Intercom Control Panel Installation

Description

This Technical Brief will describe both **RCS/DCS/SCS** type and **SOC** type panels.

The RCS/DCS/SCS type panels are complete intercom stations with communications mic/preamp, loudspeaker/amplifier and associated controls.

The SOC type panels offer control only; talk and listen audio must be provided by the user. Current panels which have Intercom Control functions include APC-88, PBS-16 and 32, CDS-8 and TP-8A. If other panel types are provided please reference the separate addendums or manuals for those panels.

The Intercom Panels may be used with **32000** or **32KD** Systems. Each panel will communicate to the System via RS-485, a single pair balanced data line that can be shared by more than one control panel; each control panel is addressed so that the port administrator can poll each panel in sequence. Each complete panel will provide Talk audio to the System (mic preamp audio) on one audio pair. Each panel also requires Listen audio from the System (audio to the speaker or headphones) on another pair.

For **32KD** systems, each Model DRC-16E or RIO Chassis provides 16 RS-485 ports. Each port may be configured to communicate with Intercom panels (protocol) and each port will support up to 4 panels, each at a different address. The panel address must be strapped on the control panel mating connector ('Main I/O'). We recommend that the RS-485 bus be brought to a splitter or other distribution point (punch block, etc.) and then separately run to each control panel. Each port is programmable for Talk and Listen audio I/O numbers; the names for each System audio input (Talk from station) and audio output (Listen to the Station) are programmed using the 32KD audio Source and Destination config folders.

For **32000** systems, each Model SXT-32 Crosspoint / Output Module supports two physical intercom ports with two audio outputs, one for each Station, and one 'panel' RS-485/422 bus (pins C27, B27, A27: see SXT32WM1) which connects to both Stations (the higher/even number station requires an address strap on the mating I/O connector; see below). We recommend that the RS-485 bus be brought to a splitter or other distribution point (punch block, etc.) and then separately run to each control panel.

Each **RCS/DCS/SCS** type control panel connects to one audio input (talk), one audio output (listen) and one RS-485 control line. These connections are all made to the 'Main I/O' connector, J7. These panels provide [8 + 2] or [16 + 2] programmable pushbuttons. These pushbuttons can each be programmed to perform Talk (to any Station/output), Listen (to any Input) or Group Talk. The RCS/DCS panels provide pushbuttons arranged in two rows of eight buttons (1 to 8 upper row, 9 to 16 lower row) and one row of four: 17, 18, Call Answer and Dial Up. Note that the RCS/DCS –8 panels do not have pushbuttons 9 to 16, but they do have 17, 18, Call Answer and Dial Up. The SCS-8 has only one row of eight pushbuttons and provides Call Answer on button 8.

Each RCS/DCS panel is provided with an alphanumeric eight character LED dot matrix display and shaft encoder. The display provides a means to Talk to any system destination, not just those programmed to direct Talk pushbuttons, and Tally of Last Call received. The alpha display allows selection of any Station/output by using the shaft encoder to dial through the directory in alphabetical order and the 'Dial Up' pushbutton to Talk. The last selected destination on the shaft encoder is always in queue, assigned to the 'Dial Up' pushbutton until a new selection is made. When an incoming call is received the incoming callers location is displayed in the alpha display and the 'Call Answer' pushbutton illuminates. The Call Answer pushbutton is programmed to Talk to this Station which last called. When the Dial Up pushbutton is depressed to talk out or the shaft encoder is moved, the Dial Up pushbutton illuminates and the display changes to the selected destination. Note that the Dial Up and Call Answer pushbuttons are programmed to the last selected values at all times. The illuminated pushbutton indicates which destination is shown in the alpha display. A quick tap on either pushbutton will change the display to show that destination.

Each panel is provided with a footswitch input, relay outputs and opto inputs. The footswitch input activates the Dial Up key on the RCS/DCS panels. This allows the operator to program the desired destination and 'press to talk' with a momentary footswitch for hands free operation. The footswitch input of the SCS-8 activates the Call Answer.

Two relay outputs are provided: one closes during outgoing talk and one closes during incoming speech. These may be useful for steering audio into talkback circuits, muting or dimming monitors or even muting or dimming other intercom stations in close proximity to minimize the potential for feedback. The opto inputs allow speaker mute or dim.

