

SAS 16000 Manual Contents

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*¹ Note this manual details the DOS version of software. Please see Addendums following for SAS Windows Router Control Software (WinRCS) installation.

Drawings:

Connection Drawing:

16BW1 SAS 16000 50 pin / punchblock pin out

Addendum:

Addendum 1: WinRCS, SAS Windows Router Control Software, Installation

Addendum 2: SAS Server software for WinRCS, Installation

SAS16000 Manual

1. SAS 16000 Audio Routing Switcher

The SAS 16000 Audio Routing Switcher from Sierra Automated Systems & Engineering Corporation is a high performance microprocessor controlled audio switching system designed for operations in professional broadcast facilities.

The SAS 16000 provides 32 inputs X 32 outputs in one 2 rack unit package. The system is controlled by an advanced microprocessor and provides multiple serial ports for direct communication with output control panels.

The SAS 16000 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 which have both stereo and mono sources and destinations to manage.

Also available is a 'Slave Chassis' which adds a second 32 X 32 matrix to allow 32 X 32 stereo operation. When connected in this manner the Master chassis is used for the Left channel routing and the Slave chassis is used for the Right channel routing. The PC system software and remote control panels all connect to the Master chassis, as in a standard single chassis system. The Slave simply follows the Master, so that Left and Right signals switch simultaneously.

The SAS 16000 Central Controller handles system administration, programming of system alphanumeric and central control for all system components and functions. Total system configuration and operational control of the SAS 16000 is provided through software operating an IBM compatible personal computer. The 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. Off-line editing of user configuration options allows system configurations to be stored to hard disk for archiving. The PC is only required for system setup; it is not required for day to day system operation.

The SAS 16000 is based on reliability and performance. Gold plated two-piece 'micro-ribbon' style connectors are used for interface. Cables, cross-connect blocks and other accessories are available off the shelf for quick and easy installation.

2. Input Amplifiers

The SAS 16000 has 32 independent active balanced buffer amplifiers. Adjacent input pairs may be 'software linked' to operate as stereo pairs.

Each individual amplifier is electronically balanced and floating. Input impedance is high and balanced with respect to ground. Maximum input level is greater than +26 dBu allowing freedom from overload. Excellent common mode rejection across the audio spectrum combined with very high common mode voltage tolerance ensures signal integrity.

3. Crosspoint & Output Amplifiers

The SAS 16000 Crosspoint / Output Section contains all the electronic switches, output amplifiers and control circuitry necessary to switch 32 audio inputs (up to 16 stereo) to 32 audio outputs (up to 16 stereo).

CMOS switching is used to ensure low distortion and noise. The output amplifiers are balanced and provide a low source impedance of 60 ohms, ideal for modern 'voltage distribution' systems. The circuit is fully floating, maintaining output level even if one phase is inadvertently shorted to ground. Maximum output level is in excess of +26 dBu providing ample headroom in any installation.

4. System Controller

The System Controller is the axis for central control. It is equipped with non-volatile memory for storage of all alphanumeric names, stereo links, crosspoint inhibits, pushbutton tables and crosspoint status in the event of power loss. When power is applied, crosspoints immediately return to their last state and remote control panels are updated to current alpha lists and crosspoint state.

The system has two RS-232 ports for computer interface. The system comes complete with SAS CMC Configuration Management & Control software. The software runs on a PC for programming alphanumerics, stereo links, pushbuttons and other system parameters. The PC communicates to the System Controller on one of the RS-232 ports, J6, System Computer. The other RS-232 port, J7, USI User Serial Interface, is for connection to a user supplied automation computer, audio storage / delivery computer, or other serial device.

The System also has sixteen RS-485 ports for remote control panels. Each port may be programmed to interface with one SAS XY / Automation device or up to two SAS Single Output Remote Control Panels. XY / Automation devices may be full system access XY control panels or an automation system like the GPI 1600 which may access any input / output crosspoints. Single Output Remote Control Panels may be programmed to control

any one system output. If two remote control panels are connected to one RS-485 port, (in party line mode), the second panel must have an address strap installed to properly respond in the allotted 'time slot'. The RS-485 ports are programmed using the SAS CMC software which runs on a PC.

5. System Power Supply

The SAS 16000 utilizes a remote 'desk top' style power supply with wide input voltage and international safety approvals. The power supply should be 'ty-wrapped' to a rack support or other location to maintain good ventilation and provide a tidy installation.

6. Remote Control Panels

Front panel controls are provided to control input to output routing and for programming other operational parameters (see Operation Section 15). In addition to the front panel controls, two basic types of remote control panels are available; single output controllers and full system access controllers.

6.1 Single Output Control Panels

Single output controllers communicate directly to one of the RS-485 serial lines at 76.8 kilobaud. Single output controllers are available in several configurations:

- alphanumeric 8 character LED displays with rotary shaft encoder input selection
- pushbutton input selection
- alpha-numeric display / shaft encoder with 'hot punch' pushbuttons
- single rack unit 19" EIA rack mount controllers
- console or turret mount - very small outline - controllers

All alphanumeric panels provide bright, easy to read eight character dot matrix LED displays for showing source names. The names are displayed in alphabetical order as the Input Select shaft encoder is rotated. This presents the operator with an intuitive interface for selecting sources. The shaft encoders have 36 positions per revolution and no end stops for rapidly accessing the desired source. 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 LEDs in the display control pushbuttons. When the Input Select shaft encoder is rotated the display automatically switches to the Select mode and the available source names are displayed in alphabetical order. After a Take command the display returns to Active mode. Other selectable features are:

- Preset Exchange which allows rapid transitions between two sources, and
- Dynamic Take which switches crosspoints directly as the Input Select knob is rotated

(see Operation Section 14).

The Model ANC-8 is a rack mounted single output alpha control panel. A dual version, the Model ANC-8D, provides two independent sets of controls for control of two outputs in a one rack unit package.

The Model CPI-80 is the smallest alpha controller and is designed for console or turret mounting. The entire electronics assembly, including alpha display, measures 1.4 X 3.3 inches. The Model APC-88 is a console mountable control panel with full eight character alpha capabilities and eight 'hot punch' instant access pushbuttons. It measures 1.4 X 5.3 inches, suitable for most console six inch and larger slots.

Pushbutton input select panels are available with 16 (Model PBS-16) or 32 (Model PBS-32) programmable pushbuttons in a single rack unit chassis. Each pushbutton is programmable to instantly select the programmed source. An LED in the pushbutton confirms the input status. Designation strips are provided with each panel for inserting user legends.

6.2 Full System Access 'X-Y' Control Panels

Remote full system access is allowed via Model AXC-8 Alphanumeric X-Y Control Panel and from an IBM compatible personal computer. XY panels communicate to the system controller 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 to any input / output. XY panels may be programmed to access only a selected group of destinations. Each AXC-8 panel is independently programmable to 'lock out' any output(s).

The Model AXC-8 Alphanumeric XY Control Panel provides 2 eight character LED displays, one for source names and one for destination names. Shaft encoders allow selection of the desired input and output. The output names are displayed in alphabetical order as the Output shaft encoder is rotated. The input LED display will show the input that is currently Active or the input which has been Selected (preset) for a Take transition using the Input shaft encoder. Display mode is indicated by the LEDs in the display control pushbuttons. When the Input Select shaft encoder is rotated the display is automatically switched to the Select mode and available source names are displayed in alphabetical order. After a Take command the display returns to Active mode.

