



PESA

TECHNICAL ADDENDUM



DIRECT ACCESS OF ADJACENT CHANNEL AUDIO SUMMATION AND DIFFERENCE SIGNALS



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1.1 DESCRIPTION

This Technical Addendum presents an additional capability inherent to the control system for both standard DRS and DRS Enterprise (high-signal capacity) audio routers that allows you to directly access an audio signal derived from the summation or difference of any two adjacent paired audio input signals, without modifying either signal of the adjacent pair at the input signal frame. This capability is in addition to the stereo remedies options available through configuration screens for each input or output signal frame within a channel group.

This addendum assumes that the reader has access to the ***PERC2000 User Guide***, PESA Publication 81905906050, Rev C; has working knowledge of the PESA DRS audio router system; and is familiar with the system controller software control application being used (PERC2000 GUI or Catrax). The PERC2000 User Guide is available on our website at www.pesa.com.

1.2 REVIEW OF INPUT CHANNEL PAIRING

PESA's DRS and DRS Enterprise audio router support several digital signal processing (DSP) functions that, among other things, generate a summation signal (L+R/2) or a difference signal (L-R/2) from any set of **adjacent paired** audio input signals. With many installations adjacent channel pairs are the left and right channels of a stereo audio source. In terms of stereo audio, when these signals are generated, the first signal of an adjacent pair is processed as the left channel audio and the second signal is processed as the right channel audio.

By way of a quick review, recall that with AES digital audio each signal actually carries two channels of audio data, and the two channels of an input signal are considered by DRS to be adjacent paired channels.

With analog signal frames, every two consecutive input channels, beginning with input channels 1 and 2, are considered to be adjacent paired signals. For example, with the first input signal frame of channel group 1, signals 1 and 2, 3 and 4, 5 and 6, etc. are adjacent paired channels. Input signals 2 and 3, 4 and 5, etc. are NOT adjacent paired channels. If there is a second input signal frame in the channel group, signals 129 and 130, 131 and 132, etc. are adjacent paired channels. This pairing continues for all input signal frames and channel groups in the system.

For additional information on signal pairing and adjacency refer to Paragraphs 7.7.1 and 7.7.2 or 8.10.4 and 8.10.5 in the ***DRS Technical Manual***, PESA Publication 81905905890, Rev E.

1.3 USING DIRECT ACCESS SUMMATION AND DIFFERENCE SIGNALS

In some applications it may be desirable to have available a monaural audio signal derived from a stereo pair, in addition to the discrete stereo channels; or to use stereo sum and difference signals (such as when using Mid/Side Stereo Encoding) rather than discrete left and right audio signals. The DRS processing system produces these as virtual signals derived from every pair of adjacent input signals to the router. Direct access capability makes these virtual signals available to any router destination channel by inserting a specific code number, corresponding to the virtual signal, as the source for the destination channel on which you wish to access the signal. Source code numbers are calculated as follows:

Summation of two adjacent paired signals – Add the decimal number 8192 (16384 with Enterprise DXE systems) to the channel number of the first signal (left channel in stereo terms) of the adjacent pair and insert the result as the source number for the desired output channel.

Difference of two adjacent paired signals – Add the decimal number 8192 (16384 with Enterprise DXE systems) to the channel number of the second signal (right channel in stereo terms) of the adjacent pair and insert the result as the source number for the desired output channel.

Examples:

1. To directly access the virtual summation signal ($L+R/2$) of the adjacent paired signals on system input channels 35 and 36 and assign the signal as a router source:
 - On the Sources configuration screen of the software control application, define a source name for the summation signal and enter the number **8227** ($8192 + 35$) [**16419** ($16384 + 35$) with Enterprise DXE systems] as the physical router signal input under the level column for the desired switching level on which you wish to route the summation signal as a source.
 - Download the configuration file to the System Controller.
 - Take a switch either through the control application or a remote control panel to route the summation source to the desired destination(s).
2. To directly access the virtual difference signal ($L-R/2$) of the adjacent paired signals on system input channels 3 and 4 as a router source:
 - On the Sources configuration screen of the software control application, define a source name for the difference signal and enter the number **8196** ($8192 + 4$) [**16388** ($16384 + 4$) with Enterprise DXE systems] as the physical router signal input under the level column for the desired switching level on which you wish to route the difference signal as a source.
 - Download the configuration file to the System Controller.
 - Take a switch through the control application or a remote control panel to route the difference source to the desired destination(s).

By creating a named source for the summation or difference signal as part of the router configuration file, the virtual signal may be assigned to a switching level and routed to any desired destination just as any physical signal source, or may be accessed for a particular destination on the fly through the Matrix Status or Matrix Preset software control application screens.

It is also possible to access the virtual summation or difference signal for any adjacent paired input signals by inserting the calculated source code number directly into the Status/Scratchpad area of the Frame Controller Configuration software control application screen.

1.4 SUMMARY

Direct access capability provides a simple method of accessing summation and difference signals for any adjacent paired audio input signals to the DRS at any desired output channel without any modification to the original input pair signals.

Use the decimal number 8192 with standard DRS systems, 16384 with Enterprise DXE systems, added to the first number (L channel) of the adjacent pair to derive the summation signal source code; and added to the second number (R channel) of the pair to derive the difference signal source code. Use the calculated source code in place of the physical signal input number when defining the router audio source.

This addendum introduces an addition to the existing DRS Technical Manual and should be retained with the manual for future reference.

If you have any questions concerning this addendum or using the Direct Access of Adjacent Channel Audio Summation and Difference Signals capability, please contact PESA Customer Service.



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