Operating manual

(Rel. 1.1)

Oxygen 7

Broadcast Console

AXEL TECHNOLOGY

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PART I: INPUT MODULES

1 TABLE OF CONTENTS

2 SAFETY INSTRUCTIONS

Read instructions: Retain these safety and operating instructions for future reference. Adhere to all warnings printed here and on the console power unit. Follow the operating instructions printed in this operating manual.

Do not remove covers: Operate the power unit with its covers correctly fitted. Refer any service work to competent technical personnel only.

Power sources: Connect the power unit to a mains power only of the type described in this Operating manual and marked on the rear panel. Use the power as provided with the console. If the provided plug does not fit into your outlet consult your service agent for assistance.

Power cord routing: Route the power cord so that it is not likely to be walked on, stretched or pinched by items placed upon or against it.

Grounding: Do not defeat the grounding and polarisation means of the power cord plug. Do not remove or tamper with the ground connection in the power cord.

Water and moisture: To reduce the risk of fire or electric shock do not expose the power unit or console to rain or moisture or use it in damp or wet conditions. Do not place containers of liquids on it which might spill into any openings.

Ventilation: Do not obstruct the ventilation slots or position the console or power unit where the air flow required for ventilation is impeded.

Environment: Protect from excessive dirt, dust, heat and vibration when operating and storing. Avoid tobacco ash, smoke, drinks spillage, and exposure to rain and moisture. If the console becomes wet, switch off and remove mains power immediately. Allow to dry out thoroughly before using again.

Servicing: Switch off the equipment and unplug the power cord immediately if it is exposed to moisture, spilled liquid, objects fallen into the openings, the power cord or plug become damaged, during lightening storms, or if smoke, odour or noise is noticed. Refer servicing to qualified technical personnel only.

Installation: Install the console in accordance with the instructions printed in this Operating Manual. Do not connect the output of power amplifiers directly to the console. Use connectors only for their intended purpose.

Damage: To prevent damage to the controls and cosmetics avoid placing heavy objects on the control surface, scratching the surface with sharp objects, or subjecting the console to rough handling and vibration.

Radiation: To avoid induced noise and interference pickup do not operate the console close to strong sources of electromagnetic radiation such as power supplies, lighting cables and dimmers.

Cleaning: Avoid the use of chemicals, abrasives or solvents. The control panel is best cleaned with a soft brush and dry lint-free cloth. Do not leave marking tape stuck to the console for long periods of time as the adhesive can degrade and leave a sticky residue. The faders, switches and potentiometers are lubricated for life. The use of electrical lubricants on these parts is not recommended.

Transporting: The console should be transported in the original packing. Protect the control surface from damage during transit. The console is a large and heavy item. To avoid injury ensure adequate man power and precaution when lifting or moving the console.

3 CONNECTING MAINS POWER

WARNING: Make sure the power supply voltage is correctly set to match your local mains voltage. Refer to the Power Supply Chapter in this operating manual. Before connecting the Oxygen 7 to mains power, determine the actual mains voltage and confirm that the Oxygen 7 has been configured correctly. As could be expected, an incorrect mains configuration could seriously damage the unit. Should it be necessary to change the unit's operating voltage refer to the Power Supply Chapter in this operating manual

The Power Supply unit accepts mains voltages 100 and 230V AC by setting the position of an internal switch. The PSU is fused with a 2 Amp slow blow fuse for 110 Volt or 1.2 Amp slow blow fuse for 230 Volt. DO NOT use any other value, as this would be hazardeous, and the guarantee will be void.

Make sure that the IEC mains plug is pressed fully into the MAINS INPUT socket.

Connecting the DC Cable: Plug the cable into the power supply MIXER CONECTION socket. Press the plug into the socket, and screw on the locking ring to hold it firmly in place. Plug and secure the other end into the console PWS socket.

Turning the Console On or Off: First check that the mains and DC leads are correctly plugged in and secured. Turn on the power supply using its rear panel mains switch. The console must be connected to the power supply before turning it on. To avoid loud pops in the speakers make sure that the connected power amplifiers are turned off before switching the console on or off.

WARNING: To avoid damage to the speakers always switch the power amplifiers on last and off first.
The console meters pulse briefly on power up. This is normal.

3.1 EARTHING

The connection to earth (ground) in an audio system is important for two reasons:

1. SAFETY
2. AUDIO PERFORMANCE

For safety it is important that all equipment earths are connected to mains earth so that exposed metal parts are prevented from carrying high voltage which can injure or even kill the operator

The same earth is also used to shield audio cables from external interference such as the hum fields associated with power transformers, lighting dimmer buzz, and computer radiation. Problems arise when the signal sees more than one path to mains earth. An earth loop results causing current to flow between the different earth paths. This condition is usually detected as a mains frequency audible hum or buzz. To ensure safe and trouble-free operation we recommend the following:

Use a clean mains outlet for the audio system: Be sure to use a 'clean' power outlet, i.e. one that is fed directly from the mains, including earth. "Polluted" mains are caused by changing currents on the outlets, such as air-conditioners, coffee machines, fridges, computers, dimmer packs etc. DO NOT connect any of these types of items to the Oxygen 7 main power outlet.

Use star point earthing: Grounding MUST BE a starground system.You have to install a 'star point' system where the individual earths to the equipment racks and equipment areas are separately run from a solid central reference earth point.
It is advisable to install several multiple mains connectors close to the Oxygen 7, with a master power switch to shut down all power to the studio..

Have your mains system checked by a qualified electrician.

Do not remove the earth connection from the console mains plug: The console chassis is connected to mains earth through the power cable to ensure your safety. Audio 0V (GND) is connected to the console chassis internally.
If problems are encountered with earth loops disconnect the cable screens at one end, usually at the destination. Equipment such as CD players do not have a mains ground connection. In this case the shielding can be connected on both sides of the connection - a ground loop will not occur. Try to choose a CD player with metal housing.

Avoid induced interference: To prevent interference pickup keep audio cables away from mains power units, cables and distribution boards, motors, lighting and computer cables and equipment, and any other heavy duty electrical equipment. Where this cannot be avoided cross the audio and 'dirty' equipment cables at right angles to minimise interference.

Use low impedance sources such as microphones and line level equipment rated at 200 ohms or less to reduce susceptibility to interference. The console outputs are designed to operate at very low impedance to minimise interference problems.

Use balanced connections where possible as these provide further immunity by cancelling out interference that may be picked up on long cable runs. To connect an unbalanced source to a balanced console input, link the cold input (XLR pin 3 or jack ring) to 0V earth (XLR pin 1 or jack sleeve) at the console. To connect a balanced console output to an unbalanced destination, link the cold output to 0V earth at the console.

Use good quality cables and connectors and check for correct wiring and reliable solder joints. Allow sufficient cable loop to prevent damage through stretching.

If you are not sure ... Contact your Axel Technology agent for advice.

3.2 POSITION

The console should be located in a convenient space commensurate with the use to which the console is being put. Ideally a cool area is preferred not in close proximity to power distribution equipment or other potential sources of interference. Provision should be made for some flat surface surrounding the console to prevent people using it as a table top.

3.3 INSTALLATION OF NEW (EXTRA) MODULES

When installing new (extra) modules in your Oxygen 7 it is necessary to switch off PSU before.

4 SYSTEM OVERVIEW

Oxygen 7 quality. The Oxygen 7 is a specially designed On-Air broadcast console. Although the design has been carefully budgeted, no compromises has been made in either quality or features, particularly in the areas of VCA control, switching, signalling, fader start/stop and communication. Most all of the switches have led indicators and all similar functions are grouped and colour coded, with additional fader knobs with different channel colour coding. The use of VCA's controlled switchers and faders ensure tight stereo tracking and eliminates mechanical and electronic noise. ALPS long throw faders give a smooth, repeatable response.

Oxygen 7 flexibility. In designing the Oxygen 7, Axel technology decided to make the system as flexible for the operator as possible, and the Oxygen 7 can therefore be used in many ways.
There are many jumper settings which can be set to suit your own needs. The Oxygen 7 can be used in a traditional manner with separate control and announcer rooms, or in a studio-complex environment, where there is more than one studio/control room being used for broadcast. In this situation, the Oxygen 7 is capable of being the main On-Air console, due to the three main (Master, Sub 1 and Sub 2) outputs it contains..

Oxygen 7 modularity The console is fully modular, which means flexibility in the configuration. The Mono and Stereo input modules can be placed anywhere in the chassis. A partially loaded Oxygen 7 can be completed using low cost 'blind' modules. The modular approach to the design means that module replacement, or expansion of the system can be carried out quickly and efficiently. All modules are internally connected by a strong bus cable which clips into place - removal of the cable and two screws allows each module to be easily removed.

Self Contained. The Oxygen 7 is a complete and self contained piece of hardware, requiring no additonal items in order to be operated. All relevent functions are built-in, such as fader start/stop (pulse or continuously selectable). The optional DJ Console unit is a nice looking alternative with many extra's for remote Mic On/Off switching and audio background level control.

Oxygen 7 frames. Oxygen 7 console is available in four frame sizes : the frame 10, which can contain 10 overall modules, the frame 20, the frame 30 and the frame 40. A script try (10 module wide) is also available. Each console has always two output modules (Master and Monitor) to the far right which controls the Studio/Control Room monitoring, pre-fade listen and talkback functions together with the output selection of the Master signal. The meter bridge contains three VU meters (Cue + Master Left / Right) and, as an option, two digital timer.

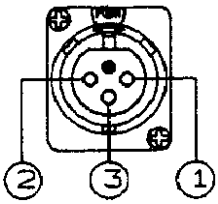
Signalling and communications. The Oxygen 7 has extensive possibilities for signalling and communications. Every microphone channel has its own talkback circuitry and signalling to know whether microphone is active. The announcer/technician/producer/director can communicate with the announcer studio or to the callers connected to the Telco modules for private communications.
Each Oxygen 7 module allows also to control two relays controlling ON-AIR lamps.

Final word… A little care with setting gain structure throughout the signal chain and connections will give you the very best performance and most manageable control of the mix.

5 AUDIO CONNECTIONS

Matching the Console to Destination Equipment. The console produces a standard XLR output level of 0dBu for a meter reading of '0'. It can produce a maximum of +23dBu and is therefore well suited to driving equipment operating at nominal 0dBu or +4dBu while providing plenty of headroom. If you are connecting directly to a sensitive power amplifier it is advisable to turn down its input trim control if the normal console level is too high.

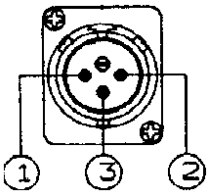
XLR FEMALE SOCKET (input)



Pin	
1	Ground
2	In-phase (Hot)
3	Out-of-phase (Cold)

Short-circuit Pin 1 and 3 for unbalanced connections

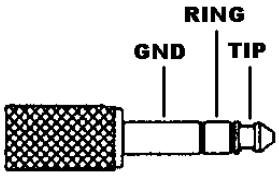
XLR MALE SOCKET (output)



Pin	
1	Ground
2	In-phase (Hot)
3	Out-of-phase (Cold)

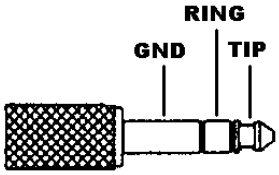
Short-circuit Pin 1 and 3 for unbalanced connections

¼" JACK PLUG CONNECTORS FOR '*B*' AND '*TUNER'* INPUT SOCKETS



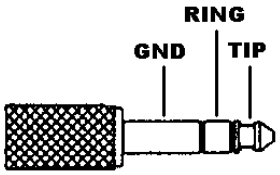
Pin	
Ground	Ground
Ring	Out-of-phase (Cold) (-)
Tip	In-phase (Hot) (+)

