



EAW COMMERCIAL APPLICATIONS GUIDE

Your Guide to Installing
EAW Commercial Audio Products



Court Room

VOLUME #6

EAW Commercial

The New Standard in Commercial Audio

For more than 25 years, touring and installation professionals have turned to EAW for the world's finest loudspeaker systems. As well, musicians and engineers have long known Mackie for their great sounding, ultra-reliable mixers, amplifiers and speakers. So once EAW set its sights on the commercial audio market, a partnership seemed perfectly natural.

Introducing EAW Commercial

EAW Commercial is a new brand of high-performance commercial audio solutions from the professionals at EAW and Mackie. The new EAW Commercial line includes DSP matrix mixers, amplifiers, ceiling speakers, as well as a full range of loudspeakers. Ideal for permanent installations in a wide range of venues, these products provide better sound, higher flexibility and greater overall integration.

The EAW Commercial Difference

Because EAW Commercial can draw upon the world-class engineering and manufacturing resources of EAW, Mackie, SIA Software and Acuma Labs, we're able to bring cutting-edge technology to commercial audio. EAW engineers have designed digitally steerable arrays which combine our formidable digital signal processing, analog amplifier and professional loudspeaker technology into a single breakthrough product line.



However all the technology in the world doesn't mean a thing if it doesn't give your clients great sound and years of reliability. That's why all EAW Commercial products adhere to EAW and Mackie's rigorous design principles and meticulous engineering processes. Most importantly, we pay attention to all the details – like quality materials, construction, and ease of installation – so you won't have to. And thanks to our vast manufacturing resources and sheer buying power, these products give your customers a significant step-up in quality, without a step-up in price.

Now and In the Future...

Based on the solid technology and design foundations of EAW and Mackie, EAW Commercial has the experience to bring you the best performance and value in the market. We invite you to grow with us.

Sound System Design for a Small Courtroom.



When standing before a judge, chances are your mind is occupied by topics unrelated to the courtroom's sophisticated audio system. Due to their shape and highly reflective surfaces, small courtrooms are not conducive to a PA or speech reinforcement system.

High-powered systems and speaker cabinets in view are rarely the norm. Proper courtroom sound reinforcement requires many speakers placed near the listeners—those required to speak will need microphones, making the problems of feedback management a top concern. Loudspeakers, amps, and other system equipment must be installed invisibly, so that they do not distract from serious proceedings.

Master Control – We'll use a DX810 Matrix Mixer to solve the sonic problems presented by the courtroom. In order to eliminate annoying feedback while providing adequate and intelligible sound reinforcement, we need to separate each microphone and isolate it from the output of the sound system. Only those microphones that are in use should be "on" at any given moment. Using the DX810, we can program a "mix-minus" system, grouping microphones and loudspeakers in such a way that the nearest loudspeaker never amplifies the person speaking. The DX810's gating functions allow us to create a sophisticated mixing state in which microphones are on only when the users are speaking—opening the gate on any mic will turn off the speakers located in its zone. Each zone has EQ, compression, crossover points, and delays, programmed into automatic switches in the DX810. These switches then turn on the appropriate preset configuration programmed into the DX810.

We'll use all eight inputs on the DX810 to configure six microphones, an audio input for taped testimony, and a

response feed from an outside telephone line. Microphones will be provided for the judge, witness box, recorder, jury, defense, and prosecution locations. We can program any combination of the eight inputs to be routed to any of the ten outputs of the DX810. The judge can use a generic remote control device to switch the DX810's logic, or change features using the DXSW4 and DXRV remote panels. Entire system configurations can change with a single push of a button.

The Judge Rules – The judge's microphone will have priority over all other microphones by setting up the priority levels in the DX810. The remote controls can be positioned at his bench, so if he needs to speak with someone without broadcasting, he can simply turn off his microphone or parts of the system.

Audience Gallery – We can run a large number of speakers as a single zone for the audience section. We'll use twelve CIS65 Ceiling Speakers powered by a CXA120 Amplifier running on a 100V line. Each CIS65 is tapped at 5 watts. We'll then apply EQ and compression from the DX810 so that the level of the audio stays constant. There are no mics in this zone, so there isn't the need for feedback control.

