INSTALLATION INSTRUCTIONS

MicroComm DXI

SAB-300 Station Audio Board

1. Intent & Scope

This document describes the installation procedure for the SAB-300 Station Audio Board.

2. Description

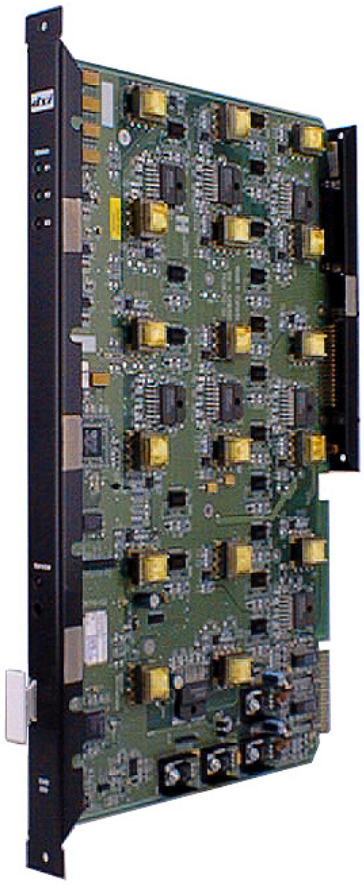
The SAB-300 Station Audio Board is used to connect generic intercom stations and master stations to the MicroComm DXI system. Generic intercom stations are stations with a speaker, 25-volt line matching transformer, and a call switch.

Each SAB-300 has 1 full duplex audio channel and 15 half-duplex audio channels. The SAB-300 can be connected to either 16 stations or 15 stations and one master station. Each station is wired to its own channel on the station audio board. Only 400 series Master Stations (IMS-440, IMS-445, MAI-425 or an IMS-130 with an MAI-420) can be used with the SAB-300.

Full duplex communication allows both parties to speak and listen at the same time. Full duplex communications can only take place if both end devices are full duplex. Full duplex devices include master station with handsets and/or headsets, telephone sets, and stations with handsets.

Half-duplex communications is unidirectional, which means the parties take turns speaking and listening. This form of communication is used between master stations and devices such as intercom stations and loudspeakers.

System planners should be aware that audio signal levels transmitted from the intercom station to the SAB-300 in microphone mode are in the millivolt range, while audio signals levels transmitted from the SAB-300 to the intercom station in loudspeaker mode are in the volts range. Due to the large difference in signal levels, cross talk can occur in cable runs where microphone signals are transmitted at the same time as loudspeaker signals. System planners should take into account the possible interaction of signals and follow standard practices for separating signals of different levels. 400 series intercom stations are much less susceptible to cross talk interference; they incorporate amplifiers that bring microphone signals levels up to the range of loudspeaker signal levels for cross talk immunity.



SAB 300

3. Station Interface

Each channel has an audio port and a switch input port. Intercom stations have their audio connected by a single shielded twisted pair and their switch input(s), such as call request, over a second pair of unshielded wires

3.1 Audio Connections

Intercom audio pairs are connected to audio input ports 1-15, and may be connected to audio input port 16 if a master station does not use it.

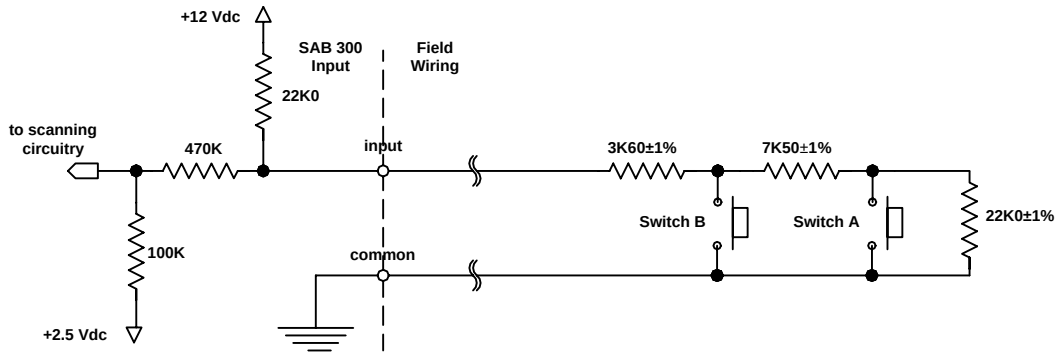
Intercom master stations are capable of full duplex operation and, therefore, are connected to the station audio board with two shielded, twisted pair cables. Refer to master station installation bulletins for additional master station data, power, and accessory wiring requirements.