¼" JACK PLUG CONNECTORS FOR *HEADPHONES* SOCKETS



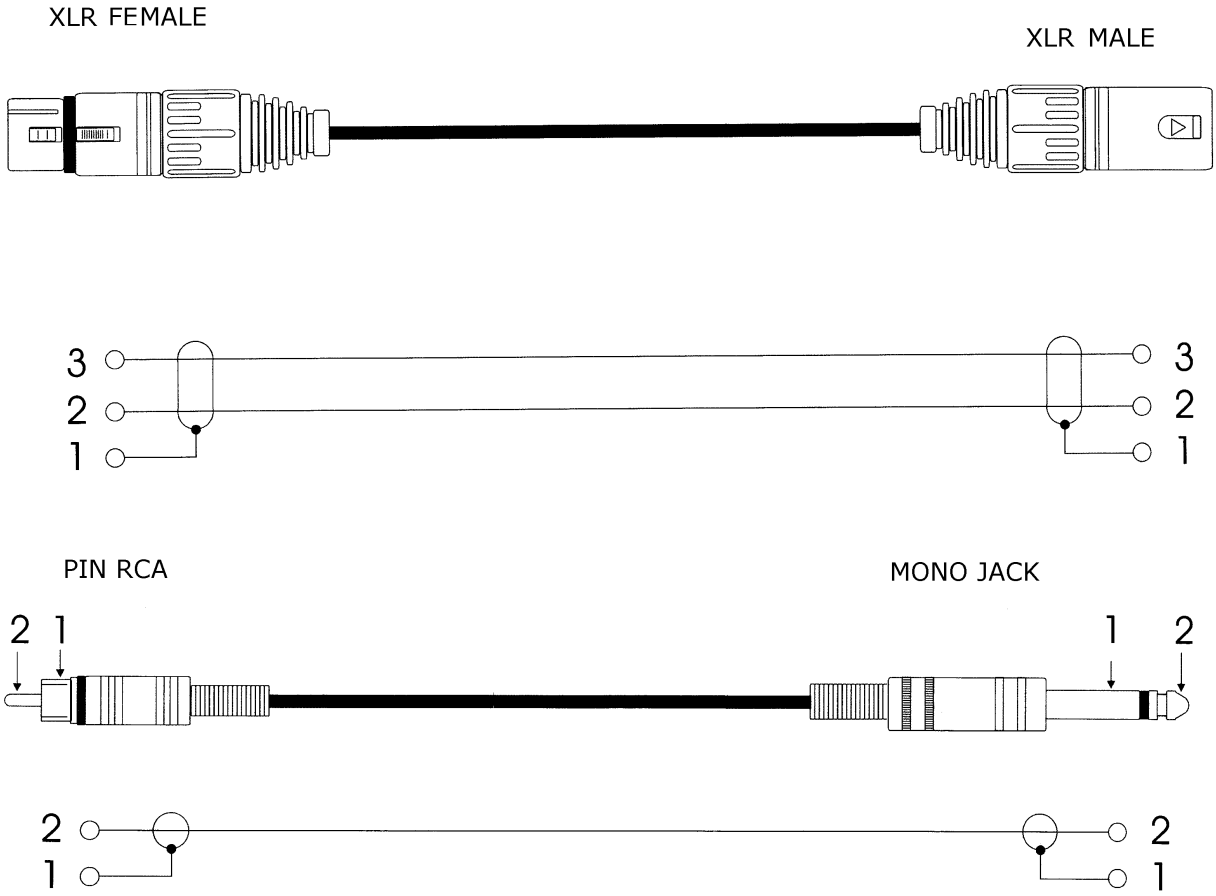
Pin	
Ground	Ground
Ring	Right Channel
Tip	Left Channel

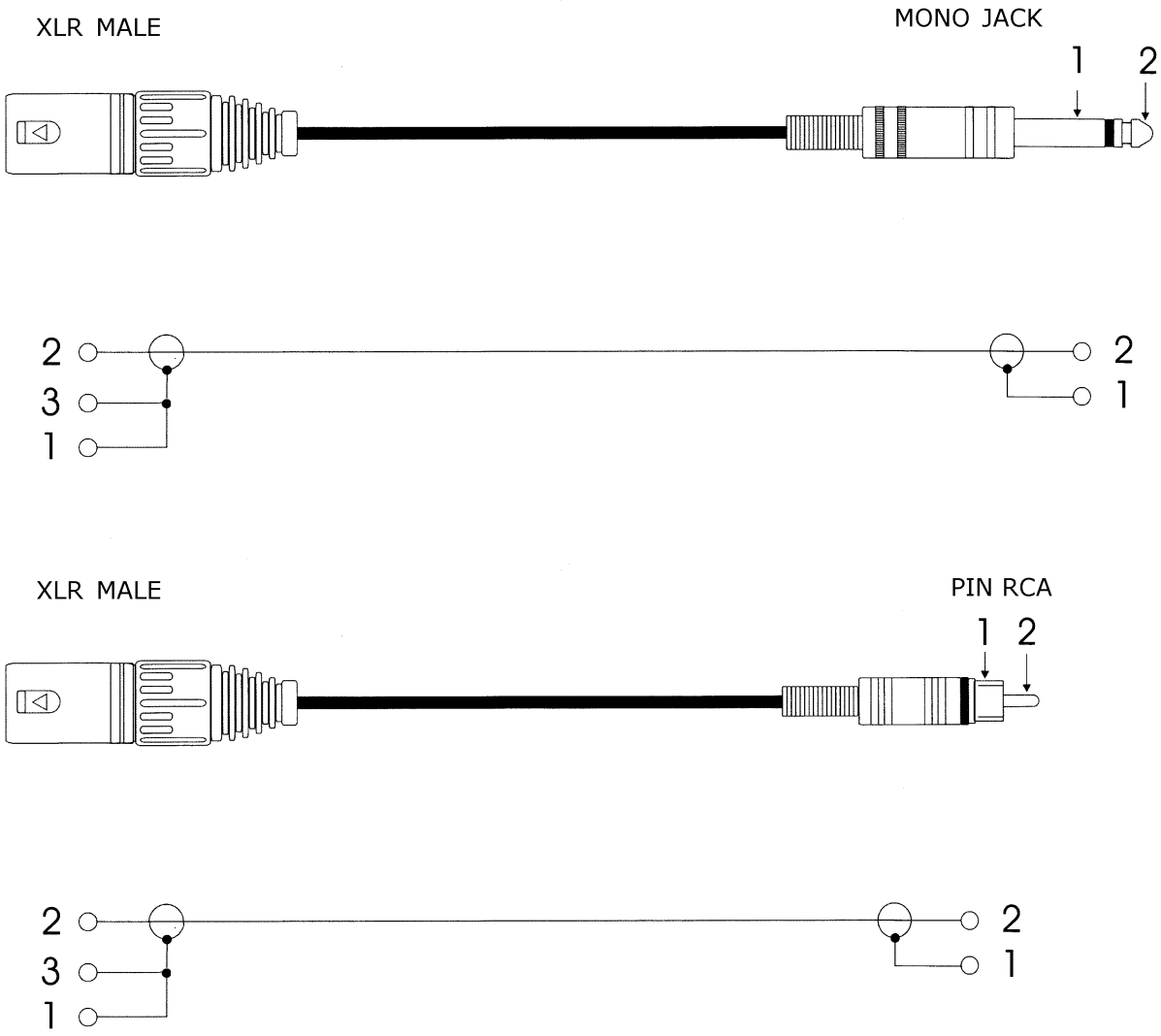
¼" JACK PLUG CONNECTORS FOR *INSERT* SOCKETS



Pin	
Ground	Common Ground
Ring	Channel audio return (inserted from external equipment)
Tip	Channel audio output (to be provided to the external equipment)

EXAMPLE OF CONNECTIONS




XLR MALE
MONO JACK
1
2
2
3
1
2
1
XLR MALE
PIN RCA
1
2
2
3
1
2
1

6 VCA & DUCK INTRODUCTION

The acronym **VCA** stands for Voltage Controlled Amplifier, an electronic device that passes audio signal with its gain controlled by an external DC voltage.
Each mixer channel is fitted with several VCA devices which replaces the conventional fader and audio switcher (MST/Sub routing, Stereo Mode switchers, etc) circuits.
No audio passes through the fader and the switchers, as it does in the non-VCA consoles.
One advantage of this is that VCA faders do not suffer from such severe noise and signal loss problems that conventional faders may have when wear and tear causes the resistive surface to deteriorate.
The benefit is longer fader life, as the crackles and dropouts typical of the traditional audio faders are smoothed out.

A VCA is quite simply a means of remote controlling multiple inputs using a single 'master duck' fader or a master duck signal auto-generated. The "duck level" is the amount of attenuation applied to the input, responding to a 'control' voltage. The 'ducked' signal may be adjusted between fully off (mute), and fully on.

Oxygen 7 has **both manual and automatic ducking capabilities**. It means:

1) the ducking circuitry allows any combination of MONO and TELCO inputs to duck (attenuate) one or more of the remaining modules (Stereo, Mono, Telco or Sub). Auto ducking is triggered by signal present at the selected input Modules (see DUCK MIX selection on MONO and TELCO modules).

2) the ducking circuitry allows an (external) master fader (e.g. the DJ Console) controlling the whole mix of the channels where 'duck' control is activated.

In the first case, to **allow automatic duck control**, follow these steps:

a) enable DUCK MIX option on the MONO and TELCO Modules that will drive the Duck circuitry (see **Duck Mix Jumper** in the Jumper bay setting - § 7.7)

b) press DUCK MIX switch on the MASTER Module. Release time for the duck circuit is adjustable from 0.5 seconds to 5 seconds. 'Duck ratio' is also adjustable. A duck LED will indicate that ducking is occurring.

c) press DUCK switch on the modules to be 'ducked'.

In the second case (**manual ducking**):

a) connect the 'Duck Master' potentiometer (e.g. the Axel Technology's DJ Console) to one of the 'Mono Module Remote Interface'

b) press DIRECT DUCK switch on the MASTER Module

c) press DUCK switch on the modules to be 'ducked'.

7 MONO MODULE

7.1 MONO MODULE - REMOTE CONNECTOR

The 9 pin D-Type plug remote connector provides the inputs and outputs for the following functions :

- Remote Start / Stop for equipment connected to Input A
- Remote Start / Stop for equipment connected to Input B
- External Talkback Control
- Remote control for the channel On/Off
- External Duck Control

A 6 VDC ± 50 mV current-limited output is also provided for use with the remote control inputs.

7.1.1 CHANNEL On/Off

A pushbutton needs to be connected to the pins 7 and 6 of the interface (it makes + 6VDC the pin 7). Using the pushbutton, the announcer can remotely switch On/Off the module (and therefore its microphone…).

7.1.2 START A and B

When the channel is active, the two optocouplers applied between pins 9 and 8 or between pins 5 and 4 will close, depending on the selected input: A or B. They can be used to activate an external led (f.i. **Mic On** red) or an external opto coupler. Start A and Start B commands are always 'stable'. **NEVER CONNECT 110-230 VOLT LAMPS DIRECTLY TO THE THESE SIGNALLING OUTPUTS !** In addition to the localised 'mic-on' signalling, there is also a master signalling ouput in the **Power Supply Unit**. **Two relays** offer the option of driving external red light 'On Air' indicators in the studio (Ref to POWER SUPPLY Chapter). Two jumpers per channel select which relay will be activated (ref to § 7.7 for jumper settings). Refer also to Sections 7.1.7 and 7.7

Please, consider than max current allowed on optocouplers is 10 mA (nominal: 5 mA). Apply the provided + 6V tension through a **560 Ω carbon resistor** in order to preserve optocouplers from extra currents.

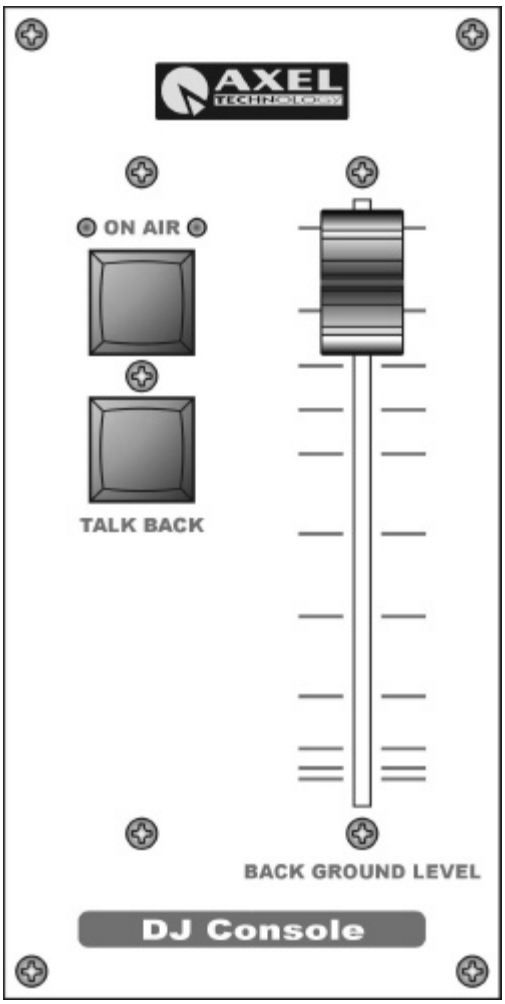
7.1.3 TALKBACK enable

A pushbutton needs to be connected to the pins 6 and 2 of the interface (it makes + 6VDC the pin 2). Using the pushbutton, the announcer can remotely switch On/Off the Talkback audio path (which is routed toward the Studio or the Control Room via the two Jumpers in the Jumper bay (ref to § 7.7 for jumper settings) and settings on the Master Module. NOTE: during the TB announcements, the channel is <u>not</u> automatically switched off !! Refer also to § 7.1.7)

7.1.4 DUCK Control

Pins 3, 6 and 1 allow remote control of the VCA fader circuits using an external linear potentiometer (10k ohm) connected across the + 6 V output and the GND input terminals. + 6 V at the pin 3 input yields 0 dB attenuation and 0 V yields the maximum attenuation. This control will affect each channel having 'DUCK' switcher pressed. **DIRECT DUCK** switcher on the **MASTER module** must be also pressed.

