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SAS 64000

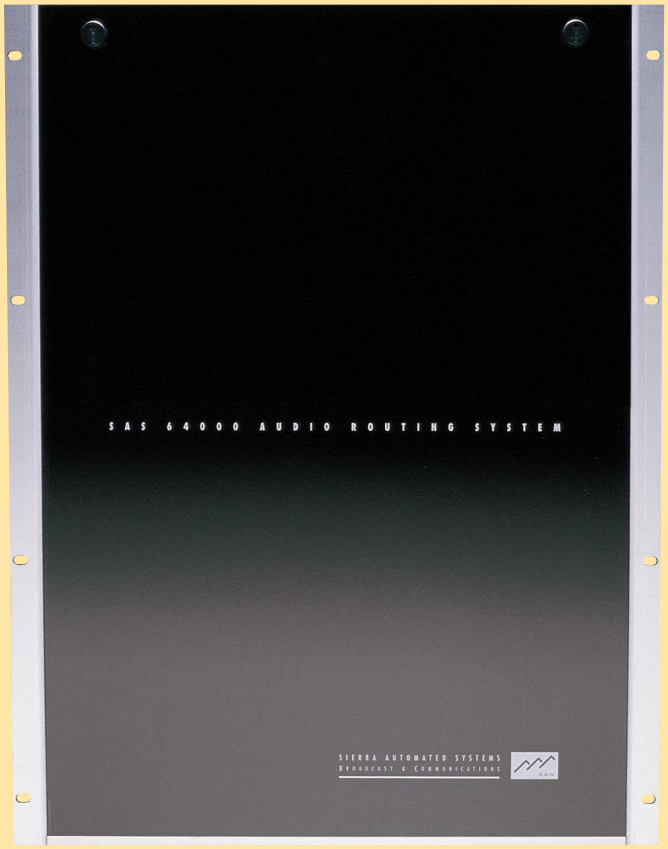
Audio Routing System

- Ultra-high density – 256 x 256 in one frame
- Analog and digital I/O
- Stereo/mono easily integrated within system
- SAS-EMPA multi-processor architecture
- 118 dB enhanced dynamic range
- +28 dBu max. input/output levels
- Superb broadcast-quality performance
- Wide selection of control panel options
- Multi-point RS-232 & RS-422 interfaces
- Dual redundant modular power supplies

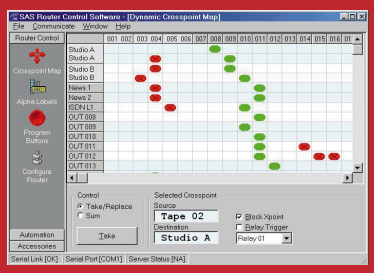
THE SAS 64000 AUDIO ROUTING SWITCHER is a high performance microprocessor controlled audio switching system designed for large-scale operations in professional broadcast facilities.

The SAS 64000 builds upon the design philosophies and technologies developed in its predecessor, the SAS 32000. The same system architecture, rugged design and construction techniques have been proven in installations dating back to 1987. Employing multiple micro-processors to provide distributed control and enhanced reliability has also paid off with impressive results. Implementation of the latest analog and digital LSI technology has created an uncompromised level of performance and exceptional high packaging density: 256 X 256 in one equipment frame; 256 X 256 all stereo in only two frames.

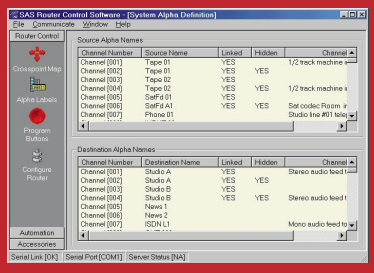
The SAS 64000 supports analog and digital I/O and can be configured to operate as a mono, stereo or a mixed mono/stereo system. The control software allows adjacent inputs or outputs to be linked as stereo pairs and treated as one source or destination. Stereo linking provides a flexible and convenient solution for facilities managing both stereo and mono sources and destinations.



