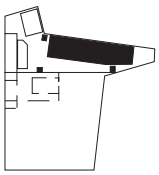
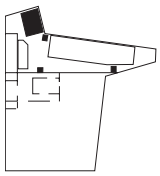
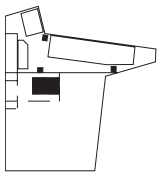
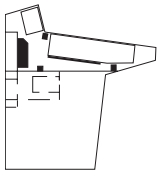
STUDER
professional audio equipment

Studer 928

Mixing Console

	1. General **List of all Plug-In Modules** **Layout and Designations, Specifications** **Block Diagram**
	2. Operation
	3. Jumper Settings **Alignment**
	**4. Plug-In Units of the Input Section (1.928...)** **Inputs, Groups,** **AUX Master Units** **Talkback/Monitoring**
	**5. Plug-In Units of the Meter Panel** **Signaling** **Metering** **Generator**
	**6. EU Standard PCBs**
	7. Connectors
	8. Wiring Lists
	**9. Wiring Diagrams** **Bus Boards**
	10. 19" Rack-Mount Power Supply

Operating and Service Instructions

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CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

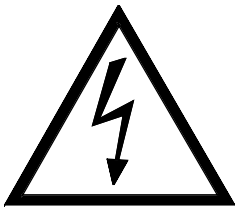
ATTENTION
RISQUE DE CHOC ELECTRIQUE
NE PAS OUVRIR

ACHTUNG
GEFAHR: ELEKTRISCHER SCHLAG
NICHT ÖFFNEN

To reduce the risk of electric shock, do not remove covers (or back). No user-serviceable parts inside. Refer servicing to qualified service personnel.

Afin de prévenir un choc électrique, ne pas enlever les couvercles (où l'arrière) de l'appareil. Il ne se trouve à l'intérieur aucune pièce pouvant être réparée par l'usager.

Um die Gefahr eines elektrischen Schlages zu vermeiden, entfernen Sie keine Geräteabdeckungen (oder die Rückwand). Überlassen Sie Wartung und Reparatur qualifiziertem Fachpersonal.



This symbol is intended to alert the user to presence of uninsulated "**dangerous voltage**" within the apparatus that may be of sufficient magnitude to constitute a risk of electric shock to a person.

Ce symbole indique à l'utilisateur qu'il existent à l'intérieur de l'appareil des "**tensions dangereuses**". Ces tensions élevées entrainent un risque de choc électrique en cas de contact.

Dieses Symbol deutet dem Anwender an, dass im Geräteinnern die Gefahr der Berührung von "**gefährlicher Spannung**" besteht. Die Grösse der Spannung kann zu einem elektrischen Schlag führen.



This symbol is intended to alert the user to the presence of **important instructions** for operating and maintenance in the enclosed documentation.

Ce symbole indique à l'utilisateur que la documentation jointe contient **d'importantes instructions** concernant le fonctionnement et la maintenance.

Dieses Symbol deutet dem Anwender an, dass die beigelegte Dokumentation **wichtige Hinweise** für Betrieb und Wartung enthält.

CAUTION: Lithium battery. Danger of explosion by incorrect handling. Replace by battery of the same make and type only.

ATTENTION: Pile au lithium. Danger d'explosion en cas de manipulation incorrecte. Ne remplacer que par un modèle de même type.

ACHTUNG: Explosionsgefahr bei unsachgemässem Auswechseln der Lithiumbatterie. Nur durch den selben Typ ersetzen.

ADVARSEL: Lithiumbatterei. Eksplosinsfare. Udskinftning ma kun foretages af en sagkyndig of som beskrevet i servicemanualen (DK).

FIRST AID

(in case of electric shock)

1. Separate the person as quickly as possible from the electric power source:
- by switching off the equipment
- or by unplugging or disconnecting the mains cable
- pushing the person away from the power source by using dry insulating material (such as wood or plastic).
- *After having sustained an electric shock, always consult a doctor.*

PREMIERS SECOURS

(en cas d'électrocution)

1. Si la personne est dans l'impossibilité de se libérer:

- Couper l'interrupteur principal
- Couper le courant

- Repousser la personne de l'appareil à l'aide d'un objet en matière non conductrice (matière plastique ou bois)
- *Après une électrocution, toujours consulter un médecin.*

ERSTE HILFE

(bei Stromunfällen)

1. Bei einem Stromunfall die betroffene Person so rasch wie möglich vom Strom trennen:
- Ausschalten des Gerätes
- Ziehen oder Unterbrechen der Netzzuleitung
- Betroffene Person mit isoliertem Material (Holz, Kunststoff) von der Gefahrenquelle wegstossen

- *Nach einem Stromunfall sollte immer ein Arzt aufgesucht werden.*

WARNING!

DO NOT TOUCH THE PERSON OR HIS CLOTHING BEFORE THE POWER IS TURNED OFF, OTHERWISE YOU STAND THE RISK OF SUSTAINING AN ELECTRIC SHOCK AS WELL!

2. If the person is unconscious:

- check the pulse,
- reanimate the person if respiration is poor,
- lay the body down, turn it to one side, call for a doctor immediately.

ATTENTION!

NE JAMAIS TOUCHER UNE PERSONNE QUI EST SOUS TENSION, SOUS PEINE DE SUBIR EGALEMENT UNE ELECTROCUTION.

2. En cas de perte de connaissance de la personne électrocutée:
- Controller le pouls
- Si nécessaire, pratiquer la respiration artificielle
- Placer l'accidenté sur le flanc et consulter un médecin.

ACHTUNG!

EINE UNTER SPANNUNG STEHENDE PERSON DARF NICHT BERÜHRT WERDEN. SIE KÖNNEN DABEI SELBST ELEKTRISIERT WERDEN!

2. Bei Bewusstlosigkeit des Verunfallten:
- Puls kontrollieren,
- bei ausgesetzter Atmung künstlich beatmen,
- Seitenlagerung des Verunfallten vornehmen und Arzt verständigen.

Installation

Vor der Installation des Gerätes müssen die hier aufgeführten und auch die weiter in dieser Anleitung mit ⚠ bezeichneten Hinweise gelesen und während der Installation und des Betriebes beachtet werden.
Untersuchen Sie das Gerät und sein Zubehör auf allfällige Transportschäden.
Ein Gerät, das mechanische Beschädigung aufweist oder in welches Flüssigkeit oder Gegenstände eingedrungen sind, darf nicht ans Netz angeschlossen oder muss sofort durch Ziehen des Netzsteckers vom Netz getrennt werden. Das Öffnen und Instandsetzen des Gerätes darf nur von Fachpersonal unter Einhaltung der geltenden Vorschriften durchgeführt werden.

Falls dem Gerät kein konfektioniertes Netzkabel beiliegt, muss dieses durch eine Fachperson unter Verwendung der mitgelieferten Kabel-Gerätedose IEC320/C13 oder IEC320/C19 und unter Berücksichtigung der einschlägigen, im geweiligen Lande geltenden Bestimmungen angefertigt werden; siehe unten.
Vor Anschluss des Netzkabels an die Netzsteckdose muss überprüft werden, ob die Stromversorgungs- und Anschlusswerte des Gerätes (Netzspannung, Netzfrequenz) innerhalb der erlaubten Toleranzen liegen. Die im Gerät eingesetzten Sicherungen müssen den am Gerät angebrachten Angaben entsprechen.
Ein Gerät mit einem dreipoligen Gerätestecker (Gerät der Schutzklasse I) muss an eine dreipolige Netzsteckdose angeschlossen und somit das Gerätegehäuse mit dem Schutzleiter der Netzinstallation verbunden werden (Für Dänemark gelten Starkstrombestimmungen, Abschnitt 107).

Installation

Before you install the equipment, please read and adhere to the following recommendations and all sections of these instructions marked with ⚠ .

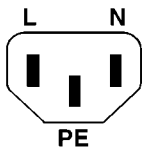
Check the equipment for any transport damage.

A unit that is mechanically damaged or which has been penetrated by liquids or foreign objects must not be connected to the AC power outlet or must be immediately disconnected by unplugging the power cable. Repairs must only be performed by trained personnel in accordance with the applicable regulations.

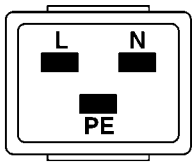
Should the equipment be delivered without a matching mains cable, the latter has to be prepared by a trained person using the attached female plug (IEC320/C13 or IEC320/C19) with respect to the applicable regulations in your country - see diagram below.

Before connecting the equipment to the AC power outlet, check that the local line voltage matches the equipment rating (voltage, frequency) within the admissible tolerance. The equipment fuses must be rated in accordance with the specifications on the equipment.

Equipment supplied with a 3-pole appliance inlet (equipment conforming to protection class I) must be connected to a 3-pole AC power outlet so that the equipment cabinet is connected to the protective earth conductor of the AC supply (for Denmark the Heavy Current Regulations, Section 107, are applicable).



IEC 320 / C13



IEC 320 / C19

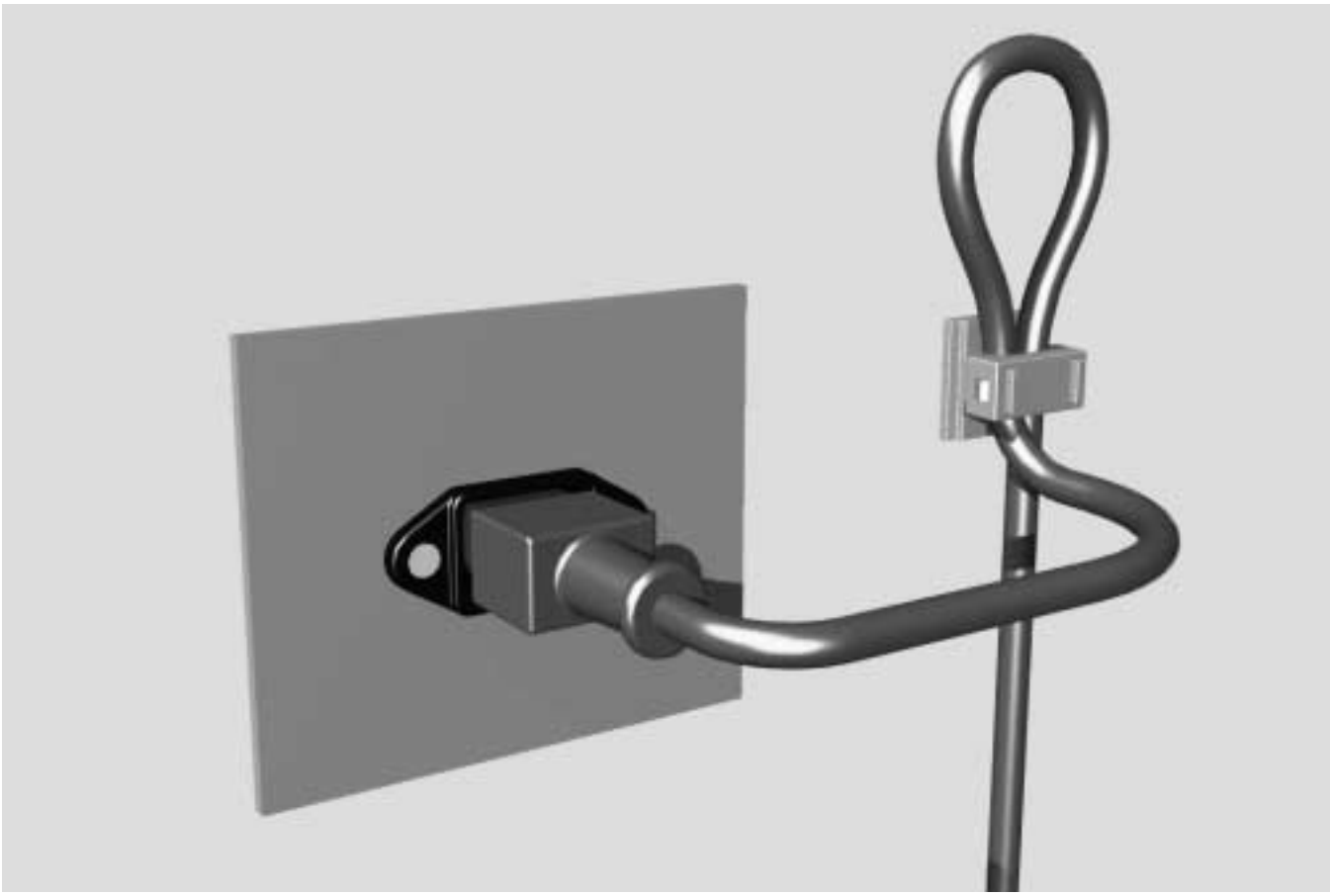
Female plug (IEC320), view from contact side: L live; brown N neutral; blue PE protective earth; green and yellow	National American Standard:	Black White green
Connecteur femelle (IEC320), vue de la face aux contacts: L phase; brun N neutre; bleu PE terre protective; vert et jaune	Standard national américain:	Noir Blanc Vert
Ansicht auf Steckkontakte der Kabel-Gerätesteckdose (IEC320): L Phase; braun N Nulleiter; blau PE Schutzleiter; gelb/grün	USA-Standard:	Schwarz Weiss grün

Zugentlastung für den Netzanschluss

Zum Verankern von Steckverbindungen ohne mechanische Verriegelung (z.B. IEC-Kaltgerätedosen) empfehlen wir die folgende Anordnung:

Mains connector strain relief

For anchoring connectors without a mechanical lock (e.g. IEC mains connectors), we recommend the following arrangement:



Vorgehen: Der mitgelieferte Kabelhalter ist selbstklebend. Bitte beachten Sie bei der Montage die folgenden Regeln:

1. Der Untergrund muss sauber, trocken und frei von Fett, Öl und anderen Verunreinigungen sein. Temperaturbereich für optimale Verklebung: 20...40° C.
2. Entfernen Sie die Schutzfolie auf der Rückseite des Kabelhalters und bringen sie ihn mit kräftigem Druck an der gewünschten Stelle an. Lassen sie ihn unbelastet so lange wie möglich ruhen – die maximale Klebekraft ist erst nach rund 24 Stunden erreicht.
3. Die Stabilität des Kabelhalters wird erhöht, wenn Sie ihn zusätzlich verschrauben. Zu diesem Zweck liegen ihm eine selbstschneidende Schraube sowie eine M4-Schraube mit Mutter bei.
4. Legen Sie das Kabel gemäss Figur in den Halter ein und pressen Sie die Klemme kräftig auf, bis das Kabel fixiert ist.

Procedure: The cable clamp shipped with your unit is auto-adhesive. If mounting, please follow the rules below:

1. The surface to be adhered to must be clean, dry, and free from grease, oil or other contaminants. Best application temperature range is 20...40° C.
2. Remove the plastic protective backing from the rear side of the clamp and apply it firmly to the surface at the desired position. Allow as much time as possible for curing. The bond continues to develop for as long as 24 hours.
3. For improved stability, the clamp can be fixed with a screw. For this purpose, a self-tapping screw and an M4 bolt and nut are included.
4. Place the cable into the clamp as shown in the illustration above and firmly press down the internal top cover until the cable is fixed.

Lufttemperatur und Feuchtigkeit

Allgemein

Die Betriebstauglichkeit des Gerätes oder Systems ist unter folgenden Umgebungsbedingungen gewährleistet:
EN 60721-3-3, Set IE32, Wert 3K3.
Diese Norm umfasst einen umfassenden Katalog von Parametern; die wichtigsten davon sind: Umgebungstemperatur +5...+40 °C; rel. Luftfeuchtigkeit 5...85% – d h. weder Kondensation noch Eisbildung; abs. Luftfeuchtigkeit 1...25 g/m³; Temperatur-Änderungsrate < 0,5 °C/min. In den folgenden Abschnitten wird darauf näher eingegangen.
Unter den genannten Bedingungen startet und arbeitet das Gerät oder System problemlos. Ausserhalb dieser Spezifikationen möglicherweise auftretende Probleme sind in den folgenden Abschnitten beschrieben.

Umgebungstemperatur

Geräte und Systeme von Studer sind allgemein für einen Umgebungstemperaturbereich (d h. Temperatur der eintretenden Kühlluft) von +5...+40 °C ausgelegt. Bei Installation in einem Schrank muss der vorgesehene Luftdurchsatz und dadurch die Konvektionskühlung gewährleistet sein. Folgende Tatsachen sind dabei zu berücksichtigen:
1. Die zulässige Umgebungstemperatur für den Betrieb der Halbleiter-Bauelemente beträgt 0 °C bis +70 °C (commercial temperature range for operation).
2. Der Luftdurchsatz der Anlage muss gewährleisten, dass die austretende Kühlluft ständig kühler ist als 70 °C.
3. Die mittlere Erwärmung der Kühlluft soll 20 K betragen, die maximale Erwärmung an den heissen Komponenten darf somit um weitere 10 K höher liegen.
4. Zum Abführen einer Verlustleistung von 1 kW bei dieser zulässigen mittleren Erwärmung ist eine Luftmenge von 2,65 m³/min notwendig.
Beispiel: Für ein Rack mit einer Leistungsaufnahme *P = 800 W* ist eine Kühlluftmenge von *0,8 * 2,65 m³/min* nötig, entsprechend *2,12 m³/min.*
5. Soll die Kühlfunktion der Anlage (z.B. auch bei Lüfter-Ausfall oder Bestrahlung durch Spotlampen) überwacht werden, so ist die Temperatur der Abluft unmittelbar oberhalb der Einschübe an mehreren Stellen im Rack zu messen; die Ansprechtemperatur der Sensoren soll 65 bis 70 °C betragen.

Reif und Tau

Das unversiegelte System (Steckerpartien, Halbleiteranschlüsse) verträgt zwar leichte Eisbildung (Reif). Mit blossem Auge sichtbare Betauung führt jedoch bereits zu Funktionsstörungen.
In der Praxis kann mit einem zuverlässigen Betrieb der Geräte bereits im Temperaturbereich ab –15 °C gerechnet werden, wenn für die Inbetriebnahme des kalten Systems die folgende allgemeine Regel beachtet wird:
Wird die Luft im System abgekühlt, so steigt ihre relative Feuchtigkeit an. Erreicht diese 100%, kommt es zu Niederschlag, meist in der Grenzschicht zwischen der Luft und einer kühleren Oberfläche, und somit zur Bildung von Eis oder Tau an empfindlichen Systemstellen (Kontakte, IC-Anschlüsse etc.). Ein störungsfreier Betrieb mit interner Betauung, unabhängig von der Temperatur, ist nicht gewährleistet.

Air temperature and humidity

General

Normal operation of the unit or system is warranted under the following ambient conditions defined by:
EN 60721-3-3, set IE32, value 3K3.
This standard consists of an extensive catalogue of parameters, the most important of which are: ambient temperature +5... +40° C, relative humidity 5...85% – i.e. no formation of condensation or ice; absolute humidity 1...25 g/m³; rate of temperature change < 0,5 °C/min. These parameters are dealt with in the following paragraphs.
Under these conditions the unit or system starts and works without any problem. Beyond these specifications, possible problems are described in the following sections.

Ambient temperature

Units and systems by Studer are generally designed for an ambient temperature range (i.e. temperature of the incoming air) of +5...+40 °C. When rack mounting the units, the intended air flow and herewith adequate cooling must be provided. The following facts must be considered:

1. The admissible ambient temperature range for operation of the semiconductor components is 0 °C to +70 °C (commercial temperature range for operation).
2. The air flow through the installation must provide that the outgoing air is always cooler than 70 °C.
3. Average heat increase of the cooling air shall be 20 K, allowing for an additional maximum 10 K increase at the hot components.
4. In order to dissipate 1 kW with this admissible average heat increase, an air flow of 2,65 m³/min is required.

Example: A rack dissipating *P = 800 W* requires an air flow of *0,8 * 2,65 m³/min* which corresponds to *2,12 m³/min.*

5. If the cooling function of the installation must be monitored (e.g. for fan failure or illumination with spot lamps), the outgoing air temperature must be measured directly above the modules at several places within the rack. The trigger temperature of the sensors should be 65 to 70 °C.

Frost and dew

The unsealed system parts (connector areas and semiconductor pins) allow for a minute formation of ice or frost. However, formation of dew visible with the naked eye will already lead to malfunctions. In practice, reliable operation can be expected in a temperature range above –15 °C, if the following general rule is considered for putting the cold system into operation:

If the air within the system is cooled down, the relative humidity rises. If it reaches 100%, condensation will arise, usually in the boundary layer between the air and a cooler surface, together with formation of ice or dew at sensitive areas of the system (contacts, IC pins, etc.). Once internal condensation occurs, troublefree operation cannot be guaranteed, independent of temperature.

Vor der Inbetriebnahme muss das System auf allfällige interne Betauung oder Eisbildung überprüft werden. Nur bei sehr leichter Eisbildung kann mit direkter Verdunstung (Sublimation) gerechnet werden; andernfalls muss das System im abgeschalteten Zustand gewärmt und getrocknet werden.
Das System ohne feststellbare interne Eisbildung oder Betauung soll möglichst homogen (und somit langsam) mit eigener Wärmeleistung aufgewärmt werden; die Lufttemperatur der Umgebung soll ständig etwas tiefer als diejenige der Systemabluft sein.
Ist es unumgänglich, das abgekühlte System sofort in warmer Umgebungsluft zu betreiben, so muss diese entfeuchtet sein. Die absolute Luftfeuchtigkeit muss dabei so tief sein, dass die relative Feuchtigkeit, bezogen auf die kälteste Oberfläche im System, immer unterhalb 100% bleibt.
Es ist dafür zu sorgen, dass beim Abschalten des Systems die eingeschlossene Luft möglichst trocken ist (d.h. vor dem Abschalten im Winter den Raum mit kalter, trockener Luft belüften und feuchte Gegenstände, z.B. Kleider, entfernen).
Die Zusammenhänge sind im folgenden Klimatogramm ersichtlich. Zum kontrollierten Verfahren gehören Thermometer und Hygrometer sowie ein Thermometer innerhalb des Systems.
Beispiel 1: Ein Ü-Wagen mit einer Innentemperatur von 20 °C und 40% relativer Luftfeuchtigkeit wird am Abend abgeschaltet. Sinkt die Temperatur unter +5 °C, bildet sich Tau oder Eis.
Beispiel 2: Ein Ü-Wagen wird morgens mit 20 °C warmer Luft von 40% relativer Luftfeuchtigkeit aufgewärmt. Auf Teilen, die kälter als +5 °C sind, bildet sich Tau oder Eis.

Before putting into operation, the system must be checked for internal formation of condensation or ice. Only with a minute formation of ice, direct evaporation (sublimation) may be expected; otherwise the system must be heated and dried while switched off.
A system without visible internal formation of ice or condensation should be heated up with its own heat dissipation, as homogeneously (and subsequently as slow) as possible; the ambient temperature should then always be lower than the outgoing air.
If it is absolutely necessary to operate the system immediately within warm ambient air, this air must be dehydrated. In such a case, the absolute humidity must be so low that the relative humidity, related to the coldest system surface, always remains below 100%.
Ensure that the enclosed air is as dry as possible when powering off (i.e. before switching off in winter, aerate the room with cold, dry air, and remove humid objects as clothes from the room).
These relationships are visible from the following climatogram. For a controlled procedure, thermometer and hygrometer as well as a thermometer within the system will be required.
Example 1: An OB-van having an internal temperature of 20 °C and rel. humidity of 40% is switched off in the evening. If temperature falls below +5 °C, dew or ice will be forming.
Example 2: An OB-van is heated up in the morning with air of 20 °C and a rel. humidity of 40%. On all parts being cooler than +5 °C, dew or ice will be forming.

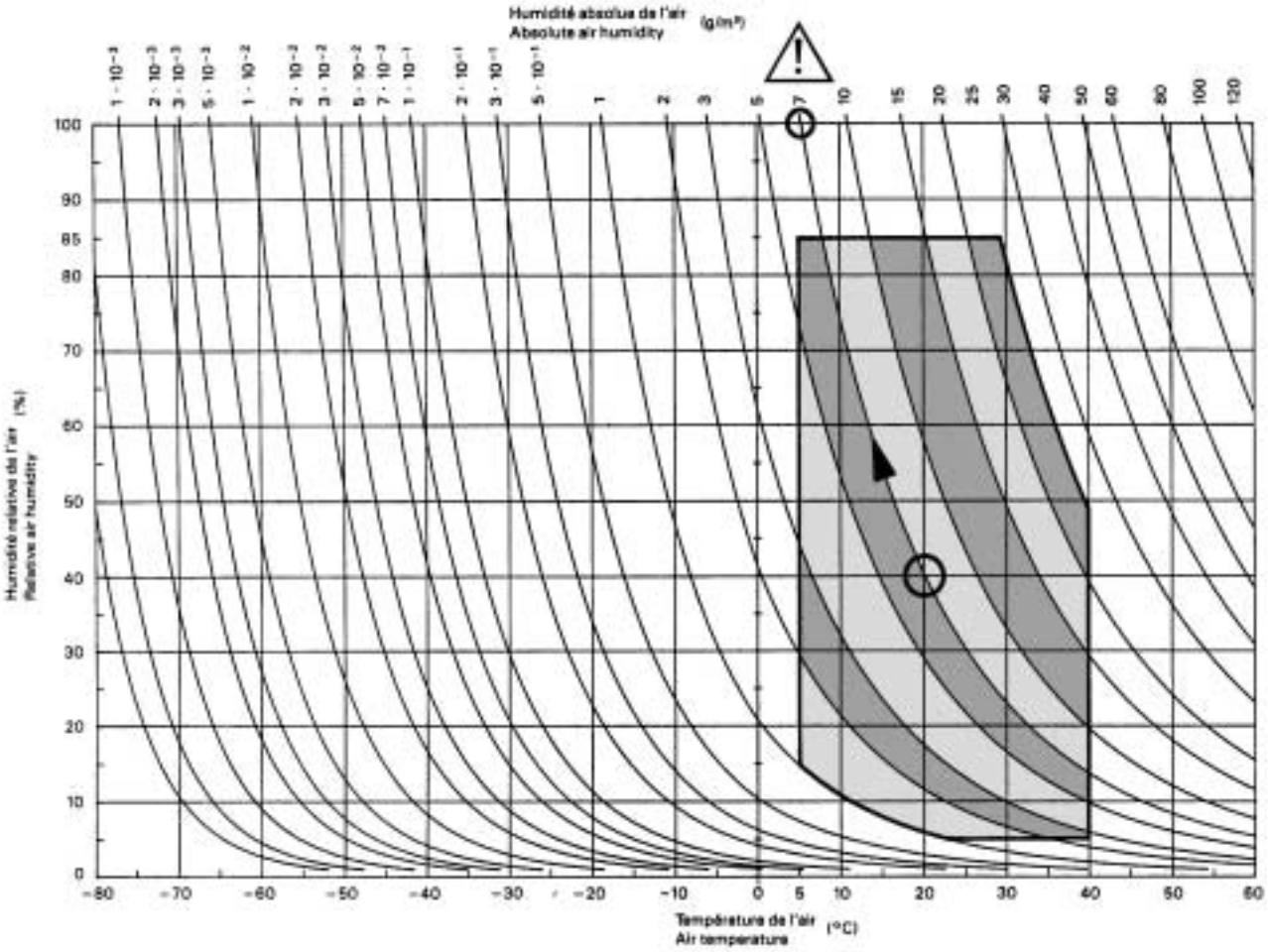


Figure B.3 – Climatogramme pour catégorie 3K3
Climatogram for class 3K3

721-3-3 © CEI:1994

Wartung und Reparatur

Durch Entfernen von Gehäuseteilen, Abschirmungen etc. werden stromführende Teile freigelegt. Deshalb müssen u.a. die folgenden Grundsätze beachtet werden:
Eingriffe in das Gerät dürfen nur von Fachpersonal unter Einhaltung der geltenden Vorschriften vorgenommen werden.
Vor Entfernen von Gehäuseteilen muss das Gerät ausgeschaltet und vom Netz getrennt werden.
Bei geöffnetem, vom Netz getrenntem Gerät dürfen Teile mit gefährlichen Ladungen (z. B. Kondensatoren, Bildröhren) erst nach kontrollierter Entladung, heiße Bauteile (Leistungshalbleiter, Kühlkörper etc.) erst nach deren Abkühlen berührt werden.

Bei Wartungsarbeiten am geöffneten, unter Netzspannung stehenden Gerät dürfen blanke Schaltungsteile und metallene Halbleitergehäuse weder direkt noch mit nichtisoliertem Werkzeug berührt werden.
Zusätzliche Gefahren bestehen bei unsachgemässer Handhabung besonderer Komponenten:

- *Explosionsgefahr* bei Lithiumzellen, Elektrolyt-Kondensatoren und Leistungshalbleitern
- *Implosionsgefahr* bei evakuierten Anzeigeeinheiten
- *Strahlungsgefahr* bei Lasereinheiten (nichtionisierend), Bildröhren (ionisierend)
- *Verätzungsgefahr* bei Anzeigeeinheiten (LCD) und Komponenten mit flüssigem Elektrolyt.

Solche Komponenten dürfen nur von ausgebildetem Fachpersonal mit den vorgeschriebenen Schutzmitteln (u.a. Schutzbrille, Handschuhe) gehandhabt werden.

Maintenance and Repair

The removal of housing parts, shields, etc. exposes energized parts. For this reason the following precautions should be observed:
Maintenance should only be performed by trained personnel in accordance with the applicable regulations.
The equipment should be switched off and disconnected from the AC power outlet before any housing parts are removed.
Even if the equipment is disconnected from the power, parts with hazardous charges (e.g. capacitors, picture tubes) must not be touched until they have been properly discharged. Touch hot components (power semiconductors, heat sinks, etc.) only when cooled off.

If maintenance is performed on a unit that is opened and switched on, no uninsulated circuit components and metallic semiconductor housings must be touched neither with your bare hands nor with uninsulated tools.
Certain components pose additional hazards:

- *Explosion hazard* from lithium batteries, electrolytic capacitors and power semiconductors
- *Implosion hazard* from evacuated display units
- *Radiation hazard* from laser units (non-ionizing), picture tubes (ionizing)
- *Caustic effect* of display units (LCD) and such components containig liquid electrolyte.

Such components should only be handled by trained personnel who are properly protected (e.g. safety goggles, gloves).

Elektrostatische Entladung (ESD) bei Wartung und Reparatur

Electrostatic Discharge (ESD) during Maintenance and Repair



ATTENTION: Observe precautions for handling devices sensitive to electrostatic discharge!

ATTENTION: Respecter les précautions d'usage concernant la manipulation de composants sensibles à l'électricité statique!

ACHTUNG: Vorsichtsmassnahmen bei Handhabung elektrostatisch entladungsgefährdeter Bauelemente beachten!

Viele ICs und andere Halbleiter sind empfindlich gegen elektrostatische Entladung (ESD). Unfachgerechte Behandlung von Baugruppen mit solchen Komponenten bei Wartung und Reparatur kann deren Lebensdauer drastisch vermindern.
Bei der Handhabung der ESD-empfindlichen Komponenten sind u.a. folgende Regeln zu beachten:

- ESD-empfindliche Komponenten dürfen ausschliesslich in dafür bestimmten und bezeichneten Verpackungen gelagert und transportiert werden.
- Unverpackte, ESD-empfindliche Komponenten dürfen nur in dafür eingerichteten Schutzzonen (EPA, z.B. Gebiet für Feldservice, Reparatur- oder Serviceplatz) gehandhabt und nur von Personen berührt werden, die durch ein Handgelenkband mit Seriewiderstand mit dem Massepotential des Reparatur- oder Serviceplatzes verbunden sind. Das gewartete Gerät wie auch Werkzeug, Hilfsmittel, EPA-taugliche (elektrisch halbleitende) Arbeits-, Ablage- und Bodenmatten müssen ebenfalls mit diesem Potential verbunden sein.
- Die Anschlüsse der ESD-empfindlichen Komponenten dürfen unkontrolliert weder mit elektrostatisch aufladbaren (Gefahr von Spannungsdurchschlag), noch mit metallischen Oberflächen (Schockentladungsgefahr) in Berührung kommen.
- Um undefinierte transiente Beanspruchung der Komponenten und deren eventuelle Beschädigung durch unerlaubte Spannung oder Ausgleichsströme zu vermeiden, dürfen elektrische Verbindungen nur am abgeschalteten Gerät und nach dem Abbau allfälliger Kondensatorladungen hergestellt oder getrennt werden.

Many ICs and semiconductors are sensitive to electrostatic discharge (ESD). The life of components containing such elements can be drastically reduced by improper handling during maintenance and repair work.

Please observe the following rules when handling ESD sensitive components:

- ESD sensitive components should only be stored and transported in the packing material specifically provided for this purpose.
- Unpacked ESD sensitive components should only be handled in ESD protected areas (EPA, e.g. area for field service, repair or service bench) and only be touched by persons who wear a wristlet that is connected to the ground potential of the repair or service bench by a series resistor. The equipment to be repaired or serviced and all tools, aids, as well as electrically semiconducting work, storage and floor mats should also be connected to this ground potential.
- The terminals of ESD sensitive components must not come in uncontrolled contact with electrostatically chargeable (voltage puncture) or metallic surfaces (discharge shock hazard).
- To prevent undefined transient stress of the components and possible damage due to inadmissible voltages or compensation currents, electrical connections should only be established or separated when the equipment is switched off and after any capacitor charges have decayed.

SMD-Bauelemente

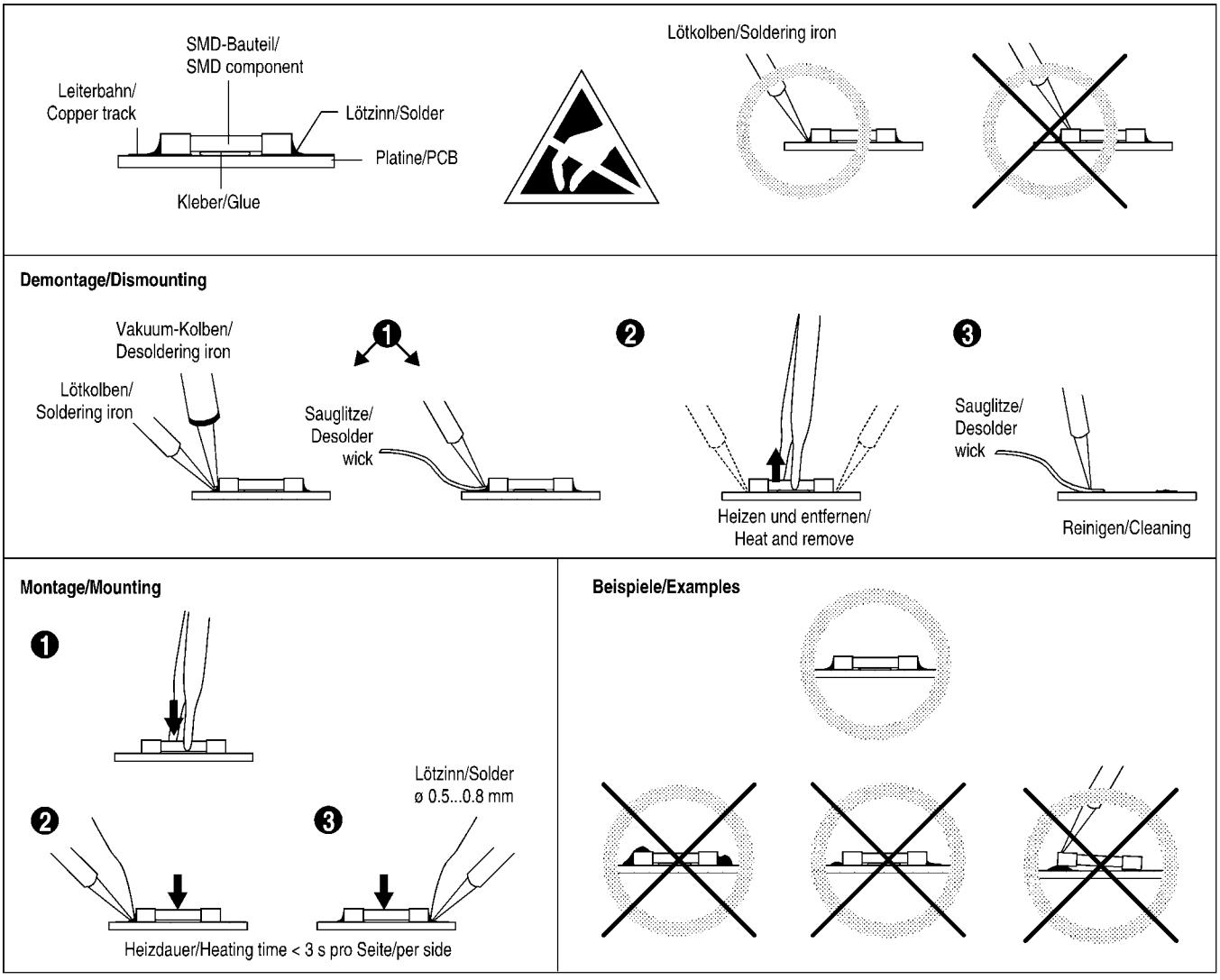
Der Austausch von SMD-Bauelementen ist ausschliesslich geübten Fachleuten vorbehalten. Für verwüstete Platinen können keine Ersatzansprüche geltend gemacht werden. Beispiele für korrekte und falsche SMD-Lötverbindungen in der Abbildung weiter unten.

Bei Studer werden keine handelsüblichen SMD-Teile bewirtschaftet. Für Reparaturen sind die notwendigen Bauteile lokal zu beschaffen. Die Spezifikationen von Spezialbauteilen finden Sie in der Serviceanleitung.

SMD Components

SMDs should only be replaced by skilled specialists. No warranty claims will be accepted for circuit boards that have been ruined. Proper and improper SMD soldering joints are depicted below.

Studer does not keep any commercially available SMDs in stock. For repair the corresponding devices should be purchased locally. The specifications of special components can be found in the service manual.



Störstrahlung und Störfestigkeit

Das Gerät entspricht den Schutzanforderungen auf dem Gebiet elektromagnetischer Phänomene, wie u.a. in den Richtlinien 89/336/EWG und FCC, Part 15, aufgeführt:

1. Vom Gerät erzeugte elektromagnetische Strahlung ist soweit begrenzt, dass bestimmungsgemässer Betrieb anderer Geräte und Systeme möglich ist.
2. Das Gerät weist eine angemessene Festigkeit gegen elektromagnetische Störungen auf, so dass sein bestimmungsgemässer Betrieb möglich ist.

Das Gerät wurde getestet und erfüllt die Bedingungen der im Kapitel „Technische Daten“ aufgeführten EMV-Standards. Die Limiten dieser Standards gewährleisten mit angemessener Wahrscheinlichkeit sowohl den Schutz der Umgebung wie auch entsprechende Störfestigkeit des Gerätes. Absolute Garantie, dass keine unerlaubte elektromagnetische Beeinträchtigung während des Betriebes entsteht, ist jedoch nicht gegeben.