Each panel has an internal loudspeaker, a gooseneck or flush mounted microphone and provision for external mic and headset connections.

Up to two panels may be installed on one system port. This technique economizes on ports when two panels are required in one location, such as a large shop or rack room. If two control panels will be installed on one port the listen audio must be connected to both stations and the talk audio must be summed. The lowest address RCS panel talk audio output is connected to the intercom matrix input. Each RCS panel provides a 'Stack Input'. Talk audio from the next panel on the same port is connected to this input and summed to the matrix input. Each panel also has two sets of pins for Listen audio. The matrix output may be connected to the lowest address panel. A connection may then be made from the other listen audio pins to the second panel. In this manner the panels may be easily 'daisy chained' together.

The essential RCS-16/8 pin out is reviewed here for reference: (see dwg RCS16S1 for detail)

J1 Power (panel: 9 pin D male)
* The power supply provided with each panel is pre-wired for direct connection.
Pin 2 Power Ground
Pin 3 +12 VDC In

J4 Mic Programming (panel: 9 pin D female)
* To enable the internal electret mic jumper pins 3 to 4 and 7 to 8 on this connector.
A programmed plug is provided with each panel for this purpose. To connect an external dynamic microphone or line level audio source see Schematic RCS16S1.

J7 Main I/O (panel: 25 pin D male)
Pin 14 RS-485 Shield (Ground reference)
Pin 2 RS-485 -
Pin 3 RS-485 +

Pin 8 Output Shield (Ground reference)
Pin 9 Talk Output - (to matrix input module)
Pin 10 Talk Output + (to matrix input module)

Pin 11 Input Shield (Ground reference)
Pin 12 Listen Input - (from matrix output module)
Pin 13 Listen Input + (from matrix output module)

Pin 4 Address 1 * Jumper Pin 4 to Pin 16 for first 'even' address.
Pin 16 Address Gnd

J9 Logic Interface
If using the opto isolated inputs with an external relay or isolated switch connect the '+' side to the +12 VDC pin available on the connector and place the switch across the '-' pin and the ground pin provided to activate.

J3 Auxiliary
Used for connection to program audio sources, telephone handsets, etc.

Each control panel has one UL approved remote 12 VDC power supply included. Film legends for the pushbuttons are easily made using a laser printer and 3M CG3300 laser printer clear film.

The **APC-88, CDS-8 and PBS-16/32** panels offer control only. The audio in & out must be provided by other means within the facility. The APC-88 console mounted panel provides eight programmable pushbuttons, one 'dial up' or 'Select' pushbutton and one 'Call Answer' pushbutton. The CDS-8 panel provides one 'dial up' pushbutton on the rotary encoder and one 'Call Answer' pushbutton. The PBS-16/32 panel provides 16/32 programmable pushbuttons and one 'Call Answer' pushbutton.

The APC-88 module also provides a solid state relay which closes on 'Incoming Speech' which may be used to trigger listen facilities. A good example would be a talkback input to a console Cue speaker or Monitor. The CDS-8 and PBS panels do not provide such a relay, although relays are available on the AXC-8R which can be programmed to provide the 'Incoming Speech' function.

To connect a Model APC-88 or CDS-8 to the first 'even' address a jumper must be installed on the mating connector between pins 6 (A gnd) and 7 (A1). Operationally the panel is quite straight forward. Each of the eight pushbuttons may be programmed using the control software (buttons 1 to 8). These pushbuttons operate as momentary push to talk (PTT) or latching listen.

The 'Call Answer' pushbutton is automatically programmed to the last incoming caller. In the APC-88 panels the caller ID will be displayed in the alphanumeric display. This display also allows selection of any destination by using the shaft encoder to dial through the directory in alphabetical order and the 'Select' pushbutton to activate. The last selected destination on the shaft encoder is always in queue, assigned to the 'Select' pushbutton until a new selection is made. When an incoming call is received the incoming callers location is displayed in the alpha display and the 'Call Answer' pushbutton illuminates. When the Select pushbutton is depressed to talk out or the shaft encoder is moved, the Select pushbutton illuminates and the display changes to the selected destination. Note that both pushbuttons are programmed to the last selected values at all times and the LED within indicates which destination is shown in the alpha display. A quick tap on either pushbutton will change the display to show that destination.

