AP800

# Audio Perfect™ 800

## Installation & Operations Manual

Gentner®

Perfect Communication through Technology, Service, and Education™

**Audio Perfect™ 800 Installation and Operations Manual**
**Gentner Part No. 800-150-001**
**February 2000 (Rev. 1.1)**



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This equipment complies with the requirements of the European guidelines:

CE 89/336/EEC "Electromagnetic Compatibility"
73/23/EEC "Electrical operating material for use within specific voltage limits"

X 98/482/EC "Single terminal connection to the public switched telephone network."

Conformity of the equipment with the above guidelines is attested by the CE mark.

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# 1 Introduction

## Audio Perfect 800

Congratulations on purchasing the Audio Perfect™ 800 (AP800) distributed echo cancelling, audio processing, microphone mixing matrix. Communication media such as voice mail, the Internet, conference calling, videoconferencing and electronic presentation are driving the demand for better audio-communication technologies. At the same time, organizations are looking for ways to decrease cost and complexity while increasing efficiency and productivity.

The Audio Perfect™ product line was developed in response to these needs. Audio is critical to electronic meetings. This eight-channel, PC-controllable microphone mixer and echo canceller is a first in the audioconferencing industry. In a single box, Distributed Echo Cancellation™ is provided for individual microphone channels, while allowing the easiest interconnection with the rest of its product family. This network-based interconnectivity allows for multiple AP800s to be connected and controlled as a single unit. Up to eight AP800s can be networked, allowing microphone coverage in applications requiring up to 64 mics. The AP800 is a perfect solution for applications in audioconferencing, videoconferencing, distance learning, board rooms, conference rooms, teletraining, telemedicine, courtrooms and hotel/convention centers.

The AP800 contains commonly requested features such as an RS232 connection for PC control or remote control via custom remote controllers, local or remote PC setup and diagnostics, logic outputs, front-panel passcode protection and user-programmable gated

microphone operation. The latter allows you to address microphones individually choosing how many you wish to gate or not to gate; when coupled with Distributed Echo Cancellation™ for each microphone channel and automatic gain control (AGC) for each input, the AP800 can work in nearly any application. This manual explains how to install, set up and operate your AP800. It also provides instructions on how to improve room acoustics and resolve minor technical problems, should any arise.

If you need additional information on how to install, set up or operate your system, please contact Gentner Communications Corporation at the location noted below. We welcome and encourage your comments so we can continue to improve our products and serve your conferencing needs.

**Gentner Communications Corporation**
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TEL: Worldwide 801.975.7200 In U.S.A. 800.945.7730
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FAX-On-Demand 24-Hour Information line 800.695.8110
FAX-On-Demand International Line 801.974.3661
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### Warranty Registration

Please register your Audio Perfect™ product online by visiting Gentner Technical Support at the World Wide Web address listed above. When your product is properly registered, Gentner Communications will be able to serve you better should you require technical assistance or desire to receive upgrades, new product information, etc.

# Features and Benefits

- Distributed Echo Cancellation™ technology; each microphone has its own echo canceller for a total of eight echo cancellers per unit
- Plug-and-play echo cancellation
- 100 percent digital signal processing (DSP)
- Simultaneous direct connection to several video codecs and telephone lines (using AP10 Telephone Interfaces)
- Two internal submixing buses used for mixing and level control in sound-reinforcement systems
- 12 x 12 matrix mixer
- Two internal submixing buses used for mixing and level control in sound-reinforcement systems
- Twelve line output channels expandable to 96; any of the 12 input channels can be mixed to any of the 12 outputs on a given unit; all output levels are adjustable and can be instantly muted
- Eight-channel automatic microphone mixer with four line inputs expandable to 64 mic inputs and 32 line inputs interconnected
- All automatic microphone functions and operating modes operate across expanded units
- Input gain, audio processing, equalization, muting, and automatic mixer programmable per input channel
- Expandable using a high- speed digital network bus; a total of eight AP800s and 16 AP10s can be interconnected
- All G-Linked devices can be accessed, controlled, and programmed via a single RS232 connection
- Program, operate and perform diagnostics from the front panel, a connected PC (direct or via modem) or any other type of serial remote-control device
- Six programmable presets for instant configuration changes
- Lockout front-panel access for security

## Applications

The AP800 contains many unique features that make the AP800 easier to set up and use. Specific user programming capabilities tailor-make AP800 functionality to suit almost any application, including audioconferencing, videoconferencing, distance learning, boardrooms, conference rooms, teletraining, telemedicine, courtrooms, and hotel/convention centers.

For block diagrams of AP800 applications, see Appendix E (page 45).

## Product Description

The AP800 performs a variety of complex, integrated audio functions, all implemented using digital signal processors (DSPs). This product line was not designed as a generic solution for a wide variety of uses. Instead, it was designed to meet the specific audio needs of a limited number of applications. By pursuing these vertical applications, the AP800 has been stripped of features and functions that would result in higher cost, complexity and unreliability.

In its most simple form, the AP800 is a microphone mixing matrix. As such, all microphone-mixing parameters can be customized and any input or combination of inputs can be routed to any output, allowing flexibility in fitting different applications and customer requirements. Adjustments in routing, level and all other functions can be made at any time in one of three ways: front-panel programming, presets activated through a closure on the rear panel, and RS232 serial interface.

However, the AP800 is much more than a simple microphone-mixing matrix. The AP800 operates on four basic principles: gating microphones, Distributed Echo Cancellation™ , decisions for each microphone, and network architecture. The AP800 gates microphones on/off when the sound within a microphone's acceptance pattern reaches a certain level. The AP800 provides Distributed Echo Cancellation™ which makes decisions for each microphone individually, based on each microphone's specific conditions. The AP800 functions with a network architecture which allows up to eight AP800s and up to 16 AP10s to be linked via the G-Link and operate as a single unit.

Each microphone reacts independently, observing its own ambient levels and making decisions based on its individual environment. Thus, a microphone located in a highly reverberant part of a conference room is able to compensate for the changes in its own area. The AP800 monitors audio levels at each microphone and reduces the mixing level for microphones not in use and/or eliminates echo. This improves the audio quality for the listener and decreases the possibility of feedback.

## Unpacking

# 2 Installation and Setup

## Unpacking

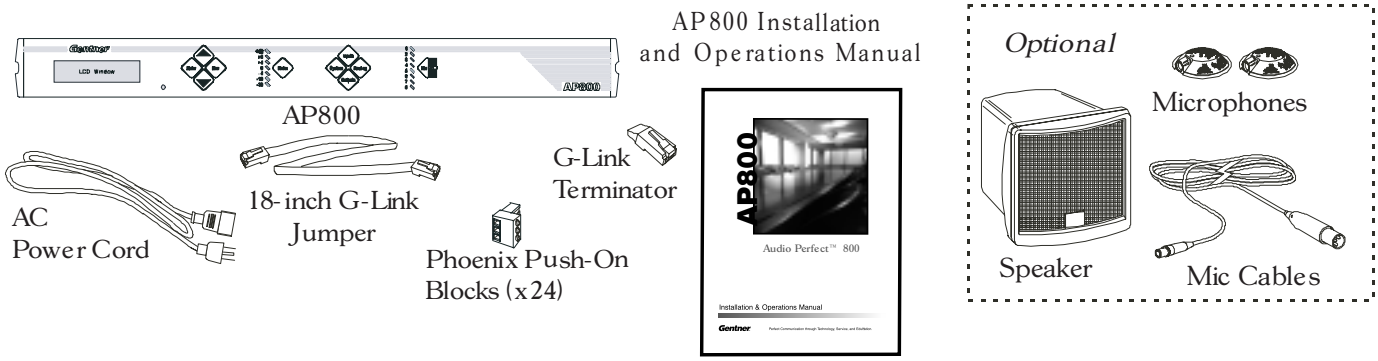


**Figure 1. Equipment**

Ensure that the equipment shown in Figure 1 was received with your shipment. Inspect your shipment for damage. Gentner Communications is not responsible for product damage incurred during shipment. You must make claims directly with the carrier.

## Front Panel

The AP800's front-panel controls (see Figure 2) perform the following functions. See page 10 for a description of each control. The controls are numbered for easy identification.

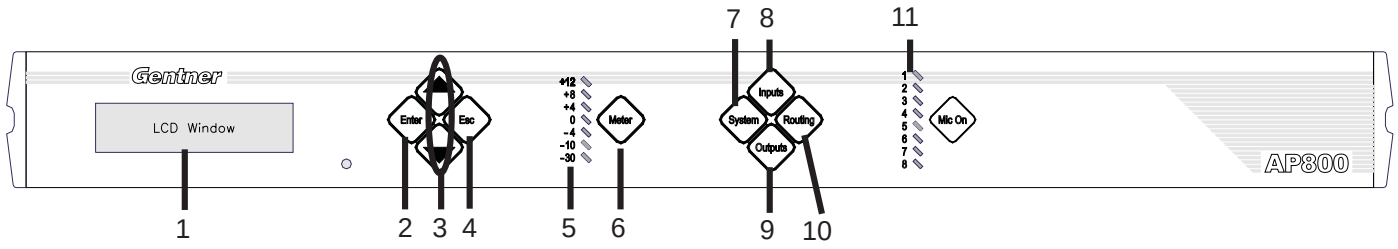


**Figure 2. Front Panel Controls**

1. LCD. The two-line, 16-character-per-line LCD display is used for AP800 setup and level adjustments in conjunction with the four associated front-panel buttons [2, 3 and 4]. Functions that can be accessed via the front-panel LCD include setup, programming, troubleshooting, and numeric audio level and gain readouts.

2. Enter. This button is used when programming the AP800 via the LCD window. To move deeper in the menu or execute a selected parameter, press this button.

3.▲/▼. These buttons scroll up and down through vertical programming options within a specific AP800 programming parameter or increases/decreases a numeric value.

4. ESC. This button, when used in programming the AP800 with the LCD window, steps out of a selected parameter or moves you up one level in the menu. When a parameter has been displayed with the arrow buttons [3], entered with the ENTER button [2], and modified, the set of parameters are then stepped out of again with the ESC button.

5. LED Meter. This LED bar meter is used to display the audio level of any input or output of the AP800, as well as displaying echo return loss (ERL) and echo return loss enhancement (ERLE) for mic channels 1–8.

**NOTE: All front panel buttons are also used to enter the front panel passcode. See Security (page 24) for more details.**

6. Meter. This button, when pressed, takes you directly to the Meter branch of the AP800's LCD programming tree.

7. System. This button, when pressed, takes you directly to the System branch of the AP800's LCD programming tree.

8. Inputs. This button, when pressed, takes you directly to the Inputs branch of the AP800's LCD programming tree.

9. Outputs. This button, when pressed, takes you directly to the Outputs branch of the AP800's LCD programming tree.

10. Routing. This button, when pressed, takes you directly to the Routing branch of the AP800's LCD programming tree.

11. Mic On LED. These LEDs indicate microphone ON status.

## Rear Panel

1. Power. This power module (See Figure 3, below) accommodates power ranging from 100–240Vac, 50/60Hz. No switching is required.

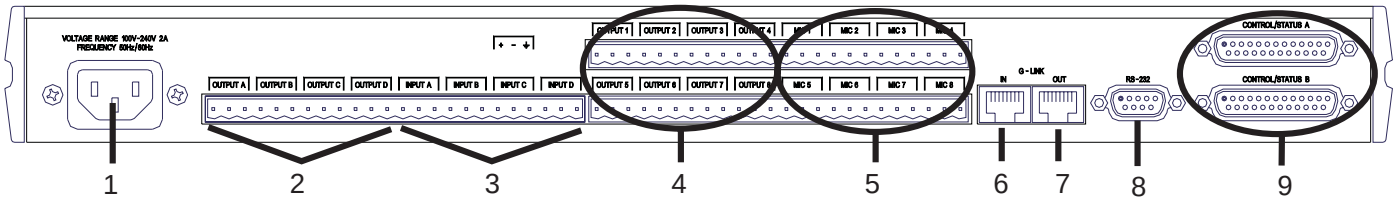


**Figure 3. Rear Panel Connectors**

2. Output A–D. This bank of Phoenix block connectors is for connection of four line-level outputs with the three-terminal Phoenix TM push-on connector(s). This bank of connectors is typically used for connection of video codecs, AP10 Telephone Interfaces, VCRs, CDs and other audio sources. These outputs may be configured to contain any combination of gated and non-gated inputs. The nominal output level is 0dBm.

3. Input A–D. This bank of Phoenix block connectors is for connection of four line-level inputs with the three-terminal Phoenix™ push-on connector(s). This bank of connectors is typically used for connection of video codecs, AP10 Telephone Interfaces, VCRs, CDs, etc. These inputs can be mixed in any combination with the gated inputs to any of the 12 outputs. Nominal input is 0dBu. Mix level can be easily set for each non-gated input. For electrical specifications, see Specifications, page 39.

**NOTE: Each position on the three-terminal Phoenix push-on connector has three possible wiring positions: + (positive), - (negative), and ground.**

4. Output 1–8. This bank of Phoenix block connectors is for connection of line-level outputs with the three-terminal Phoenix push-on connector(s). These outputs are configured at the factory to be direct outputs of the eight mic inputs but may be configured to contain a mix of any individual mic or line-level inputs. Nominal output is 0dBm. For electrical specifications, see Specifications, Page 39.

5. Mic 1–8. This bank of Phoenix block connectors is for connection of up to eight mic/line-level inputs (selectable) with the three-terminal Phoenix push-on connector(s).

6. G-Link In. This RJ45 connector is part of the AP800 RS485 LAN. The first Gentner unit in the local G-Link network must have the G-LINK IN connector terminated with a G-Link terminator. The first Gentner unit's G-LINK OUT connector is then attached to the G-LINK IN connector on the next Gentner unit, forming a daisy-chain network.

**NOTE: A G-Link network will allow interconnection of up to eight AP800s and 16 AP10s. See Network Requirements (page 13).**

7. G-Link Out. This RJ45 connector is part of the AP800 RS485 LAN. The last Gentner unit in the local G-Link network must have the G-LINK OUT connector terminated with a G-Link terminator. The first Gentner unit's G-LINK OUT connector is then attached to the G-LINK IN connector on the next Gentner unit, forming a daisy-chain network.

8. RS232. This DB9 serial port (see Figure 15) is for interconnection between the AP800 and a PC, modem or other custom remote controllers. For serial protocol, see Appendix D, Page 43.

9. Control/Status A and B. These two DB25 connectors are used to interface parallel control to the AP800. Most of the pins on these connectors can be programmed to perform any function via a closure to ground. For instructions on how to program the control and status pins, see page Appendix D, Page 44. The default settings allow control and status of the front panel, mics, outputs, volume, presets and inputs. These pins go low when active. The six presets can be activated at any time via these connectors. For pinouts, including a description of the default settings, see Appendix D, Page 44.

**NOTE: When multiple AP800s are used in a system, the gating parameters on all units must be set the same.**

### G-Link Networking

The G-Link network architecture allows up to eight AP800s, up to 16 AP10 Telephone Interfaces, and forthcoming additions to the Audio Perfect™ product line to be controlled as if all were part of a single unit.

Digital communications concepts can provide a distinct advantage in designing and controlling teleconferencing systems. One of the Audio Perfect's new approaches to teleconferencing is its use of networking for room combining and separation. A network is ideally suited for these applications, while minimizing the necessity of redundant equipment.

With AP800's G-Link network, size is much less of a constraint. Use of eight AP800s allows up to 64 microphones to be accessed and controlled as if from a single unit, as well as control of the AP10s from a single COM port.

G-Link Bus

This digital bus appears on every Audio Perfect product. This mix-minus bus allows audio to be routed to any destination on the G-Link network. The AP800 has four digital buses: X-Bus, Y-Bus, Z-Bus and G-Link EC Reference Bus.

X-Bus. This mix-minus bus is defined as the master microphone mix, and it supports NOM (see page 34). All gated microphones are default routed to this bus.

Y-Bus. This mix-minus bus is defined as the line input master mix. All line-level audio such as video codecs, AP10 Telephone Interfaces, VCRs, etc., are default routed to this bus.

Z-Bus. This mix-minus bus is a user-defined auxiliary mix bus.

G-Link EC Reference Bus. This bus provides a system-wide echo canceller reference signal. It allows for the reference signal to be passed to additional G-Linked mic channels and their associated echo cancellers. Typically, one one output on one unit will be passed along the G-Link EC Reference Bus.

Network Requirements

The G-Link (RS485 LAN), gives you the ability to interconnect the AP800 with multiple Gentner units (additional AP800s or AP10s). The maximum distance between interconnected Gentner units is 20 feet. Gentner Communications recommends that category five twisted-pair (10BaseT LAN) cable be used.

**NOTE: The Y and Z busses do not support NOM.**

### Distributed Echo Cancellation™

The AP800's Distributed Echo Cancellation™ (DEC) on separate microphone channels removes echo at each mic input. DEC makes adjustments on a per-mic basis, accounting for differences in acoustics at each microphone.

## Before You Install

The AP800 is designed to work in almost any acoustic environment. However, to maximize your audio quality, we recommend that you prepare your site by taking the following factors into consideration:

### Room Planning

Before installing your AP800, we recommend that you carefully plan your installation to ensure that you achieve the best possible results. Having a basic understanding of room acoustics and conference room design will not only help you install and operate your AP800, but will assist you in the installation and operation of other equipment used in your audioconference.

Acoustics

Conference and broadcasting rooms have unique acoustic environments. Each room has a different acoustic make up (see Figure 4). The acoustic make up of the room determines how sound travels within the room. Wall fabrics, windows or hard surfaces, room size, people walking or other movements, and the audio equipment used, are all factors that impact the room's acoustic conditions.

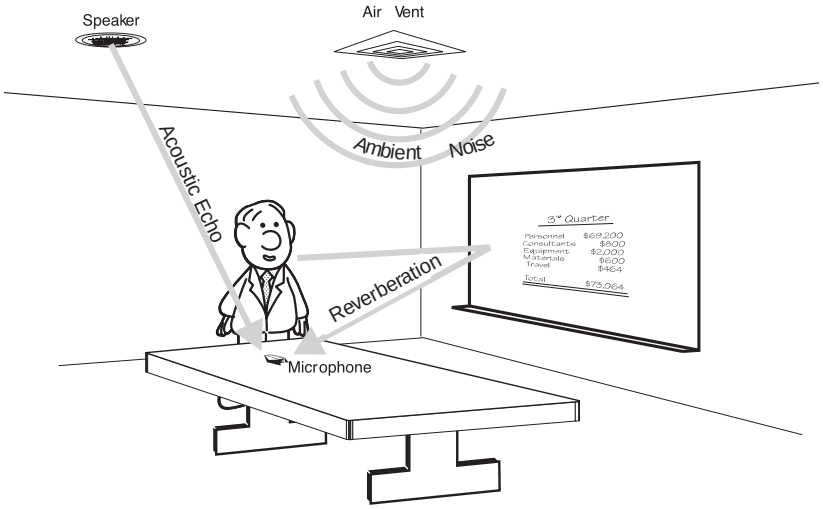


**Figure 4. Room Acoustics**

Directly related to the room's acoustic make up are several problems common to all conferencing and broadcast situations: reverberation, acoustic echo and ambient noise. The objective is to minimize the impact that these conditions have on your audioconference.

Reverberation. Reverberation is the persistence of sound due to repeated reflections from walls, ceiling, floor, furniture and occupants in a room. Reverberation dissipates over a fixed period of time determined by the room's environment.

Acoustic Echo. Acoustic echo is the sudden return of sound (rather than a smooth decay) caused primarily by a delay in the network or environment. It occurs before or after a signal leaves a speaker and enters a microphone for the return transmission, entering the originating site later. In other words, listeners at the remote location hear their own voices echoed back to them through the speakers and microphones at the opposite location.

Ambient Noise. Ambient noise, also known as room noise, is unwanted background noise picked up by the conference-room microphones. Air conditioning, heating fans, and noises created outside the room but still audible inside the room, are all examples of ambient noise.

Acoustic Room Treatment

Conference-room treatment is recommended to improve audio quality. Rooms that have large areas of windows, white boards, hard floors, etc., are acoustically "live." These areas increase the amount of audio reverberation. You can improve room acoustics by installing acoustic panels, drapes and other wall fabrics. Another way to improve overall room acoustics is to keep ambient noise to a minimum.

