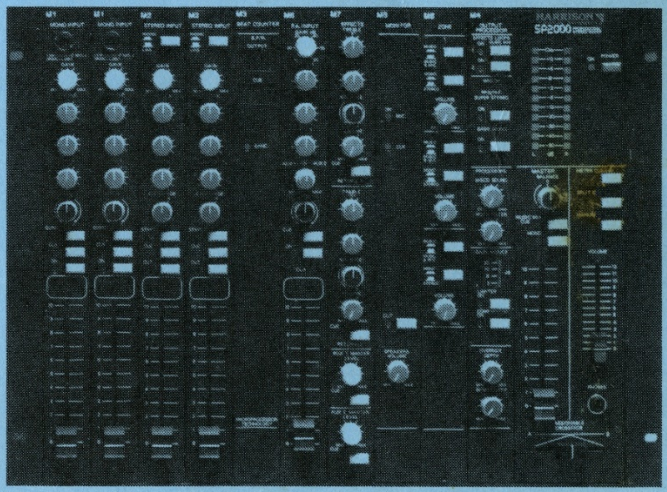
SP-SERIES

PROFESSIONAL STEREO MIXERS

USER HANDBOOK

• SP2000





HARRISON
INFORMATION TECHNOLOGY LTD

INTRODUCTION

Without doubt the SP2000 is a high-tech innovative mixer. But as it is designed by Harrison thats to be expected. Harrison have a long tradition for innovative and good looking design. The SP2000 combines a multitude of technical facilities with an audio clarity that is second to none. It is important to remember that this product has not been designed by merely Electronic Design Engineers, but Audio Engineers-and the difference makes for the spectacular sonic quality.

The SP2000 is a highly evolved multi-option system with immense flexibility. However, excellence in audio quality remains central to design philosophy and consequently the acoustic performance is quite brilliant.

A single board, computer designed, bussing system, provides a simple, thus effective and high stability backplane. The modules are connected via mating DIN 41612 gold plated double connectors. These connectors are the most stable and reliable form of electronic interaction and are widely used by the aerospace and computer industries. The bussing system provides exceptional isolation between signal paths as well as very high immunity to stray signal pickup.

The ease with which modules can be added is a perfect example of how excellent engineering offers the simplest solutions. The mating connectors are self-locating. Thereafter the placement of 2 screws finalises the fixing. There is no requirement for accurate alignment, no risk of poor connections, no electronic set-up and certainly no soldering.

Each of the modules front and rear panels are made from custom

designed extrusions, as are the rack mount frame ends. This not only makes for a beautifully constructed finish but also avoids any tolerance problems and ensures precision mechanical fixing plus great strength.

Potential users have unanimously acclaimed the SP2000's system architecture, wide ranging facilities and operational flexibility in a vast variety of circumstances.

But do not jump to conclusions because of sophistication of the technology or the high range of possible facilities. This system is by far the simplest to understand and to operate.

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SECTION 1: INSTALLATION

1.1 UNPACKING

As soon as you receive your SP2000 please inspect for any damage incurred in transit. Since the SP2000 was carefully inspected and tested at the factory, it left in perfect condition. If damage is found notify the transportation company immediately. Only the consignee may insititute a claim with the carrier for damage during shipment. Be sure to retain the cartons as evidence of damage for the carrier's inspection.

Even if the SP2000 arrived in perfect condition it is advantageous to save the packing materials for use if you ever need to ship the unit.

NOTE: The seperate carton, outer and inner pack, each have been designed for protection during transport.

