



USER GUIDE

(SOFTWARE v1.1)



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INTRODUCING THE SPIRIT 324 LIVE

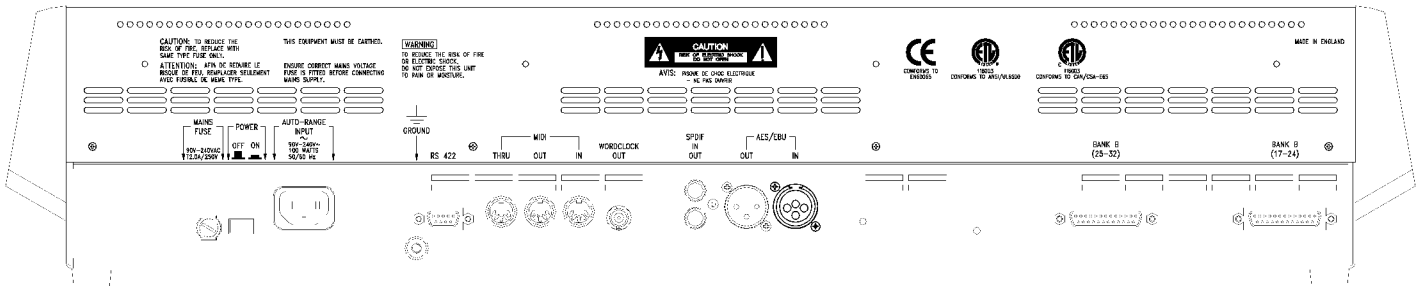
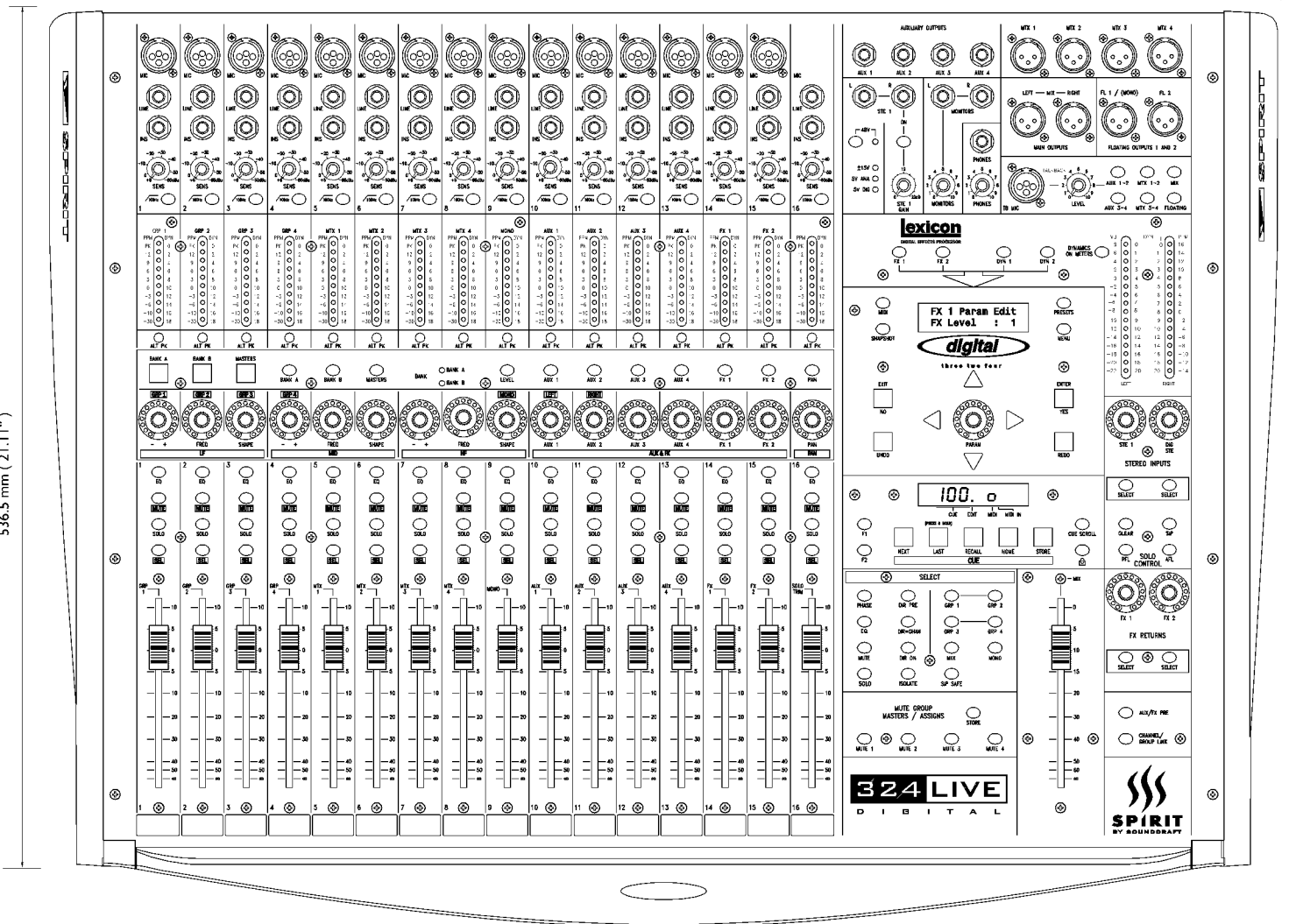
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324 LIVE DIGITAL CONSOLE

