## SIGMA SERIES STANDARD COMPONENTS

|	ORDER CODE
48 position mainframe: 24 track VU meters, includes stand and hardwood trims	24L24TRVU
48 position mainframe: 16 track VU meters, includes stand and hardwood trims	24L16TRVU
48 position mainframe: 24 track bargraph meters, includes stand and hardwood trims	24L24TRBG
48 position mainframe: 32 track bargraph meters, includes stand and hardwood trims	24L32TRBG
36 position mainframe: 16 track VU meters, includes stand and hardwood trims	24S16TRVU
36 position mainframe: 24 track bargraph meters, includes stand and hardwood trims	24S24TRBG
12 position extender frame: no metering, includes stand and hardwood trims	24X
Sigma power supply 3U 19" chassis 110, 120, 220, 240V AC operation	RPS2
DC power supply connecting cable: 6 meter length (PSU to mainframe)	DC CABLE 6
DC power supply connecting cable: 3 meter length (mainframe to extender frame)	DC CABLE 3
Busbar connecting cable assembly (mainframe to extender frame)	BUSX
Stereo output master module assembly M440, double width 76mm, 6 aux outputs	M440
Stereo output master module assembly M441, double width 76mm, 8 aux outputs	M441
Monitor master module assembly M450, double width 76mm	M450
Monitor master module assembly M451, as above with studio L.S. output	M451
Mono mic/line input module assembly M410, standard width 38mm	M410

|	
Line input/output module assembly M420, standard width 38mm	M420
Dual output module assembly M430, standard width 38mm	M430
In-line input/output module assembly M470, standard width 38mm	M470
Fader module M485, standard width 100mm carbon	M485
Master fader module M481 for master module set, quad width 154mm	M481
Master fader module M492 for master module set	M492
M482 fader assembly 16 track for 8 X M430 modules	M482
M483 fader assembly 24 track for 12 X M430 modules	M483
M491 blank fader panel, standard width	M491
M493 switch panel, part of mute processor system	M493
M493X switch panel, seven blank positions	M493X
M494 mute processor control panel, double width	M494
Blank module panel, standard width	M400
M4SF single fader harness for M485	M4SF
M4TF twin fader harness for M482/483 assemblies	M4TF
Producers desk/patchbay frame: 19" capacity total 15U including stand and trim. Unwired	24PB
Fader automation options: refer to seperate section	
AHB Sigma Series operating manual	24LOM
Sigma Series service kit	M4SK
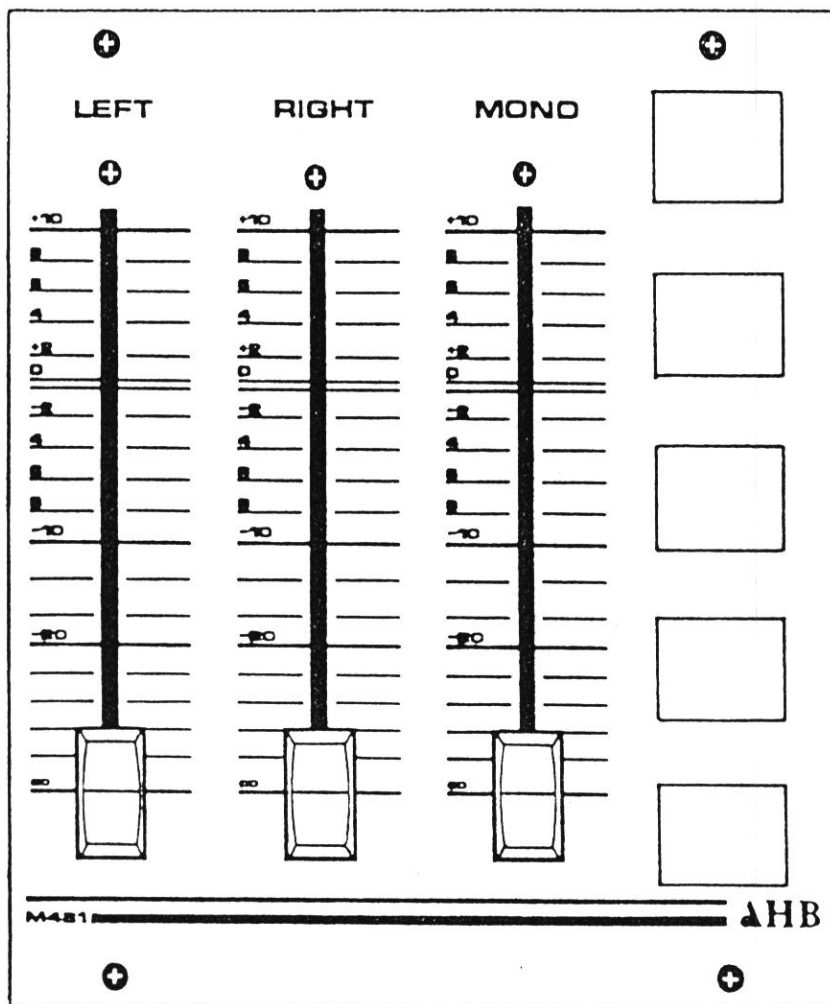
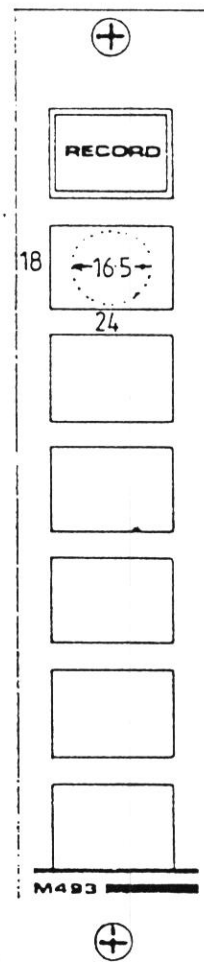AUTO MUTE MAINFRAME, STANDARD PANEL.

