

Q II - Monitor

Operators Manual

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Q II - Operators Manual
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In line with the company's policy of continual improvement, specifications and function maybe subject to change without notice. This Operator Manual was correct at the time of writing. E&OE.

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Declaration of Conformity

The Manufacturer of the Products covered by this Declaration is

Klark Teknik Building, Walter Nash Road, Kidderminster, Worcestershire, DY11 7HJ.

The Directives Covered by this Declaration.

89/336/EEC Electromagnetic Compatibility Directive, amended by 92/31/EEC & 93/68/EEC

73/23/EEC Low Voltage Equipment Directive, amended by 93/68/EEC.

The Products Covered by this Declaration.

Equipment type	Product Name	Variants
Audio Mixing Console	Q2	Q2 VCA
Audio Mixing Console	Q2 Monitor	Meterbridge
Audio Mixing Console	QMR	Meterbridge
Audio Mixing Console	FMR	
Audio Mixing Console	Forum	PA,Matrix,Mute
Audio Mixing Console	Forum Monitor	Meterbridge
Audio Mixing Console	XL200	
Audio Mixing Console	XL250	

The Basis on which Conformity is being Declared

The products identified above comply with the protection requirements of the EMC Directive and with the principal elements of the safety objectives of the Low Voltage Directive, and the manufacturer has applied the following standards:

EN 55013 : 1990

Limits and methods of measurement of radio disturbance characteristics of Broadcast Receivers and Associated Equipment.

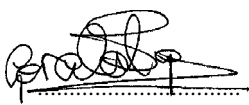
EN 50082-1 : 1992

Electromagnetic Compatibility - Generic Immunity Standard Part 1. Residential, commercial and light industry.

EN 60065 : 1994

Safety requirements for mains operated electronic related apparatus for household and similar general use.

The technical documentation required to demonstrate that the products meet the requirements of the Low Voltage Directive has been compiled by the signatory below and is available for inspection by the relevant enforcement authorities. The CE mark was first applied in 1996.

Signed: 
Authority: Product Support Manager.
Date: 1st, January 1997.

G.M.Squires

Attention

The attention of the specifier, purchaser, installer, or user is drawn to special measures and limitations to use which must be observed when these products are taken into service to maintain compliance with the above directive. Details of these special measures and limitations to use are available on request, and are also contained in product manuals.

GENERAL INFORMATION

The Q2 Monitor Console is designed to complement the Q2 Front of House Console and is specifically engineered to be a monitor console. Two versions of the console are available, mono and stereo. For the stereo console there are six stereo sends and eight mono sends available from each input module while the mono input module has 20 mono sends. Four different output modules are used giving a reassign facility for the mono groups. The stereo console uses six stereo output modules which also carry a mono output in addition to 2 stereo reassign output modules. The mono console uses 8 dual mono output modules with 4 mono reassign modules to give the required number of outputs. This reassign facility proved to be an extremely popular feature in the FORUM Monitor Console and gives a very fast method of generating monitor mixes.

Many external inputs are available and with the advent of "in ear" monitoring systems these can be used to return the wireless receiver outputs into the console in order to check the monitor send exactly as it would be received by a performer.

The CUE system is comprehensive with similar features to those of the Q2 FOH console. Pressing a SOLO fleetingly will latch the solo until the button is pressed a second time, or until the master CLEAR button is pressed. If, however, the button is held down for longer than a second the solo will cancel with the release of the button. Input solos take priority over output solos and an interlock mode can be selected where any new solo will cancel an existing solo.

WARRANTY

If within a 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 (but not faulty design) to such an extent that the effectiveness and/or the usability thereof is materially affected, the Equipment or the faulty component shall be returned to the Distributor or DDA and subject to the following conditions the Distributor or DDA will repair or at its option replace the defective components. Any components replaced will become the property of DDA.

Any Equipment or component returned will be at the risk of the End User whilst in transit (both to and from the Distributor or DDA) and postage and/or freight charges must be prepaid.

This Warranty shall only be available if:-

- i) The Equipment has been properly installed in accordance with the instructions contained in this manual.
- ii) The End User has notified the Distributor or DDA in writing within 14 days of the defect appearing.
- iii) No persons other than authorised representatives of DDA or the Distributor have effected any replacement of parts, maintenance adjustments or repairs to the Equipment.
- iv) The End User has used the Equipment for such purposes as DDA recommends with only such operating supplies as meet DDA's specifications or approval and otherwise in all respects in accordance with DDA's recommendations.

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.

Benefit of this Warranty may not be assigned by the End User.

End Users who are consumers should note that 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.

DDA shall not be liable for any damage caused to persons or property due to :-

- i) Incorrect usage of the Equipment.
- ii) Other equipment attached to the Equipment, which is not approved by DDA.
- iii) Modifications made by non-authorized persons, or by using non-recommended parts, or incorrectly made.

In no circumstances shall DDA be liable for any indirect or consequential costs, damages or losses (including loss of business profits, operating time or otherwise) arising out of the use or inability to use the product, whether or not the likelihood of damage was advised to DDA or its distributor.

Consumables such as fuses and lamps are specifically excluded from the warranty.

This notice does not affect your statutory rights.

SPECIFICATIONS

DDA reserves the right to alter the design of the unit or change the specification without notice in the interest of product development.
N.B. 0dBu = 0.775 Volt

Input Impedance:

Microphone	>2kOhm
Line	>10kOhm

Output Impedance

All outputs electronically balanced <75 Ohms

Maximum Gain:

Microphone (Channel Input to Mix Output)	60dB
Line (Channel Input to Mix Output)	25dB

Frequency Response

Mic to Mix (Gain 20dB)	20Hz -1dB	20kHz -0.25dB
Line to Mix (Gain 0dB)	20Hz -1dB	20kHz -0.25dB
Line to Group (Gain 0dB)	20Hz -1dB	20kHz -0.25dB

Noise (DIN Audio)

Microphone (Gain 55dB, EIN Ref 200 Ohm)	<-127dBu
Mix Output (Gain 0dB, 32 Channels Routed, all faders down)	<-79dBu
Single Line Input (to mix output, EQ out, channel fader at 0dB)	<-87dBu
EQ in	<84dBu

Distortion

Mic to Mix, Gain 20dB, +20dBv output	<0.05%
Gain 55dB, +20dBv output	<0.05%
Line to Mix, Gain 20dB, all routed, +20dBu output	<0.007%
Line to Group, Gain 20dB, all routed, +20dBu output	<0.007%

Output Capability

All Outputs (to balanced input)	+26dBu
Insert Sends	+26dBu

Power requirements

100V, 110V, 220V, 240V Selectable on the rear panel at 50 - 60 Hz

INSTALLATION

The Q2 Monitor console is designed to be used in fixed and mobile situations. The frame is very rigid allowing the use of motherboards to make the interconnections between the modules.

In standard form there are no multipole connectors and connections are made to each module according to the information supplied in this manual. Note that when the line input has nothing plugged in to it the microphone XLR is normalled through thus enabling the line input to be made on an XLR connector. If a jack is inserted into the line input the normalled connection is lost and the XLR will then only feed the microphone input.

A parallel feed of the XLR input is available on a connector on each module and this could be wired to a multipole connector for connection to another console.

All inputs and outputs are fully balanced.

WIRING CONSIDERATIONS

To take full advantage of the excellent audio performance of DDA mixing consoles, it is essential that the installation is carried out with care and attention. All audio signals are referenced to the system earth, which must be clean and noise-free, and essentially equipotential. In addition, the earth system integrity is absolutely necessary for safety.

Do not disconnect the mains earth wire from each piece of equipment as this could create a hazardous situation.

If in doubt consult a competent engineer and your local electricity supply company to ensure that safety regulations are not infringed or negated.

GROUNDING

The console metalwork **MUST ALWAYS** be connected to the Mains earth via the PSU lead.

Decide on a central point for the main earth system and starfeed to all mains outlets and equipment racks from this point. Common electrical wiring practice is to daisy-chain earth wires from outlet to outlet, but this is not recommended for audio installations. The location of the earth system star point should be in a convenient, easily accessible position, such as the main equipment rack. The star point must then be connected to the incoming mains earth but preferably should be connected to a totally separate technical earth (if local electrical regulations permit).

This should take the form of a large copper plate or stake buried as deeply as practical into the ground (a 1 metre [39"] copper stake hammered fully into the ground would be suitable). This should then be fed to the studio star system via heavy gauge, low impedance cable, with adequate precautions being taken to prevent excessive corrosion of the cable/earth stake.

Do not install other equipment (lighting, vending machines etc) to the technical earth - only use it for Audio Equipment.

If the star point is derived from mains earth, however, and not from a ground stake/plate, install separate clean and dirty mains outlets, wired individually to the mains distribution box. Use the clean supply for all audio equipment, and the dirty supply for all lighting, vending machines etc. Do not mix the two systems. It may be necessary to install an isolating transformer for the clean supply to ensure adequate isolation from mains-borne interference. The isolating transformer must be of adequate current capability and should incorporate a Faraday Shield, connected to the incoming mains earth.

All audio connecting cables should be good quality twin screened cable. Do not use single screened cable.

It is very important that the screen is not used as the signal return. Therefore connect the screen at one end only. Connecting the screen at both ends will cause an earth loop into which external hum fields will be induced.

In areas where high levels of radio frequency interference are present the open end of the screen can be connected to earth through a 0.01 microfarad capacitor. This will appear as a short circuit at high frequencies, and lower the effective shield impedance to earth. However at audio frequencies the reactance of the capacitor will be sufficiently high to not cause an earth loop.

In general, the screen should be connected at the signal source, and not at the signal destination. The exception to this rule of thumb is when connecting to an unbalanced input or to an electronically balanced input. In these cases the wires being screened are referenced to the destination earth.

Electronically balanced outputs which are to be operated in the unbalanced mode should be unbalanced at the output connector, not at the signal destination so that the signal current returns to earth via the shortest, least reactive route.

Rack mounted equipment which has unbalanced inputs and outputs may need to be electrically isolated from the equipment rack and/or other equipment to avoid earth loops.

DO NOT DISCONNECT THE MAINS EARTH.

Connect all equipment in a logical sequence, starting with the monitor systems, followed by the multitrack and then the stereo machines and the peripheral devices and isolate any earth loop problems as they occur. It is very difficult to rectify a problematical installation after everything has been connected due to interaction between the various earth loops.

The Console is supplied with 1 power supply unit 3U high (5.25"), 19" rack mounting. The PSU supplies the console with +18V, -18V, +48V phantom and Audio Ground (0V). Connection between supplies and console is a cable, terminated at both ends by polarised Harting multiway connectors. At the console the connector is located on the rear panel of the console.

The normal length of the PSU-Console cables is 25 feet (8 metres).

The power supply requires the following Mains supplies :-

220-240 Volts AC, 6.3 A (Maximum current ratings)
100-120 Volts AC, 10 A (Maximum current ratings)

and is connected to the AC Mains via standard IEC 3 pin lead.

The PSU has an integral low-noise cooling fan and should be provided with at least 1U (1.75") of rack space above and below it.

WARNING - ENSURE THAT THE CORRECT VOLTAGE HAS BEEN SELECTED ON THE PSU BEFORE SWITCHING ON THE UNIT.

The selection of the mains input voltage is made by removing the fuse holder from the rear panel of the PSU, and replacing it in the correct orientation for the local voltage supply. Ensure that the correct value fuse is fitted to correspond to the supply.

All Mic input connections are made by standard XLR type 3 pin connectors, wired to the convention of pin 2 hot, ie.

Pin 1 - Ground
Pin 2 - Signal +ve (hot)
Pin 3 - Signal -ve (cold)

All inputs and outputs are electronically balanced. To unbalance an input or output, connect pin 3 to ground (or pin 2 if the device to be connected is wired to the other pin 3 hot convention).

Line inputs, insert sends and returns and direct outputs are accessed by 1/4 inch A Gauge TRS jacks wired as follows.

TIP	:	Signal +ve (Hot)
RING	:	Signal -ve (Cold)
SLEEVE	:	Ground

Further details regarding the connections to each module can be found in the following pages of this manual.

ATTENTION

CABLES

This product should only be used with high quality, screened twisted pair audio cables, terminated with metal bodied 3-pin XLR connectors. The cable shield should be connected to Pin 1. Any other cable type or configuration for the audio signals may result in degraded performance due to electromagnetic interference.

ELECTRIC FIELDS

Should this product be used in an electromagnetic field that is amplitude modulated by an audio frequency signal (20Hz - 20Khz), the signal to noise ratio may be degraded. Degradation of up to 60dB at a frequency corresponding to the modulation signal may be experienced under extreme conditions (3V/m, 90% modulation).

No permanent damage or degradation of performance will be caused by these conditions.

THE Q2 MONITOR MODULES

The following pages give descriptions of the various modules used in the QII Monitor console. As previously mentioned there are two versions of the console, a mono and a stereo with different modules being required in each case.

ALM INPUT

This is the ALL MONO INPUT used on the mono console and has 20 mono monitor sends.

STM INPUT

This is the STEREO MONO INPUT used on the stereo version of the console and has 6 stereo sends and 8 mono sends.

ALM OUTPUT

This is one of the output modules used in the mono console and has two group output stages along with two external bus inputs.

ALM REASSIGN

This is the second type of output module used on the mono console. It contains a group output stage and similar controls to those found on the ALM INPUT module for reassigning the group output to other buses.

STM OUTPUT

This is one of the output modules found on the stereo console and contains a stereo group output, a mono group output and a stereo external input.

STM REASSIGN

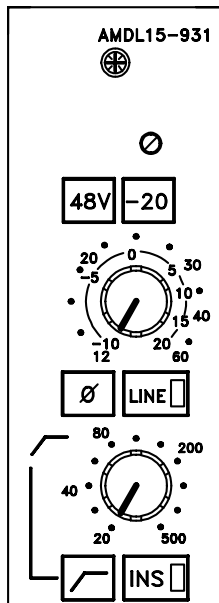
This is the second type of output module used on the stereo console. It contains a mono group output stage, a mono external input and similar controls to those used on the STM INPUT module for reassigning the group output.

MASTER AND COMMUNICATIONS MODULES

These modules are common to both the mono and stereo consoles. All the master and communication functions are located here.

THE STM /ALM INPUT MODULES

The STM input module is designed to send to 6 stereo and 8 mono monitor groups or in the case of the ALM module to 20 mono monitor groups. Microphone and line inputs are available along with an equaliser which can be internally switched either pre or post the insert point which is fully balanced on both send and return.



48V

When pressed this switches on the phantom voltage for the microphone input.

-20

This switches a 20dB attenuator into the microphone input. If the input is transformer coupled this pad can assist in preventing saturation on high level signals as it precedes the transformer.

PHASE 0

This reverses the phase of the selected input signal.

LINE

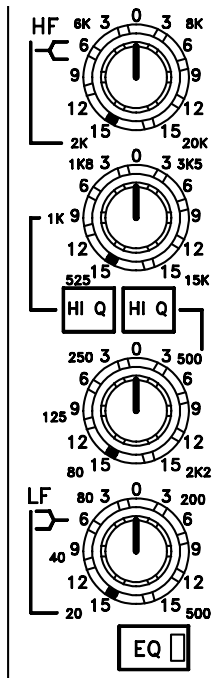
If pressed this selects the LINE INPUT otherwise the Mic input is active. The gain of both is controlled by a single rotary control.

HPF

Selects a HIGH PASS FILTER which can be swept from 20Hz to 500Hz.

INS

Selects the insert return. If the insert return is not selected then the insert send and return circuits are bypassed. If selected but no signal connection is made to the return jack then the insert send signal is normalled to this input. At all times signal is available from the insert send jack.



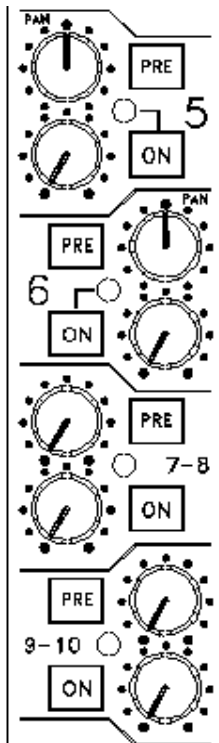
EQ

Selects the equaliser to be in circuit. When the equaliser is not switched in it is physically bypassed.

It is a 4 band equaliser with switchable Q on the mid frequency sections. Hi Q (1.8) is obtained with the buttons depressed. Low Q is 0.9.

The remaining controls are identical for each section consisting of a frequency control and a boost cut control. The mid sections have a peaking response while the HF and LF sections are shelving. Frequencies covered are as shown on the module illustration. The upper knob is the boost/cut knob while the lower knob determines the frequency of operation.

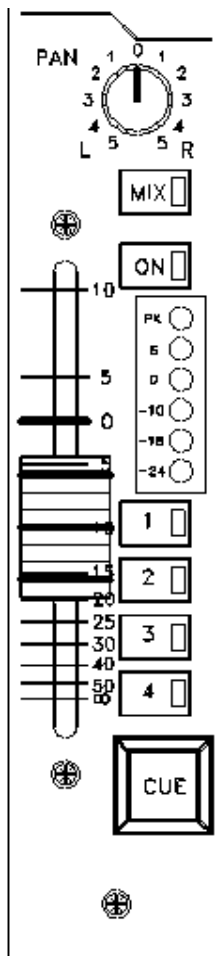
Note that the equaliser can be selected to be pre or post the insert point by means of an internal switch on the module.



The 6 stereo sends are identical and thus only two are illustrated. A stereo send consists of a rotary level and pan control, a PRE switch to select prefade operation and an ON button to make the send active. The prefade signal is selectable by links on the circuit board and can be pre or post the equaliser or post the channel ON switch so that it will be cut with the channel although the level will not depend upon the fader. Consoles will normally leave the factory with the PRE signal linked as POST-EQ.

The remaining 8 sends are mono and four of them are shown. Each mono send has a rotary level control while pairs of sends have a PRE and an ON switch operating in the same way as for the stereo sends.

For the mono version of the console a slightly different input module is used, known as the ALM module. The stereo sends are replaced with 12 mono sends which are identical to the mono sends described above.



PAN

This pans the post fade signal across the stereo mix bus when assigned to it.

MIX

This switch assigns signal to the L/R mix bus of the console. This signal is post fade post PAN.

ON

When pressed this enables the channel POST FADE and POST ON signals.

BARGRAPH

The 6 segment meter can be selected to display PRE/POST EQUALISER or POST FADER signal. As shipped it will show the PRE-EQ signal. The top LED is used to indicate that the signal is approaching clipping level and it is linked to all three points to show a peak occurring at any of them. The LED will illuminate if the signal is within 4dB of the maximum possible.

1, 2, 3, 4

Selects the MASTER MUTE GROUP assignment. Thus, for example, if switch 1 is pressed and the MASTER MUTE for Group 1 is operated the module will MUTE. The master switches are located on the master module and will be discussed in the relevant part of the manual.

FADER

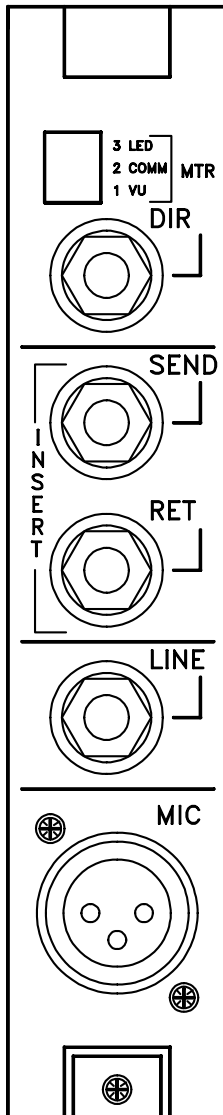
This controls the level of all post fade signals within the module. The DIRECT OUTPUT is also controlled by the fader.

CUE

This button places PRE and POST FADE signals onto the SOLO BUSES and signals the master solo logic that a solo is being requested. If pressed fleetingly the solo will latch and remain, however, if the button is held for a short period then the solo will release as the button is released. INTERLOCKING and INPUT PRIORITY MODES can be selected on the master module.

More details regarding the SOLO SYSTEM can be found in the master module section of the manual.

INPUT CONNECTOR PANEL



MIC INPUT

XLR type 3 pin connectors, Balanced

Nominal level : -56dBu to -8dBu

Pin 1 - Ground

Pin 2 - Signal +ve (hot)

Pin 3 - Signal -ve (cold)

Input impedance : >2k.

