

# STUDER 970

## AUDIO CONSOLE



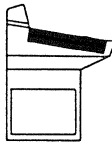
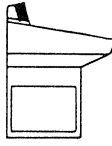
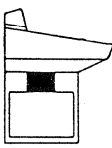
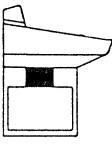
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**1 Allgemeine Daten**

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**1 General Information**

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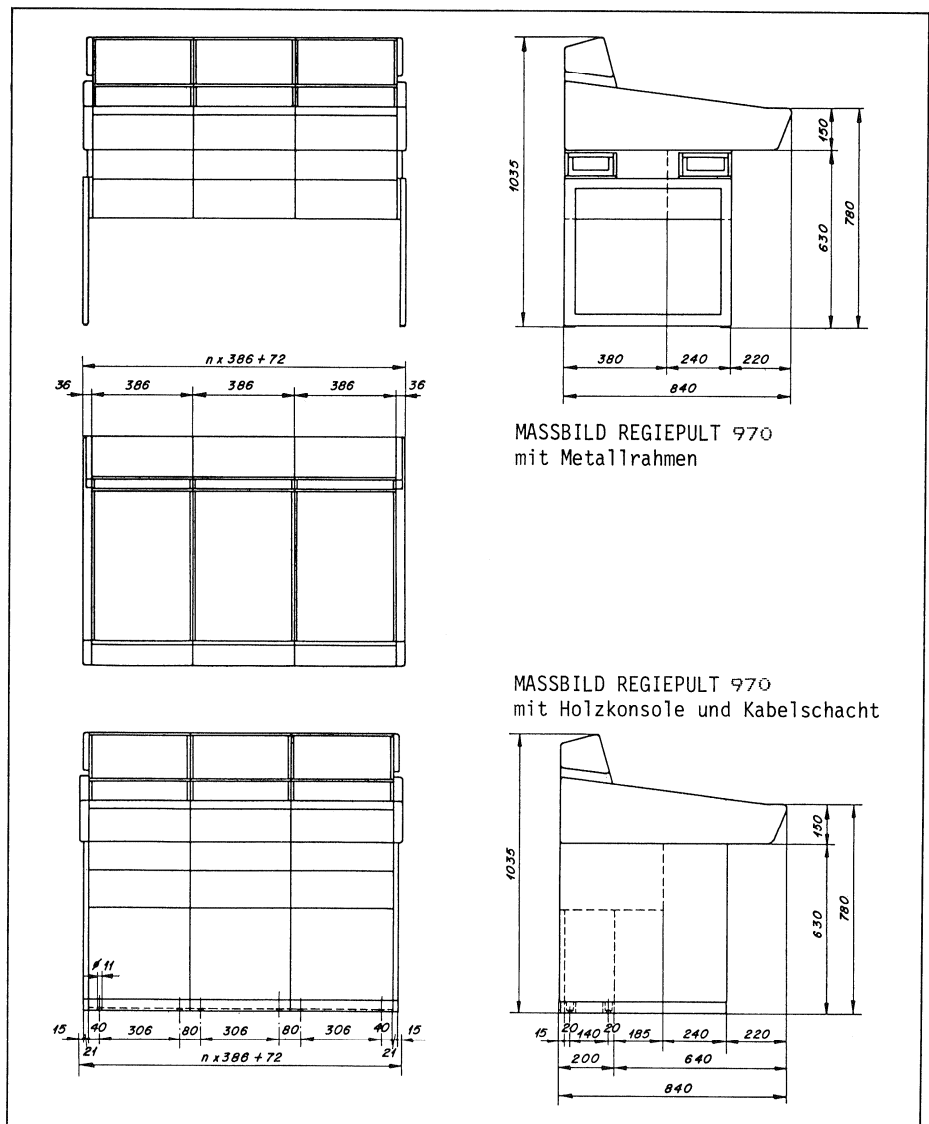
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# 1 Allgemeine Daten

## 1. Mechanische Abmessungen

Die Regiepulte 970 werden wahlweise mit einfach demontierbarem Stahlrohr-  
rahmen für den transportablen Einsatz oder mit Holzkonsole und Kabelschacht  
zum festen Einbau geliefert.

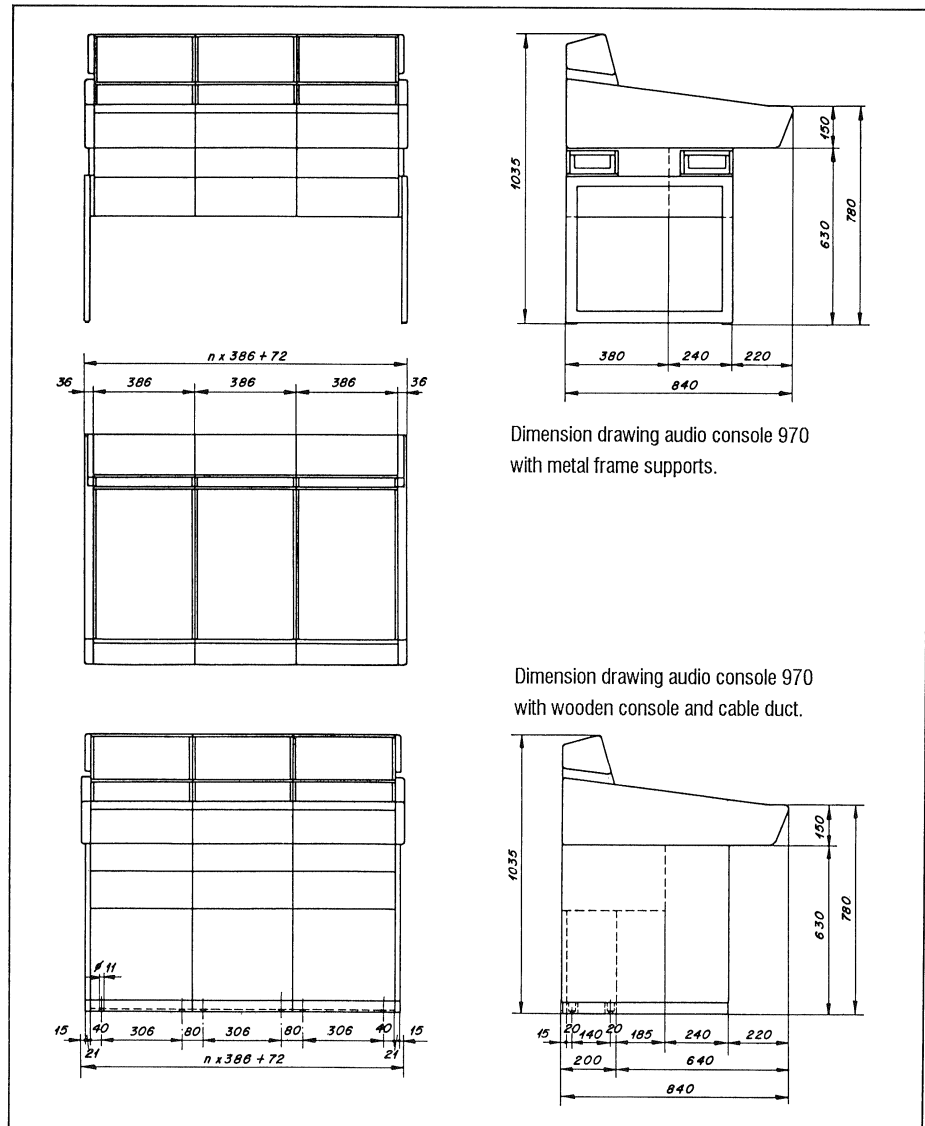
Die Regiepultbreite richtet sich nach der Anzahl der zusammengefügt me-  
chanischen Grundeinheiten.



## 1. Dimensions

The audio console 970 is available with removable metal frame support for OB application as also as a wooden console with integrated cable duct for stationary use.

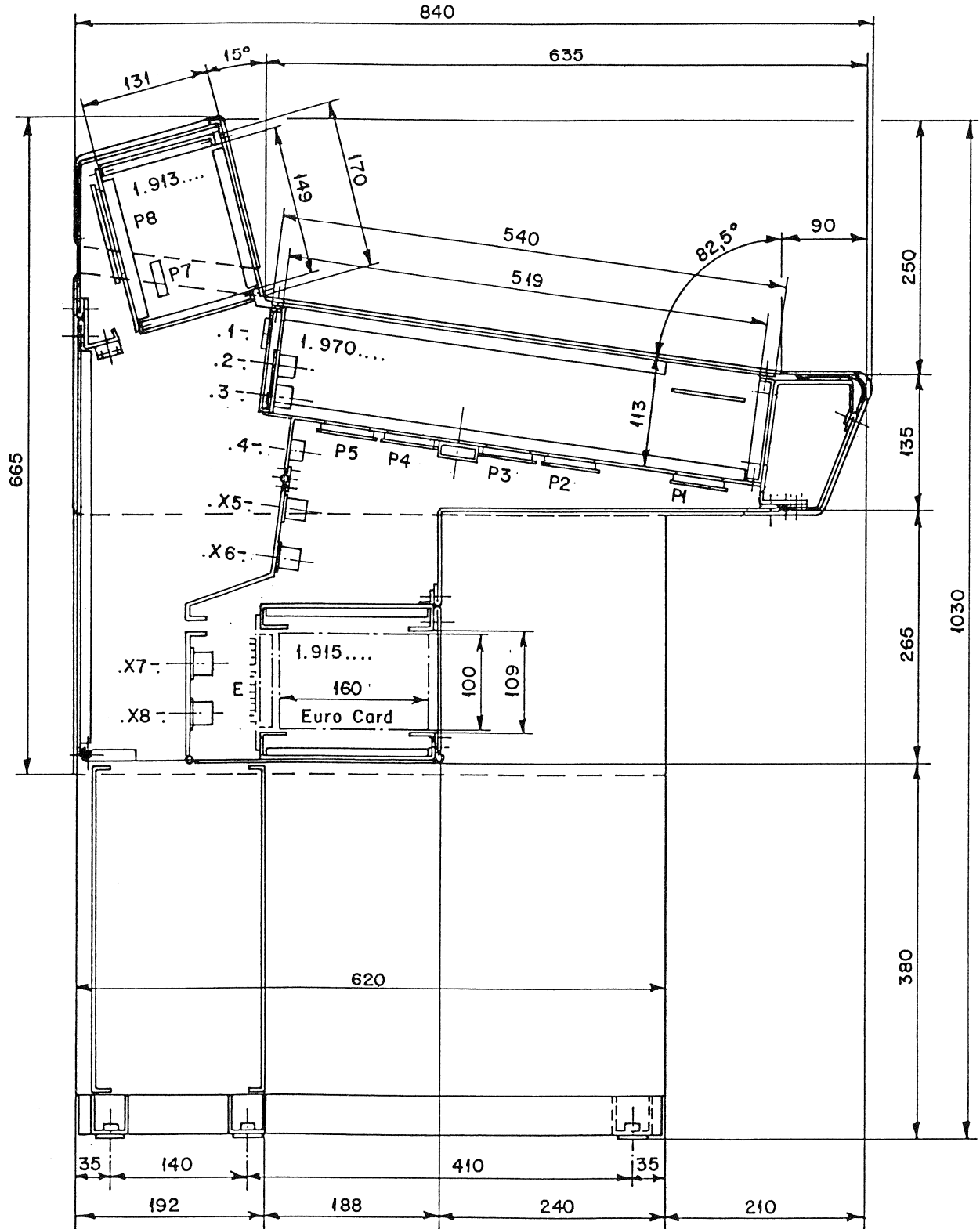
The console width depends on the number of combined baseframes.



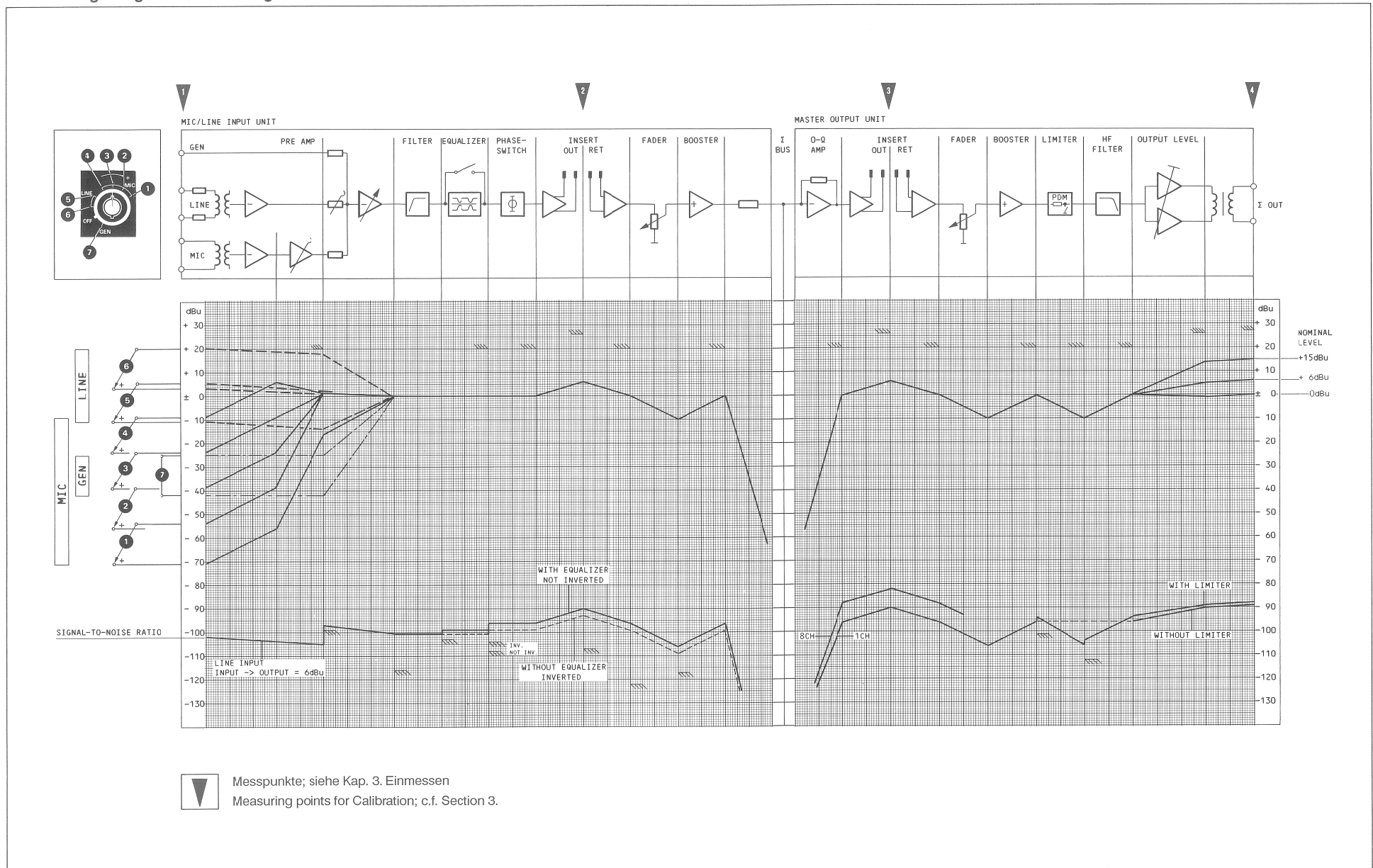
Dimension drawing audio console 970 with metal frame supports.

Dimension drawing audio console 970 with wooden console and cable duct.

1.1 Querschnitt Regiepult 970 / Cut Mixing Console 970



2. Pegeldiagramm / Level Diagram



### 3. Technische Daten

**Allgemeines:**

- Spannungen in dBu beziehen sich immer auf 0,775V.

<b>0 dBu <math>\hat{=}</math> 0,775 V</b>
---

- Alle Eingangskanal- und Summen-Flachbahnregler sind in Stellung 0 dB positioniert.
- Leitungsausgänge sind mit 600 $\Omega$  abgeschlossen.
- Externe Quellen haben einen Quellenwiderstand von  $\leq 200\Omega$ .
- Die Angaben gelten im Bereich von 31,5 Hz... 16 kHz.
- PPM-Version, Leitungspegel +6 dBu  
VU-Version, nominaler Ausgangspegel 0 VU  $\hat{=}$  +4 dBu
- Einsatzpunkt des Ausgangslimiters  $\hat{=}$  Spitzen-Ausgangspegel +6 VU  $\hat{=}$  +10 dBu

**Pegel:**

- |  |              |
|--|--------------|
| Empfindlichkeit Mikrofoneingang                | -69...-9 dBu |
| Empfindlichkeit Leitungseingang                | -9...+21 dBu |
| Empfindlichkeit Tape Eingang                   | +4...+21 dBu |
| Pegel an Einschleifpunkten und Direktausgängen | +6 dBu       |
| Ausgangspegel, Einstellbereich                 | +6...+15 dBu |
| Monitorpegel (symmetrisch, unbelastet)         | +6...+15 dBu |

**Gleichtaktunterdrückung:**

- |                 |                     |
|-----------------|---------------------|
| Mikrofoneingang | 15 kHz $\geq$ 60 dB |
| Leitungseingang | 15 kHz $\geq$ 50 dB |

**Impedanzen:**

- |                                      |                            |
|--------------------------------------|----------------------------|
| Mikrofoneingang                      | $\geq 1,6 \text{ k}\Omega$ |
| Leitungseingang/Tape Eingang         | $\geq 10 \text{ k}\Omega$  |
| Quellenimpedanz der Leitungsausgänge | $\leq 40 \Omega$           |

**Frequenzgänge:**

- |   |                     |
|---|---------------------|
| Filter ausgeschaltet<br>3 dB-Eckpunkte                        | +0,5...-1 dB        |
| Filter ausgeschaltet<br>(ausserhalb kontinuierlich abfallend) | ca. 4,5 Hz/40 kHz   |
| Trittschallfilter 12 dB/Oktave, -3 dB                         | 75 Hz $\pm$ 5 Hz    |
| Höhenregler, 20 kHz   | $\pm 15 \text{ dB}$ |
| Tiefenregler, 20 Hz   | $\pm 15 \text{ dB}$ |
| Präsenzfilter   | Q = 1               |
| einstellbar von 150 Hz...7 kHz                                | $\pm 11 \text{ dB}$ |

**Übersteuerungsreserven:**

- |   |         |
|---|---------|
| Mikrofoneingang, Maximalpegel für $K_3=1\%/31,5 \text{ Hz}$ | +6 dBu  |
| Leitungseingang, Maximalpegel für $K_3=1\%/31,5 \text{ Hz}$ | +24 dBu |
| Vor Kanalregler ( $K_{\text{tot}}=1\%$ )                    | 20 dB   |
| Vor Summenregler ( $K_{\text{tot}}=1\%$ )                   | 20 dB   |
| Maximalpegel der Leitungsausgänge, $R_L=300 \Omega$         | +24 dBu |



## STUDER AUDIO CONSOLE 970

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<b>Rauschspannung, unbewertet, MIKROFON:</b>	<ul style="list-style-type: none"><li>■ nach IEC 468-2 (DIN 45405) Äquivalente Eingangsräuschspannung mit einer Rauschbandbreite von 23 kHz, Quellenimpedanz = 200 <math>\Omega</math></li></ul>	<b><math>\leq -125</math> dBu</b>
<b>Störspannungsabstand:</b>	<ul style="list-style-type: none"><li>■ PPM-Version, bezogen auf Leitungspegel +6 dBu</li><li>■ VU-Version, bezogen auf Spitzenausgangspegel +6 VU <math>\hat{=} +10</math> dBu</li><li>■ Am Summenausgang, Summenregler geschlossen <b><math>\geq 95</math> dB</b></li><li>■ Ein Kanal, Eingangs- und Summenregler in Position 0 dB, Verstärkung Eingang <math>\rightarrow</math> Ausgang = 1;<ul style="list-style-type: none"><li>- ohne Filter <b><math>\geq 93</math> dB</b></li><li>- mit Filter, linear <b><math>\geq 92</math> dB</b></li></ul></li><li>■ 11 Kanäle, alle Fader in Position 0 dB, Verstärkung Eingang <math>\rightarrow</math> Ausgang = 1;<ul style="list-style-type: none"><li>- ohne Filter <b><math>&gt; 85</math> dB</b></li><li>- mit Filter, linear <b><math>&gt; 83</math> dB</b></li></ul></li></ul>	
<b>Klirrdämpfung:</b>	<ul style="list-style-type: none"><li>■ PPM-Version, gemessen mit Leitungspegel +6 dBu.</li><li>■ VU-Version, gemessen mit nominalem Ausgangspegel 0 VU oder Spitzen-Ausgangspegel +6 VU</li><li>■ Verstärkung = 1, 31,5 Hz...16 kHz <b><math>&lt; 70</math> dB</b></li><li>■ alle zulässigen Pegel, gemäss Pegeldiagramm, 60 Hz...10 kHz <b><math>&lt; 60</math> dB</b></li></ul>	
<b>Übersprechdämpfung:</b>	<ul style="list-style-type: none"><li>■ von Kanal zu Kanal<ul style="list-style-type: none"><li>- ohne Panorama-Potentiometer <b><math>&gt; 80</math> dB</b></li><li>- mit Panorama-Potentiometer <b><math>&gt; 70</math> dB</b></li></ul></li><li>■ Kanalwahlschalter ausgeschaltet <b><math>&gt; 90</math> dB</b></li><li>■ Faderdämpfung - Eingangsregler <b><math>&gt; 100</math> dB</b></li><li>- Ausgangsregler <b><math>&gt; 90</math> dB</b></li></ul>	
<b>Stromversorgung:</b>	<ul style="list-style-type: none"><li>■ Netzspannungen, umschaltbar <b>100...240V, <math>\pm 10\%</math></b></li><li>■ Leistungsaufnahme (970/3) <b>ca. 150 VA</b></li><li>■ Interne Betriebsspannungen;<ul style="list-style-type: none"><li>- Verstärkerschaltungen <b><math>\pm 15V</math></b></li><li>- Logik-Schaltkreise <b>-6V</b></li><li>- Mikrofon-Phantomspeisung <b>+48V</b></li></ul></li></ul>	
<b>Umgebungstemperatur:</b>	<ul style="list-style-type: none"><li>■ Betriebs-Temperaturbereich <b>0°C...+50°C (34°F...122°F)</b></li></ul>	
<b>Luftfeuchtigkeit:</b>	<ul style="list-style-type: none"><li>■ gemäss DIN 40040, Kategorie F</li></ul>	
<b>Sicherheit-Standard:</b>	<ul style="list-style-type: none"><li>■ gemäss IEC-Empfehlung, Publikation 65, Schutzklasse 1</li></ul>	

### 3. Technical Data

**General:**

- Voltage specification dBu

<b>0 dBu <math>\cong</math> 0.775 V</b>
---

- Channel input faders and master faders are set to 0 dB mark.
- Line outputs are terminated with 600 $\Omega$ .
- External sources have a source impedance of  $\leq 200\Omega$
- All data are valid within the frequency band from 31.5 Hz to 16 kHz.
- PPM version, line level +6 dBu
- VU version, nominal output level 0 VU  $\cong$  +4 dBu
- Attack point of output limiter  $\cong$  peak output level +6 VU  $\cong$  +10 dBu

**Levels:**

- |   |   |               |
|---|---|---------------|
| ■ | Microphone input sensitivity                        | -69 to -9 dBu |
| ■ | Line input sensitivity                              | -9 to +21 dBu |
| ■ | Tape input sensitivity                              | +4 to +21 dBu |
| ■ | Level at insertion points and tape inputs           | +6 dBu        |
| ■ | Output level, adjustable within                     | +6 to 15 dBu  |
| ■ | Monitor level (transformerless, balanced, unloaded) | +6 to +15 dBu |

**Common mode rejection:**

- |   |                  |                     |
|---|------------------|---------------------|
| ■ | Microphone input | 15 kHz $\geq$ 60 dB |
| ■ | Line input       | 15 kHz $\geq$ 50 dB |

**Impedances:**

- |   |  |                            |
|---|--|----------------------------|
| ■ | Impedance of microphone input          | $\geq 1.6 \text{ k}\Omega$ |
| ■ | Impedance of line input and tape input | $\geq 10 \text{ k}\Omega$  |
| ■ | Internal impedance of line outputs     | $\leq 40 \Omega$           |

**Frequency response:**

- |   |  |   |
|---|--|---|
| ■ | Filters switched off<br>3 dB points                                  | +0.5 to -1 dB                           |
| ■ | filters switched off<br>(continuously decreasing outside this range) | $\approx 4.5 \text{ Hz}/40 \text{ kHz}$ |
| ■ | Bass cut 12 dB/octave, -3 dB   | 75 Hz $\pm$ 5 Hz                        |
| ■ | High frequency equalizer, shelving at 20 kHz                         | $\pm 15 \text{ dB}$                     |
| ■ | Low frequency equalizer, shelving at 20 Hz                           | $\pm 15 \text{ dB}$                     |
| ■ | Presence equalizer   | Q = 1                                   |
| ■ | mid-frequency adjustable from 150 Hz to 7 kHz                        | $\pm 11 \text{ dB}$                     |

**Overload margin:**

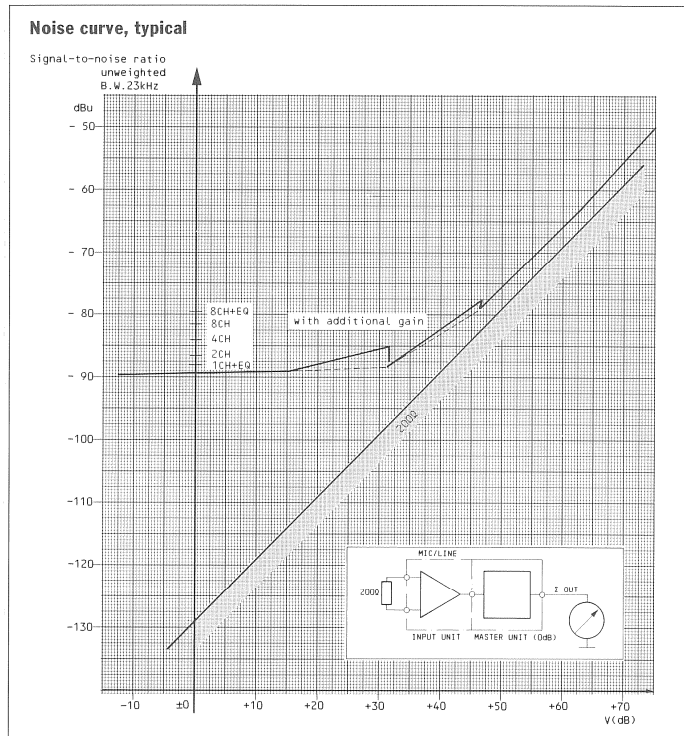
- |   |   |         |
|---|---|---------|
| ■ | Microphone input, max. level for 1% third harmonic at 31.5 Hz | +6 dBu  |
| ■ | Line input, max. level for 1% third harmonic at 31.5 Hz       | +24 dBu |
| ■ | Head room before channel fader (1% THD)                       | 20 dB   |
| ■ | Head room before master fader (1% THD)                        | 20 dB   |
| ■ | Max. line output level, $R_L=300\Omega$                       | +24 dBu |

**Unweighted noise voltage  
MICROPHONE:**

- |   |  |                         |
|---|--|-------------------------|
| ■ | according to IEC 468-2 (DIN 454005) Equivalent<br>input noise at bandwidth 23 kHz, 200 $\Omega$ terminated | $\leq -125 \text{ dBu}$ |
|---|--|-------------------------|



3.1 Rauschkurve, typisch / Noise curve, typical



## 2 Blockschaltbilder

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2.1 Blockschaltbild: Signalisations und Fernsteuerungen  
Block diagram: Signalization and Remote Control Facilities

1.970.000

2. Signalisation und Fernsteuerung

Das Mischpult 970 ist mit drei Signalisations- und Fernsteuersystemen ausgerüstet.

- Reglerstart mit galvanisch getrennten Relaiskontakten für jede Eingangseinheit.
- Studio Signalisation mit Rot-, Grün-, und Gelblicht.
- Fernsteuermöglichkeit der Kanalstummenschaltung (Mute-Funktion) zum Einsatz als Räumertaste oder "Video follow audio" Durchschaltung.

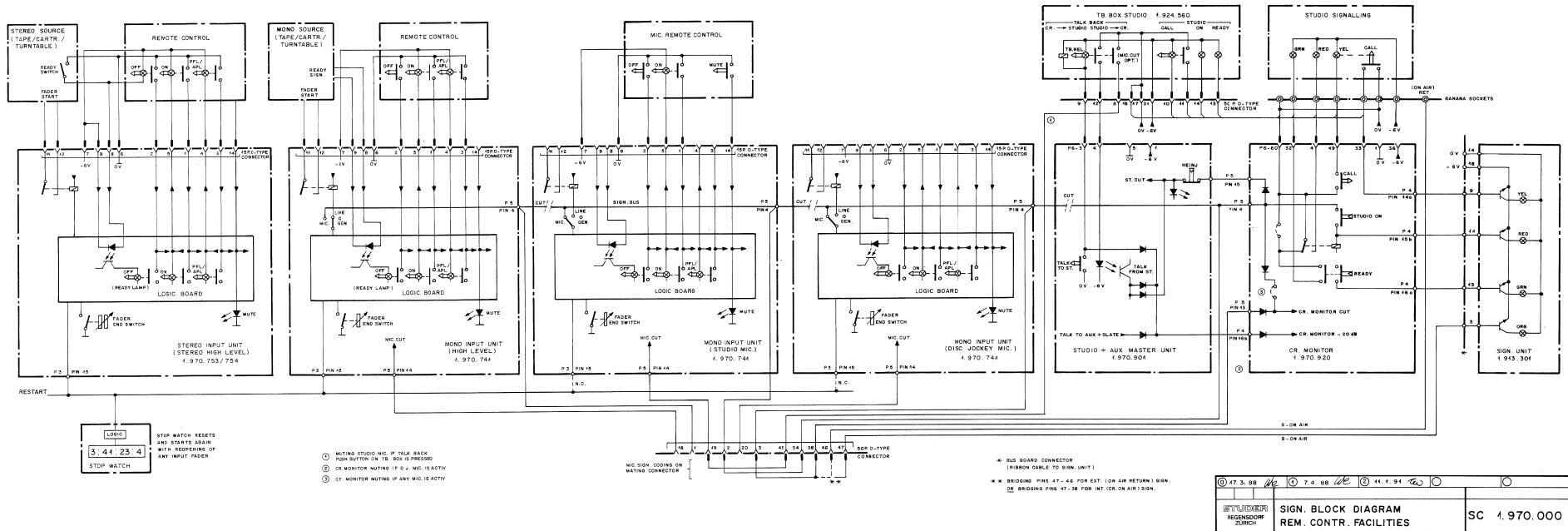
Mit der Funktion Restart wird die Stopuhr automatisch zurückgesetzt und neu gestartet, wenn der Flachbahnregler einer beliebigen Eingangseinheit geöffnet wird.

2. Signalization and Remote Control

The STUDER audio console 970 is equipped with three controlling systems:

- Faderstart with physically separated relay contacts per input unit.
- Studio signaling system with red, green and yellow lights.
- Remote control facility for the mute function. (cough button/"video follows audio")

The restart function resets and restarts the stop watch at the opening of any input fader.



### 3 Einmessen

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### 3 Einmessen

#### 1. Allgemeines

##### 1.1 Pegel-Definition

- Relative Pegelangaben in dBu

$$0 \text{ dBu} \cong 0,775 V_{\text{eff}}$$

Nennpegelangaben in dBu basieren ausschliesslich auf einem festgelegten Spannungswert als Bezugsgrösse:

Die Bezugsgrösse 0,775V des relativen Spannungspegels in dBu wurde von der Wertdefinition des absoluten Spannungspegels in dBm übernommen; jedoch ohne Bindung an die Definition (600Ω/1mW).

- Nennpegel in dBu

**Nennpegel = Studiopegel bei Vollaussteuerung**

Der Nennpegel (auch Leitungspegel) entspricht dem Studiopegel bei Vollaussteuerung.

Typische Nennpegel sind:

+	6dBu	≅	1,55V <sub>eff.</sub>
+	10dBu	≅	2,45V <sub>eff.</sub>
+	15dBu	≅	4,36V <sub>eff.</sub>

- Aussteuerungspegel

**0 dB PPM = Nennpegel**  
**0 VU = Nennpegel minus 6 dB\***

\* entspricht einem verbreiteten Wert für den Vorlauf (Lead) des VU-Instrumentes.

- Verstärkungs-/Dämpfungsmasse in dB

Relative Pegelangaben in dB geben Auskunft über das Verstärkungs-/Dämpfungsmass einer aktiven (z.B. Verstärkerstufe), resp. passiven (z.B. Flachbahnregler) Schaltungskomponente, innerhalb eines Schaltkreises.

Einige Beziehungen (approximative Faktoren):

	dB	0	1	2	3	6	10	15	20
Faktor ( $\approx$ )	Verstärkung	1	1,1	1,2	1,4	2	3,2	5,6	10
	Dämpfung	1	0,9	0,8	0,7	0,5	0,3	0,2	0,1

## 1.2 Voraussetzungen

---

**Hinweise:** Jedes ab Herstellerwerk ausgelieferte Mischpult verfügt über ein Prüfprotokoll, in dem die Daten der Endprüfung eingetragen sind, wie:

- Abgleich auf kundenspezifischen Nennpegel
- Frequenzgang, Klirrfaktor, Geräuschabstand, Rauschspannung und Übersprechdämpfung.

Das Einmessen des Mischpultes ist bei Änderungen der Betriebsbedingungen (Nennpegel) am Einsatzort oder nach Modifikationen am Mischpult erforderlich. Eine turnusgemässe Wartungs-Einmessung wird bei dieser Generation von Mischpulten nicht mehr beansprucht.

Einziges Wartungsmassnahme bildet das nachfolgend beschriebene Entmagnetisieren der Eingangsübertrager.

### 1.3 Entmagnetisieren von Mikrofon- Eingangsübertragern

Unerlaubtes Anschliessen asymmetrischer Eingangsquellen oder unbeabsichtigter Masseschluss der a/b-Tonadern von Mikrofon-Eingängen mit zugeschalteter Phantomspeisung treiben die Eingangsübertrager in die Sättigung und bewirken deren permanente Magnetisierung (Remanenz).

Diese äussert sich nachteilig durch den sogenannten Mikrofonie-Effekt: Leichte mechanische Einwirkungen auf das Mischpult, z.B. das Antippen von Einschüben, bewirken eine hörbare Modulation über die Lautsprecher, auch bei nicht belegten Mikrofon-Eingängen.

Auch kann sich Remanenz in den Übertragern im Laufe längerer Betriebsdauer kumulieren.

Es empfiehlt sich deshalb, alle Mikrofon-Eingänge periodisch, und vor Einmessvorgängen, zu entmagnetisieren:

- Vorgehen:**
- Mischpult ausschalten  
(zum Schutze angeschlossener Lautsprecher).
  - NF-Generator an Mikrofon-Eingang anschliessen.  
Dieser muss ein gleichspannungsfreies Signal einspeisen, um eine unerwünschte Magnetisierung des Übertragers zu vermeiden.

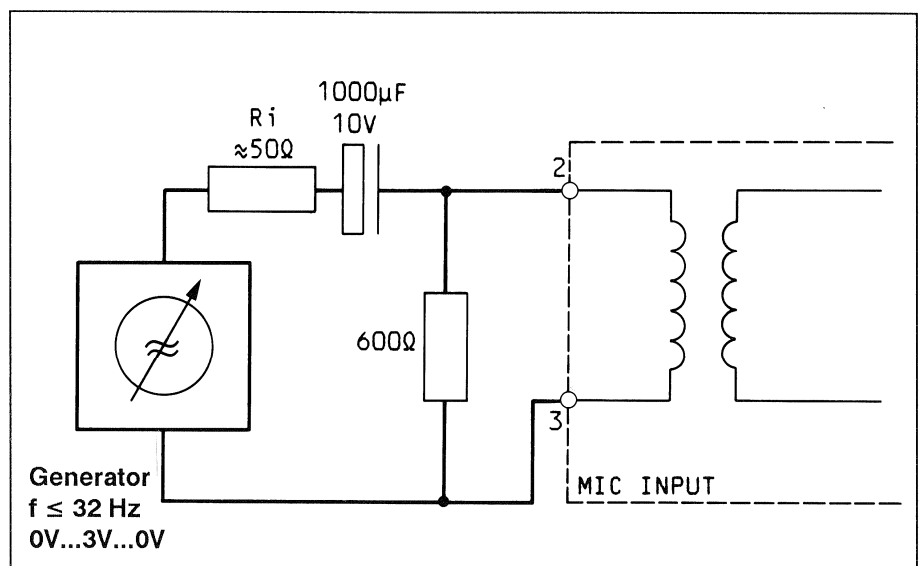


Fig. 1

- Kondensator  $C=1000\mu F/10V$  sperrt Gleichstrom-Anteile.
- Widerstand  $R_{600\Omega}$  dient der Entladung des Kondensators von Gleichstrom-Anteilen.
- Frequenz  $\leq 32\text{Hz}$  sukzessive auf Einspeispegel von  $0V \dots 3V$  erhöhen.
- Einspeispegel **langsam** auf  $0V$  zurückregeln.

## 1.4 Benötigte Messgeräte und Hilfsmittel

---

- Tonfrequenz-Generator 1kHz Sinus /  $R_s \leq 200\Omega$
- NF-Voltmeter,  $R_{z_{in}} \leq 10k\Omega$
- 2 Kanal Kathodenstrahl Oszillograph
- Abgleich-Schraubenzieher, Grösse 2
- Sammelschienen-Adapter zur Kontaktierung ausgebauter Einschübe mit der Sammelschiene. Es werden benötigt:
  - 3 Adapter mit 32 pol. Kontaktierung Best.-Nr. 1.228.322
  - 1 Adapter mit 64 pol. Kontaktierung Best.-Nr. 1.228.327
- Schaumstoffmatte, Abmessung ca. 400 x 250 mm, als Unterlage für ausgebaute, über den Adapter mit der Sammelschiene kontaktierte Einschübe (werden mit Vorteil auf das Bedienungsfeld des Mischpultes gelegt).

## 1.5 Messgrundlagen

---

**Hinweis:** Ab Herstellerwerk ausgelieferte (Ersatz-) Einschübe sind werkseitig abgeglichen und können direkt in das einzumessende Mischpult eingesetzt werden.

- Das Einmessen des Mischpultes erfolgt bei erreichter Betriebstemperatur (ca. 15 Minuten nach Einschalten).
- Einschleifpunkte (INSERTs), Monitor-, Vorhör- und Kommando- (TB-) Ausgänge sind nicht zu belasten.
- Leitungsausgänge sind mit  $600\Omega$  Last abzuschliessen.

**Prüfsignal:** 1 kHz / Sinus

**Pegelreferenz:** 0 dBu  $\cong 0,775V_{eff}$ .

## 1.6 Messaufbau

NF-Millivoltmeter und NF-Generator müssen grundsätzlich über symmetrische Ein- resp. Ausgänge verfügen. Asymmetrischen Messgeräten ist ein Symmetrier-Übertrager vorzuschalten.

**Hinweis:** Stehen keine Messgeräte mit symmetrischen Ein- resp. Ausgängen zur Verfügung, können asymmetrische Messgeräte wie folgt (behelfsmässig) beschaltet werden:

b-Leitung (3) mit Audiomasse (1) verbunden, bilden mit der a-Leitung (2) einen asymmetrischen Messpunkt. Diese Schaltung ist jedoch nicht für Messungen höherer Aussteuerungen anwendbar (Clipping-Effekt bei den transformatorlosen INSERT's).

Beim Umpegeln oder Einmessen des Mischpultes ist die aufgeführte Kapitelfolge einzuhalten!  
(manche Abgleiche bilden die Grundlage für nachfolgende Abgleichabläufe).

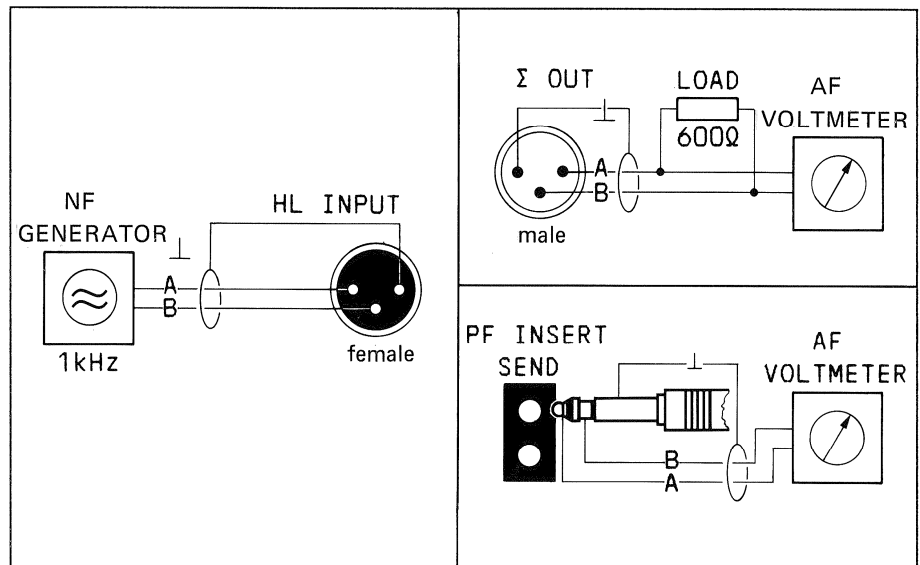


Fig. 2

### 3 Alignment

---

#### 1. General

---

##### 1.1 Level Definitions

---

- Relative level specification in dBu

$$0 \text{ dBu} \cong 0,775 V_{\text{eff}}$$

The nominal levels specified in dBu are strictly based on a defined voltage as the reference quantity:

The reference quantity 0,775V of the relative voltage level in dBu has been taken from the value definition of the absolute voltage level in dBm; however the definition (600Ω/1mW) has not been adopted.

- Nominal level in dBu

$$\text{Nominal level} = \text{Studio level at peak level}$$

The nominal level (also line level) corresponds to the studio peak level.

Typical nominal levels are:

+	6dBu	≅	1,55V <sub>eff</sub>
+	10dBu	≅	2,45V <sub>eff</sub>
+	15dBu	≅	4,36V <sub>eff</sub>

- Modulation level

$$\begin{aligned} 0 \text{ dB PPM} &= \text{Nominal level} \\ 0 \text{ VU} &= \text{Nominal level less 6 dB}^* \end{aligned}$$

\* Corresponds to a widely used value for VU instrument lead.

- Gain/attenuation in dB

Relative level specifications in dB give information on the gain/attenuation of an active (e.g. amplifier stage) or passive (e.g. linear fader) component within a circuit.

Some relationships (approximative factors):

dB		0	1	2	3	6	10	15	20
Ratio ( $\approx$ )	Gain	1	1,1	1,2	1,4	2	3,2	5,6	10
	Attenuation	1	0,9	0,8	0,7	0,5	0,3	0,2	0,1

## 1.2 Prerequisites

**General Information:** A test report is bypacked to each factory–shipped mixing console in which the data of a detailed test are recorded such as:

- Alignment to the nominal level specified by the customer
- Data from measurements concerning frequency response, distortion, S/N ratio, noise voltage and cross talk.

The mixing console needs to be recalibrated if the operating conditions (nominal level) at the place of service change or if modifications are made to the mixing console. Periodic recalibration is no longer required in this generation of mixing consoles.

The only maintenance required is the subsequently described demagnetization of the input transformers.

### 1.3 Demagnetizing the Microphone Input Transformers

Inadmissible connection of unbalanced input sources or unintentional ground connection of the a/b audio (leads of microphone inputs to a connected phantom supply) drive the input transformers into saturation and cause permanent magnetization (remanence).

This detrimental effect is manifested through so-called microphonic noise: (light metallic vibrations of the mixing console, e.g. tapping against plug-in modules, produce audible modulations via the speakers, even if the microphone inputs are not connected).

The residual magnetism in the transformers can also accumulate over extended operating times.

We therefore recommend to demagnetize all microphone inputs periodically and before calibration work:

- Procedure:**
- Switch mixing console off (to protect the connected speakers).
  - Connect audio generator to the microphone input. The generator should supply a signal without DC content in order to prevent unwanted magnetization of the transformer.

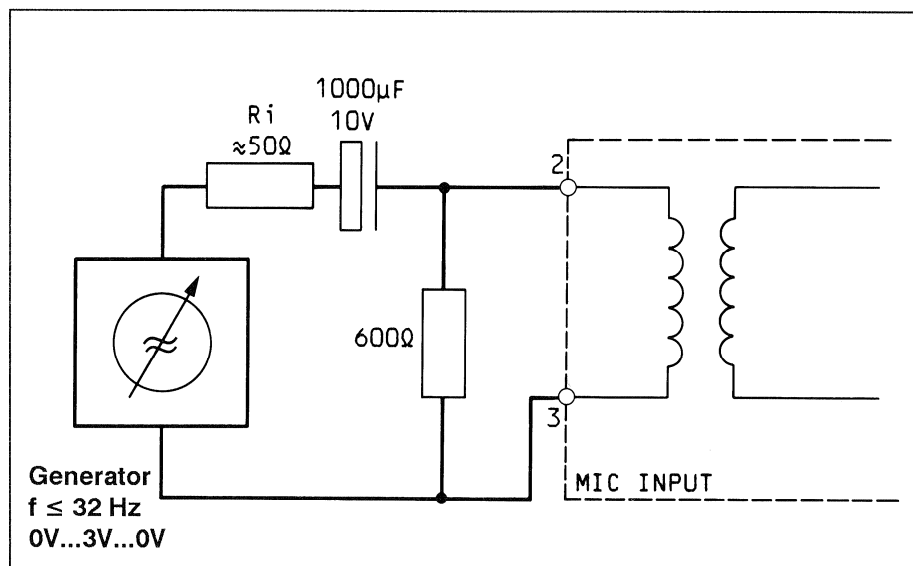


Fig. 1

- Capacitor  $C = 1000\mu F / 10V$  blocks the DC components.
- Resistor  $R_{600\Omega}$  removes DC components from the capacitors.
- Slowly increase  $\leq 32 \text{ Hz}$  frequency to supply level from  $0V \dots 3V$ .
- **Slowly** decrease supply level to  $0V$ .



## 1.4 Required Measuring Instruments and Aids

---

- AF generator 1 kHz sine-wave /  $R_s \leq 200\Omega$
- AF-voltmeter,  $R_{z_{in}} \leq 10k\Omega$
- 2 channel cathode-ray oscillograph
- Alignment screwdriver size 2
- Bus Adapter for connecting removed modules to the bus .The following are required:
  - 3 Adapter with 32 pin. Connector Order-No. 1.228.322
  - 1 Adapter with 64 pin. Connector Order-No. 1.228.327
- Foam rubber pad, approx. 400 x 250 mm as a soft surface for removed modules that are connected to the bus via the adapter (the pads are preferably placed on the operating panel of the mixing console).

## 1.5 Measuring Principles

---

**Note:** The factory-shipped (replacement) modules are already aligned and can be installed directly in the mixing console to be calibrated.

- The mixing console should only be calibrated when the operating temperature has been attained (15 minutes after power ON).
- Insertion points, monitor, prelistening, and talk-back outputs should not be loaded.
- The line outputs are to be terminated with  $600\Omega$ .

**Test Signal:** 1 kHz / sine-wave

**Level Reference:** 0 dBu  $\cong 0,775V_{eff}$ .

1.6 Measuring Setup

The AF millivoltmeter and AF generator must feature balanced inputs and outputs. A balancing unit is to be connected to the input of unbalanced measuring instruments.

**Note:** If no measuring instruments with balanced inputs and outputs are available, unbalanced measuring instruments can be connected (by way of expedient) in the following way:

b-line (3) connected to audio ground (1) together with the a-line (2) forms an unbalanced measuring point. However, this circuit is not suited for measuring higher levels (clipping effect on the transformerless INSERT's).

The specified sequence of the steps is to be followed for realigning the level or recalibrating the mixer!  
(certain alignments from the basis for subsequent alignment operations).

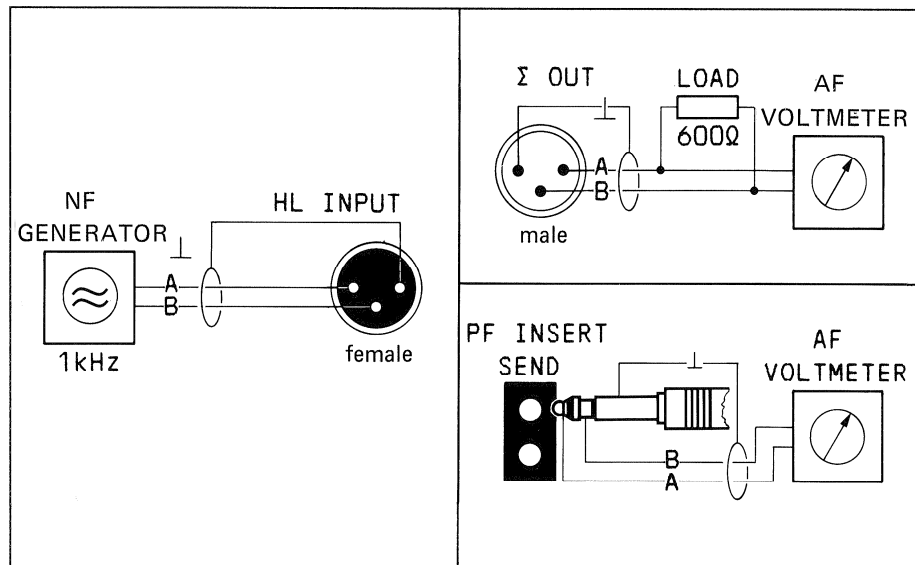


Fig. 2

2. Einmess - Anleitung der Einschub-Module

2.1 Mono Eingänge

1.970.741.81

TABELLE / TABLE	STATUS					
Bedienungselement / oper. element						
Feinabgleich / fine adjust			X			
Filter off	X					
Phasenschalter / phase switch $\phi$ off	X					
Equalizer off	X					
$\Sigma$ Anwahl / bus select off	X					
Panpot off						X
ON-Taste / ON-key		X				

Line Input







- Eingangswahlschalter auf obere Stellung LINE positionieren.
- Status der Bedienungselemente gemäss Tabelle erstellen.
- NF Generator am LINE INPUT anschliessen.
- Leitungspegel / 1 kHz einspeisen.
- NF Voltmeter am INSERT SEND anschliessen.
- Kontrolle: Soll-Ausgangspegel am INSERT SEND = Leitungspegel.
- Korrektur: Feinabgleich am zentralen Potentiometer **R64**.

Fader Aufholverstärkung

- Eingangswahlschalter auf obere Stellung LINE positionieren.
- Status der Bedienungselemente gemäss Tabelle erstellen.
- $\Sigma$  1 anwählen.
- Eingangsfader auf Pos. 0 dB.
- NF Generator am LINE INPUT anschliessen.
- Leitungspegel / 1 kHz einspeisen.
- NF Voltmeter am  $\Sigma$  1 INSERT SEND anschliessen.
- Kontrolle: Soll-Ausgangspegel am  $\Sigma$  1 INSERT SEND = Leitungspegel.
- Korrektur: am Trimpotentiometer **R164**.

## 2.2 Stereo Eingänge

1.970.753/754.81

TABELLE / TABLE	STATUS					
Bedienungselement / oper. element						
Feinabgleich / fine adjust (Gain)			X			
Equalizer	off	X				
$\Sigma$ / GR Anwahl / bus select	off	X				
Balance	off				X	
ON-Taste / ON-key		X				

## Line Input L

- Status der Bedienungselemente gemäss Tabelle erstellen.
- NF Generator am LINE INPUT L anschliessen.
- Leitungspegel / 1 kHz einspeisen.
- NF Voltmeter am INSERT SEND L anschliessen.
- Kontrolle: Soll-Ausgangspegel am INSERT SEND L = Leitungspegel.
- Korrektur: am Trimpotentiometer **R111**.

## Line Input R

- Status der Bedienungselemente gemäss Tabelle erstellen.
- NF Generator am LINE INPUT R anschliessen.
- Leitungspegel / 1 kHz einspeisen.
- NF Voltmeter am INSERT SEND R anschliessen.
- Kontrolle: Soll-Ausgangspegel am INSERT SEND R = Leitungspegel.
- Korrektur: am Trimpotentiometer **R211**.

## Fader Aufholverstärkung L

- Status der Bedienungselemente gemäss Tabelle erstellen.
- $\Sigma$  1 anwählen.
- Eingangsfader auf 0 dB. positionieren.
- NF Generator am LINE INPUT L anschliessen.
- Leitungspegel / 1 kHz einspeisen.
- NF Voltmeter am  $\Sigma$  1 INSERT SEND anschliessen.
- Kontrolle: Soll-Ausgangspegel am  $\Sigma$  1 INSERT SEND = Leitungspegel.
- Korrektur: am Trimpotentiometer **R182**.

## Fader Aufholverstärkung R

- Status der Bedienungselemente gemäss Tabelle erstellen.
- $\Sigma$  2 anwählen.
- Eingangsfader auf 0 dB. positionieren.
- NF Generator am LINE INPUT R anschliessen.
- Leitungspegel / 1 kHz einspeisen.
- NF Voltmeter am  $\Sigma$  2 INSERT SEND anschliessen.
- Kontrolle: Soll-Ausgangspegel am  $\Sigma$  2 INSERT SEND = Leitungspegel.
- Korrektur: am Trimpotentiometer **R282**.

## 2. Alignment Instruction for Level Meters

### 2.1 Mono Input

1.970.741.81

TABELLE / TABLE	STATUS					
Bedienungselement / oper. element						
Feinabgleich / fine adjust			X			
Filter off	X					
Phasenschalter / phase switch $\phi$ off	X					
Equalizer off	X					
$\Sigma$ Anwahl / bus select off	X					
Panpot off						X
ON-Taste / ON-key		X				

#### Line Input

- turn the input selector to the upper LINE position.
- set controls to the states specified in table.
- connect audio generator to LINE INPUT.
- feed line level / 1 kHz.
- connect audio voltmeter to INSERT SEND.
- check: desired output level on INSERT SEND = line level.
- correction: fine adjustment on central potentiometer **R64**.

#### Fader Booster Gain

- turn the input selector to the upper LINE position.
- set controls to the states specified in table.
- select  $\Sigma$  1 bus.
- Input fader to 0 dB position.
- connect audio generator to LINE INPUT.
- feed line level / 1 kHz.
- connect audio voltmeter to  $\Sigma$  1 INSERT SEND.
- check: desired output level on  $\Sigma$  1 INSERT SEND = line level.
- correction: with trimmer **R164**.

2.2 Stereo HL-Inputs

1.970.753/754.81

TABELLE / TABLE	STATUS					
Bedienungselement / oper. element						
Feinabgleich / fine adjust (Gain)			X			
Equalizer off	X					
$\Sigma$ / GR Anwahl / bus select off	X					
Balance off					X	
ON-Taste / ON-key		X				

Line Input L

- set controls to the states specified in table.
- connect audio generator to LINE INPUT L.
- feed line level / 1 kHz.
- connect audio voltmeter to INSERT SEND L.
- check: desired output level on INSERT SEND L = line level.
- correction: with trimmer **R111**.

Line Input R

- set controls to the states specified in table.
- connect audio generator to LINE INPUT R.
- feed line level / 1 kHz.
- connect audio voltmeter to INSERT SEND R.
- check: desired output level on INSERT SEND R = line level.
- correction: with trimmer **R211**.

Fader Booster Gain L

- set controls to the states specified in table.
- select  $\Sigma$  1 bus.
- input fader to 0 dB position.
- connect audio generator to LINE INPUT L.
- feed line level / 1 kHz.
- connect audio voltmeter to  $\Sigma$  1 INSERT SEND.
- check: desired output level on  $\Sigma$  1 INSERT SEND = line level.
- correction: with trimmer **R182**.

Fader Booster Gain R

- set controls to the states specified in table.
- select  $\Sigma$  2 bus.
- input fader to 0 dB position.
- connect audio generator to LINE INPUT R
- feed line level / 1 kHz.
- connect audio voltmeter to  $\Sigma$  2 INSERT SEND.
- check: desired output level on  $\Sigma$  2 INSERT SEND = line level.
- correction: with trimmer **R282**.



2.3 Summen Einheit

1.970.841.81

TABELLE / TABLE		STATUS					
Bedienungselement / oper. element							
Limiter / Compressor 'In'	off	X					
Gain				X			
$\Sigma$		X					
Release					X		
Ratio					X		
HL Input					X		
$\Sigma$ Anwahl / $\Sigma$ select		X					
Panpot	off					X	
Mute	off	X					

HL Input

- Status der Bedienungselemente gemäss Tabelle erstellen.
- NF Generator am HL INPUT anschliessen.
- Leitungspegel / 1 kHz einspeisen.
- NF Voltmeter am  $\Sigma$  1 INSERT SEND anschliessen.
- Kontrolle: Soll-Ausgangspegel am  $\Sigma$  1 INSERT SEND = Leitungspegel +10 dB.
- Korrektur: am Trimpotentiometer **R9**.

Summen Ausgang

- Status der Bedienungselemente gemäss Tabelle erstellen.
- NF Generator am LINE INPUT 1 anschliessen.
- Leitungspegel / 1 kHz einspeisen.
- NF Voltmeter am INSERT SEND anschliessen.
- Kontrolle: Soll-Ausgangspegel = Leitungspegel.
- NF Voltmeter am  $\Sigma$  OUT anschliessen, (mit 600 $\Omega$  Last).
- Summenfader auf 0 dB Position.
- Zu messende  $\Sigma$  anwählen.

A) Limiter überbrückt

- Kontrolle: Soll-Ausgangspegel am  $\Sigma$  OUT = Leitungspegel.
- Korrektur: am Trimpotentiometer **R104**.

B) Limiter eingeschaltet

- Generatorpegel um 20 dB reduzieren: Leitungspegel -20 dB.
  - Kontrolle: Soll-Ausgangspegel am  $\Sigma$  OUT = Leitungspegel.
  - Korrektur: am Trimpotentiometer **R7** (PDM VCA Print).
- Abgleichschritte wechselweise wiederholen bis optimale Einstellung erreicht ist.

Limiter Einsatzschwelle

- Status der Bedienungselemente gemäss Tabelle erstellen.
- NF Generator am LINE INPUT 1 anschliessen.
- Leitungspegel / 1 kHz einspeisen.
- NF Voltmeter am INSERT SEND anschliessen.
- Kontrolle: Soll-Ausgangspegel = Leitungspegel.
- NF Voltmeter am  $\Sigma$  OUT anschliessen, (mit 600 $\Omega$  Last).
- Zu messende  $\Sigma$  anwählen.
- Flachbahnregler auf +10 dB positionieren.

A) Limiter überbrückt

- Kontrolle: Soll-Ausgangspegel = Leitungspegel +10 dB.
- Korrektur: am Input Gain.

B) Limiter eingeschaltet

- Kontrolle: Soll-Ausgangspegel = Leitungspegel +0,2 dB.
- Korrektur: am Trimpotentiometer **R189**.



## 2.4 AUX Master / Studio Monitor

1.970.901.00

---

- AUX Ausgang**
- NF Generator am LINE INPUT 1 anschliessen.
  - Leitungspegel / 1 kHz einspeisen.
  - Eingangswahlschalter auf obere Stellung LINE.
  - NF Voltmeter am INSERT SEND anschliessen.
  - Kontrolle: INSERT SEND = Leitungspegel.
  - Korrektur: mit Feinabgleich einstellen bis INSERT SEND = Leitungspegel.
  - AUX 1/AUX 2 Regler auf Eingangseinheit 1 ziehen. (Stellung PF) und auf Rechtsanschlag drehen.
  - Ausgangsregler AUX Master 1+2 auf Rechtsanschlag drehen.
- AUX Ausgang 1**
- NF Voltmeter am AUX AUSGANG 1 anschliessen, (mit 600 $\Omega$  Last).
  - Ausgangspegel am Ausgangsregler AUX 1 um 15 dB reduzieren. (Übersteuerungsreserve).
  - Ausgangspegel am Trimpotentiometer **R36** auf Leitungspegel abgleichen.
- AUX Ausgang 2**
- NF Voltmeter am AUX AUSGANG 2 anschliessen, (mit 600 $\Omega$  Last).
  - Ausgangspegel am Ausgangsregler AUX 2 um 15 dB reduzieren. (Übersteuerungsreserve).
  - Ausgangspegel am Trimpotentiometer **R62** auf Leitungspegel abgleichen.
- TB Mikrophon**
- SLATE (TB auf  $\Sigma$  Sammelschiene).
- NF Generator anstelle vom TB Mic anschliessen.
  - -40 dBu / 1 kHz einspeisen.
  - NF Voltmeter am MASTER INSERT anschliessen.
  - Beide Tasten SLATE drücken.
  - Kontrolle: Soll-Ausgangspegel = Leitungspegel.
  - Korrektur: am Trimpotentiometer **R89**.
- TB AUX**
- TB AUX (TB auf AUX).
- NF Voltmeter am AUX 1 OUTPUT anschliessen (mit 600 $\Omega$  Last).
  - Taste TB AUX drücken.
  - Kontrolle: Soll-Ausgangspegel = Leitungspegel.
  - Korrektur: an Trimpotentiometer **R91**.

2.3 Master Unit

1.970.841.81

TABELLE / TABLE		STATUS					
Bedienungselement / oper. element							
Limiter / Compressor 'In'	off	X					
Gain				X			
$\Sigma$		X					
Release					X		
Ratio					X		
HL Input					X		
$\Sigma$ Anwahl / $\Sigma$ select		X					
Panpot	off					X	
Mute	off	X					

**HL Input**

- set controls to the states specified in table.
- connect audio generator to HL INPUT.
- feed line level / 1 kHz.
- connect audio voltmeter to  $\Sigma$  1 INSERT SEND.
- check: desired output level on  $\Sigma$  1 INSERT SEND = line level + 10 dB.
- correction: with trimmer **R9**.

**Master Output**

- set controls to the states specified in table.
- connect audio generator to LINE INPUT 1.
- feed line level / 1 kHz.
- connect audio voltmeter to INSERT SEND.
- check: desired output level = line level.
- connect audio voltmeter to  $\Sigma$  OUT, (with 600 $\Omega$  load).
- set group /  $\Sigma$  fader to 0 dB position.
- press corresponding group selection key.

**A) Limiter Bypassed**

- check: desired output level on  $\Sigma$  OUT = line level.
- correction: with trimmer potentiometer **R104**.

**B) Limiter Switched In:**

- decrease generator level by 20 dB: line level -20 dB.
- check: desired output level on  $\Sigma$  OUT = line level -20 dB.
- correction: with trimmer potentiometer **R7** (on PDM VCA).

Alternatively repeat alignment steps A and B until optimal alignment is attained.

**Limiter Attack Threshold**

- set controls to the states specified in table.
- connect audio generator to LINE INPUT 1 fader to 0 dB position.
- feed line level / 1 kHz.
- connect audio voltmeter to INSERT SEND 1.
- check: desired output level = line level.
- select measured group /  $\Sigma$ .
- connect audio voltmeter to  $\Sigma$  OUT, (with 600 $\Omega$  load).
- set group /  $\Sigma$  fader to the + 10 dB position.

**A) Limiter Bypassed**

- check: desired output level = line level + 10 dB.
- correction: with Input Gain.

**B) Limiter Switched On**

- check: desired output level on  $\Sigma$  / GROUP OUT = line level + 0,2 dB.
- correction: with trimmer potentiometer **R189**.

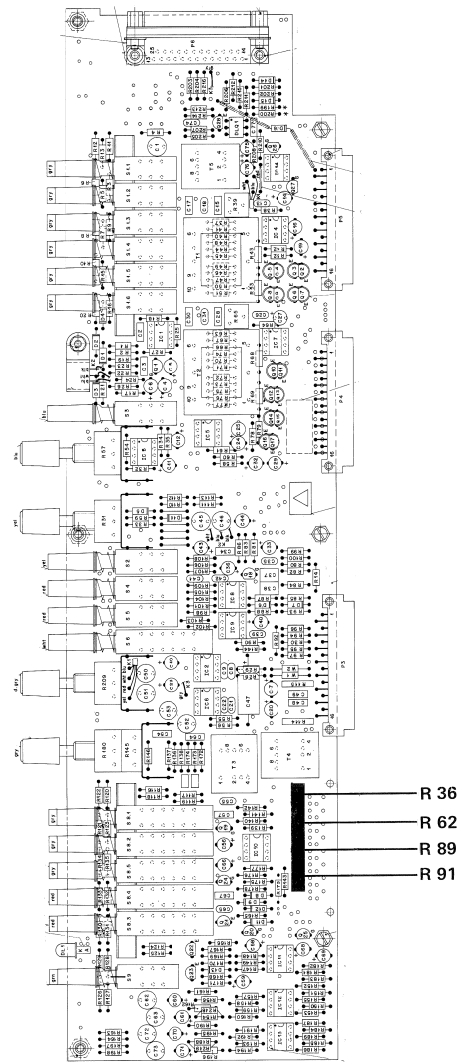
## 2.4 AUX Master / Studio Monitor

1.970.901.00

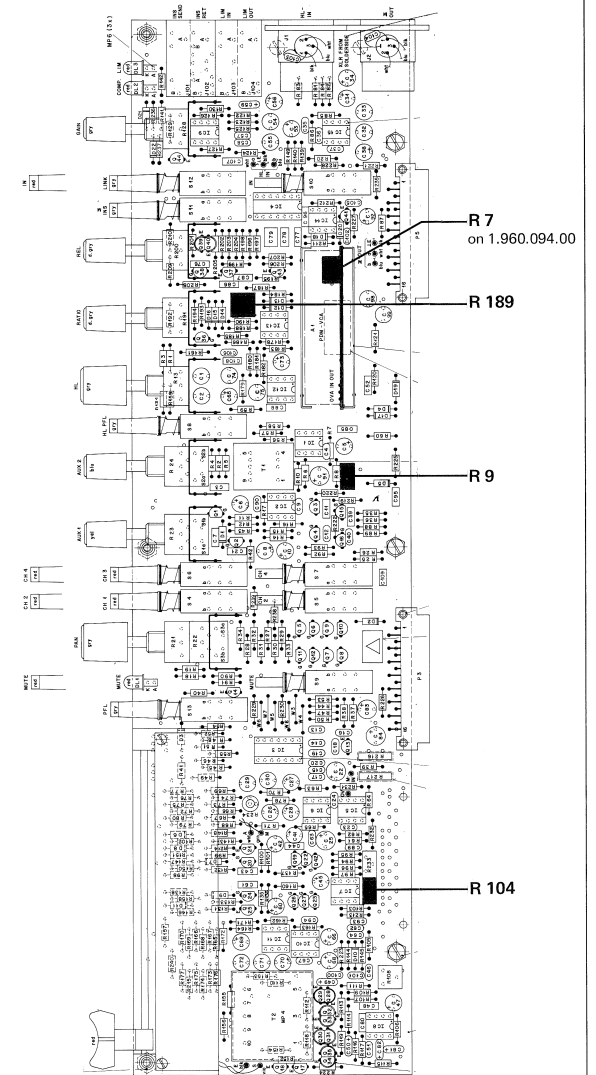
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- AUX Output**
- connect audio generator to LINE INPUT 1.
  - feed line level / 1 kHz.
  - turn the input selector to the upper LINE position.
  - connect audio voltmeter to INSERT SEND.
  - check: INSERT SEND = line level.
  - correction: on input selector within the LINE range, and fine adjustment potentiometer.
  - pull the AUX 1/AUX 2 potentiometers (PF position) and turn them to the righthand limit position.
  - turn AUX 1+2 SEND potentiometers to the right-hand limit position.
- AUX 1 Out**
- connect audio voltmeter to AUX 1 OUT (with 600 $\Omega$  load).
  - decrease output level with potentiometer AUX 1 by 15 dB (headroom).
  - align output level to line level with trimmer potentiometer **R36**.
- AUX 2 Out**
- connect audio voltmeter to AUX 2 OUT (with 600 $\Omega$  load).
  - decrease output level with potentiometer AUX 2 by 15 dB (headroom).
  - align output level to line level with trimmer potentiometer **R62**.
- TB Microphone**
- SLATE (TB on  $\Sigma$  bus).
- connect audio generator instead of TB Mic.
  - feed -40 dBu / 1 kHz.
  - connect audio voltmeter to MASTER INSERT.
  - press both SLATE buttons.
  - check: desired output level on  $\Sigma$  INSERT = line level.
  - correction: with trimmer potentiometer **R89**.
- TB AUX**
- TB AUX (TB on AUX OUTPUT 1..4).
- connect audio voltmeter to AUX 1 OUTPUT (with 600 $\Omega$  load).
  - press TB button (AUX 1).
  - check: desired output level on AUX OUT 1 (with 600 $\Omega$  load) = line level.
  - correction: with trimmer potentiometer **R91**.

AUX Master / Studio Monitor 1.970.901.00

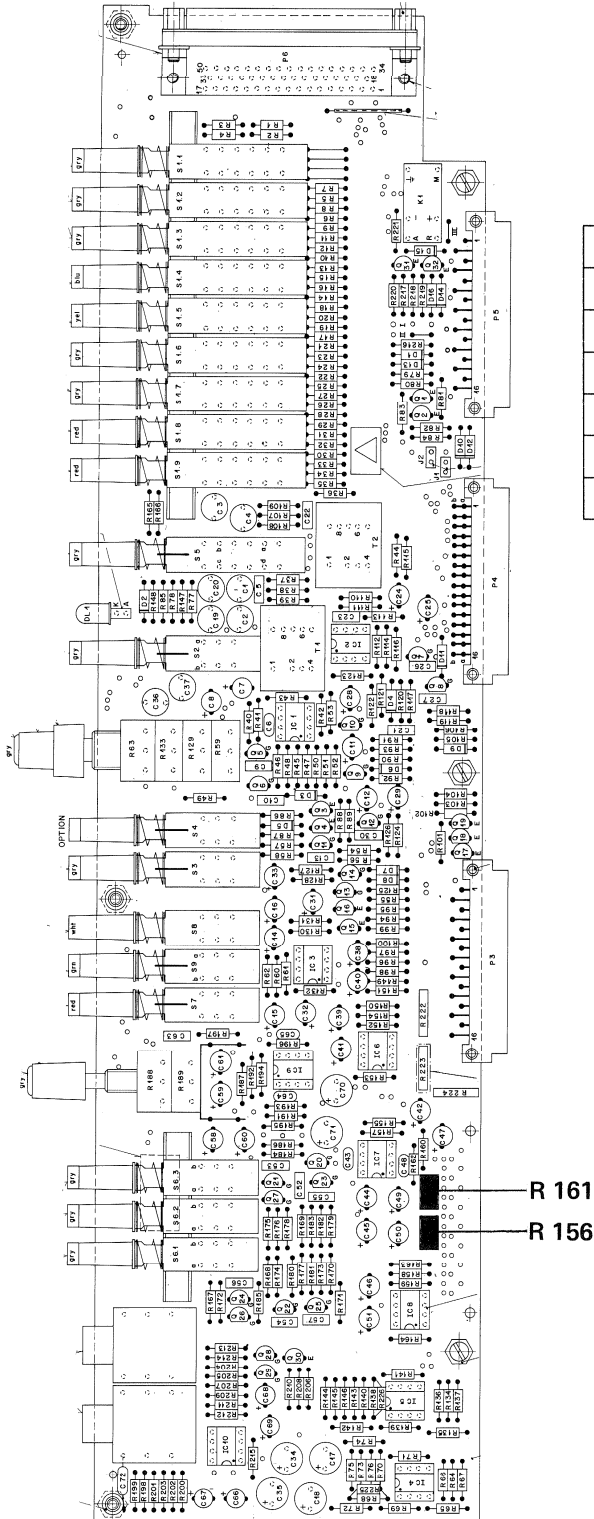


Master Unit 1.970.841.81



2.5 Kontrollraum Monitor Einheit

1.970.920.00



Voraussetzung:

Für die PFL Meter Einstellung muss zuerst das Anzeigeelement eingestellt sein.

Vgl. 3. Einmessanleitung der Anzeigeelemente.

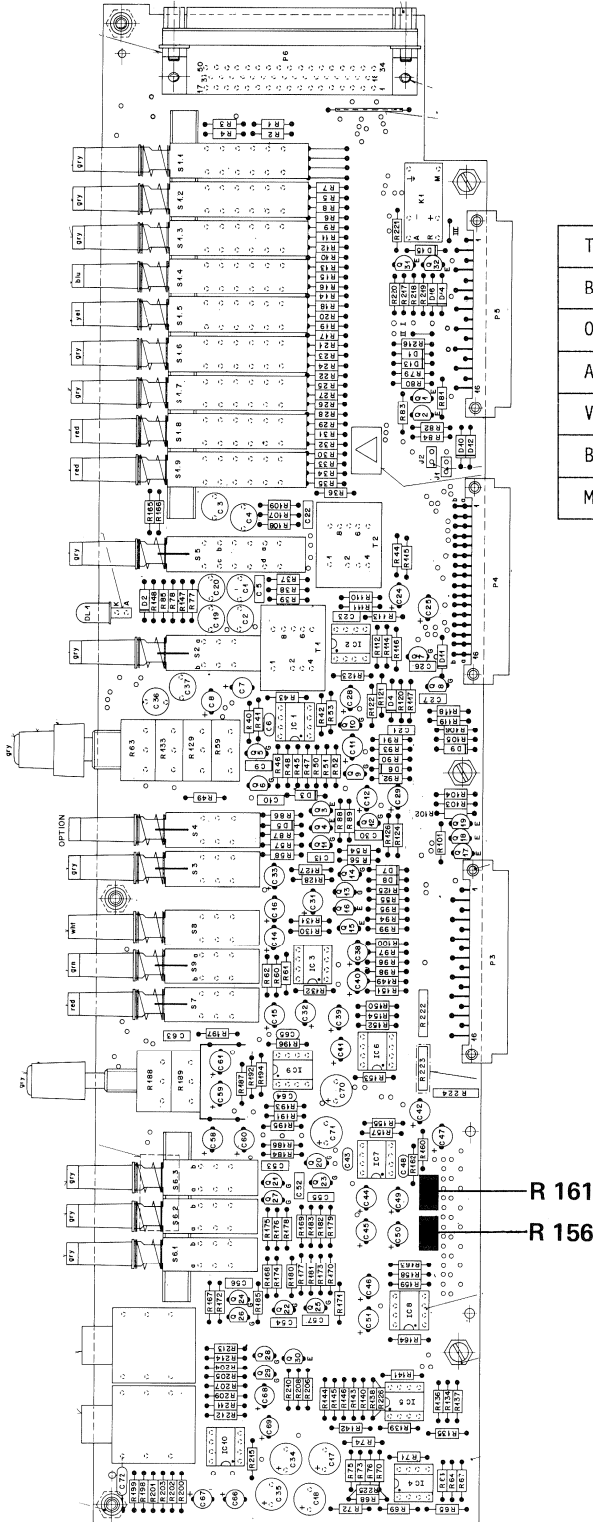
TABELLE / TABLE	STATUS					
Bedienungselement / oper. element						
Aussteuerungsanzeige METER Σ	X					
Automatik PFL TO MONITOR	X					
Volume CR MONITOR			X			
Balance BAL				X		
Monoschaltung MONO	X					

Vorhörkanal PFL

- NF Generator am LINE INPUT 1 anschliessen.
- Status der Bedienungselemente gemäss Tabelle erstellen.
- Eingangswahlschalter auf obere Stellung LINE positionieren.
- Leitungspegel / 1 kHz einspeisen.
- NF Voltmeter am INSERT SEND anschliessen.
- Kontrolle: Soll-Ausgangspegel am INSERT SEND = PPM Pulte > Leitungspegel.  
VU Pulte > Leitungspegel minus Meter Lead (+4 dBu Standard).
- PFL Taste am Input Unit 1 drücken.
- PFL Taste am C.R. Monitor drücken.
- Meterwahlschalter auf Stellung Monitor.
- Kontrolle: Soll-Anzeige am Aussteuerungsmessinstrument = 0 dB.
- Korrektur: am Trimpotentiometer R156 für linken Kanal, R161 für rechten Kanal.

2.5 Control Room Monitor Unit

1.970.920.00



**Note:**

For PFL adjustment the meter adjustment has to be done first.

Refer to 3. Alignment Instruction for Level Meters.

TABELLE / TABLE	STATUS					
Bedienungselement / oper. element						
Output meter METER Σ	X					
Automatic mode PFL TO MONITOR	X					
Volume CR MONITOR			X			
Balance BAL				X		
Mono circuit MONO	X					

**Prefader Listening Channel PFL**

- connect audio generator to LINE INPUT.
- set controls to the states specified in the table.
- turn the input selector to the upper LINE position.
- feed line level / 1 kHz.
- connect audio voltmeter to INSERT SEND.
- check: desired output level on INSERT SEND = PPM consoles line level.  
VU consoles line level minus meter lead (+4 dBu standard).
- depress PFL button on INPUT UNIT 1.
- depress PFL button on C.R. MONITOR UNIT.
- depress METER button on the C.R. MONITOR's meter section (PFL level is shown on meters).
- check: meter indication, desired indication 0 dB.
- correction: with trimmer potentiometer **R156** for PFL left channel, **R161** for right channel.

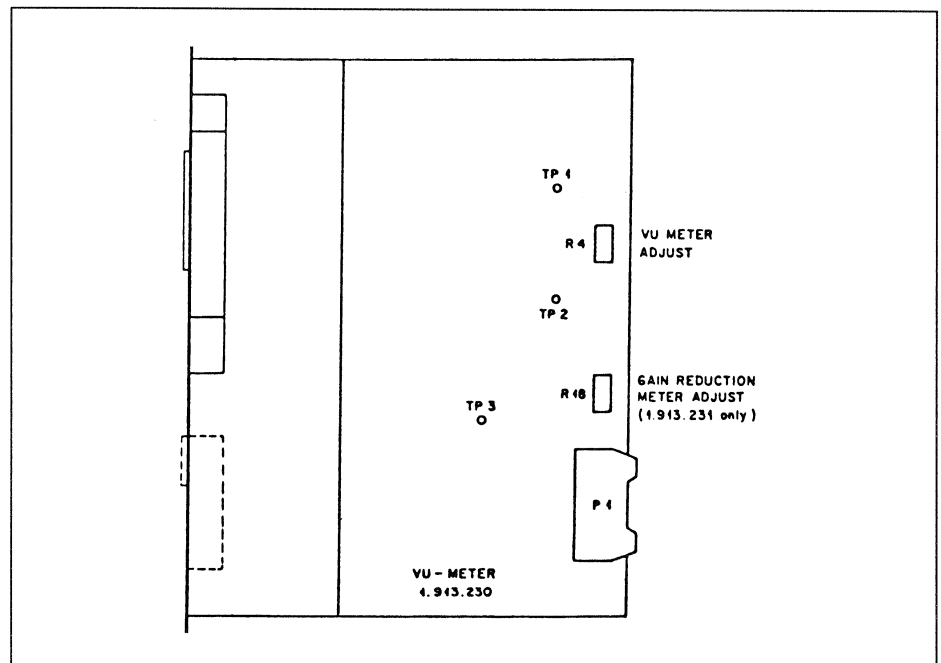
### 3. Einmess - Anleitung der Anzeigeeinstrumente

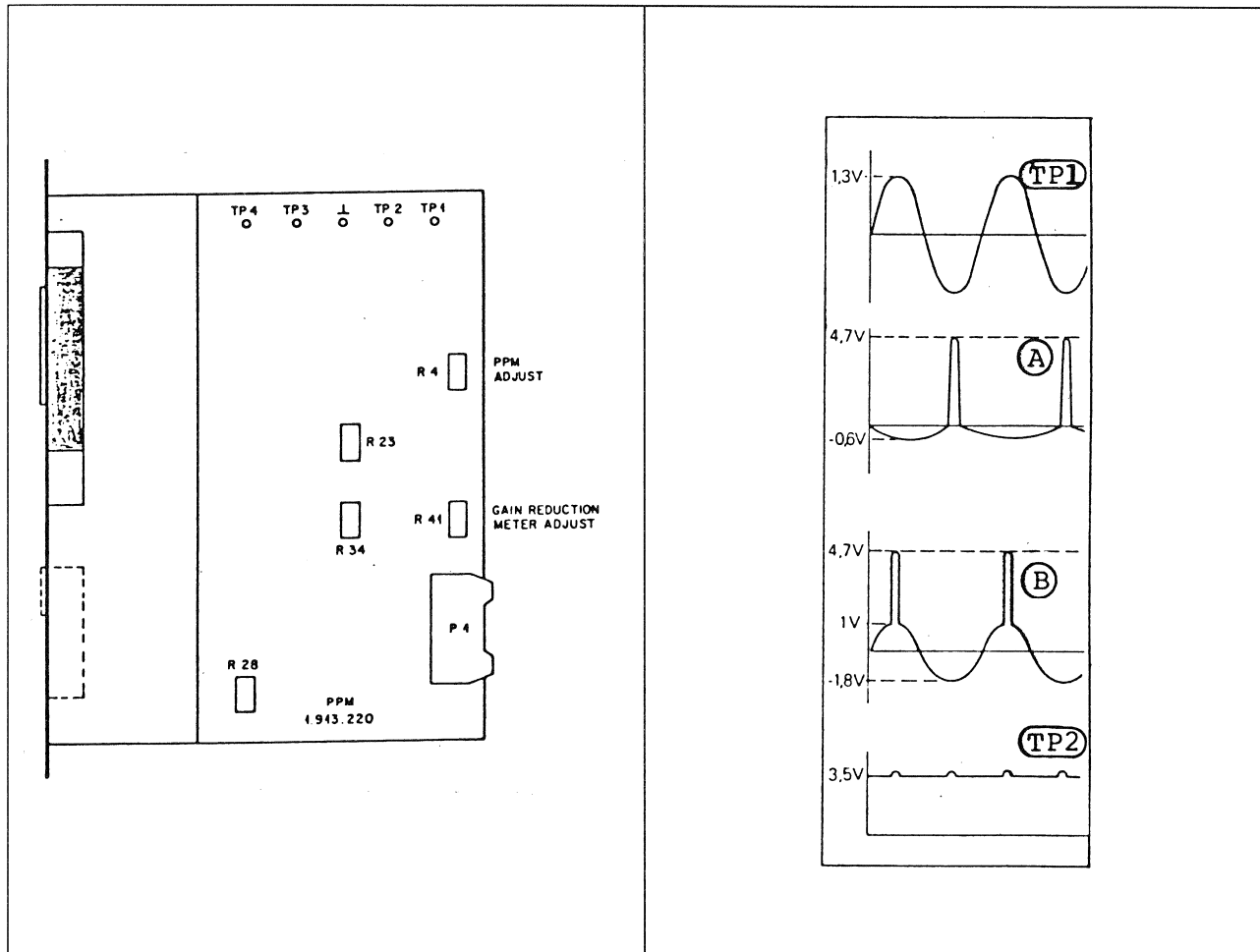
#### 3.1 VU-Meter

1.913.230/231

- TP1: Variabel ( $0,1 V \dots 0,35 V_{eff}$ )  
TP2:  $1 V_{eff}$   
TP3:  $-3,6 V$  p Vollweg-Gleichrichtung

Mit R4 kann die Referenzanzeige (0 VU) für Eingangssignale zwischen 0 dBu und + 10 dBu eingestellt werden.





1. Summen-Ausgang auf Leitungspegel (1kHz) einstellen.
2. Mit R4 (Fig. 4) am summenzugehörigen Instrument Zeigerausschlag auf 0 dB einstellen. (+3,5 V an TP2)

**Hinweis:** Die Trimpotentiometer R23, R28 und R34 dienen dem werkseitigen Skalenabgleich.

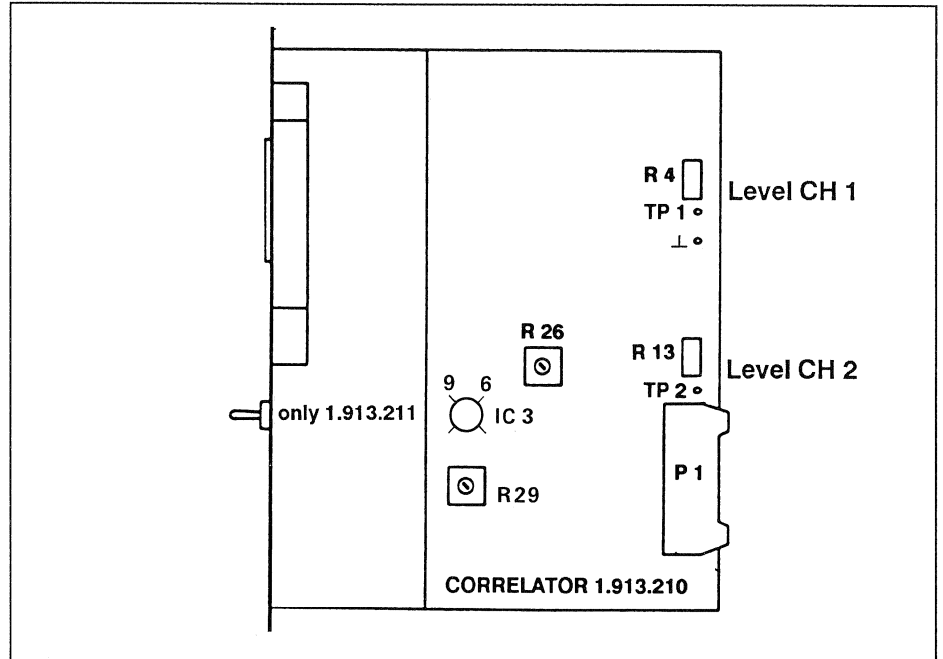
- R28: 0dB - Anzeige am Instrument
- R34: -30dB - Anzeige am Instrument
- R23: -40dB - Anzeige am Instrument

Die mechanische Nullstellung des Messwerkes liegt bei Referenzanzeige 0dB. Für Pegel, deren Anzeige 0 ... +6dB ergibt, wechselt die Polarität der Ausgangsspannung am Verstärker.



3.3 Korrelator 2CH/4CH

1.913.210/211



1. An beiden Eingängen wird ein gleichphasiges 1 kHz-Signal mit Leitungspegel eingespielen.

**R4** bzw. **R13** so einstellen, dass an den Messpunkten **TP1** bzw. **TP2** ein Pegel von 100 mV AC gegen  $\perp$  (Masse) erscheint.

2. Eingangspegel um 50 dB verringern. KO an den Ausgang 6 oder 9 von **IC3** gegen Masse  $\perp$  anschliessen. Die Amplituden beider Halbwellen mit **R29** auf gleiche Höhe einstellen.
3. Eingangspegel wieder auf Leitungspegel einstellen. Mit **R26** den Zeiger des Anzeigeinstrumentes auf +1 einstellen.
4. Einen der beiden Eingänge umpolen. Das Messinstrument soll -1 anzeigen.
5. Anzeigen gemäss Tabelle kontrollieren.

EINGANG	30 Hz	1 kHz	15 kHz
Leitungspegel = A	0,95	1	0,95
A + 20 dB	~ 1	1	~ 1
A - 20 dB	0,6	~ 1	0,5

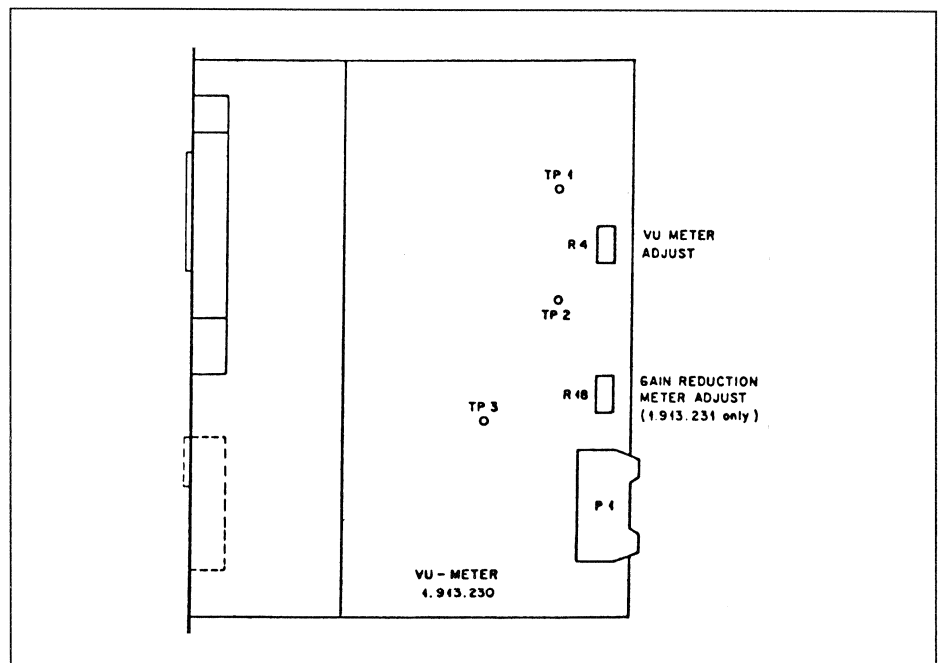
### 3. Alignment Instruction for plug in Units

#### 3.1 VU Meter

1.913.230/231

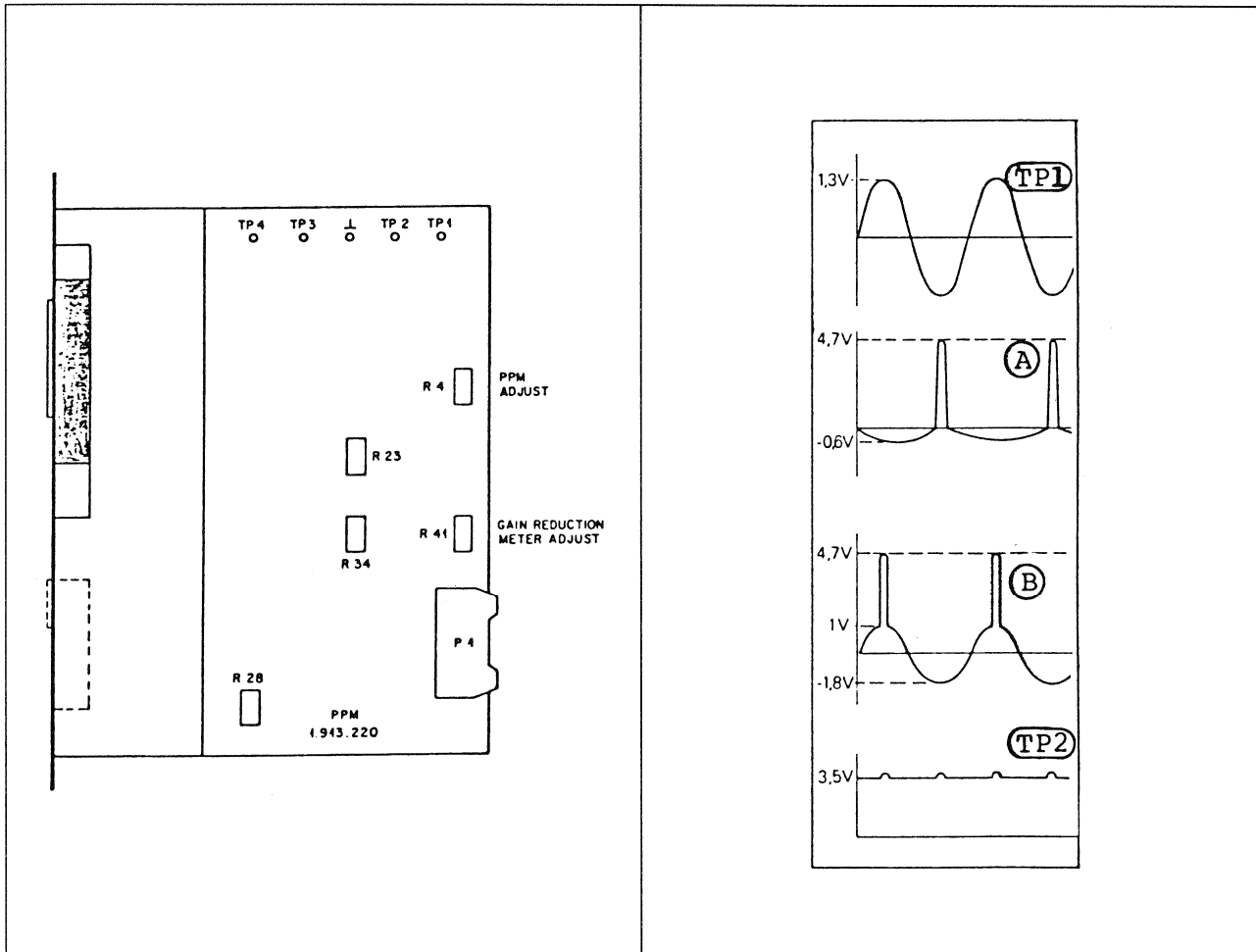
TP1: Variable (0,1 V ... 0,35 V<sub>eff</sub>)  
TP2: 1 V<sub>eff</sub>  
TP3: - 3,6 V p full-wave rectification

The reference indication (0 VU) for input signals between 0 dBu and +10 dBu can be adjusted with R4.



3.2 Peak Program Meter (PPM)

1.913.220/221



1. Line-level +6...+15 dB 1 kHz at input.
2. +3,5 V at TP2 adjust with **R4** (level PPM)

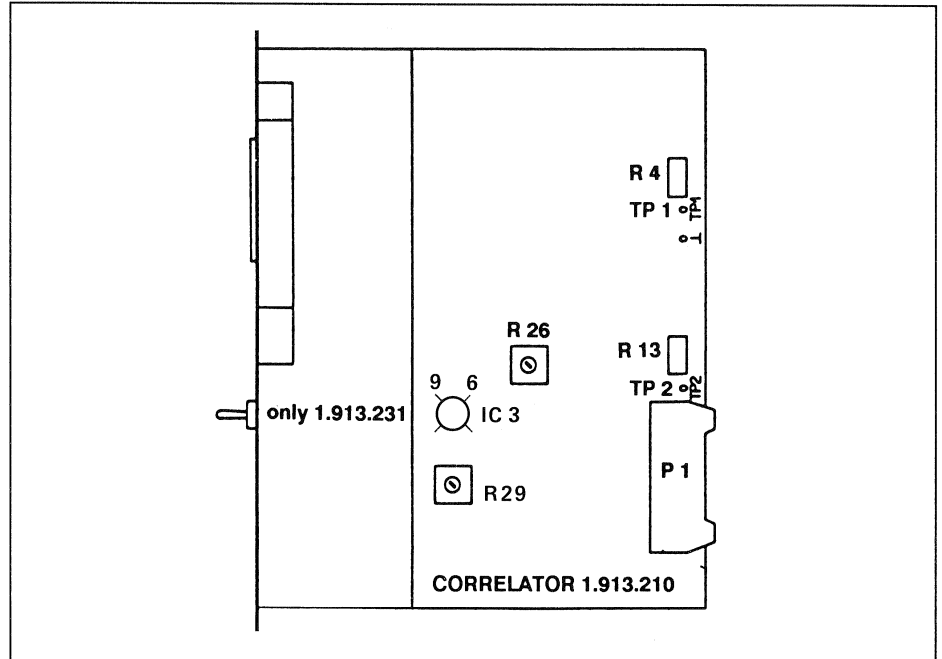
**Note:** The variable resistors R23, R28 and R34 are used for factory adjustment of the indicating scale.

- R28** adjustment of 0dB indication.
- R34** adjustment of -30dB indication.
- R23** adjustment of -40dB indication.

The mechanical zero position of the instrument corresponds to the reference indication 0 dB. For levels which give a deflection of 0...+6 dB on the scale, the amplifier 4.2 changes the polarity of the output voltage.

3.3 Correlater 2CH/4CH

1.913.210/211



1. Feed both inputs with an in-phase signal (1 kHz, line level). Adjust **R4** and **R13** in such a manner that 100 mV ACCorrelation appear at both test points **TP1** or **TP2**, against ground.
2. Reduce the input level by 50 dB. Connect oscilloscope to pin 6 or 9 of **IC3** to ground. With **R29** adjust the amplitudes of both halfwaves to equal height.
3. Restore input level to line level. With **R26** adjust the pointer of the meter to +1.
4. Reverse the polarity of one of the inputs. The meter should indicate -1.
5. Check meter readings according to the following table.

Input	30 Hz	1 kHz	15 kHz
Line level = A	0,95	1	0,95
A + 20 dB	~ 1	1	~ 1
A - 20 dB	0,6	~ 1	0,5

<b>4</b>	<b>Einschubmodule</b>	<b>1.970....</b>
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## 4 Plug in Units 1.970....

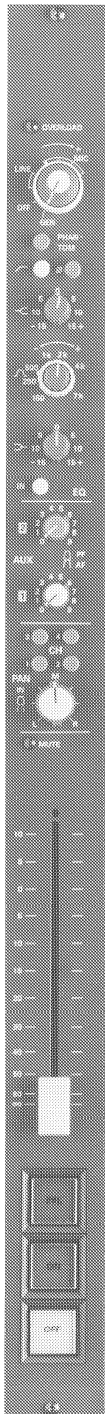
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### 1. Eingangseinheit Mono 1.970.741

---

#### 1.1 Bedienungselemente

---



**OVERLOAD:** Die mit Overload bezeichnete LED leuchtet auf, sobald der maximal zulässige Pegel vor oder nach dem Flachbahnregler überschritten wird.

**EINGANGSTEIL: MIC:** Symmetrisch, erdfreier Mikrophoneingang. Eingangsempfindlichkeit  $-70...-10$  dBu. Schaltbar in 4 Stufen zu 15 dB, dazwischen mit Potentiometer stetig einstellbar im Bereich  $0...15$  dB. Der maximale Eingangspegel am Mikrophoneingang darf  $+6$  dB betragen.

**PHANTOM:** Zuschaltbare 48 Volt Phantomspeisung.

**LINE:** Hochpegeleingang, symmetrisch, erdfreier Eingang. Eingangsempfindlichkeit  $-10...+20$  dBu. Schaltbar in 2 Stufen zu 15 dB, dazwischen stetig einstellbar im Bereich  $0...15$  dB.

**GEN:** Tongeneratoreingang über Sammelschiene vom pultinternen Tongenerator gespeist.

**Ø:** Phasenumkehrschalter, wirkt auf alle Eingänge.

**FILTER:** Schaltbare Tiefensperre mit 12 dB/Okt., Grenzfrequenz 75 Hz.

**ENTZERRER:** Siehe 1.4

**HILFSAUSGÄNGE AUX 1 und AUX 2:** Zwei getrennt regelbare Hilfsausgänge sind über die an den Potentiometer angebauten Zug-Druckschalter vor (PF) oder nach (AF) Flachbahnregler schaltbar.

**PAN. POT.:** Das Panorama-Potentiometer kann mit dem Zug-Druckschalter aktiviert werden.

**SUMMENWAHL:** Stereo und 2 Kanal-Pulte sind mit zwei Tasten zur getrennten Anwahl der Sammelschienen  $\Sigma 1$  und  $\Sigma 2$  bestückt. 4 Kanal-Pulte sind mit vier Tasten  $\Sigma 1 ... \Sigma 4$  bestückt.

**MUTE-FUNKTION:** Auf dem fünfzehenpoligen D-Type Stecker (REM-CONTR) kann der Kanal knackfrei stummgeschaltet werden. Die Mute LED-Anzeige signalisiert die aktivierte Funktion.

FLACHBAHN-  
REGLER:

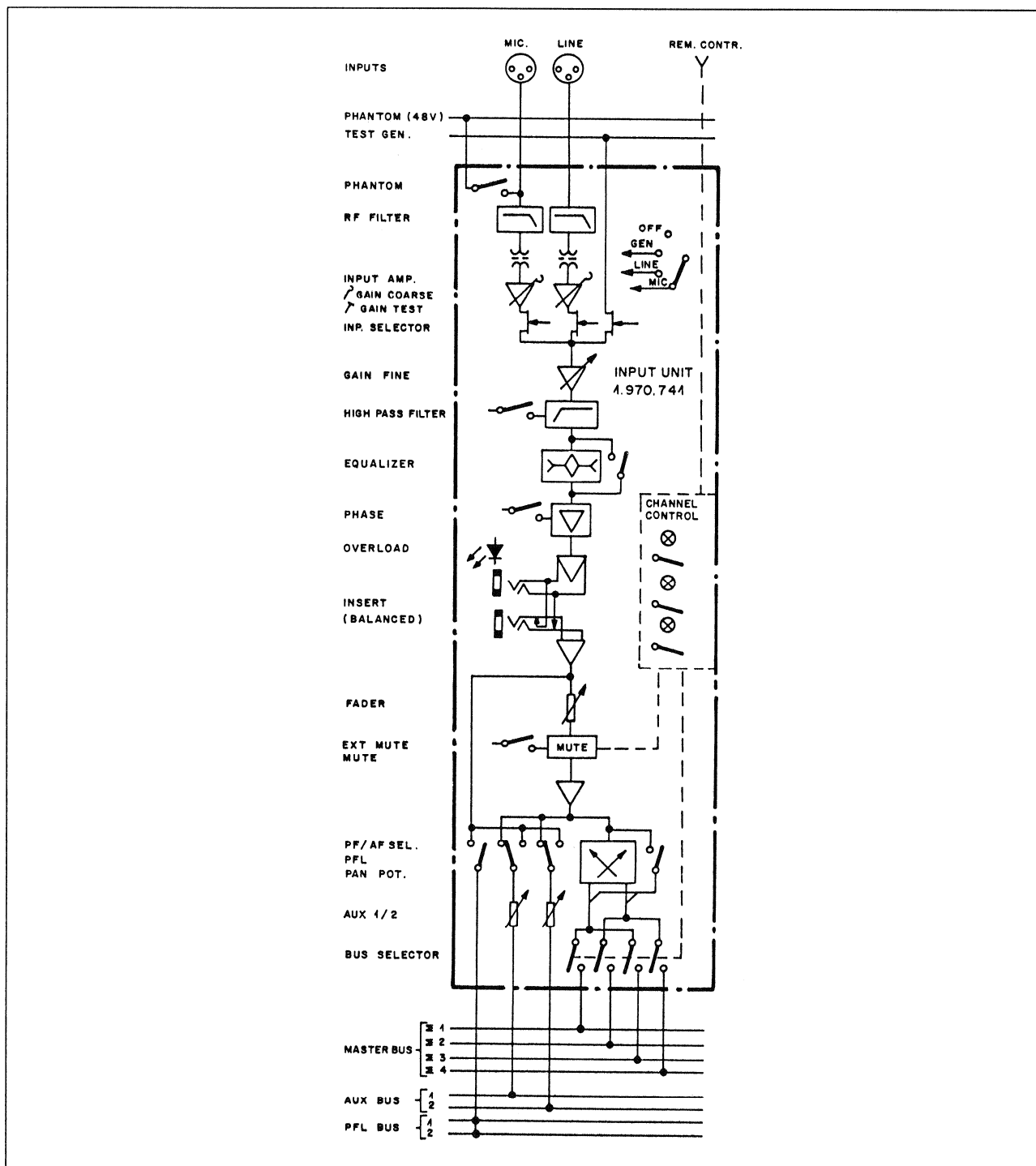
Der Flachbahnregler ist mit einer Widerstandsschicht aus leitendem Kunststoff ausgerüstet.

STEUERTASTEN:

Die drei grossen Drucktasten sind unter Punkt 1.3 beschrieben.

1.2 Blockschaltbild

1.970.741





### 1.3 Steuertasten

Vor dem Flachbahnregler sind drei geräuscharme Drucktasten mit Signallampen angebracht. Die Funktionen können im Einschub durch umstecken von Miniatur-Brückensteckern verändert werden.

Es sind 3 Grundversionen vorgesehen:

#### Version 1 (Fig.1)

PFL

- Das Vorhörsignal PFL (Pre fader listening) wird zum Vorhörlautsprecher und zum Kopfhörer durchgeschaltet. Ein weiterer Tastendruck unterbricht dieses Signal wieder.
- Gleichzeitig wird die Signallampe ein- oder ausgeschaltet.

ON

- Schaltet den Modulationsweg durch, sofern Sammelschiene angewählt und Flachbahnregler geöffnet sind.
- ON-Lampe leuchtet.
- PFL wird unterbrochen, wobei aber die PFL-Lampe weiterleuchtet um den vorher angewählten Zustand anzuzeigen.
- Signalisation resp. Faderstart-Relais wird durchgeschaltet, sofern die übrigen Kriterien erfüllt sind (siehe 1.6, Signalisation und Faderstart).
- Automatische Stoppuhr wird zurückgesetzt. (Option)

OFF

- Modulation wird unterbrochen.
- Signalisation und Faderstart-Relais fallen ab.
- Falls die PFL-Taste angewählt war, wird nun das Vorhören wieder durchgeschaltet.
- ON-Lampe erlöscht.

OFF-Lampe: ■ Wird von Extern aktiviert und kann den Bereitschaftszustand der Quelle signalisieren.

Fernsteuerung: ■ Alle Tasten und Lampensignale sind auch auf einem fünfzehnpoligen D-Type Stecker verfügbar. Obige Funktionen können also auch ferngesteuert werden.

Blockschaltbild Fernsteuerung:

(Standard)

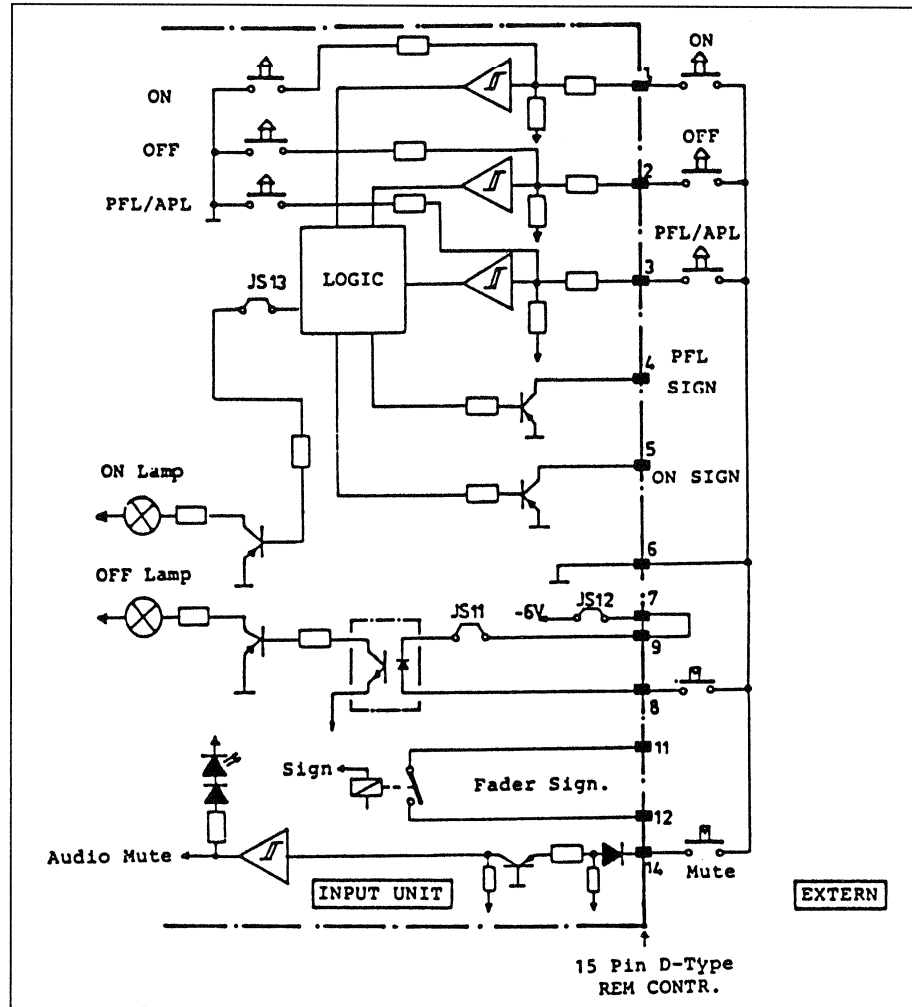
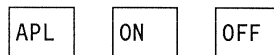


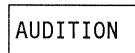
Fig. 1

Version 2



- Gleiche Funktion wie in Version 1, mit der Ausnahme, dass anstelle des Vorhörsignals vor Flachbahnregler, dasjenige nach Regler (APL) durchgeschaltet wird.

Version 3



- Schaltet den Kanal durch und wählt die Summen  $\Sigma 3 + \Sigma 4$  an (Eingangseinheiten dieser Version sind nicht mit Sammelschienenwahltasten ausgerüstet).
- AUDITION-Lampe wird eingeschaltet.
- Signalisation wird aktiviert.
- Timer Restart.

ON AIR

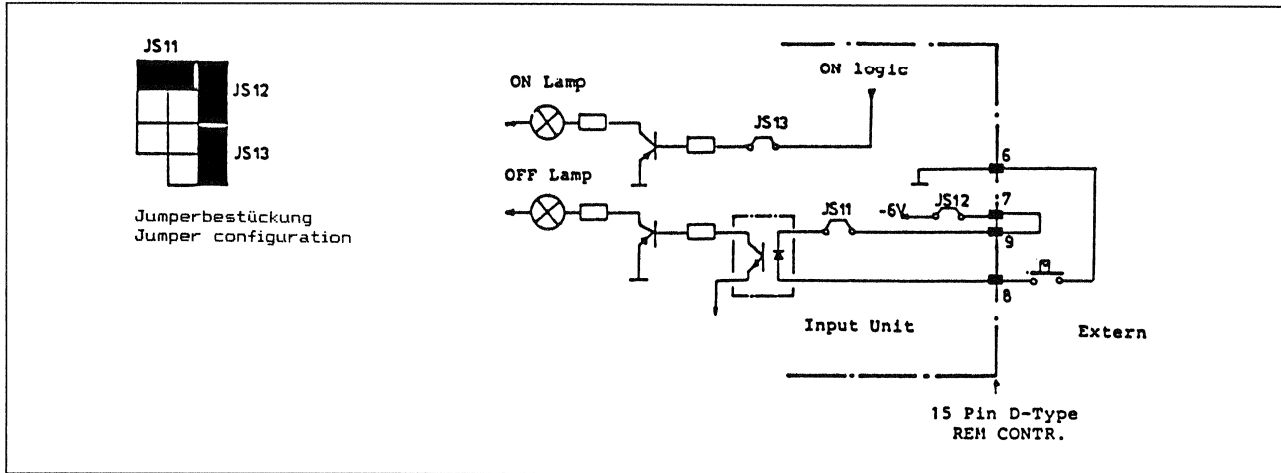
- Schaltet den Kanal durch und wählt die Summen  $\Sigma 1 + \Sigma 2$  an.
- Die ON AIR Lampe wird eingeschaltet.
- Signalisation wird aktiviert
- Timer Restart.

OFF

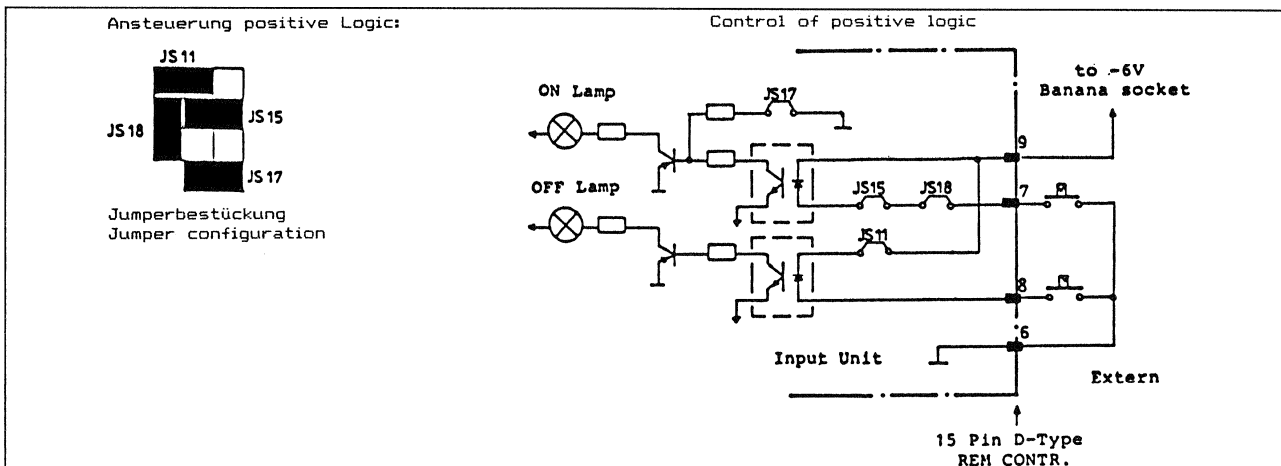
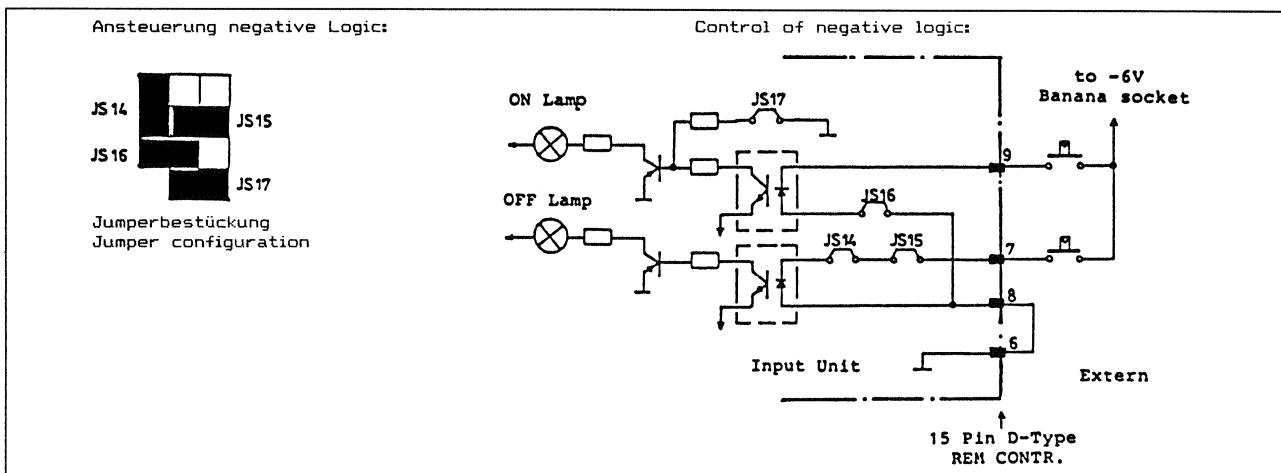
- Setzt sowohl AUDITION- als auch ON AIR-Taste zurück.
- Signalisation wird inaktiv.

Codierung für externe OFF-Lampensteuerung

(Standard)

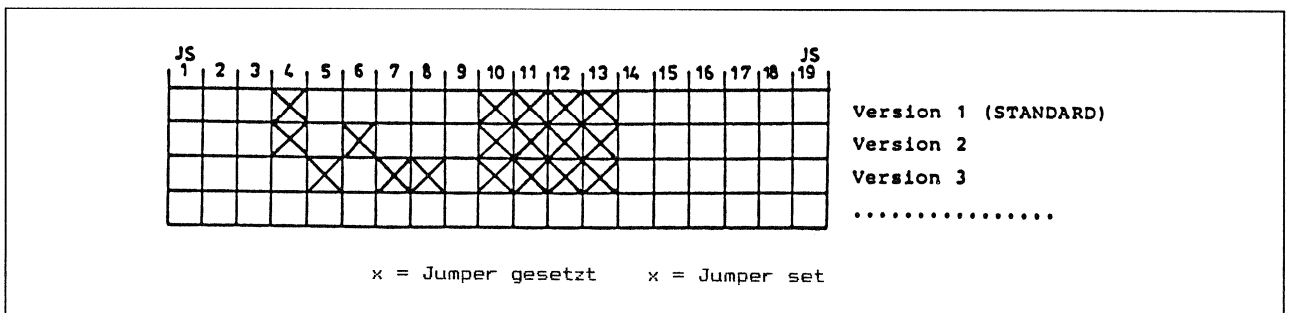
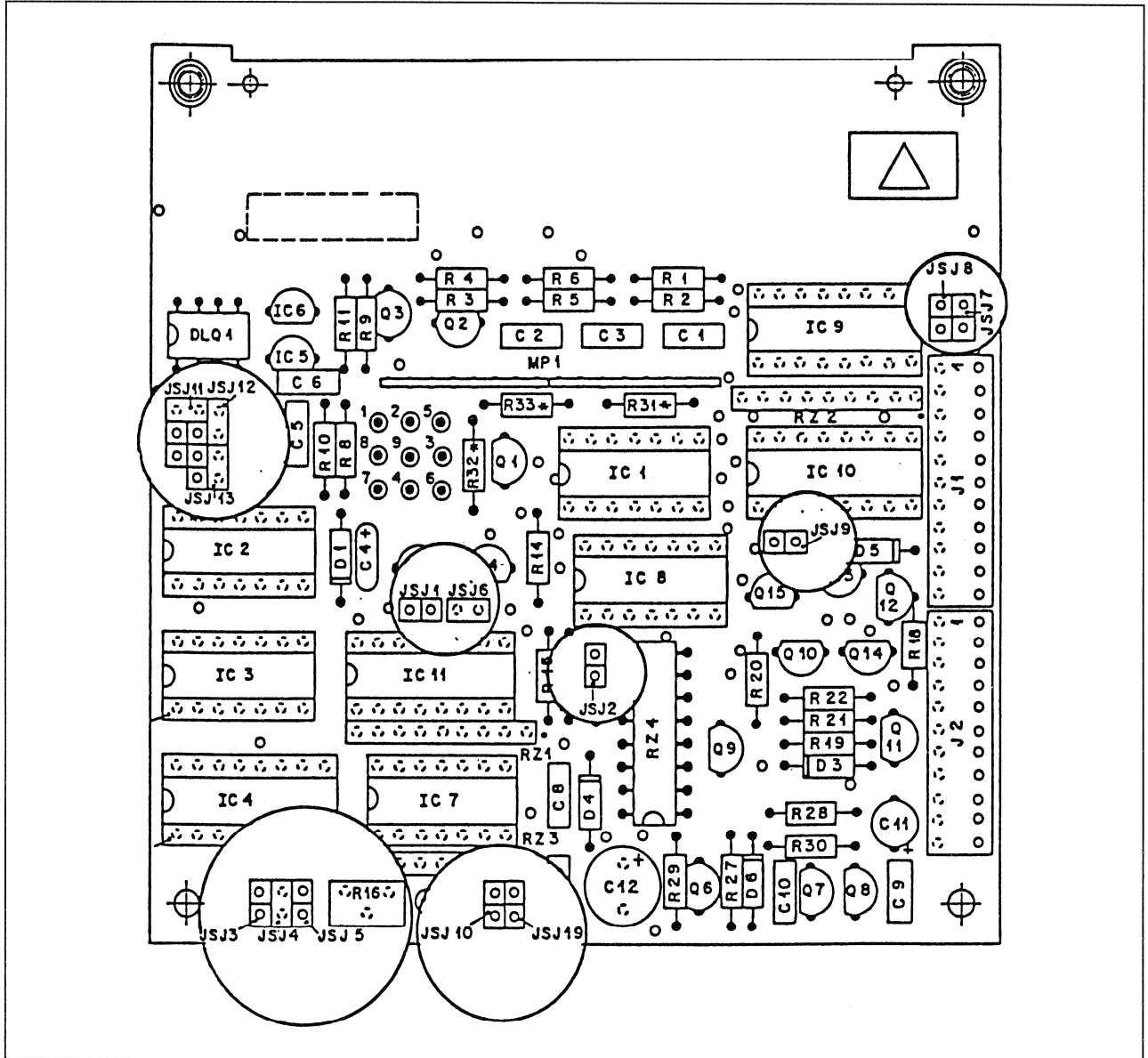


Codierung für externe ON- und OFF-Lampensteuerung



Jumpercodierung für Extension Unit

1.970.792



# STUDER AUDIO CONSOLE 970

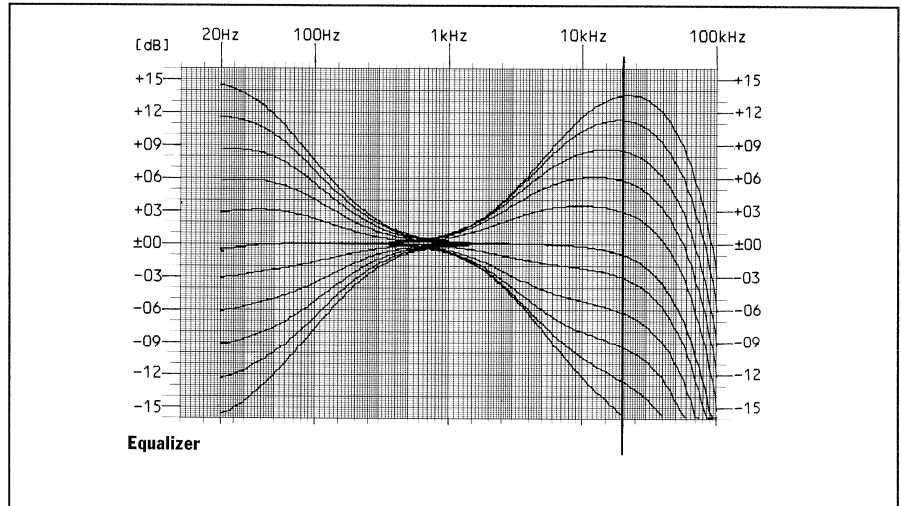
## MONO INPUT UNIT

### Optionen

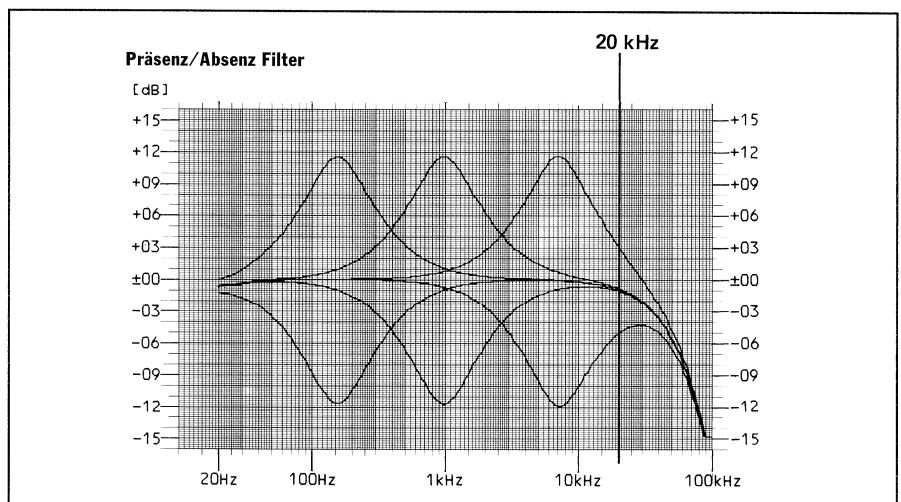
Ort	Jumper	Funktionen
JS1	gesetzt frei	OFF Lampe leuchtet, wenn ON-Taste ausgeschaltet ist. Keine Funktion
JS1 und JS2	gesetzt frei	OFF Lampe leuchtet, wenn ON-Taste und PFL/APL-Taste ausgeschaltet sind. Keine Funktion
JS3	gesetzt frei	PFL/APL-Taste <u>nur</u> einschaltend PFL/APL-Taste selbstauslösend (Toggle switch)
JS4	gesetzt frei	ON-Taste <u>nur</u> einschaltend ON-Taste selbstauslösend (Toggle switch)
JS5	gesetzt frei	OFF-Taste setzt die PFL/APL-Taste zurück Keine Funktion
JS6	gesetzt frei	APL (After Pan Listening) Version 2 PFL (Pre Fader Listening) Version 1 STANDARD
JS7	gesetzt frei	ON AIR-Taste schaltet $\Sigma 1+2$ durch. AUDITION-Taste schaltet $\Sigma 3+4$ durch. Version 3 Keine Funktion
JS9	gesetzt frei	PFL/APL-Taste steuert direkt das Line Relay an. Nur für Version 1+2! Keine Funktion
JS19	gesetzt frei	Timer-Restart Funktion ist ausgeschaltet. Timer-Restart Funktion ist eingeschaltet.

1.4 Entzerrer

Der Entzerrerteil ist mit der Drucktaste EQ IN überbrückbar. Die Tiefensperre ist davon nicht betroffen.  
 Fächerentzerrer für Höhen und Tiefen.  
 Bereich  $\pm 15$  dB bei 20 Hz / 20 kHz.



Parametrisches Glockenkurven-Filter mit einstellbarer Mittenfrequenz von 150 Hz...7 kHz. (Q=1)  
 Anhebung/Abschwächung  $\pm 11$  dB



### 1.5 Einschleifpunkt

---

Vor dem Flachbahnregler wird das Tonsignal elektronisch symmetriert und über zwei auf der Pultrückseite befindliche Bantam Jack Buchsen geführt. Der Einschleifpegel beträgt +6 dBu.

### 1.6 Signalisation und Faderstart

---

Steht der Eingangswahlschalter in MIC-Position, dann wird auf der Signalisationssammelschiene ein logisches Signal gegeben, sobald folgende Kriterien erfüllt sind:

- Kanalregler geöffnet
- Summenregler geöffnet
- Summenwahltaste betätigt
- Mute Funktion nicht aktiv
- Kanal mit ON-Taste eingeschaltet

Das summierte Signal wird in der Monitoreinheit zur Steuerung der Studiosignalisierung weiterverwendet.

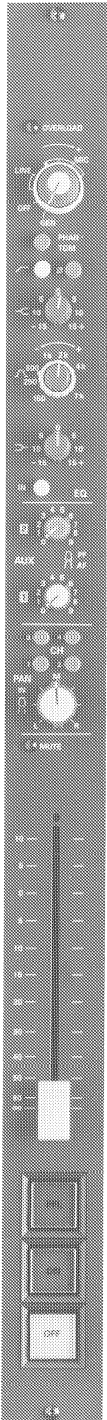
Steht der Eingangswahlschalter unter gleichen Bedingungen in Stellung LINE, so wird das im Eingangskanal eingebaute Fernsteuerrelais aktiviert. Der auf dem fünfzehnpoligen D-Type Stecker (REM-CONTR) greifbare Arbeitskontakt des Relais kann zur Fernsteuerung von Plattenspielern oder Tonbandgeräten eingesetzt werden.



## 1. Input Unit Mono

1.970.741

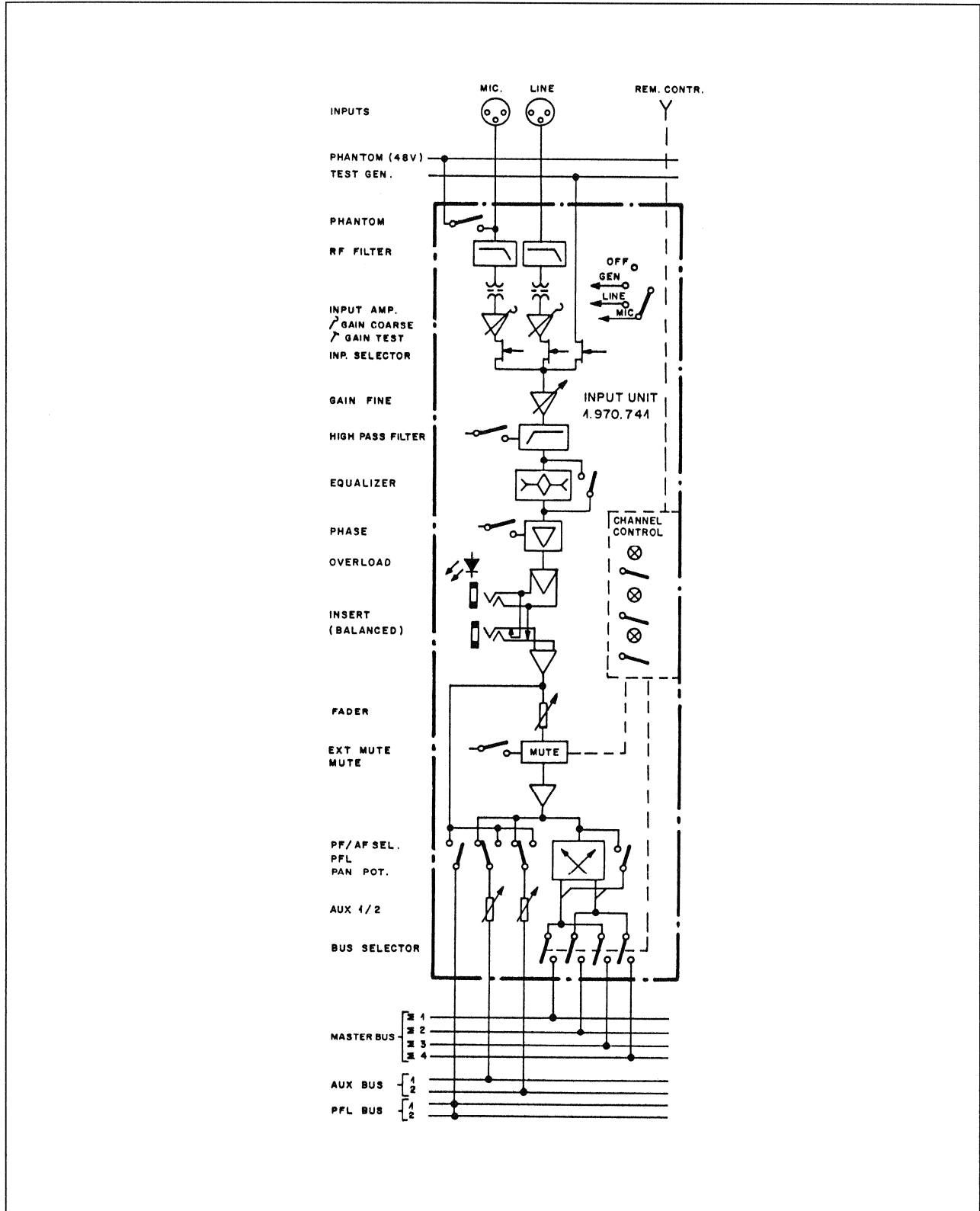
## 1.1 Operating Elements



- OVERLOAD:** The LED labelled "overload" turns on as soon as the maximum level before or after the fader has been exceeded.
- INPUT SECTION:**
- MIC:** Balanced, floating Microphone input. Sensitivity -70...10 dBu, switchable in four 15 dB steps, continuously variable between steps from 0...15 dB by means of potentiometer. The maximum input must not exceed +6 dB.
  - PHANTOM:** Switchable 48V supply voltage.
  - LINE:** High-level input, balanced and floating input. Input sensitivity -10...+20 dBu, switchable in two 15 dB steps, continuously variable between steps from 0...15 dB.
  - GEN:** Tone generator input, supplied via bus from the built-in tone generator
  - ∅:** Phase inversion switch, influence all inputs.
- FILTER:** Switchable bass cut with 12 dB/oct., cut off frequency of 75 Hz.
- EQUALIZER:** See 1.4
- 
- AUXILIARY OUTPUTS AUX 1 and AUX 2:** Two separately adjustable auxiliary outputs can be connected before or after the linear fader by means of the push-pull switches on each potentiometer.
- 
- PAN. POT AND:** The panorama potentiometer can be activated with the push-bull switch.
- MASTER SELECTION:** Stereo and 2CH mixers are equipped with two push buttons for individual selection of master  $\Sigma 1$  and  $\Sigma 2$ . 4CH mixers are equipped with four push buttons  $\Sigma 1$  ...  $\Sigma 4$ .
- 
- MUTE FUNCTION:** The channel can be muted without switching clicks on the 15-pin D-type connector (REM-CONTR). The mute LED indicates that the function is active.
- LINEAR FADER:** The linear fader is equipped with a resistive film made of conductive plastic.
- CONTROL KEYS:** See 1.3

1.2 Block Diagram

1.970.741



### 1.3 Control Keys

Three low-noise keys with signal lamps are located before the fader. The functions of the keys can be altered by changing the position of the mini-jumpers on this unit.

Three basic versions are available:

#### Version 1 (Fig.1)

PFL

- The prefader listening signal (PFL) is connected to the prelistening speaker and to the headphones. The signal is interrupted when this key is pressed a second time.
- At the same time the signal lamp is turned on or off.

ON

- Trough-connects the modulation path, provided the bus is selected and the fader is opened.
- ON lamp is turned on.
- PFL is interrupted, however the PFL lamp remains switched on to signal the previously selected state.
- Signalization or fader start relay is through-connected, provided the other criteria are satisfied. (see 1.6, signalization and fader start)
- Automatic stopwatch is reset (option)

OFF

- Modulation is interrupted.
- Signalization and fader start relay dropped out.
- If the PFL-key was selected, prelistening is again through-connected.
- ON lamp turns off.

OFF-Lamp: ■ Is activated externally and can signal the ready state of the source.

Remote Control: ■ All key and lamp signals are available on a 15-pin D-type connector. The above functions can also be remote-controlled.

Block diagram of remote controls:

(Standard)

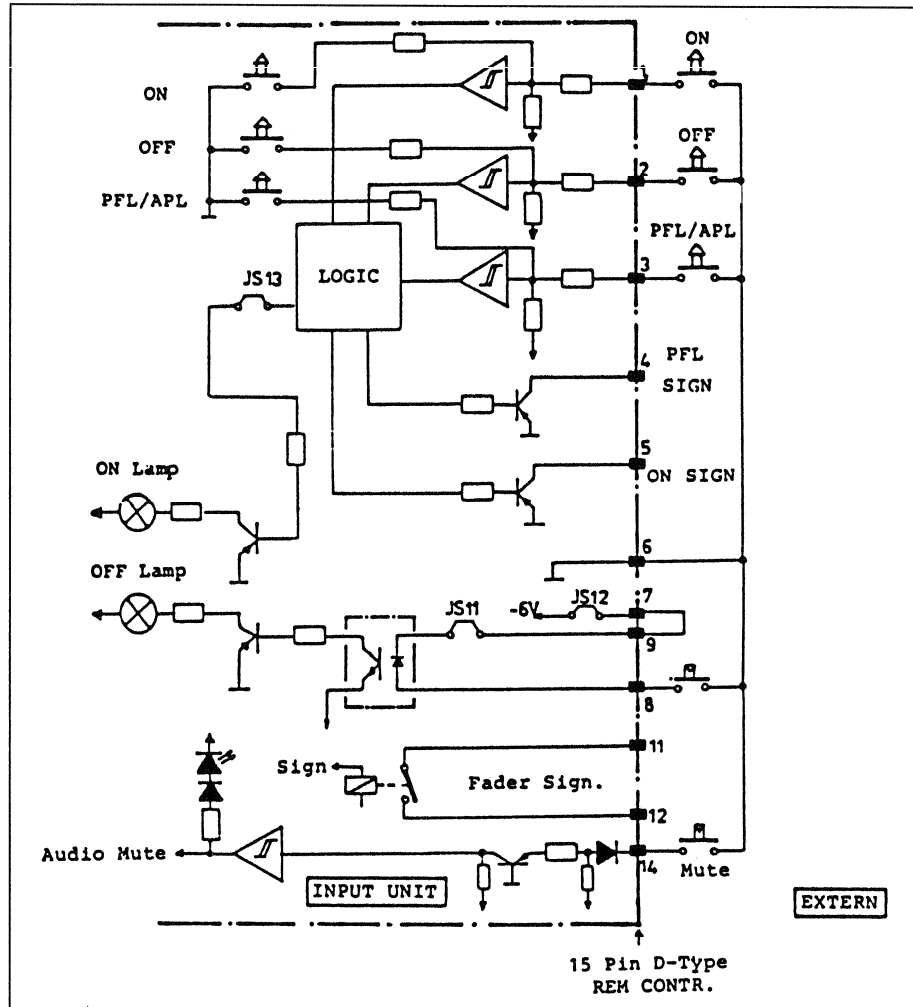
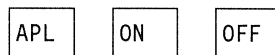


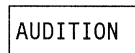
Fig. 1

Version 2



- Same function as version 1, except that the prelistening signal after the panorama potentiometer (APL) is connected rather than the signal before the fader.

Version 3



- Through-connects the channel and selects master  $\Sigma 3 + \Sigma 4$  (the input units of this version are not equipped with bus selection buttons).
- AUDITION lamp is turned on.
- Signalization is enabled.
- Timer restart.

ON AIR

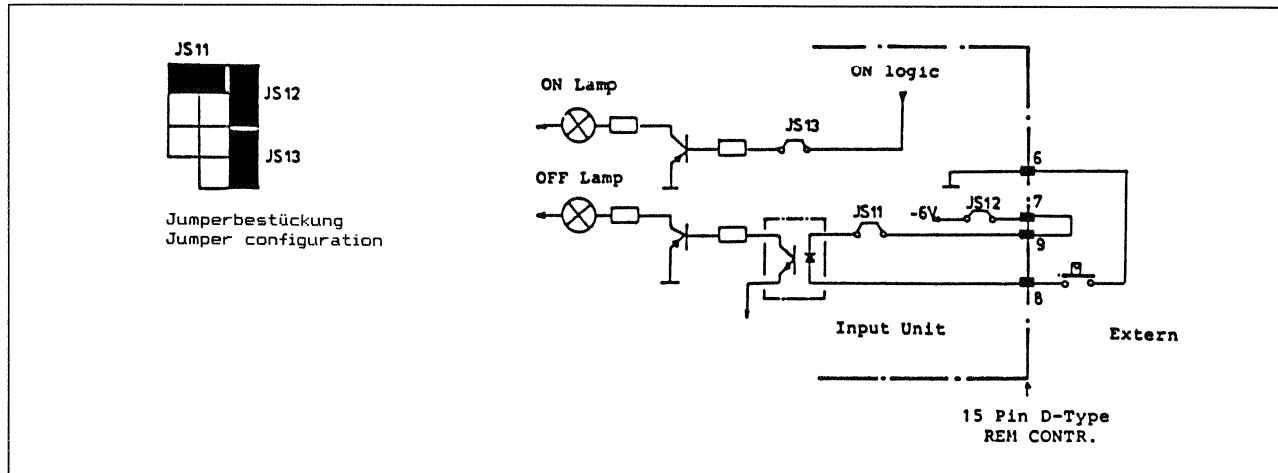
- Trough-connects the channel and selects the master  $\Sigma 1 + \Sigma 2$ .
- The ON AIR lamp is turned on.
- Signalization is enabled.
- Timer restart.

OFF

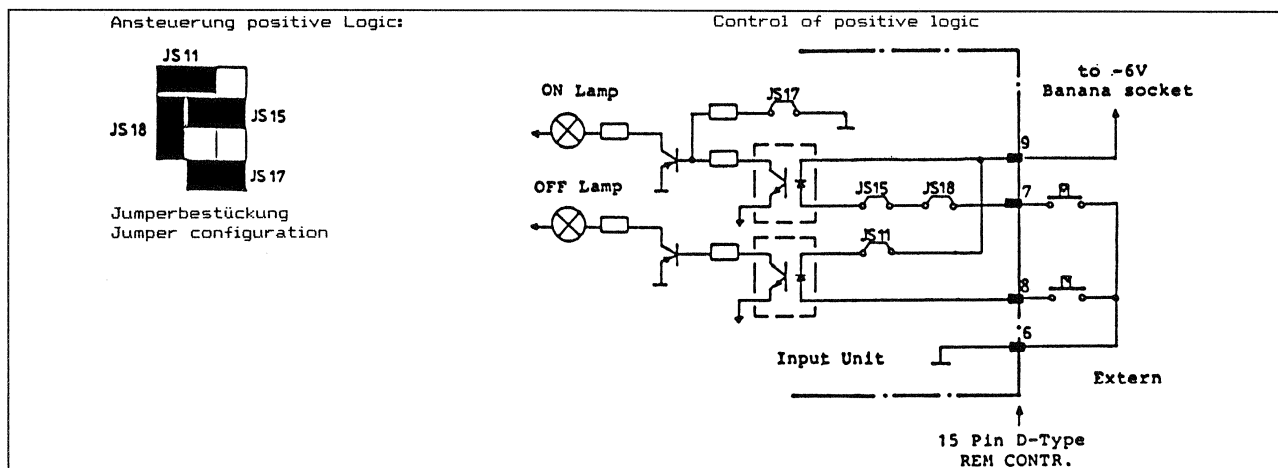
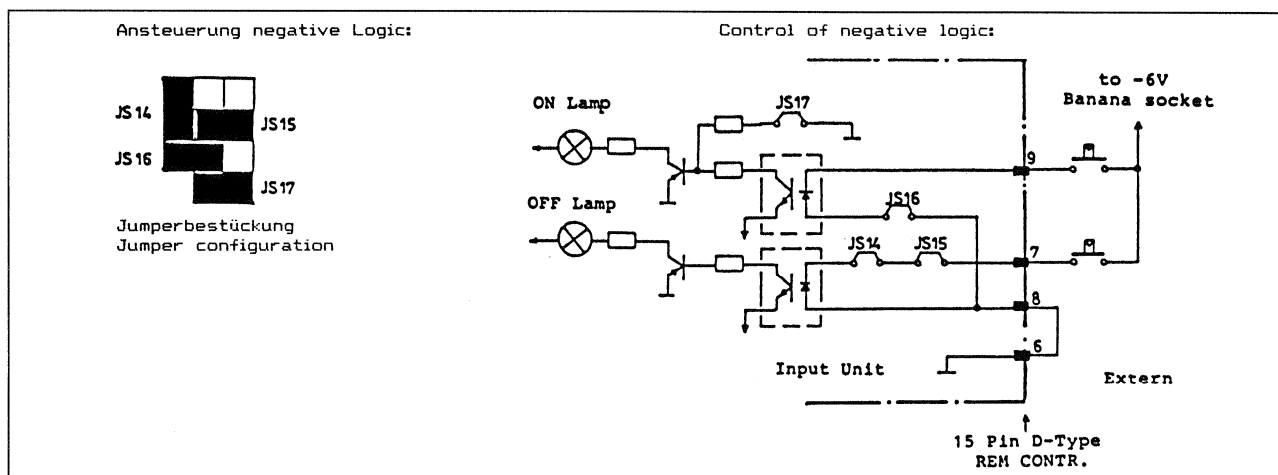
- Resets not only the AUDITION but also the ON AIR key.
- Signalization is disabled.

Coding for external OFF lamp control

(Standard)

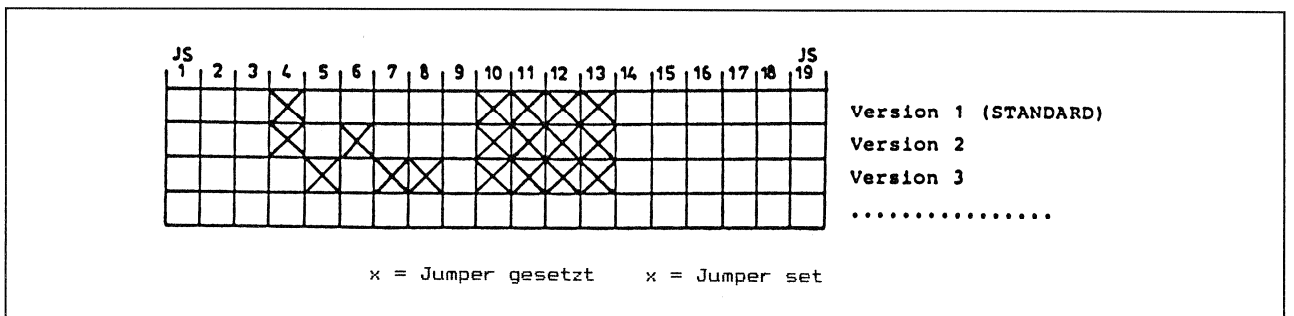
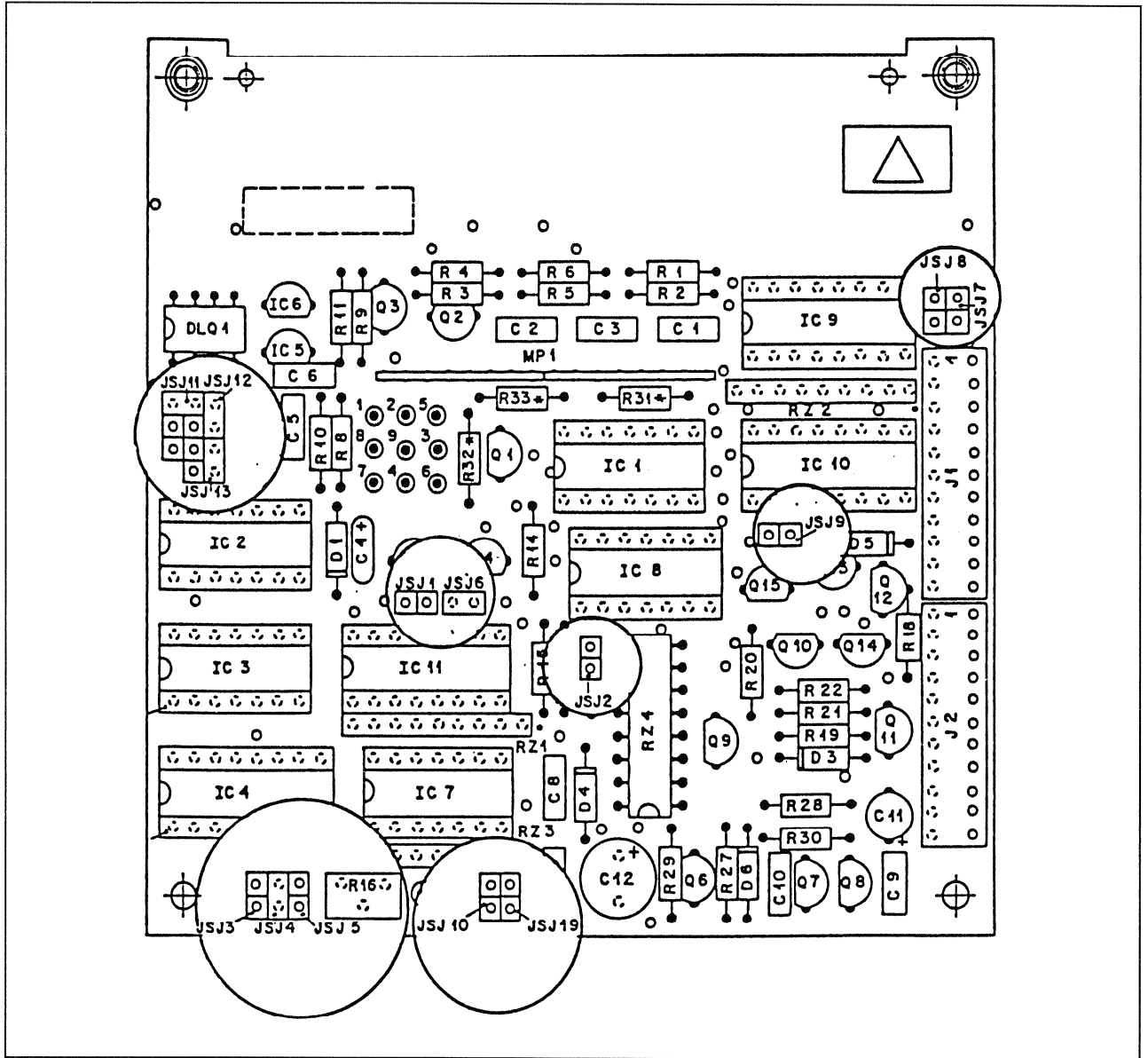


Coding for external ON and OFF lamp control



Jumper coding for extension unit

1.970.792



## STUDER AUDIO CONSOLE 970

### MONO INPUT UNIT

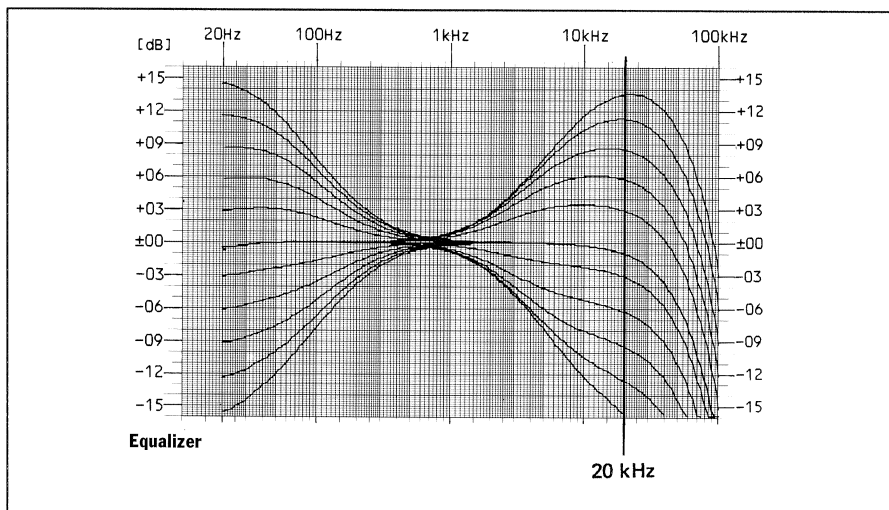
#### Options

Location	Jumper	Function
JS1	Set Not set	OFF lamp is light when the ON keys switched off. No function
JS1 und JS2	Set Not set	OFF lamp is light when the ON key and the PFL/APL key are switched off. No function
JS3	Set Not set	PFL/APL key only on-switching PFL/APL key self-releasing (toggle switch)
JS4	Set Not set	ON key only on-switching ON key self-releasing (toggle switch)
JS5	Set Not set	OFF key resets the PFL/APL key No function
JS6	Set Not set	APL (after pan listening) version 2 PFL (prefader listening) version 1 STANDARD
JS7	Set Not set	ON AIR key enables $\Sigma 1+2$ . AUDITION key enables $\Sigma 3+4$ . Version 3 No function
JS9	Set Not set	PFL/APL key directly controls the line relay. Only for version 1+2! No function
JS19	Set Not set	Timer restart, function is disabled. Timer restart, function is enabled.

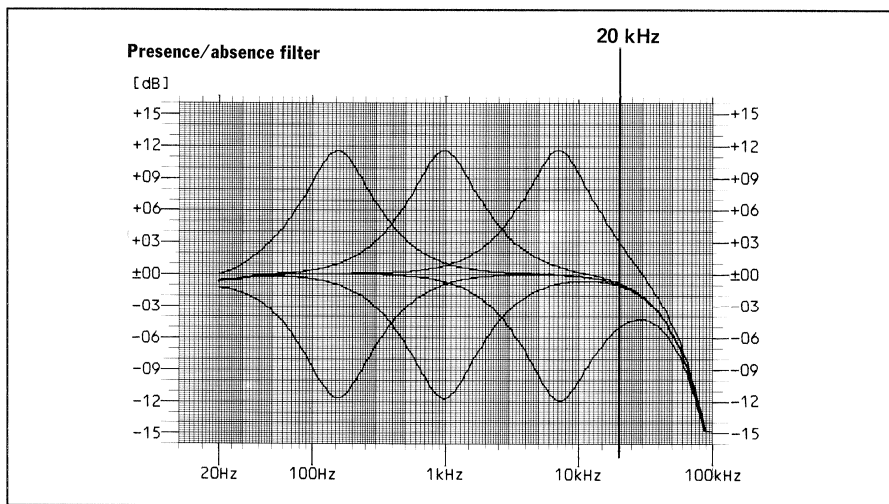


1.4 Equalizer

The entire equalizer section is only enabled if the EQUALIZER IN key is pressed.  
 The bass cut filter is not affected by this.  
 Shelving equalizer for treble and bass. Range at 20 Hz / 20 kHz:  $\pm 15$  dB.



Parametric filter with adjustable center frequency: 150 Hz...7 kHz (Q=1)  
 Emphasis / de-emphasis:  $\pm 11$  dB



### 1.5 Insertion Point

---

Before the linear fader the audio signal is electronically balanced and taken to two rearpanel bantam jack sockets. The insertion level is +6 dBu.

### 1.6 Signalization and Fader Start

---

When the input selector switch is in the MIC position, a logical signal is applied to the signalization bus as soon as the following criteria are satisfied:

- Channel fader open
- Master fader open
- Master selection key pressed
- Mute function not active
- Channel enabled with ON key.

The aggregate signal is used in the monitor unit for controlling the studio signalization.

If under the same conditions the input selector is in the LINE position, the remote control relay built into the input channel is activated. The relay make contact available on the 15-pin D-type REM-CONTR connector can be used for the remote control of turntables or tape recorders.

