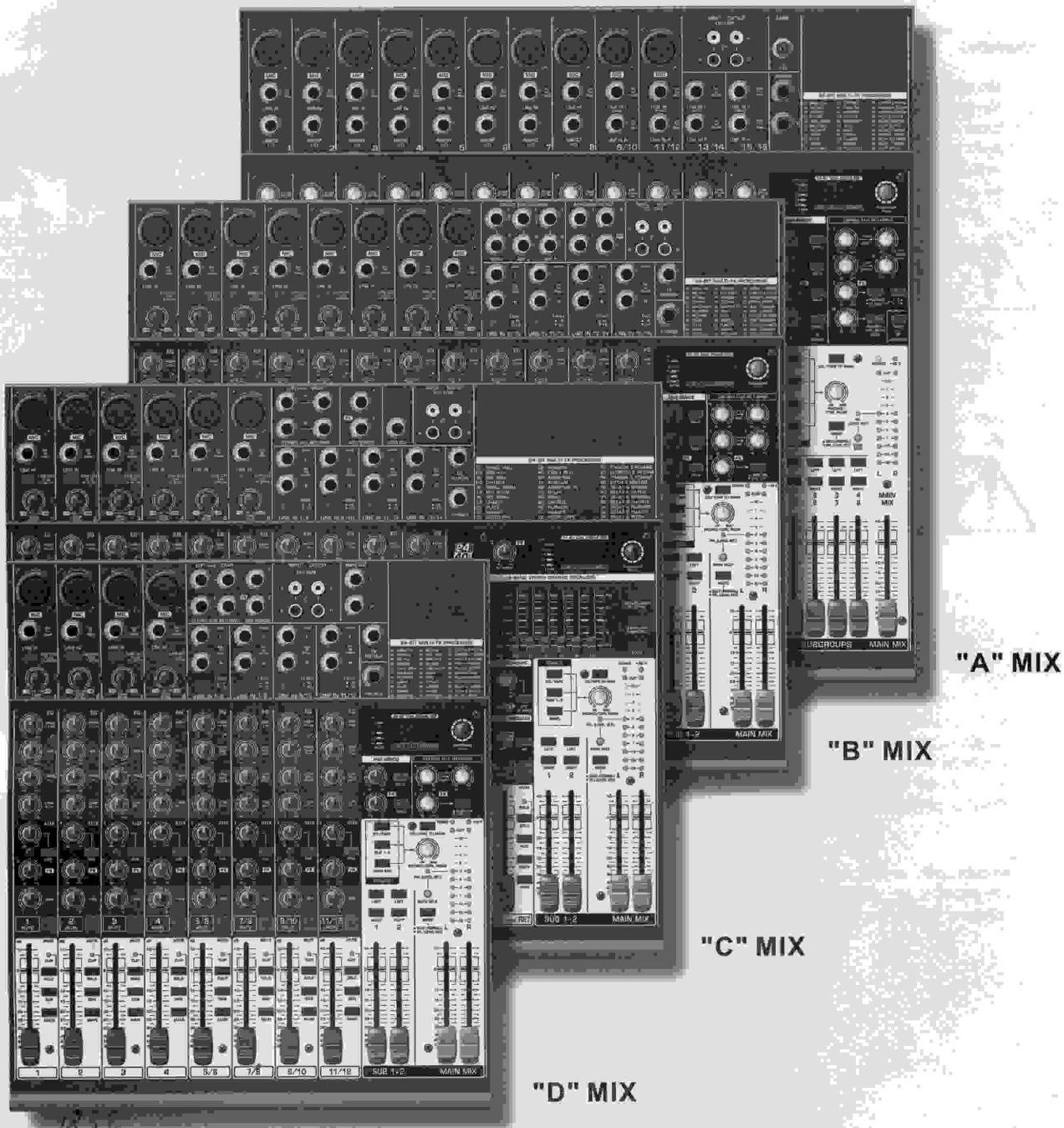


User's Manual

Version 1.0 January 2006



IMPORTANT SAFETY INSTRUCTIONS



CAUTION: To reduce the risk of electric shock, do not remove the top cover (or the rear section). No user serviceable parts inside; refer servicing to qualified personnel.

WARNING: To reduce the risk of fire or electric shock, do not expose this appliance to rain and moisture. The apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.



This symbol, wherever it appears, alerts you to the presence of uninsulated dangerous voltage inside the enclosure—voltage that may be sufficient to constitute a risk of shock.



This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Please read the manual.

2. CONTROL ELEMENTS AND CONNECTORS

This chapter describes the various control elements of your mixing console. All controls, switches and connectors will be discussed in detail.

2.1 Mono channels

2.1.1 Microphone and line inputs



Fig. 2.1: Connectors and controls of mic/line inputs

MIC

Each mono input channel offers a balanced microphone input via the XLR connector and also features switchable +48 V phantom power supply for condenser microphones. The MIX preamps provide undistorted and noise-free gain as is typically known only from costly outboard preamps.

LINE IN

Each mono input also has a balanced line input on a 1/4" jack. You can also connect unbalanced devices using mono jacks to these inputs.

INSERT

Insert points enable the processing of a signal with dynamic processors or equalizers. They are sourced pre-fader, pre-EQ and pre-aux send. Detailed information on using insert points can be found in chapter 5.3.

TRIM

Use the *TRIM* control to adjust the input gain. This control should always be turned fully counter-clockwise whenever you connect or disconnect a signal source to one of the inputs.

The scale has 2 different value ranges: the first value range (+10 to +60 dB) refers to the MIC input and shows the **amplification** for the signals fed in there.

The second value range (+10 to -40 dB) refers to the line input and shows its **sensitivity**. The settings for equipment with standard line-level signals (-10 dBV or +4 dBu) look like this: While the TRIM control is turned all the way down, connect your equipment. Set the TRIM control to the external devices' standard output level. If that unit has an output signal level display, it should show 0 dB during signal peaks. For +4 dBu, turn up TRIM slightly, for -10 dBV a bit more. Fine-tuning of a signal being fed in is done using the level meter. To route the channel signal to the level meter, you have to press the SOLO switch and set the MODE switch in the main section to PFL (LEVEL SET).

