

Sigtronics SDB-800 Installation and Operating Instructions



A Voice Activated Intercom System for Aircraft with Dual Audio Panels!

The Model SDB-800 is an intercom system specifically designed for permanent installation in aircraft using dual (separate) audio buss' systems (i.e. aircraft with two audio panels.) The SDB-800 allows both pilots, operating separate radios, the convenience of voice activated inter cabin communication while operating their respective radio systems independently. Optional passenger connections allow up to six "intercom only" positions.

The system consists of two modified SPA-400 units with their own operating controls and radio interface. An interconnect line allows intercom communication between the two units yet keeps the two VHF audio systems separate. When transmitting through their respective radios, each side will hear the other's transmission unless transmitting simultaneously. Radio transmission is also possible through either unit even when the units are "OFF."

The SDB-800 may also be used as a dual intercom system in aircraft without dual audio panels. This is convenient where it is desired to have separate conversations between pilots and passengers.

GENERAL FEATURES AND SPECIFICATIONS

Voice Activated: Allows "hands free" intercommunication between pilot(s) and passengers. Start speaking and the intercom instantly turns on to relay your message clearly to the other headsets; stop talking and it turns off to reduce background noise. There is no need to raise your voice or turn your head anymore!

Transmit Capability: Both pilot and co-pilot can transmit to air traffic control via push-to-talk switches and headset boom microphones. The intercom function is automatically disabled during transmitting, so that only the voice of the person transmitting can be heard.

Radio Monitoring Capability: Radio output can be heard whether intercom power switch is "ON" or "OFF."

Compatibility: All Sigtronics' intercoms operate with all standard aircraft headsets.

Fail safe: Provides ability to transmit through aircraft radio even if the intercoms are "OFF."

Weight: 4.5 ounces each (main chassis with panel and knobs.) Jacks and wiring harness for four headset positions weigh 5.5 ounces.

Size of each unit: Panels - 1" x 2.5". Chassis - 4" deep, 2.5" wide, 1" thick. They can be mounted either horizontally or vertically in the aircraft panel.

Input Power: 12V through 28 VDC. Maximum current drain for both units is 1/10 amp. (0.1A).

Distortion: Less than 1% total harmonic distortion.

Environmental: Meets requirements of TSO-C50b.

Warranty: The SDB-800 is constructed of high quality components and carries a one year parts and labor warranty.



Specialists in "SOUND" Management

178 East Arrow Highway, San Dimas, CA 91773 (909) 305-9399

CHASSIS INSTALLATION

The Sigtronics' Model SDB-800 consists of two complete units. Figure 4 shows that each unit is completely independent from the other except for power, ground, and the yellow wire. Each half of the SDB-800 is designed to mount either horizontally or vertically in your aircraft panel. All necessary mounting hardware is supplied for 2-way through 8-way installation.

Hardware Supplied:

Eight Headphone Output Jacks - Accept standard .250" aircraft headphone plug.

Eight Microphone Input Jacks - Accept standard .206" aircraft microphone plugs (i.e. carbon, amplified dynamic or electret). (U93 plug compatible jacks can be used in place of the jacks provided).

Mike Jack Insulating Washers: 8 shoulder and 8 flat.

Two SDB-800 intercom panels lettered on both sides.

Control Knobs (4), Switch Nuts (2) 4-40 Screws (4)

Two drill templates: Hole size pattern for drilling aircraft panel.

Two Aircraft / Intercom interface cables (4 feet long)

UNIT PLACEMENT

For ease of operation we recommend that you place the pilot's SDB unit on the pilot's side of the aircraft panel and the copilot's unit should be placed on his side. This eliminates any confusion about which half of the SDB-800 system each pilot has to operate. Also, the location selected for each SDB unit requires a minimum front panel area of 2-1/2" by 1- 1/16". Depth required behind panel is 4- 3/16" plus cable access.

CAUTION: Move aircraft flight controls through limits of travel to make sure rear of intercoms and cables will not interfere with aircraft control components.

