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SERVICE LETTER

CVR AUDIO MIXERS

PART NUMBERS

5020-1
5020-1-1

This letter supplies general instructions for installation of the Avtech 5020-1 and 5020-1-1 CVR Audio Mixers.

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COMMUNICATION - CVR AUDIO MIXER - INSTALLATION PROCEDURE

1. Effectivity

This service letter applies to all operators planning to use the Avtech 5020-1 or 5020-1-1 CVR Audio Mixers.

2. Reason

This letter gives general instructions for installation of the Avtech 5020-1 and 5020-1-1 CVR Audio Mixers.

3. General

The 5020 CVR Audio Mixer is basically an eavesdropping circuit that also deals with Push-To-Talk (PTT) and Microphone Bias voltages. Two mixer circuits are necessary for each aircraft, one for the pilot and one for the copilot. Your installation may use two (2) 5020-1 Mixer Amplifiers or one (1) 5020-1-1 Dual Station Mixer, which is two 5020-1 mixers in one box.

A. Connection Options

Figure 1 shows a single 5020-1 mixer and two choices for connection, the Paired Pins method and the Tapped Cable method.

(1) Paired Pins Method (Figure 1, sheet 1)

Both 5020 Audio Mixers supply extra sets of pins connected to the HI and LO microphone (MIC) and headphone (HDPH) input pins of the CVR mixer. These are used in the paired pins connection method to reduce the need to tap and re-splice existing cable harnesses.

The HAND MIC signal connection is an example of the paired pins connection method. The HAND MIC signal is sent to pins 13 and 14 of mixer (HAND_MIC_LO and HAND_MIC_HI). This signal also appears on pins 32 and 33 where it is sent to the Audio Control Panel (ACP) as it was before the CVR mixer installation.

The other monitored signals are connected the same way, with one exception - the cockpit speaker lines. These use the tapped cable connection method. Otherwise, large currents flowing in the pin pairs can interfere with low level mic signals in the mixer.

(2) Tapped Cable Method (Figure 1, sheet 2)

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The tapped cable connection method supplies the same connectivity as the paired pins method. More cable cutting and splicing is necessary with a tapped cable connection, however. Because the signal taps are inside the aircraft's cable harness, signals do not flow through the mixer's paired pins and potential interference from a high ground-return is avoided.

B. Microphone Bias

To supply a Hot Mic signal to the CVR, the Avtech mixer circuit gives microphone bias to all three microphones when the PTT lines are open to ground. When the Hand Mic PTT switch is pressed, pin 37 is grounded. This ground turns off the mixer's bias to the Hand Mic. This is done because most ACPs (or radios) give a bias voltage when the PTT switch is pressed.

Generally, a separate PTT switch is used with the Oxy Mic and Boom Mic. Pressing this PTT switch supplies a ground to mixer pin 10 or 29 depending on the mode (XMIT or INT). Placing a ground on pin 10 or 29 turns off the mixer bias circuits for both the Boom or Oxy Mask microphones. Proper bias is then supplied by the ACP or the radio.

It is important to examine the bias logic used by each ACP. If bias is supplied to any microphone at all times (not controlled by a PTT switch), connect the appropriate PTT pin to ground, at the mixer. This prevents two biasing circuits from being on at the same time.

C. Audio Level Adjustments

All adjustment potentiometers are factory set to give a nominal CVR Output Signal of 0.5 Vrms (2K ohm load), with nominal audio and microphone input signals. For most installations, no adjustments are necessary. However, the potentiometer settings can be changed to meet the needs of a specific aircraft audio system.

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4. Accomplishment

- A. Examine the logic used for microphone bias, as supplied by the ACPs or radios.
- B. Find the correct connections (ground, open, or PTT switch) for each of the mixer's PTT input pins (10, 29, 36 and 37).
- C. Select location(s) for two 5020-1 Mixer Amplifiers or one 5020-1-1 Dual Station Mixer. The ideal location(s) will put the mixer(s) close to the microphone sources to reduce noise pick up.
- D. Install the mixer(s) so that the adjustment potentiometers are accessible without removing the mixer(s).

CAUTION: USE A TAPPED CABLE CONNECTION FOR THE COCKPIT SPEAKER LINES (PINS 2 & 3). LARGE CURRENTS FLOWING IN THE PIN PAIRS SUPPLIED FOR THESE LINES CAN INTERFERE WITH LOW LEVEL MIC SIGNALS IN THE MIXER.

- E. Make a cable harness to connect the mixer(s) to all inputs and the CVR. The mating connector for the Avtech mixer is a DCM-37S (or equivalent).

NOTE: All audio wiring must use shielded, twisted pairs. Make sure that all cables are the necessary lengths and all connectors are correctly positioned.

- F. Make ground connections as follows:

- (1) Connect the mixer signal ground (pin 15) and +28 VDC return (pin 18) to a common point outside of the mixer amplifier, through the aircraft wiring.

NOTE: If used, CABIN_SPKR_LO must have a connection to signal ground through aircraft wiring.