LINE INPUT

1/4" TRS Jack Socket, 'A' Gauge, Balanced

Nominal Input Level : +4dBu

TIP : Signal +ve (Hot)

RING : Signal -ve (Cold)

SLEEVE : Ground

Input Impedance : >10k

INSERT SEND

1/4" TRS Jack Socket, 'A' Gauge, Balanced

Nominal Output Level : +4dBu

TIP : Signal +ve (Hot)

RING : Signal -ve (Cold)

SLEEVE : Ground

Output Impedance : <75R

INSERT RETURN

1/4" TRS Jack Socket, 'A' Gauge, Balanced

Nominal Input Level : +4dBu

TIP : Signal +ve (Hot)

RING : Signal -ve (Cold)

SLEEVE : Ground

Input Impedance : >10k

DIRECT OUTPUT

1/4" TRS Jack Socket, 'A' Gauge, Balanced

Nominal Output Level : +4dBu

TIP : Signal +ve (Hot)

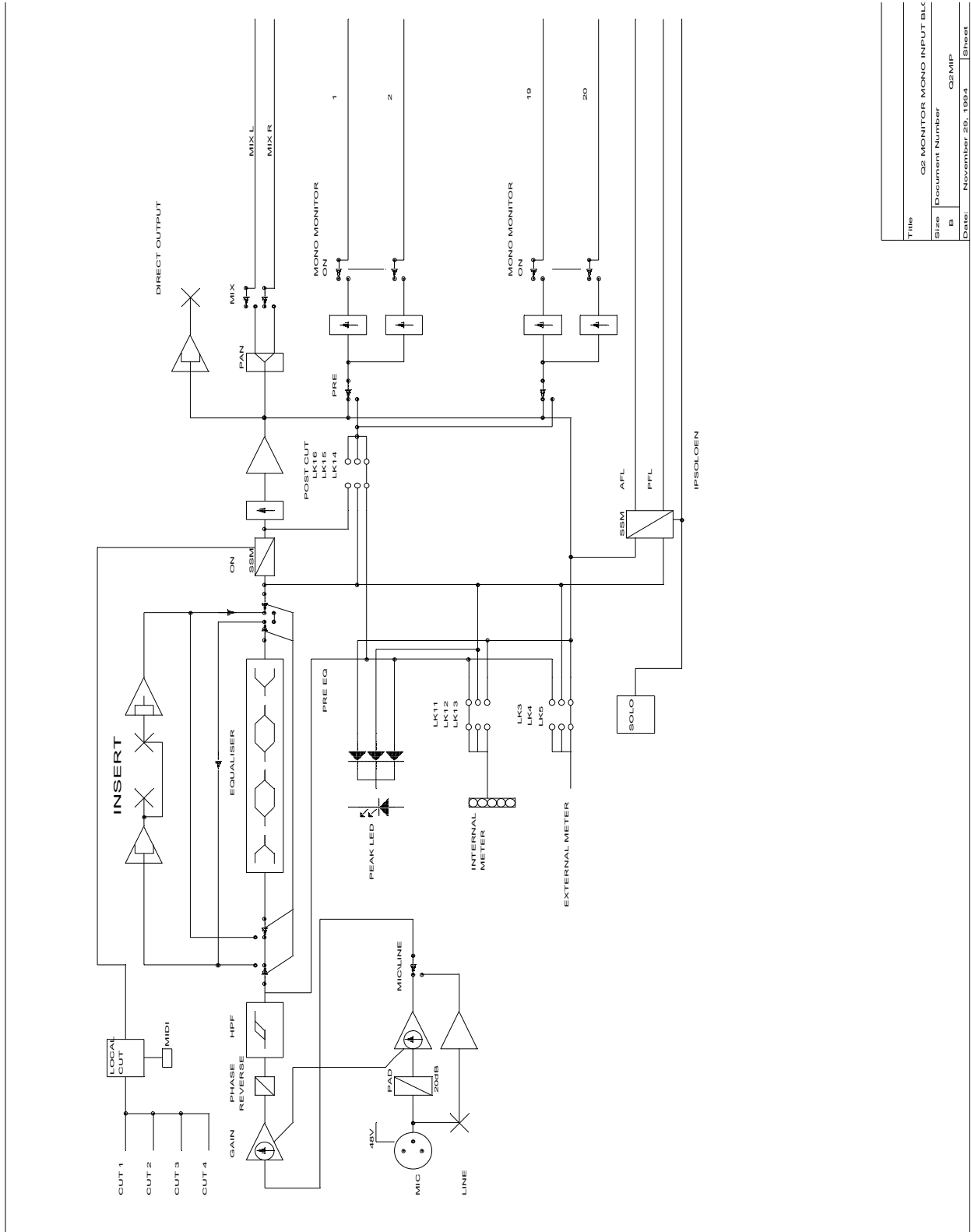
RING : Signal -ve (Cold)

SLEEVE : Ground

Output Impedance : <75R

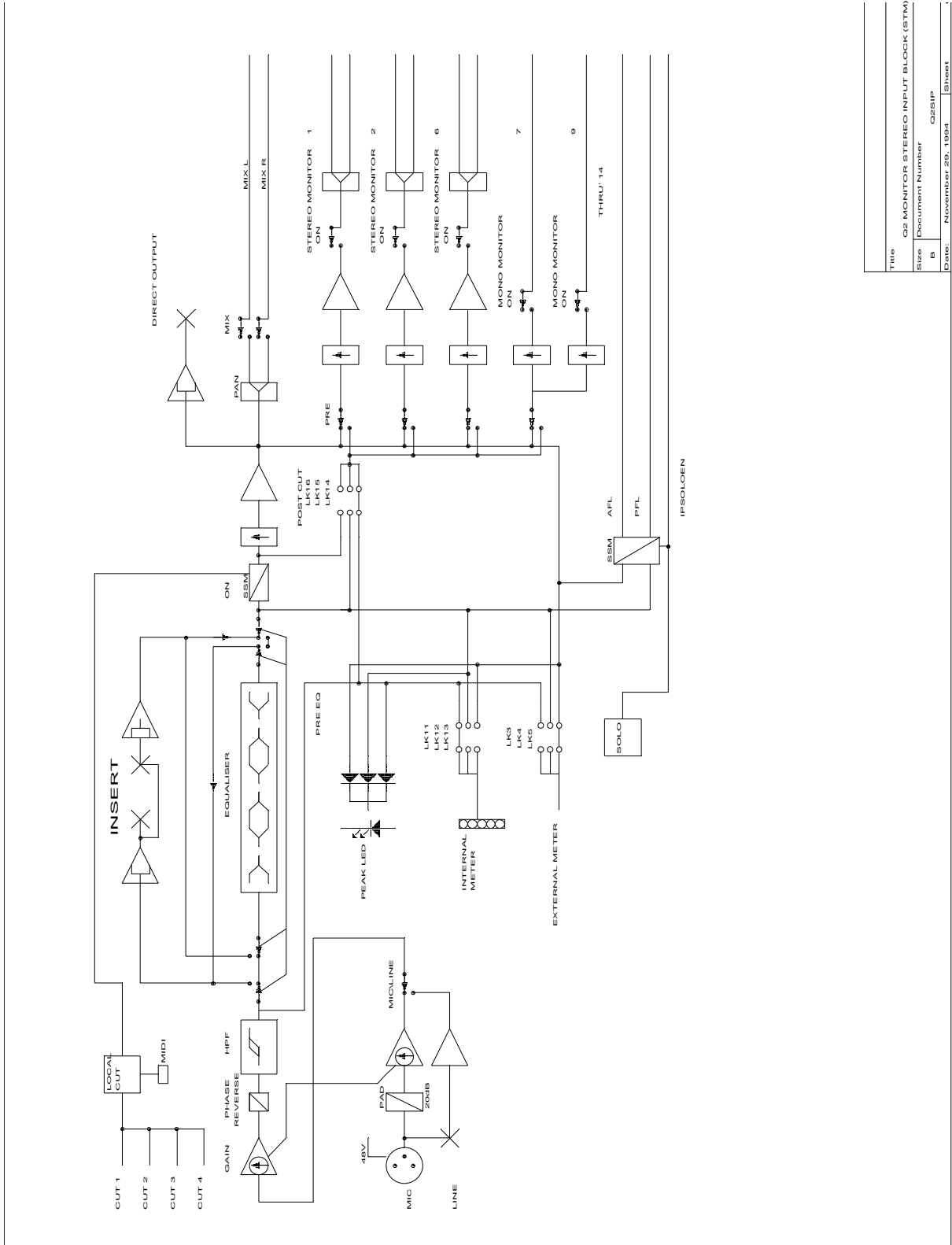
Note that the mic input can be used as the line input if no connector is inserted in the LINE INPUT jack.

ALM INPUT BLOCK DIAGRAM



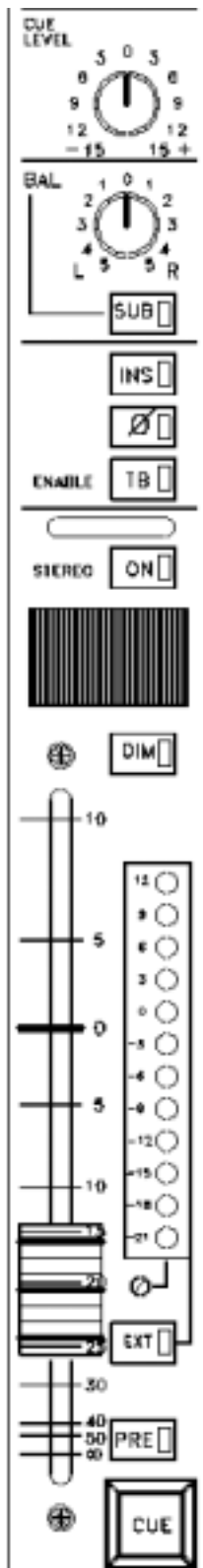
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	Sheet

STM INPUT BLOCK DIAGRAM



Title	Q2 MONITOR STEREO INPUT BLOCK (STM)
Size	Document Number Q2SIP
Date	November 26, 1994 Sheet 1

THE STM OUTPUT MODULE



The STM output module contains a stereo group output, a mono group output and a stereo external input. Normally six STM output modules are supplied in a stereo console.

THE STEREO OUTPUT SECTION

ON

This enables the stereo output.

INS

This enables the INSERT return. Note that the insert send is always active.

PHASE \emptyset

This reverses the phase of the group output and can be useful in instances where feedback is occurring.

TB

This enables talkback onto the group output. Note that the talkback is injected after the fader and the ON switch.

SUB

This enables the group to be used as a sub group by assigning it to the stereo bus.

BAL

This is a balance control which will affect the group output and consequently the SUB signal.

DIM

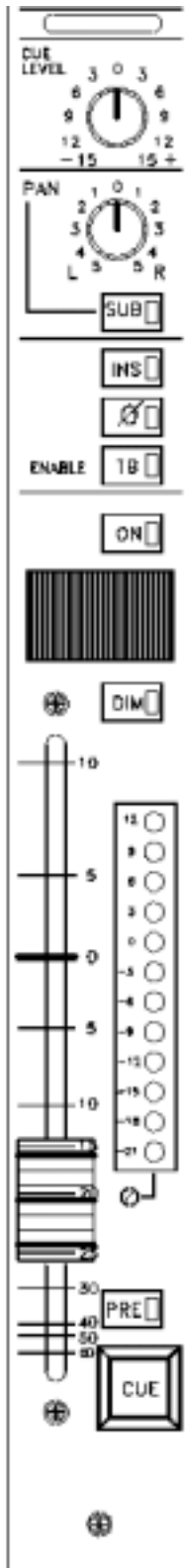
This reduces the level of the group output by 6dB and again can be useful if feedback is occurring.

METER

Normally the meter indicates the higher of the group left right levels but it can be switched to read the external input by pressing EXT.

CUE

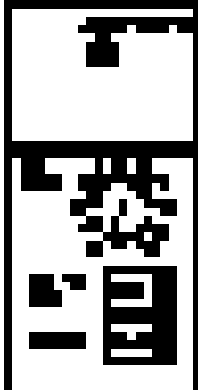
This selects the group to the SOLO system. Normally the signal is pre fade and post insert but it can be switched to read PRE INSERT. The CUE LEVEL can be adjusted by +/-15dB.



THE MONO OUTPUT SECTION

The mono output section illustrated on this page is almost identical to the stereo section described on the previous page. In place of the BALANCE control there is a PAN control which pans the signal to the L/R mix bus when the SUB switch is pressed. The meter is permanently assigned to the group output.

The CUE system is identical to that of the stereo input section with group solos being treated as output solos by the master solo logic.



THE EXTERNAL INPUT SECTION

This section allows the connection of a stereo input to the group module.

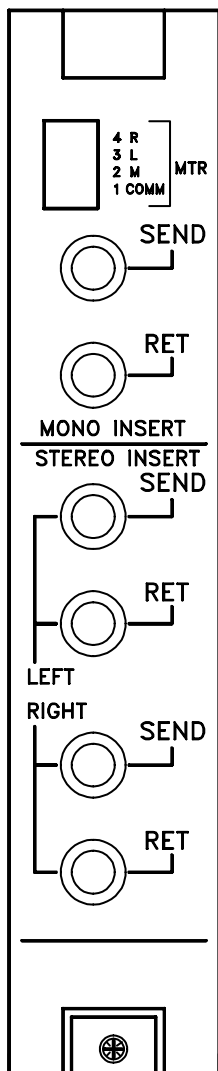
ON

This connects the external input to the stereo group bus therefore allowing it to be mixed with any other signals assigned to that group. The associated level control adjusts the external input signal level.

CUE

This enables the external input to be soloed. The external input is treated as an input solo by the master solo logic. A possible application for this would be to have the radio receiver from an in ear monitoring system connected to the external input thus enabling the monitor mix to be checked.

STM OUTPUT CONNECTOR PANEL



The connector panel contains the mono and stereo group insert jacks and the external meter connector.

INSERT SEND

1/4" TRS Jack Socket, 'A' Gauge, Balanced

Nominal Output Level : +4dBu

TIP : Signal +ve (Hot)

RING : Signal -ve (Cold)

SLEEVE : Ground

Output Impedance : <75R

INSERT RETURN

1/4" TRS Jack Socket, 'A' Gauge, Balanced

Nominal Input Level : +4dBu

TIP : Signal +ve (Hot)

RING : Signal -ve (Cold)

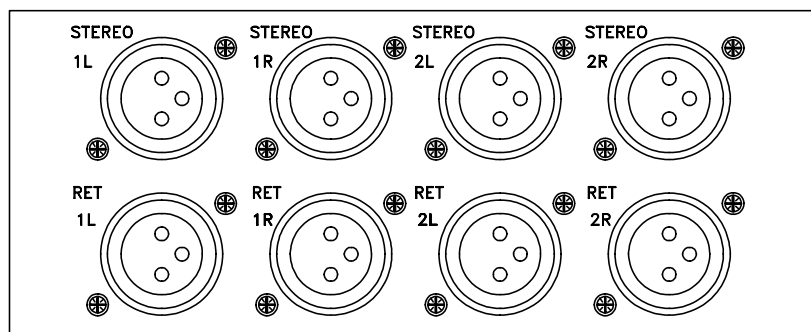
SLEEVE : Ground

Input Impedance : >10k

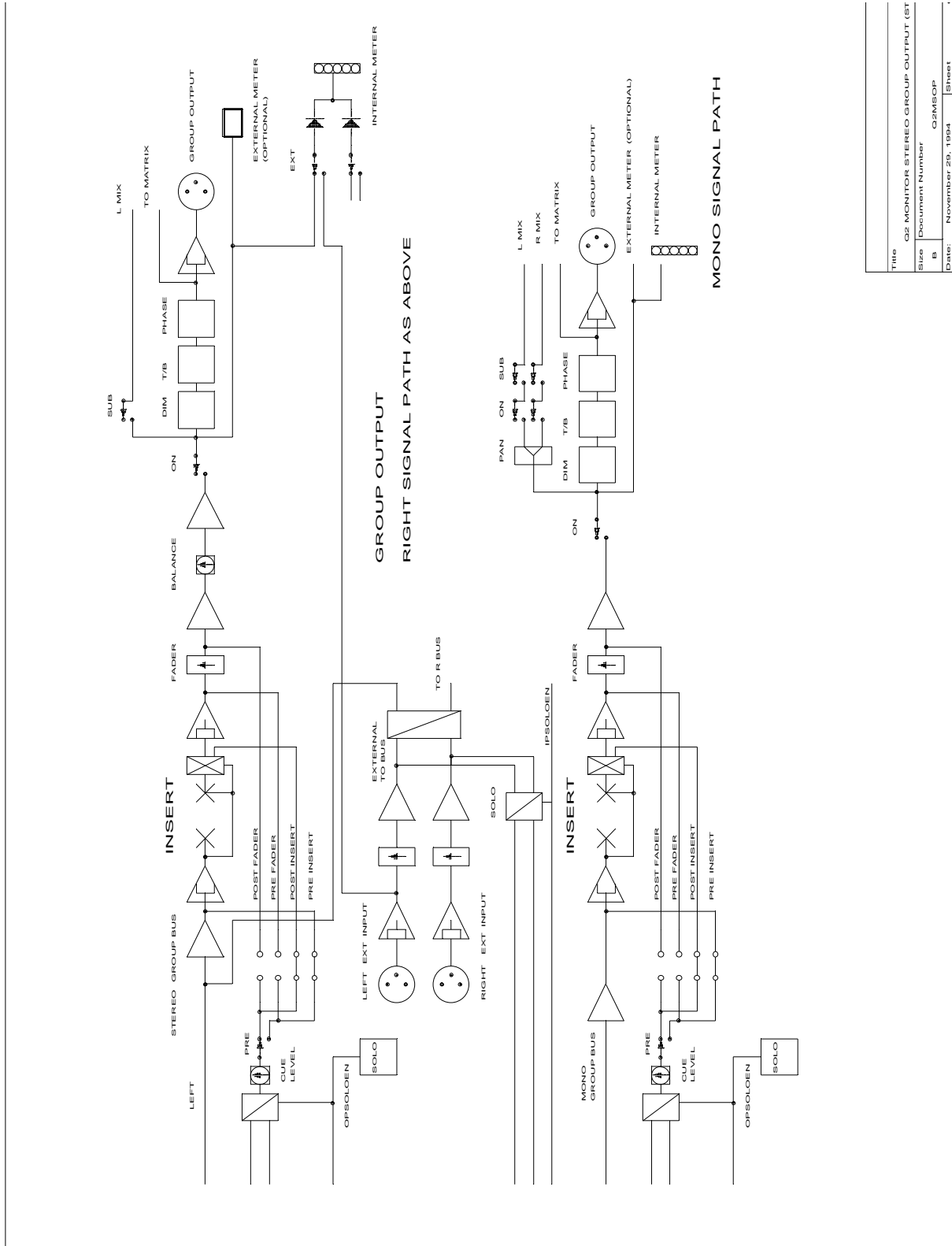
EXTERNAL METER

- 1 Common
- 2 Mono Group External Meter
- 3 Left Group External Meter
- 4 Right Group External Meter

The group outputs and external inputs are located on panels, such as that shown below, mounted below the modules on the rear of the frame

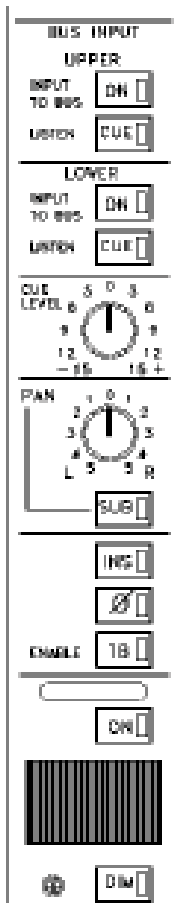


STM OUTPUT BLOCK DIAGRAM



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Date:	November 20, 1994
Sheet	Sheet

THE ALM OUTPUT MODULE



This module is only used on the mono version of the console and contains two identical mono outputs. In addition there are external inputs to the monitor buses.

BUS INPUT UPPER

This balanced mono input feeds the upper mix bus, that is, the bus that is assigned to the upper half of the module. It can be enabled by pressing the ON switch and soloed by using the CUE switch.

BUS INPUT LOWER

This balanced mono input feeds the lower mix bus, that is, the bus that is assigned to the lower half of the module. It can be enabled by pressing the ON switch and soloed by using the CUE switch.

CUE LEVEL

This determines the amount of signal going to the solo bus from the upper monitor section.

PAN

This pans the signal from the upper monitor group across the stereo mix bus of the console when the SUB switch is pressed.

INS

This enables the INSERT return. Note that the insert send is always active.

PHASE \emptyset

This reverses the phase of the group output and can be useful in instances where feedback is occurring.

TB

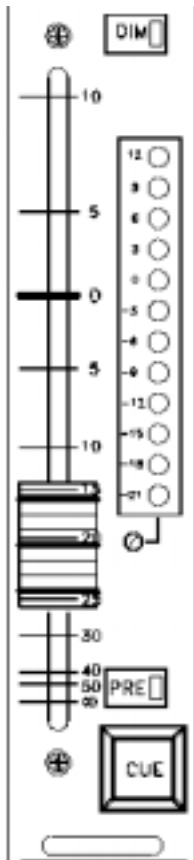
This enables talkback onto the group output. Note that the talkback is injected after the fader and the ON switch.

ON

This enables the monitor group.

DIM

This dims the group output by 6dB and could be useful in controlling feedback for example.



PRE-INSERT

This enables the group solo to be taken from before the insert point which can be very useful for troubleshooting in the event of a problem. Links 14/15 can be changed so that the solo signal is taken immediately before the fader.

CUE

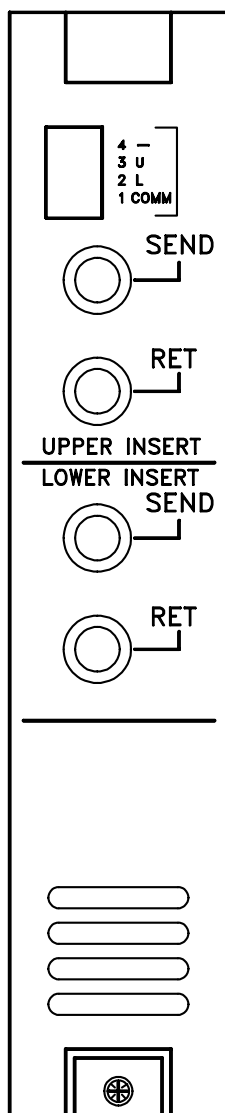
This solos the monitor group. Normally the solo will be post insert but by altering links 12/13 it can be made post fader.

FADER

A 60mm linear fader is used to control the group output level which is indicated on the 12 segment bargraph meter.

The above controls are duplicated for the lower monitor group which is identical with the exception of the links that require to be altered. A full list will be given later in this manual.

THE ALM CONNECTOR PANEL



The connector panel contains the group insert jacks and the external meter connector.

