AMS NEVE

LOGIC 3SC

USER MANUAL

527-334
Issue 1

As part of our policy of continual product improvement, we reserve the right to alter specifications without notice but with due regard to all current legislation.

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Contents

Design Features

The Logic 3SC mixing console shares most of the operational philosophies of the larger Logic 1 and Logic 2 series consoles, and all work carried out on a Logic 3SC is transferrable to or from both Logic 1 or 2 (via the appropriate medium).

The console surface is equipped to run with up to 64 channels, 16 groups, 2 main output, and 8 auxiliaries. Any path may be stereo (subject to processing resources).
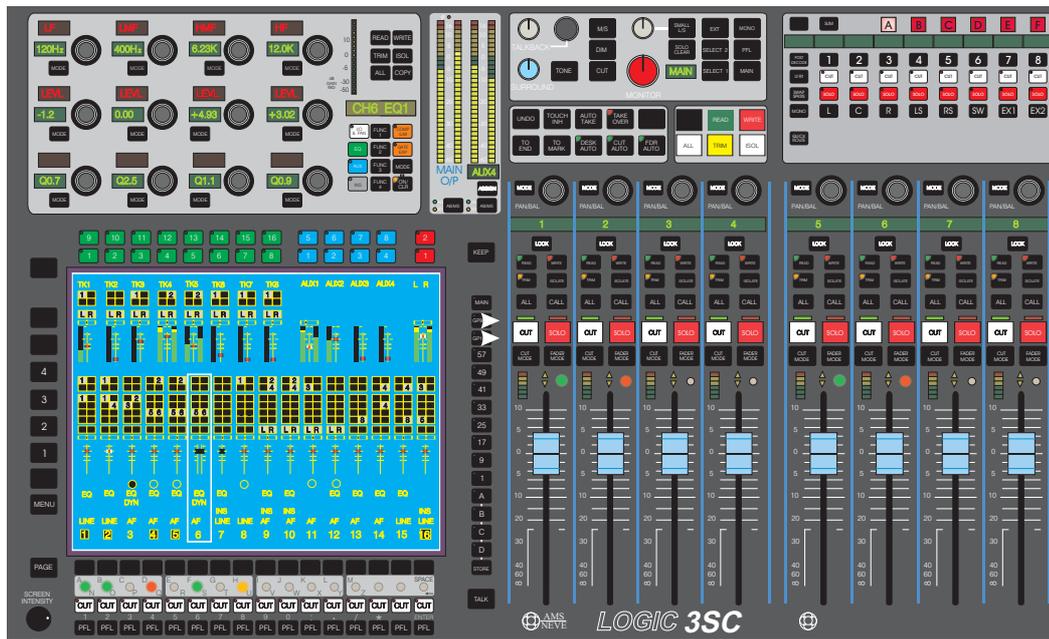
The main components of the console surface are as follows.

❏ Eight assignable fader/pan strips with automation controls, preset and programmable fader–to–path assignment selection controls, and alphanumeric assignment indicators.
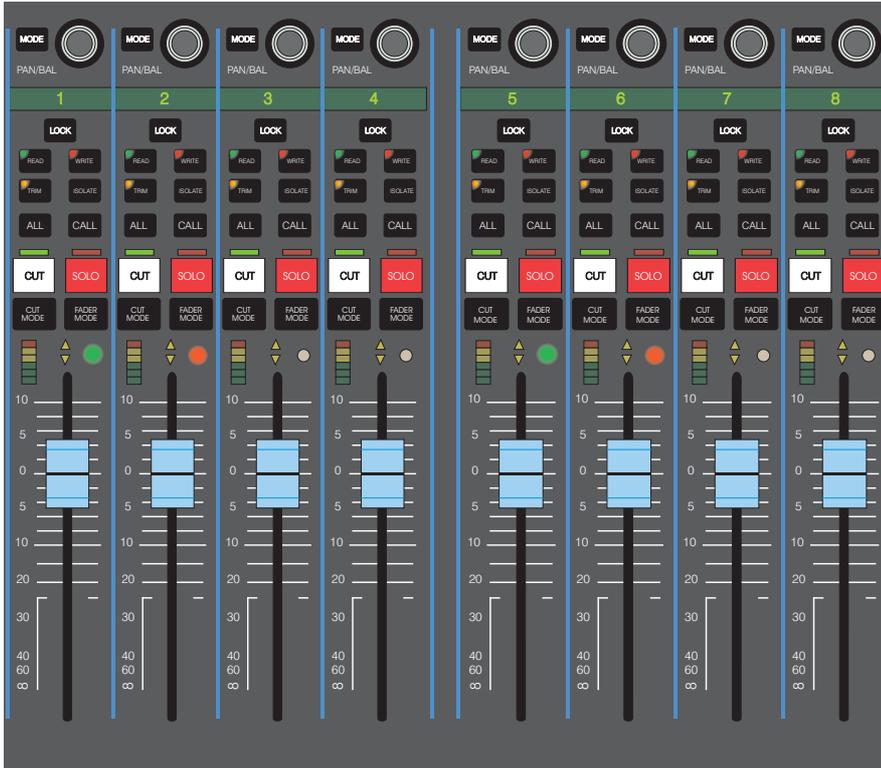
❏ An assignable alphanumeric/logicator control panel with function select and automation control switches.

❏ A large colour TFT graphic backlit–LCD console status display with aligned and screen–labelled path softkeys, metering, function switches, and page select switching.
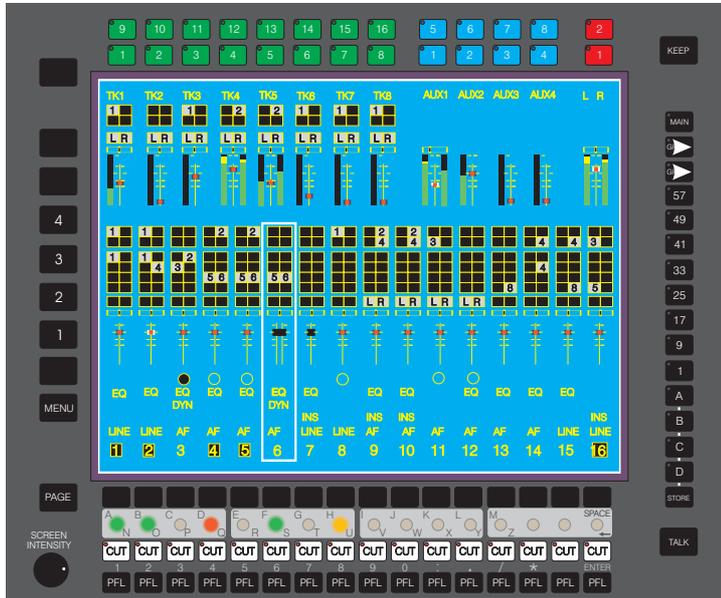
❏ A compact LS monitor selection and control panel.
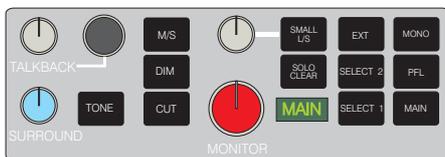
❏ Two AB/MS switchable 32–segment bargraph meters; one dedicated to the main output and one which may be assigned to groups, auxes, or main output.
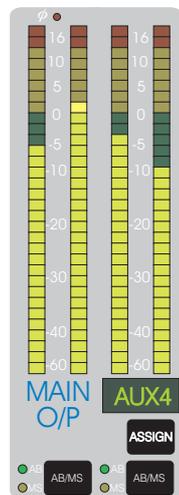
❑ A Master Automation Control Panel.

❑ A Surround Monitoring/PEC Direct Panel
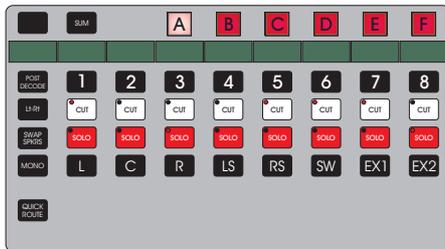
❑ Optional additional module providing up to 16 fader/pan strips.

Configuring Logic from the AudioFile Control Surface

Introduction

This section describes how Logic is setup by user interaction with a series of displays on the control surface of AudioFile. The following pages and procedures are governed by the Logic system and not by AudioFile.

✍ *Refer to the AudioFile SC User Manual for detailed explanations of AudioFile facilities and operation.*

In the AudioFile Main Menu (shown below) press the LOGIC softkey, or press the LOGIC hardkey.

The Logic Main Menu will be displayed.

```
AUDIOFILE SC                                    00:01:00  00
Tue 18 Sep 12:40pm                              LIST
  00:00:00  00.00
                                                    ┌─────────┐
                                                    │  EXIT   │
                                                    └─────────┘

                                                    ┌─────────┐
                                                    │         │
                                                    └─────────┘

                                                    ┌─────────┐
                                                    │         │
                                                    └─────────┘

                                                    ┌─────────┐
                                                    │SNAPSHOT │
                                                    │ FILING  │
                                                    └─────────┘

                                                    ┌─────────┐
                                                    │  MAIN   │
                                                    │  AUTMN  │
                                                    │ CONTROL │
                                                    └─────────┘
                                                      SC2.00
                                                    ● SC-32
                                                    ● 44100 25

┌────────┐┌────────┐┌────────┐┌────────┐┌────────┐┌────────┐┌────────┐┌────────┐
│ FILE   ││  RUN   ││  MIX   ││ LOGIC  ││ CHANGE ││  SYNC  ││ LOGIC  ││DEFAULTS│
│BROWSER ││UTILITY ││ SETUP  ││ AUTMN  ││SOFTWARE││ SELECT ││  FILE  ││        │
│        ││        ││        ││ BACKUP ││VERSION ││        ││ BACKUP ││        │
└────────┘└────────┘└────────┘└────────┘└────────┘└────────┘└────────┘└────────┘
```
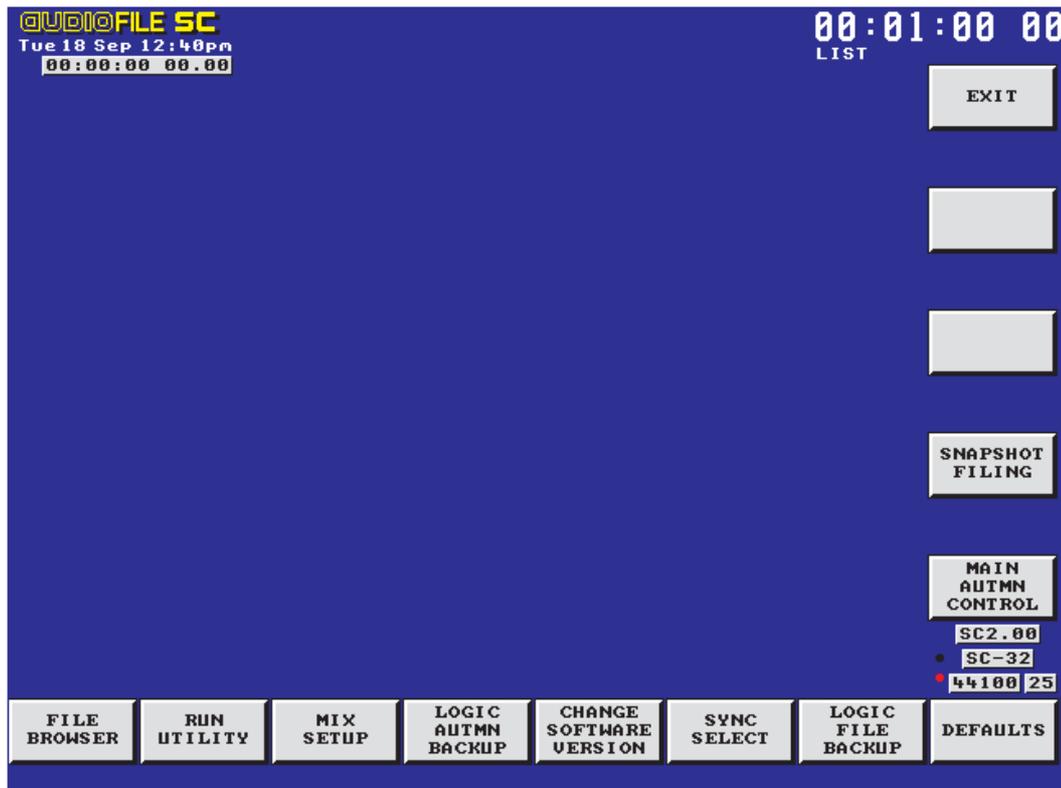
Hard Disk Usage (limit indicator)

On entry the Logic Main Menu checks the Hard Disk Usage - if the disk is over full (i.e. it has reached or exceeded the safe level) a message box will appear informing the user.

✍ *Users are advised that they can not save a file when this limit is reached (until some space has been created).*

✍ *The LOGIC 'hotkey' (located directly to the right of the CYCLE key and immediately above the RECORD AUDIO key on the AudioFile SC control surface) is used to toggle between Logic and AudioFile screens (a green LED indicates that the current selection is Logic).*

File Browser

Logic File Structure

NAME

COMMENT

Unlike MSDOS on a PC all directories in the Logic system contain fields for data i.e. all directories are also files in themselves – not just names.

The File Browser enables the user to examine (if desired) all files and their data contained within Logic.

DATA

The page is accessed from the Logic main menu by pressing the softkey labelled FILE BROWSER.

LIST OF CHILDREN

The following screen is displayed which consists of an upper file window and a lower data window.
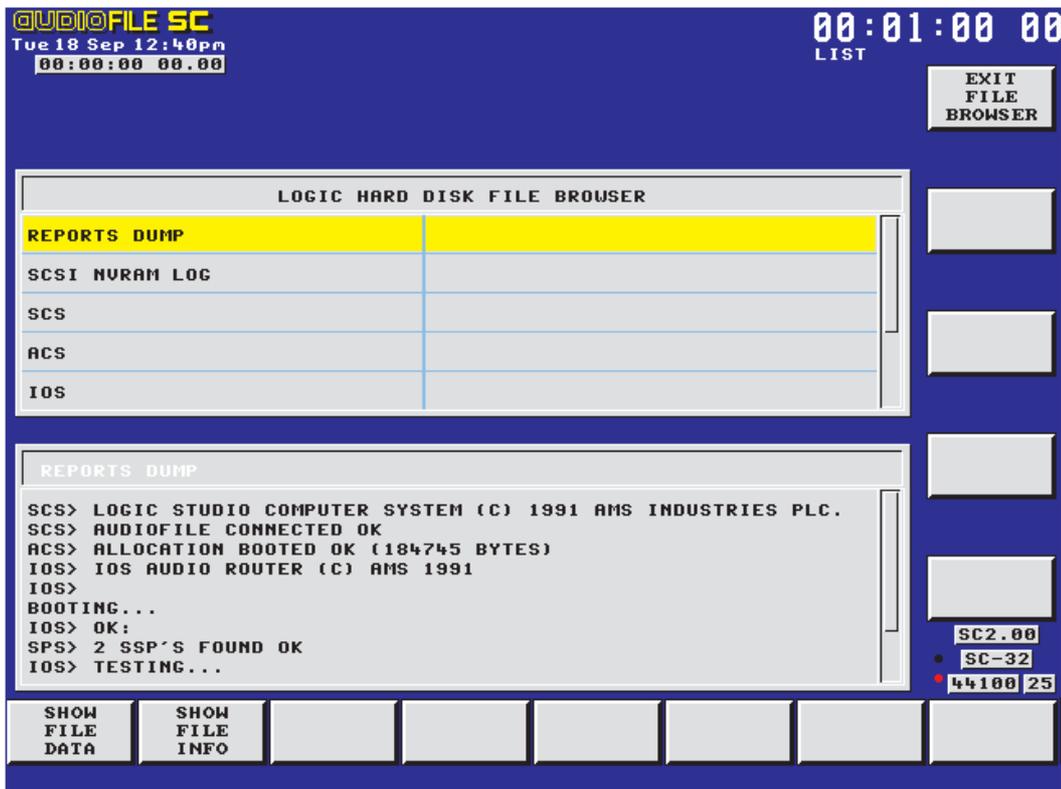
The right-hand softwheel scrolls through the data and the arrow keys operate as page up and page down commands. The left-hand softwheel scrolls through the directory and file list. Scroll bars to the right of each window show the position of the selected group within the full list.

Each main directory/file will have children and these children will in turn have their own files containing data. At the lowest level of every branch will be the data of the final child. The minus key takes you down through the structure one level at a time and the plus key works in reverse. Shown below is an example of a tree path that is followed in this way.

ENGINEERING

REPORTS DUMP   SCS   ACS   IOS   SPS   CPS

ALLOCATION RESULTS   TIME COUNT TESTS   BACKPLANE   BOOT PHASE 1   BOOT PHASE 2

SSP 0

MEMORY CHECKED OK
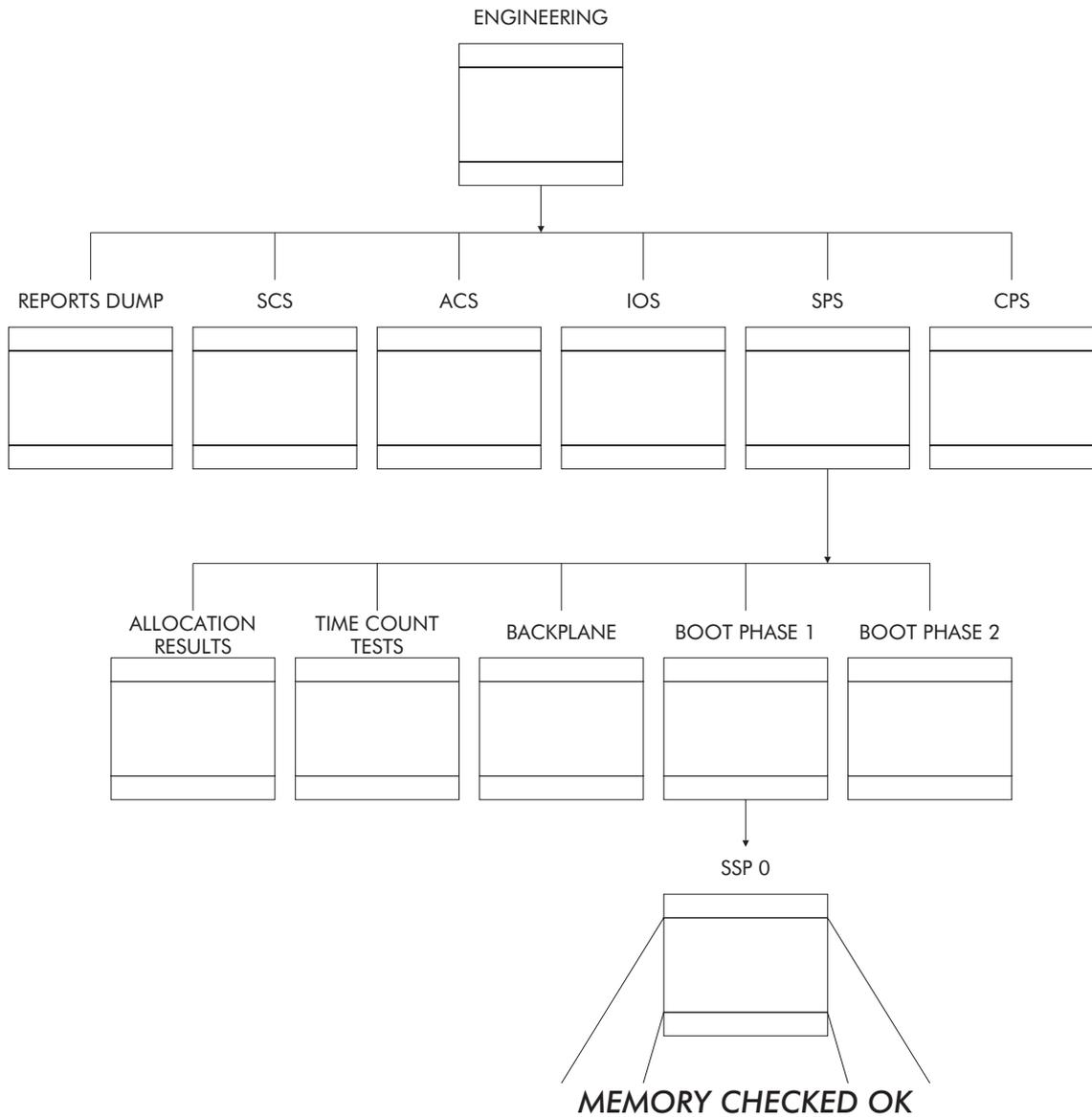
(DATA)

The softkey labelled SHOW FILE DATA enables the viewing of data associated with the current file.

➤ Press SHOW FILE DATA to call up the data of the currently selected file.

When a subsequent file is selected the data in the lower window still relates to the previous file until the SHOW FILE DATA key is pressed once again to update the information in the lower window or when a file with no children is entered. This means that data continues to be displayed as a further search through the file structure is carried out.

On entering the File Browser the user is automatically taken one level down in the hierarchy. REPORTS DUMP (which is a child of ENGINEERING) is highlighted. This is the information typically required in the event of system problems. The plus and minus keys move between levels (the plus moves upwards and the minus downwards). The top level can be reached from the opening display by pressing the plus key to move up one level to the top of the tree.

Directory Name   Comment
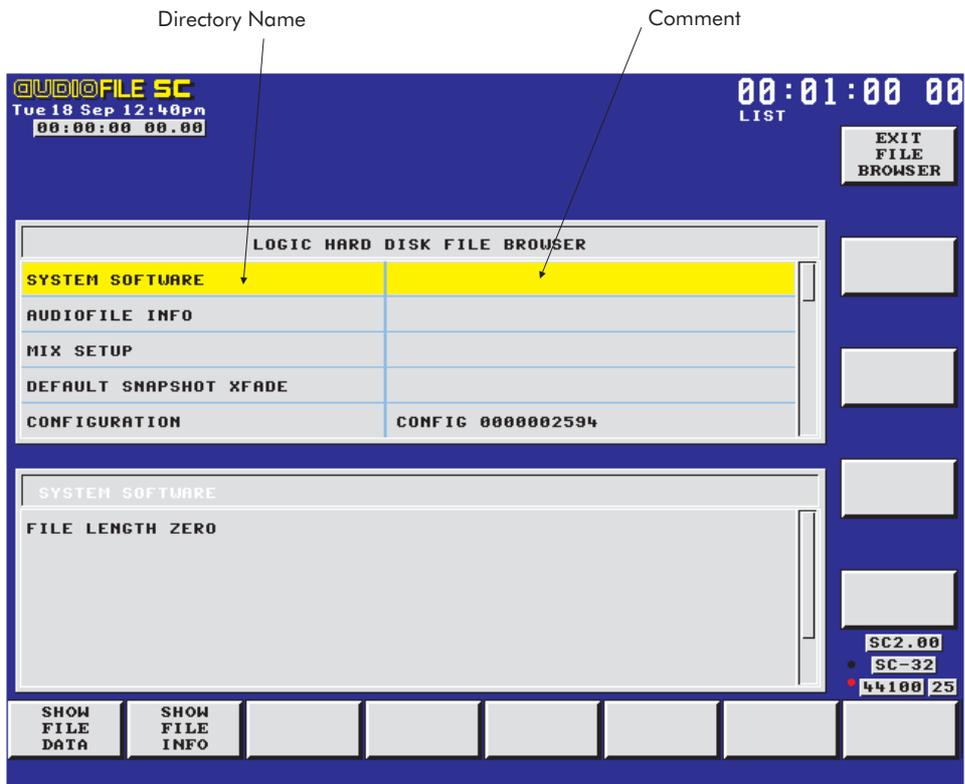
The scroll bar indicates that not every file is being displayed, the small gap at the bottom represents the extra file that isn't accommodated within the file window.

A field for comments is available to the right of the directory/file list.

If the minus key is pressed repeatedly the lowest level is reached and the data of this file appears in the lower window.

Run Utility

On pressing the RUN UTILITY softkey a list of utility programs is displayed. These can be scrolled through and selected with the left-hand softwheel. Programs can be initiated from either the hard disk or a floppy.

Input and Output Configuration

INPUT CONFIG and OUTPUT CONFIG are accessed via the RUN UTILITY softkey (in the main LOGIC page).
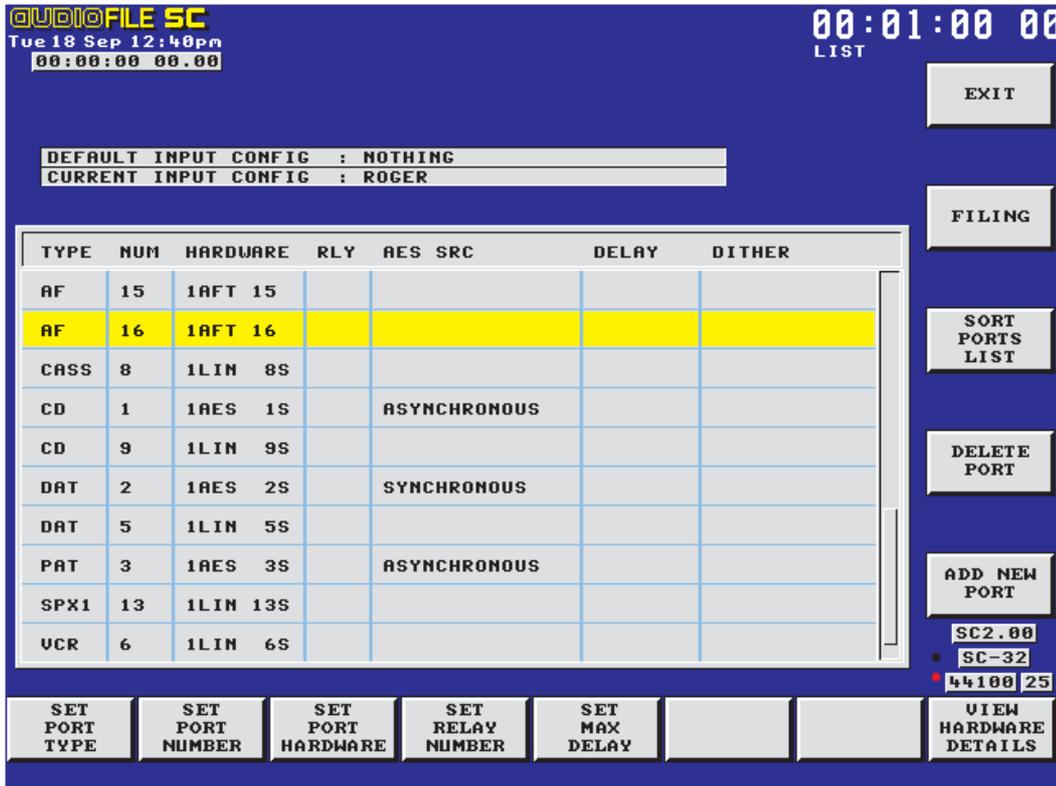
These allow the user to re–label inputs and outputs with names relevant to the project, which will therefore be more easily recognisable. e.g. SDIF–2 can be renamed to MTR 2 (i.e. Track 2 on a connected multitrack machine).

✍ *Default I/O configuration is hardware dependent.*

✍ *Routing is not performed within this page, only re-labelling of how I/O appears on the console surface.*

Filing

An entirely new configuration can be created via the main Input or Output page and saved under a new name or an existing config loaded from disk. A default configuration can be set up so as to allocate names on system bootup.

The ADD NEW PORT softkey on the right-hand side of the screen lets you add a blank port to the list on the left (which can then be edited).

The SET PORT HARDWARE softkey brings up a window showing all available hardware connected to the console. The left-hand softwheel moves the cursor through the list and the ENTER key copies the highlighted port to the config list.
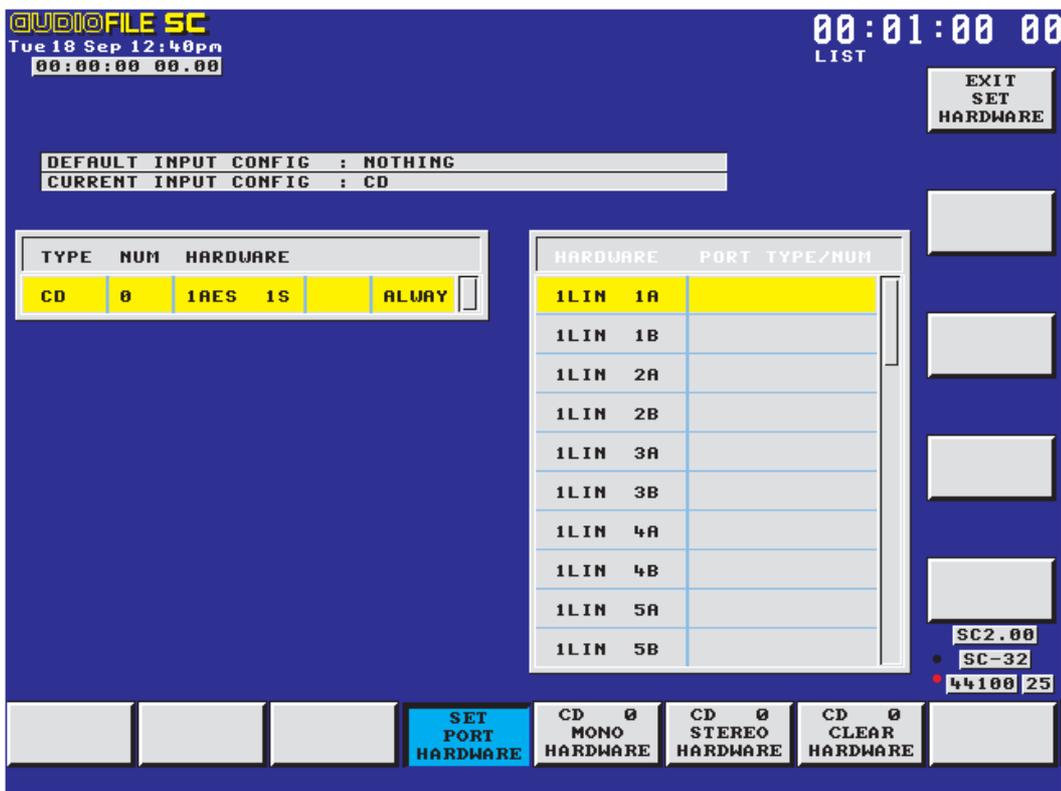
The SET PORT TYPE and SET PORT NUMBER softkeys let the user type in a 4 character name and a 4 digit number which will appear on the console surface in place of the hardware port name and number.

After the configuration has been edited it must be saved and loaded for the new names to be put into operation. It can also be set as a default after boot-up.

To rename I/O config.

➤ Press the RUN UTILITY key. The Run Utility page will appear.

➤ Next press the FILING key. The filing page will appear.
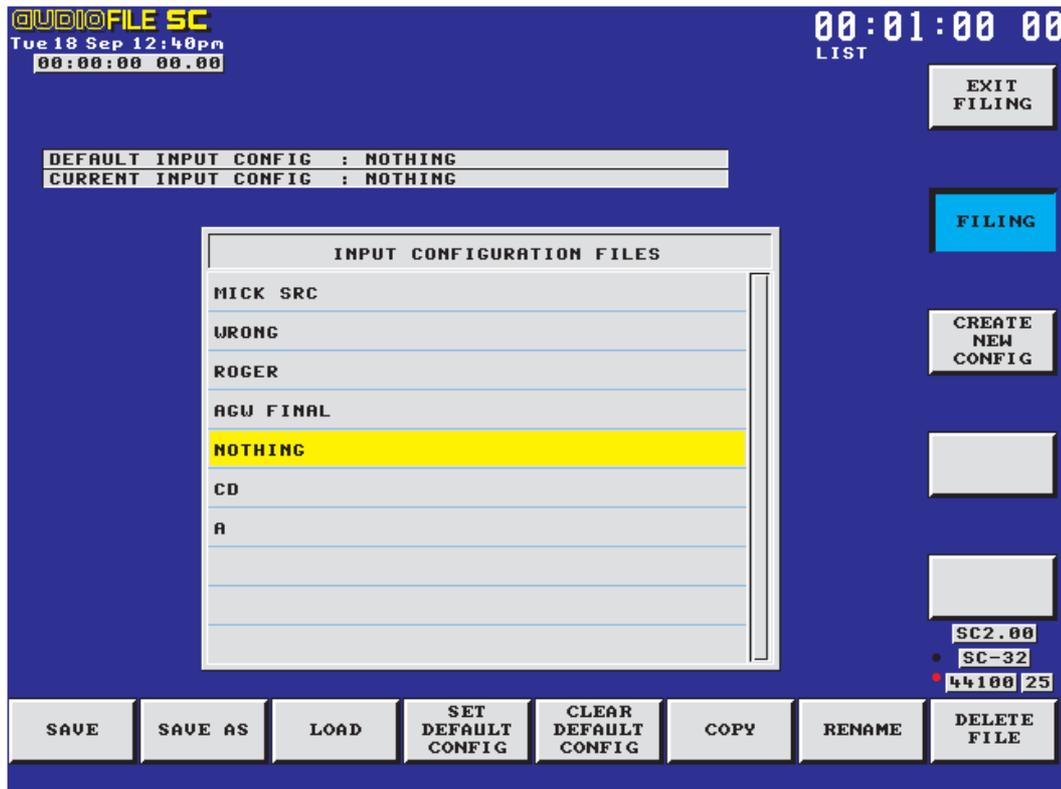
➤ Select the I/O config using the right-hand softwheel.

➤ Press the RENAME key. The rename dialogue box will appear.

➤ Enter the new name using the QWERTY keyboard and press the ENTER key.

Fader Start System (Optional)

This feature allows users to associate a relay number with any input port, so that when channels are then attached to those ports every time the fader is above -60dB the associated relay will close.

To use the fader start system

➤ Press the RUN UTILITY softkey then press the RUN UTILITY PROGRAM softkey to display the INPUT CONFIG page.

➤ Now press the SET PORT TYPE softkey and enter a relevant name, then press the SET PORT NUMBER softkey and enter the relevant number.

➤ Next press the SET PORT HARDWARE softkey and using the left-hand softwheel scroll though the available ports, then select either Mono or Stereo hardware by pressing either STEREO or MONO HARDWARE softkeys.

➤ Now press the SET RELAY NUMBER softkey and enter the relevant number, this will then associate the relay number with the port.

➤ To save the new input configuration, first press the FILING softkey followed by the SAVE AS softkey, then type in an appropriate name.

✍ *The ADD NEW PORT softkey allows for the definition of additional type, number and relay groupings.*

Regard a fader as closed even when above the threshold (Fader Start/SLS)

The Fader Start/SLS mechanism can be set (with a single key depression) to regard a fader as closed even when above the threshold.

✍ *The default status is Off.*

To regard a fader as closed even when above the threshold.

➤ Press the CUT key.

✍ *The configuration will always be loaded from boot if it has been designated as the default configuration.*

✍ *Whenever the renamed ports are accessed they will appear with their new names.*

AES Config Page

Any pair of Input/Output Config files can be imported and saved as a new AES Config.

The different types of AES card available are automatically recognised and their resources are monitored.

Output Rates on -154 cards can be generated by selecting new settings on the on-board Frequency Synthesisers.

Detailed 'live' Input Channel Status monitoring can be executed on any input port.

To use the AES Config Page

➤ Press the RUN UTILITY key.

The Run Utility options list will appear.

Scroll through the displayed list until AES CONFIG is highlighted using the left-hand Softwheel.