A master station can only be connected to audio port 16 and to the audio port labeled Master Mic Audio. The Speaker pair is connected to port 16 and the Microphone pair to the Master Mic Audio port. The switch input 16 is not used in this case.

3.2 Switch Input Connections

Supervised 2 Switch Input

The switches may have terminating resistors, which allows the DXI system to detect which one of the two switches is closed, as well it allows the system to monitor for either open or shorted faults. The following schematic shows the necessary switch wiring.



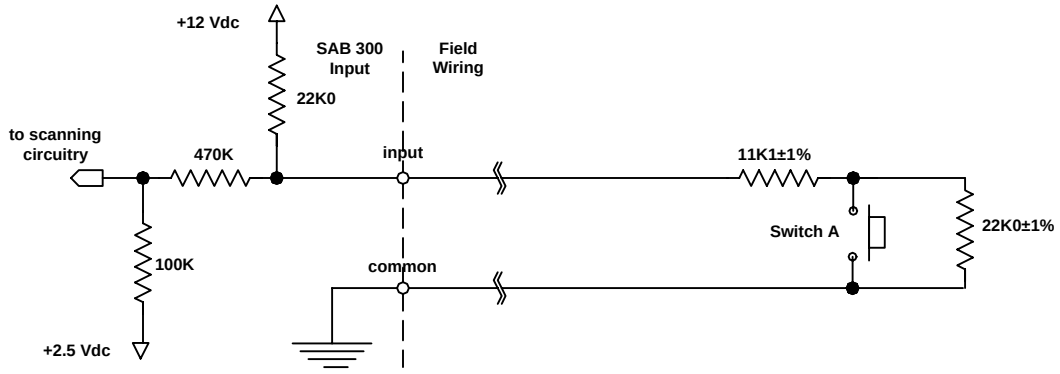
Supervised 2 Switch Input

Each input can be in one of five states. The voltage at the SAB 300 input terminals determines the states. The actual voltage measured will be slightly different than those given in the table due to component tolerances and the resistance of the field wiring.

Input State	Wiring	Switch A	Switch B	Voltage
Open Fault	Open Circuit	N/A	N/A	11.65
Idle	Normal	Not Pushed	Not Pushed	7.10
Switch A Pressed	Normal	Pushed	Not Pushed	4.00
Switch B Pressed	Normal	N/A	Pushed	1.69
Short Fault	Short Circuit	N/A	N/A	0

Supervised 1 Switch Input

A single switch, with a terminating resistor network can be used to detect switch closure, as well as monitor open and short faults. Either Switch A or Switch B can be used with the appropriate terminating resistors.

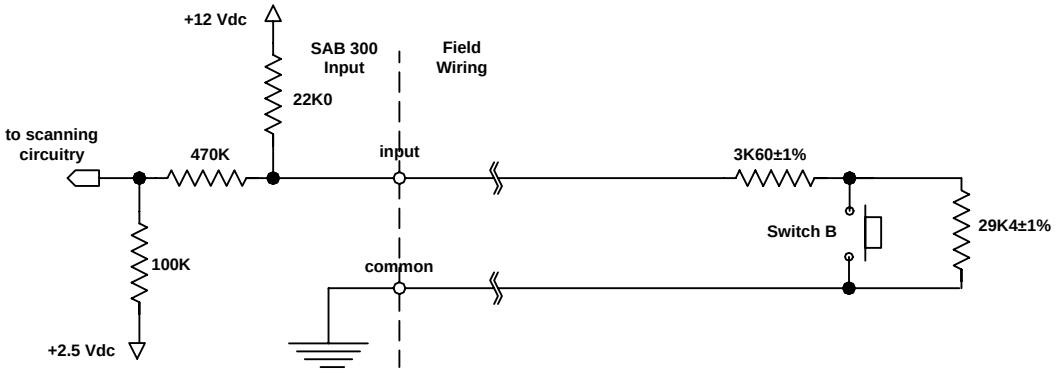


Supervised 1 Switch (Switch A) Input

Each input can be in one of four states. The voltage at the SAB 300 input terminal determines the states. The actual voltages will vary slightly due to component tolerances and the resistance of the wiring to the switch.