INSERT SEND

1/4" TRS Jack Socket, 'A' Gauge, Balanced

Nominal Output Level : +4dBu

TIP : Signal +ve (Hot)

RING : Signal -ve (Cold)

SLEEVE : Ground

Output Impedance : <75R

INSERT RETURN

1/4" TRS Jack Socket, 'A' Gauge, Balanced

Nominal Input Level : +4dBu

TIP : Signal +ve (Hot)

RING : Signal -ve (Cold)

SLEEVE : Ground

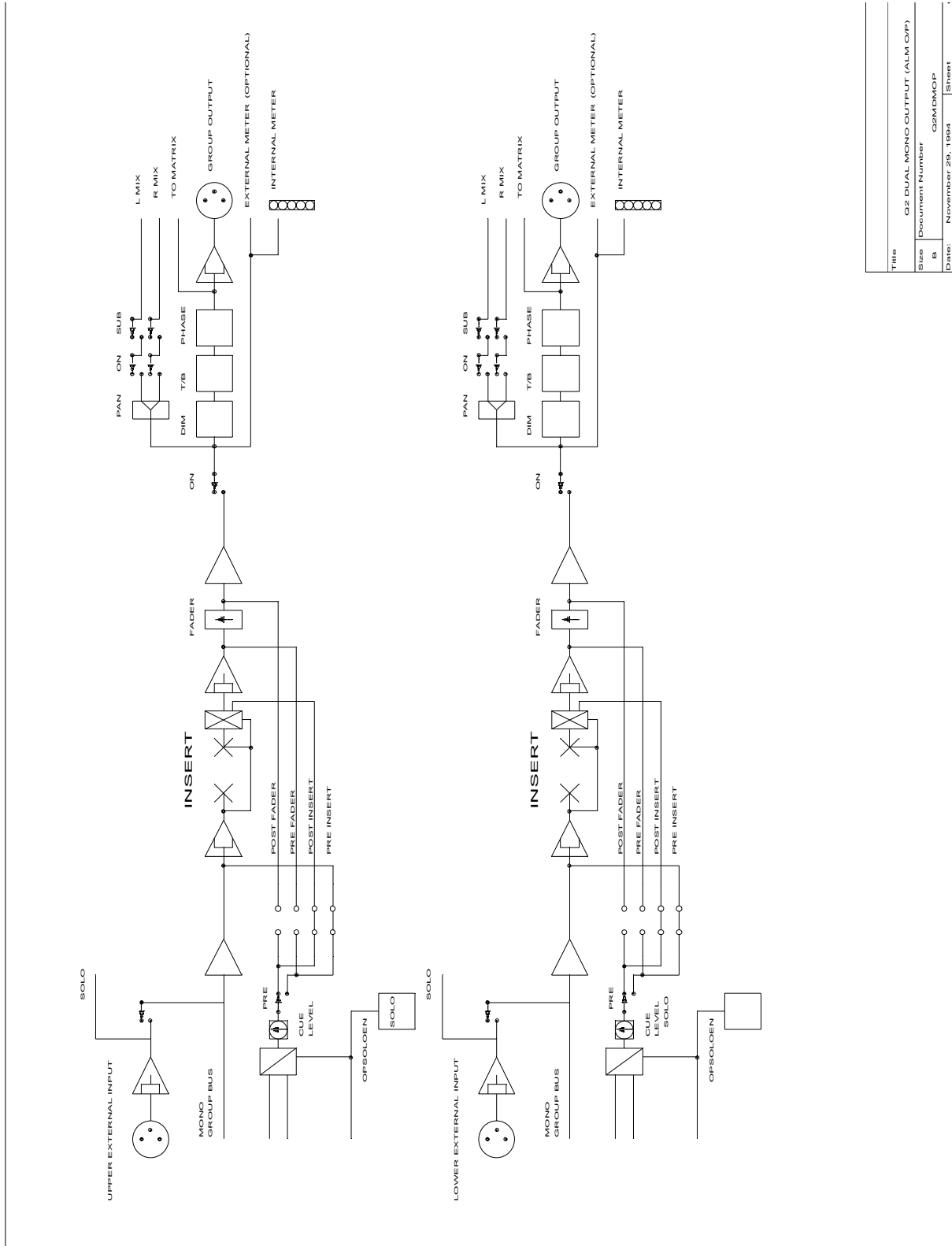
Input Impedance : >10k

EXTERNAL METER

- 1 Common
- 2 Lower Group External Meter
- 3 Upper Group External Meter
- 4 Not used

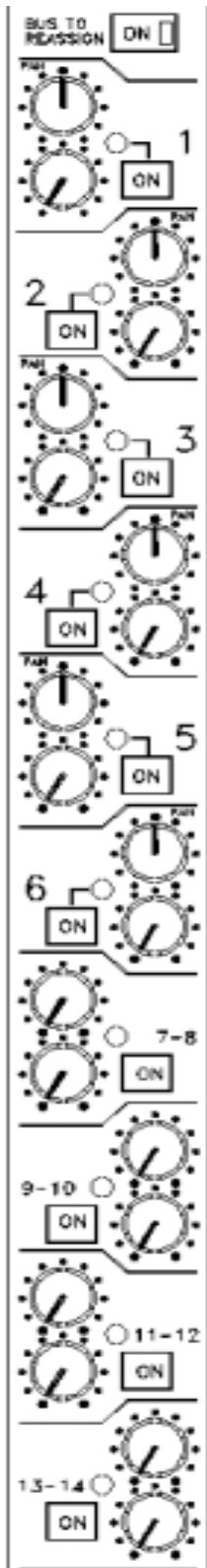
The group outputs and bus inputs are mounted on a panel below the modules on the rear of the frame.

ALM OUTPUT MODULE BLOCK DIAGRAM



Title	Q2 DUAL MONO OUTPUT (ALM O/P)
Size	Document Number
B	Q2MDMCP
Date:	November 20, 1994
	Sheet

THE STM/ALM REASSIGN OUTPUT MODULES



Normally two STM reassign modules are fitted to a stereo console and in conjunction with the six standard output modules this gives eight mono output groups. A mono console will have 4 ALM reassign modules fitted. This module differs from the stereo version in that it has 20 mono sends and no stereo sends. The mono output group on the reassign module is identical to those on the standard output modules.

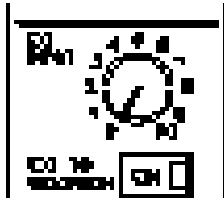
The group output is available in the normal way but by using the reassign controls the signal can also be fed to the mix buses of any output groups. Thus when a suitable mix is achieved on the mono group it can be reassigned to any other output where it can then be mixed with other signals already assigned to that output. This greatly speeds up the creation of monitor mixes.

If care is not taken with assignments it is possible to feed the signal back to its own bus thus creating feedback.

Before reassignment can take place the BUS TO REASSIGN switch must be active.

Reassignment to the stereo buses is made by LEVEL and PAN controls with each send having an ON switch. The mono reassigns are controlled by a LEVEL control with an ON switch operating across pairs of sends.

The power of the reassign facility can be realised by creating a monitor send on mono groups 13 and 14 on the stereo console or groups 17, 18, 19 and 20 on the mono console. This mix can then be reassigned to any other group or groups as the basis of that monitor send without the need to adjust sends on every input module. This can greatly speed up the creation of monitor mixes.

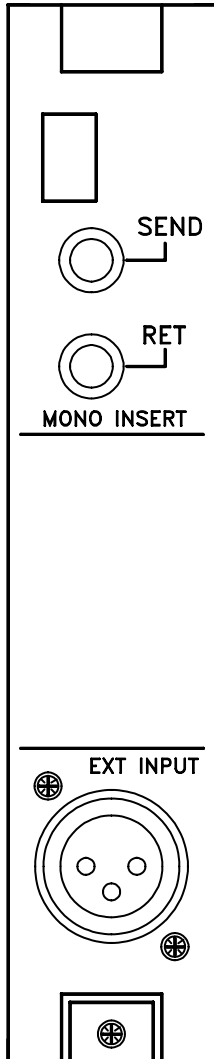


THE EXTERNAL INPUT SECTION

The external input is mono and has a LEVEL control and an ON switch. The external input can be assigned to the group by sending through the reassign output for that group.

Note that there is a danger of feedback because you can assign the group back to itself.

THE STM/ALM REASSIGN OUTPUT MODULE CONNECTOR PANEL



The connector panel contains connections for the external input, the group insert send and return and the external meter connections. The group output connectors will be found on a connector panel mounted below the modules on the rear of the console and similar to that illustrated at the bottom of this page.

INSERT SEND

1/4" TRS Jack Socket, 'A' Gauge, Balanced

Nominal Output Level : +4dBu

TIP : Signal +ve (Hot)

RING : Signal -ve (Cold)

SLEEVE : Ground

Output Impedance : <75R

INSERT RETURN

1/4" TRS Jack Socket, 'A' Gauge, Balanced

Nominal Input Level : +4dBu

TIP : Signal +ve (Hot)

RING : Signal -ve (Cold)

SLEEVE : Ground

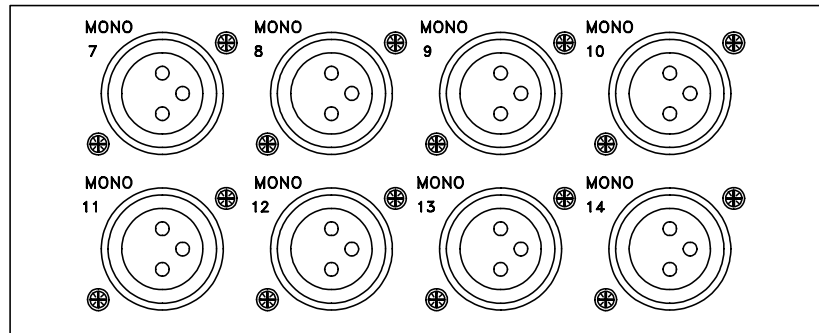
Input Impedance : >10k

EXTERNAL METER

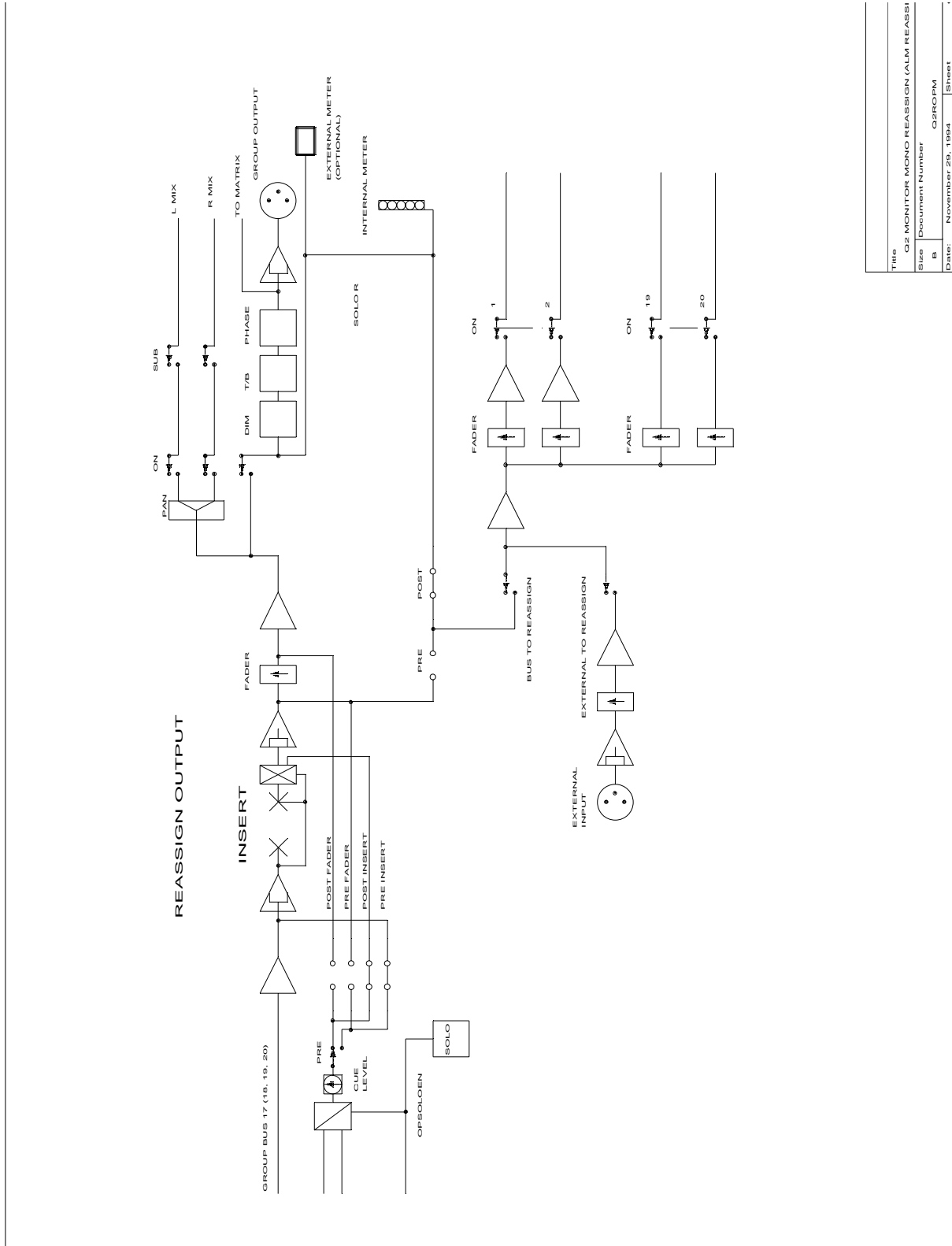
- 1 Common
- 2 Not Used
- 3 Not Used
- 4 Group Meter

GROUP OUTPUT

- XLR type 3 pin connector, Balanced
- Nominal level : +4BdBu
- Pin 1 - Ground
- Pin 2 - Signal +ve (hot)
- Pin 3 - Signal -ve (cold)
- Output Impedance : <75R

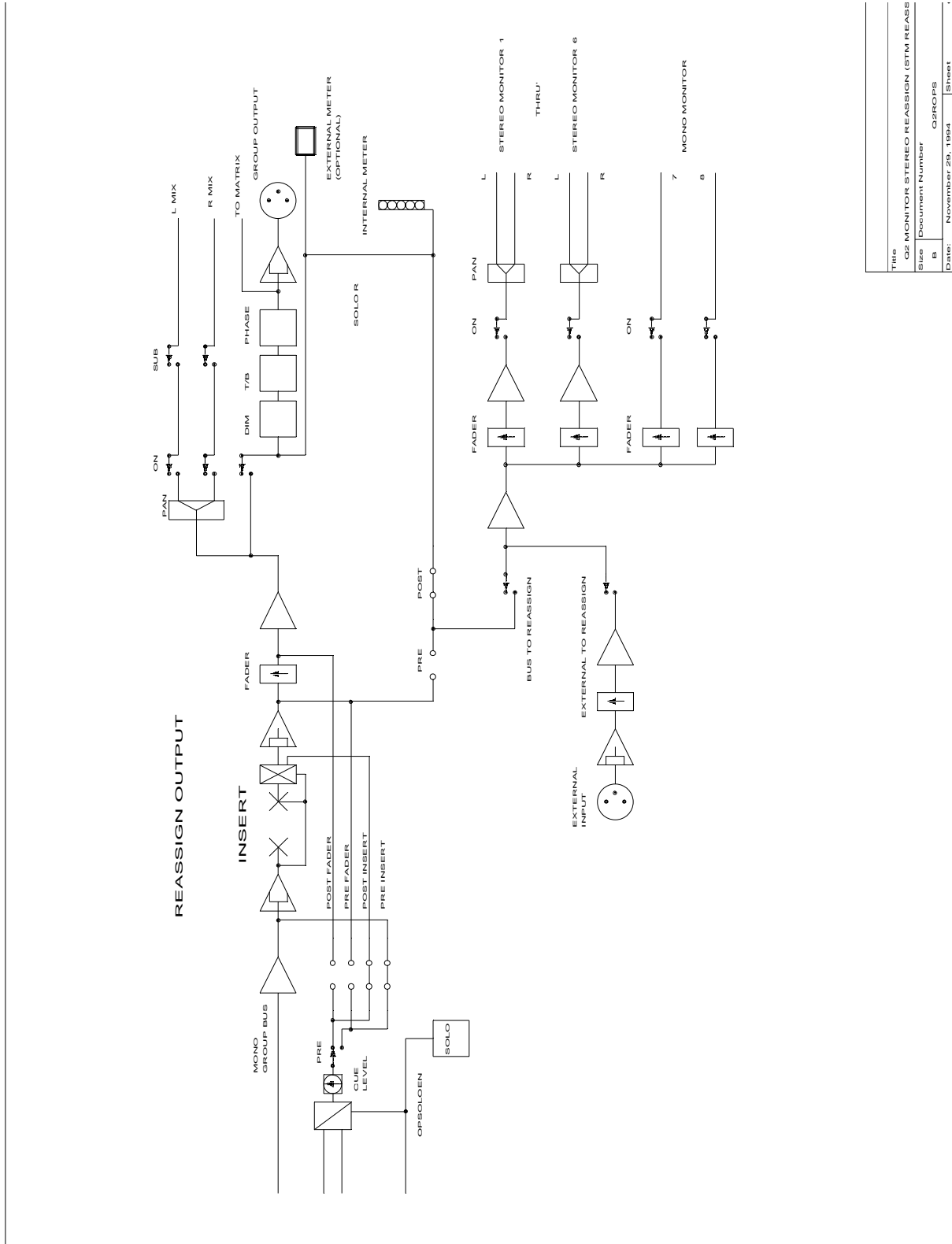


ALM REASSIGN MODULE BLOCK DIAGRAM



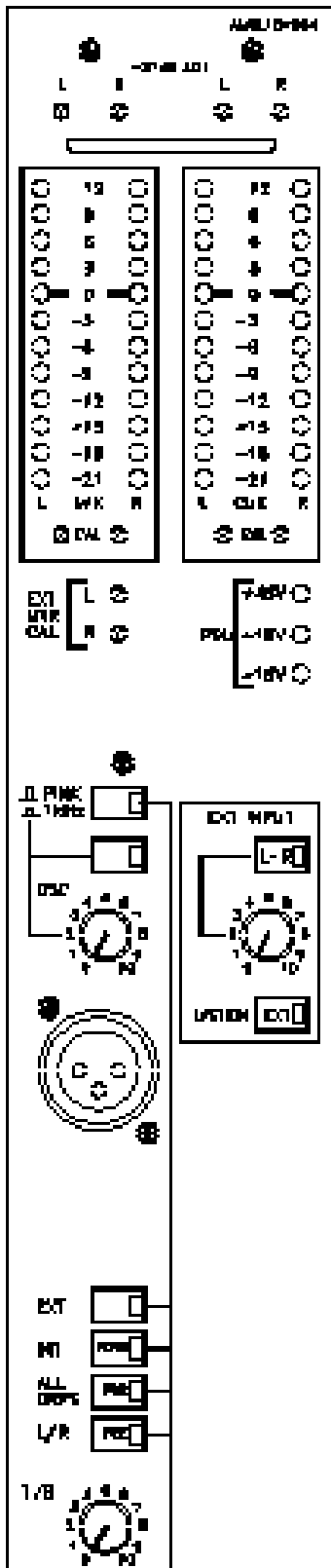
Title	Q2 MONITOR MONO REASSIGN (ALM REASSI
Size	Document Number
B	Q2PROM
Date:	November 20, 1994
Sheet	

STM REASSIGN MODULE BLOCK DIAGRAM



Title	Q2 MONITOR STEREO REASSIGN (STM REASS)
Size	Document Number
B	Q2PROPS
Date:	November 20, 1994
	Sheet

THE MASTER MODULE



The master module is a double width module containing metering, the oscillator, talkback facilities, monitoring facilities and the master faders.

METERS

Two dual meters are provided. One pair constantly indicates the stereo output while the other pair is used to indicate solo levels. Calibration is facilitated by having the trimmers accessible through the front panel.

Three LEDs are used to provide power rail status.

PINK/1KHZ

This select either the 1kHz fixed frequency oscillator or the Pink Noise Generator

OSC

Switches the oscillator and pink noise generator on and allows the level to be adjusted.

The Talkback Microphone connects into the panel mounted XLR connector.

EXT

Selects TALKBACK to the external output.

INT

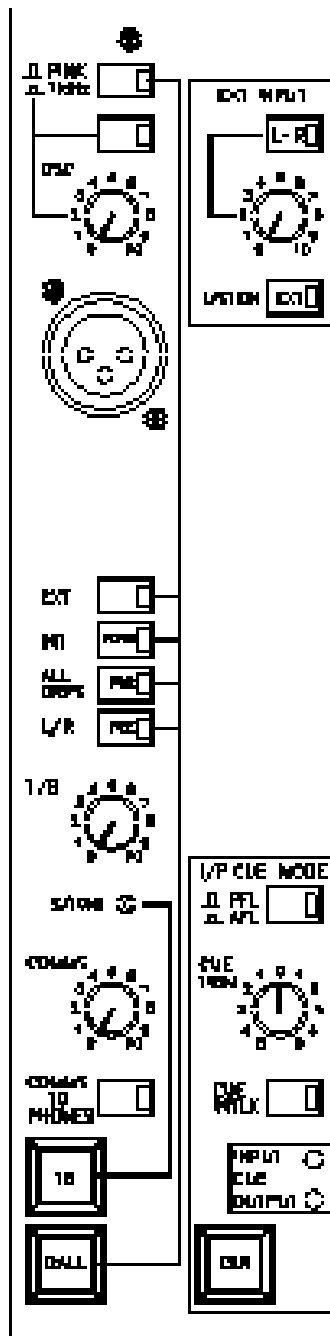
Enables TALKBACK to the groups. The T/B button should be preselected on the groups where talkback is required.

ALL GRPS

Selects TALKBACK to all group buses. Unlike the internal button this will mean that the talkback will depend upon the position of the group faders.

L/R

Selects TALKBACK to the mix left and right buses. Thus outgoing talkback will depend upon the position of the master faders.



EXTERNAL INPUT

This is similar to the external inputs on the group modules. It is stereo and can be selected to the stereo mix bus of the console where it is injected after the fader. The input level can be controlled and the input can be soloed.

COMMS

This controls the level to the COMMS headset.

S/TONE

This adjusts the sidetone level. SIDETONE is the amount of your own voice heard in the comms headset when speaking into the comms microphone. A similar effect is heard on telephones although there is no adjustment provided. It assists in creating confidence that the system is working.

T/B

This controls the gain of the talkback microphone amplifier.