Conference Room Layout

Figure 5 is a block diagram of a basic audioconferencing installation using the AP800. The AP800 mixes microphone audio, cancels echo and directs the audio to a video codec and AP10 Telephone Interface. Audio from the video codec and the telephone line is routed to the AP800 and sent to the speaker(s). A standard telephone set is used to place calls to the remote conference room.

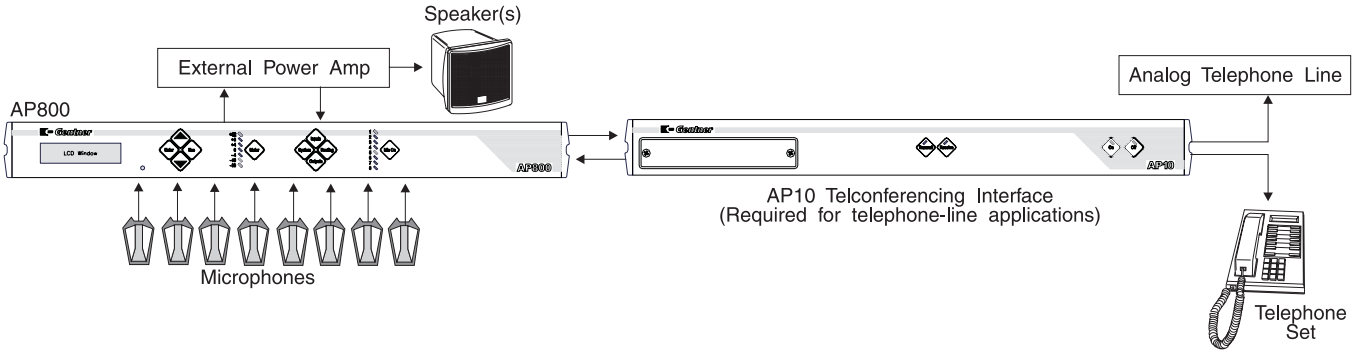


**Figure 5. Conference Room Installation**

## Microphone Selection

The type of microphone you select can have a dramatic impact on the audio quality of your conference. In particular, the type of microphone used affects the voice pick-up pattern, audio level and amount of noise introduced into the entire system. Typically, a unidirectional microphone with a cardioid pattern is the preferred choice for teleconferencing applications. Its design allows for maximum pickup from the front of the microphone and minimum pickup from the rear. Cardioid microphones are available in several styles including tabletop, podium, and lavaliere.

Tabletop

Tabletop (boundary) microphones are designed for large, flat surfaces other than the ceiling. They are most commonly placed on the center of the table, facing outward.

Podium

Podium (gooseneck) microphones are typically used in a lectern application. They are gaining acceptance in some ceiling-type applications and are sometimes used on conference-room tables as well.

Lavaliere

Lavaliere microphones are used when speaker mobility is a major concern. They are inconspicuous and can be adapted to a wireless configuration.

### Microphone Placement

One of the most effective ways to minimize the problems encountered with audioconferencing is to position the speakers and microphones so that you achieve the maximum amount of acoustic isolation (isolation between loud speaker audio and microphone audio). This can be accomplished using unidirectional microphones and placing the loud speaker out of the optimum pickup area (see Figure 6).

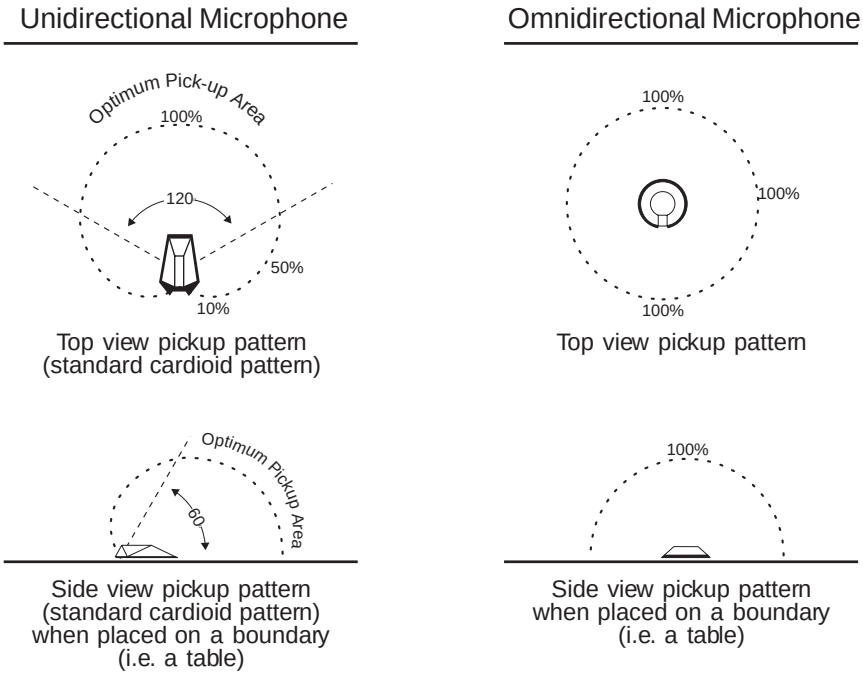


**Figure 6. Microphone Isolation**

### Power Requirements

The AP800 will accommodate an AC voltage-input of 100–240Vac, 50/60Hz, 30W.

### Windows® Requirements (Optional)

To function correctly, the AP Tools software requires Windows® 95/NT or later.

### PC Hardware Requirements (Optional)

For best performance, your PC (minimum 486DX-33) should have a minimum of 8MB RAM, 5MB of free hard-disk space, a free COM port, 9,600 bps or faster modem (US Robotics V.34 Sportster 28.8 external modem recommended), and a mouse.

### Auxiliary Equipment

Any auxiliary equipment to be used with the AP800 (i.e., AP10 Telephone Interface, desktop kit, microphones, speakers, recording equipment, etc.) should be available at time of installation.

### Equipment Placement

The AP800 is designed for mounting in a 19" equipment rack. Do not block any of the ventilation holes. With a desktop kit, it can be modified for tabletop placement.

### Environmental Requirements

The AP800 can be safely operated in a room with varying temperatures between 32° and 110° F.

## Installation

Follow these step-by-step instructions to install your AP800:

### Completed Installation

Figure 7 shows a complete AP800 installation.

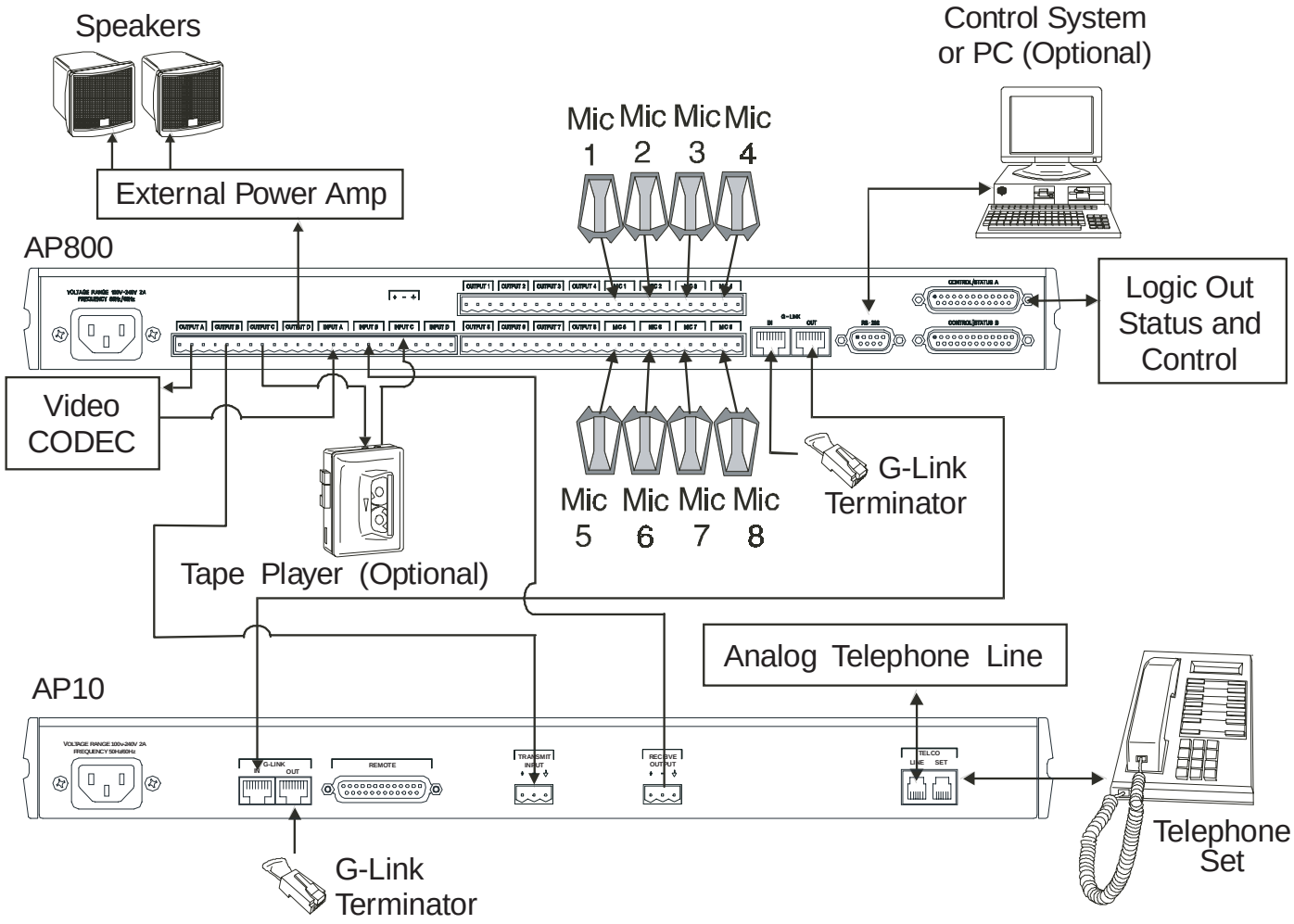


**Figure 7. Completed AP800 Installation**

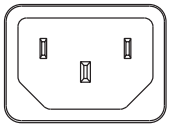

**Figure 8. Power Plug**

### Step 1 — Back Panel Connections

Power

The power module [1] (See Figure 8, left; Figure 9, below) will accommodate an AC voltage-input of 100–240Vac, 50/60Hz, 30W.

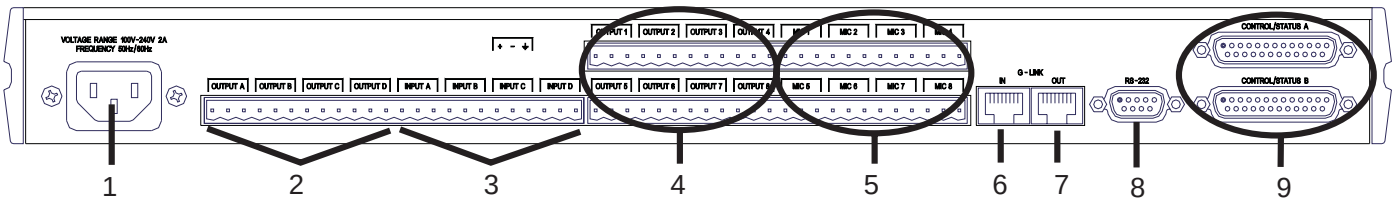


**Figure 9. Rear Panel Connectors**

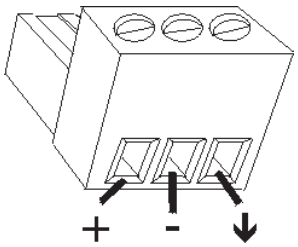

**Figure 10. Phoenix™ Three Terminal Push-on Connectors**

Output A–D

Connect up to four line-level outputs [2] to external equipment (video codecs, AP10 Telephone Interfaces, VCRs, video codecs, AP10 Telephone Interfaces, VCRs, tape recorders, etc.) via the provided three-terminal Phoenix push-on connectors (see Figure 10). These connectors are designed for easy wiring. Simply insert the desired wire into the appropriate connector opening, and tighten down the top screw. One three-terminal Phoenix push-on connector is provided for each line-level output (see Figure 11).

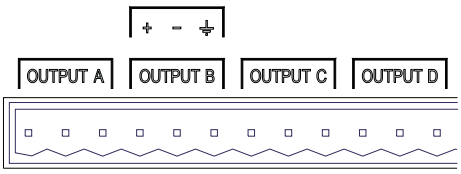


**Figure 11. Phoenix™ Connector Block, Output A-D**

Once the desired leads are wired into the Phoenix three-terminal connector, insert it into the back-panel connector on the AP800 with the set screws on top. Also note the position of the connector in relation to the screened legend on the back of the unit: overlapping from one channel to the other can cause improper operation.

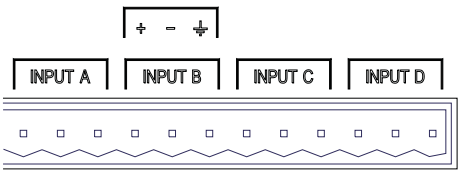


**Figure 12. Phoenix™ Connector Block, Input A-D**

Input A–D

Connect up to four line-level inputs [3] (see Figure 9) from external equipment (video codecs, AP10 Telephone Interfaces, VCRs, video codecs, AP10 Telephone Interfaces, VCRs, tape recorders, etc.) via the provided three-terminal Phoenix™ push-on connectors (see Figure 10). Insert the desired wire into the appropriate connector opening, and tighten down the top screw. One three-terminal Phoenix push-on connector is provided for each line-level input (see Figure 12).

Output 1–8

Connect up to eight line-level outputs [4] to external equipment via the provided three-terminal Phoenix™ push-on connectors. Insert the desired wire into the appropriate connector opening, and tighten down the top screw. One three-terminal Phoenix™ push-on connector is provided for each line-level output (see Figure 13).

Mic 1–8

Connect up to eight microphones [5] to the provided three-terminal Phoenix TM push-on connectors. Insert the desired wire into the appropriate connector opening, and tighten down the top screw. One three-terminal Phoenix push-on connector is provided for each mic/line-level input (see Figure 14).

RS232 Port

Connect the AP800's RS232 PORT (see Figure 15) to a free COM port of a PC or a custom remote controller. For pinouts, see Appendix D.

Note: The AP800's baud rate as shipped from the factory is 9,600 (bps) baud. However, if your application requires a different baud rate (19,200 or 38,400), refer to Baud Rate to change this setting. For serial protocol, see Appendix D.

Control/Status A and B

Connect the DB25 CONTROL/STATUS A and B [9] (see Figure 16) to parallel and status (if any). For pinouts, see Appendix D.

### Step 2 — G-Link Connections

Begin by placing the AP800s and/or AP10s in their proper locations. The G-LINK IN [6] and G-LINK OUT [7] connectors (see Figure 17) on the back panels are designed for setting up your G-Link network. G-Link connections between units are connected in a daisy-chain fashion using category five twisted-pair cable.

Note: If the Gentner units to be networked are stacked vertically, connect them using the short RJ45 jumper (provided). When networking between Gentner units (maximum distance, 20 feet), Gentner Communications recommends that category five twisted-pair (10BaseT LAN) cable be used.

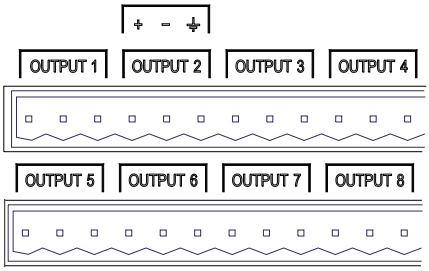


**Figure 13. Phoenix Connector Block, Output 1-8**

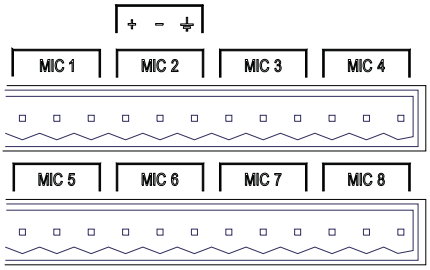


**Figure 14. Phoenix Connector Block, Mic 1-8**

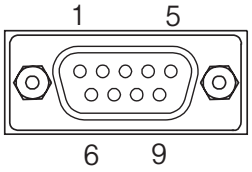


**Figure 15. AP800 COM Port Connector (RS232)**

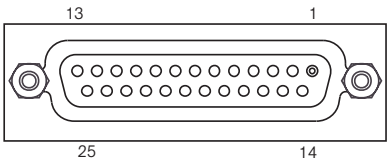


**Figure 16. AP800 Control/Status A and B DB25 Connector**

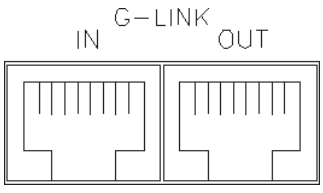


**Figure 17. AP800 G-link Connectors**

The first Gentner unit in the chain (see Figure 18) must have the G-LINK IN connector [6] (see Figure 9) terminated with a G-Link terminator (provided).

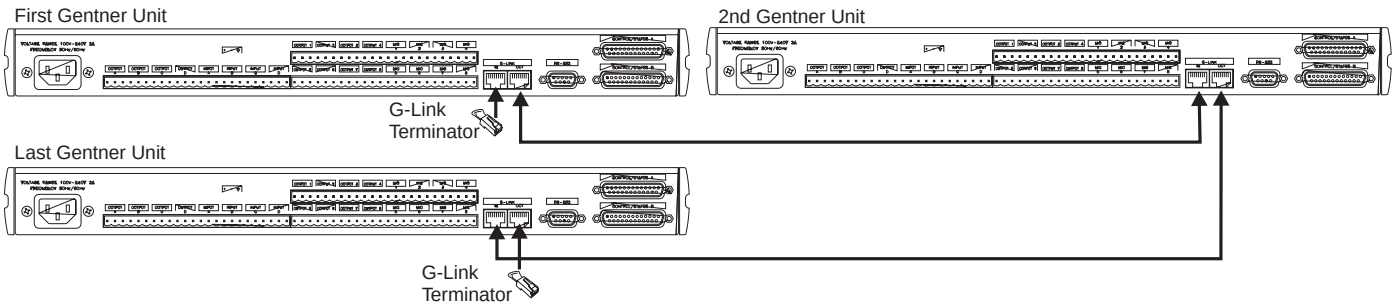


**Figure 18. G-Link Network Connection**

The first Gentner unit's G-LINK OUT connector [7] (see Figure 9) is then attached to the G-LINK IN [6] connector on the next Gentner unit in the chain. At the end of the network, the final Gentner unit attached must have the G-LINK OUT connector [7] terminated with a G-Link terminator as well. A G-Link network will allow interconnection of up to eight AP800s and 16 AP10s.

SYNCHRONIZATION ERROR NOTE:
A synchronization error occurs when slave units are not receiving a signal from the master unit. Meter LED "+12" will flash red and Mic LEDs "1", "2", and "4" will flash green on affected slave units. The error is a result of one of two problems: incorrect master/slave configuration or a broken G-Link connection.

If it is a master/slave configuration error, LEDs will flash on a unit that is designated as a slave unit but does not have a master unit. To correct the problem, make certain that MIXER MODE for the master unit is set to MASTER-LINKED and not to MASTER-SINGLE or DUAL MIXER (See Step 4 — MIXER MODE, next page).

If the error is in the G-Link connection, LEDs will flash on the units that are physically not connected to master unit. To correct the problem, check for broken connections, and simply reconnect the G-Links.

### Step 3—Device ID

Once your physical G-Link network is established (and you have more than one Gentner unit at a site), you need to appropriately set up unique G-Link device ID numbers for each AP800 on the network. As shipped from the factory, all AP800 units default as device ID 0. Set Device ID numbers for each Gentner unit at your site by manipulating the front-panel LCD.

To do so, press the front-panel SYSTEM button, then scroll through the menu until DEVICE ID is visible. Press ENTER, then scroll through the

eight (0–7) options. When the desired device ID is visible, press ENTER to select it.

DEVICE ID CONFLICT NOTE:
If the same DEVICE ID is assigned to more than one unit on the G-Link network, Meter LED "+12" will flash red and Mic LEDs "1", "2", "4" and "8" will flash green on the affected units. To correct the problem, it is necessary to change the DEVICE ID on one of the conflicting units.

