Sigtronics SCI Panel Mount Intercom System

INSTALLATION AND OPERATING INSTRUCTIONS Models SCI-4 and SCI-6

INTRODUCTION

ATTENTION INSTALLER: To assure a trouble free installation, please read the entire instructions through once before beginning.

⚠️ **WARNING:** This product can expose you to chemicals including Polyvinyl Chloride, which is known to the State of California to cause cancer, and Lead, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Once again Sigtronics is first. First with VOX, now first with dual Squelch lights. Get instant visual confirmation on who is breaking squelch.

All of our products are "systems designed" to provide reliable, fail-safe products at the lowest possible cost. And we stand behind our products to guarantee your satisfaction!

The Sigtronics Models SCI-4 and SCI-6 intercom systems are specifically designed for permanent - panel mounted installation in aircraft. The SCI units allow both pilot and co-pilot to operate the aircraft radios and have the convenience of voice activated intra-cabin communication. Passenger connections are provided that allow up to four additional intercom positions, depending on model.

SIGTRONICS SCI INTERCOM SYSTEM FEATURES:

VOICE ACTIVATED feature allows "hands free" inter-communication 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 eliminate background noise. There's no need to raise your voice or turn your head to communicate.

UP TO FOUR POSITION INTERCOM is provided with the model SCI-4. Model SCI-6 handles up to six positions. *"H"* Model units for use in *high noise aircraft.*

DUAL SQUELCH CONTROL AND INDICATOR LIGHTS - Another Sigtronics first. Know instantly who is breaking squelch, crew or passengers.

TRANSMIT CAPABILITY allows both pilot and co-pilot to transmit to air traffic control via their push-to-transmit switches and headset boom mics. Depending on the mode selected, intercom function is disabled during transmission so only the voice of person transmitting is heard.

PILOT ISOLATE MODE - The pilot can set the intercom so that he can transmit and receive on the aircraft radio(s) independently from the rest of the intercom. The co-pilot and passengers can still intercom among themselves and not be heard by the pilot. Conversely, they won't hear the aircraft radios or the pilot. This can be an advantage in areas of busy radio traffic.

CREW ISOLATE MODE - The pilot can set the intercom so that the pilot and co-pilot (crew) can intercom, transmit and receive on the aircraft radio(s) and not hear the passenger conversations. Conversely, passengers can intercom simultaneously and not be bothered by radio traffic or crew conversations.

RADIO MONITORING capability allows radio output to be heard by the pilot, whether the SCI unit is in "ALL", "ISO", or "CREW" mode.

COMPATIBILITY - Sigtronics SCI intercoms operate with all standard general aviation aircraft radios and headsets.

FAIL-SAFE feature provides the pilot with the ability to use the aircraft radios even if power is lost to the intercom.

EASY UPGRADE - In most cases enlarge three holes, add two more, and re-route three headphone wires in an existing SPA-400 or SPA-600 installation and get the latest technology in aircraft intercoms.

WEIGHT: 7.3 ounces (SCI-4 intercom unit with panel and knobs). Jacks and wiring harness weigh 6.3 ounces.

SIZE: Panel – 1" x 2½". Chassis – 1" high x 2½" wide x 6" deep. Can be mounted either horizontally or vertically in the aircraft panel.

INPUT POWER: 11VDC through 32VDC. Maximum current drain 0.2 Amp (SCI-6).

DISTORTION: Less than 1% total harmonic distortion.

WARRANTY: The SCI units are constructed of high quality components and carry a five year parts and labor warranty.