# STUDER AUDIO CONSOLE 970

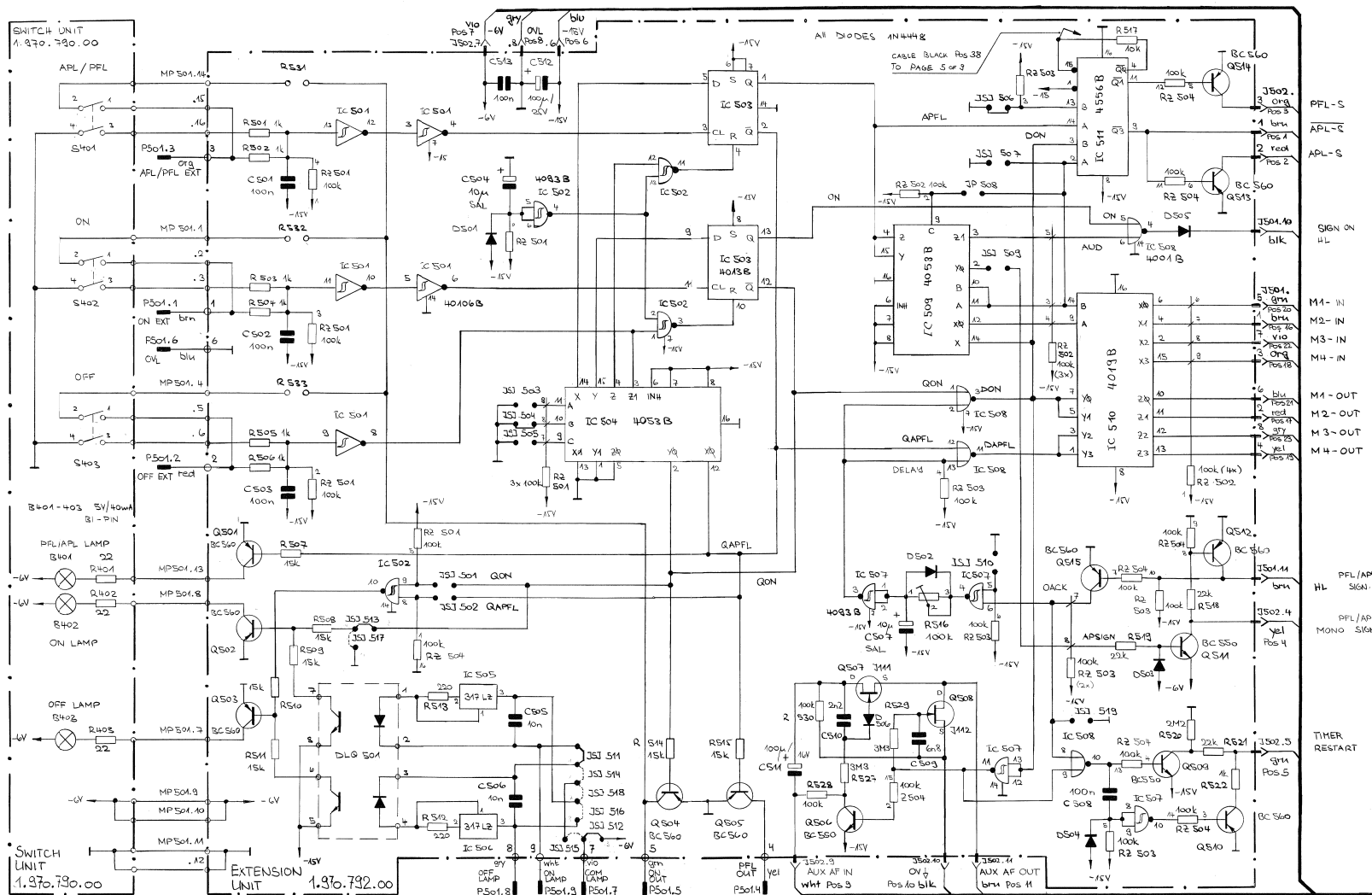
## MONO INPUT UNIT

### 1.7 Schemateil / Circuit Diagrams

1.970.741.81

#### Mono Input 4CH

#### Part 1



© 27.7.83	fa	○ . . ○ . . ○ . . ○ . .	INCL. 1.970.792.00 , 1.970.790.00	PAGE 1 OF 10
STUDER	MONO INPUT UNIT	SC	1.970.710.81	

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STUDER	MONO INPUT UNIT	SC	1.970.710.81	

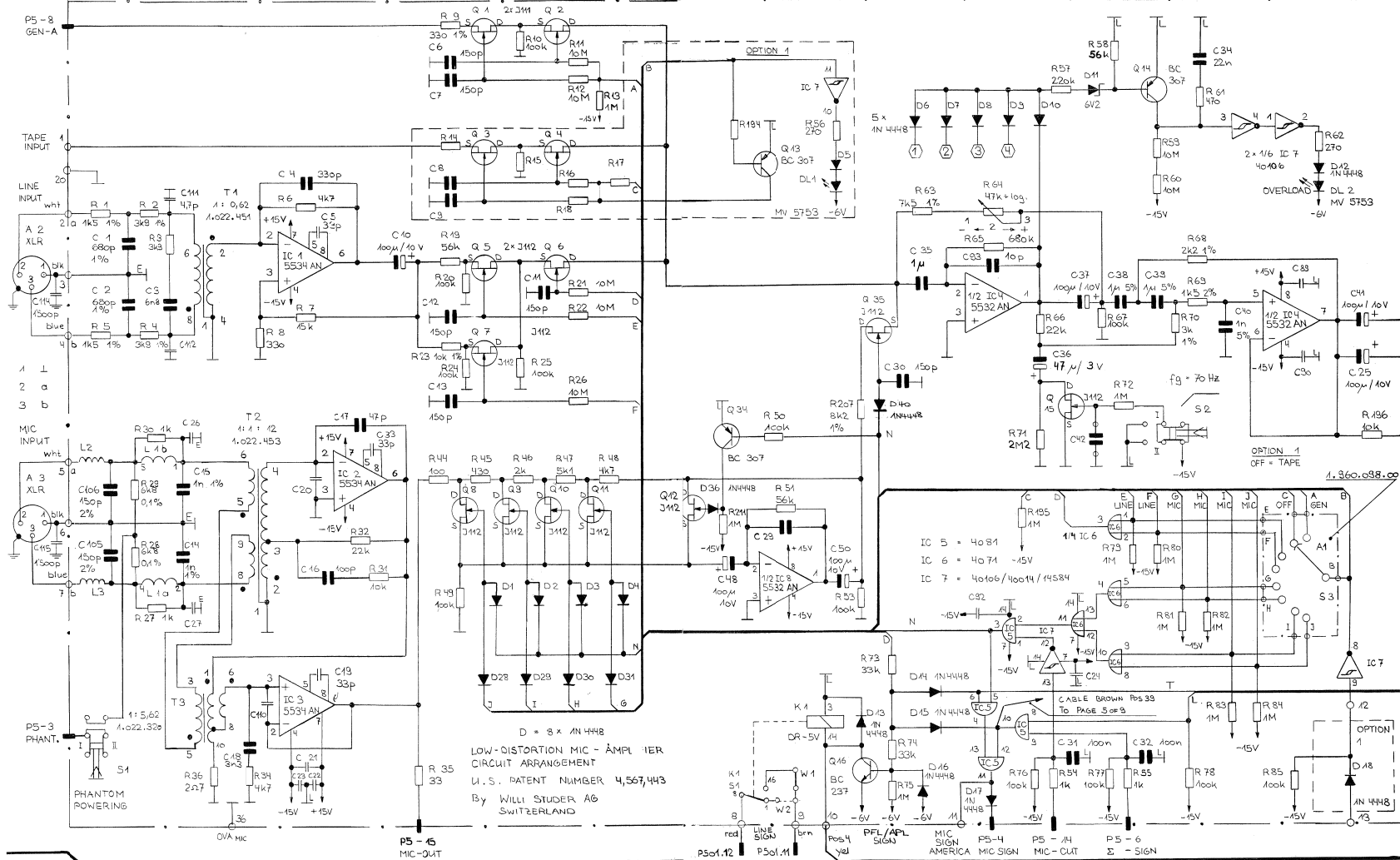
# STUDER AUDIO CONSOLE 970

## MONO INPUT UNIT

Mono Input Unit 4CH

1.970.741.81

Part 2



27.7.83	INCL. 1.970.792.00	PAGE 3 OF 10
STUDER	MONO INPUT UNIT	SC 1.970.710.81

27.7.83	INCL. 1.970.792.00	PAGE 4 OF 10
STUDER	MONO INPUT UNIT	SC 1.970.710.81

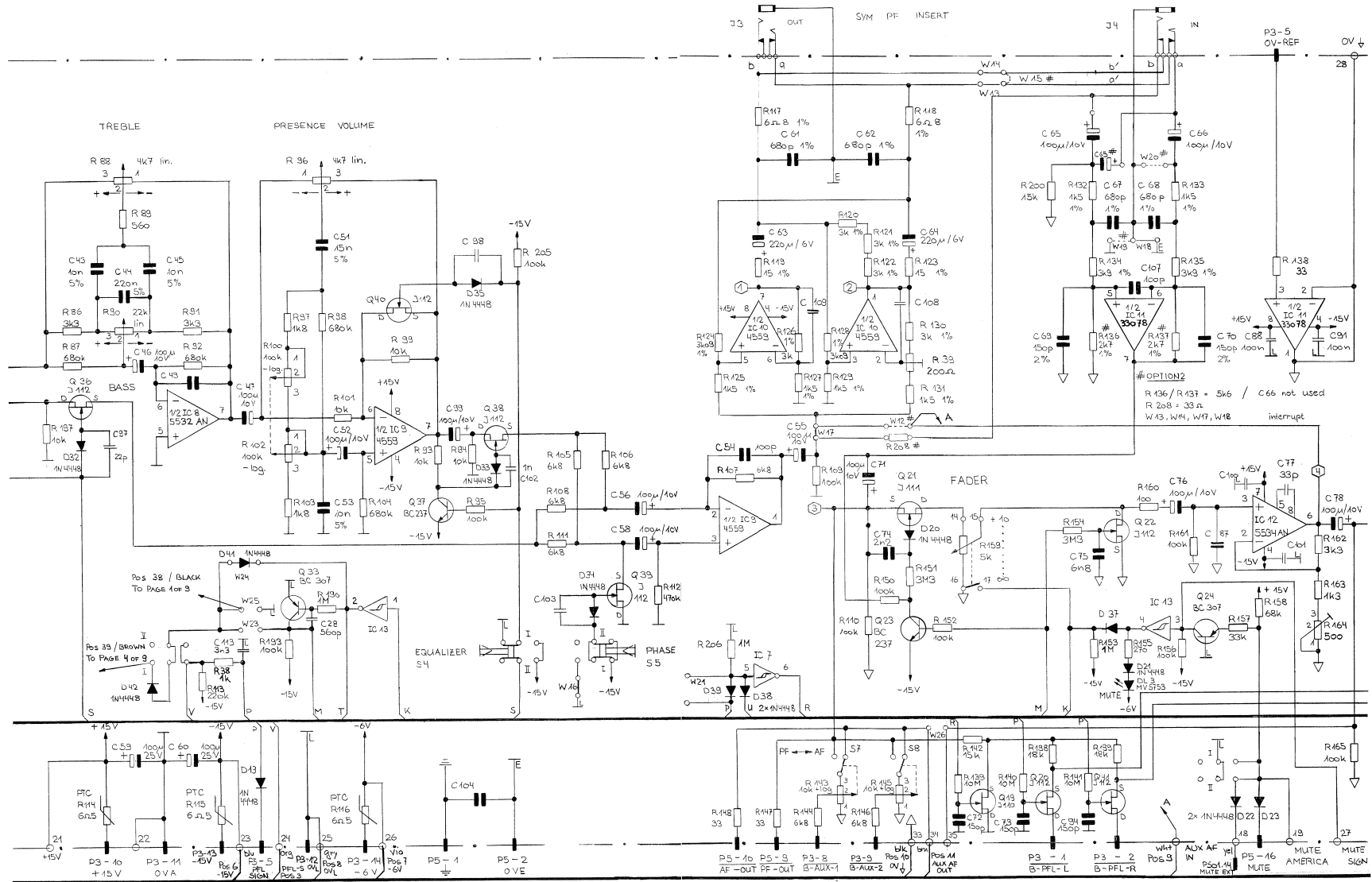
# STUDER AUDIO CONSOLE 970

## MONO INPUT UNIT

Mono Input 4CH

1.970.741.81

Part 3



27.7.89	INCL. 1.970.792.00	PAGE 5 OF 10
STUDER	MONO INPUT UNIT	SC 1.970.710.81

27.7.89	INCL. 1.970.792.00	PAGE 6 OF 10
STUDER	MONO INPUT UNIT	SC 1.970.710.81

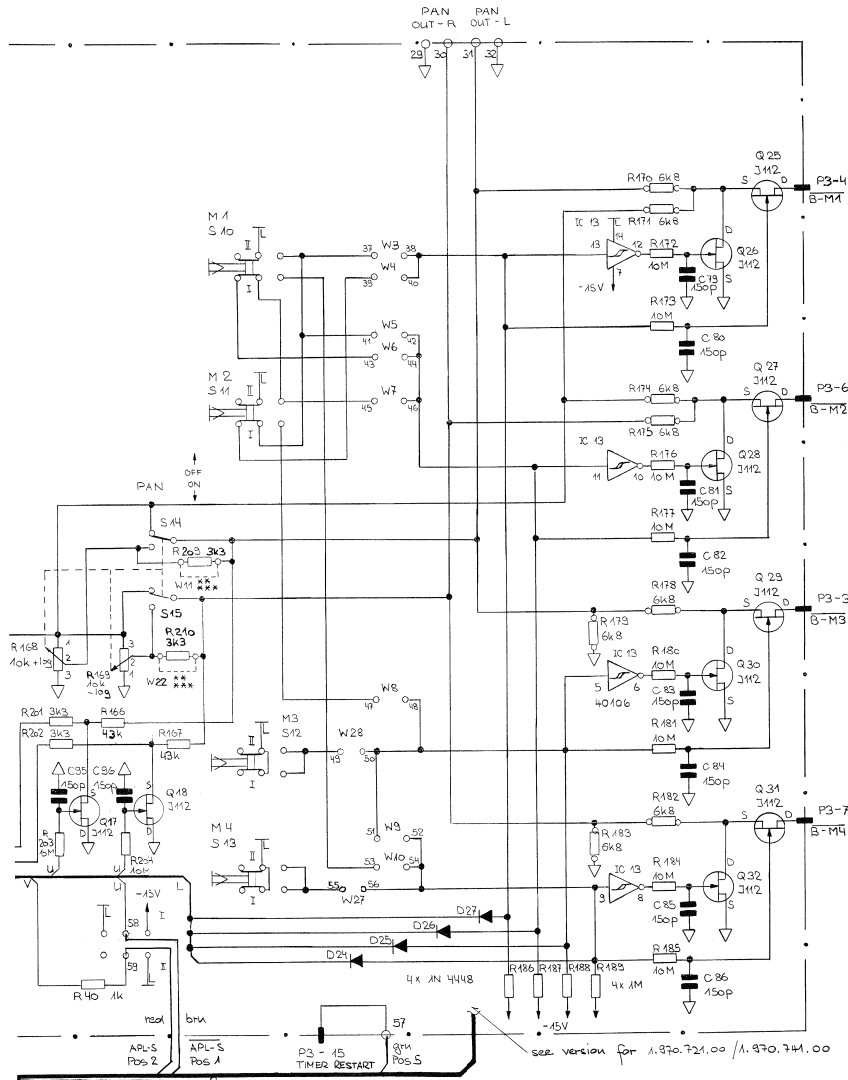
STUDER AUDIO CONSOLE 970

MONO INPUT UNIT

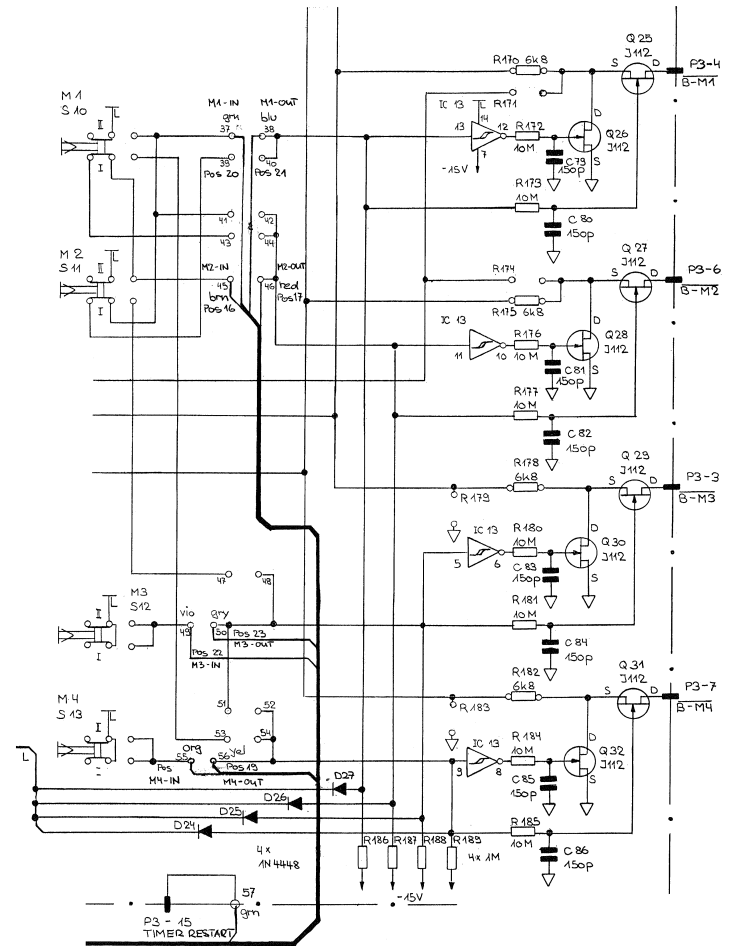
Mono Input 4CH

1.970.741

Part 4



VERSION FOR 1.970.741.00



27.7.89	INCL. 1.970.792.00	PAGE 7 OF 10
STUDER	MONO INPUT UNIT	SC 1.970.710.81

27.7.89	INCL. 1.970.792.00	PAGE 8 OF 10
STUDER	MONO INPUT UNIT	SC 1.970.710.81

# STUDER AUDIO CONSOLE 970

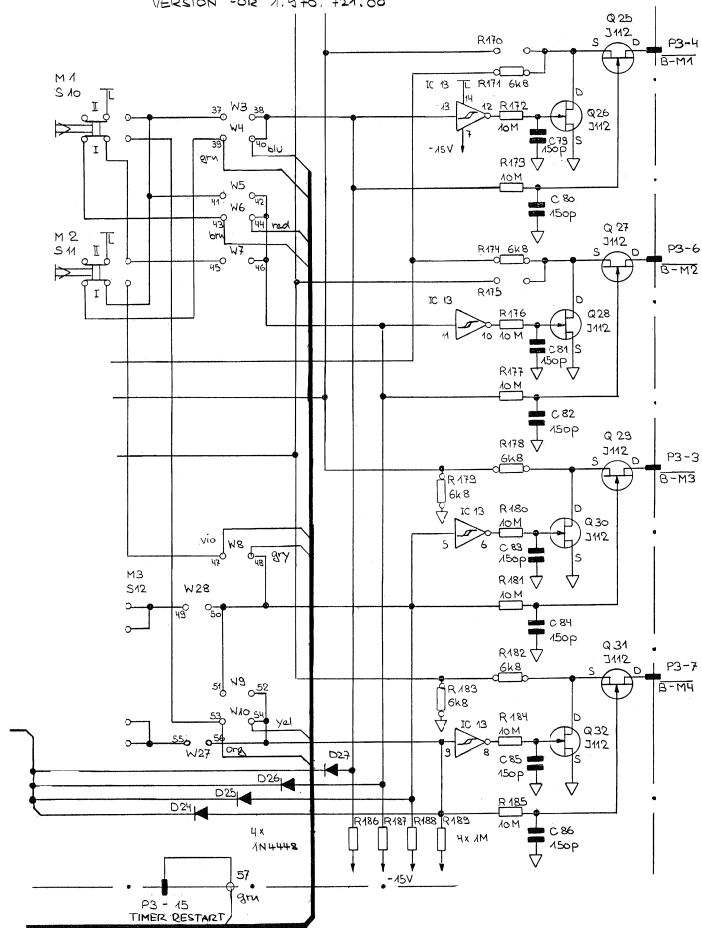
## MONO INPUT UNIT

Mono Input 4CH

1.970.741.81

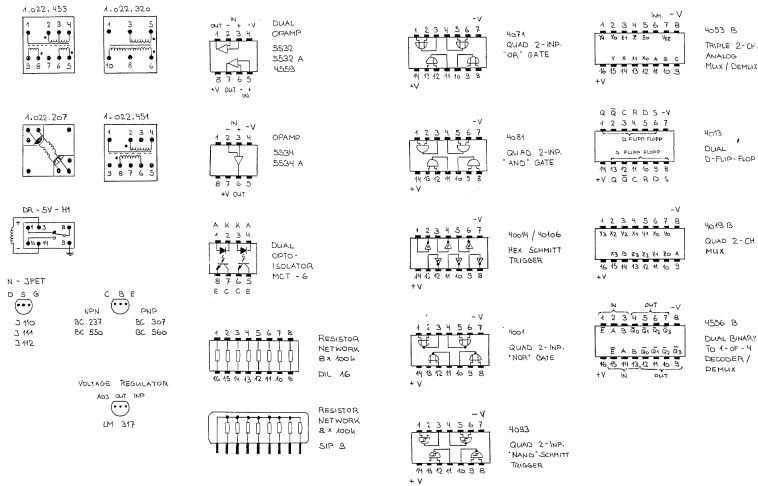
Part 5

VERSION FOR 1.970.721.00



\* VERSION NOT AVAILABLE / ONLY FOR INFORMATION

P - NO	NAME	REMARK ( EURO 16-P )	B-BUS/D-CONNECTION	P - NC NAME	REMARK ( C-TYPE 15-P )
P5 1	CHASSIS	METAL FRAME	B	PSD1 1	ON EXT
P5 2	OV-E	OV EXTERN	B	PSD1 2	OFF SWITCH EXTERN
P5 4	MIC-SIGN	MIC SIGNALLING	B	PSD1 3	APL/PFL
P5 5	PFL-SIGN	OV+PFL/+M+MON.	B	PSD1 4	APL/PFL SWITCH EXTERN
P5 6	PFL-SIGN.	OV+PFL/+M+MON.	B	PSD1 5	PFL SIGN
P5 7	M-SIGN.	MASTER SIGNALLING	B	PSD1 6	ON OUT
P5 8	GEN-A	GENERATOR SIGNALLING	B	PSD1 7	OV SIGN
P5 9	PF-OUT	PF OUTPUT	B	PSD1 8	GROUND SIGN (LOGIC) OUT
P5 10	AF-OUT	AF OUTPUT	O	PSD1 9	COMMON FOR ON AND OFF LAMP EXTERN
P5 11	-	RES	O	PSD1 10	ON LAMP
P5 12	-	RES	O	PSD1 11	OFF LAMP
P5 13	-	RES	O	PSD1 12	OFF LAMP EXTERN
P5 14	MIC-CUT	MIC SWITCH	O	PSD1 13	ON LAMP
P5 15	MIC-OUT	MIC OUTPUT	O	PSD1 14	RES
P5 16	MUTE	CH. MUTE	O	PSD1 15	RES
P3 1	B-PFL-L	PFL 0-DHM BUS LEFT	B		
P3 2	B-PFL-R	PFL 0-DHM BUS RIGHT	B		
P3 3	B+M 3	MASTER 310-DHM BUS	B		
P3 4	B+M 1	MASTER 210-DHM BUS	B		
P3 5	OV-REF	OV REFERENCE	B		
P3 6	B+M 2	MASTER 210-DHM BUS	B		
P3 7	B+M 4	MASTER 410-DHM BUS	B		
P3 8	B+M 2	AUX 210-DHM BUS	B		
P3 9	B-AUX-2	AUX 210-DHM BUS	B		
P3 10	+ 15 V	+ SUPPLY	B		
P3 11	OV-A	GROUND AUDIO	B		
P3 12	OV-L	GROUND SIGN (LOGIC)	B		
P3 13	- 15 V	- SUPPLY	B		
P3 14	+ 0 V	+ SUPPLY	B		
P3 15	TIMER	TIMER RESTART	B		
P3 16	-	RES	O		
P2 --	-	RES	O		



BOTTOM VIEW

27.7.89	INCL. 1.970.732.00	PAGE 9 OF 10
STUDER	MONO INPUT UNIT	SC 1.970.741.81

27.7.89	INCL. 1.970.741.81	PAGE 10 OF 10
STUDER	MONO INPUT UNIT	SC 1.970.741.81

# STUDER AUDIO CONSOLE 970

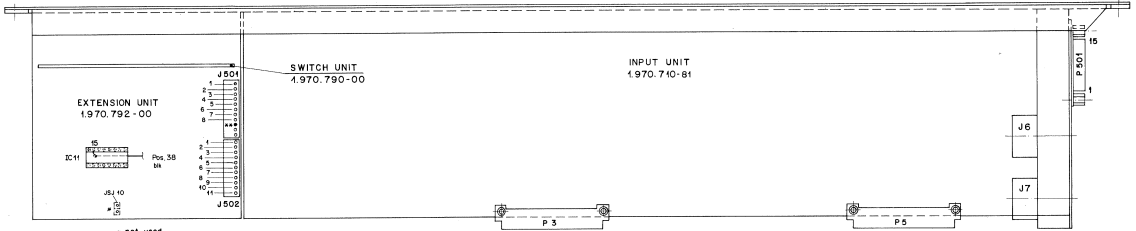
## MONO INPUT UNIT

Mono Input Unit 4CH

1.970.741.81

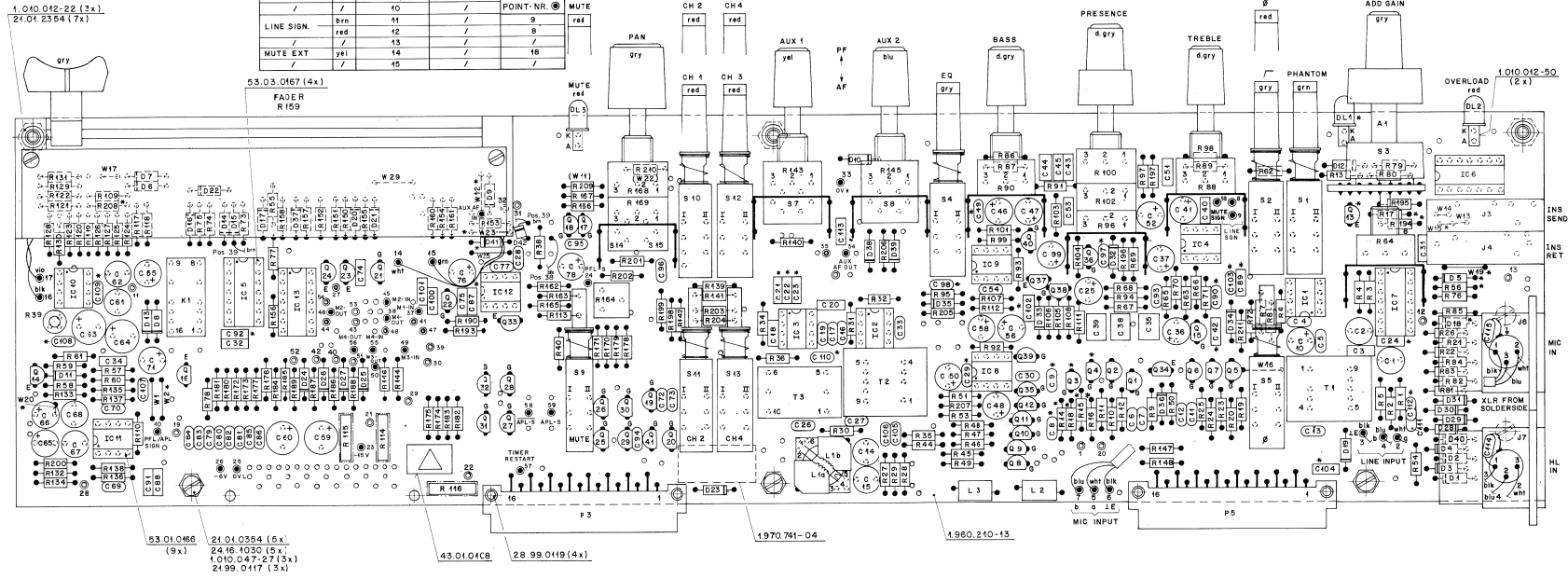
SIGN. NAME	COL.	INPUT UNIT POINT-NR.	EXTENSION UNIT J502	SIGN. NAME	COL.	INPUT UNIT POINT-NR.	EXTENSION UNIT J504
APL-S	brn	58	1	M2-IN	brn	45	1
APL-S	red	59	2	M2-OUT	red	46	2
PFL-S	org	24	3	M4-IN	org	55	3
PFL/APL SIGN	yel	10	4	M4-OUT	yel	56	4
TIMER RESTART	grn	57	5	M4-IN	grn	37	5
-15V	blu	23	6	M3-OUT	blu	38	6
-6V	wh	26	7	M3-IN	vio	49	7
OV.L	grf	25	8	M3-OUT	grf	50	8
AUX AF IN	wh	W12	9				
OV f	blk	33	10				
AF OUT	brn	34	11				

SIGN. NAME	COL.	INPUT UNIT POINT-NR.	EXTENSION UNIT POINT-NR.
ON EXT	brn	1	1
OFF EXT	red	2	2
APL/PFL EXT	org	3	3
PFL OUT	yel	4	4
ON JUT	grn	5	5
OV.L	blu	6	6
COM LAMP	vio	7	7
OFF LAMP	grf	8	8
ON LAMP	wh	9	9
LINE SIGN.	brn	41	9
	red	42	8
	yel	43	7
MUTE EXT	yel	14	18
	grf	15	17



1.040.042-22 (3x)  
24.01.2354 (7x)

53.03.067 (4x)  
FAZIR R159



53.01.0466 (9x)  
24.01.0354 (5x)  
24.16.1030 (5x)  
1.010.047-27 (3x)  
24.99.0417 (3x)

43.01.0468  
28.99.0419 (4x)

1.970.741-04

1.960.210-13

VALID FOR	NR. UNIT	NR. FRONT PANEL	NR. NUMBER LABEL
INPUT UNIT 4CH1,2,3,4	1.970.741-81	1.970.741-01	1.970.741-04

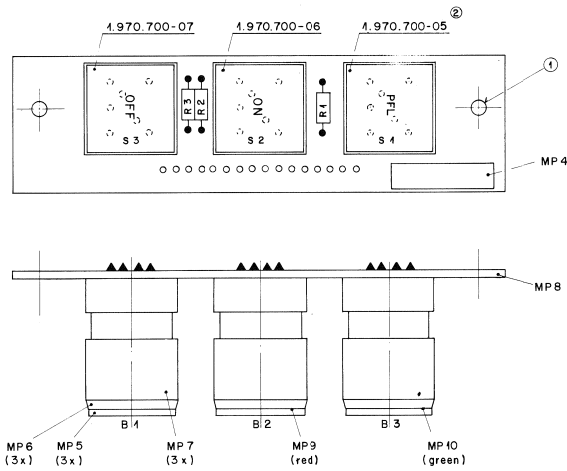
1.022.400-03 (2 x)  
unter T 1, T2  
\* not used

C 114 und C 115  
vellet nach BV 646









Numbers of positions are 4...

Switch Unit

1.970.790.00

Ad	.POS.	.REF.No.	DESCRIPTION	MANUFACTURER
B...	.401	51.02.0154	5V 40mA	Osh
B...	.402	51.02.0154	5V 40mA	Osh
B...	.403	51.02.0154	5V 40mA	Osh
MP.	.401	21.01.0354	2 pcs lotted pan head screw M3*6	
01	MP.	.401	not exist	
MP.	.402	24.16.1030	2 pcs screw locking devices D3.2 / 5.5 * 0.45	
01	MP.	.402	not exist	
MP.	.403	1.010.025.27	2 pcs hexagon post M3*25	ST
01	MP.	.403	not exist	
MP.	.404	1.970.790.04	0 pcs Studer-number-label	ST
MP.	.405	55.15.0202	3 pcs push-button assembly	EAO
MP.	.406	55.15.0221	3 pcs push-button assembly	EAO
MP.	.407	55.15.0228	3 pcs push-button knob	EAO
MP.	.408	1.970.790.11	1 pcs Switch unit PCB	
MP.	.409	55.15.0212	1 pcsp ush-button-assembly red	
MP.	.410	55.15.0215	1 pcsp ush-button-assemblygreen	
R...	.401	57.11.3220	22 Ohm 5% 0.25W	
R...	.402	57.11.3220	22 Ohm 5% 0.25W	
R...	.403	57.11.3220	22 Ohm 5% 0.25W	
S...	.401	55.15.0232	2* a Push button switch	EAO
S...	.402	55.15.0232	2* a Push button switch	EAO
S...	.403	55.15.0232	2* a Push button switch	EAO

CF=Ceramic, CF=Carbon Film, EL=Electrolytic, MF=Metal Film, PE=Polyester, PP=Polypropylen, PS=Polystyrol

MANUFACTURER: Bu=Burndy, Ex=Exar, Fc=Fairchild, GI=General Instrument, HP=Hewlett Packard, ITI=Intermetal, Mo=Motorola, Nat=National (Matsushita), NS=National Semiconductors, Ph=Philips, Ra=Raytheon, Sig=Signetics, Six=Siliconix, St=Studer, TI=Texas Instrument, Sie=Siemens, Is=Intersil, Un=Unitrode, Osh=Oshino

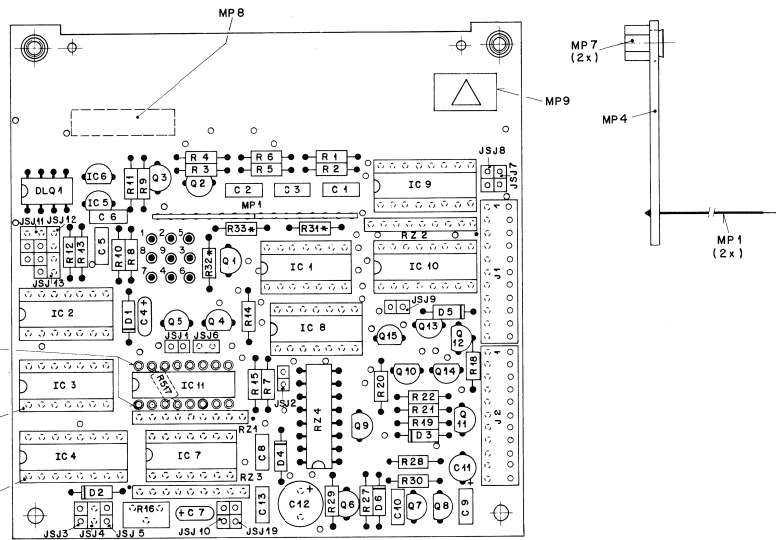
1.970.790.00	SWITCH UNIT	HG86/07/1500
1.970.790.00	SWITCH UNIT	TA 87/01/0801

# STUDER AUDIO CONSOLE 970

## INPUT UNITS

### 1.9 Extension Unit ESE

1.970.792.00



Numbers of positions are 5...

\* not used

ⓐ R517 neu dazu

### Extension Unit

1.970.792.00

Ad.	..POS.	..REF.No.	DESCRIPTION	MANUFACTURER
C..501	59.06.0104	100	10K	PE
C..502	59.06.0104	100	10K	PE
C..503	59.06.0104	100	10K	PE
C..504	59.26.2100	10	20K	16V SAL
C..505	59.06.0103	10	10K	PE
C..506	59.06.0103	10	10K	PE
C..507	59.26.2100	10	20K	16V SAL
C..508	59.06.0104	100	10K	PE
C..509	59.06.0682	6.8	10K	PE
C..510	59.06.0222	2.2	10K	PE
C..511	59.22.3101	100	10V	EL
C..512	59.22.5101	100	25V	EL
C..513	59.06.0104	100	10K	PE
D..501	50.04.0125			any
D..502	50.04.0125			any
D..503	50.04.0125			any
D..504	50.04.0125			any
D..505	50.04.0125			any
D..506	50.04.0125			any
DLQ.501	50.99.0111		MCT - 6	Dual Optokoppler
IC..501	50.07.0014	40108B	Hex Schmitt Trigger	
IC..502	50.07.0008	40938	Nand Schmitt Trigger	
IC..503	50.07.0013	40138	D-Flip-Flop	
IC..504	50.07.0013		Mux-Demux	
IC..505	50.10.0108	LM 317L	Voltage Regulator	
IC..506	50.10.0108	LM 317L	Voltage Regulator	
IC..507	50.07.0008	40938	Nand Schmitt Trigger	
IC..508	50.07.0006	4001B	Quad Nor Gate	
IC..509	50.07.0015	40538	Mux-Demux	
IC..510	50.07.0019	40198	Quad 2-Input Mux	
IC..511	50.07.0004	4556B	Decoder	
J..501	54.01.0291		CIS-Connector 11 pin	
J..502	54.01.0291		CIS-Connector 11 pin	
JSJ.501			option 6	
JSJ.502			option 6	
JSJ.503			option 4	
JSJ.504			option 4	
JSJ.505	54.01.0021		option 4	
JSJ.506			option 5	
JSJ.507	54.01.0021		option 10	
JSJ.508			option 13	
JSJ.509			option 14	
JSJ.510			option 9	
JSJ.511			not used in 1.970.741.00	option 11
JSJ.512			Jumper used in 1.970.753 / 754.00	
JSJ.513	54.01.0021		Jumper option 7 / option 8	
JSJ.514	54.01.0021		Jumper option 7 / option 8	
JSJ.515			option 7	
JSJ.516			option 7 / option 8	
JSJ.517			option 7 / option 8	
JSJ.518			option 8	
JSJ.519			option 12	
MP..501	1.010.300.64	2	pcs	Flat-band-cable 40mm
MP..502	54.03.0602	2	pcs	Flat-band-cable 40mm
MP..503	53.03.0168	4	pcs	IC-socket 16 pin
MP..504	53.03.0168	3	pcs	IC-socket 16 pin
MP..505	53.03.0167	5	pcs	IC-socket 14 pin
MP..506	1.970.792.11	1	pcs	Extension unit PCB
MP..507	54.01.0020	33	pcs	Wire Wrap pins
MP..508	1.010.014.22	2	pcs	hexagon rivetting-nut M3*4.5
MP..509	1.970.792.04	0	pcs	STUDER-number-label
MP..510	43.01.0108	1	pcs	ESE-caution-label (see note 1)

Ad.	..POS.	..REF.No.	DESCRIPTION	MANUFACTURER
R..511	57.11.3153	15	10Khm	5% 0.25W
R..512	57.11.3221	220	Ohm	5% 0.25W
R..513	57.11.3221	220	Ohm	5% 0.25W
R..514	57.11.3153	15	10Khm	5% 0.25W
R..515	57.11.3153	15	10Khm	5% 0.25W
R..516	58.01.9104	100	10Khm	10% var. resistor
R..517	57.11.3103	10	10Khm	not exist
R..518	57.11.3223	22	10Khm	5% 0.25W
R..519	57.11.3223	22	10Khm	5% 0.25W
R..520	57.11.3225	2.2	10Khm	5% 0.25W
R..521	57.11.3223	22	10Khm	5% 0.25W
R..522	57.11.3102	1	10Khm	5% 0.25W
R..523	.	.	not exist	
R..524	.	.	not exist	
R..525	.	.	not exist	
R..526	.	.	not exist	
R..527	57.11.5335	3.3	MOhm	5% 0.25W
R..528	57.11.3104	100	10Khm	5% 0.25W
R..529	57.11.5335	3.3	MOhm	5% 0.25W
R..530	57.11.3104	100	10Khm	5% 0.25W

Ad.	..POS.	..REF.No.	DESCRIPTION	MANUFACTURER
R..531	.	.	not used	
R..532	.	.	not used	
R..533	.	.	not used	
RZ..501	57.88.4104	100	10Khm	5% single line
RZ..502	57.88.4104	100	10Khm	5% single line
RZ..503	57.88.4104	100	10Khm	5% single line
RZ..504	57.88.3104	100	10Khm	5% dual in line

88/06/17 - PFL-0M-key activ : fader open -> PFL audiosignal mute  
fader closed -> PFL audiosignal on  
additional RS17 10Khm  
see also poslist 1.970.710.xx 88/06/17

85/12/12 - change of MP part number

1) ATTENTION - EXTENSION UNIT contains electro static sensitivity elements

CE=Ceramic, CF=Carbon Film, EL=Electrolytic, MF=Metal Film, PE=Polyester, PP=Polypropylen, PS=Polystyrol  
MANUFACTURER: Bu=Burdny, Ex=Exar, Fc=Fairchild, Gi=General Instrument  
Hp=Hewlett Packard, ITT=Intermetall, Mot=Motorola, Nat=National  
(Matsushita), NS=National Semiconductors, Ph=Philips,  
Ra=Raytheon, Sig=Signetics, Six=Siliconix, St=Stuerc,  
Ti=Texas Instrument, Sie=Siemens, Is=Intersil, Un=Unitrode  
Osh=Oshino

1.970.792.00	EXTENSION UNIT	TAB6/05/0500
1.970.792.00	EXTENSION UNIT	TAB8/06/1701
1.970.792.00	EXTENSION UNIT	TAB9/12/1202

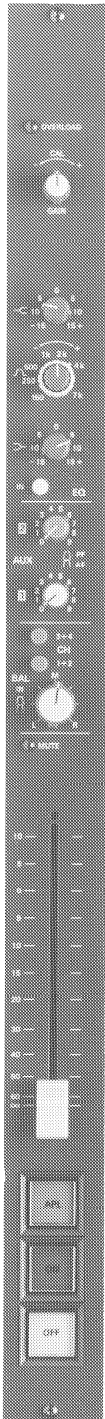
02 MP..501	1.010.300.64	2	pcs	Flat-band-cable 40mm
02 MP..502	54.03.0602	2	pcs	Flat-band-cable 40mm
02 MP..503	53.03.0168	4	pcs	IC-socket 16 pin
02 MP..504	53.03.0168	3	pcs	IC-socket 16 pin
02 MP..505	53.03.0167	5	pcs	IC-socket 14 pin
MP..506	1.970.792.11	1	pcs	Extension unit PCB
MP..507	54.01.0020	33	pcs	Wire Wrap pins
MP..508	1.010.014.22	2	pcs	hexagon rivetting-nut M3*4.5
MP..509	1.970.792.04	0	pcs	STUDER-number-label
MP..510	43.01.0108	1	pcs	ESE-caution-label (see note 1)

Q...501	50.03.0496	BC 560	PNP	IC-100mA, B-200	any
Q...502	50.03.0496	BC 560	PNP	IC-100mA, B-200	any
Q...503	50.03.0496	BC 560	PNP	IC-100mA, B-200	any
Q...504	50.03.0496	BC 560	PNP	IC-100mA, B-200	any
Q...505	50.03.0496	BC 560	PNP	IC-100mA, B-200	any
Q...506	50.03.0497	BC 550	NPN	IC-100mA, B-200	any
Q...507	50.03.0216	J 111	J-FET		Six
Q...508	50.03.0390	J 112	J-FET		Six
Q...509	50.03.0407	BC 560	NPN	IC-100mA, B-200	any
Q...510	50.03.0496	BC 560	PNP	IC-100mA, B-200	any
Q...511	50.03.0497	BC 550	NPN	IC-100mA, B-200	any
Q...512	50.03.0496	BC 560	PNP	IC-100mA, B-200	any
Q...513	50.03.0496	BC 560	PNP	IC-100mA, B-200	any
Q...514	50.03.0496	BC 560	PNP	IC-100mA, B-200	any
Q...515	50.03.0496	BC 560	PNP	IC-100mA, B-200	any

R..501	57.11.3102	1	10hm	5% 0.25W
R..502	57.11.3102	1	10hm	5% 0.25W
R..503	57.11.3102	1	10hm	5% 0.25W
R..504	57.11.3102	1	10hm	5% 0.25W
R..505	57.11.3102	1	10hm	5% 0.25W
R..506	57.11.3102	1	10hm	5% 0.25W
R..507	57.11.3153	15	10hm	5% 0.25W
R..508	57.11.3153	15	10hm	5% 0.25W
R..509	57.11.3153	15	10hm	5% 0.25W
R..510	57.11.3153	15	10hm	5% 0.25W

2.	<b>Stereo Hochpegeleinheit ohne Entzerrer</b>	<b>1.970.753</b>
	<b>Stereo Hochpegeleinheit mit Entzerrer</b>	<b>1.970.754</b>

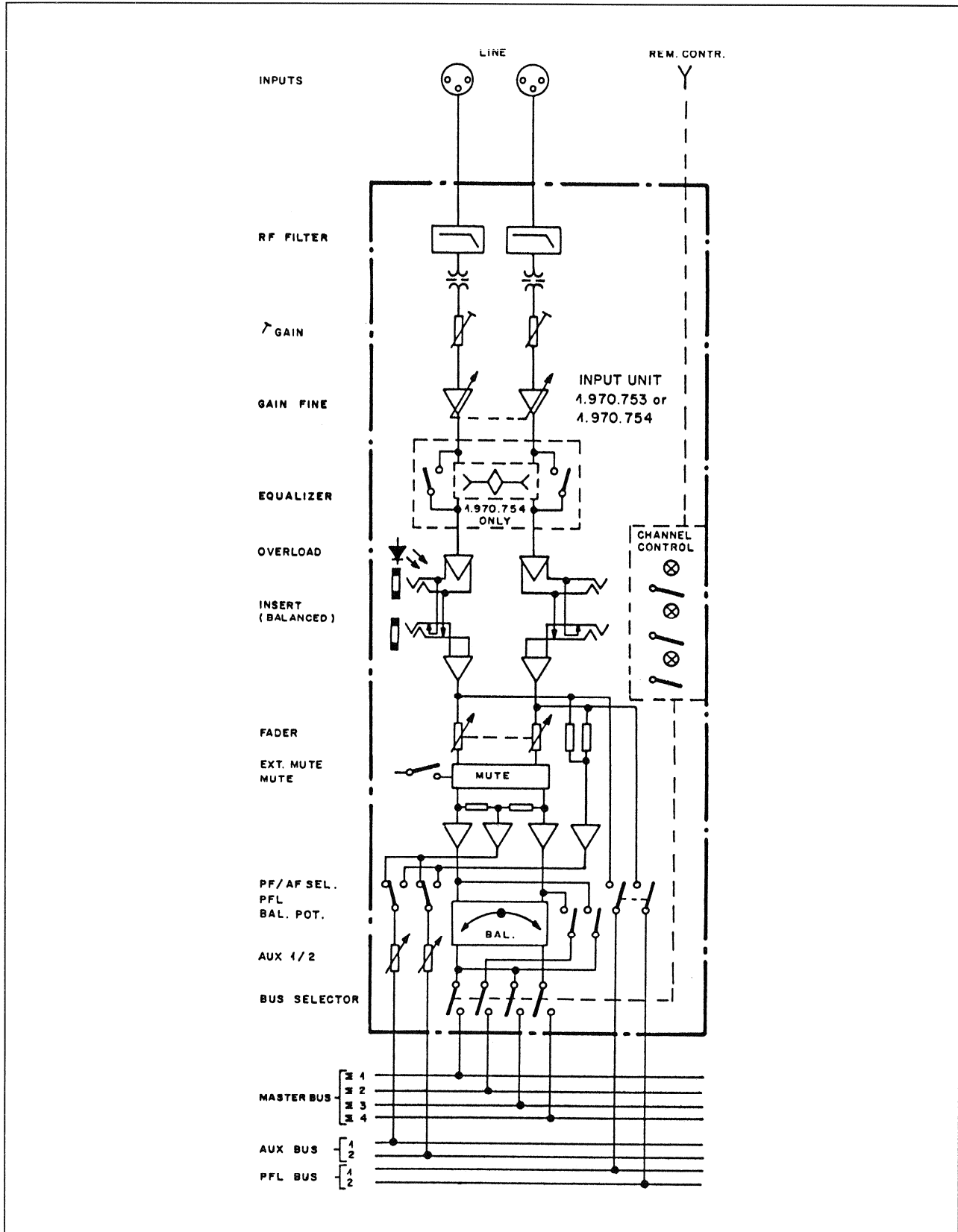
## 2.1 Bedienungselemente



<b>OVERLOAD:</b>	Die mit Overload bezeichnete LED leuchtet auf, sobald der maximal zulässige Pegel vor oder nach dem Flachbahnregler überschritten wird.
<b>EINGANGSTEIL:</b>	Stereophonischer Hochpegeleingang, symmetrisch und erdfrei. Eingangsempfindlichkeit wird auf kundenspezifischen Nennpegel abgeglichen. Eine Verstärkungsänderung um $\pm 10$ dB ist am Gain-Potentiometer möglich.
<b>ENTZERRER:</b>	Siehe 2.4
<b>HILFSAUSGÄNGE AUX 1 und AUX 2:</b>	Zwei getrennt regelbare Hilfsausgänge sind über die an den Potentiometer angebauten Zug-Druckschaltern vor oder nach Flachbahnregler schaltbar.
<b>PAN. POT. SUMMENWAHL:</b>	Das Panorama Potentiometer kann mit dem Zug-Druckschalter aktiviert werden. Stereo und 2 Kanal-Pulte sind mit einer Taste zur gemeinsamen Anwahl der Sammelschienen $\Sigma 1$ und $\Sigma 2$ bestückt. 4-Kanal Pulte sind mit zwei Tasten zur getrennten Anwahl der Sammelschiene $\Sigma 1+\Sigma 2$ und $\Sigma 3+\Sigma 4$ bestückt.
<b>MUTE-FUNKTION:</b>	Auf dem fünfzehenpoligen D-Type Stecker (REM-CONTR) kann der Kanal knackfrei stummgeschaltet werden. Die Mute LED-Anzeige signalisiert die aktivierte Funktion.
<b>FLACHBAHN- REGLER:</b>	Der Flachbahnregler ist mit einer Widerstandsschicht aus leitendem Kunststoff ausgerüstet. Beide Kanäle werden über einen Reglerknopf gemeinsam bedient.
<b>STEUERTASTEN:</b>	Siehe 2.3

2.2 Blockschaftbild

1.970.753



## 2.3 Steuertasten

Vor dem Flachbahnregler sind drei geräuscharme Drucktasten mit Signallampen angebracht. Die Funktionen dieser Tasten können im Einschub durch Umstecken von Miniatur-Brückensteckern verändert werden.

Es sind 3 Grundversionen vorgesehen:

### Version 1 (Fig.1)

PFL

- Das Vorhörsignal PFL (Pre fader listening) wird zum Vorhörlautsprecher und zum Kopfhörer durchgeschaltet. Ein weiterer Tastendruck unterbricht dieses Signal wieder.
- Gleichzeitig wird die Signallampe ein- oder ausgeschaltet.

ON

- Schaltet den Modulationsweg durch, sofern eine Summe angewählt und der Flachbahnregler geöffnet ist.
- ON-Lampe leuchtet.
- PFL wird unterbrochen, wobei aber die PFL-Lampe weiterleuchtet um den vorher angewählten Zustand anzuzeigen.
- Signalisation resp. Faderstart-Relais wird durchgeschaltet, sofern die übrigen Kriterien erfüllt sind (siehe 2.6 Sign. und Faderstart).
- Automatische Stoppuhr wird zurückgesetzt. (Option)

OFF

- Modulation wird unterbrochen.
- Signalisation und Faderstart-Relais fallen ab.
- Falls die PFL-Taste angewählt war, wird nun das Vorhören wieder durchgeschaltet.
- ON-Lampe erlöscht.

OFF-Lampe: ■ Wird von Extern aktiviert und kann den Bereitschaftszustand der Quelle signalisieren.

Fernsteuerung: ■ Alle Tasten- und Lampensignale sind auch auf einem fünfzehnpoligen D-Type Stecker verfügbar. Obige Funktionen können also auch ferngesteuert werden.

### Version 2

APL

ON

OFF

- Gleiche Funktionen wie in Version 1, mit der Ausnahme, dass anstelle des Vorhörsignales vor Flachbahnregler, dasjenige nach Regler (APL) durchgeschaltet wird.

### Version 3

#### AUDITION

- Schaltet den Kanal durch und wählt die Summen 3+4 an. (Eingangseinheiten dieser Version sind nicht mit Sammelschienenwahltasten ausgerüstet).
- AUDITION-Lampe wird eingeschaltet.
- Signalisation wird aktiviert.
- Timer Restart.

#### ON AIR

- Schaltet den Kanal durch und wählt die Summenwahlschienen 1+2 an.
- ON AIR-Lampe wird eingeschaltet.
- Signalisation wird aktiviert.
- Timer Restart.

#### OFF

- Setzt sowohl AUDITION- als auch ON AIR-Taste zurück.
- Signalisation wird inaktiv.

### Blockschema Remote Control:

(Standard)

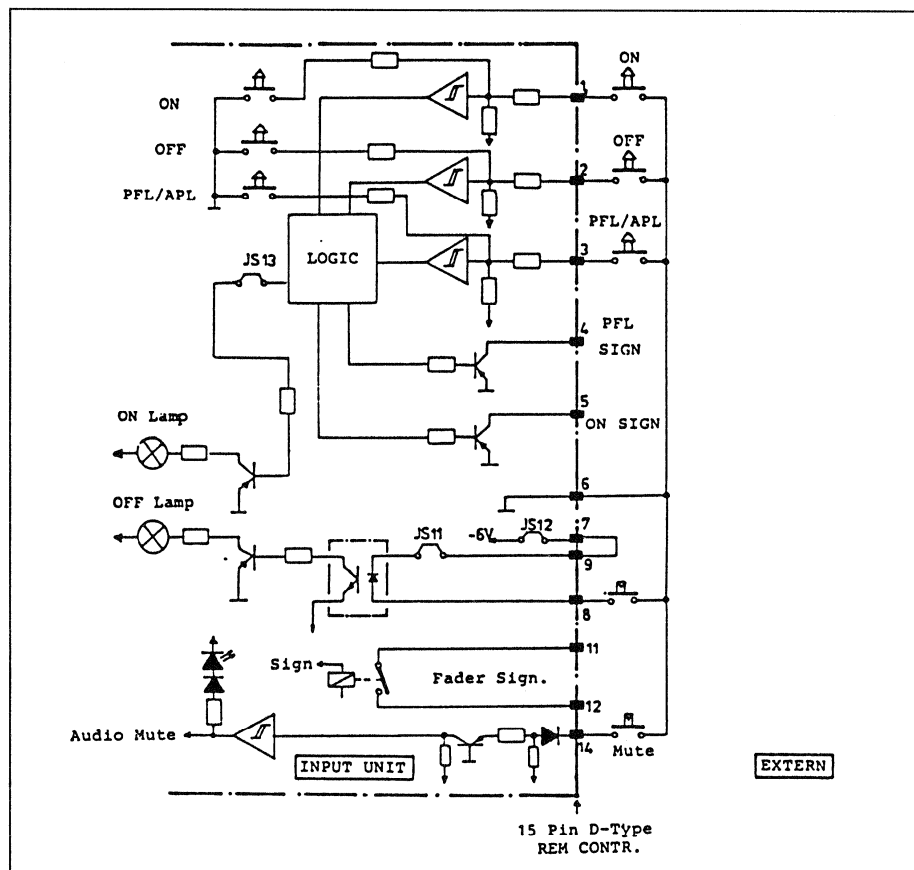
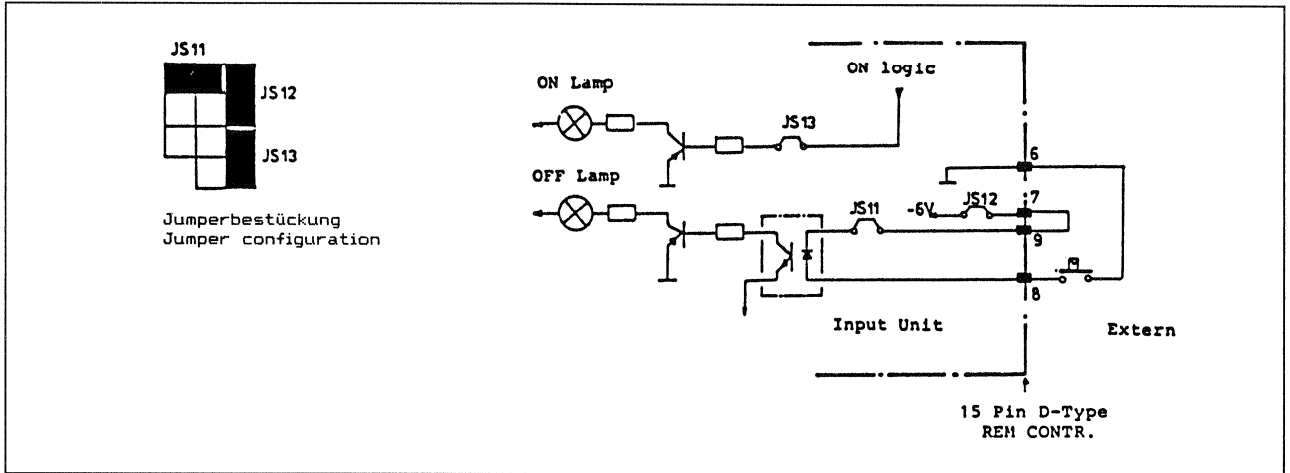


Fig. 1

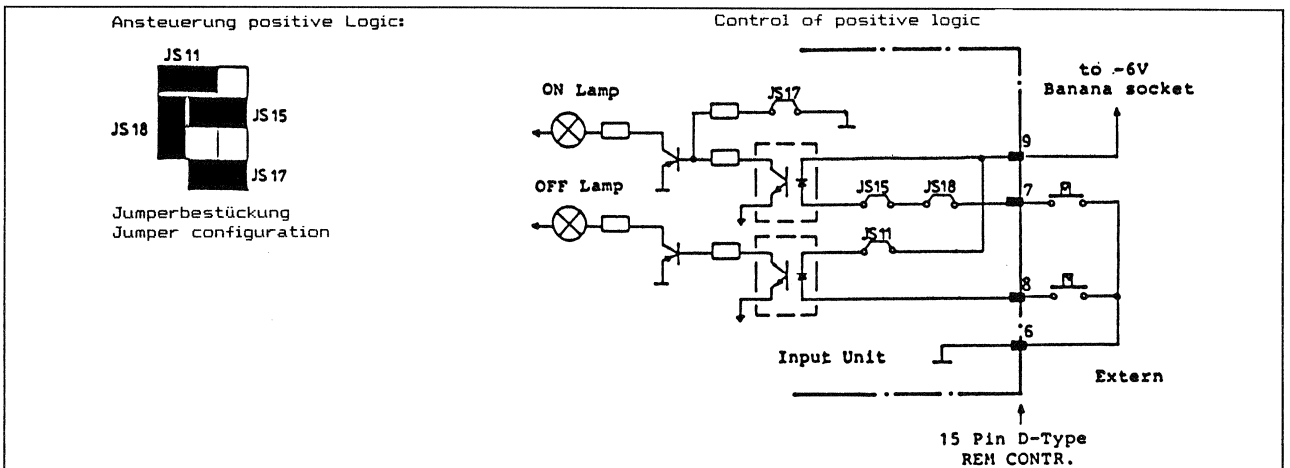
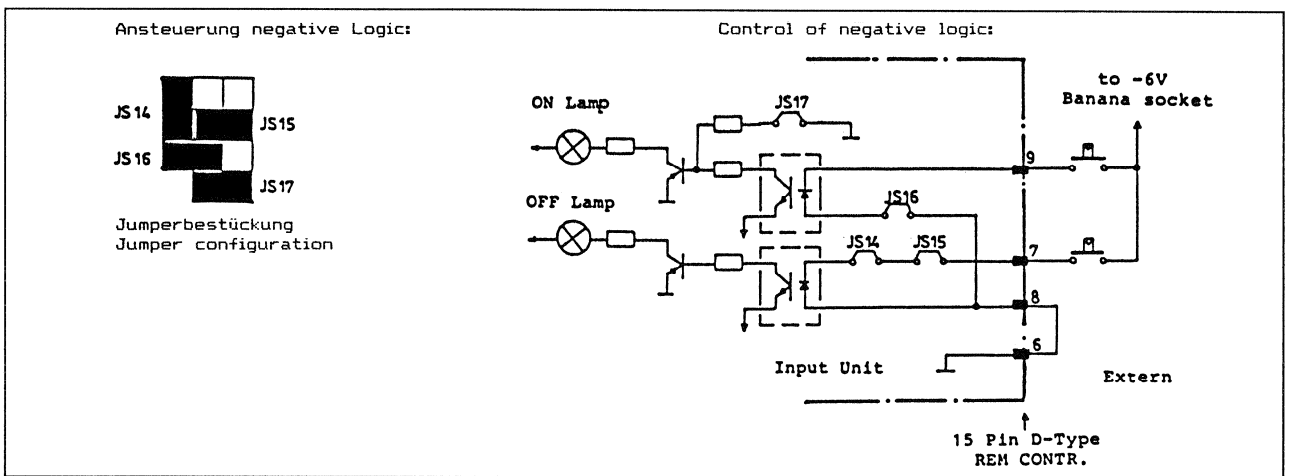


Codierung für externe OFF-Lampensteuerung

(Standard)

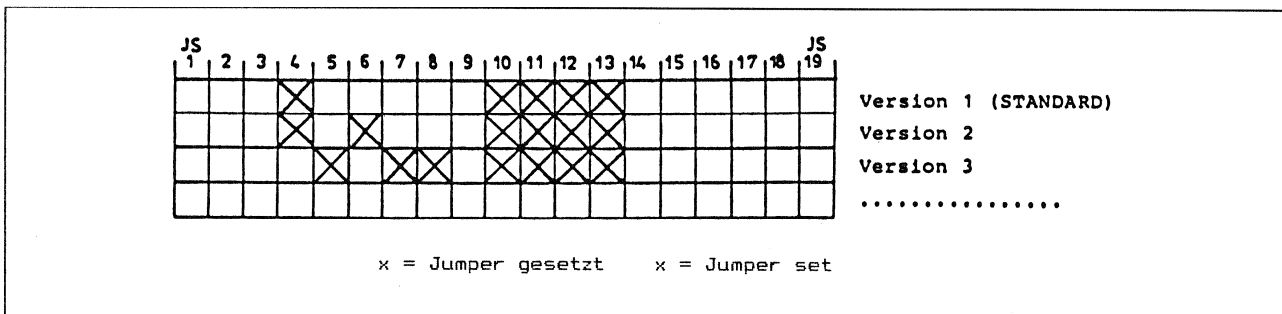
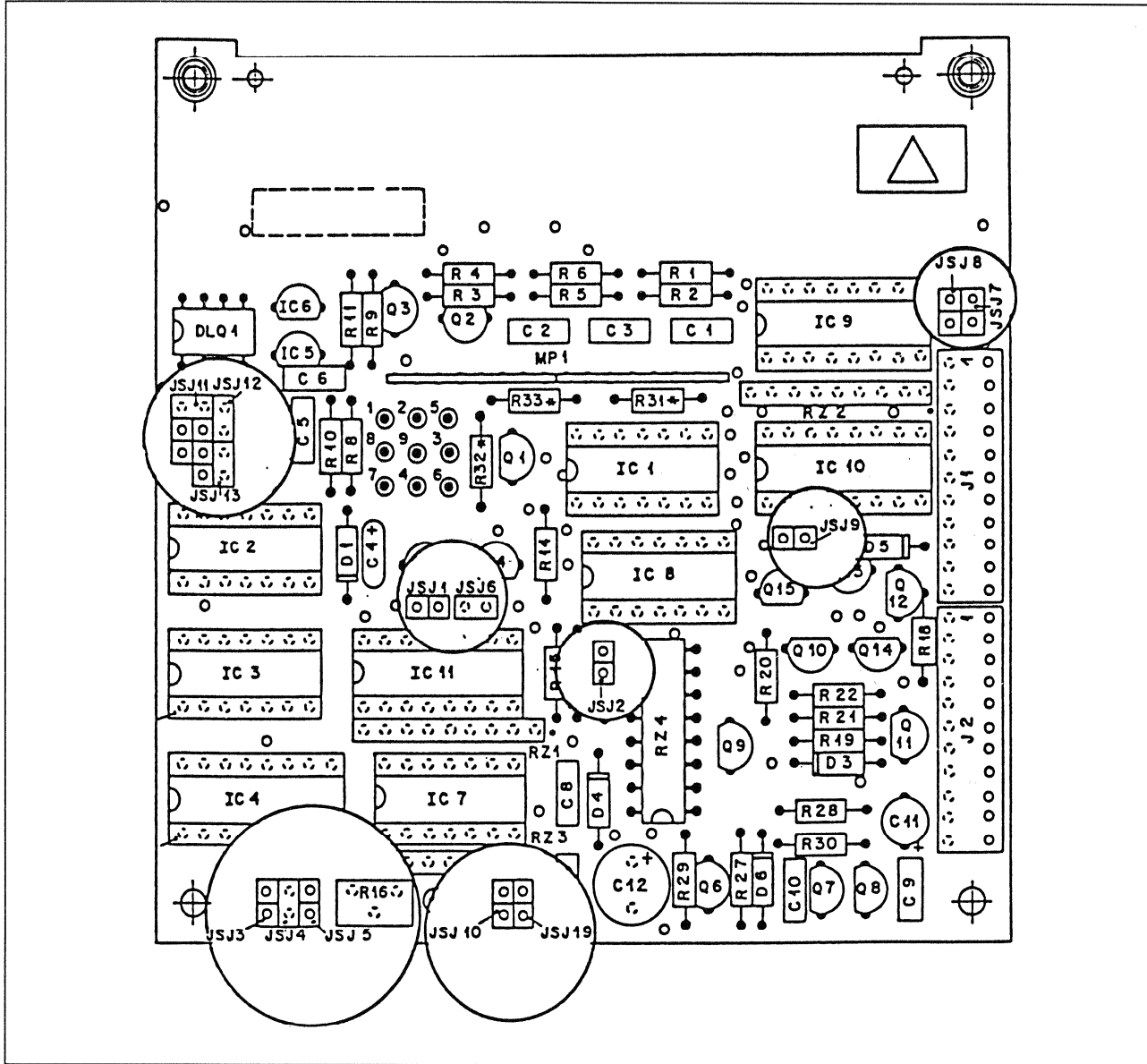


Codierung für externe ON- und OFF-Lampensteuerung



Jumpercodierung für Extension Unit

1.970.792

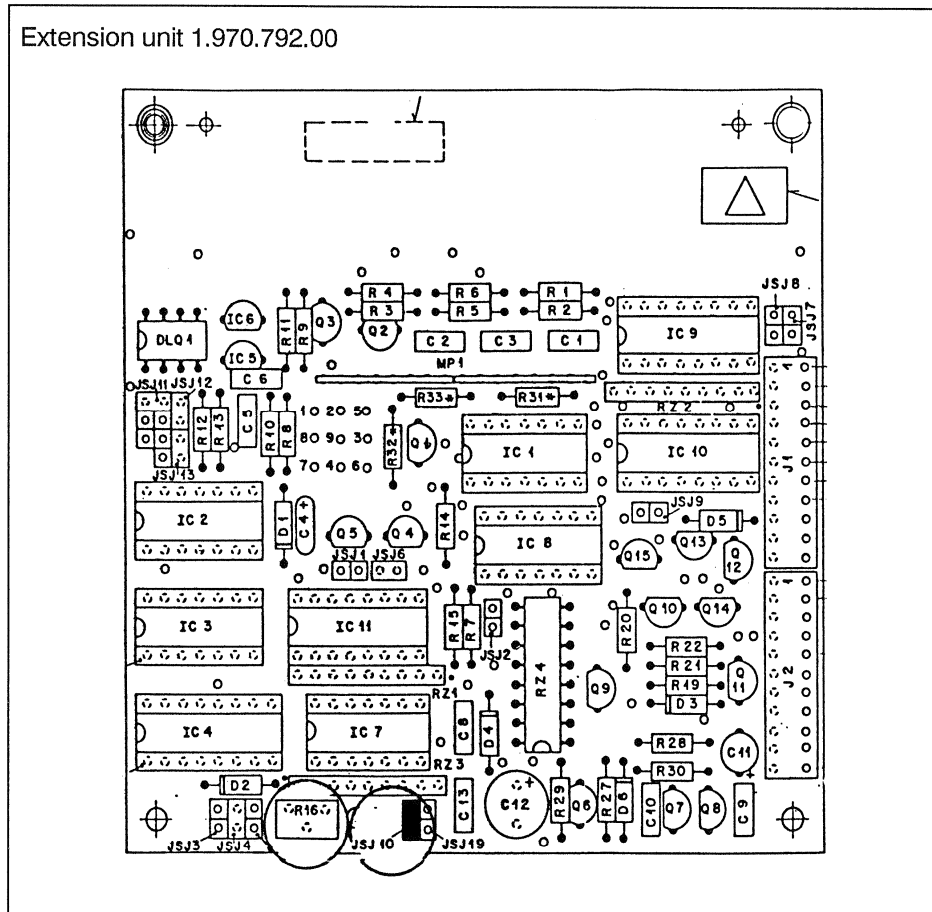


## Optionen

Ort	Jumper	Funktionen
JS1	gesetzt frei	OFF Lampe leuchtet, wenn ON-Taste ausgeschaltet ist. Keine Funktion
JS1 und JS2	gesetzt frei	OFF Lampe leuchtet, wenn ON-Taste und PFL/APL-Taste ausgeschaltet sind. Keine Funktion
JS3	gesetzt frei	PFL/APL-Taste <u>nur</u> einschaltend PFL/APL-Taste selbstauslösend (Toggle switch)
JS4	gesetzt frei	ON-Taste <u>nur</u> einschaltend ON-Taste selbstauslösend (Toggle switch)
JS5	gesetzt frei	OFF-Taste setzt die PFL/APL-Taste zurück Keine Funktion
JS6	gesetzt frei	APL (After Pan Listening) Version 2 PFL (Pre Fader Listening) Version 1 STANDARD
JS7	gesetzt	ON AIR-Taste schaltet $\Sigma 1+2$ durch. AUDITION-Taste schaltet $\Sigma 3+4$ durch. Version 3
JS7 und JS8	gesetzt frei frei	AUDITION-Taste steuert die Signalisation des HL-Einganges an. Nur Version 3 Keine Funktion Keine Funktion
JS9	gesetzt frei	PFL/APL-Taste steuert direkt das Line Relay an. Nur für Version 1+2! Keine Funktion
JS10	gesetzt frei	Time Delay justierbar mit R16 zwischen 0 ... 1 sec. Keine Verzögerung
JS19	gesetzt frei	Timer-Restart Funktion ist ausgeschaltet. Timer-Restart Funktion ist eingeschaltet.

Zeit-Verzögerung

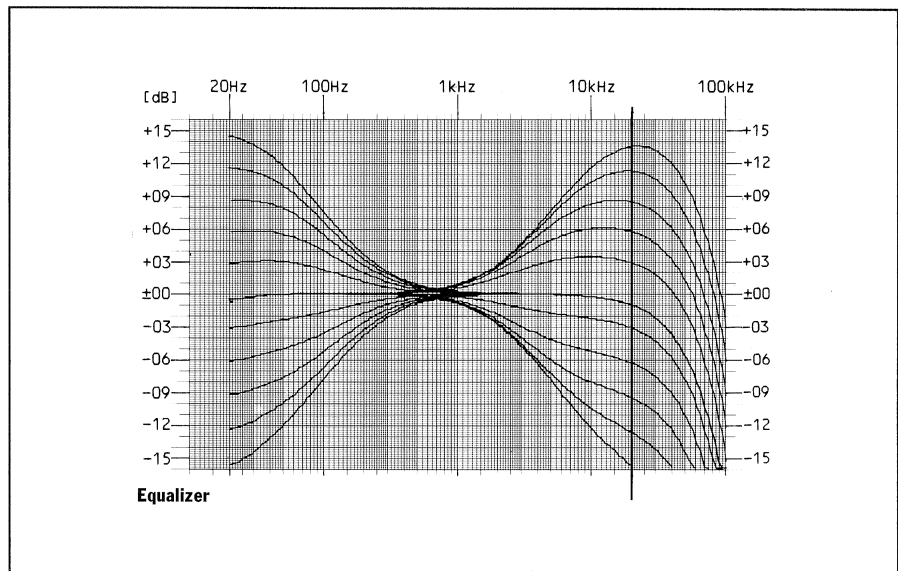
Diese Funktion ist nur für die Hochpegel Eingangseinheit 1.970.753/754.81 verfügbar.



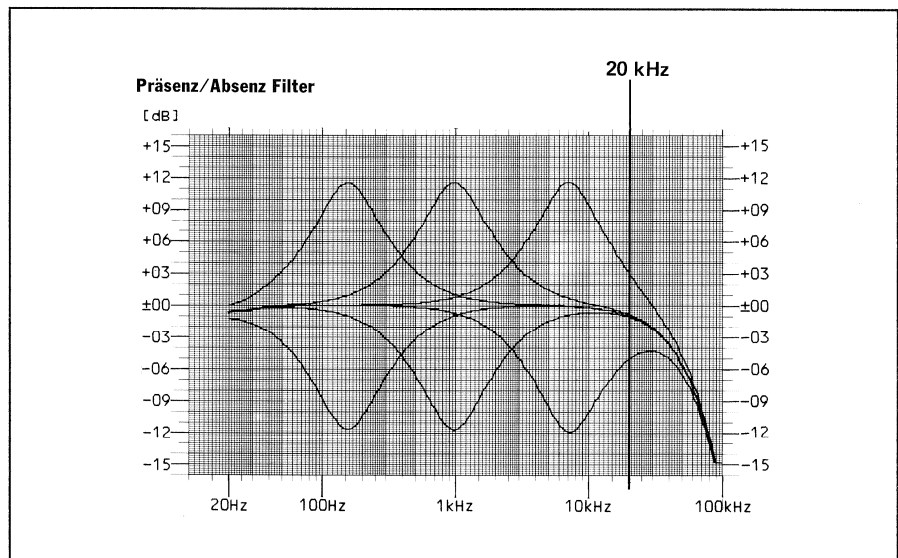
Zwischen dem Faderstart und dem Durchschalten des Audiosignals kann eine Verzögerungszeit von 0...1 sec. mit R16 (PCB 1.970.792) eingestellt werden. Der Jumper J10 muss wie oben dargestellt gesetzt sein (=Zeit-Verzögerung aktiv).

2.4 Entzerrer

Der ganze Entzerrer ist mit der Drucktaste EQUALIZER IN überbrückbar.  
 Fächerentzerrer für Höhen und Tiefen.  
 Bereich  $\pm 15$  dB.



Parametrisches Glockenkurven-Filter mit einstellbarer Mittenfrequenz von 150 Hz...7 kHz (Q=1)  
 Anhebung / Abschwächung  $\pm 11$  dB.  
 Beide Kanäle werden gemeinsam beeinflusst.



### 2.5 Einschleifpunkt

---

Vor dem Flachbahnregler werden die Tonsignale elektronisch symmetriert und über je zwei auf der Pultrückseite befindliche Bantam Jack Buchsen geführt. Der Einschleifpegel beträgt +6 dBu.

### 2.6 Signalisation und Faderstart

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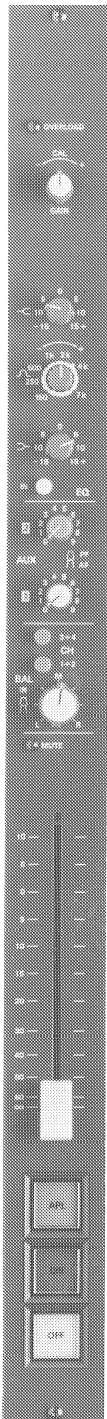
Das im Einschub untergebrachte Fernsteuerrelais wird aktiviert, sobald folgende Kriterien erfüllt sind:

- Kanalregler geöffnet
- Summenregler geöffnet
- Summenwahltaste betätigt
- Mute Funktion nicht aktiv
- Kanal mit ON-Taste eingeschaltet

Der auf dem 15 poligen D-Type Stecker (REM-CONTR.) greifbare Arbeitskontakt des Relais kann zur Fernsteuerung von Plattenspielern oder Tonbandgeräten eingesetzt werden.

2.	Stereo High-Level Unit without Equalizer	1.970.753
	Stereo High-Level Unit with Equalizer	1.970.754

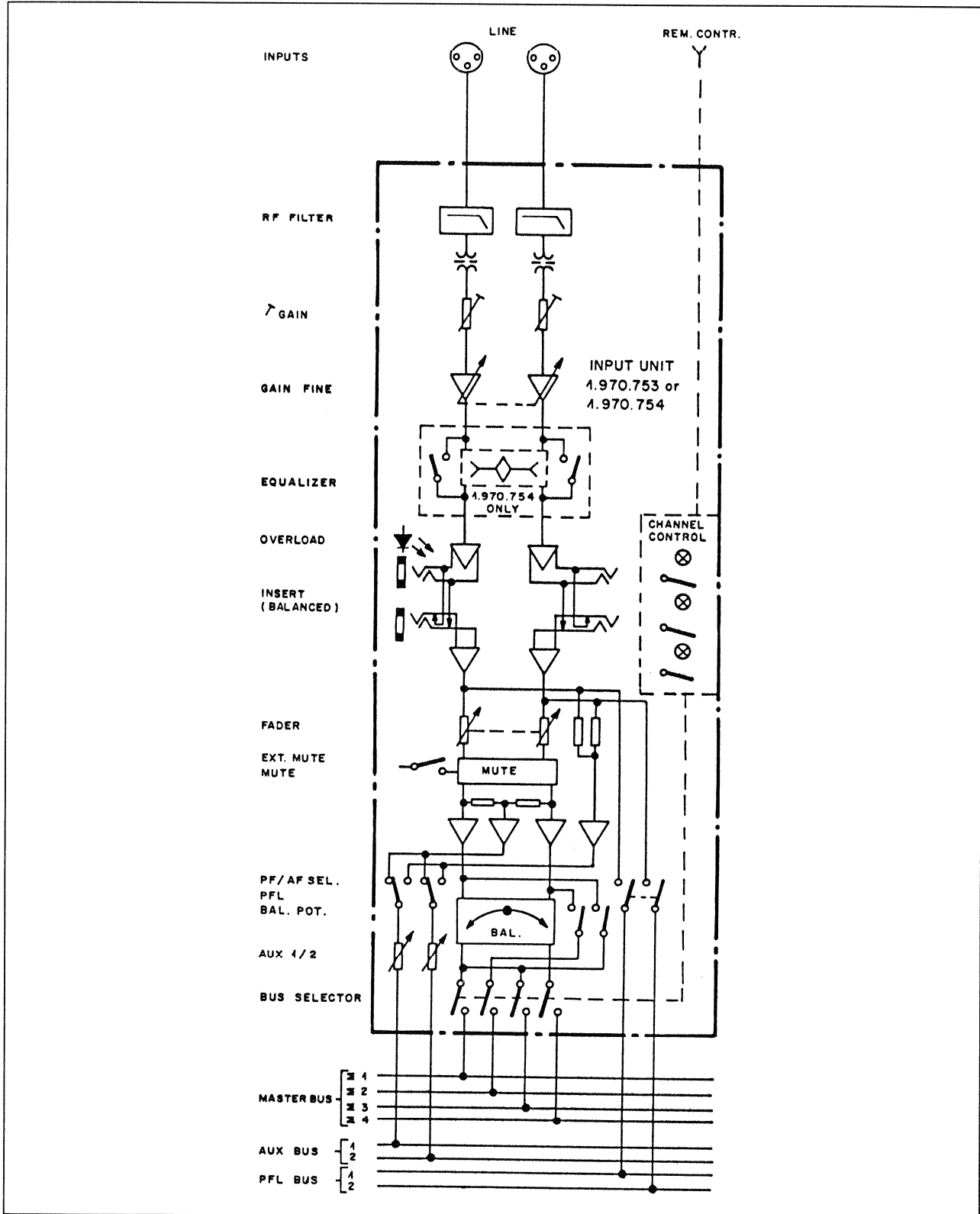
**2.1 Operating Elements**



OVERLOAD:	The LED labelled "overload" turns on as soon as the maximum admissible level before or after the fader has been exceeded.
INPUT SECTION:	Stereophonic high-level input, balanced and floating. The input sensitivity is aligned to the nominal level specified by the customer. The gain can be varied by $\pm 10$ dB on the GAIN potentiometer.
EQUALIZER:	See 2.4
AUXILIARY OUTPUTS AUX 1 and AUX 2	Two separately adjustable auxiliary outputs can be connected before or after the fader via the push-pull switches built into the potentiometers.
PAN. POT AND MASTER SELECTION:	The panorama potentiometer can be activated with the push-pull switch. Stereo and 2CH mixers are equipped with a single button for joint selection of master buses $\Sigma 1$ and $\Sigma 2$ . 4CH mixers are equipped with two buttons for separate selection of the master buses $\Sigma 1 + \Sigma 2$ and $\Sigma 3 + \Sigma 4$ .
MUTE FUNCTION:	The channel can be muted without switching clicks on the 15-pin D-type connector (REM-CONTR). The mute LED indicates that the function is active.
LINEAR FADER:	The linear fader is equipped with a resistance film made of conductive plastic. Both channels are operated jointly via a single control knob.
CONTROL KEYS:	See 2.3

2.2 Block Diagram

1.970.753





## 2.3 Control Keys

Three low-noise push keys with signal lamps are located before the fader. The functions of the keys can be altered by changing the position of the mini-jumpers on this unit.

Three basic versions are available:

### Version 1 (Fig.1)

PFL

- The prefader listening signal (PFL) is connected to the prelistening speaker and to the headphones. The signal is interrupted when this key is pressed a second time.
- At the same time the signal lamp is switched on or off.

ON

- Through-connects the modulation path, provided the bus is selected and the fader opened.
- ON lamp is turns on.
- PFL is interrupted, however the PFL lamp remains switched on to signal the previously selected state.
- Signalization or fader start relay is through-connected, provided the other criteria are satisfied. (see 2.6, signalization and fader start).
- Automatic stopwatch is reset (option).

OFF

- Modulation is interrupted.
- Signalization and fader start relays drop out.
- If the PFL-key was activated, prelistening is again through-connected, if the PFL key has been actuated.
- ON lamp turns off.

OFF-Lamp: ■ Is activated externally and can signal the ready state of the source.

Remote control: ■ All key and lamp signals are available on a 15-pin D-type connector. The above functions can also be remote-controlled.

### Version 2

APL

ON

OFF

- Same function as version 1, except that the prelistening signal after the panorama potentiometer (APL) is connected rather than the signal before the fader.

**Version 3**

**AUDITION**

- Through-connects the channel and selects master buses 3+4 (the input units of this version are not equipped with bus selection buttons).
- AUDITION lamp is turned on.
- Signalization is enabled.
- Timer restart.

**ON AIR**

- Through-connects the channel and selects master buses 1+2.
- ON AIR lamp is turned on.
- Signalization is enabled.
- Timer restart.

**OFF**

- Resets not only the AUDITION but also the ON AIR key.
- Signalization is disabled.

**Block diagram of remote controls:**

(Standard)

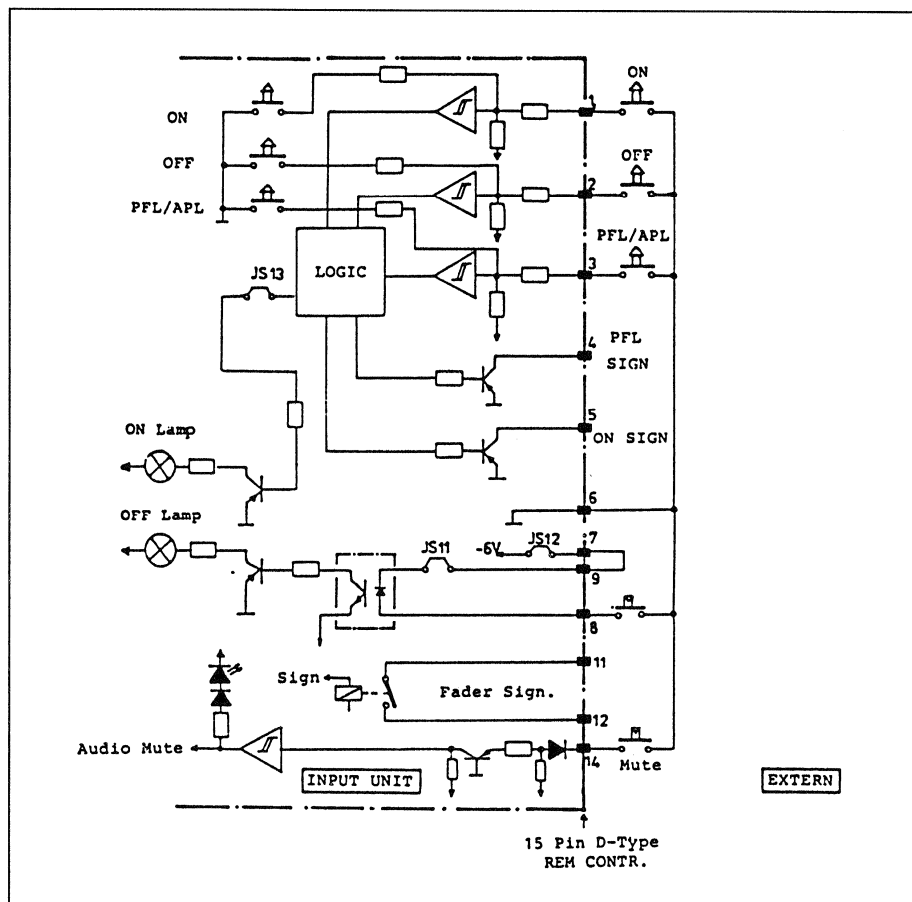
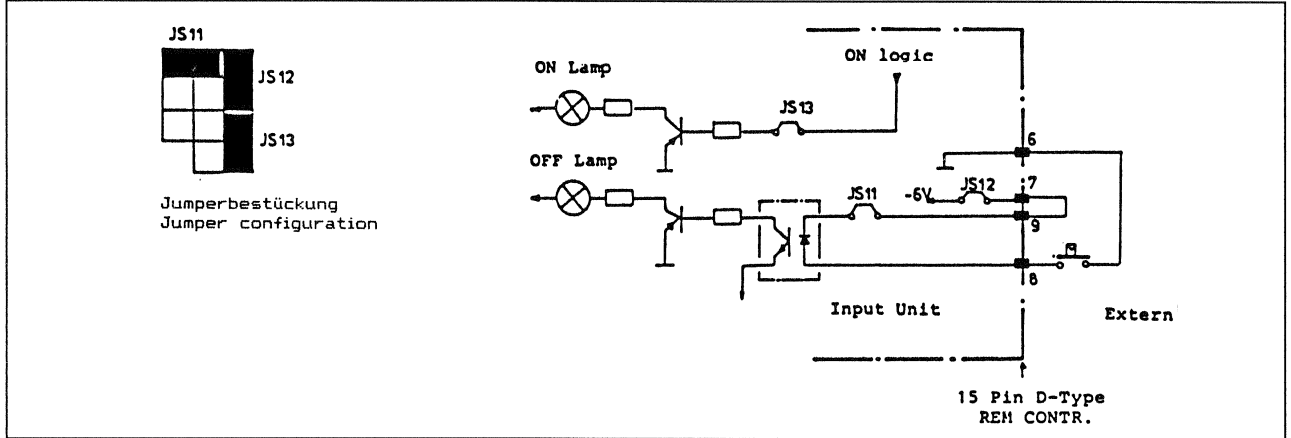


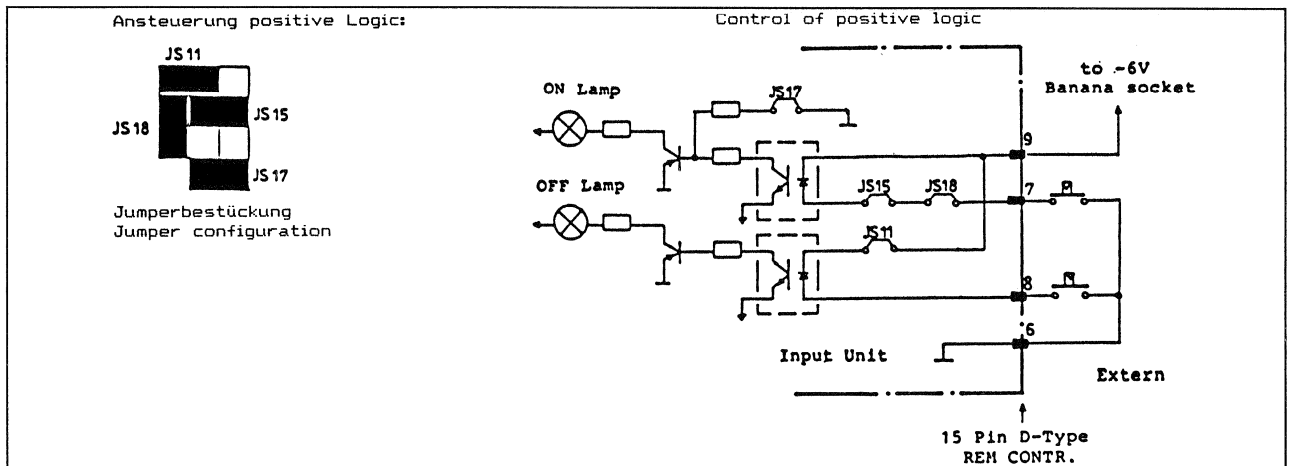
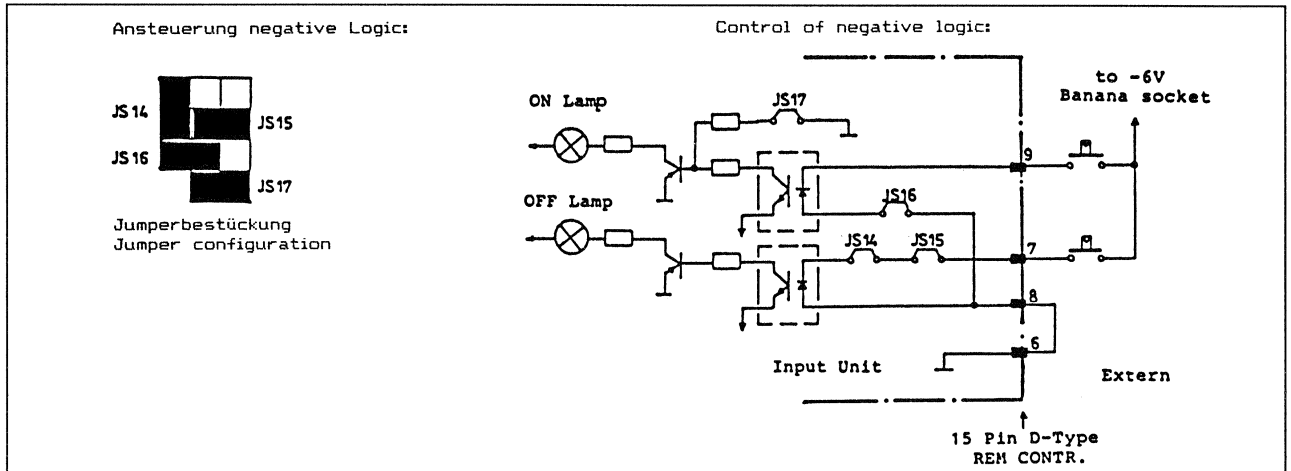
Fig. 1

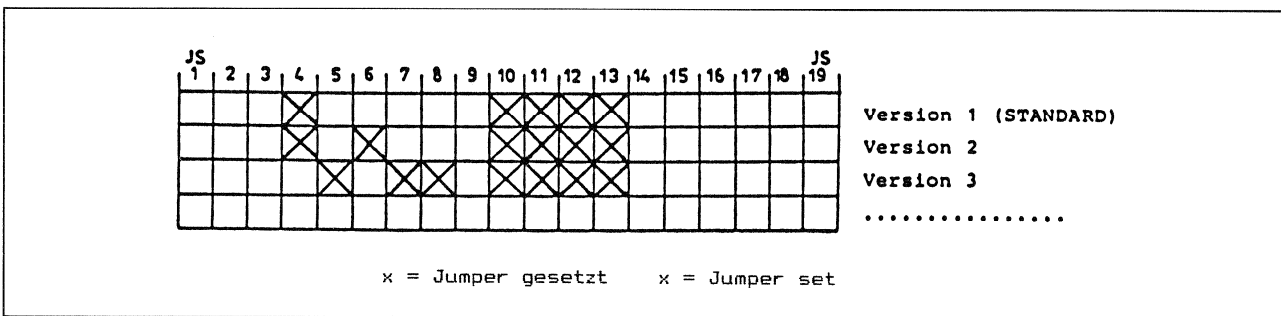
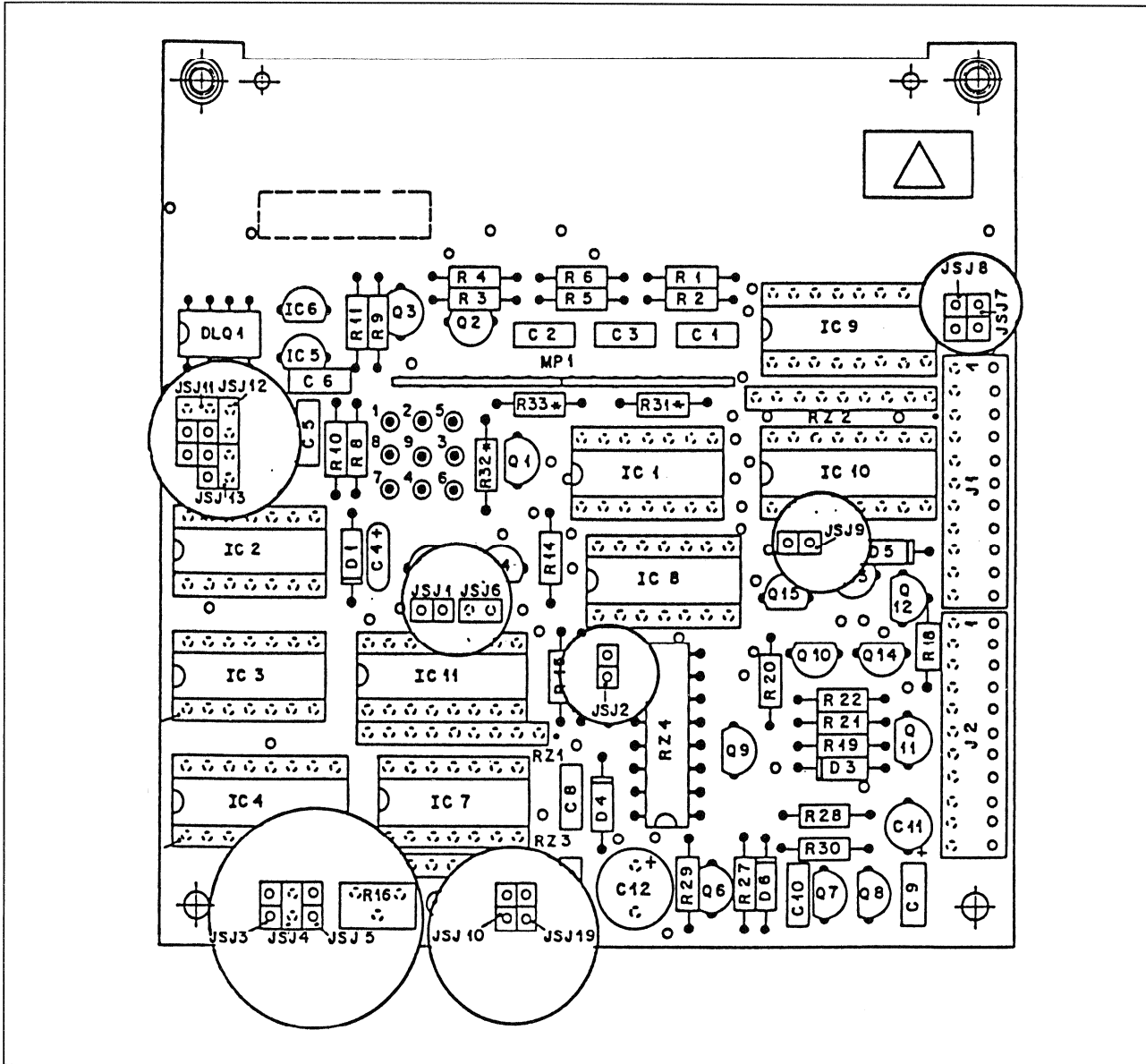
Coding for external OFF lamp control

(Standard)



Coding for external ON and OFF lamp control





## Options

Location	Jumper	Functionen
JS1	Set Not set	OFF lamp is light when the ON keys switched off. No function
JS1 und JS2	Set Not set	OFF lamp is light when the ON key and the PFL/APL key are switched off. No function
JS3	Set Not set	PFL/APL key only on-switching PFL/APL key self-releasing (toggle switch)
JS4	Set Not set	ON key only on-switching ON key self-releasing (toggle switch)
JS5	Set Not set	OFF key resets the PFL/APL key No function
JS6	Set Not set	APL (after pan listening) version 2 PFL (prefader listening) version 1 STANDARD
JS7	Set Not set	ON AIR key enables $\Sigma 1+2$ . AUDITION key enables $\Sigma 3+4$ . Version 3 No function
JS7 and JS8	Set Not set	AUDITION key controls the signalization of the HL input (ONLY version 3) No function
JS9	Set Not set	PFL/APL key directly controls the line relay. (Version 1+2) No function
JS10	Set Not set	Time delay adjustable with R16 between 0...1 sec. No delay
JS19	Set Not set	Timer restart, function is disabled. Timer restart.

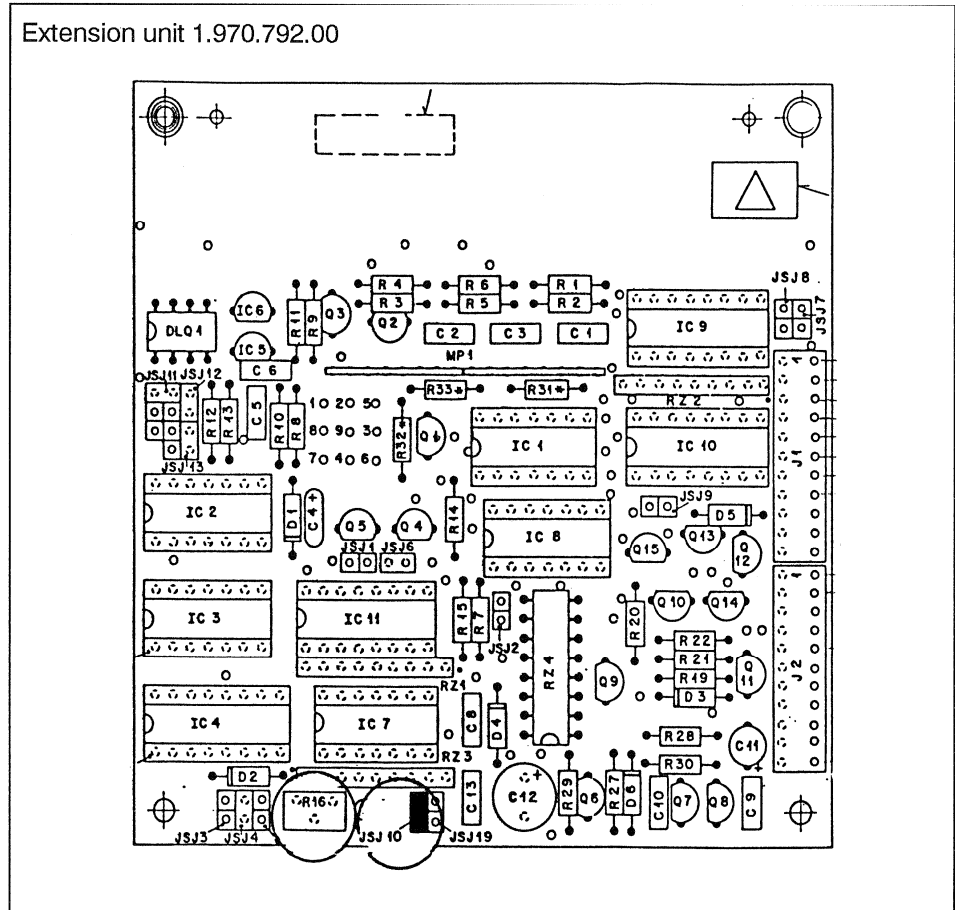
# STUDER AUDIO CONSOLE 970

## STEREO HL INPUT UNIT

### Time delay

This function is only available for HL input unit 1.970.753/754.81

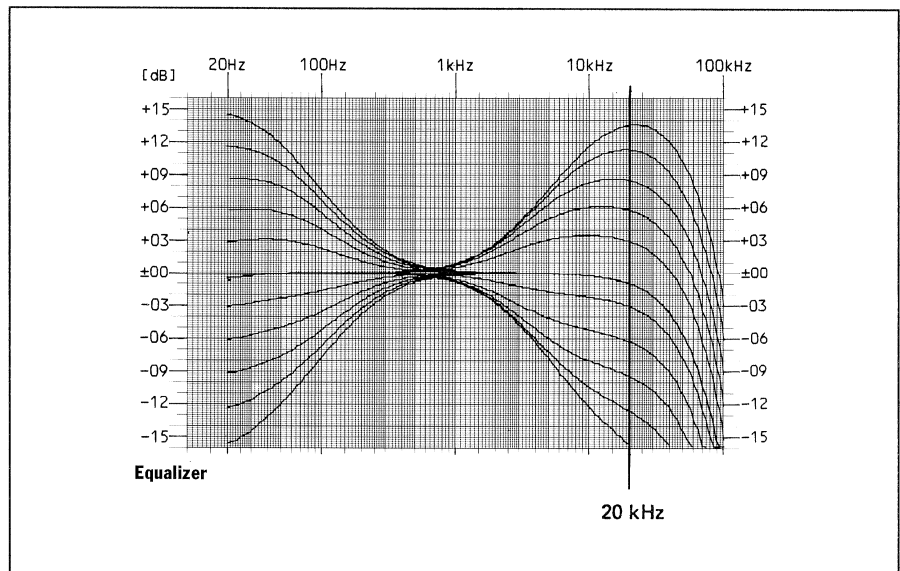
Extension unit 1.970.792.00



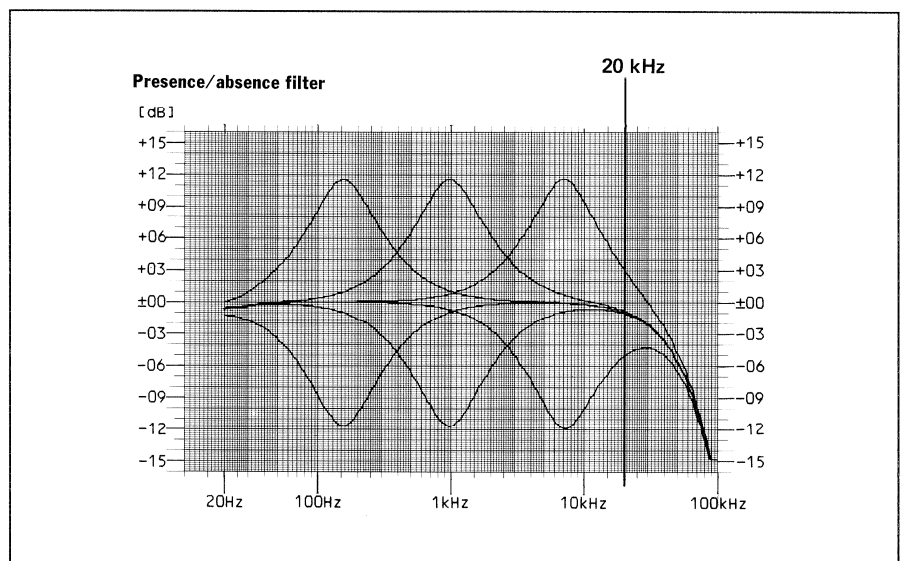
The time delay between the faderstart and the switching on of the audio signal is adjustable between 0...1 sec. with R16 (PCB 1.970.792)  
Jumper 10 must be set as shown! (Time delay = activ)

## 2.4 Equalizer

The entire equalizer section is only enabled if the EQUALIZER IN key is pressed.  
 Shelving equalizer for treble and bass.  
 Range at 20 Hz/20 kHz:  $\pm 15$  dB.



Parametric filter with adjustable center frequency: 150 Hz...7 kHz (Q=1).  
 Emphasis / de-emphasis:  $\pm 11$  dB.  
 Both channels are jointly influenced.



### 2.5 Insertion Point

---

The audio signals are electronically balanced before the stereo fader and taken to two bantam jack sockets each, located on the rear panel of the unit. The insertion level is +6 dBu.

### 2.6 Signalization and Fader Start

---

The remote control relay of this module is activated as soon as the following criteria are satisfied:

- Channel fader open
- Master fader open
- Master selection button actuated
- Mute function not active
- Channel enabled with ON key.

The relay make contact available on the 15-pin D-type REM-CONTR connector can be used for the remote control of turntables or tape recorders.



STUDER AUDIO CONSOLE 970

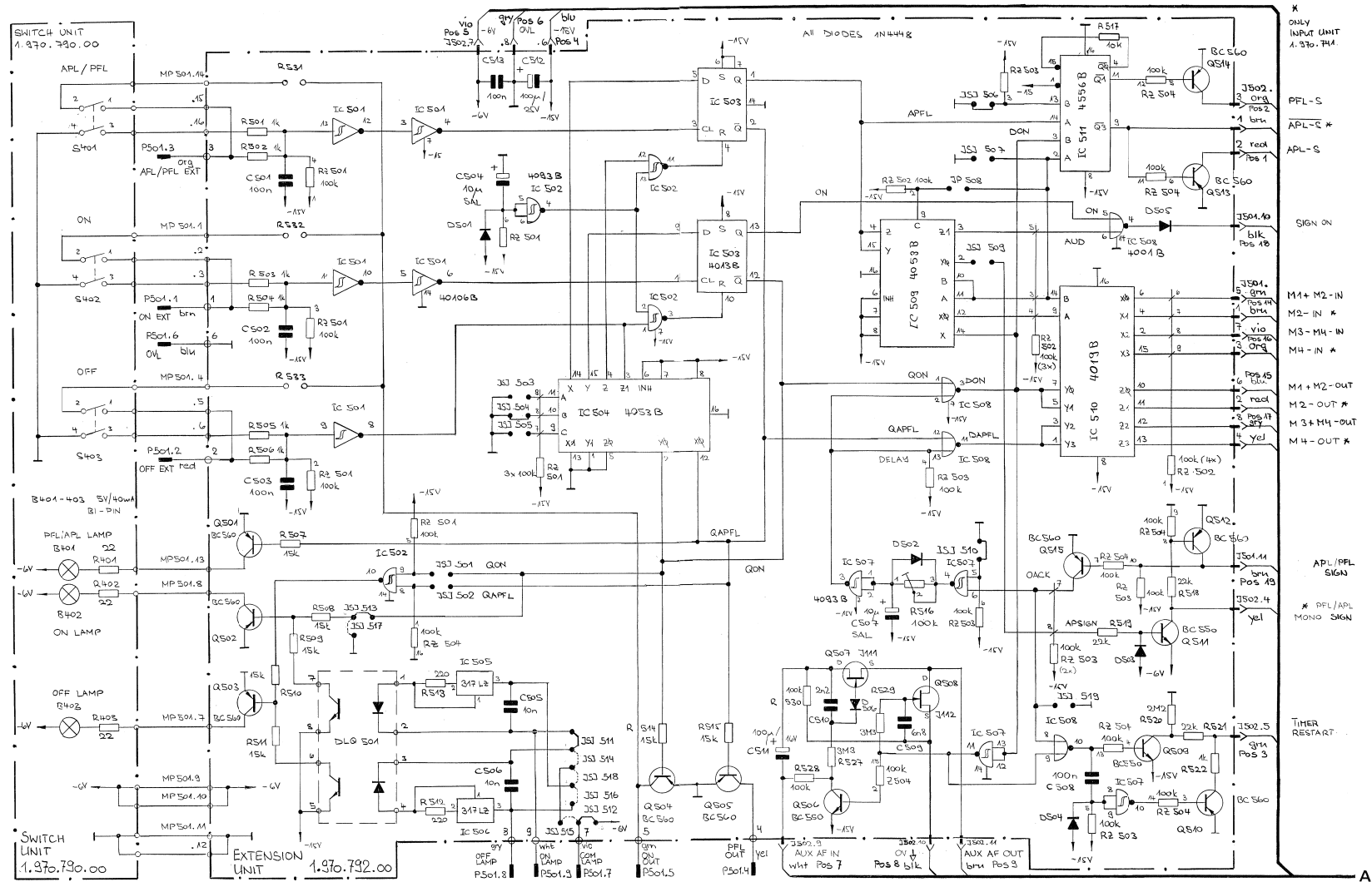
STEREO HL INPUT UNIT

1.970.753/754.81

2.7 Schemateil / Circuit Diagrams

Stereo HL Input Unit

Part 1



①17.10.83					
	INCL. 1.970.792.00	1.970.790.00		PAGE 1 OF 3	
STUDER	STEREO HL INPUT UNIT		SC	1.970.751.81	

①17.10.83					
	INCL. 1.970.792.00			PAGE 2 OF 3	
STUDER	STEREO HL INPUT UNIT		SC	1.970.751.81	

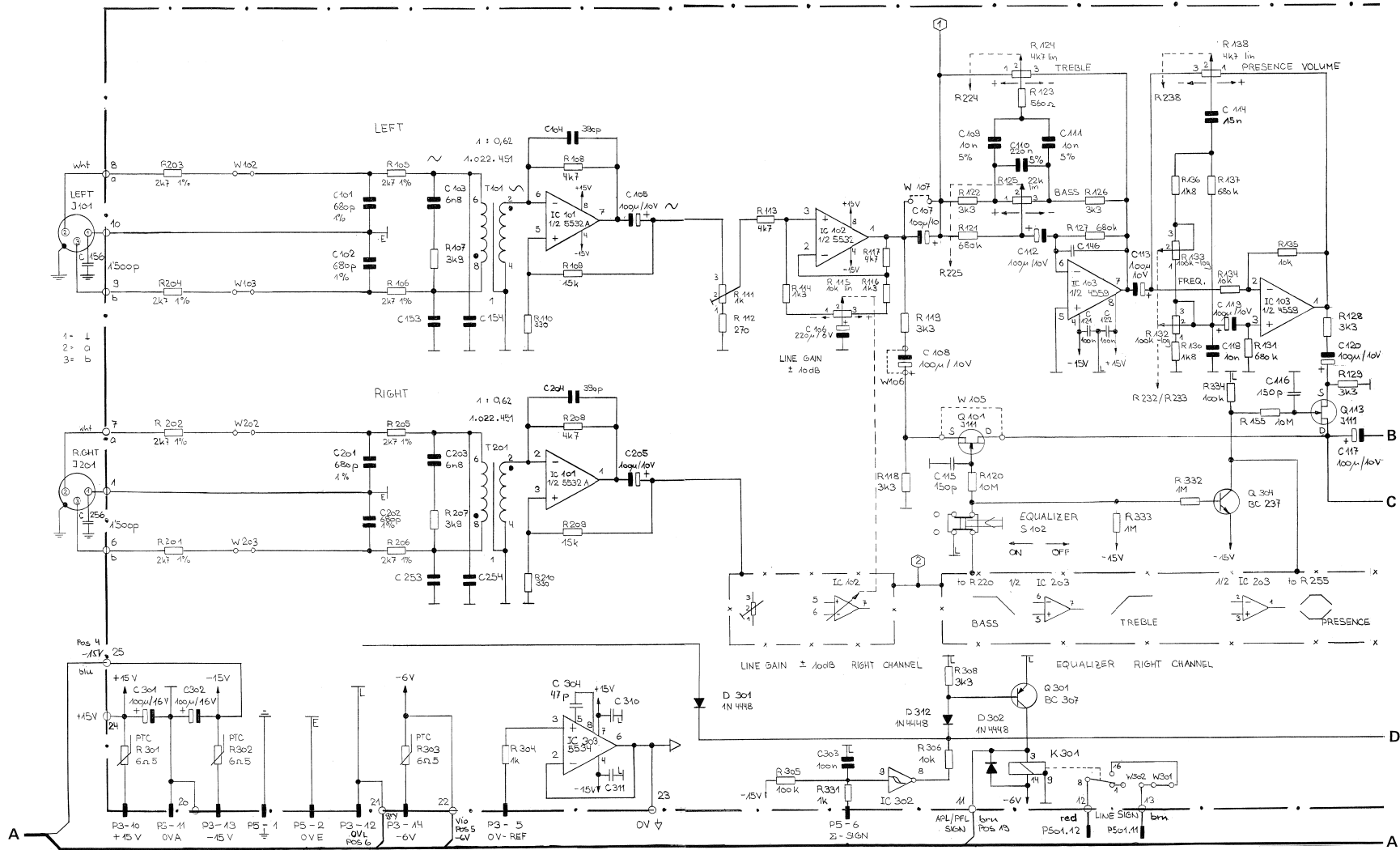
# STUDER AUDIO CONSOLE 970

## STEREO HL INPUT UNIT

Stereo HL Input Unit 4CH

1.970.753.81/1.970.754.81 w. EQ

Part 2



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STUDER	STEREO HL INPUT UNIT	SC 1.970.751.81

17.10.83	STEREO HL INPUT UNIT	PAGE 4 OF 9
STUDER	STEREO HL INPUT UNIT	SC 1.970.751.81

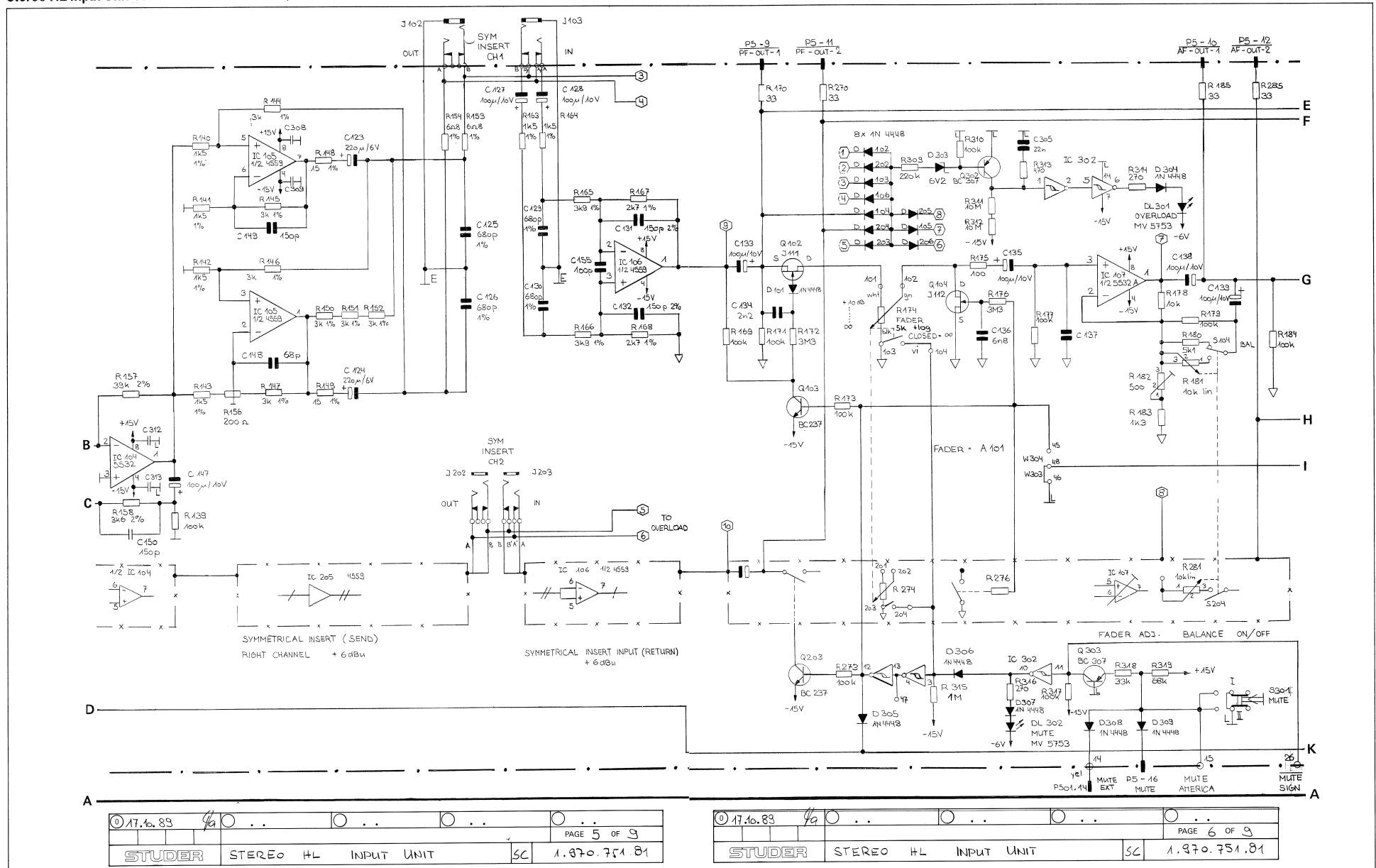
# STUDER AUDIO CONSOLE 970

## STEREO HL INPUT UNIT

Stereo HL Input Unit 4CH

1.970.753.81/1.970.754.81 w. EQ

Part 3



017.10.83	SC	1.970.751.81	PAGE 5 OF 9
STUDER		STEREO HL INPUT UNIT	SC

017.10.83	SC	1.970.751.81	PAGE 6 OF 9
STUDER		STEREO HL INPUT UNIT	SC

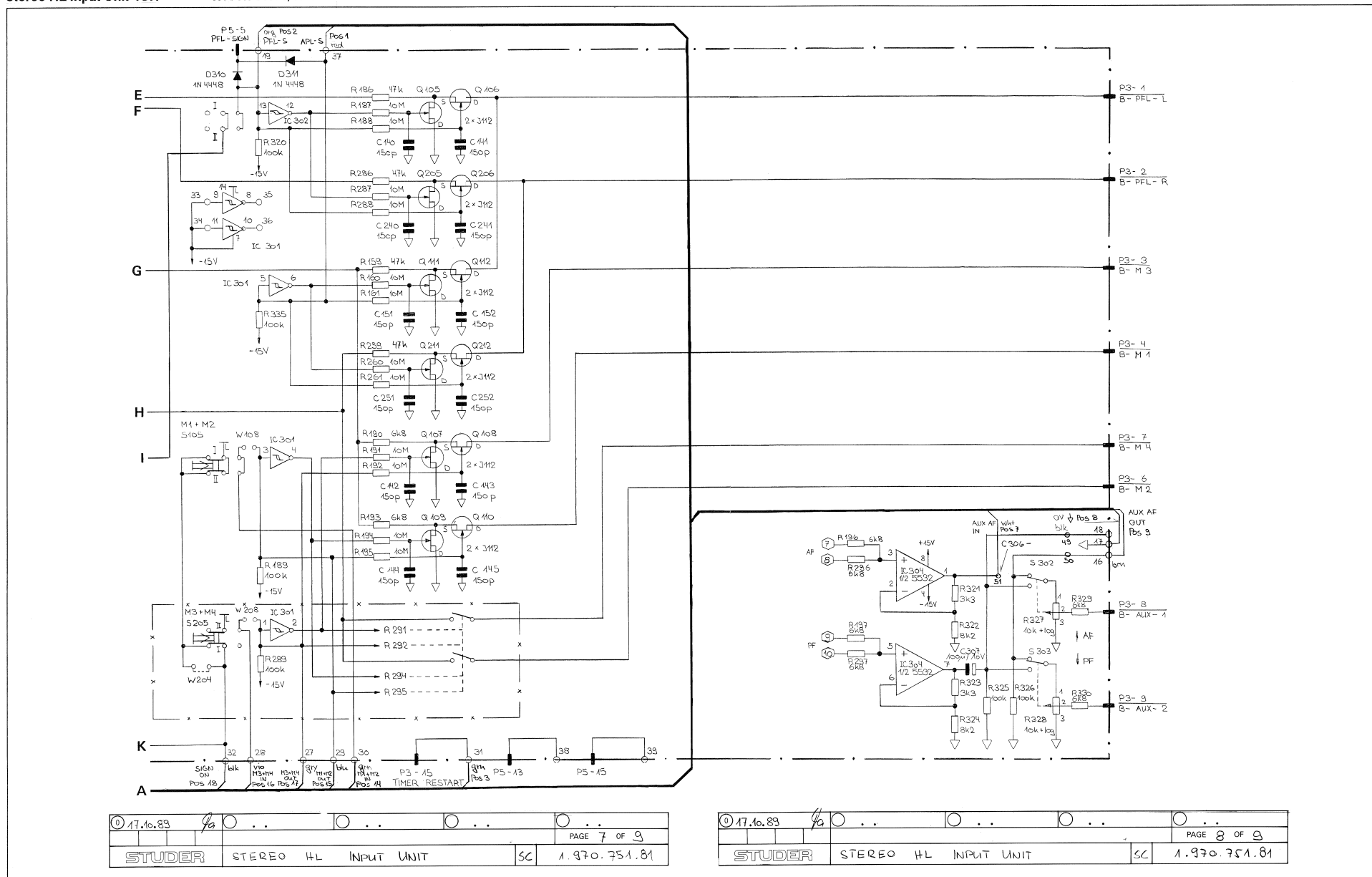
# STUDER AUDIO CONSOLE 970

## STEREO HL INPUT UNIT

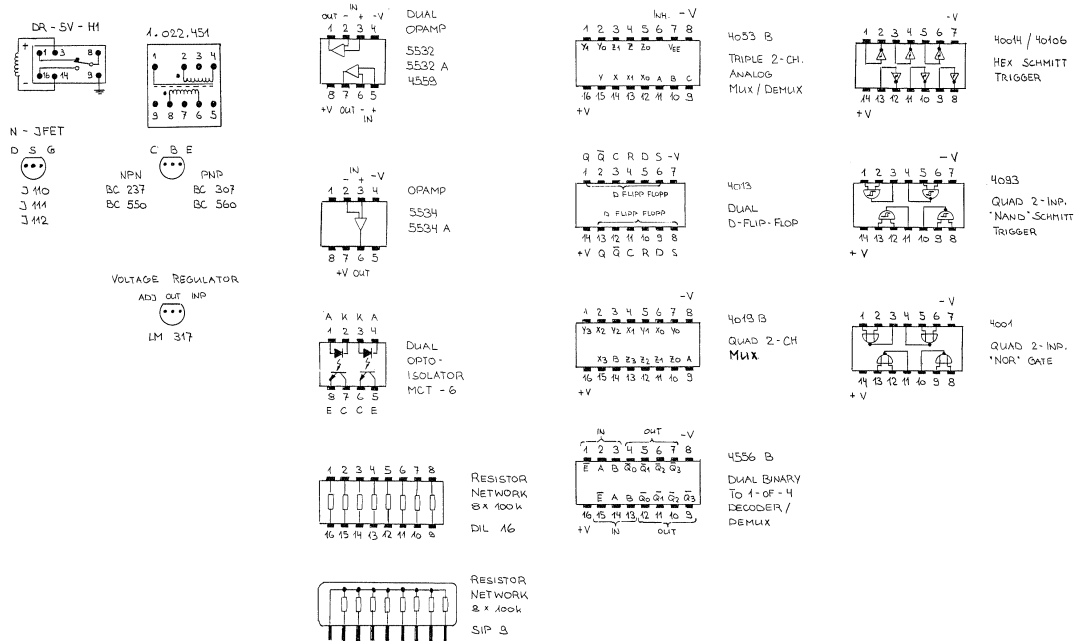
Stereo HL Input Unit 4CH

1.970.753.81/1.970.754.81 w. EQ

Part 4



P	NC	NAME	REMARK ( EURO 16-P )	B=BUS, O=CONNECTION	P	NC	NAME	REMARK ( C-TYPE 15-P )
P5	1	CHASSIS	METAL FRAME	B	P501	1	ON EXT	ON SWITCH EXTERN
P5	2	OV-E	OV EXTERN	B	P501	2	OFF EXT	OFF SWITCH EXTERN
P5	3	-	NC	B	P501	3	AFL/PFL	AFL/PFL SWITCH EXTERN
P5	4	-	NC	B	P501	4	PFL OUT	PFL SIGN
P5	5	PFL-SIGN.	OV=PFL/-6V=MON.	B	P501	5	ON OUT	ON SIGN
P5	6	M-SIGN.	MASTER SIGN.	B	P501	6	OV-L	GROUND SIGN (LOGIC) OUT
P5	7	-	NC	B	P501	7	COM LAMP	COMMON FOR ON AND OFF LAMP EXTERN
P5	8	-	NC	B	P501	8	OFF LAMP	OFF LAMP EXTERN
P5	9	PF-OUT-1	PF OUTPUT CH. 1	O	P501	9	ON LAMP	ON LAMP EXTERN
P5	10	AF-OUT-1	AF OUTPUT CH. 1	O	P501	10	-	RES
P5	11	PF-OUT-2	PF OUTPUT CH. 2	O	P501	11	LINE SIGN	LINE SIGNALISATION
P5	12	AF-OUT-2	AF OUTPUT CH. 2	O	P501	12	LINE SIGN	LINE SIGNALISATION
P5	13	-	RES	O	P501	13	-	RES
P5	14	-	RES	O	P501	14	MUTE EXT	MUTE EXTERN
P5	15	-	RES	O	P501	15	-	RES
P5	16	MUTE	CH. MUTE	O				
P3	1	B-PFL-L	PFL 0-OHM BUS LEFT	B				
P3	2	B-PFL-R	PFL 0-OHM BUS RIGHT	B				
P3	3	B-M 3	MASTER 310-OHM BUS	B				
P3	4	B-M 1	MASTER 110-OHM BUS	B				
P3	5	OV-REF	OV REFERENCE	B				
P3	6	B-M 2	MASTER 210-OHM BUS	B				
P3	7	B-M 4	MASTER 410-OHM BUS	B				
P3	8	B-AUX-1	AUX 110-OHM BUS	B				
P3	8	B-AUX-2	AUX 210-OHM BUS	B				
P3	10	+ 15 V	+ SUPPLY	B				
P3	11	OV-A	GROUND AUDIC	B				
P3	12	OV-L	GROUND SIGN (LOGIC)	B				
P3	13	- 15 V	- SUPPLY	B				
P3	14	- 6 V	- SUPPLY	B				
P3	15	TIMER	TIMER RESTART	B				
P3	16	-	RES	O				
P2	--	-	RES	-				



BOTTOM VIEW

17.10.83	fa	..	..	..	PAGE 9 OF 9	
STUDER				STEREO HL INPUT UNIT	SC	1.970.751.81

# STUDER AUDIO CONSOLE 970

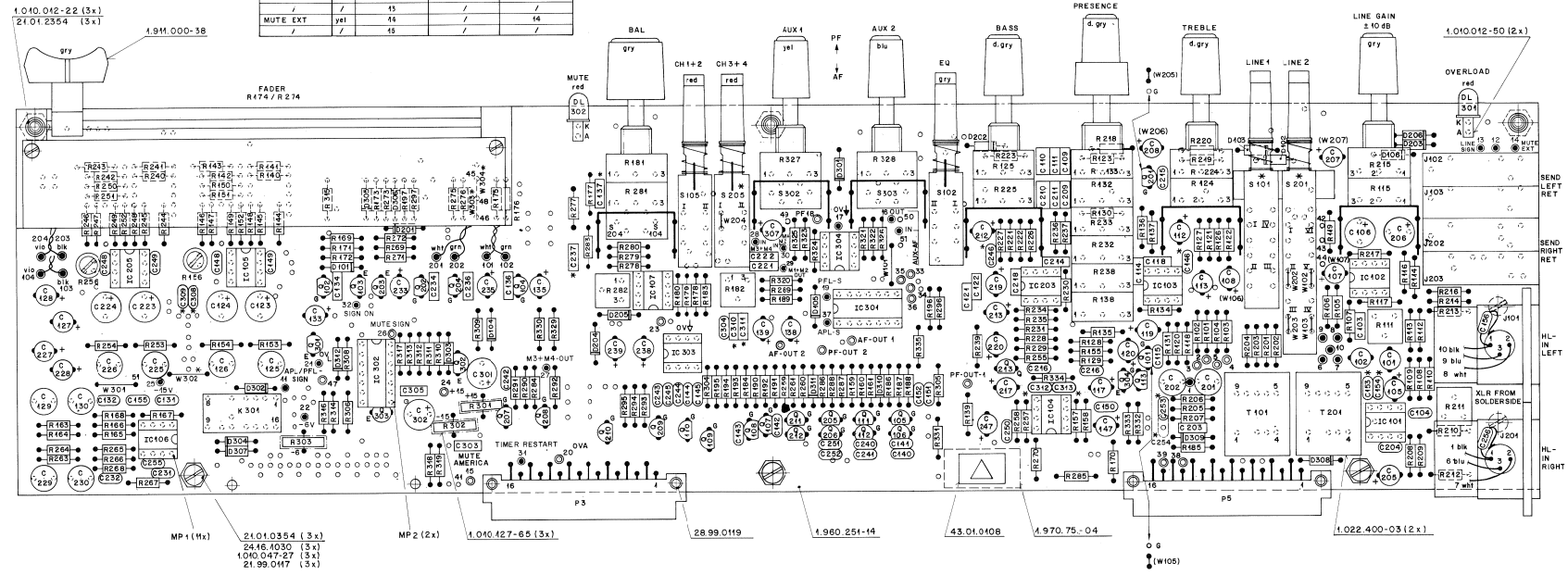
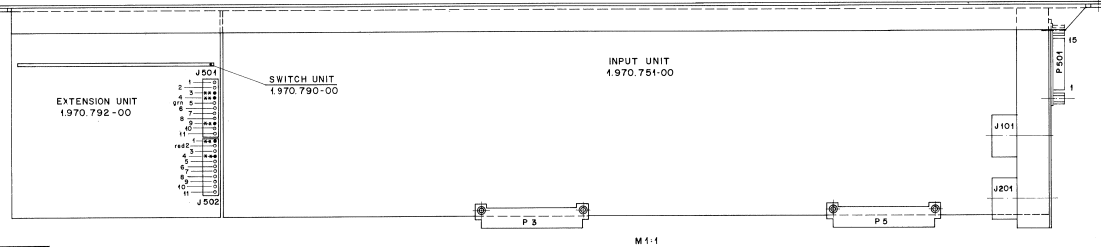
## STEREO HL INPUT UNIT

Stereo HL Input Unit 4CH

1.970.753.81 / 1.970.754.81 (w. EQ)

SIGN. NAME	COL.	INPUT UNIT POINT-NR.	EXTENSION UNIT POINT-NR.	SIGN. NAME	COL.	INPUT UNIT POINT-NR.	EXTENSION UNIT POINT-NR.
APL - S	red	37	2	M1 + M2	IN	grn	30
PFL - S	org	49	3		OUT	blu	29
TIMER RESTART	grn	34	5	M3 + M4	IN	vio	23
-15 V	blu	25	6		OUT	grf	27
-6 V	vic	22	7			blk	32
OVL	grf	24	8	APL / PFL SIGN	brn	41	44
AUX - AF	IN	whl	51				
	OVL	blk	37				
	OUT	brn	46				

SIGN. NAME	COL.	INPUT UNIT P-501 (D-Type)	EXTENSION UNIT POINT-NR.
ON EXT	brn	1	4
OFF EXT	red	2	2
APL/PFL EXT	org	3	3
PFL OUT	ysl	4	4
ON OUT	grn	4	5
OVL	blu	6	6
COM LAMP	vio	7	7
OFF LAMP	grf	8	8
ON LAMP	whl	9	9
	/	10	/
LINE SIGN.	brn	41	/
	red	42	/
	/	43	/
MUTE EXT	ysl	44	/
	/	45	/



VALID FOR	NR. UNIT	NR. FRONT PANEL	NR. NUMBER LABEL
4CH	1.970.753-00	1.970.753-01	1.970.751-04
4CH + FILTER	1.970.754-00	1.970.754-01	1.970.751-04

\* not used

C156 und C256 verlotet nach BV646

1.970.753-00 © 101, 5 201, C 107, C 108, C 207, C 208, replaced by link (W 111)







# STUDER AUDIO CONSOLE 970

## Stereo HL Input Unit 970

1.970.751.81

Ad ..POS... ..REF.No... DESCRIPTION.....MANUFACTURER

R...516	58.01.9104	100 kOhm	10%	var. resistor
R...517	.	not exist		
01 R...517	57.11.3103	10 kOhm	5%	0.25W
R...518	57.11.3223	22 kOhm	5%	0.25W
R...519	57.11.3223	22 kOhm	5%	0.25W
R...520	57.11.5225	2.2 MOhm	5%	0.25W
R...521	57.11.3223	22 kOhm	5%	0.25W
R...522	57.11.3102	1 kOhm	5%	0.25W
R...523	.	not exist		
R...524	.	not exist		
R...525	.	not exist		
R...526	.	not exist		
R...527	57.11.5335	3.3 MOhm	5%	0.25W
R...528	57.11.3104	100 kOhm	5%	0.25W
R...529	57.11.5335	3.3 MOhm	5%	0.25W
R...530	57.11.3104	100 kOhm	5%	0.25W
R...531	.	not used		
R...532	.	not used		
R...533	.	not used		
RZ..501	57.88.4104	100 kOhm	5%	single line
RZ..502	57.88.4104	100 kOhm	5%	single line
RZ..503	57.88.4104	100 kOhm	5%	single line
RZ..504	57.88.3104	100 kOhm	5%	dual in line

*	only	2 CH	1.970.751.XX	wird nicht hergestellt
**	only	2 CH with EQ	1.970.752.XX	wird nicht hergestellt
***	only	4 CH	1.970.753.XX	
****	only	4 CH with EQ	1.970.754.XX	

| Optionen : siehe Optionliste |

CE=Ceramic, CF=Carbon Film, EL=Electrolytic, MF=Metal Film,  
PE=Polyester, PP=Polypropylen, PS=Polystyrol

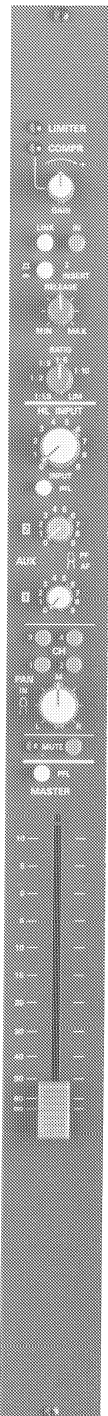
MANUFACTURER: Bu=Burndy, Ex=Exar, Fc=Fairchild, GI=General Instrument  
HP=Hewlett Packard, ITT=Intermetall, Mot=Motorola, Nat=National  
{Matsushita}, NS=National Semiconductors, Ph=Philips,  
Ra=Raytheon, Sig=Signetics, Six=Siliconix, St=Studer,  
TI=Texas Instrument

1.970.751.81 STEREO HL INPUT UNIT 970 TA89/10/1700

## 3. Master Unit

1.970.841

## 3.1 Bedienungselemente

**LIMITER/  
KOMPRESSOR:**

Die Summen-Einheit vereint drei Funktionsblöcke:

- Summenteil
- Limiter/Kompressor-Stufe mit eigenem Einschleif-pfad
- Hochpegeleingang

Über Potentiometer sind folgende Parameter einstellbar:

- Ratio:** Kompressionsverhältnis: 1:1.5...1:20 (Limiter)
- Release:** Rücklaufzeit programmabhängig beeinflussbar am Potentiometer.
- Gain:** Der Limiter/Kompressor-Einschleifpfad verfügt am Eingang über eine eigene, an Potentiometer GAIN einstellbare Kanalverstärkung. Bei ausgeschaltetem Limiter/Kompressor kann dieser Verstärker für beliebige Pegelanpassungen verwendet werden.

Der Regelteil des Kompressor / Limiters arbeitet auf dem Puls-Dauer-Modulations (PDM) Prinzip. Ein- und Ausgang sind elektronisch symmetriert. Der Nennpegel beträgt +6 dBu.

Funktionsbeschreibung unter Punkt 3.2.

**HL INPUT:**

Jeder Summenkanal ist mit einem zusätzlichen HOCH-PEGELEINGANG ausgerüstet. Eine PFL-Taste erlaubt das Vorhören des Eingangssignales. Zur Lautstärke-regulierung ist ein Potentiometer eingesetzt. Analog zu den Eingangseinheiten sind zwei Hilfsausgänge AUX 1 und AUX 2 vorhanden. Nebst Sammelschienenanwahl und Panoramasteller verfügt der Eingang auch über eine MUTE-Taste zur Stummschaltung.

**SUMMENTEIL:**

An einem Null-Ohm-Verstärker wird das Sammelschienensignal summiert und auf den elektronisch symmetrierten Einschleifpunkt (Bantam-Jack Buchsen) gebracht. Das zurückkommende Signal gelangt auf die Vorhörtaste und auf den Summenregler. Über den Schalter zum Einschleifen des Limiters gelangt das Signal auf den Ausgangsverstärker mit symmetrischem, erdfreiem Ausgang.

**PFL Master:** Das unabhängig von der Flachbahnregler-Stellung abgegriffene Vorhör-signal wird mittels Tastendruck auf beide PFL-Sammelschienen geleitet. Dies ermöglicht ein Abhören des Summenkanals, auch bei geschlossenem Flachbahnregler.

### 3.2 Limiter / Kompressor

---

Die Limiter / Kompressorstufe, mittels Taste IN zuschaltbar, wird zur Pegel- (Limiter) und Dynamik- (Kompressor) Begrenzung eingesetzt. Sie kann wahlweise dem Summenkanal zugeschaltet, oder für externe Anwendungen in den separaten LIMITER/COMPR-Einschleifpfad eingeschaltet werden (Taste  $\Sigma$ /INSERT):

---

**STEREOKOPPLUNG LINK** Über die eingerastete Taste LINK werden die Limiter-Regelkreise der Summeneinheiten, über welche ein Signal verarbeitet wird, miteinander gekoppelt. Dies bewirkt eine Verstärkungsregelung, bei der die Regelgröße vom Kanal mit dem jeweils höheren Pegel bestimmt wird.

---

**SUMMENKANAL  $\Sigma$**  Die ausgerastete Vorwahltaste (Position  $\Sigma$ ) schaltet den Limiterteil in den Summenkanal (LED LIMITER leuchtet) und dient der Pegelbegrenzung, zum Schutze der Ausgangsleitung vor Übersteuerung. Der RATIO- und der GAIN-Regler sind bei dieser Anwendung nicht wirksam. Der Pegelgrenzwert liegt bei +6dBu und lässt sich schaltungsintern abgleichen.

---

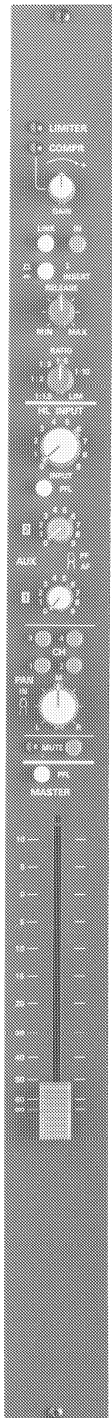
**LIMITER/KOMPRESSOR  
-EINSCHLEIFPFAD**

**INSERT** Bei eingerasteter Vorwahltaste [4] (Stellung INSERT) steht der Limiter/Kompressor-Schaltkreis zum Einschleifen in den PF-Einschleifpfad einer beliebigen Eingangs- oder Summeneinheit zur Verfügung. Folgende Parameter der Limiter-/Kompressorfunktion können verändert werden:

## 3. Master Unit

1.970.841

## 3.1 Operating Elements

**LIMITER/  
COMPRESSOR:**

The master unit comprises three functional blocks:

- Master section
- Limiter/compressor stage with separate insertion path
- High-level input

The following parameters can be adjusted via potentiometers:

- Ratio:** Compression ratio: 1:1.5...1:20 (LIMITER)
- Release:** Program dependent release time, adjustable with the potentiometer.
- Gain:** The gain of the limiter/compressor insertion path can be varied on the input with the GAIN potentiometer. This amplifier is also available for any other application when the limiter/compressor is switched off.

The control section of the compressor/limiter employs the pulse duration modulation (PDM) principle. The input and the output are electronically balanced. The nominal level is +6 dBu.

**HIGH-LEVEL INPUT:**

Each master channel is equipped with an additional high-level input. A PFL button is available for prelistening the input signal. The volume can be controlled with a potentiometer. Two auxiliary output units AUX 1 and AUX 2 are available, analogously to the input units. The buses are selected in the same way as on the input units and differ in the arrangement and design of the selection keys.

**MASTER SECTION:**

The bus signal is added by a zero-ohm amplifier and taken to the electronically balanced insertion point (bantam jack socket). The return signal is taken to the prelistening key and to the master fader. Via the limiter insertion switch the signal is taken to the output amplifier which has a balanced and floating output.

**PFL Master:** The PFL signal which is tapped independently of the fader setting can be connected to the two PFL buses by pressing button which means that the master channel can also be prelistened when the linear fader is closed.

### 3.2 Limiter / Compressor

---

The limiter/compressor stage which can be brought into the circuit with the IN button, is used for limiting the level (limiter) and the dynamic range (compressor). For external applications it can be connected to the separate LIMITER/COMPR insertion path (with button  $\Sigma$  /INSERT):

---

**STEREO COUPLING LINK** When the LINK button is engaged, the limiter control circuits of the master unit processing a signal are coupled. This results in a gain control in which the controlled variable is determined by the channel on which the higher control voltage is available.

---

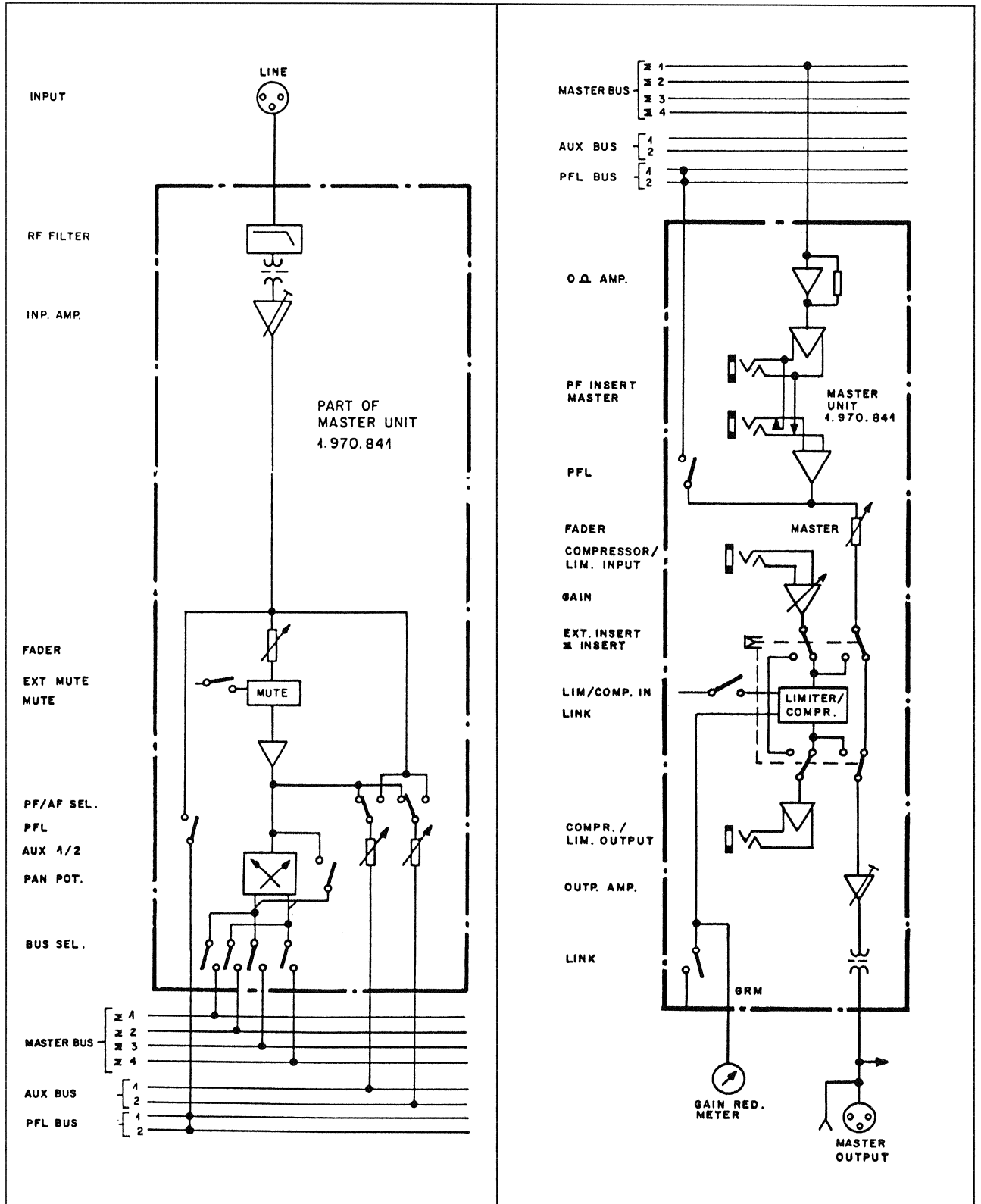
**MASTER CHANNEL  $\Sigma$**  When the preselection button is released (position  $\Sigma$ ), the limiter section connects the master channel (LIMITER LED is on) and serves as a level limiter for protecting the output line from overloads. The RATIO and the GAIN controls are disabled in this application. The level limit is +6 dBu and can be aligned internally.

---

#### LIMITER/COMPRESSOR -INSERTION PATH

**INSERT** When the preselection button is engaged (INSERT position), the limiter/compressor circuit is available on the balanced jack sockets [C] for insertion into the PF insertion path of any input or master module. The following parameters of the limiter/compressor function can be altered:

3.3 Blockschaltbild / Block Diagram



# STUDER AUDIO CONSOLE 970

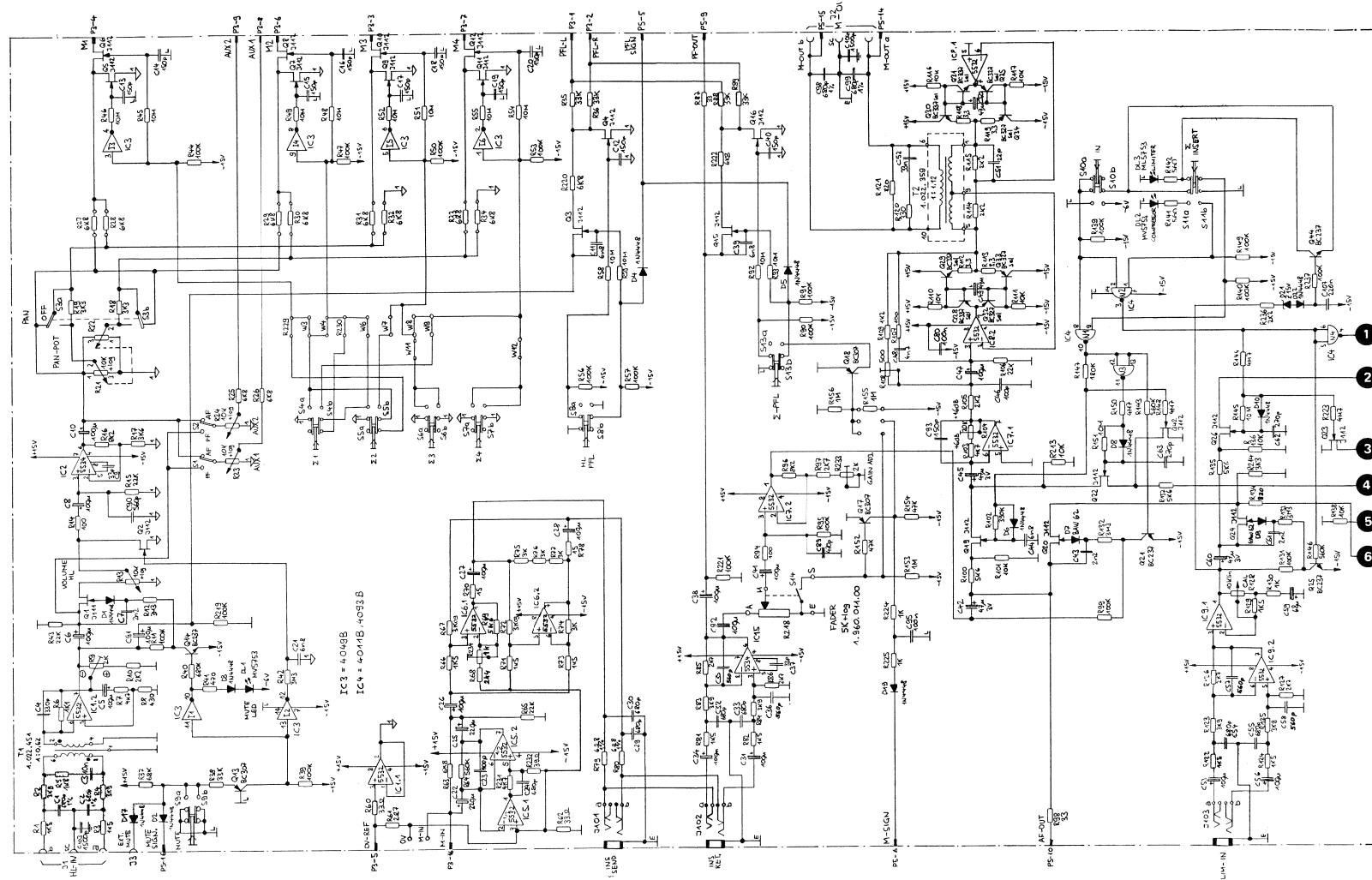
## MASTER UNIT

1.970.841.81

### 3.4 Schemateil / Circuit Diagrams

#### Master Unit 4CH

#### Part 1



- 1
- 2
- 3
- 4
- 5
- 6

DATE:	115.87	46.2.89			
SIGN:	ak	w/d			PAGE 1 OF 2
<b>STUDER</b> REGENDORF ZÜRICH	MASTER UNIT 4CH		SC 1.970.841.81		

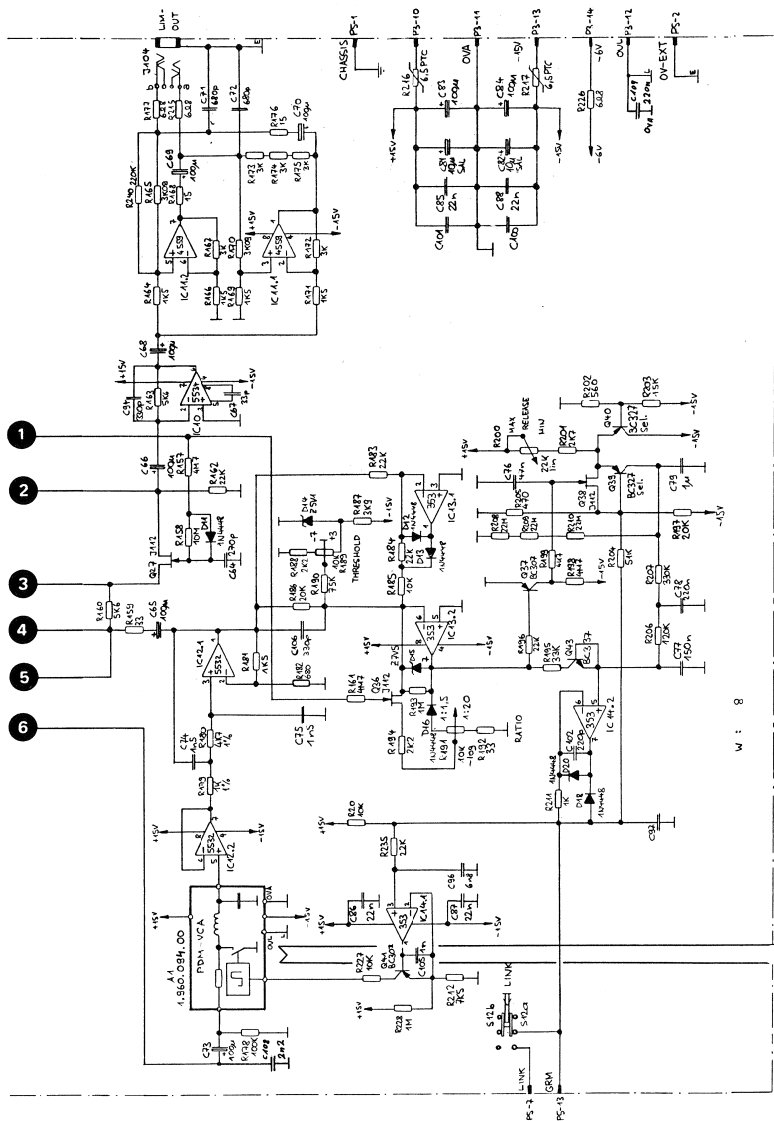
STUDER AUDIO CONSOLE 970

MASTER UNIT

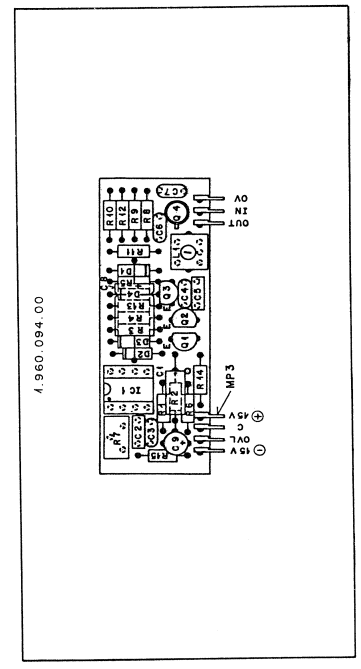
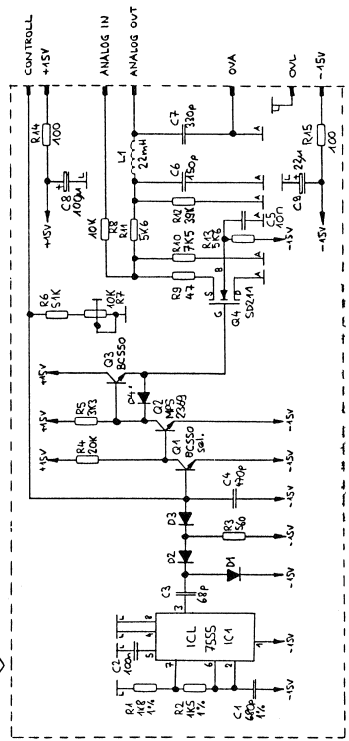
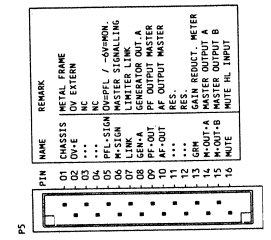
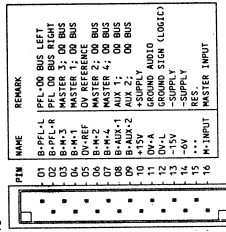
Master Unit 4CH

1.970.841.81

Part 2



W : 8



DATE:	11.5.87	16.2.89			
SIGN:	ak	W/D			PAGE 20 F 2
<b>STUDER</b> REGENSDORF ZÜRICH	MASTER UNIT 4CH			<b>SC 1.970.841.81</b>	

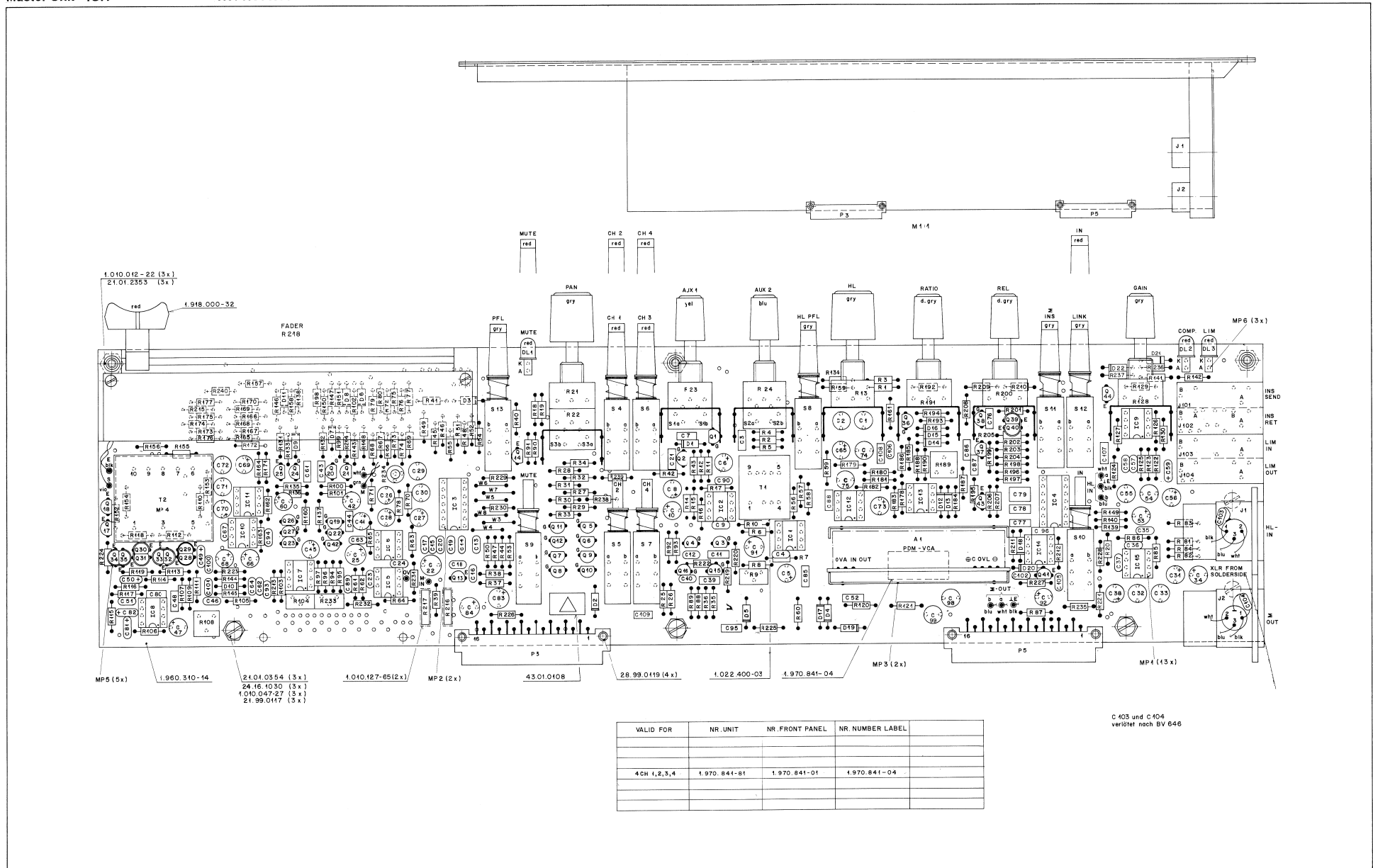


# STUDER AUDIO CONSOLE 970

## MASTER UNIT

Master Unit 4CH

1.970.810.81



1.010.012-22 (3x)  
21.01.2353 (3x)  
1.918.000-32

FADER  
R 218

MP5 (5x) 1.960.310-14  
21.04.0354 (3x)  
24.16.1030 (3x)  
1.010.047-27 (3x)  
21.39.0117 (3x)

1.010.127-6512(x)  
MP2 (2x)

43.01.0108

28.99.0119 (4x)

1.022.400-03

1.970.841-04

MP3 (2x)

C 403 und C 404  
verlötet nach BV 646

VALID FOR	NR. UNIT	NR. FRONT PANEL	NR. NUMBER LABEL
4CH 1,2,3,4	1.970.841-81	1.970.841-01	1.970.841-04



Master Unit 970

1.970.810.81

Ad	..POS..	...REF.No...	DESCRIPTION.....	MANUFACTURER	Ad	..POS..	...REF.No...	DESCRIPTION.....	MANUFACTURER
R...	191	1.010.020.58	10 kOhm 10% neg.log.	variable resistor	St	1.970.810.81	MASTER UNIT 970		TA 88-11.1802
R...	192	57.11.4330	33 Ohm 5%	0.25W		1.970.810.81	MASTER UNIT 970		TA 89-10.0503
R...	193	57.11.4105	1 MOhm 5%	0.25W		1.970.810.81	MASTER UNIT 970		WM 90-10.2404
R...	194	57.11.4222	2,2 kOhm 5%	0.25W					
R...	195	57.11.4333	33 kOhm 5%	0.25W					
R...	196	57.11.4223	22 kOhm 5%	0.25W					
R...	197	57.11.3203	20 kOhm 1%	0.25W					
R...	198	57.11.5475	4.7 MOhm 5%	0.25W					
R...	199	57.11.4472	4.7 kOhm 5%	0.25W					
R...	200	1.010.014.56	22 kOhm 10%	lin.	variable resistor	St			
R...	201	57.11.4272	2.7 kOhm 5%	0.25W					
R...	202	57.11.3561	560 Ohm 1%	0.25W					
R...	203	57.11.3153	15 kOhm 1%	0.25W					
R...	204	57.11.3513	51 kOhm 1%	0.25W					
R...	205	57.11.3471	470 Ohm 1%	0.25W					
R...	206	57.11.4124	120 kOhm 5%	0.25W					
R...	207	57.11.4334	330 kOhm 5%	0.25W					
R...	208	57.11.6226	22 MOhm 5%	0.25W					
R...	209	57.11.6226	22 MOhm 5%	0.25W					
R...	210	57.11.6226	22 MOhm 5%	0.25W					
R...	211	57.11.4102	1 kOhm 5%	0.25W					
R...	212	57.11.3752	7.5 kOhm 2%	0.25W					
R...	213	57.11.4103	10 kOhm 5%	0.25W					
R...	214	57.11.4332	3.3 kOhm 5%	0.25W					
R...	215	57.11.3689	6.8 Ohm 1%	0.25W					
R...	216	57.92.1271	6.5 Ohm	I= 270mA PTC	Philips Nr.2322 662 12711				
R...	217	57.92.1271	6.5 Ohm	I= 270mA PTC	Philips Nr.2322 662 12711				
R...	218	1.960.011.00	5 kOhm	FADER					St
R...	219	57.11.4104	100 kOhm 5%	0.25W					
R...	220	57.11.4682	6.8 kOhm 5%	0.25W					
R...	221	57.11.4104	100 kOhm 5%	0.25W					
R...	222	57.11.4682	6.8 kOhm 5%	0.25W					
R...	223	57.11.5475	4.7 MOhm 5%	0.25W					
R...	224	57.11.4102	1 kOhm 5%	0.25W					
R...	225	57.11.4102	1 kOhm 5%	0.25W					
R...	226	57.11.3689	6.8 Ohm 1%	0.25W					
R...	227	57.11.4103	10 kOhm 5%	0.25W					
R...	228	57.11.4105	1 MOhm 5%	0.25W					
R...	229	57.11.4000	0 Ohm	***					
R...	230	57.11.4000	0 Ohm	***					
R...	231	57.11.4472	4.7 kOhm 5%	0.25W					
R...	232	57.11.4390	39 Ohm 5%	0.25W					
R...	233	58.01.9202	2 kOhm 10%	variable resistor	PMG				
R...	234	58.11.6102	1 kOhm 10%	variable resistor	PMG				
R...	235	57.11.4223	22 kOhm 5%						
R...	236	57.11.4222	2.2 kOhm 5%						
R...	237	57.11.4104	100 kOhm 5%						
R...	238	57.11.4000	0 Ohm						
R...	239	57.11.4000	0 Ohm						
R...	240	57.11.4224	220 kOhm 5%						
S....	1	.	2*U	combined with R 23					
S....	2	.	2*U	combined with R 24					
S....	3	.	2*U	see note A)					
S....	4	55.15.0019	2*U	button: red	ITT				
S....	5	55.15.0019	2*U	button: red	*** / *****				
S....	6	55.15.0019	2*U	button: red	*****				
S....	7	55.15.0019	2*U	button: red	*****				
S....	8	55.15.0019	2*U	button: grey	ITT				
S....	9	55.15.0019	2*U	button: red	ITT				
S....	10	55.15.0019	2*U	button: red	ITT				
S....	11	55.15.0019	2*U	button: grey	ITT				
S....	12	55.15.0019	2*U	button: grey	ITT				
S....	13	55.15.0019	2*U	button: grey	ITT				
S....	14	.	1*On	combined with FADER R 218					
T....	1	1.022.451.00		input trafo	1:0.62	St			
T....	2	1.022.359.00		output trafo	1:1.12	St			
W....	1	.		***					
W....	2	.		***					
W....	3	.		*****					
W....	4	.	not used						
W....	5	.		*****					
W....	6	.		***					
W....	7	.	not used						
W....	8	.		***					

- (1) change of PDM-VCA part number
- (2) click suppression : IC1 MC33078
- (3) change of transistor part number
- (4) IC1, 50090117 replaced by 101005150

\*\*\*\*\*  
 \*\*\* only 2 CH 1,2 1.970.821.81  
 \*\*\*\*\* only 4 CH 1,2,3,4, 1.970.841.81  
 \*\*\*\*\*  
 A) pan - pot ( R21 / R22 )  
 Version: \*\*\* R21 / R22 1.010.004.58 without switch  
 \*\*\*\*\* R21 / R22 1.010.021.58 with S14/S15  
 \*\*\*\*\*

CE=Ceramic, CF=Carbon Film, EL=Electrolytic, MF=Metal Film,  
 PE=Polyester, PP=Polypropylen, PS=Polystyrol

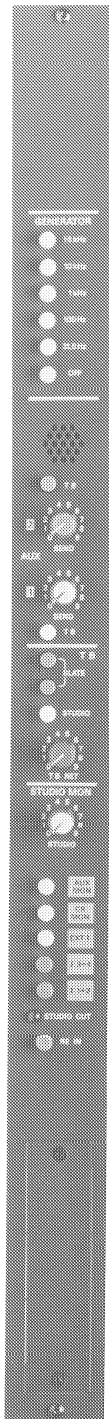
MANUFACTURER: Bu=Burndy, Ex=Exar, Fc=Fairchild, GI=General Instrument  
 HP=Hewlett Packard, ITT=Intermetall, Mot=Motorola, Nat=Nat={Matsushita},  
 NS=National Semiconductors, Ph=Philips, Ra=Raytheon, Sig=Signetics,  
 Six=Siliconix, St=Studer, TI=Texas Instrument

1.970.810.81 MASTER UNIT 970 WM 88.01.0401

4. Studio Monitor, Aux Master- und Kommandoeinheit

1.970.901

4.1 Bedienungselemente



**TESTGENERATOR:** Der eingebaute Testgenerator wird über eine Sammelschiene allen Mono Eingangseinheiten zugeführt. Fünf Frequenzen können eingestellt werden (31.5 Hz, 100 Hz, 1 kHz, 10 kHz und 15 kHz).

**KOMMANDO:** Dem Talk Back Mikrofon folgt ein Mikrofonverstärker mit integriertem Limiter. Über Drucktasten kann auf die beiden Hilfsausgänge, (TB Aux1; TB Aux2) die Summensammelschienen TB SLATE und auf den Studiolautsprecher TB STUDIO gesprochen werden.

**HILFSSUMMEN  
AUX 1 und AUX 2:** Zwei Null-Ohm Verstärker summieren die Signale der AUX Sammelschienen. Der Ausgangspegel kann an zwei Potentiometern eingestellt werden.

Zwei TB Drucktasten erlauben Kommandogabe auf die Hilfsausgänge.

Die Ausgänge der Hilfssummen sind symmetrisch und erdfrei.

**TB RETURN:** An den eingebauten TB Return Verstärker kann ein im Studio plaziertes Gegensprechmikrofon angeschlossen werden. Ein externes Steuersignal schaltet den Gegensprechweg auf den Vorhörlautsprecher.

**STUDIO MONITOR:** Der Monitor Selector erlaubt die Anwahl folgender Quellen:

- Bei Stereopulten:
- Summen  $\Sigma 1+2$
  - C.R. Monitor
  - den Hilfeinschub AUX Monitor
  - 2 Externe Quellen

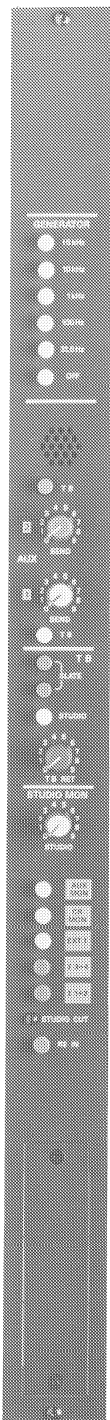
- Bei 4 Kanal Pulten:
- Summen  $\Sigma 1+2$
  - Summen  $\Sigma 3+4$
  - C.R. Monitor
  - den Hilfeinschub AUX Monitor
  - 1 Externe Quelle

**STUDIO CUT:** Nach dem Lautstärkepotentiometer folgt ein MUTE Schalter der das Studioabhören unterbricht, sobald ein Mikrofonkanal geöffnet wird. Die RE IN Taste erlaubt das Einspielen bei offenem Mikrofonkanal. Das Ausgangssignal wird elektronisch symmetriert.

4. Studio Monitor, Aux Master and Talk-back Unit

1.970.901

4.1 Operating Elements



**TEST GENERATOR:** The built-in test generator is connected to all mono input units via a bus. Five frequencies can be set (31.5 Hz, 100 Hz, 1 kHz, 10 kHz and 15 kHz).

**TALK-BACK:** The talk-back microphone is followed by a microphone amplifier with integrated limiter. Talkback on the two auxiliary outputs, (TB Aux1; TB Aux2) the master bus TB SLATE and on the studio speakers TB STUDIO is possible by pressing the corresponding buttons.

**AUXILIARY MASTERS AUX 1... AUX 4:** Two zero-ohm amplifiers add the signals of the AUX buses. The output level can be adjusted with two potentiometers.

Two TB push buttons are available for talk-back on the auxiliary outputs.

The outputs of the auxiliary masters are balanced and floating.

**TB RETURN:** An intercom microphone can be connected to the built-in TB return amplifier. An external control signal connects the intercom path to the prelistening speaker.

**STUDIO MONITOR:** The following sources can be accessed with the monitor selector:

- On stereo consoles:
- Masters  $\Sigma 1+2$
  - C.R. monitor
  - Auxiliary module AUX Monitor
  - 2 External sources

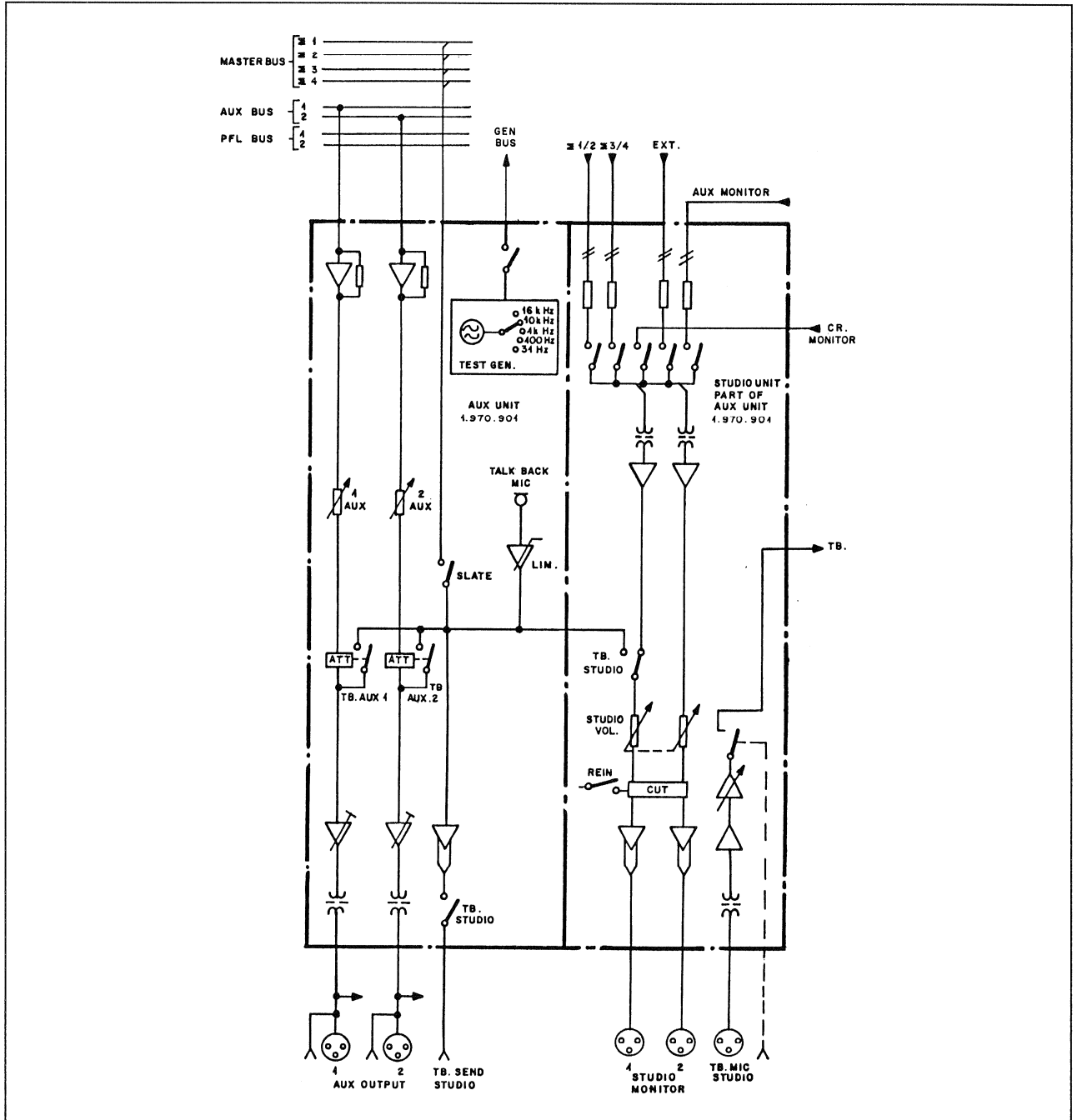
- On 4-channel consoles:
- Masters  $\Sigma 1+2$
  - Masters  $\Sigma 3+4$
  - C.R. monitor
  - Auxiliary module AUX Monitor
  - 1 External source

**STUDIO CUT:** The volume potentiometer is followed by a MUTE switch that interrupts studio monitoring as soon as a microphone channel is opened. Insertion with open microphone channel is possible with the RE IN button.

