

OPERATING INSTRUCTIONS

QM3 Series



GUARANTEE

This Audio Mixer is guaranteed against any defect in material or workmanship for a period of twelve months from the date of purchase. During this period we undertake to supply replacements free of charge for any parts which may prove on examination to be defective provided that such defectiveness is not the result of misuse, accident or modifications. The mixer or units thereof will be repaired or replaced free of charge, including labour, if consigned Carriage Paid to the manufacturer or agent. The mixer, if sent by carrier, should be returned in the original packing carton. The manufacturers have no on site service or maintenance facilities. In special circumstances, at the discretion of the manufacturer or agent, arrangements are possible, provided travelling and labour costs are paid.

General Instructions.

After opening the packing case, lay horizontally, control side up and slide out. Then check for any visual damage.

The Power supply (PS48) is packed separately, complete with 3 leads:

1. Mains cable with moulded on connector to PS48.
2. Lead with 2 x 4 pin lockable DIN plugs to socket 'A'
3. Lead with 2 x 5 pin lockable DIN plugs to socket 'B'

Check voltage selector on PS48 agrees with mains supply.

Connect leads 2 and 3 to 'A' and 'B' sockets on console and PS48 respectively then twist the ring on each plug to lock. Connect to mains and switch on. If the fuse* is O.K. the meters will illuminate and Channel LED's glow and then go out.

The LED on the Power supply (PS48) is connected to the 24v DC 2.5A (Electronic supply) and gives a direct indication of this output.

NOTE: Phantom Powering can be removed independently via switch marked +48 on rear panel (Down - off)

- * 1A 20mm Anti-surge 110-120v
600mA 20mm Anti-surge 220-240v

Pre Installation Checks.

Meter Lamps: 12v 1watt LES 2 are connected in series across the 24v AC supply
1 per VU meter and 2 per PPM

To replace, switch OFF supply; remove teak cover and relevant metal sub plate on which the lamp brackets are mounted. This should be gently tilted up at the back and lifted sufficiently clear to replace the lamp. Remember they will go out in pairs but only one lamp may be faulty.

The general function of the console can be checked using the internal oscillator.

All Monitor Mix gain controls fully off or Mon (Monitor) button UP. Aux Send selector switch central. Oscillator switch to 'IN' LED should flash 1Hz/Sec.

Frequency set 1K, GR button UP.

- a. Group (Line out) faders to 10dB. All PPM meters should now read 4. 0dBm at Line output.
- b. Press Mono and Cue button, Remix fader to 10dB, Read on Cue Meter $4\frac{1}{2}$ (+2dBm) Release Mono button and Cue.
- c. Remix meters on, remix switch to Post, Read 4 on PPM or $6\frac{1}{2}$ with Remix Fader fully UP
- d. A1-2 and A3-4 buttons UP Cue meter on, switch each of the Master Aux sends in turn to Cue and set to 4 on Meters (Max. $6\frac{1}{2}$)
- e. Input Module test. For this check A1-2 UP, A3-4 & GR buttons DOWN. Set Aux. 1 Line output to 0dBm and patch to each channel Line input. Assignment can be checked through to Group or Remix output. When the level is increased to +6dBm the Channel LED will operate and VU, if fitted, show +2 (Note 0 VU = 4dBm)
- f. Aux 1 output can also be patched into all Aux. Returns to check assignment.

PPM. For operators not familiar with the Peak Programme Meter, each division is 4dBs. Reference level of 0dBm (0.775v RMS) is 4. It has very rapid needle movement - indicates Peak Level - and an electronic hold, giving a decay of 3 seconds from 7 to 1 on the scale.

The 4 Auxiliary Master outputs- Aux cue held on - to the Echo unit or foldback amplifier can be checked aurally and visually. It is interesting to note the echo return can be checked independently of Aux return fader on A3 or A4 (Aux cue on) with AR1 and AR2 controls turned up. The same applies to AR3 and AR4.

DIM: This button dims the monitor level by 20dB should the telephone ring or someone speak, saves continuously resetting the Monitor level.

MONO: The Mono button has 2 functions.

- 1 To check the Mono Line output which is controlled by the remix master fader.
- 2 To check the Stereo/Mono compatibility on any mix, through the monitor output.

The mono level is also shown on Line 1 meter and is -3dBs down on Remix level. This can be checked using the internal oscillator.

The 'Cue' system has a master level control to match the signal level, when switch to monitor out, does not affect meter reading.

REMIX: Line Tape switch is used in conjunction with Remix meter switch. Both are grouped behind the remix master fader.

LINE position: This monitors the Remix pre master fader so the Monitor section is independent of the Remix fader.

TAPE position: This monitors the Remix tape returns including fade up or down.

NOTE. Pre/Post Remix fader switch is fitted as an option.

'Pre' for monitor mix operation independent of Remix fader.

'Post' for remix Line/Tape comparator (remix line output/tape return)

Monitor Level 2 (16/8 only) additional stereo Monitor Line output +18dBm but Max. Gain 3dB down on Mon. 1

Aux. Returns 3-4 (16/8 only) 2 additional auxiliary returns with identical routing as Aux. Returns 1 & 2 can also be sent Pre Aux. 3 & 4 faders to Foldback Buss 3 & 4 via controls AR3 and AR4.

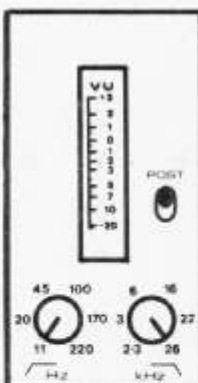
The fader section is self-explanatory except

- A. Remix faders are single paired controls when P & G DS 1820 are fitted.
- B. The 10dB reference mark on the Channel faders are a convenient working point and give unity gain on Line input i.e. 0dBm out for 0dBm in. Channel Gain set Max.

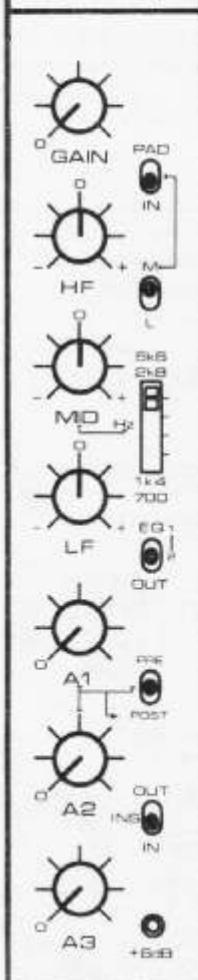
We have not issued a 16/8 connection and routing diagram, as the variations are of a minor nature, and the additions are just duplication of the 12/4 Model.

1. 4 additional output groups - as Group 2 - total 8.
2. TALKBACK Mike Input is female XLR connected 1 & 3 negative
2 is Live unbalanced. Wired as input channel Mike XLR if balanced.
3. MONITOR section. Second set of numbers applicable (9 - 10 -11 - 12)
on 'Tape In' switches.
Switches and controls increased by a factor of 2 for 16 track
monitoring (L4 to L8. T9 to T16)
4. MON. Level 2. Independent Monitor Line output taken from
top of Mon. Level control (DIM REL 3)
Mon. Level (1) to Monitor 1 output jack Left is Tip Right Channel is Ring
Mon. Level 2 to Monitor 2 output jack Left is Tip Right Channel is Ring
5. AUX RETURNS 3 - 4. 2 additional returns as Aux. Return 1 & 2
with routing and foldback sends AR3 - AR4

STANDARD INPUT MODULE



VU and FILTERS (See Options)



GAIN Control: Microphone and Line input

20dB PAD

HF Shelf control $\pm 15\text{dB}$ @ 10kHz Curve C

INPUT Select switch: Microphone or Line/Tape Return
Line has priority over Tape Return

MID Range control $\pm 15\text{dB}$ @ 700Hz - 1k4Hz - 2k8Hz and 5k6Hz
Curve D - E - F - G

LF Shelf control $\pm 15\text{dB}$ @ 220Hz '1' or 90Hz '2'
Curve A - B

3 position switch. EQ IN with LF shelf at '1' or '2' or EQ OUT (not filters)

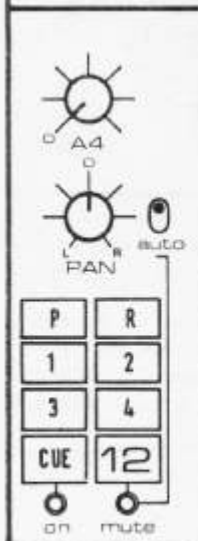
3 position auxiliary select switch.

'Pre' position all auxiliaries
Pre-Channel Fader. 'Post' position all auxiliaries
Post Channel Fader. Centre position A1 - A2 Post Fader. A3 - A4 Pre Fader.

Insert bypass switch. (Channel Break Jack)

Red LED overload indicator snaps on at +6dBm which is 10dB below EQ overload. The period of illumination relates to the overload level. Very useful when adjusting EQ boost.

A1 and A2 controls are normally for Effect and A3 and A4 for Foldback. However, the auxiliary Pre/Post switch allows all auxiliaries to serve both functions i.e. all Effect or Foldback.



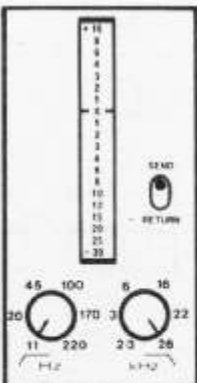
PAN Control: Approximates constant Power Law (3dB down in centre) Pans between any odd and even output group, or Left to Right on Remix (R button). This function is by-passed with 'P' button UP. In this mode equal signal level is addressed to selected Busses.

CUE Button: or Pre-Fade Listen. This button automatically over-rides the Monitors and selects the Pre-Channel fader mono signal, independent of Mute, function indicated by AMBER LED.

MUTE: Channel number button (Red). Will mute channel fader output, all auxiliaries and direct out. Can be activated by Auto-Mute, (see Options) function indicated by RED LED.

OPTIONS

The LED Bar Graph contains 8 red and 12 green LEDs forming a 2" x 1" vertical bar and has peak reading characteristics. It has a larger range (30dB to +10dB) than is normally found on most mixers - particularly useful for exploiting the dynamic range of material to the fullest. Using the send/return switch the meter will indicate channel output level, controlled by the channel fader (or direct out) or the tape return level. This position will also show the Line input level when a tape return is not connected. The brightness of the meters can be varied to suit personal requirements with a master pre-set control located above Group 1 meter. Maximum horizontal viewing angle 170°.



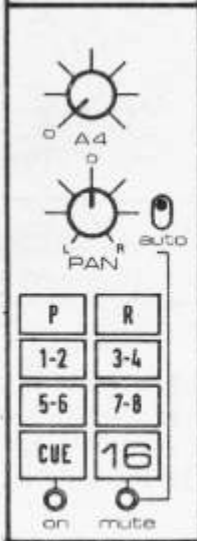
As a less expensive alternative to the LED bargraph system, we offer vertical moving coil VU meters. These have peak reading characteristics with a 1 second decay. They are illuminated and possess a standard VU scale (-20dB to +3dB). NOTE: Post switch same function as send/return switch. post = send.

The high and low pass filters are common to both types of metering modules. They are continuously variable between 11Hz (out) to 220Hz and 2.3kHz to 26kHz (out). The slope of both is 12dB per octave.

The Parametric module offers a highly flexible choice of channel equalisation frequencies with switchable 'Q' (curve widths). Each of the three independent parametric circuits have three associated controls to (A) select the frequency (B) cut or boost and (C) switch between a wide medium or narrow curve via the 'Q' switch. Q 0.7 - 1.5 - 3 per section. It should be made clear that this is a no compromise design that does not suffer from the drawbacks that many cheaper parametric and 'sweep' circuits produce. For example, there is no interaction between the three sections and the constant 'Q' design used means there is no instability or harshness. The LED overload is extremely useful in this module, for boosts of 30dB are possible.

The module is constructed as a mother board with a plug-in daughter board containing only the parametric circuitry. Therefore, the module can still function without the daughter board with the 'eq' switch out.

Other options include an auto-mute facility, transformer balanced outputs, ultra high performance limiter-compressor C30 fitted into all the main outputs (see separate data) patchable to channels or groups.



AUTO-MUTE is standard on 8 group output versions and fitted on request on 12/4 version and is used when more than 1 channel is required switched off (muted) at the same instance. Each input channel has a pre-select switch marked Auto. In this position the channel so selected can be muted as a group with the master auto button. This status is indicated both by the auto and channel mute LEDs illuminating; by reverse operation channel can be switched on as a group.

CHILTON

MASTER CONTROL PANEL

AUX. SEND /RETURN: A1 and A2 are the master aux. level controls which are intended as effect sends. The associated cue switch automatically over-rides the monitors for aural checks only. The aux. return signals are then controlled by twin fader (not shown) which can be addressed and panned to the selected busses.

AUTO BUTTON Master on/off. status shown by red LED (see options)

TALKBACK: A flush mounted microphone is fitted as shown which is activated by a hold-down Mic Button; this also dims the monitors by -20dB. This comprehensive Talkback System can be routed to all relevant outputs plus the separate Talkback output via push-button selection. The level is controlled by the associated GAIN control.