7.1.5 AXEL TECHNOLOGY'S DJ CONSOLE



The Mono Module remote interface is suitable for **Axel Technology's DJ CONSOLE**.

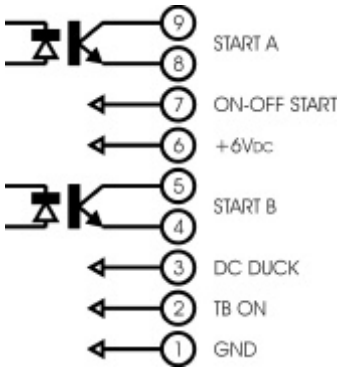
Using the push-buttons during broadcast, the announcer situated in the studio booth can remotely switch On/Off the Mono module. At the same time, using the Talk push-button his microphone will be routed to the TB to CRoom path, in order to give him the opportunity to communicate with the engineer / producer.

Moreover, a mixer-like slider allows him to fade the level of the on-air musical program (for speech interventions mixed to the songs).

The Dj console is available as an option for Oxygen 7 console.

7.1.6 INTERFACE PIN-OUT

SUB D 9P FEMALE



PIN	DESCRIPTION	DIRECTION
1	Ground GND	
2	Talkback enable	**IN**
3	Duck control	**IN**
4	Emitter of photocoupler - **Start B** command	**OUT**
5	Collector of photocoupler - **Start B** command	**OUT**
6	+ 6 V DC	**OUT**
7	Channel On/Off remote control	**IN**
8	Emitter of photocoupler - **Start A** command	**OUT**
9	Collector of photocoupler - **Start A** command	**OUT**

7.1.7 APPLICATIONS

CONTROLLING A MIC LIVE / ON AIR LAMP/DISPLAY

A mic/live display (On Air lamp as Mr Light) can be controlled in different ways. If you have only one mic channel, the display can be controlled directly from the module remote interface, as described in 7.1.2. If you have a number of mic channels, the display can be controlled from two Relays built-in in the Power Supply. Two Jumpers (see § 7.6) allow to address the relays for this aim. Relay connections are provided in the PWS Chapter.

The relays (and therefore the Mic/live display) are active when the module is ON (see the START mode settings – Jumpers **FADER ➞ START** and **START ➞ FADER - § 7.7).**

ENABLING TALKBACK

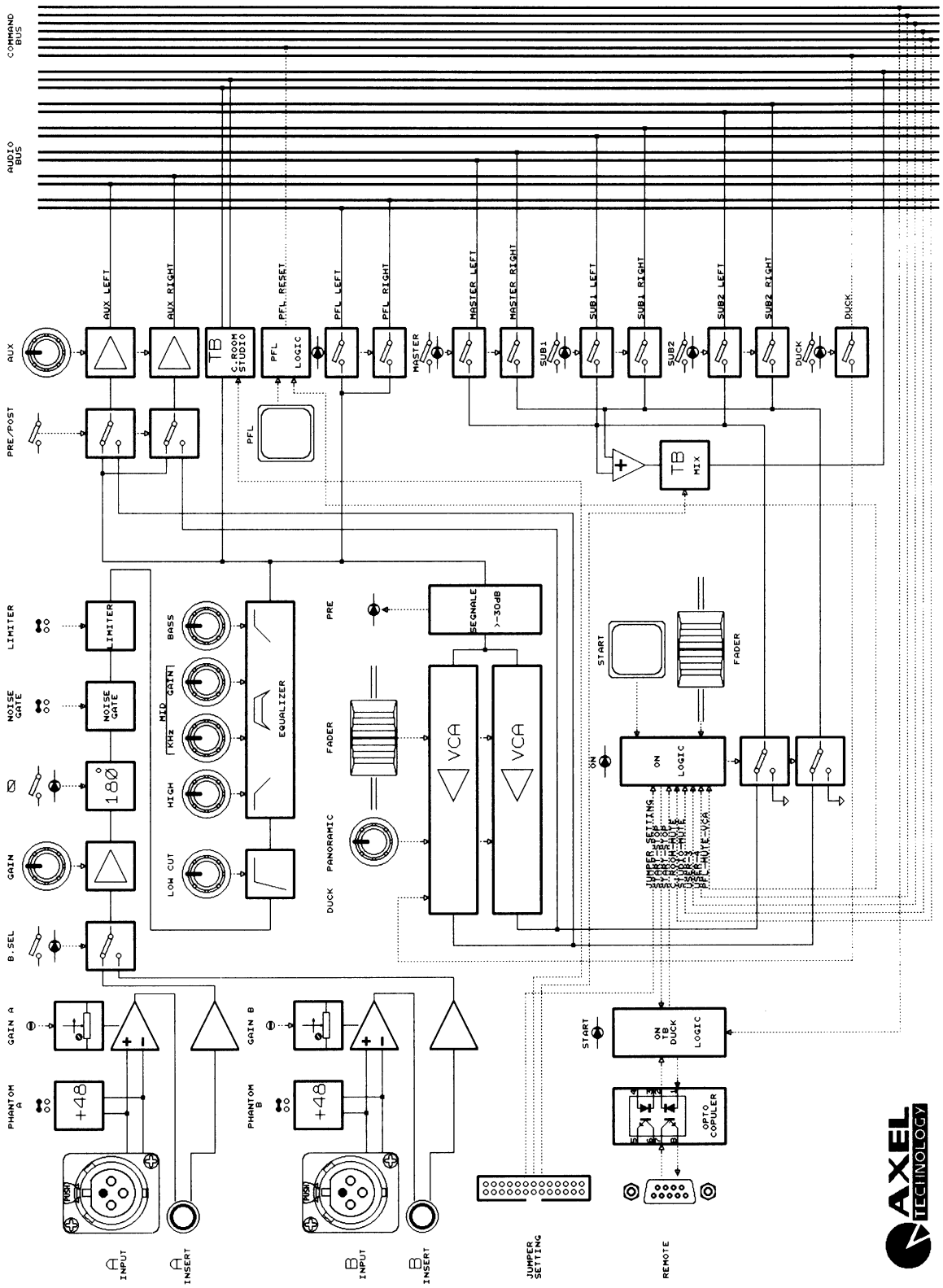
Talkback is used for off-air communication between:

- Studio and Control Room
- the presenter and the producer / sound engineer
- the presenter or the producer / sound engineer and **the callers** on the telephone line, etc

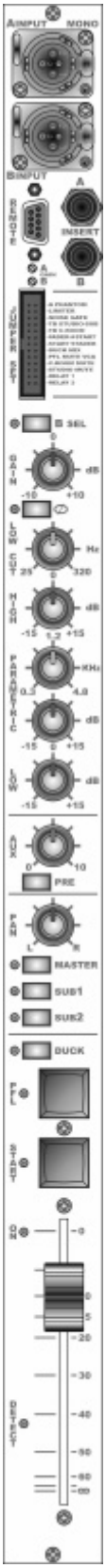
External talkback switch is connected between pins 2 and 6 of the remote connector.

The pre-fade input signal is fed to the T/B (to) CONTROL ROOM or to the T/B (to) STUDIO mix buses depending on the TB Jumper configuration (see § 7.7) which also appear at the Studio/Control Room output connectors (Monitor and Phones) on the Monitor Module.

7.2 BLOCK DIAGRAM



7.3 INTRODUCTION



Each MONO module has two selectable mono inputs which comes factory preset for **Mic** (**input A**) and **Line** (**input B**) levels. Normally input A is selected but by pressing B SEL button the alternative input is selected.

There are individual preset gain adjustements for each of A and B input with multi-turn controls and the selected source is fed through a phase switch and a common gain trim control giving a further ± 10dB of gain adjustment on the front panel. A jumper is also available to apply phantom power to microphone A input.

All mono modules are fitted with a high pass filter with variable frequency. A three band parametric equaliser is also fitted as standard, where the centre band can be swept from 300 Hz to 4.8 kHz.

The Auxiliary (AUX) send may be switched pre or post fade.

The signal is routed via a pan control and the three stereo routing switches to either the main stereo programme (Master) or the two stereo subgroups (Sub 1 and Sub 2)

The whole signal path throughout the module is controlled by Vca circuits.

The DUCK switch allows the module to be attenuated from the master ducker circuits. The MONO module has a jumper fitted to make it a source for the automatic ducker circuits.

The PFL switch makes the pre-fade signal available for monitoring and can be programmed to mute or selectively attenuate the main audio path.

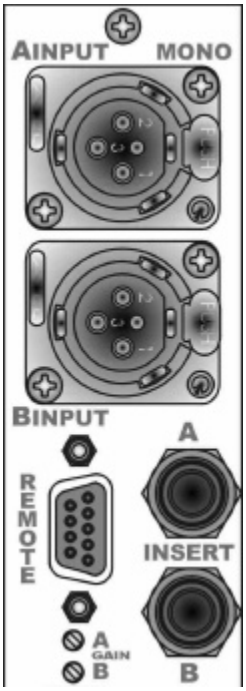
The module provides a jumper selectable output to facilitate either Control Room or Studio Monitor muting, two relay closure. There are also logic remote input controls for the module On/Off, for the remote Talkback activation and for the Ducker remote control (f.i. by DJ CONSOLE by Axel Technology). The remote input/outputs are connected to a 9 way D type and are fed from opto-isolators.

Jumper selection allows You to configure module activation by fader or by using the Start button.

The Mono module may also be used to feed talkback path.

The Mono module is intended to be connected to Microphone either placed in the Control Room or in the Studio. Several jumpers allow the user to to route the TB accordingly to the microphone installation (TB will be set as 'TB to Control Room' when the announcer's microphone is in the studio and as 'TB to Studio' for use by the producer or the assistant in the Control Room).
A selective 'muting' of Control Room or Studio speakers is also provided. This option is for use with the mic input. When a microphone is live to air, the monitor speakers in the room containing the microphone will need to be muted so that there is no feedback.
So, for example, if the mic input is being used for a microphone in the studio, the studio monitors should be muted.

7.4 INPUT STAGE



The **A Input** is via a standard female XLR-3 connector and it is set for **MICROPHONE** sources. The input is electronically balanced and it is factory-preset for a micro level.

The recessed **GAIN A trimmer** allows you to adjust the gain in a large range. In conjunction with the GAIN potentiometer (see) this allows you to adjust the overall gain to any desired figure within the available range.

The **A PHANTOM jumper** on the jumper bay (see § 7.7) applies phantom powering +48V to the MIC input A socket for condenser microphones.

WARNING: *The Phantom power is used to power micrphones with built-in condenser or electrect preamplifiers. This system requires both conductors to have the same D.C.potential. So, it's indispensable that cables and connectors are balanced and in perfect condition. If these rules are observed, Phantom power can be applied even if microphones without preamplifier built-in (e.g. dynamic microphones) are connected, although it's preferable to avoid doing so.*

The **B Input** is via a standard female XLR-3 connector and it is set for signals providing a signal **LINE** level such as tape machines, RadioMic receivers, ISDN codecs.The input is electronically balanced and factory-preset for a 0 dB level.

The recessed **GAIN B trimmer** allows you to adjust the gain in a large range. In conjunction with the GAIN potentiometer (see) this allows you to adjust the overall gain to any desired figure within the available range.

Only one of the two inputs (Input A or Input B) will be active at any time, depending upon the setting of the **B SEL switch** (see)

Two unbalanced **INSERT** sockets (**A** and **B**) are provided which are a break point in the input channel signal path. The insert point allows external piece of equipment such as limiters, compressors and other signal processing units to be added as required to particular input channels.
The Insert are a 3-pole ¼" 'A' gauge Jack Socket, which are normally by-passed. When a jack plug is inserted, the signal path is broken at a point just after the preamplifier stage, but before the Input Selection (B SEL key). The signal from the channel appears on the TIP of the plug and is returned on the RING to continue through to the final output.
Using some external equipment, may be wise to place a **resistor of 100 Ohm** in series with the **signal coming from the module** and driving the external load.

7.5 B SEL Switch

The **B SEL** switch selects the INPUT B (Line) socket when depressed and the INPUT A (Mic) when released. A LED glows **red** when the INPUT B is selected.
Both left and right signal paths are fed by the same mono input signal.

The **same switch** enables **Remote Start A or B** (see Remote Interface description) accordingly to the selected Input. I.e. only one of the two controls (Input A Start/Stop or Input B Start/Stop) will be active at any time, depending upon the setting of the B SEL switch

7.6 REMOTE interface

This 9P SUB D FEMALE connector allows you to implement the following facilities:

- **START** status input A
- **START** status input B
- **External TB** (Talk Back) enabling
- **External START** (ON-OFF) control
- **DC DUCK control**

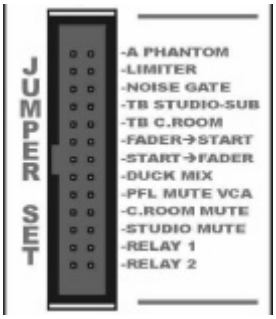
The Connettors provides also +6V$_{DC}$ and GND conections.