The output signal is electronically balanced.

4.2 Blockschaltbild/Block Diagram

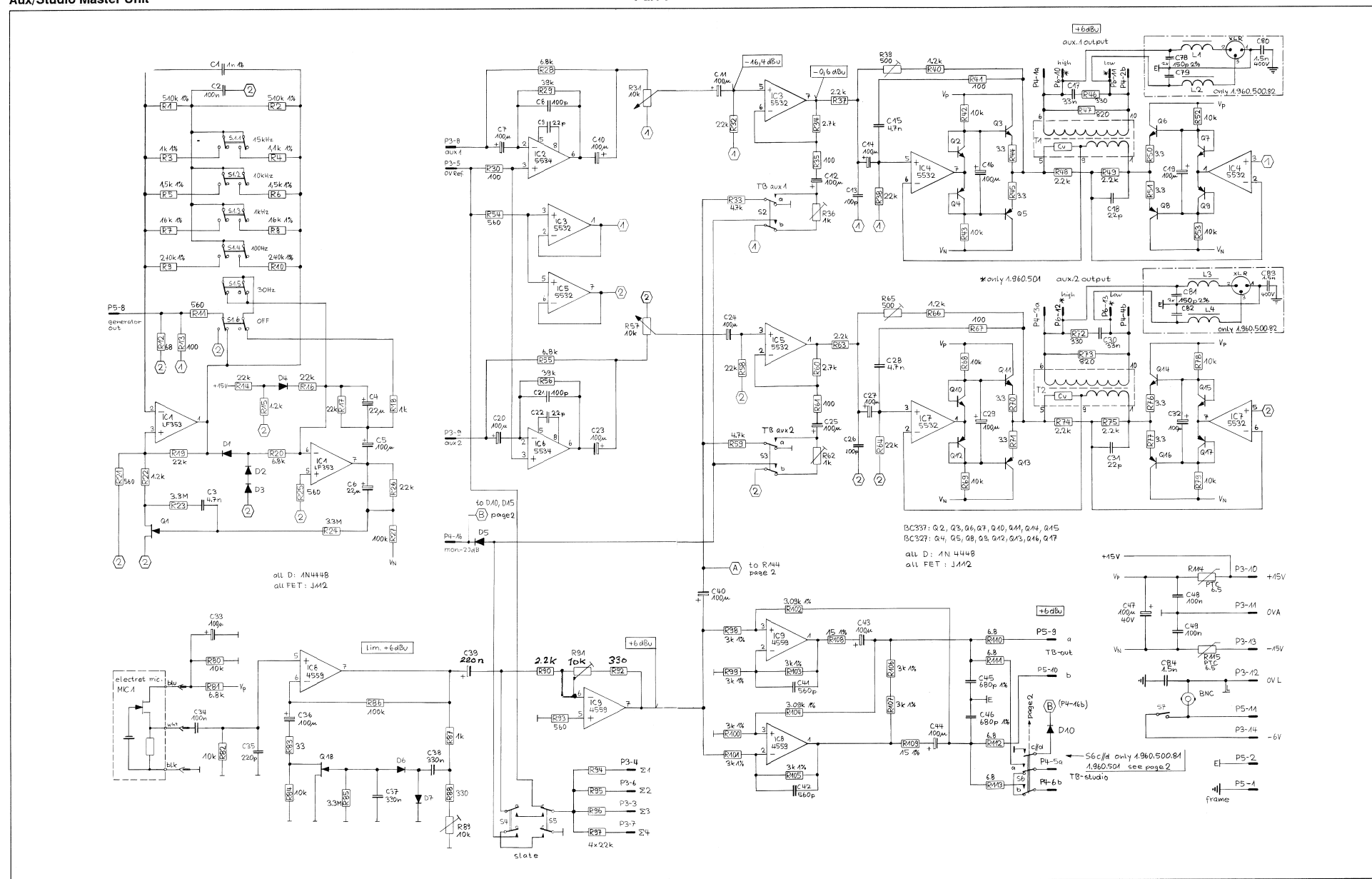
1.970.901



4.3 Schemateil / Circuit Diagrams

Aux/Studio Master Unit

Part 1



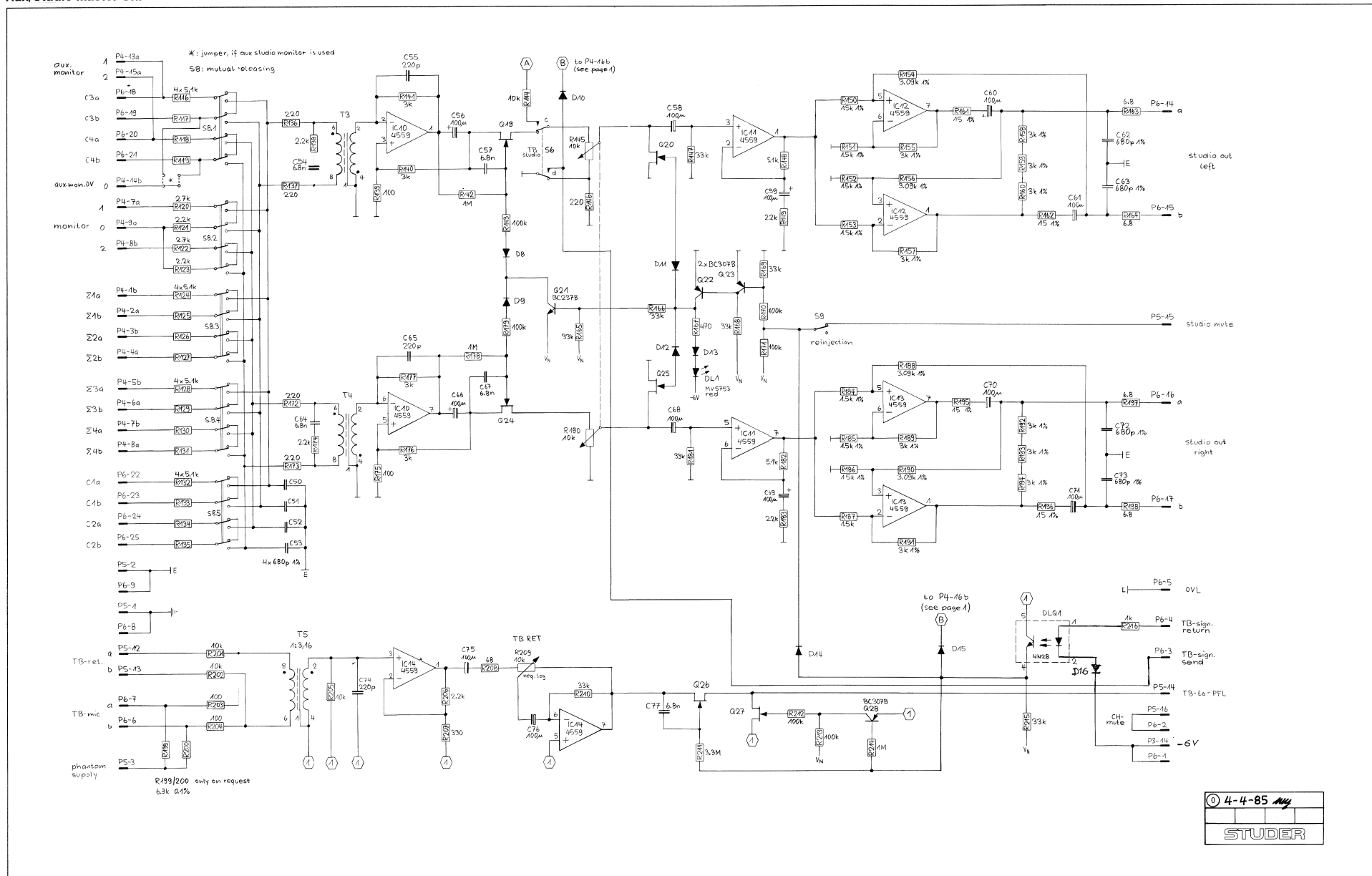
# STUDER AUDIO CONSOLE 970

## AUX, TB, STUDIO MON.

Aux/Studio Master Unit

1.970.901.00

Part 2



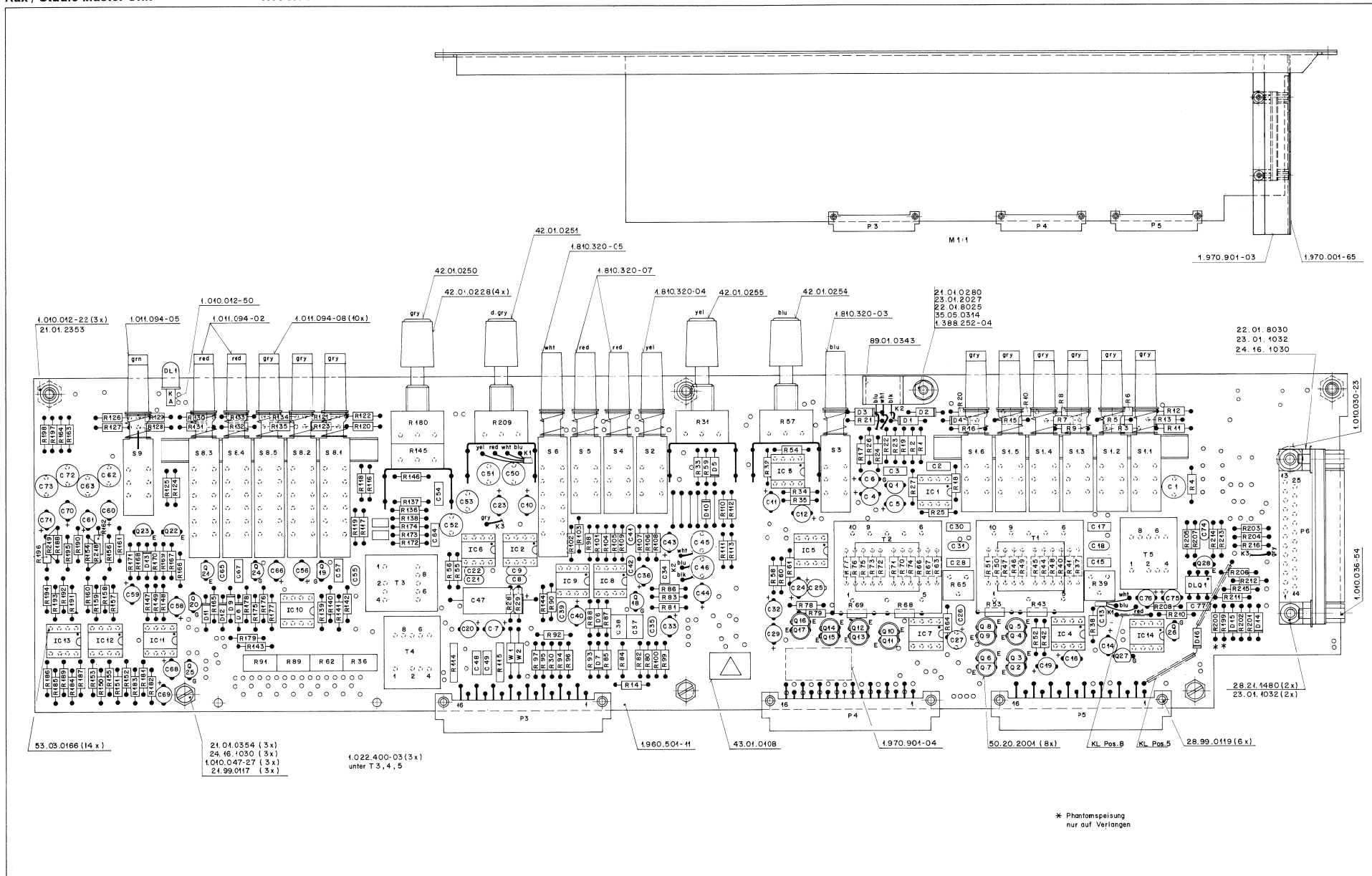


# STUDER AUDIO CONSOLE 970

AUX, TB, STUDIO MON.

Aux / Studio Master Unit

1.970.901.00



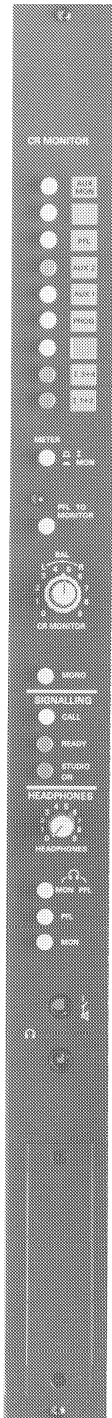
\* Phantomspeisung  
nur auf Verlangen



## 5. Kontrollraum (CR) Monitoreinheit

1.970.920

## 5.1 Bedienungselemente



**REGIEABHÖREN:** Über gegenseitig auslösende Drucktasten können 9 verschiedene Abhörquellen angewählt werden.

**CR Monitor** Die Lautstärke der Abhörlautsprecher kann an einem Potentiometer eingestellt werden. Das auf der gleichen Achse untergebrachte Balance Potentiometer erlaubt es, allfällige durch den Raum oder die Lautsprecher hervorgerufene Lautstärkeunsymmetrien auszugleichen.

**Meter** Mit der METER TO MONITOR Taste können die Aussteuerungsmesser 1 und 2 wahlweise an die Summenausgänge  $\Sigma 1+2$  oder parallel zu den Abhörlautsprechern geschaltet werden.

**PFL to Monitor** Bei eingeschalteter PFL-TO-MONITOR-Funktion wird automatisch das PFL-Signal auf den Monitor geschaltet, sobald eine PFL/APL-Taste gedrückt wird. Die laufende Aufnahme oder Sendung wird dabei nicht beeinflusst. Sobald alle PFL/APL Tasten wieder ausgeschaltet sind, wird das angewählte Monitorprogramm wieder hörbar.

Die MONO-Taste erlaubt das abhören von Stereoquellen in Mono.

Während der Kommandogabe über das eingebaute Mikrofon wird der Abhörpegel um 20 dB gedämpft.

**SIGNALISATION:** Drei Drucktasten sind zur Signalgabe ins Studio vorgesehen. Der Signalisationszustand wird an drei LED auf dem Instrumentenpanel des Regiepultes angezeigt.

**CALL** Der Arbeitskontakt der Impulstaste kann ein Warnsignal (Gelb) im Studio steuern. Die gelbe LED im Instrumentenpanel von aussen (Taste im Studio) aktiviert werden.

**READY** Über den Arbeitskontakt der haltenden Drucktaste kann ein Achtung-Signal im Studio gesteuert werden. (Grün)

**STUDIO ON** Diese Taste aktiviert das Studio Rotlicht, wenn gleichzeitig wenigstens ein Mikrofonkanal geöffnet ist. Zur Rotlichtsteuerung steht ein Relaisarbeitskontakt zur Verfügung.

KOPFHÖRER:

Über einen dreiteiligen Tastenschalter kann entweder das am Monitor Selector angewählte Signal (MON) oder das Vorhörsignal (PFL) abgehört werden. In der dritten Stellung ist das Monitorsignal solange hörbar, als keine PFL Taste angewählt ist (MON PFL). Nach dem Betätigen einer PFL Taste wird die Monomischung des Monitorsignales in der einen Hörmuschel und das PFL Signal in der anderen Muschel hörbar.

Wird in der oberen Kopfhörerbuchse kein Jack eingesteckt, so wird das Signal auch über den eingebauten Vorhörlautsprecher hörbar.

STEUERTASTEN:

Im Vorderteil des Einschubes können auf Kundenwunsch bis zu drei Steuertasten eingebaut werden.

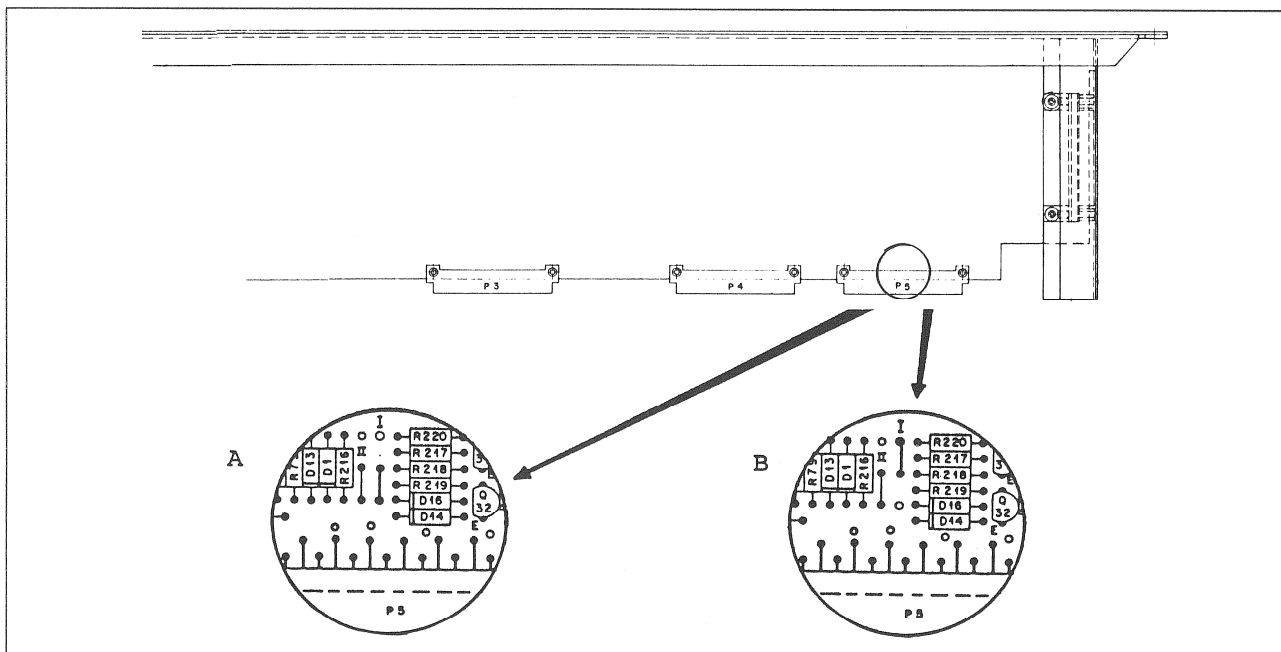
5.2 Option

Brücke I einlöten wie in Zeichnung A:

Bei DJ Betrieb wird das Abhörsignal automatisch unterbrochen, wenn an einer Eingangseinheit der Eingangswahlschalter auf MIC steht und der Flachbahnregler geöffnet ist.

Brücke I einlöten wie in Zeichnung B:

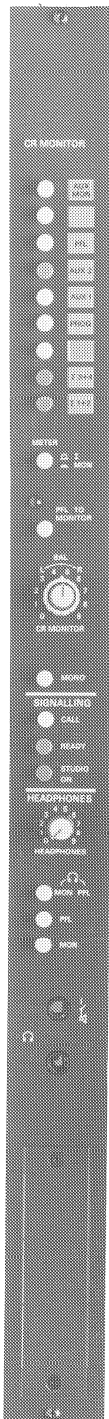
STUDIO ON Taste muss gedrückt werden, dann gleiche Funktion wie vorher beschrieben.



## 5. Control Room Monitor Unit

1.970.920

## 5.1 Operating Elements

CONTROL ROOM  
MONITORING:

Nine different monitoring sources can be selected by means of interlocking push buttons.

**CR Monitor** The volume of the monitor speakers can be set with a potentiometer. Possible volume imbalances caused by the room characteristics or by the speakers can be compensated with the coaxial balance potentiometer. Stereo sources can be monitored in mono mode by pressing the MONO button.

**Meter** With the METER TO MONITOR button output meters 1 and 2 can be selectively connected to the master outputs  $\Sigma 1+2$  or in parallel to the monitor speakers.

**PFL to Monitor** With the PFL TO MONITOR button, monitoring is interrupted and the selected PFL signal is connected to the monitor speakers as soon as one or more PFL or APL keys are pressed. The current recording or broadcast is not influenced. As soon as all PFL/APL keys are switched off again, the selected monitor program can be heard again.

The monitoring level is attenuated by 20 dB, while commands are given through the built-in microphone.

## SIGNALIZATION:

Three push buttons are available for transmitting signals to the studio. The signalization status is indicated by three LEDs on the instrument panel of the audio mixer.

**CALL** The make contact of the momentary action push button can control a warning signal in the studio (yellow light). The yellow LED in the instrument panel can be activated externally (push button in the studio).

**READY** An attention signal in the studio can be controlled via the make contact of the self-holding push button. (green light)

**STUDIO ON** This key activates the red on-air light when at least one microphone channel is open. A relay make contact is available for controlling the red light.

**HEADPHONES:** By means of 3 interlocking push button switches either the signal available from the monitor selector (MON) or the prefader listening signal (PFL) can be monitored. In the third position (MON PFL) the monitor signal can be heard as long as no PFL key is active. After a PFL key has been actuated, the mono mix of the monitor signal becomes audible in one earpiece and the PFL signal in the other earpiece.

If no Jack is inserted in the upper headphones socket, the signal can also be heard via the built-in monitor speaker.

**CONTROL KEYS:** Up to three control keys can be installed on the front of the module according to the customer's specifications.

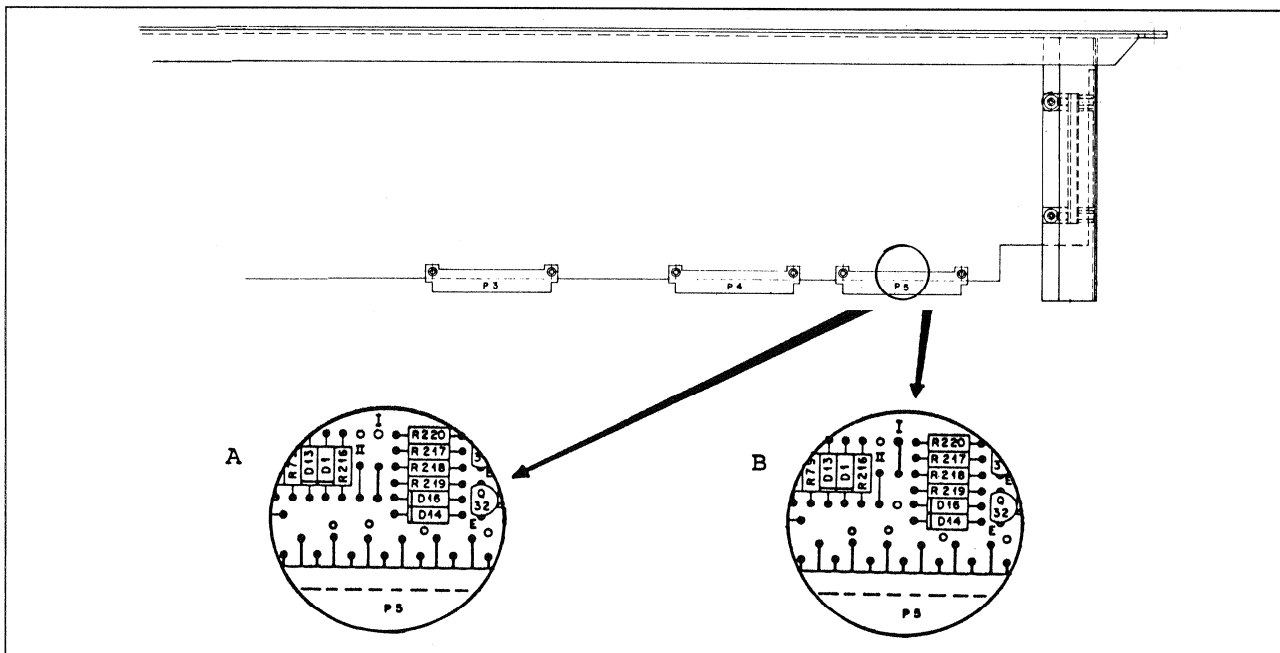
### 5.2 Option

Solder in jumper I as shown in diagram A:

In DJ mode the monitoring signal is automatically interrupted when the input selector of an input module is in the MIC position and the fader is open.

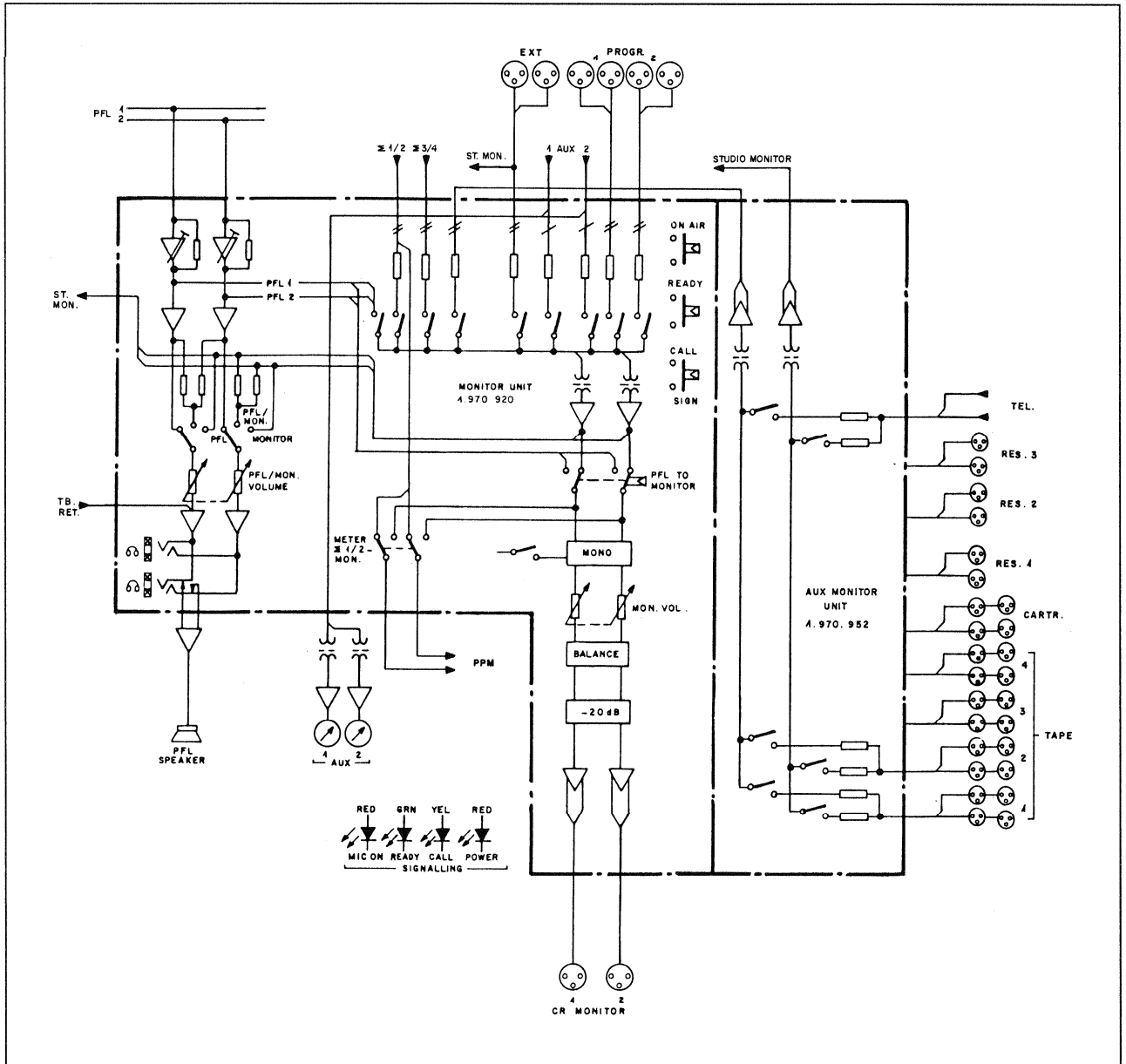
Solder in jumper I as shown in diagram B:

STUDIO ON key must be pressed, otherwise same function as described above.



5.3 Blockschaltbild / Block Diagram

1.970.920



STUDER AUDIO CONSOLE 970

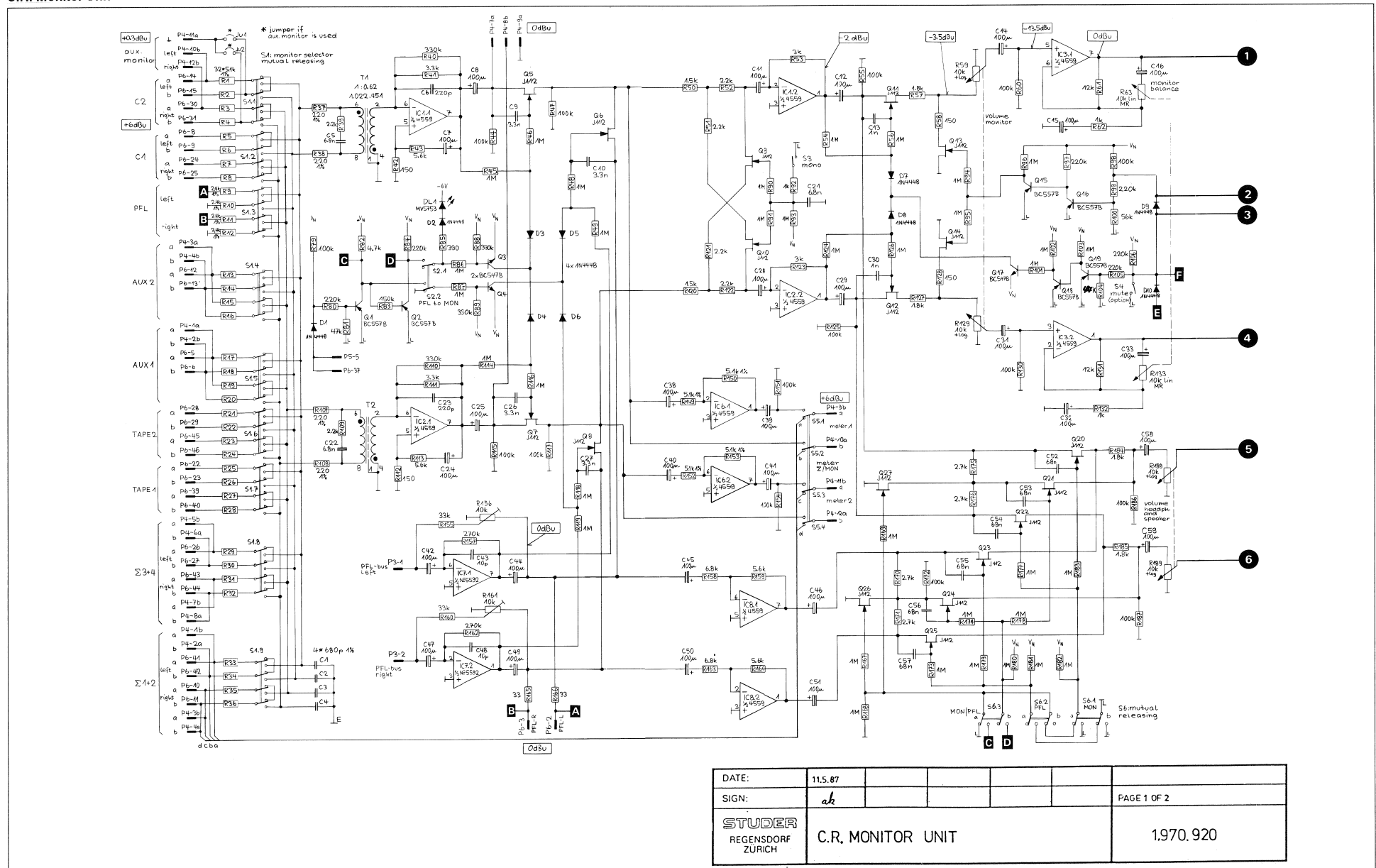
CR MON.

1.970.920.00

5.4 Schemateil / Circuit Diagrams

C.R. Monitor Unit

Part 1



DATE:	11.5.87				
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<b>STUDER</b> REGENSDORF ZÜRICH	<b>C.R. MONITOR UNIT</b>				1.970.920



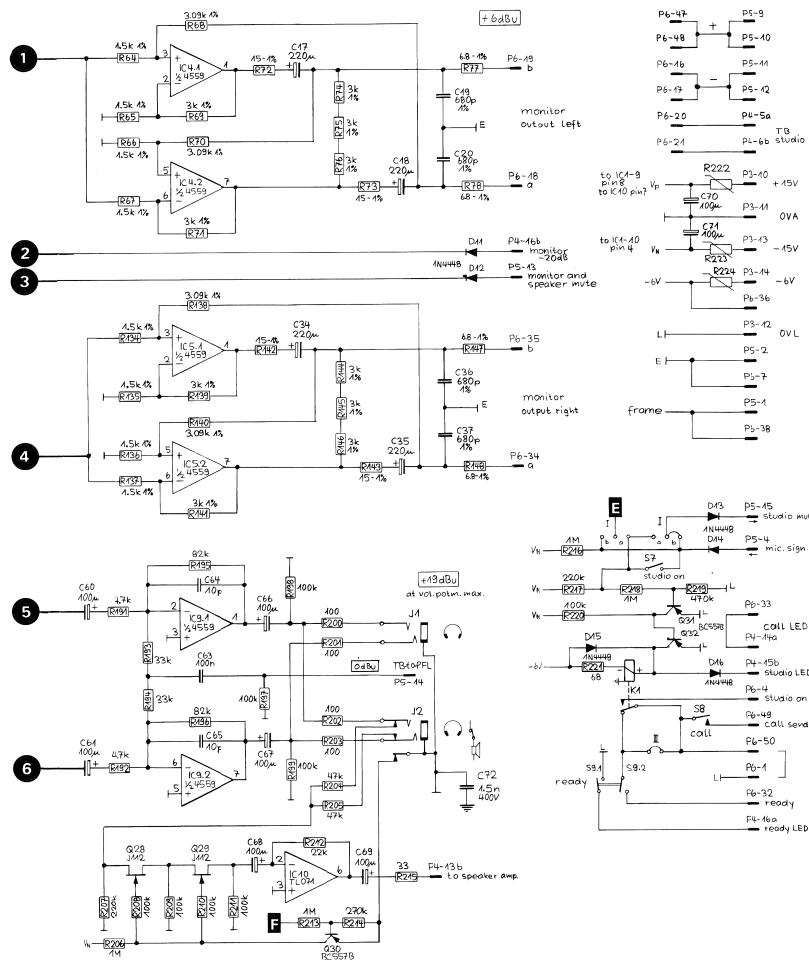
STUDER AUDIO CONSOLE 970

CR MON.

C.R. Monitor Unit

1.970.920

Part 2



PIN	NAME	REMARK
01	B-PFL-L	PFL 00 BUS LEFT
02	B-PFL-R	PFL 00 BUS RIGHT
03	...	NC
04	...	NC
05	OV-REF	OV REFERENCE
06	...	NC
07	...	NC
08	...	NC
09	...	NC
10	+SUPPLY	GROUND AUDIO
11	OV-A	OV MON. OV ISP.
12	OV-L	GROUND SIGN (LOGIC)
13	-SUPPLY	-6V
14	...	SUPPLY
15	...	RES.
16	...	RES.

PIN	NAME	REMARK	A	B
01	AUX-1-A	AUX 1A OUTPUT	M-1-A	MASTER 1A OUTPUT
02	M-1-B	MASTER 1B OUTPUT	AUX-1-B	AUX 1B OUTPUT
03	AUX-2-A	AUX 2A OUTPUT	M-2-A	MASTER 2A OUTPUT
04	M-2-B	MASTER 2B OUTPUT	AUX-2-B	AUX 2B OUTPUT
05	TBS-A	TALK BACK STUDIO A	M-3-A	MASTER 3A OUTPUT
06	M-3-B	MASTER 3B OUTPUT	TBS-B	TALK BACK STUDIO-B
07	MON-1-A	MONITOR 1A OUTPUT	M-4-A	MASTER 4A OUTPUT
08	M-4-B	MASTER 4B OUTPUT	MON-2-A	MONITOR 2A OUTPUT
09	MON-OV	MONITOR OV SUPPLY	MET-1-A	METER 1A
10	MET-1-B	METER 1B	M-1-A	MONITOR 1A IMP.
11	AM-OV	AUX MON. OV ISP.	MET-2-A	METER 2A
12	MET-2-B	METER 2B	M-2-A	AUX MONITOR 2A IMP.
13	...	SUPPLY	PFL-SP	PFL SPEAKER
14	CAL-LED	CALL LED SIGN.	STU-LED	STUDIO LED SIGN.
15	...	RES.	MON-200B	MONITOR 200B ATTEM.
16	KEY-LED	READY LED SIGN.		

PIN	NAME	REMARK
01	CHASSIS	METAL FRAME
02	OV-E	OV EXTERN
03	...	NC
04	...	NC
05	MIC-SIGN	MIC SIGNALLING
06	...	NC
07	...	NC
08	...	NC
09	SUPPLY	EXTERN DC POWER +
10	SUPPLY	EXTERN DC POWER -
11	SUPPLY	EXTERN DC POWER +
12	SUPPLY	EXTERN DC POWER -
13	MON-MUTE	MONITOR MUTE
14	TBOPFL	TB RETURN TO PFL
15	...	STU-MUTE STUDIO MUTE
16	...	RES.

Signal protocol		50pin D-TYPE CONNECTOR P6		Pin assignment	
PIN NO.	SIGNAL NAME	FUNCTION	CR MONITOR CONNECTOR TO CR MONITOR 1.970.920 (P6)	CR MONITOR CONNECTOR TO Terminal box	PIN/WIRE COLOR
01	OV-L	OV SIGL.			01 wht
02	PFL-L	PRE FADER LISTENING LEFT			02 brn
03	PFL-R	PRE FADER LISTENING RIGHT			03 grn
04	STU-OM	STUDIO OM			04 blk/gry/pnk
05	AUX-1-A	AUXILIARY OUTPUT 1-A			05 gry/wht
06	AUX-1-B	AUXILIARY OUTPUT 1-B			06 yel/brn
07	OV-E	OV SCREEN CABLE			07 red/blk/blu
08	C-1-1-A	CONNECTOR C1 INPUT 1-A			08 yel/blk/wht
09	C-1-1-B	CONNECTOR C1 INPUT 1-B			09 yel/blk/brn
10	M-2-A	MASTER 12 OUTPUT A			10 vio
11	M-2-B	MASTER 12 OUTPUT B			11 pnk/gry
12	AUX-2-A	AUXILIARY OUTPUT 2-A			12 red/blu
13	AUX-2-B	AUXILIARY OUTPUT 2-B			13 grn/wht
14	C-2-1-A	CONNECTOR C2 INPUT 1-A			14 grn/brn
15	C-2-1-B	CONNECTOR C2 INPUT 1-B			15 yel/wht
16	-SUPPLY	EXTERN POWER -			16 blk+red/blu
17	-SUPPLY	EXTERN POWER -			17
18	CR-1-A	CR MONITOR OUTPUT L-A			18 gry/brn
19	CR-1-B	CR MONITOR OUTPUT L-B			19 pnk/wht
20	TB-A	TALK BACK OUTPUT A			20 pnk/brn
21	TB-B	TALK BACK OUTPUT B			21 blk/wht
22	T-1-1-A	TAPE1 RETURN 1-A			22 blk/brn
23	T-1-1-B	TAPE1 RETURN 1-B			23 red/wht
24	C-1-2-A	CONNECTOR C1 INPUT 2-A			24 red/brn
25	C-1-2-B	CONNECTOR C1 INPUT 2-B			25 blk/wht
26	M-3-A	MASTER 13 OUTPUT A			26 brn/blk
27	M-3-B	MASTER 13 OUTPUT B			27 grn/gry
28	T-2-1-A	TAPE2 RETURN 1-A			28 yel/gry
29	T-2-1-B	TAPE2 RETURN 1-B			29 pnk/grn
30	C-2-2-A	CONNECTOR C2 INPUT 2-A			30 pnk/yel
31	C-2-2-B	CONNECTOR C2 INPUT 2-B			31 blk/grn
32	READY	READY SIGNALISATION			32 yel/blu
33	CAL-LED	CALL LED SIGNALISATION			33 red/grn
34	CR-2-A	CR MONITOR OUTPUT R-A			34 yel/red
35	CR-2-B	CR MONITOR OUTPUT R-B			35 grn/blk
36	-	SUPPLY			36 yel/wht
37	PFL-SIGN	PFL SIGNALISATION			37 blk/gry
38	CHASSIS	METAL FRAME			38 blk/pnk
39	T-1-2-A	TAPE1 RETURN 2-A			39 red/gry
40	T-1-2-B	TAPE1 RETURN 2-B			40 red/pnk
41	M-1-A	MASTER 11 OUTPUT A			41 blk/gry
42	M-1-B	MASTER 11 OUTPUT B			42 blk/wht
43	M-4-A	MASTER 14 OUTPUT A			43 blk/blk
44	M-4-B	MASTER 14 OUTPUT B			44 red/blk
45	T-2-2-A	TAPE2 RETURN 2-A			45 brn/wht/blk
46	T-2-2-B	TAPE2 RETURN 2-B			46 grn/yel/blk
47	+SUPPLY	EXTERN POWER +			47 red/yel/gry
48	+SUPPLY	EXTERN POWER +			48 blk/wht
49	CAL-SEND	CALL SEND SIGNALISATION			49 grn/wht/blk
50	G.S	GROUND SIGNALISATION			50 brn/blk/grn

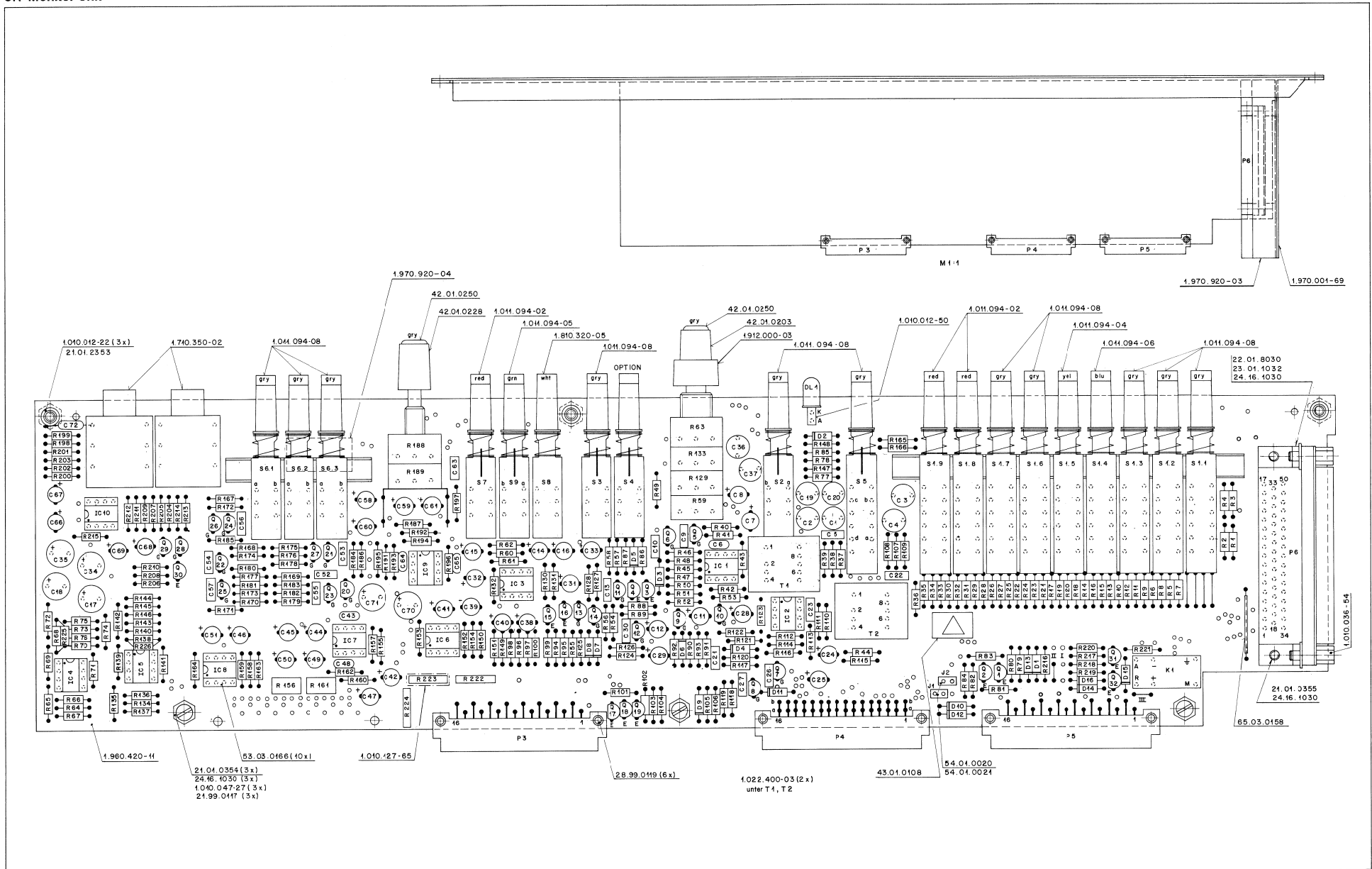
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STUDER REGENDORF ZURICH		C.R. MONITOR UNIT		1.970.920

# STUDER AUDIO CONSOLE 970

CR MON.

CR-Monitor Unit

1.970.920.00



STUDER AUDIO CONSOLE 970

Control room Monitor Unit

1.970.920.00

Table with columns: Ad, POS, REF.No., DESCRIPTION, MANUFACTURER. Lists various components like resistors, capacitors, and connectors.

Control room Monitor Unit

1.970.920.00

Table with columns: Ad, POS, REF.No., DESCRIPTION, MANUFACTURER. Lists various components like resistors, capacitors, and connectors.

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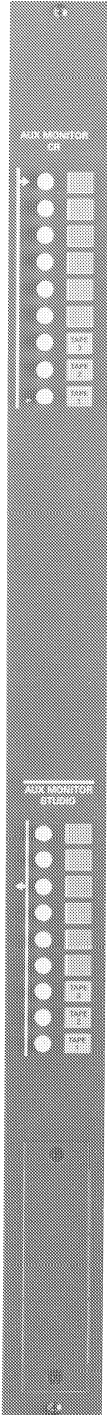
CER = ceramic, EL = electrolytic, PE = polyester, PP = polypropylen

MANUFACTURER: CH=Chicago Miniatur, GI=General Instruments, HP=Hewlett-Packard, Mo=Motorola, Ra=Raytheon, Sch=Schadow-TIT, St=Studer, TI=Texas Instruments,

1.970.920.00 CR MONITOR UNIT NY 86/08/2200
1.970.920.00 CR MONITOR UNIT NY 88/05/2011

6. Monitoreerweiterung

1.970.952



Erweiterung für CR Monitor 1.970.920  
 und Studio Monitor 1.970.901

**QUELLENANWAHL:** Je ein Tastensatz von neun, sich gegenseitig auslösenden Quellenwahltasten ergänzen den CR MONITOR resp. den STUDIO MONITOR um neun Programm-Eingänge. Neun Eingänge führen parallel auf die zwei Tastensätze für den CR- und Studio Monitor.

**EINGANGSSCHALTUNG:** (Beschrieben wird ein Kanal, der zwei möglichen Eingangsstufen). Die Eingangsstufe ist als symmetrisch, erdfreier Knotenpunktverstärker ausgelegt. Die angewählte Signalquelle führt über die entsprechenden Koppelwiderstände (R1...36) und (R37/38) an den Eingangsübertrager (T1). C1...4 leiten hochfrequente Störsignale auf Massenpotential ab. Das RC-Glied (R39-C5) unterstützt das Rechteckverhalten des Eingangssignals. Das sekundärseitig ausgekoppelte asymmetrische NF-Signal führt zum invertierenden Eingang des OpAmp (IC1.1). Die Widerstände (R42/43) kompensieren, zwecks Optimierung des Klirrabstandes, den Kupferwiderstand der sekundärseitigen Transformatorwicklung.

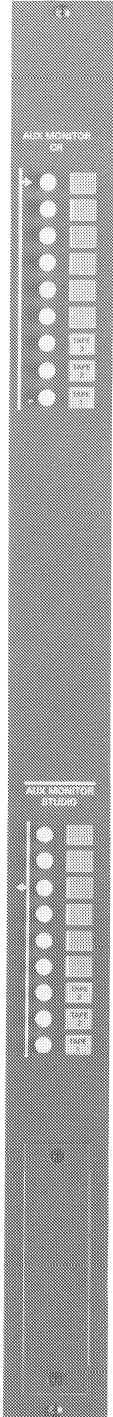
**ANKOPPLUNG AN CR-STUDIO MONITOR:** Über P4 führt das NF-Signal auf den reservierten Eingang des CR-, resp. STUDIO-Monitors. Dieser erfährt, bei erweiterter Monitoreinheit, eine Änderung; Siehe entsprechendes Schema:

CR/MONITOR 1.970.920  
 STUDIO MONITOR 1.970.901

Durch das Setzen der Drahtbrücken (\*) werden die "b"-Signaladern auf 0V geführt, was eine asymmetrische Signalverarbeitung über Eingangsübertrager, und eine Signalverstärkung durch den nachfolgenden OpAmp, von den zugeführten +0dBu auf Nennpegel +6dBu zur Folge hat.

6. Monitor Expansion Unit

1.970.952



Monitor expansion for CR Monitor 1.970.920  
and for Studio Monitor 1.970.901

**SOURCE SELECTION:** On set of nine interlocked source selection buttons each expand the CR MONITOR or the STUDIO MONITOR respectively by nine program inputs. The nine inputs are taken in parallel to both sets of correspondingly arranged selector buttons.

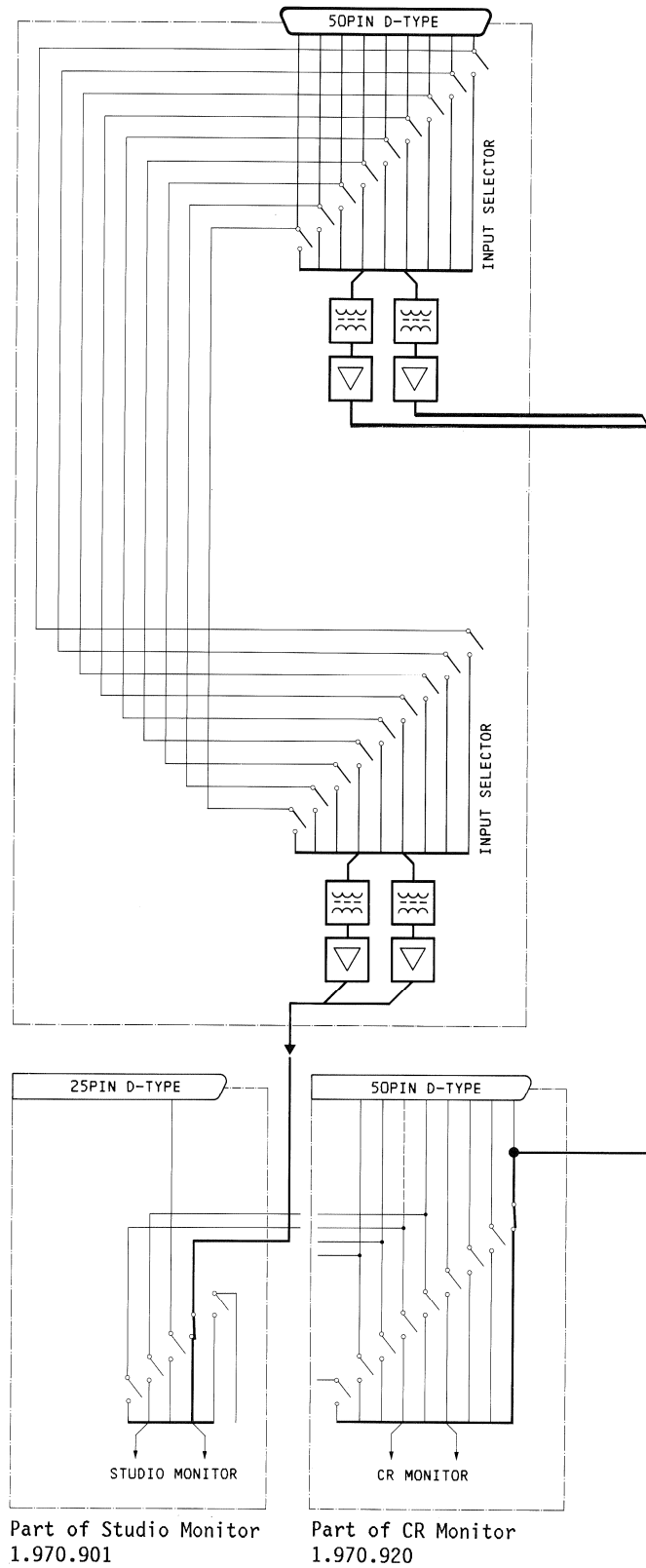
**INPUT CIRCUIT:** (Described is one channel of the two possible input stages)  
the input stage is designed as an unbalanced and floating nodal point amplifier. The selected signal source is taken via the corresponding coupling resistor (R1...36) and (R37/38) to the input transformer (T1). C1...4 discharge high-frequency noise signals to ground potential. The RC element (R39-C9) supports the square-wave behavior of the input signal. The unbalanced audio signal decoupled on the secondary side is taken to the inverting input of opamp (IC1.1). The resistors (R42/43) compensate the copper resistance of the secondary transformer winding in order to optimize the distortion factor.

**COUPLING TO CR/STUDIO MONITOR:** The audio signal is taken via P4 to the reserved input of the CR or STUDIO monitor. The latter is modified when the monitor module is expanded; refer to corresponding diagram.

CR/MONITOR 1.970.920  
STUDIO MONITOR 1.970.901

Wenn the two jumpers (\*) are set, the b-signal conductors are connected to 0 V with the result that the signals are processed unbalanced via input transformers and the signals are amplified by the subsequent opamp from the available 0.3 dBu to the nominal level of +6 dBu.

6.1 Blockschaltbild / Block Diagram



# STUDER AUDIO CONSOLE 970

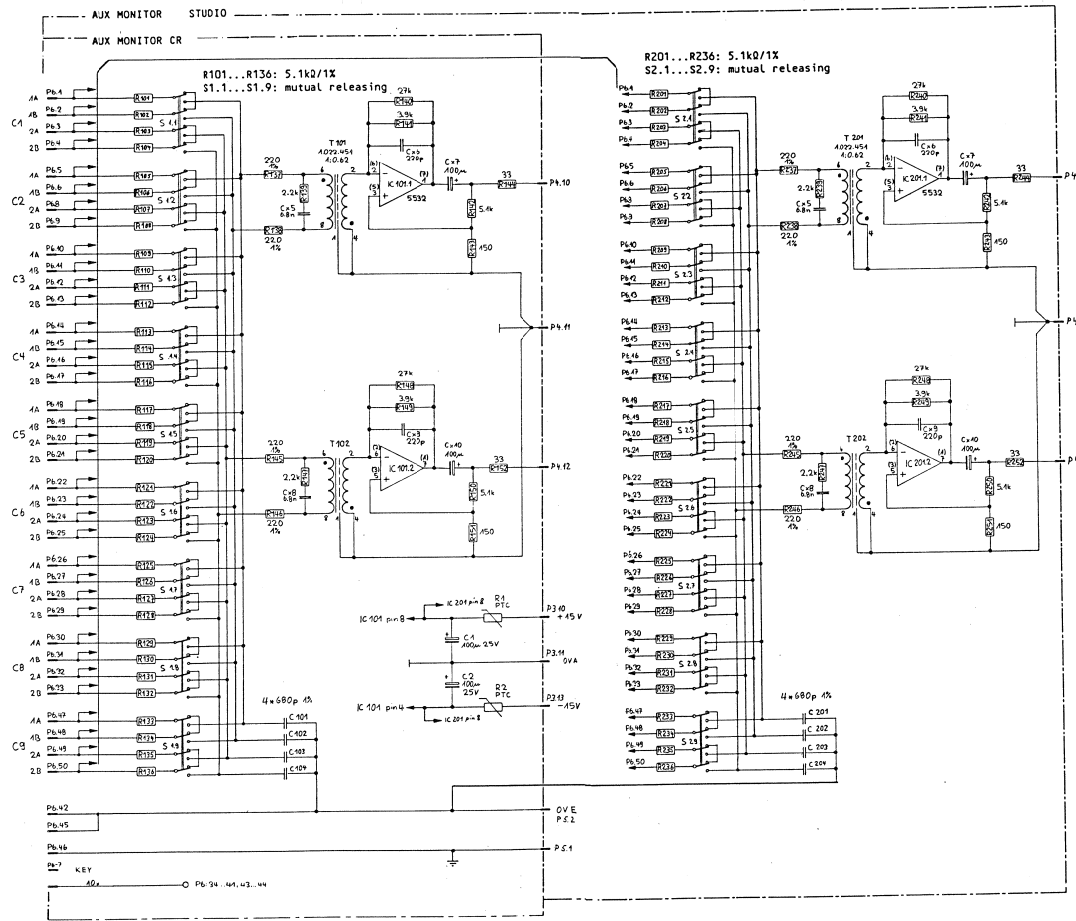
## AUX MONITOR

1.970.952.00

### 6.2 Schemateil / Circuit Diagrams

#### Aux Monitor

#### Part 1



Signal protocol		50pin D-TYPE CONNECTOR P6		Pin assignment	
PIN NO.	SIGNAL NAME	FUNCTION	CH1/L	AUX MONITOR CONNECTOR TO AUX MONITOR UNIT 1.970.952	CABLE CONNECTOR AUX MONITOR Terminal box
01	C-1-1-A	CONNECT C1 (CH1) INPUT 1-A	CH1/L	D-TYP. MALE VIEW FROM CONNECTOR SIDE	D-TYP. FEMALE VIEW FROM SOLDER SIDE
02	C-1-1-B	CONNECT C1 (CH1) INPUT 1-B	CH1/L		
03	C-1-2-A	CONNECT C1 (CH2) INPUT 2-A	CH1/L		
04	C-1-2-B	CONNECT C1 (CH2) INPUT 2-B	CH1/L		
05	C-2-1-A	CONNECT C2 (CH1) INPUT 1-A	CH1/L		
06	C-2-1-B	CONNECT C2 (CH1) INPUT 1-B	CH1/L		
07	...	KEY	CH1/L		
08	C-2-2-A	CONNECT C2 (CH2) INPUT 2-A	CH1/L		
09	C-2-2-B	CONNECT C2 (CH2) INPUT 2-B	CH1/L		
10	C-3-1-A	CONNECT C3 (CH1) INPUT 1-A	CH1/L		
11	C-3-1-B	CONNECT C3 (CH1) INPUT 1-B	CH1/L		
12	C-3-2-A	CONNECT C3 (CH2) INPUT 2-A	CH1/L		
13	C-3-2-B	CONNECT C3 (CH2) INPUT 2-B	CH1/L		
14	C-4-1-A	CONNECT C4 (CH1) INPUT 1-A	CH1/L		
15	C-4-1-B	CONNECT C4 (CH1) INPUT 1-B	CH1/L		
16	C-4-2-A	CONNECT C4 (CH2) INPUT 2-A	CH1/L		
17	C-4-2-B	CONNECT C4 (CH2) INPUT 2-B	CH1/L		
18	C-5-1-A	CONNECT C5 (CH1) INPUT 1-A	CH1/L		
19	C-5-1-B	CONNECT C5 (CH1) INPUT 1-B	CH1/L		
20	C-5-2-A	CONNECT C5 (CH2) INPUT 2-A	CH1/L		
21	C-5-2-B	CONNECT C5 (CH2) INPUT 2-B	CH1/L		
22	C-6-1-A	CONNECT C6 (CH1) INPUT 1-A	CH1/L		
23	C-6-1-B	CONNECT C6 (CH1) INPUT 1-B	CH1/L		
24	C-6-2-A	CONNECT C6 (CH2) INPUT 2-A	CH1/L		
25	C-6-2-B	CONNECT C6 (CH2) INPUT 2-B	CH1/L		
26	C-7-1-A	CONNECT C7 (CH1) INPUT 1-A	CH1/L		
27	C-7-1-B	CONNECT C7 (CH1) INPUT 1-B	CH1/L		
28	C-7-2-A	CONNECT C7 (CH2) INPUT 2-A	CH1/L		
29	C-7-2-B	CONNECT C7 (CH2) INPUT 2-B	CH1/L		
30	C-8-1-A	CONNECT C8 (CH1) INPUT 1-A	CH1/L		
31	C-8-1-B	CONNECT C8 (CH1) INPUT 1-B	CH1/L		
32	C-8-2-A	CONNECT C8 (CH2) INPUT 2-A	CH1/L		
33	C-8-2-B	CONNECT C8 (CH2) INPUT 2-B	CH1/L		
34	RES	-----	CH1/L		
35	RES	-----	CH1/L		
36	RES	-----	CH1/L		
37	RES	-----	CH1/L		
38	RES	-----	CH1/L		
39	RES	-----	CH1/L		
40	RES	-----	CH1/L		
41	RES	-----	CH1/L		
42	OV-E	DV SCREEN CABLE	CH1/L		
43	RES	-----	CH1/L		
44	RES	DV SCREEN CABLE	CH1/L		
45	OV-E	-----	CH1/L		
46	CHASSIS	METAL FRAME	CH1/L		
47	C-9-1-A	CONNECT C9 (CH1) INPUT 1-A	CH1/L		
48	C-9-1-B	CONNECT C9 (CH1) INPUT 1-B	CH1/L		
49	C-9-2-A	CONNECT C9 (CH2) INPUT 2-A	CH1/L		
50	C-9-2-B	CONNECT C9 (CH2) INPUT 2-B	CH1/L		

PIN	NAME	REMARK
01		
02		
03		
04		
05		
06		
07		
08		
09		
10		
11	+15V	+SUPPLY
12	DV-L	GROUND AUDIO
13	DV-L	GROUND SIGM (LOGICS)
14	+15V	+SUPPLY
15	-0V	-SUPPLY
16		
17		
18		
19		
20		

PIN	NAME	REMARK
01		
02		
03		
04		
05		
06		
07		
08		
09		
10	AM-1-A	AUX MON 1A OUTPUT
11	AM-OV	AUX MONITOR OV
12	AM-2-A	AUX MON 2A OUTPUT
13	ASM-1-A	AUX STUDIO MON. 1A
14	ASM-OV	AUX STUDIO MON. OV
15	ASM-2-A	AUX STUDIO MON. 2A
16		

PIN	NAME	REMARK
01	CHASSIS	METAL FRAME
02	OV-E	DV EXTERN
03		
04		
05		
06		
07		
08		
09		
10		
11		
12		
13		
14		
15		
16		

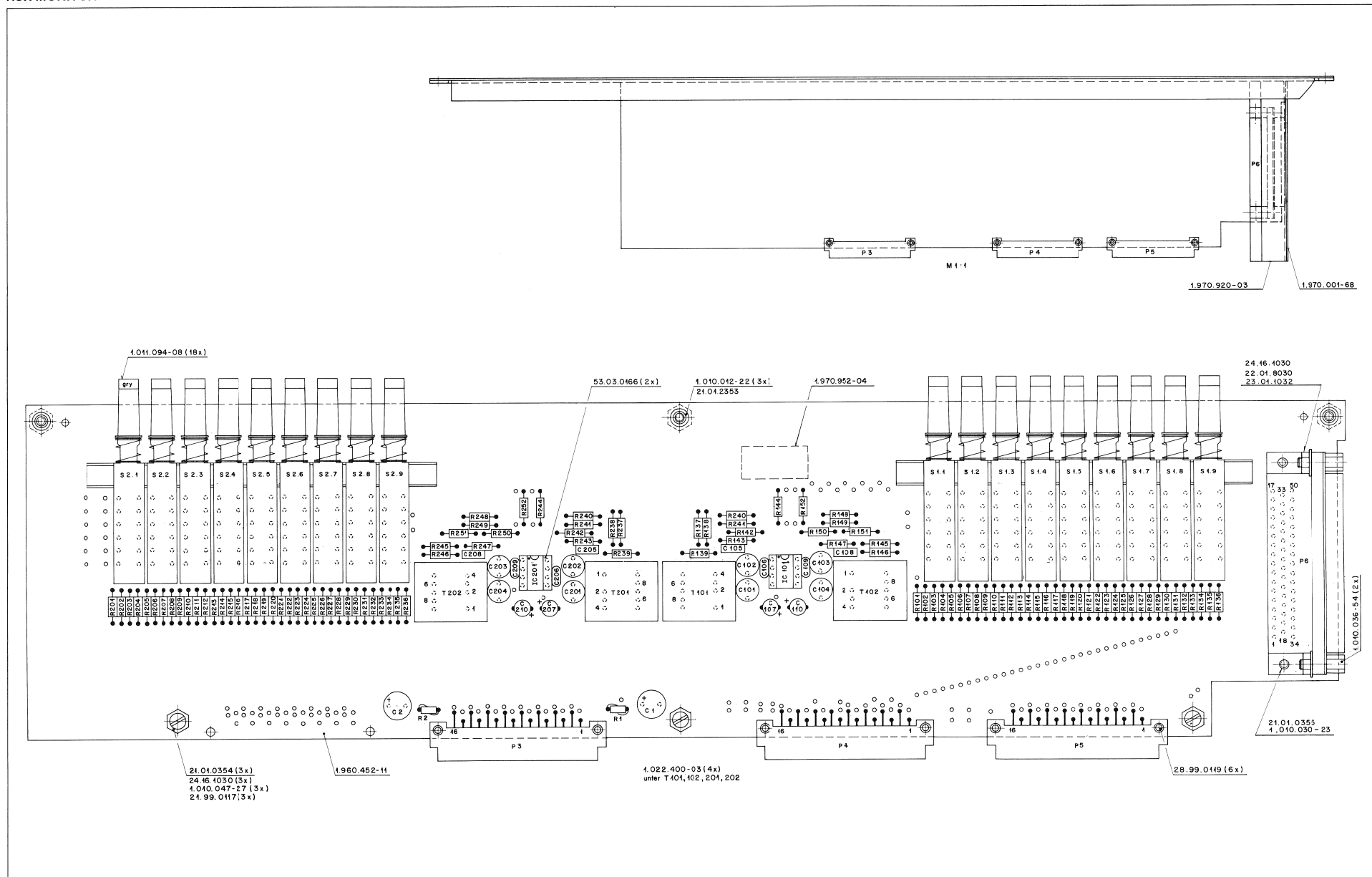
DATE:	11.5.87		
SIGN:	ak		PAGE 10F 1
STUDER REGENSDORF ZURICH		AUX MONITOR	
		1.970.952	

# STUDER AUDIO CONSOLE 970

## AUX MONITOR

AUX MONITOR

1.970.952.00







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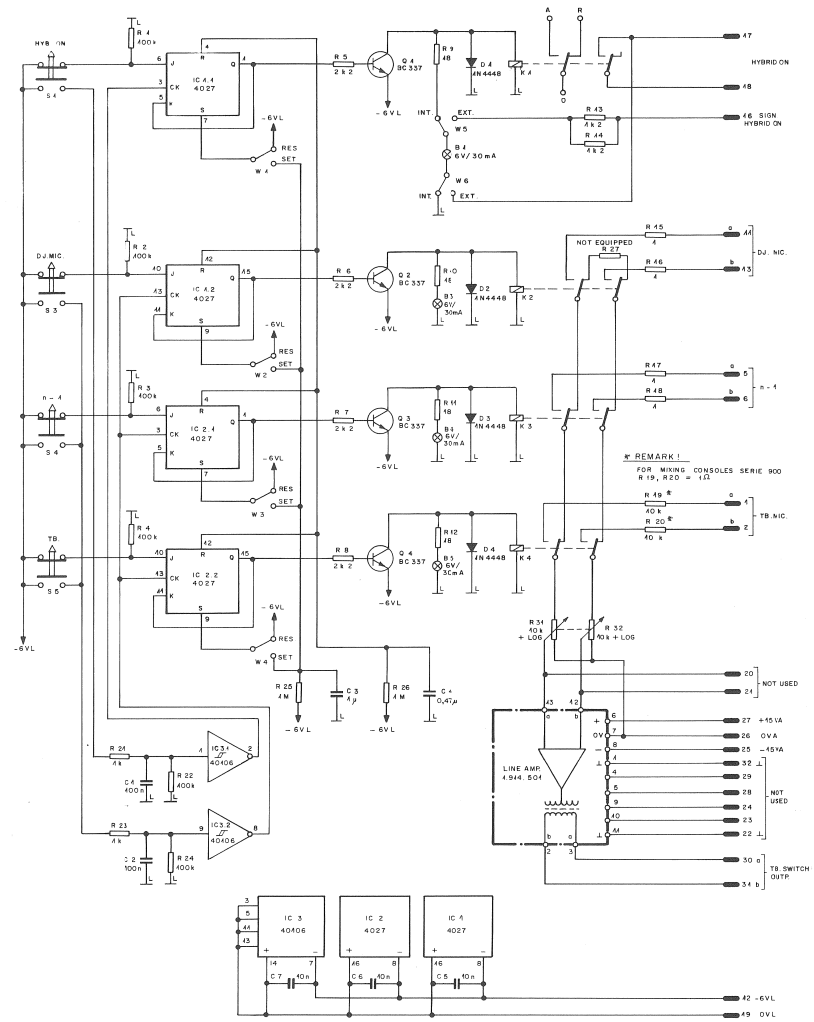
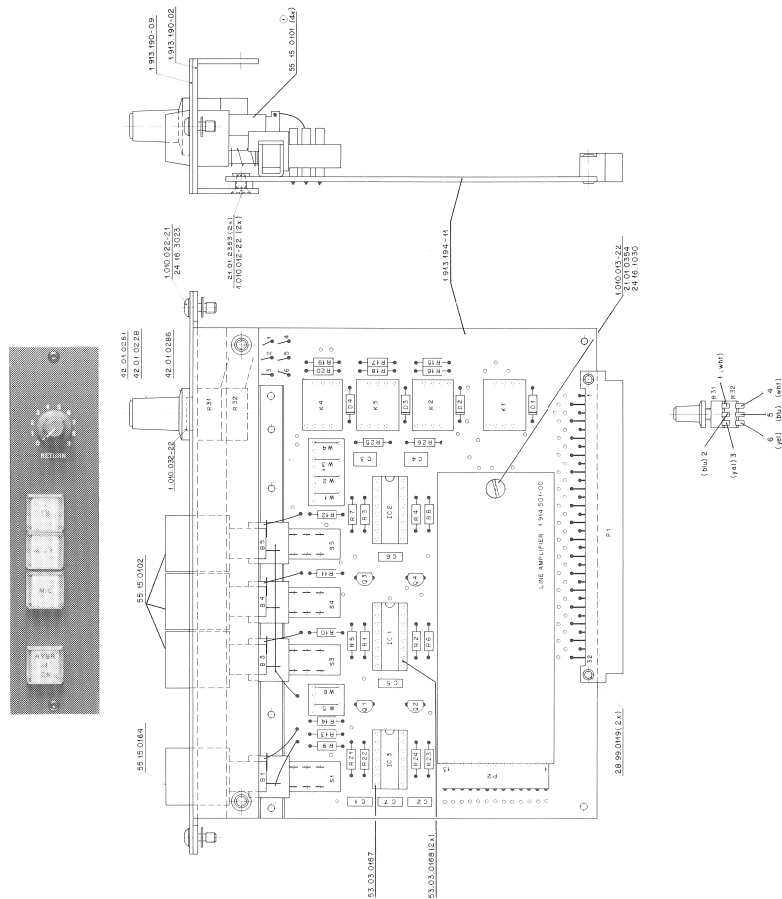
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5 Plug in Units

1.913...

1. Telephone Hybrid Remote Control / Mix Minus

1.913.194.00



		TEL. HYBRID REM. CONTR. MIX MINUS	SC 4.913.494.00
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STUDER AUDIO CONSOLE 970

Tel. Hybrid Remote Control Mix Minus 1.913.194.00

Ad ...POS... ..REF.No... DESCRIPTION.....MANUFACTURER

B....1	51.02.0144	6V/30MA	LAMP	
B....2	51.02.0144	6V/30MA	LAMP	
B....3	51.02.0144	6V/30MA	LAMP	
B....4	51.02.0144	6V/30MA	LAMP	
C....1	59.06.0104	100 NF	-10%	FETP
C....2	59.06.0104	100 NF	-10%	FETP
C....3	59.06.0105	1 UF	-10%	FETP
C....4	59.06.0474	0.47UF	-10%	FETP
C....5	59.06.0103	0.01UF	-10%	FETP
C....6	59.06.0103	0.01UF	-10%	FETP
C....7	59.06.0103	0.01UF	-10%	FETP
D....1	50.04.0125	1N4448		ANY
D....2	50.04.0125	1N4448		ANY
D....3	50.04.0125	1N4448		ANY
D....4	50.04.0125	1N4448		ANY
IC....1	50.07.0027	4027	DUAL JK-FLIP-FLOP	ANY
IC....2	50.07.0027	4027	DUAL JK-FLIP-FLOP	ANY
IC....3	50.07.0014	40106	HEX INVERTING SCHMITT TRIGGER	ANY
K....1	56.04.0170	2U/6V	RELAY 2U 6V	ITT
K....2	56.04.0170	2U/6V	RELAY 2U 6V	ITT
K....3	56.04.0170	2U/6V	RELAY 2U 6V	ITT
K....4	56.04.0170	2U/6V	RELAY 2U 6V	ITT
MP....1	1.913.194.11	1 PCS	PRINTED CIRCUIT BOARD	
MP....2	53.03.0167	1 PCS	IC SOCKET 14 PIN	
MP....3	53.03.0168	2 PCS	IC SOCKET 16 PIN	
MP....4	55.15.0102	3 PCS	PUSH BUTTON GREY CALOT. WHT	
MP....5	55.15.0164	1 PCS	PUSH BUTTON GREY CALOT. YEL	
MP....6	42.01.0288	1 PCS	KNOP GREY D 10/4	
MP....7	42.01.0251	1 PCS	COVER GREY TO KNOP D 10	
MP....8	42.01.0286	1 PCS	KNOP SKIRT GREY TO KNOP D 10	
MP....9	21.01.0354	1 PCS	C-SCREW M 3 * 6	
MP....10	21.01.2353	2 PCS	S-SCREW M 3 * 5	
MP....11	1.010.022.21	2 PCS	OVAL HEAD SCREW IS SPEC M 3 * 8	
MP....12	24.16.1030	1 PCS	LOCK WASHER M 3	
MP....13	24.16.3023	2 PCS	CIRCLIP D 2.3	
MP....14	1.010.012.22	2 PCS	RIVET NUT SW 6 M 3 * 2	
MP....15	1.010.013.22	1 PCS	RIVET NUT SW 6 M 3 * 3	
MP....16	28.99.0119	2 PCS	RIVET D2.5 * 0.15 * 10	
MP....17	1.913.190.02	1 PCS	MOUNTING PANEL	
MP....18	1.913.190.09	1 PCS	FRONT SHIELD	
P....1	54.01.0359		CONNECTOR 2 * 16 PIN	ANY
P....2	54.01.0309		CONNECTOR C15 13 PIN	ANY
Q....1	50.03.0497	BC 550	NPN	ANY
Q....2	50.03.0497	BC 550	NPN	ANY
Q....3	50.03.0497	BC 550	NPN	ANY
Q....4	50.03.0497	BC 550	NPN	ANY
R....1	57.11.3104	100 KOHM	1% 0.25W	
R....2	57.11.3104	100 KOHM	1% 0.25W	
R....3	57.11.3104	100 KOHM	1% 0.25W	
R....4	57.11.3104	100 KOHM	1% 0.25W	
R....5	57.11.3222	2.2 KOHM	1% 0.25W	
R....6	57.11.3222	2.2 KOHM	1% 0.25W	
R....7	57.11.3222	2.2 KOHM	1% 0.25W	
R....8	57.11.3222	2.2 KOHM	1% 0.25W	
R....9	57.11.3180	18 OHM	1% 0.25W	
R....10	57.11.3180	18 OHM	1% 0.25W	
R....11	57.11.3180	18 OHM	1% 0.25W	
R....12	57.11.3180	18 OHM	1% 0.25W	
R....13	57.11.3122	1.2 KOHM	1% 0.25W	
R....14	57.11.3122	1.2 KOHM	1% 0.25W	
R....15	57.11.3109	1 OHM	1% 0.25W	
R....16	57.11.3109	1 OHM	1% 0.25W	
R....17	57.11.3109	1 OHM	1% 0.25W	
R....18	57.11.3109	1 OHM	1% 0.25W	
R....19	57.11.3103	10 KOHM	1% 0.25W	
R....20	57.11.3103	10 KOHM	1% 0.25W	
R....21	57.11.3102	1 KOHM	1% 0.25W	
R....22	57.11.3104	100 KOHM	1% 0.25W	
R....23	57.11.3102	1 KOHM	1% 0.25W	
R....24	57.11.3104	100 KOHM	1% 0.25W	
R....25	57.11.3105	1 MOHM	1% 0.25W	
R....26	57.11.3105	1 MOHM	1% 0.25W	
R....27			NOT USED	
R....31	1.912.001.34	10 KOHM	10 KOHM POS LOG COMBINATION WITH R32	ST
R....32		10 KOHM	SEE POS R03	ST
S....1	55.15.0001	1 * 2U	PUSH BUTTON COMBINATION WITH S3,S4,S5	ST
S....3		1 * 2U	SEE POS S001	ST
S....4		1 * 2U	SEE POS S001	ST
S....5		1 * 2U	SEE POS S001	ST
W....1	55.12.1002	1 * 1U	DIL SWITCHER	SIE
W....2	55.12.1002	1 * 1U	DIL SWITCHER	SIE
W....3	55.12.1002	1 * 1U	DIL SWITCHER	SIE
W....4	55.12.1002	1 * 1U	DIL SWITCHER	SIE
W....5	55.12.1002	1 * 1U	DIL SWITCHER	SIE
W....6	55.12.1002	1 * 1U	DIL SWITCHER	SIE

CE=Ceramic, CF=Carbon Film, EL=Electrolytic, MF=Metal Film, PE=Polyester, PP=Polypropylene, PS=Polystyrol

MANUFACTURER: Bu=Burndy, Ex=Exar, Fc=Fairchild, Gi=General Instrument, H=Hewlett Packard, ITT=Intermetall, Mo=Motorola, NS=National Semiconductors, Ph=Philips, Ra=Raetheon, Sig=Signetics, Six=Siliconix, St=Studer, Ti=Texas Instrument, CK=C&K

1.913.194.00 TEL.HYBR.REM.CONTR./MIX.MINUS W1887/12/0700

## 2. Korrelator

1.913.210/211

Der Korrelator zeigt die Phasenkorrelation einer Stereoaufnahme an.

Die Phasenkorrelation ist die gegenseitige Beziehung der Phasen beider Kanäle.

Wenn die Signale beider Kanäle gleichphasig sind, z.B. bei Monoaufnahmen, zeigt das Korrelationsinstrument +1 an; wenn sie gegenphasig ( $\pm 180^\circ$ ) sind, zeigt das Instrument -1 an. Bei einem Stereoprogramm wird ein Mittelwert von gleich- und gegenphasigen Signalen angezeigt.

Stereoprogramme weisen normalerweise einen positiven Korrelationswert auf, vorzugsweise um + 0,5. Negative Werte zeigen eine Phasenvertauschung im System an.

## 2.1 Anwendungen, die einen Korrelator erfordern:

**Monokompatibilität von Stereoprogrammen**

Damit eine stereophone Aufnahme auch monophon abgehört werden kann, muss die Korrelation überwacht werden.

Gegenphasige Anteile führen zu partiellen Auslöschungen.

**Tiefe Frequenzen auf Stereo-Schallplatten**

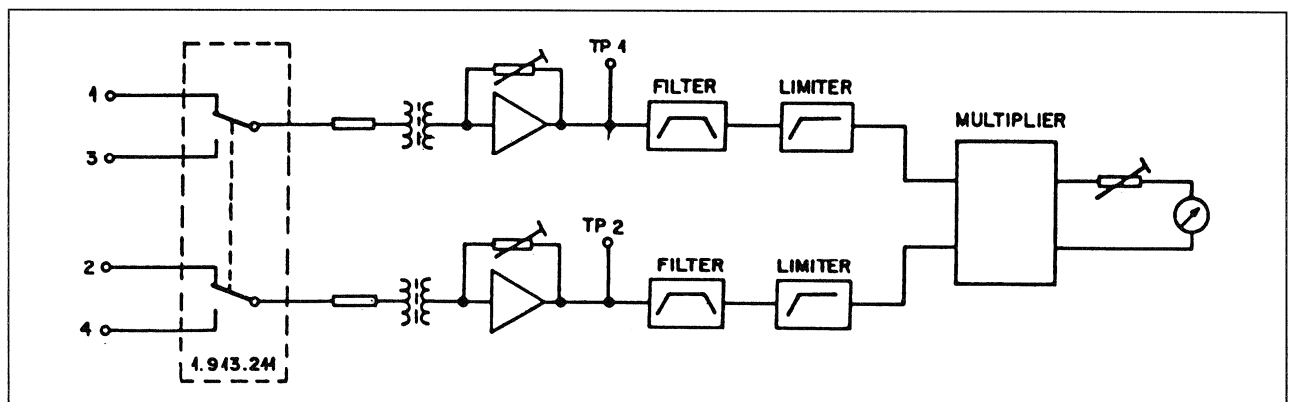
Die Abtastfähigkeit eines Abtastsystems ist für vertikale Auslenkung viel geringer als für horizontale Auslenkung.

Gegenphasige Signale mit hohem Pegel und tiefen Frequenzen weisen eine grosse vertikale Auslenkung auf und müssen deshalb vermieden werden.

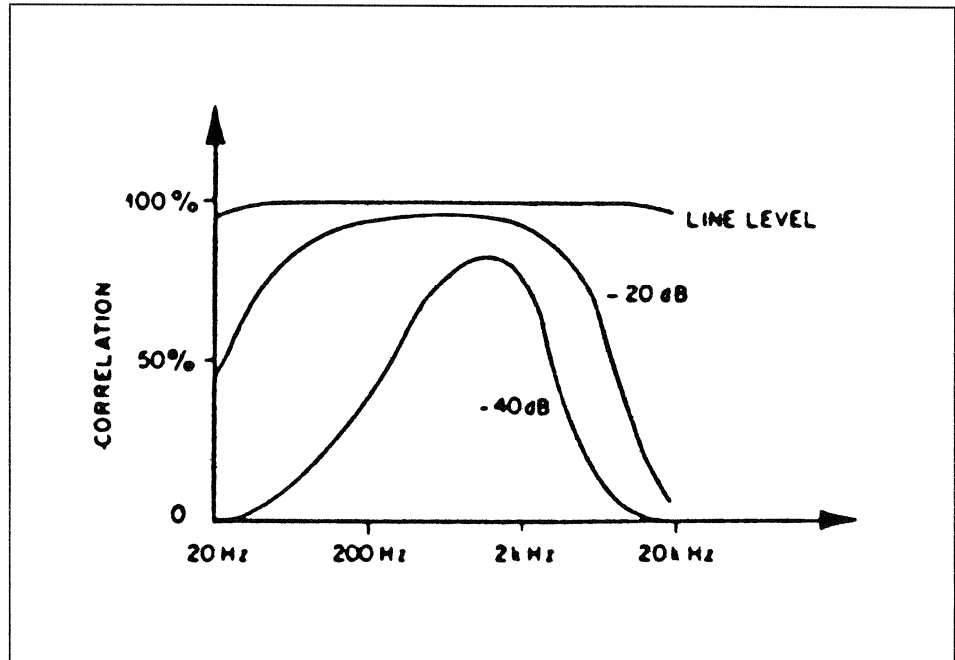
**Modulation von FM-Stereosendern**

Die FM-Strecke Sender-Empfänger ist sehr empfindlich auf übermässig hohe Frequenzdifferenz-Signale. Es entstehen dabei unzulässige Verzerrungen.

## 2.2 Blockschaltbild



Korrelation



2.3 Technische Daten

**Eingang:** symmetrisch und erdfrei  
 Eingangsimpedanz 20 Hz ... 20 kHz: > 10 kOhm  
 Eingangsspegel, einstellbar: +6 ... +15 dBu

**Filter:** Hochpass 6 dB/Oktave:  $f_U$  ca. 340 Hz  
 Tiefpass 12 dB/Oktave:  $f_O$  ca. 3,4 kHz

**Ausgang:** Ausgangstrom für Instrumente, einstellbar  $\pm 300 \mu A$

**Temperatureinfluss:** Fehler bei 0° C ... 50° C, bezüglich Raumtemperatur: +3 ... -1 %

Stromaufnahme bei  $\pm 15 V$ : ca. 15 mA

**Abmessung Frontplatte:** 170 x 180 mm

**Tiefe:** 135 mm

**Gewicht:** 390 gr

2. Correlator

1.913.210/211

The correlator indicates the phase correlation of a stereo program.

The phase correlation is the mutual relation of the phases on both channels.

If the signals of both channels are in phase, e.g. in a mono production, the correlation instrument indicates +1, if they are phased inversely ( $\pm 180^\circ$ ) the instrument indicates -1. The correlator always indicates the average of in-phase and antiphase signals of a stereo production.

Stereo programs normally shown a positive correlation value, preferably around +0,5. Negative values indicate that the phase in the system is inverted.

2.1 Application which require a Correlator

**Mono compatibility of stereo programs**

To ensure that a stereo recording can also be reproduced in mono mode it is necessary to monitor the correlation.

No phased-inversed components are allowed because they partially cancel during monophonic reproduction.

**Low frequencies on stereo records**

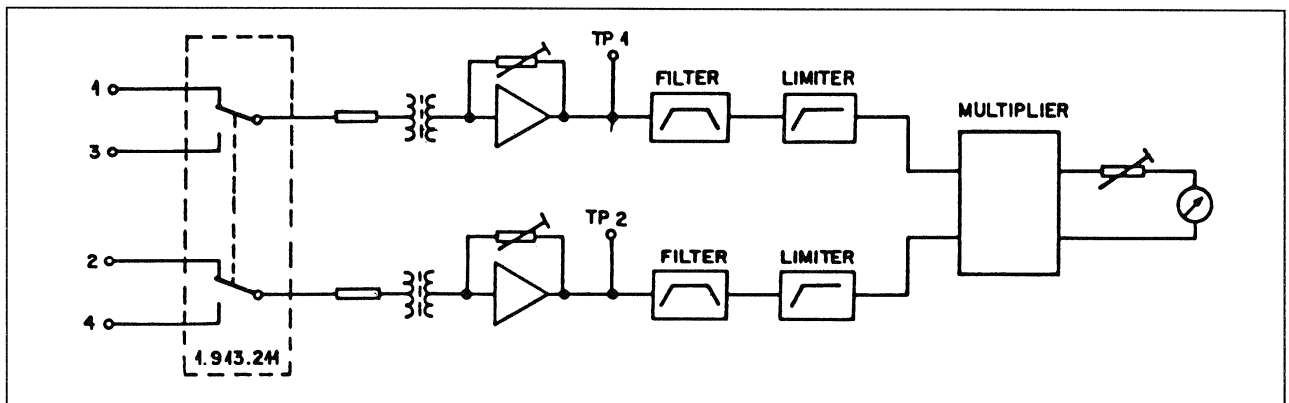
The tracking capability of a cartridge is much lower for vertical excursion than for horizontal excursion.

Antiphase signals with high levels and low frequencies result in high vertical excursion and should, therefore, be avoided.

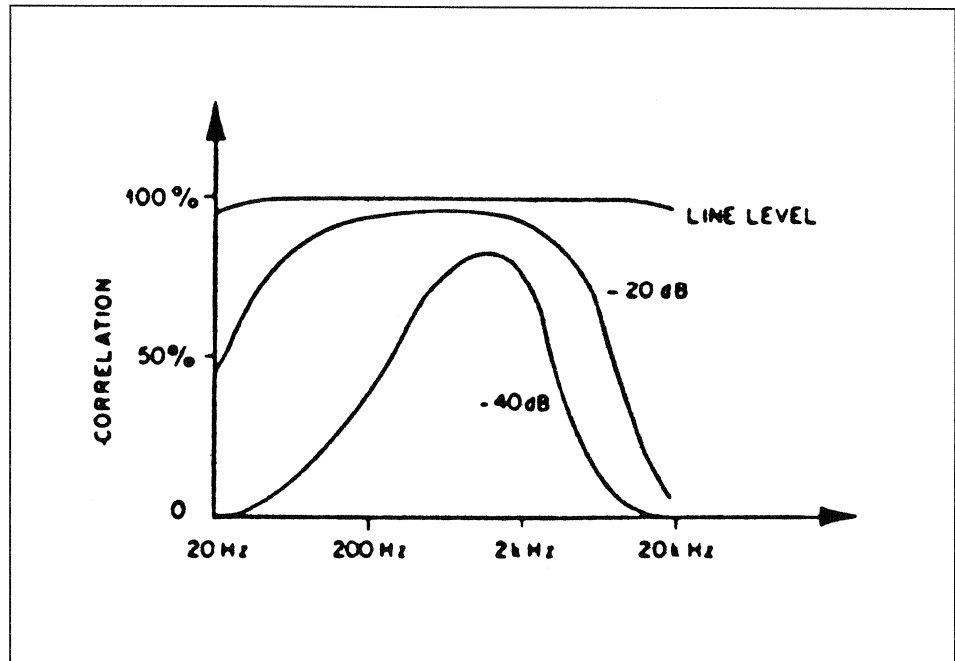
**Modulation from FM stereo transmitters**

The FM path from the transmitter to the receiver is very sensitive to excessively high frequency-difference signals. They produce unacceptable distortion.

2.2 Block Diagram



Correlation



2.3 Specifications

**Input:** Balanced and floating  
 Input impedance 20 Hz ... 20 kHz: > 10 kOhm  
 Input level, variable: +6 ... +15 dBu

**Filter:** High-pass 6 dB/octave:  $f_L$ . ca. 340 Hz  
 Low-pass 12 dB/octave:  $f_U$ . ca. 3,4 kHz

**Output:** Output current for instruments, variable  $\pm 300 \mu\text{A}$

**Influence of temperature:** Error at 0°C ... 50°C, relative to room temperature: +3 ... -1 %  
 Connected load at  $\pm 15 \text{ V}$ : approx. 15 mA

**Dimensions of front panel:** 170 x 180 mm

**Depth:** 135 mm

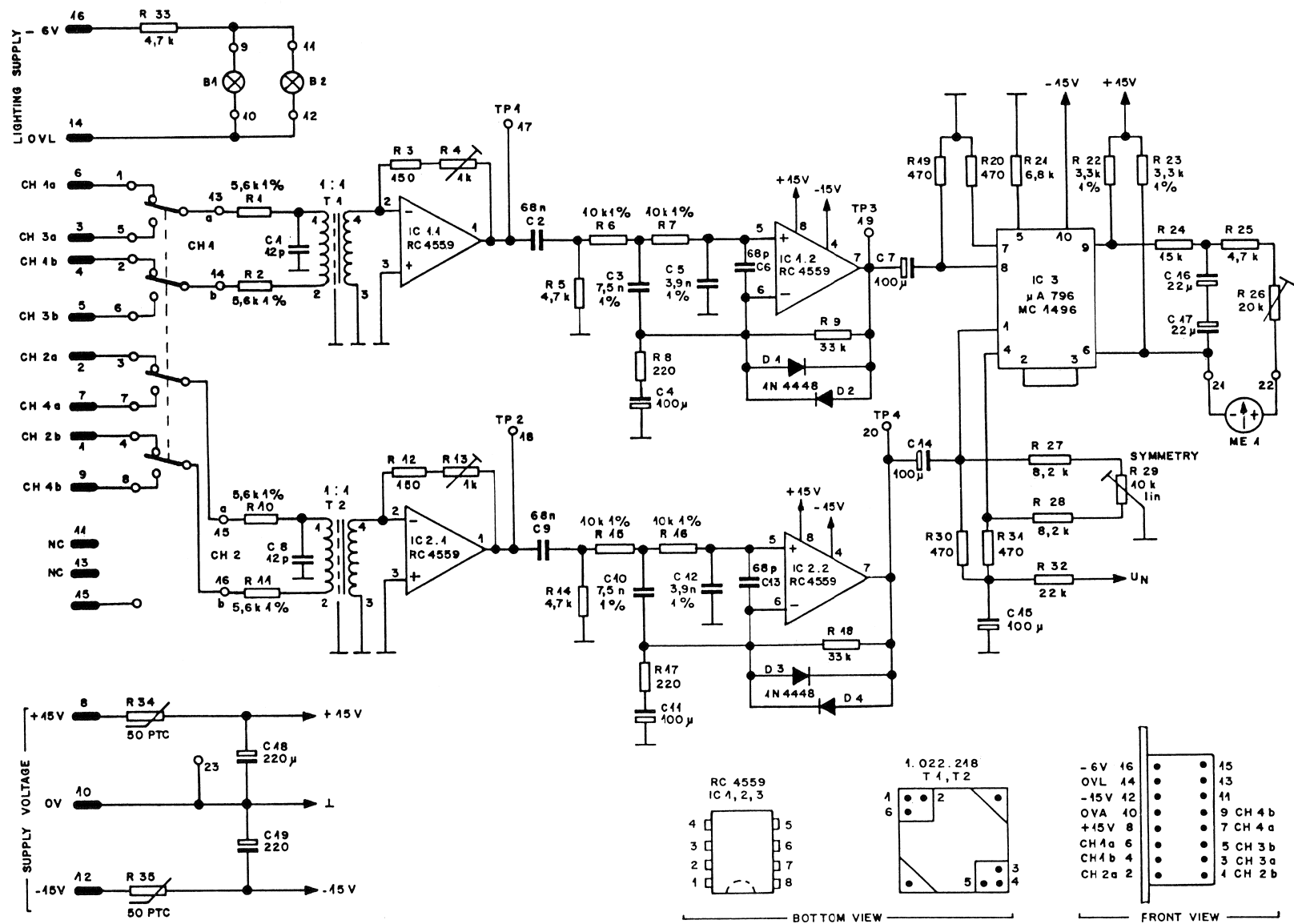
**Weight:** 390 g

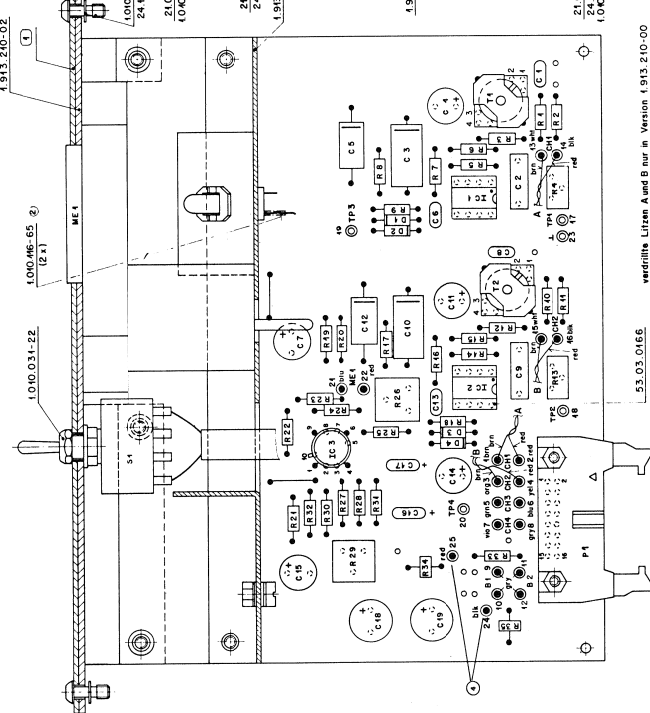
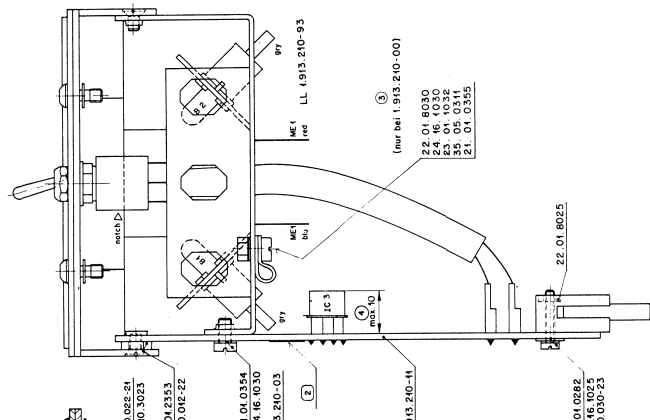


# STUDER AUDIO CONSOLE 970

Correlator 2CH / 4CH

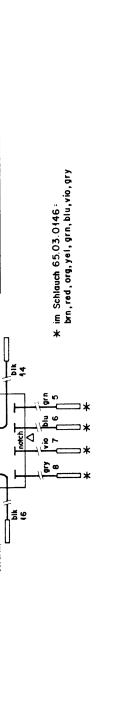
1.913.210/211





verdrillte Litzen A und B nur in Version 1.913.210-00 LL 1.913.210-53

GRH für:	LL	Z
2CH	1.913.210-00	1.913.210-04
4CH	1.913.211-00	1.913.211-04



IND POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
C 1	58.34.4420	42pF	5%	
C 2	58.02.5683	68nF	5%	
C 3	58.42.7752	75nF	4%	
C 4	59.22.5404	100uF	46V	
C 5	58.42.1392	38nF	4%	
C 6	58.44.4687	88pF	5%	
C 7	59.22.5404	100uF	46V	
C 8	58.34.4420	42pF	5%	
C 9	58.02.5683	68nF	5%	
C 10	58.42.7752	75nF	4%	
C 11	58.22.5404	100uF	46V	
C 12	58.42.1392	38nF	4%	
C 13	59.24.4680	88pF	5%	
C 14	58.22.5404	100uF	46V	
C 15	59.22.5404	100uF	46V	
C 16	59.26.4220	22uF	40V	
C 17	59.26.4220	22uF	40V	
C 18	58.22.4224	220uF	46V	
C 19	58.22.4224	220uF	46V	
D 1	50.04.0425	4N4488		
D 2	50.04.0425	4N4488		
D 3	50.04.0425	4N4488		
D 4	50.04.0425	4N4488		
IC 1	50.09.0407	4559		Ro, Ti
IC 2	50.09.0407	4559		
IC 3	50.05.0422	MC4486	μA796 HC	M, F

IND POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
R 1	57.44.3562	5,6k	1%	
R 2	57.44.3562	5,6k	1%	
R 3	57.44.4454	150		
R 4	58.04.3402	4k	TRIM-POT.	
R 5	57.44.4472	47k		
R 6	57.44.3403	40k	1%	
R 7	57.44.3403	40k	1%	
R 8	57.44.4224	220		
R 9	57.44.4333	33k		
R 10	57.44.3562	5,6k	1%	
R 11	57.44.3562	5,6k	1%	
R 12	57.44.4454	150		
R 13	58.04.3402	4k	TRIM-POT.	
R 14	57.44.4472	47k		
R 15	57.44.3403	40k	1%	
R 16	57.44.3403	40k	1%	
R 17	57.44.4224	220		
R 18	57.44.4333	33k		
R 19	57.44.4474	470		
R 20	57.44.4474	470		
R 21	57.44.4682	68k		
R 22	57.44.3332	33k	1%	
R 23	57.44.3332	33k	1%	
R 24	57.44.4455	15k		
R 25	57.44.4472	47k		
R 26	58.04.8203	20k	TRIM-POT.	
R 27	57.44.4822	8,2k		
R 28	57.44.4822	8,2k		
R 29	58.04.8403	10k	TRIM-POT.	
R 30	57.44.4474	470		

IND	DATE	NAME		
ⓐ			F Feichtild	Ti Texas Instruments
ⓑ			M Motorola	
ⓒ			Ro Raytheon	
ⓓ			also valid for correlator 4CH 1.913.211	
ⓔ	20-8-81	alg	STUDER CORRELATOR 2CH 1.913.210 PAGE 4 OF 3	

IND	DATE	NAME		
ⓐ			also valid for correlator 4CH 1.913.211	
ⓑ				
ⓒ				
ⓓ	20-8-81	alg	STUDER CORRELATOR 2CH 1.913.210 PAGE 2 OF 3	

IND POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
R 31	57.44.4474	470		
R 32	57.44.4223	22k		
R 33	57.44.4472	47k		
R 34	57.98.0206	50	PTC	
R 35	57.98.0206	50	PTC	
S 1	55.04.0445	4x 0h-0h	only 1.913.211	
T 1	1.022.248	4:1	INPUT TRAFO	SHURE
T 2	1.022.248	4:1	INPUT TRAFO	SHURE
B 1	54.02.0444	6V/30W	Lamp	
B 2	54.02.0444	6V/30W	Lamp	
ME 1	4813.004.03		Conn-Meter	
P 1	54.44.2042		Connector 4pins	
XIC	53.03.0166		IC-Socket, Rows	

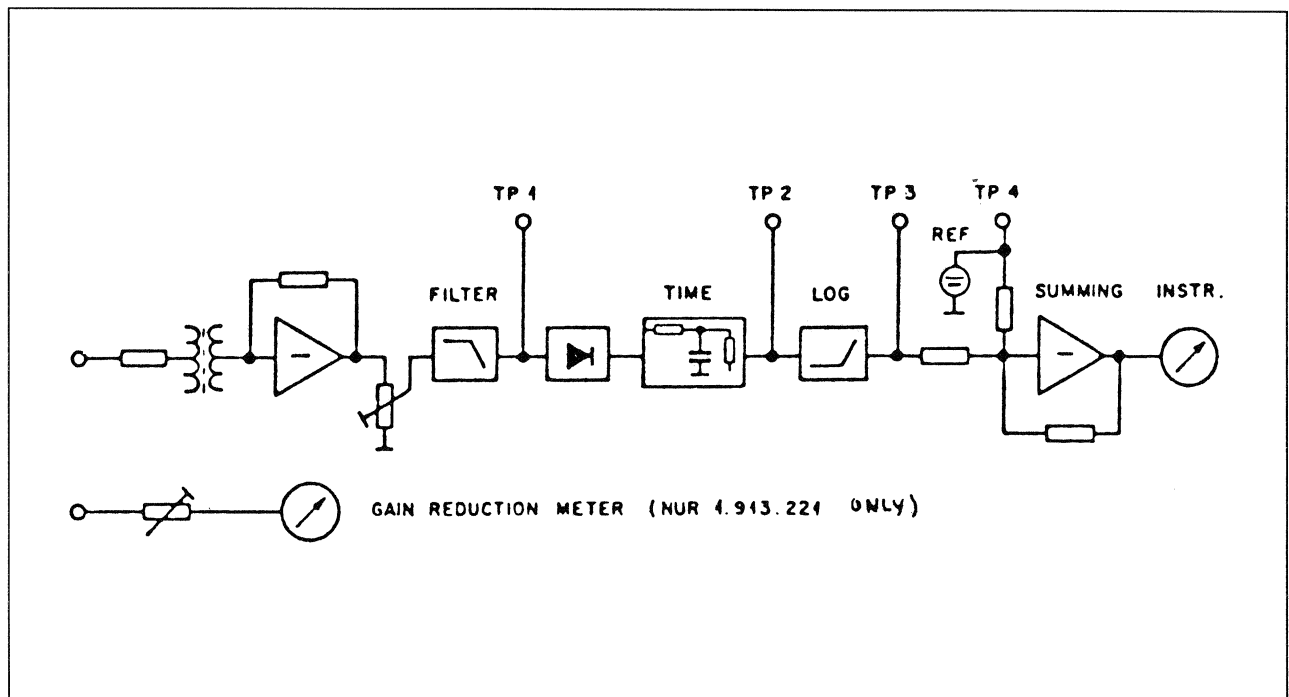
IND	DATE	NAME		
ⓐ			also valid for correlator 4CH 1.913.211	
ⓑ				
ⓒ	20-8-81	alg	STUDER CORRELATOR 2CH 1.913.210 PAGE 3 OF 3	

## 3. Peak Program Meter (PPM)

1.913.220/221

Aussteuerungsmesser mit symmetrisch, erdfreiem Eingang. Dynamisches Verhalten gemäss IEC/DIN Normen.

## 3.1 Blockschaftbild



## 3.2 Technische Daten

---

<b>Eingangsempfindlichkeit</b>	für Referenzanzeige (0 dB)	<b>+ 6 dBu ... + 15 dBu</b>
<b>Eingangeimpedanz</b>		<b>&gt; 10 kOhm</b>
<b>Anzeigebereich</b>		<b>- 40 dB ... + 6 dB</b>
<b>Genauigkeit</b>	bei 20°C, 1 kHz, - 40 dB ... + 6 dB	<b>± 0,5 dB</b>
<b>Frequenzgang</b>	bei Referenzanzeige 0°C ... 50°C, 31,5 Hz ... 15 kHz	<b>± 0,5 dB</b>
<b>Temperatureinfluss</b>	bei Referenzanzeige, 1 kHz, 0°C... 50°C	<b>Fehler &lt; 0,5 dB</b>

### Dynamisches Verhalten

<b>Überschwingen</b>		<b>≤ 1 dB</b>
<b>Ansprechzeit</b>	auf - 1 dB ± 0,5 dB auf - 4 dB ± 1 dB	<b>10 ms 3 ms</b>
<b>Rücklaufzeit</b>	0 ... -20 dB	<b>1,7 s ± 0,3 s</b>
<b>Stromaufnahme</b>	bei ± 15 V	<b>ca 15 mA</b>

### Mechanische Daten

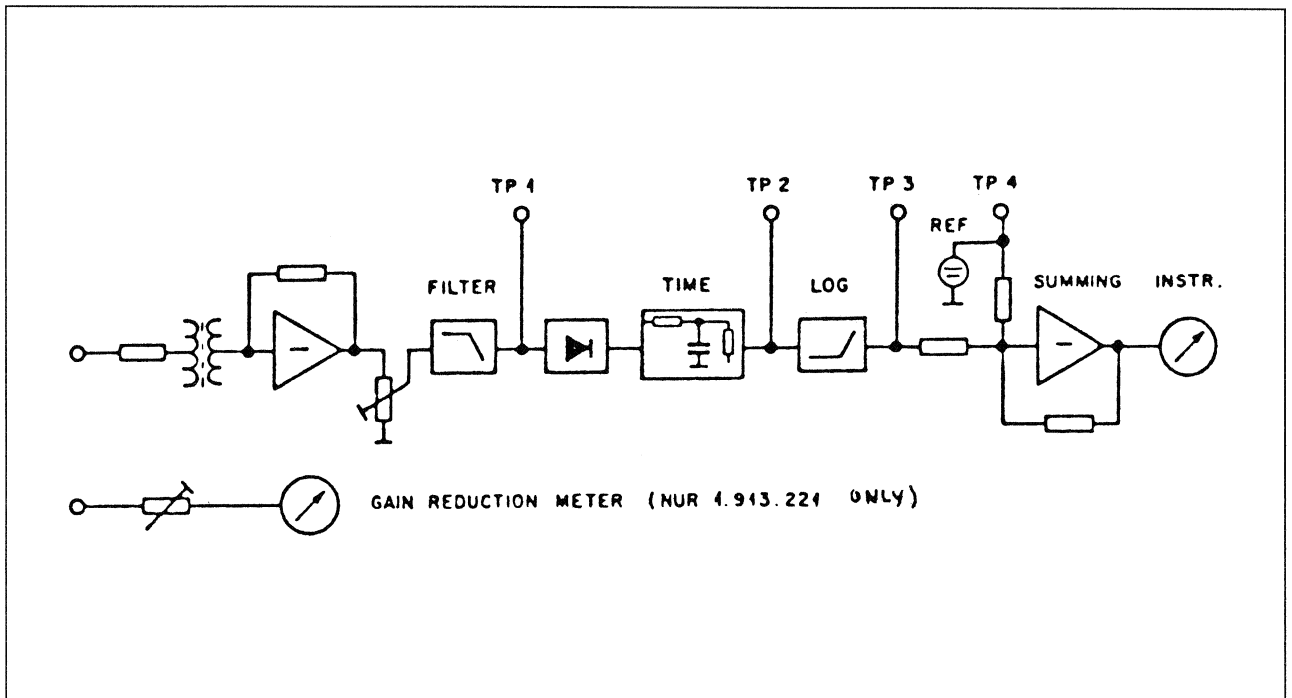
<b>Abmessung Frontplatte:</b>	170 x 80 mm
<b>Tiefe:</b>	135 mm
<b>Gewicht:</b>	360 gr

3. Peak Program Meter (PPM)

1.913.220/221

Level indicator with balanced and floating input. Dynamic response according to IEC/DIN standards.

3.1 Block Diagram



## 3.2 Specifications

---

<b>Input sensitivity</b>	for reference indication (0 dB)	<b>+6 dBu ... +15 dBu</b>
<b>Input impedance</b>		<b>&gt; 10 kOhm</b>
<b>Indicating range</b>		<b>- 40 dB ... +6 dB</b>
<b>Accuracy</b>	at 20°C, 1 kHz, -40 dB ... +6 dB	<b>± 0,5 dB</b>
<b>Frequency response</b>	at reference indication 0°C ... 50°C, 31,5 Hz ... 15 kHz	<b>± 0,5 dB</b>
<b>Influence of temperature</b>	at reference indication, 1 kHz, 0°C... 50°C	<b>error &lt; 0,5 dB</b>

### Dynamic response

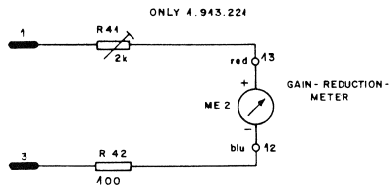
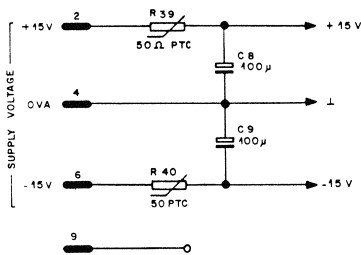
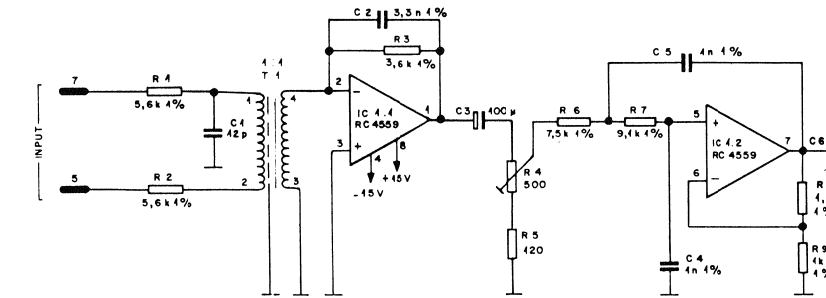
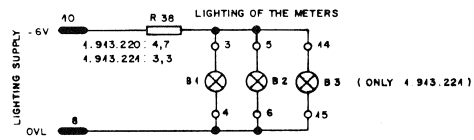
<b>Overswing</b>		<b>≤ 1 dB</b>
<b>Attack time</b>	- 1 dB ± 0,5 dB - 4 dB ± 1 dB	<b>10 ms 3 ms</b>
<b>Return time 0 ...-20 dB</b>		<b>1,7 s ± 0,3 s</b>
<b>Connected load at ± 15 V</b>		<b>ca 15 mA</b>

### Physical Data

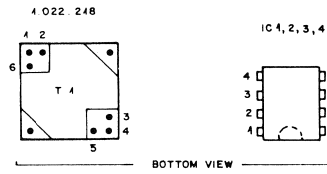
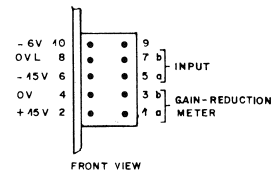
<b>Dimensions of front panel:</b>	170 x 80 mm
<b>Depth:</b>	135 mm
<b>Weight:</b>	360 gr

Peak Programme Meter

1.913.220/221

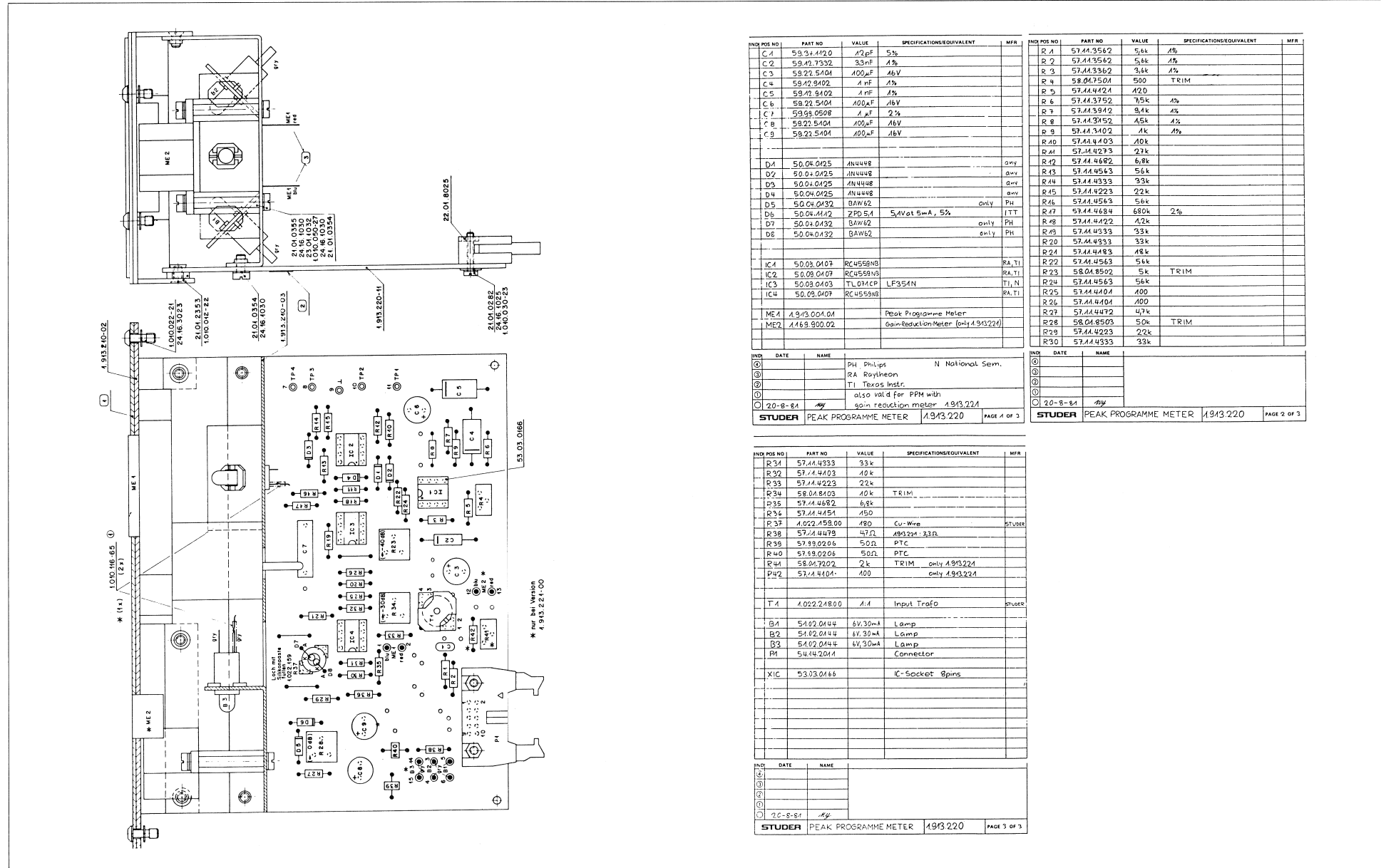


- ADJUSTMENT :
- 3,5 V DC AT TP 2 - R 4
  - 0 dB AT ME 1 - R 28
  - 30 dB AT ME 1 - R 34
  - 40 dB AT ME 1 - R 23



Peak Programme Meter

1.913.220/221



IND POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
C1	59.91.412.0	12 pF	5%	
C2	59.42.7332	33 nF	1%	
C3	58.22.5401	100 µF	46V	
C4	59.42.8402	1 nF	1%	
C5	59.42.8402	1 nF	1%	
C6	59.22.5401	100 µF	16V	
C7	59.93.0508	1 µF	2%	
C8	59.22.5401	100 µF	16V	
C9	59.22.5401	100 µF	16V	
D1	50.04.0425	AN4448		any
D2	50.04.0425	AN4448		any
D3	50.04.0425	AN4448		any
D4	50.04.0425	AN4448		any
D5	50.04.0432	BAW62		only PH
D6	50.04.1142	ZPD5.1	5,1Vat 5mA, 5%	
D7	50.04.0432	BAW62		only PH
D8	50.04.0432	BAW62		only PH
IC1	50.03.0107	RC4558NB		RA, TI
IC2	50.03.0107	RC4558NB		RA, TI
IC3	50.03.0103	TL074CP	LF354N	TI, N
IC4	50.03.0107	RC4558NB		RA, TI
ME1	1.913.001.01		Peak Programme Meter	
ME2	1.163.900.02		Gain-Reduction Meter (only 1.913.221)	

IND POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
R1	57.11.3562	5.6k	1%	
R2	57.11.3562	5.6k	1%	
R3	57.11.3362	3.6k	1%	
R4	58.01.7501	500	TRIM	
R5	57.11.4421	420		
R6	57.11.3752	75k	1%	
R7	57.11.3912	9.1k	1%	
R8	57.11.3752	75k	1%	
R9	57.11.3402	4k	1%	
R10	57.11.4403	40k		
R11	57.11.4273	27k		
R12	57.11.4682	6.8k		
R13	57.11.4563	56k		
R14	57.11.4333	33k		
R15	57.11.4223	22k		
R16	57.11.4583	5.6k		
R17	57.11.4684	6.8k	2%	
R18	57.11.4422	4.2k		
R19	57.11.4333	33k		
R20	57.11.4333	33k		
R21	57.11.4483	4.8k		
R22	57.11.4563	56k		
R23	58.01.8502	5k	TRIM	
R24	57.11.4563	56k		
R25	57.11.4404	400		
R26	57.11.4404	400		
R27	57.11.4472	4.7k		
R28	58.01.8503	50k	TRIM	
R29	57.11.4223	22k		
R30	57.11.4333	33k		

IND	DATE	NAME
④		PH, Philips
⑤		RA, Raytheon
⑥		TI, Texas Instr.
⑦		also valid for PPM with gain reduction meter 1.913.221
⑧	20-8-81	any

STUDER PEAK PROGRAMME METER 1.913.220 PAGE 1 OF 3

IND	DATE	NAME
④		PH, Philips
⑤		RA, Raytheon
⑥		TI, Texas Instr.
⑦		also valid for PPM with gain reduction meter 1.913.221
⑧	20-8-81	any

STUDER PEAK PROGRAMME METER 1.913.220 PAGE 2 OF 3

IND POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
R31	57.11.4333	33k		
R32	57.11.4403	40k		
R33	57.11.4223	22k		
R34	58.01.8403	40k	TRIM	
R35	57.11.4682	6.8k		
R36	57.11.4451	450		
R37	1.022.158.00	180	Cu-Wire	STUDER
R38	57.11.4479	47Ω	1802±.33%	
R39	57.99.0206	50Ω	PTC	
R40	57.99.0206	50Ω	PTC	
R41	58.01.7202	2k	TRIM only 1.913.221	
R42	57.11.4404	400	only 1.913.221	
T1	1.022.218.00	1:1	Input Trafo	STUDER
B1	51.02.0144	6V, 30mA	Lamp	
B2	51.02.0144	6V, 30mA	Lamp	
B3	51.02.0144	6V, 30mA	Lamp	
B4	51.44.2011		Connector	
X1C	53.03.0166		IC-Socket 8pins	

IND	DATE	NAME
④		
⑤		
⑥		
⑦		
⑧	20-8-81	any

STUDER PEAK PROGRAMME METER 1.913.220 PAGE 3 OF 3

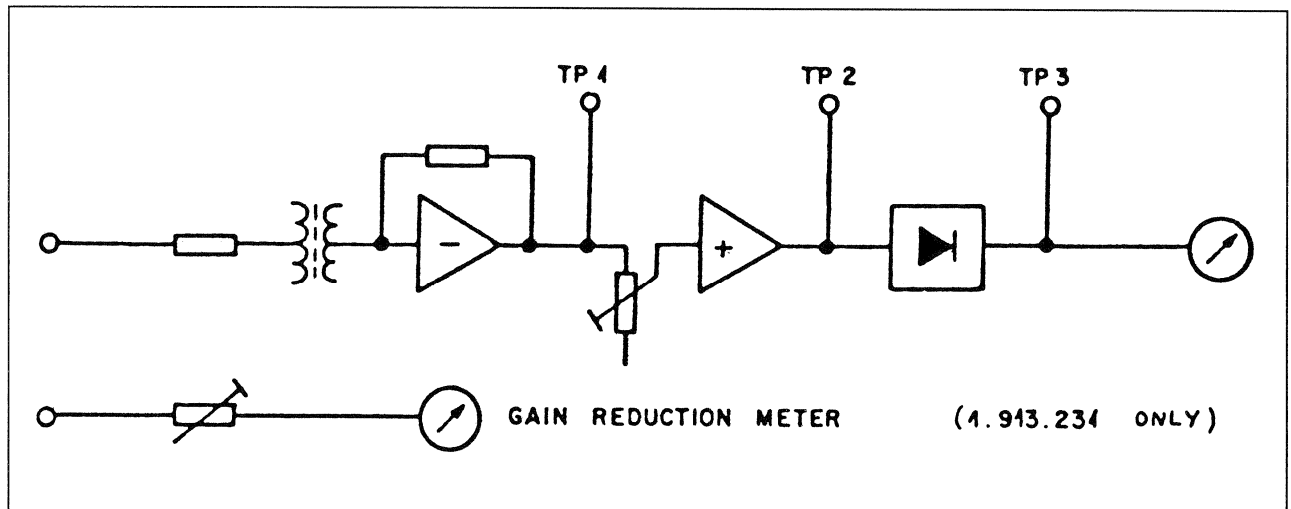


## 4. VU-Meter

1.913.230/231

VU-Meter mit symmetrisch, erdfreiem und hoch-ohmigem Eingang.  
Dynamische Daten gemäss IEC.

## 4.1 Blockschaltbild



## 4.2 Technische Daten

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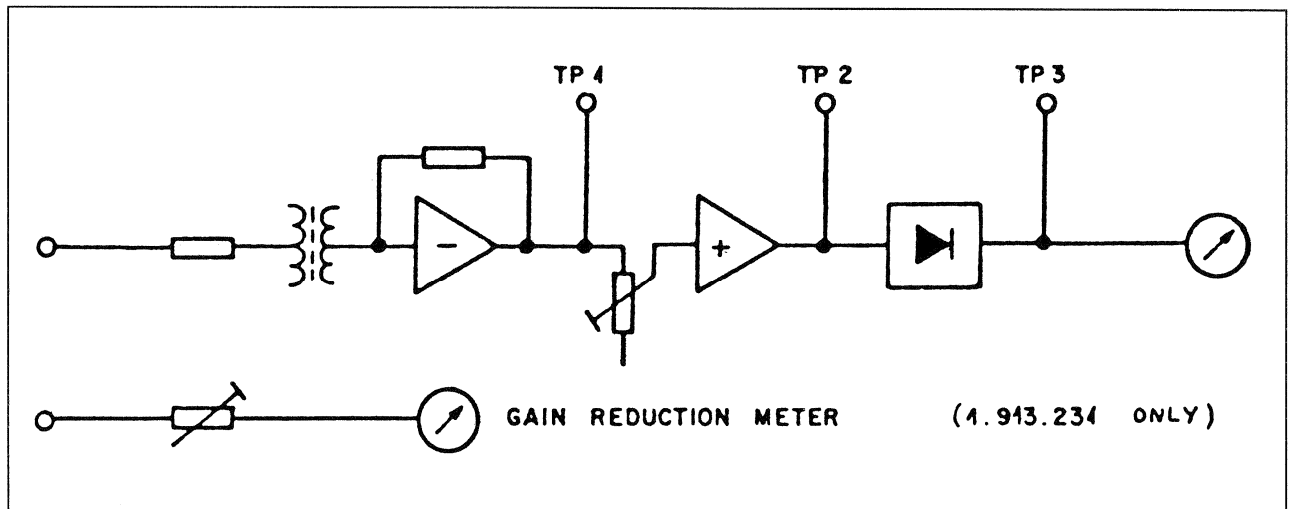
<b>Eingangsempfindlichkeit</b>	für Referenzanzeige (0 VU)	<b>0 dBu ... + 10 dBu</b>
<b>Eingangsimpedanz</b>		<b>&gt; 10 kOhm</b>
<b>Anzeigebereich</b>		<b>- 20 VU ... + 3 VU</b>
<b>Genauigkeit</b>	bei 20°C, 1kHz, -10 VU ... +3 VU	<b>± 0,5 VU</b>
<b>Frequenzgang</b>	für Referenzanzeige 0°C ... 50°C, 31,5 Hz ... 15 kHz	<b>± 0,5 VU</b>
<b>Ansprechzeit</b>	auf - 1 VU	<b>207 ms ± 30 ms</b>
<b>Speisung</b>		<b>+ 15 V / 10 mA</b> <b>- 15 V / 10 mA</b> <b>- 6 V / 60 mA (90mA)</b>
<b>Abmessungen Frontplatte:</b>		<b>170 x 80 mm</b>
<b>Tiefe:</b>		<b>135 mm</b>
<b>Gewicht:</b>		<b>310 gr</b>

## 4. VU-Meter

1.913.230/231

VU-meter with balanced, floating and high-impedance input. Dynamic response according to IEC.

## 4.1 Block Diagram



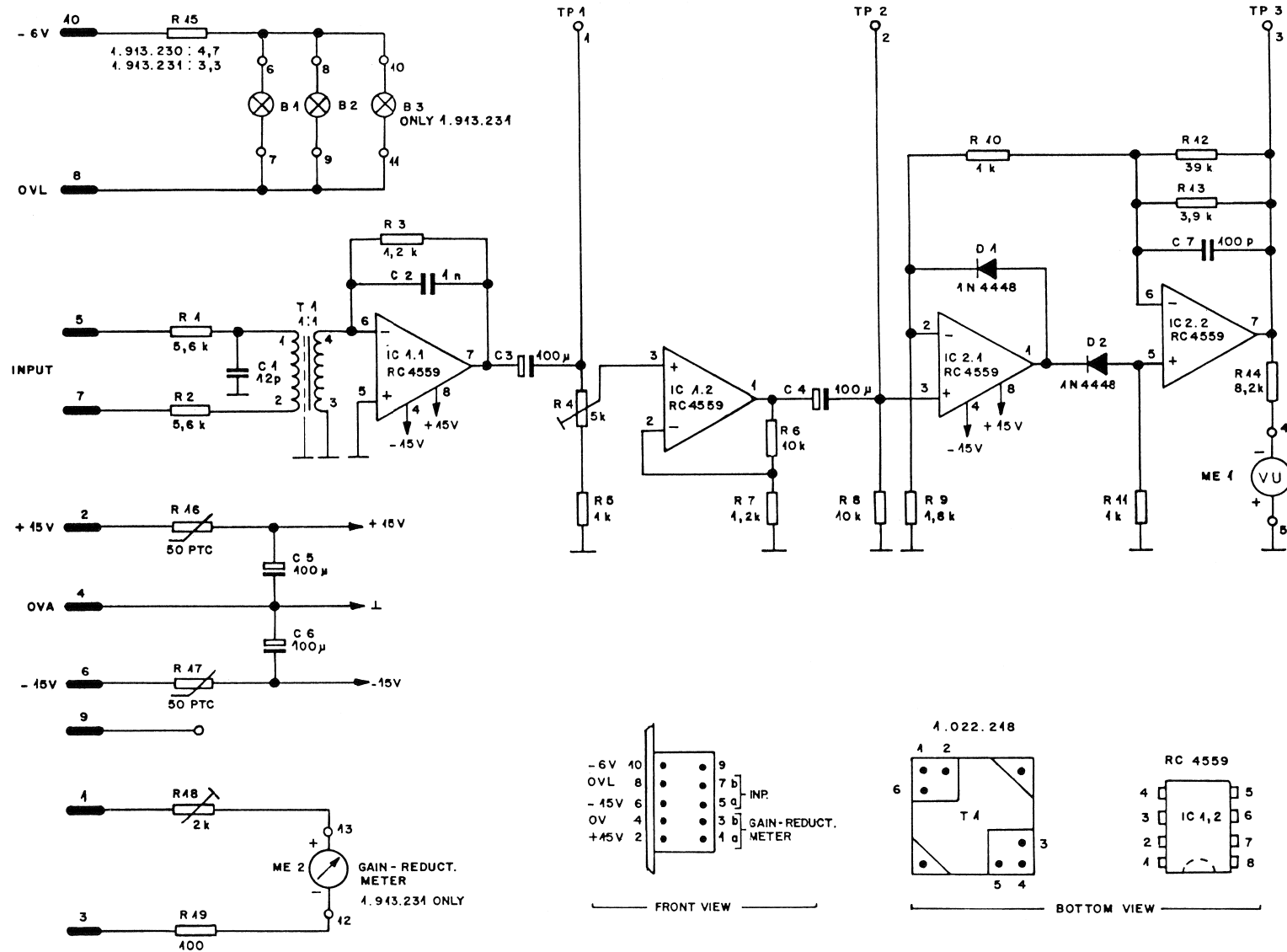
## 4.2 Specifications

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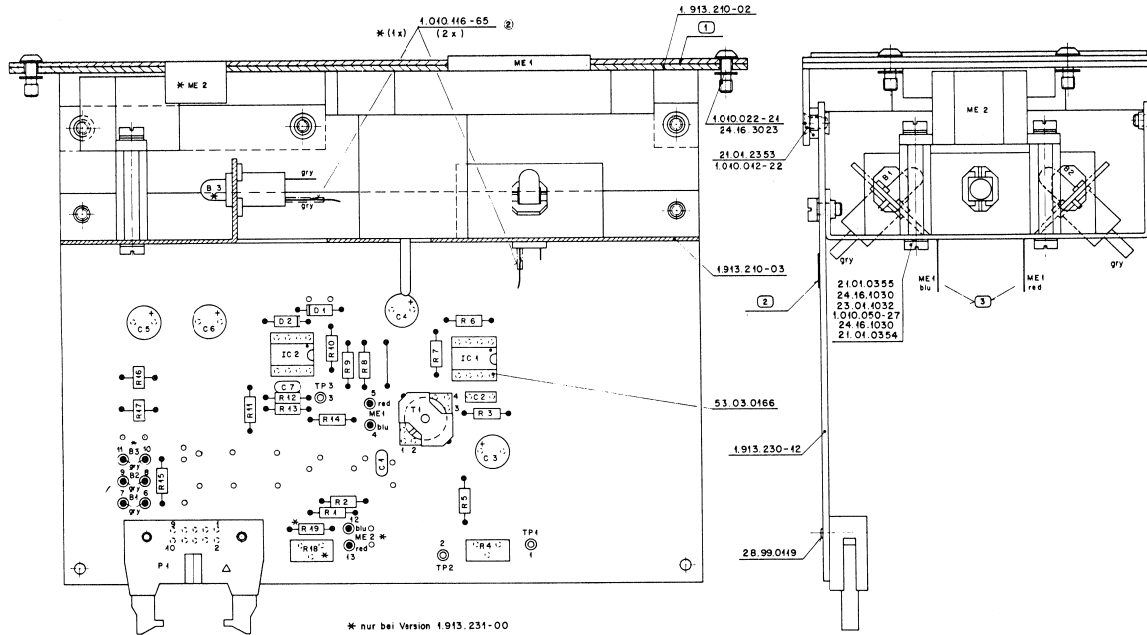
<b>Input sensitivity</b>	for reference indication (0 VU)	<b>0 dBu ... + 10 dBu</b>
<b>Input impedance</b>		<b>&gt; 10 kOhm</b>
<b>Indicating range</b>		<b>- 20 VU ... + 3 VU</b>
<b>Accuracy</b>	at 20°C, 1 kHz, - 10 VU ... + 3 VU	<b>± 0,5 VU</b>
<b>Frequency response</b>	for reference 0°C ... 50°C, 31,5 Hz ... 15 kHz	<b>± 0,5 VU</b>
<b>Attack time</b>	to -1 VU	<b>207 ms ± 30 ms</b>
<b>Supply</b>		<b>+ 15 V 10 mA</b> <b>- 15 V 10 mA</b> <b>- 6 V 60 mA</b>
<b>Dimensions of front panel:</b>		<b>170 x 80 mm</b>
<b>Depth:</b>		<b>135 mm</b>
<b>Weight:</b>		<b>310 gr</b>

VU-Meter

1.913.230/231



VU-Meter 1.913.230/231



\* nur bei Version 1.913.231-00

Gültig für	1	2	3
1.913.230-00	1.913.210-01	1.913.230-04	1.913.210-93
1.913.231-00	1.913.224-01	1.913.231-04	1.913.221-93

IND. POS. NO.	PART NO.	VALUE	SPECIFICATIONS/EQUIVALENT	MFR.
C1	59.24.1120	12 pF	5%	
C2	59.04.2402	1 nF	A0%	
C3	59.22.5404	100 nF	± 45V	
C4	59.22.5104	100 nF	± 45V	
C5	59.22.5404	100 nF	± 45V	
C6	59.22.5104	100 nF	± 45V	
C7	59.34.1104	100 pF	5%	
D1	50.04.0125	1N4448		50%
D2	50.04.0125	1N4448		50%
IC1	50.09.0107	RC4559NB	Dual OP AMP	Ro, TI
IC2	50.09.0107	RC4559NB	Dual OP AMP	Ro, TI
R1	57.11.3562	5.6k	1%	
R2	57.11.3562	5.6k	1%	
R3	57.11.4422	12k		
R4	58.04.7502	5k	TRIM-POTM.	
R5	57.11.4402	1k		
R6	57.11.4403	10k		
R7	57.11.4402	12k		
R8	57.11.4403	10k		
R9	57.11.4402	18k		
R10	57.11.4402	1k		
R11	57.11.4402	1k		
R12	57.11.4383	39k		
R13	57.11.4382	3.9k		
R14	57.11.4822	8.2k		

IND.	DATE	NAME	
1			Ro Raytheon
2			TI Texas Instr.
3			also valid for VU-meter with gain reduction meter 1.913.231
4			
5	20-8-81		

STUDER VU-METER 1.913.230 PAGE 1 OF 2

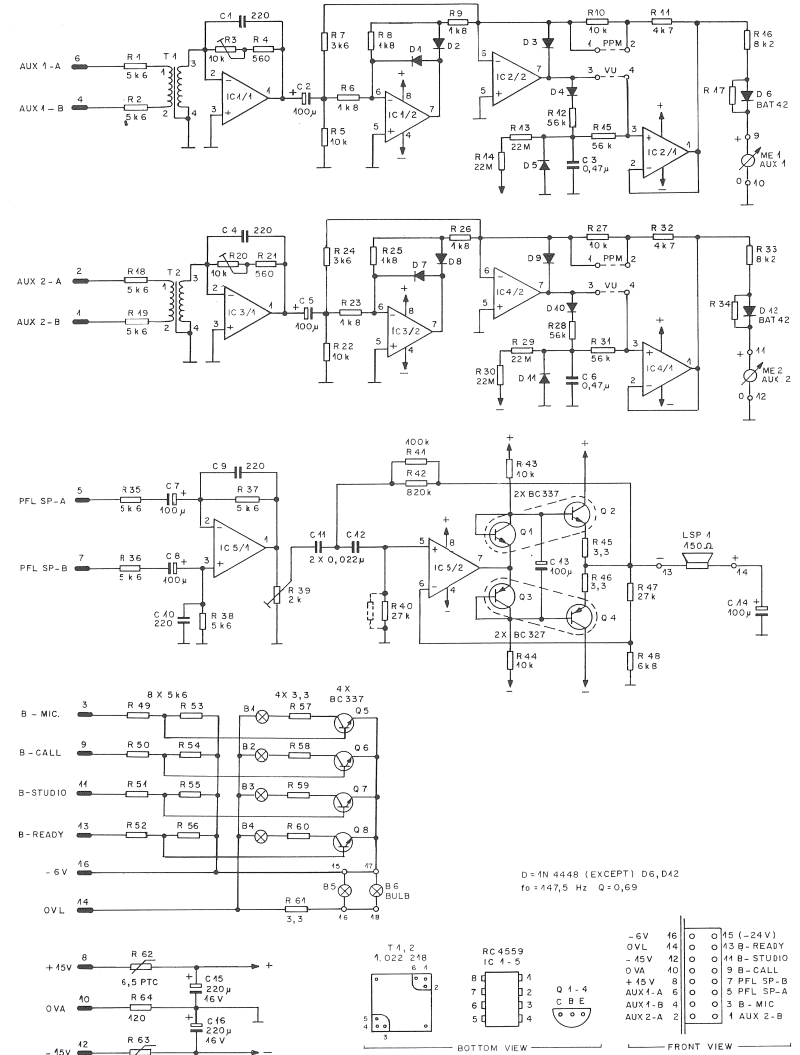
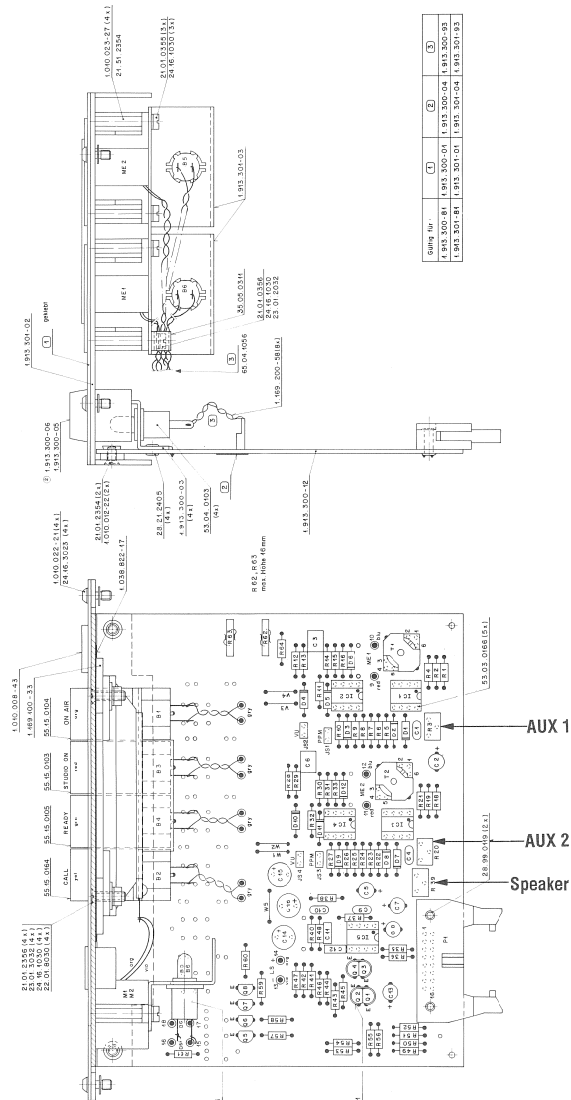
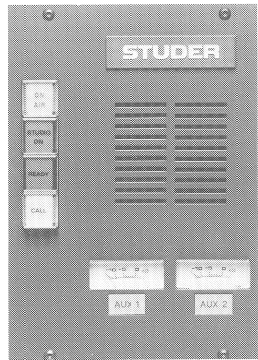
IND. POS. NO.	PART NO.	VALUE	SPECIFICATIONS/EQUIVALENT	MFR.
R15	57.11.4479	47 Ω	A91231: 93 Ω (51.1k.938)	
R16	57.99.0206	50	PTC PHILIPS 2.322.661.94002	
R17	57.99.0206	50	PTC PHILIPS 2.322.661.94002	
R18	58.04.7202	2k	Trim-Pot. (only 1.913.231)	
R19	57.11.4404	100	(only 1.913.231)	
TA	A022.248.00	1A	Input Trafo	
B1	54.02.0144	6V, 30mA	Lamp	
B2	54.02.0144	6V, 30mA	Lamp	
ME1	1.913.00.102		VU-Meter	
ME2	1.469.00.02		Gain-Reduction Meter (only 1.913.231)	
PI	54.44.20M		Connector 10pins	
X1C	53.03.0466		IC-Socket 8pins DIP	
B3	54.02.0144	6V, 30mA	Lamp (only 1.913.231)	

IND.	DATE	NAME	
1			
2			also valid for VU-meter with gain reduction meter 1.913.231
3			
4	20-8-81		

STUDER VU-METER 1.913.230 PAGE 2 OF 2

5. PFL / SIGN. / AUX Indication Unit

1.913.301.81



1.913.301-01	1.913.301-01	1.913.301-01	1.913.301-01
STUDER REGENSDORF ZURICH	PFL / SIGN. / AUX INDICATION UNIT	SC 1.913.301.81	

# STUDER AUDIO CONSOLE 970

## PFL/SIGN/AUX INDICATION UNIT 1.913.301.81

Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER
B....1	51.02.0143	6 V	166mA W2*4.60	
B....2	51.02.0143	6 V	166mA W2*4.60	
B....3	51.02.0143	6 V	166mA W2*4.60	
B....4	51.02.0143	6 V	166mA W2*4.60	
B....5	51.02.0144	6 V	30mA W2*4.60	
B....6	51.02.0144	6 V	30mA W2*4.60	
C....1	59.34.4221	220 pF		CER
C....2	59.22.3101	100 uF	10V	EL
C....3	59.06.0474	470 nF	10%	PE
C....4	59.34.4221	220 pF		CER
C....5	59.22.3101	100 uF	10V	E.
C....6	59.06.0474	470 nF	10%	PE
C....7	59.22.3101	100 uF	10V	E.
C....8	59.22.3101	100 uF	10V	EL
C....9	59.34.4221	220 pF	5%	CER
C....10	59.34.4221	220 pF	5%	CER
C....11	59.06.5223	22 nF	5%	PE
C....12	59.06.5223	22 nF	5%	PE
C....13	59.22.3101	100 uF	10V	EL
C....14	59.22.4101	100 uF	16V	EL
C....15	59.22.4221	220 uF	16V	EL
C....16	59.22.4221	220 uF	16V	EL
D....1	50.04.0125	1N4448		any
D....2	50.04.0125	1N4448		any
D....3	50.04.0125	1N4448		any
D....4	50.04.0125	1N4448		any
D....5	50.04.1112	ZD 5V1		any
D....6	50.04.0127	BAS40-02	(Sie),400mV at 10mA; BAT85 (Ph), BAT42 (Tho)	any
D....7	50.04.0125	1N4448		any
D....8	50.04.0125	1N4448		any
D....9	50.04.0125	1N4448		any
D....10	50.04.0125	1N4448		any
D....11	50.04.1112	ZD 5V1		any
D....12	50.04.0127	BAS40-02	(Sie),400mV at 10mA; BAT85 (Ph), BAT42 (Tho)	any
IC....1	50.09.0107	RC4559NB	dual op.amp.	Ra
IC....2	50.09.0107	RC4559NB	dual op.amp.	Ra
IC....3	50.09.0107	RC4559NB	dual op.amp.	Ra
IC....4	50.09.0107	RC4559NB	dual op.amp.	Ra
IC....5	50.09.0107	RC4559NB	dual op.amp.	Ra
LS....1	71.01.0114	150 Ohm	loud-speaker, 2403.257.2356/A03371 Y150,	Ph
ME....1	1.913.001.04		meter	St
ME....2	1.913.001.04		meter	St
P.....1	54.14.2012	16 pin		
Q.....1	50.03.0340	BC337-25	NPN, 800mA	Sie, Ph, ITT
Q.....2	50.03.0340	BC337-25	NPN, 800mA	Sie, Ph, ITT
Q.....3	50.03.0351	BC327-25	PNP, 800mA	Sie, Ph, ITT
Q.....4	50.03.0351	BC327-25	PNP, 800mA	Sie, Ph, ITT
Q.....5	50.03.0340	BC337-25	NPN, 800mA	Sie, Ph, ITT
Q.....6	50.03.0340	BC337-25	NPN, 800mA	Sie, Ph, ITT
Q.....7	50.03.0340	BC337-25	NPN, 800mA	Sie, Ph, ITT
Q.....8	50.03.0340	BC337-25	NPN, 800mA	Sie, Ph, ITT
R....1	57.11.4562	5.6 kOhm		
R....2	57.11.4562	5.6 kOhm		
R....3	58.01.9103	10 kOhm	trimpot.	
R....4	57.11.4561	560 Ohm		
R....5	57.11.4103	10 kOhm		
R....6	57.11.4182	1.8 kOhm		
R....7	57.11.3362	3.6 kOhm		
R....8	57.11.4182	1.8 kOhm		
R....9	57.11.4182	1.8 kOhm		
R....10	57.11.4103	10 kOhm		
R....11	57.11.4472	4.7 kOhm		
R....12	57.11.4563	56 kOhm		
R....13	57.11.6226	22 MOhm		
R....14	57.11.6226	22 MOhm		
R....15	57.11.4563	56 kOhm		
R....16	57.11.4822	8.2 kOhm		
R....18	57.11.4562	5.6 kOhm		
R....19	57.11.4562	5.6 kOhm		
R....20	58.01.9103	10 kOhm	trimpot.	
R....21	57.11.4561	560 Ohm		
R....22	57.11.4103	10 kOhm		
R....23	57.11.4182	1.8 kOhm		
R....24	57.11.3362	3.6 kOhm		
R....25	57.11.4182	1.8 kOhm		
R....26	57.11.4182	1.8 kOhm		
R....27	57.11.4103	10 kOhm		
R....28	57.11.4563	56 kOhm		
R....29	57.11.6226	22 MOhm		
R....30	57.11.6226	22 MOhm		
R....31	57.11.4563	56 kOhm		
R....32	57.11.4472	4.7 kOhm		
R....33	57.11.4822	8.2 kOhm		
R....35	57.11.4562	5.6 kOhm		
R....36	57.11.4562	5.6 kOhm		
R....37	57.11.4562	5.6 kOhm		
R....38	57.11.4562	5.6 kOhm		
R....39	58.01.9202	2 kOhm	trimpot	
R....40	57.11.4273	27 kOhm		
R....41	57.11.4104	100 kOhm		
R....42	57.11.4124	120 kOhm		
01 R....42	57.11.4824	820 kOhm		
R....43	57.11.4103	10 kOhm		
R....44	57.11.4103	10 kOhm		
R....45	57.11.4339	3.3 Ohm		
R....46	57.11.4339	3.3 Ohm		
R....47	57.11.4273	27 kOhm		
R....48	57.11.4682	6.8 kOhm		
R....49	57.11.4562	5.6 kOhm		
R....50	57.11.4562	5.6 kOhm		

Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER
R....51	57.11.4562	5.6 kOhm		
R....52	57.11.4562	5.6 kOhm		
R....53	57.11.4562	5.6 kOhm		
R....54	57.11.4562	5.6 kOhm		
R....55	57.11.4562	5.6 kOhm		
R....56	57.11.4562	5.6 kOhm		
R....57	57.11.4339	3.3 Ohm		
R....58	57.11.4339	3.3 Ohm		
R....59	57.11.4339	3.3 Ohm		
R....60	57.11.4339	3.3 Ohm		
R....61	57.11.4339	3.3 Ohm		
R....62	57.92.1271	6.5 Ohm	PTC	
R....63	57.92.1271	6.5 Ohm	PTC	
R....64	57.11.4101	100 Ohm		
T....1	1.022.218.00		input trafo 1:1	St
T....2	1.022.218.00		input trafo 1:1	St

CER = ceramic, EL = electrolytic, PE = polyester

MANUFACTURER: ITT=ITT-Intermetall, Ph=Philips, Ra=Raytheon, Sie=Siemens, St=Studer,