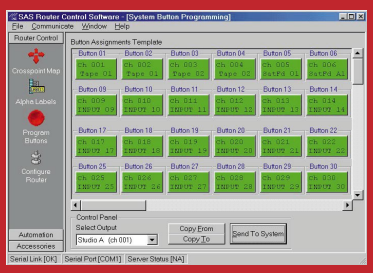
SAS
SIERRA AUTOMATED SYSTEMS



DYNAMIC MATRIX MAP



ALPHA EDITING



PUSHBUTTON PROGRAMMING



AXC-8 SOFT PANEL



ANC-8 SOFT PANEL

PROGRAMMING DISPLAY SCREENS

A BRIEF TECHNICAL DESCRIPTION

The central frame is 14 rack units in height and houses all input and output modules, frame controller and plug-in power supplies. Each Model SIA-64 Input Module provides 64 audio inputs to the system. The SXT-256 Module switches up to 256 audio sources to 16 audio output ports. Each SXT-256 Crosspoint/Output Module is powered by its own advanced microprocessor and provides multiple serial ports for direct communication with output control panels and the MCU-10 Frame Controller Module. The SXT-256 and its local panels form an independent system which is self-sustaining and unaffected by other output modules. The DXE-256 Module creates a true hybrid of analog and digital signals within the 64000 system. It provides 8 stereo AES/EBU digital inputs and outputs and, like the analog SXT, provides multiple serial ports for direct communication with output control panels. Multiple DXE modules communicate digitally with each other but also provide 24 bit A/D and D/A for full integration with the analog modules. In other words, any input signal is available at any output, analog or digital. Signal integrity is never compromised.

The MCU-10 Frame Controller handles system administration, programming of system alphanumerics, and central control for all system components and functions. The integral software is controlled by a PC and can be set up to program all common system parameters.

System Interconnect: The "Wireless" Concept

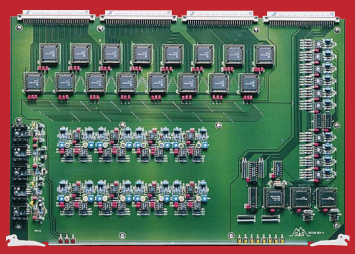
The SAS 64000 is based on reliability and performance. Gold plated two-piece Euroconnectors are used on all circuit cards and frame-level motherboards. Hi-rel crimp contacts for customer interconnect are inserted into euroconnector housings and electrical connection is made directly to each individual circuit cards mating connector from the frame's rear panel. Internal frame wiring applies only to the power input and power supply output distribution.

Break-out wiring and/or panels to customer specifications are readily available. Popular wiring options include "pig tails", terminal/punch blocks and patch fields.

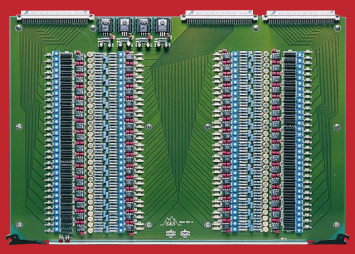
System Software

Total system configuration and operational control of the SAS 64000 is provided by dedicated Router Control Software operating on a standard PC. This mouse driven software package provides an intuitive interface for defining alphanumeric names, channel notes, stereo input and output links, programming button assignments for pushbutton type control panels as well as monitoring and controlling the crosspoint matrix. The 'channel note' dialog box allows a descriptive message to be entered for each source and destination, such as detailed wire routing or cross-connect block information. Off-line editing of user configuration options allows system configurations to be stored to disk.

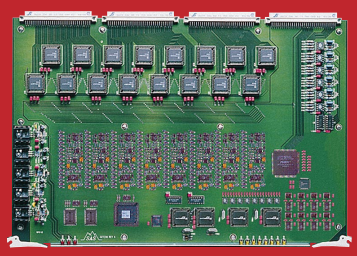
Macros (salvos) provide the ability to activate several crosspoint commands as a single event. Each group of commands is programmed using the SAS Router Control Software and assigned a unique name which may be accessed by control panels operating in macro mode.



SXT-256 STEREO CROSSPOINT/OUTPUT MODULE



SIA-64 STEREO INPUT AMPLIFIER



DXE-256 DIGITAL I/O MODULE

This elegant design frees operators from the need to know if a source is analog or digital. In operation, the desired source is selected by name and the system automatically makes connection via the most direct path.

FRAME CONTROLLER

Model MCU-10 Frame Controller is the axis for central control. It communicates to each input/output module, gathering information on the switch status when local changes are made. It also communicates with XY panels and distributes XY and automation crosspoint commands to the SXT modules. As a standard protection feature, the MCU-10 contains non-volatile memory for safekeeping of all alphas, pushbutton tables and crosspoint status in the event of power loss.

POWER SUPPLY MODULES

Two SPS-5 Switching Power Supply Modules, each with its own line cord, allow for separate AC power sources. Each SPS-5 powers half of the frame load, and automatically provides power to the entire system if the other supply loses primary power or is temporarily removed. Advanced-level switching regulators provide high efficiency and reduced operating temperatures.

