Soundcraft

SAC100

USER GUIDE

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Soundcraft Electronics Ltd.
Cranborne House
Cranborne Industrial Estate
Cranborne Road
Potters Bar
Herts.
EN6 3JN
England

Tel: 0707 665000
Fax: 0707 660482

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Introduction

Introduction to SAC100

The SAC100 has been designed to meet the requirements of a high quality, low cost and simple to operate stereo ON-AIR Broadcast console. Its simplicity and ease of use makes it ideal for local and community radio stations and also suitable for Hospital and Campus radio.

The console may be installed as either a desk top version or, by the attachment of side support brackets, may be flush mounted. A feature is the hinged Overbridge, which houses 2 LED bargraphs as standard or can be fitted with 2 VU meters and/or a dual Machine/Microphone Timer as options.

The hinged Overbridge concept gives the console a compact, user- friendly feel and enables ease of access for operation of all controls.

The Overbridge conceals signal connections and sensitivity adjustments, with cables being routed through a rear mounted cable channel. Once set up the console is therefore secure and may not be accidentally tampered with.

The console is fully modular, and the standard configuration is supplied with the following modules:

- 6 Stereo modules, each having a connector for remote operation of CUE and ON/OFF. A 2-band fixed frequency EQ is an optional extra.

- 4 Mono modules, each may be used for Mic/Line inputs and has a connector for remote operation of ON/OFF and COUGH facilities. A 3-band fixed frequency EQ is an optional extra.

- 1 Telco (Telephone Communication) module which provides for on and off-air telephone conversations with the operator. A 2-band fixed frequency EQ is provided as standard. An additional Telco module is available as an option.

- 1 Master module which features a Talkback input suitable for a goose-neck Microphone and Limiter to prevent the output rising above a predetermined level.

All faders are fitted with a microswitch which may be used to control module ON/OFF status or may be accessed directly for external use. P&G faders are optional.

Note: Should you wish to replace or add extra modules, please contact your authorised Soundcraft dealer, who can supply the modules and change the configuration without invalidating the warranty.

Precautions and Safety Instructions

General Precautions

Avoid storing or using the mixing console in conditions of excessive heat or cold, or in positions where it is likely to be subject to vibration, dust or moisture. Do not use any liquids to clean the fascia of the unit: a soft dry brush is ideal. Use only water or ethyl alcohol to clean the trim and scribble strips. Other solvents may cause damage to paint or plastic parts.

Avoid using the console close to strong sources of electromagnetic radiation (e.g. video monitors, high power electric cabling): this may cause degradation of the audio quality due to induced voltages in connecting leads and chassis. For the same reason, always site the console power supply away from the unit.

Caution! **In all cases, refer servicing to qualified personnel.**

Handling and Transport

The console is supplied in a rugged cardboard box. If it is necessary to move it any distance after installation it is recommended that this packing is used to protect it. Be sure to disconnect all cabling before moving. If the console is to be regularly moved (e.g. for roadshows) we recommend that it is installed in a foam lined flight case. At all times avoid applying excessive force to any knobs, switches or connectors.

Power supplies & cables

Always make sure that the power supply has been set to the same source voltage as the mains supply.

Always use the power supply and power cable supplied with the mixer: the use of alternative supplies may cause damage and voids the warranty; the extension of power cables may result in malfunction of the mixing console.

Warning! **Always switch the power supply off before connecting or disconnecting the console power cable, removing or installing modules, and servicing. In the event of an electrical storm, or large mains voltage fluctuations, immediately switch off the PSU and unplug from the mains.**

Always ensure that that you use the correct power supply for your console.
A CPS150 unit is required for the standard console.

Signal Levels

It is important to supply the correct input levels to the console, otherwise signal-to-noise ratio or distortion performance may be degraded; and in extreme cases damage to the internal circuitry may result. Likewise, on all balanced inputs avoid sources with large common mode DC, AC or RF voltages, as these will reduce the available signal range on the inputs. Note that 0dBu = 0.775V RMS.

The microphone input is designed for use with balanced low impedance (150 or 200Ω) microphones.

Caution! **DO NOT use unbalanced microphones or battery powered condenser microphones without isolating the +48V phantom power. - degraded performance or damage to the microphone may result.**

The sensitivity of the microphone input is variable from -16dBu to -68dBu (for +4dBu at the Program outputs), and the maximum input level (balanced) is +6dBu.

The Talkback microphone input has an impedance of greater than 2kΩ and a maximum input level of -15dBu. Sensitivity is adjustable from -32dBu to -59dBu.

The line input has a sensitivity variable between -21dBu and +10dBu, and can also handle a maximum input level up to 26dBu. Note that the maximum input level for unbalanced inputs is 6dB less than that for balanced signals, so very high level unbalanced signals (e.g. loudspeaker outputs of power amplifiers) may cause distortion. The input impedance is greater than 10kΩ.

The Telco input will similarly accept signals up to a maximum of +26dBu, with a +/- 10dB range on the trim control.

The main outputs of the console (Desk Left & Right) have a nominal output level which can be selected to 0dBu, +4dBu or +6dBu, and have an output impedance of <75Ω. The Aux output has a nominal output level of +4dBu and has an output impedance of <75Ω. These outputs can deliver full level (+26dBu balanced) into loads of greater than 600Ω. Secondary outputs, such as Cue, Control Room and Studio speakers (all unbalanced) have a nominal output level of +4dBu and an output impedance of <75Ω, and will only deliver the full output level of +21dBu into load impedances of greater than 5kΩ. The Record outputs have a nominal level of -2dBu and +21dBu capability into loads greater than 5kΩ.

Studio/Guest headphone outputs can deliver a maximum +18dBu into 600Ω. Control Room headphone outputs can deliver a maximum +21dBu into 600Ω.

Installation

Connectors

Module Connections

Connector Pinouts

Examples of Use

Installation

SAC100 is designed for reliability, high performance and built to the highest standards. Whilst great care has been taken to ensure that installations are made as trouble-free as possible, care taken at this stage, followed by correct setting up will be rewarded by a long life and reliable operation.

Warning! **Before switching on your SAC100 console, check that the mains voltage selector on the power supply unit is set to the correct mains voltage for your area, and that the fuse is of the correct rating. This is clearly marked on the case of the power supply. Do not replace the fuse with any other type, as this could become a safety hazard and will void the warranty.**

Always ensure that you use the correct power supply for your console. A CPS150 unit is required for the standard console.

Wiring Considerations

A For optimum performance it is essential for the earthing system to be clean and noise-free, as all signals are referenced to this earth. A central point should be decided on for the main earth point, and all earths should be 'star-fed' from this point. It is recommended that an individual earth wire be run from each electrical outlet, back to the system star point to provide a safety earth reference for each piece of equipment.

B Install separate mains outlets for the audio equipment, and feed these independently from any other equipment.

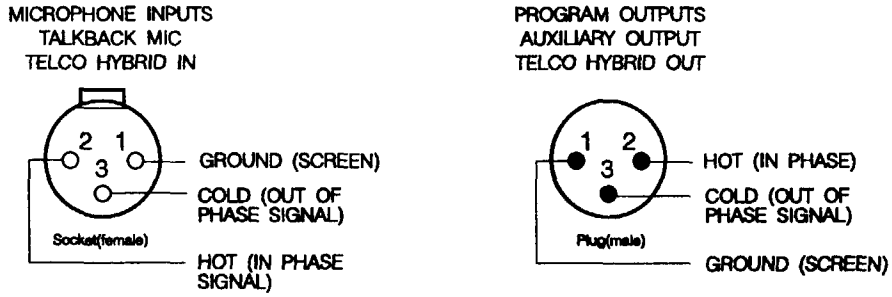
C Avoid locating mains distribution boxes near audio equipment, especially tape recorders, which are very sensitive to electro- magnetic fields.

D Where possible ensure that all audio cable screens and other signal earths are connected to ground only at their source.

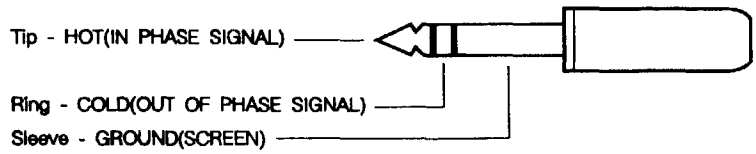
Connectors

Wiring Conventions

The SAC100 console uses two different types of audio connector, 3 pin XLR (top diagram) and ¼" three pole ('A' gauge or stereo) jacks. The latter are used in four different configurations, as shown below. All connectors are accessible from the front of the console by hinging back the overbridge and all cabling is concealed by routing through the generous apertures into the overbridge section.

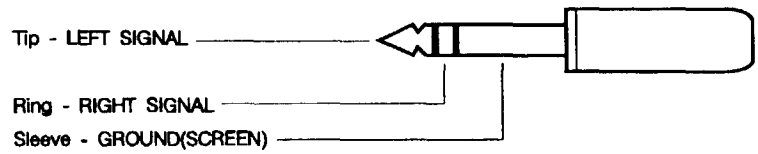


¼" 'A' Gauge Stereo Jack Plug used as balanced line input:

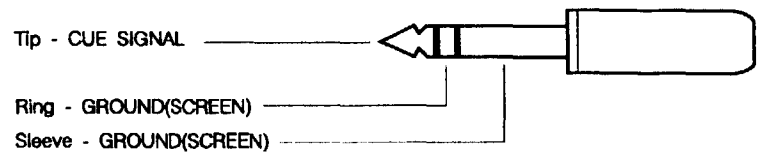


¼" 'A' Gauge Stereo Jack Plug used as a stereo output:
Phones & C/Room, Studio, Studio Phones, Guest Phones, Record Outputs

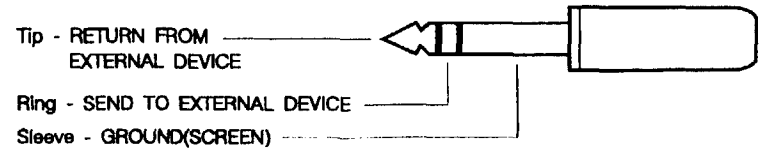
¼" 'A' Gauge Stereo Jack Plug used as a stereo input:
Ext. A, Ext B, Air inputs



¼" 'A' Gauge Stereo Jack Plug used as unbalanced output: Cue output



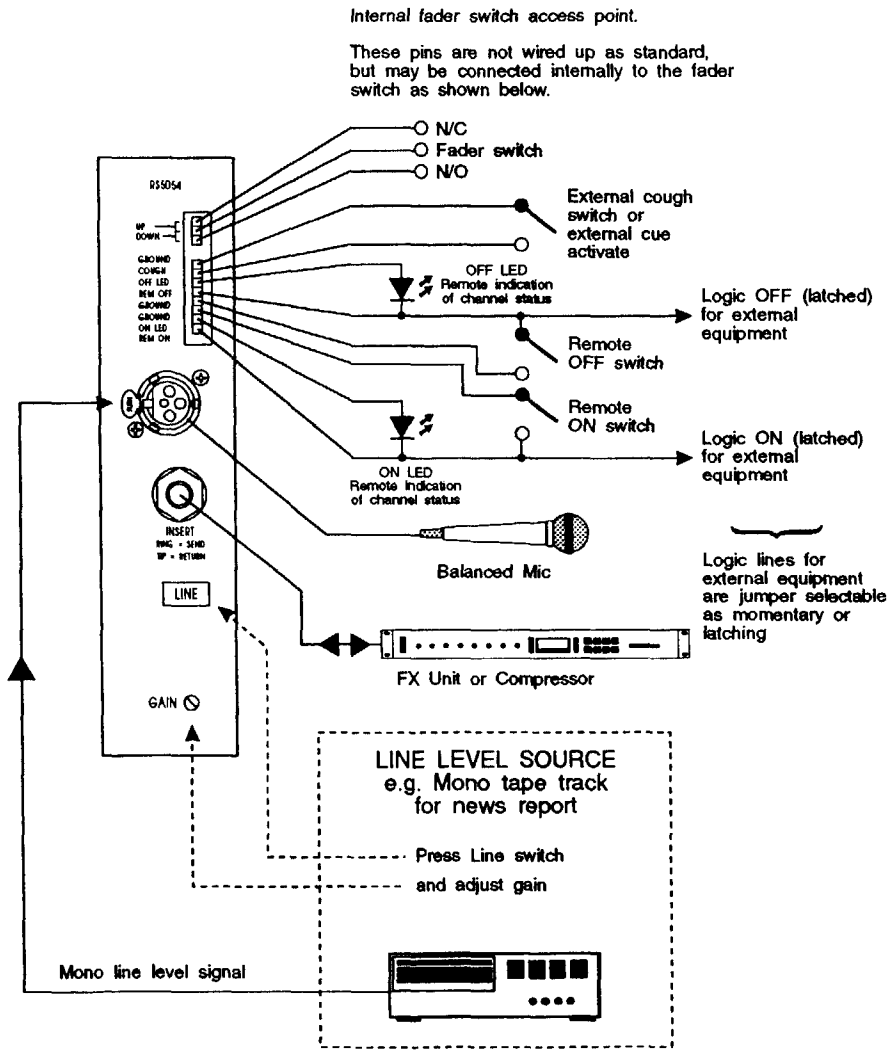
¼" 'A' Gauge Stereo Jack Plug used as insert send/return (Mic channels only):