715.20 mm (28.15")

536.5 mm (21.1")



1 - KEY FEATURES AND SPECIFICATIONS

324 Live features:



- 100 snapshots for storage of digital console parameters
- Clear, dedicated LED for display of current Cue number
- Backlit LCD Screen for Parameter editing, and Global Setup and Configuration
- 'E-strip' – the class-leading intuitive user interface for channel access
- Surface Lock function to prevent unauthorised use in an auditorium
- 4 "pages" of faders give access to Inputs, Bank B Inputs (TDIF inputs), Masters and MIDI Controllers
- 4 Mute Groups

I/O CAPABILITY:

ANALOGUE INPUTS

- 16 Mic/Line Inputs, with Insert point, Gain control and 100Hz HPF.
- Up to 32 channel inputs possible with optional Mic/Line Interface via T/DIF ports
- 1 x Stereo
- Talkback Mic

ANALOGUE OUTPUTS

- 4 Auxiliaries
- 2 Floating Outputs (assignable)
- 4 Matrix Busses
- Mix Left / Right
- Mono (Shared with Floating Output I)
- Monitors

DIGITAL I/O

- 2 x 8-way TDIF Inputs and Outputs
- S/PDIF Input and Output
- AES/EBU Input and Output
- Wordclock Output
- Digital Stereo Input (via S/PDIF or AES/EBU)
- MIDI IN/OUT/THRU

ON-BOARD PROCESSING:

- 2 x stereo Multi-FX units
- 2 x stereo Dynamics processors

2 - TYPICAL SPECIFICATIONS

Frequency Response:

Measured 20Hz - 20kHz @ 1kHz (+4dBu into 600Ω) +0.5dB / -1.5dB

Analogue to Digital Conversion:

Mic/Line Inputs 24-bit, 128 x oversampling
Stereo Inputs 24-bit, 128 x oversampling

Digital to Analogue Conversion:

Mix Outputs 24-bit, 128 x oversampling
Aux Outputs 24-bit, 128 x oversampling

Internal Processing:

24-bit, 56 - bit bussing

Dynamic Range:

Digital Input to Mix Output: 104dB
Mic Input to Mix Output: 101dB
Stereo Input to Mix Output: 99dB

Noise:

Mic Equivalent Input Noise: 127dBu (150Ω source)
Mix Output with Mix Fader down: <-86dBu
Mix Output with Mix Fader at Unity: <-86dBu
Mix Output with Mix Fader at Unity, 32 Channels
routed with Faders at Unity: <-74dBu