Jury Box – Since we need to have individual zones, it means we also need amplifiers for each zone. Here's how the cost relationship for this type of audio system usually works. You can save money simply by using fewer amplifiers. However, you can't have two separate audio mixes or feeds from



a single amp channel. The Audience Gallery was an easy design because they all get the same mix and a microphone is not needed. We were able to use a constant voltage system (100V) to run many speakers from a single amp. We need six more zones to handle the other areas in the courtroom and that means six more amp channels. We can use CAZ800 Amplifiers for these zones, as they have two channels of amplification in one unit, which will save costs. This set up would be a problem if we had to run a large number of speakers like we did in the Audience Gallery, but these amplifiers are low-z amplifiers instead of constant 100V amplifiers. The load adds up quickly with multiple speakers so we use CIS300 Ceiling Monitors rated at 16 ohms and can have up to four speakers per amplifier channel. This set up works well because the jury box needs four CIS300s, the judge needs two, and all the other positions need only one. Thus we can do all six zones with three CAZ800 Amplifiers running in "stereo" mode.

Data Logging and Communications – There are two outputs remaining on the DX810 for a tape logger and a telephone output feed. The court stenographer can make spoken notes to the recorder without broadcasting over the main courtroom speakers. When the judge requires the stenographer to read back testimony, all they have to do is push a button to open that microphone. The remaining output on the DX810 is available for a press box or hallway monitor.

INSTALLATION NOTES:

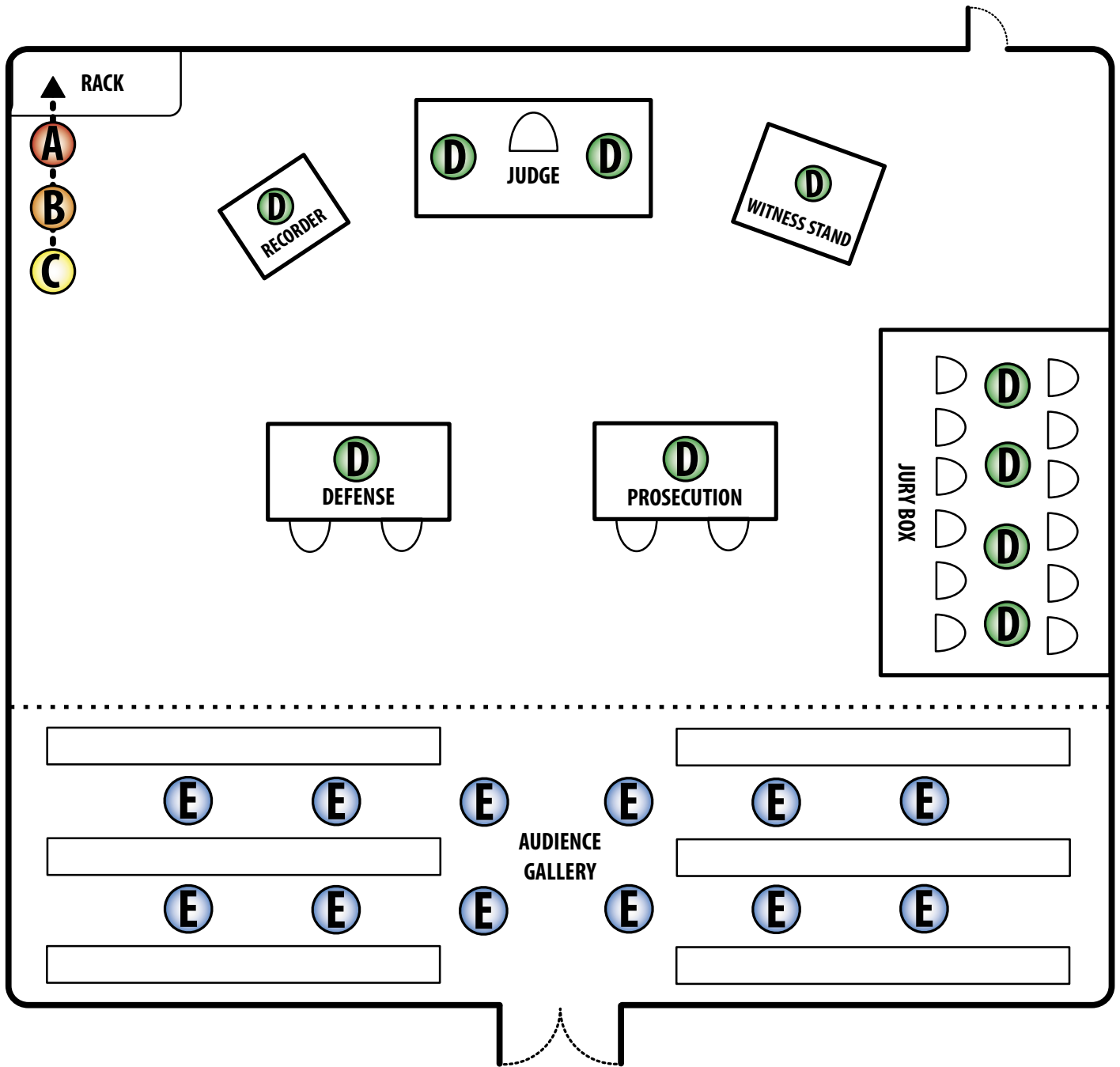
Loudspeaker Placement – Determining the number of speakers needed in a particular installation is not always an easy task. Attempting to apply various published formulas can often mislead the designer into believing that everything will come out sounding fine. Note that our Applications Guide doesn't specify ceiling height, listener positions, required SPL levels or other major variables needed for the best sounding system. Consult a professional sound installer for best results.