Repeat this process until the device ID for each AP product on the G-Link network is set.

### Step 4 — Mixer Mode

Once your physical G-Link network is established and unique G-Link device ID numbers for each AP800 on the network are set, the mixer mode must be set. There are four mixer-mode settings (see Figure 19): master-single (default), master-linked, slave and dual mixer. Master-single must be used when only one AP800 is used in a system; however, only one AP800 can be designated as master-linked when multiple AP800s are used in a system. Master-linked denotes the master AP800 unit when more than one AP800 is on the network.

Slave is used for all networked AP800s that are not designated as master-linked, master-single, or dual mixer. If there are two AP800s networked, one must be set with the master-linked parameter, the other must be set with the slave parameter. Dual mixer is used when a single AP800 is to be used as two distinct mic mixers.

A system is defined as one or more AP800 units that communicate to perform mixing functions. A system may consist of one unit in master-single or dual mixer mode, or several units that work together with one master-linked unit and multiple slave units. Systems may be G-Linked together for easy reconfiguration as shown in Figure 19. The physical location on the G-Link network determines which system individual units belong to. In Figure 19, for example, AP800 Device 4 has been designated as master-linked, the units located below this unit on the G-Link network constitute System 3, while units above it belong to different systems. The entire network could be easily reconfigured into one system by changing the mixer mode on Devices 3 and 4 to slave units which would then refer to the only master-linked unit on the system: AP800 Device 0.

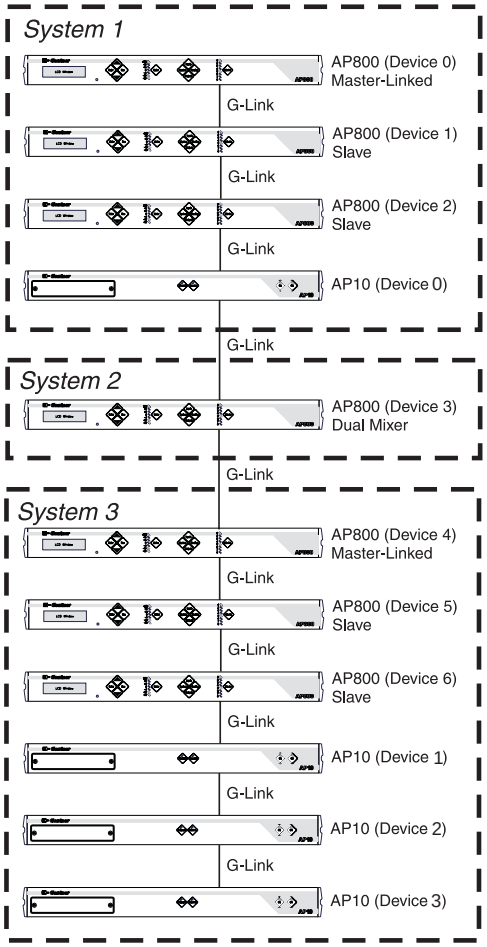


**Figure 19. Multiple AP Systems Block Diagram (multiple AP800s, multiple AP10s)**

DUAL MIXER NOTE:
A dual-mixer AP800 acts as a closed system (See Figure 19). This parameter cannot be used if the unit is to link audio with other AP800 units on the G-Link network within a single system.

When using the dual mixer parameter, a single AP800 unit can be used as two distinct mic mixers, allotting mics 1–4 and outputs 1–4/A–B to one mixer, and mics 5–8 and outputs 5–8/C–D to the second mixer.

To do so, press the front-panel SYSTEM button, then scroll through the menu until MIXER MODE is visible. Press ENTER, then scroll through the four options. When the desired mixer mode is visible, press ENTER to select it.

Repeat this process until the mixer mode for each AP800 on the G-Link network is set.

MULTIPLE UNITS TO ONE SPEAKER OUTPUT NOTE:
When multiple AP800 units are linked together and will be using only one output channel to drive the speaker system, this output must be defined as the acoustic source which will be used by all of the linked AP800s as the sample reference for echo cancellation. In other words, the output which the master unit will use as the EC reference must be identified to the slave units via the G-Link. See page 36 for details on Echo Cancellation Setup for multiple unit.

Hardware installation is now complete.

## LCD Programming

The AP800's front panel is simple and intuitive to operate, thanks to its front-panel user interface: a 2x16 character LCD, previously described menu buttons, level LED bar meter and gate LED bar meter.

When power is applied to the AP800, the LCD panel will first read INITIALIZING. If an error is displayed, contact technical support. If initialization is completed without any errors, a title screen is displayed, including the product name (top line) and the version number (bottom line). The title screen remains on display until an event occurs (i.e., a button is pressed) that writes information to the LCD panel or a device conflict error is detected.

### Menu Trees

There are five menu trees (menu categories): meter, inputs, outputs, routing, and system. All menu items are arranged under these menus. In order to enter one of the five trees or to jump from one tree to another, the corresponding category button must be pressed.

The menu trees are structured in levels, such that the first level (top of the tree) branches into multiple subcategories. These branches typically end when an adjustable parameter or viewable value is reached (see Figure 20).

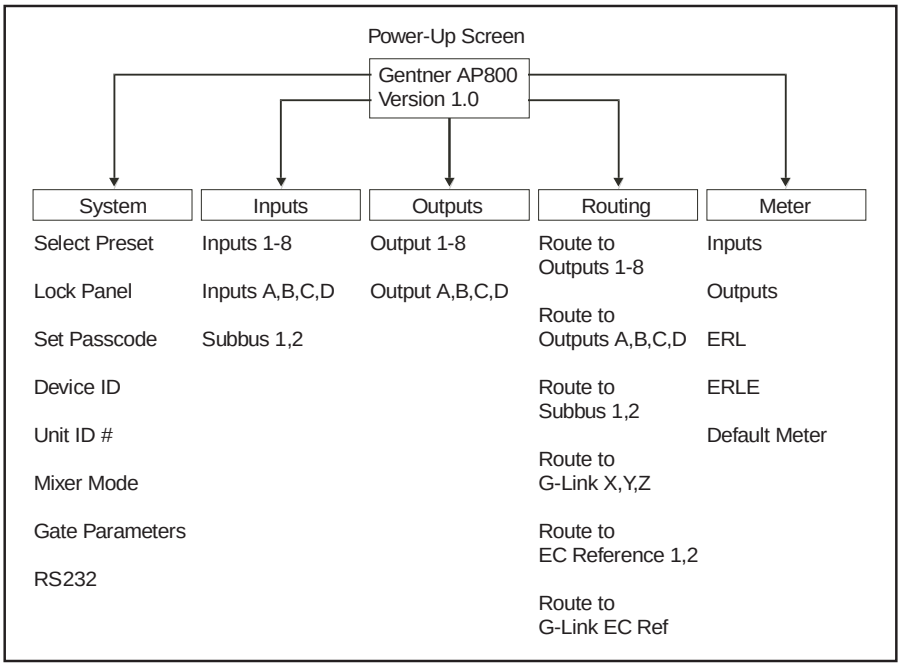


**Figure 20. LCD Menu Tree**

To scroll through the menu items at a particular level, the ▲ and ▼ buttons are used. When the last menu item is reached, the display scrolls back to the beginning of the list, and vice-versa. If an ▲/▼ button is held down, a repeat rate causes the scrolling to move at a higher rate.

To descend a menu level (go deeper into the tree), press ENTER. To ascend a menu level (go back toward the top of the tree), press ESC.

ESC BUTTON NOTE:
Pressing ESC at the top of the tree does nothing.

To switch between main menu categories, press the SYSTEM, ROUTING, OUTPUTS, INPUTS, or METER buttons to jump from your present position within the menu tree to the top level of the target sub-menu. If the menu tree is left inactive for a period of time (see Timeout, page 31), the LCD reverts to the title screen.

To adjust a parameter, first verify that it is flashing. If the parameter is not flashing, it cannot be adjusted. If the parameter is flashing, adjust the value with the ▲ and ▼ buttons. As the value is adjusted, the parameter is updated immediately. For example, if input gain is

adjusted, you should be able to hear the difference as it changes. To store the new value, press ENTER. To discard the change and revert back to the old value, press ESC. If a category button is pressed while a parameter is being adjusted, the LCD will prompt for the new information to be saved or discarded before switching to another menu category.

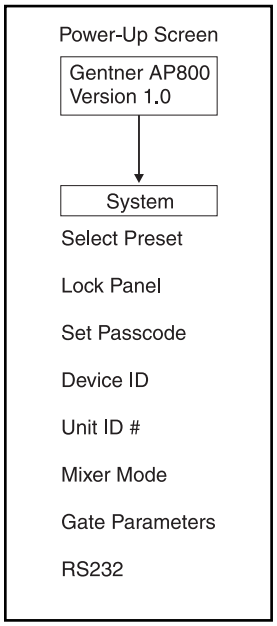


**Figure 21. System-Level LCD Parameters**

In general, while adjusting parameters, numerical values do not wrap around when the end is reached. However, parameters that toggle between two values (or are a list of values) will wrap around. When adjusting a parameter and an ▲/▼ button is held down, the slower (standard) repeat rate will persist for two seconds before a faster repeat rate kicks in.

### Security

There are two aspects to AP800 security (see Figure 21): locking the front panel and the passcode.

Lock Panel

Locking. The front panel may be locked to prevent unauthorized adjustments to the AP800. To lock the front panel, press the SYSTEM button, then scroll through the menu items to select LOCK PANEL and press ENTER. Select ON and press ENTER again.

LOCK PANEL NOTE:
Menu items can still be scrolled through when the panel is locked; settings simply cannot be altered/entered until the panel is unlocked by entering the appropriate passcode.

Unlocking. To unlock the front panel, merely attempt to adjust a parameter. The AP800 will prompt for the passcode. Upon entering the fifth character (if entered correctly), the front panel will unlock. (The default passcode for all boxes is ▲▲▼▼ENTER.)

Set Passcode

Once the AP800 is unlocked, the passcode may be changed. Before the AP800 will allow passcode changes, the new passcode must be entered, then re-entered to validate the new passcode.

A good way to remember the new passcode would be to create a word using the first letters of the buttons. For example, using ROOMS as the passcode would be the key sequence: routing, output, output, meter, system. The passcode must be five characters long.

### System Parameters

There are eight system-level parameters (See Figure 21, previous page) with which an AP800 can be programmed: select preset, lock panel, set passcode, device ID, unit ID number, mixer mode, gate parameters, and RS232. For default settings, see the programming worksheet (see Figure 22). Bolded items are the factory defaults.

**System Wide Parameters**

| Program Parameter | Selection Range |
|---|---|
| Preset | **1**-6 |
| Lock Front Panel | On, **Off** |
| Set Passcode | Any Front Panel Keys |
| Device ID No. | **0**-7 |
| Unit ID No. | Factory Programmed |
| Mixer Mode | **Master-Single**, Master-Linked, Slave, Dual |
| RS232 Baud Rate | **9.6**, 19.2, 38.4 kbps |
| RS232 Flow Control | On, **Off** |
| Modem Mode | On, **Off** |
| Clear Modem Password | Enter |
| Timeout | 0-15 (**10**) |

**Auto Mix Parameters**

| Program Parameter | Selection Range |
|---|---|
| PA Adaptive | **On**, Off |
| Maximum No. of Mics. | Off, 1-8 (**4**) |
| First Mic Priority | **On**, Off |
| Last Mic Mode | Last On, **Off** or Mic 1 |
| Gate Ratio | 0-50dB (**15**) |
| Off Attenuation | 0-50dB (**12**) |
| Hold Time | .1-8.0 seconds (**.3**) |
| Decay Rate | **Slow**, Medium, Fast |
| Manual Ambient | 0dB to -70dB (**-30**) |

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| **Input Channel** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | A | B | C | D | S1 | S2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Program Parameter** / **Selection Range** | | | | | | | | | | | | | | |
| Input Gain Adjust: -20dB to 20dB (**0**) | | | | | | | | | | | | | | |
| Subbus Attenuation: 0dB to -20dB (**-6dB**) | | | | | | | | | | | | | | |
| Input Type: **Mic 55dB**, Mic 25dB, Line | | | | | | | | | | | | | | |
| Microphone Activation: **Auto**, Override On/Off, Manual On/Off | | | | | | | | | | | | | | |
| Mute: On,**Off** | | | | | | | | | | | | | | |
| Phantom Power: **On**, Off | | | | | | | | | | | | | | |
| AGC: On, **Off** | | | | | | | | | | | | | | |
| High-Pass Filter: On, **Off** | | | | | | | | | | | | | | |
| EQ: On, **Off** | | | | | | | | | | | | | | |
| Low Band EQ: -12dB to 12dB (**0**) | | | | | | | | | | | | | | |
| Mid Band EQ: -12dB to 12dB (**0**) | | | | | | | | | | | | | | |
| High Band EQ: -12dB to 12dB (**0**) | | | | | | | | | | | | | | |
| Chairman Mic: On, **Off** | | | | | | | | | | | | | | |
| Adaptive Ambient: **On**, Off | | | | | | | | | | | | | | |
| EC Reference: **1**, 2 | | | | | | | | | | | | | | |
| Echo Cancellation: **On**, Off | | | | | | | | | | | | | | |
| NLP: Off, **Soft**, Medium, Aggressive | | | | | | | | | | | | | | |

| **Output Channel** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | A | B | C | D | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Program Parameter** / **Selection Range** | | | | | | | | | | | | | | |
| Output Gain Adjust: -20dB to 20dB (**0**) | | | | | | | | | | | | | | |
| Mute: On, **Off** | | | | | | | | | | | | | | |
| NOM: On (**A-D**) or Off (**1-8**) | | | | | | | | | | | | | | |

**Figure 22. Default Programming Worksheet**

Select Preset

The SELECT PRESET menu item allows for one of six preprogrammed presets to be selected for AP800 use. These preset configurations can be easily loaded via the LCD display or by serial commands to the RS232 port. For example, the AP800 may be set up for different room microphones configurations (i.e. Preset 1 for a two-mic presentation, Preset 2 for an eight-mic conference, Preset 3 for a three-mic priority panel discussion with 20 mics for audience questions, etc.). To select a preset, scroll through the numbered presets until the desired preset is visible, then press ENTER. The preset will immediately be loaded into AP800 memory for active use.

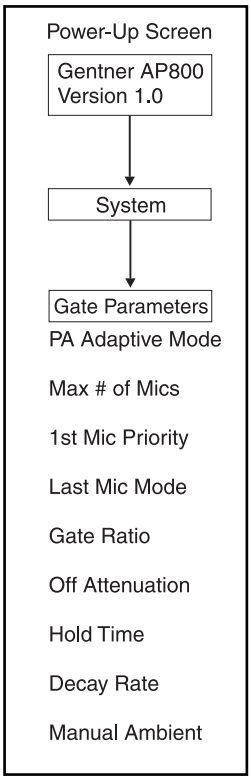



**Figure 23. Gate Parameters LCD Submenu**

Device ID

From the DEVICE ID menu selection, the AP800's device ID is set. There are eight G-Link network positions to be chosen from (0–7). See Step 3 — Device ID, page 20.

Unit ID Number

The UNIT ID # menu selection allows for accessing the read-only address set at the factory. This unique ID number identifies that particular unit and cannot be changed.

Gate Parameters

There are nine gate parameters that can be adjusted via the front-panel LCD (see Figure 23). The parameters in this submenu include last mic mode, maximum numbers of mics, PA adaptive mode, first mic priority, gate ratio, off attenuation, hold time, decay rate and manual ambient.

Last Mic Mode

There are three modes of last-mic operation: last on, mic 1 and off. Last On leaves the microphone that was activated last full ON until another microphone input is gated ON. Mic 1 allows the AP800 to revert back to a mic 1 input when all microphones gate off. The default setting for mic mode is OFF. To select one of the last-mic mode options, select it and press ENTER.

Maximum Number of Mics

This parameter sets the maximum number of microphones that can be gated ON at any one time. This range can be set from one to eight microphones or OFF. The default setting is four. To set the maximum number of microphones, scroll through the number ranges (one through eight), select the desired number and press ENTER.

PA Adaptive Mode

The AP800 recognizes how much loud speaker audio is picked up by the microphones and then uses this level as the new ambient level when audio is present at the power amplifier (see Figure 24). This prevents loud speaker audio from gating ON a microphone while still allowing people in the room to gate ON microphones as they speak. This mode can be turned on (default) or off by selecting the option and pressing ENTER. Gentner Communications recommends leaving this feature ON.

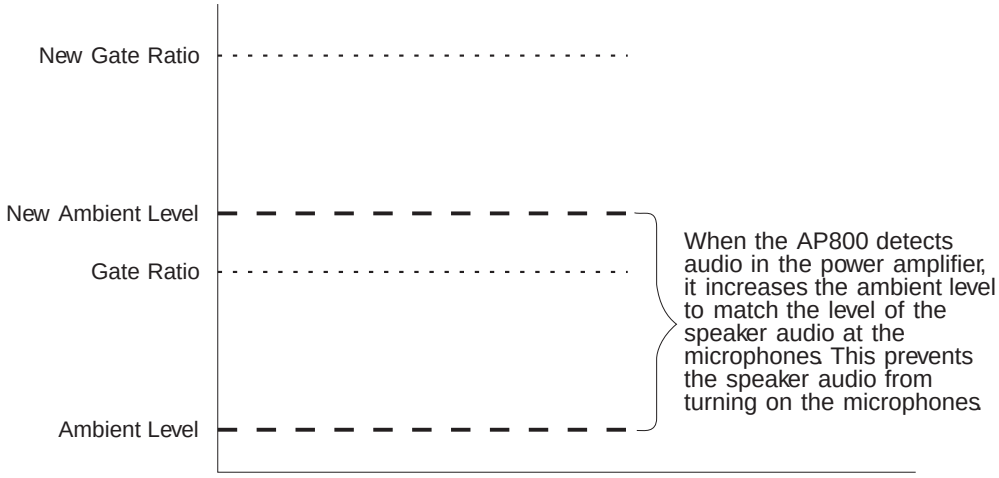



**Figure 24. PA Adaptive Mode**

First Mic Priority. This feature helps maintain maximum audio intelligibility by only allowing one microphone to gate ON when one person is speaking. Gentner Communications recommends leaving this setting ON. When turned OFF, usually two or more microphones gate on when only one person speaks. However, when this parameter is turned ON, one person will usually be able to gate ON only one microphone. It does this by determining the audio level received by all microphones when the first microphone is gated ON. This audio level is then used as the ambient level for all other microphones. This mode can be turned on (default) or off by selecting the option and pressing ENTER.

Gate Ratio. The gate ratio specifies how much louder the microphone audio level must be above the ambient level before a microphone gates ON. Remember, this value is relative to the ambient level. If adaptive ambient mode is ON, the actual on-threshold changes as the ambient level changes. The adjustment range is from 0–50dB in 1dB increments. Default setting is 15. If the microphones frequently gate ON when no one is speaking, increase the gate ratio.

Off Attenuation. This sets the amount of level reduction applied to a microphone when it is OFF (see Figure 25). Low values increase the amount of echo and reverberation allowed into the system. If the value is set high, you may be able to hear the microphones gate on and gate off as the background noise is reduced. The adjustment range is from 0–50dB in 1dB increments. Default setting is 12. As more and more microphones are added to the system, the off attenuation should be adjusted toward 50 (high).

