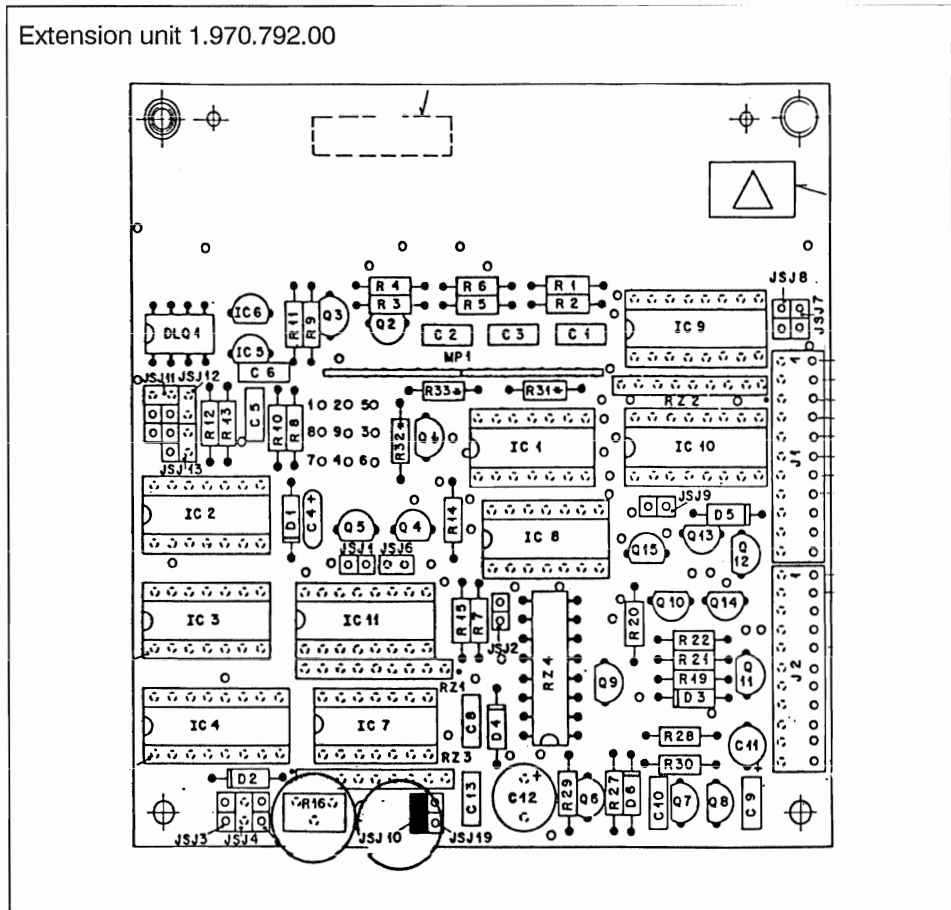


Time delay

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

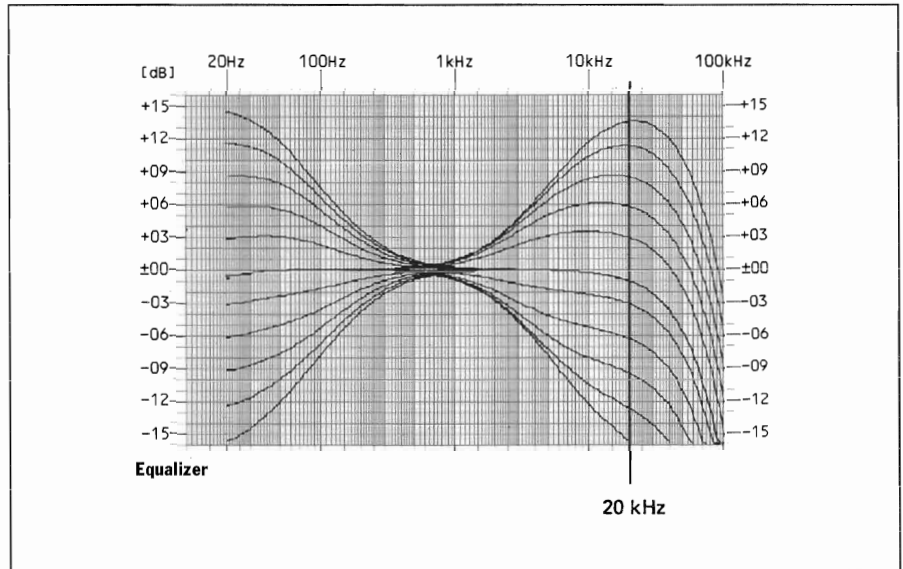
Extension unit 1.970.792.00



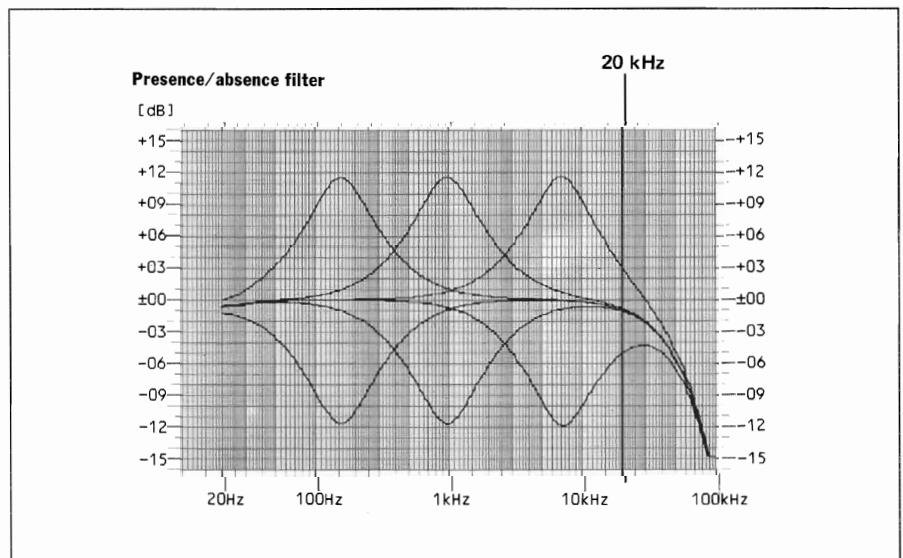
The time delay between the faderstart and the switching on of the audio signal is adjustable between 0...1 sec. with R16 (PCB 1.970.792)
Jumper 10 must be set as shown! (Time delay = activ)

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: ± 15 dB.



Parametric filter with adjustable center frequency: 150 Hz...7 kHz (Q=1).
 Emphasis / de-emphasis: ± 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

