

3A

THE INPUTS AND OUTPUTS

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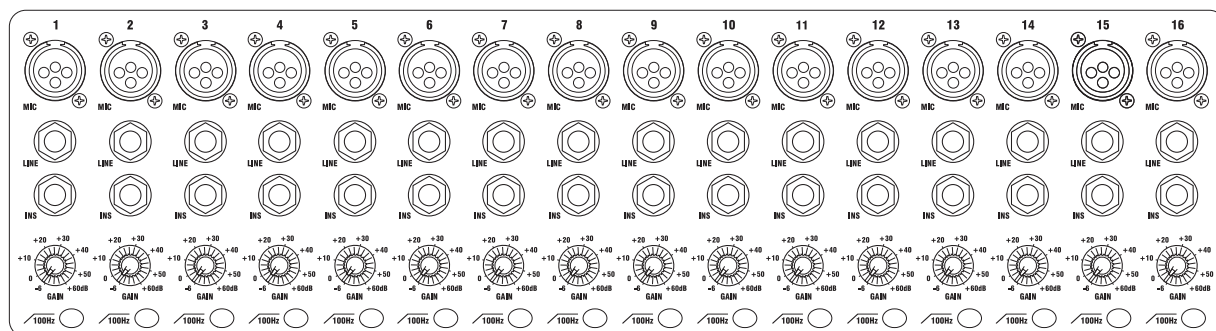
Part 1

The Front Panel Inputs and Outputs

Analogue Inputs 1-16

The analogue input section of the 328XD comprises 16 microphone and line inputs, each with dedicated insert point, analogue gain control and high pass filter (HPF)

After the analogue signal has passed through the high pass filter stage, the analogue - digital conversion takes place. From here on the signal remains in the digital domain until converted back into the analogue domain at one of the analogue outputs.



MIC INPUT

The microphone input accepts XLR type connectors and is designed to accept a wide range of balanced or unbalanced signals up to +28dBu (66dB of Gain range). For optimum performance use a professional condenser, dynamic or ribbon microphone with a correctly balanced cable. The 48V Phantom Power switch can be used to power condenser microphones or direct injection (DI) boxes if required.

LINE INPUT

The Line Input is balanced and accepts 3 pole ¼" (TRS) jack plugs.

Use this input for keyboards, drum machines, synthesisers, samplers or guitars.

Although the Line input is balanced, it will also accept unbalanced sources as well.

For cable connection diagrams, see **Appendix E**.

INSERT POINT

The insert point is unbalanced and is derived pre-fade, pre-EQ and pre-dynamics. It allows for the connection of analogue outboard equipment such as compressors, gates or equalisers for additional signal processing. For the correct method of making up insert cables for use with the 328XD please consult **Appendix E** of this User Guide.

GAIN (PRE-AMP SENSITIVITY)

This knob sets the input level of the source signal, offering adjustable GAIN between -6dBu and +60dBu. The GAIN pot should be used to get as much signal into the 328XD without clipping (distorting) the signal. Setting the GAIN pot to '0' will give unity gain for use with Line level signal sources. Because the GAIN control is analogue, its position is not stored within a Snapshot or User Setup.

100HZ HIGH PASS FILTER (HPF)

Pressing this button activates an analogue 100Hz high pass filter (HPF) which has a steep 18dB per octave bass roll off characteristic. When selected the HPF will reduce frequencies below 100Hz, and is very useful for reducing rumble on stage or popping on microphones. As the HPF is within the analogue domain, it is not stored within Snapshot or User Setup.

BARGRAPH METERS

Each input stage has a tri-colour, 10 segment, peak reading bargraph meter. These meters can be switched globally using either one of the 3 BANK SELECT switches or the DYNAMICS ON METERBANK switch to represent any of the following signals:

- Analogue inputs 1-16 (pre-fade, post-EQ, post-dynamics) by pressing the BANK SELECT 1-16 switch
- Digital inputs 17-32 (pre-fade, post-EQ, post-dynamics) by pressing the BANK SELECT 17-32 switch



DO NOT plug balanced or unbalanced microphones into the XLR MIC inputs when the 48V phantom power is active. To avoid damage to the console or to external devices DO NOT switch the 48V Phantom Power switch on or off unless the faders for analogue inputs 1-16 are DOWN. Microphones that do not require phantom power may be used with the phantom power switched on ONLY if correctly balanced cables are used. Always ensure that the microphone is connected before switching on the phantom power.