Total Harmonic Distortion:

Mic Input 1kHz @ 30dB gain, to Mix Output at +14dBu: <0.005%

Crosstalk:

Input to Input: >90dB
Fader Attenuation: >86dB
Channel Mute Attenuation: >86dB

Sampling Frequency:

Internal: 44.1kHz

SRC:

Sample Rate Conversion Range on Digital Inputs: 30-50kHz

Power Consumption

100 W

Weight

14.4kg,, (31.7 lbs)

Dimensions:

Height x Width x Depth: 160mm x 715mm x 537mm

3 - AN OVERVIEW OF THE SPIRIT 324 LIVE

Thank you for purchasing the Spirit 324 Live mixer, which is brought to you with much pride by the Spirit team. Your Spirit 324 Live mixer has been manufactured exclusively by Soundcraft in the UK, combining state of the art technology with 27 years' experience in professional console design. The Spirit range gives you premier audio quality and features, whatever your mixing requirements. We hope you enjoy using your Spirit 324 Live mixer as much as we enjoyed designing it!

The User Guide

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This manual has been designed to make the time needed to get to know the 324 Live as short as possible.

Every function of the 324 Live's operation is covered in the manual. Please also refer to the two supplied booklets, namely 'The Spirit Guide to Digital Mixing' and 'The Spirit Guide to Mixing' which cover most of the other questions you may have about mixing in both Live and Studio Recording applications.

Quick start

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If you want to jump straight in, then flip forward to Section II 'Getting started straight out of the box' but please skim through Section I first to get an idea of what features the 324 Live offers!

Overview

.....

324 Live is designed first and foremost as a Live Sound mixer. The benefits of automation to the Live Sound engineer are obvious - simple, single switch recall of a complete console state, with FX, routing and EQ all configured just how they were during Soundcheck. Song by song. Cue by cue. Whether in a pub or a club, a theatre, or a conference centre, 324 Live will offer the user repeatable, detailed control over a powerful featureset.

All of this control would have been little use, however, without the class-leading intuitive interface, first used on the 324 Live's sister product, the Digital 328. This interface, based around the "E-Strip", allows fast access to all audio parameters on the console. Avoiding time-sapping screen-based systems, the "Select and Edit" functionality of 324 Live enables even the first-time operator a familiar channel strip and conventional "above the channel" metering.

Immediacy is critical in Live Sound, and it was therefore important to have dedicated controls on each channel, including functions like EQ In/Out, Phase In/Out, Channel Mute, dedicated Aux and FX send pots, full metering and a silky smooth 100mm long throw fader. Each channel boasts fully parametric EQ with "real" controls, and sends to the two Lexicon FX processors with the legendary "Lexicon" sound. Also on offer are two great assignable stereo dynamics processors, 24 bit 128 x oversampling A/Ds and D/As, and built in TDIF interfaces.

The automation on 324 Live has been tuned to the Live operator. The unpredictable nature of Live Sound means that an automated Live console needs to be capable of riding the problems as they arrive - not compounding them. For example, using the ISOLATE function, channels may quickly be removed from the automation, allowing manual control over troublesome channels with the press of single switch, whilst retaining automation elsewhere on the console.

Automation systems, in combination with Digital Audio mixing technology, offer an unprecedented level of control and flexibility to the Live Sound engineer. With 324 Live, those possibilities become realities.

The Ins and Outs of the 324 Live

ANALOGUE INPUTS

The Spirit Digital 324 Live offers 16 BANK A inputs, using Spirit's highly acclaimed UltraMic™ + Pre-amps.

All BANK A Inputs have an Insert point, Gain control and High Pass Filter. Two further Stereo Inputs are also available, and all of the above inputs feature 24 bit 128 x oversampling A/D converters. All have full access to the revolutionary 'E-Strip' which offers 3 band fully Parametric Equalisation, 4 Auxiliary Sends, 2 Effects Sends (routed to 2 x internal Lexicon FX Processors) and a Pan control.