COMMS TO PHONES

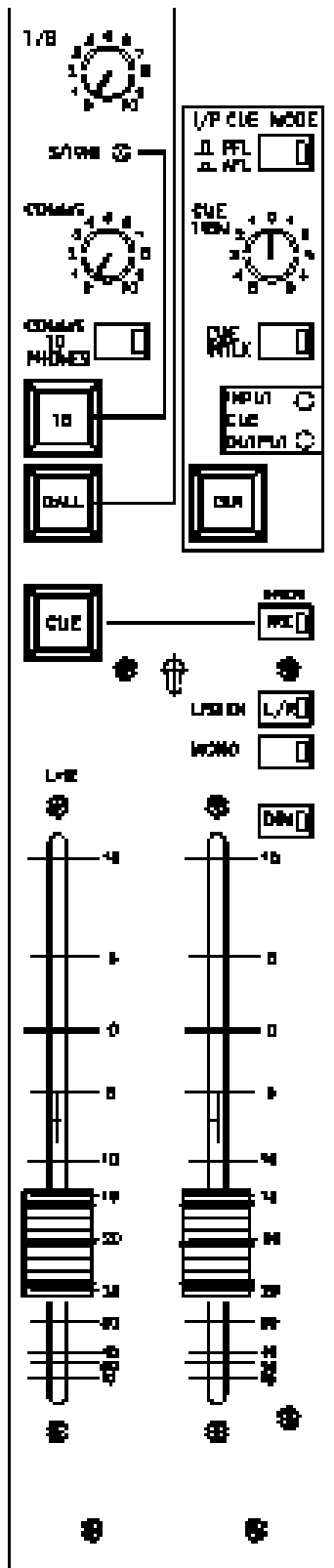
This enables talkback to the headphone output.

T/B (Button)

Enables talkback to selected destinations.

CALL

This is used to signal other destinations connected to the communications ring circuit and to indicate that one is calling.



CUE

Enables a solo of the main outputs. It can be selected to be PRE-INSERT by a switch.

LISTEN L/R

Enables the L/R mix outputs for the monitoring system. If this is not active then the monitors will only be active during solos.

MONO

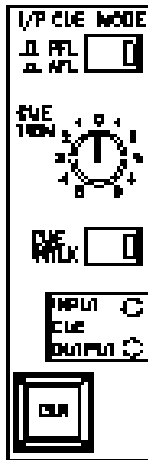
This will mono the main monitoring output.

DIM

This will dim the main monitoring output.

FADERS

The left fader is a stereo fader for the main L/R output while the right fader is the monitor fader.



MASTER SOLO CONTROLS

PFL/AFL

This selects the system to read pre or after fade signals. Both are placed on the solo buses at the same time and the master module selects which is to be monitored.

CUE TRIM

This adjusts the audible cue level without affecting the meters.

CUE INTLK

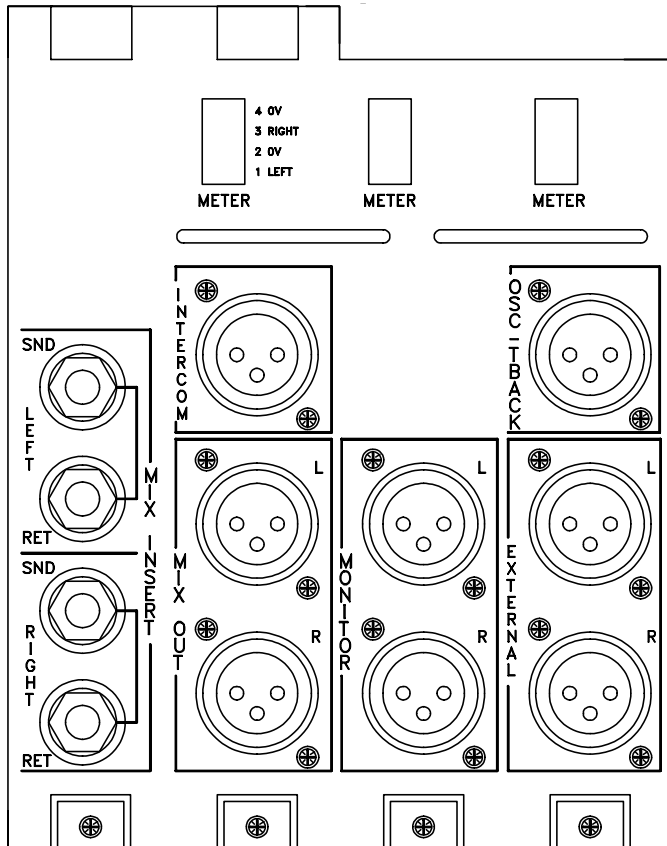
This selects cue interlock mode. In this mode only one solo can be active at a time and a newly selected solo will cancel a previously selected solo. The normal condition is that any number of solos can be active at one time with input solos taking priority over output solos. Outputs solos are not cancelled but are suspended until the input solo is cleared. If many cues are active when switching to INTLK mode they will remain so until the next cue is requested. At this time they will all be cancelled and only the last selected cue will remain.

CLR

This clears all solos from the console except those on the external inputs which are held by mechanical switches. A flashing indication is given when any cue is active.

Two LEDs indicate whether an input or an output solo is active.

THE MASTER CONNECTOR PANEL



The connector panel contains connectors for the left and right mix outputs, the left and right insert points, the monitor outputs, the external input, the external talkback/oscillator output, the intercom and external meters.

MIX, MONITOR and OSCILLATOR OUTPUTS

XLR type 3 pin connector, Balanced
 Nominal level : +4BdBu
 Pin 1 - Ground
 Pin 2 - (hot) Signal +ve
 Pin 3 - (cold) Signal -ve
 Output Impedance : <75R

INSERT SEND

1/4" TRS Jack Socket, 'A' Gauge,
 Balanced
 Nominal Output Level : +4dBu
 TIP (Hot) : Signal +ve
 RING (Cold) : Signal -ve
 SLEEVE : Ground
 Output Impedance : <75R

INSERT RETURN

1/4" TRS Jack Socket, 'A' Gauge,
 Balanced
 Nominal Input Level : +4dBu
 TIP (Hot) : Signal +ve
 RING (Cold) : Signal -ve
 SLEEVE : Ground
 Input Impedance : >10k

EXTERNAL METER

- 1 Common
- 2 Not Used
- 3 Not Used
- 4 Group Meter

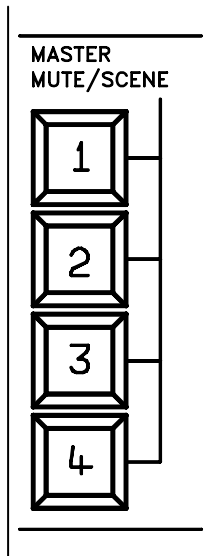
EXTERNAL INPUTS

XLR type 3 pin connector, Balanced
 Nominal level : +4BdBu
 Pin 1 - Ground
 Pin 2 - (hot) Signal +ve
 Pin 3 - (cold) Signal -ve
 Input Impedance : >10K

INTERCOM

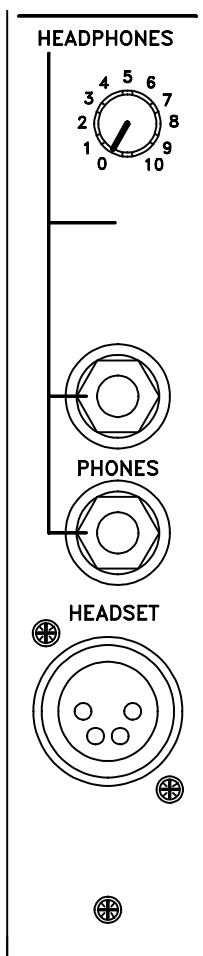
XLR Type 3 pin connector
 Pin 1 Ground
 Pin 2 Ring Power Input
 Pin 3 Audio + CALL

HEADPHONES AND MASTER MUTE MODULE



MUTE MASTERS

Four switches are provided - one for each of the mute groups to which an input module can be assigned. Operating the master mute switch will cause any modules assigned to that mute group to be muted.



HEADPHONE OUTPUTS

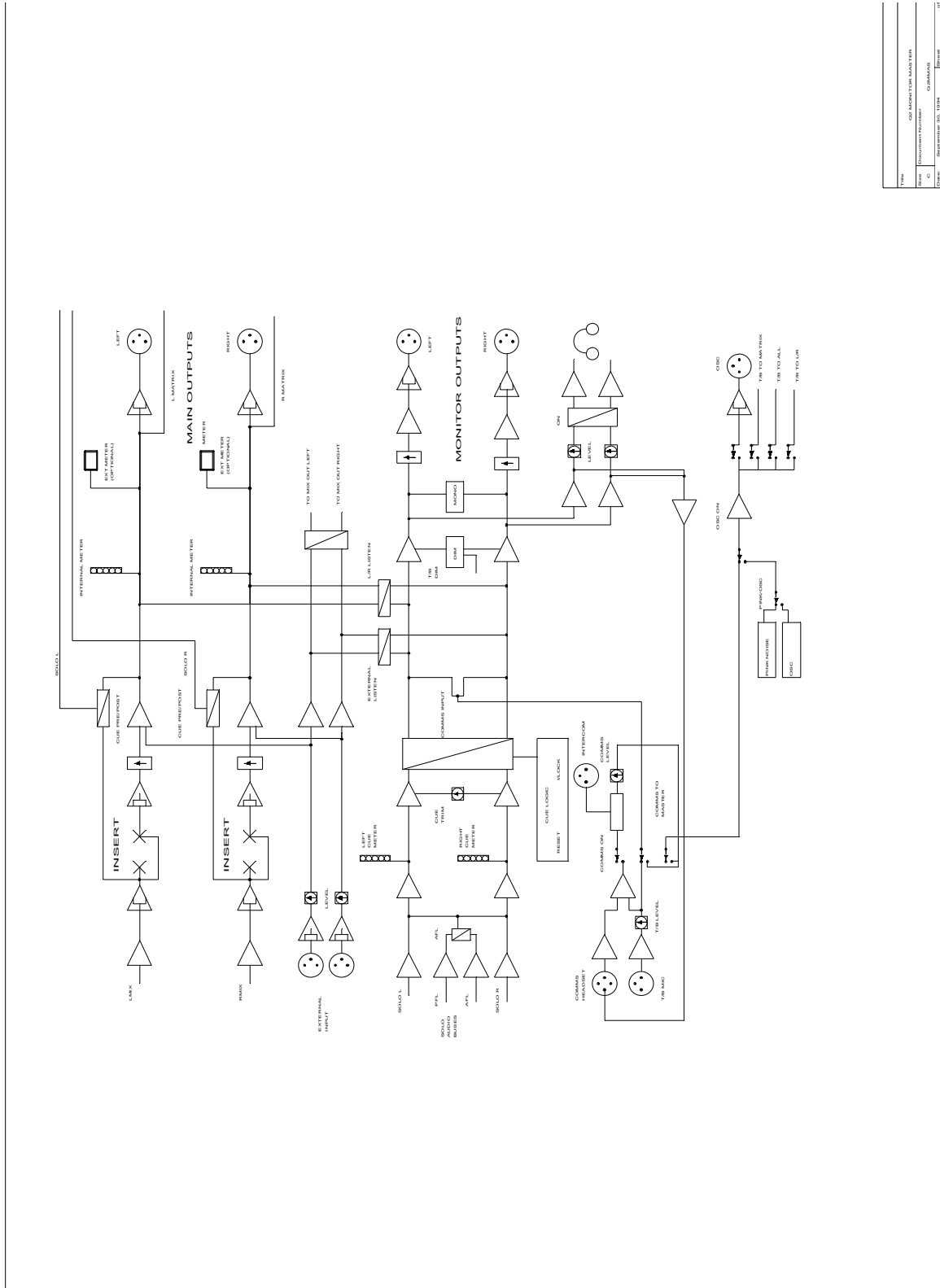
Two headphones outputs are mounted on the front panel of the module and the gain can be adjusted by a level control. The headphone output is identical to the monitor loudspeaker feed although it is taken before the MONO and DIM switches and the monitor fader.

The XLR for the COMMS headset is also mounted here and the wiring for this is as follows.

HEADSET

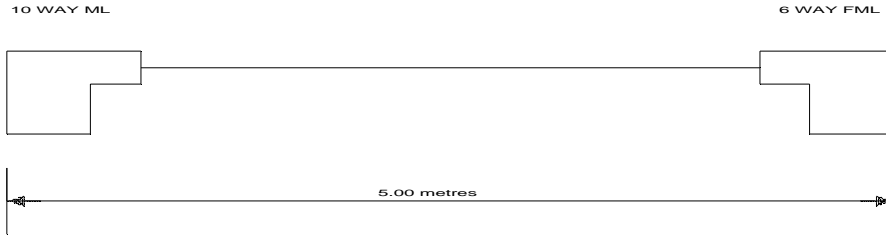
Pin 1	Mic Input -ve
Pin 2	Mic Input +ve
Pin 3	Ground
Pin 4	Headphone Signal

MASTER MODULE BLOCK DIAGRAM



TYPE	OUR MASTER FOR MASTER
DATE	REVISION 1/1960
BY	C. J. JAMES
CHKD.	REVISION 1/1960

Q2 POWER CABLE



PARTS LIST

INSERT: CONTACT 10.1920
 HOOD: CONTACT 10.0420
 CBL CLAMP: CONTACT 12.9607

PARTS LIST

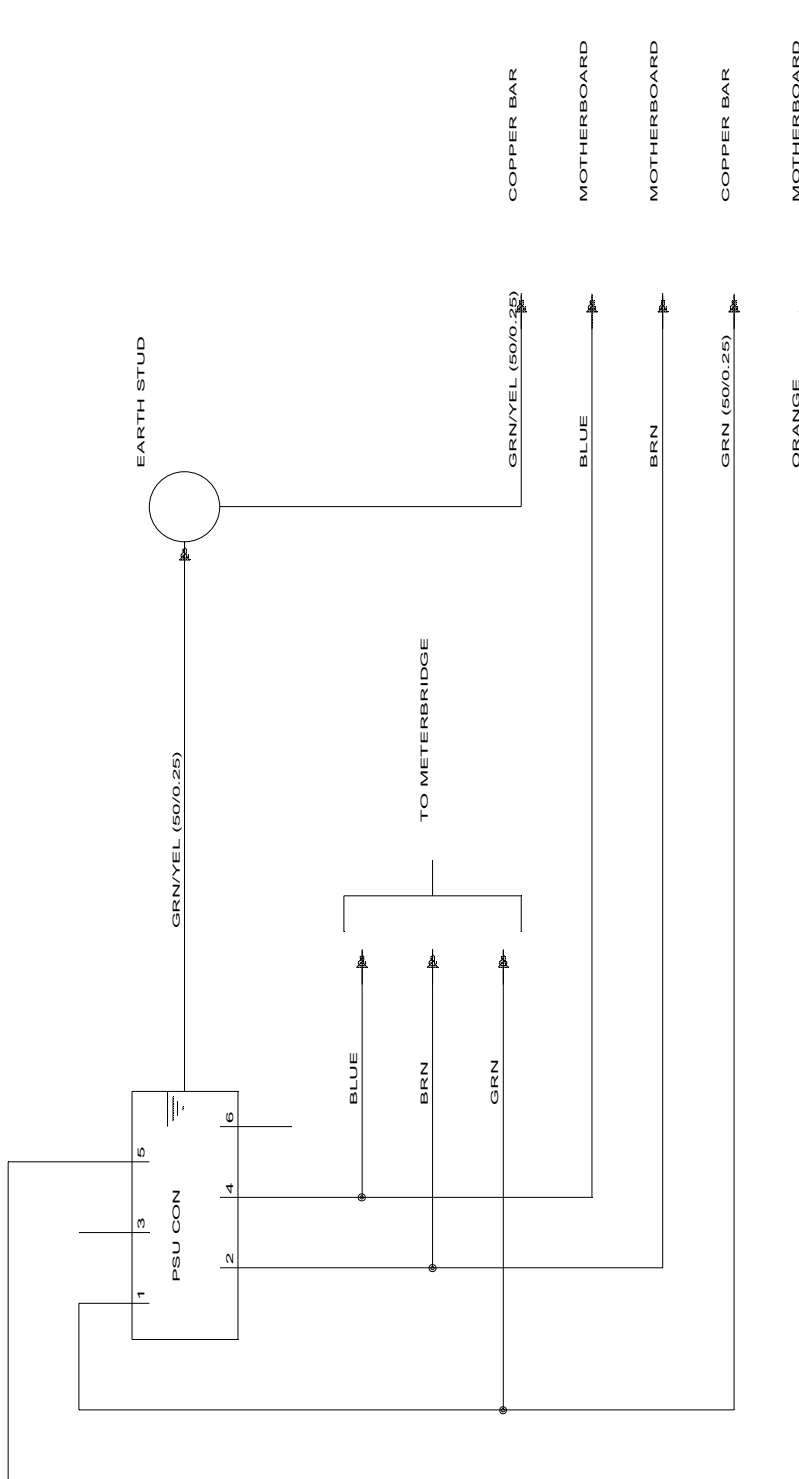
INSERT: HARTING 09 31 006 2701
 HOOD: CONTACT 10.0420
 CBL CLAMP: CONTACT 12.9607

Description	Pin	Cable	Pin
+18V	2	2	2
-18V	4	4	4
+48V	10	1	5
Chassis	Case	G/Y	Case
0V	6	5	6
0V	7	6	1

PART NO. - ACBL15-100

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TEL: (0)81-570-7161 FAX: (0)81-577-3677		
Title Q2 PSU CABLE		
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Date: June 1, 1993	Sheet 1	of 1

Q2 POWER DISTRIBUTION



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Title		Q2 FRAME POWER WIRING	
Size	Document Number	AS1324-2	
A			
Date:	June 30, 1993	Sheet	1 of

Q2 MONITOR TECHNICAL DESCRIPTION

THE AUDIO MASTER MODULE

This consists of a main board, a comms board and two sub boards. The sub boards carry the LEFT stereo and cue meters, external input circuits, mix left/right outputs and left/right monitor outputs.

THE MAIN BOARD

Typically the signal path from the left mix bus to the mix output is as follows. The signal from the LEFT bus is mixed in a virtual earth amplifier and following this the LMIXPRE signal is taken to other parts of the circuit. Following this an SSM2142 is used to send a balanced insert send signal to the send jack which is normalled to the return jack. From here the signal passes through an SSM2143 (IC4) balanced to unbalanced stage into the main fader. A fader buffer stage (IC5A) follows after which the signal is fed up to the sub board to the main mix outputs of the console and also to the solo switching. The signal is known as LMIX at this point. A buffer stage generates a signal known as LEFTMIX which goes to the matrix link connector.

The Left and Right PRE signal derived following the mix amplifiers is used for a SOLO feed and is fed via SSM2404s onto the solo buses. A switch selects pre or post insert operation.

The PFL and AFL buses are mixed and selected by means of switch S11 after which they are combined with the L/R solo buses. The solo signals are then presented to an SSM2404 (IC23) where they can be switched into the monitoring system. A further SSM2404 (IC24) is used to select the mix output or the external input to the monitoring system. The monitor has associated MONO and DIM buttons. Two sections of IC23 are used to electronically activate the DIM while the MONO button simply connects the left and right fader inputs together. The monitor fader is followed by a buffer stage and after this the signal goes to the sub board where the output stage is located.

The EXTERNAL input from the sub board is controlled by VR1 and can be switched to the L/R bus by SW2.

MASTER SOLO LOGIC

First of all it is necessary to understand that input priority is the normal condition in which any input solo will cancel an output solo for its duration. Multiple input and output solos can be active in this mode. INTERLOCK mode means that only one solo in the console can be active at any time. The RESET button can be used to clear solos in either mode.

Consider first of all an input solo in the input priority condition. The solo makes the output of IC44 pin 1 go low causing TR1 to switch on which in turn causes TR2 to switch on giving INPUT SOLO indication. Pin 7 of IC44 will go high as it will invert the low from pin 1 causing TR4 to switch on which in turn switches TR8 on. This causes the RESET line to stay in a high condition which disables the solos on the output modules. Further input solos can be added and the reset button can be used to cancel them. If a solo is to be cancelled from the master reset button then a positive voltage is fed to the base of TR9 to switch it on causing the reset line to go low. Some means must be used to turn off TR8 as otherwise the Vdd and Vss rails would be shorted together and TR3 is turned on to prevent this from occurring.

In the INTERLOCK position of the switch pin 1 of IC44 is also fed to IC45 which is configured as a virtual earth mixer. Pin 7 of IC45 will thus go high and be applied to the voltage comparator IC46. With only one solo active this comparator will not operate and the output will remain low. When a second solo is received then pin 1 of IC44 will rise higher in voltage causing pin 7 of IC45 to rise which in turn will cause the voltage comparator to operate giving a reset via TR9. Of course solos can still be cancelled on the modules on which they are active. The same is true for output solos which enter via IC45 and are mixed with the input solos before reaching the voltage comparator. A reset can thus be generated by requesting another solo or by operating the master reset.

THE COMMS BOARD

The COMMS board carries circuitry mainly associated with the talkback function.

The Q2 is fitted with a CLEARCOM communication interface which is a three wire system carrying DC signalling and two way audio. The oscillator can generate either 1kHz or pink noise whose level can be controlled by a pot. The talkback and oscillator can be routed to groups, matrix, L/R mix and Mono outputs. To talk to the matrix and groups a further switch must be pressed on the required output module.

The talkback microphone amplifier is adjustable in level from a front panel control and can be routed to the same destinations as the oscillator in addition to the CLEARCOM interface. Incoming communication from the CLEARCOM interface can be routed to the monitor system by use of the COMMS ON key.

A SIDETONE trimmer allows the level of sidetone to be adjusted. This is the amount of your voice that you will then hear in the headphones when using the CLEARCOM system. IC6A is used to amplify incoming communications and to reject outgoing talkback which travels on the same wire as the incoming talkback. PR6 alters the rejection and hence the sidetone can be increased or decreased. When talkback is used a DIM command is sent to the main board. Talkback audio is also incoming from the headset and this is fed to the CLEARCOM interface together with any audio from the console talkback microphone.

The COMMS TO PHONES switch has several functions as follows:-

To allow incoming talkback onto the monitor system by operating an electronic switch and passing audio over to the main board.