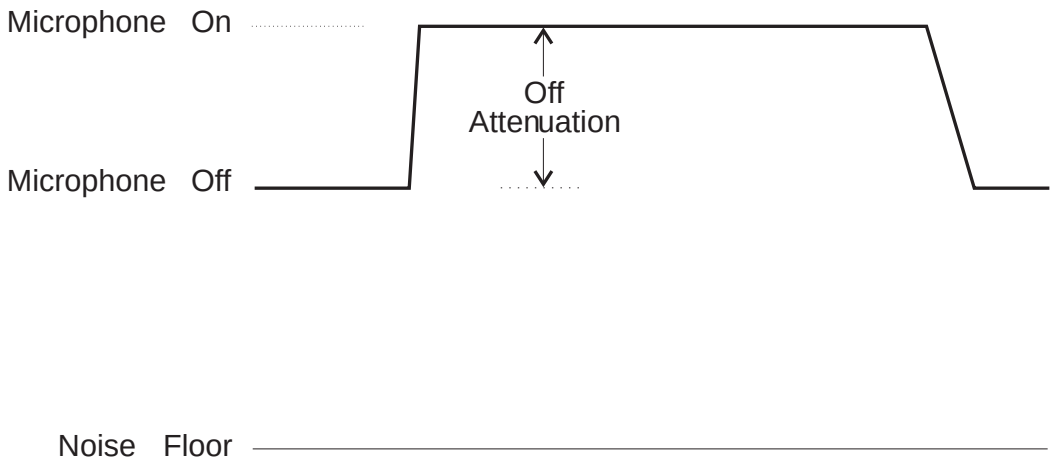



**Figure 25. Off Attenuation**

Hold Time. This feature determines the length of time that a microphone remains ON after the microphone audio level drops below the gate ratio (Figure 26, below). Values range from 0.1–8.0 seconds in one-tenth of a second increments. Default setting is 0.3. Setting this value too low may cause the microphones to gate ON and OFF too frequently during brief pauses of speech. However, setting this value too high may cause too many microphones to be ON at one time.

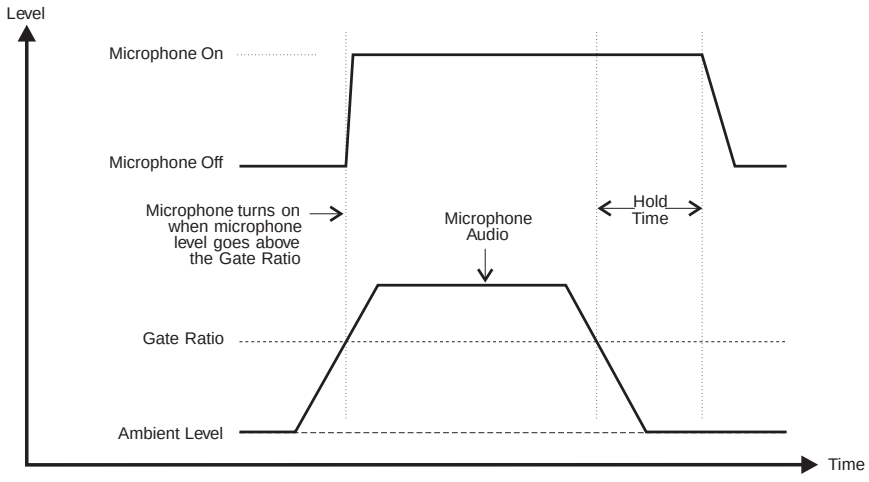



**Figure 26. Hold Time**

Decay Rate. This feature determines how fast a microphone gates OFF after the hold time expires (see Figure 27). Three options are available for this feature: slow (default), medium, and fast.

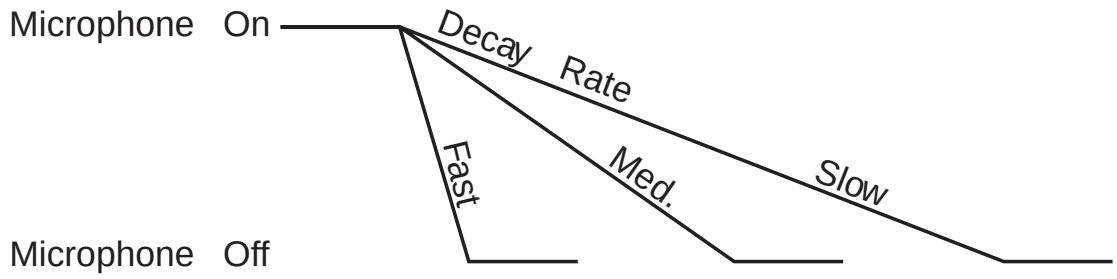



**Figure 27. Decay Rate**

If your room has very low ambient noise, set the value to fast. This reduces the effects of echo and reverberation. If you hear ambient noise "swoosh" down while the microphones decay, set this value to either medium or slow.

Manual Ambient. This setting is relevant only if the adaptive ambient mode is OFF on a mic channel (see page 32). Best results are usually achieved when the adaptive ambient mode is ON. However, if you need to set the ambient level to a fixed value, turn OFF the adaptive ambient mode on the desired microphone channels. A manual ambient setting is a global setting and will affect all mics equally which are set to adaptive ambient OFF. The ambient level ranges from 0dB to -70dB with the default setting at -30dB. You can determine the ambient level by following the steps below.

Step 1. Check your current gate ratio from the GATE PARAMETERS menu. Make a note of the value. Example: "Gate Ratio: 15."

Step 2. Select MANUAL AMBIENT from the GATE PARAMETERS menu. Press Enter to change the dB value.

Step 3. Scroll up or down through the dB values until the mic gates on (Gating is indicated when the mic LED lights up). Individual room conditions will determine whether you need to scroll up or down. When the LED flickers, the dB value indicated on the LCD display is the ambient level of the room.

Step 4. Deduct the gate ratio value from the ambient level value you have just determined. For example, if the ambient noise level of the room is identified as -50dB and the gate ratio is 15, the manual ambient setting would be -35dB.

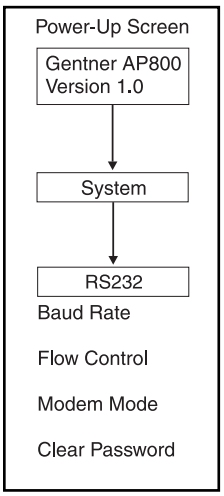



**Figure 28. RS232 Parameters LCD Submenu**

ADAPTIVE/MANUAL AMBIENT NOTE:
Any combination of channels may be set in adaptive ambient or manual ambient modes. Only individual channels cannot be set with both modes active.

RS232

There are four RS232 parameters that can be adjusted via the front panel LCD (see Figure 28). The parameters in this submenu include baud rate, flow control, modem mode and clear password.

Baud Rate. This parameter allows for the AP800's RS232 port communication rate to be controlled. There are three settings: 9,600 (default), 19,200 and 38,400 baud (bps). To set the baud rate, scroll through the three settings to select the desired baud rate, then press ENTER.

Flow Control. This parameter allows activation and deactivation of hardware flow control. The two options are ON and OFF (default). To activate the flow control, scroll to ON and press ENTER. To deactivate it, scroll to OFF and press ENTER.

Modem Mode. This parameter controls whether the AP800 is set to communicate via a modem through its RS232 port. Upon activating modem mode or powerup (when modem mode is already active), the AP800 will send an init string to the modem to initialize it.

INIT STRING NOTE:
The init string can only be set via the MINIT serial command (see Appendix G, Page 62) or the Audio Perfect Tools Windows® software. It cannot be set through the front panel LCD.

The default setting is OFF. To activate modem mode, scroll to the ON setting and press ENTER. To deactivate modem mode again, scroll to OFF and press ENTER.

Clear Password. This parameter clears the RS232 password for modem access. This password is set with the RS232 command MPASS (see Appendix G, Page 63) or the Windows®-compatible software package, Audio Perfect Tools. (see Audio Perfect Tools Manual for details). The CLEAR PASSWORD function is helpful if the password is forgotten and needs to be reset. However, the password cannot be set via the front-panel LCD. It can only be set via the RS232 port. This password is not to be confused with the front-panel passcode which performs a completely different security function.

SERIAL OVERRUN ERROR NOTE:
If data is lost during serial access via the RS232 port, a serial overrun error will occur. This is indicated by flashing microphone LEDs. If the error is caused by incoming data, LEDs "3" and "8" will flash green. If the error is caused by outgoing data, LEDs "3" and "7" will flash green. Call Gentner Tech Support for help correcting this error.

Timeout
The AP800 has one additional system mode called TIMEOUT. This parameter may be adjusted via the RS232 port only, either using the Audio Perfect TM Tools or the TOUT command (see page 70). TIMEOUT controls the delay time (in minutes) before the AP800 LCD panel will automatically switch back to the title screen and default meter. The range is zero to 15 minutes. Default is 10 minutes; zero disables this mode.

TIMEOUT NOTE:
Disabling the timeout will allow the AP800 to remain in the same position in the LCD menu until the LCD menu is manipulated again.

## Input Parameters

There are three main submenus under the inputs menu tree: mic inputs 1–8, inputs A, B, C, D and subbus 1–2.

Inputs 1–8/Inputs 1–8 Global
The parameter submenus below this level control how an input channel deals with input audio. All parameters described can be applied to INPUT 1–8 or INPUT 1–8 GLOBAL, which applies the selected parameters to all eight mic inputs. The thirteen mic input parameters (See Figure 29) include gain adjust, mic/line input, mic activation, mute, phantom power, AGC, high-pass filter, three-band EQ, chairman mic, adaptive ambient, AEC reference, echo canceller and NLP adjust.

Gain Adjust. This adjusts the level for each gated input's gain (ranging between -20dB and 20dB). In conjunction with the LCD readout and the LED bar graph, all gated inputs can be simply calibrated for the right level on the mix bus. The default setting is 0dB.

Mic/Line Input. Each input defaults as a microphone level (55dB gain) but may be switched to a line-level input or microphone level (25dB gain).

Mic Activation. Each input defaults to the auto-gate mode, but may be switched to manual mode (manual gate ON, manual gate OFF, gate override ON, gate override OFF). Auto-gate is where a microphone does not gate ON until audio is present at the mic. The AP800 decides

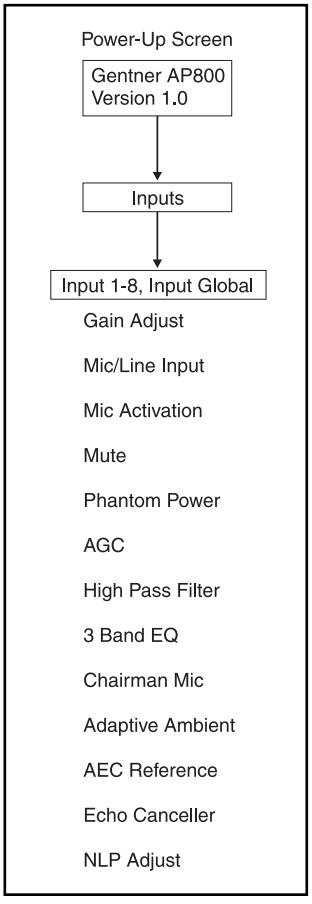



**Figure 29. Mic Inputs 1-8 Parameters LCD Submenu**

to gate the microphone on or off as per parameters set elsewhere in this submenu (i.e. gate ratio, etc.). Manual on activates a microphone unit until it is manually deactivated. Manual off deactivates a microphone until it is manually activated. In both cases, this can be done via the CONTROL/STATUS port. Override on activates a microphone but does not allow it to contribute to mixing parameters, such as set in NOM, maximum number of microphones, etc. Override off deactivates the microphone.

Mute. This parameter mutes a particular mic channel.

Phantom Power. Each input will default with 24V phantom power enabled, but may be switched OFF to accommodate signals not requiring phantom power.

AGC. Each input can use automatic gain control (AGC). This feature keeps softer and louder talkers at a consistent transmit level. This feature is disabled when shipped from the factory. The target gain is 0dB and adjusts at 2dB per second. The AGC start adjustment is +20dB, but will only adjust +6dB. Adjustments will not be made at .5dB either side of the target (0dB).

High-Pass Filter. A high-pass filter may be selected on each gated input to reduce unwanted noise. The filter has a break frequency at 250Hz, and -3dB down at 200Hz, then rolls off at 6dB per octave. This feature is disabled when shipped from the factory.

Three-Band EQ. A three-band graphic equalizer may be selected for each input for matching dissimilar microphones and for general circuit tuning. This EQ circuit provides 12dB of cut or boost centered at frequencies of 250Hz, 1kHz and 4kHz, Q factor of 1.4. This feature is disabled when shipped from the factory.

Chairman Mic. Each input may be selected as the chairman override microphone, allowing the chairman's microphone to gate on, regardless of which other microphones may be on. As shipped from the factory, this feature is disabled. This feature may have a single microphone selected or a group of microphones selected.

Adaptive Ambient. The adaptive ambient mode can be turned ON (default) and OFF. The recommended setting is ON. However, if the ambient noise in the room is constantly changing and the AP800 is unable to track properly (see Figure 30), turn this mode OFF and set the ambient level manually (see Manual Ambient, page 29). Fixed values range from 0dB to -70dB with increments of 1dB.

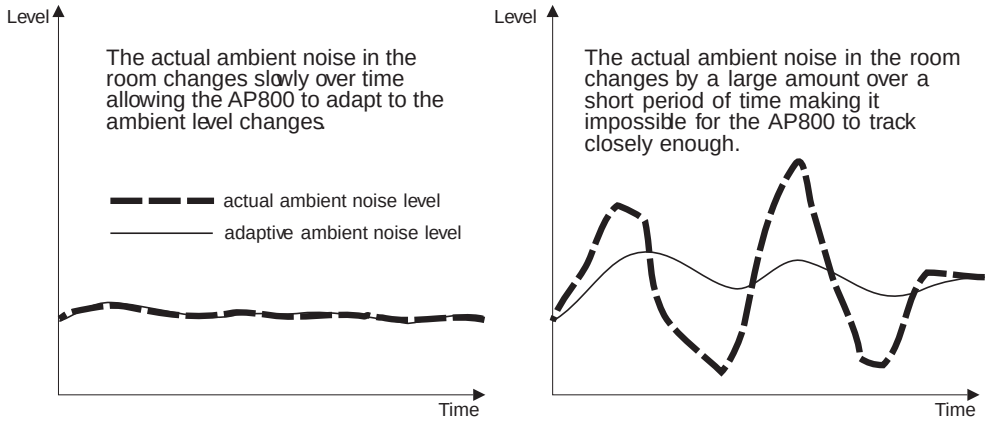



**Figure 30. Adaptive Ambient**

AEC Reference. There are two options for this parameter: EC Ref 1 and EC Ref 2. EC REF 1 (default) references Output D (typically used for connection to a power amp and speaker). EC REF 2 is not factory set. EC REF 2 is typically used in sound-reinforcement applications. This allows for the AP800 to provide two zones of sound reinforcement per AP800 unit.

Echo Canceller. Activate or deactivate the echo cancellation feature for each gated input. Factory default is ON.

NLP Adjust. Non-linear processing (NLP) has four settings: soft (6 dB), medium (12dB), aggressive (18dB), and OFF. NLP adds additional echo cancelling "horsepower" to the echo canceller in difficult acoustic environments. Care should be taken when using NLP because of the corresponding trade-offs which potentially include suppression and half-duplex operation. The factory default is SOFT.

Inputs A, B, C, D

The parameter submenus below this level control how inputs A, B, C and D deal with input audio. All parameters described can be applied to INPUT A–D. There are three input parameters (See Figure 31, left.) that can be applied to the inputs: gain adjust, AGC and mute.

Gain Adjust. This adjusts each input's gain (ranging between -20dB and 20dB). In conjunction with the LCD readout and the LED bar graph, all gated inputs can be simply calibrated for the right level on the mix bus. The default setting is 0dB.

AGC. Each input can use automatic gain control (AGC). This feature keeps softer and louder input audio at a consistent transmit level. This feature is disabled when shipped from the factory.

Mute. This parameter mutes a particular input channel.

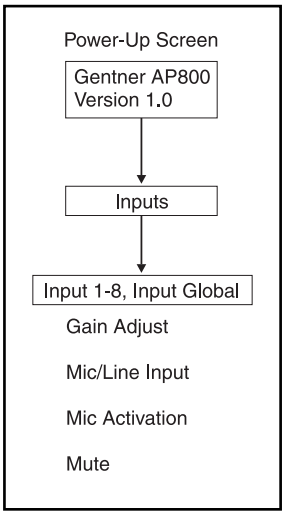



**Figure 31. Inputs A-D Parameters LCD Submenu**

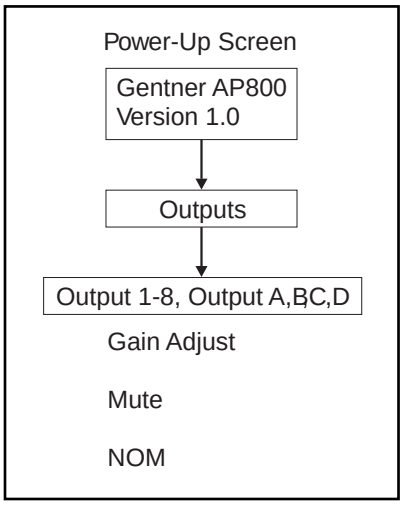



**Figure 32. Output Parameters LCD Submenu**

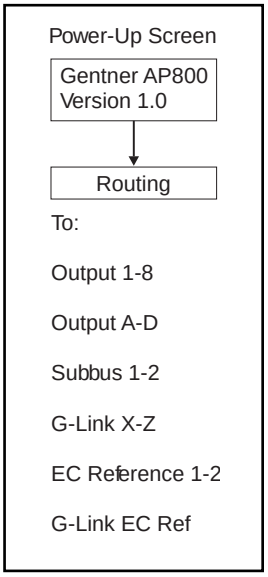



**Figure 33. Routing Parameters LCD Submenu.**

Subbus 1, 2

The subbus parameters allow control of gain (attenuation) to mix audio from the microphones into the speaker audio. There are two parameters that can be set: subbus 1 and subbus 2. Each gain can be adjusted in dB.

### Output Parameters

There are two main submenus under the outputs menu tree: output 1–8, and output A, B, C, D. The two main submenus all contain the same menus at the next menu depth: gain adjust, mute and NOM (Figure 32). Each parameter is applied to the respective outputs (1–8 or A–D).

Gain Adjust. This adjusts each output's gain (ranging between -20dB and 20dB). In conjunction with the LCD readout and the LED bar meter, all gated outputs can be simply calibrated for the right level on the mix bus. Default is 0dB.

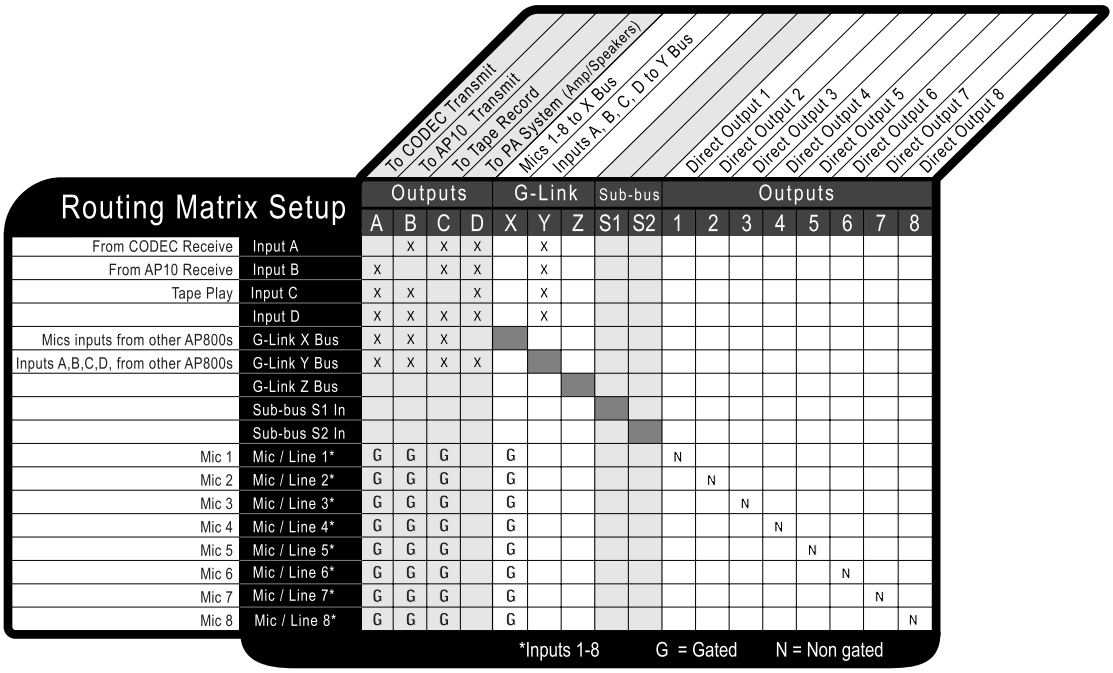
Mute. This parameter mutes a particular output channel.