The AXC-8 display can also show the Numeric value of the source and destination. If the Active pushbutton is pressed after the display is in Active mode the panel displays will change to show the numeric value of the input and output. This is a useful feature for the technical user to find out the physical (numeric) input or output which a particular name is programmed to without having to return to the computer alpha programming screens to perform a cross-reference.

7. Specifications

System

Gain	0 dB \pm 0.2 dB, 20-20kHz.
Frequency Response	\pm 0.1 dB, 20-15kHz. +0/-0.25 dB, 20kHz.
Noise	<-90 dBu, 20kHz. bandwidth
Dynamic Range	>118dB, 20 kHz bandwidth noise floor
THD	<0.05%, 20-20kHz.
IM [SMPTE]	<0.05%
Crosstalk	<-80dB, 20-20kHz., adjacent inputs fed <-100dB typical, 1kHz.

Audio Inputs

Input Impedance	>40 kohms, balanced
Max. Input Level	+26dBu
CMRR	exceeds 70dB, 20-20kHz. -90dB typical 50/60 Hz.

Audio Outputs

Source Impedance	60 ohms
Max. Output Level	+26dBu, 10 kohm load +24dBm, 600 ohm load

Serial Interface

System Computer, PC	RS-232C, 19.2 kilobaud
USI User Serial Interface	RS-232C, 9600 baud
Control Head Format	RS-485 (RS-422 full duplex), 76.8 kilobaud

General

Power Requirements	100 / 240 VAC \pm 10%, 40 VA max.
Physical Size	3.5"H X 19"W X 16"D [2 EIA rack units]

Notes:

0dBu	= 0.775 V rms
0dBm	= 1 milliwatt = 0.775 V rms across 600 ohms

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

8. Installation

Each SAS 16000 occupies 2 rack units (RU) of space. The desk top style power supply should be 'ty-wrapped' to a rack support or other location to maintain good ventilation and provide a tidy installation.

The audio I/O and serial data connections are via 50 pin micro-ribbon (Amphenol / Champ / etc..) connectors. These connectors offer high reliability, ready availability and low installed cost. SAS interlaces signal pairs and shield (system Common) pairs to provide a very flexible interface, capable of connecting with pre-wired punch or terminal blocks. The interlaced Commons allow shield connection points when using shielded cable for connecting to studios and other points within the facility. See Wiring Diagram 16BW1. SAS offers overall shielded cables for audio connections and Category 3 cables for data connections.

9. Audio Input Interconnect

Each input connector services 16 audio inputs. Refer to Wiring Diagram 16BW1. Adjacent inputs may be 'linked' to operate as stereo using the SAS CMC Configuration Management & Control software. When adjacent inputs are 'linked' the right channel will automatically follow the left. The system will address the stereo pair by the alphanumeric name given to the low number (left) source. The numeric value of the stereo pair is also the number of the 'left' channel input. The high number (right channel) alpha name should be 'masked' by giving its alpha name the right hand brace bracket '{ ' as the first character, which will 'hide' the undesired alpha from all control panels and the front panel display.

<u>Audio Inputs Serviced</u> (see above)	<u>Rear Connector</u>
1 to 16	J1
17 to 32	J2

10. Audio Output Interconnect

Each output connector services 16 audio outputs. Refer to Wiring Diagram 16BW1. Adjacent outputs may be 'linked' to operate as stereo using the SAS CMC Configuration Management & Control software. When adjacent outputs are 'linked' the right channel selection will automatically follow the left. If a mono source is selected it will automatically be selected to both left and right outputs. The system will address the stereo pair by the alphanumeric name given to the low number (left) destination. The numeric value of the stereo pair is also the number of the 'left' channel output. The high number (right channel) alpha name should be 'masked' by giving its alpha name the right hand brace bracket '{ ' as the first character, which will hide the undesired alpha from the front panel display.

<u>Audio Outputs Serviced</u> (see above)	<u>Rear Connector</u>
1 to 16	J3
17 to 32	J4

11. RS-232 / RS-485 Serial Control Port Connections

The system has two RS-232 ports, one for local computer control and one for automation or slave interconnect. The system comes complete with SAS CMC Configuration Management & Control software. The software runs on a PC for programming alphanumerics, stereo links, pushbuttons and other system parameters. The PC communicates to the SAS 16000 on one RS-232 port, J6, System Computer. The other RS-232 port, J7, USI User Serial Interface, is for connection to an SAS 16000 slave chassis or a user supplied automation computer, audio storage / delivery computer, etc. The RS-232 connectors are industry standard 9 pin D sub pinout: TX pin 2, RX pin 3, Gnd Pin 5.

The System also has sixteen RS-485 control ports for remote control panels on connector J5. Refer to Wiring Diagram 16BW1. Each port may be programmed to interface with one SAS XY / Automation device or up to two SAS Single Output Remote Control Panels.

XY / Automation devices may be full system access XY control panels or an automation system like the GPI 1600 which may access any input / output crosspoints.

Each RS-485 port may connect to two Single Output Remote Control Panels at separate addresses, A1 and A2. Each port address may be programmed to control any one of the 32 system outputs. See Section 13.3.5. The RS-485 port addresses are programmed using the SAS CMC software which runs on a PC. SAS single output control panels will communicate at address A1 by default when connected to one of these RS-485 ports. If the panel is to control the output which is programmed to port address A2, an address jumper must be installed on the mating 9 pin D sub connector (pins 2-6 for rack mount panels, pins 6-7 for console mounted panels). Two control panels connected to the same serial line at the same address (e.g. both panels have no address jumpers) will not function. A1 does not require an external address strap on the control panel mating connector (default) and A2 does require the strap. When outputs are 'linked' to operate as a stereo pair the control is made referring to the low (or left) number. The right channel selection will automatically follow.

The RS-485 cable connects serial data at 76.8 Kbaud. Low capacitance shielded data cable such as Belden 1800A (single pair) or 1805A (8 pair) is recommended. Maximum cable length should not exceed 300 feet from control panel to SAS 16000. The data cables can be terminated with a 110 ohm resistor if longer cable runs will be encountered.

The SAS 'standard' rack mounted control panel serial data interface connector is a 9 pin D subminiature, male on panel, female on cable.

Rack Mounted Control Panel connections are:

Pin 1: Shield
Pin 4: Data +
Pin 5: Data -

Pin 2: Address Common
Pin 6: A1, address bit 1
Pin 7: A2, address bit 2
Pin 8: A3, address bit 3

Note that each control panel requires a ground reference, usually through the shield back to the central equipment area. If unshielded wiring is utilized then Pin 1 should be connected to technical ground, either through a wire to the technical ground bus close to where the panel is located or through an additional wire which runs along with the data pair back to the central equipment area.