**FAA TSO:** C-50c
ENVIRONMENTAL: DO-160D
Environmental Category:
A1D1XCAAS2MXXXXXXZBBBBXXXXXXXXXXX

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OPTION - PILOT TRANSMIT PRIORITY - If the pilot and the copilot key at the same time (not a common occurrence) the default operation is that both microphones will go out the aircraft radio to the tower. If you prefer only the pilot's microphone active when both press their PTT's simultaneously then enable this option. Note - if only one of the pilots presses his PTT only his mic will go out over the radio regardless if this option is selected or not.
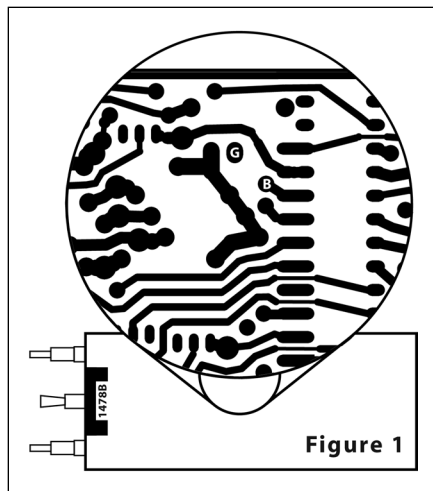
To enable this option, remove the four screws on the bottom of the SCI unit and remove the cover. Refer to Figure 1. To enable pilot transmit priority solder a small jumper between pad "B" and pad "G". Replace the cover and the four screws and tighten. Removing this jumper will deactivate the option.

Figure 1

CHASSIS INSTALLATION

To upgrade an existing SPA-400 installation to a SCI-4 or a SPA-600 to SCI-6 skip to the "UPGRADING A SPA INSTALLATION TO A SCI" section on page 3. For a completely new intercom installation continue below.

Hardware Supplied

Besides the intercom unit and these instructions, each SCI system comes with the following hardware:

	SCI-4	SCI-6
Headphone Output Jacks - Accept standard 0.250" aircraft headphone plugs.	4	6
Microphone Input Jacks - Accept standard 0.206" aircraft microphone plugs. (U93 plug compatible jacks can be used in place of the jacks provided).	4	6
Mic Jack Insulating Washers, Flat	4	6
Mic Jack Insulating Washers, Shoulder	4	6
Intercom Panel - lettered on both sides.	1	1
Intercom Control Knobs	4	4
Mounting Screws 4-40 x 1/2	2	2
Drill Template - Adhesive backed hole size pattern for drilling aircraft panel.	1	1
Aircraft/Intercom Interface Cable (4 feet long)	1	1
Headphone/intercom Interface Cable (4 feet long)	1	1

UNIT PLACEMENT

The SCI unit has been designed to mount either horizontally or vertically in your aircraft panel.

The location selected for the SCI unit requires a minimum front panel area of 2½" by 1". Depth required behind panel is 6" plus cable access.

CAUTION: Move the aircraft flight controls through the limits of travel while observing the selected area and making sure that the rear of the intercom and cable will not interfere with any aircraft control components.

Panel Preparation

1. Position the adhesive drill template on the aircraft panel in the selected area.

2. Center punch each hole at the cross lines. (Five holes are in a straight line and equally spaced 0.4" apart, two holes are 0.8" apart).

3. Drill ⅛" pilot holes in all seven places.

4. Enlarge two holes to ⁹⁄₁₆", one hole to ⁷⁄₁₆", and two holes to ³⁄₁₆" per the template.

Mounting Chassis (See Figure 2)

1. Remove the knobs from the Volume and Squelch controls using a 0.050" Allen wrench. NOTE: DO NOT REMOVE the nuts from the Volume/Squelch, or ALL/ISO/CREW controls.

2. Insert the SCI unit from the rear of the aircraft panel with the appropriate arrow on the unit chassis pointing upwards. Make sure the squelch indicator lights have unrestricted movement through aircraft panel.

3. Install the printed SCI panel and lightly thread the two 4-40 screws through the holes in intercom panel. The nuts on the Volume/Squelch and ALL/ISO/CREW controls will fit inside the ⁹⁄₁₆" and ⁷⁄₁₆" diameter holes.

4. Tighten the two screws.

5. Install the knobs on the Volume (VOL) and Squelch (SQL) control shafts and tighten the Allen screws.

Mounting Headphone And Microphone Jacks (See Figure 3)

1. Locate the mounting areas. (One mic and one headphone jack required for each headset). Again, make sure that the jacks will not interfere with any aircraft control components. (Note that the jack contacts will expand when a plug is inserted into the jack.)

2. Drill ⅜" diameter holes for headphone jacks and install.

3. Drill ½" diameter holes for the mic jacks and install with the insulating washers supplied. (See Figure 3)

Note: If the aircraft already has pilot headset jacks, they can be used for intercom, however, the mic jack must be re-wired as follows:

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 wire to the barrel terminal of the mic jack and connect the other end to Point "A".