NOM. Number of open mics (NOM) corrects for increased output level when more than one microphone is gated ON. As microphones gate ON, the AP800 reduces the level according to the number of active microphones. This mode can be turned ON (default for outputs A-D) or OFF (default for outputs 1-8). NOM adjusts at 10log of the number of open microphones, or approximately 3dB every time the mics double.

### Routing Parameters

When programming routing through the front-panel LCD, there are 20 submenus (routing destinations) below the ROUTING menu (see Figure 33): route to output 1–8, route to output A–D, route to G-Link X–Z, route to subbus 1–2, route to EC reference 1–2 and route to G-Link EC reference. Select one of these parameters and press ENTER to scroll through the inputs available for routing to that output. When the desired input is visible, press ENTER to route it to that output.

Routing consists of determining which inputs go to which outputs. When considering routing, refer to the default routing matrix (see Figure 34). There is also a routing matrix worksheet at the end of this manual (see Appendix H, page 71).




## Routing Matrix Setup

| | | Outputs | | | | G-Link | | | Sub-bus | | Outputs | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | X | Y | Z | S1 | S2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| From CODEC Receive | Input A | | X | X | X | | X | | | | | | | | | | | |
| From AP10 Receive | Input B | X | | X | X | | X | | | | | | | | | | | |
| Tape Play | Input C | X | X | | X | | X | | | | | | | | | | | |
| | Input D | X | X | X | X | | X | | | | | | | | | | | |
| Mics inputs from other AP800s | G-Link X Bus | X | X | X | | | | | | | | | | | | | | |
| Inputs A,B,C,D, from other AP800s | G-Link Y Bus | X | X | X | X | | | | | | | | | | | | | |
| | G-Link Z Bus | | | | | | | | | | | | | | | | | |
| | Sub-bus S1 In | | | | | | | | | | | | | | | | | |
| | Sub-bus S2 In | | | | | | | | | | | | | | | | | |
| Mic 1 | Mic / Line 1* | G | G | G | | G | | | | | N | | | | | | | |
| Mic 2 | Mic / Line 2* | G | G | G | | G | | | | | | N | | | | | | |
| Mic 3 | Mic / Line 3* | G | G | G | | G | | | | | | | N | | | | | |
| Mic 4 | Mic / Line 4* | G | G | G | | G | | | | | | | | N | | | | |
| Mic 5 | Mic / Line 5* | G | G | G | | G | | | | | | | | | N | | | |
| Mic 6 | Mic / Line 6* | G | G | G | | G | | | | | | | | | | N | | |
| Mic 7 | Mic / Line 7* | G | G | G | | G | | | | | | | | | | | N | |
| Mic 8 | Mic / Line 8* | G | G | G | | G | | | | | | | | | | | | N |

*Inputs 1-8 G = Gated N = Non gated

**Figure 34. Default Routing Matrix**

Routing Guidelines

The audio matrix is made of sources and destinations. There are 25 possible input sources and 17 destinations.

Internal Subbus

Subbus 1, 2. The AP800 is equipped with two internal sub-mix buses. The subbus is a matrix output which allows signals to be mixed and level controlled. The subbus is then made available as an input to the matrix for further signal routing.

G-Link Bus

This digital bus appears on every Audio Perfect TM product. This mix-minus bus allows audio to be routed to any destination on the G-Link network. The AP800 has four digital buses: X-Bus, Y-Bus, Z-Bus (as follows) and G-Link EC Reference Bus (See Echo Cancellation Setup, next page).

X-Bus. This mix-minus bus is defined as the master microphone mix, and it supports NOM. All gated microphones are default routed to this bus.

Y-Bus. This mix-minus bus is defined as the line input master mix. All line-level audio such as video codecs, AP10 Telephone Interfaces, VCRs, etc., are default routed to this bus. This subbus does not support NOM.

Z-Bus. This mix-minus bus is a user-defined auxiliary mix bus. This subbus does not support NOM.

Echo Cancellation Setup

EC Reference 1, 2. The EC reference tells the microphones which output will be used as the sample reference for echo cancellation. EC REF 1 (default) references Output D (typically used for connection to a power amp and speaker). A unit will support one common EC reference for all eight microphones (as shown in Figure 35). However, in the case of splitting a single AP800 unit into two zones or two mic mixers, it will be able to support two EC references – one for each zone or mixer.

| Echo Cancellation Setup | Outputs | | | | | | | | | | | | G-Link EC Ref |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| Define EC Ref #1 | | | | X | | | | | | | | | |
| Define EC Ref #2 | | | | | | | | | | | | | |
| Define G-Link EC Ref Bus | | | | | | | | | | | | | |

**Figure 35. Echo Cancellation Setup Default Matrix**

G-Link EC Reference Bus. This bus provides a system-wide echo canceller reference signal. When multiple AP800 units are linked together and will be using only one output channel to drive the speaker system, that output must be defined as the sample reference which will be used by all of the linked AP800s for echo cancellation. It allows the reference signal to be passed to additional G-Linked mic channels and their associated echo cancellers. In order for echo cancellation to function properly, the output which the master unit will use as the EC reference must be identified to the slave units via the G-Link (see Figures 36 & 37 for ROUTING configuration).

The following example illustrates the Echo Cancellation Setup necessary to communicate the EC reference from the master unit to the slave unit:

Master Unit

"Define EC Ref #1" tells the master unit which output (In this case Output D) will be used as the reference for echo cancellation for the master unit. This output (D) must also be defined as the "G-Link EC Ref Bus" which slave units will refer to when you are defining their EC references (see Figure 36).

| Echo Cancellation Setup | Outputs | | | | | | | | | | | | G-Link EC Ref |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| Define EC Ref #1 | | | | X | | | | | | | | | |
| Define EC Ref #2 | | | | | | | | | | | | | |
| Define G-Link EC Ref Bus | | | | X | | | | | | | | | |

**Figure 36. EC Setup for Multiple Units to One Output (Master Unit)**

Slave Unit

Because the slave unit will not be using one of its own outputs as the EC reference, "EC Ref #1" must be defined as the "G-Link EC Ref" only (as shown in Figure 37). The slave unit will then use the master's defined output (in this case, Output D) as its reference for echo cancellation.

| Echo Cancellation Setup | Outputs | | | | | | | | | | | | G-Link EC Ref |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| Define EC Ref #1 | | | | | | | | | | | | | X |
| Define EC Ref #2 | | | | | | | | | | | | | |
| Define G-Link EC Ref Bus | | | | | | | | | | | | | |

**Figure 37. EC Setup for Multiple Units to One Output (Slave Unit)**

### Meter Parameters

There are five main submenus under the meter menu tree: inputs, outputs, ERL, ERLE and default meter (see Figure 35). The first four submenus are all handled in the same way. Using the LCD, press the METER button, then scroll through the options (inputs, outputs, ERL and ERLE) to specify which is to be metered by the front-panel LED meter. When the desired option is visible, press ENTER to begin monitoring its status on the front-panel LED. The default meter parameter determines what is being displayed on the LED meter when a parameter is not using the LED bar graph, and the AP800 times out (see Timeout, page 31).

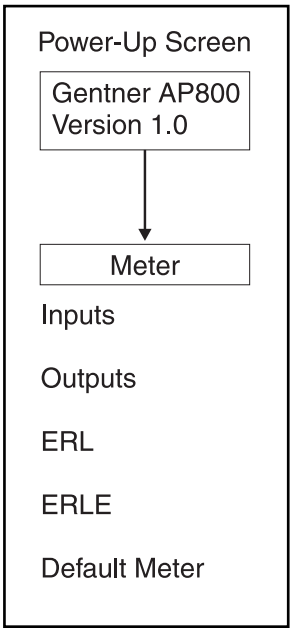



**Figure 38. Meter Parameters, LCD Submenu**

# Operation

When operating the AP800, there should be very little to do with the AP800 unit itself. If correctly installed and programmed, it should, for all intents and purposes, not require any further interface other than perhaps controlling volume of a particular output, or muting an input or output.

REMOTE CONTROL NOTE:
Gentner Communications recommends use of a custom remote controller for user interface. Refer to the manufacturer's documentation for your particular custom remote controller.

All other functionality requiring direct interface with the equipment is contained in other parts of the Audio Perfect™ system, such as the AP10, or is handled through the serial port.

### Volume Control

When participating in a conference, you may need to decrease the volume of a particular output. For instance, when testing the microphone input in a conference, you may have simply been talking more softly or more loudly than the person seated near that microphone. To adjust the volume, determine which output (speaker, telephone, etc.) the input audio (microphones, CD player, etc.) is being routed to, then press the OUTPUTS button, scroll to the GAIN ADJUST selection and press ENTER. Adjust the gain level with the ▲ and ▼ buttons. You should be able to hear the volume level adjust while increasing or decreasing the gain. When the desired level is reached, press ENTER.

### Muting

Use this function to mute a particular input or output.

Input

To mute an input, determine which input needs to be muted, then press the INPUTS button, scroll through to the desired input channel and press ENTER. Now scroll through the input parameters until MUTE is visible and press ENTER. Use the ▲ and ▼ buttons to select ON, then press ENTER. The input is now muted. To unmute the input, follow the same procedure, but select OFF to deactivate the mute function.

Output

To mute an output, press the OUTPUTS button, scroll through to the desired output channel and press ENTER. Now scroll through the output parameters until MUTE is visible and press ENTER. Use the ▲ and ▼ buttons to select ON, then press ENTER. The output is now muted. To unmute the output, follow the same procedure, but select OFF to deactivate the mute function.

# 3 Appendices

## Appendix A: Specifications

**Dimensions**
19"/48.3cm x 1.75"/4.45cm x 10"/25.4cm (WxHxD)

**Weight**
10 lbs./4.5kg dry 13 lbs./5.9kg shipping

**Connectors**

| | |
|---|---|
| POWER: | Auto-adjusting power module; 100-240Vac; |
| 50/60Hz; | (fuse) 2 amp 250Vac, 30W typical |
| RS232: | DB9 female, selectable 9,600/19,200/38,400 (bps) baud |
| CONTROL/ STATUS I/O: | DB25 female; (2) +5Vdc pins, 100mA each |
| STATUS OUTPUTS: | DB25 female; open collector, 20Vmax, 40mA each |
| CONTROL INPUTS: | Input activation selectable; momentary or latching ground |

**Mic/Line Inputs**
Removable Phoenix™ block connector, -55, -25 or 0dBu nominal, adjustable, balanced bridging; impedance 4kOhms

| | |
|---|---|
| Frequency Response: | 20Hz to 15kHz +2dB |
| Phantom Power: | 24Vdc input, selectable |
| Noise: | EIN 20Hz to 15kHz-125dBu |
| THD: | <.1% |

**Line Inputs**
Removable Phoenix™ block connector, 0dBu nominal, adjustable, balanced bridging; impedance 20kOhms

Frequency Response: 20Hz to 15kHz +2dB
SNR: >65dB referenced at 0dBu input, 0dBm output
THD: <.1%

**Outputs**
Removable Phoenix® block connector, 0dBu nominal, adjustable, balanced bridging; impedance 50 ohms (designed to drive >600 ohm inputs)
Frequency Response: 20Hz to 15kHz +2dB
SNR: >65dB referenced at 0dBu input, 0dBm output
THD: <.1%

**Power Requirements**
100–240Vac, 50/60Hz, 30W; fuse 2A, 250Vac, Slo-Blo type

**Tail Time**
>120 milliseconds, each gated input

**Operating Temperature**
0–50° C

Specifications are subject to change without notice.

# Appendix B: Warranty and Compliance

## Warranty

Gentner Communications Corporation (Manufacturer) warrants that this product is free of defects in both materials and workmanship. Should any part of this equipment be defective, the Manufacturer agrees, at its option, to:

A. Repair or replace any defective part free of charge (except transportation charges) for a period of one year from the date of the original purchase, provided the owner returns the equipment to the Manufacturer at the address set forth below. No charge will be made for parts or labor during this period;

B. Furnish replacement for any defective parts in the equipment for a period of one year from the date of original purchase. Replacement parts shall be furnished without charge, except labor and transportation.

This Warranty excludes assembled products not manufactured by the Manufacturer whether or not they are incorporated in a Manufacturer product or sold under a Manufacturer part or model number.

**THIS WARRANTY IS VOID IF:**

A. The equipment has been damaged by negligence, accident, act of God, or mishandling, or has not been operated in accordance with the procedures described in the operating and technical instructions; or,

B. The equipment has been altered or repaired by other than the Manufacturer or an authorized service representative of the Manufacturer; or,

C. Adaptations or accessories other than those manufactured or provided by the Manufacturer have been made or attached to the equipment which, in the determination of the Manufacturer, shall have affected the performance, safety or reliability of the equipment; or,

D. The equipment's original serial number has been modified or removed.

NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE, APPLIES TO THE EQUIPMENT, nor is any person or company authorized to assume any warranty for the Manufacturer or any other liability in connection with the sale of the Manufacturer's products.

Manufacturer does not assume any responsibility for consequential damages, expenses, or loss of revenue or property, inconvenience, or interruption in operation experienced by the customer due to a malfunction in the purchased equipment. No warranty service performed on any product shall extend the applicable warranty period.

In case of unsatisfactory operation, the purchaser shall promptly notify the Manufacturer at the address set forth below in writing, giving full particulars as to the defects or unsatisfactory operation. Upon receipt of such notice, the Manufacturer will give instructions respecting the shipment of the equipment, or such other matters as it elects to honor this warranty as above provided. This warranty does not cover damage to the equipment during shipping and the Manufacturer assumes no responsibility for such damage. All shipping costs shall be paid by the customer.

This warranty extends only to the original purchaser and is not assignable or transferable.

Gentner Communications Corporation
1825 Research Way
Salt Lake City, Utah 84119

## FCC Part 15 Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her own expense.

Changes or modifications not expressly approved by Gentner Communications Corporation could void the user's authority to operate the equipment.

## Safety Information

CAUTION: Users should not attempt to make such connections themselves, but should contact the appropriate electrical inspection authority, or electrician, as appropriate.

# Appendix C: Glossary

In order to gain a better understanding of the AP800 and how it operates, you should be familiar with several terms associated with automatic microphone mixers:

**Adaptive Ambient.** This portion of the mixer monitors the varying ambient noise level in the room and changes the threshold level at which a microphone gates on. People generally talk at levels slightly higher than the surrounding ambient noise. As the ambient noise level changes, so does the level of the voice. The adaptive-ambient feature compensates for these changes to prevent microphones from gating on due to ambient noise.

**Attenuate.** To reduce the level of a signal.

**Decay Time.** This time determines how fast the microphones are reduced to the off-attenuation level from the on level.

**Gating Ratio.** This is the voice (input) level that must be reached before a microphone will gate on.

**Hold Time.** This is the length of time that a microphone remains on after the voice (input) level drops below the gating threshold. This prevents the microphone from gating off with brief pauses during speech.

**Off Attenuation.** This is the amount of gain (level) reduction a microphone is given when the microphone is not gated on.

# Appendix D: Connector Pinouts

**Table 1: RS232 COM DCE Port Pinout**

| Pin Number | Control | Pin Number | Control |
|---|---|---|---|
| 1 | DCD | 6 | DSR |
| 2 | TXD | 7 | CTS |
| 3 | RXD | 8 | RTS |
| 4 | DTR | 9 | No connection |
| 5 | Ground | | |

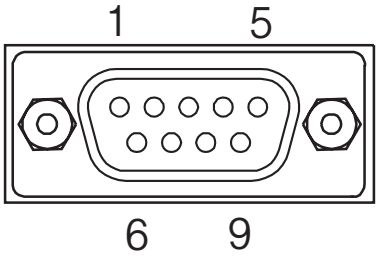


**Table 2: Control/Status A Port Pinout**

| Pin Number | User Definable* | Status | Momentary/Latching | Default Description |
|---|---|---|---|---|
| 1 | Yes | C | M | Lock front panel toggle |
| 2 | Yes | S | | Status of front panel lock |
| 3 | Yes | C | M | Mute all mics toggle |
| 4 | Yes | S | | Status of mute all mics |
| 5 | Yes | C | M | Mute A output toggle |
| 6 | Yes | S | | Status of A output mute |
| 7 | Yes | C | M | Mute B output toggle |
| 8 | Yes | S | | Status of B output mute |
| 9 | Yes | C | M | Mute C output toggle |
| 10 | Yes | S | | Status of C output mute |
| 11 | Yes | C | M | Mute D output toggle |
| 12 | Yes | S | | Status of D output mute |
| 13 | Yes | C | M | Volume Up D Output (1dB) |
| 14 | Yes | S | | Not Active |
| 15 | Yes | C | M | Volume Down D Output (1dB) |
| 16 | Yes | S | | Not Active |
| 17 | No | S | | Mic #1 Gate Status |
| 18 | No | S | | Mic #2 Gate Status |
| 19 | No | S | | Mic #3 Gate Status |
| 20 | No | S | | Mic #4 Gate Status |
| 21 | No | S | | Mic #5 Gate Status |
| 22 | No | S | | Mic #6 Gate Status |
| 23 | No | S | | Mic #7 Gate Status |
| 24 | No | S | | Mic #8 Gate Status |
| 25 | No | Ground | | Ground |

**Table 3: Control/Status B Port Pinout**

| Pin Number | User Definable* | Status | Momentary/Latching | Default Description |
|---|---|---|---|---|
| 1 | Yes | C | M | Preset 1 |
| 2 | Yes | S | | Status of Preset 1 |
| 3 | Yes | C | M | Preset 2 |
| 4 | Yes | S | | Status of Preset 2 |
| 5 | Yes | C | M | Preset 3 |
| 6 | Yes | S | | Status of Preset 3 |
| 7 | Yes | C | M | Preset 4 |
| 8 | Yes | S | | Status of Preset 4 |
| 9 | Yes | C | M | Mute Input A Toggle |
| 10 | Yes | S | | Status of Input A Mute |
| 11 | Yes | C | M | Mute Input B Toggle |
| 12 | Yes | S | | Status of Input B Mute |
| 13 | Yes | C | M | Mute Input C Toggle |
| 14 | Yes | S | | Status of Input C Mute |
| 15 | Yes | C | M | Mute Input D Toggle |
| 16 | Yes | S | | Status of Input D Mute |
| 17 | No | S | | Input A Presence Status |

| Pin Number | User Definable* | Status | Momentary/Latching | Default Description |
|---|---|---|---|---|
| 18 | No | S | | Input B Presence Status |
| 19 | No | S | | Input C Presence Status |
| 20 | No | S | | Input D Presence Status |
| 21 | No connection | | | |
| 22 | No connection | | | |
| 23 | No | - | | +5Vdc |
| 24 | No | - | | +5Vdc |
| 25 | No | - | | Ground |

***Control/Status Pinout Note:**
The first 16 pins on each of the Control/Status Ports (A & B) are programmable via the AP Tools software and/or direct serial port commands For more information on pin programming, see Appendix G, pages 50 and 67.

# Appendix E: Applications

As teleconferencing continues to grow, sophisticated equipment will make the difference between an average (or even frustrating) meeting and a high class, perfectly managed meeting. Executives at all levels appreciate the carefree ease of use that the AP800 provides for conferencing.

The benefit derived from using the AP800 in conferencing is its ability to use multiple, gating microphones. This keeps unused microphones closed, preventing reverberation, echo, etc. When someone speaks at the “closed” microphone, it will automatically gate on (if properly programmed).

When the AP800 is used at multiple sites, and linked through telephone connections, each site can program its AP800 to accommodate the type of conference (audioconference or videoconference) and the size of the conference room. The AP800 can be easily programmed to tailor each system to the application. The program allows you to specify adaptive ambient mode, ambient level (dBu), constant gain mode, decay rate, first-mic priority mode, gate ratio (dB), hold time (tenths/a second), last-mic mode, maximum number of microphones, off attenuation (dB) and PA adaptive mode.

The AP10 Telephone Interface is frequently used with the AP800 in this type of application (see Figure 39).

Each additional AP10 connects a telephone line into your conference.

