XCOM

Aircraft Intercom System

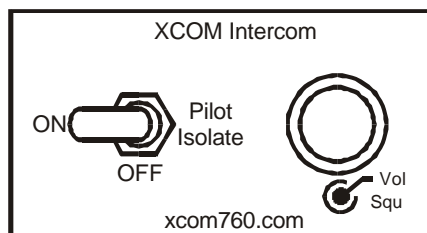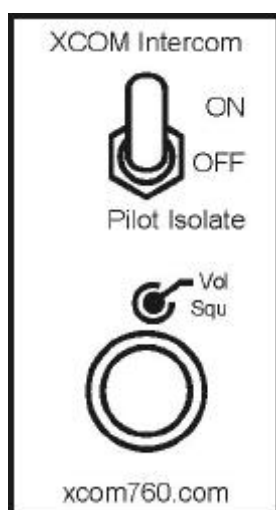### XCOM - 2   (2 place intercom)

XCOM - 4   (4 place intercom)

Version 1.0

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Introduction

The XCOM 2 and XCOM 4 series intercoms represent a new era in intercom technology. Both the 2-place and 4-place intercoms boast the same features as current 2 or 4 place units with music input however the XCOM utilizes microprocessor controlled processing for enhanced speech detection. In addition, the unit is fitted with a RS 232 data port and has considerably lower power consumption than other intercoms. The RS 232 port can be used to change intercom parameters and enables future firmware updates with software downloaded from the Internet. The microprocessor controller uses digital signal sampling to obtain microphone levels and precisely sets levels for squelch activation. Low power consumption allows the unit to be run on battery power if required.

Standard inputs are

|	
COM 1	Receive audio (existing VHF radio)
COM 1	Mike out (Microphone output to existing VHF radio)
COM 1	PTT out (push to talk out to existing VHF radio)
Pilot Mike	In (Pilots microphone input)
Co-pilot Mike	In (Co Pilots microphone input)
Pilot PTT	(Pilot PTT input)
Co-pilot PTT	(Co pilots PTT input)
COM 2 audio	(Second radio audio in only, ADF or VOR, GPS beep, landing gear warning etc)
Music input	(Accepts mono input from a cassette player or CD music source, if using stereo use a suitable stereo to mono adapter)

Specifications

Models	XCOM - 2 (2 place intercom)
	XCOM - 4 (4 place intercom)
Voltage range and current consumption	9 to 32 Vdc Audio muted – 13ma
	Audio at ½ volume – 80ma
Microphone types	Electret or amplified dynamic
Microphone impedance	TBA
COM1 and 2 input impedance and range	100 to 3V P to P, 600 Ohms max
Music input and range	100 to 3V P to P, 600 Ohms max
RS 232 port	Standard RS 232 levels
Stuck Mike timeout	1 minute default (adjustable 0 to 3 minutes, 0=off, 180= 3 minutes)

Operation description
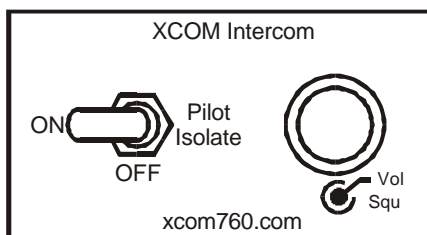
Controls

Intercom mounted vertically
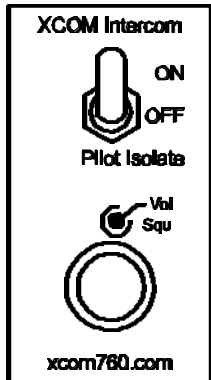
On (toggle is switched up) – When this switch is in the "On" position the intercom is active. Both the pilot and the co-pilot (passengers) will hear each other, COM 1, COM2 and music.

Off (toggle in center position) – When this switch is in the "Off" position the intercom is deactivated. No audio is heard however COM1 is active, that is COM 1 functions as a normal transceiver.

Isolate (toggle is switched down) – When this switch is in the "Isolate" position, the Pilot is isolated from co-pilot (and passengers). The co-pilot (and passengers) will hear the music audio and may converse with the other passengers if the 4 place unit is fitted. The Pilot hears only the COM 1 and COM 2 audio.

Intercom mounted horizontally

Intercom
ON

Intercom
OFF

Pilot
Isolate

On (toggle is switched left) – When this switch is in the "On" position the intercom is active. Both the pilot and the co-pilot (passengers) will hear each other, COM 1, COM2 and music.

Off (toggle in center position) – When this switch is in the "Off" position the intercom is deactivated. No audio is heard however COM1 is active, that is COM 1 functions as a normal transceiver.