Using the TRIM control, drive the signal to the 0-dB mark. This way you have a vast amount of drive headroom for use with very dynamic signals. The CLIP display should light up only rarely, preferably never. While fine-tuning, the equalizer should be set to neutral.

LOW CUT

Additionally, the mono channels of the mixing consoles have a high-slope *LOW CUT* filter for eliminating unwanted, low-frequency signal components (75 Hz, 18 dB/octave).

2.1.2 Equalizer

All mono input channels have a 3-band equalizer with semi-parametric mid bands. All bands provide boost or cut of up to 15 dB. In the central position, the equalizer is off (flat).



All models

Fig. 2.2: Equalizer of the input channels

The upper (HIGH) and the lower (LOW) bands are shelving filters that increase or decrease all frequencies above or below their cut-off frequency. The cut-off frequencies of the upper and lower bands are 12 kHz and 80 Hz respectively. For the mid range, the console features a semi-parametric equalizer with a filter quality (Q) of 1 octave, tunable from 100 Hz to 8 kHz. Use the MID control to set the amount of boost or cut, and the FREQ control to determine the central frequency.

2.1.3 Monitor and effects busses (Aux sends)



"D" MIX



"A" MIX

Fig. 2.3: Aux Send control MON and FX in the channel strips

Monitor and effects busses (AUX sends) source their signals via a control from one or more channels and sum these signals to a so-called bus. This bus signal is sent to an aux send connector (for monitoring applications: MON OUT) and then routed, for example, to an active monitor speaker or external effects device. In the latter case, the effects return can then be brought back into the console via the aux return connectors.

All monitor and effects busses are mono, are tapped into post EQ and offer amplification of up to +15 dB.

Pre-fader/post-fader

When using effects on a channel signal, it is usual to have the aux send post fader so that the balance between effect and dry signal stays constant even when the channel fader is altered. If this were not the case, the effects signal of the channel would remain audible even when the channel fader is turned all the way down. For monitoring, the aux sends are generally pre-fader, i.e. they operate independently of the position of the channel fader.

PRE

When the *PRE* switch is pressed down, the associated aux send is taken pre-fader.

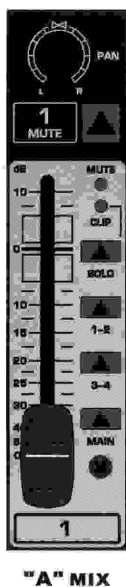
FX

The aux send marked *FX* offers a direct route to the built-in effects processor and is therefore post-fader and post-mute. Please refer to chapter 4 "DIGITAL EFFECTS PROCESSOR" for detailed information.

☞ If you are using the built-in effects processor, make sure that STEREO AUX RETURN 3 has nothing plugged into it ("A" MIX and "B" MIX), otherwise the internal effects return will be muted. This is not relevant if you use the FX OUT jack to drive an external effects device.

☞ "D" MIX and "C" MIX: On these consoles, the above note refers to the STEREO AUX RETURN 2 jacks as these models do not have a dedicated effect output.

2.1.4 Routing switch, PAN, SOLO and channel fader



"A" MIX

Fig. 2.4: The panorama and routing controls and the channel fader

PAN

The *PAN* control determines the position of the channel signal within the stereo image. When working with subgroups, you can use the *PAN* control to assign the signal to just one output, which gives you additional flexibility in recording situations. For example, when routing to subgroups 3 and 4, panning hard left will route the signal to group output 3 only, and panning hard right will route to group output 4 only.

MUTE

The *MUTE* switch breaks the signal path pre-channel fader, hence muting that channel in the main mix. The aux sends which are set to post-fader are likewise muted for that channel, while the pre-fader monitor paths remain active irrespective of whether the channel is muted or not.

MUTE LED

The *MUTE* LED indicates a muted channel.

CLIP-LED

The *CLIP*-LED lights up when the input signal is driven too high. If this happens, back off the *TRIM* control and, if necessary, check the setting of the channel EQ.

SOLO

The *SOLO* switch is used to route the channel signal to the solo bus (Solo In Place) or to the PFL bus (Pre Fader Listen). This enables you to listen to a channel signal without affecting the main output signal. The signal you hear is taken either before the pan control (PFL, mono) or after the pan and channel fader (Solo, stereo) (cf. chap. 2.3.10 "Level meters and monitoring").

SUB (1-2 and 3-4)

The *SUB* switch routes the signal to the corresponding subgroups. The "A" MIX has 4 subgroups (1-2 and 3-4).

MAIN

The *MAIN* switch routes the signal to the main mix bus.

The channel fader determines the channel's volume in the main mix (or submix).

2.2 Stereo channels

2.2.1 Channel inputs

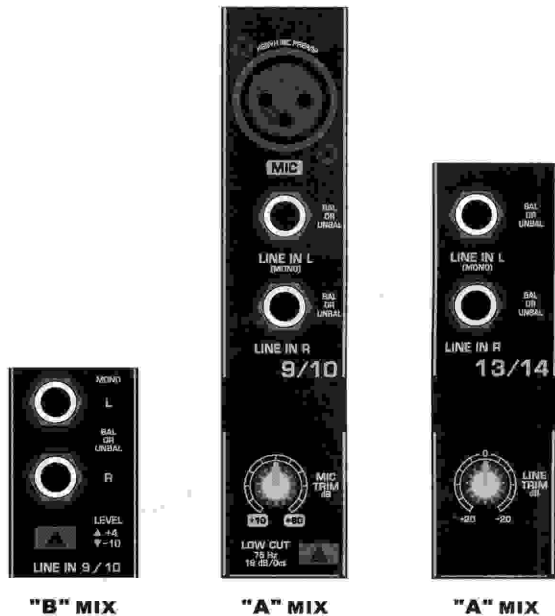


Fig. 2.5: The various stereo channel inputs

Each stereo channel has two balanced line level inputs on jacks for left and right channels. Channels 9/10 and 11/12 on the "A" MIX feature an additional XLR microphone jack with phantom power. If only the left jack (marked "L") is used, the channel operates in mono. The stereo channels are designed to handle typical line level signals, and, depending on model, have a level switch (+4 dBu or -10 dBV) and/or a line TRIM control. Both jack inputs will also accept unbalanced connectors.