Um die Wahrscheinlichkeit solcher Beeinträchtigung weitgehend auszuschliessen, sind u.a. folgende Massnahmen zu beachten:

- Installieren Sie das Gerät gemäss den Angaben in der Betriebsanleitung, und verwenden Sie das mitgelieferte Zubehör.
- Verwenden Sie im System und in der Umgebung, in denen das Gerät eingesetzt ist, nur Komponenten (Anlagen, Geräte), die ihrerseits die Anforderungen der obenerwähnten Standards erfüllen.
- Sehen Sie ein Erdungskonzept des Systems vor, das sowohl die Sicherheitsanforderungen (die Erdung der Geräte gemäss Schutzklasse I mit einem Schutzleiter muss gewährleistet sein), wie auch die EMV-Belange berücksichtigt. Bei der Entscheidung zwischen stern- oder flächenförmiger bzw. kombinierter Erdung sind Vor- und Nachteile gegeneinander abzuwägen.
- Benutzen Sie abgeschirmte Kabel, wo vorgesehen. Achten Sie auf einwandfreie, grossflächige, korrosionsbeständige Verbindung der Abschirmung zum entsprechenden Steckeranschluss und dessen Gehäuse. Beachten Sie, dass eine nur an einem Ende angeschlossene Kabelabschirmung als Sende- bzw. Empfangsantenne wirken kann (z.B. bei wirksamer Kabellänge von 5 m oberhalb von 10 MHz), und dass die Flanken digitaler Kommunikationssignale hochfrequente Aussendungen verursachen (z.B. LS- oder HC-Logik bis 30 MHz).
- Vermeiden Sie Bildung von Masseschleifen oder vermindern Sie deren unerwünschte Auswirkung, indem Sie deren Fläche möglichst klein halten und den darin fliessenden Strom durch Einfügen einer Impedanz (z.B. Gleichtaktdrossel) reduzieren.

Electromagnetic Compatibility

The equipment conforms to the protection requirements relevant to electromagnetic phenomena that are listed in the guidelines 89/336/EC and FCC, part 15.

1. The electromagnetic interference generated by the equipment is limited in such a way that other equipment and systems can be operated normally.
2. The equipment is adequately protected against electromagnetic interference so that it can operate correctly.

The unit has been tested and conforms to the EMC standards applicable to residential, commercial and light industry, as listed in the section „Technical Data“. The limits of these standards reasonably ensure protection of the environment and corresponding noise immunity of the equipment. However, it is not absolutely warranted that the equipment will not be adversely affected by electromagnetic interference during operation.

To minimize the probability of electromagnetic interference as far as possible, the following recommendations should be followed:

- Install the equipment in accordance with the operating instructions. Use the supplied accessories.
- In the system and in the vicinity where the equipment is installed, use only components (systems, equipment) that also fulfill the above EMC standards.
- Use a system grounding concept that satisfies the safety requirements (protection class I equipment must be connected with a protective ground conductor) that also takes into consideration the EMC requirements. When deciding between radial, surface or combined grounding, the advantages and disadvantages should be carefully evaluated in each case.
- Use shielded cables where shielding is specified. The connection of the shield to the corresponding connector terminal or housing should have a large surface and be corrosion-proof. Please note that a cable shield connected only single-ended can act as a transmitting or receiving antenna (e.g. with an effective cable length of 5 m, the frequency is above 10 MHz) and that the edges of the digital communication signals cause high-frequency radiation (e.g. LS or HC logic up to 30 MHz).
- Avoid ground loops or reduce their adverse effects by keeping the loop surface as small as possible, and reduce the noise current flowing through the loop by inserting an additional impedance (e.g. common-mode rejection choke).

Class A Equipment - FCC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide a reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Caution:
Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment. Also refer to relevant information in this manual.

CE-Konformitätserklärung

Der Hersteller,

Studer Professional Audio AG,
CH-8105 Regensdorf,

erklärt in eigener Verantwortung, dass das Produkt

Studer 928, Mischpult,
(ab Serie-Nr. 1001),

auf das sich diese Erklärung bezieht, entsprechend den Bestimmungen der EU-Richtlinien und Ergänzungen

- Elektromagnetische Verträglichkeit (EMV):
  89/336/EWG + 92/31/EWG + 93/68/EWG
- Niederspannung:
  73/23/EWG + 93/68/EWG

mit den folgenden Normen und normativen Dokumenten übereinstimmt:

- Sicherheit:
  Schutzklasse 1, EN 60950:1992 + A1/A2:1993
- EMV:
  EN 55103-1/-2:1996, elektromagnetische Umgebungen E2 und E4

Regensdorf, 28. Februar 1997



B. Hochstrasser, Geschäftsleiter



P. Fiala, Leiter QS

CE Declaration of Conformity

The manufacturer,

Studer Professional Audio AG,
CH-8105 Regensdorf,

declares under his sole responsibility that the product

Studer 928, Mixing Console,
(on from serial No. 1001),

to which this declaration relates, according to following regulations of EU directives and amendments

- Electromagnetic Compatibility (EMC):
  89/336/EEC + 92/31/EEC + 93/68/EEC
- Low Voltage (LVD):
  73/23/EEC + 93/68/EEC

is in conformity with the following standards or other normative documents:

- Safety:
  Class 1, EN 60950:1992 + A1/A2:1993
- EMC:
  EN 55103-1/-2:1996, electromagnetic environments E2 and E4

Regensdorf, February 28, 1997



B. Hochstrasser, Managing director



P. Fiala, Manager QA

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1.2.3 Adjustments, repair E1/4
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1 GENERAL

The Studer 928 console features a modular 30 mm concept with mechanical frames for 12 or 16 units. This way, different size consoles can be built; the maximum would be 96 input units. Both mono and stereo input units are available. The standard configuration contains 8 mono groups, 2 stereo masters, 6 mono and 2 stereo AUX channels, and 2 monitor modules for studio and control room monitoring.

Functionality of the console is very high. N-1 circuits, direct outputs from every input stage, a sophisticated EQ stage, and a high number of AUX channels, limiters in each group and master stage, and dedicated on-air switching features are normally found only in much more expensive constructions.

The gain control is effected via VCAs in all stages which allow the formation of VCA groups. In every input unit the VCA can be locked to one of four VCA groups, and the group master fader is a linear fader in the monitor module.

To cope with special customer requirements, the meter bridge is able to house all Studer 170 mm units. In addition, Studer Eurocards can be installed in the lower chassis.

No automation is provided in the concept.

The main applications of the console comprise:

- Live transmission in radio and TV
- Recording
- Theatre and Opera
- Sound reinforcement
- OB van applications

This development shows the Studer standard of quality the audio world is used to see in our mixing consoles. Studer transformers are used at inputs and outputs, gold contacts for all audio switches, and high quality VCAs to maintain Studer's standard of "good sound".

1.1 Utilization for the purpose intended

The Studer 928 mixing console is intended for professional use.
It is presumed that the unit is operated only by trained personnel. Servicing is reserved to skilled technicians.



The electrical connections may be connected only to the voltages and signals designated in this manual.

1.2 First steps

1.2.1 Unpacking and inspection

Your new mixing console is shipped in a special packing which protects the units against mechanical shock during transit. Care should be exercised when unpacking so that the surfaces do not get marred.
Verify that the content of the packing agrees with the items listed on the enclosed shipping list.
Check the condition of the equipment for signs of shipping damage. If there should be any complaints you should immediately notify the forwarding agent and your nearest Studer distributor.
Please retain the original packing material because it offers the best protection in case your equipment ever needs to be transported.

1.2.2 Installation

The power supply units are auto-ranging; therefore no voltage selector must be adjusted before connecting them to the mains.

General precautions:

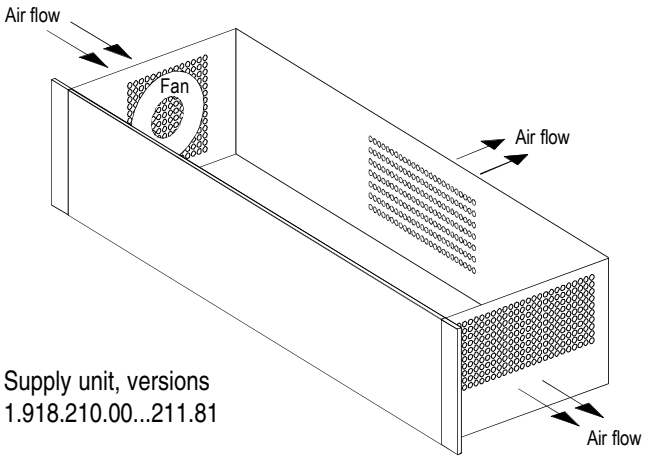


Do not use the units in conditions of excessive heat or cold, near any source of moisture, in excessively humid environments, or in positions where they are likely to be subjected to vibration or dust. Do not use any liquids to clean the exterior of the units. A soft, dry cloth or brush will usually do.

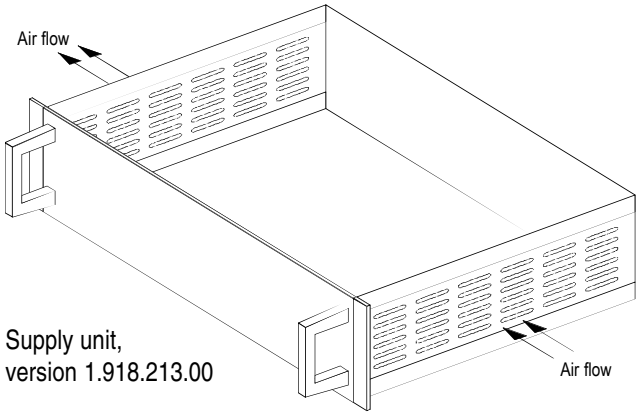
Ventilation/rack mounting:



When installing the power supply unit in a rack or any other location, make sure that there is adequate ventilation. The unit should be situated so that its location or position does not interfere with its proper ventilation. Please refer to the drawing below.
If the power supply unit is rack mounted, the feet may be removed; these may be unscrewed from the outside – do not open the case.



Supply unit, versions
1.918.210.00...211.81



Power connection:

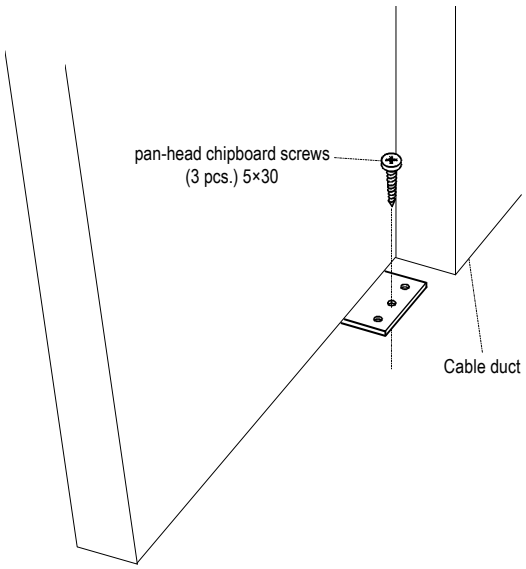
The attached female IEC 320/C13 mains cable socket has to be connected to an appropriate mains cable by a trained technician, respecting your local regulations. Refer to the "Installation, Operation, and Waste Disposal" section at the beginning of this manual.
Maintenance work inside the units must be performed by a trained technician.

Earthing:

This equipment must be earthed, due to the mains input filter network being connected to the mains earth.
Some consideration should be given to the earthing arrangement of the system at the center of which is the console and the power supply unit(s). The console chassis is earthed to the mains earth via the power supply. If the power supply is rack-mounted care should be taken to avoid any possible "ground loops" in the system; this would cause audible hum to be introduced to an otherwise clean audio signal. Ground loops may occur where signal processing equipment, patched to the console, has its signal earth commoned to the equipment chassis. The ground loop is formed if this chassis and the power supply chassis are in electrical contact through fixing rails that they share in the rack.

Tip-over protection:

The console must be secured against tipping-over when a weight is placed on the front rail of the console. For this purpose a bracket is fixed to the bottom side of each console foot (3 countersunk-head chipboard screws each). These brackets must then be screwed to the floor with 3 pan-head chipboard screws each; refer to the drawing below.



1.2.3 Adjustments, repair

Danger: All internal adjustments as well as repair work on this product are to be performed by skilled technicians!

Replacing the primary fuse:

Supply unit, versions 1.918.210.00...211.81:
Switch the unit off, remove the mains lead plug from the mains supply socket and then from the IEC type mains connector on the unit. The fuse is located in the fuse holder contained in the IEC type mains connector.
Use only an F 8 A H/250 V fuse.

Supply unit, version 1.918.213.00:
The primary fuse is located inside the power supply unit and cannot be changed. In case of failure, the complete supply unit must be replaced. Please ask your nearest Studer representative.

1.2.4 Accessories, options

Accessories shipped with the 928 console: **(Set: order No. 1.928.096.00)**

5	Circlips, 2.3 mm	Order No. 24.16.3023
1	Rotary knob, grey, Ø 10 mm	Order No. 42.01.0203
1	Cap, dark grey, for button Ø 10 mm	Order No. 42.01.0251
5	Rotary knobs, dark grey, Ø 11 mm	Order No. 42.01.1200
5	Rotary knobs, red, Ø 11 mm	Order No. 42.01.1202
5	Rotary knobs, yellow, Ø 11 mm	Order No. 42.01.1204
5	Rotary knobs, green, Ø 11 mm	Order No. 42.01.1205
5	Rotary knobs, blue, Ø 11 mm	Order No. 42.01.1206
5	Rotary knobs, bright grey, Ø 11 mm	Order No. 42.01.1208
1	Rotary knob, dark grey, Ø 15 mm	Order No. 42.01.1220
1	Rotary knob, bright grey, Ø 15 mm	Order No. 42.01.1228
5	Rotary knobs, lower, dark grey, Ø 15 mm	Order No. 42.01.1240
2	TRS plugs	Order No. 54.02.0601
2	Cap, red	Order No. 55.15.0912
2	Cap, yellow	Order No. 55.15.0914
2	Cap, green	Order No. 55.15.0915
1	Allen screwdriver, short, size 2	Order No. 98.00.0612
1	Hexagonal screwdriver, size 2	Order No. 98.00.2022
1	Hexagonal key, size 2	Order No. 98.00.2405
1	Hexagonal key, size 2.5	Order No. 98.00.2406
5	Oval-head screws, M3×8, w. washer	Order No. 1.010.022.21
6	Fader coupling bridges, 42 mm	Order No. 1.911.000.07
2	Fader knobs (P+G), red	Order No. 1.911.000.42
2	Fader knobs (P+G), orange	Order No. 1.911.000.43
2	Fader knobs (P+G), yellow	Order No. 1.911.000.44
2	Fader knobs (P+G), green	Order No. 1.911.000.45
2	Fader knobs (P+G), blue	Order No. 1.911.000.46
2	Fader knobs (P+G), grey	Order No. 1.911.000.48
2	Fader knobs (P+G), white	Order No. 1.911.000.49
2	Module extractors	Order No. 1.912.000.06

1.3 Specifications

General

Voltage specification dBu: 0 dBu ≙ 0.775 V
Channel input faders and master faders are set to 0 dB mark.
Line outputs are terminated with 600 Ω.
External sources have a source impedance of < 200 Ω.
All data are valid within the frequency band from 31.5 Hz...16 kHz.
PPM version: line level +6 dBu
VU version: nominal output level 0 VU = +4 dBu

Levels

Microphone input sensitivity:	–71...+10 dBu
Line input sensitivity:	+6 dBu ±14 dB
Level at insert points and N–1/direct outputs:	+6 dBu
Output level:	+6 dBu, adjustable
Monitor level (balanced, unloaded):	+6...+15 dBu

Common mode rejection

Microphone input: U_{in} = 0 dBu;		@ 15 kHz >50 dB
V = 0 dB; Fine = min		@ 50 Hz >75 dB
Line input:	with transformer	@ 50 Hz...15 kHz >50 dB
	without transformer	@ 50 Hz...15 kHz >46 dB

Impedances

Microphone input:	>1.6 kΩ, balanced and floating (w. transformer)
Line/tape input:	>10 kΩ, electronically balanced (transformer optional)
Source impedance of line outputs:	<40 Ω

Master outputs ➔ balanced/floating (w. transformer)
All other outpus ➔ electronically balanced

Frequency response

Filters switched off:		0.5 dB
–3 dB points, filter switched off:		approx. 4.5 Hz/40 kHz (continuously decreasing outside this range)
Bass cut (18 dB/oct.)		–3 dB @ 75 Hz
High frequency equalizer,	1 kHz...16 kHz:	15 dB
High-mid equalizer,	500 Hz...8 kHz:	15 dB
Low-mid Equalizer,	125 Hz...2 kHz:	15 dB
Low frequency equalizer,	32 Hz...500 Hz:	15 dB

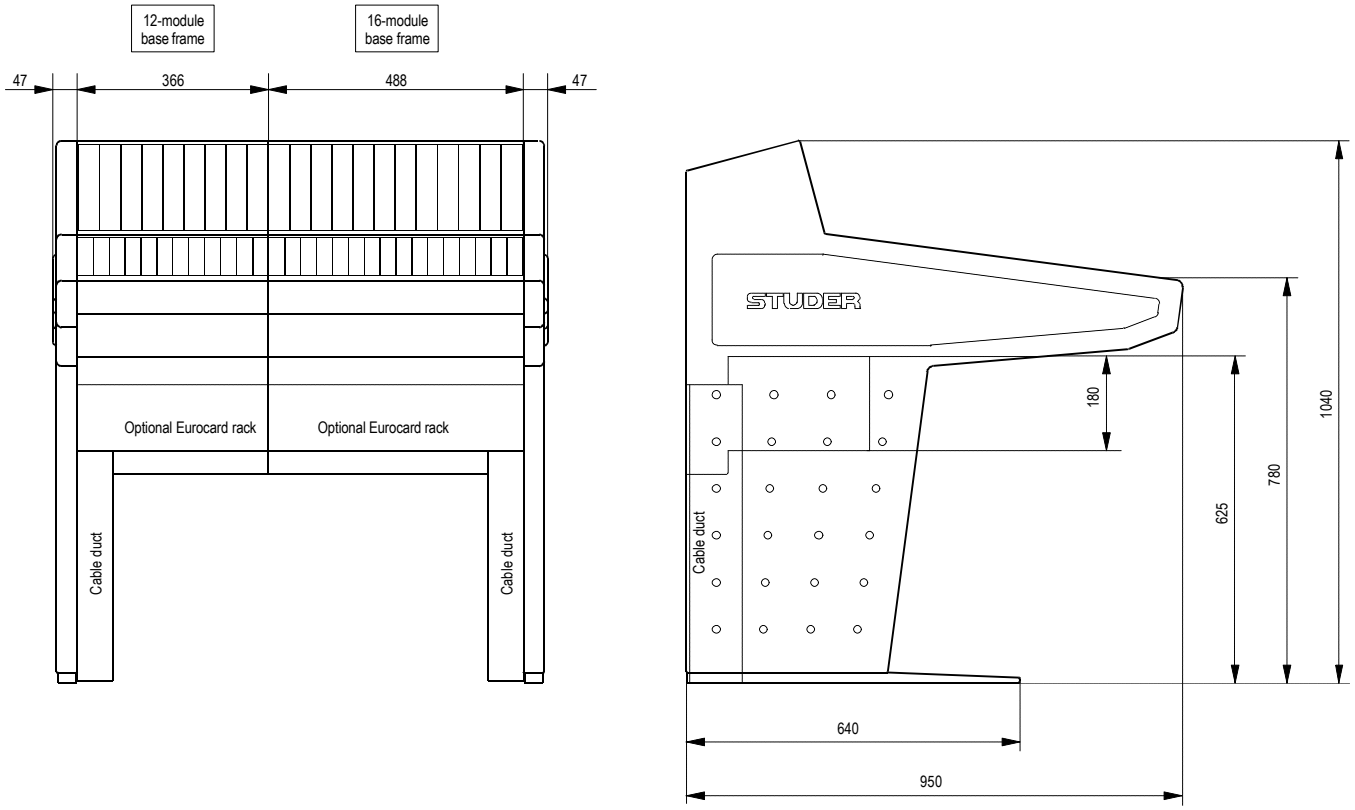
Overload margin

Microphone input:	
Max. level for 1% 3rd harmonic @ 31.5 Hz:	+3 dBu; Pos. +10
Line input:	
Max. level for 1% 2nd harmonic @ 31.5 Hz:	+24 dBu
Fine adjust 0 dB	
Before channel fader (THD = 1%):	20 dB
Before master fader (THD = 1%):	20 dB
Max. line output level:	
R_L = 300 Ω;	
- with transformer:	+23.5 dBu
- without transformer:	+23 dBu

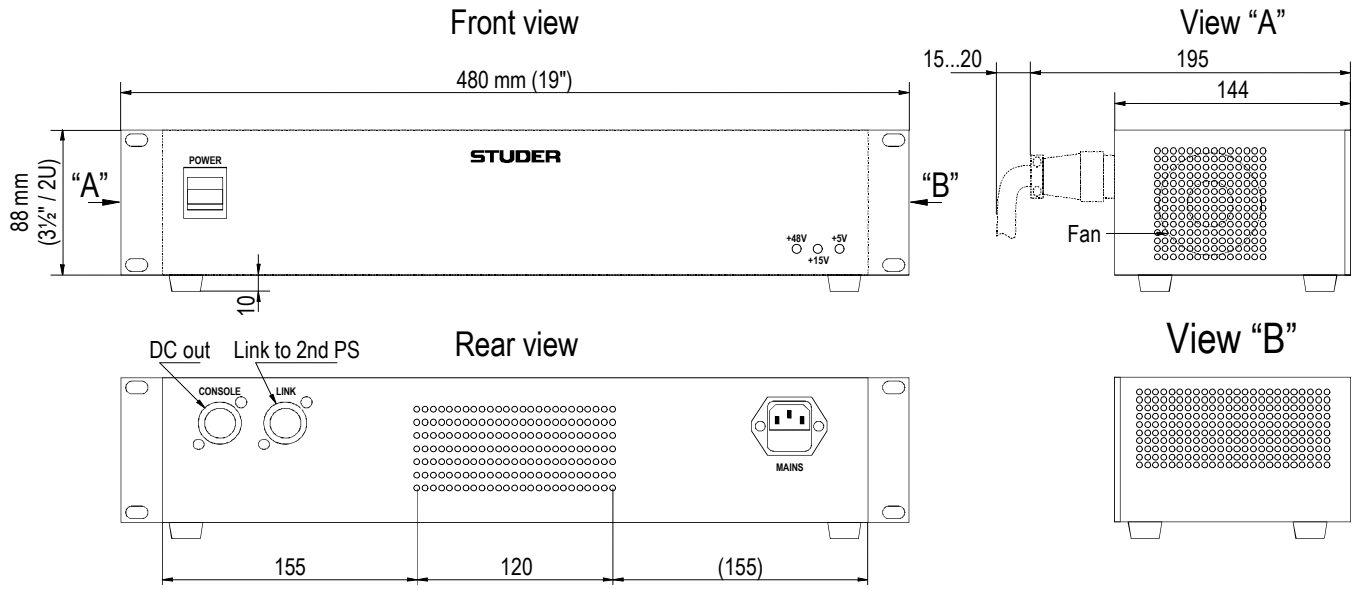
Unweighted noise voltage, Microphone	according to IEC 468-2 (DIN 45405) Equivalent input noise for 23 kHz bandwidth, termination 200 Ω:	<–126 dBu
Signal-to-noise ratio	PPM version, relative to line level (+6 dBu) VU version, relative to peak output level (+6 VU ≙ +10 dBu) On master output, master fader closed: One channel, input and master faders at 0 dB mark, unity gain; - Filters off: - Filters on, linear: 11 channels, all faders at 0 dB mark, unity gain; - Filters off: - Filters on, linear:	 > 95 dB > 93 dB > 92 dB > 85 dB > 83 dB
Harmonic ratio	PPM version, measured with line level +6 dBu; VU version, measured with nominal output level 0 VU, or peak output level +6 VU; unity gain, 31.5 Hz...16 kHz:	 70 dB
Crosstalk attenuation	Channel to channel, - without panorama potentiometer - with panorama potentiometer Channel bus selector switched off: Fader attenuation, input Fader attenuation, output	 >80 dB >70 dB >90 dB >100 dB >90 dB
Power supply		100...240 V, 50/60 Hz
	Power consumption (Studer 928 32/8/4)	approx. 400 VA

Note: Depending on the application, the on-air mixing consoles can have different configurations. For this reason the abovementioned values are applicable only to a typical configuration; in an individual case, the values may differ.
We reserve the right to make changes as technological progress may warrant.

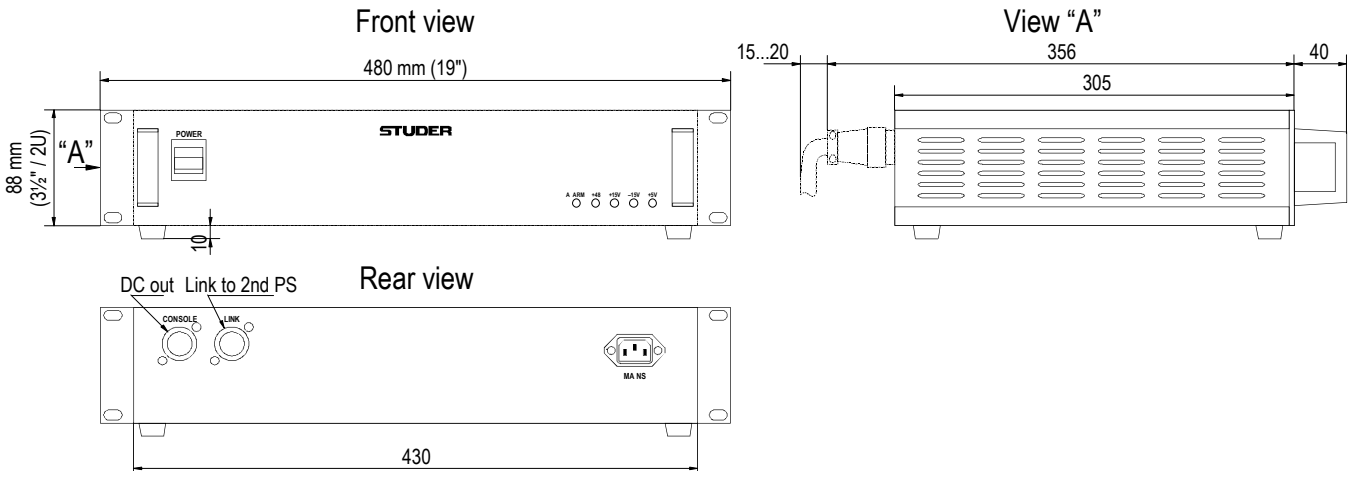
Dimensions (console) in mm:



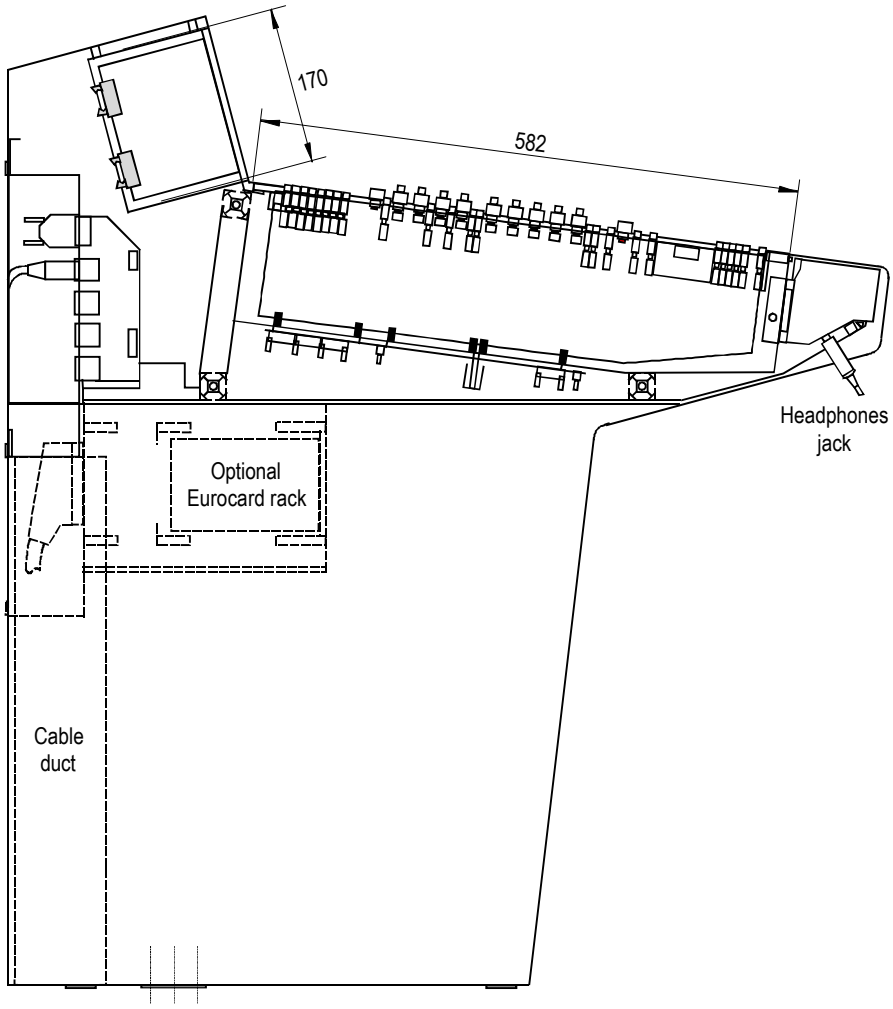
Dimensions (supply unit, versions 1.918.210.00...211.81) in mm:



Dimensions (supply unit, version 1.918.213.00) in mm:



928 console cross section:

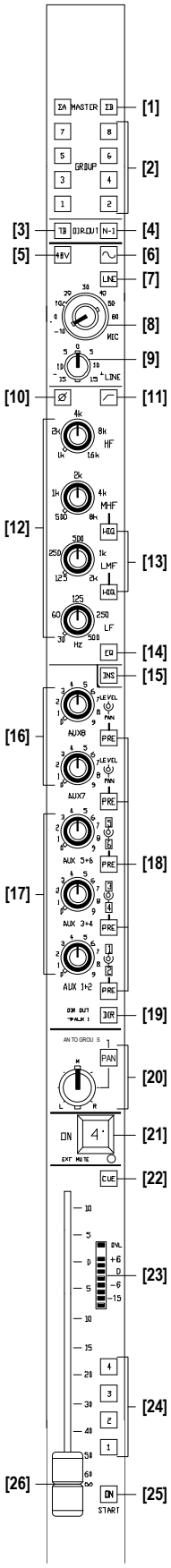


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2 Operation E2/1
2.1 Mono input unit E2/1
2.2 Stereo input unit E2/5
2.3 Mono group unit E2/9
2.4 Master unit A/B E2/12
2.5 CR Monitor unit E2/14
2.6 Studio Monitor unit E2/16

2 OPERATION

2.1 Mono input unit 1.928.220



[1] MASTER ΣA, ΣB
Keys for routing the audio signal to the stereo MASTER busses.

[2] GROUP 1...8
Keys for routing the audio signal to the GROUP busses.

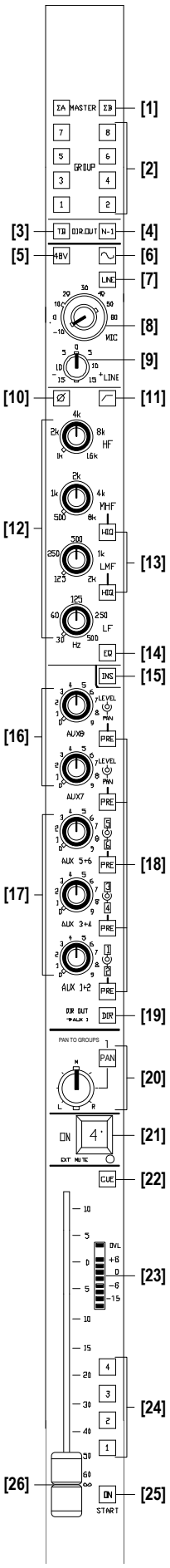
[3] TB DIR. OUT
Talk back, momentary pushbutton for talking via the command microphone to the electronically balanced Direct Output.

[4] DIR. OUT/N–1
Key to select N–1 mode ("mix-minus" mode) for the Direct Output. In this operating mode all selected sources except the channel's own modulation are audible.
There are two N–1 busses in the console: The N–1 ΣA bus, and the N–1/$\overline{\Sigma A}$ bus. The N–1 bus carries a mono mix of the ΣA mix. To provide a mix-minus signal at the direct output using the ΣA mix, the ΣA and the N–1 keys must be pressed.
If the N–1 key is pressed and the ΣA is released, the $\overline{\Sigma A}$ bus is used as the source of the mix-minus signal. The N–1/$\overline{\Sigma A}$ bus carries a mix from all the input modules which have their N–1 key but not their ΣA keyspressed.
Typical application: Direct transmissions or telephone recordings, if the concerned channel is used as a feedback channel to an outside commentator.
The direct output can be jumper-selected to be pre- or after-fader (refer to section 3.1.1).

[5] 48 V
Key for activating the 48 V phantom power for the transformer-balanced MICrophone input. If phantom powering is active, the key is illuminated. If the MIC2 option is installed (i.e. 2nd microphone input), the phantom power is applied to both microphone inputs simultaneously if the 48 V key is pressed.

[6] ~
Key for selecting the test generator input. If selected, the key is illuminated; a signal with a fixed level and the frequency selected in the TEST GEN section of the CR Monitor unit is fed into the input.
If the ~ key is released, the LINE or the MIC input is selected, depending on the LINE key [7].

Note: The test generator input is replaced by the MIC2 input if the corresponding option is installed; in this case, no test generator signal is available, but a second microphone can be connected.



[7] LINE

Key for selecting the electronically balanced line input (input transformer optional). Input sensitivity adjustable in a ±15 dB range with potentiometer LINE [9].
If the LINE key is released, the transformer-balanced MICrophone input is selected, and the key is dark.

[8] MIC

Gain setting for the MIC input.
Ring: Coarse gain setting in 10 dB steps, –10...+60 dB.
Knob: Additional fine gain adjustment in a range of ±10 dB.

[9] LINE

Fine adjustment of the LINE input gain. Adjustment range ±15 dB, with detent in calibrated center position.

[10] Ø

Phase inversion switch. If pressed, the phase of the input signal is inverted, and the key is illuminated.

[11] ⌐

Key for activating the high-pass filter (turnover frequency 75 Hz, slope 18 dB/oct.). If pressed, the filter is active, and the key is illuminated.

[12] HF, HMF, LMF, LF

Semi-parametric four-band equalizer, activated by the EQ key [14].
HF, LF: Shelving treble/bass filter. The turnover frequencies are adjustable with the outer ring (1...16 kHz or 30...500 Hz, resp.); boost/cut is adjustable with the center knobs up to ±15 dB.
HMF: Semi-parametric constant-Q equalizer, Qs of 0.7 or 2 can be selected. Center frequency adjustable with the outer ring (500 Hz...8 kHz), boost/cut adjustable with the center knob up to ±15 dB.
HLF: Semi-parametric equalizer as HMF, but the center frequency is adjustable between 120 Hz and 2 kHz.

[13] HI Q

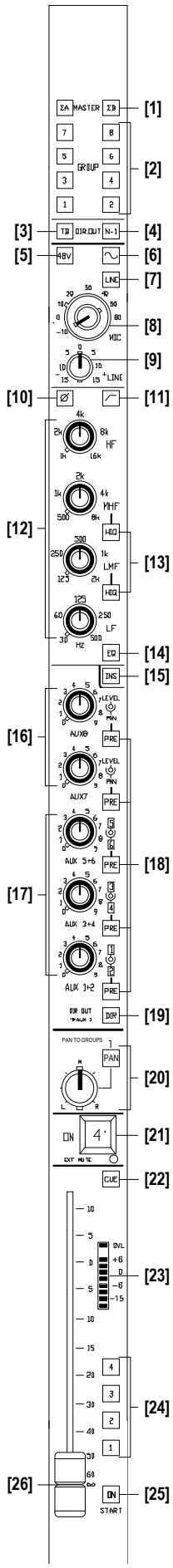
Keys for Q selection of the equalizer's HMF and HLF sections. Key pressed/illuminated: high Q (Q = 2); key released/dark: low Q (Q = 0.7).

[14] EQ

Key for inserting (key pressed and illuminated) or bypassing (key released and dark) the equalizer [12], [13].

[15] INS

Electronically balanced insert point. If the INS key is pressed and illuminated, the signal path is routed via the built-in Bantam patch field, else the signal path is routed internally.
The signal is always available on the INSERT SEND jack socket, regardless of the INS key. The insert point can be configured with jumpers to be pre-EQ, post-EQ but pre-fader, or post-fader (refer to section 3.1.1).



[16] AUX 7, AUX 8
Outputs to the stereo auxiliary busses 7 and 8. The (pre- or post-fader) input signal can be mixed to the desired AUX bus with the concentric potentiometers. The small knobs are the level controls, while the outer rings are used as PAN controls.

[17] AUX 1+2, AUX 3+4, AUX 5+6
Outputs to the mono auxiliary busses 1...6. The (pre- or post-fader) input signal can be mixed to the desired AUX bus with the concentric potentiometers; the knobs are the level controls for the odd-numbered AUX busses (1, 3, 5), the outer rings for the even-numbered AUX busses (2, 4, 6).

[18] PRE
If PRE is pressed, the pre-fader signal is mixed to the AUX bus instead of the post-fader signal, and the key is illuminated.

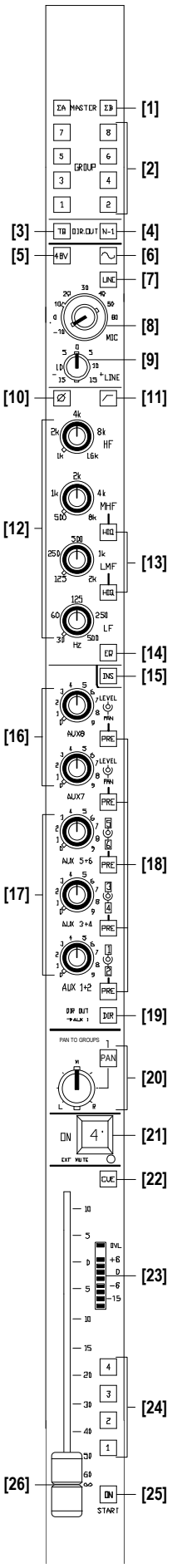
[19] DIR
Key for inserting the AUX 1 potentiometer into to the direct output or N–1 path (DIR OUT). If this key is pressed, the AUX 1 output is muted.

[20] PAN TO GROUPS
Panorama potentiometer with detent in center position. For positioning the mono input signal within the stereo image of the ΣA and ΣB main mixes (MASTER), regardless whether the adjacent PAN key is pressed or not.
If the PAN key is not pressed, the channel signal is routed in mono to all Groups. If it is pressed (and illuminated), the pan pot splits the signal into left and right outputs which are routed to the odd- and even-numbered Groups respectively.

[21] ON
Key for activating the channel with the possibility of external control. The EXT MUTE LED below the key is on if MUTE is externally controlled via the remote input.

[22] CUE
Key to activate the CUE function. If the key is pressed for a short time (less than 0.5 s), the function latches; if the key is pressed for more than 0.5 s, it is used as a momentary pushbutton, and the function will be reset after the key has been released.
If the CUE function is activated while the fader is set to its –∞ position, the AFL/PFL signal is connected to the CUE bus, depending on the AFL/PFL setting made on the CR Monitor Unit. The function will be reset as soon as the fader is moved away from the –∞ position.