DO NOT SHIP THE UNIT WITHOUT THIS FACTORY PACK

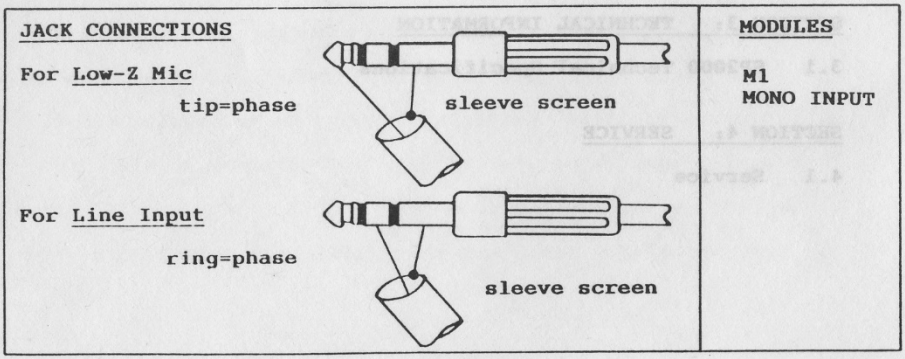
1.2 RACK CONSOLE MOUNTING

The SP2000 is designed for 19" rack mounting as well as installation in a desk top or free standing console. Overall dimensions are as shown in the diagram opposite.

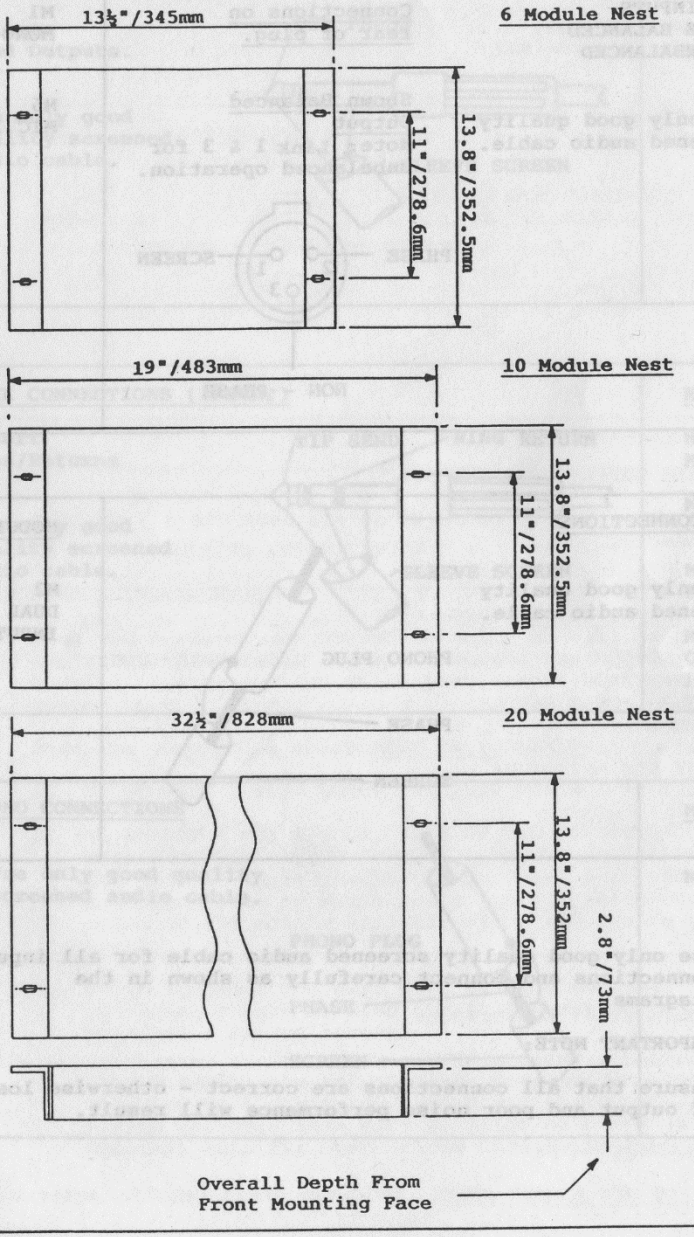
The SP2000's shallow overall depth allows the unit to be easily mounted in small consoles or in permanent installations with complete reliability.