Isolate (toggle is switched right) – When this switch is in the "Isolate" position, the Pilot is isolated from co-pilot (and passengers). The co-pilot (and passengers) will hear the music audio and may converse with the other passengers if the 4 place unit is fitted. The Pilot hears only the COM 1 and COM 2 audio.

Squelch Adjusts the level at which the background noise becomes silent. Turning this knob anticlockwise will reduce the level at which the background noise will become audible. Turning this knob clockwise will increase the level at which the background noise will become audible. The higher the setting, the louder you need to speak to open the squelch.

Volume Adjusts the intercom voice volume only. Turning this knob clockwise increases the volume level. Note that this has no effect on COM 1 and COM 2 audio or the music input. The COM 1, COM 2 and Music volume levels are adjusted by the individual devices themselves. For example, to increase the music level, simply turn up the volume on the music player. To increase the COM 1 audio, adjust the volume using the COM1 control.

In-Flight

Operation of the intercom is quite straightforward.

Power is supplied to the unit through the aircraft Master power switch or through an auxiliary switch placed in the intercom power line. The intercom On/Off/Isolate switch is not used to power down the unit.

Switch the unit ON via the aircraft's master/aux switch. Adjust the volume control on the unit to a comfortable listening level. If you are using different brands of headsets with the XCOM intercom some may hear the audio louder than others. The best way to overcome this is to individually adjust the level using the headset adjustment on the headphones. In the case where a headset does not have this adjustment, adjust the intercom control for best listening level on this headset and then adjust the second headset using the headset control.

Tips for adjusting the Squelch

Adjusting the squelch may take a few adjustments before you arrive at the most suitable level. Initially adjust the squelch with the motor running whilst taxing. Turn the squelch knob anticlockwise until the background sounds are heard continuously, then wind the squelch knob clockwise until the background noise is no longer heard. You can now talk into the microphone for each of the headsets to confirm that your voice is activating the intercom. Adjust the squelch as necessary to hear the voice. Again, a small difference in level may be observed if there is a mixing of brands of headphones.

In full flight the level may need minor adjustment as the background noise will increase and the squelch will break if set too low. Once this adjustment is completed it should not be necessary to adjust the squelch again.

To test the connections of COM1, COM2 and Music, adjust each device so that sound is heard. This is most easily achieved by adjust the squelch and volume settings on each device in accordance with the device manufacturers instructions.

Once the levels for external devices are set, test the music fade / cut-out. Speak into your microphone and observe that the music will fade down into the background whilst you speak and slowly return back when you have stopped talking (auto fader). Note also that if Air Traffic Control (ATC) or another aircraft broadcasts on COM 1 or COM 2 then the music will cut-out completely and return after a few seconds of in-activity. Transmitting whilst in the on mode will also mute the music. Transmitting whilst in the isolate mode will not mute the music to the co-pilot and passengers.

How the music circuit operates with the Intercom in ON mode

♪	Pilot and Co Pilot talk to each other	Music level drops to 50% so the conversation can be heard and slowly returns to normal volume about 1 second after talking has stopped
	Air Traffic Control or another aircraft broadcast through either COM 1 or COM 2	Music level drops to 0% so the broadcast can be heard and slowly returns to normal volume after the transmission has stopped

Whilst transmitting, the COM 1 sidetone should be heard. The Push to Talk (PTT) control allows either the Pilot or Co-pilot to use the COM radios while the intercom is switched ON. If the intercom is switched OFF, only the pilot PTT will work. The pilot has a priority over ride feature, which over rides the co-pilot PTT should it be necessary. This is useful for instructional situations.

The stuck microphone feature is enabled by default. This means that if you key the mike for longer than 1 minute the intercom will release the PTT line and the radio will revert to receive. This is a safety feature to prevent jammed or stuck PTT switches which can cause interference to other radio traffic. This can be adjusted in software to activate after a period of between 0 (which disables the feature) and 180 seconds (3 minutes).

Installation

Packing list

1 x XCOM Intercom with removable front plate.
1 x DB15 female plug and backshell
1 x Instruction manual
1 x Inline fuse holder and 500-ma fuse
1 x Drilling template for easy installation

Connections

Use only aircraft quality wire (Tefzel etc) and ensure all crimping if required is done using a good quality-crimping tool.
Mount the intercom as per diagram below. Remove the press on squelch and volume knobs. Mark out the holes using the supplied template. Securely mount the intercom as per the diagram and press the knobs back onto the shaft. We recommend a light smearing of nail varnish on the inner shaft to help hold the knob on, though this is not generally required.