[23] LED bargraph with OVL LED
The point to be monitored with the level meter can be selected with jumpers from pre-EQ, post-fader, or direct output/N–1. The meter characteristics can be jumper-selected from PPM or VU. (For jumper settings: refer to section 3.1.1).
The OVL LED monitors pre-EQ, post-EQ, and post-fader; if any of these points reaches a level of 6 dB below clipping, the LED comes on.



[24] 1, 2, 3, 4

Keys for selecting the four VCA group master faders located on the CR Monitor and Studio Monitor Units. The selected group faders are acting on the channel VCA in parallel to the channel fader. If a VCA group master fader is selected, the corresponding key is illuminated.

[25] START ON

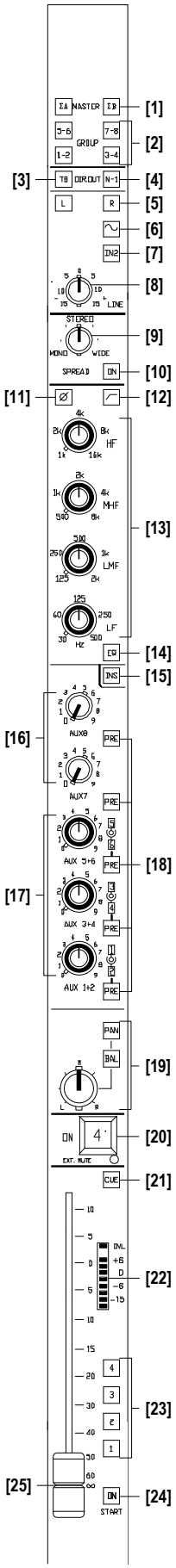
Two sets of relay contacts to start/stop external machines are available. These may be set to latching (default) or pulsed operation with jumpers (refer to section 3.1.1). The relays are operative only if the unit's LINE input is selected.

The START ON key works in conjunction with the fader's end switch. The ON key will be illuminated at half intensity if the fader is in its –∞ position when the ON key is pressed, indicating that the remote start is armed. When the fader is moved up, the start relay is excited and the LED in the ON key is illuminated with full intensity. Alternately, if the fader is moved up before the ON key is activated, the relay is excited as soon as the ON key is pressed.

[27] Fader

Linear Penny & Giles fader with VCA control. The fader is placed immediately after the Mute section, allowing for 10 dB gain at its maximum setting.

2.2 Stereo input unit 1.928.250



[1] MASTER ΣA, ΣB
Keys for routing the audio signal to the stereo MASTER busses.

[2] GROUP 1-2...7-8
Keys for routing the audio signal to the GROUP bus pairs.

[3] TB DIR. OUT
"Talk back", momentary pushbutton for talking via the command microphone to the electronically balanced Direct Output.

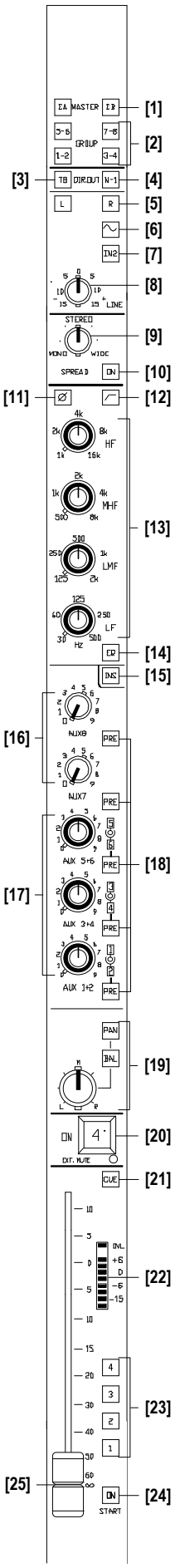
[4] DIR. OUT/N–1
Key to select N–1 mode ("mix–minus" mode) for the Direct Output. In this operating mode all selected sources except the channel's own modulation are audible.
There are two N–1 busses in the console: The N–1 ΣA bus, and the N–1/$\overline{\Sigma A}$ bus. The N–1 bus carries a mono mix of the ΣA mix. To provide a mix-minus signal at the direct output using the ΣA mix, the ΣA and the N–1 keys must be pressed.
If the N–1 key is pressed and the ΣA is released, the $\overline{\Sigma A}$ bus is used as the source of the mix-minus signal. The N–1/$\overline{\Sigma A}$ bus carries a mix from all the input modules which have their N–1 key but not their ΣA key pressed.
Typical application: Direct transmissions or telephone recordings, if the concerned channel is used as a feedback channel to an outside commentator.
The direct output can be jumper-selected to be pre- or post-fader (refer to section 3.1.2).

[5] L, R
Channel selector keys. If both keys are dark, the left and the right input channels are routed to the left and right output channels. If both keys are illuminated, the left and the right input channels are swapped and routed to the right and left output channels, respectively. If either the L or the R key is illuminated, only the left or the right input channel is routed to both output channels.

[6] ~
Key for selecting the test generator input. If selected, the key is illuminated; a signal with a fixed level and the frequency selected in the TEST GEN section of the CR Monitor unit is fed into the input.
If the ~ key is released, the standard LINE input or the second IN2 input is selected, depending on the IN2 key [7].

[7] IN2
Key for selecting from the electronically balanced LINE or IN2 inputs (input transformers optional); if the key is illuminated, the IN2 input is active. Input sensitivity adjustable with potentiometer LINE [9].

[8] LINE
Fine adjustment of the input gain. Adjustment range ±15 dB, with detent in calibrated center position.



[9] SPREAD
Control for adjusting the image width from mono (counterclockwise stop position) through normal stereo (detent in center position) to extra wide (clockwise stop position).

[10] SPREAD **ON**
Key for activating the SPREAD control [9].

[11] Ø
Phase inversion switch. If pressed, the phase of the right channel is inverted, and the key is illuminated.

[12] ⌐
Key for activating the high-pass filter (turnover frequency 75 Hz, slope 18 dB/oct.). If pressed, the filter is active, and the key is illuminated.

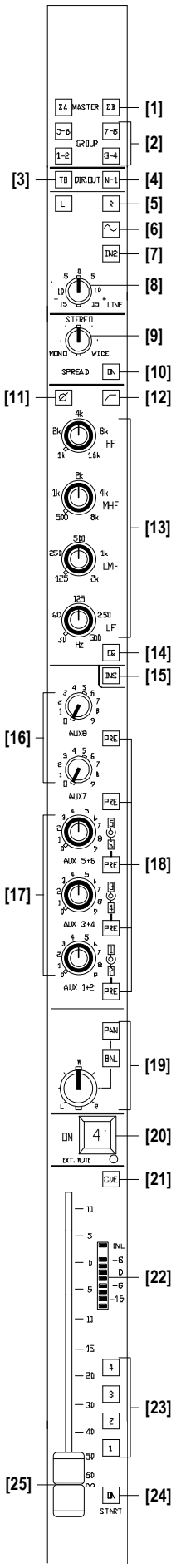
[13] HF, HMF, LMF, LF
Fixed-Q equalizer, activated by the EQ key [14].
HF, LF: Shelving treble/bass filter. The turnover frequencies are adjustable with the outer ring (1...16 kHz or 30...500 Hz, resp.); boost/cut is adjustable with the center knobs up to ±15 dB.
HMF: Semi-parametric constant-Q equalizer (Q = 0.7). The center frequency is adjustable with the outer ring (500 Hz...8 kHz), boost/cut is adjustable with the center knob up to ±15 dB.
HLF: Semi-Parametric equalizer as HMF, but the center frequency is adjustable between 120 Hz and 2 kHz.

[14] EQ
Key for inserting (key pressed and illuminated) or bypassing (key released and dark) the equalizer [13].

[15] INS
Electronically balanced insert point. If the INS key is pressed and illuminated, the signal path is routed via the built-in Bantam jack field, else the signal path is routed internally.
The signal is always available on the INSERT SEND jack socket, regardless of the INS key. The insert point can be configured with jumpers (refer to section 3.1.2) to be pre-EQ or post-EQ.

[16] AUX 7, AUX 8
Outputs to the stereo auxiliary busses 7 and 8. The (pre- or post-fader) stereo input signal can be mixed to the desired AUX bus with the dual (ganged) potentiometers.

[17] AUX 1+2, AUX 3+4, AUX 5+6
Outputs to the mono auxiliary busses 1...6. The left- and right-channel (pre- or post-fader) input signals are summed to a mono signal and can be mixed to the desired AUX bus with the concentric potentiometers; the knobs are the level controls for the odd-numbered AUX busses (1, 3, 5), the outer rings for the even-numbered AUX busses (2, 4, 6).



[18] PRE

If PRE is pressed, the pre-fader signal is mixed to the AUX bus instead of the post-fader signal, and the key is illuminated.

[19] PAN/BAL

Either panorama or balance potentiometer with detent in center position. Function selectable with the adjacent, mutually releasing PAN and BAL keys.

If the adjacent BAL key is pressed (and illuminated), the potentiometer is used for correcting level differences between the right and the left channel. In BAL mode the maximum attenuation of the "unwanted" channel is limited to 10 dB.

If the adjacent PAN key is pressed (and illuminated), the potentiometer is used for positioning the stereo input signal within the stereo image of the master or group mix. At the potentiometer's counterclockwise or clockwise stop, the complete information of both input channels is retained, however in mono, and only in the left or right channel respectively.

The PAN/BAL potentiometer is always active for both Groups and Master busses.

[20] ON

Key for activating the channel with the possibility of external control. The EXT MUTE LED below the key is on if MUTE is controlled externally.

[21] CUE

Key to activate the CUE function. If the key is pressed for a short time (less than 0.5 s), the function latches; if the key is pressed for more than 0.5 s, it is used as a momentary pushbutton, and the function will be reset after the key has been released.

If the CUE function is activated while the fader is set to its –∞ position, the AFL/PFL signal is connected to the CUE bus, depending on the AFL/PFL setting made on the CR Monitor Unit. The function will be reset as soon as the fader is moved away from the –∞ position.

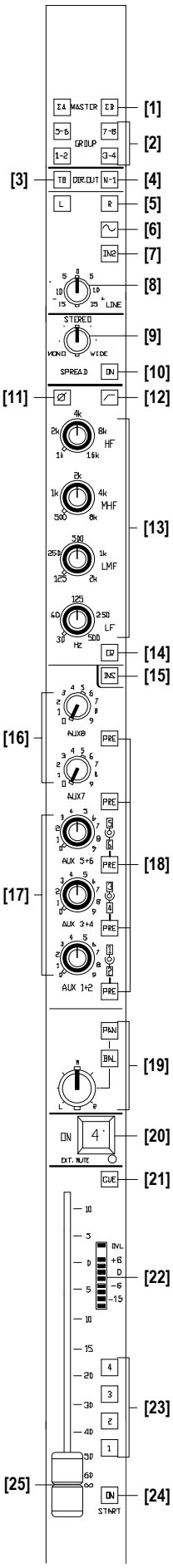
[22] LED bargraph with OVL LED

The point to be monitored with the level meter can be selected with jumpers (refer to section 3.1.2) from pre-EQ or direct output N–1. The meter characteristics can be jumper-selected from PPM or VU.

The OVL LED monitors pre-EQ, post-EQ, and post-fader; if any of these points reaches a level of 6 dB below clipping, the LED comes on.

[23] 1, 2, 3, 4

Keys for selecting the four VCA group master faders located on the CR Monitor and Studio Monitor Units. The selected group faders are acting on the channel VCA in parallel to the channel fader. If a VCA group master fader is selected, the corresponding key is illuminated.



[24] START ON

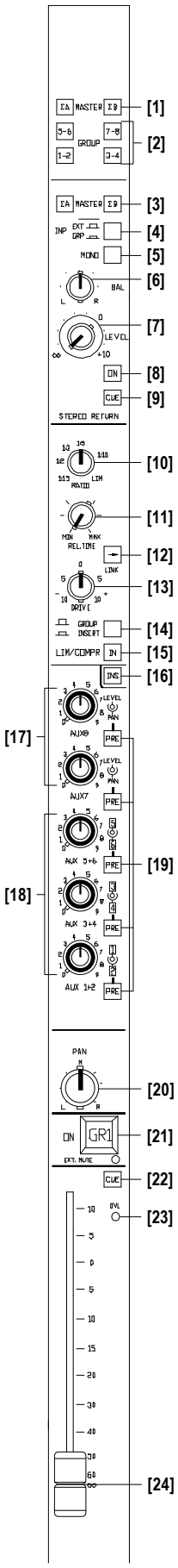
Two sets of relay contacts to start/stop external machines are available. These may be set to latching (default) or pulsed operation with jumpers (refer to section 3.1.2). The relays are operative only if the unit's LINE input is selected.

The START ON key works in conjunction with the fader's end switch. The ON key will be illuminated at half intensity if the fader is in its –∞ position when the ON key is pressed, indicating that the remote start is armed. When the fader is moved up, the start relay is excited and the LED in the ON key is illuminated with full intensity. Alternately, if the fader is moved up before the ON key is activated, the relay is excited as soon as the ON key is pressed.

[25] Fader

Linear Penny & Giles fader with VCA control. The fader is placed immediately after the Mute section, allowing for 10 dB gain at its maximum setting.

2.3 Mono group unit 1.928.230



[1] MASTER ΣA, ΣB
The panned signal is routed to the MASTER busses with the MASTER ΣA and ΣB switches. It may also be routed to the other Group busses.

[2] GROUP 1-2...7-8
Keys for routing the group signal to the GROUP busses. The left signal is routed to the odd-numbered groups, and the right signal to the even-numbered groups.
Each Group is disabled from routing to itself.

[21] ON
Key for activating the group path with the possibility of external control.
The EXT MUTE LED below the key is on if MUTE is controlled externally.

[22] CUE
Key to activate the CUE function. If the key is pressed for a short time (less than 0.5 s), the function latches; if the key is pressed for more than 0.5 s, it is used as a momentary pushbutton, and the function will be reset after the key has been released.

[23] OVL LED
The OVL LED monitors pre- and post-fader; if any of these points reaches a level of 6 dB below clipping, the LED comes on.

[24] Fader
Linear Penny & Giles fader with VCA control. The fader is placed immediately after the Mute section, allowing for 10 dB gain at its maximum setting.

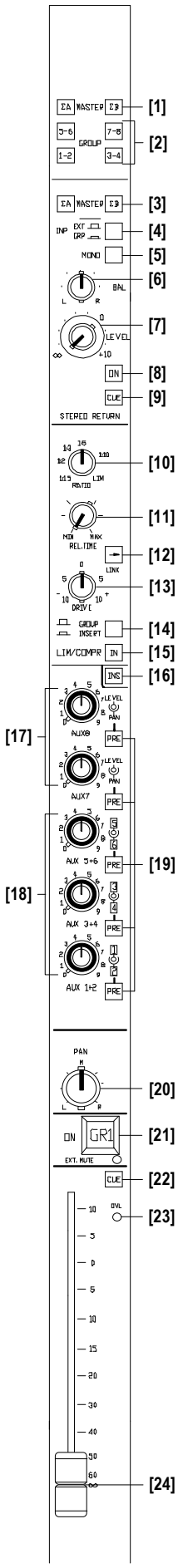
STEREO RETURN:

[3] MASTER ΣA, ΣB
Keys for routing the signal selected with the INP EXT/GRP switch [4] (either the electronically balanced EXTernal line signal or the pre-fader group signal) to the MASTER busses.

[4] INP EXT/GRP
Key for selecting the EXTernal stereo input signal or the pre-fader group signal to the stereo return circuit. When the key is pressed, GRP is selected.

[5] MONO
The stereo return signals from the two electronically balanced XLR input connectors can be summed to a mono signal by pressing the MONO key (key is illuminated).

[6] BAL
Balance potentiometer for the stereo return circuit. If either EXT and MONO or GRP is selected with the keys [4] and [5], respectively, the balance pot acts as a panorama pot with a gain of 3 dB and a drop of 10 dB at either end.



[7] LEVEL
Potentiometer to control the input gain. Adjustment range: –∞...+10 dB.

[8] ON
Key for connecting the output of the stereo return circuit to the Master busses.

[9] CUE
Key to activate the CUE function. If the key is pressed for a short time (less than 0.5 s), the function latches; if the key is pressed for more than 0.5 s, it is used as a momentary pushbutton, and the function will be reset after the key has been released.
If the CUE function is activated while the fader is set to its –∞ position, the AFL/PFL signal is connected to the CUE bus, depending on the AFL/PFL setting made on the CR Monitor Unit. The function will be reset as soon as the fader is moved away from the –∞ position.

COMPRESSOR/LIMITER:

The built-in compressor/limiter can be inserted either into the group channel or be connected to any desired channel via the Bantam patch panel.

[10] RATIO
Potentiometer for adjusting the compression ratio in a range of 1:1.5 to 1:10. In the fully clockwise stop position, the limiter is activated at line level.

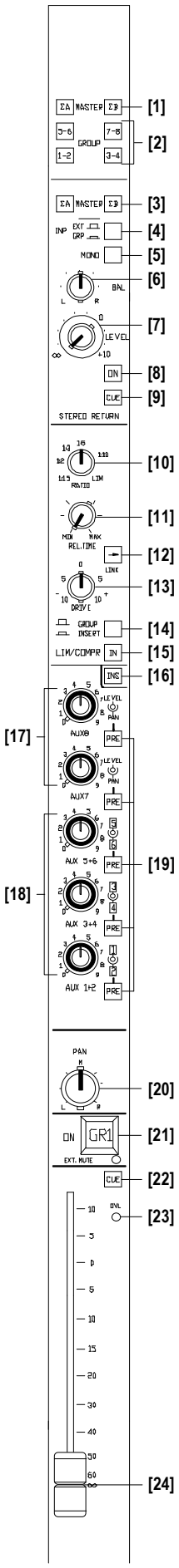
[11] REL. TIME
Potentiometer for adjusting the compressor/limiter's release time in a range of 200 ms to 10 s.

[12] LINK ➔
The LINK key allows linking of the limiter to the next one on its right-hand side (on the far right Group Unit, this has no effect). If limiters are linked, any signal which causes one limiter to start acting will also cause the other linked limiters to act. In this way a stable stereo image is produced even if the compressor/limiter is used.

[13] DRIVE
Potentiometer for adjusting the compressor/limiter's threshold and gain.

[14] GROUP/INSERT
When this key is released (and dark), the compressor/limiter is looped after the fader into the group signal path; when it is pressed, the input and the output of the compressor/limiter is connected to the Bantam patch field.

[15] LIM/COMPR IN
Key for activating the limiter/compressor; when active, the key is illuminated.



GROUP CHANNEL:

[16] INS

Electronically balanced insert point. If the INS key is pressed and illuminated, the signal path is routed via the INSERT SEND/RETURN connectors, else the signal path is routed internally.
The signal is always available on the INSERT SEND connector, regardless of the INS key.

[17] AUX 7, AUX 8

Outputs to the stereo auxiliary busses 7 and 8. The (pre- or post-fader) group signal can be mixed to the desired AUX bus with the concentric potentiometers. The small knobs are the level controls, while the outer rings are used as PAN controls.

[18] AUX 1+2, AUX 3+4, AUX 5+6

Outputs to the mono auxiliary busses 1...6. The (pre- or post-fader) group signal can be mixed to the desired AUX bus with the concentric potentiometers; the knobs are the level controls for the odd-numbered AUX busses (1, 3, 5), the outer rings for the even-numbered AUX busses (2, 4, 6).

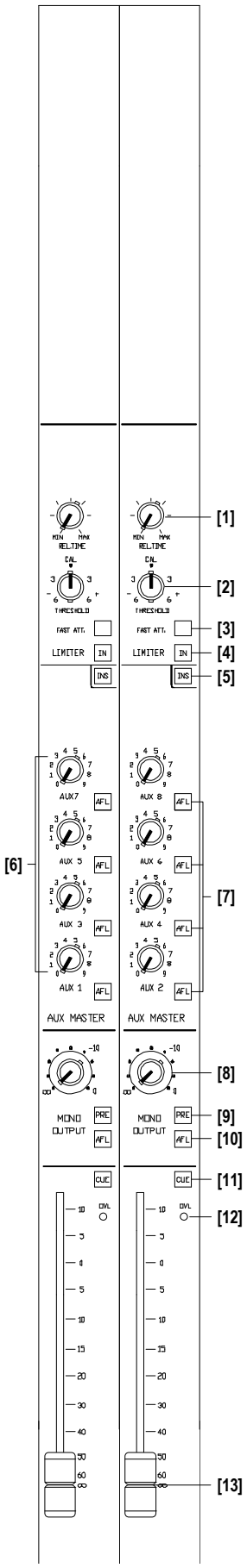
[19] PRE

If PRE is pressed, the pre-fader signal is mixed to the AUX bus instead of the post-fader signal, and the key is illuminated.

[20] PAN

The post-fader signal is routed to the PAN potentiometer (detent in center position). The potentiometer is used for positioning the group signal within the stereo image of the main (MASTER) mix or the other group pairs; the unit's own group bus pair cannot be accessed with the group selector.

2.4 Master unit A/B 1.928.320/.321



There are two master units (A and B) in a console, each handling a stereo channel, 3 mono AUX masters, and one stereo AUX master.

LIMITER:

[1] REL. TIME
Potentiometer for adjusting the limiter's release time in a range of 200 ms to 10 s.

[2] THRESHOLD
Potentiometer for setting the signal level at which the limiter starts operating; setting range ±6 dB, referred to nominal operating level.

[3] FAST ATT.
Key for selecting the limiter's attack time. When the key is released (and dark): 10 ms; when the key is pressed (and illuminated): 0.5 ms.

[4] LIMITER IN
Key for inserting the stereo limiter *after* the Master fader; when inserted, the key is illuminated.

INSERT POINTS:

[5] INS
Electronically balanced insert point. If the INS key is pressed and illuminated, the signal path is routed via the built-in Bantam patch field, else the signal path is routed internally.
The signal is always available on the INSERT SEND jack socket, regardless of the INS key. The insert point can be configured with jumpers to be pre-fader or post-fader (refer to section 3.1.4).

AUX MASTER SECTION:

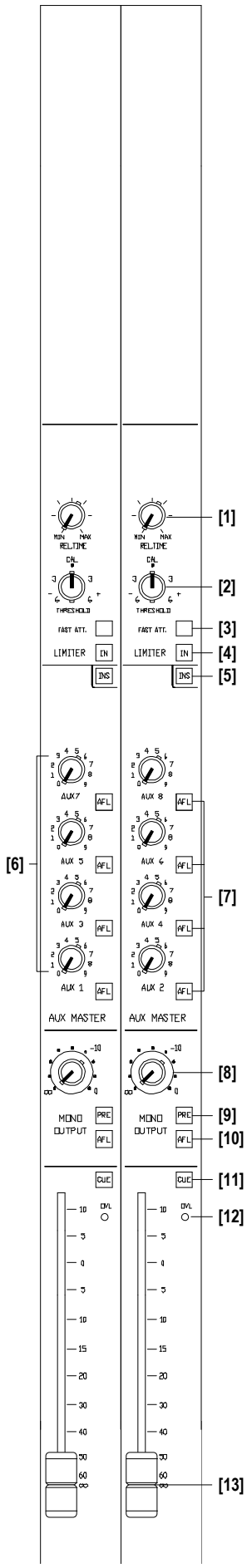
[6] AUX 1, 3, 5, 7/AUX 2, 4, 6, 8
Aux Master level controls.

[7] AFL
The AFL keys allow listening to the signal after the AUX potentiometer via the Cue system.

MONO OUTPUTS:

[8] MONO OUTPUT
Level control for the MONO output signal. The left and right master busses are summed to a mono signal. If PRE [9] is pressed (and illuminated), this mono signal is tapped after the insert point, but before the limiter. If PRE [9] is released (and dark), the mono signal is tapped after insert point, fader, and limiter. Maximum gain is 0 dB.

[9] PRE
If this key is pressed (and illuminated), the signal is tapped before the VCA and routed to the Direct output; else, the signal is tapped after the VCA and routed to the Direct output.



[10] AFL

If this key is pressed (and illuminated), the mono signal is tapped after the level control [8] and routed to the CUE system.

OUTPUT LEVEL CONTROL:

[11] CUE

Key to activate the CUE function. If the key is pressed for a short time (less than 0.5 s), the function latches; if the key is pressed for more than 0.5 s, it is used as a momentary pushbutton, and the function will be reset after the key has been released.
If the CUE function is activated while the fader is set to its –∞ position, the AFL/PFL signal is connected to the CUE bus, depending on the AFL/PFL setting made on the CR Monitor Unit. The function will be reset as soon as the fader is moved away from the –∞ position.

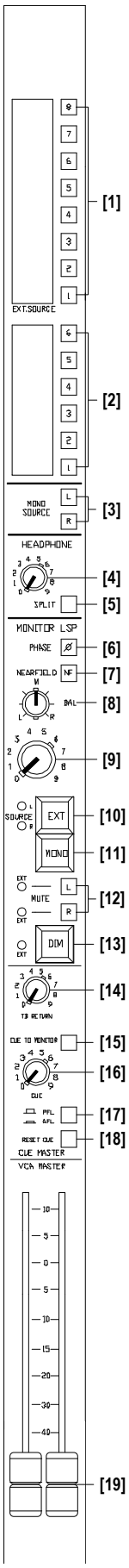
[12] OVL LED

The OVL LED monitors the master busses; if any of these points reaches a level of 6 dB below clipping, the LED comes on.

[13] Fader

Linear Penny & Giles fader with VCA control. The fader is placed immediately after the Mute section, allowing for 10 dB gain at its maximum setting.

2.5 CR Monitor unit 1.928.420



MONITOR SOURCES:

[1] EXT. SOURCE 1...8

The EXT. SOURCE bank of mutually releasing switches allows to select one of eight external inputs as external monitor source, if the SOURCE EXT switch [10] is pressed.

[2] 1...6

The internal source bank of mutually releasing switches allows to select one of six signals as internal monitor source, if the SOURCE EXT switch [10] is released.

For consoles with 8 groups, the internal source can be selected from the following: Groups 1+2, Groups 3+4, Groups 5+6, Groups 7+8, ΣA, ΣB.

For consoles with 4 groups, the internal source can be selected from the following: ΣA mono, ΣB mono, Groups 1+2, Groups 3+4, ΣA, ΣB.

[3] MONO SOURCE L/R

If these switches are both released, the stereo pairs of the sources are routed normally. If only the MONO SOURCE L or the MONO SOURCE R switch is pressed, the left- or right-hand signal is fed to both sides of the monitor circuit. If both are pressed, a mono mix of both sides is fed to both sides of the monitor circuit.

[10] SOURCE EXT

Switchover between the external and internal monitor selector banks (refer to [1] and [2]). The switchover can also be done by external control lines, individually for the left- and right-hand signals. When this is the case, the SOURCE L and/or SOURCE R LEDs are on.

OUTPUTS:

[4] HEADPHONE

Level control for the headphones connector located below the handrest on the right-hand side of the console.

[5] SPLIT

If this key is pressed and a cue (PFL or AFL) is activated from anywhere on the console, both channels of the headphone monitor signal are fed in mono to the left-hand headphones transducer, while the cue signal is fed to the right-hand headphones transducer.

[6] PHASE Ø

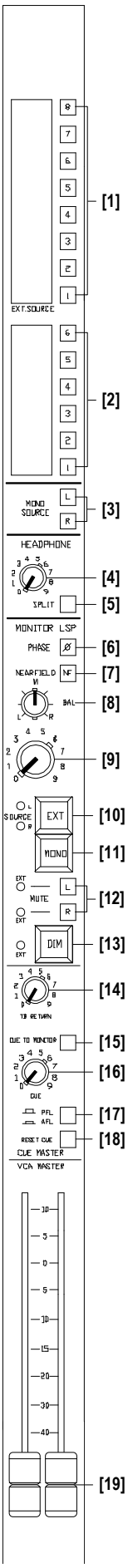
If this key is pressed, the phase of the right-hand monitor speaker channel is reversed.

[7] NEARFIELD NF

If this key is pressed, the second set of monitor speakers is selected for convenient switchover between far field and near field monitoring.

[8] BAL

Balance control for the monitor speaker outputs.



[9] Level control
Overall output level control for the monitor speaker outputs. For optimum stereo tracking, this potentiometer controls two VCAs

[11] MONO
If this key is pressed, the left- and right-hand signals are summed to a mono signal for both monitor speakers; this feature can be used for mono compatibility checks.

[12] MUTE L/R
By pressing these keys the left- and the right-hand monitor signals can be muted individually. This muting can also be done by external control lines, individually for the left- and right-hand signals. When this is the case, the EXT MUTE L and/or EXT MUTE R LEDs are on.

[13] DIM
By pressing this key the monitor signal can be attenuated by 20 dB or muted (jumper-programmable, refer to section 3.1.5). If this attenuation is caused by anything other than use of this key (e.g. talkback), the EXT DIM LED is on.

CUEING SYSTEM:

[14] TB RETURN
Talkback return level control for the cue speaker installed in the meter bridge.

[15] CUE TO MONITOR
If this key is pressed, the left- and right-hand cue signals are switched over from the cue speaker outputs to the monitor speaker outputs, as soon as one or more CUE keys are activated.

[16] CUE
Level control for the internal and external CUE speakers.

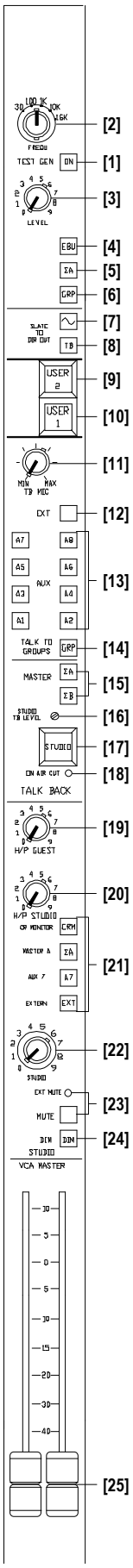
[17] CUE MASTER **PFL/AFL**
Master key to select if the cueing system is set to PFL or AFL.
If this key is not pressed, PFL is active. If it is pressed, AFL is active.

[18] RESET CUE
The various CUE keys may be electronically latched or unlatched by toggling the individual keys. In addition, they all can be unlatched by pressing the RESET CUE key. This key is illuminated if one or more cues are active.

MASTER FADERS:

[19] VCA MASTER 1/2 faders
Linear Penny & Giles faders. These faders send the appropriate control voltages to the individual input modules. VCA group master faders #1 and #2 are on this unit, #3 und #4 are located on the Studio Monitor unit.

2.6 Studio Monitor unit 1.928.520



[1] TEST GEN. ON
Key for activating the internal test generator; if active, the key is illuminated.
The generator output signal is routed to the internal tone bus and (after the LEVEL control [3]) to the internal ΣA and ΣB busses.
The internal tone bus is disabled if the ON-AIR switch on the signalling panel is active.

[2] FREQU.
Rotary switch for frequency selection of the internal test generator (30 Hz, 100 Hz, 1 kHz, 10 kHz, 16 kHz).

[3] LEVEL
Control for the internal test generator's output level.

[4] EBU
Key for selecting EBU mode for the test generator; if active, the key is illuminated, and the OSC R output is muted for 100 ms every 3 s.

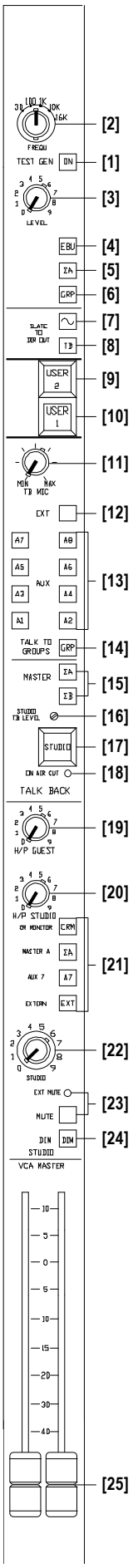
[5] ΣA
The post-level control generator signal is connected via the ΣA key to the Master A stereo outputs. The key is illuminated if this routing is active. If the ON AIR switch on the signalling panel is active, the generator signal is interrupted.

[6] GRP
The post-level control generator signal is connected via the GRP key to each of the Group outputs. The key is illuminated if this routing is active.

[7] SLATE TO DIR OUT / ~
Key for routing the test generator signal to the DIRect output of every input unit; if active, the key is illuminated. If this key is pressed together with the TB key, a 30 Hz signal and the talkback signal are sent together to the DIRect outputs.

[8] SLATE TO DIR OUT/TB
Key for routing the talkback signal to the DIRect output of every input unit; if active, the key is illuminated. If this key is pressed together with the ~ key, the talkback signal and a 30 Hz signal are sent together to the DIRect outputs.

[9], [10] USER 2/1
For both of these two keys, an external input is available normally connected to an external output. The output can be switched over to the talkback signal by pressing the corresponding key. The external output can be jumper-connected to Ground if the key is not pressed. Two other jumpers are provided for connecting the talkback signal to the N–1 busses if the corresponding USER key is pressed (refer to section 3.1.6).



[11] TB MIC
The input to the talkback system is from the built-un talkback mic. The overall gain of the talkback system is adjusted with the TB MIC potentiometer.

[12] EXT
Key for routing the talkback signal to the External Talkback output. If active, the key is illuminated.

[13] AUX A1...8
Keys for routing the talkback signal to the corresponding AUX 1...8 busses. If active, the corresponding key is illuminated.

[14] GRP
Key for routing the talkback signal to the group busses. If the key is pressed for a short time (less than 0.5 s), the function latches; if the key is pressed for more than 0.5 s, it is used as a momentary pushbutton, and the function will be reset after the key has been released. If talkback is active, the key is illuminated.
If the ON-AIR switch on the signalling panel is active, talkback to GRP is inhibited.

[15] MASTER ΣA, ΣB
Keys for routing the talkback signal to the stereo master mixes A and/or B. If the keys are pressed for a short time (less than 0.5 s), the functions latch; if they are pressed for more than 0.5 s, they are used as momentary pushbuttons, and the functions will be reset after the keys have been released. If talkback is active, the keys are illuminated.
If the ON-AIR switch on the signalling panel is active, talkback is inhibited.

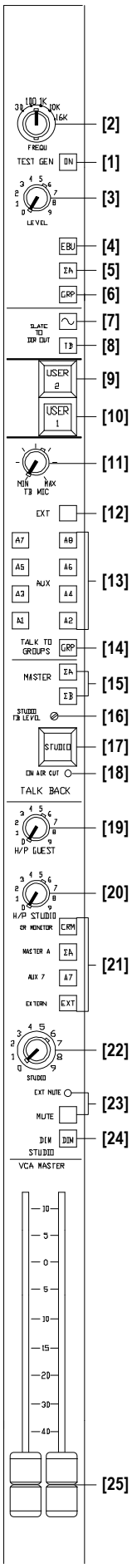
[16] STUDIO TB LEVEL
Potentiometer for setting the talkback level which can be fed to the monitor speakers and headphones in the studio when the STUDIO key [17] is pressed.

[17] STUDIO
Key for routing the talkback signal to the monitor speakers and headphones in the studio. The studio monitor speakers are muted when the ON-AIR key on the signalling panel is pressed.

[18] ON AIR CUT
If this LED is on, the talkback signal will be muted in the following paths:
- Stereo master mixes A and B,
- Studio monitor speakers,
- Studio headphones.

[19] H/P GUEST
Level control for the guest headphones.

[20] H/P STUDIO
Level control for the studio headphones.



[21] CRM, ΣA, A7, EXT

The input signal for the guest headphones, studio headphones and studio monitor speakers is selected with this bank of mutually releasing selector keys. The selection is CRM (i.e. the same signal as is fed to the control room monitor speakers via the CR Monitor unit), ΣA, AUX 7, or EXT (external input from the rear panel connector).

[22] STUDIO

Level control for the studio monitor speakers. Jumper-programmable to VCA remote control from an external potentiometer (refer to section 3.1.6).

[23] MUTE

Key for muting the studio monitor speakers. The EXT MUTE LED next to this key is on if the muting has been activated by the STUDIO MIC ON signal.

[24] DIM

Key for attenuating the level of the studio monitor speakers. The amount of attenuation is set by an internal trimmer potentiometer.

[25] VCA MASTER 3/4 faders

Linear Penny & Giles faders. These faders send the appropriate control voltages to the individual input modules. VCA group master faders #3 and #4 are on this unit, #1 und #2 are located on the CR Monitor unit.

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3.1.2 INPUT UNIT STEREO E3/5
3.1.3 GROUP UNIT E3/7
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3 JUMPER SETTINGS, ALIGNMENT

3.1 Jumpers

3.1.1 INPUT UNIT MONO 1.928.220

Insert

With the settings of jumpers LK1...LK8 the insert point can be placed either before the equalizer, before the fader, or after the fader.

Jumper	Insert Pre-EQ	Insert Pre-Fader (default)	Insert Post-Fader
LK1	1-2	2-3	no effect
LK2	1-2	2-3	no effect
LK3	1-2	2-3	no effect
LK4	1-2	2-3	no effect
LK5	1-2	1-2	2-3
LK6	1-2	1-2	2-3
LK7	1-2	1-2	2-3
LK8	1-2	1-2	2-3

Mic 2 Option

Instead of the test tone input, on the input unit a second microphone can be connected. For this purpose, the module 1.928.710 must be replaced by the module 1.928.711, and the jumpers J1 and J2 are to be set as follows:

	Test tone (default)	MIC 2
J1	closed	open
J2	open	closed

Remote control and signalization

APPLIES TO VERSION 1:

Each input unit is equipped with two remote control relays. The normally-open contacts of these relays are terminated on the 9-pin D-type connector of the rear panel.
The relay contacts can be used for remote control or signalization. The function and the behavior of the remote control can be varied with jumpers J3, J4, J5, and J11.

Remote control output

J3	1-2	Fader start pulse on the REM output of the remote control Fader stop pulse on the STOP output of the remote control
	2-3 (default)	Latching contact on the REM output of the remote control for as long as the fader is open and the ON key is active. Fader stop pulse on the STOP output of the remote control.

Remote control key

With the START key the fader start can be prepared or initiated. If the key is pressed when the fader is closed (dim backlight of the key) the fader start command is executed as soon as the fader is opened and the ON key is activated.
If the START key is pressed when the fader is already open and the ON key is active, it immediately executes the fader start command.

J4	1-2 (default)	START key is active
	2-3, and D18, D30 removed	START key is ineffective
J5	1-2	The START key generates start pulses
	2-3 (default)	The START key functions as a latching start/stop key and enables or disables fader start activation with the fader control

Signalization

The 928 mixing console features two signaling busses that are used for on-air signaling and deactivation of the studio speakers.

J11	2-3 (default)	Fader start active (not applicable to version 2 of the input unit)
J12	1-2	When the microphone channel is opened, the CR monitor is dimmed (DJ mode)
	2-3 (default)	When the microphone channel is opened, the studio speaker is switched off, and the studio on-air lamp is activated if the ON AIR signal is available or the STUDIO ON key in the signaling unit is pressed.
J13	1-2 (default)	The microphone input acts on the signaling busses.
	2-3	The LINE input acts on the signaling busses

Input channel Meters

The built-in LED meter can be operated with VU or PPM characteristic and can indicate either the input signal, the post-fader signal or the signal on the direct output (N-1).