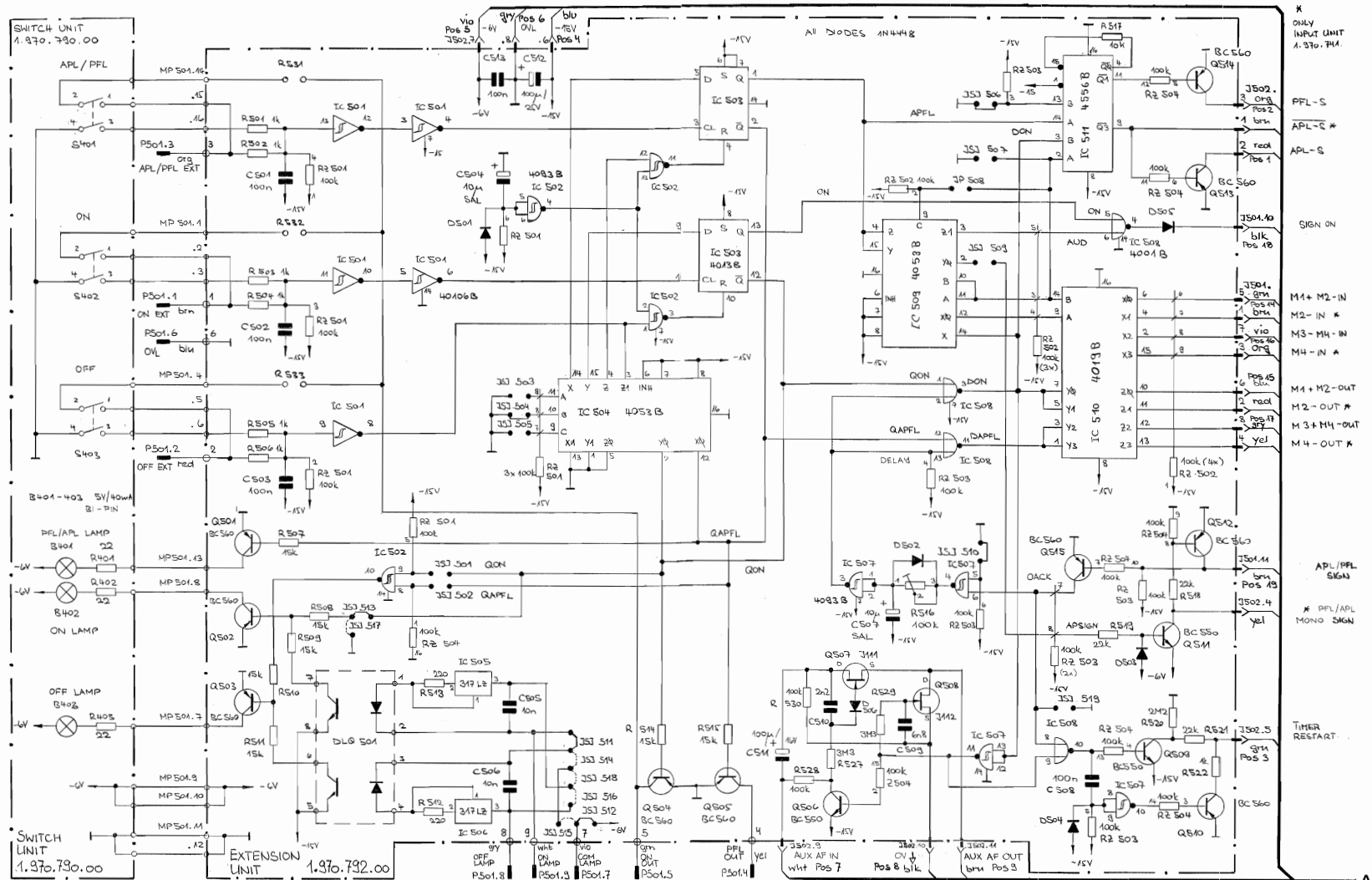
STEREO HL INPUT UNIT

1.970.753/754.81

2.7 Schemateil / Circuit Diagrams

Stereo HL Input Unit

Part 1



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

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

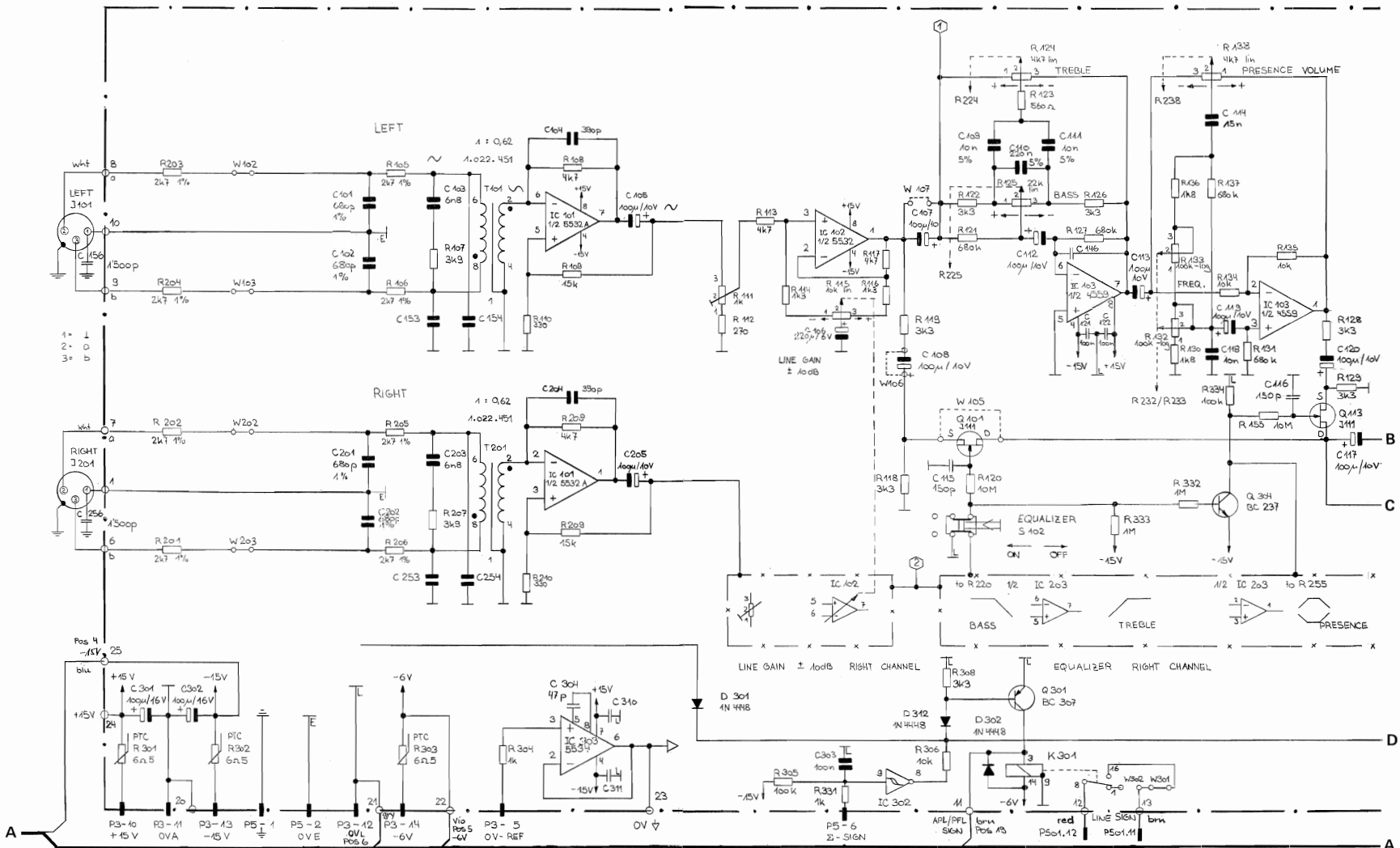
STUDER AUDIO CONSOLE 970

STEREO HL INPUT UNIT

Stereo HL Input Unit 4CH

1.970.753.81/1.970.754.81 w. EQ

Part 2



017.10.83	INXL. 1.970.792.00 / 1.970.790.00	PAGE 3 OF 9
STUDER	STEREO HL INPUT UNIT	SC 1.970.754.81

017.10.83	PAGE 4 OF 9	
STUDER	STEREO HL INPUT UNIT	SC 1.970.754.81

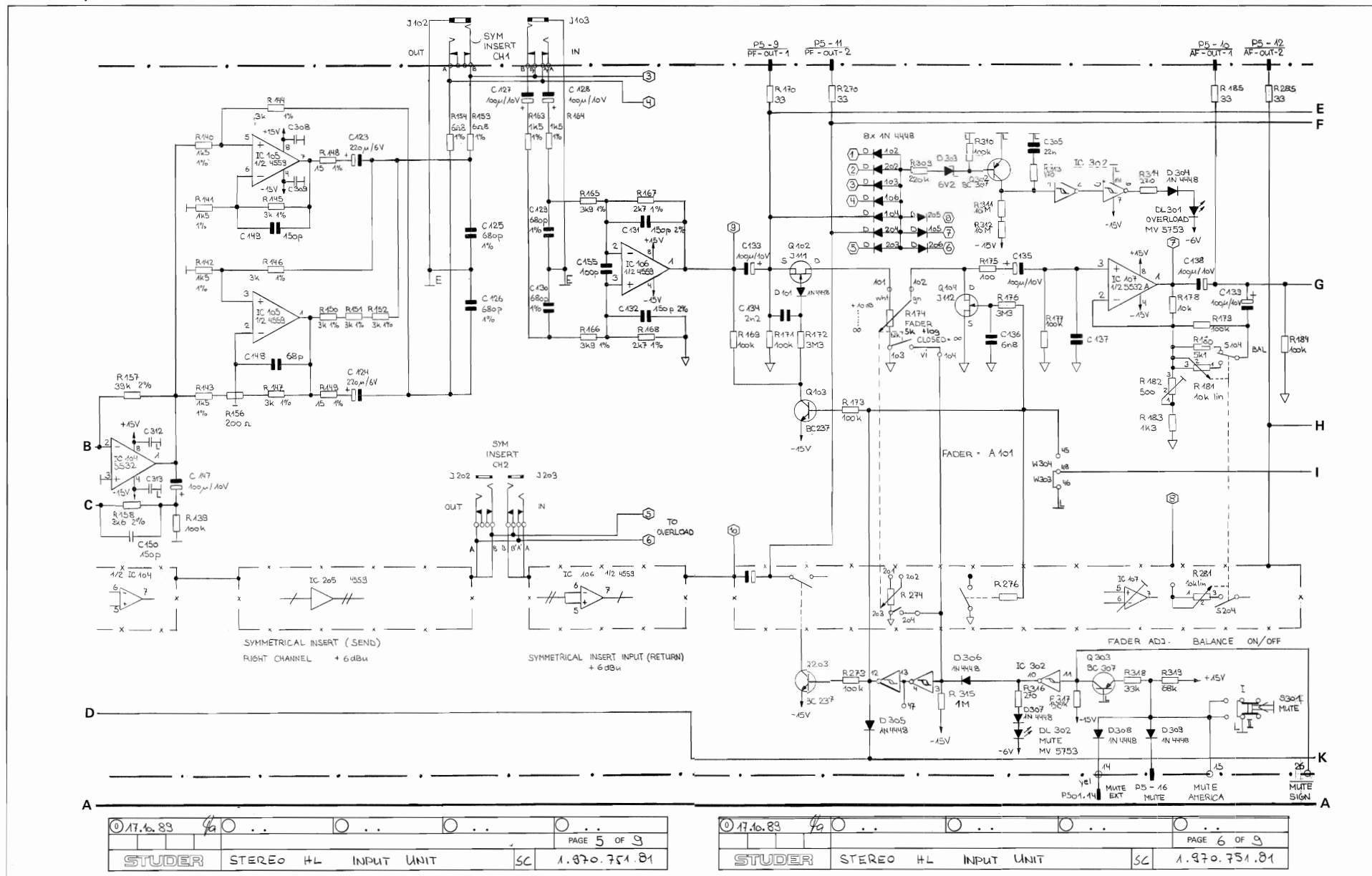
STUDER AUDIO CONSOLE 970

STEREO HL INPUT UNIT

Stereo HL Input Unit 4CH

1.970.753.81/1.970.754.81 w. EQ

Part 3



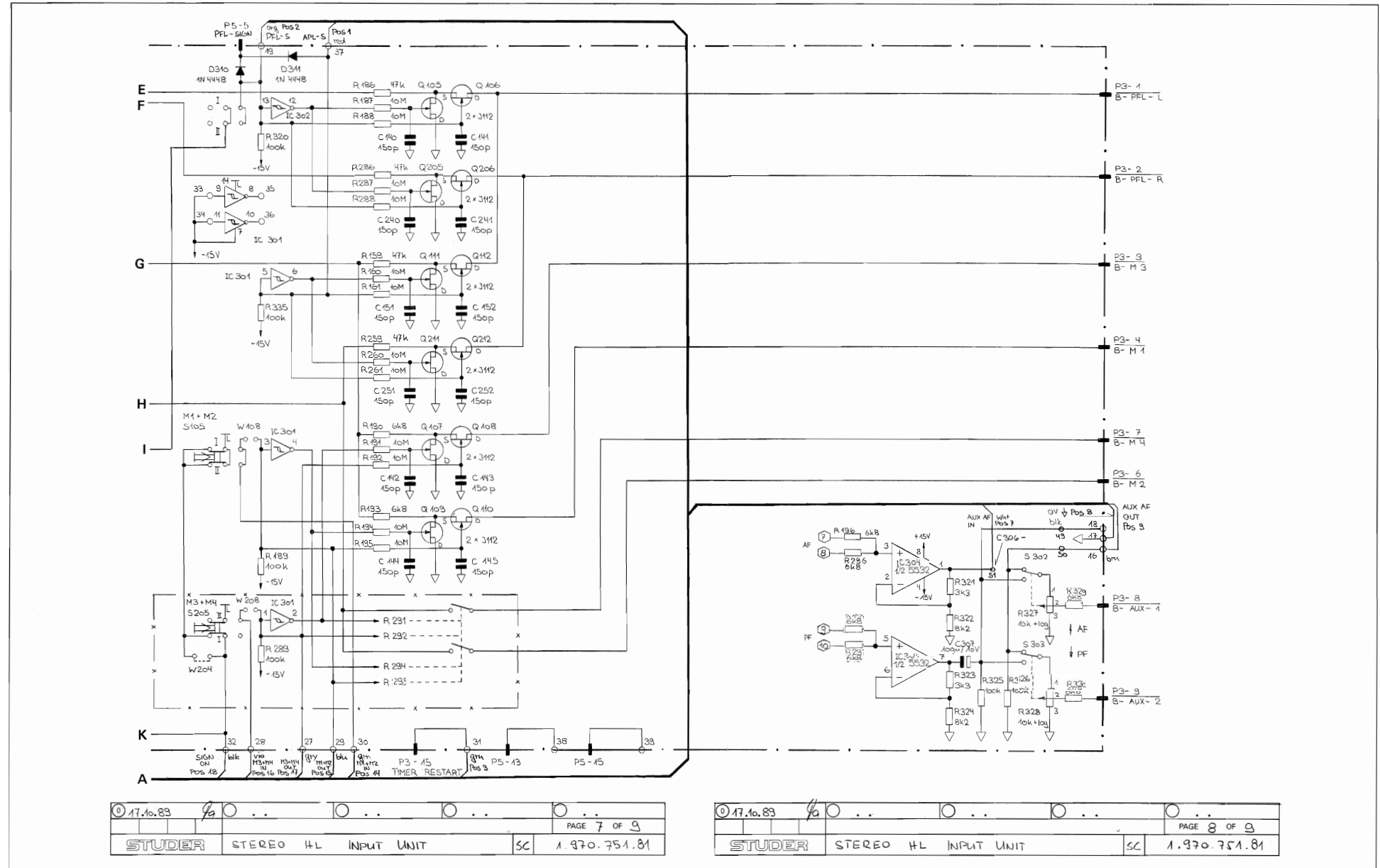
STUDER AUDIO CONSOLE 970

STEREO HL INPUT UNIT

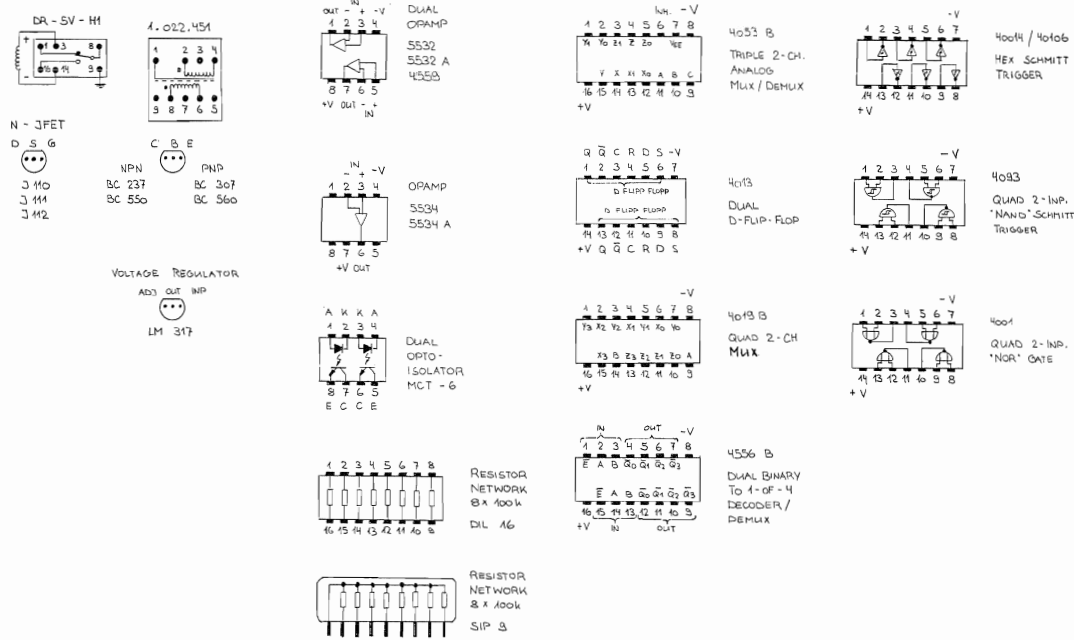
Stereo HL Input Unit 4CH

1.970.753.81/1.970.754.81 w. EQ

Part 4



P	NC	NAME	REMARK (EURO 16-P)	B=BUS,0=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	APL/PFL	APL/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	0	P501	9	ON LAMP	ON LAMP EXTERN	
P5	10	AF-OUT-1	AF OUTPUT CH. 1	0	P501	10	-	RES	
P5	11	PF-OUT-2	PF OUTPUT CH. 2	0	P501	11	LINE SIGN	LINE SIGNALISATION	
P5	12	AF-OUT-2	AF OUTPUT CH. 2	0	P501	12	LINE SIGN	LINE SIGNALISATION	
P5	13	-	RES	0	P501	13	-	RES	
P5	14	-	RES	0	P501	14	MUTE EXT	MUTE EXTERN	
P5	15	-	RES	0	P501	15	-	RES	
P5	16	MUTE	CH. MUTE	0					
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	9	B-AUX-2	AUX 210-OHM 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	-6 V	- SUPPLY	B					
P3	15	TIMER	TIMER RESTART	B					
P3	16	-	RES	0					
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

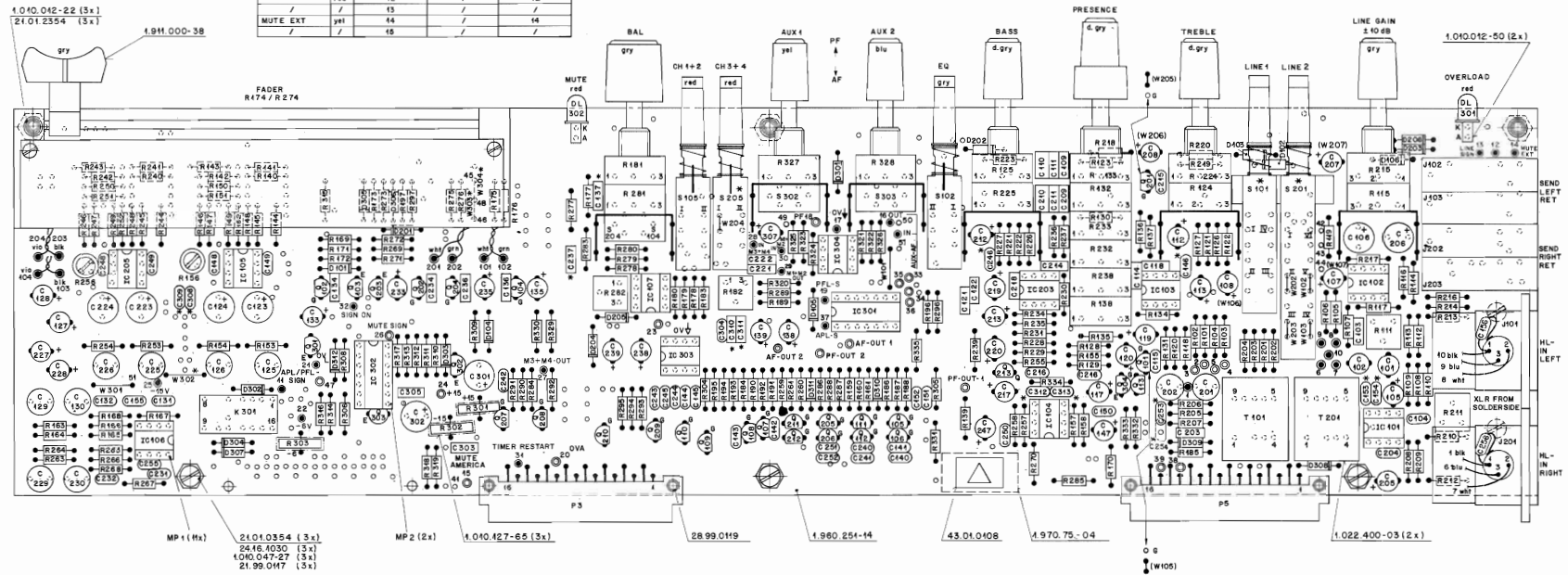
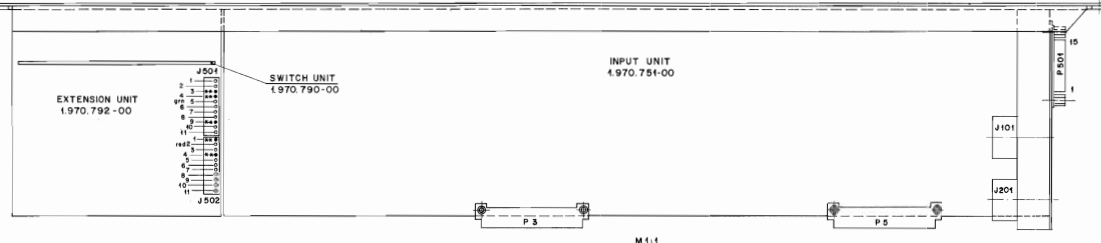
STEREO HL INPUT UNIT

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	5
PFL - S	org	19	3	OUT	blu	29	6
TIMER RESTART	brn	31	5	M3+M4 IN	vio	28	7
-15 V	blu	25	6	OUT	grf	27	8
-6 V	vio	22	7	SIGN ON	blk	32	10
OVL	grf	21	8	APL / PFL SIGN	brn	11	11
AUX - AF IN	whr	51	9				
OV+	blk	17	10				
OUT	brn	16	11				

SIGN. NAME	COL.	INPUT UNIT P.501 (D-Type)	EXTENSION UNIT POINT-NR.	INPUT UNIT POINT-NR.
ON EXT	brn	1	4	13
OFF EXT	red	2	2	12
APL/PFL EXT	org	3	3	14
PFL OUT	yel	4	4	15
ON OUT	brn	5	5	16
OVL	blu	6	6	
COM LAMP	vio	7	7	
OFF LAMP	grf	8	8	
ON LAMP	whr	9	9	
LINE SIGN	brn	11	11	
MUTE EXT	red	12	12	
	yel	14	14	
	blk	15	15	
	whr	16	16	



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

* not used

C156 und C256 verlohrt nach BV646

1.970.753-00 Q 101, R 201, C 107, C 108, C 207, C 208 replaced by link (W...)

STUDER AUDIO CONSOLE 1970

Stereo HL Input Unit 970

1.970.751.81

Table with columns: Ad., POS., REF.No., DESCRIPTION, MANUFACTURER. Contains component list for Stereo HL Input Unit 970.

Table with columns: Ad., POS., REF.No., DESCRIPTION, MANUFACTURER. Contains component list for Stereo HL Input Unit 970.

Stereo HL Input Unit 970

1.970.751.81

Table with columns: Ad., POS., REF.No., DESCRIPTION, MANUFACTURER. Contains component list for Stereo HL Input Unit 970.

Table with columns: Ad., POS., REF.No., DESCRIPTION, MANUFACTURER. Contains component list for Stereo HL Input Unit 970.

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 Vorhörsignal 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 Σ /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 Σ Die ausgerastete Vorwahltaste (Position Σ) 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.

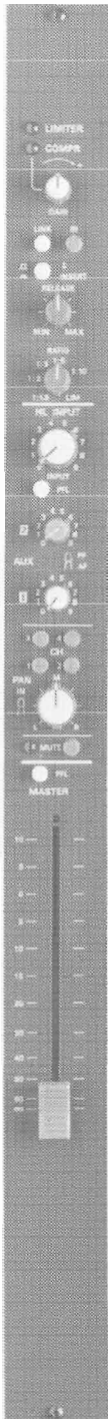
**LIMITER/KOMPRESSOR
-EINSCHLEIFPFAD**

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 Σ /INSERT):

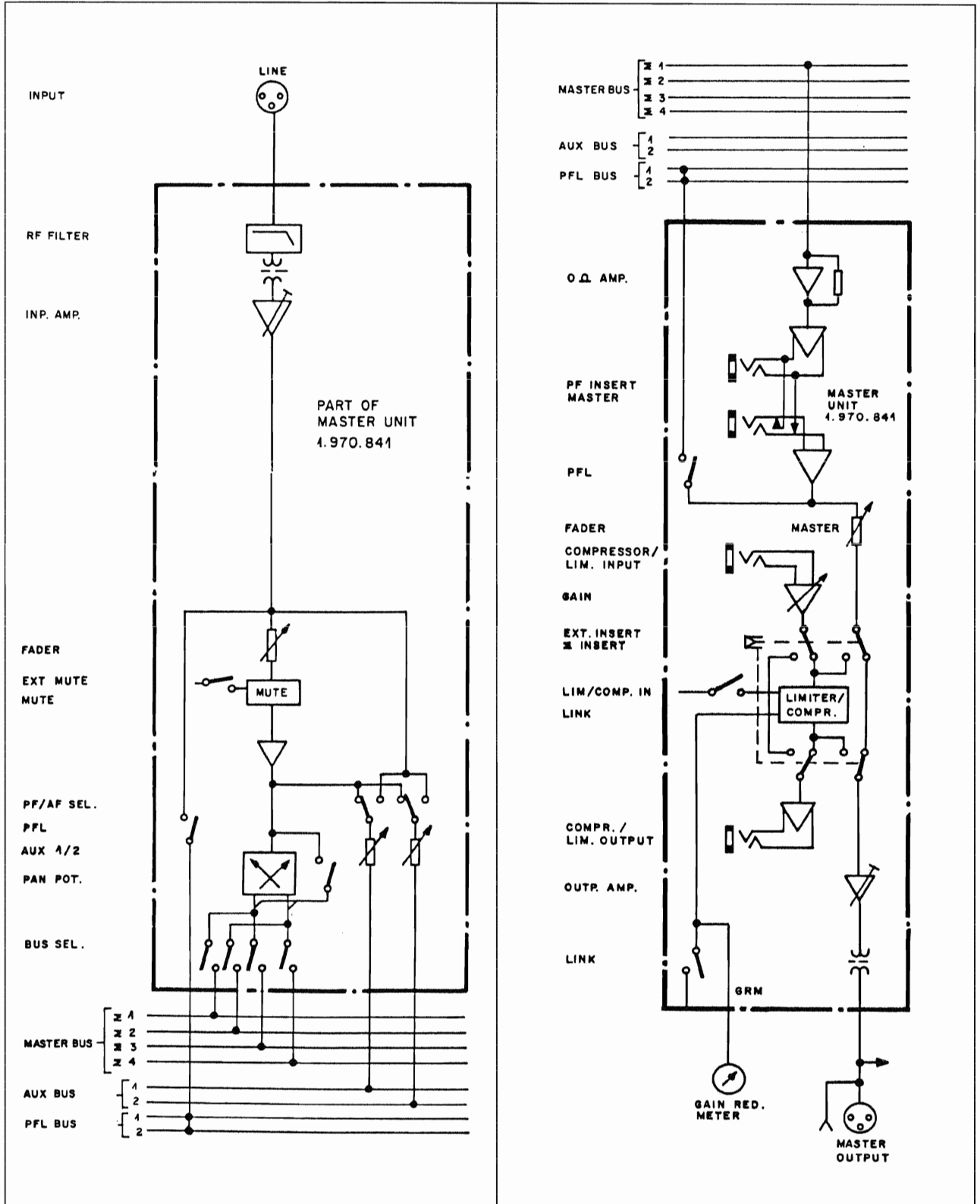
STEREO COUPLING LINK When the LINK button is engaged, the limiter control circuits of the master unit processing a signal are coupled. This results in a gain control in which the controlled variable is determined by the channel on which the higher control voltage is available.