The console mounted control panels have slightly different pin outs, described here. The console mounted units are very small and this necessitated the use of one interface connector for RS-485 data, DC power and address / option bits. The CPI-80 panel was developed first, and the APC-88 expanded the addressable capabilities by adding one extra bit on the D sub connector:

Console Mounted Panels (male on panel: female on cable)

Pin 1: Shield

Pin 4: RS-485 +

Pin 5: RS-485 -

Pin 2: Power Common

Pin 3: +8 to 12 VDC, 200 mAmp

CPI-80

Pin 6: Common

Pin 7: A1, address bit 1 / Option A

Pin 8: Common

Pin 9: A2, address bit 2 / Option B

APC-88

Common

A1, address bit 1 / Option A

A2, address bit 2 / Option B

A3, address bit 3 / Option C

Pins 6 & 7 are used to strap the CPI or APC for 'even mono' operation.

See the section on central system programming regarding naming conventions. Sources and destinations which are unused should have the right hand brace bracket '{' as the first character. This removes the names from the alpha directory for remote control panels. Note that the right channel of a stereo source or destination should also be 'bracketed out' to eliminate clutter or confusion.

11.1 Master - Slave Interconnect

When a Slave chassis is added to allow 32 X 32 all stereo operation, the Left audio I/O connects to the Master chassis and the Right audio I/O connects to the Slave. All control is via the Master, both front panel and remote control panels. The Slave communicates to the Master by connecting the Slave chassis 'System Computer' port, J6, pins 2,3(5), to the Master chassis 'USI', J7, pins 3,2(5) [+,-(shield)]. If you have an external computer or other system which communicates serially it may be connected to the Slave chassis USI connector.

12. Audio Monitor Connections

Connector J9 provides the audio input to the monitor amplifier / loudspeaker. For convenience the connector has system outputs 1 and 32 also available. The unit leaves the factory with a dummy plug which connects system output 32 to the monitor input. It is common to dedicate an output to the central rack area, where signals may be monitored and / or measured. This is the output which should be bridged to the monitor input.

13. Central System Programming & Control

Total system configuration and operational control of the SAS 16000 is provided through software operating an IBM compatible personal computer. The 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, inhibits, control panel configuration as well as monitoring and controlling the crosspoint matrix. Off-line editing of user configuration options allows system configurations to be stored to hard disk for archiving. The PC is only required for system setup; it is not required for day to day system operation. It may, however, provide useful information and control if it is made available.

13.1 PC Requirements

Sierra Automated Systems recommends that the IBM compatible personal computer which will run the software be dedicated exclusively to router control and not used for general computer tasks. Also, the machine should meet the following minimum requirements:

1. Intel based 80486 - 66 MHz processor.
2. VGA color monitor and video card (640x480 16 color).
3. Eight (8) megabytes of RAM (If Windows is to be used).
4. Two (2) RS-232 serial I/O ports.
5. One (1) 3 1/2" 1.44 meg floppy disk drive.
6. A fast hard drive with a 2 meg disk cache (Microsoft SmartDrive).
7. A Logitek Bus Mouse, set to COM 5, IRQ 7

Note that items 6 and 7 are recommended so that SAS Model GPI 1600 Automation can be run on the same computer simultaneously. Once the automation software is set up and operational it typically will run 24 hours per day, 7 days a week.

Connect one PC serial port to the SAS 16000. Note that the SAS software defaults to COM 2, but may be changed via command line switches as required (see below).

<u>System Computer Port</u> <u>DB9 male on cable</u>	<u>to Computer RS-232</u> <u>DB9 female on cable</u>	<u>OR</u>	<u>DB25 female on cable</u>
	(cable)		
TX pin 2 > -----	< RX pin 2		RX pin 3
RX pin 3 > -----	< TX pin 3		TX pin 2
Gnd pin 5 > ----- shield	< Gnd pin 5		Gnd pin 7

13.2 PC Software Installation

To install the SAS Automation Software insert the software disk in the computers floppy drive, switch to the drive letter for the floppy drive (either A: or B:) and type "INSTALL A: C:" (without the quotes). The install batch file will create a directory on the computers hard drive called C:\SASTERM and copy the program files into it. The software may be installed in a different drive/directory by manually creating a directory in the desired location and copying the program files into it.

To start the software, change to the SASTERM directory and type SASTERM <Enter>. There are several options which should be addressed when setting up the system. Typing the command SASTERM /? will list the options on the screen. The defaults are:

19200 baud, 8 data bits, no parity, 1 stop bit, COM 2:, save settings on exit and load at startup

The options are:

/R=X	Recall last exit configuration, 'Y' or 'N'
/Q=X	Save configuration on exit, 'Y' or 'N'
/F=X	Download (fetch) configuration data from system frame on startup, 'Y' or 'N'
/B=XXXX	Set baud rate to XXXX (hardware requires default of 19200)
/D=X	Set data bits to X
/S=X	Set stop bits to X
/P=X	Set port to X, COM 1 through 4 supported
/T=C	Set parity to C; N - none: E - even: O - odd

If the defaults are acceptable it is not necessary to type any options. If you wish to change any of the options, add them to the command line after a space. Note that the communication baud rate and other settings must match the hardware, and should not be adjusted. Only the COM port is likely to need adjustment.

The software operates under DOS. If multi-tasking software such as Microsoft Windows is used, and properly configured, the computer may also be used to run the SAS Model GPI 1600 Automation package. The GPI 1600 provides time based automation of switcher commands and 16 relays for machine control or other general purpose application.

13.3 Main Menu

The Main Menu of the system control software is shown below. The selections are divided into functional groups to help you program system operating parameters. Each of the selections has comprehensive on-line Help available to guide you through any questions which may come up while programming the system. The following sections briefly describe the system programming.

```
SIERRA AUTOMATED SYSTEMS

[ MAIN SYSTEM CONTROL MENU ]

1) Edit Input Alpha Labels & Links
2) Edit Output Alpha Labels & Links
3) Edit Pushbutton Assignments
4) Dynamic Crosspoint Map
5) Configure Serial Control Ports
6) Save Complete System To Disk
7) Restore Complete System From Disk
8) Retrieve Current System Configuration
9) Exit Software

Mon Dec 16 16:49:17 1996          PORT: COM2 - BAUD: 19200 - CONNECTED (YES)
```

The bottom line of this screen displays basic system information. The PC port and baud rate (always 19200 baud) are shown and the communication status of the PC to MCU link is displayed. If the serial communication is disrupted the (YES) will immediately reflect (NO).

You may press <F1> or click with the mouse on SIERRA AUTOMATED SYSTEMS to display the pop up box below. This information will be helpful when communicating to the factory.

```
SIERRA AUTOMATED SYSTEMS

SAS16000 SYSTEM CONTROL SOFTWARE
ver 1.01 Free Mem: 11536, 1604320

SIERRA AUTOMATED SYSTEMS
2112 N. Glenoaks Blvd.
Burbank. CA 91504
(818) 840.6749

Disk
```

13.3.1 Edit Input Alpha Labels and Links

This menu is used to program the alphanumeric names which the operators will use to select sources and to program the stereo 'links'.

Each alphanumeric name can be up to 8 ASCII characters. The names will be presented to the operators in alphanumeric order. The sort routine operates based on the leftmost character first. Normally you would left justify the names. You could shift a group of names to the right by a 'space' (or any other ASCII character) if it is required to isolate a group of names.