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*****
*
* This position list is valid for:
* Diese Positionenliste ist gultig fur:
*
* - 1.913.300.81 PFL-SIGN-INDICATION UNIT
* folgende Positionen sind bestückt:
* B1-B4, C7-C16, I05, L51, P1, Q1-Q8, R35-R64 ohne R61
*
* - 1.913.301.81 PFL-SIGN-AUX-INDICATION UNIT
* alle Positionen sind bestückt
*
*****

```

1.913.300.81 PFL-SIGN-INDICATION UNIT WY 86/10/2900

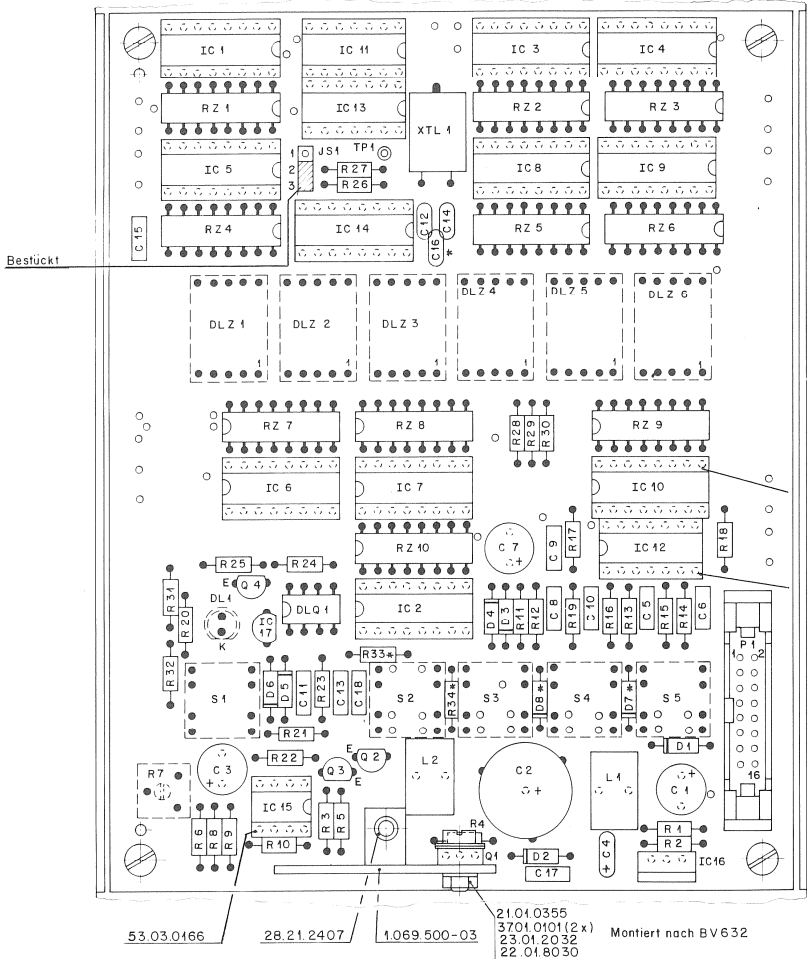


6. Stop Watch Unit

1.913.310.81

Stop watch Unit

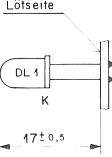
1.913.310.81



53.03.0168 (11x)

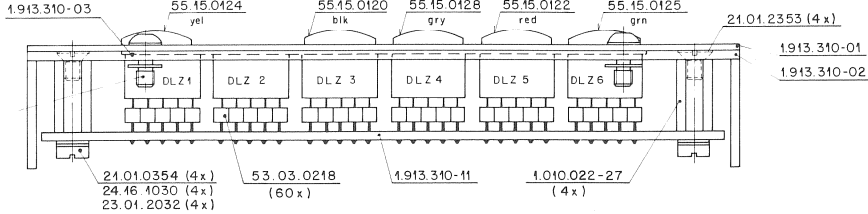
53.03.0167 (3x)

L 1, L 2 geklebt nach BV 640



R 7  
 DL 1  
 DL Z 1 - 6  
 S 4 - 5 } auf Lötseite bestückt

\* D 8, D 7, R 33, R 34, C 46 nicht bestückt  
 Warnschild-ESE und Nr. Etikette nach Fabr. Muster aufgeklebt.



# STUDER AUDIO CONSOLE 970

## Stop Watch

1.913.310.81

Ad	..POS..	..REF.No..	DESCRIPTION.....	MANUFACTURER
C.....1	59.22.6470	47 uF	-20% 40V EL	
C.....2	59.22.6102	1000 uF	-20% 40V EL	
C.....3	59.22.4101	100 uF	-20% 16V EL	
C.....4	59.26.2100	10 uF	-20% 16V EL	
C.....5	59.06.0104	100 nF	10% PE	
C.....6	59.06.0104	100 nF	10% PE	
C.....7	59.22.4101	100 uF	-20% 16V EL	
C.....8	59.06.0104	100 nF	10% PE	
C.....9	59.06.0104	100 nF	10% PE	
C.....10	59.06.0104	100 nF	10% PE	
C.....11	59.06.0104	100 nF	10% PE	
C.....12	59.34.4101	100 pF	CE	
C.....13	59.06.0104	100 nF	10% PE	
C.....14	59.34.1829	8.2 pF	CE	
C.....15	59.06.0104	100 nF	10% PE	
C.....16			not used	
C.....17	59.06.0104	100 nF	10% PE	
C.....18	59.06.0104	100 nF	10% PE	
D.....1	50.04.0512	1N5818	Schottky Diode	any
D.....2	50.04.0512	1N5818	Schottky Diode	any
D.....3	50.04.0125	1N4448		any
D.....4	50.04.0125	1N4448		any
D.....5	50.04.1112	Z 5V1	400mW BZX83C5V1 ,BZX55C5V1 ,ZPD 5V1	Ses,ITT
D.....6	50.04.0125	1N4448		any
D.....7			not used	
D.....8			not used	
DL.....1	50.04.2112	LED	Led gb dif.	
DLQ...1	50.99.0111	MCT6	Dual Optokoppler	
DLZ...1	73.01.0140	HDSP 550	3 Display	HP
DLZ...2	73.01.0140	HDSP 550	3 Display	HP
DLZ...3	73.01.0140	HDSP 550	3 Display	HP
DLZ...4	73.01.0140	HDSP 550	3 Display	HP
DLZ...5	73.01.0140	HDSP 550	3 Display	HP
DLZ...6	73.01.0140	HDSP 550	3 Display	HP
JS....1	54.01.0020		Jumper Plug 3 Pin	
JP....1	54.01.0021		Jumper Jack	
IC....1	50.07.0566	MC14566B	ind. time base generator	Mot
IC....2	50.07.0566	MC14566B	ind. time base generator	Mot
IC....3	50.07.0566	MC14566B	ind. time base generator	Mot
IC....4	50.07.0566	MC14566B	ind. time base generator	Mot
IC....5	50.07.0511	MC14511B	latch/decoder/display-driver	Mot
IC....6	50.07.0511	MC14511B	latch/decoder/display-driver	Mot
IC....7	50.07.0511	MC14511B	latch/decoder/display-driver	Mot
IC....8	50.07.0511	MC14511B	latch/decoder/display-driver	Mot
IC....9	50.07.0511	MC14511B	latch/decoder/display-driver	Mot
IC....10	50.07.0511	MC14511B	latch/decoder/display-driver	Mot
IC....11	50.07.0006	HEF4001	Quad 2-Input NOR Gate	
IC....12	50.07.0008	HEF4093	NAND Schmitt trigger	
IC....13	50.07.0013	HEF4013	Dual D-flip-Flop	
IC....14	50.07.0060	HEF4060	Binary Counter	Mot
IC....15	50.09.0101	TL 072	dual op. amp. ( LF 353 N )	TI
IC....16	50.10.0104	LM 317	Voltage Reg.	
IC....17	50.10.0108	LM 317	Voltage Reg.	
01 IC....17	50.10.0107	7805	Voltage Reg.	
L....1	62.03.0005	L 250uH	RFI-suppression coil	Token
L....2	62.03.0005	L 250uH	RFI-suppression coil	Token
MP....1	53.03.0166	1pcs	1c-socket 8 Pin	
MP....2	53.03.0167	3pcs	1c-socket 14 Pin	
MP....3	53.03.0168	11pcs	1c-socket 16 Pin	
MP....4	1.069.500.03	1pcs	Head sink	
MP....5	1.010.012.22	1pcs	Nietbolzen M3*2	
MP....6	55.15.0124	1pcs	yel.Bottom for S1	
MP....7	55.15.0120	1pcs	blk.Bottom for S2	
MP....8	55.15.0128	1pcs	gray Bottom for S3	
MP....9	55.15.0122	1pcs	red.Bottom for S4	
MP....10	55.15.0125	1pcs	grn.Bottom for S5	
P....1	54.14.2052	16 Pin	ribbon cable connector	
Q....1	50.03.0493	Bd 437	npn	
Q....2	50.03.0351	Bc 327	pnp	
Q....3	50.03.0436	Bc 237	npn	
Q....4	50.03.0436	Bc 237	npn	
R....1	57.11.4152	1.5 kOhm	5% 0.25W	
R....2	57.11.4221	220 Ohm	5% 0.25W	
R....3	57.11.4471	470 Ohm	5% 0.25W	
R....4	57.11.4121	120 Ohm	5% 0.25W	
R....5	57.11.4332	3.3 kOhm	5% 0.25W	
R....6	57.11.4681	680 Ohm	5% 0.25W	
R....7	58.01.8102	1 kOhm	10% 0.50W	trimming resistor
R....8	57.11.4821	820 Ohm	2% 0.25W	
R....9	57.11.4102	1 kOhm	5% 0.25W	
R....10	57.11.4105	1 MOhm	5% 0.25W	
R....11	57.11.4102	1 kOhm	5% 0.25W	
R....12	57.11.4104	100 kOhm	5% 0.25W	
R....13	57.11.4104	100 kOhm	5% 0.25W	
R....14	57.11.4104	100 kOhm	5% 0.25W	
R....15	57.11.4102	1 kOhm	5% 0.25W	
R....16	57.11.4102	1 kOhm	5% 0.25W	
R....17	57.11.4104	100 kOhm	5% 0.25W	
R....18	57.11.4472	4.7 kOhm	5% 0.25W	
R....19	57.11.4104	100 kOhm	5% 0.25W	
R....20	57.11.4102	1 kOhm	5% 0.25W	
R....21	57.11.4472	4.7 kOhm	5% 0.25W	
R....22	57.11.4103	10 kOhm	5% 0.25W	
R....23	57.11.4221	220 Ohm	5% 0.25W	
R....24	57.11.4152	1.5 kOhm	5% 0.25W	
01 R....24	57.11.3221	220 Ohm	5% 0.25W	
R....25	57.11.4152	1.5 kOhm	5% 0.25W	
R....26	57.11.4104	100 kOhm	5% 0.25W	
R....27	57.11.4222	2.2 kOhm	5% 0.25W	
R....28	57.11.4331	330 Ohm	5% 0.25W	

Ad	..POS..	..REF.No..	DESCRIPTION.....	MANUFACTURER
R....29	57.11.4331	330 Ohm	5% 0.25W	
R....30	57.11.4331	330 Ohm	5% 0.25W	
R....31	57.11.4104	100 kOhm	5% 0.25W	
R....32	57.11.4104	100 kOhm	5% 0.25W	
01 R....32	57.11.3102	1 kOhm	5% 0.25W	
R....33	.	.	not used	
R....34	.	.	not used	
RZ....1	57.88.3473	47 kOhm	Interface Network	
RZ....2	57.88.3473	47 kOhm	Interface Network	
RZ....3	57.88.3473	47 kOhm	Interface Network	
RZ....4	57.88.3221	220 Ohm	Interface Network	
RZ....5	57.88.3221	220 Ohm	Interface Network	
RZ....6	57.88.3221	220 Ohm	Interface Network	
RZ....7	57.88.3221	220 Ohm	Interface Network	
RZ....8	57.88.3221	220 Ohm	Interface Network	
RZ....9	57.88.3221	220 Ohm	Interface Network	
RZ....10	57.88.3473	47 kOhm	Interface Network	
S....1	55.15.0113	2P	switch , latching	
S....2	55.15.0112	2P	switch , non latching	
S....3	55.15.0112	2P	switch , non latching	
S....4	55.15.0112	2P	switch , non latching	
S....5	55.15.0112	2P	switch , non latching	
TP....1	54.01.0020		Jumper Plug 1 Pin	
XTL...1	89.01.0376	3.2768MHZ	Quarz	ITT

(01) faster rise time for optocoupler

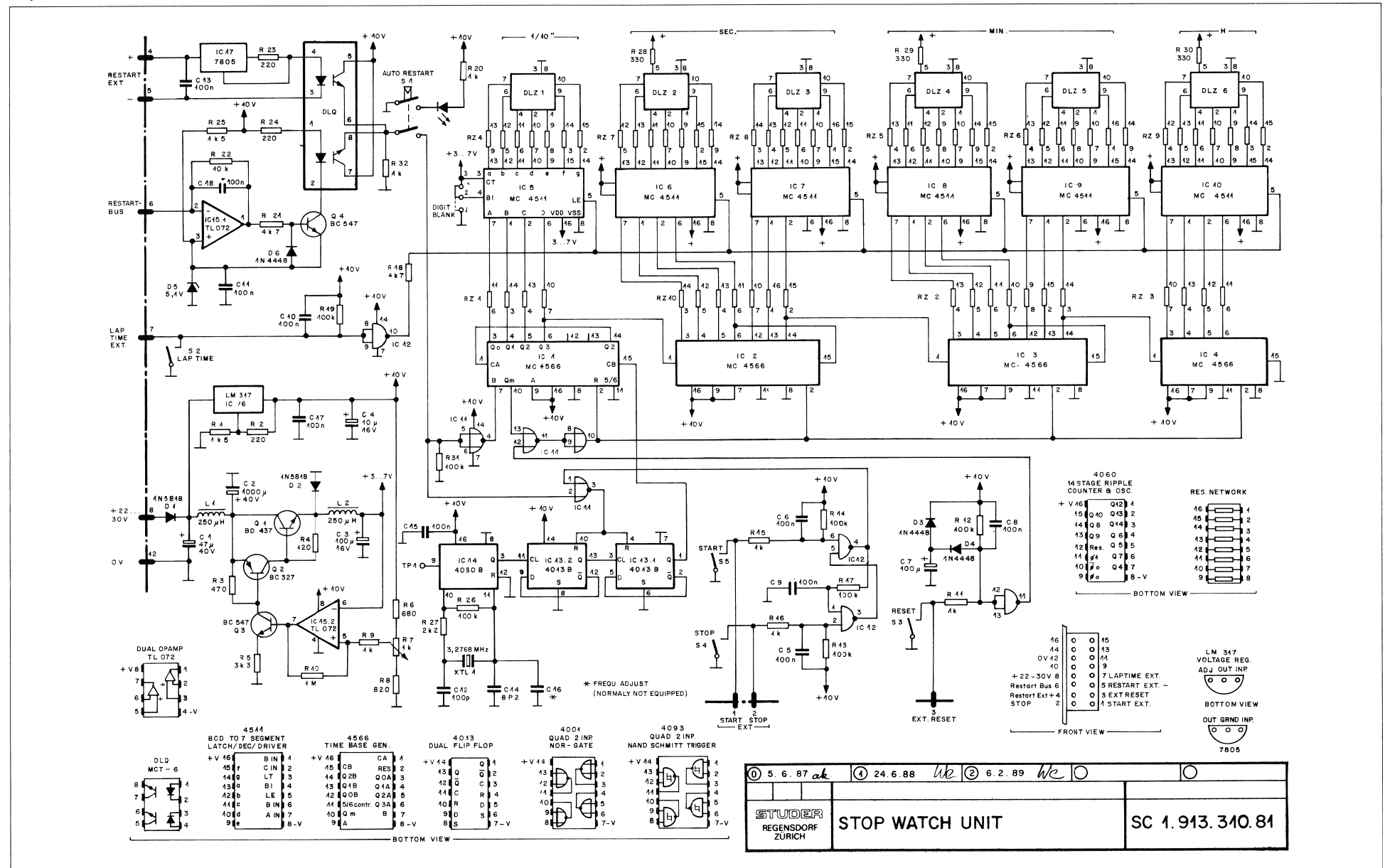
CE=Ceramic, CF=Carbon Film, EL=Electrolytic, MF=Metal Film, PE=Polyester, PP=Polypropylen, PS=Polystyrol

MANUFACTURER: Bu=Burdny, Ex=Exar, Fc=Fairchild, GI=General Instrument  
 HP=Hewlett Packard, ITT=Intermetall, Mot=Motorola, Nat=National  
 (Matsushita), NS=National Semiconductors, Ph=Philips,  
 Ra=Raytheon, Sig=Signetics, Six=Siliconix, St=Studer,  
 TI=Texas Instrument

1.913.310.81 STOP WATCH SE 88/01/0400

1.913.310.81 STOP WATCH SE 88/06/2401

Stop watch Unit 1.913.310.81



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## **1 INTRODUCTION**

---

The individual descriptions and application notes contained in this brochure are intended to acquaint designers and project engineers with the Studer Audio System Components. They allow to realize custom-tailored signal distribution, signal switching and amplifying systems to satisfy almost any individual requirement.

**Euro-Cards (1.915....)** The backbone of the system is the so-called Euro-card, a circuit board measuring 100 × 160 mm, which comes in a great variety of different circuit configurations.

**Modular Sub-Cards (1.914....)** Furthermore, there are the Modular Sub-Cards, small plug-in cards. Four of them can be accommodated on one Euro-size motherboard, allowing to make up a system which provides the ultimate in flexibility.

**Racks, Frames (1.918....)** Matching 19" mounting frames and 19" sub-racks for Euro-cards with or without power supply are available as well as installation hardware.

For prices please consult your local Studer distributor or contact:

Studer Professional Audio GmbH  
Althardstrasse 30  
CH-8105 Regensdorf  
Switzerland

Phone: +41 44 870 75 11  
Fax: +41 44 870 71 34  
e-mail: sales@studer.ch

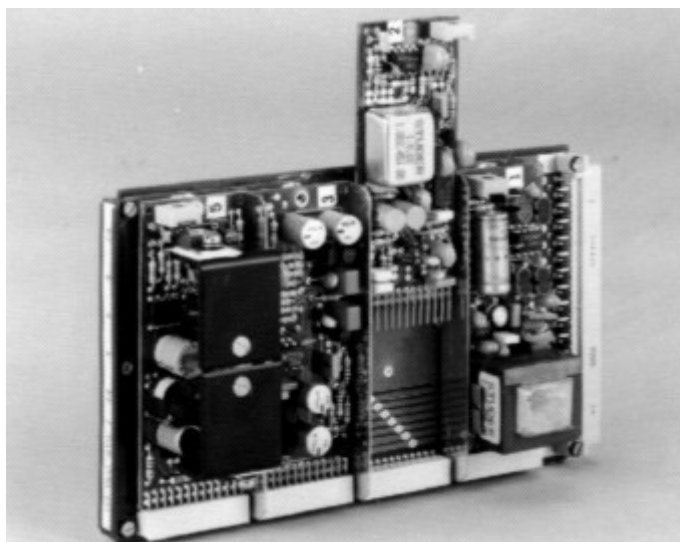
We reserve the right to change the design and the performance specifications of the products listed here as technical progress may warrant.

## 2 MSC SYSTEM

To provide highest possible flexibility for the designer of professional sound systems, Studer engineers have pursued a completely new concept.

The Euro-card is a convenient circuit board as far as its size and its plug-in features are concerned. However, it often offers excess space for a particular circuit. This has triggered the idea to utilize the Euro-card simply as a carrier (“motherboard”, order no. 1.915.770) for four smaller plug-in circuit boards, the “Modular Sub-Cards” (MSC).

The 32 connections of the Euro-card are divided into 6 supply lines common to the modular sub-cards, and  $4 \times 6$  individual lines joining the plug-in sockets for each sub-card. The remaining 2 connections are used as separate bus lines, one of them leading to sub-cards 1 and 2, the other one to sub-cards 3 and 4, resulting in a total of 13 connections to each MSC. A small motherboard for only one MSC is available as well (order no. 1.914.500).



A great variety of different circuits is available in form of MSCs, such as

- Balancing amplifiers
- Microphone pre-amplifiers
- Speaker amplifiers
- $0-\Omega$  input amplifiers
- Limiters
- Voltage controlled amplifiers (VCAs)
- Relay sub-cards
- High level input amplifiers
- Line output amplifiers
- 1900 Hz signal generator/decoder
- $90^\circ$  filter, stereo/mono
- Flip-flop
- Breadboarding card (0.1"/2.54 mm grid)

To meet the requirements of a system concept, a designer will be able to build individual circuits similar to working with a construction set: He either selects from the available circuits on Euro-cards or makes up his own Euro-card by simply arranging the most suitable combination of Modular Sub-Cards on the motherboard.

## 2.1 Modular Sub-Cards (MSCs)

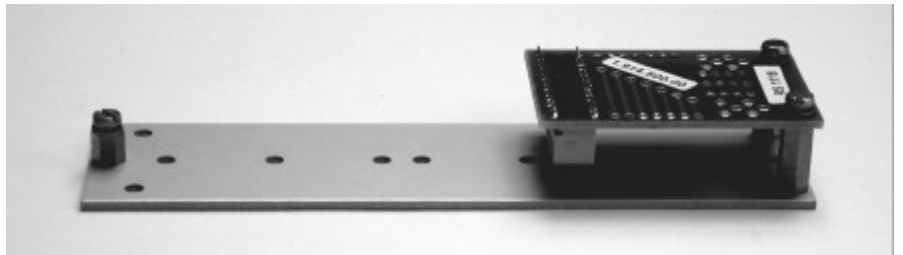
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### 2.1.1 Motherboard for 1 MS-Card

1.914.500

If only one MS-card is used, this motherboard is helpful for both mechanical and electrical interfacing. It consists of an aluminium mounting base (135 × 36 mm) and a small PCB with a connector for the MS-card; for wiring, this PCB contains solder terminals.

**Note:** For installation of up to four MS-cards, there is a second, Euro-card format motherboard available (1.915.770) that can be installed into an Euro-card rack. Please refer to chapter 2.2.1.

**Ordering Information**

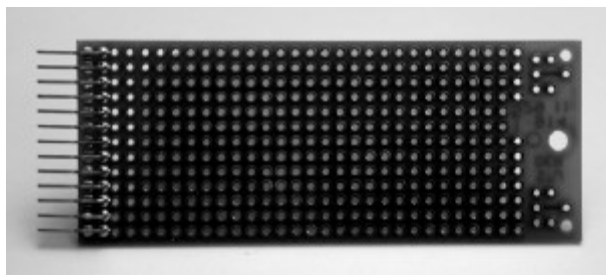
Motherboard for 1 MS-card

1.914.500.xx

### 2.1.2 Breadboarding Card

1.914.529

This experimental board is an empty plug-in PCB compatible with the MSC system. It offers a punched 0.1" grid (2.54 × 2.54 mm) for individual component placement.

**Ordering Information:**

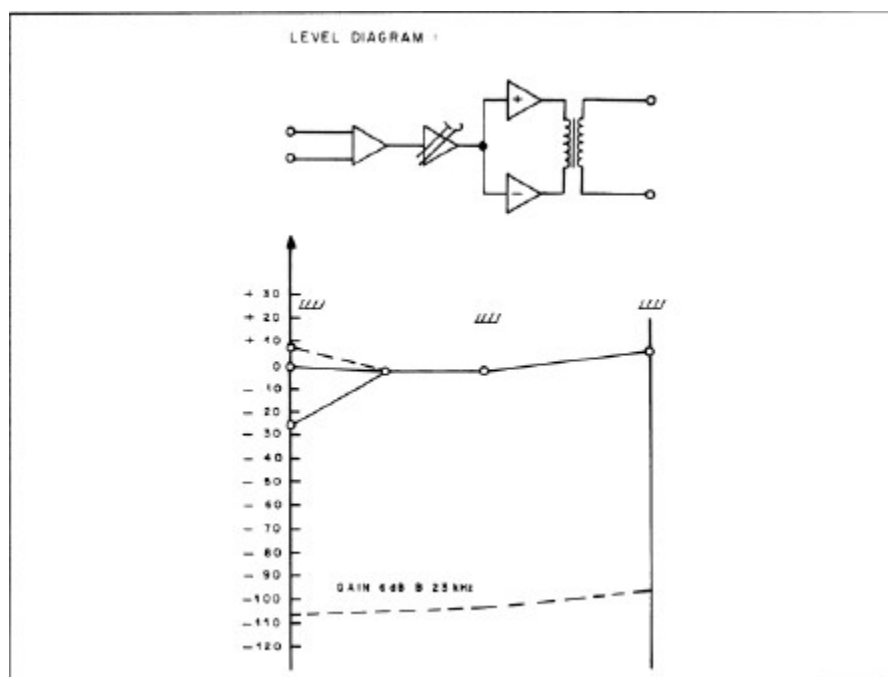
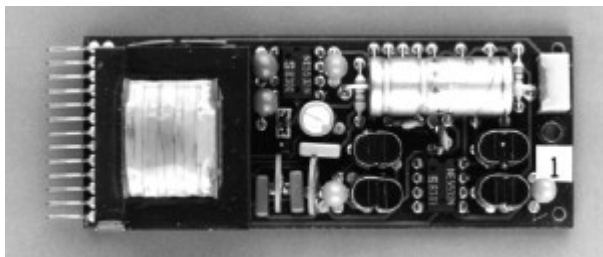
Breadboarding card

1.914.529.xx

### 2.1.3 Line Output Amplifier

1.914.501

Designed for operation at a nominal line level of +6 dBu (1.55 V<sub>rms</sub>), this amplifier can handle levels of up to +24 dBu (12.3 V<sub>rms</sub>), providing an excellent overload margin without the risk of clipping. A unique circuit around the primary of the amplifier's output transformer ensures excellent frequency response performance throughout the audible range. Fine and coarse gain adjustment is provided which allows to accommodate input levels in the range from -22...+8 dBu for a nominal +6 dBu output.

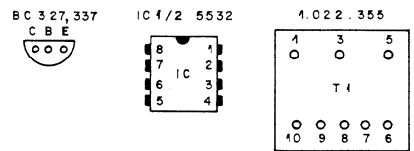
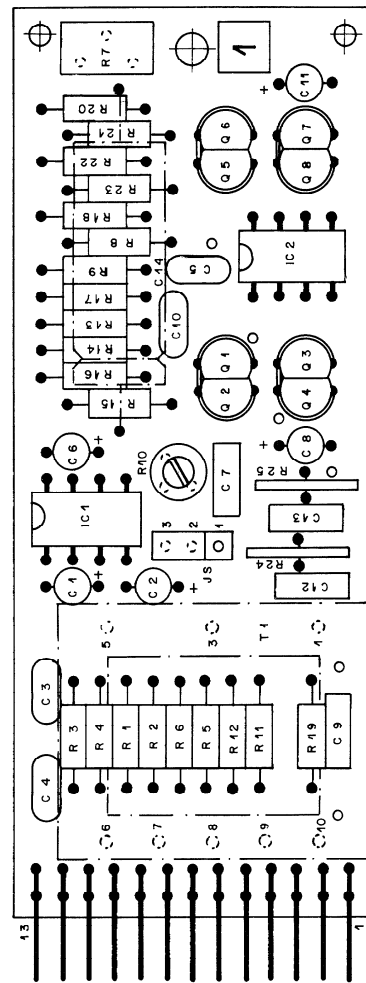
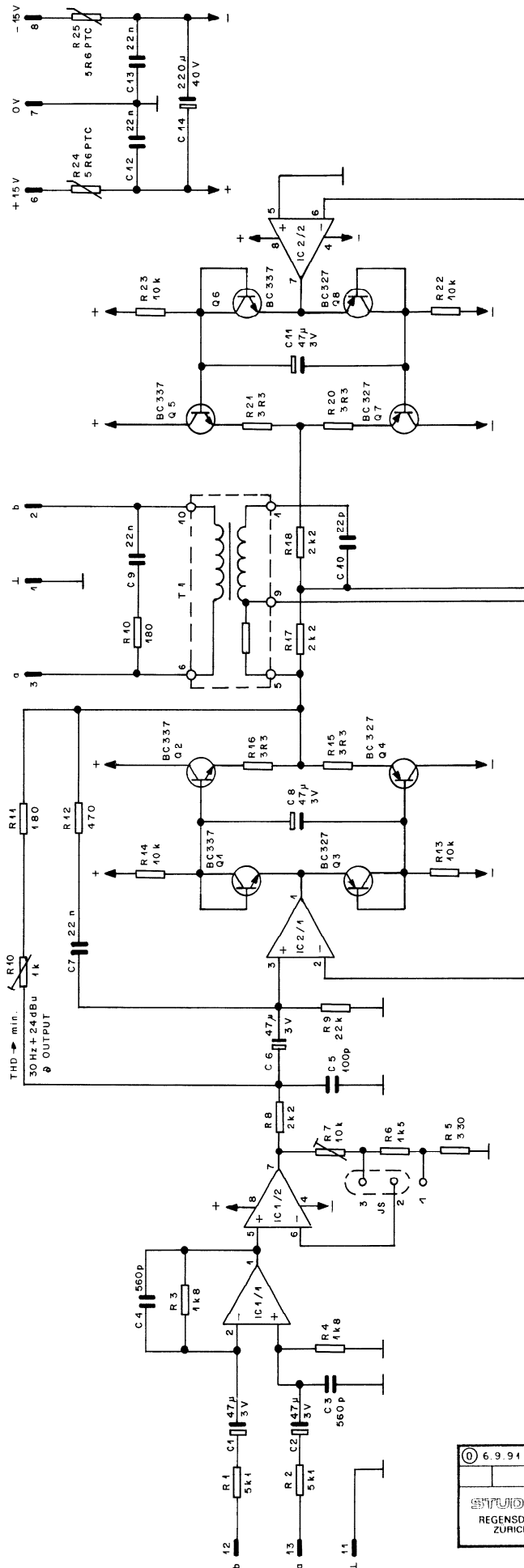




**Technical Specifications**

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<b>Input:</b>	Impedance	> <b>10 kW</b> , electronically balanced (transformerless)
	Overload point	<b>+24 dBu</b>
<b>Output:</b>	Impedance	< <b>50 W</b> , balanced and floating
	Minimum load	<b>200 W</b>
	Maximum level	<b>+24 dBu</b>
	Gain	<b>-2 dB...+28 dB</b> ; adjustment: coarse 0 or 15 dB/fine -2 dB...+13 dB
	Frequency response	<b>±0.2 dB</b> , 30 Hz...16 kHz
	THD	< <b>0.01%</b> , 30 Hz...16 kHz
	Equivalent input noise	< <b>-106 dB</b> , linear, at 6 dB gain
<b>Supply:</b>		<b>±15 V</b> (25 mA idling; max. 170 mA at +24 dBu into 200 Ω)
<b>Dimensions:</b>		<b>MS-card</b> , 34 × 85 mm
<b>Ordering Information:</b>	Line output amplifier	1.914.501.xx



BOTTOM VIEW

PIN	EURO 32 PIN			
	(A)	(B)	(C)	(D)
INP a	13	1	7	24
INP b	12	2	8	22
⊥	11	3	9	23
OUT a	3	4	10	24
OUT b	2	5	11	25
⊥	4	6	13	26
+ 15V	6	16		
0V	7	15		
-15V	8	14		

<p>STUDER REGENSDORF ZÜRICH</p>	<p>LINE AMPLIFIER (NR 1)</p>	<p>SC 1.914.501.00</p>
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MSC LINE AMPLIFIER

Ad	POS	REF.No.	DESCRIPTION			MANUFACTURER
①	C....1	59.30.1470	47µ	3V	TA	
①	C....2	59.30.1470	47µ	3V	TA	
	C....3	59.34.5561	560pF	5%	CER	
	C....4	59.34.5561	560pF	5%	CER	
	C....5	59.34.4101	100pF		CER	
	C....6	59.30.1470	47µF	3V	TA	
	C....7	59.06.0222	2200pF		PE	
	C....8	59.30.1470	47µF	3V	TA	
	C....9	59.06.0223	0,022µF		PE	
	C....10	59.34.2220	22pF		CER	
	C....11	59.30.1470	47µF	3V	TA	
	C....12	59.06.0223	0,022µF		PE	
	C....13	59.06.0223	0,022µF		PE	
	C....14	59.25.5221	220µF	40V	EL	
	IC....1	50.09.0105	NE5532	XR5532 DUAL OP LOW NOISE		SIG/EX
	IC....2	50.09.0105	NE5532	XR5532 DUAL OP LOW NOISE		SIG/EX
	J5J	54.01.0021		JUMPER JACK		
	J5P	54.01.0020		JUMPER PLUG 3PIN		
	Q....1	50.03.0516	BC337	NPN IC 0,8A	] MATCHED	ST
	Q....2	50.03.0516	BC337	NPN IC 0,8A		ST
	Q....3	50.03.0625	BC327	PNP IC 0,8A	] MATCHED	ST
	Q....4	50.03.0625	BC327	PNP IC 0,8A		ST
	Q....5	50.03.0516	BC337	NPN IC 0,8A	] MATCHED	ST
	Q....6	50.03.0516	BC337	NPN IC 0,8A		ST
	Q....7	50.03.0625	BC327	PNP IC 0,8A	] MATCHED	ST
	Q....8	50.03.0625	BC327	PNP IC 0,8A		ST
	R....1	57.11.3512	5k1	1%		
	R....2	57.11.3512	5k1	1%		
	R....3	57.11.3182	1k8	1%		
	R....4	57.11.3182	1k8	1%		
	R....5	57.11.4331	330			
	R....6	57.11.4152	1k5			
	R....7	58.11.9103	10k	TRIM LIN		
	R....8	57.11.4222	2k2			
	R....9	57.11.4223	22k			
	R....10	58.11.6102	1k	TRIM LIN		
	R....11	57.11.4681	680			
	R....12	57.11.4471	470			
	R....13	57.11.4103	10k			
	R....14	57.11.4103	10k			
	R....15	57.11.4339	3,3			
	R....16	57.11.4339	3,3			
	R....17	57.11.4222	2k2			
	R....18	57.11.4222	2k2			
	R....19	57.11.4181	180			
	R....20	57.11.4339	3,3			
	R....21	57.11.4339	3,3			
	R....22	57.11.4103	10k			
	R....23	57.11.4103	10k			
	R....24	57.11.0209	5,6	PTC		PH
	R....25	57.11.0209	5,6	PTC		PH
		50.20.2001		CLIP		
	T....1	1.022.355.00		LINE OUTPUT TRAFO		ST

CER=Ceramic, EL=Electrolytic, PE=Polyester, TA=Tantalum

MANUFACTURER: ST=Studer, SIG=Signetics, EX=Exar, PH=Philips

1.914.501.00 LINE AMPLIFIER (Nr. 1)

FRI 06/06/83

1.914.501.00 LINE AMPLIFIER (Nr. 1)

① FRI 17/11/83

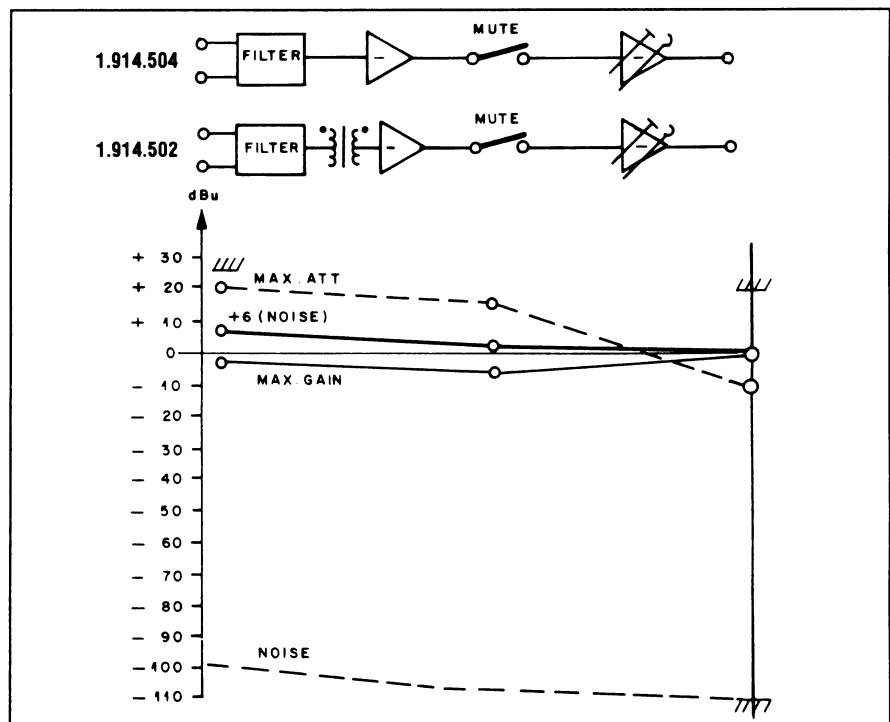
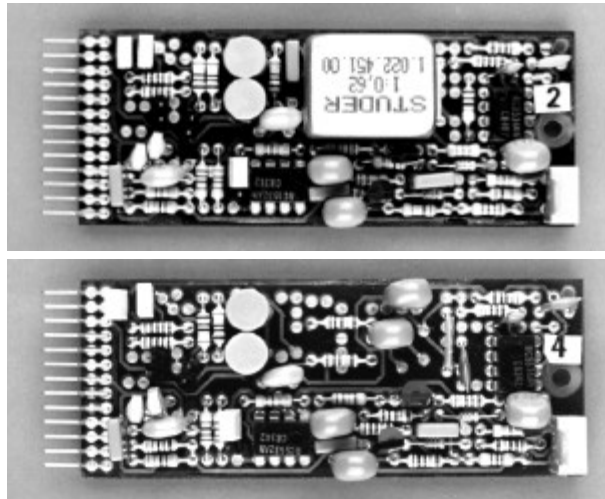
END



**2.1.4 High-Level Input Amplifier**

1.914.502/504

Basically, this is an amplifier with near 0 dB gain for high-level applications, yet with additional features, such as remote muting facility, RF input filter, and choice of two input and output impedances. The input configuration is balanced, whereas the output is unbalanced. Jumpers in the primary of the input circuit permit selection of either high-impedance operation with RF filter or a 0-Ω input without filter, for summing-bus applications. The combining (mixing) resistors have to be added externally. The combining (mixing) resistors have to be added externally. By switching pin3 of the amplifier's 13-pin plug to ground (via a corresponding connection on the motherboard) the amplifier may be muted from a remote point. If only 20 dB level reduction is desirable instead of muting, this can be programmed by connecting a resistor across two solder points.



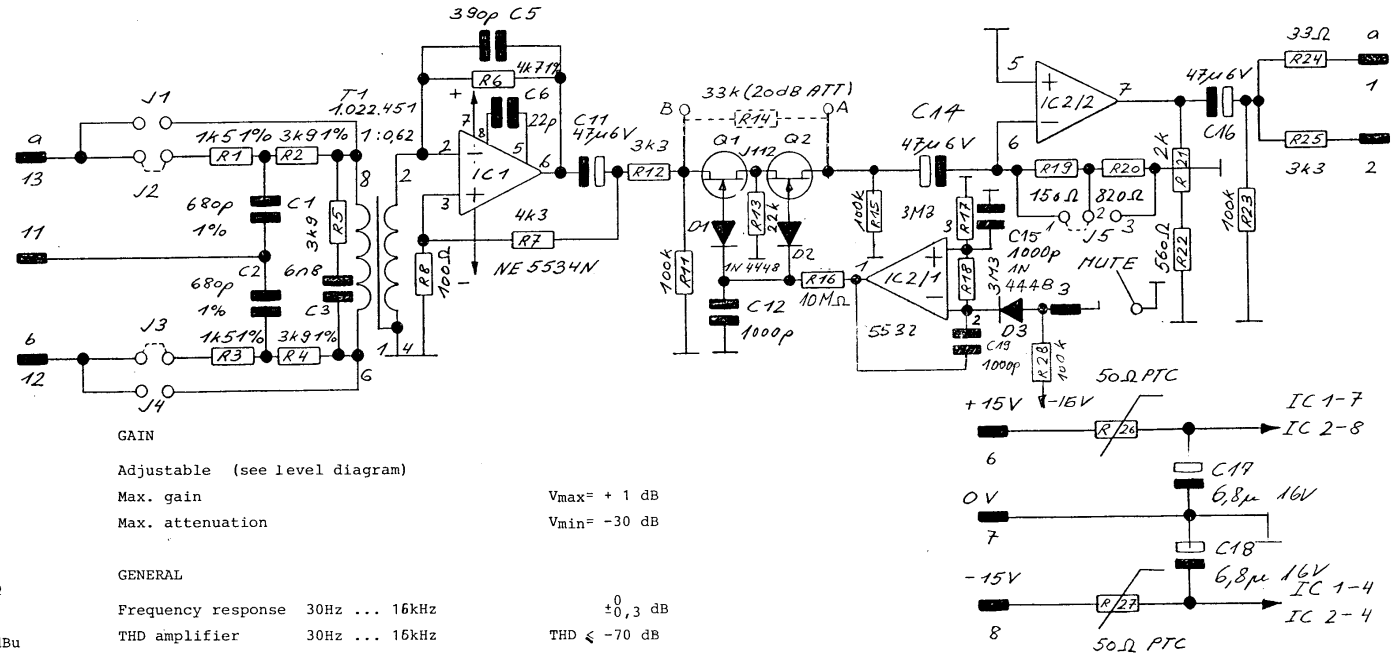
The amplifier may be used, for example, to work into a 600  $\Omega$  load, or into the input of a 0- $\Omega$  input amplifier of another summing circuit.

If transformerless yet balanced input configuration is desired, an MSC amplifier with basically the same performance characteristics is available as well. Refer to the ordering information below.

## Technical Specifications

<b>Input:</b>	Impedance	> <b>10 kW</b> (transformer- or electronically balanced versions available; input with RF filter; 0- $\Omega$ input selectable with jumpers)	
	Common mode rejection	> <b>50 dB</b>	
	Overload point	+ <b>24 dBu</b> (12.3 V <sub>rms</sub> )	
<b>Output:</b>	Impedance	<b>33 W</b> (pin1), unbalanced	
	Minimum load	<b>600 W</b>	
	Maximum level	+ <b>20 dBu</b> (7.75 V <sub>rms</sub> )	
	Impedance	<b>3.3 kW</b> (pin2), unbalanced, for 0- $\Omega$ operation	
	Maximum gain	<b>1 dB</b>	
	Maximum attenuation	<b>30 dB</b>	
	Frequency response	$\pm$ <b>0.3 dB</b> , 30 Hz...16 kHz	
	THD	< <b>0.03%</b> , 30 Hz...16 kHz	
	Equivalent input noise	- <b>100 dBu</b> , unweighted, at 6 dB attenuation	
	Programmable attenuation	<b>20 dB</b> (resistor 33 k $\Omega$ across muting circuit)	
<b>Supply:</b>		$\pm$ <b>15 V</b> (11 mA idling)	
<b>Dimensions:</b>		<b>MS-card</b> , 34 $\times$ 85 mm	
<b>Ordering Information:</b>		High level input amp with transformer-balanced input	1.914.502.xx
		High level input amp with electronically balanced input	1.914.504.xx

CIS		EURO 32 P			
PIN		(a)	(b)	(c)	(d)
IN a	13	1	7	21	27
IN b	12	2	8	22	28
IN L	11	3	9	23	29
	10				
-15V	8	14			
0 V	7	15			
+15V	6	16			
	5				
MUTE I	3	4	10	24	30
OUT (3K3)	2	5	11	25	31
OUT	1	6	13	26	32



GAIN

Adjustable (see level diagram)  
 Max. gain  
 Max. attenuation

$V_{max} = +1 \text{ dB}$   
 $V_{min} = -30 \text{ dB}$

GENERAL

Frequency response 30Hz ... 16kHz  
 THD amplifier 30Hz ... 16kHz  
 Noise (B 23kHz), gain -6 dB

$\pm 0,3 \text{ dB}$   
 THD  $\leq -70 \text{ dB}$   
 $U_{NOISE} = -106 \text{ dBu}$

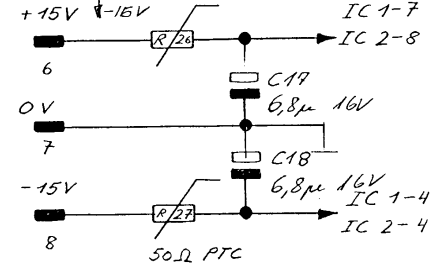
ATTENUATOR

Mute switch, with resistor programmable to an attenuator of 20 dB

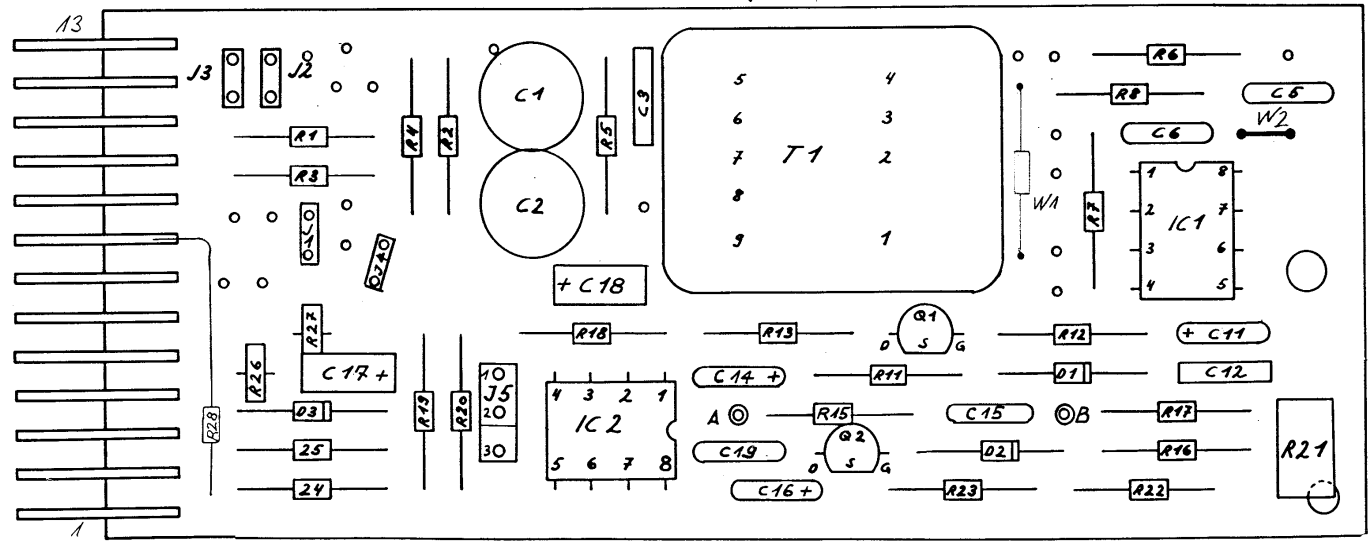
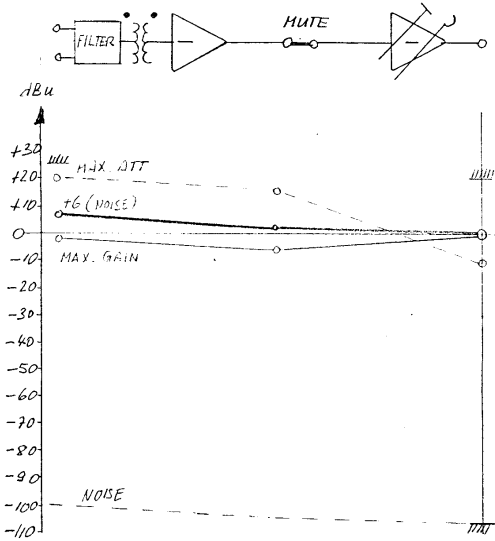
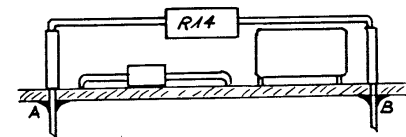
SUPPLY

Supply voltage  
 Idle current

$U = \pm 15 \text{ V}$   
 $I = 11 \text{ mA}$



OPTION  
 33k (20 dB Attenuation)



**HL Input Amp, transformer-balanced 1.914.502.81 ( 1)**

Idx. Pos.	Part No.	Qty.	Type/Val.	Description	Idx. Pos.	Part No.	Qty.	Type/Val.	Description
0	C 1	59.05.1681	680p	PP, 1%, 630V					
0	C 2	59.05.1681	680p	PP, 1%, 630V					
0	C 3	59.06.5682	6n8	PETP, 63V, 5%, RM5					
0	C 5	59.34.5391	390p	CER 63V, 5%, N1500					
0	C 6	59.34.2220	22p	CER 63V, 5%, N150					
0	C 11	59.26.0470	47u	SAL 6.3V 20%					
0	C 12	59.32.4102	1n0	CER 20%, 50V					
0	C 13	not used	1n0	PETP, 63V, 10%, RM5					
0	C 14	59.26.0470	47u	SAL 6.3V 20%					
0	C 15	59.06.0102	1n0	PETP, 63V, 10%, RM5					
0	C 16	59.26.0470	47u	SAL 6.3V 20%					
0	C 17	59.26.2689	6u8	SAL 16V 20%					
0	C 18	59.26.2689	6u8	SAL 16V 20%					
0	C 19	59.06.0102	1n0	PETP, 63V, 10%, 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	IC 1	50.05.0244	5534A	Single Op-amp, low noise					
0	IC 2	50.09.0106	5532A	Dual Op-Amp, low noise					
0	J 1	54.01.0021	Jumper	0.63*0.63mm, Au					
0	J 2	54.01.0021	Jumper	0.63*0.63mm, Au					
0	J 3	54.01.0021	Jumper	0.63*0.63mm, Au					
0	P 1	54.01.0273	13p	Stecker CIS parallelsteck					
0	P 2	54.01.0020	11 pcs 1p	Pin, 1reihig, gerade					
0	Q 1	50.03.0350	J112	JFET N-Channel					
0	Q 2	50.03.0350	J112	JFET N-Channel					
0	R 1	57.11.3152	1k5	MF, 1%, 0207					
0	R 2	57.11.3392	3k9	MF, 1%, 0207					
0	R 3	57.11.3152	1k5	MF, 1%, 0207					
0	R 4	57.11.3392	3k9	MF, 1%, 0207					
0	R 5	57.11.3392	3k9	MF, 1%, 0207					
0	R 6	57.11.3472	4k7	MF, 1%, 0207					
0	R 7	57.11.3432	4k3	MF, 1%, 0207					
0	R 8	57.11.3101	100R	MF, 1%, 0207					
0	R 11	57.11.3104	100k	MF, 1%, 0207					
0	R 12	57.11.3332	3k3	MF, 1%, 0207					
0	R 13	57.11.3223	22k	MF, 1%, 0207					
0	R 14	not used	33k	MF, 1%, 0207					
				<i>optional (20 dB attenuation)</i>					
0	R 15	57.11.3104	100k	MF, 1%, 0207					
0	R 16	57.11.5106	10M	MF, 5%, 0207					
0	R 17	57.11.5335	3M3	MF, 5%, 0207					
0	R 18	57.11.5335	3M3	MF, 5%, 0207					
0	R 19	57.11.3151	150R	MF, 1%, 0207					
0	R 20	57.11.3821	820R	MF, 1%, 0207					
0	R 21	58.01.9202	2k0	Cermet, 10%, 0.5W, vertical					
0	R 22	57.11.3561	560R	MF, 1%, 0207					
0	R 23	57.11.3104	100k	MF, 1%, 0207					
0	R 24	57.11.3330	33R	MF, 1%, 0207					
0	R 25	57.11.3332	3k3	MF, 1%, 0207					
0	R 26	57.99.0206	50R	PTC, 25V, 0.5W					
0	R 27	57.99.0206	50R	PTC, 25V, 0.5W					
0	R 28	57.11.3104	100k	MF, 1%, 0207					
0	T 1	1.022.451.00	1:0.62	EINGANGSTRAFO 1 : 0,62					
1	W 1	57.11.3000	0R0	MF, 0207					
1	W 2	64.01.0106	0,6mm	Schaltdraht Cu					

End of List

Comments:

(01) W1, W2 added

STUDER

HL INPUT AMP. BALANCED (NR4)

300

1.914.504.81

PAGE 1 OF 1

①	19.4.8545
②	8.2.9398
③	14.10.8545

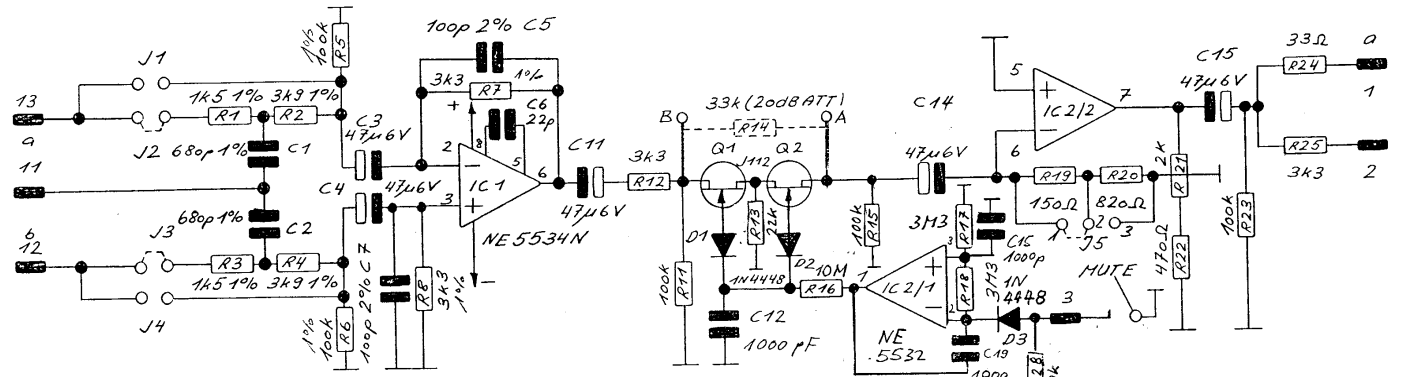
CIS		EURO 32 P			
PIN		(a)	(b)	(c)	(d)
INa	13	1	7	21	27
INb	12	2	8	22	28
IN L	11	3	9	23	29
	10				
-15V	8	14			
0 V	7	15			
+15V	6	16			
	5				
MUTE	3	4	10	24	30
OUT(3k3)	2	5	11	25	31
OUT	1	6	13	26	32

INPUT

Balanced, RF-filter  
 Input impedance  $R_i > 10 \text{ k}\Omega$   
 0  $\Omega$  input with jumper  
 Max. input level  $U_{in} = +24 \text{ dBu}$   
 Source impedance  $R_s \leq 200 \Omega$

OUTPUT

Max. output level  $U_{out} = +20 \text{ dBu}$   
 Output impedance pin 1  $R_{out} = 33 \Omega$   
 Load  $R_L \geq 600 \Omega$   
 Output impedance pin 2 (to a 0  $\Omega$  amp.)  $R_{out} = 3k3$



GAIN

Adjustable (see level diagram)

Max. gain

Max. attenuation

$V_{max} = +1 \text{ dB}$

$V_{min} = -30 \text{ dB}$

GENERAL

Frequency response 30Hz ... 16kHz

$\pm 0,3 \text{ dB}$

THD amplifier 30Hz ... 16kHz

THD  $\leq 80 \text{ dB}$

Noise (B 23kHz), gain -6 dB

$U_{NOISE} = -107 \text{ dBu}$

ATTENUATOR

Mute switch, with resistor programmable to an attenuator of 20 dB

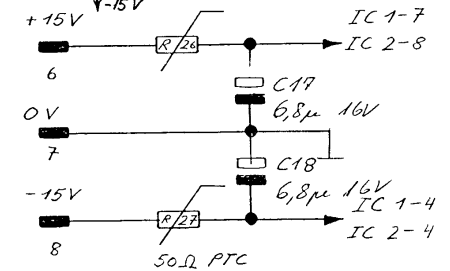
SUPPLY

Supply voltage

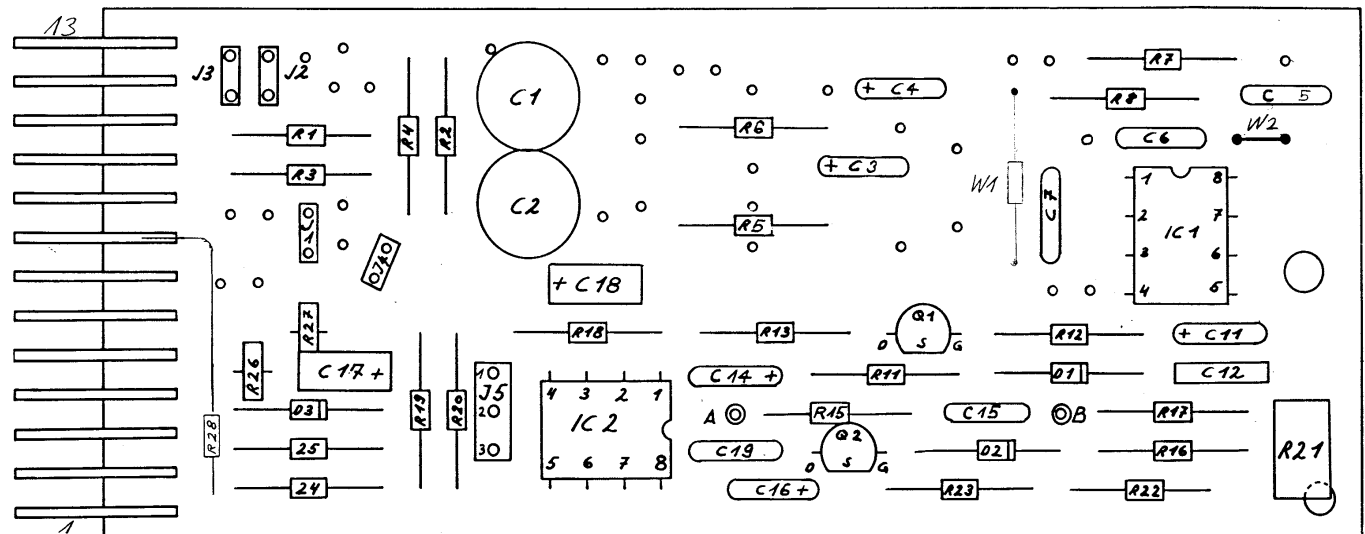
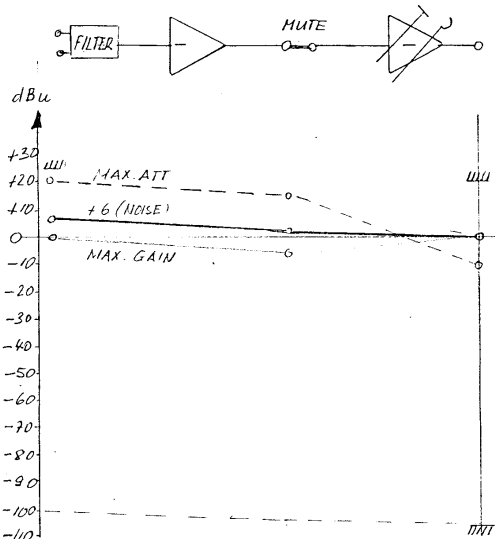
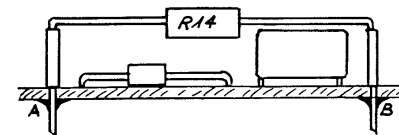
$U = \pm 15 \text{ V}$

Idle current

$I = 11 \text{ mA}$



OPTION 33k (20 dB Attenuation)





**HL Input Amp, electronically balanced 1.914.504.81 ( 1)**

Idx. Pos.	Part No.	Qty.	Type/Val.	Description	Idx. Pos.	Part No.	Qty.	Type/Val.	Description
0	C 1	59.05.1681	680p	PP, 1%, 630V					
0	C 2	59.05.1681	680p	PP, 1%, 630V					
0	C 3	59.26.0470	47u	SAL 6.3V 20%					
0	C 4	59.26.0470	47u	SAL 6.3V 20%					
0	C 5	59.34.2101	100p	CER 63V, 5%, N150					
0	C 6	59.34.2220	22p	CER 63V, 5%, N150					
0	C 7	59.34.2101	100p	CER 63V, 5%, N150					
0	C 11	59.26.0470	47u	SAL 6.3V 20%					
0	C 12	59.32.4102	1n0	CER 20%, 50V					
0	C 14	59.26.0470	47u	SAL 6.3V 20%					
0	C 15	59.06.0102	1n0	PETP, 63V, 10%, RM5					
0	C 16	59.26.0470	47u	SAL 6.3V 20%					
0	C 17	59.26.2689	6u8	SAL 16V 20%					
0	C 18	59.26.2689	6u8	SAL 16V 20%					
0	C 19	59.06.0102	1n0	PETP, 63V, 10%, 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	IC 1	50.05.0244	5534A	Single Op-amp, low noise					
0	IC 2	50.09.0106	5532A	Dual Op-Amp, low noise					
0	J 1	54.01.0021	Jumper	0.63*0.63mm, Au					
0	J 2	54.01.0021	Jumper	0.63*0.63mm, Au					
0	J 3	54.01.0021	Jumper	0.63*0.63mm, Au					
0	P 1	54.01.0273	13p	Stecker CJS parallelsteck					
0	P 2	54.01.0020	9 pcs	1p					
0	Q 1	50.03.0350	J112	JFET N-Channel					
0	Q 2	50.03.0350	J112	JFET N-Channel					
0	R 1	57.11.3152	1k5	MF, 1%, 0207					
0	R 2	57.11.3392	3k9	MF, 1%, 0207					
0	R 3	57.11.3152	1k5	MF, 1%, 0207					
0	R 4	57.11.3392	3k9	MF, 1%, 0207					
0	R 5	57.11.3104	100k	MF, 1%, 0207					
0	R 6	57.11.3104	100k	MF, 1%, 0207					
0	R 7	57.11.3332	3k3	MF, 1%, 0207					
0	R 8	57.11.3332	3k3	MF, 1%, 0207					
0	R 11	57.11.3104	100k	MF, 1%, 0207					
0	R 12	57.11.3332	3k3	MF, 1%, 0207					
0	R 13	57.11.3223	22k	MF, 1%, 0207					
0	R 14	not used	33k	MF, 1%, 0207					
				<i>optional (20 dB attenuation)</i>					
0	R 15	57.11.3104	100k	MF, 1%, 0207					
0	R 16	57.11.5106	10M	MF, 5%, 0207					
0	R 17	57.11.5335	3M3	MF, 5%, 0207					
0	R 18	57.11.5335	3M3	MF, 5%, 0207					
0	R 19	57.11.3151	150R	MF, 1%, 0207					
0	R 20	57.11.3821	820R	MF, 1%, 0207					
0	R 21	58.01.9202	2k0	Cermet, 10%, 0.5W, vertical					
0	R 22	57.11.3471	470R	MF, 1%, 0207					
0	R 23	57.11.3104	100k	MF, 1%, 0207					
0	R 24	57.11.3330	33R	MF, 1%, 0207					
0	R 25	57.11.3332	3k3	MF, 1%, 0207					
0	R 26	57.99.0206	50R	PTC, 25V, 0.5W					
0	R 27	57.99.0206	50R	PTC, 25V, 0.5W					
1	R 28	57.11.3104	100k	MF, 1%, 0207					
1	W 1	57.11.3000	0R0	MF, 0207					
1	W 2	64.01.0106	0.6mm	Schalt draht Cu					

End of List

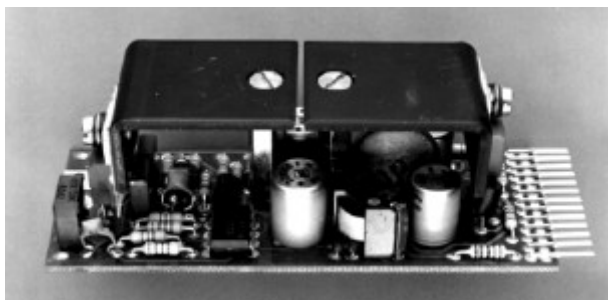
Comments:

(01) R28, W1, W2 added

## 2.1.5 Loudspeaker Amplifier

1.914.505

This low-power amplifier on a modular sub-card is designed to drive a 10...15  $\Omega$  speaker. Power output is about 2...3 W. As can be concluded from this specification, the amplifier is not intended for high-quality monitoring. It will be ideally suited, however, for pre-fader listening and similar applications. The amplifier's input is balanced and floating, with adjustable gain.



### Technical Specifications

Input impedance	> <b>10 kW</b> , balanced and floating (with transformer)
Nominal power output	<b>2 W</b> into 15 $\Omega$
Power output	<b>25 mW...2.5 W</b> into 15 $\Omega$ , with 0 dBu input
Distortion	< <b>0.5%</b> at 2 W < <b>0.15%</b> at 500 mW
S/N	<b>99 dB</b> , ref. to 2 W at max. gain
Frequency response	<b>-0.5 dB</b> at 15 kHz
High pass filter	<b>150 Hz</b> , 12 dB/oct.

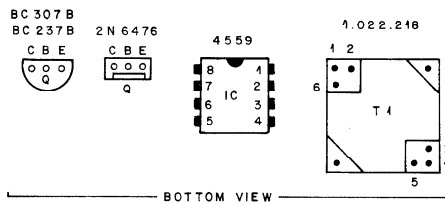
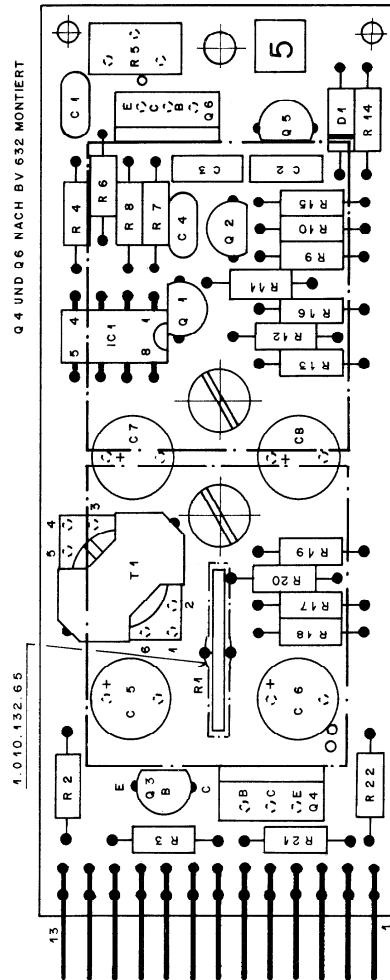
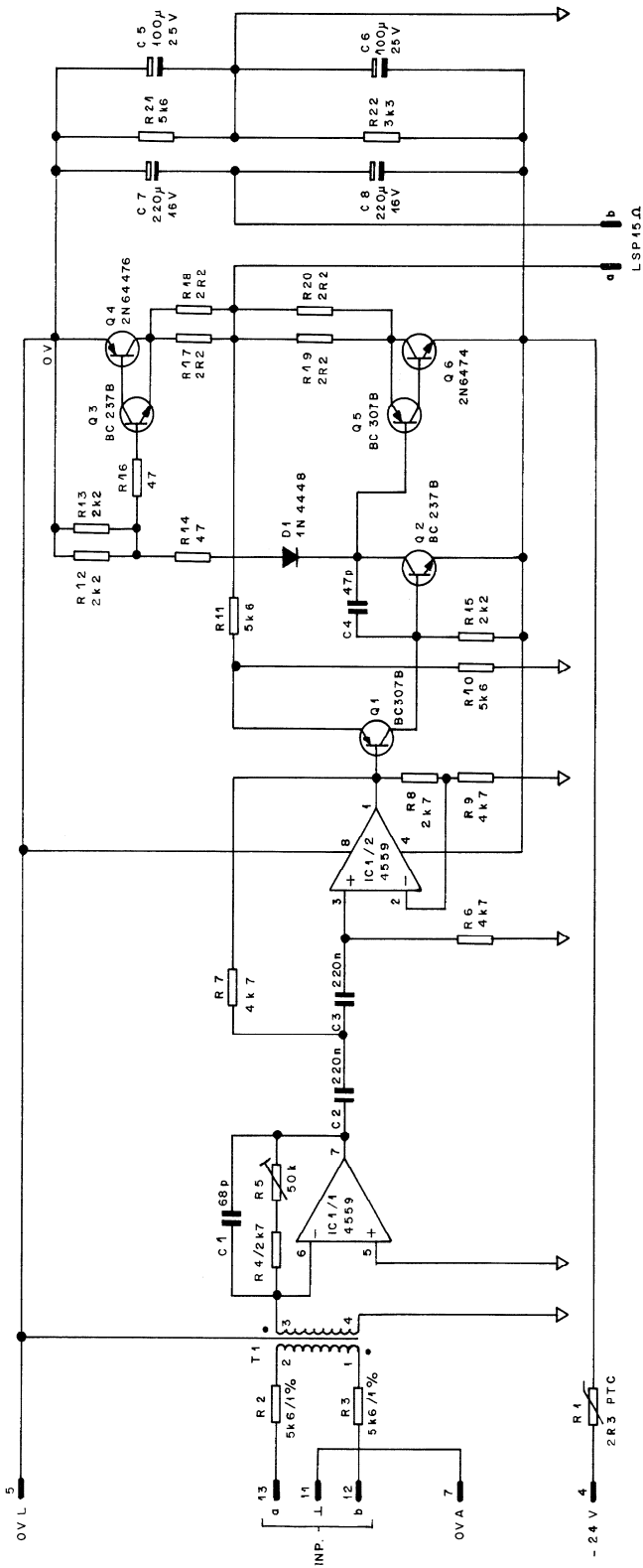
**Supply:** -24 V (40 mA idling, max. 220 mA fully driven)

**Dimensions:** **MS-card**, 34 × 85 mm

**Ordering Information:** Loudspeaker amplifier

1.914.505.xx

MSC SPEAKER AMPLIFIER



CIS	PIN	EURO 32 PIN			
		(a)	(b)	(c)	(d)
INP a	13	1	7	21	27
INP b	12	2	8	22	28
(L)	11	3	9	23	29
40	9				
8	8				
(L)	7				
6	6				
0V	5	19			
-24V	4	20			
OUT a	3	4	10	24	30
OUT b	2	5	11	25	31
1	1				

13. 9. 91			
STUDER REGENSDORF ZÜRICH	LSP AMPLIFIER 3 W (NR. 5)	1.914.505.00	

MSC SPEAKER AMPLIFIER

Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER
	C....1	59.34.4680	68pF	CER
	C....2	59.06.0224	0,22µF	PE
	C....3	59.06.0224	0,22µF	PE
Ⓞ	C....4	59.34.2470	47pF	CER
	C....5	59.22.5101	100µF 25V	EL
	C....6	59.22.5101	100µF 25V	EL
	C....7	59.22.4221	220µF 16V	EL
	C....8	59.22.4221	220µF 16V	EL
	D....1	50.04.0125	1N4448	
	IC....1	50.09.0107	RC4559	
	P....1	54.01.0273	13P	CIS
	Q....1	50.03.0515	BC307B	
	Q....2	50.03.0436	BC237B	
	Q....3	50.03.0436	BC237B	
	Q....4	50.03.0345	2N6476	
	Q....5	50.03.0515	BC307B	
	Q....6	50.03.0344	2N6474	
	R....1	57.99.0210	2,3kΩ	PTC
	R....2	57.11.3562	5,6kΩ	
	R....3	57.11.3562	5,6kΩ	
	R....4	57.11.4272	2,7kΩ	
	R....5	58.01.9503	50kΩ	PMG
	R....6	57.11.4472	4,7kΩ	
	R....7	57.11.4472	4,7kΩ	
	R....8	57.11.4272	2,7kΩ	
	R....9	57.11.4472	4,7kΩ	
	R....10	57.11.3562	5,6kΩ	
	R....11	57.11.3562	5,6kΩ	
	R....12	57.11.4222	2,2kΩ	
	R....13	57.11.4222	2,2kΩ	
	R....14	57.11.4470	47Ω	
	R....15	57.11.4222	2,2kΩ	
	R....16	57.11.4470	47Ω	
	R....17	57.11.4229	2,2Ω	
	R....18	57.11.4229	2,2Ω	
	R....19	57.11.4229	2,2Ω	
	R....20	57.11.4229	2,2Ω	
	R....21	57.11.3562	5,6kΩ	
	R....22	57.11.4332	3,3kΩ	
	T....1	1.022.218.00	1:1	

CER=Ceramic, PE=Polyester, EL=Electrolytic, PTC=Pos. Temp. Coif., PMG=Cermet

1.914.505.00 LSP AMPLIFIER 3W (Nr. 5) P. Casutt 07/09/83

1.914.505.00 LSP AMPLIFIER 3W (Nr. 5) Ⓞ A. Ho 30/11/83

END



**2.1.6 Microphone Pre-Amplifiers**

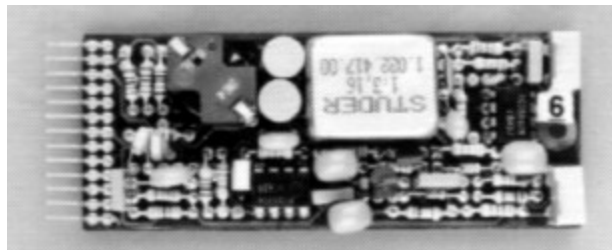
1.914.506/507

Two different microphone pre-amplifiers are available, for dynamic or condenser microphones, and for electret microphones. Both offer high gain and low noise, as is required for microphone pre-amplification.

1.914.506 features a balanced and floating input. It is designed for dynamic or condenser microphones with a source impedance of 200 Ω or less. An RF filter is incorporated at the input transformer's primary. Furthermore, the input is equipped with the resistors required for phantom powering of condenser microphones.

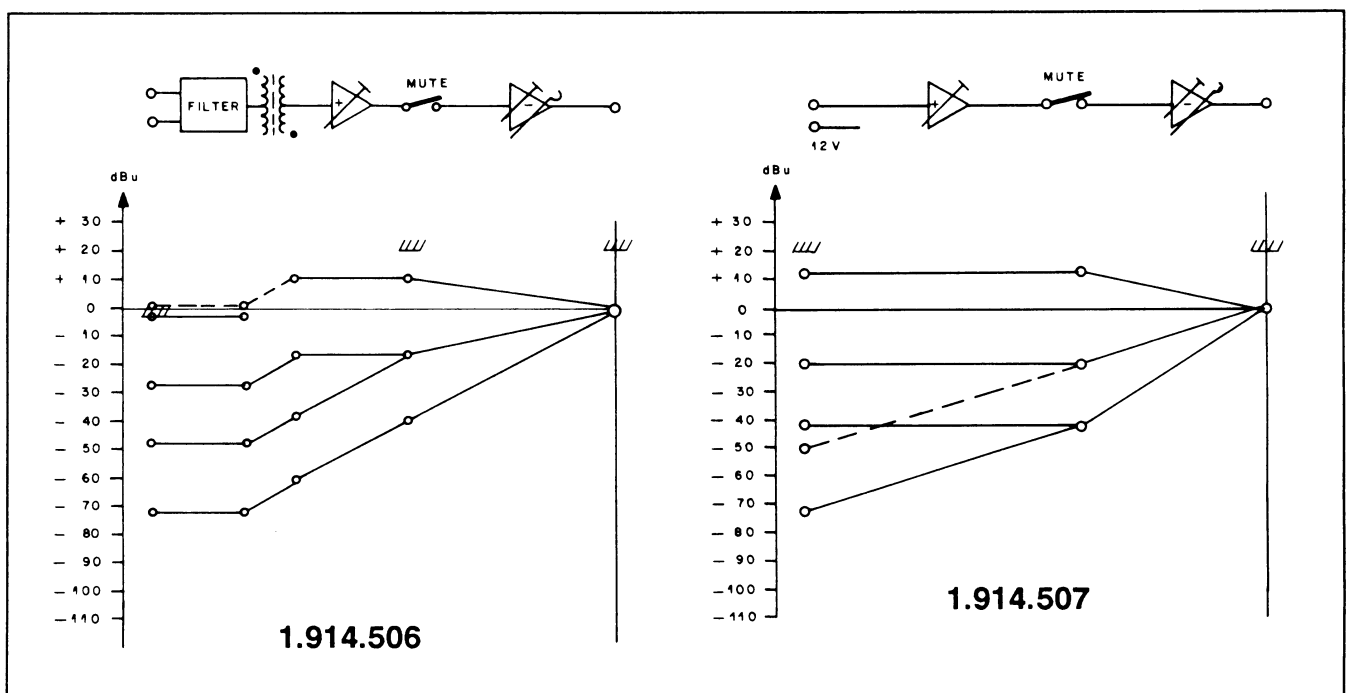
1.914.507 is designed for unbalanced electret microphones requiring a 12 V supply.

A wide range of input levels can be accommodated (see level diagram).



By using the same solid-state switching circuit as can be found in the line and high-level amplifiers, remote muting or activation of a fixed amount of attenuation are possible as well.

The amplifier's two outputs are unbalanced, with impedances of 3.3 kΩ or 33 Ω, respectively.

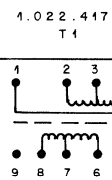
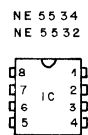
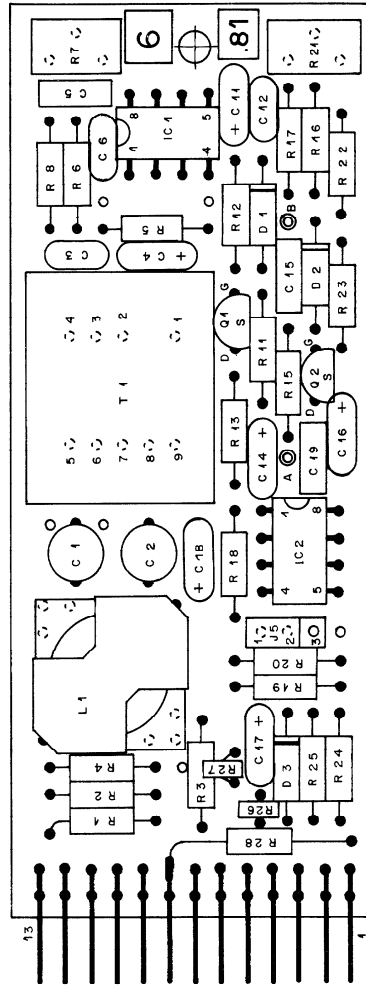
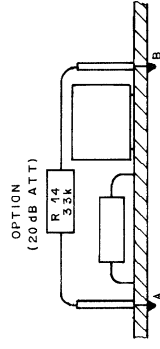
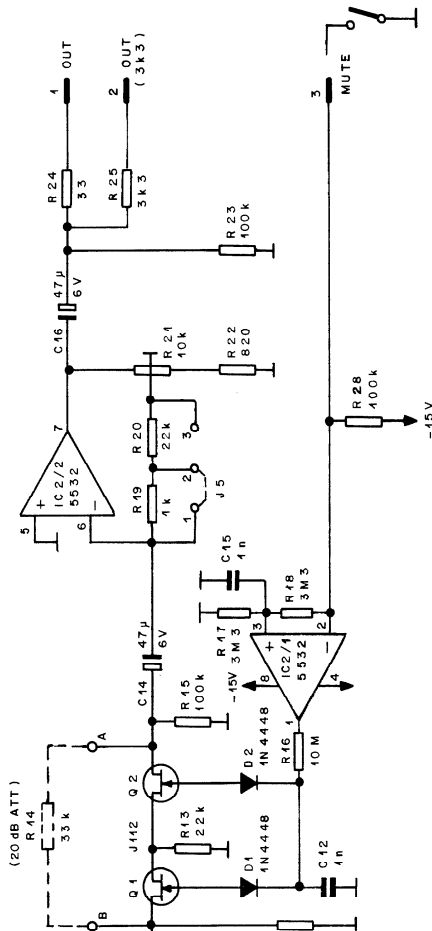


**Technical Specifications**

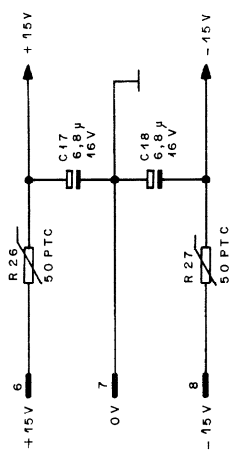
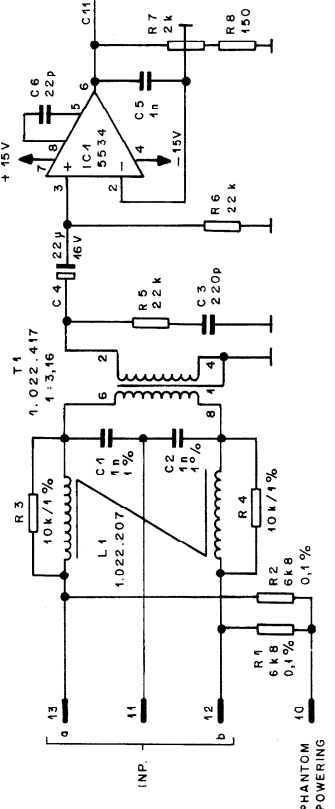
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<b>Input:</b>	Transformer-balanced and floating, with RF filter	(1.914.506)
	Unbalanced, with RF filter and electret supply	(1.914.507)
Impedance	> <b>1 kW</b> , for microphones with an impedance of 200 $\Omega$ or less.	
Max. input level	-2 <b>dBu</b> (615 mV <sub>rms</sub> ); THD at 30 Hz: approx. 1%	
Common mode rejection	> <b>60 dB</b> , unbalanced, to ground	
<b>Output:</b>	Max. level	+20 <b>dBu</b> (7.75 V <sub>rms</sub> )
	Nominal level	0 <b>dBu</b> (0.775 V <sub>rms</sub> )
	Impedance	33 <b>W</b> (pin1)
		3.3 <b>kW</b> (pin2; to a 0- $\Omega$ amp.)
	Minimum load	600 <b>W</b>
	Max. gain	71 <b>dB</b> (see level diagram)
Frequency response	$\pm$ 0.5 <b>dB</b> , 30 Hz...16 kHz	
THD	< 0.3%, 30 Hz...16 kHz at 20 dB gain	
Noise figure, linear	< 4.5 <b>dB</b> , input terminated with 200 $\Omega$	
<b>Supply:</b>	$\pm$ 15 <b>V</b> (11 mA idling)	
	+48 <b>V</b> (1.914.506, only if phantom powering required)	
<b>Dimensions:</b>	<b>MS-card</b> , 34 $\times$ 85 mm	
<b>Ordering Information:</b>	<ul style="list-style-type: none"><li>• Microphone pre-amplifier for dynamic microphones</li><li>• Microphone pre-amplifier for electret microphones</li></ul>	1.914.506.xx 1.914.507.xx

MSC MICROPHONE PRE-AMP.



BOTTOM VIEW



CIS	PIN	EURO 32 PIN			
		(A)	(B)	(C)	(D)
IN a	13	4	7	24	27
IN b	12	2	8	22	28
IN L	11	3	9	23	29
PHANTOM	10	17	18	18	18
	9				
-15V	8	14			
0V	7	15			
+15V	6	16			
	5				
	4				
MUTE	3	4	10	24	30
OUT (3k3)	2	5	11	25	31
OUT	1	6	13	26	32

## MICROPHONE PRE-AMP. MSC

Ad	POS.	REF.No.	DESCRIPTION			MANUFACTURER
C	...	1	59.05.1102	1000pF	630V 1%	PP
C	...	2	59.05.1102	1000pF	630V 1%	PP
C	...	3	59.34.4221	220pF		CER
C	...	4	59.30.4220	22pF	16V	TA
C	...	5	59.06.0102	1000pF		PE
C	...	6	59.34.2220	22pF		CER
C	...	11	59.26.0470	47pF	6,3V	SAL
C	...	12	59.32.4102	1000pF		CER
C	...	13				
C	...	14	59.26.0470	47pF	6,3V	SAL
C	...	15	59.06.0102	1000pF		PE
C	...	16	59.26.0470	47pF	6,3V	SAL
C	...	17	59.26.2689	6,8pF	16V	SAL
C	...	18	59.26.2689	6,8pF	16V	SAL
C	...	19	59.06.0102	1000pF		PE
D	...	1	50.04.0125	1N4448		
D	...	2	50.04.0125	1N4448		
D	...	3	50.04.0125	1N4448		
IC	...	1	50.05.0244	NES534AN	LOW NOISE OP AMP	SIG
IC	...	2	50.09.0106	NES532AN	DUAL LOW NOISE OP AMP	SIG
J	...	5	54.01.0021		JUMPER	
L	...	1	1.022.207.00		HF SYM. COIL	ST
P			54.01.0273	13PIN	CIS	
P (J5)			54.01.0020	PIN	JUMPER PLUG	
Q	...	1	50.03.0350	J112	N	N-FET
Q	...	2	50.03.0350	J112	N	N-FET
R	...	1	57.99.0250	6,8kΩ	0,1%	
R	...	2	57.99.0250	6,8kΩ	0,1%	
R	...	3	57.11.3103	10kΩ	1%	
R	...	4	57.11.3103	10kΩ	1%	
R	...	5	57.11.4123	12kΩ		
R	...	6	57.11.4223	22kΩ		
R	...	7	58.01.9202	2kΩ	POT	
R	...	8	57.11.4151	150		
R	...	11	57.11.4104	100kΩ		
R	...	12	57.11.4332	3,3kΩ		
R	...	13	57.11.4223	22kΩ		
R	...	14	57.11.4333	33kΩ	OPTIONAL (20dB ATT)	
R	...	15	57.11.4104	100kΩ		
R	...	16	57.11.5106	10MΩ		
R	...	17	57.11.5335	3,3MΩ	5%	
R	...	18	57.11.5335	3,3MΩ	5%	
R	...	19	57.11.4102	1kΩ		
R	...	20	57.11.4223	22kΩ		
R	...	21	58.01.9103	10kΩ	POT	
R	...	22	57.11.4821	820Ω		
R	...	23	57.11.4104	100kΩ		
R	...	24	57.11.4330	33Ω		
R	...	25	57.11.4332	3,3kΩ		
R	...	26	57.99.0206	50Ω	PTC	PH
R	...	27	57.99.0206	50Ω	PTC	PH
R	...	28	57.11.4104	100kΩ		
T	...	1	1.022.417.00	1:3,16	TRAFO	ST

CER=Ceramic, PE=Polystyrene, SAL=Solid Aluminium, PP=Polypropylen, TA=Tantalum

MANUFACTURER: ST=Studer, SIG=Signetics, PH=Philips

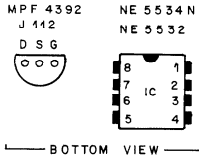
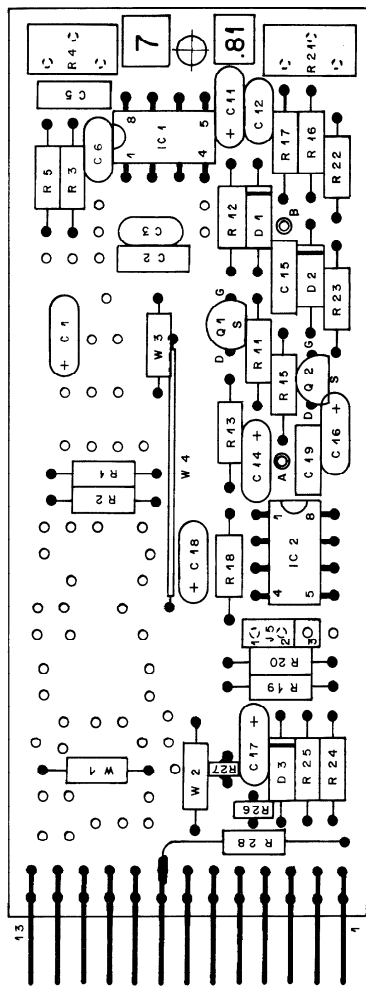
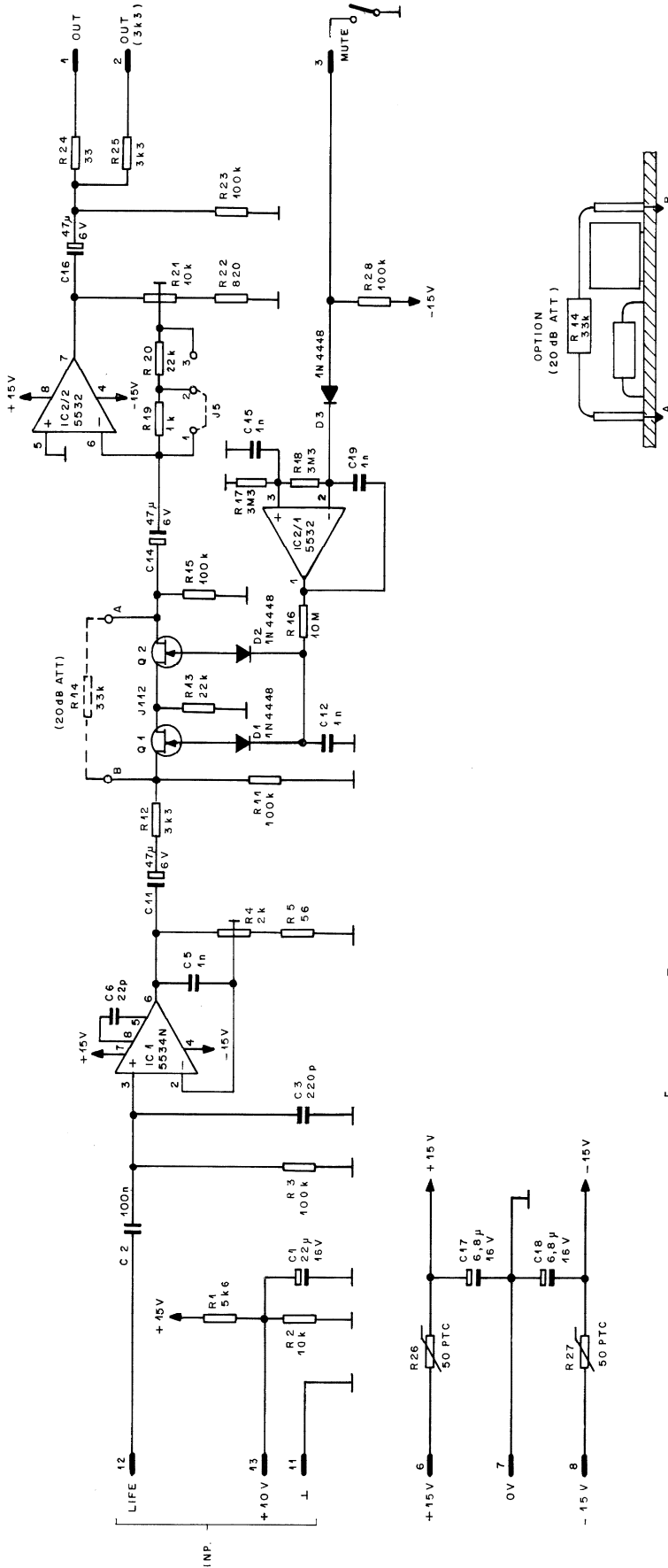
1.914.506.81 MIC. AMPLIFIER, FLOATING (Nr. 6)

FRI 19/04/85

END

→





C15	PIN	EURO 32 PIN			
		(a)	(b)	(c)	(d)
+ 10 V	13	1	7	21	27
IN	12	2	8	22	28
IN L	11	3	9	23	29
	10				
	9				
- 15 V	8	14			
0 V	7	15			
+ 45 V	6	16			
	5				
	4				
MUTE	3	4	10	24	30
OUT(3k3)	2	5	11	25	31
OUT	1	6	13	26	32

12.9.91			
STUDER REGENSDORF ZÜRICH	ELECTRET MIC. AMP. (NR. 7)	1.914.507.81	

## MICROPHONE PRE-AMP. MSC

Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER
C....1		59.30.4220	22 $\mu$ F 16V	TA
C....2		59.06.5104	0,1 $\mu$ F 63V	PE
C....3		59.34.4221	220pF	CER
C....5		59.06.0102	1000pF	PE
C....6		59.34.2220	22pF	CER
C....11		59.26.0470	47 $\mu$ F 6,3V	SAL
C....12		59.32.4102	1000p	CER
C....13				
C....14		59.26.0470	47 $\mu$ F 6,3V	SAL
C....15		59.06.0102	1000pF	PE
C....16		59.26.0470	47 $\mu$ F 6,3V	SAL
C....17		59.26.2689	6,8 $\mu$ F 16V	SAL
C....18		59.26.2689	6,8 $\mu$ F 16V	SAL
C....19		59.06.0102	1000pF	PE
D....1		50.04.0125	1N4448	
D....2		50.04.0125	1N4448	
① D....3		50.04.0125	1N4448	
IC....1		50.05.0244	NE5534AN	LOW NOISE OP AMP
IC....2		50.09.0106	NE5532AN	DUAL LOW NOISE OP AMP
J....5		54.01.0021		JUMPER
P		54.01.0273	13PIN	CIS
P (J5)		54.01.0020	PIN	JUMPER PLUG
Q....1		50.03.0350	J112	N-FET
Q....2		50.03.0350	J112	N-FET
R....1		57.11.4562	5,6k $\Omega$	
R....2		57.11.4103	10k $\Omega$	
R....3		57.11.4104	100k $\Omega$	
R....4		58.01.9202	2k $\Omega$	POT
R....5		57.11.4560	56 $\Omega$	
R....11		57.11.4104	100k $\Omega$	
R....12		57.11.4332	3,3k $\Omega$	
R....13		57.11.4223	22k $\Omega$	
R....14		57.11.4333	33k $\Omega$	OPTIONAL (20dB ATT)
R....15		57.11.4104	100k $\Omega$	
R....16		57.11.5106	10M $\Omega$	
R....17		57.11.5335	3,3M $\Omega$	5%
R....18		57.11.5335	3,3M $\Omega$	5%
R....19		57.11.4102	1k $\Omega$	
R....20		57.11.4223	22k $\Omega$	
R....21		58.01.9103	10k $\Omega$	POT
R....22		57.11.4821	820 $\Omega$	
R....23		57.11.4104	100k $\Omega$	
R....24		57.11.4330	33 $\Omega$	
R....25		57.11.4332	3,3k $\Omega$	
R....26		57.99.0206	50 $\Omega$	PTC
R....27		57.99.0206	50 $\Omega$	PTC
R....28		57.11.4104	100k $\Omega$	
① W....1		57.11.4000	0 $\Omega$	LINK
① W....2		57.11.4000	0 $\Omega$	LINK
① W....3		57.11.4000	0 $\Omega$	LINK
① W....4				WIRE

CER=Ceramic, PE=Polystyrene, SAL=Solid Aluminium, TA=Tantalum

MANUFACTURER: SIG=Signetics, PH=Philips

1.914.507.81 ELECTRET MIC AMP (Nr. 7)

FRI 19/04/85

1.914.507.81 ELECTRET MIC AMP (Nr. 7)

① FRI 14/10/85

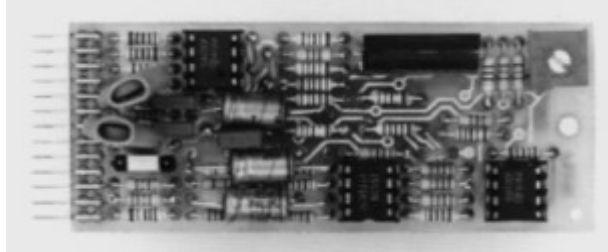
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**2.1.7 VCA with Electronically Balanced Connections**

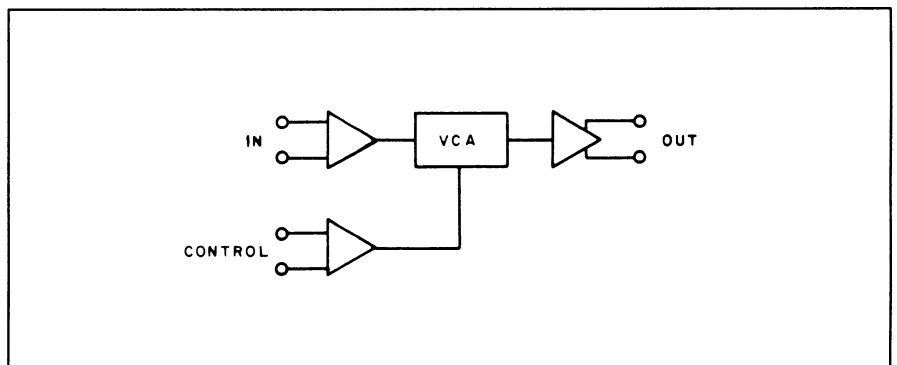
1.914.515

In contrast to the VCA 1.914.518/528 (chapter 2.1.8), this assembly features an electronically balanced input and output.



It is intended for use in balanced audio systems for a variety of applications, especially when gain is to be controlled from a remote point. It will be useful in audio-video post-production work where suitable DC ramps can control cross-fades, voice-overs, etc. Its high overload margin and its exceptionally low noise and distortion performance make it the perfect choice for high-quality audio applications.

By connecting the gain control terminals of a number of VCAs to a common potentiometer or fader, several audio channels may thus be controlled simultaneously.

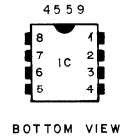
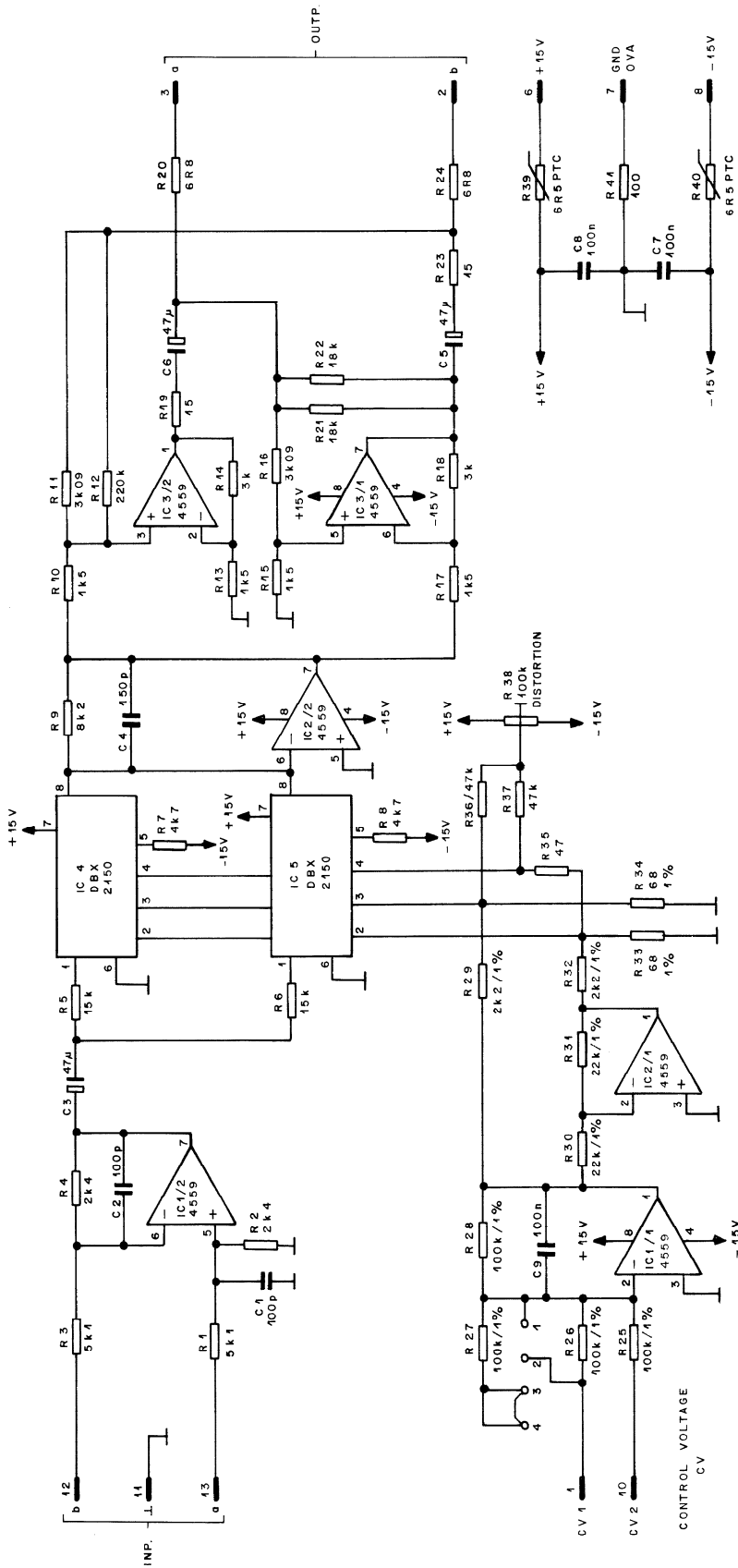


Two control inputs provide VCA gain control from two different remote points

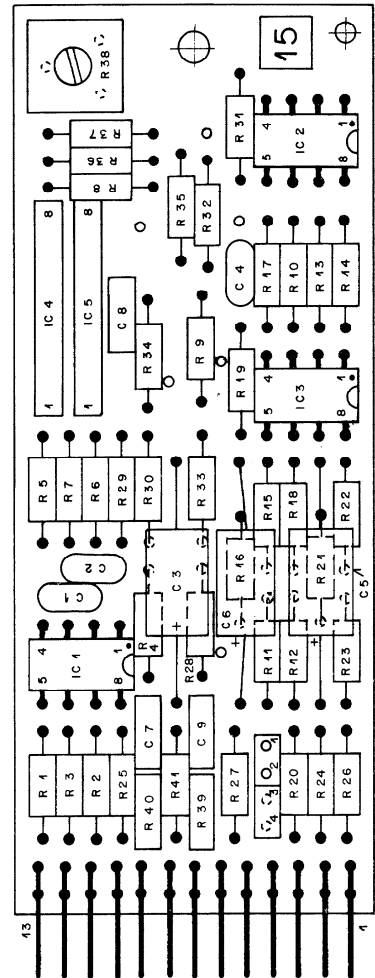
**Technical Specifications**

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<b>Input:</b>	Impedance	<b>≈ 10 kW</b> , electronically balanced
	Clipping point	<b>+24 dBu</b>
<b>Output:</b>		Electronically balanced
	Recommended load	<b>≈ 2 kW</b>
	Maximum level	<b>+24 dBu</b>
	Frequency response	<b>-0.5 dB</b> , 30 Hz...15 kHz
	Gain/attenuation range	<b>+40...-100 dB</b> , with ext. control
	Control input: pin1; gain tracking	<b>0 V = unity gain;</b> <b>1 dB/μA</b> ; jumper 1-2 <b>20 dB/V</b> ; jumper 2-3 <b>10 dB/V</b> ; jumper 3-4
	Control input: pin10; gain tracking	<b>10 dB/V</b>
	THD	<b>&lt; 0.1%</b>
	Equivalent input noise	<b>-93 dBu @ unity gain</b>
<b>Supply:</b>		<b>±15 V (25 mA)</b>
<b>Dimensions:</b>		<b>MS-card</b> , 34 × 85 mm
<b>Ordering Information:</b>	VCA with electronically balanced input and output	1.914.515.xx



CIS	PIN	EURO 32 PIN			
		(a)	(b)	(c)	(d)
INP a	13	1	7	24	27
INP b	12	2	8	22	28
+	11	3	9	23	29
CV 2	10	17	17	18	18
-15V	7	14			
OVA	7	45			
+15V	6	16			
	5				
	4				
OUT a	3	4	10	24	30
OUT b	2	5	11	25	31
CV 1	1	6	13	26	32



© 17.9.94			
STUDER REGENSDORF ZURICH	BAL. AMP. WITH VCA	1.914.515.00	

MSC VCA

Ad ..POS... ..REF.No... DESCRIPTION.....MANUFACTURER

C.....1	59.34.4101	100 pF		CER	
C.....2	59.34.4101	100 pF		CER	
C.....3	59.25.3470	47 pF		ALU	
C.....4	59.34.4151	150 pF		CER	
C.....5	59.25.3470	47 pF		ALU	
C.....6	59.25.3470	47 pF		ALU	
C.....7	59.06.5104	100 nF		PE	
C.....8	59.06.5104	100 nF		PE	
C.....9	59.06.5104	100 nF		PE	
JS....1	54.01.0020		JUMPER PLUG 4-PIN		
JP....1	54.01.0021		JUMPER JACK		
IC....1	50.09.0107	RC4559	dual op. amp.		Ra, NE
IC....2	50.09.0107	RC4559	dual op. amp.		Ra, NE
IC....3	50.09.0107	RC4559	dual op. amp.		Ra, NE
IC....4	50.11.0140	2150A	VCA		DBX
IC....5	50.11.0140	2150A	VCA		DBX
P.....1	54.01.0273	13 PIN		CIS	
R.....1	57.11.3512	5.1 kOhm	1% 0.25W	MF	
R.....2	57.11.3242	2.4 kOhm	1% 0.25W	MF	
R.....3	57.11.3512	5.1 kOhm	1% 0.25W	MF	
R.....4	57.11.3242	2.4 kOhm	1% 0.25W	MF	
R.....5	57.11.3153	15 kOhm	1% 0.25W	MF	
R.....6	57.11.3153	15 kOhm	1% 0.25W	MF	
R.....7	57.11.4472	4.7 kOhm	5% 0.25W	MF	
R.....8	57.11.4472	4.7 kOhm	5% 0.25W	MF	
R.....9	57.11.3822	8.2 kOhm	1% 0.25W	MF	
R.....10	57.11.3152	1.5 kOhm	1% 0.25W	MF	
R.....11	57.39.3091	3.09kOhm	1% 0.25W	MF	
R.....12	57.11.4224	220 kOhm	2% 0.25W	MF	
R.....13	57.11.3152	1.5 kOhm	1% 0.25W	MF	
R.....14	57.11.3302	3.0 kOhm	1% 0.25W	MF	
R.....15	57.11.3152	1.5 kOhm	1% 0.25W	MF	
R.....16	57.39.3091	3.09kOhm	1% 0.25W	MF	
R.....17	57.11.3152	1.5 kOhm	1% 0.25W	MF	
R.....18	57.11.3302	3.0 kOhm	1% 0.25W	MF	
R.....19	57.11.3150	15 Ohm	1% 0.25W	MF	
R.....20	57.11.3689	6.8 Ohm	1% 0.25W	MF	
R....21	57.11.3183	18 kOhm	1% 0.25W	MF	
R....22	57.11.3183	18 kOhm	1% 0.25W	MF	
R....23	57.11.3150	15 Ohm	1% 0.25W	MF	
R....24	57.11.3689	6.8 Ohm	2% 0.25W	MF	
R....25	57.11.3104	100 kOhm	1% 0.25W	MF	
R....26	57.11.3104	100 kOhm	1% 0.25W	MF	
R....27	57.11.3104	100 kOhm	1% 0.25W	MF	
R....28	57.11.3104	100 kOhm	1% 0.25W	MF	
R....29	57.11.3222	2.2 kOhm	1% 0.25W	MF	
R....30	57.11.3223	22 kOhm	1% 0.25W	MF	
R....31	57.11.3223	22 kOhm	1% 0.25W	MF	
R....32	57.11.3222	2.2 kOhm	1% 0.25W	MF	
R....33	57.11.3680	68 Ohm	1% 0.25W	MF	
R....34	57.11.3680	68 Ohm	1% 0.25W	MF	
R....35	57.11.4470	47 Ohm	2% 0.25W	MF	
R....36	57.11.4473	47 kOhm	2% 0.25W	MF	
R....37	57.11.4473	47 kOhm	2% 0.25W	MF	
R....38	58.01.8104	100 kOhm	10% 0.5 W	PMG trimming resistor	
R....39	57.92.1271	6.5 Ohm		PTC Philips Nr.2322 662 12711	
01 R....39	57.92.7013	0.75 Ohm	I-Hold 0.5A	R-PTC	
R....40	57.92.1271	6.5 Ohm		PTC Philips Nr.2322 662 12711	
01 R....40	57.92.7013	0.75 Ohm	I-Hold 0.5A	R-PTC	
R....41	57.11.4101	100 Ohm	2% 0.25W	MF	

(01) 89/11/02 - Improvement of distance PTC - R

CER=Ceramic, PE=Polyester, SAL=Solid Aluminium  
MF=Metal Film, PMG=Cermet

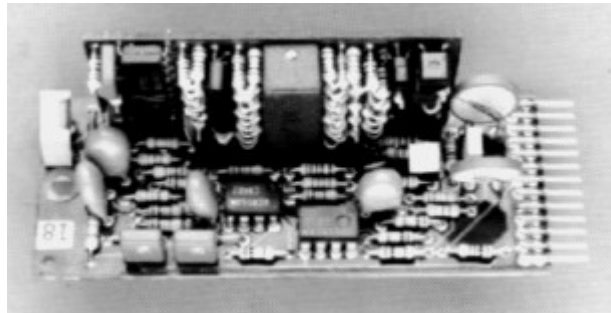
MANUFACTURER: Ex=Exar, NE=NEC, Ph=Philips, Ra=Raytheon,  
Sig=Signetics, St=Studer,

1.914.515.00 BAL AMP WITH VCA SE 87/07/0100  
1.914.515.00 BAL AMP WITH VCA TA 89/11/0201

**2.1.8 VCA with 1 or 3 Control Ports**

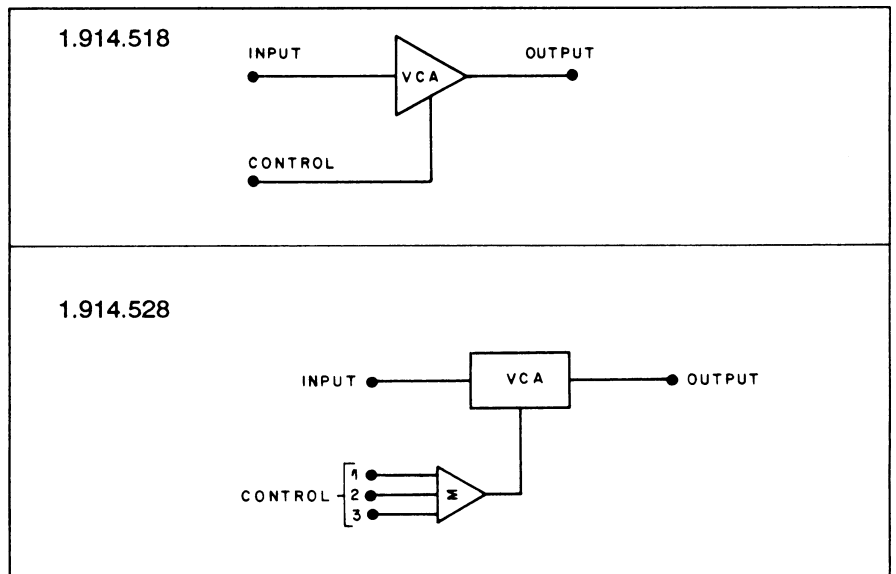
1.914.518/528

Within the range of modular sub-cards, two more VCAs are available. Voltage controlled amplifiers are ideally suited for applications such as remote level control, level limiting (in combination with the voltage processor 1.914.519) or for automatic “voice-over” circuits, when driven by suitable ramp generators. These VCAs offer outstandingly low noise and harmonic distortion.



For best performance, they should be operated at a level of 0 dBu. Gain pre-selection is possible on the 1.914.518 version, allowing gain/attenuation ranges either from +10 to -90 dB or from +40 to -70 dB, using an external potentiometer.

The 1.914.528 VCA card differs in that it is equipped with three external control inputs, providing gain control from three different locations.

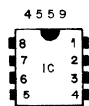
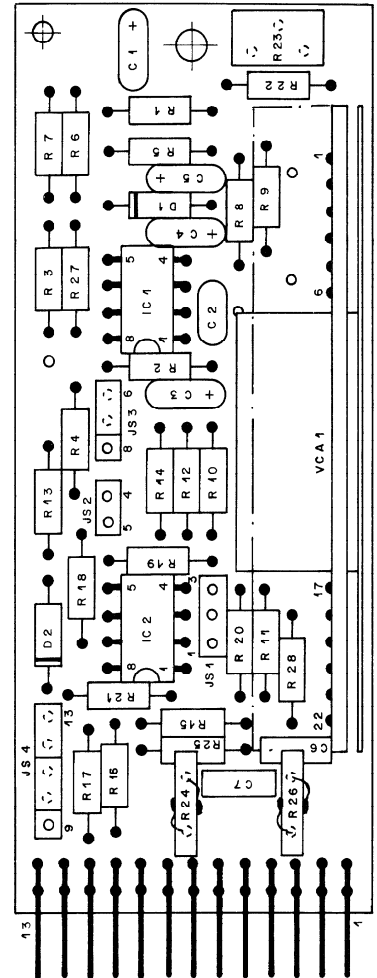
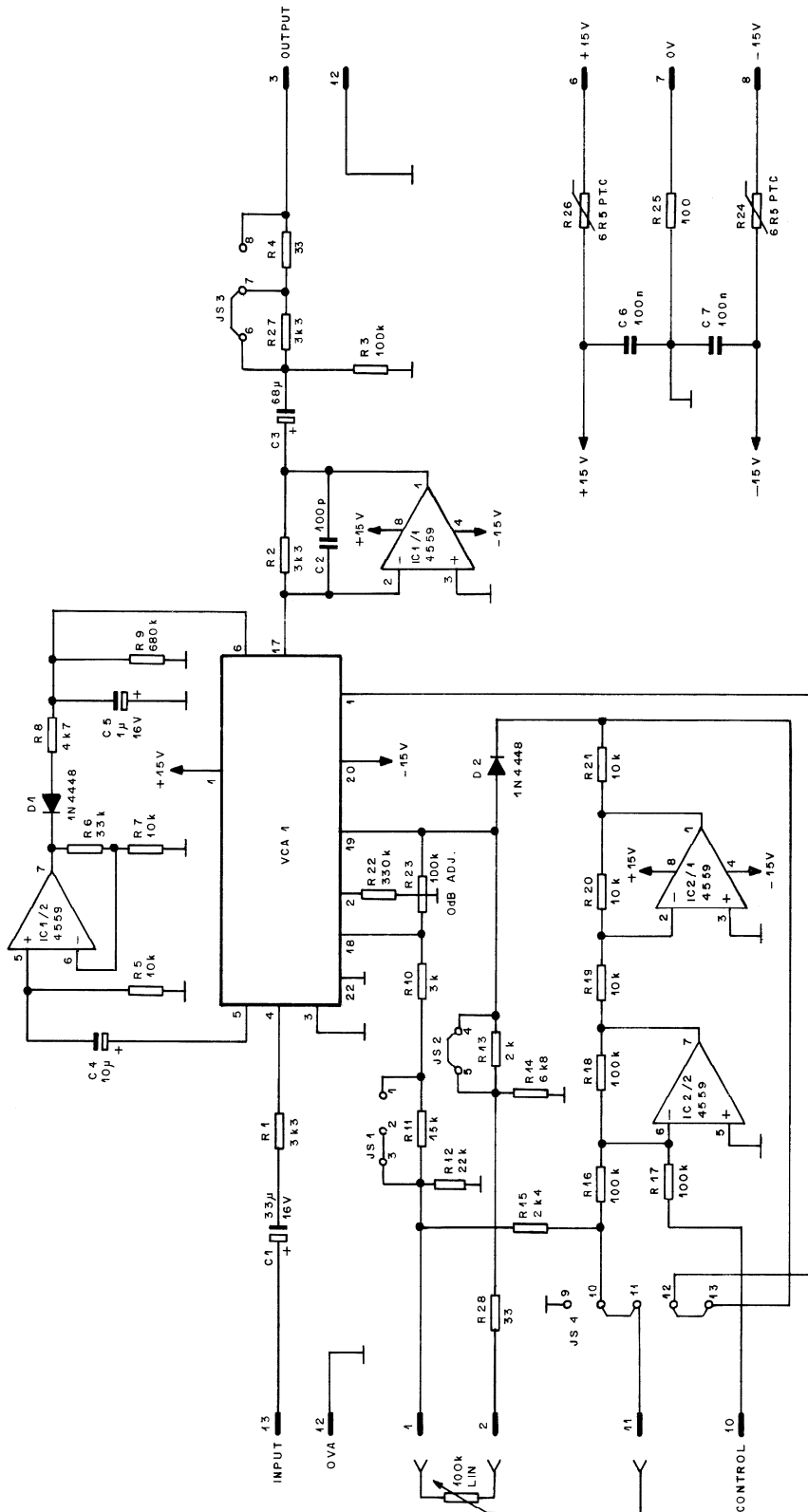


**Technical Specifications**

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<b>Input:</b>	Impedance	> <b>3 kW</b>	
	Clipping point	<b>+20 dBu</b>	
<b>Output:</b>	Impedance	<b>33 W or 3.3 kW</b> , selectable	
	Max. level	<b>+20 dBu</b>	
	Recommended load	<b>≈ 2 kW</b>	
	Frequency response	<b>-0.5 dB</b> , 30 Hz...16 kHz	
	External gain control	<b>+40...-90 dB</b> (1.914.518.xx) <b>+40...-100 dB</b> (1.914.528.xx)	
Gain/attenuation range (pot. meter)		<b>+40...-60 dB / +10...-70 dB / +10...-90 dB</b> (1.914.518.xx only, jumper-selectable)	
	Gain tracking	<b>10 dB/V</b>	
	THD	<b>&lt; 0.1%</b>	
	Equivalent input noise	<b>-102 dBu</b>	
<b>Supply:</b>		<b>±15 V</b> (40 mA)	
<b>Dimensions:</b>		<b>MS-card</b> , 34 × 85 mm	
<b>Ordering Information:</b>	Voltage controlled amplifier with 1 control port		1.914.518.xx
	Voltage controlled amplifier with 3 control ports		1.914.528.xx





BOTTOM VIEW

CIS	PIN			
	①	②	③	④
INPUT	13	1	7	21
L(INP./OUTP.)	12	2	8	22
LIN POT TAP	11	3	9	23
LEVEL CONTR.	10	17	17	48
	9			
-15V	8	14		
0V	7	15		
+15V	6	16		
	5			
	4			
OUTPUT	3	4	10	24
LIN POT 100k	2	5	11	25
LIN POT 100k	1	6	13	26

① 17.9.91			
STUDER REGENSDORF ZÜRICH	VCA UNIT		1.914.518.81

MSC VCA

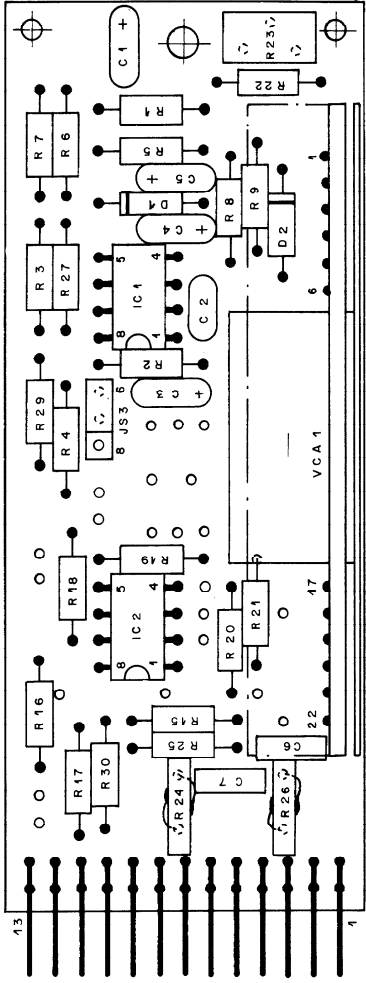
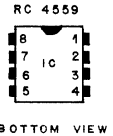
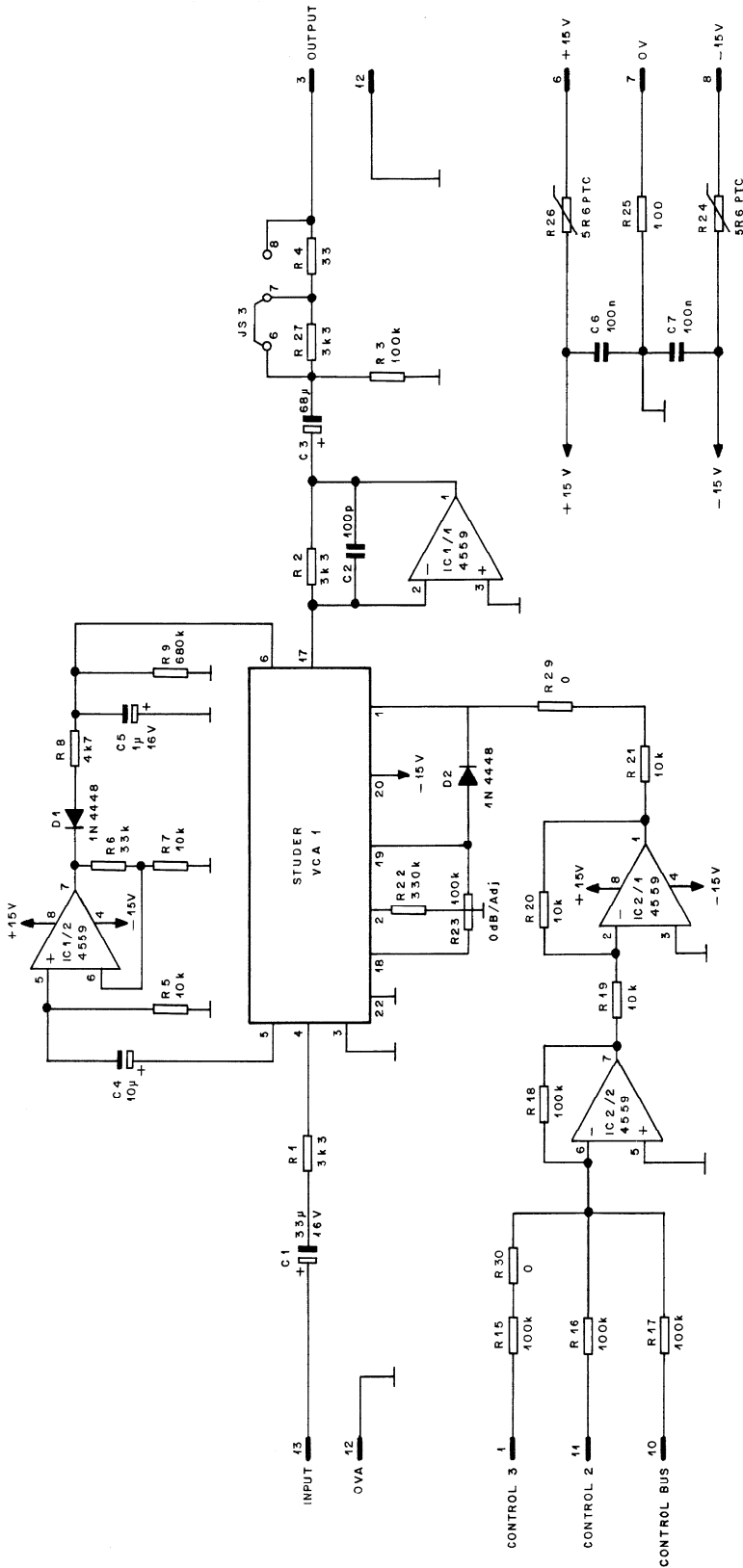
Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER
	A....1	1.010.110.50	Studer VCA	St
01	A....1	1.911.290.00	VCA-BOARD	St
02	A....1	1.911.290.81	VCA BOARD	St
	C....1	59.26.1330	33 uF	SAL
	C....2	59.34.4101	100 pF	CER
	C....3	59.26.0680	68 uF	SAL
	C....4	59.26.2100	10 uF	SAL
	C....5	59.26.9109	1 uF	SAL
	C....6	59.06.5104	100 nF	PE
	C....7	59.06.5104	100 nF	PE
	D....1	50.04.0125	1N4448	any
	D....2	50.04.0125	1N4448	any
	JS....1	54.01.0020	JUMPER PLUG 3-PIN	
	JS....2	54.01.0020	JUMPER PLUG 2-PIN	
	JS....3	54.01.0020	JUMPER PLUG 3-PIN	
	JS....4	54.01.0020	JUMPER PLUG 5-PIN	
	JP....1	54.01.0021	JUMPER JACK	
	JP....2	54.01.0021	JUMPER JACK	
	JP....3	54.01.0021	JUMPER JACK	
	JP....4	54.01.0021	JUMPER JACK	
	IC....1	50.09.0107	RC4559	dual op. amp. Ra,NE
	IC....2	50.09.0107	RC4559	dual op. amp. Ra,NE
	P....1	54.01.0273	13 PIN	CIS
	R....1	57.11.4332	3.3 kOhm	5% 0.25W MF
	R....2	57.11.4332	3.3 kOhm	5% 0.25W MF
	R....3	57.11.4104	100 kOhm	5% 0.25W MF
	R....4	57.11.4330	33 Ohm	5% 0.25W MF
	R....5	57.11.4103	10 kOhm	5% 0.25W MF
	R....6	57.11.4333	33 kOhm	5% 0.25W MF
	R....7	57.11.4103	10 kOhm	5% 0.25W MF
	R....8	57.11.4472	4.7 kOhm	5% 0.25W MF
	R....9	57.11.4684	680 kOhm	5% 0.25W MF
	R....10	57.11.3302	3.0 kOhm	2% 0.25W MF
	R....11	57.11.4153	15 kOhm	2% 0.25W MF
	R....12	57.11.3242	2.4 kOhm	2% 0.25W MF
	R....13	57.11.3202	2 kOhm	2% 0.25W MF
	R....14	57.11.4682	6.8 kOhm	5% 0.25W MF
	R....15	57.11.4223	22 kOhm	5% 0.25W MF
	R....16	57.11.4104	100 kOhm	2% 0.25W MF
	R....17	57.11.4104	100 kOhm	2% 0.25W MF
	R....18	57.11.4104	100 kOhm	2% 0.25W MF
	R....19	57.11.4103	10 kOhm	2% 0.25W MF
	R....20	57.11.4103	10 kOhm	2% 0.25W MF
	R....21	57.11.4103	10 kOhm	5% 0.25W MF
	R....22	57.11.4334	330 kOhm	5% 0.25W MF
	R....23	58.01.9104	100 kOhm	10% 0.5 W PMG trimming resistor
	R....24	57.92.1271	6.5 Ohm	PTC Philips Nr.2322 662 12711
	R....25	57.11.4101	100 Ohm	5% 0.25W MF
	R....26	57.92.1271	6.5 Ohm	PTC Philips Nr.2322 662 12711
	R....27	57.11.4332	3.3 kOhm	5% 0.25W MF
	R....28	57.11.4330	33 Ohm	5% 0.25W MF

- (1) 89/01/13 A1 VCA 1.010.110.50 replaced by 1.911.290.00
- (2) 90/01/17 A1 VCA 1.911.290.00 replaced by 1.911.290.81

CER=Ceramic, PE=Polyester, SAL=Solid Aluminium Lacquard  
 MF=Metal Film, PMG=Cermet

MANUFACTURER: Ex=Exar, NE=NEC, Ph=Philips, Ra=Raytheon,  
 Sig=Signetics, St=Studer,

1.914.518.81	VCA UNIT	SE 86/11/0500
1.914.518.81	VCA UNIT	SE 89/01/1301
1.914.518.81	VCA UNIT	WY 90/01/1702



CIS	PIN	EURO 32 PIN			
		(a)	(b)	(c)	(d)
INPUT	13	1	7	21	27
IN / OUT	12	2	8	22	28
CONTROL 2	11	3	9	23	29
CONTROL BUS	40	17	17	18	18
-15V	9				
0V	8	14			
+15V	7	15			
	6	16			
	5				
	4				
OUTPUT	3	4	10	24	30
	2	5	11	25	31
CONTROL 3	1	6	13	26	32

<p>STUDER REGENSDORF ZÜRICH</p>	VCA UNIT / 3 CONTROL	1.914.528.00
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VCA MSC

Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER
A....1	1.010.110.50		Studer VCA	St
01 A....1	1.911.290.00		VCA-BOARD	St
02 A....1	1.911.290.81		VCA-BOARD	St
C....1	59.26.1330	33 uF	SAL	
C....2	59.34.4101	100 pF	CER	
C....3	59.26.0680	68 uF	SAL	
C....4	59.26.2100	10 uF	SAL	
C....5	59.26.9109	1 uF	SAL	
C....6	59.06.5104	100 nF	PE	
C....7	59.06.5104	100 nF	PE	
D....1	50.04.0125	1N4448		any
D....2	50.04.0125	1N4448		any
JS...3	54.01.0020		JUMPER PLUG 3-PIN	
JP...1	54.01.0021		JUMPER JACK	
IC...1	50.09.0107	RC4559	dual op. amp.	Ra,NE
IC...2	50.09.0107	RC4559	dual op. amp.	Ra,NE
P....1	54.01.0273	13 PIN	CIS	
R....1	57.11.4332	3.3 kOhm	5% 0.25W MF	
R....2	57.11.4332	3.3 kOhm	5% 0.25W MF	
R....3	57.11.4104	100 kOhm	5% 0.25W MF	
R....4	57.11.4330	33 Ohm	5% 0.25W MF	
R....5	57.11.4103	10 kOhm	5% 0.25W MF	