SIGMA

FADER SYSTEMS

100mm non-automated types

SWITCH BLANKS
6 off
for customer use
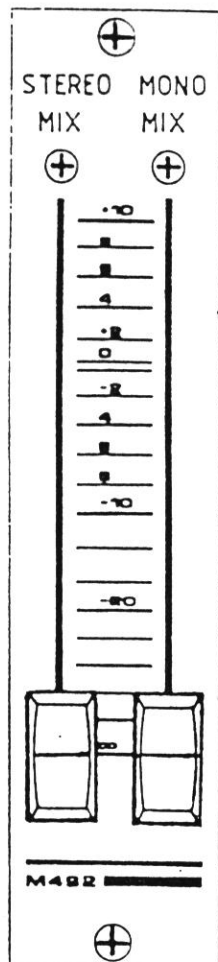
OPTIONAL PANEL.
STANDARD ON MUTE-
PROCESSOR MAINFRAMES
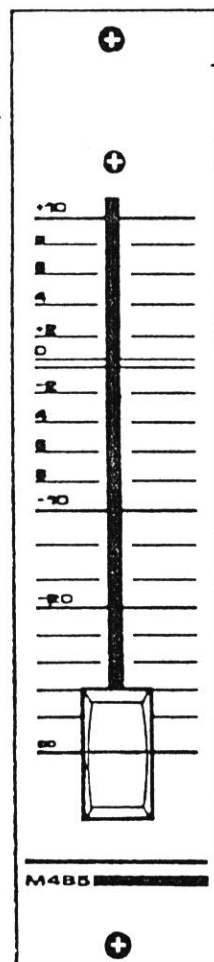
STANDARD SINGLE
FADER.

PART OF MUTE
PROCESSOR.

FADER SYSTEMS

1) Mainframes and extender frames have a fader bay area between the main modules and the arm rest and running the full width.

2) Access to fader bay is from the operating surface. The end and bottom panels are fixed.

3) Dimensions of the fader bay panel and fixings are shown in the diagram. Note that the standard panel width is 38mm. The 38.5 pitch provides clearance between adjacent panels.

4) Access to the fader bay includes:

   (i)   at each module position a plain hole 25mm (1") for the module fader audio harness.
   (ii)   cut outs in the bottom plate at each end for AHB SSR auto mute harnesses and fader automation harnesses.
   (iii) cut outs in the vertical plate seperating main modules and fader modules at each end and in the centre for use as required. Refer to the fader bay drawing for details.

5) Standard Sigma fader bay equipment is a 100mm carbon fader module type M485, each requires one fader harness type M45F.

6) Master fader module M481 is for M440 and M450 master module set. Note that M481 is four module widths and provides faders for left, right and mono outputs plus space for optional pushbutton switches as required.

7) Alternative master fader module M492 is fitted with mute processor main frames and provides stereo and mono faders, replacing the M481 module. This is also available as an option for all console versions.

8) Standard faders for M430 dual output sets are fader panel assemblies M482 for 16 track (8 X M430) and M483 for 24 track (12 X M430). These are single panels carrying all faders for the module set. Requires fader harnesses M4TF.