Use the arrow and tab keys or the mouse to highlight the name which you wish to edit. The channel notes area provides a 'scratchpad' to write information about the source. Use <F2> or the mouse to enter the area and <Enter> to save the note to disk.

The naming convention allows for 'masking' or removing names which are not installed or any name that you do not want presented to the operators. The first character must be the left hand brace bracket '{' for names which you do not want displayed on remote control panels.

'Stereo linking' is provided to allow adjacent inputs to operate as a stereo pair, and to be treated as one source. Use the <Control - Tab> key combination or click with the mouse in the link area of the screen to set or remove stereo links. When two sources are linked to operate as a stereo pair the stereo source will be identified with the left channel alphanumeric name and number. The right channel alphanumeric name should be 'masked' by using the left hand brace bracket '{' as the first character. This prevents confusion when scrolling through the source names on an output control panel. The right channel will automatically follow when the stereo source is selected to a stereo linked output. If the stereo source is selected to a mono destination the left channel will be selected.

NUM	ALPHA	LINK	NUM	ALPHA
01	STUDIO A		02	STUDIO B
03	STUDIO C		04	STUDIO D
05	STUDIO K		06	FM PROD
07	REMOTE 1		08	REMOTE 2
09	REMOTE 3		10	REMOTE 4
11	AM CTL A	<-->	12	{AM CTRL
13	AM CTL B	<-->	14	{AM CTRL
15	FM CTL K	<-->	16	{FM CTRL
17	FM CTL C	<-->	18	{FM CTRL
19	TAPE 1	<-->	20	{TAPE 1R
21	TAPE 2	<-->	22	{TAPE 2R
23	AP NET 1	<-->	24	{AP NETR
25	AP PGM M		26	AP PGM 2
27	PHONE 1		28	PHONE 2
29	PHONE 3		30	PHONE 4
31	SATELITE		32	TWO WAY

EDIT INPUT ALPHA LABELS

· SELECTED CHANNEL NOTES ·

Studio feed routed through
patchbays PB112, 113 & 126

FILENAME []

·

CTL TAB	TAB	F1	F2	F4	F5	F6	F7		F9	ESC
Link	L-R Ch	Help	Notes	Print	Save	Load	Send		SndLnk	Menu

When the input list has been edited it is necessary to upload the new information to the SAS 16000 system controller. The <F7> key sends the complete alphanumeric and link list to the system. If changes are made only to the stereo links the <F9> key sends the link list only, which is faster than sending the complete alpha tables.

The input alpha/link list may be saved to a file on disk by pressing <F5>. The software will prompt you for a file name to save the list to. The <F6> key will recall a previously saved input alpha/link file into the software. The list must be uploaded to the system using the <F7> key before the settings become active. Note that complete system settings (input & output alphas/links, notes, port configuration, inhibits and pushbutton tables) may be saved to or retrieved from disk using main menu choices 5 & 6. These settings are loaded into the PC software from disk. For any list to be used by the routing system it must be uploaded using the <F7> key from the editing menus.

13.3.2 Edit Output Alpha Labels and Links

This menu is used to program the alphanumeric names which the system provides for destination names and to program the stereo output 'links'. These destination names will be available on the XY control panel display.

Each alphanumeric name can be up to 8 ASCII characters. The names will be presented to the operator in alphanumeric order. The sort routine operates based on the leftmost character first. Normally you would left justify the names. You could shift a group of names to the right by a 'space' (or any other ASCII character) if it is required to isolate a group of names.

Use the arrow and tab keys or the mouse to highlight the name which you wish to edit. The channel notes area provides a 'scratchpad' to write information about the source. Use <F2> or the mouse to enter the area and <Enter> to save the note to disk.

NUM	ALPHA	LINK	NUM	ALPHA
01	WBZ AIR	<-->	02	{WBZ R
03	KFWB AIR	<-->	04	{KFWB R
05	WODS AIR	<-->	06	{WODS R
07	KABC PGM		08	KABC BAK
09	KMPC PGM		10	KMPC BAK
11	ISDN 1		12	ISDN 2
13	ISDN 3		14	ISDN 4
15	REMOTE 1	<-->	16	{REMOT1R
17	REMOTE 2	<-->	18	{REMOT2R
19	OUT 19		20	OUT 20
21	OUT 21		22	OUT 22
23	OUT 23		24	OUT 24
25	OUT 25		26	OUT 26
27	OUT 27		28	OUT 28
29	OUT 29		30	OUT 30
31	OUT 31		32	OUT 32

EDIT OUTPUT ALPHA LABELS

• SELECTED CHANNEL NOTES •

FILENAME []

CTL TAB	TAB	F1	F2	F4	F5	F6	F7		F9	ESC
Link	L-R Ch	Help	Notes	Print	Save	Load	Send		SndLnk	Menu

The naming convention allows for 'masking' or removing names which are not installed or any name that you do not want presented to the operators. The first character must be the left hand brace bracket '{' for names which you do not want displayed on remote control panels.

'Stereo linking' is provided to allow adjacent outputs to operate as a stereo pair, and to be treated as one destination. Use the <Control - Tab> key combination or click with the mouse in the link area of the screen to set or remove stereo links. When two outputs are linked to operate as a stereo pair the stereo destination will be identified with the left channel alphanumeric name and number. The right channel alphanumeric name should be 'masked' by using the left hand brace bracket '{' as the first character. This prevents confusion when scrolling through the destination names on a control panel. The right channel input will automatically follow when a stereo source is selected to a stereo linked output. If a mono source is selected to a stereo destination it will be selected to both left and right outputs.

When the output list has been edited it is necessary to upload the new information to the SAS 16000 system controller. The <F7> key sends the complete alphanumeric and link list to the system. If changes are made only to the stereo links the <F9> key sends the link list only, which is faster than sending the complete alpha tables.

The output alpha/link list may be saved to a file on disk by pressing <F5>. The software will prompt you for a file name to save the list to. The <F6> key will recall a previously saved output alpha/link file into the software. The list must be uploaded to the SAS 16000 using the <F7> key before the settings become active. Note that complete system settings (input & output alphas/links, inhibits, port settings and pushbutton tables) may be saved to or retrieved from disk using main menu choices 6 & 7. These settings are loaded into the PC software from disk. For any list to be used by the routing system it must be uploaded using the <F7> key from the editing menus.

13.3.3 Edit Pushbutton Tables

This menu is used to program the source to be selected by pushbuttons on output remote control panels which provide 'hot punch' programmable pushbuttons. Output control panels are available with 8, 16 and 32 pushbuttons. Each pushbutton list provides 32 button locations. When programming the list for a panel with 8 pushbuttons, the first eight button selections will determine the source assignments. The other buttons selections become 'don't care'.

The SAS 16000 provides 32 Templates of 32 Buttons each for pushbutton programming. Each destination (output) may use any template. The software defaults with all outputs utilizing template 1. Using the <Page Up> <Page Down> keys scroll to the output which you wish to program. You may also click with the mouse in the field and type in the output number. Select a template to use. Other outputs which are currently using the template will show up in the lower area of the screen. If more outputs use the template than will fit in the area provided, the number of additional outputs using the template will be indicated. The template table may be freely edited in this screen. Use the arrow keys or the mouse to position the cursor in the field to be edited. Type the number of the source to be assigned to the pushbutton and press <Enter>. If you make a mistake press <Escape> and start again. You may also scroll through the list of sources by pressing <Spacebar> to pop up the input list and <Enter> to select the desired source.