The GAIN control has a wide sensitivity range to cope with both microphone and line inputs. With either a mic or line input connected start with the GAIN control turned fully anti-clockwise (6dBu) and adjust the level until the red '0' LED on the Input meter lights up occasionally during the loudest sections of the music. NB - If you are unfamiliar with how to set the input level on a mixing console, read through Section 2 'Getting Started Out Of The Box' in this manual for an explanation.

- Group Out 1-8, Aux Send 1-4 and FX Send 1 & 2 (post-fade, post-dynamics) by pressing the BANK SELECT MASTERS switch
- Gain reduction levels of the internal compressors, by pressing the DYNAMICS ON METERBANK switch. When in this mode, the BANK SELECT switches continue to operate.

REC/GATE LED (RECORD ARM/NOISE GATE LED)

The red 'REC' LED is used in conjunction with recording devices that support MIDI MACHINE CONTROL (MMC). External recording devices can be put into record from the front panel of the 328. The current status of the recording devices tracks (1-16) can be monitored using these LEDs as follows:

- When the REC/GATE LED is OFF the connected tape machine track is not in record mode
- When the LED is FLASHING the connected tape machine track is in record ready
- When the LED is ON the connected tape machine track is in record mode

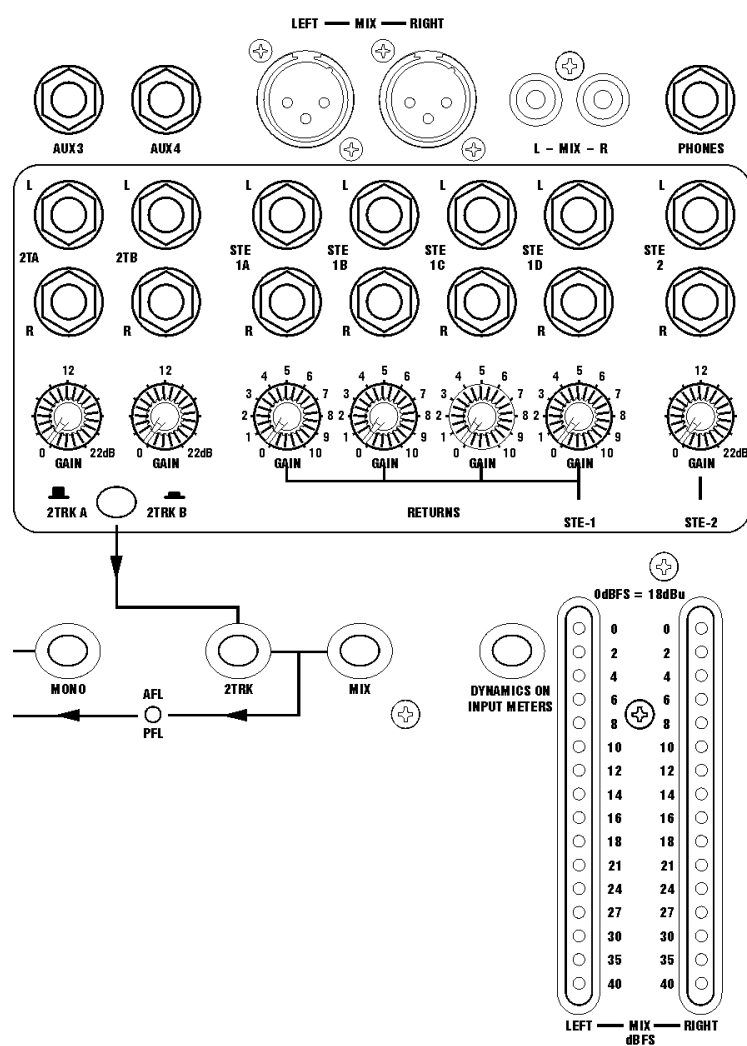
(See '**Section 3C - The SELECT Panel**' for more information)

When the DYNAMICS ON METERS switch is active, the REC/GATE LEDs indicate the open/closed state of the internal noise gates. In its 'on' state the LED indicates that the noise gate is closed, and in its 'off' state the LED indicates that the noise gate is open. For more information, see **Section 3B Part 3 - The E-Strip as a Dynamics Processor**.