PANEL PREPARATION:

1. Position adhesive template on aircraft panel in selected areas.
2. Center punch each hole at cross lines. (The five holes are in a straight line and are equally spaced 0.4" apart).
3. Drill 1/8" pilot hole all five places.
4. Enlarge holes to 1/4" and 3/8" per template.
5. Repeat above for the other SDB unit

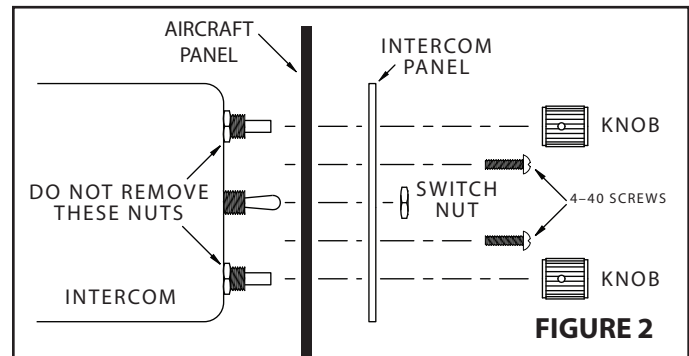
MOUNTING CHASSIS: See Figure 2

1. Remove nut from SDB unit ON-OFF switch bushing.
2. Remove the 4-40 screws on either side of switch.
3. Remove Volume and Squelch control knobs. **NOTE: DO NOT REMOVE** nuts from Volume and Squelch control potentiometers.
4. Insert SDB unit from rear of aircraft panel with appropriate arrow pointing upwards.
5. Install panel and lightly thread nut on to ON-OFF switch. Nuts and washers on Volume and Squelch controls should fit inside the 3/8" diameter holes.

6. Install two 4-40 screws through holes in intercom panel. Tighten ON-OFF switch nut.

7. Install knobs on Volume (VOL) and Squelch (SQ) control shafts using .050" Allen wrench.

8. Repeat for other SDB unit.



MOUNTING HEADPHONE AND MICROPHONE JACKS

1. Locate mounting areas. (One mike and one headphone jack for each headset). Again, make sure the jacks will not interfere with aircraft control components.
2. Drill 3/8" diameter holes for headphone jacks and install.
3. Drill 1/2" diameter holes for mike jacks and install with insulating washers supplied. (See Figure 3).

NOTE: If the aircraft already has pilot headset jacks, they can be used for the intercoms, but they must be rewired as follows:

Mike Jack:

1. Remove any existing wires from the tip, ring, and barrel connections.
2. Connect the intercom white / black wire to the ring terminal.
3. Connect one end of a ground wire to the barrel terminal of the mike jack and connect the other end to Point A.
4. Install insulating washers as necessary if the barrel of the mike jack is mounted in metal. These are not necessary for function, however they reduce the possibilities of ground loop induced noise.

For the headphone jack: add the appropriate blue wire to the tip terminal. No need to remove existing wires on the headphone jack.