EDIT PUSHBUTTON TABLES

PB01 001 STUDIO A	PB02 002 STUDIO B	PB03 003 STUDIO C	PB04 004 STUDIO D	PB05 005 STUDIO K	PB06 006 FM PROD	PB07 007 REMOTE 1	PB08 008 REMOTE 2
PB09 009 REMOTE 3	PB10 010 REMOTE 4	PB11 011 AM CTL A	PB12 012 {AM CTRL	PB13 013 AM CTL B	PB14 014 {AM CTRL	PB15 015 FM CTL K	PB16 016 {FM CTRL
PB17 017 FM CTL C	PB18 018 {FM CTRL	PB19 019 TAPE 1	PB20 020 {TAPE 1R	PB21 021 TAPE 2	PB22 022 {TAPE 2R	PB23 023 AP NET 1	PB24 024 {AP NETR
PB25 025 AP PGM M	PB26 026 AP PGM 2	PB27 027 PHONE 1	PB28 028 PHONE 2	PB29 029 PHONE 3	PB30 030 PHONE 4	PB31 031 SATELITE	PB32 032 TWO WAY

EDITING OUTPUT [001] (WBZ AIR) TEMPLATE [01] FILE(none..,)

— OUTPUTS USING THIS TEMPLATE — [16 More]

WBZ AIR	KFWB AIR	WODS AIR	KABC PGM	KMPC PGM	ISDN 1	ISDN 3	REMOTE 1
{WBZ R	{KFWB R	{WODS R	KABC BAK	KMPC BAK	ISDN 2	ISDN 4	{REMOT1R

<CTL>PG UP/DN	PG UP/DN	SPACE BAR	F1	F5	F6	F7	←↑↓→	ESC
Template Sel	Output Sel	Alpha Sel	Help	Save	Load	Send	Move	Menu

When the pushbutton list has been edited it is necessary to upload the new information to the SAS 16000 system controller. The <F7> key sends the complete list of all pushbutton assignments to the system.

The pushbutton assignment list may be saved to a file on disk by pressing <F5>. The software will prompt you for a file name to save the list to. The <F6> key will download a pushbutton assignment file into the software. The list must be uploaded to the system controller using the <F7> key before the settings become active. Note that complete system settings (input & output alphas/links, inhibits, port assignments and pushbutton tables) may be saved to or retrieved from disk using main menu choices 6 & 7. These settings are loaded into the PC software from disk. For any list to be used by the routing system it must be uploaded using the <F7> key from the editing menus.

13.3.4 Dynamic Crosspoint Display - Display, Control & Inhibits

This menu choice provides a means to control the matrix, to visually monitor crosspoint activity and to establish Inhibits which prohibit the selection of a source to destination crosspoint.

The Dynamic Crosspoint Display is organized with outputs down the left side of the screen and inputs across the screen, left to right. Each page shows 16 outputs. To 'page' up and down to different output groups use the <Page Up> and <Page Down> keys. The arrow keys and the mouse may be used to move the cursor around the screen. As the cursor is moved the alphanumeric designation of the input and output for that crosspoint are shown in a box in the upper left of the screen. The <T> key will Take the crosspoint where the cursor is located. If you move to the crosspoint location with the mouse, click to position the underscore cursor and then activate with the <T> key to Take or click in the (T)ake box at the bottom of the screen.

Stereo linked output pairs are shown with a vertical 'link bar' connecting left (upper) and right (lower) channels. The system will not allow direct control of a right channel output. The source which is selected to the right output channel is always calculated from the left channel selection. To select sources to stereo destinations, make your selection to the left channel and the right will automatically follow. When the left channel of a stereo input pair is selected to a left output, the right channel input will be automatically selected to the right output. If a mono source is selected it will be connected to both the left and right outputs. The alphanumeric names of the crosspoint are shown in the upper left corner of the screen, and are helpful for source / destination identification.

		DYNAMIC CROSSPOINT DISPLAY SCREEN																															
User Alphas		1								10								20								30							
AM CTL A KFWB AIR		123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789	0123456789								
[	OUTPUT 01	----	X----	-----	I-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----						
	OUTPUT 02	----	X----	-----	I-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----							
[	OUTPUT 03	--IX----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----						
[	OUTPUT 04	--IX----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----						
[	OUTPUT 05	-----	-----	-----	X-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----						
	OUTPUT 06	-----	-----	-----	X-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----							
	OUTPUT 07	--X-I----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----							
	OUTPUT 08	--X-I----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----							
	OUTPUT 09	-----	X-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----							
	OUTPUT 10	-----	X-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----							
	OUTPUT 11	-----	X-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----							
	OUTPUT 12	-----	X-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----							
	OUTPUT 13	-----	X-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----							
	OUTPUT 14	-----	X-----	-----	I-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----							
[	OUTPUT 15	-----	X-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----						
[	OUTPUT 16	-----	X-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----						

(T)ake Take Xpoint	(I)nhhibit Set Inhibit	F7 Send Inhibits	PG UP/DOWN Output Page	F1 Help	←↑↓→ Move	ESC Menu
-----------------------	---------------------------	---------------------	---------------------------	------------	--------------	-------------

Inhibits will prevent the selection of a source to the destination. Move the cursor to the desired input/output on the screen and press the 'I' key or click in the (I)nhhibit box at the bottom of the screen. A red 'I' will now be shown at the output/input location showing the inhibit status. After marking the Inhibits you must 'Send' the inhibit list to the SAS 16000 using the <F7> key. If you attempt to Take an Inhibited input to an output using the SAS 16000 front panel controls the display will not show any change, since no change is allowed. If a remote output control panel attempts to Take an Inhibited source it will briefly flash the word 'Inhibit' in the display before returning to Active display mode, showing the source which is currently selected to that destination.

Another feature which is available from this matrix screen is 'stereo reverse'; the right channel input is selected to the left channel output and the left channel input is selected to the right channel output. If the right channel of a stereo input pair is selected to the left channel output, the system will automatically select the left channel of the stereo input pair to the to the right output using the stereo link. This feature is not typically accessed from remote control panels, although it can be made available. Remote control panels on the SAS 16000 system always control the left channel output of a stereo pair. Pushbutton panels may have any pushbutton