Monitor Section

The Monitor section of the 328XD supplies the outputs to which the studio monitor speakers, headphones and analogue mix down machines should be connected.

Using the switches in the monitor path, you can also select the source signal you wish to monitor from the CRM and phones outputs.



2TRK

Press the 2TRK switch to feed the selected 2 track input - either analogue A or B or digital 2-Track (see **Section 3 Part 5.9** and **Section 3 Part 5.10**) to the CRM and PHONES outputs, overriding the Mix bus. The 2-Track input is the ideal input to connect your mastering device, such as a DAT machine or CD recorder, allowing you to separate the monitoring paths.

MIX

Press MIX to feed the MIX L/R signal to the CRM and PHONES outputs. This is the default state of the console. When the console is switched on, regardless of the power-down state, the MIX bus will automatically be set as the active monitor path.

AFL/PFL LED

Whenever a SOLO button is active, the AFL/PFL LED illuminates to warn that the CRM and PHONES outputs will be carrying the AFL or PFL signal instead of the normal source. To clear all SOLOed channels, press the CLEAR button in the SOLO CONTROL panel. When the console is in SIP (solo in place) mode its default state, the AFL/PFL LED will not light.

MONO

Pressing MONO sums the left and right outputs of both the CRM and PHONES outputs. This is extremely useful for checking the mono compatibility of your mixes or for phase checking etc.

DIM

Pressing this button dims the CRM and PHONES outputs by 30dB.

CRM CUT

When this button is pressed the control room output is muted. The PHONES output is unaffected.

PHONES

This control adjusts the level sent to the stereo PHONES output.

CRM

This control adjusts the level sent to the CRM (control room) output.

48V (PHANTOM POWER)

When this button is pressed, 48V phantom power is provided to the microphone input, for powering professional condenser microphones or Direct Injection (DI) boxes. The 48V LED will illuminate to indicate that phantom power is on.

NOTE: To prevent damage to the mixer or external devices, do not connect microphones to the microphone inputs with the 48V power switched on, and only switch the 48V power on or off when the output faders are DOWN! Microphones that do not require phantom power may be used with phantom power switched on if correctly balanced cables are used. Ensure that the microphone is connected before switching on the phantom power.

PSU INDICATORS

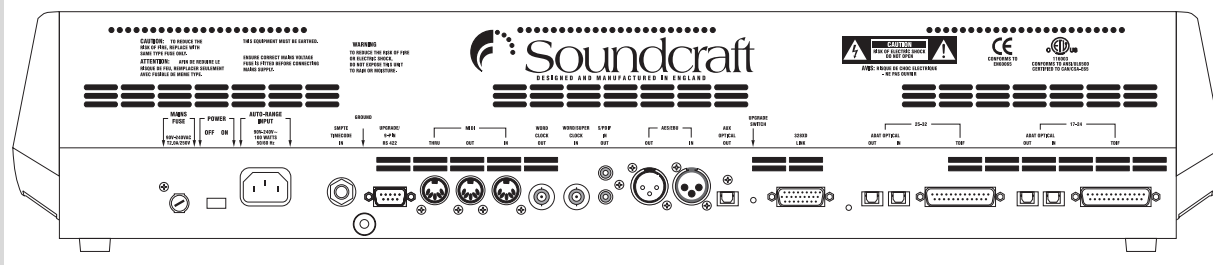
There are three green LEDs to monitor the status of the +/- 15V, 5V analogue and 5V digital power supplies. Under normal operating circumstances all three LEDs will be illuminated.

BARGRAPH METERS

Two 16 segment peak reading bargraph meters show the level of the selected monitor path - the output signal present at the CRM and Phones outputs. Under normal operation the reading will be of the mono or stereo Mix L/R bus, but when activated, the SOLO bus or 2TRK level will be displayed, overriding the Mix bus.