The SP2000 produces virtually no heat at all when operating and can be installed in console and rack systems with complete confidence. However avoid mounting the SP2000 above any other item of equipment which may produce heat, as this is not advisable.

1.3 INPUT CONNECTIONS



SP2000 MOUNTING DIMENSIONS



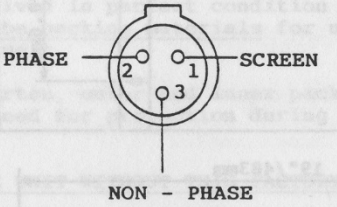
XLR CONNECTIONS

MIC INPUTS
LOW-Z BALANCED
OR UNBALANCED

Use only good quality screened audio cable.

Connections on rear of plug.

Shown Balanced Output
Note: Link 1 & 3 for unbalanced operation.



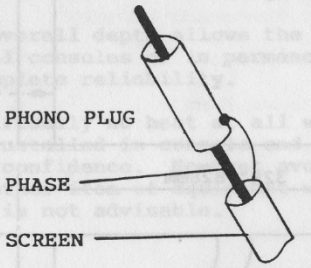
MODULES

M1
MONO INPUT

M6
MIC INPUT

PHONO CONNECTIONS

Use only good quality screened audio cable.



MODULES

M2
DUAL STEREO
INPUT

Use only good quality screened audio cable for all input connections and connect carefully as shown in the diagrams.

IMPORTANT NOTE:

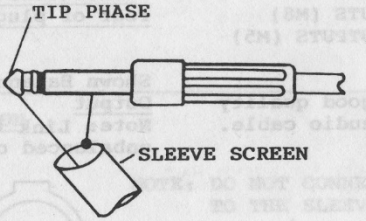
Ensure that all connections are correct - otherwise loss of output and poor noise performance will result.

1.4 OUTPUT CONNECTIONS

JACK CONNECTIONS (MONO)

Effects
Send Outputs.

Use only good
quality screened
audio cable.



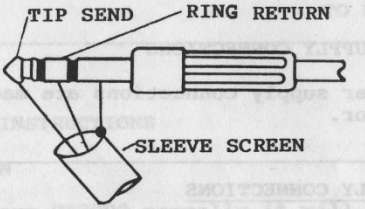
MODULES

M7
EFFECTS

JACK CONNECTIONS (INSERT)

Insert
Send/Returns

Use only good
quality screened
audio cable.



MODULES

M1
MONO

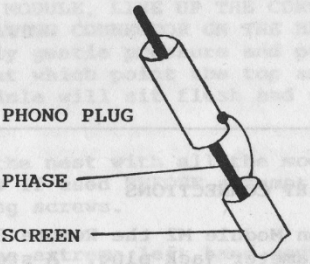
M2
STEREO

M6
P.A.

M4
OUTPUT
PROCESSOR

PHONO CONNECTIONS

Use only good quality
screened audio cable.



MODULES

MASTER

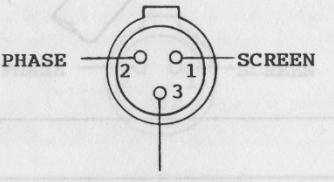
XLR CONNECTIONS

MAIN OUTPUTS
ZONE OUTPUTS (M8)
MONITOR OUTPUTS (M5)

Use only good quality screened audio cable.

Connections on rear of plug.

Shown Balanced Output
Note: Link 1 & 3 for unbalanced operation.



MODULES

M8
ZONE

M5
MONITOR

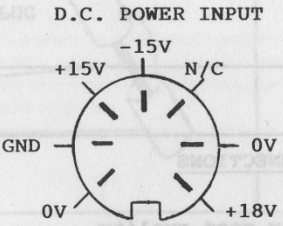
1.5 POWER SUPPLY CONNECTIONS

The power supply connections are made via a 7 way DIN connector.