4. Install insulating washers as necessary if the barrel of the mic jack is mounted in metal.

For the headphone jack, remove any existing wires from the tip connection. Connect the green wire (J2 pin 1) to the tip connection.

AIRCRAFT PANEL
INTERCOM PANEL
UP
DO NOT REMOVE THESE NUTS
SCI INTERCOM CHASSIS
KNOB
4-40 SCREWS
KNOB
UP RX. ADJ. MOD. ADJ.
Figure 2

TIP
SHOULDER WASHER
FLAT INSULATED WASHER
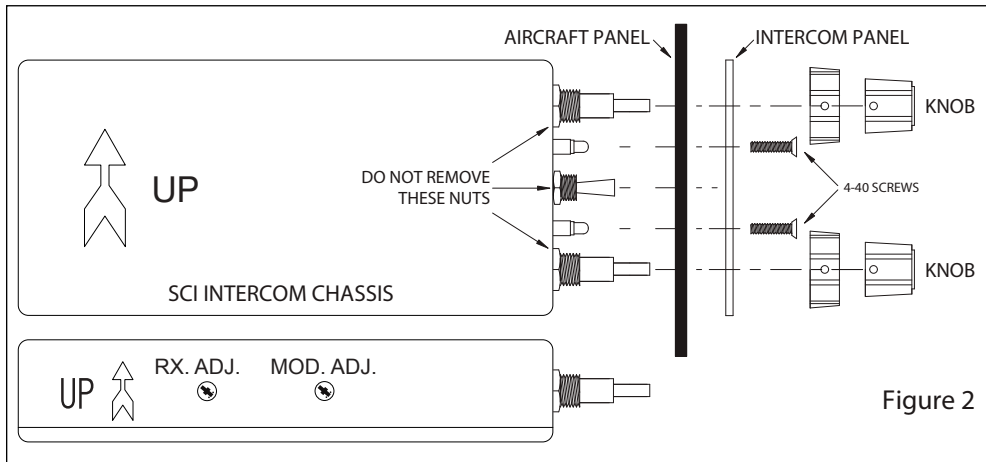FLAT METAL WASHER
NUT
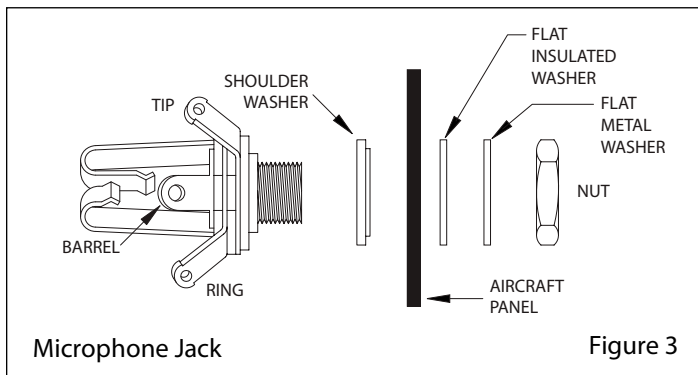BARREL
RING
AIRCRAFT PANEL
Microphone Jack
Figure 3

WIRING INSTRUCTIONS

Connections should be made as shown in Figure 4 and indicated in Table 1 and 2. If longer wire lengths are required, use a good quality hook-up wire - 22 gauge or larger. Although not necessary, shielded audio wire can be used if desired. 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 mic jack grounds to a single aircraft chassis ground point - Point "A" - as shown in Figure 4. (Use the black washers supplied to insulate the intercom mic jacks from aircraft chassis ground). Note this intercom central grounding point is used to eliminate any unwanted electrical noises, such as alternator whine or strobe noise, from being induced into the intercom system through the grounds. All intercom mic jack barrels must be insulated from ground where they are mounted and connected back to Point "A" on their own individual ground wire. Similarly, both intercom ground wires (pin 4) and the push-to-transmit switch grounds must also be connected back to Point "A". It is not necessary, however, to connect the headphone jack barrels to Point "A". They can either be grounded where they are mounted or some place nearby.

*3. The red wire may be connected to either 12V (14V) or 24V (28V) power source. No switching or adjustments are required to operate from either source.

*4. Tan wires (pins 8 and 9) are only used on installations that require extra intercom positions.