MASTER CHANNEL Σ When the preselection button is released (position Σ), 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

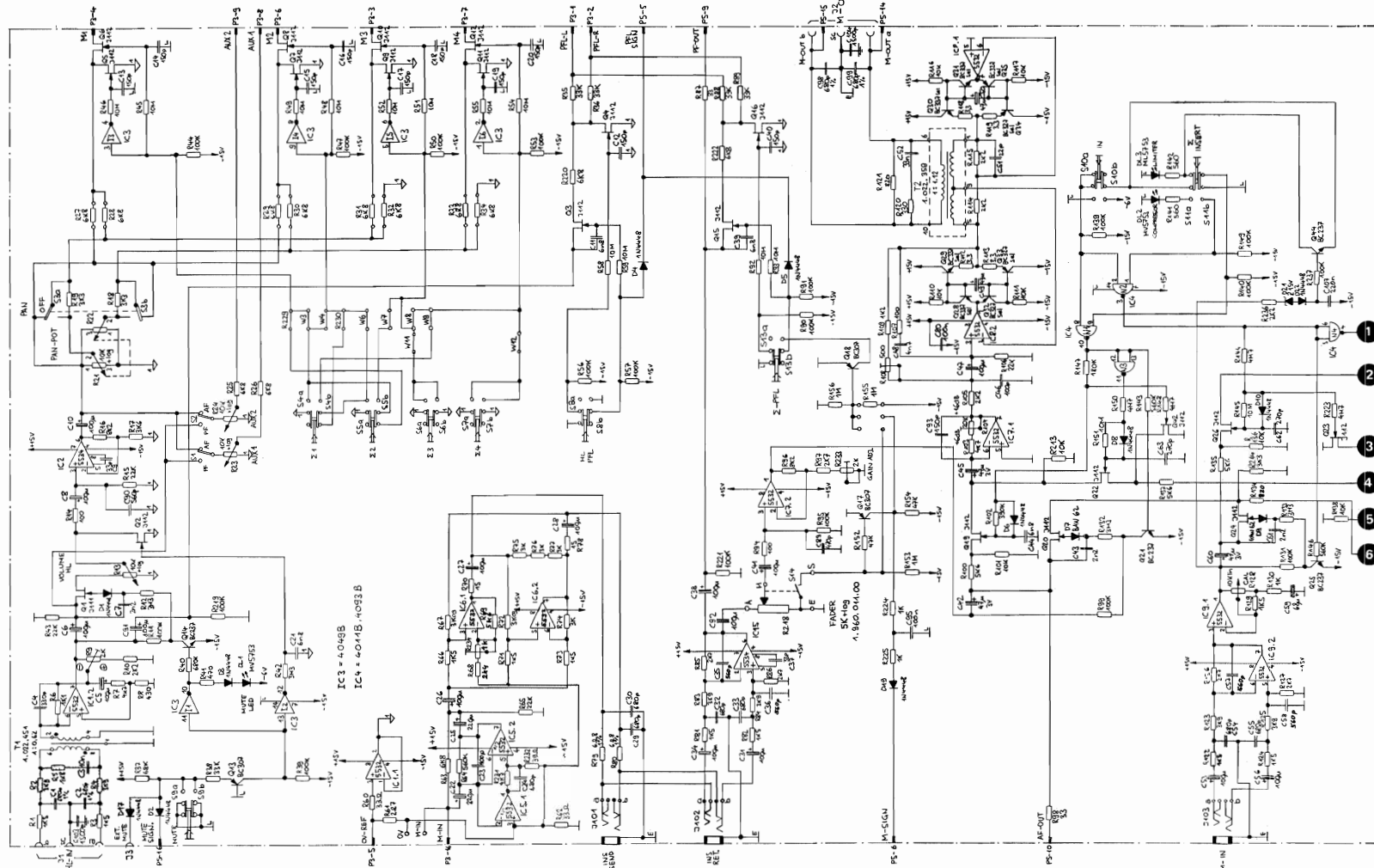
MASTER UNIT

3.4 Schemateil / Circuit Diagrams

1.970.841.81

Master Unit 4CH

Part 1



DATE:	115.87	46.2.89		
SIGN:	ak	wid		PAGE 1 OF 2
STUDER REGENSDORF ZÜRICH	MASTER UNIT 4CH			SC 1.970.841.81

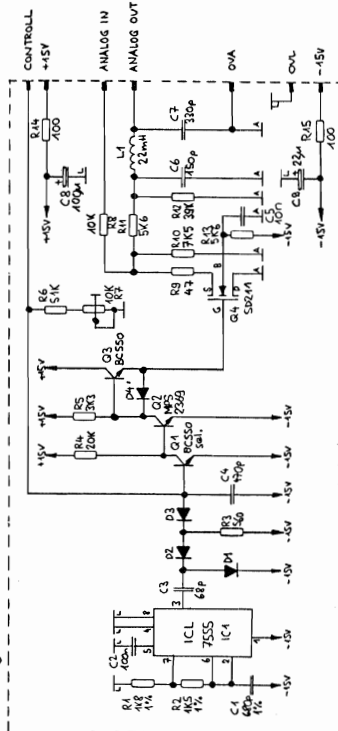
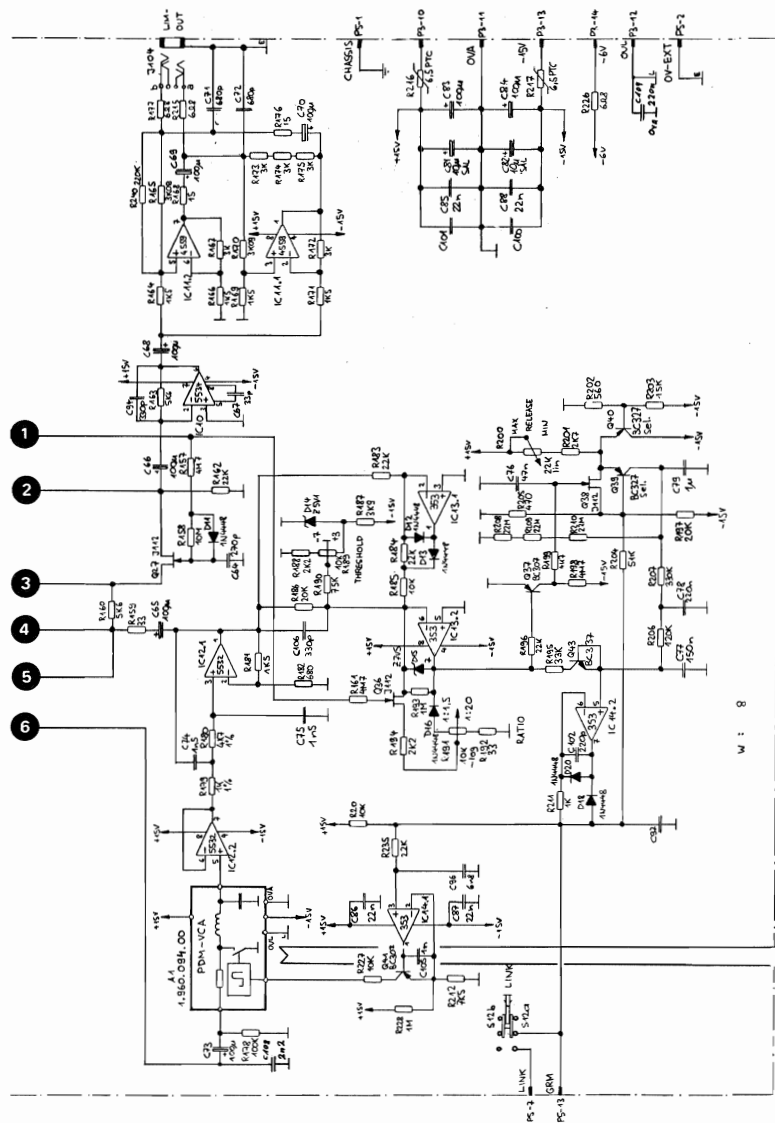
STUDER AUDIO CONSOLE 970

MASTER UNIT

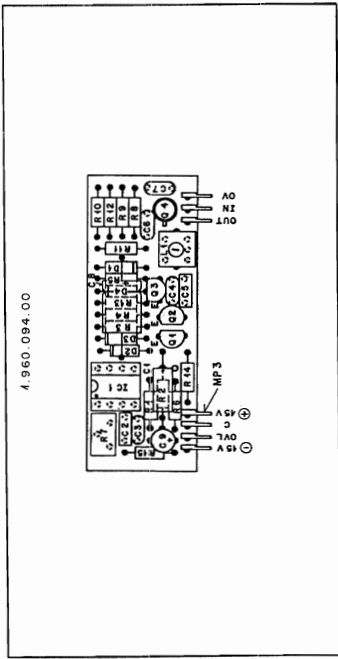
Master Unit 4CH

1.970.841.81

Part 2



PTM	NAME	REMARK
01	B-PFL-L	PFL-00 BUS LEFT
02	B-PFL-R	PFL-00 BUS RIGHT
03	B-M-1	MASTER 1: 00 BUS
04	DV-REF	DV REFERENCE
05	B-M-2	MASTER 2: 00 BUS
06	B-M-3	MASTER 3: 00 BUS
07	B-AUX-1	AUX 1: 00 BUS
08	B-AUX-2	AUX 2: 00 BUS
09	DV-1	DV-1
10	DV-2	DV-2
11	DV-4	GROUND AUDIO
12	DV-5	GROUND SIGM (LOGIC)
13	DV-6	RES.
14	DV-7	-SUPPLY
15	DV-8	RES.
16	M-INPUT	MASTER INPUT



PTM	NAME	REMARK
01	FM-SSCS	METAL FRAME
02	DV-2E	DV EXTERN
03	...	...
04	...	...
05	M-SIGN	MASTER SIGNALING
06	GEN-A	GENERATOR OUT A
07	PF-OUT	PF OUTPUT MASTER
08	PF-OUT	PF OUTPUT MASTER
09	PF-OUT	PF OUTPUT MASTER
10	PF-OUT	PF OUTPUT MASTER
11	RES.	RES.
12	...	...
13	GM-OUT-A	GROUND MASTER
14	GM-OUT-B	GROUND MASTER
15	N-OUT-B	MASTER OUTPUT B
16	MUTE	MUTE HL INPUT

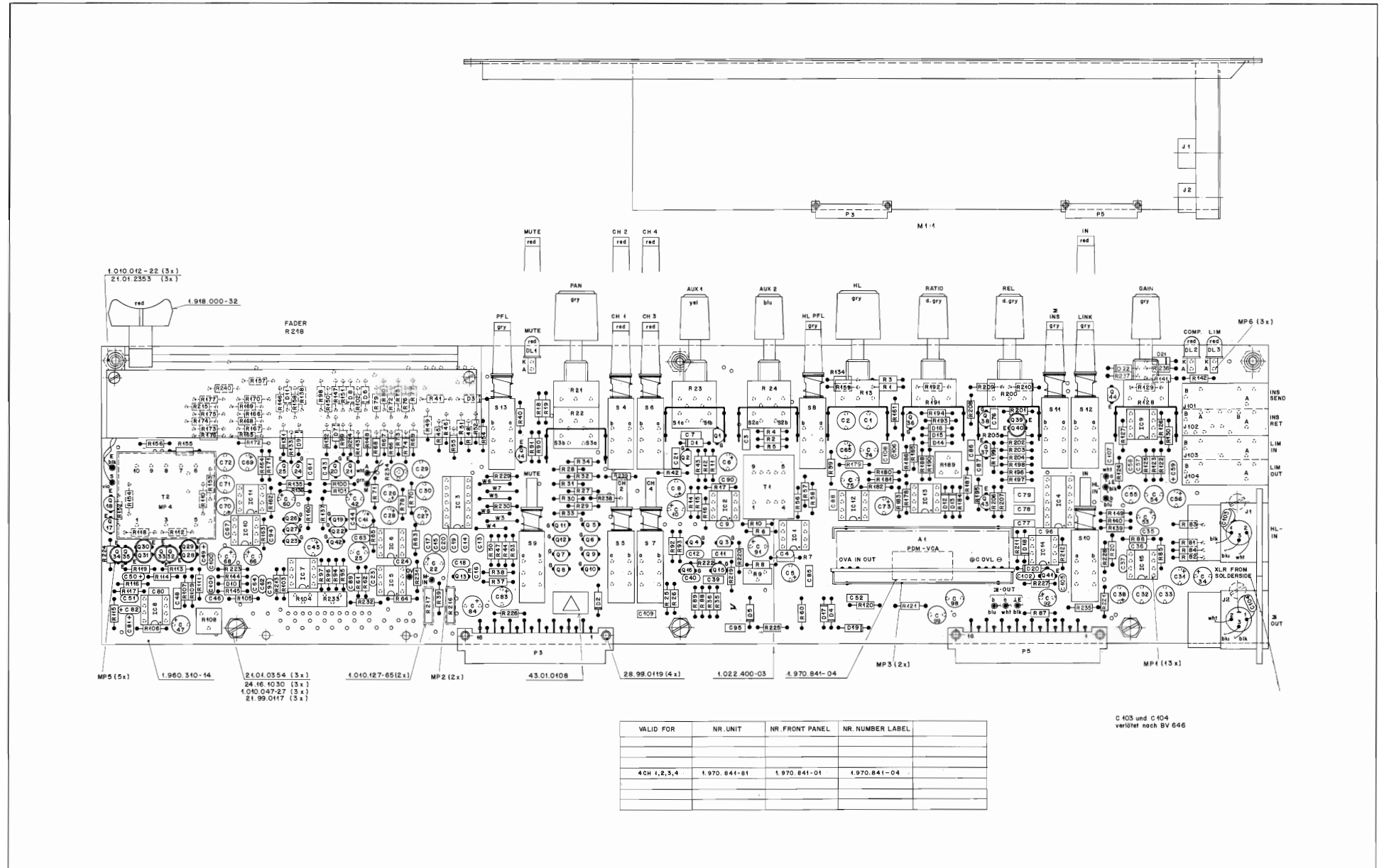
DATE:	11.5.87	4.6.2.89			
SIGN:	ak	W/D			PAGE 20F 2
STUDER REGENSDORF ZÜRICH	MASTER UNIT 4CH				SC 1.970.841.81

STUDER AUDIO CONSOLE 970

MASTER UNIT

Master Unit 4CH

1.970.810.81



STUDER AUDIO CONSOLE 970

Master Unit 970

1.970.810.81

Table with columns: Ad., POS., REF. No., DESCRIPTION, MANUFACTURER. Lists components for Master Unit 970 including resistors, capacitors, and connectors.

Master Unit 970

1.970.810.81

Table with columns: Ad., POS., REF. No., DESCRIPTION, MANUFACTURER. Lists components for Master Unit 970, including various electronic parts and their specifications.

Table with columns: Ad., POS., REF. No., DESCRIPTION, MANUFACTURER. Lists components for Master Unit 970, including various electronic parts and their specifications.

Master Unit 970

1.970.810.81

Ad	..POS..	..REF.No..	DESCRIPTION	MANUFACTURER
R...	191	1.010.020.58	10 kOhm 10% neg.log. variable resistor	St
R...	192	57.11.4330	33 Ohm 5% 0.25W	
R...	193	57.11.4105	1 MOhm 5% 0.25W	
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 *** / *****	ITT
S....	6	55.15.0019	2*U button: red *****	ITT
S....	7	55.15.0019	2*U button: red *****	ITT
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	.	***	

Ad	..POS..	..REF.No..	DESCRIPTION	MANUFACTURER
		1.970.810.81	MASTER UNIT 970	TA 88.11.1802
		1.970.810.81	MASTER UNIT 970	TA 89.10.0503
		1.970.810.81	MASTER UNIT 970	WM 90.10.2404

- (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 Hilfseinschub AUX Monitor
 - 2 Externe Quellen

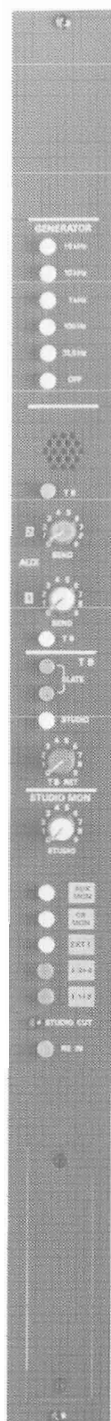
- Bei 4 Kanal Pulten:
- Summen $\Sigma 1+2$
 - Summen $\Sigma 3+4$
 - C.R. Monitor
 - den Hilfseinschub AUX Monitor
 - 1 Externe Quelle

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

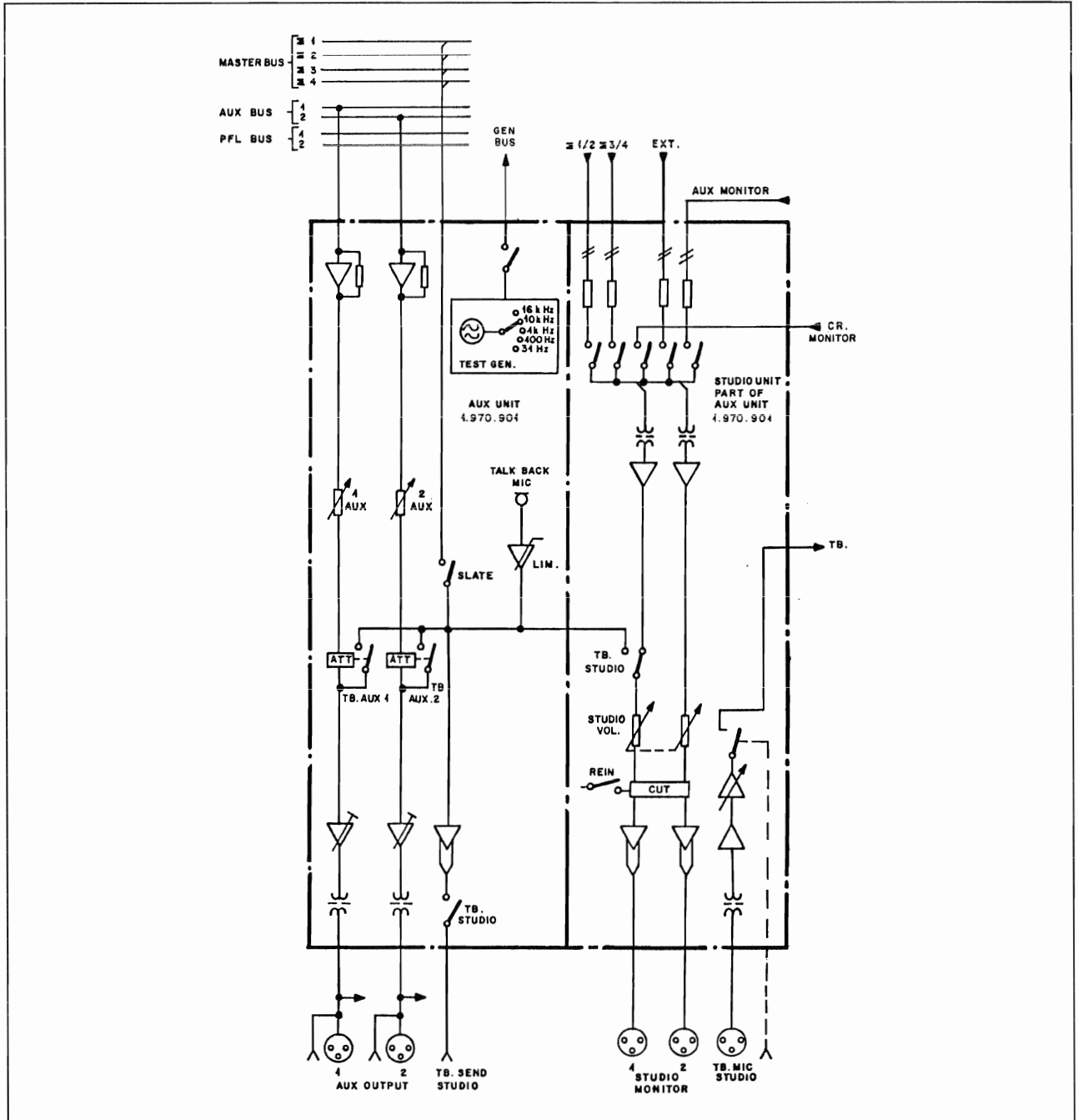
- On 4-channel consoles:
- Masters $\Sigma 1+2$
 - Masters $\Sigma 3+4$
 - C.R. monitor
 - Auxiliary module AUX Monitor
 - 1 External source