POWER SUPPLY CONNECTIONS

IMPORTANT
USE PS30 POWER SUPPLY UNIT ONLY.

DO NOT USE ANY OTHER SUPPLY



1.6 REMOTE START CONNECTIONS

Provided on Module M2 the Remote Start connection is via a 3.5mm diameter jack plug. A stereo jack plug is provided with each M2 unit.

IMPORTANT NOTE:

DO NOT USE A MONO MACK. This may short out the internal

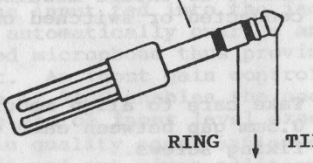
connections and cause damage to your M2 module and also invalidate the warranty.

USE ONLY THE STEREO JACK PROVIDED

REMOTE START CONNECTION

MODULE 2

NOTE: DO NOT CONNECT TO THE SLEEVE



RING TIP

TO DECK

SECTION 2: OPERATING INSTRUCTIONS

2.1 MODULE INSTALLATION

When you recieve your SP2000 normally it will be complete and ready to operate. However because the SP2000 is modular in construction it is possible to configure the system to your needs.

Here are some rules which MUST BE FOLLOWED:

1. SWITCH OFF & DISCONNECT THE PS30 POWER SUPPLY.

2. TO INSERT A NEW MODULE, LINE UP THE CONNECTOR ON THE BACK WITH THE MATING CONNECTOR ON THE BACK PLANE (IN THE NEST). Apply gentle pressure and push the connector home at which point the top and bottom edges of the module will sit flush and square to the nest.

3. Fully populate the nest with all the modules including blanks if used BEFORE attempting to put in the module fixing screws.

4. Starting with the extreme left hand module, screw the self tap No 6 countersunk head fixing screws into the fixing strips. Take care to align each module squarely into the nest before tightening each screw.

Note that a gap of approximiately 0.5mm should be set between each module to allow for removal and insertion.

5. Check that all the modules are evenly spaced and neatly aligned and if necessary adjust the fixing screws until this is acheived.

6. Your SP2000 is now ready to be re-connected to the PS30 Power Supply.

DO NOT

- Attempt to force modules into place if the connectors are not lined up.

- Remove or insert modules with the PS30 power supply connected or switched on.

DO

- Take care to align modules squarely in the nest with a 0.5mm gap between each one before tightening the module fixing screws.

NOTES:

1. THE MASTER MODULE must always go in the extreme right hand position in the 6 Unit Nest, the 10 Unit Nest and the 20 Unit Nest.

   DO NOT TRY AND FIT IT IN ANY OTHER POSITION.

2. WHEN FITTING A M4 MODULE TO A NEST NOT PREVIOUSLY EQUIPPED WITH ONE, FOUR LINKS ON THE MASTER MODULE MUST BE REMOVED.

   REFER THIS OPERATION TO QUALIFIED SERVICE PERSONNAL.

2.2 INITIAL OPERATION

Before switching on the power set the Master output level fader down at '0' and all the input module faders at '0' and all equalisation controls to the 'flat' position.

Apply a music signal to one of the M2 inputs and gradually increase the fader level and Master fader level settings. A clean stereo signal should now be heard on both left and and right outputs. If the sound is distorted, hums or is not present at all re-check all connections and correct any faults.

2.3 M1 MONO MODULE 1 off

M1 Front Panel



A Mono input channel to be used for microphone or external jingle machines. A choice of two independent mic inputs are provided - 1 input jack, front panel mounted for high impedance mics and one latching XLR, rear mounted, for low impedance mics which is electronically balanced.
Optional transformer balancing is available for the low impedance mic input.
A mic or line input fed into the jack socket will automatically overide any XLR connected microphone thus providing a dual input. An input gain control, with a range of 24dB enables the operator to determine source input level exactly.
Superb studio quality equalisation with ±15dB of lift and cut gives additional tone control keeping your vocals right up-front.
A seperate rotary level control provides full sweep smooth pan.
The override switch operates remotely with the sensitivity and depth controls on M4. This facility causes a reduction in the music output, allowing the operator to make automatic voice-over announcements.
An 'On' switch enables the operator to leave the fader pre-set for ease of use and accurate voice levels.
100mm travel professional quality faders lets you control output levels smoothly and with optimum accuracy. Penny and Giles option available.
The cue system is controlled by computer logic devices to give you instant monitoring of the channel input and output. The Cue Switch has associated LED indicating when monitoring is occurring.