Only one of the two Start commands (A or B) will be active at any time, depending upon the setting of the **B SEL switch** (see)

Please refer to § 7.1 for interface connections.

This interface is suitable for **Axel Technology's DJ CONSOLE**.
Thanks to it, the presenter (normally located in studio) is able to remotely switch On/Off the Mono module. Moreover, through a mixer-like slider he may fade the level of the on-air musical program (for speech interventions mixed to the songs). A Talk Back enabling key is also provided to enable private communications from Studio to Control Room.

7.7 MODULE OPTIONS AND JUMPER SETTINGS



The MONO module can be configured in a number of different ways depending on the jumper options set on the JUMPER SET bay:

When closed, the **A PHANTOM** jumper allows for Phantom power on Input A When using a phantom powered microphone, ensure that the mixer is switched off when the microphone is plugged in to the XLR connector.

When closed, the **LIMITER** jumper enables a Limiter internal stage. The purpose of the limiter is to provide control over the hottest peaks in the signal. Limiter is not user-settable and acts when signal goes over 0 dB.

When closed, the **NOISE GATE** jumper enables an internal Noise Gate circuit so that as the signal level drops below the -60dB threshold, the signal is muted.

When closed, the **TB** (to) **STUDIO-SUB** jumper put the signal from the pre-fade section of the module onto the TalkBack Studio audio Bus and allows it to be output on the Studio Monitor section (see MONITOR module).
The major use of this facility is also that TB STUDIO bus feeds the Sub channels (see Slate/TB functions) and the Telco channels and will therefore allow the Producer to talk to a telephone caller off-air. Please refer also to TB Route settings on the **Master** Module.

When closed, the **TB** (to) **C.ROOM** jumper put the signal from the pre-fade section of the module onto the TalkBack Ctrl Room audio Bus and allows it to be output on the Control Room Monitor section (see MONITOR module).
The major use of this facility is the off-air communication from the Studio (e.g. the presenter) and the Control Room. Please refer also to TB Route settings on the **Master** Module.

When **FADER → START** jumper is closed, moving the fader away from the down position brings the module into the ON status and a Start command is given (see Remote Interface). Moving the fader back to its down position brings the module to OFF status. This jumper does not affect START button operating.

When **START → FADER** jumper is closed, press START button to activate the module and provide a START command. Press START again to de-activate it. ON/OFF status of the module is regardless of the Fader position.
When the START switch is not activated, the channel fader can be opened without bringing the audio up and without generating a start command. The channel can now be activated, by pressing the START switch (ON red led will glow).

When closed, **DUCK MIX** jumper makes the signal from the pre-fade section controlling the ducker circuit (with the module ON). The signal to be attenuated by the ducker are determined by the local Duck switches**. Please refer to Chapter 6.**

When the **PFL MUTE VCA** jumper is closed, the PFL key toggles the module ON and OFF. In particular, when PFL is activated the module is OFF and viceversa.

When the **C.ROOM MUTE** jumper is closed, the action of moving the fader away from its down position is associated to the cut-off (or the selective fading) of the **C.ROOM SPK** output on the MONITOR module. CUT led on the MONITOR Ctrl Room section illuminates accordingly.

When the **STUDIO MUTE** jumper is closed, the action of moving the fader away from its down position is associated to the cut-off (or the selective fading) of the **STUDIO SPK** output on the MASTER module. CUT led on the MASTER Studio section illuminates accordingly.

When the **RELAY 1** jumper is closed, relay switch #1 inside the Power Supply closes when the fader is moved away from its down position. This relay may be used to control an On Air Lamp (such as MR. LIGHT by Axel Technology).

When the **RELAY 2** jumper is closed, relay switch #2 inside the Power Supply closes when the fader is moved away from its down position. This relay may be used to control an On Air Lamp (such as MR. LIGHT by Axel Technology).

7.8 GAIN control + PHASE REVERSE switch

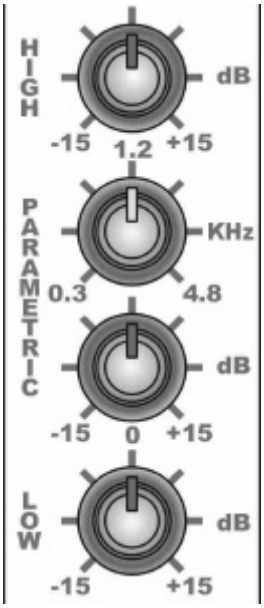
The **GAIN potentiometer** provides a variable 20dB range from +10 to +10dB gain to match the connected source to the internal 0dBu operating level
This knob allows you to match the input level to suit a wide variety of professional and semiprofessional sources. Start with a low setting, especially for professional equipment, checking the level on the meters using PFL, and increase it if you cannot reach an adequate signal level with the fader at maximum (refer also to § 7.20).

The button associated with the “circle-with-a-slash” graphic symbol is used to select the **phase reverse** function. In the normal (out) position, the mic or line input signal maintains the same polarity from input all the way through to the main and AUX audio buses. In the reverse (in) position, the signal is inverted by 180 degrees. This function can be useful in situations where multiple microphones are present, and signal cancellation problems occur. The cancellation can be caused by miswired interconnecting cables, faulty equipment, or acoustic conditions related to microphone placement.

7.9 LOW CUT control

In the 25 Hz (left) position the filter leaves the signal essentially flat. In the other positions the filter removes low-frequency energy.
The filter is useful in live situations for eliminating wind noise, traffic rumble, and AC mains hum.
Its use is strongly recommended, even on male vocals.
For most voice applications the filter can be left activated. For wide-bandwidth signals, such as music, the filter should be used only as necessary.

7.10 EQUALISER



The Equaliser(EQ) comprises four sections. The upper control provides H.F.(treble) boost and cut of +/-15dB and the lower control provides L.F. (bass) boost and cut of +/-15dB.

The centre two knobs is arranged as MID frequency section, with a cut/boost control (lower knob) of +/- 15dB, and a frequency control which determines at which frequency the boost/cut action will be centered. This MID section is particularly versatile for speech, enabling particular characteristics of the presenter to be lifted or suppressed very precisely.

Set the cut/boost control of each section to the centre-detented position when not required.

7.11 AUX SEND

This control sends the input channel signal to the Auxiliary bus (range -∞ to 0 dB max). As AUX bus is separated from the main outputs, it can provide additional output for foldback, echo units or extra loudspeaker feed.

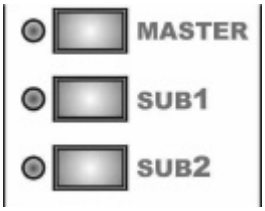
AUX signal is always derived after the EQ section and may also be selected as PRE FADER or POST FADER by pressing the associated PRE switcher.

When PRE selection is pressed, AUX signal is unaffected by the fader position. This makes them particularly suitable for foldback or monitor feeds, which need to be controlled separately from the Master mix.
When PRE selection is released, AUX signal is derived after the EQ and channel fader, and therefore follows any changes in fader level. It is normally used to drive effects processing units which are fed back into the mixer and which must fade out with the input channel.
The channels `START' switch will NOT switch the Auxiliary send on or off when it is set post fader.

7.12 PAN

The PAN control determines the position of the signal within the stereo mix image. Rotation fully anticlockwise feeds the signal solely to the Left mix bus (Master, Sub 1 & Sub 2 outputs), while rotation clockwise sweeps the image to the Right mix bus (Master, Sub 1 & Sub 2 outputs).
The centre applies 0dB of gain to both signals.

7.13 MASTER-SUB1-SUB2 ROUTING SWITCHES



The input channel signal may be routed to the main Stereo MIX (L-R) or pairs SUB busses 1 & 2 by pressing the respective switches.

The routing switchers work in conjunction with the module status (On or Off)

There is a red LED next to each switch which will illuminate at two levels of brightness.

The LED will illuminate at half brightness if the Switch is pressed but the module is Off.
You may regard this as the routing circuit being armed but not active.
To make it active the On status must be engaged (see § 7.16). The LED will illuminate at full brightness to indicate that the circuit is now active.

When one or more routing switchers are depressed, LED is off and the routing circuit is never active, regardless of the module status (On/Off).

LED **OFF**	switch depressed / the status of the module doesn't affect routing circuit
LED **ON**	switch pressed / routing circuit is active as the module is On
LED **HALF BRIGH.**	switch pressed / routing circuit is non active as the module is Off

This three mode operating has been introduced in order to prevent buss from additional noise when routing switchers are pressed and module is off.

The Sub mix can be mixed into the main output mixbuss in the master section (see Master routing switcher on the Sub modules).
This is a convenient way to use the SUB assigment switch as a subgroup system, creating new possibilities in the Oxygen 7 console.

7.14 DUCK SWITCH

The Duck is an ON/OFF switch which tells each VCA fader whether or not they partecipate in the external Duck control.
Please ref to Chapter 6.

The DUCK switcher works in conjunction with the module status (On or Off)

There is a red LED next to the switch which will illuminate at two levels of brightness.

The LED will illuminate at half brightness if the switch is pressed but the module is Off.
You may regard this as the DUCK routing circuit being armed but not active.

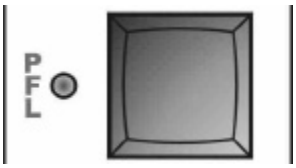
To make it active the On status must be engaged (see § 7.16). The LED will illuminate at full brightness to indicate that the circuit is now active.

When the switch is depressed, LED is off and the circuit is never active, regardless of the module status (On/Off).

LED **OFF**	switch depressed / the status of the module doesn't affect routing circuit
LED **ON**	switch pressed / DUCK circuit is active as the module is On
LED **HALF BRIGH.**	switch pressed / DUCK circuit is non active as the module is Off

This three mode operating has been introduced in order to prevent buss from additional noise when switch is pressed and module is off.

7.15 PFL button



Stereo pre-fade listening. PFL button (operated only in latched) mode allows pre-fade listening (post pan-pot) of the channel with the fader closed.

When the PFL button is activated, the channel signal will be connected to the PFL output and to the CUE single-meter circuitry.
Even when the channel is active, the PFL system is active.

The PFL function can be cancelled:

- by using the PFL RESET button on the MASTER Module
- by activating PFL on another module (if PFL MODE Jumper on the Master module is open – see Master module Jumper settings)
- by pressing the PFL button again

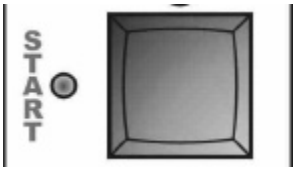
The PFL signal can be heard by way of external headphones and amplifiers with loudspeaker connected to the Control Room and / or Studio sections – please refer to § Master and Monitor module descriptions.

The user may chose among two PFL operating modes: ADDITIVE or SINGLE

- In the ADDITIVE Mode, You can listen to one or more PFLs at the same time by pressing one or more PFL keys
- In the SINGLE Mode, only one PFL is active at once

Please refer to PFL MODE jumper on the MASTER Module.
PFL RESET key will always disable all the active PFL keys, regardless of PFL MODE jumper.

7.16 START button



The START button is used to start and stop a remote piece of equipment, as well as working in conjunction with the fader open signal to allow output from the channel.

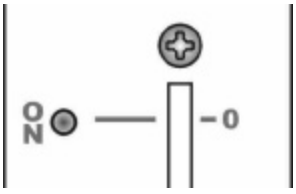
Each press of the START button will alternately send Start and Stop signals (See Remote Interface § 7.1). The LED illuminates accordingly.

Two Start operating mode are given:

When **FADER → START** jumper is closed (see § 7.7 Module settings), moving the fader away from the down position brings the module into the ON (Start) status and a Start command is given (see Remote Interface). Moving the fader back to its down position brings the module to OFF status. This jumper does not affect START button operating.

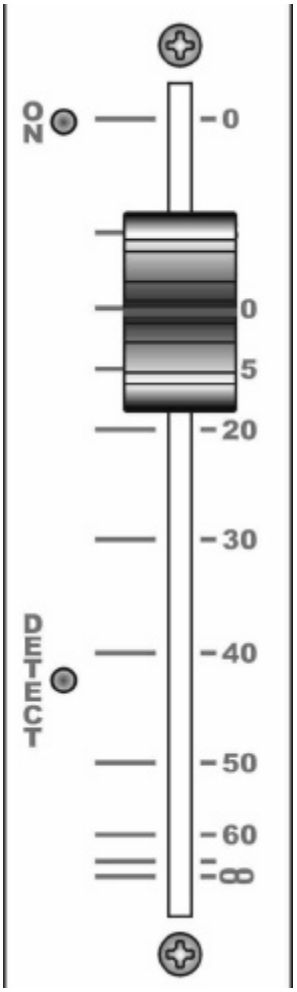
When **START → FADER** jumper is closed (see § 7.7 Module settings), press START button to activate the module and provide a START command. Press START again to de-activate the module. ON/OFF status of the module is regardless of the Fader position.
When the START button is not activated, the channel fader can be opened without bringing the audio up and without generating a start command. The channel can now be activated, by pressing the START button (ON and START red LEDs will glow).