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

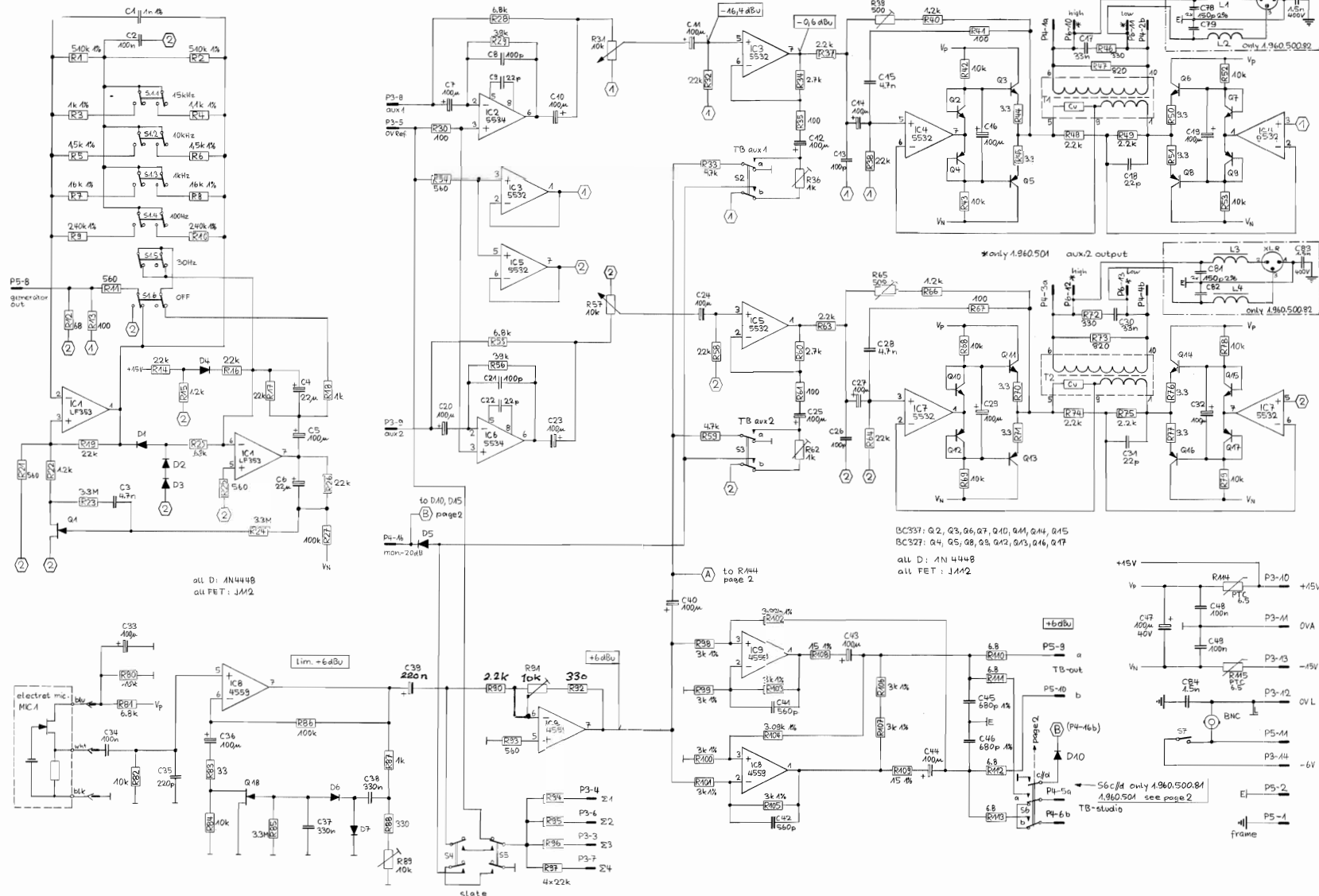
1.970.901



4.3 Schemateil / Circuit Diagrams

Aux/Studio Master Unit

Part 1



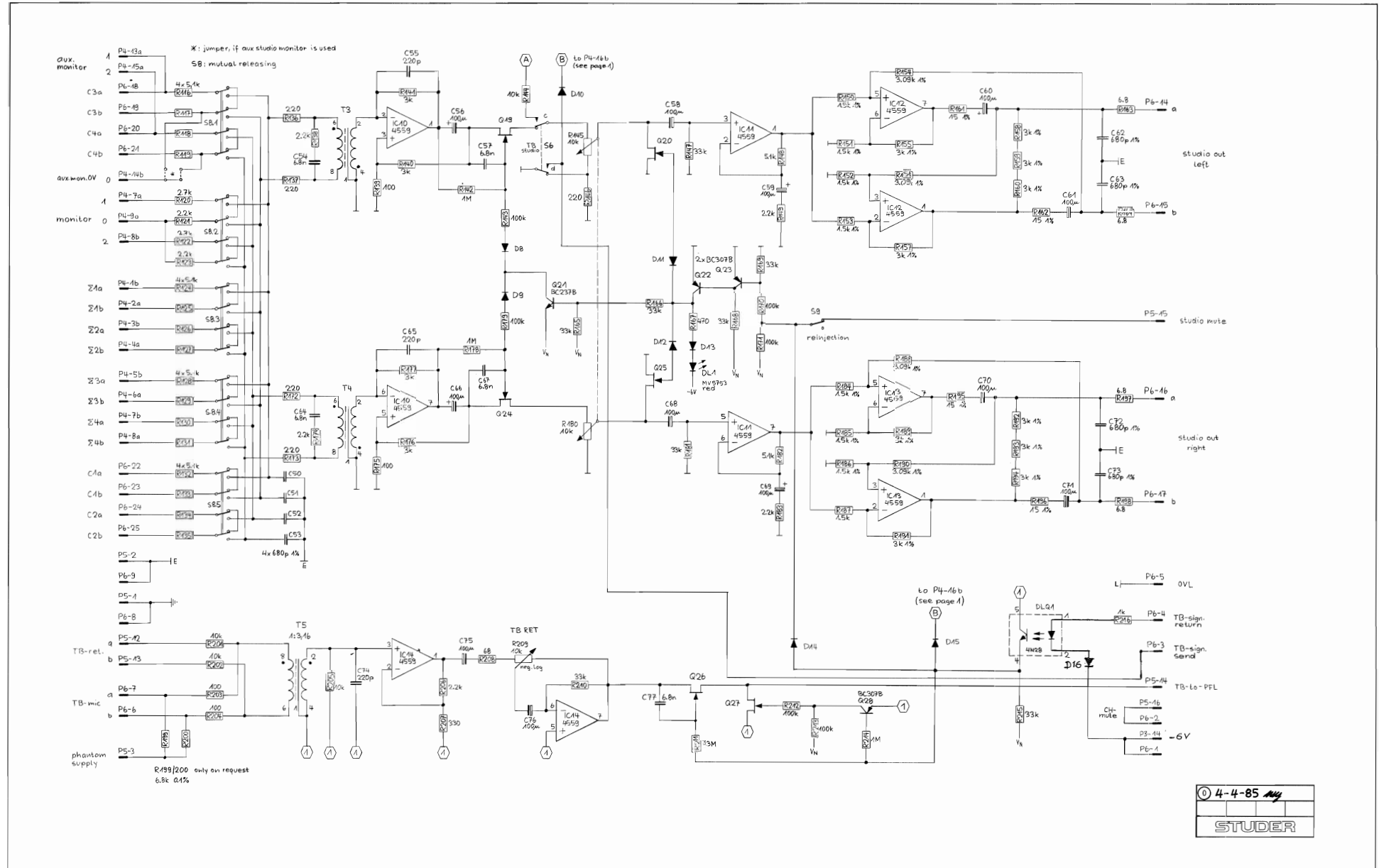
STUDER AUDIO CONSOLE 970

AUX, TB, STUDIO MON.

Aux/Studio Master Unit

1.970.901.00

Part 2



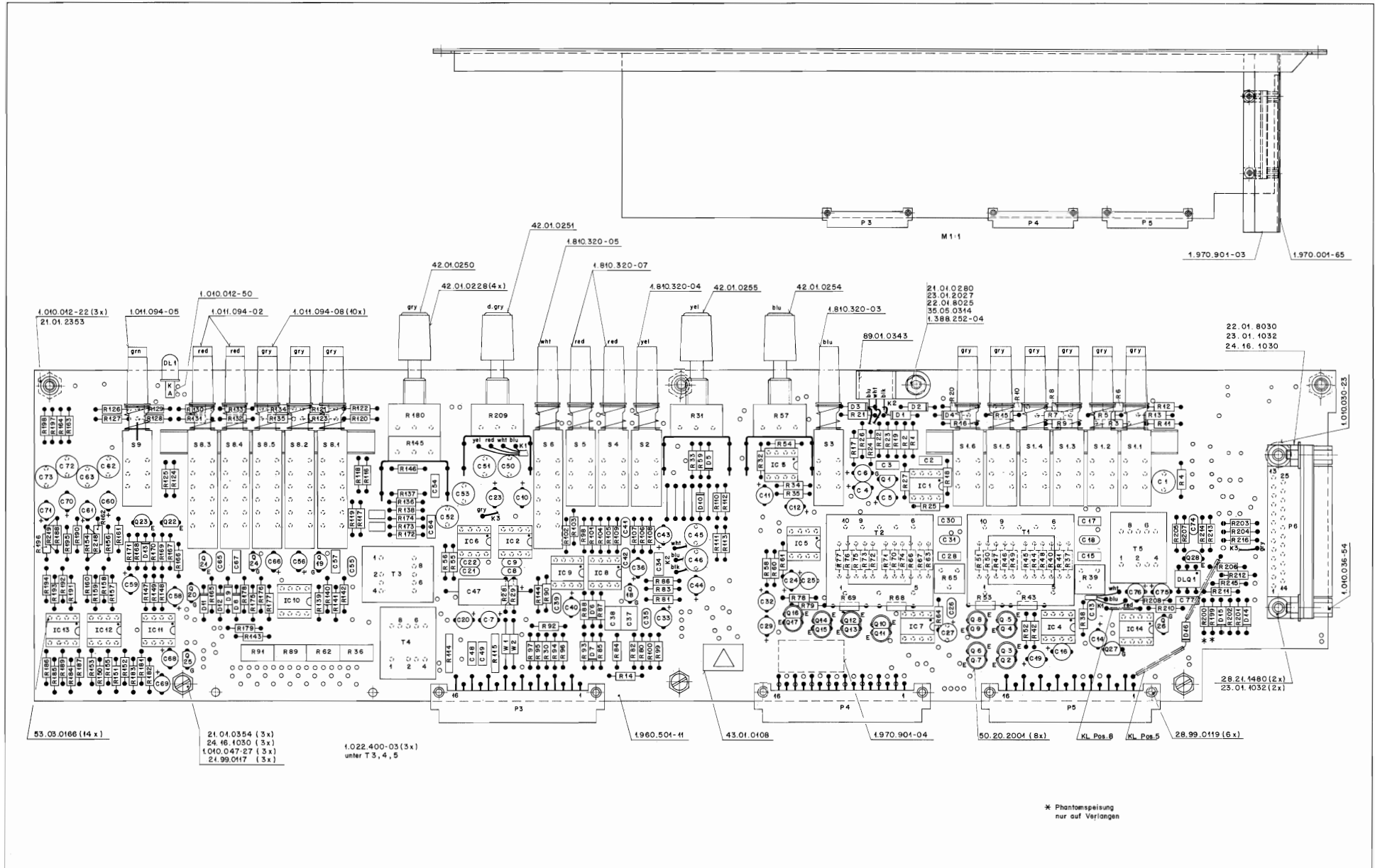
4-4-85
STUDER

STUDER AUDIO CONSOLE 970

AUX, TB, STUDIO MON.

Aux / Studio Master Unit

1.970.901.00



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.

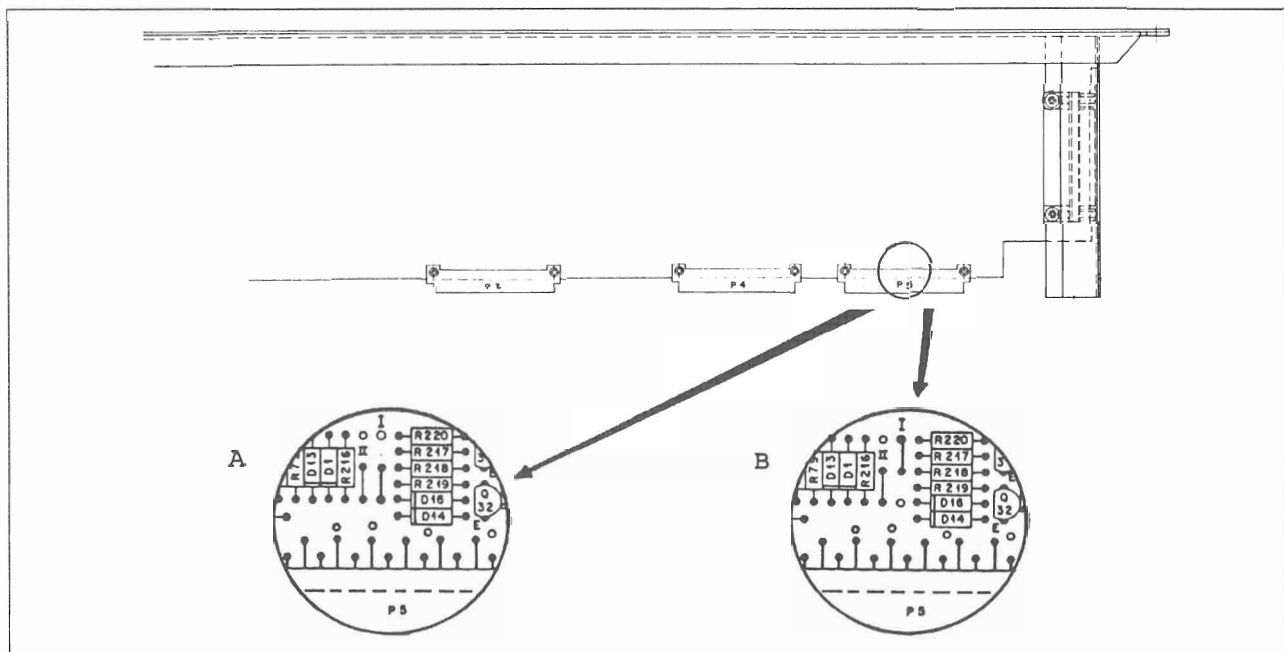
5.2 Option

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:

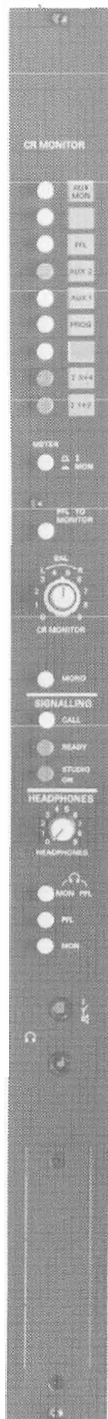
STUDIO ON Taste muss gedrückt werden, dann gleiche Funktion wie vorher beschrieben.



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.

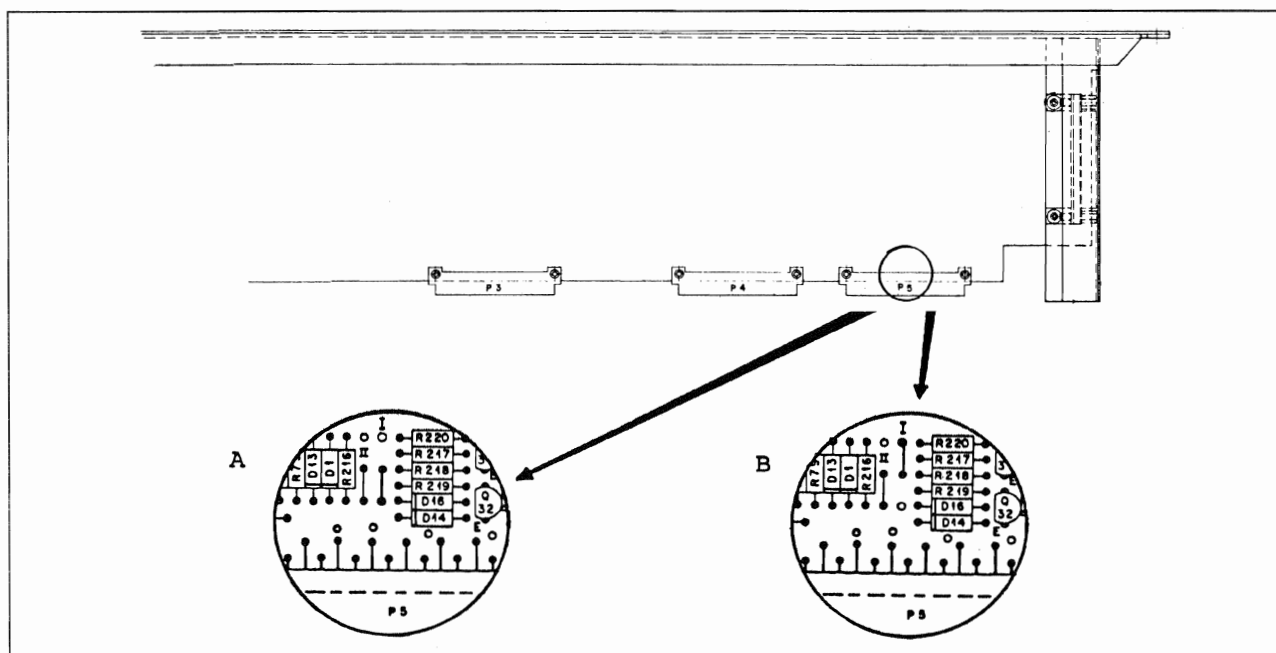
5.2 Option

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.