- (2) Mount the mixer(s) to a grounded/conductive surface. If such a surface is not available, connect a ground wire to the mounting hardware.

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- (3) Connect the braided shielding of the twisted/shielded signal wiring pairs to each other.

NOTE: Ground only one end of the braided shields. The connector housing is connected to chassis ground.

- G. Do a complete system test to make sure that the connections are correct. Make level adjustments as necessary per the CVR manufacturer's installation procedure.
- H. Install the cable harness.
- I. Install the mixer(s) and connect the cable harness.
- J. Do a complete CVR/Audio System test.

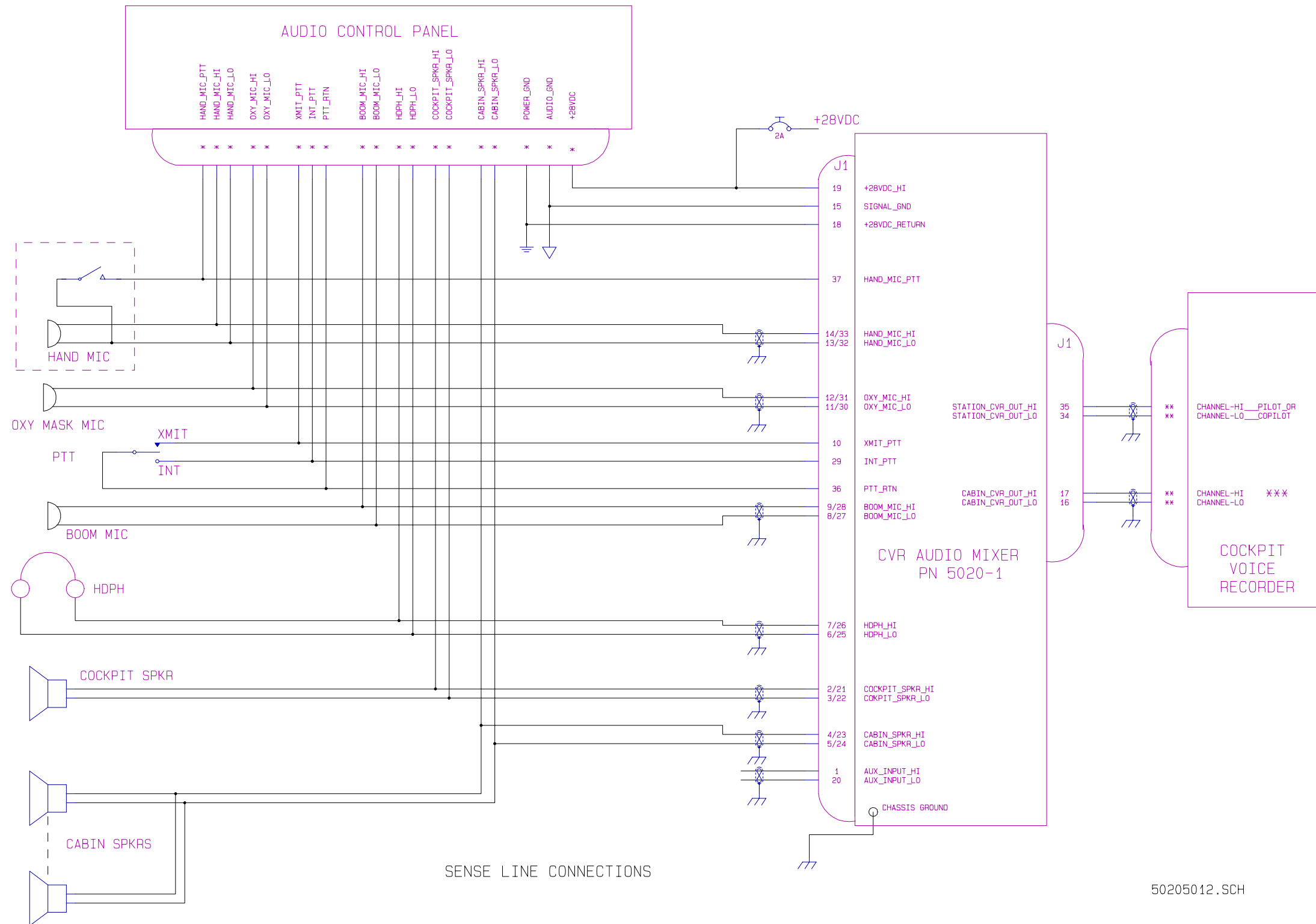
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| CVR AUDIO MIXER SPECIFICATIONS | |
|----------------------------------|---|
| Size | 5020-1 Mixer 1.3" x 3.0" x 4.0" 5020-1-1 Mixer 2.35" x 3.0" x 4.0" |
| Weight | 5020-1 0.4 lbs 5020-1-1 0.7 lbs |
| Mounting Holes | Four each 0.20" diameter, 2.0" x 3.5" centers |
| Connector | DCM-37PD (mates with DCM-37S) 5020-1 has one connector, 5020-1-1 has two |
| Input Power | +22 to +32 VDC, 200 mA maximum for mixer |
| Mic Inputs | Biased by 13 VDC through a 300 ohm resistor Input impedance approximately 300 ohms Nominal input signal is 0.25 Vrms (0.15 - 1)* |
| Headphone and Aux Inputs | Impedance approximately 20K ohms Nominal input signal is 3.0 Vrms (1.0 - 5.0)* |
| Cockpit and Cabin Speaker Inputs | Impedance approximately 20K ohms Nominal signal is 4.5 Vrms (1.0 - 7.8)* |
| Output to CVR | Adjustable from 0.10 to 1.5 Vrms Nominal CVR output (factory set) is 0.5 Vrms |
| Frequency Response | 300 Hz to 6 kHz (+/- 3 dB) |
| Design Criteria | DO-160B, built per TSO requirements |
| * acceptable range | |