R....6	57.11.4333	33 kOhm	5% 0.25W MF	
R....7	57.11.4103	10 kOhm	5% 0.25W MF	
R....8	57.11.4472	4.7 kOhm	5% 0.25W MF	
R....9	57.11.4684	680 kOhm	5% 0.25W MF	
R...15	57.11.4104	100 kOhm	2% 0.25W MF	
R...16	57.11.4104	100 kOhm	2% 0.25W MF	
R...17	57.11.4104	100 kOhm	2% 0.25W MF	
R...18	57.11.4104	100 kOhm	2% 0.25W MF	
R...19	57.11.4103	10 kOhm	2% 0.25W MF	
R...20	57.11.4103	10 kOhm	2% 0.25W MF	
R...21	57.11.4103	10 kOhm	5% 0.25W MF	
R...22	57.11.4334	330 kOhm	5% 0.25W MF	
R...23	58.01.9104	100 kOhm	10% 0.5 W PMG trimming resistor	
R...24	57.92.1271	6.5 Ohm	PTC Philips Nr.2322 662 12711	
R...25	57.11.4101	100 Ohm	5% 0.25W MF	
R...26	57.92.1271	6.5 Ohm	PTC Philips Nr.2322 662 12711	
R...27	57.11.4332	3.3 kOhm	5% 0.25W MF	
R...29	57.11.4000	0 Ohm		
R...30	57.11.4000	0 Ohm		

- (1) 89/01/13 A1 VCA 1.010.110.50 replaced by 1.911.290.00
- (2) 90/01/17 A1 VCA 1.911.290.00 replaced by 1.911.290.81

CER=Ceramic, PE=Polyester, SAL=Solid Aluminium  
 MF=Metal Film, PMG=Cermet

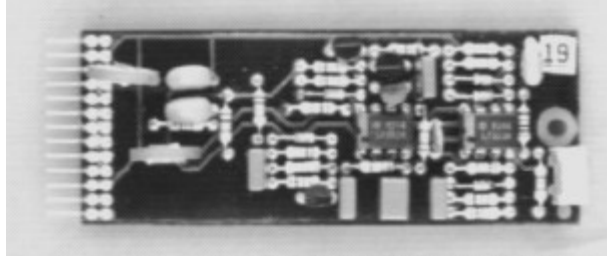
MANUFACTURER: Ex=Exar, NE=NEC, Ph=Philips, Ra=Raytheon,  
 Sig=Signetics, St=Studer.

1.914.528.00	VCA UNIT / 3 CONTROL	SE 86/10/2800
1.914.528.00	VCA UNIT / 3 CONTROL	SE 89/01/1301
1.914.528.00	VCA UNIT / 3 CONTROL	WY 90/01/1702

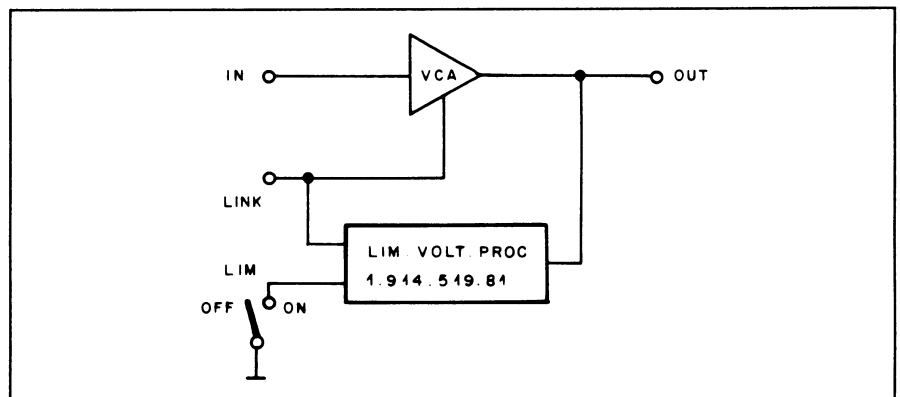
## 2.1.9 Limiter Voltage Processor

1.914.519

Together with this voltage processor, the VCAs 1.914.518/528 can perform as signal level limiters.



The processor's threshold can be set within a wide range of levels, so that limiting action becomes effective at a desired level within a range of  $-15$  to  $+15$  dBu. Limiting action attacks within 1 ms, whereas release can vary from 50 ms to 5 s, depending on the program's energy content. This means that no audible "pumping" action – which is often associated with such a device – will occur. After the cessation of loud passages, amplification will recover only slowly. For stereo applications, a two-channel set-up (VCAs and voltage processor) can be linked, so that identical amounts of gain reduction will take place simultaneously in both channels.

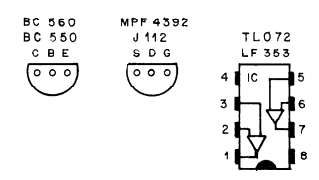
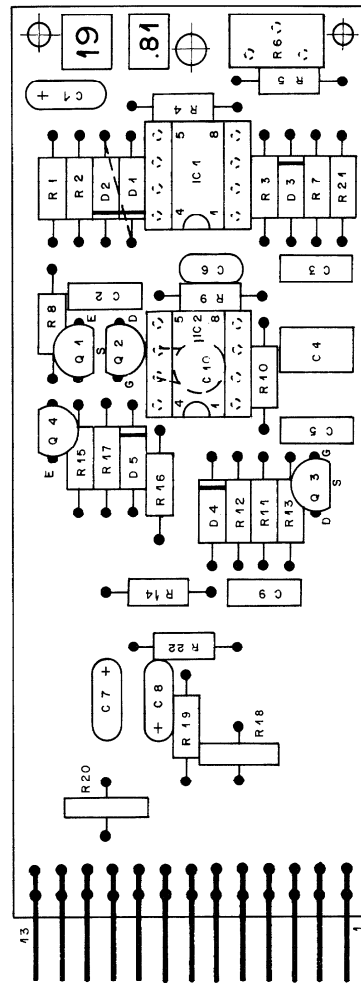
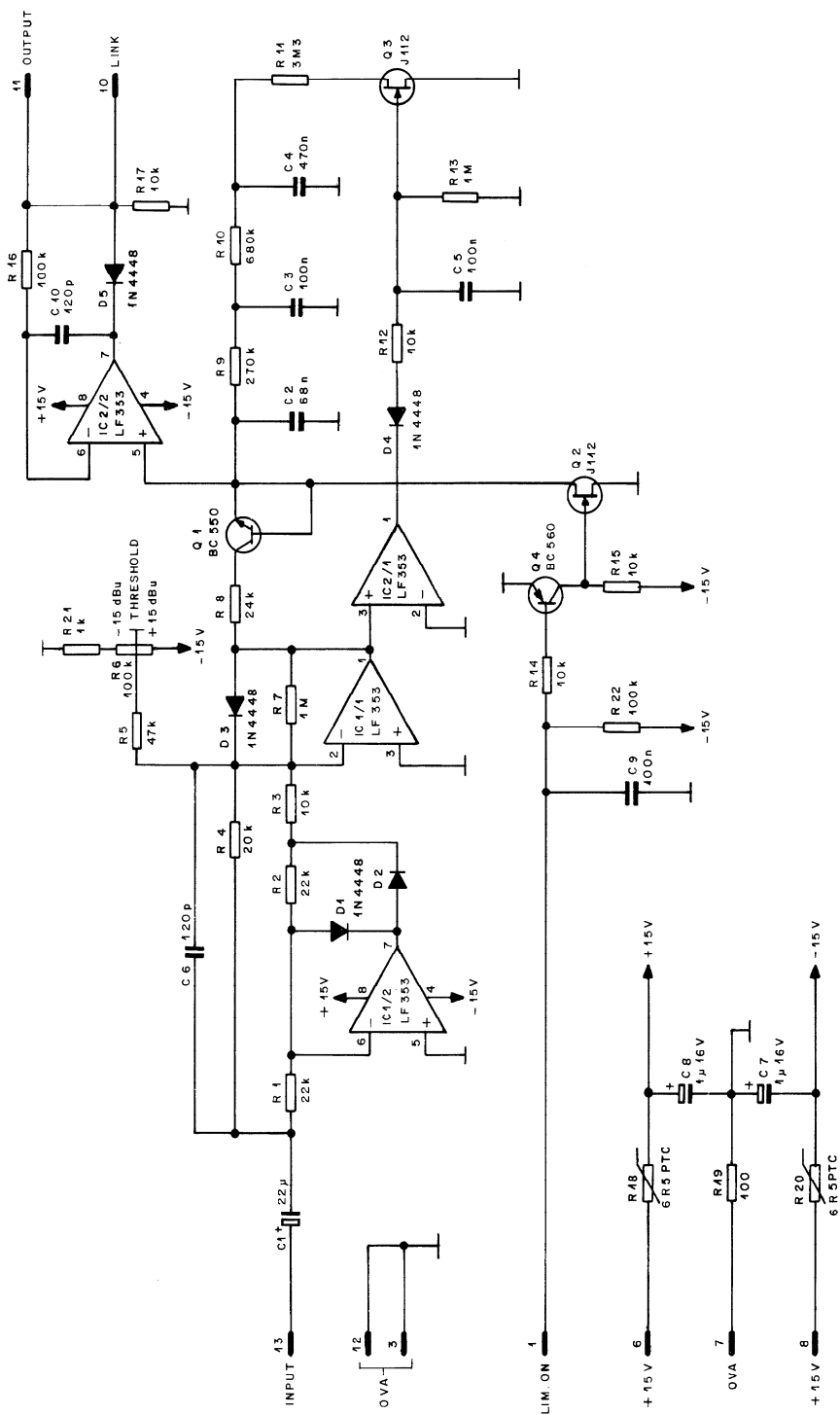


The input of the voltage processor has to be wired to the output of the VCA. The processor's output, when connected to the VCA's control terminal, will effect the necessary gain reduction so that a limiting characteristic is obtained. The limiting threshold is adjustable in a wide range. Remote on/off switching of the limiter function is possible.

**Technical Specifications**

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<b>Limiter:</b>	Input impedance	<b>≥ 10 kW</b>	
	Max. input level	<b>+20 dBu</b>	
	Frequency range	<b>30 Hz...16 kHz</b>	
	Output voltage	<b>0...-13 V<sub>DC</sub></b>	
	Threshold level	<b>-15 dBu...+15 dBu</b>	
	Attack time	<b>1 ms</b>	
	Release time	<b>50 ms...5 s, program-dependent</b>	
	Compression ratio	<b>20:1, in conjunction with a VCA</b>	
<b>Supply:</b>		<b>±15 V (10 mA)</b>	
<b>Dimensions:</b>		<b>MS-card, 34 × 85 mm</b>	
<b>Ordering Information:</b>	Limiters voltage processor		1.914.519.xx



BOTTOM VIEW

CIS	PIN	EURO 32 PIN			
		(E)	(B)	(C)	(D)
INPUT	13	1	7	21	27
I (INP./OUTP.)	12	2	8	22	28
OUTPUT	11	3	9	23	29
LINK	10	17	17	18	18
	9				
- 15 V	8				
0 V	7				
+ 15 V	6				
	5				
	4				
L (LIM ON)	3	4	10	24	30
	2	5	11	25	31
LIM ON	1	6	13	26	32

© 16.9.94				
STUDER REGENSDORF ZÜRICH	LIMITER VOLTAGE PROCESSOR			1.914.519.81

MSC LIMITER

Ad	..POS..	..REF.No...	DESCRIPTION.....	MANUFACTURER
C.....1	59.26.1220	22 uF	SAL	
C.....2	59.06.0683	68 nF	PE	
C.....3	59.06.5104	100 nF	PE	
C.....4	59.06.5474	470 nF	PE	
C.....5	59.06.5104	100 nF	PE	
C.....6	59.34.4121	120 pF	CER	
C.....7	59.26.9109	1 uF	SAL	
C.....8	59.26.9109	1 uF	SAL	
C.....9	59.06.5104	100 nF	PE	
C.....10	59.34.4121	120 pF	CER	
D.....1	50.04.0125	1N4448		any
D.....2	50.04.0125	1N4448		any
D.....3	50.04.0125	1N4448		any
D.....4	50.04.0125	1N4448		any
D.....5	50.04.0125	1N4448		any
IC.....1	50.09.0101	TL 072	dual op. amp. low noise	NS, TI
IC.....2	50.09.0101	TL 072	dual op. amp. low noise	NS, TI
P.....1	54.01.0273	13 PIN	CIS	
Q.....1	50.03.0497	BC 550	NPN IC>100mA, B>100	any
Q.....2	50.03.0350	J 112	N-JFET	NS, Mot, Six
Q.....3	50.03.0350	J 112	N-JFET	NS, Mot, Six
Q.....4	50.03.0496	BC 560	PNP IC>100mA, B>100	any
R.....1	57.11.4223	22 kOhm	2% 0.25W MF	
R.....2	57.11.4223	22 kOhm	2% 0.25W MF	
R.....3	57.11.4103	10 kOhm	2% 0.25W MF	
R.....4	57.11.3203	20 kOhm	2% 0.25W MF	
R.....5	57.11.4473	47 kOhm	5% 0.25W MF	
R.....6	58.01.9104	100 kOhm	10% 0.50W PMG trimming resistor	
R.....7	57.11.4106	1 MOhm	5% 0.25W MF	
R.....8	57.11.3243	24 kOhm	5% 0.25W MF	
R.....9	57.11.4274	270 kOhm	5% 0.25W MF	
R.....10	57.11.4684	680 kOhm	5% 0.25W MF	
R.....11	57.11.4335	3.3 MOhm	5% 0.25W MF	
R.....12	57.11.4103	10 kOhm	5% 0.25W MF	
R.....13	57.11.4105	1 MOhm	5% 0.25W MF	
R.....14	57.11.4103	10 kOhm	5% 0.25W MF	
R.....15	57.11.4103	10 kOhm	5% 0.25W MF	
R.....16	57.11.4104	100 kOhm	5% 0.25W MF	
R.....17	57.11.4103	10 kOhm	5% 0.25W MF	
R.....18	57.92.1271	6.5 Ohm	PTC Philips Nr.2322 662 12711	
R.....19	57.11.4101	100 Ohm	5% 0.25W MF	
R.....20	57.92.1271	6.5 Ohm	PTC Philips Nr.2322 662 12711	
R.....21	57.11.4102	1 kOhm	5% 0.25W MF	
R.....22	57.11.4104	100 kOhm	5% 0.25W MF	

CER=Ceramic, PE=Polyester, SAL=Solid Aluminium  
 MF=Metal Film, PMG=Cermet

MANUFACTURER: Mot=Motorola, NS=National Semiconductors  
 Six=Siliconix, TI=Texas Instruments

1.914.519.81 LIM VOLTAGE PROCESSOR WM 86.21.1100



**2.1.10 1900 Hz Signal Generator**

1.914.520

This signal generator produces a stable frequency of 1900 Hz to establish communication on outside broadcast lines, as specified in the EBU/CCIR recommendations.

**Technical Specifications**

Frequency	<b>1900 Hz</b> (adjustable)
Distortion	<b>&lt; 1%</b>
Output level	<b>-15...+6 dBu</b> (adjustable)
Output	<b>balanced and floating</b>
Output Impedance, out 1	<b>&lt; 15 W</b>
out 2	<b>600 W</b>
Minimum load	<b>200 W</b>

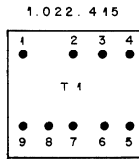
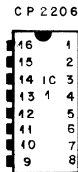
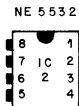
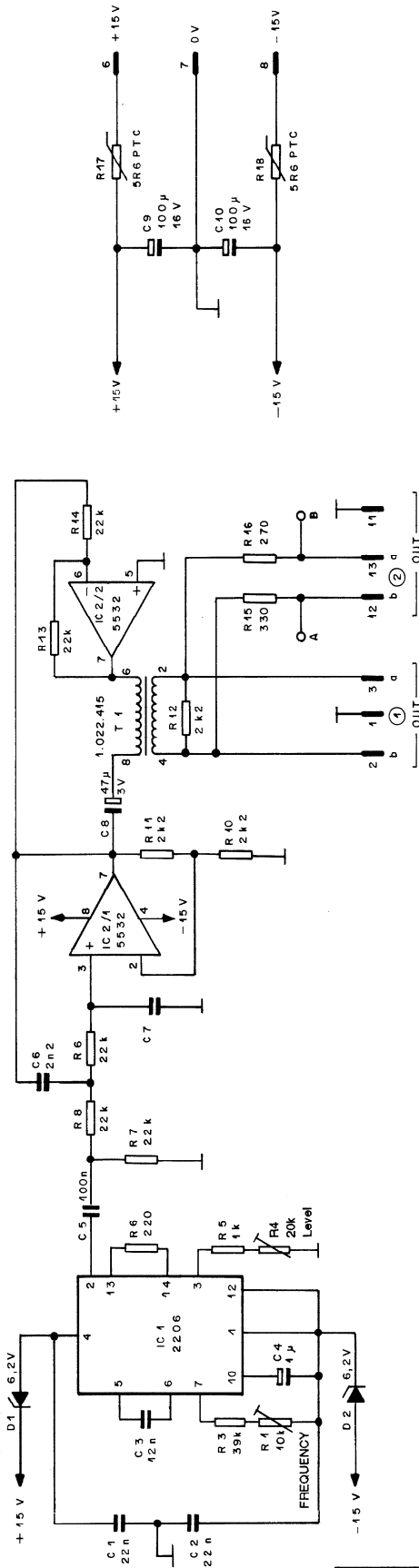
**Supply:** **±15 V** (20 mA)

**Dimensions:** **MS-card**, 34 × 85 mm

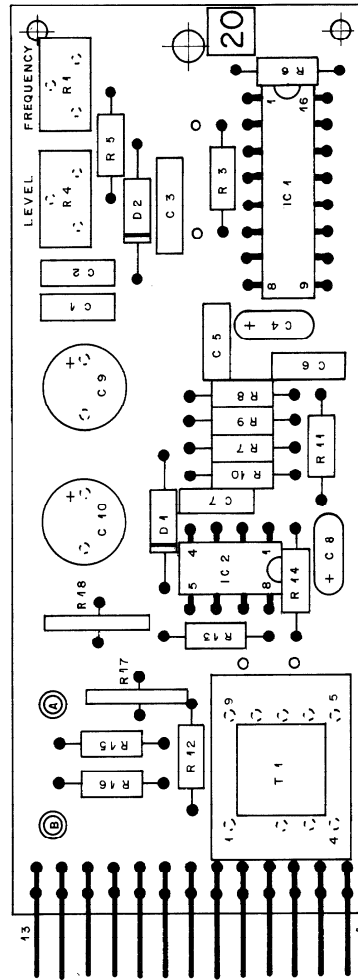
**Ordering Information:** 1900 Hz signal generator

1.914.520.xx

MSC 1900 HZ GENERATOR



CIS	PIN	EURO 32 PIN			
		(a)	(b)	(c)	(d)
OUT a	13	1	7	24	27
OUT b	12	2	8	22	28
L	11	3	9	23	29
	10				
	9				
-15 V	8	14			
0 V	7	15			
+15 V	6	16			
	5				
	4				
OUT a	3	4	10	24	30
OUT b	2	5	11	25	31
L	1	6	13	26	32



18.9.91			
STUDER REGENSDORF ZÜRICH	SIGNAL GENERATOR (NR. 20)	1.914.520.00	

Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER	
C	...	1	59.06.0223	0,022µF PE	
C	...	2	59.06.0223	0,022µF PE	
C	...	3	59.99.0220	0,012µF PE	
C	...	4	59.26.9109	1µF 40V	
C	...	5	59.06.0104	0,1µF	
C	...	6	59.06.5222	2200pF PE	
C	...	7	59.06.5222	2200pF PE	
C	...	8	59.26.0470	47µF 6,3V SAL	
C	...	9	59.22.4101	100µF 16V EL	
C	...	10	59.22.4101	100µF 16V EL	
D	...	1	50.04.1511	6,2V 1,3W Zener	
D	...	2	50.04.1511	6,2V 1,3W Zener	
IC	...	1	50.11.0108	2206CP DIL 16	
IC	...	2	50.09.0105	NE5532 DIP 8	
P	...		54.01.0273	13P CIS AMP	
R	...	1	58.01.9103	10kΩ TRIM	
R	...	3	57.11.4393	39kΩ	
R	...	4	58.01.9203	20kΩ TRIM	
R	...	5	57.11.4102	1kΩ	
⓪	R	...	6	57.11.4221	220kΩ
R	...	7	57.11.4223	22kΩ	
R	...	8	57.11.4223	22kΩ	
R	...	9	57.11.4223	22kΩ	
R	...	10	57.11.4222	2,2kΩ	
R	...	11	57.11.4222	2,2kΩ	
R	...	12	57.11.4222	2,2kΩ	
R	...	13	57.11.4223	22kΩ	
R	...	14	57.11.4223	22kΩ	
⓪	R	...	15	57.11.4331	330kΩ
⓪	R	...	16	57.11.4271	270kΩ
R	...	17	57.99.0209	5,6kΩ 2322 662 91005	
R	...	18	57.99.0209	5,6kΩ 2322 662 91005	
T	...	1	1.022.415.00	1:2 ST	

PE=Polyester, SAL=Solid Aluminium, EL=Electrolytic

MANUFACTURER: EX=Exar, SIG=Signetics, ST=Studer, PH=Philips

1.914.520.00 SIGNAL GENERATOR (Nr. 20) P. Casutt 14/07/83

1.914.520.00 SIGNAL GENERATOR (Nr. 20) ⓪ FRI 01/09/83

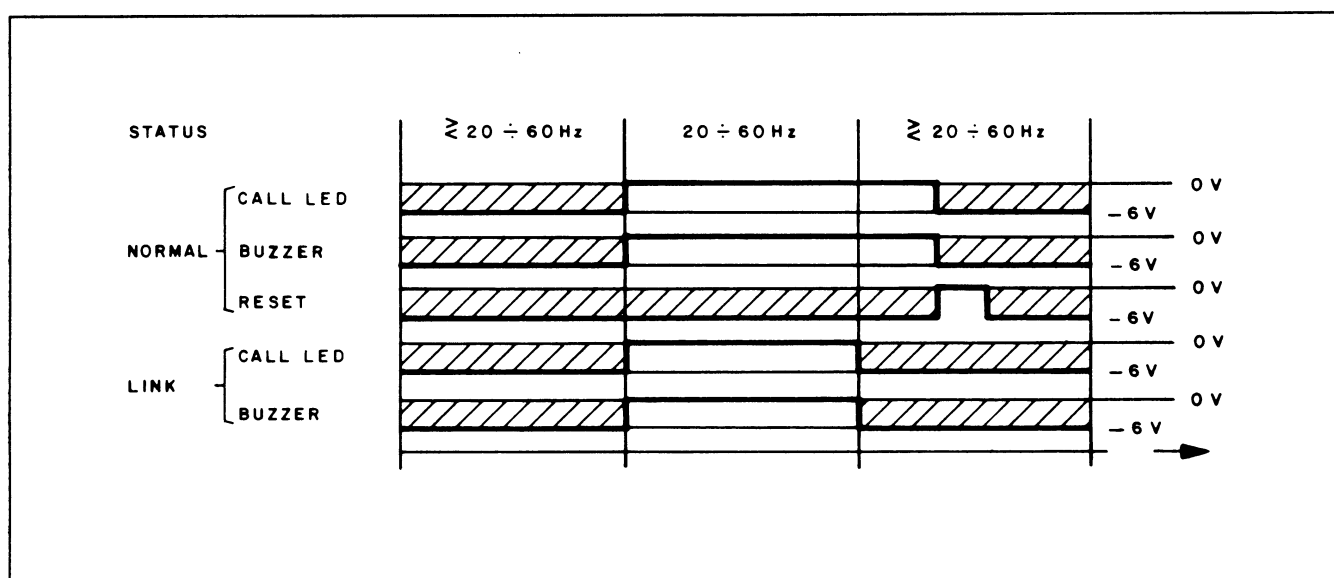
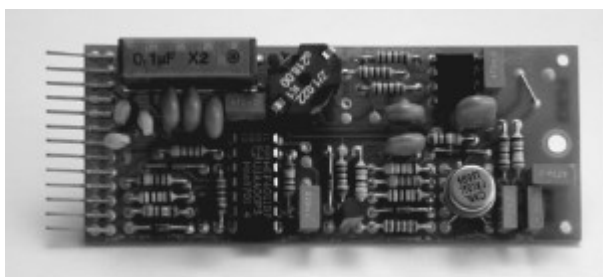
END

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**2.1.11 Call Decoder 20...60 Hz**

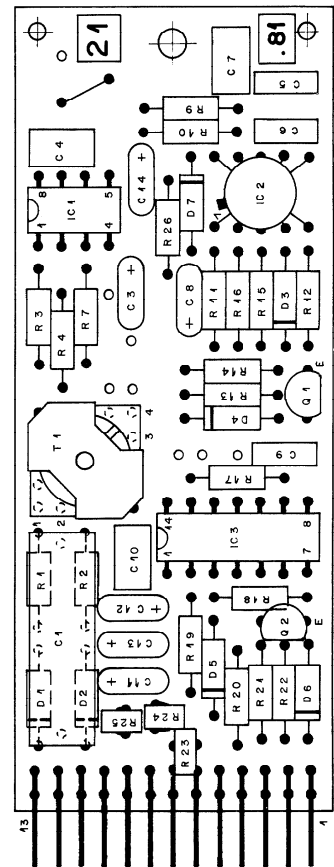
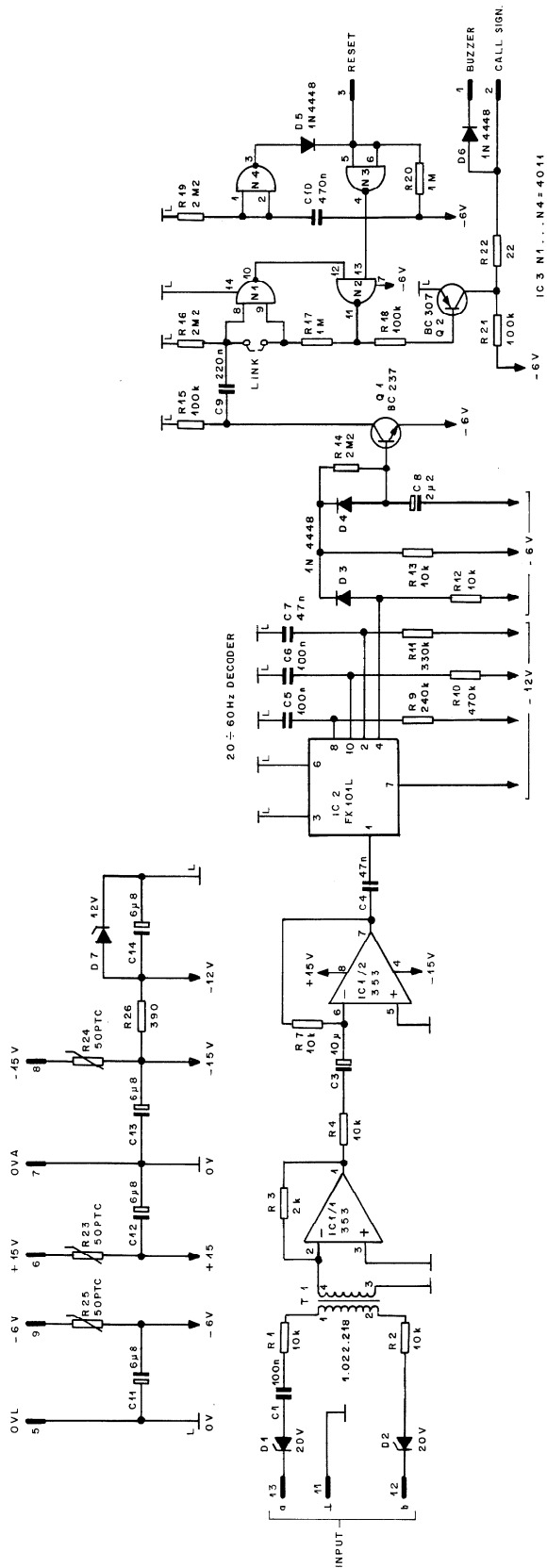
1.914.521

This assembly features a call receiver for the ringing frequency on telephone lines (20...60 Hz). The receiver can activate an optical and/or an acoustical signal generated by an external buzzer (not supplied). In normal mode the buzzer will be on until reset. In linked mode the signal lasts only as long as a call is detected.

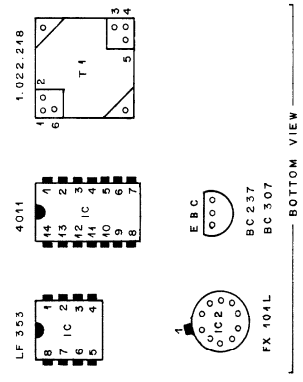
**Technical Specifications**

<b>Input:</b>	<b>balanced, floating; no DC</b>
Impedance	<b>&gt; 20 kW</b>
Frequency	<b>20...60 Hz</b>
Min. level	<b>17 V<sub>rms</sub></b>
Nominal level	<b>70 V<sub>rms</sub></b>
<b>Supply:</b>	<b>+15 V (5 mA); -15 V (10 mA); -6 V (2 mA)</b>
<b>Dimensions:</b>	<b>MS-card, 34 × 85 mm</b>
<b>Ordering Information:</b>	<b>Call decoder 20...60 Hz</b>

1.914.521.xx



CIS	PIN	EURO 32-PIN
INPUT a	13	1
INPUT b	12	2
-6V	11	3
0V	10	4
+15V	9	5
0V	8	6
RESET	7	7
CALL SIGN	6	8
BUZZER	5	9
	4	10
	3	11
	2	12
	1	13



21.9.94	STUDER REGENSDORF ZÜRICH	20 ÷ 60 Hz DECODER (NR. 21)	1.914.521.00
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MSC CALL DECODER

Ad	POS.	REF.No.	DESCRIPTION			MANUFACTURER
C	...	1	59.99.0453	0,1µF	250V Rifa	MP
C	...	3	59.26.2100	10µF	16V	SAL
C	...	4	59.06.5474	0,47µF		PE
C	...	5	59.06.5104	0,1µF		PE
C	...	6	59.06.5104	0,1µF		PE
C	...	7	59.06.5474	0,47µF		PE
C	...	8	59.26.5229	2,2µF	25V	SAL
C	...	9	59.06.0224	0,22µF		PE
C	...	10	59.06.5474	0,47µF		PE
C	...	11	59.26.2689	6,8µF	16V	SAL
C	...	12	59.26.2689	6,8µF	16V	SAL
C	...	13	59.26.2689	6,8µF	16V	SAL
C	...	14	59.26.2689	6,8µF	16V	SAL
D	...	1	50.04.1109	20V	400mW Zener	
D	...	2	50.04.1109	20V	400mW Zener	
D	...	3	50.04.0125	1N4448		
D	...	4	50.04.0125	1N4448		
D	...	5	50.04.0125	1N4448		
D	...	6	50.04.0125	1N4448		
D	...	7	50.04.1117	12V	400mW Zener	
IC	...	1	50.09.0101	LF353N	DIP 8	
IC	...	2	50.07.0032	FX101L		CML
① IC	...	3	50.07.1011	4011BPC	DIL 14	
P			54.01.0273	13P	CIS	
Q	...	1	50.03.0436	BC237B	NPN	
Q	...	2	50.03.0515	BC307B	PNP	
R	...	1	57.11.4103	10kΩ		
R	...	2	57.11.4103	10kΩ		
① R	...	3	57.11.3202	2kΩ		
R	...	4	57.11.4103	10kΩ		
R	...	7	57.11.4103	10kΩ		
② R	...	9	57.11.3244	240kΩ		
R	...	10	57.11.4474	470kΩ		
R	...	11	57.11.4334	330kΩ		
R	...	12	57.11.4103	10kΩ		
R	...	13	57.11.4103	10kΩ		
① R	...	14	57.11.5225	2,2MΩ		
R	...	15	57.11.4104	100kΩ		
① R	...	16	57.11.5225	2,2MΩ		
R	...	17	57.11.4105	1MΩ		
R	...	18	57.11.4104	100kΩ		
① R	...	19	57.11.5225	2,2MΩ		
R	...	20	57.11.4105	1MΩ		
R	...	21	57.11.4104	100kΩ		
R	...	22	57.11.4220	22Ω		
R	...	23	57.99.0206	50Ω	PTC	{ 2322 660 91008 Philips Typ YS 822 ITT PTH 608D 470M 050 Murata
R	...	24	57.99.0206	50Ω	PTC	
R	...	25	57.99.0206	50Ω	PTC	
R	...	26	57.11.4391	390kΩ		
T	...	1	1.022.218.00	1:1		ST

PE=Polyester, SAL=Solid Aluminium

MANUFACTURER: CML=Consumer Microcircuit LTD, ST=Studer

1.914.521.00 20=60HZ DECODER (Nr. 21) FRI 23/08/83

1.914.521.00 20=60HZ DECODER (Nr. 21) ① FRI 01/09/83

1.914.521.00 20=60HZ DECODER (Nr. 21) ② FRI 18/06/84

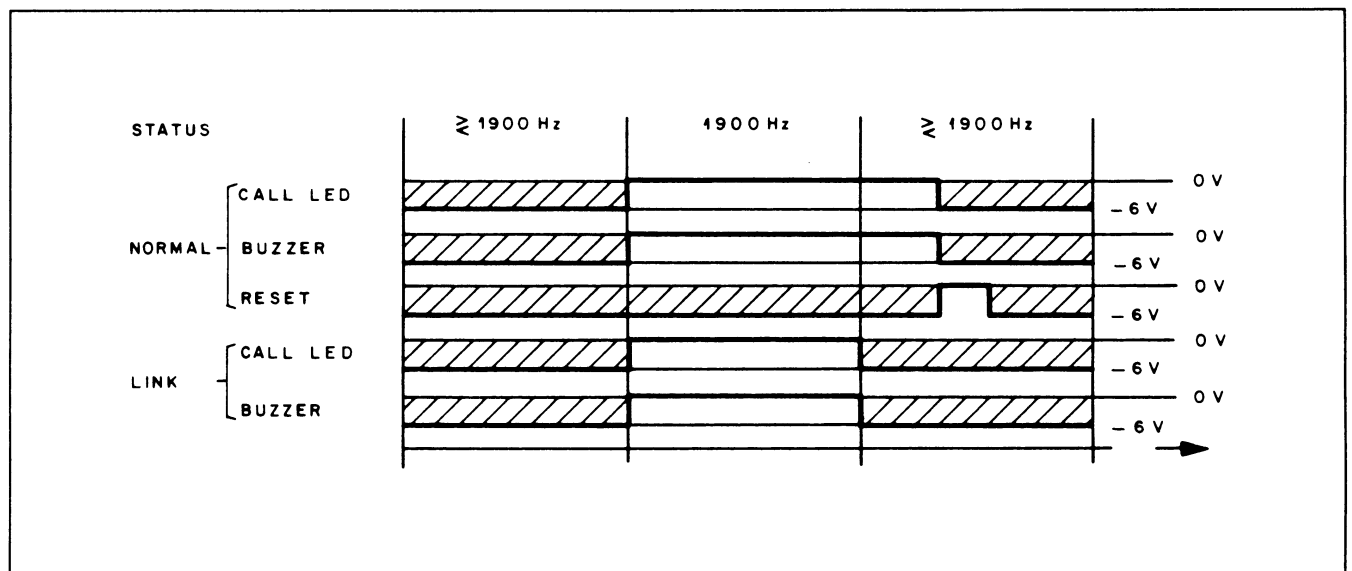
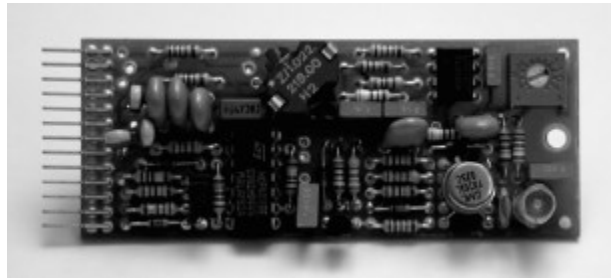
END  
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**2.1.12 Call Decoder 1900 Hz**

1.914.522

This card contains a call receiver for the standardized 1900 Hz call frequency on OB lines. It is tuned to respond to 1900 Hz  $\pm$  1 %. The receiver can be switched either to activate an optical or an acoustical signal for the duration of the 1900 Hz call (linked mode), or the acoustical signal can be selected to remain activated until reset (normal mode).

The acoustical signal can be generated by an external buzzer (not supplied).

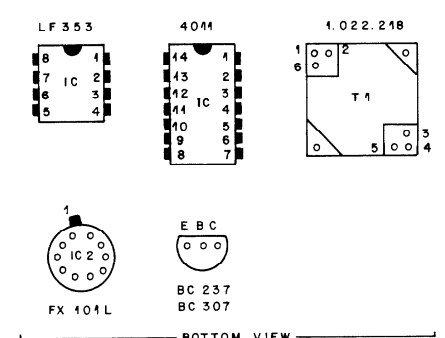
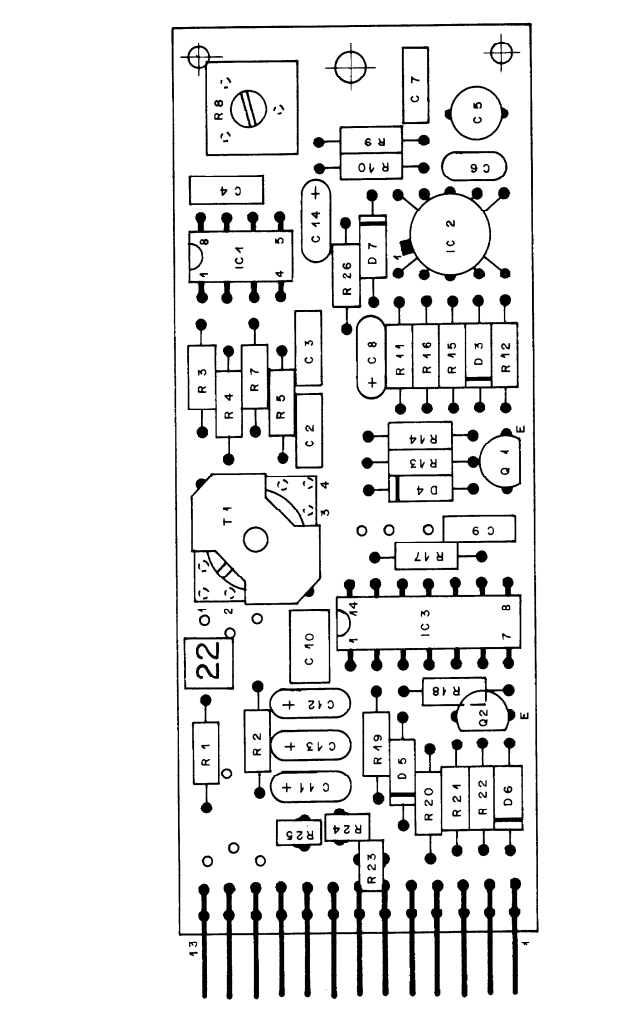
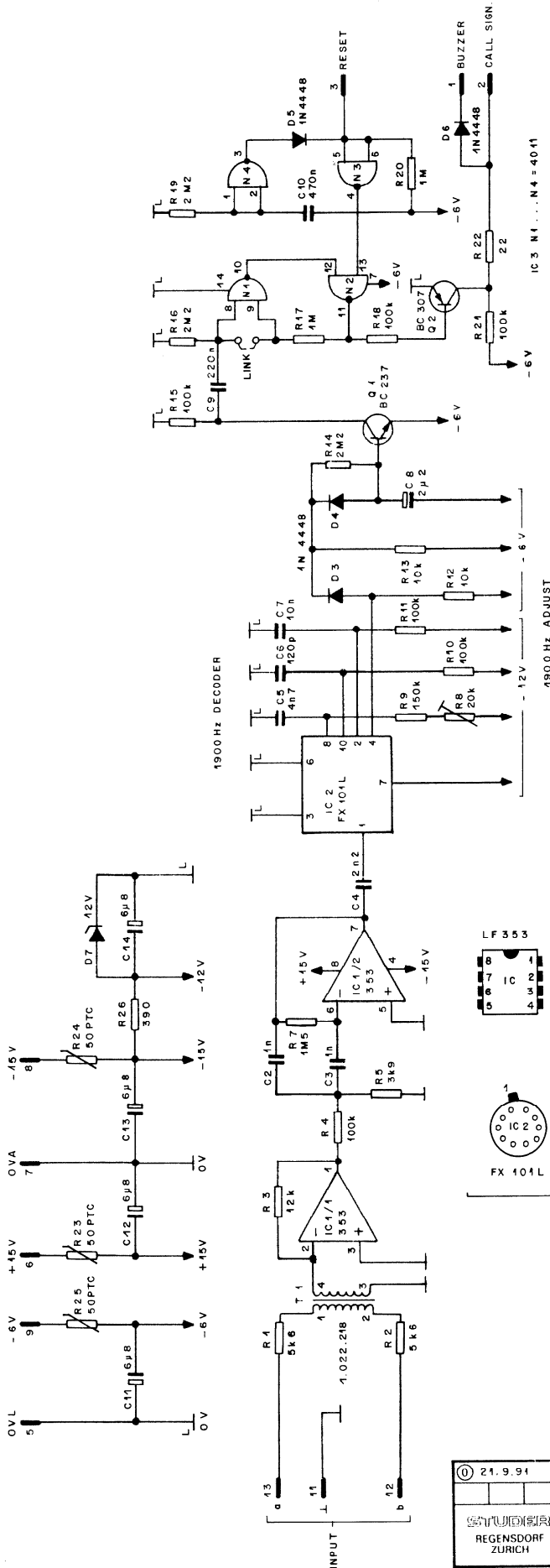
**Technical Specifications**

<b>Input:</b>		<b>balanced, floating; no DC</b>
	Frequency	<b>1900 Hz, <math>\pm</math>1%</b>
	Impedance	<b>&gt; 10 kW</b>
	Min. level	<b>-30 dBu</b>
	Nominal level	<b>+24 dBu</b>
<b>Supply:</b>		<b>+15 V (5 mA); -15 V (10 mA); -6 V (2 mA)</b>
	Insulation rating	<b>500 V<sub>DC</sub></b>
<b>Dimensions:</b>		<b>MS-card, 34 <math>\times</math> 85 mm</b>

**Ordering Information:** Call decoder 1900 Hz

1.914.522.xx

1900Hz CALL-DECODER MSC



CIS	PIN	EURO 32 PIN (a)	EURO 32 PIN (b)	EURO 32 PIN (c)	EURO 32 PIN (d)
INPUT a	13	1	7	21	27
INPUT b	12	2	8	22	28
L	11	3	9	23	29
	10				
-6V	9	12			
-15V	8	14			
OVA	7	15			
+15V	6	16			
OVL	5	19			
	4				
RESET	3	4	10	24	30
CALL SIGN	2	5	11	25	31
BUZZER	1	6	13	26	32

21.9.91	STUDER REGENSDORF ZURICH	1900 Hz DECODER (NR.22)	1.914.522.00
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**Call Decoder 1900 Hz 1.914.522.00 ( 1)**

Idx. Pos.	Part No.	Qty.	Type/Val.	Description
0	C 2	59.06.0102	1n0	PETP, 63V, 10%, RM5
0	C 3	59.06.0102	1n0	PETP, 63V, 10%, RM5
0	C 4	59.06.0222	2n2	PETP, 63V, 10%, RM5
0	C 5	59.05.2472	4n7	PP, 2.5%, 63V
0	C 6	59.34.4121	120p	CER 63V, 5%, N750
0	C 7	59.06.0103	10n	PETP, 63V, 10%, RM5
0	C 8	59.26.5229	2u2	SAL, 20%, 25V
0	C 9	59.06.0224	220n	PETP, 63V, 10%, RM5
0	C 10	59.06.5474	470n	PETP, 63V, 5%, RM5
0	C 11	59.26.2689	6u8	SAL 16V 20%
0	C 12	59.26.2689	6u8	SAL 16V 20%
0	C 13	59.26.2689	6u8	SAL 16V 20%
0	C 14	59.26.2689	6u8	SAL 16V 20%
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	50.04.1117	12V	Zener, 5%, 0.5W, DO-35
0	IC 1	50.09.0101	TL072	Dual op-amp biFET
0	IC 2	50.07.0032	FX101	IC FX-101 L, ,A
1	IC 3	50.07.1011	4011	Quad 2-inp NAND
0	P 1	54.01.0273	13p	Stecker CIS parallelsteck
0	Q 1	50.03.0515	BC307B	PNP 100mA 45V
0	Q 2	50.03.0436	BC237B	NPN 100mA 45V
0	R 1	57.11.3562	5k6	MF, 1%, 0207
0	R 2	57.11.3562	5k6	MF, 1%, 0207
0	R 3	57.11.3123	12k	MF, 1%, 0207
0	R 4	57.11.3104	100k	MF, 1%, 0207
0	R 5	57.11.3392	3k9	MF, 1%, 0207
0	R 7	57.11.5155	1M5	MF, 5%, 0207
0	R 8	58.01.8203	20k	Cermet, 10%, 0.5W, horizontal
0	R 9	57.11.3154	150k	MF, 1%, 0207
0	R 10	57.11.3104	100k	MF, 1%, 0207
0	R 11	57.11.3104	100k	MF, 1%, 0207
0	R 12	57.11.3103	10k	MF, 1%, 0207
0	R 13	57.11.3103	10k	MF, 1%, 0207
0	R 14	57.11.5225	2M2	MF, 5%, 0207
0	R 15	57.11.3104	100k	MF, 1%, 0207
1	R 16	57.11.5225	2M2	MF, 5%, 0207
0	R 17	57.11.3105	1M0	MF, 1%, 0207
0	R 18	57.11.3104	100k	MF, 1%, 0207
1	R 19	57.11.5225	2M2	MF, 5%, 0207
0	R 20	57.11.3105	1M0	MF, 1%, 0207
0	R 21	57.11.3104	100k	MF, 1%, 0207
0	R 22	57.11.3220	22R	MF, 1%, 0207
0	R 23	57.99.0206	50R	PTC, 25V, 0.5W
0	R 24	57.99.0206	50R	PTC, 25V, 0.5W
0	R 25	57.99.0206	50R	PTC, 25V, 0.5W
0	R 26	57.11.3391	390R	MF, 1%, 0207
0	T 1	1.022.218.00	1 : 1	EINGANGSTRAFO 1 : 1

Idx. Pos.	Part No.	Qty.	Type/Val.	Description
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End of List

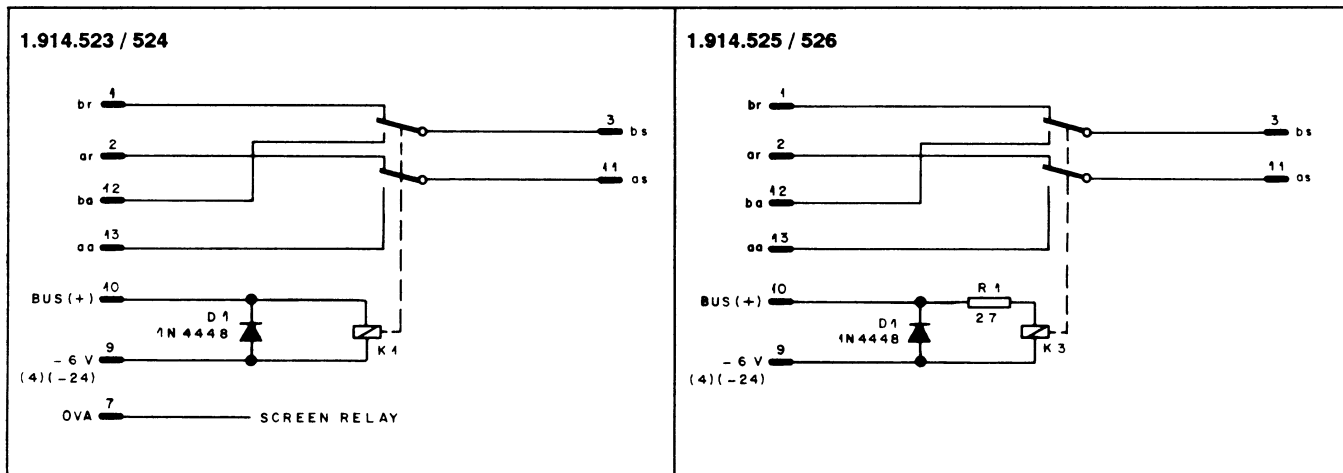
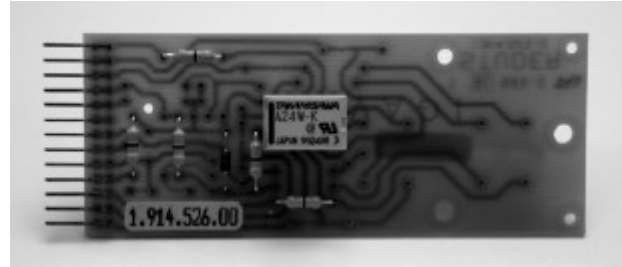
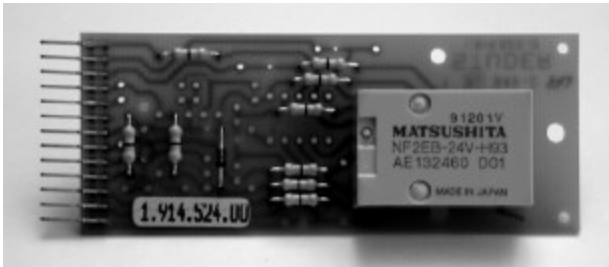
Comments:

(01) IC3, R16, R19 changed

**2.1.13 Relay Sub-Cards**

1.914.523/524/525/526

Audio signal routing or enabling/disabling of certain circuit sections is often effected best using relays. The Modular Sub-Card System, therefore, offers a selection of four relays on individual circuit boards. Because only one relay can be accommodated on one MS-Card, several cards (or a card from the Euro-card range) will be required if more complex switching has to be realized.



The relays offer double pole/double throw switching with non-shorting contacts, and coils rated for either 6 V<sub>DC</sub> or 24 V<sub>DC</sub> operation. A diode is wired across the relay coil in all versions to suppress interfering back-EMF when de-energizing the relay.

For studio applications where the mechanical click produced by the relay's armature is objectionable, a low-noise type is available.

No.	Coil	Contact Rating	
1.914.523	6 V <sub>DC</sub> / 137 Ω	220 V / 2 A / 60 W	
1.914.524	24 V <sub>DC</sub> / 2.0 kΩ	220 V / 2 A / 60 W	
* 1.914.525	5 V <sub>DC</sub> / 135 Ω	100 V / 0.5 A / 30 W	(R1 = 27 Ω for 6 V operation)
* 1.914.526	24 V <sub>DC</sub> / 2.6 kΩ	100 V / 0.5 A / 30 W	(R1 = 0 Ω)
* Low-noise relays			

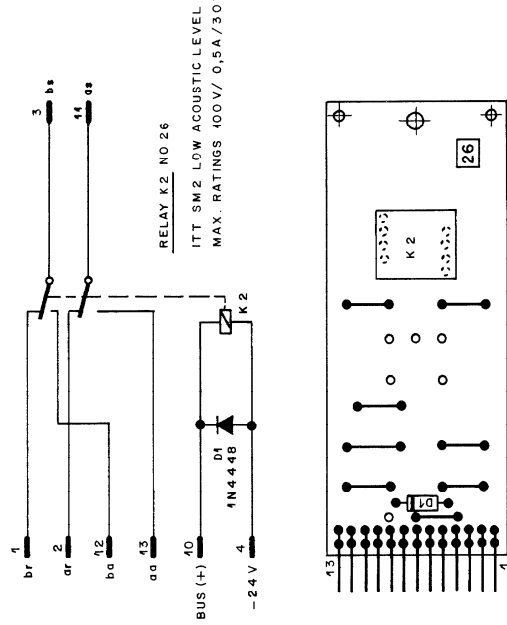
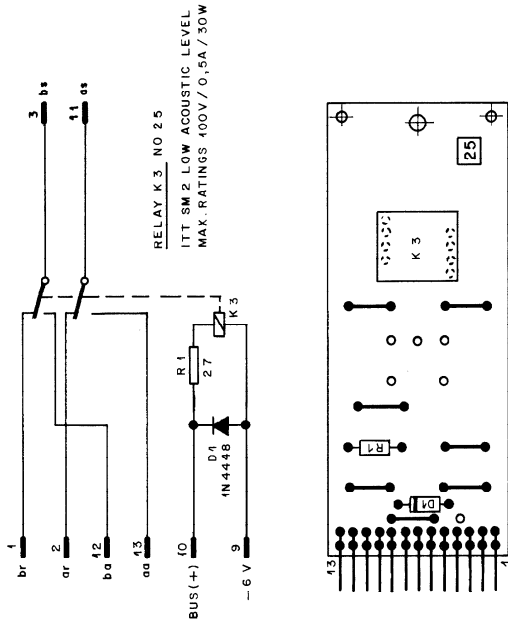
**Dimensions:** MS-card, 34 × 85 mm

**Ordering Information:**

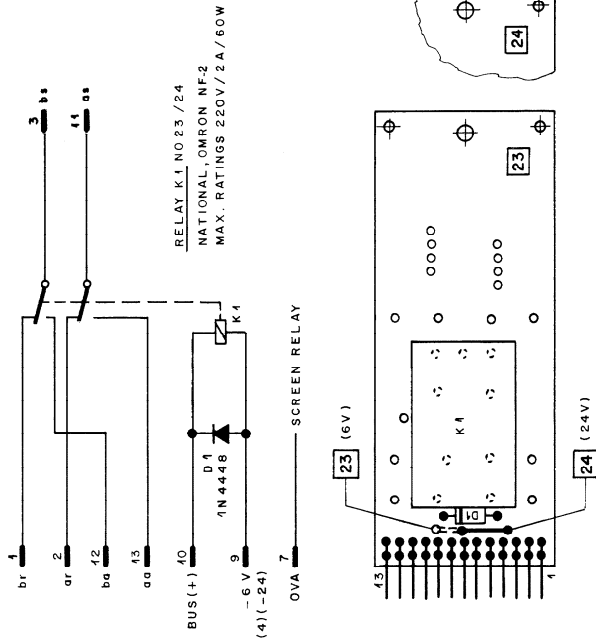
MSC relay 6 V <sub>DC</sub>	1.914.523.xx
MSC relay 24 V <sub>DC</sub>	1.914.524.xx
MSC relay 6 V <sub>DC</sub> ; low-noise	1.914.525.xx
MSC relay 24 V <sub>DC</sub> ; low-noise	1.914.526.xx

MSC RELAYS

RELAY 6V LN



RELAY 24V LN



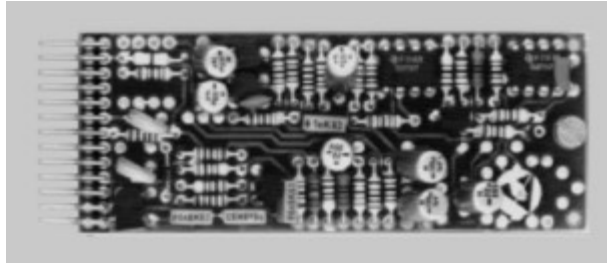
CIS	PIN	EURO 32 P			
		(a)	(b)	(c)	(d)
aa	43	1	7	21	27
ba	42	2	8	22	28
ca	41	3	9	23	29
BUS	40	17	47	18	18
-6V	9	42			
	8	7			
	6				
	5	20			
-24V	4	4	10	24	30
bs	3	5	11	25	31
ar	2	6	13	26	32
br	1				

2.10.94					
STUDER REGENSDORF ZURICH	RELAY BOARD 2 U			24V LN	1.914.526.00
				6 V LN	1.914.525.00
				24V	1.914.524.00
				6 V	1.914.523.00

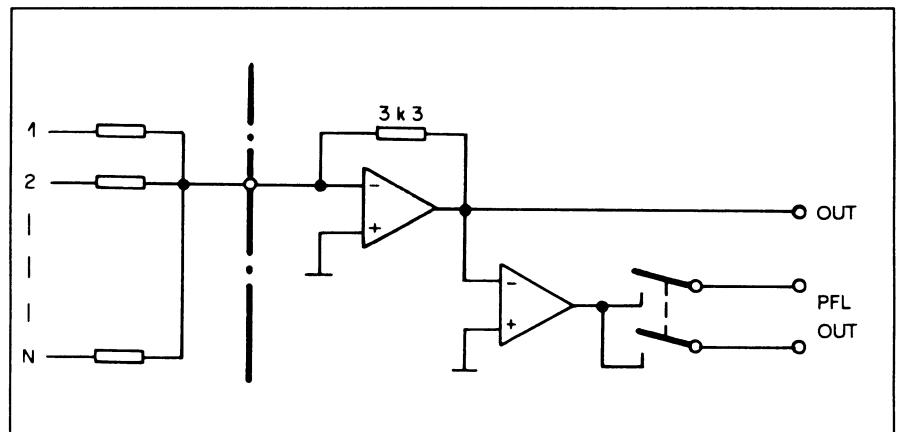
**2.1.14 0-Ω Input Amplifier with PFL Facility**

1.914.530

This amplifier with its characteristic input impedance of less than 1 Ω finds its application as a summing amplifier. A multitude of unbalanced sources can thus be mixed with a high degree of effective isolation between the individual inputs.

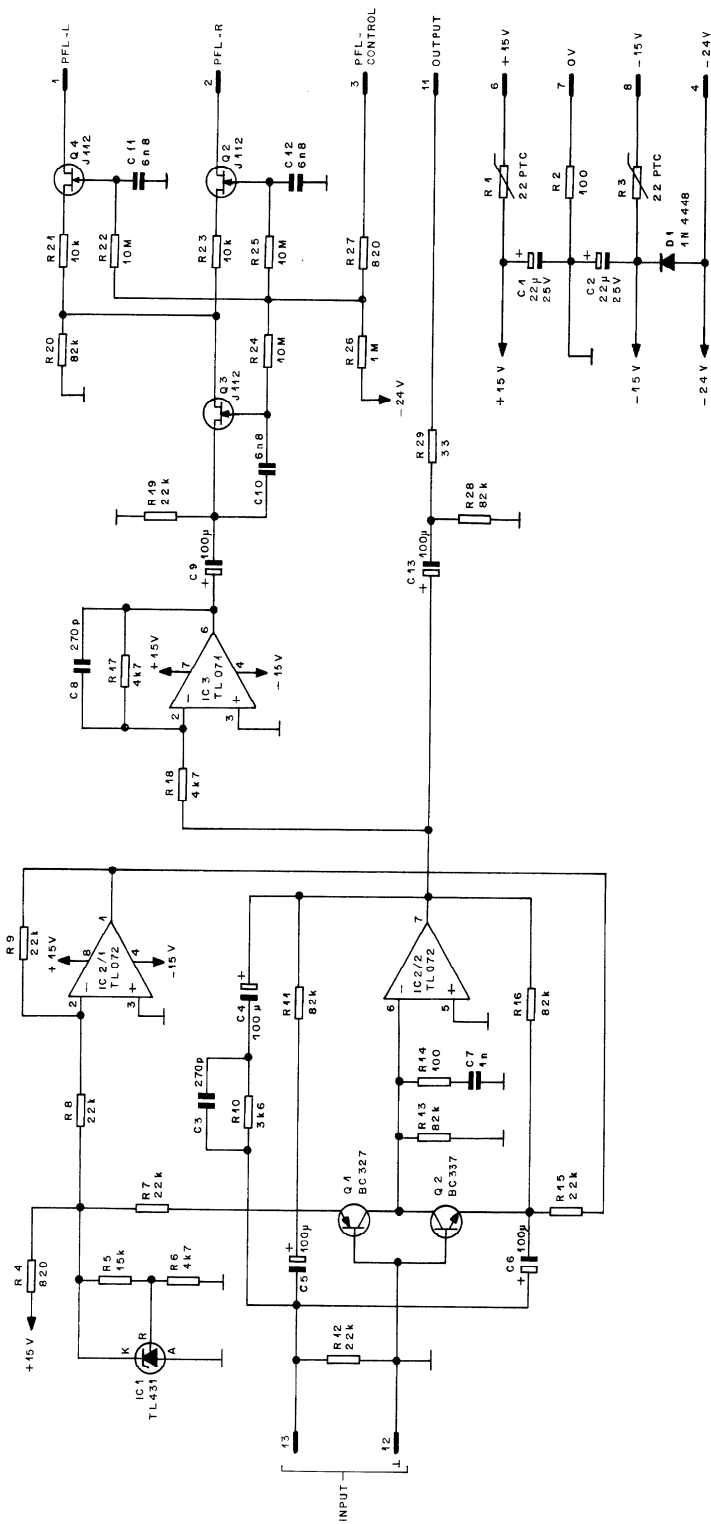


When using 3.3 kΩ resistors as combining (mixing) resistors in series with each source feeding the summing bus, gain will be unity (0 dB), i.e., the amplifier's output level will be equal to the level of the signal source ahead of the combining resistor. The amplifier's output is unbalanced, with low impedance. Additional outputs for monitoring (or pre-listening) can be activated via solid-state switches by remote control.

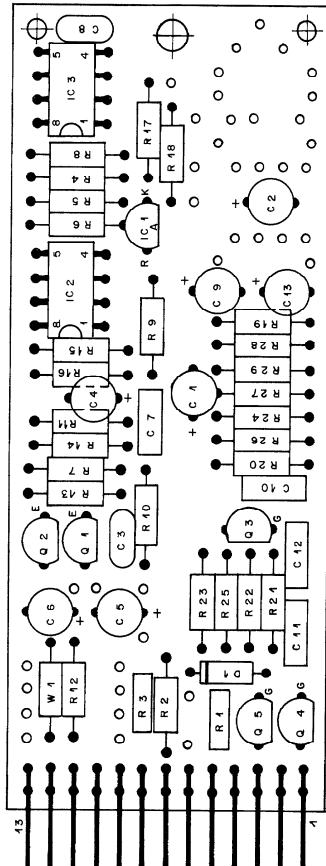
**Technical Specifications**

<b>Input:</b>	Max. current	<b>2.5 mA<sub>rms</sub></b> for max. output swing
	Current for 0 dBu	<b>234.2 μA</b> ; 0 dBu output ( $\approx 3.3 \text{ k}\Omega$ at the input for unity gain)
<b>Output:</b>	Impedance	<b>33 W</b>
	Max. output swing	<b>+20 dBu</b>
	Load	<b><math>\approx 600 \text{ W}</math></b> @ max. output swing
	Frequency response	<b><math>\pm 0.3 \text{ dBu}</math></b> , 30 Hz...16 kHz
	THD	<b>&lt; -75 dB</b> , 30 Hz...16 kHz
	Noise voltage at the output	<b>-110 dBu</b> , input terminated with 3.3 kΩ, bandwidth 23 kHz
	Noise figure, 12 inputs	<b>F &lt; 2 dB</b> $\approx R_S = 275 \Omega$
<b>Supply:</b>		<b>+15 V</b> (11 mA idling); <b>-15 V</b> (7 mA idling)
<b>Dimensions:</b>		<b>MS-card</b> , 34 × 85 mm
<b>Ordering Information:</b>		Zero-Ω input amplifier (PFL facility)

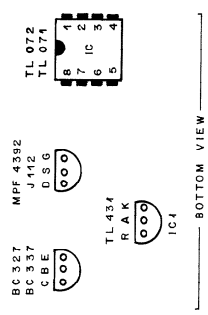
1.914.530.xx



SCHILDER 43.01.0108 / 1.914.530-04 AUFGEKLEBT NACH FABRIKATIONSMUSTER.



CIS	PIN	EURO 32 PIN
INPUT	43	(D) 1
OV (INPUT)	42	(D) 2
OUTPUT	41	(D) 3
	40	(D) 4
-15V	6	(D) 14
0V	7	(D) 15
+15V	6	(D) 16
	5	(D) 17
-24V	4	(D) 20
PFL CONTRBUS	3	(D) 4
PFL RIGHT BUS	2	(D) 5
PFL LEFT BUS	1	(D) 6
		(D) 13
		(D) 26
		(D) 32



© 24.9.91	STUDER REGENSDORF ZÜRICH	0-Ω-INPUT WITH PFL	ESE	1.914.530.00
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MSC 0Ω-INPUT

Ad	..POS..	...REF.No...	DESCRIPTION.....	MANUFACTURER
C.....1		59.22.5220	22 uF 25V EL	
C.....2		59.22.5220	22 uF 25V EL	
C.....3		59.34.4271	270 pF CER	
C.....4		59.22.3101	100 uF 10V EL	
C.....5		59.22.3101	100 uF 10V EL	
C.....6		59.22.3101	100 uF 10V EL	
C.....7		59.06.0102	1 nF PE	
C.....8		59.34.4271	270 pF CER	
C.....9		59.22.3101	100 uF 10V EL	
C.....10		59.06.0682	6.8 nF PE	
C.....11		59.06.0682	6.8 nF PE	
C.....12		59.06.0682	6.8 nF PE	
C.....13		59.22.3101	100 uF 10V EL	
D.....1		50.04.0125	1N4448	any
IC....1		50.10.0106	TL431CLP voltage regulator	TI, Mot
IC....2		50.09.0101	TL072 dual op.amp.	TI
IC....3		50.09.0103	TL071 dual op.amp.	TI
P.....1		54.01.0273	CIS, 13 pin	
Q.....1		50.03.0625	BC327 PNP, low noise	
Q.....2		50.03.0516	BC337 NPN, low noise	
Q.....3		50.03.0350	J112 N-J-FET	NS, Mot, Six
Q.....4		50.03.0350	J112 N-J-FET	NS, Mot, Six
Q.....5		50.03.0350	J112 N-J-FET	NS, Mot, Six
R.....1		57.92.1121	22 Ohm PTC	
R.....2		57.11.4101	100 Ohm	
R.....3		57.92.1121	22 Ohm PTC	
R.....4		57.11.4821	820 Ohm	
R.....5		57.11.4153	15 kohm	
R.....6		57.11.4472	4.7 kohm	
R.....7		57.11.4223	22 kohm	
R.....8		57.11.4223	22 kohm	
R.....9		57.11.4223	22 kohm	
R.....10		57.11.3362	3.6 kohm	
R.....11		57.11.4823	82 kohm	
R.....12		57.11.4223	22 kohm	
R.....13		57.11.4823	82 kohm	
R.....14		57.11.4101	100 Ohm	
R.....15		57.11.4223	22 kohm	
R.....16		57.11.4823	82 kohm	
R.....17		57.11.4472	4.7 kohm	
R.....18		57.11.4472	4.7 kohm	
R.....19		57.11.4223	22 kohm	
R.....20		57.11.4823	82 kohm	
R.....21		57.11.4103	10 kohm	
R.....22		57.11.5106	10 MOhm	
R.....23		57.11.4103	10 kohm	
R.....24		57.11.5106	10 MOhm	
R.....25		57.11.5106	10 MOhm	
R.....26		57.11.4105	1 MOhm	
R.....27		57.11.4821	820 Ohm	
R.....28		57.11.4823	82 kohm	
R.....29		57.11.4330	33 Ohm	
W.....1		57.11.4000	0 Ohm	

CER = ceramic, EL = electrolytic, PE = polyester

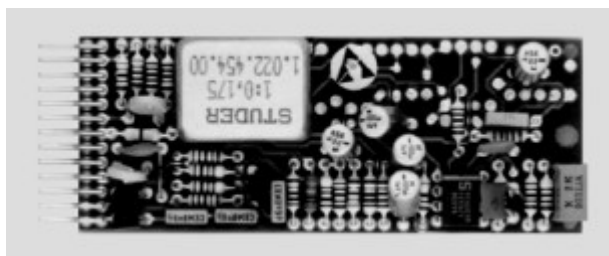
MANUFACTURER Mot=Motorola, NS=National Semiconductor, Six=Siliconics, TI=Texas Instruments

1.914.530.00 0-OHM INPUT WITH PFL WY 87/06/1800

**2.1.15 High-Level Input with PFL Facility**

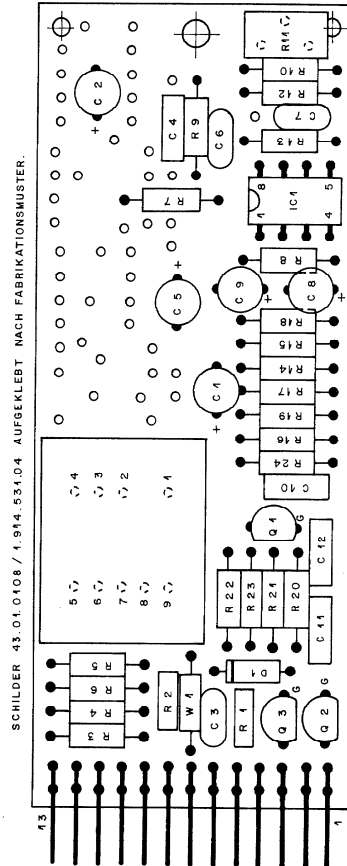
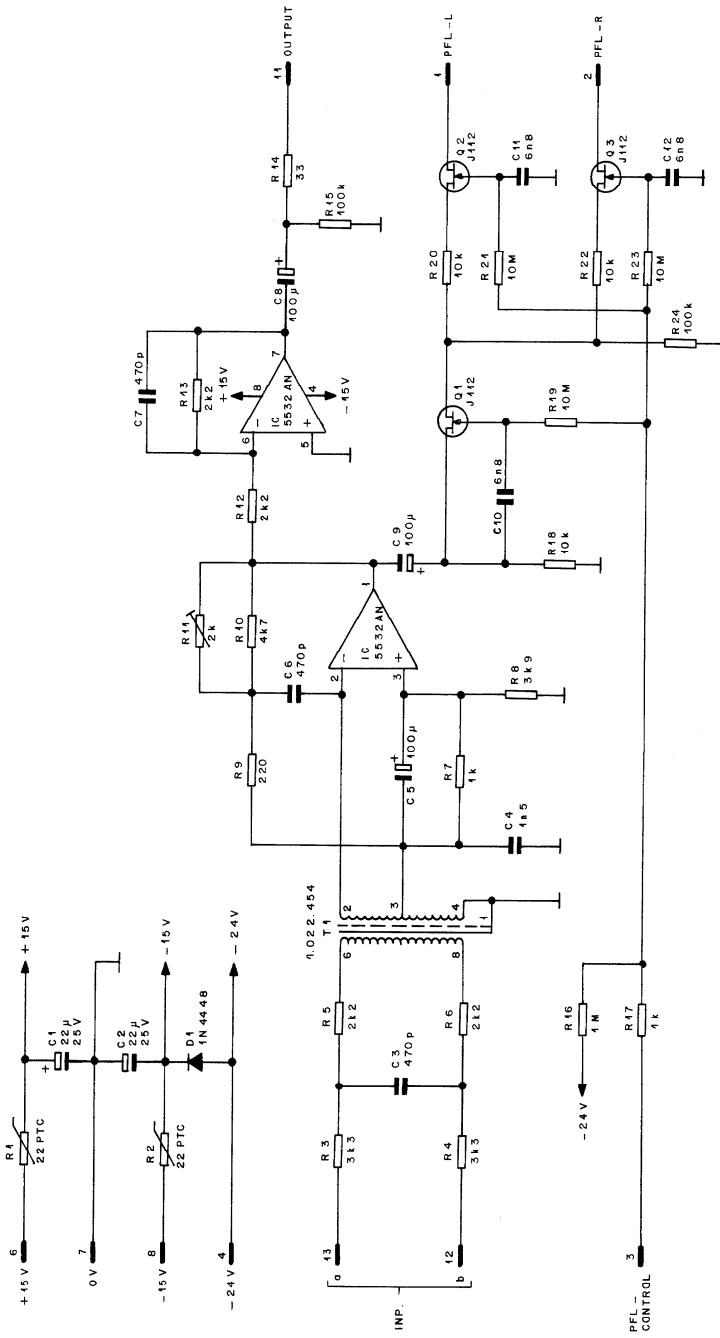
1.914.531

This compact high-level input amplifier features a balanced and floating input stage. The output is unbalanced, with low impedance and low distortion up to +24 dBu. An additional PFL monitoring facility is electronically switchable (FET).

**Technical Specifications**

<b>Input:</b>	Balanced and floating
Impedance	> <b>10 kW</b>
Max. level	<b>+26 dBu</b>
CMRR	> <b>110 dB @ 50 Hz</b> > <b>110 dB @ 16 kHz</b>
<b>Output:</b>	Unbalanced
Impedance	<b>33 W</b>
Load	<b>≈ 600 W @ max. output swing</b>
Max. output swing	<b>+20 dBu</b>
Gain	<b>-1.4...-17.8 dB</b>
Frequency response	<b>±0.3 dB, 30 Hz...16 kHz</b>
THD	<b>&lt; -85 dB, 30 Hz...16 kHz</b>
Noise voltage	<b>&lt; -107 dBu, gain -6 dB, bandwidth 23 kHz</b>
<b>Supply:</b>	<b>±15 V (10 mA idling)</b>
<b>Dimensions:</b>	<b>MS-card, 34 × 85 mm</b>
<b>Ordering Information:</b>	HL input with PFL

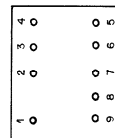
1.914.531.xx



SCHILDER 43.01.0108 / 1.914.531.04 AUFGEKLEBT NACH FABRIKATIONSMUSTER.

CIS	PIN	EURO 32 PIN
INPUT a	13	1
INPUT b	12	2
OUTPUT	11	3
-45V	10	4
0V	9	5
+15V	8	6
-24V	7	7
PFL SIGN. BUS	6	8
PFL RIGHT BUS	5	9
PFL LEFT BUS	4	10
	3	11
	2	12
	1	13

1.022.454  
T1



AN 5532



MPF 4392  
030



BOTTOM VIEW

25.9.94	STUDER REGENSDORF ZURICH	HL INPUT WITH PFL	ESE	1.914.531.00
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MSC HL INPUT WITH PFL

Ad	..POS..	..REF.No..	DESCRIPTION	MANUFACTURER
C....1	59.22.5220	22 uF	25V EL	
C....2	59.22.5220	22 uF	25V EL	
C....3	59.34.5471	470 pF	CER	
C....4	59.06.5152	1.5 nF	PE	
C....5	59.22.3101	100 uF	10V EL	
C....6	59.34.5471	470 pF	CER	
C....7	59.34.5471	470 pF	CER	
C....8	59.22.3101	100 uF	10V EL	
C....9	59.22.3101	100 uF	10V EL	
C....10	59.06.0682	6.8 nF	PE	
C....11	59.06.0682	6.8 nF	PE	
C....12	59.06.0682	6.8 nF	PE	
D....1	50.04.0125	1N4448		any
IC....1	50.09.0106	NE5532AN	dual op.amp. low noise	Sig
P....1	54.01.0273		CIS, 13 pin	
Q....1	50.03.0350	J112	N-J-FET	NS, Mot, Six
Q....2	50.03.0350	J112	N-J-FET	NS, Mot, Six
Q....3	50.03.0350	J112	N-J-FET	NS, Mot, Six
R....1	57.92.1121	22 Ohm	PTC	
R....2	57.92.1121	22 Ohm	PTC	
R....3	57.11.3332	3.3 kOhm	1%	
R....4	57.11.3332	3.3 kOhm	1%	
R....5	57.11.3222	2.2 kOhm	1%	
R....6	57.11.3222	2.2 kOhm	1%	
R....7	57.11.4102	1 kOhm		
R....8	57.11.4392	3.9 kOhm		
R....9	57.11.4221	220 Ohm		
R....10	57.11.4472	4.7 kOhm		
R....11	58.01.9202	2 kOhm	trim potm.	
R....12	57.11.3222	2.2 kOhm		
R....13	57.11.3222	2.2 kOhm		
R....14	57.11.4330	33 Ohm		
R....15	57.11.4104	100 kOhm		
R....16	57.11.4105	1 MOhm		
R....17	57.11.4102	1 kOhm		
R....18	57.11.4103	10 kOhm		
R....19	57.11.5106	10 MOhm		
R....20	57.11.4103	10 kOhm		
R....21	57.11.5106	10 MOhm		
R....22	57.11.4103	10 kOhm		
R....23	57.11.5106	10 MOhm		
R....24	57.11.4104	10 kOhm		
T....1	1.022.454.00		input trafo	
W....1	57.11.4000	0 Ohm		

CER = ceramic, EL = electrolytic, PE = polyester

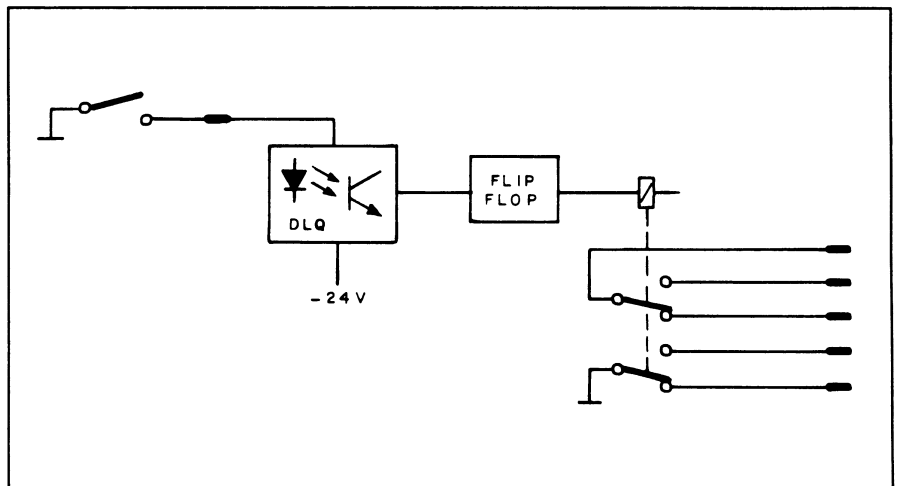
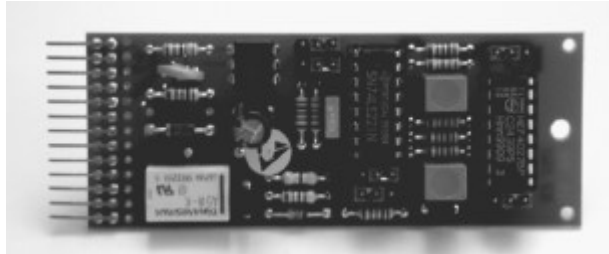
MANUFACTURER Mot=Motorola, NS=National Semiconductor, Six=Siliconics, TI=Texas Instruments, Sig=Signetics

1.914.531.00 HL-INPUT WITH PFL WY 87/06/1800

**2.1.16 Flip-flop Unit**

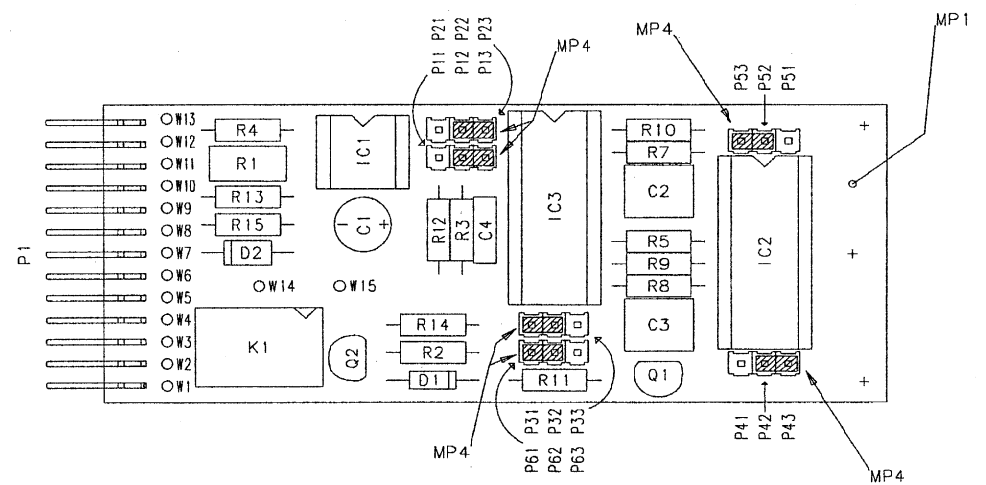
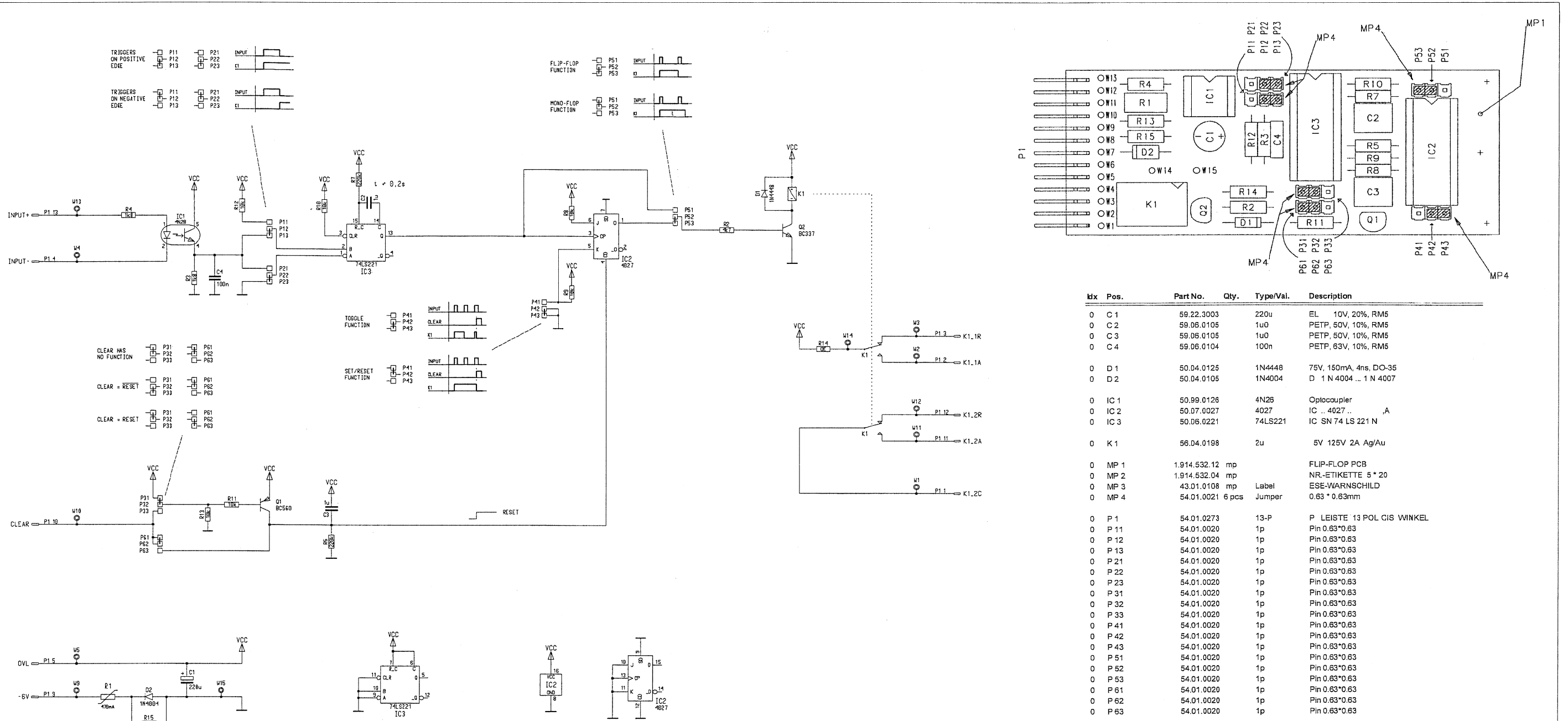
1.914.532

The Flip-flop Unit consists of a relay with two DPDT contacts and a flip-flop circuit with a control input (opto-coupler). A ground pulse from a non-latching switch applied to the input activates the relay. A next ground pulse will deactivate it again.

**Technical Specifications**

<b>Input:</b>		<b>floating</b> , with opto-coupler	
<b>Relay contacts:</b>	Max. rating	<b>100 V/0.5 A/30 W</b>	
<b>Supply:</b>		-6 V for logic -24 V for opto-coupler	
<b>Dimensions:</b>		<b>MS-card</b> , 34 × 85 mm	
<b>Ordering Information:</b>		Flip-flop unit	1.914.532.xx

MSC FLIP FLOP



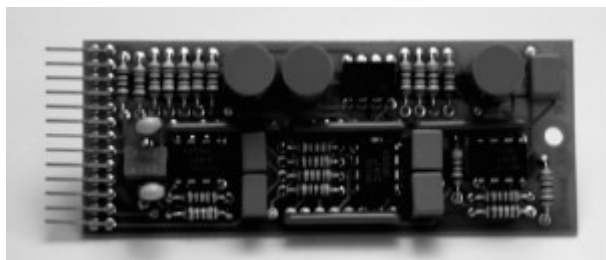
Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	C 1	59.22.3003		220u	EL 10V, 20%, RM5
0	C 2	59.06.0105		1u0	PETP, 50V, 10%, RM5
0	C 3	59.06.0105		1u0	PETP, 50V, 10%, RM5
0	C 4	59.06.0104		100n	PETP, 63V, 10%, RM5
0	D 1	50.04.0125		1N4448	75V, 150mA, 4ns, DO-35
0	D 2	50.04.0105		1N4004	D 1 N 4004 ... 1 N 4007
0	IC 1	50.99.0126		4N26	Optocoupler
0	IC 2	50.07.0027		4027	IC .. 4027 .. A
0	IC 3	50.06.0221		74LS221	IC SN 74 LS 221 N
0	K 1	56.04.0198		2u	5V 125V 2A Ag/Au
0	MP 1	1.914.532.12	mp		FLIP-FLOP PCB
0	MP 2	1.914.532.04	mp		NR-ETIKETTE 5 * 20
0	MP 3	43.01.0108	mp	Label	ESE-WARNSCHILD
0	MP 4	54.01.0021	6 pcs	Jumper	0.63 * 0.63mm
0	P 1	54.01.0023		13-P	P LEISTE 13 POL CIS WINKEL
0	P 11	54.01.0020		1p	Pin 0.63*0.63
0	P 12	54.01.0020		1p	Pin 0.63*0.63
0	P 13	54.01.0020		1p	Pin 0.63*0.63
0	P 21	54.01.0020		1p	Pin 0.63*0.63
0	P 22	54.01.0020		1p	Pin 0.63*0.63
0	P 23	54.01.0020		1p	Pin 0.63*0.63
0	P 31	54.01.0020		1p	Pin 0.63*0.63
0	P 32	54.01.0020		1p	Pin 0.63*0.63
0	P 33	54.01.0020		1p	Pin 0.63*0.63
0	P 41	54.01.0020		1p	Pin 0.63*0.63
0	P 42	54.01.0020		1p	Pin 0.63*0.63
0	P 43	54.01.0020		1p	Pin 0.63*0.63
0	P 51	54.01.0020		1p	Pin 0.63*0.63
0	P 52	54.01.0020		1p	Pin 0.63*0.63
0	P 53	54.01.0020		1p	Pin 0.63*0.63
0	P 61	54.01.0020		1p	Pin 0.63*0.63
0	P 62	54.01.0020		1p	Pin 0.63*0.63
0	P 63	54.01.0020		1p	Pin 0.63*0.63
0	Q 1	50.03.0601		BC560C	BC 560 C
0	Q 2	50.03.0340		BC337-25	800mA, 45V, NPN
0	R 1	57.92.1391		470mA	PTC, 30V, 2.5 Ohm
0	R 2	57.11.3472		4k7	MF, 1%, 0207
0	R 3	57.11.3182		1k8	MF, 1%, 0207
0	R 4	57.11.3182		1k8	MF, 1%, 0207
0	R 5	57.11.3224		220k	MF, 1%, 0207
0	R 7	57.11.3224		220k	MF, 1%, 0207
0	R 8	57.11.3103		10k	MF, 1%, 0207
0	R 9	57.11.3103		10k	MF, 1%, 0207
0	R 10	57.11.3103		10k	MF, 1%, 0207
0	R 11	57.11.3103		10k	MF, 1%, 0207
0	R 12	57.11.3103		10k	MF, 1%, 0207
0	R 13	57.11.3103		10k	MF, 1%, 0207
0	R 14	57.11.3000		0R0	MF, 0207
0	R 15	not used		0R0	MF, 0207
0	XIC 2	53.03.0168		16p	DIL 0.3", lot, gerade
0	XIC 3	53.03.0168		16p	DIL 0.3", lot, gerade

End of List

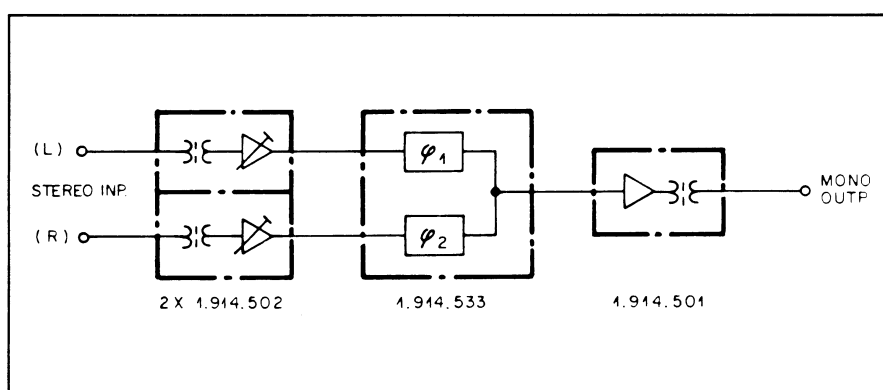
**2.1.17 90° Filter**

1.914.533

This active 90° filter is used to form a monophonic signal from the left and right channel of stereo signals. Simple mixing of the left and right channel will not produce a mono signal of satisfactory quality, but results in an emphasis of the center information. By summing the stereo signals in a 90° phase-shifted manner, this undesirable effect can be avoided.



The 90° filter consists of two all-pass filter chains, producing a uniform 90° phase difference across the whole audio range. The left and the right stereo signals are each passed through one of these filters and added at the filter's output. Doubling of equally-phased signal components as well as canceling of opposite-phased components is thus avoided.



The filter circuits are of unbalanced configuration. For this reason a summing circuit usually consists of two high-level amplifiers with balanced inputs (1.914.502), one 90° filter, and one high-level output amplifier (1.914.501), all accommodated on one MSC motherboard, as shown in the diagram above.

The gain of this combination can be adjusted. A correlated stereo input of equal level in both channels will provide a mono signal of identical level. With only one input channel (left or right), the mono output level will be lower by 3 dB.

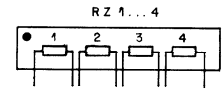
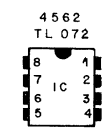
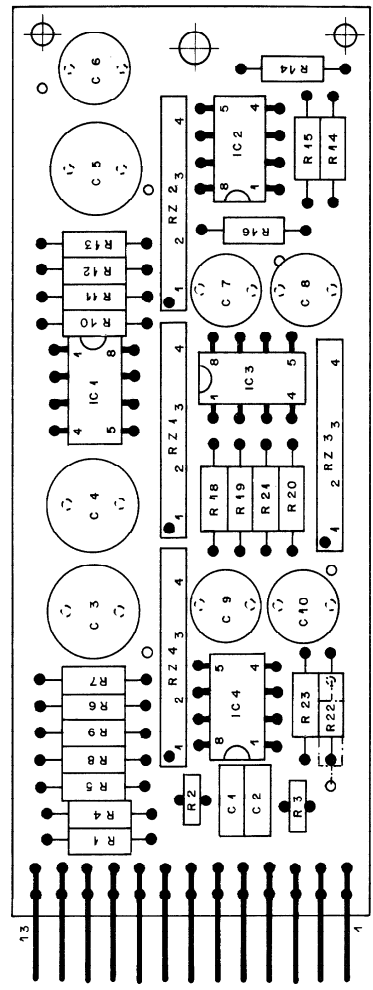
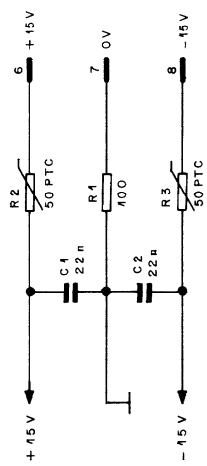
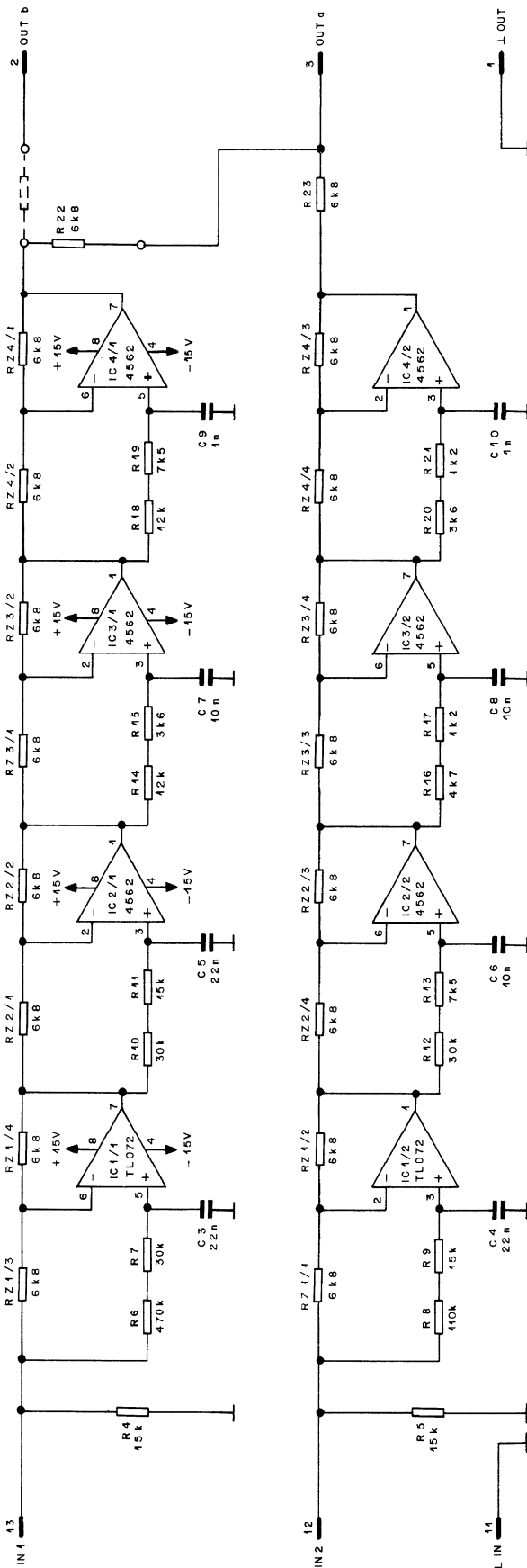
Since the 90° filter with its input and output cards can be realized on a single, Euro-card size MSC motherboard, it can possibly be combined with other Audio Components, such as limiters and isolation amplifiers. Such stereo-to-mono combinations are in use at various radio stations to feed the stereo programs to the monophonic AM-transmitter in a correctly summed manner.

**Technical Specifications**

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<b>Input:</b>	Max. level	<b>+20 dBu</b>
	Impedance	<b>4 kW</b>
<b>Output:</b>	Max. level	<b>+20 dBu</b>
	Impedance	<b>6.8 kW</b>
	Frequency response	<b>30 Hz...16 kHz, ±0.3 dB</b>
	Phase	<b>90° ±3°; 30 Hz...16 kHz</b>
	THD	<b>£ -80 dB</b>
	Noise	<b>&lt; -95 dBu</b>
<b>Supply:</b>		<b>±15 V (18 mA idling)</b>
<b>Dimensions:</b>		<b>MS-card, 34 × 85 mm</b>
<b>Ordering Information:</b>		<b>90° filter stereo/mono</b>

1.914.533.xx



BOTTOM VIEW

CIS	PIN	EURO 32 PIN			
		(A)	(B)	(C)	(D)
IN 1	13	1	7	21	27
IN 2	12	2	8	22	28
⊥	11	3	9	23	29
	10				
	9				
-15 V	8	14			
0 V	7	15			
+15 V	6	16			
	5				
	4				
OUT a	3	4	10	24	30
OUT b	2	5	11	25	31
⊥	1	6	13	26	32

© 26.9.94 <b>STUDER</b> REGENSDORF ZÜRICH	<b>90 DEGREE FILTER</b>	1.914.533.00
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MSC 90° FILTER

Ad ..POS... ..REF.No... DESCRIPTION.....MANUFACTURER

C....1	59.06.0223	22 nF		PE	
C....2	59.06.0223	22 nF		PE	
C....3	59.05.1223	22 nF 1%		PP	
C....4	59.05.1223	22 nF 1%		PP	
C....5	59.05.1223	22 nF 1%		PP	
C....6	59.05.1103	10 nF 1%		PP	
C....7	59.05.1103	10 nF 1%		PP	
C....8	59.05.1103	10 nF 1%		PP	
C....9	59.05.1102	1 nF 1%		PP	
C....10	59.05.1102	1 nF 1%		PP	
IC....1	50.09.0101	TL072	dua1 op.amp.		TI
01 IC....2	50.09.0107	RC4559	dua1 op.amp.		Ra
01 IC....3	50.09.0107	RC4559	dua1 op.amp.		Ra
01 IC....4	50.09.0107	RC4559	dua1 op.amp.		Ra
P....1	54.01.0273		CIS, 13 pin		
R....1	57.11.3101	100 Ohm			
R....2	57.99.0206	50 Ohm	PTC		
R....3	57.99.0206	50 Ohm	PTC		
R....4	57.11.3153	15 kOhm			
R....5	57.11.3153	15 kOhm			
R....6	57.11.3474	470 kOhm	1%		
R....7	57.11.3303	30 kOhm	1%		
R....8	57.11.3114	110 kOhm	1%		
R....9	57.11.3153	15 kOhm	1%		
R....10	57.11.3303	30 kOhm	1%		
R....11	57.11.3153	15 kOhm	1%		
R....12	57.11.3303	30 kOhm	1%		
R....13	57.11.3752	7.5 kOhm	1%		
R....14	57.11.3123	12 kOhm	1%		
R....15	57.11.3362	3.6 kOhm	1%		
R....16	57.11.3472	4.7 kOhm	1%		
R....17	57.11.3122	1.2 kOhm	1%		
R....18	57.11.3123	12 kOhm	1%		
R....19	57.11.3752	7.5 kOhm	1%		
R....20	57.11.3362	3.6 kOhm	1%		
R....21	57.11.3122	1.2 kOhm	1%		
R....22	57.11.3682	6.8 kOhm	1%		
R....23	57.11.3682	6.8 kOhm	1%		
RZ....1	57.88.2682	6.8 kOhm		Resistor-Network	
RZ....2	57.88.2682	6.8 kOhm		Resistor-Network	
RZ....3	57.88.2682	6.8 kOhm		Resistor-Network	
RZ....4	57.88.2682	6.8 kOhm		Resistor-Network	

PE = polyester, PP = polypropylen

(01) 90/06/21 IC 2...4 RC 4562 replaced by RC 4559

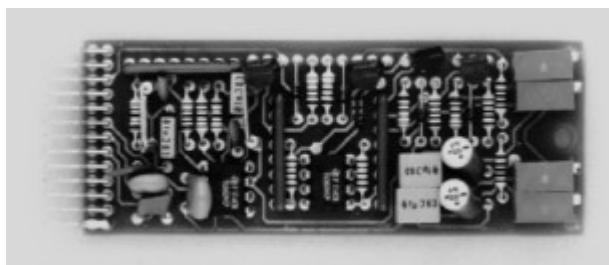
MANUFACTURER TI=Texas Instruments, Ra=Raytheon

1.914.533.00 90 DEGREE FILTER HAM88/02/2400  
 1.914.533.00 90 DEGREE FILTER FRI90/06/2101

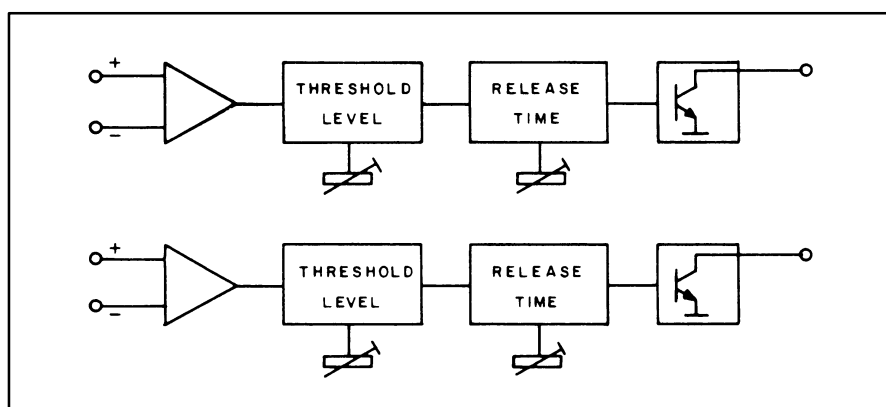
**2.1.18 Dual Vox Detector**

1.914.534

The Dual Vox Detector card contains two adjustable threshold level detector circuits. Threshold level ( $-22$  dBu... $+16$  dBu) and release time ( $0.2$  s... $10$  s) are separately adjustable for two audio channels. These adjustments are effected very precisely with multi-turn trimmer potentiometers.



The high-impedance audio input is balanced. The open-collector output is prepared to activate a relay or an alarm device. A possible application of this card would be to detect incoming modulation.

**Technical Specifications****Inputs:**

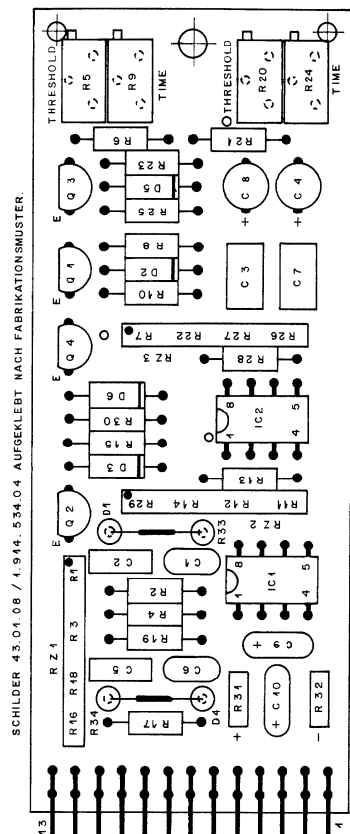
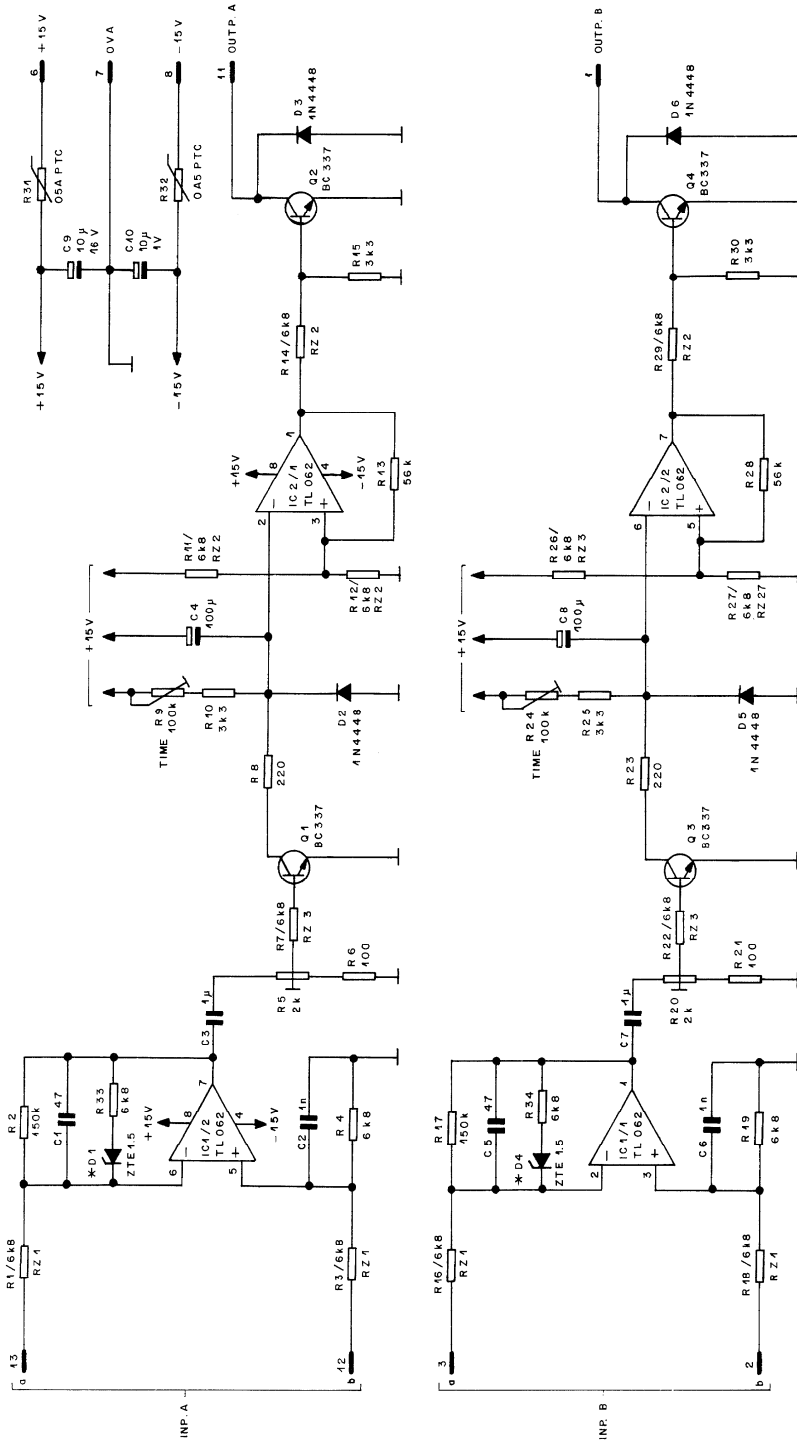
Impedance	<b>Electronically balanced</b>
Max. level	<b>± 10 kW</b>
Frequency response	<b>+24 dBu</b> ( $0 \text{ dBu} \hat{=} 0,775 \text{ V}_{\text{rms}}$ )
Threshold level	<b>75 Hz...12 kHz, -3 dB</b>
Attack time	<b>-22 dBu...+16 dBu</b>
Release time	<b>100 ms</b>
Hysteresis	<b>200 ms...10 s</b>
	<b>± 1 dB</b>

**Outputs:****Open-collector;**  $U_{\text{CE}} \leq +45 \text{ V}$ ;  $I_{\text{max}} \leq 100 \text{ mA}$ **Supply:****±15 V** ( $\leq 15 \text{ mA}$  /  $4 \text{ mA}$  idling)**Dimensions:****MS-card**,  $34 \times 85 \text{ mm}$ **Ordering Information:**

Dual vox detector

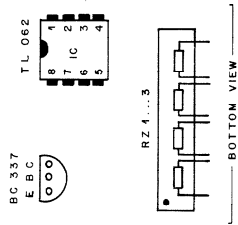
1.914.534.xx





\* CATHODE RING CONNECTED TO THE POSITIVE VOLTAGE OF THE VOLTAGE.

CIS	PIN	EURO 32 PIN
INPUT A a	13	1
INPUT B b	12	2
OUTPUT	11	3
	10	4
-15V	8	14
OVA	7	15
+15V	6	16
	5	17
INPUT A q	4	10
INPUT B b	3	11
OUTPUT A	2	12
	1	13
		14
		15
		16
		17
		18
		19
		20
		21
		22
		23
		24
		25
		26
		27
		28
		29
		30
		31
		32



27.9.94			
STUDER REGENSDORF ZÜRICH	THRESHOLD LEVEL DETECTOR	ESE	1.914.534.00

MSC DUAL VOX DETECTOR

Ad	POS	REF.No	DESCRIPTION	MANUFACTURER	
01	C.....1	59.34.2470	47 pF 63V	CER 5%	
01	C.....2	59.34.5102	1000 pF 63V	PE 5%	
	C.....3	59.06.5105	1 uF	PE 5%	
	C.....4	59.22.3101	100 uF 10V	EL	
01	C.....5	59.34.2470	47 pF 63V	CER 5%	
01	C.....6	59.06.5102	1000 pF 63V	PE 5%	
	C.....7	59.06.5105	1 uF	PE 5%	
	C.....8	59.22.3101	100 uF 10V	EL	
	C.....9	59.26.2100	10 uF 16V	EL	
	C.....10	59.26.2100	10 uF 16V	EL	
01	D.....1	50.99.0183	ZTE1.5	1.5V ZENER	ITT
	D.....2	50.04.0125	1N4448		any
	D.....3	50.04.0125	1N4448		any
01	D.....4	50.99.0183	ZTE1.5	1.5V ZENER	ITT
	D.....5	50.04.0125	1N4448		any
	D.....6	50.04.0125	1N4448		any
	IC....2	50.09.0119	TL062	dual op.amp.	TI
	IC....3	50.09.0119	TL062	dual op.amp.	TI
	P.....1	54.01.0273		CIS, 13 pin	
	Q.....1	50.03.0516	BC337	NPN	any
	Q.....2	50.03.0516	BC337	NPN	any
	Q.....3	50.03.0516	BC337	NPN	any
	Q.....4	50.03.0516	BC337	NPN	any
	R.....1	.	6.8 kOhm	RZ 1	
01	R.....2	57.11.3154	150 kOhm		
	R.....3	.	6.8 kOhm	RZ 1	
01	R.....4	57.11.3682	6.8 kOhm		
	R.....5	58.05.0202	2 kOhm	Trim 10%	
	R.....6	57.11.3101	100 Ohm		
	R.....7	.	6.8 kOhm	RZ 3	
	R.....8	57.11.3221	220 Ohm		
	R.....9	58.05.0104	100 kOhm	Trim 10%	
	R.....10	57.11.3332	3.3 kOhm		
	R....11	.	6.8 kOhm	RZ 2	
	R....12	.	6.8 kOhm	RZ 2	
	R....13	57.11.3563	56 kOhm		
	R....14	.	6.8 kOhm	RZ 2	
	R....15	57.11.3332	3.3 kOhm		
	R....16	.	6.8 kOhm	RZ 1	
01	R....17	57.11.3154	150 kOhm	1%	
	R....18	.	6.8 kOhm	RZ 1	
01	R....19	57.11.3682	6.8 kOhm		
	R....20	58.05.0202	2 kOhm	Trim 10%	
	R....21	57.11.3101	100 Ohm		
	R....22	.	6.8 kOhm	RZ 3	
	R....23	57.11.3221	220 Ohm		
	R....24	58.05.0104	100 kOhm	Trim 10%	
	R....25	57.11.3332	3.3 kOhm		
	R....26	.	6.8 kOhm	RZ 3	
	R....27	.	6.8 kOhm	RZ 3	
	R....28	57.11.3563	56 kOhm		
	R....29	.	6.8 kOhm	RZ 2	
	R....30	57.11.3332	3.3 kOhm		
	R....31	57.92.7001	0.3 Ohm	PTC .5A	
	R....32	57.92.7001	0.3 Ohm	PTC .5A	
01	R....33	57.11.3682	6.8 kOhm		
01	R....34	57.11.3682	6.8 kOhm		
	RZ....1	57.88.2682	6.8 kOhm	R. Network 4*6.8k	
	RZ....2	57.88.2682	6.8 kOhm	R. Network 4*6.8k	
	RZ....3	57.88.2682	6.8 kOhm	R. Network 4*6.8k	

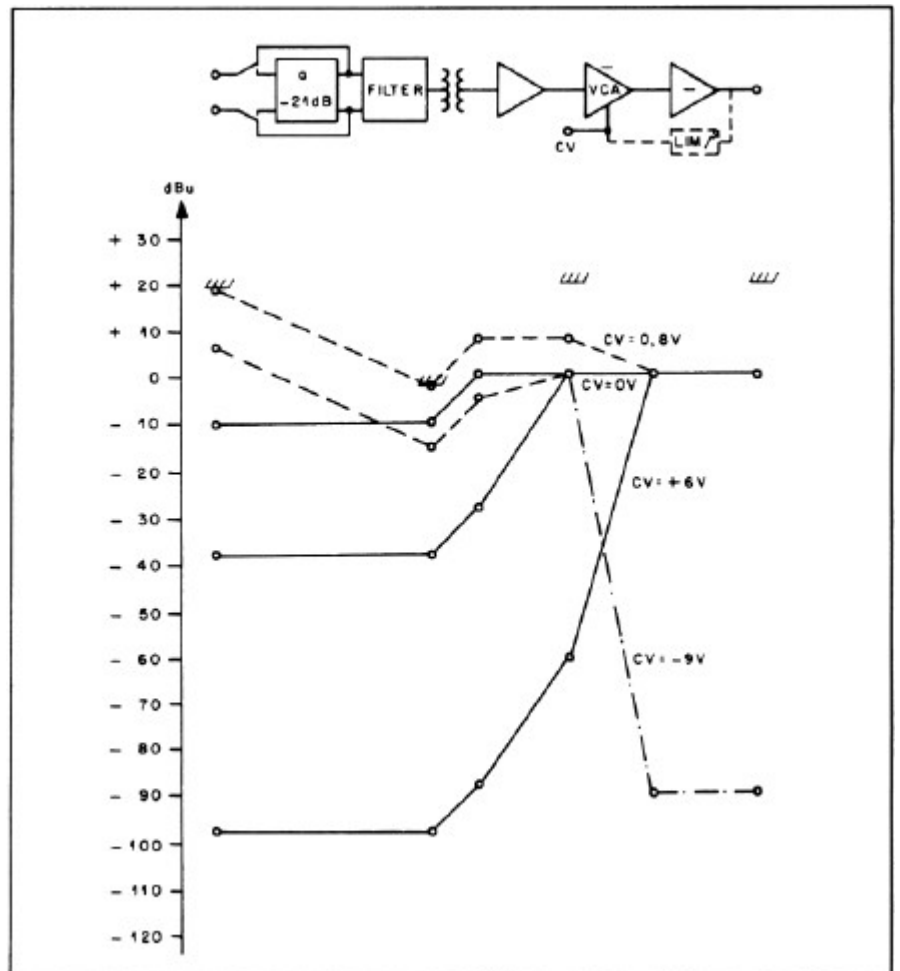
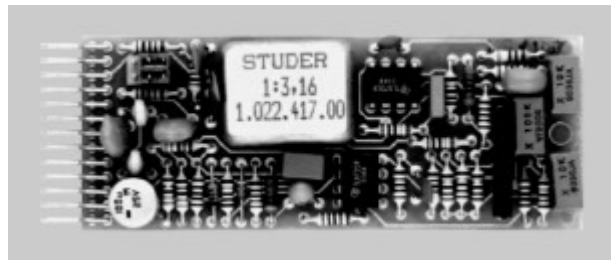
(01) update  
 (02) old name: THRESHOLD DETECTOR  
 CER = ceramic, EL = electrolytic, PE = polyester

MANUFACTURER	Part No.	Description	Reference
Mot	Motorola		
NS	National Semiconductor		
Six	Siliconics		
TI	Texas Instruments		
	1.914.534.00	THRESHOLD LEVEL DETECTOR	FRI88/06/1800
	1.914.534.00	THRESHOLD LEVEL DETECTOR	FRI88/09/0701
	1.914.534.00	DUAL VOX DETECTOR (POS)	FRI88/10/2702

**2.1.19 Microphone Amplifier with Limiter**

1.914.539

This assembly combines a microphone amplifier and a VCA limiter circuit with adjustable threshold level and program-depending release time. The input is balanced and floating, the output is unbalanced and with low impedance. Gain control is effected internally with a trimmer potentiometer, or externally with a gain-control DC voltage. A jumper-selectable pad reduces the input level by 21 dB.



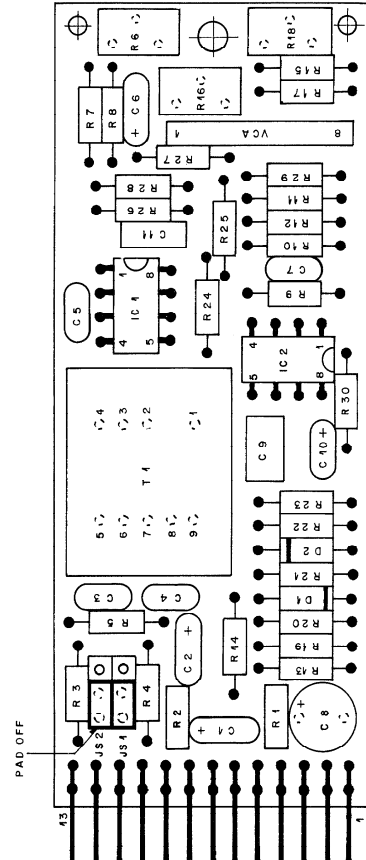
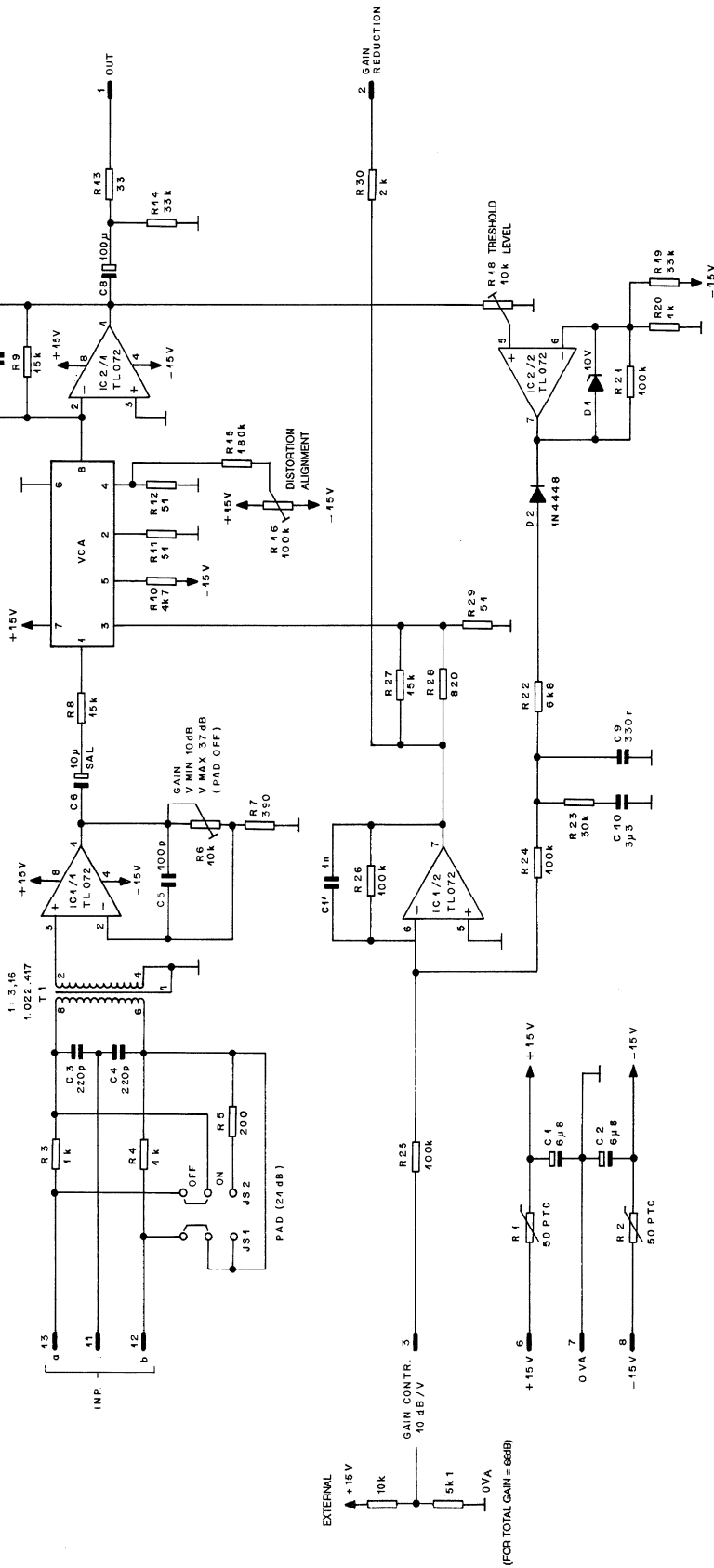
The operation of the limiter circuit can be monitored at the gain reduction output, if an appropriate instrument (GRM) is connected.

This card is ideally suited for talkback applications.

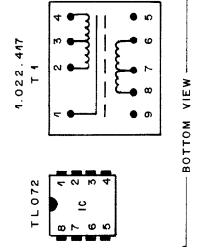
**Technical Specifications**

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<b>Input:</b>	Impedance	> <b>1 kW</b> , balanced, floating	
	Max. level	<b>-2 dBu</b> (THD at 30 Hz $\leq$ 1%) <b>+19 dBu</b> , pad on	
	Pad (attenuation)	<b>-21 dB</b> , jumper-selectable	
	CMRR	> <b>60 dB</b> @ 16 kHz	
	Source impedance	<b>£ 200 W</b>	
<b>Output:</b>	Max. level	<b>+20 dBu</b>	
	Impedance	<b>33 W</b>	
	Load	<b>≈ 2 kW</b>	
	Gain adjust ( $v_1$ )	<b>min. +10 dB</b> , VCA = 0 dB; pad off	
		<b>max. +37 dB</b> , VCA = 0 dB; pad off	
		<b>min. -11 dB</b> , VCA = 0 dB; pad on	
		<b>max. +16 dB</b> , VCA = 0 dB; pad on	
	Gain control characteristics ( $v_2$ )	<b>10 dB/V</b>	
		DC range	<b>-10...+6 V</b> , pin3: gain control input
		Total gain	<b><math>v_{tot} = v_1 + v_2</math></b>
Max. attenuation		> <b>90 dB</b>	
<b>General:</b>	Frequency response	<b><math>\pm 0.5</math> dB</b> , 30 Hz...16 kHz	
	THD	<b>£ -50 dB</b> , 20 dB gain; 30 Hz...16 kHz	
	Noise voltage	<b>-95 dBu</b> , pad on; 0 dB gain	
	Noise figure	<b>F ~ 10 dB</b> , bandwidth = 23 kHz; 60 dB gain; $R_s = 200 \Omega$ ; pad off	
<b>Limiters:</b>	Threshold level	<b>-7...+20 dBu</b>	
	Attack time	<b>0.5 ms</b>	
	Release time	<b>50 ms...1 s</b> , program-dependent	
	Compression ratio	<b>10:1</b> @ 1 kHz	
<b>Supply:</b>		<b><math>\pm 15</math> V</b> (25 mA)	
<b>Ordering Information:</b>	Microphone amplifier with limiter	1.914.539.xx	



CIS	PIN	EURO 32 PIN
IN a	13	1
IN b	42	2
IN L	41	3
	40	4
-15V	9	14
0VA	7	15
+15V	6	16
GC	3	4
GRM	2	5
OUT	1	6
		13
		14
		15
		16
		17
		18
		19
		20
		21
		22
		23
		24
		25
		26
		27
		28
		29
		30
		31
		32



4.10.91	STUDER REGENSDORF ZÜRICH	MIC. AMPLIFIER WITH LIMITER	1.914.539.00
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MSC MIC AMP / LIMITER

Ad ..POS.. ..REF.No... DESCRIPTION.....MANUFACTURER

C....1	59.26.2689	6.8 uF	16V	SAL		
C....2	59.26.2689	6.8 uF	16V	SAL		
C....3	59.34.4221	220 pF	63V	CER	5%	
C....4	59.34.4221	220 pF	63V	CER	5%	
C....5	59.34.4101	100 pF	63V	CER	5%	
C....6	59.26.5100	10 uF	25V	SAL		
C....7	59.34.4101	100 pF	63V	CER	5%	
C....8	59.22.4101	100 uF	16V	EL		
C....9	59.06.0334	330 nF	63V	PETP	10%	
C....10	59.30.6339	3.3 uF	35V	TA	20%	
C....11	59.06.0102	1 nF	63V	PETP	10%	
D....1	50.04.1114	BZX55-C10	Z 10V	0.4W		any
D....2	50.04.0125	1N4448	diode			any
IC....1	50.09.0101	TL072 CP	dual op.amp.	bifET		TI
IC....2	50.09.0101	TL072 CP	dual op.amp.	bifET		TI
IC....3	50.11.0140	dbx2150 A	VCA			dBx
JS....1	54.01.0021	Jumper	Au			
JS....2	54.01.0021	Jumper	Au			
MP....1	43.01.0108	ESE	ESE warning			
P....1	54.01.0273	13 PIN	CIS			
P....2	54.11.0136	2*3 PIN	Stiftleiste			
PCB...1	1.914.539.11		empty PCB			St
R....1	57.99.0206	50 Ohm	PTC			
R....2	57.99.0206	50 Ohm	PTC			
R....3	57.11.3102	1 kOhm				
R....4	57.11.3102	1 kOhm				
R....5	57.11.3201	200 Ohm				
R....6	58.01.9103	10 kOhm	variable resistor	10%	PGM	
R....7	57.11.3391	390 Ohm				
R....8	57.11.3153	15 kOhm				
R....9	57.11.3153	15 kOhm				
R....10	57.11.3472	4.7 kOhm				
R....11	57.11.3510	51 Ohm				
R....12	57.11.3510	51 Ohm				
R....13	57.11.3330	33 Ohm				
R....14	57.11.3333	33 kOhm				
R....15	57.11.3184	180 kOhm				
R....16	58.01.9104	100 kOhm	variable resistor	10%	PGM	
R....17	57.11.3102	1 kOhm				
R....18	58.01.9103	10 kOhm	variable resistor	10%	PGM	
R....19	57.11.3333	33 kOhm				
R....20	57.11.3102	1 kOhm				
R....21	57.11.3104	100 kOhm				
R....22	57.11.3682	6.8 kOhm				
R....23	57.11.3303	30 kOhm				
R....24	57.11.3104	100 kOhm				
R....25	57.11.3104	100 kOhm				
R....26	57.11.3104	100 kOhm				
R....27	57.11.3153	15 kOhm				
R....28	57.11.3821	820 Ohm				
R....29	57.11.3510	51 Ohm				
R....30	57.11.3202	2 kOhm				
T....1	1.022.417.00	1:3.16	input-transformer			St

CER = ceramic, EL = electrolytic, PETP = polyester  
SAL = solid aluminium, TA = tantal

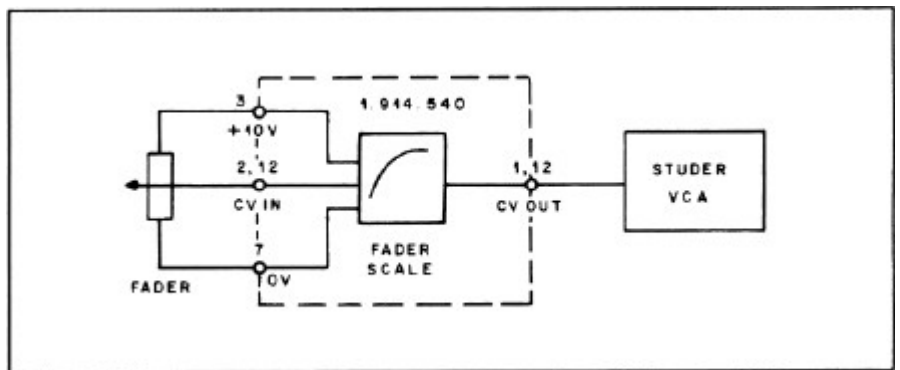
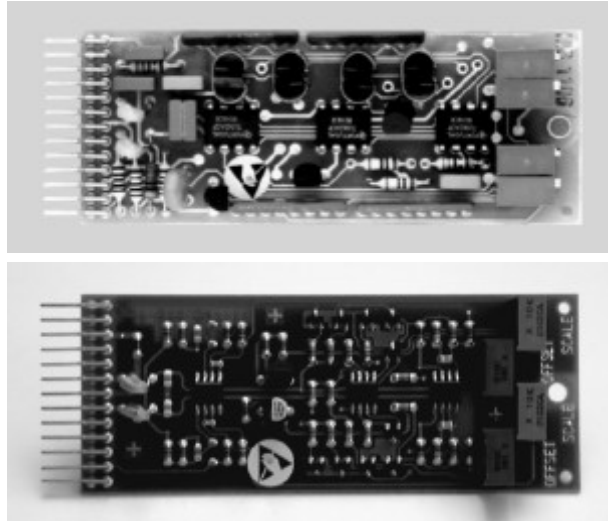
MANUFACTURER dBx= dBx-Incorp., St= Studer, TI= Texas Instruments

1.914.539.00 MIC.AMPLIFIER WITH LIMITER HOR20/11/9000

**2.1.20 Dual Fader/VCA Control Voltage Interface**

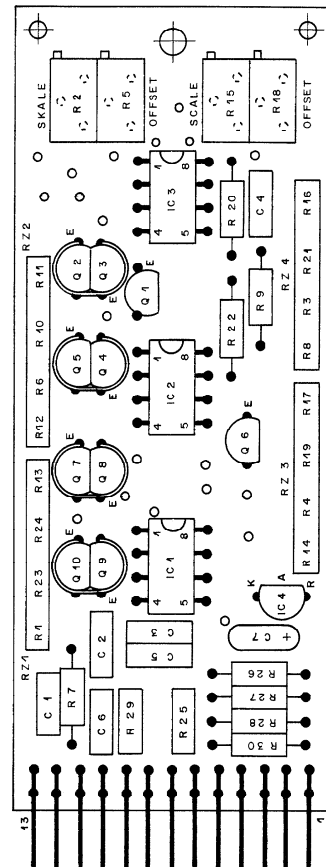
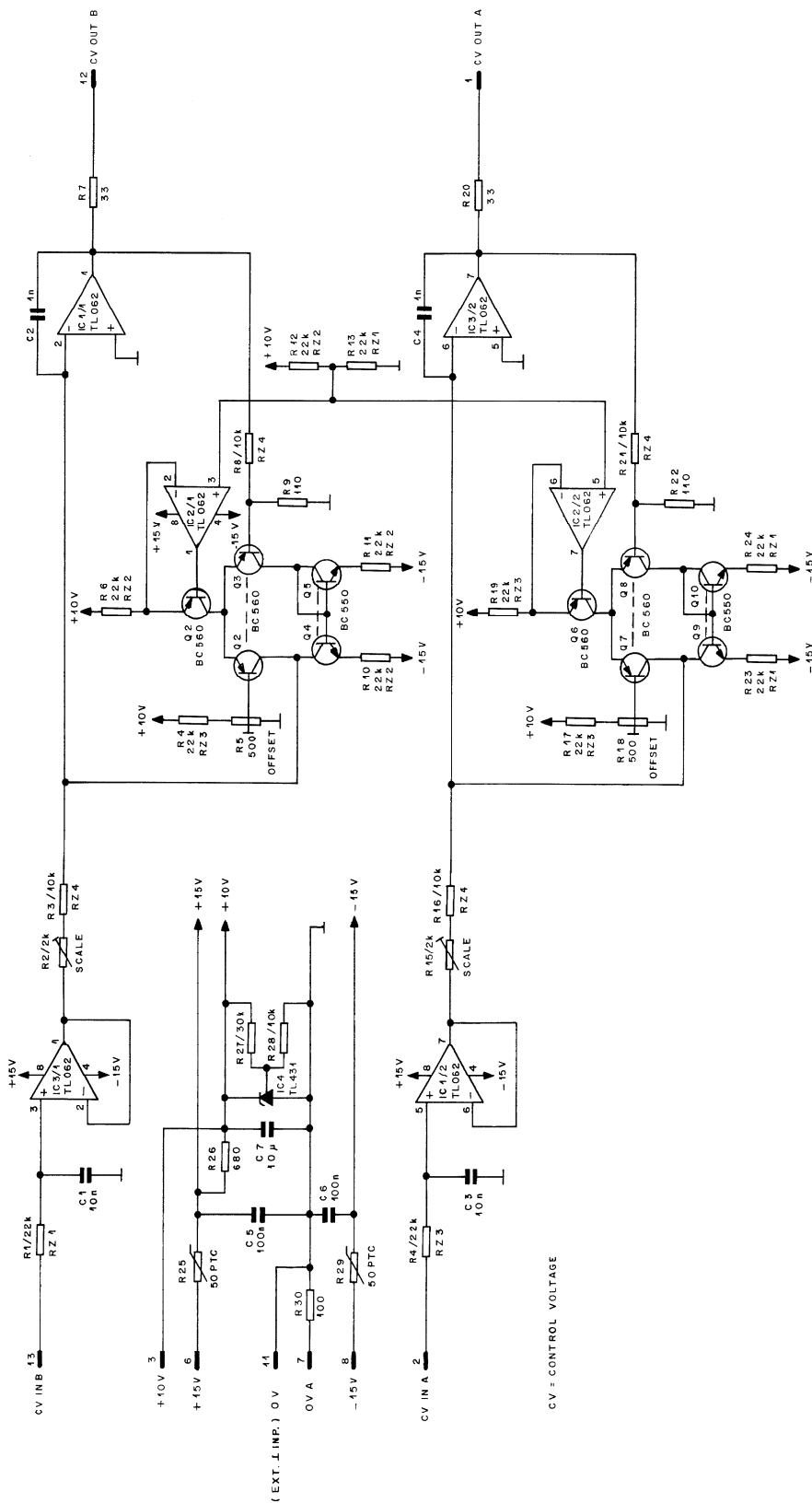
1.914.540 /541

These interfaces are used to convert the voltage of a linear fader to the non-linear dB scale of a Studer VCA. One card processes two channels. It is available in two versions: 540.xx (0...+10 V<sub>DC</sub> control voltage), and 541.xx (+5...0 V<sub>DC</sub> control voltage). A regulated +10 V<sub>DC</sub> reference voltage is generated on-board. The DC from the fader's wiper is connected to the input. Offset and scale alignment is performed with on-board trimmer potentiometers for matching the VCA gain to the dB scale of the fader.

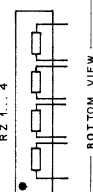
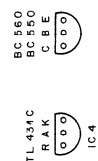


**Technical Specifications**

		<b>1.914.540.xx</b>	<b>1.914.541.xx</b>
<b>Input:</b>	Impedance	> 1 MW, unbalanced	100 kW, unbalanced
	Level range	0...+10 V	+5...0 V
<b>Output:</b>	Impedance	33 W, unbalanced	33 W, unbalanced
	Control range	+1 V...-10 V	+1 V...-10 V
<b>Supply:</b>		±15 V (15 mA)	
<b>Dimensions:</b>		MS-card, 34 × 85 mm	
<b>Ordering Information:</b>	Fader/VCA control interface		1.914.540.xx
	Fader/VCA control interface		1.914.541.xx



CIS	PIN	EURO	52 PIN
CV IN B	43	1	27
CV OUT B	42	2	28
OV (CV)	41	3	23
	10	9	29
-15.5V	8	14	
0VA	7	15	
+15.5V	6	16	
	5		
+10V (FADER)	4	4	30
CV IN A	3	5	31
CV OUT A	1	1	26
			32



7 10 91			
		<b>FADER / VCA CV INTERFACE BOARD</b>	
		1.914.540.00	



MSC FADER / VCA INTERFACE

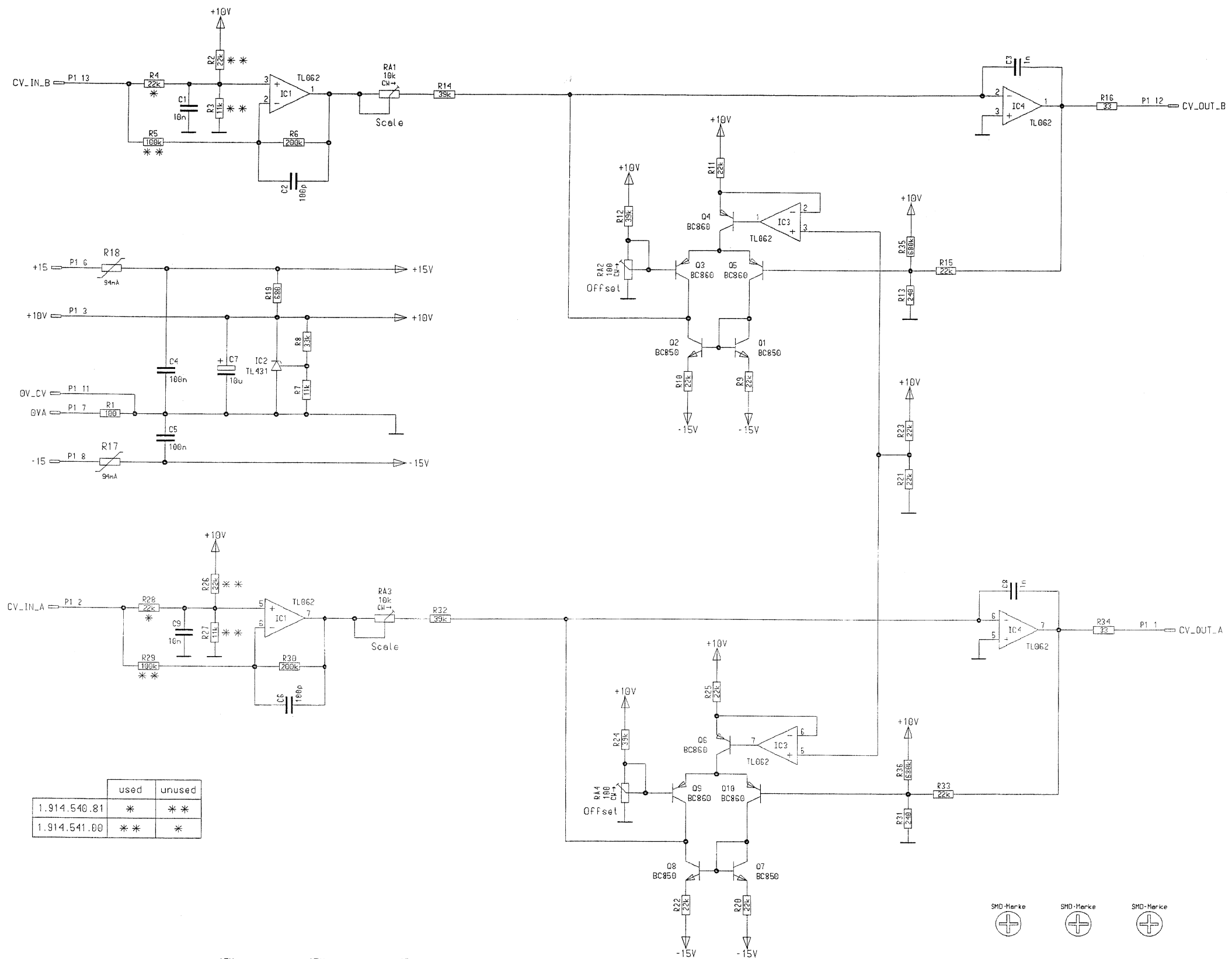
Ad	..POS..	..REF.No..	DESCRIPTION.....	MANUFACTURER
C....1	59.06.0103	10 nF	63V PE 10%	
C....2	59.06.0102	1 nF	63V PE 10%	
C....3	59.06.0103	10 nF	63V PE 10%	
C....4	59.06.0102	1 nF	63V PE 10%	
C....5	59.06.0104	0.1 uF	63V PE 10%	
C....6	59.06.0104	0.1 uF	63V PE 10%	
C....7	59.26.2100	10 uF	16V SAL	
IC....1	50.09.0119	TL062 ACP	dual op.amp.	TI
IC....2	50.09.0119	TL062 ACP	dual op.amp.	TI
IC....3	50.09.0119	TL062 ACP	dual op.amp.	TI
IC....4	50.10.0106	TL431 CLP	shunt regulator	TI
MP....1	50.20.2001	CLIP	2 * TO 92	
MP....2	50.20.2001	CLIP	2 * TO 92	
MP....3	50.20.2001	CLIP	2 * TO 92	
MP....4	50.20.2001	CLIP	2 * TO 92	
MP....5	43.01.0108	ESE	ESE warning	
P....1	54.01.0273	13 PIN	CIS	
PCB...1	1.914.540.11		empty PCB	St
Q....1	50.03.0496	BC560	PNP	Sie
Q....2	50.03.0600	BC560	PNP E6310	Sie see note 1
Q....3	50.03.0600	BC560	PNP E6310	Sie see note 1
Q....4	50.03.0524	BC550	NPN E6310	Sie see note 1
Q....5	50.03.0524	BC550	NPN E6310	Sie see note 1
Q....6	50.03.0496	BC560	PNP	Sie
Q....7	50.03.0600	BC560	PNP E6310	Sie see note 1
Q....8	50.03.0600	BC560	PNP E6310	Sie see note 1
Q....9	50.03.0524	BC550	NPN E6310	Sie see note 1
Q....10	50.03.0524	BC550	NPN E6310	Sie see note 1
R....1	58.05.0104	100 kOhm	multi-turn 10%	
R....2	58.05.0501	500 Ohm	multi-turn 10%	
R....3	57.11.3330	33 Ohm		
R....4	57.11.3241	240 Ohm		
R....5	58.05.0104	100 kOhm	multi-turn 10%	
R....6	58.05.0501	500 Ohm	multi-turn 10%	
R....7	57.11.3330	33 Ohm		
R....8	57.11.3241	240 Ohm		
R....9	57.92.1820	42 Ohm	PTC	
R....10	57.11.3681	680 Ohm		
R....11	57.11.3303	30 kOhm		
R....12	57.11.3103	10 kOhm		
R....13	57.92.1820	42 Ohm	PTC	
R....14	57.11.3101	100 Ohm		
RZ....1	57.88.2223	22 kOhm	network 4 * 22k	
RZ....2	57.88.2223	22 kOhm	network 4 * 22k	
RZ....3	57.88.2223	22 kOhm	network 4 * 22k	
RZ....4	57.88.2223	22 kOhm	network 4 * 22k	

SAL = electrolytic, PE = polyester

MANUFACTURER TI=Texas Instruments, Sie=Siemens, St=Studer

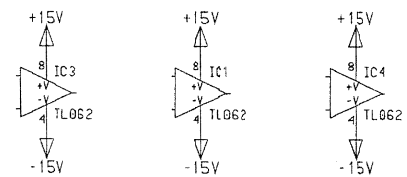
Note 1: Q2,Q3,Q4,Q5,Q7,Q8,Q9,Q10 must fulfill BV 678 I

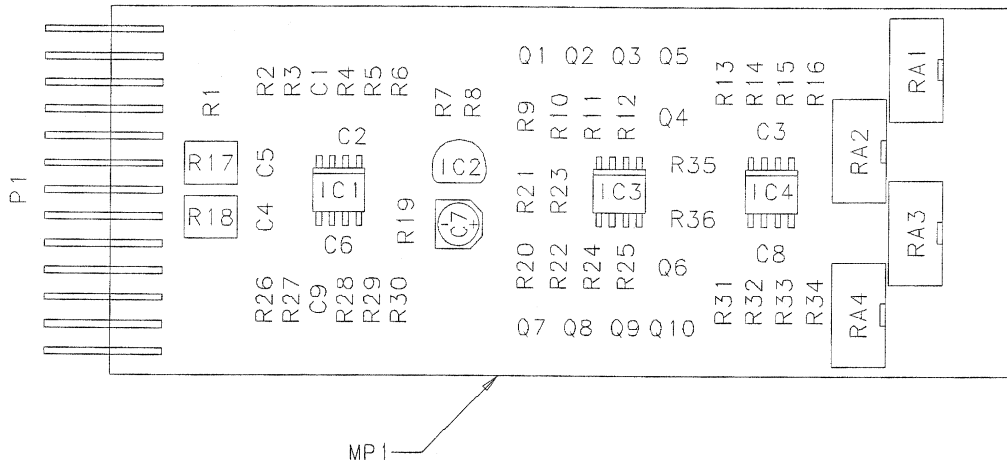
1.914.540.00 FADER/VCA CV INTERFACE BOARD HOR16/11/9000



	used	unused
1.914.540.81	*	**
1.914.541.00	**	*

NC P1 4  
 NC P1 5  
 NC P1 9  
 NC P1 10





Accompanying documents: Zugehoerige Unterlagen: PL		General tolerance: Freimasstoleranz:		Scale: Masstab: 1.5:1		Edition Ausgabe		17.04.2000		ZT		ML		RL		⊙	
Substitute for: Ersatz fuer:						Date Datum		Viso Gez.		Checked Gepr.		Seen Ges.		Index			
Page: Seite:								1 / 1									
<b>STUDER</b> REGENSDORF		Description: Benennung:		FADER/VCA INTERFACE TYPE2 FADER/VCA CV INTERFACE		Z		Number: Number:		1.914.541.00		1.914.540.81					

**Dual Fader/VCA Control Voltage IF 1.914.541.00 ( 0)**

Idx. Pos.	Part No.	Qty.	Type/Val.	Description	Idx. Pos.	Part No.	Qty.	Type/Val.	Description
0	C 1	59.60.3325	1 pce	10n	CER 50V, 10%, X7R, 0805				
0	C 2	59.60.2249	1 pce	100p	CER 50V, 5%, C0G, 0603				
0	C 3	59.60.2373	1 pce	1n0	CER 50V, 5%, C0G, 0805				
0	C 4	59.60.3337	1 pce	100n	CER 50V, 10%, X7R, 0805				
0	C 5	59.60.3337	1 pce	100n	CER 50V, 10%, X7R, 0805				
0	C 6	59.60.2249	1 pce	100p	CER 50V, 5%, C0G, 0603				
0	C 7	59.68.0065	1 pce	10u	EL 16V, 4.0*5.7				
0	C 8	59.60.2373	1 pce	1n0	CER 50V, 5%, C0G, 0805				
0	C 9	59.60.3325	1 pce	10n	CER 50V, 10%, X7R, 0805				