*5. Provided on SCI-6 units only.

Skip to the INSTALLATION CHECK OUT AND ADJUSTMENTS section on page 5.

UPGRADING A SPA INSTALLATION TO A SCI

Chassis Mounting

The SCI-4 is specifically designed to easily replace a SPA-400. Similarly, the SCI-6 can replace a SPA-600. The panels are exactly the same dimensions (1" x 2½"), however the SCI units are 1¾" longer than the SPA units. You will have to make sure that you have the extra depth required behind your panel. Five mounting holes are exactly in the same positions. The center hole will have to be enlarged from ¼" to ⁷⁄₁₆", the two outer holes will have to be enlarged to ⁹⁄₁₆", and two additional holes drilled to ³⁄₁₆" (As per template).

To upgrade, first remove the SPA unit from the aircraft panel. This is done by unscrewing the two Phillips head screws and the nut on the ON/OFF switch. Remove the printed SPA panel. Pull the SPA unit out and unplug the white connector from the wiring harness. Next, drill the center hole in the aircraft panel out to ⁷⁄₁₆". Then drill the two outer holes to ⁹⁄₁₆", then use template to mark the position of the final two holes and drill. Finally mount the SCI chassis (see Figure 2 on page 3):

1. Remove the knobs from the Volume and ALL/ISO/CREW controls using a 0.050" Allen wrench. NOTE: DO NOT REMOVE the nuts from the Volume/Squelch (VOL/ SQ) or ALL/ISO/CREW controls.

2. Insert the SCI unit from the rear of the aircraft panel with the appropriate arrow on the unit chassis pointing upwards. The squelch indicator lights (LED's) should easily fit through their respective holes.

3. Install the printed SCI panel and lightly thread the two 4-40 screws through the holes in intercom panel. The nuts on the Volume/Squelch and ALL/ISO/CREW controls should fit inside the aircraft panel holes.

4. Tighten the two screws. Make sure LED's have unrestricted movement in aircraft panel holes.

5. Put the knobs on the Volume and Squelch control shafts and tighten the Allen screws.

Wiring Change

The wiring changes to an existing SPA installation is as follows. Re-wire the pilot, co-pilot, and passenger(s) headphone lines. You will not need the 4 foot interface cable (12 or 15 pin) that comes with the SCI system. You will use the SPA harness already in the aircraft and the 4 foot headphone/intercom interface cable (3 pin).