➤ Press the RUN UTILITY PROGRAM key.

The AES Config page will appear.
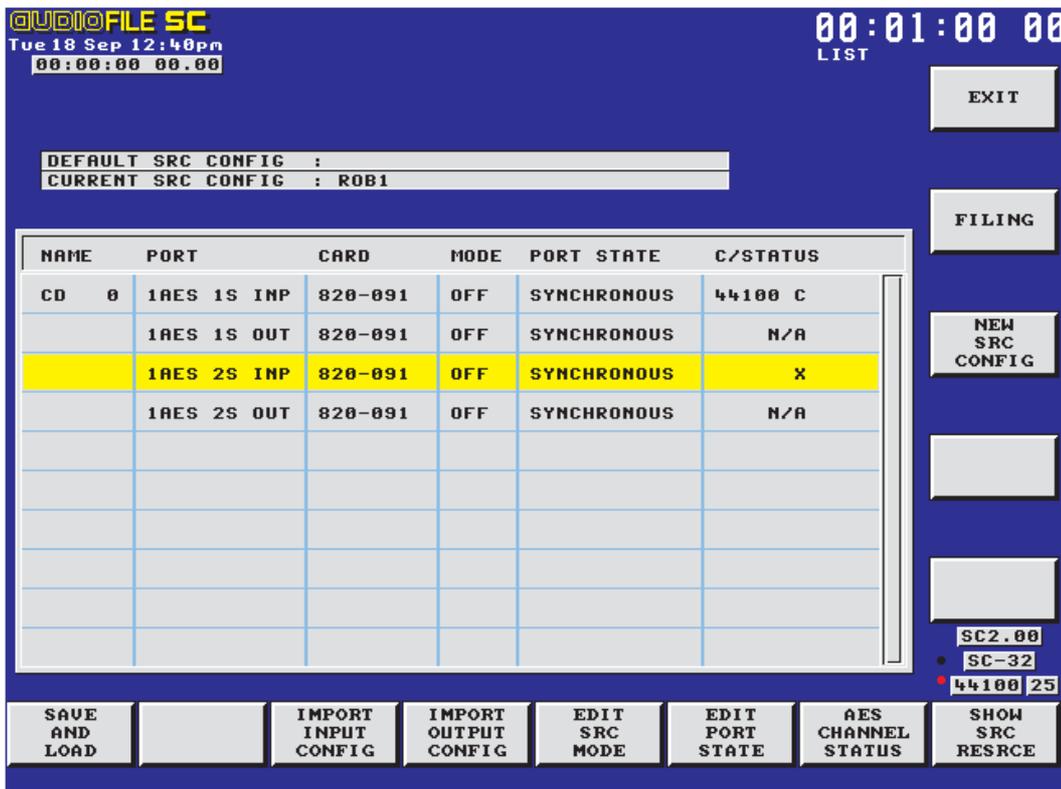
➤ Select input or output using the left-hand Softwheel.

➤ Press the EDIT PORT STATE key.

The list of available options will appear.

✎ *These options are determined by the type of card installed (i.e. 091 or -154).*

➤ Select the option desired using the left-hand Softwheel.

➤ Press the ENTER key to confirm selection.

➤ Press the EDIT PORT STATE key again to abandon the selection.

Card Types

091 card

Input Options

❏ Synchronous - port locked to system sample rate.

❏ Asynchronous - incoming signal buffered and truncated/interpolated with crossfade to compensate for sample rate discrepancies.

❏ Always 44100 - port locked to 44.1kHz regardless of system sample rate.

❏ Always 48000 - port locked to 48kHz regardless of system sample rate.

❏ NTSC Pullup - port locked to 44.056kHz if system sample rate is 44.1kHz or port locked to 47.957kHz if system sample rate is 48kHz.

Output Options

As above except for the Asynchronous option.

-154 card

Input Options

❏ On/Off.

Output Options

❏ SRC off

❏ SRC - > 44.1k

❏ SRC - > 48k

❏ SRC - > 44.056k

❏ SRC - > 47.952k

❏ SRC - > 32k

❏ LOCK IP - > OP - this takes the input clock and provides that as the output clock - i.e. the desk sample rate becomes the input sample rate.

✍ *Original settings can be viewed but not changed in the Input/Output Config pages.*

✍ *AES configuration files are fully supported in Backup/Restore.*

I/O Delay

A shared bank of delay is available at the console's input and output ports. Depending on the amount of RAM installed the total available is 2.7 or 11 seconds (each) for both input and output ports.

The maximum delay available to a port is set in an INPUT or OUTPUT Configuration, which must then be loaded to activate it.

➤ Press the RUN UTILITY softkey, then press the RUN UTILITY PROGRAM softkey.

➤ Now setup the ports as desired and press the SET MAX DELAY key.

➤ Type in the delay required using the QWERTY keyboard and press the SAVE AND LOAD softkey.

Delay Type Options

Users can choose between SAMPLES, TIME, DISTANCE, SMPTE and FRAMES.

To select delay options

➤ Press the VIEW HARDWARE DETAILS softkey (in the INPUT CONFIG or OUTPUT CONFIG pages).

The options box will appear.

➤ Select the option required using the left-hand Softwheel.

The system does not allow total delay greater than that available for inputs or outputs. Delay time remaining is displayed and the operator is notified when the delay pool is empty.

When a port with delay allocated to it is selected and switched on, the delay control appears on a Logicator on I/O page 3. If interrogated the Logicator displays DLY (and resets to zero delay when cleared with the ON/CLR button).

Delay is adjustable up to the maximum allocated to the port and the value is saved with Mix Setup. The control can be automated in the usual way.

When a Mix Setup is loaded with delays saved on ports (but not currently allocated) the delay value is retained until delay is allocated. Prior to that the DLY logicator reads '– – – –' but will show the latent delay when the MODE button is pressed.

Delay is expressed in samples, therefore the actual delay time is dependent on the system sample rate.

Dither Pattern Selection - Quad MADI

This feature allows for the addition of noise to Output ports which has the effect of redistributing the noise content of the signal over the whole frequency spectrum – eliminating noise peaks.

The options available are 16, 18, 20 and 24 bit dithering with 3 patterns:

> LSB Rounding
> Rectangular
> Triangular.

Mix Setup

The Current Mix is whichever mix is presently active. The Default Mix is the mix which is selected to automatically configure the console when the system boots up. The Default Mix can be changed from within the Filing Page.

If a Default Mix is either corrupt or invalid, Logic will boot up anyway. However the user is guided by diagnostic information appearing in the Mix Results box. If information in the allocation status message area extends beyond the boundary of the box the softwheel enables scrolling in both directions. When the Default Mix is blank the message 'NO MIX SET UP' is displayed.

➤ Press the MIX SETUP softkey to access the Mix Setup page.
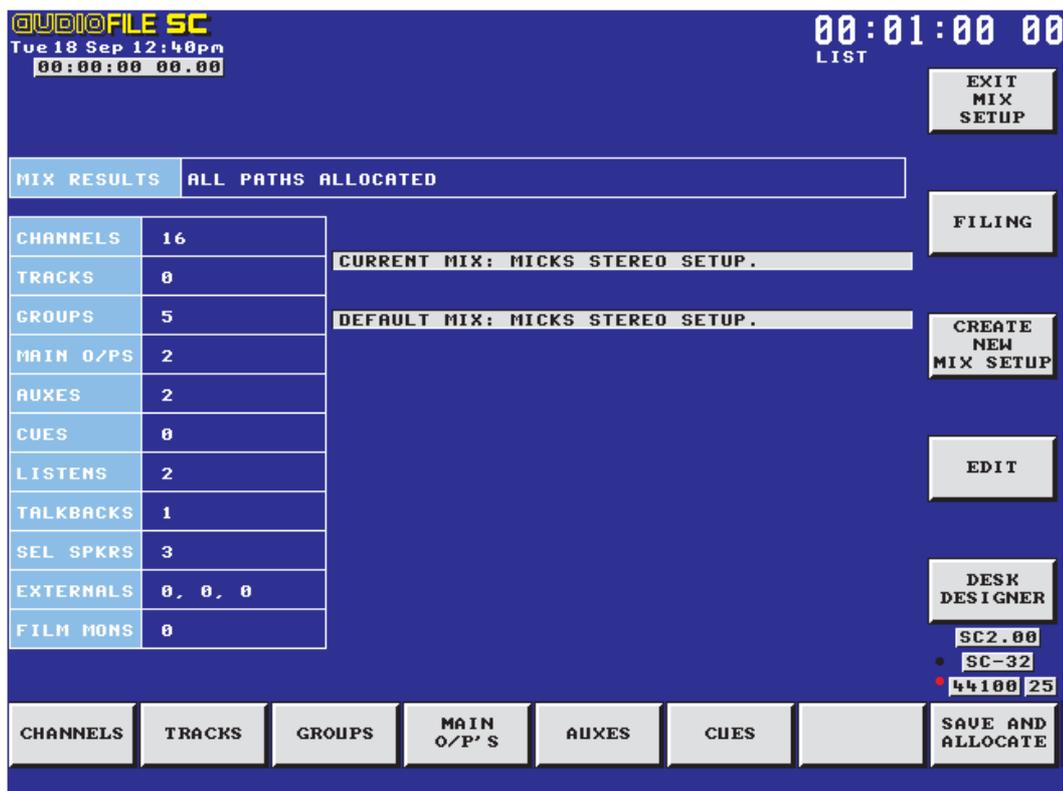
➤ By pressing EDIT and selecting a particular field in the window on the left (with either the softwheel or associated Nudge Keys) the values can be altered.

➤ Use the softkeys at the foot of the Mix Setup page to configure a path type. For instance, the display shown under editing paths will appear when the CHANNELS softkey is pressed.
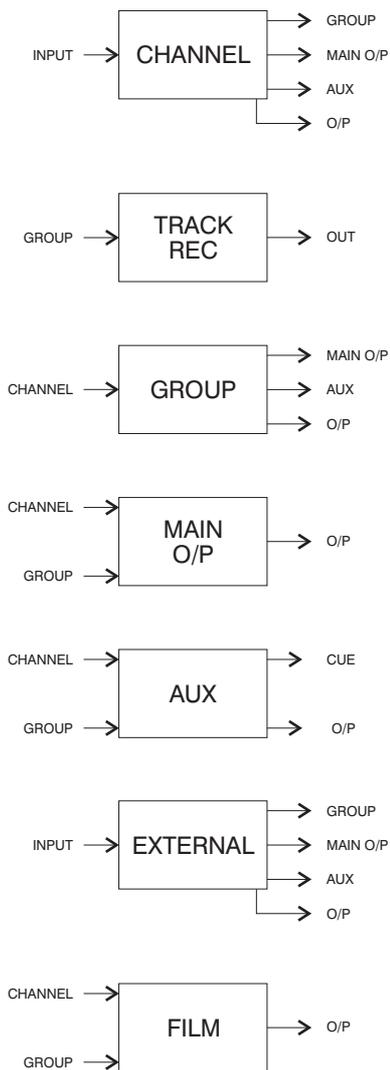
Path Types

CHANNELS – mono/stereo (within processing limits). Provide the main inputs to the console.

TRACKS – mono only. Tracks provide the necessary outputs in the surround sound panning system. Track routing cannot be configured by the user.

GROUPS – mono/stereo. In mono form groups can also be used to provide the necessary outputs in the surround sound panning system. Channels' can be routed to groups which in turn can be routed to main outputs.

MAIN OUTPUT – mono/stereo. Generally the final destination of all inputs and all eligible outputs, i.e. groups and record monitors. Normally routed to a mastering machine in the studio.

AUXES - Auxes are available from channels groups and tracks.

LISTENS – An output bus which enables Logic to provide a comprehensive AFL/PFL system.

TALKBACKS – Provide a talkback system and TONE generator.

SELS – abbreviation of monitor SELect. An output bus routed to the studio monitoring system.

Editing Paths

The display shown below lists up to 8 channels of information at a time. Where more paths exist the softwheel or associated Nudge Keys will scroll across to display further channels.

➤ Press the CHANNELS softkey in the Mix Setup page to access the Channel Edit page.

The names of channels and process paths can be edited by choosing EDIT NAME or EDIT PROCESS from the vertical softkeys.

The left-hand softwheel allows scrolling by character across all path names. To immediately enter the adjacent label box at the first character position, press ENTER on the numeric pad or Qwerty keyboard.

Two softkeys toggle between SHOW PATH NAME and SHOW PATH NUMBER. When SHOW PATH NAME is active the user can assign names to the channels (up to four characters long) by pressing the EDIT NAME softkey and typing an appropriate name into the box displayed at the top of the page. Press SHOW PATH NUMBERS to view the channel numbers.

When EDIT PROCESS is pressed the path names become active. Once a mix setup is loaded these also appear in the console scribble displays.
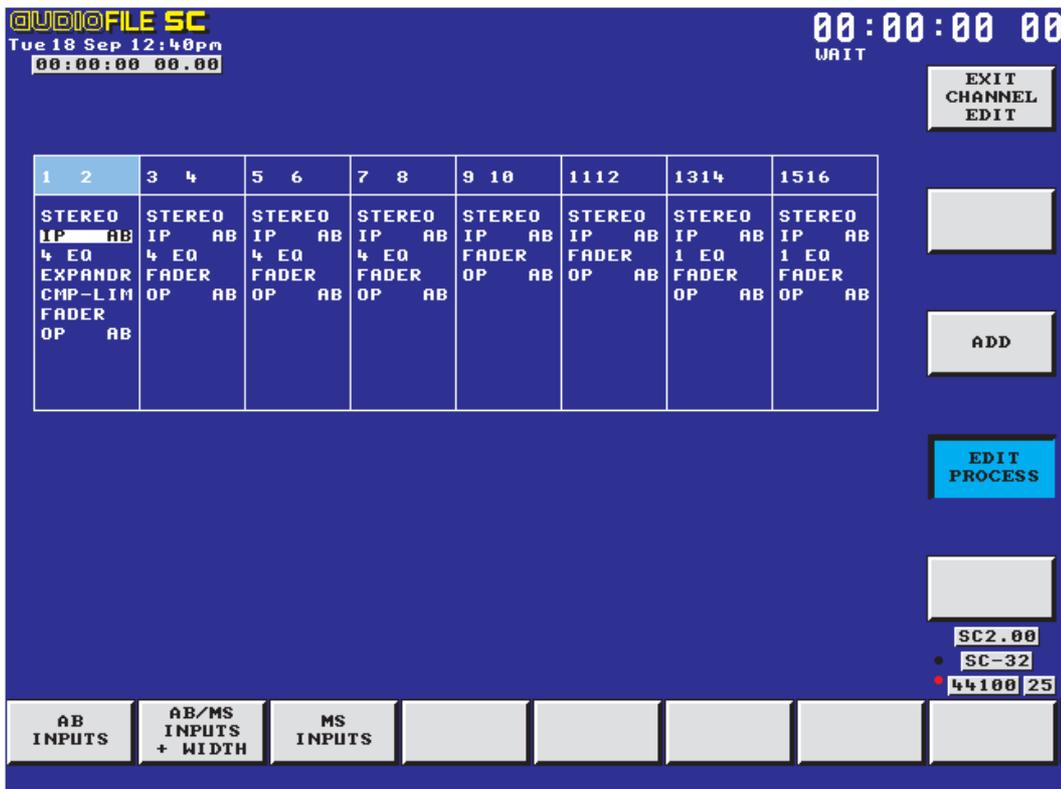
The COPY softkey functions as an ON/OFF switch for the various cut and paste options. A ninth panel labelled PASTE is available as a temporary store for a path of processes allowing mix set–up data to be transferred between channels as shown below.

COPY TO PASTE BOX takes the selected path and deposits it in the PASTE buffer. PASTE INTO CHANNEL copies the contents of the PASTEBOX into the selected path. Similarly PASTE INTO ALL CHANNELS copies the contents of the PASTEBOX into all paths.

Creating a New Path & Editing an Existing Path

When first entering the Channel Edit Page the panel is empty and can be used for creating channels.

➤ Press the EDIT PROCESS softkey and the STEREO and MONO softkeys will appear.

Further selections are now carried out in sequence until the path is finished or the processing capacity is exhausted.

Each selection automatically invokes the next available option.

If Paste window is empty it can be used for adding processing to blank channels by selecting COPY and pasting into a selected channel or all channels (according to which of the two PASTE softkeys is pressed). Whether PASTE INTO CHANNEL or PASTE INTO ALL CHANNELS is selected the channels in question are overwritten.

If the same data is to be entered into a number of channels the COPY TO PASTE BOX softkey can be used to transfer the required process information from the selected channel into the Paste Box. This data can then be copied across to other channels individually or all channels simultaneously.

The PROCESS softwheel allows scrolling up and down the list for revisions and deletions. The first two parameters (stereo/mono input types) are not deletable as they must pre-exist any other selections.

Editing An Existing Path

➤ Press the CHANNEL softkey and then press the EDIT PROCESS softkey.

By rotating the softwheel the list of processes in the current path can be scrolled through to enable adjustments, deletions etc. to be carried out. The horizontal softkeys change function according to the process currently selected. At any stage the CHANNEL softwheel is available to change to another path.

The ADD softkey is available whenever a further process can be added to the path. On pressing ADD a question mark appears in the path beneath the active process. This '?' indicates the position where a new process can be inserted into the path. The horizontal softkeys display the available options (expander, DRC etc.). Further levels of selection (when present) are available from the horizontal softkeys. EQ, FILTER, and DYNAMICS have a second level of parameters (for example 2/4 band EQ) as do Inputs and Outputs when in stereo. Press VIEW PROCESS LIST to get back to the first level again.

Select STEREO or MONO and softkeys are displayed. If stereo is chosen a selection is now invited from the three options available on softkeys AB INPUTS, AB INPUTS + WIDTH or MS INPUTS.

On pressing one of these three softkeys a further choice becomes available. The display now allows the operator to select from the FADER, FILTER, EQ, DYNAMICS, INSERT or OUTPUT fields (other than when editing an existing configuration).
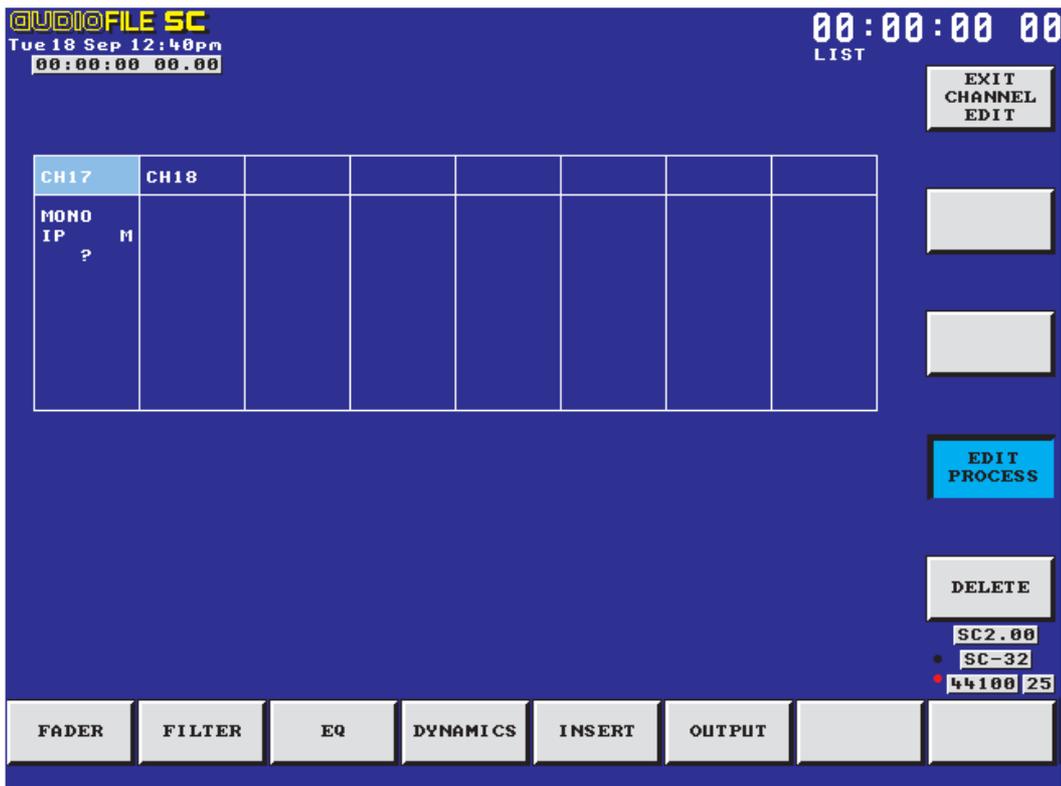
This page enables each channel to be allocated a certain configuration of the six fields named in the softkeys above. The EQ, FILTER and DYNAMICS selections have a further level of parameters which are displayed on their selection.

The **EQ** process offers single, two, three and four band EQ.

The **FILTER** process offers single and two band filters.

The **DYNAMICS** process offers compressor/limiter, expander or gate or DRC.

Save and Allocate

When the SAVE AND ALLOCATE softkey is pressed the current mix setup is saved to hard disk leaving the configuration of the desk unaltered. In effect this key performs a macro sequence that saves the operator from having to press four keys in succession: FILING, SAVE, KEEP and LOAD.

Path Allocation Inhibit

This feature allows a large mix from a large console (i.e. a Logic 2) to be loaded onto a smaller console (i.e. a Logic 1 or 3) by inhibiting paths not considered essential for a project, while at the same time ensuring that essential paths (Mains, SELs etc.) remain completely unaffected.
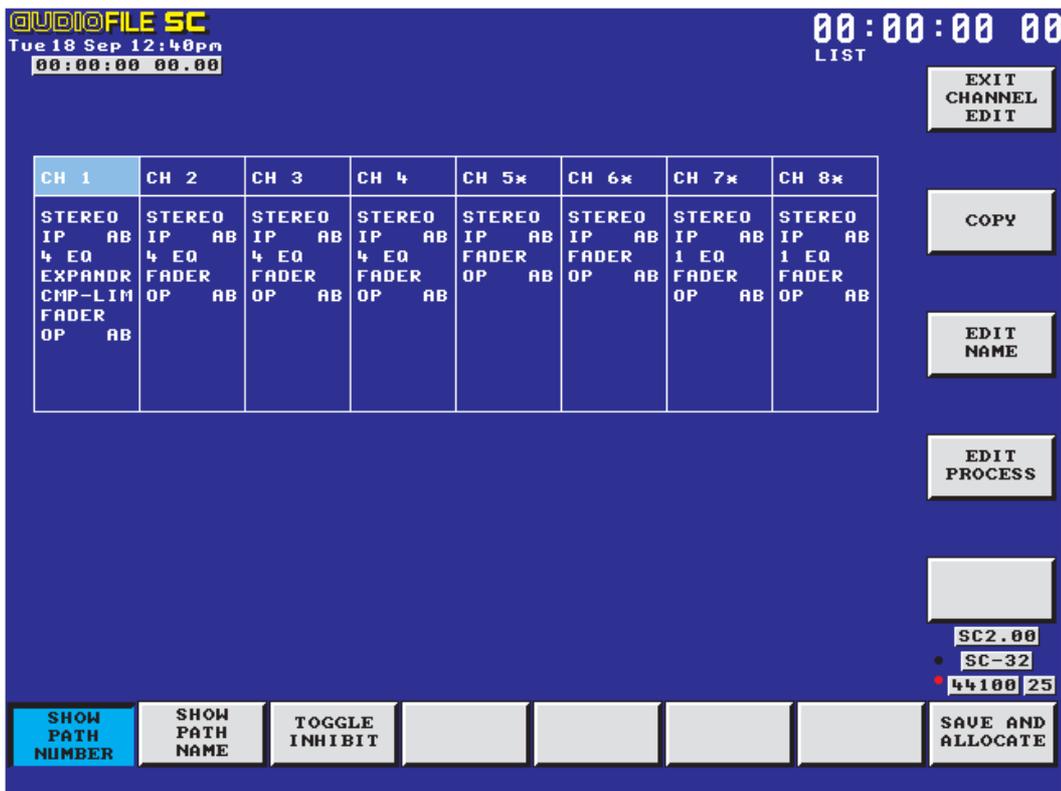
To inhibit a path

➤ Enter the Mix Setup page and press the CHANNELS (or TRACKS, etc.) softkey, then use the left-hand softwheel to scroll across to the required selection, now use the TOGGLE INHIBIT softkey to allocate the inhibit function.

➤ Press the SAVE AND ALLOCATE softkey to confirm selection.

All inhibited channels will be clearly marked with an asterisk (indicating their status) at the top of the processing display (and also in the path selection window of the Desk Designer display).

Display of Uninhibited Paths

Uninhibited paths are placed onto any empty path positions on the Logic 3SC screen.

✍ *Automation on allocated paths (even if subsequently inhibited) is retained.*

✍ *Having completed the mix on a smaller console it can then be re-loaded onto the larger console, where it can be re-assembled.*

Mix Filing

A list of stored mixes is shown in the main screen area. The mix that is being edited is shown in the current mix box.
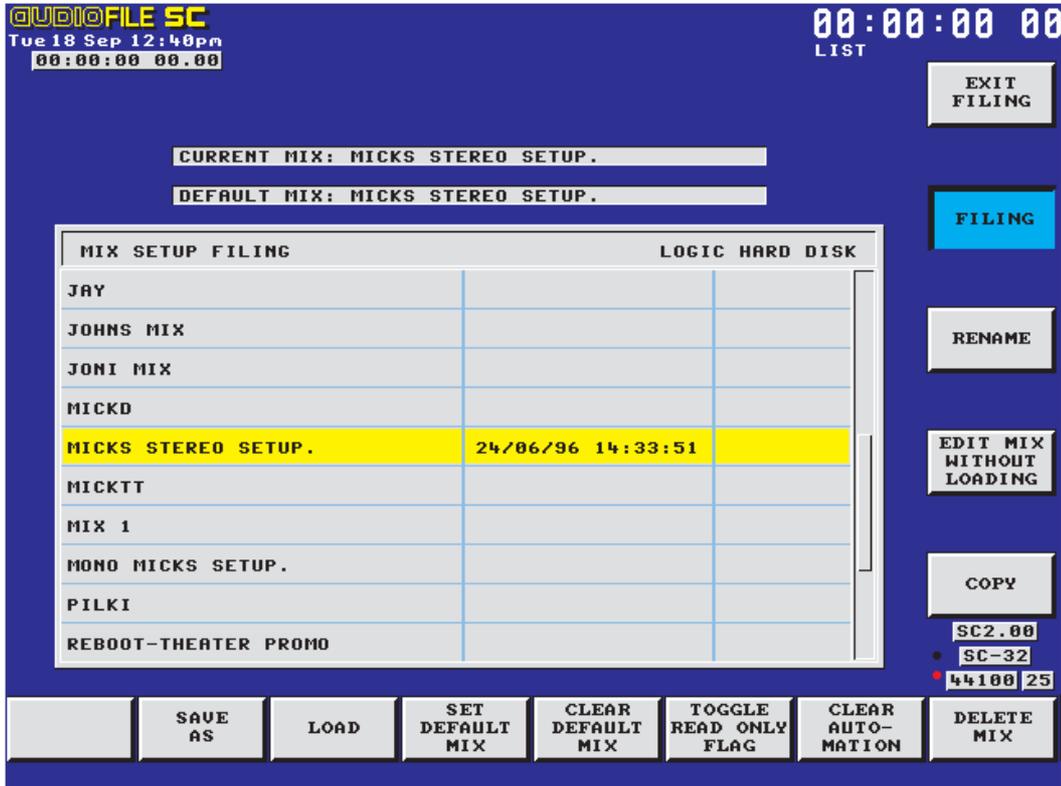
The Default Mix can be changed by scrolling through the list of mix titles and pressing the SET DEFAULT MIX softkey when the required mix is active.

CLEAR DEFAULT MIX boots the system up unconfigured enabling a fresh start.

Pressing the TOGGLE READ ONLY FLAG converts the selected file to one that cannot be overwritten or deleted by the filing system or back to read and write status.

EDIT MIX WITHOUT LOADING will load the selected mix and permits editing without the implementation of the mix on the desk.

To rename mix setups

➤ Select the mix setup using the right-hand softwheel.

➤ Press the RENAME key in the mix setup filing page.

The Rename Logic dialogue box will appear.

➤ Enter the new name using the QWERTY keyboard.

➤ Press the ENTER key.

✍ *The current mix cannot be renamed.*

Read Only

The Filing System implements a READ ONLY flag facility (i.e. the Mix Setup directory is scanned on boot up and any older mix setups with a "READ ONLY" note are converted to use the file attribute).

Turbo Allocation

(IN CONSOLE SETUP MODE)

This feature enables users to add or remove processing modules (live on the console) from existing signal paths.

➤ To access Turbo Allocation press the MENU key on the main Logic page (on the Logic 3SC console screen), then press the TURBO ALLOC softkey.

The screen will then display the processing currently allocated to each channel.
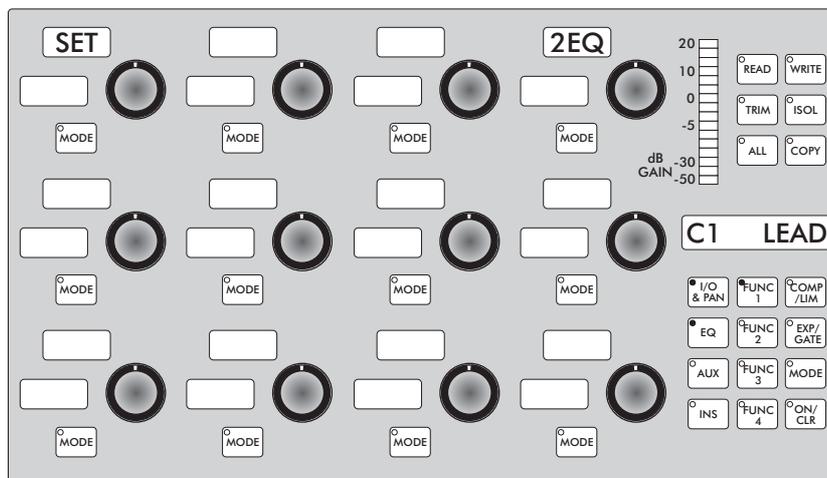
➤ Select the required channel(s) using the path key(s). 'SET' will be displayed in alpha 1 on the AFU.

➤ To then select the type of processing required, press the relevant processing button: EQ, COMP/LIM, GATE/EXP, etc., and the top right-hand Logicator (e.g. to select 1, 2, 3 or 4 bands of EQ).

Additionally 'inserts' are controlled via Logicator 4 on the auxiliaries section (which switches between INS1 and INS2), with alpha 4 displaying the current selection.

➤ Finally press the ON/CLR button (on the EQ panel).

After a few seconds alpha 2 will display "OK" to confirm allocation (or "XXXX" if the number of processing modules the user has attempted to allocate exceeds the maximum number permitted (currently 11).
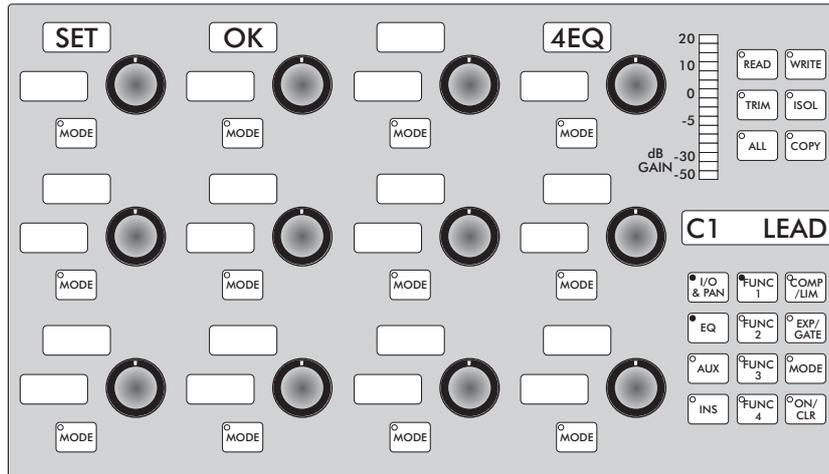
Turbo allocation is then implemented and the desk becomes immediately usable (there is no need to re-allocate).

➤ To remove processing press the ON/CLR button again.
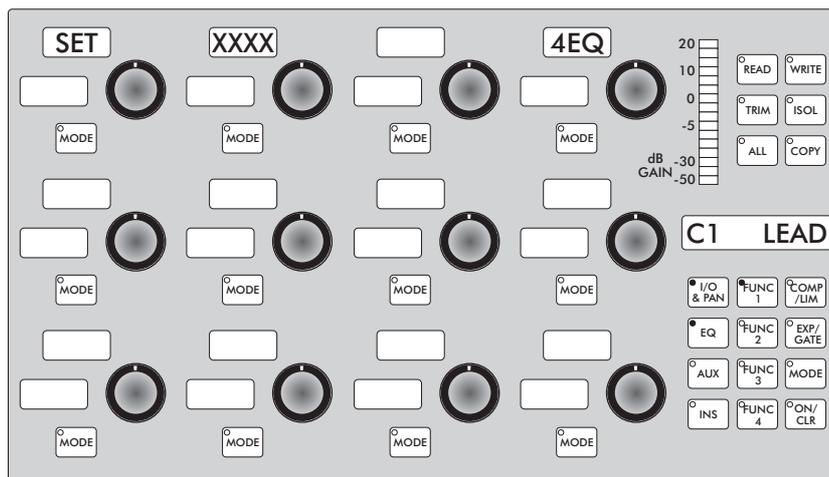
It is possible to monitor changes as they are made from within the appropriate section of the Mix Setup page (e.g. if an expander is added to Channel 3 and the processing structure for Channels 1 - 8 is currently displayed on screen, then the expander will appear in the structure for Channel 3 as it is added).

In Turbo Allocation Mode, presence is indicated by either red or yellow LEDs and absence by green LEDs.

Editing can be executed in both Console Desk Designer (Console Setup Mode) or in the Mix Setup page, but not at the same time (a message will inform users that this is not possible).

When in Console Setup Mode it is possible to enter the Mix Setup page and observe the console layout and processing content, but it is not possible to execute any edits (an on screen message will inform users that this is not possible).

If edits are made in the Mix Setup page it is not possible to enter Console Setup Mode until those edits have been implemented by pressing the SAVE AND ALLOCATE softkey or discarded by exiting Mix Setup.

As described above, there is a soft-limit (11) to the number of process modules which can be allocated and in addition to "XXXX" which will appear on alpha 2, users will also be prompted with "PATH FULL" when this limit is reached.

In Turbo Allocation loss of previous (existing) processing during the procedure is not possible.

Backing-Up Mix Set-Up and Automation Data

This facility provides a complete back-up facility for mix set-ups, Automation files (projects, titles, mixes and passes), I/O configurations etc. (either individually or globally).

