliable, widely accepted, hardware-friendly format for shows where redundancy and compatibility are key.

LTC has long been the backbone of time-synchronized systems in the live events world. From complex lighting sequences to precisely timed video cues, LTC enables the kind of frame-accurate sync with audio that modern shows demand. But while the utility of timecode is undeniable, the complexity of managing multiple streams across departments, playback rigs, and backup systems has been a pain point for years.

While the concept is simple—take a timecode output from the audio playback rig and distribute it to any technical department that needs it—the reality is more involved. Because timecode is how everything is driven, there needs to be an easy way to switch between local timecode "split tracks" used for programming, and the "show code" coming from the playback rig.

Additionally, there are many applications where multiple timecode sources need to be switched during a show. Live and televised music festivals and award shows often have guest acts who bring their own playback, and the creative teams need a reliable way to verify the signal and ensure they are listening to the right timecode stream.

Distributing timecode from backstage to the front of house and beyond has also been a bumpy evolution. Technically, LTC is not an audio signal, but it is compatible with audio systems and almost always originates from the audio playback world. Oftentimes, LTC can hitch a ride on an audio or comm snake or other existing infrastructure, but, given its piercing squeal when accidentally played through speakers, sometimes there is hesitation to put it through the audio system.

Another major issue with simply treating timecode as an audio source is that there is no ability to monitor or repair damaged or intermittent signals. LTC is known for having hiccups and occasional drops because of a badly generated file or other errors. An audio distribution amplifier would simply pass along these errors to downstream devices without the operator being able to monitor the waveform and troubleshoot issues. Visibility and the tools to fix errors in real-time are a critical function of LTC distribution.

ProPlex, a brand known for robust, show-ready hardware, has developed a suite of timecode tools designed specifically to address these challenges. Here's a closer look at how their lineup—FOH Friend DAC, CodeCommander, CodeBridge, and CodeClock—helps streamline the live event workflow.

FOH-Friend.

FOH Friend: your switchable sidekick

A fundamental function for programmers in any creative discipline working with live music is to be able to switch quickly between recorded rehearsal tracks and "show code." During rehearsals, fixing notes between runs or while other departments are working is critical to maximizing the time in the room. Most programmers have some combination of A/B switches, USB audio interfaces, headphone amplifiers, routers, or mini-mixers to achieve this. Working with in-ear monitors, speakers (or both), multiple programmers can work seamlessly on their parts of the show until it's time to all play

FOH Friend DAC.

together and watch it in the room.

FOH Friend DAC combines all these functions into one compact and easy-to-use box. The digital-analog converter (DAC) allows this box to attach to any computer and become a high-quality two-channel sound card. A separately controlled front headphone and back speaker output allows for independent or simultaneous audio monitoring. With the flip of a switch, the audio and timecode sources can be changed, and the volume adjusted between the USB audio source and the analog sources coming in from the production.

For those who don't want to rely on a computer for their local audio source, there is also a FOH Friend without the included DAC that requires analog sources for both inputs (like the headphone jack from your computer). Recently, to enhance the music listening experience, some computer manufacturers and operating systems have started slightly mixing left and right channels together to create a more "spatialized" audio experience when listening to headphones. This setting can be frustrating to troubleshoot and turn off and results in timecode contamination on the audio channel. By using a dedicated DAC, these problems can be solved easily.

Example: During a tour rehearsal, the lighting programmer may want to update some cues using the rehearsal tracks while the dancers are running through choreography with music from the PA. By using the FOH Friend DAC in local mode, the lighting console would be seeing LTC, and the Programmer would be listening with in-ear monitors to the tracks from the computer. Once everyone is ready to run the song together, the programmer switches back to show code, ready to play along with everyone.

CodeBridge.

CodeBridge: the versatile translator

One of the biggest challenges faced by productions using timecode is how to distribute it where it needs to go, usually over pretty long distances from playback world onstage to the front of house and beyond. There are several options that have been used from the comm snake, having the audio team send it to the front of house, long XLR cable in the lighting snake, over fiber-audio boxes, and more recently via Dante networks. Using audio infrastructure to transport timecode works, but it does have drawbacks.

CodeBridge aims to solve this by implementing a network-based protocol using existing Art-Net architecture to translate the LTC signal into network packets and make them available to any other CodeBridge on the network.

CodeBridge has both XLR and MIDI timecode inputs and outputs, as well as a PoE network port and USB-C power and computer connection for USB MIDI timecode. Each box can be configured either as a transmitter or a receiver. In addition to the front menu screen that monitors incoming streams and waveforms, there is also a web interface for configuring the unit and updating firmware. There is a built-in generator for testing code transmission. The handheld ProPlex IQ Tester LV is also capable of reading and transmitting Art-Net timecode to test and troubleshoot the network signal.

The simplest CodeBridge configuration would be to have one unit in playback world acting as a Transmitter to ingest the LTC from XLR and use existing network infrastructure to get the signal out to the front of house where another CodeBridge acting as the receiver would decode the network packets and output LTC via XLR or MIDI to the devices that needed timecode.