CONTROL PANELS

Single Output Controllers

Single output controllers communicate directly to a SXT-256 Output Module or DXE-256 Digital I/O Module on an RS-485 serial line. Each SXT/DXE functions independent of other modules, serving 16 mono / 8 stereo outputs. Single output controllers are available in several configurations: alphanumeric 8-character LED displays with rotary shaft encoder input selection; pushbutton input selection; alphanumeric displays with "hot punch" pushbuttons; 1RU 19" rack mount controllers; console-mount (very small outline) controllers.

All alphanumeric panels provide bright, easy-to-read 8-character dot matrix LED or LCD displays for showing source names. The names are displayed in alphabetical order by rotating the Input Select shaft encoder. This presents the operator with an intuitive interface for selecting sources. The LED display shows the currently Active input or the Selected input (preset) as ready for a Take transition. Display mode is indicated by the display control pushbutton LEDs. As the Input Select knob is rotated, the display automatically switches to the Select mode. After a Take command, the display returns to Active mode. Preset Exchange allows rapid transitions between two sources, while Dynamic Take switches crosspoints while tracking the Input Select knob.

Model ANC-8 is a rack mounted single output alpha control panel. The ANC-8D places two ANC-8s within a single rack unit. Model CPI-80 is a small alpha controller measuring 1.4" x 3.3" and mounts in consoles or turrets. Model APC-88 is console mountable (1.4" x 5.3") and features full 8-character alpha readout and eight "hot punch" buttons. A rack mounted version, Model APR-88 is also available. Model CDS-8 is the smallest alpha controller at 1.33" x 2.4" and is available in console, turret, desk top and rack mount packages. The CDS-8 provides an LED backlit LCD graphic display within its Take pushbutton, and a rotary encoder for source selection.

Pushbutton input select panels are available with 16 (Model PBS-16), 32 (Model PBS-32), or 64 (Model PBS-64) pushbuttons in a single rack unit chassis. Each pushbutton is programmable to instantly select any of the available sources. Designation strips are provided with each panel for inserting user generated legends.

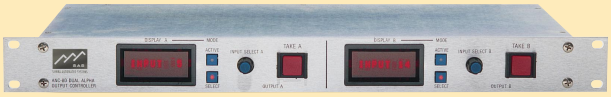
The CRS-40 Control Room Selector panel is useful for operator controlled switching of control room to transmitter routing. The current ON-AIR control room must preset the NEXT TO AIR. All locations receive a flashing tally but only the preset room may TAKE AIR. A single frame SAS 32000 system is often used for transmitter routing to isolate this function from the "house" routing system.