9) Where a single module blank is fitted a fader module blank, M480, is required.

10) Standard fader modules include a male connector to mate with the fader harness of the main module.

11) Optional faders are as follows:

Single Penny & Giles fader:	P&G3220,10K log, M, plus knob. Fits M485 panel, with a slight calibration error.
Stereo master P & G fader:	P & G 3222, 10K log, M, 11mm red knob. Fits M492 panel and replaces the carbon stereo fader.
AHB VCA DC group system:	refer to fader automation details.

12) The fader bay includes DC power connection points for optional equipment. Refer to fader automation and SSR auto mute sections for details.

MODULE SYSTEMS

The module variety available at September 1987 comprises:

TYPE	FUNCTION	SYSTEM CAPACITY	WIDTH
M440 stereo master	Main stereo, auxiliary and cue outputs	One always fitted	2
M441 stereo master	As above, but 8 aux outputs		
M450 monitor master	Loudspeaker and head-phone monitor controls	One always fitted	2
M451 monitor master	as above with studio L.S. output		
M410 channel	Mono mic/line multi-track input	Any number 0 to 56	1
M420 output	Line input - output	Any number 0 to 56	1
M430 dual output	Dual output/monitor	Any number 0 to 56	1
M470 input-output	In-line system	Up to 56	
M485 fader panel	Single analogue 100mm fader	One per M410, M420, or M470	1
M481 master fader panel	L, R, mono output master faders	One per M440/M450 set	4
M492 master fader	Stereo and mono output faders	one per M441/M451 set	1
M491 fader blank	Blank	As required	1
M493 switch panel	Part of mute processor system	One per system	1
M400 module blank	Blank	As required	1
M493X switch panel	7 holes for customer use	As required	1
M482 fader panel	16 faders for 8 X M430	One or two	8
M483 fader panel	24 faders for 12 X M430	One	12
M494 control panel	Mute processor controller	One	2

Fader automation   Replaces M485, refer to As required for M410,
systems   seperate section for   M420 and M470 modules
                          details

Module types planned for introduction.

Stereo input   Stereo line input
Stereo input fader   Stereo 100mm fader with auxiliary controls
PA group   Output to replace M420 multitrack output
PA master   Matrix output master module

Note: M440/450 master modules willbe supplied in split format consoles.
M441/451 master modules will be supplied with in-line format consoles.   The
M440/450 combination will be discontinued in 1988.

Ordering Procedure

Arrive at the required operating system by reference to the following details.

1) Decide on the number of outputs required, meterbridges are available with
   8,16 and 24 output meters.

2) Chose the type of output module required either:

   M420 line I/O module with EQ and multitrack routing. Automation capable.
   M430 dual output with EQ but not multitrack routing or automation capable.

3) Decide on the number of M410 mono mic/line inputs required.

4) Calculate the number of modules required as follows:

Module		Qty	Frame Space
M410		N	N
M420	1 output per module	X	X
M430	2 outputs per module	16 or 24	8 or 12 Y
M440	Stereo output master	1	2
M450	Monitor master	1	2
	total module positions		N+X+Y+4

5) Chose the combination of main and extender frames that has capacity for this
   figure:

   Mainframe capacity   48 positions total
   Extender capacity   12 positions total

   If the sum total (4) is less than (5) request blanks to fill the spaces.

----

6) Decide how modules are to be arranged in the frames. Suggested line input - output formats start at 1 on the left and go to 44 (56) on the right. Since modules may be put anywhere you may chose to have the line I/O monitors 1-16 or 24 in the centre of the combination. Specify a "centred line I/O format". Suggested conventional group formats have M410 1 on the left and outputs M420 or M430 on the right, with masters in between. Specify "conventional group format".

Faders

1) Unless specified the console will include non automated 100mm faders at all module positions.

2) For modules M410 and M420 one fader module M485 is required per main module.

3) Fader blank M491 accompanies module blank M400.

4) For modules M430 in sets of 16 or 24 outputs fader panels M482 (16) and M483 (24) will be supplied.

5) All console formats include one fader master panel M481 to accompany master module set M440 and M450.

6) To order consoles with VCA fader system specify 'Sigma with fader automation'. Refer to 'fader automations' section.