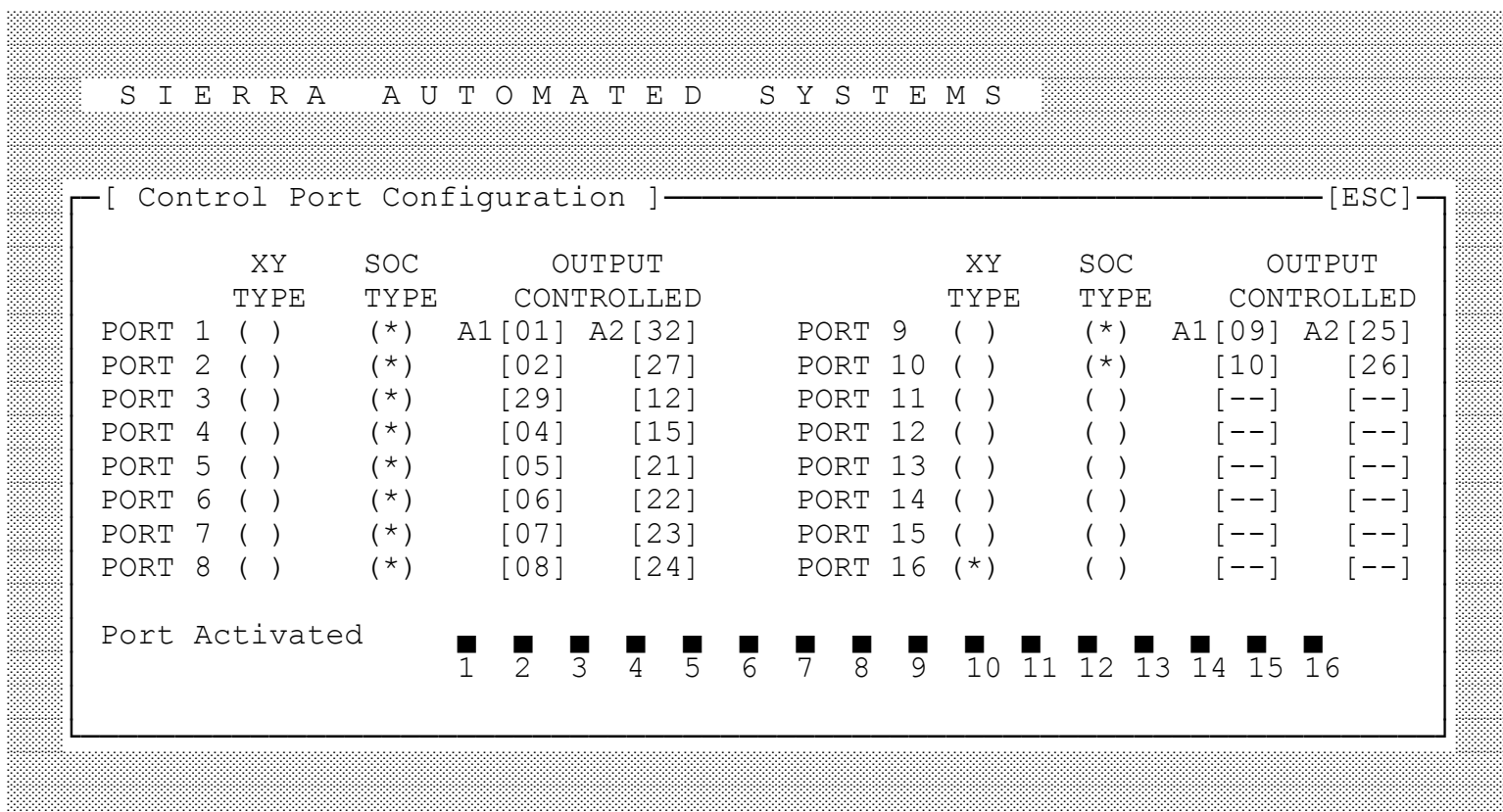
programmed to any source. If a right channel source is programmed to a pushbutton, the panel will be able to select the 'stereo reverse'. There are limited applications where this feature may be useful. We recommend that the right channel alphanumeric name be 'masked' so that it does not appear on the display of alphanumeric remote control panels. To make the 'stereo reverse' feature accessible from alphanumeric remote control panels the right channel name should not be masked. The name should be chosen to make it clear to the operator that the right, or reverse, channel will be selected.

13.3.5 Configure Serial Control Ports

This menu allows each of the 16 SAS RS-485 serial ports to be configured. Each port may be disabled (default) or enabled to communicate with 'SOC single output control panels' or with 'XY full system access' devices.

When the port is enabled to communicate with SOC panels the port will address up to two control panels, with addresses A1 and A2. SAS single output control panels will communicate at address A1 by default when connected to one of these RS-485 ports. If the panel is to control the output which is programmed to address A2, an address jumper must be installed on the mating 9 pin D sub connector (pins 2-6 for rack mount panels, pins 6-7 for console mounted panels). Two control panels connected to the same serial line at the same address (e.g. both panels have no address jumpers) will not function.

When the port is enabled to communicate with XY full system access devices such as a Model AXC-8 XY Control Panel or a GPI 1600 Automation Controller, only one panel is supported per port.



Tue Sep 09 16:43:27 1997

PORT: COM1 - BAUD: 19200 - CONNECTED (YES)

13.3.6 Save Complete System to Disk

This menu choice allows you to archive the system alphanumeric labels, stereo link assignments and pushbutton templates & assignments to a file on your computer disk drive. When you have your system properly configured for operation you should save these assignments and store the file on a floppy disk as a back up. The system automatically saves the 'current configuration' when exiting the software. However, it is prudent to archive the information when changes are made which affect the system configuration.

13.3.7 Restore Complete System from Disk

This menu choice will load an archived configuration into the system software. The settings will not be transferred to the system equipment unless you intentionally enter into menu choices 1, 2 & 3 and Send the settings to the system frame using <F7>. Before restoring system settings from an archive file be sure to save the current configuration to an archive file if the settings are current and not yet archived. If you restore a file without first archiving the 'current' configuration you can recover the settings from the system frame with menu choice #8 as detailed below.

13.3.8 Retrieve Current Frame Configuration

This option will download the configuration information from the equipment frame into the software on the PC. This is useful if you are using a PC like a laptop which may not have the current system settings in memory or on disk.

13.3.9 Exit

This option exits the software and saves the 'current' system settings to a file on disk (default).

14 Control Panel Operation

14.1 Front Panel Controls

Front panel mounted controls are provided to Select and Take any source to any destination. Rotate the Destination shaft encoder to the desired output and the vacuum fluorescent display will show the currently selected source and the preset source. The Preset source will be instantly selected to the destination if the red Take switch is depressed.

In addition to the crosspoint controls there are three yellow pushbuttons which allow configuration of operational parameters. By pressing the F1 / MODE pushbutton the display will go through the available options.

14.1.1 Display Sort Mode

As the shaft encoders are rotated to scroll through the destinations or sources, the names may be sorted in alphanumeric order or numeric order. The remote control panels always sort in alphanumeric order, A to Z to simplify the selection process for the operators. The SAS 16000 front panel controls may be set to scroll in numeric mode, 1 to 32, which may be useful for engineering during installation. Note that 'masked' names which have been assigned the left hand brace bracket '{' as their first character using the CMC software will not show in the display in either mode.

14.1.2 Preset Exchange Mode

When a source is Taken to a destination, the SAS 16000 may put the previously Active source into the Preset location so that rapid transitions between two sources may be accomplished with repeated presses of the Take pushbutton. This mode of operation is called Preset Exchange. If you respond with 'no' to the preset exchange option the system will Take the preset source, but not update the Preset location. The system requires the operator to scroll the source shaft encoder to preset another source for a Take transition.

