



TECHNICAL BULLETIN # 100

Analog Audio Logging with Daytona and Inline cards

PIKA Technologies Inc., 20 Cope Drive, Kanata, Ontario, Canada, K2M 2V8

Ph: +1 (613) 591-1555 Fax: +1 (613) 591-9295

Date Issued:	July 31 st , 2001
Software Version:	MonteCarlo 5.5 or greater
Product(s):	Daytona and Inline cards
Purpose:	Describes the techniques for connecting Daytona and Inline cards for audio logging applications.

Introduction

Audio logging on analog trunk lines can be performed in one of 2 modes using the Pika Daytona or InLine cards: *Active* mode or *Passive* mode. Since the *active* audio logging is an inherent functionality embedded in all Pika analog as well as digital telephony cards, the primary focus of this document is to present a number of industry-leader solutions provided by Pika for *Passive* audio logging.

Daytona

Audio logging using the Daytona card can be done in *on-hook* or *off-hook* states, depending on the application. Logging in these two states are commonly referred to as *passive* or *active* audio logging, respectively.

Active / Off-Hook Mode

Active audio logging is normally performed in applications such as a *call-center* where recording a phone conversation (e.g. between a customer and the agent) can be activated by the agent at any time during the call. The recording can then be stopped at any time by the agent or upon terminating the call. In this configuration the card is part of the network and provides the switching between the phones and trunk lines physically connected to the board. Naturally, in this scenario the recording is performed in the *off-hook* state. In such applications, all parties are normally aware that their phone conversation may be recorded.

NOTE: The practice of warning all parties involved in a phone conversation before recording their voice is a requirement by the law in many countries around the world.
--

Passive / On-Hook Mode

The *on-hook* or *passive* audio logging is commonly utilized in applications where there is no real-time direct human intervention in activating or deactivating the recordings. Due to the nature of such applications, the recording is normally performed in “silence” mode and transparent to all parties. As shown in the diagram below, the Daytona (LS) card would be connected in parallel to

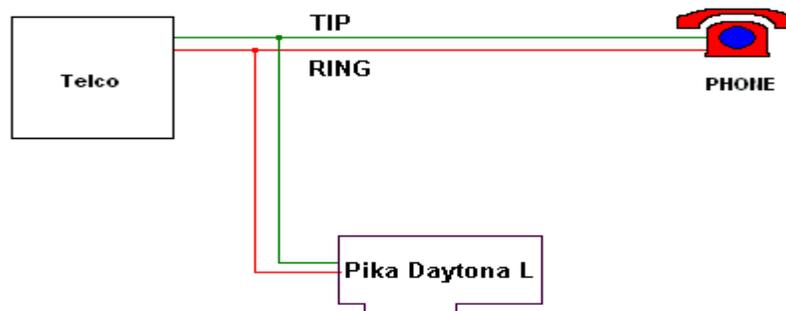
the analog phone line connecting the phone to the CO. In this configuration, the Daytona board is equipped (through FSB054) to detect DC and AC voltage changes that result in the generation of appropriate software events. These events can be detected in the application for managing the audio logging activities, such as start & stop. Also, other Pika DSP-based features - such as DTMF, Speech, and/or Tone detection - may be combined with the line events to further refine an audio logging activity using the Daytona board.

For example, Advance Tone Detection (ATD) is a standard feature on all Pika cards. This feature, along with line events, may be used to distinguish between inbound and outbound calls. When the line goes off-hook to place a call, the ATD feature on the card detects the dial tone on the line and produces a distinct event (PK_EVENT_ATD_TONE_ON). However, no such event is generated when the phone goes off-hook to answer an incoming call. Therefore, a combination of the ATD and ring-on events may be used not only to activate a logging session but also identify the direction of the call.