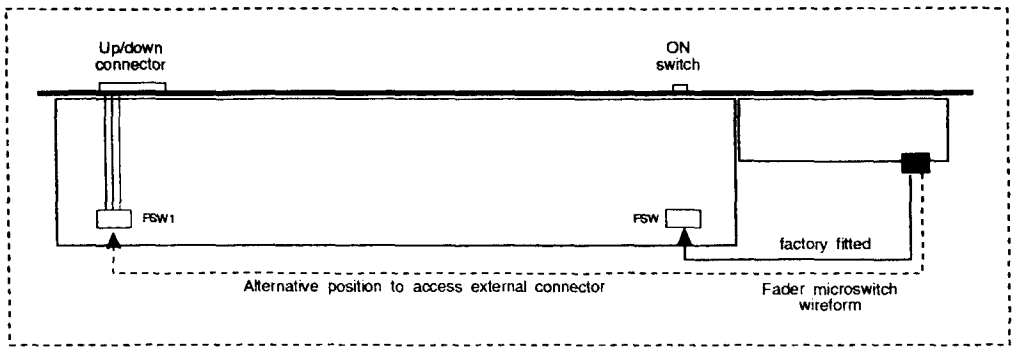
Module Connections

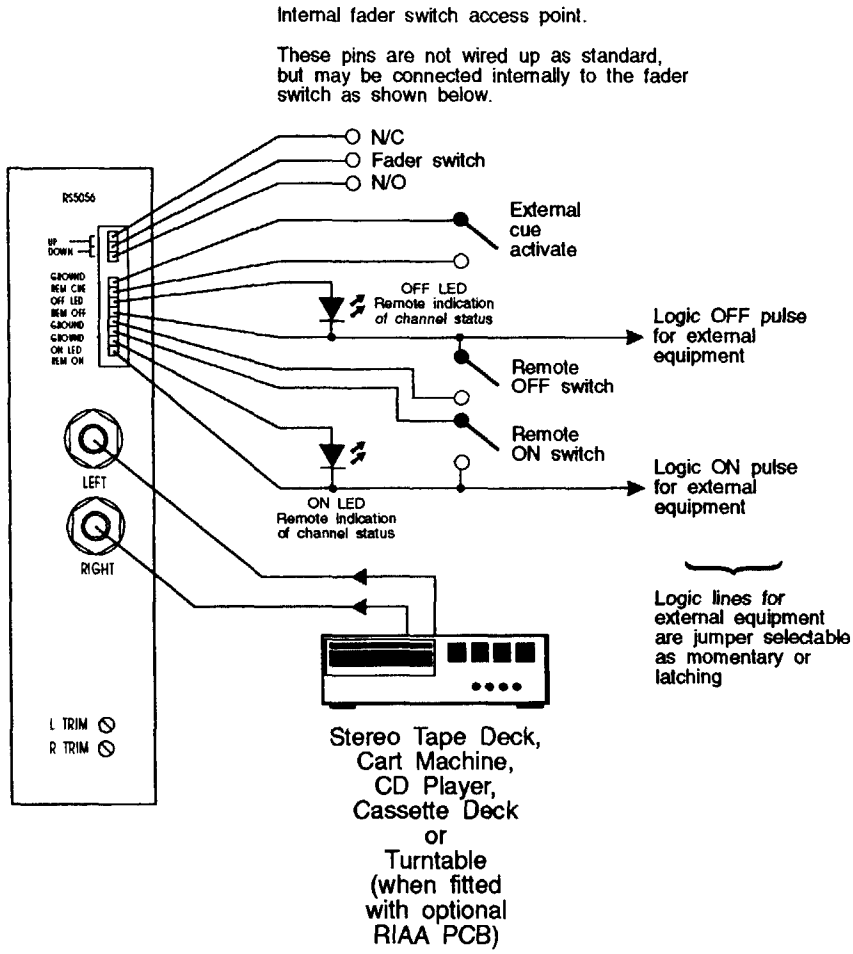
The diagrams below show typical connections to each module, including customer options where applicable. The following section gives further detail of the pinouts and function of each connector.

Mono Input

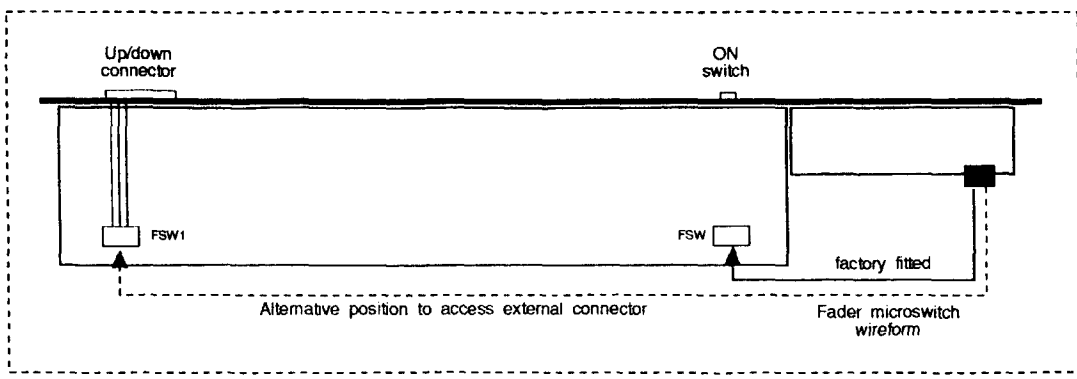


FADER MICROSWITCH WIRING OPTION

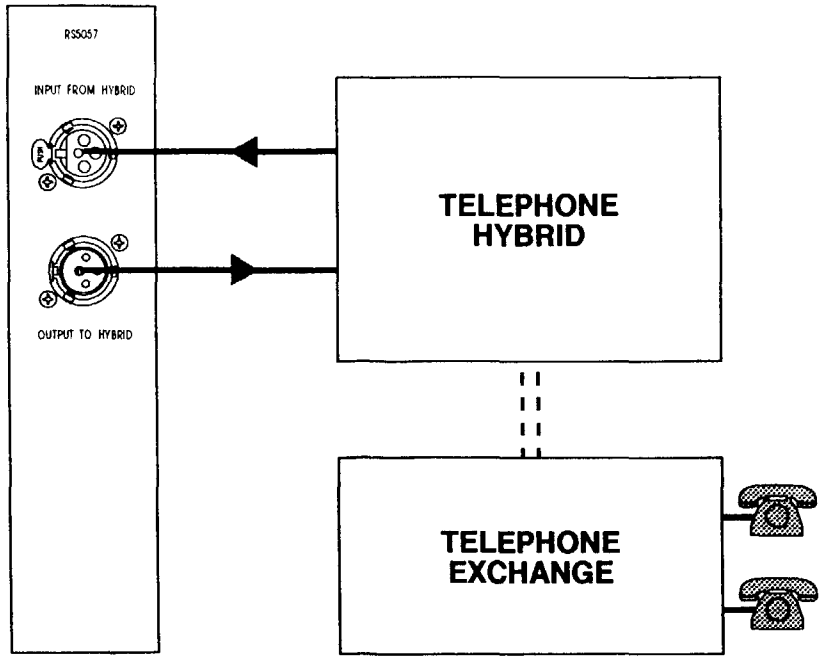




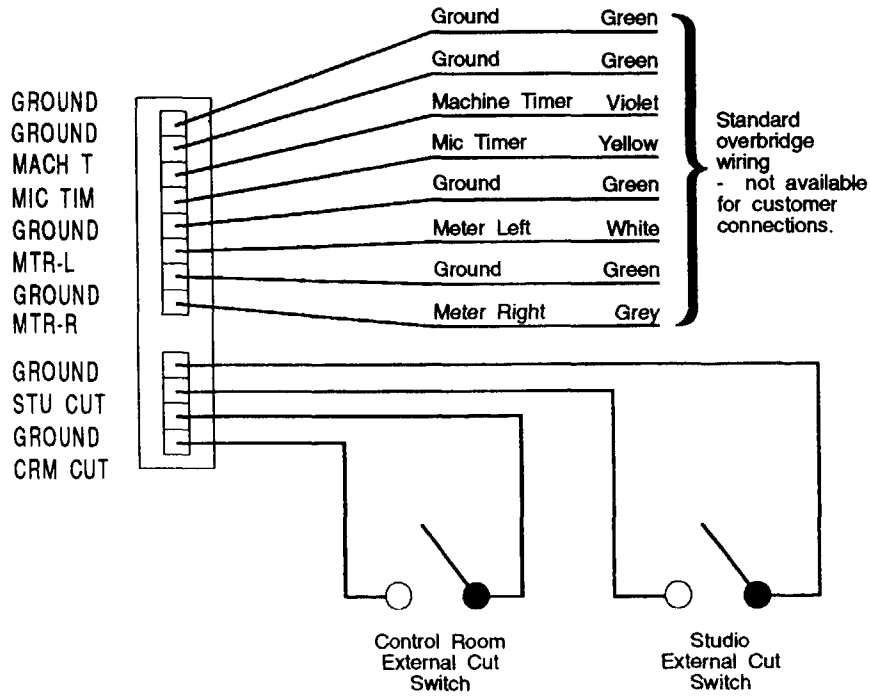
FADER MICROSWITCH WIRING OPTION

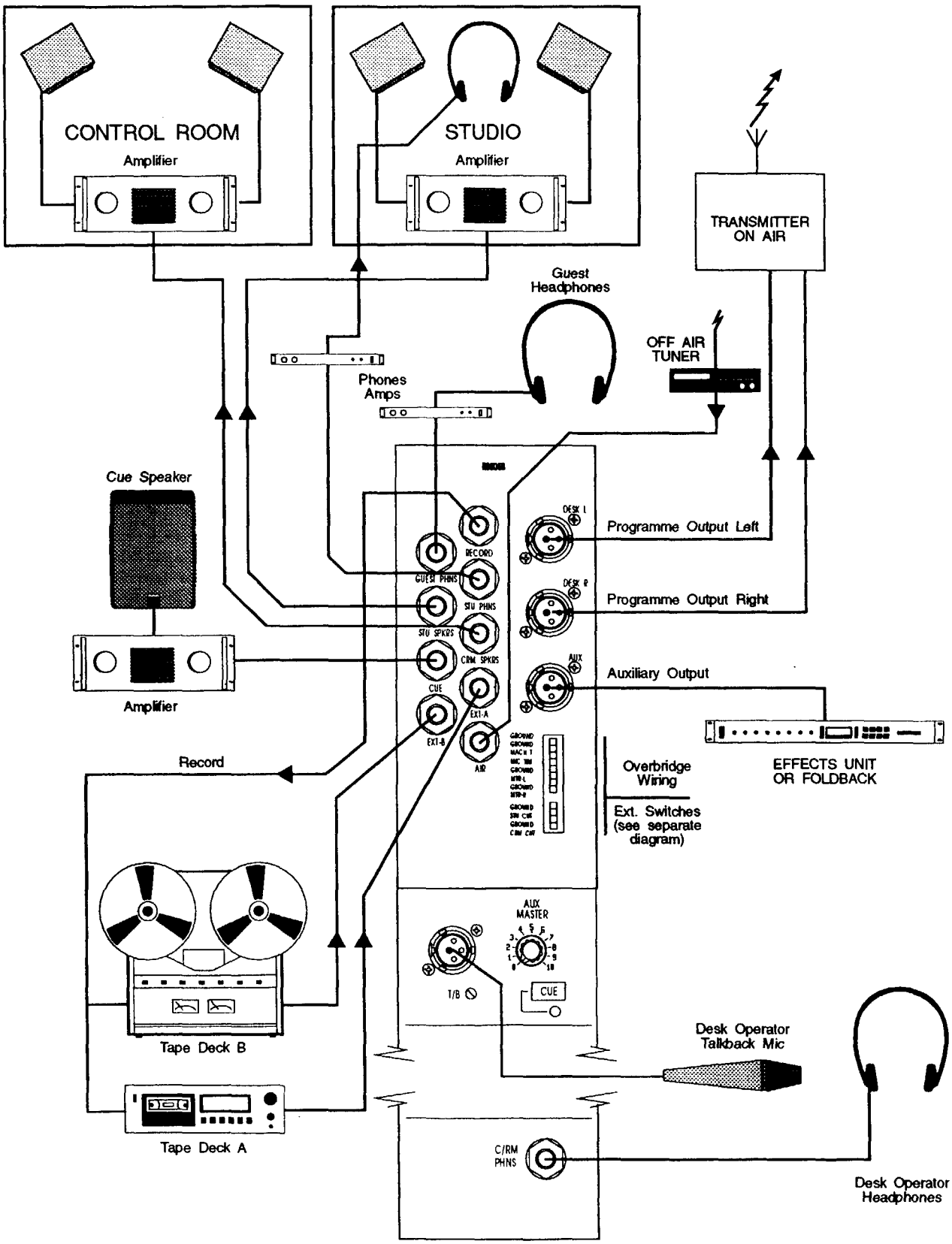


Telco Module



Master Module




CONTROL ROOM
Amplifier
STUDIO
Amplifier
TRANSMITTER
ON AIR
Guest
Headphones
OFF AIR
TUNER
Phones
Amps
Cue Speaker
Amplifier
RECORD
GUEST PHNS
STU PHNS
STU SPKRS
CRM SPKRS
CUE
EXT-A
EXT-B
AIR
DESK L
DESK R
AUX
Programme Output Left
Programme Output Right
Auxiliary Output
Record
Overbridge
Wiring
Ext. Switches
(see separate
diagram)
EFFECTS UNIT
OR FOLDBACK
AUX
MASTER
T/B
CUE
Tape Deck B
Tape Deck A
Desk Operator
Talkback Mic
C/RM
PHNS
Desk Operator
Headphones

Module Connector Pinouts

Further detail on connector pinouts may be found in the SAC100 Technical Manual.