LOW CUT and MIC TRIM

These two control elements operate on the XLR connectors of the "A" MIX, and are used to filter out frequencies below 75 Hz (LOW CUT) and to adjust microphone levels (MIC TRIM).

LINE TRIM

Use this control to adjust the line signal levels on channels 13-16 ("A" MIX only).

LEVEL

For level matching, the stereo inputs on the "D" MIX, "C" MIX and "B" MIX have a *LEVEL* switch to select between +4 dBu and -10 dBV. At -10 dBV (homerecording level), the input is more sensitive than at +4 dBu (studio level).

2.2.2 Equalizer stereo channels

The stereo channels contain a stereo EQ section. The cut-off frequencies of the high and low bands are 12 kHz and 80 Hz respectively, while the center frequencies of the high-mid and low-mid bands are 3 kHz and 500 Hz respectively. The HIGH and LOW controls have the same characteristics as the EQ in the mono channels. Both mid range bands are of the peak filter type. A stereo EQ is superior to two mono EQs on a stereo signal as two separate EQs will usually result in a discrepancy between left and right channels.

2.2.3 Aux sends stereo channels

In principle, the aux sends of the stereo channels function the same way as those of the mono channels. As the aux sends are mono, the send from a stereo channel is first summed to mono before it reaches the aux bus.

2.2.4 Routing switch, solo and channel fader



Fig. 2.6: Balance control and mute switch

BAL

The *BAL*(ANCE) control has a similar function to the PAN control in the mono channels.

The balance control determines the levels of the left and right input signals relative to each other before both signals are routed to the left/right main mix bus (or odd/even subgroup).

The remaining control elements in the stereo channels perform the same functions as their counterparts in the mono channels (MUTE switch, MUTE and CLIP LEDs, SOLO switch, SUB and MAIN switches and channel fader).

2.3 Interface panel and main section

Where it was useful to trace the signal flow from top to bottom in order to gain an understanding of the channel strips, we now look at the mixing console from left to right. The signals are, so to speak, collected from the same point on each of the channel strips and then routed to the main section all together.

2.3.1 MON control, aux sends 1, 2 and 3 (FX)

Turning up the AUX 1 control in a channel routes the signal to the aux send bus 1.

As the "C" MIX is equipped with an additional monitor path, its first aux control in the channel strips is named MON. The console also has a dedicated master fader (MON SEND) for this aux path.

AUX SEND 1, 2 and 4

The *AUX SEND 1* control governs the master send level of the mix created by the individual channel AUX 1 sends.

Likewise, the *AUX SEND 2* control is the master control for the aux 2 bus, and *AUX SEND 4* controls the AUX 4 bus.



"A" MIX

Fig. 2.7: The *AUX SEND* controls of the main section!

AUX SEND 3 (FX)

The *FX* control determines the signal level for effects processing, i.e. regulates the level to an external (or the internal) effects device.

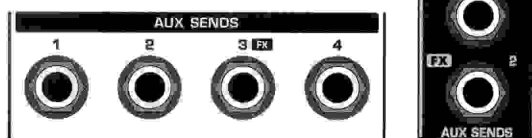
"D" MIX and "C" MIX: On these consoles, this function is performed by the *AUX SEND 2* control (FX).

SOLO

You can use the SOLO switch to separately monitor the aux sends via the CONTROL ROOM/PHONES outputs and check these with the level meters.

If you want to monitor the signal of just one AUX bus, none of the other SOLO SWITCHES should be pressed and the MODE switch should be in the SOLO position (not depressed).

2.3.2 Aux send jacks



"A" MIX

"C" MIX

Fig. 2.8: Aux send jacks

AUX SEND jacks

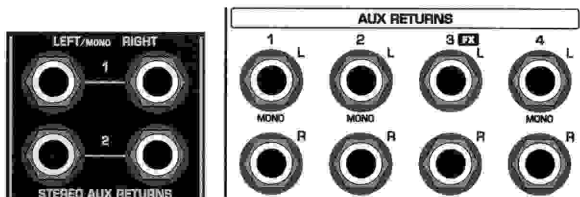
The *AUX SEND* jack should be used when hooking up a monitor power amp or active monitor speaker system. The relevant aux path should be set pre-fader.

As already mentioned, the aux sends in the channels—if set post-fader—can be used to connect to external effects devices.

AUX SEND (FX)

The *AUX SEND (FX)* jack carries the master aux mix (from the channel's FX controls). You can connect this to an external effects device to process the FX bus. The processed signal can then be brought from the effects device back into the STEREO AUX RETURN jacks.

2.3.3 Stereo aux return connectors



"C" MIX

"A" MIX

Fig. 2.9: The aux return connectors

On the 2222FX, 1832FX and 1622FX the STEREO AUX RETURN jacks are located on the front panel of the unit.

STEREO AUX RETURN

The *STEREO AUX RETURN 1* jacks generally serve as the return for the effects mix (created using the post-fader aux sends) by connecting the output of an external effects device. If only the left jack is connected, the AUX RETURN is automatically switched to mono.

You can also use these jacks as additional line inputs.

All stereo aux returns are balanced, but can of course also be used with unbalanced connectors. If you use an aux send for monitoring, the associated unused stereo aux returns are available for other line level signals (e.g. keyboards).

