

MIDAS XL2

Technical Manual

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MIDAS XL2

The Midas XL2 series of consoles has been designed not only to provide the highest possible quality sound processing facilities, but also the greatest possible degree of reliability. However, no unit of such complexity can be expected never to need service, and to help anyone undertaking such work circuit descriptions will be found below. The less experienced technician or operator may find the following notes helpful in an emergency to help in fault finding when more experienced help may not be available.

The priority in console fault finding is to adopt a logical approach, as this is the quickest way to identify the precise source of a problem. For instance, if an input module appears to have failed, it will be helpful to establish with greater accuracy where the failure is. Does the signal return if the equaliser is switched out? [Failure in equaliser section]. Is it present at PFL? Is it absent from all groups. Are auxiliary feeds affected both pre- and post-fader? In this way a particular circuit block can be identified as faulty, and a careful inspection will often reveal a disconnected wire, a damaged component, or a suspect IC can be changed. Furthermore, if help is sought over the telephone, it will be helpful to have the greatest possible amount of detail for the technician to work with.

When performing tests on the console, it is tempting to remove or replace modules without switching off the power supply. This must never be done, as it not only destroys some components at once, but leads to the early failure of many that appear to have survived. The power supply is designed to bring the console to full power gradually, which protects sensitive components from damage caused by voltage spikes created by sudden powering up.

The console is supplied with a spare parts kit which contains the necessary components for field servicing. An optional two extender card set is available, which allows active tests to be performed on modules while they are out of the frame but powered up. Care must be taken that the bottom of the p.c.b. is not allowed to rest on anything metallic which could short-circuit the tracks.

GENERAL INFORMATION

To take full advantage of the excellent audio performance of Midas consoles it is essential that the installation, even in a mobile touring condition is carried out and planned with care and attention.

Many factors must be considered when installing a console relating to wiring, earthing etc. A brief resume of wiring considerations is given in this section. [Also given in this section are details of input, output and insert wiring.]

All audio signals are referenced to the system earth, which must be clean, noise free and essentially equipotential. In addition, the earth system integrity is absolutely necessary for safety.

Do not disconnect the mains earth from any piece of equipment as this could create a potentially lethal and/or illegal situation.

If in doubt please consult a competent engineer or the local electricity supply company to ensure that safety regulations are not infringed or neglected.

A. Decide on a central point for the main earth system and star feed 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. In some touring situations it may be difficult to achieve the above recommendations. However this should be a guideline for the planning and execution of the installations. The star point must be connected to the incoming mains earth or in extreme cases to a totally separate technical earth. [If local regulations permit]

B. Use only clean mains. Do not mix lighting and other mains with audio mains.

C. In some extreme cases it may be necessary to install an isolating transformer to ensure isolation from mains born interference. The isolating transformer must be of adequate current capability and should incorporate a Faraday Shield, connected to the incoming mains earth.

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

E. It is very important that the screen is not used as the signal return. Therefore the screen should be connected at one end only. Connecting the screen at both ends will cause an earth loop into which an external hum field will be induced. In touring situations it may be difficult to have separate input and output leads therefore use external equipment with an earth lift facility.

F. In areas where a high level of radio frequency interference is present the open end of the screen may be connected to earth through a 0.01 micro farad 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.

G. 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 to be screened are referenced to the destination earth.

H. 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.

I. 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.

J. Connect all equipment in a logical sequence and isolate any earth loop problems as they occur. It is very difficult to identify an installation problem after everything has been connected due to interaction between the various earth loops.

POWER SUPPLY

The Midas XL2 has an external power supply. The power supply is nineteen inch rack mountable providing two fully protected outputs allowing power supply linking for fail safe operation. The outlets are through polarised multiconnectors at the power supply and one polarised multiconnector at the console end.

The power supply gives voltage rails of + and - 18 volts DC at 10 amps per rail and + 48 volts phantom power at 500 mA for capacitor microphones and direct injection systems.

Connection of power supply to console is via a multiconductor cable fitted with polarised multiconnectors. Cable length is 5 meters.

Linking of two power supplies is via the link outlet/inlet.
(See Diagram XL290_4)

Linking of two power supplies and two consoles.
[See Diagram XL290_5]

The power supply delivers enough current for a full console of 40 input modules plus all the output sections. If two consoles are coupled together use the arrangement in Diagram XL290_5].

For multiconnector wiring see maintenance section of this manual.

INPUT MODULE

Diagram XL01A-4.

The input signal enters via the relevant XLR connector on the console back panel at pins 7 and 8 on connector ST1, where pin 7 is hot [pole 3 of the XLR in standard format], and pin 8 is cold [pole 2 of the XLR in standard format]. Input ground [pole 1 of the XLR] is on pin 9 on module connector ST1, which is grounded only through the Earth Lift switch S1. S3 supplies +48v phantom power for condenser microphones etc. via current limiting and decoupling components R1, R2, R3, and C1 to pins 2 and 3 of the XLR connector with reference to pin 1. S3 Will also override the Earth Lift switch S1. The Mic/Line switch S2 offers a balanced attenuator and impedance changing network before the signal arrives at the balanced input stage.

In standard format, this is of an electronically balanced design, where RF decoupling is achieved by C4, C5, and C6, input gain is adjusted by RVA1, and a typical Common Mode Rejection Ratio of 85dB at 100Hz is set by VR1. DC blocking for the input amplifiers Q1 and Q2 is provided by C2, C3, C8, and C9, and the diode bridge network D29, D30, D31, and D32 blunts any spikes in excess of rail voltages. IC1 debalances the input signal and feeds it to the high pass filter via SL3 and C19.

If input balancing is by transformers, these will be fitted to a bracket which runs the length of the console beneath the motherboards. They are wired via pins on connector ST1: 19 [hot, primary], 20 [cold, primary], 21 [cold, secondary], and 22 [hot, secondary]. IC2 and IC3 comprise the input amplifier and gain control [note that the input transformer is wired with its secondary hot grounded to preserve phase coherence] and the signal is fed to the high pass filter via SL3 and C19.

Connector ST3 feeds the PFL/insert PCB [see diagram XLSO].

Diagram XL01A-1.

The phase reverse switch S4 controls the inversion mode of IC4, and passes the signal to the 12dB/octave high pass filter around IC4B controlled by S5 and RVA3/RVB3. From the wiper of S5 the signal is fed to three different points:-

[a] The insert switch via ST3 pin 3 [diagram XL01A-4] to provide the insert return by-pass [see diagram XLSO].

[b] The insert send balancing network. This is built around IC6 as a unity-gain, phase-contrasting amplifier whose common mode rejection ratio is set by VR3 [typically 85dB at 100Hz]. Diodes D40, D41, D42, and D43 are provided to protect the insert send circuitry from damage by an excessive back e.m.f.

[c] The pre-equaliser meter drive circuitry, consisting of a full-wave rectifier [IC7A] and a mixing amplifier [IC7C].

After leaving the equaliser [see diagram XL01A-2] the signal is fed both to the post-equaliser meter drive [full-wave rectifier IC7B and mixing amplifier IC7C] and to the main fader RV14; then through the non-inverting buffer IC8A to the mute relay RL1, which can be activated either locally or remotely by the automute system. In both cases, a voltage is applied to R89 [locally by the mute switch S14 from V+ via R88; remotely from one of the eight mute busses via R93] which turns on Q7. The resultant drop in voltage at the collector turns Q5 off, and the consequent rise in voltage at its collector illuminates the mute LED and activates the relay RL1; this puts the feed to the pan control RVA15/RVB15 to ground. Q6 and its associated components form a constant current source for the relay. If the mute LED fails to illuminate due to the LED itself becoming faulty, then the mute relay will not be activated. The pan control RVA15/RVB15 offers 3dB of attenuation at pan centre, and feeds pan left and pan right via buffers IC9A and IC9B.

The feeds for the auxiliaries are derived from the equaliser output/fader top [pre-fader, via buffer IC10B] and from the mute switch relay output [post-fader, via buffer IC10A]. The direct output at ST5 can also be derived from either of these points, dependent on the jumper at SL4, before it is balanced by the optional add-on p.c.b. and routed to pin 17 of connector B [hot to component side, cold to solder side].

Diagram XL01A-2.

Treble and Bass controls each provide 15dB of boost and/or cut by varying the feedback parameters at selected frequencies between the output and the inverting input of IC11A. The shelving points are determined by S7 and S8 for the treble and S9 and S10 for the bass [as defined by the front panel legends]. This is achieved by changing the network frequency selective components around the level controls [C102, C1103 C104, RP4, C63, C64, and C65 for the treble; C70, C71, C72, RP3, R114, C73, C74, and C75 for the bass]. This section operates at a fixed selectivity of 12dB per octave: the two mid controls are configured to provide continuously variable boost and/or cut of 15dB, sweepable frequencies, and switchable selectivity. Taking the low mid as the example, the boost and cut are provided at IC13A by the same mixing of output and inverting input signals as was used on the treble and bass controls: the frequency setting is determined by RVA12/R121 and RVB12/R130 working in conjunction with C78, C79, C81, and C82. The bandwidth is set by R118 and R119 in conjunction with IC11B at 2 octaves at full boost or cut; when R119 is shorted out by the Narrow switch S12, this is reduced to one-third of an octave. IC15B is the phase-correcting equaliser output buffer. The feed to the fader top is via the equaliser by-pass switch S13, which selects either equalised signal from C90 or pre-equaliser signal from C91.

Diagram XL01A-3.

The group routing switches S41-48 have two modes of operation, dependent on whether they are used singly or in adjacent pairs where the even group has the higher number. Taking groups 7 and 8 as the example [S47 and S48], both switches are fed with signal from three sources: pan left, pan right, and AFL [pre-pan]. If group 7 alone is selected, the AFL signal is left unrouted by block b of S47 [the group 7 switch]; however, the wiper of block d of this switch is fed with AFL signal from block b of S48 [the group 8 switch] as long as that switch is off. While only group 7 is selected, pan left signal is left unrouted by block b of the group 8 switch [S48], and pan right signal is routed to ground via block b of the group 7 switch [S47], R184, and block d of the group 8 switch [S48].

If group 8 is now switched in [S48], the AFL feed to block d of the group 7 switch [S47] is replaced by pan left signal by block b of the group 8 switch [S48], and pan right signal is now routed by block d of the group 8 switch [S48] to the group 8 buss instead of to ground. If group 7 is now switched off [leaving group 8 on], pan left signal is routed to ground by block d of the group switch 7 [S47] via R185, pan right signal is disconnected by block b of the group 7 switch [S47], and AFL signal is routed to the group 8 buss via block b of the group 7 switch [S47], R184, and block d of the group 8 switch [S48].

Auxiliary routing is selected from the PFL or AFL points identified on diagram XL01A-1 by switches S23-30, and then switched on or off by switches S31-38; signals then pass to their respective busses via level controls RV16-23 and buss resistors R189, R191 etc.

Mute group selection is by switches S15-22 via blocking diodes D51-59, which prevent leakage of mute logic status from module to module.

Diagram XL50.

The switching card is fed from ST3 [see diagram XL01A-4] with both insert and PFL/Solo signals, and also the solo gate voltage which is used in the master module to activate the solo-to-masters function. Note that the pins on the connectors are numbered from the top towards the bottom, i.e. pin 1 is nearest the switches.

Diagram XL10M.

Q2 and its associated components form a constant current source for the LED chain; Q1 provides a stabilised voltage for the LM3915. The calibration preset for the meter is VR4 [see diagram XL01A-1]; a signal of 0dB [monitored at the insert] should just activate D5.

Switch LED Powering (All diagrams).

The status LEDs are powered by two constant current sources based round Q3 and Q4 [Diagram XL01A-4].

The order for the first chain starting from Q3 is phantom, equaliser, filter, auxiliaries 1-8, master, group 1, insert, and PFL/solo.

The order for the second chain starting from Q4 is groups 2-8, mute groups 1-8.

Both chains finish at the negative rail.

GROUP MODULE

This module combines three functions which will be separately considered.

Auxiliary Input (Diagram XL10B-1)

The signal appears at connector ST1 pin 19 (hot) and 20 (cold) from the XLR socket on the console back panel. First order R.F. filtering is provided by R1/C5 and R2/C7 and over-voltage protection by D30/D31 and D32/D33. IC1 operates as a differential amplifier whose common mode rejection is set by VR1 at the factory for maximum rejection (typically 85dB) at 100Hz. The equaliser is built around IC2A, with in-phase and out-of-phase signals at each end of the treble and bass potentiometers being fed by their wipers to the inverting input of the amplifier. Frequency selection is achieved by alteration of the capacitances around the potentiometers by the switches S1 and S2. H.F. stability is maintained by C15 and C17. The signal then passes through C23 to the auxiliary input PFL/solo switch [S13 on diagram XL10B-3] and via the level potentiometer RV4 to the non-inverting buffer IC2B, and then to the mute switch S14. From here the signal arrives at block c of the changeover switch S12, which routes it either to the group input via C111 and R24, or to the auxiliary pan control RVA5/RVB5 [Diagram XL10B-3], which attenuates the signal by 3dB at pan centre, and through buffers IC14A and IC14B to connector ST2 pins 22 (left auxiliary master buss) and 23 (right auxiliary master buss).

Group Output (Diagram XL10B-1).

Group signals arrive via connector B pins 26 [signal] and 27 [ground] at the virtual earth summing stage IC3B, and are reinverted by IC3A before being fed to the fader changeover switch S15, which transposes the signals from the group and auxiliary busses [block c feeds the group and block d the auxiliary circuitry]. IC5 is the balancing network for the insert send which appears at connector A pins 12 [hot] and 13 [cold], protected from an excessive back e.m.f. by the diode bridge D34-37, and set for maximum common mode rejection at 100Hz by VR2 [typically 85dB].

The insert return appears at connector A pins 21 [hot] and 22 [cold]; it is protected from R.F. contamination by R43/C49 and R45/C51, and from over-voltage by diode bridge D42-45. IC8 is a differential amplifier whose common mode rejection is factory set by VR4 to maximum at 100Hz, typically 85dB. [Change to diagram XL10B-4]. The insert switch S2 and PFL/Solo switch S1 are fed by connector ST1 [ST9 on the main p.c.b.], whose pins are numbered from the top towards the bottom, i.e. pin 1 is nearest the switches. Block b of the insert switch S2 selects pre-insert signal from C113 (Diagram XL10B-1) or post insert signal from C63 and feeds it to block e of the group output PFL/Solo switch S1, and to group output fader RV15 (change to diagram XL10B-2).

The non-inverting buffer IC10A feeds both the meter [via the meter changeover switch S34] and the mute switch S17/RL1. The inverting input of IC10A is fed via the talk switch S16 and connector B pin 21 [component side only] with talk signals from the communications module.

The mute switch can be activated either locally or remotely by the automute system. In both cases, a voltage is applied to R90 [locally from +VC via R93; remotely from one of the eight mute busses via R92] which turns on Q2. The resultant drop in voltage at the collector turns Q1 off, and the consequent rise in voltage at its collector illuminates the mute LED which activates the relay RL1; this puts the signal feed to ST5 and ST6 to ground. Q3 and its associated components form a constant current source for the relay. Mute group selection is by switches S3-10 [change to diagram XL10B-3], via blocking diodes D62-70 which prevent leakage of mute logic status from module to module. The output stage IC13 [diagram XL10B-2] is protected from an excessive back e.m.f by the diode bridge D58-61, and set for maximum common mode rejection at 100Hz by VR7 [typically 85dB].

The pan control offers 3dB of attenuation at pan centre, and feeds master left and right busses via buffers IC11A and IC11B.

Auxiliary Output (Diagram XL10B-1).

Auxiliary signals arrive via connector B pins 24 [signal] and 25 [ground] at the virtual earth summing stage IC4B, and are reinverted by IC4A before being fed to the fader changeover switch S15, which transposes the signals from the group and auxiliary busses [block c feeds the group and block d the auxiliary circuitry]. IC6 is the balancing network for the insert send which appears at connector A pins 8 [hot] and 9 [cold], protected from an excessive back e.m.f by the diode bridge D38-41, and set for maximum common mode rejection at 100Hz by VR3 [typically 85dB].

The insert return appears at connector A pins 6 [hot] and 7 [cold]; it is protected from R.F. contamination by R52/C58 and R54/C60, and from over-voltage by diode bridge D46-49. IC9 is a differential amplifier whose common mode rejection is factory set by VR5 to maximum at 100Hz, typically 85dB. The insert switch S32 block b selects pre-insert signal from C112 or post-insert signal from C64 and feeds it [change to diagram XL10B-2] to block e of the auxiliary output PFL/Solo switch S36, and to the auxiliary output level control RV21. The non-inverting buffer IC7A feeds both the meter [via the meter changeover switch S34] and the mute switch S35 block b. The inverting input of IC7A is fed via the talk switch S33 and connector B pin 21 [solder side only] with talk signals from the communications module. The mute switch block b wiper feeds both the auxiliary output PFL/Solo switch [S36] blocks c and d [mono signal to both solo busses] and the output stage IC12, which is protected from an excessive back e.m.f. by the diode bridge D54-57, and set for maximum common mode rejection at 100Hz by VR6 [typically 85dB].

Output Meter (Diagram XL20M)

IC3A and B receive, rectify, and calibrate the signal selected by the meter changeover switch S34 block b [diagram XL1 OB-2]. The signal, now a varying positive voltage, is fed to IC3C and D; IC3C has 30dB of gain, which enables D1-D10 to turn on 30dB ahead of D11-D20.

Q1 provides a regulated power source for the LM3915s: Q2 and Q3 are constant current sources for the LED chains.

To calibrate the meter, a signal of 0dB is applied at pin 1 of ST1 and the cathode of D23 is monitored by an oscilloscope. After a symmetrical trace is obtained by adjusting VR1, then VR2 is adjusted so that D13 (the 0dB yellow LED) just illuminates. Then the signal is reduced to -30dB, when the LED chain should have only the first three LED's (D1-D3) illuminated. If the calibration appears to be wrong, the symmetry should be rechecked. (The level can be externally verified at whichever output is driving the meter, selected by the meter changeover switch S34).

Switch LED Powering (All diagrams)

The status LEDs are powered by two constant current sources based round Q4 and Q5 [Diagram XL10B-4].

The order for the first chain starting from Q4 is auxiliary output talk, auxiliary output insert, auxiliary output PFL, auxiliary output mute, meter changeover, fader changeover, auxiliary/subgroup, auxiliary input PFL, subgroup output talk, matrix 1-2, auxiliaries 1-3.

The order for the second chain starting from Q5 is auxiliaries 4-8 and mute groups 1-8. Running in parallel with the mute group LEDs are the group insert and group PFL LEDs. Both chains finish at the negative rail.

MASTER MODULE

This module is constructed from two identical printed circuit boards, each of which contains the circuitry for one master output, one matrix output, one auxiliary return to masters summing stage, and one half of the solo-to-masters facility [both halves are controlled by S10, however]. The following description applies equally to each half of the module, except where specific exception is made. Each function of the module will be considered separately.

Master Output (Diagram XL20B-1).

Master signals arrive via connector B pins 8 and 9 [signal] and 7 [ground] at the virtual earth summing stage IC2B, and are reinverted by IC2A before arriving at the master/solo changeover relay RLY1, which is activated by the solo-to-masters switch S10 [which operates only if there is a voltage on the solo gate derived from any solo/PFL switch being switched on]; this transposes the signals from the solo and master summing stages. IC4 is the balancing network for the insert send which appears at connector A pins 19 [hot] and 20 [cold], protected from an excessive back e.m.f by the diode bridge D1-4, and set for maximum common mode rejection at 100Hz by VR1 [typically 85dB].

The insert return appears at connector A pins 21 [hot] and 22 [cold]; it is protected from R.F. contamination by R21/C18 and R26/C21, and from over-voltage by diode bridge D5-8. IC5 is a differential amplifier whose common mode rejection is factory set by VR2 to maximum at 100Hz, typically 85dB. Block b of the insert switch S2 selects pre-insert signal from RLY1 or post-insert signal from C24 and feeds it to block b of the master output PFL switch S3 [change to diagram XL20B-3], and via JP'A' to the master output fader RV1. The non-inverting buffer IC12A feeds both the meter [via the meter changeover switch S8] and the mute switch S4. The inverting input of IC12A is fed via connector B pin 12 [component side only] with talk signals from the communications module. The mute switch [S4] wiper feeds the output stage IC6, which is protected from excess voltage by the diode bridge D9-12, and set for maximum common mode rejection at 100Hz by VR3 [typically 85dB].

Matrix Output (Diagram XL20B-2).