Power Connector

1	Green/Yellow	Ground
2	Green	Ground
3	Orange	+48V Phantom power
4	Brown	+17V Audio supply
5	Blue	-17V Audio supply

Interface PCB

CON 2 (Power In)

1	Green	Ground
2		no connection
3	Blue	-17V Audio supply
4	Brown	+17V Audio supply
5		no connection
6	Orange	+48V Phantom power

PWR (Headphone Amp)

1	Brown	+17V
2	Green	Ground
3	Blue	-17V

CON 3 (VU & Timer Power & Lamp Supply)

1	Brown	+17V
2	Brown	+17V
3	Blue	-17V
4	Blue	-17V
5	Red	+7.5V
6	Green	Ground
7	Green	Ground
8	Black	-7.5V

CON 4 (PPM Meter Supply - option only)

1	Brown	+17V
2	Brown	+17V
3	Blue	-17V
4	Blue	-17V
5	Brown	+17V
6	Green	Ground
7	Green	Ground
8	Blue	-17V

Master Module

Monitor Cut Lines

1	Logic Ground	}	Switch closure to operate
2	Remote Studio Cut		
3	Logic Ground	}	Switch closure to operate
4	Remote Control Room Cut		

Mono Input

Fader Microswitch

1	Normally Closed	(Up)
2	Common	
3	Normally Open	(Down)

Remote Operation

1	GROUND	Ground
2	COUGH	$\overline{\text{External Cue}}$ *
3	OFF LED	LED +7.5V Supply via 680R
4	REM OFF	$\overline{\text{'OFF' Access}}$ *
5	GROUND	Ground
6	GROUND	Ground
7	ON LED	LED +7.5V Supply via 680R
8	REM ON	$\overline{\text{'ON' Access}}$ *

* Bi-directional Logic Lines. Pull to Ground (pins 1,5,6) to activate.

Stereo Input

Fader Microswitch

1	Normally Closed	(Up)
2	Common	
3	Normally Open	(Down)

Remote Operation

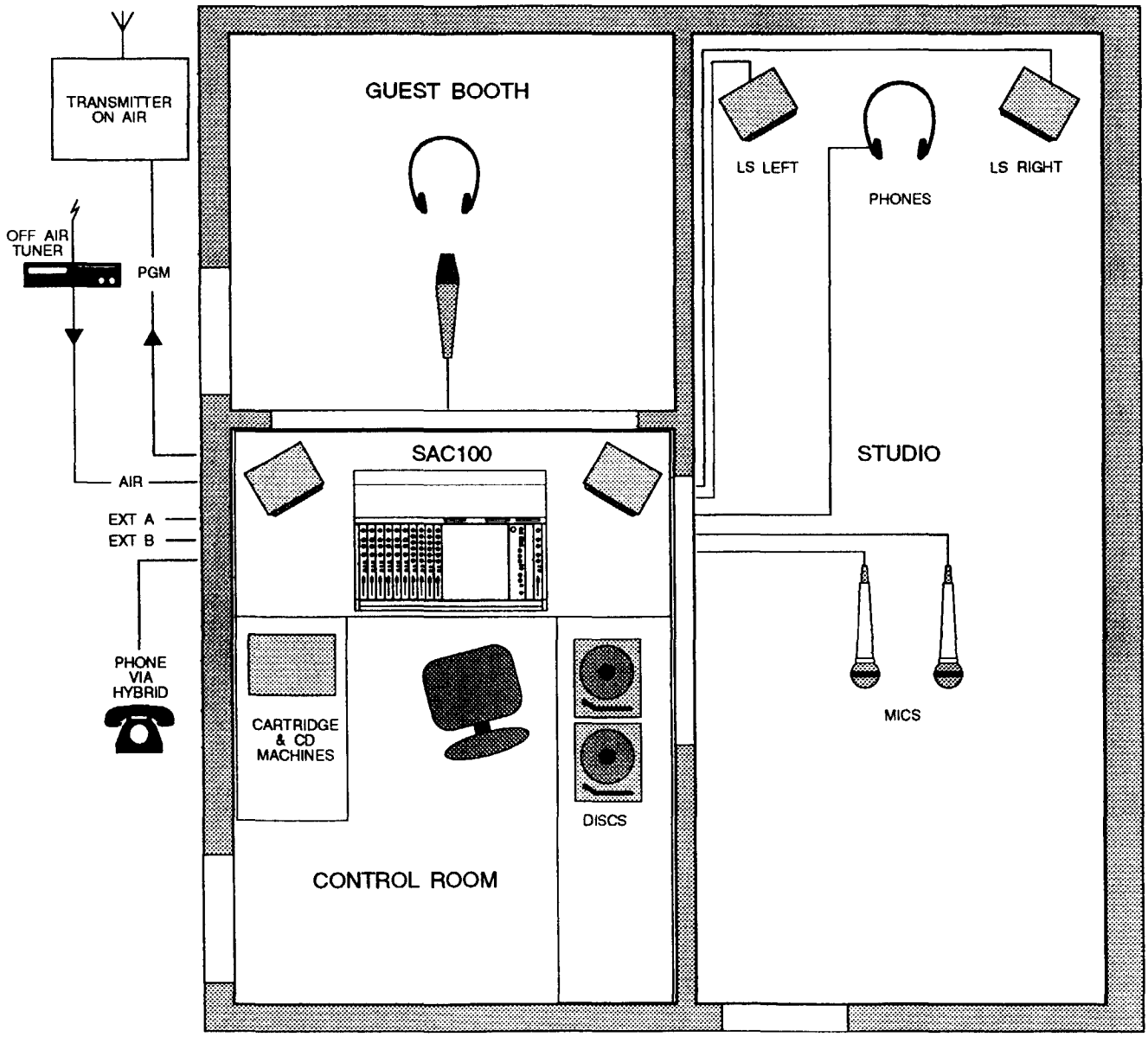
1	GROUND	Ground
2	REM CUE	$\overline{\text{External Cue}}$ *
3	OFF LED	LED +7.5V Supply via 680R
4	REM OFF	$\overline{\text{'OFF' Access}}$ *
5	GROUND	Ground
6	GROUND	Ground
7	ON LED	LED +7.5V Supply via 680R
8	REM ON	$\overline{\text{'ON' Access}}$ *

* Bi-directional Logic Lines. Pull to Ground (pins 1,5,6) to activate.

1	Studio Cut Control Line
2	Mic Timer Control Line
3	Control Room Cut Control Line
4	Machine Timer Control Line
5	Logic Ground
6	Logic Ground
7	-7.5V Logic Supply
8	-7.5V Logic Supply
9	+7.5V Logic Supply
10	+7.5V Logic Supply
11	Flash Bus
12	Audio Ground
13	Cue Enable
14	Audio Ground
15	Cue Left Bus
16	Audio Ground
17	Cue Right Bus
18	Audio Ground
19	Audio Ground
20	Audio Ground
21	Program Right Bus
22	Audio Ground
23	Program Left Bus
24	Audio Ground
25	Aux Bus
26	Audio Ground
27	Ground Compensation Bus
28	Audio Ground
29	Talkback Link
30	+48V Phantom Power
31	-17V Audio Supply
32	-17V Audio Supply
33	+17V Audio Supply
34	+17V Audio Supply

Examples of Use

The SAC100 has been designed to provide all the central facilities of a low-cost production/on-air console. The illustration below shows a typical small-scale broadcast studio and demonstrates the comprehensive range of inputs and outputs available on the console. The diagram shows a standard console, which would require optional RIAA cards fitted to two of the stereo inputs for the record turntables.