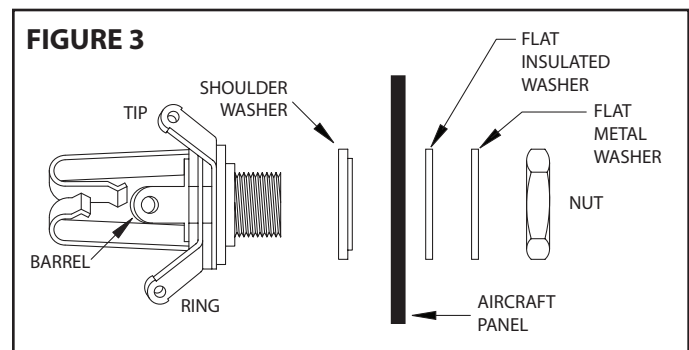


Table 1

Pin	Wire Color	Function	Connection
1	White / Black	Pilot Mic Input	Ring Terminal of Pilot Intercom Mic Jack
2	White / Red	Pilot Transmit Switch Input	Pilot Transmit Switch (PTT) (Switch to Ground to Transmit)
3	Blue *1	Headphone–Radio & Intercom Output	Radio Headphone Output & Intercom Headphone Jacks
4	Black **2	Intercom Central Grounding Point	Aircraft Chassis Ground
5	White *3	Radio Transmit Key Control Output	Tip Terminal of A/C Hand Mic Jack or Key Input of Audio Panel
6	Brown	Transmit Mic Audio Output	Ring Terminal of A/C Hand Mic Jack or Mic Input of Audio Panel
7	Red *4	12 thorough 24 VDC Power Input	Intercom Circuit Breaker
8	Tan *5	Passenger Mic Input	Ring Terminal of Passenger Intercom Mic Jack
9	Tan *5	Passenger Mic Input	Ring Terminal of Passenger Intercom Mic Jack
10	White / Blue	No Connection	
11	White / Orange	Passenger Mic Input	Ring Terminal of Passenger Intercom Mic Jack
12	Yellow	Bidirectional Intercom Link	To Other Intercom Yellow Wire

* See Wiring Instructions

WIRING INSTRUCTIONS

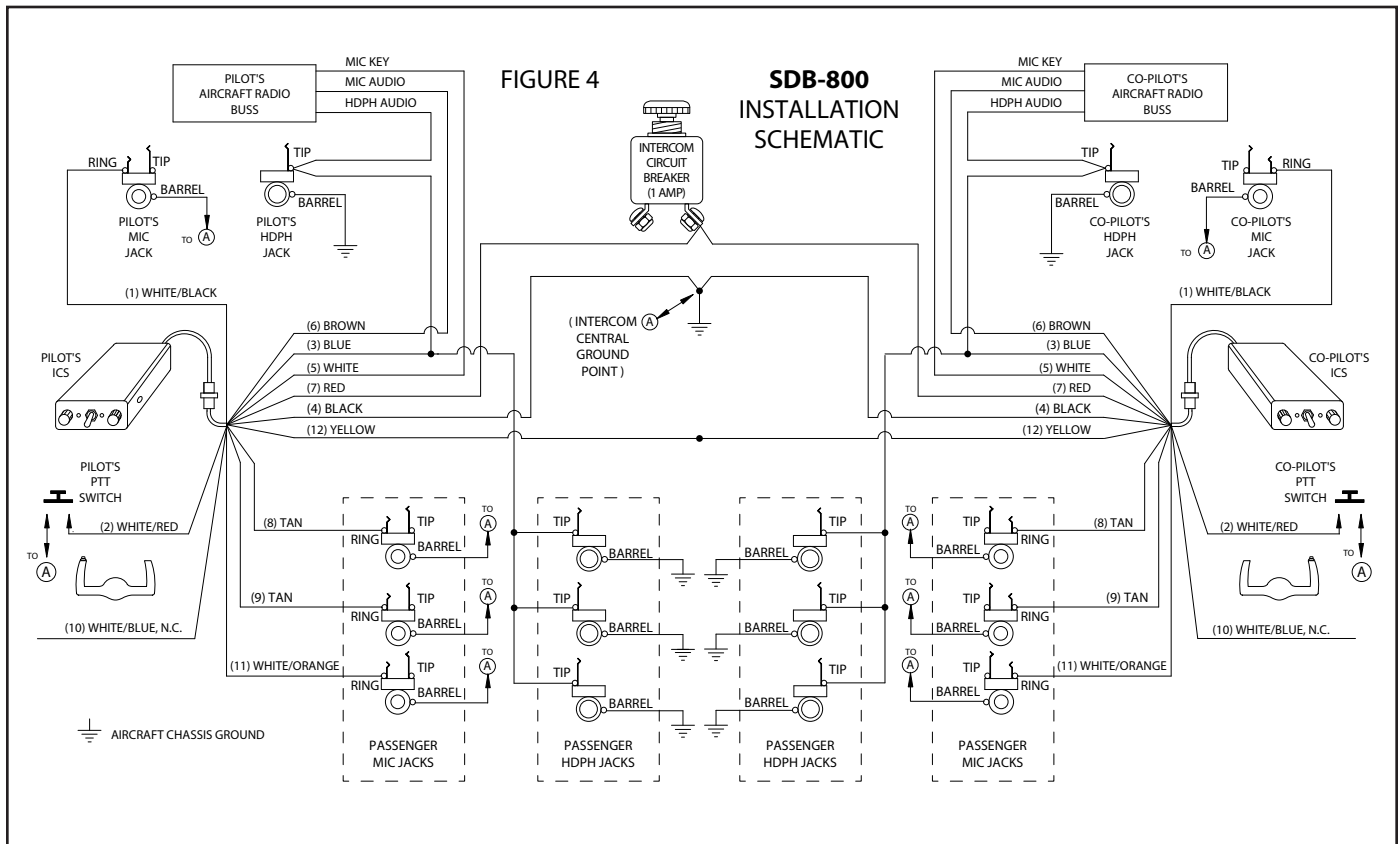
Figure 4 and Table 1 show how to make the wiring connections. If you need longer wire lengths, use good quality hook-up wire, 22 gauge or larger. Shielded audio wire can be used, however, it is not necessary. This can simplify the wiring process.