DIGITAL INPUTS

The 16 Digital Inputs on the rear of the 324 Live are accessed by two 8 Channel TDIF connectors. There is also a dedicated AES/EBU Input, and an S/PDIF Input for connecting CD, Minidisc and DAT Machines. All of these inputs have full access to the 'E-strip' which offers 3 band fully Parametric Equalisation, 4 Auxiliary Sends, 2 Effects Sends (routed to 2 x internal Lexicon FX Processors) and a Pan control.



The 16 digital inputs can also be converted to function as additional analogue inputs with the addition of Spirit's external rack mount converter boxes.

ANALOGUE OUTPUTS

324 Live offers an array of Analogue Outputs including Left/Right MIX Outputs on 2 balanced male XLR, 4 male XLRs for Matrix Outputs, 4 balanced Auxiliary Outputs, 2 Floating outputs on male XLRs, Monitor Outputs on balanced jacks and a Headphone Output with its own level control.



4 Analogue Group Outputs or 16 Analogue Direct Outputs can be achieved by the addition of Spirit's external rack mount converter boxes.

DIGITAL OUTPUTS

There are 16 Digital Outputs available via the 8 TRK A and 8 TRK B outputs on TDIF connectors. These can be configured as either 16 Direct Outputs - sourced from BANK A Input Channels 1-16 - or alternatively as four paralleled 4 Group Bus Outputs.

The AES/EBU and S/PDIF Stereo Digital Outputs can output signals from any of the following sources - MIX Out, AUX 1&2, AUX 3&4, or FX-1/2.

METERING

The 324 Live has full metering of every input and output signal as standard – no need for an extra meterbridge here! The 10 segment bar graph meters have 3 easily selected modes that show either BANK A Inputs 1-16, BANK B Inputs 17-32 or GROUP Outputs 1-4, Mono Output, AUX Outputs 1-4 and FX Sends 1 and 2.

Additionally the Stereo Output Meters can be switched to show Gain Reduction Level and Gate Open/Closed when assigned to a Dynamics Processors.

FADERS

The 100mm long throw faders found on the 324 Live work just as you would expect on an analogue console. There are 4 modes of operation for the channel faders according to the FADER BANK selection:

- 1 BANK A 1-16 – Faders control the level of the BANK A Inputs 1-16.
- 2 BANK B 17-32 – Faders control the level of the BANK B Inputs 17-32.
- 3 MASTERS – Faders control output level of GROUP 1-4, Mono buss, 4 Matrix Outputs, Master output level for AUX 1, 2, 3 or 4 and Master Send level for FX 1 and 2. Note that the Master Fader will only operate up to unity (0dB). It is not possible to add gain over a Master Fader - only to attenuate.
- 4 MIDI controller mode – When none of the FADER BANK buttons are selected the 16 channel faders function as programmable MIDI controllers.

E-STRIP

The 'E-Strip' is a feature unique to the Spirit 328 and 324 Live , and works just like a conventional analogue channel strip lying on its side. The 'E-Strip' has 3-band fully parametric equalisation, 4 AUX Sends, 2 FX Sends and a PAN control which are available for use on the BANK A and BANK B channels, Stereo Input 1&2 and FX Return 1&2.

The 'E-Strip' can also be configured to work as 16 dedicated Level controls for BANK A Inputs 1-16 or BANK B Inputs 17-32, or as dedicated controllers for AUX Send level 1, 2, 3 and 4, FX Send level 1 and 2 or PAN controls.

LEXICON EFFECTS PROCESSORS

The 324 Live features two built-in Lexicon Stereo FX Processors that include superlative Reverb, Delay, Chorus and Flange effects and are accessed from FX Sends 1&2. The two dedicated Effects Returns – FX 1 and FX 2 – control the amount of effect sent to the Mix Outputs.

STEREO DYNAMICS PROCESSORS

There are two Dynamics Processors that can be configured for either Mono or Stereo operation, and these can be applied to the BANK A and BANK B Channels, Stereo Inputs 1&2, FX Returns 1&2 and the Mix Outputs.