OSCILLATOR: A flashing LED indicates the oscillator is working both on 'IN' and 'OUT' positions. 'IN' means that the oscillator is ready to be routed to any output via the talkback routing switches. 'OUT' routes the oscillator only to rear jack socket. All frequency select buttons up 40Hz. Pressing any button is additive i.e. 1K + 5K + 10K = 16kHz

CUE CONTROL: is the master aural level for all cue function (incl. PFL) DIM: Lockable -20dB Monitor switch

MON: is the master level control for all monitoring functions

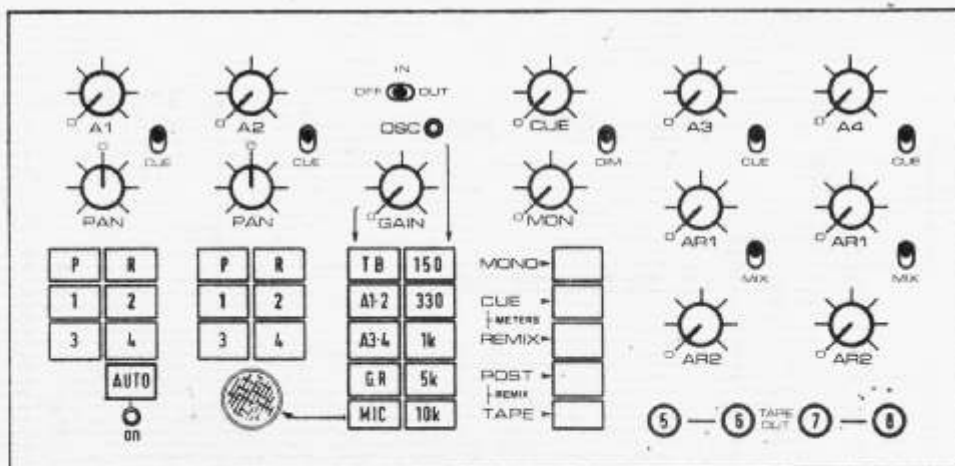
MONITOR MIX 12-4

(T9-16 on 16/8 and 24/8)

This module will allow a simulated mixdown to be heard whilst still filling up tracks or over-dubbing. It will also serve as a suitable A/B monitor unit for up to 8 tracks.

Either a tape return (from the same numbered input channel jack socket as corresponding to the numbered sequence on this panel) can be routed to any two, one or none of the auxiliary busses and/or by depressing the pushbutton labelled MON the same signal can be panned across either remix buss using the PAN and GAIN controls together.

Conversely, by depressing any pushbutton engraved 1 - 8 (underneath the PAN control on the panel) the tape output now overrides the tape return via the group output faders and associated TAPE OUT switches



MONO BUTTON: Switches monitors to mono mode. Also visual check of mono output level on cue meter. Note: Mono is a summation of the remix outputs

CUE BUTTON: Over-rides PPM 1 to give meter level checks on all cue functions including master aux sends.

REMI X BUTTON: Over-rides PPM 3 and 4 to indicate Remix output or Tape Return level

'POST' BUTTON: Switches monitors to post remix fader output or Tape Return. Mode selected by tape button. Use only during remix.

TAPE BUTTON: A-B Check on remix recording.

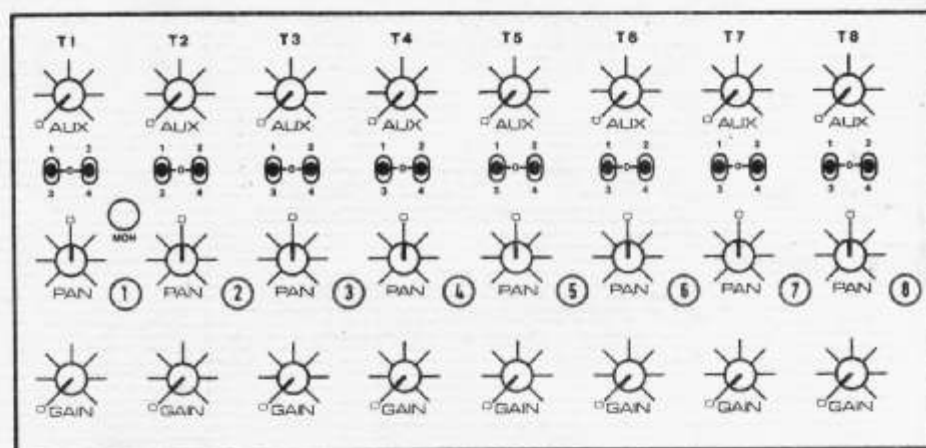
AUX SENDS: A3 and A4 are master aux level controls which are intended as foldback outputs. The associate Cue switch (Hold on) automatically over-rides the monitors for aural checks only.

AR1 AR2: These allow the effects in use via aux returns 1 and 2 to be mixed into either or both foldback mixes, independent of the return fader setting (i.e. Pre fader)

MIX: This will add a mono signal of the remix outputs to the foldback mix (A3-A4) for over-dub etc.

TAPE OUT: These push buttons route the 4 (or 8) group outputs to the 8 (or 16) tape outputs for tape track selection as follows:

Group 1 Button UP - 1 DOWN - 5
Group 2 Button UP - 2 DOWN - 6
Group 3 Button UP - 3 DOWN - 7
Group 4 Button UP - 4 DOWN - 8



These 4 switches route the four group outputs to the 8 tape outputs (on the back of the mixer) in the following manner:-

GROUP 1 To No. 1 or 5 tape output
GROUP 2 To No. 2 or 6 tape output
GROUP 3 To No. 3 or 7 tape output
GROUP 4 To No. 4 or 8 tape output

The selected tape output is then assigned to the relevant engraved pushbutton on the monitor module.

It should be noted that when using this module for monitoring, the remix busses are used to carry the signal to the monitors, therefore the POST pushbutton (on the main control sections monitoring switch array) should be UP to connect it to the monitor system independent of the remix fader.

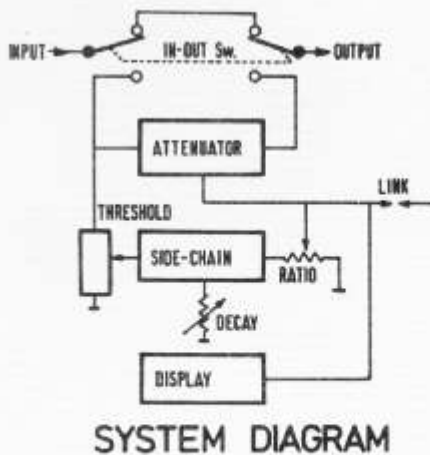
C 30 COMPRESSOR SYSTEM

Specification

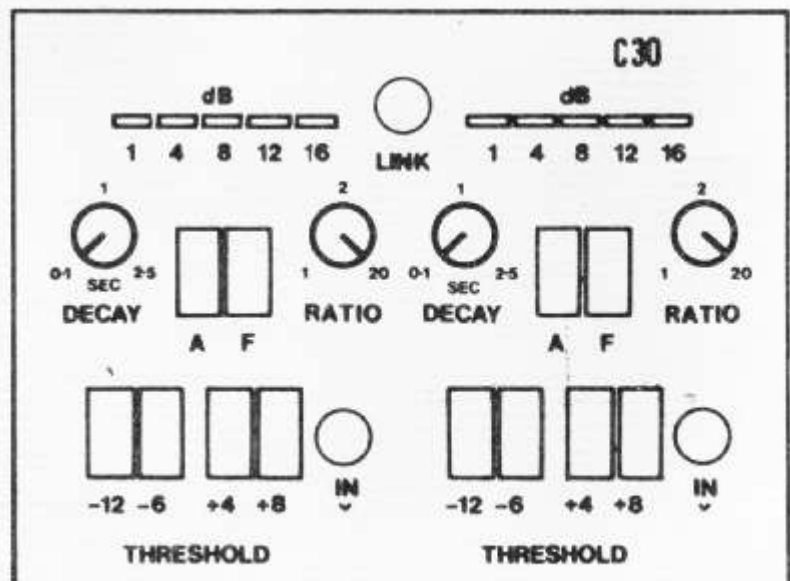
THRESHOLD	4 Push buttons set the threshold. They are usable in any combination and give almost uniform coverage in nominal 2dB steps from -18dBm to +12dBm except (-16dBm & 10dBm)
COMPRESSION	Continuously variable from 1:1 to a limit ratio of 20:1
INDICATION	5 Red LEDs at threshold (1dB gain reduction) -4 -8 -12 & -16dB gain reduction
RELEASE	Continuously variable 100mS to 2.5Secs
ATTACK	Push button F choice of fast 250uS or slow 2.5mS
AUTO (RELEASE)	Push button A fast release (100mS) for isolated peaks and 2.5Secs for sustained levels
STEREO LINKING	Provides linking of other side-chains to attenuate output signal with mismatch of only 0.15dB under all conditions
FREQUENCY RESPONSE	Under any condition of level and compression 20Hz to 20kHz \pm 1dB into 600 ohms
INSERTION GAIN LOSS	At no compression or 1:1 ratio \pm 0.5dB By-pass switch loss 0dB
DISTORTION	At 1:1 ratio @ +10dBm in 0.01% @ 1K At Limit (long release setting) 1kHz 0.03%
Z In	Nominally 10K unbalanced
Z Out	Nominally 10ohms output +19dBm into 600 ohms
NOISE	Lower than -80dBm 20Hz to 20kHz (-88dBm @ +8 Threshold)
POWER	Consumption 24v @ 60mA per channel
CONTROL VOLTAGE FEED THROUGH	-65dB
COMPRESSION LAW LINEARITY	Worst case at limit, no variation greater than \pm 1dB range over 36dB gain reduction range

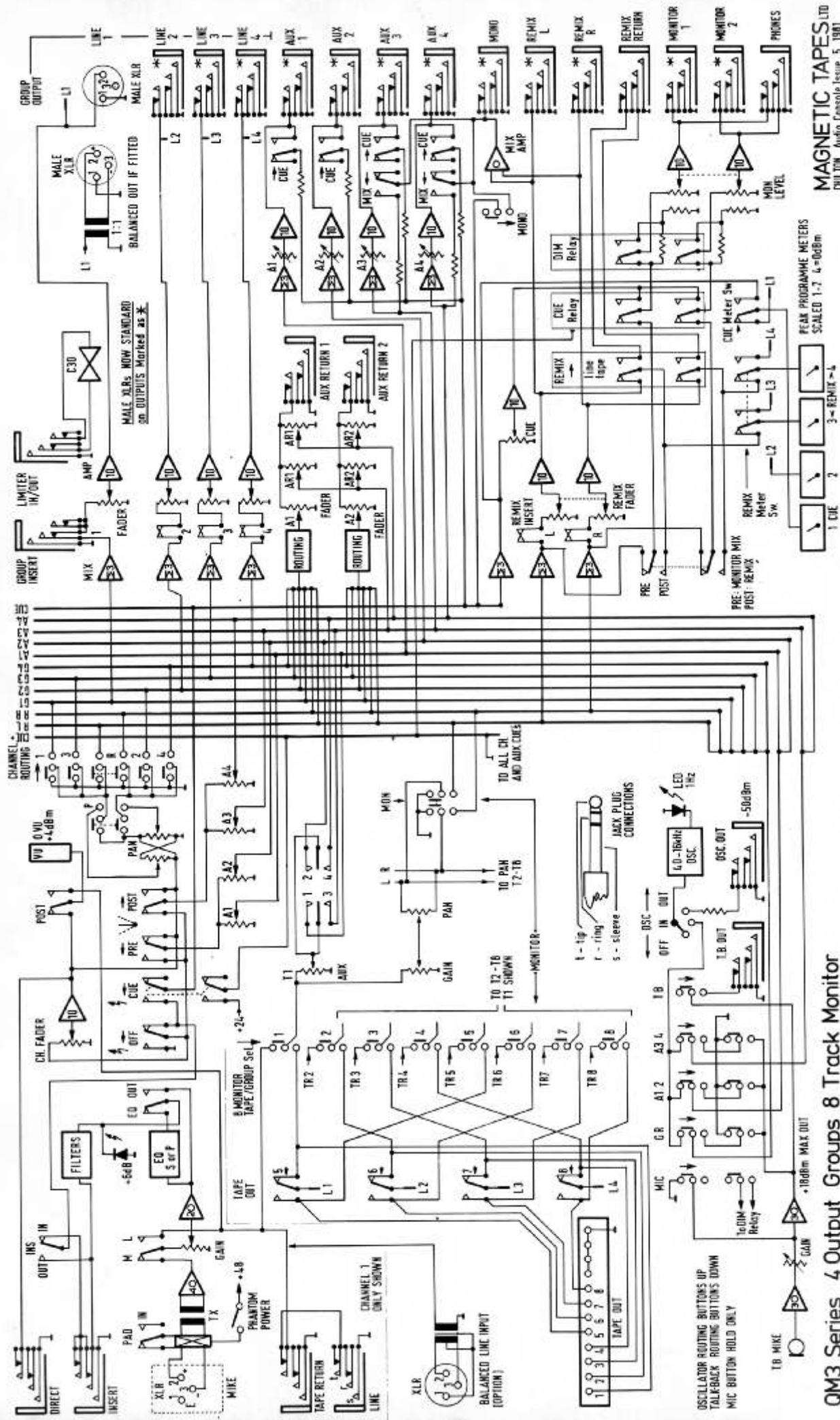
NOTES

COMPRESSION	law is a true ratio not an approximation as is achieved with C25 gating level reducer and other cheap FET units.
GAIN REDUCING	element employs novel variable nepor generator approach to achieve repeatable attenuations. This permits lower distortion, better tracking, no FET matching or drifting, and allows the control voltages of up to 8 units to be ganged. It also allows accurate display of gain reduction called for by using LEDs (accurate to \pm 0.3dB) Noise floor is also lower than is common with FET units and does not alter when higher thresholds or ratios are used. The noise level falls with gain reduction thus achieving a constant nearly 110dB of dynamic range.
THRESHOLD	Setting with push buttons gives very wide range of 30dB in approximately 2dB stops.
INDEPENDENT	Side-chain uses feed forward technique and speeds up attack time. It could also permit use of a forward delay time to completely eliminate overshoot even on slow attack times.
SIDE-CHAIN	design means that all controls are non-interactive and that providing there is no reduction in action, any adjustment of the controls does not interfere with the signal passing through.