Module Block Diagrams

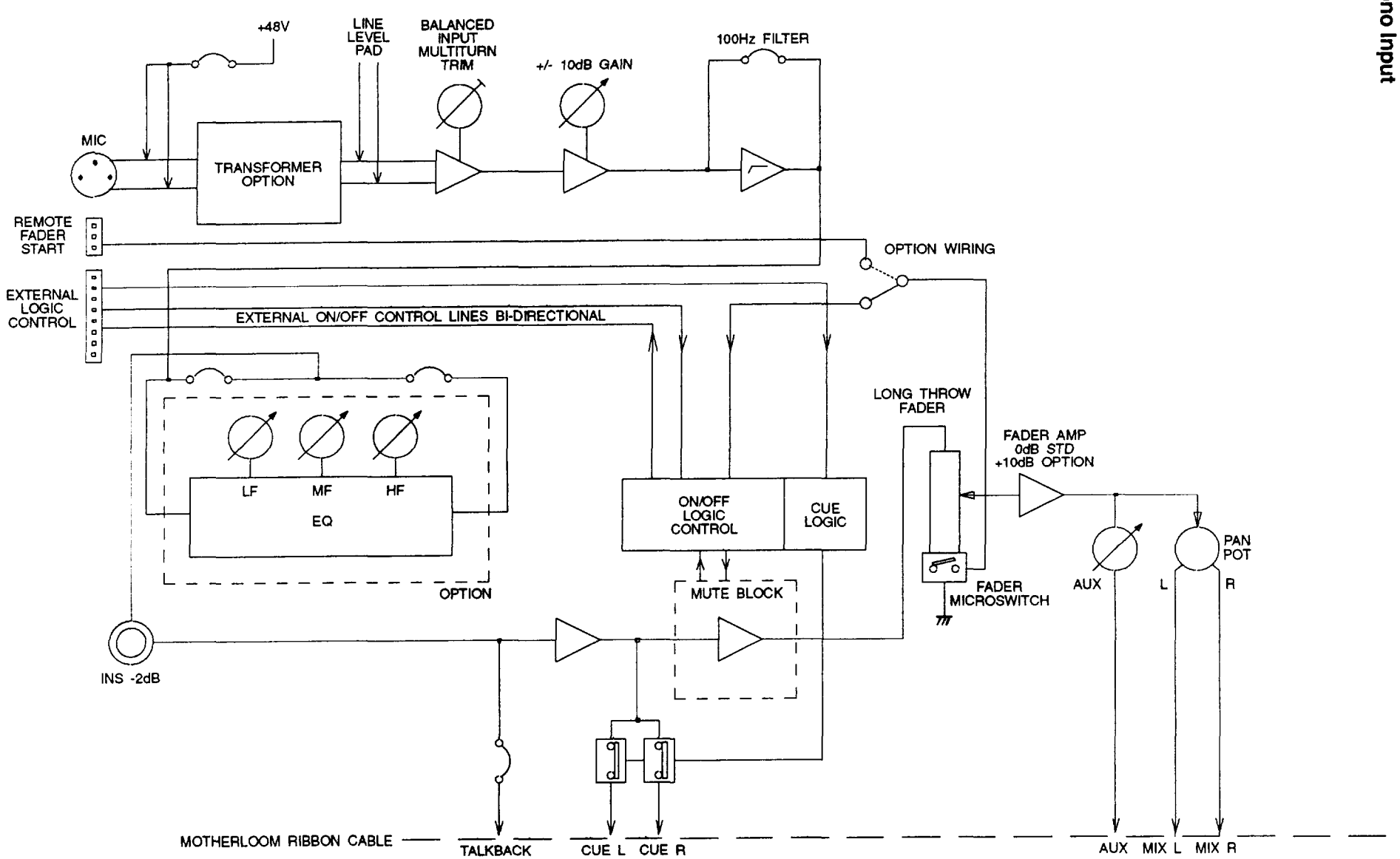
Mono Input

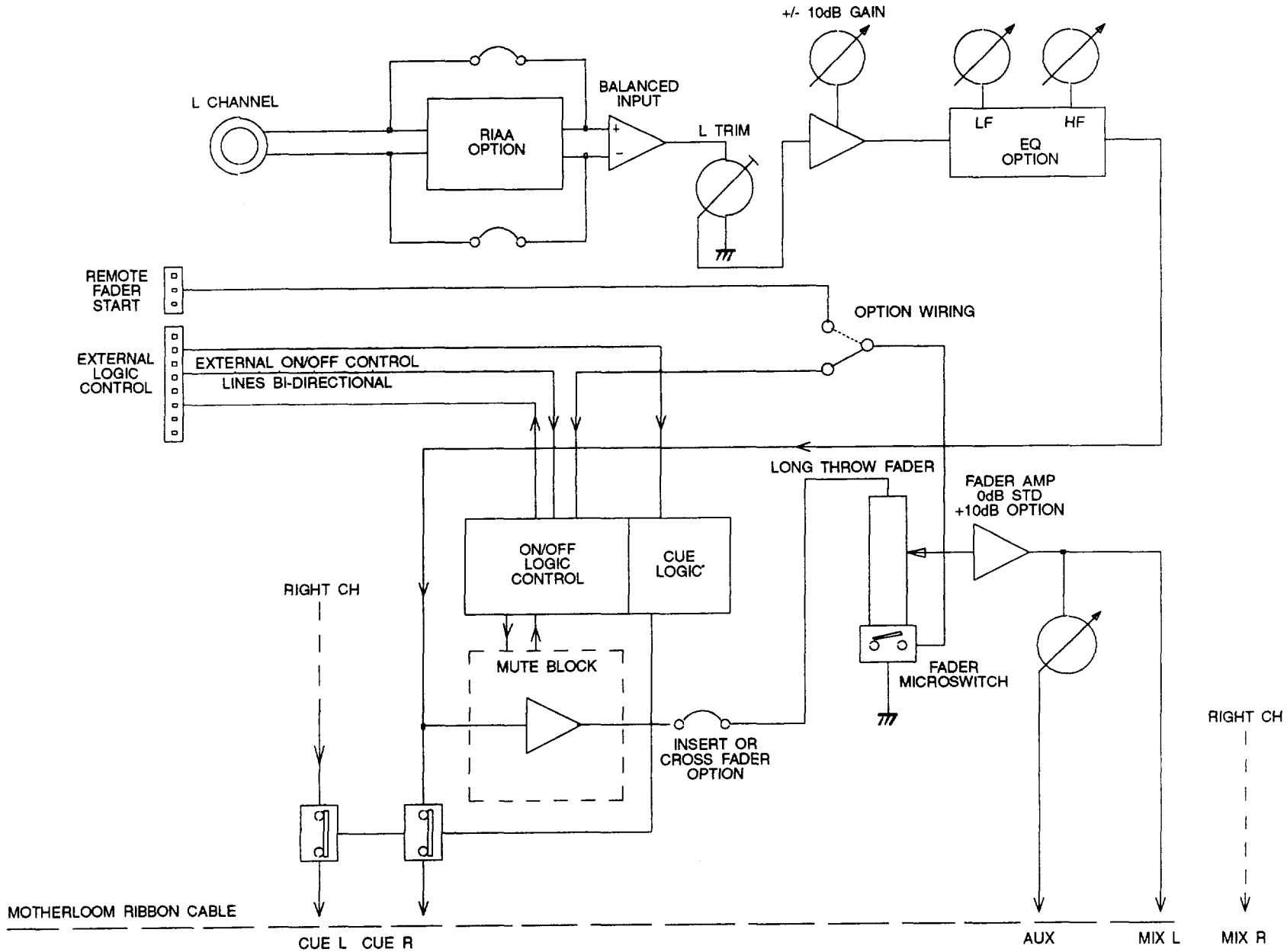
Stereo Input

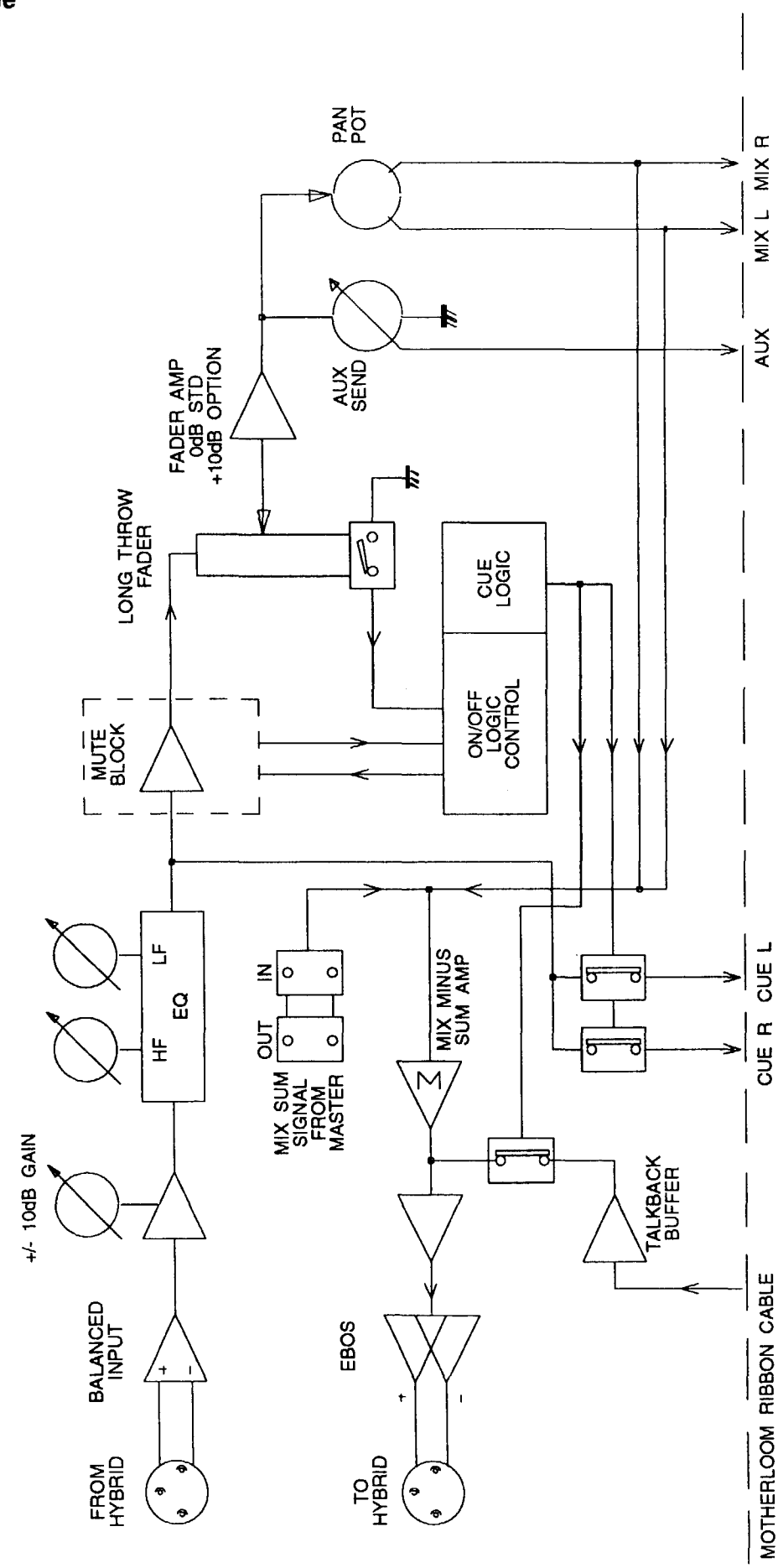
Telco Module

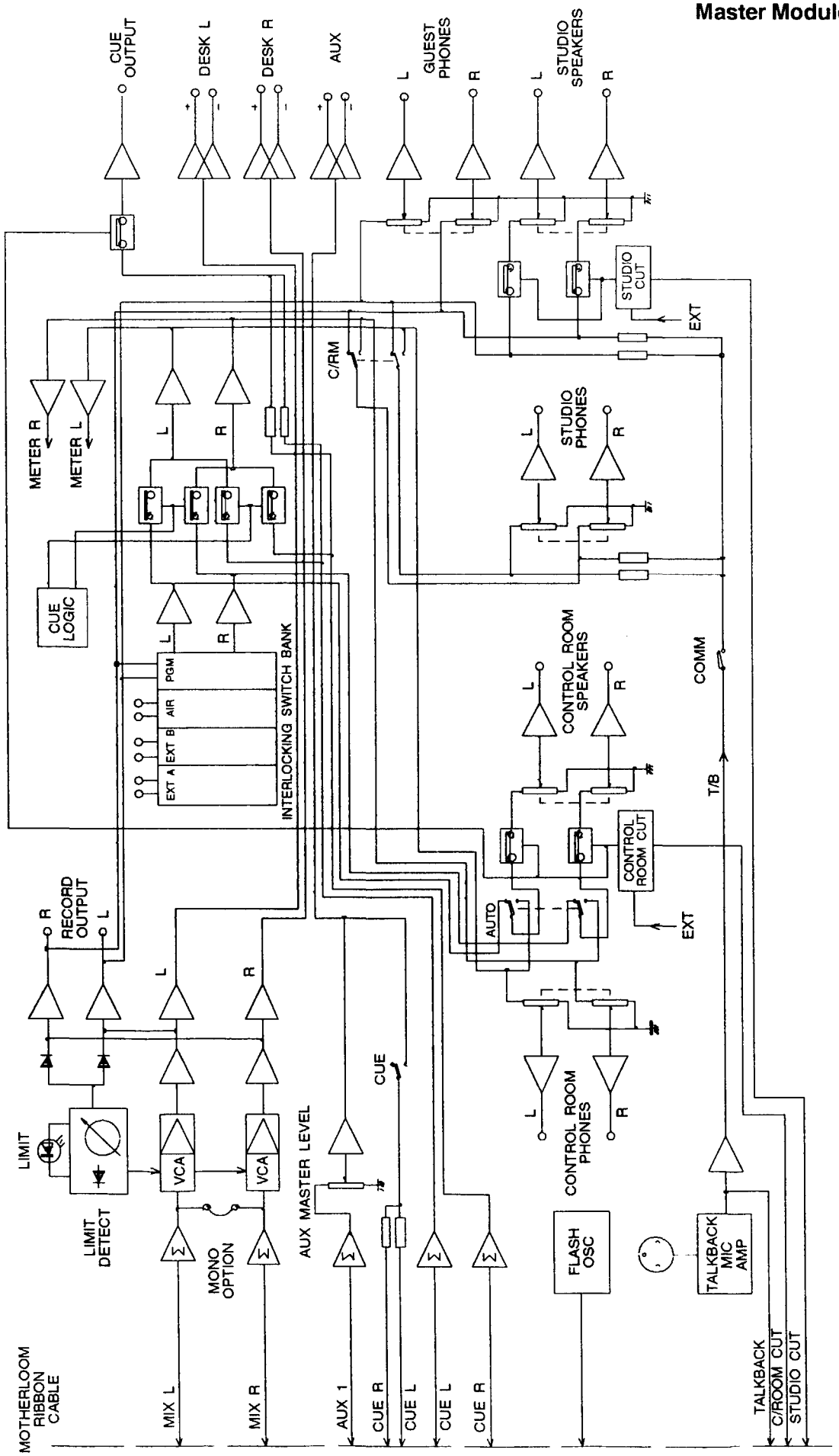
Master Module

System Diagram

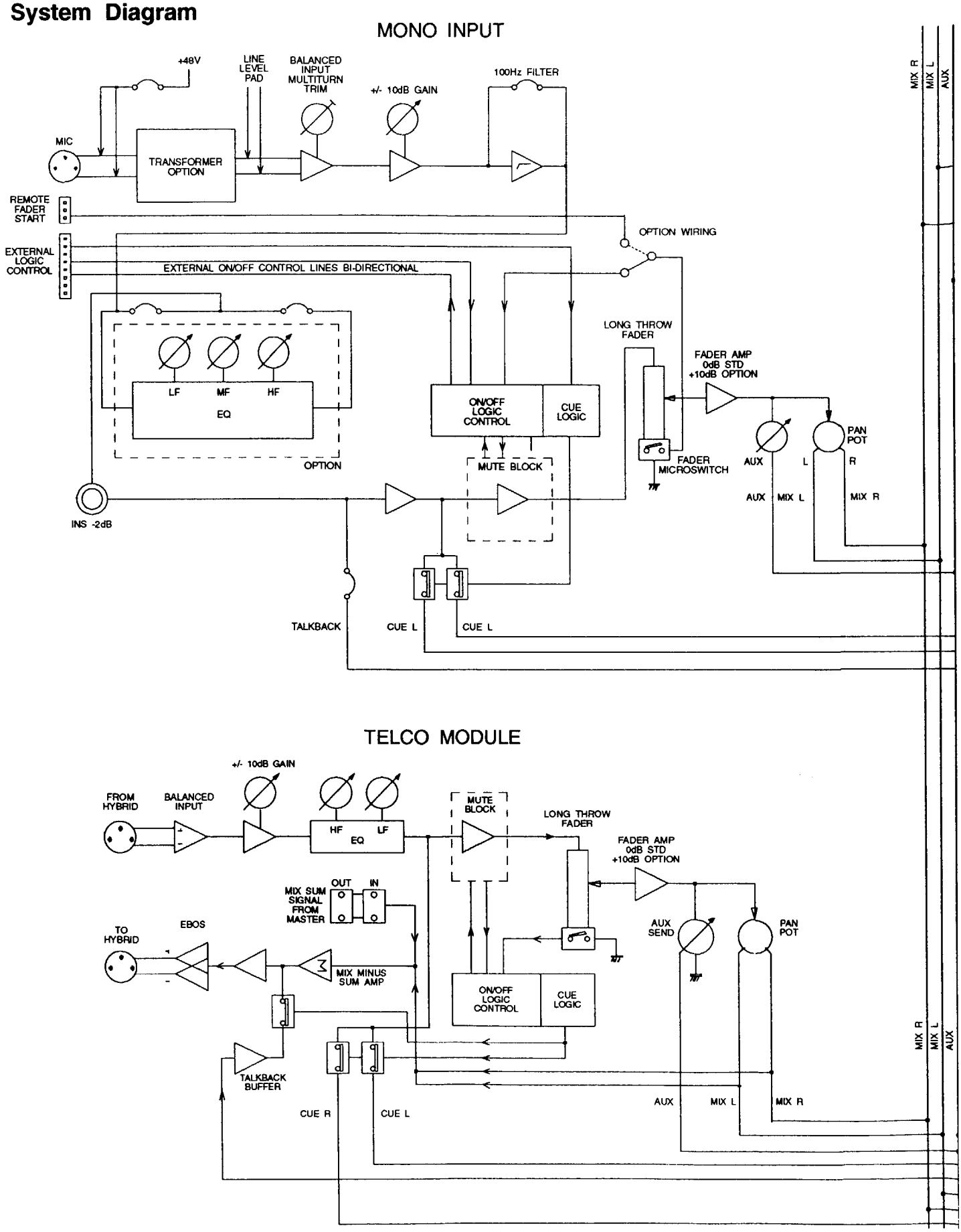

+48V
LINE LEVEL PAD
BALANCED INPUT MULTITURN TRIM
+/- 10dB GAIN
100Hz FILTER
MIC
TRANSFORMER OPTION
REMOTE FADER START
OPTION WIRING
EXTERNAL LOGIC CONTROL
EXTERNAL ON/OFF CONTROL LINES BI-DIRECTIONAL
LONG THROW FADER
FADER AMP 0dB STD +10dB OPTION
LF
MF
HF
EQ
ON/OFF LOGIC CONTROL
CUE LOGIC
OPTION
MUTE BLOCK
FADER MICROSWITCH
AUX
PAN POT
L
R
INS -2dB
MOTHERLOOM RIBBON CABLE
TALKBACK
CUE L
CUE R
AUX
MIX L
MIX R