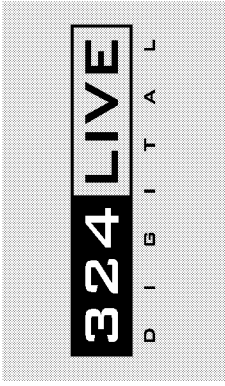
SNAPSHOT AND DYNAMIC AUTOMATION

324 Live has two different types of automation - namely 'SNAPSHOT' and 'DYNAMIC AUTOMATION' which give maximum flexibility to the user. Complete recall of all console settings can be stored in up to 100 'SNAPSHOT' memory locations for recall either manually or against incoming MIDI Timecode.

Recording via MIDI to a MIDI Recording device allows complete DYNAMIC AUTOMATION of all the functions found on the 324 Live except for the input gain controls and High Pass Filter.

AUDIO QUALITY

All analogue inputs and outputs on the 324 Live have the same crystal clear 24 bit 128 x oversampling Analogue to Digital/Digital to Analogue (AD/DA) converters, ensuring wide dynamic range and superb sonic performance.



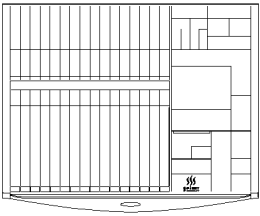
II

GETTING STARTED STRAIGHT OUT OF THE BOX

In this Section:

Getting started straight out the box

10



Get started straight out of the box

If you are one of those people who just has to 'get your hands dirty' before you read through the Reference Manual then this section is for you.

The goal of this short section is to quickly take you through the basic features of the 324 Live. We will get a signal into the console on Channel 1, route it to the Mix outputs, add some EQ, and then add some Reverb and a Compressor, and finally store all the settings we have made as a 'Snapshot'. We will also route a signal to a Group and a Matrix output.

GETTING STARTED

Plug the power cord into the nearest plug socket and switch the 324 Live on. You will see that every LED on the mixer lights up briefly. Don't worry, this is perfectly normal, and is all part of the boot up procedure which should take about a minute to complete. Once the boot up is complete the 324 Live is ready to go.

AUDIO HOOK-UP

For the purpose of this section we will assume that there is a microphone plugged into MIC Input 1 and an amplifier with some speakers connected to the Left and Right MIX outputs.



If you have bought this mixer second hand (and are lucky enough to still have the user manuals) then you might want to re-initialise the 324 Live, so that it is returned to the original factory settings it had when it left our factory. To do this:

- 1 Switch off the mixer.
- 2 Hold down the left and right arrow keys simultaneously. Now switch on the mixer again whilst holding down these keys.
- 3 Keep holding down the arrow keys until the LCD display reads 'Hard reset to factory defaults' then you can let go of the arrow keys and allow the boot up procedure to finish.
- 4 The mixer is now reset to where it was when it left the factory.

LET'S MAKE SOME NOISE!

Before starting, make sure that the Monitor Out level control is fully down (anti-clockwise), and the MIX fader set at 10.

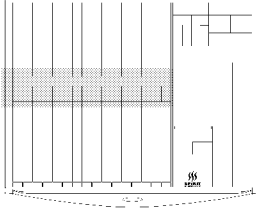
Ensure that the "BANK A" switch is illuminated in the FADER BANK selection area. Press the 'SEL' button for BANK A Channel 1 (it should illuminate with a cool shade of green!) to put the channel into 'SELECT' mode. Make sure that the 'MIX' button in the 'SELECT' panel is selected.

Pull the Channel 1 Fader fully down, and press the MUTE switch (This should prevent any chance of a sudden feedback howl, if your microphone happens to be too close to your speakers!). Plug in a Microphone, and if it requires 48v Phantom Power, press the 48V button.

Make sure that both the FADER BANK and METER BANK selector switches are set to BANK A.

(This ensures that the faders are controlling level from BANK A inputs 1-16 and the meters are showing input level for BANK A inputs 1-16).