SYSTEM DIAGRAM





MAGNETIC TAPES LTD
 CHILTON Audio Console Issue 5 1981

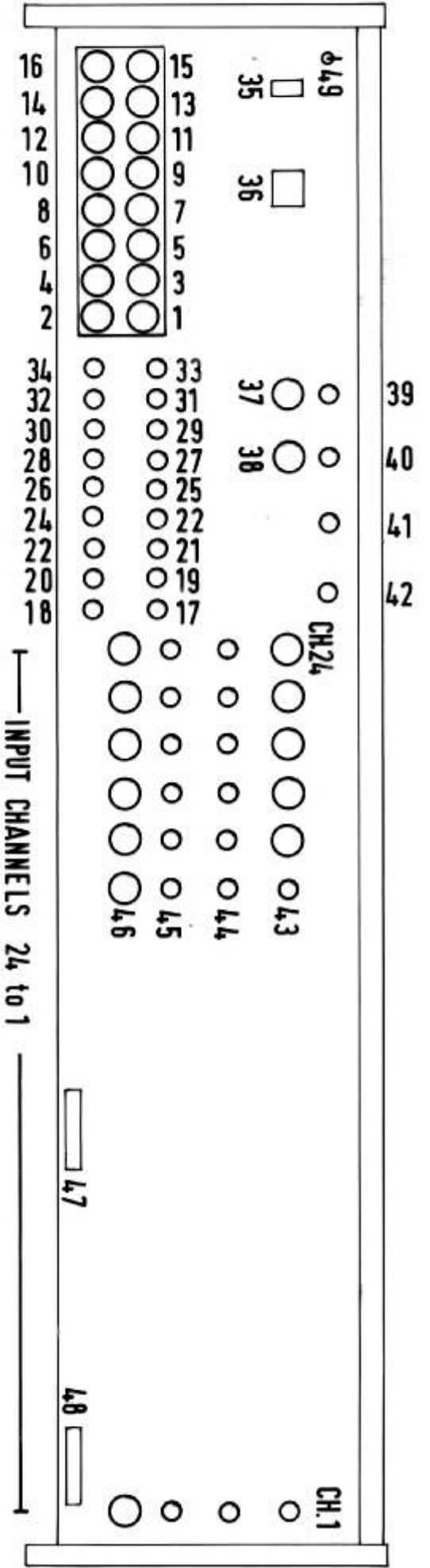
PEAK PROGRAMME METERS
 SCALED 1-7 4-0dBm
 1 CUE 2 3-4 REMIX-1

OM3 Series 4 Output Groups 8 Track Monitor

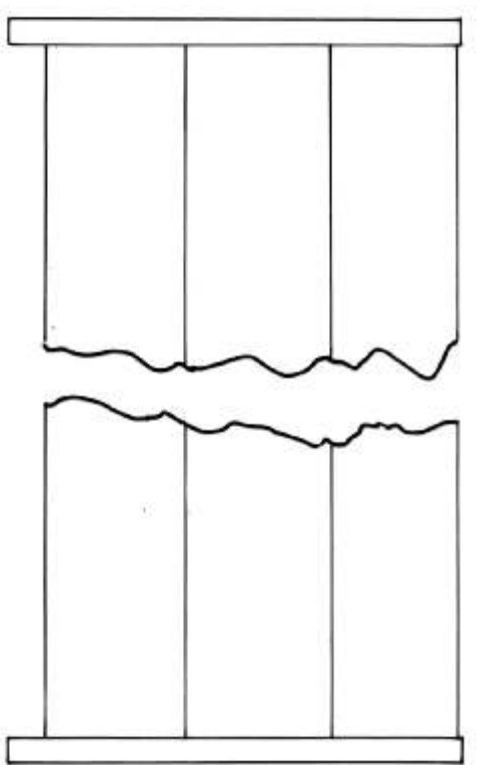
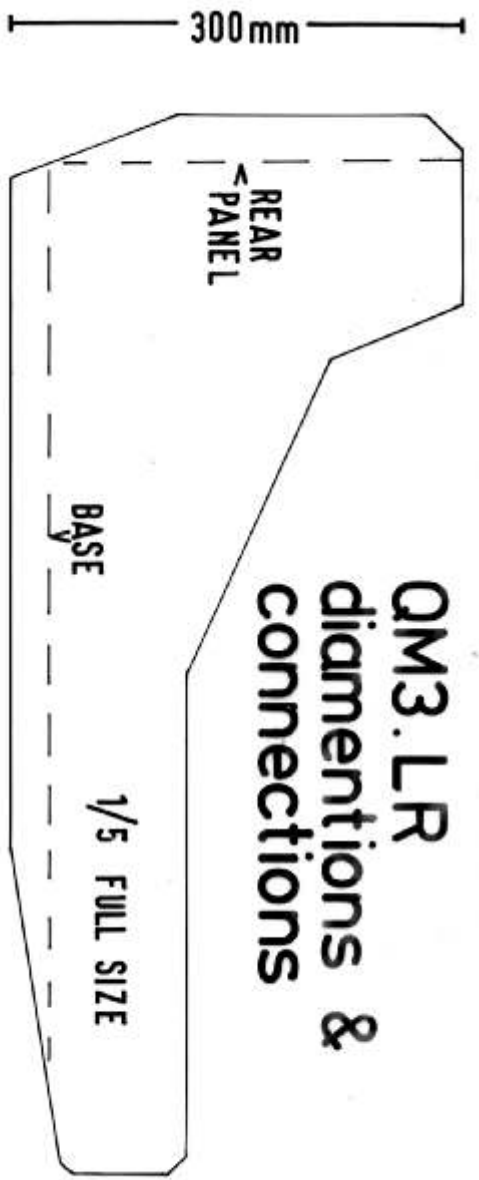
QM3 LR REAR CONNECTIONS

1	G1	}	Group Out Balanced	27	A1	}	Auxiliary Returns
2	G2			28	A2		
3	G3			29	A3		
4	G4			30	A4		
5	G5			31	MON (CUB)	Monitor Output Stereo	
6	G6			32	MON 2	Monitor Output Stereo	
7	G7			33	MAIN RET.	not connected, use 37-38	
8	G8			34	OSC.	Test Oscillator Output	
9	A1	}	Auxiliary Out Balanced	35	Supply Input	8 way	
10	A2			36	Spare	20 way connector not wired	
11	A3			37	Tape Return Right	} Balanced Input	
12	A4			38	Tape Return Left		
13	MONO OUT		Balanced	39	C30 4	} Limiter Compressor Jack : in-out Tip: output Ring: input	
14	T.B. Talk-back Out			40	C30 3		
15	MAIN L	}	Master Stereo Balanced Out	41	C30 2		
16	MAIN R			42	C30 1		
17	ML	}	Main Left Main Right	43	LINE INPUT	Balanced Channels 20 to 24 only	
18	MR			44	DIRECT OUT		
19	G1	}	Inserts	45	INSERT		
20	G2			46	MIC.	Microphone Inputs Balanced	
21	G3			47	Connector 32 way	} Not Wired	
22	G4			48	Connector 32 way		
23	G5			49	+48v. Master Phantom Power Switch		
24	G6						
25	G7						
26	G8						

- A Male XLRs on all balanced outputs (except T. B.)
- B Female XLRs on all balanced inputs
- C All insert jacks wired: Tip-Return
Ring-Send
Sleeve- NC
- D All stereo jacks wired: Tip-Left
Ring-Right
Sleeve- Common
- E All mono jacks wired: Tip-Live
Ring-Common
Sleeve-NC

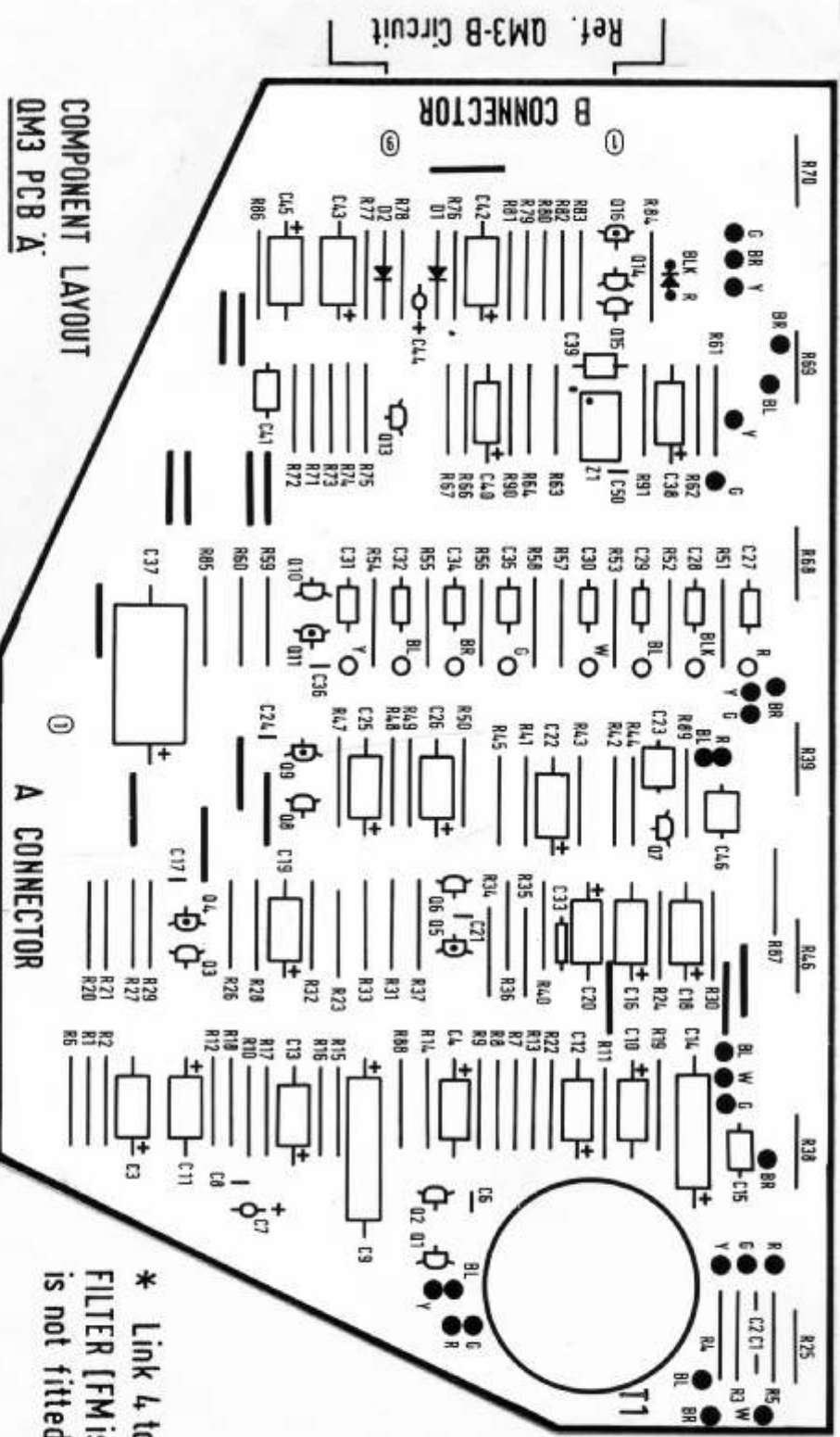


QM3.LR dimensions & connections



700mm
SIDE

1504mm
FRONT



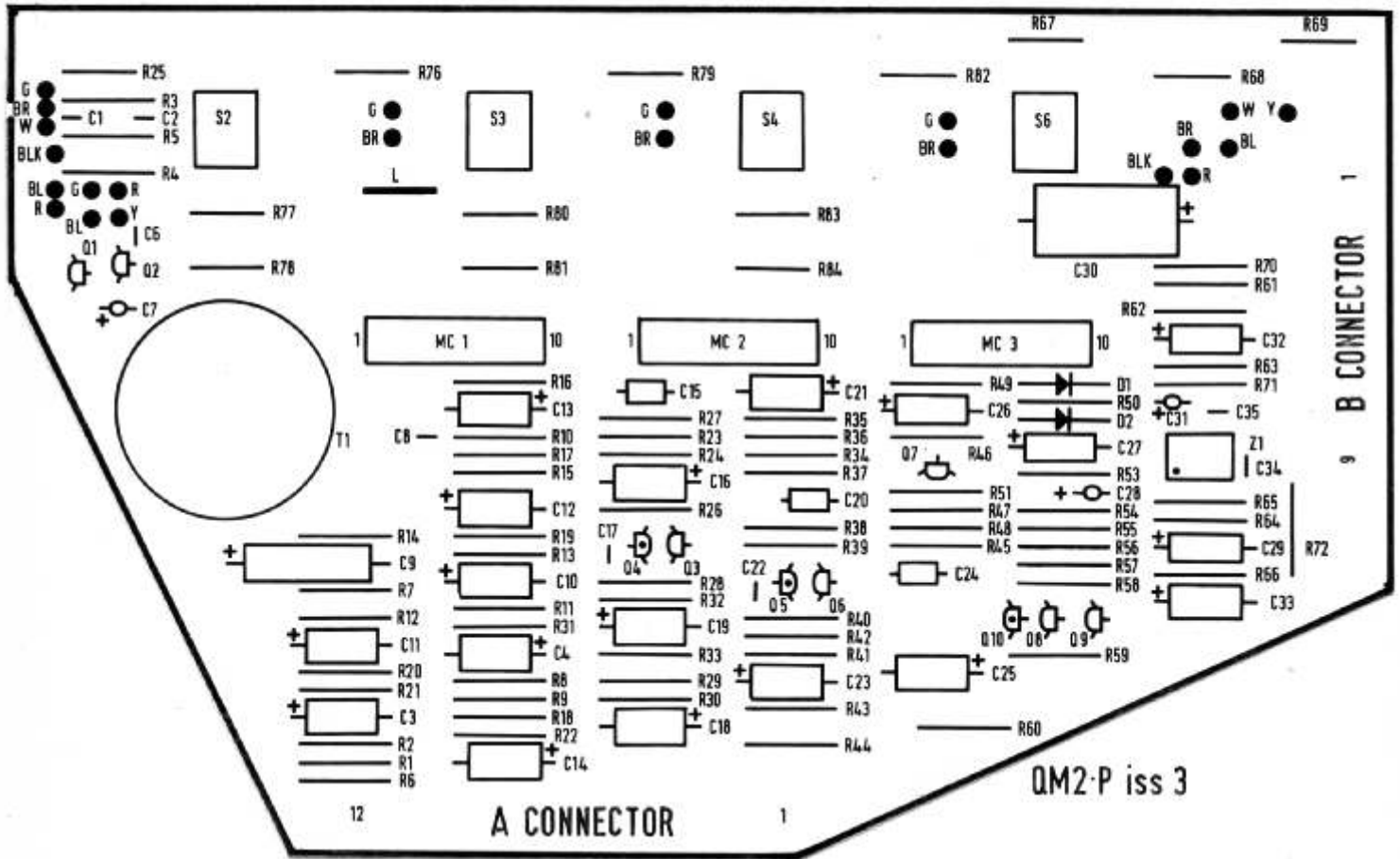
COMPONENT LAYOUT
QM3 PCB A

- 1. +24 to FILTERS
- 2. *
- 3. INSERT JACK tip
- 4. EQ OUT to FILTERS
- 5. DIRECT OUT
- 6. INSERT JACK ring
- 7. LINE INPUT
- 8. - COMMON
- 9. MIC INPUT +
- 10. MIC INPUT -
- 11.
- 12. +48 INPUT