Matrix signals arrive via connector B pins 10 and 11 [signal] and 7 [ground] at the virtual earth summing stage IC7B, and are reinverted by IC7A. IC8 is the balancing network for the insert send which appears at connector A pins 6 [hot] and 7 [cold], protected from an excessive back e.m.f by the diode bridge D13-16, and set for maximum common mode rejection at 100Hz by VR4 [typically 85dB].

The insert return appears at connector A pins 8 [hot] and 9 [cold]; it is protected from R.F. contamination by R50/C47 and R55/C50, and from over-voltage by diode bridge D17-20. IC9 is a differential amplifier whose common mode rejection is factory set by VR5 to maximum at 100Hz, typically 85dB. Block b of the insert switch S5 selects pre-insert signal from C37 or post-insert signal from C53 and feeds it to block b of the matrix output PFL switch S6 [Diagram XL20B-3], and via JP'C' to the matrix output fader RV2. The non-inverting buffer IC13A feeds both the meter [via the meter changeover switch S8] and the mute switch S7. The inverting input of IC13A is fed via connector B pin 12 [solder side only] with talk signals from the communications module.

The mute switch [S7] wiper feeds the output stage IC10, which is protected from an excessive back e.m.f by the diode bridge D21-24, and set for maximum common mode rejection at 100Hz by VR6 [typically 85dB].

Auxiliary-to-masters (Diagram XL20B-1).

Signals from the auxiliary inputs [if routed to masters] appear at connector B pins 13 and 14 and are summed by the virtual earth stage IC3B. Provided they are not muted by the auxiliary master mute switch S1, they pass via R17 to the master inverting stage IC2A.

Record Output (Diagram XL20B-2).

The record outputs share one level control and one level check switch [which overrides whichever input has been selected by the meter changeover switch S8 on diagram XL20B-3]. The controls are linked by the ribbon connector between ST2a and ST2b, but in all other respects each output is entirely separate.

Signal is derived from the wiper of the master mute switch S4 [diagram XL20B-3] and fed to the top of the level control RV3a or b, from the wiper of which it passes through a non-inverting buffer IC14B. From here the signal is fed both to the check level switch S9a or b via C66, and to the output stage IC11A, which is protected from an excessive back e.m.f by the diode bridge D25-28, and set for maximum common mode rejection at 100Hz by VR7 [typically 85dB].

Output Meter (Diagram XL20M).

IC3A and B receive, rectify, and calibrate the signal selected by the meter changeover switch S8 block b and the check level switch S9. The signal, now a varying positive voltage, is fed to IC3C and D; IC3C has 30dB of gain, which enables D1-D10 to turn on 30dB ahead of D11-D20. Q1 provides a regulated power source for the LM3915s; Q2 and Q3 are constant current sources for the LED chains.

To calibrate the meter, a signal of 0dB is applied at pin 1 of ST1, and the cathode of D23 is monitored by an oscilloscope. After a symmetrical trace is obtained by adjusting VR1, then VR2 is adjusted so that D13 [the 0dB yellow LED] just illuminates. Then the signal is reduced to -30dB, when the LED chain should have only the first three LEDs [D1-D3] illuminated. If the calibration appears to be wrong, the symmetry should be rechecked. (The level can be externally verified at whichever output is driving the meter, selected by the meter change over switch S34).

LED Powering (All diagrams).

The status LEDs are powered by a constant current source based round Q2 [Diagram XL20B-1].

The order for the chain starting from Q2 is meter changeover, matrix insert, master insert, matrix PFL, master PFL, matrix mute, auxiliaries-to-master mute, and master mute. The chain finishes at the negative rail.

COMMUNICATIONS MODULE

Centred in this module are the controls for the intercom, talk and pink noise generator functions, the automute system, and the signal monitoring facilities, as well as the headphone amplifier.

Intercom (Diagram XL30B-1).

The intercom shares much of its circuitry with the monitoring and talkback facilities; the intercom switch [S3] selects the routing and function of the microphone amplifier and headphone signal. In intercom mode, microphone signals arrive through either the headset or microphone connectors [both mounted on the module's front panel], pass through the a.g.c. amplifier IC5 and IC6a and to the remote station via the isolating transformer T1 via block d of the intercom switch S3. VR3 adjusts the amount of microphone signal fed to the headphones by varying the common mode rejection ratio of the microphone input to IC6B without varying the gain structure for signals arriving from the remote station via T1. Overall intercom level is adjusted by RV3 before it passes through blocks a and e of the intercom switch, the headphone level controls RV1 and the headphone mute switch to the headphone amplifier [see diagram XL-HPA] and the headphone jack socket on the module front panel. IC7 and IC8 are isolating networks which ensure that ground loops are avoided when the intercom is used with an actively powered station.

When the intercom is switched on, a negative voltage is applied via block f of the intercom switch S3 to the anode of the LED in IC7, causing a positive voltage to be applied to pin 14 of connector A via D18 and R52; when a call is received, the positive voltage on pin 14 energises the photo-transistor within IC8 and turns on Q1, which illuminates the intercom call light [LP1]. In the event that the console is to be used as the slave station, the intercom can be decoupled completely from the console's power supply by applying the master station's power rail via the unused pin on the intercom XLR connector and edge connector A pin 15 to RLY1, which disconnects the intercom ground completely from the console.

Talk Facility (Diagram XL30B-1).

Microphone and headset signals arrive at block d of the intercom switch S3 as previously described for the intercom: however, with the switch in its normal [non-intercom] position, talk signals pass through block c to block b of the pink noise generator switch S6 [change to diagram XL30B-2]. From the wiper of this switch the signal passes both via buffer IC10B to connector A pin 12 [and thus to the talk external XLR connector on the console back panel] and to the talk master switch S13.

When this switch is on, signal is fed to the three talk level pots [RV4-6]; a further 10dB of gain is provided by IC10a, IC12a, or IC12b before the individual talk switches [S7-S12] enable signals to pass to their respective busses.

The LED indicators for these switches are wired in parallel between +VA and ground via limiting resistors R58-R63, with +VA appearing on each wiper of the LED switching blocks; all the normally open contacts are joined and fed to the second block of the talk master switch S13. This means that whenever a talk route is open [i.e. the talk master switch and any individual talk switch both on] a gate voltage is fed from the talk master switch to Q2 and Q3, which dims the local outputs to avoid the feedback which would otherwise result if the talkback microphone and a loudspeaker driven from a local output are close together.

Pink Noise Generator (Diagram XL30B-3).

IC9 is the noise source; R92/C62, R93/C63, and R94/C64 provide the necessary filtering for pink noise. IC11A corrects the gain structure and provides a buffer stage before the pink noise is fed to its switch S6 [Diagram XL30-2], from which point it follows the same path as the talk signals.

Automute Master Controls (Diagram XL30B-3).

These eight illuminating switches [S14-21] feed positive rail voltage current-limited by R111 and decoupled by C77-8 and R103-110 to the automute busses on connector B [pins 15-22].

Signal Monitoring (Diagram XL30B-1).

PFL signals arrive at connector B pin 1 where they are summed by the virtual earth stage IC1b and reinverted by IC1a. The solo listen switch S2 blocks c and d select either PFL signals from C3 or AFL signals from the master module via connector B pins 13 and 14 and feed them through the intercom switch S3 blocks a and e to the headphone level control RV1 and headphone mute switch S4, and thus to the headphone amplifier [see diagram XL-HPA]. In addition to driving the headphone level control, the wipers of S3 blocks a and e feed the local output level control RV2 [change to diagram XL30B-2]: signals pass through the local output mute switch S5 and buffers IC2a and b to the balanced local output stages IC3 and IC4, which are protected from an excessive back e.m.f by the diode bridges D6-9 and 10-13, and set for maximum common mode rejection at 100Hz by VR1 and VR2 [typically 85dB].

Headphone Amplifier (Diagram XL-HPA)

R19/C17 and R20/C18 are the power supply decoupling networks; RF protection is afforded by R2/C1 and R4/C2. Connections to the module are hard-wired.

Signal Metering (Diagram XL30B-1).

The two meters are controlled by changeover switch S1. In solo mode [switch on], blocks c and d are fed with solo left and right signals respectively from connector B pins 13 and 14 and pass them to the meters via ST3 and ST4. In PFL mode [switch S1 off], block c is fed with PFL signals from C3 and passes them to the left meter via ST3; block d is fed with left local output post-fader signals from the junction of R17 and C6 [diagram XL30B-2] and passes them to the right meter via ST4.

LED Powering (All diagrams).

The status LEDs [with the exception of all the talk switches] are powered by a constant current source based round Q4 [Diagram XL30B-3].

The order for the chain starting from Q4 is meter changeover, intercom, pink noise, mute group masters 1-8, solo listen, local output mute, and headphone mute. The chain finishes at the negative rail.

POWER SUPPLY

The power supply provides the three power rails required for the successful operation of the XL2 range of consoles. On the front panel are two 19-pole connectors; one female for connection to the console, and one male which enables another Midas XL power supply to be linked to the console. The two connectors are parallel wired and the three power modules incorporate blocking diodes, so that the power supplies can share the load but never feed power into each other in the event of one unit failing. Each 18 volt block incorporates an over-temperature sensor which switches off the affected unit. If this occurs while two power supplies are connected, there will be no effect on the operation of the console since load sharing and switchover is automatic; however, the relevant monitoring LED on the front panel will be extinguished. The relevant block will reset automatically on cooling and the LED will come back on when this happens.

PLEASE NOTE THAT THE POWER SUPPLY CONTAINS CIRCUITRY WHICH GENERATES LETHAL VOLTAGES. NOT ONLY IS IT POWERED BY HIGH VOLTAGE, BUT THE SWITCH MODE BLOCKS FOR THE 18v RAILS CREATE VOLTAGES FAR IN EXCESS OF THE MAINS INPUT. ALL SERVICING OF THESE UNITS MUST BE REFERRED ONLY TO AUTHORISED SERVICE AGENTS OF MIDAS. ON NO ACCOUNT MUST SERVICE WORK BE ATTEMPTED BY ANYONE ELSE. IF IT IS, THE WARRANTY WHICH COVERS THE EQUIPMENT BECOMES INVALID, AND MIDAS (KLARK TEKNIK RESEARCH LTD) ACCEPT NO LIABILITY FOR CONSEQUENT DAMAGE TO THE CONSOLE OR ANCILLARY EQUIPMENT. QUALIFIED SERVICE PERSONNEL ONLY MAY UNDERTAKE THE SERVICE WORK DETAILED BELOW.

Voltage Changeover.

There are five steps involved in this operation. It is most important that all five are carried out together, and that power is not applied to the unit when changeover procedures are incomplete, and that the **power is disconnected by unplugging the mains lead before work is commenced.**

1. Change the fuse.

The fuse holder is located on the back of the unit below the mains input plug. The correct fuse ratings are as follows:-

220/240 volt operation: 5A.(F)
100/110 volt operation: 10A.(F)

The fuse is 20mm, HRC type.

2. Rejumper the +18 volt block.

The lid of the power supply must be removed by taking out all the relevant screws: four from the front panel, four from each side at the bottom of the unit, and three from the back panel. The voltage changeover jumper may now be moved to the appropriate position. [See Diagram XL290_6.DGM]

3. Rejumper the -18 volt block.

This procedure is identical to the +18 volt block.

4. Selector, phantom power module.

The voltage change over switch is located at the rear of the regulator/phantom pcb, and its setting is clearly marked on the pcb.

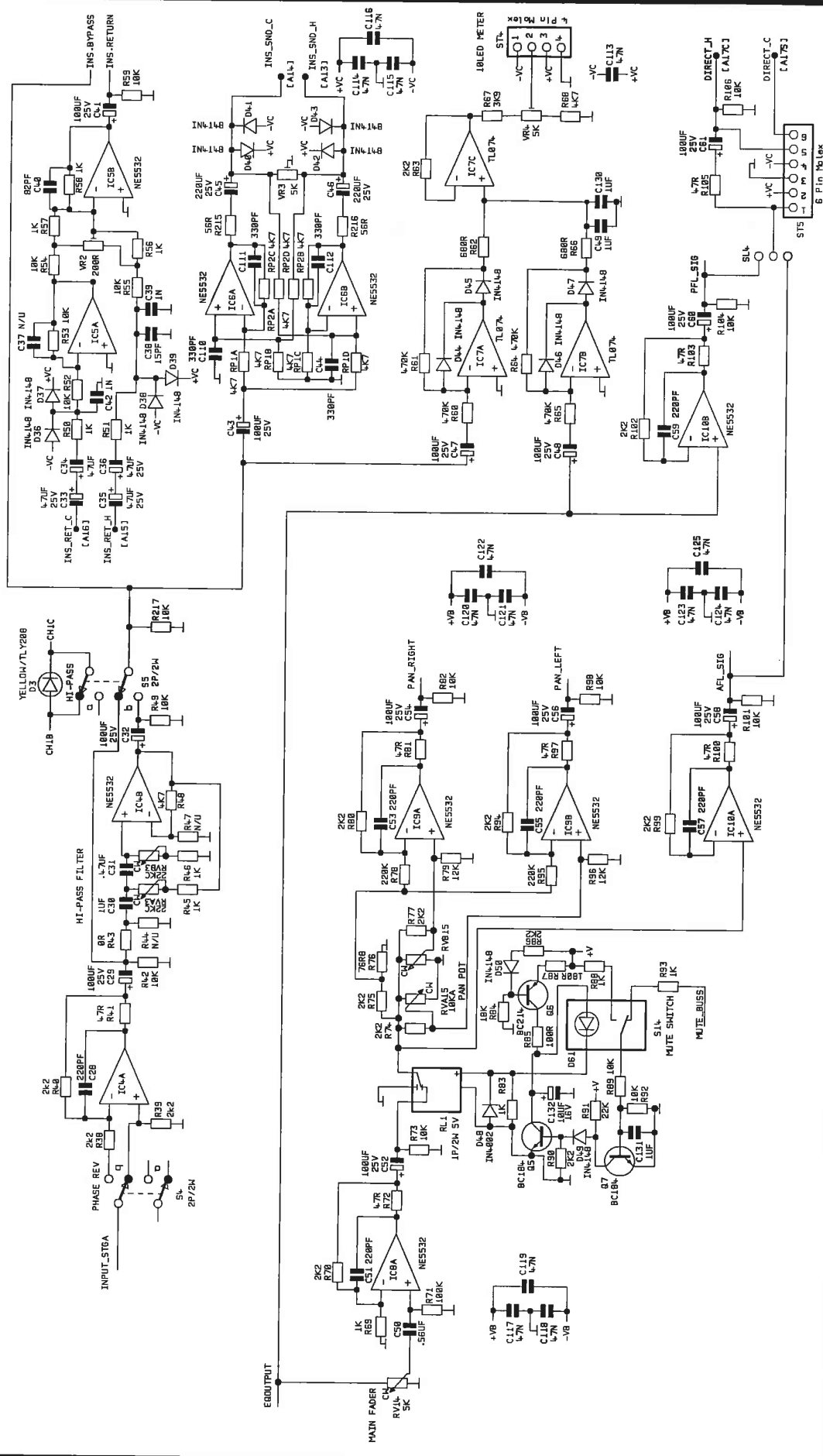
5. Replace lid before reconnecting the mains supply.

Indicator Module. (Diagram XL290-1).

The pcb for this module (BRD:2690/1) is mounted behind the front panel and houses led indicators for each of the P.S.U. output voltages. Also mounted on this pcb is the ground lift switch S1. This disconnects earth from the 0V rails. Earth remains connected to all the console metalwork.

Regulator Assembly. (Diagram XL290-1).

This contains the linear regulators for both 18V supplies along with the 48V phantom supply. Both negative and positive regulators are identical utilising a series power FET (Q3 & Q6 respectively). Output voltages are factory set at 18V with RV2 & RV4 respectively whilst output currents are factory set at 12A with RV1 & RV3 respectively. D9 & D12 allow fail safe linking. The 48V phantom supply is derived from transformer T1, (supply voltage selected by SW1) via rectifiers D1 to D4 and linear regulator IC1. The output voltage being set by R1 and R2. D6 allows fail safe linking.