J7	1-2 (default)	PPM characteristic
	2-3	VU characteristic
J8/J10	1-1 (default)	Meter before equalizer
	2-2	Meter on direct (N-1) output signal
	3-3	Meter after fader

Direct output

The signal for the direct output can optionally be tapped before or after the fader.

J14	1-2 (default)	Direct output post-fader
	2-3	Direct output pre-fader
J9	1-2	For talkback to the Dir/N-1 output the normal output signal is interrupted (TB signal exclusive)
	2-3 (default)	The talkback signal is added to the Dir/N-1 signal

APPLIES TO VERSION 2:

Each input unit is equipped with two remote control relays. The normally-open contacts of these relays are terminated on the 9-pin D-type connector of the rear panel.
The relay contacts can be used for remote control or signalization. The function and the behavior of the remote control can be varied with jumpers J3, J4, J5, and J11.

Remote control output

J3	1-2	Start pulse on the REM output of the remote control. Stop pulse on the STOP output of the remote control.
	2-3 (default)	Latching contact on the REM output of the remote control for as long as the fader is open and the ON key is active. Stop pulse on the STOP output of the remote control.

Remote control key

With the START key the fader start can be prepared or initiated. If the key is pressed when the fader is closed (dim backlight of the key) the fader start command is executed as soon as the fader is opened and the ON key is activated.
If the START key is pressed when the fader is already open and the ON key is active, it immediately executes the fader start command.

J4	1-2 (default)	START key is active
J11	closed	
J4	2-3	START key is disabled, fader start depends only on the fader and the ON key
J11	open	
J5	1-2	START key generates start pulses
	2-3 (default)	START key functions as a latching start/stop key and enables or disables fader start activation with the fader control

Signalization

The 928 mixing console features two signaling buses that are used for on-air signaling and deactivation of the studio speakers.

J12	1-2	When the microphone channel is opened, the CR monitor is dimmed (DJ mode)
	2-3 (default)	When the microphone channel is opened, the studio speaker is switched off, and the studio on-air lamp is activated if the ON AIR signal is available or the STUDIO ON key in the signaling unit is pressed.
J13	1-2 (default)	Microphone input acts on the signaling buses.
	2-3	LINE input acts on the signaling buses

Input channel meters

The built-in LED meter can be operated with VU or PPM characteristic and indicate either the input signal, the post-fader signal or the signal on the direct output or N-1 output.

J7	1-2 (default)	PPM characteristic
	2-3	VU characteristic
J8/J10	1-1 (default)	Meter before equalizer
	2-2	Meter on direct (N-1) output signal
	3-3	Meter after fader

Direct output

The signal for the direct output can optionally be tapped before or after the fader.

J14	1-2 (default)	Direct output post-fader
	2-3	Direct output pre-fader
J9	1-2	For talkback on the Dir/N-1 output, the normal output signal is interrupted (TB signal exclusive)
	2-3 (default)	The talkback signal is mixed down with the Dir/N-1 signal

3.1.2 INPUT UNIT STEREO 1.928.250

Insert

With the settings of jumpers J1...J4 the insert point can be placed either before the equalizer or before the fader.

Jumper	Insert Pre-EQ	Insert Pre-Fader
J1	1-3 and 2-4	3-5 and 4-6
J2	1-3 and 2-4	3-5 and 4-6
J3	1-3 and 2-4	3-5 and 4-6
J4	1-3 and 2-4	3-5 and 4-6

Remote control

Each input unit is equipped with two remote control relays. One of them produces the fader start signal for the LINE1 input, the other one produces the fader start signal for the LINE2 input. The normally-open contacts of these relays are terminated on the 9-pin D-type connector of the rear panel.
The relay contacts can be used for remote control or signalization. The function and the behavior of the remote control can be varied with jumpers J2, J3, J4, and J5 *on the Side Board*.

Remote control output

J5	Selection	Remote output	J2: 1-2	J2: 2-3
1-2	**LINE1**	REM	Fader start pulse	Fader start pulse
		STOP	Fader stop pulse	Fader stop pulse
	LINE2	REM	= LOW for as long as the fader is open and the ON key is active.	Fader start pulse
		STOP	Fader start pulse	Fader stop pulse
2-3	**LINE1**	REM	Latching contact for as long as the fader is open and the ON key is active.	Latching contact for as long as the fader is open and the ON key is active.
		STOP	---	---
	LINE2	REM	= LOW for as long as the fader is open and the ON key is active.	Latching contact for as long as the fader is open and the ON key is active.
		STOP	Latching contact for as long as the fader is open and the ON key is active.	---

Remote control key

With the START key the fader start can be prepared or initiated. If the key is pressed when the fader is closed (dim backlight of the key) the fader start command is executed as soon as the fader is opened and the ON key is activated.
If the START key is pressed when the fader is already open and the ON key is active, it immediately executes the fader start command.

J4 (on Side Board)	1-2 (default)	START key is active
	2-3	START key is ineffective, fader start depends only on the fader and the ON key
J3 (on Side Board)	1-2	The START key generates start pulses
	2-3 (default)	The START key functions as a latching start/stop key and enables or disables fader start activation with the fader control

Input channel Meters

The built-in LED meter can be operated with VU or PPM characteristic and can indicate either the input signal or the signal on the direct output (N-1).

J7	1-2	VU characteristic
	2-3 (default)	PPM characteristic
J5 + J6	1-2	Meter on direct (N-1) output signal
	2-3 (default)	Meter before EQ

Direct output

The signal for the direct output can optionally be tapped before or after the fader.

J8 + J9	1-2 (default)	Direct output post-fader
	2-3	Direct output pre-fader
J1 (on Side Board)	1-2	For talkback to the Dir/N-1 output the normal output signal is interrupted (TB signal exclusive)
	2-3 (default)	The talkback signal is added to the Dir/N-1 signal

3.1.3 GROUP UNIT 1.928.230

Stereo return

With the EXT/GRP key, the stereo return signal can be selected either from an external stereo line input or from the internal pre-fader group signal.
If in GRP position (key pressed), the signal is tapped before or after the limiter, depending on the position of jumper J1.

J1	1-2 (default)	Before fader and limiter/compressor
	2-3	After fader and limiter/compressor

Groups

If jumpers J2...J5 are not set, the bus cannot be connected to the own group.

Do NOT set Jumper	for groups
J5	1 and 2
J4	3 and 4
J3	5 and 6
J2	7 and 8

Talkback

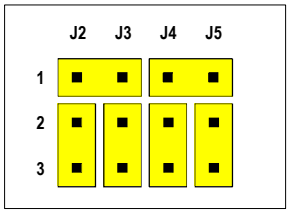
J6	closed (default)	Slate signal replaces group signal
	open	Slate signal is mixed down to the group signal
J8	closed (default)	Talkback signal replaces group signal
	open	Talkback signal is mixed to the group signal
J7	1-2 (default)	On Air signal has no influence on TB
	2-3	On Air signal inhibits talkback and slate

3.1.4 MASTER UNIT 1.928.320

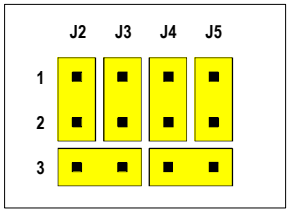
Insert

With the settings of jumpers J2...J5, the insert point of the master channel can be placed either before or after the fader.

Pre-fader insert (default)



Post-fader insert



Talkback

J1	closed (default)	Talkback signal interrupts the master signal
	open	Talkback signal is mixed down to the master signal

Fader start signal

J6	1-2 (default)	Fader start output REM is closed when the master fader is open
	2-3	Fader start output on REM can be controlled externally

3.1.5 CR MONITOR 1.928.420

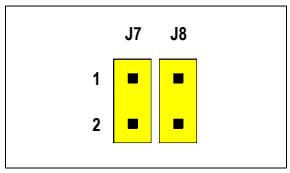
Main Board 1.928.420

CR monitor ➔ studio monitor

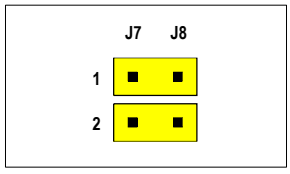
The CR monitor unit can also be used as a studio monitor unit by establishing the following jumper settings:

J1 / J3	1-2 (default)	Cue signal on headphones of the monitor unit
	2-3	Talkback signal on headphones of the monitor unit
J2 / J4	1-2 (default)	Cue signal on speakers of the monitor unit
	2-3	Talkback signal on speakers of the monitor unit
J5 / J6	1-2 (default)	Cue control signal
	2-3	Talk to studio control signal
J9	1-2 (default N.C.)	No function
	2-3	Prod TB control signal
J10	1-2 (default N.C.)	No function
	2-3	Prod TB control signal

CUE speaker



The master level of the left and right cue signal is output to the CUE speaker built into the console. If the overpress option is installed, the cue is muted by the overpress function.



If external CUE speakers are connected, the setting of jumpers J7 and J8 must be changed. If the overpress function is installed, the cue is muted by the overpress function if the connection J7/pin1 to J8/pin1 is set. Without this connection the CUE output will not be interrupted.

Supplementary Board 1.928.423

Mute/Dim

J1	1-2 (default)	CR speaker is dimmed with Monitor DIM
	2-3	CR speaker is switched off with Monitor DIM
J3	1-2 (default N.C.)	Studio mute control switches the speaker off (only for studio monitor option)

External input 8

J2	1-2 (default N.C.)	No function
	2-3	The input sensitivity of the EXT monitor input 8 is increased by 8 dB.

Headphones output

J4	1-2 (default)	The cue signal is mixed to the headphones program
	2-3	The cue signal replaces the headphones program as soon as a cue source is selected

3.1.6 STUDIO MONITOR 1.928.520

Option TB output of user keys

J1 / J2	1-2	An external signal is connected to User Output
	2-3	Ground is connected to User Output
J5 / J6	1-2	Talk to all N-1 outputs

Talkback to studio speaker

J3	1-2 (default)	Red light interrupts talkback to the studio speaker
	2-3	Even when red light is on, talkback to the studio speaker is possible
J4	1-2 (default)	The talkback signal is mixed to the speaker signal
	2-3	Interrupts the speaker signal during talkback

Internal/external volume control of studio speaker

J7	1-2	The volume is controlled by an external potentiometer
	2-3 (default)	The built-in speaker potentiometer is enabled

3.2 Alignment, general information

- The mixing console should be aligned only when it has reached its operating temperature.
- For measuring the levels on the line outputs they must not be loaded with less than 10 kΩ.
- Work should be performed in the indicated sequence only, because several of the steps are prerequisites for subsequent steps.
- All fixing screws of the modules must be firmly tightened. Solid ground connections and the specified EMC values are only achievable if all modules are correctly inserted and fastened.

3.2.1 Level definitions

Level specification: The nominal level specified in *dBu* is based on a fixed voltage as reference level:

0 dBu ≙ 0.775 V_{rms}

Nominal level in dBu:

Nominal level = level at full amplitude

The nominal level corresponds to the level at full amplitude. The terms nominal level, studio level, and line level are used as synonyms. The nominal level is used as the 0 dB value for all relative level specifications.

Output level:

0 dB PPM = nominal level
0 VU = nominal level minus 6 dB*

* 6 dB corresponds to a commonly used lead of the VU indicator.

PPM consoles Peak Program Meters as quasi-peak-indicating instruments indicate the level of a sine wave as RMS value. A signal with nominal level results in an indication of 0 dB.

VU consoles For a continuous tone, a VU instrument indicates a value that is too high by the amount of the lead. For a 0 VU reading the level of the test signal must be reduced by the lead value.
VU consoles are frequently set to a nominal value of +10 dBu, i.e., with a 6 dB lead of the VU meter a level of +4 dBu is indicated as 0 VU.

3.2.2 Voltage level ↔ Decibel

U1/U2	µV ---------- dBu mV ---------- dBu V ------- dBu				U1/U2	µV ---------- dBu mV ---------- dBu V ------- dBu			
1.00	**0.775**	0	–60	–120	31.6	**24.5**	+30	–30	–90
1.12	**0.869**	+1	–59	–119	35.5	**27.5**	+31	–29	–89
1.26	**0.975**	+2	–58	–118	39.8	**30.8**	+32	–28	–88
1.41	**1.09**	+3	–57	–117	44.7	**34.6**	+33	–27	–87
1.59	**1.23**	+4	–56	–116	50.1	**38.8**	+34	–26	–86
1.78	**1.38**	+5	–55	–115	56.2	**43.6**	+35	–25	–85
2.00	**1.55**	+6	–54	–114	63.1	**48.9**	+36	–24	–84
2.24	**1.73**	+7	–53	–113	70.8	**54.8**	+37	–23	–83
2.51	**1.95**	+8	–52	–112	79.4	**61.5**	+38	–22	–82
2.82	**2.18**	+9	–51	–111	89.1	**69.0**	+39	–21	–81
3.16	**2.45**	+10	–50	–110	100	**77.5**	+40	–20	–80
3.55	**2.75**	+11	–49	–109	112	**86.9**	+41	–19	–79
3.98	**3.08**	+12	–48	–108	126	**97.5**	+42	–18	–78
4.47	**3.46**	+13	–47	–107	141	**109**	+43	–17	–77
5.01	**3.88**	+14	–46	–106	159	**123**	+44	–16	–76
5.62	**4.36**	+15	–45	–105	178	**138**	+45	–15	–75
6.31	**4.89**	+16	–44	–104	200	**155**	+46	–14	–74
7.08	**5.48**	+17	–43	–103	224	**173**	+47	–13	–73
7.94	**6.15**	+18	–42	–102	251	**195**	+48	–12	–72
8.91	**6.90**	+19	–41	–101	282	**218**	+49	–11	–71
10.0	**7.75**	+20	–40	–100	316	**245**	+50	–10	–70
11.2	**8.69**	+21	–39	–99	355	**275**	+51	–9	–69
12.6	**9.75**	+22	–38	–98	398	**308**	+52	–8	–68
14.1	**10.9**	+23	–37	–97	447	**346**	+53	–7	–67
15.9	**12.3**	+24	–36	–96	501	**388**	+54	–6	–66
17.8	**13.8**	+25	–35	–95	562	**436**	+55	–5	–65
20.0	**15.5**	+26	–34	–94	631	**489**	+56	–4	–64
22.4	**17.3**	+27	–33	–93	708	**548**	+57	–3	–63
25.1	**19.5**	+28	–32	–92	794	**615**	+58	–2	–62
28.2	**21.8**	+29	–31	–91	891	**690**	+59	–1	–61
31.6	**24.5**	+30	–30	–90	1000	**775**	60	0	–60

3.2.3 Alignment necessity

Every mixing console leaving the factory comes with an alignment protocol containing the data of the final inspection, as:

- Alignment to customer-specific nominal level
- Frequency response, harmonic distortion, signal-to-noise ratio, noise voltage, and crosstalk attenuation.

Aligning the console is required after changing the operating conditions (nominal level) or after modifications to the console. The only measure to be performed regularly is demagnitizing the input transformers (see 3.2.8).

Note: New (spare) modules are factory-aligned to a nominal level of +6 dBu and can be installed in the console without further measures.

3.2.4 Electrostatically sensitive components („ESE“)



Many materials of today's working environment are possible sources of static electricity. Under certain conditions persons or objects can be charged to very high voltages – and according to Murphy's Law, these conditions are always met. When discharged, pulses of substantial peak power can occur. If this energy even partly finds its way into an electronic component, the latter can be damaged or destroyed.

Handling „ESE“ assemblies

Correct handling of electronic assemblies is a very important factor in the area of equipment maintenance; some simple guidelines must be followed:

1. Discharge your body by touching ground potential before touching any electronic assembly.
2. Shake hands with your partner before handing him over an electronic assembly.
3. Only touch a PCB at its edges (or its front panel, if any).
4. Switch off power before removing or inserting an assembly.
5. Stocking and transporting of „ESE“ assemblies must be performed only in special packaging material designed for this purpose.
6. Work only with tools suited and tested for „ESE“ components.
7. Always wear the grounding wrist-strap when working on electronic assemblies.
8. Keep Styrofoam, PVC foils, plastic bags and similar materials far away from „ESE“ assemblies.



Use of a grounded protection mat („ESE“ mat) is strongly recommended (refer to the next paragraph).

3.2.5 Required test equipment and tools

- Audio frequency generator with balanced output,
  output impedance ≤ 200 Ω (e.g. included in AudioPrecision "Portable One")
  or (if no balanced output is available): additional balancing transformer – also refer to 2.11.7
- Audio frequency voltmeter with balanced input,
  input impedance ≥ 10 kΩ (e.g. included in AudioPrecision "Portable One")
  or (if no balanced input is available): additional balancing transformer – also refer to 2.11.7
- DC voltmeter, $R_i \geq 20$ kΩ/V
- Distortion analyzer (e.g. included in AudioPrecision "Portable One")
- Two-channel oscilloscope (not mandatory; if available only)
- Alignment screwdriver, size 1
- Bus adapters for connecting detached modules to the bus; minimum requirement:
  2 Bus adapters, 2 × 32-pin Order No. 1.228.332.00
- 2 Module extractors Order No. 1.912.000.06 (1 pce.)

Note: The module extractors are contained in the accessories set, order no. 1.928.096.00 (refer to section 1.2.4).

- „ESE" protection set (mat 60 × 70 cm, grounding wrist strap, and grounding cable) Order No. 20.020.001.44
- Solid insulating mat (e.g. rubber or cardboard), approx. 25 × 40 cm, as a rest for detached modules which are connected to the bus and are placed onto the operating surface of the console.

3.2.6 Measurement basics

Temperature: Aligning the console should only be performed when it has reached operating temperature (approx. 15 min after powering on).

Load: All outputs and insert points are to be measured without load – i.e. the input impedance of the AF voltmeter must be 10 kΩ at least.

Test signal: Sine wave, approx. 1 kHz.

Level reference: *All indications in the following instructions are referred to a nominal level of +6 dBu.*
Other nominal levels require changed indications according to the table below:

Level overview:

Nominal level	Line outputs	(6 dB lead) 0 VU indication @	(PPM) 0 dB indication @
+6 dBu	+6 dBu	+0 dBu	+6 dBu
+10 dBu	+10 dBu	+4 dBu	+10 dBu
+15 dBu	+15 dBu	+9 dBu	+15 dBu

Insert levels: The level of the balanced insert points is equal to the nominal level.

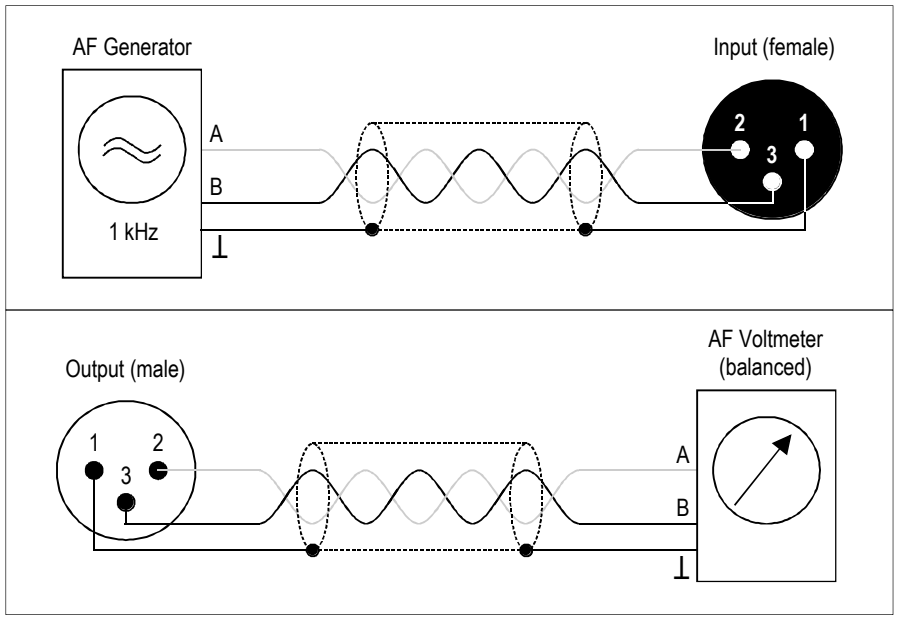
3.2.7 Measuring set-up

Inserting/removing modules: The modules to be aligned must be removed from the console and connected to the bus via bus adapters.

The 0 W bus amplifiers are sensitive to voltage peaks occurring during hot patching.

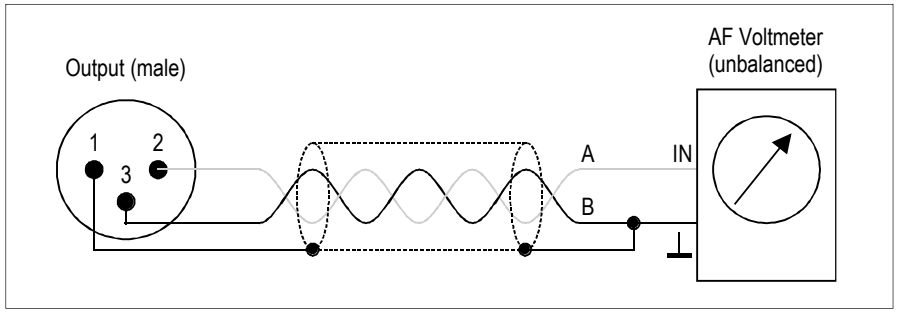
For protection of the console and its periphery, the modules may be inserted or removed only after switching the console off.

Balanced test equipment: As a matter of principle, the AF voltmeter must have a balanced input, the AF generator must have a balanced output.



Connection of the AF generator with a balanced line. Measurements with the AF voltmeter are performed without load (Ri ≥ 10 kΩ)

Unbalanced test equipment: If the input of the AF voltmeter is unbalanced, it has to be connected via a balancing transformer. Should this not be feasible, the following method can be used as a makeshift:



The „cold" B-line (pin 3) is connected to the audio ground (pin 1) and constitutes an unbalanced ground point.

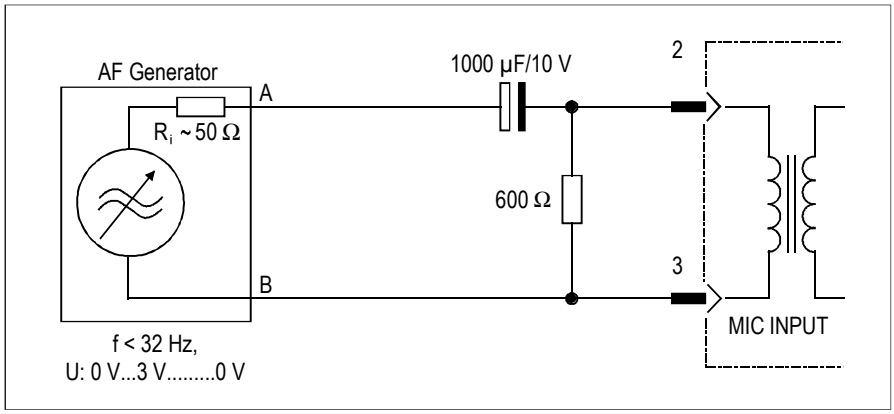
This set-up cannot be used for high-level measurements (in electronically balanced outputs clipping can occur).

3.2.8 Demagnetizing the input transformers

- Prohibited connection of unbalanced input sources or unintentional shorting of the A and/or B audio line of the microphone inputs to chassis when phantom supply is active can drive the input transformers into saturation and cause permanent magnetization (remanence). This manifests itself in the form of significantly higher harmonic distortion and microphonic noise: Light mechanical action on the mixing console, as tapping, causes an audible modulation via the outputs even when the microphone inputs are not active.
- Remanence can also accumulate over extended operating periods.
- All microphone inputs should, therefore, be demagnetized periodically *and prior to calibration*.

Procedure:

- *Switch the console off.*
- Feed a frequency of < 32 Hz to one microphone input after the other.
- Increase the generator level from 0 V to about 3 V.
- Continuously reduce the level *very slowly* to 0 V.



Capacitor (1000 µF/10 V) blocks any DC component
Resistor (600 Ω) is used for discharging the capacitor

3.3 Alignment

For alignment, the fader unit concerned must be removed from the console and connected to it via bus adapters.



Always switch the console off before connecting and disconnecting the modules to avoid damaging the modules.

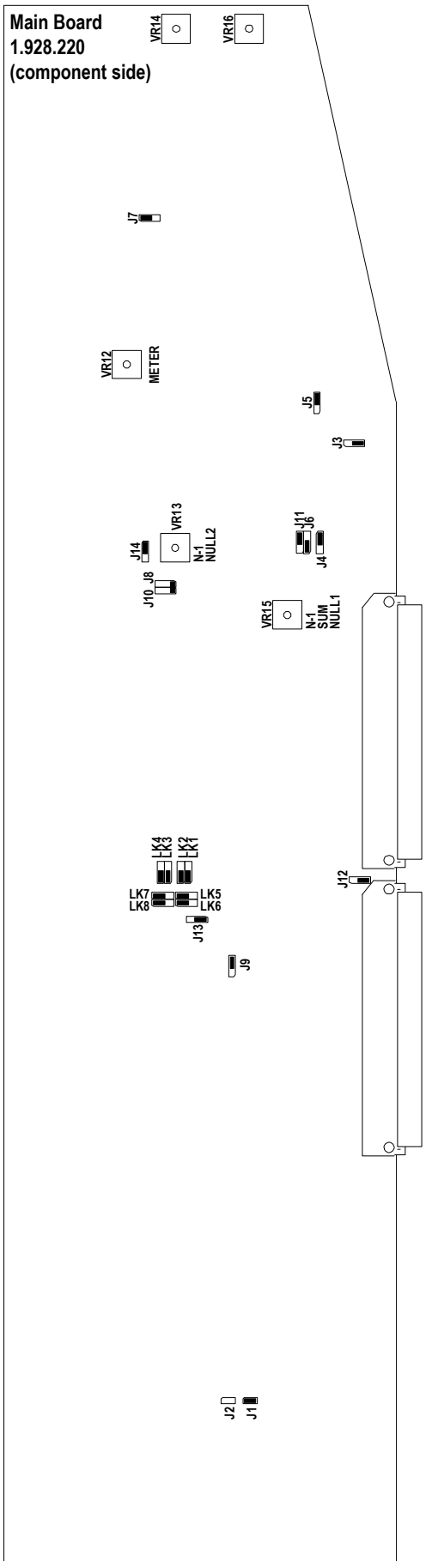
During the alignment, any filters, equalizers, as well as the balance and pan pots must be switched off.
All settings are performed on the faders only.

3.3.1 Generator level

(Please refer to the drawings in section 3.3.7).

- Connect AF voltmeter to the generator bus (connector 2c-23) and to ground (connector 1c-29) at any input.
- Switch test generator on and set it to 1 kHz on the Studio Monitor unit.
- Adjust **VR9** on the Studio Monitor unit to **–50 dBu** generator bus level.

3.3.2 Input unit mono 1.928.220



Distortion:

- Feed test signal with nominal level (1 kHz, typ. +6 or +10 dBu) to the LINE input.
- Set the LINE GAIN and PAN potentiometers to their center positions (CAL.), switch filters off, and set the fader to its 0 dB position.
- Remove the Input unit from the console and reconnect it via the bus adapter (optionally available; order no. 1.228.332.00).
- Route the signal to Master A (ΣA).
- Connect the distortion analyzer to the PF INSERT SEND connector of Master unit A.
- Adjust **VR14** to **minimum distortion** (typical value: <80 dB @ 1 kHz).

Level:

- Connect the AF voltmeter to the PF INSERT SEND connector of Master unit A.
- Adjust the level with trimmer potentiometer **VR16** to **3 dB below nominal level**.

Meter PPM (JP7 set to 1-2, see section 3.1.1):

- Feed test signal with nominal level (1 kHz, typ. +6 or +10 dBu) to the LINE input.
- Adjust trimmer potentiometer **VR12 to 0 dB indication.**

Meter VU (JP7 set to 2-3, see section 3.1.1):

- Feed test signal with nominal level –6 dB (1 kHz, typ. 0 or +4 dBu) to the LINE input.
- Adjust trimmer potentiometer **VR12 to 0 dB indication.**

Note: Usually, a 6 dB lead is used to compensate for the lower rise time of the VU meter (example: If the nominal level is +10 dBu, 0 VU is indicated with an input level of +4 dBu).

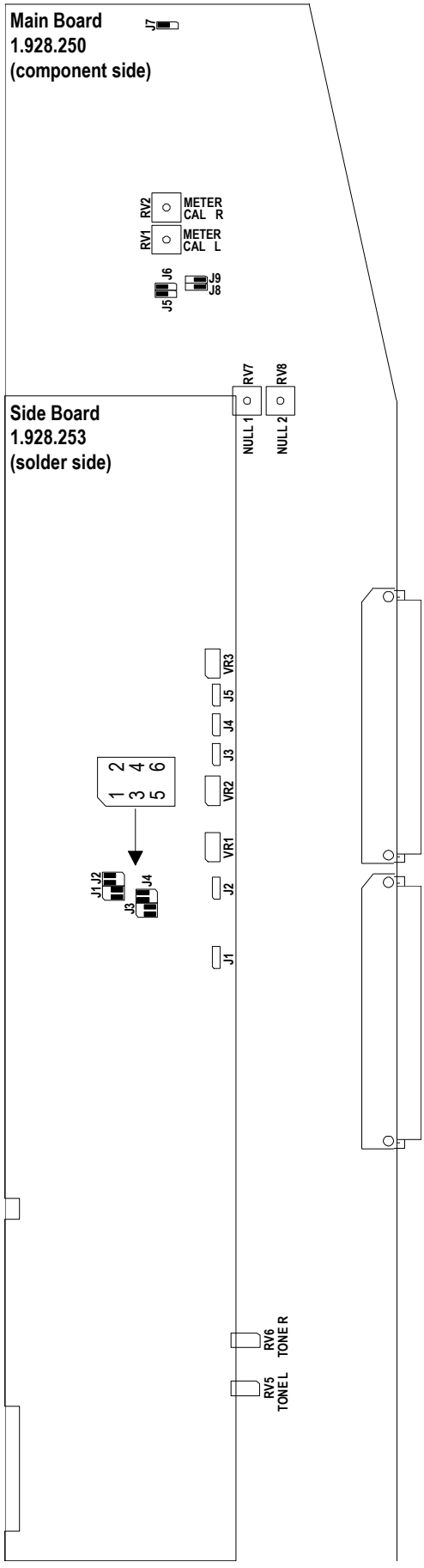
Direct output:

- Connect the AF voltmeter to the DIRECT OUTPUT.
- Route the signal to Master A (ΣA).
- Press the N-1 switch ("clean feed").
- Adjust the output to **minimum** level with trimmer potentiometer **VR15**.
- Press the Master A routing switch (ΣA).
- Adjust the output signal to **minimum level** with trimmer potentiometer **VR13**.

Generator:

- Select the generator ("~") in the input selector section.
- Switch the generator ON on the Studio Monitor module, set the frequency to 1 kHz.
- Connect the AF voltmeter to the PF INSERT SEND connector of Master unit A.
- Set the PAN potentiometer to its center position and the fader to its 0 dB position.
- Adjust **RA1** on the INPUT SIDE SWITCH BOARD to **3 dB below nominal level.**

3.3.3 Input unit stereo 1.928.250



Distortion:

- Feed test signal with nominal level (1 kHz, typ. +6 or +10 dBu) to the LINE 1 LEFT input.
- Set the LINE GAIN potentiometer to center position (CAL.), switch filters off, and set the fader to its 0 dB position.
- Remove the Input unit from the console and reconnect it via the bus adapter (optionally available, order no. 1.228.332.00).
- Route the signal to Master A (ΣA).
- Connect the distortion analyzer to the PF INSERT SEND connector of Master unit A left.
- Set **VR1** on the Side Board (left channel) to **minimum distortion** (typical value: <80 dB @ 1 kHz).
- Feed test signal with nominal level (1 kHz, typ. +6 dB or +10 dBu) to the LINE 1 RIGHT input.
- Connect the distortion analyzer to the PF INSERT SEND connector of Master unit A right.
- Set **VR2** on the Side Board (right channel) to **minimum distortion** (typical value: <80 dB @ 1 kHz).

Level:

- Feed test signal with nominal level (1 kHz, typ. +6 dB or +10 dBu) to the LINE 1 LEFT input.
- Connect the AF voltmeter to the PF INSERT SEND connector of Master unit A left.
- Set the level with trimmer potentiometer **VR3** on the Side Board to **nominal level**.

Meter PPM (JP7 set to 2-3, section 3.1.2)**:**

- Feed test signal with nominal level (1 kHz, typ. +6 or +10 dBu) to the LINE 1 LEFT input.
- Set trimmer potentiometer **RV1** on the Main Board for **0 dB indication** on the left-channel meter.
- Feed test signal with nominal level (1 kHz, typ. +6 or +10 dBu) to the LINE 1 RIGHT input.
- Adjust trimmer potentiometer **RV2** on the Main Board for **0 dB indication** on the the right-channel meter.

Meter VU (JP7 set to 1-2, see section 3.1.2)**:**

- Feed test signal with nominal level –6 dB (1 kHz, typ. 0 or +4 dBu) to the LINE 1 LEFT input.
- Adjust trimmer potentiometer **RV1** on the Main Board for **0 dB indication** on the the left-channel meter.
- Feed test signal with nominal level –6 dB (1 kHz, typ. 0 or +4 dBu) to the LINE 1 RIGHT input.
- Adjust trimmer potentiometer **RV2** on the Main Board for **0 dB indication** on the the right-channel meter.

Note:
Usually, a 6 dB lead is used to compensate for the lower rise time of the VU meter (example: If the nominal level is +10 dBu, 0 VU is indicated with an input level of +4 dBu).

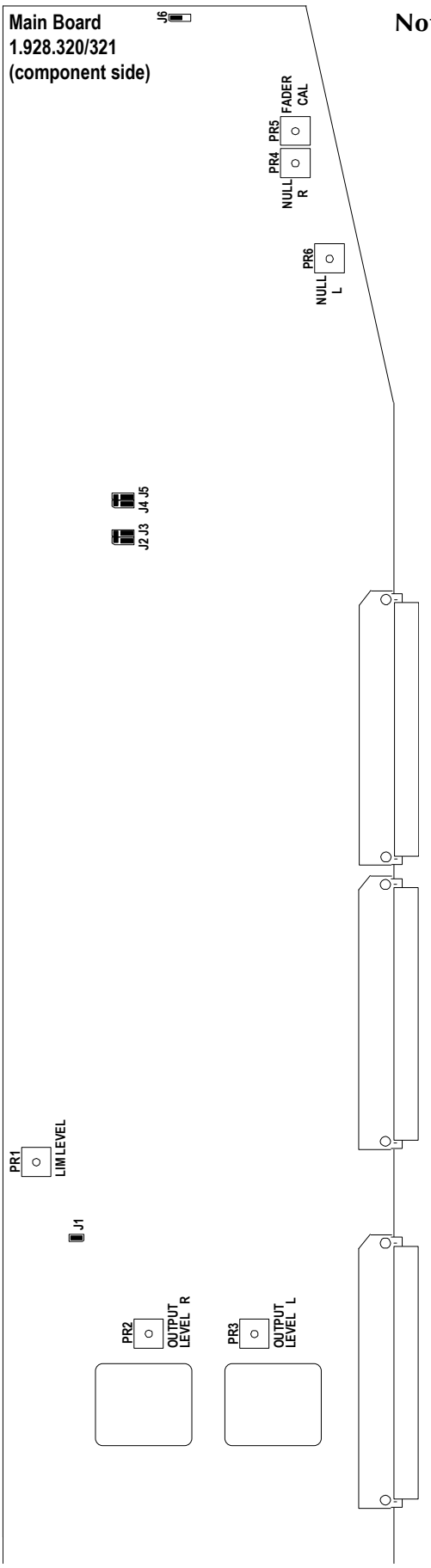
Direct Output:

- Feed test signal with nominal level (1 kHz, typ. +6 or +10 dBu) to the LINE 1 LEFT input (the Direct Output is only influenced by the PAN pot if jumpers J8/J9 are set to "post fader", position 1-2, see section 3.1.2).
- Connect the AF voltmeter to the DIRECT OUTPUT LEFT.
- Route the signal to Master A (ΣA).
- Press the N-1 switch ("cleanfeed").
- Adjust output with trimmer potentiometer **RV7** to **minimum level**.
- Release the Master A (SA) routing switch.
- Adjust output with trimmer potentiometer **RV8** to **minimum level**.

Generator:

- Select the generator in the input selector section.
- Switch the generator ON on the Studio Monitor unit and set it to 1 kHz.
- Connect the AF voltmeter to the PF INSERT SEND connector of Master unit A Left.
- Set the fader to its 0 dB position.
- Adjust the voltmeter indication with **RV5** on the Input Main Board to **nominal level**.
- Connect the AF voltmeter to the PF INSERT SEND connector of Master unit A Right.
- Verify if the fader is still in its 0 dB position.
- Adjust the voltmeter indication with **RV6** on the Input Main Board to **nominal level**.

3.3.4 Master units A/B 1.928.320/1.928.321



Note: If the calibration must be done from a stereo input module, and the PAN potentiometer is off, all measured levels are lower by 3 dB.

Fader calibration:

- Feed test signal with nominal level (1 kHz, typ. +6 or +10 dBu) to the LINE input of a mono channel.
- Route the signal to Master A (ΣA) or B (ΣB).
- Set the LINE GAIN and the PAN potentiometers to their center positions (CAL.), switch filters off, set the input and master faders to their 0 dB positions.
- Remove the Master unit from the console and reconnect it via the bus adapter (optionally available; order no. 1.228.332.00).
- Connect the *unbalanced input* of the AF voltmeter to J3/pin1, and *ground* to the unit's ground cable.
- Adjust level with trimmer potentiometer **PR5** to **9 dB below nominal level** (3 dB below nominal level due to the PAN potentiometer in center position, and an additional 6 dB because of unbalanced measurement setup).
- This adjustment is valid for both channels.

Distortion:

- Connect the distortion analyzer to the corresponding MASTER OUTPUT LEFT.
- Adjust with trimmer potentiometer **PR6** to **minimum distortion**.
- Connect the distortion analyzer to the corresponding MASTER OUTPUT RIGHT.
- Adjust with trimmer potentiometer **PR4** to **minimum distortion**.