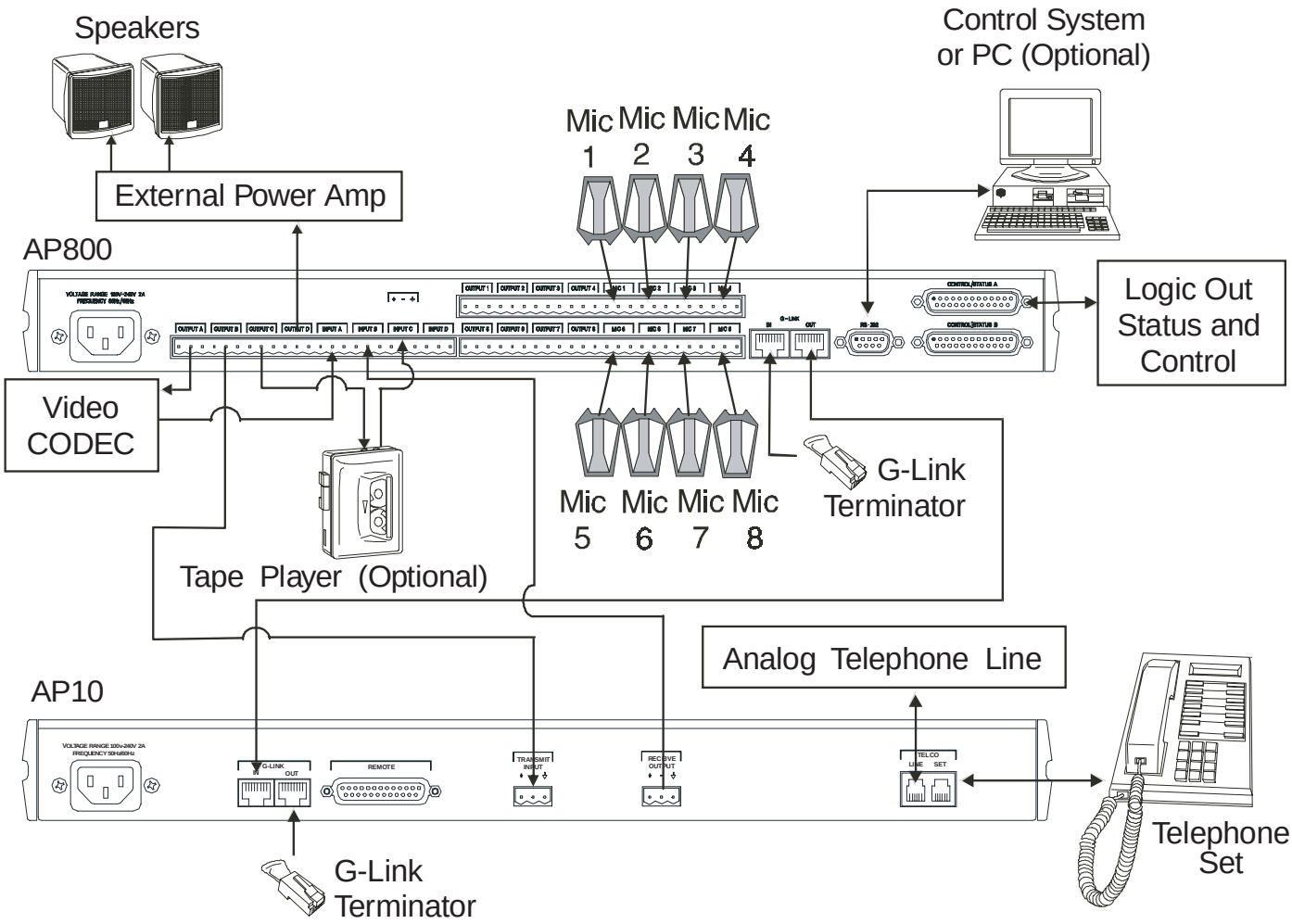



**Figure 39. AP800 Teleconferencing Application**

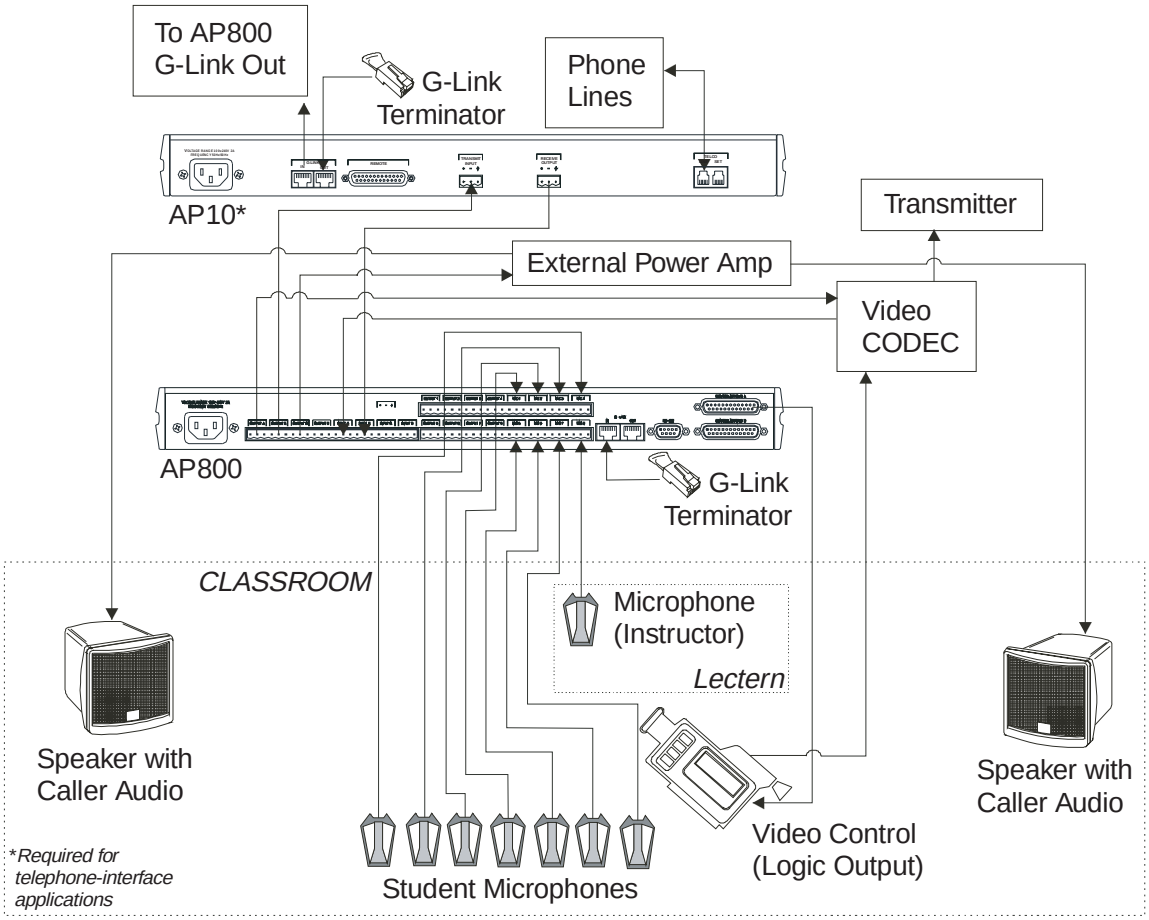
Also commonly used in a teleconferencing scenario are Gentner's Assistive Listening System (ALS) products: RX-1A Assistive Listening Receiver, RX-6 Assistive Listening Receiver, TX-37A Transmitter.

For more information on these products, contact Gentner Communications at one of the numbers listed at the bottom of the page.

### Distance Learning

The demand for teaching institutions to ensure quality education for students at multiple and distant locations has created an increasing need for quality equipment to meet various specifications and setups. The AP800, when used in conjunction with an AP10, meets that need.

Figure 40 illustrates one common setup distance-learning configuration using the AP800, AP10 Telephone Interface and Assistive Listening Systems.




This unique combination allows the lecturer full control when taking incoming calls from the various distant locations. The caller audio is easily transmitted back to all participants at all locations, allowing them full interactive communication for the entire lecture.

**Figure 40. AP800 Distance Learning Application**

### Courtrooms

Sophisticated courtrooms use microphones at the attorney stands or desks, the judicial bench and the witness stand. The AP800 can be used successfully in this and other types of forums and public meeting rooms where multiple microphones are used for audience and panel participation.

Because this application requires multiple microphones, the AP800's automatic gating feature and preset or programmable software setup helps control the microphones for optimum audio quality.

Where only one site needs to be monitored through one or more AP800s, other equipment used in previously described conferencing applications is not necessary. If your courtroom application requires communication with an off-site location, the configuration shown in Figure 41 is a possible setup using Gentner equipment for multisite communication.

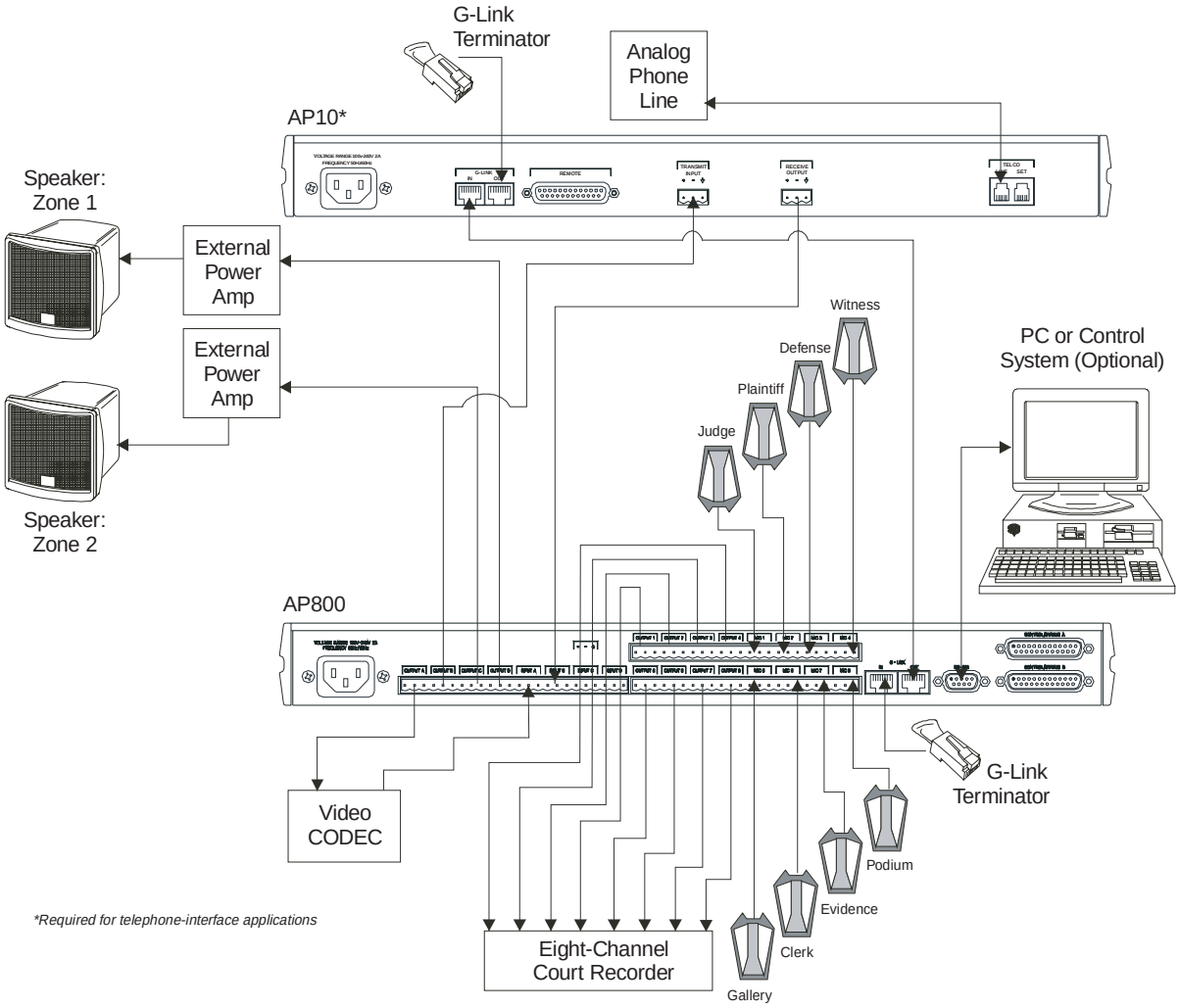
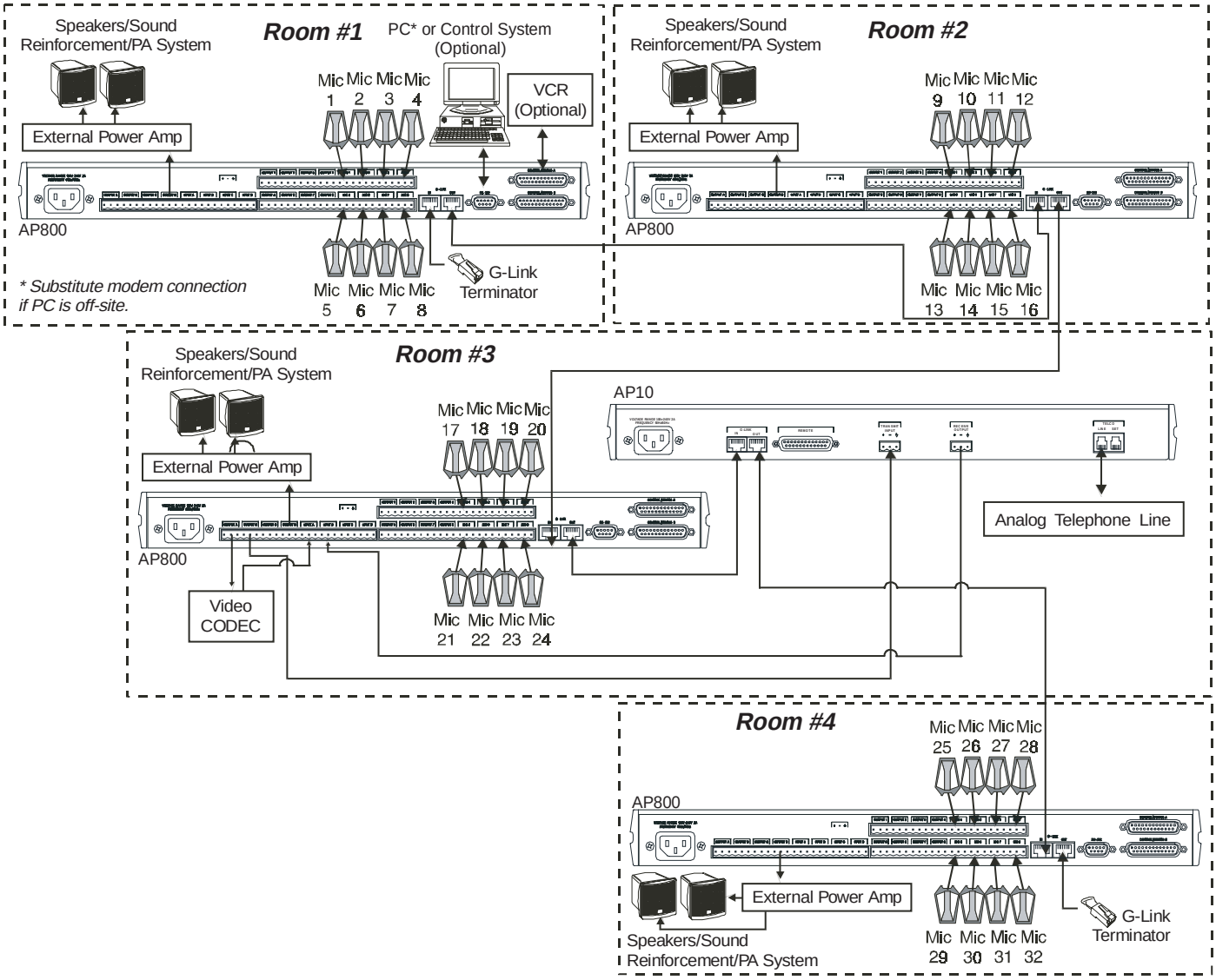



**Figure 41. AP800 Courtroom Application**

### Convention Center/Hotel Dividable Meeting Rooms

Gentner equipment supports meetings set up for panel discussions in conference centers and hotels. This type of meeting requires a different setup than that of a business meeting or distance-learning application.

Each AP800, in this application, provides up to eight microphones with the power and amplification necessary to conduct a successful meeting. The automatic microphone gating helps control and minimize unnecessary room and microphone noise. Using Gentner equipment allows the installer greater layout and setup flexibility. Figure 42 details one possible layout. The pre-programmed presets allow instant room reconfiguration at the touch of a button.




Contact Gentner for help specifying your equipment and setup requirements.

**Figure 42. AP800 Convention Center Application**

# Appendix F: Accessories

| Accessory | Gentner Part Number |
|---|---|
| AP10 Telephone Interface | 910-150-201 |
| Tabletop Omni Microphone | 910-103-160 (with cable) |
| Tabletop Uni Microphone | 910-103-161 (with cable) |
| Tabletop Omni Microphone | 910-103-162 (black button)/ 910-103-163 (white button) |
| Tabletop Uni Microphone | 910-103-164 (black button)/ 910-103-165 (white button) |
| Ceiling Microphone | 910-103-166 (XLR)/ 910-103-167 (panel mount) |
| Delta Microphone | 910-103-340 |
| Desktop Kit | 860-150-002 |
| Ceiling Speaker | 910-103-004 (4")/ 910-103-006 (pair, 6") |
| Wall Mount Speaker | 910-103-010 |

# Appendix G: Serial Port Commands

The AP products accept serial commands via the AP800's serial port; the commands are then channeled along the G-Link network to all interconnected AP products. The commands provide the same control as the LCD menu structure, plus several others. The following commands pertain only to the AP800.

### RS232 Serial Port Protocol

(9,600 (default), 19,200 or 38,400 baud, 8 bits, 1 stop bit, no parity)
The AP800 will accept the commands outlined in Table 4 (see page 52). The structure of serial commands is as follows: "#" (which signifies the start of a command line), device ID, command, then any additional options in the order that they appear in the command descriptions on the following pages.

For example, a command to disable Automatic Gain Control for Mic 2 on AP800 device "0" would have the command line: #10 AGC 2 0. In this command line, 1=AP800, 0=unit 0, AGC=command, 2=mic channel, 0=off state). If a command calls for a "null" value, leave a blank in the command line (i.e. "#10 AGC 2" would return the current AGC state of Mic 2 on device 10).

Commands can be either UPPER CASE or lower case. Return values are always in upper case. In order for a command to be recognized by the serial port, the command must be terminated by a carriage return.

### Command Syntax

All command lines will be set off by the flag symbol "O". The serial command line that follows the "O" uses the following typographic conventions:

| | |
|---|---|
| <X> | Parameters enclosed in "< >" indicate a mandatory parameter |
| [X] | Parameters enclosed in "[ ]" indicate an optional parameter. |
| 1-8 | Parameters separated by a "-" indicate a range between the values |
| 4,7,9 | Parameters separated by a "," indicate a list of available values |
| MREF | Words in ALL CAPS bold indicate command text |
| [DEVICE] | Device type and number on G-Link network (valid combinations depend on connected devices: for an AP800, device type is 1, device number will always be 0–7. If omitted, the product that first receives the command processes it. |
| * | Can be used to set a parameter on all microphone channels, but it can't be used to query all mic channels. Note: Using the all-mic toggle may not produce the desired result,depending on the state they are in. For example, if one mic is muted and all other mics are not, an all-mic toggle would mute all others, but unmute that one mic. |

### Error Codes

The following lists possible error messages and their explanations:

| | |
|---|---|
| ERROR 1 | The address is not valid/out of range or an invalid character. |
| ERROR 2 | Could not extract a command from the string received. |
| ERROR 3 | Serial overrun. |
| ERROR 4 | Reserved. |
| ERROR 5 | Invalid parameter. |
| ERROR 6 | Unrecognized command. |

The command string will then be explained (where necessary), followed by the returned values and (where necessary) an example.