Example of Console Format

1) 24 track non automated line input - output system:

M420 module qty:	24
M410 module qty:	20
Master module set:	4+
	--
total positions used	48
	--
24L mainframe capacity	48
	--

Order: Sigma 24L 24 track 20 M410, 24 M420, line I/O format, non automated.
  or: Sigma 24L 24 track 20 M410, 24 M420, centred line I/O format, non automated.

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2) 24 track automated line input - output system:
    M420 module qty: 24
    M410 module qty: 32
    Master module set: 4+
                                                            --
              total positions used   60
                                                            --
              24L mainframe and extender   60
              capacity   --

    Fader automation system AHB VCA DC group:

    M420 fader automation: 24
    M410 fader automation: 32+
                                                            --
              total faders M487   56
                                                            --
              VCA master fader M488   1+
                                                            --
              total faders   57
                                                            --
    M485 non automated L, R, mono faders   3+
                                                            --
              total positions used   60
                                                            --

    Order: Sigma 24L 24 track 32 M410, 24 M420, line I/O format, left hand
    extender.
    AHB VCA fader: all M410, all M420.

3) 16 track conventional system, non automated
    M430 module qty (16 outputs):   8
    M410 module qty: 24
    Master module set: i   4+
                                                            --
              total positions used   36
                                                            --
    24S mainframe capacity   36
                                                            --

    Order: Sigma 24S 16 track 24 M410, 8 M430, conventional group format,
            non automated.

4) Dual 16 track conventional system,
    automated, for 2 X 16 track synchronised
    M430 module qty (32 outputs):   16
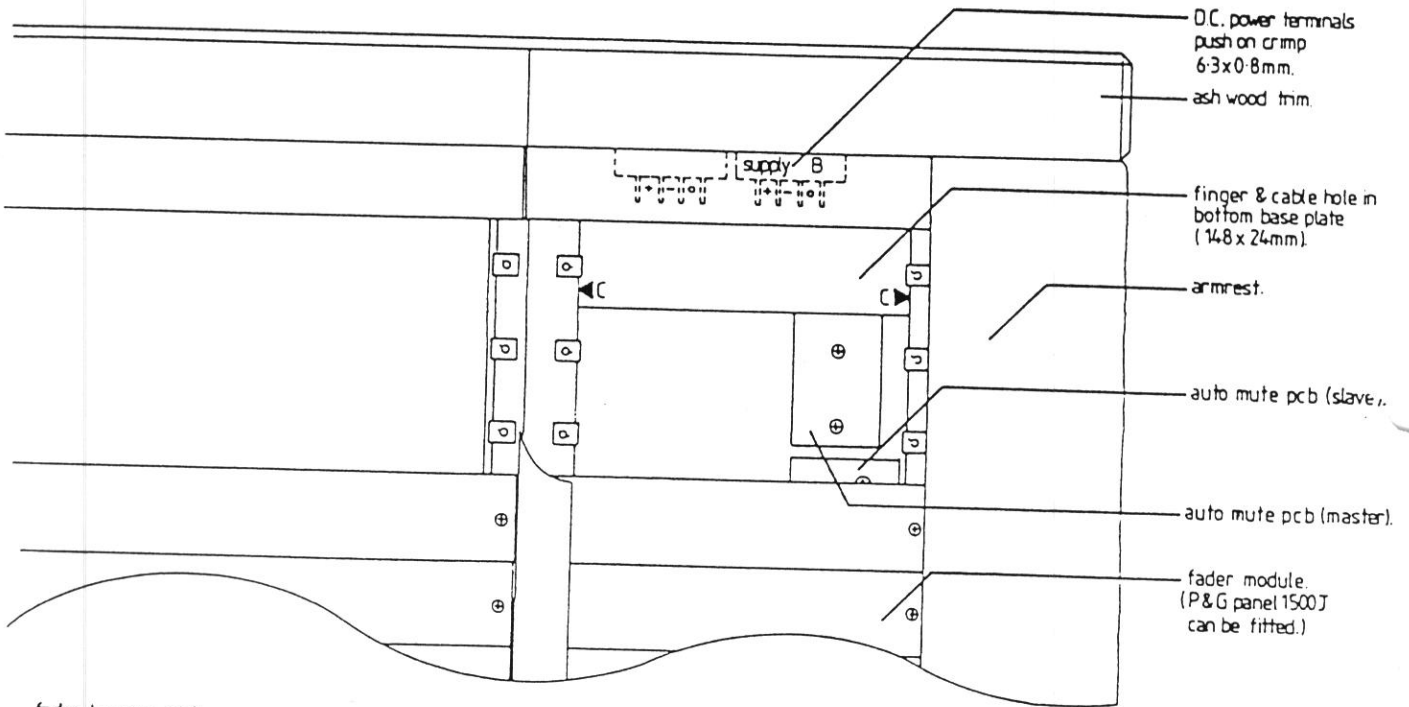   M410 module qty: 40
    Master module set: 4+
                                                     --
              total positions used   60