The ACP-88 / CDS-8 / PBS-16 pin out is reviewed here for reference:

	APC-88	CDS-8	PBS-16
J1 Power, RS-485 & Address (panel: 9 pin D male)			
Digital Common (Serial Comm Reference)	pin 1	pin 1	pin 1
RS-485 + (Serial Comm)	pin 4	pin 4	pin 4
RS-485 - (Serial Comm)	pin 5	pin 5	pin 5
Power Common	pin 2	pin 2	-
Power Input	pin 3	pin 3	-
Address common	pin 6	pin 6	pin 2
Address bit 1	pin 7	pin 7	pin 6
Address bit 2	pin 8	-	pin 7
Address bit 3	pin 9	-	pin 8
J2 Accessory - for APC-88 only			
Relay	pins 7 & 8		
	two pins farthest from 9 pin D		

MAIN ELECTRONICS PCA
SHEETS 2, 4 & 5

FRONT PANEL PCA
SHEET 3

J9 — LOGIC INTERFACE (DB25S)

13	REMOTE GAIN POT LOW
25	
12	REMOTE GAIN POT WIPER
24	
11	REMOTE GAIN POT HIGH	SHEET 5
23	
10	RELAY INCOMING B
22	
9	RELAY INCOMING A
21	
8	RELAY OUTGOING B
20	
7	RELAY OUTGOING A
19	
6	
18	FOOTSWITCH −
5	
17	FOOTSWITCH +
4	
16	DIM −
3	
15	DIM +
2	
14	MUTE −
1	MUTE +	SHEET 2

+12

J7 — MAIN I/O (DB25P)

13	MAIN INPUT +
25	
12	MAIN INPUT −
24	
11	SHIELD	SHEET 5
23	
10	MAIN OUTPUT +
22	STACK IN +
9	MAIN OUTPUT −
21	STACK IN −
8	SHIELD
20	SHIELD	SHEET 4
7	A4
19	GND
6	A3
18	GND
5	A2
17	GND
4	A1
16	GND
3	RS-485 +
15	+12 VDC IN
2	RS-485 −
14	POWER/485 GND
1	NC	SHEET 2

J1 — POWER (DE9P)

5	
9	
4	
8	
3	+12 VDC IN
7	
2	POWER GND
6	
1	A5	SHEET 2

J3 — AUX I/O (DE9P)

5	CHASSIS
4	AUX OUT −
8	CHASSIS
3	AUX OUT +
7	+12 VDC IN	SHEET 4
2	AUX IN −
6	POWER GND
1	AUX IN +	SHEET 5

J4 — MIC PROGRAMMING (DE9S)

5	LINE IN +
9	LINE IN −
4	ELEC BIAS
8	MIC IN −
3	MIC IN +
7	MIC COMMON	SHEET 4
2	MIC COMMON
6	HEADPHONE HIGH
1	HEADPHONE GND	SHEET 5

J11 / J1 CON7 — SWITCH INTERFACE

7	DATA IN	7
6	DATA OUT	6
5	CLOCK	5
4	+12 VDC	4
3	STROBE	3
2	+5 VDC	2
1	GROUND	1

J10 / J3 CON8 — SHAFT ENCODER

8	ENCODER 1	8
7	ENCODER 2	7
6	ENCODER 3	6
5		5
4	PORT C0	4
3	PORT C1	3
2	PORT A0	2
1	PORT A3	1

J12 / J4 CON8 — DISPLAY INTERFACE

8	PORT B0	8
7	PORT B1	7
6	PORT B2	6
5	PORT B3	5
4	PORT B4	4
3	PORT B5	3
2	PORT B6	2
1		1

J5 CON3 — MICROPHONE (X1)

1	COMMON
2	ELEC BIAS
3	COMMON

J2 CON3 — VOLUME 5 K LIN

1	PANEL POT HIGH
2	PANEL POT WIPER
3	PANEL POT LOW

J8 CON4 — PHONEJACK STEREO SW (J8A)

1	HP GND
2	SWITCH R
3	SWITCH T
4	HP HIGH

J6 CON2 — SPEAKER (LS)

| 1 | SPEAKER + |
| 2 | SPEAKER − |