Speak into the microphone and turn the TRIM control slowly until a good level is seen on the Channel 1 Input Meter. As a guide your loudest peaks should occasionally light the top amber LED.



This will ensure good signal to noise ratio. The level should not be allowed to hit the red LED at the top of the travel, as this indicates that the signal level is close to "clipping" (overloading) the input to the Analogue/Digital (A/D) converter on the channel. Brief overloading should not cause any damage to the mixer, but will result in an unpleasant distortion of the incoming signal.

Now de-select the Channel 1 MUTE button and bring up the Channel 1 fader level, while speaking into the microphone. You should see level showing in the LEFT/RIGHT output meters. If there is no level shown on the output meter, check that the 'DYNAMICS ON METERS' switch to the left of the main output meters is de-selected (the reason for this is simply that the Stereo Output meters can show the stereo output level, or Gain Reduction and Gate Open/Close for the Dynamics Processors when the Dynamics button is selected). You should now hear the signal in your speaker system.

USING THE 'E-STRIP' FOR EQUALISATION, PANNING, AUX SENDS AND ADDING EFFECTS

Now that you have some audio running through the console, let's check out the 'E-strip' (See Section III.2, "The E-Strip", - for an in depth look at this unique 324 Live feature.)

When you press the 'SELECT' button on Channel 1 the 'E-strip' instantly becomes active on that channel. You now have access to 3 band EQ, 4 AUX sends, 2 FX sends and a PAN control. These functions operate just as you would find on an analogue console and will remain at their current setting even if you select another channel.

Although each of the E-strip controls has its own LED ring to show values, more information on the exact values set may be seen on the LCD. This page is accessed by ensuring that NONE of the four page switches surrounding the LCD are active (if one of the page switches is ON, pressing it a second time will extinguish it).

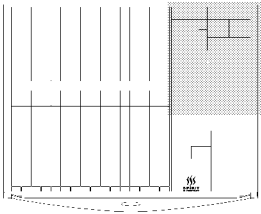
LET'S ADD SOME REVERB TO THE SIGNAL

Adding a reverb effect to a signal is just like working with an external effect processor, but without the need for cables. There is also the added bonus of keeping the signal in the digital domain at all times. As you would expect we will need to send a signal into the effects processor and blend the return signal into the mix.

- 1 Press the PRESETS switch to the right of the LCD.
- 2 Use the PARAM encoder or the ▲▼ arrow keys to select the FX 1 Presets menu – it will flash when selected.
- 3 Press the ENTER/YES button and the < FX Presets > Factory/User menu comes up.
- 4 Press the ENTER/YES button again to bring up the library of preset effects and choose Hall Reverb using either the PARAM encoder or the ▲▼ arrow keys, then press the ENTER/YES button to load your chosen effect.
- 5 Press the MASTERS button on the METER BANK panel. This will switch the bar graph meters to display the output levels of Groups 1 - 4, FX 1&2 and Auxes 1 - 4 so that we can see the level of signal being sent to FX Processor 1 from FX 1 Send.
- 6 Turn the FX 1 control in the FX RETURNS section fully down.
- 7 Make sure that BANK A Channel 1 is still selected, and using the FX 1 control on the "E-strip" slowly raise the FX 1 control while speaking into the microphone, until you see a good amount of signal showing on the Bargraph meter labelled FX 1.
- 8 Now turn up the level of FX RET 1 to adjust the amount of Reverb return you want to hear in the MIX.



It is considered good practice to send as much signal as possible into the effects processors from the individual FX Sends on the channels, and have the level of the FX Return at a lower level. This way a good Signal to Noise Ratio (SNR) is achieved.



COMPRESSION

The two high quality Dynamics Processors built into the 324 Live can be applied to the signal in the usual way, i.e. by feeding the full signal to the input of the processor and returning the output back to the same channel.

- 1 Press the DYN1 button above the LCD
- 2 Press the ENTER/YES button. The LCD display will show either:

<DP 1 * Bypass * > or **<DP 1 ALGORITHM>**.