7.17 ON LED



It will glow when the channel is in the ON / START status (ref to § 7.16).

7.18 FADER



The fader is an ultra smooth 100 mm ALPS K-Series model controlling the internal high quality VCA circuity.

There is no audio going through the faders which guarantees noise free fading for ever! (see Chapter 6).

When the fader is closed, the signal is automatically muted, providing a cut-off in excess of 100 dB. This high dB cut-off value ensures that the main output is protected from crosstalk from announcers or fast spooling tape decks.

The scale shows the attenuation. Normal operating position is at the '0' mark, providing overall 0 dB of gain.

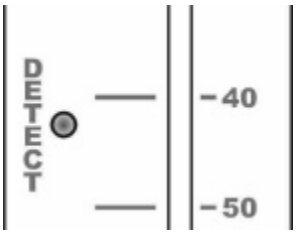
As described at the § 7.16, the START switch operates in tandem with the fader position.

There are two methods of activating the channel:

a) when **FADER → START** jumper is closed (see § 7.7 Module settings), moving the fader away from the down position brings the module into the ON (Start) status and a Start command is given (see Remote Interface). Moving the fader back to its down position brings the module to OFF status. This jumper does not affect START button operating.

b) when **START → FADER** jumper is closed (see § 7.7 Module settings), press START button to activate the module and provide a START command. Press START again to de-activate the module. ON/OFF status of the module is regardless of the fader position.
When the START button is not activated, the channel fader can be opened without bringing the audio up and without generating a start command. The channel can now be activated, by pressing the START button (ON and START red LEDs will glow).

7.19 Detect LED



The Detect LED illuminates when a signal > - 30 dB is present on the selected input (A or B). The control is performed PRE-FADER.

7.20 ALIGNEMENT OF INPUTS

When plugging in a new source start with the channel muted or fader turned down and the Cue activated.
This prevents any unexpected signal in the loudspeakers. The signal is displayed on the main CUE meter providing finer resolution and dynamic indication.
Adjust the channel GAIN control for an average channel meter reading of '0' with loud moments lighting '+3'.
Adjust the Gain trimmers if the signal is still too high with gain turned down. Reduce the gain if the signal meter always ranges in the 0 ÷ + 3dB area. It may be necessary to re-adjust the gain if changes are made to the equaliser or inserted signal processing.

Select channel PFL to check the signal quality in the headphones while the fader is off or the channel is muted.

7.21 TIMER

Oxygen 7 may feature, as an option, two Timers on the meterbridge. They may be useful for timing the duration of music tracks or presenter speech. In particular, one Timer can be factory configured so that it is controlled (started) by the use of the faders on Stereo Modules and the second can be factory configured so that it is controlled (started) by the use of the faders on Mono Modules.
The Timers can be also manually controlled using the Timer Control module buttons.

Reset Reset pressed while the timer is stopped simply returns the time display to 00:00.00. The timer can only be reset when in the Stop mode.

Hold When pressed, freezes the timer's display (showing the present time). The timer does not continue to run. Releasing Hold runs the time display again.

Start/Stop Immediately starts / stops the timer from the displayed time.

Restart When pressed, the timer automatically and immediately resets to 00:00.00 and immediately starts. The same result is achieved **whenever the fader of an Input module, with its timer function enabled, is moved from its down (closed) position**. The timer will be in any case stopped by a manual stop (STOP button on the Timer frame).

8 STEREO MODULE

8.1 STEREO MODULE - REMOTE CONNECTOR

The 15 pin D-Type plug remote connector provides the inputs and outputs for the following functions :

- Remote Start for equipment connected to Input A
- Remote Stop for equipment connected to Input A
- Remote Start for equipment connected to Input B
- Remote Stop for equipment connected to Input B
- Remote PFL enable
- Remote Start/Stop control

A 6 VDC ± 50 mV current-limited output is also provided for use with the remote control inputs.

8.1.1 REMOTE START/STOP CONTROL

Using an external pushbutton, the **Start/Stop commands** can be remotely controlled (so achieving the same function as the Start/Stop module button). For this aim, the Start/Stop optocoupler (see interface scheme) must be properly driven. Please, consider than max current allowed on optocouplers is 10 mA (nominal: 5 mA). Apply the provided + 6V tension through a **560 Ω carbon resistor** in order to preserve optocouplers from extra currents.
Please also note that the **Access Mode** jumper (see § 8.8) allows to address the Start/Stop LED only (in order to signal the 'ready' of an external equipment) instead of enable full Start/Stop command.

8.1.2 START / STOP A and B

The Start button can remotely Start and Stop external equipment. Four optocouplers will close, depending on the selected input (A or B).

The remote Start and Stop can be made either momentary or latched by setting the jumper A REM LATCH for input A and the jumper on the internal board for Input B (see § 8.8).
If no jumper is set, the Start remote operates in momentary mode.

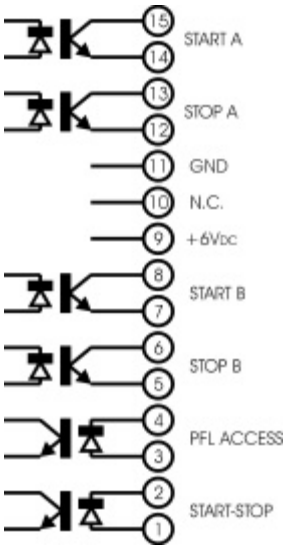
Please, consider than max current allowed on optocouplers is 10 mA (nominal: 5 mA). Apply the provided + 6V tension through a **560 Ω carbon resistor** in order to preserve optocouplers from extra currents.

8.1.3 External PFL enable

Using an external pushbutton, the **channel PFL audio path** (which is routed toward the Studio or the Control Room outputs) can be remotely switched On/Off (so achieving the same function as the module button). For this aim, the PFL Access optocoupler (see interface scheme) must be properly driven. Please, consider than max current allowed on optocouplers is 10 mA (nominal: 5 mA). Apply the provided + 6V tension through a **560 Ω carbon resistor** in order to preserve optocouplers from extra currents.

8.2 INTERFACE PIN-OUT

SUB D 15P FEMALE

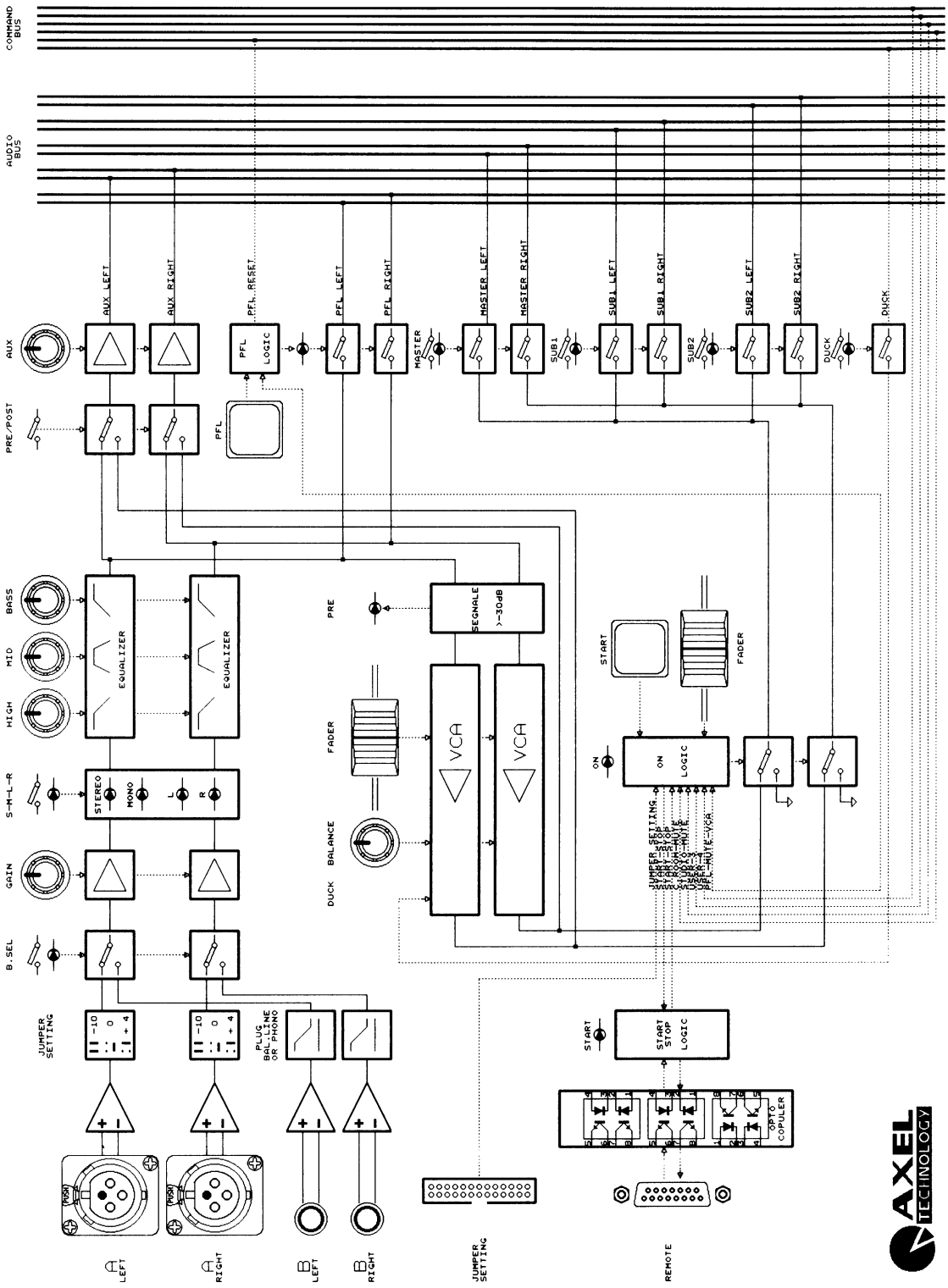


PIN	DESCRIPTION	DIRECTION
15	Collector of photocoupler - **Start A** command	**OUT**
14	Emitter of photocoupler - **Start A** command	**OUT**
13	Collector of photocoupler – **Stop A** command	**OUT**
12	Emitter of photocoupler - **Stop A** command	**OUT**
11	Ground GND	
10	Not Connected	
9	+ 6 V DC	**OUT**
8	Collector of photocoupler - **Start B** command	**OUT**
7	Emitter of photocoupler - **Start B** command	**OUT**
6	Collector of photocoupler - **Stop B** command	**OUT**
5	Emitter of photocoupler - **Stop B** command	**OUT**
4	Remote PFL enable - Cathode of ph.	**IN**
3	Remote PFL enable - Anode of photoc.	**IN**
2	Start / Stop remote control – Cathode of ph.	**IN**
1	Start / Stop remote control – Anode of photoc.	**IN**

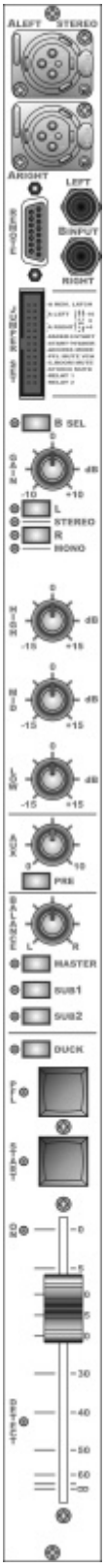
NOTE A: Nearly all modern devices require pulse start commands. Continuous signals however, can have the advantage that during broadcast a CD player cannot be accidentally stopped. One disadvantage however is that some CD players are blocked from other functions when started with a continuous pulse.

NOTE B: Some of the older equipment, require additional relays or switching transistors to operate satisfactorily, contact your dealer for more information.

8.3 BLOCK DIAGRAM



8.4 INTRODUCTION



Each STEREO module has two selectable stereo inputs which comes factory preset for **Line** (**input A**) and **Line** (**input B**) levels or **Line** (**input A**) and **Phono/RIAA** (**input B**) levels, depending on the customer requirement. Normally input A is selected but by pressing B SEL button the alternative input is selected.

There is individual preset gain adjustement for A input via jumpers (see 8.8) and the selected source is fed through a phase switch and a common gain trim control giving a further ± 10dB of gain adjustment on the front panel.

The channel support real world broadcast applications, where left and right signals may, or may not, be an actual stereo pair. Routing buttons allow each left and right input to be assigned to the left output bus, to the right output bus, to both output buses

A three band equaliser is also fitted as standard.

The Auxiliary (AUX) send may be switched pre or post fade.

The signal is routed via a balance control for small adjustments to the stereo image and the three stereo routing switches to either the main stereo programme (Master) or the two stereo subgroups (Sub 1 and Sub 2)

The whole signal path throughout the module is controlled by Vca circuits.