To back-up from the Logic hard disk to removable back-up media (i.e. Exabyte, StarNet or Optical Disk), first press the LOGIC AUTMN BACKUP softkey in the main menu. This will then access the Backup & Restore page.
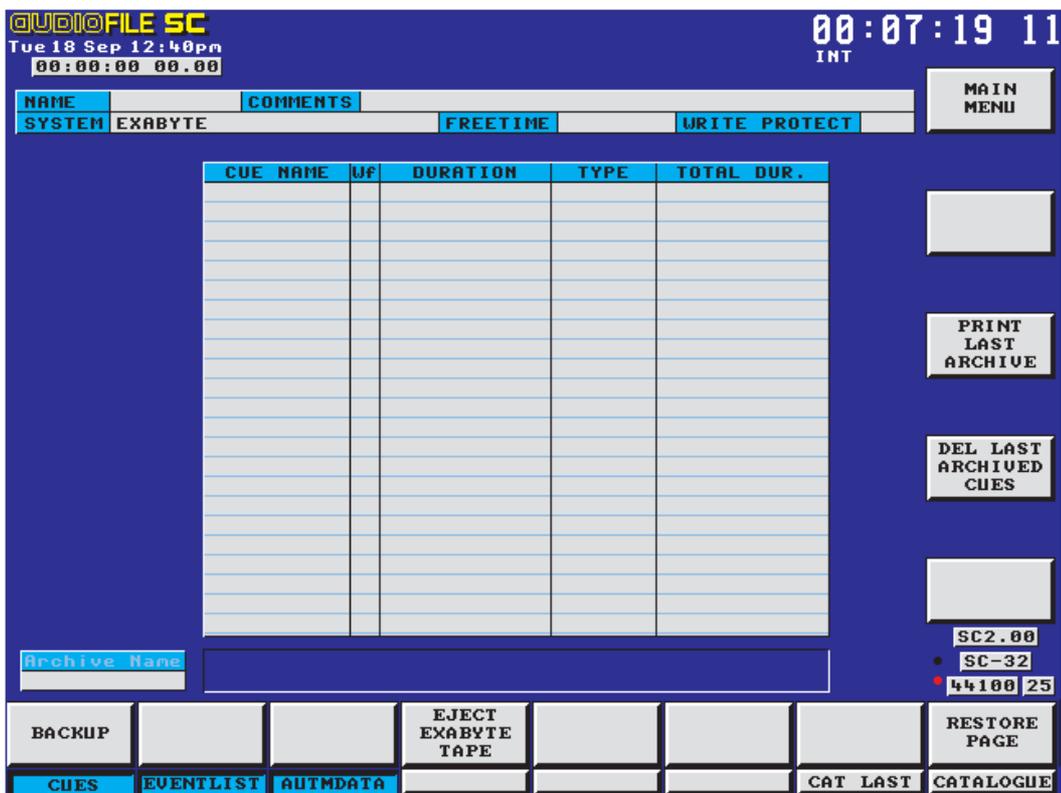
The currently selected back-up medium will be displayed in the top left-hand corner of the Backup & Restore page and the SELECT SYSTEM softkey can be used to toggle between (and therefore select) the required back-up medium.

✍ *Automation floppy backup/restore is not supported on 'S' and 'L3SC' Systems.*

This is an example where a StarNet project is selected.

➤ Press the BACKUP AUTOMAT'N DATA softkey and a series of messages will appear - LOGGING MIX SETUPS, LOGGING AUTOMATION FILES, LOGGING TITLES etc.

These indicate that the system is logging all mix set-ups and automation files on the hard disk.

On completion of the logging procedure the BACKUP SUMMARY will appear on screen (this will show how many mix set-ups and automation files are capable of being tagged for back-up).
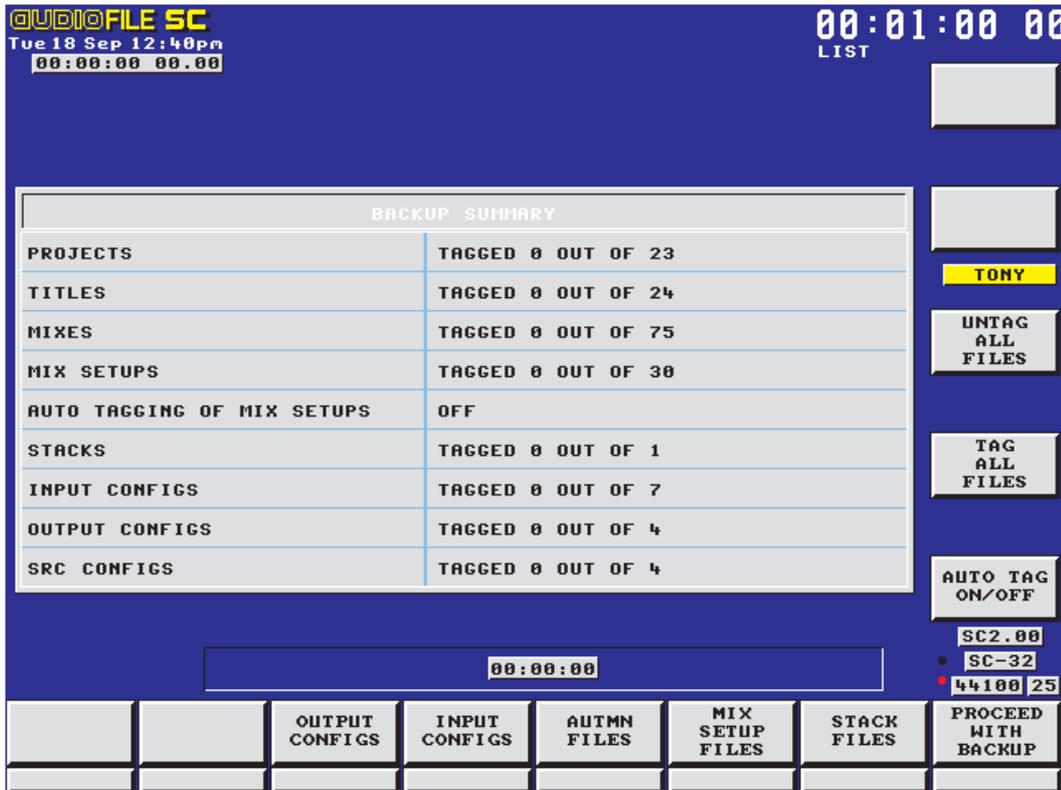
Along the bottom of the screen, the softkeys will display the options available for tagging (e.g. INPUT CONFIGS, AUTMN FILES etc).

➤ Press the relevant softkey to access the filing system (e.g. AUTMN FILES to access automation filing at PROJECT LEVEL, ENTER TITLE to access at MIX LEVEL etc).

➤ To return to the backup page (having first tagged the desired Project, Title, Mix etc) press the AUTMN FILES softkey.

It will then be possible to see which files have been tagged for back-up.

➤ To complete the process, press the PROCEED WITH BACKUP softkey.

✍ *To exit at any level (without performing a back-up) press the SAFE EXIT key.*

➤ Press the LOGIC AUTMN BACKUP softkey, then verify what is to be backed-up (ie. Automation or Cues).

➤ Press the Backup key.

A prompt will appear asking for the user to enter a name.

➤ Enter a name using the QWERTY keyboard and press the ENTER key.

A prompt will appear informing the user of the length of time the backup will take.

➤ Press either the QUIT or CONTINUE softkey as desired.

Hard Disk Space (buffer zone)

Logic requires a minimum of 7% free disk space to execute a backup - if the disk becomes over full (i.e. it reaches or exceeds the safe level) a message box will appear informing the user that any edits will be lost when any Logic page is entered.

✍ *This affects all Logic pages and automation passes.*

Restoring Mix Set-Up & Automation Data

To restore mix set-up or automation data

➤ Press the LOGIC AUTMN BACKUP softkey in the Logic main menu page, which will access the Backup & Restore page.

The top left-hand corner of the display will show the current selected medium (i.e. Exabyte or optical disk).

➤ Use the SELECT SYSTEM softkey to toggle between (and select) the required restore medium, then press the RESTORE PAGE softkey to start a search of its contents.

Having completed the search, a display will appear listing the contents (i.e. Job Name, Comments, Cue name, duration etc).

Depending on the type of media being used, the screen will display one of two windows. In both cases the users is required to provide a name, but when using media other than floppy disks, the user is also required to complete the comments section.

➤ Press the LOGIC AUTMN BACKUP softkey, then press the relevant softkey to restore CUES, EVENT LIST and AUTOMATION.

➤ Now press the RESTORE softkey and select the job for restoration using the left hand softwheel.

➤ Tag the desired job using the AUTOMATION DATA softkey.

The selected job will appear in the Restore Box.

➤ When the selection has been made, press the RESTORE softkey.

A prompt will appear informing the user of the length of time the restore process will take.

➤ Press the QUIT RESTORE or START RESTORE softkey as desired.

The Backup Summary page will now appear, displaying mix set-up and automation data (press the MIX SETUP FILES softkey to view the contents).

➤ To tag or untag individual elements within the list, use the left-hand softwheel to scroll through the contents and the TAG MIX SETUP/UNTAG MIX SETUP softkeys to select or de-select.

➤ Having made a selection, press the PROCEED WITH RESTORE softkey.

The following prompt will appear "ARE YOU SURE", press "Y" to confirm selection.

To use restored data, access the MIX SETUP FILING page in the usual way.

✍ *To obtain a display of the mix set-up directory press the LOGIC FILE BACKUP softkey.*

✍ *To restore under a new name press the RENAME softkey and enter a new name in the box provided for that purpose (via the QWERTY keyboard).*

Logic File Backup

This provides an alternative backup facility for users who are not employing an Exabyte/optical disk with their Logic console.

It also allows users to restore data created prior to the introduction of the LOGIC AUTOMATION BACKUP facility.

In addition it provides a diagnostics function with BACKUP REPORT DUMPS, which allows the transfer of engineering reports onto floppy disk and in the unlikely event that a user experiences problems this can be sent to AMS Neve for analysis.

➤ To access this facility, press the LOGIC FILE BACKUP softkey on the main menu and insert an AMS Neve formatted 3.5" floppy disk into the drive.
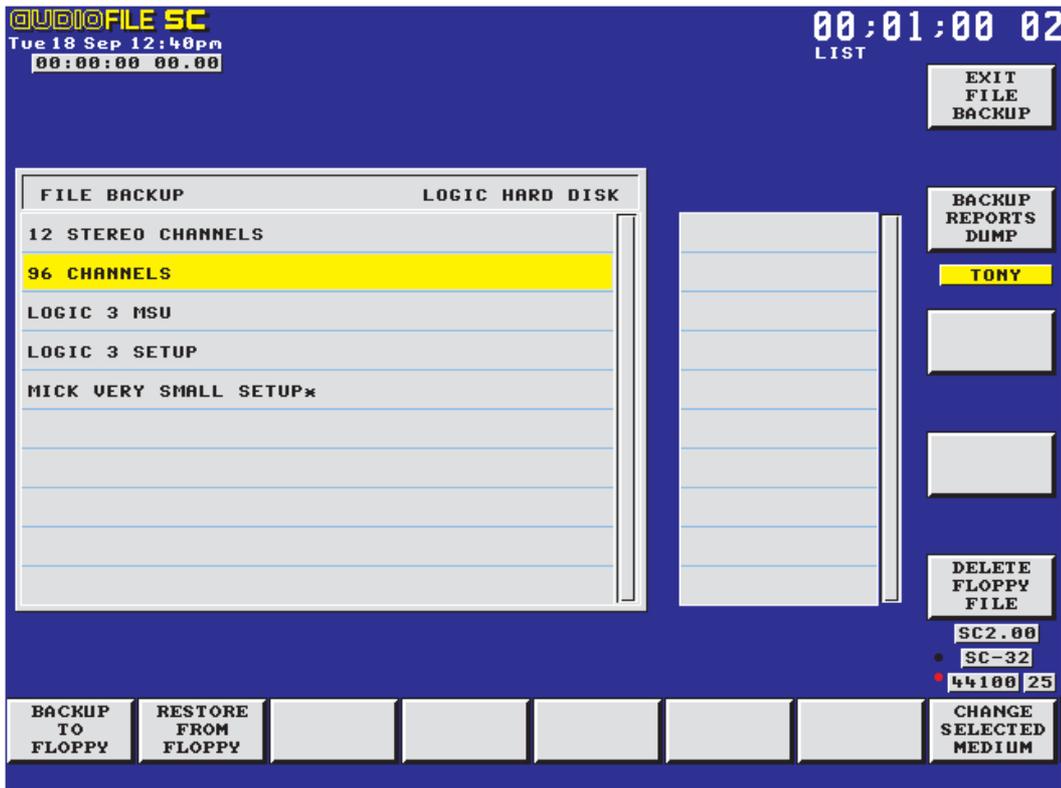
Files can then be backed-up or restored using the appropriate softkeys provided for this purpose with scroll bars displayed in the window to enable easy selection of files for backup/restore.

Two windows will be displayed on screen, one for the Logic hard disk and one for the floppy disk, the CHANGE SELECTED MEDIUM softkey allows users to toggle between the two windows with the current selection always highlighted.

When backing-up files, the backup can be named manually by entering up to eight characters in the box that appears for that purpose or automatically (i.e. when no name is typed into the box a default tittle is created e.g. BAK1.TRE). A user defined name is automatically given the extension .TRE (therefore this should not be typed).

✍ *When using floppies for backup it is recommended that new (i.e. unused) disks are used for storing information.*

✍ *Depending on the amount of data being backed-up, users may require a number of floppies.*

Select Sync Source

SELECT SYNC SOURCE (on Sync Select Main Page) is self-explanatory and provides access to the page shown below. Select the desired sync source with the left-hand softwheel or associated Nudge Keys and press ENTER. Where syncing does not take place according to the option selected, the mode reverts to internal.

SET VARISPEED LIMIT allows the user to set the UPPER varispeed limit for the system sample rate and provides maximum processing resources. Use the left-hand softwheel to scroll through the options available. If varispeed is required it is advisable to set the maximum limit at the start of the session by pressing ENTER after selection - this will re-allocate the console.

VARISPEED is controlled (within the limits set) using the left hand softwheel.
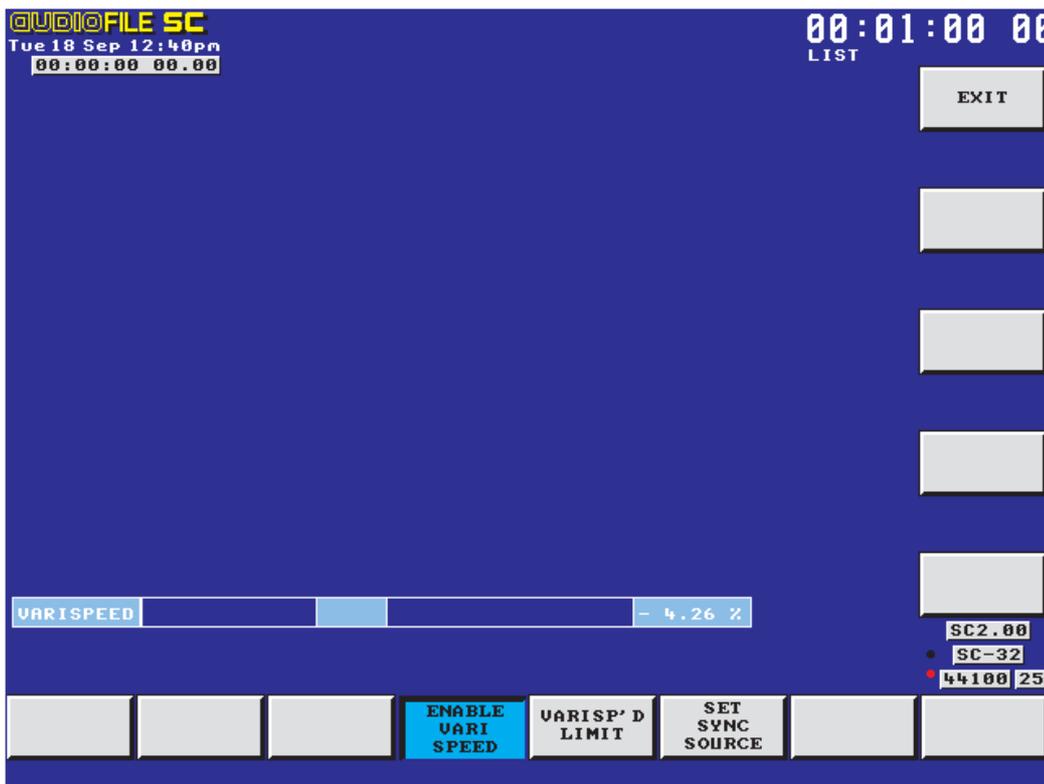
Defaults

Defaults enables various system options to be established.

➤ Press DEFAULTS from the opening display to access the first DEFAULTS page.
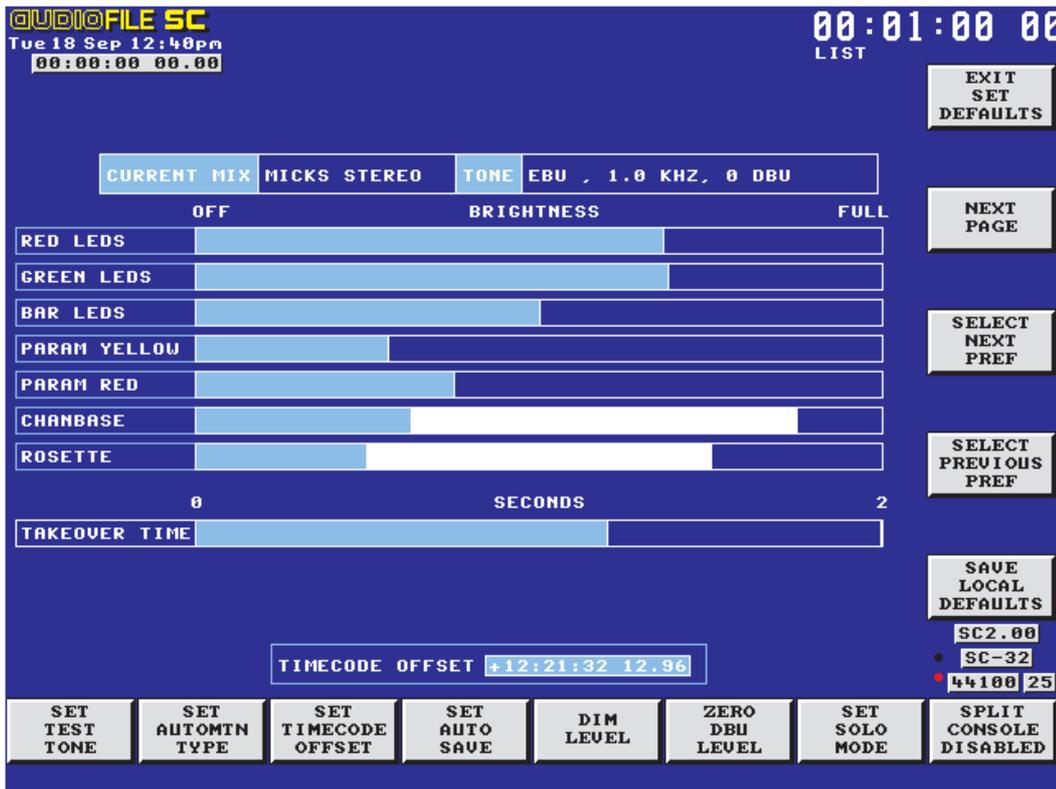
LED Settings

LED settings can be optimised and saved as part of the mix set–up data.

Seven bars will be displayed, representing the categories of LEDs that can be adjusted.

Except for CHANBASE and ROSETTE which are adjusted using the left–hand softwheel to darken and the right–hand softwheel to brighten.

When each of the parameters has been selected, the setting is saved by pressing SAVE LOCAL DEFAULTS, the current mix set will then include that data.

Takeover Time

An eighth bar enables the user to set the time taken to interpolate between two modes (e.g. when the operator is WRITING information to a mix in autotakeover mode and then releases the control to enter READ, the LED configuration alters to indicate this change). The time taken by *Logic* to interpolate between modes is measured in seconds and can be set from a minimum of zero to a maximum of two.

To select preferences use the two softkeys labelled SELECT PREVIOUS PREF and SELECT NEXT PREF, the current selection will be highlighted.

Once a selection has been made, the left–hand softwheel can be used to adjust the level of brightness required, rotating clockwise increasing the intensity and anti-clockwise to reduce it.

Set Test Tone

A test tone can be selected with the SET TEST TONE softkey which displays a window as shown below.
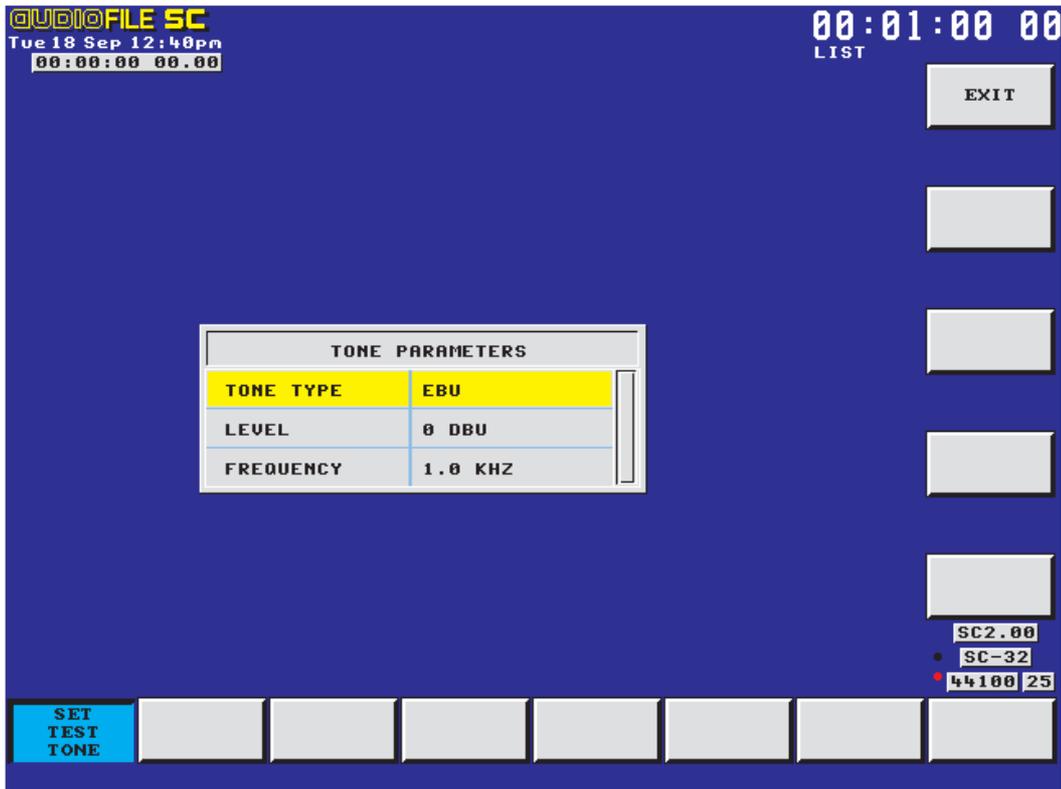
➤ To make a selection from the four options use the left-hand softwheel and press the ENTER key to confirm the choice.

➤ To interrogate the current test tone press the SET TEST TONE softkey to view. Press the softkey again to cancel the window.

The sample rate is set during bootup and determined by AudioFile.

Set Automation Type

The SET AUTOMTN TYPE softkey enables Dynamic automation to be selected.

```
@UDIOFILE SC                                    00:01:00 00
Tue 18 Sep 12:40pm                              LIST
   00:00:00 00.00
                                                        EXIT
                                                        SET
                                                      DEFAULTS

         CURRENT MIX MICKS STEREO   TONE EBU , 1.0 KHZ, 0 DBU
             OFF            BRIGHTNESS              FULL       NEXT
  RED LEDS                                                    PAGE
  GREEN LEDS
  BAR LEDS
  PARAM YELLOW        SELECT AUTOMATION TYPE                 SELECT
                                                             NEXT
  PARAM RED           DYNAMIC                                PREF
  CHANBASE
  ROSETTE             THEATRE
                                                            SELECT
         0              SECONDS              2             PREVIOUS
  TAKEOVER TIME                                              PREF

                                                            SAVE
                                                            LOCAL
                                                          DEFAULTS
                                                           SC2.00
                                                         • SC-32
             TIMECODE OFFSET +12:21:32 12.96              • 44100 25
  SET      SET      SET      SET     DIM    ZERO    SET    SPLIT
  TEST    AUTOMTN TIMECODE   AUTO   LEVEL   DBU    SOLO  CONSOLE
  TONE     TYPE   OFFSET     SAVE          LEVEL   MODE  DISABLED
```

Set Timecode Offset

A Timecode offset for a complete automation mix can be entered by pressing the SET TIMECODE OFFSET softkey and entering the desired offset in the displayed box using the keyboard.

Set Auto Save

SET AUTO SAVE enables the Autosave function for Multiple Mix Passes.

Dim Level

Allows users to select the value that the output will be cut to when the DIM key on the master quadstrip is pressed.
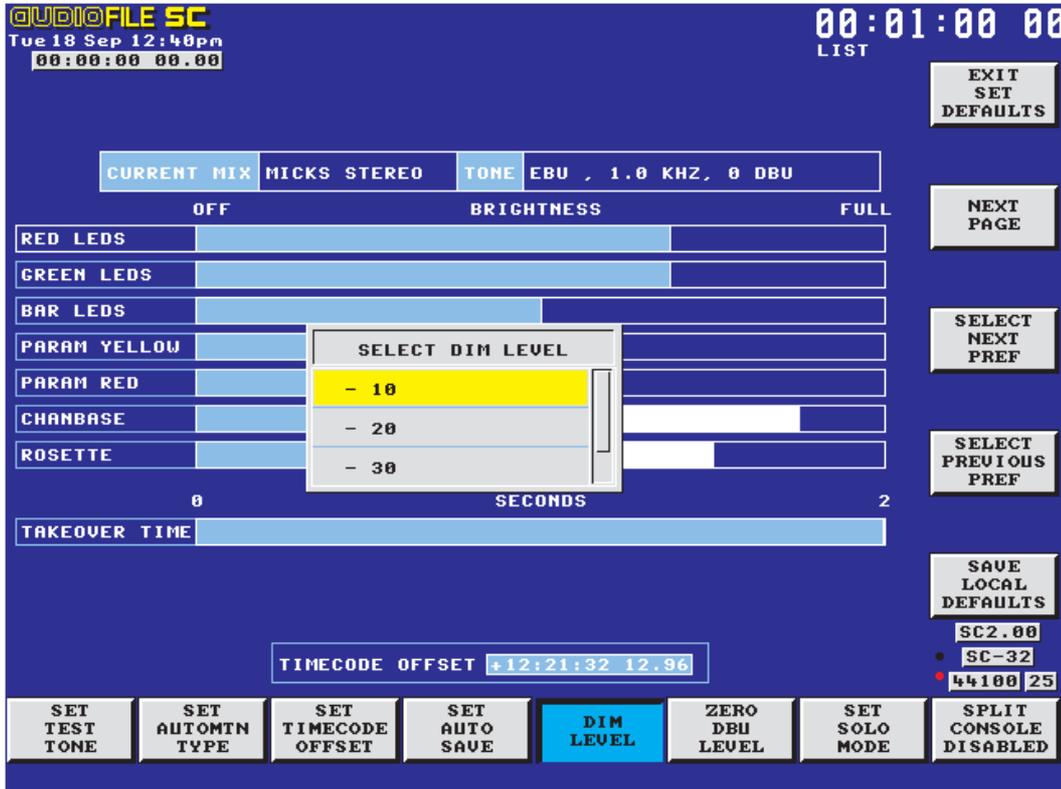
The user can select the DIM LEVEL from the range of values –10dB, –20dB, –30dB or –40dB.

Zero Dbu Level

This feature allows the system to operate with a digital headroom of anywhere between 8dBu and 30dBu in 1dBu steps, the default is 18dBu.
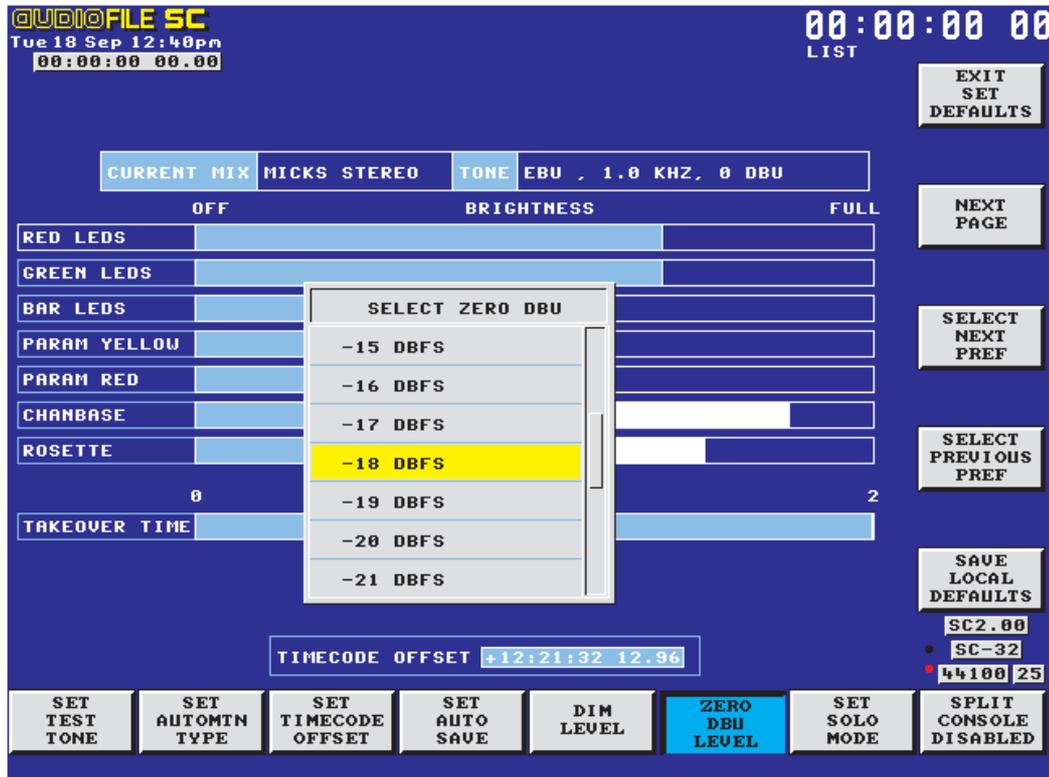
Changing the operating level produces a corresponding change in PPM and VU meter sensitivity (and in the level of the console tone generator at any given setting). The console dynamic processing threshold levels are also altered accordingly.

To Set The Zero dBu Level

➤ Press the DEFAULTS softkey, then press the ZERO DBU LEVEL softkey.

➤ Scroll through the options using the left–hand softwheel and select the level required. To confirm selection press the ENTER key then the SAVE LOCAL DEFAULTS softkey and finally the EXIT SET DEFAULTS softkey.

The selection made will now represent 0dBu.

✎ *0dBu = 18dBuFs. The levels are expressed in dBFS because the only useful reference point for digital signals is full modulation of the digital signal path (similar to defining 0.775v rms as 0dBu).*

The choice of operating level is primarily a question of the headroom preferred for a particular application. However the need to interface with external equipment with operating levels that cannot be adjusted can also determine operating levels. Both operating levels and ADC/DAC scaling can be matched so that the console is consistent with external devices in those circumstances. Having set the operating level the PPM and VU meters read zero (as marked on the meter scale) when a signal at the operating level is present.

The console tone generator will produce a signal at the operating level when set to 0dB and dynamics thresholds will be at the operating level when set to 0dB.

This will be sufficient for all digital interfacing but the utility only sets the operating level within the digital domain, therefore further adjustments may be required to ADCs and DACs to set the desired operating level in the analogue domain.

When setting ADCs and DACs the important parameters are the scaling of the conversion and the maximum analogue signal level (or clip level) which the converters are capable of producing or accepting before clipping.

Setting the analogue clip level on AMS/Neve converters as described, will simultaneously scale the convertor so that the clip level corresponds to full digital modulation (therefore optimising performance).

For 16-bit converters, the clip level may be set between +16 and +24dBu, and for 20-bit between +16 and +26dBu in 2dB steps.

Examples

**1+18dBu analogue clip level,
18dB nominal headroom (EBU standard).**

ADC clip level: +18dBu (Factory standard)

DAC clip level: +18dBu (Factory standard)

Console 0dB reference: set to -18dBFS

Meter zero: 0dBu

0dB tone level   0dBu

**2+22dBu analogue clip level,
20dB nominal headroom.**

ADC clip level: set to +22dBu

DAC clip level: set to +22dBu

Console 0dB reference: set to -20dBFS

Meter zero: +2dBu

0dB tone level   +2dBu

**3+24dBu analogue clip level,
20dB nominal headroom. (Sony/US convention)**

ADC clip level: set to +24dBu

DAC clip level: set to +24dBu

Console 0dB reference: set to -20dBFS

Meter zero: +4dBu

0dB tone level   +4dBu

Set Solo Mode

The SET SOLO MODE softkey allows the user to select from three modes of operation with respect to Solo mode:
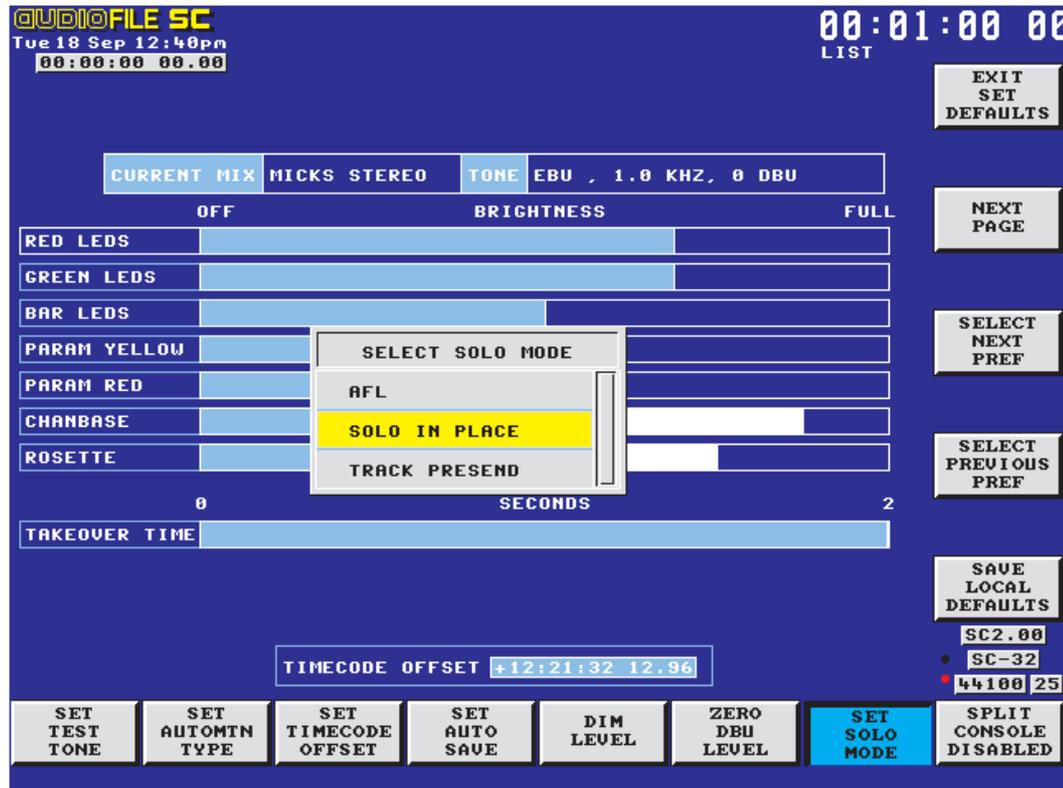
1) AFL (After Fader Listen) mode routes selected SOLOs to a listen bus and routes this to the Control Room monitors. All other signals are still present in the desk but are not audible.