Allowing either the talkback microphone or the output of the CLEARCOM system to go to talkback routing.

Routing the talkback microphone and the headset microphone to the CLEARCOM system.

Also located on the COMMS board are the FLASH oscillator for flashing lamps and the RIGHT meter. The COMMS sub board contains the LEFT mix meter ONLY.

THE INPUT MODULE

The Q2 MONITOR is equipped with a microphone and line input selected by a switch and controlled by the same pot. The microphone input may have a 20dB pad switched in and a phantom supply can be fed to the microphone from each module. From here the signal enters or bypasses a phase reverse circuit (IC2A) which is simply a unity gain inverting stage. The signal then enters or bypasses the sweepable high pass filter (IC2B). At this point the equaliser can be selected pre or post the insert point and from here the signal enters the CUT SSM2402 (IC8) followed by the fader, the fader buffer stage (IC7B) and the pan circuit (IC9) before going to the monitor sends located on the sub board.

THE RESET CIRCUIT

A reset for the module logic is given by the RC network formed by C41 and R142. On power up C41 will charge through R142 causing TR1 to switch on. This applies a low to the SET input of the flip flop and a high to the reset input causing Q bar to go high giving a channel ON condition. The RESET line is also fed to the SOLO enable circuit.

THE SOLO SYSTEM

The Q2 solo system is a little more comprehensive than in other consoles and there are some novel features about the way in which it operates.

The SOLO button can be pressed fleetingly and the solo will latch until the button is pressed for a second time. If the button is depressed for a longer period then the solo will not latch but will release as the solo button is released. There is also a facility for all solos to be cleared by the operation of a master button on the console.

The heart of the system is IC11 a dual D-Type flip flop. Normally the reset pin will be held low and under this condition the state of the Q output will toggle with each operation of the solo switch. If the solo switch is held down then C43 will charge through D13 and R155 causing pin 1 of IC12 to go high. Pin 2 is already high as the flip flop has operated to give a solo and thus pin 3 of IC12 will go low. This low is applied to pin 2 of IC13 and when the solo button is released pin 1 will also go low. Pin 3 of IC13 then goes high causing the flip flop to be reset thus cancelling the solo. TR6 is also switched on to discharge C43.

The output of IC12 will then revert to a high state causing the reset to go low and allow normal operation of the flip flop. A RESET signal from the master module will be received by pin 2 of IC13 and will cause pin 3 to go high (since pin 1 will already be low) again giving a reset and cancelling any solo.

Another version of the above circuit exists based around 4001 OR gates although the principle behind it is exactly the same. The example shown is an output solo and in order for the input priority system to work then an extra gate is used - IC47D. When a solo is requested audio is allowed onto all four solo buses with selection being made on the master module depending upon the selected solo mode.

The RESET line from the master module is in fact tri-state and in the high condition it is used to pull pin 11 of IC47D low cancelling the solo. This only occurs when input priority mode is selected and when an input solo is called for. The RESET does not reset the output solo latch so that when cancelled the previous output solo can again take effect. When the RESET line goes high it will go to almost the audio positive rail. This excess voltage is removed by zener diode D50 which is used to block the output of IC47B which will be at 5V. When the RESET line goes low then IC48A will be reset cancelling any solo.

ON/CUT CIRCUIT

The ON circuit of an input module is based around IC11 a dual, positive edge triggered S/R Flip Flop. Under static conditions C40 will charge through R140 holding the clock input low. Pressing the ON switch applies Vdd to the clock input causing pin 2 to be clocked through to pin 1 reversing the states of Q and Q bar. For the channel to be on Q bar should be high. Assuming that the channel is SAFE at the moment then pin 10 of IC12 will go low causing pin 11 to go high. Following this through the ON LAMP link TR3 will be switched off by this high causing TR5 to be off which means that the LED will be ON. An anti phase feed is taken to the series and shunt FETs such that in the ON condition the series FET receives a high while the shunt FET receives a low.

An alternative is for the lamp to indicate the CUT condition. A local channel CUT will set Q bar low and thus pin 10 of IC12 will be high. This will cross the cut lamp link and switch TR3 off causing the LED to come on indicating a mute. At this time Q is high causing pin 4 of IC13 to be low and therefore pin 6 of IC12 to be low. If the channel is not locally cut but an external cut is received from one of the master cut switches Q will be low and the external cut signal will put a low on to pin 6 of IC13. Pin 4 will thus go high and allow the FLASH signal to blink the CUT lamp if LK9 is installed. The external cut is also applied to pin 8 of IC12 causing pin 10 to go high to operate the FETs and the lamp. Thus a flashing cut lamp is an indication that a remote cut has been received.

THE MIDI INTERFACE.

A cut is also possible from a midi muting system and this operates on the flip flop by setting Q high and Q bar low from the same signal which is inverted at TR2. The cut is a high on pin 2 of CON8. The local cut switch is connected to pin 1 of CON8 to feed a cut to the midi system.

THE LEVEL METER

The peak LED operates independently from the remainder of the meter and is wired to three points as follows:-

Pre EQ
Post EQ
Post fader

Thus a high level on any of the three points may bring the peak LED on. The main meter can be wired to any one of the three points to indicate the desired level and is normally linked to the pre equalizer signal.

THE MONITOR SEND SUB BOARD

This board contains the monitor send circuitry. There are six stereo sends and eight mono sends.

A stereo send has PRE and POST signals fed to the board and selected by S1, the PRE switch. The signal is buffered by IC1, fed through the ON switch to a PAN control VR1 and then back to the main board where it passes through a bus resistor onto the monitor send bus.

The mono sends are fed through PRE switches in pairs and then to independent level controls. This is followed by an ON switch after which the signal returns to the main board and onto the bus via a resistor.

INPUT MODULE LINKS

Link		Function
1	*	Transformer Bypass
2	*	Transformer Bypass
3		External Meter Pre EQ
4		External Meter Post EQ
5	*	External Meter Dir
7		Cut Lamp
8	*	On Lamp
9		Cut Lamp Flash
11	*	Internal Meter Pre EQ
12		Internal Meter Post EQ
13		Internal Meter Post
14		Monitor Pre Pre EQ
15	*	Monitor Pre Post EQ
16		Monitor Pre Post On
	*	Factory installed
	#	Depends on module position

THE STM OUTPUT MODULE

This contains a stereo group output, a mono group output and an external input.

STEREO GROUP OUTPUT

The left and right signal paths are identical. Signal is picked off the group bus and combined by IC1 (Left). The signal is then inverted by IC2 before being passed to the insert send. The output of IC2 is also fed to a switch S4 where the pre or post insert signal can be selected before going to the group fader. The fader is followed by a buffer stage (IC2A) and the BALANCE CONTROL which is buffered by IC5. From here the signal passes through the ON switch to the DIM switch, which, when active will dim the group output by 6dB. IC15 forms a simple mixing amplifier where talkback is combined with the group signal. The TALKBACK key must be pressed to activate this function. The signal then passes through a phase inverting stage controlled by S5. This operates FETS which causing IC15 to invert the phase of the group signal. The signal then passes to IC17, an SSM2142 for balancing before going to the group output connector. Immediately after the ON switch a feed named SUBL is taken to the SUB switch to create the subgroup function by feeding the group output to the stereo mix bus.

THE MONO GROUP OUTPUT

The signal path for the MONO group output is identical although of course different component numbers apply. The SUB function for the mono group differs in that the mono signal is fed through a pan pot to create a pannable signal on the L/R buses.

THE METERS

The stereo group meter has the SUBL and SUBR signals fed to it. Although there is only one meter the higher of the two signals is always displayed. S9 will cause the meter to display the external input. The mono meter has the SUB signal fed to it. The three group signals are fed to a connector so that external meters can be used if required.

The external input is stereo and uses ICs 25 and 27 as input stages. An SSM2404 is used to switch the signal to the group buses and to the solo system. These functions are controlled by the ON switch and the LISTEN switch respectively.

The groups can be soloed and it is possible to select a pre or post insert signal by using S10. The level of the solo is adjustable and VR2 is used for this. Depending upon the links installed the POST solo will be post fader or post insert. The PRE solo will be pre fader or pre insert point. If the insert point is in use then the pre signal and the post insert signal are the same. If the insert point is not selected then the pre signal and the pre insert signal are the same.

STEREO OUTPUT MODULE LINKS

LK1	#	For mix bus selection
LK2	#	For mix bus selection
LK3	#	For mix bus selection
KK4	#	For matrix feed selection
LK5	#	For matrix feed selection
LK6	#	For matrix feed selection
LK7		Post/Post Insert Pre/Pre Insert for the stereo group solo
LK8		Post for the mono group solo
LK9	*	Post Insert for the mono group solo
LK10		Pre for the mono group solo
LK11	*	Pre insert for the mono group solo
	*	Factory installed
	#	Depends on module position

MONO GROUP OUTPUT

The signal path for the mono group signal is identical to that of the stereo group output module. The major difference lies in the reassign function which this module is capable of.

The sub board used on an input module is identical to that used on the mono output module giving access to all the groups for the reassign function. The input to the sub board is fed from the group sub signal through S2 when post is selected or from the pre signal if pre is selected. The selection is made by jumpers and normally the console is shipped with the SUB jumper installed..

The external input, which is mono, can also be reassigned by pressing S1. No solo function is available for this input.

A meter is mounted on the module which reads the mono group output. A feed to an external meter exists through CON13.

The mono output stages are located on the HEADPHONE AND MUTE MASTER module. LK6 selects the output to the appropriate output stage and matrix feed.

MONO MODULE OUTPUT LINKS

LK1	#	Bus selection link
LK6	#	Output selection link to matrix and output stage
LK8		Post for group solo
LK9	*	Post insert for group solo
LK10		Pre for group solo
LK11	*	Pre insert for group solo
LK12	*	Group post fade signal to reassign
LK13		Group pre fade signal to reassign
	*	Factory installed
	#	Depends on module position

MUTE GROUP/ PHONES MODULE

Eight SSM2142 ICs provide the balanced output stages for the mono groups which are then taken down to the connector panel.

The communications headset connector is also located on this module with its associated microphone and headphone amplifier. The "normal" headphones are driven by another stereo amplifier and the two output sockets are connected in parallel.

The Master Mute Group switches simply send out 5 Volts on the mute bus when operated.

PARTS LIST

Q2 MASTER AUDIO (MAIN)
 CD1240-1 Revision: A
 Bill Of Materials

Revised: June 14, 1994

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Item	Quantity	Reference	Part	Description	Part Number
1	2	C2,C45	22P	22pF Ceramic Capacitor	CAP01-0001
2	22	C1,C4,C12,C14,C16,C46, C56,C58,C70,C71,C73,C74, C76,C77,C86,C90,C92,C94, C96,C98,C201,C202	33P	33pF Ceramic Capacitor	CAP01-0002
3	28	C7,C8,C9,C10,C13,C15,C17, C39,C51,C52,C53,C54,C57, C59,C72,C75,C78,C85,C87, C89,C91,C93,C95,C97,C99, C108,C109,C110	100U 16V	100u 16VElec.Rad.Cap.	CAP04-0005
4	4	C5,C6,C49,C50	22U 25V	22u 25V Elec.Rad.Cap.	CAP04-0006
5	1	C200	10N 0.2	10n Polyester Cap 0.2"	CAP06-0007
6	2	C20,C44	100N 0.2	100n Polyester Cap 0.2"	CAP06-0013
7	4	C11,C55,C100,C101	220N 0.2	220n Polyester Cap 0.2"	CAP06-0015
8	4	CON7,CON9,CON16,CON17	3WAY MH	0.1" 3WY LKG ML HDR	CON01-0049
9	1	CON11	10WAY FHV10	WAY FML PCB MNT	CON01-0027
10	1	CON14	10WAY IDC BX	VERT BOX ML HDR	CON03-0034
11	1	CON15	16WAY IDC RM	16WY R/A ML HDR	CON03-0039
12	1	CON13	50WAY IDC MH	50WY R/A ML HDR	CON03-0055
13	4	CON1,CON2,CON5,CON6	1/4JACKSL	R/A PCB JACK SLIMLINE	CON02-0022
14	1	VR1	20KB ALP2	ALPS 9MM 20KB X 2	POT04-0005
15	1	VR3	10KB ALP2CD	9MM 10KB X 2 C/D	POT04-0009
16	6	R1,R41,R60,R65,R70,R75	75R 1/8W	75R Res.M.Film 2% 0.125w	RES04-0022
17	4	R6,R7,R46,R47	100R 1/8W	100R Res.M.Film 2% 0.125w	RES04-0025
18	4	R220,R221,R224,R225	1K 1/8W	1K Res.M.Film 2% 0.125w	RES04-0049
19	2	R215,R216	1K1 1/8W	1K1 Res.M.Film 2% 0.125w	RES04-0050
20	2	R108,R110	2K2 1/8W	2K2 Res.M.Film 2% 0.125w	RES04-0057
21	2	R107,R117	3K6 1/8W	3K6 Res.M.Film 2% 0.125w	RES04-0062
22	12	R2,R17,R37,R38,R39,R42, R61,R66,R68,R71,R95,R99	4K7 1/8W	4K7 Res.M.Film 2% 0.125w	RES04-0065
23	2	R102,R103	9K1 1/8W	9K1 Res.M.Film 2% 0.125w	RES04-0072
24	45	R3,R5,R10,R11,R12,R13, R15,R16,R36,R43,R50,R51, R52,R53,R62,R63,R64,R67, R69,R72,R73,R74,R83,R85, R86,R88,R89,R91,R92,R93, R96,R97,R100,R101,R106, R111,R113,R118,R219,R222, R223,R226,R227,R228,R229	10K 1/8W	10K Res.M.Film 2% 0.125w	RES04-0073
25	6	R20,R81,R82,R162,R164, R218	100K 1/8W	100K Res.M.Film 2% 0.125w	RES04-0097
26	2	R8,R48	220K 1/8W	220K Res.M.Film 2% 0.125w	RES04-0105
27	1	R217	270K 1/8W	270K Res.M.Film 2% 0.125w	RES04-0107
28	4	R9,R49,R109,R115	680K 1/8W	680K Res.M.Film 2% 0.125w	RES04-0118

Item	Quantity	Reference	Part	Description	Part Number
29	5	LED5,LED8,LED9,LED13, LED19	GRN	STD 3MM GREEN LED	SEM01-0001
30	1	LED12	RED	STD 3MM RED LED	SEM01-0002
31	1	LED14	YEL	STD 3MM YELLOW LED	SEM01-0012
32	11	D1,D2,D3,D4,D9,D10,D11, D12,D51,D52,D54	1N4148	1N4148	SEM02-0001
33	4	IC5,IC15,IC22,IC27	TL072	TL072 SEM06-0002	
34	2	IC1,IC11	NE5534	NE5534	SEM06-0004
35	1	IC18	CD4011	CD4011	SEM06-0007
36	6	IC2,IC19,IC20,IC21,IC25, IC26	NE5532	NE5532P	SEM06-0009
37	2	IC4,IC14	SSM2143	SSM2143 -6dB BAL I/P	SEM06-0078
38	2	IC3,IC13	SSM2142	SSM2142 BAL O/P	SEM06-0079
39	3	IC23,IC24,IC30	SSM2404	SSM2404 FET SWITCH	SEM06-0107
40	6	SW9,S10,S11,SW14,S16,S17	2PSUJ	2 POLE SUJ	SWT01-0004
41	1	SW2	4PSUJ	4 POLE SUJ	SWT01-0005
42	6	L1,L3,L4,L5,L6,L7	0H	FERRITE BEAD	TMR99-0002

Item	Quantity	Reference	Part	Description	Part Number
1	14	C3,C4,C5,C8,C9,C10,C16, C17,C23,C24,C25,C31,C32, C33	100U 16V	100u 16V Elec.Rad.Cap.	CAP04-0005
2	13	C1,C2,C6,C7,C21,C22,C29, C30,C50,C60,C61,C62,C63	22U 25V	22u 25V Elec.Rad.Cap.	CAP04-0006
3	1	C52	10U 16V	10u 16V Elec.Rad.Cap.	CAP04-0011
4	1	C51	220N 0.2	220n Polyester Cap 0.2"	CAP06-0015
5	1	CON10	10WAY IDCTR	10 WAY MINI DIP	CON01-0022
6	1	CON9	10WAY MHX	10WY EXT ML HDR	CON01-0055
7	1	CON11	20WAY IDCMRH	20WY R/A ML HDR	CON03-0010
8	1	PR5	500R 1/4V	500R 1/4" VERTICAL	POT02-0012
9	1	PR4	5K 1/4V	5K 1/4" VERTICAL	POT02-0013
10	2	R71,R72	10R	10R Res.M.Film 5% 0.25w	RES01-0001
11	2	R70,R73	1R	1R Res.M.Film 5% 0.25w	RES01-9999
12	8	R1,R2,R5,R6,R28,R29,R43, R44	100R 1/8W	100R Res.M.Film 2% 0.125w	RES04-0025
13	1	R61	2K2 1/8W	2K2 Res.M.Film 2% 0.125w	RES04-0057
14	14	R3,R4,R7,R8,R11,R12,R22, R30,R31,R37,R45,R46,R64, R65	10K 1/8W	10K Res.M.Film 2% 0.125w	RES04-0073
15	1	R60	22K 1/8W	22K Res.M.Film 2% 0.125w	RES04-0081
16	1	R63	47K 1/8W	47K Res.M.Film 2% 0.125w	RES04-0089
17	1	R62	270K 1/8W	270K Res.M.Film 2% 0.125w	RES04-0107
18	8	LED1,LED2,LED3,LED4, LED5,LED6,LED7,LED8	STD 3MM GREEN LED		SEM01-0001
19	4	LED9,LED10,LED11,LED12	RED	STD 3MM RED LED	SEM01-0002
20	8	D1,D2,D3,D4,D5,D6,D7,D8	1N4148	1N4148	SEM02-0001
21	4	D13,D14,D15,D16	18V	18V ZENER	SEM02-0018
22	1	IC15	BA683A	BA683A 12 LED DRIVER	SEM06-0076
23	2	IC4,IC5	SSM2143	SSM2143 -6dB BAL I/P	SEM06-0078
24	4	IC1,IC2,IC8,IC11	SSM2142	SSM2142 BAL O/P	SEM06-0079

Item	Quantity	Reference	Part	Description	Part Number
1	1	C51	33P	33pF Ceramic Capacitor	CAP01-0002
2	2	C32,C33	470P	470pF Ceramic Capacitor	CAP01-0004
3	3	C23,C25,C81	2U2 63V	2.2u 63V Elec.Rad.Cap.	CAP04-0003
4	15	C6,C9,C18,C34,C35,C36, C40,C41,C42,C43,C52,C55, C56,C57,C62	100U 16V	100u 16V Elec.Rad.Cap.	CAP04-0005
5	5	C3,C22,C66,C75,C76	22U 25V	22u 25V Elec.Rad.Cap.	CAP04-0006
6	4	C73,C74,C84,C85	220U 25V	220u 25V Elec.Rad.Cap.	CAP04-0010
7	2	C68,C82	10U 16V	10u 16V Elec.Rad.Cap.	CAP04-0011
8	5	C4,C24,C26,C71,C72	33U 63V	33uF/63V Elec.Rad.Cap.	CAP04-0012
9	2	C8,C17	1N 0.2	1nF Polyester Cap 0.2"	CAP06-0001
10	2	C77,C86	10N 0.2	10n Polyester Cap 0.2"	CAP06-0007
11	1	C5	22N 0.2	22n Polyester Cap 0.2"	CAP06-0009
12	1	C48	47N 0.2	47n Polyester Cap 0.2"	CAP06-0011
13	13	C2,C7,C16,C19,C20,C21, C27,C30,C31,C47,C49,C53, C54	100N 0.2	100n Polyester Cap 0.2"	CAP06-0013
14	3	C29,C46,C67	220N 0.2	220n Polyester Cap 0.2"	CAP06-0015
15	6	C28,C44,C45,C50,C58,C83	470N 0.2	470n Polyester Cap 0.2"	CAP06-0017
16	3	CON3,CON5,CON7	3WAY MH	0.1" 3WY LKG ML HDR	CON01-0049
17	2	CON8,CON9	4WAY MH	0.1" 4WY LKG ML HDR	CON01-0048
18	1	CON10	4WAY MHR/A	0.1" 4WY R/A ML HDR	CON01-0056
19	1	CON12	4WAY FHV	0.1" 4WY VER FML HDR	CON01-0078
20	1	CON11	16WAY IDC RM	16WY R/A ML HDR	CON03-0039
21	1	CON2	50WAY IDC MH	50WY R/A ML HDR	CON03-0055
22	1	CON1	DIN64ROT	DIN 41612 PLUG	CON01-0010
23	1	PL1	1/4"RPB	0.25" R/A PCB BLADE	CON99-0015
24	3	BRKT1,BRKT2,BRKT3	MWK99-0006	ALPS 9MM BRACKET	MWK99-0006
25	1	PR5	500R 1/4V	500R 1/4" VERTICAL	POT02-0012
26	4	PR1,PR2,PR4,PR6	5K 1/4V	5K 1/4" VERTICAL	POT02-0013
27	3	VR1,VR2,VR3	20KB ALPS	ALPS 9MM 20KB	POT04-0003
28	4	R137,R138,R139,R140	10R	10R Res.M.Film 5% 0.25w	RES01-0001
29	2	R165,R166	100R	100R Res.M.Film 5% 0.25w	RES01-0025
30	1	R142	22R 1/8W	22R Res.M.Film 2% 0.125w	RES04-0010
31	1	R174	75R 1/8W	75R Res.M.Film 2% 0.125w	RES04-0022
32	2	R28,R172	100R 1/8W	100R Res.M.Film 2% 0.125w	RES04-0025
33	1	R66	150R 1/8W	150R Res.M.Film 2% 0.125w	RES04-0027
34	1	R59	330R 1/8W	330R Res.M.Film 2% 0.125w	RES04-0037
35	1	R61	510R 1/8W	510R Res.M.Film 2% 0.125w	RES04-0042
36	1	R72	820R 1/8W	820R Res.M.Film 2% 0.125w	RES04-0047
37	4	R3,R4,R7,R29	1K 1/8W	1K Res.M.Film 2% 0.125w	RES04-0049
38	1	R58	1K2 1/8W	1K2 Res.M.Film 2% 0.125w	RES04-0051
39	2	R42,R57	1K5 1/8W	1K5 Res.M.Film 2% 0.125w	RES04-0053
40	3	R43,R55,R121	2K2 1/8W	2K2 Res.M.Film 2% 0.125w	RES04-0057