Input State	Wiring	Switch A	Voltage
Open Fault	Open Circuit	N/A	11.65
Idle	Normal	Not Pushed	7.10
Switch A Pressed	Normal	Pushed	4.00
Short Fault	Short Circuit	N/A	0

If Switch B is used again the input can be in one of four states. The states are determined by the voltage at the SAB 300 input terminal (The actual voltages will vary slightly due to component tolerances and the resistance of the wiring to the switch).

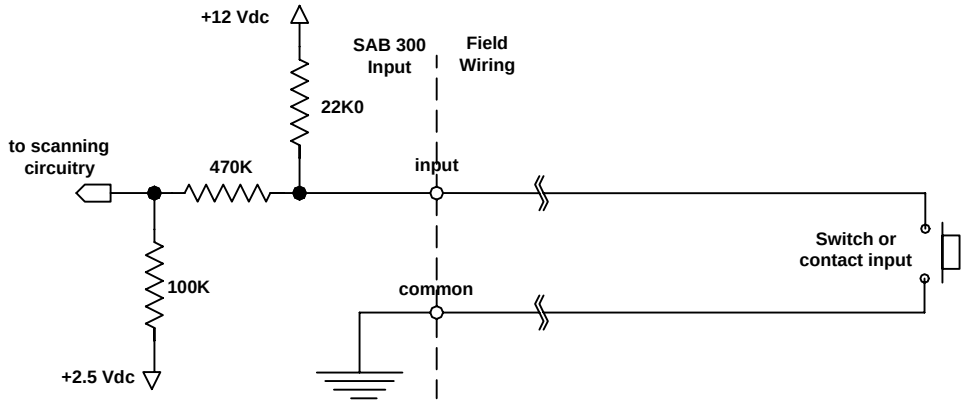


Supervised 1 Switch (Switch B) Input

Input State	Wiring	Switch B	Voltage
Open Fault	Open Circuit	N/A	11.65
Idle	Normal	Not Pushed	7.10
Switch B Pressed	Normal	Pushed	1.69
Short Fault	Short Circuit	N/A	0

Non-Supervised 1 Switch Input

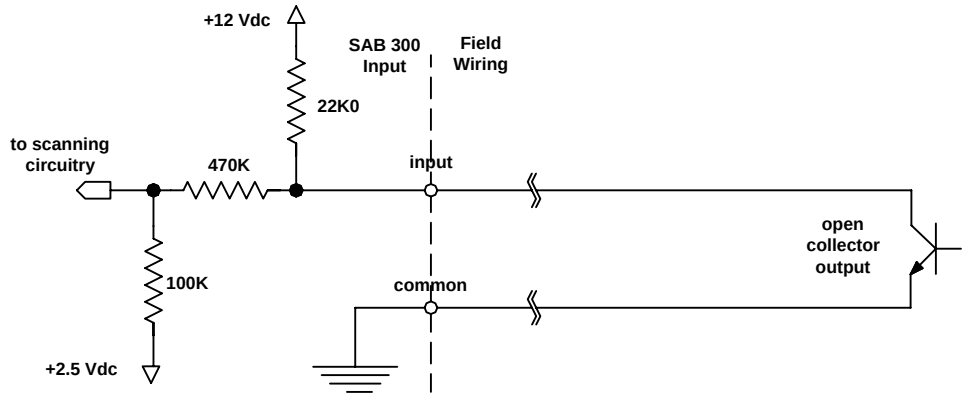
The following switch configuration allows the system to detect a single switch contact closure.



Non-Supervised 1 Switch Input

Solid State Switch Input

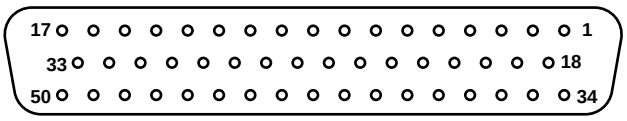
The following schematic shows the input connected to an open collector switch. The open collector must be capable of sinking 0.6 mA.



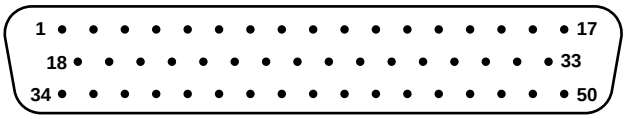
Solid State Switch Input

4. Field Interface Cables

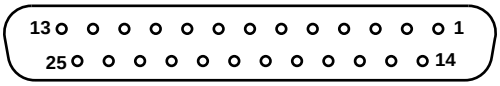
The Station Audio Board uses a female DB-50 connector to interface to the external audio lines and a female DB-25 connector to interface to the external switch inputs. The Station Audio Board requires two cables, a CBL-130 cable to interface the audio inputs to the field wiring and a CBL-180 cable to interface to the switch inputs to the field wiring.