Wattage Allotments – Our Applications Guide uses both low impedance systems and constant voltage systems. Most misunderstood of the two are constant voltage systems. Choosing an amplifier for a 100V system is easy just add up the number of transformer taps you want to use on each speaker. For example, eight CIS400 ceiling speakers tapped at 7.5 watts would ask for 60 watts. A simple rule of thumb is to allow 20% more wattage than needed to handle variations in volume and material.

The benefits of using a distributed 100V system is that each speaker only pulls the amount of wattage assigned it on the transformer taps, so you can add many speakers to a single amplifier without having to calculate the maximum impedance. You only have to pay attention to the wattage maximum. You can also mix and match different tap settings to configure some of the speakers louder in volume than other speakers in the same system.

This Applications Guide was created by EAW Commercial to demonstrate a basic sound system application using EAW Commercial products. As such, we do not include details such as room dimensions, ceiling heights, building materials, types of use, etc.—all of which will have a profound affect on the total system performance.

Courtroom Floor Layout



DIGITAL MATRIX MIXER

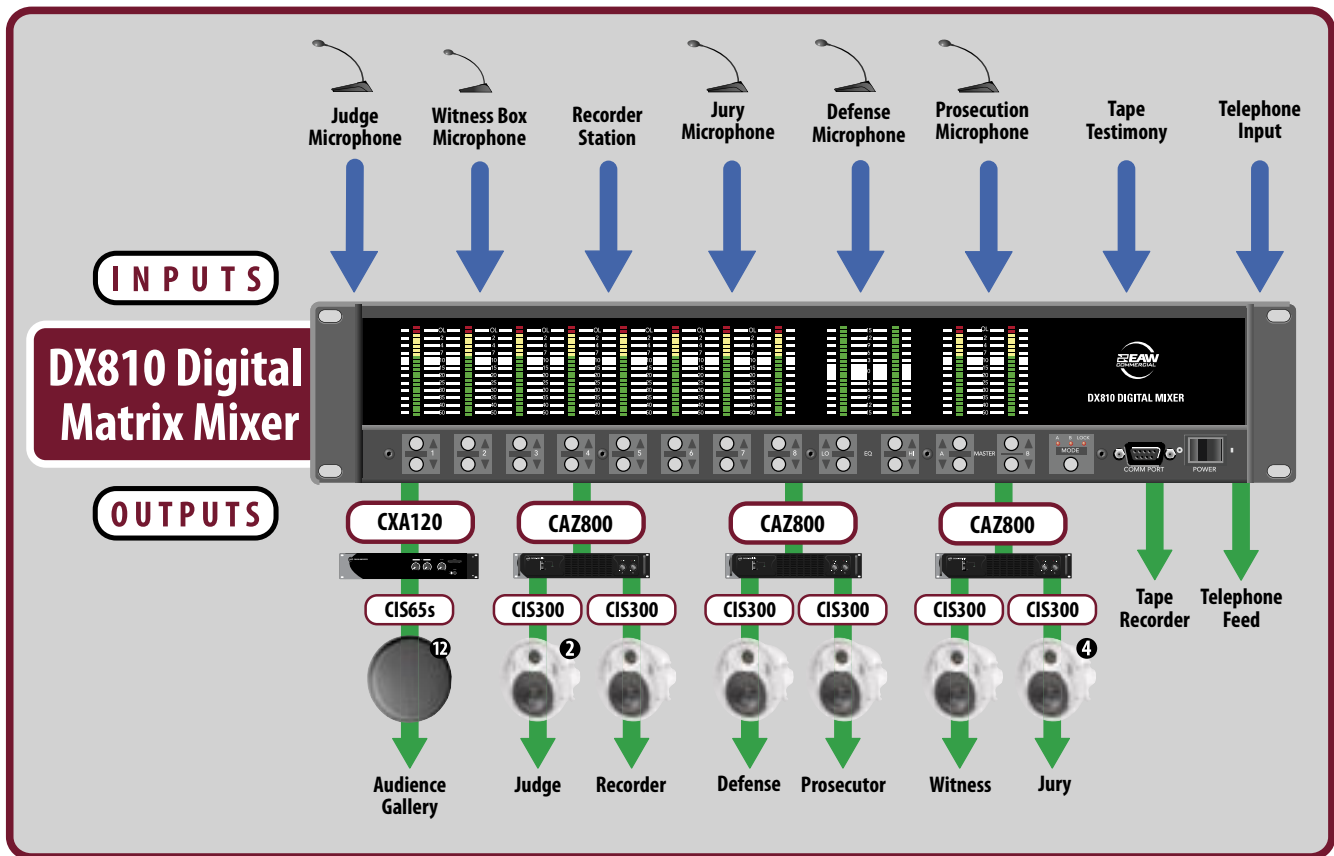
The DX810 is a full-featured Matrix Mixer and processor that will change the way you specify, design and build installed sound systems. It delivers true 8 x 10 mixing, 3-band swept EQ, gates and compressors on each input plus 1/3-octave graphic and 8-band parametric EQ, delays and crossovers on each input. All functions are individually programmable through an intuitive graphical user interface that offers unmatched usability and zero learning curve.