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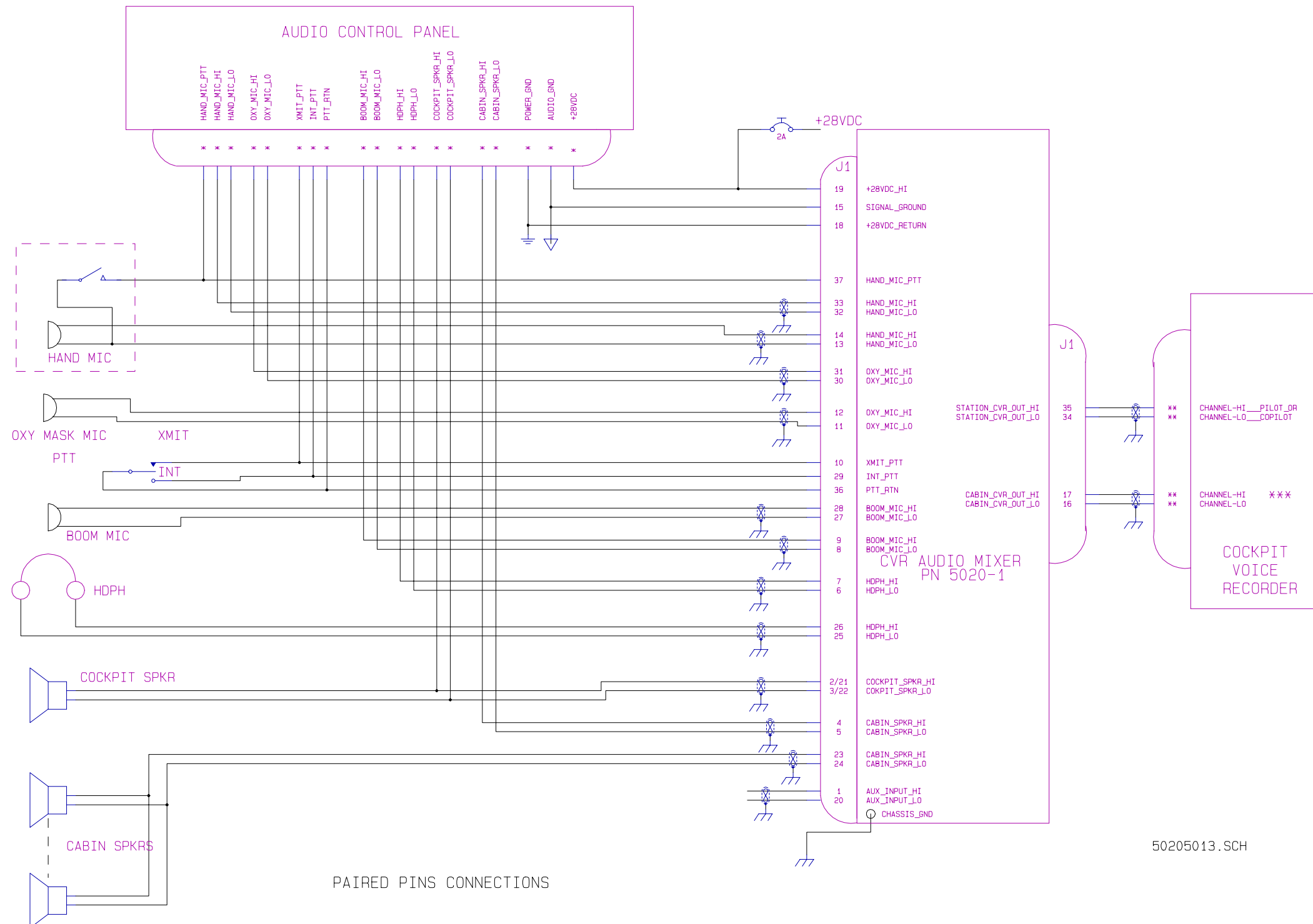


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CVR Audio Mixer Interface Diagram
Figure 1 (sheet 1 of 2)

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CVR Audio Mixer Interface Diagram
Figure 1 (sheet 2 of 2)