0	IC 1	50.61.0201	1 pce	TL062	Dual FET Op-Amp				
0	IC 2	50.10.0106	1 pce	TL431	Shunt regulator				
0	IC 3	50.61.0201	1 pce	TL062	Dual FET Op-Amp				
0	IC 4	50.61.0201	1 pce	TL062	Dual FET Op-Amp				
0	MP 1	1.914.541.11	1 pce		FADER/VCA INTERFACE2 PCB				
0	MP 2	1.914.541.04	1 pce		NR.-ETIKETTE 5 * 20				
0	MP 3	43.01.0108	1 pce	Label	ESE-Warnschild				
0	P 1	54.01.0273	1 pce	13p	Stecker CIS parallelsteck				
0	Q 1	50.60.0002	1 pce	BC850C	NPN 45V 100mA SOT 23				
0	Q 2	50.60.0002	1 pce	BC850C	NPN 45V 100mA SOT 23				
0	Q 3	50.60.1002	1 pce	BC860C	PNP 45V 100mA SOT 23				
0	Q 4	50.60.1002	1 pce	BC860C	PNP 45V 100mA SOT 23				
0	Q 5	50.60.1002	1 pce	BC860C	PNP 45V 100mA SOT 23				
0	Q 6	50.60.1002	1 pce	BC860C	PNP 45V 100mA SOT 23				
0	Q 7	50.60.0002	1 pce	BC850C	NPN 45V 100mA SOT 23				
0	Q 8	50.60.0002	1 pce	BC850C	NPN 45V 100mA SOT 23				
0	Q 9	50.60.1002	1 pce	BC860C	PNP 45V 100mA SOT 23				
0	Q 10	50.60.1002	1 pce	BC860C	PNP 45V 100mA SOT 23				
0	R 1	57.60.1101	1 pce	100R	MF, 1%, 0204, E24				
0	R 2	57.60.1223	1 pce	22k	MF, 1%, 0204, E24				
0	R 3	57.60.1113	1 pce	11k	MF, 1%, 0204, E24				
0	R 4	not used	1 pce	22k	MF, 1%, 0204, E24				
0	R 5	57.60.1104	1 pce	100k	MF, 1%, 0204, E24				
0	R 6	57.60.1204	1 pce	200k	MF, 1%, 0204, E24				
0	R 7	57.60.1113	1 pce	11k	MF, 1%, 0204, E24				
0	R 8	57.60.1333	1 pce	33k	MF, 1%, 0204, E24				
0	R 9	57.60.1223	1 pce	22k	MF, 1%, 0204, E24				
0	R 10	57.60.1223	1 pce	22k	MF, 1%, 0204, E24				
0	R 11	57.60.1223	1 pce	22k	MF, 1%, 0204, E24				
0	R 12	57.60.1393	1 pce	39k	MF, 1%, 0204, E24				
0	R 13	57.60.1241	1 pce	240R	MF, 1%, 0204, E24				
0	R 14	57.60.1393	1 pce	39k	MF, 1%, 0204, E24				
0	R 15	57.60.1223	1 pce	22k	MF, 1%, 0204, E24				
0	R 16	57.60.1330	1 pce	33R	MF, 1%, 0204, E24				
0	R 17	57.92.1820	1 pce	94mA	PTC 60V				
0	R 18	57.92.1820	1 pce	94mA	PTC 60V				
0	R 19	57.60.1681	1 pce	680R	MF, 1%, 0204, E24				
0	R 20	57.60.1223	1 pce	22k	MF, 1%, 0204, E24				
0	R 21	57.60.1223	1 pce	22k	MF, 1%, 0204, E24				
0	R 22	57.60.1223	1 pce	22k	MF, 1%, 0204, E24				
0	R 23	57.60.1223	1 pce	22k	MF, 1%, 0204, E24				
0	R 24	57.60.1393	1 pce	39k	MF, 1%, 0204, E24				
0	R 25	57.60.1223	1 pce	22k	MF, 1%, 0204, E24				
0	R 26	57.60.1223	1 pce	22k	MF, 1%, 0204, E24				
0	R 27	57.60.1113	1 pce	11k	MF, 1%, 0204, E24				
0	R 28	not used	1 pce	22k	MF, 1%, 0204, E24				
0	R 29	57.60.1104	1 pce	100k	MF, 1%, 0204, E24				
0	R 30	57.60.1204	1 pce	200k	MF, 1%, 0204, E24				
0	R 31	57.60.1241	1 pce	240R	MF, 1%, 0204, E24				
0	R 32	57.60.1393	1 pce	39k	MF, 1%, 0204, E24				
0	R 33	57.60.1223	1 pce	22k	MF, 1%, 0204, E24				
0	R 34	57.60.1330	1 pce	33R	MF, 1%, 0204, E24				
0	R 35	57.60.1684	1 pce	680k	MF, 1%, 0204, E24				
0	R 36	57.60.1684	1 pce	680k	MF, 1%, 0204, E24				
0	RA 1	58.01.9103	1 pce	10k	Cermet, 10%, 0.5W, vertical				
0	RA 2	58.01.9101	1 pce	100R	Cermet, 10%, 0.5W, vertical				
0	RA 3	58.01.9103	1 pce	10k	Cermet, 10%, 0.5W, vertical				
0	RA 4	58.01.9101	1 pce	100R	Cermet, 10%, 0.5W, vertical				

End of List

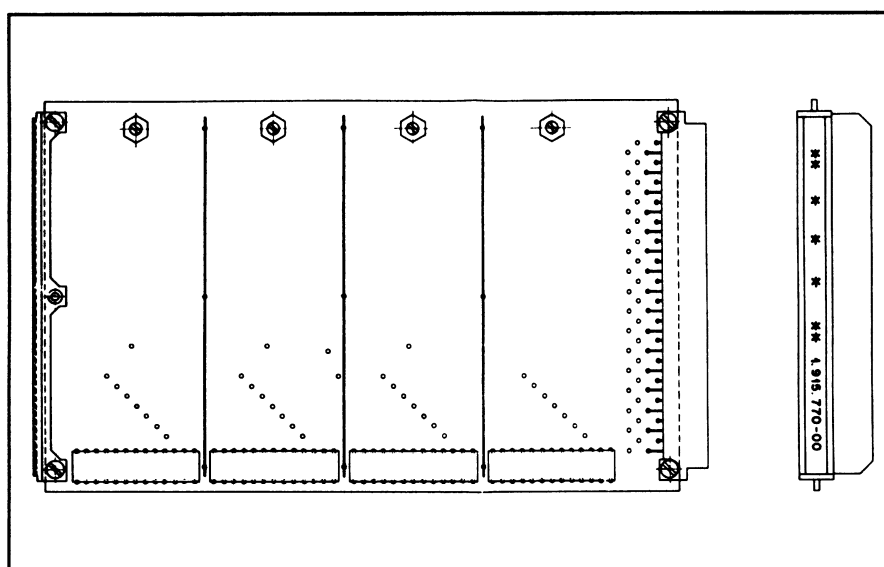
Comments:

## 2.2 Euro-Cards

### 2.2.1 Motherboard for 4 MS-Cards

1.915.770

The Modular Sub-Cards require a mounting base for mechanical and electrical installation. This motherboard for four MS-cards in standard Euro-card size easily integrates into the Studer audio components system; it carries 32 printed tracks from its edge connector to four small plug-in sockets. Each socket has 13 contacts; six of them are common supply lines, while another six are individual to each socket. Then there is a separate bus line for circuits 1 and 2, and another bus line for circuits 3 and 4. A motherboard for only one MS-card is available as well, refer to chapter 2.1.1.



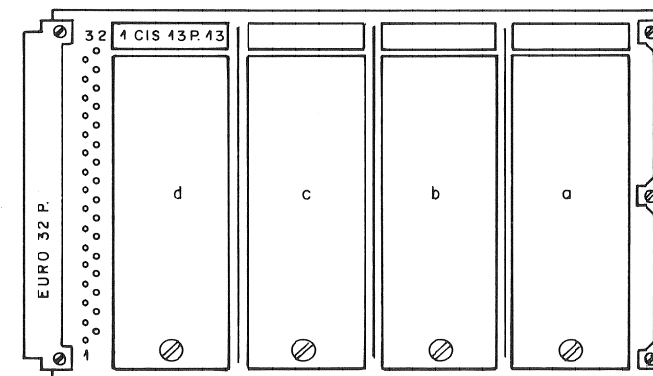
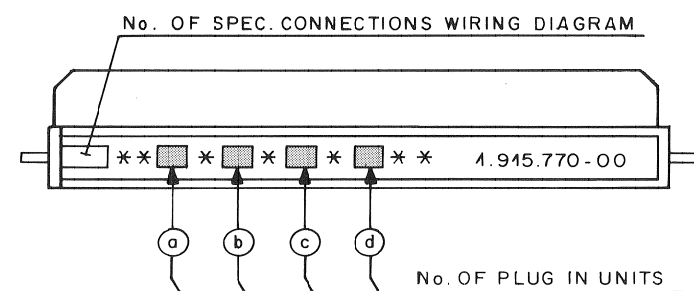
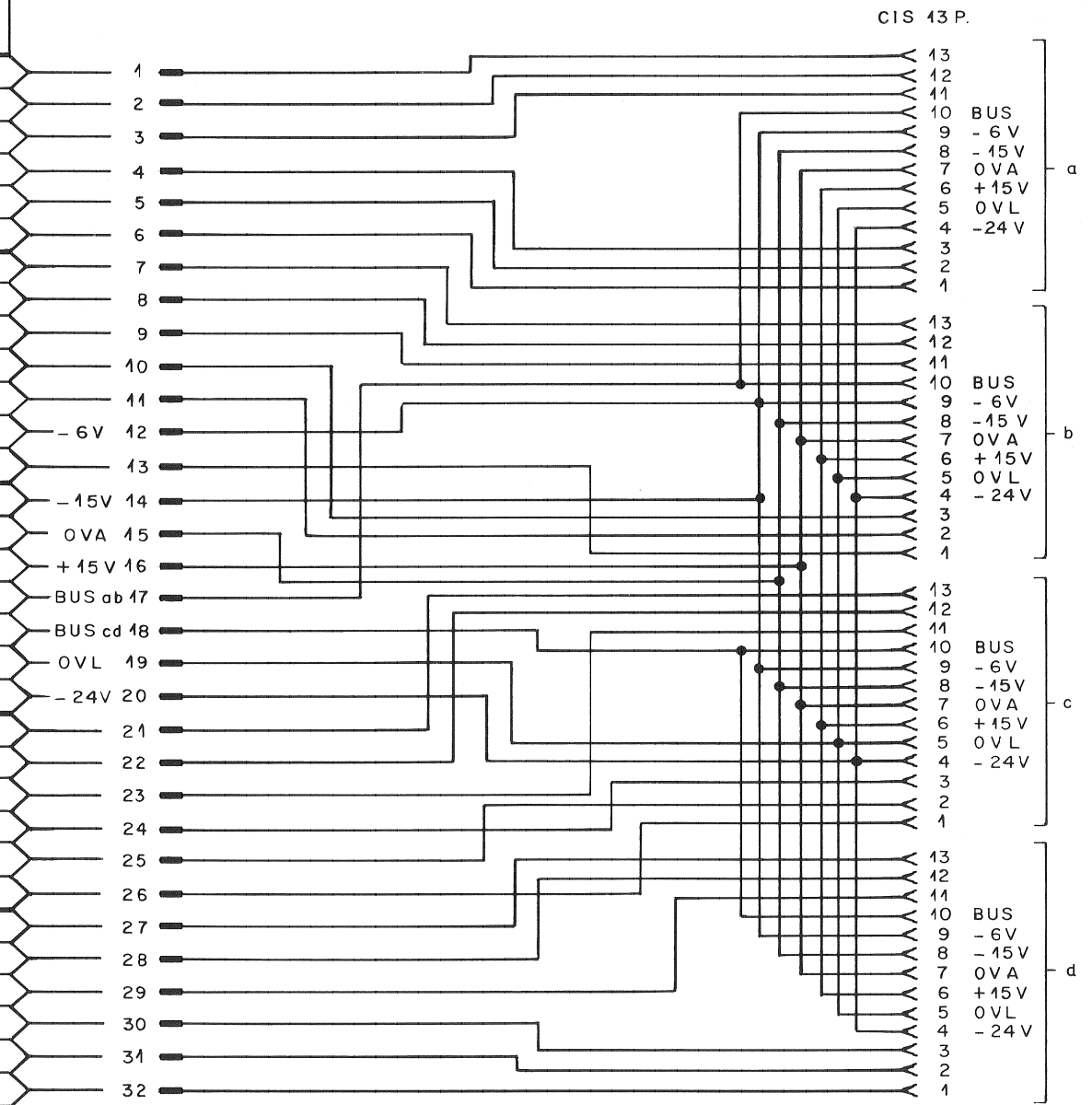
**Dimensions:** Euro-card **100 × 160 mm**

**Connectors:** 1 × Euro connector **32-pin, DIN 41612**  
4 × CIS connector **13-pin, plug-in socket for MSC**

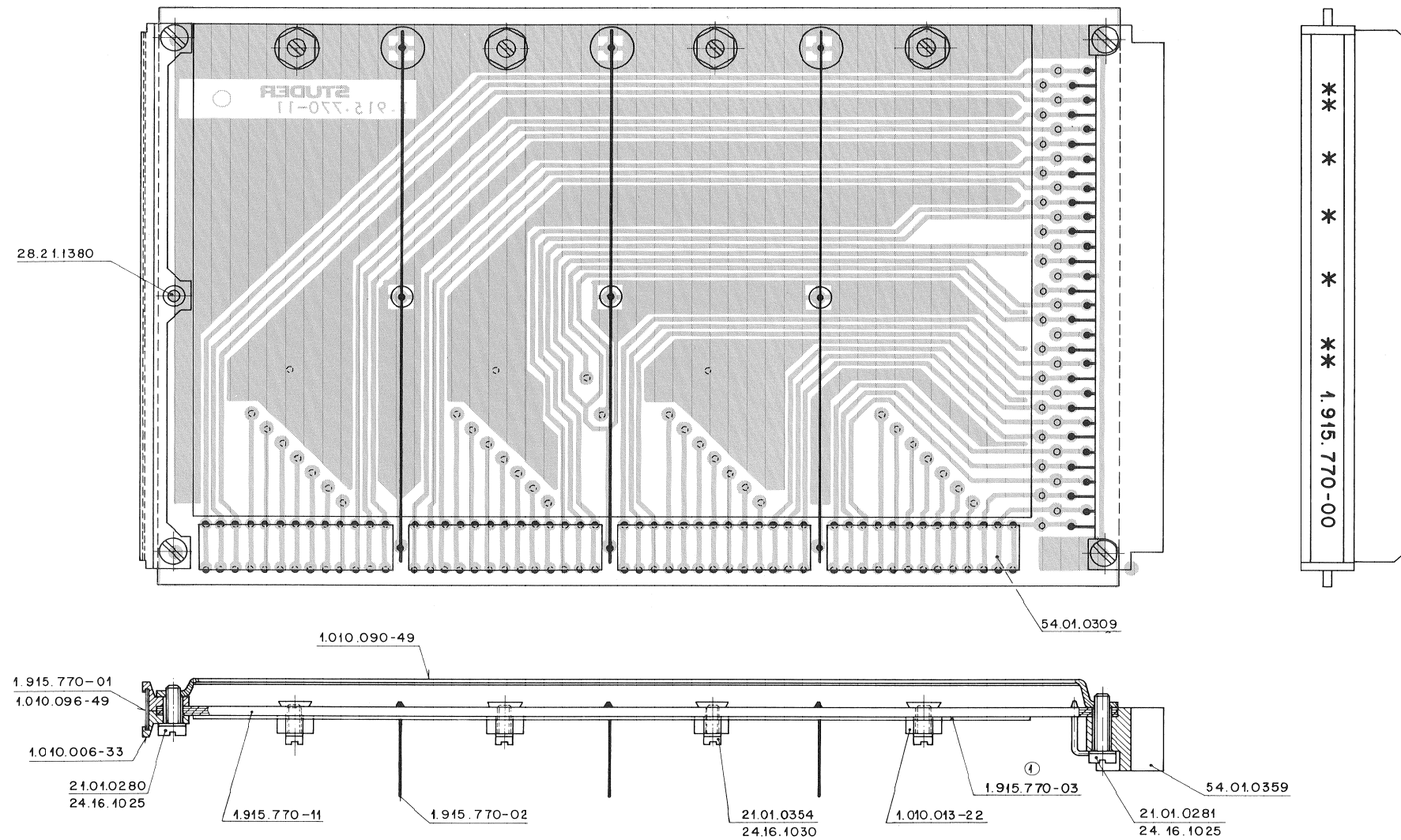
**Ordering Information:** MSC motherboard

1.915.770.xx

PIN No.		SIGNAL	SECTION	CONNECTION REMARKS
EURO	CIS			
1	a 13		1.914.5 . .	
2	a 12			
3	a 11		(a) NAME	
4	a 3		-----	
5	a 2			
6	a 1			
7	b 13		1.914.5 . .	
8	b 12			
9	b 11		(b) NAME	
10	b 3		-----	
11	b 2			
12		- 6V		
13	b 1			
14		- 15V		
15		OVA		
16		+ 15V		
17	a, b 10			
18	c, d 10			
19		OVL		
20		- 24V		
21	c 13		1.914.5 . .	
22	c 12			
23	c 11		(c) NAME	
24	c 3		-----	
25	c 2			
26	c 1			
27	d 13		1.914.5 . .	
28	d 12			
29	d 11		(d) NAME	
30	d 3		-----	
34	d 2			
32	d 1			



MSC MOTHER BOARD



STUDER REGENSDORF ZÜRICH		Basisung		BASIS BOARD		Nummer		1.915.770-00	
Ausgabe		Datum		Gez		Gepr		Index	
8.2.85		04.04.84		A Ho		ST J		①	
③		②		①		①		①	
Kopie für:									

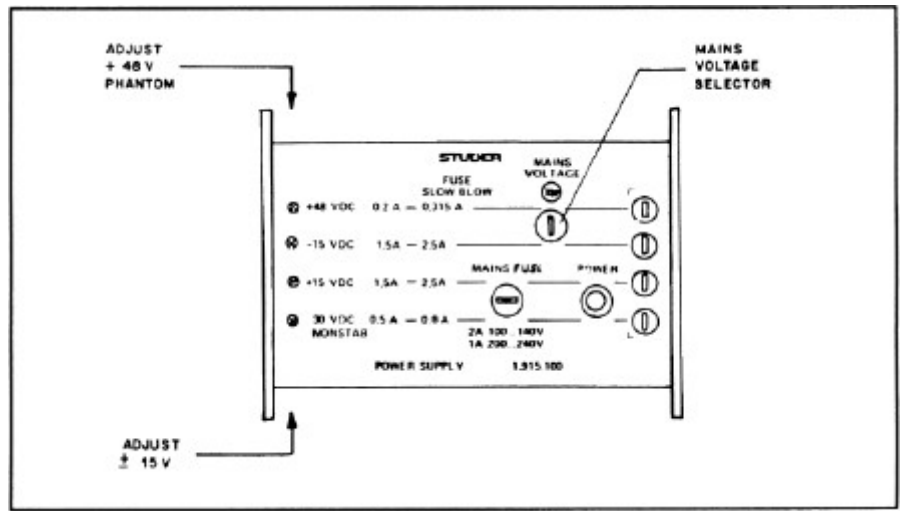
**2.2.2 Power Supply**

1.915.100

This power supply provides a regulated output of  $\pm 15\text{ V}_{\text{DC}}$  at a maximum load of 1.5 A for audio circuits, plus a regulated 48  $\text{V}_{\text{DC}}$  output for the phantom powering of microphones. In addition, 30 V of unregulated DC are available as well.

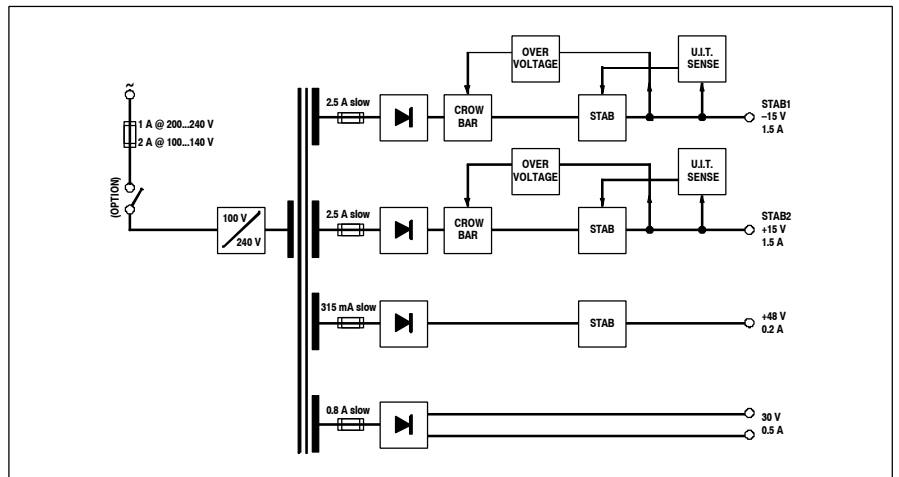
If a regulated 24  $\text{V}_{\text{DC}}$  supply is required, the stabilizer card 1.915.105.xx can be connected to the 30  $\text{V}_{\text{DC}}$  output.

Each of the output voltages is derived from a separate secondary winding of the mains transformer and can be fine-adjusted.



The  $\pm 15\text{ V}_{\text{DC}}$  supply is fully short-circuit proof and is protected against overvoltage and excess temperature. Short-circuit-protection is also effective in the 48  $\text{V}_{\text{DC}}$  section.

The power supply has no on/off switch in the primary circuit. Such a switch, if needed, will have to be fitted separately.



Mains transformer and regulator electronics are housed in one rectangular unit fitting into the 19" Euro-card frame (1.918.318/319), occupying the space of 28M widths. For this purpose, a mounting kit 1.918.316 is recommended (see chapter 2.3.4).

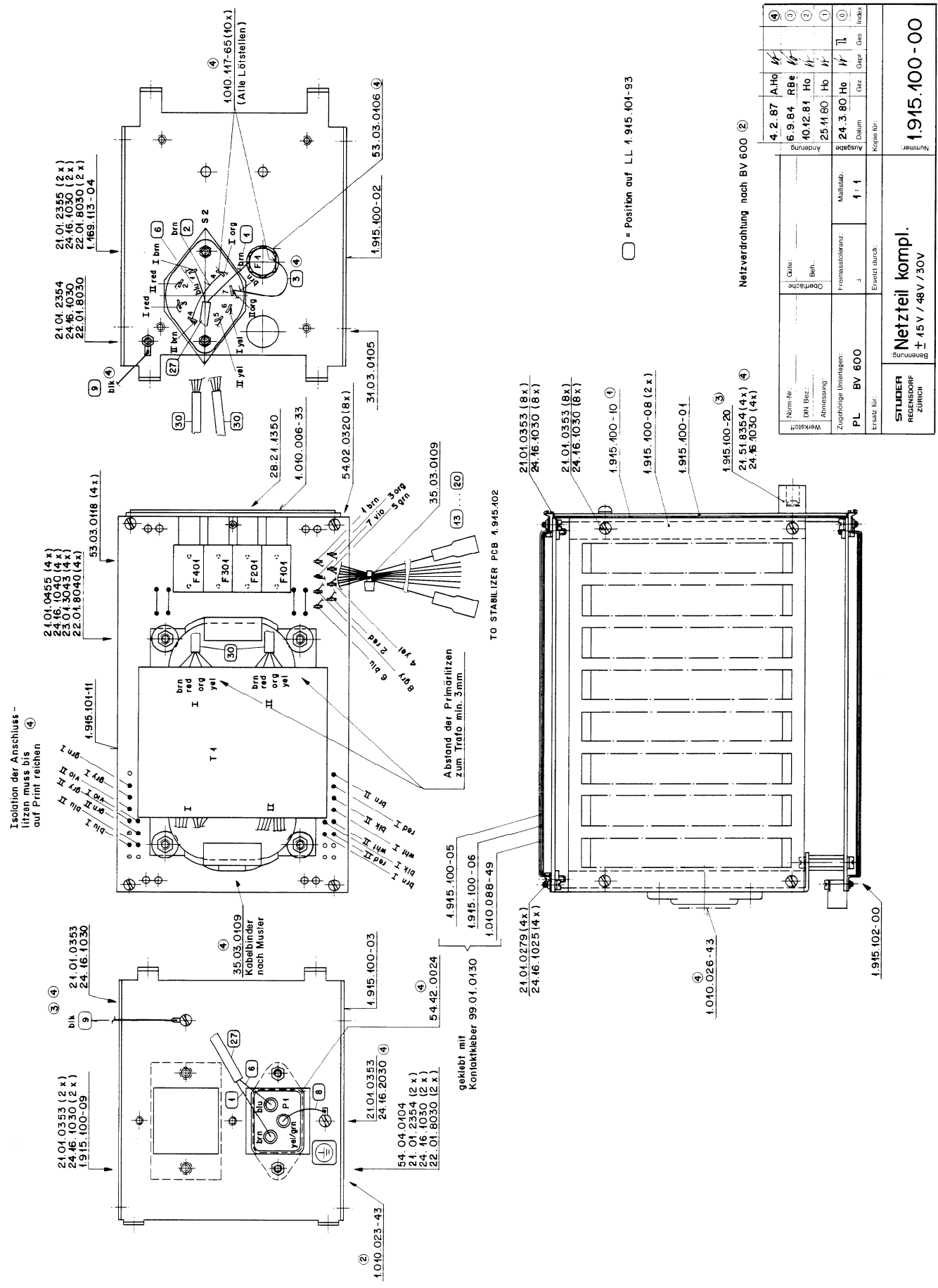


**Technical Specifications**

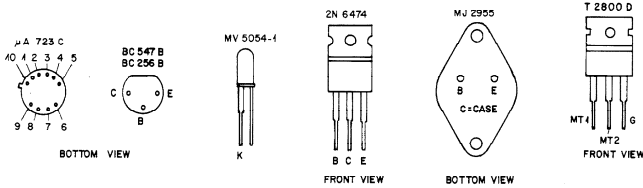
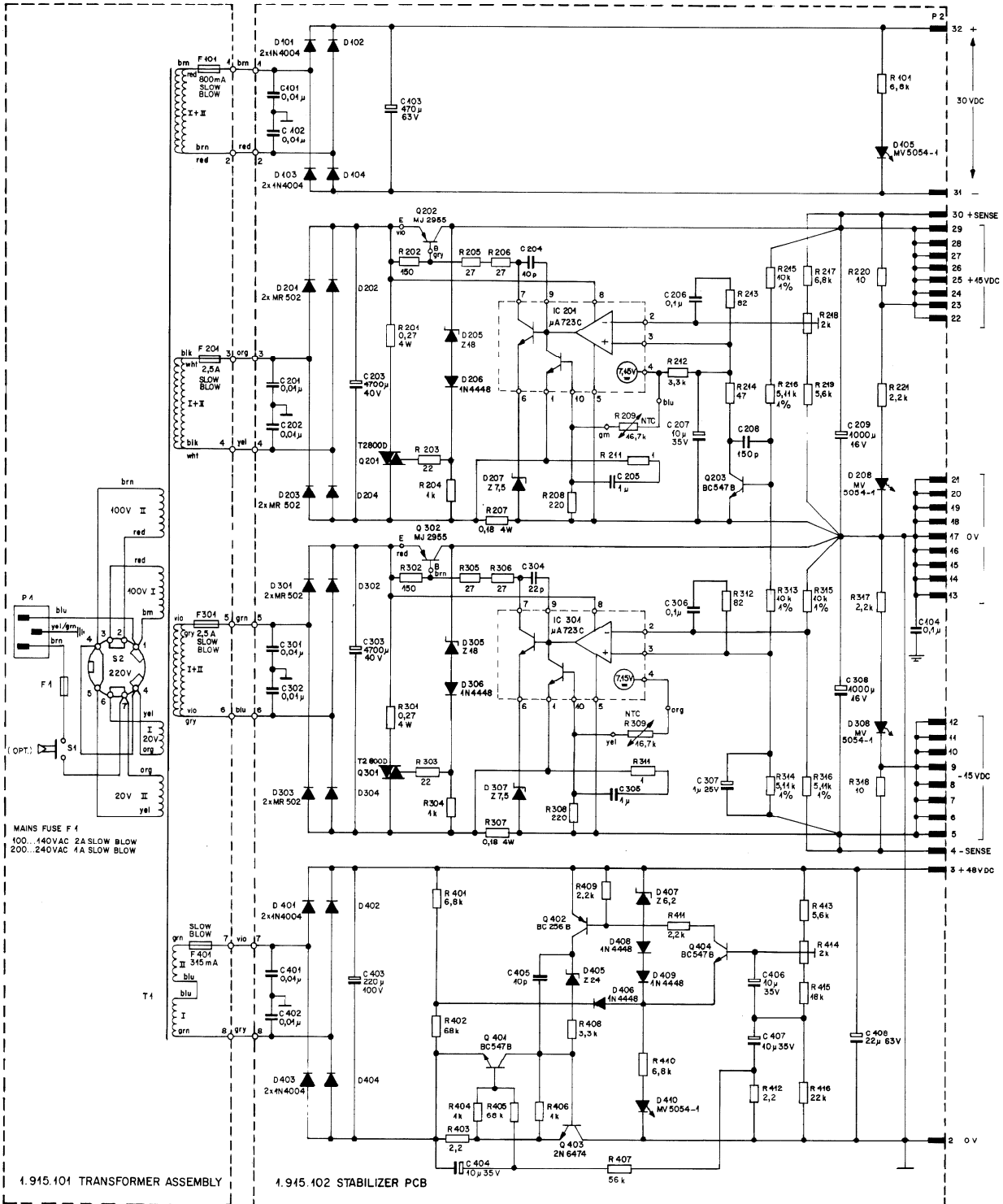
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<b>Primary:</b>	Voltage selector	<b>100/120/140/200/220/240 V<sub>AC</sub> ±10%</b>	
	Fuse	<b>T 2 A (slow), 100...140 V</b>	
		<b>T 1 A (slow), 200...240 V</b>	
	Power consumption	<b>&lt; 120 W (190 VA)</b>	
<b>Secondary:</b>	<b>Audio supply:</b>	<b>±15 V/1.5 A max., regulated voltage</b>	
	Ripple	<b>100 µV</b>	
	Fuses	<b>2 × T 2.5 A (slow)</b>	
	<b>Phantom supply:</b>	<b>48 V/200 mA max., regulated voltage, according to DIN 45596</b>	
	Ripple	<b>100 µV</b>	
	Fuse	<b>T 315 mA (slow)</b>	
	<b>Unregulated DC:</b>	<b>30 V/0.5 A max.</b>	
	Fuse	<b>T 0.8 A (slow)</b>	
<b>Dimensions:</b>	W × H × D	<b>140 × 100 × 160 mm, Euro-card/28M units</b>	
	Weight	<b>2.75 kg</b>	
<b>Ordering Information:</b>	Power supply		1.915.100.xx
	Mounting kit for installation in ELMA frame (1.918.318)		1.918.316.xx

POWER SUPPLY



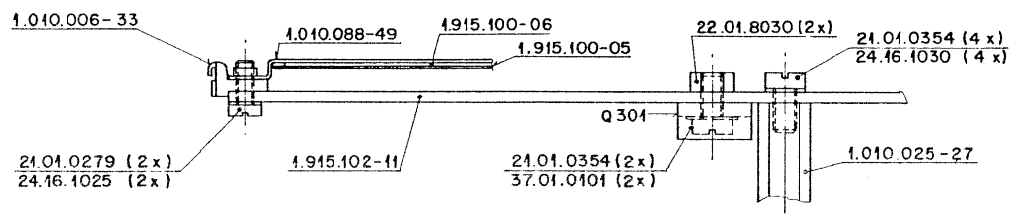
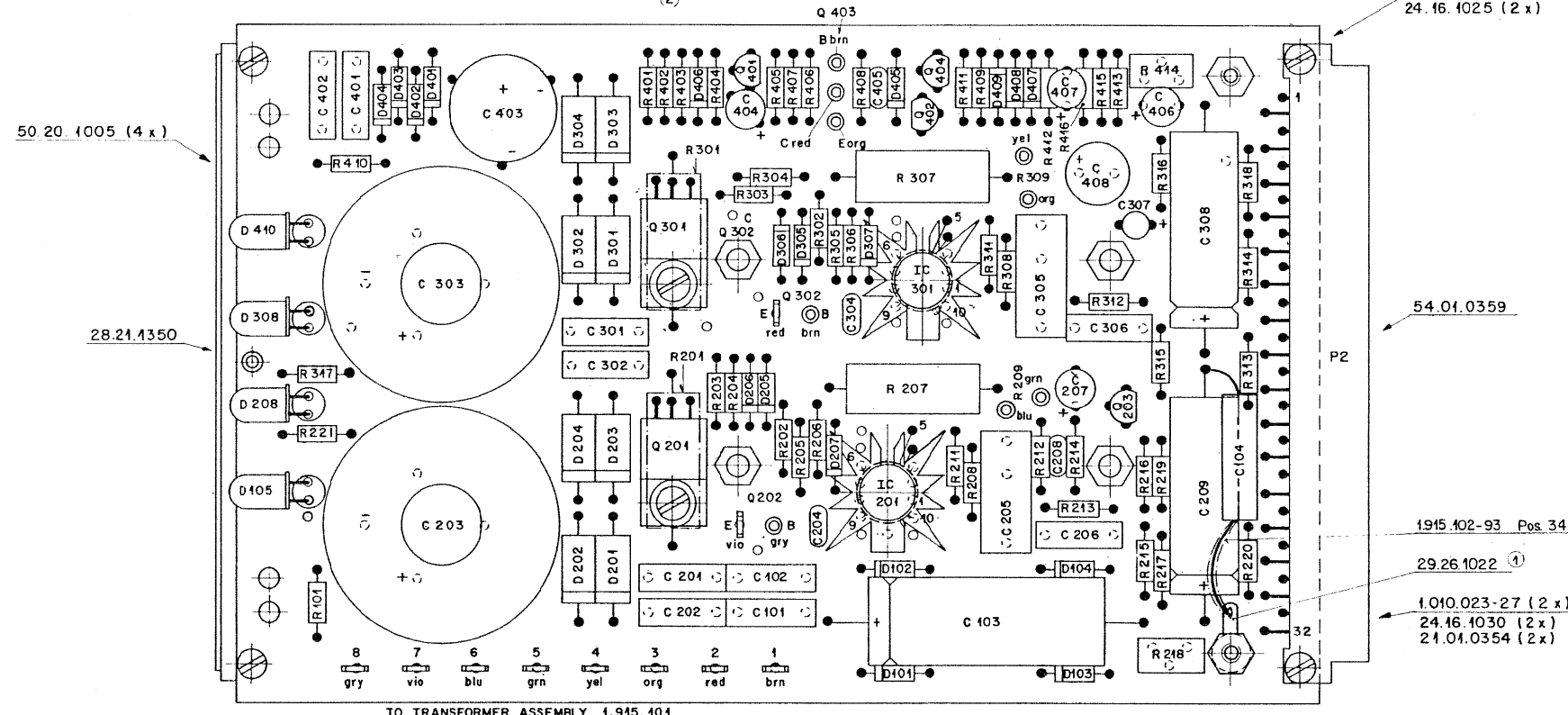
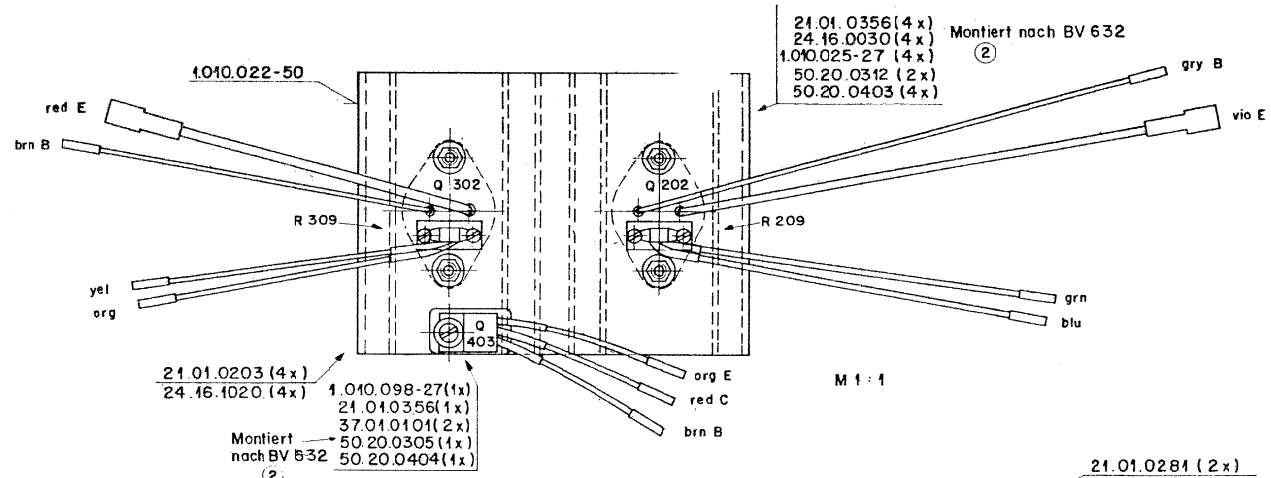
Norm-Nr.:	4.2.87	A:Ho	④
DIN Bez.:	6.9.84	RB:	③
Abmessung:	10.12.81	Ho	②
Zugehörige Unterlagen:	25.11.80	Ho	①
Formastorenanz:	24.3.80	Ho	①
Erstellt durch:	1.1	Datum	Grz
Geprüft durch:		Grz	Grz
Werkst.:			Insk
Netzverdrahtung nach BV 600 ②			
PL BV 600			
STUDER RECHENUNGS- ZENTRUM ZÜRICH	Netzteile kompl. Benennung		
	1.915.100-00		
	Nummer		



Änderung						③
2. 4. 86	S:					②
A. 12. 78	Sr:					①
Datum	Gez.	Gepr.	Ges.	Index		④
Kopie für:						
Nummer: SC 1.915.100						

**STUDER**  
 REGENSDORF  
 ZÜRICH

Bezeichnung: **EU POWER SUPPLY**  
 ±15V 1,5A / +48V 0,2A /  
 30V DC 0,5A



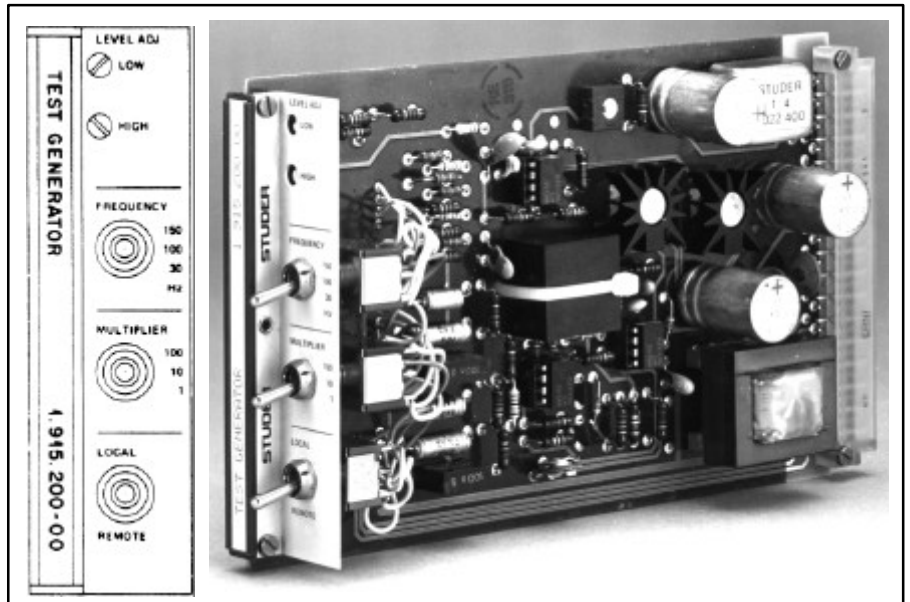
Oberfläch:		Gute		Änderung		171.86 A.Hb		②	
Beh:		Beh.		6.9.84 RBe		①		①	
Zugehörige Unterlagen:		BV 632		Freimasstoleranz:		Maßstab:		Ausgabe	
PL 1.915.100		(2)		+		2:1 (1:1)		Datum	
AL 1.915.100-95				Ersetzt durch:		Kopie für:		Gez. Gepr. Ges. Index	
Ersatz für:				Ersetzt durch:				Kopie für:	
STUDER REGENSDORF ZÜRICH		Benennung:		Stabilisator-Print		Nummer:		1.915.102-00	



**2.2.3 Audio Generator**

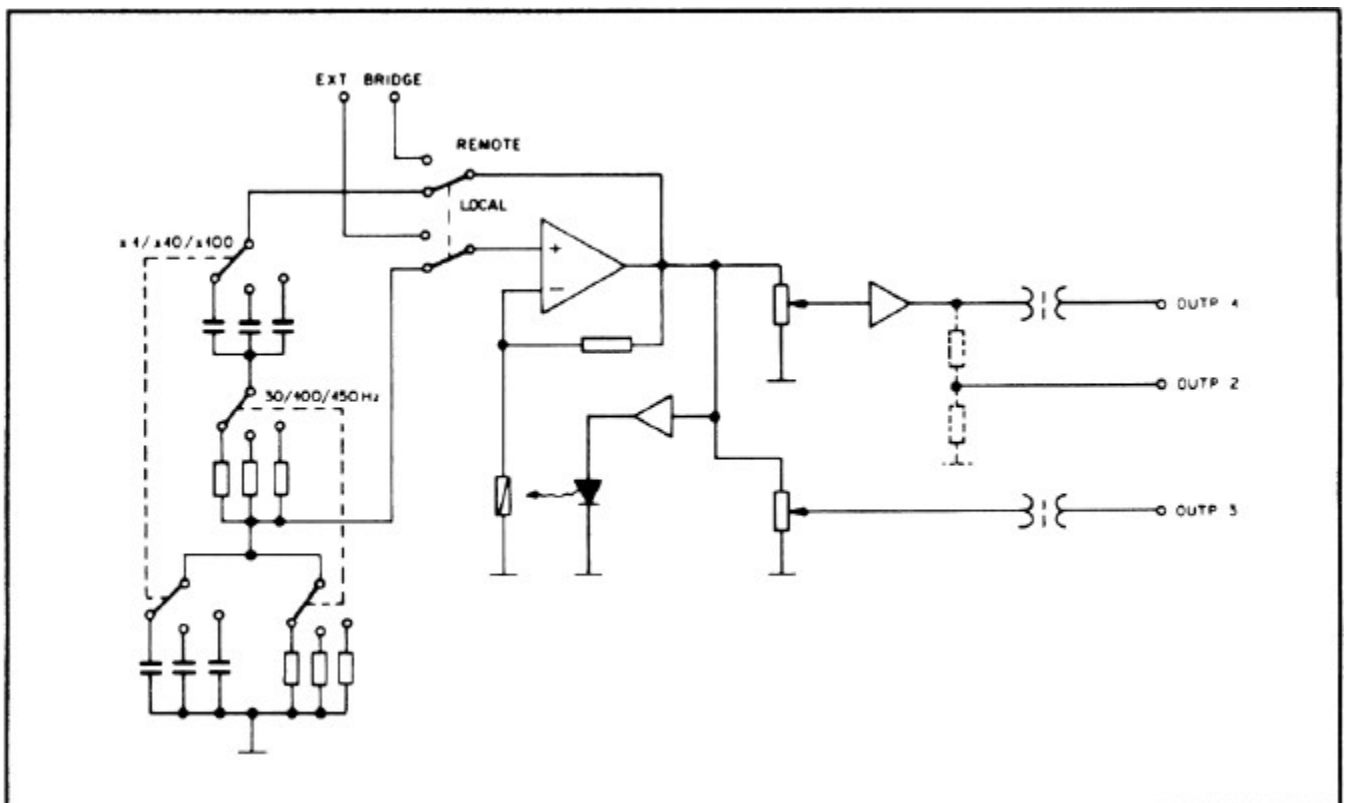
1.915.200

This oscillator circuit provides a convenient source of 9 fixed audio frequencies with stable signal level, accommodated on one Euro-card. It is well suited for quick frequency-response measurements or for other calibration work in an audio system.



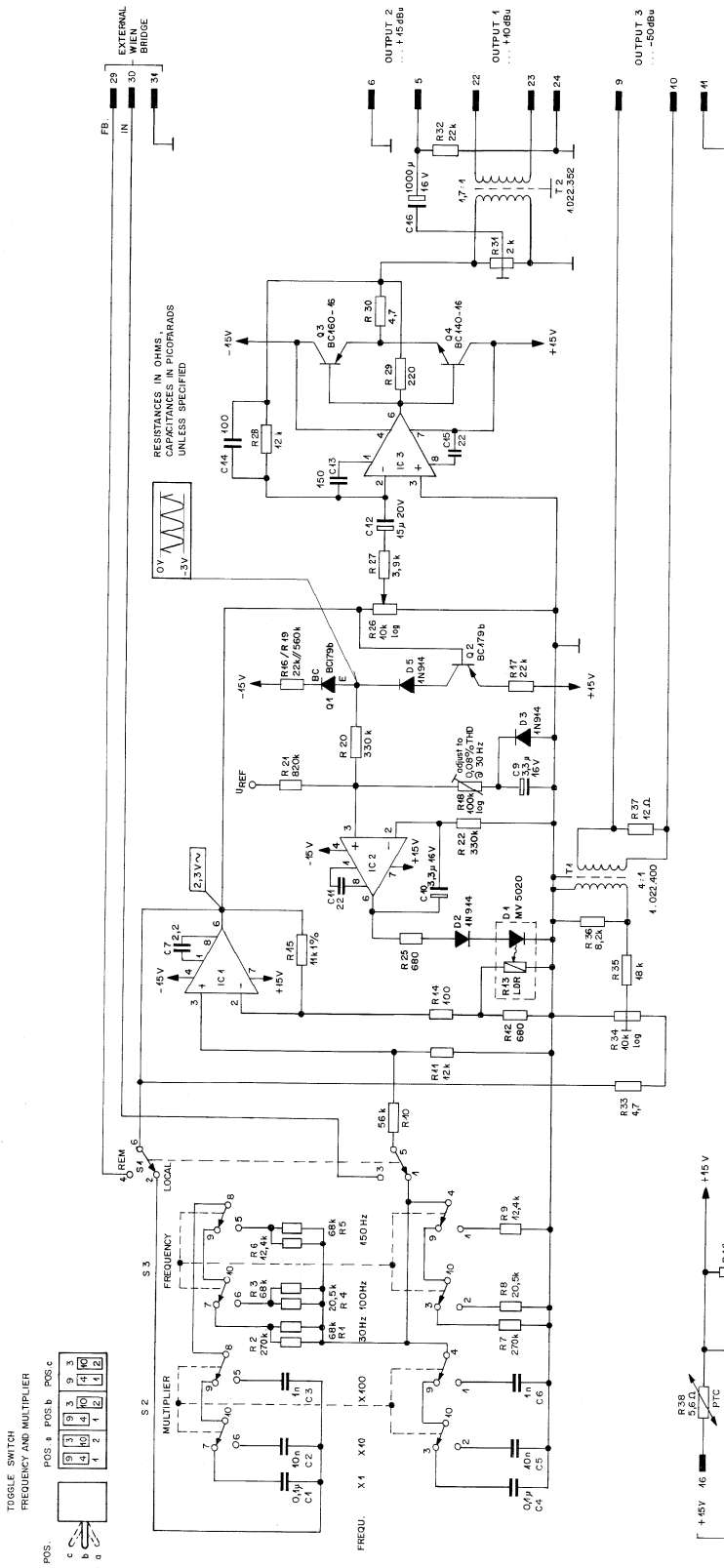
Two three-position rocker switches allow the selection of the 9 frequencies, a third switch permits changeover to an external Wien-bridge, if external frequency control should be desired.

An output amplifier with level control on its input is also implemented, providing three different outputs, as far as levels and balanced/unbalanced configurations are concerned.

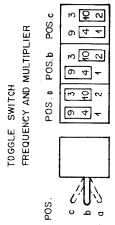
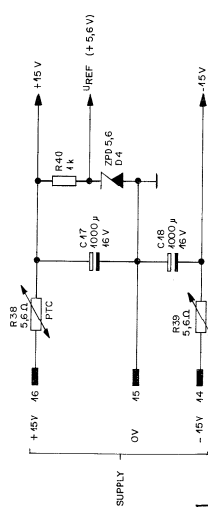


**Technical Specifications**

<b>General:</b>	Frequencies	<b>30 / 100 / 150 / 300 Hz / 1 / 1.5 / 3 / 10 / 15 kHz</b> , fixed (accuracy $\pm 5\%$ )
	Settling time	<b>&lt; 5 s</b> (30 Hz) <b>&lt; 1 s</b> (1 kHz)
	Level accuracy	<b>+0.1/-0.2 dB</b> (0...50° C)
	Operating temperature	<b>-10...+55° C</b>
	Supply	<b><math>\pm 15</math> V</b> , regulated within $\pm 0.2$ V (< 25 mA)
<b>Output 1:</b>	balanced and floating	<b>separately adjustable</b>
	Output level range	<b>-<math>\infty</math>...+10 dBu</b> (0...2.45 V <sub>rms</sub> )
	Level uniformity vs. frequency	<b><math>\pm 0.1</math> dB</b> (20° C)
	THD	<b>&lt; 0.25%</b> , 30 Hz...15 kHz <b>&lt; 0.1%</b> , 100 Hz...10 kHz
	Output impedance	<b>&lt; 30 W</b>
	Minimum load	<b>200 W</b>
<b>Output 2:</b>	unbalanced	<b>separately adjustable</b>
	Output level range	<b>-<math>\infty</math>...+15 dBu</b> (0...4.4 V <sub>rms</sub> )
	Level uniformity vs. frequency	<b><math>\pm 0.2</math> dB</b> (20° C)
	THD	<b>&lt; 0.15%</b> , 30 Hz...15 kHz <b>&lt; 0.1%</b> , 100 Hz...10 kHz
	Minimum load	<b>200 W</b>
<b>Output 3:</b>	balanced and floating	<b>separately adjustable</b>
	Output level range	<b>-<math>\infty</math>...-50 dBu</b> (0...2.5 mV <sub>rms</sub> )
	Level uniformity vs. frequency	<b><math>\pm 0.2</math> dB</b> (20° C)
	THD	<b>&lt; 0.2%</b> , 30 Hz...15 kHz
	Output impedance	<b>12 W</b>
	Minimum load	<b>200 W</b>
<b>Dimensions:</b>	Euro-card	<b>100 × 160 mm, 7M units wide</b>
	Weight	<b>approx. 350 g</b>
<b>Ordering Information:</b>	Audio generator 30 Hz...15 kHz	1.915.200.xx



FREQUENCIES: 30Hz, 300Hz, 3kHz, 400Hz, 4kHz, 40kHz, 450Hz, 4.5kHz, 45kHz  
 ALL IC'S LM 309

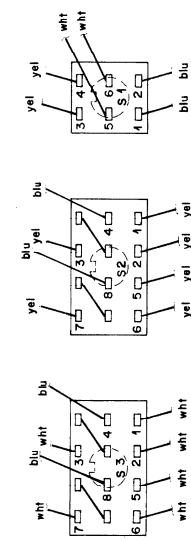
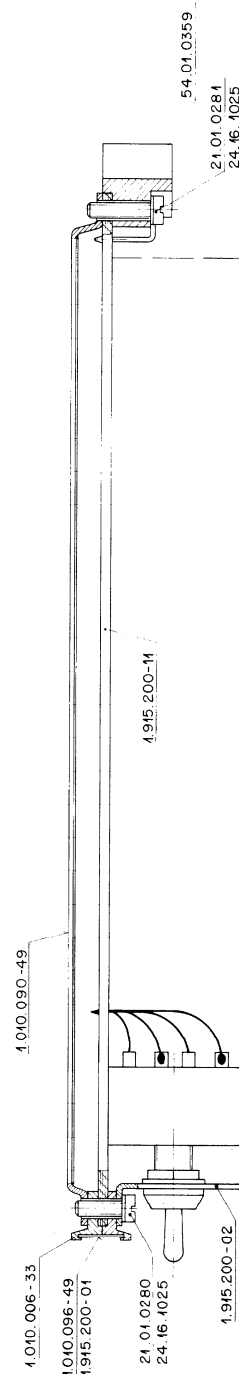
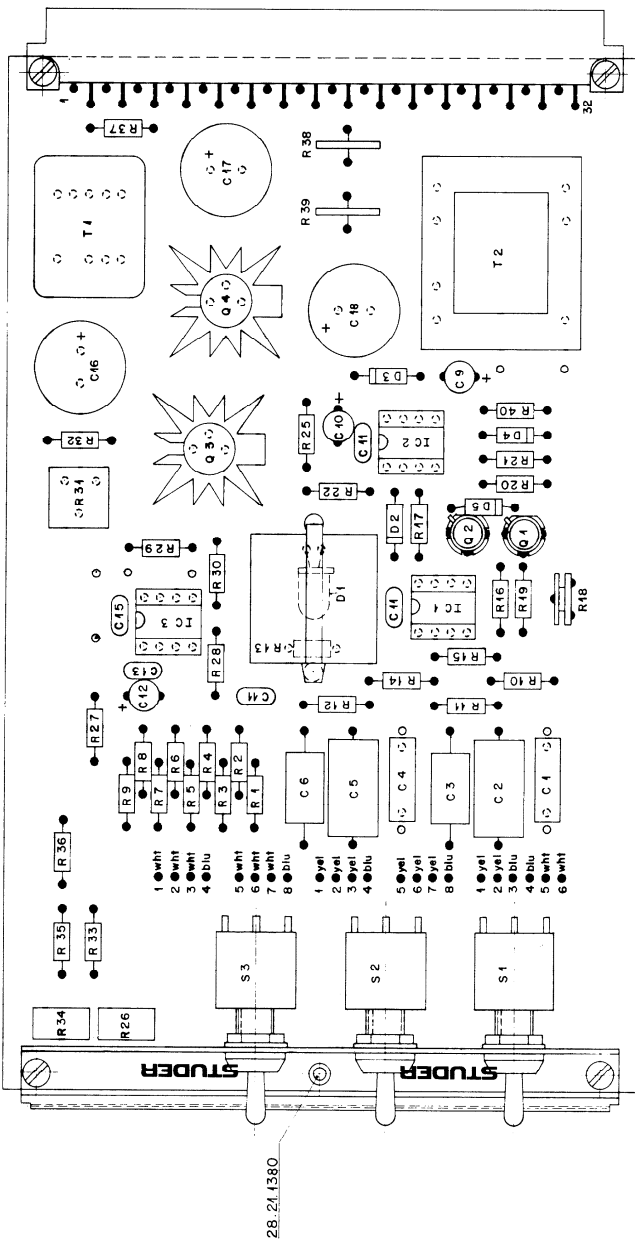
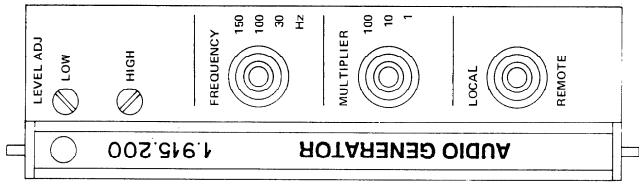


Ersatz für:	Ersetzt durch:	Kopie für:
STUDER REGENSDORF ZÜRICH	<b>AUDIO GENERATOR</b>	1.915.200
Benennung:		Nummer:

Änderung	Datum	Gez.	Gepr.	Gek.	Index
1. 3. 83		Si	Wc		③
29.10.79		Si	Wc		①
16.10.78		Si	SK		②



AUDIO GENERATOR



Hersteller STUDER AG Zürcherstrasse 11 8002 Zürich	PL	2-1	30.10.79 Ho	1.915.200-00
STUDER REGENSCHNITT ZÜRICH		AUDIO GENERATOR		1.915.200-00

Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER
C	...	1	59.99.0254	0,1µ 2% 100V PE
C	...	2	59.12.7103	0,01µ 1% 63V PS
C	...	3	59.12.9102	1000p 1% 500V PS
C	...	4	59.99.0254	0,1µ 2% 100V PE
C	...	5	59.12.7103	0,01µ 1% 63V PS
C	...	6	59.12.9102	1000p 1% 500V PS
C	...	7	59.34.0229	2,2p CER
C	...	8		
C	...	9	59.36.3339	3,3µ 20% 16V TA
C	...	10	59.36.3339	3,3µ 20% 16V TA
C	...	11	59.32.0220	22p 20% 400V CER
C	...	12	59.36.4150	15µ 20% 25V TA
C	...	13	59.32.1151	150p 10% 400V CER
C	...	14	59.32.0101	100p 20% 400V CER
C	...	15	59.32.0220	22p 20% 400V CER
C	...	16	59.22.4102	1000µ -10% 16V EL
C	...	17	59.22.4102	1000µ -10% 16V EL
C	...	18	59.22.4102	1000µ -10% 16V EL
D	...	1	50.04.2104	MV5020 LED
D	...	2	50.04.0125	1N4448 SI IN914
D	...	3	50.04.0125	1N4448 SI IN914
D	...	4	50.04.1104	25.6 5% 0.4W
D	...	5	50.04.0125	1N4448 SI IN914
IC	...	1	50.05.0144	LM301AN OP AMP
IC	...	2	50.05.0144	LM301AN OP AMP
IC	...	3	50.05.0144	LM301AN OP AMP
Q	...	1	50.03.0305	BC179B PNP
Q	...	2	50.03.0305	BC179B PNP
Q	...	3	50.03.0315	BC160-16 PNP
Q	...	4	50.03.0316	BC140-16 NPN
R	...	1	57.41.4683	68k 5% 1/4W CSCH
R	...	2	57.39.2673	267k 1% 1/4W MF
R	...	3	57.41.4683	68k 5% 1/4W CSCH
R	...	4	57.39.2052	20,5k 1% 1/4W MF
R	...	5	57.41.4683	68k 5% 1/4W CSCH
R	...	6	57.39.1242	12,4k 1% 1/4W MF
R	...	7	57.39.2673	267k 1% 1/4W MF
R	...	8	57.39.2052	20,5k 1% 1/4W MF
R	...	9	57.39.1242	12,4k 1% 1/4W MF
R	...	10	57.41.4563	56k 5% 1/4W CSCH
R	...	11	57.41.4123	12k 5% 1/4W CSCH
R	...	12	57.41.4681	680 5% 1/4W CSCH
R	...	13	57.99.0135	1k LDR 100UIX
R	...	14	57.41.4101	100 5% 1/4W CSCH
R	...	15	57.39.1102	11k 1% 1/4W MF
R	...	16	57.41.4223	22k 5% 1/4W CSCH
R	...	17	57.41.4223	22k 5% 1/4W CSCH
R	...	18	58.02.8104	100k LOG 20% 0,1W PSCH
R	...	19	57.41.4564	560k 5% 1/4W CSCH
R	...	20	57.41.4334	330k 5% 1/4W CSCH
R	...	21	57.41.4824	820k 5% 1/4W CSCH
R	...	22	57.41.4334	330k 5% 1/4W CSCH
R	...	23		
R	...	24		
R	...	25	57.41.4681	680 5% 1/4W CSCH
R	...	26	58.01.7103	10k 10% 1/4W PMG
R	...	27	57.39.3921	3,92k 1% 1/4W MF
R	...	28	57.41.4123	12k 5% 1/4W CSCH
R	...	29	57.41.4221	220 5% 1/4W CSCH
R	...	30	57.41.4479	4,7 5% 1/4W CSCH
R	...	31	58.01.8202	2k 10% 1/4W PMG
R	...	32	57.41.4223	22k 5% 1/4W CSCH
R	...	33	57.41.4479	4,7 5% 1/4W CSCH
R	...	34	58.01.7103	10k 10% 1/4W PMG
R	...	35	57.41.4183	18k 5% 1/4W CSCH
R	...	36	57.41.4822	8,2k 5% 1/4W CSCH
R	...	37	57.41.4120	12 5% 1/4W CSCH
R	...	38	57.99.0209	5,6 PTC
R	...	39	57.99.0209	5,6 PTC
R	...	40	57.41.4102	1k 5% 1/4W CSCH
S	...	1	55.01.0112	2xON-ON SWITCH AU KIPP
S	...	2	55.01.0114	4xON-ON-ON SWITCH AU KIPP
S	...	3	55.01.0114	4xON-ON-ON SWITCH AU KIPP
T	...	1	1.022.400.00	4:1 TRAF0 ST
T	...	2	1.022.352.00	ST

CER=Ceramic, PE=Polyester, PS=Polystyrol, PMG=Trimmer, MF=Metal Film, CSCH=Carbon Film  
 PSCH=Poti, EL=Electrolytic, TA=Tantalum

MANUFACTURER: ST=Studer

1.915.200 AUDIO GENERATOR

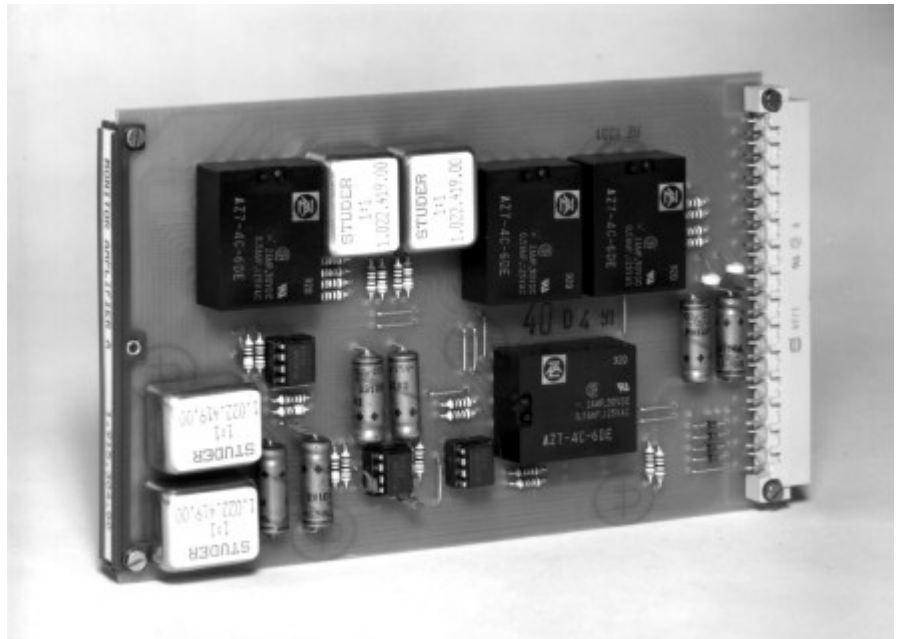
WE 24/03/80

END  
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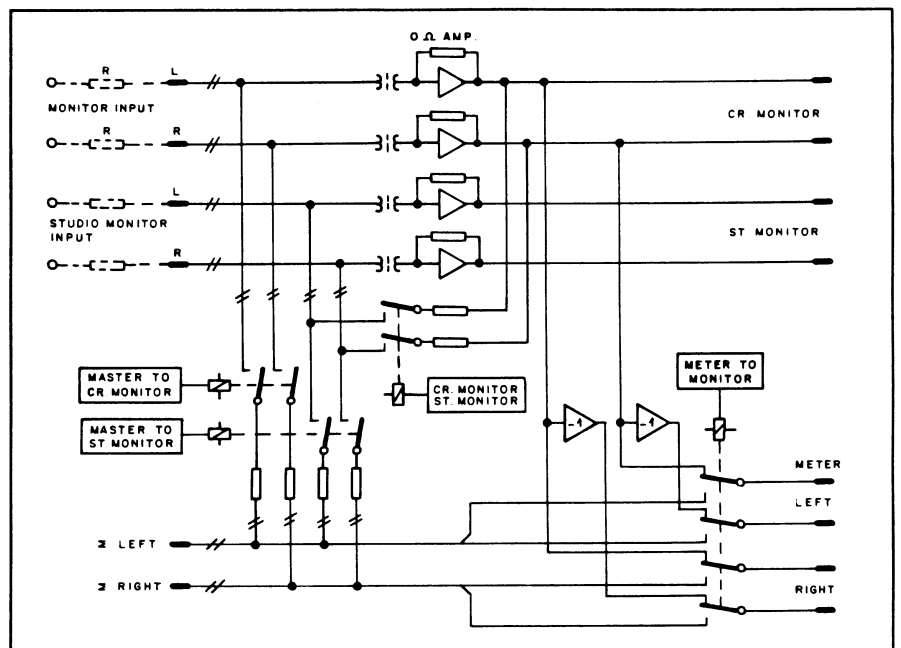
**2.2.4 Monitor Amplifier and Switching Relays (Studio/CR)**

1.915.304

The circuit on this Euro-card is designed to form part of an audio monitoring system. The card is narrower than most others, i.e., 4 M units only. It contains four amplifiers, each presenting a 0-Ω input impedance, two metering amplifiers, and four relays for audio switching.



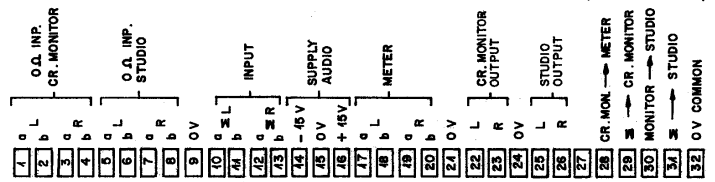
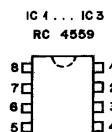
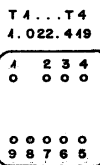
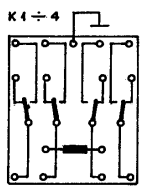
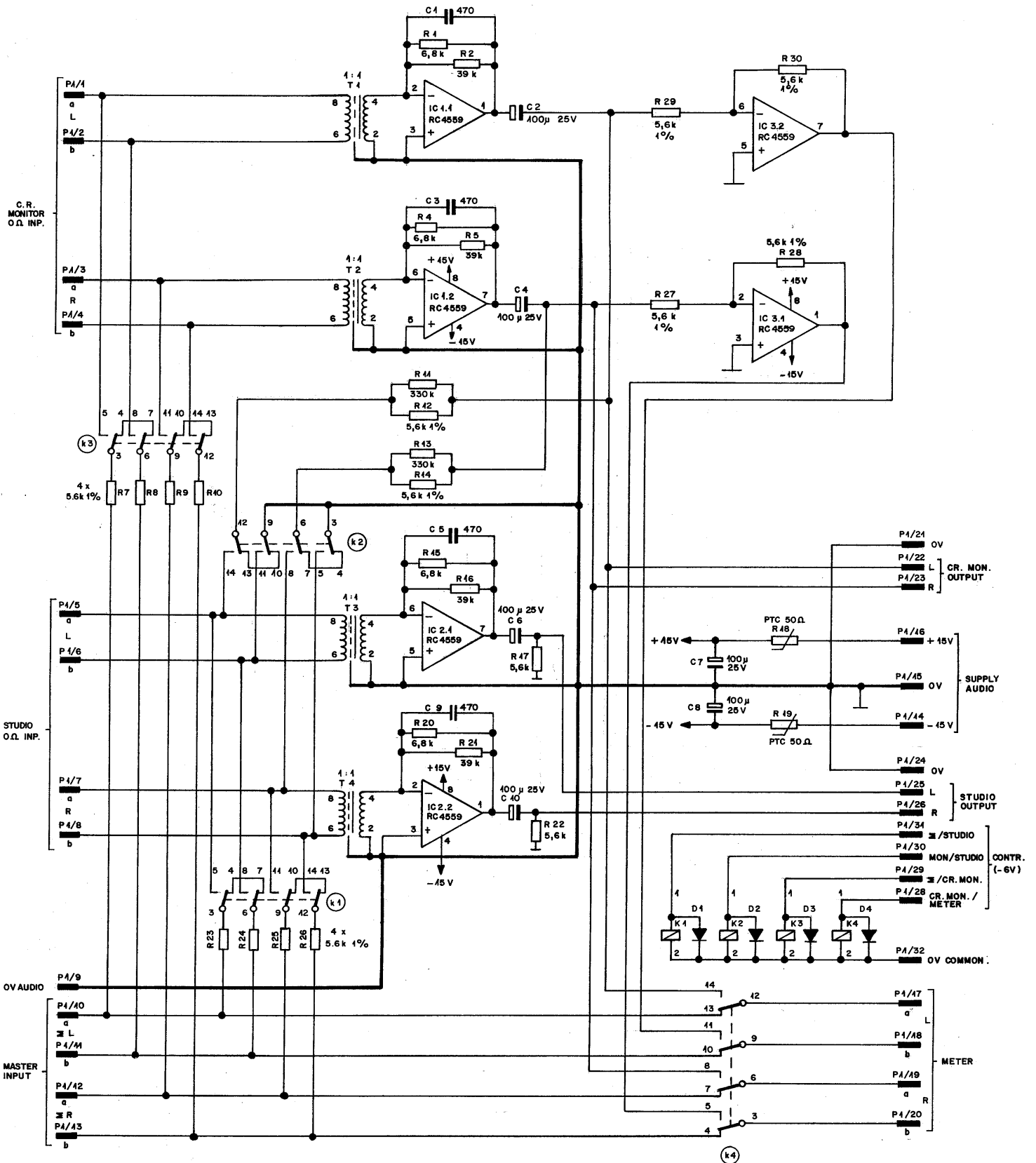
Two stereo signal inputs from a combination of sources (with suitable isolation resistors at the output of each source) can thus be summed for Control Room (CR) and Studio Monitoring, for example. In addition, the signal from the stereo master can be assigned to either monitor line and, if needed, CR monitoring and studio monitoring can be paralleled. A further circuit permits switchover of level meters from the master bus to the CR monitor line. The relays are designed for 6 V<sub>DC</sub> operation.



**Technical Specifications**

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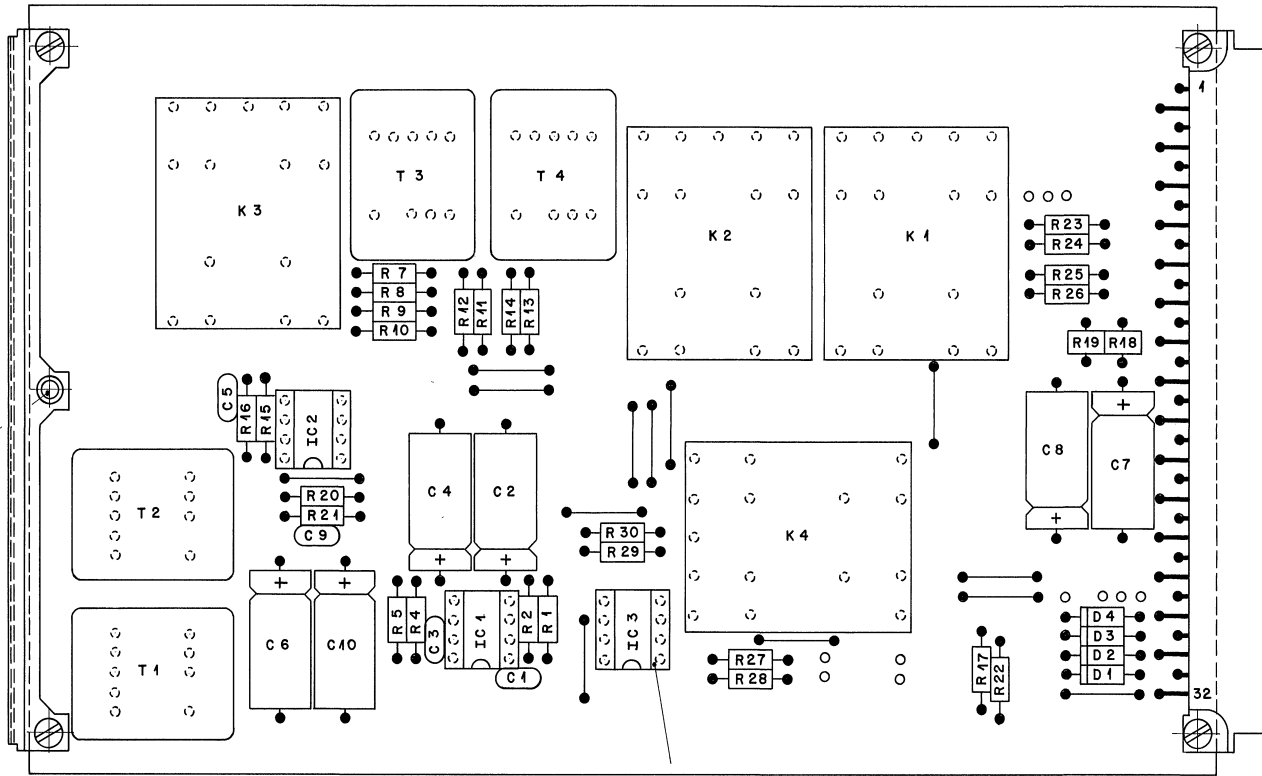
<b>Inputs:</b>		<b>balanced and floating</b> (for CR monitor and studio monitor)
	Impedance	<b>&gt; 10 kW</b>
	Maximum level	<b>+24 dBu</b>
<b>Outputs:</b>		<b>unbalanced</b> (for CR monitor and studio monitor)
	Impedance	<b>&lt; 3 W</b>
	Maximum level	<b>+20 dBu</b> into 1 k $\Omega$
	Maximum load	<b>1 kW</b>
<b>Meter outputs:</b>		<b>push-pull</b>
	Maximum level	<b>+24 dBu</b>
	Frequency response	<b><math>\pm 0.5</math> dB</b> , 30 Hz...16 kHz
	THD	<b>&lt; 0.1%</b> , @ +6 dBu input, 30 Hz...16 kHz
	S/N	<b>105 dB</b> , 20 Hz...23 kHz
<b>Supply:</b>		<b><math>\pm 15</math> V</b> (20 mA)
<b>Dimensions:</b>	Euro-card	<b>100 <math>\times</math> 160 mm, 4M units wide (19 mm)</b>
	Connector system	<b>DIN 41612, type B</b>
	Weight	<b>approx. 270 g</b>
<b>Ordering Information:</b>		Monitor amplifier and switching relay
		1.915.304.xx



BOTTOM VIEW

DATE:	20.11.81		
SIGN:	<i>[Signature]</i>		
<b>STUDER</b> REGENSDORF ZÜRICH	<b>MONITOR AMPLIFIER A</b>		<b>SC. 1.915.304</b>

28.24.4380



53.03.0166 (3x)

4.010.006-33

4.010.090-49

4.010.096-49  
1.915.304-01

54.01.0359

21.01.0280 (2x)  
24.16.4025 (2x)

1.915.304-11

21.01.0281 (2x)  
24.16.4025 (2x)

MONITOR AMPLIFIER A  
1.915.304-00

Ausgabe	Änderung					③
	4.4.84	A.Ho	✓	✓		①
Datum	8.10.81	Ho	✓	✓		②
Gez.						①
Gepr.						②
Ges.						③
Index						④
Kopie für:						
Benennung:	Monitor Amplifier A					3
Nummer:	1.915.304-00					4

STUDER  
REGENSDORF  
ZÜRICH

Benennung: Monitor Amplifier A

Nummer: 1.915.304-00

**Monitor Amp 1.915.304.00 ( 0)**

Idx. Pos.	Part No.	Qty.	Type/Val.	Description
0 C 1	59.32.4471	1 pce	470p	CER , 20%, 50V
0 C 2	59.25.4101	1 pce	100u	EL 25V 20% axial
0 C 3	59.32.4471	1 pce	470p	CER , 20%, 50V
0 C 4	59.25.4101	1 pce	100u	EL 25V 20% axial
0 C 5	59.32.4471	1 pce	470p	CER , 20%, 50V
0 C 6	59.25.4101	1 pce	100u	EL 25V 20% axial
0 C 7	59.25.4101	1 pce	100u	EL 25V 20% axial
0 C 8	59.25.4101	1 pce	100u	EL 25V 20% axial
0 C 9	59.32.4471	1 pce	470p	CER , 20%, 50V
0 C 10	59.25.4101	1 pce	100u	EL 25V 20% axial
0 D 1	50.04.0125	1 pce	1N4448	75V, 150mA, 4ns, DO-35
0 D 2	50.04.0125	1 pce	1N4448	75V, 150mA, 4ns, DO-35
0 D 3	50.04.0125	1 pce	1N4448	75V, 150mA, 4ns, DO-35
0 D 4	50.04.0125	1 pce	1N4448	75V, 150mA, 4ns, DO-35
0 IC 1	50.09.0107	1 pce	4559	Dual Op-Amp
0 IC 2	50.09.0107	1 pce	4559	Dual Op-Amp
0 IC 3	50.09.0107	1 pce	4559	Dual Op-Amp
0 K 1	56.04.0146	1 pce	4*u	6V, 220V/2A, PCB
0 K 2	56.04.0146	1 pce	4*u	6V, 220V/2A, PCB
0 K 3	56.04.0146	1 pce	4*u	6V, 220V/2A, PCB
0 K 4	56.04.0146	1 pce	4*u	6V, 220V/2A, PCB
0 R 1	57.11.3682	1 pce	6k8	MF, 1%, 0207
0 R 2	57.11.3393	1 pce	39k	MF, 1%, 0207
0 R 4	57.11.3682	1 pce	6k8	MF, 1%, 0207
0 R 5	57.11.3393	1 pce	39k	MF, 1%, 0207
0 R 7	57.11.3562	1 pce	5k6	MF, 1%, 0207
0 R 8	57.11.3562	1 pce	5k6	MF, 1%, 0207
0 R 9	57.11.3562	1 pce	5k6	MF, 1%, 0207
0 R 10	57.11.3562	1 pce	5k6	MF, 1%, 0207
0 R 11	57.11.3334	1 pce	330k	MF, 1%, 0207
0 R 12	57.11.3562	1 pce	5k6	MF, 1%, 0207
0 R 13	57.11.3334	1 pce	330k	MF, 1%, 0207
0 R 14	57.11.3562	1 pce	5k6	MF, 1%, 0207
0 R 15	57.11.3682	1 pce	6k8	MF, 1%, 0207
0 R 16	57.11.3393	1 pce	39k	MF, 1%, 0207
0 R 17	57.11.3562	1 pce	5k6	MF, 1%, 0207
0 R 18	57.99.0206	1 pce	50R	PTC, 25V, 0.5W
0 R 19	57.99.0206	1 pce	50R	PTC, 25V, 0.5W
0 R 20	57.11.3682	1 pce	6k8	MF, 1%, 0207
0 R 21	57.11.3393	1 pce	39k	MF, 1%, 0207
0 R 22	57.11.3562	1 pce	5k6	MF, 1%, 0207
0 R 23	57.11.3562	1 pce	5k6	MF, 1%, 0207
0 R 24	57.11.3562	1 pce	5k6	MF, 1%, 0207
0 R 25	57.11.3562	1 pce	5k6	MF, 1%, 0207
0 R 26	57.11.3562	1 pce	5k6	MF, 1%, 0207
0 R 27	57.11.3562	1 pce	5k6	MF, 1%, 0207
0 R 28	57.11.3562	1 pce	5k6	MF, 1%, 0207
0 R 29	57.11.3562	1 pce	5k6	MF, 1%, 0207
0 R 30	57.11.3562	1 pce	5k6	MF, 1%, 0207
0 T 1	1.022.419.00	1 pce		EINGANGSTRAFO 1:1
0 T 2	1.022.419.00	1 pce		EINGANGSTRAFO 1:1
0 T 3	1.022.419.00	1 pce		EINGANGSTRAFO 1:1
0 T 4	1.022.419.00	1 pce		EINGANGSTRAFO 1:1

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

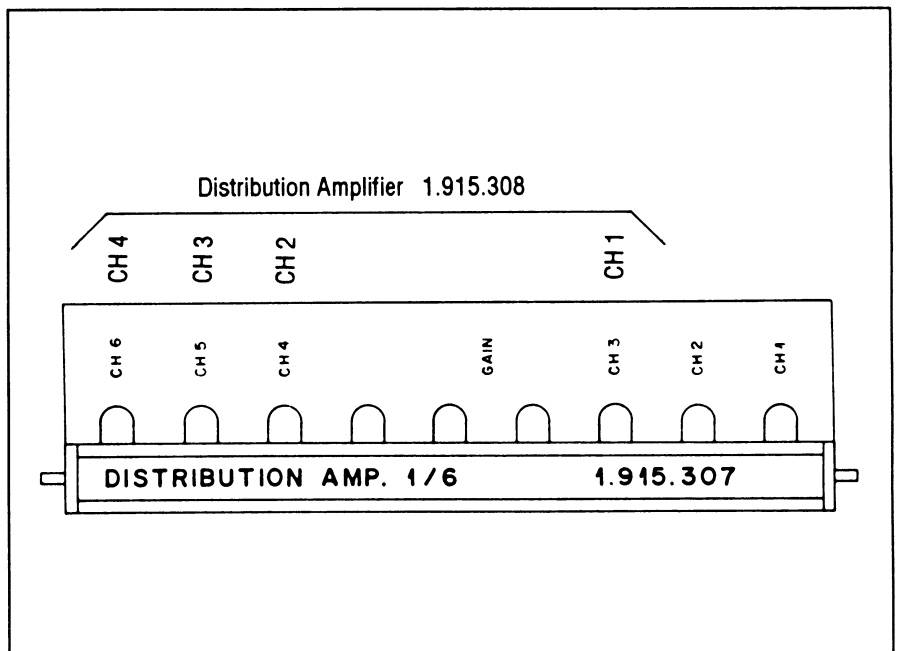
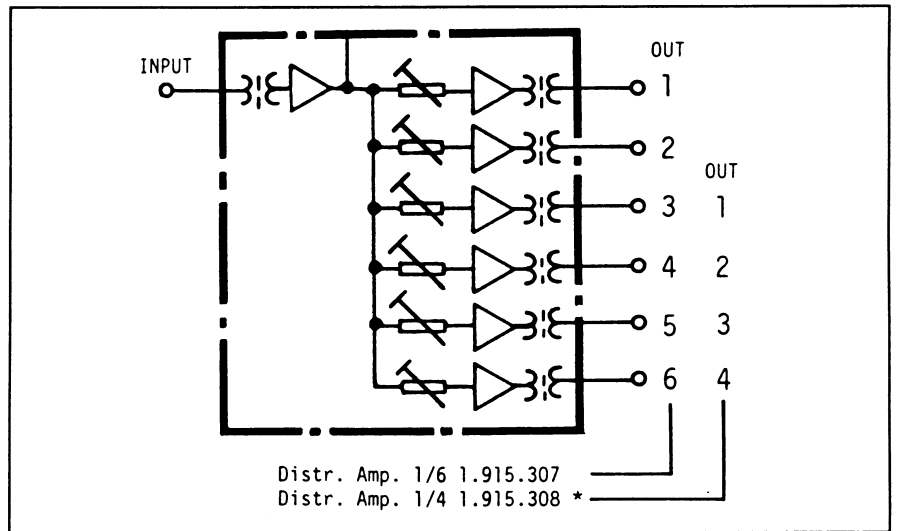
End of List

Comments:

**2.2.5 Distribution Amplifier**

1.915.307/308

The distribution amplifier cards offer splitting of one input to four or six individually adjustable outputs (versions 1.915.308 or 1.915.307, respectively). The input and all outputs are transformer-balanced and floating. These cards satisfy any complex requirement of signal routing and distribution.

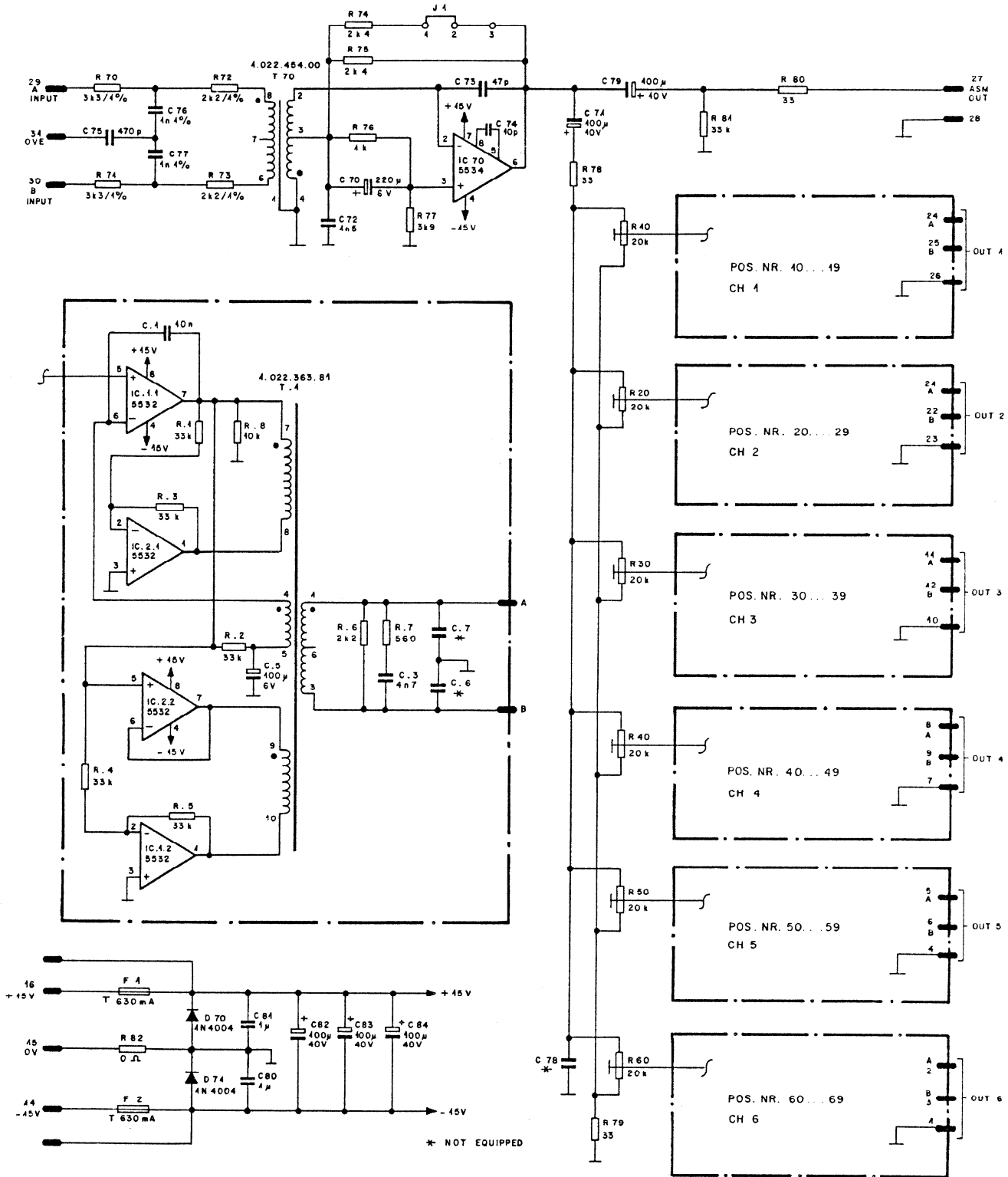




**Technical Specifications**

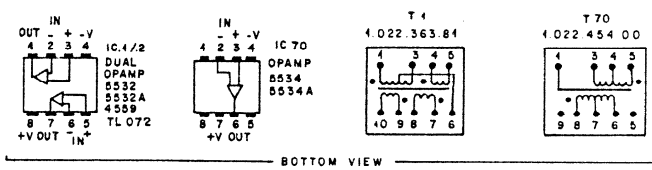
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<b>General:</b>	Frequency range	<b>31.5 Hz...16 kHz</b>	
	Frequency response	<b>+0.2/-0.5 dB, <math>R_L = 300 \Omega</math></b>	
<b>Input:</b>		<b>balanced and floating</b>	
	Impedance	<b><math>\approx 10 \text{ kW}</math></b>	
	Symmetry	<b><math>\approx 60 \text{ dB}</math></b>	
	Gain, adjustable	<b>-20...+10 dB (Jumper 2-3: +6 dB Gain)</b>	
<b>Outputs:</b>		<b>balanced and floating</b>	
	Impedance	<b><math>\approx 40 \text{ W}</math></b>	
	Maximum level	<b>+24 dBu, <math>R_L = 600 \Omega</math>/THD &lt; 1%</b>	
		<b>+21 dBu, <math>R_L = 200 \Omega</math>/THD &lt; 1%</b>	
	THD	<b><math>\approx 0.02\%</math>, +6 dBu/300 <math>\Omega</math></b>	
	Output noise voltage	<b>-100 dBu, 0 dB gain</b>	
<b>Supply:</b>		<b><math>\pm 15 \text{ V}_{\text{DC}}</math></b>	<b>(90 mA, all outputs +6 dBu, without load; 180 mA, all outputs +24 dBu into 300 <math>\Omega</math>)</b>
<b>Dimensions:</b>	Euro-card	<b>100 × 160 mm, 7 M units wide</b>	
	Weight	<b>500 g (1.915.308)</b>	
		<b>600 g (1.915.307)</b>	
<b>Ordering Information:</b>			
<b>Euro-cards:</b>	•	Distribution amplifier 1 to 6	1.915.307.xx
	•	Distribution amplifier 1 to 4	1.915.308.xx
<b>19"/1U standard products:</b>	•	Distribution unit 2 × 1 in/4 out on XLR	75.700.89301
	•	Distribution unit 3 × 1 in/4 out on XLR	75.700.89302
	•	Distribution unit 2 × 1 in/6 out on XLR	75.700.89303



\* NOT EQUIPPED

- 11
- 20
- 30
- 41
- 50
- 60
- 71
- 80
- 90
- 101
- 110
- 120
- 13
- 14 -15V
- 15 0V
- 16 +15V
- 17
- 18
- 19
- 20
- 21 0
- 22 B
- 23 L
- 24 0
- 25 B
- 26 L
- 27 ASM. OUT
- 28 L
- 29 0
- 30 B
- 31 0VE
- 32



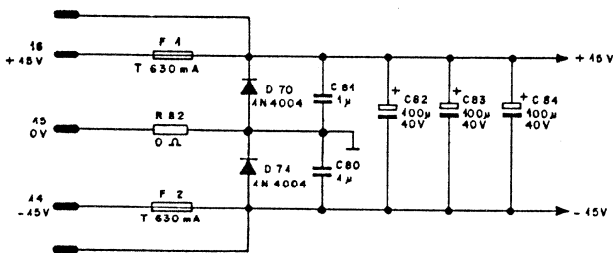
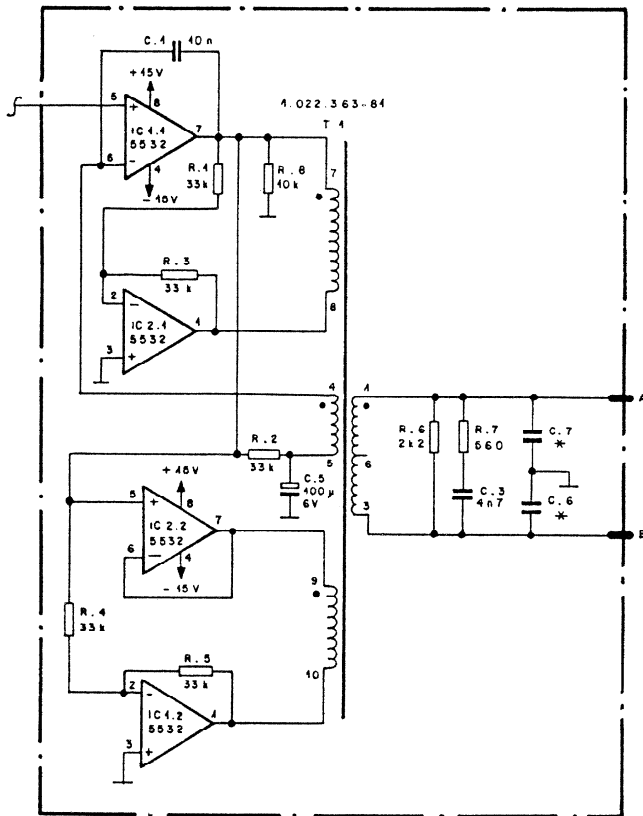
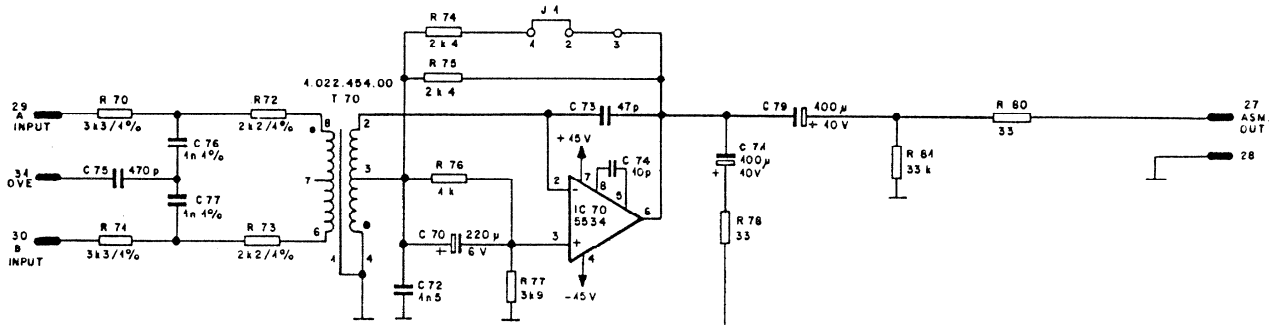
24.11.93 <i>fe</i>	12.4.94 <i>we</i>		
<b>STUDER</b> REGENSDORF ZÜRICH	DISTRIBUTION AMP. 1/6	SC 1.915.307-81	

DISTRIBUTION AMPLIFIER

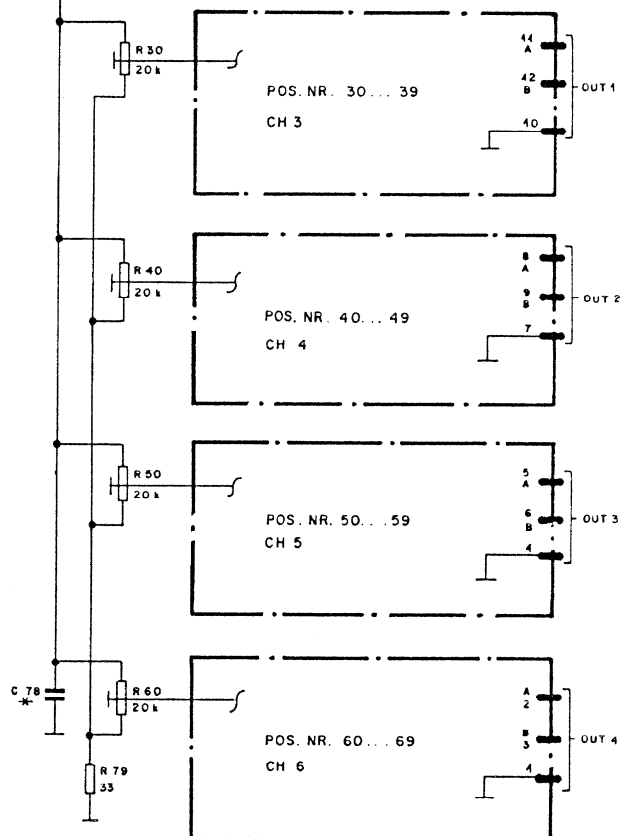
Table with columns: Ad, POS., REF.No., DESCRIPTION, MANUFACTURER. Contains component lists for Distribution Amplifier, including resistors (R...), capacitors (C...), integrated circuits (IC...), transformers (T...), and jumpers (JP...).

END

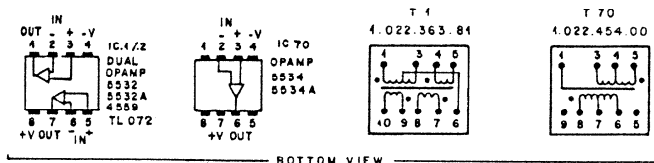
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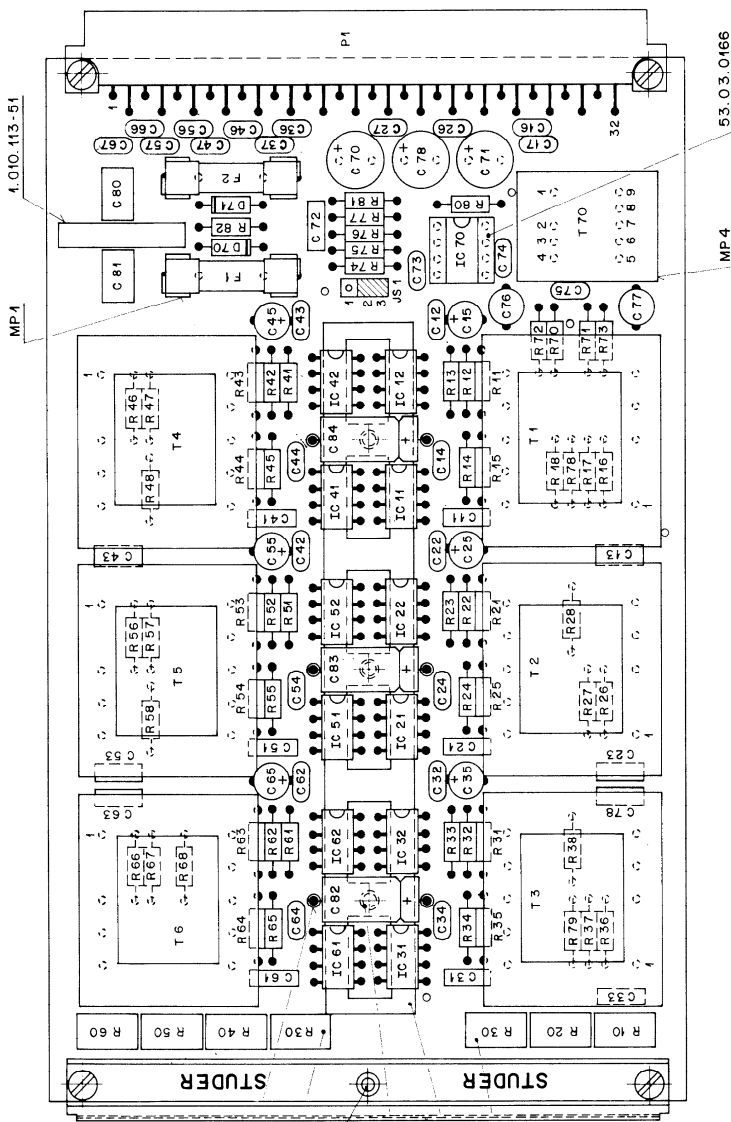
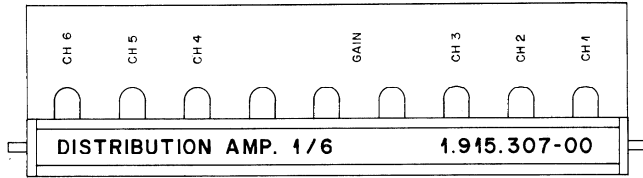
\* NOT EQUIPPED



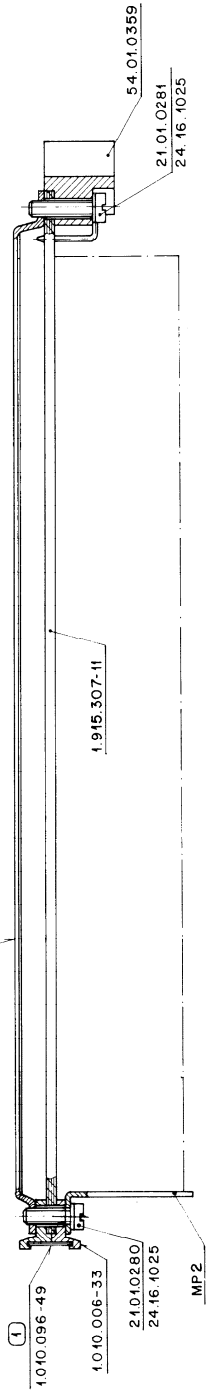
- 1 a
- 2 a
- 3 b
- 4 l
- 5 a
- 6 b
- 7 l
- 8 a
- 9 b
- 10 l
- 11 a
- 12 b
- 13
- 14 -45V
- 15 0V
- 16 +15V
- 17
- 18
- 19
- 20
- 21
- 22
- 23
- 24
- 25
- 26
- 27 ASM. OUT
- 28 l
- 29 a
- 30 b
- 31 0V
- 32



① 24.11.93	① 12.4.94	○	○	○
STUDER REGENSDORF ZÜRICH		DISTRIBUTION AMP 1/4		SC 1.915.308-81



1.915.307-90 (6A)  
 ONLY 1.915.308-00  
 28.21.1380  
 28.21.2307  
 \* MP3  
 ONLY 1.915.307-00



VALID FOR	NR.	UNIT + PL	(1)
DISTR. AMP 1/6	1.915.307-00	1.915.307-01	
DISTR. AMP 1/4	1.915.308-00	1.915.308-01	

\* Zwischen IC 11/12 / 21/22 / 31/32 / 41/42 / 51/52 / 61/62 und Kühlblech MP3 Wärmeleitpaste 99.01.0506

Norm-Nr		③
DIN-Bez		②
Abmessung		①
Zugehörige Unterlagen		
Werkstoff		
Überfläche		
Beh.		
Freimastlötlack		
Maßstab	2 : 1	
Datum	19.8.67	
Verf.	A.Ho	
Gez.		
Gez.		
Index		
Änderung		
Ausgabe		
Ersetzt durch		
Klein für		
Benennung	DISTRIBUTION AMP. 1/6	
Nummer	1.915.307-00	

DISTRIBUTION AMPLIFIER

Ad	..POS..	...REF.No...	DESCRIPTION.....	MANUFACTURER
		C....31	not used	
01	C....31	59.06.0222	2.2 nF	PE
	C....32	59.34.2470	47 pF	CER
	C....33	59.06.0472	4.7 nF	PE
	C....34	59.34.2470	47 pF	CER
	C....35	59.22.3101	100 uF	ALU 10V
	C....36	59.32.1680	68 pF	CER 400V
	C....37		not used	
	C....41		not used	
01	C....41	59.06.0222	2.2 nF	PE
	C....42	59.34.2470	47 pF	CER
	C....43	59.06.0472	4.7 nF	PE
	C....44	59.34.2470	47 pF	CER
	C....45	59.22.3101	100 uF	ALU 10V
	C....46	59.32.1680	68 pF	CER 400V
	C....47		not used	
	C....51		not used	
01	C....51	59.06.0222	2.2 nF	PE
	C....52	59.34.2470	47 pF	CER
	C....53	59.06.0472	4.7 nF	PE
	C....54	59.34.2470	47 pF	CER
	C....55	59.22.3101	100 uF	ALU 10V
	C....56	59.32.1680	68 pF	CER 400V
	C....57		not used	
	C....61		not used	
01	C....61	59.06.0222	2.2 nF	PE
	C....62	59.34.2470	47 pF	CER
	C....63	59.06.0472	4.7 nF	PE
	C....64	59.34.2470	47 pF	CER
	C....65	59.22.3101	100 uF	ALU 10V
	C....66	59.32.1680	68 pF	CER 400V
	C....67		not used	
	C....70	59.22.4221	220 uF	ALU 6V
	C....71	59.22.4101	100 uF	ALU 10V
	C....72	59.06.0152	1.5 nF	CER
	C....73	59.34.2470	47 pF	CER
	C....74	59.34.4100	10 pF	CER
	C....75	59.34.5471	470 pF	CER
	C....76	59.05.1102	1 nF	1%
	C....77	59.05.1102	1 nF	1%
	C....79	59.22.4101	100 uF	ALU 10V
	C....80	59.06.5105	1 uF	PE
	C....81	59.06.5105	1 uF	PE
	C....82	59.25.5101	100 uF	40V
	C....83	59.25.5101	100 uF	40V
	C....84	59.25.5101	100 uF	40V

Ad	..POS..	...REF.No...	DESCRIPTION.....	MANUFACTURER
		R....56	57.11.4222 2.2 kOhm	5% 0.25W MF
		R....57	57.11.4102 1 kOhm	5% 0.25W MF
		R....58	57.11.4103 10 kOhm	5% 0.25W MF
		R....60	58.01.9203 20 kOhm	10% 0.5 W PMG trimming resistor
		R....61	57.11.4333 33 kOhm	5% 0.25W MF
		R....62	57.11.4333 33 kOhm	5% 0.25W MF
		R....63	57.11.4333 33 kOhm	5% 0.25W MF
		R....64	57.11.4333 33 kOhm	5% 0.25W MF
		R....65	57.11.4333 33 kOhm	5% 0.25W MF
		R....66	57.11.4222 2.2 kOhm	5% 0.25W MF
		R....67	57.11.4102 1 kOhm	5% 0.25W MF
		R....68	57.11.4103 10 kOhm	5% 0.25W MF
		R....70	57.11.3332 3.3 kOhm	1% 0.25W MF
		R....71	57.11.3332 3.3 kOhm	1% 0.25W MF
		R....72	57.11.3222 2.2 kOhm	1% 0.25W MF
		R....73	57.11.3222 2.2 kOhm	1% 0.25W MF
		R....74	57.11.3242 2.4 kOhm	1% 0.25W MF
		R....75	57.11.3242 2.4 kOhm	1% 0.25W MF
		R....76	57.11.4102 1 kOhm	5% 0.25W MF
		R....77	57.11.4392 3.9 kOhm	5% 0.25W MF
		R....78	57.11.4330 33 Ohm	5% 0.25W MF
		R....79	57.11.4330 33 Ohm	5% 0.25W MF
		R....80	57.11.4330 33 Ohm	5% 0.25W MF
		R....81	57.11.4333 33 kOhm	5% 0.25W MF
		R....82	57.11.4000 0 Ohm	5% 0.25W MF
		T....30	1.022.363.00	output trafo
		T....40	1.022.363.00	output trafo
		T....50	1.022.363.00	output trafo
		T....60	1.022.363.00	output trafo
		T....70	1.022.454.00	input trafo

CER=Ceramic, PE=Polyester, SAL=Solid Aluminium  
MF=Metal Film, PMG=Cermet

MANUFACTURER: Ex=Exar, NE=NEC, Ph=Philips, Ra=Raytheon,  
Sig=Signetics, St=Studer,

1.915.308.00 DISTRIBUTION AMP.1/4 SE 87/09/0400  
1.915.308.00 DISTRIBUTION AMP.1/4 SE 92/07/0201

END

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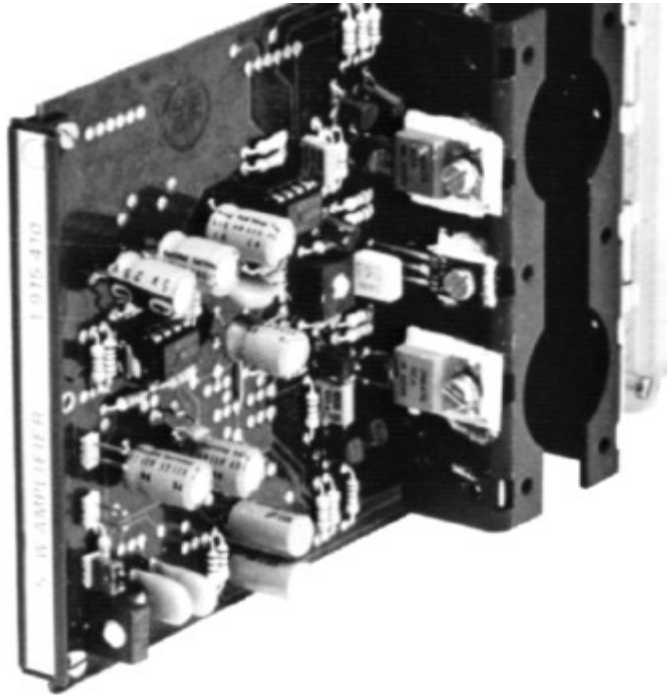
D....70	50.04.0105	1N4004		
D....71	50.04.0105	1N4004		
F....1	51.01.0115	T 630mA /250V 5*20		
F....2	51.01.0115	T 630mA /250V 5*20		
IC...31	50.09.0106	NE5532AN	dual op. amp.	Ra,NE
IC...32	50.09.0106	NE5532AN	dual op. amp.	Ra,NE
IC...41	50.09.0106	NE5532AN	dual op. amp.	Ra,NE
IC...42	50.09.0106	NE5532AN	dual op. amp.	Ra,NE
IC...51	50.09.0106	NE5532AN	dual op. amp.	Ra,NE
IC...52	50.09.0106	NE5532AN	dual op. amp.	Ra,NE
IC...61	50.09.0106	NE5532AN	dual op. amp.	Ra,NE
IC...62	50.09.0106	NE5532AN	dual op. amp.	Ra,NE
IC...70	50.05.0244	NE5534AN	single op.amp.	Ra,NE
JP...1	54.01.0021		JUMPER JACK	
JS...1	54.01.0020		JUMPER PLUG 3-PIN	
MP...1	53.03.0142	4 pcs	Fuse holder	
MP...2	1.915.307.02	1 pcs	Abdeckwinkel	
MP...3	1.915.307.05	1 pcs	Kuelblech	
MP...4	1.022.400.03	1 pcs	Isolation T 70	
R....30	58.01.9203	20 kOhm	10% 0.5 W	PMG trimming resistor
R....31	57.11.4333	33 kOhm	5% 0.25W	MF
R....32	57.11.4333	33 kOhm	5% 0.25W	MF
R....33	57.11.4333	33 kOhm	5% 0.25W	MF
R....34	57.11.4333	33 kOhm	5% 0.25W	MF
R....35	57.11.4333	33 kOhm	5% 0.25W	MF
R....36	57.11.4222	2.2 kOhm	5% 0.25W	MF
R....37	57.11.4102	1 kOhm	5% 0.25W	MF
R....38	57.11.4103	10 kOhm	5% 0.25W	MF
R....40	58.01.9203	20 kOhm	10% 0.5 W	PMG trimming resistor
R....41	57.11.4333	33 kOhm	5% 0.25W	MF
R....42	57.11.4333	33 kOhm	5% 0.25W	MF
R....43	57.11.4333	33 kOhm	5% 0.25W	MF
R....44	57.11.4333	33 kOhm	5% 0.25W	MF
R....45	57.11.4333	33 kOhm	5% 0.25W	MF
R....46	57.11.4222	2.2 kOhm	5% 0.25W	MF
R....47	57.11.4102	1 kOhm	5% 0.25W	MF
R....48	57.11.4103	10 kOhm	5% 0.25W	MF
R....50	58.01.9203	20 kOhm	10% 0.5 W	PMG trimming resistor
R....51	57.11.4333	33 kOhm	5% 0.25W	MF
R....52	57.11.4333	33 kOhm	5% 0.25W	MF
R....53	57.11.4333	33 kOhm	5% 0.25W	MF
R....54	57.11.4333	33 kOhm	5% 0.25W	MF
R....55	57.11.4333	33 kOhm	5% 0.25W	MF

### 2.2.6 5 W Power Amplifier

1.915.410/415

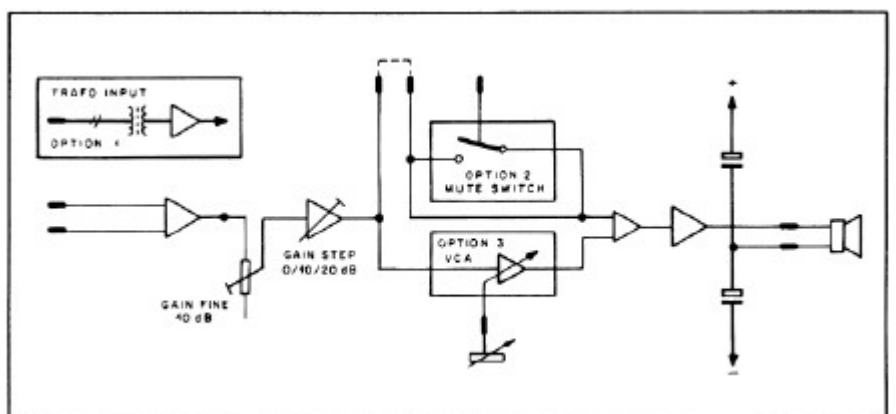
This amplifier on one Euro-card is designed for operation on a  $\pm 15$  V supply. It is capable of providing a power output of 5 W into a load of  $8 \Omega$ .

With its low-to-medium power level, this amplifier is ideally suited for applications such as pre-listening or talkback speaker operation. Its output stage is protected by instantaneous output power limiting.



The standard version has an electronically balanced (transformerless) input. It is also available with the following options:

- Input balancing transformer
- Remote muting
- Remote gain control (VCA)
- Input balancing transformer plus remote muting
- Input balancing transformer plus remote gain control (VCA).



**Technical Specifications**

---

<b>Audio:</b>	Power output	<b>4 W/15 W</b> <b>5 W/8 W</b> <b>2.5 W/4 W</b> , continuous, sine wave
	THD	<b>&lt; 0.1%</b> @ rated output, 30 Hz...16 kHz
	Frequency response	<b>±0.5 dB</b> , 30 Hz...16 kHz
	Input impedance	<b>10 kW</b> , balanced
	Sensitivity	<b>-17...+16 dBu</b> (0.11...4.9 V <sub>rms</sub> ) for rated output
	Maximum input level	<b>+24 dBu</b> (12.3 V <sub>rms</sub> ) clipping point
	S/N	<b>100 dB</b> , linear to 23 kHz at normal operating gain (input +6 dBu) <b>85 dB</b> , at maximum gain

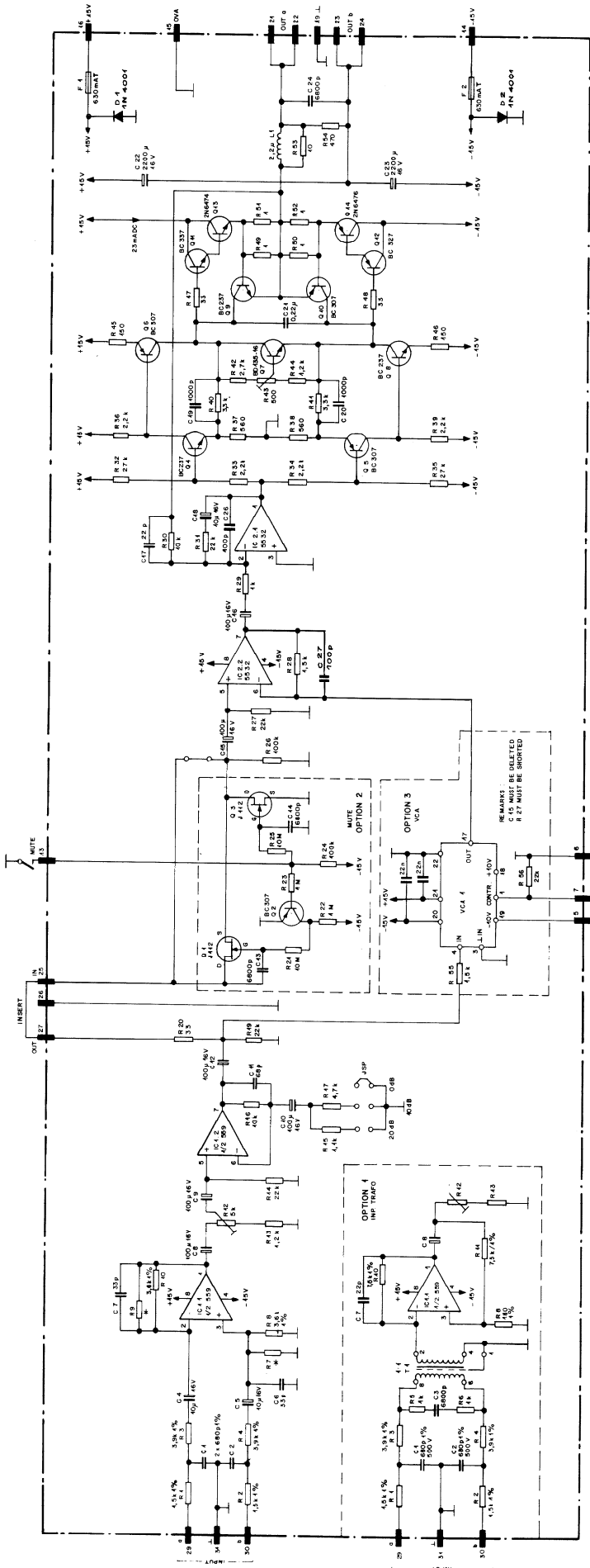
<b>Supply:</b>		<b>±15 V DC</b> (40 mA idling; 400 mA @ 5 W/8 Ω)
	Output stage quiescent current	<b>23 mA</b>

<b>Dimensions:</b>	Euro-card	<b>100 × 160 mm, 7M units wide</b>
	Weight	<b>approx. 210 g</b>

**Ordering Information:**

<b>5 W amplifier with</b>	• transformerless input	1.915.410.xx
	• input transformer	1.915.411.xx
	• transformerless input and remote muting facility	1.915.412.xx
	• input transformer and remote muting facility	1.915.413.xx
	• transformerless input and remote gain control (VCA)	1.915.414.xx
	• input transformer and remote gain control (VCA)	1.915.415.xx

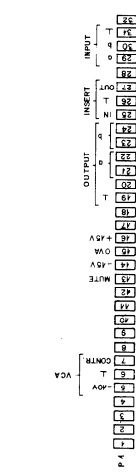
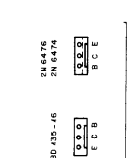
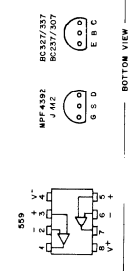
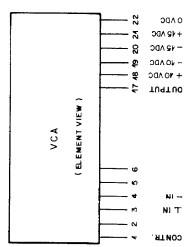




4 R.T. 615 SELECTED FOR BEST COMMONMODE REJECTION

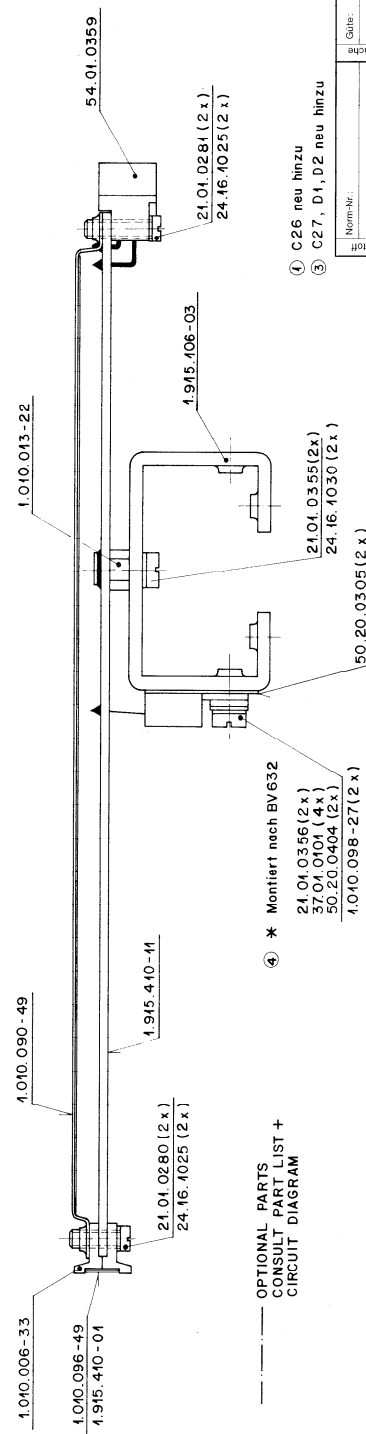
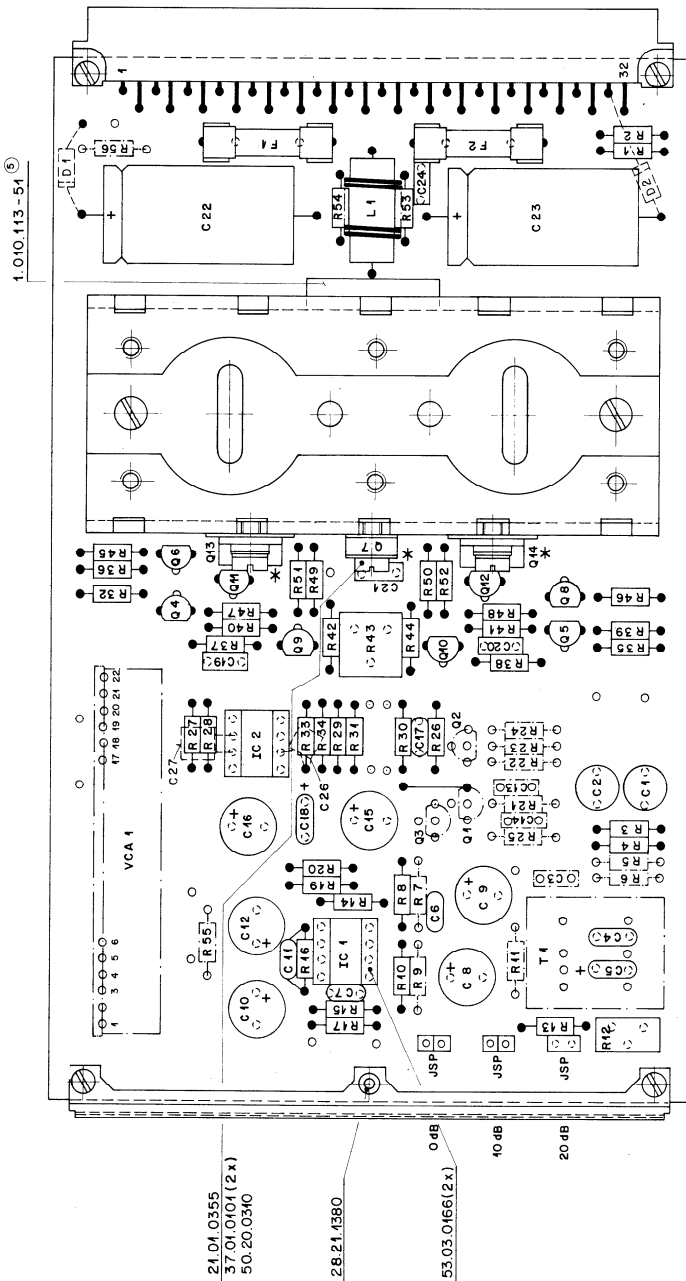
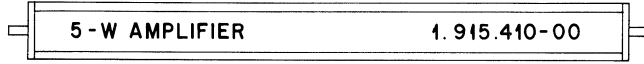
4 915

OPTION	IC	RESISTOR
MUTE	412	4K
VCA	414	415
DIFF AMP	416	TR40



DATE:	15.5.82	17.4.83	8.1.85	10.8.85	10.8.85
SIGN:	Th	ML	ML	ML	ML
STUDER	5 WATT AMPLIFIER				
RECEIVED	SC 1.915.410				
ZÜRICH					

5W AUDIO AMPLIFIER



OPTIONAL PARTS  
CONSULT PART LIST +  
CIRCUIT DIAGRAM

- ④ \* Montiert nach BV632  
21.01.0356 (2x)  
37.01.0101 (4x)  
50.20.0404 (2x)  
1.010.098-27 (2x)

- ① C25 neu hinzu
- ② C27, D1, D2 neu hinzu

⑥										
⑤	27.5.87	79	101.86	A Ho	1/1	1/1	1/1	1/1	1/1	
④	18.4.85	A Ho	4.4.84	A Ho	1/1	1/1	1/1	1/1	1/1	
③	10.11.83	A Ho	16.9.82	Ho	1/1	1/1	1/1	1/1	1/1	
②	16.9.82	Ho								
①										
	Änderung	Änderung	Änderung	Änderung	Änderung	Änderung	Änderung	Änderung	Änderung	
	Nummer	DIN-Biz.	Abmessung	Zugehörige Unterlagen	Material	Preis	Gez.	Gepr.	Gez.	
	Werkstoff									
	PL, BV 632 ④									
	Ersatz für									
	Kopiert für									
	Benennung	5-Watt Amplifier							Nummer	1.915.410-00
		STUDER REGENDORF ZÜRICH								

5W AUDIO AMPLIFIER

Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER	Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER
C	...	1	59.05.1681	680p 1% 500V PP	R	...	33	57.11.4222	2,2k
C	...	2	59.05.1681	680p 1% 500V PP	R	...	34	57.11.4222	2,2k
C	...	3		OPT 1	R	...	35	57.11.4273	27k
C	...	4	59.26.2100	10µ 16V SAL	R	...	36	57.11.4222	2,2k
C	...	5	59.26.2100	10µ 16V SAL	R	...	37	57.11.4561	560
C	...	6	59.34.2330	33p CER	R	...	38	57.11.4561	560
C	...	7	59.34.2330	33p CER	R	...	39	57.11.4222	2,2k
C	...	8	59.22.5101	100µ 16V EL	R	...	40	57.11.4332	3,3k
C	...	9	59.22.5101	100µ 16V EL	R	...	41	57.11.4332	3,3k
C	...	10	59.22.5101	100µ 16V EL	R	...	42	57.11.4272	2,7k
C	...	11	59.34.4680	68p CER	R	...	43	58.01.8501	500 TRIM
C	...	12	59.22.5101	100µ 16V EL	R	...	44	57.11.4122	1,2k
C	...	13		OPT 2	R	...	45	57.11.4151	150
C	...	14		OPT 2	R	...	46	57.11.4151	150
C	...	15	59.22.5101	100µ 16V EL	R	...	47	57.11.4330	33
C	...	16	59.22.5101	100µ 16V EL	R	...	48	57.11.4330	33
C	...	17	59.34.2220	22p CER	R	...	49	57.11.4109	1
C	...	18	59.26.2100	10µ 16V SAL	R	...	50	57.11.4109	1
C	...	19	59.06.0102	1000p PE	R	...	51	57.11.4109	1
C	...	20	59.06.0102	1000p PE	R	...	52	57.11.4109	1
C	...	21	59.06.0224	0,22µ PE	R	...	53	57.11.4100	10
C	...	22	59.25.3222	2200µ 16V EL	R	...	54	57.11.4471	470
C	...	23	59.25.3222	2200µ 16V EL	R	...	55		OPT 3
C	...	24	59.06.0682	6800p PE	R	...	56		OPT 3
C	...	25		OPT 3					
① C	...	26	59.34.4101	100p CER	XF		53.03.0142		FUSE HOLDER
② C	...	27	59.34.4101	100p CER	XIC		53.03.0166		8pDIL
F	...	1	51.01.0115	630mA SLOW BLOW 5*20					
F	...	2	51.01.0115	630mA SLOW BLOW 5*20					
IC	...	1	50.09.0107	4559 DUAL OP AMP	RA				OPTION 1
① IC	...	2	50.09.0106	5532 DUAL OP AMP	SIG	C	...	3	59.06.0682 6800p PE
JSP			54.01.0020	PIN (2*)		C	...	7	59.34.2220 22p CER
L	...	1	1.068.614.00	2,2µH		R	...	5	57.11.4102 1k
P	...	1	54.01.0359	32p EDGE CONN. TYBE B		R	...	6	57.11.4102 1k
Q	...	1		OPT 2		R	...	8	57.11.3181 180 1%
Q	...	2		OPT 2		R	...	10	57.11.3752 7,5k 1%
Q	...	3		OPT 2		R	...	11	57.11.3752 7,5k 1%
Q	...	4	50.03.0436	BC237B NPN GEN. PURPOSE		T	...	1	1.022.419.00 1:1
Q	...	5	50.03.0515	BC307B PNP GEN. PURPOSE				1.022.400.03	INSULATION
Q	...	6	50.03.0515	BC307B PNP GEN. PURPOSE		C	...	13	59.06.0682 6800p
Q	...	7	50.03.0495	BD135-16 NPN		C	...	14	59.06.0682 6800p
Q	...	8	50.03.0436	BC237B NPN GEN. PURPOSE		Q	...	1	50.03.0350 J112 ND FET
Q	...	9	50.03.0436	BC237B NPN GEN. PURPOSE		Q	...	2	50.03.0515 BC307 PNP GEN. PURPOSE
Q	...	10	50.03.0515	BC307B PNP GEN. PURPOSE		Q	...	3	50.03.0350 J112 ND FET
Q	...	11	50.03.0340	BC337 NPN 800mA		R	...	21	57.11.6106 10M
Q	...	12	50.03.0351	BC327 PNP 800mA		R	...	22	57.11.4105 1M
Q	...	13	50.03.0344	2N6474 NPN	RCA	R	...	23	57.11.4105 1M
Q	...	14	50.03.0345	2N6476 PNP	RCA	R	...	24	57.11.4104 100k
R	...	1	57.11.3152	1,5k 1%		R	...	25	57.11.6106 10M
R	...	2	57.11.3152	1,5k 1%					
R	...	3	57.11.3392	3,9k 1%		② D	...	1	50.04.0122 1N4001
R	...	4	57.11.3392	3,9k 1%		② D	...	2	50.04.0122 1N4001
R	...	5		OPT 1		R	...	55	57.11.4152 1,5k
R	...	6		OPT 1		R	...	56	57.11.4223 22k
R	...	7		SELECTED		VCA	...	1	1.010.110.50 VOLTAGE CONTROLLED AMPL.
R	...	8	57.11.3362	3,6k 1%					ST
R	...	9		SELECTED					
R	...	10	57.11.3362	3,6k 1%					
R	...	11		OPT 1					
R	...	12	58.01.7502	5k TRIM					
R	...	13	57.11.4122	1,2k					
R	...	14	57.11.4223	22k					
R	...	15	57.11.3112	1,1k 1%					
R	...	16	57.11.4103	10k					
R	...	17	57.11.4472	4,7k					
R	...	18		NOT USED					
R	...	19	57.11.4223	22k					
R	...	20	57.11.4330	33					
R	...	21		OPT 2					
R	...	22		OPT 2					
R	...	23		OPT 2					
R	...	24		OPT 2					
R	...	25		OPT 2					
R	...	26	57.11.4104	100k					
R	...	27	57.11.4223	22k					
R	...	28	57.11.4152	1,5k					
R	...	29	57.11.4102	1k					
R	...	30	57.11.4103	10k					
R	...	31	57.11.4223	22k					
R	...	32	57.11.4273	27k					

END  
→

Additional Diodes see Page 6

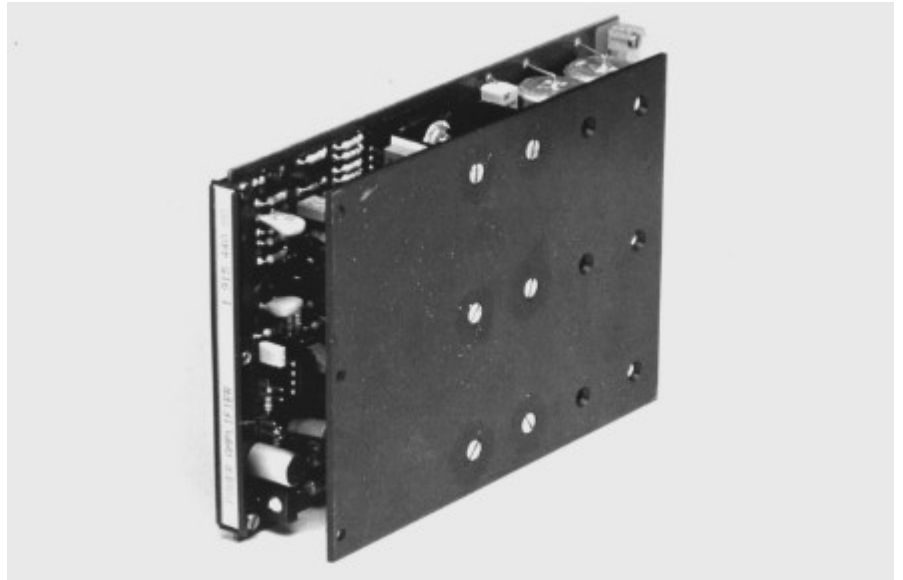
PP=Polypropylene, SAL= Solid Aluminium, CER=Ceramic, EL=Electrolytic, PE=Polyester  
MANUFACTURER: ST=Studer, MOT=Motorola, SIX=Siliconix, RA=Raytheon, SIG=Signetics

1.915.410.00 5 WATT AMPLIFIER TH 14/04/82  
1.915.410.00 5 WATT AMPLIFIER ① HO 04/11/83  
1.915.410.00 5 WATT AMPLIFIER ② PA 18/04/85

## 2.2.7 40 W Power Amplifier

1.915.440/441

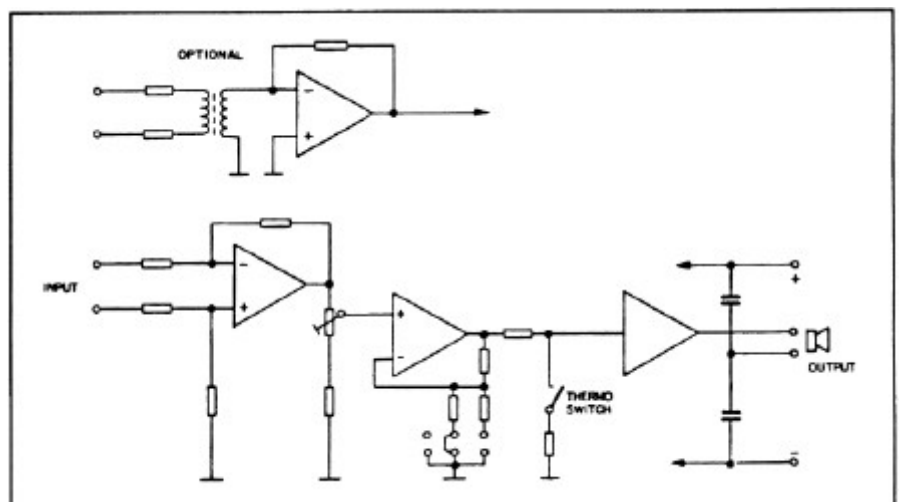
For applications where higher power level is needed, a 40 W amplifier has been realized on a Euro-card. Its width is 32 mm, which equals 7M widths approximately.



Power is supplied from a separate 45 V<sub>DC</sub> source, as is contained in the 19" mounting frame 1.918.120.xx. Two amplifier cards will fit into that frame, making it suitable for applications where stereophonic monitoring is required.

### Special Features

- Transformerless version with electronically balanced inputs standard
- Version with balanced and floating inputs available
- Output stage protected from overload by momentary power limiting
- Temperature sensing avoids thermal overload
- High-end frequency response limited to prevent transient intermodulation distortion
- Low distortion performance, even at low power output
- Operation with output transformer possible



**Technical Specifications**

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<b>Audio:</b>	Power output	<b>40 W/4 W</b> , continuous, sine-wave,
	THD	< <b>0.1 %</b> , 30 Hz...15 kHz (up to rated output)
	Output impedance	<b>0.1 W</b>
	Input impedance	<b>10 kW</b>
	Common mode rejection	> <b>50 dB</b> , 30 Hz...16 kHz (with input transformer)
	Input sensitivity	<b>-12...+18 dBu</b> (0.195...6.2 V <sub>rms</sub> ) for rated output (adjustable with jumper in three 10 dB-increments, plus fine-trim range of 12 dB)
	Frequency response	<b>+0.5/-1 dB</b> , 30 Hz...15 kHz
	S/N	<b>105 dB</b> @ maximum gain <b>90 dB</b> @ minimum gain

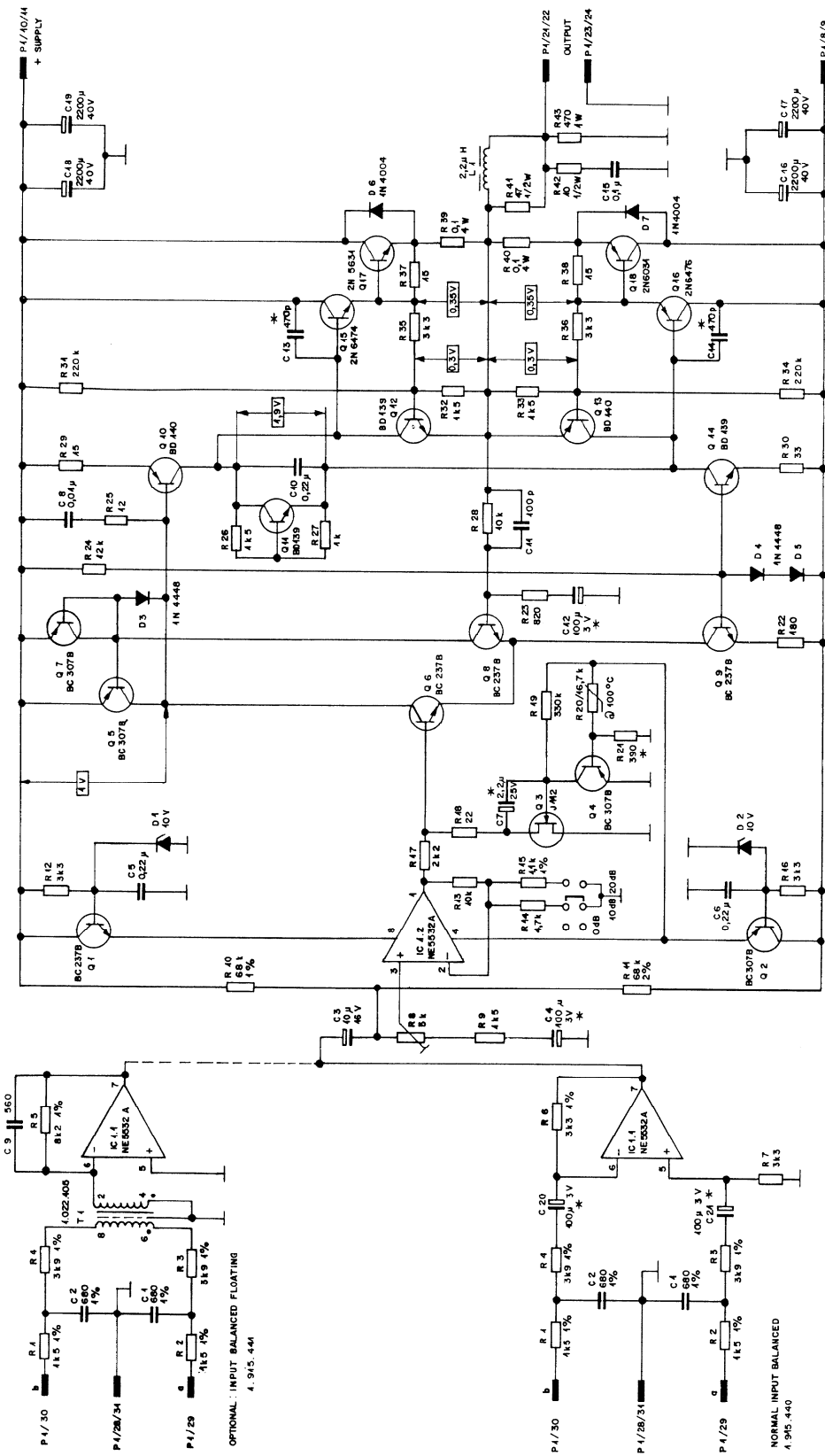
**Supply:** **45 V<sub>DC</sub>** (70 mA idling, 1.5 A @ 40 W/4 Ω)

**Dimensions:** Euro-card **100 × 160 mm, 7M units wide**

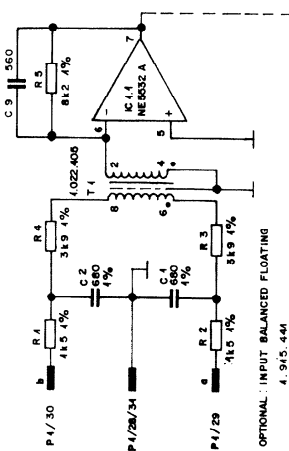
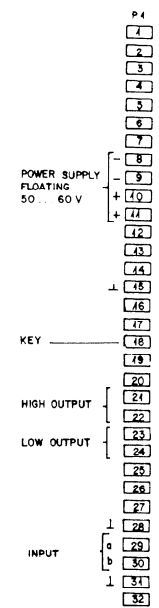
**Ordering Information:**

<b>Euro-cards</b>	• 40 W power amplifier with transformerless input	1.915.440.xx
	• 40 W power amplifier with input transformer	1.915.441.xx
<b>19"/1U standard products</b>		
<b>40 W power amplifier</b>	• Mono version, 19"/1U	75.700.80311
	• Stereo version, 19"/1U	75.700.80322
	• 19"/1U mounting frame (without amplifier cards)	1.918.120.xx

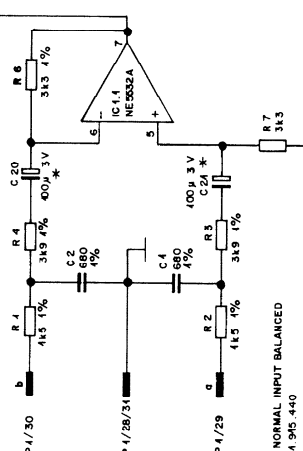
40W POWER AMPLIFIER



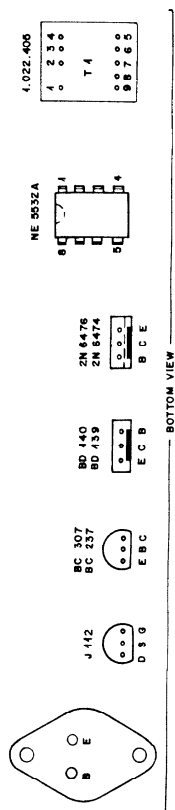
\* SEE MODIFICATION LIST



OPTIONAL INPUT BALANCED FLOATING  
4.945.441



NORMAL INPUT BALANCED  
4.945.440



BOTTOM VIEW

DATE:	12.1.82	24.5.83	24.6.83	23.11.83	
SIGN:	<i>Jr</i>	<i>Me</i>	<i>We</i>	<i>We</i>	
<b>STUDER</b> REGENSDORF ZURICH	<b>POWER AMPLIFIER</b> OPTIONAL: INP. BALANCED FLOATING				<b>SC 1.915.440</b> 4.945.441



40W POWER AMPLIFIER

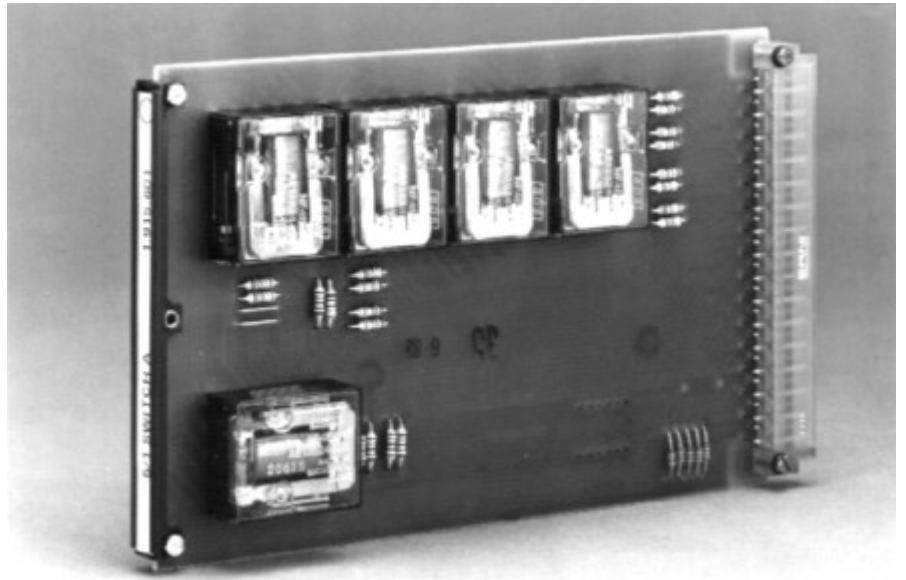
Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER	Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER
	C . . . .1	59.12.9681	680pF 500V 1%	PS	R . . .36	57.11.4332	3,3k		
	C . . . .2	59.12.9681	680pF 500V 1%	PS	R . . .37	57.11.4150	15		
	C . . . .3	59.26.2100	10pF 16V	SAL	R . . .38	57.11.4150	15		
Ⓢ	C . . . .4	59.30.1101	100pF 3V	TA	R . . .39	57.56.5108	0,1	10%	4W WW
	C . . . .5	59.06.0224	0,22pF	PE	R . . .40	57.56.5108	0,1	10%	4W WW
	C . . . .6	59.06.0224	0,22pF	PE					
Ⓢ	C . . . .7	59.26.5229	2,2pF 25V	SAL	R . . .41	57.11.4470	47		0,4W
	C . . . .8	59.06.0103	0,01pF	PE	R . . .42	57.11.4100	10		0,4W
	C . . . .9	59.34.5561	560pF	CER (1.915.441)	R . . .43	57.13.4471	470		1W
	C . . .10	59.06.0224	0,22pF	PE					
Ⓢ	C . . .11	59.34.4101	100pF	CER	T . . . .1	1.022.405.00	1:1	INPUT TRANSFORMER	ST
Ⓢ	C . . .12	59.30.1101	100pF 3V	TA	<b>MODIFICATION LIST</b>				
Ⓢ	C . . .13	59.32.1471	470pF	CER	Ⓢ C . . . .4	220pF → 100pF		QUALITY IMPROVEMENT	
Ⓢ	C . . .14	59.32.1471	470pF	CER	Ⓢ C . . . .7	0,22pF → 2,2pF		BETTER INRUSH	
	C . . .15	59.06.0104	0,1pF	PE	Ⓢ C . . .12	100pF → 100pF		QUALITY IMPROVEMENT	
	C . . .16	59.25.5222	2200pF 40V	EL	Ⓢ C . . .13	560pF → 470pF		PRODUCTIONS REASONS	
	C . . .17	59.25.5222	2200pF 40V	EL	Ⓢ C . . .20	100pF → 100pF		QUALITY IMPROVEMENT	
	C . . .18	59.25.5222	2200pF 40V	EL	Ⓢ C . . .21	100pF → 100pF		QUALITY IMPROVEMENT	
	C . . .19	59.25.5222	2200pF 40V	EL	Ⓢ R . . .21	1kΩ → 390Ω		SWITCH OFF @ 100° C	
Ⓢ	C . . .20	59.30.1101	100pF 3V	TA (1.915.440)	Ⓢ R . . .31	100k → 220k		CURRENT LIMIT @ HIGHER IDLE VOLTAGES	
Ⓢ	C . . .21	59.30.1101	100pF 3V	TA (1.915.440)	Ⓢ R . . .34	100k → 220k		CURRENT LIMIT @ HIGHER IDLE VOLTAGES	
	D . . . .1	50.04.1114	ZPD10V 10V @ 5mA		PS=Polystyrene, EL=Electrolytic, SAL=Solid Aluminium, PE=Polyester, CER=Ceramic, SI=Silicium, T=Tantalum				
	D . . . .2	50.04.1114	ZPD10V 10V @ 5mA		WW=Wire Wound				
	D . . . .3	50.04.0125	1N4448	SI	MANUFACTURER: PH=Philips, SIG=Signetics, SIX=Siiconix, SIE=Siemens, TI=Texas Instruments, R=RCA				
	D . . . .4	50.04.0125	1N4448	SI	MOT=Motorola, N=National, ST=Studer				
	D . . . .5	50.04.0125	1N4448	SI	Also Valid for: 1.915.441 Ⓢ				
	D . . . .6	50.04.0105	1N4004 1,1V @ 1A	SI	1.915.440 POWER AMPLIFIER PA 09/06/81				
	D . . . .7	50.04.0105	1N4004 1,1V @ 1A	SI	1.915.440 POWER AMPLIFIER Ⓢ VO 25/05/83				
	IC . . . .1	50.09.0105	NE5532A DUAL OPA	SIG	1.915.440 POWER AMPLIFIER Ⓢ FRI 06/07/83				
	L . . . .1	1.068.614.00	2,2pH	ST	1.915.440 POWER AMPLIFIER Ⓢ VO 23/11/83				
	Q . . . .1	50.03.0436	BC237B NPN	PH, TI	1.915.440 POWER AMPLIFIER Ⓢ VO 23/09/91				
	Q . . . .2	50.03.0515	BC307B PNP	PH, TI	END				
	Q . . . .3	50.03.0350	J112 FET	SIX, N	→				
	Q . . . .4	50.03.0515	BC307B PNP	PH, TI					
	Q . . . .5	50.03.0515	BC307B PNP	PH, TI					
	Q . . . .6	50.03.0436	BC237B NPN	PH, TI					
	Q . . . .7	50.03.0515	BC307B PNP	PH, TI					
	Q . . . .8	50.03.0436	BC237B NPN	PH, TI					
	Q . . . .9	50.03.0436	BC237B NPN	PH, TI					
	Q . . .10	50.03.0452	BD140 PNP	PH, SIE					
	Q . . .11	50.03.0451	BD139 NPN	PH, SIE					
	Q . . .12	50.03.0451	BD139 NPN	PH, SIE					
	Q . . .13	50.03.0452	BD140 PNP	PH, SIE					
	Q . . .14	50.03.0451	BD139 NPN	PH, SIE					
	Q . . .15	50.03.0344	2N6474 NPN	R					
	Q . . .16	50.03.0345	2N6476 PNP	R					
	Q . . .17	50.03.0342	2N5631 NPN	MOT					
	Q . . .18	50.03.0343	2N6031 PNP	MOT					
	R . . . .1	57.11.3152	1,5k 1%						
	R . . . .2	57.11.3152	1,5k 1%						
	R . . . .3	57.11.3392	3,9k 1%						
	R . . . .4	57.11.3392	3,9k 1%						
	R . . . .5	57.11.3822	8,2k 1% (1.915.441)						
	R . . . .6	57.11.3332	3,3k 1% (1.915.440)						
	R . . . .7	57.11.3332	3,3k 1% (1.915.440)						
	R . . . .8	58.01.7502	5k 10% LIN						
	R . . . .9	57.11.4152	1,5k						
	R . . .10	57.11.4683	68k						
	R . . .11	57.11.4683	68k						
	R . . .12	57.11.4332	3,3k						
	R . . .13	57.11.4103	10k 2%						
	R . . .14	57.11.4472	4,7k 2%						
	R . . .15	57.11.3112	1,1k 2%						
	R . . .16	57.11.4332	3,3k						
	R . . .17	57.11.4222	2,2k 2%						
	R . . .18	57.11.4220	22						
	R . . .19	57.11.4334	330k						
Ⓢ	R . . .20	57.99.0803	16,7k NTC	PH					
Ⓢ	R . . .21	57.11.4391	390						
	R . . .22	57.11.4181	180						
	R . . .23	57.11.4821	820						
	R . . .24	57.11.4123	12k						
	R . . .25	57.11.4120	12						
	R . . .26	57.11.4152	1,5k						
	R . . .27	57.11.4102	1k						
	R . . .28	57.11.4103	10k						
	R . . .29	57.11.4150	15						
	R . . .30	57.11.4330	33						
Ⓢ	R . . .31	57.11.4224	220k						
	R . . .32	57.11.4152	1,5k						
	R . . .33	57.11.4152	1,5k						
Ⓢ	R . . .34	57.11.4224	220k						
	R . . .35	57.11.4332	3,3k						



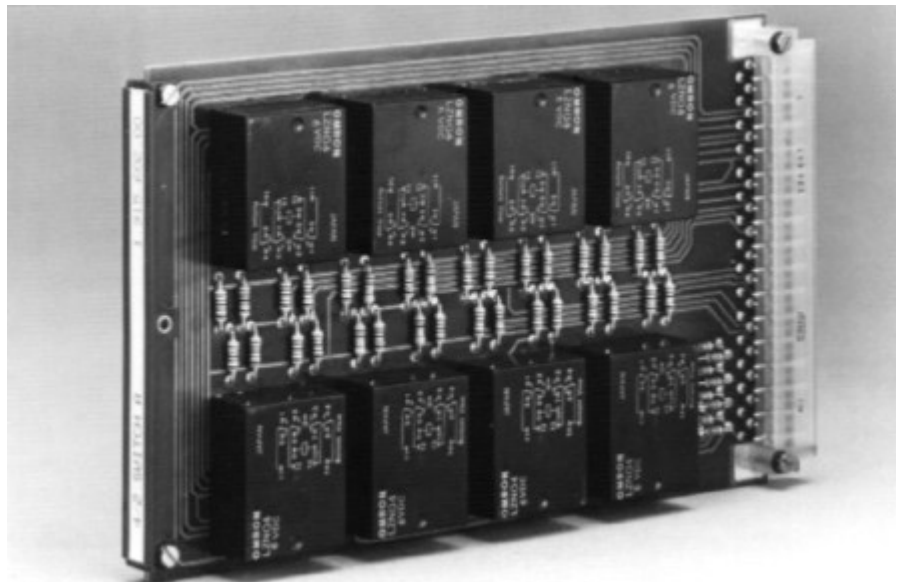
## 2.2.8 Monitor Switching Relays

1.915.601/602

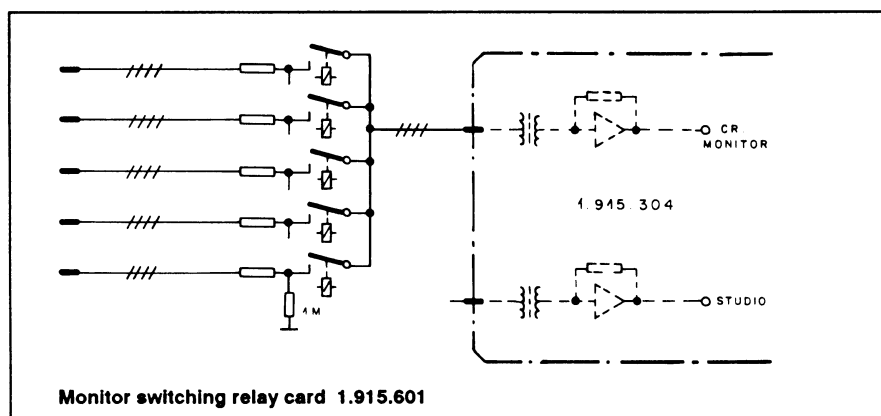
Two different monitor circuit switching cards are available. They are equipped with either five or eight relays for switching of a corresponding number of stereo sources to one or two stereo outputs in monitor circuits.



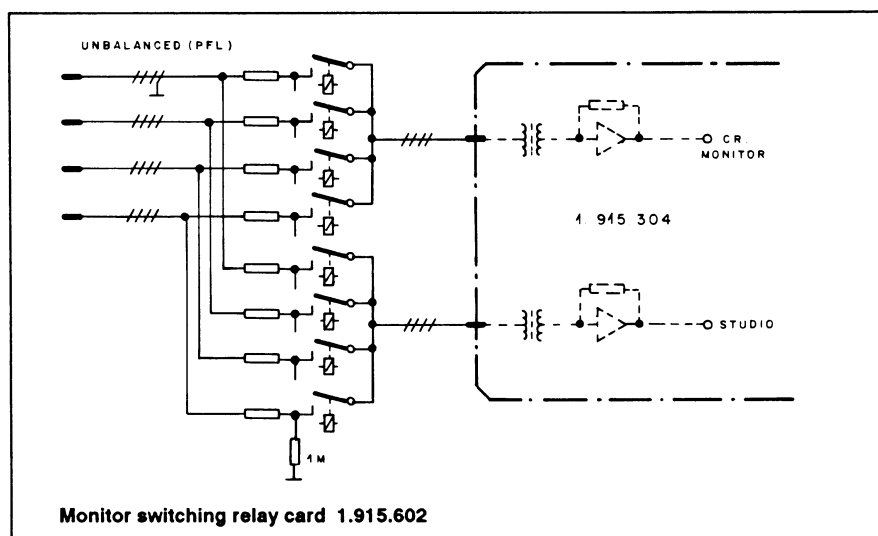
The relays are available with coil ratings of  $6V_{DC}$  or  $24V_{DC}$ , depending on the user's requirement. Click-suppressing diodes are wired across each relay coil. The relays are equipped with four double throw (change-over) contacts each.



Isolation of the monitor lines from external circuitry is achieved by  $5.6k\Omega$  resistors in the "a" and "b" legs of each stereo line, thus a high impedance (bridging) load is presented to the outside source, even in de-energized (non-selected) status, when the respective pair of relay contacts shorts the lines after the respective isolation resistors. With a relay energized, the corresponding stereo pair is routed to a stereo bus available on four pins of the 32-contact edge connector (in case of the 5-input card 1.915.601.xx).



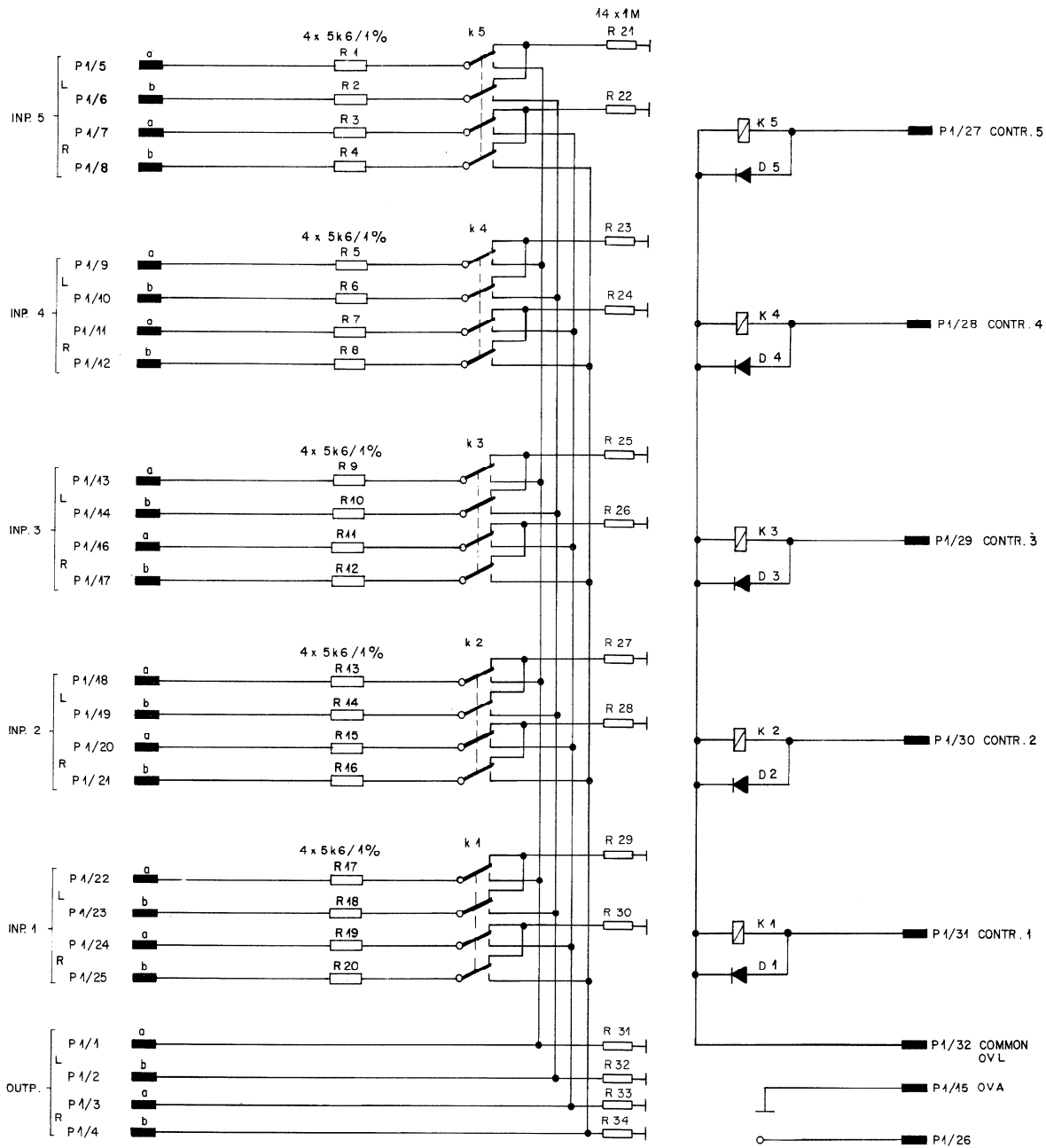
Card 1.915.602.xx features a similar circuit configuration with eight relays, to switch one unbalanced and three balanced stereo inputs. Two stereo buses appear on eight pins of the edge-connector; in this way, the four inputs can be switched to either one or to both outputs, such as may be the case with separate monitor circuits in the control room and in the studio.



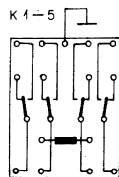
**Dimensions:** Euro-card **100 × 160 mm, 4 M units wide**  
**Weight** **approx. 250 g**

**Ordering Information:**

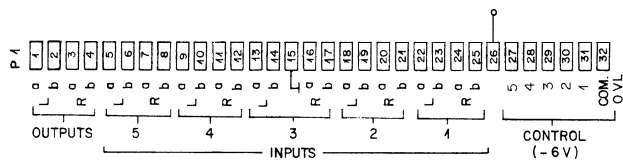
- Relay card, 5 IN/1 OUT 1.915.601.xx
- Relay card, 4 IN/2 OUT 1.915.602.xx



D 1 ... D 5 = 1N 4448

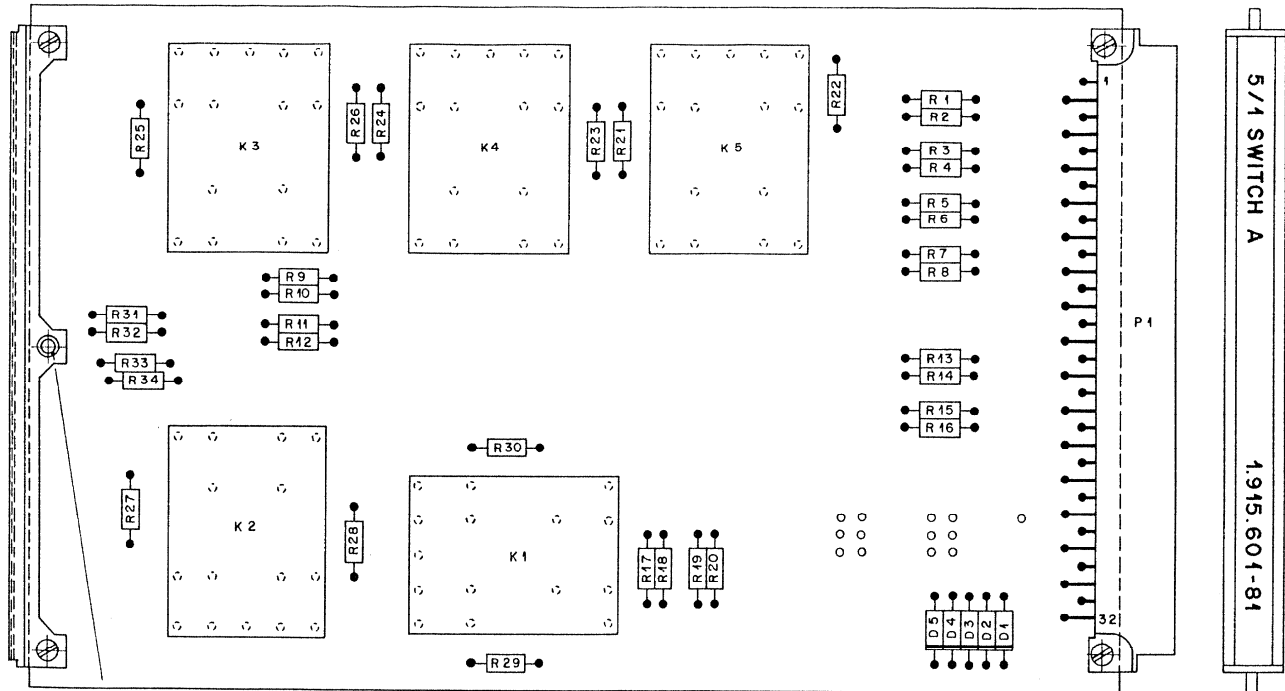


BOTTOM VIEW



DATE:	26.10.87		
SIGN:			
STUDER REGENSDORF ZÜRICH	5/1 SWITCH A MONITOR RELAYS		SC 1.915.601.81

RELAYS



Werkstoff: DIN-Bez.:	Norm-Nr.:	Oberfläche:	Güte:	Ausgabe:	Änderung:	③
	Abmessung:		Beh.:			
Zugehörige Unterlagen:	Freimassoleranz:	Maßstab:	9.10.87	A.Ho	Sc	②
PL	±	2:1	Datum	Gez.	Grnr.	④
Ersatz für: 1.915.601-00	Ersetzt durch:	Kopie für:				
STUDER REGENSDORF ZÜRICH	Benennung: <b>5/1 SWITCH A</b>		Nummer: <b>1.915.601-81</b>			

Ad.	POS.	REF.No.	DESCRIPTION	MANUFACTURER
D...	1	50.04.0125	1N4448	ANY
D...	2	50.04.0125	1N4448	ANY
D...	3	50.04.0125	1N4448	ANY
D...	4	50.04.0125	1N4448	ANY
D...	5	50.04.0125	1N4448	ANY
K...	1	56.04.0146	4U/6V	N/O
K...	2	56.04.0146	4U/6V	N/O
K...	3	56.04.0146	4U/6V	N/O
K...	4	56.04.0146	4U/6V	N/O
K...	5	56.04.0146	4U/6V	N/O
R...	1	57.11.3562	5,6k 1%	
R...	2	57.11.3562	5,6k 1%	
R...	3	57.11.3562	5,6k 1%	
R...	4	57.11.3562	5,6k 1%	
R...	5	57.11.3562	5,6k 1%	