2) SOLO IN PLACE cuts all routing (including aux sends and direct pre/post sends) except where SOLO has been selected.

3) SOLO IN PLACE TRACK PRESEND cuts all routing except where SOLO has been selected but track mon aux pre sends are not cut.

✍ *Main output and auxes are immune from the effects of CUT/SOLO. Any signal can be made immune by use of the SOLO INHIBIT button on the signal strip. Groups should be protected in this way.*

Defaults Page 2

A second page of defaults is accessed by pressing the NEXT PAGE softkey.
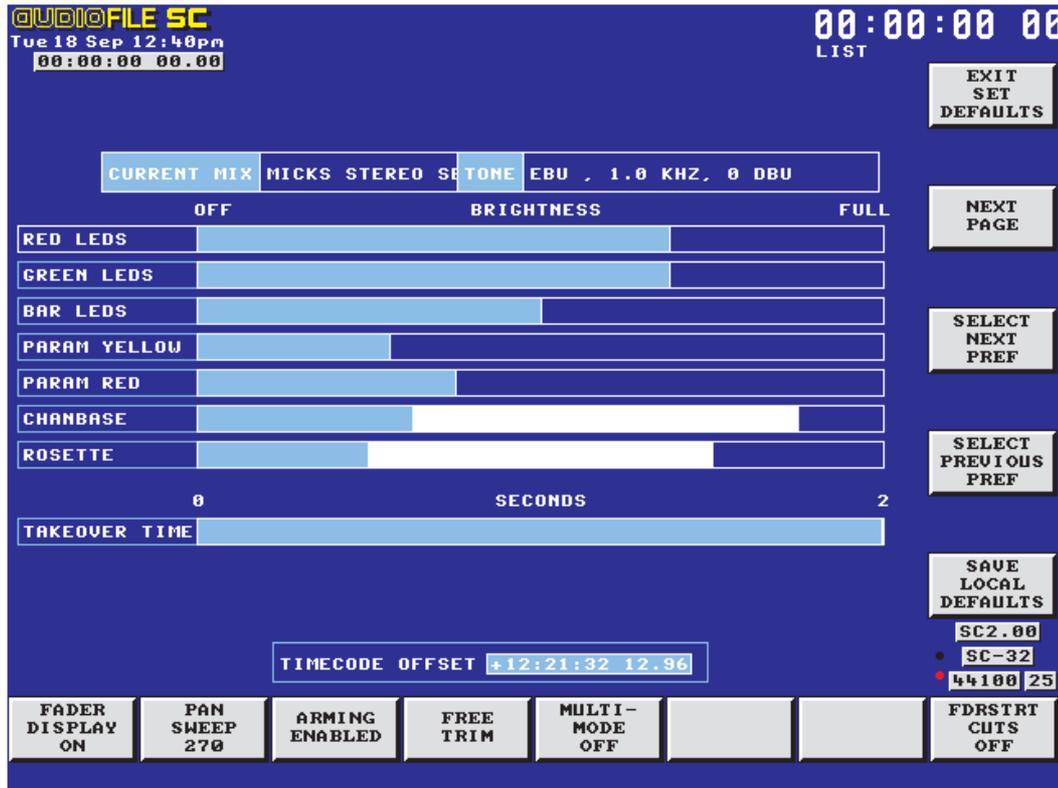
Fader Display On/Off

This feature enables users to disable the Fader Level Display, allowing the path name to remain indicated even when a fader is touched.

To access Fader Level Display Inhibit from the main Logic page (on AudioFile)

➤ Press the DEFAULTS softkey (which will bring up the first default page) then press the NEXT PAGE softkey.

➤ To activate/deactivate, toggle the FADER DISPLAY OFF/ON softkey.

➤ Finally press the SAVE LOCAL DEFAULTS softkey then the EXIT TO MAIN softkey.

The fader displays will now be on/off as selected.

Pan Sweep

This feature allows the end-to-end travel of Pan Logicators to be reduced from 270 degrees to 180 degrees, for easier fast or long pans.

To access Selectable Pan Logicator Travel from the main Logic page

➤ Press the DEFAULTS softkey (which will bring up the first default page) then press the NEXT PAGE softkey.

➤ To activate, toggle the PAN SWEEP softkey from 270 to 180 and press the SAVE LOCAL DEFAULTS softkey, then the EXIT SET DEFAULTS softkey.

The system's Pan Logicators end-to-end travel will now be 180 (use the same procedure to return to 270 degrees).

Arming Disable

This feature enables users to disable the Automation Arming feature, allowing bi-directional Automation Mode selection (i.e. ALL+WRITE or WRITE+ALL).

To access the Automation Arming Disable from the main Logic page

➤ Press the DEFAULTS softkey (this will bring up the first default page) then press the NEXT PAGE softkey.

➤ To activate/deactivate, toggle the ARMING ENABLED/DISABLED softkey.

➤ Finally press the SAVE LOCAL DEFAULT softkey, then the EXIT TO MAIN softkey.

The Automation Arming feature will now be enabled or disabled as selected.

Free/Centre Fader Trim

This feature enables the Fader Trim to operate with a fixed centre null position (e.g. when a fader is put into Trim mode it will move to the centre of the travel and relative trim can then be added from the centre null position).

To access Centre Fader Trim from the main Logic page

➤ Press the DEFAULTS softkey (this will bring up the first default page) then press the NEXT PAGE softkey.

➤ To activate Centre Fader trim, toggle the CENTRE TRIM/FREE TRIM softkey.

➤ Finally press the SAVE LOCAL DEFAULTS softkey then the EXIT TO MAIN softkey.

Multi Mode Automation

This feature enables each control on the console to operate in any of the three Automation Touch Modes (e.g. TOUCH INHIBIT, TAKEOVER or AUTOTAKE) regardless of the touch modes of other controls.

To access Multi Mode Automation from the main Logic page (on AudioFile)

➤ Press the DEFAULTS softkey (which will bring up the first default page) then press the NEXT PAGE softkey.

➤ To activate the Multi Mode function, toggle the MULTI MODE ON/OFF softkey to ON.

➤ Finally press the SAVE LOCAL DEFAULTS softkey then the EXIT TO MAIN softkey.

The system will now operate in multi mode automation.

✍ *The touch mode for each control will be taken from the global touch mode in force when the control is put into WRITE.*

Fader Start Cuts

The FDRSTRT CUTS ON/OFF softkey allows users to enable/disable the relay box to recognise if the fader is cut or not.

The button toggles between the two states.

✎ *Only applies to consoles with a relay box.*

Defaults Page 3

A third page of defaults is accessed by pressing the NEXT PAGE softkey.

➤ To access the page from the main Logic page, press the DEFAULTS softkey and press the NEXT PAGE softkey twice.
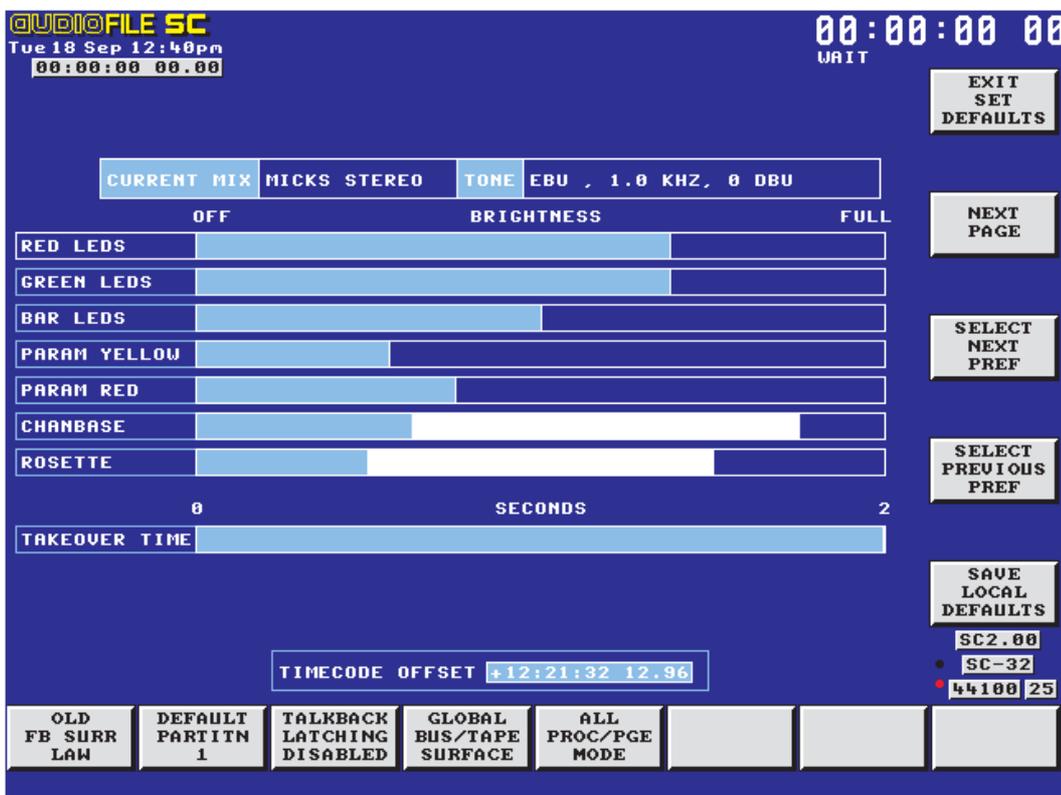
Fb Surround Law

The OLD/NEW FB SURR LAW softkey allows users to select OLD (i.e. pre 1.7 release) or NEW front back surround law.

The button is used to toggle between the two states.

✎ *The default state is Old.*

Talkback Latching

ENABLED (i.e. latched) - if the TBK key in the Talkback panel is pressed once it will be selected, if pressed again it will be deselected.

✎ *If pressed and held down it is also activated but when released it will not be latched.*

DISABLED - the TBK key must be pressed and held to activate.

The button is used to toggle between the two states.

All Process/Page Change

Three options are provided for all-process/page operation (i.e. OLD, UNIVERSAL and INTELLIGENT).
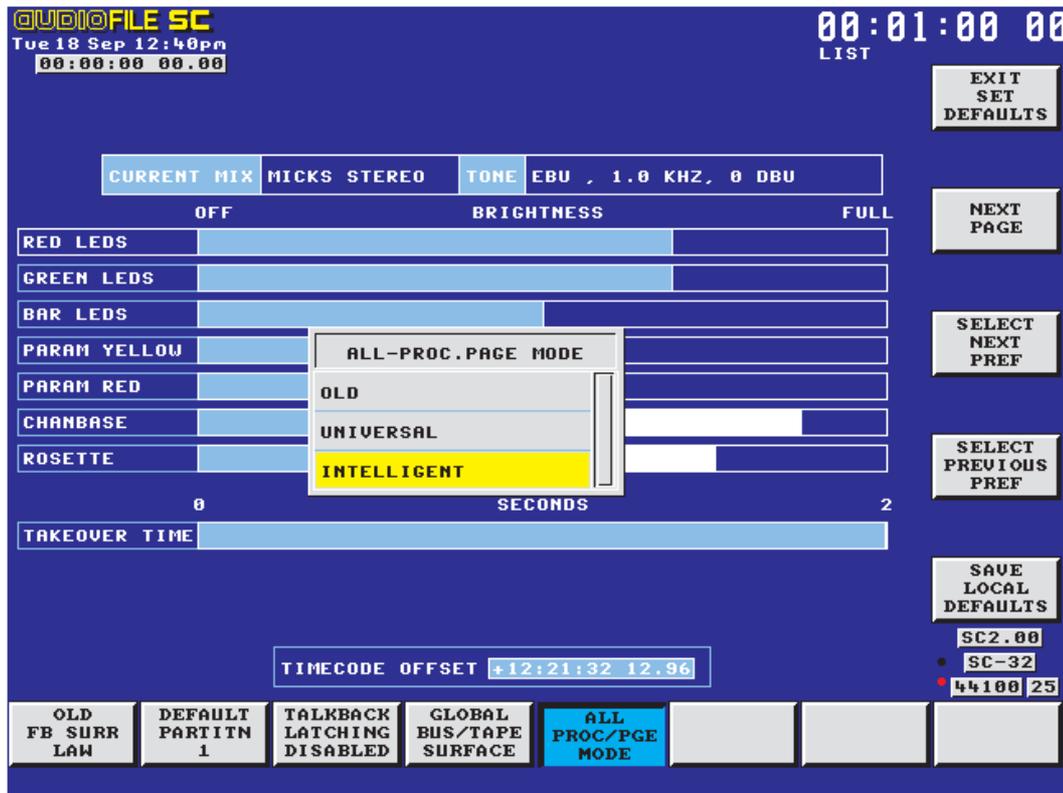
OLD

Only affects the current layer.

✍ *If no input is selected the layer is not affected.*

UNIVERSAL

This changes process and page on all channel strips universally (blanking panels that have no process of the chosen type).

To affect all paths on the top layer

➤ Press Channel all and proc/page.

To affect paths on all layers

➤ Press Master all and proc/page.

✍ *It will not change proc/page on paths that do not have the chosen process.*

To affect all paths on the top layer.

➤ Press Channel all and proc/page.

To affect paths on all layers.

➤ Press Master all and proc/page.

To access any of the three options from the main Logic page

➤ Press the DEFAULTS key.

➤ Press the NEXT PAGE key twice.

➤ Press the ALL PROC/PAGE MODE key.

Use the left-hand Softwheel to scroll though the three options.

➤ Press the ENTER key to confirm selection.

Feet And Frames

Timecode can be expressed in feet and frames in Logic automation pages if AudioFile (S Systems onwards) is set to feet and frames.

To select Feet and Frames in AudioFile (from Logic)

➤ Press the LOGIC Hardkey.

The Main AudioFile page will appear.

➤ Press the DEFAULTS key.

The Main defaults page will appear.

➤ Toggle the USER/DISPLAY/MACHINE key to USER.

The user defaults page will appear.

➤ Use the left-hand Softwheel or associated <> keys to select Timecode/Feet and Frames display type.

➤ Use the right-hand Softwheel or associated <> keys to select the type desired.

16mm 24 - 16mm 25

35mm 24 - 35mm 25

➤ Press the SAVE DEFAULTS key.

➤ Press the EXIT key.

➤ Press the LOGIC key.

The Main Logic page will appear.

Summary of Facilities

The Path Status Display

The large colour TFT screen on the console shows routing status, pan and fader levels for all paths within the console.

Channels above channel 16 appear on a second, third and fourth page (accessed by pressing the **PAGE** button at the bottom left–hand corner of the display).

Starting from the bottom of the screen a channel display consists of:

❏ the channel number

❏ the channel name and CUT status (red highlight when CUT)

❏ an allocated channel signal processing list (EQ/DYN/INSERT)

❏ a graphical representation of the channel fader position. Stereo channels are shown with a double 'slot' and the fader 'knobs' are colour–filled to reflect their automation status.

❏ a display of the channel routing to MAIN (LEFT and RIGHT), GROUPS and AUXILIARIES

The group status displays are similar to channel displays except for the group routing indication.

Stereo Group metering appears with the A and B leg on either side of the fader graphic. Mono groups have the meter to the *left* of the fader graphic.

The Auxiliaries and Main output are similar, but have no routing display.

Channel–To–Main and Group–To–Main Routing

➤ Press and hold a destination path key (the softkeys of paths routed to it will then be illuminated Red).

Then route or de–route by toggling them.

➤ Press and hold a source path softkey to see its current routing status (wherever it is routed the path keys illuminate Red).

This action will also bring up that path to the AFP (see below). Panning and Routing to groups is affected by group Pan–type, as set on the group input page (see below).

If a mono channel is routed to a mono M–pan group, the pre–pan signal is routed.

If a mono channel is routed to a mono L or R–pan group, only the post–pan Left or Right signal is routed.

If a mono channel is routed to a stereo group, the post–pan Left and Right signals are routed to the group Left and Right respectively.

If a stereo channel is routed to a mono M–pan group, a post–bal mix of the Left and Right signals is routed.

If a stereo channel is routed to a mono L or R–pan group, only the post–bal Left or Right leg is routed.

If a stereo channel is routed to a stereo group, the post–bal Left and Right signals are routed to the group Left and Right respectively.

Assignment Of Paths To Faders

The eight fader strips allow control of any eight paths in the console (as selected by the operator using the fader assignment keys immediately to the left of the faders). In this way pressing the 9 button brings channels 9-16 under the eight faders from left to right. The A/B/C/D buttons provide four programmable assignment configurations (set up using the STORE button). To do this press and hold STORE and press A, B, C, or D to store the current assignment to that button.

Pressing and holding the fader CALL button (at any time) then pressing a path softkey will immediately bring that path under the fader (and calls that path to the assign panel).

An assignment may be locked in place using the LOCK button (when activated the assignment for that fader cannot be changed). LOCK is a toggle–action button.

Pressing CALL+LOCK locks that strip into Call mode (assignments to it can be made by simply pressing path softkeys).

In all cases, the current assignment for each fader is shown on its own alpha display immediately below the PAN control.
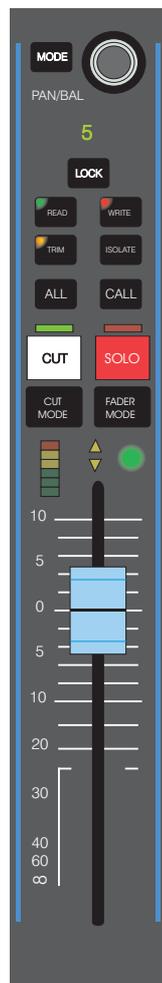
Pfl, Solo, and Local Cut

Solo–in–place is provided via the SOLO button when paths are called to a fader strip.

A local cut button is provided in addition to the main CUT button on the fader strip. Press the button just below the channel signal present LED. Its status is shown in the button illumination – Red for CUT, off otherwise, and is latching.

The Assignable Functions Panel (AFP)

Pressing just the CALL button alone on a fader strip brings up the path currently assigned to the strip on the assignable functions panel.

Pressing any path softkey brings up the path to the AFP directly (with no need to assign it to a fader).

The AFP is used to access path INPUT/OUTPUT STATUS AND ROUTING, EQ/FILTERS SETTINGS, AUXILIARY SEND LEVEL/PAN and PRE/POST switching and DYNAMICS PROCESSOR SETTINGS.

Once a path is called to the AFP, the buttons marked I/O & PAN, EQ, AUX, INS, COMP/LIM, and GATE/EXP (together with the FUNC 1–4 buttons) are used to call those path processes to the panel. Unless it is used to access the AUXILIARY MASTER CONTROLS in which case they are inoperative.

The path currently called up to the AFP has its fader graphic boxed on the large LCD path status display.

The path processing controls are laid out as follows on the AFP:
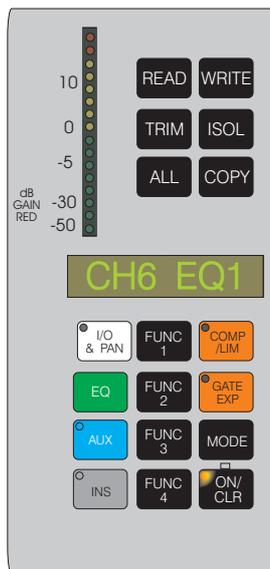
I/O/FUNC1 (Input page)

Input port assignment controls (labelled BANK and INPU) enable selection of any analogue or digital input or AudioFile output as the input for that path.

A bus PAN or balance (BAL) control (if stereo) for the path.

A GAIN control giving +/−24dB input gain trim in the digital domain.

Mic/line switching and mic gain control are provided if mic pre amps are fitted.

A path phase–reverse (PHAS) switch.

Presence (PRES), width (WDTH), and input leg decoding (LEGS) controls (if stereo AB Wide inputs have been allocated).

On groups a pan–type (PTYP) selector (press and hold ON/CLR to dial through the pan types).

I/O/FUNC2 (Output page)

Output port assignment controls (labelled BANK and INPU) enable selection of any analogue or digital output or AudioFile input as the output for that path.

An output balance (BAL) control (if stereo) for the path.

A GAIN control giving +/–24dB output gain trim in the digital domain.

Presence (PRES) and width (WDTH) controls if a stereo AB Wide output has been allocated.

EQ FUNC1 (Eq page 1)

Frequency (FREQ), Level (LEVL) and Q adjustment (Q) for up to four fully–parametric bands of EQ (as allocated). Each band has a 12Hz–20KHz range, +/–24dB level adjustment and 0.1–10 Q–factor adjustment. Overall in/out switching is provided via the ON/CLR button.

EQ FUNC2 (Eq page 2)

Response shape adjustment for each EQ band.

EQ FUNC3 (Filters page 1)

Controls for Filter Type (H/LP), frequency (FREQ), slope (SLPE) and in/out switching (using the ON/CLR button) for one or two filters (if allocated).

AUX/FUNC1 (aux page 1)

Level (AUXn), PAN/BAL and on/off controls for up to 4 mono or stereo auxiliaries.

AUX/FUNC2 (aux page 2)

Pre/Post switching for up to 4 mono or stereo auxiliaries.

COMP/LIM /FUNC1 (Compressor–limiter 1)

Threshold (THRS), ratio (RTIO), attack (ATTK), release (RELS), knee (KNEE), manual/automatic make–up gain switching (GAIN) and manual make–up gain (GAIN) controls.

A gain reduction meter, which is repeated (at lower resolution) on the fader strip when the path is assigned to the fader.

COMP/LIM /FUNC2 (Compressor–limiter 2)

As above for a second compressor (if allocated).

GATE/EXP /FUNC1 (Expander)

Threshold (THRS), ratio (RTIO), attack (ATTK), release (RELS), knee (KNEE) and depth (DPTH) controls.

A gain reduction meter which is repeated (at lower resolution) on the fader strip when the path is assigned to the fader.

GATE/EXP /FUNC2 (Gate)

Threshold (THRS), depth (DPTH), attack (ATTK), release (RELS), and hysteresis (HYST) controls.

A gain reduction meter which is repeated (at lower resolution) on the fader strip when the path is assigned to the fader.

Loudspeaker Monitor Facilities

Main and small monitor LS outputs are provided, with independent level control and a button to select SMALL LS. A five button cancelling set allows selection of the LS monitor source as MAIN Output, PFL, EXT, SELECT1, or SELECT2.
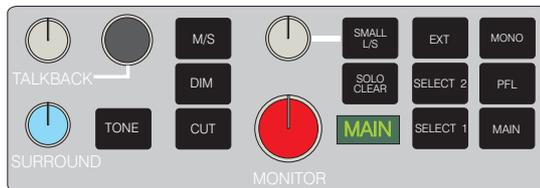
SELECT1 and SELECT2 allow monitoring of several buses simultaneously. Press and hold SELECT1 or 2 and use the main, group and aux RTE keys to select the buses required. Mono buses are fed to both speakers.

The current source is always shown in the alpha display next to the main LS volume, and shows SOLO when any channel is soloed. The SOLO CLEAR button cancels any solos in the console.

A separate output and level control is provided for a PFL Loudspeaker which is fed from the PFL bus output.

The MONO button feeds a mix of both legs of the source (if stereo) to both legs of the LS monitor output.

The M/S button converts the monitor output to M/S format.

CUT and DIM buttons are provided, which affect both main and small loudspeakers. The DIM level defaults to −10dB and is programmable on the Logic defaults page (see page 2:26).

External Input Monitoring

➤ Hold the EXT key and press a CALL key (as for SEL/LISTEN I/O).

➤ Dial up an input port.
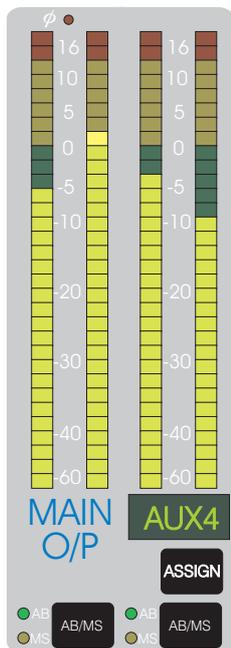
Metering

Signal present, near–clip and overload LEDs (tricolour) are provided on each channel with a one–second hold time. There is a repeat on the fader strip when the channel is assigned to the fader.

PPM–type bargraph meters are provided on the LCD screen on group, aux, and main buses (as detailed above).

There are also two AB/MS switchable 32–segment bargraph meters. One dedicated to the main output and one which may be assigned to channels, groups or auxes. Press and hold ASSIGN then press the RTE buttons to select a bus.

If mono incompatibility is detected on the main output (in either AB or MS mode) the Phase error LED (ø) Illuminates red for 4 seconds.

✎ *Mono incompatibility is defined as S exceeding M for more than 100msec, when M is greater than PPM 1.*

Tone And Talkback

Talkback may be injected into group, aux or main buses by pressing and holding the TALK button and toggling feeds to the buses using their RTE keys. This talkback routing pattern is preserved until changed by the operator and is used whenever TALK is pressed.
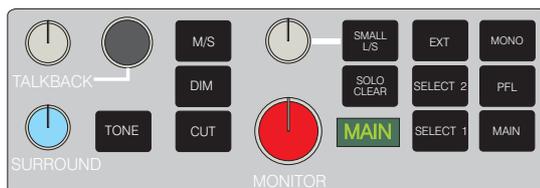
Tone injection works in exactly the same way using the TONE button.

Using the Talkback output relay to trigger an external talkback system

The Talkback path must be routed to a destination.

Use the Talkback key to control the LED and relay.

The input does not need to be routed.

SELs

In order for monitoring to fully function (e.g. to enable PFL and AFL), users must modify the LISTENS and SEL features on the console.

LOGIC 3SC MONITORING

LISTENS: 0 SELECTED = NONE
1 SELECTED = AFL ONLY
2 SELECTED = AFL & PFL

ALL PATH SHOWN ARE STEREO
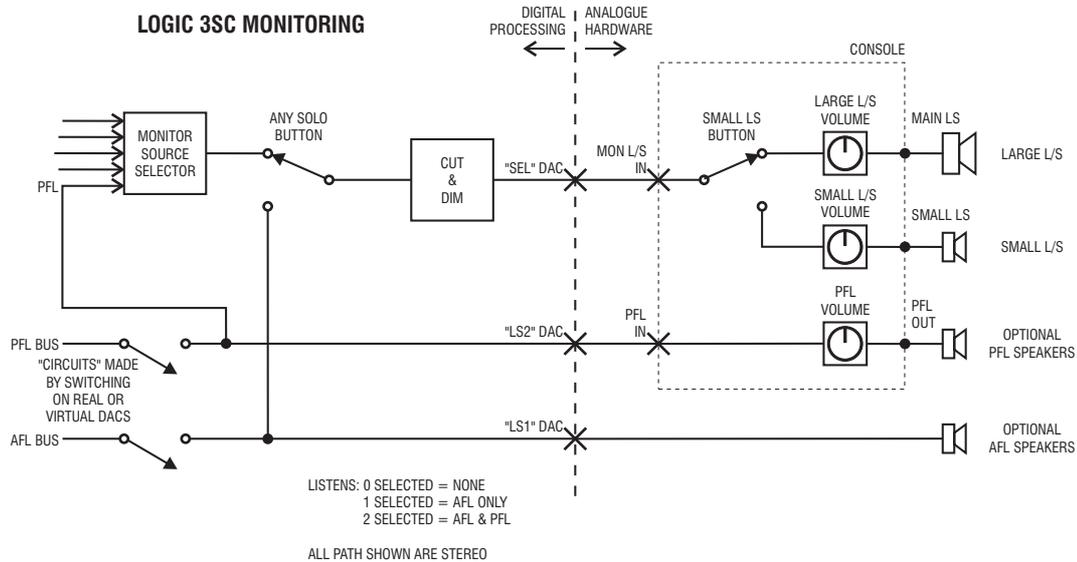
➤ From the main Logic page (on AudioFile) press the MIX SETUP softkey then press the EDIT softkey.

This will highlight the options list located on the left-hand side of the screen.

➤ Using the left-hand softwheel, scroll through the options and select 'LISTENS', then enter (via the numeric keypad) either 1 to enable AFL or 2 which enables both AFL and PFL (the default is 0).

➤ Continue to scroll through the options and select 'SEL SPKRS', then enter 1 (via the numeric keyboard).

➤ Press the SAVE AND ALLOCATE softkey.

A message will appear on screen asking if the user has decided to permanently overwrite the existing set-up (e.g. OVERWRITE Y/N).

➤ Press Y (on the QWERTY keyboard) to confirm selection.

➤ Now press the EXIT TO MIX SETUP softkey and the monitoring will be ready to become fully functional.

To activate AFL/PFL

➤ Hold the PFL button on the monitoring section and use any CALL button on the fader section to toggle between AFL and PFL.

The display adjacent to the PFL button will show either Pfl or Afl according to the current selection (this action will also bring up LS1 or LS2).

➤ Alternatively hold any CALL button on the fader section and toggle the PFL button between AFL and PFL (the displays will act in the same way as described in the previous paragraph).

➤ Press the I/O & PAN and FUNC 2 button (this will bring up the output configuration) then select a 'virtual' (e.g. a non-physical) DAC output using the output Logicator.

This will appear as an additional AB (e.g. over and above the existing DACs/cards).

➤ Finally press ON/CLEAR to activate.

Creating Virtual DACs

The SELs procedure requires the prior creation of 'virtual' DACs (subject to rack size) to enable internal routing/monitoring and these would normally be set on commissioning.

If a user requires optional/additional speakers (for PFL/AFL) there is no need to use 'virtual' DACs as users can employ existing physical DACs.

✍ *Although a 'virtual' DAC is non- physical (e.g. it is software as opposed to hardware) it is never-the-less recognised as 'real' by the console for the purpose of the SELs procedure.*

Equalisation

EQ – FUNC 1

Selection and Adjustment

Pressing the EQ and FUNC 1 buttons displays the allocated bands of EQ processing on the AFP (up to a maximum of 4 bands – LF, LMF, HMF and HF)
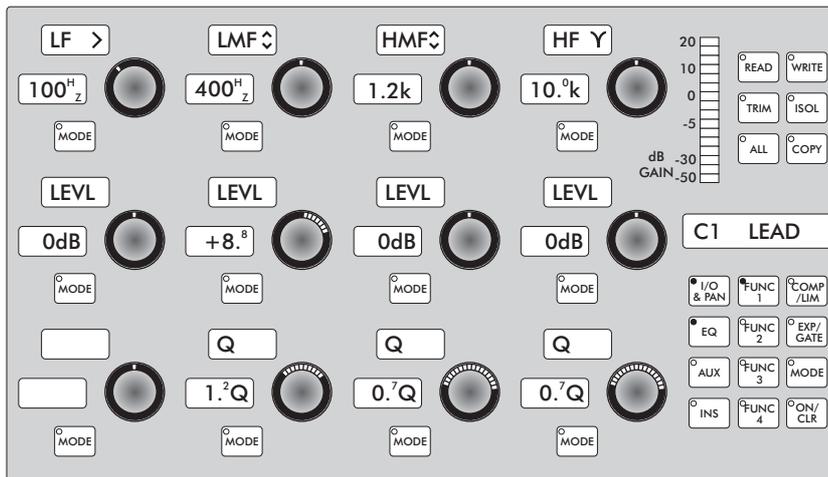
The top logicators adjust the frequency of the response in each band in the range 12Hz to 20kHz (line–up values: LF=100Hz, LMF=400Hz, HMF=1kHz and HF=10kHz). The relevant value is displayed as a spot on the logicator and as a value on the adjacent alpha.

If the response for the band is a Filter, the middle logicators act as five position switches to alter the slope of the roll–off between FLAT (default), 6, 12, 18 or 24dB per octave.

If a Shelf response is selected for the band, the middle logicators alter the Cut/Lift values in the range +/–24dB (with a line–up default of 0dB i.e. flat). As the logicator control is rotated the alpha displays the Cut/Lift value in dBs and the logicator displays an arc proportional in length to the current value.

The lower logicators adjusts the Q factor of the response in the range 0.1 to 10 in each band. The line–up condition is 0.7Q.

✍ *Q is only adjustable for Bell and Notch responses.*

EQ – FUNC 2

Selection and Adjustment

Pressing the EQ and FUNC 2 buttons shows the response in each band and allows it to be altered.
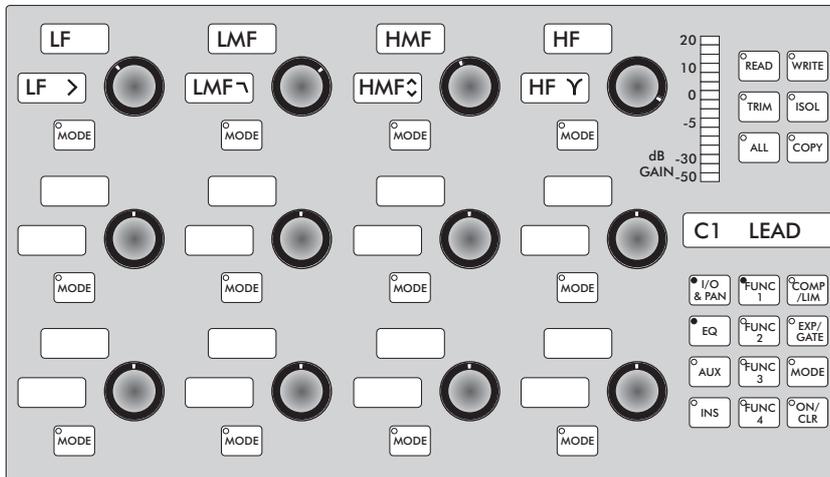
The top logicator behaves like a six position switch altering the response between Low Filter, Low Shelf, Bell, High Shelf, High Filter and Notch Filter.

These different responses are indicated by the following symbols:

⌐   Low Filter (High pass)

❯   Low Shelf

⌃⌄   Bell

❮   High Shelf

⌐   High Filter (Low pass)

Y   Notch Filter

✍ *The ON/CLR button toggles the process in/out of the path.*

Copy Function

This function allows settings (including EQ, Dynamics and Aux parameters) to be copied from a source path and applied to any number of paths (from one to the maximum available).

To select a source path

➤ Call it to the AFP and press and hold the COPY button, then press ON/CLR to set it as the current copy source.

The COPY button LED will illuminate amber to show that selection has taken place and will remain that way even if the button is released (until a new path is selected as the source).

Now select either:

❏ The individual controls to be copied, by first selecting the relevant FUNC button, pressing and holding the COPY button and then toggling the MODE buttons.

❏ All the controls on the AFU, by pressing and holding the COPY button and pressing the FUNC button for those parameters.

❏ Or all the controls on a path, by pressing and holding the COPY button and pressing the ALL button (located to the left of the COPY button).

To copy the selected parameters

➤ Press and hold the COPY button then press the SOFTKEY buttons of the desired destination paths (for Aux and MAIN press the path button).

This 'copy' template is maintained for the copy source path when the COPY button is released and can be interrogated or modified at any time by pressing it.

To set a new source path

Call it to the console surface then press and hold the COPY button and finally press the ON/CLR button.

✍ *Filter and Dynamic settings can also be copied as described above.*
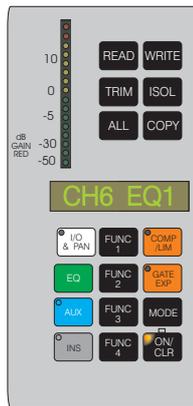
Setting Automation Modes

Pressing and holding the EQ button and pressing WRITE will force all controls for EQ processes into WRITE or READY (depending upon the current TOUCH MODE).