STEREO AUX RETURN FX

The *STEREO AUX RETURN FX* jacks accept the effects mix return (created using the channel FX sends). If these jacks are already in use as additional inputs, you can route the effects signal back into the console via a different channel. The advantage of this is that you can now use that channel's EQ on the effects return signal.

☞ In this instance, the FX control of the channel being used as an effects return should be turned fully counterclockwise, otherwise feedback problems could occur!

☞ If you wish to use the internal effects processor, do not plug any connectors into the STEREO AUX RETURN FX jacks, unless you want to tap the processed signal via the FX OUT ("B" MIX and "A" MIX only).

2.3.4 The monitor section of the 1832FX

One of the ways that the "C" MIX differs from the other models of this series is that it has a separate monitor output.



"C" MIX

Fig. 2.10: Monitor output of the "C" MIX

The first aux send (MON) on this console is used to set up the monitor mix from the channels and route it to the MON SEND fader.



"C" MIX

Fig. 2.11: Monitor fader of the "C" MIX

MUTE

Press the MUTE switch to mute the monitor send.

SOLO

The SOLO switch routes the monitor send to the solo bus (post-fader and post-mute) or to the PFL bus (pre-fader and pre-mute). The position of the MODE switch in the main section determines which of the buses is selected.

2.3.5 Stereo aux return control

STEREO AUX RETURN 1

The STEREO AUX RETURN 1 control determines the level of this signal in the main mix. If STEREO AUX RETURN 1 is used as effects return, this will determine the level of the effects when mixed with any "dry" channel signal.

☞ When used in this way, the effects device should be set at 100% effect.



"A" MIX

Fig. 2.12: Stereo aux return and stereo aux return (to aux send) controls

STEREO AUX RETURN 1/2 (TO AUX SEND)

The two right-hand STEREO AUX RETURN controls have a special function: they can be used to add an effect to a monitor mix. An example follows ("D" MIX wired to an effects device):

Monitor mix with effect

In this instance, your effects device should be set up as follows: the AUX SEND 2 jack should be connected to the L/Mono input of your effects device, with its outputs coming back into the STEREO AUX RETURN 1 jacks.

Connect the AUX SEND 1 jack output to the amplifier of your monitor system. The AUX SEND 1 master control determines the overall volume of the monitor mix.

Using the STEREO AUX RETURN (TO AUX SEND) control, the effect signal can now be blended into the monitor mix.

The following table shows which jacks on the console can be used for this purpose.

External effects device receives signal from	External effects device routes signal back to	The effect signal reaches the monitor mix via
"D" MIX		
AUX SEND 2	STEREO AUX RETURN 1 connectors	STEREO AUX RETURN 1 (TO AUX SEND 1) control
"C" MIX		
AUX SEND 1	STEREO AUX RETURN 2 connectors	MONITOR switch of the FX/AUX 2 RET
"B" MIX		
AUX SEND 2	STEREO AUX RETURN connectors 1 or 2	STEREO AUX RETURN 1 (TO AUX SEND 1) control
"A" MIX		
AUX SEND 2	STEREO AUX RETURN 1 connectors	STEREO AUX RETURN 1 (TO AUX SEND 1) control
optional:		
AUX SEND 1	STEREO AUX RETURN 2 connectors	STEREO AUX RETURN 2 (TO AUX SEND 2) control

Tab. 2.1: Connectors and controls for monitor mix with effect

STEREO AUX RETURN FX

On consoles "D" MIX and "C" MIX this is the STEREO AUX RETURN 2, on consoles "B" MIX and "A" MIX this is the STEREO AUX RETURN 3.

2.3.7 XPQ Surround function ("C" MIX only)

Use the STEREO AUX RETURN FX control to determine the level of the signal routed from the AUX RETURN FX jacks to the main mix. If nothing is connected to these jacks, the output of the built-in effects module will appear.

MAIN MIX / TO SUBS

This switch routes the signal fed in via the STEREO AUX RETURN FX jacks either to the main mix (not pressed) or to the submix (pressed).

On the "A" MIX you can select which subgroup the signal is assigned to (switches 1-2 / 3-4, to the right of MAIN MIX / TO SUBS).

SOLO RETURNS

Additionally, this model allows you to route the aux returns together to the solo bus and the PFL bus. The LED lights up when Solo is on.

STEREO AUX RETURN 4 ("A" MIX only)

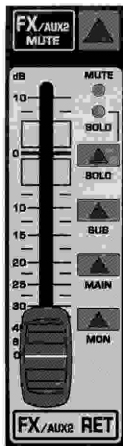
This control behaves the same way as the other stereo aux returns. Additionally, it provides for a simple monitor path using the switch PHONES/CTRL ROOM ONLY.

PHONES/CTRL ROOM ONLY

Use this switch to route the signal appearing at the AUX RETURN 4 jacks to the control room and headphones outputs.

2.3.6 Supplement to "C" MIX

The "C" MIX has a stereo fader for the AUX RETURN FX and offers a variety of routing options: MUTE disables the effect return (but not PFL of course!), SOLO routes it to the Solo or PFL busses, SUB to the subgroups and MAIN to the main mix.



"C" MIX

Fig. 2.13: The FX/AUX 2 return fader of the "C" MIX

MON

The MON switch routes the signals appearing at the AUX RETURN 2 jacks to the monitor path, along with the monitor signals from the channels.

If you wish to route the effect signal to the monitor mix, you can also switch aux 1 to pre-fader, drive the effect device from the aux 1 output and return the effect signal via AUX RETURN 2 to the monitor signal.



"C" MIX

Fig. 2.14: Control elements of the surround function



The XPQ surround function can be enabled/disabled with the XPQ TO MAIN switch. This is a built-in effect that widens the stereo width, thus making the sound more lively and transparent. Use the SURROUND control to determine the intensity of this effect.

VOICE CANCELLER



Here, you have a filter circuitry that lets you almost entirely remove the vocal portion of a recording. The filter is constructed in such a way that voice frequencies are targeted without majorly affecting the rest of the signal. Additionally, the filter seizes only the middle of the stereo image, exactly there where the vocals are typically located.