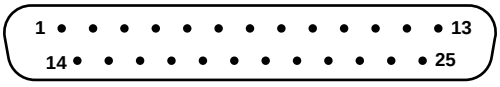
Female DB-50 Connector



Male DB-50 Connector



Female DB-25 Connector

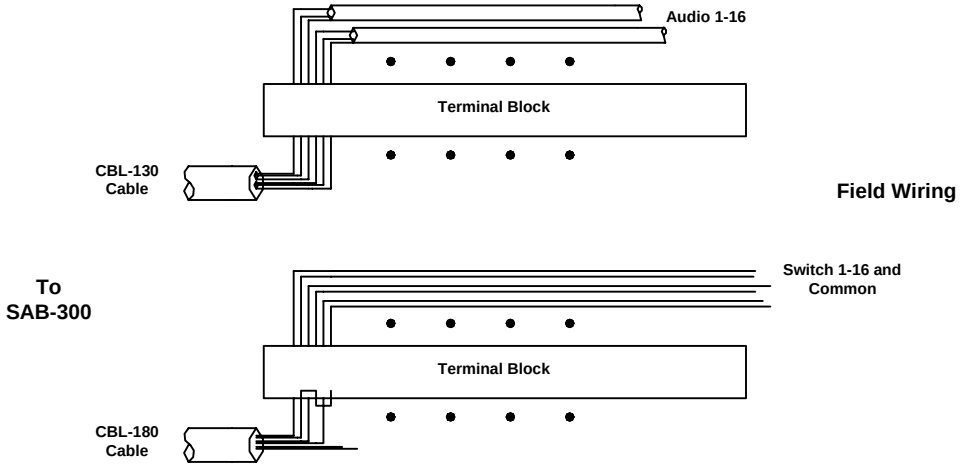


Male DB-25 Connector

A CBL-130 audio cable connects the audio input lines to the female DB-50 connector. The Audio Ports table gives the pin numbers, wire colors, and terminal block position for each of the station audio board signals. The cable should be terminated on the terminal block in the fashion as shown. Two tables are shown for the Audio Ports, one for generic terminal blocks and a second table for BIX style terminal blocks.