In TAKEOVER or AUTOTAKEOVER, pressing and holding EQ and pressing WRITE twice will force a touch on all the controls for all the EQ processes on that path, providing a convenient method of writing EQ settings without having to physically touch a large number of controls.

Filters

EQ – FUNC 3

Selection and Adjustment

Pressing the EQ and FUNC 3 buttons displays the Filters allocated in the processing on the AFP.
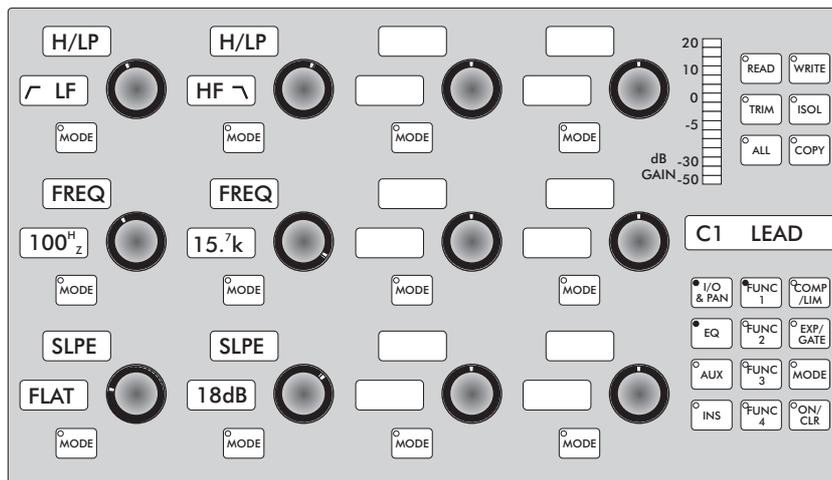
The top logicator selects either a Low (LF) or High (HF) Filter.

The middle logicator sets the frequency cut–off point in the range 12Hz – 20kHz.

The lower Logicator 3 acts as a five position switch to select the slope of the roll–off between FLAT (or OFF), 6, 12, 18 or 24dB per octave.

✍ *The ON/CLR button toggles the process in/out of the path.*

✍ *Filter settings can be copied from one path to another.*
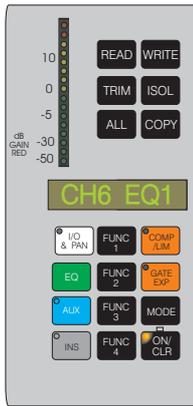
Setting Automation Modes

Pressing and holding the EQ button and pressing WRITE will force all controls for EQ processes into WRITE or READY (depending upon the current TOUCH MODE).

If in TAKEOVER or AUTOTAKEOVER, pressing and holding EQ and pressing WRITE twice will force a touch on all the controls for all filter processes on that path, providing a convenient method of writing filter settings without having to physically touch a large number of controls.

Dynamics

COMP/LIM – FUNC 1

Selection and Adjustment

Pressing the COMP/LIM and FUNC 1 buttons displays a compressor–limiter (if allocated in the processing) on the AFP.
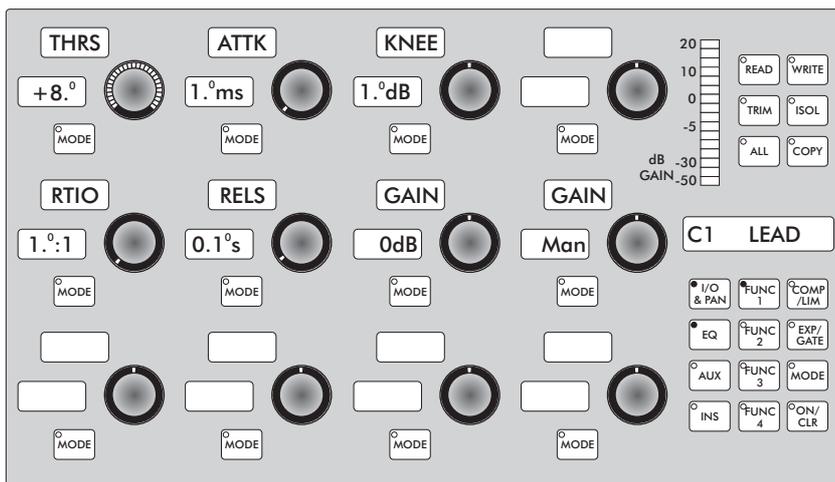
Logicators are available to adjust the following parameters:

Threshold
Ratio
Attack Time
Release Time
Soft–Knee Width
Make–up Gain (Manual or Automatic)

A second compressor–limiter is available on page 2 (FUNC 2).

GATE/EXP – FUNC 1

An expander is available (if allocated in mix setup) on GATE/EXP – FUNC 1. The following parameters are adjustable:

Threshold
Ratio
Attack Time
Release Time
Soft–Knee Width
Depth
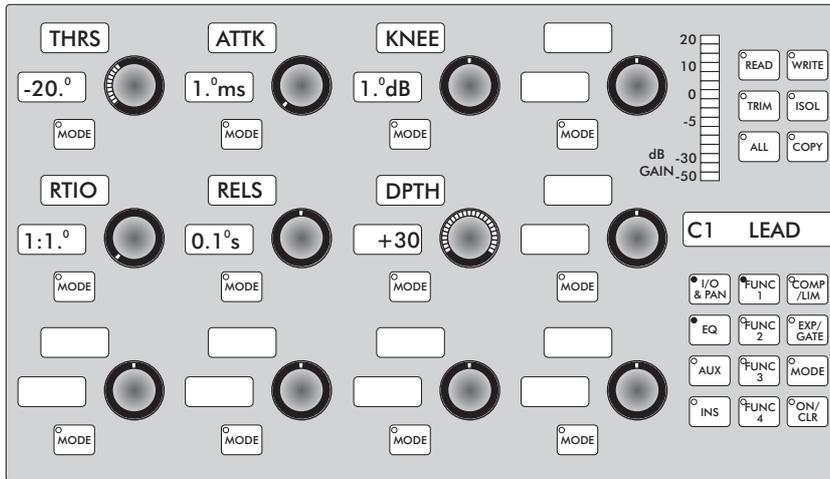
GATE/EXP – FUNC 2

A noise gate is available on page 2 (FUNC 2) if allocated. Logicators are available for the adjustment of:

Threshold
Depth
Attack Time
Hysteresis
Release Time
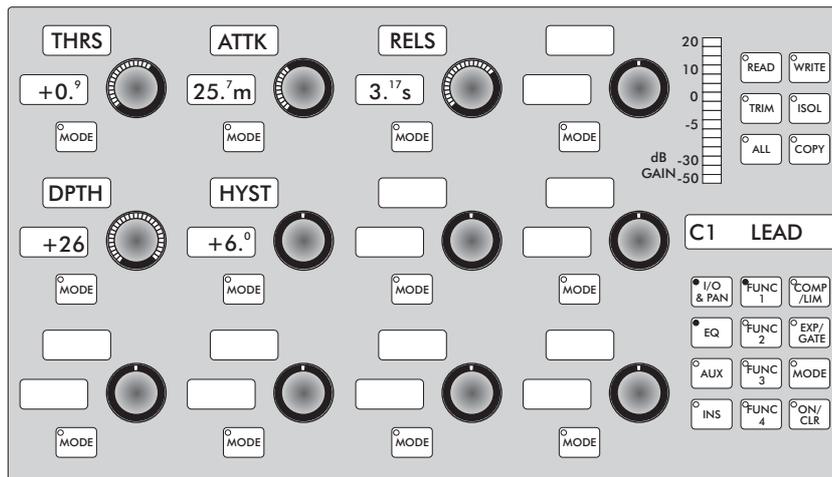
✎ *The ON/CLR button toggles the process in/out of the path.*

Dynamic Range Controller

A Dynamic Range Controller (DRC) is an alternative dynamics processor which uses significantly less processing resources than Compressor/Limiter and Expander/Gate units. A DRC consists of a Compressor and fixed-ratio Expander in one unit.

Disable DRC Expander

Although the Expander section of the DRC cannot actually be turned off it can effectively be disabled.

To disable the DRC Expander.

➤ Set the Expander Threshold to MIN.

This sets the threshold to an insignificantly low level (about -350dB).

✎ *This will remove the effect of the expander for all real-world signals except for digital silence (in which case the expander will still engage and show on the meter).*

COMP/LIM – FUNC 1

Selection and Adjustment

If a DRC is allocated in mix setup, pressing the COMP/LIM and FUNC 1 buttons allows the following parameters to be adjusted.

Compressor Threshold
Compressor Ratio
Expander Threshold
Attack Time
Release Time

The fixed ratio of the Expander element is 2:1.
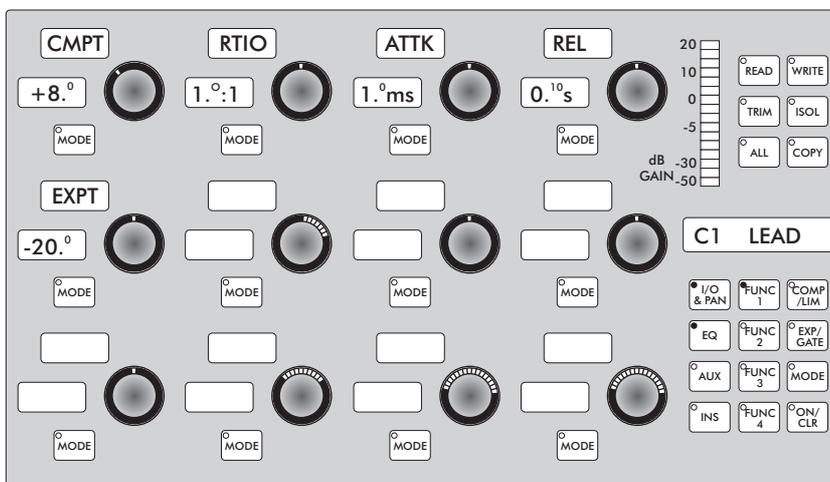
Activation

Toggling the ON/CLR button switches the process into the path and the LEDs in the COMP button and the ON/CLR button change colour to amber confirming that the process is active.

✍ *Dynamic settings can be copied from one path to another.*
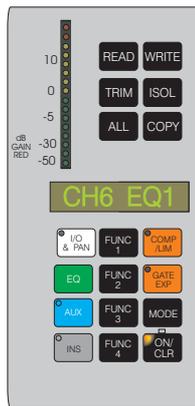
Setting Automation Modes

Pressing and holding the COMP/LIM or GATE/EXP button and pressing WRITE will force all controls for dynamics processes into WRITE or READY (depending upon the current TOUCH MODE).

If in TAKEOVER or AUTOTAKEOVER, pressing and holding COMP or EXP and pressing WRITE twice will force a touch on all the controls for all those dynamics processes on that path, providing a convenient method of writing dynamics settings without having to physically touch a large number of controls.

Dynamic Key Inputs & Sidechain Listen

Key Inputs allows the Dynamics Sidechain of a path to be controlled not only from the pre-dynamics audio of that path but also by the mix output of any other path.
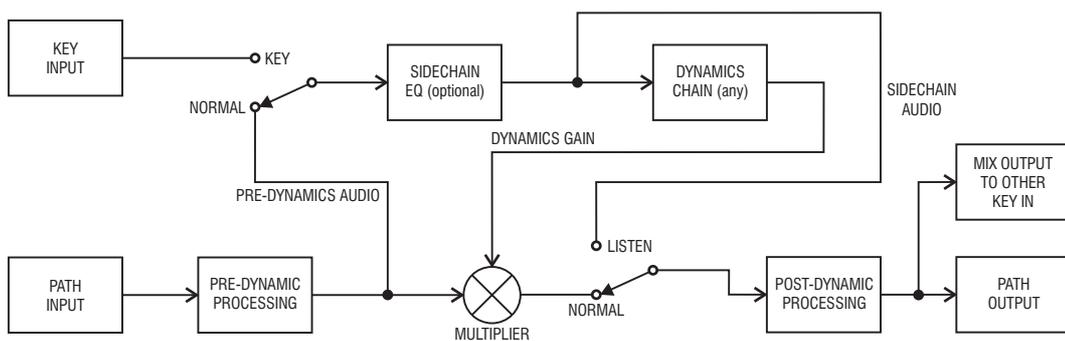
In this way it is possible to enable a (source) channel's key input signal to define the dynamics gate of another channel (e.g. the signal of one channel can affect the dynamics of another channel).

The Sidechain Listen function enables users to monitor elements that they would not normally be able to hear during adjustment (e.g. de-essing, sidechain EQ etc.) by routing the sidechain audio of any path (derived from the path's pre-dynamic audio or its key input) directly to the post-dynamics processing of the path.

This feature is applied in an identical way to all other processing.

Key Input Controls

Selection

Key Input control and Sidechain Listen are selected by pressing either the COMP/LIM or GATE/EXP FUNC 3 buttons, followed by the ON/CLR button.

Control is then found on the three horizontal rows of (four Logicators) in the following order.
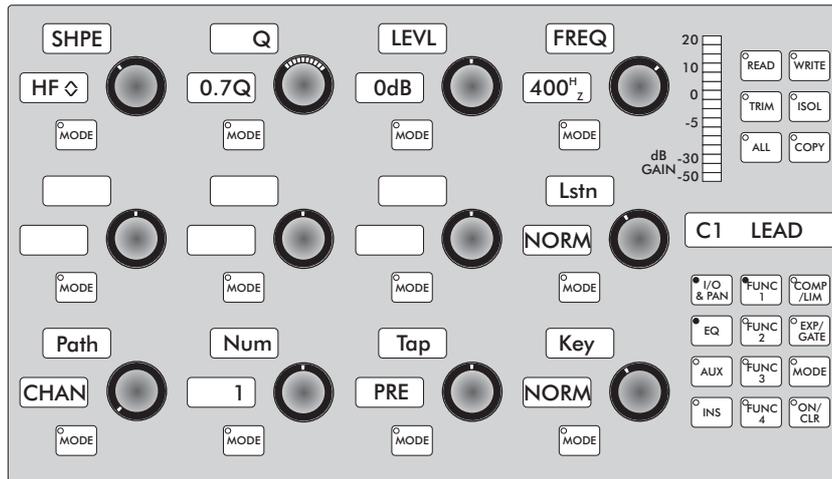
Top row of Logicators

Logicator 1 controls EQ shape with its alpha displaying the current selection.

Logicator 2 allows adjustment of Q level, with its alpha displaying the current value.

Logicator 3 provides level control with its alpha displaying the current value.

Logicator 4 provides control of frequency, with its alpha displaying the current selection.

Middle row of Logicators

Logicator 1,2 and 3 are blank.

Logicator 4 controls Sidechain Listen and switches between the two values LSTN (listen) and NORM (normal), with its alpha displaying the current setting.

Bottom row of Logicators

Logicator 1 selects the types of path whose mix output will be used as the key signal (e.g. CHAN, GRP, MAIN or AUX), with its alpha displaying the current selection.

Logicator 2 selects the path number (within the path type), with its alpha displaying the current selection.

Logicator 3 switches between PRE and POST fader as the 'tap-off' point of the source path, with its alpha displaying the current setting.

Logicator 4 switches between KEY and NORM (sidechain input), with its alpha displaying the current setting.

✍ *If Key Input and Dynamic EQ are selected at the same time, then the controls of both will be combined.*

✍ *The signal being heard is a 'soft input' not an actual physical input from another path.*

✍ *This feature allows users to 'tune' a trigger into a single part of a signal.*

Automation

Introduction

All controls (apart from ROUTING, SOLO and PFL) have full dynamic automation. Rotary controls and faders are touch-sensitive, have 10-bit resolution and are sampled at frame rate. Switches are sampled at one-tenth of the frame rate. Mix data is held on a 180Mb hard disk with a 4Mb RAM cache used for greater speed.

Control Modes

All controls on the console can be in any one of the following modes as indicated by the colour of illumination of the corresponding mode button LED.

ISOLate (LED unlit)

The control is effectively disconnected from the automation system and operates exactly as on a conventional console, causing immediate corresponding changes in the audio processing. No data is ever written to a mix and no mix can affect the status of the control. Controls in ISOLate remain so until a mode change is forced by the operator.

✍ *If the transport is stopped all controls behave as if they were in ISOLate; controls in READ will then jump to their replay values when the transport starts.*

READ (LED green constant)

The control is inoperative to the user and the status display is either as for the last play back or that currently being played back from a mix. The audio processing status corresponds to this display. If no mix containing the control has been played back since initialisation a default status is displayed and applied to the audio processing. No data is ever written to a mix in this mode. Controls in READ remain so until a mode change is forced by the operator.

WRITE (LED red constant)

The control is active causing immediate corresponding changes in the audio processing. These control changes are written into the mix currently playing (if any) and the display reflects this current status. Controls in WRITE remain so until a mode change is forced by the operator, or timecode is interrupted in which case they revert to full READ.

TAKEOVER (touch sensitive controls only, LED green flashing)

The control is in READ as described above, until touched at which point it goes into WRITE as described above. It remains in WRITE when released until a mode change is forced by the operator or timecode is interrupted in that instance it reverts to TAKEOVER.

AUTOTAKEOVER (touch sensitive controls only, LED green flashing)

The control is in READ as described above until touched in which case it goes into WRITE as described above. It interpolates back to the current READ value at a programmable rate and writes this to the mix when let go before going back into AUTOTAKEOVER.

ARMED (LED yellow flashing when interrogated)

MATCHING (LED red flashing)

Control is interpolating (crossfading) back to the old replay value. When interpolation is complete TAKEOVER READY is automatically entered.
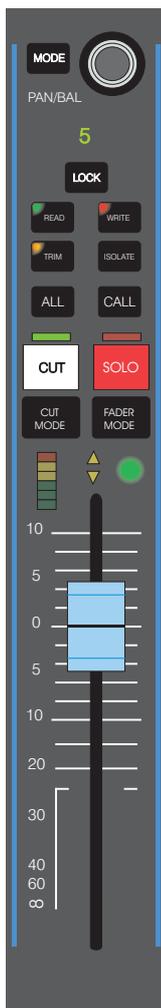
Channel Automation Controls

MODE + READ/WRITE/ISOLATE

Select mode for single control.

ALL + READ/WRITE/ISOLATE

Select mode for all controls on channel (see Note 1 and 2).

ALL

Interrogate armed status for all controls on channel (Armed = Yellow flashing).

ALL + MODE

Toggle arm/disarm single control.

READ/WRITE/ISOLATE

Select mode for all armed controls on channel (see Note 1 and 2).

Master Automation Controls
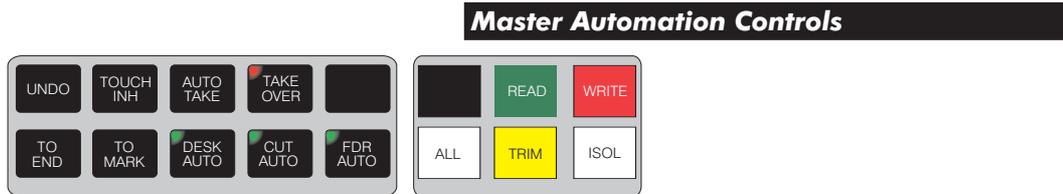
ALL + READ/WRITE/ISOLATE

Select mode for all controls on desk (see Note 1 and 2).

ALL

Interrogate armed status for all controls on desk (Armed = Yellow flashing).

ALL + Channel MODE

Toggle arm/disarm single control.

ALL + Channel ALL

Arm (1st press) /disarm (2nd press) whole channel (see Note 1 and 3).

ALL + UNDO

Disarm all controls on desk.

READ/WRITE/ISOLATE

Select mode for all armed controls on desk (see Note 1).

TO END

All controls in WRITE are written to end of mix (Transport must be running).

ALL + TO END

All controls are written to end of mix (Transport must be running).

UNDO

Undo changes made (if any) on most recent pass (Transport must be stopped).

KEEP

Save current automation data and snapshot to disk (under current mix setup).

LOCK + ISOLATE

Lock out automation - press again to re-enable.

✍ *Note 1*

Functions which affect all controls (or all armed controls) are limited to sections of the desk selected by the FADER AUTO, CUT AUTO and DESK AUTO (everything else) buttons. By default all of these are enabled (green).

✍ *Note 2*

In TAKEOVER or AUTO TAKEOVER modes, ALL+WRITE does not affect switches.

✍ *Note 3*

In TAKEOVER or AUTO TAKEOVER modes Master ALL+Chan ALL (1st press) does not affect arm state of switches. 2nd press disarms all controls on the channel including switches.

Touch Modes

TOUCH INHIBIT

All mode changes happen immediately on command. Touch sensors are ignored.

When the TOUCH INH button is pressed all controls in TAKEOVER (green flashing) are changed to READ.

TAKEOVER

When WRITE is selected for a non-switch control it goes instead into TAKEOVER (green flashing). This is functionally equivalent to READ except that touching the control makes it change to WRITE mode.

If you select WRITE mode for a control which is already in WRITE it interpolates back to its previous replay value and enters TAKEOVER. If you press the TAKEOVER button all controls in WRITE will interpolate back in this way.

AUTOWAIT

When in TAKEOVER if a fader or automatable rotary control is held whilst selecting WRITE for the control again or pressing TAKEOVER, the control enters AUTOWAIT.

Having selected AUTOWAIT the control remains writing (even if released) until the play pass setting matches the current setting, then resumes playing back.

Whilst in AUTOWAIT the 'sense-to-match' of a control is indicated by arrows on the parameter display or the path display for faders.

Transport stop puts all controls in WRITE into TAKEOVER.

AUTO TAKEOVER

Identical to TAKEOVER but when a control is released it immediately interpolates back to its previous replay value and then enters TAKEOVER READY.

Transition Modes

These modes are selected using data mode buttons labelled WRITE, READ and ISOLATE. A set of these buttons appears on each channel strip and a master global set is located to the left of the master section. The way data modes can be selected and the exact nature of transitions between modes is governed by the transition mode selected. Three buttons near the master data mode buttons allow TOUCH INHIBIT, TAKEOVER, or AUTOTAKEOVER to be selected as the current transition mode and are known as transition mode buttons.

Multi-Mode Automation

This feature enables each control on the console to operate in any of three Automation Touch Modes (TOUCH INHIBIT, TAKEOVER, AUTOTAKEOVER) regardless of other controls. Access to Multi-Mode Automation is provided via the default page.

The system supports three methods of selecting controls that change data mode:

➤   The first (and simplest) is to press and hold the ALL button on a channel strip and then press a data mode button on that strip. All the controls on that channel are then forced into that data mode immediately, this is known as a forced mode change. Pressing and holding global ALL and then pressing a global data mode button causes a forced mode change over the entire console.

➤   The second method allows only nominated or armed controls to have their data mode changed. By simply pressing a data mode button on the channel strip the armed controls in that channel (and only those) will change data mode. Pressing a global data mode button will change the data mode of all armed controls in the console.

➤   Thirdly simply pressing and holding a control's mode button and then pressing a channel data mode button on that channel will select that mode for that control.

✍ *When the console is in either takeover mode the control does not go directly into the chosen data mode (see transitions in TAKEOVER and AUTOTAKEOVER).*

Arming

➤ Press and hold the ALL button on the desired channel then press the mode buttons for the controls to be armed.

The mode buttons selected come on yellow flashing but revert to indicating the current data mode when the ALL button is released.

➤ To show which channels are armed press and hold ALL once more.

The mode buttons of armed controls will show yellow flashing and may be toggled to disarmed (lamp off) by pressing the mode button again. The channel ALL button functions in this case as an arm interrogate for that channel.

If the global ALL button is pressed and held, entire channels can be toggled between armed and disarmed with the channel ALL button, as well as individual controls using their respective mode buttons.

If a channel ALL key is used to disarm the entire channel all controls are disarmed regardless of their previous state.

Controls always remain armed until disarmed by the operator as described above and their armed status is unaffected by forced mode changes.

DATA MODE TRANSITIONS IN TOUCH INHIBIT

The chosen mode is effective as soon as the channel or global data mode button is pressed.

READ to WRITE

➤ Arm the desired controls and press the WRITE buttons on the desired channels or use the global WRITE button.

Armed mode buttons go immediately from green steady to red steady.

➤ Alternatively press channel or global ALL WRITE to force the entire channel or entire console respectively into WRITE.

The status or value indicated (the current READ value) on the control/s is put into WRITE and being heard is taken as the initial WRITE value. This is then written to the mix file for that channel (if a mix is being played). The selected controls stay in WRITE until a mode change is forced by the user or timecode is interrupted in which case they revert to READ with their mode buttons green steady. Any mix being played then reverts to its old value at that point unless no data has previously been written beyond that point, with the WRITE value just entered written to the end of the mix.

➤ To try again on that part of a mix simply rewind and press WRITE channel or global again.

ISOLATE to WRITE

➤ Arm the desired controls and press the WRITE buttons on the desired channels or use the global WRITE button.

Armed mode buttons go immediately from off to red steady.

➤ Alternatively press channel or global ALL WRITE to force the entire channel or entire console respectively into WRITE.

The status or value indicated on the control (i.e. that preset by the user) and therefore also being heard, is written to the mix file for that channel (if a mix is being played). The selected controls stay in WRITE until a mode change is forced by the user or timecode is interrupted at which point they revert to READ with their mode buttons on green steady.

The mix then reverts to its old value at that point (that is unless no data has been previously been written beyond that point). In which case the WRITE value just entered is written to the end of the mix.

➤ To try again on that part of a mix simply rewind, press ISOLATE channel or global then play and press WRITE channel or global at the desired point.

ISOLATE to READ

➤ Arm the desired controls and press the READ buttons on the desired channels or use the global READ button.

Armed mode buttons go immediately from off to green steady.

➤ Alternatively press channel or global ALL READ to force the entire channel or entire console respectively into READ.

The control changes to the current READ value for that control and the status indicator reflects this. No data is written to any mix being played and the selected controls stay in READ until a mode change is forced by the user.

WRITE to READ

➤ Arm the desired controls and press the READ buttons on the desired channels or use the global READ button.

Armed mode buttons go immediately from red to green steady.

➤ Alternatively press channel or global ALL READ to force the entire channel (or entire console) into READ.

The control changes to the current READ value for that control and the status indicator reflects this. Any mix being played always reverts to its old value for the control at that point. No further data is written and there is no effect whatsoever on the mix beyond the transition point. The selected controls stay in READ until a mode change is forced by the user.

DATA MODE TRANSITIONS IN TAKEOVER

The write mode (used to 'write into a mix') only becomes effective when the control is touched. When released the control remains in WRITE until a mode change is forced or play is stopped. Takeover is only applicable when going from READ to WRITE.

READ to WRITE

➤ Arm the selected controls and press the WRITE buttons on the desired channels or use the global WRITE button.

➤ Alternatively press channel or global ALL WRITE to force the entire channel or entire console respectively into TAKEOVER.

The mode button of any control set to TAKEOVER in this way will flash green.

No further action is taken until either:

❏ A control in TAKEOVER is touched at which point the control goes into WRITE and from then on behaves as described above, (except that it reverts to TAKEOVER when play is stopped). If you select WRITE mode for a control which is already in WRITE it interpolates back to its previous replay value and enters TAKEOVER. If you press the TAKEOVER button all controls in WRITE will interpolate back in this way.

❏ A mode change is forced by the operator.

❏ Transport stop puts all controls in WRITE into TAKEOVER.

If timecode is interrupted all controls still in TAKEOVER (i.e. they haven't been touched) remain in that mode with their mode buttons flashing green. No data is written for those controls and the mix for them is unaffected.

DATA MODE TRANSITIONS IN AUTOTAKEOVER

The WRITE mode is used to 'write into a mix' and only becomes effective when the control is touched. When released, it interpolates back to the current READ value (at a programmable rate) and writes this to the mix before going back into AUTOTAKEOVER. Autotakeover is only applicable when going from READ to WRITE.

READ to WRITE

➤ Arm the desired controls and press the WRITE buttons on the desired channels or use the global WRITE button.

➤ Alternatively press channel or global ALL WRITE to force the entire channel or entire console respectively into AUTOTAKEOVER.

The mode button of any control set to AUTOTAKEOVER in this way will flash green.

No further action is taken until either:

❏ A control in AUTOTAKEOVER is touched at which point the control goes into WRITE and stays in write as long as it is held. When released it interpolates back to the current READ value at that particular point (at a programmable rate) and writes this to the mix before going back into AUTOTAKEOVER with its mode button flashing green. At that point any mix being played will revert to its old value.

❏ A mode change is forced by the operator.

If timecode is interrupted all controls in AUTOTAKEOVER (i.e. not currently touched) remain in that mode with their mode buttons flashing green. No data is written beyond that point for those controls and the mix for them beyond that point is unaffected.

Automation To Mark

Two markers are provided in the Main Logic Automation page in between which TO MARK and ALL-TO MARK operations are active.

To write the current value of controls in write to the high marker.

➤ Press the TO MARK key between the two markers.

All controls will return to their value at that point in the previous pass.

To flatten all controls in write to their current value.

➤ Hold down the ALL key and press the TO MARK key.

All automation events outside the region defined by the markers will be unaffected.

✍ *This is similar to TOUCH TO END.*

Changing Between Transition Modes

TOUCH INHIBIT to TAKEOVER

➤ Press the TAKEOVER button.

Any control in WRITE interpolates before going into TAKEOVER. Any mix being played then reverts to its old value for that control at that point. Unless no data has previously been written beyond that point in which case the WRITE value just entered is written to the end of the mix. Controls in READ and ISOLATE are unaffected. All armed controls remain armed.

TOUCH INHIBIT to AUTOTAKEOVER

➤ Press the AUTOTAKEOVER button.

Any control in Write interpolates before going into AUTOTAKEOVER. Any mix being played then reverts to its old value for that control at that point. Unless no data has previously been written beyond that point in which case the WRITE value just entered is written to the end of the mix. Controls in READ and ISOLATE are unaffected. All armed controls remain armed.

TAKEOVER or AUTOTAKEOVER to TOUCH INHIBIT

➤ Press the TOUCH INHIBIT button.

Any control in WRITE stays in WRITE and any in TAKEOVER or AUTOTAKEOVER go into READ. Controls in READ and ISOLATE are unaffected. All armed controls remain armed.

TAKEOVER to AUTOTAKEOVER

➤ Press the AUTOTAKEOVER button.

Any control in WRITE interpolates before going into AUTOTAKEOVER. Any mix being played then reverts to its old value for that control at that point. Unless no data has previously been written beyond that point in which case the WRITE value just entered is written to the end of the mix. Any control in TAKEOVER goes into AUTOTAKEOVER without affecting the mix.

Switches

The reading and writing of switches is controlled by the ON-MODE button for the ON/CLR button for the group of switches. Since the ON/CLR button is assignable to control one (and only one) of several switches at any particular time the ON-MODE button can be used to control the recording and playback of switch data on an individual basis.

The ON-MODE button therefore always shows the automation status (READ or WRITE) of the switch to which the ON/CLR button is currently assigned.

The ON/CLR button itself shows the current logical status of the switch to which it is assigned. Which is usually echoed by the function select button (i.e. EQ, FLT, COMP etc).

Buttons are not touch-sensitive and so cannot be operated in either TAKEOVER or AUTOTAKEOVER mode. When WRITE is selected on a switch where TAKEOVER or AUTOTAKEOVER is the current Transition Mode it goes immediately into WRITE and the displayed logical status on the button is written to the mix.

Faders

Faders are a special case within the automation because they 'playback' moves (during a mix) in precisely the same way as when they were originally made. Fader drives are always disabled when touched by the operator, regardless of the data or transition mode, and always when timecode is interrupted.

FADER DATA MODE TRANSITIONS IN TOUCH INHIBIT

The chosen mode is effective as soon as the channel or global data mode button is pressed.

READ to WRITE

➤ Arm the fader and press the WRITE button on that channel or use the global WRITE button.

The fader mode button goes immediately from green steady to red steady and the fader drive is immediately switched off.

➤ Alternatively press global ALL - WRITE to force all faders into WRITE.

The current fader position (i.e. the current READ value) therefore the level being heard, is taken as the initial WRITE value and written to the mix file for that channel if a mix is being played.

The fader remains in WRITE until a mode change is forced by the user or timecode is interrupted. In which case its drive remains disabled and it reverts to READ with its mode button green steady. Any mix being played then reverts to its old value at that point. That is unless no data has previously been written beyond that point in which case the WRITE value just entered is written to the end of the mix.

➤ To try again on that part of a mix rewind and press WRITE channel or fader global again.

ISOLATE to WRITE

➤ Arm the fader and press the WRITE button on that channel or use the global WRITE button.

The fader mode button goes immediately from off steady to red steady.

➤ Alternatively press global ALL - WRITE to force all faders into WRITE.

The level indicated on the fader (i.e. that which has been preset by the user) and therefore also being heard, is written to the mix file for that channel (if a mix is being played). The fader stays in WRITE until a mode change is forced by the user or timecode is interrupted in which case its drive remains disabled and it reverts to READ with its mode button green steady. Any mix being played then reverts to its old value at that point unless no data has previously been written beyond that point in which case the WRITE value just entered is written to the end of the mix.

➤ To try again on that part of a mix rewind and press WRITE channel or fader global again.

ISOLATE to READ

➤ Arm the fader and press the READ buttons on that channel or use the global READ button.

Armed mode buttons go immediately from off to green steady.

➤ Alternatively press global ALL - READ to force all faders and cuts into READ.

The fader changes to the current READ level for that channel and it moves into position to reflect this. No data is written to any mix being played and the fader stays in READ until a mode change is forced by the user.

WRITE to READ

➤ Arm the fader and press the READ button on that channel or use the global READ button.

The fader mode button goes immediately from red steady to green steady.

➤ Alternatively press global ALL - READ to force all faders and cuts into READ.

The fader changes to the current READ level for that channel and moves into position to reflect this. Any mix being played always reverts to its old level at that point. No further data is written and there is no effect whatsoever on the mix beyond this point. The fader stays in READ until a mode change is forced by the user.

FADER DATA MODE TRANSITIONS IN TAKEOVER

The WRITE mode (used to 'write' the fader level in a mix) only becomes effective when the fader is touched. When released the fader remains in WRITE until a mode change is forced or play is stopped. TAKEOVER on faders is only applicable when going from READ to WRITE.

READ to WRITE

➤ Arm the fader and press the WRITE button on that channel or use the global WRITE button.

➤ Alternatively press global ALL - WRITE to force all faders into TAKEOVER.

The fader mode button set to TAKEOVER will flash green.

No further action is taken until either:

❏ The fader is touched and the fader goes into WRITE, from then on behaving as described in 1a above except that it reverts to TAKEOVER when play is stopped.

❏ A mode change is forced by the operator.

If timecode is interrupted all faders still in TAKEOVER (i.e. they haven't been touched) remain in that mode with their mode buttons flashing green. No data is written for those faders and the mix for them is unaffected.

DATA MODE TRANSITIONS IN AUTOTAKEOVER

The WRITE mode (used to 'write' into a mix) only becomes effective when the fader is touched. If in WRITE when released it interpolates back to the current READ value (at a programmable rate) and writes this to the mix, before going back into AUTOTAKEOVER (as previously described). AUTOTAKEOVER is only applicable when going from READ to WRITE.

READ to WRITE

➤ Arm the chosen faders and press the WRITE buttons on the desired channels or use the global WRITE button.

