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ROSEN AVIATION

Headphone Distribution Amplifier

Technical Manual

Model 0700-001

Document Number 100318 Rev A

Technical Manual, Headphone Distribution Amplifier 0700-001

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1. INTRODUCTION

The Headphone Distribution Amplifier 0700-001 features three audio inputs, a pilot mic input, and eight controllable audio outputs. The pilot mic input will override the other inputs when active. The unit is designed to integrate into any entertainment system with analog audio capability and controllers that allow you to select different audio sources in the aircraft.

This guide describes general configuration information for the Rosen Headphone Distribution Amplifier with any audio source equipment to supplement the Outline and Installation Drawing (P/N **0700-001-CD**).

Note: Only trained and qualified personnel should perform installation and service.

1.1. Unpacking

The following parts are shipped with the Headphone Distribution Amplifier

- Outline and Installation Drawing (P/N **0700-001-CD**)
- Headphone Distribution Amplifier (P/N **100312**)
- Headphone Distribution Amplifier CD (P/N **101156**)

NOTICE

The *Outline & Installation* drawings are also available at www.rosenaviation.com.

From the Rosen Aviation home page, select **Support→ Drawings and Pinouts**, and look for the product name under the Accessories category.

2. DEFINITIONS

Independent channels	All eight outputs, or channels, operate independently.
Source select	A switch that enables you to select between three different audio input sources independently.
Output channel	An audio output from the Headphone Distribution Amplifier (outputs 1-8).
Input channel	Refers to the line-level audio source (inputs channels A, B, and C. For example, a DVD player, iPod, and RosenView VX.

2.1. Operating Modes

Each output channel may be configured to one of two modes of operation by setting the DIP switches according to the ON indicators on the audio distribution amplifier.

Fixed output Keeps the output channel set to a specific input channel: either A, B, or C.

Switched output Allows the user to select input channels independently of the other output channels. Requires a source select switch wired to the unit.

3. CONFIGURATION DIP SWITCHES

Use the configuration DIP switches to set the audio control for all seats. Each output channel uses two switches. Figure 1 shows the pairs of switches that control each channel.

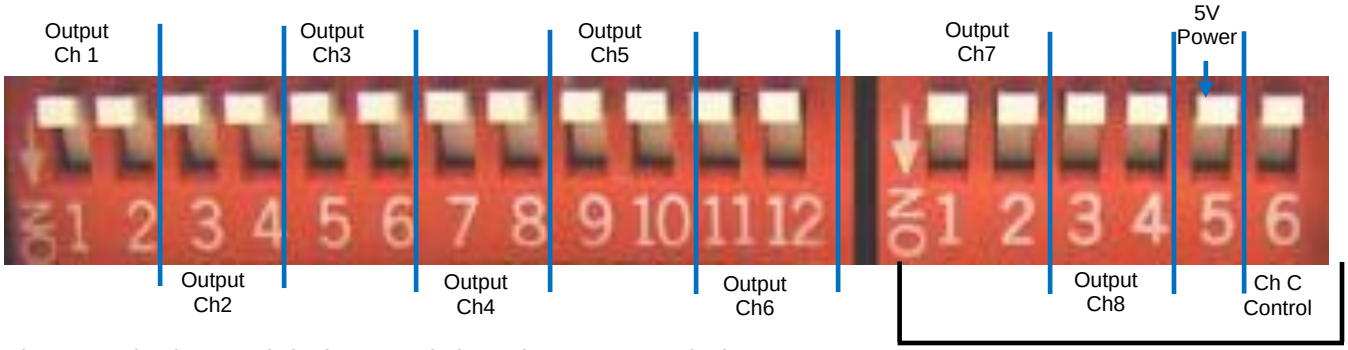


Figure 1 The factory default DIP switch settings are **OFF** (up)

3.1. Auxiliary Configuration Switches

The Headphone Distribution Amplifier features an optional 5V power supply that will handle up to 0.5 A.

The Channel C Control is an optional switch that enables the third audio input. Leave these and any other unused switches OFF (up) unless you need to configure them.