Connect the signal sources you wish to process using the Voice Cancellor to the CD/TAPE INPUT connectors. The Voice Cancellor circuitry is not available for other inputs.

Possible applications for the Voice Cancellor are obvious: you can very simply stage background music for Karaoke events. Of course, you can also do this at home or at your rehearsal room before you hit the stage. Singers with their own band can practice singing difficult parts using a complete playback from a tape player or a CD, thus minimizing rehearsal time.

2.3.8 CD/Tape input, CD/tape output



"A" MIX

Fig. 2.15: 2-track connectors and lamp socket

CD/TAPE INPUT

The CD/TAPE INPUT jacks (RCA) are designed to accept a 2-track recorder (e.g. DAT recorder), or they can be used as stereo line input. If you connect the output of a hi-fi amplifier (with a source selection switch) to the CD/TAPE INPUT, you can easily listen to additional sources (e.g. cassette recorder, MD player, sound card, etc.).

Using the voice canceller function ("C" MIX only), you can process all signals being brought into your mixing console via these connectors.

CD/TAPE OUTPUT

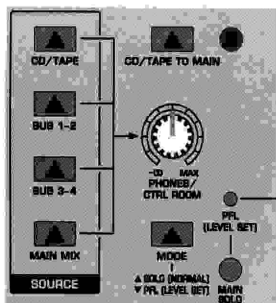
These connectors are wired in parallel to the MAIN OUT and carry the main mix signal (unbalanced). Connect this to the inputs of your recording device. The final output level can be adjusted

⚠ If you connect a compressor or a noise gate post 2-track output, the main mix fader will probably not be able to create a satisfactory fade-out effect.

2.3.9 Lamp socket ("A" MIX only)

Use this BNC socket to connect a gooseneck lamp (12 V DC, max. 0.5 A).

2.3.10 Level meter and monitoring



"A" MIX

Fig. 2.16: Control room and phones sections of the "A" MIX

CD/TAPE

The **CD/TAPE** switch routes the signal from the CD/TAPE INPUT jacks to the level meter, the CONTROL ROOM OUT outputs and the PHONES jack—this is a simple way to check recorded signals via monitor speakers or headphones.

SUB 1-2 or SUB

The **SUB 1-2** switch routes subgroup 1-2 to the level meter, CONTROL ROOM OUT and phones.

SUB 3-4

The **SUB 3-4** switch performs a similar function for subgroup 3-4 ("A" MIX only).

MAIN MIX

The **MAIN MIX** switch sends the main mix to the CONTROL ROOM OUT and the PHONES output as well as to the level meter.

PHONES/CTRL ROOM

Use this control to adjust the control room output level and the headphones volume.

CD/TAPE TO MAIN

When the **CD/TAPE TO MAIN** switch is depressed, the 2-track input is routed to the main mix and thus serves as an additional input for tape machines. You can also connect MIDI instruments or other signals here that do not require any further processing. At the same time, this switch disables the main mix to tape output link.

POWER

The blue **POWER** LED indicates that the device is switched on.

+48 V

The red "+48 V" LED lights up when phantom power is switched on. Phantom power is required to operate condenser microphones.

⚠ While phantom power is switched on, do not connect or disconnect microphones on the mixer (or the stagebox/wallbox). Connect any microphones before switching on phantom power. Additionally, monitor/PA speakers should be muted before you activate the phantom power supply. After switching on, wait approx. one minute before adjusting the input gain so that the system has time to stabilize.

LEVEL METER

The high-precision level meters always give you an accurate display of signal level.

LEVEL SETTING:

When recording to digital recorders, the recorder's meter should not go into overload. This is because, unlike analog recordings, it takes only slightly excessive levels to create unpleasant digital distortion.

When recording to analog, the VU meters of the recording machine should reach approx. +3 dB with low-frequency signals (e.g. kick drum). Due to their inertia, VU meters tend to display too low a signal level at frequencies above 1 kHz. You should only drive instruments such as a Hi-Hat as far as -10 dB. Snare drums should be driven to approx. 0 dB.

⚠ The peak meters of your XENYX display level almost independent of frequency. A recording level of 0 dB is recommended for all types of signal.

MODE

The **MODE** switch determines whether the channels' **SOLO** switch operates as PFL (Pre Fader Listen) or as solo (Solo In Place).

PFL (LEVEL SET)

To activate the PFL function, press the **MODE** switch. The PFL function should, as a rule, be used for level setting (TRIM). The signal is sourced pre-fader and assigned to the mono PFL bus. In "PFL" mode, only the left side of the peak meter is in operation. A PFL'd channel should be driven to the 0 dB mark of the VU meter.

SOLO (NORMAL)

When the **MODE** switch is not depressed, the stereo solo bus is active. Solo is actually short for "Solo In Place". This is the customary method for listening to an individual signal or to a group of signals. As soon as a solo switch is pressed, all channels not solo selected are muted in the monitor path (control room and phones). A channel's position in the stereo image is maintained. The solo bus carries the output signals of the channel pan controls, the aux sends and the stereo line inputs. On the "A" MIX all aux returns, and on the "C" MIX only aux return 2 can be routed to the solo bus. The solo bus is, as a rule, taken post-fader.

⚠ The **PAN** control in the channel strip offers a constant power characteristic. This means that the signal is always at a constant level, irrespective of position in the stereo panorama. If the **PAN** control is moved fully left or right, the level in that channel increases by 4 dB. This ensures that, when set at the center of the stereo image, the audio signal does not appear louder. For this reason, with the solo function activated (Solo In Place), audio signals from channels with **PAN** controls that have not been moved fully left or right are displayed at a lower volume than in the PFL function.

As a rule, solo signals are monitored via the control room outputs and headphones jack and are displayed by the level meters. If a solo switch is pressed, the signals from the tape input, the subgroups and the main mix are cut from these outputs and the level meter.