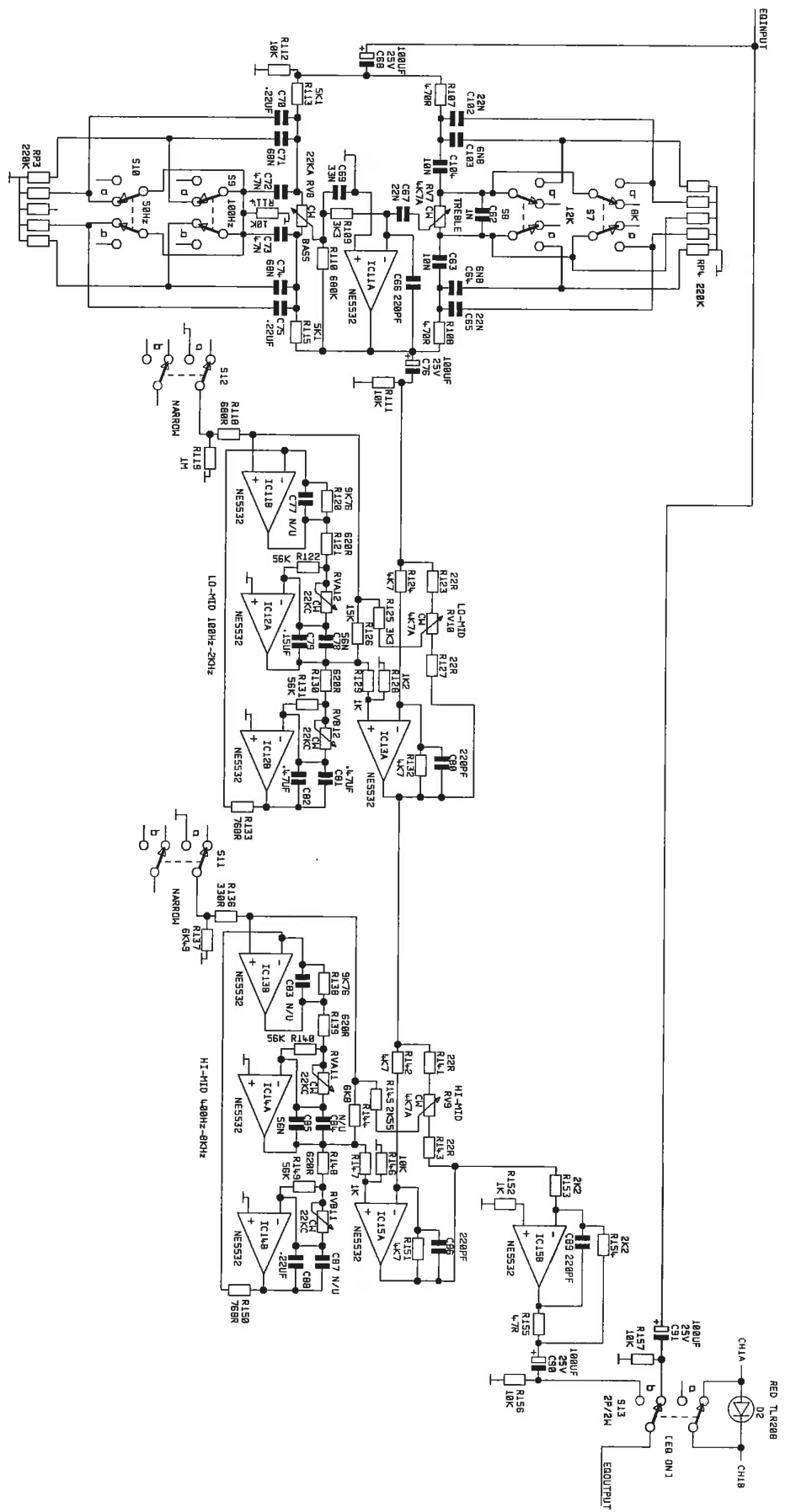


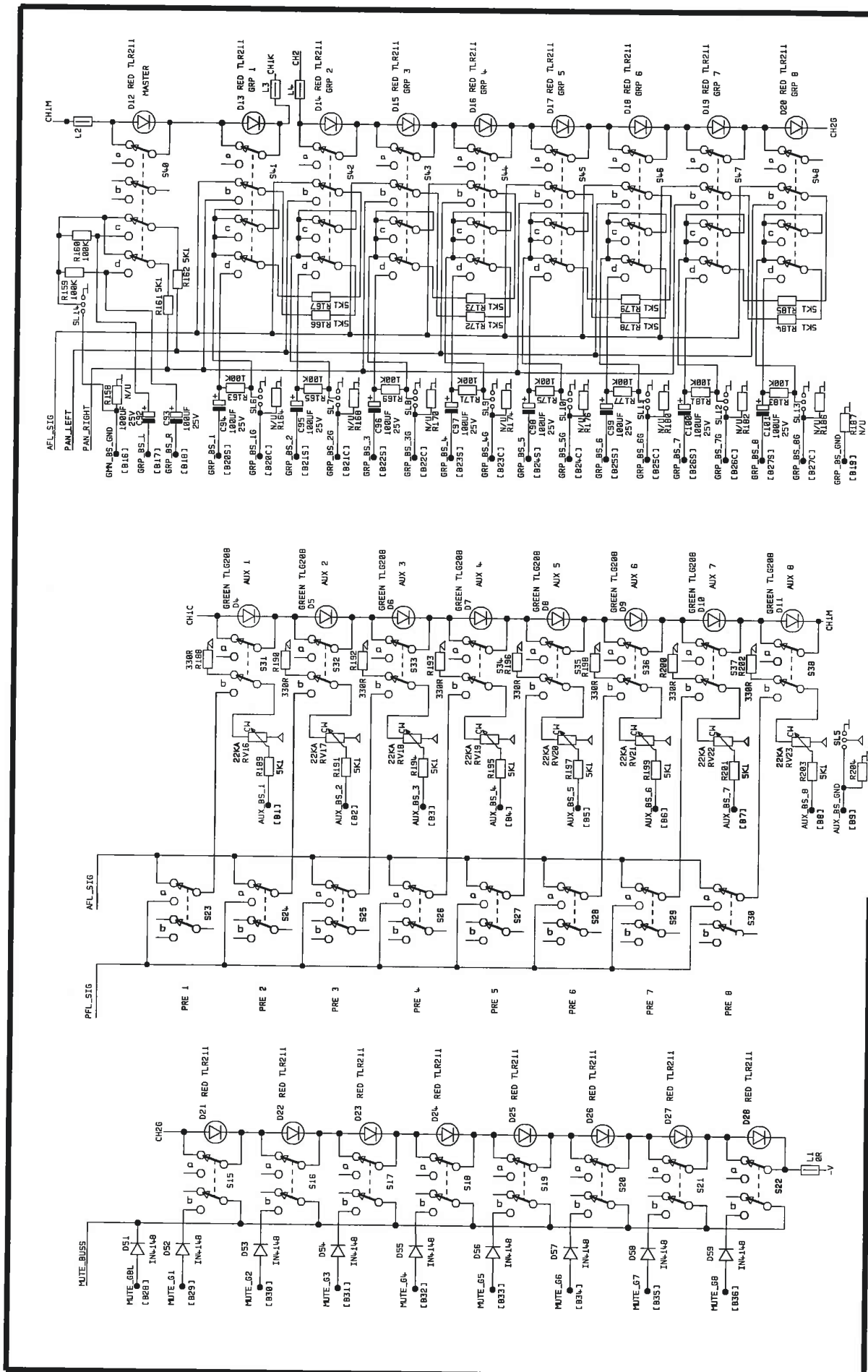
VALUES CORRECT ON 25.APRIL.89

XL01A-INPUT-GENERAL-XL01A_1.DGM:10.AUG.88

VALUES CORRECT ON 25.APRIL.89

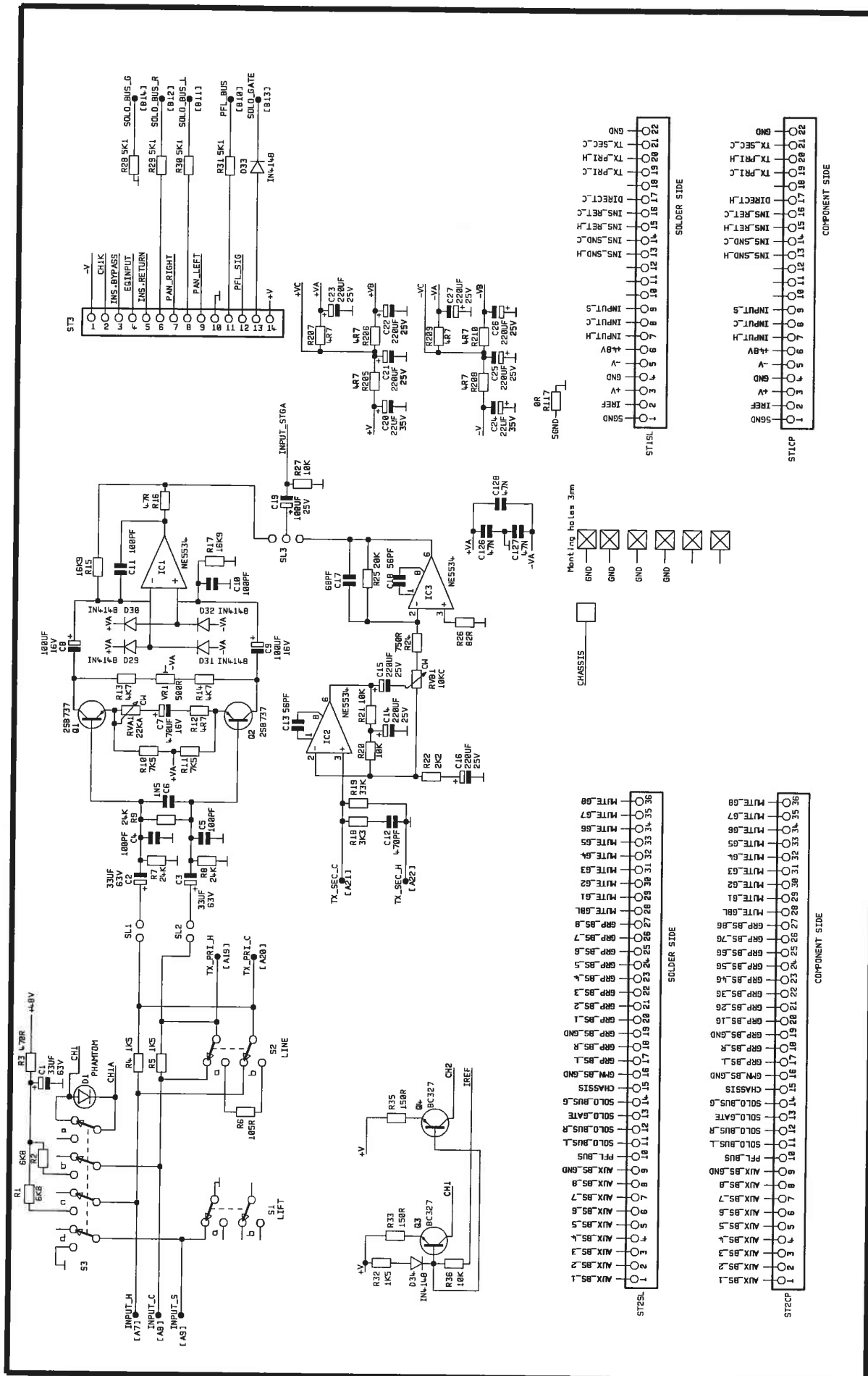
XL01A-INPUT-MAIN EQ SECTION-XL01A_2.DGM:10.AUG.88





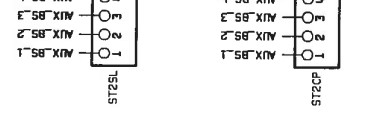
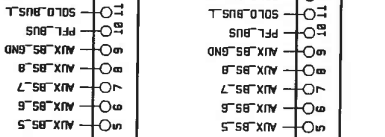
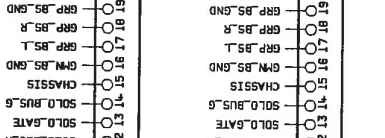
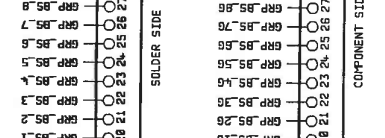
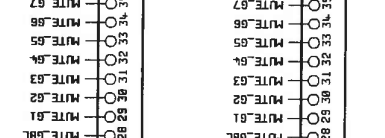
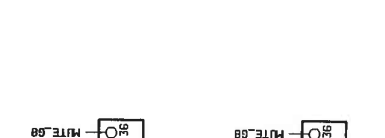
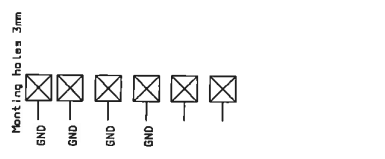
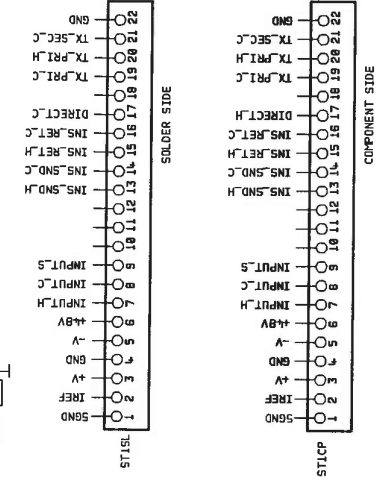
VALUES CORRECT ON 25.APRIL.89

XL01A-INPUT-ROUTES-XL01A_3.DGM:10.AUG.88

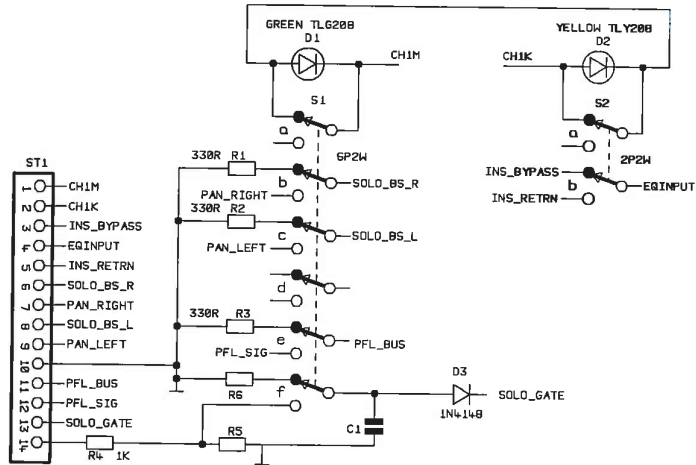


XL01A-INPUT-LINEMIC-XL01A_4-DGM:10-AUG.88

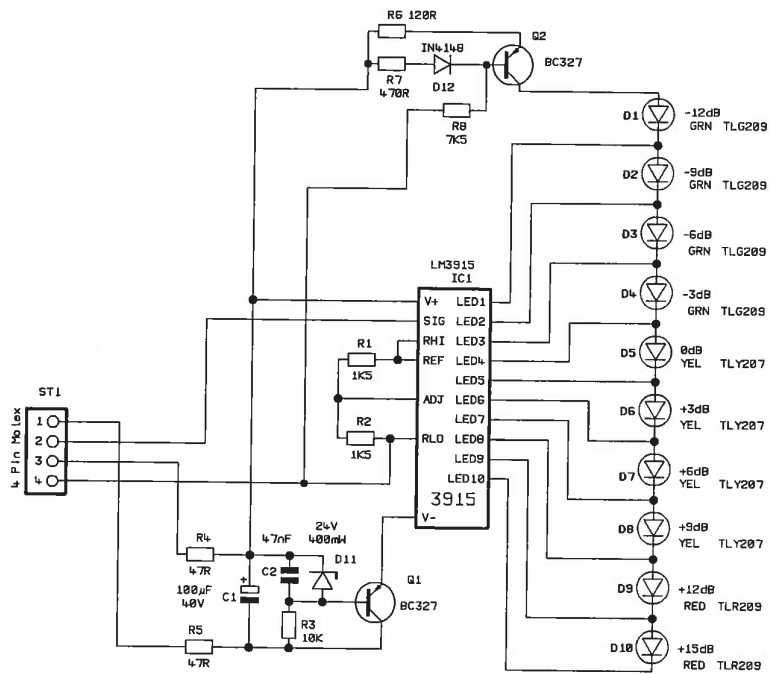
VALUES CORRECT ON 25-APRIL-89



VALUES CORRECT AT:- 9.MAY.89



XLS0 PFL INSERT BOARD | XLS0.DGM | 9.FEB.89

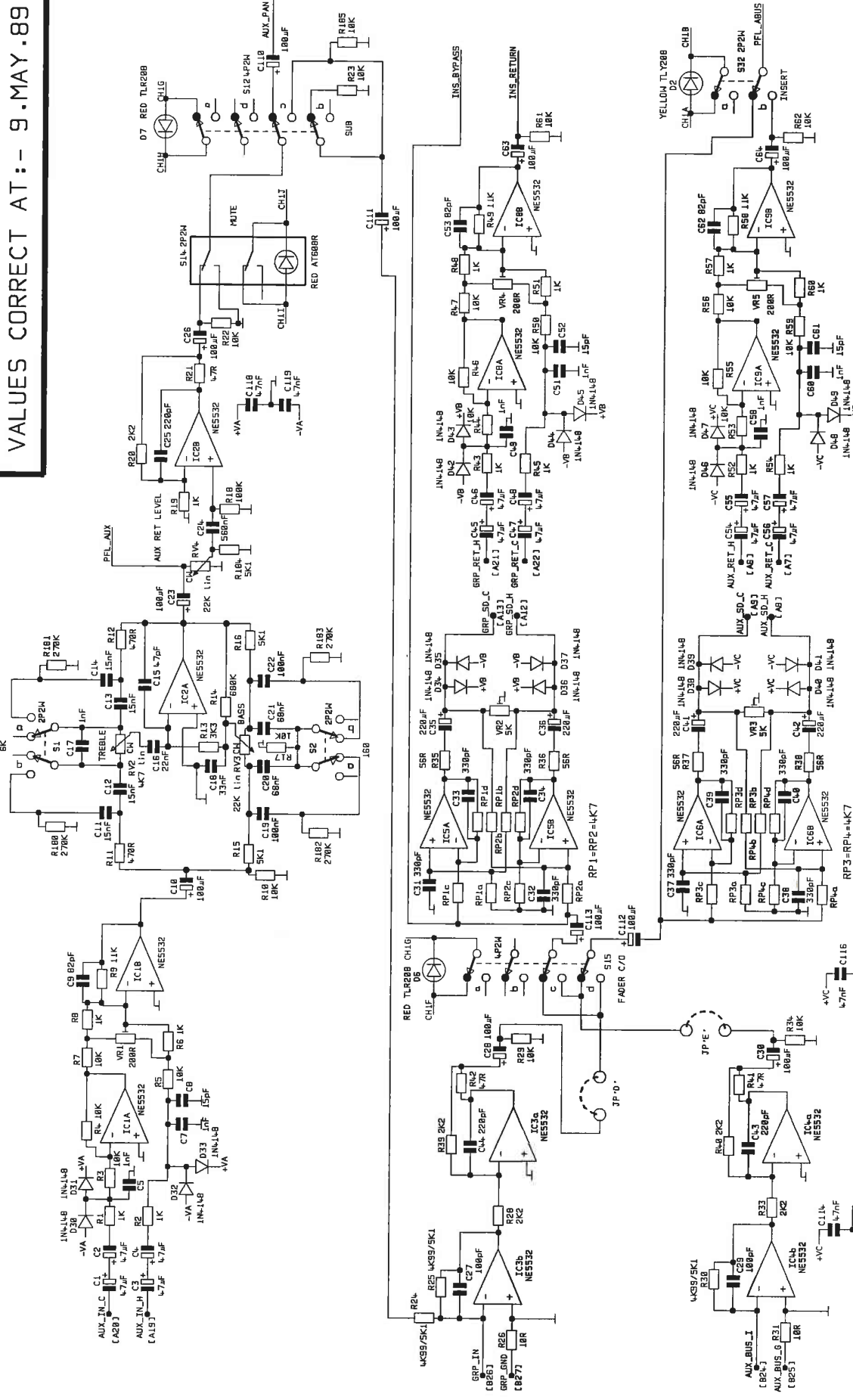


VALUES CORRECT

AT:- 9.MAY.89

XL10M-10 WAY METER-XL10M.DGM:02.SEP.88

VALUES CORRECT AT: - 9.MAY.89



XL10B GROUP AUX INPUT

25V working

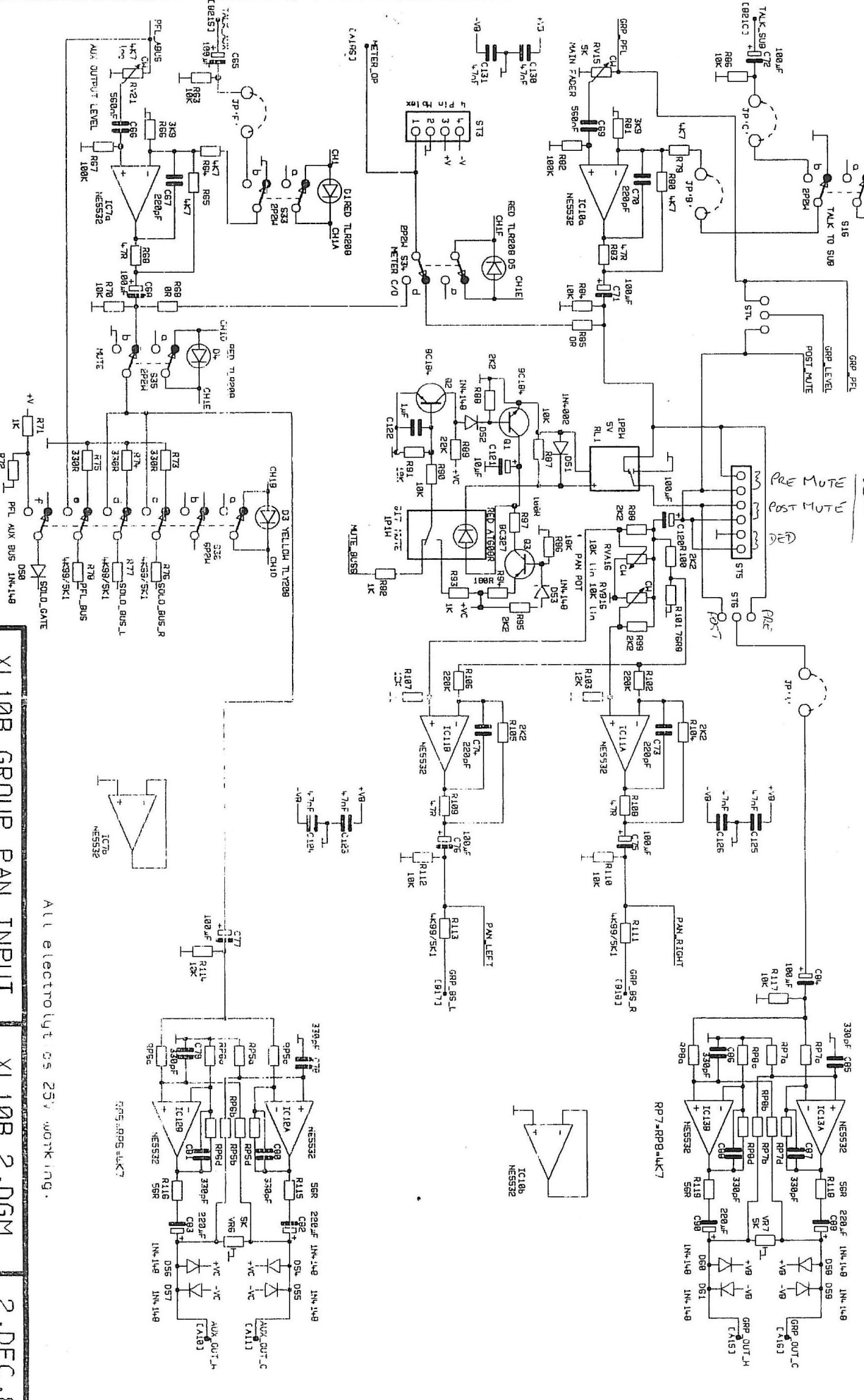
All electrolytics 25V working

2.DEC.88

VALUES CORRECT AT: - 9.MAY.89

MASTER'S
SETUP

PRE MUTE
POST MUTE
DET

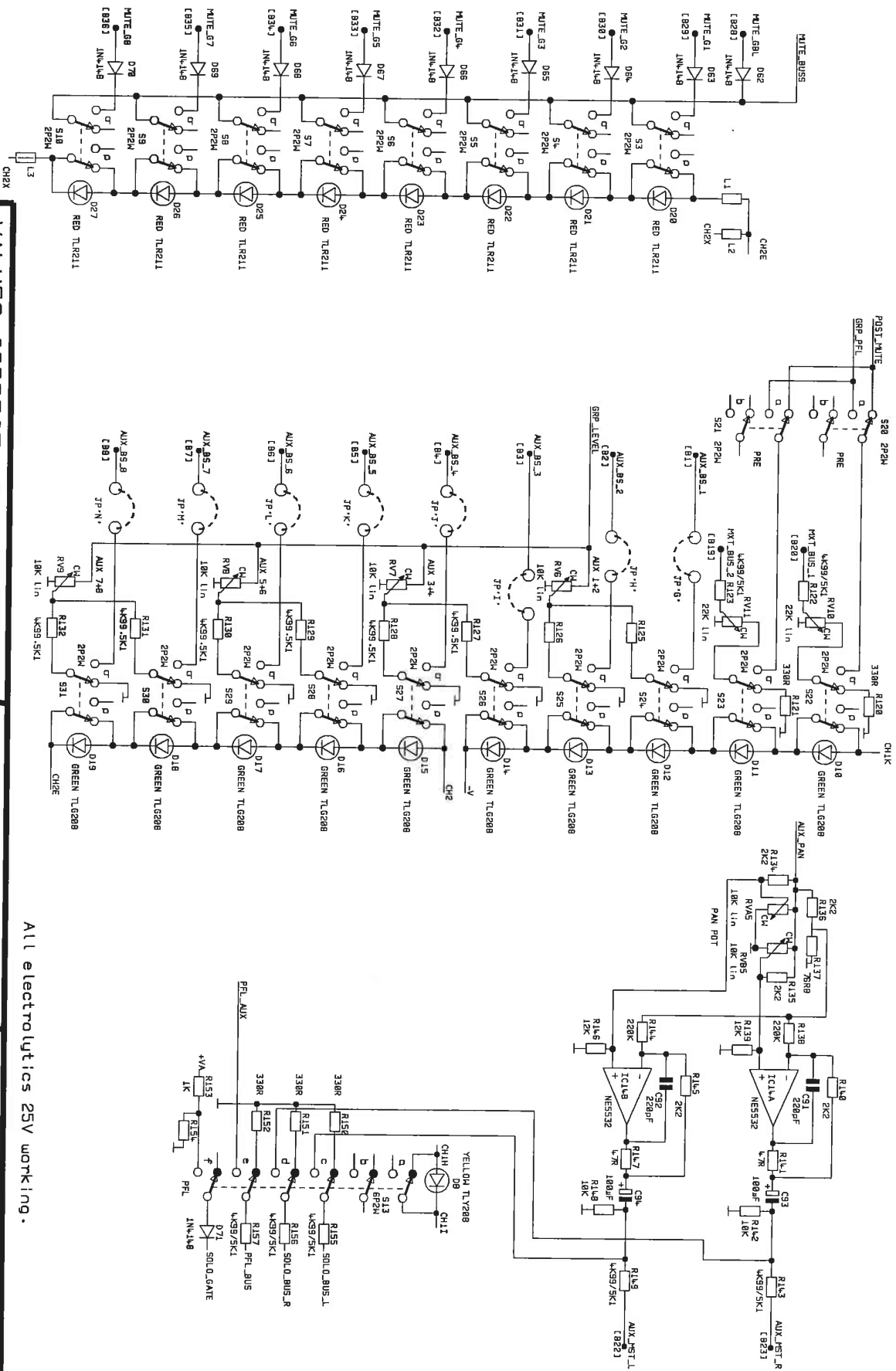


All electrolyts are 25V working.