Item	Quantity	Reference	Part	Description	Part Number
411	R41	2K7 1/8W	2K7	Res.M.Film 2% 0.125w	RES04-0059
42	2	R22,R37	3K 1/8W	3K Res.M.Film 2% 0.125w	RES04-0060
43	3	R30,R33,R56	3K3 1/8W	3K3 Res.M.Film 2% 0.125w	RES04-0061
44	2	R113,R116	3K6 1/8W	3K6 Res.M.Film 2% 0.125w	RES04-0062
45	2	R71,R156	3K9 1/8W	3K9 Res.M.Film 2% 0.125w	RES04-0063
46	4	R110,R167,R168,R170	4K7 1/8W	4K7 Res.M.Film 2% 0.125w	RES04-0065
47	2	R31,R32	5K6 1/8W	5K6 Res.M.Film 2% 0.125w	RES04-0067
48	1	R69	6K2 1/8W	6K2 Res.M.Film 2% 0.125w	RES04-0068
49	4	R39,R44,R135,R136	6K8 1/8W	6K8 Res.M.Film 2% 0.125w	RES04-0069
50	1	R8	8K2 1/8W	8K2 Res.M.Film 2% 0.125w	RES04-0071
51	1	R68	9K1 1/8W	9K1 Res.M.Film 2% 0.125w	RES04-0072
52	27	R17,R18,R19,R25,R26,R27, R36,R47,R48,R53,R54,R62, R63,R64,R70,R75,R80,R111, R114,R124,R125,R154,R155, R158,R160,R164,R176	10K 1/8W	10K Res.M.Film 2% 0.125w	RES04-0073
53	1	R171	11K 1/8W	11K Res.M.Film 2% 0.125w	RES04-0074
54	2	R67,R85	18K 1/8W	18K Res.M.Film 2% 0.125w	RES04-0079
55	5	R1,R112,R115,R120,R162	22K 1/8W	22K Res.M.Film 2% 0.125w	RES04-0081
56	12	R90,R92,R93,R95,R96,R98, R99,R101,R102,R103,R104, R105	24K 1/8W	24K Res.M.Film 2% 0.125w	RES04-0082
57	2	R45,R173	33K 1/8W	33K Res.M.Film 2% 0.125w	RES04-0085
58	8	R91,R94,R97,R100,R106, R107,R108,R109	36K 1/8W	36K Res.M.Film 2% 0.125w	RES04-0086
59	8	R5,R6,R14,R15,R40,R46, R123,R159	47K 1/8W	47K Res.M.Film 2% 0.125w	RES04-0089
60	12	R16,R20,R21,R23,R24, R34,R35,R60,R65,R157, R161,R163	100K1/8W	Res.M.Film 2% 0.125w	RES04-0097
61	1	R76	220K 1/8W	220K Res.M.Film 2% 0.125w	RES04-0105
62	1	R122	270K 1/8W	270K Res.M.Film 2% 0.125w	RES04-0107
63	1	R2	1M 1/8W	1M Res.M.Film 2% 0.125w	RES04-0116
64	1	R77	680K 1/8W	680K Res.M.Film 2% 0.125w	RES04-0118
65	9	LED1,LED13,LED14,LED15, LED16,LED17,LED18,LED19, LED20	GRN	STD 3MM GREEN LED	SEM01-0001
66	10	LED2,LED3,LED4,LED5,LED6, RED LED11,LED21,LED22,LED23, LED24		STD 3MM RED LED	SEM01-0002
67	14	D3,D4,D6,D7,D8,D14,D15, D23,D24,D25,D26,D27,D28, D29	1N4148	1N4148	SEM02-0001
68	1	D5	24V	24V ZENER	SEM02-0005
69	2	D1,D2	9V1	9.1V ZENER	SEM02-0008
70	1	D31	5V1	5.1V ZENER	SEM02-0014
71	4	D10,D11,D12,D13	18V	18V ZENER	SEM02-0018
72	4	TR1,TR5,TR6,TR7	BC182	BC182/547	SEM04-0004
73	1	TR10	BC212	BC212/557	SEM04-0005

Item	Quantity	Reference	Part	Description	Part Number
74	2	TR8,TR9	J111	J111 FET	SEM04-0010
75	3	IC9,IC13,IC19	TL072	TL072 SEM06-0002	
76	4	IC3,IC6,IC12,IC14	NE5532	NE5532P	SEM06-0009
77	1	IC20	BA683A	BA683A 12 LED DRIVER	SEM06-0076
78	1	IC8	SSM2142	SSM2142 BAL O/P	SEM06-0079
79	1	IC1	SL6270	VOGAD	SEM06-0105
80	1	IC11	MM5437	PINK NOISE GENERATOR	SEM06-0106
81	2	IC4,IC5	CNY17	OPTO ISOLATOR	SEM99-0010
82	5	SW1,SW3,SW4,SW5,SW6	2PSUJ	2 POLE SUJ	SWT01-0004
83	1	SW2	4PSUJ	4 POLE SUJ	SWT01-0005
84	1	SW11	6PSUJ	6 POLE SUJ	SWT01-0006
85	1	RLA1	MINPCB	MIN PCB RELAY	SWT99-0004
86	1	T1	COMTRANS	600R MATCHING	TMR02-0006
87	1	R141	0R 1/8W	Link CSM01-0008	
88	8	R81,R82,R83,R84,R86,R87, R88,R89	OPT 1/8W	Not fitted as standard	NOT FITTED

Item	Quantity	Reference	Part	Description	Part Number
1	2	C145,C146	2U2 63V	2.2u 63V Elec.Rad.Cap.	CAP04-0003
2	6	C136,C141,C142,C143,C144, C147	22U 25V	22u 25V Elec.Rad.Cap.	CAP04-0006
3	2	C139,C140	220U 25V	220u 25V Elec.Rad.Cap.	CAP04-0010
4	1	C149	10U 16V	10u 16V Elec.Rad.Cap.	CAP04-0011
5	1	C138	47N 0.2	47n Polyester Cap 0.2"	CAP06-0011
6	2	C134,C135	100N 0.2	100n Polyester Cap 0.2"	CAP06-0013
7	1	C148	220N 0.2	220n Polyester Cap 0.2"	CAP06-0015
8	2	CON20,CON22	4WAY MH	0.1" 4WY LKG ML HDR	CON01-0048
9	1	CON21	DIN64ROT	DIN 41612 PLUG	CON01-0010
10	1	PL1	1/4"RPB	0.25" R/A PCB BLADE	CON99-0015
11	2	BRKT1,BRKT2	MWK99-0006	ALPS 9MM BRACKET	MWK99-0006
12	1	PR5	500R 1/4V	500R 1/4" VERTICAL	POT02-0012
13	1	PR4	5K 1/4V	5K 1/4" VERTICAL	POT02-0013
14	3	R239,R240,R243	10R	10R Res.M.Film 5% 0.25w	RES01-0001
15	2	R237,R238	1R	1R Res.M.Film 5% 0.25w	RES01-9999
16	1	R248	100R 1/8W	100R Res.M.Film 2% 0.125w	RES04-0025
17	1	R193	180R 1/8W	180R Res.M.Film 2% 0.125w	RES04-0029
18	4	R200,R212,R241,R242	1K 1/8W	1K Res.M.Film 2% 0.125w	RES04-0049
19	3	R206,R207,R252	2K2 1/8W	2K2 Res.M.Film 2% 0.125w	RES04-0057
20	2	R177,R204	3K3 1/8W	3K3 Res.M.Film 2% 0.125w	RES04-0061
21	2	R245,R246	4K7 1/8W	4K7 Res.M.Film 2% 0.125w	RES04-0065
22	16	R174,R178,R179,R186,R187, R188,R189,R190,R191,R197, R199,R201,R214,R236,R255, R256	10K 1/8W	10K Res.M.Film 2% 0.125w	RES04-0073
23	2	R198,R247	12K 1/8W	12K Res.M.Film 2% 0.125w	RES04-0075
24	2	R205,R251	22K 1/8W	22K Res.M.Film 2% 0.125w	RES04-0081
25	1	R196	24K 1/8W	24K Res.M.Film 2% 0.125w	RES04-0082
26	1	R249	33K 1/8W	33K Res.M.Film 2% 0.125w	RES04-0085
27	5	R180,R181,R230,R231,R254	47K 1/8W	47K Res.M.Film 2% 0.125w	RES04-0089
28	17	R175,R176,R182,R183,R184, R185,R192,R194,R195,R202, R203,R209,R210,R211,R232, R233,R234	100K 1/8W	100K Res.M.Film 2% 0.125w	RES04-0097
29	1	R235	220K 1/8W	220K Res.M.Film 2% 0.125w	RES04-0105
30	1	R253	270K 1/8W	270K Res.M.Film 2% 0.125w	RES04-0107
31	1	R263	1M 1/8W	1M Res.M.Film 2% 0.125w	RES04-0116
32	8	LED25,LED26,LED27,LED28, LED29,LED30,LED31,LED32	GRN	STD 3MM GREEN LED	SEM01-0001
33	8	LED1,LED2,LED3,LED15, LED21,LED22,LED23,LED24	RED	STD 3MM RED LED	SEM01-0002
34	2	LED16,LED17	YEL	STD 3MM YELLOW LED	SEM01-0012

Item	Quantity	Reference	Part	Description	Part Number
35	11	D27,D28,D29,D30,D31,D32, D33,D34,D35,D49,D53	1N4148	1N4148	SEM02-0001
36	2	D39,D40	12V	12V ZENER	SEM02-0003
37	1	D50	9V1	9.1V ZENER	SEM02-0008
38	1	D36	5V1	5.1V ZENER	SEM02-0014
39	4	D41,D42,D43,D44	18V	18V ZENER	SEM02-0018
40	7	TR1,TR3,TR4,TR5,TR6,TR9, TR11	BC182	BC182/547	SEM04-0004
41	5	TR2,TR7,TR8,TR10,TR12	BC212	BC212/557	SEM04-0005
42	1	IC49	78L05	78L05 SEM05-0012	
43	2	IC44,IC45	TL072	TL072 SEM06-0002	
44	1	IC47	CD4001	CD4001	SEM06-0008
45	1	IC48	4013	4013 SEM06-0038	
46	1	IC50	BA683A	BA683A 12 LED DRIVER	SEM06-0076
47	1	IC46	LM311N	LM311 VOLTAGE COMP	SEM06-0092
48	1	SW12	4PSUJ	4 POLE SUJ	SWT01-0005
49	1	R244	0R 1/8W	Link CSM01-0008	

Item	Quantity	Reference	Part	Description	Part Number
1	1	C1	22U 25V	22u 25VElec.Rad.Cap.	CAP04-0006
2	1	C3	10U 16V	10u 16VElec.Rad.Cap.	CAP04-0011
3	1	C2	220N 0.2	220n Polyester Cap 0.2"	CAP06-0015
4	1	CON1	4WAY MHX	VER MALE HDR EXT	CON01-0077
5	1	PR2	500R 1/4V	500R 1/4" VERTICAL	POT02-0012
6	1	PR1	5K 1/4V	5K 1/4" VERTICAL	POT02-0013
7	1	R2	2K2 1/8W	2K2 Res.M.Film 2% 0.125w	RES04-0057
8	2	R5,R6	10K 1/8W	10K Res.M.Film 2% 0.125w	RES04-0073
9	1	R1	22K 1/8W	22K Res.M.Film 2% 0.125w	RES04-0081
10	1	R4	47K 1/8W	47K Res.M.Film 2% 0.125w	RES04-0089
11	1	R3	270K 1/8W	270K Res.M.Film 2% 0.125w	RES04-0107
12	8	LED1,LED2,LED3,LED4,LED5, LED6,LED7,LED8	GRN	STD 3MM GREEN LED	SEM01-0001
13	4	LED9,LED10,LED11,LED12	RED	STD 3MM RED LED	SEM01-0002
14	4	D13,D14,D15,D16	18V	18V ZENER	SEM02-0018
15	1	IC1	BA683A	BA683A 12 LED DRIVER	SEM06-0076

Item	Quantity	Reference	Part	Description	Part Number
1	3	C2,C10,C18	22P	22pF Ceramic Capacitor	CAP01-0001
2	19	C1,C3,C9,C11,C17,C19,C32, C35,C38,C41,C44,C52,C56, C72,C76,C79,C82,C94,C98	33P	33pF Ceramic Capacitor	CAP01-0002
3	46	C4,C5,C6,C7,C8,C12,C13, C14,C15,C16,C20,C21,C22, C23,C24,C33,C36,C39,C42, C45,C47,C49,C50,C53,C54, C57,C59,C62,C63,C64,C67, C68,C70,C73,C75,C77,C78, C80,C81,C83,C92,C93,C95, C96,C97,C99	100U 16V	100u 16V Elec.Rad.Cap.	CAP04-0005
4	12	C25,C26,C28,C29,C60,C61, C65,C66,C84,C85,C86,C89	22U 25V	22u 25V Elec.Rad.Cap.	CAP04-0006
5	2	C88,C91	10U 16V	10u 16V Elec.Rad.Cap.	CAP04-0011
6	1	C100	10N 0.2	10n Polyester Cap 0.2"	CAP06-0007
7	2	C58,C74	100N 0.2	100n Polyester Cap 0.2"	CAP06-0013
8	14	C27,C30,C31,C34,C37,C40, C43,C46,C48,C51,C55,C71, C87,C90	220N 0.2	220n Polyester Cap 0.2"	CAP06-0015
9	3	CON10,CON11,CON12	3WAY PIN	0.1" 3WY PINS. USE 3 OFF	CON99-0003
10	1	CON13	4WAY MHR/A	R/A LKNG ML HDR	CON01-0056
11	1	CON3	10WAY IDC MH	10 WAY ML HDR	CON03-0006
12	1	CON16S	16WAY IDC VF	16WY VERT FML HDR	CON03-0060
13	7	LK1,LK2,LK3,LK4,LK5,LK6, LK7	16WAY IDC VM	VERT DIL ML HDR	CON03-0051
14	1	CON16	16WAY IDC BX	VERT ML BOX HDR	CON03-0037
15	1	CON2	50WAY IDC MH	50WY R/A ML HDR	CON03-0055
16	1	CON1	DIN64ROT	DIN 41612 PLUG	CON01-0010
17	6	CON4,CON5,CON6,CON7, CON8, CON9	R/A PCB JACK	SLIMLINE	CON02-0022
18	2	PR5,PR7	500R 1/4V	500R 1/4" VERTICAL	POT02-0012
19	5	PR1,PR2,PR3,PR4,PR6	5K 1/4V	5K 1/4" VERTICAL	POT02-0013
20	1	VR4	10KB ALPSCD	ALPS 9MM 10KB C/D	POT04-0002
21	1	VR1	20KB ALP2	ALPS 9MM 20KB X 2	POT04-0005
22	2	VR3,VR5	20KB ALPSCD	9MM 20KB X 2 C/D	POT04-0006
23	1	VR2	10KB ALP2CD	9MM 10KB X 2 C/D	POT04-0009
24	2	R171,R172	10R	10R Res.M.Film 5% 0.25w	RES01-0001
25	2	R173,R174	33R	33R Res.M.Film 5% 0.25w	RES01-0013
26	4	R82,R83,R86,R87	100R	100R Res.M.Film 5% 0.25w	RES01-0025
27	2	R126,R127	2K2	2K2 Res.M.Film 5% 0.25w	RES01-0057
28	1	R176	33R 1/8W	33R Res.M.Film 2% 0.125w	RES04-0013
29	11	R1,R9,R17,R30,R35,R52, R70,R78,R100,R156,R161	75R 1/8W	75R Res.M.Film 2% 0.125w	RES04-0022

Item	Quantity	Reference	Part	Description	Part Number
30	13	R59,R60,R61,R62,R90,R91, R106,R107,R113,R114,R120, R121,R175	1K 1/8W	1K Res.M.Film 2% 0.125w	RES04-0049
31	2	R36,R43	1K8 1/8W	1K8 Res.M.Film 2% 0.125w	RES04-0055
32	2	R133,R148	2K2 1/8W	2K2 Res.M.Film 2% 0.125w	RES04-0057
33	2	R39,R45	3K3 1/8W	3K3 Res.M.Film 2% 0.125w	RES04-0061
34	3	R140,R143,R146	3K6 1/8W	3K6 Res.M.Film 2% 0.125w	RES04-0062
35	21	R3,R4,R11,R12,R19,R20, R29,R34,R51,R80,R81,R101, R102,R110,R117,R124,R125, R155,R160,R169,R170	4K7 1/8W	4K7 Res.M.Film 2% 0.125w	RES04-0065
36	2	R40,R46	8K2 1/8W	8K2 Res.M.Film 2% 0.125w	RES04-0071
37	4	R37,R42,R53,R54	9K1 1/8W	9K1 Res.M.Film 2% 0.125w	RES04-0072
38	71	R5,R6,R7,R8,R13,R14,R15, R16,R21,R22,R23,R24,R28, R33,R41,R47,R50,R56,R58, R63,R64,R65,R66,R67,R69, R71,R72,R73,R74,R75,R77, R84,R85,R88,R89,R93,R94, R95,R96,R97,R99,R104, R105,R108,R109,R111,R112, R115,R116,R118,R119,R122, R123,R128,R129,R130,R131, R136,R137,R138,R141,R144, R151,R152,R153,R154,R157, R158,R159,R162,R167	10K 1/8W	10K Res.M.Film 2% 0.125w	RES04-0073
39	6	R132,R139,R142,R145,R147, R166	22K 1/8W	22K Res.M.Film 2% 0.125w	RES04-0081
40	4	R2,R10,R163,R164	24K 1/8W	24K Res.M.Film 2% 0.125w	RES04-0082
41	1	R18	36K 1/8W	36K Res.M.Film 2% 0.125w	RES04-0086
42	2	R135,R150	47K 1/8W	47K Res.M.Film 2% 0.125w	RES04-0089
43	5	R25,R79,R103,R165,R168	100K 1/8W	100K Res.M.Film 2% 0.125w	RES04-0097
44	3	R26,R31,R48	220K 1/8W	220K Res.M.Film 2% 0.125w	RES04-0105
45	2	R134,R149	270K 1/8W	270K Res.M.Film 2% 0.125w	RES04-0107
46	3	R68,R76,R98	2M2 1/8W	2M2 Res.M.Film 2% 0.125w	RES04-0117
47	7	R27,R32,R38,R44,R49,R55, R57	680K 1/8W	680K Res.M.Film 2% 0.125w	RES04-0118
48	21	LED1,LED3,LED7,LED11, LED15,LED22,LED23,LED24, LED25,LED26,LED27,LED28, LED29,LED34,LED35,LED36, LED37,LED38,LED39,LED40, LED41	GRN	STD 3MM GREEN LED	SEM01-0001
49	19	LED4,LED5,LED6,LED8,LED9, LED10,LED12,LED13,LED14, LED16,LED17,LED18,LED19, LED20,LED21,LED30,LED31, LED32,LED33	RED	STD 3MM RED LED	SEM01-0002

Item	Quantity	Reference	Part	Description	Part Number
50	1	LED2	YEL	STD 3MM YELLOW LED	SEM01-0012
51	27	D1,D2,D3,D4,D5,D6,D7,D8, D9,D10,D11,D12,D13,D14, D15,D16,D17,D18,D19,D56, D57,D58,D59,D60,D61,D62, D63	1N4148 0.4"	1N4148	SEM02-0001
52	2	D29,D30	12V 0.4"	12V ZENER	SEM02-0003
53	1	D28	5V1 0.4"	5.1V ZENER	SEM02-0014
54	8	D20,D21,D22,D23,D24,D25, D26,D27	18V 0.4"	18V ZENER	SEM02-0018
55	3	TR1,TR2,TR3	J111	J111 FET	SEM04-0010
56	8	IC15,IC16,IC19,IC20,IC21, TL072 IC22,IC23,IC24		TL072 SEM06-0002	
57	3	IC1,IC6,IC10	NE5534	NE5534	SEM06-0004
58	6	IC2,IC5,IC7,IC11,IC14, IC26	NE5532	NE5532P	SEM06-0009
59	2	IC30,IC31	BA683A	BA683A 12 LED DRIVER	SEM06-0076
60	5	IC4,IC9,IC13,IC25,IC27	SSM2143	SSM2143 -6dB BAL I/P	SEM06-0078
61	5	IC3,IC8,IC12,IC17,IC18	SSM2142	SSM2142 BAL O/P	SEM06-0079
62	2	IC28,IC29	SSM2404	SSM2404 FET SWITCH	SEM06-0107
63	9	SW1,SW2,SW5,SW6,SW12, SW13,SW14,SW16,SW17	2PSUJ	2 POLE SUJ	SWT01-0004
64	8	SW3,SW4,SW7,SW8,SW9,SW10, SW11,SW15	4PSUJ	4 POLE SUJ	SWT01-0005
65	3	L1,L2,L3	0H	FERRITE BEAD	TMR99-0002
66	2	LK9,LK11	LINK	Wire Link	CSM01-0008
67	2	LK8,LK10	LINK-OPT	Wire Link(Optional)	NOT FITTED
68	1	R177	OR 1/8W	Link CSM01-0008	

