

Advanced Features

*Advanced features make the **Prima LT** superior to any other audio codec in its class*

9 Advanced Features

The **Prima LT** shares most of the advanced features found in the **CDQPrima** series of audio codecs. These features include bit error and out-of-frame detection, Prima Logic Language and psychoacoustic parameter adjustment. In addition, as with all **CDQPrima** models, the **Prima LT** allows software upgrading in the field, without having to return the unit to the factory.

9.1 Prima Logic Language

Only a brief discussion of Prima Logic Language follows. For more detailed information, or for programming examples, please refer to the **CDQPrima** Technical Reference Manual, available from MUSICAM USA or on-line at www.musicamusa.com.

Prima Logic Language makes the **Prima LT's** powerful micro-processor available to the user for automatic control of internal and external functions. Using Prima Logic Language, it is possible to configure the **Prima LT** to automatically dial, configure, send alarms, start or stop external devices, etc., depending on certain internal or external conditions.

Prima Logic Language is based on the premise that certain user defined 'events' may be translated into user defined 'actions'. Prima Logic Language (PLL) handles the conversion of events, such as bit errors, into actions, such as relay closures. PLL is a simple but powerful

language based on this ‘event-to-action’ logic designed specifically for **Prima LT** monitor and control.

At the **Prima LT**, there are various inputs called *events*. One class of events is switch closures, which can be either internal ‘virtual’ switches, or external switches. Other events are based on detectors, such as error detection, and status detection. These events are all binary in nature; i.e., ON or OFF (high or low).

Events include bit error or out-of-frame errors, timer expiration, internal operating parameters (codec status), and far-end signals.

Actions could be physical, link, or ‘virtual’. Closing a relay is an example of a physical action and closing a relay on the far-end codec is an example of a link action. Virtual actions are used to execute any remote control command, or string of commands, such as auto configuring and dialing, or changing line formats if a second line connects.

It is these “Virtual Actions” that make the **Prima LT** so powerful. Some examples of the use of Virtual Actions include auto-configuration and automatic STL backup.

9.2 Bit Error And Out Of Frame Detection

These detectors can not only provide inputs, as events, to Prima Logic Language programs, but can also be used as stand alone performance monitoring and debugging tools. Monitoring the header CRC bits, the bit error detector can provide a very good indication of the state of the transmission medium, such as ISDN.

Knowing that not all transmission errors will affect an audio frame, the **Prima LT** also includes a frame error detector, used similarly to the bit error detector.

For a full description of these functions, please refer to the [CDQPrima Technical Reference Manual](#) for a detailed explanation and examples.

9.3 Psychoacoustic Parameter Adjustment

A detailed explanation of psychoacoustic modeling, parameters, and adjustment can be found in Chapter 8 of the <u>CDQPrima Technical Reference Manual</u> .

With a bandwidth of 20 Hz-20,000 Hz and a signal-to-noise ratio better than 92 dB, the digital capacity requirement for a high quality stereo audio signal is approximately 1.4 Mb/s (million bits per second). Due to the direct relationship between bit rate and costs for transmission and storage it is desirable to reduce the rate. More sophisticated coding schemes, such as MPEG Layer II, exploit psychoacoustical phenomena, such as the ear's masking functions in time and frequency domain to achieve lower bit rates.

With MPEG encoding, real-time audio transmission is now possible via available multiples of 64 kb/s and 56 kb/s digital transmission channels. The relatively low cost of ISDN and satellite channels now lessens the need for high bit rate channels.

Standards bodies have defined the MPEG decoders and bit streams, and have left the encoder design up to the manufacturer. MUSICAM USA has spent thousands of hours tuning the base psychoacoustic parameters (those recommended by the standards organizations) of the encoder and has added nearly two dozen more to develop the MUSICAM® enhanced Layer II algorithm.

Unlike other codec manufacturers, MUSICAM USA gives you the capability to further fine tune the encoder's the psychoacoustic parameters. The Windows Remote Control program allows adjustment of all psychoacoustic parameters in real-time, and even allows you to save the settings for future use.

9.4 Software Maintenance, Upgrading, Version and serial Numbers

MENU NAVIGATION	COMMAND	WINDOWS RC	DESCRIPTION
<System Setup><Version>	CVN	Help	Print software version number
<System Setup><Defaults> <Factory>	CDF	Setup, Default system	Reload all factory default settings
	MVN	DC	Print software version number with checksum values
<System Setup><Defaults> <Serial No>	CSX	DC	Print Prima serial number

If any single feature can be highlighted that sets the **Prima LT** apart from all other codecs available today, it is the **Prima LT's** ability to

easily upgrade not only the control software, but also the software controlling the audio compression algorithms. The software that controls all processors within the **Prima LT**, including the powerful control processor and all DSPs, is contained in non-volatile flash-RAM. This allows the software to be easily updated as advances are made, without having to return the **Prima LT** to the factory.

The current command processor version is always displayed after the **Prima LT** boots, and this and all other software module versions can be displayed at any time using the **mvn** or **cvn** commands. Please remember that not all software modules have the same version number.

Upgrading your **Prima LT**'s software is easy, and requires only an IBM compatible PC and a remote control cable (see Appendix A). Windows is not required since all downloads are performed from the DOS prompt. MAC download routines are not available, and we have found that Windows emulation programs for the MAC do not work for this application.

To determine if new software is available, contact MUSICAM USA or CCS Europe. You can also log on to our Web Page at www.musicamusa.com and follow the links to Technical Support for the **Prima LT** and check the current software version. You can download the most current versions directly from our Web Page! If you do not have Internet access, we will be happy to send you an upgrade kit on your request.