Intercom Mounting Options
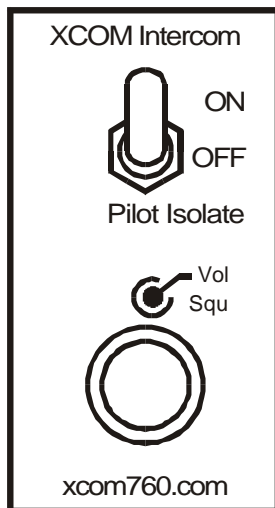
Vertically Intercom Model
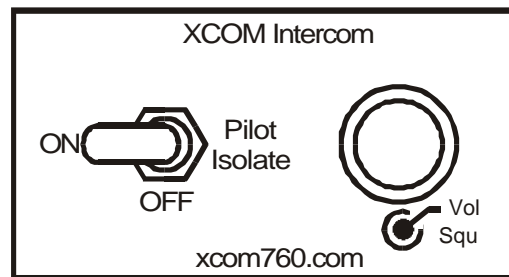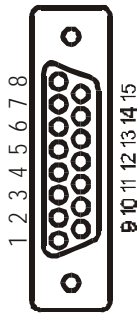

Horizontal Mounted Intercom

Wire the intercom as per diagram. Make sure all pins are pre tinned before soldering. It is important to make sure that the PTT switch for the pilot lines up with the pilot mike connection at the mike jack. Ensure that the intercom power supply has the 500-ma fuse fitted, which is supplied with the Intercom. Connections for the 3 wire RS -232 interface are via the 3.5mm stereo jack and as per the following diagram. Pre wired harness for most popular brands of transceivers can be purchased directly from XCOM on the web site http://www.xcom760.com/ or you may choose to do it yourself or have your local avionics shop wire the intercom up for you.

When the unit has been connected a simple transmit test must be carried out. Whilst listening on another radio or test set, transmit with the pilot PTT and talk into the pilot mic. The audio should sound clear. Adjust the Mic Gain control on the intercom if necessary using a No. 2 flat bladed screw driver so that the received audio sounds loud and not distorted. If you have access to radio testing equipment, adjust the Mic Gain for around 80% modulation. Ensure that the mic is only half an inch away from your mouth; otherwise the background cockpit noise may be heard.

This concludes the operation and installation of the XCOM intercom system, log on to our website for further technical tips and future software upgrades. http://www.xcom760.com

XCOM Intercom DIY Wiring Diagram

123.45 119.00

Aircraft Radio Panel Mount or Handheld

Music Input, CD-Player MP3, Tape Deck etc....

Co-Pilot PTT Switch

ON
OFF
ISD
XCOM INTERCOM
Vol Squ

Aux IN
Second Com, Landing
Stall Warnings etc...

500 ma Fuse
Must be Installed

Aircraft Battery
or Power Supply

Pilot PTT Switch

xcom760.com

Headphone MIC   Headphone MIC
Optional Passengers 1 & 2

Headphone MIC   Headphone MIC
Co-Pilot

Headphone MIC
Pilot

DB 15 plug viewed from the BACK

1 2 3 4 5 6 7 8
9 10 11 12 13 14 15

DB 15 Pinouts

Pin 1	Pilot Microphone
Pin 2	Co Pilot Microphone
Pin 3	Music audio input
Pin 4	COM 1 Audio Input
Pin 5	AUX Audio Input
Pin 6	PTT Co Pilot
Pin 7	PTT Pilot
Pin 8	PTT COM 1 Output
Pin 9	Power In + 12 Volts
Pin 10	COM 1 Mike Out
Pin 11	Ground
Pin 12	PAX Mike In
Pin 13	PAX Headphones Out
Pin 14	Pilot Headphones Out
Pin 15	Co Pilot Headphones Out

NOTES: Don't cheat on your plane & Equipment. ONLY use TEFZEL Aircraft quality wire for all harnesses it may cost more than ordinary wire but the results are well worth the extra expence.

Power Pins 9 & 11
Pin No. 9 is the positive in, connect to a battery or to your positive wires in the aircraft, it MUST have a 500 ma fuse fitted.
Pin No. 11 must be connected to a good ground, a lot of radio / intercom problems come back to a poor ground, ground to radio chassis also.

Radio Connection Pins 8, 10 & 4
Pin No. 8 is the COM 1 PTT out pin, this makes the radio transmit
Pin No. 10 is COM 1 Mike out allows your voice to be broadcast via the intercom to the radio
Pin No. 4 is the COM 1 audio input, this allows you to hear the radio broadcasts

Music IN Pin 3
Pin No. 3 is the music input which allows you to listen to radio, CD, MP3 or other devices

Aux IN Pin 5
Pin No. 5 is the Auxiliary IN, this can be used for a second COM, landing gear warnings, stall warnings etc... where you want to hear the sound through your headsets

Pin 12 & 13
Pins No. 12 and 13 are used in the 4 place intercom for wiring the position 3 and 4 headsets into the XCOM Intercom

XCOM INTERCOM Wiring Diagram.cdr