    24L mainframe and extender capacity   --
                                                     60
                                                     --

    Fader automation system AHB VCA DC group:

    M410 fader automation   40
    M430 fader automation   not available
                                                     --
              total faders M487   40

    VCA master fader M488   --
                                                      1+
                                                     --
              total fader automation positions   41

    Non automated L, R, Mono faders M485   --
                                                      3

    Non automated output faders M482 X 2   16
                                                     --
              total fader positions   60
                                                     --
        Order: Sigma 24L dual 16 track, 40 M410, 16 M430, conventional group
           format, left hand extender.
           AHB VCA fader all M410 positions.

SIGMA SERIES FADER BAY ARRANGEMENT

RIGHT HAND SIDE OF MAINFRAME TOP ELEVATION WITH 3 FADER PANELS REMOVED.

D.C. power terminals
push on crimp
6·3 x 0·8mm.

ash wood trim.

supply B

finger & cable hole in
bottom base plate
(148 x 24mm).

◄C   C►

armrest.

auto mute pcb (slave).

auto mute pcb (master).

fader module.
(P & G panel 1500 J
can be fitted.)

fader harness port
hole. 25mm ø at each
module position.

port hole for harness
used on automated
VCA systems. 3 off
50 x 20mm

◄D   D►

◄E   E►

A   A

B

A   B
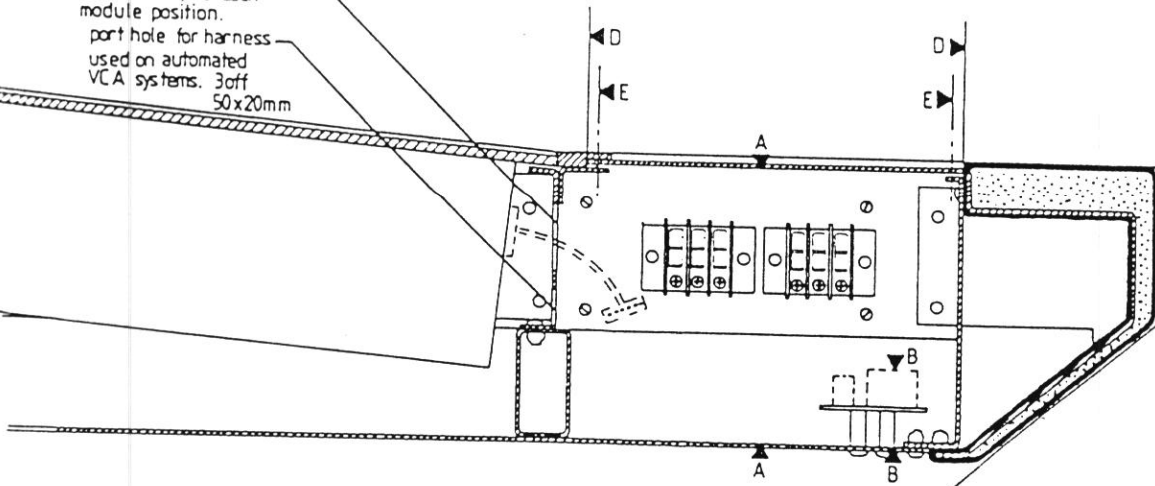
CROSS SECTION

INTERNAL DIMENSIONS

	mm	inches
A =	130	5,11
B =	30	1,18
C =	160	6,29
D =	178	7
E =	168,4	6,6

FADER AUTOMATION SYSTEMS

1) All Sigma consoles include provision for automation of fader and mute.

2) Modules M410 input and M420 Line I/O and M470 can accept fader automation.

3) Master module left, right and mono output faders can be automated, however this requirement is not foreseen.

4) Module M430 dual output cannot accept fader automation modules due to the closer spacing of the two faders required per M430 module.

5) There are two levels of fader automation:

   i)   VCA DC grouping, no memory of fader position is created.

   ii) Fader automation with memory storage and recall of fader position synchronised to the audio programme, eg. VCA fader modules with data storage on multitrack; VCA fader modules with data storage in computer memory; 'moving fader' servo systems with data storage in computer memory.