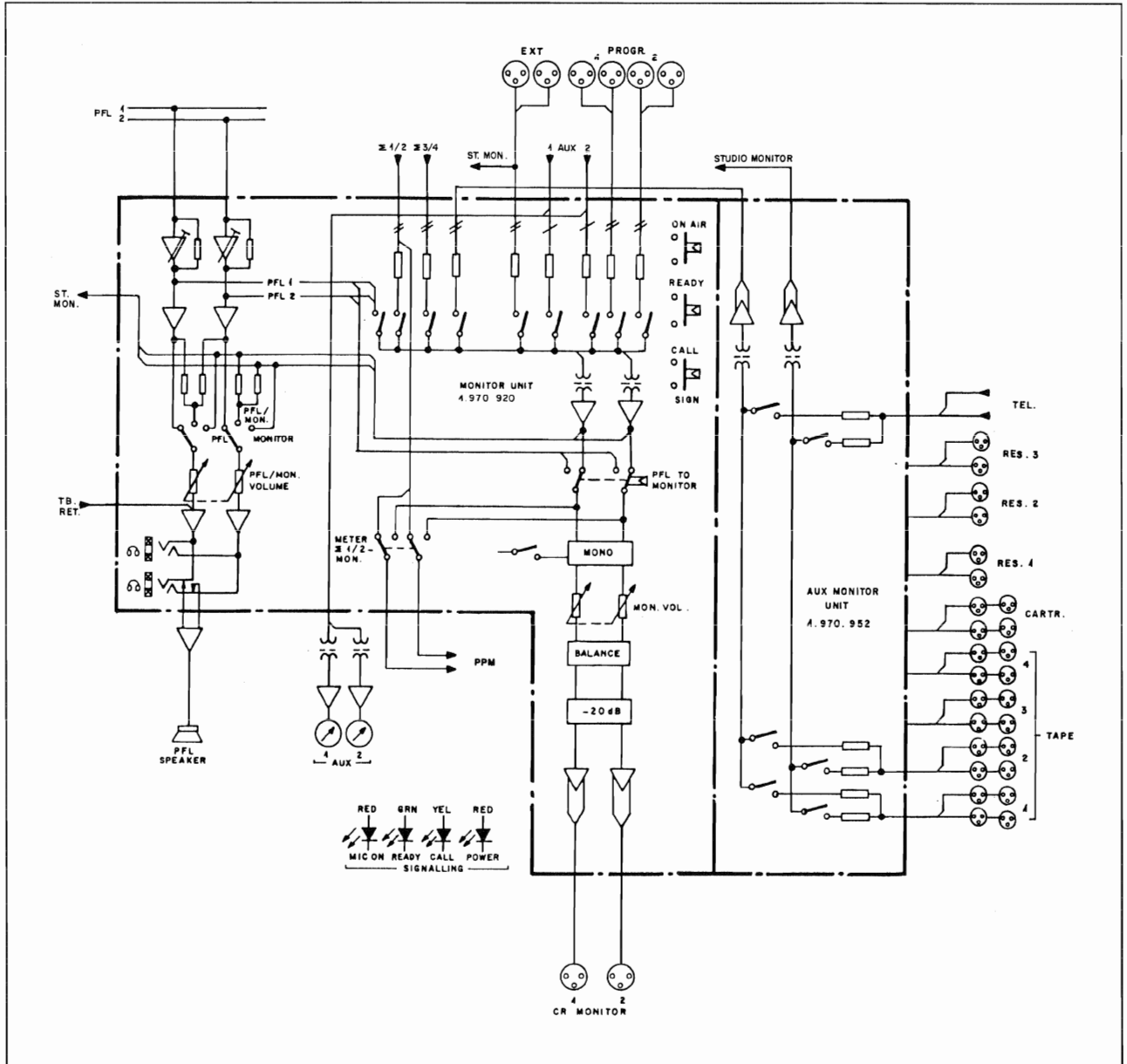
Solder in jumper I as shown in diagram B:

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



5.3 Blockschaltbild / Block Diagram

1.970.920



STUDER AUDIO CONSOLE 970

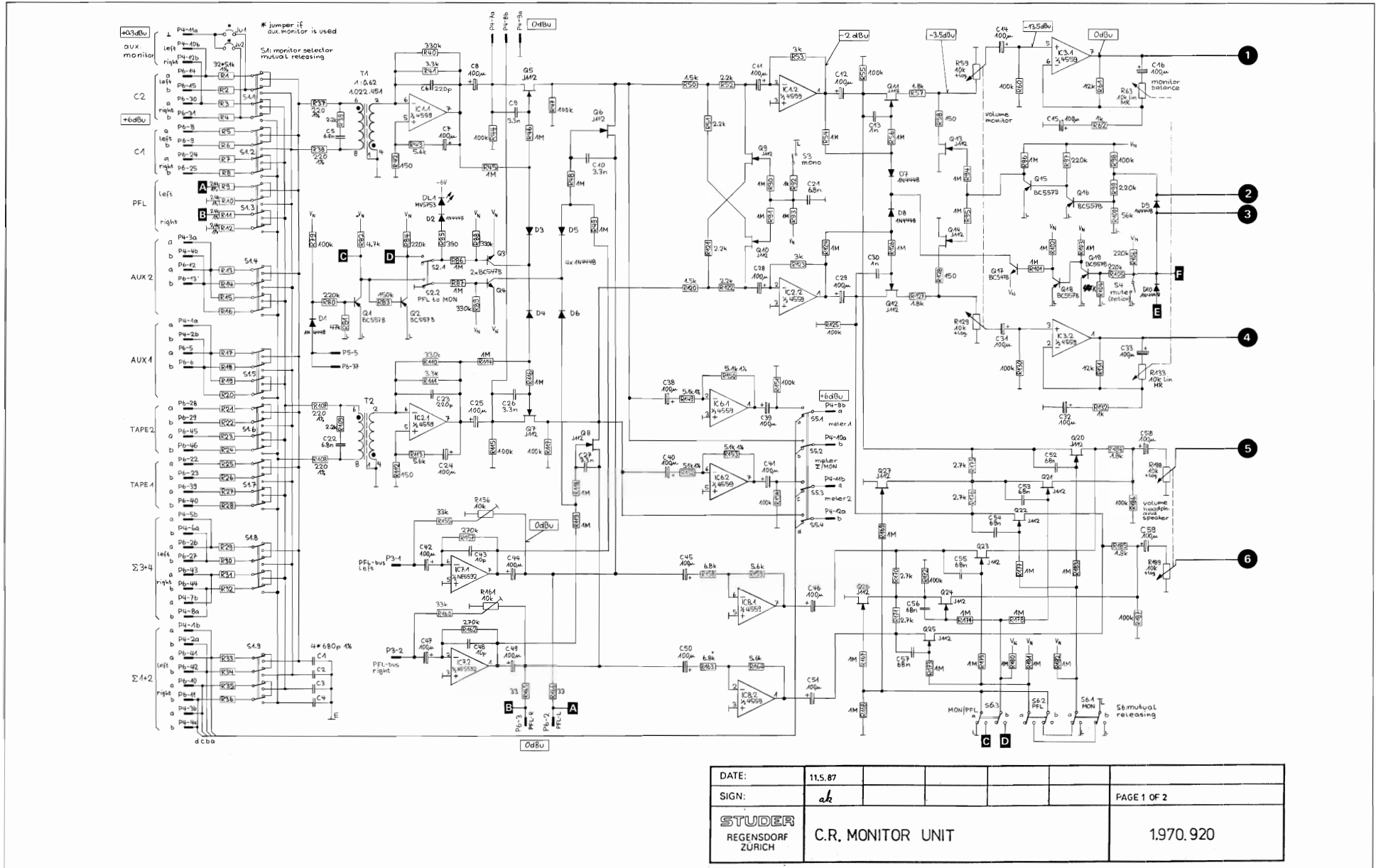
CR MON.

1.970.920.00

5.4 Schemateil / Circuit Diagrams

C.R. Monitor Unit

Part 1



DATE:	11.5.87				
SIGN:	ak				PAGE 1 OF 2
STUDER REGENDORF ZURICH	C.R. MONITOR UNIT				1.970.920

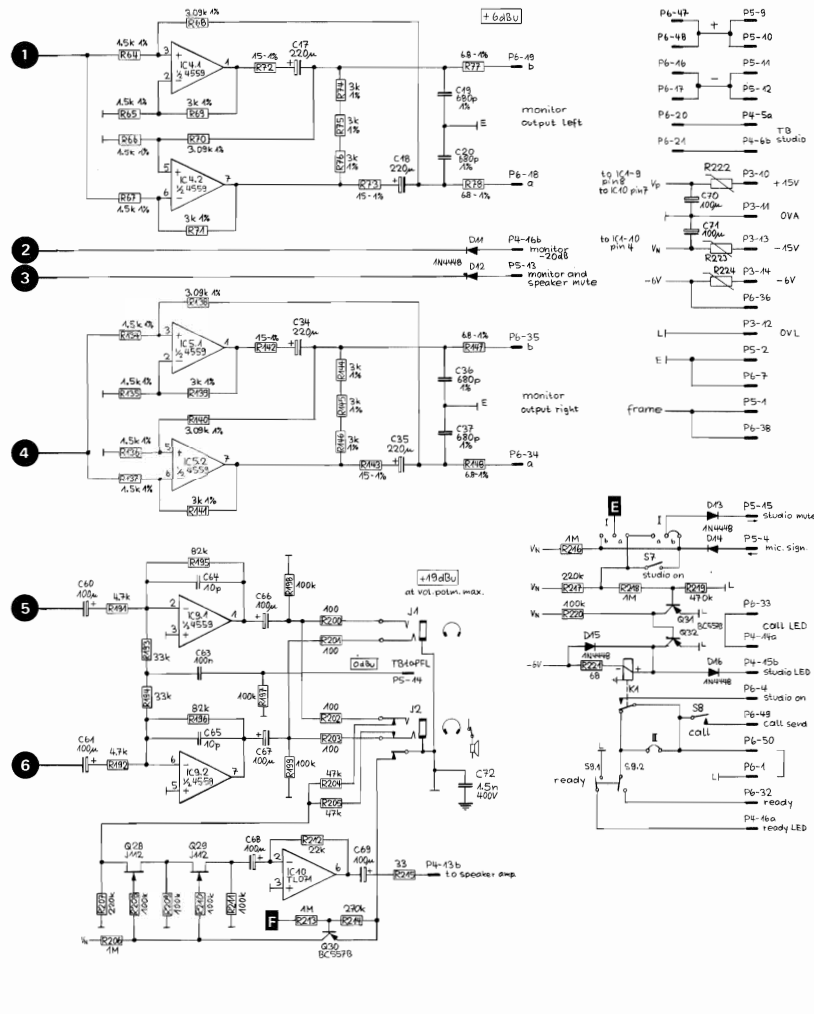
STUDER AUDIO CONSOLE 970

CR MON.

C.R. Monitor Unit

1.970.920

Part 2



PIN	NAME	REMARK
01	B-PFL-L	PFL DO BUS LEFT
02	B-PFL-R	PFL DO 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	GROUND SIGN (LOGIC)
12	OV-L	GROUND SIGN (LOGIC)
13	-15V	-SUPPLY
14	-6V	-SUPPLY
15	...	RES.
16	...	RES.

PIN	NAME	REMARK	A	NAME	REMARK	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	TALK-BACK STUDIO A	M-3-A		MASTER 3A OUTPUT		
06	M-3-B	MASTER 3B OUTPUT		TALK-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-2-B	MONITOR 2B OUTPUT		METER 1A	METER 1A	
10	METER 1B	METER 1B		AM-1-A	AUX MONITOR 1A IMP.	
11	AM-1-B	AUX MON. OV IMP.		METER 2A	METER 2A	
12	METER 2B	METER 2B		AM-2-A	AUX MONITOR 2A IMP.	
13	CALL-LED	CALL LED SIGN.		PFL-SP	PFL SPEAKER	
14	...	...		STU-LED	STUDIO LED SIGN.	
15	...	...		MON-200B	MONITOR 200B ATTEN.	
16	KEY-LED	READY LED SIGN.		...	...

PIN	NAME	REMARK
01	CHASSIS	METAL FRAME
02	OV-E	OV EXTERN
03	...	NC
04	REC-SIGN	REC SIGNALLING
05	PFL-SIGN	PFL 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	TB-OPFL	TB RETURN TO PFL
15	STU-MUTE	STUDIO MUTE
16	...	RES.

50pin D-TYPE CONNECTOR P6

PIN NO.	SIGNAL NAME	FUNCTION	CR MONITOR CONNECTOR P6		CABLE PLUG		CR MONITOR
			PRELISTENING	TALK-BACK/INTERCOM	VIEW FROM CONECTOR SIDE	VIEW FROM SOLDER SIDE		PIN/WIRE COLOR
01	OV-L	OV SIGN.					01 wht
02	PFL-L	PRE FADE LISTENING LEFT					02 brn
03	PFL-R	PRE FADE LISTENING RIGHT					03 grn
04	STU-ON	STUDIO ON					04 blk/grn/pnk
05	AUX-1-A	AUXILIARY OUTPUT 1-A					05 grn/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 2Z OUTPUT A					10 vio
11	M-2-B	MASTER 2Z 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 grn/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 blu/wht
22	T-1-1-A	TAPE1 RETURN 1-A					22 blu/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 3Z OUTPUT A					26 brn/blk
27	M-3-B	MASTER 3Z 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 blu/grn
32	READY	READY SIGNALISATION					32 yel/blu
33	CALL-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	-6V	- SUPPLY					36 yel/blk
37	PFL-SIGN	PFL SIGNALISATION					37 blu/grn
38	CHASSIS	METAL FRAME					38 blu/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 1Z OUTPUT A					41 blk/pnk
42	M-1-B	MASTER 1Z OUTPUT B					42 blk/pnk
43	M-4-A	MASTER 4Z OUTPUT A					43 blk/blk
44	M-4-B	MASTER 4Z 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
49	CALL-SIGN	CALL SIGN SIGNALISATION					49 grn/wht/blk
50	G.S	GROUND SIGNALISATION					50 brn/blk/grn

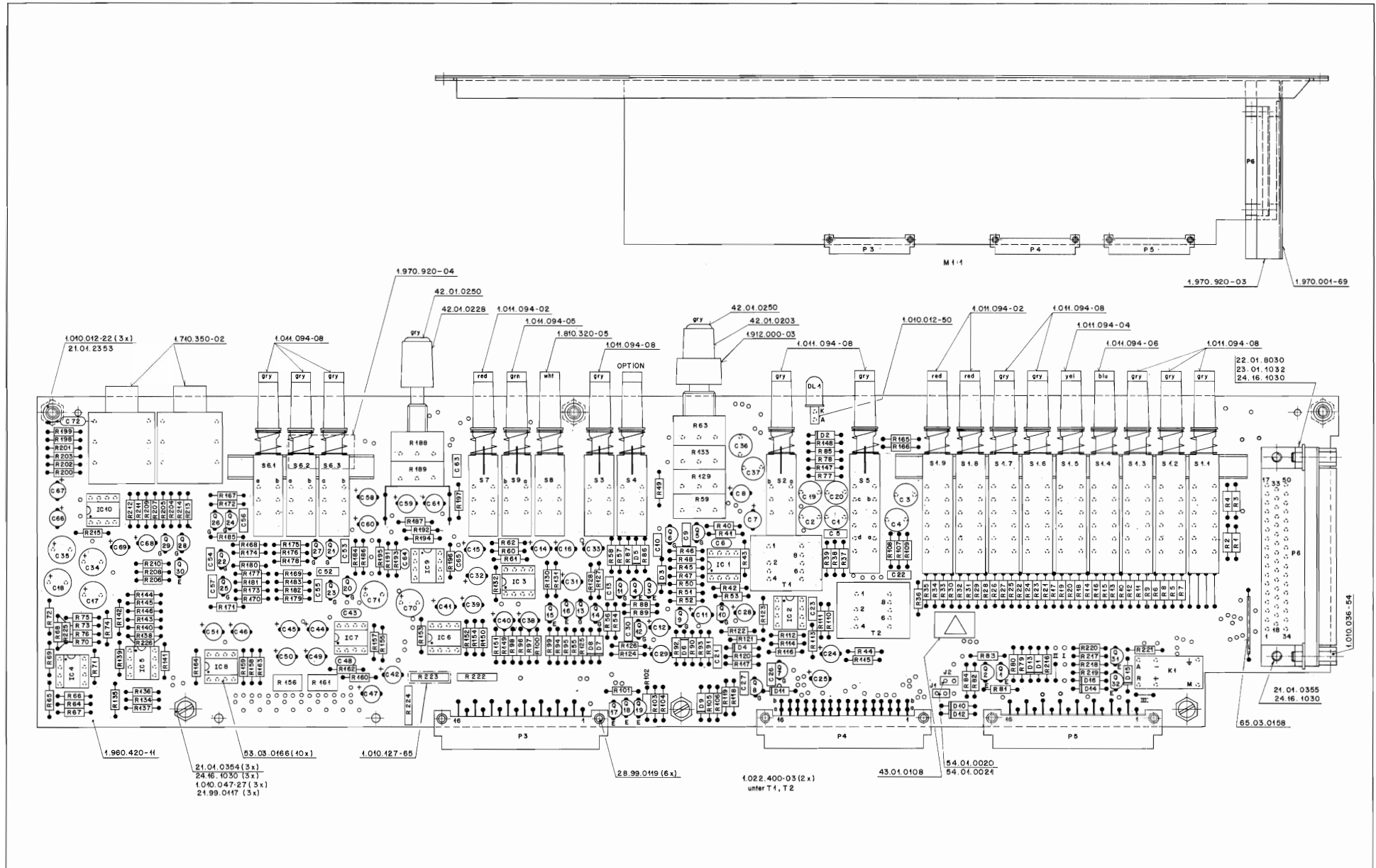
DATE:	11.5.87		
SIGN:	ak		PAGE 2 OF 2
STUDER REGENSDORF ZÜRICH	C.R. MONITOR UNIT		1970.920

STUDER AUDIO CONSOLE 970

CR MON.

CR-Monitor Unit

1.970.920.00



STUDER AUDIO CONSOLE 170

Control room Monitor Unit

1.970.920.00

Table with columns: Ad., POS., REF.No., DESCRIPTION, MANUFACTURER. Lists components like resistors, capacitors, and connectors for the control room monitor unit.