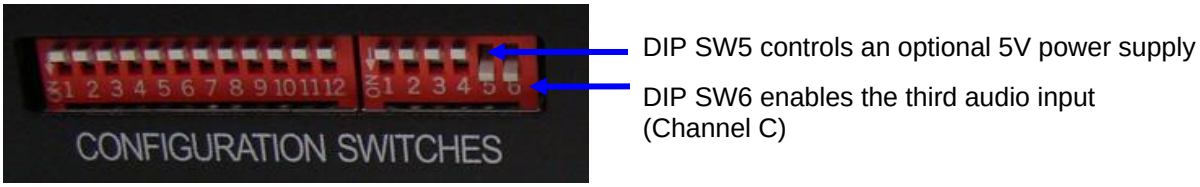


Figure 2 Auxiliary DIP switches

4. CONFIGURING A SINGLE OUTPUT CHANNEL

Configuring a single output channel depends on several variables.

- Number of audio inputs
- Use of a source select switch (such as a controller, IR remote, or at the seat)
- Choice of fixed inputs: channel A, B, or C

4.1. Fixed Mode Example

If you are using only one input, you do not need a source select switch or need to enable channel C.

If you do not need a source select switch for the output channel, see Table 1. This example shows that using DIP switches 1 and 2 (SW1 and SW2) will set the output to receive a desired input: either A, B, or C for seat 1.

Table 1 Fixed mode: one audio source and no select switch

	DIP SW1	DIP SW2	Input
Channel 1	OFF	OFF	A
	OFF	ON	B
	ON	OFF	C*
	ON	ON	N/A

The audio is constantly on pilot mic with this configuration

*Channel C control, SW6 (small bank), does not have to be ON to listen to Channel C in fixed mode.

Note: Do not set all DIP switches to ON. Doing so will cause the PA to override the audio all the time.

4.2. Switched Mode Examples

If you use a source select switch, see Table 2. This example shows that channels A and B for seat 1 are enabled using a source select switch. The Channel C enable switch (SW6) is OFF.

Table 2 Two audio sources (A & B) and a select switch

	DIP SW1	DIP SW2	Input
Channel 1	OFF	OFF	A & B
	OFF	ON	N/A
	ON	OFF	N/A
	ON	ON	N/A

The DIP switch settings are identical to the fixed mode Channel A in Table 1; the difference is that a source select switch is used to toggle between inputs A and B.

For independent switching, configure desired seats to input Channel A.

To configure the remaining output channels (2-8), copy the appropriate switch settings from Tables 1-3. Fixed modes will use either an ON/OFF, OFF/ON, or OFF/OFF combination and switched modes will always use the OFF/OFF combination.

If you use three audio sources and a source select switch, configure the DIP switches as shown in Table 3. The Channel C Enable switch must be ON to use the third audio input.

Table 3 Three audio sources and a select switch

	DIP SW1	DIP SW2	DIP SW6 Channel C	Output Channel
Channel 1	OFF	OFF	ON	A, B, & C
	OFF	ON	ON	N/A
	ON	OFF	ON	N/A
	ON	ON	ON	N/A

The N/A outputs do not switch the audio properly

4.3. Installation Example

You can mix the audio control and configure each seat differently, as shown in Figure 3.

Channels 5 and 6 are set to Input A, and these seats have a choice. Either they may have a source select switch to allow them to change their channel, or they can remain without a source select switch and stay on input A.