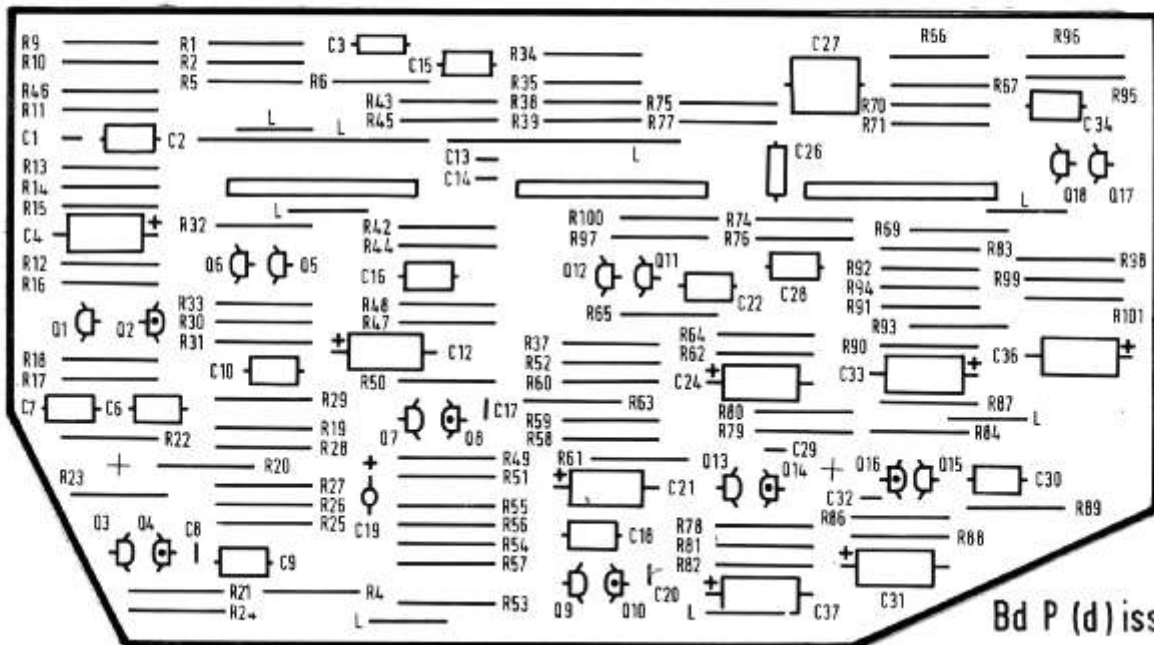
* Link 4 to 6 when
FILTER [FMissC] PCB
is not fitted.

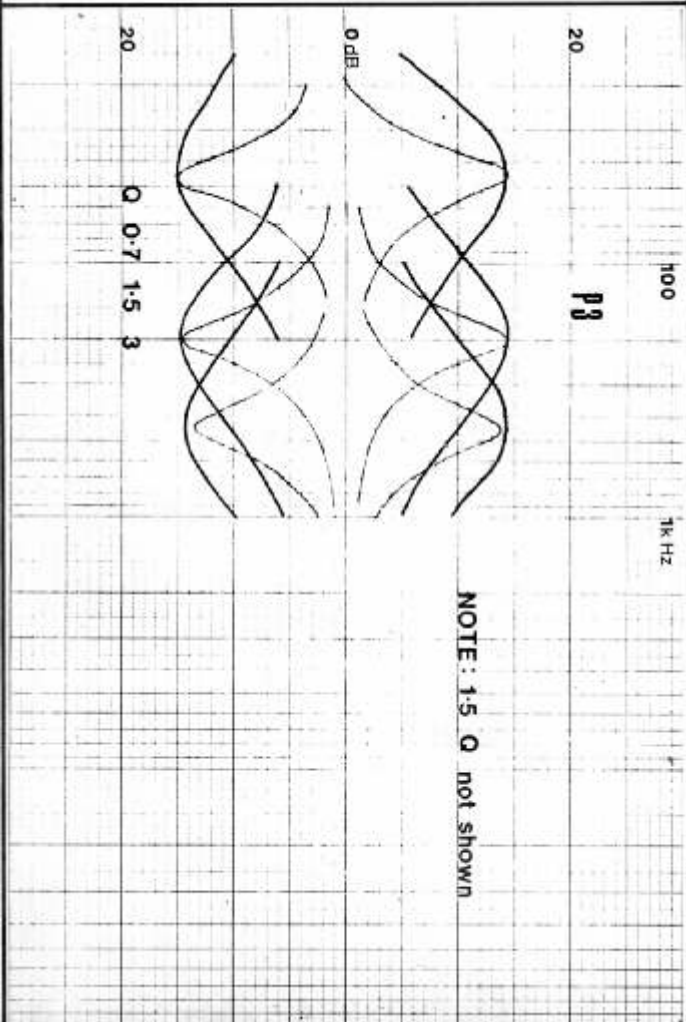
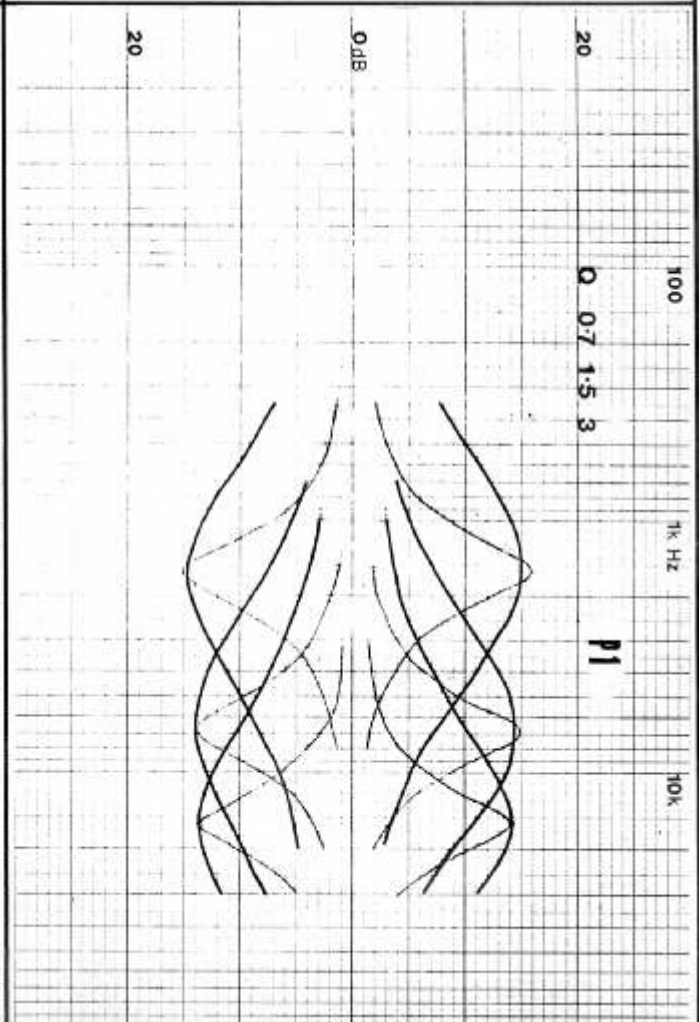
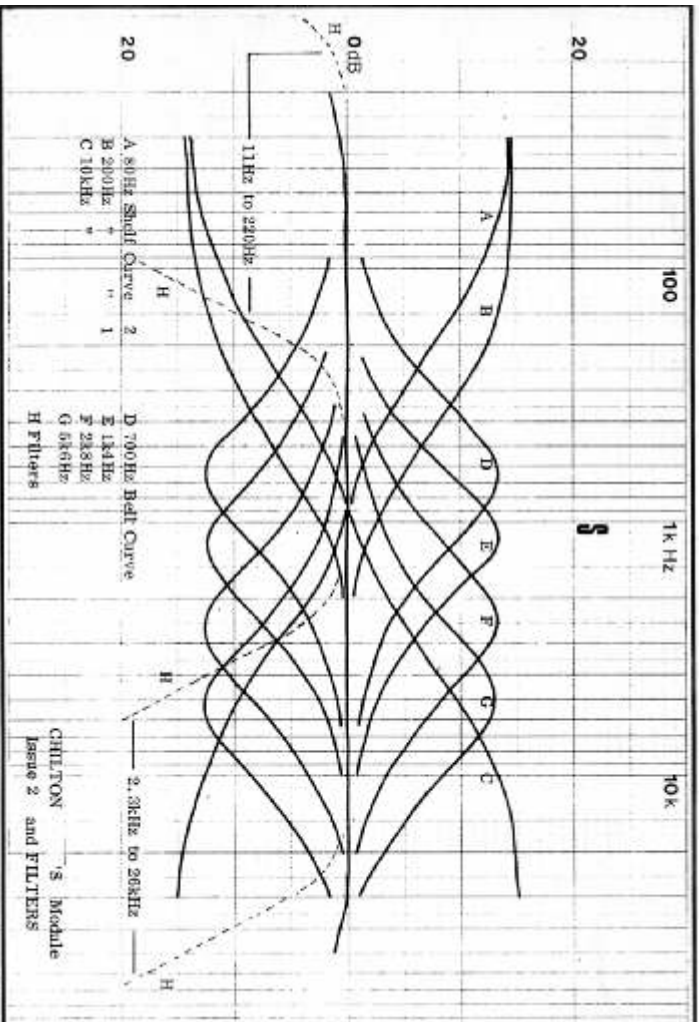
Ref. QM3-B Circuit