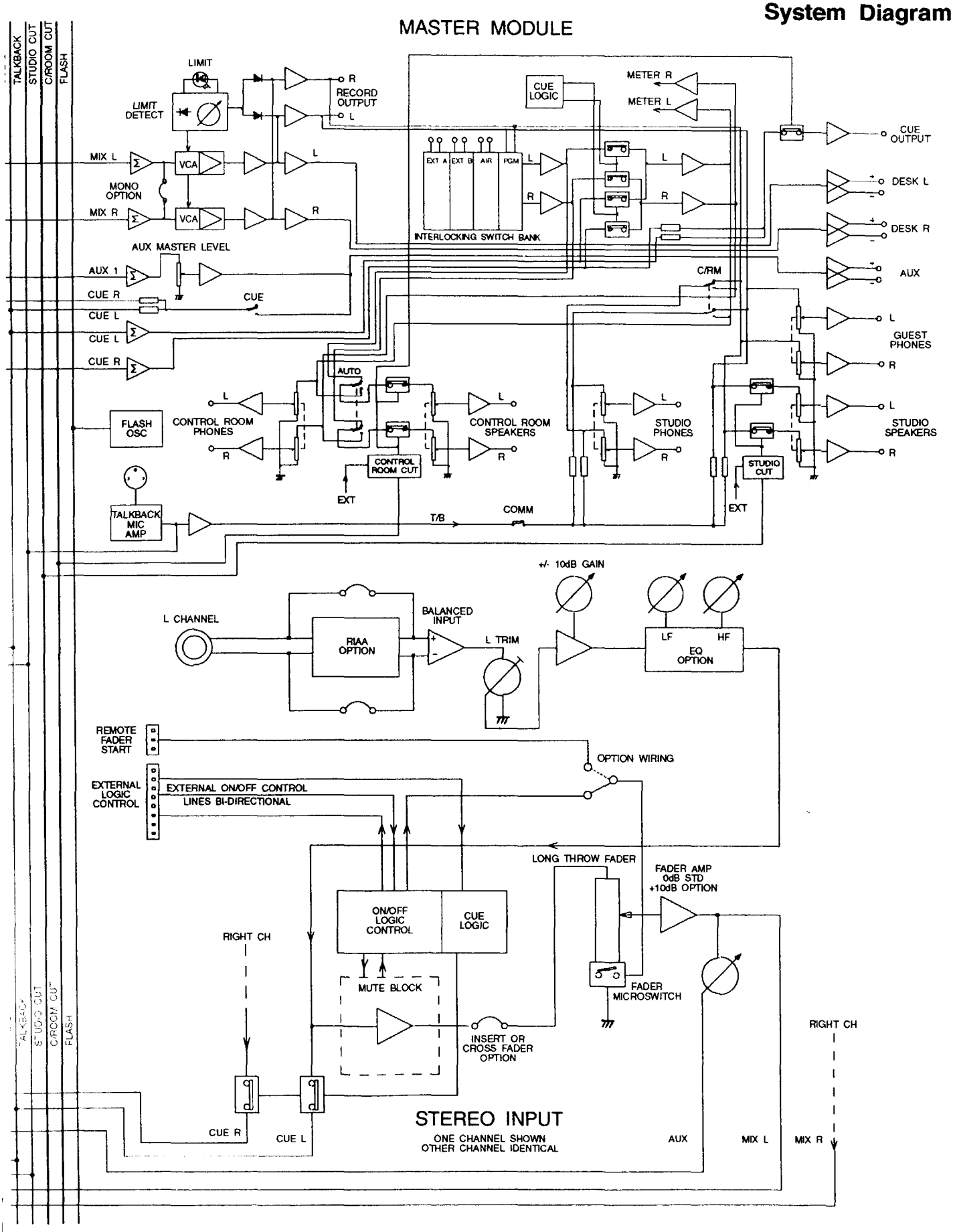

+/- 10dB GAIN
L CHANNEL
BALANCED INPUT
RIAA OPTION
L TRIM
LF
HF
EQ OPTION
REMOTE FADER START
OPTION WIRING
EXTERNAL LOGIC CONTROL
EXTERNAL ON/OFF CONTROL
LINES BI-DIRECTIONAL
LONG THROW FADER
FADER AMP
0dB STD
+10dB OPTION
ON/OFF LOGIC CONTROL
CUE LOGIC
RIGHT CH
MUTE BLOCK
FADER MICROSWITCH
INSERT OR CROSS FADER OPTION
RIGHT CH
MOTHERLOOM RIBBON CABLE
CUE L
CUE R
AUX
MIX L
MIX R


PAN POT
MIX L
MIX R
AUX SEND
AUX
FADER AMP 0dB STD +10dB OPTION
LONG THROW FADER
CUE LOGIC
ON/OFF LOGIC CONTROL
MUTE BLOCK
LF
HF
EQ
+/- 10dB GAIN
BALANCED INPUT
FROM HYBRID
IN
OUT
MIX SUM SIGNAL FROM MASTER
MIX MINUS SUM AMP
EBOS
TO HYBRID
TALKBACK BUFFER
CUE L
CUE R
MOTHERLOOM RIBBON CABLE

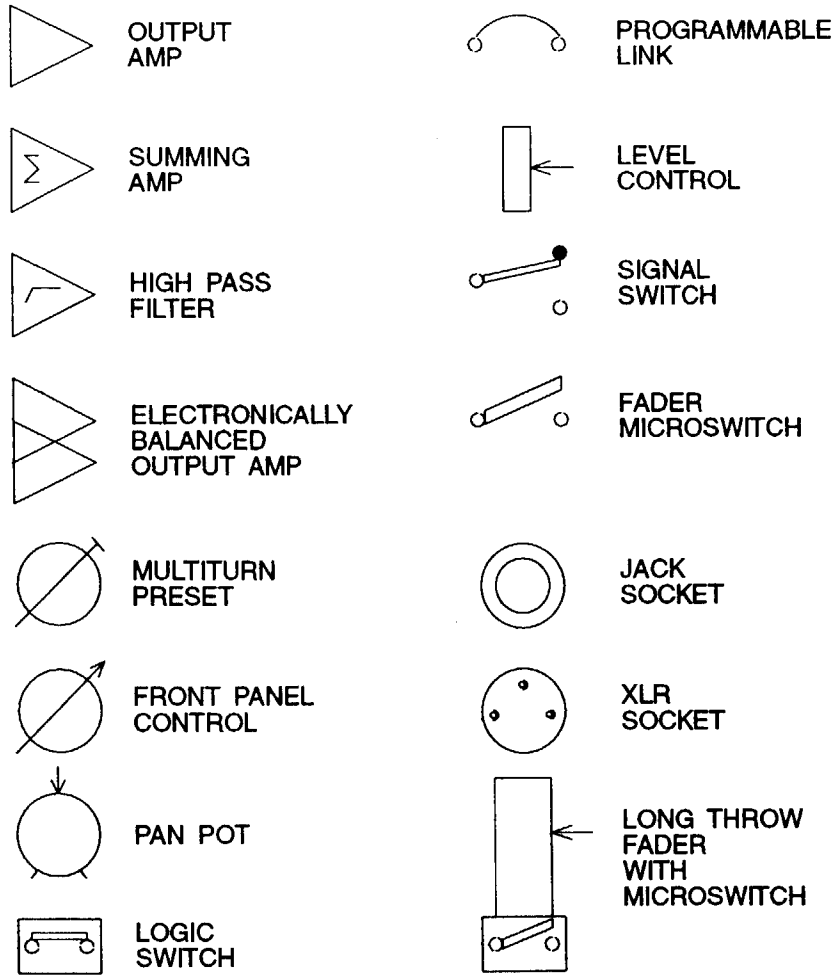

CUE OUTPUT
DESK L
DESK R
AUX
GUEST PHONES
STUDIO SPEAKERS
STUDIO CUT
EXT
C/RM
METER R
METER L
STUDIO PHONES
CUE LOGIC
INTERLOCKING SWITCH BANK
PGM
AIR
EXT B
EXT A
CONTROL ROOM SPEAKERS
COMM
T/B
CONTROL ROOM CUT
RECORD OUTPUT
AUTO
LIMIT
VCA
CUE
AUX MASTER LEVEL
CONTROL ROOM PHONES
LIMIT DETECT
MONO OPTION
FLASH OSC
TALKBACK MIC AMP
MOTHERLOOM RIBBON CABLE
MIX L
MIX R
AUX 1
CUE R
CUE L
TALKBACK
C/ROOM CUT
STUDIO CUT

System Diagram




MASTER MODULE
TALKBACK
STUDIO CUT
C/ROOM CUT
FLASH
LIMIT
LIMIT DETECT
R
RECORD OUTPUT
L
CUE LOGIC
METER R
METER L
CUE OUTPUT
MIX L
VCA
L
MONO OPTION
MIX R
VCA
R
EXT A
EXT B
AIR
PGM
INTERLOCKING SWITCH BANK
DESK L
DESK R
AUX
AUX MASTER LEVEL
AUX 1
CUE R
CUE
CUE L
CUE L
CUE R
C/RM
GUEST PHONES
AUTO
FLASH OSC
CONTROL ROOM PHONES
CONTROL ROOM SPEAKERS
STUDIO PHONES
STUDIO SPEAKERS
CONTROL ROOM CUT
STUDIO CUT
EXT
EXT
TALKBACK MIC AMP
T/B
COMM
+/- 10dB GAIN
L CHANNEL
BALANCED INPUT
RIAA OPTION
L TRIM
LF
HF
EQ OPTION
REMOTE FADER START
OPTION WIRING
EXTERNAL LOGIC CONTROL
EXTERNAL ON/OFF CONTROL LINES BI-DIRECTIONAL
LONG THROW FADER
FADER AMP 0dB STD +10dB OPTION
ON/OFF LOGIC CONTROL
CUE LOGIC
RIGHT CH
MUTE BLOCK
FADER MICROSWITCH
INSERT OR CROSS FADER OPTION
RIGHT CH
STEREO INPUT
ONE CHANNEL SHOWN
OTHER CHANNEL IDENTICAL
CUE R
CUE L
AUX
MIX L
MIX R

Key to Block Diagrams



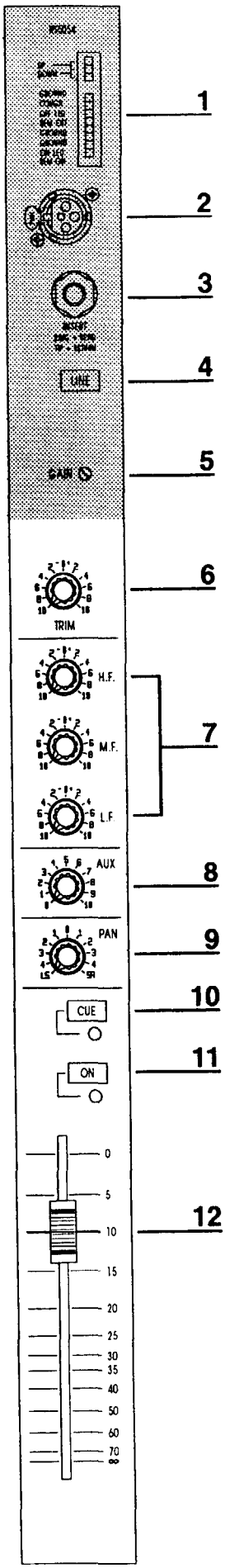
Mono Module

Description

Specifications

and Operation

Mono Module



1 REMOTE CONNECTOR

UP/DOWN This is not connected as standard.

Option: The Fader microswitch may be accessed directly to allow for Fader start of external equipment or external Mutes,"ON AIR", "MIC LIVE" lights. In this case the Fader will no longer control the module ON/OFF logic.

COUGH Pulling this line down to ground will mute the module and operate the CUE system.

REM OFF/REM ON

These lines are bi-directional. As an input they can be used to turn the module ON and OFF by momentarily pulling the appropriate line to ground. As open collector pull downs these latching outputs may also be used as a tally or to operate external equipment.

Option: The bi-directional output may be made momentary instead of latching by replacing jumpers J7, J13 with J6, J12.

OFF LED/ON LED

An LED may be connected between "OFF LED" (anode) and "REM OFF" (cathode) and another between "ON LED" (anode) and "REM ON" (cathode). Each LED pin has an internal current limiting pull-up resistor. This enables both remote control (see above) and display of the module status .

Note: The LED display will be either momentary or latching, according to the jumper designation for the bi-directional logic described above.

2 INPUT FEMALE XLR

This input feeds the mic pre-amp circuitry via the LINE switch.

Options: The +48V phantom power on pins 2 and 3 of the XLR may be enabled by fitting link J1. A Transformer may be fitted between the input and the mic pre-amp.

3 INSERT JACK

This ¼" stereo jack socket has the insert send on the ring, and the insert return on the tip. The sleeve is grounded. The insert is immediately before the pre-fade CUE and Talkback take off points.

4 LINE

When selected, the **LINE** switch inserts a 25dB attenuation pad before the mic pre-amp and disables the +48V phantom power.

5 GAIN

A multiturn preset varies the mic input sensitivity. If the **LINE** switch is selected, the sensitivity is altered due to the 25dB pad inserted before the mic pre-amp.

6 TRIM CONTROL

This centre detented control gives an additional +/- 10dB adjustment of the input sensitivity.

7 3-BAND FIXED FREQUENCY EQ (OPTION)

Where this option is fitted it provides a 3-band EQ with 10dB of cut or boost.

High Frequency (HF)

This centre detented control gives 10dB of cut or boost with a shelving response. The break frequency is at 4.7kHz.