6) Sigma Series mainframes include space in the fader bay for the location of hardware for both types of fader automation. Analogue faders M485 are replaced with automated fader modules. The fader module panel and fader bay capacity are shown in the illustration. The fader module panel is a Penny & Giles standard panel size 1500 series J option.

7) Consoles delivered non-automated can be modified later to include fader automation.

FADER AUTOMATION: Other Systems

AHB Sigma Series consoles will accept other-brand fader automation which meets the following criteria:

1) The active fader modules fit the fader bay, see diagram. Panel width is 38mm, pitch is 38.5mm.

2) There is space allowed in the fader bay for additional fader automation control modules that may be needed.

3) The gain structure of the modules can provide 10dB attenuation between audio input and output at normal fader position.

4) The system is provided with DC power and does not draw power from the console PSU.

5) Audio input and output connections are compatible with the AHB fader interface. This employs 'Molex' type 0.1" pitch female headers on a flying lead from each main audio module. The module send to fader is 0dBv from 22 ohms, the return from fader is -10dBv into 10k ohms when set for unity gain panel indication.

AHB will be pleased to provide quotations for individual systems and can supply some systems ready installed for use on delivery of the console.

When selecting the system account should be made of value for money, inter-studio compatibility and after sales service. The manufacturers guarantee for after sales service is negotiated to be transferred to the end user in the country of use. Where this is not possible AHB will advise the individual circumstances.

Mastermix by Audio Kinetics, with Digital Grouping.

Mastermix uses high quality VCA fader modules and computer programs to generate fader position information which is stored on floppy disk and SMPTE/EBU timecode is used on one track of the audio recorder to synchronise fader events with the program.

Mastermix MX200 type fader modules replace AHB M485 non-automated faders. The Mastermix fader controller is located alongside the console MONO output fader beneath the M450 module. Fader modules are finished to match Sigma panels.

Mastermix fader interface hardware occupies 3U of rack space in the console patchbay. The Mastermix Automation Computer and Automation power supply may be located in the console patchbay or in a wall patchbay. The Mastermix controller is a portable device which is positioned as required.

Mastermix is available ready installed on ex-works consoles or may be retrofitted at a later date.

Variations arise from the number of channels to be automated and from patchbay location to the left or right of the console.

No modification to console audio modules is involved.

For each fader which is automated the analogue fader harness M4SF is replaced with automation fader harness M4AF.

The Mastermix maximum capacity is 64 faders, an extended Sigma console can accomodate 56 automated faders. Your dealer will provide the Audio Kinetics literature on request.

The Audio Kinetics hardware required is as follows:

UNIT   PART NO.   DESCRIPTION

COMPUTER

              MMM012   MX 644 Mastermix Computer System
                          comprising:

                          -AMM010 Mastermix Computer
                          -AMM100 Remote Controller
                          -AAM020 Controller Cable - 8m
                          -AAM010 Computer/Interface Cable - 8m
                          -10 Mastermix Format 5.25" floppy discs
                          -Operating Manual

CONSOLE
INTERFACES

                          MX700 SERIES for Digital Grouping Faders

              MMK716   16 Channel with Enclosure
              MMK732   32 Channel with Enclosure
              MMK748   48 Channel with Enclosure
              MMK764   64 Channel with Enclosure

DIGITAL
GROUPING
FADERS

                  MX 200 Series Mastermix Faders:

    MX200   178mm x 38mm, AHB Sigma finish

FADER
CONTROLLER

                  178mm x 38mm, AHB Sigma finish

POWER
SUPPLY

    AMM301(UL) Mastermix Power Supply Unit for Interface
              and Faders in 3U Enclosure

INSTALLATION
KITS

                  Audio Kinetics Fader/Full Retrofit
    ADM001   Fader Installation Kit, per 16 channels
    ADM002   Fader Installation Kit, per 8 channels
    ADM003   Fader Control Installation Kit
    ADM006   Earth Kit

ACCESSORIES

    XMD102   Formatting Disc
    ACE252   16 Channel Digitiser Card, Digital Grouping
    ACE280   32 Channel DC Card Assembly

MASTERMIX - SOME QUESTIONS ANSWERED

Q. What consoles can I fit Mastermix to?

A. The list is long, and includes AHB (Sigma Series), Amek (2500, Angela, APC), Cadac, Calrec (U8000), DDA (AMR24), Harrison (MR2, MR3, MR4, Raven, 32C), MCI (JH600), Neotek (Series 3, Elite), Neve (most models), Soundcraft (TS24 + 2400), Studer (900), Trident (Series 80, TSM and DI-AN), if in doubt please ask us.