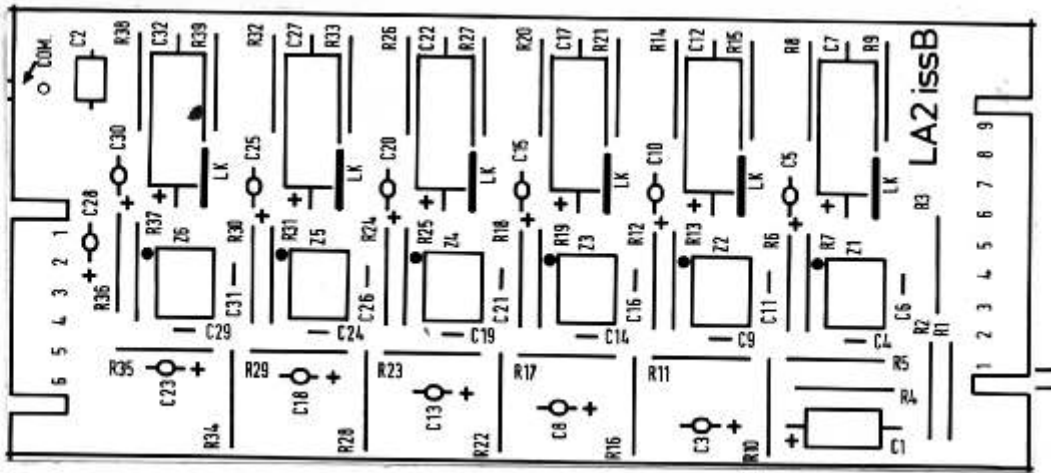
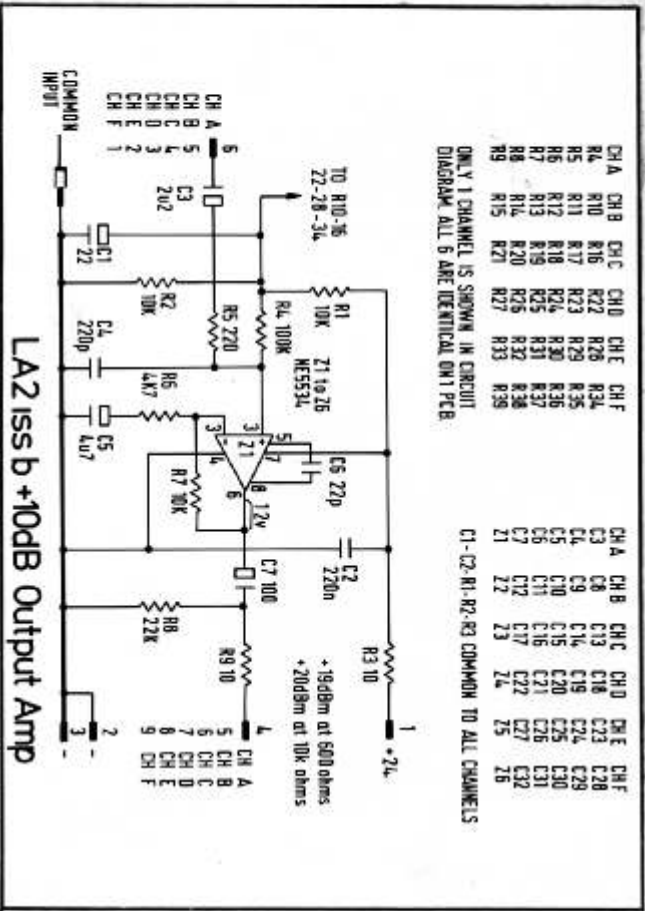
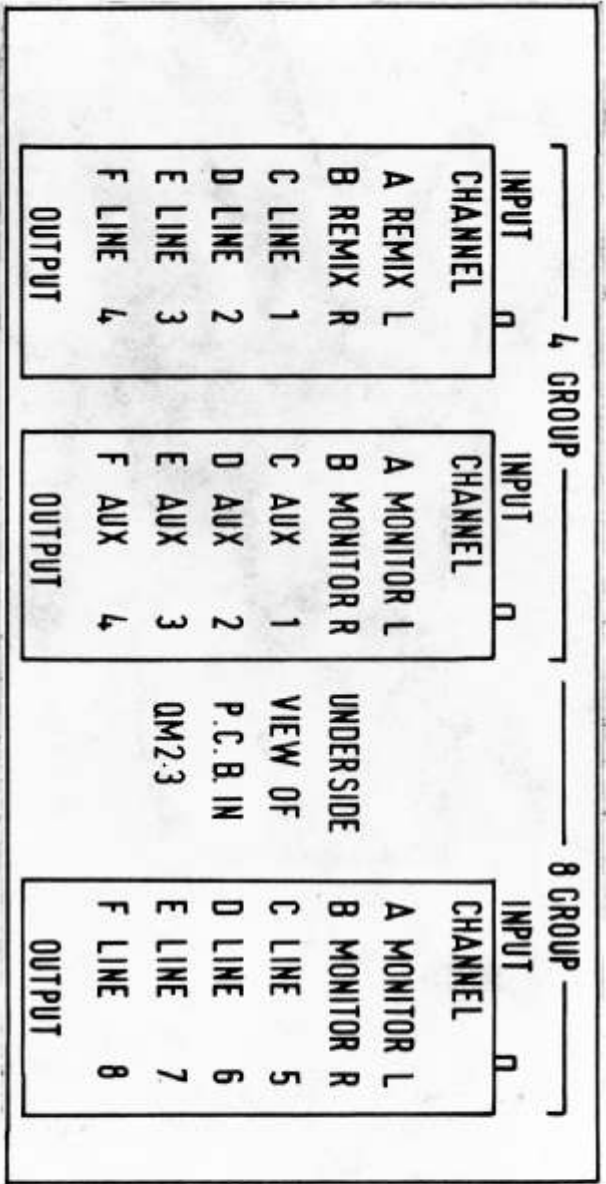
COMPONENT LAYOUT PARAMETRIC MODULE

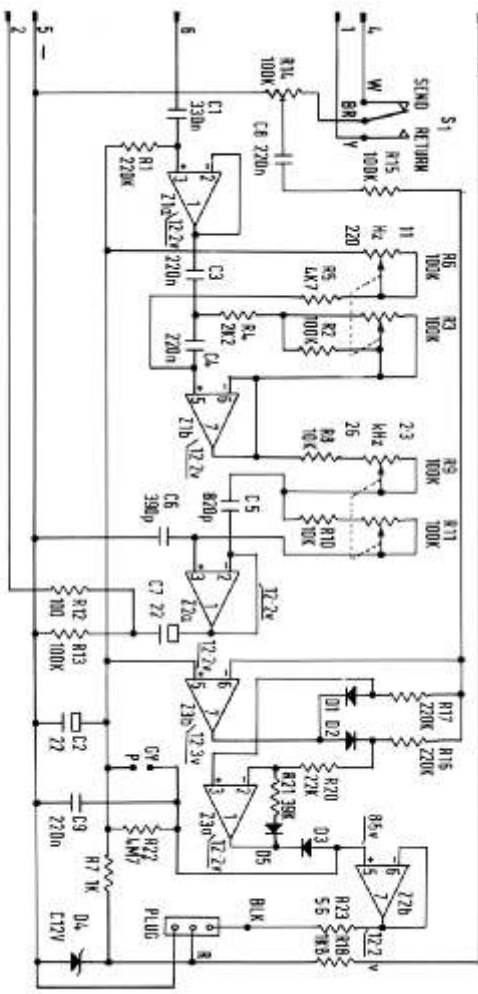


CONNECTOR A and B Ref QM3 PCB A



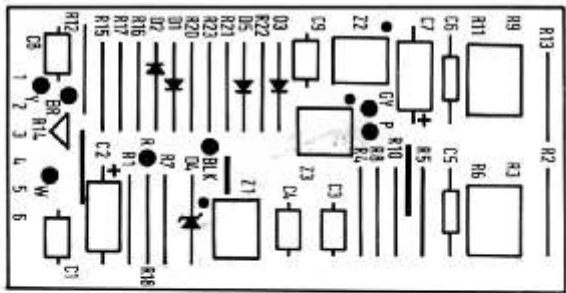




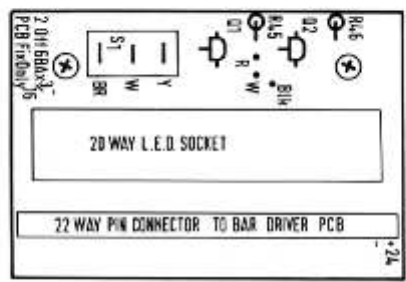


8 7 5 5 PWB - 2L
 1 2 3 4 PWB 4 - Y
 D1235 GP Silicon Diode
 D6 82V80 12V

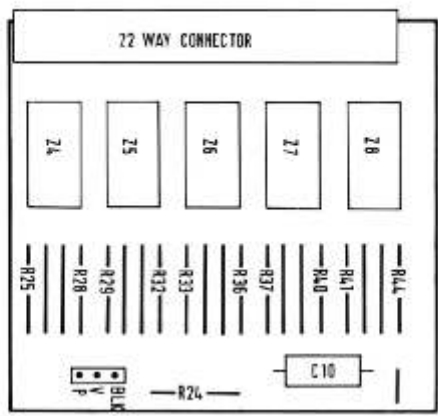
OM3 Filter PCB (FM iss c)



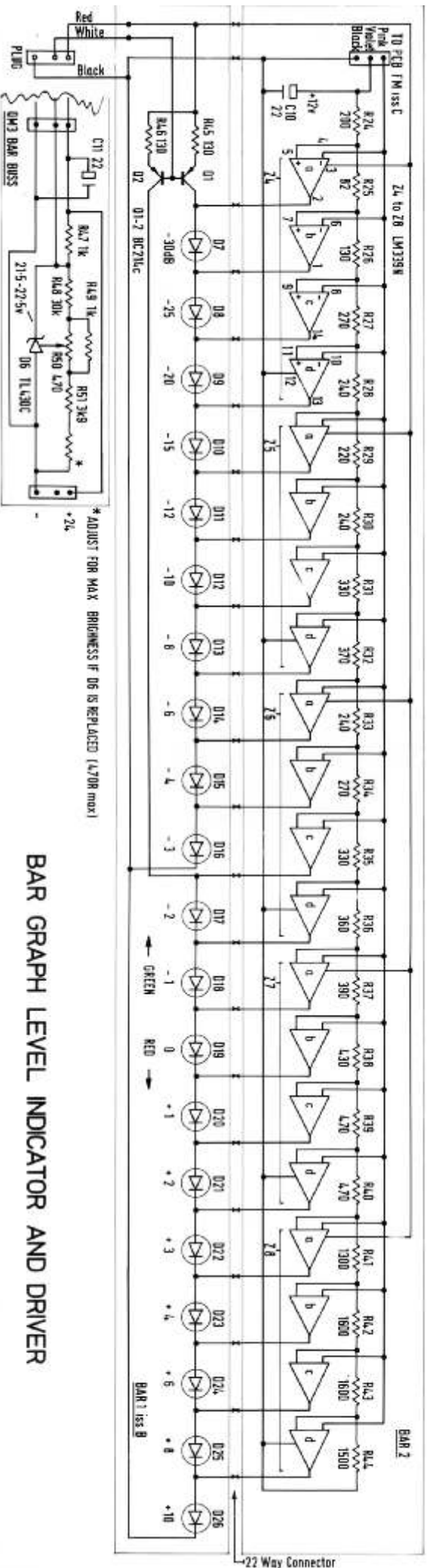
FM iss c



BAR 1 iss b



BAR 2 LED Driver



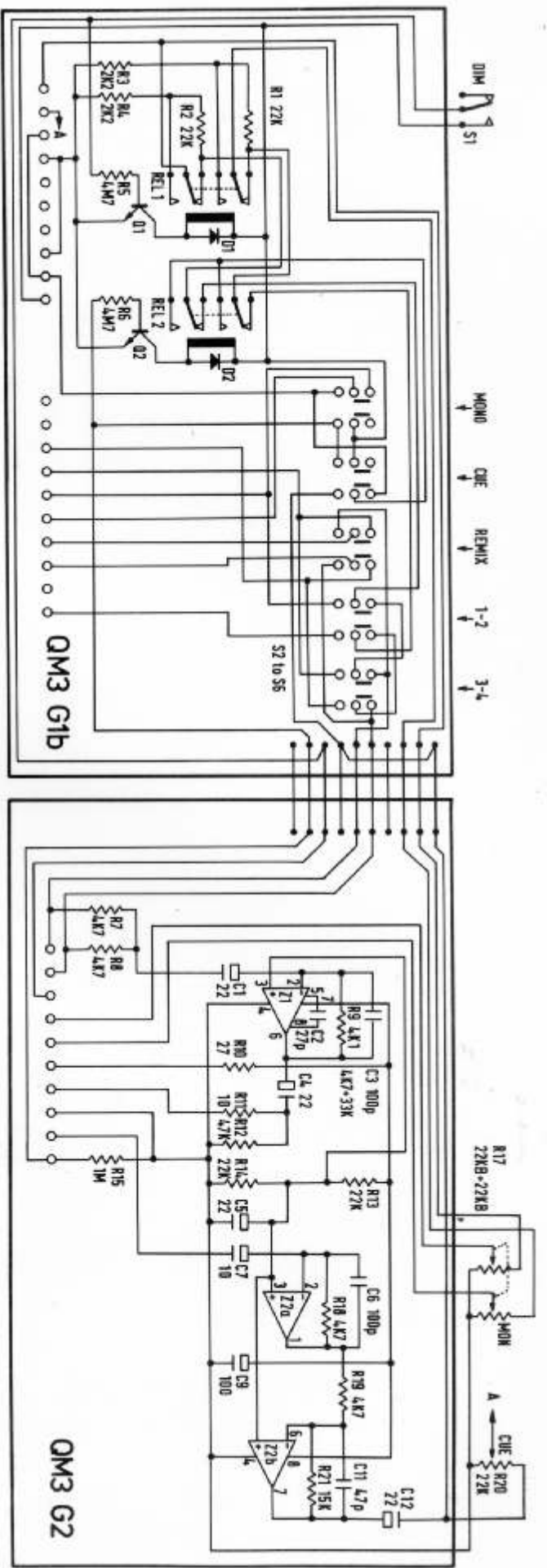
*ADJUST FOR MAX BRIGHTNESS IF D6 IS REPLACED (L70R max)