The WRITE button(s) on the selected channels illuminate red steady.

➤ Alternatively press channel or global ALL - WRITE to force the entire channel or entire console respectively into AUTOTAKEOVER.

The mode button of any fader set to AUTOTAKEOVER in this way will flash green.

No further action is taken until either:

❏ A fader in AUTOTAKEOVER is touched in which case the fader goes into WRITE and stays in write until released. When released it interpolates back to the current READ value at that particular point (at a programmable rate) and writes this to the mix, before going back into READ (with its mode button green steady). Any mix being played then reverts to its old value at that point. To work again on that part of a mix simply rewind and grab the fader.

❏ A mode change is forced by the operator.

If timecode is interrupted all faders in AUTOTAKEOVER (i.e. not currently touched) remain in that mode with mode buttons flashing green. No data is written beyond that point for those faders and the mix for them beyond that point is unaffected.

Automation TRIM Mode

The initial release of Automation Trim applies to the faders only.

Once a WRITE pass has been completed it may be necessary to offset the recorded automation data by a certain level, for instance to level match another piece of audio.

TRIM is used in order to do this without destroying any underlying automation moves.

➤ TRIM is initiated by pressing and holding the FADER MODE button and then pressing TRIM.

The FADER MODE indicator either flashes yellow or becomes steady yellow depending on which of the three global modes (TOUCH INHIBIT, TAKEOVER or AUTOTAKE) it is in.

In Free Trim the point at which the fader is put into TRIM is taken as the null point and when touched the fader control shows 0dB in the alpha window.

In Centre Trim mode, when the fader is put into TRIM, the fader moves to the centre position which is then taken to be the null point.

There are two modes of operation associated with this control:

TAKEOVER TRIM mode

In TAKEOVER mode a fader in TRIM has its Fader Mode indicator flashing yellow showing that it is in TRIM READ. Any underlying WRITE moves are shown on the fader together with any TRIM moves. Moving a fader applies an offset to the WRITE move and its Fader Mode indicator becomes steady yellow indicating that it is in TRIM RECORD.

When the fader is released it continues to WRITE that fader position until the transport is stopped (returning to TRIM READ).

AUTOTAKE TRIM mode

In AUTOTAKE mode a fader in TRIM has its Fader Mode indicator flashing yellow showing that it is in TRIM READ. Any underlying WRITE moves are shown on the fader together with TRIM moves (if any). Moving a fader applies an offset to the WRITE move and its Fader Mode indicator becomes steady yellow indicating that it is in TRIM RECORD.

When the fader is released the fader reverts to playing the underlying WRITE move with its new offset. Its Fader Mode indicator becomes flashing yellow to show that it is in TRIM READ but this time the TRIM offset will interpolate back to its previous value at the takeover time rate.

'Play Safe'

This mode makes WRITE function as ISOLATE whilst keeping the TAKEOVER/AUTOTAKEOVER capabilities. It can be used for rehearsing automation moves without altering stored data.

➤ Select PLAY SAFE mode by holding TOUCH INHIBIT/TAKEOVER/AUTOTAKEOVER and pressing ISOLATE.

The touch mode LED changes from red to flashing yellow and the memory usage display reads 'Safe'.

➤ To revert to normal operation, hold one of the touch mode buttons and press WRITE.

Mix A/B Compare

Two mixes may be compared 'on-the-fly' with timecode running. To do this Compare mode must be set to ON and the two mixes loaded as MIX A and MIX B.

Load/review the first mix/pass from the Automation Filing page with MIX A highlighted on the MIX A/MIX B bistate button. Then toggle the bistate button to MIX B and load/review the second mix/pass.

The MIX A/MIX B button can then be toggled at any time to select the mix currently playing back.

Switching between MIX A/B is still possible when COMPARE MODE is set to OFF, but only when the transport is stopped.

✍ *In principle when COMPARE MODE is ON new data cannot be written to either mix, the console behaves as though in PLAY SAFE, i.e. controls can be put into WRITE or TRIM but nothing should be recorded.*

Mix Merge/Join

Parts of two mixes may be joined together to form a third composite mix. The join points and associated automation crossfade rates may be rehearsed in real time whilst hearing the results before creating the composite mix. To do this load the two desired mixes as MIX A and MIX B (as described in Mix A/B Compare) and press the MIX JOIN button in the Main Automation page.

The screen displays a linear graphical representation of the two mixes to be joined in the same style as the Main Automation Control page. Horizontally across the middle of the screen, a band is shown running either above or below the line dividing the graphics window. This shows which parts of the two mixes will be assembled to form the new composite mix.

Whilst in the Mix Join page the automation system is locked into PLAY SAFE, and when playing across join points the console will be forced into ALL READ.
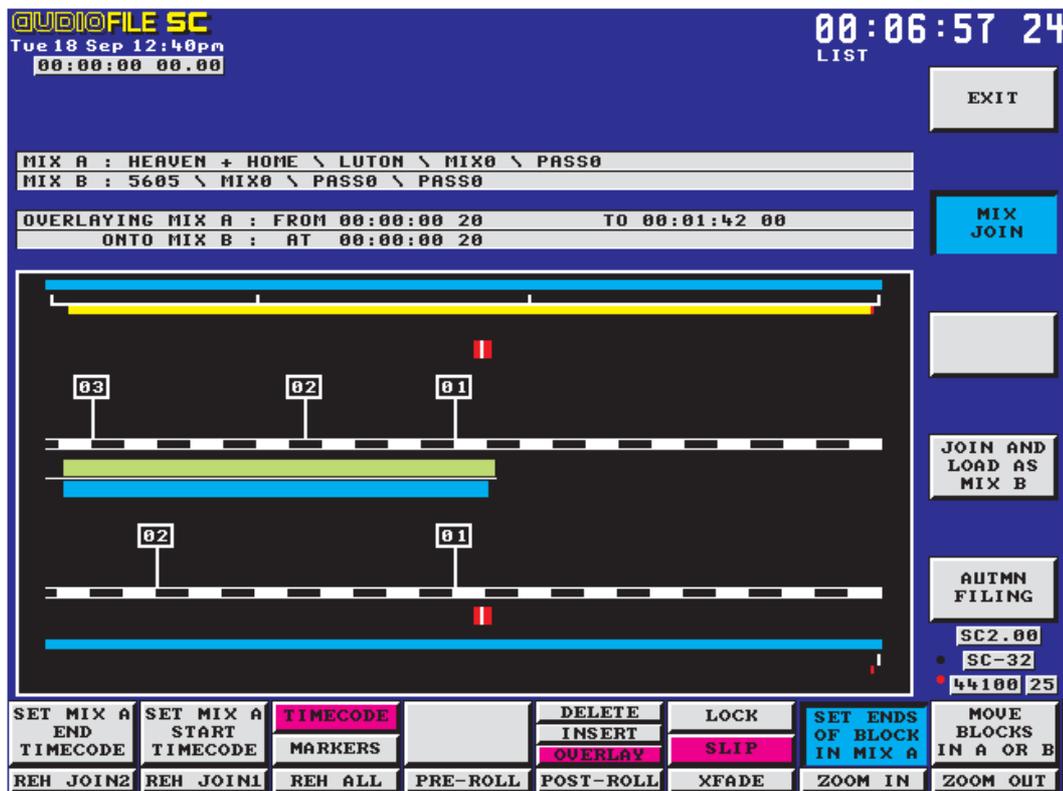
The buttons and controls operate as follows:

The jog wheels move the two join points. With TIMECODE selected (via the TIMECODE/MARKERS bistate button) the join points can be moved in subframe increments. With MARKERS selected positioning of the join points 'snaps' to the markers.

The SET BLOCK START/END TIMECODE buttons allow the timecodes of the join points to be typed in.

Pressing the REH JOIN1 or REH JOIN 2 button locates to that join point and plays across it with pre and postroll times set via the PREROLL and POSTROLL buttons.

The LOCK/SLIP bistate button determines whether the portion of mix A to be joined can be offset in time when joined to mix B.

When set to LOCK the join points are at the same timecodes in both mix A and mix B.

In SLIP mode the join points may be at different timecodes in mix A and mix B. An additional button SET START IN MIX B is used to allow the insert/overlay startpoint to be set in Mix B.

The DELETE/INSERT/OVERLAY tristate button determines whether the portion of mix A to be joined is overlaid onto mix B (e.g. erasing data in mix B between the join points), or inserted into mix B (e.g. into a gap created by offsetting all data in mix B downstream of the join).

The XFADE button allows the automation crossfade times at the join points to be set.

Pressing JOIN AND LOAD AS MIX B creates a new mix from mix A and mix B which uses the join points as set and loads this mix as the new mix B.

The ZOOM IN, ZOOM OUT, INT/EXT and AUTOMATION FILING buttons work in the same way as they do on the Main Automation Control page.

Off-Line Editing

A text-format automation editing system may be accessed from the Main Automation page by pressing the AUTOMATION EDIT button.

A list of the automation events in the Current Mix is shown in the lower window with a highlighted cursor which is moved using the RH jogwheel. The window scrolls automatically when the cursor moves off the edge of the window. The LH jogwheel scrolls the list in pages with the cursor remaining in the same screen position.

A linear graphical representation of the mix being edited is shown in the upper window with the current cursor and playout position marked.

The transport controls (including LOC) may be used to locate to any portion of the mix and play automation including any edits made. The list window remains at the position set.

The PATH FILTER SETUP button allows paths to be included or excluded from the display and therefore editing operations. It may be switched on and off using the FILTER ON/OFF bistate button.

The I/O & PAN, FADER, MUTES, EQ, AUX, and DYNAMICS buttons enable inclusion or exclusion of those types of event in the display. They toggle ON or OFF when pressed and default to all ON after a boot-up. The FILTER ON button must be set to use this function.

The MARK button sets the start of a marked block of events at the current cursor position.

The cursor may then be moved forwards or backwards and ENTER pressed to mark a block of events. Marked events are highlighted in the list. All editing operations (see below) will affect all events in a marked block or the event currently under the cursor (when no marked block exists).

A second, temporary editing space is provided to aid editing operations called the Clipboard. Events may be copied to and from the Clipboard and it may be edited in the same way as the current Mix. To view the clipboard, press the VIEW CLIPBOARD button (the button will only appear after a COPY or CUT operation as described below).

The COPY button copies all marked events or the event under the cursor to the Clipboard.

The CUT button moves all marked events or the event under the cursor to the Clipboard.

The PASTE button inserts (at their designated timecodes) all events in the Clipboard into the mix currently being edited (the button will only appear after a COPY operation as described below).

Relative Block Paste in Off-line Editing

A relative timecode can be entered during a PASTE.

This allows the block to be pasted back with a relative offset from its original timecode values.

The DELETE button deletes all marked events or the event under the cursor after prompting for confirmation.

The NUDGE EVENT/BLOCK button allows timecode adjustment of events or blocks by using the jogwheels (LH nudges in frames and RH in subframes), by typing a new absolute timecode or by typing in '+' or '-' followed by a timecode offset. If an absolute timecode is entered whilst a block is marked the first marked event is moved to that timecode and the rest of the block is offset accordingly.

When an event's timecode is changed, the displayed list is reshuffled to accommodate the change (if necessary), and the cursor moves to the event (or block) at its new position in the list.

@UDIOFILE **SC**

Tue 18 Sep 12:40pm
00:00:00 00.00

SELECT PATH FOR NEW EVENT,
(ENTER) TO CONFIRM.

00:01:00 00
LIST

EXIT
ADD
EVENT

PROJECT : CASUALTY   TITLE : MICKS MIX
MIX   : MIX5   PASS : PASS0
NOTE   :   FROM : 14:42:59 20.1
CHANGED   : NO   TO   : 14:43:05 12.2

ADD
EVENT

PATHS

MIC.

2TRK

GRP1

GRP2

GRP3

GRP4

2TRK

MAIN

SETUP	(2324) FADER LEV	.8 DB
SETUP	(GRP1) FADER LEV	9.2 DB
SETUP	(GRP2) OUTPUT	
SETUP	(GRP3) OUTPUT	
SETUP	(GRP4) OUTPUT	
SETUP	(MAIN) FADER LEV	.3 DB
SETUP	(MAIN) OUTPUT	
14:42:59 20.1 (2TRK) FADER LEV		.3 DB
14:42:59 20.2 (2TRK) FADER LEV		.9 DB
14:42:59 21.2 (2TRK) FADER LEV		.6 DB
14:42:59 22.2 (2TRK) FADER LEV		.3 DB
14:42:59 23.2 (2TRK) FADER LEV		.1 DB
14:42:59 24.2 (2TRK) FADER LEV		.0 DB
14:43:00 00.2 (2TRK) FADER LEV		.0 DB
14:43:00 01.2 (2TRK) FADER LEVEL		-1.1 DB

SC2.00
SC-32
44100 25

@UDIOFILE **SC**

Tue 18 Sep 12:40pm
00:00:00 00.00

SELECT EVENT TO ADD TO GRP2
FROM THE SELECTION BELOW.

00:01:00 00
LIST

EXIT
ADD
EVENT

PROJECT : CASUALTY   TITLE : MICKS MIX
MIX   : MIX5   PASS : PASS0
NOTE   :   FROM : 14:42:59 20.1
CHANGED   : NO   TO   : 14:43:05 12.2

ADD
EVENT

SETUP	(2324) FADER LEVEL	-8.8 DB
SETUP	(GRP1) FADER LEVEL	-19.2 DB
SETUP	(GRP2) OUTPUT	ON
SETUP	(GRP3) OUTPUT	ON
SETUP	(GRP4) OUTPUT	ON
SETUP	(MAIN) FADER LEVEL	-9.3 DB
SETUP	(MAIN) OUTPUT	ON
14:42:59 20.1 (2TRK) FADER LEVEL		-3.3 DB
14:42:59 20.2 (2TRK) FADER LEVEL		-2.9 DB
14:42:59 21.2 (2TRK) FADER LEVEL		-2.6 DB
14:42:59 22.2 (2TRK) FADER LEVEL		-2.3 DB
14:42:59 23.2 (2TRK) FADER LEVEL		-2.1 DB
14:42:59 24.2 (2TRK) FADER LEVEL		-2.0 DB
14:43:00 00.2 (2TRK) FADER LEVEL		-2.0 DB
14:43:00 01.2 (2TRK) FADER LEVEL		-1.1 DB

SC2.00
SC-32
44100 25

MUTE ON	MUTE OFF	EQ ON	EQ OFF	AUX ON	AUX OFF	FADER TRIM

The ADD EVENT button allows a new MUTE ON/OFF, EQ ON/OFF, AUX ON/OFF or Fader Trim (TRIM) event to be added to the mix.

After setting the timecode for the new event the path may be selected using the RH Jogwheel or by typing in the path name or number. Pressing MUTE ON, MUTE OFF, EQ ON or EQ OFF then creates the event.

Pressing AUX ON, AUX OFF will prompt for an Aux no. and then create the event.

Pressing FADER TRIM will prompt for an offset level in dBs and then create the event.

The new event will then be inserted into the display list at the designated timecode and the cursor moved to it.

To keep all changes press SAVE AS NEW PASS which creates a new pass of automation containing the changes. It will then be loaded automatically as the current pass.

```
── PROJECT1
   └── TITLE1
       ├── MIX1
       │   ├── PASS0
       │   └── PASS1
       └── MIX2
           ├── PASS0
           ├── PASS1
           ├── PASS2
           └── PASS3
   └── TITLE2
       └── MIX1
           ├── PASS0
           └── PASS1
── PROJECT2
   └── TITLE1
       └── MIX1
           ├── PASS0
           ├── PASS1
           └── PASS2
```

Automation Filing

Introduction

Multiple Mix Passes can be saved in an inbuilt filing system accessed from the AUTOM FILING softkey in the LOGIC page.

Passes are stored according to the directory tree structure. Multiple Passes are stored in a Mix. Mixes belong to a Title of a Project etc. This provides the facility to store and recall automation and mix setup data without having to reboot the desk.

If the KEEP button is pressed whilst the Autosave function is off the console saves a new pass to the current mix.

If the Autosave function is on the KEEP button transfers the current pass to the mix setup.

If the controls are in WRITE mode, every time the PLAY transport key is pressed and automation data is entered by moving a control or fader a new pass is added to the current mix (after the transport is stopped again). This is indicated by 'Saving...' appearing on the scribble display of the main channel.

This allows the user to automate a mix one fader/control at a time. If the last pass is not considered acceptable a new mix can then be created using coalesced automation data up to and including the last acceptable pass by pressing the LOAD softkey.

Automation File Auto-numbering

When the system automatically generates an Automation File Name any gaps in the sequence (i.e. earlier files have been deleted) will remain in place and will not be used for new files (e.g. if the existing files were - Mix0, Mix1, Mix2, (gap), Mix4 - the next file generated will be "Mix5 not "Mix3).
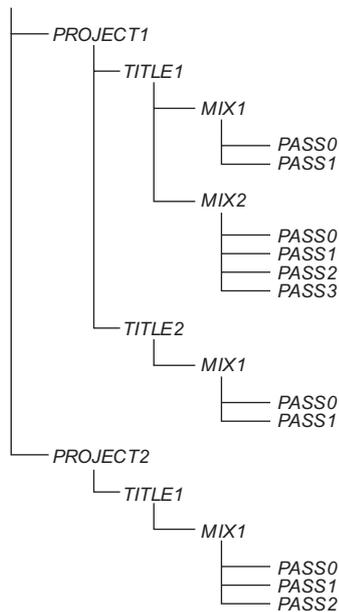
PROJECT LEVEL

From this level projects may be created, copied, renamed or deleted by use of the appropriate softkeys. A user-definable note can also be attached to each project.
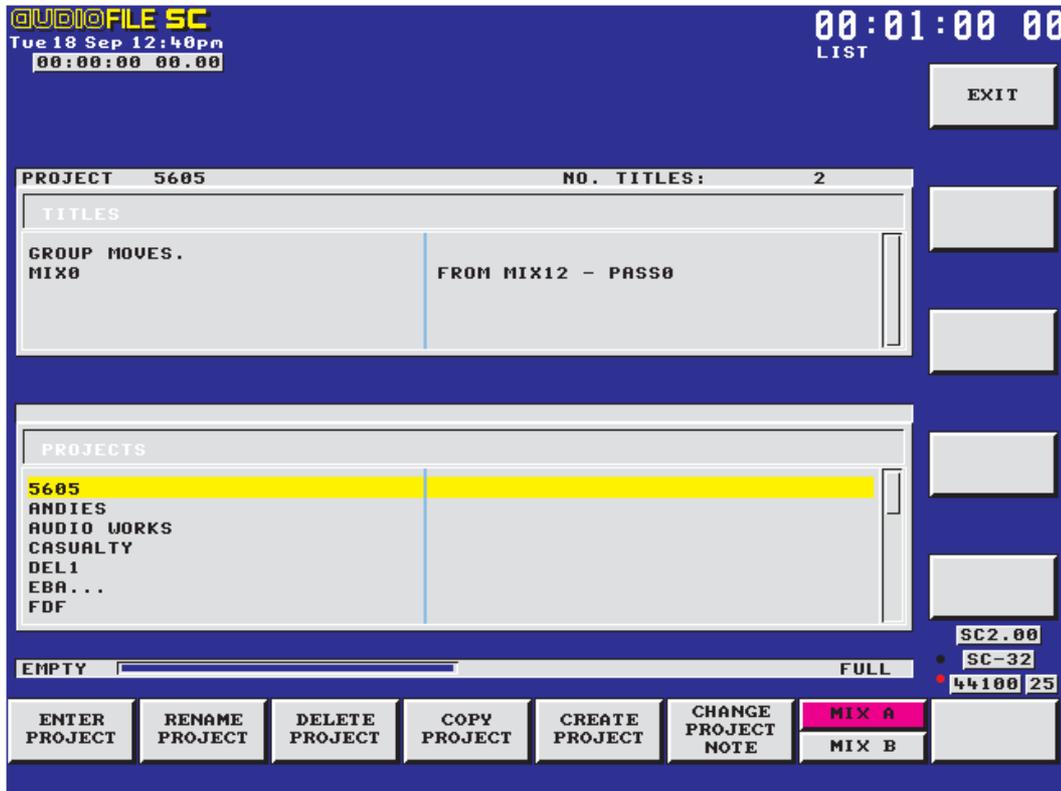
The bar at the top shows how many titles belong to the highlighted project and the names of these titles are shown in the box below.

The ENTER PROJECT softkey steps down the directory tree to the highlighted project.

TITLE LEVEL

At this level titles may be created, copied, renamed and deleted in the same way as at the project level.
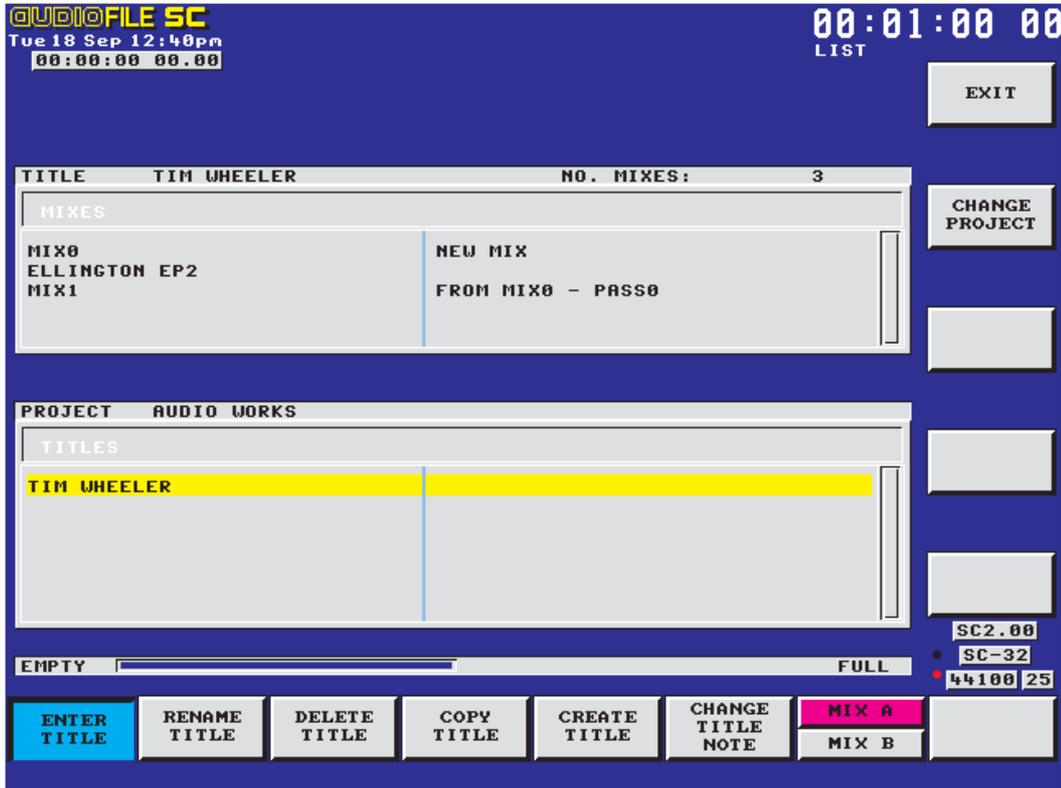
The CHANGE PROJECT softkey allows you to step back up the directory tree to the project level which will let you change project.

MIX LEVEL

At this level mixes can be added, renamed etc.
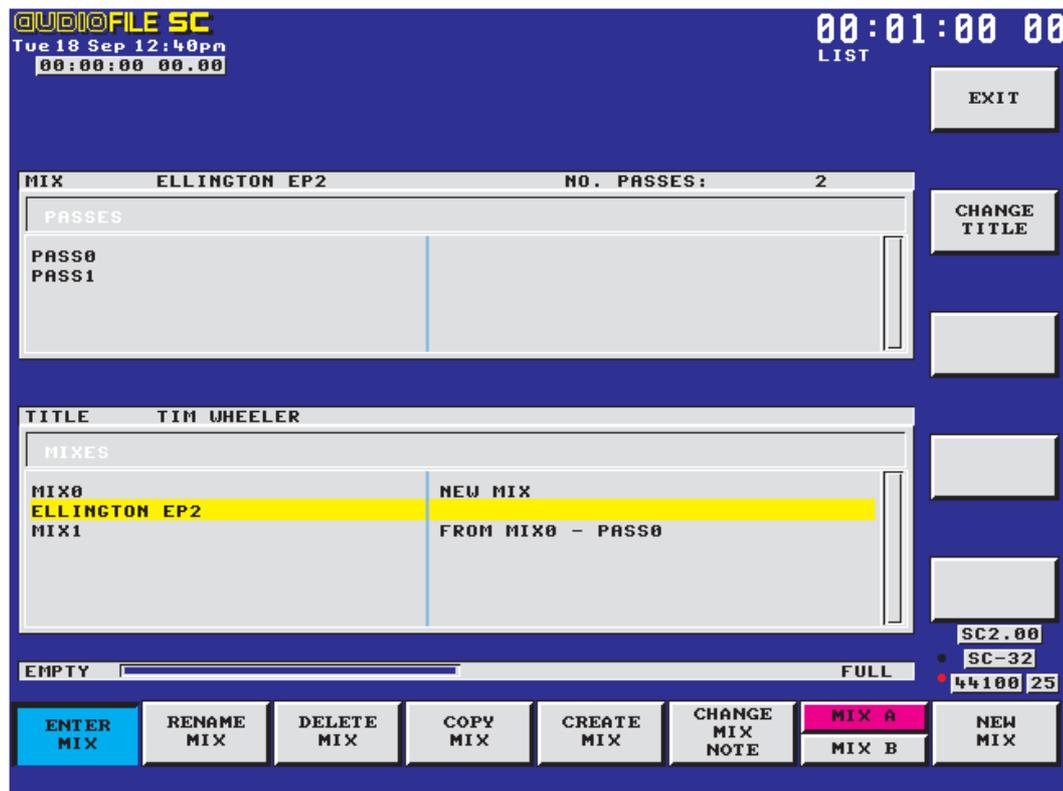
The CHANGE TITLE softkey allows you to step back up the directory tree to the title level to let you change title.

CREATE MIX installs existing mix setup automation into the pass system as PASS 0 with a user defined mix title.

The NEW MIX softkey creates a snapshot of all automation console settings regardless of mode, time stamped at minus infinity. This also activates the virgin territory feature.

To rename Projects

➤ Press the MAIN AUTNM softkey.

The main automation page will appear.

➤ Press the AUTMN FILING softkey.

The automation filing page will appear.

➤ Select the project using the right-hand Softwheel.

➤ Press the RENAME PROJECT softkey.

The rename project dialogue box will appear.

➤ Enter the new name using the QWERTY keyboard.

➤ Press the ENTER key.

To rename Titles (from projects)

➤ Press the ENTER PROJECT softkey.

➤ Select the title using the right-hand Softwheel.

➤ Press the RENAME TITLE softkey.

The rename title dialogue box will appear.

➤ Enter the new name using the QWERTY keyboard.

➤ Press the ENTER key.

To rename Mixes (from titles)

➤ Press the ENTER MIX softkey.

➤ Select the mix using the right-hand Softwheel.

➤ Press the RENAME MIX softkey.

The rename mix dialogue box will appear.

➤ Enter the new name using the QWERTY keyboard.

➤ Press the ENTER key.

PASS LEVEL

The pass level allows you to REVIEW PASS which adds a new pass to the current mix or LOAD pass which creates a new mix using coalesced data up to and including the highlighted pass.
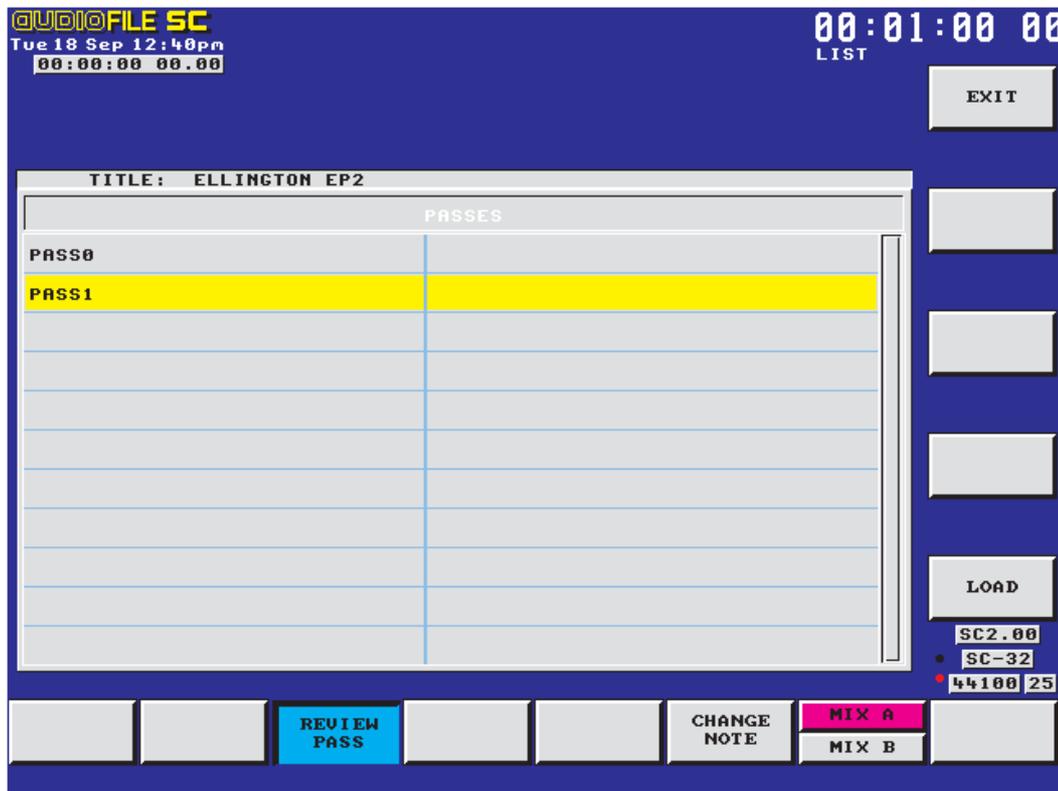
✎ *Mix Setup Automation, Modes, Ends and Virgin Territory States are converted when paths are added or removed (i.e. path map changes), unlike pass automation.*

Logic Automation Restore

During a Logic Automation Restore, automation data is restored to the current mix and also placed in the automation filing system with PROJECT, TITLE and MIX names of FLOPPY RESTORE (as shown in the figure opposite).

```
└─FLOPPY RESTORE
 .    └─FLOPPY RESTORE
 .         └─FLOPPY RESTORE
 .              └─PASS0
```
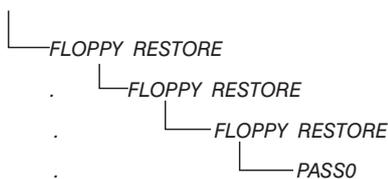
✎ *Unless the restored project is renamed it is susceptible to being overwritten by another restored floppy.*

✎ *See Configuration for a description of Backup and Restore.*

Setup Cycle

Allows users to create a cycle on the associated transport.

✍ *A cycle can only be setup after loading a mix.*

To setup a cycle

➤ Load a mix.

➤ Press the SETUP CYCLE button (in the main automation page).

The SETUP CYCLE page will appear.
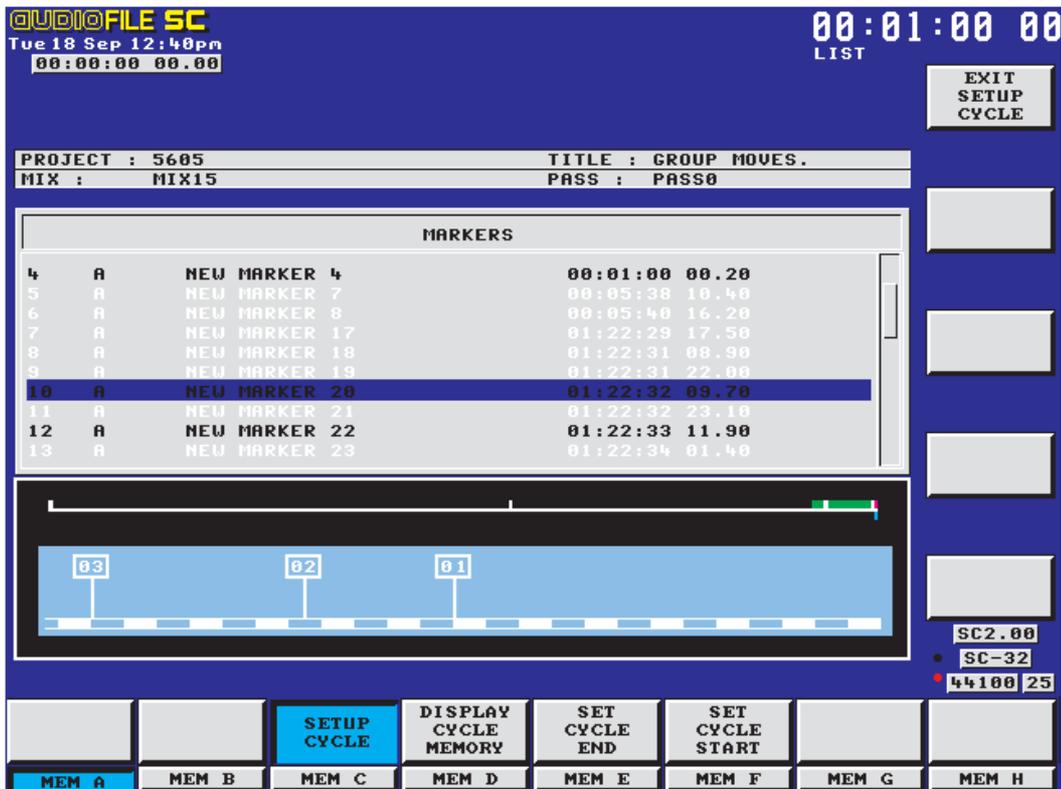
➤ Press the SET CYCLE START button.

➤ Type in the start time using the alphanumeric keyboard.

or

➤ Select a marker (lollipop) using the left-hand Softwheel.

➤ Press the ENTER key to confirm the highlighted selection.

➤ Press the SET CYCLE END button.

➤ Type in the end time using the alphanumeric keyboard.

or

➤ Select a marker (lollipop) using the left-hand Softwheel.

➤ Press the ENTER key to confirm selection

To display an existing cycle

➤ Press the DISPLAY CYCLE MEMORY button.

To leave the page

➤ Press the EXIT SETUP CYCLE or SETUP CYCLE button.

To play transport in cycle mode

➤ Press the CYCLE hard key (located to the left of the LOGIC key and adjacent to the alphanumeric keyboard).