Q. Why is there a feature difference between DC and Digital Grouping Systems?

A. The VCA Fader fitted to most DC Grouping Automation Ready Consoles do not allow computer control of the fader functions (Read, Write, etc). The Grouping on these faders is hard-wired, selected by switches on the fader (hence the 'DC'). Digital systems offer much more flexibility, and more 'automatic' operation.

Q. Is there a display of VCA levels available?

A. Yes, a new Audio Kinetics display interface will shortly be available and there are systems available from other manufacturers (eg. Audioscope or EMT) which can be fitted to read the VCA DC levels.

Q. In normal operation, should I use WRITE or UPDATE?

A. Use WRITE as much as possible. Remember that UPDATE only modifies existing fader movements, so it will not erase mistakes or wrong level changes, only add to them. You will probably need UPDATE near the end of the session.

Q. How long is the memory - how much of a mix can I store?

A. This depends on how many channels there are on the console, and how busy the mix is, but typically, each memory can store 1/2 hour of an average-to-busy mix. It is unlikely that you would run out of memory on a music track, or even several tracks.

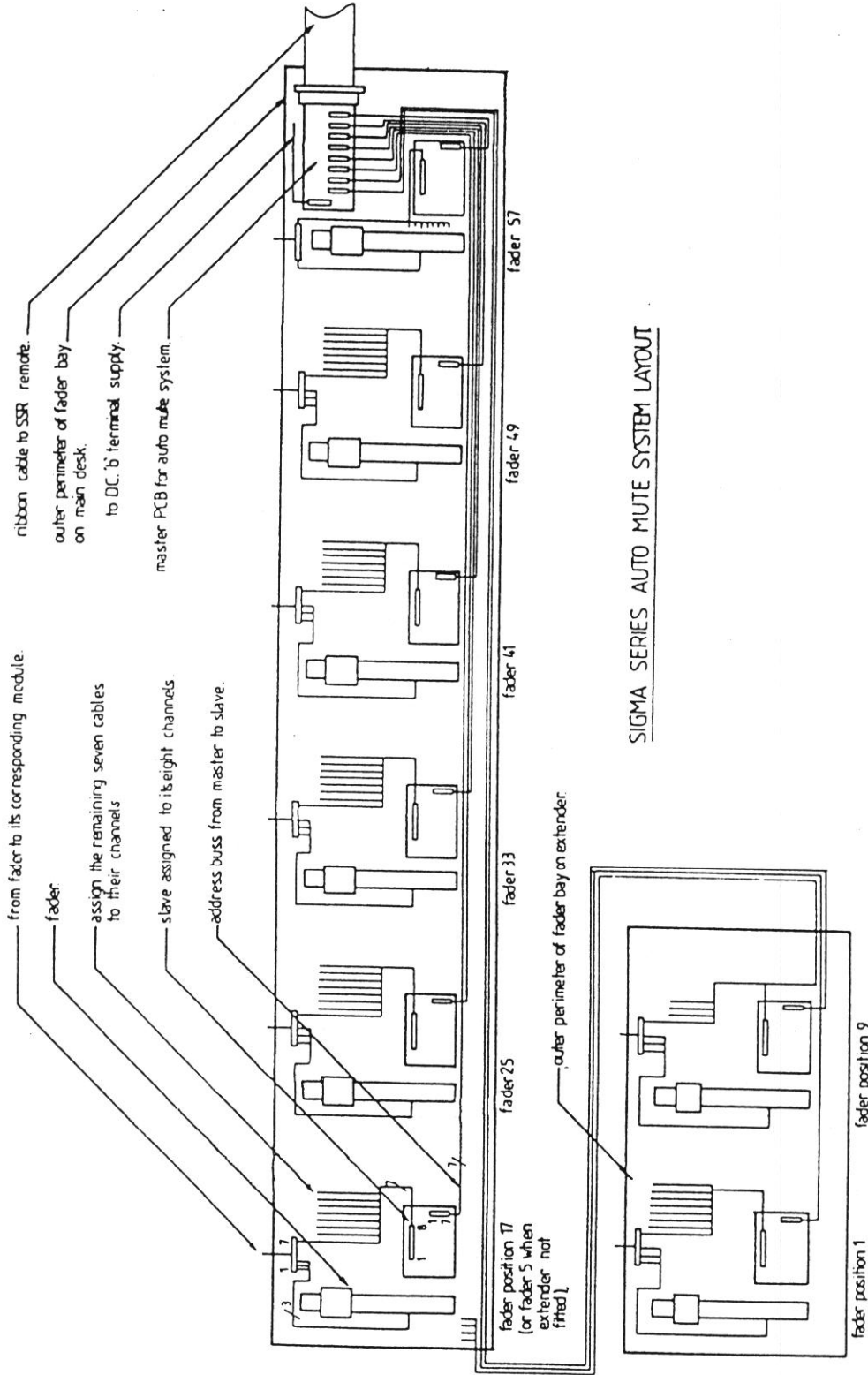Q. What is the accuracy of the VCA level in Replay?