BAR GRAPH LEVEL INDICATOR AND DRIVER

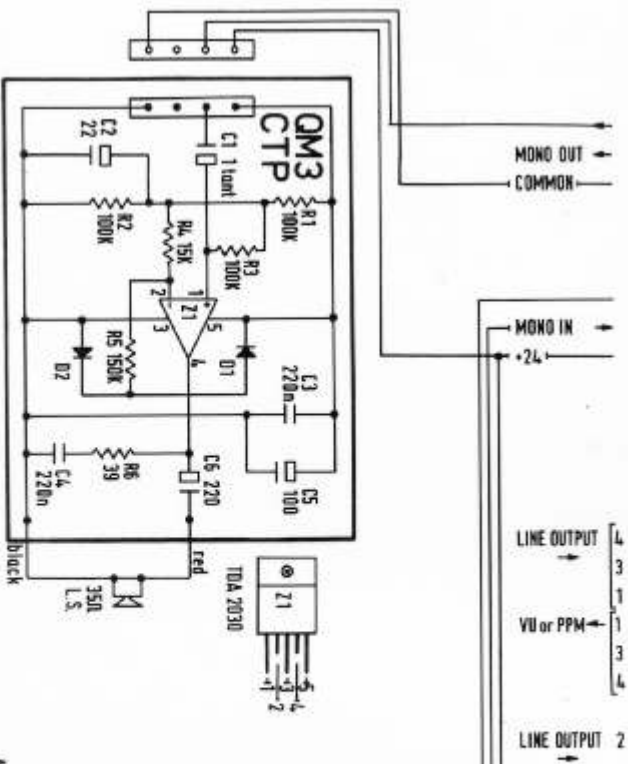
BAR 1 iss B

BAR 2

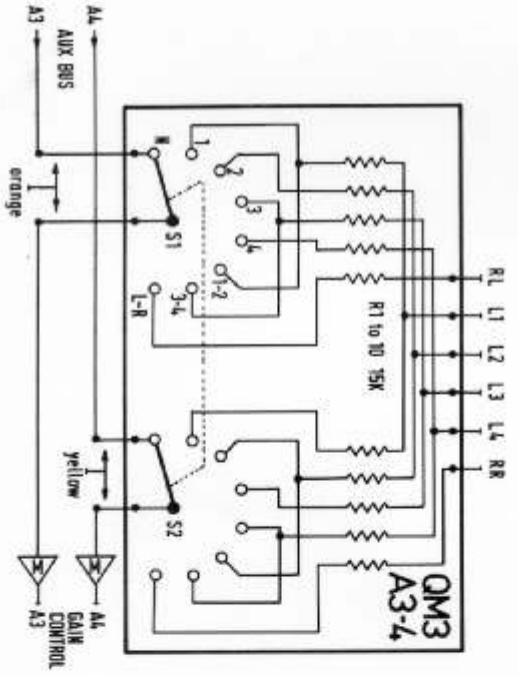
22 Way Connector



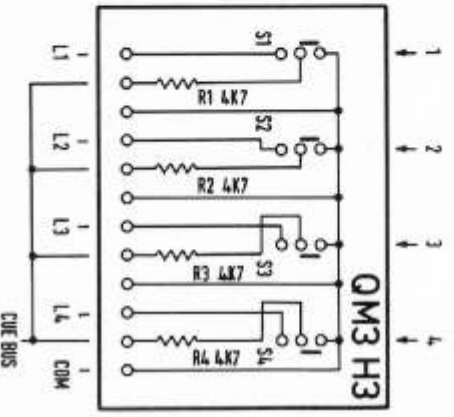
Monitor / Cue Module



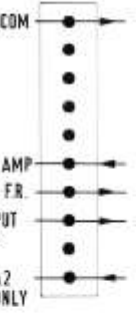
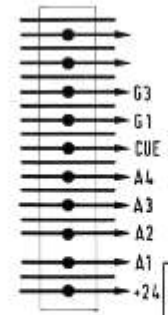
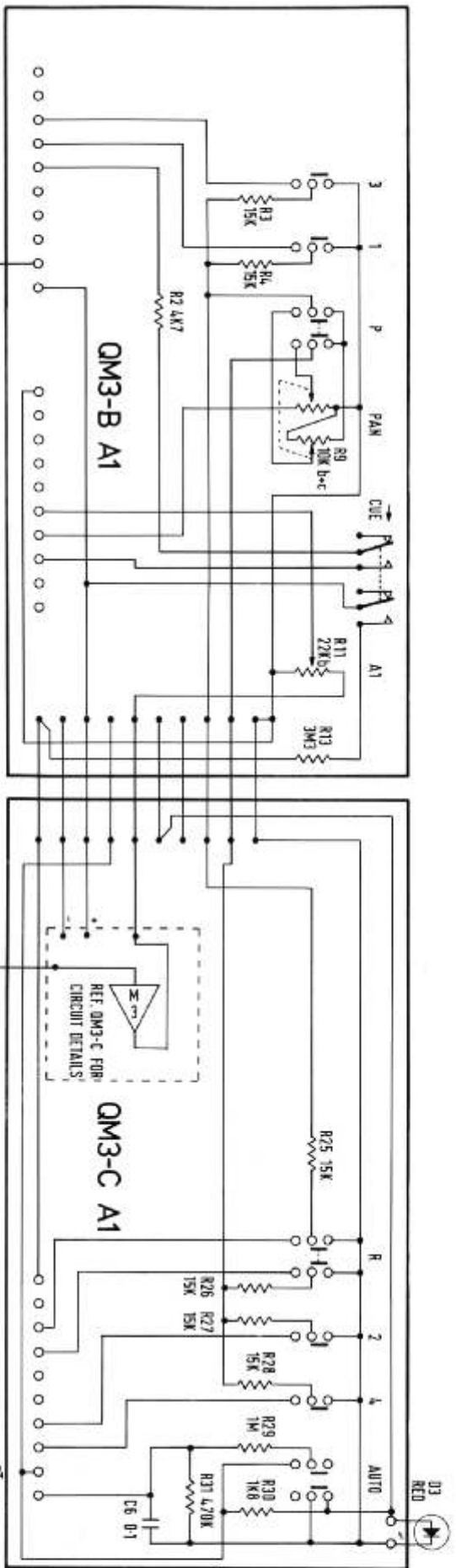
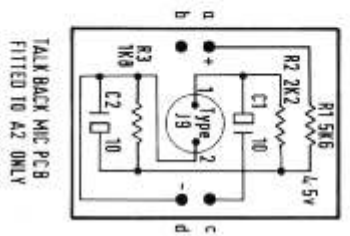
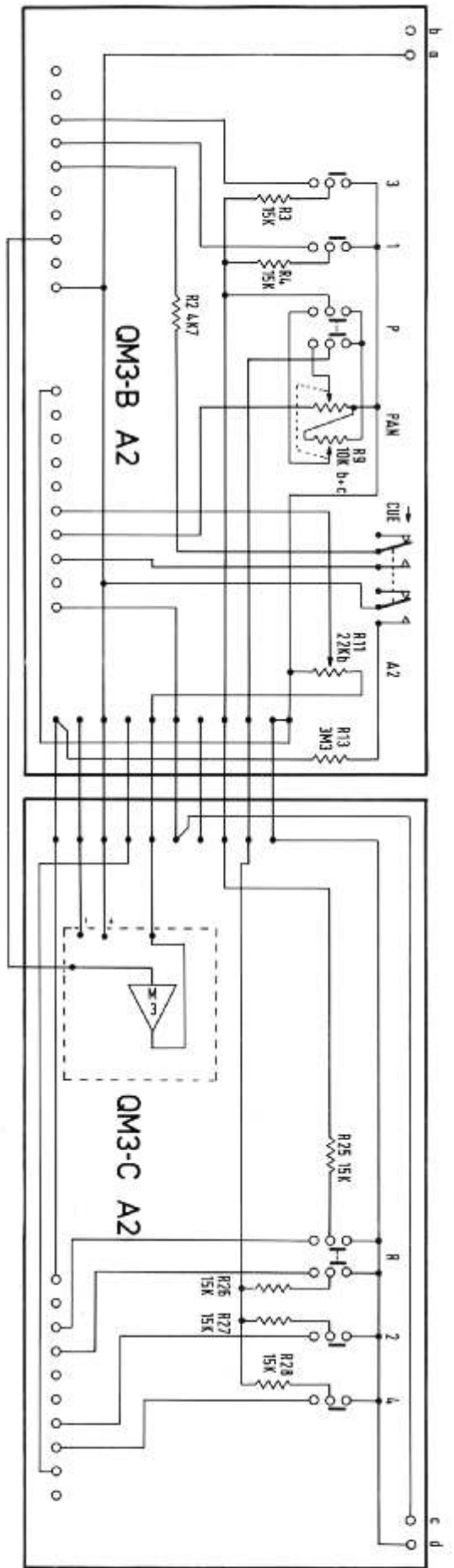
Cue L.S. Amp.