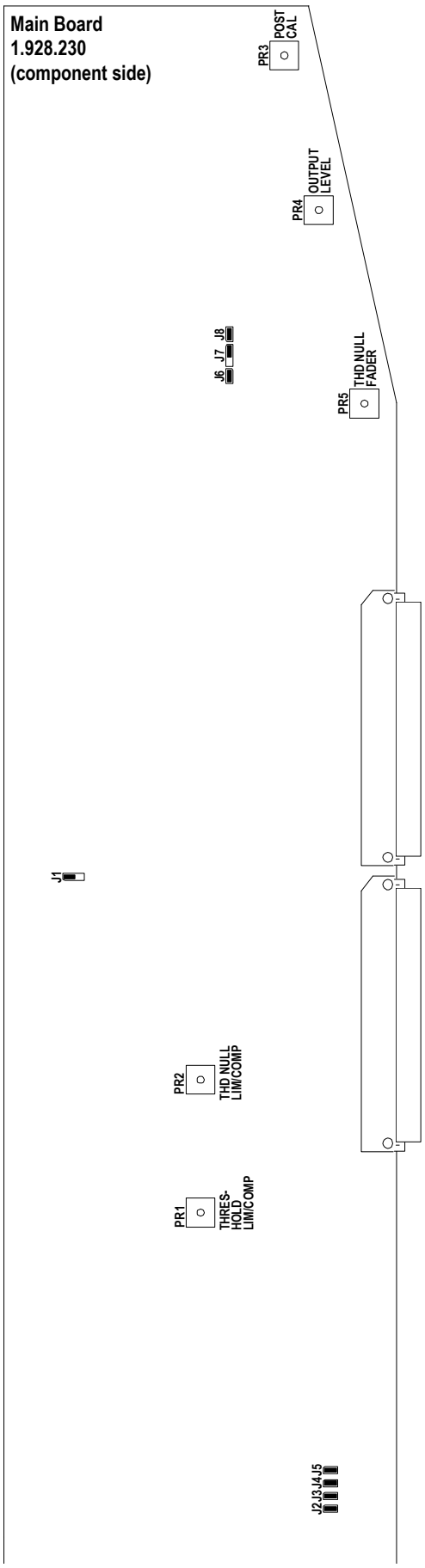
Master output level:

- Connect the AF voltmeter to the corresponding MASTER OUTPUT LEFT.
- Adjust the measured level with trimmer potentiometer **PR3** to **3 dB below nominal level**.
- Connect the AF voltmeter to the corresponding MASTER OUTPUT RIGHT.
- Adjust the measured level with trimmer potentiometer **PR2** to **3 dB below nominal level**.

Limiter:

- Connect the AF voltmeter to the corresponding MASTER OUTPUT LEFT.
- Activate the limiter by pressing the LIMITER IN key.
- Increase the input level with GAIN potentiometer by 10.2 dB (nominal level +10.2 dB).
- Set the THRESHOLD potentiometer to its center ("CAL") position.
- Adjust the output level with trimmer potentiometer **PR1** to **nominal level +0.2 dB**.

3.3.5 Group unit 1.928.230



First, verify the jumpers according to the jumpers list in section 3.1.3, in order to prevent the groups from routing to themselves (e.g. that group 1/2 can only be routed to all the other groups, but not to group 1/2. Therefore, jumper J5 must not be inserted).

Fader calibration:

- Feed test signal with nominal level (1 kHz, typ. +6 or +10 dBu) to the LINE input of a mono channel.
- Route the signal to the group to be adjusted.
- Remove the Group unit from the console and reconnect it via the bus adapter (optionally available; order no. 1.228.332.00).
- Set the LINE GAIN potentiometer to center position (CAL.), switch filters off, and set the input and group faders to their 0 dB positions.
- Connect the unbalanced input of the AF voltmeter to the "after fader" point of jumper J1, i.e. position 3.
- Adjust the measured level with trimmer potentiometer **PR3** to **6 dB below nominal level** because of the unbalanced measurement.

Distortion:

- Connect the distortion analyzer to the corresponding group output.
- Adjust with trimmer potentiometer **PR5** to **minimum distortion.**

Group output level:

- Connect the AF voltmeter to the corresponding group output.
- Adjust the measured level with trimmer potentiometer **PR4** to **nominal level**.

Limiter distortion:

- Connect the distortion analyzer to the corresponding group output.
- Activate the limiter/compressor section by pressing the LIM/COMPR IN key.
- Adjust with trimmer potentiometer **PR2** to **minimum distortion**.

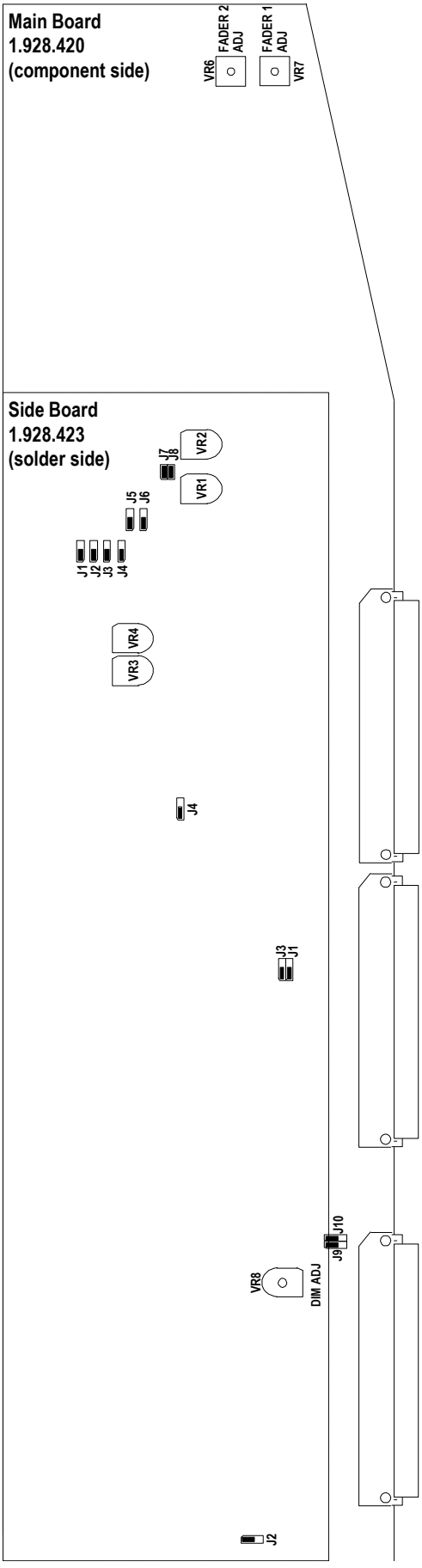
Limiter level:

- Connect the AF voltmeter to the corresponding group output.
- Increase the input level with GAIN potentiometer by 10.2 dB (nominal level +10.2 dB).
- Set the DRIVE potentiometer to its center position, and the RATIO potentiometer to its maximum (limiter) position.
- Adjust the group output level with trimmer potentiometer **PR1** to **nominal level +0.2 dB**.

Meter:

- If available, adjust the corresponding limiter meter to **+10 dB** indication.

3.3.6 CR Monitor unit 1.928.420



Distortion:

- Feed test signal with nominal level (1 kHz, typ. +6 or +10 dBu) to the left channel of one of the EXT. SOURCE inputs and press the SOURCE EXT. pushbutton.
- Remove the CR Monitor unit from the console and reconnect it via bus adapter (optionally available; order no. 1.228.332.00).
- Select the appropriate input with one of the EXT. SOURCE pushbuttons.
- Set the level control potentiometer fully clockwise (maximum level), and the BAL potentiometer to its center position.
- Connect the distortion analyzer to the CR MONITOR OUTPUT LEFT.
- Adjust with trimmer potentiometer **VR4** on the Side Board to **minimum distortion**.
- Connect the distortion analyzer to the CR MONITOR OUTPUT RIGHT.
- Adjust with trimmer potentiometer **VR3** on the Side Board to **minimum distortion.**

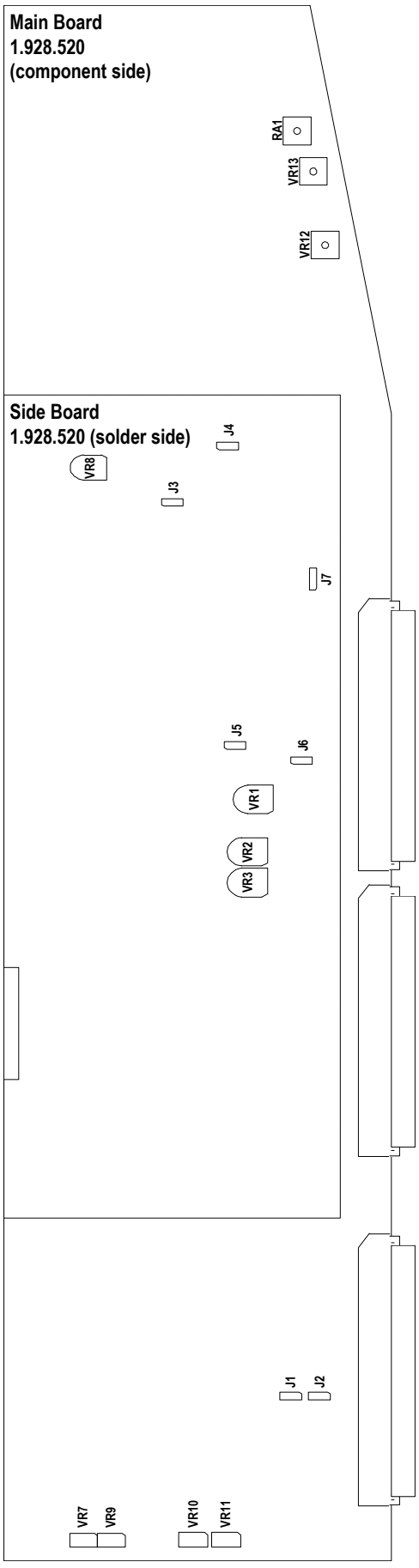
Level:

- Connect the AF voltmeter to the CR MONITOR OUTPUT LEFT.
- Adjust the measured level with trimmer potentiometer **VR2** on the Side Board to **nominal level +10 dB.**
- Feed test signal with nominal level (1 kHz, typically +6 or +10 dBu) into the left channel of one of the EXT. SOURCE inputs.
- Select the appropriate input by pressing one of the EXT. SOURCE pushbuttons.
- Connect the AF voltmeter to the CR MONITOR OUTPUT RIGHT.
- Adjust the measured level with trimmer potentiometer **VR1** on the Side Board to **nominal level +10 dB.**

DIM attenuation:

- Connect the AF voltmeter to either of the CR MONITOR OUTPUT RIGHT or LEFT and measure the level.
- Press the DIM switch.
- Adjust the measured level with trimmer potentiometer **VR8** on the Main Board to **20 dB below the level measured before** (e.g. if the nominal level is +6 dBu and the level potentiometer is set to maximum, the undimmed output level will then be +16 dBu. Therefore, adjust to –4 dBu when the DIM button is pressed).

3.3.7 Studio Monitor unit 1.928.520



Distortion:

- Feed test signal with nominal level (1 kHz, typ. +6 or +10 dBu) to the left channel of one of the EXT. STUDIO MONITOR inputs and press the EXT pushbutton.
- Remove the Studio Monitor unit from the console and reconnect it via the bus adapter (optionally available; order no. 1.228.332.00).
- Set the STUDIO level control potentiometer potentiometer fully clockwise (maximum level).
- Connect the distortion analyzer to the STUDIO MONITOR OUTPUT LEFT.
- Adjust with trimmer potentiometer **VR1** on the Side Board to **minimum distortion**.
- Connect the distortion analyzer to the STUDIO MONITOR OUTPUT RIGHT.
- Adjust with trimmer potentiometer **VR3** on the Side Board to **minimum distortion**.

Level:

- Connect the AF voltmeter to the STUDIO MONITOR OUTPUT LEFT.
- Adjust the measured level with trimmer potentiometer **VR2** on the Side Board to **nominal level +10 dB.**
- Verify if the right-channel output is within ±0.5 dB from the left-channel output. The right-channel output cannot be adjusted separately.

DIM attenuation:

- Connect the AF voltmeter to one of the STUDIO MONITOR OUTPUT LEFT or RIGHT, and measure the level.
- Press the DIM switch.
- Adjust the measured level with the trimmer potentiometer **VR8** on the Main Board to **20 dB below the level measured before** (for example: if the nominal level is +6 dBu, and the STUDIO level potentiometer is set to maximum, the undimmed output level will then be +16 dBu. Therefore, adjust to –4 dBu when the DIM button is pressed).

Test generator:

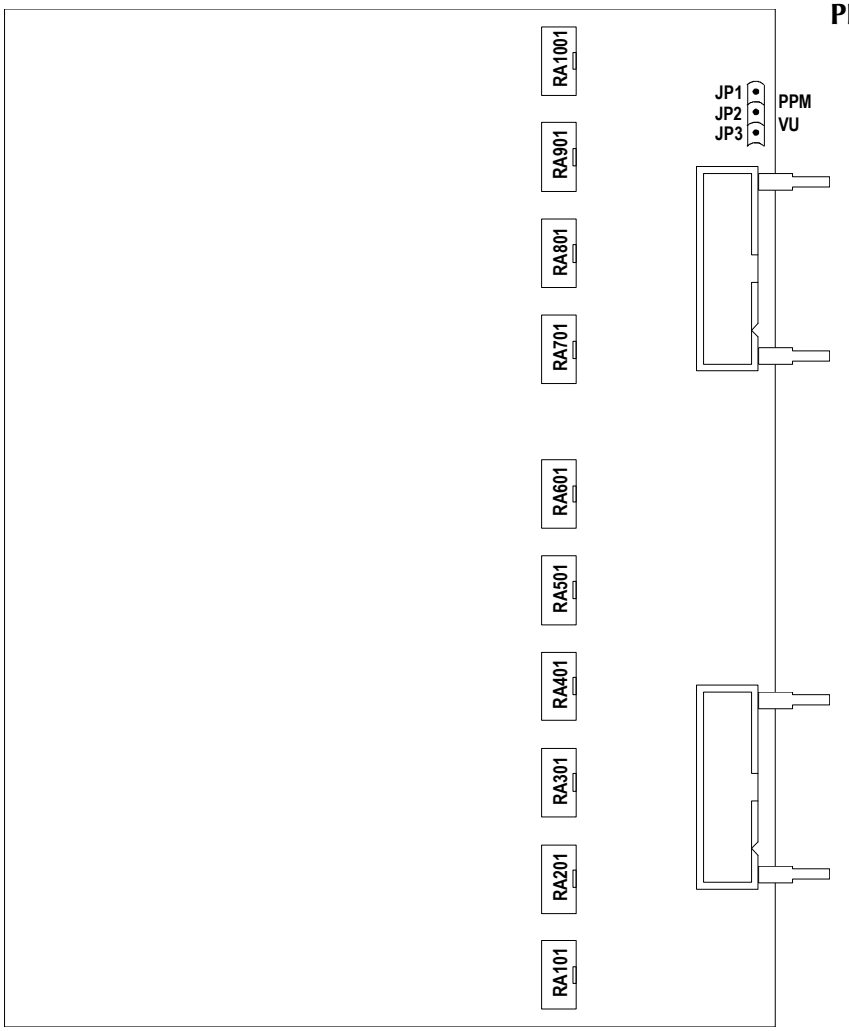
- Press the SLATE TO DIR OUT / ~ key in the test generator section, in order to feed the test generator's output directly to the DIRect outputs of all input units.
- Connect the AF voltmeter to the DIR OUT of a mono input unit.
- Activate the test generator by pressing the TEST GEN ON key.
- Set the TEST GEN LEVEL potentiometer (VR1) fully clockwise (maximum level) .
- Adjust the measured level with trimmer potentiometer **VR7** to **nominal level**.

3.3.8 VCA masters (on CR Monitor and Studio Monitor units)

(Please refer to the drawings in sections 3.3.6 and 3.3.7).

- Feed test signal with nominal level (1 kHz, typ. +6 or +10 dBu) to the LINE input of a mono channel.
- Route the signal to ΣA.
- Connect the AF voltmeter to the ΣA LEFT insert send.
- Set the LINE gain potentiometer to center position (CAL.), switch filters off, set the input faders to their 0 dB positions.
- Remove the CR Monitor unit from the console and reconnect it via the bus adapter (optionally available; order no. 1.228.332.00).
- Set all four VCA master faders to their 0 dB positions.
- Select VCA group 1 on the desired input unit.
- Adjust the measured level with trimmer potentiometer **VR7** on the CR Monitor unit to **nominal level.**
- Select VCA group 2 on the desired input unit.
- Adjust the measured level with trimmer potentiometer **VR6** on the CR Monitor unit to **nominal level.**
- Reinstall the CR Monitor unit into the console.
- Remove the Studio Monitor unit from the console and reconnect it via the bus adapter (optionally available; order no. 1.228.332.00).
- Select VCA group 3 on the desired input unit.
- Adjust the measured level with trimmer potentiometer **VR13** on the Studio Monitor unit to **nominal level.**
- Select VCA group 4 on the desired input unit.
- Adjust the measured level with trimmer potentiometer **VR12** on the Studio Monitor unit to **nominal level.**

3.3.9 AUX meters 1.913.312



PPM: (the VU/PPM selector jumper connects JP1 with JP2):

- Feed test signal with nominal level (1 kHz, typ. +6 or +10 dBu) to the LINE input of a mono channel.
- Connect the AF voltmeter to the AUX 1 output.
- Adjust the AUX 1 master potentiometer to nominal level.
- Repeat the last two steps for AUX 2...6.
- Connect the AF voltmeter to the AUX 7 left output, turn the PAN potentiometer to its counterclockwise stop position.
- Adjust the AUX 7 master potentiometer to nominal level.
- Repeat the last two steps for AUX 8.
- AUX 1...6 (mono): Adjust trimmer potentiometers **RA101...RA601** for 0 dB indication.
- AUX 7 left/right (PAN pot in center position): Adjust trimmer potentiometers **RA701** and **RA801** for 0 dB indication.
- AUX 8 left/right (PAN pot in center position): Adjust trimmer potentiometers **RA901** and **RA1001** for 0 dB indication.

VU: (the VU/PPM selector jumper connects JP2 with JP3):

- Feed test signal with nominal level (1 kHz, typ. +6 or +10 dBu) to the LINE input of a mono channel.
- Connect the AF voltmeter to the AUX 1 output.
- Adjust the AUX 1 master potentiometer to 6 dB below nominal level (i.e., 6 dB lead).
- Repeat the last two steps for AUX 2...6.
- Connect the AF voltmeter to the AUX 7 left output, turn the PAN potentiometer to its counterclockwise stop position.
- Adjust the AUX 7 master potentiometer to 6 dB below nominal level (i.e., 6 dB lead).
- Repeat the last two steps for AUX 8.
- AUX 1...6 (mono): Adjust trimmer potentiometers **RA101...RA601** for 0 dB indication.
- AUX 7 left/right (PAN pot in center position): Adjust trimmer potentiometers **RA701** and **RA801** for 0 dB indication.
- AUX 8 left/right (PAN pot in center position): Adjust trimmer potentiometers **RA901** and **RA1001** for 0 dB indication.

CIRCUIT DIAGRAMS

Plug-In Units of the Input Section

Synopsis: Structure Lists and Block Diagrams

Assembly	Assembly No.
Mono Input Unit	1.928.225.81
Block Diagram Mono Input Unit	1.928.220.81
Mono Group Unit	1.928.230.83
Block Diagram Mono Group Unit	1.928.230.81
Input Unit Stereo, HL, with EQ	1.928.255.81
Block Diagram Input Unit Stereo	1.928.250.00
Master Unit A	1.928.320.81
Block Diagram Master Unit A	
Master Unit B	1.928.321.81
Block Diagram Master Unit B	
CR Monitor Unit	1.928.420.82
Block Diagram CR Monitor Unit	1.928.420.81
Studio Monitor Unit	1.928.525.00
Block Diagram Studio Monitor Unit	1.928.520.81

Synopsis: Assemblies, Circuit Diagrams, Component Layouts, Parts Lists

Assembly	Assembly No.	Circuit Diagram	Component Layout	Parts List
Input MIC Switch Board	1.928.206.00	1.928.206.00	1.928.206.00	1.928.206.00
MIYA Switch Board, latching	1.928.207.00	1.928.207.00	1.928.207.00	1.928.207.00
MIYA Switch Board, non-latching	1.928.208.00	1.928.207.00	1.928.207.00	1.928.208.00
Input Unit Mono, Main Board	1.928.225.81	1.928.225.81	1.928.220.82	1.928.225.81
Input Unit Mono with Option HL, Transformer-Balanced, Main Board	1.928.226.81	1.928.225.81	1.928.220.82	1.928.225.81
Input Unit with Option 2 Mic Inputs, Main Board	1.928.227.81	1.928.225.81	1.928.220.82	1.928.225.81
Input Unit with Option HL, Transf.-Balanced + 2 Mic In, Main Board	1.928.229.81	1.928.225.81	1.928.220.82	1.928.225.81
Input Mono Side Board	1.928.223.82	1.928.223.82	1.928.223.82	1.928.223.82
Group Unit Mono	1.928.230.83	1.928.230.83	1.928.230.83	1.928.230.83
Group Mono Side Board	1.928.233.81	1.928.233.81	1.928.233.81	1.928.233.81
Input Unit Stereo, High Level, with EQ	1.928.255.81	1.928.255.81	1.928.250.81	1.928.255.81
Input Unit Stereo, HL, with EQ, Transformer-Balanced	1.928.257.81	1.928.255.81	1.928.250.81	1.928.255.81
Input Stereo Side Board	1.928.253.81	1.928.253.81	1.928.253.81	1.928.253.81
Master Unit A	1.928.320.81	1.928.320.81	1.928.320.81	1.928.320.81
Master Unit B	1.928.321.81	1.928.320.81	1.928.320.81	1.928.321.81
CR Monitor Unit, Main Board	1.928.420.82	1.928.420.82	1.928.420.82	1.928.420.82
CR Monitor Unit, Side Board	1.928.423.82	1.928.423.82	1.928.423.82	1.928.423.82
Studio Monitor Unit, Main Board	1.928.525.00	1.928.525.00	1.928.520.83	1.928.525.00
Studio Monitor Unit, Side Board	1.928.523.81	1.928.523.81	1.928.523.81	1.928.523.81

Input Unit Mono 1.928.225.81

Assembly Structure

Assembly	Assembly No.
Input Unit Mono	1.928.225.81
Mono Input Unit PCB	*1.928.220.12*
Input Mono Side Board	1.928.223.82
Mono Input Side PCB	*1.928.223.12*
Input MIC Switch Board	1.928.206.00
Input MIC Switch Board PCB	*1.928.206.12*
Miya Switch Board, non-latching	1.928.208.00
Miya Switch PCB	*1.928.208.11*

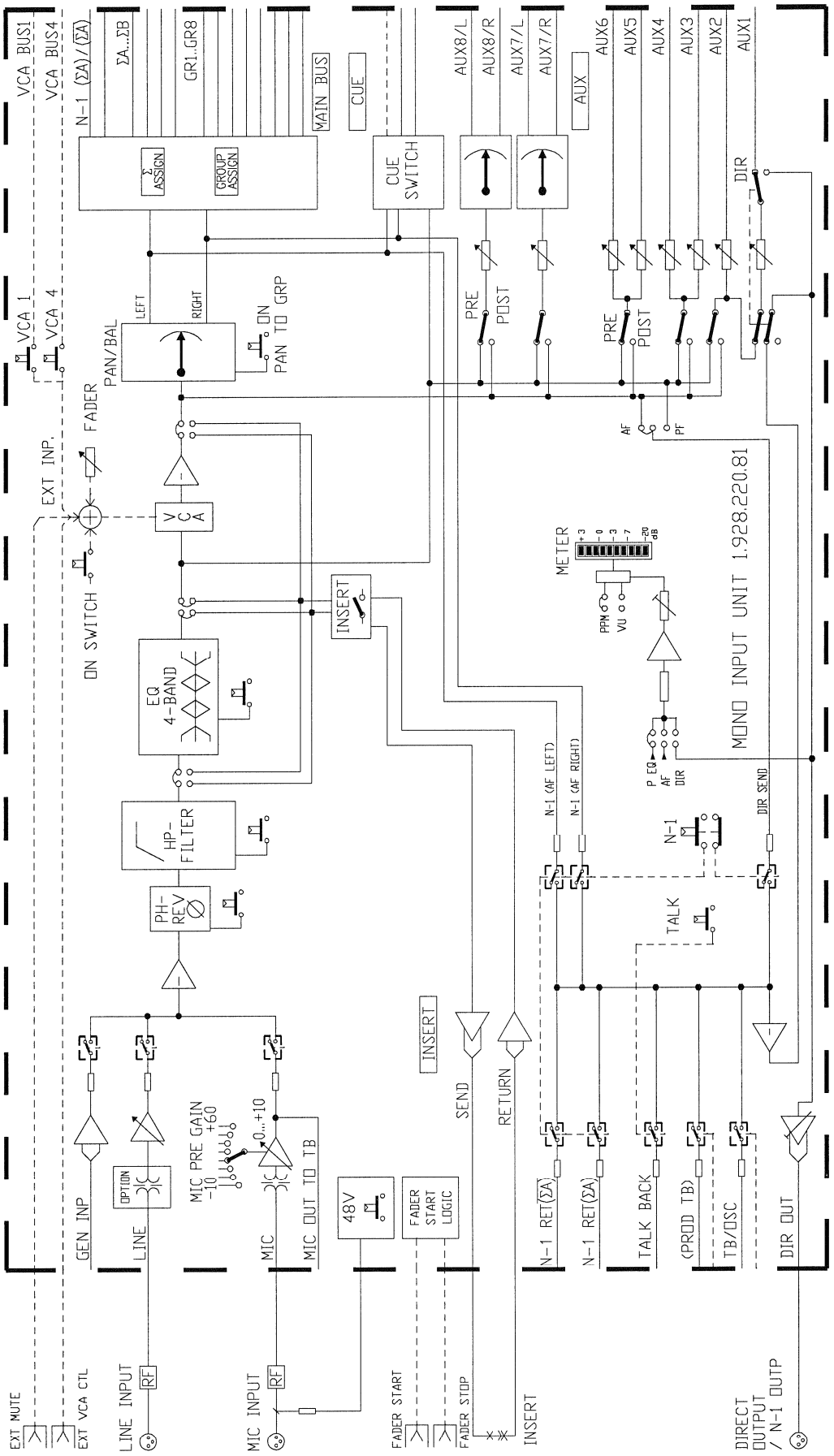
Block Diagram

Assembly	Block Diagram
Input Unit Mono *(please turn page)*	1.928.220.81

Circuit Diagrams, Component Layout Drawings, Parts Lists

Assembly	Assembly No.	Circuit Diagram	Component Layout	Parts List
Input Unit Mono	1.928.225.81	1.928.225.81	1.928.220.82	1.928.225.81
Input Mono Side Board	1.928.223.82	1.928.223.82	1.928.223.82	1.928.223.82
Input MIC Switch Board	1.928.206.00	1.928.206.00	1.928.206.00	1.928.206.00
Miya Switch Board, non-latching	1.928.208.00	1.928.207.00	1.928.207.00	1.928.208.00

Block Diagram: Input Unit Mono 1.928.220.81



Group Unit Mono 1.928.230.83

Assembly Structure

Assembly	Assembly No.
Group Unit Mono	1.928.230.83
Mono Group Unit PCB	*1.928.230.12*
Group Mono Side Board	1.928.233.81
Mono Group Side PCB	*1.928.233.11*

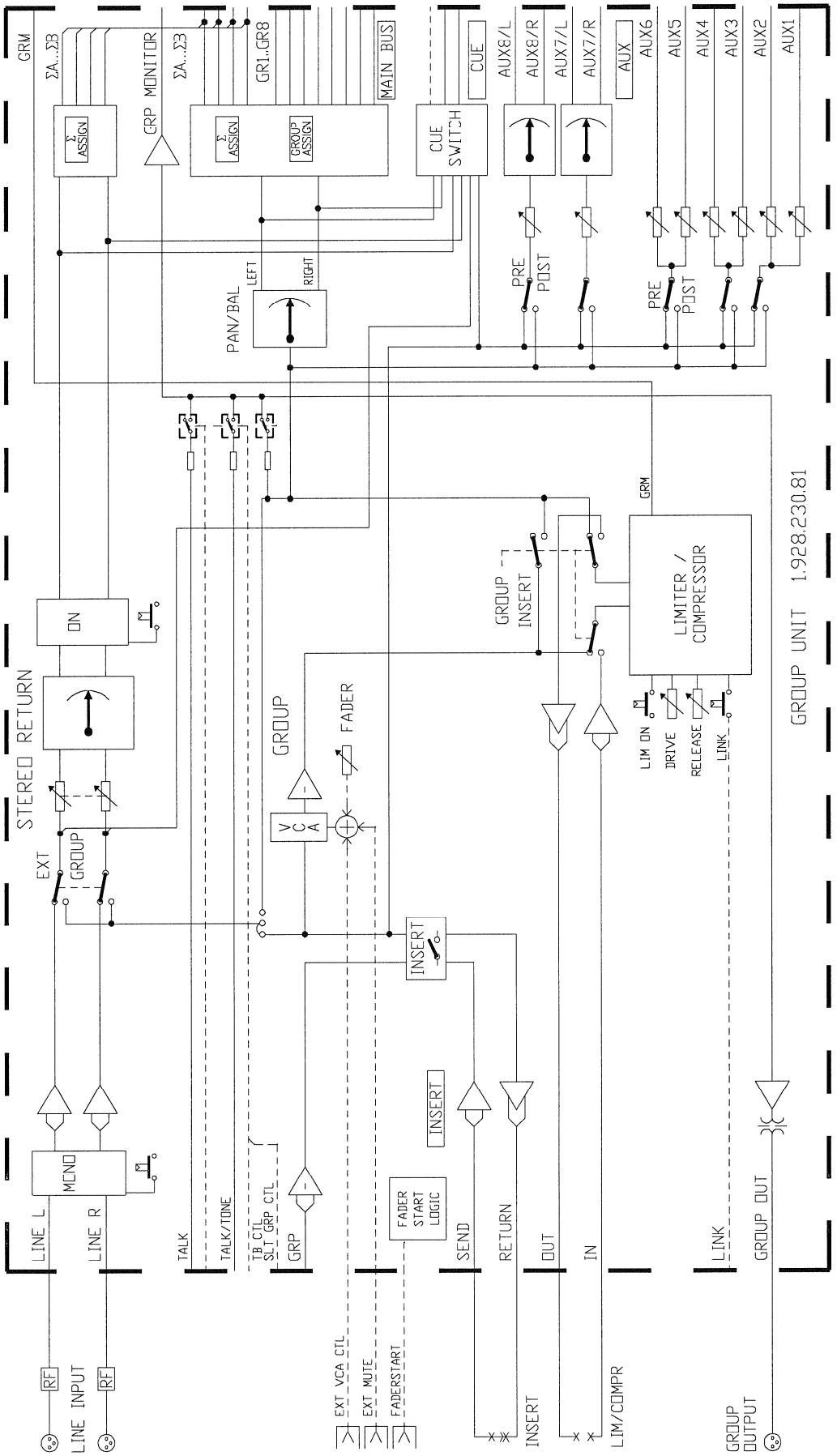
Block Diagram

Assembly	Block Diagram
Group Unit Mono *(please turn page)*	1.928.230.81

Circuit Diagrams, Component Layout Drawings, Parts Lists

Assembly	Assembly No.	Circuit Diagram	Component Layout	Parts List
Group Unit Mono	1.928.230.83	1.928.230.83	1.928.230.83	1.928.230.83
Group Mono Side Board	1.928.233.81	1.928.233.81	1.928.233.81	1.928.233.81

Block Diagram: Group Unit Mono 1.928.230.81



Input Unit Stereo, HL, with EQ 1.928.255.81

Assembly Structure

Assembly	Assembly No.
Input Unit Stereo	1.928.255.81
Input Unit Stereo PCB	*1.928.250.11*
Input Stereo Side Board	1.928.253.81
Input Stereo Side PCB	*1.928.253.11*
Miya Switch Board, non-latching	1.928.208.00
Miya Switch PCB	*1.928.208.11*

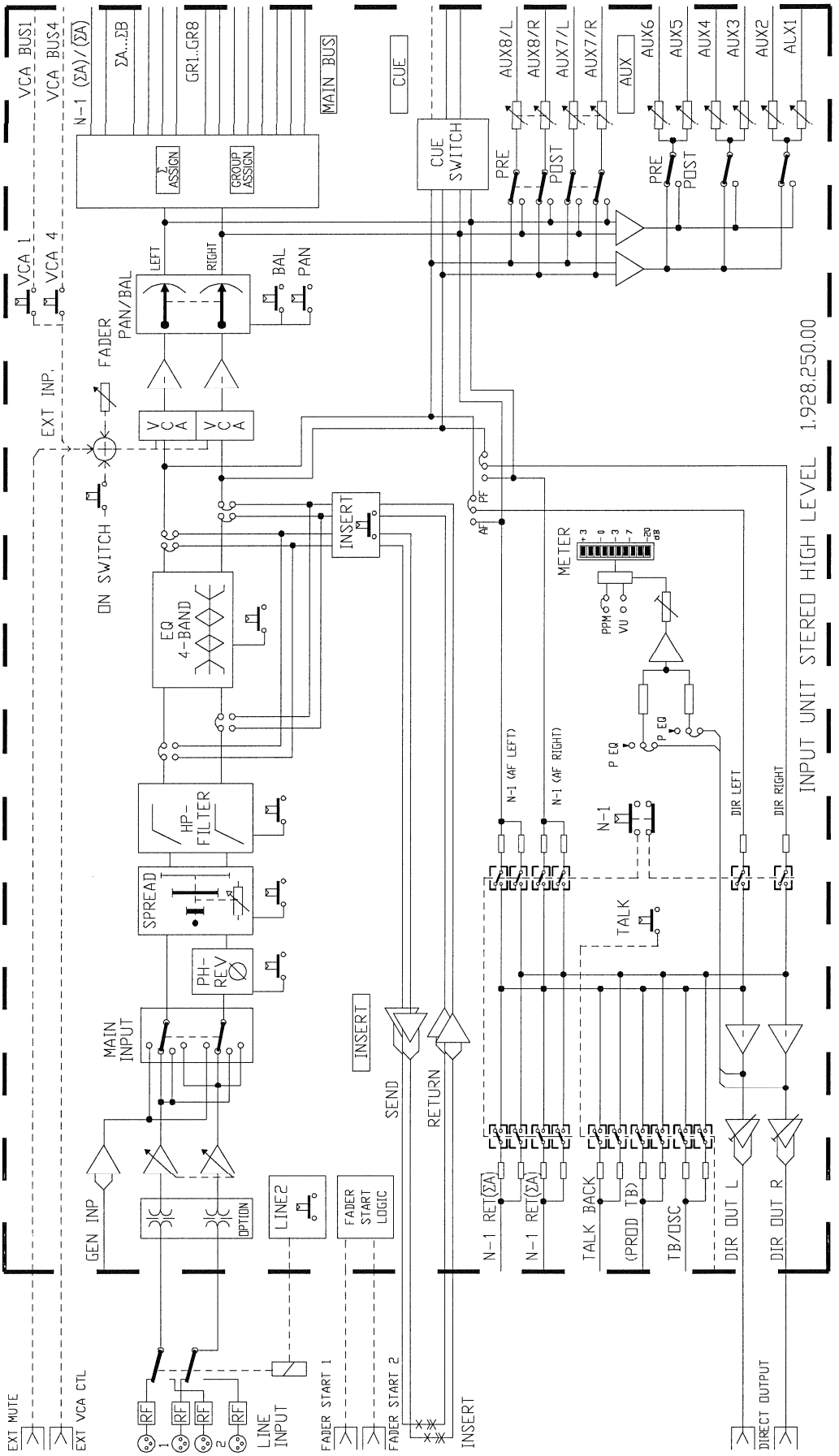
Block Diagram

Assembly	Block Diagram
Input Unit Stereo *(please turn page)*	1.928.250.00

Circuit Diagrams, Component Layout Drawings, Parts Lists

Assembly	Assembly No.	Circuit Diagram	Component Layout	Parts List
Input Unit Stereo	1.928.255.81	1.928.255.81	1.928.250.81	1.928.255.81
Input Stereo Side Board	1.928.253.81	1.928.253.81	1.928.253.81	1.928.253.81
Miya Switch Board, non-latching	1.928.208.00	1.928.207.00	1.928.207.00	1.928.208.00

Block Diagram: Input Unit Stereo, HL, with EQ 1.928.250.00



Master Unit A 1.928.320.81

Assembly Structure

Assembly	Assembly No.
Master Unit A	1.928.320.81
Master Unit PCB	*1.928.320.12*

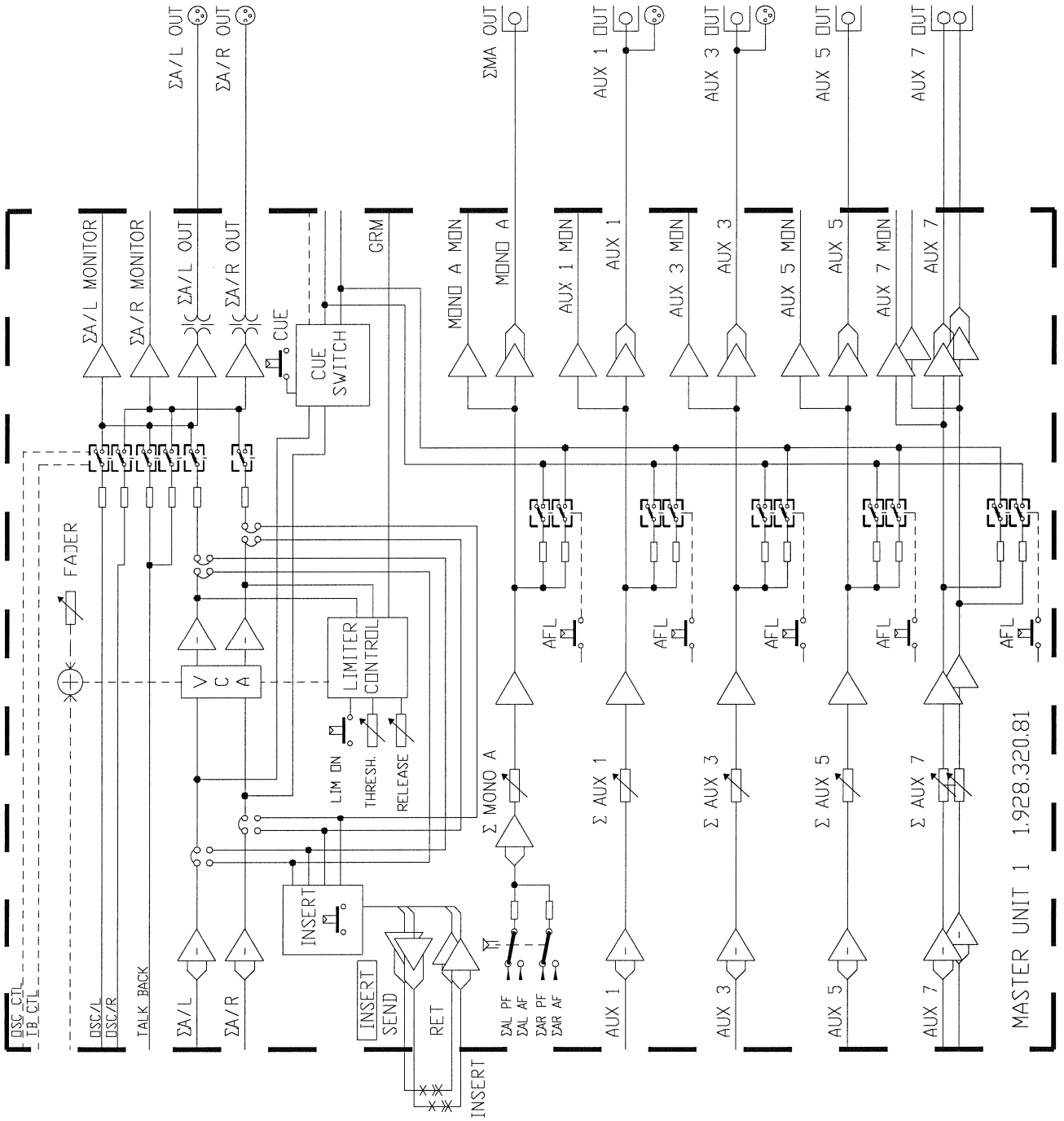
Block Diagram

Assembly	Block Diagram
Master Unit A *(please turn page)*	1.928.320.81

Circuit Diagrams, Component Layout Drawings, Parts Lists

Assembly	Assembly No.	Circuit Diagram	Component Layout	Parts List
Master Unit (A)	1.928.320.81	1.928.320.81	1.928.320.81	1.928.320.81