ANC-8 SINGLE OUTPUT ALPHA CONTROL PANEL



APR-88 SINGLE OUTPUT ALPHA CONTROL PANEL



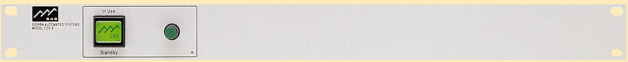
ANC-8D DUAL OUTPUT ALPHA CONTROL PANEL



APR-88 DUAL OUTPUT ALPHA CONTROL PANEL



AXC-8 ALPHANUMERIC X-Y CONTROL PANEL



CDS-8R SINGLE OUTPUT ALPHA CONTROL PANEL



PBS-16 PUSHBUTTON SELECT CONTROL PANEL



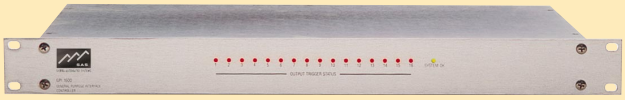
CDS-8R DUAL OUTPUT ALPHA CONTROL PANEL



PBS-32 PUSHBUTTON SELECT CONTROL PANEL



CDS-8R QUAD OUTPUT ALPHA CONTROL PANEL



GPI-1600 AUTOMATION INTERFACE



CDS-8 CONSOLE DUAL OUTPUT ALPHA CONTROL PANEL



CPI-80 SINGLE OUTPUT ALPHA CONTROL PANEL



APC-88 SINGLE OUTPUT ALPHA CONTROL PANEL



CRS-40 OUTPUT ORIENTED CONTROL PANEL



CDS-8 SINGLE OUTPUT ALPHA CONTROL PANEL



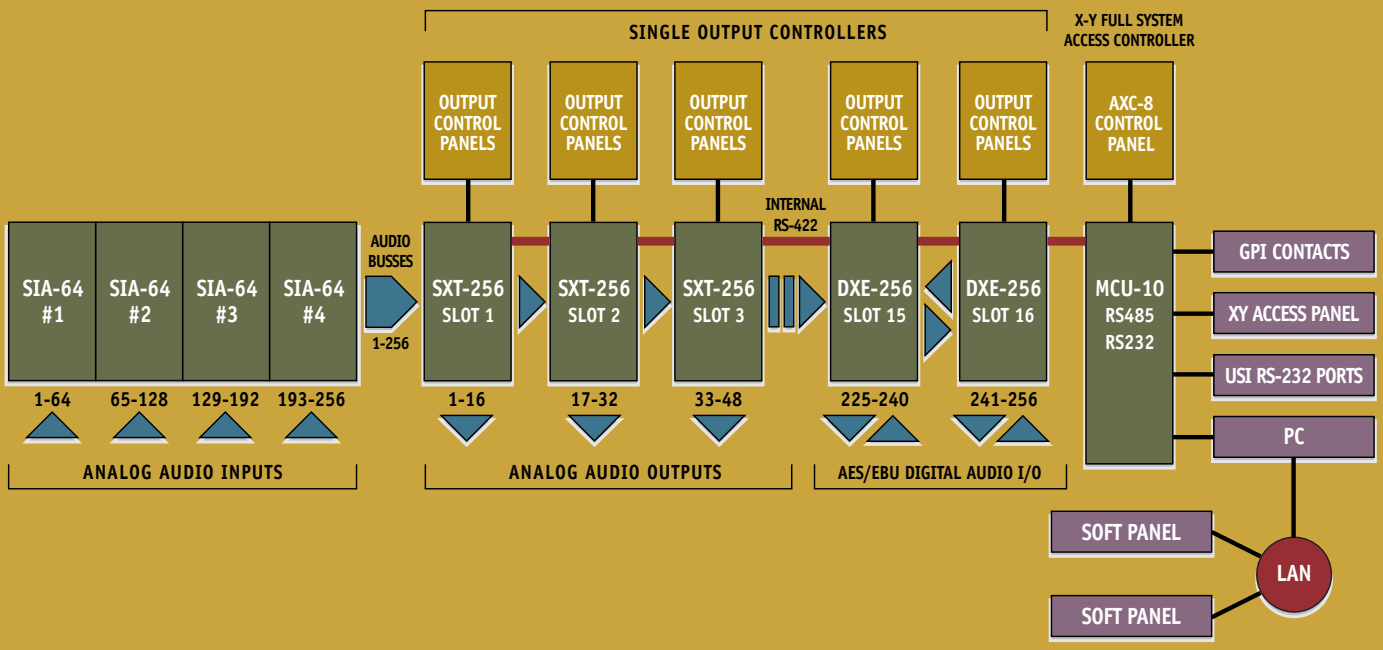
CDS-8 DUAL OUTPUT ALPHA CONTROL PANEL



CDS-8DT DESKTOP ALPHA CONTROL PANEL



DSS-8 SINGLE OUTPUT ALPHA CONTROL PANEL W/SPKR



SAS 64000 SINGLE FRAME BLOCK DIAGRAM

Soft Panels

The SAS 64000 software package includes pop-up 'soft' panel graphical user interfaces. These virtual control panels exist within Windows applications and communicate to the SAS router control software (SAS server) over a standard LAN. Both 'photo realistic' and conventional Windows 'pull down' panels are included. These panels are ideal for locations already served by a PC, and where a dedicated hardware panel is not required. Newsroom workstations, engineering offices or even the PD's office are all good candidates for soft panels. Remote off-site access is possible if the facility is equipped with a WAN.

ANALOG INPUT MODULES

Model SIA-64 Input Amplifier provides 64 independent active-balanced buffer amplifiers. Only four SIA-64 modules are required for installing 256 audio inputs to the system frame. Adjacent input pairs may be "software linked" to operate as stereo pairs.

ANALOG OUTPUT MODULES

Model SXT-256 Crosspoint/Output Module contains all the electronic switches, output amplifiers and control circuitry necessary to switch 256 audio inputs (up to 128 stereo) to 16 audio outputs (up to 8 stereo). An on-board CMOS microprocessor controls the crosspoints and communicates to output control panels and MCU-10 Frame Controller via ten independent RS-485 serial ports. This proven distributed processor architecture is an SAS exclusive, realizing enhanced reliability and fast access times.

DIGITAL I/O MODULES

Model DXE-256 Digital I/O Module provides 8 stereo AES/EBU inputs, 8 stereo AES/EBU outputs, and 8 RS-485 ports for SAS remote control panels. Multiple modules communicate digitally to increase the matrix size. For example, four DXE-256 modules provide a 32 X 32 stereo AES/EBU digital section. Eight modules provide a 64 X 64 section.