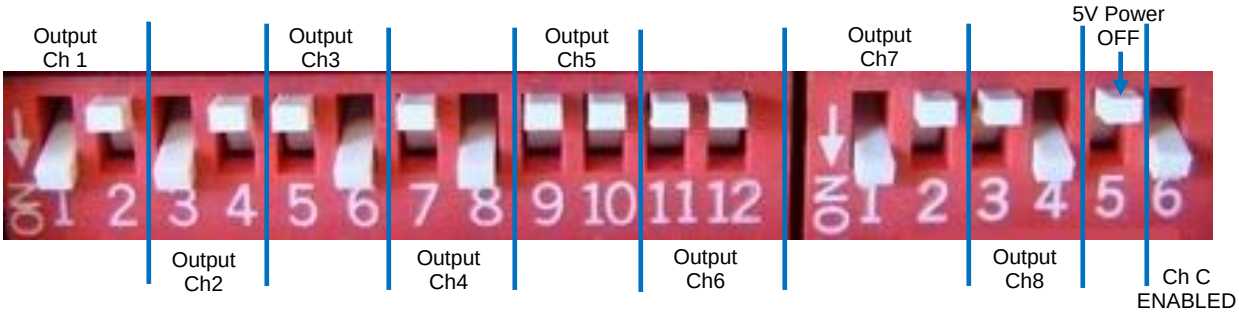


Figure 3 Configuration DIP switch settings

Table 4 DIP switch settings for Figure 3

Output Channel #	Input Setting Fixed Mode	Input Setting Switched Mode
Channel 1	C	N/A
Channel 2	C	N/A
Channel 3	B	N/A
Channel 4	B	N/A
Channel 5	A	A, B, C
Channel 6	A	N/A
Channel 7	C	N/A
Channel 8	B	N/A

Channels **1**, **2**, and **7** are set to **Input C**. Channels **3**, **4**, and **8** are set to **Input B**.

The seats for these six channels do not have source select switches.

Only channels 5 and 6, which are set to Input A, can use a source select switch. This is because the DIP switches controlling these channels are turned OFF.

Tip: For more configuration examples, see the Appendix on page 11.

5. MOUNTING

Mount the Headphone Distribution Amplifier in any orientation using the four mounting slots in the flange brackets on the exterior housing. Refer to Note 3 on the *Outline and Installation Drawing* 0700-001-CD.

6. ADJUSTING THE MAXIMUM AUDIO LEVEL

The factory defaults for the potentiometers, as shown in Figure 4, are set to line level. This means that the signal coming out of the amplifier is equal to the signal going in. Adjust each knob individually to set the maximum audio level for each input.

After establishing the maximum audio level, use the potentiometers to match the line levels for the audio sources to provide a consistent volume when switching input sources. To lower the audio level, turn the knob counter-clockwise; to raise it, turn the knob clockwise.

Table 5 Audio input level controls

Potentiometer	Control
A	Channel A
B	Channel B
C	Channel C
PA	Pilot mic

Figure 4 Line-level positions for potentiometers

Note: To avoid popping when you power the system on and off, do not reverse or interconnect the ground and return lines.

7. TECHNICAL REFERENCES AND SUPPORT

NOTICE

The *Outline & Installation* drawing is also available at www.rosenaviation.com.

From the Rosen Aviation home page, select **Support→ Drawings and Pinouts**, and look for the product name under the Accessories category.

7.1. DO-160E Qualifications

Table 6 DO 160E test criteria to which we test the Headphone Distribution Amplifier

Description	DO-160E Section	DO-160E Category
Temperature and Altitude	4.0	A1
Temperature Variation	5.0	C
Humidity	6.0	A
Operational Shocks & Crash Safety	7.0	B
Vibration	8.0	S, Curve B
Explosive Atmosphere	9.0	N/A
Waterproofness	10.0	N/A
Fluids Susceptibility	11.0	N/A
Sand and Dust	12.0	N/A
Fungus Resistance	13.0	N/A
Salt Spray	14.0	N/A
Magnetic Effect	15.0	A
Power Input	16.0	Z,B
Voltage Spike	17.0	A
Audio Frequency Conducted Susceptibility – Power Inputs	18.0	Z
Induced Signal Susceptibility	19.0	AC
Radio Frequency Susceptibility (Radiated and Conducted)	20.0	T
Emission of Radio Frequency Energy	21.0	B
Lightning Induced Transient Susceptibility	22.0	N/A
Lightning Direct Effects	23.0	N/A
Icing	24.0	N/A
Electrostatic Discharge (ESD)	25.0	A
Fire, Flammability	26.0	N/A

7.2. Specifications

Table 7 Headphone Distribution Amplifier specifications

Weight	.85 lbs [.3856 kg]
Dimensions	7.7” (W) x 1.4” (H) x 5” (D) [19.56 cm (W) x 3.56 cm (H) x 12.7 cm (D)]
Power Requirements	28V DC
Operating Temperature	0ºC - 50ºC
Warranty	2 year

7.3. Troubleshooting

If the audio does not function properly, refer to the following troubleshooting tips for symptoms and possible solutions before contacting Rosen Aviation field support.