Block Diagram: Master Unit A 1.928.320.81



Master Unit B 1.928.321.81

Assembly Structure

Assembly	Assembly No.
Master Unit B	1.928.321.81
Master Unit PCB	*1.928.320.12*

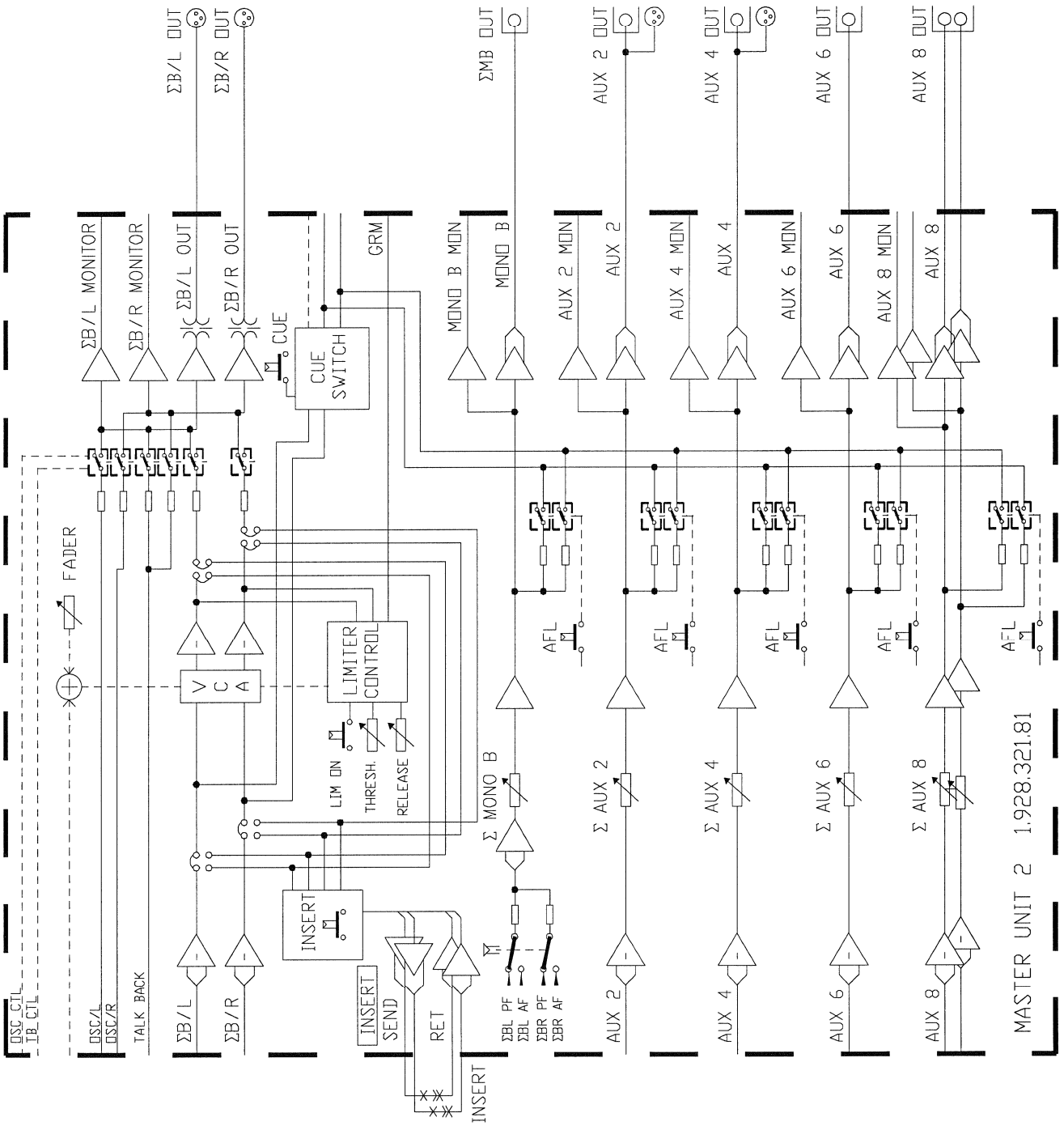
Block Diagram

Assembly	Block Diagram
Master Unit B *(please turn page)*	1.928.321.81

Circuit Diagrams, Component Layout Drawings, Parts Lists

Assembly	Assembly No.	Circuit Diagram	Component Layout	Parts List
Master Unit (B)	1.928.321.81	1.928.320.81	1.928.320.81	1.928.321.81

Block Diagram: Master Unit B 1.928.321.81



CR Monitor Unit 1.928.420.82

Assembly Structure

Assembly	Assembly No.
CR Monitor Unit *CR Monitor Unit PCB*	1.928.420.82 *1.928.420.12*
CR Monitor Unit, Side Board *CR Monitor Side PCB*	1.928.423.82 *1.928.423.12*
Miya Switch Board, latching *Miya Switch PCB*	1.928.207.00 *1.928.208.11*

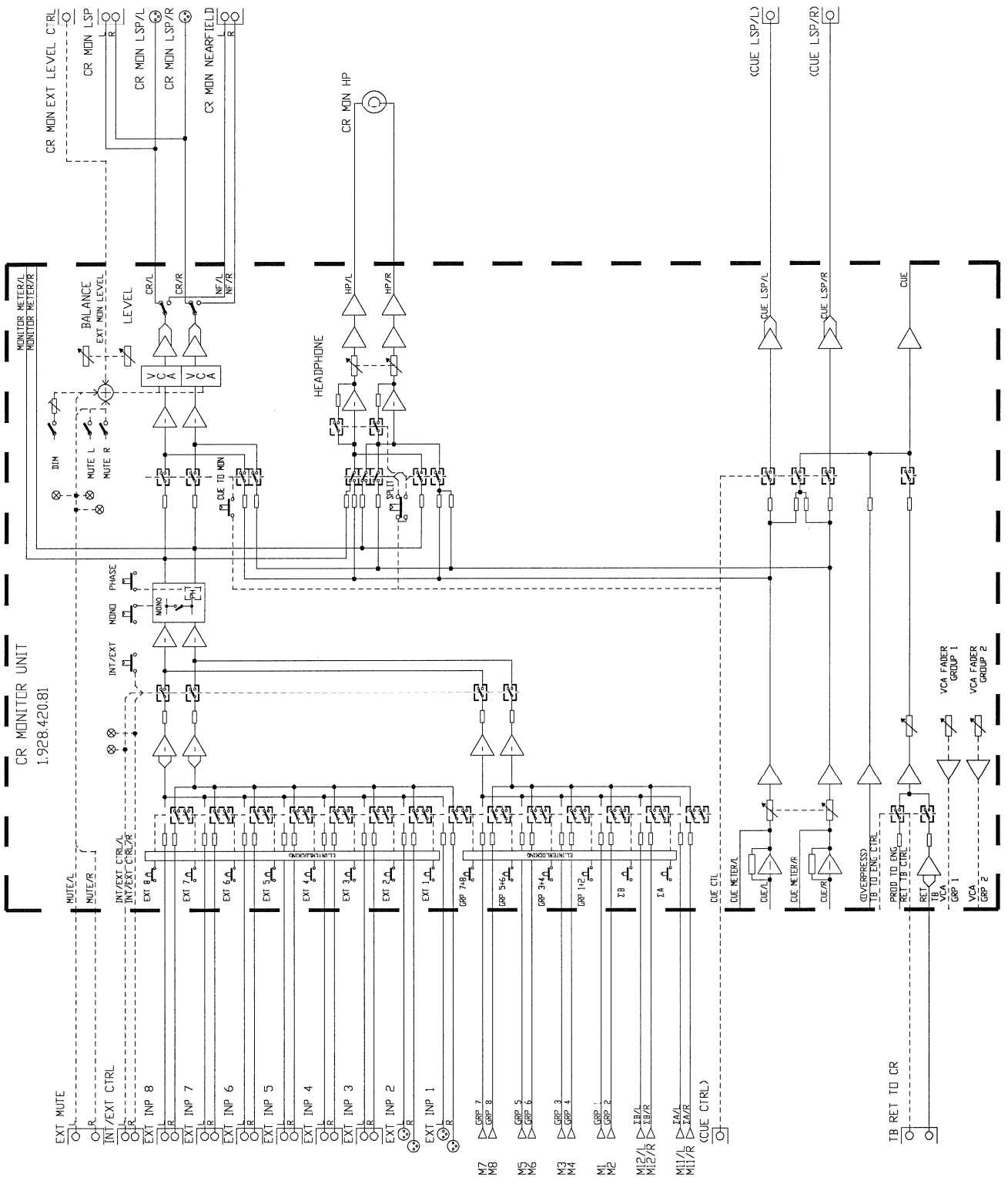
Block Diagram

Assembly	Block Diagram
CR Monitor Unit *(please turn page)*	1.928.420.81

Circuit Diagrams, Component Layout Drawings, Parts Lists

Assembly	Assembly No.	Circuit Diagram	Component Layout	Parts List
CR Monitor Unit	1.928.420.82	1.928.420.82	1.928.420.82	1.928.420.82
CR Monitor Unit, Side Board	1.928.423.82	1.928.423.82	1.928.423.82	1.928.423.82
Miya Switch Board, latching	1.928.207.00	1.928.207.00	1.928.207.00	1.928.207.00

Block Diagram: CR Monitor Unit 1.928.420.81



Studio Monitor Unit 1.928.525.00

Assembly Structure

Assembly	Assembly No.
Studio Monitor Unit	1.928.525.00
Studio Monitor Unit PCB	*1.928.520.12*
Studio Monitor Unit, Side Board	1.928.523.81
Studio Monitor Side PCB	*1.928.523.12*
Miya Switch Board, latching	1.928.207.00
Miya Switch PCB	*1.928.208.11*

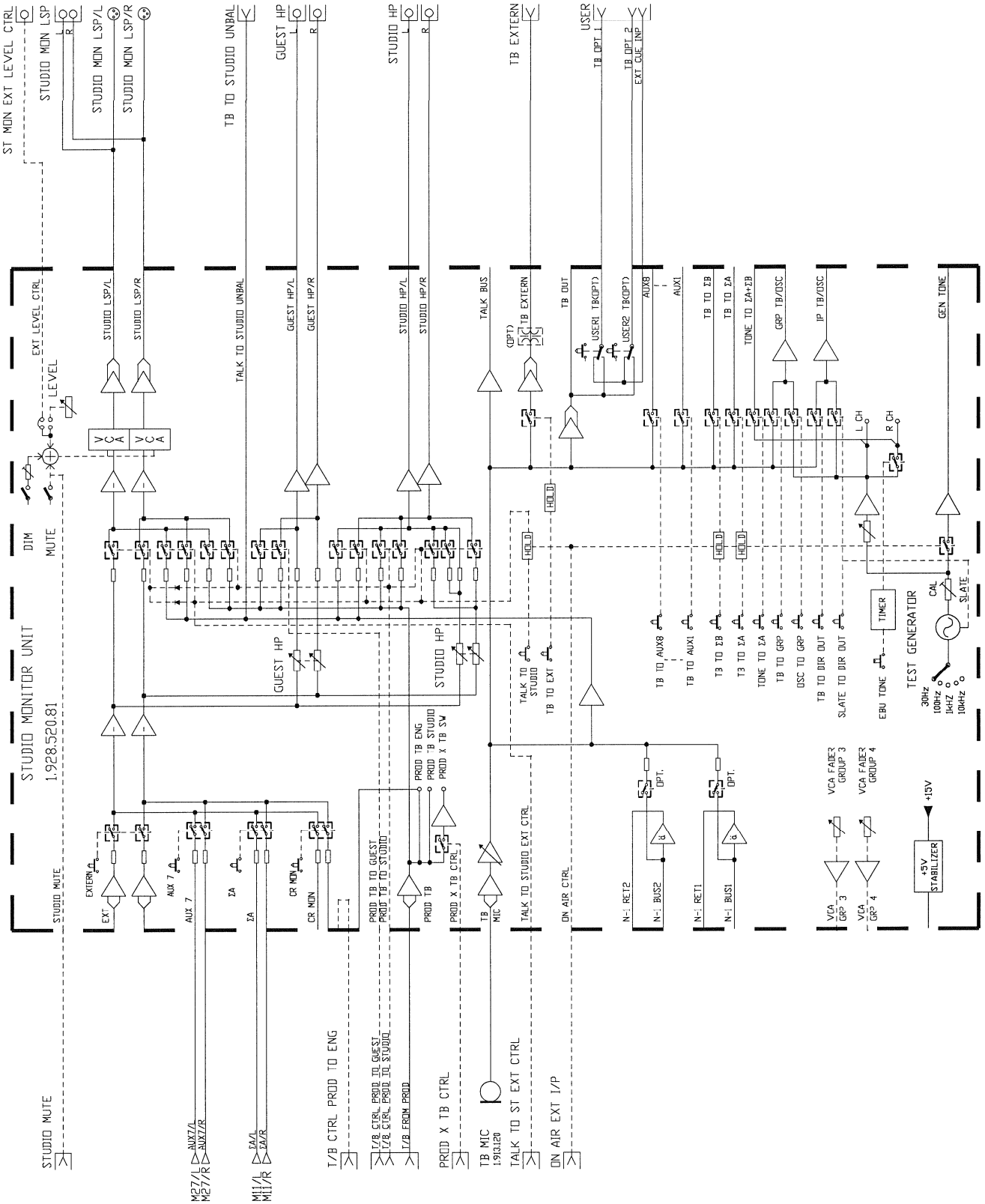
Block Diagram

Assembly	Block Diagram
Studio Monitor Unit *(please turn page)*	1.928.520.81

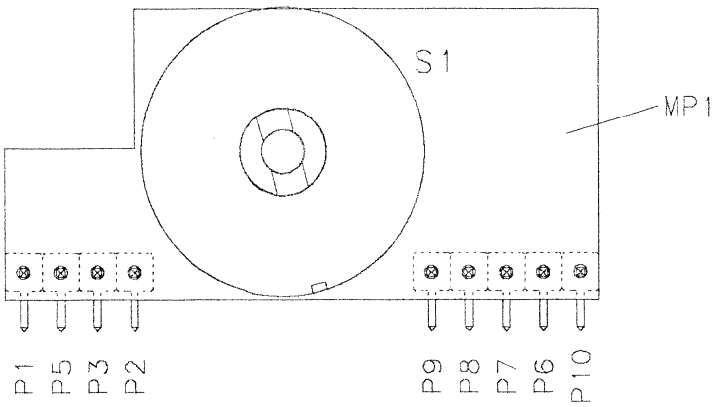
Circuit Diagrams, Component Layout Drawings, Parts Lists

Assembly	Assembly No.	Circuit Diagram	Component Layout	Parts List
Studio Monitor Unit	1.928.525.00	1.928.525.00	1.928.520.83	1.928.525.00
Studio Monitor Unit, Side Board	1.928.523.81	1.928.523.81	1.928.523.81	1.928.523.81
Miya Switch Board, latching	1.928.207.00	1.928.207.00	1.928.207.00	1.928.207.00

Block Diagram: Studio Monitor Unit 1.928.520.81



Input MIC Switch Board 1.928.206.00



Modification Aenderung					
	.	.			3
	.	.			2
	.	.			1
Edition Ausgabe	13.12.97	AF			0
	Date Datum	Visa Gez.	Checked Gepr.	Seen Ges.	Index

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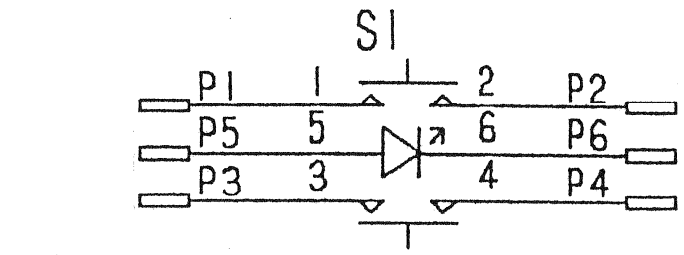
STUDER REGENSDORF	Description: Benennung:	Input MIC Switch Board	Number: Nummer:	1.928.206.00

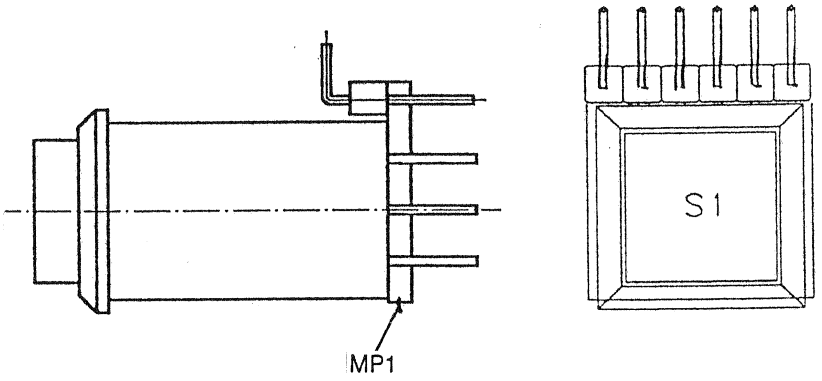
Idx.	Pos.	Part No.	Qty.	Type/Val.	Description
0	MP 1	1.928.209.12			INPUT MIC SWITCH PCB
0	P 1	54.11.0132		1p	P STIFT,WINKEL 1 PIN=1 STK.
0	P 2	54.11.0132		1p	P STIFT,WINKEL 1 PIN=1 STK.
0	P 3	54.11.0132		1p	P STIFT,WINKEL 1 PIN=1 STK.
0	P 5	54.11.0132		1p	P STIFT,WINKEL 1 PIN=1 STK.
0	P 6	54.11.0132		1p	P STIFT,WINKEL 1 PIN=1 STK.
0	P 7	54.11.0132		1p	P STIFT,WINKEL 1 PIN=1 STK.
0	P 8	54.11.0132		1p	P STIFT,WINKEL 1 PIN=1 STK.
0	P 9	54.11.0132		1p	P STIFT,WINKEL 1 PIN=1 STK.
0	P 10	54.11.0132		1p	P STIFT,WINKEL 1 PIN=1 STK.
0	S 1	1.928.209.01			DREHSCHALTER NACHARBEIT

End of List

Comments

MIYA Switch Latch Board 1.928.207.00/
MIYA Switch non Latch Board 1.928.208.00





MIYA Switch Latch Board 1.928.207.00

Idx.	Pos.	Part No.	Qty.	Type/Val.	Description
0	MP 1	1.928.208.11			MiYAMA SWITCH PCB
0	P 1	54.11.0132		1-P	P STIFT,WINKEL 1 PIN=1 STK.
0	P 2	54.11.0132		1-P	P STIFT,WINKEL 1 PIN=1 STK.
0	P 3	54.11.0132		1-P	P STIFT,WINKEL 1 PIN=1 STK.
0	P 4	54.11.0132		1-P	P STIFT,WINKEL 1 PIN=1 STK.
0	P 5	54.11.0132		1-P	P STIFT,WINKEL 1 PIN=1 STK.
0	P 6	54.11.0132		1-P	P STIFT,WINKEL 1 PIN=1 STK.
0	S 1	55.15.0902		1*s	Leuchttaste rastend

End of List

Comments

MIYA Switch non Latch Board 1.928.208.00

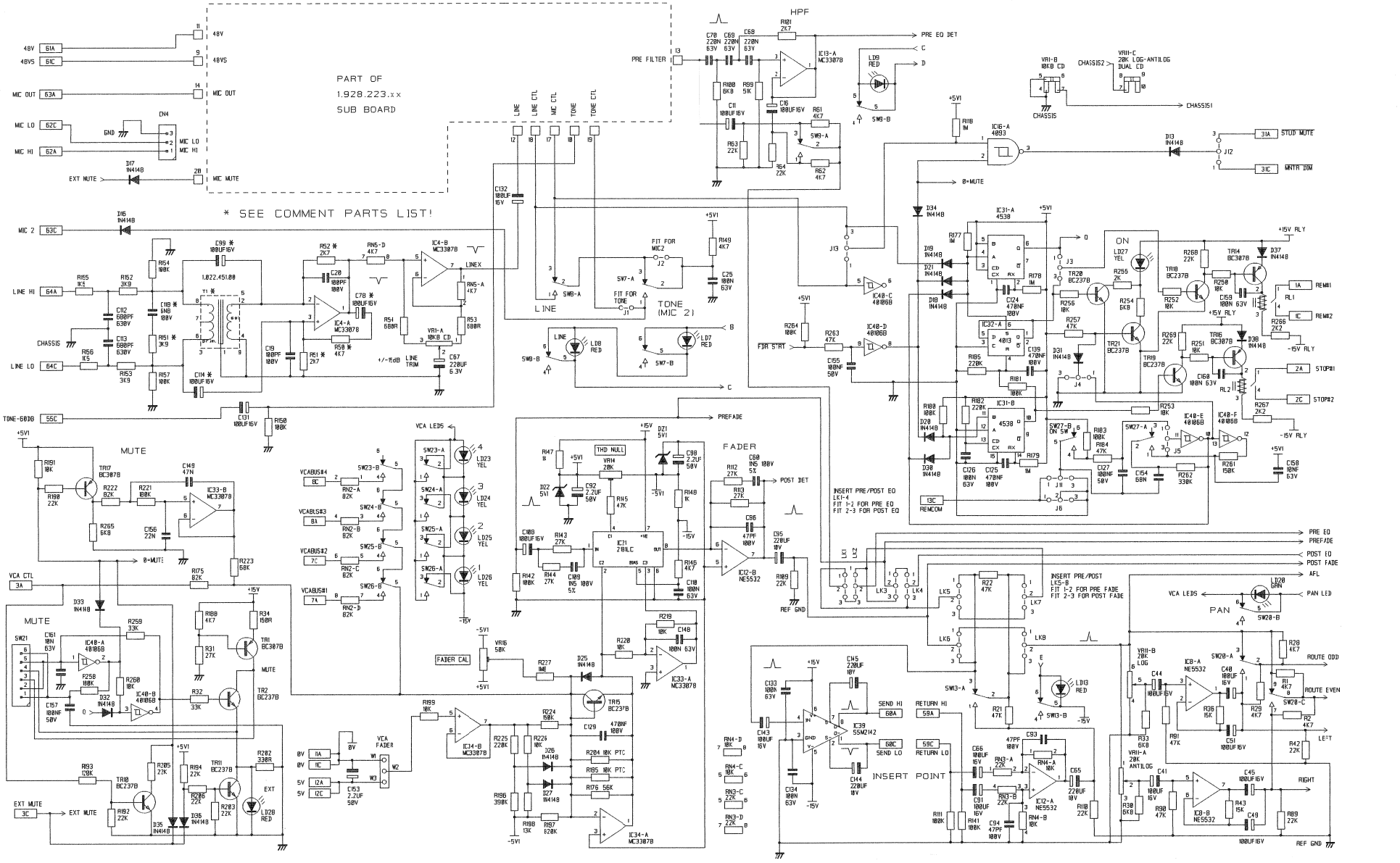
Idx.	Pos.	Part No.	Qty.	Type/Val.	Description
0	MP 1	1.928.208.11			MiYAMA SWITCH PCB
0	P 1	54.11.0132		1-P	P STIFT,WINKEL 1 PIN=1 STK.
0	P 2	54.11.0132		1-P	P STIFT,WINKEL 1 PIN=1 STK.
0	P 3	54.11.0132		1-P	P STIFT,WINKEL 1 PIN=1 STK.
0	P 4	54.11.0132		1-P	P STIFT,WINKEL 1 PIN=1 STK.
0	P 5	54.11.0132		1-P	P STIFT,WINKEL 1 PIN=1 STK.
0	P 6	54.11.0132		1-P	P STIFT,WINKEL 1 PIN=1 STK.
0	S 1	55.15.0901		1*imp	Leuchttaste impuls

End of List

Comments

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	MC 928			PAGE 1 / 1
STUDER	MIYA Switch Board		SC	1.928.207.00

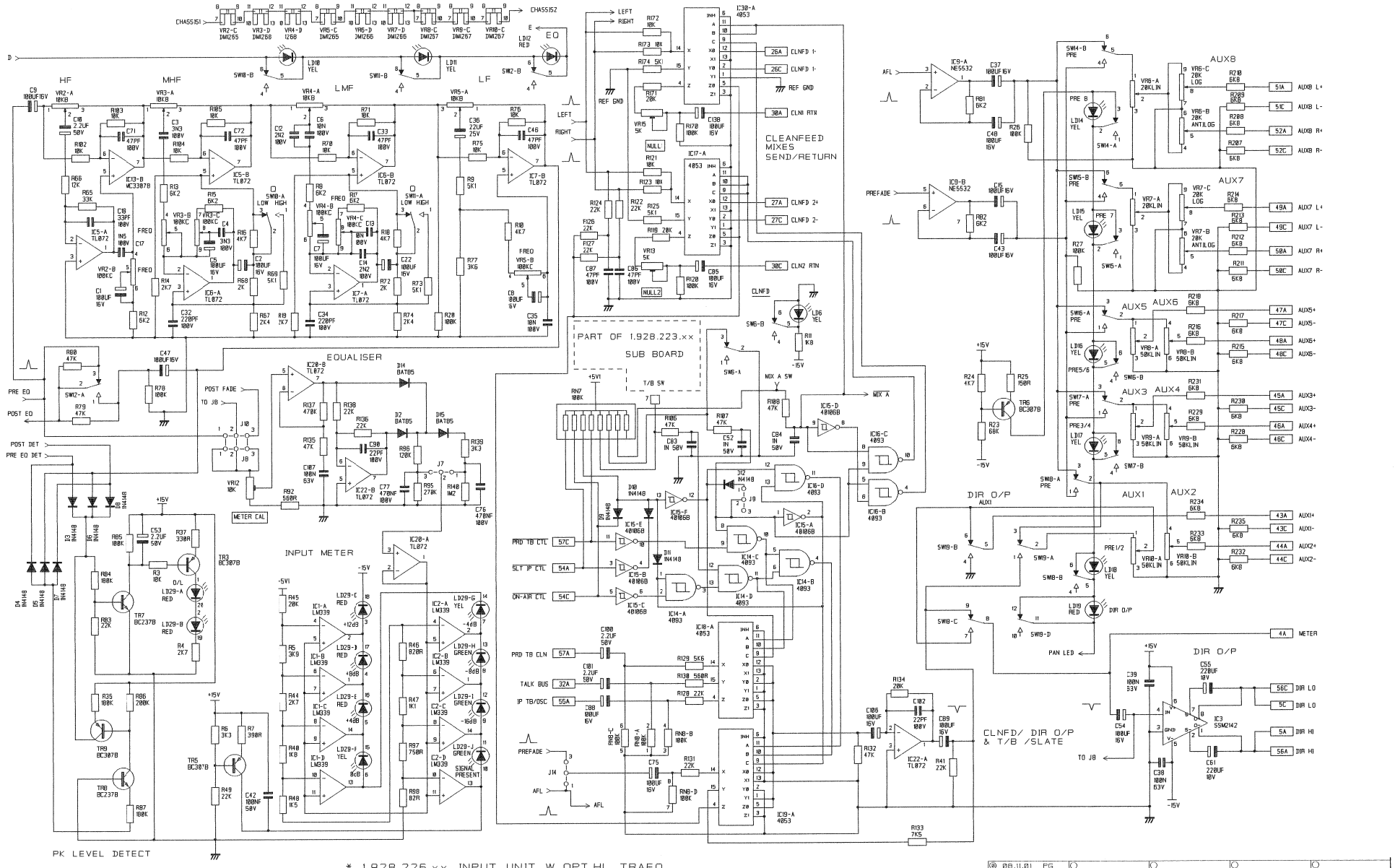
Input Main Mono Board 1.928.225.81 *Input Unit with Option 2 Mic. Input 1.928.227.81
*Input Unit wiht Option HL Trafo 1.928.226.81 *Input Unit with Option HL Trafo + 2 Mic. 1.928.229.81



* 1.928.226.xx INPUT UNIT W OPT.HL TRAFO
* 1.928.227.xx INPUT UNIT W OPT.2MIC INP.
* 1.928.229.xx INPUT UNIT W OPT.HL TRAFO+2MIC

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STUDER	INPUT MAIN MO BOARD	SC	1.928.225.81

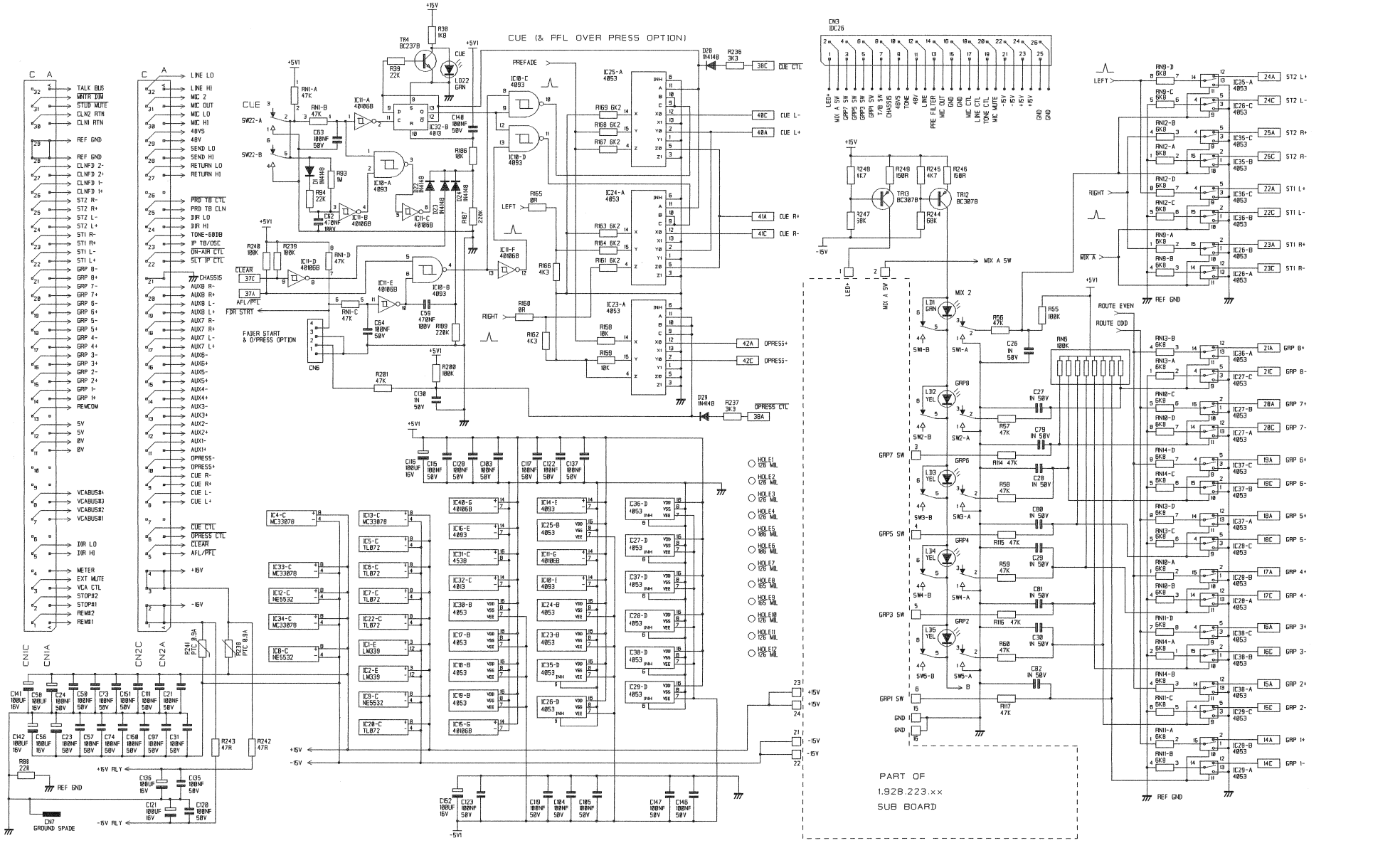
Input Main Mono Board 1.928.225.81 *Input Unit with Option 2 Mic. Input 1.928.227.81
*Input Unit wiht Option HL Trafo 1.928.226.81 *Input Unit with Option HL Trafo + 2 Mic. 1.928.229.81



* 1.928.226.xx INPUT UNIT W OPT.HL TRAFO
* 1.928.227.xx INPUT UNIT W OPT.2MIC INP.
* 1.928.229.xx INPUT UNIT W OPT.HL TRAFO+2MIC

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STUDER	INPUT MAIN MO BOARD			SC	1.928.225.81

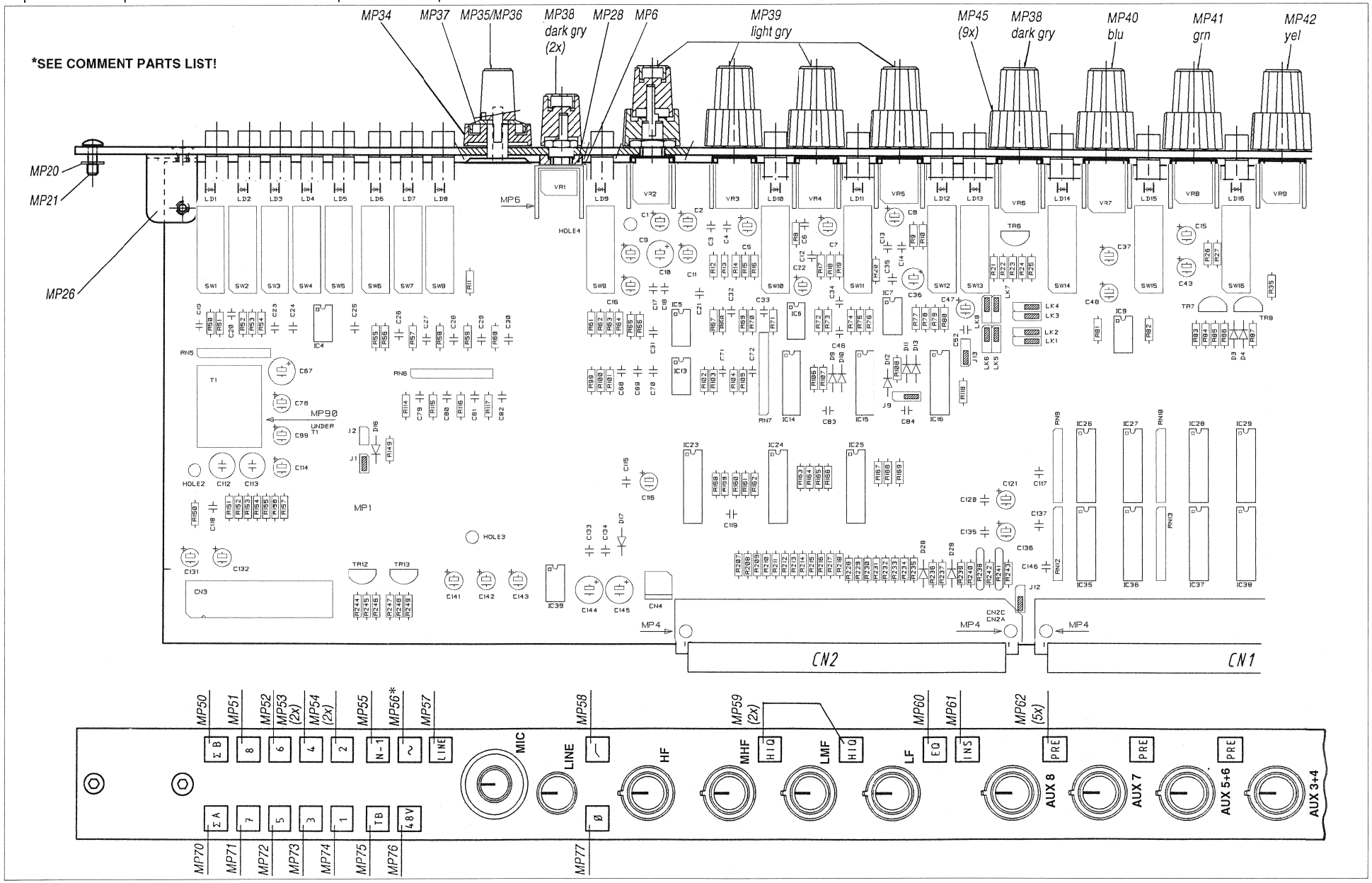
Input Main Mono Board 1.928.225.81 *Input Unit with Option 2 Mic. Input 1.928.227.81
*Input Unit wiht Option HL Trafo 1.928.226.81 *Input Unit with Option HL Trafo + 2 Mic. 1.928.229.81



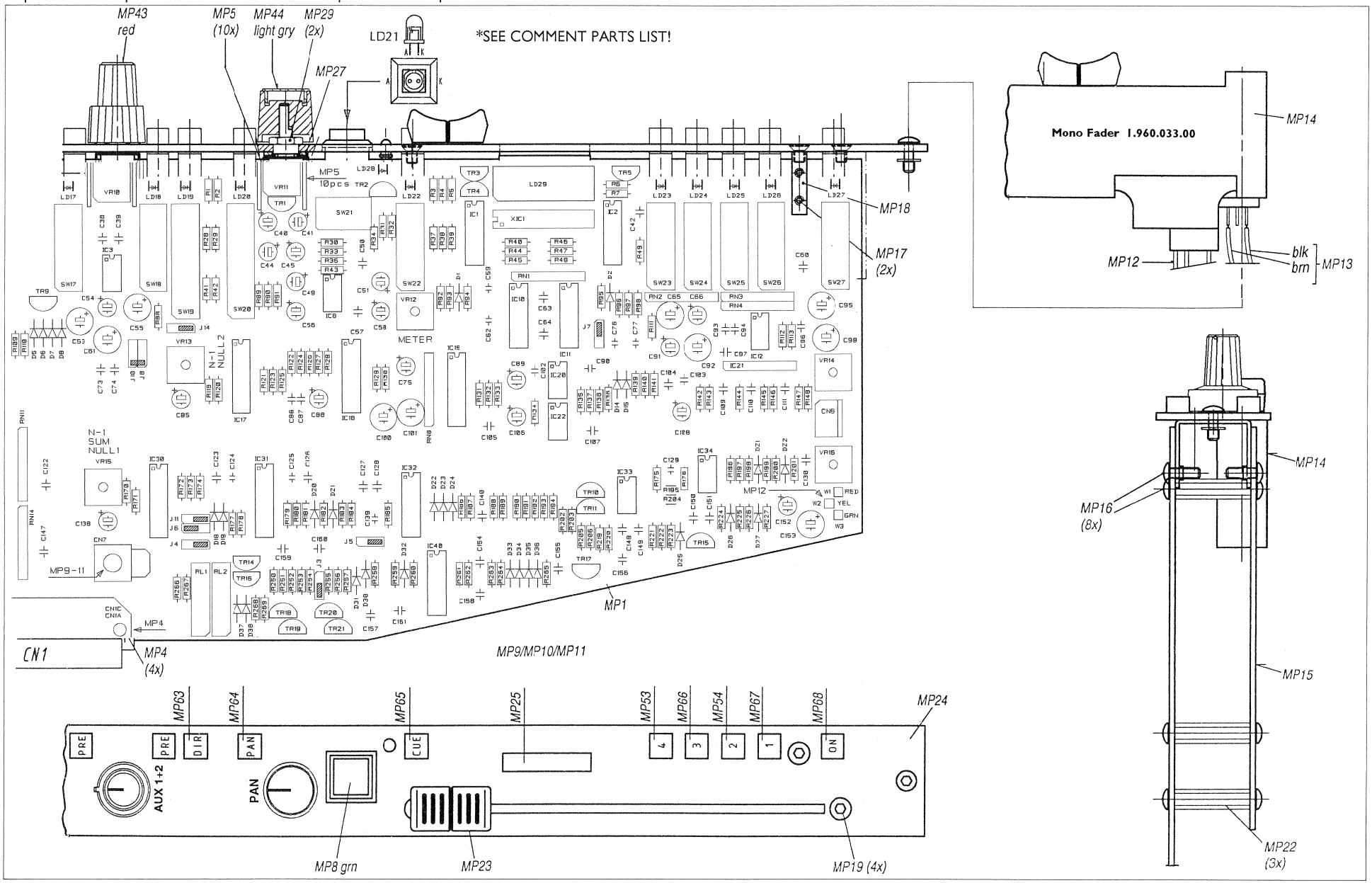
* 1.928.226.xx INPUT UNIT W OPT.HL TRAFO
* 1.928.227.xx INPUT UNIT W OPT.2MIC INP.
* 1.928.229.xx INPUT UNIT W OPT.HL TRAFO+2MIC