XL10B GROUP PAN INPUT

XL10B_2.DGM

2.DEC.88



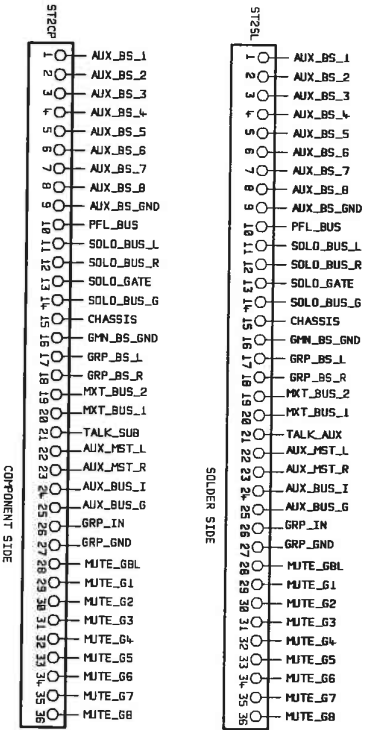
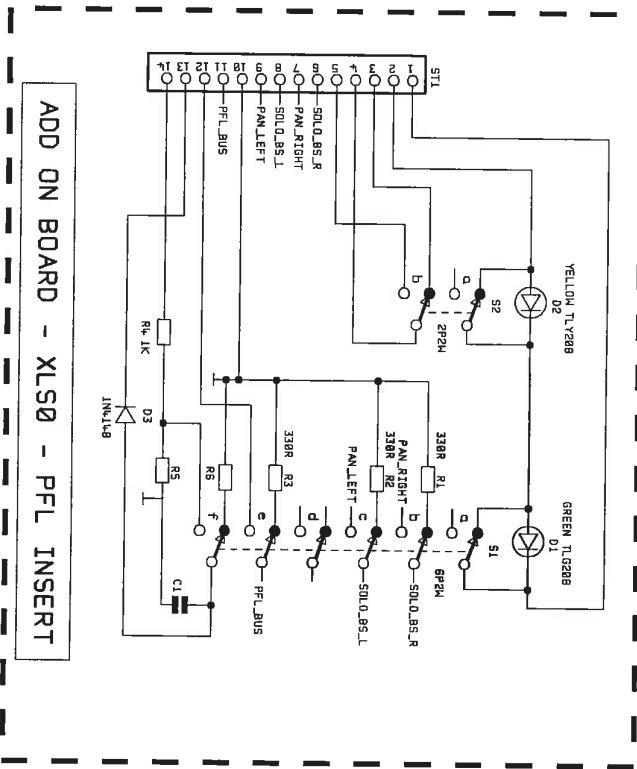
All electrolytics 25V working.

VALUES CORRECT AT:- 9.MAY.89 XL108 INPUT ROUTES XL108_3.DGM 2.DEC.88

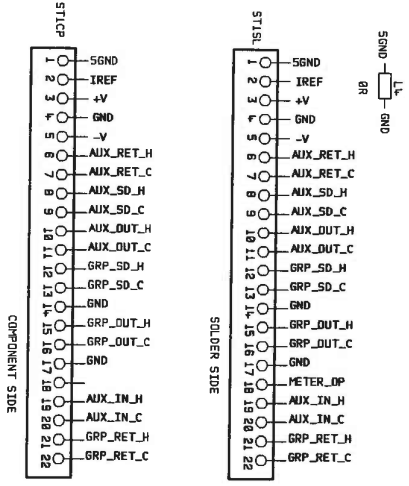
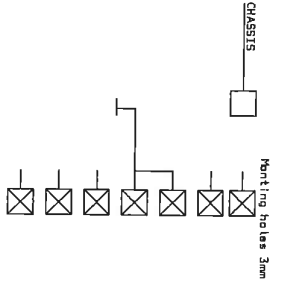
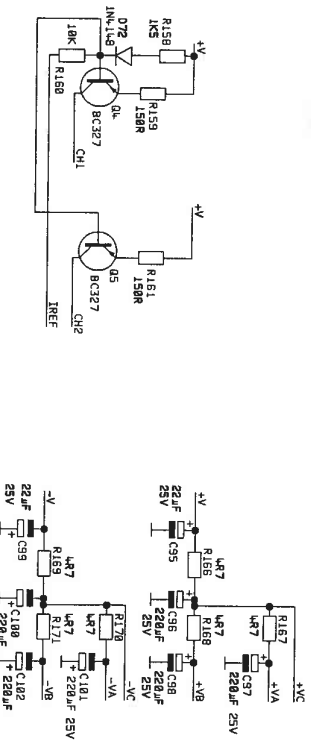
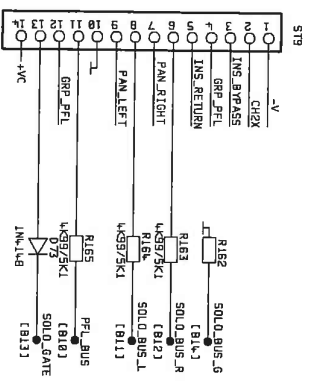
VALUES CORRECT AT: - 9.MAY.89

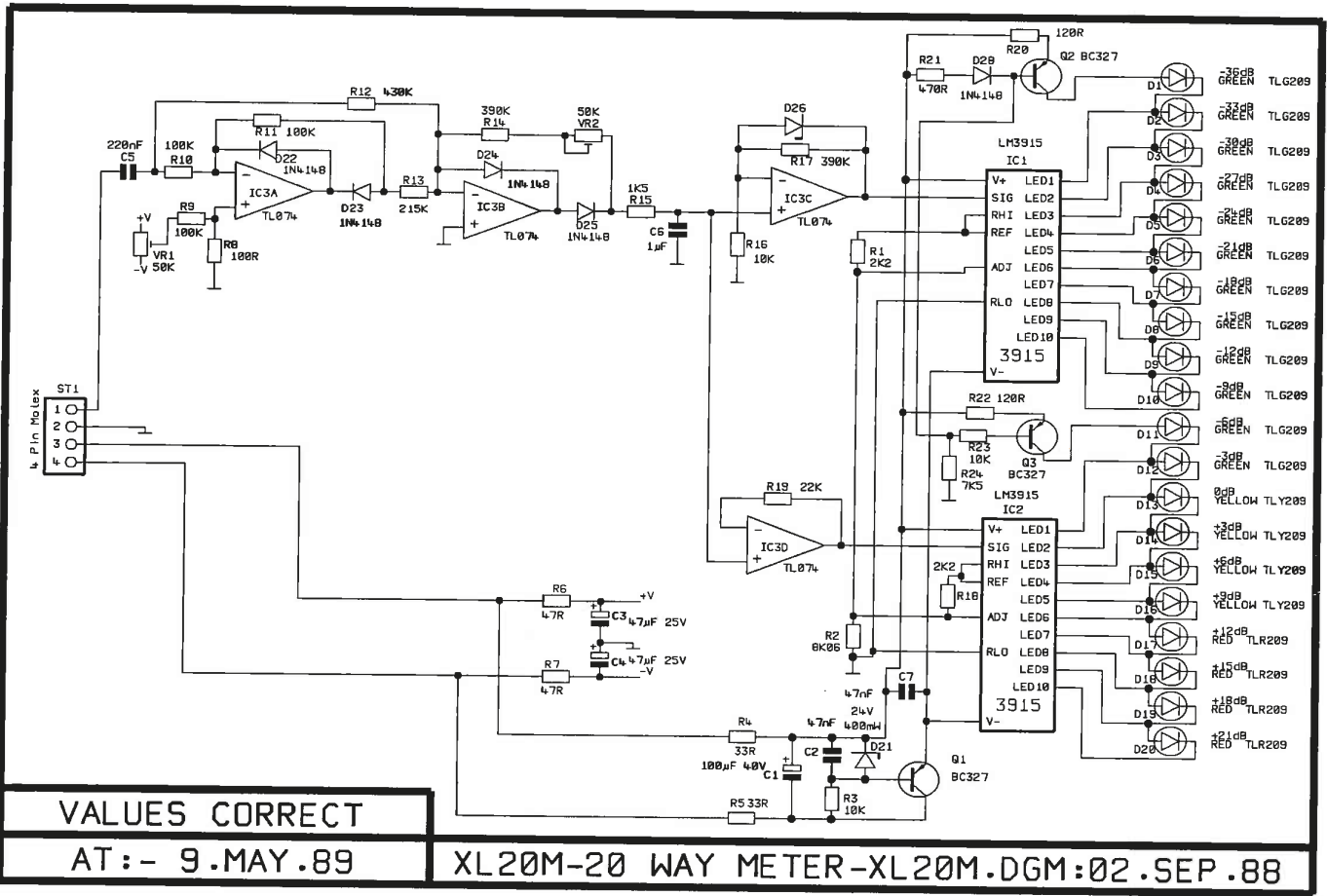
XL10B CONNECTOR & PSU

XL10B_4.DGM 2.DEC.88

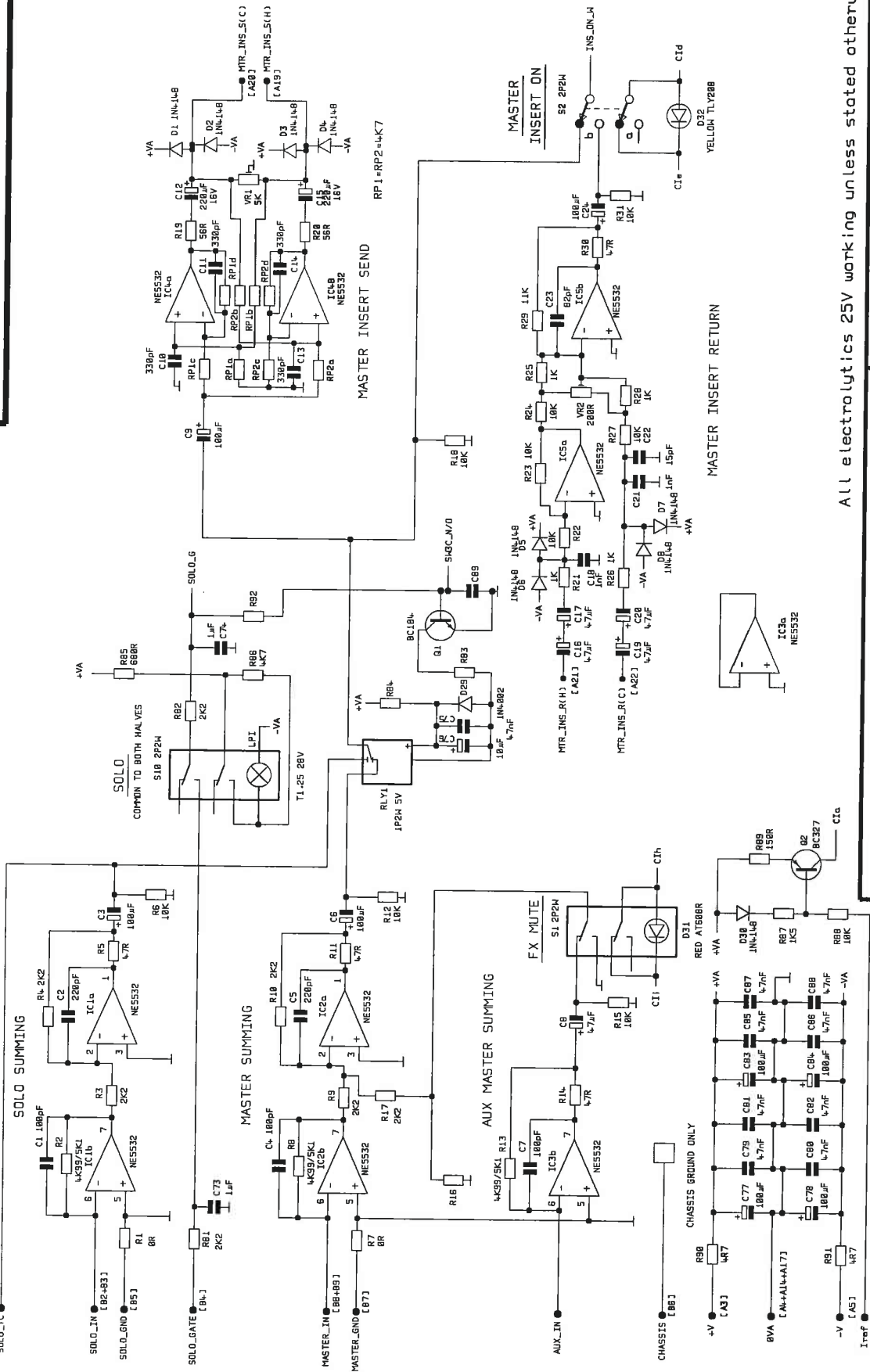


TO PFL INSERT BOARD





VALUES CORRECT AT: - 9.MAY.89

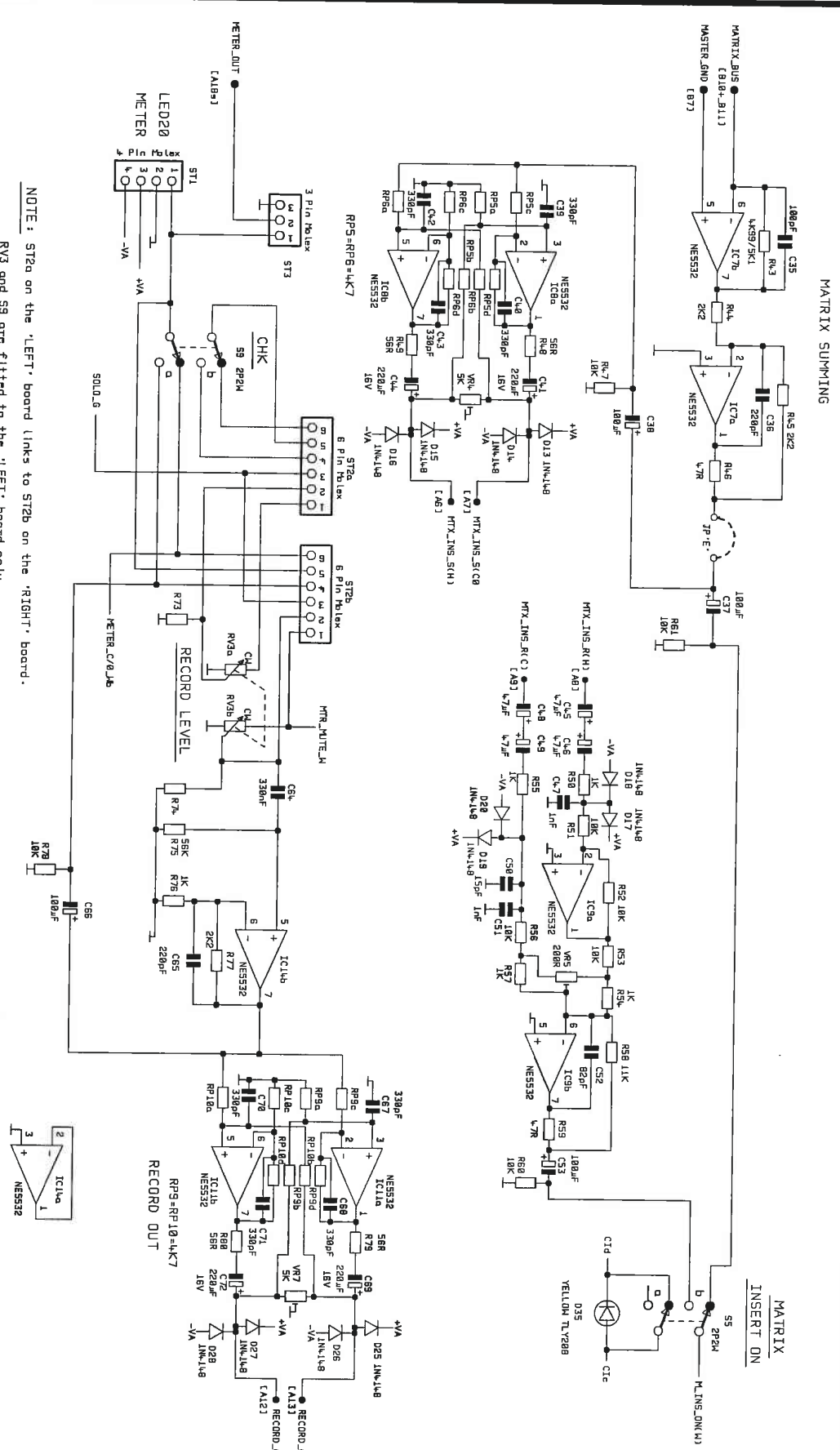


All electrolytics 25V working unless stated otherwise.

XL20B-SUMMING & MASTER INSERT

XL20B_1.DGM

26.OCT.88



NOTE: ST2a on the 'LEFT' board links to ST2b on the 'RIGHT' board.
RV3 and S9 are fitted to the 'LEFT' board only.