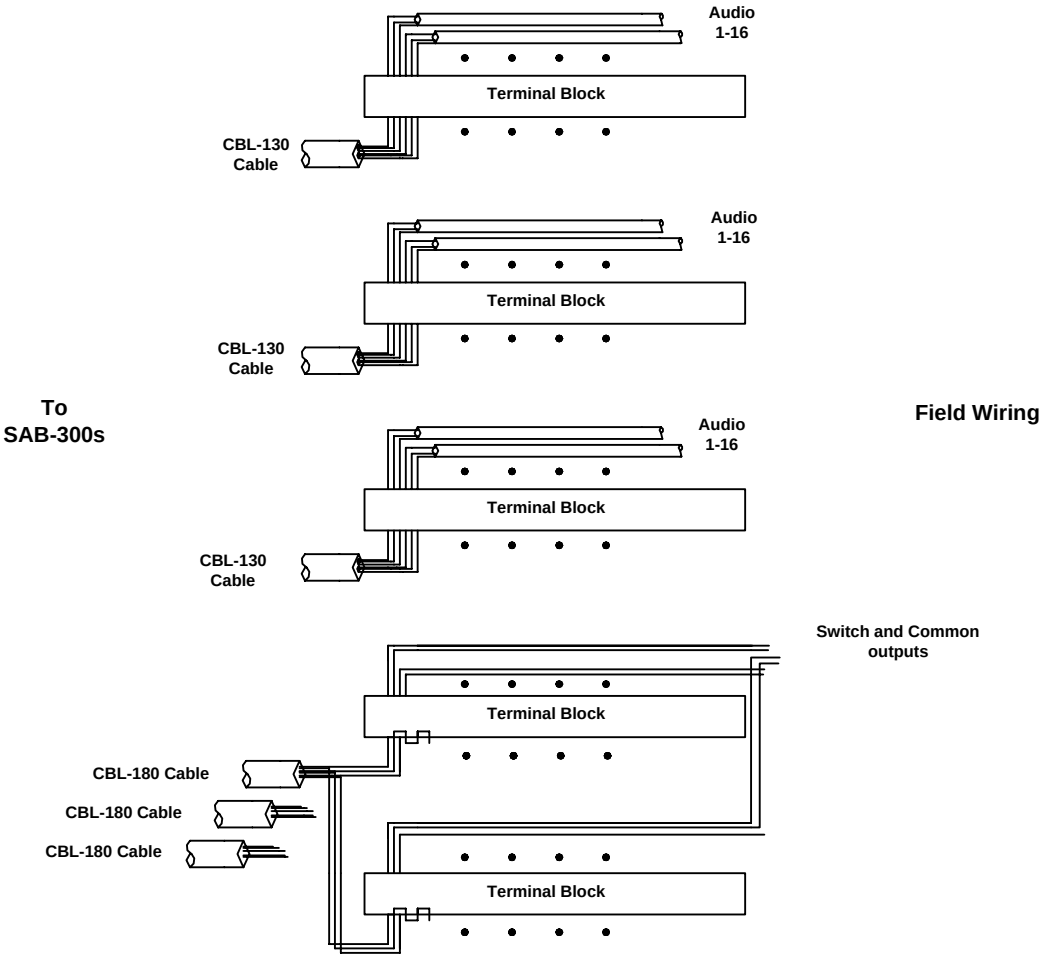
A CBL-180 cable connects the switch inputs to the female DB-25 connector. The Switch Input Ports table gives the pin numbers, wire colors, and terminal block position of the station switch input. Note that 16 of the terminal block terminals connected to the field wiring are to be connected to Gnd. Four of the wires in the CBL-180 cable are labeled Gnd. The table shows the connections to the terminal block. Each of the Gnd wires in the CBL-180 connects to 4 terminals on the CBL-180 side of the terminal Block.

Two configurations are possible for the terminal block arrangement. The first would have the following configuration, where one terminal block is used for the audio lines and the second for the switch inputs. The tables following this section are based on this configuration.



Terminal Block Arrangement 1

A second possible configuration uses 3 terminal blocks for audio lines and two terminal blocks for the switch inputs. This will lead to denser wiring but a net saving in the number of terminal blocks required.



Terminal Block Arrangement 2

Wiring Table for Generic Terminal Blocks

DB50 Pin Number	Signal	SAB Cable Wire Color	Terminal Block Pin Number
1	Audio 1 +	Black	1
18	Audio 1 -	Red	2
34	Audio 1 Shield	BR Shield	3
2	Audio 2 +	Black	4
19	Audio 2 -	White	5
35	Audio 2 Shield	BW Shield	6
3	Audio 3 +	Black	7
20	Audio 3 -	Green	8
36	Audio 3 Shield	BG Shield	9
4	Audio 4 +	Black	10
21	Audio 4 -	Blue	11
37	Audio 4 Shield	BBl Shield	12
5	Audio 5 +	Black	13
22	Audio 5 -	Yellow	14
38	Audio 5 Shield	BY Shield	15
6	Audio 6 +	Black	16
23	Audio 6 -	Brown	17
39	Audio 6 Shield	BBr Shield	18
7	Audio 7 +	Black	19
24	Audio 7 -	Orange	20
40	Audio 7 Shield	BO Shield	21
8	Audio 8 +	Red	22
25	Audio 8 -	White	23
41	Audio 8 Shield	RW Shield	24
9	Audio 9 +	Red	25
26	Audio 9 -	Green	26
42	Audio 9 Shield	RG Shield	27
10	Audio 10 +	Red	28
27	Audio 10 -	Blue	29
43	Audio 10 Shield	RBl Shield	30
11	Audio 11 +	Red	31
28	Audio 11 -	Yellow	32
44	Audio 11 Shield	RY Shield	33
12	Audio 12 +	Red	34
29	Audio 12 -	Brown	35
45	Audio 12 Shield	RBr Shield	36
13	Audio 13 +	Red	37
30	Audio 13 -	Orange	38
46	Audio 13 Shield	RO Shield	39
14	Audio 14 +	Green	40
31	Audio 14 -	White	41
47	Audio 14 Shield	GW Shield	42
15	Audio 15 +	Green	43
32	Audio 15 -	Blue	44
48	Audio 15 Shield	GBl Shield	45
16	Audio 16 +	Green	46
33	Audio 16 -	Yellow	47
49	Audio 16 & 17 Shield	GY Shield & GBr Shield	48
17	Master Mic Audio +	Green	49
50	Master Mic Audio -	Brown	50

Master (Audio 16 and Master Mic) wiring is polarity sensitive.