MAIN SOLO

The **MAIN SOLO** LED lights up as soon as a channel or aux send solo switch is pressed. The **MODE** switch must be set to "Solo".

PFL (LEVEL SET)

The **PFL (LEVEL SET)** LED indicates that the peak meter is set to PFL mode.



Fig. 2.17: PHONES jack

PHONES jack

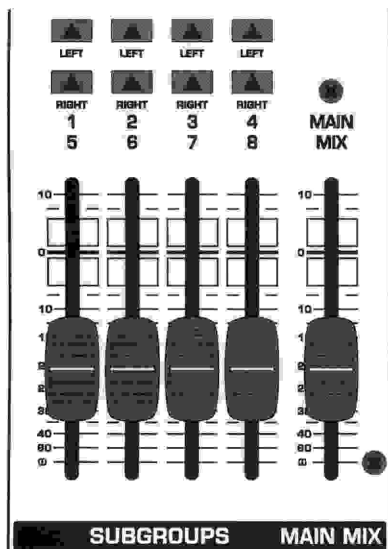
You can connect headphones to this 1/4" stereo jack ("A" MIX: 2 phones jacks). The signal routed to the PHONES connection is the same as that routed to the control room output.

2.3.11 Subgroups and main mix fader

You use the high-precision quality faders to control the output level of the subgroups and the main mix.

LEFT/RIGHT switch

The switches located above the subgroup faders assign the subgroup signal either to the left or right side of the main bus. Similarly, it can be routed to both sides or none at all. In the latter case, the submix is present only at the corresponding subgroup outputs.



"A" MIX

Fig. 2.18: Subgroup and main mix faders

3. GRAPHIC 9-BAND EQUALIZER ("C" MIX only)

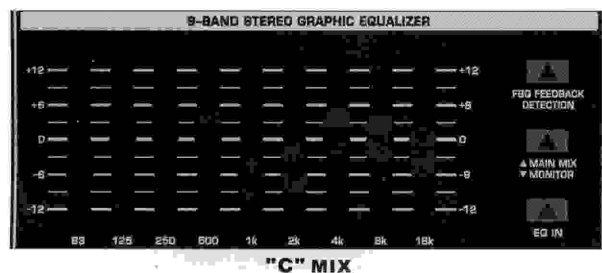


Fig. 3.1: The graphic stereo equalizer of the "A" MIX

The graphic stereo equalizer allows you to tailor the sound to the room acoustics.

EQUALIZER

Use this switch to activate the graphic equalizer.

MAIN MIX/MONITOR

This toggles the graphic equalizer between the main mix and the monitor mix. With the switch up (not depressed), the equalizer is active in stereo on the main mix, and inactive on the monitor mix.

When the switch is depressed the equalizer is active in mono on the monitor mix, and inactive on the main mix.

FBQ FEEDBACK DETECTION



The switch turns on the FBQ Feedback Detection System. It uses the LEDs in the frequency band faders to indicate the critical frequencies. On a per-need basis, lower the frequency range in question somewhat in order to avoid feedback.

The graphic stereo equalizer has to be turned on in order to use this function.

Logically, at least one (ideally several) microphone channels have to be open for feedback to occur at all

Feedback is particularly common when stage monitors ("wedges") are concerned, because monitors project sound in the direction of microphones. Therefore, you can also use the FBQ Feedback Detection for monitors by placing the equalizer in the monitor bus (see MAIN MIX/MONITOR).

4. DIGITAL EFFECTS PROCESSOR

24-BIT MULTI-EFFECTS PROCESSOR



Here you can find a list of all presets stored in the multi-effects processor. This built-in effects module produces high-grade standard effects such as reverb, chorus, flanger, delay and various combination effects. Use the Aux Send FX on the channels and the Aux Send FX master control to determine the input signal of the effects processor.

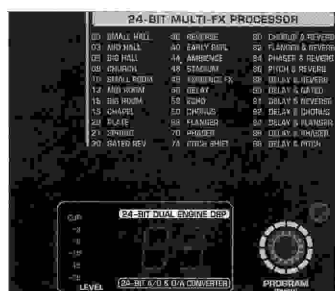


Fig. 4.1: Digital effects module

The built-in stereo effects processor has the advantage that it does not need to be wired up. This excludes the danger of humming or level mismatch right from the start and thus considerably facilitates use.

These effect presets are classical "mixing effects". If you move the STEREO AUX RETURN FX control, you mix the channel signal (dry) and the effect signal. You can control the balance between the two signals with the channel fader and the STEREO AUX RETURN FX control.

FX OUT

Mixing consoles "B" MIX and "A" MIX have a separate output for the effects device, which is unbalanced and stereo (tip = left signal; ring = right signal; sleeve = ground/shielding). Thus, you can record, for example, a vocal track enhanced with reverb in parallel to a "dry" vocal track; when doing the mix-down later on, you can freely determine the amount of reverb added.

The "A" MIX has the effect output on the rear, "B" MIX has it located next to the aux sends on the front panel.

LEVEL

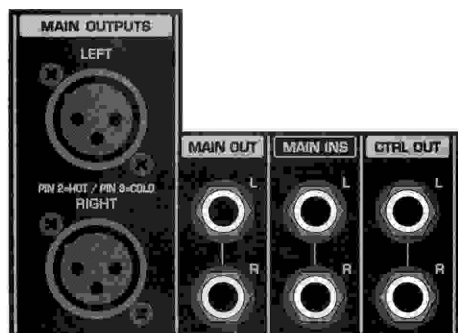
The LED level meter on the effects module should display a sufficiently high level. Take care to ensure that the clip LED only lights up at peak levels. If it is lit constantly, you are overloading the effects processor and this could cause unpleasant distortion.

PROGRAM

You can select the effect preset by turning the *PROGRAM* control. The display flashes with the number of the current preset. To recall the selected preset, press on the button; the flashing stops.