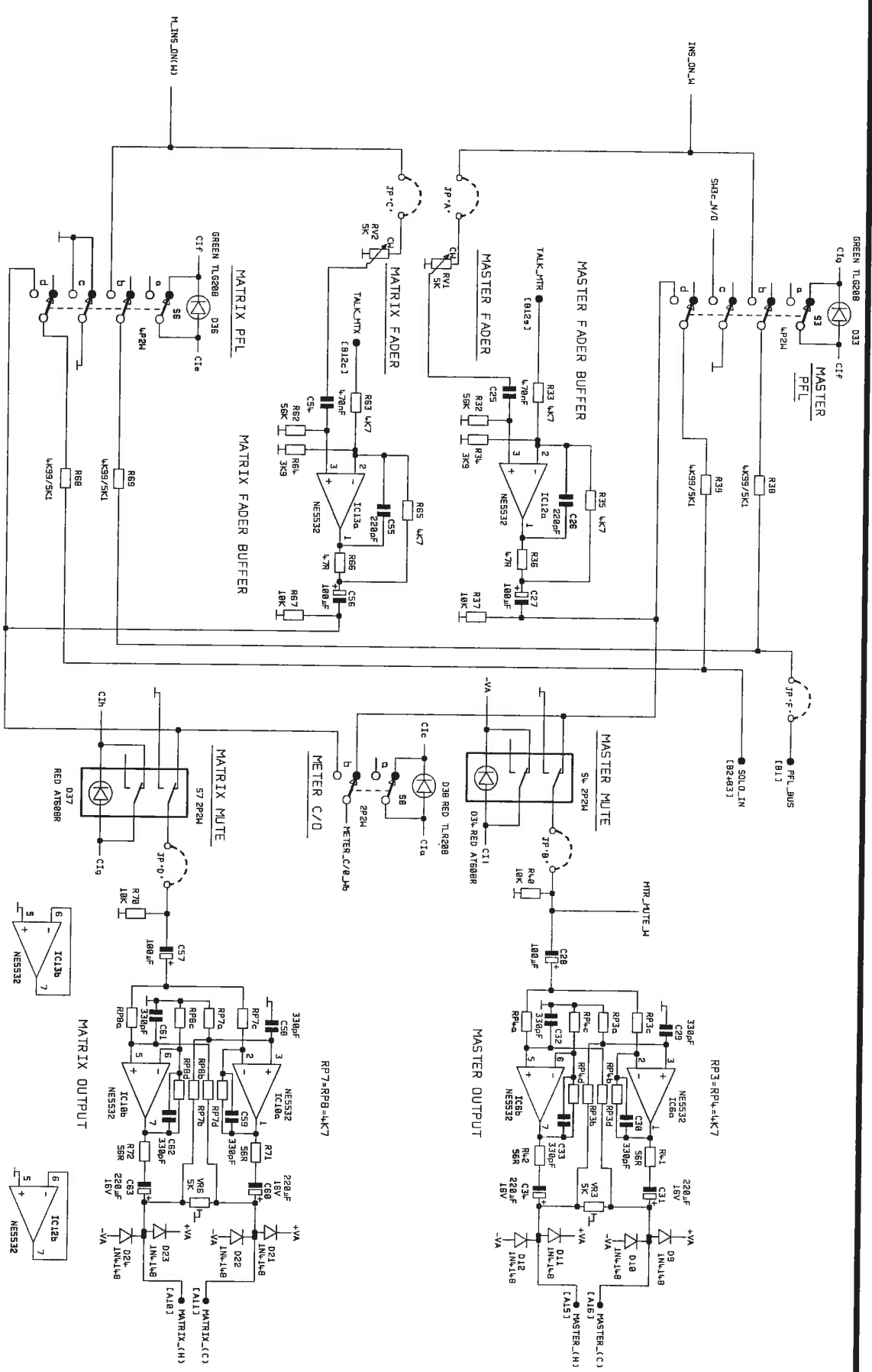
All electrolytics 25V working unless stated otherwise.

VALUES CORRECT AT: - 9.MAY.89

XL20B MATRIX & RECORD

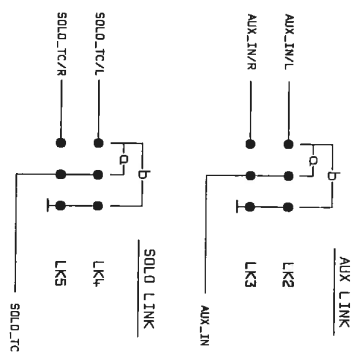
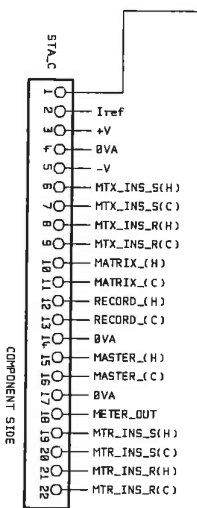
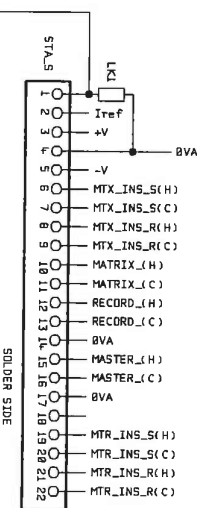
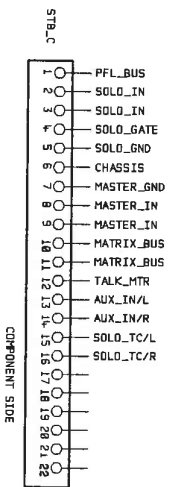
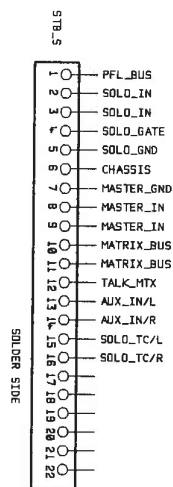
XL20B_2.DGM

26.OCT.88



All electrolytics 25V working unless stated otherwise.

VALUES CORRECT AT: - 9.MAY.89 XL20B MASTER & MATRIX OUTPUTS XL20B_3.DGM 26.OCT.88

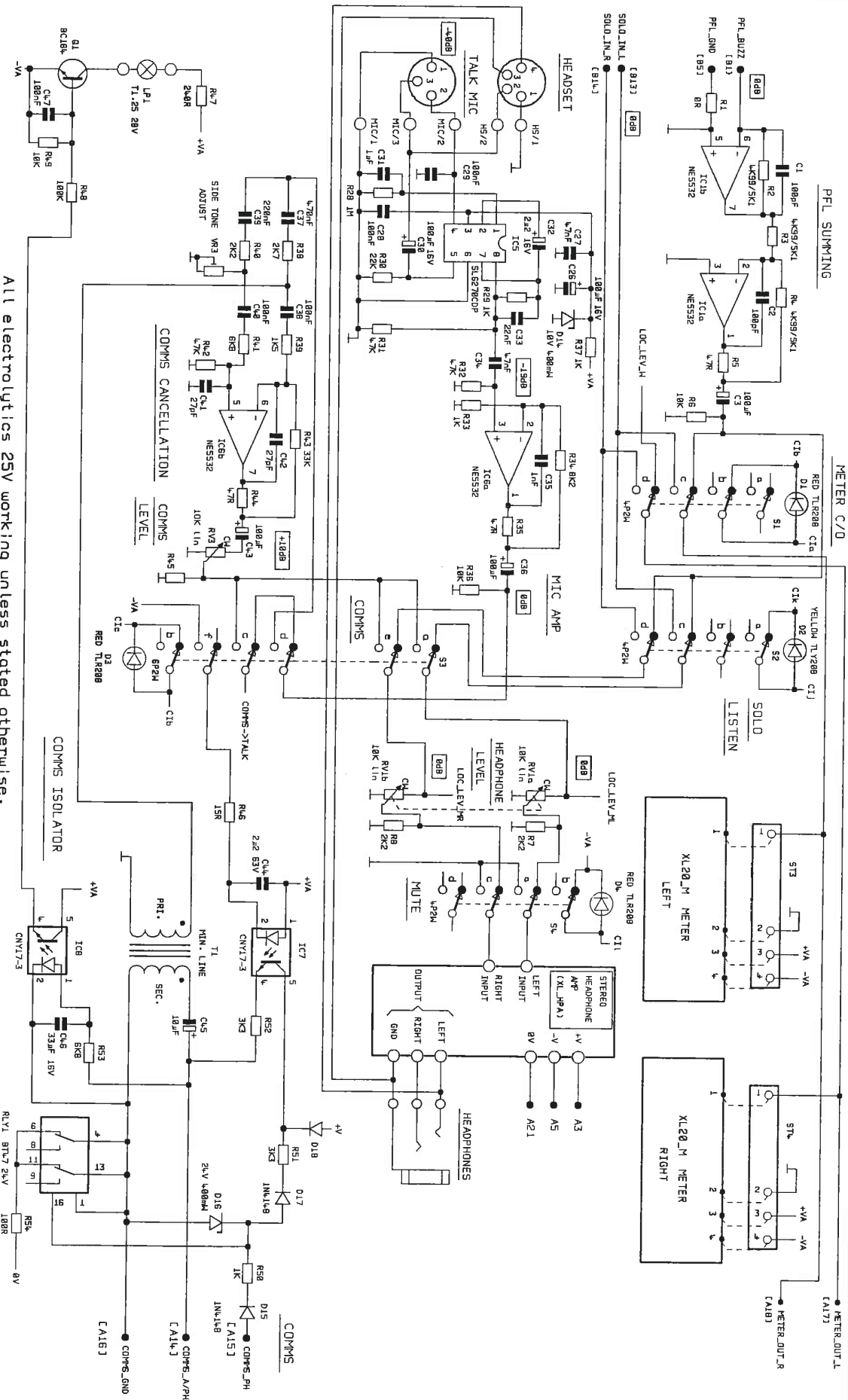


ON LEFT PCB

Fit links 'a' to LK2 & LK4
Fit links 'b' to LK3 & LK5

ON RIGHT PCB

Fit links 'a' to LK3 & LK5
Fit links 'b' to LK2 & LK4



All electrolytics 25V working unless stated otherwise.

VALUES CORRECT ON: - 9.MAY.89

XL30B COMMS, PFL & PHONES

XL30B_1.DGM

7.FEB.89

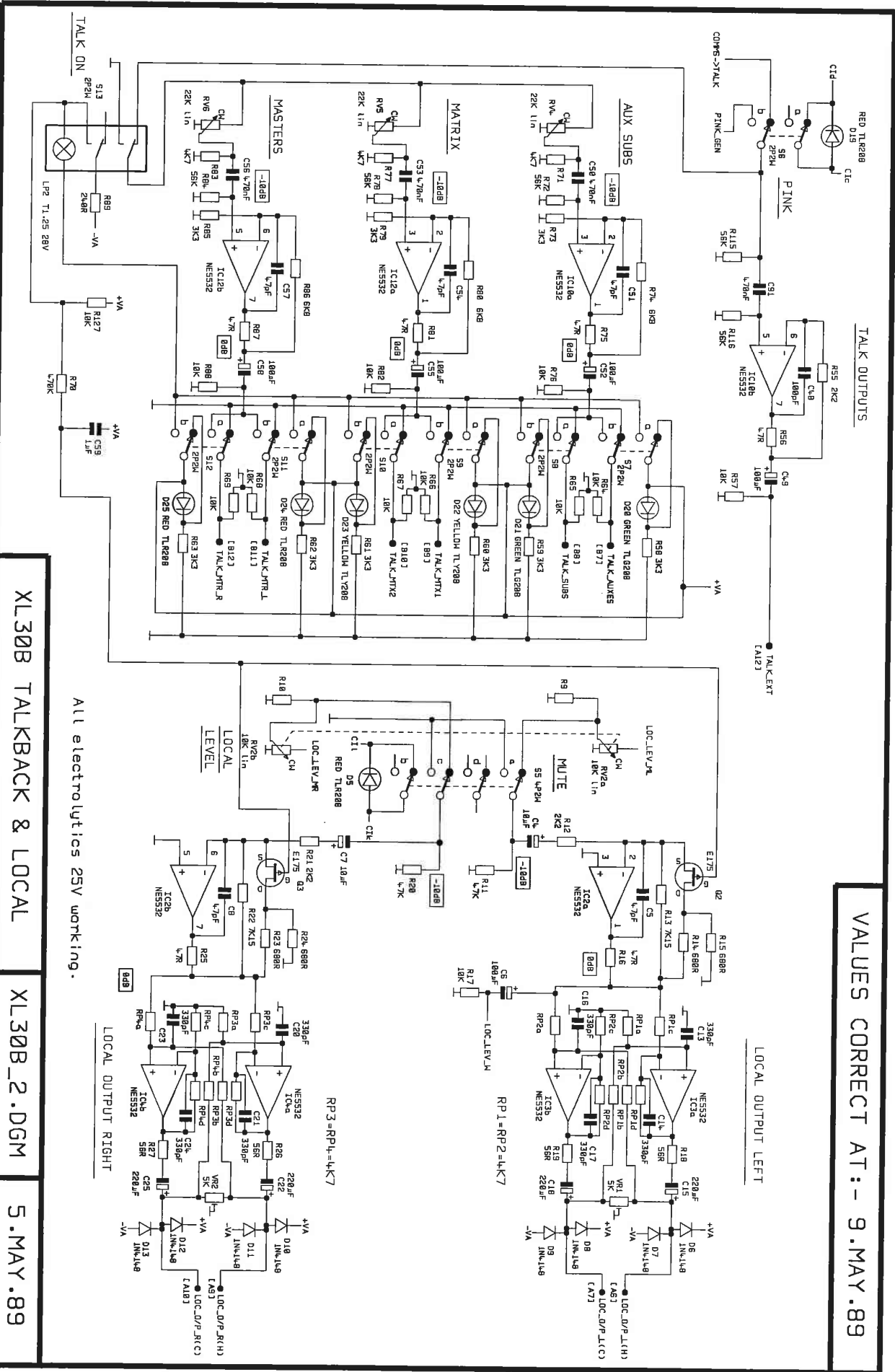
VALUES CORRECT AT: - 9.MAY.89

All electrolytics 25V working.

XL30B TALKBACK & LOCAL

XL30B_2.DGM

5.MAY.89



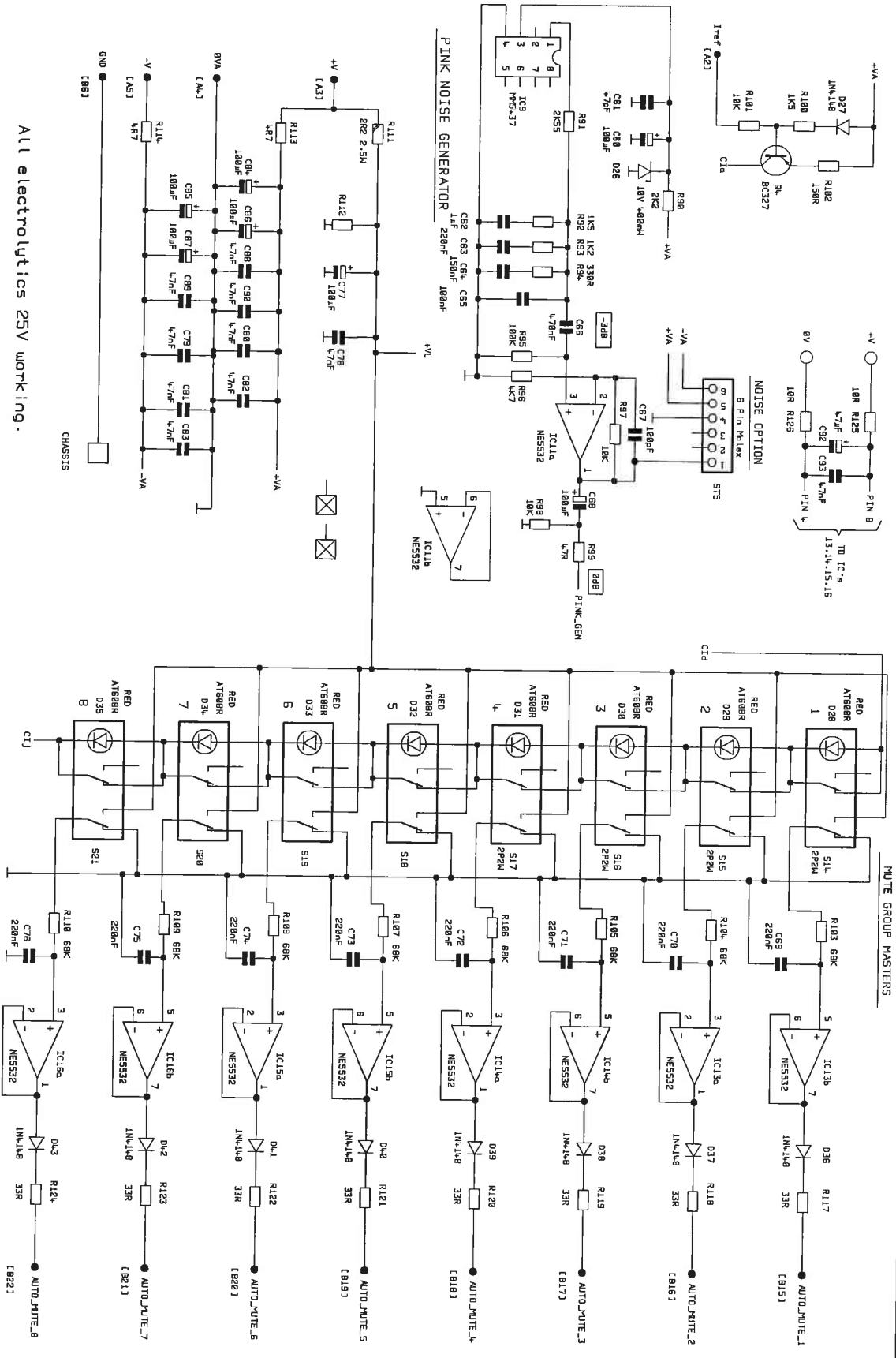
VALUES CORRECT AT: - 9.MAY.89

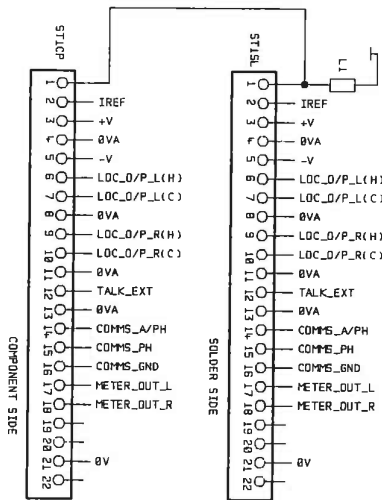
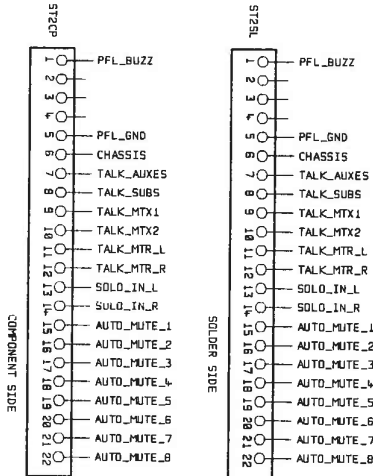
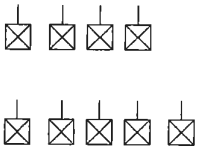
XL30B PINK NOISE, AUTO MUTES & PSU

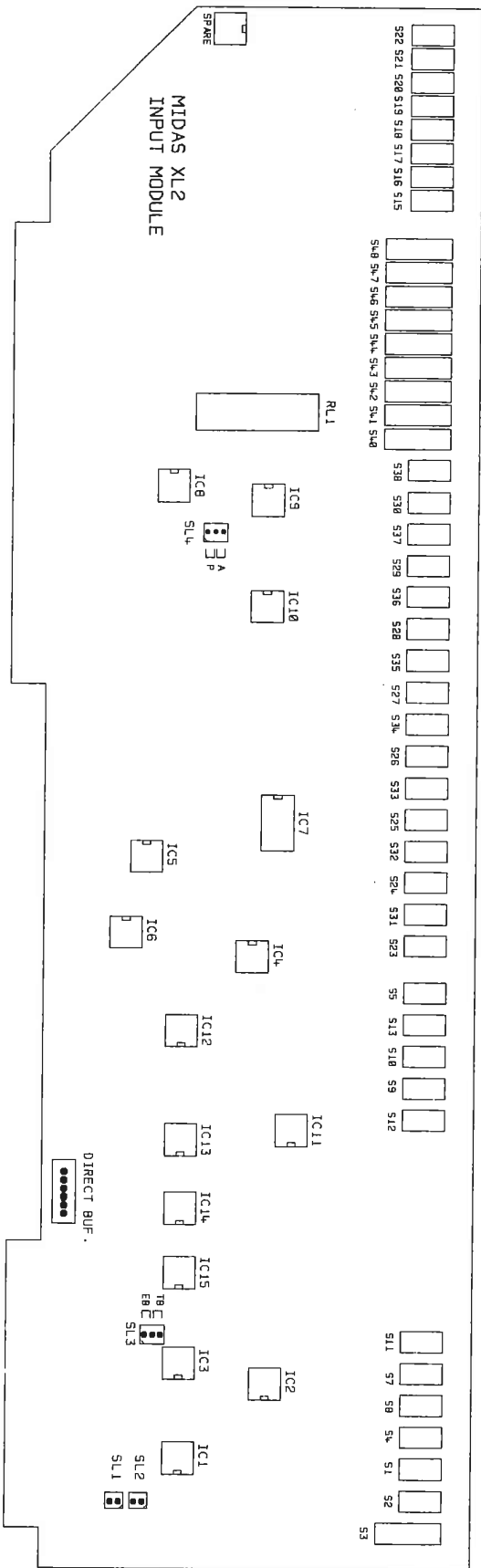
XL30B_3.DGM

4.MAY.89

All electrolytics 25V working.