The DUCK switch allows the module to be attenuated from the master ducker circuits (Mono modules have a jumper fitted to make it a source for the automatic ducker circuits).

The PFL switch makes the pre-fade signal available for monitoring.

The module provides indipendent Start/Stop controls for external equipment connected to Input A or B. The remote Start/Stop operation can be jumper configured to be either momentary or latched, to give a continuous output - a feature that may be required for some types of equipment.

The remote Start Stop commands are connected to a 15 way D type and are fed from opto-isolators.

Jumper selection allows You to configure Start/Stop commands by fader or by using the Start button.

8.5 INPUT STAGE

The **A Stereo Input** is via standard female XLR-3 connectors and it is set for **LINE** sources. The input is electronically balanced and it is factory-preset for a 0 dB level (ref to § 8.8 for Sensibility adjustement).

The **B Stereo Input** is via standard Jack ¼" sockets and it is set for signals providing a signal **LINE** level. The input is electronically balanced and factory-preset for a 0 dB level.

On request, to notify at order, an RIAA equalised (grammophone) amplifier can be fitted so that a turntable can be connected directly to the input B.

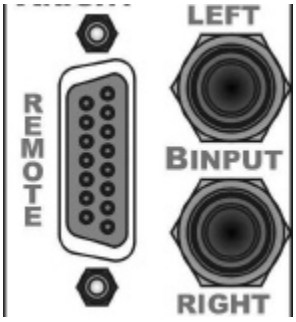
Only one of the two inputs (Input A or Input B) will be active at any time, depending upon the setting of the **B SEL switch** (see)

8.6 B SEL switch

The **B SEL** switch selects the INPUT B (Line) socket when depressed and the INPUT A (Mic) when released. A LED glows **red** when the INPUT B is selected.
Both left and right signal paths are fed by the same mono input signal.

The **same switch** enables **Remote Start A or B** (see Remote Interface description) accordingly to the selected Input. I.e. only one of the two controls (Input A Start/Stop or Input B Start/Stop) will be active at any time, depending upon the setting of the B SEL switch

8.7 REMOTE interface



This 15P SUB D FEMALE connector allows you to implement the following facilities:

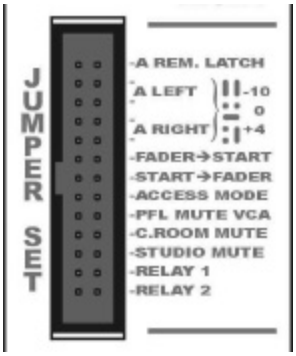
- Remote Start for equipment connected to Input A
- Remote Stop for equipment connected to Input A
- Remote Start for equipment connected to Input B
- Remote Stop for equipment connected to Input B
- Remote PFL enable
- Remote Start/Stop control

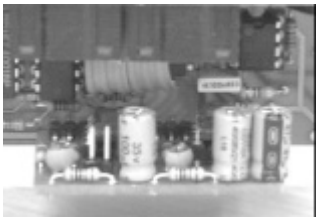
The Connettors provides also +6V$_{DC}$ and GND conections.

Only one of the two Start commands (A or B) will be active at any time, depending upon the setting of the **B SEL switch** (see)

Please refer to § 8.1 for interface connections.

8.8 MODULE OPTIONS AND JUMPER SETTINGS





The STEREO module can be configured in a number of different ways depending on the jumper options set on the JUMPER SET area:

The remote Start and Stop commands for A Input can be made either momentary or latched by setting the jumper **A.REM. LATCH**. When jumper is closed, commands are latched and viceversa. The same option (momentary or latched) is available also for Input B. The related configuration jumper is situated on an internal, additional module board, behind the Input B jack connector (ref to the picture here closed)

Input A is configurable for a **nominal input level** of –10 dBu, 0 dBu or + 4 dBu. Setting an input for –10 dBu, while connecting an audio source with a +4dBu nominal level can lead to distortion (“clipping”) of the signal. To remedy this problem simply use the appropriate jumper setting to configure the input for +4dBu operation. Please, set Left and Right channel at the same nominal input level. The second and third rows of connector are referred to Input A left, while fourth and fifth rows are referred to Input A Right.

When **FADER → START** jumper is closed, moving the fader away from the down position brings the module into the ON status and a Start command is given (see Remote Interface). Moving the fader back to its down position brings the module to OFF status. This jumper does not affect START button operating.

When **START ➙ FADER** jumper is closed, press START button to activate the module and provide a START command. Press START again to de-activate it. ON/OFF status of the module is regardless of the Fader position.
When the START switch is not activated, the channel fader can be opened without bringing the audio up and without generating a start command. The channel can now be activated, by pressing the START switch (ON red led will glow).

When closed, **ACCESS MODE** jumper makes the Start/Stop LED on the module enabled from the Start/Stop optocoupler of remote control interface. Start/Stop module button is not affected from this setting. This option may be used to signal to the sound engineer the 'ready' status of suitable external equipment.

When the **PFL MUTE VCA** jumper is closed, the PFL key toggles the module muted (ON/OFF). In particular, when PFL is activated the module is OFF (muted) and viceversa.

When the **C.ROOM MUTE** jumper is closed and the fader is moved away from its down position, the action of moving the fader away from its down position is associated to the cut-off (or the selective fading) of the **C.ROOM SPK** output on the MONITOR module. CUT led on the MONITOR Ctrl Room section illuminates accordingly.

When the **STUDIO MUTE** jumper is closed and the fader is moved away from its down position, the action of moving the fader away from its down position is associated to the cut-off (or the selective fading) of the **STUDIO SPK** output on the MASTER module. CUT led on the MASTER Studio section illuminates accordingly.

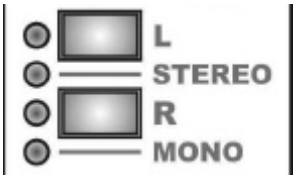
When the **RELAY 1** jumper is closed, relay switch #1 inside the Power Supply closes when the fader is moved away from its down position. This relay may be used to control an On Air Lamp (such as MR. LIGHT by Axel Technology).

When the **RELAY 2** jumper is closed, relay switch #2 inside the Power Supply closes when the fader is moved away from its down position. This relay may be used to control an On Air Lamp (such as MR. LIGHT by Axel Technology).

8.9 GAIN control

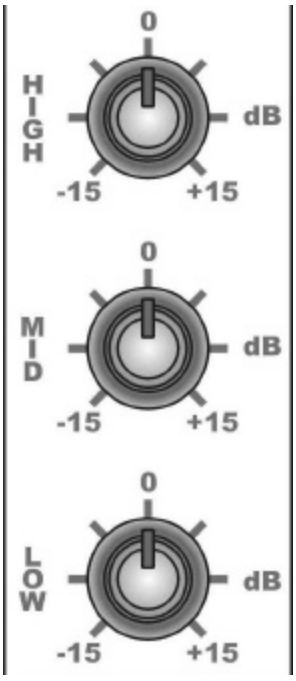
The **GAIN potentiometer** provides a variable 20dB range from +10 to +10dB gain to match the connected source to the internal 0dBu operating level
This knob allows you to match the input level to suit a wide variety of professional and semiprofessional sources. Start with a low setting, especially for professional equipment, checking the level on the meters using PFL, and increase it if you cannot reach an adequate signal level with the fader at maximum (refer also to § 8.21). The gain should be set so that the PFL channel meter averages '0' with loudest sound moments.

8.10 MODE switches



With **both** left and right switches **activated**, the stereo signal will be mixed to mono on both outputs.
With **only Mono L. activated**, the left signal will be sent to both left and right signal paths.
With **only Mono R. activated**, the right signal will be sent both left and right signal paths.
In the **'Stereo' mode**, neither Mono L. or Mono R. switches need to be activated.

8.11 EQUALISER



The Equaliser(EQ) comprises three sections. The upper control provides H.F.(treble) boost and cut of +/-15dB and the lower control provides L.F. (bass) boost and cut of +/-15dB.

The centre knob is arranged as MID frequency section, with a cut/boost control (lower knob) of +/- 15dB.

Set the cut/boost control of each section to the centre-detented position when not required.

8.12 AUX SEND

This control sends the input channel signal to the Auxiliary bus (range -∞ to 0 dB max). As AUX bus is separated from the main outputs, it can provide additional output for foldback, echo units or extra loudspeaker feed.

AUX signal is always derived after the EQ section and may also be selected as PRE FADER or POST FADER by pressing the associated PRE switcher.

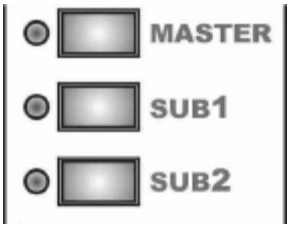
When PRE selection is pressed, AUX signal is unaffected by the fader position. This makes them particularly suitable for foldback or monitor feeds, which need to be controlled separately from the Master mix.
When PRE selection is released, AUX signal is derived after the EQ and

channel fader, and therefore follows any changes in fader level. It is normally used to drive effects processing units which are fed back into the mixer and which must fade out with the input channel.
The channels `START' switch will NOT switch the Auxiliary send on or off when it is set post fader.

8.13 BALANCE

It adjusts the balance between the L and R outputs. At the detented centre position the signal routes equally to L and R.

8.14 MASTER-SUB1-SUB2 ROUTING SWITCHES



The input channel signal may be routed to the main Stereo MIX (L-R) or pairs SUB busses 1 & 2 by pressing the respective switches.

The routing switchers work in conjunction with the module status (On or Off)

There is a red LED next to each switch which will illuminate at two levels of brightness.

The LED will illuminate at half brightness if the Switch is pressed but the module is Off.
You may regard this as the routing circuit being armed but not active.
To make it active the On status must be engaged (see §). The LED will illuminate at full brightness to indicate that the circuit is now active.

When one or more routing switchers are depressed, LED is off and the routing circuit is never active, regardless of the module status (On/Off).

LED **OFF**	switch depressed / the status of the module doesn't affect routing circuit
LED **ON**	switch pressed / routing circuit is active as the module is On
LED **HALF BRIGH.**	switch pressed / routing circuit is non active as the module is Off

This three mode operating has been introduced in order to prevent buss from additional noise when routing switchers are pressed and module is off.
The Sub mix can be mixed into the main output mixbuss in the master section (see Master routing switcher on the Sub modules).
This is a convenient way to use the SUB assigment switch as a subgroup system, creating new possibilities in the Oxygen 7 console.

8.15 DUCK SWITCH

The Duck is an ON/OFF switch which tells each VCA fader whether or not they partecipate in the external Duck control.
Please ref to Chapter 6.

The DUCK switcher works in conjunction with the module status (On or Off)

There is a red LED next to the switch which will illuminate at two levels of brightness.

The LED will illuminate at half brightness if the switch is pressed but the module is Off.
You may regard this as the DUCK routing circuit being armed but not active.

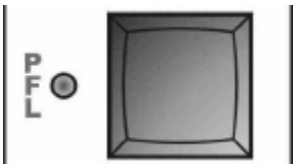
To make it active the On status must be engaged (see § 8.17). The LED will illuminate at full brightness to indicate that the circuit is now active.

When the switch is depressed, LED is off and the circuit is never active, regardless of the module status (On/Off).

LED **OFF**	switch depressed / the status of the module doesn't affect routing circuit
LED **ON**	switch pressed / DUCK circuit is active as the module is On
LED **HALF BRIGH.**	switch pressed / DUCK circuit is non active as the module is Off

This three mode operating has been introduced in order to prevent buss from additional noise when switch is pressed and module is off.

8.16 PFL button



Stereo pre-fade listening. PFL button (operated only in latched) mode allows pre-fade listening (post pan-pot) of the channel with the fader closed.

When the PFL button is activated, the channel signal will be connected to the PFL output and to the CUE single-meter circuitry.
Even when the channel is active, the PFL system is active.

The PFL function can be cancelled:

- by using the PFL RESET button on the MASTER Module
- by activating PFL on another module (if PFL MODE Jumper on the Master module is open – see Master module Jumper settings)
- by pressing the PFL button again

The PFL signal can be heard by way of external headphones and amplifiers with loudspeaker connected to the Control Room and / or Studio sections – please refer to § Master and Monitor module descriptions.

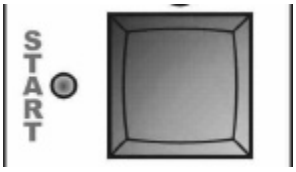
The user may chose among two PFL operating modes: ADDITIVE or SINGLE

- In the ADDITIVE Mode, You can listen to one or more PFLs at the same time by pressing one or more PFL keys
- In the SINGLE Mode, only one PFL is active at once

Please refer to PFL MODE jumper on the MASTER Module.

PFL RESET key will always disable all the active PFL keys, regardless of PFL MODE jumper.

8.17 START button



The START button is used to start and stop a remote piece of equipment, as well as working in conjunction with the fader open signal to allow output from the channel.