R...	6	57.11.3562	5,6k 1%	
R...	7	57.11.3562	5,6k 1%	
R...	8	57.11.3562	5,6k 1%	
R...	9	57.11.3562	5,6k 1%	
R...	10	57.11.3562	5,6k 1%	
R...	11	57.11.3562	5,6k 1%	
R...	12	57.11.3562	5,6k 1%	
R...	13	57.11.3562	5,6k 1%	
R...	14	57.11.3562	5,6k 1%	
R...	15	57.11.3562	5,6k 1%	
R...	16	57.11.3562	5,6k 1%	
R...	17	57.11.3562	5,6k 1%	
R...	18	57.11.3562	5,6k 1%	
R...	19	57.11.3562	5,6k 1%	
R...	20	57.11.3562	5,6k 1%	
R...	21	57.11.4105	1M	
R...	22	57.11.4105	1M	
R...	23	57.11.4105	1M	
R...	24	57.11.4105	1M	
R...	25	57.11.4105	1M	
R...	26	57.11.4105	1M	
R...	27	57.11.4105	1M	

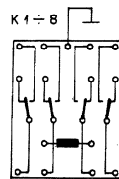
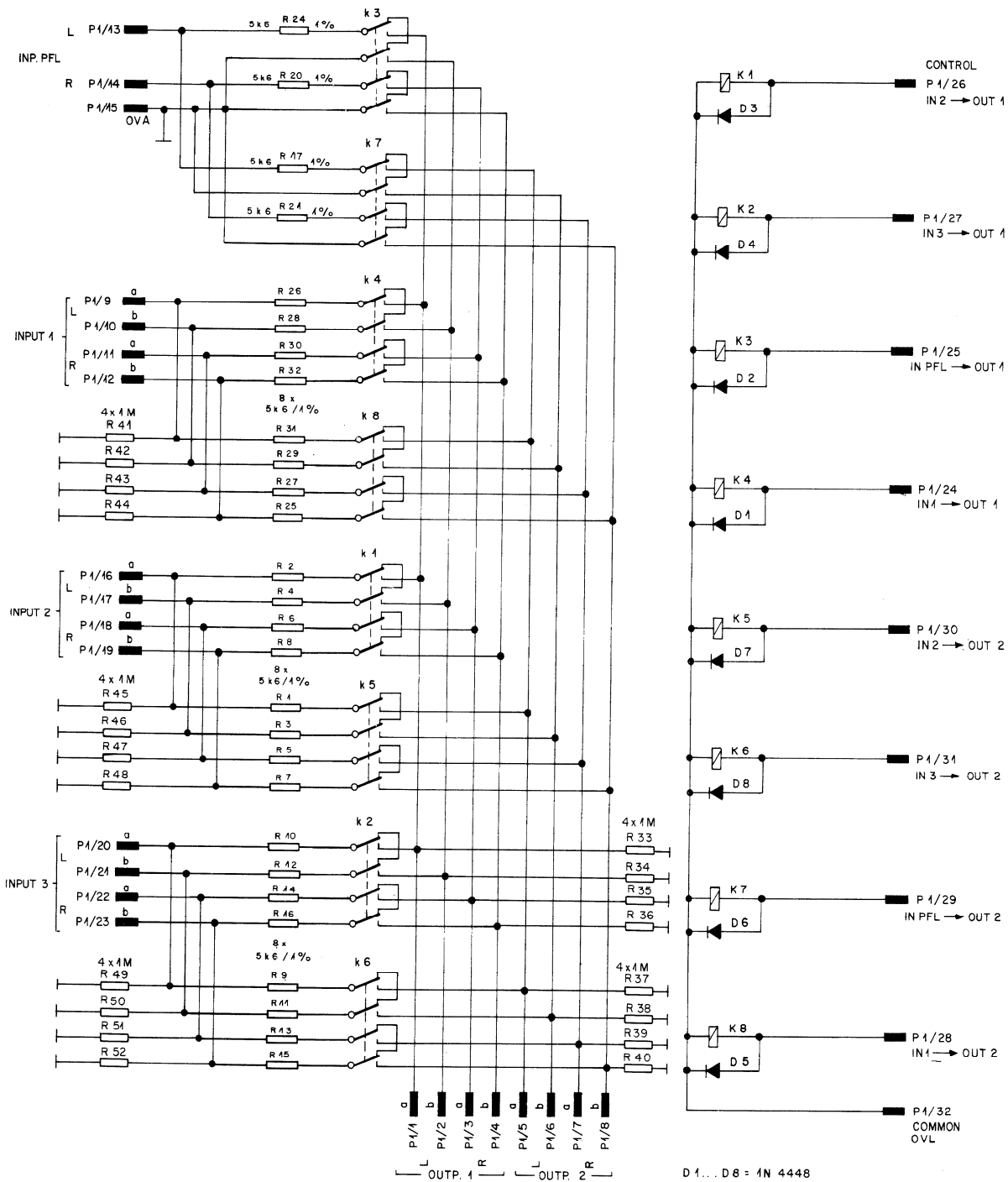
Ad.	POS.	REF.No.	DESCRIPTION	MANUFACTURER
R...	28	57.11.4105	1M	
R...	29	57.11.4105	1M	
R...	30	57.11.4105	1M	
R...	31	57.11.4105	1M	
R...	32	57.11.4105	1M	
R...	33	57.11.4105	1M	
R...	34	57.11.4105	1M	

MANUFACTURER: N=National, O=Omron

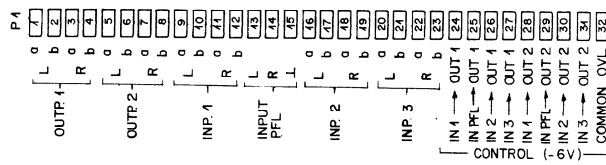
1.915.601.81 5/1 SWITCH A

WY 14/10/87

END  
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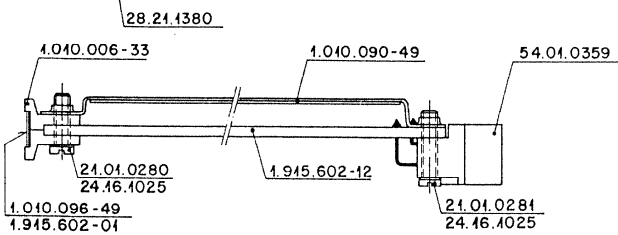
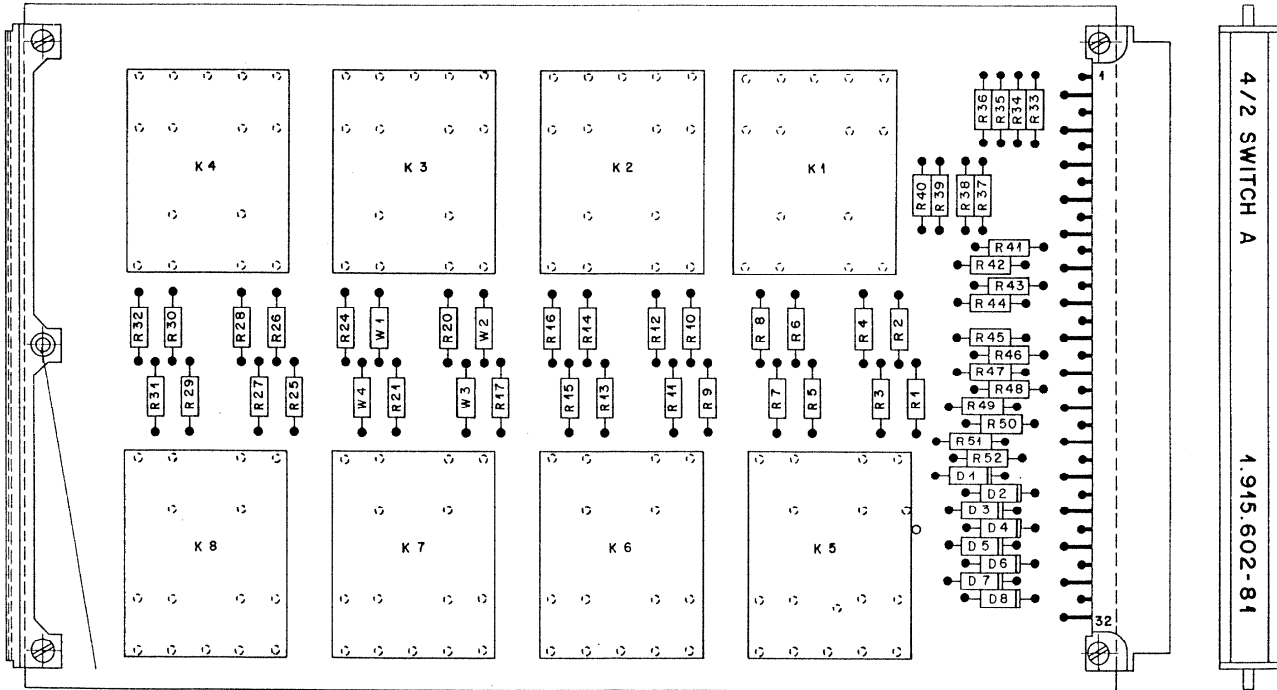


BOTTOM VIEW



DATE:	26.10.87			
SIGN:	<i>[Signature]</i>			
<b>STUDER</b> REGENSDORF ZÜRICH	<b>4/2 SWITCH A</b> MONITOR RELAYS	<b>SC 1.915.602.81</b>		

RELAYS



Norm-Nr.:	Güte:	Änderung:	③
DIN-Bez.:	Beh.:	②	①
Abmessung:			
Zugehörige Unterlagen:	Freimasstoleranz:	Maßstab:	9.10.87 A.Ho. <i>S. My</i> ④
PL	±	2:1	Datum Gez. Gepr. Ges. Index
Ersatz für 1.945.602-00	Ersetzt durch:	Kopie für:	
STUDER REGENSDORF ZÜRICH	Benennung: 4/2 SWITCH A	Nummer: 1.915.602-81	

Ad.	POS.	REF.No.	DESCRIPTION	MANUFACTURER
D. . . . .1		50.04.0125	IN4448	ANY
D. . . . .2		50.04.0125	IN4448	ANY
D. . . . .3		50.04.0125	IN4448	ANY
D. . . . .4		50.04.0125	IN4448	ANY
D. . . . .5		50.04.0125	IN4448	ANY
D. . . . .6		50.04.0125	IN4448	ANY
D. . . . .7		50.04.0125	IN4448	ANY
D. . . . .8		50.04.0125	IN4448	ANY
K. . . . .1		56.04.0146	4U/6V	N / O
K. . . . .2		56.04.0146	4U/6V	N / O
K. . . . .3		56.04.0146	4U/6V	N / O
K. . . . .4		56.04.0146	4U/6V	N / O
K. . . . .5		56.04.0146	4U/6V	N / O
K. . . . .6		56.04.0146	4U/6V	N / O
K. . . . .7		56.04.0146	4U/6V	N / O
K. . . . .8		56.04.0146	4U/6V	N / O
R. . . . .1		57.11.3562	5,6k 1% 28Stk.	
R. . . . .2		57.11.3562	5,6k 1% 28Stk.	
R. . . . .3		57.11.3562	5,6k 1% 28Stk.	
R. . . . .4		57.11.3562	5,6k 1% 28Stk.	
R. . . . .5		57.11.3562	5,6k 1% 28Stk.	
R. . . . .6		57.11.3562	5,6k 1% 28Stk.	
R. . . . .7		57.11.3562	5,6k 1% 28Stk.	
R. . . . .8		57.11.3562	5,6k 1% 28Stk.	
R. . . . .9		57.11.3562	5,6k 1% 28Stk.	
R. . . . .10		57.11.3562	5,6k 1% 28Stk.	
R. . . . .11		57.11.3562	5,6k 1% 28Stk.	
R. . . . .12		57.11.3562	5,6k 1% 28Stk.	
R. . . . .13		57.11.3562	5,6k 1% 28Stk.	
R. . . . .14		57.11.3562	5,6k 1% 28Stk.	
R. . . . .15		57.11.3562	5,6k 1% 28Stk.	
R. . . . .16		57.11.3562	5,6k 1% 28Stk.	
R. . . . .17		57.11.3562	5,6k 1% 28Stk.	
R. . . . .25		57.11.3562	5,6k 1% 28Stk.	
R. . . . .26		57.11.3562	5,6k 1% 28Stk.	
R. . . . .27		57.11.3562	5,6k 1% 28Stk.	
R. . . . .28		57.11.3562	5,6k 1% 28Stk.	
R. . . . .29		57.11.3562	5,6k 1% 28Stk.	

Ad.	POS.	REF.No.	DESCRIPTION	MANUFACTURER
R. . . . .30		57.11.3562	5,6k 1% 28Stk.	
R. . . . .31		57.11.3562	5,6k 1% 28Stk.	
R. . . . .32		57.11.3562	5,6k 1% 28Stk.	
R. . . . .33		57.11.3105	1M	
R. . . . .34		57.11.3105	1M	
R. . . . .35		57.11.3105	1M	
R. . . . .36		57.11.3105	1M	
R. . . . .37		57.11.3105	1M	
R. . . . .38		57.11.3105	1M	
R. . . . .39		57.11.3105	1M	
R. . . . .40		57.11.3105	1M	
R. . . . .41		57.11.3105	1M	
R. . . . .42		57.11.3105	1M	
R. . . . .43		57.11.3105	1M	
R. . . . .44		57.11.3105	1M	
R. . . . .45		57.11.3105	1M	
R. . . . .46		57.11.3105	1M	
R. . . . .47		57.11.3105	1M	
R. . . . .48		57.11.3105	1M	
R. . . . .49		57.11.3105	1M	
R. . . . .50		57.11.3105	1M	
R. . . . .51		57.11.3105	1M	
R. . . . .52		57.11.3105	1M	
W. . . . .1		57.11.3000	0-Ω	
W. . . . .2		57.11.3000	0-Ω	
W. . . . .3		57.11.3000	0-Ω	
W. . . . .4		57.11.3000	0-Ω	

MANUFACTURER: N=National, O=Omron

1.915.602.81 4/2 SWITCH A

WY 14/10/87

1.915.602.81 4/2 SWITCH A

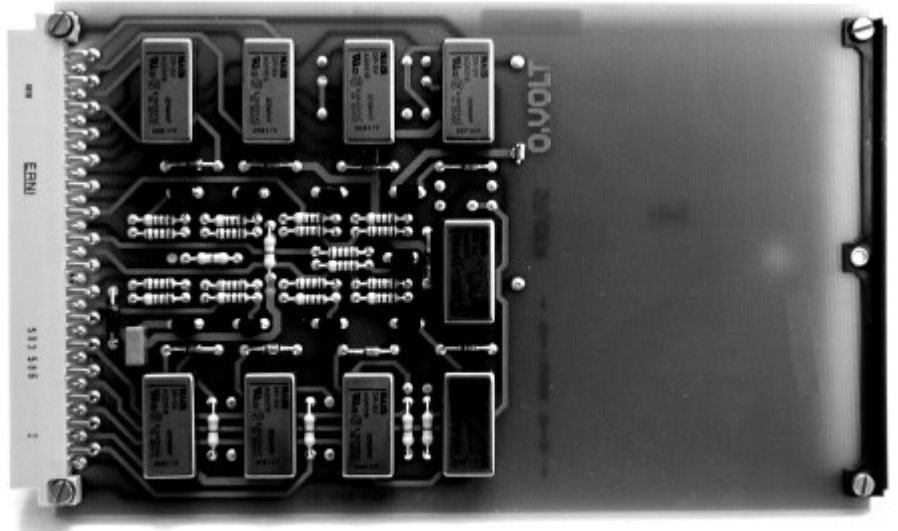
⊙ WY 22/05/89

END  
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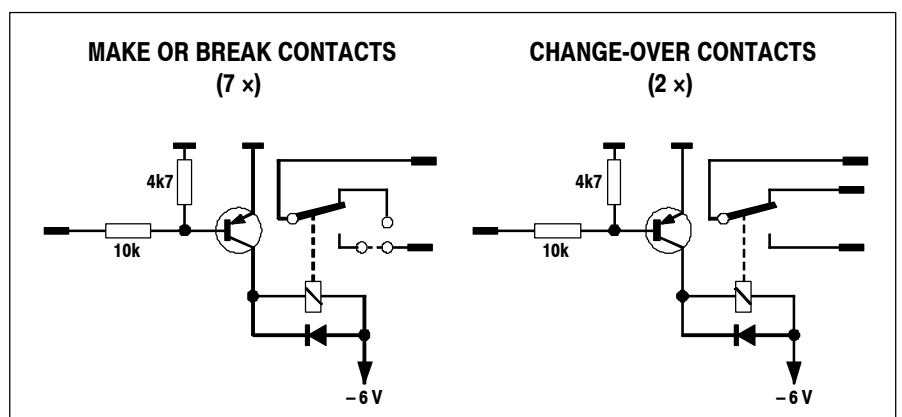
## 2.2.9 Transistor-Driven Relays (7+2)

1.915.603

This Euro-card is supplied with nine transistor-driven relays with single-pole, double-throw (SPDT) contacts. For two of the relays, both normally-open and normally-closed contacts are routed to the edge connector; for the remaining seven it is jumper-selectable whether the normally-open or the normally-closed contact is used.



The relays are designed for operation on 6 V<sub>DC</sub>, and each relay coil is bridged with a click-suppressing diode. PNP transistors in series with the coils are blocking the current flow, because each transistor is normally bi-ased off. By applying the output from the gate of an external control logic to the base of a transistor, it is switched into saturation, thereby energizing the respective relay. This arrangement of nine relays was designed for use in signaling systems within a studio installation; however, it may find its use for other applications as well.



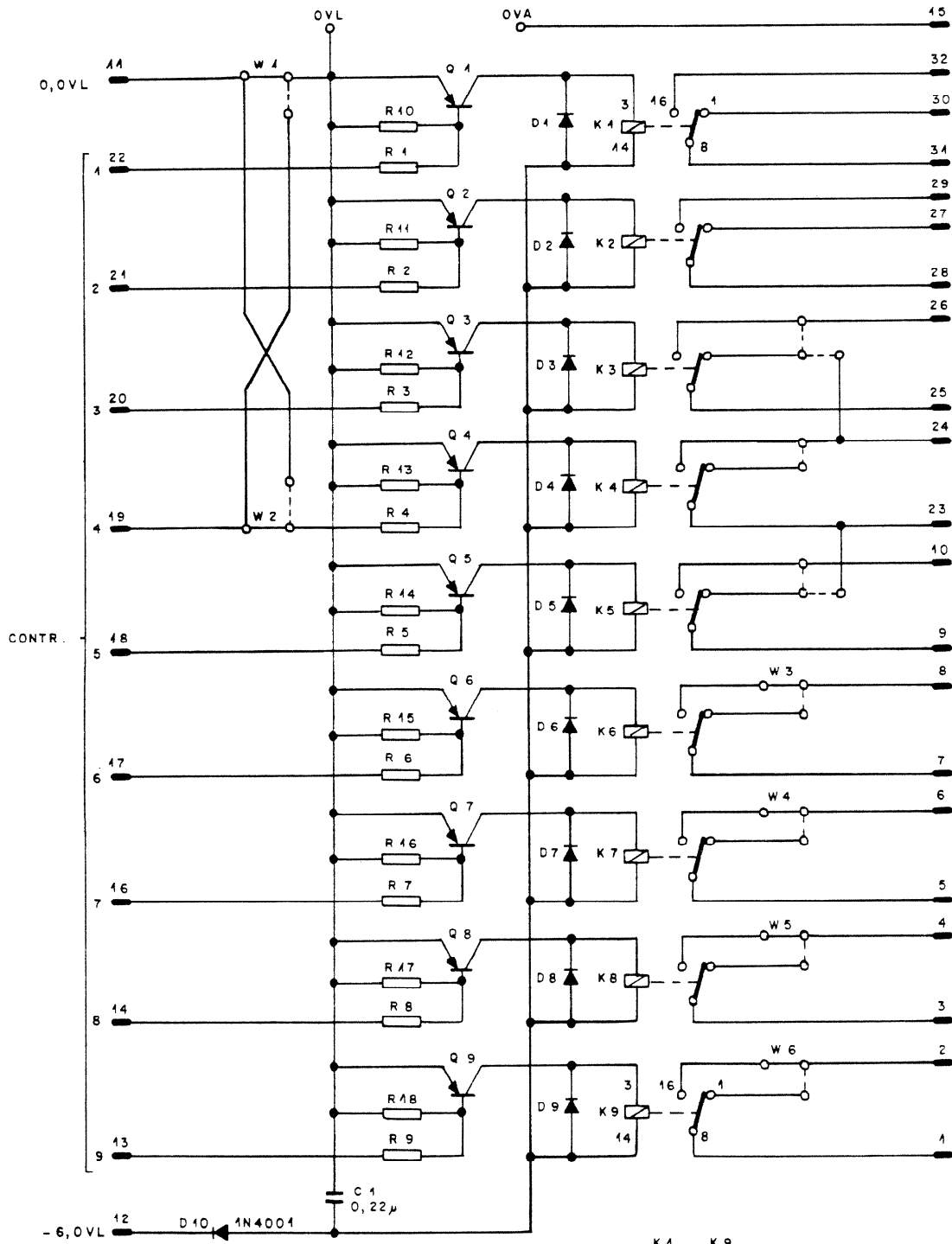
Polarity of the relay's supply voltage must be observed when utilizing this circuit.

**Technical Specifications**

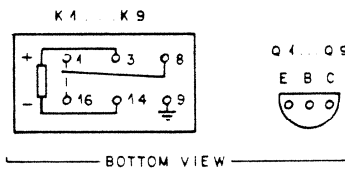
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<b>Contact Ratings:</b>		<b>max. 1 A/30 V<sub>DC</sub> or 0.3 A/125 V<sub>AC</sub></b>	
	<b>Note:</b>	<i>In this application 48 V must not be exceeded to avoid shock hazard.</i>	
	Switching power	<b>60 VA (AC)</b>	
		<b>100 W (DC)</b>	
<b>Dimensions:</b>	Euro-card	<b>100 × 160 mm, 4 M units wide</b>	
<b>Ordering Information:</b>		Transistor-driven relays	1.915.603.xx



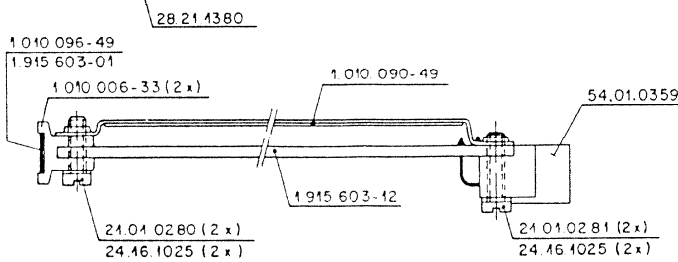
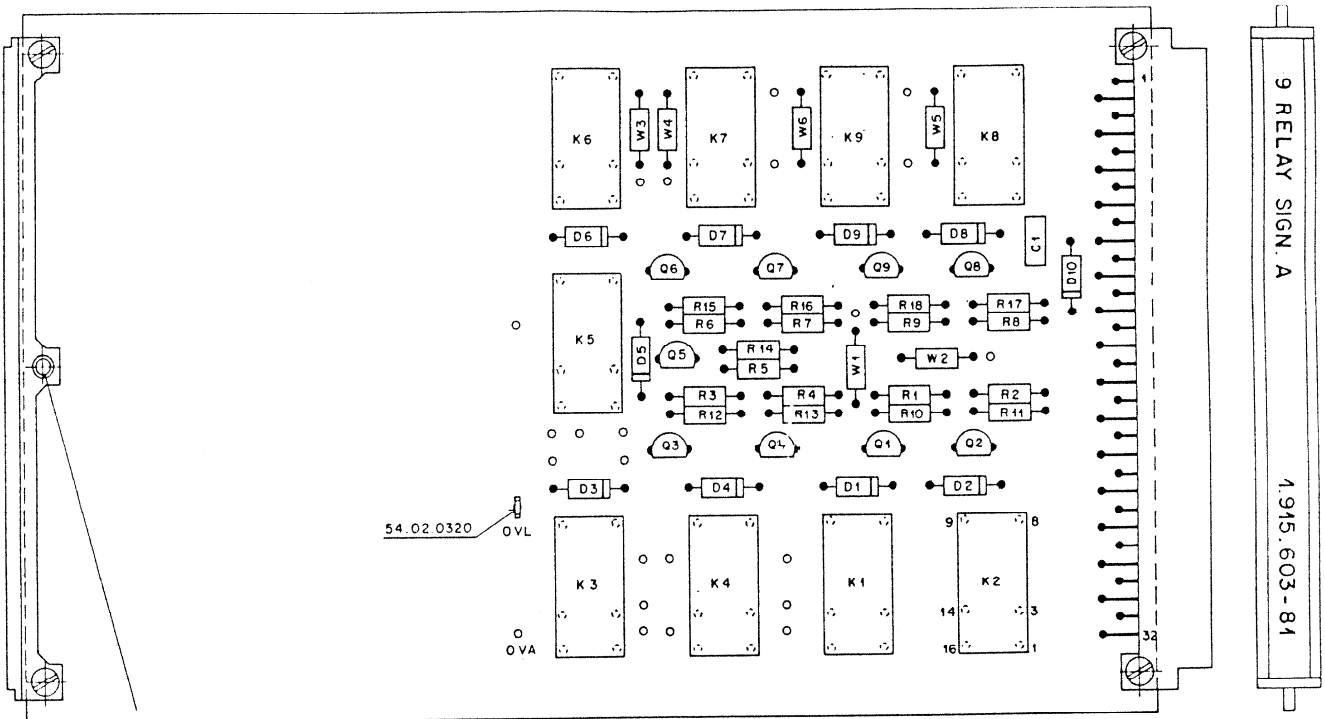


- R 1... R 9 = 10 k
- R 10... R 18 = 4 k 7
- D 1... D 9 = 1N 444 B
- Q 1... Q 9 = BC 560
- K 1... K 9 = DR - 5 V



① 24 11 92 <i>We</i> ○ ○ ○ ○	<b>STUDER</b> REGENSDORF ZÜRICH	<b>9 RELAYS SIGN. A</b>	<b>SC 1.915.603-81</b>
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RELAYS



Version	Norm-Nr.	Überf. Güte		
DIN-Bez.		Ben		
Abmessung				
Zugehörige Unterlagen	Freiwilligenanz	Maßstab	Nummer	30.992
PL	±	2 : 1	Datum	
Erstellt für	Erstellt durch	Kopie Nr.		
STUDER REGENSDORF ZÜRICH		Bezeichnung RELAYS UNIT 9 A SIGNALISATION		Nummer 1.915.603-81

Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER
C	....1	59.06.0224	KONDENSATOR 0,22µ	
D	....1	50.04.0125	DIODE 1N 4448	
D	....2	50.04.0125	DIODE 1N 4448	
D	....3	50.04.0125	DIODE 1N 4448	
D	....4	50.04.0125	DIODE 1N 4448	
D	....5	50.04.0125	DIODE 1N 4448	
D	....6	50.04.0125	DIODE 1N 4448	
D	....7	50.04.0125	DIODE 1N 4448	
D	....8	50.04.0125	DIODE 1N 4448	
D	....9	50.04.0125	DIODE 1N 4448	
D	....10	50.04.0122	DIODE 1N 4001	
K	....1	56.04.0190	RELAYS DR-5V	
K	....2	56.04.0190	RELAYS DR-5V	
K	....3	56.04.0190	RELAYS DR-5V	
K	....4	56.04.0190	RELAYS DR-5V	
K	....5	56.04.0190	RELAYS DR-5V	
K	....6	56.04.0190	RELAYS DR-5V	
K	....7	56.04.0190	RELAYS DR-5V	
K	....8	56.04.0190	RELAYS DR-5V	
K	....9	56.04.0190	RELAYS DR-5V	
Q	....1	50.03.0601	TRANSISTOR BC 560	
Q	....2	50.03.0601	TRANSISTOR BC 560	
Q	....3	50.03.0601	TRANSISTOR BC 560	
Q	....4	50.03.0601	TRANSISTOR BC 560	
Q	....5	50.03.0601	TRANSISTOR BC 560	
Q	....6	50.03.0601	TRANSISTOR BC 560	
Q	....7	50.03.0601	TRANSISTOR BC 560	
Q	....8	50.03.0601	TRANSISTOR BC 560	
Q	....9	50.03.0601	TRANSISTOR BC 560	

Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER
R	....1	57.11.3103	WIDERSTAND 10K	
R	....2	57.11.3103	WIDERSTAND 10K	
R	....3	57.11.3103	WIDERSTAND 10K	
R	....4	57.11.3103	WIDERSTAND 10K	
R	....5	57.11.3103	WIDERSTAND 10K	
R	....6	57.11.3103	WIDERSTAND 10K	
R	....7	57.11.3103	WIDERSTAND 10K	
R	....8	57.11.3103	WIDERSTAND 10K	
R	....9	57.11.3103	WIDERSTAND 10K	
R	....10	57.11.3472	WIDERSTAND 4,7K	
R	....11	57.11.3472	WIDERSTAND 4,7K	
R	....12	57.11.3472	WIDERSTAND 4,7K	
R	....13	57.11.3472	WIDERSTAND 4,7K	
R	....14	57.11.3472	WIDERSTAND 4,7K	
R	....15	57.11.3472	WIDERSTAND 4,7K	
R	....16	57.11.3472	WIDERSTAND 4,7K	
R	....17	57.11.3472	WIDERSTAND 4,7K	
R	....18	57.11.3472	WIDERSTAND 4,7K	
W	....1	57.11.3000	0 OHM WIDERSTAND	
W	....2	57.11.3000	0 OHM WIDERSTAND	
W	....3	57.11.3000	0 OHM WIDERSTAND	
W	....4	57.11.3000	0 OHM WIDERSTAND	
W	....5	57.11.3000	0 OHM WIDERSTAND	
W	....6	57.11.3000	0 OHM WIDERSTAND	

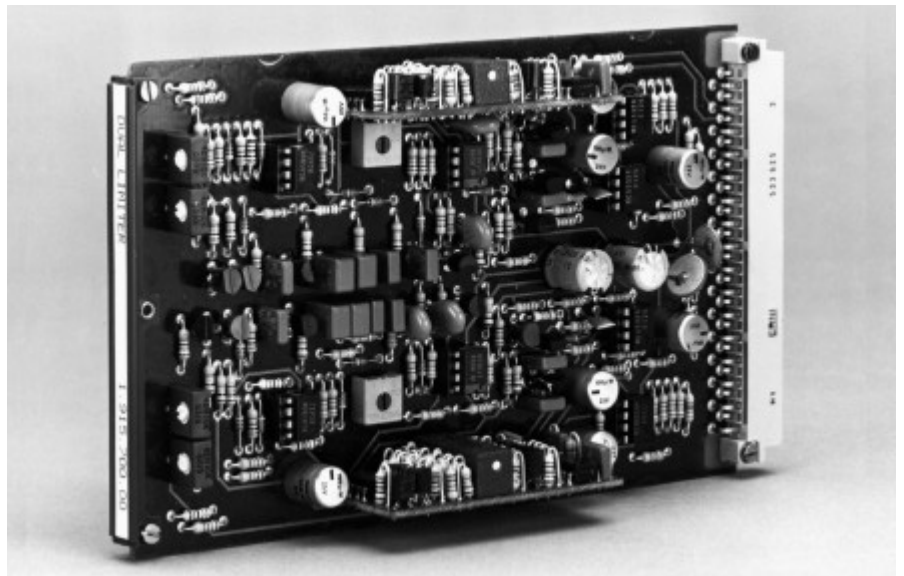
1.915.603.81 RELAY UNIT 9A 21/10/92

END

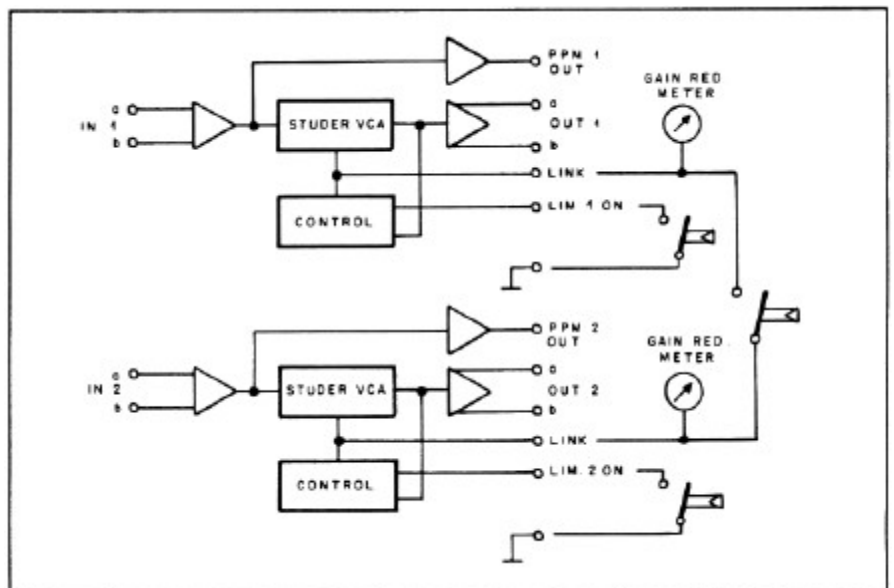
### 2.2.10 Dual Limiter

1.915.700

In sound work there are numerous situations where the signal amplitude has to be limited to a pre-determined level in order to prevent overloading of succeeding equipment, such as light modulators in film work, or radio transmitters. With this limiter, excessive levels are automatically reduced to a preset level, and, since regulation is controlled by the program's energy content, the performance of this limiter is free of any "pumping" effects. Gain reduction is achieved with a Studer Voltage Controlled Amplifier (VCA) which ensures low noise performance and negligible distortion.



Two identical, independent limiter circuits are contained on one Euro-card, plus additional, separate gain stages to drive peak program meters. The perfect tracking of the two VCAs makes this Dual Limiter suitable for stereo work as well, in which case a simple electrical connection is needed to link the units.

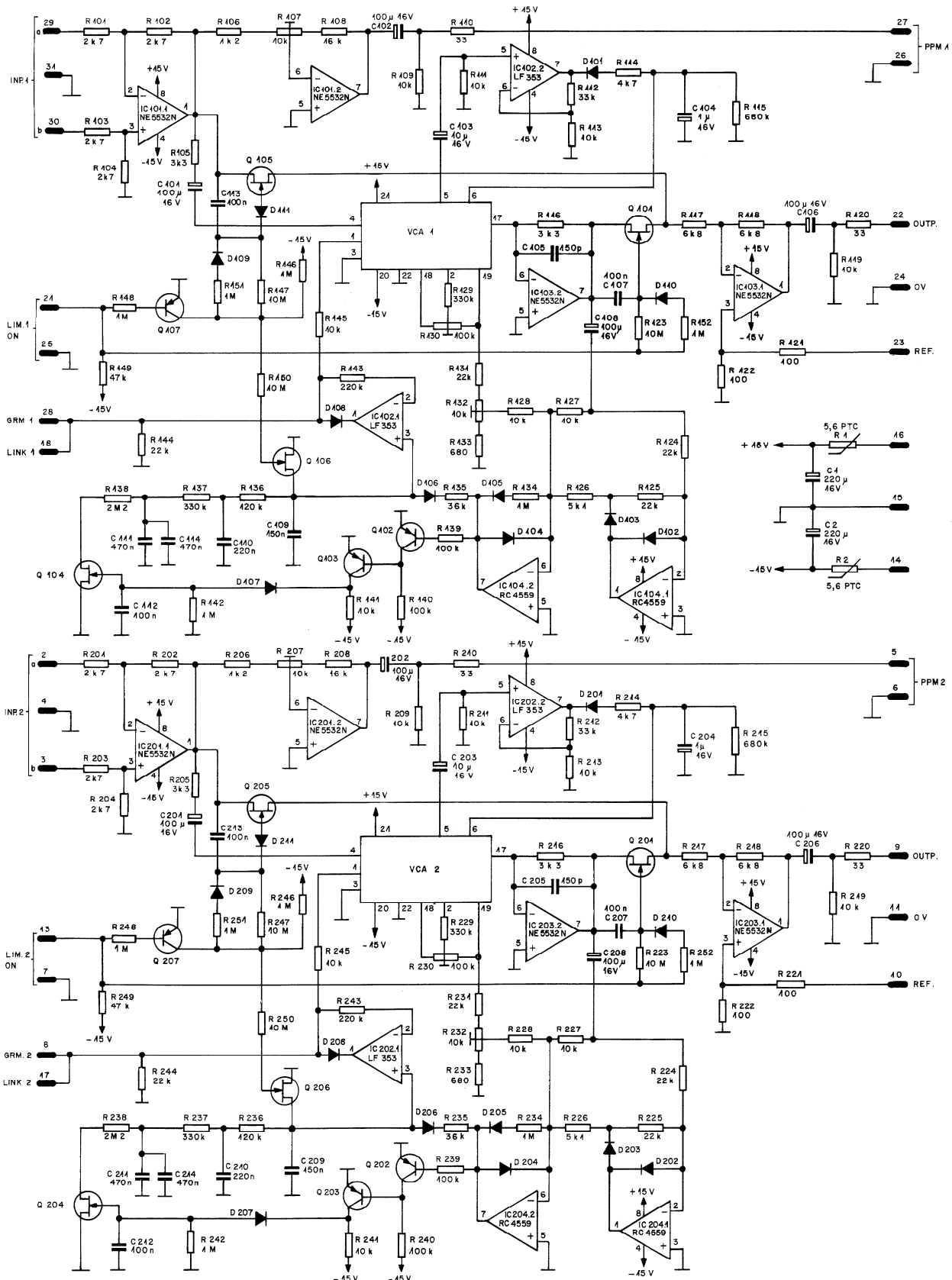


**Note:** Gain reduction meters (*not supplied*) can be connected to the LINK outputs as well, if required.

**Technical Specifications**

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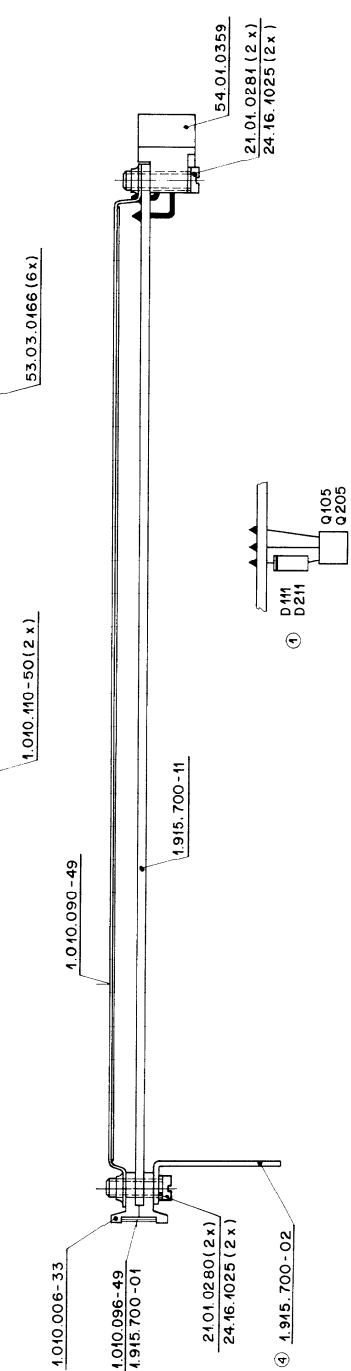
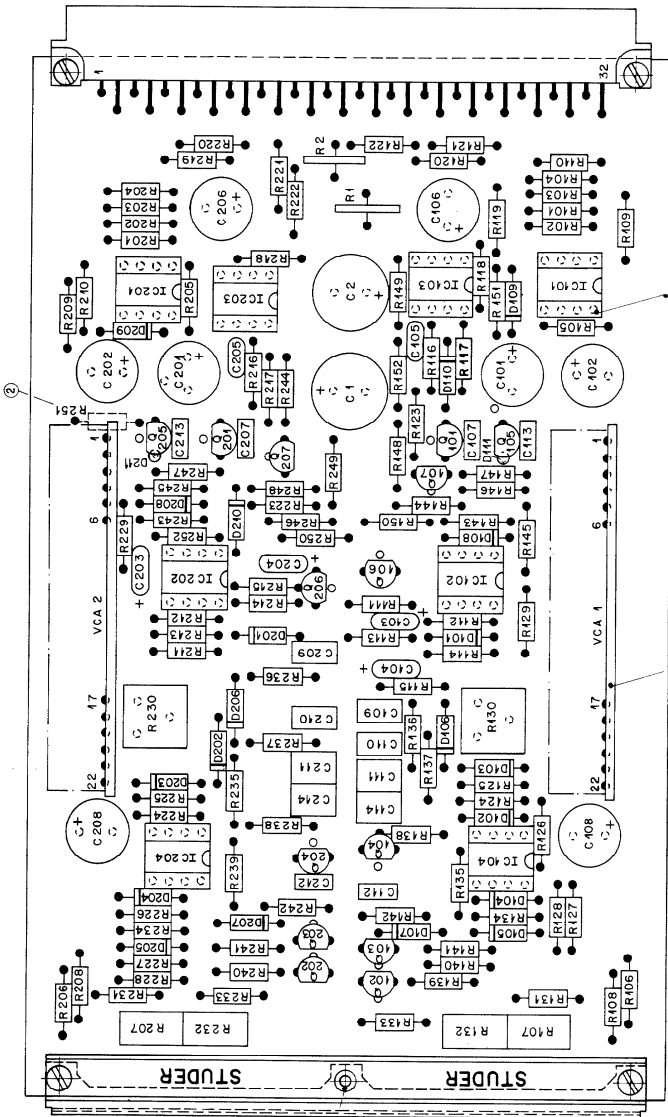
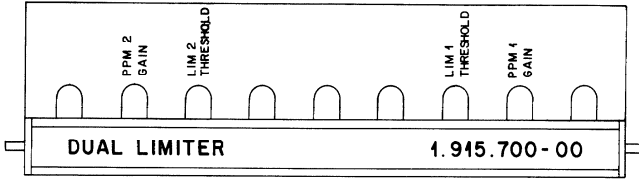
<b>Input:</b>	Impedance	<b>5.4 kW</b> , balanced configuration <b>2.7 kW</b> , unbalanced configuration
	Overload point	<b>+20 dBu</b> (7.75 V <sub>rms</sub> )
<b>Output:</b>	Impedance	<b>&lt; 50 W</b> , unbalanced
	Frequency response	<b>+0/-0.5 dB</b> , 30 Hz...15 kHz <b>+0/-3 dB</b> , 2 Hz...200 kHz
	Gain	<b>0 dB</b> , limiter off
	Output noise level	<b>-102 dBu</b> , Limiter on <b>-106 dBu</b> , Limiter off
	Limiting ratio	<b>20:1</b>
	Threshold	<b>-15 dBu...+3 dBu</b> , adjustable
	Limited output level	<b>-14 dBu...+4 dBu</b> , depending on threshold setting
	Attack time	<b>1 ms</b>
	Release time	<b>50 ms...5 s</b> , program-dependent
<b>PPM Section:</b>	Output impedance	<b>&lt; 50 W</b> , unbalanced
	Maximum output level	<b>+20 dBu</b>
	Gain	<b>2.5 dB...27 dB</b> , adjustable
	Frequency response	<b>+0/-3 dB</b> , 2 Hz...200 kHz
<b>Supply:</b>		<b>±15 V</b> (100 mA)
<b>Dimensions:</b>	Euro-card	<b>100 × 160 mm, 7 M units wide</b>
<b>Ordering Information:</b>	Dual limiter	1.915.700.xx



ALL DIODES 1N4448  
 ALL PNP BC 560  
 ALL FET J 412

DATE:	3.3.83	46.7.84			
SIGN:	<i>ml</i>	<i>ml</i>			
STUDER REGENSDORF ZÜRICH	DUAL LIMITER				SC 1.915.700

DUAL LIMITER



28.2.1.1380

- 1.010.006-33
- 1.010.096-49
- 1.915.700-01
- 21.01.0280 (2 x)
- 24.16.1025 (2 x)
- ④ 1.915.700-02

Norm.Nr.:	Werkstoff	20.12.84 A Ho	④
DN Bz.:	Güte:	4.4.84 A Ho	③
Almessung:	Beh.:	3.1.84 A Ho	③
Zugehörige Unterlagen:	Formasozonanz:	14.12.82 A Ho	①
PL	Material:	18.9.82 Ho	①
Erstellt für:	Datum:	Gez.:	Grpr.:
	Erreicht durch:	Gez.:	Inbax:
Benennung:		1.915.700-00	
STUDER REGENSCHOPF ZÜRICH		Dual Limiter	

DUAL LIMITER

Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER	Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER
C...	1	59.22.4221	220µ 16V	EL	R...	43	57.11.4224	220k	
C...	2	59.22.4221	220µ 16V	EL	R...	44	57.11.4223	22k	
C...	1	59.22.4101	100µ 16V	EL	R...	45	57.11.4103	10k	
C...	2	59.22.4101	100µ 16V	EL	R...	46	57.11.4105	1M	
C...	3	59.26.2100	10µ 16V	EL, SAL	R...	47	57.11.6106	10M	
C...	4	59.26.5109	1µ 16V	EL, SAL	R...	48	57.11.4105	1M	
C...	5	59.34.4151	150p	CER	R...	49	57.11.4473	47k	
C...	6	59.22.4101	100µ 16V	EL	R...	50	57.11.6106	10M	
C...	7	59.06.5104	100n	PETP	R...	51	57.11.4105	1M	
C...	8	59.22.4101	100µ 16V	EL	R...	52	57.11.4105	1M	
C...	9	59.06.5154	150n	PETP					
C...	10	59.06.5224	220n	PETP	Ⓢ VCA .1	1.911.290.81		STUDER VCA-BOARD	ST
C...	11	59.06.5474	470n	PETP	Ⓢ VCA .2	1.911.290.81		STUDER VCA-BOARD	ST
C...	12	59.06.5104	100n	PETP	XIC	53.03.0166		DIP8POL	
C...	13	59.06.5104	100n	PETP					
C...	14	59.06.5474	470n	PETP					
D...	1	50.04.0125	1N4448	SI					
D...	2	50.04.0125	1N4448	SI					
D...	3	50.04.0125	1N4448	SI					
D...	4	50.04.0125	1N4448	SI					
D...	5	50.04.0125	1N4448	SI					
D...	6	50.04.0125	1N4448	SI					
D...	7	50.04.0125	1N4448	SI					
D...	8	50.04.0125	1N4448	SI					
D...	9	50.04.0125	1N4448	SI					
D...	10	50.04.0125	1N4448	SI					
Ⓢ D...	11	50.04.0125	1N4448	SI					
IC...	1	50.09.0106	NE5532N DUAL OP	XR5532N	SIG, EX				
IC...	2	50.09.0101	LF353N DUAL OP	TL072	N, TI				
IC...	3	50.09.0106	NE5532N DUAL OP	XR5532N	SIG, EX				
IC...	4	50.09.0107	RC4559NB DUAL OP		RA, TI				
Q...	1	50.03.0350	J112	J-FET	SIX, N				
Q...	2	50.03.0496	BC560	PNP	SIE				
Q...	3	50.03.0496	BC560	PNP	SIE				
Q...	4	50.03.0350	J112	J-FET	SIX, N				
Q...	5	50.03.0350	J112	J-FET	SIX, N				
Q...	6	50.03.0350	J112	J-FET	SIX, N				
Q...	7	50.03.0496	BC560	PNP	SIE				
R...	1	57.99.0209	5,6	PTC	PH				
R...	2	57.99.0209	5,6	PTC	PH				
R...	1	57.11.4272	2,7k	2%					
R...	2	57.11.4272	2,7k	2%					
R...	3	57.11.4272	2,7k	2%					
R...	4	57.11.4272	2,7k	2%					
R...	5	57.11.4332	3,3k	2%					
R...	6	57.11.4122	1,2k						
R...	7	58.01.7103	10k	10% LIN	PMG				
R...	8	57.11.3163	16k						
R...	9	57.11.4103	10k						
R...	10	57.11.4330	33						
R...	11	57.11.4103	10k						
R...	12	57.11.4333	33k						
R...	13	57.11.4103	10k						
R...	14	57.11.4472	4,7k						
R...	15	57.11.4684	680k						
R...	16	57.11.4332	3,3k	2%					
R...	17	57.11.4682	6,8k	2%					
R...	18	57.11.4682	6,8k	2%					
R...	19	57.11.4103	10k						
R...	20	57.11.4330	33						
R...	21	57.11.4101	100	2%					
R...	22	57.11.4101	100	2%					
R...	23	57.11.6106	10M						
R...	24	57.11.4223	22k	2%					
R...	25	57.11.4223	22k	2%					
R...	26	57.11.3512	5,1k	2%					
R...	27	57.11.4103	10k	2%					
R...	28	57.11.4103	10k	2%					
R...	29	57.11.4334	330k						
R...	30	58.01.8104	100k	10% LIN	PMG				
R...	31	57.11.4223	22k						
R...	32	58.01.7103	10k	10% LIN	PMG				
R...	33	57.11.4681	680						
Ⓢ R...	34	57.11.4105	1M						
Ⓢ R...	35	57.11.3363	36k						
R...	36	57.11.4124	120k						
R...	37	57.11.4334	330k						
R...	38	57.11.5225	2,2M						
R...	39	57.11.4104	100k						
R...	40	57.11.4104	100k						
R...	41	57.11.4103	10k						
R...	42	57.11.4105	1M						

EL=Electrolytic, SAL=Solid Aluminium, CER=Ceramic, PETP=Polyester, SI=Silicium, PTC=Pos. Temp. Coif. PMG=Cermet

MANUFACTURER: SIG=Signetics, EX=Exar, N=National, TI=Texas Instruments, RA=Raytheon, SIX=Siliconix SIE=Siemens, PH=Philips, ST=Studer

1.915.700.00 DUAL LIMITER W. Markl 14/06/82

1.915.700.00 DUAL LIMITER Ⓢ W. Markl 14/12/82

1.915.700.00 DUAL LIMITER Ⓢ A. Ho 01/04/84

1.915.700.00 DUAL LIMITER Ⓢ VO 16/07/84

1.915.700.00 DUAL LIMITER Ⓢ PA 13/01/89

1.915.700.00 DUAL LIMITER Ⓢ WY 17/01/90

END

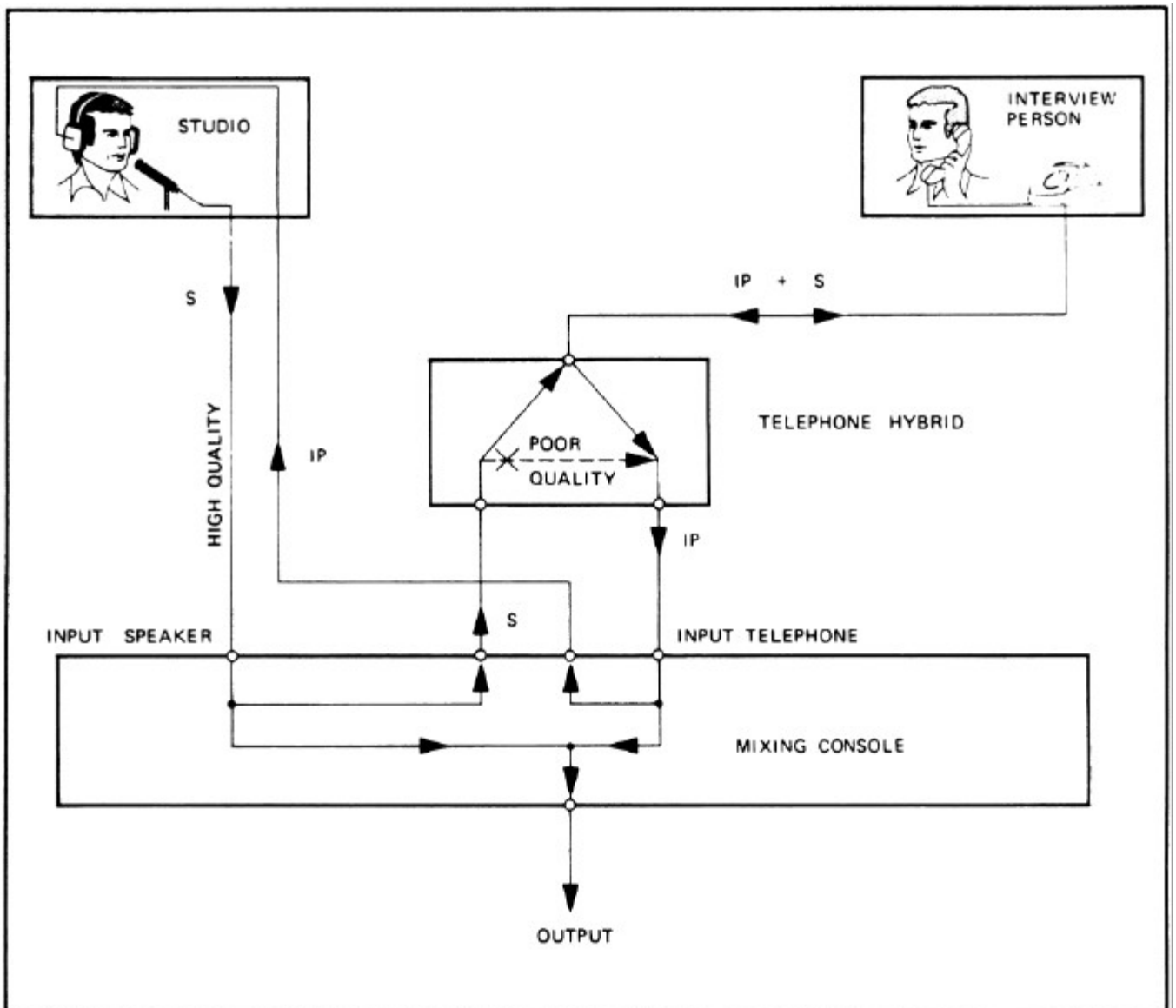


### 2.2.11 Telephone Hybrid

1.915.760/764

In order to record or transmit a conversation between the announcer in the studio and a person outside the studio being interviewed by telephone, the telephone line must be connected to the mixing console.

In such a case, the full conversation is transmitted, since both voice signals are carried on normal 2-wire telephone lines. However, also the voice of the announcer in the studio is then transmitted in telephone quality (300... 3400 Hz). By mixing the microphone signal of the announcer (in studio quality) to the conversation, the addition of the “good” and “poor” signals results in a distorted and untrue signal.



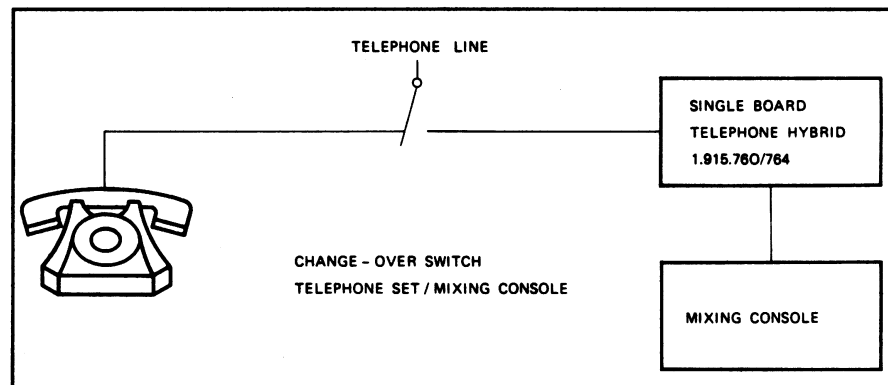
Principle of a telephone transmission via a mixing console

The telephone hybrid allows to greatly improve the quality of a telephone transmission by selectively suppressing the undesired “poor” announcer signal (side-tone attenuation). This side-tone attenuation is done in principle by a hybrid circuit which is a familiar feature in telephony.



The Studer telephone hybrid permits high-quality transmission of telephone conversations with the announcer in the studio. Apart from connecting it to the telephone line, the hybrid works automatically.

Maximum side-tone attenuation of the studio voice signal in the receiver line is achieved by automatically constituting a dummy load for the telephone line. This adjustment is performed electronically, the real (resistive) and imaginary (capacitive) components of the telephone line impedance being matched as near as possible. This automatic matching process begins as soon as an announcer signal is present.



Operation with a single Telephone Hybrid Board

The telephone set is used to establish a telephone connection (call). After switching over to the mixing console, the holding current for the subscriber's relay is maintained by a resistor on the hybrid board.

#### Versions:

A variety of 19" Telephone Hybrid units with one or two channels is available, consisting of the following versions:

- Standard version (ST) – 19"/1U Telephone Hybrid unit for direct connection to the telephone line and a relay to switch the telephone line from the telephone set to the hybrid.
- Noise gate version (NG) – same as standard version, equipped with a noise gate
- Current-adjustable version (CA) – same as standard version, but additionally featuring adjustable holding current for the telephone line.

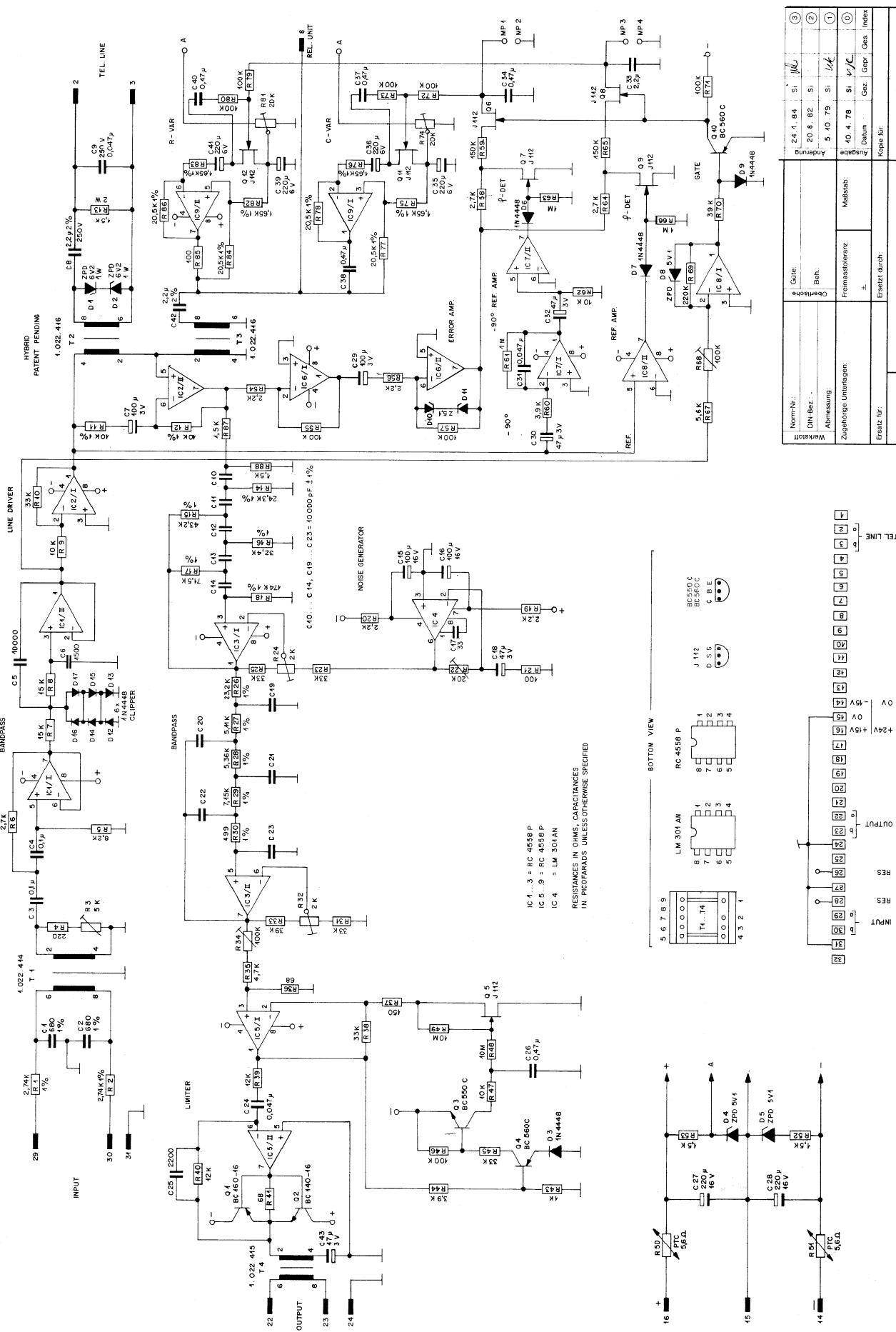
#### Ordering Information:

##### Euro-cards:

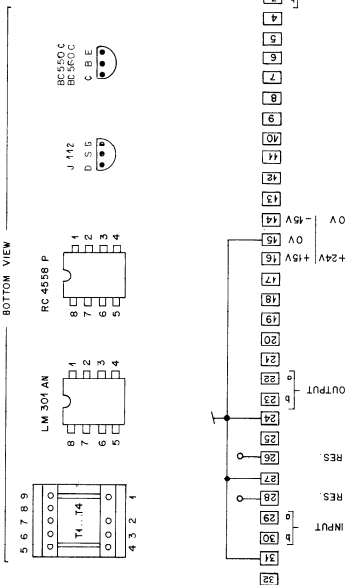
- Telephone hybrid card 1.915.760.xx
- Telephone hybrid card with noise gate 1.915.764.xx

##### 19" standard products:

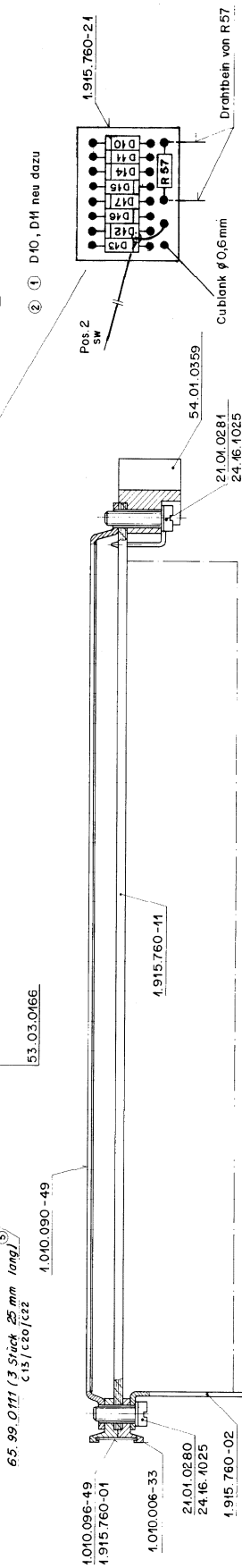
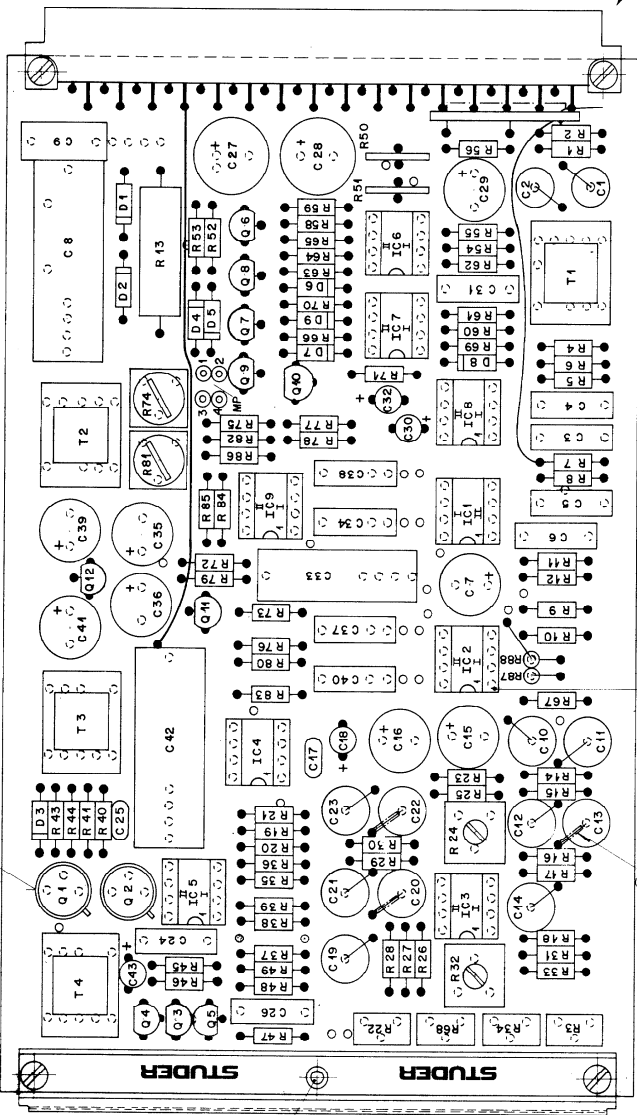
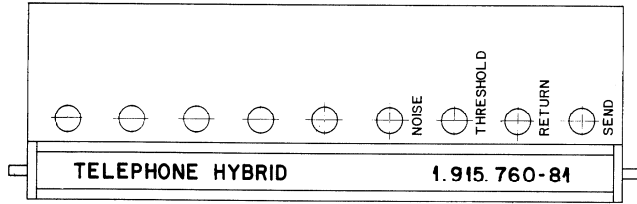
- Telephone hybrid 1CH-ST 75.700.89118
- Telephone hybrid 2CH-ST 75.700.89228
- Telephone hybrid 1CH-NG 75.700.89114
- Telephone hybrid 2CH-NG 75.700.89224
- Telephone hybrid 1CH-CA 75.700.89116
- Telephone hybrid 2CH-CA 75.700.89226
- Telephone hybrid 1CH-CA/NG 75.700.89117
- Telephone hybrid 2CH-CA/NG 75.700.89227



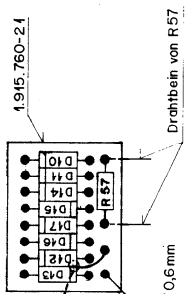
RESISTANCES IN OHMS, CAPACITANCES IN MICROFARADS UNLESS OTHERWISE SPECIFIED



Norm-Nr.:	Güte:	24.1.84	Si	1	
DIN Bez.:	Beh.:	20.8.82	Si	2	
Abmessung:	Freiassensweise:	5.10.79	Si	1	
Zugehörige Unterlagen:	Maßstab:	10.4.78	Si	1	
Erstellt für:	Erstellt durch:				
Automatic Telephone Hybrid (Patent pending)					
STUDER REGENDORF ZÜRICH				Nr.:	1.915.760/81



② ① D10, D11 neu dazu



② Diodenprint

Norm-Nr.	54.01.0359	24.01.0281	24.16.4025
Teiln. Bez.			
Abmessung			
Zugehörige Unterlagen			
Positionsliste	1.915.760-84	Malbuch	2:1
Abteilleiste	1.915.760-95		
Ersatz für		Ersetzt durch	
Werkstoff			
Code			
Libr.			
Druckart			
Produktionsart			
Material			
Datum			
Gez.			
Gez.			
Gez.			
Index			
1	11.5.79	Ho	
2	109.80	Ho	
3	244.84	A.Hg	
4	4.4.84	A.Hg	
5	25.6.84		
6	18.2.87		

Benennung		1.915.760-81
Telefon Hybrid		
STUDER REGENSBRUNN ZÜRICH		

Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER	Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER
	C....1	59.12.9681	680pF 1% 500V-	PS		R....4	57.11.4221	220	
	C....2	59.12.9681	680pF 1%	PS		R....5	57.11.4822	8,2k	2%
	C....3	59.31.6104	0,1µF 10%	PE		R....6	57.11.4272	2,7k	2%
	C....4	59.31.6104	0,1µF 10%	PE		R....7	57.11.4153	15k	2%
	C....5	59.12.4103	0,01µF 5%	PE		R....8	57.11.4153	15k	
	C....6	59.11.6152	1500pF 5%	PC		R....9	57.11.4103	10k	
	C....7	59.22.4101	100µF 3V	EL		R....10	57.11.4333	33k	
①	C....8	1.915.760.03	2,2µF 1%	250V-	ST				
①③	C....9	59.31.8473	0,047µF 400V-	PE		R....11	57.39.1002	10k	1%
	C....10	59.12.7103	0,01µF 1%	PS		R....12	57.39.1002	10k	1%
						R....13	57.56.5152	1,5k	2W
	C....11	59.12.7103	0,01µF 1%	PS		R....14	57.39.2432	24,3k	1%
	C....12	59.12.7103	0,01µF 1%	PS		R....15	57.39.4322	43,2k	1%
	C....13	59.12.7103	0,01µF 1%	PS		R....16	57.39.3242	32,4k	1%
	C....14	59.12.7103	0,01µF 1%	PS		R....17	57.39.7152	71,5k	1%
	C....15	59.22.4101	100µF 16V	EL		R....18	57.39.1743	174k	1%
	C....16	59.22.4101	100µF 16V	EL		R....19	57.11.4222	2,2k	
	C....17	59.34.2330	33pF	CER		R....20	57.11.4222	2,2k	
	C....18	59.36.0470	47µF 3V	TA					
	C....19	59.12.7103	0,01µF 1%	PS		R....21	57.11.4101	100	
	C....20	59.12.7103	0,01µF 1%	PS		R....22	58.01.7203	20k	LIN 10%
						R....23	57.11.4333	33k	2%
	C....21	59.12.7103	0,01µF 1%	PS		R....24	58.01.8202	2k	LIN 10%
	C....22	59.12.7103	0,01µF 1%	PS		R....25	57.11.4333	33k	2%
	C....23	59.12.7103	0,01µF 1%	PS		R....26	57.39.2322	23,2k	1%
	C....24	59.12.4473	0,047µF	PE		R....27	57.39.5111	5,11k	1%
	C....25	59.32.2222	2200pF	CER		R....28	57.39.5361	5,36k	1%
	C....26	59.02.0474	0,47µF 5%	PC		R....29	57.39.7151	7,15k	1%
	C....27	59.22.4221	220µF 16V	EL		R....30	57.39.4990	499	1%
	C....28	59.22.4221	220µF 16V	EL					
	C....29	59.22.4101	100µF 3V	EL		R....31	57.11.4333	33k	2%
	C....30	59.36.0470	47µF 3V	TA		R....32	58.01.8202	2k	LIN 10%
						R....33	57.11.4393	39k	2%
	C....31	59.12.4473	0,047µF	PE		R....34	58.01.7104	100k	LIN 10%
	C....32	59.36.0470	47µF 3V	TA		R....35	57.11.4472	4,7k	
	C....33	59.02.2225	2,2µF	PC		R....36	57.11.4680	68	
①	C....34	59.02.0474	0,47µF	PE		R....37	57.11.4151	150	
	C....35	59.22.2221	220µF 6V	EL		R....38	57.11.4333	33k	
	C....36	59.22.2221	220µF 6V	EL		R....39	57.11.4123	12k	
	C....37	59.02.0474	0,47µF	PC		R....40	57.11.4123	12k	
	C....38	59.02.0474	0,47µF	PC					
	C....39	59.22.2221	220µF	EL		R....41	57.11.4680	68	
	C....40	59.02.0474	0,47µF	PC		R....42			
						R....43	57.11.4102	1k	
①	C....41	59.22.2221	220µF 6V	EL	ST	R....44	57.11.4392	3,9k	
	C....42	1.915.760.03	2,2µF 1%	250V-		R....45	57.11.4333	33k	
	C....43	59.36.0470	47µF 3V	TA		R....46	57.11.4104	100k	
						R....47	57.11.4103	10k	
	D....1	50.04.1511	U <sub>2</sub> 6,2V	ZPD 6V2 1W		R....48	57.02.5106	10M	
	D....2	50.04.1511	U <sub>2</sub> 6,2V	ZPD 6V2 1W		R....49	57.02.5106	10M	
	D....3	50.04.0125	1N4448		SI	R....50	57.99.0209	5,6Ω	PTC 2322 662 91005
	D....4	50.04.1112	U <sub>2</sub> 5,1V	ZPD 5V1 0,4W					PH
	D....5	50.04.1112	U <sub>2</sub> 5,1V	ZPD 5V1 0,4W		R....51	57.99.0209	5,6Ω	PTC
	D....6	50.04.0125	1N4448		SI	R....52	57.11.4152	1,5k	
	D....7	50.04.0125	1N4448		SI	R....53	57.11.4152	1,5k	
	D....8	50.04.1112	U <sub>2</sub> 5,1V	ZPD 5V1 0,4W		R....54	57.11.4222	2,2k	
	D....9	50.04.0125	1N4448		SI	R....55	57.11.4104	100k	
②	D....10	50.04.1112	U <sub>2</sub> 5,1V	ZPD 5V1 0,4W		R....56	57.11.4222	2,2k	
						R....57	57.11.4104	100k	
③	D....11	50.04.1112	U <sub>2</sub> 5,1V	ZPD 5V1 0,4W		R....58	57.11.4272	2,7k	
③	D....12	50.04.0125	1N4448		SI	R....59	57.11.4154	150k	
③	D....13	50.04.0125	1N4448		SI	R....60	57.11.4392	3,9k	
③	D....14	50.04.0125	1N4448		SI				
③	D....15	50.04.0125	1N4448		SI	R....61	57.11.4105	1M	
③	D....16	50.04.0125	1N4448		SI	R....62	57.11.4103	10k	
③	D....17	50.04.0125	1N4448		SI	R....63	57.11.4105	1M	
④	IC....1	50.09.0107	RC4559NB	DUAL OP AMP	TI, RA	R....64	57.11.4272	2,7k	
④	IC....2	50.09.0107	RC4559NB			R....65	57.11.4154	150k	
④	IC....3	50.09.0107	RC4559NB			R....66	57.11.4105	1M	
④	IC....4	50.05.0144	LM301AN	OP AMP	NS	R....67	57.11.4562	5,6k	
④	IC....5	50.09.0107	RC4559NB			R....68	58.01.7104	100k	LIN 10%
④	IC....6	50.09.0107	RC4559NB			R....69	57.11.4224	220k	
④	IC....7	50.09.0107	RC4559NB			R....70	57.11.4393	39k	
④	IC....8	50.09.0107	RC4559NB						
④	IC....9	50.09.0107	RC4559NB			R....71	57.11.4104	10k	
						R....72	57.11.4104	100k	
						R....73	57.11.4104	100k	
	Q....1	50.03.0315	BC160-16		SIE, F	R....74	58.01.8203	20k	LIN 10%
	Q....2	50.03.0316	BC140-16		SIE, F	R....75	57.39.1651	1,65k	1%
	Q....3	50.03.0497	BC550-C		T, ITT	R....76	57.39.1651	1,65k	1%
	Q....4	50.03.0496	BC560-C		T, ITT	R....77	57.39.2052	20,5k	1%
	Q....5	50.03.0350	J112		SIX, NS	R....78	57.39.2052	20,5k	1%
	Q....6	50.03.0350	J112		SIX, NS	R....79	57.11.4104	100k	
	Q....7	50.03.0350	J112		SIX, NS	R....80	57.11.4104	100k	
	Q....8	50.03.0350	J112		SIX, NS				
	Q....9	50.03.0350	J112		SIX, NS	R....81	58.01.8203	20k	LIN 10%
	Q....10	50.03.0496	BC560-C		T, ITT	R....82	57.39.1651	1,65k	1%
						R....83	57.39.1651	1,65k	1%
	Q....11	50.03.0350	J112		SIX, NS	R....84	57.39.2052	20,5k	1%
	Q....12	50.03.0350	J112		SIX, NS	R....85	57.11.4101	100	2%
						R....86	57.39.2052	20,5k	1%
	R....1	57.39.2741	2,74k	1%		① R....87	57.02.5152	1,5k	
	R....2	57.39.2741	2,74k	1%		① R....88	57.02.5152	1,5k	
①	R....3	58.01.7502	5k	LIN	TR, SP				

## TEL. HYBRID

T. . . . 1	1.022.414	1:1	ST
T. . . . 2	1.022.416	1:1	ST
T. . . . 3	1.022.416	1:1	ST
T. . . . 4	1.022.415	1:2	ST

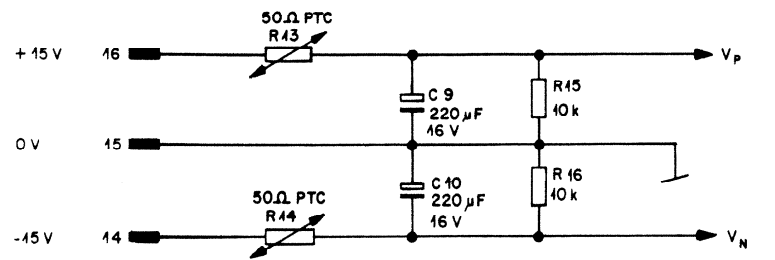
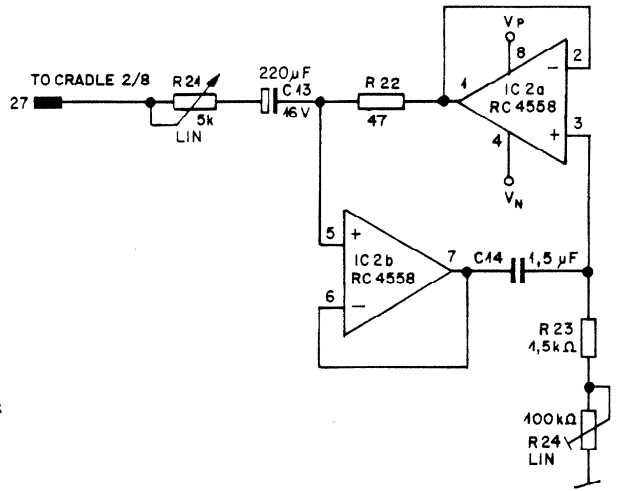
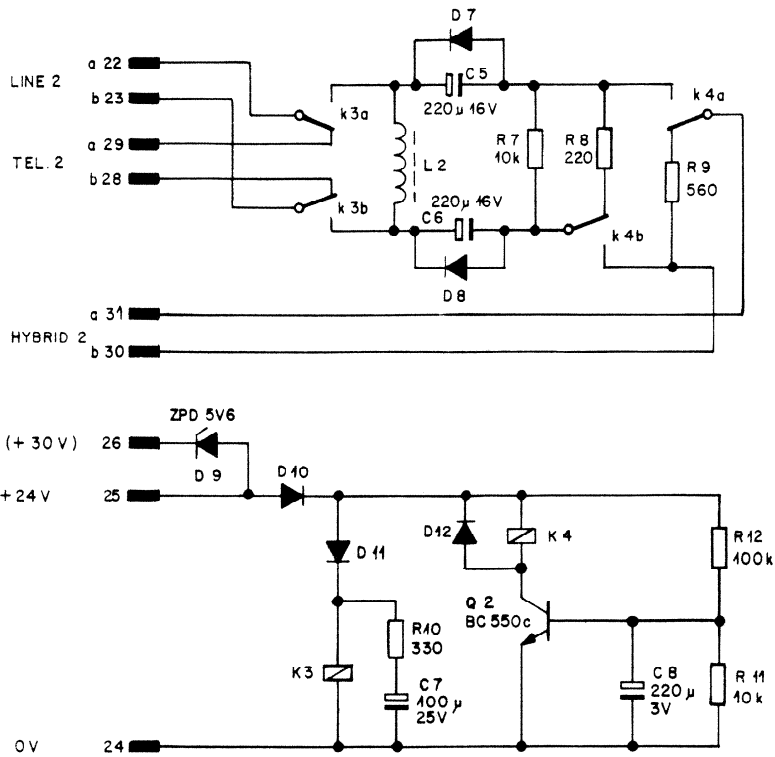
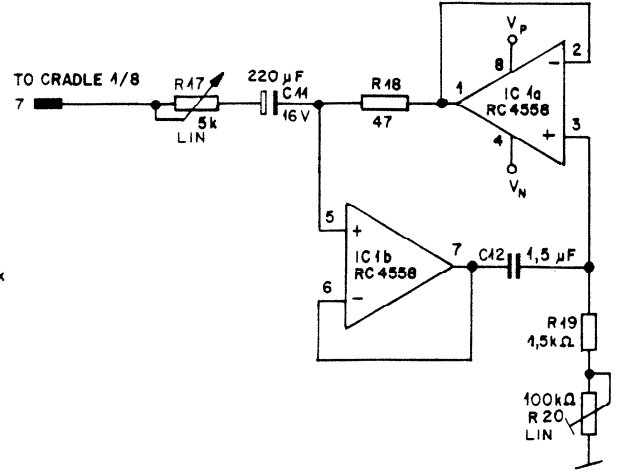
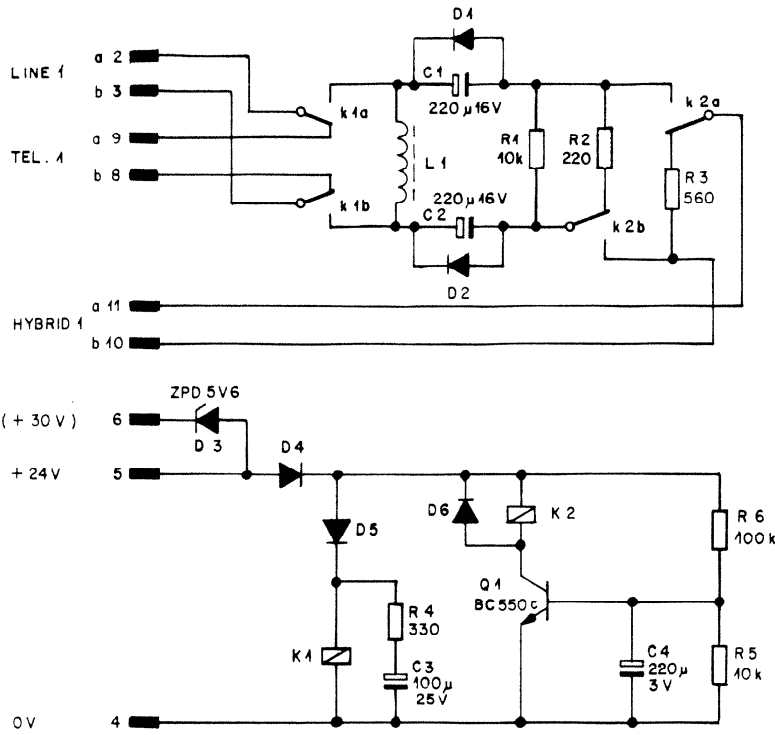
CER=Ceramic, EL=Electrolytic, TA=Tantalum, PE=Polyester, PS=Polystyrene, PC=Polycarbonate

MANUFACTURER: ST=Studer, PH=Philips, TR=TRW, SP=Spectrol, TI=Texas Instruments, RA=Raytheon  
NS=National Sem., SIX=Siliconix, T=Telefunken, SIE=Siemens, F=Fairchild

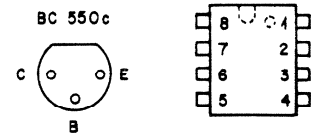
1.915.760.81 TELEPHONE HYBRID	FRI 14/03/78
1.915.760.81 TELEPHONE HYBRID	① FRI 06/11/78
1.915.760.81 TELEPHONE HYBRID	② HO 11/05/79
1.915.760.81 TELEPHONE HYBRID	③ HO 10/09/80
1.915.760.81 TELEPHONE HYBRID	④ VO 11/03/81
1.915.760.81 TELEPHONE HYBRID	⑤ VO 20/06/82

END

→

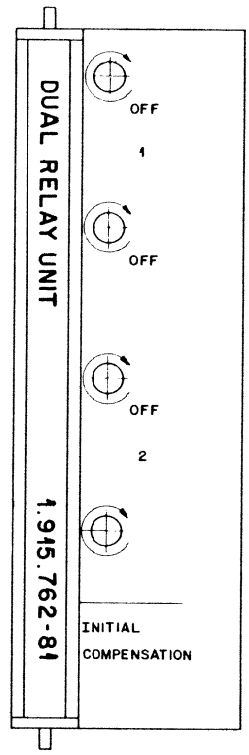
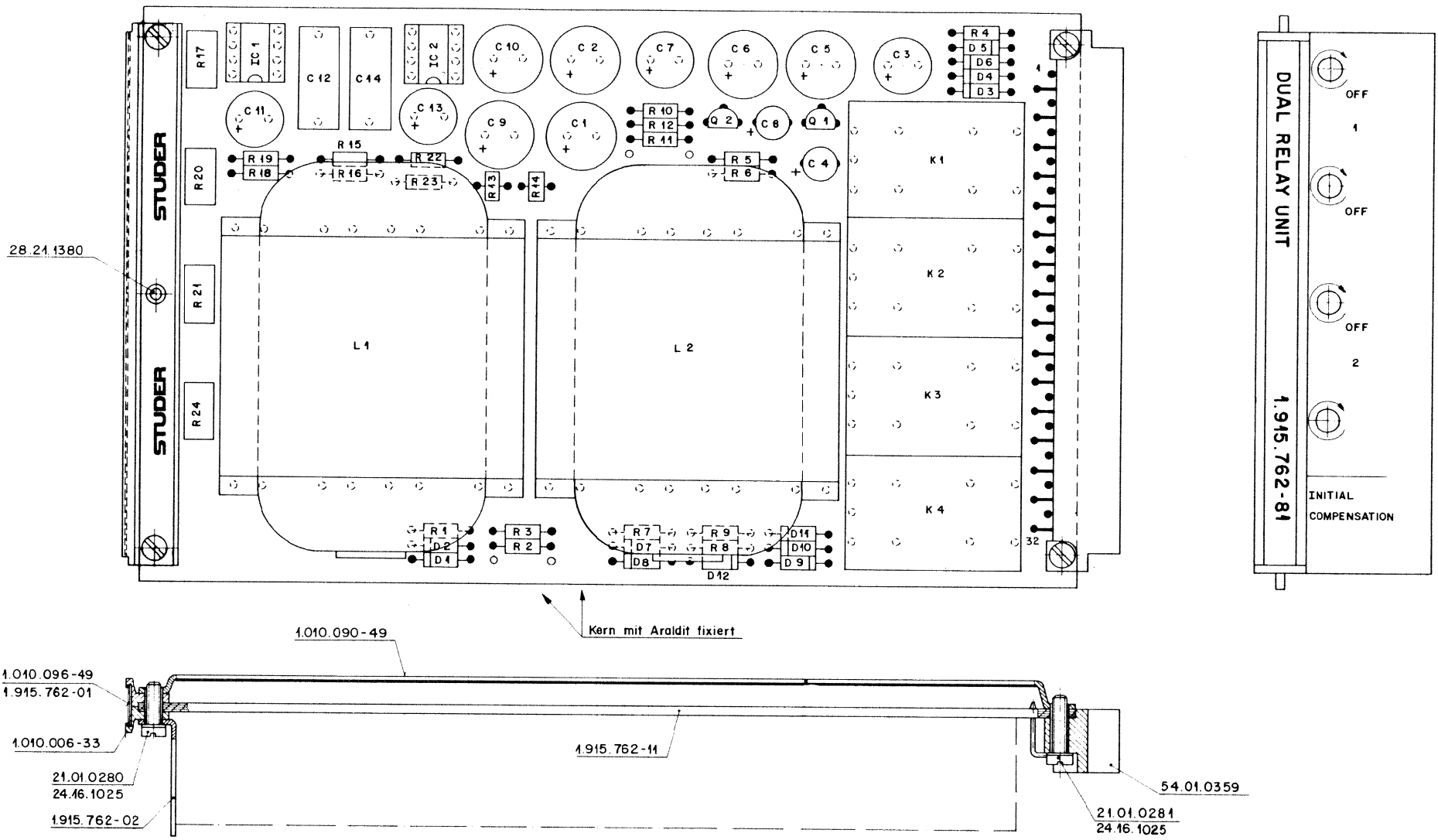


BOTTOM VIEW  
RC 4558



D = 1N 4448  
L1, L2 = 1.022.525

Ausgabe	16. 2. 79	Si	<i>[Signature]</i>	⊙
Datum		Gez.	Gepr.	Index
Ersatz für:		Ersetzt durch:		Kopie für:
STUDER REGENSDORF ZÜRICH		Benennung: DUAL RELAY UNIT		Nummer: SC 1. 915. 762-81



Werkstoff Norm Nr DIN-Bez Abmessung	Güte- Oberfläche Ben	Änderung 4.4.84 A.Ho <i>Vr Vr</i>	
Zugehörige Untertagen PL, AL	Freimasstoleranz	Maßstab 2:1	Ausgabe 18.7.79 Ho <i>Muy Vr</i> 0.
Ersatz für	Ersetzt durch	Datum Gez Gepr Ges Index	
STUDER REGENSDORF ZÜRICH		Benennung Dual Relay Unit	
Nummer 1.915.762-81		Kopie für	

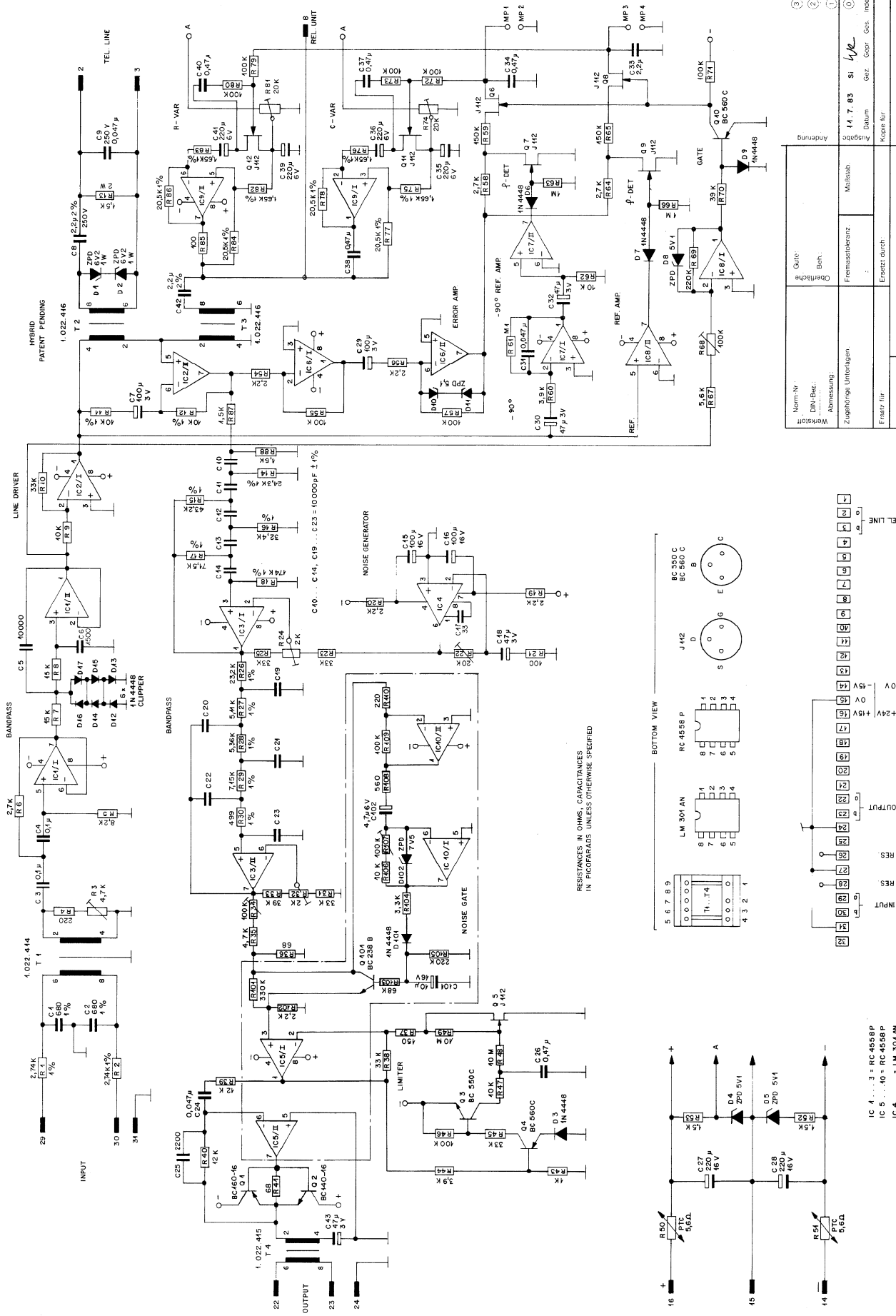
INDI	POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT		MFR
C	1	59.22.4221	220 $\mu$ F	16 V	EL	
C	2	59.22.4221	220 $\mu$ F	16 V	EL	
C	3	59.22.5101	100 $\mu$ F	25V	EL	
C	4	59.30.1221	220 $\mu$ F	3V	TA	
C	5	59.22.4221	220 $\mu$ F	16 V	EL	
C	6	59.22.4221	220 $\mu$ F	16 V	EL	
C	7	59.22.5101	100 $\mu$ F	25V	EL	
C	8	59.30.1221	220 $\mu$ F	3V	TA	
C	9	59.22.4221	220 $\mu$ F	16 V	EL	
C	10	59.22.4221	220 $\mu$ F	16 V	EL	
C	11	59.22.2221	220 $\mu$ F	6V	EL	
C	12	59.05.1155	1,5 $\mu$ F	63V	MPC	
C	13	59.22.2221	220 $\mu$ F	6V	EL	
C	14	59.05.1155	1,5 $\mu$ F	63V	MPC	
D	1...12	50.04.0125	1N4448	or equivalent		ANY
		except				
D	3, 9	50.04.1108	ZPD5V6	BZX83 5V6		ITT,S
① IC	1, 2	50.09.0107	RC4559NB	Dual Op. Amp.		TI, RA
② K	1...4	56.04.0143	2u, AgAu	Relay		NA
L	1, 2	1.022.525		Inductivity		ST
P		54.01.0359		Edge Connector		
Q	1, 2	50.03.0497	BC550C			T,P,ITT

INDI	DATE	NAME		
④			ITT INTERMETALL	ST STUDER
③			NA NATIONAL	TI TEXAS INSTRUMENTS
②	15.9.82	7ff	P PHILIPS	EL ELECTROLYTIC
①	11.3.81	16	RA RAYTHEON	TA TANTALLUM
○	18.7.79	WY	S SIEMENS	MPC POLYCARBONATE

INDI	POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT		MFR
R	1	57.11.4103	10 k			
R	2	57.11.4221	220			
R	3	57.11.4561	560			
R	4	57.11.4331	330			
R	5	57.11.4103	10k			
R	6	57.11.4104	100k			
R	7	57.11.4103	10k			
R	8	57.11.4221	220			
R	9	57.11.4561	560			
R	10	57.11.4331	330			
R	11	57.11.4103	10k			
R	12	57.11.4104	100k			
R	13	57.99.0206	50	PTC		
R	14	57.99.0206	50	PTC		
R	15	57.11.4103	10 k			
R	16	57.11.4103	10 k			
R	17	58.01.7502	5 k	Potm.		
R	18	57.11.4470	47			
R	19	57.11.4152	1,5k			
R	20	58.01.7104	100k	Potm.		
R	21	58.01.7502	5 k	Potm.		
R	22	57.11.4470	47			
R	23	57.11.4152	1,5k			
R	24	58.01.7104	100k	Potm.		
XIC		53.03.0166		IC-socket DIL 8pins		

INDI	DATE	NAME		
④				
③				
②	15.9.82	7ff		
①	11.3.81	16		
○	18.7.79	WY		

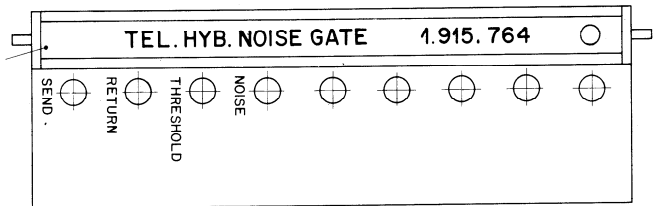
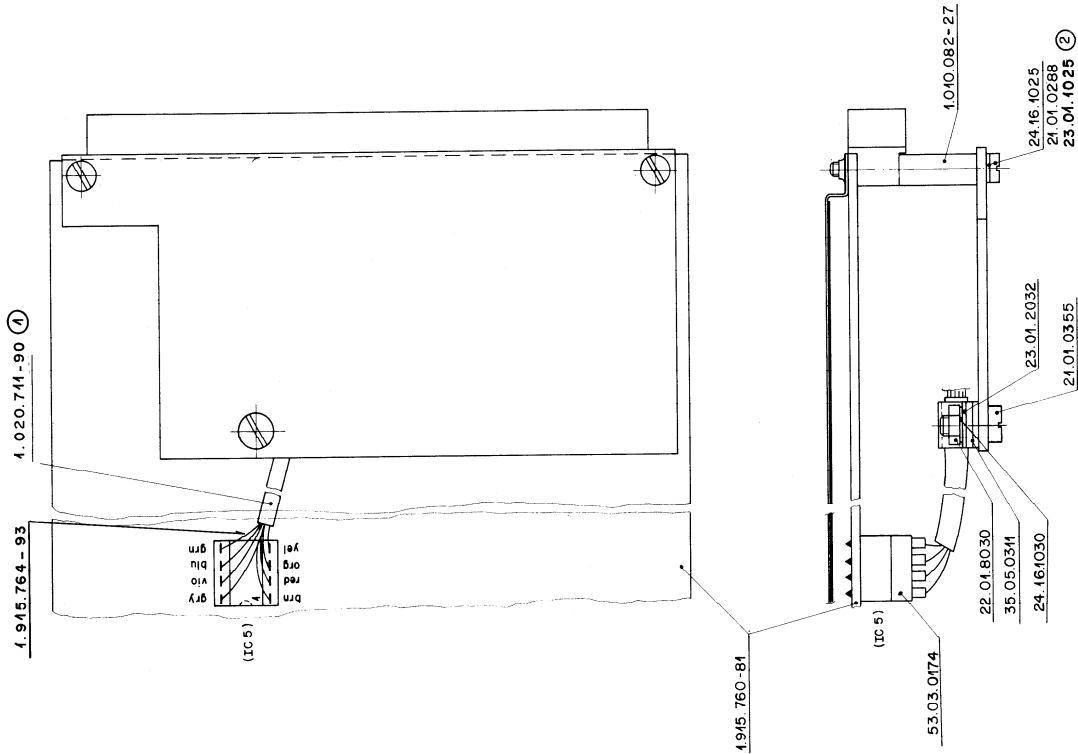




Norm-Nr.	14.7.83	Si	4/2
DIN-Bez.			
Abmessung:			
Zugehörige Unterlagen			
Werkstoff			
Gültig:			
Oberfläche			
Fremstoffveranz.			
Material			
Änderung			
Nummer	SC 1.915.764		

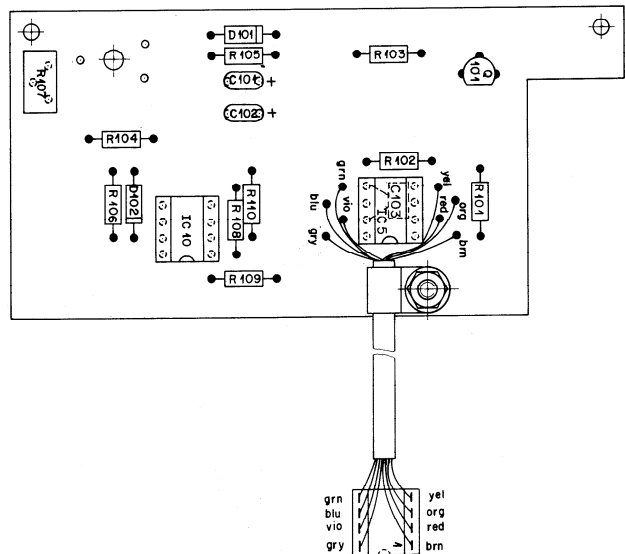


TEL. HYBRID



Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER
C	101	59.26.2100	10µF 16V	EL
C	102	59.26.1479	4,7µF 10V	EL
⊙	C	103	59.32.1101	110pF CR
D	101	50.04.0125	IN4448	
D	102	50.04.1103	ZPD7V5	
IC	5	50.09.0107	RC4559	DUAL OP AMP
IC	10	50.09.0107	RC4559	DUAL OP AMP
Q	1	50.03.0436	BC237B	NPN
		53.03.0174		ADAPTER PLUG
		1.915.760.81		TEL. HYBRID KOMPL
		21.01.0355	M3x8	SCREW
		23.01.2032	7/3,2	WASHER
		22.01.8030	M3	NUT
		35.05.0311	4,8	BINDER
		21.01.0288	M2,5x25	SPACER
		1.010.082.27	3,2/5x13	SPACER
		1.915.764.01		LABEL
R	101	57.11.4334	330k	
R	102	57.11.4222	2,2k	
R	103	57.11.4683	68k	
R	104	57.11.4332	3,3k	
R	105	57.11.4224	220k	
R	106	57.11.4103	10k	
R	107	58.01.7104	100k	LIN
R	108	57.11.4561	560	
R	109	57.11.4104	100k	
R	110	57.11.4221	220	

TI, RA  
TI, RA  
PH, SIE, MOT  
ST  
ST



EL=Electrolytic

MANUFACTURER: ST=Studer, TI=Texas Instruments, RA=Raytheon, PH=Philips, SIE=Siemens, MOT=Motorola

1.915.764.00 TEL. HYBRID WITH NOISE GATE FRI 30/11/81  
1.915.764.00 TEL. HYBRID WITH NOISE GATE ⊙ VO 19/10/87

END  
→

Nijm Nr	Guite	49.40.87	Si	Ge	3
Werkstoff	Übersicht	27.5.87	Si	Ge	2
WZ-Nr	Beh	3.6.86	Ho	Ge	1
Abmessung					
Zugehörige Unterlagen:	Freiabschleifanz	Maßstab			
PL, LL		2-4			
Ersetzt für	Ersetzt durch				
Kopie für					
STUDER REGENSDORF ZÜRICH	Telephon Hybrid with Noise Gate	1.915.764-00			

**2.2.12 Line Equalizer**

1.915.776/777/779

The Line Equalizer Euro-card is the ideal component to cope with situations as inadequate frequency response or excessive level loss on long-haul audio lines. Special effects equalization may be another application.

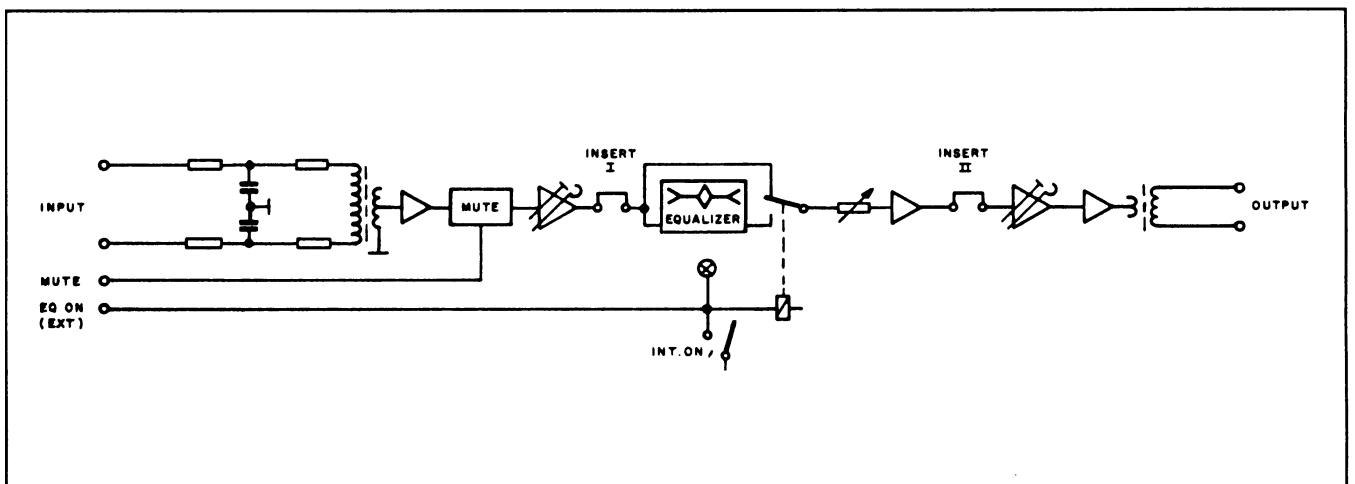
The frequency response can be varied in three bands over a  $\pm 15$  dB range, as shown by the respective graphs below. Gain is normally set to unity, with 10 dB of continuously variable gain or attenuation available. Remote controlled muting or bypassing is possible.

The equalizer cards are supplied with a choice of different front panels for either horizontal recessed, vertical recessed, or vertical flush installation into suitable mounting frames.



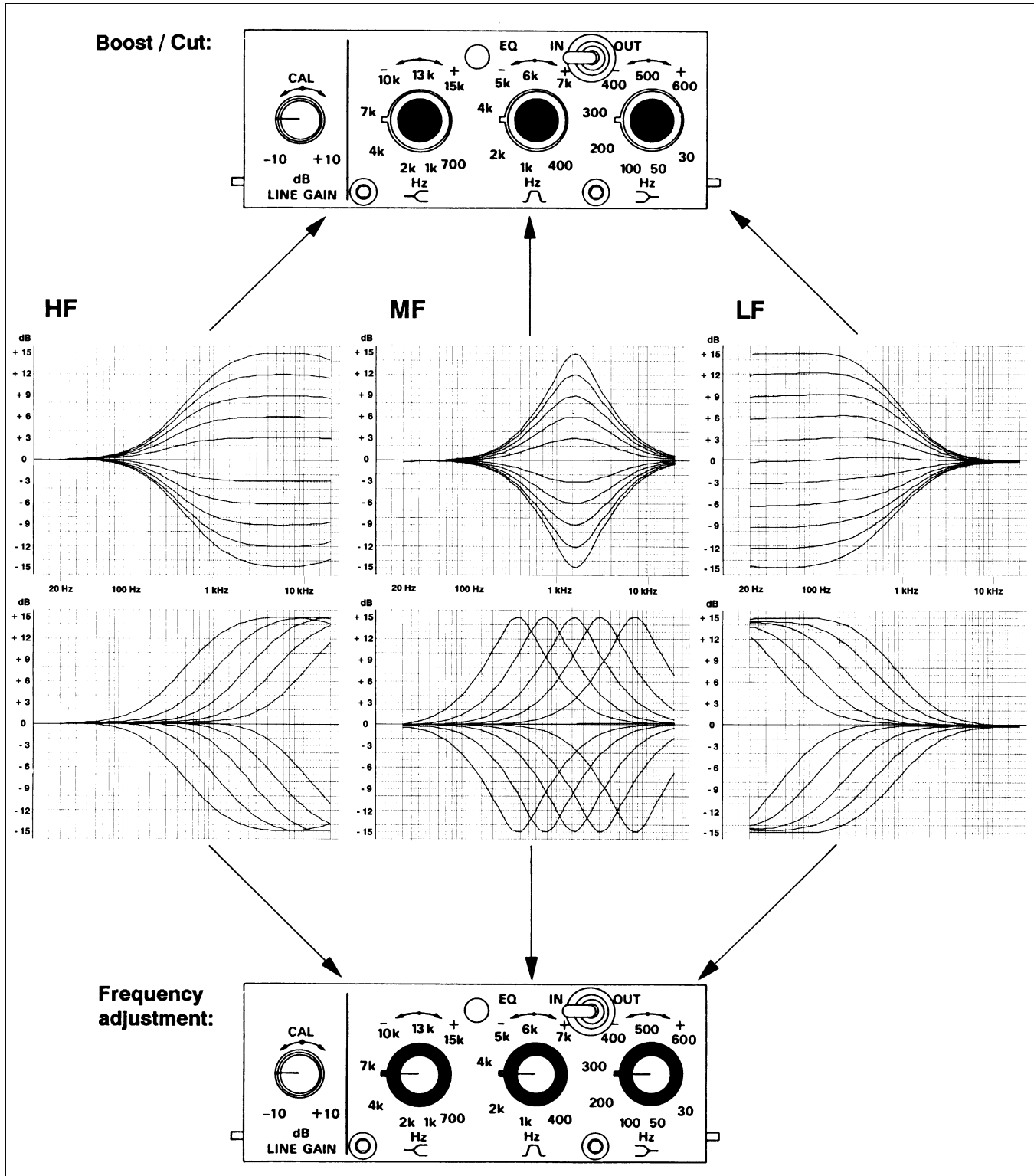
When installed vertically, each equalizer occupies 8 M units.

A 19" mounting frame for three equalizer cards plus the required power supply is described below.



**Parametric filter diagrams:**

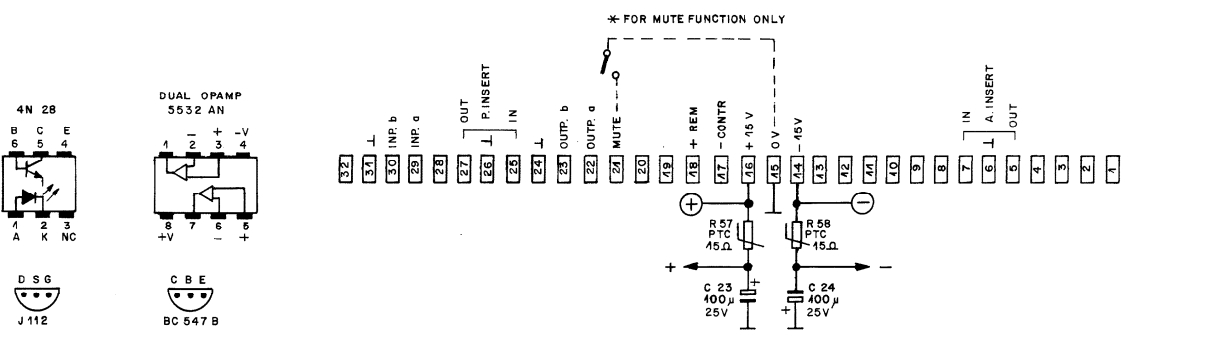
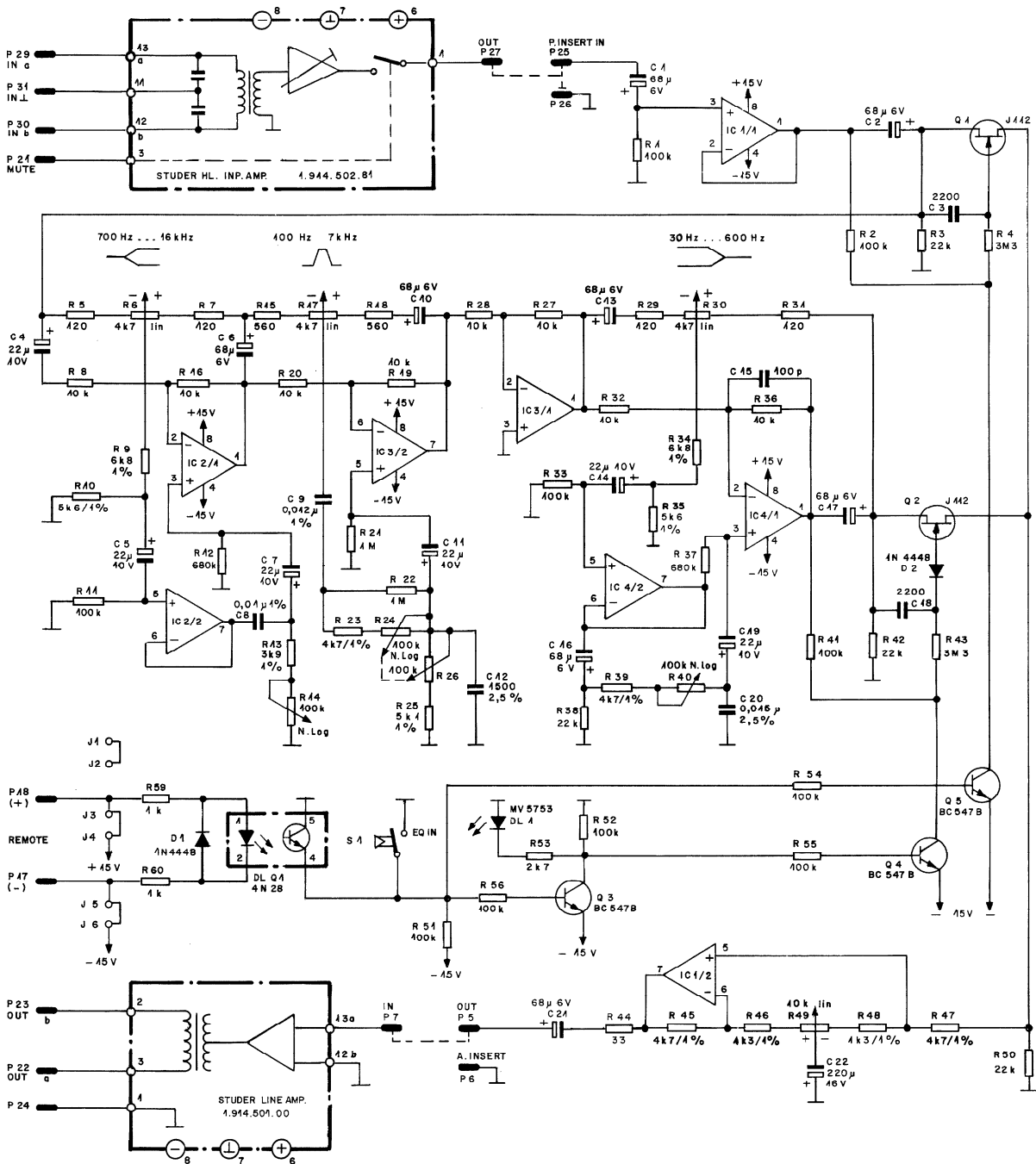
- HF shelving equalizer: Treble filter 700 Hz...15 kHz,  $\pm 15$  dB
- MF bell-shaped equalizer: Center frequency 400 Hz...7 kHz,  $\pm 15$  dB; Q approx. 1
- LF shelving equalizer: Bass filter 30 Hz...600 Hz,  $\pm 15$  dB



**Technical Specifications**

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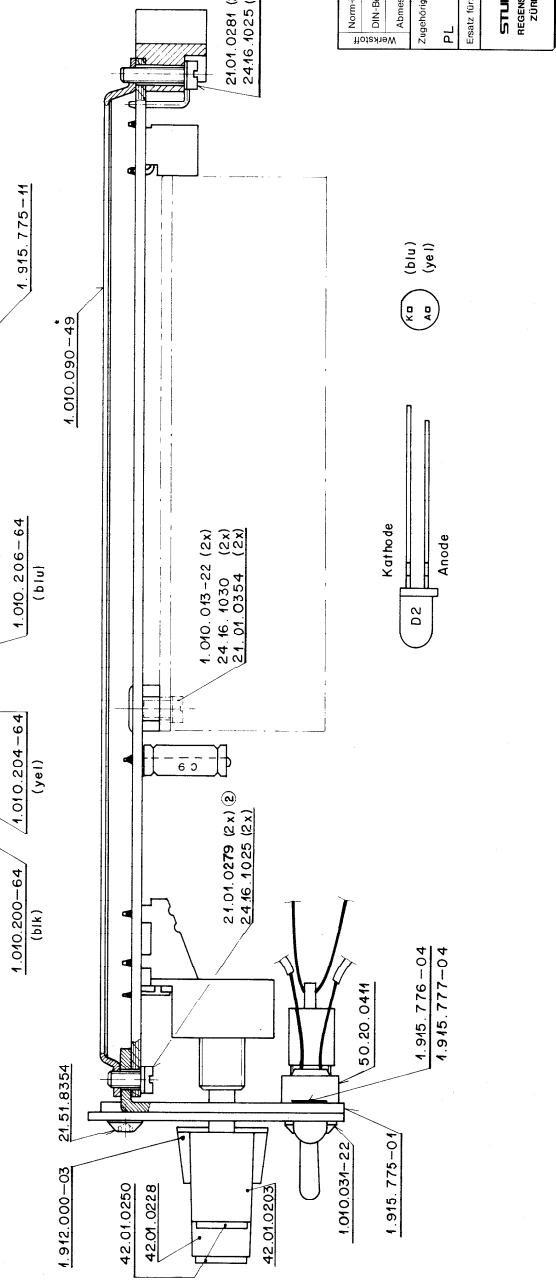
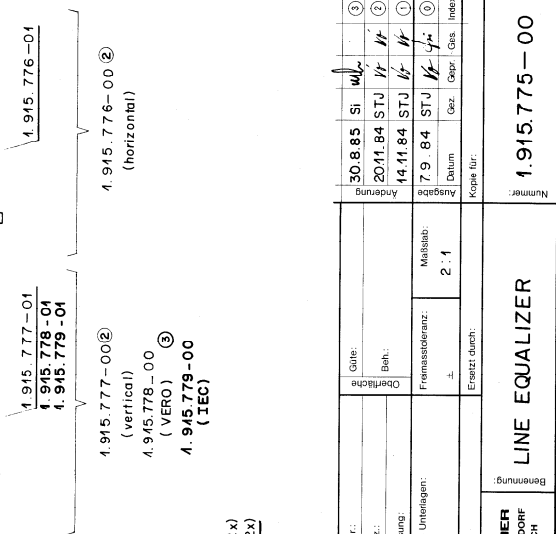
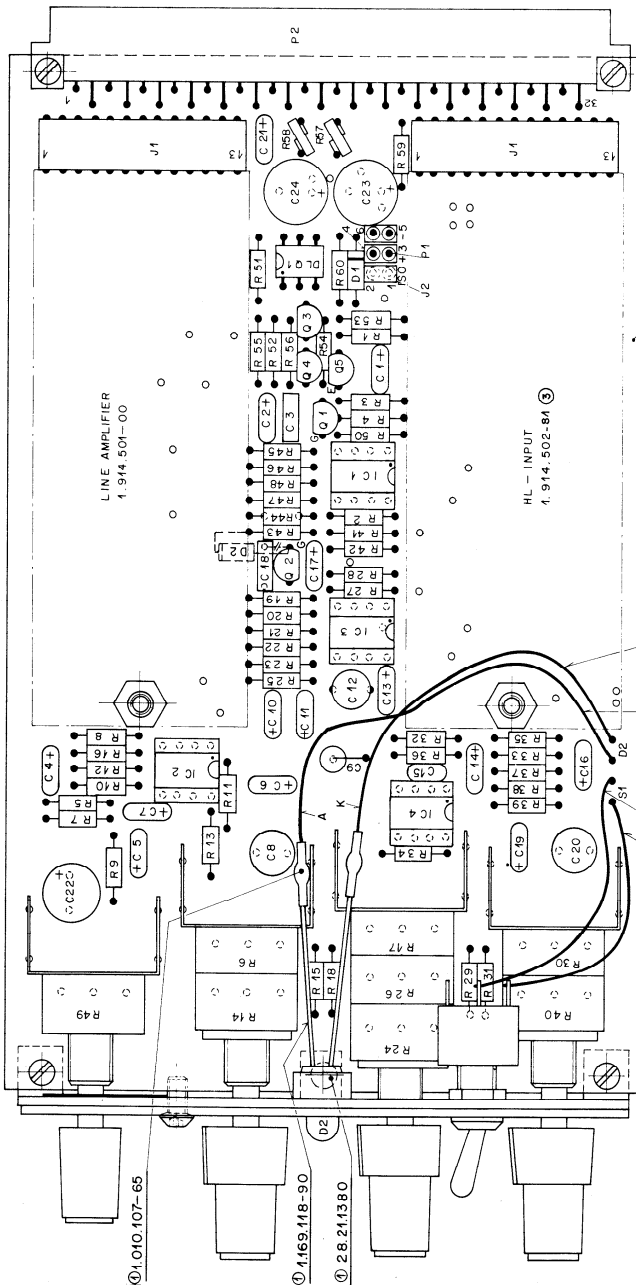
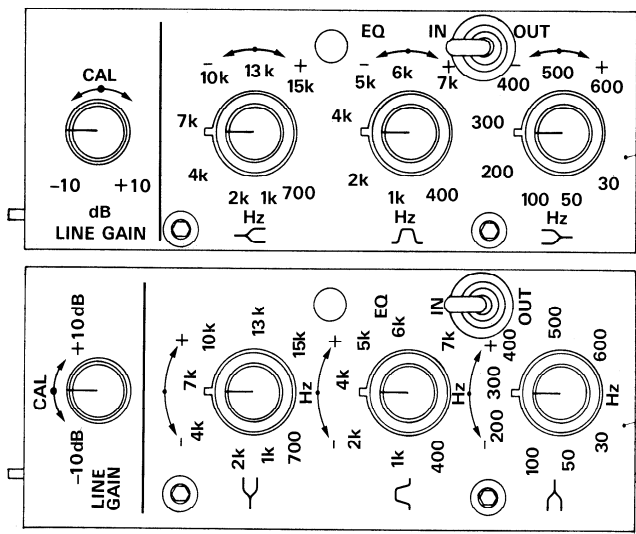
<b>Input:</b>		<b>balanced and floating</b> , with RF filter
	Impedance	> <b>10 kW</b>
	Clipping point	<b>+24 dBu</b> (12.3 V)
	Common mode rejection	> <b>50 dB</b> , unbalanced to ground
<b>Output:</b>		<b>balanced and floating</b>
	Minimum permissible load	<b>200 W</b>
	Maximum output level	<b>+24 dBu</b> (12.3 V)
	Frequency response	<b>±0.2 dB</b> , 30 Hz...60 kHz, equalization off
	THD	< <b>0.01%</b> , at nominal level
<b>Equalization:</b>	Characteristics	<b>see diagram</b> , referred to +6 dBu in/out
	S/N	> <b>96 dB</b> , equalizer off
		> <b>93 dB</b> , equalizer on (linear)
<b>Supply:</b>		<b>±15 V</b> (80 mA idling, 170 mA @ +24 dBu into 200 Ω)
<b>Dimensions:</b>	Euro-card	<b>100 × 160 mm, 8 M units wide</b>
<b>Ordering Information:</b>		
<b>Euro-cards:</b>		
	• Line equalizer, horizontal, for recessed mounting	1.915.776.xx
	• Line equalizer, vertical, for recessed mounting	1.915.777.xx
	• Line equalizer, vertical, for flush mounting (ELMA)	1.915.779.xx
<b>19" standard product</b>	• Mounting frame (19"/1U) with power supply and front panel, wired for three equalizer cards 1.915.776 (not incl.)	1.918.117.xx



IC 1 --- IC 4 = 5532 AN

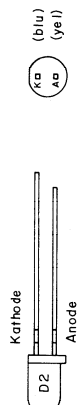
DATE:	10.9.84	20.11.84	10.4.85	30.8.85	VERTICAL	1.915.777
SIGN:	<i>We</i>	<i>We</i>	<i>fr</i>	<i>ur</i>	HORIZONTAL	1.945.776
STUDER REGENSDORF ZÜRICH					SC 1.915.775	
<b>LINE EQUALIZER BOARD</b>						

LINE EQUALIZER



Norm-Nr.:	30.885	Si	14	1	3
DIN-Bz.:	20/1.84	STU	1/1	1/1	1/1
Abmessung:	14/1.84	STU	1/1	1/1	1/1
Zugehörige Unterlagen:	7.9.84	STU	1/1	1/1	1/1
Maßstab:	Datum	Gez.	Gez.	Gez.	Index
PL	2.1				
Erstellt durch:					
Benennung:	LINE EQUALIZER				
Nummer:	1.915.775-00				

Leiter auf Lötseite aufgetrennt



LINE EQUALIZER

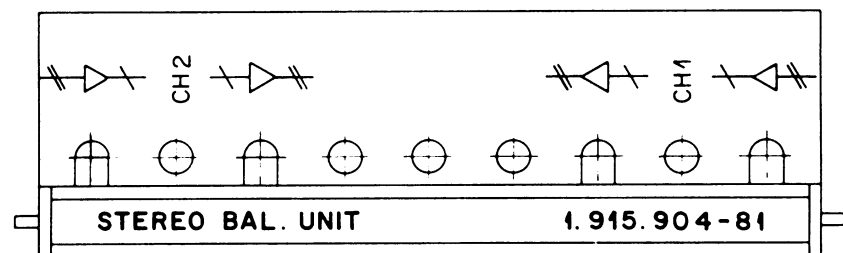
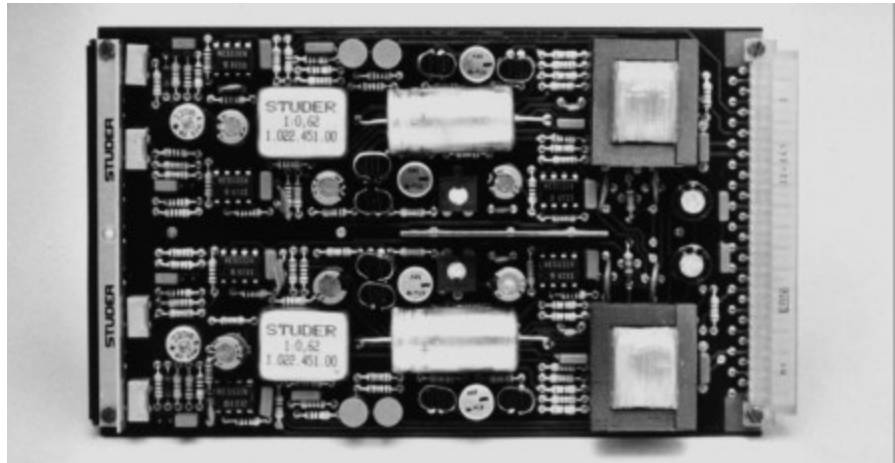
Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER	Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER
C.....1	59.26.0680	68 uF	20%	6.3V SAL	R....43	57.11.5335	3.3 MOhm	5%	0.25W MF
C.....2	59.26.0680	68 uF	20%	6.3V SAL	R....44	57.11.4330	33 Ohm	2%	0.25W MF
C.....3	59.06.0222	2.2nF	10%	63V PETP	R....45	57.11.3472	4.7 kOhm	1%	0.25W MF
C.....4	59.26.1220	22 uF	20%	10V SAL	R....46	57.11.3132	1.3 kOhm	1%	0.25W MF
C.....5	59.26.1220	22 uF	20%	10V SAL	R....47	57.11.3472	4.7 kOhm	1%	0.25W MF
C.....6	59.26.0680	68 uF	20%	6.3V SAL	R....48	57.11.3132	1.3 kOhm	1%	0.25W MF
C.....7	59.26.1220	22 uF	20%	10V SAL	R....49	1.010.001.58	10 kOhm	20%	lin. variable resistor
C.....8	59.05.1103	10nF	1%	63V PS	R....50	57.11.4223	22 kOhm	2%	0.25W MF
C.....9	59.12.7123	12nF	1%	63V PS	R....51	57.11.4104	100 kOhm	2%	0.25W MF
C.....10	59.26.0680	68 uF	20%	6.3V SAL	R....52	57.11.4104	100 kOhm	2%	0.25W MF
C.....11	59.26.1220	22 uF	20%	10V SAL	R....53	57.11.4272	2.7 kOhm	2%	0.25W MF
C.....12	59.05.2152	1.5nF	2.5%	160V PP	R....54	57.11.4104	100 kOhm	2%	0.25W MF
C.....13	59.26.0680	68 uF	20%	6.3V SAL	R....55	57.11.4104	100 kOhm	2%	0.25W MF
C.....14	59.26.1220	22 uF	20%	10V SAL	R....56	57.11.4104	100 kOhm	2%	0.25W MF
C.....15	59.32.1101	100pF	10%	400V CE	R....57	57.92.1121	120 mA		R-PTC 56V 15 ohm Philips
C.....16	59.26.0680	68 uF	20%	6.3V SAL	R....58	57.92.1121	120 mA		R-PTC 56V 15 ohm Philips
C.....17	59.26.0680	68 uF	20%	6.3V SAL	R....59	57.11.4102	1 kOhm	2%	0.25W MF
C.....18	59.06.0222	2.2nF	10%	63V PETP	R....60	57.11.4102	1 kOhm	2%	0.25W MF
C.....19	59.26.1220	22 uF	20%	10V SAL	S.....1	55.01.0111	ON-ON		SWITCH C & K
C.....20	59.05.2153	15nF	2.5%	63V PP	V.....1	1.914.501.00			LINE AMPLIFIER St
C.....21	59.26.0680	68 uF	20%	6.3V SAL	V.....2	1.914.502.00			HL. INPUT AMP. (FLOATING) St
C.....22	59.22.3221	220uF	20%	10V EL	XIC...1	53.03.0166	OIL	8-PIN	4X
C.....23	59.22.5101	220uF	20%	25V EL	=====				
C.....24	59.22.5101	100 uF	20%	25V EL	1.915.775.00	LINE EQUALIZER - BOARD			
D.....1	50.04.0125	1N4448		any	1.915.776.00	LINE EQUALIZER - HORIZONTAL			
D.....2	50.04.0125	1N4448		any	1.915.777.00	LINE EQUALIZER - VERTICAL			
DL...1	50.04.2111	MV5753	red	GI,HP	=====				
DLQ...1	50.99.0126	4N28			CE=Ceramic, CF=Carbon Film, EL=Electrolytic, MF=Metal Film, PE=Polyester, PP=Polypropylen, PS=Polystyrol				
IC...1	50.09.0106	NE5532AN	dual op. amp.	RA,SIG	MANUFACTURER: Bu=Burdy, Ex=Exar, Fc=Fairchild, GI=General Instrument				
IC...2	50.09.0106	NE5532AN	dual op. amp.	RA,SIG	HP=Hewlett Packard, ITT=Intermetall, Mot=Motorola, Nat=National				
IC...3	50.09.0106	NE5532AN	dual op. amp.	RA,SIG	{Matsushita}, NS=National Semiconductors, Ph=Philips,				
IC...4	50.09.0106	NE5532AN	dual op. amp.	RA,SIG	Ra=Raytheon, Sig=Signetics, Six=Siliconix, St=Studer,				
J....1	54.01.0309	13 PIN-JUMPER	CIS 2X		TI=Texas Instrument				
J....2	54.01.0021	13 PIN-JUMPER	CIS 2X		1.915.775.00	LINE-EQUALIZER BOARD			FRI 84/09/0600
P....1	54.01.0020	J-PLUG	6X		1.915.775.00	LINE-EQUALIZER BOARD			FRI 84/11/2001
P....2	54.01.0359	2*16 EURO - PLUG			=====				
MP...1	42.01.0203	GRY	UPPER KNOB	3X,4/10	END				
MP...2	42.01.0228	GRY	KNOB	1X,4/10	↓				
MP...3	42.01.0250	L-GRY	COVER	4X					
MP...4	1.912.000.03	L-GRY	LOWER KNOB	3X,6/13					
MP...5	1.010.090.49		SCREEN PLATE						
MP...6	1.915.776.01		FRONT PANEL VERTICAL						
MP...7	1.915.776.01		FRONT PANEL HORIZONTAL						
MP...8	1.915.777.01		FRONT PANEL HORIZONTAL						
MP...9	1.915.777.01		FRONT PANEL VERTICAL						
MP...10	1.915.777.01		FRONT PANEL VERTICAL						
Q....1	50.03.0350	J 112	N-JFET	NS,Mot,Six					
Q....2	50.03.0350	J 112	N-JFET	NS,Mot,Six					
Q....3	50.03.0436	BC 547	NPN IC>100mA, B>100	any					
Q....4	50.03.0436	BC 547	NPN IC>100mA, B>100	any					
Q....5	50.03.0436	BC 547	NPN IC>100mA, B>100	any					
R....1	57.11.4104	100 kOhm	2%	0.25W MF					
R....2	57.11.4104	100 kOhm	2%	0.25W MF					
R....3	57.11.4223	22 kOhm	2%	0.25W MF					
R....4	57.11.4335	3.3 MOhm	2%	0.25W MF					
R....5	57.11.4121	120 Ohm	2%	0.25W MF					
R....6	1.010.003.58	4.7 kOhm	20%	lin. variable resistor					
R....7	57.11.4121	120 Ohm	2%	0.25W MF					
R....8	57.11.4103	10 kOhm	2%	0.25W MF					
R....9	57.11.3682	6.8 kOhm	1%	0.25W MF					
R....10	57.11.3562	5.6 kOhm	1%	0.25W MF					
R....11	57.11.4104	100 kOhm	2%	0.25W MF					
R....12	57.11.4684	680 kOhm	2%	0.25W MF					
R....13	57.11.3392	3.9 kOhm	1%	0.25W MF					
R....14	57.11.3392	100 kOhm	10%	neg.log. variable resistor,see R 6					
R....15	57.11.4561	560 Ohm	2%	0.25W MF					
R....16	57.11.4103	10 kOhm	2%	0.25W MF					
R....17	1.010.005.58	4.7 kOhm	20%	lin. variable resistor					
R....18	57.11.4561	560 Ohm	2%	0.25W MF					
R....19	57.11.4103	10 kOhm	2%	0.25W MF					
R....20	57.11.4103	10 kOhm	2%	0.25W MF					
R....21	57.11.4105	1 MOhm	2%	0.25W MF					
R....22	57.11.4105	1 MOhm	2%	0.25W MF					
R....23	57.11.3472	4.7 kOhm	1%	0.25W MF					
R....24	57.11.3512	100 kOhm	10%	neg.log. variable resistor,see R17					
R....25	57.11.3512	5.1 kOhm	1%	0.25W MF					
R....26	57.11.3512	100 kOhm	10%	neg.log. variable resistor,see R17					
R....27	57.11.4103	10 kOhm	2%	0.25W MF					
R....28	57.11.4103	10 kOhm	2%	0.25W MF					
R....29	57.11.4121	120 Ohm	2%	0.25W MF					
R....30	1.010.003.58	4.7 kOhm	20%	lin. variable resistor					
R....31	57.11.4121	120 Ohm	2%	0.25W MF					
R....32	57.11.4103	10 kOhm	2%	0.25W MF					
R....33	57.11.4104	100 kOhm	2%	0.25W MF					
R....34	57.11.3682	6.8 kOhm	1%	0.25W MF					
R....35	57.11.3562	5.6 kOhm	1%	0.25W MF					
R....36	57.11.4103	10 kOhm	2%	0.25W MF					
R....37	57.11.4684	680 kOhm	2%	0.25W MF					
R....38	57.11.4223	22 kOhm	2%	0.25W MF					
R....39	57.11.3472	4.7 kOhm	1%	0.25W MF					
R....40	57.11.3472	100 kOhm	10%	neg.log. variable resistor,see R30					
R....41	57.11.4104	100 kOhm	2%	0.25W MF					
R....42	57.11.4223	22 kOhm	2%	0.25W MF					



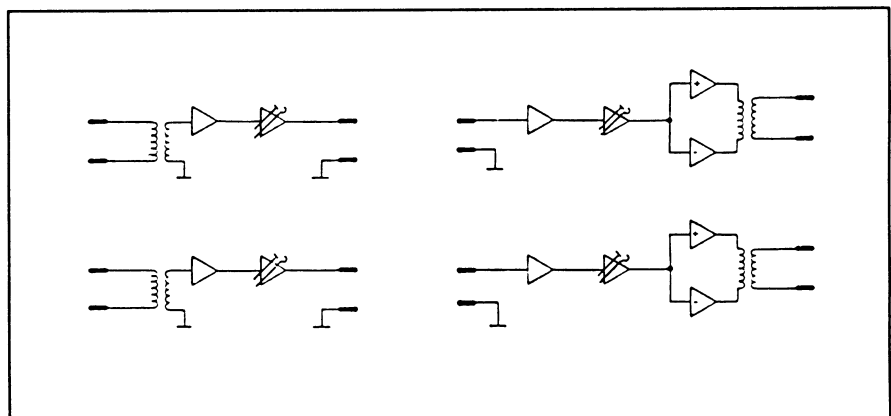
**2.2.13 Dual Balancing Unit/Dual Line Amplifier**

1.915.904

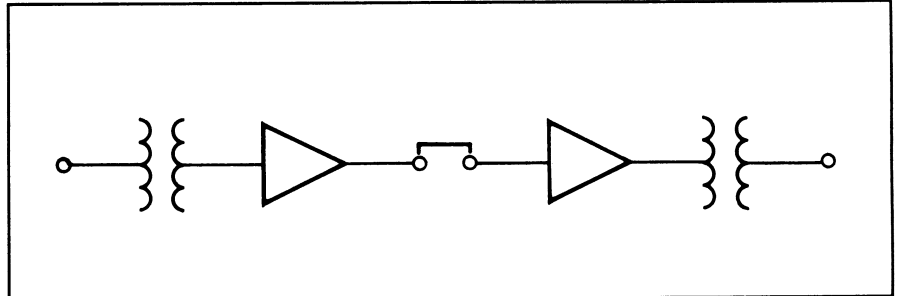
In professional audio work it is not uncommon that equipment with unbalanced input or output configuration must be connected to a system that is based on a strictly balanced design. The Dual Balancing Unit is the ideal component if the requirement of matching unbalanced to balanced equipment or vice versa has to be satisfied.



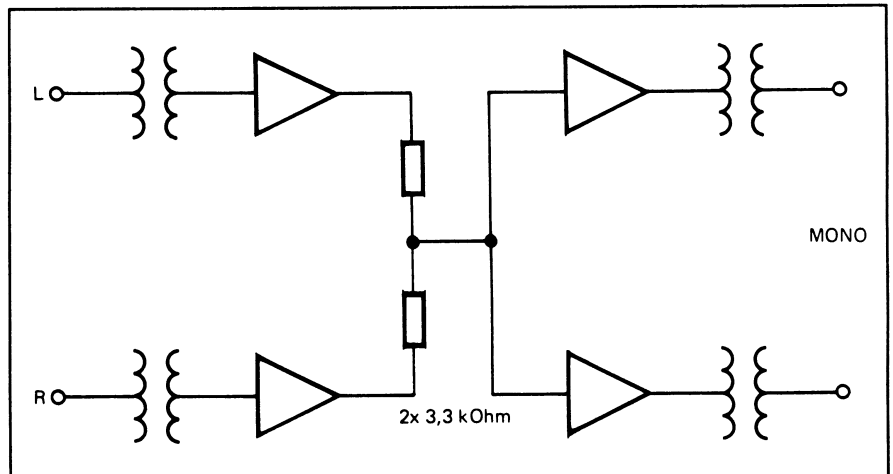
The Dual Balancing Unit consists of one Euro-card which contains four separate circuits to accommodate unbalanced-to-balanced or balanced-to-unbalanced matching in a stereo system. It is the ideal choice for applications in which consumer-type stereo equipment has to be integrated into a professional audio system, where balanced audio lines are a must. The Dual Balancing Unit will also be used in situations where balanced auxiliary units must be connected to unbalanced insert points on a mixing desk.



The use of the balancing unit is not restricted to matching of balanced and unbalanced audio system components, because it can also be utilized as a (line) booster amplifier or as a stereo-to-mono mixer. By simply connecting the unbalanced outputs and inputs together and by adjusting again within the available ranges, two booster amplifiers with a maximum gain of 30 dB and a maximum output capability of +24 dBu\*) can be realized.



For stereo-to-mono mixing, the unbalanced sides of the amplifier sections simply are connected by means of combining (mixing) resistors, as shown in the diagram below.



- \*) To avoid signal clipping, a system should always be designed in such a way that signal peaks stay well below an amplifier's maximum output capacity. Alignment procedures and level settings depend to a large degree on the type of metering used in an audio system. When making measurements with a steady-state signal, a margin of 6 dB below a system's clipping point and the PPM deflected to "zero volume", or a margin of 15 dB (for programs with extreme crest factors, even 20 dB) when utilizing a VU-meter, is considered good engineering practice.

**Technical Specifications**

---

**Balanced to unbalanced (Section 1):**

Input impedance	<b>≥ 10 kW</b> , balanced/floating
Maximum input level	<b>+24 dBu</b>
Output impedance	<b>&lt; 100 W</b> , unbalanced
Maximum output level	<b>+20 dBu</b>
Minimum load	<b>600 W</b>
Frequency response	<b>±0.2 dB</b> , 30 Hz...16 kHz
Attenuation	<b>0/15 dB</b> ; two fixed steps <b>0...15 dB</b> ; variable
S/N	<b>&gt; 100 dB</b> ; attenuation set to 6 dB, line level +6 dBu

**Unbalanced to balanced (Section 2):**

Input impedance	<b>5 kW</b> , unbalanced
Maximum input level	<b>+20 dBu</b>
Output impedance	<b>£ 50 W</b> , balanced/floating
Minimum load	<b>200 W</b>
Maximum output level	<b>+24 dBu</b>
Frequency response	<b>±0.2 dB</b> , 30 Hz...16 kHz
Gain	<b>14/30 dB</b> ; two fixed steps <b>0...17 dB</b> ; variable
S/N	<b>&gt; 100 dB</b> ; gain set to 6 dB, line level +6 dBu

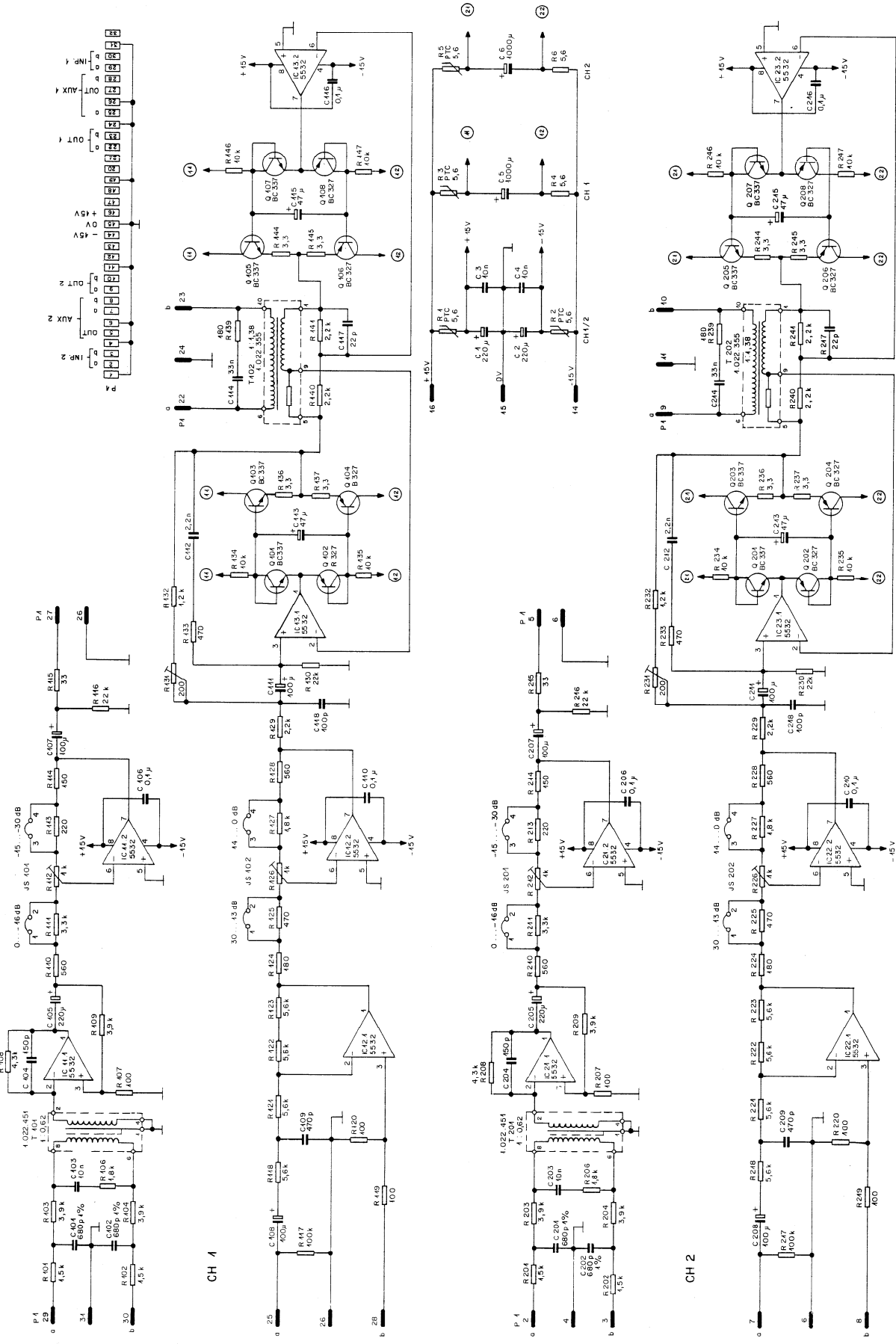
**Supply:** ±15 V (70 mA, idling; 170 mA, each channel +24 dBu into 200 Ω)

**Dimensions:** Euro-card **100 × 160 mm, 7 M units wide**

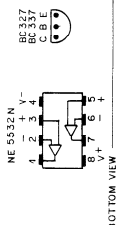
**Ordering Information:**

<b>Euro-card:</b>	• Dual balancing unit	1.915.904.xx
<b>19"/1U standard products:</b>	• 2CH balancing unit (1 × 1.915.904)	75.700.89212
	• 4CH balancing unit (2 × 1.915.904)	75.700.89422
	• 6CH balancing unit (3 × 1.915.904)	75.700.89632

DUAL BALANCING UNIT

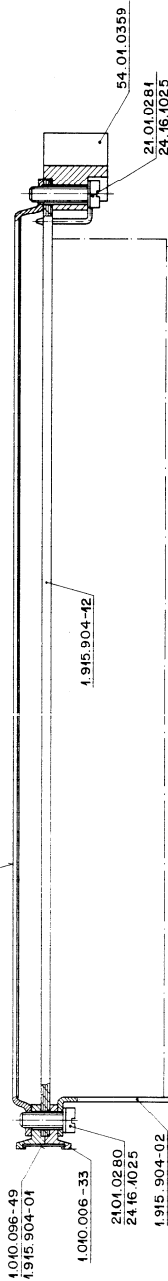
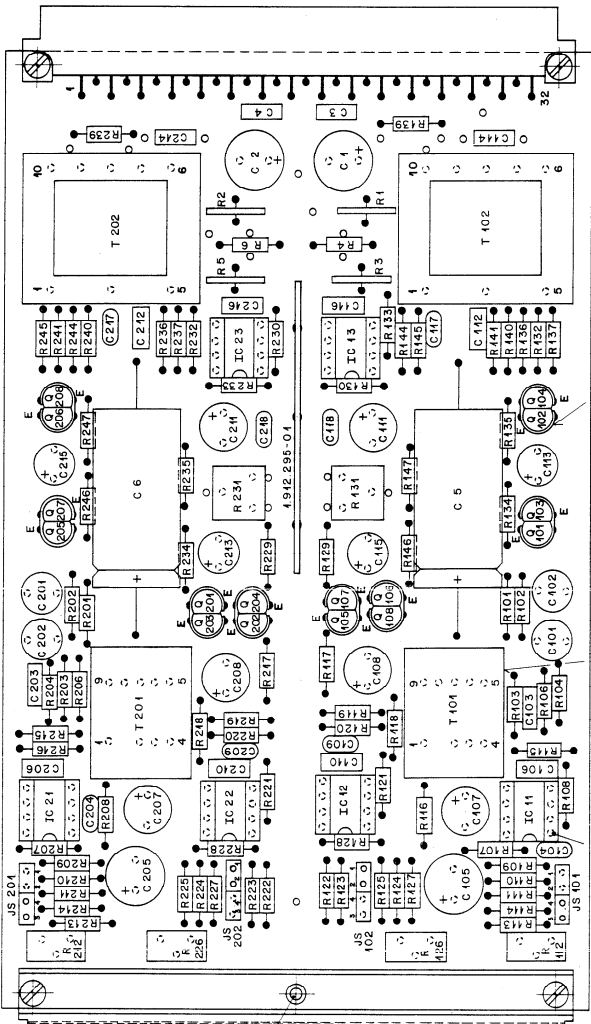
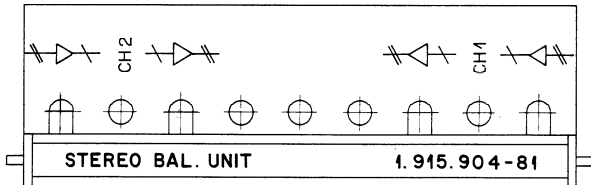


DATE:	8.7.83
SIGN:	<i>Rec</i>
STUDIENFACH:	STEREO BALANCING UNIT
REGISNR.:	SC 1.915.904-81
ZÜRICH:	



- 1 2 3 4
- T 101, T 201
- 5 6 7 8 9
- 10 11 12 13

DUAL BALANCING UNIT



Norm-Nr.	1.915.904-00	Erweitert durch	
Werkstoff	PL		
Abmessung			
Zugehörige Unterlagen			
Umfeld			
Überfläche			
Änderung	29.2.92	4-4.84	AHO
Datum	24.11.82	AHO	
Ansatz	2:1		
Kopie für			
Gez.			
Gepr.			
Index			
Nummer	1.915.904-81		

**Bearbeitung**  
**Stereo Balancing Unit**  
**STÜBLER**  
**REGARDORF**  
**ZÜRICH**

DUAL BALANCING UNIT

Ad.	POS.	REF.No.	DESCRIPTION			MANUFACTURER	Ad.	POS.	REF.No.	DESCRIPTION			MANUFACTURER
C....	1	59.22.4221	220p	16V	EL	R....	41	57.11.4222	2,2k	2%			
C....	2	59.22.4221	220p	16V	EL	R....	42						
C....	3	59.06.0103	10n	63V	PE	R....	43						
C....	4	59.06.0103	10n	63V	PE	R....	44	57.11.4339	3,3				
C....	5	59.25.5102	1000p	40V	EL	R....	45	57.11.4339	3,3				
C....	6	59.25.5102	1000p	40V	EL	R....	46	57.11.4103	10k				
						R....	47	57.11.4103	10k				
C....	1	59.05.1681	680p	1%	630V	PP	T....	1	1.022.451.00	1:0,62	INPUT TRAFO	ST	
C....	2	59.05.1681	680p	1%	630V	PP	T....	2	1.022.355.00	1:1,38	LINE OUTPUT TRAFO	ST	
C....	3	59.06.0103	10n	63V	PE								
C....	4	59.34.4151	150p	63V	CER								
C....	5	59.22.2221	220p	6V	EL	XIC	53.03.0166	8P	IC SOCKET				
C....	6	59.06.0104	0,1p	63V	PE								
C....	7	59.22.5101	100p	25V	EL								
C....	8	59.22.5101	100p	25V	EL								
C....	9	59.34.5471	470p	63V	CER								
C....	10	59.06.0104	0,1p	63V	PE								
C....	11	59.22.5101	100p	25V	EL								
C....	12	59.06.0222	2,2n	63V	PE								
C....	13	59.22.5470	47p	25V	EL								
C....	14	59.06.0333	33n	63V	PE								
C....	15	59.22.5470	47p	25V	EL								
C....	16	59.06.0104	0,1p	63V	PE								
C....	17	59.34.2220	22p	63V	CER								
C....	18	59.34.4101	100p	63V	CER								
IC....	1	50.09.0105	NE5532	DUAL OP AMP		XR5532	SIG, EX						
IC....	2	50.09.0105	NE5532	DUAL OP AMP		XR5532	SIG, EX						
IC....	3	50.09.0105	NE5532	DUAL OP AMP		XR5532	SIG, EX						
JS....	1	54.01.0020	4PIN										
		54.01.0021	JUMPER										
JS....	2	54.01.0021	4PIN										
		54.01.0021	JUMPER										
P....	1	54.01.0359	2*16P										
Q....	1	1.010.037.50	BC337	NPN	} MATCHED								
Q....	2	1.010.036.50	BC327	PNP									
Q....	3	1.010.037.50	BC337	NPN									
Q....	4	1.010.036.50	BC327	PNP									
Q....	5	1.010.037.50	BC337	NPN									
Q....	6	1.010.036.50	BC327	PNP									
Q....	7	1.010.037.50	BC337	NPN									
Q....	8	1.010.036.50	BC327	PNP									
R....	1	57.99.0209	5,6	PTC		PH							
R....	2	57.99.0209	5,6	PTC		PH							
R....	3	57.99.0209	5,6	PTC		PH							
R....	4	57.11.4569	5,6										
R....	5	57.99.0209	5,6	PTC		PH							
R....	6	57.11.4569	5,6										
R....	1	57.11.3152	1,5k	1%									
R....	2	57.11.3152	1,5k	1%									
R....	3	57.11.3392	3,9k	1%									
R....	4	57.11.3392	3,9k	1%									
R....	5												
R....	6	57.11.4182	1,8k										
R....	7	57.11.3101	100										
R....	8	57.11.3432	4,3k										
R....	9	57.11.3392	3,9k	2%									
R....	10	57.11.4561	560										
R....	11	57.11.4332	3,3k										
R....	12	58.01.9102	1k	10% TRIM									