DIRECT OUTPUT (WHEN FITTED)

- PRE-FADE DIRECT OUTPUT.
- Fit SL4 Jumper in P position.
- POST-FADE DIRECT OUTPUT.
- Fit SL4 Jumper in A position.

FOR ELECTRONIC BALANCED INPUT.

1. Fit Jumpers to SL1 & SL2
2. Change SL3 Jumper to EB position.

FOR TRANSFORMER BALANCED INPUT.

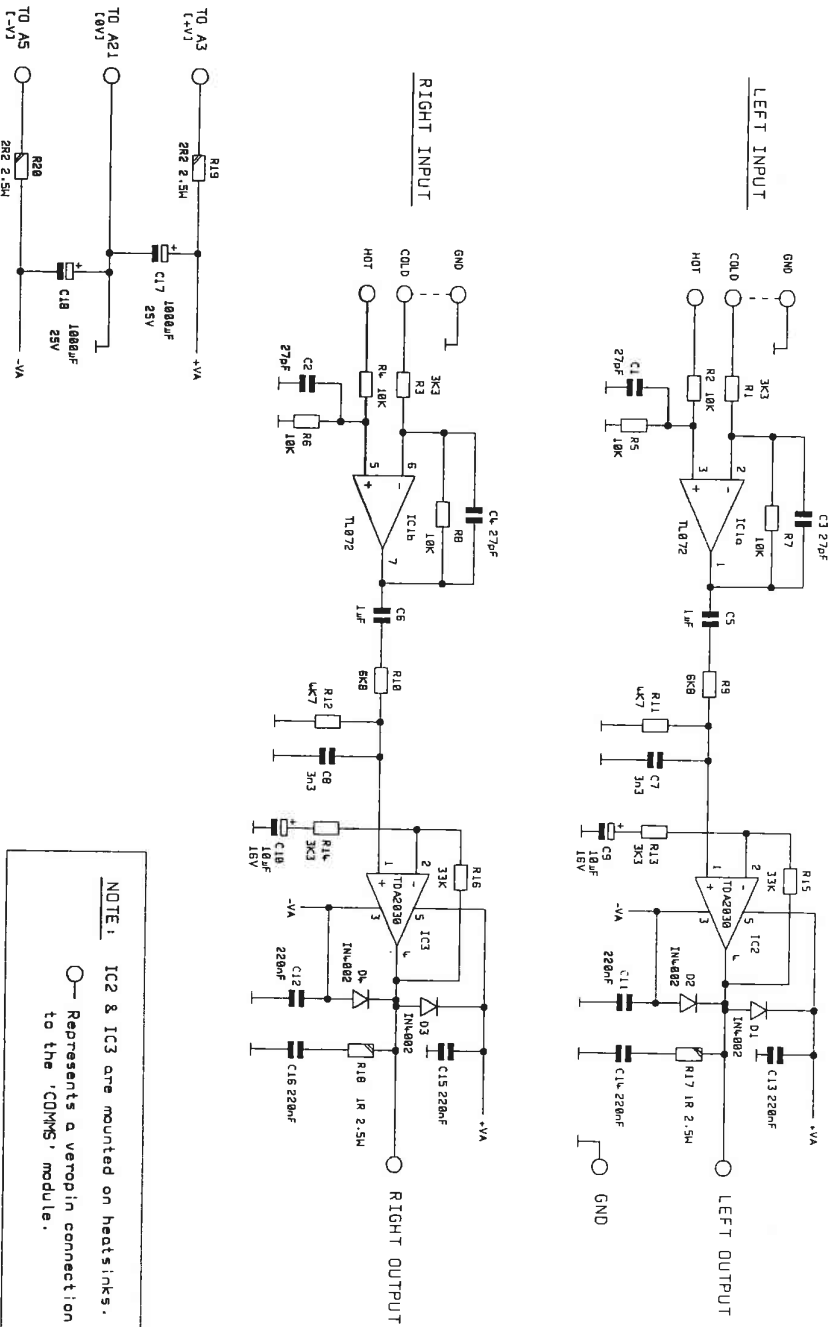
1. Remove Jumpers from SL1 & SL2
2. Change SL3 Jumper to TB position.

XL2 INPUT CHANNEL USER OPTION LINKS

XL01_LK.DGM

20.OCT.88

VALUES CORRECT AT :- 9.MAY.89



NOTE: IC2 & IC3 are mounted on heatinks.
 ○ Represents a veropin connection to the 'COMMS' module.

XL_HPA STEREO HEADPHONE AMPLIFIER

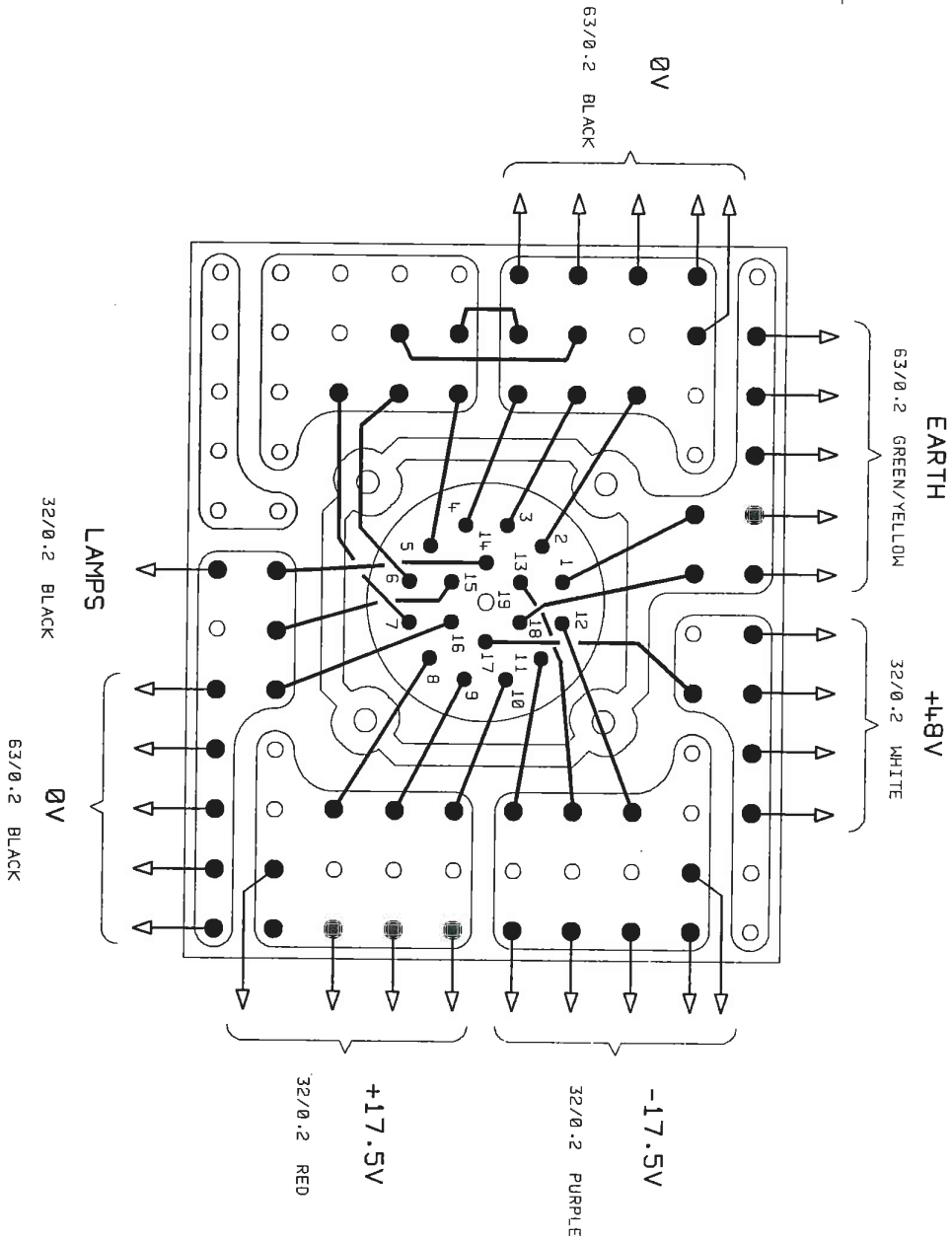
XL_HPA.DGM

15.FEB.89

CONNECTOR PIN ASSIGNMENT

PIN 1:	EARTH
PIN 2:	0V
PIN 3:	0V
PIN 4:	0V
PIN 5:	0V
PIN 6:	0V
PIN 7:	0V
PIN 8:	+17.5V
PIN 9:	+17.5V
PIN 10:	+17.5V
PIN 11:	-17.5V
PIN 12:	-17.5V
PIN 13:	-17.5V
PIN 14:	0V
PIN 15:	0V
PIN 16:	0V
PIN 17:	+4.8V
PIN 18:	EARTH
PIN 19:	Not used

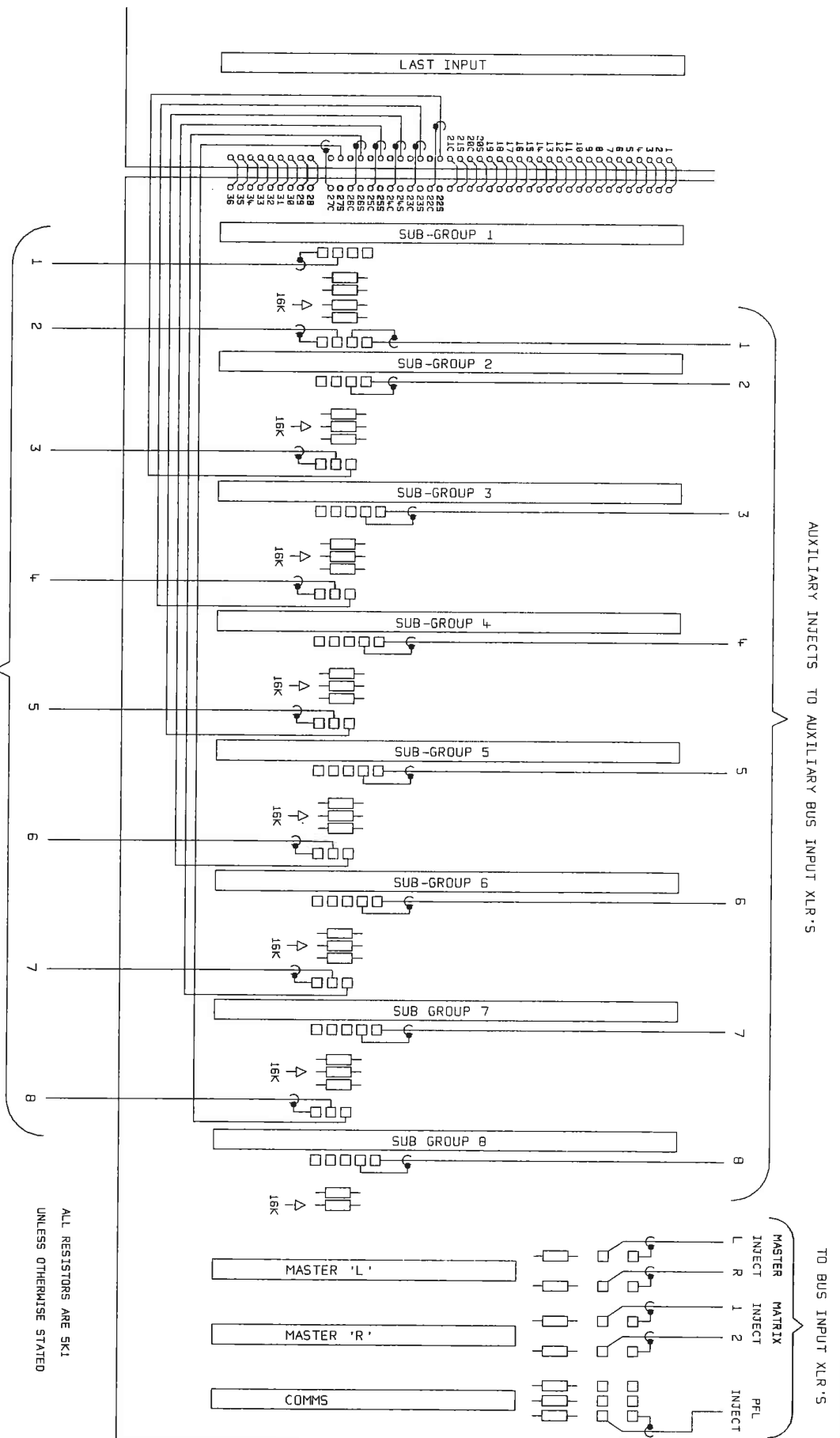
REAR VIEW OF CONNECTOR



XL2 CHASSIS POWER INPUT PCB CONNECTIONS

XLFRM_1.DGM

11.OCT.88



NOTE: ALL BUS INPUT XLR'S
ARE WIRED PIN 3 HOT
PINS 1 & 2 GROUND

XL2 MOTHERBOARD CONNECTOR 'B' MONO WIRING

XLFRM_3.DGM

13.OCT.88

XL2 MOTHERBOARD CONNECTOR 'B' MONO WIRING

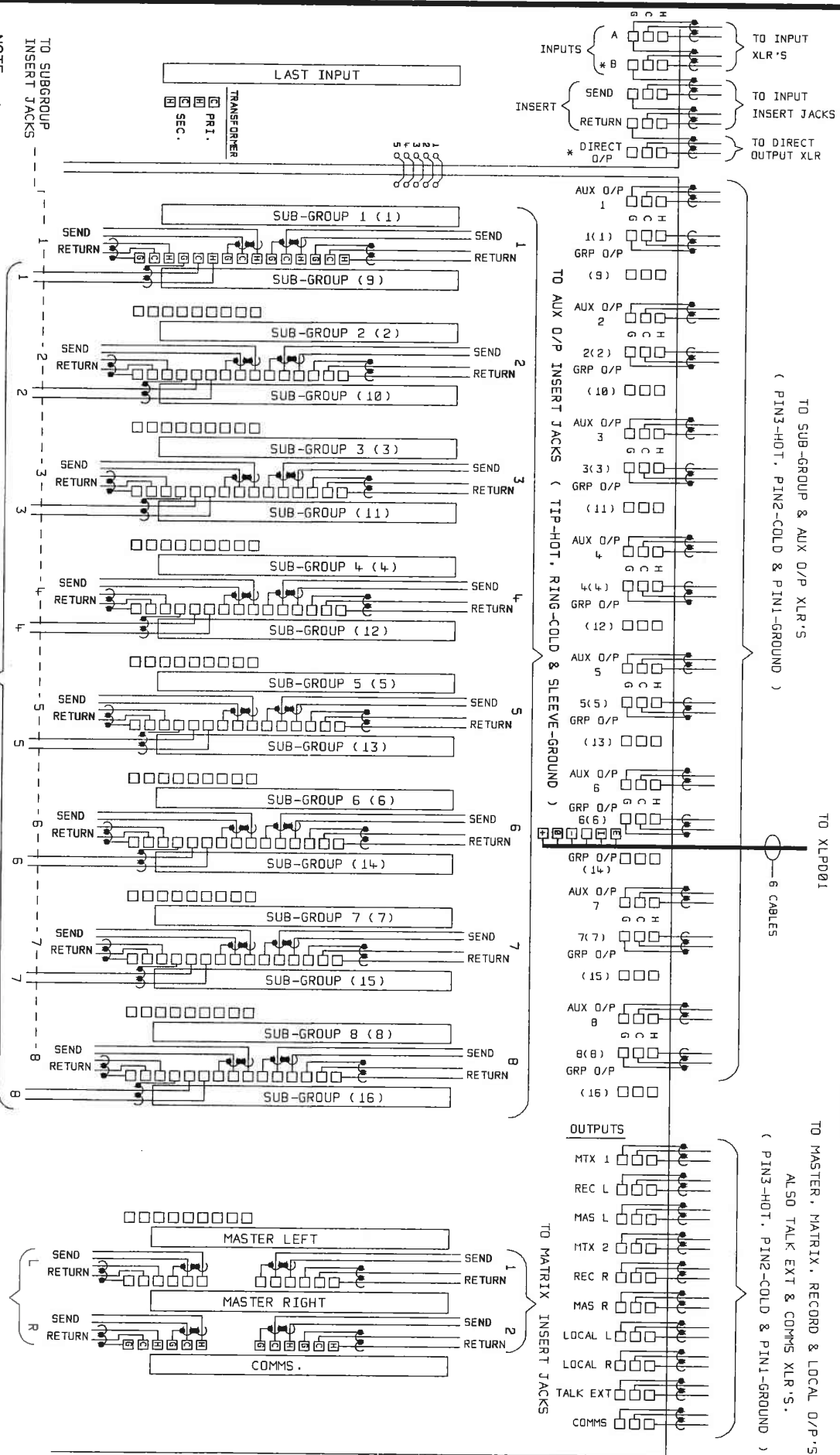
XLFRM_4.DGM

13.OCT.88

NOTE: * Input 'B' or DIRECT outputs are custom options. Stereo groups are shown in brackets.

TO AUX I/P XLR'S (PIN3-HOT, PIN2-COLD & PIN1-GROUND)

TO MASTER INSERT JACKS



TO SUBGROUP INSERT JACKS

TO SUB-GROUP & AUX O/P XLR'S (PIN3-HOT, PIN2-COLD & PIN1-GROUND)

TO MASTER, MATRIX, RECORD & LOCAL O/P'S. ALSO TALK EXT & COMMS XLR'S. (PIN3-HOT, PIN2-COLD & PIN1-GROUND)

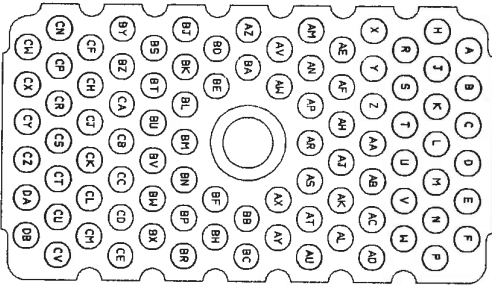
TO MASTER INSERT JACKS

TO MASTER, MATRIX, RECORD & LOCAL O/P'S. ALSO TALK EXT & COMMS XLR'S. (PIN3-HOT, PIN2-COLD & PIN1-GROUND)

TO MASTER, MATRIX, RECORD & LOCAL O/P'S. ALSO TALK EXT & COMMS XLR'S. (PIN3-HOT, PIN2-COLD & PIN1-GROUND)

50 WAY . EDAC . CONNECTOR

PIN VIEW



NO. MPC-1
DESCRIPTION : INPUT INSERT SENDS

A	H	INPUT INSERT	1	BD	H	INPUT INSERT	15
B	C	SEND		BE	C	SEND	
C	S			BF	S		
D	H	INPUT INSERT	2	B7	H	INPUT INSERT	16
E	C	SEND		BK	C	SEND	
F	S			BL	S		
H	H	INPUT INSERT	3	BM	H	INPUT INSERT	17
J	C	SEND		BN	C	SEND	
K	S			BP	S		
L	H	INPUT INSERT	4	B5	H	INPUT INSERT	18
M	C	SEND		BT	C	SEND	
N	S			BU	S		
R	H	INPUT INSERT	5	AY	H	NOT USED	
S	C	SEND		BC	C		
T	S			BH	S		
U	H	INPUT INSERT	6	BV	H	INPUT INSERT	19
V	C	SEND		BM	C	SEND	
W	S			BX	S		
X	H	INPUT INSERT	7	BY	H	INPUT INSERT	20
Y	C	SEND		BZ	C	SEND	
Z	S			CA	S		
AA	H	INPUT INSERT	8	CB	H	INPUT INSERT	21
AB	C	SEND		CC	C	SEND	
AC	S			CD	S		
AE	H	INPUT INSERT	9	CF	H	INPUT INSERT	22
AF	C	SEND		CH	C	SEND	
AH	S			CT	S		
P	H	NOT USED		CK	H	INPUT INSERT	23
AD	C			CL	C	SEND	
AU	S			CH	S		
A7	H	INPUT INSERT	10	CN	H	INPUT INSERT	24
AK	C	SEND		CP	C	SEND	
AL	S			CR	S		
AM	H	INPUT INSERT	11	CS	H	INPUT INSERT	25
AP	C	SEND		CT	C	SEND	
AS	S			CU	S		
AR	H	INPUT INSERT	12	CM	H	INPUT INSERT	26
AT	C	SEND		CX	C	SEND	
AV	H	INPUT INSERT	13	CZ	H	INPUT INSERT	27
AM	C	SEND		DA	C	SEND	
AX	S			DB	S		
AZ	H	INPUT INSERT	14	BR	H	NOT USED	
BA	C			CE	C		
BB	S			CY	S		