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STUDER	INPUT MAIN MO BOARD	SC	1.928.225.81

Input Main Mono Board 1.928.220.82 *Input Unit with Option 2 Mic. Input 1.928.222.82
*Input Unit with Option HL Trafo 1.928.221.82 *Input Unit with Option HL Trafo + 2 Mic. 1.928.224.82



Input Main Mono Board 1.928.220.82 *Input Unit with Option 2 Mic. Input 1.928.222.82
*Input Unit with Option HL Trafo 1.928.221.82 *Input Unit with Option HL Trafo + 2 Mic. 1.928.224.82



Input Main Mono Board 1.928.225.81

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	C 1	59.22.4002		100u	EL 16V 20% RM5
0	C 2	59.22.4002		100u	EL 16V 20% RM5
0	C 3	59.06.0332		3n3	PETP, 63V, 10%, RM5
0	C 4	59.06.0332		3n3	PETP, 63V, 10%, RM5
0	C 5	59.22.4002		100u	EL 16V 20% RM5
0	C 6	59.06.0103		10n	PETP, 63V, 10%, RM5
0	C 7	59.22.4002		100u	EL 16V 20% RM5
0	C 8	59.22.4002		100u	EL 16V 20% RM5
0	C 9	59.22.4002		100u	EL 16V 20% RM5
0	C 10	59.22.8229		2u2	EL 50V 20% RM5
0	C 11	59.22.4002		100u	EL 16V 20% RM5
0	C 12	59.06.0222		2n2	PETP, 63V, 10%, RM5
0	C 13	59.06.0103		10n	PETP, 63V, 10%, RM5
0	C 14	59.06.0222		2n2	PETP, 63V, 10%, RM5
0	C 15	59.22.4002		100u	EL 16V 20% RM5
0	C 16	59.22.4002		100u	EL 16V 20% RM5
0	C 17	59.06.0152		1n5	PETP, 63V, 10%, RM5
0	C 18	59.34.2330		33p	CER 63V, 5%, N150
0	C 19	59.34.4101		100p	CER 63V, 5%, N750
0	C 20	59.34.4101		100p	CER 63V, 5%, N750
0	C 21	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 22	59.22.4002		100u	EL 16V 20% RM5
0	C 23	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 24	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 25	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 26	59.06.0102		1n0	PETP, 63V, 10%, RM5
0	C 27	59.06.0102		1n0	PETP, 63V, 10%, RM5
0	C 28	59.06.0102		1n0	PETP, 63V, 10%, RM5
0	C 29	59.06.0102		1n0	PETP, 63V, 10%, RM5
0	C 30	59.06.0102		1n0	PETP, 63V, 10%, RM5
0	C 31	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 32	59.34.4221		220p	CER 63V, 5%, N750
0	C 33	59.34.2470		47p	CER 63V, 5%, N150
0	C 34	59.34.4221		220p	CER 63V, 5%, N750
0	C 35	59.06.0103		10n	PETP, 63V, 10%, RM5
0	C 36	59.22.5220		22u	EL 25V 20% RM5
0	C 37	59.22.4002		100u	EL 16V 20% RM5
0	C 38	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 39	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 40	59.22.4002		100u	EL 16V 20% RM5
0	C 41	59.22.4002		100u	EL 16V 20% RM5
0	C 42	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 43	59.22.4002		100u	EL 16V 20% RM5
0	C 44	59.22.4002		100u	EL 16V 20% RM5
0	C 45	59.22.4002		100u	EL 16V 20% RM5
0	C 46	59.34.2470		47p	CER 63V, 5%, N150
0	C 47	59.22.4002		100u	EL 16V 20% RM5
0	C 48	59.22.4002		100u	EL 16V 20% RM5
0	C 49	59.22.4002		100u	EL 16V 20% RM5
0	C 50	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 51	59.22.4002		100u	EL 16V 20% RM5
0	C 52	59.06.0102		1n0	PETP, 63V, 10%, RM5
0	C 53	59.22.8229		2u2	EL 50V 20% RM5
0	C 54	59.22.4002		100u	EL 16V 20% RM5
0	C 55	59.22.3003		220u	EL 10V 20% RM5
0	C 56	59.22.4002		100u	EL 16V 20% RM5
0	C 57	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 58	59.22.4002		100u	EL 16V 20% RM5
0	C 59	59.06.0474		470n	PETP, 63V, 10%, RM5
0	C 60	59.06.5152		1n5	PETP, 63V, 5%, RM5
0	C 61	59.22.3003		220u	EL 10V 20% RM5
0	C 62	59.06.0474		470n	PETP, 63V, 10%, RM5
0	C 63	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 64	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 65	59.22.3003		220u	EL 10V 20% RM5
0	C 66	59.22.4002		100u	EL 16V 20% RM5
0	C 67	59.22.3003		220u	EL 10V 20% RM5
0	C 68	59.06.0224		220n	PETP, 63V, 10%, RM5
0	C 69	59.06.0224		220n	PETP, 63V, 10%, RM5
0	C 70	59.06.0224		220n	PETP, 63V, 10%, RM5
0	C 71	59.34.2470		47p	CER 63V, 5%, N150
0	C 72	59.34.2470		47p	CER 63V, 5%, N150
0	C 73	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 74	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 75	59.22.4002		100u	EL 16V 20% RM5
0	C 76	59.06.0474		470n	PETP, 63V, 10%, RM5
0	C 77	59.06.0474		470n	PETP, 63V, 10%, RM5
0	C 78	not used		100u	EL 16V 20% RM5
		Used with transformator only!			
0	C 79	59.06.0102		1n0	PETP, 63V, 10%, RM5
0	C 80	59.06.0102		1n0	PETP, 63V, 10%, RM5
0	C 81	59.06.0102		1n0	PETP, 63V, 10%, RM5
0	C 82	59.06.0102		1n0	PETP, 63V, 10%, RM5
0	C 83	59.06.0102		1n0	PETP, 63V, 10%, RM5
0	C 84	59.06.0102		1n0	PETP, 63V, 10%, RM5
0	C 85	59.22.4002		100u	EL 16V 20% RM5
0	C 86	59.34.2470		47p	CER 63V, 5%, N150
0	C 87	59.34.2470		47p	CER 63V, 5%, N150
0	C 88	59.22.4002		100u	EL 16V 20% RM5
0	C 89	59.22.4002		100u	EL 16V 20% RM5
0	C 90	59.34.2220		22p	CER 63V, 5%, N150
0	C 91	59.22.4002		100u	EL 16V 20% RM5
0	C 92	59.22.8229		2u2	EL 50V 20% RM5
0	C 93	59.34.2470		47p	CER 63V, 5%, N150
0	C 94	59.34.2470		47p	CER 63V, 5%, N150
0	C 95	59.22.3003		220u	EL 10V 20% RM5
0	C 96	59.34.2470		47p	CER 63V, 5%, N150
0	C 97	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 98	59.22.8229		2u2	EL 50V 20% RM5
0	C 99	59.22.4002		100u	EL 16V 20% RM5
		Used without transformator only!			
0	C 100	59.22.8229		2u2	EL 50V 20% RM5
0	C 101	59.22.8229		2u2	EL 50V 20% RM5
0	C 102	59.34.2220		22p	CER 63V, 5%, N150
0	C 103	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 104	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 105	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 106	59.22.4002		100u	EL 16V 20% RM5
0	C 107	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 108	59.22.4002		100u	EL 16V 20% RM5
0	C 109	59.06.5152		1n5	PETP, 63V, 5%, RM5
0	C 110	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 111	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 112	59.05.1681		680p	PP, 1%, 630V
0	C 113	59.05.1681		680p	PP, 1%, 630V
0	C 114	59.22.4002		100u	EL 16V 20% RM5
		Used without transformator only!			
0	C 115	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 116	59.22.4002		100u	EL 16V 20% RM5
0	C 117	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 118	not used		6n8	PETP, 63V, 10%, RM5
		Used with transformator only!			
0	C 119	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 120	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 121	59.22.4002		100u	EL 16V 20% RM5
0	C 122	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 123	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 124	59.06.0474		470n	PETP, 63V, 10%, RM5
0	C 125	59.06.0474		470n	PETP, 63V, 10%, RM5
0	C 126	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 127	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 128	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 129	59.06.0474		470n	PETP, 63V, 10%, RM5
0	C 130	59.06.0102		1n0	PETP, 63V, 10%, RM5
0	C 131	59.22.4002		100u	EL 16V 20% RM5
0	C 132	59.22.4002		100u	EL 16V 20% RM5
0	C 133	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 134	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 135	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 136	59.22.4002		100u	EL 16V 20% RM5
0	C 137	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 138	59.22.4002		100u	EL 16V 20% RM5
0	C 139	59.06.0474		470n	PETP, 63V, 10%, RM5
0	C 140	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 141	59.22.4002		100u	EL 16V 20% RM5
0	C 142	59.22.4002		100u	EL 16V 20% RM5
0	C 143	59.22.4002		100u	EL 16V 20% RM5
0	C 144	59.22.3003		220u	EL 10V 20% RM5
0	C 145	59.22.3003		220u	EL 10V 20% RM5
0	C 146	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 147	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 148	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 149	59.06.0473		47n	PETP, 63V, 10%, RM5
0	C 150	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 151	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 152	59.22.4002		100u	EL 16V 20% RM5
0	C 153	59.22.8229		2u2	EL 50V 20% RM5
0	C 154	59.06.0683		68n	PETP, 63V, 10%, RM5
0	C 155	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 156	59.06.0223		22n	PETP, 63V, 10%, RM5
0	C 157	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 158	59.06.0103		10n	PETP, 63V, 10%, RM5
0	C 159	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 160	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 161	59.06.0103		10n	PETP, 63V, 10%, RM5
0	CN 1	54.01.0365		64p	P EU-C 2 * 32 A,C
0	CN 2	54.01.0365		64p	P EU-C 2 * 32 A,C
0	CN 3	54.14.2003		26p	1/20" Au, gerade, ohne Verrieg
0	CN 4	54.12.0703		3p	Stecker gerade PCB
0	CN 6	54.12.0704		4p	Stecker gerade PCB
0	CN 7	54.02.0343			P FLACH, 6.3*0.8, WINKEL 45
0	D 1	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 2	50.04.0127		BAT85	200mA, Schottky
0	D 3	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 4	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 5	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 6	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 7	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 8	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 9	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 10	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 11	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 12	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 13	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 14	50.04.0127		BAT85	200mA, Schottky
0	D 15	50.04.0127		BAT85	200mA, Schottky
0	D 16	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 17	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 18	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 19	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 20	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 21	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 22	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 23	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 24	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 25	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 26	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 27	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 28	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 29	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 30	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 31	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 32	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 33	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 34	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 35	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 36	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 37	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 38	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	DZ 1	50.04.1112		5V1	Zener, 5%, 0.5W, DO-35
0	DZ 2	50.04.1112		5V1	Zener, 5%, 0.5W, DO-35
0	IC 1	50.11.0104		LM339	IC LM 339 N, ,A
0	IC 2	50.11.0104		LM339	IC LM 339 N, ,A
0	IC 3	50.09.0124		2142	Audio balanced line driver
0	IC 4	50.09.0117		MC33078	IC MC 33078 P
0	IC 5	50.09.0101		TL072	IC TL 072 CN ,A
0	IC 6	50.09.0101		TL072	IC TL 072 CN ,A
0	IC 7	50.09.0101		TL072	IC TL 072 CN ,A
0	IC 8	50.09.0105		NE5532N	IC NE 5532 N, RC 5532 NB ,A
0	IC 9	50.09.0105		NE5532N	IC NE 5532 N, RC 5532 NB ,A
0	IC 10	50.07.0008		4093	Quad 2-inp NAND
0	IC 11	50.07.0014		40106	Hex inverting Schmitt trigger
0	IC 12	50.09.0105		NE5532N	IC NE 5532 N, RC 5532 NB ,A
0	IC 13	50.09.0117		MC33078	IC MC 33078 P
0	IC 14	50.07.0008		4093	Quad 2-inp NAND
0	IC 15	50.07.0014		40106	Hex inverting Schmitt trigger
0	IC 16	50.07.0008		4093	Quad 2-inp NAND
0	IC 17	50.07.0015		4053	Tripple 2ch analog mux/demux
0	IC 18	50.07.0015		4053	Tripple 2ch analog mux/demux
0	IC 19	50.07.0015		4053	Tripple 2ch analog mux/demux
0	IC 20	50.09.0101		TL072	IC TL 072 CN ,A
0	IC 21	50.11.0140		THAT2181C	IC VCA THAT 2181C
0	IC 22	50.09.0101		TL072	IC TL 072 CN ,A
0	IC 23	50.07.0015		4053	Tripple 2ch analog mux/demux
0	IC 24	50.07.0015		4053	Tripple 2ch analog mux/demux
0	IC 25	50.07.0015		4053	Tripple 2ch analog mux/demux
0	IC 26	50.07.0015		4053	Tripple 2ch analog mux/demux
0	IC 27	50.07.0015		4053	Tripple 2ch analog mux/demux
0	IC 28	50.07.0015		4053	Tripple 2ch analog mux/demux
0	IC 29	50.07.0015		4053	Tripple 2ch analog mux/demux
0	IC 30	50.07.0015		4053	Tripple 2ch analog mux/demux
0	IC 31	50.07.1538		4538	Dual retrigg monost multivibra
0	IC 32	50.07.0013		4013	Dual D-type FF
0	IC 33	50.09.0117		MC33078	IC MC 33078 P
0	IC 34	50.09.0117		MC33078	IC MC 33078 P
0	IC 35	50.07.0015		4053	Tripple 2ch analog mux/demux
0	IC 36	50.07.0015		4053	Tripple 2ch analog mux/demux
0	IC 37	50.07.0015		4053	Tripple 2ch analog mux/demux
0	IC 38	50.07.0015		4053	Tripple 2ch analog mux/demux
0	IC 39	50.09.0124		2142	Audio balanced line driver
0	IC 40	50.07.0014		40106	Hex inverting Schmitt trigger
0	J 1	54.01.0020	2 pcs	1p	Pin, 1reihig, gerade
0	J 2	54.01.0020	2 pcs	1p	Pin, 1reihig, gerade
0	J 3	54.01.0020	3 pcs	1p	Pin, 1reihig, gerade
0	J 4	54.01.0020	3 pcs	1p	Pin, 1reihig, gerade
0	J 5	54.01.0020	3 pcs	1p	Pin, 1reihig, gerade
0	J 6	54.11.0136	1 pce	2*3p	Pin 0.63*0.63, RM2.54
0	J 7	54.01.0020	3 pcs	1p	Pin, 1reihig, gerade
0	J 8	54.11.0136	1 pce	2*3p	Pin 0.63*0.63, RM2.54
0	J 9	54.01.0020	3 pcs	1p	Pin, 1reihig, gerade
0	J 10	not used	3 pcs	1p	Pin, 1reihig, gerade
					See J8
0	J 11	not used	3 pcs	1p	Pin, 1reihig, gerade
					See J6
0	J 12	54.01.0020	3 pcs	1p	Pin, 1reihig, gerade
0	J 13	54.01.0020	3 pcs	1p	Pin, 1reihig, gerade
0	J 14	54.01.0020	3 pcs	1p	Pin, 1reihig, gerade
0	LD 1	50.04.2206		L934GT	LED 3mm green
0	LD 2	50.04.2205		L934YT	LED 3mm yellow
0	LD 3	50.04.2205		L934YT	LED 3mm yellow
0	LD 4	50.04.2205		L934YT	LED 3mm yellow
0	LD 5	50.04.2205		L934YT	LED 3mm yellow
0	LD 6	50.04.2205		L934YT	LED 3mm yellow
0	LD 7	50.04.2204		L934ID	LED 3mm red
0	LD 8	50.04.2204		L934ID	LED 3mm red
0	LD 9	50.04.2204		L934ID	LED 3mm red
0	LD 10	50.04.2205		L934YT	LED 3mm yellow
0	LD 11	50.04.2205		L934YT	LED 3mm yellow
0	LD 12	50.04.2204		L934ID	LED 3mm red
0	LD 13	50.04.2204		L934ID	LED 3mm red
0	LD 14	50.04.2205		L934YT	LED 3mm yellow
0	LD 15	50.04.2205		L934YT	LED 3mm yellow
0	LD 16	50.04.2205		L934YT	LED 3mm yellow
0	LD 17	50.04.2205		L934YT	LED 3mm yellow
0	LD 18	50.04.2205		L934YT	LED 3mm yellow
0	LD 19	50.04.2204		L934ID	LED 3mm red
0	LD 20	50.04.2206		L934GT	LED 3mm green
0	LD 21	50.04.2162		HLMP1540	LED 3mm, grün klar
					LED for SW21
0	LD 22	50.04.2206		L934GT	LED 3mm green
0	LD 23	50.04.2205		L934YT	LED 3mm yellow
0	LD 24	50.04.2205		L934YT	LED 3mm yellow
0	LD 25	50.04.2205		L934YT	LED 3mm yellow
0	LD 26	50.04.2205		L934YT	LED 3mm yellow
0	LD 27	50.04.2206		L934GT	LED 3mm green
0	LD 28	50.04.2129		LS3360	DL LS 3360 , RT DIFF
0	LD 29	50.04.2813		DC4SR6SG	LED Bargraph 4*red, 6*green
0	LK 1	54.11.0136		2*3p	Pin 0.63*0.63, RM2.54
0	LK 2	not used	3 pcs	1p	Pin, 1reihig, gerade
					See LK1
0	LK 3	54.11.0136		2*3p	Pin 0.63*0.63, RM2.54
0	LK 4	not used	3 pcs	1p	Pin, 1reihig, gerade
					See LK3
0	LK 5	54.11.0136		2*3p	Pin 0.63*0.63, RM2.54
0	LK 6	not used	3 pcs	1p	Pin, 1reihig, gerade
					See LK5
0	LK 7	54.11.0136		2*3p	Pin 0.63*0.63, RM2.54
0	LK 8	not used	3 pcs	1p	Pin, 1reihig, gerade
					See LK7
0	MP 1	1.928.220.12	1 pce		INPUT MAIN MONO PCB
0	MP 2	1.928.220.04	1 pce		STUDER NR. ETIKETTE 10X20
0	MP 3	43.01.0108	1 pce	Label	ESE-WARNSCHILD
0	MP 4	28.99.0119	4 pcs		ROHRNIETE D 2.5*0.15* 9
0	MP 5	1.928.220.09	10 pcs		9mm ALPS POT BRACKET WITH PIPS
0	MP 6	1.928.220.10	1 pce		POT-HALTER NACHARBEIT
0	MP 7	54.01.0021	20 pcs	Jumper	0.63*0.63mm, Au
0	MP 8	55.15.0915	1 pce		Kalotte grün mit Streuscheibe
0	MP 9	21.51.8455	1 pce	M4*8	Linsenkopf-Schr IS, Ni
0	MP 10	22.01.8040	1 pce	M4	6kt-Mutter 0.8d St Zn gb
0	MP 11	24.16.2040	2 pcs	4.3/8.0	Fächerscheibe Form A
0	MP 12	1.942.210.93	1 pce		LL-FADER
0	MP 13	1.928.220.93	1 pce		LL-Fader
0	MP 14	1.960.033.00	1 pce		MONOFADER LIN. P+G 100MM
0	MP 15	1.928.223.82	1 pce		INPUT SIDE MONO SWITCH BOARD
0	MP 16	21.53.8706	8 pcs	M3*6	Lin-Schr IS, Zn gb, Tuflock
0	MP 17	21.53.0279	2 pcs	M2.5*6	Z-Schraube Inbus Zn gb chr
0	MP 18	1.928.220.05	1 pce		STÜTZBOLZEN
0	MP 19	21.99.0175	4 pcs	M3*6	S-Schraube IS A2 sw oxydiert
0	MP 20	24.16.3023	2 pcs		WELLENSICHERUNG 2.3
0	MP 21	1.010.022.21	2 pcs	M3*8	L-Schraube IS sw spezial
0	MP 22	1.010.024.27	3 pcs	M3*20	Mutter-Bolzen 6kt Ms Ni
0	MP 23	1.911.000.48	1 pce		KNOPF HELLGRAU
0	MP 24	1.928.220.01	1 pce		FRONTPLATTE
0	MP 25	1.928.220.02	1 pce		FENSTER
0	MP 26	1.928.220.03	1 pce		PRINTHALTER
0	MP 27	1.928.220.06	1 pce		ZENTRIERSCHEIBE 1
0	MP 28	1.928.220.07	1 pce		ZENTRIERSCHEIBE 2,8
0	MP 29	1.928.220.08	2 pcs		MUTTER M7x0.75
0	MP 34	1.980.220.06	1 pce		DREHKNOPF

Input Main Mono Board 1.928.225.81

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	MP 35	42.01.0227	1 pce		KNEBELKNOPF GR D 10/ 3
0	MP 36	42.01.0251	1 pce		DECKEL D'GR ZU KNOPF-D 10
0	MP 37	42.01.0286	1 pce		MUTTERABDECK. D'GR ZU D 10
0	MP 38	42.01.1200	2 pcs		DREHKNOPF D11 gr/gr
0	MP 39	42.01.1208	4 pcs		DREHKNOPF D11 gr/hellgr
0	MP 40	42.01.1206	1 pce		DREHKNOPF D11 gr/bl
0	MP 41	42.01.1205	1 pce		DREHKNOPF D11 gr/gn
0	MP 42	42.01.1204	1 pce		DREHKNOPF D11 gr/gb
0	MP 43	42.01.1202	1 pce		DREHKNOPF D11 gr/rt
0	MP 44	42.01.1228	1 pce		DREHKNOPF D15 gr/hellgr
0	MP 45	42.01.1240	9 pcs		DREHKNOPF D15 gr unten
0	MP 50	1.928.201.17	1 pce		PUSH BUTTON |B
0	MP 51	1.928.201.08	1 pce		PUSH BUTTON 8
0	MP 52	1.928.201.06	1 pce		PUSH BUTTON 6
0	MP 53	1.928.201.04	2 pcs		PUSH BUTTON 4
0	MP 54	1.928.201.02	2 pcs		PUSH BUTTON 2
0	MP 55	1.928.201.32	1 pce		PUSH BUTTON N-1
0	MP 56	1.928.201.41	1 pce		PUSH BUTTON ~
0	MP 57	1.928.201.31	1 pce		PUSH BUTTON LINE
0	MP 58	1.928.201.40	1 pce		PUSH BUTTON /-
0	MP 59	1.928.201.27	2 pcs		PUSH BUTTON HIQ
0	MP 60	1.928.201.24	1 pce		PUSH BUTTON EQ
0	MP 61	1.928.201.29	1 pce		PUSH BUTTON INS
0	MP 62	1.928.201.37	5 pcs		PUSH BUTTON PRE
0	MP 63	1.928.201.22	1 pce		PUSH BUTTON DIR
0	MP 64	1.928.201.35	1 pce		PUSH BUTTON PAN
0	MP 65	1.928.201.20	1 pce		PUSH BUTTON CUE
0	MP 66	1.928.201.03	1 pce		PUSH BUTTON 3
0	MP 67	1.928.201.01	1 pce		PUSH BUTTON 1
0	MP 68	1.928.201.34	1 pce		PUSH BUTTON ON
0	MP 70	1.928.231.71	1 pce		PUSH BUTTON |A
0	MP 71	1.928.231.64	1 pce		PUSH BUTTON 7
0	MP 72	1.928.231.63	1 pce		PUSH BUTTON 5
0	MP 73	1.928.201.62	1 pce		PUSH BUTTON 3
0	MP 74	1.928.201.61	1 pce		PUSH BUTTON 1
0	MP 75	1.928.201.72	1 pce		PUSH BUTTON TB
0	MP 76	1.928.201.73	1 pce		PUSH BUTTON 48V
0	MP 77	1.928.201.74	1 pce		PUSH BUTTON 0
0	MP 90	not used	1 pce		ISOLATION
				Used with transformator only!	
0	R 1	57.11.3472		4k7	MF, 1%, 0207
0	R 2	57.11.3472		4k7	MF, 1%, 0207
0	R 3	57.11.3103		10k	MF, 1%, 0207
0	R 4	57.11.3332		3k3	MF, 1%, 0207
0	R 5	57.11.3392		3k9	MF, 1%, 0207
0	R 6	57.11.3332		3k3	MF, 1%, 0207
0	R 7	57.11.3241		240R	MF, 1%, 0207
0	R 8	57.11.3622		6k2	MF, 1%, 0207
0	R 9	57.11.3512		5k1	MF, 1%, 0207
0	R 10	57.11.3472		4k7	MF, 1%, 0207
0	R 11	57.11.3182		1k8	MF, 1%, 0207
0	R 12	57.11.3622		6k2	MF, 1%, 0207
0	R 13	57.11.3622		6k2	MF, 1%, 0207
0	R 14	57.11.3272		2k7	MF, 1%, 0207
0	R 15	57.11.3622		6k2	MF, 1%, 0207
0	R 16	57.11.3472		4k7	MF, 1%, 0207
0	R 17	57.11.3622		6k2	MF, 1%, 0207
0	R 18	57.11.3472		4k7	MF, 1%, 0207
0	R 19	57.11.3272		2k7	MF, 1%, 0207
0	R 20	57.11.3104		100k	MF, 1%, 0207
0	R 21	57.11.3473		47k	MF, 1%, 0207
0	R 22	57.11.3473		47k	MF, 1%, 0207
0	R 23	57.11.3683		68k	MF, 1%, 0207
0	R 24	57.11.3472		4k7	MF, 1%, 0207
0	R 25	57.11.3151		150R	MF, 1%, 0207
0	R 26	57.11.3104		100k	MF, 1%, 0207
0	R 27	57.11.3104		100k	MF, 1%, 0207
0	R 28	57.11.3472		4k7	MF, 1%, 0207
0	R 29	57.11.3472		4k7	MF, 1%, 0207
0	R 30	57.11.3682		6k8	MF, 1%, 0207
0	R 31	57.11.3273		27k	MF, 1%, 0207
0	R 32	57.11.3333		33k	MF, 1%, 0207
0	R 33	57.11.3682		6k8	MF, 1%, 0207
0	R 34	57.11.3151		150R	MF, 1%, 0207
0	R 35	57.11.3184		180k	MF, 1%, 0207
0	R 36	57.11.3153		15k	MF, 1%, 0207
0	R 37	57.11.3331		330R	MF, 1%, 0207
0	R 38	57.11.3182		1k8	MF, 1%, 0207
0	R 39	57.11.3223		22k	MF, 1%, 0207
0	R 40	57.11.3182		1k8	MF, 1%, 0207
0	R 41	57.11.3223		22k	MF, 1%, 0207
0	R 42	57.11.3223		22k	MF, 1%, 0207
0	R 43	57.11.3153		15k	MF, 1%, 0207
0	R 44	57.11.3272		2k7	MF, 1%, 0207
0	R 45	57.11.3203		20k	MF, 1%, 0207
0	R 46	57.11.3821		820R	MF, 1%, 0207
0	R 47	57.11.3112		1k1	MF, 1%, 0207
0	R 48	57.11.3152		1k5	MF, 1%, 0207
0	R 49	57.11.3223		22k	MF, 1%, 0207
0	R 50	not used		4k7	MF, 1%, 0207
				Used with transformator only!	
0	R 51	57.11.3272		2k7	MF, 1%, 0207
				Value with transformator 150R!	
0	R 52	57.11.3272		2k7	MF, 1%, 0207
				Value with transformator 3K3!	
0	R 53	57.11.3681		680R	MF, 1%, 0207
0	R 54	57.11.3681		680R	MF, 1%, 0207
0	R 55	57.11.3104		100k	MF, 1%, 0207
0	R 56	57.11.3473		47k	MF, 1%, 0207
0	R 57	57.11.3473		47k	MF, 1%, 0207
0	R 58	57.11.3473		47k	MF, 1%, 0207
0	R 59	57.11.3473		47k	MF, 1%, 0207
0	R 60	57.11.3473		47k	MF, 1%, 0207
0	R 61	57.11.3472		4k7	MF, 1%, 0207
0	R 62	57.11.3472		4k7	MF, 1%, 0207
0	R 63	57.11.3223		22k	MF, 1%, 0207
0	R 64	57.11.3223		22k	MF, 1%, 0207
0	R 65	57.11.3333		33k	MF, 1%, 0207
0	R 66	57.11.3123		12k	MF, 1%, 0207
0	R 67	57.11.3242		2k4	MF, 1%, 0207
0	R 68	57.11.3202		2k0	MF, 1%, 0207
0	R 69	57.11.3512		5k1	MF, 1%, 0207
0	R 70	57.11.3103		10k	MF, 1%, 0207
0	R 71	57.11.3103		10k	MF, 1%, 0207
0	R 72	57.11.3202		2k0	MF, 1%, 0207
0	R 73	57.11.3512		5k1	MF, 1%, 0207
0	R 74	57.11.3242		2k4	MF, 1%, 0207
0	R 75	57.11.3103		10k	MF, 1%, 0207
0	R 76	57.11.3103		10k	MF, 1%, 0207
0	R 77	57.11.3362		3k6	MF, 1%, 0207
0	R 78	57.11.3104		100k	MF, 1%, 0207
0	R 79	57.11.3473		47k	MF, 1%, 0207
0	R 80	57.11.3473		47k	MF, 1%, 0207
0	R 81	57.11.3622		6k2	MF, 1%, 0207
0	R 82	57.11.3622		6k2	MF, 1%, 0207
0	R 83	57.11.3223		22k	MF, 1%, 0207
0	R 84	57.11.3184		180k	MF, 1%, 0207
0	R 85	57.11.3104		100k	MF, 1%, 0207
0	R 86	57.11.3204		200k	MF, 1%, 0207
0	R 87	57.11.3184		180k	MF, 1%, 0207
0	R 88	57.11.3220		22R	MF, 1%, 0207
0	R 89	57.11.3223		22k	MF, 1%, 0207
0	R 90	57.11.3473		47k	MF, 1%, 0207
0	R 91	57.11.3473		47k	MF, 1%, 0207
0	R 92	57.11.3561		560R	MF, 1%, 0207
0	R 93	57.11.3105		1M0	MF, 1%, 0207
0	R 94	57.11.3223		22k	MF, 1%, 0207
0	R 95	57.11.3274		270k	MF, 1%, 0207
0	R 96	57.11.3124		120k	MF, 1%, 0207
0	R 97	57.11.3751		750R	MF, 1%, 0207
0	R 98	57.11.3820		82R	MF, 1%, 0207
0	R 99	57.11.3513		51k	MF, 1%, 0207
0	R 100	57.11.3682		6k8	MF, 1%, 0207
0	R 101	57.11.3272		2k7	MF, 1%, 0207
0	R 102	57.11.3103		10k	MF, 1%, 0207
0	R 103	57.11.3103		10k	MF, 1%, 0207
0	R 104	57.11.3103		10k	MF, 1%, 0207
0	R 105	57.11.3103		10k	MF, 1%, 0207
0	R 106	57.11.3473		47k	MF, 1%, 0207
0	R 107	57.11.3473		47k	MF, 1%, 0207
0	R 108	57.11.3473		47k	MF, 1%, 0207
0	R 109	57.11.3223		22k	MF, 1%, 0207
0	R 110	57.11.3223		22k	MF, 1%, 0207
0	R 111	57.11.3104		100k	MF, 1%, 0207
0	R 112	57.11.3273		27k	MF, 1%, 0207
0	R 113	57.11.3273		27k	MF, 1%, 0207
0	R 114	57.11.3473		47k	MF, 1%, 0207
0	R 115	57.11.3473		47k	MF, 1%, 0207
0	R 116	57.11.3473		47k	MF, 1%, 0207
0	R 117	57.11.3473		47k	MF, 1%, 0207
0	R 118	57.11.3105		1M0	MF, 1%, 0207
0	R 119	57.11.3203		20k	MF, 1%, 0207
0	R 120	57.11.3104		100k	MF, 1%, 0207
0	R 121	57.11.3103		10k	MF, 1%, 0207
0	R 122	57.11.3223		22k	MF, 1%, 0207
0	R 123	57.11.3103		10k	MF, 1%, 0207
0	R 124	57.11.3223		22k	MF, 1%, 0207
0	R 125	57.11.3512		5k1	MF, 1%, 0207
0	R 126	57.11.3223		22k	MF, 1%, 0207
0	R 127	57.11.3223		22k	MF, 1%, 0207
0	R 128	57.11.3223		22k	MF, 1%, 0207
0	R 129	57.11.3562		5k6	MF, 1%, 0207
0	R 130	57.11.3561		560R	MF, 1%, 0207
0	R 131	57.11.3223		22k	MF, 1%, 0207
0	R 132	57.11.3473		47k	MF, 1%, 0207
0	R 133	57.11.3752		7k5	MF, 1%, 0207
0	R 134	57.11.3203		20k	MF, 1%, 0207
0	R 135	57.11.3473		47k	MF, 1%, 0207
0	R 136	57.11.3223		22k	MF, 1%, 0207
0	R 137	57.11.3474		470k	MF, 1%, 0207
0	R 138	57.11.3223		22k	MF, 1%, 0207
0	R 139	57.11.3332		3k3	MF, 1%, 0207
0	R 140	57.11.5125		1M2	MF, 5%, 0207
0	R 141	57.11.3104		100k	MF, 1%, 0207
0	R 142	57.11.3104		100k	MF, 1%, 0207
0	R 143	57.11.3273		27k	MF, 1%, 0207
0	R 144	57.11.3273		27k	MF, 1%, 0207
0	R 145	57.11.3473		47k	MF, 1%, 0207
0	R 146	57.11.3472		4k7	MF, 1%, 0207
0	R 147	57.11.3102		1k0	MF, 1%, 0207
0	R 148	57.11.3102		1k0	MF, 1%, 0207
0	R 149	57.11.3472		4k7	MF, 1%, 0207
0	R 150	57.11.3104		100k	MF, 1%, 0207
0	R 151	not used		3k9	MF, 1%, 0207
				Used with transformator only!	
0	R 152	57.11.3392		3k9	MF, 1%, 0207
0	R 153	57.11.3392		3k9	MF, 1%, 0207
0	R 154	57.11.3104		100k	MF, 1%, 0207
0	R 155	57.11.3152		1k5	MF, 1%, 0207
0	R 156	57.11.3152		1k5	MF, 1%, 0207
0	R 157	57.11.3104		100k	MF, 1%, 0207
0	R 158	57.11.3103		10k	MF, 1%, 0207
0	R 159	57.11.3103		10k	MF, 1%, 0207
0	R 160	57.11.3000		0R0	MF, 0207
0	R 161	57.11.3622		6k2	MF, 1%, 0207
0	R 162	not used		4k3	MF, 1%, 0207
0	R 163	57.11.3622		6k2	MF, 1%, 0207
0	R 164	57.11.3622		6k2	MF, 1%, 0207
0	R 165	57.11.3000		0R0	MF, 0207
0	R 166	not used		4k3	MF, 1%, 0207
0	R 167	57.11.3622		6k2	MF, 1%, 0207
0	R 168	57.11.3622		6k2	MF, 1%, 0207
0	R 169	57.11.3622		6k2	MF, 1%, 0207
0	R 170	57.11.3104		100k	MF, 1%, 0207
0	R 171	57.11.3203		20k	MF, 1%, 0207
0	R 172	57.11.3103		10k	MF, 1%, 0207
0	R 173	57.11.3103		10k	MF, 1%, 0207
0	R 174	57.11.3512		5k1	MF, 1%, 0207
0	R 175	57.11.3823		82k	MF, 1%, 0207
0	R 176	57.11.3563		56k	MF, 1%, 0207
0	R 177	57.11.3105		1M0	MF, 1%, 0207
0	R 178	57.11.3105		1M0	MF, 1%, 0207
0	R 179	57.11.3105		1M0	MF, 1%, 0207
0	R 180	57.11.3104		100k	MF, 1%, 0207
0	R 181	57.11.3104		100k	MF, 1%, 0207
0	R 182	57.11.3224		220k	MF, 1%, 0207
0	R 183	57.11.3104		100k	MF, 1%, 0207
0	R 184	57.11.3473		47k	MF, 1%, 0207
0	R 185	57.11.3224		220k	MF, 1%, 0207
0	R 186	57.11.3103		10k	MF, 1%, 0207
0	R 187	57.11.3224		220k	MF, 1%, 0207
0	R 188	57.11.3472		4k7	MF, 1%, 0207
0	R 189	57.11.3224		220k	MF, 1%, 0207
0	R 190	57.11.3223		22k	MF, 1%, 0207
0	R 191	57.11.3103		10k	MF, 1%, 0207
0	R 192	57.11.3223		22k	MF, 1%, 0207
0	R 193	57.11.3124		120k	MF, 1%, 0207
0	R 194	57.11.3223		22k	MF, 1%, 0207
0	R 195	57.69.8301		10k	PTC, 1%, +3300 PPM
0	R 196	57.11.3394		390k	MF, 1%, 0207
0	R 197	57.11.3824		820k	MF, 1%, 0207
0	R 198	57.11.3133		13k	MF, 1%, 0207
0	R 199	57.11.3103		10k	MF, 1%, 0207
0	R 200	57.11.3104		100k	MF, 1%, 0207
0	R 201	57.11.3473		47k	MF, 1%, 0207
0	R 202	57.11.3331		330R	MF, 1%, 0207
0	R 203	57.11.3223		22k	MF, 1%, 0207
0	R 204	57.69.8301		10k	PTC, 1%, +3300 PPM
0	R 205	57.11.3223		22k	MF, 1%, 0207
0	R 206	57.11.3223		22k	MF, 1%, 0207
0	R 207	57.11.3682		6k8	MF, 1%, 0207
0	R 208	57.11.3682		6k8	MF, 1%, 0207
0	R 209	57.11.3682		6k8	MF, 1%, 0207
0	R 210	57.11.3682		6k8	MF, 1%, 0207
0	R 211	57.11.3682		6k8	MF, 1%, 0207
0	R 212	57.11.3682		6k8	MF, 1%, 0207
0	R 213	57.11.3682		6k8	MF, 1%, 0207
0	R 214	57.11.3682		6k8	MF, 1%, 0207
0	R 215	57.11.3682		6k8	MF, 1%, 0207
0	R 216	57.11.3682		6k8	MF, 1%, 0207
0	R 217	57.11.3682		6k8	MF, 1%, 0207
0	R 218	57.11.3682		6k8	MF, 1%, 0207
0	R 219	57.11.3103		10k	MF, 1%, 0207
0	R 220	57.11.3103		10k	MF, 1%, 0207
0	R 221	57.11.3184		180k	MF, 1%, 0207
0	R 222	57.11.3823		82k	MF, 1%, 0207
0	R 223	57.11.3683		68k	MF, 1%, 0207
0	R 224	57.11.3154		150k	MF, 1%, 0207
0	R 225	57.11.3224		220k	MF, 1%, 0207
0	R 226	57.11.3103		10k	MF, 1%, 0207
0	R 227	57.11.5185		1M8	MF, 5%, 0207
0	R 228	57.11.3682		6k8	MF, 1%, 0207
0	R 229	57.11.3682		6k8	MF, 1%, 0207
0	R 230	57.11.3682		6k8	MF, 1%, 0207
0	R 231	57.11.3682		6k8	MF, 1%, 0207
0	R 232	57.11.3682		6k8	MF, 1%, 0207
0	R 233	57.11.3682		6k8	MF, 1%, 0207
0	R 234	57.11.3682		6k8	MF, 1%, 0207
0	R 235	57.11.3682		6k8	MF, 1%, 0207
0	R 236	57.11.3332		3k3	MF, 1%, 0207
0	R 237	57.11.3332		3k3	MF, 1%, 0207
0	R 238	57.92.7021		0.9A	PTC 60V
0	R 239	57.11.3104		100k	MF, 1%, 0207
0	R 240	57.11.3104		100k	MF, 1%, 0207
0	R 241	57.92.7021		0.9A	PTC 60V
0	R 242	57.19.0470		47R	5%, 0207, Fuse
0	R 243	57.19.0470		47R	5%, 0207, Fuse
0	R 244	57.11.3683		68k	MF, 1%, 0207
0	R 245	57.11.3472		4k7	MF, 1%, 0207
0	R 246	57.11.3151		150R	MF, 1%, 0207
0	R 247	57.11.3683		68k	MF, 1%, 0207
0	R 248	57.11.3472		4k7	MF, 1%, 0207
0	R 249	57.11.3151		150R	MF, 1%, 0207
0	R 250	57.11.3103		10k	MF, 1%, 0207
0	R 251	57.11.3103		10k	MF, 1%, 0207
0	R 252	57.11.3103		10k	MF, 1%, 0207
0	R 253	57.11.3103		10k	MF, 1%, 0207
0	R 254	57.11.3682		6k8	MF, 1%, 0207
0	R 255	57.11.3202		2k0	MF, 1%, 0207
0	R 256	57.11.3103		10k	MF, 1%, 0207
0	R 257	57.11.3473		47k	MF, 1%, 0207
0	R 258	57.11.3104		100k	MF, 1%, 0207
0	R 259	57.11.3333		33k	MF, 1%, 0207
0	R 260	57.11.3103		10k	MF, 1%, 0207
0	R 261	57.11.3154		150k	MF, 1%, 0207
0	R 262	57.11.3334		330k	MF, 1%, 0207
0	R 263	57.11.3473		47k	MF, 1%, 0207
0	R 264	57.11.3104		100k	MF, 1%, 0207
0	R 265	57.11.3682		6k8	MF, 1%, 0207
0	R 266	57.11.3222		2k2	MF, 1%, 0207
0	R 267	57.11.3222		2k2	MF, 1%, 0207
0	R 268	57.11.3223		22k	MF, 1%, 0207
0	R 269	57.11.3223		22k	MF, 1%, 0207
0	RL 1	56.02.1101			Reed Relay
0	RL 2	56.02.1101			Reed Relay
0	RN 1	57.88.2473		47k	4*R Resistor-Netw 2% SIP9
0	RN 2	57.88.2823		82k	4*R Resistor-Netw 2% SIP9
0	RN 3	57.88.2223		22k	4*R Resistor-Netw 2% SIP9
0	RN 4	57.88.2103		10k	4*R Resistor-Netw 2% SIP9
0	RN 5	57.88.2472		4k7	4*R Resistor-Netw 2% SIP9
0	RN 6	57.88.4104		100k	8*R Resistor-Netw 2% SIP9
0	RN 7	57.88.4104		100k	8*R Resistor-Netw 2% SIP9
0	RN 8	57.88.2104		100k	4*R Resistor-Netw 2% SIP9
0	RN 9	57.88.2682		6k8	4*R Resistor-Netw 2% SIP9
0	RN 10	57.88.2682		6k8	4*R Resistor-Netw 2% SIP9
0	RN 11	57.88.2682		6k8	4*R Resistor-Netw 2% SIP9
0	RN 12	57.88.2682		6k8	4*R Resistor-Netw 2% SIP9
0	RN 13	57.88.2682		6k8	4*R Resistor-Netw 2% SIP9
0	RN 14	57.88.2682		6k8	4*R Resistor-Netw 2% SIP9
0	SW 1	55.15.0931		2*u	rastend
0	SW 2	55.15.0931		2*u	rastend
0	SW 3	55.15.0931		2*u	rastend