**Table 4. AP800 Serial Commands**

| Command | Function | Command | Function |
|---|---|---|---|
| AAMB | Enable/disable adaptive ambient* | MDMODE | Enable/disable modem mode |
| AGC | Enable/disable AGC* | MEQ | Set/report three-band equalization* |
| AMBLVL | Set/report ambient level | MHP | Enable/disable high-pass filter* |
| BAUD | Set/report RS232 port baud rate | MINIT | Set/report modem initialization string |
| CHAIRO | Enable/disable chairman override* | MLINE | Set/report mic/line level* |
| DECAY | Set/report decay rate | MMAX | Set/report max. number/mics |
| DFLTM | Set/report default meter | MPASS | Program modem password string |
| EC | Enable/disable echo canceller* | MREF | Set/report echo canceller reference* |
| ERL | Return ERL for a mic channel* | MTRX | Program/report matrix configuration* |
| ERLE | Return ERLE for a mic channel* | MUTE | Set/report mute status* |
| EQ | Enable/disable equalization* | NLP | Set/report nonlinear processing* |
| FLOW | Enable/disable flow-control | NOM | Enable/disable NOM attenuation* |
| FMP | Enable/disable first mic priority | OFFA | Set/report off attenuation |
| FPP | Set/report front-panel passcode | PAA | Enable/disable PA adaptive mode |
| GAIN | Set/report gain setting* | PCMD | Program/report GPIO control pin |
| GATE | Report mic gating status | PEVNT | Program/report GPIO status pin |
| GMODE | Set/report gating mode* | PP | Enable/disable phantom power* |
| GRATIO | Set/report gate ratio | PRESET | Set/report active preset |
| HOLD | Set/report hold time | REFSEL | Set/report output for EC reference |
| LFP | Enable/disable front-panel lock | TOUT | Set/report inactivity timeout |
| LMO | Set/report last-mic-on mode | UID | Returns unit identification number |
| LVL | Report level* | VER | Return current version of software |
| MASTER | Set/report master/slave settings | | |

* Applied to a specific channel

## Serial Command Parameters and Explanations

### AAMB

This command changes or reports back the state of the adaptive ambient for a microphone.

⚐ [DEVICE] **AAMB** <CH> <X>

Explanation

<CH>

CH= 1-8 Parameter to apply to the specified microphone channel

CH= * Parameter to apply command to all microphone channels

<X>

X=0 Parameter to set the state to OFF

X=1 Parameter to set the state to ON

X=Null Parameter to return the current state

Return Values

The command will return the updated condition (On=1, Off=0) of the adaptive ambient in the same format as the command.

**The flag symbol "O" signals the start of a command line. For serial port command protocol and syntax, see pages 50-51.**

### AGC

This command changes or reports back the state of the AGC for a microphone or line input.

[DEVICE] **AGC** <CH> <X>

Explanation

<CH>

CH= 1-8 Parameter to apply to the specified microphone channel
CH= A-D Parameter to apply to the specified line input
CH= * Parameter to apply command to all microphone channels

<X>

X=0 Parameter to set the state to OFF
X=1 Parameter to set the state to ON
X=2 Parameter to toggle the state from one state to the other (regardless of current state)
X=Null Parameter to return the current state

Return Values

The command will return the updated condition (On=1, Off=0) of the AGC in the same format as the command.

### AMBLVL

This command changes or reports back the setting of the fixed ambient level for each AP800. This value is only used if adaptive ambient is not enabled.

[DEVICE] **AMBLVL** <X>

Explanation

<X>

X=0 to -70 Parameter to set the ambient level (in dB)
X=Null Parameter to return the ambient level

Return Values

The command will return the updated ambient level for the selected AP800 in the same format as the command.

### BAUD

This command selects or returns the baud rate for the RS232 port on the AP800.

[DEVICE] **BAUD** <X>

Explanation

<X>

X=1 Selects 9,600 baud (bps) rate
X=2 Selects 19,200 baud (bps) rate
X=3 Selects 38,400 baud (bps) rate
X=Null Parameter to return the baud (bps) rate

Return Values
The command will return the updated condition (1=9,600 baud, 2=19,200 baud, 3=38,400 baud) of the RS232 baud rate in the same format as the command.

### CHAIRO

This command changes or reports back the state of the chairman override for a microphone channel.
[DEVICE] **CHAIRO** <CH> <X>

Explanation
<CH>
CH= 1-8 Parameter to apply to the specified microphone channel
CH= * Parameter to apply command to all microphone channels
<X>
X=0 Parameter to set the state to OFF
X=1 Parameter to set the state to ON
X=2 Parameter to toggle the state from one state to the other (regardless of current state)
X=Null Parameter to return the current state

Return Values
The command will return the updated condition (On=1, Off=0) of the chairman override in the same format as the command.

### DECAY

This command changes or reports back the setting of the decay rate for a given AP800.
[DEVICE] **DECAY** <X>

Explanation
<X>
X=1 Parameter to set the decay rate to slow
X=2 Parameter to set the decay rate to medium
X=3 Parameter to set the decay rate to fast
X=Null Parameter to return the current decay rate

Return Values
The command will return the updated decay rate for the selected AP800 in the same format as the command.

### DFLTM

This command changes and reports back the status of the default meter.
[DEVICE] **DFLTM** <CH> <W>

Explanation
<CH>
CH= 1-8 Parameter to apply to the specified channel
CH= A-D Parameter to apply to the specified channel
CH= Null Parameter to return the current state of the default meter

<W>

W= I Parameter to specify an input channel
W= O Parameter to specify an output channel

Return Values
The command will return the current default meter in the same format as the command.

### EC

This command changes or reports back the state of the echo canceller for a microphone
[DEVICE] **EC** <CH> <X>

Explanation
<CH>

CH= 1-8 Parameter to apply to the specified microphone channel
CH= * Parameter to apply command to all microphone channels

<X>

X=0 Parameter to set the state to OFF
X=1 Parameter to set the state to ON
X=Null Parameter to return the current state

Return Values
The command will return the updated condition (On=1, Off=0) of the echo canceller in the same format as the command.

### ERL

This command reports back the echo return loss (ERL) for a microphone channel in dB.
[DEVICE] **ERL** <CH>

Explanation
<CH>

CH= 1-8 Parameter to apply to the specified microphone channel

Return Values
The command will return the ERL of the microphone channel in the same format as the command (#10 ERL 1 20).

### ERLE

This command reports back the echo return loss enhancement (ERLE) for a microphone channel in dB.
[DEVICE] **ERLE** <CH>
Explanation
<CH>

CH= 1-8 Parameter to apply to the specified microphone channel

Return Values
The command will return the ERLE of the microphone channel in the same format as the command (#10 ERLE 1 20).

**EQ**
This command changes or reports back the state of the equalizer for a microphone
[DEVICE] **EQ** <CH> <X>

Explanation
<CH>
CH= 1-8 Parameter to apply to the specified microphone channel
CH= * Parameter to apply command to all microphone channels
<X>
X=0 Parameter to set the state to OFF
X=1 Parameter to set the state to ON
X=2 Parameter to toggle the state from one state to the other (regardless of current state)
X=Null Parameter to return the current state

Return Values
The command will return the updated condition (On=1, Off=0) of the equalizer in the same format as the command.

**FLOW**
This command selects or reports whether hardware flow control is enable or disabled for the AP800. Hardware flow control is implemented using RTS and CTS.
[DEVICE] **FLOW** <X>

Explanation
<X>
X=0 Sets flow control to OFF
X=1 Sets flow control to ON
X=Null Parameter to return the current mode

Return Values
The command will return the updated condition (On=1, Off=0) of the AP800 in the same format as the command.

**FMP**
This command selects or returns the current status of the first microphone priority mode for the AP800.
[DEVICE] **FMP** <X>

Explanation
<X>
X=0 Parameter to select first microphone priority mode to OFF
X=1 Parameter to select first microphone priority mode to ON
X=Null Parameter to return the current mode

Return Values
The command will return the updated condition (On=1, Off=0) of first mic priority mode in the same format as the command.

### FMP

This command selects or returns the status of the first microphone priority mode for the AP800.
[DEVICE] **FMP** <X>

Explanation
<X>

X=0 Parameter to select first microphone priority mode to OFF
X=1 Parameter to select first microphone priority mode to ON
X=Null Parameter to return the current mode

Return Values
The command will return the updated condition (On=1, Off=0) of first mic priority mode in the same format as the command.

### FPP

This command sets and reports the current passcode setting for the AP800.
[DEVICE] **FPP** <XXXXX>

Explanation
<XXXXX>

| | |
|---|---|
| X=1 | ▲ button |
| X=2 | ENTER button |
| X=3 | ESC button |
| X=4 | ▼ button |
| X=5 | METER button |
| X=6 | INPUT button |
| X=7 | SYSTEM button |
| X=8 | OUTPUT button |
| X=9 | ROUTING button |
| X=Null | Parameter to return current passcode |

Return Values
The command returns the current or updated condition of the front panel passcode.

### GAIN

This command changes or reports back the input gain for a channel . The command supports all inputs, outputs, and subbuses.
[DEVICE] **GAIN** <CH> <W> <X> [<Y>]

Explanation
<CH>

CH= 1-8 Parameter to apply to select the microphone channel
CH= A-D Parameter to apply to select the line channel

CH= 1-2 Parameter to apply to select the subbus channel
CH= * Parameter to apply command to all microphone channels

<W>

W=S Parameter to set subbus
W=I Parameter to set input
W= O Parameter to set output

<X>

X=-20–20 Parameter to set the level
X=Null Parameter to return the current level

<Y>

Y=R Parameter to indicate relative
Y=A Parameter to set the level absolute
Y= Null Parameter will default to R (relative)

Return Values

The command will return the updated level of the channel in the same format as the command. The level returned is always absolute.

Examples

The following command lowers the gain 3dB on microphone input channel 2. This command applies only to the box the serial The following is returned out the serial port indicating cable connects to since the device is not specified: an updated gain value:
GAIN 2 I -3 GAIN 2 I -12

**GATE**

This command reports back the microphone gating status of an AP800. This command is read only.
[DEVICE] **GATE**

Return Values

The command will return the current status of microphone gating for a given unit with a hex value.

Example

The following command requests the gate status from device 14. (When this command was issued, mics 1, 4, and 7 were gated on.): #14 GATE

The following is returned out the serial port indicating an updated gate value: #14 GATE 49

**Microphone Gating Key**

| Mic # | 8 7 6 5 4 3 2 1 | Hex value |
|---|---|---|
| | 0 0 0 0 0 0 0 0 | 0 |
| | 0 0 0 0 0 0 0 1 | 1 |
| | 0 0 0 0 0 0 1 0 | 2 |
| | 0 0 0 0 0 0 1 1 | 3 |
| | 0 0 0 0 0 10 0 | 4 |
| | 0 0 0 0 0 1 0 1 | 5 |
| | through | |
| | 1 1 1 1 1 1 1 1 | FF |

### GMODE

This command changes or reports back the gating mode for a microphone.
[DEVICE] **GMODE** <CH> <X>

Explanation
<CH>
CH= 1-8 Parameter to apply to the specified microphone channel
CH= * Parameter to apply command to all microphone channels
<X>
X=1 Parameter to set the state to AUTO
X=2 Parameter to set the state to MANUAL ON
X=3 Parameter to set the state to MANUAL OFF
X=4 Parameter to set the state to OVERRIDE ON
X=5 Parameter to set the state to OVERRIDE OFF
X=Null Parameter to return the current state

Return Values
The command will return the updated condition of the gating in the same format as the command.

### GRATIO

This command changes or reports back the setting of the gate ratio.
[DEVICE] **GRATIO** <X>

Explanation
<X>
X=0-50 Parameter to set the Gate Ratio (in dB)
X=Null Parameter to return the current gate ratio

Return Values
The command will return the updated gate ratio (0–50) in the same format as the command.

### HOLD

This command changes or reports back the setting of the hold time
[DEVICE] **HOLD** <X>

Explanation
<X>
X=100-8000 Parameter to set the hold time (in milliseconds)
X=Null Parameter to return the current hold time

Return Values
The command will return the updated hold time in the same format as the command.

### LFP

This command locks, unlocks, or returns the current state of the front panel from the serial port.
[DEVICE] **LFP** <X>

Explanation
<X>
X=0 Parameter to unlock the front panel.
X=1 Parameter to lock the front panel
X=2 Parameter to toggle the state from one state to the other (regardless of current state)
X=Null Parameter to return the current state of the front panel

Return Values
The command will return the updated condition of the front panel.

**LMO**
This command changes or reports back the setting of the last microphone on mode for each AP800.
[DEVICE] **LMO** <X>

Explanation
<X>
X=0 Parameter to set the mode to OFF
X=1 Parameter to set the mode to Microphone #1
X=2 Parameter to set the mode to Last Microphone On
X=Null Parameter to return the current mode

Return Values
The command will return the updated mode for the selected AP800 in the same format as the command.

**LVL**
This command reports back the level for a given channel.
[DEVICE] **LVL** <CH> <W>

Explanation
<CH>
CH= 1-8 Parameter to apply to the specified channel
CH= A-D Parameter to apply to the specified channel
<W>
W= I Parameter to specify an input meter
W= O Parameter to specify an output meter
W= A Parameter to specify an adaptive ambient meter

Return Values
The command will return the input level of the channel in the same format as the command.

**MASTER**
This command selects or returns the current mode of the AP800 from the serial port.
[DEVICE] **MASTER** <X>

Explanation
<X>
X=1 Parameter to designate the AP800 as master-single
X=2 Parameter to designate the AP800 as dual mixer
X=3 Parameter to designate the AP800 as slave
X=4 Parameter to designate the AP800 as master-linked
X=Null Parameter to return the current mode

Return Values
The command will return the updated condition of the mixer in the same format as the command.

### MDMODE

This command enables or disables the modem mode for the AP800. When the modem mode is enabled, the modem initialization string is sent out the serial port and the serial port now requires a password before a command is processed. Note: The default password is a carriage return (enter). If the password is forgotten, it may be cleared back to a carriage return via the front panel.

INACTIVITY NOTE:
After five minutes of serial inactivity, the password will be requested to continue serial activity.
[DEVICE] **MDMODE** <X>

Explanation
<X>
X=0 Sets modem mode to OFF
X=1 Sets modem mode to ON

Return Values
The command will return the updated condition (1=On, 0=Off) of the pin in the same format as the command.

### MEQ

This command changes or reports back the state of the equalizer adjustment for a microphone input.
[DEVICE] **MEQ** <CH> <BAND> <X>

Explanation
<CH>
CH= 1-8 Parameter to apply to the specified microphone channel
CH= * Parameter to apply command to all microphone channels
<BAND>
BAND=H, M, L Parameter to select which band is modified
<X>
X=-12 –12 Parameter to set level of the band
X=Null Parameter to return the current level

Return Values
The command will return the updated condition of the equalizer in the same format as the command.

**MHP**

This command changes or reports back the state of the high pass filter for a microphone

[DEVICE] **MHP** <CH> <X>

Explanation

<CH>

CH= 1-8 Parameter to apply to the specified microphone channel

CH= * Parameter to apply command to all microphone channels

<X>

X=0 Parameter to set the state to OFF

X=1 Parameter to set the state to ON

X=Null Parameter to return the current state

Return Values

The command will return the updated condition (On=1, Off=0) of the high pass filter in the same format as the command.

**MINIT**

This command sets or reports the current setting for the initialization string sent to the modem when in modem mode.

[DEVICE] **MINIT** <STRING>

Explanation

STRING can be any character combination up to 30 characters. If STRING is not specified the command returns the currently assigned string. To specify no initialization string, set STRING to "NULL"

Return Values

The command will return the updated string in the same format as the command was issued.

**MLINE**

This command changes or reports back how much gain is applied to the microphone input. The three settings are 0dB, 25dB, and 55dB.

[DEVICE] **MLINE** <CH> <X>

Explanation

<CH>

CH= 1-8 Parameter to apply to the specified microphone channel

CH= * Parameter to apply command to all microphone channels

<X>

X=1 Parameter to set the state to 55dB gain

X=2 Parameter to set the state to 25dB gain

X=3 Parameter to set the state to 0dB (line level)

X=Null Parameter to return the current state

Return Values
The command will return the updated condition of the gain applied in the same format as the command.

### MMAX
This command changes or reports back the setting for the maximum number of microphones on each AP800.
[DEVICE] **MMAX** <X>

Explanation
<X>
X=0 Parameter to set the maximum to no limit
X=1-8 Parameter to set the maximum number of microphones allowed on
X=Null Parameter to return the maximum number of microphones allowed on

Return Values
The command will return the updated maximum number of microphones allowed on for the selected AP800 in the same format as the command.

### MPASS
This command sets the current password for modem mode. Note: The default password is a carriage return (enter). If the password is forgotten, it may be cleared back to a carriage return via the front panel.
[DEVICE] **MPASS** <STRING>

Explanation
STRING can be any valid character combination up to 8 characters.

Return Values
Once the command is given, the unit responds by echoing back the command.

### MREF
This command changes or reports back which echo canceller reference will be used by the microphone input.
[DEVICE] **MREF** <CH> <X>

Explanation
<CH>
CH= 1-8 Parameter to apply to the specified microphone channel
CH= * Parameter to apply command to all microphone channels
<X>
X=1 Parameter to set the echo canceller reference to EC reference 1
X=2 Parameter to set the echo canceller reference to EC reference 2
X=Null Parameter to return the current state

Return Values

The command will return the updated condition of the echo canceller reference in the same format as the command.

**MTRX**

This command programs or reports the configuration of where an input is routed. The data is in a hex format. See the matrix configuration table for specific routing information

[DEVICE] **MTRX** <INPUT> <OUTPUTMIX>

Explanation

<INPUT>

INPUT=1-25 Selects the input to be routed to mix outputs

| Input | Input Word Assignment | Input | Input Word Assignment |
|---|---|---|---|
| 1 | Mic input | 1 | Post gate 13 Subbus 1 |
| 2 | Mic input 2 post gate | 14 | Subbus 2 |
| 3 | Mic input 3 post gate | 15 | G-Link X |
| 4 | Mic input 4 post gate | 16 | G-Link Y |
| 5 | Mic input 5 post gate | 17 | G-Link Z |
| 6 | Mic input 6 post gate | 18 | Mic input 1 pregate |
| 7 | Mic input 7 post gate | 19 | Mic input 2 pregate |
| 8 | Mic input 8 post gate | 20 | Mic input 3 pregate |
| 9 | Line input A | 21 | Mic input 4 pregate |
| 10 | Line input B | 22 | Mic input 5 pregate |
| 11 | Line input C | 23 | Mic input 6 pregate |
| 12 | Line input D | 24 | Mic input 7 pregate |
| | | 25 | Mic input 8 pregate |

<OUTPUTMIX>

OUTPUTMIX=hex word The selected input will be routed to the outputs indicated in

OUTPUTMIX=null Mix Command to return the current setting for the input.

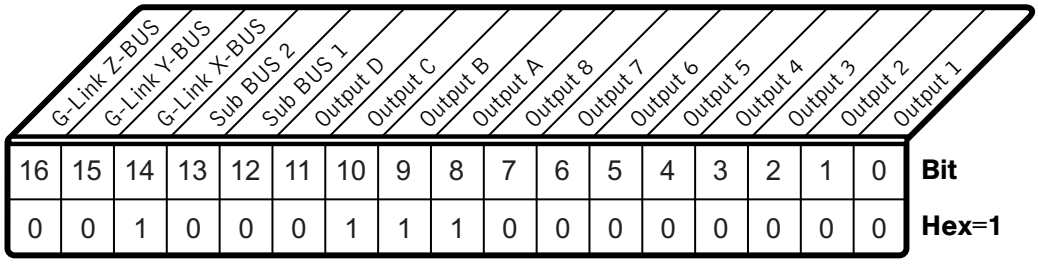
<OUTPUTMIX> Note:

When entering the hex value of the <OUTPUTMIX>, it is not necessary to add the leading zeros, only zeros that follow the value, as in examples 1 & 2, below and on the next page.

Example 1

The following command routes PREGATE MIC INPUT 1 audio to OUTPUT 1. This command applies to the box the serial cable connects to only since a device is not specified.

**MTRX 18 1**




**Example 1: OUTPUTMIX Matrix**

Example 2
The following command routes MIC INPUT 1 POST GATE audio to OUTPUTS A, B, and C, and to the G-LINK X-BUS.

**MTRX 1 4700**

| G-Link Z-BUS | G-Link Y-BUS | G-Link X-BUS | Sub BUS 2 | Sub BUS 1 | Output D | Output C | Output B | Output A | Output 8 | Output 7 | Output 6 | Output 5 | Output 4 | Output 3 | Output 2 | Output 1 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | **Bit** |
| 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **Hex=4700** |

**Example 2: OUTPUTMIX Matrix**

Return Values
The command will return the updated condition of the matrix for the selected input in the same format as the command was issued.