Advanced 24 bit D/A converters provide an analog copy of all digital input signals to the 64000 analog backplane for selection by analog output modules. Similarly, 24 bit A/D converters provide a digital copy of any analog sources for selection to digital outputs. This unique architecture allows digital to digital direct (no conversion) and analog to analog direct (no conversion). Yet all analog sources can be delivered to any digital output (non-blocking) and all digital sources can be delivered to any analog output (non-blocking).

Full System Access Controllers

Full system access is allowed via Model AXC-8 X-Y Control Panel and/or from a PC. Communication from the X-Y panels to the MCU-10 Frame Controller takes place via an RS-485 serial bus running at 76.8 kilobaud. These panels continuously monitor system status (both communication status and changes made by single output controllers) and allow changes to be made by Engineering. All X-Y panels provide an RS-232 port for interface to external systems such as automation.

Model AXC-8 Alphanumeric X-Y Control Panel provides two 8-character LED displays, one for source names and one for destination names. Shaft encoders are provided for input/output selection. Additional AXC-8 panels may be used for locations requiring multiple output control from one control panel. These additional panels may be programmed to access only a selected group of destinations.

Remote Access

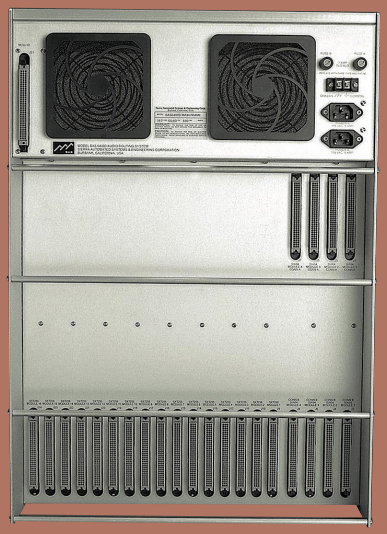
The 64000 has been field tested with a number of remote access options ranging from 'soft panels' operating over a WAN, direct modem connection with remote router control software, access to the on-site computer via remote communication software (e.g. pcAnywhere), and even DTMF over dial up lines. SAS Engineering is readily available to assist with tailoring a remote access configuration.

GPI-1600 AUTOMATION INTERFACE

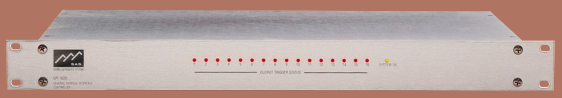
is a compact automation system that ties into the SAS 64000 system. It contains 16 form C relays for general purpose machine control and an option for 16 opto-isolated inputs. The automation software runs on a PC and provides a useful tool for capturing news feeds, roll recording machines and other events.



SPS-5 DUAL REDUNDANT POWER SUPPLY



SAS 64000 CHASSIS REAR VIEW



GPI-1600 AUTOMATION INTERFACE

SPECIFICATIONS

SYSTEM	
Gain	0 dB, ±0.2 dB, 20-20 kHz
Frequency Response	±0.1 dB, 20-15 kHz +0/-0.25 dB, 20 kHz
Noise	< -90 dBu, 20 kHz bandwidth
Dynamic Range	> 118 dB
THD	< 0.05%, 20-20 kHz
IM (SMPTE)	< 0.05%
Crosstalk	< -80 dB, 20-20 kHz, adjacent inputs; < -100 dB; typical @ 1 kHz

SERIAL INTERFACE	
RCS PC	RS-232, 19.2 kilobaud
Computer/Modem	RS-232, 9600 Baud

AUDIO INPUTS	
Input Impedance	>40 k ohms, balanced
Max. Input Level	+28 dBu
CMRR	Exceeds 70 dB, 20-20 kHz, -90 dB, typical 50/60 Hz

AUDIO OUTPUTS	
Source Impedance	60 ohms
Max. Output Level	+28 dBu, 10 k ohm load +25 dBm, 600 ohm load

AES/EBU INPUTS	
Input Impedance	110 ohms, balanced, transformer isolated
Input Level	2 to 7 V p-p

AES/EBU OUTPUTS	
Source Impedance	110 ohms, balanced transformer isolated
Output Level	5 V p-p
Sample Rate	48kHz or lock to external AES 11

GENERAL	
Power	115/230 VAC, ±10%, 500 VA max.
Physical Size (each Frame)	24.5"H x 19"W x 16"D (14 EIA rack units)

Sierra Automated Systems reserves the right to change specifications without notice.

SIERRA AUTOMATED SYSTEMS
BROADCAST & COMMUNICATIONS

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