A



DX810

- 31-band Graphic EQ combined with a 8-band Parametric EQ
- Variable compressor available on each Output
- True Room combining capability (up to 16 combinations)
- Mute/Enable logic for each Input, output and group
- Expanded remote control capabilities
- Expanded logic input and output features
- Faster up/downloads to and from the host PC
- Password security levels



AMPLIFIERS

The CXA, CAM and CAZ Series Amplifiers are designed for continuous duty in speech, music, paging, and sound reinforcement applications that demand high performance, flexible features, and rugged dependability.

CXA SERIES AMPLIFIERS: An excellent choice for applications requiring basic amplification of all audio signals in a distributed audio system.

B



CXA120

- 120W RMS
- 4 Ohm – 25V – 70V – 100V Outputs
- 1 balanced input
- Hi and Lo EQ
- Rack mounting kit included
- Automatic 24DC back-up power input

AMPLIFIERS (cont.)

CAZ SERIES AMPLIFIERS: Where low-impedance systems are desired, the CAZ Series offers the flexibility of three different power points.

C



CAZ800

- 800W @ 4 Ohms bridged
- Easily switchable mono/stereo/bridged mono operating modes
- Separate outputs for channel A and channel B
- Third output for mono bridged applications: also provides both output channels on a single connector
- 30Hz subsonic filter for low-frequency speaker protection
- Handles for easy transport and protection of level controls
- Defeatable clip limiter
- Front-panel signal and overload indication

CEILING SPEAKERS

The CIS Series Ceiling Mount Speakers offer multiple solutions for applications requiring superior audio reproduction. Designed for basic paging and background music, the CIS Series Ceiling Mount Speakers provide an economical solution.

D



CIS300

- Waveguide-loaded 1" tweeter
- 4" LF Driver
- Integrated mounting systems
- Built-in switchable high-pass crossover
- 30 watt , 70/100V transformer built-in
- 16-ohm setting
- Includes mounting hardware
- UL/cUL/CE listed

E



CIS65

- Fitted with 6.5" 2-way speaker, with a polypropylene cone, 10 oz. magnet and 2" mylar tweeter
- 70V/100V operation
- Bi-polar crossover
- 10 watt transformer with multi taps down to 0.625W
- Dished grille design for acoustic integrity
- Galvanized steel construction, finished in brilliant white
- Included fire dome



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