5. REAR PANEL CONNECTORS

5.1 Main mix outputs, insert points and control room outputs



"A" MIX

Fig. 5.1: Main Mix outputs, main mix insert points and control room outputs

MAIN OUTPUTS

The *MAIN* outputs carry the *MAIN MIX* signal and are unbalanced XLR jacks with a nominal level of +4 dBu. In parallel with this, 1/4" phone jacks carry the main mix signal in a balanced format ("D" MIX: here, the phone jack outputs are unbalanced and located on the front panel).

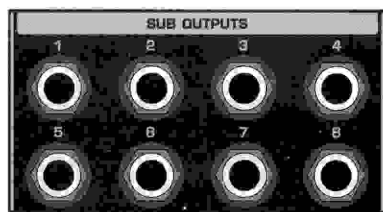
CONTROL ROOM OUTPUTS (CTRL OUT)

The control room output is normally connected to the monitoring system in the control room and carries the stereo mix or, when selected, the solo signals.

MAIN INS(ERTS) ("A" MIX only)

These are the insert points for the main mix. In the signal path, they are post-main mix amp, but pre-main fader(s). Use them to insert, for example, a dynamics processor or graphic equalizer. Please also note the information on insert points in chapter 5.3.

5.2 Subgroup outputs



"C" MIX

Fig. 5.2: Subgroup outputs

SUB OUTPUTS

The subgroup outputs are unbalanced and provide the mix of those channels assigned to each subgroup with the *SUB* switch ("A" MIX: switches 1-2 or 3-4) next to the channel faders. Thus, you can, for example, route a subgroup to a second console or use the output as a recording output in parallel to the main outputs. In this way, you can record several tracks simultaneously. With an 8-track recorder, use Y cables and wire the inputs of your

machine so that you have 2 x 4 tracks available (e.g. channel 1 to track 1 and 2, etc.). In the first pass, you can record the tracks 1, 3, 5 and 7, in the second the tracks 2, 4, 6 and 8.

The "A" MIX already has subgroup outputs wired in parallel (1-5, 2-6, etc.).

5.3 Inserts



"D" MIX

Fig. 5.3: Insert points

On the "A" MIX the channel insert points are located on the control panel between the line input and the *TRIM* control.

Insert points are very useful to process channel signals with dynamic processors or equalizers. Unlike reverb or other effects devices, whose signals are usually added to the dry signal, dynamic processors are most effective on the complete signal. In this case, aux send paths are a less-than-perfect solution. It is better to interrupt the signal path and insert a dynamic processor and/or equalizer. After processing, the signal is routed back to the console at precisely the same point it left. However, the channel signal path is interrupted only if a plug is inserted into the corresponding jack (stereo phone plug: tip = signal output; ring = return input). All mono input channels are equipped with inserts. They are pre-fader, pre-EQ and pre-aux send. Inserts can also be used as pre-EQ direct outputs, without interrupting the signal path. To this end, you will need a cable fitted with mono phone plugs on the tape machine or effect device end, and a bridged stereo phone plug on the console side (tip and ring connected).

5.4 Direct outputs ("A" MIX only)



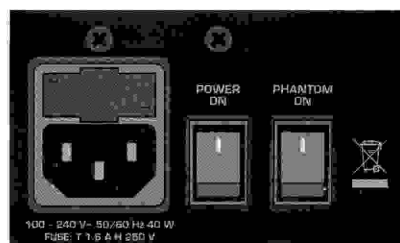
"A" MIX

Fig. 5.4: Direct outputs

DIRECT OUTPUTS

The direct outputs of the "A" MIX (1 each per mono input channel) are ideal for recording if several tracks are to be recorded simultaneously. These unbalanced phone jacks are post-EQ, post-mute and post-fader.

5.5 Voltage supply, phantom power supply and fuse



Alle Modelle

Fig. 5.5: Voltage supply and fuse

FUSE HOLDER/IEC MAINS RECEPTACLE

The console is connected to the mains via the cable supplied,

which meets the required safety standards. Blown fuses must only be replaced by fuses of the same type and rating. The mains connection is made via a cable with IEC mains connector. An appropriate mains cable is supplied with the equipment.

POWER switch

Use the *POWER* switch to turn on the mixing console. The *POWER* switch should always be in the "Off" position when you are about to connect your unit to the mains.

To disconnect the unit from the mains, pull out the main cord plug. When installing the product, ensure that the plug is easily accessible. If mounting in a rack, ensure that the mains can be easily disconnected by a plug pull or by an all-pole disconnect switch on or near the rack.

Attention: The *POWER* switch does not fully disconnect the unit from the mains. Unplug the power cord completely when the unit is not used for prolonged periods of time.

PHANTOM switch

The *PHANTOM* switch activates the phantom power (necessary to operate condenser microphones) on the XLR sockets of the mono channels. The red +48 V LED illuminates when phantom power is on. As a rule, dynamic microphones can still be used with phantom power, provided that they are wired in a balanced configuration. In case of doubt, contact the microphone manufacturer!

Connect microphones before you switch on the phantom power supply. Please do not connect microphones to the mixer (or the stagebox/wallbox) while the phantom power supply is switched on. In addition, the monitor/PA loudspeakers should be muted before you activate the phantom power supply. After switching on, wait approx. one minute to allow for system stabilization.

6. INSTALLATION

6.1 Rack mounting

The packaging of your mixing console contains two 19" rack mounts for installation on the side panels of the console.

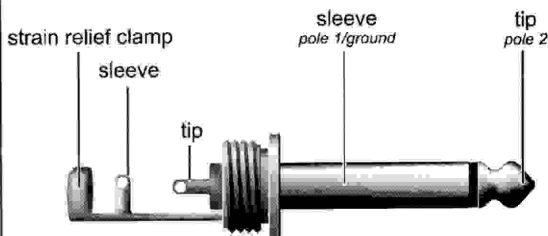
Before you can attach the rack mounts to the mixing console, you need to remove the screws holding the left and right side panels. Then, use these screws to fasten the two rack mounts, each specifically to one side. With the rack mounts installed, you can mount the mixing console in a commercially available 19" rack. Be sure to allow for proper air flow around the unit, and do not place the mixing console close to radiators or power amps, so as to avoid overheating.