Control room Monitor Unit

1.970.920.00

Table with columns: Ad., POS., REF.No., DESCRIPTION, MANUFACTURER. Lists components like resistors, capacitors, and connectors for the control room monitor unit.

Table with columns: Ad., POS., REF.No., DESCRIPTION, MANUFACTURER. Lists components like resistors, capacitors, and connectors for the control room monitor unit.

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.

INGANGSSCHALTUNG: (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.

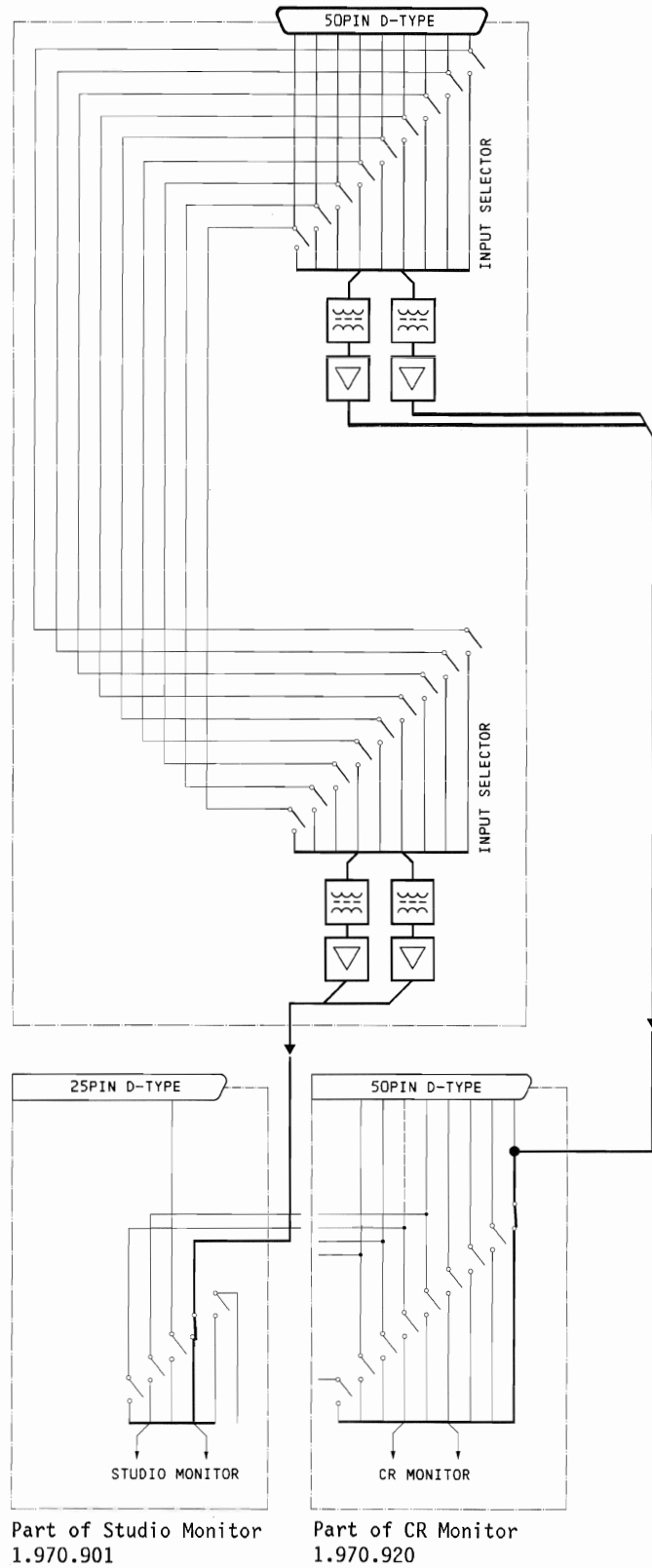
INPUT CIRCUIT: (Described is one channel of the two possible input stages)
 the input stage is designed as an unbalanced and floating nodal point amplifier. The selected signal source is taken via the corresponding coupling resistor (R1...36) and (R37/38) to the input transformer (T1). C1...4 discharge 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

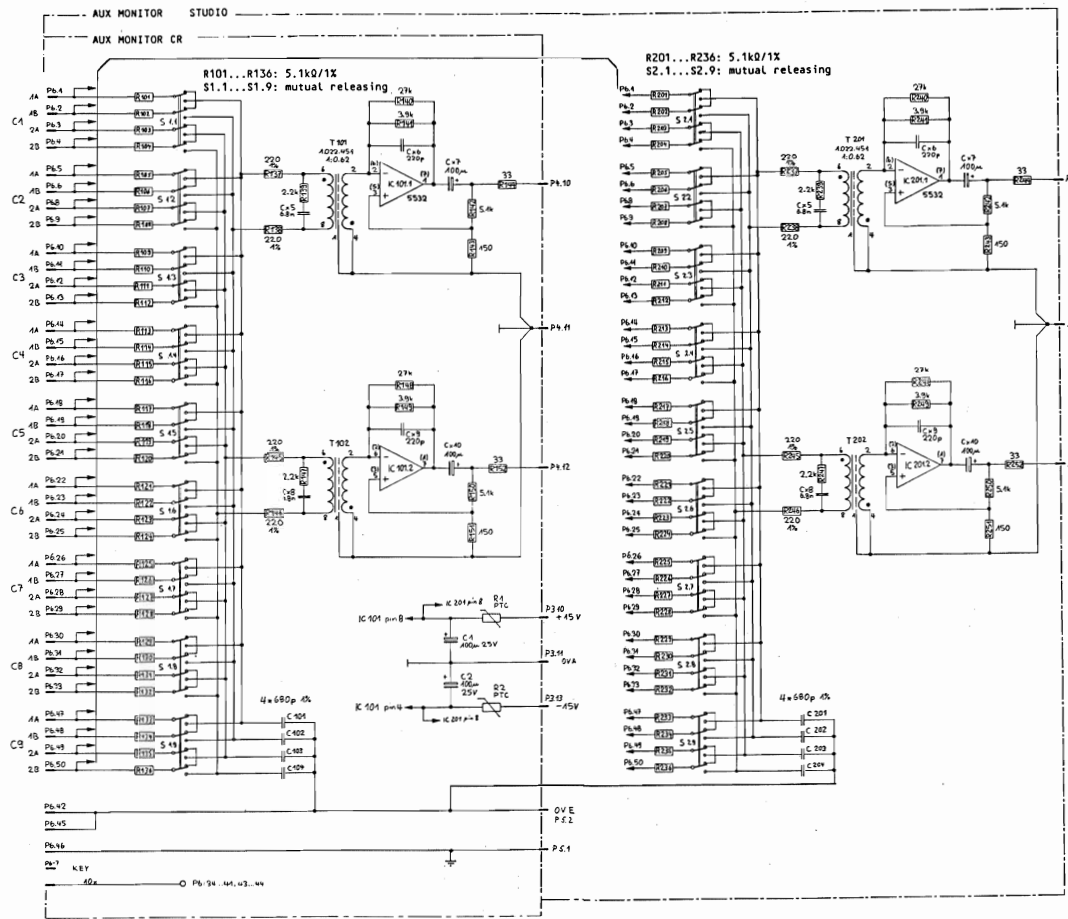
AUX MONITOR

1.970.952.00

6.2 Schemateil / Circuit Diagrams

Aux Monitor

Part 1



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

PIN	NAME	REMARK
01		
02		
03		
04		
05		
06		
07		
08		
09		
10	+15V	-SUPPLY
11	DV-A	AUX MON. 1A OUTPUT
12	DV-L	GROUND SIGN (LOGIC)
13	-15V	-SUPPLY
14		
15		
16		

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

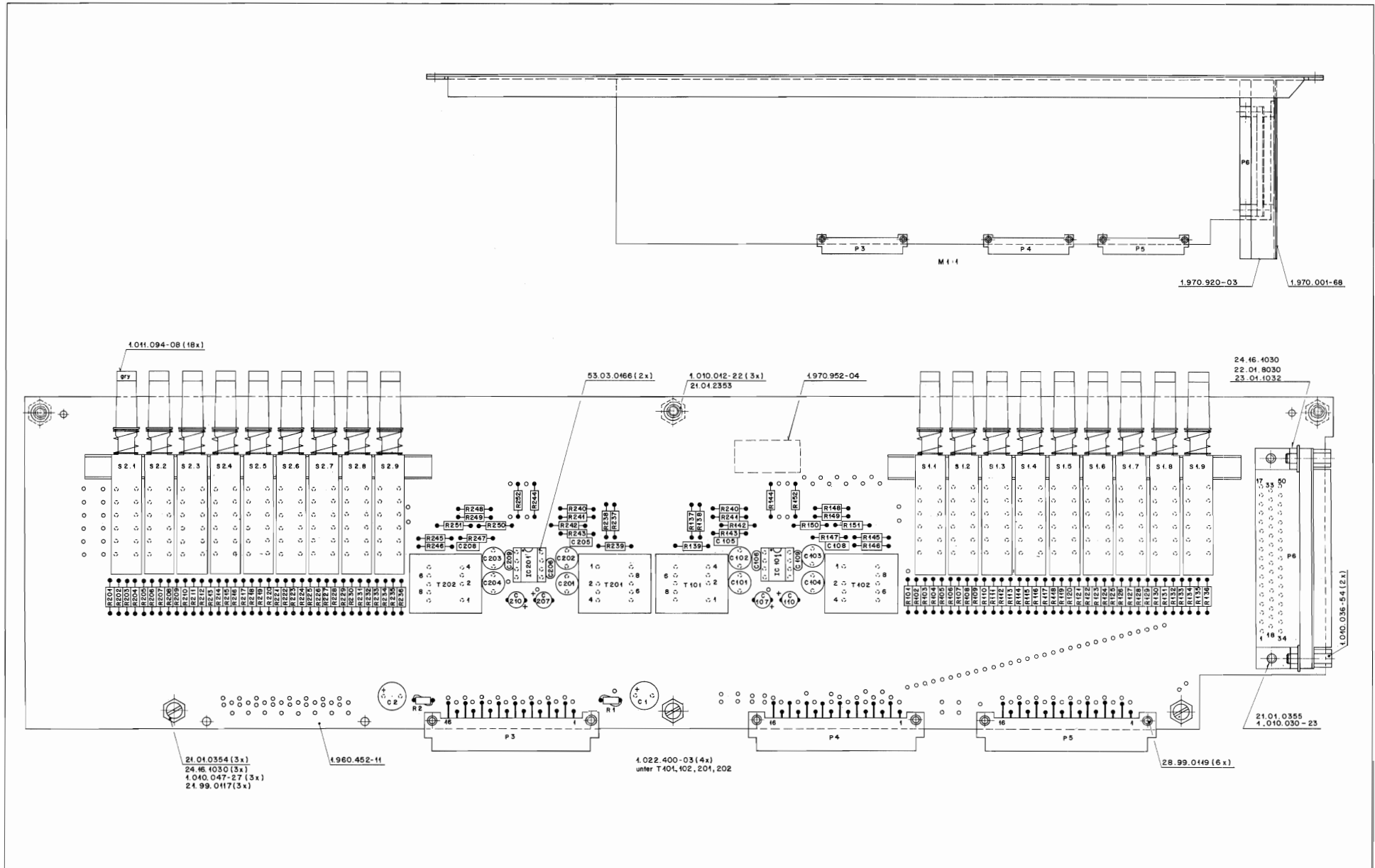
DATE:	11.5.87				
SIGN:	ak				PAGE 10F 1
STUDER REGENSDORF ZURICH		AUX MONITOR			1.970.952

STUDER AUDIO CONSOLE 970

AUX MONITOR

AUX MONITOR

1.970.952.00



5	Einschubmodule	1.913...
1.	Telephone Hybrid Remote Control	1.913.194..... 1
2.	Korrelator	1.913.210/211..... 3
	2.1 Anwendungen, die einen Korrelator erfordern	..... 3
	2.2 Blockschaltbild	..... 3
	2.3 Technische Daten	..... 4
3.	Peak Program Meter (PPM)	1.913.220/221 9
	3.1 Blockschaltbild	..... 9
	3.2 Technische Daten	..... 10
4.	VU-Meter	1.913.230/231..... 15
	4.1 Blockschaltbild	..... 15
	4.2 Technische Daten	..... 16
5.	PFL/SIGN. Indicator Unit	1.913.301..... 21
6.	Stop Watch Unit	1.913.310 23

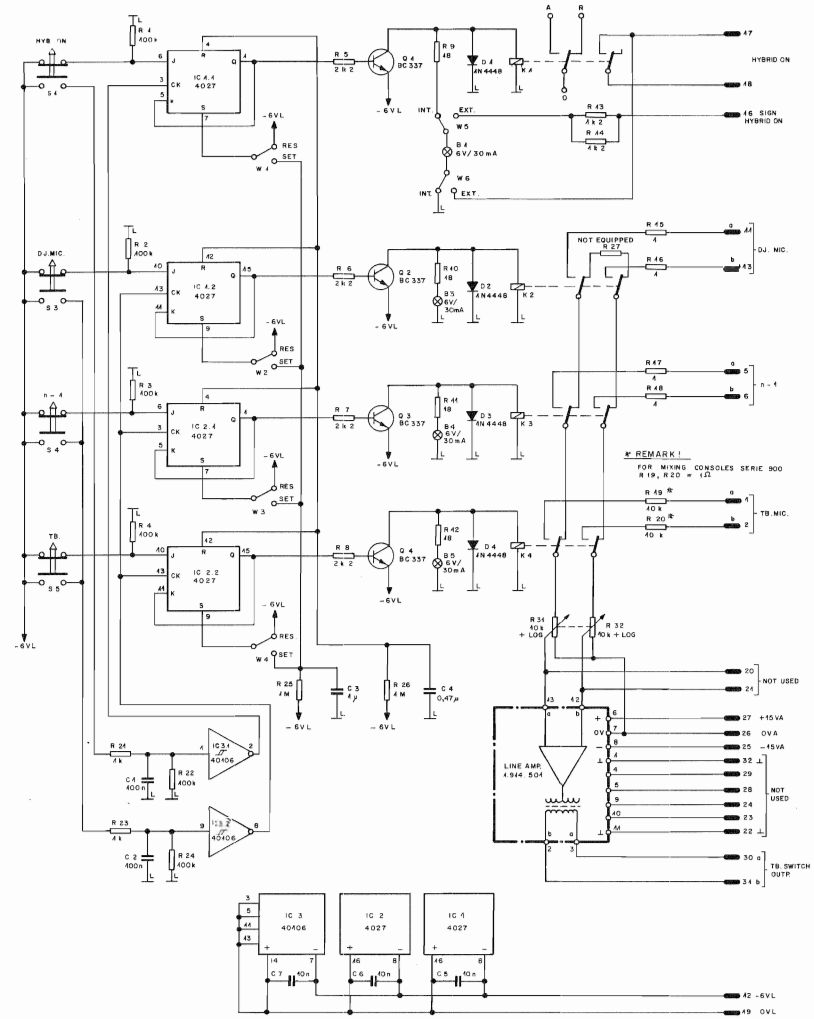
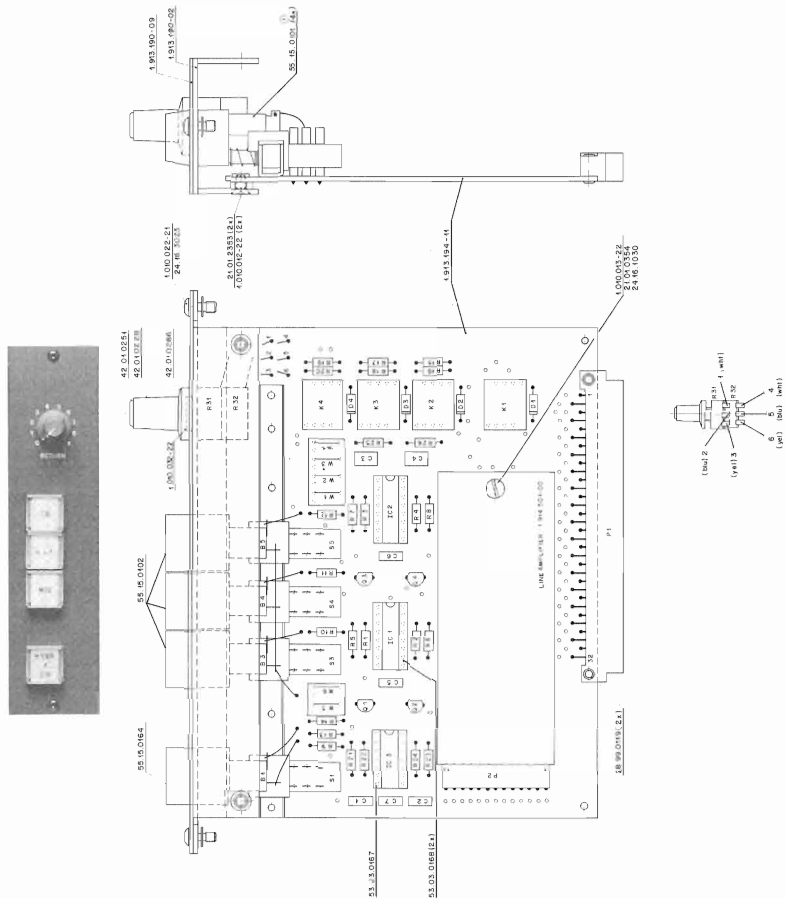
5	Plug in Units	1.913...
1.	Telephone Hybrid Remote Control	1.913.194..... 1
2.	Correlator	1.913.210/211..... 5
	2.1 Applications which require a Correlator	..... 5
	2.2 Block Diagram	..... 5
	2.3 Specifications	..... 6
3.	Peak Program Meter (PPM)	1.913.220/221 11
	3.1 Block Diagram	..... 11
	3.2 Specifications	..... 12
4.	VU-Meter	1.913.230/231..... 17
	4.1 Block Diagram	..... 17
	4.2 Specifications	..... 18
5.	PFL/SIGN. Indicator Unit	1.913.301..... 21
6.	Stop Watch Unit	1.913.310 23

5 Plug in Units

1.913....