In an SPA installation, the tip terminals of the pilot, co-pilot, and passenger headphone jacks are wired to the blue wire (pin 3). They need to be disconnected from there and connected to their respective pins on the headphone/intercom interface harness. (See Figure 4 on page 4). Make sure that the blue wire (pin 3) is still connected to the tip of the radio headphone line.
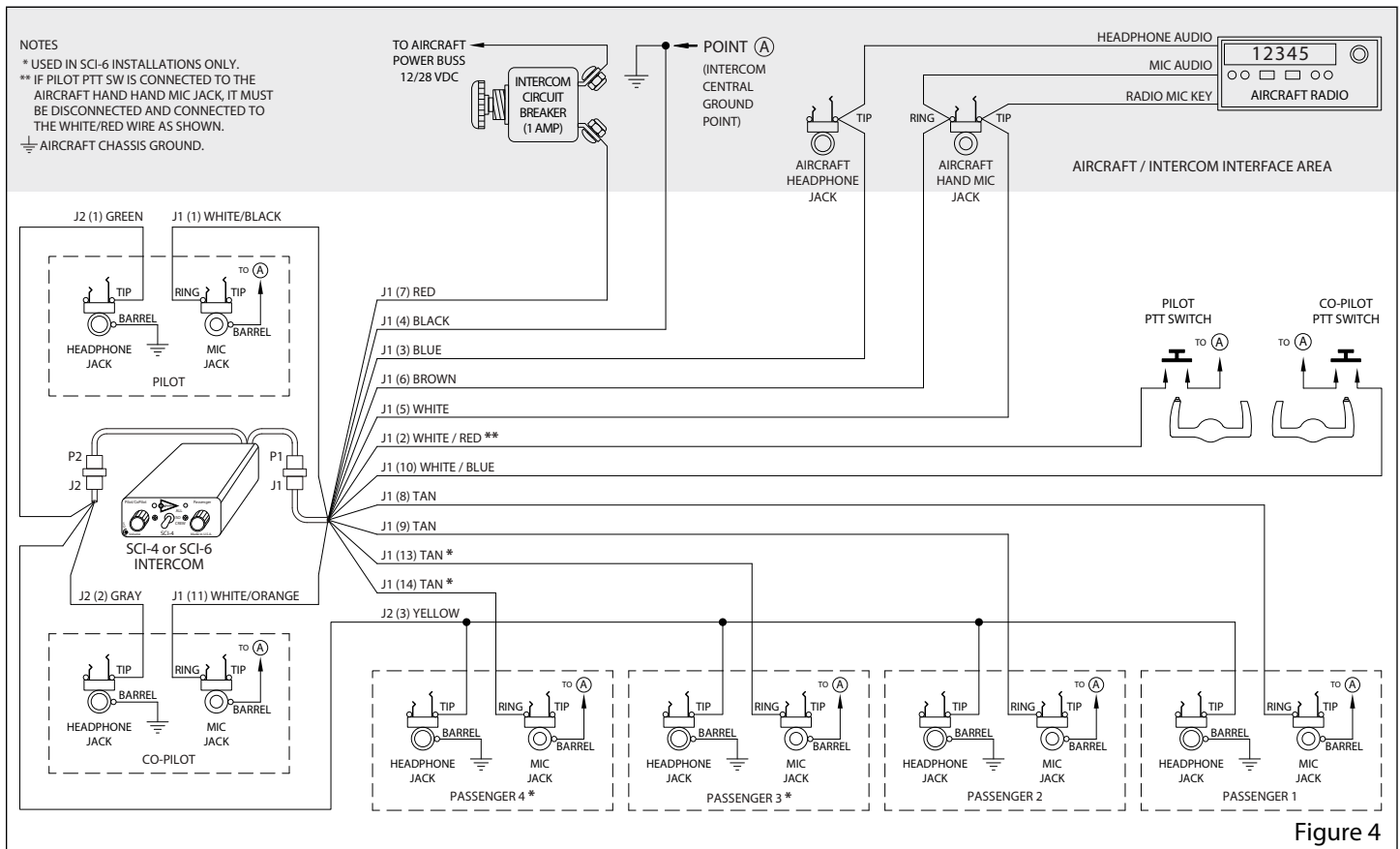
Figure 4

	TABLE 1 – P1 / J1 – See Wiring Instructions		
PIN	**WIRE COLOR**	**FUNCTION**	**CONNECT TO**
1	White / Black	Pilot Mic Input	Ring Terminal of Pilot Mic Jack
2	White / Red	Pilot Transmit Switch Input	Pilot Transmit Switch (PTT) (Switch to Ground to Transmit)
3	Blue *1	Radio Headphone Input	Radio Headphone Output
4	Black *2	Intercom Central Grounding Point "A"	Aircraft Chassis Ground
5	White	Radio Transmit Key Output	Tip Terminal of Aircraft Hand Mic Jack, or Key Input of Aircraft Radio or Audio Panel
6	Brown	Transmit Mic Audio Output	Ring Terminal of Aircraft Hand Mic Jack or Mic Input of Aircraft Radio or Audio Panel
7	Red *3	12 through 28 VDC Power Input	Intercom Circuit Breaker
8	Tan *4	Passenger #1 Mic Input	Ring Terminal of Passenger #1 Intercom Mic Jack
9	Tan *4	Passenger #2 Mic Input	Ring Terminal of Passenger #2 Intercom Mic Jack
10	White / Blue	Co-Pilot Transmit Switch Input	Co-Pilot Transmit Switch (PTT) (Switch to Ground to Transmit)
11	White / Orange	Co-Pilot Mic Input	Ring Terminal of Co-Pilot Mic Jack
12	N/C	None	No Connection
13	Tan *5	Passenger #3 Mic Input	Ring Terminal of Passenger #3 Intercom Mic Jack
14	Tan *5	Passenger #4 Mic Input	Ring Terminal of Passenger #4 Intercom Mic Jack
15	N/C *5	None	No Connection