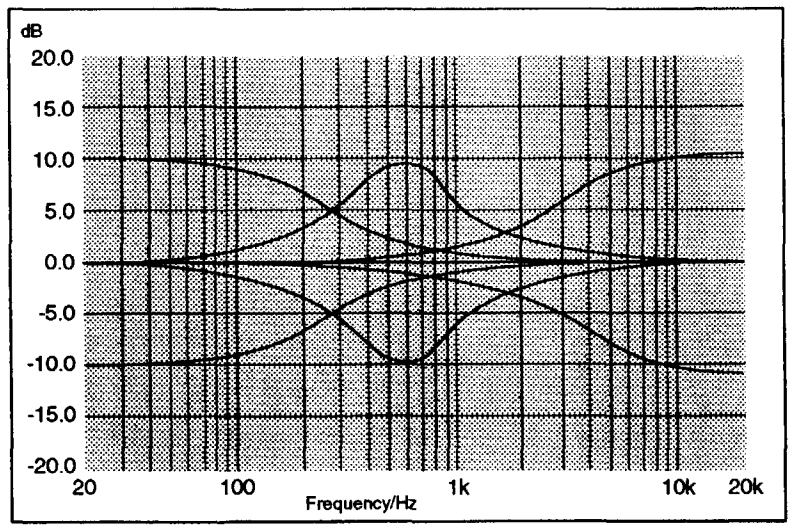
Medium Frequency (MF)

This centre detented control gives 10dB of cut or boost at 600Hz with a Q of 1.1.

Low Frequency (LF)

This centre detented control gives 10dB of cut or boost with a shelving response. The break frequency is at 180Hz.

Frequency Response Curves of the Equaliser



INTERNAL HIGH PASS FILTER (OPTION)

A 100Hz, 12dB per octave high pass filter follows the TRIM circuitry and may be enabled by removing jumper J2.

8 AUXILIARY SEND

This rotary potentiometer controls the post fader signal level sent to the Auxiliary output.

9 PAN CONTROL

A centre detented control which has a restricted range giving a level differentiation of 6.5dB between the L and R outputs at either extremity.

10 CUE SWITCH

A latching switch that routes the pre-fade, pre-mute signal to the L and R cue busses, independent of the Pan control, and mutes the module. An adjacent orange LED flashes to warn that the channel (and the monitoring system) is in **CUE** mode.

Option: If module mute is not required then remove jumper J14.

11 ON SWITCH

This is a momentary action switch which, if pushed, will always change the ON/OFF status of the module.

The ON/OFF status may also be changed via the Remote Connector or the Fader microswitch. Either of these three ON/OFF controls may be used to change the current status of the module.

An adjacent green LED indicates the module ON/OFF status. The **C/RM** and **STU SPKRS** will mute when the module is ON. Each time the console is switched on, all modules automatically reset to OFF.

Option: STU and C/RM SPKRS mute may be disabled by removing diodes D18, D19 respectively.

12 FADER

The module Fader is a smooth action 100mm control with unity gain at the top of the Fader. An integral microswitch controls the ON/OFF status of the module.

Options: The Fader microswitch may be wired directly to the Remote Connector (*see Remote Connector*) allowing Fader control of external equipment. Fader microswitch control of ON/OFF status may be disabled by removing jumper J5. An additional +10dB gain at the top of the Fader may be achieved by fitting R50 (2K2).

TIMER OPTION

If the Timer option in the Overbridge is fitted, then turning the module ON will start the Microphone Timer. If Timer start is not required then remove jumper J10.

Specification

Microphone Input

Electronically balanced (Transformer Optional)

Input Impedance	>2kΩ
Maximum I/P level	+6dBu
Sensitivity Range	-16 to -68dBu
CMRR	>75dB at Max Gain 1kHz
EIN : 150R source	-127.5dBu at Max Gain

Line Input

Electronically balanced

Input Impedance	>10kΩ
Maximum I/P level	+26dBu
Sensitivity Range	-21 to +10dBu
CMRR	>70dB at Max Gain 1kHz
EIN : 40R source	-93dBu at Unity Gain

Equalisation

Boost/Cut Range	+/-10dB
Break frequencies	HF 4.7 kHz Shelving
	LF 180 Hz Shelving
	MF +/-10dB at 600Hz
	Q=1.1
Highpass Filter	-3dB at 100Hz, 2nd Order

General

Insert Send level	-2dBu, Unbalanced
Insert Send Max O/P	20dBu into 2kΩ
Mute off ratio	>100dB @ 1kHz 95dB @ 10kHz
Fader off ratio	>100dB @ 1kHz 95dB @ 10kHz
	re +20dBu, unity gain
Pan Range	+4dB, -2.5dB
THD	<0.005% @ 1kHz
	<0.01% @ 10 kHz

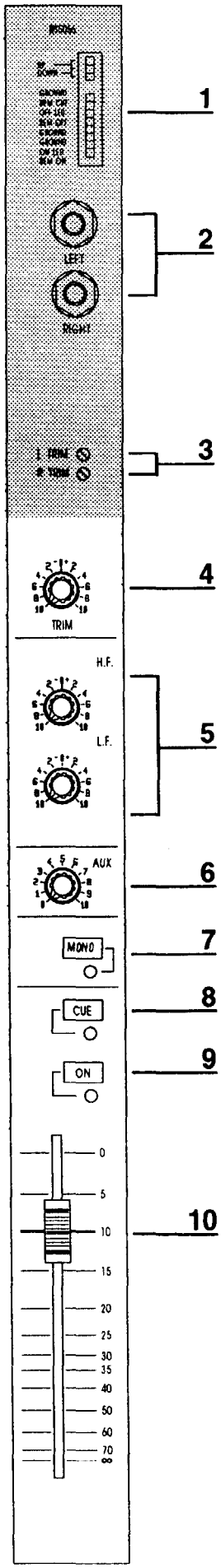
Stereo Module

Description

Specifications

and Operation

Stereo Module



1 REMOTE CONNECTOR

UP/DOWN This is not connected as standard.

Option: The Fader microswitch may be accessed directly to allow for Fader start of external equipment e.g. Turntable, CD Player or Cart Machine. In this case the Fader will no longer control the module logic.

CUE

Pulling this line down to ground will mute the module and operate the CUE system. This may be used, for example, to cue a two-track tape machine with a foot switch, allowing hands free operation.

REM OFF/REM ON

These lines are bi-directional. As an input they can be used to turn the module ON and OFF by momentarily pulling the appropriate line to ground. As open collector pull-downs these momentary outputs may also be used as a tally or to operate external equipment.

Option: The bi-directional output may be made latching instead of momentary by replacing jumpers J6, J12 with J7, J13.

OFF LED/ON LED

An LED may be connected between "OFF LED" (anode) and "REM OFF" (cathode) and another between "ON LED" (anode) and "REM ON" (cathode). Each LED pin has an internal current limiting pull-up resistor. This enables both remote control (see above) and display of the module status .

Note: The LED display will be either momentary or latching, according to the jumper designation for the bi-directional logic described above.

2 INPUT JACK SOCKETS

These are standard ¼" Jack Sockets and connect to the electronically balanced line input pre-amp.

Option: A stereo RIAA pre-amp may be fitted between the Input Sockets and the line pre-amp.

3 LTRIM AND RTRIM

These two multiturn pre-sets allow accurate interfacing to external sources and provide sufficient gain to use the RIAA option, which has a nominal output of 100mV.

4 TRIM CONTROL

This centre detented control provides 10dB cut or boost to the Line Input gain.

5 2-BAND FIXED FREQUENCY EQ (OPTION)

Where this option is fitted it provides a 2-band EQ with 10dB of cut or boost.

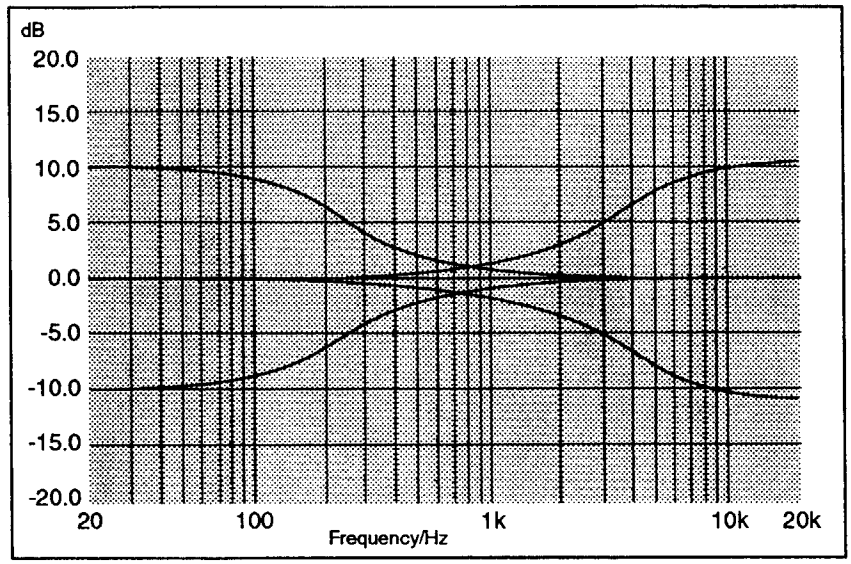
High Frequency (HF)

This centre detented control gives 10dB of cut or boost with a shelving response. The break frequency is at 4.7kHz.

Low Frequency (LF)

This centre detented control gives 10dB of cut or boost with a shelving response. The break frequency is at 180Hz.

Frequency Response Curves of the Equaliser



6 AUXILIARY SEND

A rotary potentiometer which controls the level of post-Fader signal sent to the Auxiliary output. The output is a mono sum of the L and R signal paths.

7 MONO Switch

Routes the L and R signal, in mono, to both L and R mix busses. This provides not so much a mono output from a stereo source as a mono output from a single source (this may be an unexpected single track source, such as a news report recorded on one track of a stereo tape machine, for example). An adjacent red LED flashes to indicate activation of the MONO switch.

8 CUE Switch

This latching switch routes the pre-fade, pre-mute stereo signal to the L and R cue busses and mutes the module. The take-off point is before the **MONO** switch and so will warn the operator if the incoming source is single track. An adjacent orange LED flashes to warn that the channel (and the monitoring system) is in CUE mode.

Option: If module mute is not required then remove jumper J14.

9 ON Switch

A momentary action switch which, if pushed, will always change the ON/OFF status of the module. The ON/OFF status may also be changed via the Remote Connector or the Fader microswitch. Either of these three ON/OFF controls may be used to change the current status of the module. An adjacent green LED indicates the module ON/OFF status. Each time the console is switched on, all modules automatically reset to OFF.

10 FADER

The module Fader is a smooth action 100mm control with unity gain at the top of the Fader. An integral microswitch controls the ON/OFF status of the module.

Options: The Fader microswitch may be wired directly to the Remote Connector (see Remote Connector) allowing Fader control of external equipment. Fader microswitch control of ON/OFF status may be disabled by removing J5. An additional +10dB gain at the top of the Fader may be achieved by fitting resistors R50 (2k2) and R22 (2k2).

TIMER OPTION

If the Timer option in the Overbridge is fitted, then turning the module ON will reset the (continuously running) Machine Timer. If Timer reset is not required then remove jumper J11.

Specification

Line Inputs

Electronically balanced	
Input Impedance	10kΩ
Max I/P level	+22dBu
Gain Trim Range	+24dBu .... -75dB

Equalisation

Boost/Cut Range	+/- 10dB
Break frequencies	HF 4.7kHz Shelving
	LF 180Hz Shelving

General

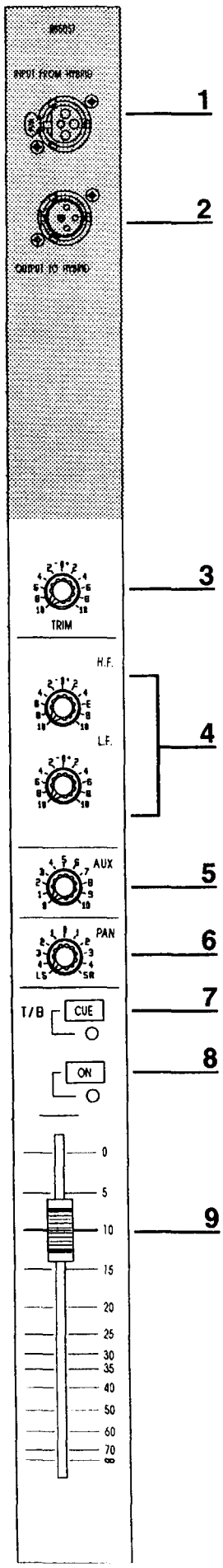
Trim Range	+/- 10dB
Mute ratio off	>95dB @ 1kHz, 10kHz
Fader ratio off	>90dB @ 1kHz, 10kHz
	re +20dBu, Unity gain
L/R Crosstalk	>75dB @ 1kHz, 63dB @ 10kHz
THD	<0.005% @ 1kHz
	<0.01% @ 10kHz

Telco Module

Description

Specifications

and Operation



Telco Module

1 INPUT FROM HYBRID

A female XLR input into which may be plugged the output from an external telephone Hybrid.

2 OUTPUT TO HYBRID

A male XLR output which may be connected to the input of an external Telephone Hybrid. The return signal comprises the mono sum of the Desk output minus the output of the Telco itself.

3 TRIM

This centre detented control provides 10dB of cut or boost after the input pre-amp.

4 2-BAND FIXED FREQUENCY EQ

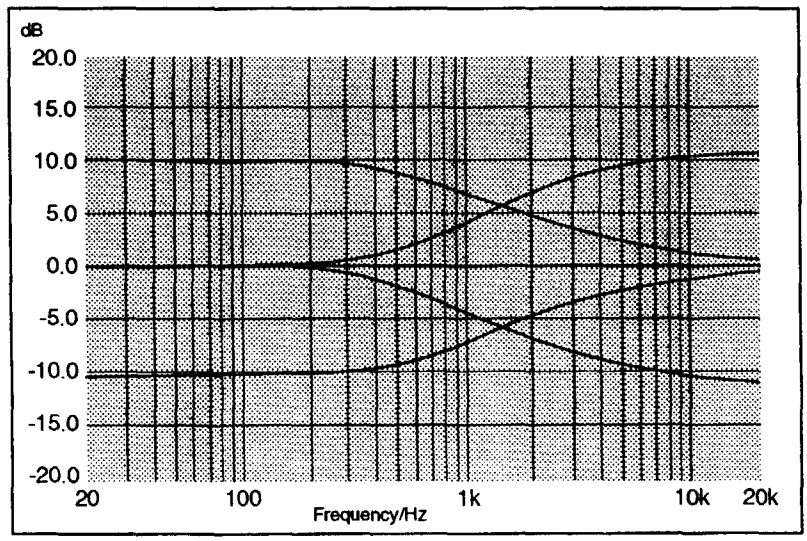
High Frequency (HF)

This centre detented control gives 10dB of cut or boost with a shelving response. The break frequency is at 2.3kHz.