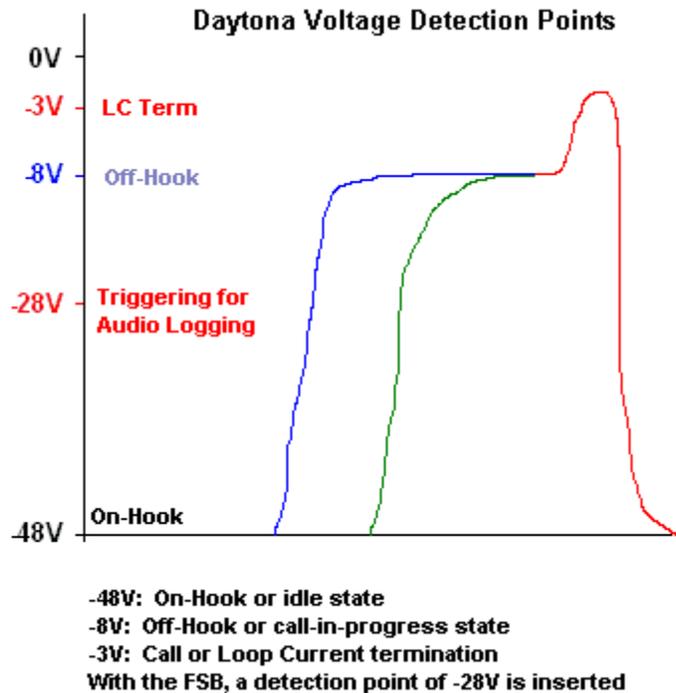
In *passive* logging, the card always remains in *on-hook* state even during the recording. This form of logging is also known as *high impedance* audio logging. The recording can be triggered in two ways: when the line goes off-hook to place or answer a call (-28 Vdc triggering) and when the line is ringing due to incoming call (90 Vac, 20 Hz). In this configuration the card is not part of the network and, unlike the *active* mode, it is not involved in handling the calls as part of the system.

The specific events used with audio logging applications are: PK_EVENT_TRUNK_RINGING_ON and PK_EVENT_TRUNK_RINGING_OFF. These events are generated when the phone under monitoring goes off-hook to place and on-hook to end a call, respectively. The same events are also generated periodically, in short intervals, when the line is ringing (during an incoming call). Due to the FSB modification for passive audio logging, the LC_TERM event will no longer be generated.

NOTE: The *PK_TRUNK_AudioLogging* function has to be called in order to detect these events in a passive audio logging application.



Additional Information



Inline

Audio logging with the InLine card is different than with the Daytona card and it can only be done in the *off-hook* state, for both *active* and *passive* configurations.

Active Mode

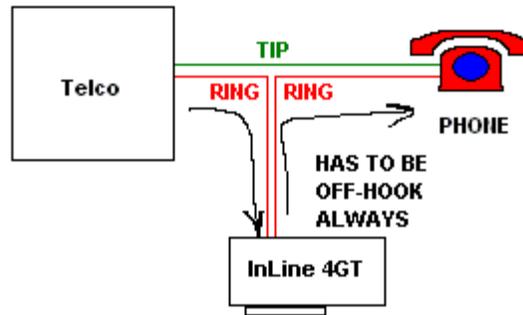
Similar to Daytona, in *active* audio logging the InLine card would be part of the network and the recording is normally controlled by real-time human interventions.

Passive Mode

As shown in the diagram below, in the *passive* audio logging with InLine, the card should be connected in series with the trunk lines connecting the phone to the CO. The card should always remain in the *off-hook* state in order to maintain the connection of the phone with the local network. Setting the card to the *on-hook* state would mean complete disconnection of the phone from the network; i.e. making or receiving calls would not be possible!

The InLine card generates two software events for automatically managing the initiation & termination of audio logging on the lines connected to the card. The events `PK_EVENT_TRUNK_LC_POS` (or `LC_NEG`, depending on the network) and `PK_EVENT_TRUNK_LC_TERM` are generated when the phone goes off-hook or on-hook, respectively. When the phone under monitoring hangs-up first to terminate a call with the other party, only the `LC_TERM` event is generated. However, if the call is terminated by the other party, two events would be generated; first the `LC_TERM` and secondly the `LC_POS` event. Along with using many other DSP-based features available on the InLine card, this is one of the

ways to monitor and record certain activities on the line. Unlike the Daytona board, no specific *ring-on* or *ring-off* events are generated, meaning no DC triggering is available on the InLine card.



NOTE: No hardware change is required for the InLine card to perform passive audio logging. An insertion loss of -6 dB will occur on the line when the card is connected in series.