	TABLE 2 – P2 / J2 – See Wiring Instructions		
PIN	**WIRE COLOR**	**FUNCTION**	**CONNECT TO**
1	Green	Pilot Intercom Headphone Output	Tip Terminal of Pilot Headphone Jack
2	Gray	Co-Pilot Intercom Headphone Output	Tip Terminal of Co-Pilot Headphone Jack
3	Yellow	Passenger Intercom Headphone Output	Tip Terminal of Passenger Headphone Jacks

INSTALLATION CHECK-OUT AND ADJUSTMENTS

After the unit is installed, again check that the SCI unit chassis, jacks, and wiring harness are clear of all aircraft operating controls and cause no interference with them. Next, to check out the SCI unit installation, plug in all the headset mic and phone plugs into the respective intercom jacks. Put on the pilot's headset and position the boom mic close to the mouth, as is the practice with a hand-held mic. Voice clarity is best when the mic is at one side of the mouth and ¼" from the lips.

To assure that the aircraft radios, pilot's headset, and PTT switch are connected and functioning properly, remove power to the SCI by pulling intercom circuit breaker. If applicable, set the aircraft audio panel to "Headphone" position. Then turn on the aircraft radio(s) as usual, and verify that the pilot can hear the radios and can transmit using his push-to-transmit switch and headset. Aircraft radio(s) and audio panel should operate exactly as they did before the SCI system was installed. Aircraft radio reception should not be heard in the co-pilot or passenger headsets. There should be no intercom between headsets with no power to the SCI unit.

Next restore power to the SCI unit. Switch ALL/ISO/CREW control to the "ALL" position. Set the SCI volume controls to mid-position. Set both SCI squelch controls fully clockwise. Verify that all headset positions can now intercom with each other, including the passengers. Verify that both pilot and co-pilot can operate the aircraft radio(s). In this mode all headsets on the intercom will hear the aircraft radio(s).

It may be necessary at this time to adjust the SCI unit mic output to the aircraft radios. A small adjustable potentiometer is provided inside the unit for this purpose. It is accessible through a hole in the side of the SCI chassis. It is marked "Mod. Adj.", and can be adjusted with a small blade screwdriver (See Figure 2). In the event of over-modulation (garbled) or reports of weak transmissions over the aircraft radio, an appropriate adjustment can be made. Clockwise rotation increases the output level to the aircraft radio mic input. Counter-clockwise rotation decreases modulation level. This adjustment sometimes needs to be made after the initial installation of the intercom or if a new radio is installed. (The output is set for unity gain at Sigtronics).

It may also be necessary to adjust the SCI unit radio receive input from the aircraft radio. A small adjustable potentiometer is provided inside the unit for this purpose. It is accessible through a hole in the side of the SCI chassis. It is marked "RX Adj.", and can be adjusted with a small blade screwdriver (See Figure 2). In the event of low aircraft radio volume in the "ALL" or "CREW" mode relative to "ISO" mode, an appropriate adjustment can be made. Clockwise rotation increases the input level to the SCI radio receive input. Counter-clockwise rotation decreases input level. This adjustment sometimes needs to be made after the initial installation of the intercom or if a new radio is installed that has a low output impedance or low output power. The adjustment is best made with the pilot and co-pilot headsets plugged in. (The input is set full CCW which is unity gain for 500Ω radios).

If everything checks out, refer to the OPERATING INSTRUCTIONS on page 6 for proper use and other operating modes of the Sigtronics SCI intercom system. If something does not work as above, carefully go over the intercom wiring again. If something is still not right or you have any questions regarding the installation and operation of the Sigtronics SCI intercom or any other Sigtronics product feel free to contact us directly or email us at tech@sigtronics.com. Technicians are available Monday though Friday 8 am to 4:30 PM Pacific time.

This concludes the installation check-out.

OPERATING INSTRUCTIONS

The Sigtronics SCI-4/SCI-6 is a voice activated (VOX) intercom for aircraft with "transmit through the aircraft radio capability" using your push-to-transmit switches. Three controls are provided on the SCI units:

ALL/ISO/CREW Switch - Sets the intercom mode of operation.

PILOT/CO-PILOT VOL - Volume Control - Controls the intercom volume for pilot (except in ISO mode) and co-pilot. (Does not affect aircraft radio volume. Set radio volume on radio as normal.)