This is an elegant solution for a straightforward single-line use case, but what happens when there are multiple timecode sources, like on a festival or award show? Timecode streams—or buses—are the method used to allow multiple timecode sources on the same network at the same time. Think of a timecode stream like a conduit. At first, it's empty until a transmitter initiates an output stream by selecting the Stream ID. Now the transmitter device is driving the stream data. But any receiver can tap in and listen to that stream. By adding more CodeBridge units to a system, you can have multiple streams of timecode running at once from different sources.

This network functionality gets even more powerful when paired with the CodeCommander.

Example: A festival has three bands who all need to get their own timecode to the front of house. In order for preshow checks to take place for each band while the other bands are playing, these really should be separate lines. Each band could have a pair of CodeBridges—one at their playback world and one at the front of house with the lighting operator. Using different timecode Streams, each pair of CodeBridges could send and receive the timecode for each band all over the same network.

CodeCommander: centralized timecode management

CodeCommander is the hub of the timecode system. It doesn't just switch between LTC sources, it visualizes the whole ecosystem. With real-time monitoring of all incoming LTC signals and intuitive priority routing, you can make smart decisions on the fly.

CodeCommander comes standard with two XLR-combo timecode inputs, MIDI timecode in and out, and four bal-

CodeCommander.

anced-XLR switched timecode outputs. It also has an expansion plate with three options for additional outputs, including DB25 (Tascam), TRS, and CPC. Finally, there's a PoE network port and USB-C computer connection for USB MIDI timecode.

The front of the unit has a five-way menu button system, four pushbutton selectors, and a large, square-pixel RGB timecode readout display. There is also a fully featured web menu and live timecode clock readout that can be made available to anyone with a device on the network (think stage managers, show operators) without needing any additional hardware.

The core functionality is easy to understand: Multiple timecode inputs—mapped to selector buttons—change which timecode stream is routed to the outputs. The real power of CodeCommander is in the setup and software side.

The four assignable selection buttons can each be programmed to run in three different modes: Auto, Priority, or Generator. Auto mode is assigned to the first timecode source that becomes active, and maps subsequent connections. As long as only one connected timecode source is running at a time, Auto switches to whichever timecode source is active. Priority mode allows you to assign up to four sources in the order they should be used per button. Generator mode is a fully featured timecode generator with stop/reset functionality and customizable start point.

Using optional CodeBridges as transmitters, the CodeCommander can also accept multiple timecode streams via the network and send out a switched "show" stream of the selected timecode to other CodeBridges configured as receivers. By combining these two boxes, more complex networks of timecode can be managed seamlessly.

Another function of the CodeCommander is the auto-failover prioritizing system. Each selector button can be configured to follow a preset order of sources to failover to when one source goes down. This allows for peace of mind and added reliability. By having two or more sources accessible by the CodeCommander, the failover system allows for seamless switching if one feed of timecode stops working.

In any mode, one of the main functions of the CodeCommande—along with the rest of the range–is to clean up or "reshape" the timecode before outputting it. This helps maintain the integrity of the signal and reduce hiccups and errors downstream on the devices that read the signals.

Example: On an arena tour, the CodeCommander would sit at the front of house and distribute timecode to all of the lighting consoles, pyro, automation, and laser controllers via XLR. Backstage, three CodeBridge transmitters sit beside both the opening act playback rigs and the headliner ProTools system. Using the existing network between backstage and the front of house, the CodeBridges send streams of Art-Net LTC to the CodeCommander that can easily switch between the different playback rigs. As a backup, the headliner front-of-house engineer is also sending a copper XLR timecode line to act as a backup source for their show. Another CodeBridge acting as a receiver would sit backstage with the media server system and act as a receiver taking in the "show" stream of timecode from the front-of-house CodeCommander so it would receive the switched source as well.

CodeClock.

CodeClock: generation and distribution

CodeClock is a compact timecode reader and generator. It has a single XLR-combo input, MIDI timecode in and out, four balanced-XLR switched timecode outputs, and USB-C power and computer connection for USB MIDI timecode (it requires USB-C power). The front of the unit has a small menu screen with three-button navigation as well as the square-pixel RGB timecode readout.

The generator mode produces an ultra-stable timecode signal with customizable frame rates and start times. Like the other devices in the range, the CodeClock can also cross-convert between LTC and MIDI timecode.

Example: On a small club tour, the CodeClock sits at the front of house and distributes LTC to both main and backup lighting consoles. Using an FOH Friend DAC to switch between show and local code, the CodeClock's large display helps the LD easily see when timecode is running. The three outputs allow for up to three devices to be directly connected, or more with the use of XLR splitter cables.

Why it all matters

In a high-stakes live environment, timecode is either your best friend or your biggest liability. The ProPlex suite gives programmers, operators, and technicians the power to monitor, manage, and master their timecode infrastructure with confidence.

Looking to the future, the roadmap also calls for adding DMX/Art-Net control of the CodeCommander functions to automate failovers and possibly integrating VITC input and output to translate between LTC and the video timecode standard.

Whether you're running a stadium tour or a corporate show with tight integration between creative departments, these tools cut down on setup time, reduce the chance of failure, and let you focus on creativity instead of cabling.

In short: ProPlex isn't just solving a tech problem—it's providing peace of mind.

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