NO. MPC-2
DESCRIPTION : INPUT INSERT RETURNS

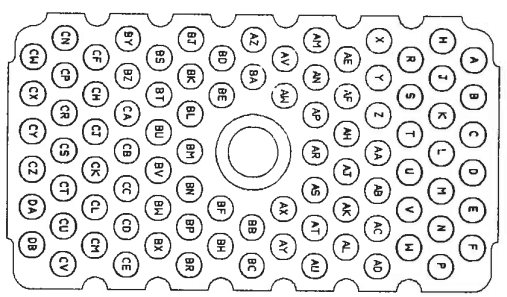
A	H	INPUT INSERT	1	BD	H	INPUT INSERT	15
B	C	RETURN		BE	C	RETURN	
C	S			BF	S		
D	H	INPUT INSERT	2	B7	H	INPUT INSERT	16
E	C	RETURN		BK	C	RETURN	
F	S			BL	S		
H	H	INPUT INSERT	3	BM	H	INPUT INSERT	17
J	C	RETURN		BN	C	RETURN	
K	S			BP	S		
L	H	INPUT INSERT	4	B5	H	INPUT INSERT	18
M	C	RETURN		BT	C	RETURN	
N	S			BU	S		
R	H	INPUT INSERT	5	AY	H	NOT USED	
S	C	RETURN		BC	C		
T	S			BH	S		
U	H	INPUT INSERT	6	BV	H	INPUT INSERT	19
V	C	RETURN		BM	C	RETURN	
W	S			BX	S		
X	H	INPUT INSERT	7	BY	H	INPUT INSERT	20
Y	C	RETURN		BZ	C	RETURN	
Z	S			CA	S		
AA	H	INPUT INSERT	8	CB	H	INPUT INSERT	21
AB	C	RETURN		CC	C	RETURN	
AC	S			CD	S		
AE	H	INPUT INSERT	9	CF	H	INPUT INSERT	22
AF	C	RETURN		CH	C	RETURN	
AH	S			CT	S		
P	H	NOT USED		CK	H	INPUT INSERT	23
AD	C			CL	C	RETURN	
AU	S			CH	S		
A7	H	INPUT INSERT	10	CN	H	INPUT INSERT	24
AK	C	RETURN		CP	C	RETURN	
AL	S			CR	S		
AM	H	INPUT INSERT	11	CS	H	INPUT INSERT	25
AN	C	RETURN		CT	C	RETURN	
AP	S			CU	S		
AR	H	INPUT INSERT	12	CM	H	INPUT INSERT	26
AS	C	RETURN		CX	C	RETURN	
AT	S			CZ	H	INPUT INSERT	27
AV	H	INPUT INSERT	13	DA	C	RETURN	
AM	C	RETURN		DB	S		
AX	S			BR	H	NOT USED	
AZ	H	INPUT INSERT	14	CE	C		
BA	C			CY	S		
BB	S						

XL2 EDAC MULTIMWAY WIRING (1 OF 3)

XLFRM_5.DGM

19.OCT.88

90 MAY EDAC CONNECTOR
PIN VIEW



ND. MPC-3
DESCRIPTION: INPUT, AUX & LOCAL INSERTS

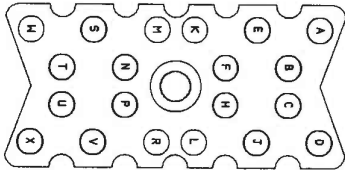
A	H	INPUT INSERT	28	BD	H	AUX INSERT	5
B	C	SEND		BE	C	SEND	
C	S			BF	S		
D	H	INPUT INSERT	29	BT	H	AUX INSERT	6
E	C	SEND		BK	C	SEND	
F	S			BL	S		
H	H	INPUT INSERT	30	BM	H	AUX INSERT	7
J	C	SEND		BN	C	SEND	
K	S			BP	S		
L	H	INPUT INSERT	31	BU	H	AUX INSERT	8
M	C	SEND		BT	C	SEND	
N	S			BU	S		
R	H	INPUT INSERT	32	AY	H	NOT USED	
S	C	SEND		BC	C		
T	S			BH	S		
U	H	INPUT INSERT	28	BV	H	AUX INSERT	1
V	C	RETURN		BM	C	RETURN	
W	S			BX	S		
X	H	INPUT INSERT	29	BY	H	AUX INSERT	2
Y	C	RETURN		BZ	C	RETURN	
Z	S			CA	S		
AA	H	INPUT INSERT	30	CB	H	AUX INSERT	3
AB	C	RETURN		CC	C	RETURN	
AC	S			CD	S		
AE	H	INPUT INSERT	31	CF	H	AUX INSERT	4
AF	C	RETURN		CH	C	RETURN	
AH	S			CT	S		
P	H	NOT USED		CK	H	AUX INSERT	5
AO	C			CL	C	RETURN	
AU	S			CM	S		
AT	H	INPUT INSERT	32	CN	H	AUX INSERT	6
AK	C	RETURN		CP	C	RETURN	
AL	S			CR	S		
AM	H	AUX INSERT	1	CS	H	AUX INSERT	7
AN	C	SEND		CT	C	RETURN	
AP	S			CU	S		
AR	H	AUX INSERT	2	CH	H	AUX INSERT	8
AS	C	SEND		CX	C	RETURN	
AT	S			CY	S		
AV	H	AUX INSERT	3	CZ	H	SOLD INSERT	R
AM	C	SEND		DA	C	RETURN	
AX	S			DB	S		
AZ	H	AUX INSERT	4	BR	H	NOT USED	
BA	C	SEND		CE	C		
BB	S			CT	S		

ND. MPC-4
DESCRIPTION: GROUP & MASTER INSERTS

A	H	SUB GROUP	1	BD	H	SUB GROUP	6
B	C	INSERT SEND		BE	C	INSERT RETURN	
C	S			BF	S		
D	H	SUB GROUP	2	B7	H	SUB GROUP	7
E	C	INSERT SEND		BK	C	INSERT RETURN	
F	S			BL	S		
H	H	SUB GROUP	3	BM	H	SUB GROUP	8
J	C	INSERT SEND		BN	C	INSERT RETURN	
K	S			BP	S		
L	H	SUB GROUP	4	BT	H	SOLD INSERT	L
M	C	INSERT SEND		BS	C	SEND	
N	S			BU	S		
R	H	SUB GROUP	5	AY	H	NOT USED	
S	C	INSERT SEND		BC	C		
T	S			BH	S		
U	H	SUB GROUP	6	BV	H	MATRIX INSERT	1
V	C	INSERT SEND		BM	C	SEND	
W	S			BX	S		
X	H	SUB GROUP	7	BY	H	MATRIX INSERT	2
Y	C	INSERT SEND		BZ	C	SEND	
Z	S			CA	S		
AA	H	SUB GROUP	8	CB	H	MATRIX INSERT	1
AB	C	INSERT SEND		CC	C	RETURN	
AC	S			CD	S		
AE	H	SOLD INSERT	R	CF	H	MATRIX INSERT	2
AF	C	SEND		CH	C	RETURN	
AH	S			CJ	S		
P	H	NOT USED		CK	H	MASTER INSERT	L
AO	C			CL	C	SEND	
AU	S			CM	S		
AT	H	SUB GROUP	1	CN	H	MASTER INSERT	R
AK	C	INSERT RETURN		CP	C	SEND	
AL	S			CR	S		
AM	H	SUB GROUP	2	CS	H	MASTER INSERT	L
AN	C	INSERT RETURN		CT	C	RETURN	
AP	S			CU	S		
AR	H	SUB GROUP	3	CH	H	MASTER INSERT	R
AS	C	INSERT RETURN		CX	C	RETURN	
AT	S			CY	S		
AV	H	SUB GROUP	4	CZ	H	SOLD INSERT	L
AM	C	INSERT RETURN		DA	C	RETURN	
AX	S			DB	S		
AZ	H	SUB GROUP	5	BR	H	NOT USED	
BA	C	INSERT RETURN		CE	C		
BB	S			CT	S		

20 MAY · EDAC · CONNECTOR

PIN VIEW



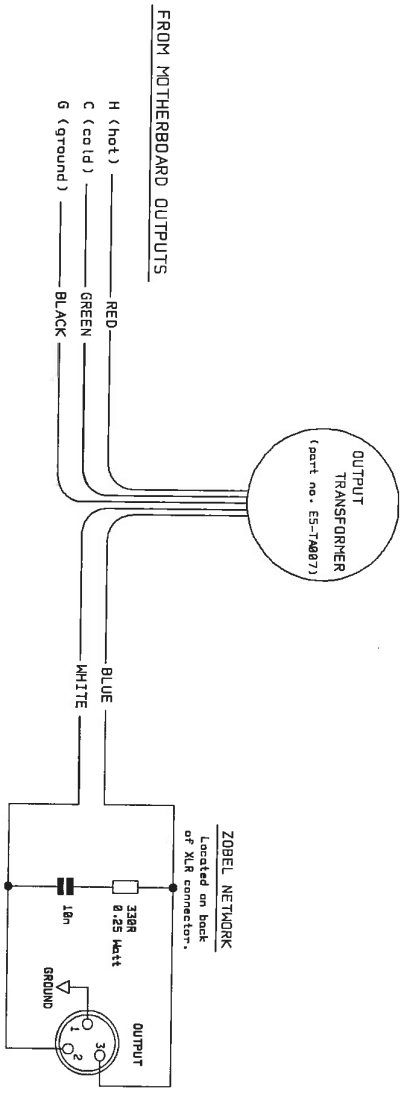
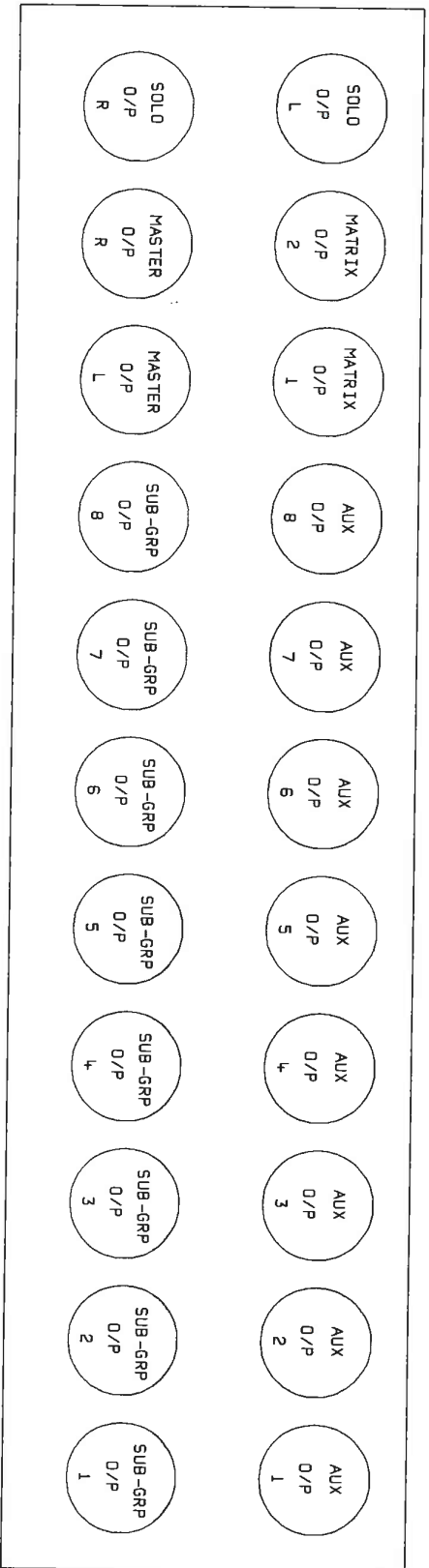
NO.	DESCRIPTION	NO.	DESCRIPTION
A	CHANNEL 1	COMMON	
B	CHANNEL 1	NORMALLY OPEN	
C	CHANNEL 2	COMMON	
D	CHANNEL 2	NORMALLY OPEN	
E	CHANNEL 3	COMMON	
F	CHANNEL 3	NORMALLY OPEN	
G	CHANNEL 4	COMMON	
H	CHANNEL 4	NORMALLY OPEN	
I	CHANNEL 5	COMMON	
J	CHANNEL 5	NORMALLY OPEN	
K	CHANNEL 6	COMMON	
L	CHANNEL 6	NORMALLY OPEN	
M	CHANNEL 7	COMMON	
N	CHANNEL 7	NORMALLY OPEN	
O	CHANNEL 8	COMMON	
P	CHANNEL 8	NORMALLY OPEN	
Q	CHANNEL 9	COMMON	
R	CHANNEL 9	NORMALLY OPEN	
S	CHANNEL 10	COMMON	
T	CHANNEL 10	NORMALLY OPEN	
U	NOT USED		
V	NOT USED		
W	NOT USED		
X	NOT USED		

XL2 EDAC MULTIMAY WIRING (3 OF 3)

XLFRM_7.DGM

19.OCT.88

OUTPUT TRANSFORMER LAYOUT



XL2 OUTPUT TRANSFORMER LOCATION AND WIRING

XLFRM_8.DGM

16.FEB.89

XL2 INPUT/OUTPUT CONNECTORS 'A'

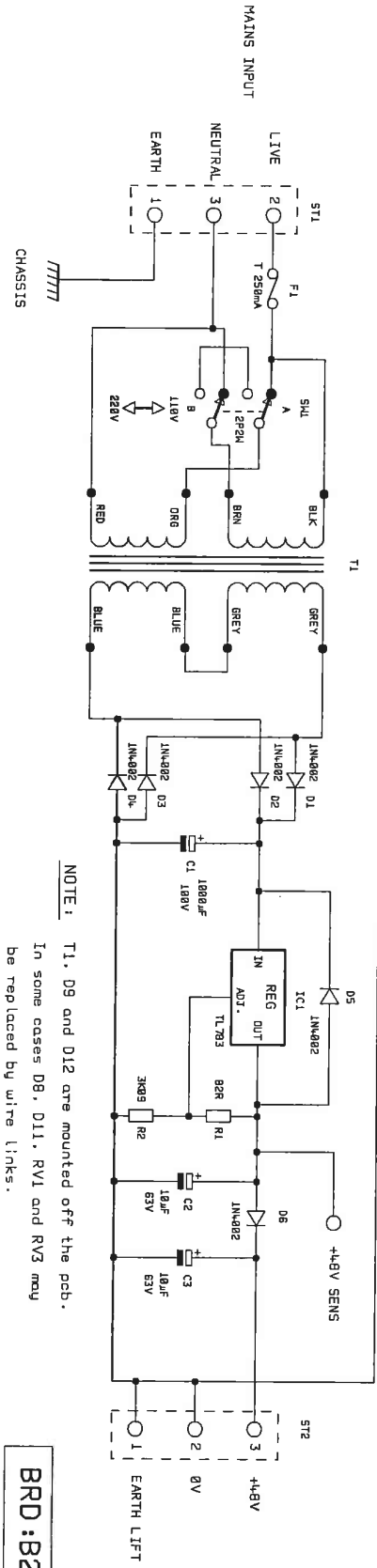
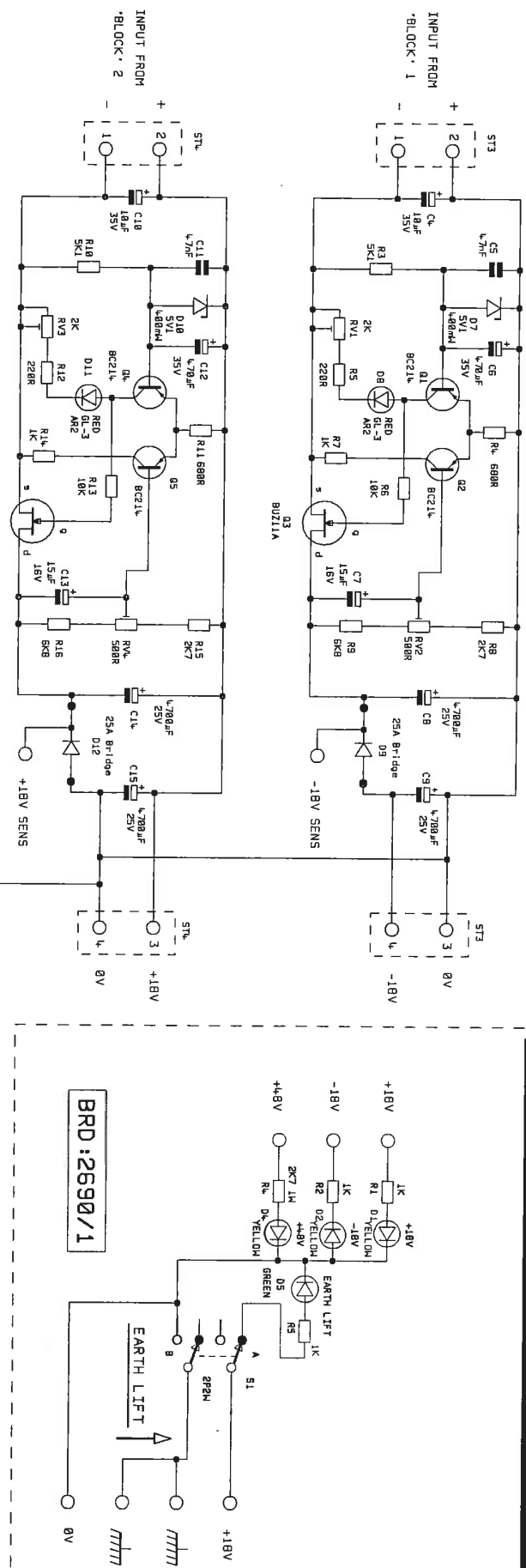
	XL01A 'INPUT'	XL10B 'SUB-GROUP'	XL20B 'MASTER'	XL30B 'COMMS'
1	GND	GND	GND	GND
2	Iref	Iref	Iref	Iref
3	+V	+V	+V	+V
4	GND	GND	GND	GND
5	-V	-V	-V	-V
6	+48V	AUX O/P INSERT RET. HOT	MATRIX INSERT SEND HOT	LOCAL OUTPUT LEFT HOT
7	INPUT 'A' HOT	AUX O/P INSERT RET. COLD	MATRIX INSERT SEND COLD	LOCAL OUTPUT LEFT COLD
8	INPUT '2' COLD	AUX O/P INSERT SEND HOT	MATRIX INSERT RET. HOT	GND
9	INPUT 'A' GND	AUX O/P INSERT SEND COLD	MATRIX INSERT RET. COLD	LOCAL OUTPUT RIGHT HOT
10	INPUT 'B' HOT	AUX OUTPUT HOT	MATRIX OUTPUT HOT	LOCAL OUTPUT RIGHT COLD
11	INPUT 'B' COLD	AUX OUTPUT COLD	MATRIX OUTPUT COLD	GND
12	INPUT 'B' GND	GROUP INSERT SEND HOT	RECORD OUTPUT HOT	TALK EXTERNAL
13	INSERT SEND HOT	GROUP INSERT SEND COLD	RECORD OUTPUT COLD	GND
14	INSERT SEND COLD	GND	GND	COMMS PIN 3
15	INSERT RETURN HOT	GROUP OUTPUT HOT	MASTER OUTPUT HOT	COMMS PIN 2
16	INSERT RETURN COLD	GROUP OUTPUT COLD	MASTER OUTPUT COLD	COMMS PIN 1
17	DIRECT OUT: COLD / HOT	GND	GND	METER OUT LEFT
18	-	- / METER OUT	- / METER OUT	METER OUT RIGHT
19	TX PRIMARY COLD	AUX INPUT HOT	MASTER INSERT SEND HOT	-
20	TX PRIMARY HOT	AUX INPUT COLD	MASTER INSERT SEND COLD	-
21	TX SECONDARY COLD	GROUP INSERT RETURN HOT	MASTER INSERT RET. HOT	0V HEADPHONES
22	GND	GROUP INSERT RETURN COLD	MASTER INSERT RET. COLD	-

XL2 CONNECTORS 'B'