M1 Rear Panel



2.4 M2 DUAL STEREO MODULE 3 off

M2 Front Panel



A dual stereo channel to be used for Disc, CD players, Tape Recorders and Video Players. Independent phono (RIAA equalised) and line inputs are provided thus providing actual dual use. Line and Phono is switchable from the front panel.
An input gain control, with a range of 30dB enables the operator to source input level exactly.
Additional tone control is provided by the studio specification equalisation (Treble, Mid and Bass) with ±10dB of lift and cut.
A unique assignable crossfade facility enables the operator to crossfade between any M2 module via the slider on the Master module. M2's may be designated A or B by the operator.
Remote start switch controls any CD, tape or record decks connected. LED indicates 'On' mode.
The Cut button is especially designed for the latest DJ mixing techniques. It is spring loaded, push to cut button, and thus stuttering effects or alternative beat playing etc. may be readily obtained.
100mm travel professional quality faders allow you to control output levels smoothly and with optimum accuracy.
Penny and Giles option available.

M2 Rear Panel



The remote Deck Start switch is connected by a Stereo miniature jack plug on the back panel.
Four modes of operation are possible.

1. As a latching On/Off switch. (This is the Standard format)

2. When the LED is on the contacts are closed.

3. When the LED is on the contacts are open.

4. The switch type can be changed to momentary On/Off action for 'pulse start' deck operation.

2.5 M3 BEAT COUNTER MODULE 1 off

M3 Front Panel



A formidible asset to any DJ. This microprocessor controlled module monitors the output B.P.M. constantly. It will also automatically monitor any Cue designated. 3 digit displays record the B.P.M.
In addition, a software driven 'sync' indicator will alight when the O/P and Cue are in exact tempo and the beat is aligned. This ensures absolutely perfect music mix and crossfading.

M3 Rear Panel



2.6 M4 OUTPUT PROCESSOR 1 off

M4 Front Panel



A host of the most exciting features available to a DJ or club operator.
There are two independent effects loops. One is dedicated to the music mix only, whilst the other operates with the entire output mix.
Several signal processing facilities are incorporated.
The spectacular Super Stereo switch gives ordinary stereo originals enhanced image reproduction by accentuating the stereo seperation.
A width controller switches the bass into Mono for extra Disco punch.
A bigger brighter sound can be achieved by using the Disco Sound control. This facility controls the music mix frequency response to your acoustic requirements.
The Voice filter enables you to reduce the lead vocal content on the music by tracking the voice frequencies and suppressing them.
This facility enables you to add live vocals or encourage audience participation.
A fast acting limiter prevents overload distortion and reduces the risk of speaker damage. The compressor feature reduces the dynamic range of the music signals which allows dynamic balancing of widely differing types of recording media.

M4 Rear Panel



The thresholds of both the limiter and the compressor may be set exactly on the back panel via variable pots. The front panel controls can be deactivated by preset 'On' switches on the rear panel.
An extremely useful bar graph display indicates exactly, in dB, when gain reduction is occurring. This assists in the prevention of system overload.
Voice override controls are assignable from any M1 module. The sensitivity control determines the point at which the override system becomes active and the depth control allows you to set the ammount of gain reduction applied to the music output.
Shortly after the input from the mic module stop, the music signal fades smoothly back up to its previous set level. The entire process is totally surge free and void of drastic sound changes.