1. Telephone Hybrid Remote Control / Mix Minus

1.913.194.00



STUDER REGENSDORF ZÜRICH	TEL. HYBRID REM. CONTR. MIX MINUS	SC 4.913.194.00
--------------------------------	--------------------------------------	-----------------

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% PETP	
C.....2	59.06.0104	100 NF	-10% PETP	
C.....3	59.06.0105	1 UF	-10% PETP	
C.....4	59.06.0474	0.47UF	-10% PETP	
C.....5	59.06.0103	0.01UF	-10% PETP	
C.....6	59.06.0103	0.01UF	-10% PETP	
C.....7	59.06.0103	0.01UF	-10% PETP	
D.....1	50.04.0125	1M4448		ANY
D.....2	50.04.0125	1M4448		ANY
D.....3	50.04.0125	1M4448		ANY
D.....4	50.04.0125	1M4448		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	42.01.0268	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 CIS 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 R031	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
 HP=Hewlett Packard, ITT=Intermetal, Mo=Motorola, NS=National Semiconductors, Ph=Philips, Ra=Raytheon, 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

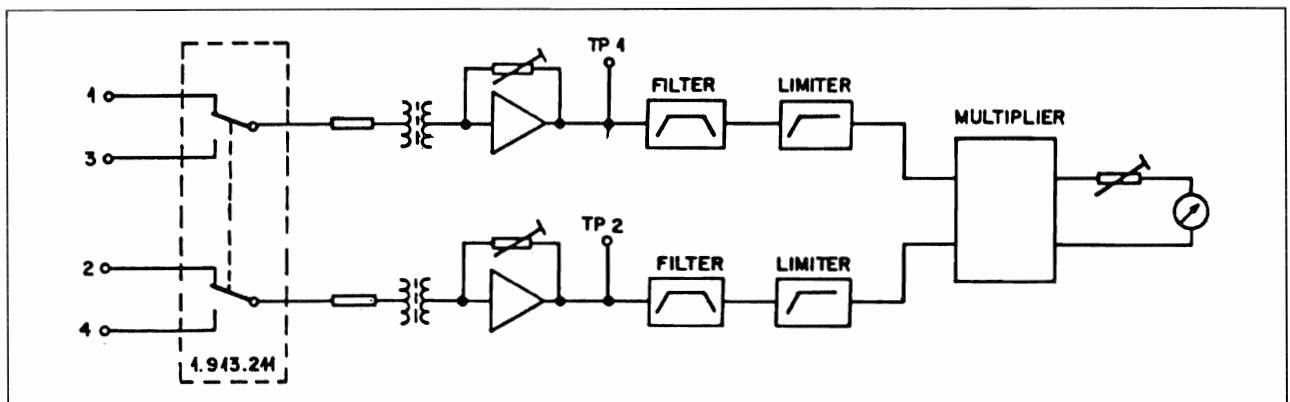
Die Abtastfähigkeit eines Abtastsystems ist für vertikale Auslenkung viel geringer als für horizontale Auslenkung.

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

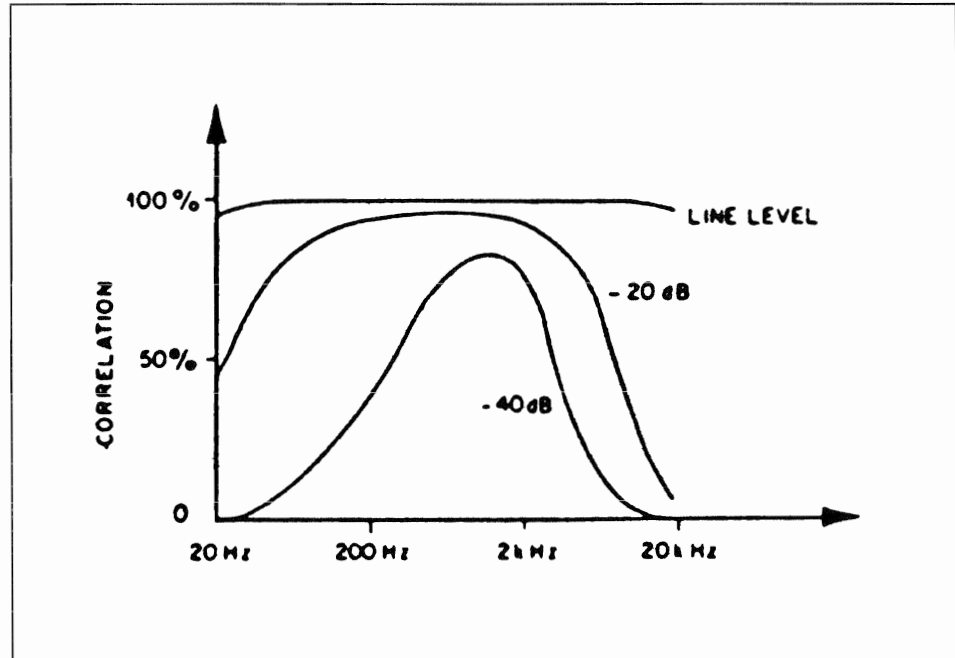
Modulation von FM-Stereosendern

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
 Eingangspegel, einstellbar: +6 ... +15 dBu

Filter: Hochpass 6 dB/Oktave: f_H 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

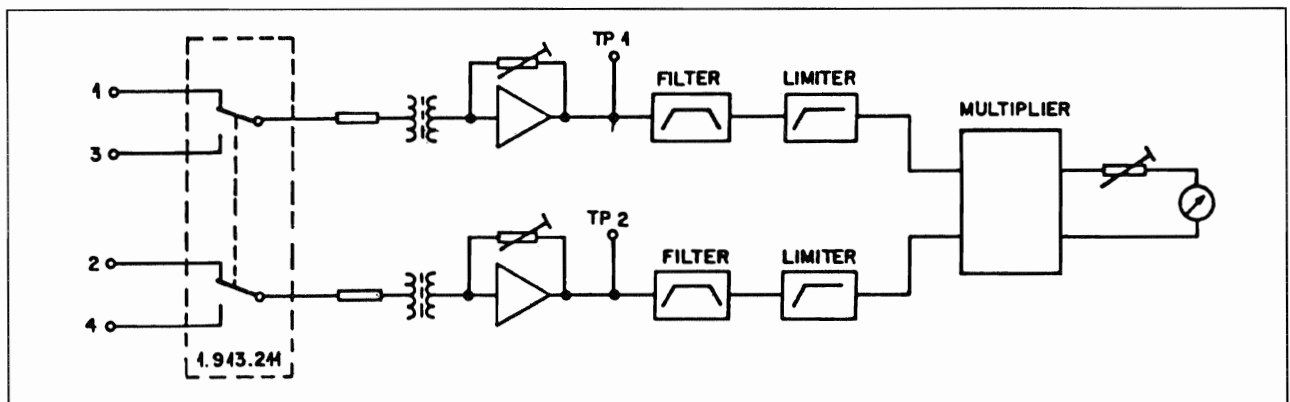
The tracking capability of a cartridge is much lower for vertical excursion than for horizontal excursion.

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

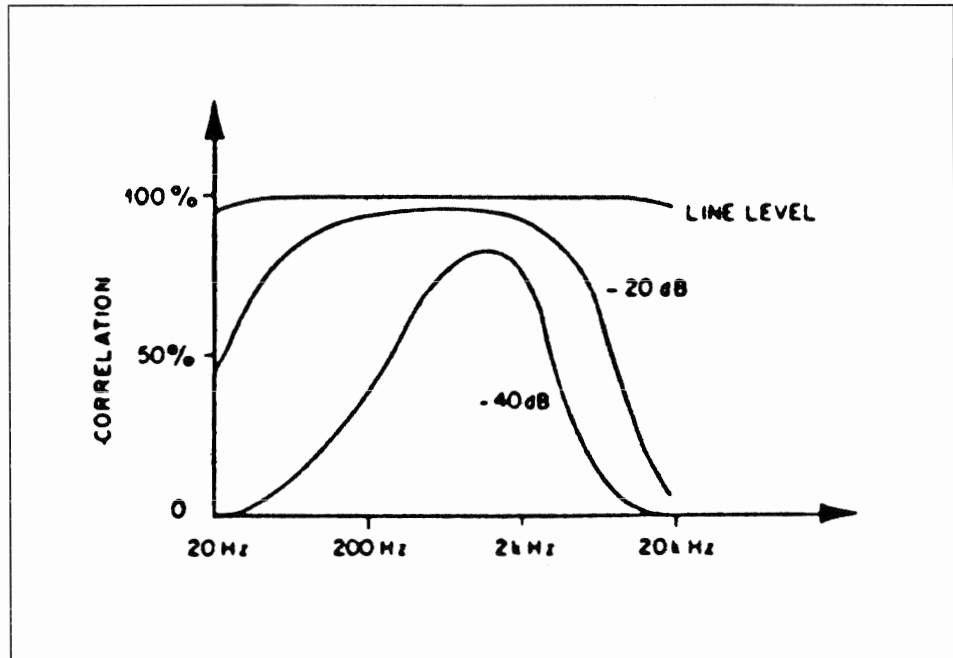
Modulation from FM stereo transmitters

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_1 . 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

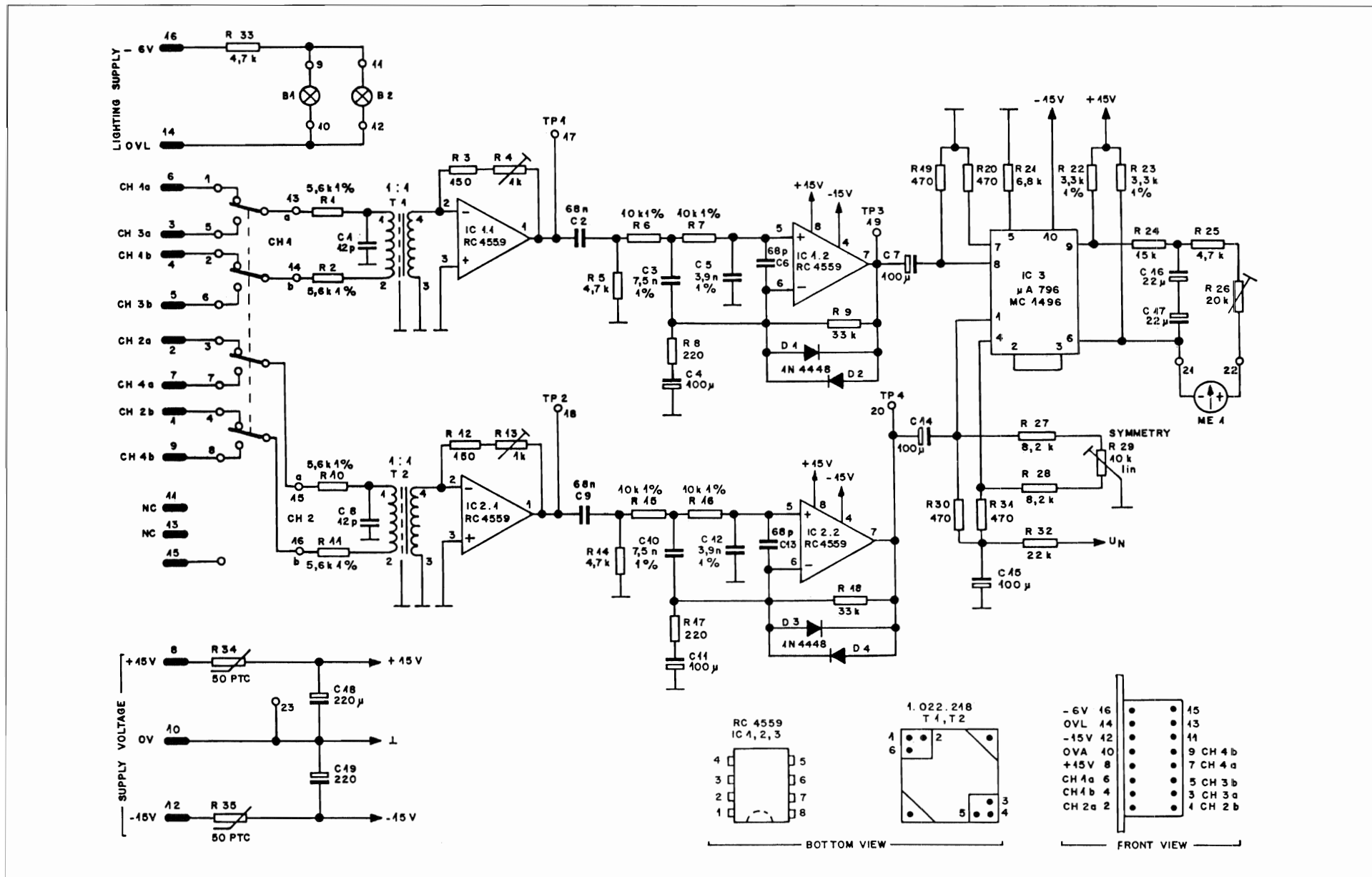
Dimensions of front panel: 170 x 180 mm

Depth: 135 mm

Weight: 390 g

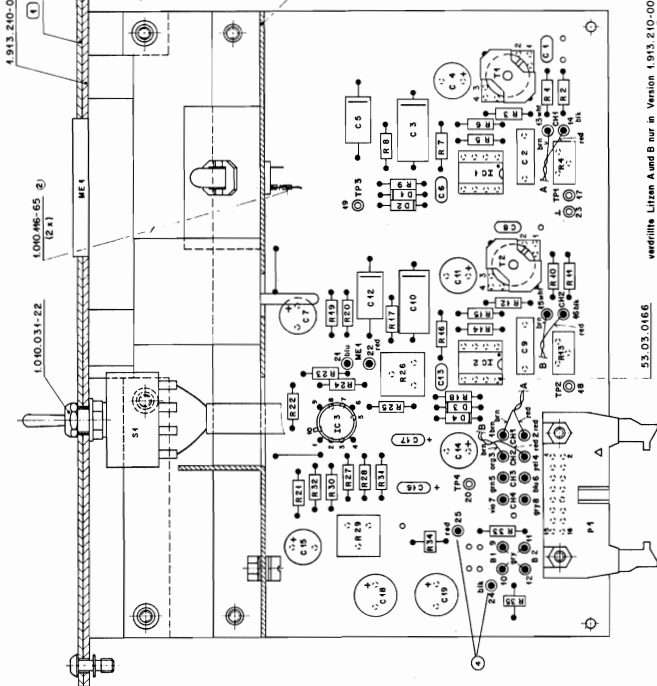
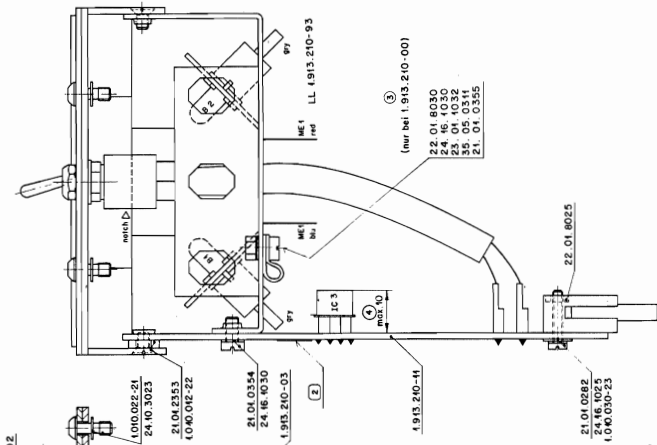
Correlator 2CH / 4CH

1.913.210/211



Correlator 2CH / 4CH

1.913.210/211

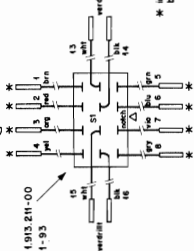


verifizierte Litzen A und B nur in Version 1.913.210-00
LL 1.913.212-93

CH	1.913.210-00	1.913.210-01	1.913.210-04
4CH	1.913.211-00	1.913.211-01	1.913.211-04

* im Schaubild 65.03.0146
ben, mel, org, yfi, gn, Su, r, 6, 977

nur in Version 1.913.211-00
LL 1.913.211-93



IND	POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
C1	59344420	42pF	5%		
C2	58025683	68nF	5%		
C3	58427752	75nF	4%		
C4	59225404	400µF	46V		
C5	59225404	39nF	4%		
C6	59344687	68pF	5%		
C7	59225404	400µF	46V		
C8	58344420	42pF	5%		
C9	59225683	68nF	5%		
C10	58427752	75nF	4%		
C11	59225404	400µF	46V		
C12	59225404	39nF	4%		
C13	59344680	68pF	5%		
C14	59225404	400µF	46V		
C15	59225404	400µF	46V		
C16	59244220	22µF	40V		
C17	58264220	22µF	40V		
C18	58224224	220µF	46V		
C19	59224224	220µF	46V		
D1	50040425	1N4448			
D2	50040425	1N4448			
D3	50040425	1N4448			
D4	50040425	1N4448			
IC1	50080407	4558		Ro, TI	
IC2	50080407	4558			
IC3	50050422	MC4486	µA796 HC	M, F	

IND	POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
R1	57.44.3542	5,6k	4%		
R2	57.44.3542	5,6k	4%		
R3	57.44.4454	150			
R4	58.04.7402	1k		TRIM-POTM	
R5	57.44.4472	47k			
R6	57.44.3403	40k	4%		
R7	57.44.3403	40k	4%		
R8	57.44.2204	220			
R9	57.44.3333	33k			
R10	57.44.3542	5,6k	4%		
R11	57.44.3542	5,6k	4%		
R12	57.44.4454	150			
R13	58.04.7402	1k		TRIM-POTM	
R14	57.44.4472	47k			
R15	57.44.3403	40k	4%		
R16	57.44.3403	40k	4%		
R17	57.44.2204	220			
R18	57.44.3333	33k			
R19	57.44.4474	470			
R20	57.44.4474	470			
R21	57.44.4682	6,8k			
R22	57.44.3332	33k	4%		
R23	57.44.3332	33k	4%		
R24	57.44.4453	45k			
R25	57.44.4472	47k			
R26	58.04.8203	20k		TRIM-POTM	
R27	57.44.8202	8,2k			
R28	57.44.8202	8,2k			
R29	58.04.8403	40k		TRIM-POTM	
R30	57.44.4474	470			

IND	DATE	NAME	
①		F Fairchild	TI Texas Instruments
②		M Motorola	
③		Ro Raytheon	
④			also valid for correlator 4CH 1.913.211
⑤	20-8-84	ajp	
STUDER			CORRELATOR 2CH 1.913.210
			PAGE 4 OF 3

IND	DATE	NAME	
①			
②			
③			
④			also valid for correlator 4CH 1.913.211
⑤	20-8-84	ajp	
STUDER			CORRELATOR 2CH 1.913.210
			PAGE 2 OF 3