## MUTE

This command changes or reports the state of mute for a given channel
[DEVICE] **MUTE** <CH> <W> <X>

Explanation
<CH>
CH= 1-8 Parameter to apply to the specified microphone channel
CH= A-D Parameter to apply to select the line channel
CH= 1-2 Parameter to apply to select the subbus channel
CH= * Parameter to apply to all microphone channels
<W>
W= S Parameter to set subbus
W=I Parameter to set input
W=O Parameter to set output
<X>
X=0 Set mute to OFF
X=1 Set mute to ON (mute the selected channel)
X=2 Parameter to toggle the state from one state to the other (regardless of current state)
X=NULL Report the current state of mute for the selected channel

Return Values
The command will return the mute status (On=1, Off=0) in the same format as the command.

**NLP**

This command changes or reports back the state of the nonlinear processing for a microphone.

[DEVICE] **NLP** <CH> <X>

Explanation

<CH>

CH= 1-8 Parameter to apply to the specified microphone channel

CH= * Parameter to apply command to all microphone channels

<X>

X=0 Parameter to set the state to OFF

X=1 Parameter to set the state to soft

X=2 Parameter to set the state to medium

X=3 Parameter to set the state to aggressive

X=Null Parameter to return the current state

Return Values

The command will return the updated condition (0=Off, 1=Soft, 2=Medium, 3=Aggressive) of the nonlinear processing in the same format as the command.

**NOM**

This command changes or reports back state of NOM attenuation for each channel.

[DEVICE] **NOM** <CH> <X>

Explanation

<CH>

CH= 1-8 Parameter to apply to the specified direct output channel

CH= A-D Parameter to apply to the specified line output

<X>

X=0 Parameter to set NOM attenuation to OFF

X=1 Parameter to set NOM attenuation to ON

X=Null Parameter to return the current state of NOM attenuation

Return Values

The command will return the updated condition (On=1, Off=0) of NOM attenuation for the selected channel in the same format as the command.

**OFFA**

This command changes or reports back the setting of Off attenuation.

[DEVICE] **OFFA** <X>

Explanation

<X>

X=0-50 Parameter to set the amount of off attenuation (indB)

X=Null Parameter to return the current value of off attenuation

Return Values
The command will return the updated value of off attenuation in the same format as the command.

**PAA**
This command selects or returns the current status of the PA adaptive mode.
[DEVICE] **PAA** <X>

Explanation
<X>

X=0 Parameter to select PA adaptive mode to OFF
X=1 Parameter to select PA adaptive mode to ON
X=Null Parameter to return the current mode

Return Values
The command will return the updated condition (On=1, Off=0) of the PA adaptive mode in the same format as the command.

**PCMD**
This command programs or returns the program of the GPIO control pins from the serial port. COMMAND can be any valid command. These values are not part of the preset and do not change when presets are loaded.
[DEVICE] **PCMD** <LOCATION> <COMMAND>

Explanation
<LOCATION>

| | | | |
|---|---|---|---|
| LOCATION=1 | Control A pin 1 active | LOCATION=17 | Control B pin 1 active |
| LOCATION=2 | Control A pin 1 inactive | LOCATION=18 | Control B pin 1 inactive |
| LOCATION=3 | Control A pin 3 active | LOCATION=19 | Control B pin 3 active |
| LOCATION=4 | Control A pin 3 inactive | LOCATION=20 | Control B pin 3 inactive |
| LOCATION=5 | Control A pin 5 active | LOCATION=21 | Control B pin 5 active |
| LOCATION=6 | Control A pin 5 inactive | LOCATION=22 | Control B pin 5 inactive |
| LOCATION=7 | Control A pin 7 active | LOCATION=23 | Control B pin 7 active |
| LOCATION=8 | Control A pin 7 inactive | LOCATION=24 | Control B pin 7 inactive |
| LOCATION=9 | Control A pin 9 active | LOCATION=25 | Control B pin 9 active |
| LOCATION=10 | Control A pin 9 inactive | LOCATION=26 | Control B pin 9 inactive |
| LOCATION=11 | Control A pin 11 active | LOCATION=27 | Control B pin 11 active |
| LOCATION=12 | Control A pin 11 inactive | LOCATION=28 | Control B pin 11 inactive |
| LOCATION=13 | Control A pin 13 active | LOCATION=29 | Control B pin 13 active |
| LOCATION=14 | Control A pin 13 inactive | LOCATION=30 | Control B pin 13 inactive |
| LOCATION=15 | Control A pin 15 active | LOCATION=31 | Control B pin 15 active |
| LOCATION=16 | Control A pin 15 inactive | LOCATION=32 | Control B pin 15 inactive |

<COMMAND>

COMMAND=String Pin will execute string when actuated
COMMAND=Null Parameter to return the current programming for the pin
COMMAND=Clear Parameter to clear current programming (do nothing state)
COMMAND LIST: LFP, PRESET, MUTE, GAIN, AGC, EQ, GMODE, CHAIRO

Return Values

The command will return the updated condition of the pin in the same format as the command. If the command did not alter the state, the command returns the current command for which the pin is programmed.

Example

The PCMD command line contains both the PCMD command and the command being programmed. To program AP800 unit 0 control A pin 1 to toggle mute on mic 1, the command would appear as follows: #10 PCMD 1 MUTE 1 I 2 (toggles mute to the opposite state: ON to OFF and vice versa)

**PEVNT**

This command programs or returns the program of the GPIO status pins from the serial port. The command line follows the same format as shown in the PCMD example above.

[DEVICE] **PEVNT** <LOCATION> <EVENT>

Explanation

<LOCATION>

LOCATION=1 Status A pin 2 active LOCATION=17 Status B pin 2 active
LOCATION=2 Status A pin 2 inactive LOCATION=18 Status B pin 2 inactive
LOCATION=3 Status A pin 4 active LOCATION=19 Status B pin 4 active
LOCATION=4 Status A pin 4 inactive LOCATION=20 Status B pin 4 inactive
LOCATION=5 Status A pin 6 active LOCATION=21 Status B pin 6 active
LOCATION=6 Status A pin 6 inactive LOCATION=22 Status B pin 6 inactive
LOCATION=7 Status A pin 8 active LOCATION=23 Status B pin 8 active
LOCATION=8 Status A pin 8 inactive LOCATION=24 Status B pin 8 inactive
LOCATION=9 Status A pin 10 active LOCATION=25 Status B pin 10 active
LOCATION=10 Status A pin 10 inactive LOCATION=26 Status B pin 10 inactive
LOCATION=11 Status A pin 12 active LOCATION=27 Status B pin 12 active
LOCATION=12 Status A pin 12 inactive LOCATION=28 Status B pin 12 inactive
LOCATION=13 Status A pin 14 active LOCATION=29 Status B pin 14 active
LOCATION=14 Status A pin 14 inactive LOCATION=30 Status B pin 14 inactive
LOCATION=15 Status A pin 16 active LOCATION=31 Status B pin 16 active
LOCATION=16 Status A pin 16 inactive LOCATION=32 Status B pin 16 inactive

<EVENT>

EVENT=String Pin will execute string when actuated
EVENT=Null Parameter to return the current programming for the pin
EVENT=Clear Parameter to clear current programming (do nothing state)
EVENT LIST: LFP, PRESET, MUTE, GAIN, AGC, EQ, GMODE, CHAIRO

Return Values
The command will return the updated condition of the pin in the same format as the command. If the command did not alter the state, the command returns the current event for which the pin is programmed.

PRESET COMMAND NOTE:
PRESET has two status parameters which can be set in a PEVNT command line: preset and NOT preset. To indicate NOT preset, add "!" to the end of the string. For example, this could be used to show when PRESET 1 occurs and then shut off if any other preset is selected. You would enter PRESET 1 in the active location and PRESET 1! in the inactive location for the desired pin.

**PP**
This command changes or reports back the state of the phantom power for a microphone.
[DEVICE] **PP** <CH> <X>

Explanation
<CH>
CH= 1-8 Parameter to apply to the specified microphone channel
CH= * Parameter to apply command to all microphone channels
<X>
X=0 Parameter to set the state to OFF
X=1 Parameter to set the state to ON
X=Null Parameter to return the current state

Return Values
The command will return the updated condition (On=1, Off=0) of the phantom power in the same format as the command.

**PRESET**
This command selects or reports the current preset configuration used by the AP800.
[DEVICE] **PRESET** <X>

Explanation
<X>
X=1-6 Sets the preset to the number specified
X=Null Parameter to return the current preset

Return Values
The command will return the current preset. If the command changed the preset, the updated preset is returned.

**REFSEL**
This command selects or returns the output to be used as the EC Reference 1 and EC Reference 2.
[DEVICE] **REFSEL** <X> <OUTPUT>

Explanation
<X>
X=1 Parameter to select the EC Reference 1
X=2 Parameter to select the EC Reference 2
X=3 Parameter to select the G-Link EC Ref bus
<OUTPUT>
OUTPUT=1-8 Parameter to select 1-8 as the EC reference
OUTPUT=A-D Parameter to select A-D as the EC reference
OUTPUT=E Parameter to select G-Link EC Ref bus as the EC Reference
OUTPUT=F Parameter to select none
OUTPUT=Null Parameter to return the EC reference value

Return Values
The command will return the updated condition of the reference select in the same format as the command.

**TOUT**
This command sets or reports the current inactivity timeout before returning to the title screen used by the unit.
[DEVICE] **TOUT** <X>

Explanation
<X>
X=0 Disables inactivity timeout
X=1-15 Sets the number of minutes specified
X=Null Parameter to return the current number of minutes

Return Values
The command will return the current timeout value. If the command changed the timeout, the updated timeout is returned.

**UID**
This command returns the unique ID number, the device type and the device number of the AP800. This command is read only. The unique ID number is preprogrammed at the factory and is unique to the unit, while the device number is set by the user at the time of installation.
[DEVICE] **UID**

Return Values
UID returns the device type, device number and unique ID number. The unique ID is composed of an eight-digit hex number assigned at the factory to uniquely identify the unit.

Example
The following command request the unit ID from
device 11: #11 VER

The following is returned out the serial port: #11 VER 1.0

# Appendix H: Worksheets and Diagrams

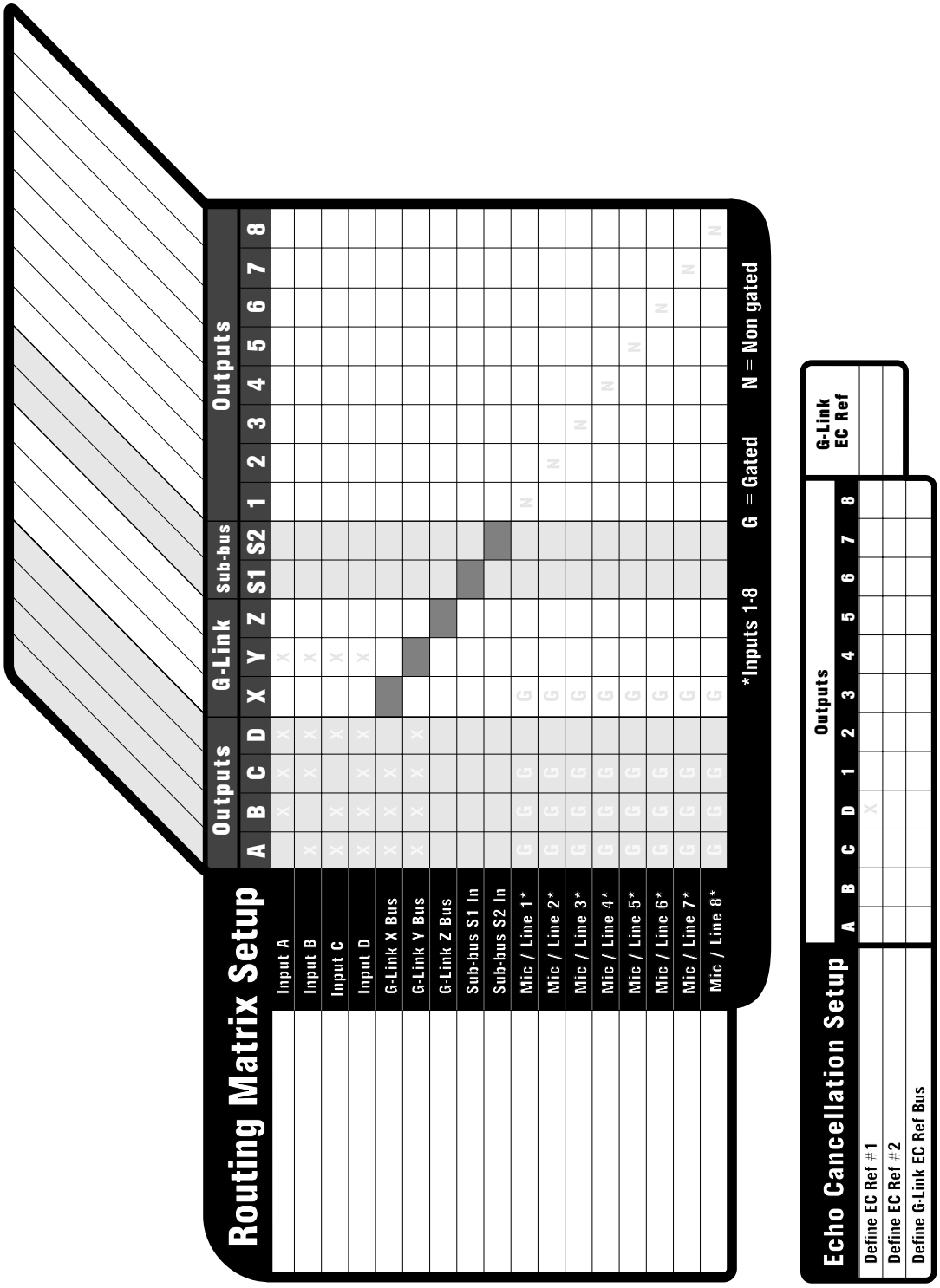



**Figure 43. Routing Matrix Worksheet**

## System Wide Parameters

| Program Parameter | Selection Range |
|---|---|
| Preset | **1**-6 |
| Lock Front Panel | On, **Off** |
| Set Passcode | Any Front Panel Keys |
| Device ID No. | **0**-7 |
| Unit ID No. | Factory Programmed |
| Mixer Mode | **Master-Single**, Master-Linked, Slave, Dual |
| RS232 Baud Rate | **9.6**, 19.2, 38.4 kbps |
| RS232 Flow Control | On, **Off** |
| Modem Mode | On, **Off** |
| Clear Modem Password | Enter |
| Timeout | 0-15 (**10**) |

## Auto Mix Parameters

| Program Parameter | Selection Range |
|---|---|
| PA Adaptive | **On**, Off |
| Maximum No. of Mics. | Off, 1-8 (**4**) |
| First Mic Priority | **On**, Off |
| Last Mic Mode | Last On, **Off** or Mic 1 |
| Gate Ratio | 0-50dB (**15**) |
| Off Attenuation | 0-50dB (**12**) |
| Hold Time | .1-8.0 seconds (**.3**) |
| Decay Rate | **Slow**, Medium, Fast |
| Manual Ambient | 0dB to -70dB (**-30**) |



## Input Channel

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | A | B | C | D | S1 | S2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |

| Program Parameter | Selection Range |
|---|---|
| Input Gain Adjust | -20dB to 20dB (**0**) |
| Subbus Attenuation | 0dB to -20dB (**-6dB**) |
| Input Type | **Mic 55dB**, Mic 25dB, Line |
| Microphone Activation | **Auto**, Override On/Off, Manual On/Off |
| Mute | On,**Off** |
| Phantom Power | **On**, Off |
| AGC | On, **Off** |
| High-Pass Filter | On, **Off** |
| EQ | On, **Off** |
| Low Band EQ | -12dB to 12dB (**0**) |
| Mid Band EQ | -12dB to 12dB (**0**) |
| High Band EQ | -12dB to 12dB (**0**) |
| Chairman Mic | On, **Off** |
| Adaptive Ambient | **On**, Off |
| EC Reference | **1**, 2 |
| Echo Cancellation | **On**, Off |
| NLP | Off, **Soft**, Medium, Aggressive |

## Output Channel

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | A | B | C | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |

| Program Parameter | Selection Range |
|---|---|
| Output Gain Adjust | -20dB to 20dB (**0**) |
| Mute | On, **Off** |
| NOM | On (**A-D**) or Off (**1-8**) |

**Figure 44. Programming Worksheet**

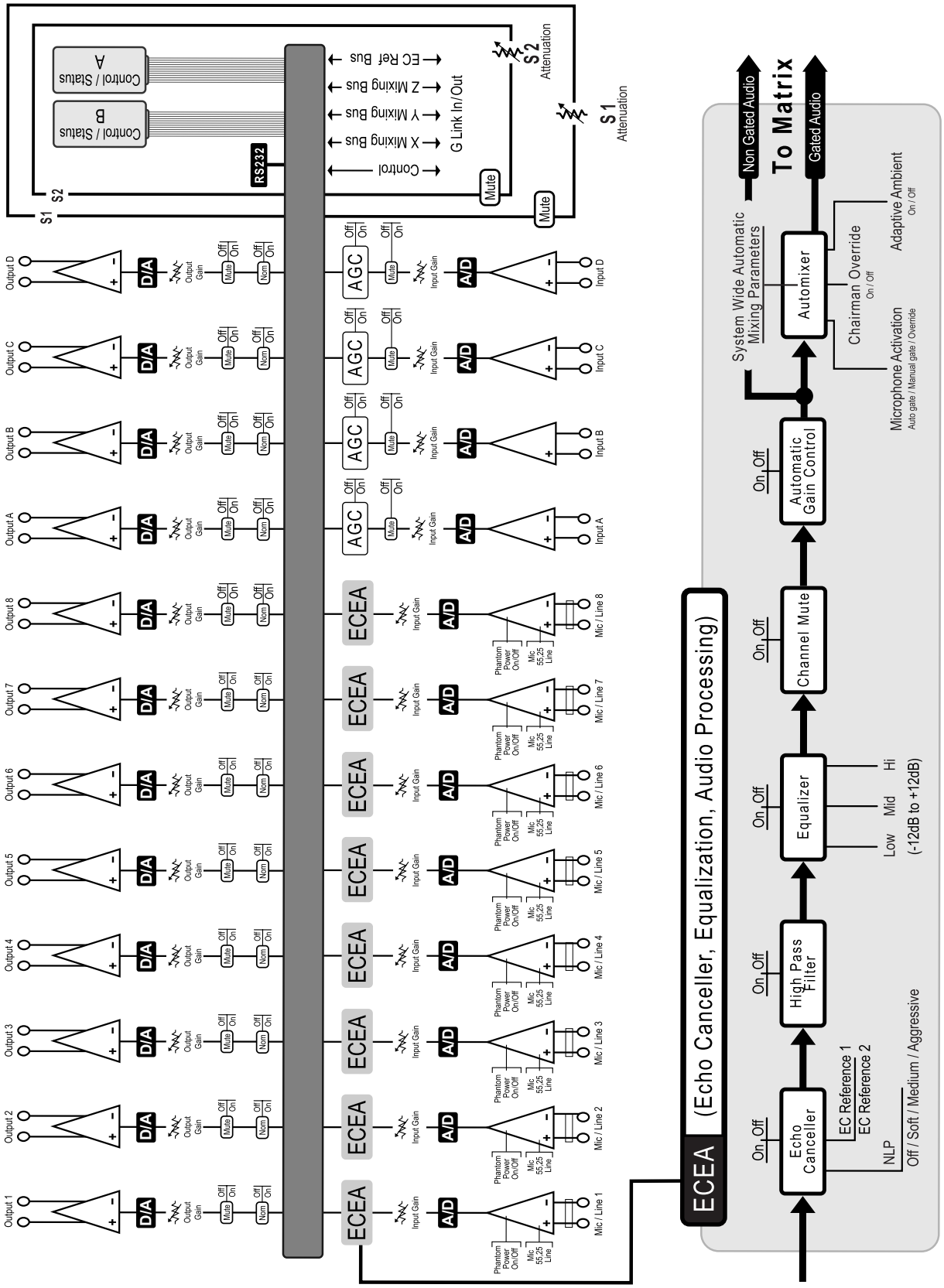



**Figure 45. AP800 Block Diagram**

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