2.7 M5 MONITOR MODULE

M5 Front Panel



To be used for driving Broadcast and DJ booth loudspeaker monitoring amplifiers. The outputs will normally monitor the music mix. However, intelligent circuitry automatically switches the monitor to cue mix as soon as any cue button is activated. Status LED's indicate what is being monitored. In addition, should any mic input be activated, the monitoring is automatically cut, thus preventing any danger of 'howl around'. Harrison's fast fade FET circuitry ensures click free switching. Manual Cut control switch is also included, as well as a speaker level control.
Balanced XLR outputs are provided featuring turn on/off thump inhibit circuits for extra security.

M5 Rear Panel



2.8 M6 P.A. INPUT MODULE 2 off

M6 Front Panel



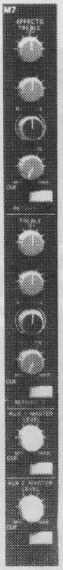
For live mixing. Rear mounted latching XLR provides low impedance electronically balanced input. A gain control, calibrated in dB is variable from +10dB to +60dB.
Acoustically brilliant 3 band EQ and PAN controls provide total sound shaping facilities. Twin auxillary sends talk remotely to the effects controls on M7. Aux 1 send is pre fade for use as foldback, whilst Aux 2 send is post fade for use as echo, etc.
Naturally cue and on switches with status indicators are incorporated as well as a very useful clip indicator in order to avoid overload. This clip indicator monitors both pre and post EQ headroom for maximum safty.
100mm travel, professional quality faders let you control output levels smoothly and with optimum accuracy, Penny and Giles option available.

M6 Rear Panel



2.9 M7 EFFECTS RETURN MODULE 1 off

M7 Front Panel



To be used in conjunction with 1 or more M6 P.A. input modules. It can also be used as a means of inputting two stereo line level sources, for example reverb or echo returns, with EQ. Each return has two band EQ, balance control and rotary fader.
Two master Auxillary sends feature rotary level controls. Individual cue is also supplied per return/master and each has an associated independent status indicator.

M7 Rear Panel



2.10 M8 ZONE MODULE

M8 Front Panel



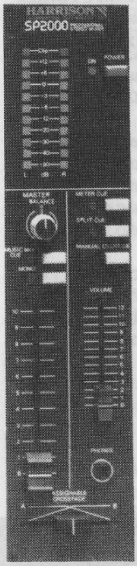
This stunning facility solves dozens of the common problems encountered by installers of larger venues in 1 simple and inexpensive step. 3 independent zone facilities are provided. XLR outputs enable you to connect directly to the selected zones, bypassing the master fader. Each zone contains individual controls to allow a choice of music only or music plus Mic Output, either in Stereo or Mono and a Rotary fader for volume selection.

M8 Rear Panel



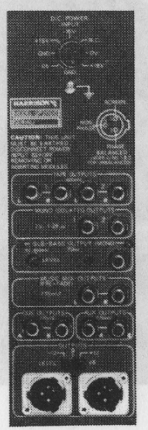
2.11 MASTER MODULE

Master
Front Panel



Contains more outstanding features than any other master module on the market. Dual stereo bargraph displays, visually monitor the output, or may be switched to monitor the cue.
A single 100mm professional stereo output fader, coupled with a Rotary Balanced control provide simple but exact master output control.
The short throw, horizontal, crossfade slider automatically interfaces to any M2 module and is assignable in any combination.
The headphone output features individual level control and, naturally, a split cue switch is provided.
The manual overide button facilitates easy talk over operation. This clever switch circuitry reduces volume, dominatly suppressing the mid and high frequencies, thus allowing talk over without losing the dance beat momentum.
A whole host of output connections are available. Master outputs are via sturdy XLR's and are balanced. A nominal level switch enables signal level to be pre-determined at either -12dB, OdBu or +12dBu thus allowing optimum system performance. The master outputs are also unbalanced compatable.
Other outputs include auxilary, unbalanced at OdBu, cue outputs to facilitate connection to products such as the SL80 Digital Sampler, dedicated pre-fade music outputs providing an additional zone facility, mono bass output with a level control variable between 100mV and 1V, and two stereo tape outputs each set at a nominal 400mV.
Specialist mono outputs with isolating transformers are also provided to ensure absolutely safe connection to lighting equipment.