A. The resolution of the VCA control is 1 part in 256. This means that the level will be within $\pm$ 1/3 dB of the original each time. This is not added to on successive updates.

Q. How often are the faders scanned?

A. The whole fader section is scanned once every frame (1/25 or 1/30 of a second) so all level change and mutes will be written within that time.

Q. Why only 4 memories?

A. Although it seems a small number, remember that this is 4 complete mixes, unlike other systems where each memory is a defined segment and have to be joined together at the end. The length of the mix is defined automatically by the timecodes you play over, so you do not have to define anything directly.

Courtesy of Audio Kinetics Limited.

SIGMA SERIES AUTO MUTE SYSTEM LAYOUT

ribbon cable to SSR remote.

outer perimeter of fader bay on main desk.

to D.C. 'b' terminal supply.

master PCB for auto mute system.

from fader to its corresponding module.

fader.

assign the remaining seven cables to their channels

slave assigned to its eight channels

address buss from master to slave.

outer perimeter of fader bay on extender.

fader 57

fader 49

fader 41

fader 33

fader 25

fader position 17
(or fader 5 when extender not fitted).

fader position 9

fader position 1

SSR AUTOMUTE SYSTEM

AHB SSR Automute System: ordering and installation.

The system is supplied ready to use with the console.
The system comprises:

1 control unit
1 connecting cable to console fader bay
1 automute master pcb assembly
8 automute slave pcb assembly
1 set internal harness

refer to the illustration of fader bay wiring for the system.

Automute operates fader mutes of M410 modules and M420/430 monitor sections.

Installation

The relationship between console module and automute channel is shown for
several typical consoles below:

                                    Automute channel numbers

Model	Input Sequence	Monitor Sequence
24L 20 X 24 (410/420)	1-20	21-44
24L 28 X 16 (410/420)	1-28	29-44
24L 32 X 24 (410/420)	1-32	33-56
24L 32 X 24 (410/430)	1-32	33-55 ODD
		34-56 EVEN

Note that while it is safe to unplug the control unit cable with power on this
will lock the last operating status. Reconnection with power on will reset the
system to the status of mute patch '0'. If power is applied without the SSR
control unit being connected then a random pattern of mutes will result. To run
the system without control unit lift the 3 pin DC plug from the Automute master
pcb in the right hand end of the fader bay.

POWER SUPPLY

AHB power supply model RPS2 is supplied with all Sigma Series systems.

Dimensions: 19" rack chassis, 3U height, 400mm (15 3/4") behind panel.

Construction: Alloy and steel case. Painted front panel with legend.

Connections: AC inlet at rear, IEC 3 pin male panel connector.
                       DC outlet at rear, 8 pin female connector.
                       Use AHB Sigma DC connecting cables only.
                       AC fuses on front panel. DC fuses inside.
                       AC requirement: single phase 50/60Hz
                                        110, 120, 220, 240V AC input.

                       Nominal   Range

                       110   100 - 110
                       120   110 - 120
                       220   200 - 220
                       240   220 - 240

DC Outputs: Audio supply 'A' +16V @ 5A smoothed and regulated.
                       Supply B +15V @ 3A smoothed and regulated.
                       Phantom power supply +48V @ 0.2A smoothed and regulated.
                       All outputs short circuit protected.

Ventilation: Heatsinks at rear require free air flow.

Connecting Cables: Mainframe to PSU   6 meter (20ft) length.
                       Mainframe to extender   3 meter (10ft) length.

Earthing: PSU case is connected to the AC inlet earth.
                       DC outputs DO NOT INCLUDE AC EARTH.
                       Mainframes carry a binding post terminal for the connection
                       of studio technical earth.

Health & Safety
Warning: Lethal voltages exist inside this equipment.
                       Disconnect AC supply before removing covers.
                       Protect from moisture.