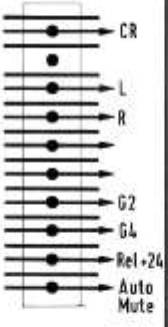
A3-A4 Select Sw PCB

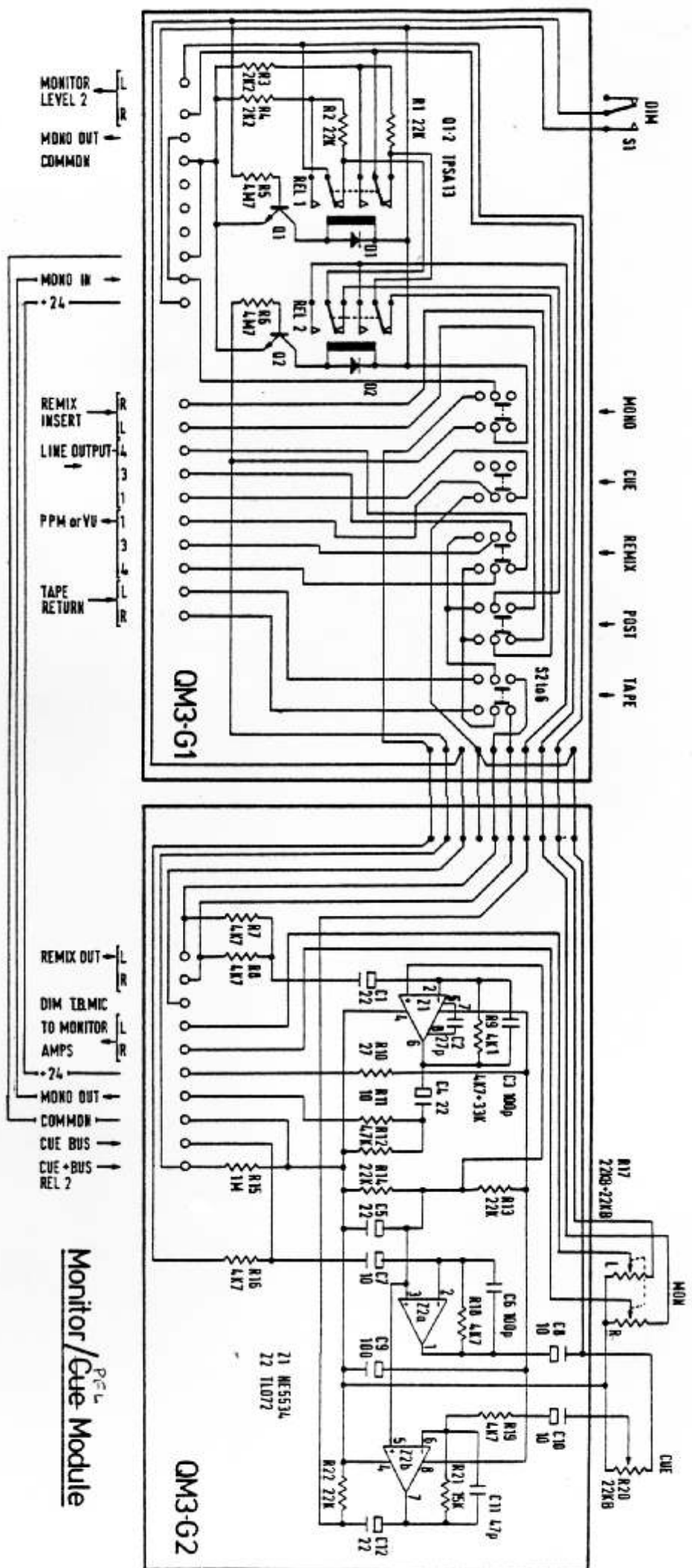


Group Assign to Cue

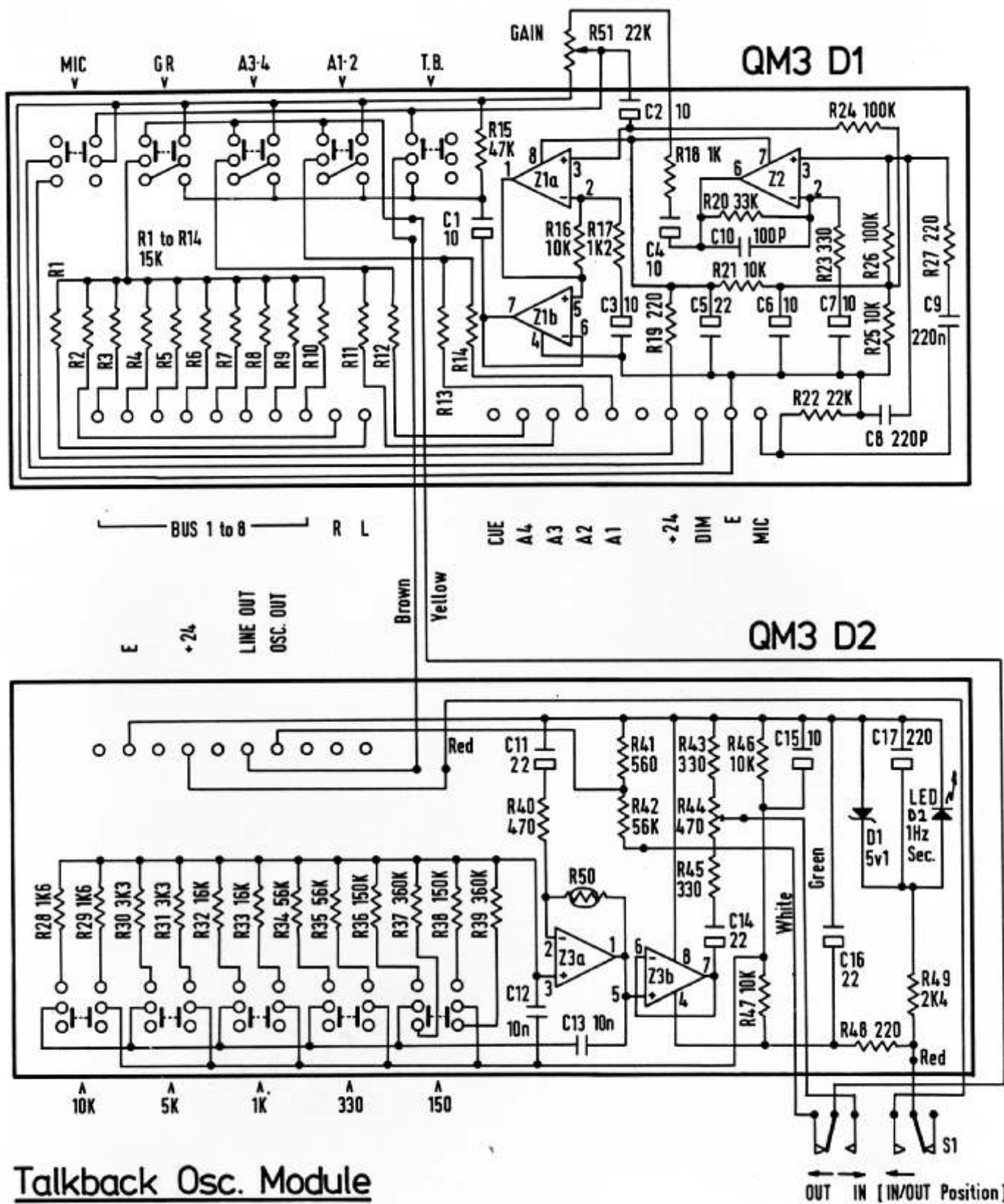


NOTE: CR Marked CUE+
on Schematic

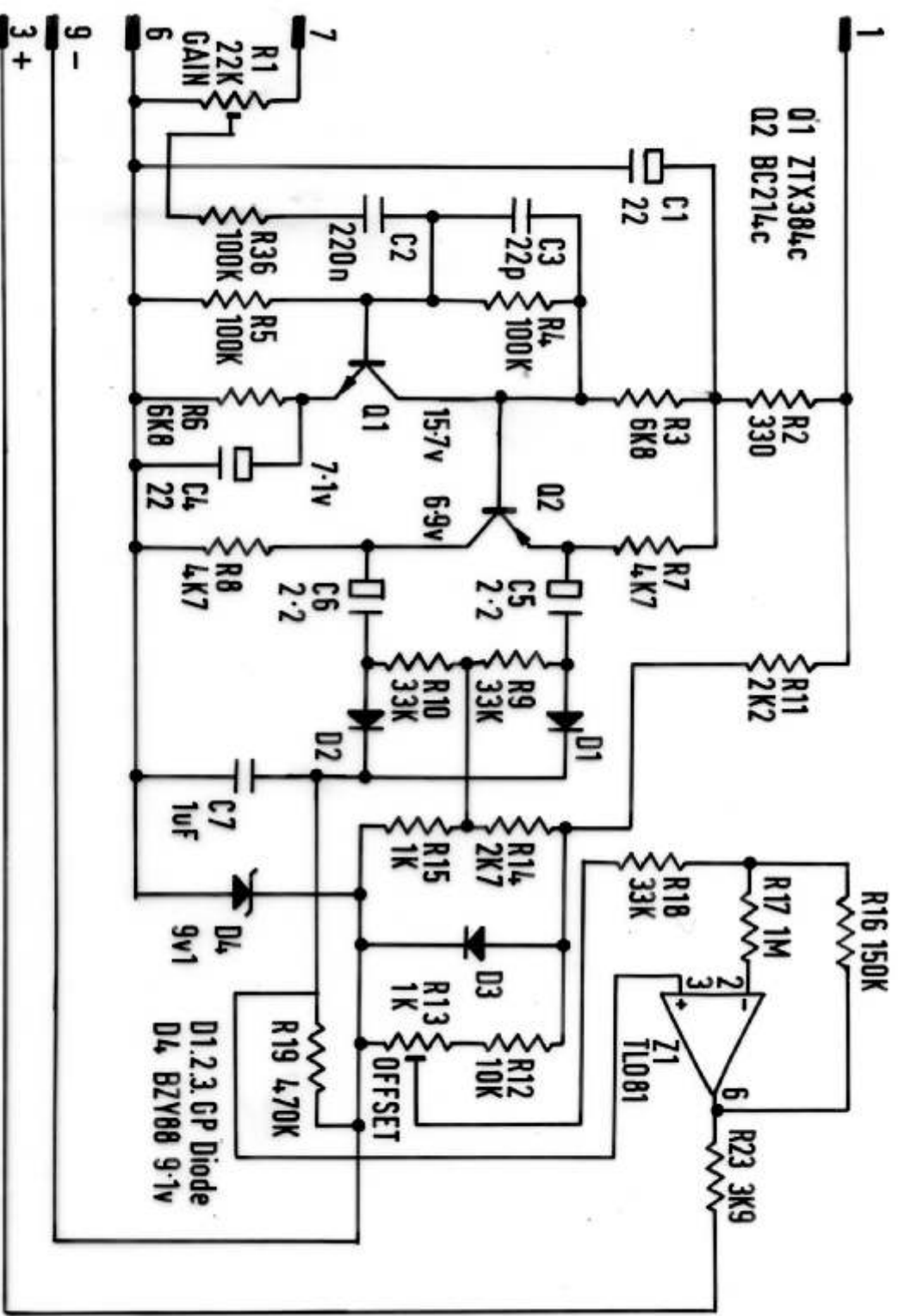




Monitor/Cue Module
PCL



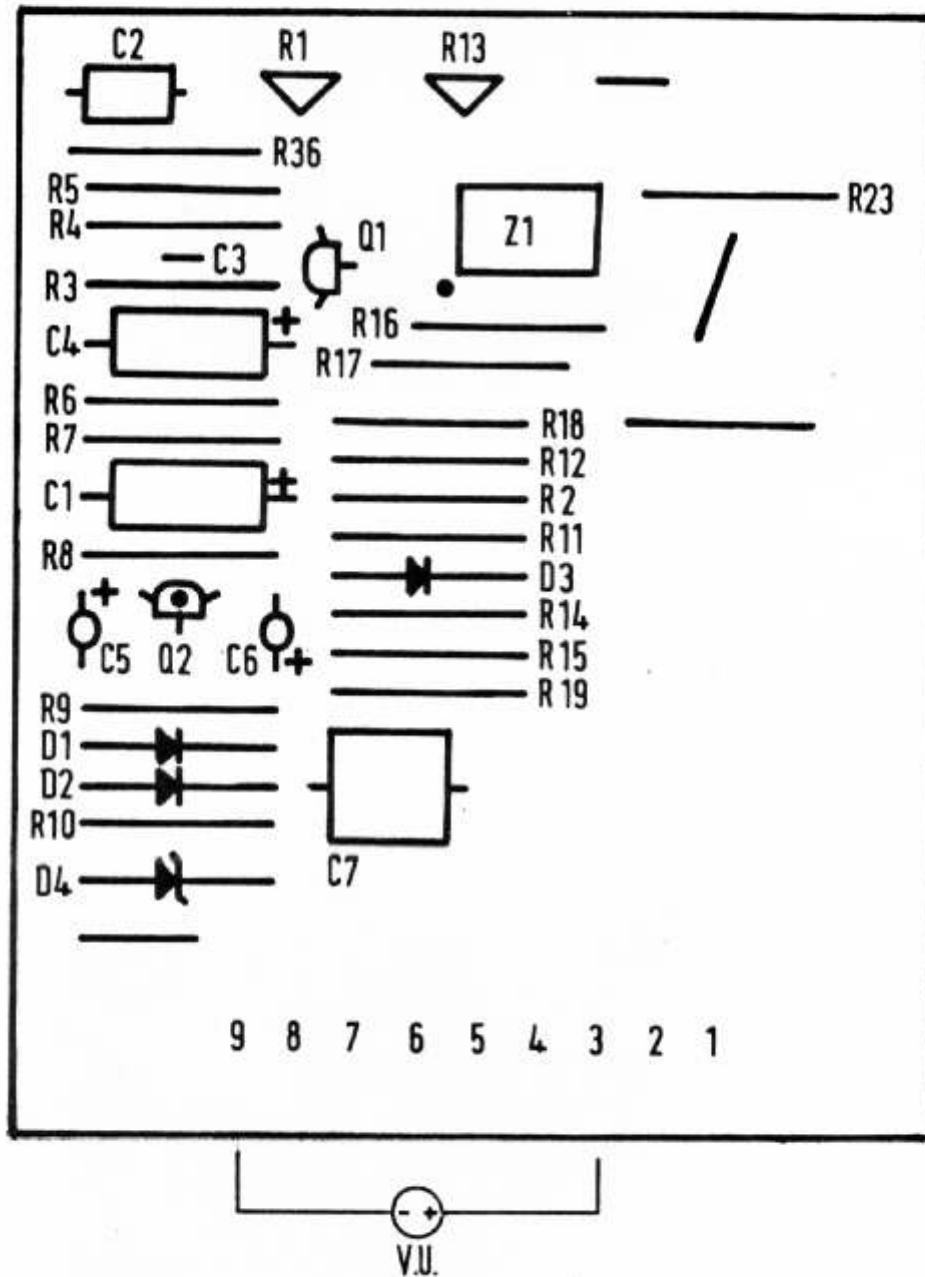
Talkback Osc. Module



QM3 - V.U. PCB [QM2 Miss 2]

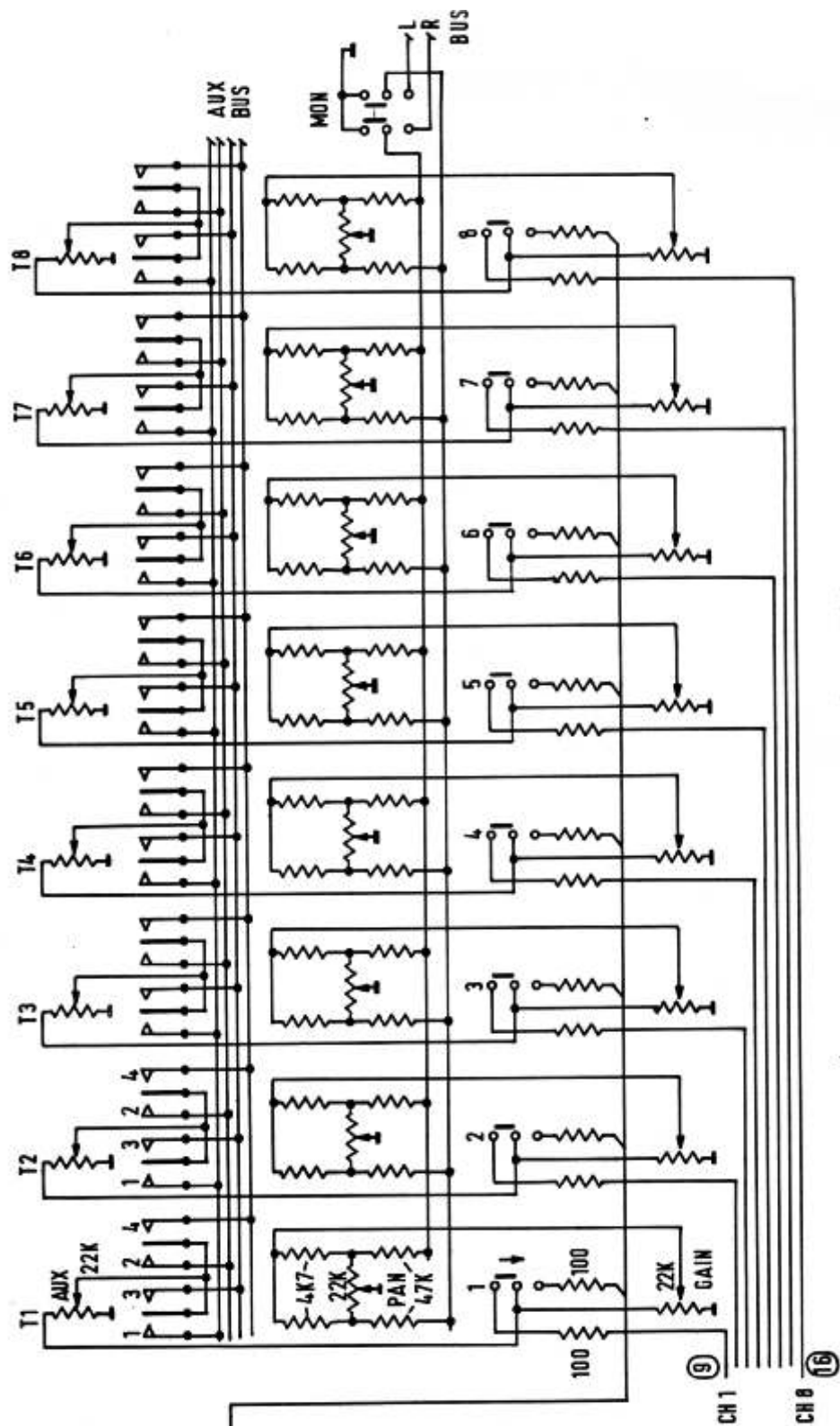
PRE-SET ADJUSTMENT:

1. Adjust offset (R13) to read 0 (mechanical zero) with no signal input.
2. 1kHz input level + 4dBm adjust R1 for meter reading 0 VU.