Master
Rear Panel



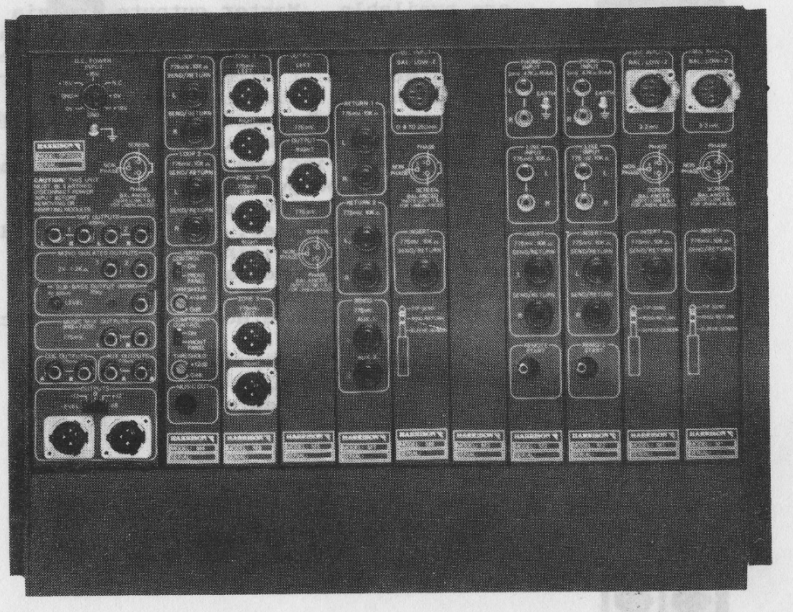
2.12 PS30 POWER SUPPLY

PS30

A 7 pin connector on the master module is provided.
The PS30 is designed to conform to all major international safty and R.F. emmission regulation standards.



SP2000 REAR 10 MODULE NEST



SECTION 3: TECHNICAL INFORMATION

3.1 TECHNICAL SPECIFICATION

MODULE FEATURE SPECIFICATION

M1 Mono input channel with electronically balanced low impedance mic input, unbalanced high impedance mic and line inputs. Optional transformer balance for low impedance mic input. 3 band EQ pan control and 100mm fader.

M2 Stereo input channel with line level and RIAA equalised inputs, switch selectable from front panel. Gain control, 3 band EQ ,crossfader assignment switch and 100mm fader. Unique spring loaded cut button.

M3 Microprocessor controlled output/cue beat counter module. Dual displays and software driven 'sync' indicator ensure exact tempo and alignment of beat for crossfading to next track.

M4 Output Processor module offering a number of signal processing facilities:

-2 switched effects loops, one dedicated to music mix.
-Stereo width switches for super stereo mid and high frequencies and mono bass switch.
-Discosound control to contour the music mix frequency response for added punch and presence.
-Voice filter to reduce the lead vocal content of music, to add live vocals or audience singalong.
-Limiter and compressor. LED bargraph indicates when gain reduction is occurring.

M5 Monitor module for driving Broadcast and DJ booth loudspeaker monitoring amplifiers. Outputs monitor the music max or cue mix. Automatic cut when microphone input is on . LED indicators. Speaker level and manual cut controls. Outputs balanced via XLR's.

M6 Mono P.A. input channel. Low impedance electronically balanced input via XLR, with calibrated gain control varable from +10dB to +60dB, 3 Band EQ, 2 Aux sends, one prefade and one post fade, pan control, mute button and 100mm fader. Clip indicator monitors pre and post EQ headroom.