R....	13	57.11.4221	220	2%									
R....	14	57.11.4151	150	2%									
R....	15	57.11.4330	33										
R....	16	57.11.4223	22k										
R....	17	57.11.4104	100k										
R....	18	57.11.3562	5,6k										
R....	19	57.11.3101	100										
R....	20	57.11.3101	100	1%									
R....	21	57.11.3562	5,6k										
R....	22	57.11.3562	5,6k										
R....	23	57.11.3562	5,6k										
R....	24	57.11.4181	180	2%									
R....	25	57.11.4471	470	2%									
R....	26	58.01.9102	1k	10% TRIM									
R....	27	57.11.4182	1,8k	2%									
R....	28	57.11.4561	560	2%									
R....	29	57.11.4222	2,2k										
R....	30	57.11.4223	22k										
R....	31	58.01.8201	200	TRIM									
R....	32	57.11.4122	1,2k										
R....	33	57.11.4471	470										
R....	34	57.11.4103	10k										
R....	35	57.11.4103	10k										
R....	36	57.11.4339	3,3										
R....	37	57.11.4339	3,3										
R....	38												
R....	39	57.11.4181	180										
R....	40	57.11.4222	2,2k	2%									

END  
→

EL=Electrolytic, PE=Polyester, PP=Polypropylen, CER=Ceramic  
MANUFACTURER: SIG=Signetics, PH=Philips, EX=Exar, ST=Studer

1.915.904.81 STEREO BAL. UNIT

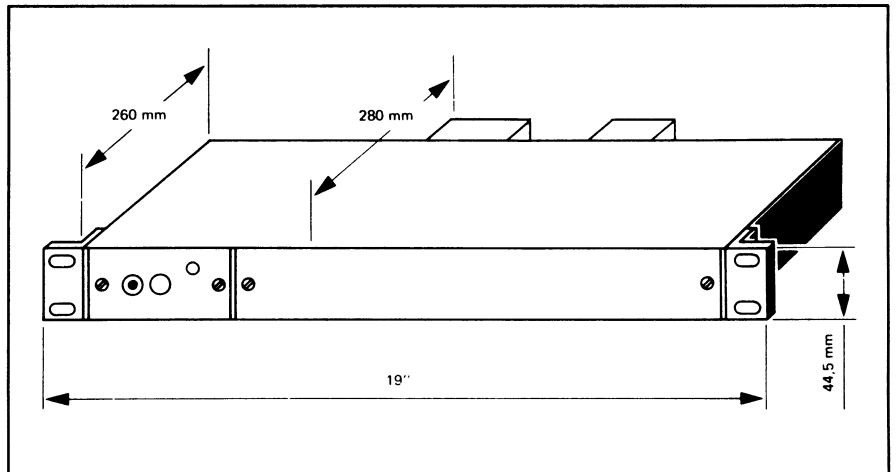
BR 24/11/82

**2.3 Racks and Frames**

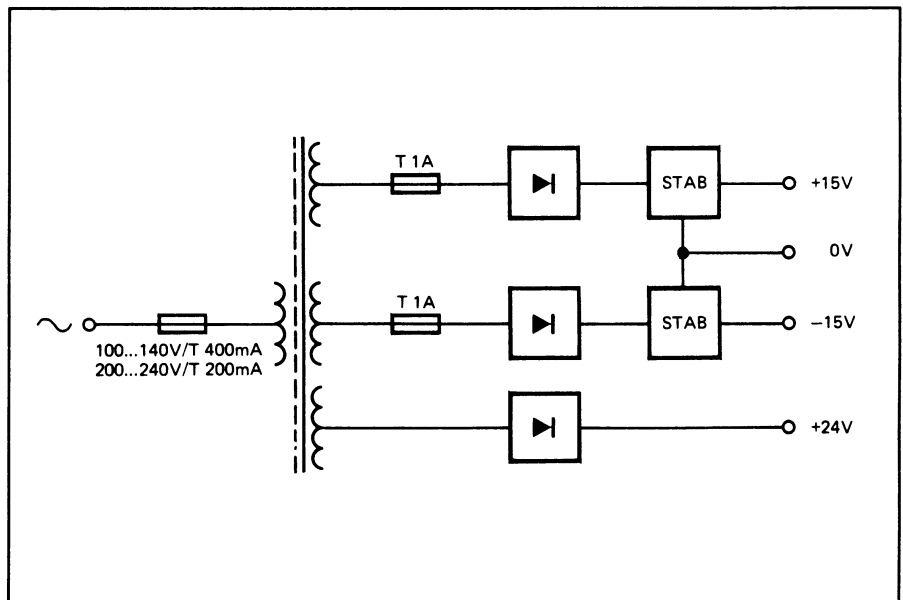
**2.3.1 19" Mounting Frame for 3 Euro-Cards**

1.918.100

This 19" mounting frame (height: 44.5 mm/1U) offers space for three Euro-cards next to the power supply. The power supply provides  $\pm 15\text{ V}_{\text{DC}}$  (regulated) and  $24\text{ V}_{\text{DC}}$  (unregulated).



The frame comes equipped with three edge connectors to accommodate three Euro-cards horizontally, side by side. A blank back panel of anodized aluminium is provided and permits the installation of input and output connectors as required, depending on the application.



## Technical Specifications

**Primary:** Voltage selector for **100, 120, 140, 200, 220, 240 V<sub>AC</sub>**  
 Fuse (slow-blow) **400 mA** (for 100...140 V<sub>AC</sub>)  
**200 mA** (for 200...240 V<sub>AC</sub>)

**Secondary:** Regulated voltage **±15 V<sub>DC</sub>**, 0.5 A max.  
 Unregulated voltage **24 V<sub>DC</sub>**, 0.2 A max. (for signaling)  
 Fuses (slow-blow) **2 × 1 A**

### Ordering Information:

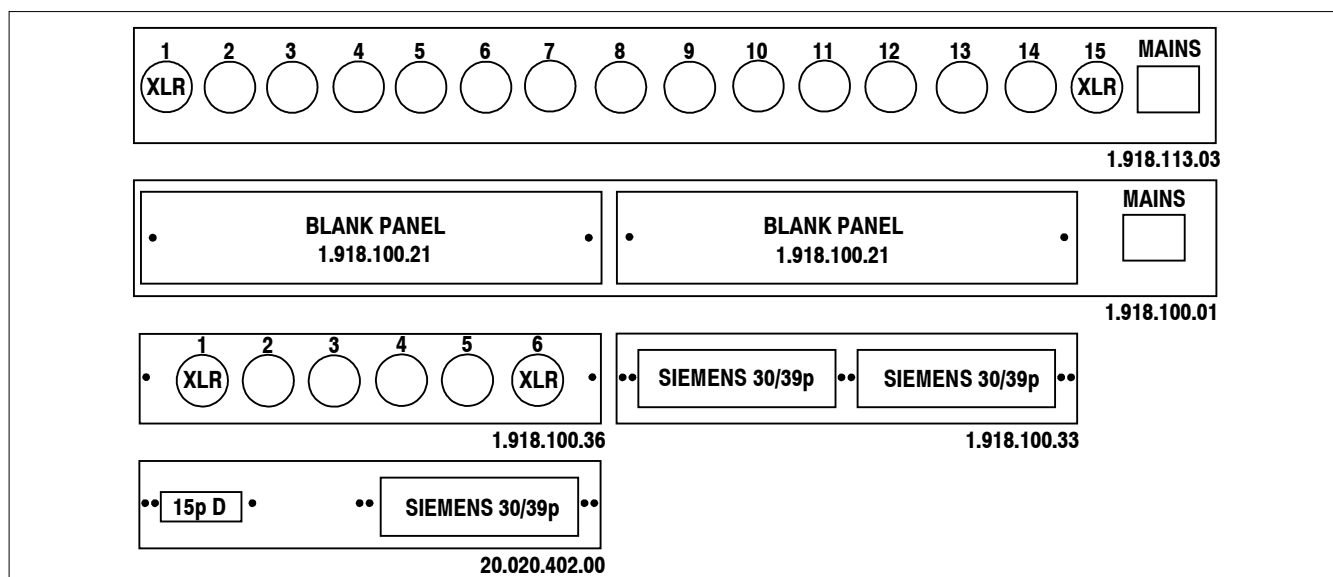
**19"/1U standard product**

- Mounting frame for three Euro-cards with power supply and stabilizer PCB, with two blank aluminium back panels (1.918.100.21)

1.918.100.xx

### Alternative Back Panels:

The mounting frame 1.918.100.xx can be equipped with the following back panels:



### Ordering Information:

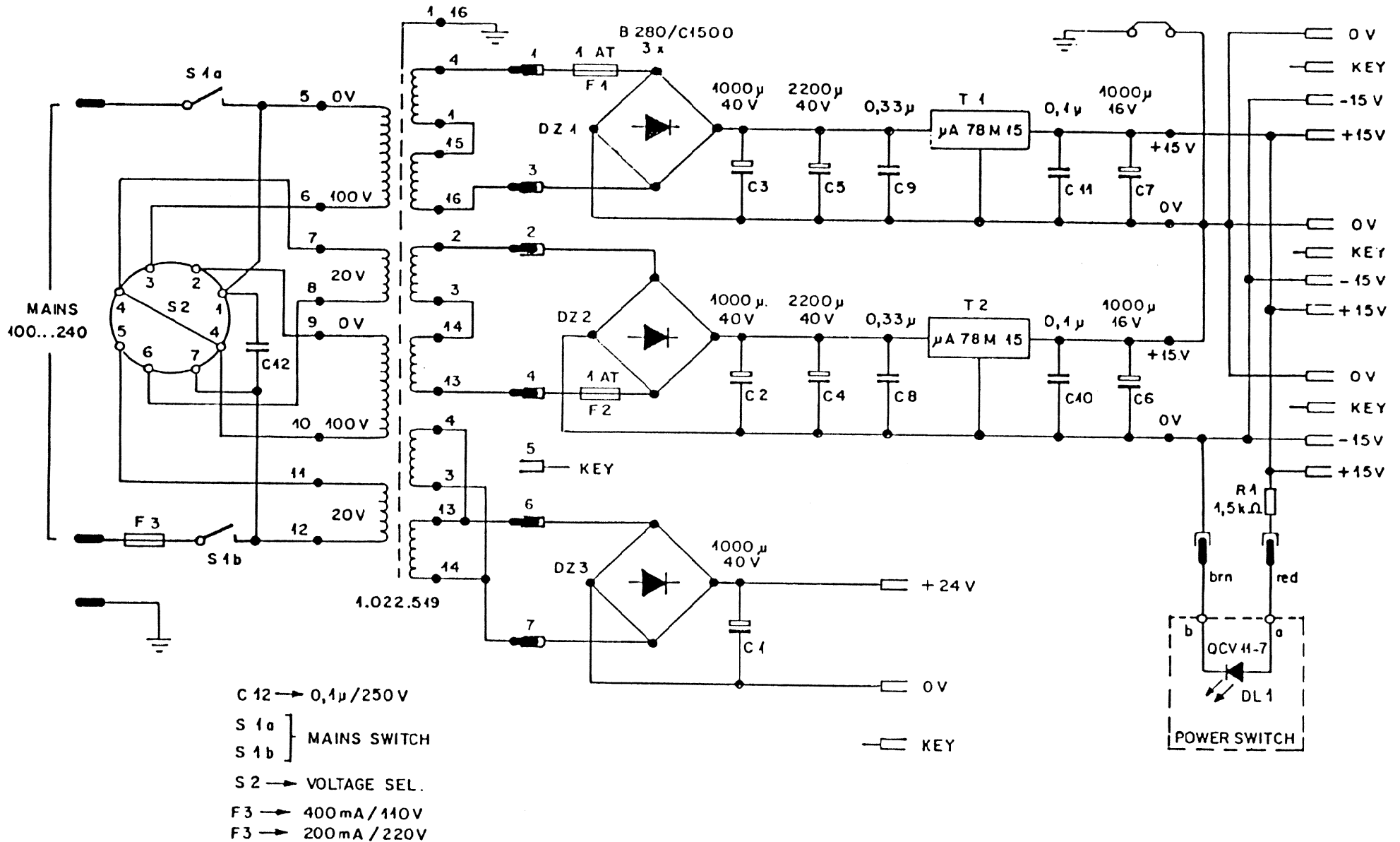
#### Alternative Back Panels for Mounting Frame 1.918.100

- Steel back panel for 15 × XLR sockets (Neutrik) 1.918.113.03

#### Alternative Back Panels for Blank Panels 1.918.100.21

- Aluminium back panel for 6 × XLR sockets (Neutrik) 1.918.100.36
- Aluminium back panel for 1 × Siemens 30/39 pin and 1 × 15pin D-type sockets 20.020.402.00
- Aluminium back panel for 2 × Siemens 30/39 pin sockets 1.918.100.33
- *Mechanical interface Siemens panel → D-type connector: see chapter 2.3.4.*



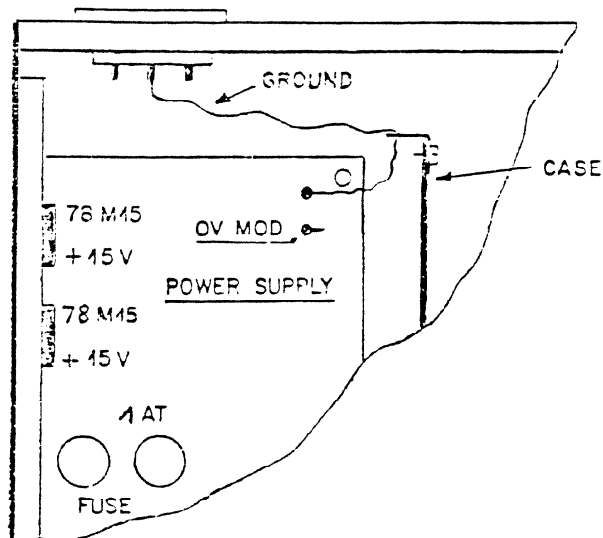
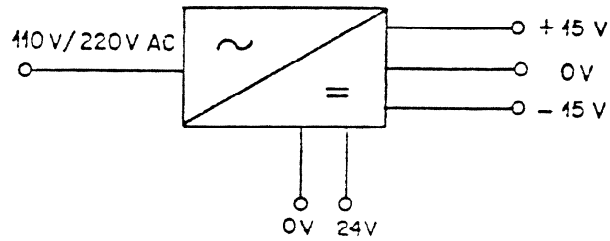


DATE:	9.4.85				REPLACES 4.918.099-84
SIGN:	We				
STUDER REGENSDORF ZURICH	POWER SUPPLY ±15V/24V				1.918.098-00

P O W E R   S U P P L Y   1.918.098

Technical data:

Input	100 ... 240 V AC
Output	±15 V, 0.5A (audio) 24 V, 0.2A (signalling)
Prim.fuse	400 mAT (100 ... 140 V AC) 200 mAT (200 ... 240 V AC)
Sec. fuse	1 AT (± 15 V DC)



1.010.115-51

50.20.0305 (2 x)

1.918.099-01

1.010.081-43

21.01.0353 (6x)  
24.16.4030 (6x)  
35.99.0104

B Drahtbrücke

T4, T2 78M 15C

C1...C3 1000µ 40V  
C4, C5 2200µ 40V  
C6, C7 1000µ 16V  
C8, C9 0,33 µ  
C10, C11 0,1 µ  
R1 1,5 kΩ / 4W

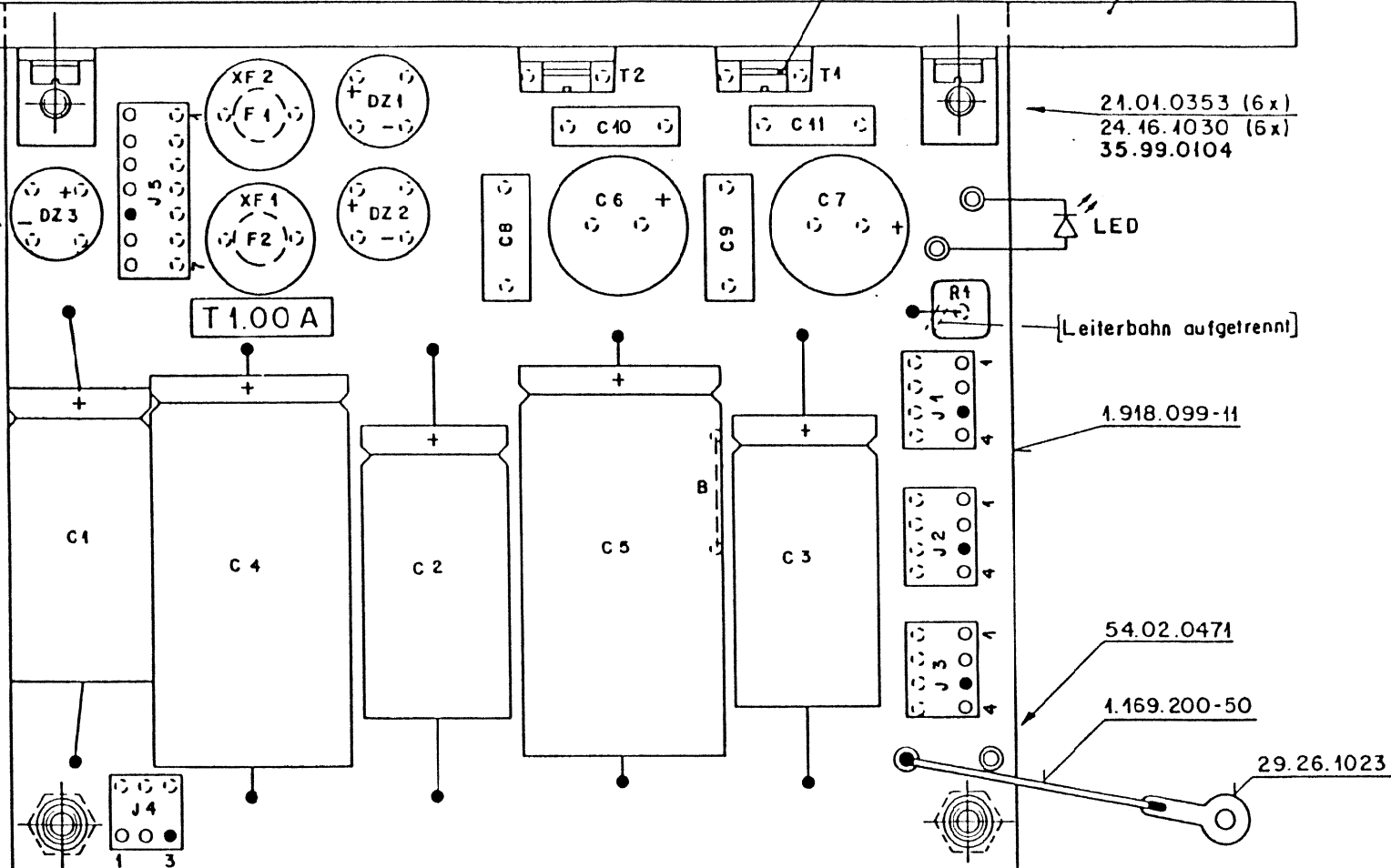
XF1, XF2 5x20 Sicherungshalter  
F1, F2 1 AT

DZ1, DZ2, DZ3 B 250 C1500 Si

J1...J3  
1 +15V  
2 -15V  
3 Key  
4 0V

J4  
1 +24V  
2 0V  
3 Key

J7  
1 20V~  
2 }  
3 } 20V~  
4 }  
5 Key  
6 20V~  
7 20V~



[Leiterbahn aufgetrennt]

1.918.099-11

54.02.0471

1.169.200-50

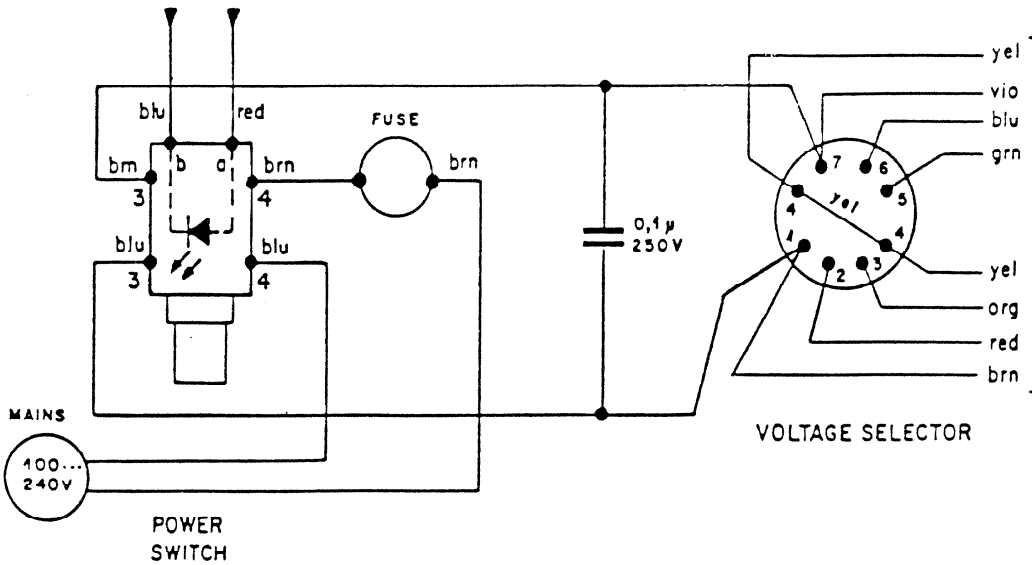
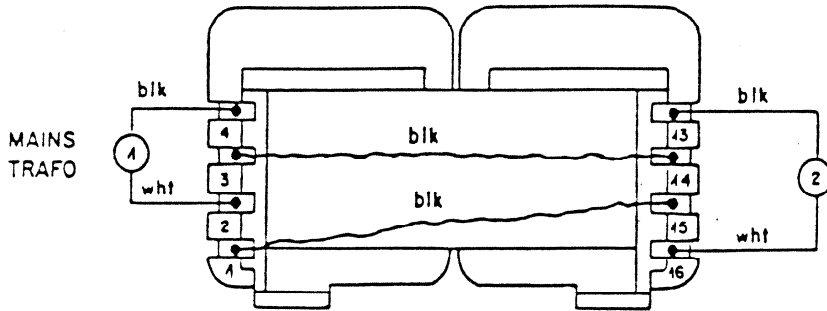
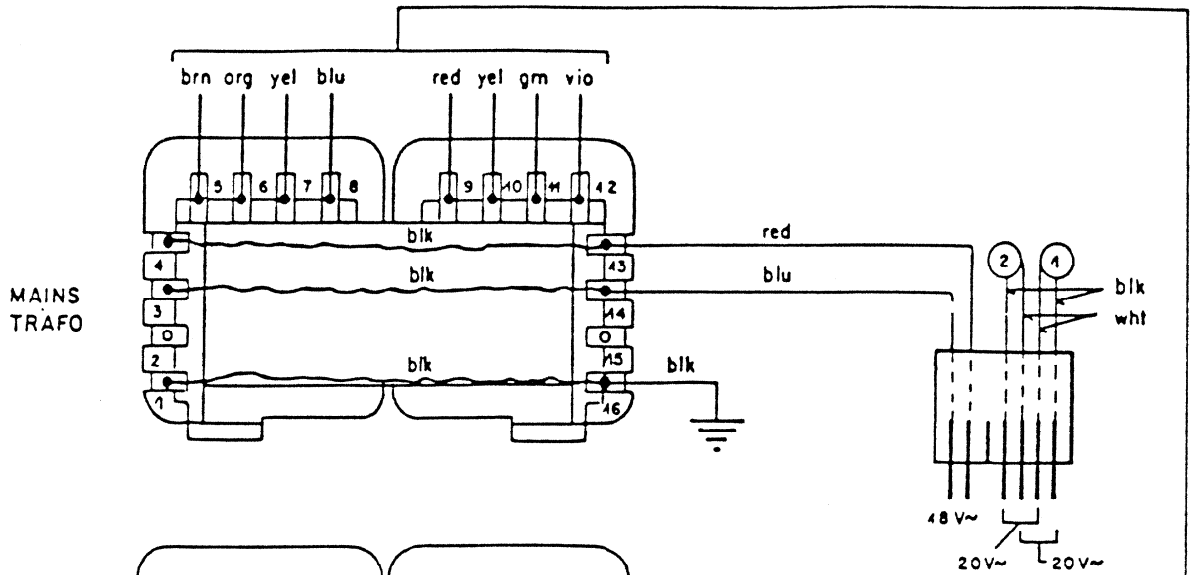
29.26.1023

1.010.041-22

Codierung: Schaltdraht 64.01.0108 Ø0,8x8mm  
(muss 4mm vorstehen)

In Buchsenleiste	J1 in Kontakt	3
" "	J2 " "	3
" "	J3 " "	3
" "	J4 " "	3
" "	J5 " "	5

DATE:	9 4 85					REPLACES 1.918.099-81
SIGN:	We					
STUDER REGENSDORF ZÜRICH	POWER SUPPLY ±15V / 24V					1.918.098

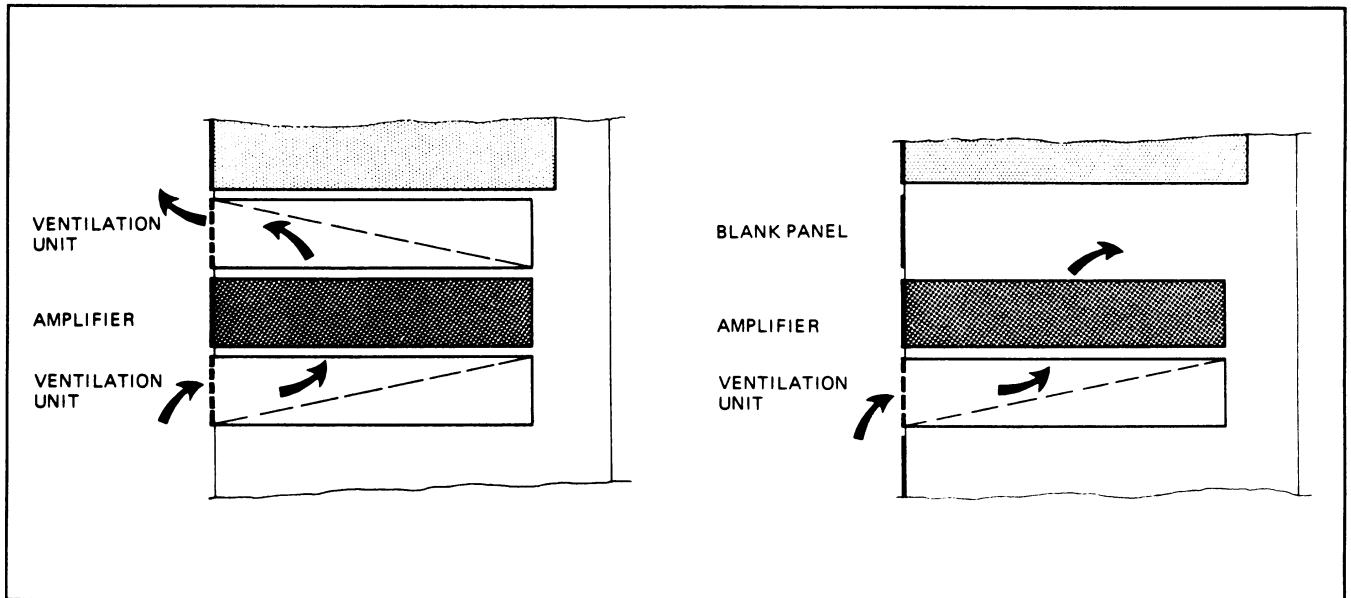


DATE:	6.11.79	25.3.85			
SIGN:	<i>We</i>	<i>We</i>			
<b>STUDER</b> REGENSDORF ZÜRICH	<b>WIRING</b>				1.918.100 1.918.101 1.918.102

### 2.3.2 19" Ventilation Unit/19" Blank Panels

1.918.119/0XX

When filling a cabinet rack with various electronic equipment, considerable heat may be generated, which could be harmful to other nearby components. To provide for sufficient convection cooling, the use of ventilation units above and below the heat-generating equipment is strongly recommended.



A ventilation unit consists of a 19" wide and 1U high sheet metal structure, which extends about 340 mm into the rack. The unit's front section is perforated, with a slanting metal panel mounted inside. By installing the ventilation unit with that panel either slanting upwards or downwards, the air flow can be directed as desired.

If only moderate heat problems have to be coped with, it may be sufficient to use one ventilation unit above or below the heat source, and to provide sufficient spacing from adjacent equipment by installing a 1U blank panel on the opposite side.

#### Ordering Information:

##### 19" Ventilation Units

- Ventilation unit 19"/1U 1.918.119.xx
- Ventilation unit without air guide panel 1.918.119.09

##### 19" Blank Panels

- Blank panel 19"/1U high, anodized finish 1.918.001.xx
- Blank panel 19"/2U high, anodized finish 1.918.002.xx
- Blank panel 19"/3U high, anodized finish 1.918.003.xx
- Blank panel 19"/1U high, plastic coated, grey 1.918.001.09
- Blank panel 19"/2U high, plastic coated, grey 1.918.002.09
- Blank panel 19"/3U high, plastic coated, grey 1.918.003.09
- Blank panel 19"/1U high, paint finish, grey 1.918.011.xx
- Blank panel 19"/2U high, paint finish, grey 1.918.012.xx
- Blank panel 19"/3U high, paint finish, grey 1.918.013.xx

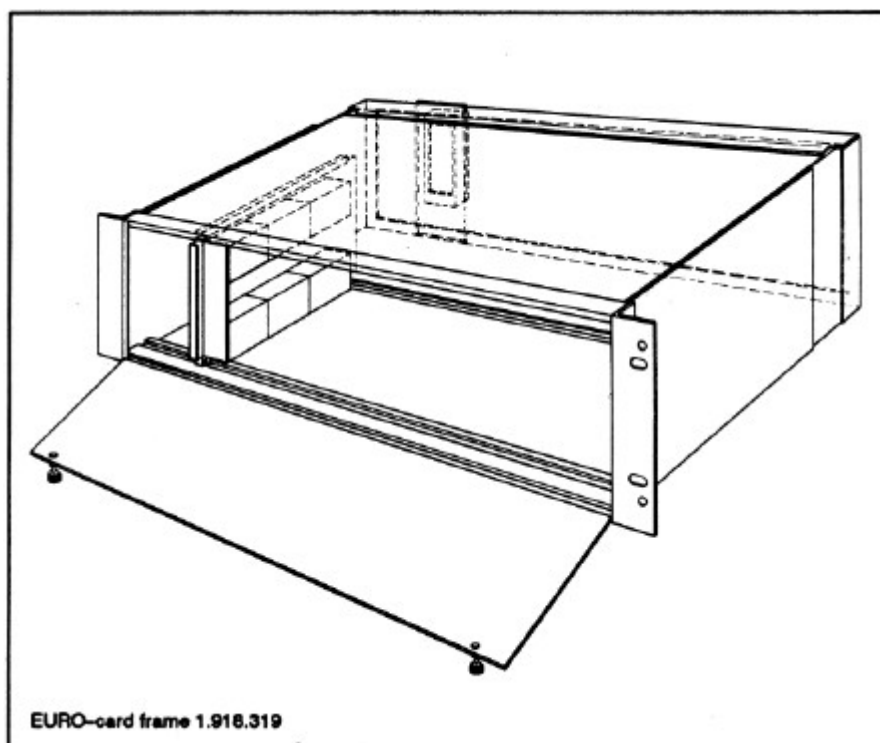
### 2.3.3 19" Euro-Card Mounting Frames

1.918.318/319

The Euro-card mounting frame (sometimes also referred to as 19" Sub Rack) is an empty structure which fits into any standard 19" rack. It is intended to accommodate PCBs of the Euro format vertically, side by side. The available space within the sub rack is divided into 84 Modular Widths, each measuring 5.08 mm (0.2 inches). One Euro-card usually occupies 7 M (Module) widths, thus up to 12 Euro-cards may be installed.

The Euro-card frame is supplied as a kit for assembly by the user. Assembly instructions are included with each kit.

Supplied with the kit is a hinged front panel of anodized aluminium, providing quick access to the plug-in PCBs if required. This front panel and its hinges are available separately in case a damaged panel or hinge needs to be replaced.



Separate edge connectors and slide rails are required for each Euro-card and power supply unit installed into the Euro-card frame. Mounting kits containing the slide rails, edge connectors, and other accessories are described below (1.918.315/316).

To provide for convection cooling within an equipment rack, the Ventilation Unit 1.918.119.xx is recommended.

#### **Euro-Card Racks, Ordering Information:**

- Euro-card frame (19"/3U, ELMA), direct access to 32pin connectors on back panel 1.918.318.xx
- Euro-card frame (19"/3U, ELMA) with additional rear panel, for max. 10 freely assignable connector panels 1.918.319.xx

### 2.3.4 19" Euro-Card Mounting Accessories

#### Euro-Card Mounting Kit

For installing Euro-cards and/or a power supply unit into a Euro-card frame 1.918.318/319, suitable edge connectors and guide rails are required.

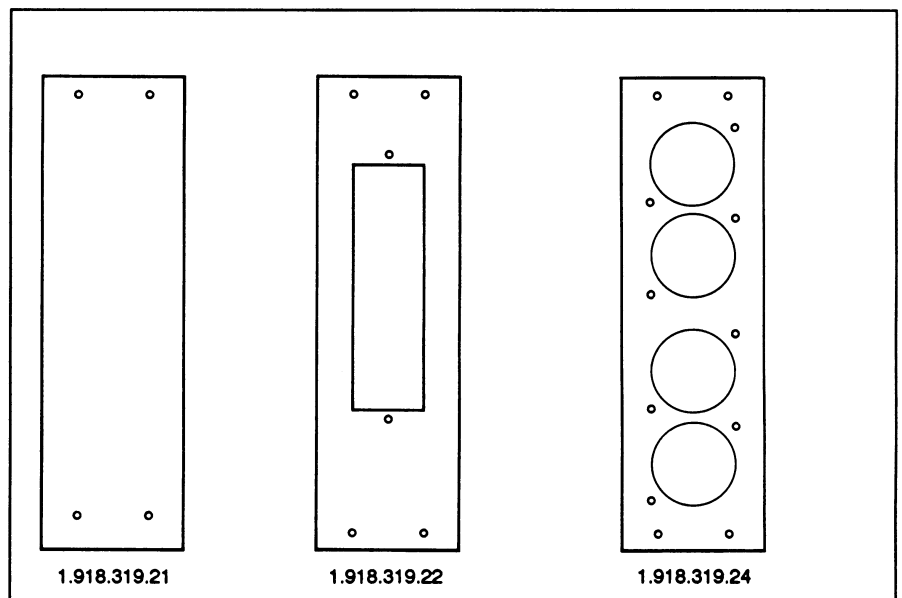


#### Euro-Card Mounting Kit, Ordering Information:

- Mounting kit for 1 Euro-card (ELMA rack); see photograph 1.918.315.xx
- Mounting kit for power supply 1.915.100 1.918.316.xx

#### Connector Panels:

The connector panels fit into the Euro-card frame with back panel (1.918.319). Please order the suitable panels separately.

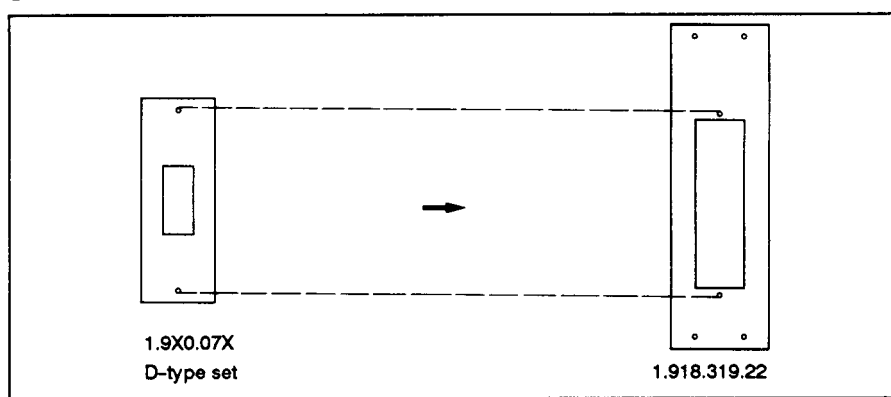


**Connector Panel (3U high) Ordering Information:**

- |  |              |
|--|--------------|
| • Blank panel  | 1.918.319.21 |
| • Panel for Siemens connector (cut out 18 × 67 mm) * | 1.918.319.22 |
| • Panel for mains inlet and 2 banana sockets         | 1.918.319.23 |
| • Panel for 4 XLR sockets                            | 1.918.319.24 |

- \* **Siemens Connector Sets:** Including male and female connector:
- |  |              |
|--|--------------|
| – Siemens 30pin, without connector panel | 1.900.080.xx |
| – Siemens 39pin, without connector panel | 1.900.081.xx |

- \* **D-Type Adapter Panels:** The Siemens connector panel can be used as a base for mounting a D-type connector adapter panel. The adapter sets listed below include male and female connectors, connector cover, bolting spring, clamp, and adapter panel:

**Adapter Panel Ordering Information:**

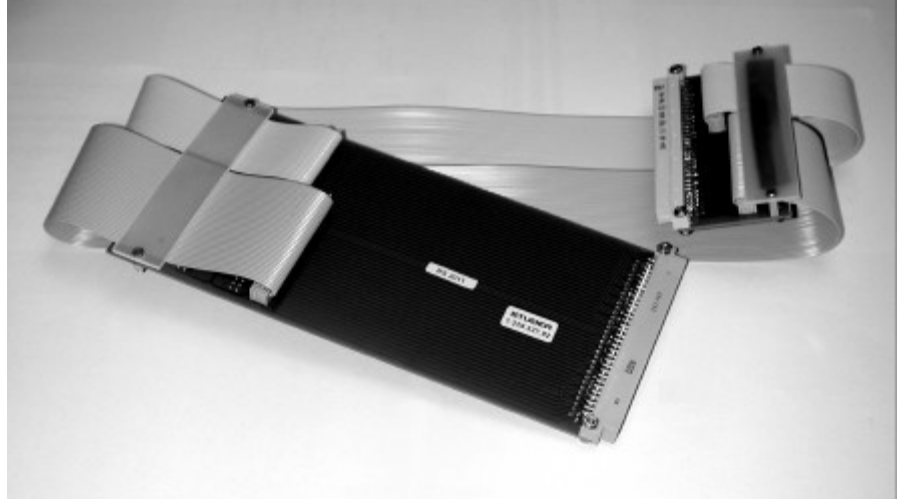
The adapter kits consist of male and female D-type connector, metal or plastic connector cover, adapter panel, and mounting hardware, to fit on the Siemens connector panels 1.918.319.22 (for 3U frames) or 1.918.100.33 (for 1U frames):

- |  |              |
|--|--------------|
| – D-type set, 9pin, metal connector cover    | 1.900.075.xx |
| – D-type set, 15pin, metal connector cover   | 1.900.076.xx |
| – D-type set, 25pin, metal connector cover   | 1.900.077.xx |
| – D-type set, 37pin, metal connector cover   | 1.900.078.xx |
| – D-type set, 50pin, metal connector cover   | 1.900.079.xx |
| – D-type set, 9pin, plastic connector cover  | 1.970.075.xx |
| – D-type set, 15pin, plastic connector cover | 1.970.076.xx |
| – D-type set, 25pin, plastic connector cover | 1.970.077.xx |
| – D-type set, 37pin, plastic connector cover | 1.970.078.xx |
| – D-type set, 50pin, plastic connector cover | 1.970.079.xx |



**Extension Board:**

For alignment and repair, a Euro-card may have to be operated outside the mounting frame. To facilitate any service work that has to be performed on individual cards, extending the card's 32 electrical connections is possible by means of a flexible extension board.



**Ordering Information:** Extension PCB for Euro-cards, 2 × 32pin, flexible

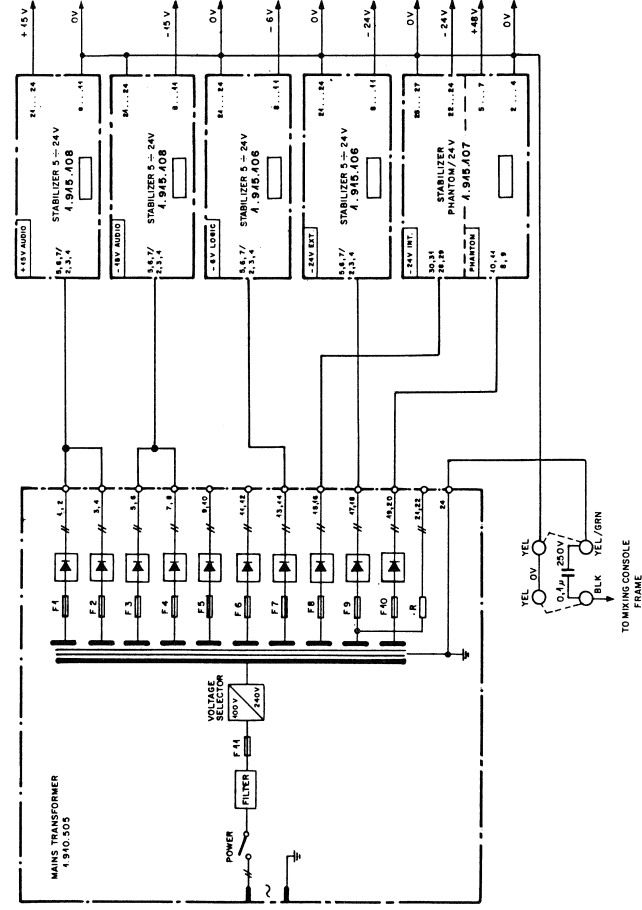
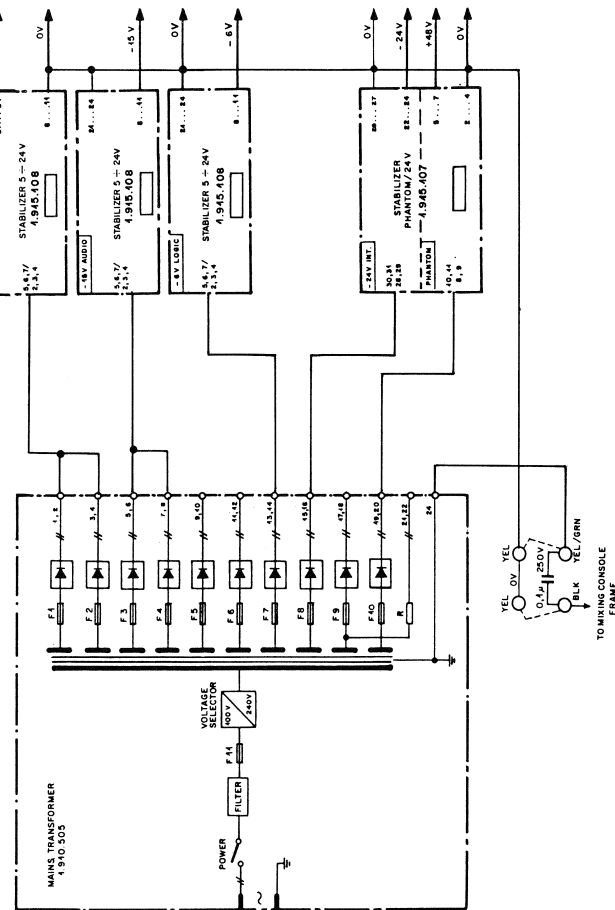
1.228.327.82

7 Europe PCB + Power supply

1.970.101/102

Power Supply

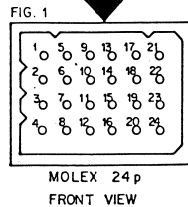
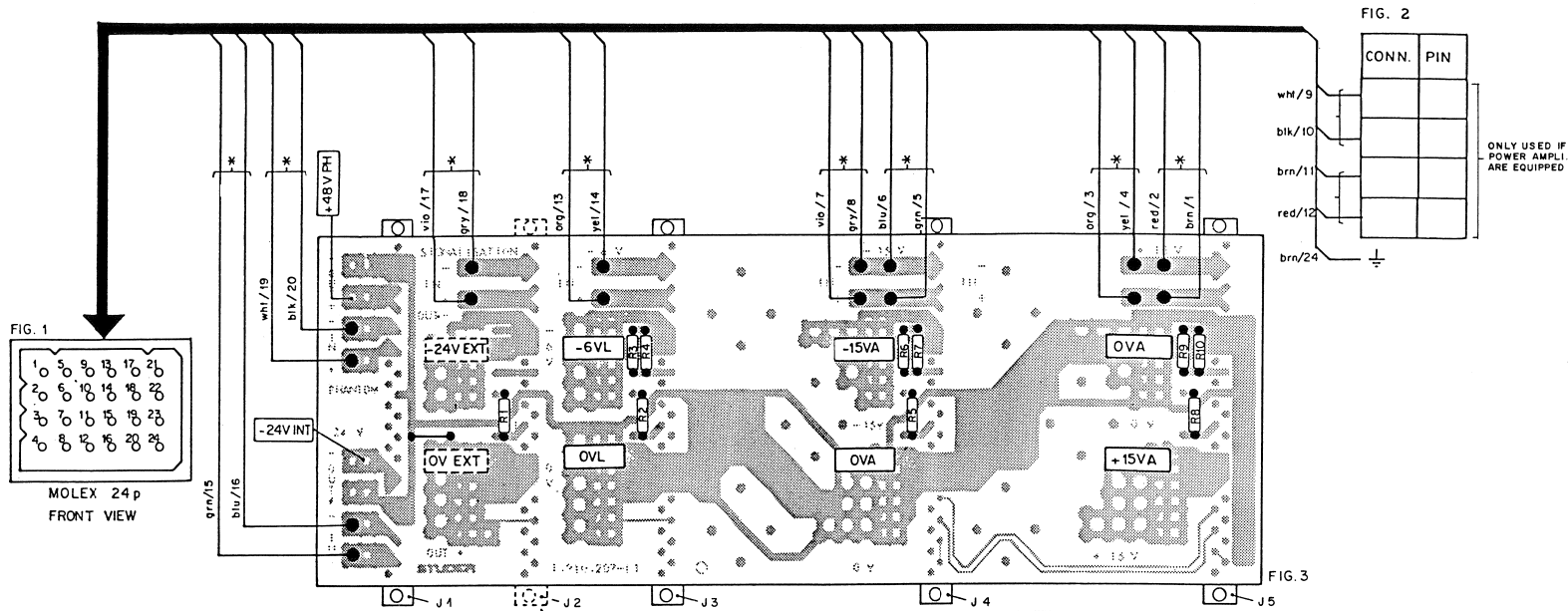
1.970.101



① 3. 7. 87 We			
STUDER REGENSDORF ZÜRICH	POWER SUPPLY 970 AUDIO CONSOLE	SC 1.970.101	

① 3. 7. 87 We			
STUDER REGENSDORF ZÜRICH	POWER SUPPLY 970 AUDIO CONSOLE	SC 1.970.102	

Power Supply 1.970.101/102



MOLEX PIN	COLOR	WIRED TO	* = TWISTED	NAME
1	brn	J5/5,6,7	*	INP +15V STAB.
2	red	J5/2,3,4	*	INP +15V STAB.
3	org	J5/5,6,7	*	INP +15V STAB.
4	yel	J5/2,3,4	*	INP +15V STAB.
5	grn	J4/5,6,7	*	INP -15V STAB.
6	blu	J4/2,3,4	*	INP -15V STAB.
7	vio	J4/5,6,7	*	INP -15V STAB.
8	grv	J4/2,3,4	*	INP -15V STAB.
9	whl	SEE FIG. 2	*	INP. PWR. AMP. 1+
10	blk	SEE FIG. 2	*	INP. PWR. AMP. 1-
11	brn	SEE FIG. 2	*	INP. PWR. AMP. 2+
12	red	SEE FIG. 2	*	INP. PWR. AMP. 2-
13	org	J3/5,6,7	*	INP. -6V STAB.
14	yel	J3/2,3,4	*	INP. -6V STAB.
15	grn	J1/30,31	*	INP. -24V STAB.
16	blu	J1/28,29	*	INP. -24V STAB.
17	vio	J2/5,6,7	*	INP. -24V STAB.
18	grv	J2/2,3,4	*	INP. -24V STAB.
19	whl	J1/10,11	*	INP. +48V STAB.
20	blk	J1/8,9	*	INP. +48V STAB.
21	brn	(TRAF0 2/23)	*	PWR. ON REL. T2
22	red	(TRAF0 2/24)	*	PWR. ON REL. T2
23				
24	brn	CASE		CASE

TAB. 1

ONLY USED IF GROUP-CH ARE EQUIPPED WITH BAR-GRAPH-METERS (POWER SUPPLY 4.963.102)

POS.	PART NO.	VALUE	SPECIFIC.
R1	57.11.4122	1k2	2%
R2	57.11.3332	3k3	1%
R3	57.11.4471	470	2%
R4	57.11.3332	3k3	1%
R5	57.11.3472	4k7	1%
R6	57.11.3472	4k7	1%
R7	57.11.3104	100k	1%
R8	57.11.3472	4k7	1%
R9	57.11.3472	4k7	1%
R10	57.11.3104	100k	1%

TAB. 2

POWER SUPPLY 4.963.101  
 J 1 EQUIPPED WITH STABILIZER 4.945.107  
 J 2 NOT USED  
 J 3  
 J 4 EQUIPPED WITH STABILIZER 4.945.108  
 J 5

POWER SUPPLY 4.963.102  
 J 1 EQUIPPED WITH STABILIZER 4.945.107  
 J 2 EQUIPPED WITH STABILIZER 4.945.106  
 J 3  
 J 4 EQUIPPED WITH STABILIZER 4.945.108  
 J 5

ONLY USED IF POWER AMPLI. ARE EQUIPPED

Trafoblock mit Gleichrichter

1.910.50X

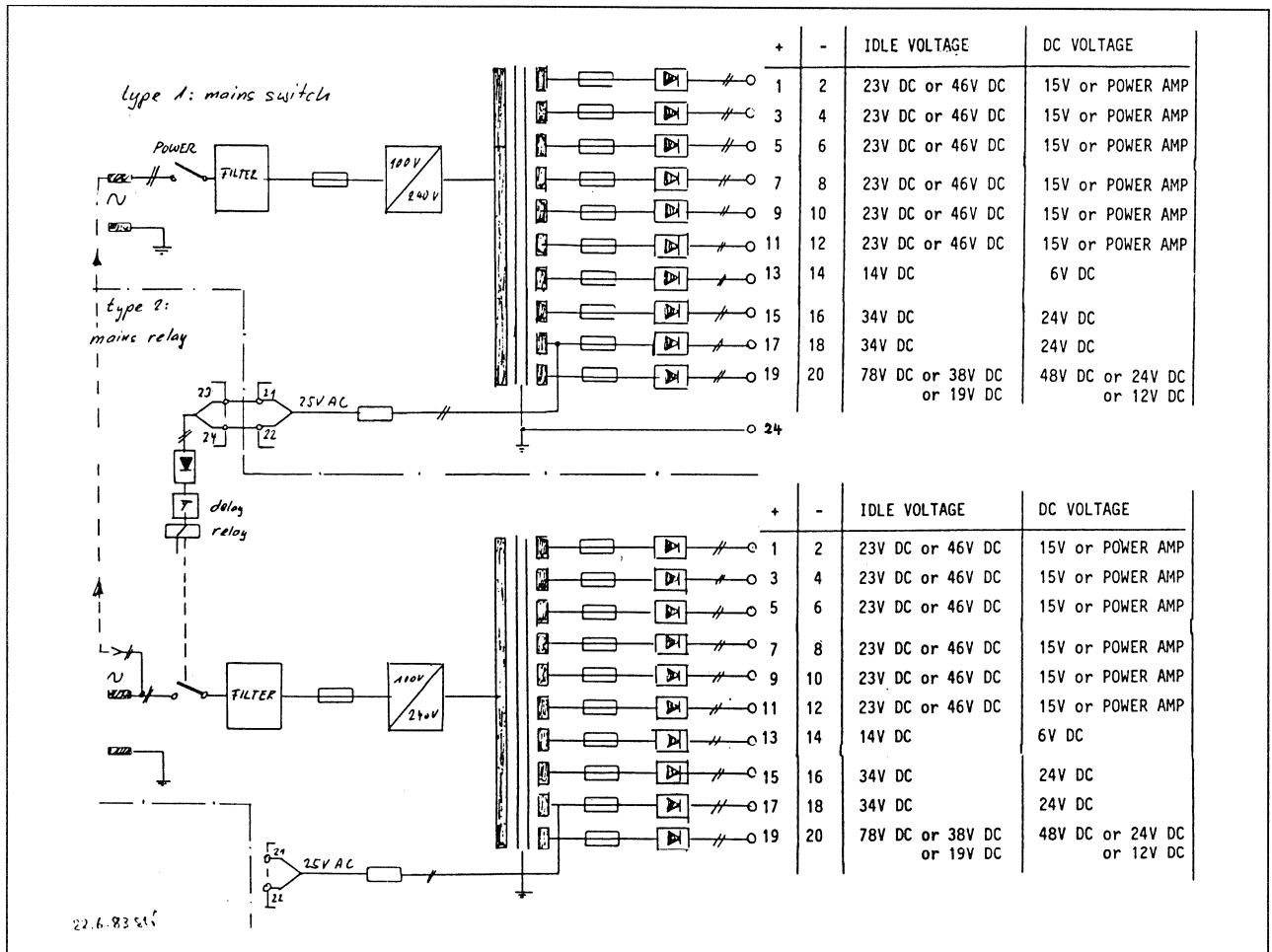
Trafoblock mit Gleichrichter. Es bestehen zwei Grundausführungen:

- mit Netzschalter
- mit Netzrelais

1. Beschreibung

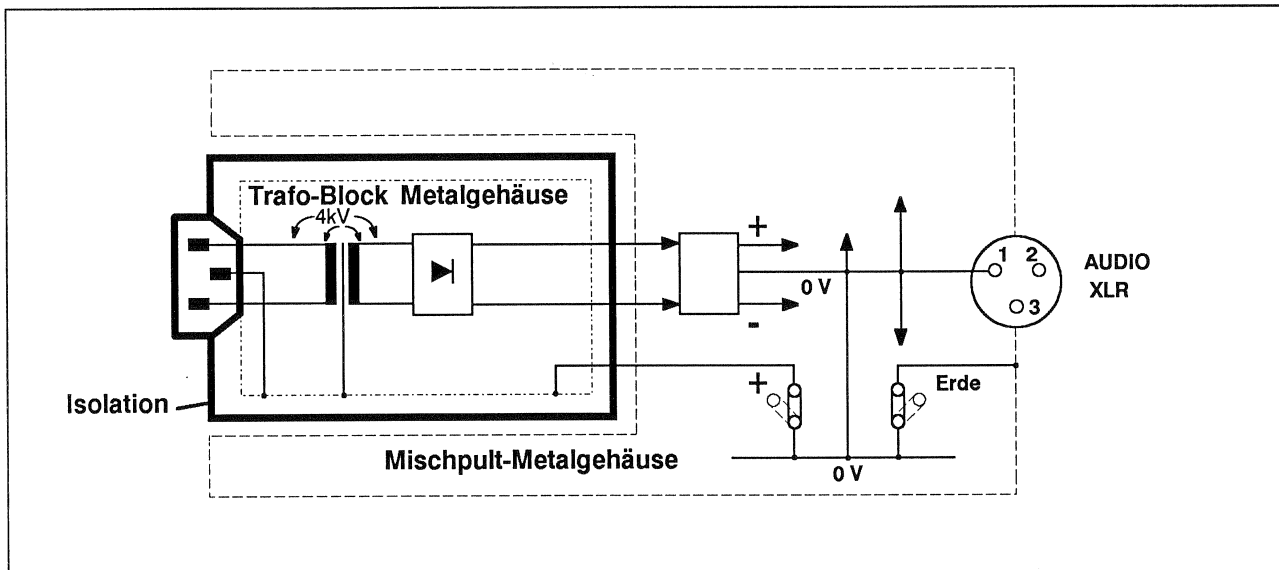
- Die Ausgangsspannungen sind programmierbar.
- Die Gleichrichter sind stark überdimensioniert.
- Die Sekundärseite ist mit 4 kV Prüfspannung von der Primärseite isoliert.
- Der Trafoblock ist allseitig geschlossen und liegt isoliert im Mischpult.
- Alle Primär- und Sekundärspannungen sind einzeln abgesichert.

Blockschaltbild



## 2. Sicherheit

Der Trafoblock ist aufgebaut wie ein schutzisoliertes Gerät nach IEC 65, Klasse II. Als zusätzliche Sicherheit wird der Endleiter eingeführt. Der Trafoblock 1.910.50X ist im Mischpult isoliert eingebaut, so dass die Verbindung zwischen Schutzleiter und Mischpultgehäuse gefahrlos aufgetrennt werden kann.



## 3. Spezielle Daten

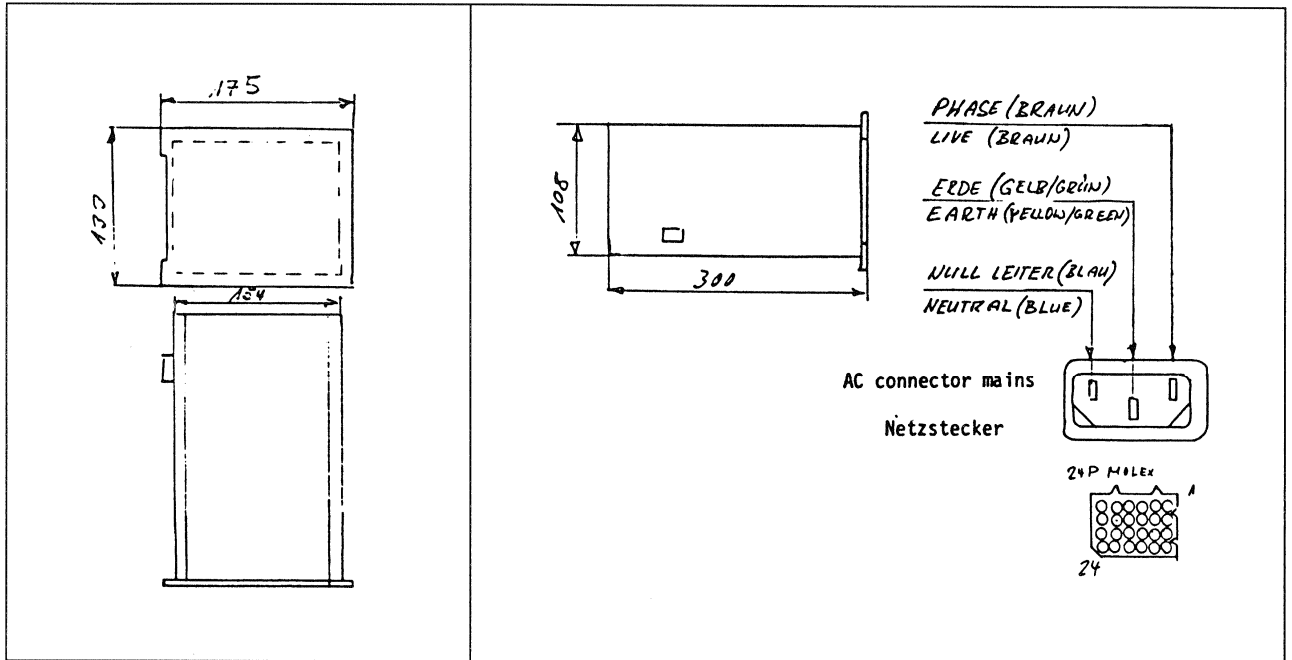
Siehe unter spezielle Datenblätter

1.910.500
1.910.505

## 4. Mechanische Daten

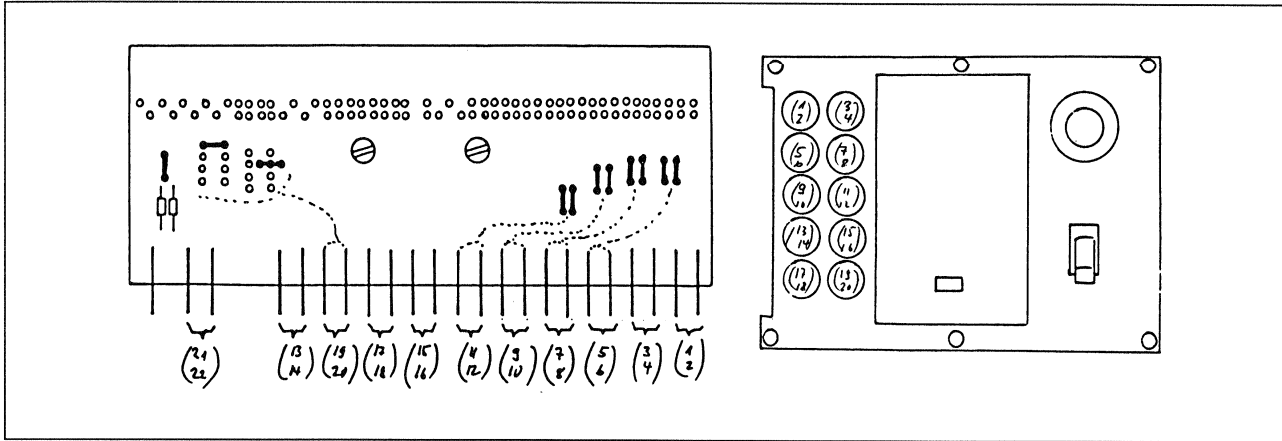
Sekundär Buchse: 24P Molex

Gewicht: 9400 gr



Trafoblock

1.910.50X



Trafoblock

TRAFO BLOCK				TRAFO BLOCK			
Grenzwerte:	Einzel Stabikarte		Limiting values	SINGLE STABI PC			
	max. Strom	Sicherung		max. current	FUSE		
6V Wicklung (13)	4A	T 5A	6V winding (13)	4A	T 5A		
(14)			6V winding (14)				
12V Wicklung (19)	2,4A	T 5A	12V winding (19)	2,4A	T 5A		
24V Wicklung (20)			24V winding (20)				
48V Wicklung (19)	0,6A	T 2A	48V winding (19)	0,6A	T 2A		
15V Wicklung (20)			15V winding (20)				
24V Wicklung	2,1A	T 5A	24V winding	2,1A	T 5A		
40V Wicklung	1,2A	T 5A	40V winding	1,2A	T 5A		
	1,2A	T 2A	40V winding	1,2A	T 2A		

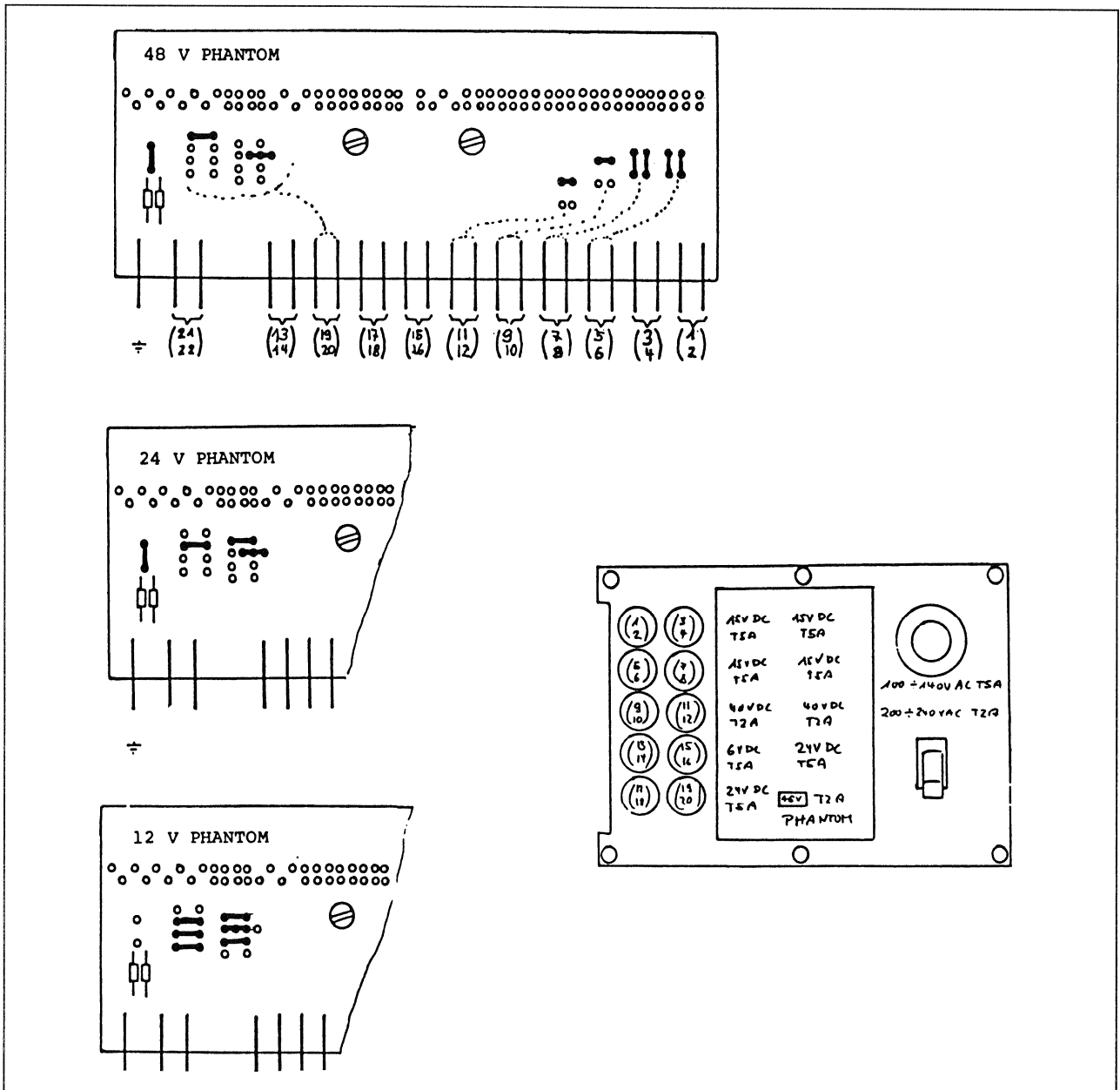
Grenzwerte:	Doppel Stabikarte		Limiting values	DUAL STABI PC		parallel schalten parallel connection
	max. Strom	Sicherung		max. current	FUSE	
6V Wicklung (13)	8A	2 x T 5A	6V winding (13)	8A	2 x T 5A	
(14)			6V winding (14)			
12V Wicklung (19)	5A	2 x T 4A	12V winding (19)	5A	2 x T 4A	
24V Wicklung (20)			24V winding (20)			
48V Wicklung	4-5 A	2 x T 4A	48V winding	4-5A	2 x T 4A	(1), (3), (5), (7), (9), (11)
15V Wicklung			15V winding			
24V Wicklung	2,5 A	-	24V winding	2,5A	-	
40V Wicklung	-	-	40V winding	-	-	

- Die maximale Belastung darf auf der gleichgerichteten Seite 350W nicht überschreiten.

Trafoblock

1.910.500.81

1.910.500.81    1 x 6 V DC                    2 x 24 V DC  
                          2 x 15 V DC  
                          4 x 40 V DC                    1 x 48 V DC PHANTOM



**Umbau auf andere Phantomspannungen**

- Trafo-Block umbauen
- Widerstände auf dem Anschlussprint der Eingangseinheit ändern
  - 48V 6,8 kOhm/0,4 %                    1.169.200.21
  - 24V 4,3 kOhm/0,4 %                    Entwurf IEC 268-15A
  - 12V 580 Ohm/0,4 %                    1.169.200.20
- Stabilisatorkarte 1.915.107 Litze umstecken



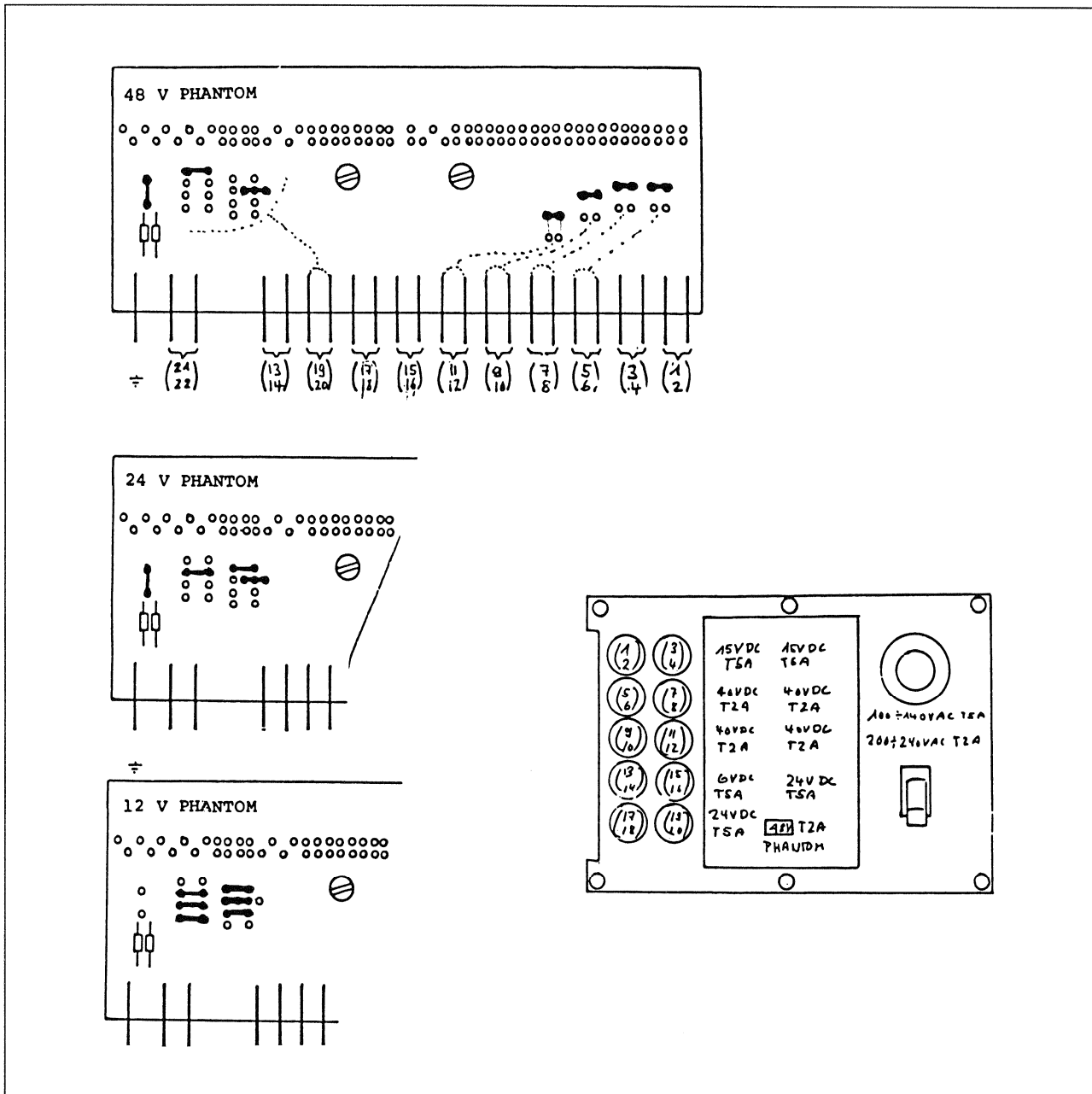
Trafoblock

1.910.505.81

1.910.505.81

1 x 6 V DC  
4 x 15 V DC  
2 x 40 V DC

2 x 24 V DC  
1 x 48 V DC PHANTOM



Umbau auf andere Phantomspannungen

- Trafo-Block umbauen
- Widerstände auf dem Anschlussprint der Eingangseinheit ändern
  - 48V 6,8 kOhm/0,4 % 1.169.200.21
  - 24V 4,3 kOhm/0,4 % Entwurf IEC 268-15A
  - 12V 580 Ohm/0,4 % 1.169.200.20
- Stabilisatorkarte 1.915.107 Litze umstecken

Mains Trafo Block

1.910.50X

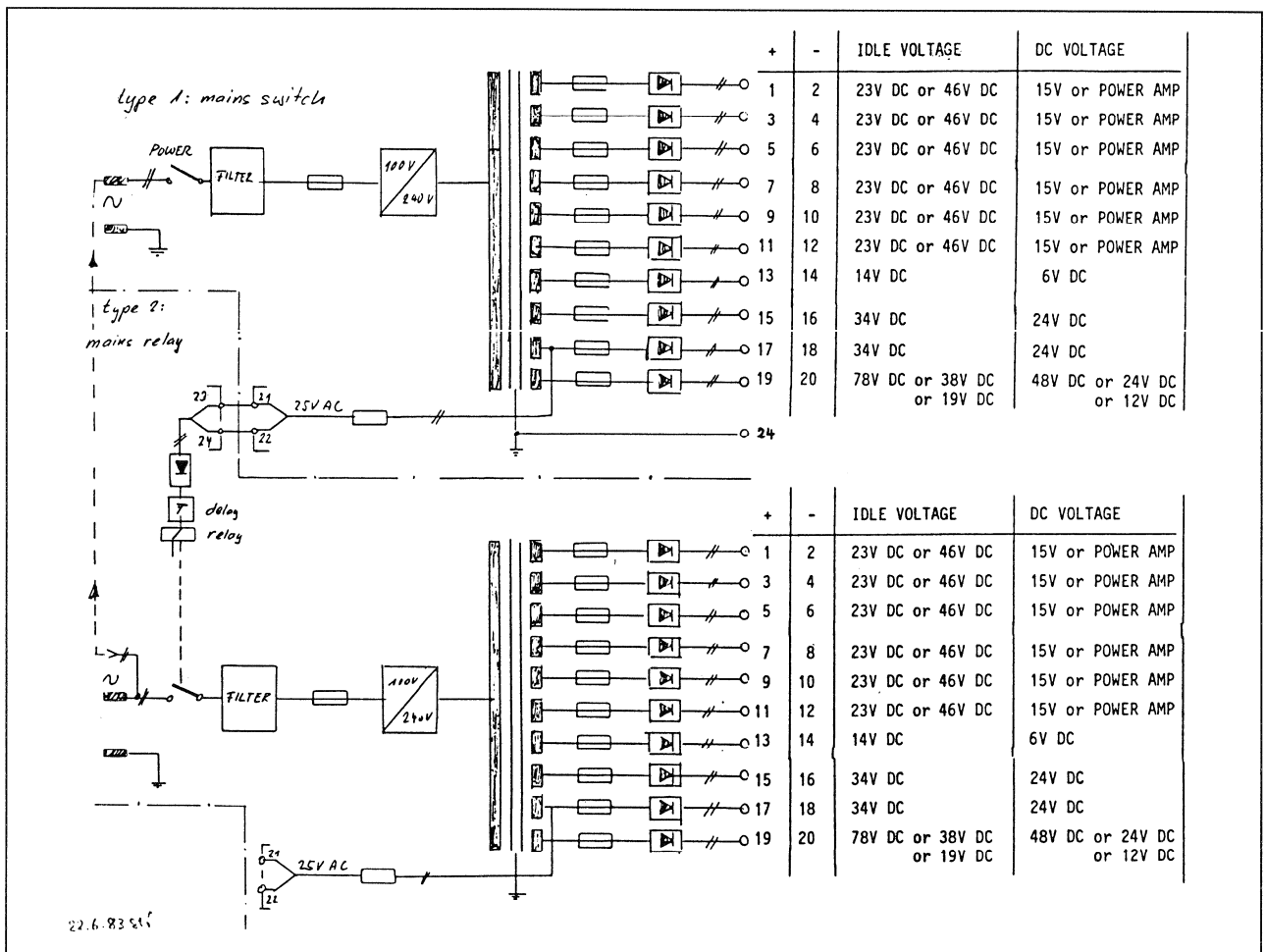
Trafo with rectifier. Two basic types are available:

- with mains switch
- with mains relay

1. Features

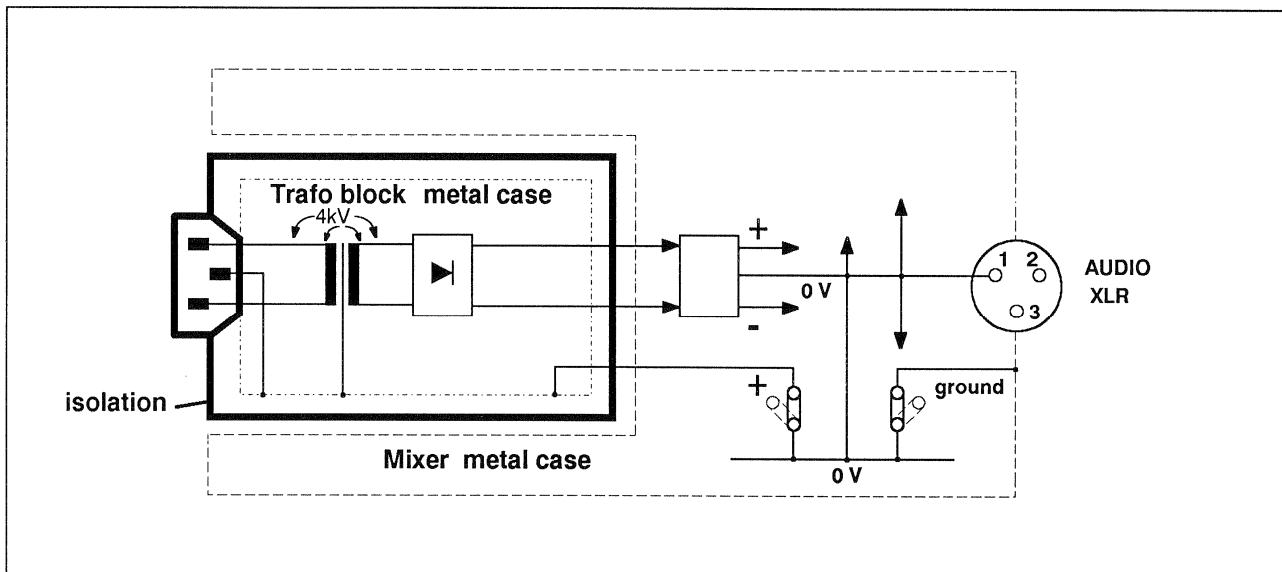
- Output voltages are programmable.
- Rectifiers are heavily oversized.
- Secondary windings are isolated by 4 kV against the primary side.
- The trafo-block is separately boxed and fixture by means of isolators.
- All voltages are protected by fuses individually.

Block Diagram



## 2. Safety

The trafo-block is built like a double-isolated electric device (IEC 65 clause II). For improved safety, the connection to earth is also wired. In the mixer, the trafo-block 1.910.50X is built-in isolated. On the back side of the mixer the connection between earth and ground can be opened without the danger of an electric shock.



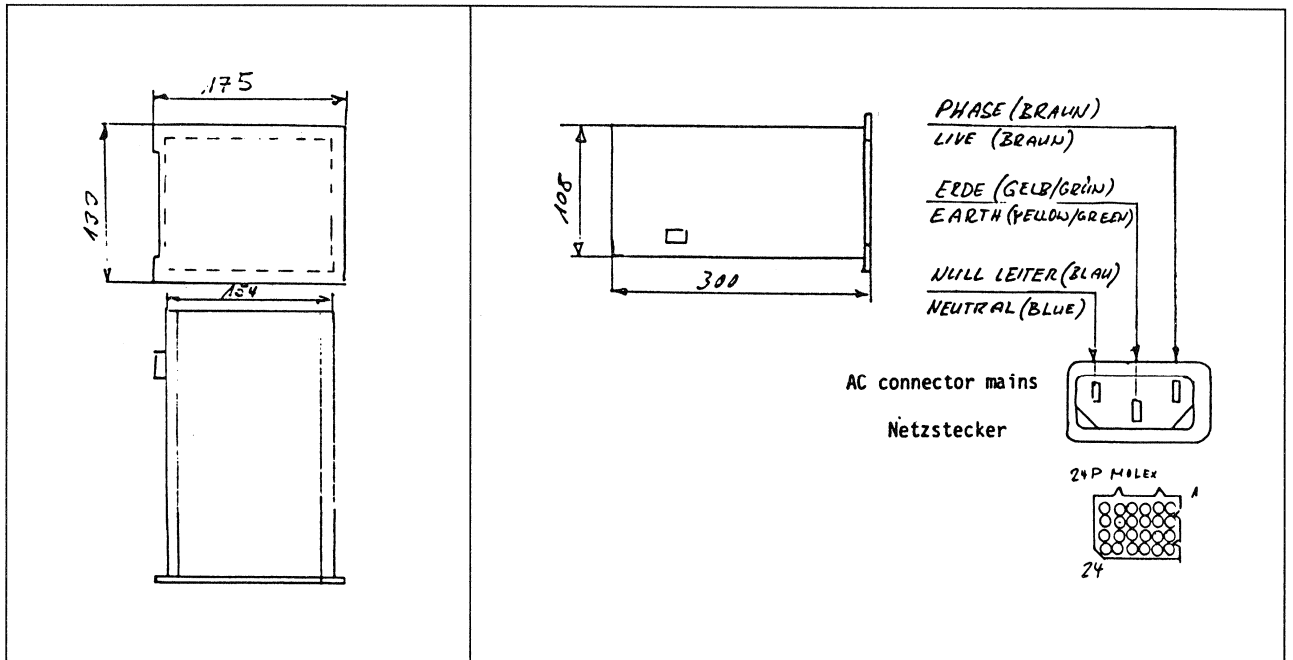
## 3. Specifications

See special data sheet      1.910.500  
   1.910.505

## 4. Dimensions

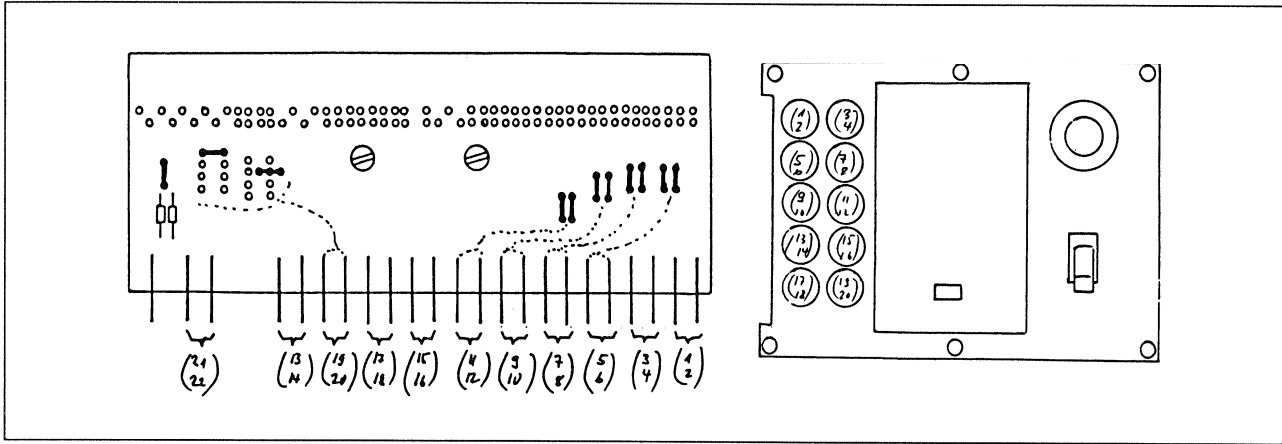
Secondary connector: 24P Molex

Weight: 9400 gr



Trafo Block

1.910.50X



Trafo Block

TRAFO BLOCK				TRAFO BLOCK			
Grenzwerte:	Einzel Stabikarte max. Strom	Sicherung	Limiting values	SINGLE STABI max. current	PC FUSE		
6V Wicklung (13) (14)	4A	T 5A	6V winding (13) (14)	4A	T 5A		
12V Wicklung } (19)	2,4A	T 5A	12V winding } (19)	2,4A	T 5A		
24V Wicklung } (20)	1,2A	T 5A	24V winding } (20)	1,2A	T 5A		
48V Wicklung }	0,6A	T 2A	48V winding }	0,6A	T 2A		
15V Wicklung	2,1A	T 5A	15V winding	2,1A	T 5A		
24V Wicklung	1,2A	T 5A	24V winding	1,2A	T 5A		
40V Wicklung	1,2A	T 2A	40V winding	1,2A	T 2A		

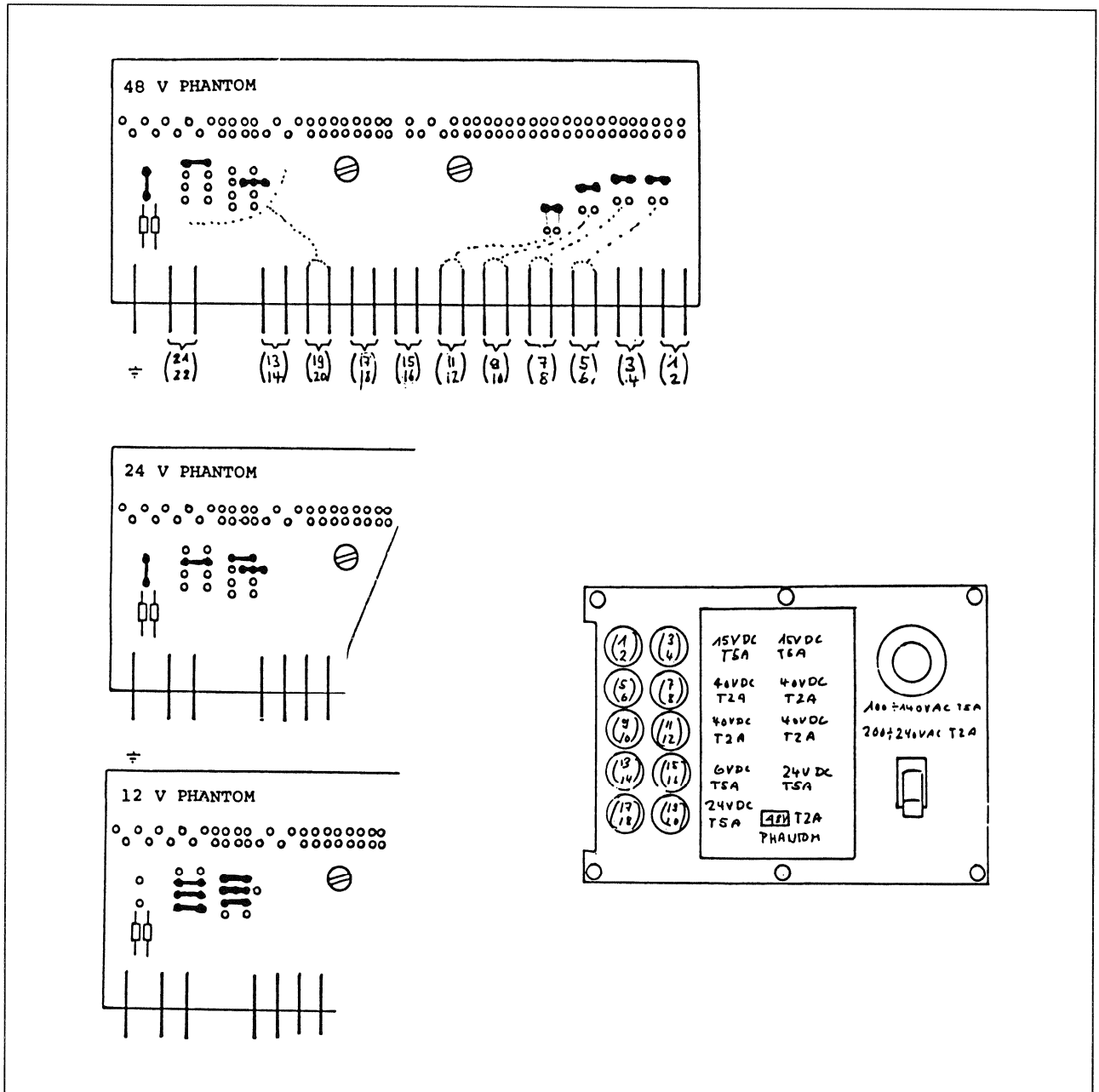
Grenzwerte:	Doppel Stabikarte max. Strom	Sicherung	Limiting values	DUAL STABI max. current	PC FUSE	parallel schalten parallel connection
6V Wicklung (13) (14)	8A	2 x T 5A	6V winding (13) (14)	8A	2 x T 5A	$(\frac{1}{2})(\frac{3}{4})/(\frac{5}{6})(\frac{7}{8})/(\frac{9}{10})(\frac{11}{12})$
12V Wicklung }	5A	2 x T 4A	12V winding }	5A	2 x T 4A	
24V Wicklung } (19) (20)			24V winding } (19) (20)			
48V Wicklung }			48V winding }			
15V Wicklung	4-5 A	2 x T 4A	15V winding	4-5A	2 x T 4A	
24V Wicklung	2,5 A		24V winding	2,5A		
40V Wicklung	-	-	40V winding	-	-	

- The maximum load should not exceed 350 W on the rectifier side.

Trafo Block

1.910.500.81

1.910.500.81    1 x 6 V DC                    2 x 24 V DC  
                          2 x 15 V DC  
                          4 x 40 V DC                    1 x 48 V DC PHANTOM



Conversion of phantom powering

- Convert trafo-block
- Change resistor on the connection PCB of the input unit
  - 48V 6,8 kOhm/0,4 %
  - 24V 4,3 kOhm/0,4 %
  - 12V 580 Ohm/0,4 %
- Reconnect the stranded wire on the stabilizer PCB 1.915.107

1.169.200.21  
 Draft IEC 268-15A  
 1.169.200.20

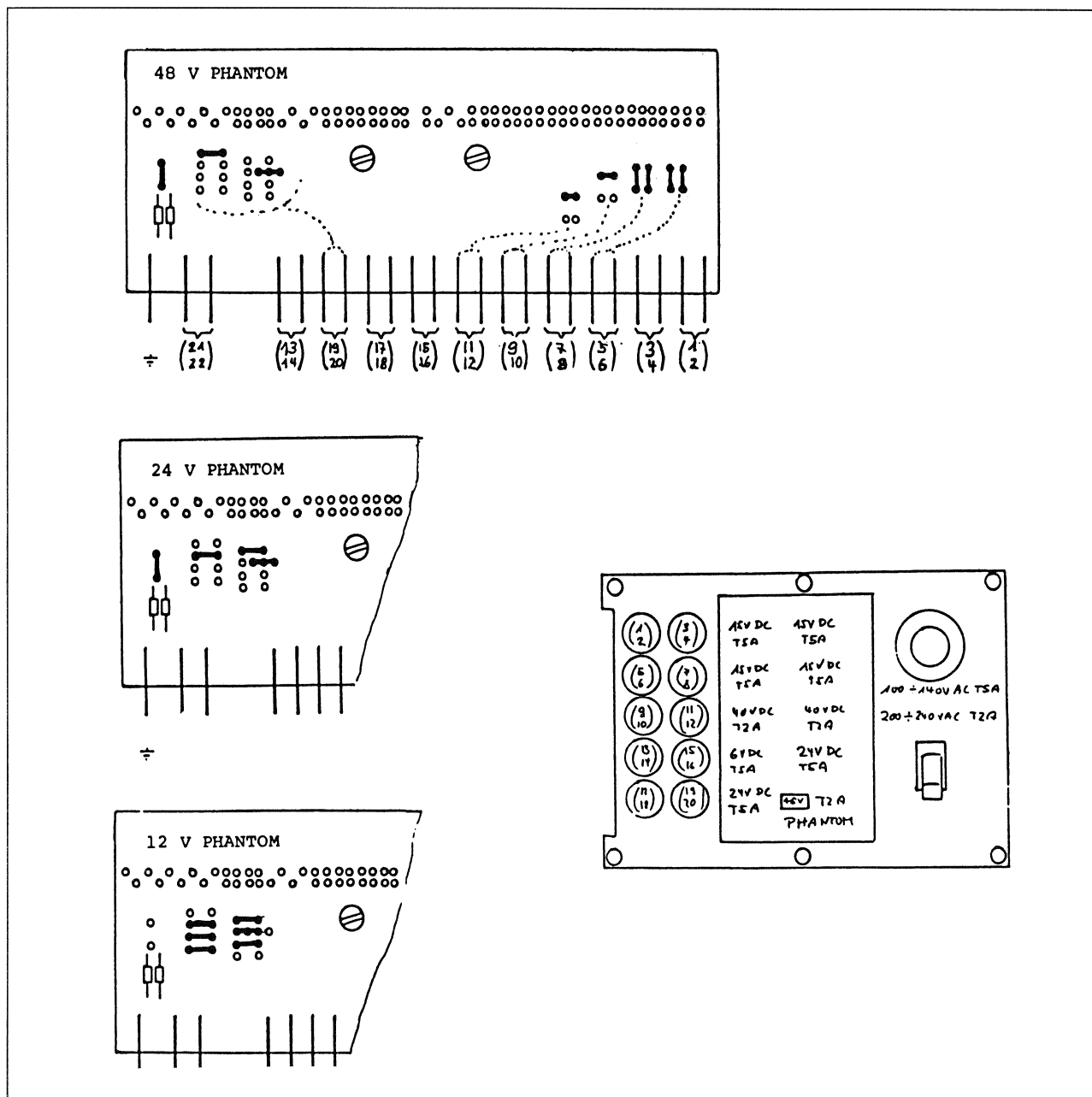
Trafo Block

1.910.505.81

1.910.505.81

1 x 6 V DC  
4 x 15 V DC  
2 x 40 V DC

2 x 24 V DC  
1 x 48 V DC PHANTOM



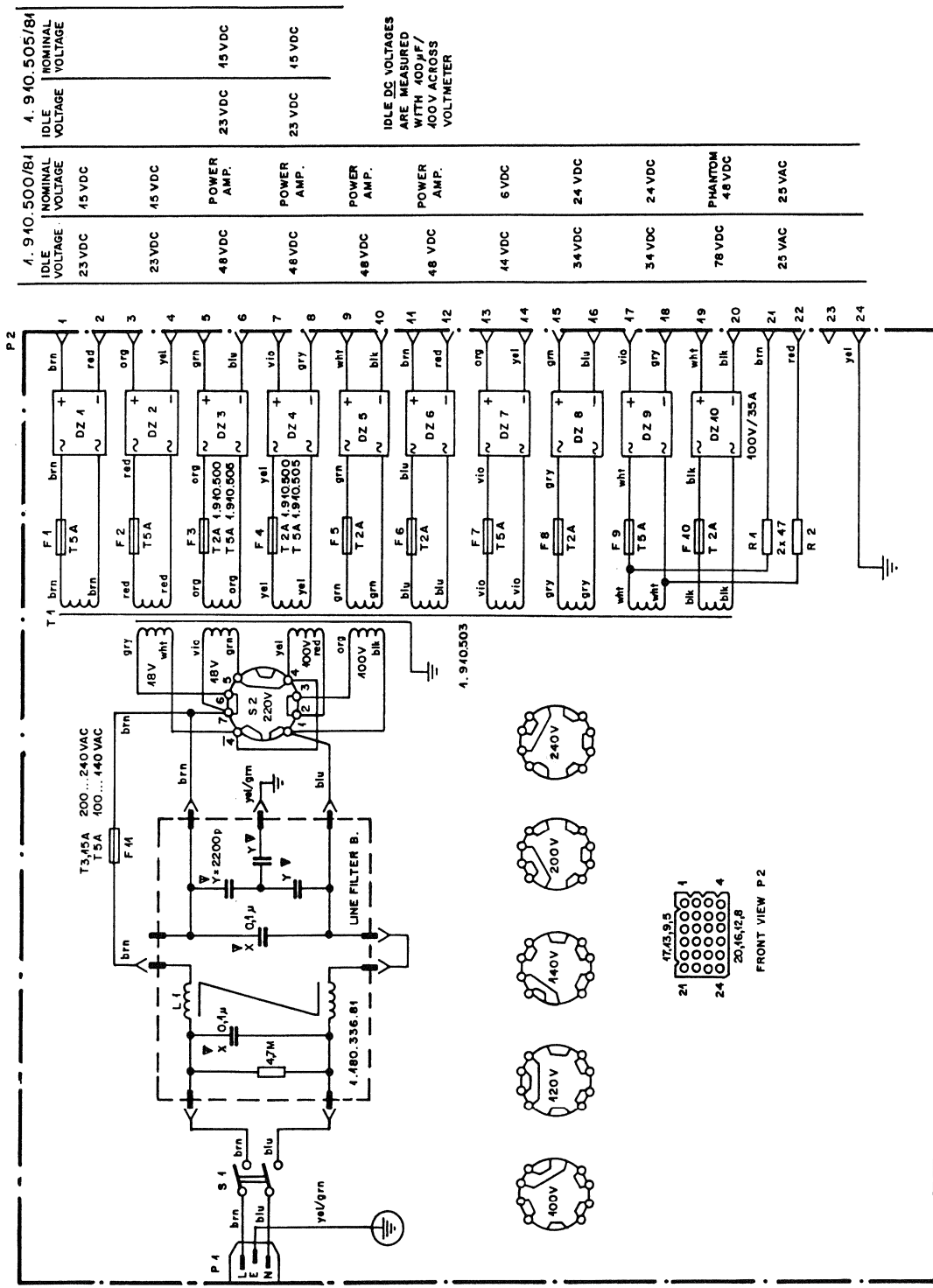
Conversion of phantom powering

- Convert trafo-block
- Change resistor on the connection PCB of the input unit
  - 48V 6,8 kOhm/0,4 %
  - 24V 4,3 kOhm/0,4 %
  - 12V 580 Ohm/0,4 %
- Reconnect the stranded wire on the stabilizer PCB 1.915.107

1.169.200.21  
Draft IEC 268-15A  
1.169.200.20

Mains-Transformer-Block

1.910.500.81/1.910.505.81

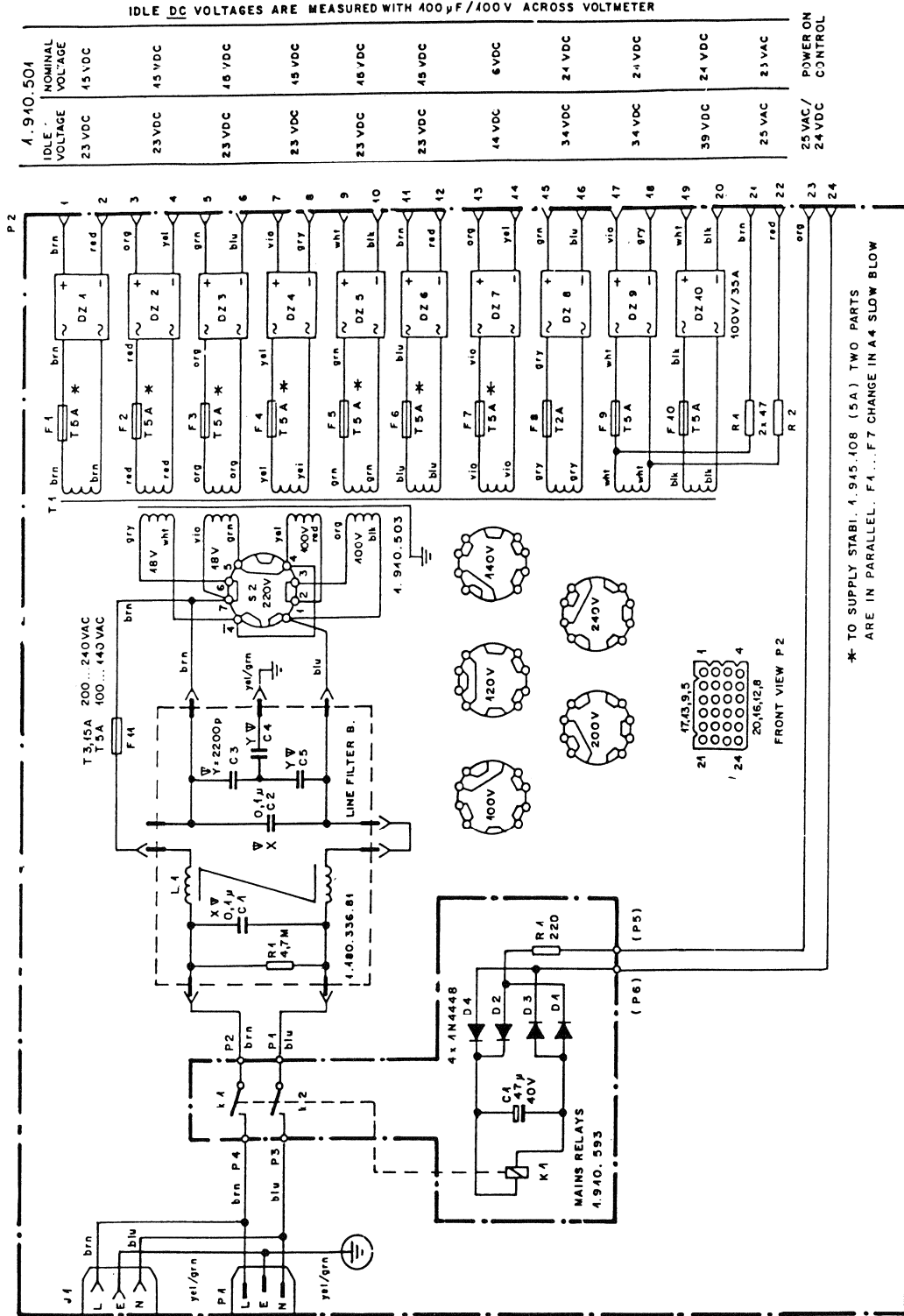


DATE:	28.4.82	19.8.83	2.3.84	3.6.85	
SIGN:	<i>fr</i>	<i>Me</i>	<i>wh</i>	<i>ml</i>	
STUDER REGENSDORF ZURICH	<b>MAINS - TRANSFORMER - BLOCK</b>				SC 1.910.500/81 SC 1.910.505/81



## Mains-Transformer-Block Remote

1.910.501



\* TO SUPPLY STABI. 1.945.408 (5A) TWO PARTS ARE IN PARALLEL. F 1...F 7 CHANGE IN A4 SLOW BLOW

DATE:	30. 5. 83	19. 8. 83	2. 3. 84	6. 8. 84	3. 6. 85
SIGN:	<i>ml</i>	<i>ml</i>	<i>ml</i>	<i>ml</i>	<i>ml</i>
STUDER REGENSDORF ZURICH	MAINS - TRANSFORMER - BLOCK REMOTE				SC 1.910.501

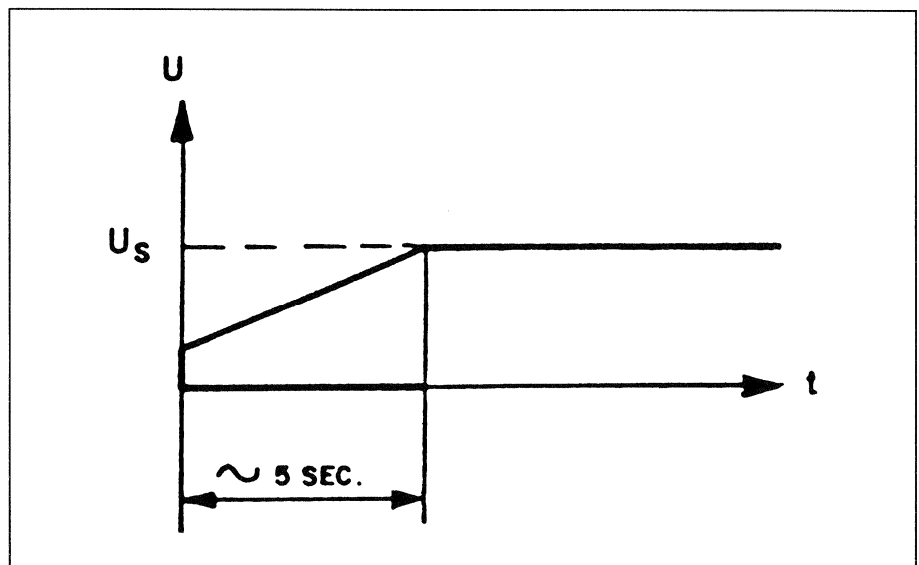
Spannungsstabilisator dessen Ausgangsspannung und Kurzschlussstrom mit Widerständen extern einstellbar ist. Mit Ausnahme der Phantom Stromversorgung werden alle in den Mischpulten der Serie 900 benötigten Betriebsspannungen mit den beiden Kartentypen 1.915.106 und 1.915.108 stabilisiert.

Leuchtdiode zur Anzeige des Betriebszustandes.

Drei von vorne zugängliche Messpunkte zur Kontrolle der Referenz- und Ausgangsspannung.

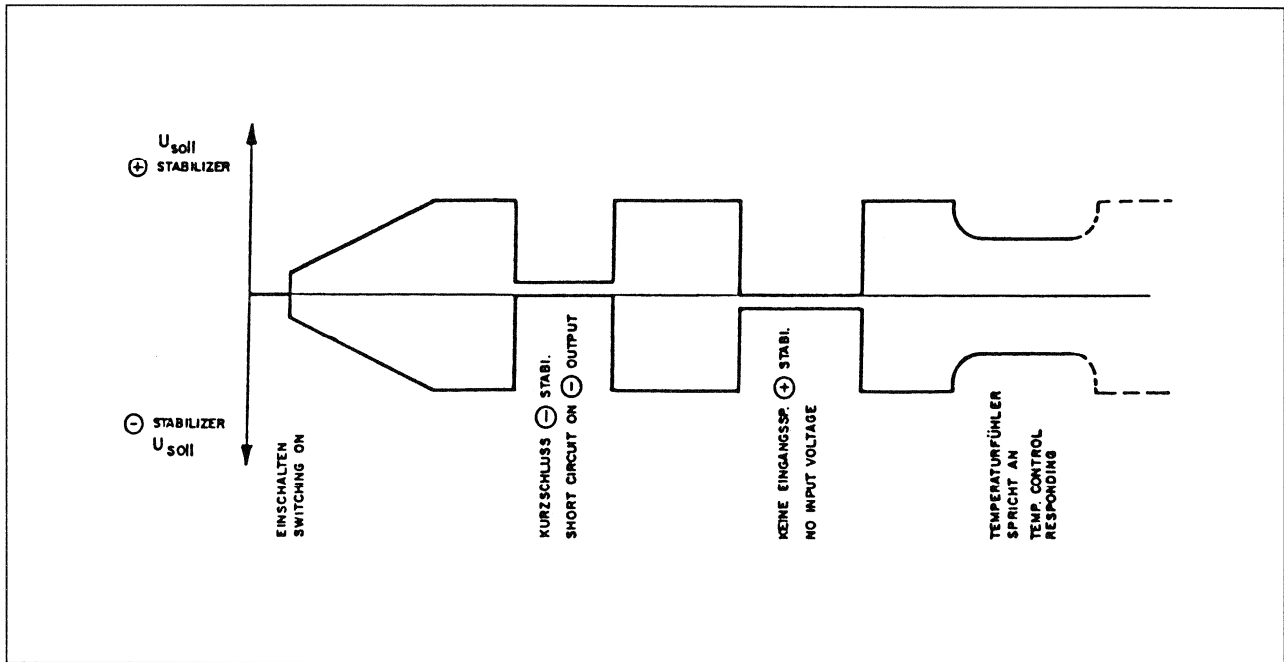
## 1. Schutzeinrichtungen

- "Crow Bar" schaltet ab bei zu hoher Ausgangsspannung
- Temperaturüberwachung am Regeltransistor
- Verpolungsschutz am Ausgang
- Langsames Hochfahren der Spannung beim Einschalten

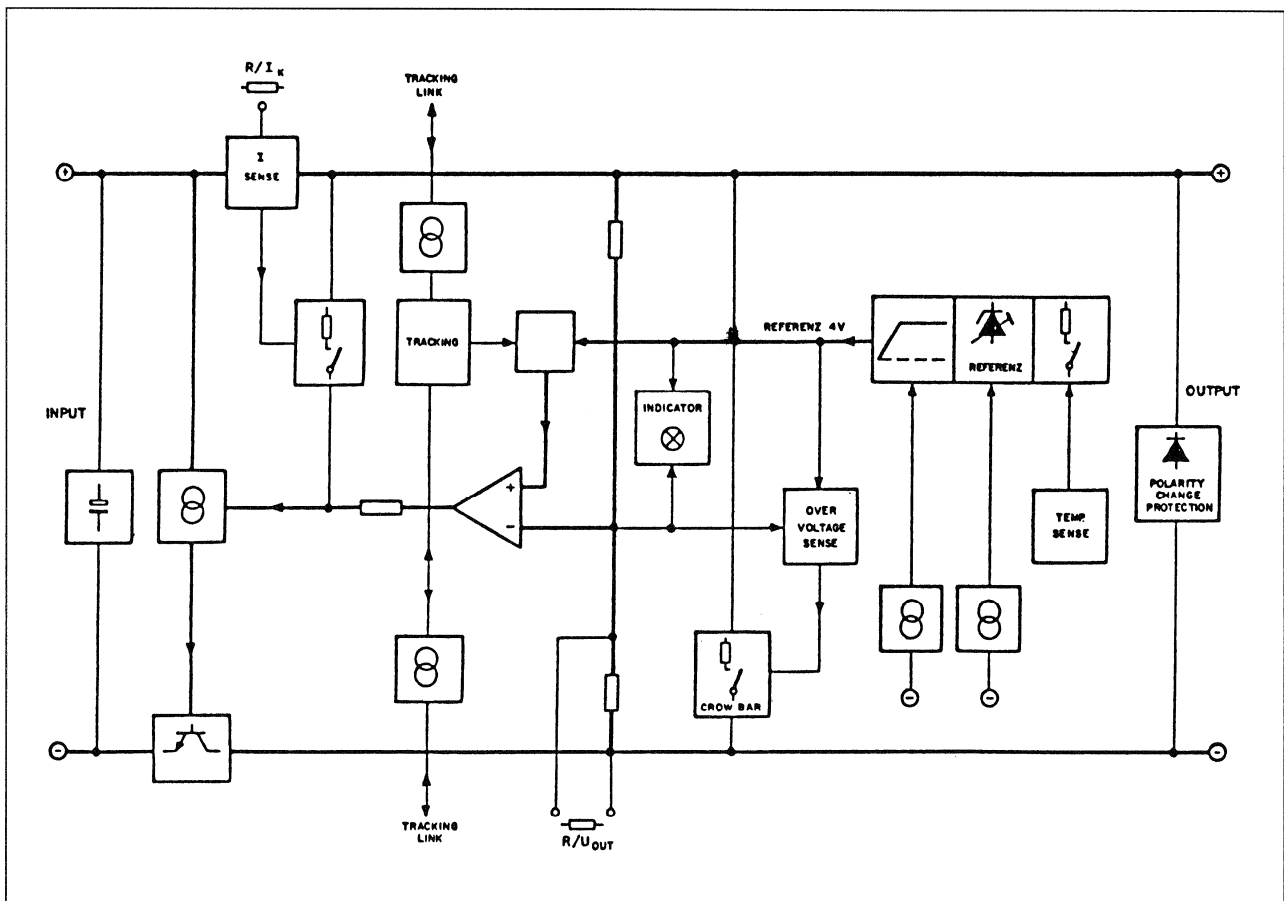


Beim Betrieb als Doppelstabilisator für die Stromversorgung von Verstärkern mit positiver und negativer Speisespannung werden zwei Stabilisatorkarten gekoppelt.

Die Ausgangsspannung des einen Stabilisators steuert die Ausgangsspannung des anderen (Tracking). Damit werden die Koppelkondensatoren der angeschlossenen Audioverstärker nicht unnötig belastet.



Blockschaltbild



2. Technische Daten

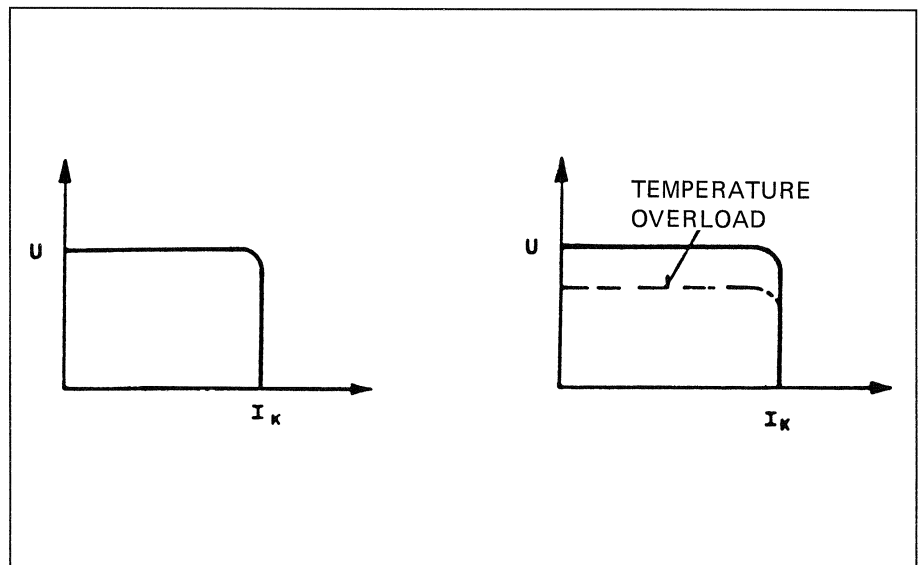
1.915.106

1.915.108

Ausgangsspannung extern programmierbar	$U = 5 \div 24V$	$U = 5 \div 24V$
Minimale Eingangsspannung (ohne Rippel)	$U_{min} = U + 1,5V$	$U_{min} = U + 1,5V$
Maximale Eingangsspannung	$U_{max} = 36V$	$U_{max} = 36V$
Kurzschlussstrom extern programmierbar	$I_k \approx 0,5 \dots 4,5A$	$I_k \approx 0,5 \dots 8,0A$
Max. Verlustleistung am Kühlblech	$P \approx 18 W$	$P \approx 30 W$

Kurzschlussverhalten

Bei Überlast regelt der Temperatursensor die Ausgangsspannung zurück.



Überspannungsschutz spricht an bei ca. 15% Überspannung am Ausgang

Max. Ausgangsstrom	@ $U_{15V}:5A$ @ $U_{6V}:8A$	@ $U_{15V}:5A$ @ $U_{6V}:8A$
Überlagerte Brummspannung	$U_{Br} \leq 100\mu V$	$U_{Br} \leq 100\mu V$
Leerlaufstrom	$I_o(@U_{in} 30V) = 30mA$	$I_o(@U_{in} 30V) = 30mA$

**3. Mechanische Daten****1.915.106****1.915.108**

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Abmessungen	Europakarte 100mm x 160mm	Europakarte 100mm x 160mm
Breite	33mm, 7 E	66mm, 14 E
Steckersystem	DIN 41 612 TYP B	DIN 41 612 TYP B
Gewicht	ca. 360 gr	ca. 560 gr

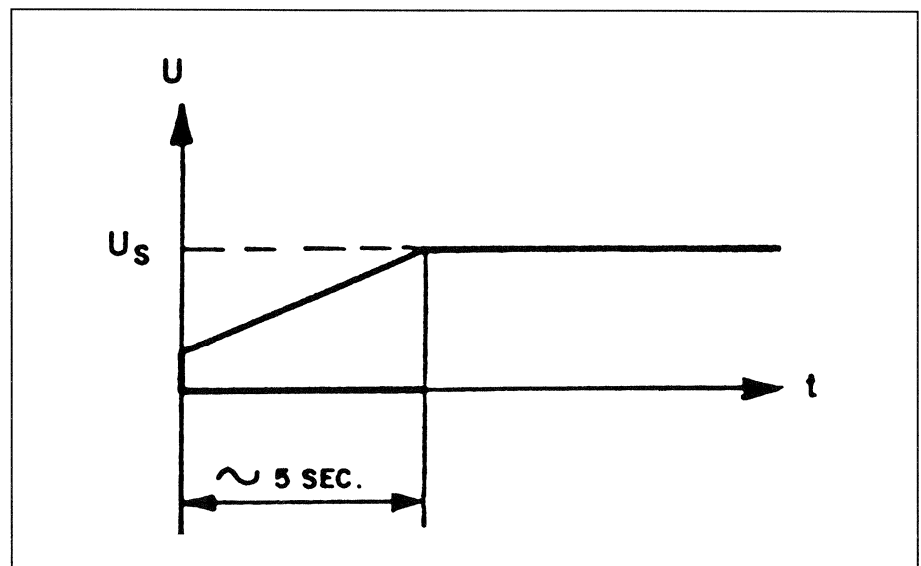
The output voltage and the short-circuit current of this voltage stabilizer are externally adjustable with resistors. Except for the phantom supply, all operating voltages of the Series 900 mixers are stabilized with the two types of circuit board numbered as 1.915.106 and 1.915.108.

Pilot LED for indicating the operating status.

Three test points for checking the reference voltage and the output voltage are accessible from the front.

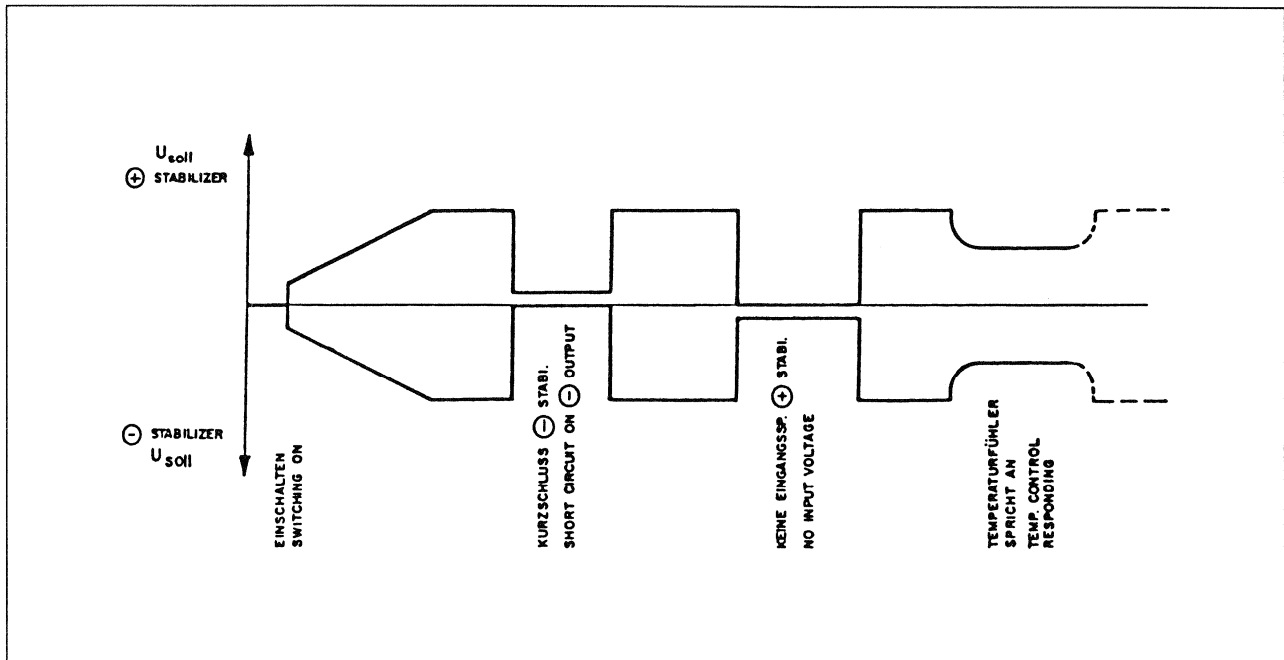
## 1. Protective features

- "Crow Bar" disconnects if overvoltages are detected
- Temperature monitoring at regulating transistor
- Polarity confusion protection at output
- Slow voltage run-up when unit is switched on

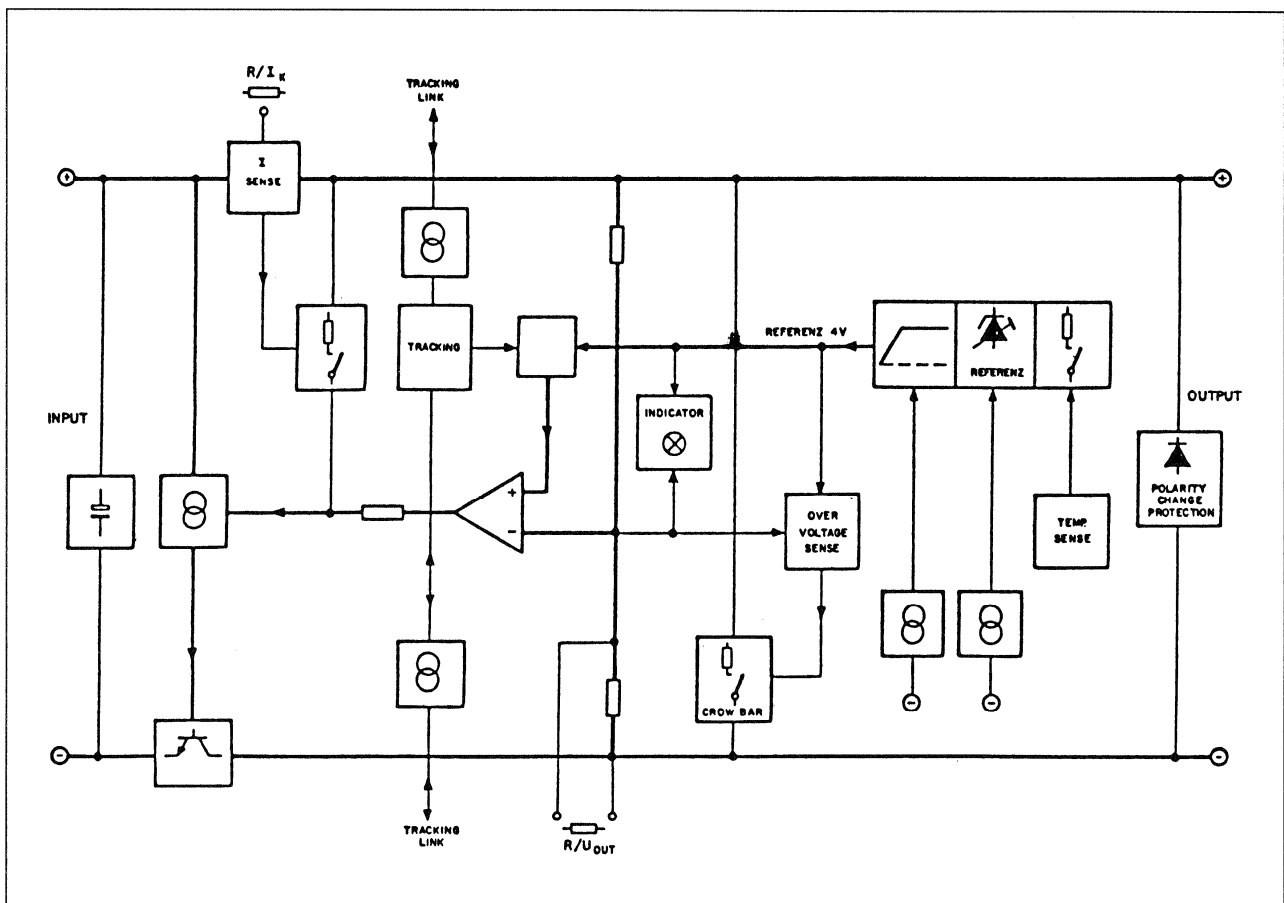


Dual stabilizer operation for supplying amplifiers with negative and positive supply voltages is possible by coupling two stabilizer boards.

The output voltage of the first stabilizer controls the output voltage of the other (tracking). In this manner the coupling capacitors of the audio amplifiers are not unnecessarily loaded.



Block Diagram



2. Specifications

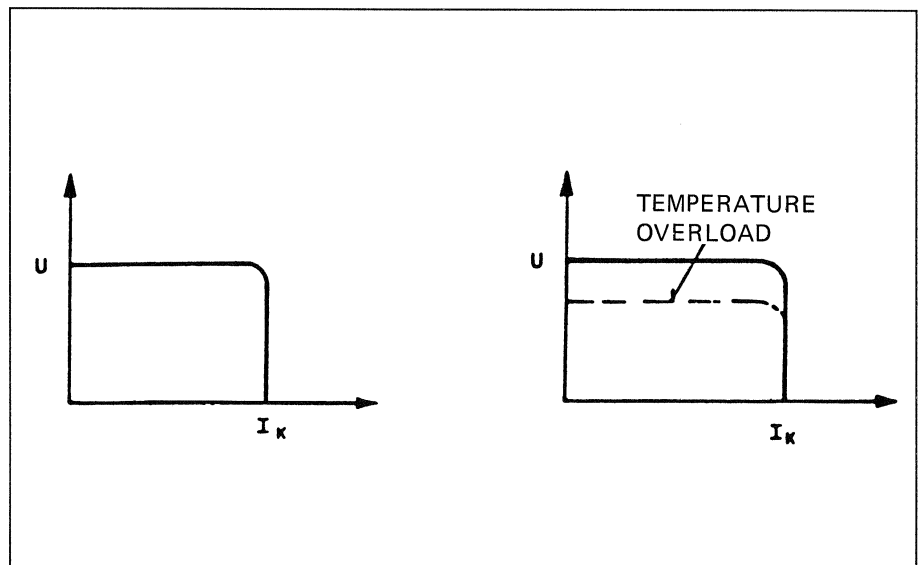
1.915.106

1.915.108

Output voltage externally programmable	$U = 5 \div 24V$	$U = 5 \div 24V$
Minimum input voltage without ripple	$U_{min} = U + 1,5V$	$U_{min} = U + 1,5V$
Maximum input voltage	$U_{max} = 36V$	$U_{max} = 36V$
Short-circuit current externally progr.	$I_k \approx 0,5 \dots 4,5A$	$I_k \approx 0,5 \dots 8,0A$
Max. power dissipation at heat sink	$P \approx 18W$	$P \approx 30W$

Short circuit response:

In the event of an overload the output voltage is regulated down by the temperature sensor.



Over-voltage sense responds at approx. 15% excess output voltage

Maximum output current	@ $U_{15V}$ : 5A @ $U_{6V}$ : 8A	@ $U_{15V}$ : 5A @ $U_{6V}$ : 8A
Superimposed ripple voltage	$U_{Br} \leq 100\mu V$	$U_{Br} \leq 100\mu V$
Idle current	$I_o(@U_{in} 30V) = 30mA$	$I_o(@U_{in} 30V) = 30mA$



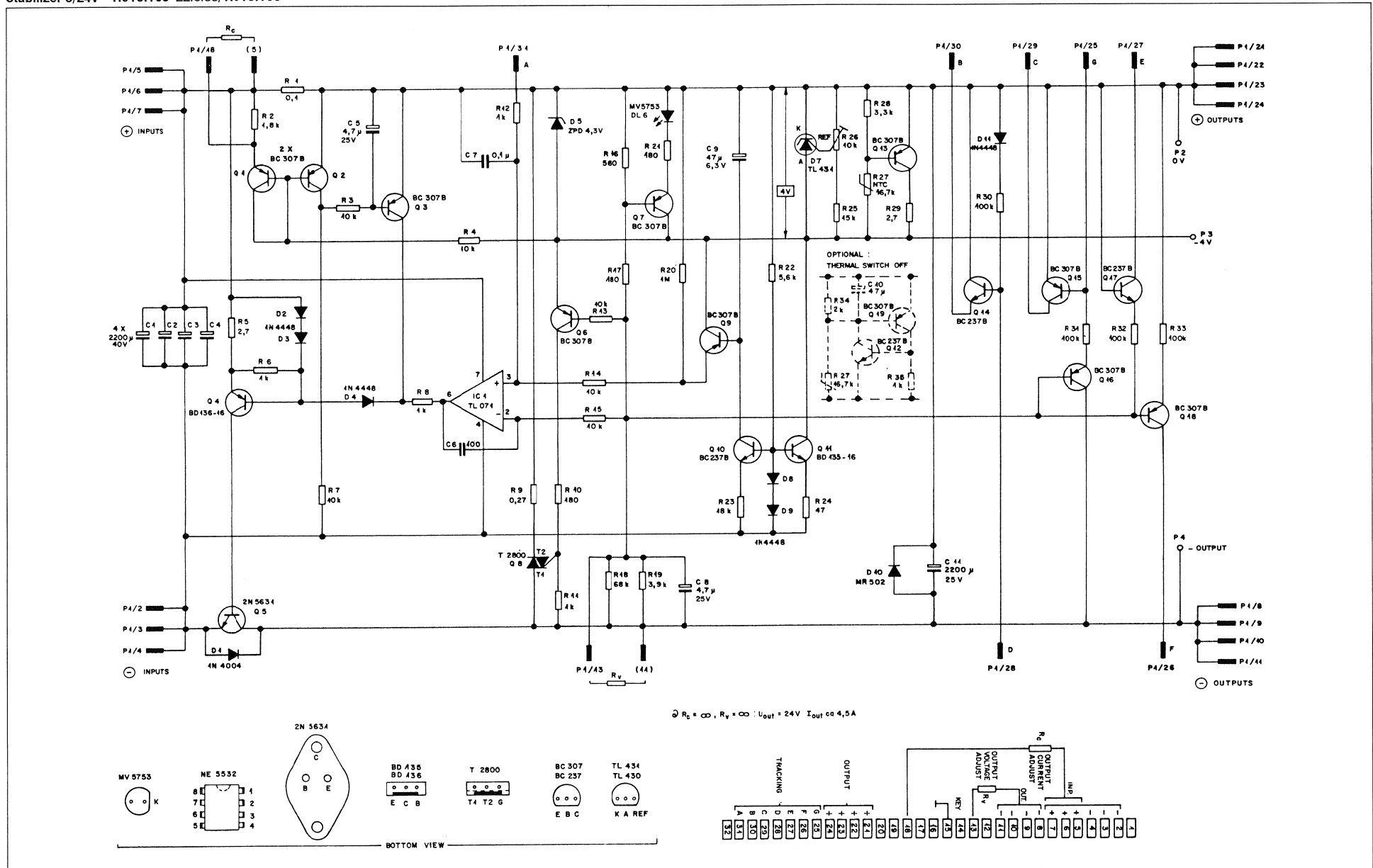
**3. Mechanical Data****1.915.106****1.915.108**

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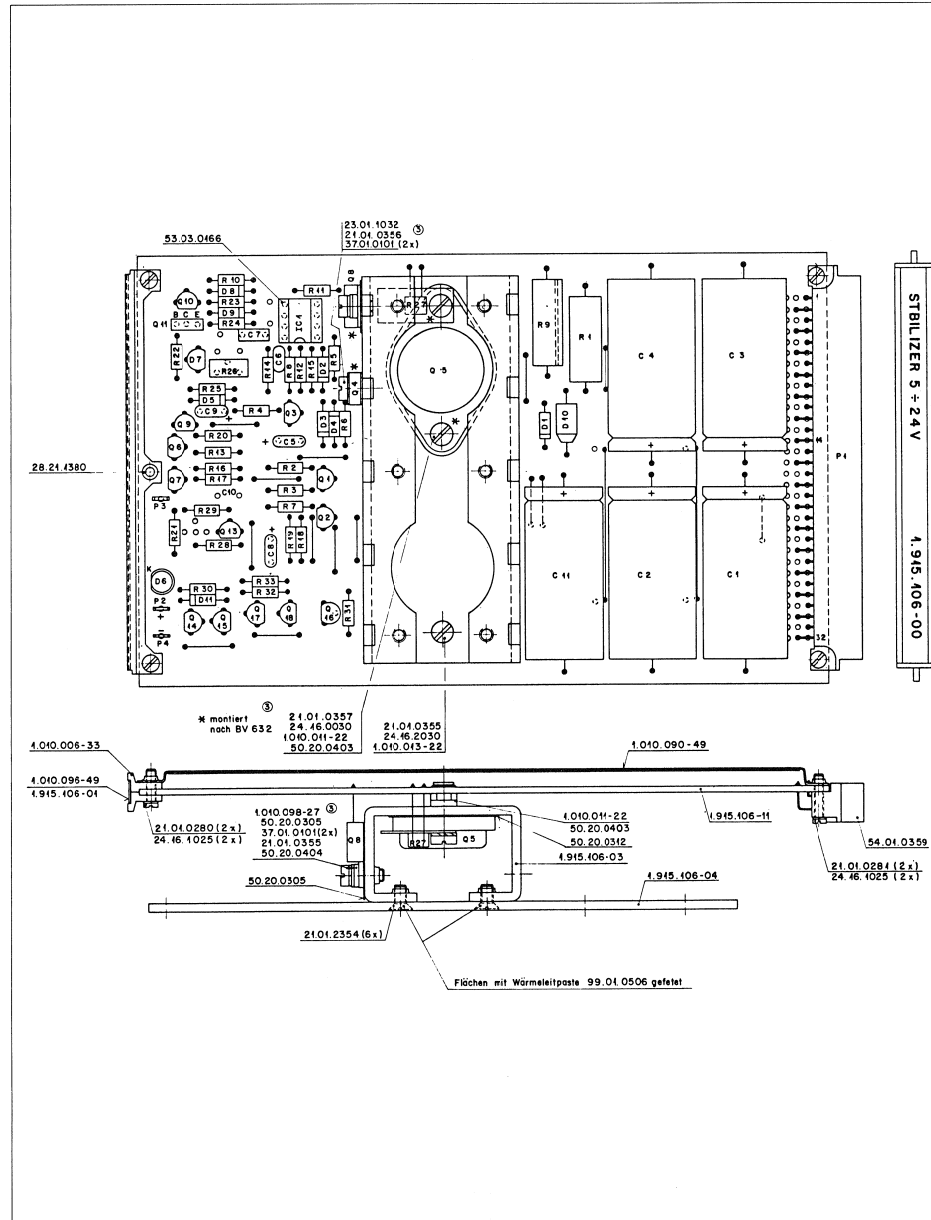
Dimensions	"Europe" PCB 100mm x 160 mm	"Europe" PCB 100mm x 160 mm
Width	33mm, 7 U	66mm, 14 U
Connector system	DIN 41 612 type B	DIN 41 612 type B
Weight	ca. 360 gr	ca. 560 gr

# STUDER AUDIO CONSOLE 970

Stabilizer 5/24V 1.915.106 22.6.83/1.915.108



Stabilizer 5/24V 1.915.106



IND. POS. NO.	PART NO.	VALUE	SPECIFICATIONS/EQUIVALENT	MFR	IND. POS. NO.	PART NO.	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
C 1	59.25.5222	2200 µF	40V	EL	Q 1	50.03.0515	BC307B	PNP (General purpose 0.1A/100V 240V)	MFR
C 2	59.25.5222	2200 µF	40V	EL	Q 2	50.03.0515	BC307B	PNP	---
C 3	59.25.5222	2200 µF	40V	EL	Q 3	50.03.0515	BC307B	PNP	---
C 4	59.26.6222	2200 µF	40V	EL	Q 4	50.03.0510	BD437C	NPN min 1A/10V	MST
C 5	59.26.5473	47 µF	25V	SAL	Q 5	50.03.0342	2N663A	NPN min 1A/min 10V 200W	M
C 6	59.39.4101	100 pF		CER	Q 6	50.03.0515	BC307B	PNP	---
C 7	59.06.0104	0.1 µF		PE	Q 7	50.03.0515	BC307B	PNP	---
C 8	59.24.5129	1 µF	25V	SAL	Q 8	50.03.0101	T2800	TRIAC 8A SC-116 D	R/GF
C 9	59.24.0470	47 µF	6.3V	SAL	Q 9	50.03.0515	BC307B	PNP	---
C 10					Q 10	50.03.0436	BC237B	NPN (General purpose 0.1A/100V 140V)	---
C 11	59.25.4222	2200 µF	25V	EL	Q 11	50.03.0495	BD435-K	NPN P min 2W	MST
D 1	50.04.0115	1N4004	1A		Q 12				
D 2	50.04.0125	1N4448			Q 13	50.03.0515	BC307B	PNP	---
D 3	50.04.0125	1N4448			Q 14	50.03.0436	BC237B	NPN	---
D 4	50.04.0125	1N4448			Q 15	50.03.0515	BC307B	PNP	---
D 5	50.04.1170	ZPD43V	5%		Q 16	50.03.0515	BC307B	PNP	---
D 6	59.04.2411	NY3253	LED	CHA-28*8 WSKH	Q 17	50.03.0436	BC237B	NPN	---
D 7	50.10.0186	TR439	µA 430 CLP	IC THF	Q 18	50.03.0515	BC307B	PNP	---
D 8	50.04.0125	1N4448			Q 19	50.03.0515	BC307B	PNP	---
D 9	59.04.0125	1N4448			Q 20	50.03.0515	BC307B	PNP	---
D 10	50.04.0507	MRS02	3A/30V		Q 21	50.03.0436	BC237B	NPN	---
D 11	50.04.0125	1N4448			Q 22	50.03.0515	BC307B	PNP	---
IC 1	50.03.0103	72071	1F351 SINGLE FET OPA	T11N	Q 23	50.03.0515	BC307B	PNP	---

IND.	DATE	NAME		IND.	DATE	NAME	
①			EL - Electrolytic	①			M - Milano
②			SAL - Solid Aluminium	②			R - RCA
③			PE - Polyester	③			S - Siemens
④ 22.6.83		1A	CER - CERAMIC	④			T - Telefunken
⑤ 22.7.81		Hij		⑤ 22.6.83		H	
				⑥ 22.7.81		Hij	GE - General Electric

IND. POS. NO.	PART NO.	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
R 10	57.11.4111	180 Ω		
R 11	57.11.4102	1 k		
R 12	57.11.4102	1 k		
R 13	57.11.4103	10 k		
R 14	57.11.4103	10 k		
R 15	57.11.4103	10 k		
R 16	57.11.4511	510 Ω	2%	
R 17	57.11.4414	180 Ω	2%	
R 18	57.11.4413	88 k	2%	
R 19	57.11.4392	3.9 k	2%	
R 20	57.11.4405	1A		
R 21	57.11.4414	180 Ω		
R 22	57.11.4512	5.1 k		
R 23	57.11.4413	18 k		
R 24	57.11.4470	47 Ω		
R 25	57.11.4153	15 k		
R 26	58.01.7103	10 k	LIN N°4 CERMET	
R 27	57.35.0204	16.7 k	0.1W NTC 2322 640 98005	PH
R 28	57.11.4332	3.3 k		
R 29	57.11.4279	2.7 Ω		
R 30	57.11.4404	100 k		
R 31	57.11.4104	100 k		
R 32	57.11.4104	100 k		
R 33	57.11.4104	100 k		

IND.	DATE	NAME	
①			PH - Philips
②			
③			
④ 22.6.83		1A	
⑤ 22.7.81		Hij	

STUDER Stabilizer 5/24V 1.915.106.00 PAGE 3 OF 3

## Phantom / 24 V Stabilisator

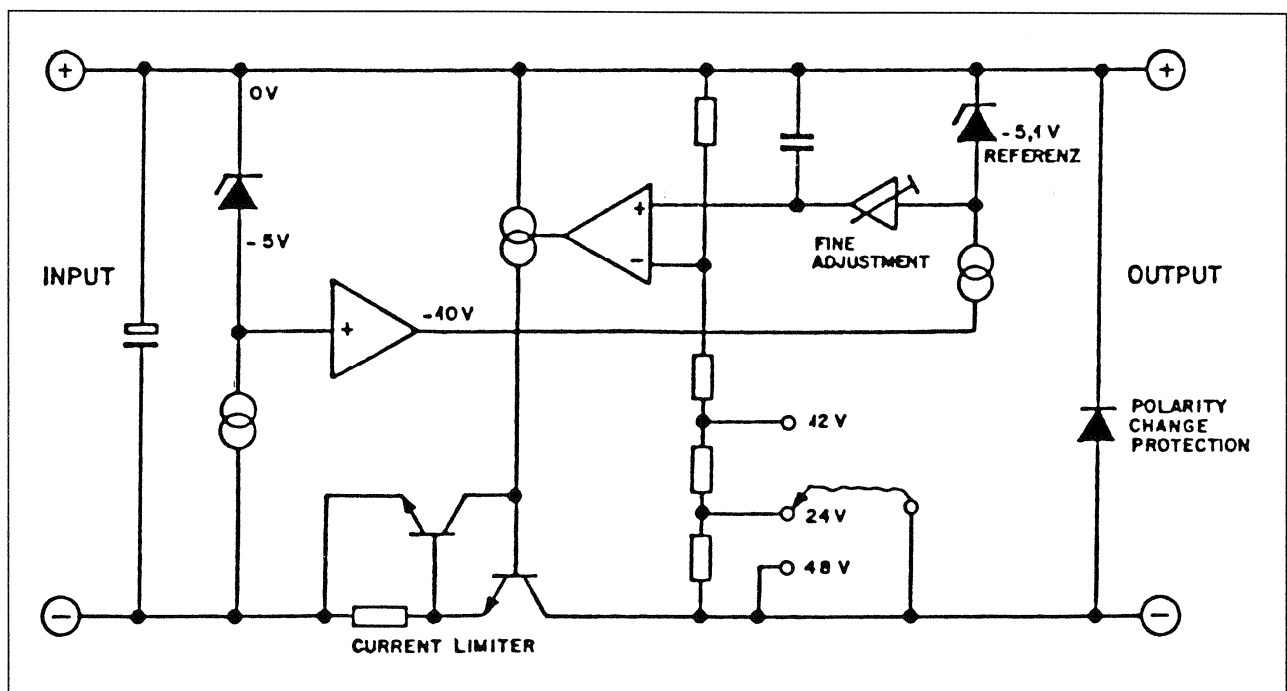
1.915.107

Stabilisatorkarte mit zwei getrennten, isoliert aufgebauten Spannungsstabilisatoren für die Phantom- und 24 V Stromversorgung. Zwei Leuchtdioden zeigen den Betriebszustand an. Zwei Messpunktpaare sind mit Messklemmen von vorne zugänglich.

## 1. Phantomversorgung

Die Ausgangsspannung von 12V, 24V oder 48V ist mit einer Brücke einstellbar (Beachten Sie, dass eine Änderung der Phantomspannung auch eine Anpassung der Eingangsspannung und eine Änderung der Phantomeinspeisewiderstände im Mikrokanal bedingt).

## Blockschaltbild



2. Technische Daten

**Ausgangsspannung einstellbar**  $U=12V, 24V, 48V$

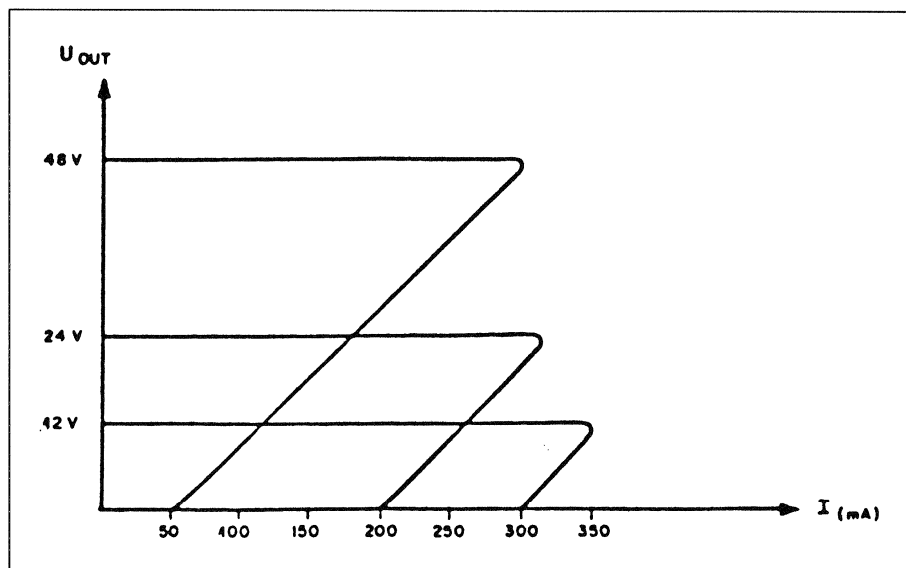
**Minimale Eingangsspannung für 12V**  $U_{min}=13V$

**Max. Eingangsspannung**  $U_{max}=100V$

**Kurzschlussstrom**  $I_k=350mA$

**Laststrom**  $I_{max}=300mA$

Kurzschlussverhalten mit automatisch, spannungsabhängigem "Fold Back"



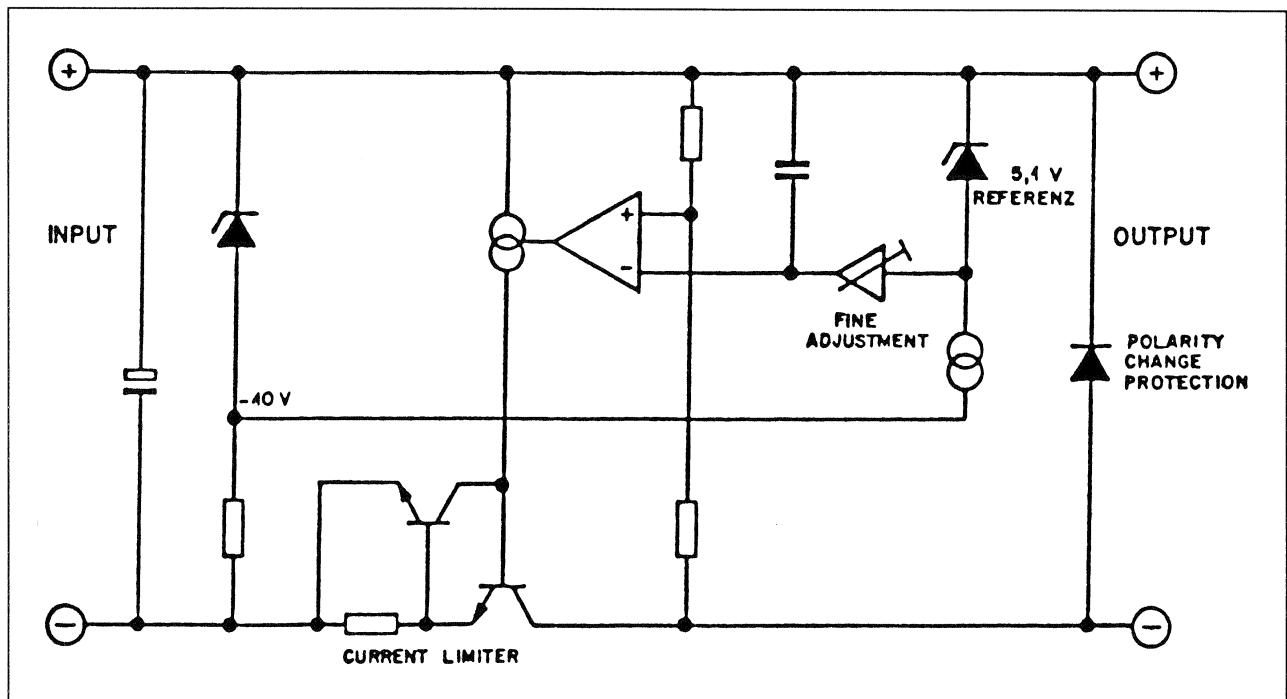
**Überlagerte Brummspannung**  $U_{Br} \leq 100\mu V$

**Leerlaufstrom**  $I_{o@80V} U_{in}=25mA$

### 3. 24V Stabilisator

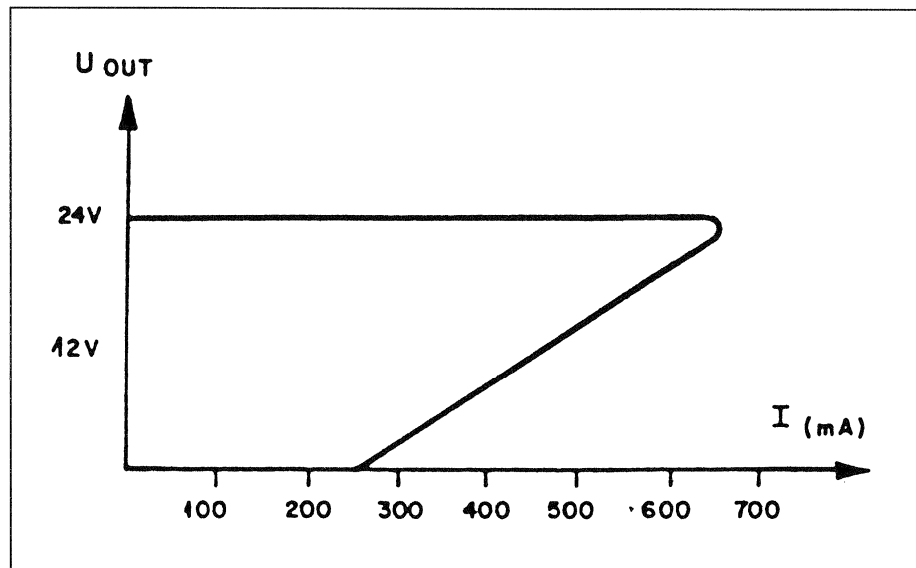
Die Ausgangsspannung ist fest eingestellt auf 24V DC.

#### Blockschaltbild



### 4. Technische Daten

<b>Ausgangsspannung</b>	$U=24V$
<b>Minimale Eingangsspannung (ohne Ripple)</b>	$U_{\min}=25V$
<b>Maximale Eingangsspannung</b>	$U_{\max}=36V$
<b>Kurzschlussstrom</b>	$I_k \sim 660mA$
<b>Laststrom</b>	$I_{\max}=600mA$
	Kurzschlussverhalten mit automatischem "Fold Back"



Überlagerte Brummspannung  $U_{Br} \leq 100 \mu V$

Leerlaufstrom  $I_{o@U_{in}30V} = 20mA$

## 5. Mechanische Daten

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Abmessungen "EUROPE" PCB 100mm x 160mm

Steckersystem DIN 416 12 Typ B

Breite 33mm 7m

Gewicht ca. 320 gr

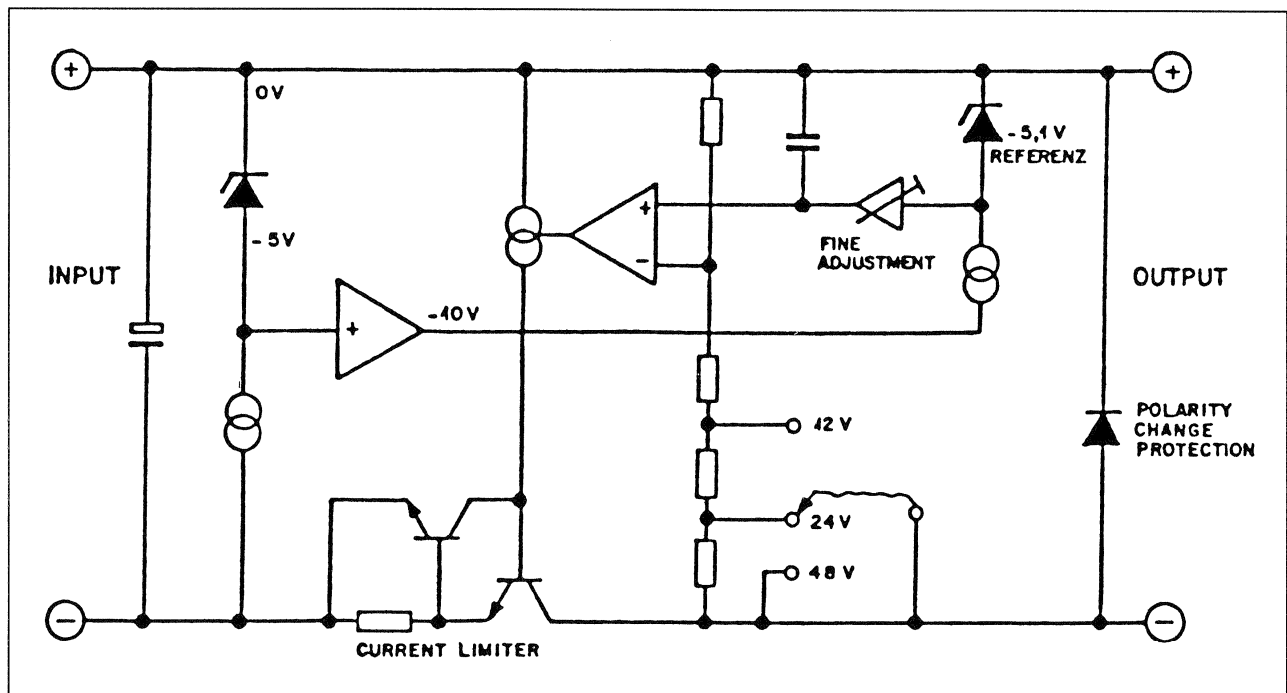
## Phantom / 24 V Stabilizer

1.915.107

Stabilizer board with two separate and isolated voltage stabilizers for the phantom supply and the 24V supply. The two pilot LEDs indicate the operating status. Two pairs of test points are accessible from the front with test clips.

## 1. Phantom Supply

The 12V, 24V or 48V output voltage can be adjusted with a bridge. (Please note that any change of the phantom voltage requires a corresponding adjustment of the input voltage and the replacement of the phantom supply resistors in the microphone channel).

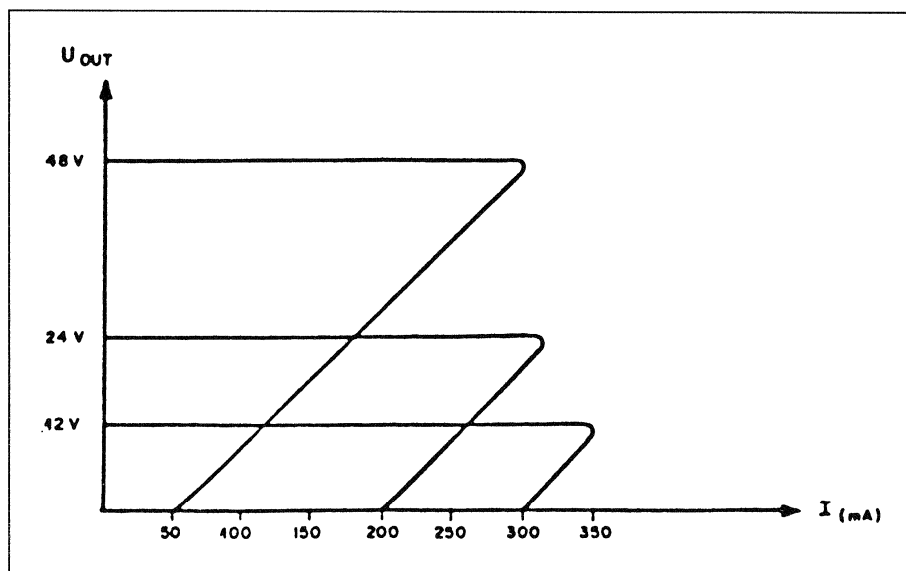




## 2. Specifications

<b>Output voltage, variable</b>	$U=12V, 24V, 48V$
<b>Minimum input voltage for 12V</b>	$U_{min}=13V$
<b>Max. input voltage</b>	$U_{max}=100V$
<b>Short-circuit current</b>	$I_k=350mA$
<b>Load current</b>	$I_{max}=300mA$

Short-circuit response with automatic, voltage-dependent fold-back

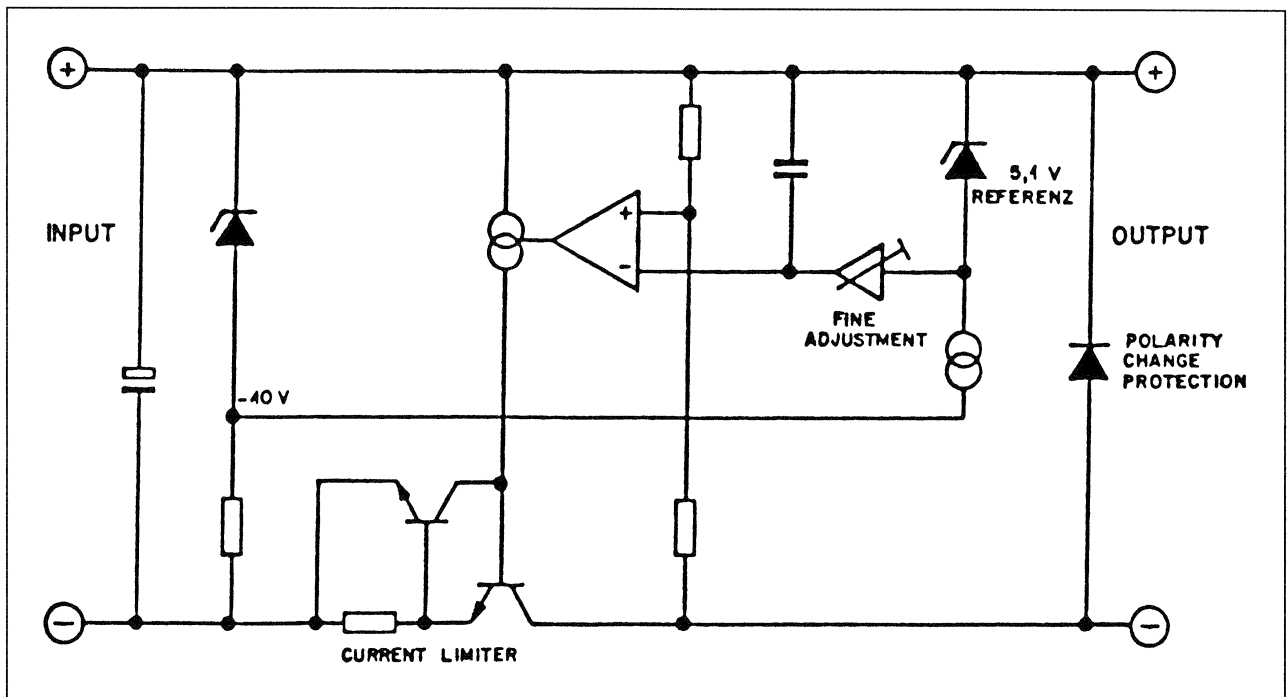


<b>Superimposed ripple voltage</b>	$U_{Br} \leq 100\mu V$
<b>No-load current</b>	$I_{o@80V U_{in}} = 25mA$

### 3. 24V Stabilizer

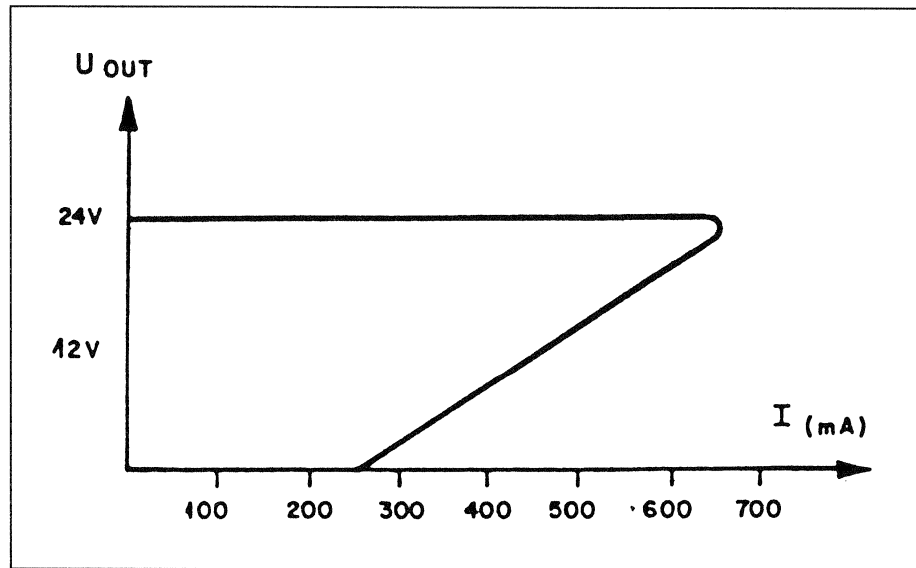
The output voltage is permanently set to 24 VDC.

#### Block Diagram



### 4. Specifications

<b>Output voltage</b>	$U=24V$
<b>Minimum input voltage (without ripple)</b>	$U_{\min}=25V$
<b>Maximum input voltage</b>	$U_{\max}=36V$
<b>Short-circuit current</b>	$I_k \sim 660mA$
<b>Load current</b>	$I_{\max}=600mA$
	Short-circuit response with automatic fold-back



Superimposed ripple voltage  $U_{Br} \leq 100\mu V$

No-load current  $I_{o@U_{in}30V} = 20mA$

## 5. Mechanical Data

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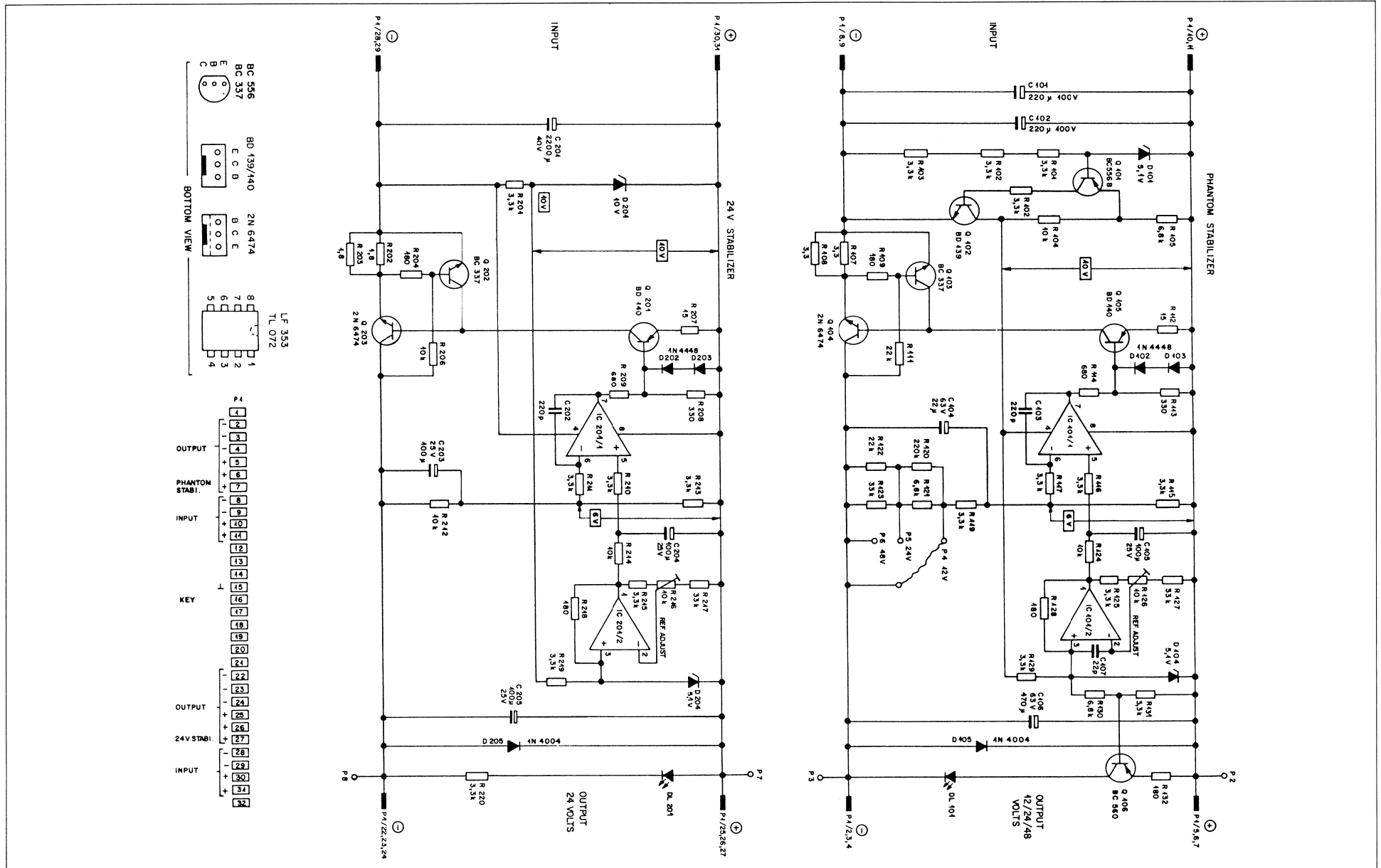
Dimensions "EUROPE" PCB 100mm x 160mm

Connector system DIN 416 12 type B

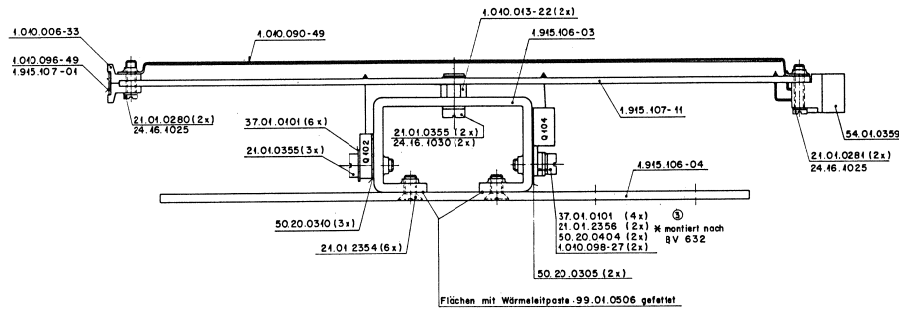
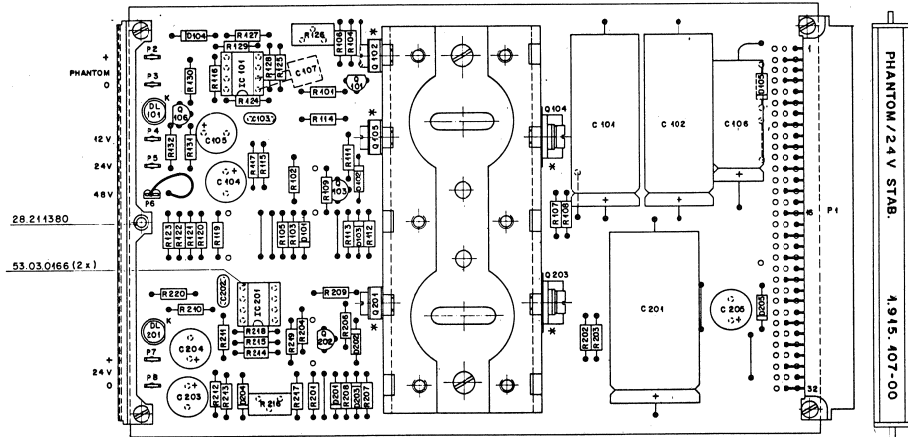
Width 33mm 7m

Weight ca. 320 gr

Phantom / 24 V Stabilizer 1.915.107



Phantom / 24 V Stabilizer 1.915.107



IND POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
C 101	59.25.7221	220 µF	100 V EL	
C 102	59.25.7221	220 µF	100 V EL	
C 103	59.34.4221	220 pF	CER	
C 104	59.22.8220	22 µF	63 V EL	
C 105	59.22.5101	100 µF	25 V EL	
1 C 106	59.25.6471	470 µF	63 V EL	
C 201	59.25.5222	2200 µF	40 V EL	
C 202	59.34.4221	220 pF	CER	
C 203	59.22.5101	100 µF	25 V EL	
C 204	59.22.5101	100 µF	25 V EL	
C 205	59.22.5101	100 µF	25 V EL	
1 C 107	59.34.2220	22 pF	CER	
D 101	50.04.1112	Z 51V	5.1V @ 5mA 5%	
D 102	50.04.0125	1N4448		
D 103	50.04.0125	1N4448		
D 104	50.04.1112	Z 51V	5.1V @ 5mA 5%	
D 105	50.04.0105	1N4004	1.1V @ 1A	
D 201	50.04.1114	Z 10V	10V @ 5mA 5%	
D 202	50.04.0125	1N4448		
D 203	50.04.0125	1N4448		
D 204	50.04.1112	Z 51V	5.1V @ 5mA 5%	
D 205	50.04.0105	1N4004	1.1V @ 1A	
DL 101	50.04.2111	MV5753	CM4-2818 MS/G	
DL 201	50.04.2111	MV5753	CM4-2818 MS/G	

IND	DATE	NAME	EL ELECTROLYTIC MS MONSANTO	MS MONSANTO
①			CER CERAMIC	CM CHICAGO MINIATURE
①	13.1.83	1/2		
①	9.6.81	1/2		

STUDER PHANTOM / 24V STAB 1.915.107.00 page 1 of 4

IND POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
IC 101	50.09.0404	TL 072	DUAL OPA LF 353	N, TI
IC 201	50.09.0404	TL 072	DUAL OPA LF 353	N, TI
Q 101	50.03.0482	BC 556	PNP 0.1A U <sub>CEs</sub> 80V	S, T
Q 102	50.03.0451	BD 139	NPN	P, S
Q 103	50.03.0340	BC 337	NPN 0.8A	P, TI
Q 104	50.03.0344	2N 6474	NPN	R
Q 105	50.03.0452	BD 740	PNP	P, S
Q 106	50.03.0496	BC 560	PNP 0.1A	S
Q 201	50.03.0452	BD 440	PNP	P, S
Q 202	50.03.0340	BC 337	NPN 0.8A	P, TI
Q 203	50.03.0344	2N 6474	NPN	R
R 101	57.11.4332	33k		
R 102	57.11.4332	33k		
R 103	57.11.4332	33k		
R 104	57.11.4103	10k		
R 105	57.11.4682	68k		
R 106	57.11.4103	10k		
R 107	57.11.4339	3.3		
R 108	57.11.4339	3.3		
R 109	57.11.4181	180		
R 110				
R 111	57.11.4223	22k		
R 112	57.11.4450	45		
R 113	57.11.4334	330		
R 114	57.11.4684	680		
R 115	57.11.4332	33k	2%	

IND	DATE	NAME	S SIEMENS	I ITT
①			RA RAYTHEON	N NATIONAL
①			TI TEXAS INSTR.	
①	13.1.83	1/2	P PHILIPS	
①	9.6.81	1/2	R RCA	

STUDER PHANTOM / 24V STAB. 1.915.107.00 page 2 of 4

IND POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
R 116	57.11.4332	33k		
R 117	57.11.4332	33k		
R 118				
R 119	57.11.4332	33k	2%	
R 120	57.11.4224	220k	2%	
R 121	57.11.4682	68k	2%	
R 122	57.11.4223	22k	2%	
R 123	57.11.4333	33k	2%	
R 124	57.11.4103	10k		
R 125	57.11.4332	33k		
R 126	58.01.7103	40k	LIN. 10%	
R 127	57.11.4333	33k		
R 128	57.11.4181	180		
R 129	57.11.4332	33k		
R 130	57.11.4682	68k		
R 131	57.11.4332	33k		
R 132	57.11.4181	180		
R 201	57.11.4332	33k		
R 202	57.11.4189	48		
R 203	57.11.4189	48		
R 204	57.11.4181	180		
R 205				
R 206	57.11.4103	10k		
R 207	57.11.4150	45		
R 208	57.11.4334	330		
R 209	57.11.4684	680		
R 210	57.11.4332	33k		
R 211	57.11.4332	33k		
R 212	57.11.4103	10k	2%	
R 213	57.11.4332	33k	2%	

IND	DATE	NAME	EL ELECTROLYTIC MS MONSANTO	MS MONSANTO
①			CER CERAMIC	CM CHICAGO MINIATURE
①	13.1.83	1/2		
①	9.6.81	1/2		

STUDER PHANTOM / 24V STAB. 1.915.107.00 page 3 of 4

IND POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
R 214	57.11.4103	10k		
R 245	57.11.4332	33k		
R 246	58.01.7103	40k	LIN. 10%	
R 247	57.11.4333	33k		
R 248	57.11.4181	180		
R 249	57.11.4332	33k		
R 200	57.11.4332	33k		

Modification List

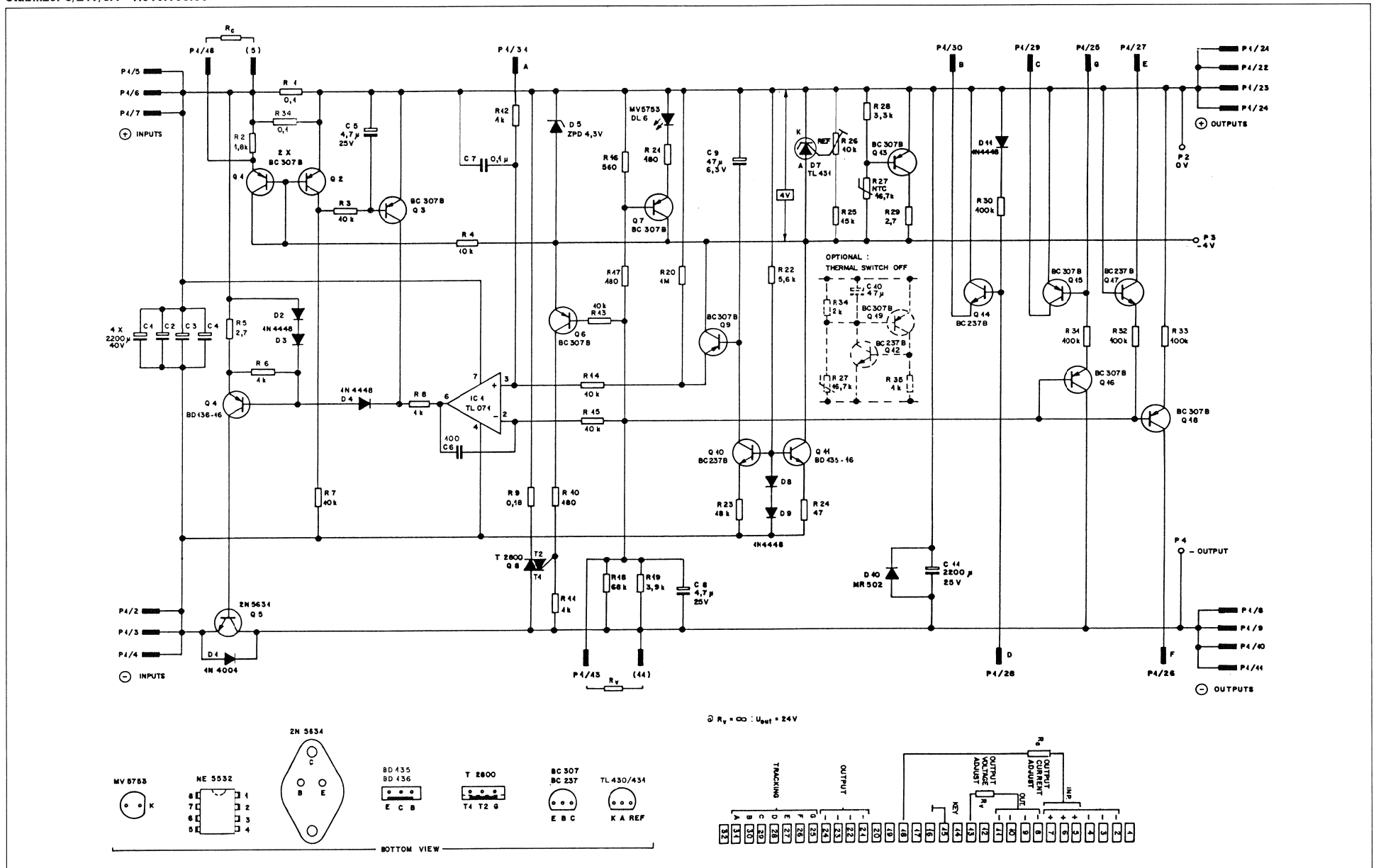
Def.	HF Problems
1 13.1.83	
C 106	22 µF → 470 pF
C 107	22 pF → new

IND	DATE	NAME	S SIEMENS	I ITT
①			RA RAYTHEON	N NATIONAL
①	13.1.83	1/2	P PHILIPS	
①	9.6.81	1/2	R RCA	

STUDER PHANTOM / 24V STAB. 1.915.107.00 page 4 of 4

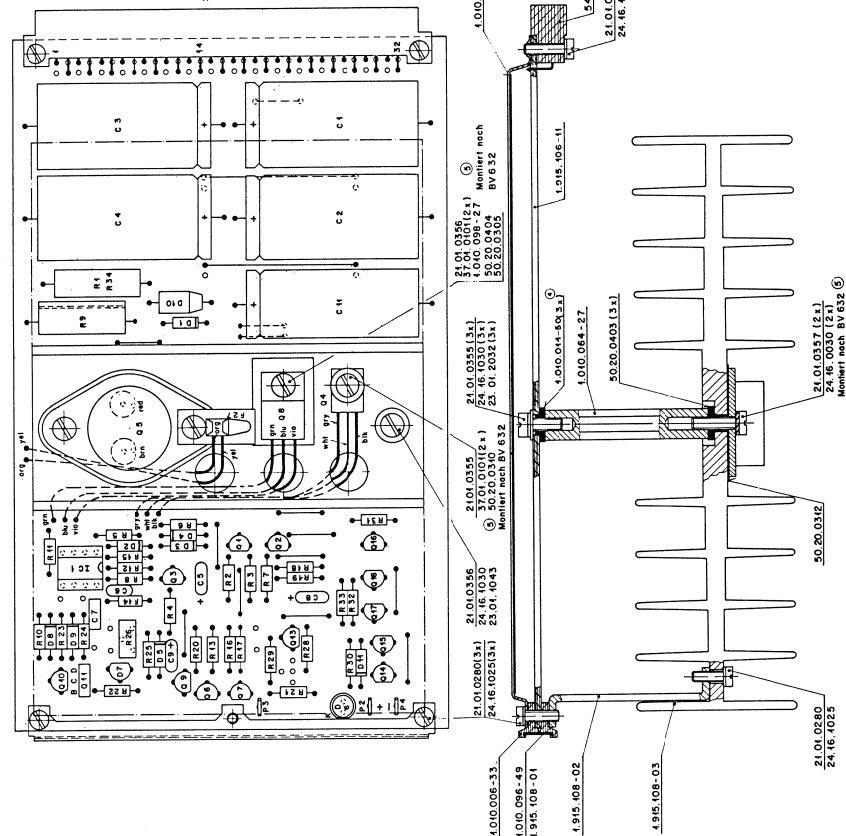
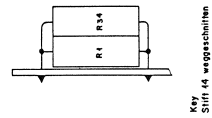
# STUDER AUDIO CONSOLE 970

Stabilizer 5/24V/5A 1.915.108.00



Stabilizer 5/24V/5A 1.915.108

STABILIZER 5 ÷ 24V 1.915.108-00



IND POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
C 1	59.25.5222	2200 µF	40V	EL
C 2	59.25.5222	2200 µF	40V	EL
C 3	59.25.5222	2200 µF	40V	EL
C 4	59.25.5222	2200 µF	40V	EL
C 5	59.26.5479	4,7 µF	25 V	SAL
C 6	59.38.4101	100 pF		CER
C 7	59.01.0104	0,1 µF		PE
C 8	59.26.5479	4,7 µF	25V	SAL
C 9	59.26.0470	4,7 µF	6,3V	SAL
C 10				
C 11	59.25.4222	2200 µF	25V	EL
D 1	50.01.0115	1N4004	1A	
D 2	50.01.0125	1N4448		
D 3	50.01.0125	1N4448		
D 4	50.01.0125	1N4448		
D 5	50.01.1120	2PD43V	5 1/4"	
DL 6	50.01.2411	MY5253	LED	CHA-28P-B MSH
D 7	50.10.0108	TL430	µA A30 CLP	IC THF
D 8	50.01.0125	1N4448		
D 9	50.01.0125	1N4448		
D 10	50.01.0507	HR502	3A/30V	
D 11	50.01.0125	1N4448		
IC 1	50.09.0103	72071	LF354 SINGLE FET OPA	TIN

IND POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
Q 1	50.03.0515	BC307B	PNP (General purpose Q14/150 20V)	ang
Q 2	50.03.0515	BC307B	PNP	
Q 3	50.03.0515	BC307B	PNP	
Q 4	50.03.0510	BD135C	PNP min 1A/10V	MST
Q 5	50.03.0342	2N5631A	NPN min 1A/min 10V 20W	M
Q 6	50.03.0515	BC307B	PNP	
Q 7	50.03.0515	BC307B	PNP	
Q 8	50.03.0108	T 2800	TRIAC 8A S-16 D	R/G
Q 9	50.03.0515	BC307B	PNP	
Q 10	50.03.0436	BC237B	NPN (General purpose Q14/150) 40V	ang
Q 11	50.03.0495	BD135C	NPN P min 2W	MST
Q 12				
Q 13	50.03.0515	BC307B	PNP	
Q 14	50.03.0436	BC237B	NPN	
Q 15	50.03.0515	BC307B	PNP	
Q 16	50.03.0515	BC307B	PNP	
Q 17	50.03.0436	BC237B	NPN	
Q 18	50.03.0515	BC307B	PNP	
R 1	57.56.5108	0,1 Ω	4W	
R 2	57.11.4102	1,8 k	2 1/2 W	
R 3	57.11.4103	10 k		
R 4	57.11.4102	10 k		
R 5	57.11.4279	2,7 Ω		
R 6	57.11.4102	1 k		
R 7	57.11.4103	10 k		
R 8	57.11.4102	1 k		
R 9	57.57.5108	0,10 Ω	4W	

IND	DATE	NAME	CL - Electrolytic	MS - Monsanto
①			SAL - Solid Aluminium	CM - Chicago Miniature
②			PE - Polyester	TI - Texas Instruments
③	22.6.83	JK	CER - CERAMIC	N - National
④	22.11.82	JK		F - Fairchild

STUDER Stabilizer 5 ÷ 24V/5A 1.915.108.00 PAGE 1 OF 3

IND	DATE	NAME	M - Motorola
①			R - RCA
②			S - Siemens
③	22.6.83	JK	T - Telefunken
④	22.11.82	JK	GE - General Electric

STUDER Stabilizer 5 ÷ 24V/5A 1.915.108.00 PAGE 2 OF 3

IND POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
R 10	57.11.4111	180 Ω		
R 11	57.11.4102	1 k		
R 12	57.11.4102	1 k		
R 13	57.11.4103	10 k		
R 14	57.11.4102	10 k		
R 15	57.11.4103	10 k		
R 16	57.11.4567	510 Ω	2 1/2 W	
R 17	57.11.4102	180 Ω	2 1/2 W	
R 18	57.11.4693	68 k	2 1/2 W	
R 19	57.11.4392	3,9 k	2 1/2 W	
R 20	57.11.4105	1 M		
R 21	57.11.4102	100 Ω		
R 22	57.11.4562	5,6 k		
R 23	57.11.4103	10 k		
R 24	57.11.4470	47 Ω		
R 25	57.11.4153	45 k		
R 26	58.01.7102	10 k	LIN 11 1/2 CERMET	
R 27	57.99.0204	16,7 k	±100% NTC 2322 640 98005	PH
R 28	57.11.4332	3,3 k		
R 29	57.11.4279	2,7 Ω		
R 30	57.11.4404	100 k		
R 31	57.11.4104	100 k		
R 32	57.11.4104	100 k		
R 33	57.11.4102	100 k		
R 34	57.56.5108	0,1 Ω	4W	

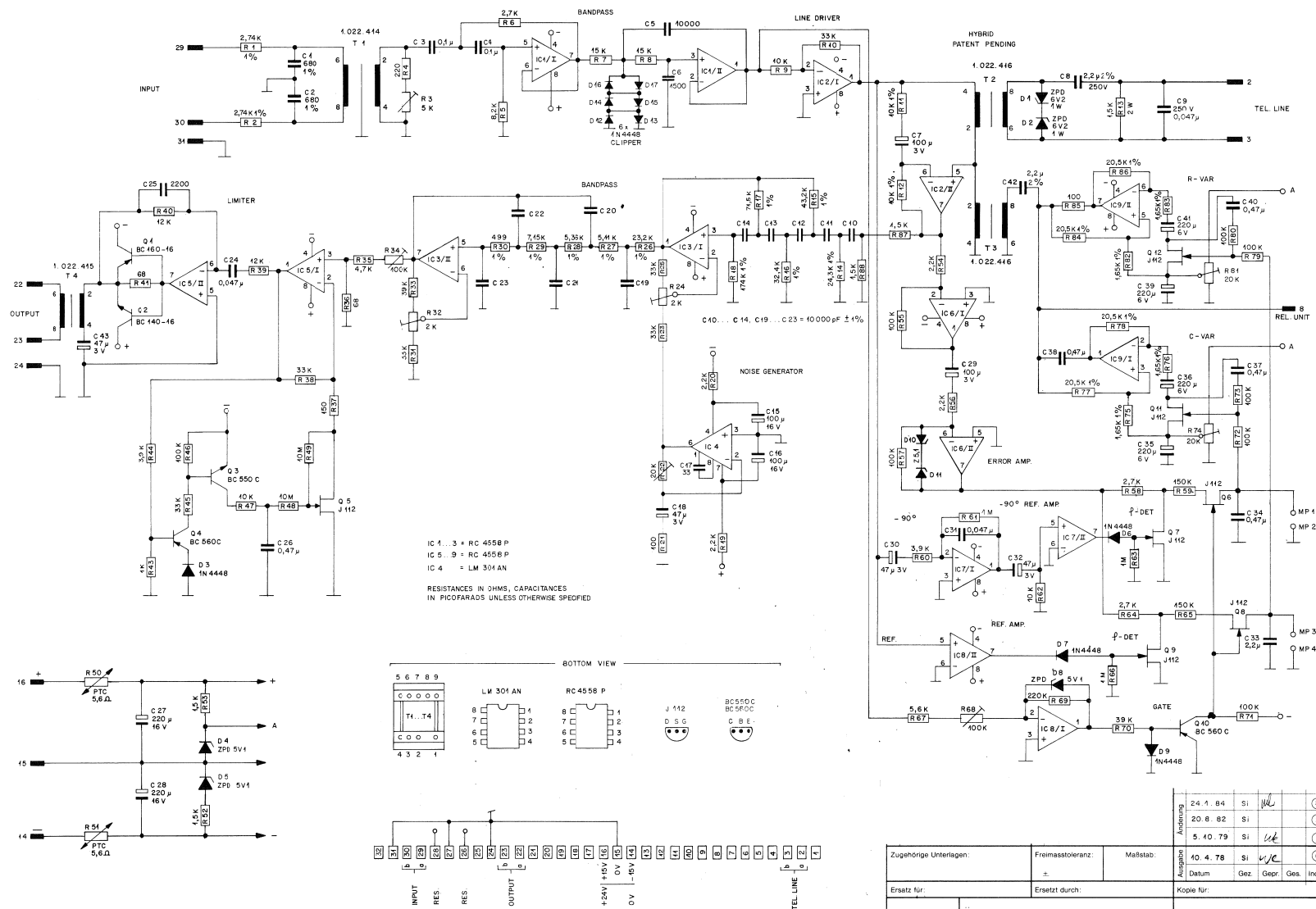
Modification List

IND	DATE	NAME	PH - Philips
①			
②			
③	22.6.83	JK	
④	22.11.82	JK	

STUDER Stabilizer 5 ÷ 24V/5A 1.915.108.00 PAGE 3 OF 3

# STUDER AUDIO CONSOLE 970

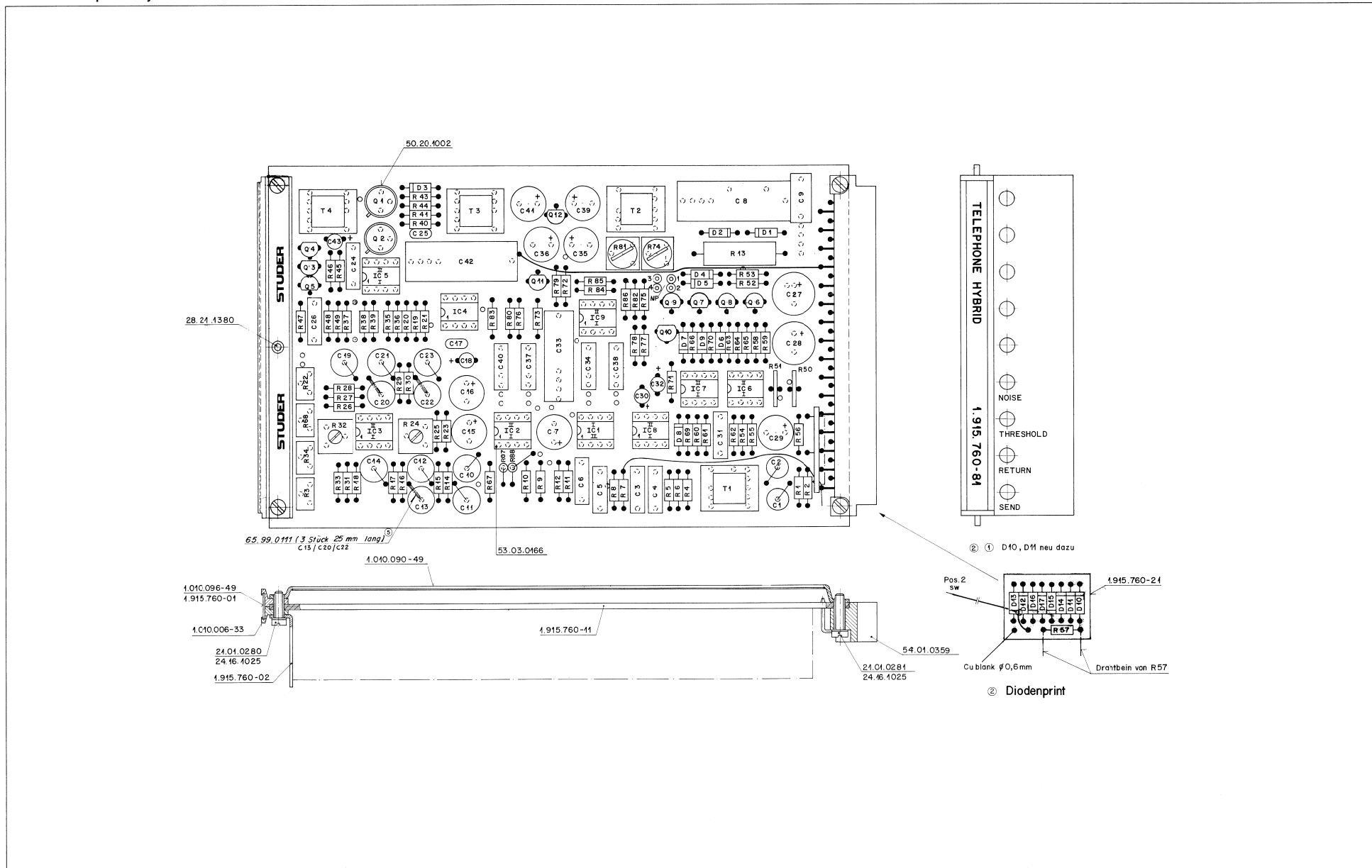
## Automatic Telephone Hybrid 1.915.760.81



Zugehörige Unterlagen:	Freimasstoleranz:	Maßstab:	Äußerliche Änderungen:	①
±			24.1.84	②
Ersatz für:	Ersetzt durch:	Kopie für:	20.8.82	③
STUDER REGENSDORF ZÜRICH	Automatic Telephone Hybrid (Patent pending)	SC 1.915.760/81	5.10.79	④
Bezeichnung:	Äußerliche Änderungen:	Datum:	Gez. Gepr. Ges. Index	
		10.4.78		



Automatic Telephone Hybrid 1.915.760.81



Automatic Telephone Hybrid 1.915.760.81

POS NO	PART NO	VALUE	SPECIFICATIONS	EQUIVALENT	MFR
C 1	59.12.3681	680 pF	1% 500V	PS	
C 2	59.12.3681	680 pF	1%	PS	
C 3	59.34.6104	0,1 μF	10%	PE	
C 4	59.34.6104	0,1 μF	10%	PE	
C 5	59.12.4103	0,01 μF	5%	PS	
C 6	59.11.6157	1500 pF	5%	PC	
C 7	59.22.4401	100 μF	3V	EL	
C 8	4.915.760-08	2,2 μF	10% 250V	PE	ST
C 9	59.31.8473	0,047 μF	400V	PE	
C 10	59.12.7103	0,01 μF	1%	PS	
C 11	59.12.7103	0,01 μF	1%	PS	
C 12	59.12.7103	0,01 μF	1%	PS	
C 13	59.12.7103	0,01 μF	1%	PS	
C 14	59.12.7103	0,01 μF	1%	PS	
C 15	59.22.4101	100 μF	16V	EL	
C 16	59.22.4101	100 μF	16V	EL	
C 17	59.34.2330	33 pF		CSP	
C 18	59.36.0470	47 pF	3V	TA	
C 19	59.12.7103	0,01 μF	1%	PS	
C 20	59.12.7103	0,01 μF	1%	PS	
C 21	59.12.7103	0,01 μF	1%	PS	
C 22	59.12.7103	0,01 μF	1%	PS	
C 23	59.12.7103	0,01 μF	1%	PS	
C 24	59.12.4473	0,047 μF		PE	
C 25	59.32.2222	2200 pF		CER	
C 26	59.02.0474	0,47 μF	-5%	PC	
C 27	59.22.4221	220 μF	16V	EL	
C 28	59.22.4221	220 μF	16V	EL	
C 29	59.22.4101	100 μF	3V	EL	
C 30	59.36.0470	47 pF	3V	TA	
C 31	59.12.4472	0,047 μF		PE	
C 32	59.36.0470	47 pF	3V	TA	
C 33	59.02.2225	2,2 μF		PE	
C 34	59.02.0474	0,47 μF		PE	
C 35	59.22.2221	220 μF	6V	EL	
C 36	59.22.2221	220 μF	6V	EL	
C 37	59.02.0474	0,47 μF		PE	
C 38	59.02.0474	0,47 μF		PE	
C 39	59.22.2221	220 μF		EL	
C 40	59.02.0474	0,47 μF		PE	
C 41	59.22.2221	220 μF	6V	EL	
C 42	4.915.760-02	2,2 μF	10% 250V	PE	ST
C 43	59.36.0470	47 pF	3V	TA	

POS NO	PART NO	VALUE	SPECIFICATIONS	EQUIVALENT	MFR
R 8	57.11.4453	15k			
R 9	57.11.4403	10k			
R 10	57.11.4323	33k			
R 11	57.38.1002	10k	1%		
R 12	57.38.1002	10k	1%		
R 13	57.56.5152	1,5k	2W		
R 14	57.38.2432	24,3k	1%		
R 15	57.38.4322	43,2k	1%		
R 16	57.38.3242	32,4k	1%		
R 17	57.38.7152	71,5k	1%		
R 18	57.38.1743	174k	1%		
R 19	57.11.4222	2,2k			
R 20	57.11.4222	2,2k			
R 21	57.11.4101	100			
R 22	57.01.7203	20k	LIN 10%		TR, SP
R 23	57.11.4323	33k	2%		
R 24	57.01.8202	2k	LIN 10%		TR, SP
R 25	57.11.4323	33k	2%		
R 26	57.38.2322	23,2k	1%		
R 27	57.38.5111	5,1k	1%		
R 28	57.38.5361	5,36k	1%		
R 29	57.38.7151	71,5k	1%		
R 30	57.38.4890	489	1%		
R 31	57.11.4323	33k	2%		
R 32	57.01.8202	2k	LIN 10%		TR, SP
R 33	57.11.4323	33k	2%		
R 34	57.01.7104	100k	LIN 10%		TR, SP
R 35	57.11.4472	4,7k			
R 36	57.11.4680	68			
R 37	57.11.4151	150			
R 38	57.11.4323	33k			
R 39	57.11.4123	12k			
R 40	57.11.4123	12k			
R 41	57.11.4680	68			
R 42					
R 43	57.11.4102	1k			
R 44	57.11.4392	39k			
R 45	57.11.4323	33k			
R 46	57.11.4104	10k			
R 47	57.11.4103	10k			
R 48	57.02.5106	10M			
R 49	57.02.5106	10M			
R 50	57.38.0209	5,6k			
R 51	57.38.0209	5,6k	PTC 2322 662 91005		PH
R 52	57.11.4152	1,5k	PTC		PH
R 53	57.11.4152	1,5k			

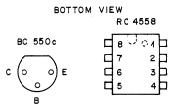
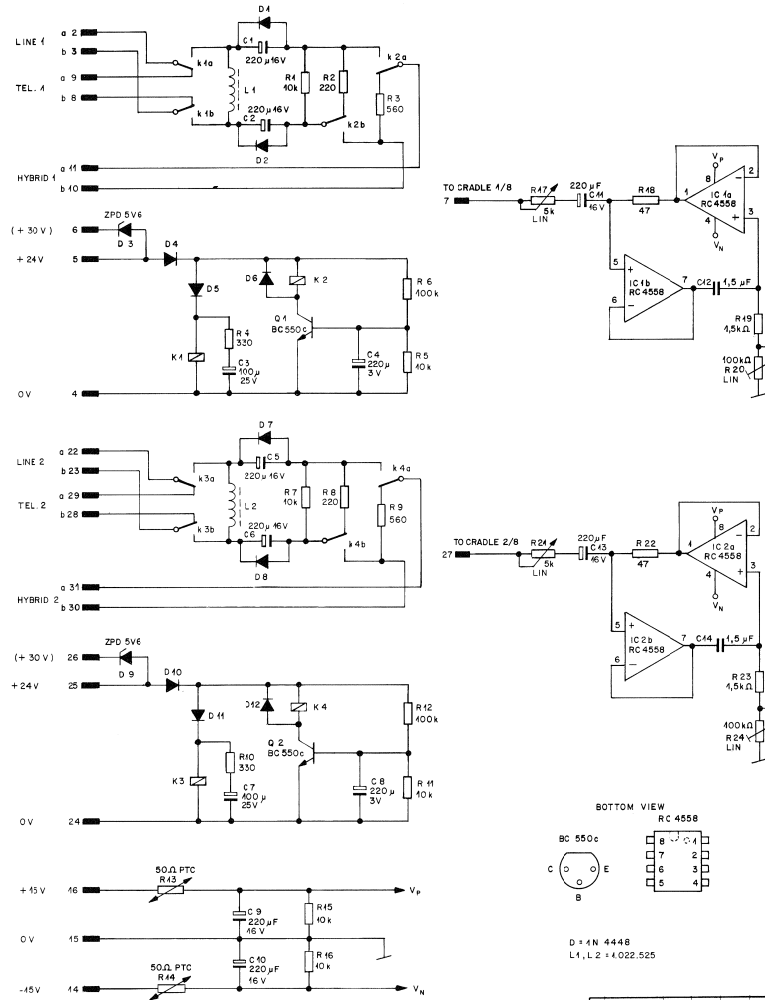
  

IND	DATE	NAME
⑤	20.8.82	JK
⑥	11.3.84	JK
⑦	10.9.80	JK
⑧	11.5.79	JK
⑨	6.11.78	JK
⑩	14.3.78	JK

IND	DATE	NAME
⑤	20.8.82	JK
⑥	11.3.84	JK
⑦	10.9.80	JK
⑧	11.5.79	JK
⑨	6.11.78	JK
⑩	14.3.78	JK

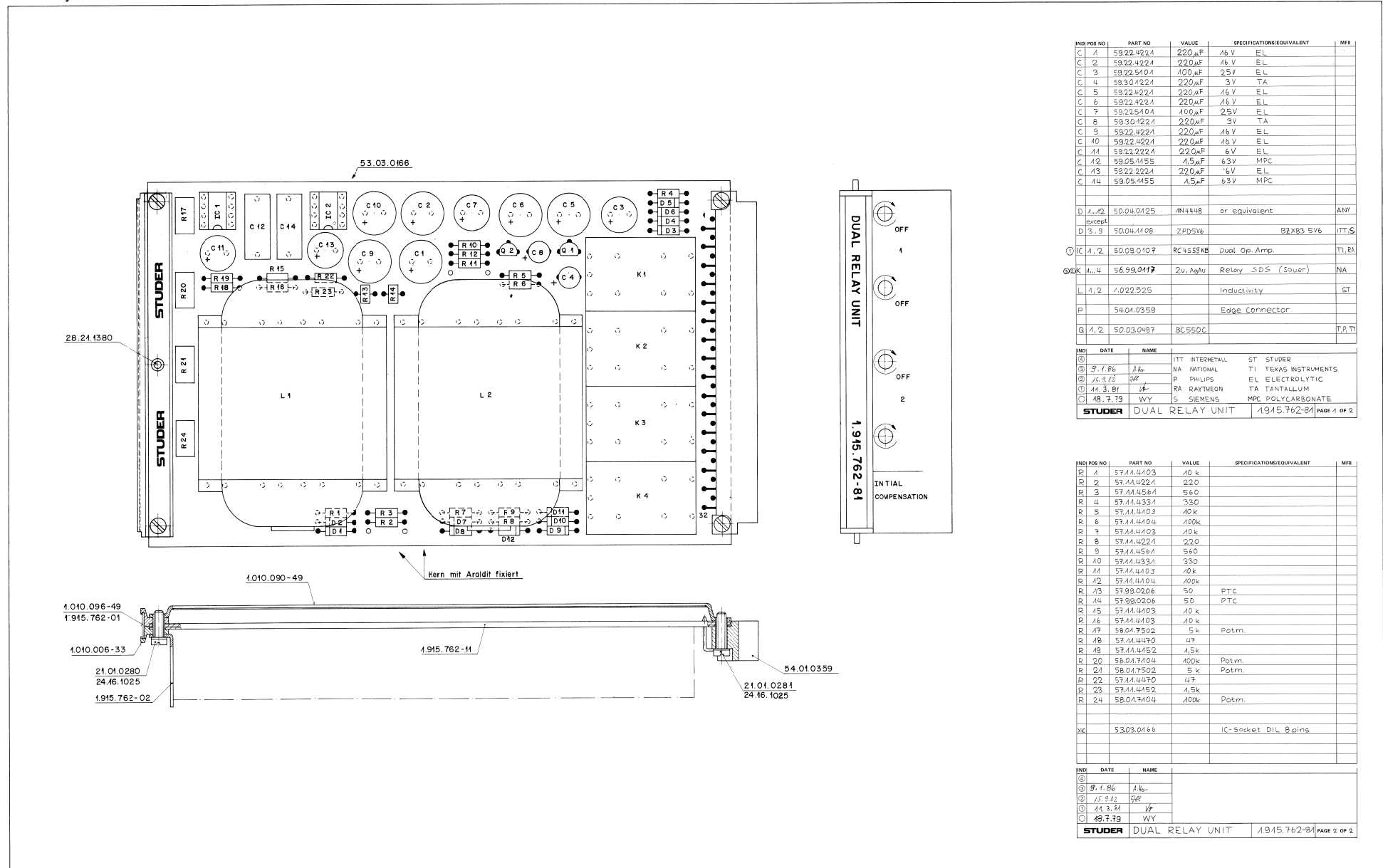
Dual Relay Unit 1.915.762.81



D = 1 N 4448  
L1, L2 = 4.022.525

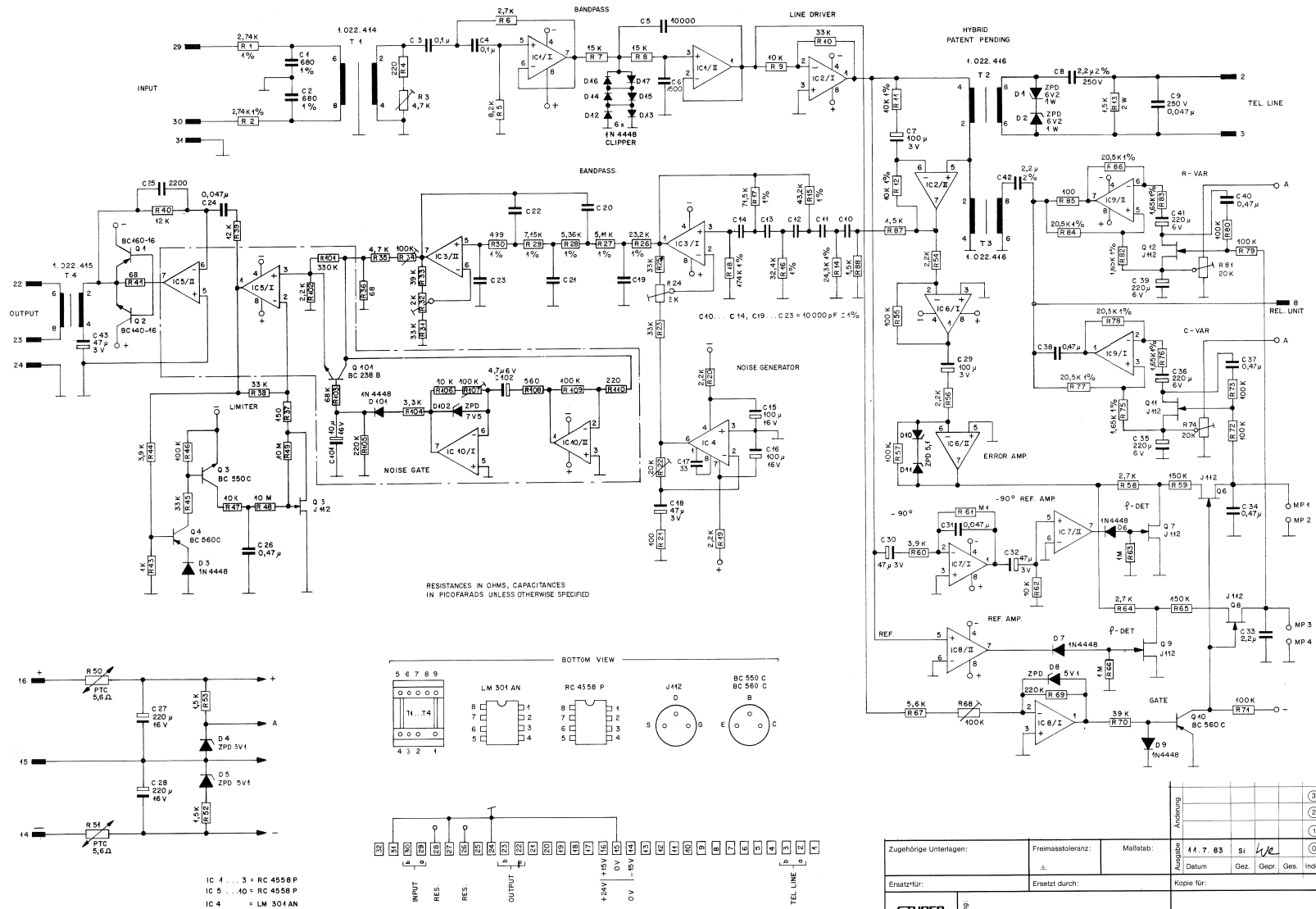
Ersatz für:		Ersetzt durch:		Kopie für:	
STUDER REGENSDORF ZÜRICH		DUAL RELAY UNIT		Nummer: SC. 1.915.762-81	
Bezeichnung:		Datum:		Gez. Gepr. Ges. Index	

Dual Relay Unit 1.915.762.81



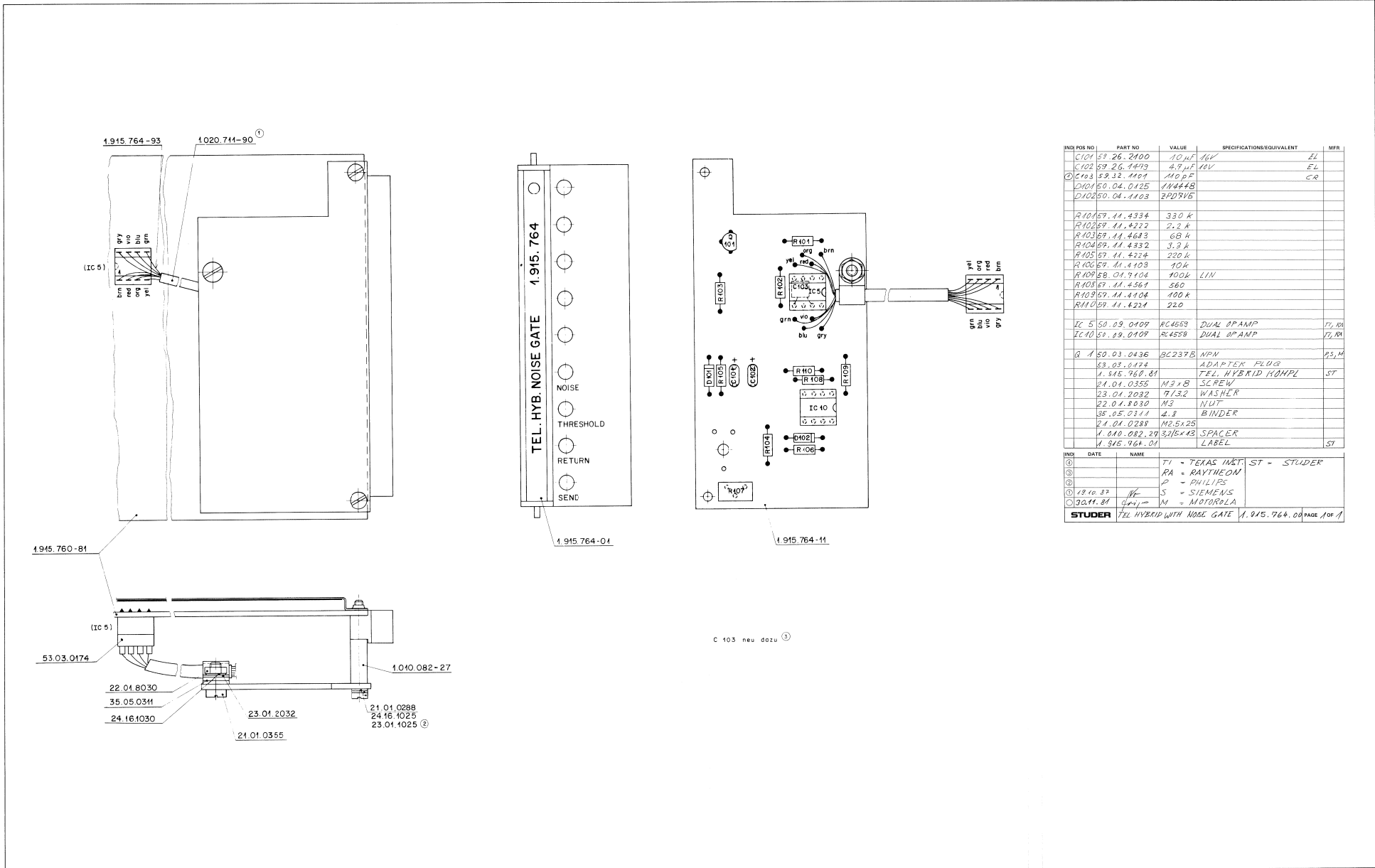
# STUDER AUDIO CONSOLE 970

Automatic Telephone Hybrid 1.915.764.00

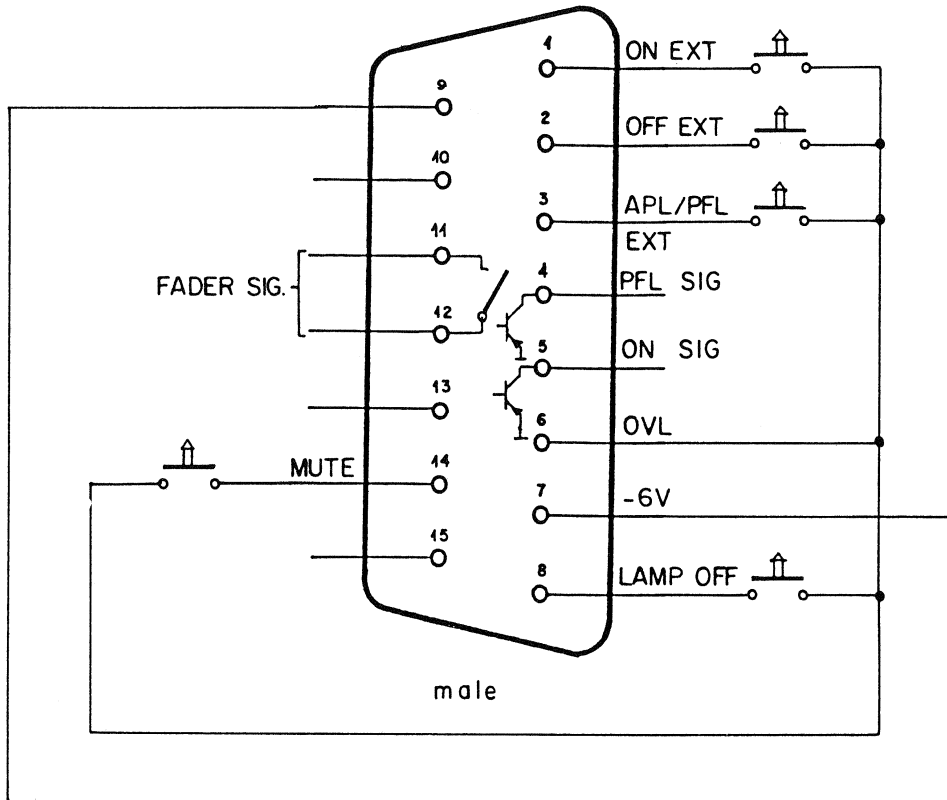


Zugehörige Unterlagen:	Freimastoleranz:	Maßstab:	Änderung:
±	±	4:1	①
Ersatz für:	Ersetzt durch:	Kopie für:	②
STUDER REGENSDORF ZÜRICH	Automatic Telephone Hybrid (Patent pending)	SC 1.915.764	③

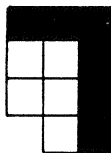
Automatic Telephone Hybrid 1.915.764.00



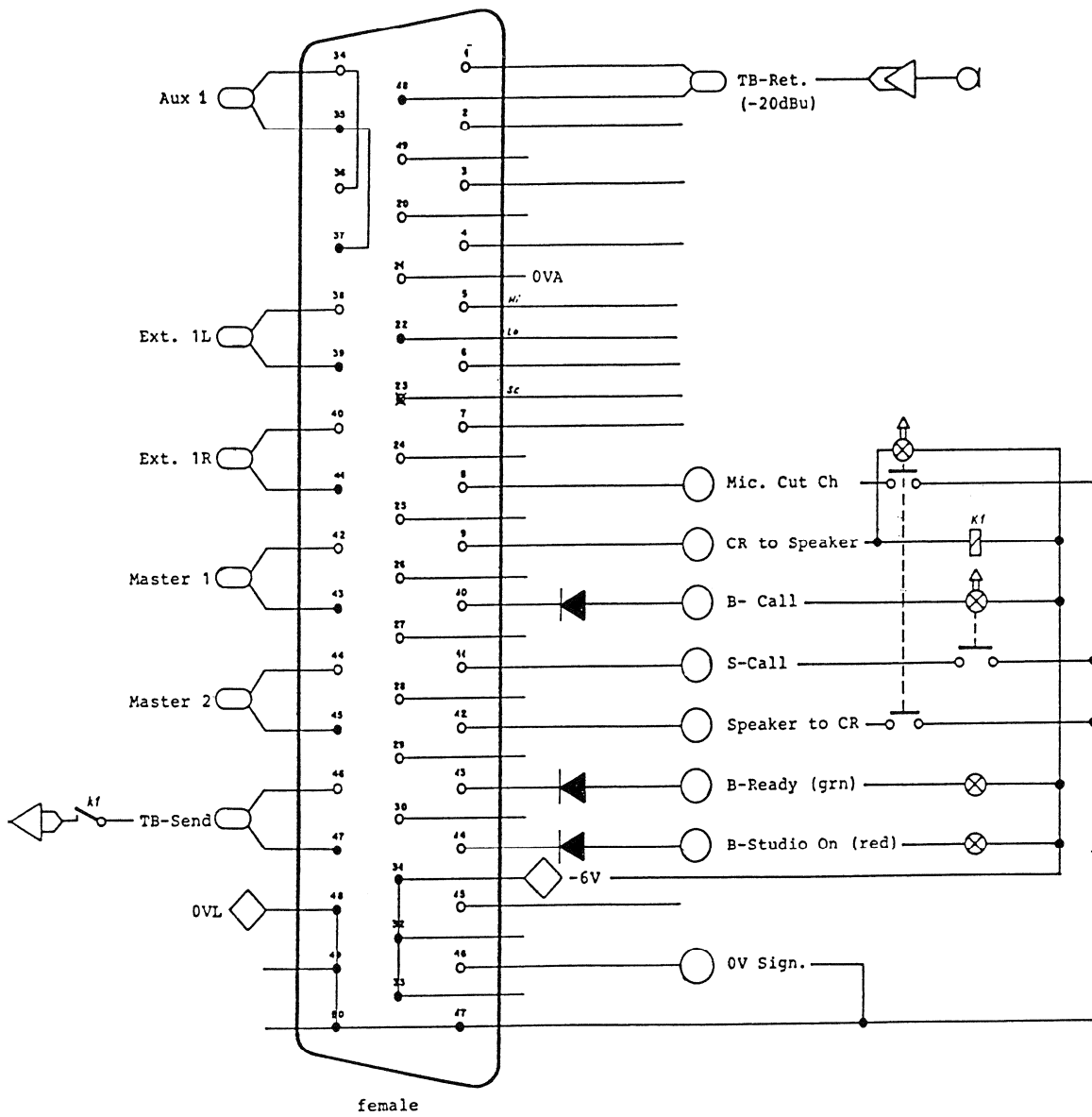
8 Connectors



JUMPERS 511, 512, 513 (STANDARD)



2.3.87 w13	<b>D - TYP - CONNECTOR 15 PIN.</b>	
<b>STUDER</b>	MIXING CONSOLE 970 15 pin D-TYPE INPUT UNIT	1.970.



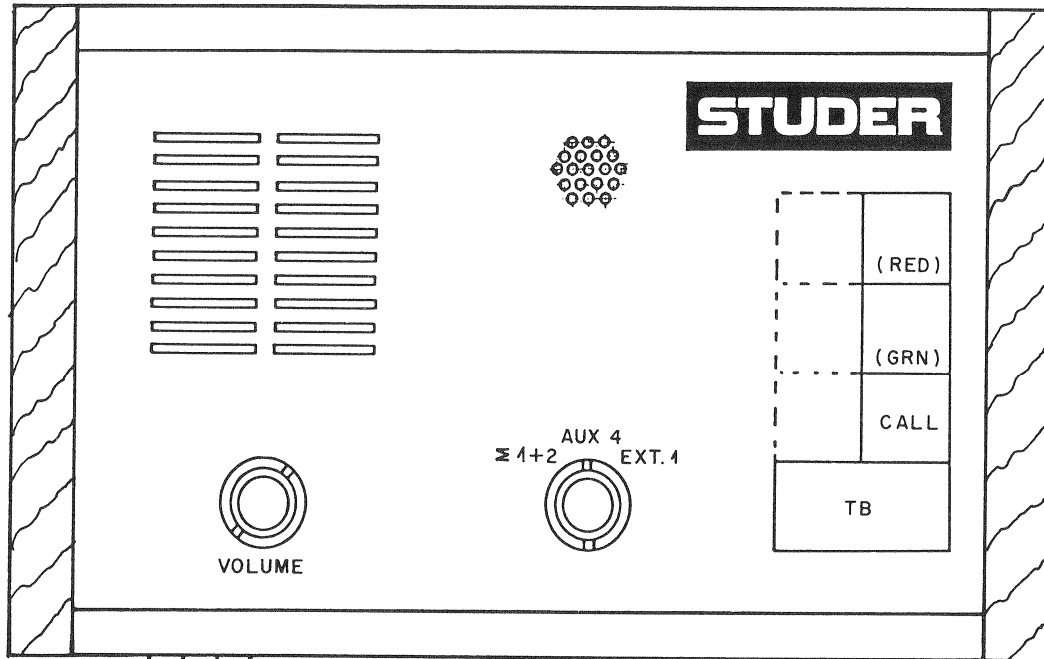
	D-TYP-CONNECTOR 50 PIN.	
<b>STUDER</b>	TB-Box	



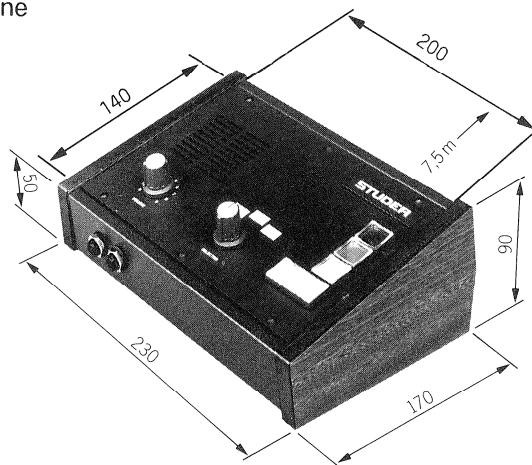
10 Accessories

1. Talk Back Box

1.924.560



Headphone  
Socket

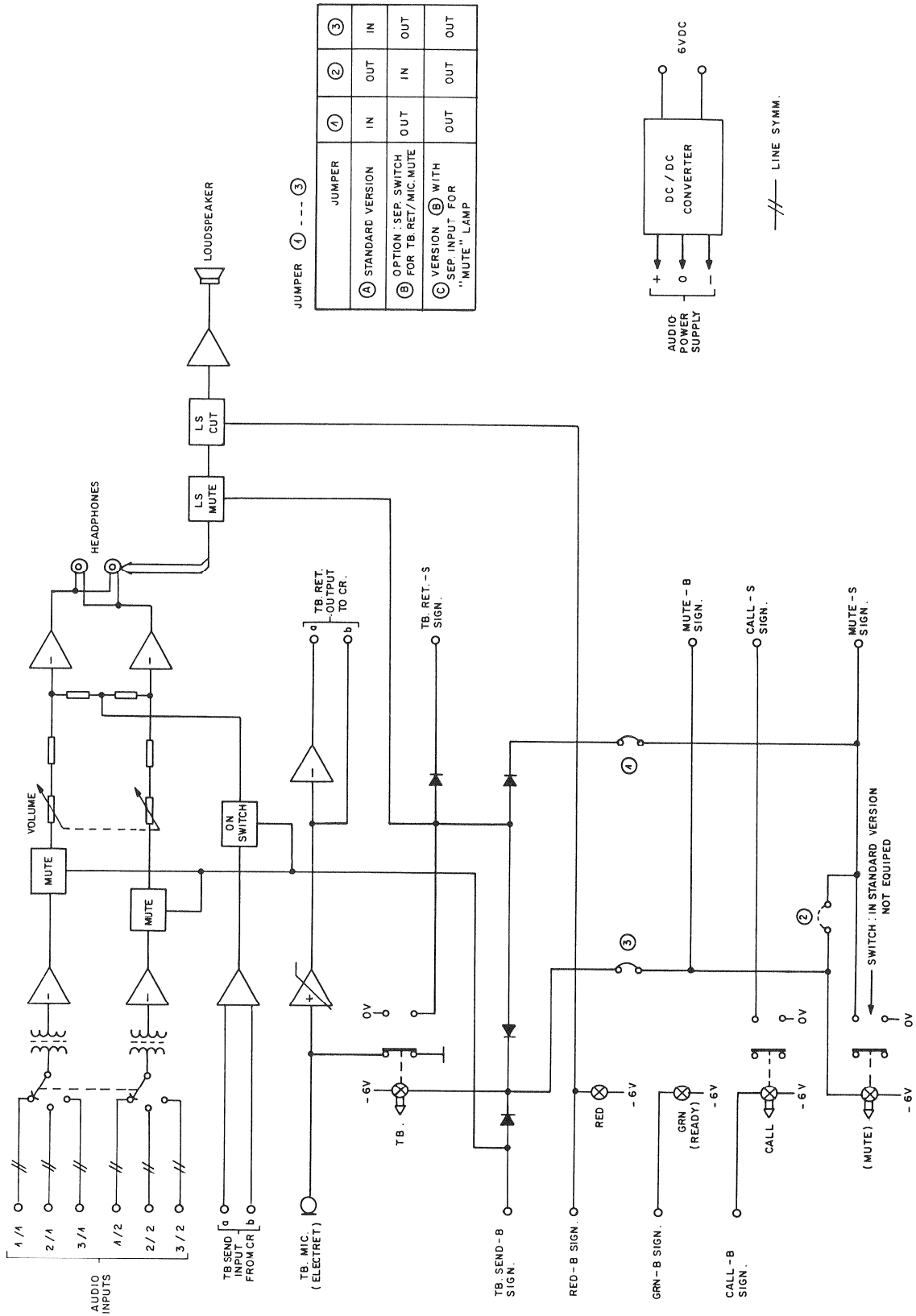


© 14. 11. 85		○	○	○	○
STUDER REGENSDORF ZURICH	TALK BACK BOX			1.924.560	

# STUDER AUDIO CONSOLE 970

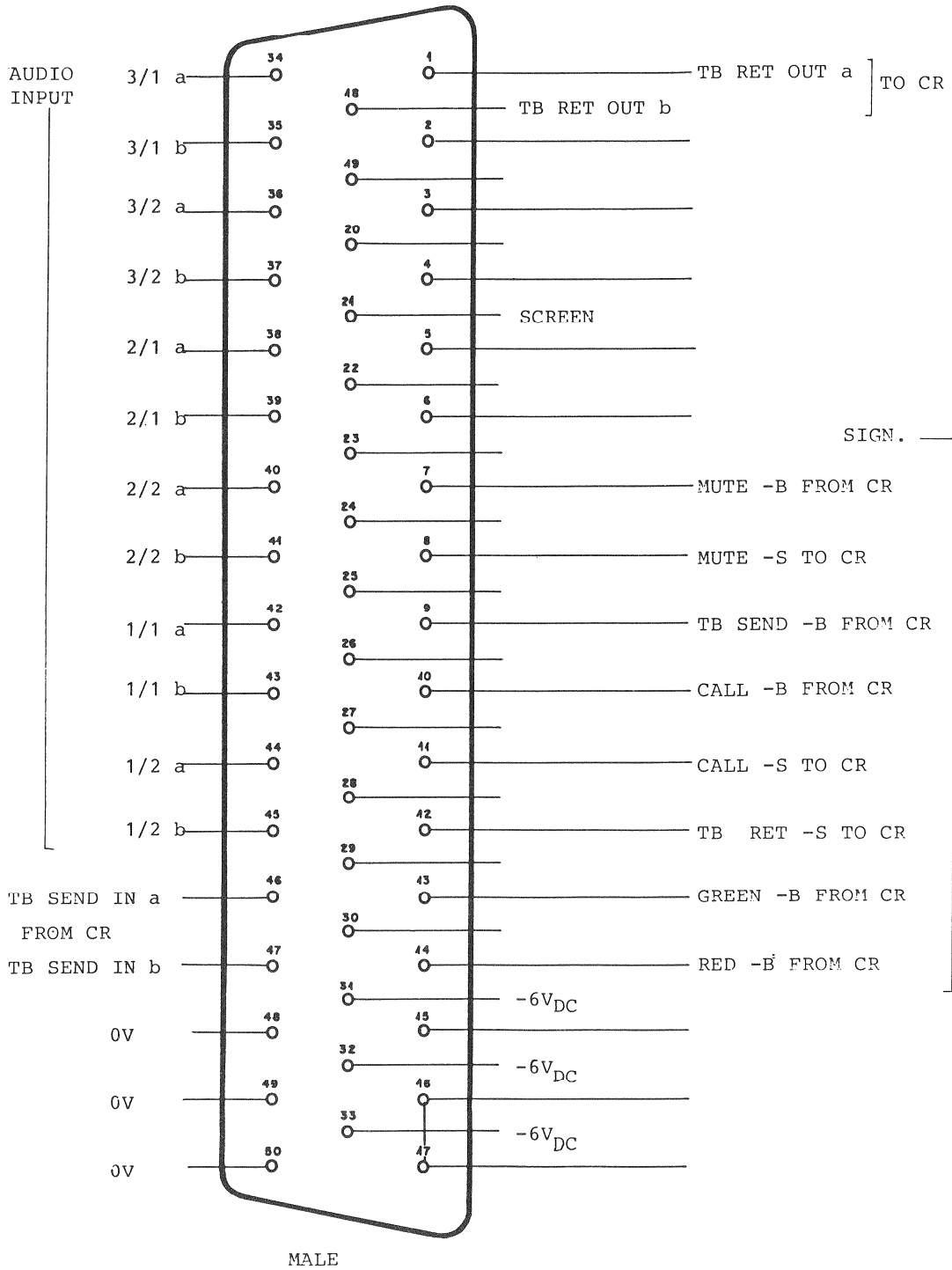
## Block Diagram Talk Back Box

1.924.560/1



**Talk Back Box**  
**D-Typ-Connector 50 PIN.**

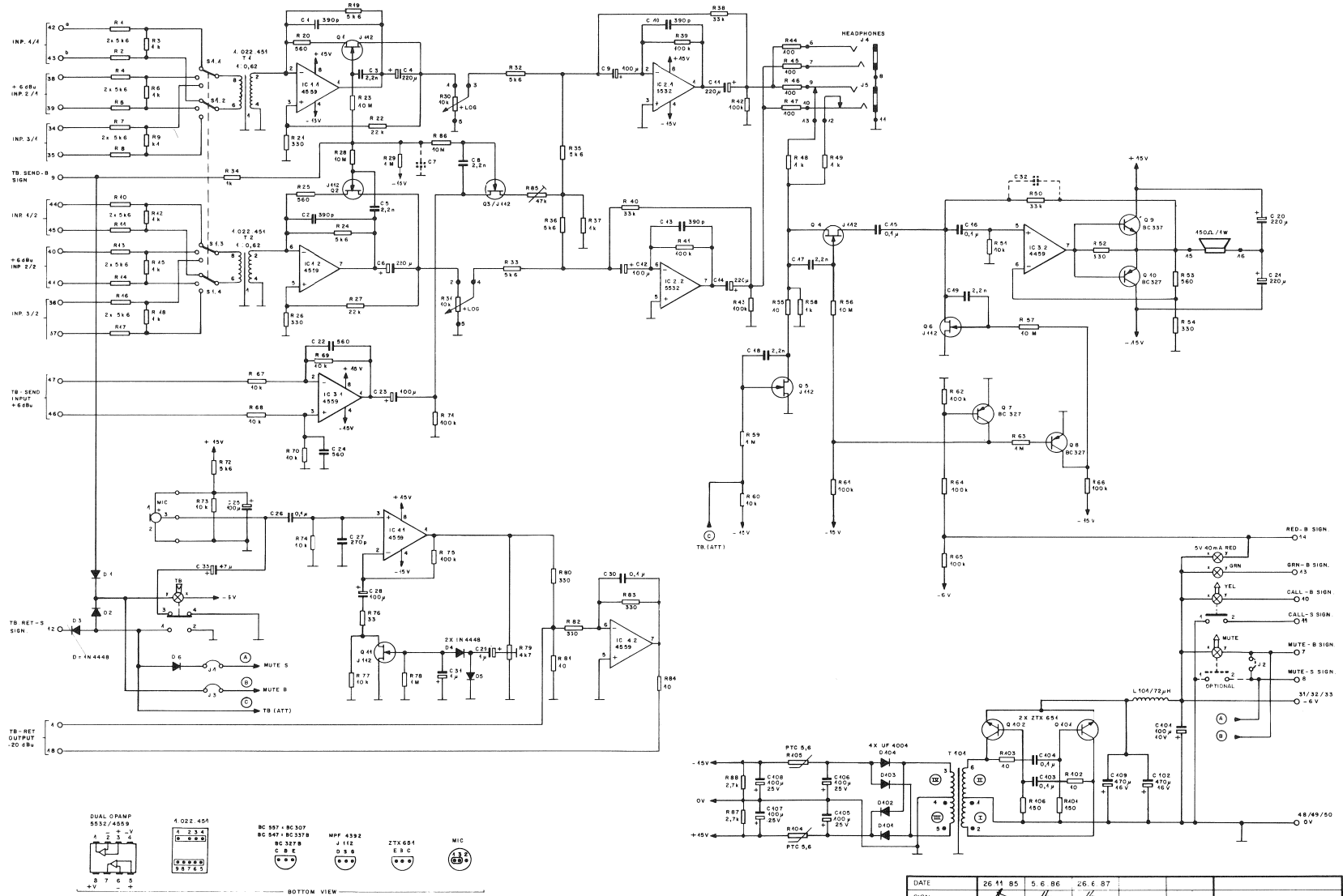
1.924.560



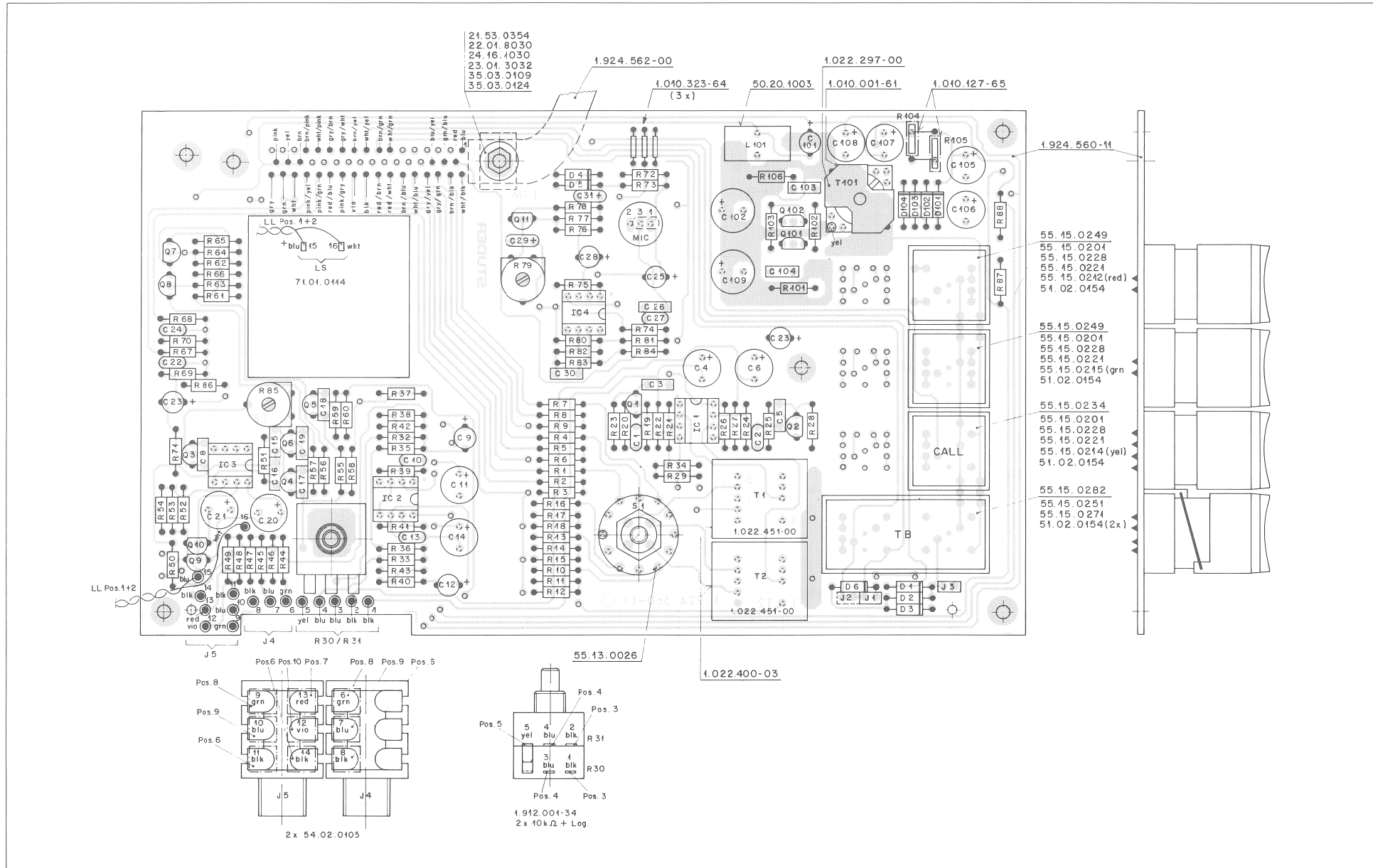
15.11.85	<b>D-TYP-CONNECTOR 50 PIN.</b>	
<b>STUDER</b>	TALK BACK BOX	1.924.560

# STUDER AUDIO CONSOLE 970

## Talk Back Box 1.924.560



Talk Back Box 1.924.560





# STUDER AUDIO CONSOLE 970

## TALK BACK BOX 1.924.560

IND	POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
	R30	57.11.004.34	10L	alog Polimeter	ST
	R31	"	10L	alog	
	R32	57.11.4562	5,6k		
	R33	57.11.4562	5,6k		
	R34	57.11.4102	1k		
	R35	57.11.4562	5,6k		
	R36	57.11.4562	5,6k		
	R37	57.11.4102	1k		
	R38	57.11.4333	33k		
	R39	57.11.4104	100k		
	R40	57.11.4333	33k		
	R41	57.11.4104	100k		
	R42	57.11.4104	100k		
	RR3	57.11.4104	100k		
	RR4	57.11.4104	100		
	RR5	57.11.4104	100		
	RR6	57.11.4104	100		
	RR7	57.11.4104	100		
	RR8	57.11.4102	1k		
	RR9	57.11.4102	1k		
	R50	57.11.4333	33k		
	R51	57.11.4103	10k		
	R52	57.11.4333	33k		
	R53	57.11.4561	560		
	R54	57.11.4333	33k		
	R55	57.11.4100	10		
	R56	57.11.5106	10M		
	R57	57.11.5106	10M		
	R58	57.11.4102	1k		
	R59	57.11.4105	1M		

IND	POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
	R101	57.11.4151	150		
	R102	57.11.4100	10		
	R103	57.11.4100	10		
	R104	57.99.0209	5,6	PTC	Ph
	R105	57.99.0209	5,6	PTC	Ph
	R106	57.11.4151	150		
	S1	55.13.0026	4x3U	Rotary switch	ELMA
	S2	55.15.02P2			EAO
	S3	55.15.0234		Optional	EAO
	S4	55.15.0234			EAO
	XB	55.15.0248			EAO
	B1.5	51.02.0154	54/10mA	TA 3.. Pin	
	T1	1.022.451.00	1:0,62		ST
	T2	1.022.451.00	1:0,62		ST
	T101	1.022.297.00		Converter Trafo	ST

IND	DATE	NAME			
④			St. Studer		
③					
②					
①	12.1.87	He			
○	13.11.85	He			
STUDER	78 BOX	1924 560	PAGE 5 OF 8		

IND	DATE	NAME			
④			Ph: Philips		
③			SI: Studer		
②			EAO		
①	12.1.87	He	ELMA		
○	13.11.85	He			
STUDER	78 BOX	1924 560	PAGE 7 OF 8		

IND	POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
	R60	57.11.4103	10k		
	R61	57.11.4104	100k		
	R62	57.11.4104	100k		
	R63	57.11.4105	1M		
	R64	57.11.4104	100k		
	R65	57.11.4104	100k		
	R66	57.11.4104	100k		
	R67	57.11.4103	10k		
	R68	57.11.4103	10k		
	R69	57.11.4103	10k		
	R70	57.11.4103	10k		
	R71	57.11.4104	100k		
	R72	57.11.4562	5,6k		
	R73	57.11.4103	10k		
	R74	57.11.4103	10k		
	R75	57.11.4104	100k		
	R76	57.11.4330	33		
	R77	57.11.4103	10k		
	R78	57.11.4105	1M		
	R79	58.02.5472	47k	Pol.	
	R80	57.11.4331	33k		
	R81	57.11.4100	10		
	R82	57.11.4331	33k		
	R83	57.11.4331	33k		
	R84	57.11.4100	10		
	R85	58.02.5473	47k	Pol.	
	R86	57.11.4106	10M		
	R87	57.11.4272	2,7k		
	R88	57.11.4272	2,7k		

IND	POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
	MIC	89.01.0343		Electret	
	LS	71.01.0114		150Ω φ.80mm	
	7(S)1.2	54.01.0020	4 Pin		
	7(S)3	54.01.0020	2 Pin		
	J4	54.02.0105		Stereo Jack Socket	
	J5	54.02.0105		Stereo Jack Socket	

IND	DATE	NAME			
④					
③					
②					
①	12.1.87	He			
○	13.11.85	He			
STUDER	78 BOX	1924 560	PAGE 6 OF 8		

IND	DATE	NAME			
④					
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①	12.1.87	He			
○	13.11.85	He			
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