XL01A 'INPUT'		XL10B 'SUB-GROUP'		NOTE: Unless shown otherwise, both component and solder side of connectors are common. When not common, the convention is:- SOLDER SIDE / COMPONENT SIDE		
1	AUX BUS 1	AUX BUS 1	AUX BUS 1			
2	AUX BUS 2	AUX BUS 2	AUX BUS 2			
3	AUX BUS 3	AUX BUS 3	AUX BUS 3			
4	AUX BUS 4	AUX BUS 4	AUX BUS 4			
5	AUX BUS 5	AUX BUS 5	AUX BUS 5			
6	AUX BUS 6	AUX BUS 6	AUX BUS 6			
7	AUX BUS 7	AUX BUS 7	AUX BUS 7			
8	AUX BUS 8	AUX BUS 8	AUX BUS 8			
9	AUX BUS GND	AUX BUS GND	AUX BUS GND			
10	PFL BUS	PFL BUS	PFL BUS	1	PFL BUS	PFL BUS
11	SOLO BUS LEFT	SOLO BUS LEFT	SOLO BUS LEFT	2(1)	SOLO BUS LEFT	-
12	SOLO BUS RIGHT	SOLO BUS RIGHT	SOLO BUS RIGHT	3(2)	SOLO BUS RIGHT	-
13	SOLO GATE	SOLO GATE	SOLO GATE	4	SOLO GATE	-
14	SOLO BUS GND	SOLO BUS GND	SOLO BUS GND	5	SOLO BUS GND	SOLO BUS GND
15	CHASSIS	CHASSIS	CHASSIS	6	CHASSIS	CHASSIS
16	MASTER BUS GND	MASTER BUS GND	MASTER BUS GND	7	MASTER BUS GND	TALK TO AUXES
17	MASTER BUS LEFT	MASTER BUS LEFT	MASTER BUS LEFT	8(1)	MASTER BUS LEFT	TALK TO SUBS
18	MASTER BUS RIGHT	MASTER BUS RIGHT	MASTER BUS RIGHT	9(2)	MASTER BUS RIGHT	TALK TO MATRIX 1
19	GROUP BUS GND	MATRIX BUS 2	MATRIX BUS 2	10	MATRIX BUS 2	TALK TO MATRIX 2
20	GROUP BUS 1 / -	MATRIX BUS 1	MATRIX BUS 1	11	MATRIX BUS 1	TALK TO MASTER LEFT
21	GROUP BUS 2 / -	TALK TO AUX / TALK TO SUB	TALK TO AUX / TALK TO SUB	12	TALK TO: MATRIX / MASTER	TALK TO MASTER RIGHT
22	GROUP BUS 3 / -	AUX INPUT MASTER BUS LEFT	AUX INPUT MASTER BUS LEFT	13(1)	AUX INPUT MASTER BUS LEFT	SOLO IN FROM MASTERS (L)
23	GROUP BUS 4 / -	AUX INPUT MASTER BUS RIGHT	AUX INPUT MASTER BUS RIGHT	14(2)	AUX INPUT MASTER BUS RIGHT	SOLO IN FROM MASTERS (R)
24	GROUP BUS 5 / -	AUX GROUP BUS INPUT	AUX GROUP BUS INPUT	15(1)	SOLO LEFT TO COMMS	MUTE GROUP 1
25	GROUP BUS 6 / -	AUX GROUP BUS GND	AUX GROUP BUS GND	16(2)	SOLO RIGHT TO COMMS	MUTE GROUP 2
26	GROUP BUS 7 / -	GROUP BUS INPUT	GROUP BUS INPUT	17	-	MUTE GROUP 3
27	GROUP BUS 8 / -	GROUP BUS GND	GROUP BUS GND	18	-	MUTE GROUP 4
28	MUTE LOGIC BUS	MUTE LOGIC BUS	MUTE LOGIC BUS	19	-	MUTE GROUP 5
29	MUTE GROUP 1	MUTE GROUP 1	MUTE GROUP 1	20	-	MUTE GROUP 6
30	MUTE GROUP 2	MUTE GROUP 2	MUTE GROUP 2	21	-	MUTE GROUP 7
31	MUTE GROUP 3	MUTE GROUP 3	MUTE GROUP 3	22	-	MUTE GROUP 8
32	MUTE GROUP 4	MUTE GROUP 4	MUTE GROUP 4			
33	MUTE GROUP 5	MUTE GROUP 5	MUTE GROUP 5			
34	MUTE GROUP 6	MUTE GROUP 6	MUTE GROUP 6			
35	MUTE GROUP 7	MUTE GROUP 7	MUTE GROUP 7			
36	MUTE GROUP 8	MUTE GROUP 8	MUTE GROUP 8			


 (1) TO LEFT CONNECTOR OF MODULE ONLY
 (2) TO RIGHT CONNECTOR OF MODULE ONLY

VALUES CORRECT AT: - 9.MAY.89



NOTE: T1, D9 and D12 are mounted off the pcb.
In some cases D8, D11, RV1 and RV3 may be replaced by wire links.

XL290 REGULATOR AND INDICATOR BOARDS

BRD5:B2686/1 & XL90IS

XL290_1.DGM

3.OCT.88

BRD:B2686/1

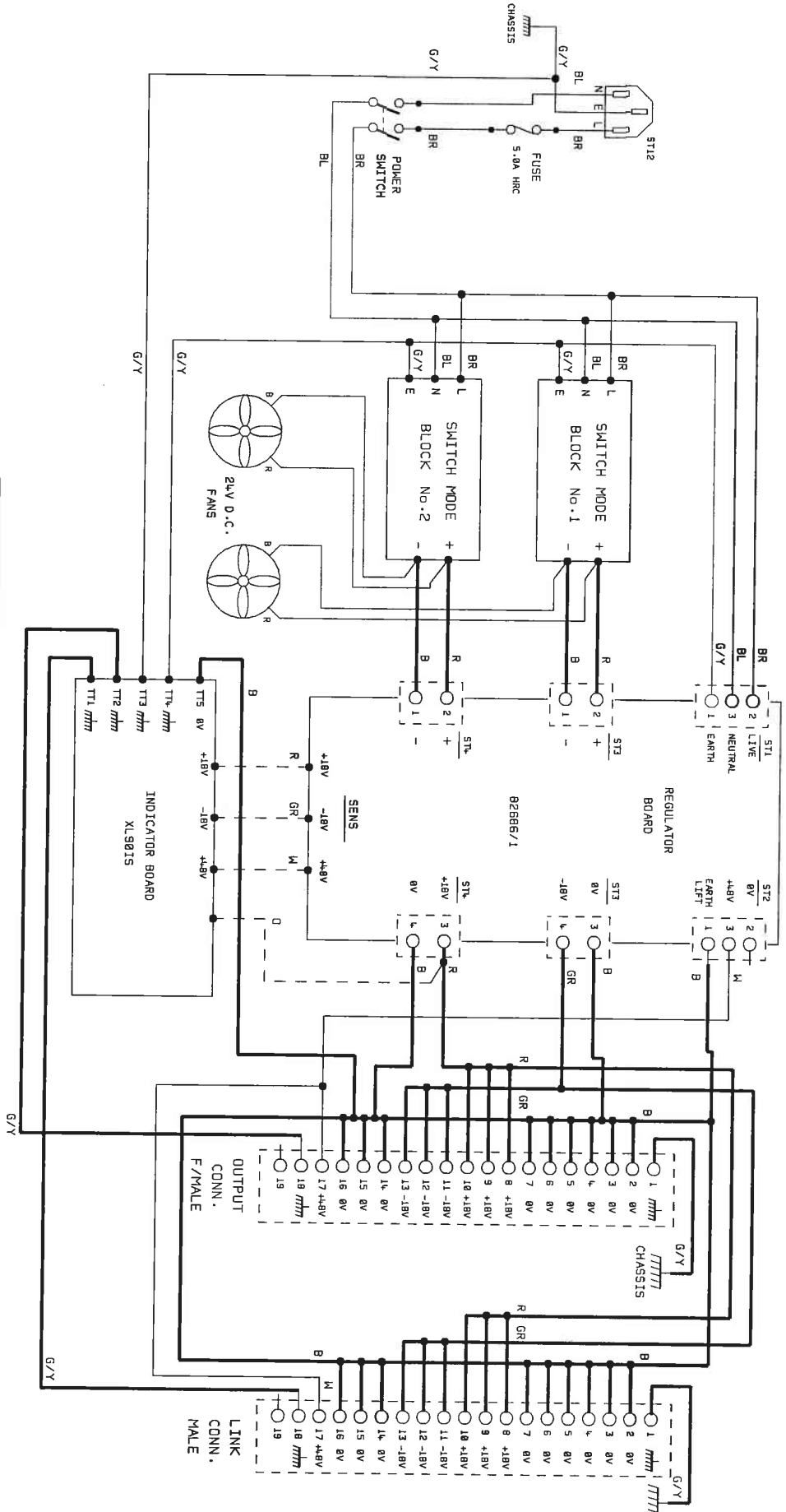
BRD:2690/1

WIRING TYPE

--- 7/8 .2mm (0.22mm sq)
 - - - 32/8 .2mm (1.0mm sq)
 _____ 63/0 .2 (2.0mm sq)

COLOR CODE

B = Black BL = Blue
 R = Red BR = Brown
 M = White G/Y = Green/Yellow
 GR = Grey
 O = ORANGE



XL290 POWER SUPPLY BLOCK DIAGRAM

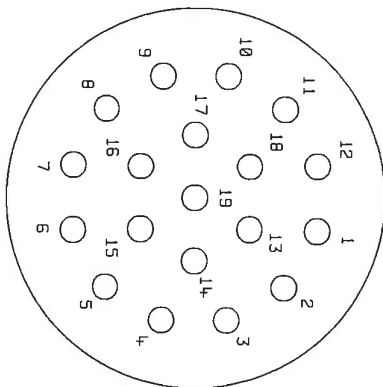
XL290_2.DGM

4.OCT.88

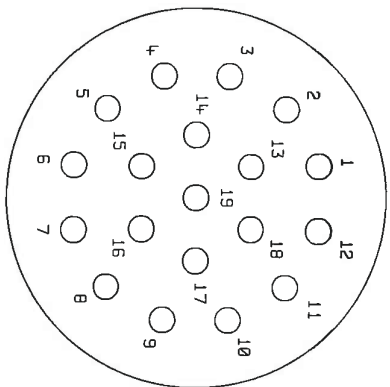
CONNECTOR PIN ASSIGNMENT

PIN 1:	EARTH
PIN 2:	0V
PIN 3:	0V
PIN 4:	0V
PIN 5:	0V
PIN 6:	0V
PIN 7:	0V
PIN 8:	+17.5V
PIN 9:	+17.5V
PIN 10:	+17.5V
PIN 11:	-17.5V
PIN 12:	-17.5V
PIN 13:	-17.5V
PIN 14:	0V
PIN 15:	0V
PIN 16:	0V
PIN 17:	+4.8V
PIN 18:	EARTH
PIN 19:	Not used

REAR VIEW OF CONNECTORS



OUTPUT
FEMALE

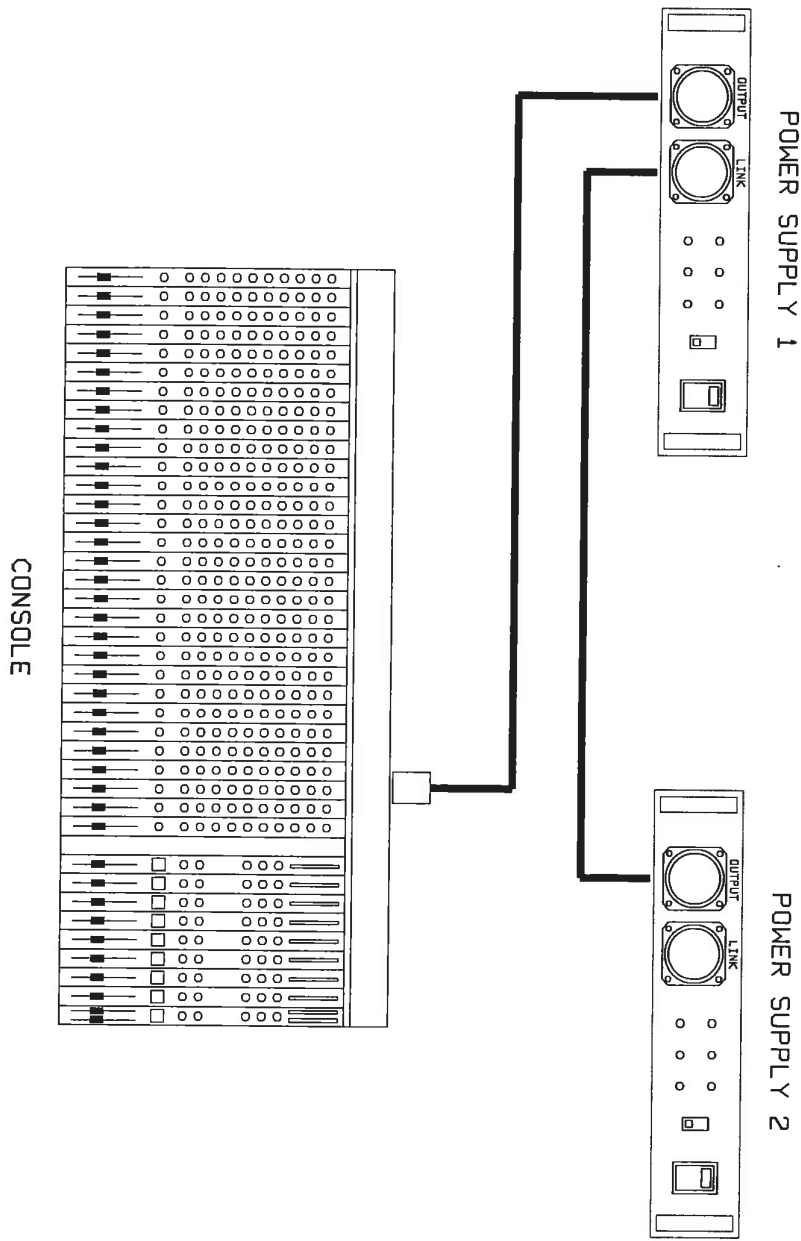


LINK
MALE

XL290 CONNECTOR PIN ASSIGNMENT

XL290_3.DGM

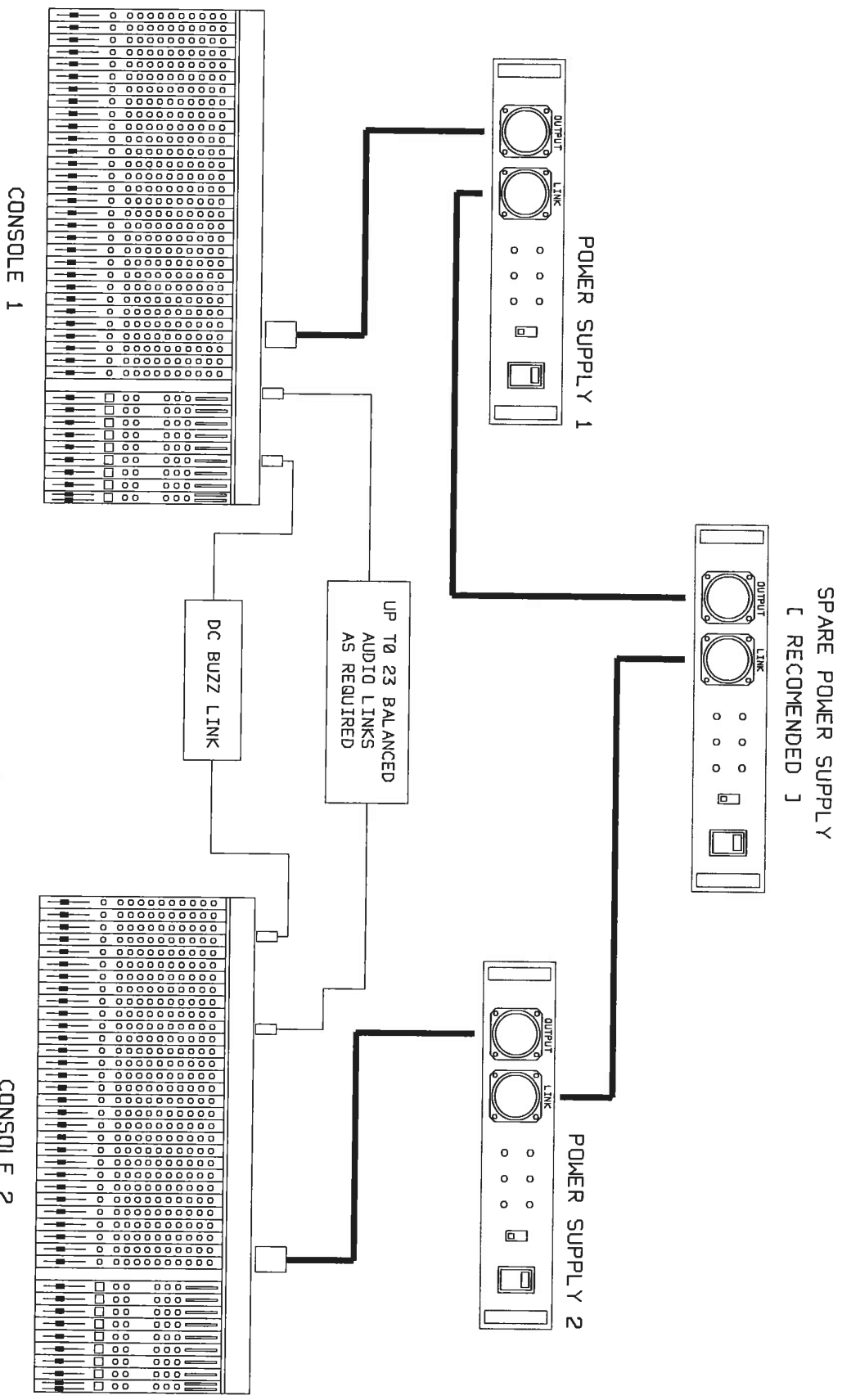
10.OCT.88



XL290 POWER SUPPLY LINKING

XL290_4.DGM

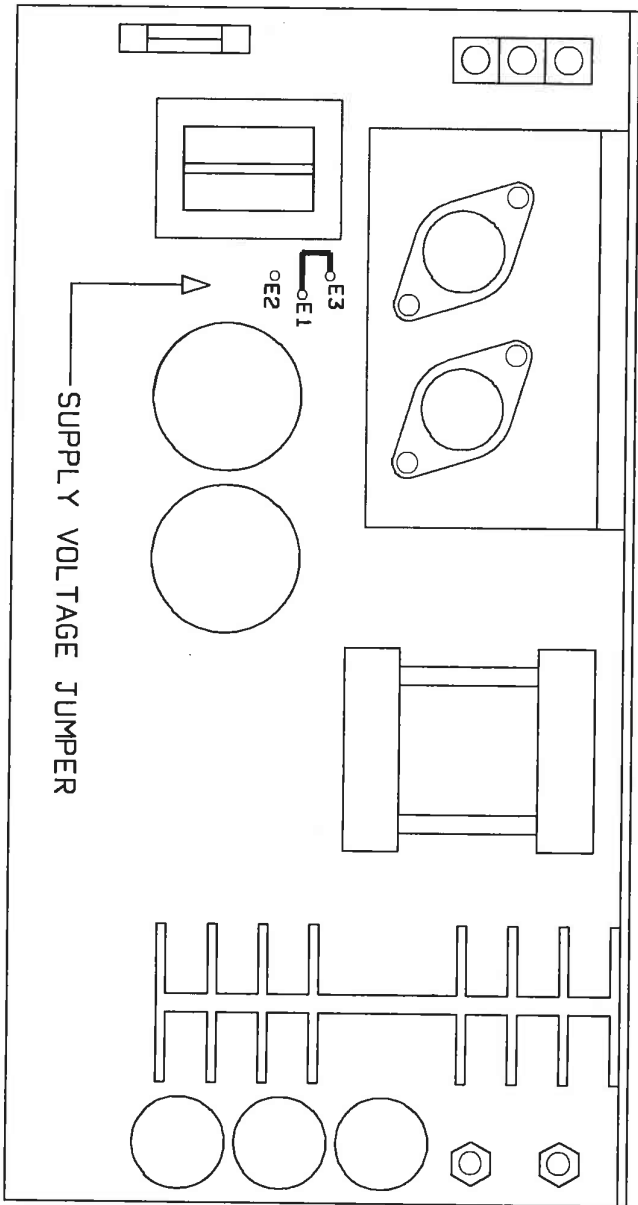
17.NOV.89



LINKING TWO XL2 CONSOLES AND POWER SUPPLIES

XL290_5.DGM

17.NOV.89



SUPPLY SHOWN FOR 22V OPERATION
 FOR 110V OPERATION LINK E1 WITH E2

XL290 SWITCH MODE BLOCK

XL290_6.DGM

30.AUG.89