14.1.3 Crosspoint Mode

The current revision of software only operates in 'crosspoint mode'. Later revisions are planned to include Salvo mode, which will allow programming several crosspoint changes to one event name, and Snapshot mode, which will allow store and recall of the input/output map for all 32 outputs.

14.2 Model ANC-8 and ANC-8D Single Output Alphanumeric Control Panels

The ANC rack mounted single output alphanumeric control panels may be operated in three distinct modes:

- Select and Take Mode, and
- Preset Exchange which allows rapid transitions between two sources, and
- Dynamic Take which switches crosspoints directly as the Input Select knob is rotated

The panels default on power up to Preset Exchange, where the preset source is taken and the previously active source is put into the Select memory. By repeatedly depressing the Take pushbutton the two sources are alternately taken. This can be very useful if comparison of the two sources is desired.

The mode may be changed by depressing and holding the two display control pushbuttons and then pressing the large Take pushbutton. The display will show the mode as

SEL w/EX for Select and Take with Preset Exchange
SEL noEX for Select and Take without exchange
Dyn Take for Dynamic Take

Select and Take Mode without exchange will not automatically update the Select or preset location. The operator must manually select the next source to be taken.

Dynamic Take simply emulates a rotary switch. Each click of the shaft encoder will Take the next source in alphabetical order. The Take pushbutton is inactive.

14.2.1 Address Jumpers

The SAS16000 has sixteen RS-485 data ports to support remote control panels. When a port is enabled to communicate with single output control panels (such as the ANC-8 or 8D) the port will address up to two control panels, with addresses A1 and A2. SAS single output control panels will communicate at address A1 by default when connected to one of these RS-485 ports. If the panel is to control the output which is programmed to address A2, an address jumper must be installed on the mating 9 pin D sub connector (pins 2-6 for rack mount panels, pins 6-7 for console mounted panels). Two control panels connected to the same serial line at the same address (e.g. both panels have no address jumpers) will not function.

SAS16000 (Control Port)	(cable)	To ANC-8/D (P1) Rear DB9 Male (RS-485/power)
Signal	gnd >----- shield -----<	pin 1
Signal	- >-----<	pin 5
Signal	+ >-----<	pin 4

Address Strap

Address	Common >-----<	pin 2
Address	A1 >-----<	pin 6

14.3 Model CPI-80 and APC-88 Alphanumeric Control Panels, Console Mounted

The Model CPI-80 and APC-88 control panels are compact assemblies which may be mounted in most commercial audio consoles and other 'custom' applications. A 9 pin D sub-miniature connector is provided on the rear of the module for connection to the SXT-32 data port and to a local power supply. These units require a DC power source, 8 to 12 volts DC with a current requirement of 200 milliAmps maximum. Each unit is shipped with a wall mount power supply and mating connector. For installations where several console mounted control heads will be located a 1.5 amp 12 volt DC power source will suitably supply up to 8 control panels. At each location where multiple console mounted control panels are required, a splitter as detailed in drawing SP8W01 is recommended for distributing power and RS-485 data to each panel. A splitter panel, Model SPA-80, may be ordered from Sierra Automated Systems for this purpose. Many engineers prefer the distributed nature of the wall mount supplies. Connection from the APC-88 to the Control Port connector of the SAS 16000 is as follows:

SAS 16000 (Control Port) (cable) To CPI-80 (P1) Rear DB9 Male (RS-485/power)

Signal gnd >---- shield -----< pin 1
 Signal - >-----< pin 5
 Signal + >-----< pin 4

Power Supply

+12v >-----< pin 3
 Gnd >-----< pin 2

Address Strap (see Option A section following)

Address Common >-----< pin 6
 Address A1 >-----< pin 7

14.3.1 Power On Initialization.

When power is applied, the CPI-80 / APC-88 will go through an initialization period where it checks all option jumpers. The unit will display "HELLO" for a few seconds, followed by option messages "OPTION A" and/or "OPTION B". The messages are displayed for a few seconds if the option jumper is installed. The option message is simply not displayed when the jumpers are not installed. The final message indicating the switch mode is then displayed. "SW. NORM" is displayed for normal "Select and Take" mode switching, and "SW. DYN" is displayed for "Dynamic" switching; this is set by the Switch mode jumper. The Switch mode is the final initialization display and is followed by showing the currently selected crosspoint (by alpha name) or "NO SXT" if there is no data connection between the panel and the SXT-256. The panel will wake-up in display "Active" mode with the first source (alphabetically) designated in the pre-select register. These compact panels have only one display control pushbutton; when the LED is extinguished the display is showing the Active source. When the LED is illuminated the display is showing the Selected or preset source.

14.3.2 Jumper Options.

Option A: Address Jumper

The SAS 16000 has sixteen RS-485 data ports to support remote control panels. When a port is enabled to communicate with SOC panels the port will address up to two control panels, with addresses A1 and A2. SAS single output control panels will communicate at address A1 by default when connected to one of these RS-485 ports. If the panel is to control the output which is programmed to address A2, an address jumper must be installed on the mating 9 pin D sub connector (pins 2-6 for rack mount panels, pins 6-7 for console mounted panels). Two control panels connected to the same serial line at the same address (e.g. both panels have no address jumpers) will not function.

Option A not installed:
 CPI-80 will control and display status of the A1 channel.

Option A installed (pin 6 jumpered to pin 7):
 CPI-80 will control and display status of the A2 channel.

Option B: Preset Exchange

Option B is a jumper that is installed on the mating connector (female cable end) of the 9 pin D RS-485 system connector P1. Jumper pins 6 to 8 for the APC-88 or pins 8 to 9 for the CPI-80 to enable option B.

Option B not installed:
'Preset Exchange' mode is **not** enabled.

Option B installed:
'Preset Exchange' mode is enabled. This allows repeated rapid transitions between two sources. When a new input selection is made, the previously ACTIVE input is put into the SELECT or preset position. Depressing the TAKE switch again will 'swap' the two sources.

Option C: Take Switch Control Mode.

Option C is a jumper that is installed on the mating connector (female cable end) of the 9 pin D RS-485 system connector P1 for the APC-88. Jumper pins 6 to 9. For the CPI-80 place a jumper on Auxiliary connector J1 pins 1 and 2 (the TAKE switch pins).

The CPI-80 / APC-88 can operate in 2 control modes: "Select and Take" or "Dynamic". Normal operating mode is Select and Take, where a TAKE pushbutton action is required to actually switch to the crosspoint that has been preselected using the shaft encoder. In the "Dynamic" control mode crosspoints will be switched immediately as the shaft encoder is adjusted.

Option C not installed:
'Select and Take' mode. Normal setting.

Option C installed:
'Dynamic' switch mode.

Preset Display Blink

The CPI-80 / APC-88 is shipped with the PRESET DISPLAY BLINK jumper installed.

Aux Header J1:

pin 4 - "FLASH SYNC IN"
pin 5 - "FLASH SYNC OUT"

With jumper installed between pins 4 and 5 of J1, the display will blink in "SELECT" mode. When the jumper is removed the display will be steadily on in "SELECT" mode. For installations utilizing more than one APC-88 within a console all displays may be made to blink synchronously when in the "SELECT" mode. This is accomplished by wiring J1 pin 4 (FLASH SYNC OUT) of any one APC-88 to J1 pin 5 (FLASH SYNC IN) terminal on all other panels.