- *1. The blue wire from Pin 3 must be connected to the aircraft radio headphone output - NOT the speaker output.
- *2. Connect all intercom mike jack grounds to a single aircraft chassis ground point - Point "A" - See Figure 4. (Use the black washers supplied to insulate intercom mike jacks from aircraft chassis ground)."
- *3. Do NOT connect transmit switches to white (key) wire.

*4. Red wire may be connected to either 12V (14V) or 24V (28V) power source. No switching or adjustments are necessary to operate from either source.

*5. Tan wires (pins 8 and 9) and white / orange wires (pin 10) are only used on installations that require extra intercom positions.

****NOTE:** Use this intercom central grounding point so that no unwanted electrical noise, such as alternator whine or strobe noise, will be induced into the intercom system through the grounds. Each intercom mike jack barrel should be insulated from ground and connected back to Point "A" on its individual ground wire. Similarly, both intercom ground wires (pin 4) and the push-to-talk switch grounds should be connected back to Point "A". It is not necessary, however, to connect the headphone jack barrels to Point "A". They can be grounded where you mount them or some place nearby.



FINAL CHECK-OUT AND ADJUSTMENTS

After installing the units, again check that the SDB chassis, jacks, and wiring harnesses are clear of all aircraft operating controls and cause no interference with them. Check out the SDB unit functions by following the instructions:

1. Plug in all the headsets mike and phone plugs into the respective intercom jacks. Put on headset/s and position the boom mike close to the mouth, as is the practice with a hand-held mike. Voice clarity is best when mike is at one side of the mouth and 1/4" from the lips.
2. To assure that the aircraft radios, pilot's headsets, and PTT switches are functioning properly, turn both SDB units' ON/OFF switches to "OFF" position. Set both audio panels to "Headphone" position, then turn on the aircraft radios as usual, and verify that the pilot and co-pilot can hear the radios and can transmit using their respective push-to-talk switches and headsets. Aircraft radios and both audio panels should operate exactly as they did before the SDB-800 system was installed. Aircraft radios reception should also be heard in the passenger headsets (if applicable). Intercom functions will not work when both units are turned OFF.
3. Turn both pilot and co-pilot SDB units to the ON position. Turn the squelch controls of both units to full clock-wise position. Set both unit's volume controls to mid position. Verify that all headset positions can now intercom to each other, including the passengers, if used.
4. Verify that with both SDB units ON, both pilots can independently operate the aircraft radios. (Check that the pilot can transmit and receive properly on the radios selected on the pilot's audio panel. Do a similar check on the co-pilot's side.
5. Radio / Tower Transmit Check: If there is over-modulation (garbled) or weak transmissions over the aircraft radio, an appropriate adjustment can be made. There is a small, square, adjustable trimmer potentiometer inside each of the two SDB units. These adjust the mike outputs to the aircraft radios. It is accessible through a hole in the side of each case and is marked "Mod. Adj." It can be adjusted with a screwdriver. Clockwise rotation increases the output level to the aircraft radio mike input. Counter-clockwise rotation decreases modulation level.