Each press of the START button will alternately send Start and Stop signals (See Remote Interface § 7.1). The LED illuminates accordingly.

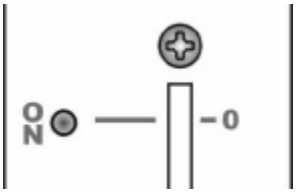
Two Start operating mode are given related to the Fader position:

When **FADER ➞ START** jumper is closed (see § 7.7 Module settings), moving the fader away from the down position brings the module into the ON status and a **Start** command is given (see Remote Interface). Moving the fader back to its down position brings the module to OFF status and a **Stop** command is given. This jumper does not affect START button operating.

When **START ➞ FADER** jumper is closed (see § 7.7 Module settings), Moving the fader away from the down position does NOT bring the module into the ON (Start) status. While the fader is already away from the down position press START button to activate the module and provide a START command. Press START again to de-activate the module. ON/OFF status of the module is regardless of the Fader position.

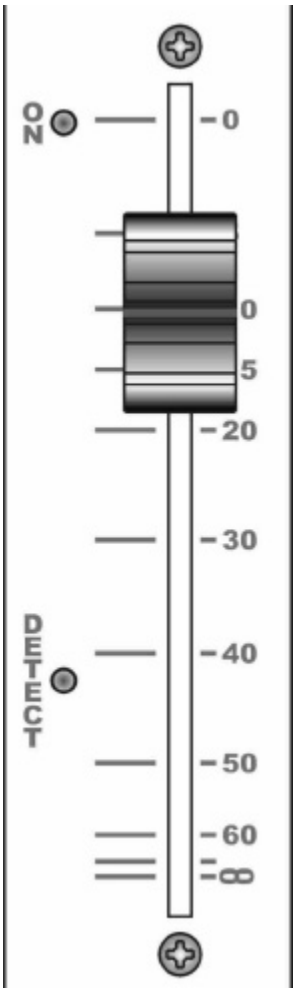
When the START button is not activated, the channel fader can be opened without bringing the audio up and without generating a start command. The channel can now be activated, by pressing the START button (ON and START red LEDs will glow).

8.18 ON LED



It will glow when the channel is in the ON / START status (ref to § 7.16).

8.19 FADER



The fader is an ultra smooth 100 mm ALPS K-Series model controlling the internal high quality VCA circuity.

There is no audio going through the faders which guarantees noise free fading for ever! (see Chapter 6).

When the fader is closed, the signal is automatically muted, providing a cut-off in excess of 100 dB. This high dB cut-off value ensures that the main output is protected from crosstalk from announcers or fast spooling tape decks.

The scale shows the attenuation. Normal operating position is at the '0' mark, providing overall 0 dB of gain.

As described at the § 7.16, the fader may operate in tandem with the START switch.

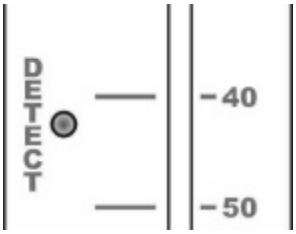
Three operating modes are given:

1) fader indipendent from the Start/Stop button. If the fader is down (closed), the routing LEDs (MST, SUB1 and SUB2) glow at half brightness and the routing circuitry can be regarded as being armed. To activate the circuitry, the fader should be moved away from the down position - the LEDs then glow with full power.

2) **FADER → START** jumper is closed (see § 7.7 Module settings). Moving the fader away from the down position brings the module into the ON (Start) status and a Start command is given (see Remote Interface). Moving the fader back to its down position brings the module to OFF status and a Stop command is given. This jumper however does not affect START button operating.

3) **START → FADER** jumper is closed (see § 7.7 Module settings). Moving the fader away from the down position does NOT bring the module into the ON (Start) status. While the fader is already away from the down position press START button to activate the module and provide a START command. Press START again to de-activate the module. ON/OFF status of the module is regardless of the Fader position.

8.20 Detect LED



The Detect LED illuminates when a signal > - 30 dB is present on the selected input (A or B). The control is performed PRE-FADER.

8.21 ALIGNEMENT OF INPUTS

When plugging in a new source start with the channel muted or fader turned down and the Cue activated.
This prevents any unexpected signal in the loudspeakers. The signal is displayed on the main CUE meter providing finer resolution and dynamic indication.
Adjust the channel GAIN control for an average channel meter reading of '0' with loud moments lighting '+3'.
Adjust the Gain trimmers if the signal is still too high with gain turned down. Reduce the gain if the signal meter always ranges in the 0 ÷ + 3dB area. It may be necessary to re-adjust the gain if changes are made to the equaliser or inserted signal processing.
Select channel PFL to check the signal quality in the headphones while the fader is off or the channel is muted.

8.22 TIMER

Oxygen 7 may feature, as an option, two Timers on the meterbridge. They may be useful for timing the duration of music tracks or presenter speech. In particular, one Timer can be factory configured so that it is controlled (started) by the use of the faders on Stereo Modules and the second can be factory configured so that it is controlled (started) by the use of the faders on Mono Modules.The Timers can be also manually controlled using the Timer Control module buttons.

Reset Reset pressed while the timer is stopped simply returns the time display to 00:00.00. The timer can only be reset when in the Stop mode.

Hold When pressed, freezes the timer's display (showing the present time). The timer does not continue to run. Releasing Hold runs the time display again.

Start/Stop Immediately starts/ stops the timer from the displayed time.

Restart When pressed, the timer automatically and immediately resets to 00:00.00 and immediately starts. The same result is achieved **whenever the fader of an Input module, with its timer function enabled, is moved from its down (closed) position**. The timer will be in any case stopped by a manual stop (STOP button on the Timer frame).

9 TELCO MODULE

9.1 TELCO MODULE - REMOTE CONNECTOR

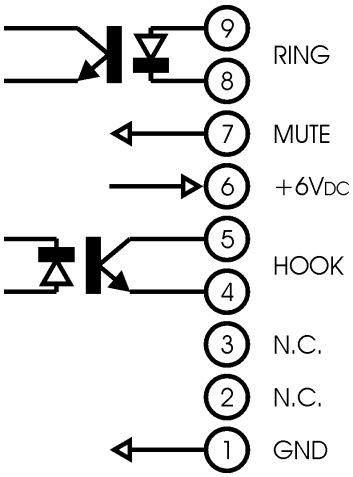
The 9 pin D-Type plug remote connector provides the inputs and outputs for the following functions:

- Remote control for line 'hooking' on the external telephone hybrid
- External control for RING LED (i.e. RING LED on the Telco module can be driven by a suitable external command)

A 15 VDC current-limited output is also provided for use with the remote control outputs.

9.1.1 REMOTE INTERFACE PIN-OUT

SUB D 9P FEMALE



(console internal view)

PIN	DESCRIPTION	DIRECTION
1	Ground GND	**/**
2	Not Connected	**/**
3	Not Connected	**/**
4	HOOK command - emitter of photocoupler	**OUT**
5	HOOK command - collector of photocoupler	**OUT**
6	+ 6 VDC	**OUT**
7	External muting control	**IN**
8	External RING control - cathode of photocoupler	**IN**
9	External RING control - anode of photocoupler	**IN**

9.1.2 DESCRIPTION

Pins 8 and 9 are used to make RING LED on the Telco module panel blinking when a call is coming in.

The remote interface photocoupler (pin 9 = Anode and pin 8 = Cathode) must be driven by an external suitable command generated by external telephone hybrid. Typical current allowed: 5 mA (max 10 mA). Max voltage allowed: 15 V.

A + 6VDC is provided on Pin 6 of interface.

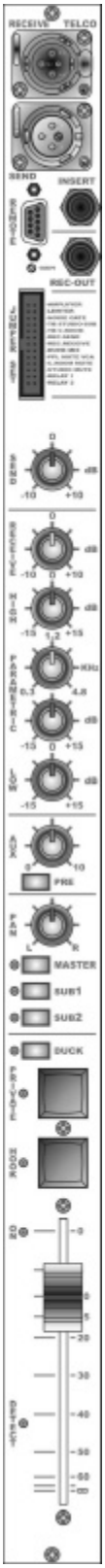
The Oxygen 7's *Hook* optoinsulator closes whenever 'Hook' button is pressed. Typical current allowed: max 10 mA. Max voltage allowed: 15 V.

It may be necessary to consult the hybrid manufacturer's user manual in order to control its functions.

OXYGEN 7 Telco remote interface has been designed for **direct connection** to **BOXTEL** and **MACROTEL 5 / 7 / 9** by **Axel Technology**.

A regular, not crossed **Pin – to – Pin 9 pole cable** featuring **standard RS232** connectors is required for Boxtel connection (9 pin serial connection computer type).

9.2 INTRODUCTION



This module controls the connection to the telephone external hybrid unit and has EQ, coarse and fine gain control, PFL and Master, Sub1 and Sub 2 output select. It has only one mono input, the other XLR connector being used for the output (mix minus) to the telephone hybrid. The presenter can talk off-air with a caller whilst the programme is being output through the *TB to STUDIO* audio path.

All Telco modules are fitted with a high pass filter with variable frequency. A three band parametric equaliser is also available, where the centre band can be swept from 300 Hz to 4.8 kHz.

The Auxiliary (AUX) send may be switched pre or post fade.

The signal is routed via a pan control and the three stereo routing switches to either the main stereo programme (Master) or the two stereo subgroups (Sub 1 and Sub 2)

The whole signal path throughout the module is controlled by Vca circuits.

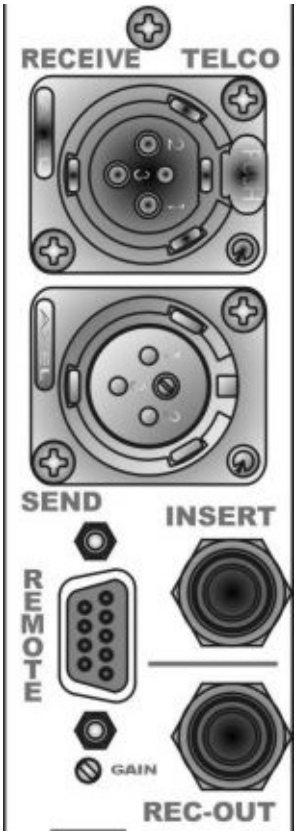
The DUCK switch allows the module to be attenuated from the master ducker circuits. The module has a jumper fitted to make it a source for the automatic ducker circuits.

The PFL switch makes the pre-fade signal available for monitoring and can be programmed to mute or selectively lower the main audio path.

A remote interface is provided, which allows remote control of connected Telephone Hybrid units.

Communication between caller and engineer is easily accomplished by activating the PFL / Private switch in the Telco module.

9.3 INPUT / OUTPUT STAGE



The **RECEIVE** is via a standard female XLR-3 connector and it is set for **line** sources. The input is electronically balanced.

The recessed **GAIN trimmer** allows you to adjust the gain in a large range. In conjunction with the GAIN potentiometer (see) this allows you to adjust the overall gain of Receive signal to any desired figure within the available range. The trimmer is acting only with AMPLIFIER jumper closed (see).

The **SEND** is via a standard male XLR-3 connector into which may be plugged the *input* of an external telephone hybrid. It is a balanced output, providing a *mix-minus* feed (i.e. the programme output signal *minus* the phone signal).

The unbalanced **INSERT** socket is provided which is a break point in the input (Receive) channel signal path. The insert point allows external piece of equipment such as limiters, compressors and other signal processing units to be added as required to particular input channels.
The Insert is a 3-pole ¼" 'A' gauge Jack Socket, which are normally by-passed. When a jack plug is inserted, the signal path is broken at a point just after the preamplifier stage. The signal from the channel appears on the TIP of the plug and is returned on the RING to continue through to the final output.

9.4 REMOTE CONNECTOR

The 9 pin D-Type plug remote connector provides the inputs and outputs for the following functions:

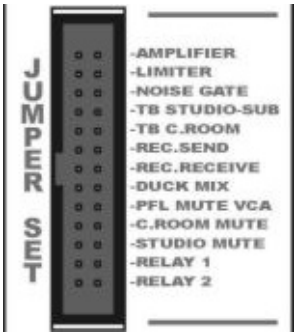
- Remote control for line 'hooking' on the external telephone hybrid
- External control for RING LED (i.e. RING LED on the Telco module can be driven by a suitable external command)

Ref to Section 9.1

9.5 REC OUT socket

The Rec Out is a 3-pole ¼" 'A' gauge Jack Socket, electronically balanced (MONO). It provides Receive-only signal, Send-only signal or the Receive mixed to the Send, depending on the module jumper configuration (see § 9.6).

9.6 MODULE OPTIONS AND JUMPER SETTINGS



The TELCO module can be configured in a number of different ways depending on the jumper options set on the JUMPER SET area:

When closed, the **AMPLIFIER** jumper allows for extra-amplification on Receive signal. The recessed trimmer allows You to adjust the level.