Input Main Mono Board 1.928.225.81

*Input Unit with Option 2 Mic. Input 1.928.227.81
*Input Unit wiht Option HL Trafo 1.928.226.81 *Input Unit with Option HL Trafo + 2 Mic. 1.928.229.81

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	SW 4	55.15.0931		2*u	rastend
0	SW 5	55.15.0931		2*u	rastend
0	SW 6	55.15.0931		2*u	rastend
0	SW 7	55.15.0931		2*u	rastend
0	SW 8	55.15.0931		2*u	rastend
0	SW 9	55.15.0931		2*u	rastend
0	SW 10	55.15.0931		2*u	rastend
0	SW 11	55.15.0931		2*u	rastend
0	SW 12	55.15.0931		2*u	rastend
0	SW 13	55.15.0931		2*u	rastend
0	SW 14	55.15.0931		2*u	rastend
0	SW 15	55.15.0931		2*u	rastend
0	SW 16	55.15.0931		2*u	rastend
0	SW 17	55.15.0931		2*u	rastend
0	SW 18	55.15.0931		2*u	rastend
0	SW 19	55.15.0933		4*u	rastend
0	SW 20	55.15.0933		4*u	rastend
0	SW 21	1.928.208.00			MIYAMA SWITCH NON LATCH. BOARD
0	SW 22	55.15.0932		2*u	impuls
0	SW 23	55.15.0931		2*u	rastend
0	SW 24	55.15.0931		2*u	rastend
0	SW 25	55.15.0931		2*u	rastend
0	SW 26	55.15.0931		2*u	rastend
0	SW 27	55.15.0932		2*u	impuls
0	T 1	not used		1:0.62	EINGANGSTRAFO 1 : 0,62
				Option	
0	TR 1	50.03.0515		BC307B	BC 307 B , BC 557 B ,PNP
0	TR 2	50.03.0436		BC237B	BC 237 B, 547 B, 550 B,
0	TR 3	50.03.0515		BC307B	BC 307 B , BC 557 B ,PNP
0	TR 4	50.03.0436		BC237B	BC 237 B, 547 B, 550 B,
0	TR 5	50.03.0515		BC307B	BC 307 B , BC 557 B ,PNP
0	TR 6	50.03.0515		BC307B	BC 307 B , BC 557 B ,PNP
0	TR 7	50.03.0436		BC237B	BC 237 B, 547 B, 550 B,
0	TR 8	50.03.0436		BC237B	BC 237 B, 547 B, 550 B,
0	TR 9	50.03.0515		BC307B	BC 307 B , BC 557 B ,PNP
0	TR 10	50.03.0436		BC237B	BC 237 B, 547 B, 550 B,
0	TR 11	50.03.0436		BC237B	BC 237 B, 547 B, 550 B,
0	TR 12	50.03.0515		BC307B	BC 307 B , BC 557 B ,PNP
0	TR 13	50.03.0515		BC307B	BC 307 B , BC 557 B ,PNP
0	TR 14	50.03.0515		BC307B	BC 307 B , BC 557 B ,PNP
0	TR 15	50.03.0436		BC237B	BC 237 B, 547 B, 550 B,
0	TR 16	50.03.0515		BC307B	BC 307 B , BC 557 B ,PNP
0	TR 17	50.03.0515		BC307B	BC 307 B , BC 557 B ,PNP
0	TR 18	50.03.0436		BC237B	BC 237 B, 547 B, 550 B,
0	TR 19	50.03.0436		BC237B	BC 237 B, 547 B, 550 B,
0	TR 20	50.03.0436		BC237B	BC 237 B, 547 B, 550 B,
0	TR 21	50.03.0436		BC237B	BC 237 B, 547 B, 550 B,
0	VR 1	58.20.6501		10k lin	1*R
0	VR 2	58.20.6702		100k-/10k lin	2*R, Doppelachse
0	VR 3	58.20.6802		2*100k-/10k l	3*R, Doppelachse
0	VR 4	58.20.6802		2*100k-/10k l	3*R, Doppelachse
0	VR 5	58.20.6702		100k-/10k lin	2*R, Doppelachse
0	VR 6	58.20.6801		2*20k-/20k li	3*R, Doppelachse
0	VR 7	58.20.6801		2*20k-/20k li	3*R, Doppelachse
0	VR 8	58.20.6701		2*50k lin	2*R, Doppelachse
0	VR 9	58.20.6701		2*50k lin	2*R, Doppelachse
0	VR 10	58.20.6701		2*50k lin	2*R, Doppelachse
0	VR 11	58.20.6601		20k+/20k-	2*R
0	VR 12	58.01.8103		10k	Cermet, 10%, 0.5W, horizontal
0	VR 13	58.01.8502		5k0	Cermet, 10%, 0.5W, horizontal
0	VR 14	58.01.8203		20k	Cermet, 10%, 0.5W, horizontal
0	VR 15	58.01.8502		5k0	Cermet, 10%, 0.5W, horizontal
0	VR 16	58.01.8503		50k	Cermet, 10%, 0.5W, horizontal
0	XIC 1	53.03.0185		20p	DIL 0.3", löt, winkel
				Socket for LD29	

Idx	Pos.	Part No.	Qty.	Type/Val.	Description

End of List

Comments

OPTIONS FOR 1.928.225.xx

1.928.226.xx INPUT UNIT W OPT.HL TRAFO

C	78	59.22.4002		100uF 16V
C	99	not used		
C	114	not used		
C	118	59.06.0682		6n8 63V
MP	90	1.022.400.03		isolation for T1
R	50	57.11.3472		4k7
R	51	57.11.3151		150R
R	52	57.11.3332		3k3
R	151	57.11.3392		3k9
T	1	1.022.451.00		transformator

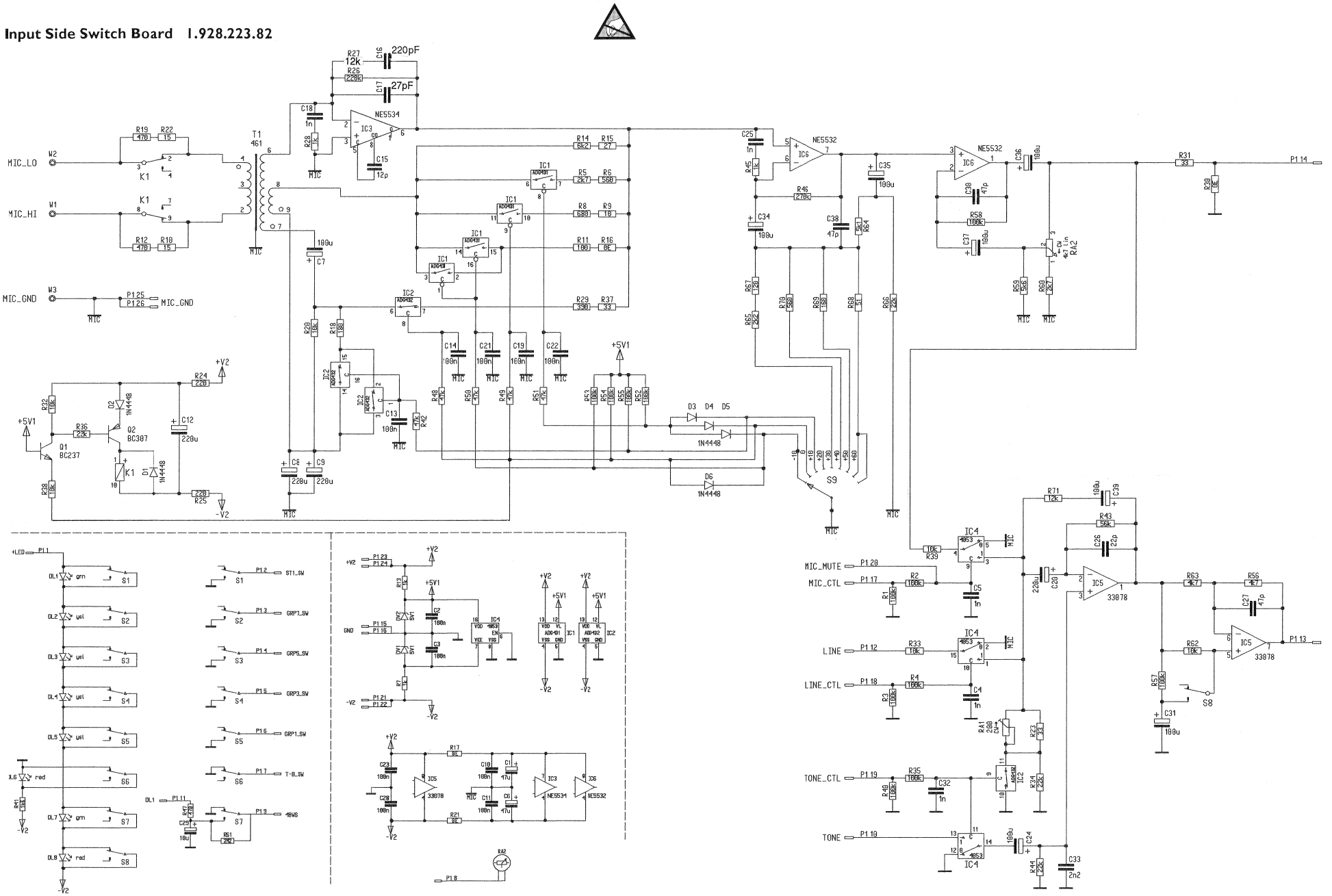
1.928.227.xx INPUT UNIT W OPT.2MIC INP

MP	56	1.928.201.46		push buton mic2

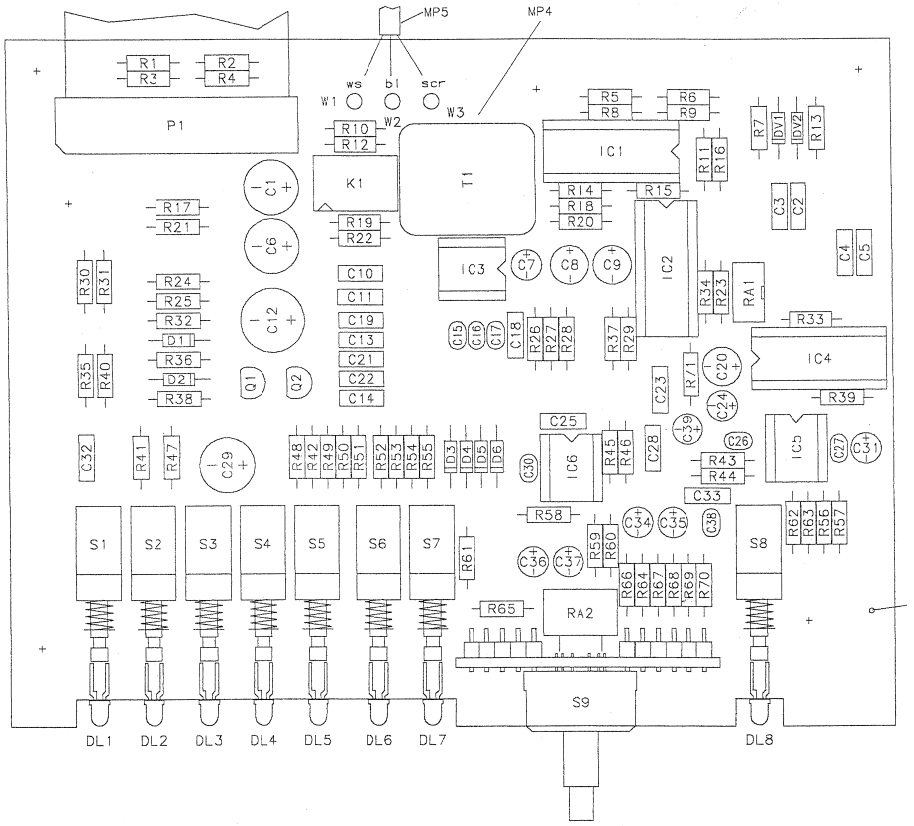
1.928.229.xx INPUT UNIT W OPT.HL TRAFO+2MIC

C	78	59.22.4002		100uF 16V
C	99	not used		
C	114	not used		
C	118	59.06.0682		6n8 63V
MP	56	1.928.201.46		push buton mic2
MP	90	1.022.400.03		isolation for T1
R	50	57.11.3472		4k7
R	51	57.11.3151		150R
R	52	57.11.3332		3k3
R	151	57.11.3392		3k9
T	1	1.022.451.00		transformator

Input Side Switch Board 1.928.223.82



Input Side Switch Board 1.928.223.82



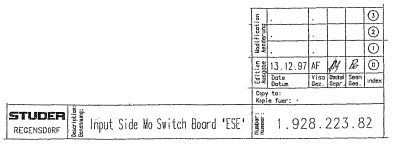
Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	C 1	not used		47u	EL 4CV 20% RM5
0	C 2	56.06.0104		100n	PETP, 63V, 10%, RM5
0	C 3	56.06.0104		100n	PETP, 63V, 10%, RM5
0	C 4	56.06.0102		1n0	PETP, 63V, 10%, RM5
0	C 5	56.06.0102		1n0	PETP, 63V, 10%, RM5
0	C 6	not used		47u	EL 40V 20% RM5
0	C 7	59.22.4002		100u	EL 16V 20% RM5
0	C 8	59.22.3003		220u	EL 10V 20% RM5
0	C 9	59.22.3003		220u	EL 10V 20% RM5
0	C 10	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 11	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 12	59.22.5221		220u	EL 25V 20% RM5
0	C 13	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 14	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 15	not used		12p	CER 63V, 5%, NP 0
2	C 16	59.34.4221		220p	CER 63V, 5%, N750
1	C 17	59.34.2270		27p	CER 63V, 5%, N150
0	C 18	not used		1n0	PETP, 63V, 10%, RM5
0	C 19	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 20	59.22.3003		220u	EL 10V 20% RM5
0	C 21	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 22	59.06.0104		100n	PETP, 63V, 10%, RM5

Idx.	Pos.	Part No.	Qty.	Type/Val.	Description
0	C 23	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 24	59.22.4002		100uF	EL 16V, 20%, RM5
0	C 25	not used		1n0	PETP, 63V, 10%, RM5
0	C 26	59.34.2220		22p	CER 63V, 5%, N150
0	C 27	59.34.2470		47p	CER 63V, 5%, N150
0	C 28	59.06.0104		100n	PETP, 63V, 10%, RM5
0	C 29	59.22.8100		10u	EL 63V, 20%, RM5
0	C 30	59.34.2470		47p	CER 63V, 5%, N150
0	C 31	59.22.4002		100uF	EL 16V, 20%, RM5
0	C 32	59.06.0102		1n0	PETP, 63V, 10%, RM5
0	C 33	59.06.0222		2n2	PETP, 63V, 10%, RM5
0	C 34	59.22.4002		100uF	EL 16V, 20%, RM5
0	C 35	59.22.4002		100uF	EL 16V, 20%, RM5
0	C 36	59.22.4002		100uF	EL 16V, 20%, RM5
0	C 37	59.22.4002		100uF	EL 16V, 20%, RM5
0	C 38	59.34.2470		47p	CER 63V, 5%, N150
0	C 39	59.22.4002		100uF	EL 16V, 20%, RM5
0	D 1	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 2	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 3	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 4	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 5	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 6	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	DL 1	50.04.2206		934GT	LED 3mm green
0	DL 2	50.04.2205		934YT	LED 3mm yellow
0	DL 3	50.04.2205		934YT	LED 3mm yellow
0	DL 4	50.04.2205		934YT	LED 3mm yellow
0	DL 5	50.04.2205		934YT	LED 3mm yellow
0	DL 6	50.04.2204		934ID	LED 3mm red
0	DL 7	50.04.2206		934GT	LED 3mm green
0	DL 8	50.04.2204		934ID	LED 3mm red
0	DV 1	50.04.1112		5V1	Zener, 5%, 0.5W, DO-35
0	DV 2	50.04.1112		5V1	Zener, 5%, 0.5W, DO-35
0	IC 1	50.19.0303		ADG431	Quad SPST make
0	IC 2	50.19.0304		ADG432	Quad SPST brake
0	IC 3	50.05.0244		NE553<AN	IC 5534 ANB, NE 5534 SAN, ,A
0	IC 4	50.07.0015		4053B	IC .. 4053 .. ,A
0	IC 5	50.09.0117		MC33078	IC MC 33078 P
0	IC 6	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	K 1	56.04.0197		2u	24V 125V 2A Ag/Au
0	MP 1	1.928.223.13			INPUT SIDE MO PCB
0	MP 2	1.928.223.04			NR. ETIKETTE 5X20
0	MP 3	43.01.0108		Label	ESE-WARNSCHILD
0	MP 4	1.022.400.03			ISOLATION
0	MP 5	1.928.223.94			KL-Input Side Board
1	MP 6	43.10.0110		A	Revisions-Etikette 5mm h'blau
0	P 1	1.023.112.09			FLACHKABEL 26 POL. 0,045M
0	Q 1	50.03.0436		BC237B	BC 237 B, 547 B, 550 B,
0	Q 2	50.03.0515		BC307B	BC 307 B , BC 557 B ,PNP
0	R 1	57.11.3104		100k	MF, 1%, 0207
0	R 2	57.11.3104		100k	MF, 1%, 0207
0	R 3	57.11.3104		100k	MF, 1%, 0207
0	R 4	57.11.3104		100k	MF, 1%, 0207
0	R 5	57.11.3272		2k7	MF, 1%, 0207
0	R 6	57.11.3561		560R	MF, 1%, 0207
0	R 7	57.11.3102		1k0	MF, 1%, 0207
0	R 8	57.11.3681		680R	MF, 1%, 0207
0	R 9	57.11.3100		10R	MF, 1%, 0207
0	R 10	57.11.3150		15R	MF, 1%, 0207
0	R 11	57.11.3101		100R	MF, 1%, 0207
0	R 12	57.11.3471		470R	MF, 1%, 0207
0	R 13	57.11.3102		1k0	MF, 1%, 0207
0	R 14	57.11.3622		6k2	MF, 1%, 0207
0	R 15	57.11.3270		27R	MF, 1%, 0207
0	R 16	57.11.3000		0R0	MF, 0207
0	R 17	57.11.3000		0R0	MF, 0207
0	R 18	57.11.3181		180R	MF, 1%, 0207
0	R 19	57.11.3471		470R	MF, 1%, 0207
0	R 20	57.11.3103		10k	MF, 1%, 0207
0	R 21	57.11.3000		0R0	MF, 0207
0	R 22	57.11.3150		15R	MF, 1%, 0207

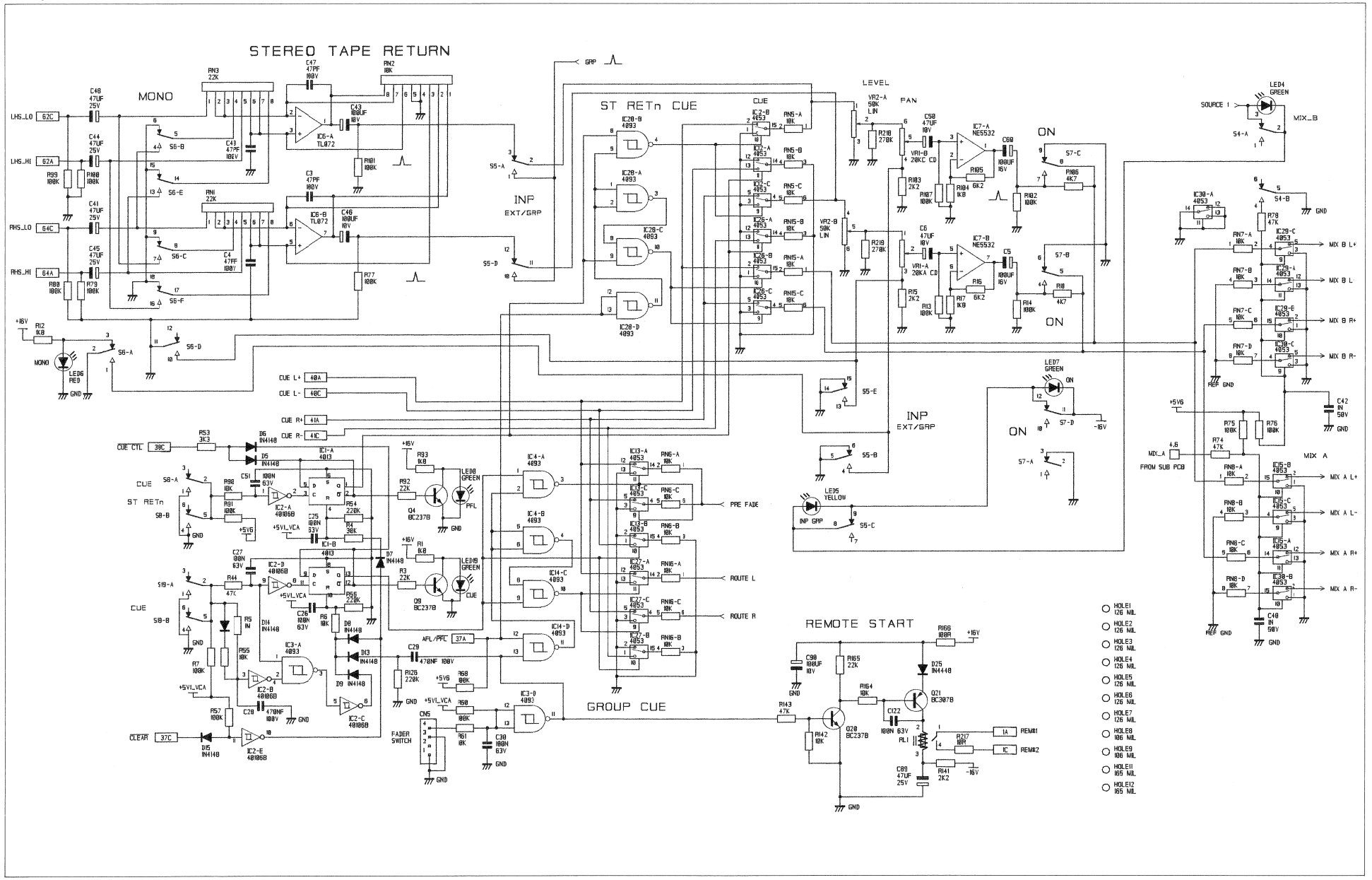
Idx.	Pos.	Part No.	Qty.	Type/Val.	Description
0	R 23	57.11.3330		33R	MF, 1%, 0207
0	R 24	57.11.3221		220R	MF, 1%, 0207
0	R 25	57.11.3221		220R	MF, 1%, 0207
0	R 26	57.11.3224		220k	MF, 1%, 0207
0	R 27	57.11.3823		12k	MF, 1%, 0207
0	R 28	not used		1k0	MF, 1%, 0207
0	R 29	57.11.3391		390R	MF, 1%, 0207
0	R 30	57.11.3000		0R0	MF, 0207
0	R 31	not used		33R	MF, 1%, 0207
0	R 32	57.11.3103		10k	MF, 1%, 0207
0	R 33	57.11.3103		10k	MF, 1%, 0207
0	R 34	57.11.3223		22k	MF, 1%, 0207
0	R 35	57.11.3104		100k	MF, 1%, 0207
0	R 36	57.11.3223		22k	MF, 1%, 0207
0	R 37	57.11.3330		33R	MF, 1%, 0207
0	R 38	57.11.3103		10k	MF, 1%, 0207
0	R 39	57.11.3103		10k	MF, 1%, 0207
0	R 40	57.11.3104		100k	MF, 1%, 0207
0	R 41	57.11.3152		1k5	MF, 1%, 0207
0	R 42	57.11.3473		47k	MF, 1%, 0207
0	R 43	57.11.3563		56k	MF, 1%, 0207
0	R 44	57.11.3223		22k	MF, 1%, 0207
0	R 45	not used		1k0	MF, 1%, 0207
0	R 46	57.11.3274		270k	MF, 1%, 0207
0	R 47	57.11.3471		470R	MF, 1%, 0207
0	R 48	57.11.3473		47k	MF, 1%, 0207
0	R 49	57.11.3473		47k	MF, 1%, 0207
0	R 50	57.11.3473		47k	MF, 1%, 0207
0	R 51	57.11.3473		47k	MF, 1%, 0207
0	R 52	57.11.3104		100k	MF, 1%, 0207
0	R 53	57.11.3104		100k	MF, 1%, 0207
0	R 54	57.11.3104		100k	MF, 1%, 0207
0	R 55	57.11.3104		100k	MF, 1%, 0207
0	R 56	57.11.3472		4k7	MF, 1%, 0207
0	R 57	57.11.3104		100k	MF, 1%, 0207
0	R 58	57.11.3104		100k	MF, 1%, 0207
0	R 59	57.11.3562		5k6	MF, 1%, 0207
0	R 60	57.11.3272		2k7	MF, 1%, 0207
0	R 61	57.11.5225		2M2	MF, 5%, 0207
0	R 62	57.11.3103		10k	MF, 1%, 0207
0	R 63	57.11.3472		4k7	MF, 1%, 0207
0	R 64	57.11.3512		5k1	MF, 1%, 0207
0	R 65	57.11.3222		2k2	MF, 1%, 0207
0	R 66	57.11.3223		22k	MF, 1%, 0207
0	R 67	57.11.3121		120R	MF, 1%, 0207
0	R 68	57.11.3510		51R	MF, 1%, 0207
0	R 69	57.11.3161		160R	MF, 1%, 0207
0	R 70	57.11.3561		560R	MF, 1%, 0207
0	R 71	57.11.3123		12k	MF, 1%, 0207
0	RA 1	58.01.9201		200R	Cermet, 10%, 0.5W, vertical
0	RA 2	1.010.123.58		Pot	POT 4K7 LIN;
0	S 1	55.15.0931		2*u	rastend
0	S 2	55.15.0931		2*u	rastend
0	S 3	55.15.0931		2*u	rastend
0	S 4	55.15.0931		2*u	rastend
0	S 5	55.15.0931		2*u	rastend
0	S 6	55.15.0932		2*u	impuls
0	S 7	55.15.0931		2*u	rastend
0	S 8	55.15.0931		2*u	rastend
0	S 9	1.928.206.00			INPUT MIC SWITCH BOARD
0	T 1	1.022.461.00			HIGH-LEVEL MIC INPUT

End of List

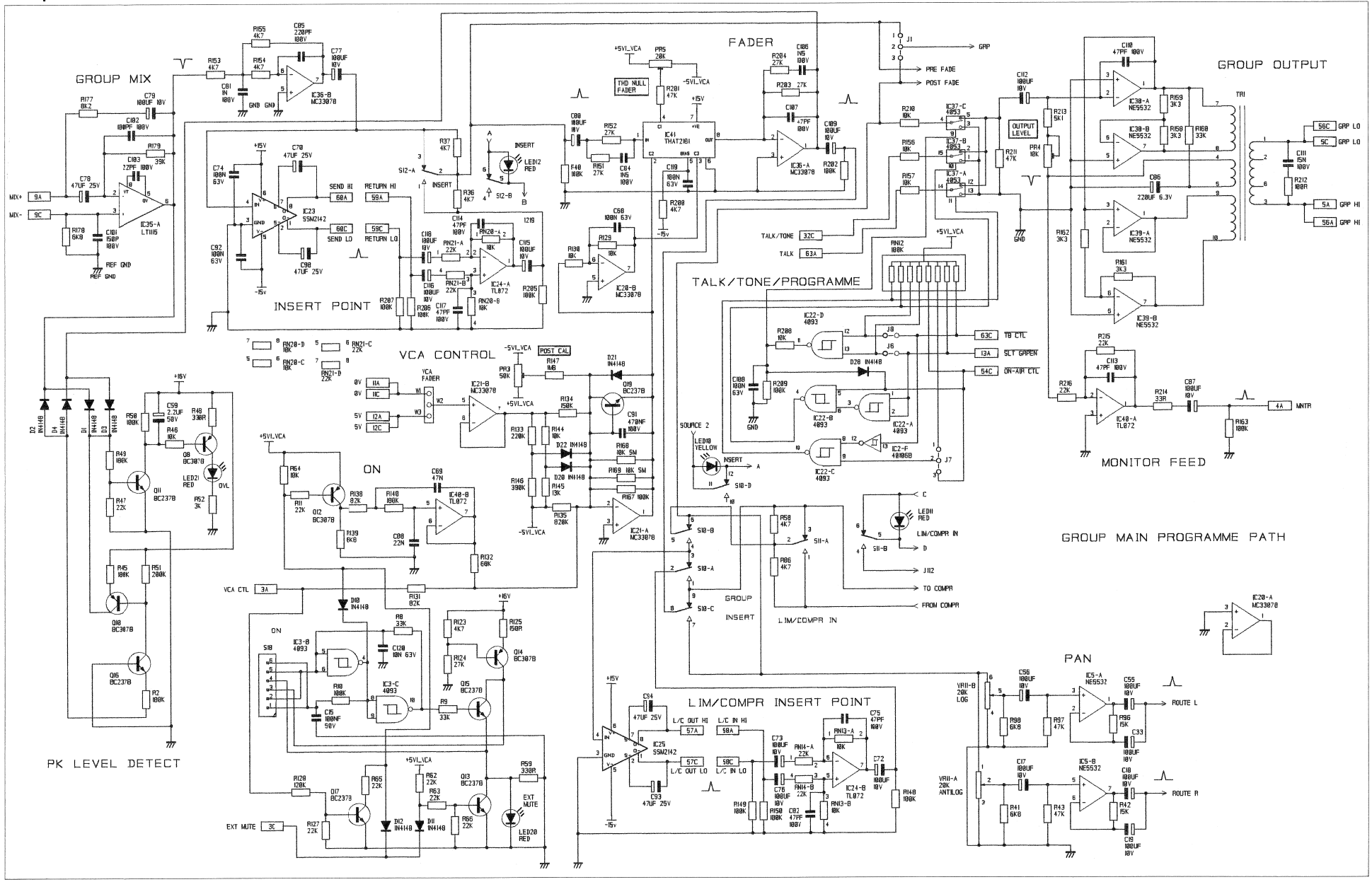
Comments



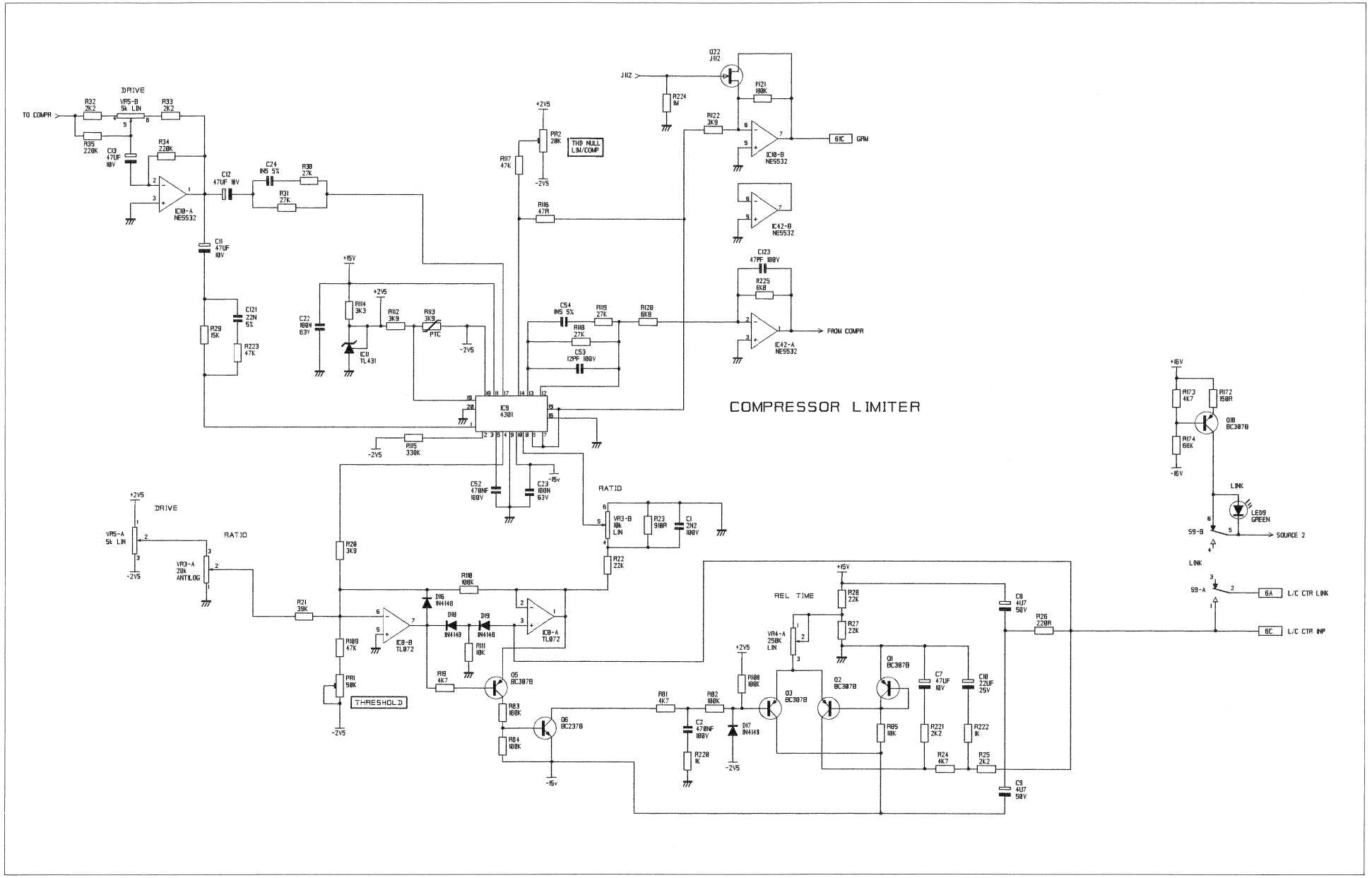
Group Unit Mono 1.928.230.83



Group Unit Mono 1.928.230.83



Group Unit Mono 1.928.230.83



Group Unit Mono 1.928.230.83