Ganging

Introduction

A multi–level "VCA–style" ganging system is supported for faders. An example of gang structure is shown below.

```
                    MASTER
        ┌─────────────┼─────────────┐
     SLAVE         SLAVE         SUBMASTER
                          ┌──────────┼──────────┬──────────┐
                       SLAVE      SLAVE      SLAVE      SUBMASTER
                                                 ┌──────────┬──────────┼──────────┬──────────┐
                                              SLAVE      SLAVE      SLAVE      SLAVE      SLAVE
```
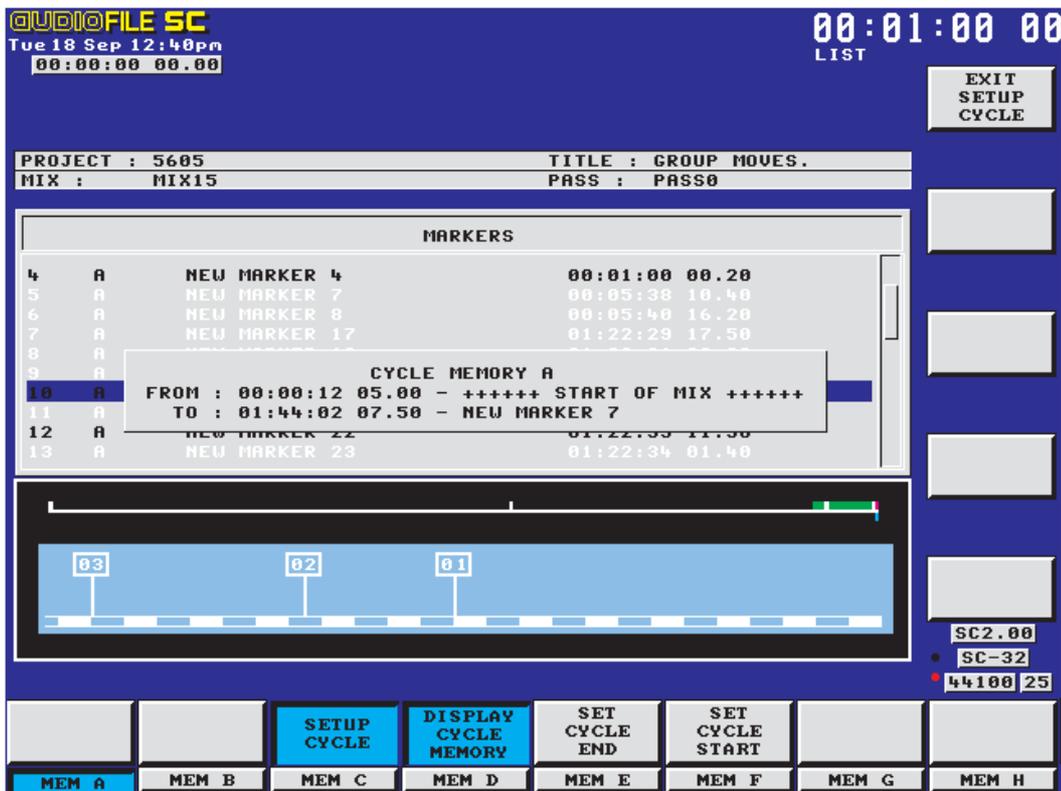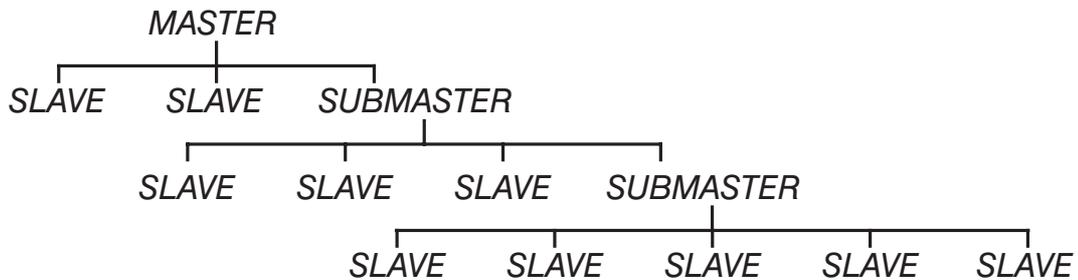
Setting Up A Gang Structure

Gangs are set up via the screen based set–up page which is accessed from the MENU key and then the GANGS SETUP softkey. The feature also has on–screen help which is toggled on and off using the HELP key.

➤ To create a master press and hold the PATH button on the path which is to be master then use other PATH buttons to select slaves to be controlled by that master.

All PATH buttons of that gang will illuminate RED and the screen display adjacent to the PATH buttons will alternate between the path names and the status of the path within the gang as follows:

❏ 'MST' for an overall master

❏ 'SLV' for a slave

❏ 'sub X' for a submaster of level X relative to the overall master

➤ To interrogate a gang structure or to add/subtract paths from a gang (once created), press and hold the PATH button of any member of the gang.

The PATH button LEDs and adjacent screen displays will show the gang structure as illustrated above.

If a master is CUT, then all its slaves will also be cut.

With SOLO IN PLACE selected, SOLOing a master will also include its slaves. Only AFL/PFL will interrogate the master alone (and not its slaves).

The faders of slaves or submasters will move when the master fader is moved and always indicate the true gain through the fader element in the path. Offsets between slaves and other masters are always maintained and may be changed at any time by moving a slaves's fader.

The gang structure is saved with mix setup when KEEP is pressed.

The relative values of a master and it's slaves are established at a new mix. Only the movements of a master or submaster are recorded to the mix path (unless an individual slave is forced into write) when it's new relative value is also saved with the mix.

Surround Sound Facilities

The surround features of the Logic 3SC are provided by the Surround Monitoring/PEC Direct panel, Joystick panel and the controls in the Channel Strips.

5.1 Format Surround Sound Example

A 5.1 Format Surround Sound setup on Stem A is used as an example for some of the features in this chapter. This is a very simple setup for illustration purposes only.

This format is known as 5.1 because there are five surround destinations (Front Left, Front Centre, Front Right, Rear Surround Left and Rear Surround Right) plus the sub-woofer.

The setup will be as follows:

❏ 5.1 Format Surround Sound using L, C, R, LS, RS and SW (sub-woofer).

❏ 1 to 6 will form Stem A.

❏ Channel 10 as a stereo input from 1lin 1AB.

❏ Channels 11 and 12 as mono inputs 1lin 2A and 1lin 2B.

All the examples listed below refer to this setup and the steps towards obtaining it. It is assumed an appropriate Desk Setup with enough Channel, Group and Film paths has been loaded. It is also assumed that the Films are patched to the correct outputs for the speakers (the particular outputs used for the speakers will be different from one Logic 3SC to another).

The other panels that relate to this example are:

❏ Select Paths to form the Stem

❏ Select the speakers for monitoring the Stem

❏ Select inputs to the Stem

❏ Monitor the result

The Surround Monitoring/PEC Direct Panel
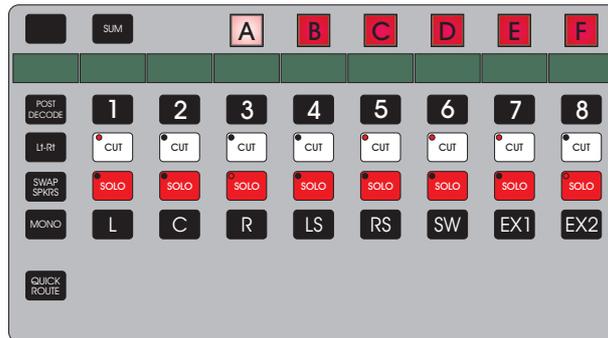
Provides controls for selecting the Stems to be monitored and the formats to use for monitoring.

It can be used to configure up to five Stems, labelled A through to E. Each Stem can consist of up to eight Groups (busses) which are then routed to the Film paths.

Each Group in each Stem also has Solo and Cut control. This only affects the signals routed to the Film paths and is the same as using Solo and Cut on the corresponding fader strips.

Tracks

The Logic 3SC can be configured with up to 8 tracks according to the surround format(s) required in the mix. These tracks are the composite stem outputs for recording combined stem surround mix, and should be connected to the stem recorder. If it is required to record the stem premixes separately, these should be recorded directly from the group stem outputs. The tracks can be accessed by pressing the "stem F" button on the panel.

The tracks are routed from the group stems according to the group-film routing. This is fixed within the system and cannot be changed. The track outputs are not affected by any SOLO or CUT operations involving the FILMS.

The Joystick Module

Provides an intuitive means of panning a signal in a surround sound field.

How the Surround Sound System Works

A surround sound setup on the Logic DFC consists of three main parts:

❑ Signal sources that are panned.

❑ Group stems that accept the panned signals.

❑ Track stems for record out.

❑ Film monitoring that controls which stems are output to the speakers.

Film stems are made up of mono Groups that have had suitable pan designators applied to them using Desk Editor. The pan designator means that when a Channel is routed to a particular Group then the Group only receives the relevant portion of the signal that is panned to that speaker position.

The Simplified Surround Monitoring diagram shows how this works:

SIMPLIFIED SURROUND MONITORING
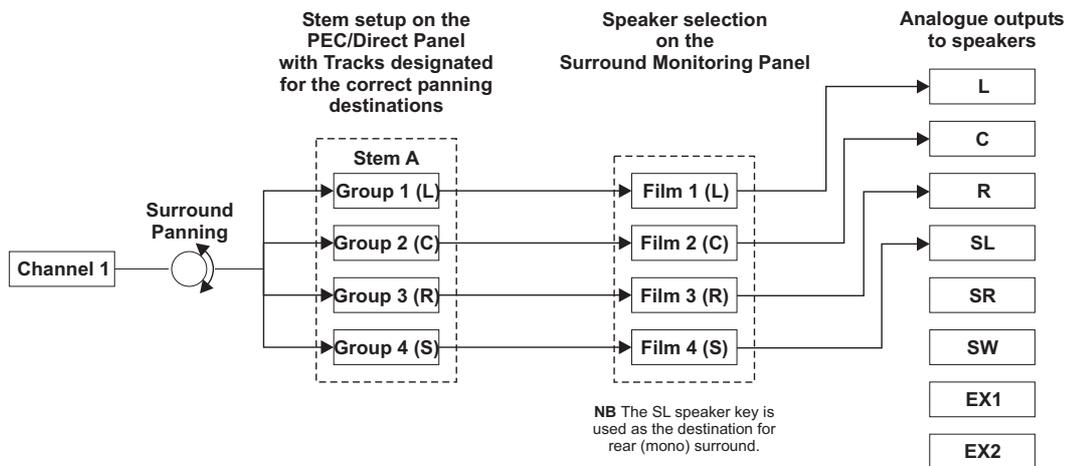
Stem A consists of the first four Groups in the current Desk Setup, and the LCRS Pan Macro has been used to designate the Groups appropriately.

Channel 1 is routed to all the Groups in Stem A.

If Channel 1 is panned fully to the left and front, then the only significant signal will be sent to Group 1 because Group 1 is designated in the panning position of (Front) Left. If the FB pan control (or a Joystick) is used to 'move' the signal back from this position then the signal will slowly diminish to the Left (Group 1) and gradually increase to the Mono Surround (Group 4).

The Group must then be routed to the correct Film paths in the Surround Monitoring Panel. The Film paths are automatically assigned to speaker positions according to the number of Film paths selected in the current Desk Setup. There can be 0, 4, 6 or 8 Film paths.

In the example in the Simplified Surround Monitoring diagram there are 4 Film paths that have been automatically assigned to the speaker buttons that are used for LCRS monitoring (L, C, R and LS).

Surround Sound Panning

The top Logicator on I/O page 1 allows any MONO group to be set as a Surround Sound destination.

Press and hold ON/CLEAR to dial through the following types:

Mono	(M)
Left	(L)
Right	(R)
Front left	(FL)
Centre	(FC)
Front right	(FR)
Surround mono	(SM)
Surround left	(SL)
Surround right	(SR)
Inner Left	(IL)
Inner Right	(IR)
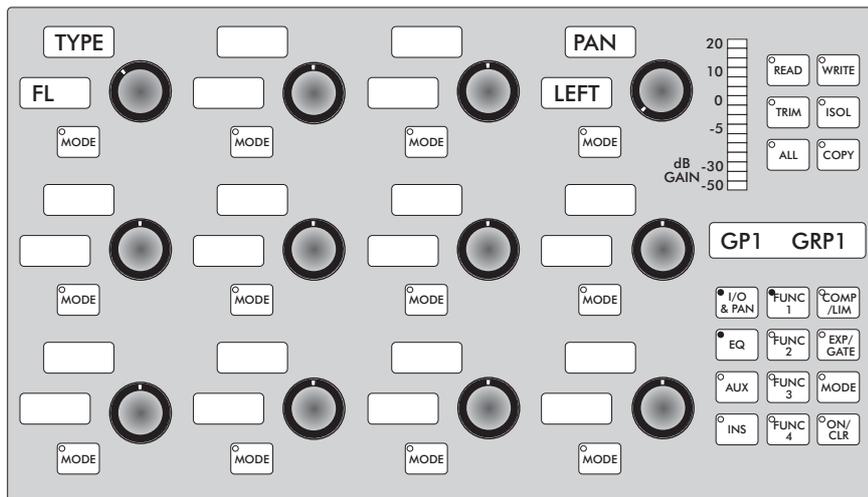
The group changes to the type selected when ON/CLR is released and the panning of all paths routed to it are adjusted appropriately (i.e. A group's filmset type determines which channel pan control will apply to that group when the channel is routed to it).

Three pan controls and one divergence control are required for all input paths and these appear on I/P Page 4. Touch-activated in/out is provided for each control.
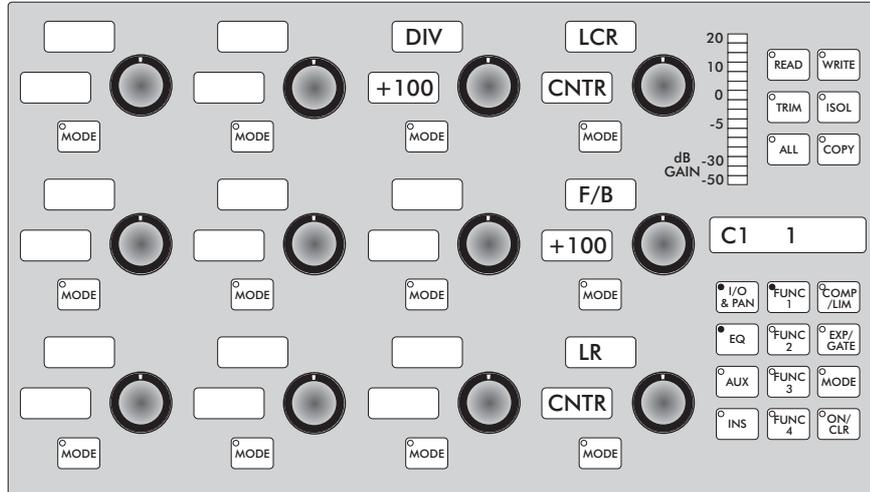
Pan and divergence controls are switched in/out of circuit by pressing and holding ON/CLR on that strip's lower chanquad section then using the relevant Logicators to toggle in/out. OUT is displayed on the alpha display when the control is out of circuit.

The LCR pan Logicator is a spot type display.

The DIV control is a Q type display widening according to the setting. Zero div, hard left, corresponds to a point source. Full divergence, hard right, (displayed as INF) indicates a source spread evenly across the LCR positions.

FB pan will be a spot-type display with hard front on the left.

LR is the familiar spot-type display.

The Logic twin joystick panner

This optional assignable control panel can provide simultaneous control of surround panning with DIVERGENCE on any channel or monitor path in the console. This allows optimum control of source placement within the soundfield. It is totally automated and enables the recording of dynamic pan-effects of the most dramatic, subtle and/or highly complex nature to be achieved quickly and easily.

The unit consists of:

1 Joystick

2 LED-matrix Pan-Position (PanPos) display

3 Nudge buttons and parameter display for divergence control

4 Path assignment display and selection controls

5 In/out controls for the individual pan elements

6 Automation controls
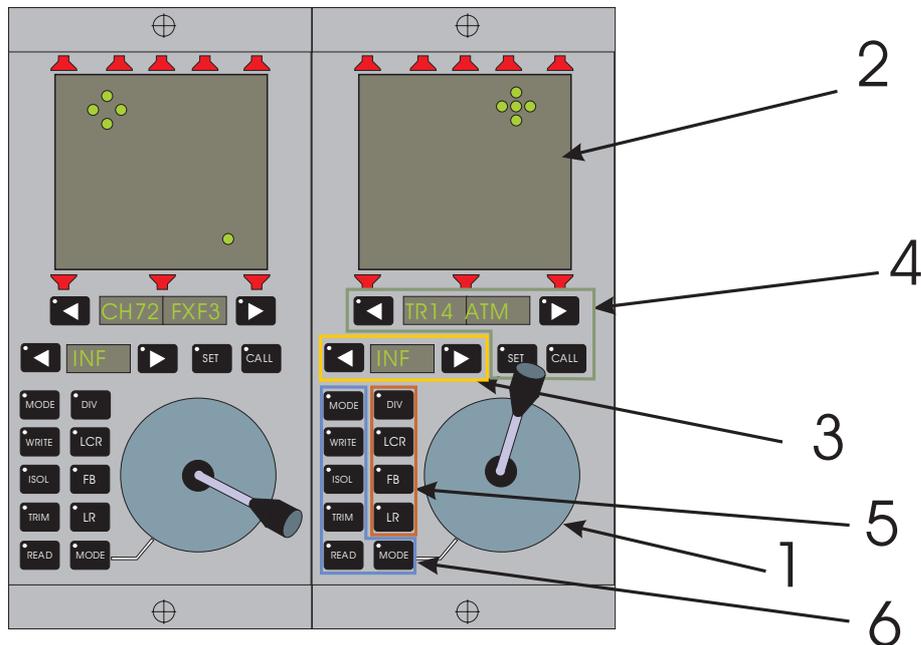
Operation

The green LED-matrix (PanPos) display above the joystick and buttons is used to represent the 2-D 'soundfield' within which a source may be notionally positioned using the joystick.

The current pan position of the source is indicated by a hollow 'diamond' (see Figure 9:3, left–hand side) on the PanPos display. The current position of the joystick is indicated by a single 'spot'. When the joystick is directly controlling the pan position (in ISOLATE or WRITE) these two symbols are superimposed and form a solid 'cross' on the display (see Figure 9:3, right–hand side).

✍ *For the rest of this section it is assumed that the joystick is in ISOLATE.*

The red loudspeaker symbols around the PanPos display represent the reproduction channels in a listening environment. They illuminate according to the pan types of the groups/Groups that the path currently under the joystick is routed to (regardless of which controls are in circuit).

To use the joystick to pan a channel or monitor path press and hold CALL on the panel then use the PATH buttons on the console to select a path.

Alternatively use the nudge buttons to the left/right of the current path assignment display to cycle through the channel and monitor list. A single press steps forward or back by one. Pressing and holding steps through the list at 4 paths/sec.

In both cases the path selected then flashes its number and user-name in the current path display window. At this point the pan position of the selected path is shown as the 'diamond' and the joystick position by the 'single spot'. Pressing CALL again moves the pan position of the path to that of the joystick – indicated by the relocation of the 'diamond' to the 'spot' which together form the solid 'cross' (see Figure 9:3).

To preserve the current pan position of the path move the 'spot' to the centre of the 'diamond' using the joystick then press CALL as previously described.

The joystick now controls the 3 Pan Logicators and Divergence Logicator on page 4 of the channel or monitor path called to the panel. The Logicators are locked out (including their touch sensors) and cannot be used for control, however the movement of the joystick is reflected on the Logicator and parameter displays.

With all 3 pan controls switched in-circuit the sideways movement of the joystick affects LCR pan and up/down movement the FB pan. Divergence control is achieved by means of two nudge-buttons and an alphanumeric display window. The left button to reduce, the right to increase, with continuous increment or decrement on press–and–hold.

The action of the joystick can be reduced by switching off LCR, FB or LR using the buttons labelled for that purpose. In that case the movement of the 'diamond' display will be restricted (replicating the effect of reduced-axis panning).

Joystick moves may be automated in the same way as other Logic controls using the joystick MODE button and its associated automation status controls. When going from READ to WRITE the joystick should first be 'nulled' to prevent a jump from the automation play pass value to the current physical position of the joystick. Do this by aligning the 'spot' to the 'diamond' before selecting WRITE.

Stem Configuration

To change the pan designators for Groups

➤ Bring the required mono Group onto the AFU.

➤ Rotate the 'Surr' Logicator on the AFU to set the pan designators.

To select the Groups (busses) for a Stem
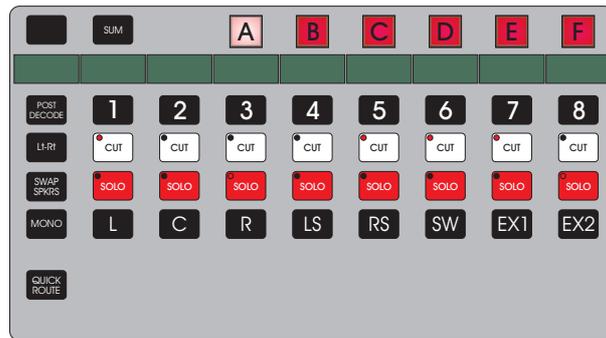
➤ Press the required Stem key (A-E).

➤ Press and hold the 1.

➤ Select the group you wish to occupy location "1" of stem A by pressing the corresponding group key above the LCD display.

➤ Repeat for the remainder of the Stem (keys 2, 3, 4, etc.) according to the Stem Type (e.g. 4 for LCRS, 6 for 5.1, etc.).

✍ *Groups (busses) are de-routed from Stems in the same way by pressing the selected source (red LED) to toggle it out (green LED).*

To select the speakers for monitoring a stem

➤ Press the A-E key for the required stem.

➤ Press and hold the required speaker key.

➤ Press the 1-8 keys with a Track (bus) which has the correct Pan Designation.

The integral LED in the number key will turn red or orange flashing according to whether or not the Stem is selected for monitoring on the STEM SEL section of the Surround Monitoring Panel. Release the speaker key.

➤ Continue to select Stem elements to the speakers.

Pressing the quick route button will route groups within the selected stem to it's corresponding FILM in a logical manner (i.e. GROUP1- FILM1, GROUP2- FILM2 etc). This routing will automatically be reflected in the group - track routing.

This can also be done in reverse:-

➤ Press and hold the number key then press the speaker key.

The speaker select key LEDs will be illuminated according to the FILM type in the current Desk Setup. For example, if four way surround sound (LCRS) is selected, the L, C, R and LS key LEDs will illuminate.

✍ *It is possible to use Stems for 'narrower' surround formats than the Desk Setup has provided with the number of Film paths. For instance, an LCRS Stem can be monitored on a 5.1 monitoring setup by routing the rear surround channel to both the left and right surround monitors.*

✍ *It is possible for more than one Group within a Stem to feed the same speaker, such as two LCR dialogue sets in one Stem.*

To select the outputs for tracks

➤ Press the "stem F" key on the surround monitor panel. This will call the tracks into the panel.

➤ Select the track by pressing numbered key below the track. This will call the track onto the AFU.

➤ Press the I/O & PAN and FUNC 2 key to assign the track output in the normal way.

To monitor the return signals from the stem recorder use the post decode function of the FILMs.

Patching Film Inserts for Post Decode & Lt-Rt

The insert sends and returns that are used by Post Decode and Lt-Rt can be patched from the console surface. The sends are shared, but the returns are set separately.

✍ *If Stereo is selected as the current Film format in Desk Edit then Post Decode and Lt-Rt are not used.*

To patch the Post Decode and Lt-Rt inserts

➤   Press the button for the required Film (L, C, R, etc.)

The Film will be called on to the AFU.

➤   Press the INS key on the AFU.
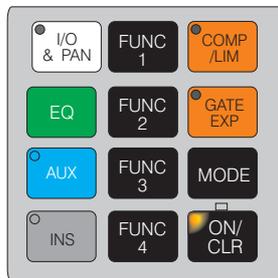
The Film path is now ready for the appropriate insert to be selected.

To set the Post Decode sends and returns

➤   Press the POST DECODE key.

The integral LED will illuminate red.

The current ports used by the send and return on each Film path will be shown on the Logicators.

Ports must be turned off with ON/CLEAR before they can be changed.

To set the return for Lt-Rt

➤ Press the Lt-Rt key.

The insert returns for Lt-Rt will be shown on FLM1 (Left) and FLM3 (Right). They can not be modified individually.

➤ Press the MONO key.

The insert returns will be shown as a stereo pair on FLM2 (Centre).

The stereo port must be turned off with ON/CLEAR before it can be changed.

When all changes have been made:

➤ Turn off POST DECODE or Lt-Rt and MONO.

Panning Controls

The appropriate panning controls are automatically enabled according to the pan designators on routing destinations for the path. The panning controls can be switched out completely from the strip, or a panning axis can be frozen when the path is panned by a Joystick.

To completely disable a panning axis

➤ Press I/O & PAN and FUNC 4.

➤ Press and hold ON/CLR.

➤ Touch Surround Pan Logicators 5 to 8 as required.

The associated alphas will display OUT when the Logicators are disabled.

➤ Release ON/CLEAR.

✎ *A panning axis can be frozen at a required setting (as opposed to being completely inactive) using the Joystick Module.*

✎ *It is advisable to press the DIM key or turn down the level control on the Control Room section before routing paths to Stems. This will prevent sudden loud noises if a signal is already present on an input.*

Surround Monitoring

When the film stems have been fully configured, the Surround Monitoring Panel allows various monitoring options, including summing of film stems.
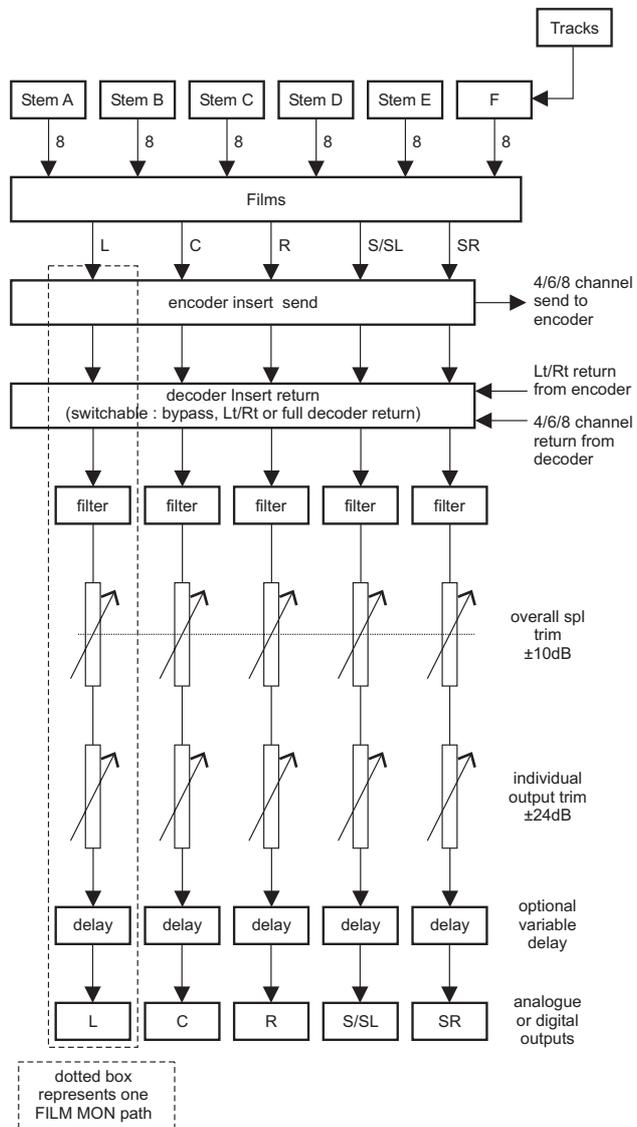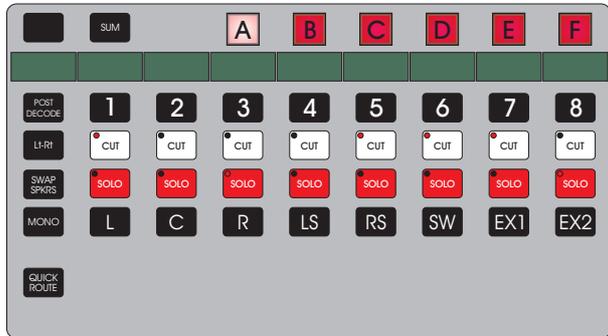
Monitoring the Stems

The STEM SEL section of the Surround Monitoring panel is used to select which Stem is being monitored.

To select a single Stem to monitor

➤ Make sure the SUM key is off (hold down the key if it is illuminated).

➤ Press the A to E key on the STEM SEL section.

The key will illuminate and the previous selection will be cancelled.

To select multiple Stems to monitor

➤ Press and hold the SUM key.

The LED above the key will illuminate.

➤ Press the A to E keys as required.

The selected keys will illuminate. All the selected Stems will be monitored.

Each time a key is pressed it will toggle on or off.

**5.1 Format Surround Sound Example:
Monitoring the Surround Sound Audio**

➤ Press the A key in the STEM SEL section of the Surround Monitoring panel.

The Channels are now fully routed through to the Film outputs via Stem A.

➤ Activate the audio source(s) (e.g. if it is a tape machine, put it into play).

➤ Gradually turn up the level control pot on the Control Room panel until the signal is audible on the speakers at a satisfactory level.

➤ Press the I/O & PAN key on the fader strips for Channel 10 to 12.

➤ Turn Logicators 5 to 8.

You will hear the effects as the changes are made to the pan position.

Alternatively

➤ Call Channel 10, 11 or 12 to a Joystick and adjust the pan position with the Joystick.

Surround Monitoring Formats

The Surround Monitor section allows the operator to override the output to the surround monitoring speakers to check the mix in different formats. The section also has trim control for fine adjustment of the monitor level.
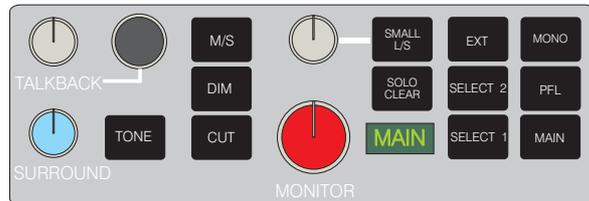
To monitor a mono mix of the surround outputs

➤ Press the MONO key in the Surround Monitor section.

The integral LED will illuminate red.

The output to all the speakers except Front Centre will be cut.

A true mono mix of the surround monitor output will be heard on the Front Centre speaker.

To swap the front left/right outputs with the main monitor output (SEL 1)

➤ Press the SWAP SPKRS key.

The integral LED will illuminate red.

The LED(s) for the currently selected Stem(s) in the Stem Sel section will flash.

The output for front left and front right will be sent to SEL 1.

The output routed to SEL 1 will appear on the front left and front right speakers and the remaining surround speakers will be cut.

The SEL1 system path is often used as an output to near-field speakers. If near-field speakers are being used (to test mixes on domestic quality speakers) then the output format can be changed (e.g. using Lt-Rt or MONO) to test compatibility with non-surround domestic systems.

LCRS Pre and Post Decode Monitoring

Both of these functions use inserts to switch the Film paths through external equipment for encoding and decoding.

To monitor the Left Total and Right Total output from the Dolby matrix encoder

➤ Press the Lt-Rt key.

The integral LED will illuminate orange.

The LED(s) for the currently selected Stem(s) in the Stem Sel section will flash.

The output to all the speakers except Front Left and Front Right will be cut.

This allows the operator to hear how an LCRS mix will sound on an ordinary left/right stereo system with the LCRS encoded in the stereo Groups.

✍ *The Lt-Rt and POST DECODE keys are latched with each other so selecting one will turn the other off if it was on.*

To monitor the decoded output from the Dolby matrix encoder

➤ Press the POST DECODE key.

The integral LED will illuminate orange.

The LED(s) for the currently selected Stem(s) in the Stem Sel section will flash.

The output to speakers other than Front Left, Front Centre, Front Right and Rear Surround Mono will be cut.

This allows the operator to hear the LCRS mix after it has been encoded into a stereo signal (Lt-Rt) and then decoded back to LCRS.

✍ *The Lt-Rt and POST DECODE keys are latched with each other so selecting one will turn the other off if it was on.*

Surround Monitor Solo and Cut

The SOLO and CUT keys on the Surround Monitor panel only affect the output to the surround monitors (speakers) via the films.
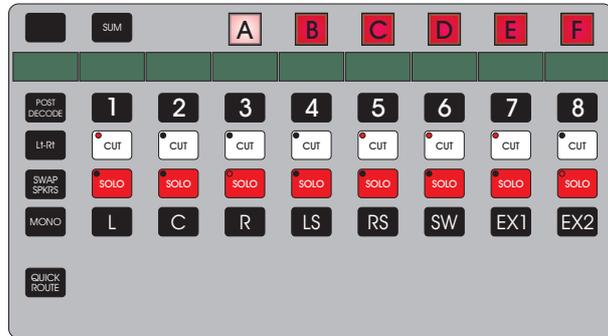
To CUT an individual speaker

➤ Press the CUT key above the required speaker key.

The LED above the CUT key will illuminate green.

To SOLO an individual speaker

➤ Press the required SOLO key.

The LED above the key will illuminate red. The LEDs above the CUT keys for the other speakers will illuminate green.

✍ *Solo is additive so L and R could be soloed by pressing their SOLO keys in turn.*

SIMPLIFIED SURROUND MONITORING

Stem setup on the PEC/Direct Panel with Tracks designated for the correct panning destinations

Speaker selection on the Surround Monitoring Panel

Analogue outputs to speakers

Stem A

Channel 1 → Surround Panning →	Group 1 (L)	Film 1 (L)
	Group 2 (C)	Film 2 (C)
	Group 3 (R)	Film 3 (R)
	Group 4 (S)	Film 4 (S)

Speakers: L, C, R, SL, SR, SW, EX1, EX2

NB The SL speaker key is used as the destination for rear (mono) surround.

Surround Path Routing

Analogue outputs to speakers

Stem A
Group 1
Group 2
Group 3
Group 4

STEM TO FILM ROUTE

Film 1
Film 2
Film 3
Film 4

Speakers: L, C, R, SL, SR, SW, EX1, EX2

Stem B
Group 5
Group 6
Group 7
Group 8

Stem C
Group 9
Group 10
Group 11
Group 12

Track 1
Track 2
Track 3
Track 4

Analogue outputs to recorder

Speakers: L, C, R, SL, SR, SW, EX1, EX2

To Use Solo In Place

➤ Press the SOLO key on the required fader strip(s).

The panned signal from the selected path will now be routed to the Film paths to output to the monitor speakers.

The signal will appear on the speakers according to how it is panned. This should match the routing through any Stems, assuming that the Groups in the Stems are routed to the correct speakers according to their pan designators.

All the surround monitoring capabilities in the Surround Monitoring panel can be used to test the Solo signal (e.g. Lt-Rt).

Any number of SOLO keys can be pressed.

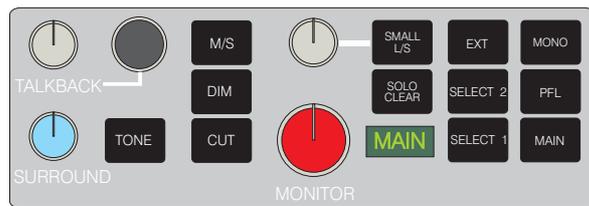The LED in the SOLO CLEAR key on the CONTROL ROOM section of the console will flash orange.

To Cancel Solo

➤ Press the SOLO keys to turn them off.

or

➤ Press SOLO CLEAR on the CONTROL ROOM section of the console.

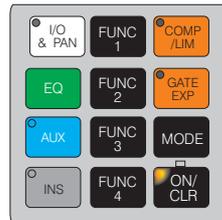The integral LED in the SOLO CLEAR key will stop flashing.

Surround Panning

Surround panning is controlled using the panning Logicators when I/O & PAN is selected or by using the Joysticks.