This adjustment sometimes needs to be made after initial installation of the intercom or if a new radio is installed at a later date. (The output is set for unity gain at Sigtronics). If adjustment is necessary, it should be done one at a time. For example, first set the pilot's Mod. Adj. After the pilot's side is set satisfactorily then adjust the co-pilot's unit.

This concludes the system check-out. Refer to the following operating instructions for proper use and other operating modes of the Sigtronics SDB-800 intercom system.

OPERATING INSTRUCTIONS

The Sigtronics' SDB-800 is a voice actuated intercom for dual audio buss' aircraft with "transmit through the aircraft radio capability" using your push-to-talk switches. Each intercom has three controls.

Power Switch - Turns unit on and off and switches the pilot's mike direct to the radio in the "off" position.

Volume Control - Controls the intercom volume.

Squelch Control - Controls the threshold of amplifier turn-on. This adjusts for variations in background noise found in different aircraft.

Each system will function as an independent intercom with pilot and co-pilot having their own ON/OFF switch. When both intercoms are ON, pilot, co-pilot, and 6 passengers (if used) can intercom. Also, when either pilot or co-pilot transmit over the radio, they will hear each other. If both transmit simultaneously, neither will hear the other. The

purpose of this feature is to allow independent VHF communication. Transmitting is also possible with the intercom OFF.

CAUTION - As is standard practice with all aircraft avionics equipment, be sure that the aircraft radio master switch is OFF when you start up the aircraft engine.

INTERCOM OPERATION

- A. First set both SDB ON/OFF switches to the "ON" position.
- B. Turn both SDB unit volume controls to the 9 o'clock position and both squelch controls all the way up (clockwise). Notice the intercom is now continually activated and you should be able to talk between headsets.
- C. To adjust the intercom squelch controls for voice activated operation (VOX), it is helpful to have some background noise present. It may also be necessary to turn up the intercom volume controls. Turn both intercom squelch controls all the way counter clockwise. Now, without speaking, rotate one of the squelch controls clockwise until you hear the background noise in your headset. Next, using the same control, rotate counter clockwise small, incremental amounts until the background noise disappears. (This procedure is necessary because the squelch is a "fast on, slow off" system). The squelch control is now set on that intercom unit.
- D. Adjust the other intercom squelch control similarly by turning it clockwise until you hear background noise. Rotate counter clockwise **incremental amounts** until the background noise disappears. Small adjustments may be necessary if aircraft background noise changes significantly - such as from idle to maximum power.

RADIO TRANSIT MODE

Because of the dual intercom design of the SDB-800, transmitting from both pilot and co-pilot positions is possible simultaneously and one-at-a-time. Each pilot selects the radio he wishes to use via his audio panel. When he presses his PTT switch, his headset mike is routed through the intercom to the radio he selected. Only his mike will be live. The microphone of any passengers connected to the pilot's side of the SDB-800 system will be muted when the pilot transmits. Similarly, when the co-pilot transmits, only the co-pilot's mike signal will go out on the radio selected by the co-pilot. When transmitting, the pilots will hear their own voice via the aircraft radio side-tone return. If the radio does not provide transmit side-tone, then they will not hear their voice. (A minor modification to the SDB unit will enable it to simulate side-tone).

RADIO MONITORING

Radio monitoring is automatic. The radio monitor circuit is always active; even with SDB unit power switch OFF. Each pilot will only hear the radio selected by his respective audio panel.

SOLO FLIGHTS

The intercoms may be turned off during solo flights. The pilot will still hear the aircraft radio, since this circuit is always active, and may transmit to ATC via his push-to-talk switch.

BACK-UP (Fail safe)

If a problem is suspected in the intercom, simply turn it off. You will still receive the aircraft radio(s) as normal and will be able to transmit from the pilot's position. You may also use the hand mike, however, the SDB unit should be turned off and you should unplug your boom mike from the mike jack. (Leave headphone plugged in for radio reception)