Only use the screws holding the mixing console side panels to fasten the 19" rack mounts.

6.2 Cable connections

You will need a large number of cables for the various connections of the console. The illustrations below show the wiring of these cables. Be sure to use only high-grade cables.

1/4" TS footswitch connector



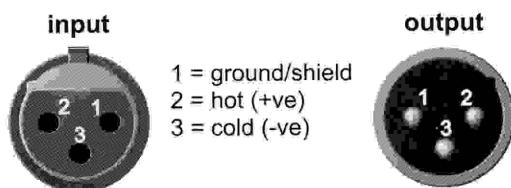
The footswitch connects both poles momentarily

6.2.1 Audio connections

Please use commercial RCA cables to wire the 2-track inputs and outputs.

You can, of course, also connect unbalanced devices to the balanced input/outputs. Use either mono plugs, or use stereo plugs to link the ring and shaft (or pins 1 & 3 in the case of XLR connectors).

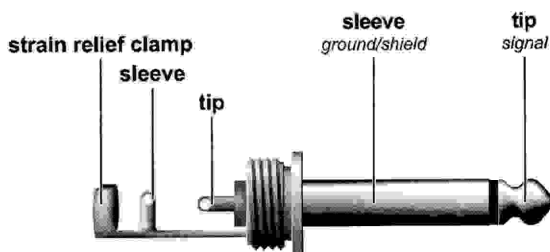
Balanced XLR connectors



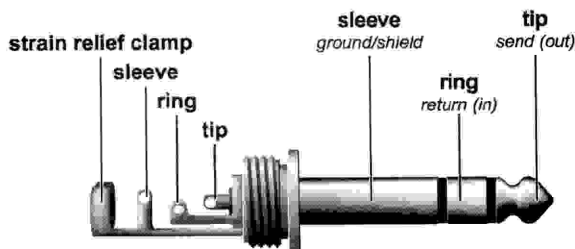
For unbalanced use pin 1 and pin 3 have to be bridged

Caution! You must never use unbalanced XLR connectors (PIN 1 and 3 connected) at the MIC input jacks if you want to use the phantom power supply.

Unbalanced 1/4" TS connector



Insert send return 1/4" TRS connector



Connect the insert send with the input and the insert return with the output of the effects device.

7. SPECIFICATIONS

Microphone inputs (Mic Preamp)

Type	XLR, electronically balanced, discrete input circuit
Mic E.I.N. (20 Hz - 20 kHz)	
@ 0 Ω source resistance	-134 dB / 135.7 dB A-weighted
@ 50 Ω source resistance	-131 dB / 133.3 dB A-weighted
@ 150 Ω source resistance	-129 dB / 130.5 dB A-weighted

Frequency response	<10 Hz - 150 kHz (-1 dB), <10 Hz - 200 kHz (-3 dB)
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Gain range	+10 to +60 dB
Max. input level	+12 dBu @ +10 dB Gain
Impedance	approx. 2.6 k Ω balanced
Signal-to-noise ratio	110 dB / 112 dB A-weighted (0 dBu In @ +22 dB gain)

Distortion (THD+N)	0.005% / 0.004% A-weighted
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Line input

Type	1/4" TRS connector electronically balanced
Impedance	approx. 20 k Ω balanced 10 k Ω unbalanced
Gain range	-10 to +40 dB
Max. input level	30 dBu

Fade-out attenuation¹ (Crosstalk attenuation)

Main fader closed	90 dB
Channel muted	89 dB
Channel fader closed	89 dB

Frequency response

Microphone input to main out	
<10 Hz - 90 kHz	+0 dB / -1 dB
<10 Hz - 160 kHz	+0 dB / -3 dB

Stereo inputs

Type	1/4" TRS connector, electronically balanced
Impedance	approx. 20 k Ω
Max. input level	+22 dBu

EQ mono channels

Low	80 Hz / ± 15 dB
Mid	100 Hz - 8 kHz / ± 15 dB
High	12 kHz / ± 15 dB

EQ stereo channels

Low	80 Hz / ± 15 dB
Low Mid	500 Hz / ± 15 dB
High Mid	3 kHz / ± 15 dB
High	12 kHz / ± 15 dB

Aux sends

Type	1/4" TS connector, unbalanced
Impedance	approx. 120 Ω
Max. output level	+22 dBu

Stereo aux returns

Type	1/4" TRS connector, electronically balanced
Impedance	approx. 20 k Ω bal. / 10 k Ω unbal.
Max. input level	+22 dBu

Main outputs

Type	XLR, electronically balanced and 1/4" TRS balanced
"D" MIX only:	1/4" TS connector unbalanced
Impedance	approx. 240 Ω symm. / 120 Ω unbalanced
Max. output level	+28 dBu +22 dBu ("D" MIX)

Control room outputs

Type	1/4" TS connector unbalanced
Impedance	approx. 120 Ω
Max. output level	+22 dBu

Headphones outputs

Type	1/4" TRS connector, unbalanced
Max. output level	+19 dBu / 150 Ω (+25 dBm)

DSP

Converter	24-bit Sigma-Delta, 64/128-times oversampling
Sampling rate	40 kHz

Main mix system data²

Noise	
Main mix @ - ∞	
Channel fader @ - ∞	-101 dB
Main mix @ 0 dB,	
Channel fader @ - ∞	-93 dB -96 dB ("D" MIX) -87 dB ("A" MIX)
Main mix @ 0 dB,	
Channel fader @ 0 dB	-81 dB -83 dB ("D" MIX) -80 dB ("A" MIX)

Power supply

Mains voltage	100 to 240 V~, 50/60 Hz
Power consumption	40 W

Fuse

Mains connection	Standard IEC receptacle
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