The Joysticks provide an intuitive means of controlling the pan position, particularly where sound must be matched to objects moving about on film.

Panning with Logicators

To access the Panning controls

➤ Press the I/O & PAN and FUNC 4 key.

The integral LED will illuminate orange.

Logicators are assigned to panning and the alpha descriptions are Rear, F-b, Div and Lcr respectively.

If appropriate Groups (busses) in Stems have not been selected (i.e. the path is not routed through to the appropriate speakers), the alphas will display OUT.

✍ *All the Stems are taken into account for panning controls. For instance, if a path is routed to front speakers on one Stem and surround speakers on another Stem then all panning controls will be available.*

To adjust front pan/balance

➤ Rotate Logicator 'LCR' to the required setting.

✍ *This is a pan control for mono signals and a balance control for stereo signals.*

To adjust divergence of a mono signal

➤ Rotate Logicator 'DIV' to the required setting.

The Logicator displays an arc which spreads from the centre as divergence is increased.

✍ *This control is not available on stereo paths.*

To adjust width of a stereo wide signal

➤ Rotate Logicator 'WDTH' to the required setting.

The Logicator displays an arc which spreads from the centre as width is increased.

✍ *This control is not available on normal stereo or mono paths.*

To adjust front to back pan

➤ Rotate Logicator 'F-b' to the required setting.

To adjust the rear surround pan/balance

➤ Rotate Logicator 'REAR' to the required setting.

✍ *This control is only available when a surround format with both left and right rear surround speakers is in use.*
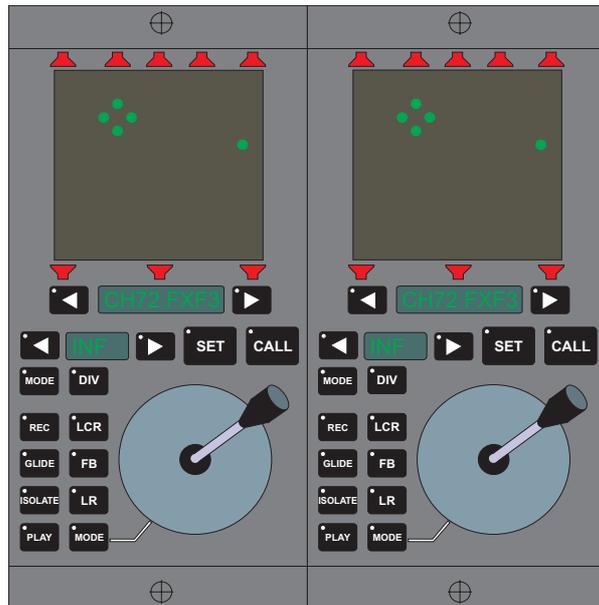
To switch a panning control in or out

➤ Press and hold the ON/CLR key.

The alpha for controls which are on will display the current setting.

The alpha for controls which are off will display OUT.

➤ Touch the required Logicators to toggle the control in or out.

Panning with Joysticks

The twin Joystick module is used to pan up to two signals across surround speaker destinations.

Channels can be assigned to a joystick. The regular panning controls on the channel strip are locked out. If I/O & PAN and FUNC 4 is selected for a path on which panning is controlled by a joystick then the alphas and Logicators will display changes as the joystick is moved.

The joystick provides full automation for recording panning information. This makes it possible to pan as many paths as required with repeated passes.

PanPos Display
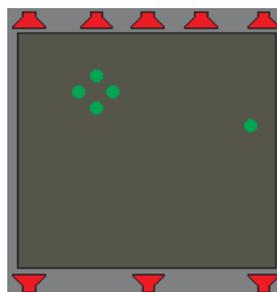
The LED matrix above each joystick is called the PanPos display.

The position of the joystick is indicated by a single dot. The notional panned position of the signal (i.e. where the signal seems to be when listening to it) is indicated by an open diamond of four dots.

When the joystick is in control of the panning, the dot and diamond join together to form a cross.

To select the path to be controlled by a joystick

➤ Press the nudge keys on either side of the alpha display below the PanPos and speaker display.

The alpha will cycle through the available paths and shows both the system and user names.

The speaker symbols will illuminate to show the speakers the path is routed to.

✍ *If a nudge key is held down then the paths names will scroll rapidly.*

or

➤ Press and hold the SET key.

➤ Select the required path from the Lower Routing Panel.

➤ Release the SET key.

In both cases, the alpha will flash the selected system path name and user path name.

To control the panning with a joystick

➤ Press the CALL key.

The integral LED will illuminate red.

The diamond on the PanPos display will jump to the dot to form a cross.

The path name will stop flashing.

➤ Move the joystick as required.

✍ *To prevent the sound jumping when the CALL key is pressed, first move the spot to the diamond.*

To freeze a panning axis or divergence

➤ Press the DIV, LCR, FB and LR keys as required.

The integral LED will cease to be illuminated.

If LCR, FB or LR is frozen then the diamond will separate from the dot as it moves according to the remaining panning axes.

If a control is un-frozen then the diamond will jump to the dot.

✍ *If a control is switched OUT completely with the ON/CLEAR key then the axis will remain frozen at its default value regardless of whether the corresponding freeze key is on or off.*

✍ *If all panning controls are switched OUT completely with the ON/CLEAR key then there will be no diamond on the PanPos display.*

To adjust divergence

➤ Press the nudge keys on either side of the divergence alpha display.

Quad AES/EBU Interface Card (QuadAES)

Introduction

Key Features

❏ Four channels in / four channels out

❏ On-board 12.5 mips 24-bit digital signal processor

❏ Transformer-coupled independent inputs and outputs

❏ High-performance front-end receiver design

❏ Intelligent Channel Status implementation

❏ Automatic digital de-emphasis filtering

❏ Upgradable signal processing facilities

General Description

The AMS QuadAES card features two AES/EBU input ports and two AES/EBU output ports. Since each AES/EBU port can carry two channels of audio (designated channel A and channel B) the card handles four audio input channels and four audio output channels. Provided the system configuration will support it, all four inputs and outputs can be operated simultaneously.

Receiver Software

In a Logic incoming channel status information is polled at frequent intervals and is used to provide automatic digital de-emphasis. The software decodes both professional and consumer format status formats. In order to ensure compatibility with transmitters conforming to the "minimum" implementation of channel status (see section 5.2.1, AES3 draft 4.0, Sept 28, 1990), incoming CRC violations are ignored.

Information pertaining to each AES/EBU receiver may be displayed on the 8 character displays in the meter panels. Possible options are:

1 Port name and number (default)

2 Eight characters of receiver status information

	1	2	3	4	5	6	7	8
Eight character display	–	–	–	–	–	–	–	–
No signal present at input	N	/	S					
Incoming sample rate 44.1kHz	4	4	.	1				
Incoming sample rate 48kHz	4	8						
Incoming sample rate 32kHz	3	2						
Wrong sample rate channel muted					M	u	t	e
50/15 s digital de-emphasis active					D			
CCITT J17 emphasis indicated (no de-emphasis applied)					J			
Consumer channel status						C		
Professional channel status						P		
Badly formed channel status						X		
Receiver error resulting in one or more samples being muted							E	
Incoming signal asynchronous to system sampling clock								A

This information is updated twice per second, with the exception of the asynchronous flag which remains on for 3 seconds after a sample slip has been detected.

3 Source and destination strings (4 characters each) decoded from the incoming channel status stream (bytes 6 to 13). This option is only valid when AES/EBU data with professional channel status is being received at the correct sampling frequency. Otherwise, the status information as described above in (2) will be displayed instead.

Transmitter software

Transmitted channel status is in professional format, and indicates that the signal contains no preemphasis. The full 24 bits of audio resolution are used. Valid CRC codewords are generated.

Dynamics

Compressor – Limiter

The compressor is probably the most important and widely used dynamics algorithm in today's music and broadcast industry. The basic function of a compressor in operational terms is to reduce the dynamic range of a signal by reducing its gain when the peak level goes above a certain threshold level. The basic comp/lim input/output curves can be seen in Figure 1. They show the effect of changing most of the controls outlined below. From this it can be seen that the amount of gain reduction required is the difference between the 1:1 curve and the compressor curve at all times. The attack and release time filters are used to determine how fast this gain reduction is applied or removed. A limiter is simply an extreme case of a compressor where a compression ratio of above 1:10 and a fast attack time are normally selected. Hard limiting can be achieved by selecting a ratio of 1:99. The effects of hard limiting (or indeed any compression/limiting) can be softened by use of the Soft Knee control. This effectively provides a gain curve with a constantly varying ratio from 1:1 to that selected (as shown in Table B:1). The controls available to the user are:

Control	Range	Display Step	Initialise	Logicator
Threshold	–60 —> +20 dB	1 dB	+8 dB	<— Max Arc
Ratio	1.0 : 1 —> 99 : 1	0.1 —> 1	1.0 : 1	—> Min Spot
Attack	0.0 —> 50.0 mS	0.1 mS	1 mS	—> Min Spot
Release	0.0 —> 5.00 S	0.01 S	0.1 S	—> Min Spot
Knee	0.0 —> +60 dB	0.1 —> 1 dB	1 dB	<—>Centre Arc
Man/Auto	Man —> Auto	—	Auto	Left/Right
Gain	0.0 —> +20 dB (Auto)	0.1 dB	0 dB	—> Min Arc

Table B:1

✎ *Display Step should not be confused with the parameters actual resolution which is much larger.*

THRESHOLD

This is the dB level above which gain reduction of the signal will occur. This is expressed in decibels relative to normal program line-up level and variable between −60 and +20dB. The alpha display initialises to +8dB and is variable in 1dB steps. The *Logicator* shows an arc with the fixed point at the maximum position (+20dB) increasing in size anti-clockwise as the threshold is lowered. This gives a visual display of the size of the region under compression (or being limited).

RATIO

This is the level of gain reduction applied to the signal above the threshold point (i.e. the ratio between changes in level (in dB) of the input to the compressor/limiter and its output). This has a range of 1.0:1 to 99:1. The *alpha* display initialises to 1.0:1 (i.e. no compression) and is variable in two step sizes:

1.0:1 —>   9.9:1 : 0.1 step size
10:1 —>   99:1 : 1 step size

The *Logicator* shows a simple dot display increasing from the minimum position clockwise to maximum as the ratio is increased.

ATTACK TIME

The attack time determines the speed at which the dynamic range control unit responds to a signal once it has entered the compression region. The attack and release filter section (peak detection circuit) is simply one bilinear filter fed by a dB value of audio level minus comp/lim curve level for that input. If audio is below threshold, 0dB is passed in. The attack filter is used when the input level is larger than the output of the peak detection circuit (switching to release when it drops below). The attack time has a range from 0 (instant attack) to 50mS. The *alpha* display initialises to 1mS and is variable in 0.1mS steps. The *Logicator* again uses a simple dot display increasing from the minimum position clockwise to maximum as the attack time is increased.

RELEASE TIME

A range of 0 (instant release) to 5Sec is provided. The alpha display initialises to 0.1S and is variable in 0.01S steps. The *Logicator* again uses a simple dot display increasing from the minimum position clockwise to maximum as the release time is increased.

SOFT KNEE

This is the number of dBs below Threshold at which compression/limiting is gradually introduced (increasing smoothly to full compression /limiting above the Threshold point). It is expressed in dBs and is variable between 0 and 60dB. The alpha display initialises to 1dB and is variable in 0.1dB steps from 0 to 9.9dB and then in 1dB steps from 10 to 60dB. The *Logicator* shows an arc with the fixed point at 12 O'Clock (0dB) increasing in both directions as the Knee size is increased. This gives a visual display of the size of the soft knee.

MAN/AUTO MAKE UP GAIN

Make up gain is used to compensate for the noticeable average gain level drop as compression is increased. This can be added manually or automatically (selectable by a *Logicator*). The *Logicator* shows a fixed point at the 11 O'Clock position for manual and at 1 O'Clock for automatic. The *alpha* next to the *Logicator* shows the word Man or Auto. In the Auto mode make up gain is only applied when the threshold level is below 0dB. The amount of positive gain applied is that which will restore a 0dB level signal back to 0dB.

MAKE UP GAIN

This is the amount of Manual make up gain added if Manual is selected. It is not added in Auto mode. It is expressed in dBs and variable between 0 and 20dB. The *alpha* display initialises to 0dB and is variable in 0.1dB steps. The *Logicator* shows an arc with the fixed point at the minimum position (0dB) increasing in size clockwise as the amount of make up gain is increased.

Expander

The basic expander input/output curves can be seen in Figure 2. They show the effect of changing each of the controls outlined below. From this it can be seen that the amount of gain reduction required is the difference between the 1:1 curve and the expander gate curve at all times. Below the Threshold level the Expander slope is larger than 1:1 therefore increasing the dynamic range of the signal applied to it. This also has the effect of making low level signals practically inaudible (accounting for an expanders use for noise reduction.

Like the Compressor/Limiter the effects of expansion can be softened by using the Soft Knee control. This effectively provides a gain curve with a constantly varying ratio from 1:1 to that selected, as shown in Table B:2.

The controls available to the user are:

Control	Range	Display Step	Initialise	Logicator
Threshold	–60 —> +20 dB	1 dB	–20 dB	—> Min Arc
Ratio	1.0 : 1 —> 9.9 : 1	0.1	1.0 : 1	—> Min Spot
Attack	0.0 —> 50.0 mS	0.1 mS	1 mS	—> Min Spot
Release	0.0 —> 5.0 S	0.01 S	0.1 S	—> Min Spot
Knee	0.0 —> +60 dB	0.1 —> 1 dB	1 dB	<—>Centre Arc
Depth	0.0 —> +60 dB	0.1 dB —> 1 dB	30 dB	<—>Centre Arc

Table B:2

✍ *Display Step should not be confused with the parameters actual resolution, which is much larger.*

THRESHOLD

This is the dB level below which gain reduction of the signal will occur. This is expressed in decibels relative to normal program line-up level and variable between −60 and +20dB. The alpha display initialises to −20dB and is variable in 1dB steps. The *Logicator* shows an arc with the fixed point at the minimum position (−60dB) increasing in size clockwise as the threshold is increased. This gives a visual display of the size of the region under expansion.

RATIO

This is the level of gain reduction applied to the signal below the threshold point (i.e. the ratio between changes in level (in dB) of the input to the expander and its output). This has a range of 1.0:1 to 9.9:1. The alpha display initialises to 1.0:1 (i.e. no expansion) and is variable in 0.1 size steps. The *Logicator* shows a simple dot display increasing from the minimum position clockwise to maximum as the ratio is increased.

ATTACK TIME

The attack time determines the rate at which the gain applied to the input signals is increased from the Depth setting to 0dB. This has a range from 0 (instant attack) to 50mS. The alpha display initialises to 1.0mS and is variable in 0.1mS steps. The *Logicator* again uses a simple dot display increasing from the minimum position clockwise to maximum as the attack time is increased.

RELEASE TIME

The release time determines the rate at which the gain applied to the input signal decreases from 0dB to the Depth setting. A range of 0 (instant release) to 5Sec is provided. The alpha display initialises to 0.10S, and is variable in 0.01S steps. The *Logicator* again uses a simple dot display, increasing from the minimum position clockwise to maximum as the release time is increased.

SOFT KNEE

This is the number of dBs above Threshold at which expansion is gradually introduced (increasing smoothly to full expansion below the Threshold point). It is expressed in dBs and is variable between 0 and 60dB. The alpha display initialises to 1dB and is variable in 0.1dB steps from 0 to 9.9dB, and then in 1dB steps from 10 to 60dB. The *Logicator* shows an arc with the fixed point at 12 O'Clock (0dB) increasing in both directions as the Knee size is increased. This gives a visual display of the size of the soft knee.

DEPTH

This is the number of dBs below Threshold at which the input/output gain change returns to 1:1 with a fixed gain reduction of depth dBs. Depth is variable from 0 to 60dB. The *alpha* display initialises to 30dB and is variable in 1dB steps. The *Logicator* shows an arc with the fixed point at 12 O'Clock (0dB) increasing in both directions as the Depth is increased. This gives a visual display of depth.

Noise Gate

The Noise Gate input/output curves can be seen in Figure 3. They show the effect of changing each of the controls outlined below. From Figure 3 it can be seen that the Gate operates like a two level switch (i.e. gain reduction jumps from Depth dBs to 0 dB when the input rises above Threshold and jumps back down to Depth dBs when it drops below Threshold minus Hysteresis). Hysteresis is used to eliminate repetitive activation of the gate for signals that jitter around the Threshold point. It is used in preference to a hold time as the gate closing point is program dependent and will follow a dynamically changing input more accurately. Attack and release times are used to shape the gates envelope (i.e. the time taken to open and close the gate).

The controls available to the user are:

Control	Range	Display Step	Initialise	Logicator
Threshold	−60 —> +20 dB	1 dB	−20 dB	—> Min Arc
Attack	0.0 —> 50.0 mS	0.1 mS	1 mS	—> Min Spot
Release	0.0 —> 5.00 S	0.01 S	0.1 S	—> Min Spot
Depth	0 —> +60 dB	1 dB	30 dB	<—>Centre Arc
Hysteresis	0.0 —> +20 dB	0.1 dB	6 dB	<—>Centre Arc

Table B:3

✍ *Display Step should not be confused with the parameters actual resolution which is much larger.*

THRESHOLD

This is the dB level at which the Gate switches on. This is expressed in decibels relative to normal program line-up level and variable between −60 and +20dB. The *alpha* display initialises to −20dB and is variable in 1dB steps.

The *Logicator* shows an arc with the fixed point at the minimum position (−60dB) increasing in size clockwise as the threshold is increased. This gives a visual display of the size of the gates switch on level.

ATTACK TIME

This determines the rate at which the gate switches on (Opens) once the input signal has risen above the Threshold level set. This has a range from 0 (instant attack) to 50mS. The *alpha* display initialises to 1mS and is variable in 0.1mS steps. The *Logicator* again uses a simple dot display increasing from the minimum position clockwise to maximum as the attack time is increased.

RELEASE TIME

This determines the rate at which the gate switches off (Closes) as the input signals level drops below the Threshold level set minus the Hysteresis size set. A range of 0 (instant release) to 5Sec is provided. The *alpha* display initialises to 0.1S and is variable in 0.01S steps. The *Logicator* again uses a simple dot display, increasing from the minimum position clockwise to maximum as the release time is increased.

DEPTH

This is the number of dBs below Threshold at which the input/output gain change returns to 1:1, with a fixed gain reduction of depth dBs. Depth is variable from 0 to 60dB. The *alpha* display initialises to 30dB, and is variable in 1dB steps. The *Logicator* shows an arc with the fixed point at 12 O'Clock (0dB) increasing in both directions as the Depth is increased. This gives a visual display of depth.

HYSTERESIS

The hysteresis control is used to select the level below Threshold at which the gate closes. The turn off threshold level is always below the turn on level. It is expressed in dBs and variable between 0 and 20dB. The alpha display initialises to 6dB and is variable in 0.1dB steps. The *Logicator* shows an arc with the fixed point at 12 O'Clock (0dB) increasing in both directions as the amount of Hysteresis is increased. This gives a visual display of ON-OFF level difference.
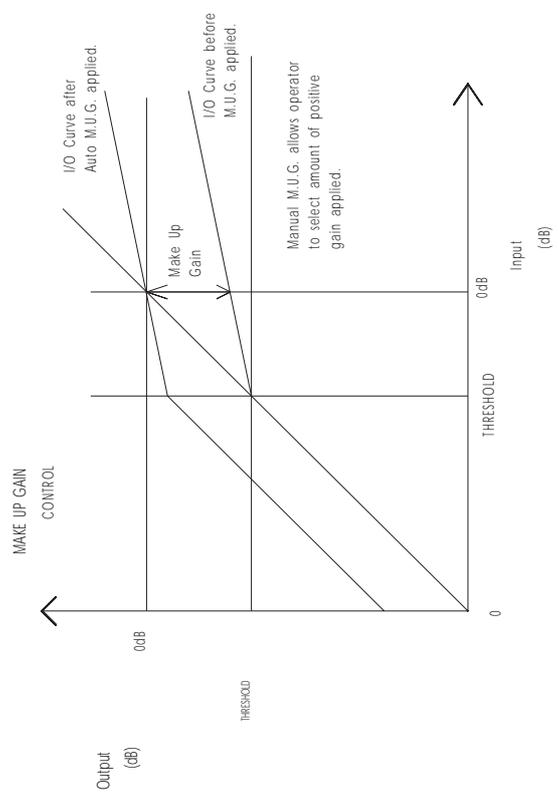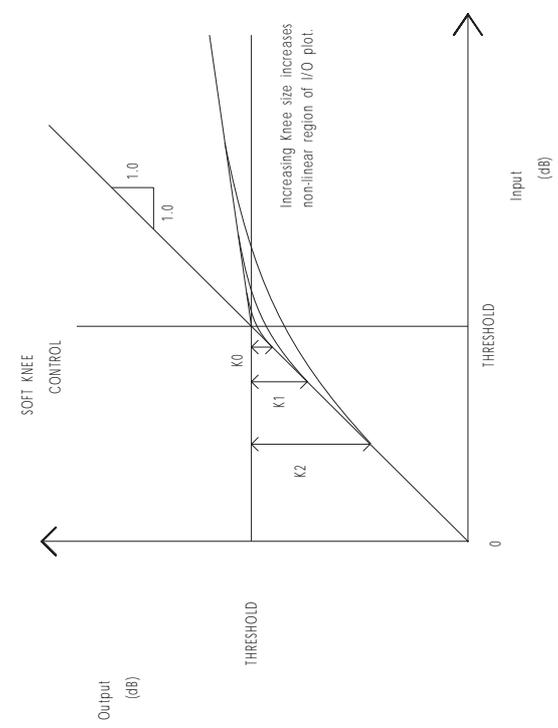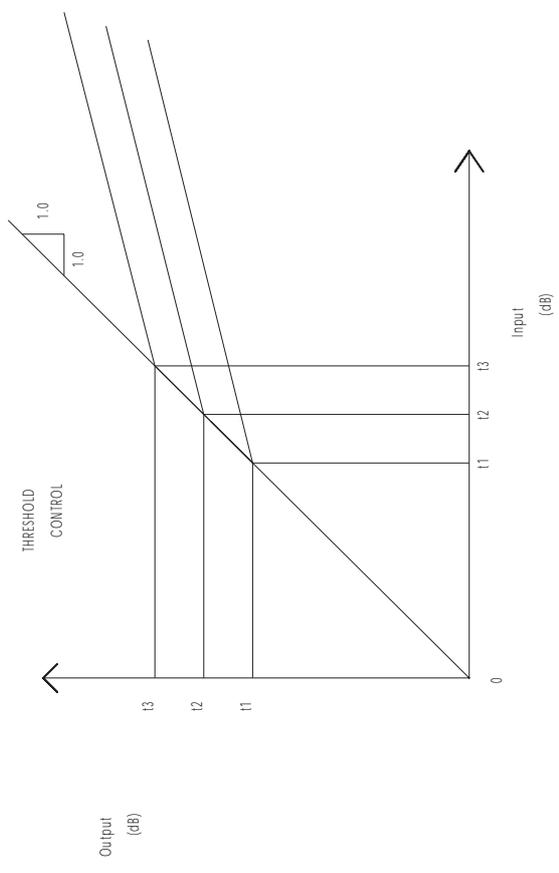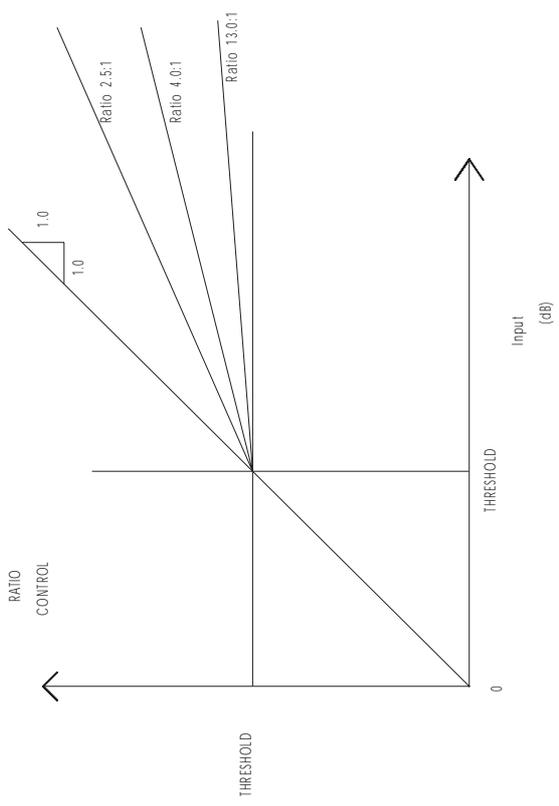
RATIO
CONTROL

Output
(dB)

THRESHOLD

1.0
1.0

Ratio 2.5:1
Ratio 4.0:1
Ratio 13.0:1

THRESHOLD

Input
(dB)

THRESHOLD
CONTROL

Output
(dB)

1.0
1.0

t3
t2
t1

0

t1   t2   t3

Input
(dB)

SOFT KNEE
CONTROL

Output
(dB)

THRESHOLD

1.0
1.0

K0
K1
K2

Increasing Knee size increases
non-linear region of I/O plot.

THRESHOLD

Input
(dB)

MAKE UP GAIN
CONTROL

Output
(dB)

0dB

THRESHOLD

I/O Curve after
Auto M.U.G. applied.

Make Up
Gain

I/O Curve before
M.U.G. applied.

Manual M.U.G. allows operator
to select amount of positive
gain applied.

0

THRESHOLD   0dB

Input
(dB)

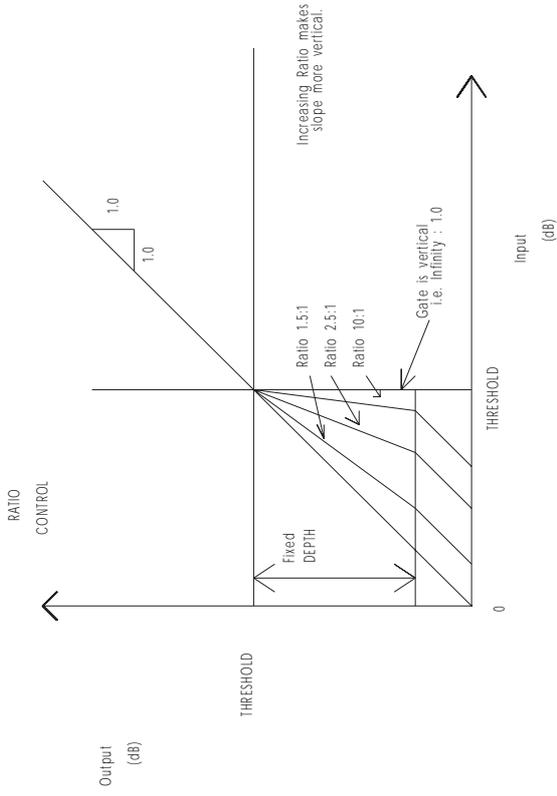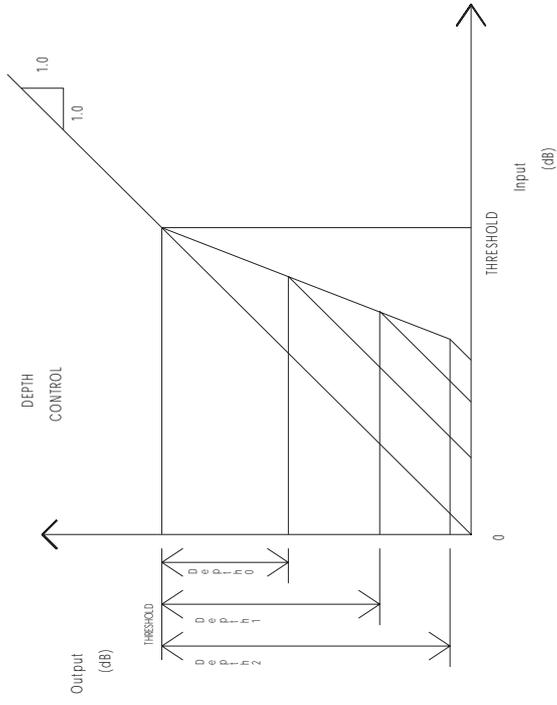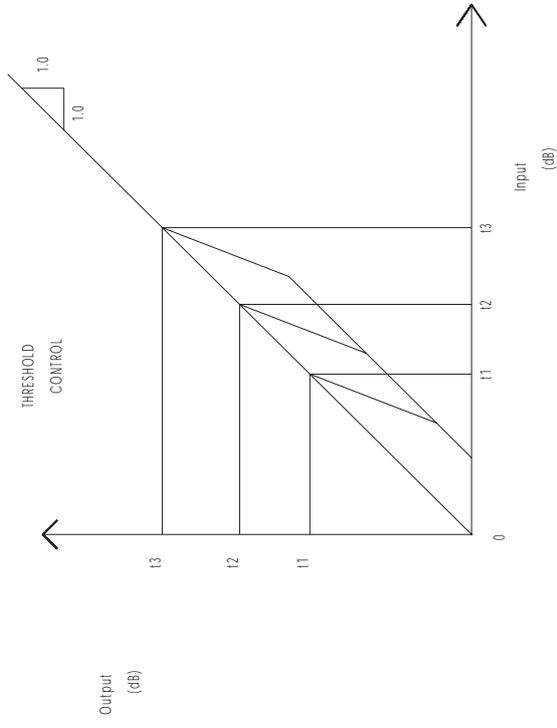FIGURE 1. COMPRESSOR/LIMITER CURVES SHOWING EFFECTS OF EACH CONTROL.
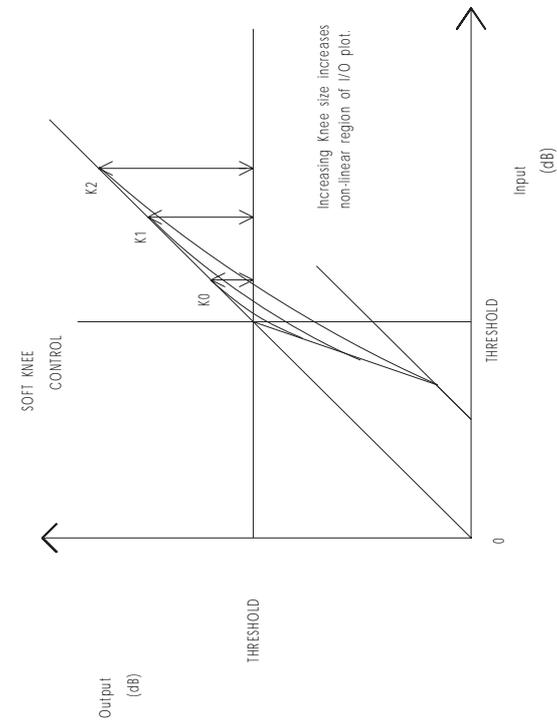
FIGURE 2. EXPANDER CURVES SHOWING EFFECTS OF EACH CONTROL.

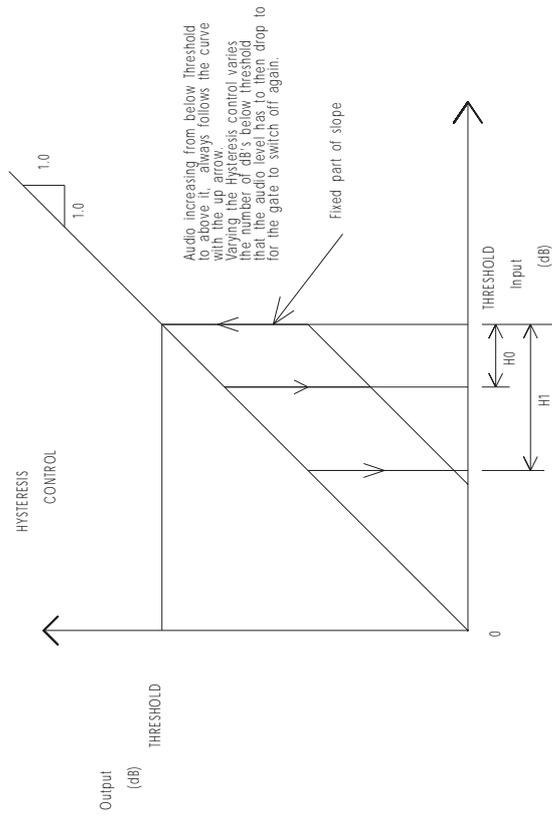THRESHOLD CONTROL (no Hysteresis)

HYSTERESIS CONTROL

Audio increasing from below Threshold
to above it, always follows the curve
with the up arrow.
Varying the Hysteresis control varies
the number of dB's below threshold
that the audio level has to then drop to
for the gate to switch off again.
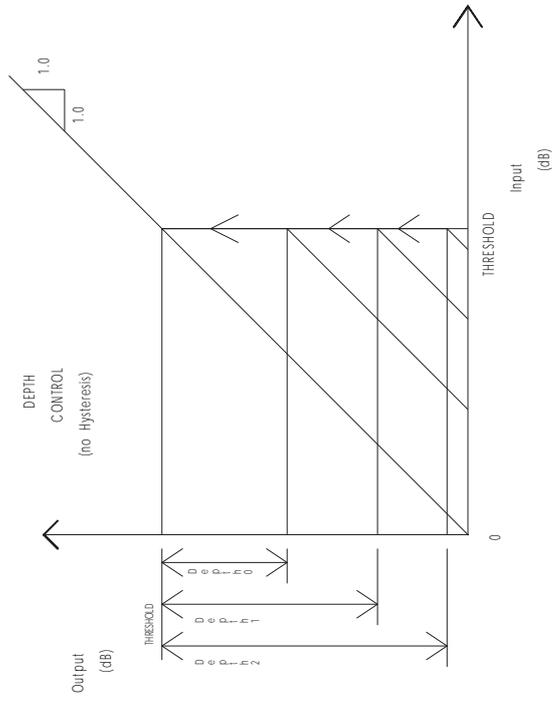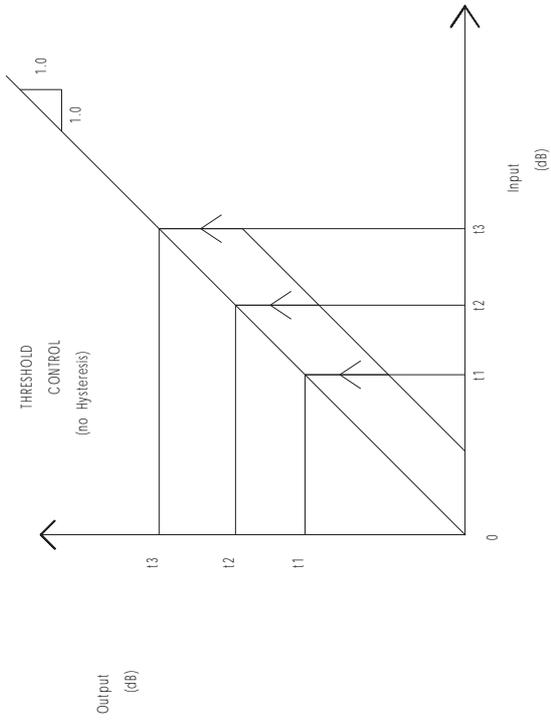
Fixed part of slope

DEPTH CONTROL (no Hysteresis)

FIGURE 3. NOISE GATE CURVES SHOWING EFFECTS OF EACH CONTROL.