Audio Ports

Wiring Table for BIX Blocks

DB-50 Pin Number	Signal Name	Wire Color	Terminal Block Pin Number
1	Audio 1 +	Black	1
18	Audio 1 -	Red	2
34	Audio Shield 1	BR Shield	3
35	Audio Shield 2	BW Shield	4
2	Audio 2 +	Black	5
19	Audio 2 -	White	6
3	Audio 3 +	Black	7
20	Audio 3 -	Green	8
36	Audio Shield 3	BG Shield	9
37	Audio Shield 4	BBl Shield	10
4	Audio 4 +	Black	11
21	Audio 4 -	Blue	12
5	Audio 5 +	Black	13
22	Audio 5 -	Yellow	14
38	Audio Shield 5	BY Shield	15
39	Audio Shield 6	BBr Shield	16
6	Audio 6 +	Black	17
23	Audio 6 -	Brown	18
7	Audio 7 +	Black	19
24	Audio 7 -	Orange	20
40	Audio Shield 7	BO Shield	21
41	Audio Shield 8	RW Shield	22
8	Audio 8 +	Red	23
25	Audio 8 -	White	24
9	Audio 9 +	Red	25
26	Audio 9 -	Green	26
42	Audio Shield 9	RG Shield	27
43	Audio Shield 10	RBl Shield	28
10	Audio 10 +	Red	29
27	Audio 10 -	Blue	30
11	Audio 11 +	Red	31
28	Audio 11 -	Yellow	32
44	Audio Shield 11	RY Shield	33
45	Audio Shield 12	RBr Shield	34
12	Audio 12 +	Red	35
29	Audio 12 -	Brown	36
13	Audio 13 +	Red	37
30	Audio 13 -	Orange	38
46	Audio Shield 13	RO Shield	39
47	Audio Shield 14	GW Shield	40
14	Audio 14 +	Green	41
31	Audio 14 -	White	42
15	Audio 15 +	Green	43
32	Audio 15 -	Blue	44
48	Audio Shield 15	GBl Shield	45
49	Audio 16 & Master Shield	GY & GBr Shield	46
16	Audio 16 +	Green	47
33	Audio 16 -	Yellow	48
17	Master Audio +	Green	49
50	Master Audio -	Brown	50

Audio Ports

Switch Cable Wiring

DB-25 Pin Number	Signal Name	Wire Color*	Terminal Block Pin Number
1	Switch_1	White-Blue	1
9	Gnd	Red-Brown	2
14	Switch_2	Blue-White	3
9	Gnd	Red-Brown	4
2	Switch_3	White-Orange	5
9	Gnd	Red-Brown	6
15	Switch_4	Orange-White	7
9	Gnd	Red-Brown	8
3	Switch_5	White-Green	9
22	Gnd	Brown-Red	10
16	Switch_6	Green-White	11
22	Gnd	Brown-Red	12
4	Switch_7	White-Brown	13
22	Gnd	Brown-Red	14
17	Switch_8	Brown-White	15
22	Gnd	Brown-Red	16
5	Switch_9	White-Slate	17
10	Gnd	Red-Slate	18
18	Switch_10	Slate-White	19
10	Gnd	Red-Slate	20
6	Switch_11	Red-Blue	21
10	Gnd	Red-Slate	22
19	Switch_12	Blue-Red	23
10	Gnd	Red-Slate	24
7	Switch_13	Red-Orange	25
23	Gnd	Slate-Red	26
20	Switch_14	Orange-Red	27
23	Gnd	Slate-Red	28
8	Switch_15	Red-Green	29
23	Gnd	Slate-Red	30
21	Switch_16	Green-Red	31
23	Gnd	Slate-Red	32
			33
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Switch Input Ports

* Note: The cable pairs may or may not be striped, i.e. instead of the first pair being White/Blue Stripe and Blue/White Stripe it may be a White and Blue pair.