Item	Quantity	Reference	Part	Description	Part Number
1	3	C73,C77,C79	33P	33pF Ceramic Capacitor	CAP01-0002
2	3	C76,C83,C86	100P	100pF Ceramic Capacitor	CAP01-0003
3	31	C7,C10,C11,C18,C21,C22, C29,C32,C33,C40,C43,C44, C67,C71,C74,C78,C80,C81, C84,C107,C110,C111,C118, C121,C122,C129,C132,C133, C140,C143,C144	100U 16V	100u 16V Elec.Rad.Cap.	CAP04-0005
4	17	C8,C9,C19,C20,C30,C31, C41,C42,C70,C108,C109, C119,C120,C130,C131,C141, C142	22U 25V	22u 25V Elec.Rad.Cap.	CAP04-0006
5	5	C75,C82,C85,C89,C90	220U 25V	220u 25V Elec.Rad.Cap.	CAP04-0010
6	1	C69	33U 63V	33uF/63V Elec.Rad.Cap.	CAP04-0012
7	2	C94,C95	1000U 25V	1000u 16V Elec.Rad.Cap.	CAP04-0017
8	1	C93	10N 0.2	10n Polyester Cap 0.2"	CAP06-0007
9	1	C72	22N 0.2	22n Polyester Cap 0.2"	CAP06-0009
10	1	C68	100N 0.2	100n Polyester Cap 0.2"	CAP06-0013
11	1	CON8	3WAY MH	0.1" 3WY LKG ML HDR	CON01-0049
12	5	CON4,CON9,CON10,CON11, CON12	4WAY MH	0.1" 4WY LKG ML HDR	CON01-0048
13	1	CON3	16WAY IDCRM	16WY R/A ML HDR	CON03-0039
14	1	CON2	20WAY IDCMRH	20WY R/A ML HDR	CON03-0010
15	1	CON13	50WAY IDCMMH	50WY R/A ML HDR	CON03-0055
16	1	CON1	DIN64ROT	DIN 41612 PLUG	CON01-0010
17	1	PL1	1/4"RPB	0.25" R/A PCB BLADE	CON99-0015
18	2	CON6,CON7	1/4JACK	R/A PCB JACK	CON02-0013
19	1	VR5	20KB ALP2	ALPS 9MM 20KB X 2	POT04-0005
20	5	R146,R147,R151,R159,R160	10R	10R Res.M.Film 5% 0.25w	RES01-0001
21	4	R201,R202,R203,R204	180R	180R Res.M.Film 5% 0.25w	RES01-0029
22	6	R115,R116,R130,R131,R139, R140	22R 1/8W	22R Res.M.Film 2% 0.125w	RES04-0010
23	16	R6,R7,R16,R17,R26,R27, R36,R37,R206,R207,R216, R217,R226,R227,R236,R237	100R 1/8W	100R Res.M.Film 2% 0.125w	RES04-0025
24	6	R113,R114,R128,R129,R137, R138	270R 1/8W	270R Res.M.Film 2% 0.125w	RES04-0035
25	2	R105,R106	1K 1/8W	1K Res.M.Film 2% 0.125w	RES04-0049
26	3	R112,R127,R136	3K3 1/8W	3K3 Res.M.Film 2% 0.125w	RES04-0061
27	1	R157	4K7 1/8W	4K7 Res.M.Film 2% 0.125w	RES04-0065
28	1	R110	6K8 1/8W	6K8 Res.M.Film 2% 0.125w	RES04-0069
29	38	R5,R8,R9,R15,R18,R19,R25, R28,R29,R35,R38,R39,R107, R109,R111,R117,R119,R121,	10K 1/8W	10K Res.M.Film 2% 0.125w	RES04-0073

Item	Quantity	Reference	Part	Description	Part Number
		R123,R124,R125,R126,R132, R134,R135,R141,R205,R208, R209,R215,R218,R219,R225, R228,R229,R235,R238,R239			
30	1	R103	22K 1/8W	22K Res.M.Film 2% 0.125w	RES04-0081
31	3	R118,R133,R142	33K 1/8W	33K Res.M.Film 2% 0.125w	RES04-0085
32	1	R104	1M 1/8W	1M Res.M.Film 2% 0.125w	RES04-0116
33	1	LED17	GRN	STD 3MM GREEN LED	SEM01-0001
34	48	D1,D2,D3,D4,D5,D6,D7,D8, 1 D9,D10,D11,D12,D13,D14, D15,D16,D18,D19,D20,D21, D43,D44,D45,D46,D47,D48, D49,D50,D51,D52,D53,D54, D101,D102,D103,D104,D105, D106,D107,D108,D109,D110, D111,D112,D113,D114,D115, D116	N4148	1N4148	SEM02-0001
35	2	D17,D42	9V1	9.1V ZENER	SEM02-0008
36	3	TR11,TR13,TR15	BC182	BC182/547	SEM04-0004
37	3	TR10,TR12,TR14	BC212	BC212/557	SEM04-0005
38	3	IC24,IC25,IC27	TL071	TL071 SEM06-0001	
39	2	IC23,IC26	TL072	TL072 SEM06-0002	
40	8	IC6,IC8,IC10,IC12,IC106, IC108,IC110,IC112	SSM2142	SSM2142 BAL OP	SEM06-0079
41	1	IC22	SL6270	VOGAD	SEM06-0105
42	1	SW17	4PSUJ	4 POLE SUJ	SWT01-0005
43	2	R150,R158	0R 1/8W	Link CSM01-0008	

Item	Quantity	Reference	Part	Description	Part Number
1	1	C18	22P	22pF Ceramic Capacitor	CAP01-0001
2	7	C17,C19,C44,C72,C82,C94, C112	33P	33pF Ceramic Capacitor	CAP01-0002
3	2	C106,C107	2U2 63V	2.2u 63V Elec.Rad.Cap.	CAP04-0003
4	15	C20,C21,C22,C23,C24,C45, C47,C49,C70,C73,C81,C83, C92,C93,C95	100U 16V	100u 16V Elec.Rad.Cap.	CAP04-0005
5	9	C25,C26,C28,C29,C89,C103, C104,C110,C111	22U 25V	22u 25V Elec.Rad.Cap.	CAP04-0006
6	2	C108,C109	220U 25V	220u 25V Elec.Rad.Cap.	CAP04-0010
7	1	C91	10U 16V	10u 16V Elec.Rad.Cap.	CAP04-0011
8	1	C100	10N 0.2	10n Polyester Cap 0.2"	CAP06-0007
9	2	C105,C113	47N 0.2	47n Polyester Cap 0.2"	CAP06-0011
10	1	C74	100N 0.2	100n Polyester Cap 0.2"	CAP06-0013
11	7	C27,C30,C43,C46,C48,C71, C90	220N 0.2	220n Polyester Cap 0.2"	CAP06-0015
12	1	CON3	3WAY WIR	0.1" WIRING PADS	NOT FITTED
13	1	CON12	3WAY PIN	0.1" 3WY PINS. USE 3 OFF	CON99-0003
14	1	CON15	4WAY MH	0.1" 4WY LKG ML HDR	CON01-0048
15	1	CON13	4WAY MHR/A	R/A LKNG ML HDR	CON01-0056
16	2	LK1,LK6	16WAY IDCVM	VERT DIL ML HDR	CON03-0051
17	1	CON11	26WAY IDCMD	26 WAY MINI DIP	CON03-0026
18	1	CON2	50WAY IDCMD	50WY R/A ML HDR	CON03-0055
19	1	CON1	DIN64ROT	DIN 41612 PLUG	CON01-0010
20	1	PL1	1/4"RPB	0.25" R/A PCB BLADE	CON99-0015
21	2	CON8,CON9	1/4JACKSL	R/A PCB JACK SLIMLINE	CON02-0022
22	2	BRKT1,BRKT2	MWK99-0006	ALPS 9MM BRACKET	MWK99-0006
23	1	PR7	500R 1/4V	500R 1/4" VERTICAL	POT02-0012
24	2	PR3,PR6	5K 1/4V	5K 1/4" VERTICAL	POT02-0013
25	1	VR4	10KB ALPSCD	ALPS 9MM 10KB C/D	POT04-0002
26	1	VR1	20KB ALPS	ALPS 9MM 20KB	POT04-0003
27	1	VR5	20KB ALPSCD	9MM 20KB X 2 C/D	POT04-0006
28	7	R171,R172,R211,R212,R213, R214,R215	10R	10R Res.M.Film 5% 0.25w	RES01-0001
29	2	R173,R174	33R	33R Res.M.Film 5% 0.25w	RES01-0013
30	1	R176	33R 1/8W	33R Res.M.Film 2% 0.125w	RES04-0013
31	2	R208,R210	47R 1/8W	47R Res.M.Film 2% 0.125w	RES04-0017
32	3	R17,R52,R100	75R 1/8W	75R Res.M.Film 2% 0.125w	RES04-0022
33	5	R90,R91,R120,R121,R175	1K 1/8W	1K Res.M.Film 2% 0.125w	RES04-0049
34	3	R148,R194,R197	2K2 1/8W	2K2 Res.M.Film 2% 0.125w	RES04-0057
35	1	R146	3K6 1/8W	3K6 Res.M.Film 2% 0.125w	RES04-0062
36	7	R19,R20,R51,R101,R102, R124,R125	4K7 1/8W	4K7 Res.M.Film 2% 0.125w	RES04-0065
37	2	R53,R54	9K1 1/8W	9K1 Res.M.Film 2% 0.125w	RES04-0072

Item	Quantity	Reference	Part	Description	Part Number
38	25	R21,R22,R23,R24,R50,R56, R58,R93,R94,R95,R96,R97, R99,R118,R119,R122,R144, R151,R152,R157,F 196,R205, R206,R216,R217	10K 1/8W	10K Res.M.Film 2% 0.125w	RES04-0073
39	1	R155	15K 1/8W	15K Res.M.Film 2% 0.125w	RES04-0077
40	8	R243,R244,R245,F 246,R247, R248,R249,R250	18K 1/8W	18K Res.M.Film 2% 0.125w	RES04-0079
41	2	R145,R147	22K 1/8W	22K Res.M.Film 2% 0.125w	RES04-0081
42	12	R231,R232,R233,F 234,R235, R236,R237,R238,F 239,R240, R241,R242	24K 1/8W	24K Res.M.Film 2% 0.125w	RES04-0082
43	1	R153	30K 1/8W	30K Res.M.Film 2% 0.125w	RES04-0084
44	2	R207,R209	33K 1/8W	33K Res.M.Film 2% 0.125w	RES04-0085
45	1	R18	36K 1/8W	36K Res.M.Film 2% 0.125w	RES04-0086
46	6	R150,R154,R156,F 195,R201, R202	47K 1/8W	47K Res.M.Film 2% 0.125w	RES04-0089
47	10	R25,R103,R193,R 99,R203, R204,R251,R252,F 253,R254	100K 1/8W	100K Res.M.Film 2% 0.125w	RES04-0097
48	2	R48,R200	220K 1/8W	220K Res.M.Film 2% 0.125w	RES04-0105
49	1	R149	270K 1/8W	270K Res.M.Film 2% 0.125w	RES04-0107
50	1	R198	1M 1/8W	1M Res.M.Film 2% 0.125w	RES04-0116
51	1	R98	2M2 1/8W	2M2 Res.M.Film 2% 0.125w	RES04-0117
52	3	R49,R55,R57	680K 1/8W	680K Res.M.Film 2% 0.125w	RES04-0118
53	11	LED1,LED11,LE 15,LED34, LED35,LED36,LE 37,LED38, LED39,LED40,LE 41	GRN	STD 3MM GREEN LED	SEM01-0001
54	9	LED12,LED13,LE 14,LED16, LED17,LED30,LE 31,LED32, LED33	RED	STD 3MM RED LED	SEM01-0002
55	1	LED2	YEL	STD 3MM YELLOW LED	SEM01-0012
56	19	D9,D10,D11,D12,I 14,D40, D41,D42,D43,D45 D46,D47, D48,D49,D50,D51 D64,D67, D68	1N4148 0.4"	1N4148	SEM02-0001
57	1	D44	9V1 0.4"	9.1V ZENER	SEM02-0008
58	4	D24,D25,D26,D27	18V 0.4"	18V ZENER	SEM02-0018
59	1	TR7	BC182	BC182/547	SEM04-0004
60	4	TR6,TR8,TR9,TR 10	BC212	BC212/557	SEM04-0005
61	3	TR3,TR12,TR14	J111	J111 FET	SEM04-0010
62	2	TR11,TR13	J175	J175 SEM04-0011	
63	1	IC35	78L05	78L05 SEM05-0012	
64	3	IC19,IC21,IC24	TL072	TL072 SEM06-0002	
65	1	IC10	NE5534	NE5534	SEM06-0004
66	1	IC34	CD4001	CD4001	SEM06-0008
67	3	IC11,IC14,IC26	NE5532	NE5532P	SEM06-0009
68	1	IC32	4013	4013 SEM06-0038	
69	1	IC31	BA683A	BA683A 12 LED DRIVER	SEM06-0076
70	2	IC13,IC25	SSM2143	SSM2143 -6dB BAL I/P	SEM06-0078

71	1	IC12	SSM2142	SSM2142 BAL O/P	SEM06-0079
72	7	SW1,SW2,SW12,SW13,SW14, SW16,SW17	2PSUJ	2 POLE SUJ	SWT01-0004
73	2	SW11,SW15	4PSUJ	4 POLE SUJ	SWT01-0005
74	1	L3	0H	FERRITE BEAD	TMR99-0002
75	3	LK9,LK11,LK12	LINK	Wire Link	CSM01-0008
76	3	LK8,LK10,LK13	LINK-OPT	Wire Link(Optional)	NOT FITTED
77	1	R177	OR 1/8W	Link CSM01-0008	

Item	Quantity	Reference	Part	Description	Part Number
1	2	C106,C107	2U2 63V	2.2u 63V Elec.Rad.Cap.	CAP04-0003
2	5	C101,C103,C104,C110,C111	22U 25V	22u 25V Elec.Rad.Cap.	CAP04-0006
3	2	C108,C109	220U 25V	220u 25V Elec.Rad.Cap.	CAP04-0010
4	2	C102,C105	47N 0.2	47n Polyester Cap 0.2"	CAP06-0011
5	2	CON14,CON15	4WAY MH	0.1" 4WY LKG ML HDR	CON01-0048
6	1	PL1	1/4"RPB	0.25" R/A PCB BLADE	CON99-0015
7	2	BRKT1,BRKT2	MWK99-0006	ALPS 9MM BRACKET	MWK99-0006
8	5	R211,R212,R213,R214,R215	10R	10R Res.M.Film 5% 0.25w	RES01-0001
9	2	R208,R210	47R 1/8W	47R Res.M.Film 2% 0.125w	RES04-0017
10	4	R180,R183,R194,R197	2K2 1/8W	2K2 Res.M.Film 2% 0.125w	RES04-0057
11	6	R182,R190,R192,R196,R205, R206	10K 1/8W	10K Res.M.Film 2% 0.125w	RES04-0073
12	2	R207,R209	33K 1/8W	33K Res.M.Film 2% 0.125w	RES04-0085
13	6	R181,R186,R187,R195,R201, R202	47K 1/8W	47K Res.M.Film 2% 0.125w	RES04-0089
14	7	R185,R188,R189,R193,R199, R203,R204	100K 1/8W	100K Res.M.Film 2% 0.125w	RES04-0097
15	2	R191,R200	220K 1/8W	220K Res.M.Film 2% 0.125w	RES04-0105
16	2	R184,R198	1M 1/8W	1M Res.M.Film 2% 0.125w	RES04-0116
17	20	D31,D32,D33,D35,D36,D37, D38,D39,D40,D41,D42,D43, D45,D46,D47,D48,D49,D50, D51,D64	1N4148 0.4"	1N4148	SEM02-0001
18	2	D34,D44	9V1 0.4"	9.1V ZENER	SEM02-0008
19	2	TR5,TR7	BC182	BC182/547	SEM04-0004
20	4	TR4,TR6,TR8,TR9	BC212	BC212/557	SEM04-0005
21	1	IC35	78L05	78L05 SEM05-0012	
22	1	IC34	CD4001	CD4001	SEM06-0008
23	1	IC32	4013	4013 SEM06-0038	
24	1	IC33	CD4093	CD4093 NAND SCHMITT	SEM06-0104

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Item	Quantity	Reference	Part	Description	Part Number
1	8	JP1,JP2,JP3,JP4,JP5,JP6, JP7,JP8		0.1" 6WY VERT FML HDR	CON01-0087
2	1	CON9	20WY IDCMDR	20WAY DIP TRANS	CON03-0033
3	1	PL1	1/4"RPB	0.25" R/A PCB BLADE	CON99-0015
4	4	CON1,CON2,CON3,CON4	XLR VM	PLASTIC VERT ML XLR	CON02-0015
5	4	CON5,CON6,CON7,CON8	XLR VF	PLASTIC VERT FML XLR	CON02-0016
6	16	LK1,LK2,LK3,LK4,LK5,LK6, LK7,LK8,LK9,LK10,LK11, LK12,LK13,LK14,LK15,LK16	LINK	Wire Link	CSM01-0008

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Item	Quantity	Reference	Part	Description	Part Number
1	2	CON11,CON12	3WAY WIR	0.1" WIRING PADS	NOT FITTED
2	1	CON10	20WAY IDCMD	20WAY DIP TRANS	CON03-0033
3	1	PL1	1/4"RPB	0.25" R/A PCB BLADE	CON99-0015
4	5	CON3,CON4,CON5,CON7, CON8	XLR VM	PLASTIC VERT ML XLR	CON02-0015
5	3	CON1,CON6,CON9	XLR VF	PLASTIC VERT FML XLR	CON02-0016

Item	Quantity	Reference	Part	Description	Part Number
1	1	C70	22P	22pF Ceramic Capacitor	CAP01-0001
2	10	C10,C16,C17,C21,C24,C27, C29,C32,C67,C68	33P	33pF Ceramic Capacitor	CAP01-0002
3	1	C6	680P	680pF Ceramic Capacitor	CAP01-0005
4	6	C37,C38,C39,C50,C51,C61	2U2 63V	2.2u 63V Elec.Rad.Cap.	CAP04-0003
5	22	C4,C5,C9,C11,C12,C15,C18, C19,C30,C34,C35,C52,C54, C55,C56,C58,C59,C69,C72, C73,C74,C75	100U 16V	100u 16V Elec.Rad.Cap.	CAP04-0005
6	11	C1,C41,C43,C46,C47,C48, C49,C62,C63,C64,C65	22U 25V	22u 25V Elec.Rad.Cap.	CAP04-0006
7	3	C33,C44,C45	220U 25V	220u 25V Elec.Rad.Cap.	CAP04-0010
8	1	C71	10U 16V	10u 16V Elec.Rad.Cap.	CAP04-0011
9	2	C2,C3	33U 63V	33uF/63V Elec.Rad.Cap.	CAP04-0012
10	1	C7	1000U 6.3V	1000u 6.3V Elec.Rad.Cap.	CAP04-0016
11	1	C22	1N 2.5%5MM	1nF Polyester 0.2" 2.5%	CAP07-0001
12	1	C25	6N8 2.5%5MM	6n8 Polyester 0.2" 2.5%	CAP07-0006
13	1	C8	10N 0.2	10n Polyester Cap 0.2"	CAP06-0007
14	1	C23	10N 2.5%5MM	10n Polyester 0.2" 2.5%	CAP07-0007
15	2	C20,C28	22N 0.2	22n Polyester Cap 0.2"	CAP06-0009
16	1	C60	47N 0.2	47n Polyester Cap 0.2"	CAP06-0011
17	2	C13,C14	68N 0.2	68n Polyester Cap 0.2"	CAP06-0012
18	1	C26	68N 2.5%5MM	68nF Polyester 0.2" 2.5%	CAP07-0012
19	4	C40,C42,C76,C77	100N 0.2	100n Polyester Cap 0.2"	CAP06-0013
20	4	C31,C66,C78,C79	220N 0.2	220n Polyester Cap 0.2"	CAP06-0015
21	3	CON1,CON7,CON8	3WAY MH	0.1" 3WY LKG ML HDR	CON01-0049
22	1	CON3	3WAY MHLR/A	0.1" LKG ML HDR R/A	CON01-0075
23	1	WIR1	3WAY WIR	0.1" WIRING PADS	NOT FITTED
24	1	CON9	4WAY MH	0.1" 4WY LKG ML HDR	CON01-0048
25	2	CON12,CON13	14WAY IDCMD	14 WAY MINI DIP	CON03-0028
26	1	CON11	26WAY IDCMD	26 WAY MINI DIP	CON03-0026
27	1	CON10	DIN64ROT	DIN 41612 PLUG	CON01-0010
28	1	PL1	1/4"RPB	0.25" R/A PCB BLADE	CON99-0015
29	4	CON2,CON4,CON5,CON6	1/4JACKSL	R/A PCB JACK SLIMLINE	CON02-0022
30	2	BRKT1VR1,BRKT1VR7	MWK99-0006	ALPS 9MM BRACKET	MWK99-0006
31	1	PR2	500R 1/4H	500R 1/4" HORIZONTAL	POT02-0010
32	1	PR1	5K 1/4V	5K 1/4" VERTICAL	POT02-0013
33	1	VR1	10KC ALPS	ALPS 9MM 10KC	POT04-0001
34	1	VR2	100KC ALP2	ALPS 9MM 100KC X 2	POT04-0004
35	1	VR7	20KB ALPSCD	9MM 20KB X 2 C/D	POT04-0006
36	4	VR3,VR4,VR5,VR6	100KC DALP3	9MM 100KC X 2 C/D D/C	POT04-0007
37	5	R175,R176,R177,R178,R181	10R	10R Res.M.Film 5% 0.25w	RES01-0001
38	4	R201,R202,R203,R204	100R	100R Res.M.Film 5% 0.25w	RES01-0025
39	2	R179,R180	1R	1R Res.M.Film 5% 0.25w	RES01-9999