Table 8 Troubleshooting tips and solutions

Problem	Possible Solutions
Power LED does not illuminate (GREEN)	● Verify pinout to power input connection is correct.
No sound	● Wait at least five seconds after turning on the Headphone Distribution Amplifier power. ● Verify the pinout for audio is correct. ● Verify audio signal on connector pins. ● Adjust the potentiometers clockwise to increase audio level. ● Verify that audio source is in play mode. ● Check for damaged connector pins. ● Check DIP switch configuration.
Amplifier does not cycle through sources	● Check the DIP switch settings and adjust. ● Check for damaged connector pins. ● Verify source select switch operation and pinout.

If you need assistance with an installation, please contact Rosen Aviation at 541.342.3802 or 888.668.4955.

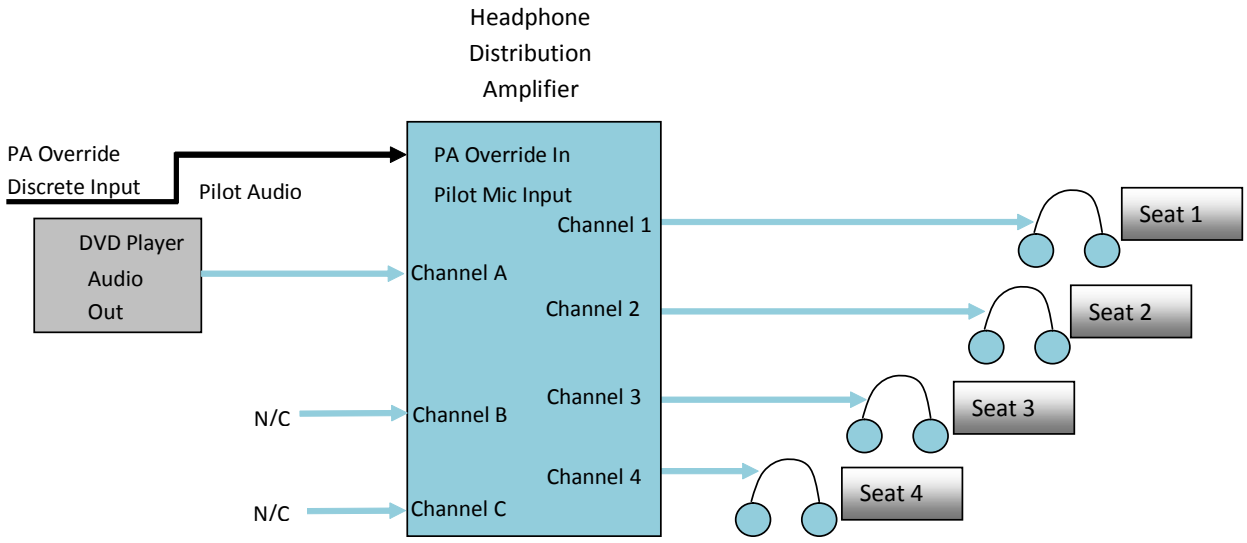
8. REVISION HISTORY

Revision	Date	Revision Description	EC #
A	03/11/08	New release	08079

9. APPENDIX

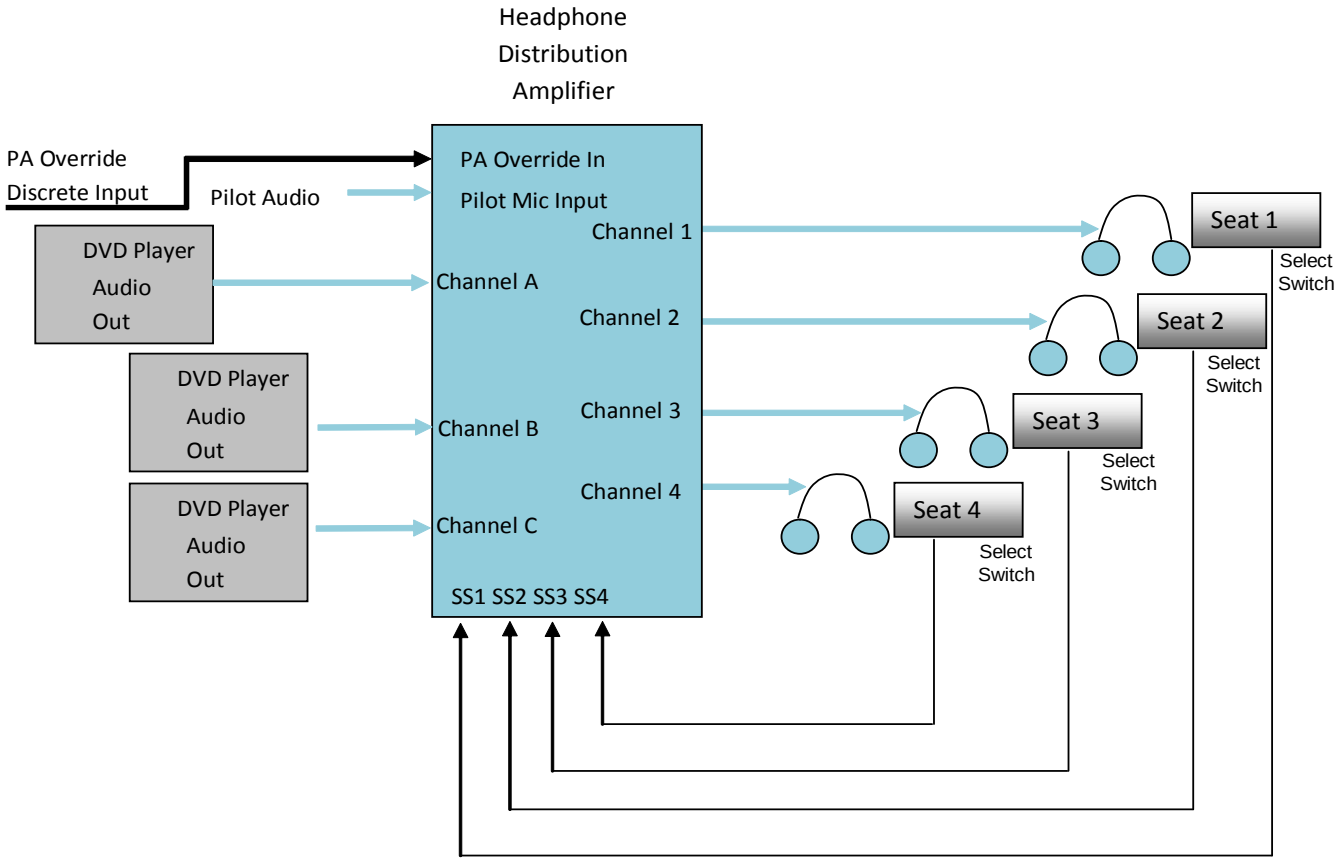
9.1. Configuration Diagrams

The following diagrams illustrate different ways to configure the unit's connections to integrate audio control into an in-flight entertainment system.