PILOT/CO-PILOT SQ - Squelch Control - Sets the pilot (except in ISO mode) and co-pilot intercom turn-on threshold for voice activated intercom (VOX) mode.

PASSENGER VOL - Volume Control - Controls the passenger intercom volume. (Does not affect aircraft radio volume. Set radio volume on radio as normal.)

PASSENGER SQ - Squelch Control - Sets the passenger intercom turn-on threshold for voice activated intercom (VOX) mode.

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

Intercom Operation

Intercom operation and adjustment can be performed by the following procedure:

1. With aircraft power on, set the SCI ALL/ISO/CREW switch to the "ALL" position - the preferred mode for setting the squelch.

2. Turn the SCI unit volume controls to the 10 o'clock position. Turn the crew squelch control full clockwise and the passenger squelch control full counter-clockwise. Inform passengers to remain silent until you finish setting the intercom squelch.

3. To adjust the intercom squelch control for voice activated operation (VOX), it is helpful to have some background noise present. Turn intercom crew SQuelch control all the way counter-clockwise. Now, without speaking, rotate the Squelch control clockwise until you hear the background noise in your headset, at this point the crew squelch indicator light will be on. Next, rotate it counter-clockwise a small amount and wait (approximately 1 second) until the background noise disappears and the squelch indicator light is off. Finally, make small adjustments until your voice triggers the unit at comfortable speaking levels. This procedure is necessary because the squelch is a "Fast-on, Slow-off" system. Now with the crew squelch set, repeat step 3 for the passenger squelch.

Once set, the intercom stays silent until someone speaks in their headset microphone (mic). Then it instantly turns on and relays the conversation. After about a second of no conversation the intercom goes silent again.

In most aircraft the squelch level won't need to be set again until the next flight. In some high noise aircraft it is better to set the squelch during climb or cruise.

Intercom Modes

ALL MODE - When the SCI is in the "ALL" mode, transmitting from both pilot and co-pilot positions is possible. As normal, the pilot selects the appropriate radio he wishes to use. When the pilot presses his PTT switch, his headset mic is automatically routed through the intercom to the radio. Only his mic will be live. The microphones of the co-pilot and any passengers will be muted when the pilot transmits. Similarly, when the co-pilot transmits, only the co-pilots mic will go out on the radio. Depending upon which priority mode is selected, only the pilot or both will go out when both PTT switches are pressed at the same time. When transmitting, everyone on the intercom will hear the transmitting pilots voice via the SCI sidetone return.

CREW MODE - When the SCI is in the "CREW" mode, transmitting from both pilot and co-pilot positions are possible. The pilot selects the appropriate radio he wishes to use. When the pilot presses his PTT switch, his headset mic is automatically routed through the intercom to the radio. Only his mic will be live. The microphone of the co-pilot will be muted when the pilot transmits. Similarly, when the co-pilot transmits, only the co-pilots mic will go out on the radio. Depending upon which priority mode is selected, only the pilot or both will go out during simultaneous keying of the PTT switches. When transmitting, the pilots will hear their own voice via the SCI sidetone return. In this mode, the passengers will still have the ability to intercom among themselves and not be bothered by radio traffic interruptions or crew intercom conversation. Similarly, the pilots will not hear the passenger's conversations.

ISO MODE - When the SCI is set to the "ISO" mode, only the pilot can transmit and receive on the aircraft radio(s). The pilot will not hear intercom and cannot talk to the other headsets. The co-pilot and passengers still have intercom, but do not hear the radios. If the radio does not provide transmit sidetone, then the pilot will not hear his voice in the "ISO" mode.

Solo Flights

Since the intercom is not needed during solo flights, it may be turned to the "ISO" position. The pilot will still hear the aircraft radio(s), since this circuit is always active, and may transmit to ATC via his headset and push-to-transmit switch. If the radio does not provide sidetone, then switch intercom mode to "CREW".

Fail-Safe

If power to the SCI unit fails, the pilot can still transmit and receive on the aircraft radio(s) (assuming the radio(s) are still functioning). Additionally, if a problem is ever suspected in the intercom, switch to "ISO" mode or remove power to unit. In this mode you will still be able to transmit and receive on the aircraft radio(s) from the pilot's position. If the radio does not provide sidetone, then the pilot will not hear his voice in the "FAIL-SAFE" or "ISO" mode.