Low Frequency (LF)

This centre detented control gives 10dB of cut or boost with a shelving response. The break frequency is at 900Hz.

Frequency Response Curves of the Equaliser



5 AUXILIARY SEND

A rotary potentiometer which controls the level of post fader signal sent to the Auxiliary output.

6 PAN CONTROL

This centre detented control has a restricted range giving a level differentiation of 6.5dB between the L and R outputs at either extremity.

7 CUE Switch

This momentary action switch performs a dual function. Firstly, it allows the operator to hear the incoming caller by routing the pre-fade, pre-mute signal in equal amounts to the L and R Cue busses. Secondly, it enables the operator to talk to the caller by routing Talkback to the Hybrid output, dimming but not muting the existing signal.

There is also a logic interlock between the ON/OFF system and the CUE system. Selecting **CUE** turns the module OFF (if not already so) and, likewise, selecting **ON** will cancel **CUE**. This means that, having established two way conversation with the caller, the operator may then go straight on-air by pressing the ON Switch or by fading up, automatically cancelling CUE.

An adjacent orange LED illuminates to indicate that the CUE system is active.

8 ON Switch

This momentary switch toggles the module ON and OFF. See above "CUE Switch" for details of interlock between these two switches. An adjacent green LED illuminates to indicate when the module is ON.

9 FADER

The Fader is a smooth action 100mm control with unity gain at the top. An integral microswitch controls the ON/OFF status of the module.

Option: Fader microswitch control of ON/OFF status may be disabled by removing link J1. An additional +10dB gain at the top of the Fader may be achieved by fitting resistor R11(2k2).

Hybrid Input

Electronically balanced	
Input Impedance	10kΩ
Maximum I/P level	+26dBu
CMRR	>60dB @ 1kHz
THD	<0.005% @ 1kHz
	<0.01% @ 10kHz

Hybrid Output

Electronically balanced	
Nominal Output level	+4dBu
Output Impedance	<75Ω
Maximum Output	+26dBu
THD	<0.003% @ 1kHz
	<0.008% @ 10kHz

Equalisation

Boost/Cut Range	+/-10dB
Break frequencies	HF 2.3kHz Shelving
	LF 900Hz Shelving

General

Mute off ratio	>100dB @ 1kHz, 10kHz
Fader off ratio	>100dB @ 1kHz, 10kHz
	re. +20dBu, unity gain
Mix Minus ratio	>30dB @ 100Hz to 10kHz

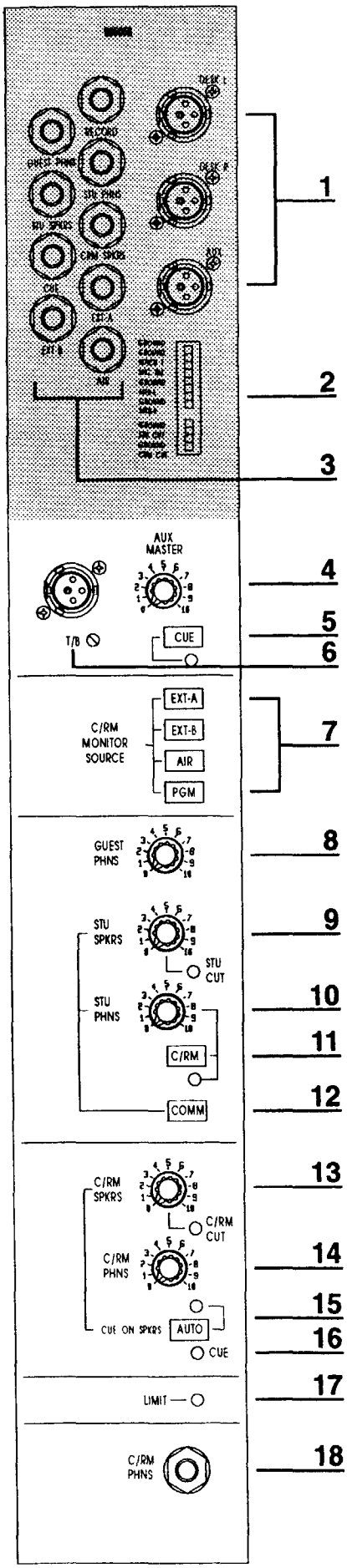
Master Module & Overbridge

Description

Specifications

and Operation

Master Module



1 XLR Connectors

The three male XLR connectors are electronically balanced outputs from Desk Left, Desk Right and the Auxiliary output.

2 Remote Connectors

The top 8-way connector connects to the SAC 100 Overbridge.

MACH T/MIC TIM (Machine Timer and Microphone Timer): These two pins activate the optional Timer module in the Overbridge.

MTR-L/MTR-R: These two pins connect to the Left and Right LED Meters in the Overbridge (or to the optional VU meters). The Meter drive is sourced via the **C/RM MONITOR SOURCE** switch or **CUE**, if activated.

The lower 4-way connector provides external control of the Studio and Control Room mute by pulling the appropriate pin to ground.

3 Jack Connectors

There are nine ¼" stereo Jack Sockets consisting of six unbalanced outputs and three unbalanced stereo inputs. The outputs are intended for use with external buffers/amplifiers.

RECORD OUTPUT: This stereo signal is a buffered output of Desk L and Desk R at a nominal level of -2dBu.

GUEST PHONES: This stereo output is sourced from the Desk L/R outputs via the Guest Phones level control.

STUDIO PHONES: This stereo output is sourced via the **C/RM** switch and the Studio Phones level control. Talkback may be injected into the signal by pressing the **COMM** switch, dimming but not replacing the existing signal.

STUDIO SPEAKERS: This stereo signal is sourced from Desk L and R via the Studio Speakers level control. Talkback may be injected into the signal by pressing the **COMM** switch, dimming but not replacing the existing signal.

Note - this signal will be muted if a Module jumpered for Studio mute is turned ON.

CONTROL ROOM SPEAKERS: The source for this stereo signal is determined by the **AUTO** switch (see below). The signal will be muted if a module jumpered for Control Room mute is turned ON.

CUE: This mono output is the sum of the L and R cue signals and is intended for use with an external power amplifier and speaker. The Cue output will mute with Control Room mute.

EXT-A, EXT-B, AIR: These are stereo inputs and are selected via the **C/RM MONITOR SOURCE** select switches. The nominal input level is -2dBu.

4 AUX MASTER

A rotary fader which controls the signal level to the Auxiliary output XLR.

5 CUE Switch

When the CUE switch is pressed, the cue system monitors the Auxiliary post-fade signal. An adjacent orange LED flashes to indicate that the Cue is active.

6 TALKBACK Microphone Input

This female XLR input is intended for use with a goose-neck microphone. The input sensitivity may be adjusted via a multi-turn preset, accessible through the front panel.

Option: If +48V phantom power is required then link J1 must be fitted on the Talkback board.

7 C/RM MONITOR SOURCE Switches

These four switches select the source to be monitored on the Control Room speakers and headphones as well as the Left and Right meters.

8 GUEST PHONES

A rotary fader which controls the signal level sent to the Guest Phones Jack Socket.

9 STUDIO SPEAKER

A rotary fader which controls the signal level sent to the Studio Speaker Jack Socket. An adjacent red LED illuminates to indicate when the signal is muted.

10 STUDIO PHONES

A rotary fader which controls the signal level sent to the Studio Phones Jack Socket.

11 C/RM Switch

This switch determines the source fed to the Studio Phones. Normally this is the Desk L/R output but, if pressed, it becomes the same as that fed to the Control Room Phones. An adjacent red LED illuminates to indicate activation of this switch.

12 COMM Switch

Pressing this switch will inject Talkback into the Studio Speaker and Phones signal paths, dimming but not replacing the existing signal.

Option: The Talkback source may be selected as one of the Mono modules by fitting link J15 on the appropriate Mono module.

13 CONTROL ROOM SPEAKERS

A rotary fader which controls the signal level sent to the Control Room Speaker Jack Socket. An adjacent red LED illuminates to indicate when the signal is muted.

14 CONTROL ROOM PHONES

A rotary fader which controls the signal level sent to the Control Room Phones Jack Socket.

15 AUTO Switch

This switch determines the source fed to the Control Room Speakers. Normally this is the C/RM Monitor Switch selection but, if pressed, it becomes CUE (if the Cue system is activated). An adjacent red LED illuminates to indicate when the source is from CUE.

16 CUE LED

A red LED which illuminates to indicate when the CUE system is activated.

17 LIMIT LED

A red LED indicates when the limiter is operating to keep the Desk Outputs below the level set by the internal "THR" (threshold) preset.

Refer to the Technical Manual for set-up procedure.

18 CONTROL ROOM PHONES Jack Socket

This stereo output may be used to drive Headphones directly and is sourced from either the C/RM Monitor Switch selection or from the CUE system, if activated.

Nominal Operating Levels

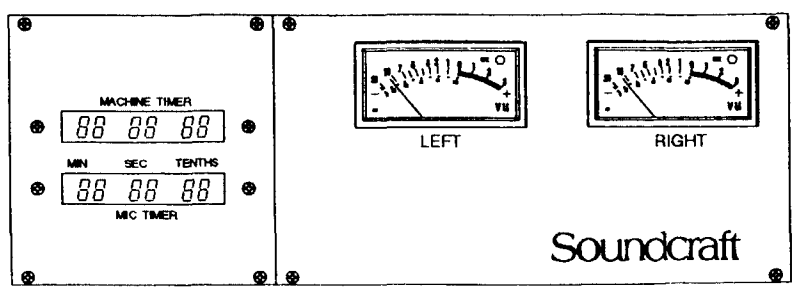
The nominal operating level of +4dBu may be changed to 0dBu or +6dBu at the Desk L/R outputs. For 0dBu nominal output remove jumpers from LK2, LK5 and fit them to LK3, LK6. For +6dB nominal output fit the j umpers to LK1, LK4.

Overbridge Options

The SAC 100 Overbridge is fitted with Left and Right LED Meters as standard, and these follow the C/Room Monitor Source. Options available are VU Meters, instead of the LED Meters, and a Timer module. Whether the Overbridge is fitted with LED or VU Meters a Timer module may be fitted into existing wiring looms.

The Timer module is comprised of a Machine Timer and a Microphone Timer. The Machine Timer runs continuously and is reset when it is enabled. The Microphone Timer runs only when it is enabled.

The Mono and Stereo modules may be programmed to operate either Machine or Microphone Timers. Fitting link J10 will enable the Microphone Timer, fitting link J11 will enable the Machine Timer. The standard console is pre-programmed so that all stereo modules will activate the Machine Timer and all Mono modules will activate the Microphone Timer. The Timers are enabled when the appropriate module is turned ON.



Desk L & R Outputs

Electronically balanced	
Norminal output level	0dBu, +4dBu, +6dBu
Output Impedance	<75Ω
Max O/P	+26dBu into 600Ω
THD	<0.005% @ 1kHz
	<0.01% @ 10kHz

Aux Output

Electronically balanced	
Norminal output level	+4dBu
Output Impedance	<75Ω
Maximum O/P	+26dBu into 600Ω
Master Gain Control	+7dB ..... -80dB
THD	<0.005% @ 1kHz
	<0.02% @ 10kHz

Monitor Outputs

CUE, C/RM & STU SPKRS	Norm level	+4dBu
	Max level	+21dBu into 5kΩ
STU/GUEST PHNS	Norm level	+4dBu
	Max level	+18dBu into 600Ω
C/RM PHNS	Norm level	+4dBu
	Max level	+21dBu into 600Ω
		40mW into 8Ω
RECORD	Norm level	-2dBu
	Max level	+21dBu into 5kΩ

Talkback Microphone

Electronically balanced	
Input impedance	>2kΩ
Sensitivity	-32dBu to -59dBu
Maximum I/P level	-15dBu
EIN : 150R source	-127.5dBu
CMRR	>75dB @ 1kHz, Max Gain

General

CUE off Ratio	>85dB @ 1kHz, 10kHz
via logic	>95dB @ 1kHz, 80dB @ 10kHz
AUX send off ratio	>75dB @ 1kHz, 70dB @ 10kHz
AUX master off ratio	>80dB @ 1kHz, 10kHz
	re +20dBu, unity gain

STUDIO SPKRS/PHNS DIM RATIO		18dB
LIMITER	Minimum threshold	+2dBu
	Attack time	200μ SEC
	Release time	200m SEC

Typical Performance Figures

Total Harmonic Distortion

Measured at +20dBu, 30kHz Bandwidth

	1kHz	10kHz
DESK Output	<0.005%	<0.01%
AUX Output	<0.005%	<0.02%
LINE I/P to any output	<0.025%	<0.025%

Crosstalk

External I/Ps to PGM/AUX	>100dB measured @ 1kHz
CUE to PGM/AUX	>90dB measured @ 1kHz
Stereo L/R	>75dB measured @ 1kHz

Noise

Mic Input EIN : 150R	-127.5dBu
DESK O/P Noise (1 channel routed)	-82dBu
(All channels routed)	-73dBu

Frequency Response

MIC or line input to any output 20Hz to 20kHz +/-0.5dB

Maximum Output Levels

Unbalanced outputs	+21dBu into 5kΩ
Balanced outputs	+26dBu into 600Ω

Input And Output Impedances

MIC Input	>2kΩ
Line level inputs	>10kΩ
Any output	<75Ω

Metering

20 Segment LED Bargraph	
Selectable, Peak or Average reading	
Calibration range	'0'dB = -2dBu to +20dBu
Accuracy relative to '0'dB	+1/-1dB

Appendices

Specification Notes

Dimensions

Configurations

Warranty

Glossary

Specification Notes

Measurements methods and conditions

A The figures displayed in the Specification tables are for a standard console.