M7 Effects send and return module for use with one or more M6 modules, or means of inputing two stereo line levels sources with EQ. Master Aux sends,

MODULE FEATURE SPECIFICATIN

plus two stereo returns. Each return has 2 band EQ, balance and rotary fader. Seperate cue button for each send and return.

M8 Zone output module, allowing seperate selection of music only or music + mics, and mono or stereo to each of 3 zones. Individual level controls per Zone.

MASTER 100mm stereo output fader with rotary balance control, Short throw crossfader slider, assignable from M2 modules in any combination. Headphone output with level control and split cue switch. Automatic music cue switching to headphones, plus meter cue enable switch. Dual bargraph meters. Outputs:

- Main outputs balanced (unbal' compatible) via XLR's with 12dBu/0dBu/ 12dBu nominal level switch accessed via rear panel.
-Unbalanced Aux outputs, 0dBu.
-Cue outputs for connection to sampler etc.
-Music Mix outputs.
- Mono bass output, with continously varable level control (100mV to 1V), accessible via rear panel.
-Dual mono outputs via isolating transformer for connection to lighting equipment, etc. Nominal level 2V.
- Two stereo tape outputs, 400mV nominal.

PS30 PS30 recommended, rated at +15V at 1A, 15V at 1A, +18V at 2A. Connection via a 7 pin DIN socket on master module. All major international safty and r.f. emission regulations complied with Input 100/120V or 220V/240V, 50/60Hz, 100VA max

MODULE CONFIGURATION

The master module is essential, but the other modules may be included or omitted as required. Maximum 1 off each M4 and M7, other modules specified in any quantity up to frame maximum. Frame sizes for 6 modules plus master, 10 modules plus master (19" rack mounting) and for 20 modules plus master. No soldering required when installing modules.

DIMENSIONS

Height. 8U (14"), Depth 75mm (3")
Width 366mm (14.4"), 6 modules + master
483mm (19"), 10 modules + master
829mm (32.6") 20 modules + master

ELECTRICAL SPECIFICATION

Measured with EQ flat, faders at maximum. M4 not fitted.
Dynamic range, M2 line input to main output in excess of 90dB.
Headroom at nominal operating level greater than 20dB.
M1 equivalent input noise, low impedance electronically balanced microphone input: better than - 119dBu (20Hz-20Hz, input terminated with 150 ohms).
M6 equivalent input noise: better than - 125dBu (20Hz-20Hz, input terminated with 150 ohms.
Frequency response: 50Hz-20kHz, ±0.5dB ref. 1kHz.
4th order Sub-bass filter below 30Hz.
EQ response, M1 and M6: ±15dB at 50Hz (bass)
±15dB at 800Hz (mid)
±15dB at 10kHz (treble)
M2: ±10dB at 50Hz (bass)
±10dB at 800Hz (mid)
±10dB at 10kHz (treble)

M4 SPECIFICATION

Dynamic range: greater than 90dB
Limiter treshold: varable 0 to +12dBu.
Limiter slope: greater than 12:1.
Compressor threshold: variable 0 to +12dBu.
Compressor ratio: 2.5:1.

SECTION 4: SERVICE

4.1 SERVICE

In the unlikely event of service being required, it is recommended that your SP2000 is returned to the factory or appointed HARRISON agent.

Because of the MODULAR construction of the SP2000 it is possible to remove an individual module only, if a problem is suspected and return this to the Sevice Agent. Remember before removing or replacing any module turn off and disconnect the PS30 Power Supply

IMPORTANT - Your SP2000 must be shipped in the original packing carton. (or replacement carton, available from HARRISON).

HARRISON will not be liable for any damage whatsoever to any SP2000 shipped in any other carton other than the approved version.

The SP2000's do not contain any user servicable parts. Service work should only be carried out by qualified and experienced engineers.

HARRISON
INFORMATION TECHNOLOGY LTD

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