Item	Quantity	Reference	Part	Description	Part Number
40	3	R17,R240,R241	10R 1/8W	10R Res.M.Film 2% 0.125w	RES04-0002
41	1	R184	33R 1/8W	33R Res.M.Film 2% 0.125w	RES04-0013
42	1	R137	47R 1/8W	47R Res.M.Film 2% 0.125w	RES04-0017
43	1	R16	56R 1/8W	56R Res.M.Film 2% 0.125w	RES04-0019
44	4	R21,R37,R67,R71	75R 1/8W	75R Res.M.Film 2% 0.125w	RES04-0022
45	1	R135	100R 1/8W	100R Res.M.Film 2% 0.125w	RES04-0025
46	1	R120	180R 1/8W	180R Res.M.Film 2% 0.125w	RES04-0029
47	1	R239	240R 1/8W	240R Res.M.Film 2% 0.125w	RES04-0033
48	1	R6	390R 1/8W	390R Res.M.Film 2% 0.125w	RES04-0039
49	3	R1,R50,R59	470R 1/8W	470R Res.M.Film 2% 0.125w	RES04-0041
50	3	R173,R174,R242	1K 1/8W	1K Res.M.Film 2% 0.125w	RES04-0049
51	2	R12,R13	1K2 1/8W	1K2 Res.M.Film 2% 0.125w	RES04-0051
52	2	R4,R5	1K8 1/8W	1K8 Res.M.Film 2% 0.125w	RES04-0055
53	2	R51,R60	2K 1/8W	2K Res.M.Film 2% 0.125w	RES04-0056
54	4	R26,R141,R154,R155	2K2 1/8W	2K2 Res.M.Film 2% 0.125w	RES04-0057
55	1	R44	3K 1/8W	3K Res.M.Film 2% 0.125w	RES04-0060
56	5	R47,R48,R56,R57,R66	3K3 1/8W	3K3 Res.M.Film 2% 0.125w	RES04-0061
57	2	R49,R58	3K48 1/8W	3K48 Res.M.Film 1% 0.125W	RES04-0120
58	2	R25,R27	3K6 1/8W	3K6 Res.M.Film 2% 0.125w	RES04-0062
59	1	R122	3K9 1/8W	3K9 Res.M.Film 2% 0.125w	RES04-0063
60	13	R28,R29,R30,R53,R62,R65, R73,R87,R88,R113,R114, R144,R158	4K7 1/8W	4K7 Res.M.Film 2% 0.125w	RES04-0065
61	1	R226	5K1 1/8W	5K1 Res.M.Film 2% 0.125w	RES04-0066
62	7	R2,R3,R43,R52,R61,R74, R75	6K8 1/8W	6K8 Res.M.Film 2% 0.125w	RES04-0069
63	1	R31	7K5 1/8W	7K5 Res.M.Film 2% 0.125w	RES04-0070
64	1	R11	8K2 1/8W	8K2 Res.M.Film 2% 0.125w	RES04-0071
65	34	R10,R15,R18,R19,R20,R22, R23,R32,R38,R39,R40,R41, R42,R45,R46,R54,R55,R63, R64,R68,R72,R152,R153, R164,R185,R211,R215,R216, R217,R218,R234,R235,R236, R237	10K 1/8W	10K Res.M.Film 2% 0.125w	RES04-0073
66	1	R121	11K 1/8W	11K Res.M.Film 2% 0.125w	RES04-0074
67	6	R8,R9,R35,R36,R221,R222	12K 1/8W	12K Res.M.Film 2% 0.125w	RES04-0075
68	8	R94,R98,R99,R102,R186, R189,R229,R230	18K 1/8W	18K Res.M.Film 2% 0.125w	RES04-0079
69	2	R24,R233	22K 1/8W	22K Res.M.Film 2% 0.125w	RES04-0081
70	17	R7,R33,R34,R91,R92,R93, R95,R96,R97,R100,R101, R187,R188,R219,R220,R227, R228	24K 1/8W	24K Res.M.Film 2% 0.125w	RES04-0082
71	2	R134,R136	33K 1/8W	33K Res.M.Film 2% 0.125w	RES04-0085
72	10	R115,R116,R117,R118,R123, R147,R148,R157,R160,R161	47K 1/8W	47K Res.M.Film 2% 0.125w	RES04-0089
73	29	R119,R129,R130,R131,R132, R133,R139,R140,R142,R143,	100K 1/8W	100K Res.M.Film 2% 0.125w	RES04-0097

Item	Quantity	Reference	Part	Description	Part Number
		R146,R149,R151,R156,R159, R162,R163,R165,R166,R167, R168,R208,R209,R210,R212, R223,R231,R232,R238			
74	1	R145	150K 1/8W	150K Res.M.Film 2% 0.125w	RES04-0101
75	2	R14,R69	220K 1/8W	220K Res.M.Film 2% 0.125w	RES04-0105
76	2	R224,R225	2M2 1/8W	2M2 Res.M.Film 2% 0.125w	RES04-0117
77	4	R70,R76,R77,R214	680K 1/8W	680K Res.M.Film 2% 0.125w	RES04-0118
78	1	RP1	8X100K 9PIN	8 X 100K 9-PIN SIL	RES99-0018
79	5	LED1,LED4,LED12,LED13, LED16	GRN	STD 3MM GREEN LED	SEM01-0001
80	7	LED2,LED3,LED14,LED22, LED23,LED24,LED25	RED	STD 3MM RED LED	SEM01-0002
81	3	LED9,LED10,LED11	YEL	STD 3MM YELLOW LED	SEM01-0012
82	29	D9,D10,D11,D12,D13,D14, D15,D16,D17,D18,D19,D20, D21,D22,D23,D24,D25,D26, D27,D31,D32,D33,D34,D35, D36,D37,D38,D39,D40	1N4148 0.4"	1N4148	SEM02-0001
83	4	D1,D2,D3,D4	6V8 0.4"	6.8V ZENER	SEM02-0007
84	1	D28	18V 0.4"	18V ZENER	SEM02-0018
85	11	TR1,TR2,TR5,TR8,TR10, TR11,TR12,TR13,TR14,TR15, TR16	BC182	BC182/547	SEM04-0004
86	6	TR3,TR7,TR9,TR17,TR18, TR28	BC212	BC212/557	SEM04-0005
87	2	TR25,TR26	J111	J111 FET	SEM04-0010
88	2	TR21,TR22	J175	J175 SEM04-0011	
89	1	IC14	78L05	78L05 SEM05-0012	
90	4	IC2,IC3,IC9,IC18	TL072	TL072 SEM06-0002	
91	1	IC13	CD4001	CD4001	SEM06-0008
92	4	IC4,IC5,IC6,IC7	NE5532	NE5532P	SEM06-0009
93	1	IC8	SSM2402	SSM2402 FET SWITCH	SEM06-0037
94	1	IC11	4013	4013 SEM06-0038	
95	1	IC1	SSM2017	SSM2017 MIC INPUT	SEM06-0074
96	1	IC15	BA6144	BA6144 5 LED DRIVER	SEM06-0075
97	2	IC16,IC17	SSM2142	SSM2142 BAL O/P	SEM06-0079
98	1	IC12	CD4093	CD4093 NAND SCHMITT	SEM06-0104
99	12	SWS1,SW2,SWS2,SWS3,SWS4, SW5,SW7,SW8,SW21,SW22, SW23,SW24	2PSUJ	2 POLE SUJ	SWT01-0004
100	2	SW25,SW36	4PSUJ	4 POLE SUJ	SWT01-0005
101	1	SW3	6PSUJ	6 POLE SUJ	SWT01-0006
102	1	SW19	2PSUJ MOMSUJ	2 POLE (MOM)	SWT01-0008
103	1	T1	(OPT) NTM1	NTM1 MIC INPUT TRTMR02-0005	
104	4	LK5,LK8,LK11,LK14	LINK	Wire Link	CSM01-0008
105	8	LK3,LK4,LK7,LK9,LK12, LK13,LK15,LK16	LINK-OPT	Wire Link(Optional)	NOT FITTED
106	2	R169,R171	0R 1/8W	Link	CSM01-0008

Q2 MONO MONITOR SEND SUB (PC1374)
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 Part

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 Description

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Item	Quantity	Reference	Part	Description	Part Number
1	1	C30	22U 25V	22u 25VElec.Rad.Cap.	CAP04-0006
2	1	CON1	26WAY IDC	26 WAY MINI DIP	CON03-0026
3	10	VR1,VR2,VR5,VR6,VR9,VR10, VR13,VR14,VR17,VR18	20KB ALPS	ALPS 9MM 20KB	POT04-0003
4	10	VR3,VR4,VR7,VR8,VR11, VR12,VR15,VR16,VR19,VR20	20KB	ALPS 9MM 20KB	POT04-0003
5	1	R70	10R	10R Res.M.Film 5% 0.25w	RES01-0001
6	10	LED1,LED2,LED3,LED4,LED5, LED6,LED7,LED8,LED9, LED10	GRN	STD 3MM GREEN LED	SEM01-0001
7	5	SW3,SW7,SW11,SW15,SW19	2PSUJ	2 POLE SUJ	SWT01-0004
8	5	SW1,SW5,SW9,SW13,SW17	2PSUJR	2 POLE SUJ (REVERSED)	SWT01-0004
9	5	SW4,SW8,SW12,SW16,SW20	4PSUJ	4 POLE SUJ	SWT01-0005
10	5	SW2,SW6,SW10,SW14,SW18	4PSUJR	4 POLE SUJ (REVERSED)	SWT01-0005

Q2 DUAL MONO OUTPUT
 CD1257-A (SEE CD1258-A)
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Item	Quantity	Reference	Part	Description	Part Number
1	2	C2,C18	22P	22pF Ceramic Capacitor	CAP01-0001
2	10	C1,C3,C17,C19,C32,C44, C52,C72,C76,C82	33P	33pF Ceramic Capacitor	CAP01-0002
3	32	C4,C5,C6,C7,C8,C20,C21, C22,C23,C24,C33,C39,C42, C45,C47,C49,C50,C53,C59, C62,C63,C64,C67,C68,C70, C73,C75,C77,C81,C83,C95, C99	100U 16V	100u 16V Elec.Rad.Cap.	CAP04-0005
4	8	C25,C26,C60,C61,C84,C85, C86,C89	22U 25V	22u 25V Elec.Rad.Cap.	CAP04-0006
5	2	C88,C91	10U 16V	10u 16V Elec.Rad.Cap.	CAP04-0011
6	1	C100	10N 0.2	10n Polyester Cap 0.2"	CAP06-0007
7	2	C58,C74	100N 0.2	100n Polyester Cap 0.2"	CAP06-0013
8	11	C27,C31,C37,C40,C43,C46, C48,C51,C71,C87,C90	220N 0.2	220n Polyester Cap 0.2"	CAP06-0015
9	2	CON10,CON12	3WAY PIN	0.1" 3WY PINS. USE 3 OFF	CON99-0003
10	1	CON13	4WAY MHR/A0.1"	4WY R/A LKNG ML HDR	CON01-0056
11	1	CON3	10WAY IDC MH	10 WAY ML HDR	CON03-0006
12	6	LK1,LK2,LK3,LK4,LK5,LK6	16WAY IDC	16 WAY VERT DIL ML HDR	CON03-0051
13	1	CON2	50WAY IDC MH	50WY R/A ML HDR	CON03-0055
14	1	CON1	DIN64ROT	DIN 41612 PLUG	CON01-0010
15	4	CON4,CON5,CON8,CON9	1/4JACKSL	R/A PCB JACK SLIMLINE	CON02-0022
16	2	PR5,PR7	500R 1/4V	500R 1/4" VERTICAL	POT02-0012
17	4	PR1,PR2,PR4,PR6	5K 1/4V	5K 1/4" VERTICAL	POT02-0013
18	2	VR2,VR4	10KB ALPSCD	ALPS 9MM 10KB C/D	POT04-0002
19	2	VR3,VR5	20KB ALPSCD	ALPS 9MM 20KB X 2 C/D	POT04-0006
20	2	R171,R172	10R	10R Res.M.Film 5% 0.25w	RES01-0001
21	2	R82,R83	33R	33R Res.M.Film 5% 0.25w	RES01-0013
22	2	R126,R127	2K2	2K2 Res.M.Film 5% 0.25w	RES01-0057
23	1	R176	33R 1/8W	33R Res.M.Film 2% 0.125w	RES04-0013
24	6	R1,R17,R30,R52,R70,R100	75R 1/8W	75R Res.M.Film 2% 0.125w	RES04-0022
25	9	R59,R60,R90,R91,R106, R107,R120,R121,R175	1K 1/8W	1K Res.M.Film 2% 0.125w	RES04-0049
26	2	R133,R148	2K2 1/8W	2K2 Res.M.Film 2% 0.125w	RES04-0057
27	2	R140,R143	3K6 1/8W	3K6 Res.M.Film 2% 0.125w	RES04-0062
28	18	R3,R4,R19,R20,R29,R51, R80,R81,R101,R102,R110, R117,R124,R125,R163,R164, R169,R170	4K7 1/8W	4K7 Res.M.Film 2% 0.125w	RES04-0065
29	4	R37,R42,R53,R54	9K1 1/8W	9K1 Res.M.Film 2% 0.125w	RES04-0072
30	48	R5,R6,R7,R8,R21,R22,R23, R24,R28,R41,R47,R50,R56, R58,R63,R64,R65,R66,R67, R69,R84,R85,R88,R89,R93, R94,R95,R96,R97,R99,R104,	10K 1/8W	10K Res.M.Film 2% 0.125w	RES04-0073

Item	Quantity	Reference	Part	Description	Part Number
		R105,R108,R109,R118,R119, R122,R123,R136,R137,R138, R141,R151,R152,F157,R162, R167,R216			
31	2	R132,R147	12K 1/8W	12K Res.M.Film 2% 0.125w	RES04-0075
32	3	R139,R142,R166	22K 1/8W	22K Res.M.Film 2% 0.125w	RES04-0081
33	4	R2,R18,R217,R218	36K 1/8W	36K Res.M.Film 2% 0.125w	RES04-0086
34	2	R135,R150	47K 1/8W	47K Res.M.Film 2% 0.125w	RES04-0089
35	5	R25,R79,R103,R105,R168	100K 1/8W	100K Res.M.Film 2% 0.125w	RES04-0097
36	2	R26,R48	220K 1/8W	220K Res.M.Film 2% 0.125w	RES04-0105
37	2	R134,R149	270K 1/8W	270K Res.M.Film 2% 0.125w	RES04-0107
38	2	R68,R98	2M2 1/8W	2M2 Res.M.Film 2% 0.125w	RES04-0117
39	6	R27,R38,R44,R49, R55,R57	680K 1/8W	680K Res.M.Film 2% 0.125w	RES04-0118
40	22	LED1,LED3,LED7, LED11, LED15,LED22,LED23,LED24, LED25,LED26,LED27,LED28, LED29,LED34,LED35,LED36, LED37,LED38,LED39,LED40, LED41,LED43	GRN	STD 3MM GREEN LED	SEM01-0001
41	18	LED4,LED5,LED6, LED8, LED10,LED12,LED13,LED14, LED16,LED17,LED18,LED19, LED20,LED21,LED30,LED31, LED32,LED33	RED	STD 3MM RED LED	SEM01-0002
42	2	LED2,LED44	YEL	STD 3MM YELLOW LED	SEM01-0012
43	20	D1,D2,D3,D4,D9,D10,D11, D12,D13,D14,D15 D56,D57, D58,D59,D60,D61 D62,D63, D65	1N4148 0.4"	1N4148	SEM02-0001
44	2	D29,D30	12V 0.4"	12V ZENER	SEM02-0003
45	1	D28	5V1 0.4"	5.1V ZENER	SEM02-0014
46	8	D20,D21,D22,D23 D24,D25, D26,D27	18V 0.4"	18V ZENER	SEM02-0018
47	2	TR1,TR3	J111	J111 N-channel FET	SEM04-0010
48	5	IC15,IC19,IC20,IC21,IC23	TL072	TL072	SEM06-0002
49	2	IC1,IC10	NE5534	NE5534	SEM06-0004
50	4	IC2,IC5,IC11,IC14	NE5532	NE5532P	SEM06-0009
51	2	IC30,IC31	BA683A	BA683A 12 LED METER DRV	SEM06-0076
52	4	IC4,IC13,IC25,IC27	SSM2143	SSM2143 -6dB BAL IPT	SEM06-0078
53	4	IC3,IC12,IC17,IC18	SSM2142	SSM2142 BAL OUTPUT	SEM06-0079
54	2	IC28,IC29	SSM2404	SSM2404 FET SWITCH	SEM06-0107
55	14	SW1,SW2,SW4,SW5,SW6,SW8, SW10,SW12,SW13,SW14,SW16, SW17,SW19,SW20	2PSUJ	2 POLE SUJ	SWT01-0004
56	4	SW3,SW7,SW11,SW15	4PSUJ	4 POLE SUJ	SWT01-0005
57	2	L1,L3	0H	FERRITE BEAD	TMR99-0002
58	4	LK9,LK11,LK13,LK15	LINK	Wire Link	CSM01-0008
59	4	LK8,LK10,LK12,LK14	LINK-OPT	Wire Link(Optional)	NOT FITTED
60	1	R177	0R 1/8W	Link CSM01-0008	

Q2 DUAL MONO OUTPUT (LOGIC)
 CD1258-A (SEE CD1257-A)
 Bill Of Materials

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Item	Quantity	Reference	Part	Description	Part Number
1	2	C106,C107	2U2 63V	2.2u 63V Elec.Rad.Cap.	CAP04-0003
2	5	C101,C103,C104,C110,C111	22U 25V	22u 25V Elec.Rad.Cap.	CAP04-0006
3	2	C108,C109	220U 25V	220u 25VElec.Rad.Cap.	CAP04-0010
4	2	C102,C105	47N 0.2	47n Polyester Cap 0.2"	CAP06-0011
5	2	CON14,CON15	4WAY MH	0.1" 4WY LKG ML HDR	CON01-0048
6	1	PL1	1/4"RPB	0.25" R/A PCB BLADE	CON99-0015
7	2	BRKT1,BRKT2	MWK99-0006	ALPS 9MM BRACKET	MWK99-0006
8	3	R211,R212,R213	10R	10R Res.M.Film 5% 0.25w	RES01-0001
9	2	R214,R215	1R	1R Res.M.Film 5% 0.25w	RES01-9999
10	2	R208,R210	47R 1/8W	47R Res.M.Film 2% 0.125w	RES04-0017
11	4	R180,R183,R194,R197	2K2 1/8W	2K2 Res.M.Film 2% 0.125w	RES04-0057
12	6	R182,R190,R192,R196,R205, R206	10K 1/8W	10K Res.M.Film 2% 0.125w	RES04-0073
13	2	R207,R209	33K 1/8W	33K Res.M.Film 2% 0.125w	RES04-0085
14	6	R181,R186,R187,R195,R201, R202	47K 1/8W	47K Res.M.Film 2% 0.125w	RES04-0089
15	7	R185,R188,R189,R193,R199, R203,R204	100K 1/8W	100K Res.M.Film 2% 0.125w	RES04-0097
16	2	R191,R200	220K 1/8W	220K Res.M.Film 2% 0.125w	RES04-0105
17	2	R184,R198	1M 1/8W	1M Res.M.Film 2% 0.125w	RES04-0116
18	20	D31,D32,D33,D35,D36,D37, D38,D39,D40,D41,D42,D43, D45,D46,D47,D48,D49,D50, D51,D64	1N4148 0.4"	1N4148	SEM02-0001
19	2	D34,D44	9V1 0.4"	9.1V ZENER	SEM02-0008
20	2	TR5,TR7	BC182	BC182/547	SEM04-0004
21	4	TR4,TR6,TR8,TR9	BC212	BC212/557	SEM04-0005
22	1	IC35	78L05	78L05 SEM05-0012	
23	1	IC34	CD4001	CD4001	SEM06-0008
24	1	IC32	4013	4013 SEM06-0038	
25	1	IC33	CD4093	CD4093 4x2 I/P NAND SCHMITT	SEM06-0104

Item	Quantity	Reference	Part	Description	Part Number
1	6	C1,C3,C5,C7,C9,C11	33P	33pF Ceramic Capacitor	CAP01-0002
2	12	C2,C4,C6,C8,C10,C12, C32,C33,C34,C35,C36	C31,	100u 16V Elec.Rad.Cap.	CAP04-0005
3	2	C29,C30	22U 25V	22u 25V Elec.Rad.Cap.	CAP04-0006
4	1	CON1	26WAY IDCMD	26 WAY MINI DIP	CON03-0026
5	7	VR2,VR6,VR10,VR13,VR14, VR17,VR18	20KB ALPS	ALPS 9MM 20KB	POT04-0003
6	7	VR4,VR8,VR12,VR15,VR16, VR19,VR20	20KB ALPSR	9MM 20KB(REVERSED)	POT04-0003
7	3	VR1,VR5,VR9	20KB ALPSCD	9MM 20KB X 2 C/D	POT04-0006
8	3	VR3,VR7,VR11	20KB ALPCDR	9MM 20KB X 2 C/D	POT04-0006
9	2	R69,R70	10R	10R Res.M.Film 5% 0.25w	RES01-0001
10	12	R25,R26,R27,R28,R29, R30,R31,R32,R33,R34, R35,R36	4K3	Res.M.Film 2% 0.125w	RES04-0064
11	12	R2,R3,R6,R7,R10,R11, R14,R16,R18,R19, R22,R23	4K7	Res.M.Film 2% 0.125w	RES04-0065
12	6	R1,R5,R9,R13,R17,R21	9K1	1/8W Res.M.Film 2% 0.125w	RES04-0072
13	6	R4,R8,R12,R15,R20,R24	10K	1/8W Res.M.Film 2% 0.125w	RES04-0073
14	10	LED1,LED2,LED3,LED4, LED5,LED6,LED7,LED8, LED9,LED10	GRN	STD 3MM GREEN LED	SEM01-0001
15	3	IC1,IC2,IC3	TL072	TL072 SEM06-0002	
16	8	SW3,SW4,SW7,SW8,SW11, SW12,SW15,SW19	2PSUJ	2 POLE SUJ	SWT01-0004
17	8	SW1,SW2,SW5,SW6,SW9, SW10,SW13,SW17	2PSUJR	2 POLE SUJ (REVERSED)	SWT01-0004
18	2	SW16,SW20	4PSUJ	4 POLE SUJ	SWT01-0005
19	2	SW14,SW18	4PSUJR	4 POLE SUJ (REVERSED)	SWT01-0005