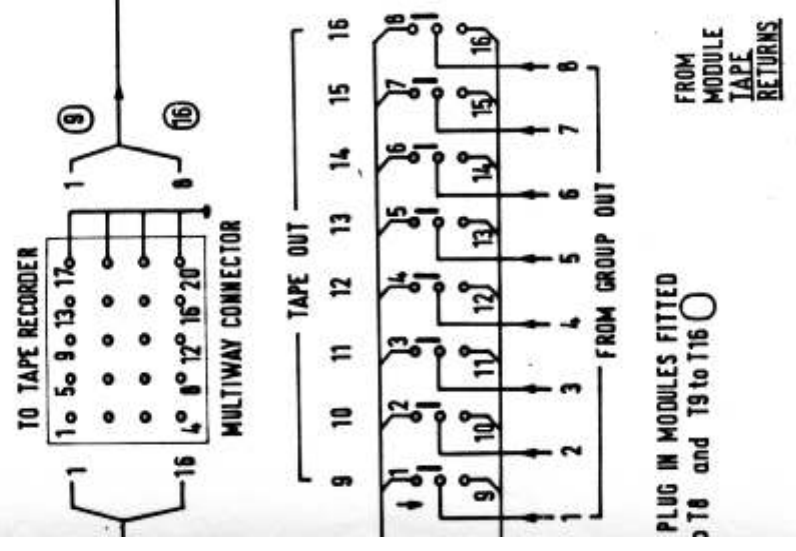


Numbers on Connector

QM3 - VU. PCB (QM2 M iss 2)

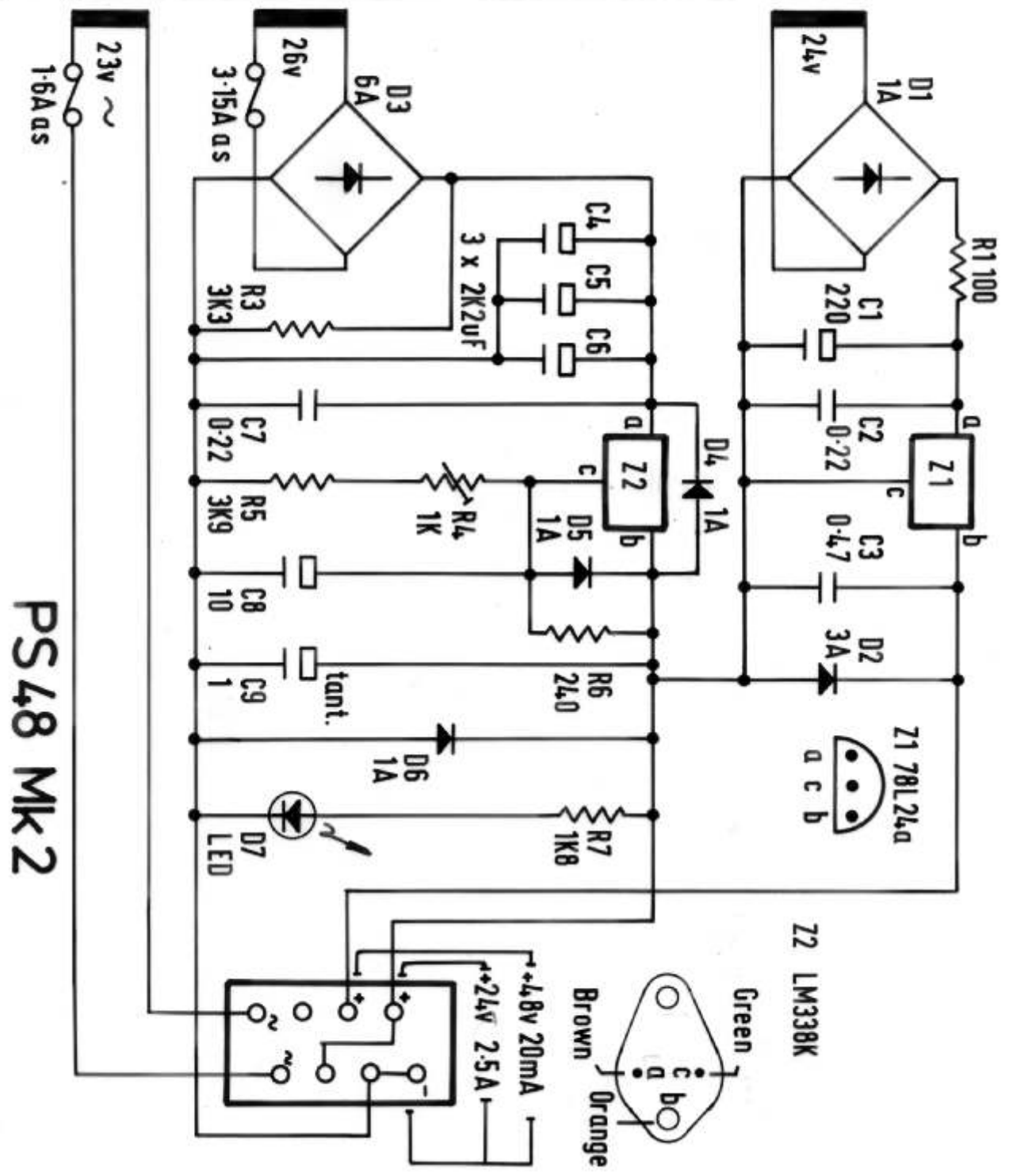
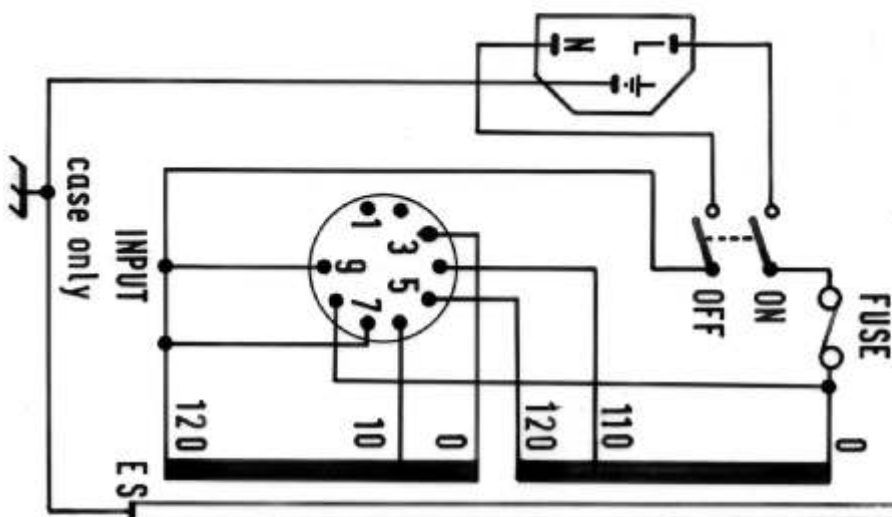


QM3.16 LINE TAPE to STEREO MIX



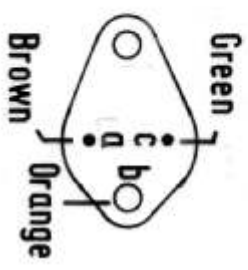
PLUG IN MODULES FITTED TO T8 and T9 to T16

110v 4-9 6-8 LINKED
 120v 3-8 5-7 ..
 220v 2-7 4-6 ..
 240v 1-6 3-5 ..
 50/60Hz ..
 110v 1amp anti-surge
 220v 0.6amp ..

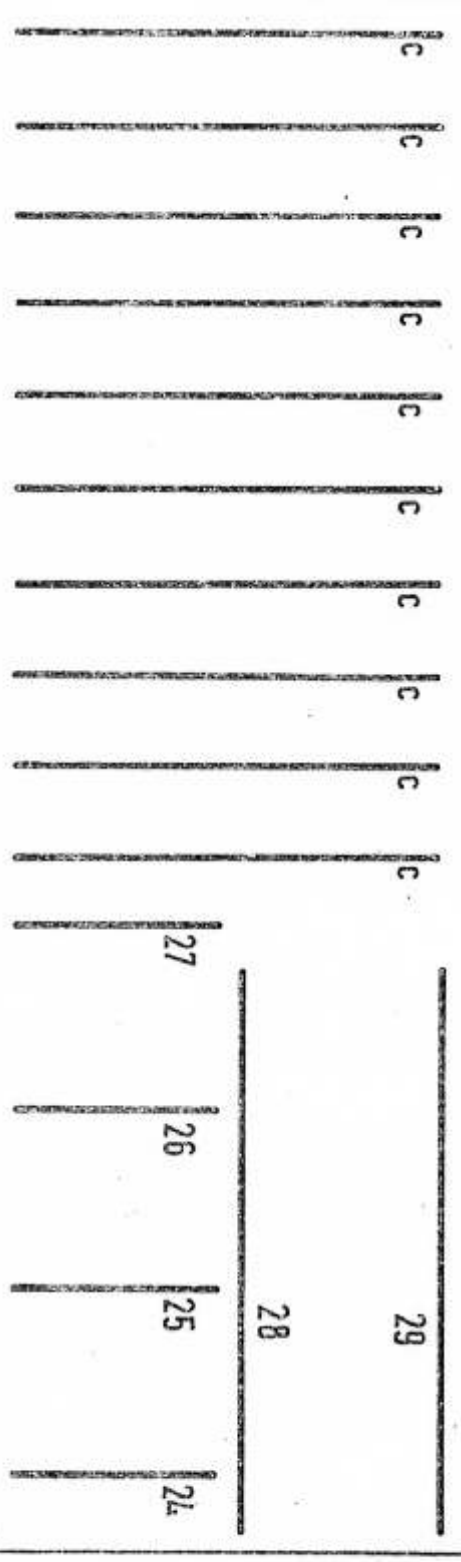
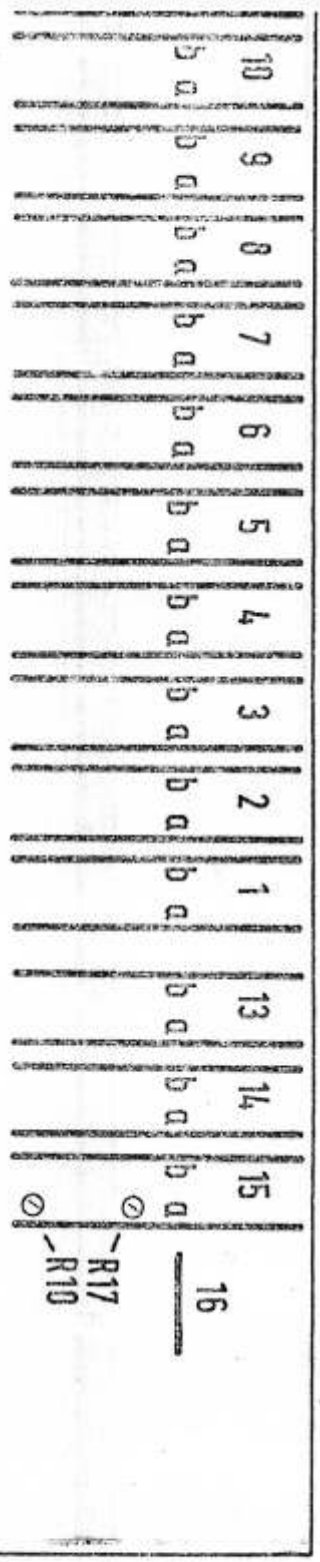
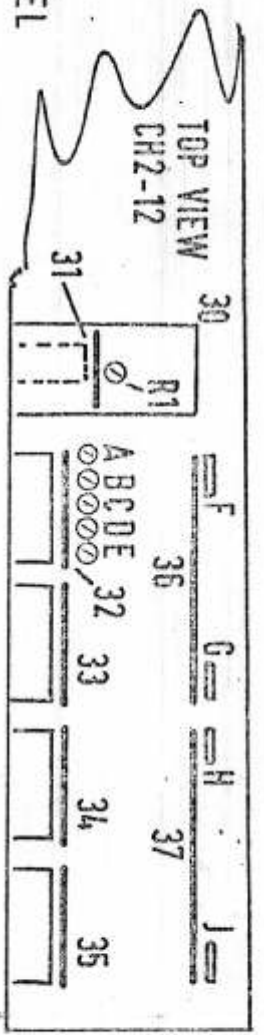


PS 48 MK 2

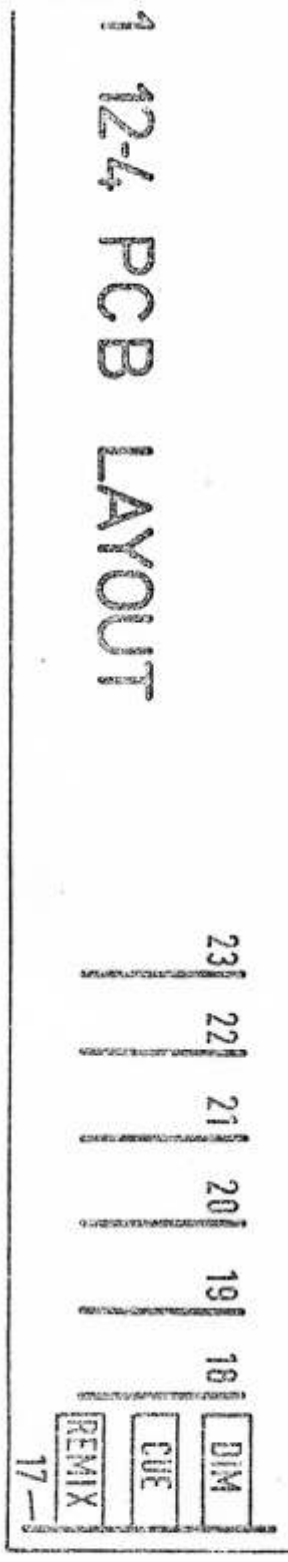
Z1 LM338K



HEL FILTERS
 LIVE AMP
 e-set V.U. GAIN
 PM SCALE CALIBRATION
 AMP GROUP 1 and 2, F-G SET LEVEL
 .. 3 and 4, H-J ..



1 12-4 PCB LAYOUT



- 1a MIX AMP REMIX L
- 1ab-12ab CH ROUTING SW. A4-PAN.
- 1c-12c CH INPUT MODULES
- 2a MIX AMP REMIX R
- 3a MIX AMP GROUP 1
- 4a .. GROUP 2
- 5a .. GROUP 3
- 6a .. GROUP 4
- 7a .. AUX 3
- 8a .. AUX 4
- 9a .. CUE
- 10a CUE AMPLIFIER
- 11a MIX AMP NOT USED
- 12a .. NOT USED
- 13a .. AUX 1
- 14a .. AUX 2
- 13ab A1 RETURN ROUTING SW.
- 14ab A2 ..
- 15a OSCILLATOR.
- 15b R17 Pre-Set OUTPUT LEVEL
- 16 MONO MIX and OUTPUT AMP.
- 17 RELAY CONTROL
- 18 LINE AMP GROUP 1 and 2
- 19 .. 3 and 4,
- 20 .. MONITOR-PHONES
- 21 .. AUX 1 and AUX 2
- 22 .. AUX 3 and AUX 4,
- 23 .. REMIX L and R
- 24-27 LIMITERS GROUPS 1-4
- 28 GROUPS to A1-4 MIX BUSS
- 29 GROUPS and TAPE RETURNS to REMIX BUSS