B The console has a nominal output level of +4dBu: all input sensitivities are relative to this: i.e. with line input gain set to '0', an input of 0dBu, will give an output of +4dBu at any group or mix output and, a sensitivity of + 4dBu gives unity gain from input to output.

C Noise measurements are taken with 22Hz-22kHz bandwidth, average reading response.

D Distortion measurements are made with an input of +20dBu (line input at +4dBu sensitivity) giving an output of +20dBu. The analyser reads THD+N with an average response, over a 30kHz bandwidth.

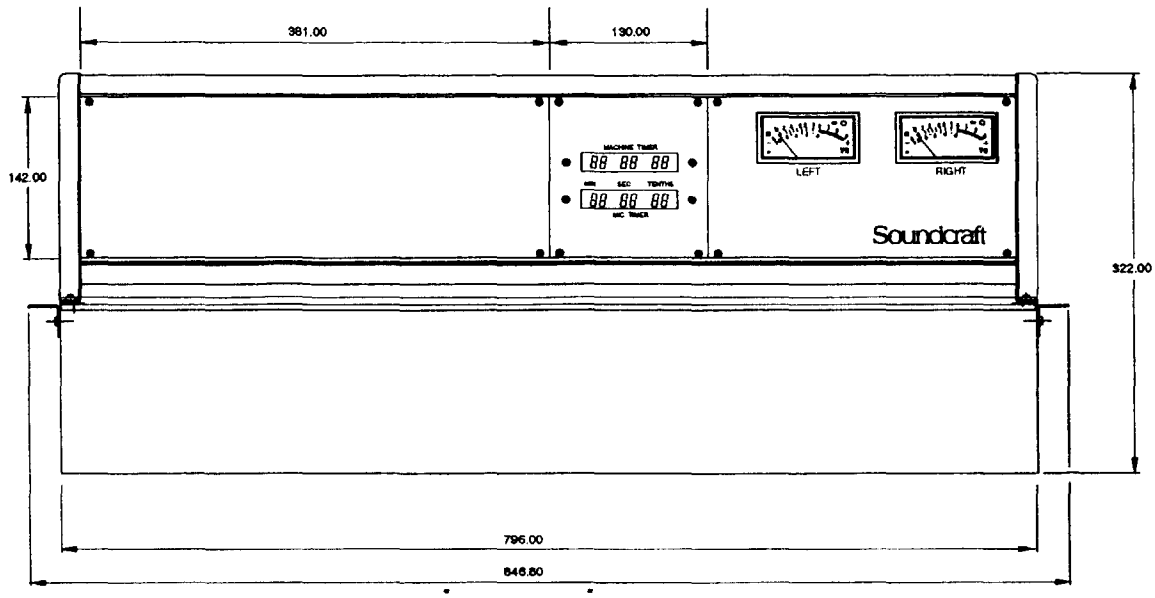
E Frequency response and E.Q. measurements are made with an input level of 0dBu to line inputs at unity gain, outputs are quoted relative to 0dBu.

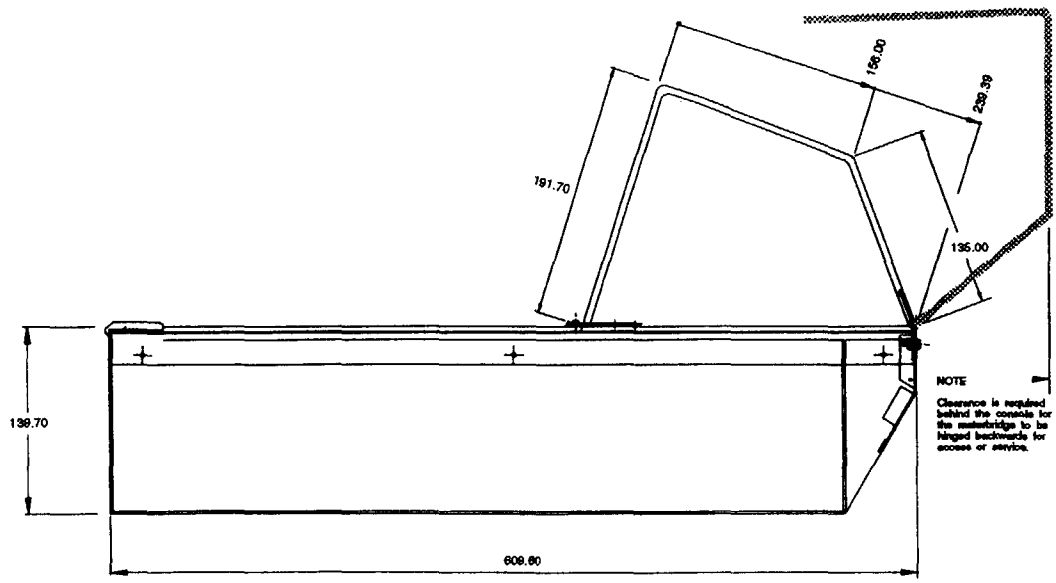
F Crosstalk and rejection measurements are made with an input level of +20dBu (line inputs at +4dBu sensitivity) giving an output of +20dBu on the active signal path. The ratio quoted is relative to +20dBu output.

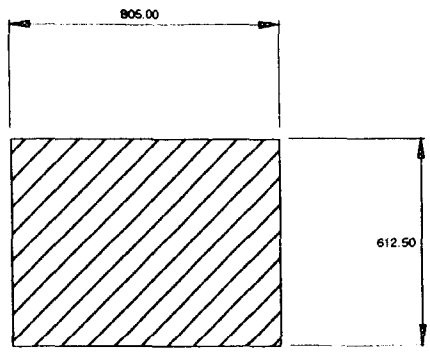
G Gain tolerance +/-1.5dB or 10% of indicated value, which ever is greater.

Dimensions

SAC100 Outline Dimensions - shown with options fitted to the overbridge



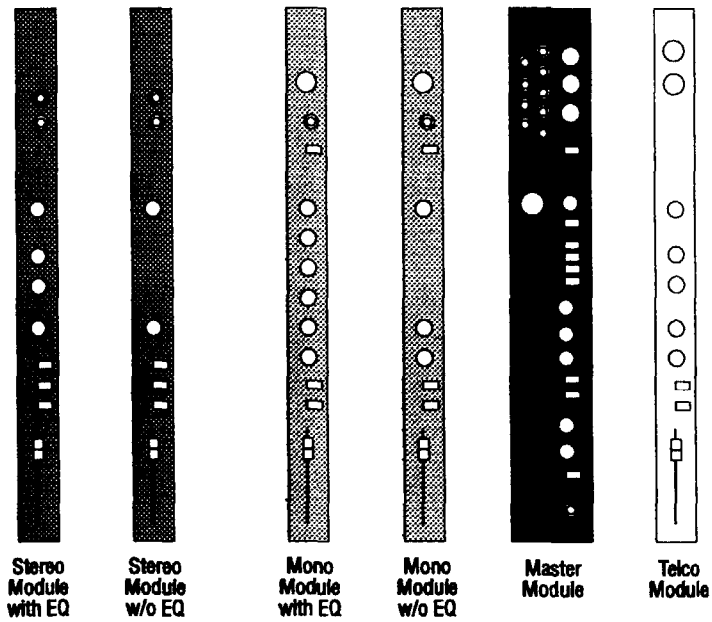


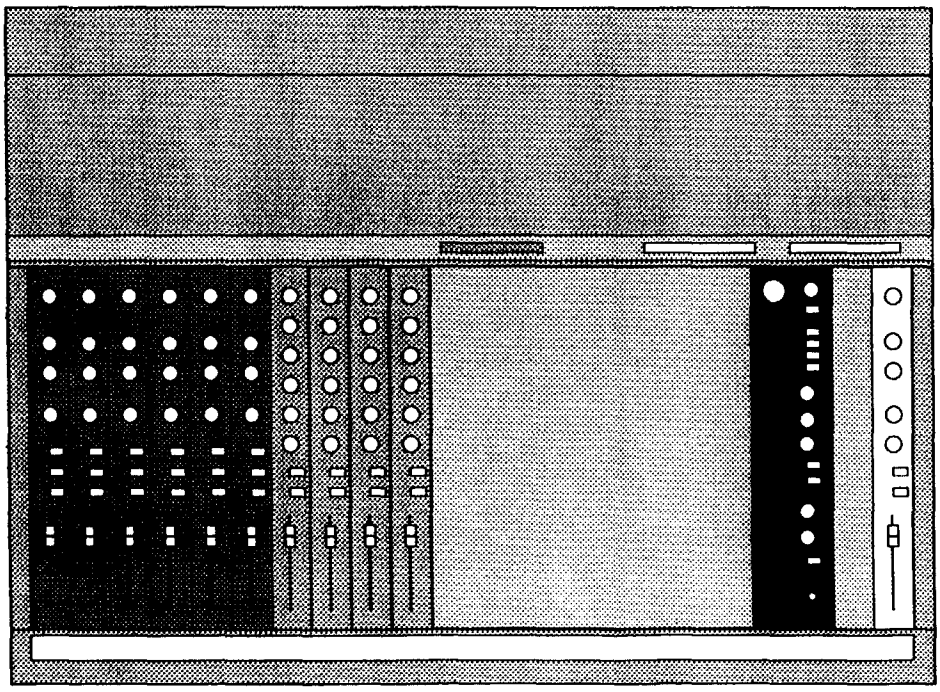


Dimensions for cutout required if console is to be furniture mounted.

Configurations

Module Options





SAC100 Standard Frame, fitted with 6 Stereo input, 4 Mono inputs, Script Tray, Master module and Telco input.

Meter bridge may be fitted with LED meters (standard), or with optional VU meters and Timers.

Warranty

1 **Soundcraft** means Soundcraft Electronics Ltd.

End User means the person who first puts the equipment into regular operation.

Dealer means the person other than Soundcraft (if any) from whom the End User purchased the Equipment, provided such a person is authorised for this purpose by Soundcraft or its accredited Distrubutor.

Equipment means the equipment supplied with this manual.

2 If within the period of twelve months from the date of delivery of the Equipment to the End User it shall prove defective by reason only of faulty materials and/or workmanship to such an extent that the effectiveness and/or usability thereof is materially affected the Equipment or the defective component should be returned to the Dealer or to Soundcraft and subject to the following conditions the Dealer or Soundcraft will repair or replace the defective components. Any components replaced will become the property of Soundcraft.

3 Any Equipment or component returned will be at the risk of the End User whilst in transit (both to and from the Dealer or Soundcraft) and postage must be prepaid.

4 This warranty shall only be available if:

a) the Equipment has been properly installed in accordance with instructions contained in Soundcraft's manual; and

b) the End User has notified Soundcraft or the Dealer within 14 days of the defect appearing; and

c) no persons other than authorised representatives of Soundcraft or the Dealer have effected any replacement of parts maintenance adjustments or repairs to the Equipment; and

d) the End User has used the Equipment only for such purposes as Soundcraft recommends, with only such operating supplies as meet Soundcraft's specifications and otherwise in all respects in accordance Soundcraft's recommendations.

5 Defects arising as a result of the following are not covered by this Warranty: faulty or negligent handling, chemical or electro-chemical or electrical influences, accidental damage, Acts of God, neglect, deficiency in electrical power, air-conditioning or humidity control.

6. The benefit of this Warranty may not be assigned by the End User.

7. End Users who are consumers should note their rights under this Warranty are in addition to and do not affect any other rights to which they may be entitled against the seller of the Equipment.

Glossary

auxiliary send — an output from the console comprising a mix of signals from channels and groups derived independently of the main stereo group mixes. Typically the feeds to the mix are implemented on rotary level controls.

clipping — the onset of severe distortion in the signal path, usually caused by the peak signal voltage being limited by the circuit's power supply voltage.

CR (control room) monitors — loudspeakers used by the operator (engineer) in the control room to listen to the mix.

cue mode — a mode in which the operator is able to preview the signal from an input or number of inputs before going on-air.

dB (decibel) — a ratio of two voltages or signal levels, expressed by the equation $dB=20Log_{10}(V1/V2)$.
Adding the suffix 'u' denotes the ratio is relative to 0.775V RMS.

equaliser — a device that allows the boosting or cutting of selected bands of frequencies in the signal path.

frequency response — the variation in gain of a device with frequency.

headroom — the available signal range above the nominal level before clipping occurs.

highpass filter — a filter that rejects low frequencies.

line level signals signals — at a nominal level of -10 to +6dBu, coming from a low impedance source.

mix minus signal — the sum of selected signals from the console *minus* the contribution from a particular input, automatically produced by the Telco module to elimate feedback on external telephone lines.

pan (pot) — abbreviation of 'panorama': controls levels sent to left and right outputs.

peaking — an equaliser response curve affecting only a band of frequencies i.e. based on a bandpass response.

rolloff — a fall in gain at the extremes of the frequency response.

shelving — an equaliser response affecting all frequencies above or below the break frequency i.e. a highpass or lowpass derived response.

spill — acoustic interference from other sources.

talkback — the operator speaking to the artistes or to tape via the auxiliary or group outputs.

telephone hybrid — an external device used to interface the public telephone network to the audio inputs and outputs of the console.