Below this line the currently active Dynamics Processor will be shown.

Pressing the ◀▶ arrow keys together will toggle the Bypass function on and off. This determines whether the currently selected Dynamics Processor is active or bypassed. Ensure that the processor is active - the LCD should show "DP 1 Algorithm".

- 3 Use the ▲▼ arrow keys or the PARAM encoder to select the Compressor and press the ENTER/YES button.
- 4 Use the ▲▼ arrow keys to select the SCH: Channel # menu page.
- 5 Now use the PARAM encoder to select Channel #01 (BANK A Input 1) and then press the ENTER/YES button to select it. DYN1 is now "over" Channel 1, and will therefore process that channel.
- 6 You may now use the ▲▼ arrow keys to step through the different parameters for the Compressor, and the PARAM encoder to adjust settings such as Knee, Threshold, Ratio, Attack, Release, and Makeup Gain.
- 7 If you want to look at the Gain Reduction level of the Compressor, press the DYNAMICS button next to the Stereo Output meters and the meters associated with the compressed channel will now show Gain Reduction.

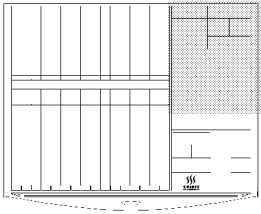
STORING THE SETTINGS IN THE 'SNAPSHOT' MEMORY LOCATIONS.

All of the adjustments we have just done can be stored in the SNAPSHOT library for later recall.

- 1 Press the SNAPSHOT button in the Master section. This will bring up the SNAPSHOT menu.
- 2 Use the ▲▼ arrow keys or the PARAM encoder to select SNAPSHOT memory location # 01. It will flash when selected.

! *If you have a used mixer with previously stored SNAPSHOTS then press the EXIT/NO button to delete the existing SNAPSHOT. The LCD display will read 'Confirm Delete?' And the currently selected SNAPSHOT number. Press the ENTER/YES button to delete the SNAPSHOT).*

- 3 Now in the CUE section press the STORE button.
- 4 The LCD display will read SAVED SNAPSHOT and then revert to showing SNAPSHOT #001
- 5 To give the SNAPSHOT a name press the ENTER/YES button and use the ◀▶ arrow keys to select the character you want to change, and the PARAM encoder to select the desired letter or number.
- 6 Press the ENTER/YES button to store the new name.



GROUPS

To demonstrate the configuration of Groups and Matrices, let's put Channel 1 into subgroup 4, then out to Matrix 3.

- 1 Ensure that BANK A Channel 1 is still selected.
- 2 Press "GRP 4" in the SELECT panel. The Channel is now routed to Group 4.
- 3 Press 'MASTERS' in the FADER BANK panel
- 4 Bring up the GRP 4 fader. The Channel should now be going to the GROUP 4 output. This can be confirmed by pressing 'MASTERS' in the METER BANK panel, and speaking into the microphone. The meter corresponding to GRP4 should now carry the microphone signal, if no signal is present, ensure that the group 4 Master fader is up.

MATRICES

The Matrix outputs on 324 Live derive their sources from Groups 1-4, the L/R Mix buss, and the Mono buss.

This routing is performed by SElecting the desired matrix output, then determining the contribution levels from each of the busses INTO that matrix.

- 1 Ensure that 'MASTERS' is selected in the FADER BANK and METER BANK panels.
- 2 Press the SEL switch above the MTX3 fader. Note that the E-strip now darkens all controls except those with the BLUE legending above, denoting GRP 1-4, MONO, LEFT and RIGHT
- 3 Bring up the MTX3 fader to the Unity point ('0')
- 4 Adjust the E-strip control above GRP 4 fader, while speaking into the microphone. As the contribution level is raised, the MTX3 meter should begin to carry the microphone signal

You have now successfully completed a basic overview of how the audio on Digital 324 Live operates.

Section III of this manual gives a much more detailed description of all of the functions available on the 324 Live.