Part 2

The Rear Panel Inputs and Outputs



DIGITAL INPUTS 17-32

The 328XD offers two 8 channel bi-directional digital I/O interfaces for connecting the console to external recording devices or Soundcraft expansion units. Both Tascam TDIF and ADAT optical digital I/O formats are supported. Only the input channels of either the ADAT or TDIF input for each port may be active at any one time (see **Section 3J - Part 5.8 Tape Port Select** for setup information). The 8 channel outputs of both TDIF and ADAT outputs are continually and simultaneously active for both ports, however. Signals connected to either the Tascam TDIF or ADAT optical ports will be controlled by the faders of BANK SELECT 17-32.

- **TDIF (Tascam Digital Interface)**

Connect machines or computer audio cards fitted with an 8 channel Tascam TDIF port to either of the TDIF ports on the rear of the 328XD. A Tascam specification TDIF cable is required. The cable is bi-directional and therefore carries the signals of the 8 input and 8 output channels to and from the 328XD TDIF ports.

- **ADAT Optical (Alesis Digital Audio Technology)**

Connect machines or computer audio cards fitted with 8 channel ADAT optical input and output ports to either of the ADAT ports on the rear of the 328XD. For bidirectional transmission, an ADAT optical cable must be connected from the ADAT output of the external device to the 328XD ADAT input and an ADAT optical cable must also be connected from the ADAT output of the 328XD to the ADAT input of the external device.

The input signals present at TDIF or ADAT port 1 are controlled by the faders and related virtual channel strips of 328XD channels 17-24 and similarly the input signals present at TDIF or ADAT port 2 are controlled by the faders and related virtual channel strips of 328XD channels 25-32.

NOTE: The wordclock of devices connected to the 328XD TDIF or ADAT inputs must be correctly synchronized with the wordclock of the 328XD. This must be done in one of 3 ways: 1) by synchronizing the external device to its TDIF or ADAT input derived from the 328XD internal clock; 2) by synchronizing the 328XD clock to the ADAT output or to a wordclock, Digidesign Superclock or AES/EBU output of the external device; 3) by synchronizing both the 328XD and the external device to another master clock. For more information consult **Section 3J Part 5** and the Soundcraft Guide to Digital Mixing.

328XD LINK

The 328XD LINK port allows you to cascade two 328XDs together by using the Spirit Digital 328 or Soundcraft 328XD Link cable available from Soundcraft. All Group and Mix bussing is summed together but FX-1/FX-2 sends remain separate to each console.

Note that the 328XD cannot be linked to the earlier Spirit by Soundcraft Digital 328 console.

See **Section 5** on linked consoles for more information.

SOFTWARE DOWNLOAD SWITCH

This recessed switch should be accessed using a small, non-metallic implement, and is used during the process of updating 328XD software, as and when a new operating system becomes available. For more information see **Section 6 - Upgrading 328XD Software**.

AUX OPTICAL OUT

The Auxiliary Optical Output may be configured to be a stereo optical S/PDIF signal to mix down to MiniDisc, for example, or a third 8 channel ADAT Optical output. When set to optical S/PDIF, the signal present at the coaxial S/PDIF output is duplicated. When used as an ADAT output, the AUX OPTICAL OUT may be configured to transmit either the 8 Group outputs or a fixed combination of the Mix bus, and Aux 1-4 and FX-1 & 2 Master Sends.

(See **Section 3J - Part 5.8 'Tape Port Select'** for set up information)

AES/EBU IN AND OUT

• AES/EBU IN

Stereo AES/EBU signals from external devices such as DAT, CD or MiniDisc players should be connected here. The destination of this input can be routed via the MENU to any of the following:

- STE 1
- STE 2
- FX Return 1
- FX Return 2
- 2TRK

When one of these destinations is selected, the AES/EBU input signal will override the usual signal present at that input.

See **Section 3 - Part 5.10 AES/EBU Input Setup** for setup information.

Note that the internal clocks of the 328XD and external AES/EBU devices must be correctly synchronized in order for the connection to be made. This can be done either by setting the console to act as a wordclock client device, synchronizing to the clock present at the AES/EBU or wordclock connection (if present) or by synchronizing the external AES/EBU device to the clock present in the 328XD AES/EBU output stream. See **Section 3J - Part 5.14 Clock Source Select** for setup information.