5. System Planning Worksheet

The following page contains blank system planning worksheets for the SAB-300 Station Audio Board for Generic Terminal Blocks. It contains a cross reference that includes the I/O board's mating connector, pin signal identification, field wiring cable conductor color, terminal block terminal point, and space to identify the field connection.

SAB-300 Station Audio Board

Card Cage: _____ Card Slot: _____

DB50 Pin Number	Signal	SAB Cable Wire Color	Terminal Block Pin Number	Station Name
1	Audio 1 +	Black	1	
18	Audio 1 -	Red		
34	Audio 1 Shield	BR Shield	3	
2	Audio 2 +	Black	4	
19	Audio 2 -	White	5	
35	Audio 2 Shield	BW Shield	6	
3	Audio 3 +	Black	7	
20	Audio 3 -	Green	8	
36	Audio 3 Shield	BG Shield	9	
4	Audio 4 +	Black	10	
21	Audio 4 -	Blue	11	
37	Audio 4 Shield	BBl Shield	12	
5	Audio 5 +	Black	13	
22	Audio 5 -	Yellow	14	
38	Audio 5 Shield	BY Shield	15	
6	Audio 6 +	Black	16	
23	Audio 6 -	Brown	17	
39	Audio 6 Shield	BBr Shield	18	
7	Audio 7 +	Black	19	
24	Audio 7 -	Orange	20	
40	Audio 7 Shield	BO Shield	21	
8	Audio 8 +	Red	22	
25	Audio 8 -	White	23	
41	Audio 8 Shield	RW Shield	24	
9	Audio 9 +	Red	25	
26	Audio 9 -	Green	26	
42	Audio 9 Shield	RG Shield	27	
10	Audio 10 +	Red	28	
27	Audio 10 -	Blue	29	
43	Audio 10 Shield	RBl Shield	30	
11	Audio 11 +	Red	31	
28	Audio 11 -	Yellow	32	
44	Audio 11 Shield	RY Shield	33	
12	Audio 12 +	Red	34	
29	Audio 12 -	Brown	35	
45	Audio 12 Shield	RBr Shield	36	
13	Audio 13 +	Red	37	
30	Audio 13 -	Orange	38	
46	Audio 13 Shield	RO Shield	39	
14	Audio 14 +	Green	40	
31	Audio 14 -	White	41	
47	Audio 14 Shield	GW Shield	42	
15	Audio 15 +	Green	43	
32	Audio 15 -	Blue	44	
48	Audio 15 Shield	GBl Shield	45	
16	Audio 16 +	Green	46	
33	Audio 16 -	Yellow	47	
49	Audio 16 & 17 Shield	GY Shield & GBr	48	
17	Master Mic Audio +	Green	49	
50	Master Mic Audio -	Brown	50	

Card Cage: _____ Card Slot: _____

DB-25 Pin Number	Signal Name	Wire Color*	Terminal Block Pin Number	Station Name
1	Switch_1	White-Blue	1	
9	Gnd	Red-Brown	2	
14	Switch_2	Blue-White	3	
9	Gnd	Red-Brown	4	
2	Switch_3	White-Orange	5	
9	Gnd	Red-Brown	6	
15	Switch_4	Orange-White	7	
9	Gnd	Red-Brown	8	
3	Switch_5	White-Green	9	
22	Gnd	Brown-Red	10	
16	Switch_6	Green-White	11	
22	Gnd	Brown-Red	12	
4	Switch_7	White-Brown	13	
22	Gnd	Brown-Red	14	
17	Switch_8	Brown-White	15	
22	Gnd	Brown-Red	16	
5	Switch_9	White-Slate	17	
10	Gnd	Red-Slate	18	
18	Switch_10	Slate-White	19	
10	Gnd	Red-Slate	20	
6	Switch_11	Red-Blue	21	
10	Gnd	Red-Slate	22	
19	Switch_12	Blue-Red	23	
10	Gnd	Red-Slate	24	
7	Switch_13	Red-Orange	25	
23	Gnd	Slate-Red	26	
20	Switch_14	Orange-Red	27	
23	Gnd	Slate-Red	28	
8	Switch_15	Red-Green	29	
23	Gnd	Slate-Red	30	
21	Switch_16	Green-Red	31	
23	Gnd	Slate-Red	32	
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* Note: The cable pairs may or may not be striped, i.e. instead of the first pair being White/Blue Stripe and Blue/White Stripe it may be a White and Blue pair.