Operation.

Hot Punch Pushbuttons

The Model APC-88 provides eight pushbuttons which will instantly select a source which has been programmed. The source to be controlled is programmed by the central system terminal or computer. The first 8 of the 64 button positions correspond to the eight pushbuttons of a Model APC-88.

Select and Take Switch Control Mode.

The INPUT SELECT dial is a shaft encoder with 36 positions per revolution, and no end stops. As the INPUT SELECT dial is rotated the source names are displayed in alphabetical order. The TAKE pushbutton is depressed to immediately switch to the input which has been pre-selected. This is confirmed by the "INPUT ACTIVE" display.

"Preset Exchange" is a feature which allows repeated rapid transitions between two sources. If enabled (Option B) the APC-88 automatically puts the previously "Active" source into the "INPUT SELECT" or preset position upon execution of a TAKE command.

The display control pushbutton allows the display to selectively view "INPUT ACTIVE" (source currently switched on), or the "INPUT SELECT" (source that is pre-selected for a TAKE transition). When the INPUT SELECT dial is rotated the display is automatically switched to the "INPUT SELECT" mode. Display mode is annunciated by illumination of the LED within the SELECT pushbutton. When in "SELECT" mode the display will automatically go into "ACTIVE" mode if the current active crosspoint is dialed up.

Dynamic Switch Control Mode.

In this mode of operation the TAKE pushbutton is inactive. The "SELECT" switch is also not required for operation. The display will be set to "ACTIVE" and the "Preset Exchange" feature will no longer be enabled. Crosspoints will be selected "Dynamically" and immediately as the select shaft encoder is moved; no Take switch action is needed. The selection when adjusting the shaft encoder will be in alphabetical order and the display will always show the currently selected crosspoint.

14.4 AXC-8 Alphanumeric XY Control Panel

The Model AXC-8 Alphanumeric Full System Access XY Control Panel has several features which can assist the engineer with normal operations and installation. These features are detailed in the following sections.

14.4.1 Alphanumeric / Numeric Display Toggle

The front panel displays may show the numeric number of the source and destination to allow the engineer to easily cross-reference the Alphanumeric to Numeric designations. When the display is in Active mode the Active display control pushbutton may be depressed and held to show the number of the source and destination. Numeric mode will show only the number, from 01 to 32, of the input and output. Stereo sources and destinations are represented by their 'left' channel number. The numeric equivalent may also be seen when the panel is on Select mode by holding the Select pushbutton.

14.4.2 Concealed Programming Layers

The AXC-8 control panel offers several programmable features accessible through 'concealed' programming layers. To enter into these sub-menus depress and hold both display control pushbuttons and then use the TAKE pushbutton and shaft encoder to alter settings as explained below (depress Select first to avoid changing display mode from alphanumeric to numeric). The Input shaft encoder is used to access the different layers. The Take pushbutton is used to alter parameters or enter into lower level layers.

14.4.2.1 'Take' Mode

The input selection is normally operated in 'Select', or 'Take and Replace', mode. As the Input shaft encoder is rotated the display is automatically entered into Select mode. Once the desired source has been preset the TAKE switch may be depressed to replace the current source with the preset selection. The display control pushbuttons, Active and Select, may be freely depressed to show either the current or preset source in the display.

The panel may also be operated in 'Dynamic' mode. Here the Input shaft encoder simply emulates a continuous rotary input selector.

To change Take Mode, enter concealed programming mode. While holding the display control pushbuttons the input display will show the take mode; SELECT or DYNAMIC. Depressing the Take pushbutton while still holding the display control pushbuttons toggles the Take Mode.

14.4.2.2 Computer Port Baud Rate

The SAS 16000 version of the AXC-8 does not support Computer port automation. Not applicable.

14.4.2.3 Gain Control

The SAS 16000 is not available with digitally controlled gain. Not applicable.

14.4.2.4 Modem Disconnect

The SAS 16000 version of the AXC-8 does not support modem capabilities. Not applicable.

14.4.2.5 Activity Auto Report

The SAS 16000 version of the AXC-8 does not support Computer port automation. Not applicable.

14.4.2.6 Output Restriction

SAS 16000 systems may be provided with multiple AXC-8 panels for 'multiple output control'. Each panel may be programmed to access only a selected group of destinations. This feature is useful in systems where an AXC-8 panel is used for control of a group of outputs in a particular location. The operator will likely only want access to the outputs which are in the area, rather than having to scroll through all system outputs. This feature can also be used to remove system outputs which are not currently installed, although the global alpha brace bracket '{' will remove these outputs from all panels in alphanumeric mode.

Enter concealed programming mode: while holding the display control pushbuttons rotate the shaft encoder five clicks clockwise. The display will show Out_ENBL, for Output Enable. Depress the Take pushbutton. You may release the two display control pushbuttons after entering this layer. The shaft encoder will toggle between *Insert* and *Delete*. The default is *Insert* which indicates that the output shown in the Output display is enabled, i.e. not restricted during normal operation. Rotate to *Delete* to remove the output from the operational directory for this panel only. The Output shaft encoder is rotated to allow selection of all outputs.

15 USI User Serial Interface Protocol

The USI port allows external serial control of the SAS 16000 system. A typical use would be to interface with a computer based storage / automation system. The protocol is ASCII based. The port runs at 9600 baud, 8, n, 1. The pin out is TX - pin 2, RX - pin 3, GND - pin 5.

15.1 Take Command

< CONTROL CHAR > < INPUT > < OUTPUT >

CONTROL CHAR: ^T (ctl-T)

INPUT: Two digit ASCII number between 1 and 32 (01 - 32)

OUTPUT: Two digit ASCII number between 1 and 32 (01 - 32)

EXAMPLE: ^T0401 - TAKE Input 4 to Output 1.

RETURNS: OK(CR / LF) -> If reply's are enabled.
 Txx:yy -> If tally is enabled (ASCII chars).
 ERROR(CR / LF) -> If out of range request and reply's are enabled.
 Nothing -> If no feedback is enabled.

15.2 Inquiry Command

< CONTROL CHAR > < OUTPUT >

CONTROL CHAR: ^I (ctl-I)

OUTPUT: Two digit ASCII number between 1 and 32 (01 - 32) Or 99 for all outputs.

EXAMPLE: ^I01 - Show the Input assigned to Output 1.

RETURNS: xx(CR/LF) -> Two digit input assigned to specified output.
 xx xx xx... -> Inputs assigned to each output in order (01 thru 32).

15.3 Feedback Setup Command

< CONTROL CHAR > < REPLY'S > < TALLY >

CONTROL CHAR: ^F (ctl-F)

REPLY'S: 1 or 0 (1-Enables Reply's 0- Defeats Reply's)

TALLY: 1 or 0 (1-Enables Tally 0- Defeats Tally)

EXAMPLE: ^F11 - Enable Reply's and Tally

RETURNS: OK(CR / LF) -> If reply's are enabled.
 ERROR(CR / LF) -> If incorrect entry and reply's are enabled.

15.4 Display Help Screen

< CONTROL CHAR >

CONTROL CHAR: ^H (ctl-H)