When closed, the **LIMITER** jumper enables a Limiter internal stage. The purpose of the limiter is to provide control over the hottest peaks in the signal. Limiter is not user-settable and acts when signal goes over 6 dB.

When closed, the **NOISE GATE** jumper enables an internal Noise Gate circuit so that as the signal level drops below the -60dB threshold, the signal is muted.

When closed, the **TB** (to) **STUDIO-SUB** jumper put the signal from the pre-fade section of the module (i.e. the caller voice) onto the TalkBack Studio audio Bus and allows it to be output on the Studio Monitor section (see MONITOR module).
Please refer also to TB Route settings on the **Master** Module.

When closed, the **TB** (to) **C.ROOM** jumper put the signal from the pre-fade section of the module (i.e. the caller voice) onto the TalkBack Ctrl Room audio Bus and allows it to be output on the Control Room Monitor section (see MONITOR module).
Please refer also to TB Route settings on the **Master** Module.

When closed, the **REC SEND** jumper put the Send signal (i.e. the mix-minus signal) onto the REC OUT socket.

When closed, the **REC RECEIVE** jumper put the signal Received from the telephone line (i.e. the caller voice) onto the REC OUT socket.

When closed, **DUCK MIX** jumper makes the signal from the pre-fade section controlling the ducker circuit (with the module ON). The signal to be attenuated by the ducker are determined by the local Duck switches**. Please refer to Chapter 6.**

When the **PFL MUTE VCA** jumper is closed, the PFL key toggles the module ON and OFF. In particular, when PFL is activated the module is OFF and viceversa.

When the **C.ROOM MUTE** jumper is closed, the action of moving the fader away from its down position is associated to the cut-off (or the selective fading) of the **C.ROOM SPK** output on the MONITOR module. CUT led on the MONITOR Ctrl Room section illuminates accordingly.

When the **STUDIO MUTE** jumper is closed, the action of moving the fader away from its down position is associated to the cut-off (or the selective fading) of the **STUDIO SPK** output on the MASTER module. CUT led on the MASTER Studio section illuminates accordingly.

When the **RELAY 1** jumper is closed, relay switch #1 inside the Power Supply closes when the fader is moved away from its down position. This

relay may be used to control an On Air Lamp (such as MR. LIGHT by Axel Technology).

When the **RELAY 2** jumper is closed, relay switch #2 inside the Power Supply closes when the fader is moved away from its down position. This relay may be used to control an On Air Lamp (such as MR. LIGHT by Axel Technology).

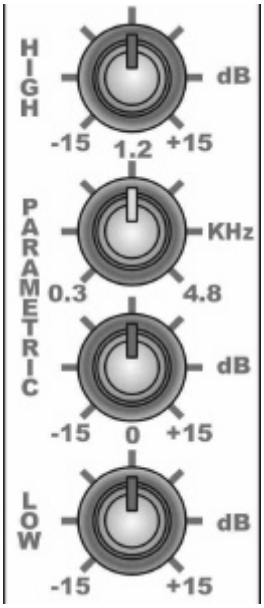
9.7 SEND level control

It adjusts in the +/- 10 dB range the level of *mix-minus* signal which is sent to the telephone caller via the external telephone hybrid.

9.8 RECEIVE level control

It adjusts in the +/- 10 dB range the level of the signal incoming from telephone caller via the external telephone hybrid.

9.9 EQUALISER



The Equaliser (EQ) comprises four sections. The upper control provides H.F.(treble) boost and cut of +/-15dB and the lower control provides L.F. (bass) boost and cut of +/-15dB.

The centre two knobs is arranged as MID frequency section, with a cut/boost control (lower knob) of +/- 15dB, and a frequency control which determines at which frequency the boost/cut action will be centered. This MID section is particularly versatile for speech, enabling particular characteristics of the presenter to be lifted or suppressed very precisely.

Set the cut/boost control of each section to the centre-detented position when not required.

9.10 AUX SEND

This control sends the input channel signal to the Auxiliary bus (range -∞ to 0 dB max). As AUX bus is separated from the main outputs, it can provide additional output for foldback, echo units or extra loudspeaker feed.

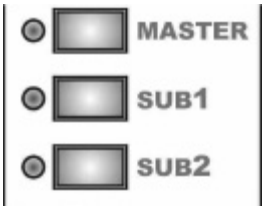
AUX signal is always derived after the EQ section and may also be selected as PRE FADER or POST FADER by pressing the associated PRE switcher.

When PRE selection is pressed, AUX signal is unaffected by the fader position. This makes them particularly suitable for foldback or monitor feeds, which need to be controlled separately from the Master mix.
When PRE selection is released, AUX signal is derived after the EQ and channel fader, and therefore follows any changes in fader level. It is normally used to drive effects processing units which are fed back into the mixer and which must fade out with the input channel.
The channels `START' switch will NOT switch the Auxiliary send on or off when it is set post fader.

9.11 PAN

The PAN control determines the position of the signal within the stereo mix image. Rotation fully anticlockwise feeds the signal solely to the Left mix bus (Master, Sub 1 & Sub 2 outputs), while rotation clockwise sweeps the image to the Right mix bus (Master, Sub 1 & Sub 2 outputs).
The centre applies 0dB of gain to both signals.

9.12 MASTER-SUB1-SUB2 ROUTING SWITCHES



The input channel signal may be routed to the main Stereo MIX (L-R) or pairs SUB busses 1 & 2 by pressing the respective switches.

The routing switchers work in conjunction with the module status (On or Off)

There is a red LED next to each switch which will illuminate at two levels of brightness.

The LED will illuminate at half brightness if the Switch is pressed but the module is Off.
You may regard this as the routing circuit being armed but not active.
To make it active the On status must be engaged moving the fader away from its down position. The LED will illuminate at full brightness to indicate that the circuit is now active.

When one or more routing switchers are depressed, LED is off and the routing circuit is never active, regardless of the module status (On/Off).

LED **OFF**	switch depressed / the status of the module doesn't affect routing circuit
LED **ON**	switch pressed / routing circuit is active as the module is On
LED **HALF BRIGH.**	switch pressed / routing circuit is non active as the module is Off

This three mode operating has been introduced in order to prevent buss from additional noise when routing switchers are pressed and module is off.

The Sub mix can be mixed into the main output mixbuss in the master section (see Master routing switcher on the Sub modules).
This is a convenient way to use the SUB assigment switch as a subgroup system, creating new possibilities in the Oxygen 7 console.

9.13 DUCK SWITCH

The Duck is an ON/OFF switch which tells each VCA fader whether or not they partecipate in the external Duck control.
Please ref to Chapter 6.

The DUCK switcher works in conjunction with the module status (On or Off)

There is a red LED next to the switch which will illuminate at two levels of brightness.

The LED will illuminate at half brightness if the switch is pressed but the module is Off.
You may regard this as the DUCK routing circuit being armed but not active.

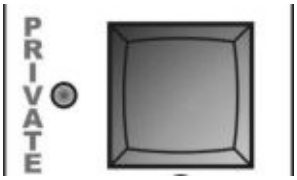
To make it active the On status must be engaged. The LED will illuminate at full brightness to indicate that the circuit is now active.

When the switch is depressed, LED is off and the circuit is never active, regardless of the module status (On/Off).

LED **OFF**	switch depressed / the status of the module doesn't affect routing circuit
LED **ON**	switch pressed / DUCK circuit is active as the module is On
LED **HALF BRIGH.**	switch pressed / DUCK circuit is non active as the module is Off

This three mode operating has been introduced in order to prevent buss from additional noise when switch is pressed and module is off.

9.14 PRIVATE button



Pre-fade listening PFL button (operated only in latched mode) allows a caller to be heard without being in the broadcast (i.e. with the fader closed) and to listen to the "**talkback"** mic(s).

When the PFL button is activated:

- the channel (Receive) signal will be connected to the PFL output and to the CUE single-meter circuitry (see also MONITOR Chapter).
- the *TalkBack To Studio* bus audio is automatically switched to the caller for "off-air" (i.e. 'Private') communications with the engineer (or with the announcer situated in the Croom).

  F.i., the engineer can talk *off-air* with a caller (whilst the Main programme is being output) via its own microphone connected

to Mono module (and routed as *TB to Studio* – see § 7.7).

When the PFL button is deactivated:

- the Master, Sub1 or Sub2 buses are automatically sent to the caller, depending on the Telco routing switches configuration
- the caller is broadcast with channel fader opened

The PFL function can be cancelled:

- by using the PFL RESET button on the MASTER Module
- by activating PFL on another module (if PFL MODE Jumper on the Master module is open – see Master module Jumper settings)
- by pressing the PFL button again

The PFL signal can be heard by way of external headphones and amplifiers with loudspeaker connected to the Control Room and / or Studio sections – please refer to § Master and Monitor module descriptions.

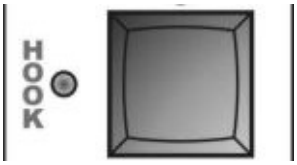
The user may chose among two PFL operating modes: ADDITIVE or SINGLE

- In the ADDITIVE Mode, You can listen to one or more PFLs at the same time by pressing one or more PFL keys.
- In the SINGLE Mode, only one PFL is active at once.

Please refer to PFL MODE jumper on the MASTER Module.

PFL RESET key will always disable all the active PFL keys, regardless of PFL MODE jumper.

9.15 HOOK button

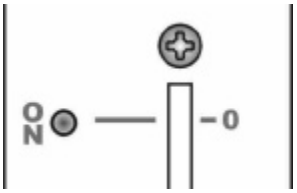


The Hook switch remotely controls the Line hooking on suitable telephone hybrids (such as Macrotel 5,7,9 and BoxTel by Axel Technology). This switch connects / disconnects the hybrid from the telephone line.

Ring led blinks when a call (ring) is coming. This requires a suitable control by the external telephone hybrid (such as Macrotel 5,7,9 and BoxTel by Axel Technology). Please refer to Telco Remote Interface - § **Errore. L'origine riferimento non è stata trovata.**

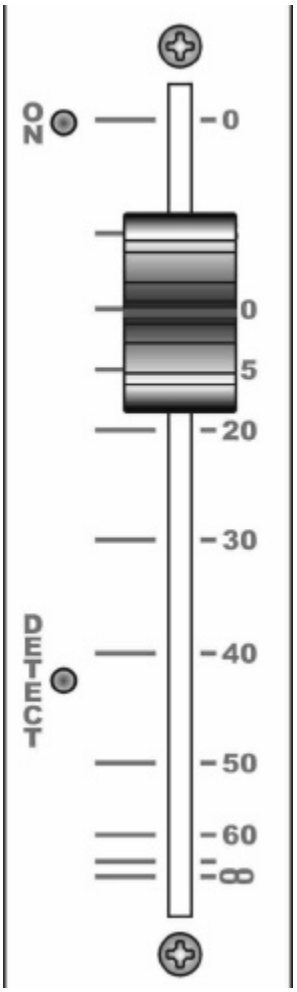
If the HOOK switch is pressed with an external hybrid properly connected, the red Hook led will illuminate and the caller is connected to the Telco module but not yet heard in the broadcast because the fader is still down.
By opening the fader, the Telco module will be activated and the signal will enter the program (see also MASTER/SUB switches and PFL PRIVATE button)

9.16 ON LED



It will glow when the channel is in the ON status (i.e. the fader is moved away from its down position).

9.17 FADER



The fader is an ultra smooth 100 mm ALPS K-Series model controlling the internal high quality VCA circuity.

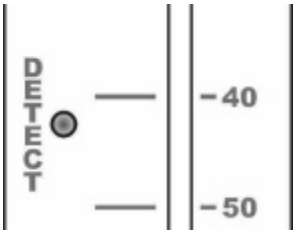
There is no audio going through the faders which guarantees noise free fading for ever! (see Chapter 6).

When the fader is closed, the signal is automatically muted, providing a cut-off in excess of 100 dB. This high dB cut-off value ensures that the main output is protected from crosstalk from announcers or fast spooling tape decks.

The scale shows the attenuation. Normal operating position is at the ‘0’ mark, providing overall 0 dB of gain.

The action of moving the fader away from the down position brings the module into the ON status.

9.18 Detect LED



The Detect LED illuminates when a signal > - 30 dB is present on the selected input (A or B). The control is performed PRE-FADER.

9.19 ALIGNEMENT OF INPUTS

When plugging in a new source start with the channel muted or fader turned down and the Cue activated.
This prevents any unexpected signal in the loudspeakers. The signal is displayed on the main CUE meter providing finer resolution and dynamic indication.
Adjust the channel GAIN control for an average channel meter reading of '0' with loud moments lighting '+3'.
Adjust the Gain trimmers if the signal is still too high with gain turned down. Reduce the gain if the signal meter always ranges in the 0 ÷ + 3dB area. It may be necessary to re-adjust the gain if changes are made to the equaliser or inserted signal processing.

Select channel PFL to check the signal quality in the headphones while the fader is off or the channel is muted.