- **AES/EBU OUT**

The stereo AES/EBU output can be selected via the MENU to derive its signal from any of the following sources:

- MIX output
- AUX send 1 and 2
- AUX send 3 and 4
- Internal FX send 1 and 2
- Groups 1 and 2
- Groups 3 and 4
- Groups 5 and 6
- Groups 7 and 8
- Control Room output

See **Section 3J - Part 5.12 AES/EBU Output Setup** for setup information.

S/PDIF IN AND OUT

- **S/PDIF IN**

Stereo S/PDIF signals from external devices such as DAT, CD or MiniDisc players should be connected here. The destination of this input can be selected via the MENU to any of the following:

- STE 1
- STE 2
- FX return 1
- FX return 2
- 2TRK

When one of these destinations is selected, the S/PDIF input signal will override the usual signal present at that input.

Note that the 328XD S/PDIF input is fitted with sample rate conversion. The internal clocks of the 328XD and external S/PDIF devices do not require to be synchronized in order for the connection to be made.

See **Section 3J - Part 5.9 SPDIF Input Setup** for setup information

- **S/PDIF OUT**

The stereo S/PDIF output can be selected via the MENU to derive its signal from any of the following sources: -

- MIX output
- AUX send 1 and 2
- AUX send 3 and 4
- Internal FX send 1 and 2,
- Groups 1 and 2
- Groups 3 and 4
- Groups 5 and 6
- Groups 7 and 8
- Control Room output

The output signal selected will also be present at the Auxiliary Optical Output if set to S/PDIF in the Aux Optical Out menu within the Tape Port Select menu (see **Section 3J Part 5.8**).

See **Section 3J - Part 5.11 SPDIF Output Setup** for setup information

WORD/SUPERCLOCK IN / WORDCLOCK OUT

The BNC connectors are for synchronizing external devices to the 328XD's own internal wordclock, or for synchronizing the 328XD to an external wordclock or Digidesign Superclock source.

See **Section 3J - Part 5.14 Clock Source Select** for setup information.

MIDI IN, OUT AND THRU

The MIDI IN, OUT and THRU connectors are used for the following applications:

- Synchronizing recall of SNAPSHOTS against incoming MTC (MIDI Timecode)
- Receiving MTC and transmitting MTC to external devices
- Transmitting and receiving MIDI Program Changes for Snapshot and User Setup recall
- Transmitting and receiving Dynamic Automation data to and from a MIDI recording device
- Sending and receiving MMC (MIDI Machine Control) messages to and from recording/playback machines
- Saving and loading SNAPSHOT and PRESET data to and from a MIDI recording device as MIDI System Exclusive information
- Sending and receiving MIDI Continuous Controller information for control of connected devices.

See **Section 3J - Part 5.2 User Options / Part 5.4 - MIDI Controllers / Part 5.4 MIDI Dump Out / Part 5.6 MIDI Dump In / Section 4 - Automation Techniques** for more information on MIDI functions.

UPGRADE / 9-PIN RS 422

The UPGRADE / RS422 port is used for machine control of machines that support the Sony 9-Pin protocol and for upgrading software using an IBM compatible PC or an Apple Macintosh with serial port fitted (see **Section 6** for details on upgrading 328XD software).

SMPTE TIMECODE IN

The SMPTE output of an external source, if present and required, should be connected to the SMPTE Timecode In jack on the rear of the console. All 100 of the 328XD snapshots can be individually programmed to recall at precise, configurable frames of a running incoming SMPTE timecode source. The incoming SMPTE timecode can also be displayed on the 328XD timecode display window.



If you would like to know more about wordclock and other digital information, please consult the relevant sections of 'The Soundcraft Guide To Digital Mixing' booklet included with this manual.

MAINS INPUT

Connect the 328XD to the mains with an IEC mains cable. The switch mode power supply will operate between 90V-240V.

MAINS FUSE

The mains fuse is located behind this screw off cap. Should the fuse require replacement, please contact your Soundcraft distributor.

POWER ON/OFF SWITCH

To prevent unnecessary studio stress, note that it is best if this switch is not idly pressed while in the middle of recording a mix during the early hours of the morning. To counteract the actions of inquisitive fingers though, the console will return to the previous power down state when booted.