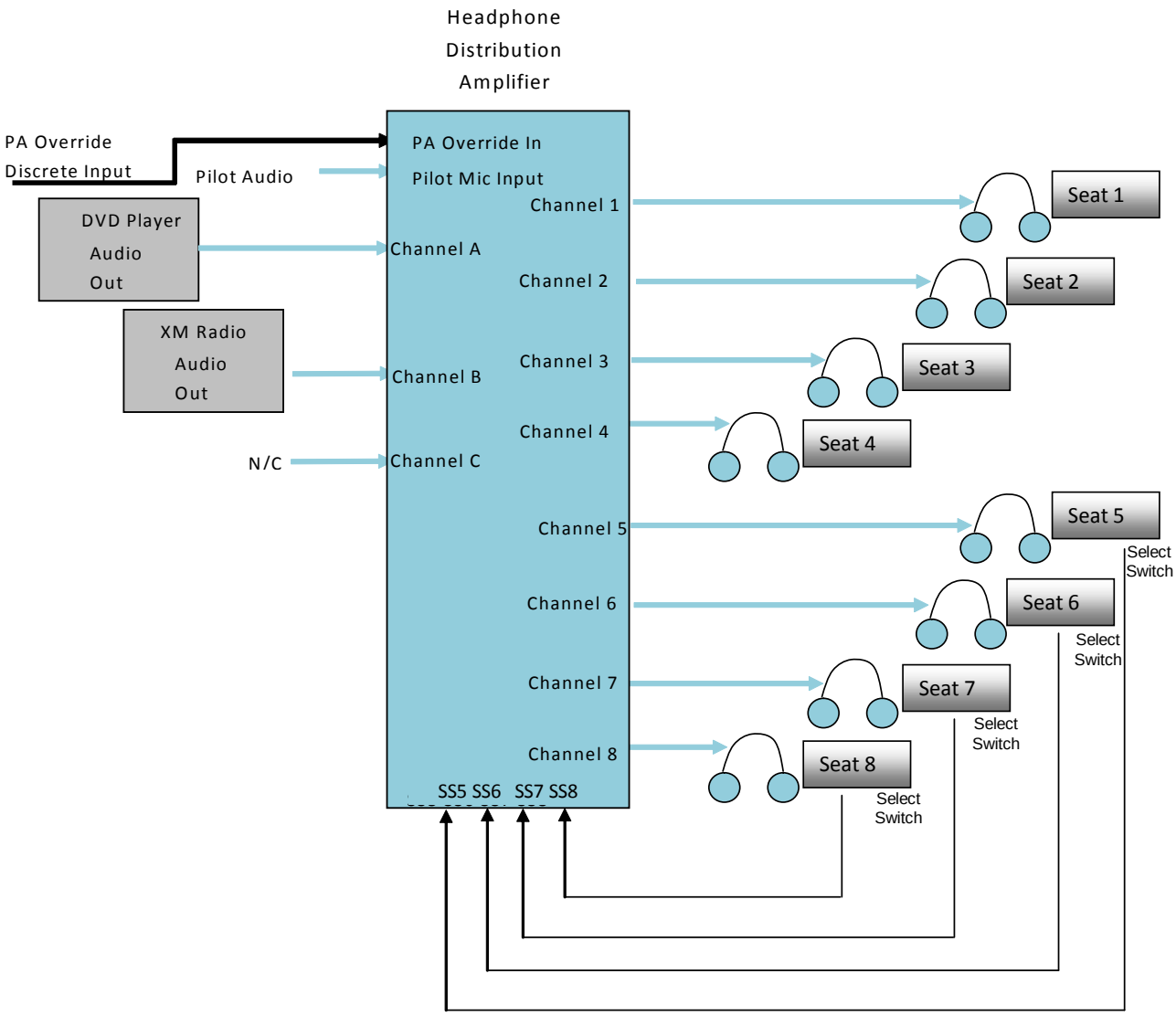
Example 1 – The aircraft has four passenger seats. Each seat has a headphone jack without source select switch. There is only one audio source in the system (DVD player).

Configure the switches on the Headphone Distribution Amplifier, as shown above. Leave all other unused switches in the OFF position.



Example 2 – The aircraft has four passenger seats. Each seat has a headphone jack with a select switch. These jacks also have LEDs for lighting. The LEDs require +5v DC. The +5v DC will be supplied by the Headphone Amp. There are three audio sources in the system. Each passenger (seat) can listen to all sources.

Configure the switches on the Headphone Distribution Amplifier, as shown above. Leave all other unused switches in the OFF position.



Example 3 – The aircraft has eight passenger seats. Seats 1-4 have headphone jacks with no select switch. These seats have access to XM Radio audio only, which is assigned to Channel B. Seats 5-8 have headphone jacks with select switches. These jacks also have LEDs for lighting. The LEDs require +5v DC, which will be supplied by the Headphone Amplifier (SW5 on the small bank of switches). Seats 5-8 can listen to either audio source: XM Radio or DVD Player.

Configure the switches on the Headphone Distribution Amplifier, as shown above. Leave all other unused switches in the OFF position.