IND	POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
R31	57.44.4474	470			
R32	57.44.4223	22k			
R33	57.44.4473	47k			
R34	57.99.0206	50		PTC	
R35	57.99.0206	50		PTC	
S1	55.04.0445	8x ON-ON	only 1.913.211		
T1	4.022.248	4:4		INPUT TFAFO	stucker
T2	4.022.248	4:4		INPUT TFAFO	stucker
B1	54.02.0444	6V,30mA		Lamp	
B2	54.02.0444	6V,30mA		Lamp	
ME1	1.913.004.03			Conn-Meter	
P1	54.44.2042			CONNECTOR, 46pins	
X1C	53.03.0166			IC-Socket, 9pins	

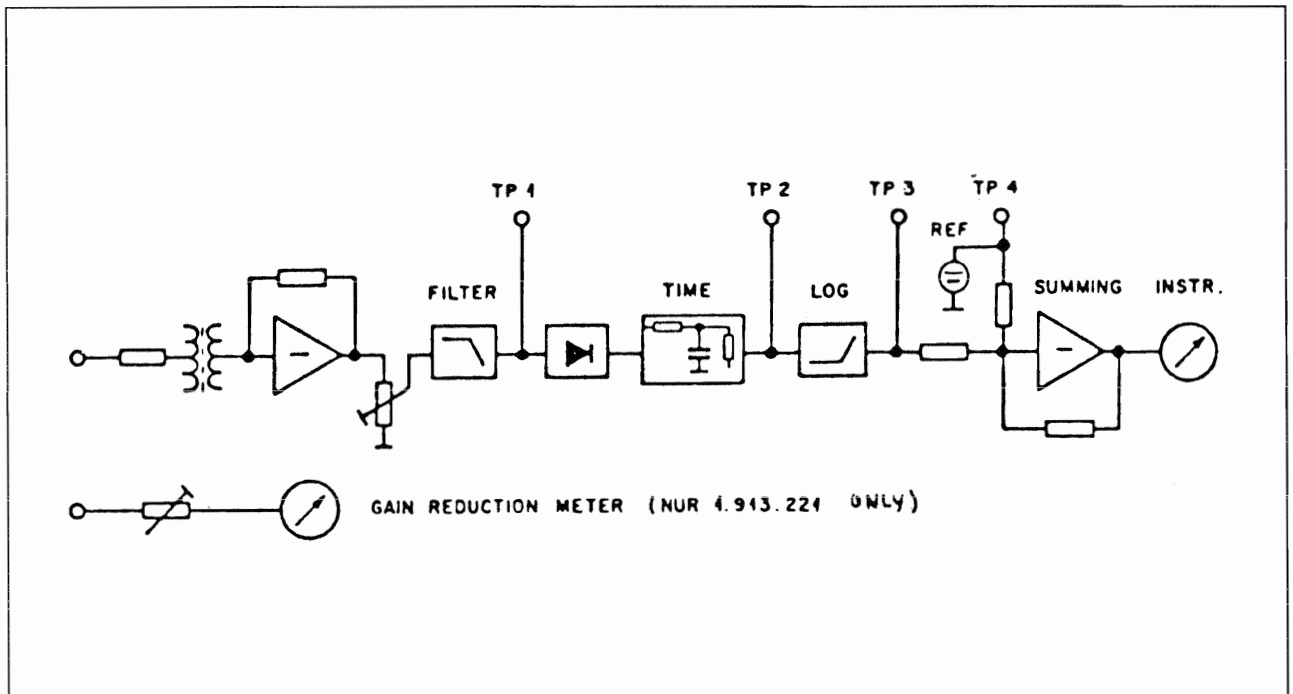
IND	DATE	NAME	
①			
②			
③			
④			also valid for correlator 4CH 1.913.211
⑤	20-8-84	ajp	
STUDER			CORRELATOR 2CH 1.913.210
			PAGE 3 OF 3

3. Peak Program Meter (PPM)

1.913.220/221

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

3.1 Blockschaltbild



3.2 Technische Daten

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

Dynamisches Verhalten

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

Mechanische Daten

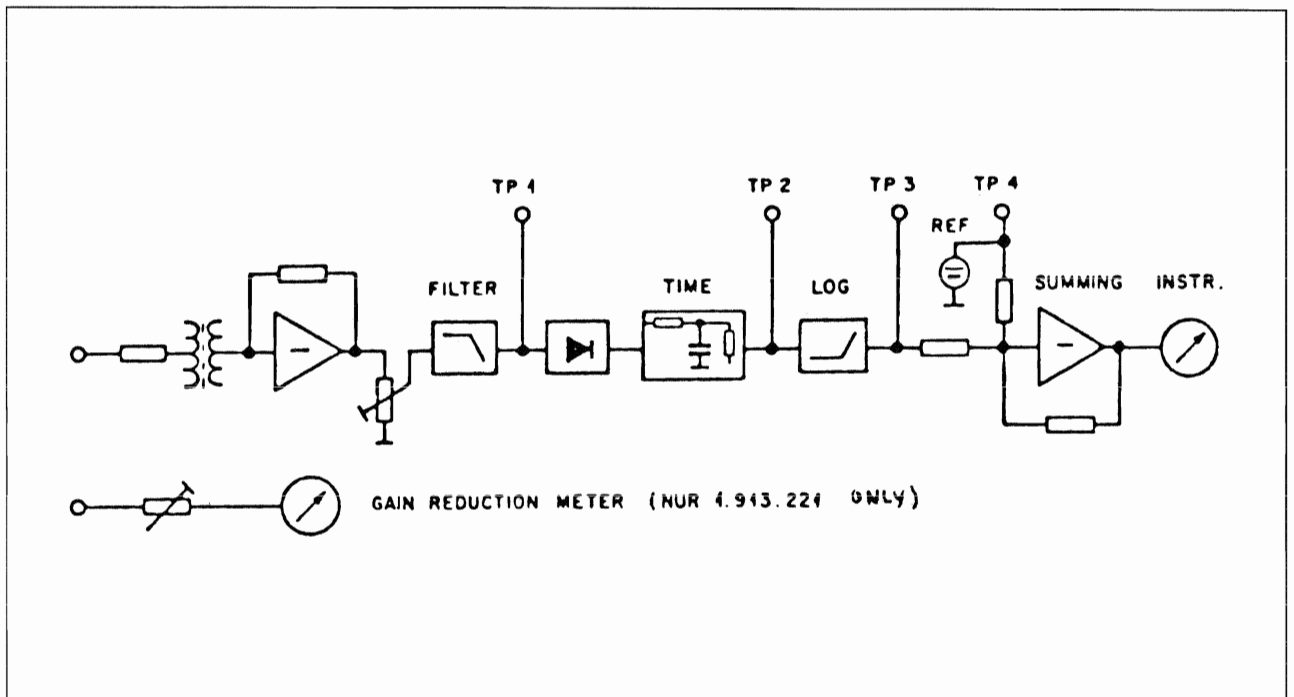
Abmessung Frontplatte:	170 x 80 mm
Tiefe:	135 mm
Gewicht:	360 gr

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

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

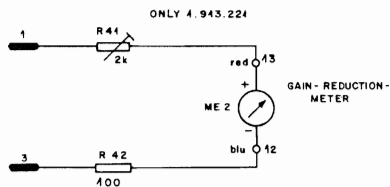
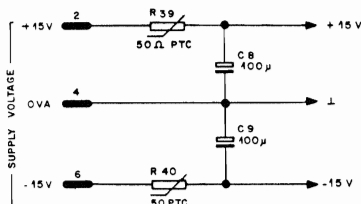
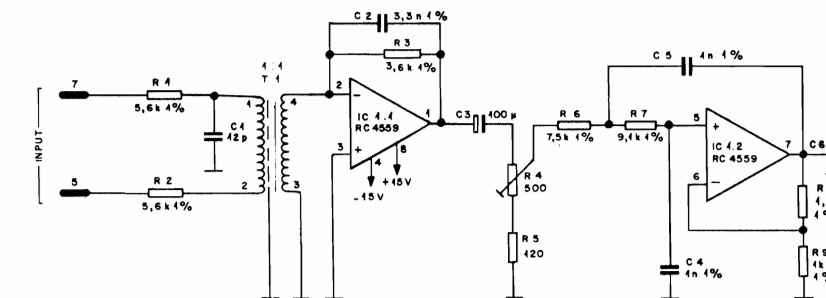
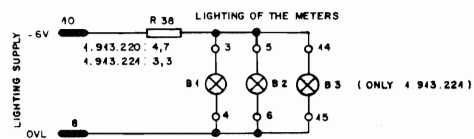
Dynamic response

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

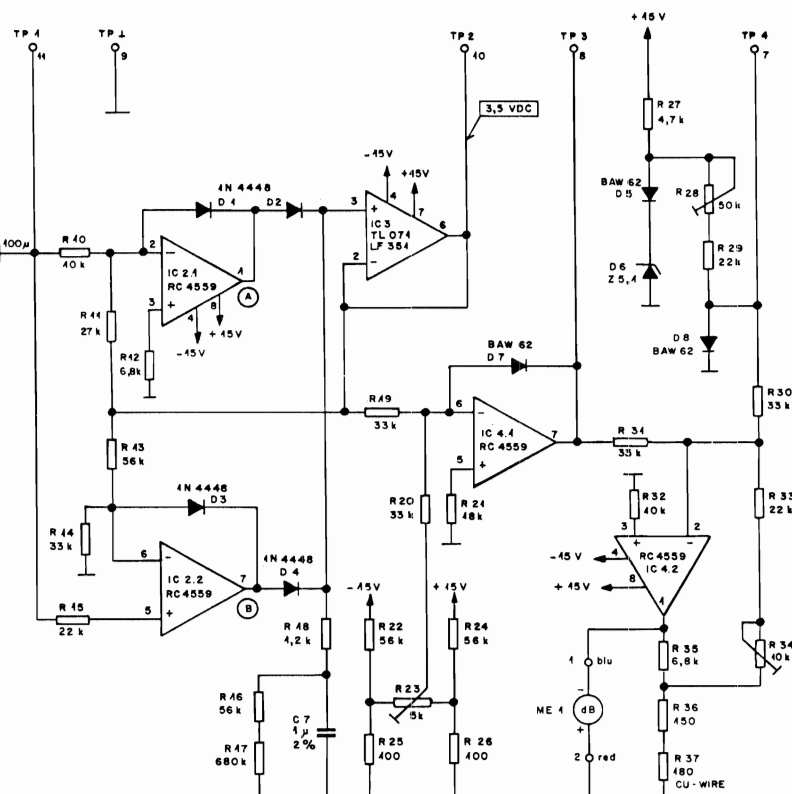
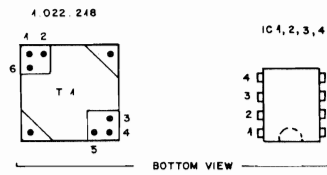
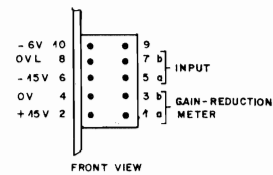
Physical Data

Dimensions of front panel:	170 x 80 mm
Depth:	135 mm
Weight:	360 gr

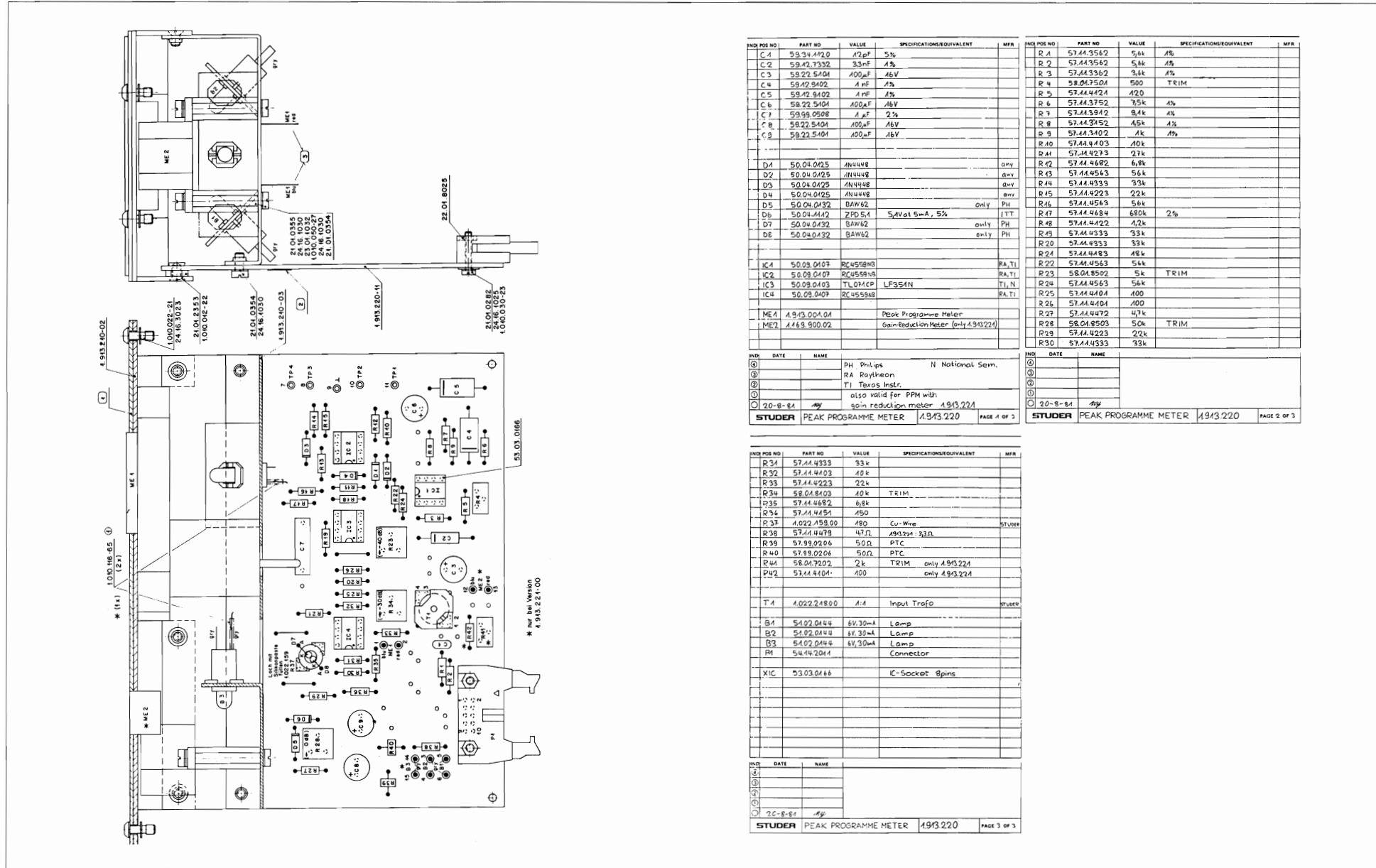
Peak Programme Meter 1.913.220/221



- ADJUSTMENT :
- 3,5V DC AT TP2 - R4
 - 0dB AT ME1 - R28
 - 30dB AT ME1 - R34
 - 40dB AT ME1 - R23



Peak Programme Meter 1.913.220/221



IND POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
C1	59.34.4920	100pF	5%	
C2	59.42.7352	33nF	1%	
C3	59.22.5404	100µF	46V	
C4	59.42.8402	1nF	1%	
C5	59.42.8402	1nF	1%	
C6	58.22.5404	100µF	16V	
C7	59.99.0508	1µF	2%	
C8	58.22.5404	100µF	16V	
C9	59.22.5404	100µF	16V	
D1	50.04.0425	JN4448		any
D2	50.04.0425	JN4448		any
D3	50.04.0425	JN4448		any
D4	50.04.0425	JN4448		any
D5	50.04.0432	BAW62		only PH
D6	50.04.4442	2PD54	5.4Vot 5mA, 5%	ITT
D7	50.04.0432	BAW62		only PH
D8	50.04.0432	BAW62		only PH
IC1	50.09.0107	RC4558ND		RA, TI
IC2	50.09.0107	RC4558ND		RA, TI
IC3	50.09.0403	TL074CP	LF354N	TI, N
IC4	50.09.0407	RC4558ND		RA, TI
ME1	1.913.004.01		Peak Programme Meter	
ME2	1.169.900.02		Gain-Reduction Meter (only 1.913.221)	

IND POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
R1	57.11.3582	54k	1%	
R2	57.11.3582	54k	1%	
R3	57.11.3362	94k	1%	
R4	58.04.7504	500	TRIM	
R5	57.11.4424	120		
R6	57.11.3752	75k	1%	
R7	57.11.3942	84k	1%	
R8	57.11.3452	45k	1%	
R9	57.11.3402	4k	1%	
R10	57.11.4403	40k		
R11	57.11.4233	22k		
R12	57.11.4682	68k		
R13	57.11.4543	56k		
R14	57.11.4333	33k		
R15	57.11.4223	22k		
R16	57.11.4563	56k		
R17	57.11.4684	680k	2%	
R18	57.11.4422	42k		
R19	57.11.4333	33k		
R20	57.11.4533	33k		
R21	57.11.4483	48k		
R22	57.11.4563	56k		
R23	58.04.8503	5k	TRIM	
R24	57.11.4563	56k		
R25	57.11.4404	400		
R26	57.11.4404	400		
R27	57.11.4422	42k		
R28	58.04.8503	50k		
R29	57.11.4223	22k		
R30	57.11.4333	33k		

IND DATE NAME
 PH Philips N National Sem.
 RA Raytheon
 TI Texas Instr.
 also valid for PPM with:
 gain reduction meter 1.913.221
 20-8-81
STUDER PEAK PROGRAMME METER 1.913.220 PAGE 1 OF 3

IND DATE NAME
 PH Philips N National Sem.
 RA Raytheon
 TI Texas Instr.
 also valid for PPM with:
 gain reduction meter 1.913.221
 20-8-81
STUDER PEAK PROGRAMME METER 1.913.220 PAGE 2 OF 3

IND POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
R34	57.11.4333	33k		
R35	57.11.4403	40k		
R36	57.11.4223	22k		
R37	58.04.8403	40k	TRIM	
R38	57.11.4682	68k		
R39	57.11.4454	450		
R40	4.022.158.00	180	Cu-Wire	STUDER
R41	57.11.4478	47Ω	A932pt. 33Ω	
R42	57.99.0206	50Ω	PTC	
R43	57.99.0206	50Ω	PTC	
R44	58.04.7202	2k	TRIM only 1.913.221	
R45	57.11.4404	400	only 1.913.221	
T1	4.022.248.00	1:1	Input Trafo	STUDER
B1	54.02.0444	6V, 30mA	Lamp	
B2	54.02.0444	6V, 30mA	Lamp	
B3	54.02.0444	6V, 30mA	Lamp	
B4	54.44.2041		Connector	
X1C	53.03.0466		IC-Socket 8pins	

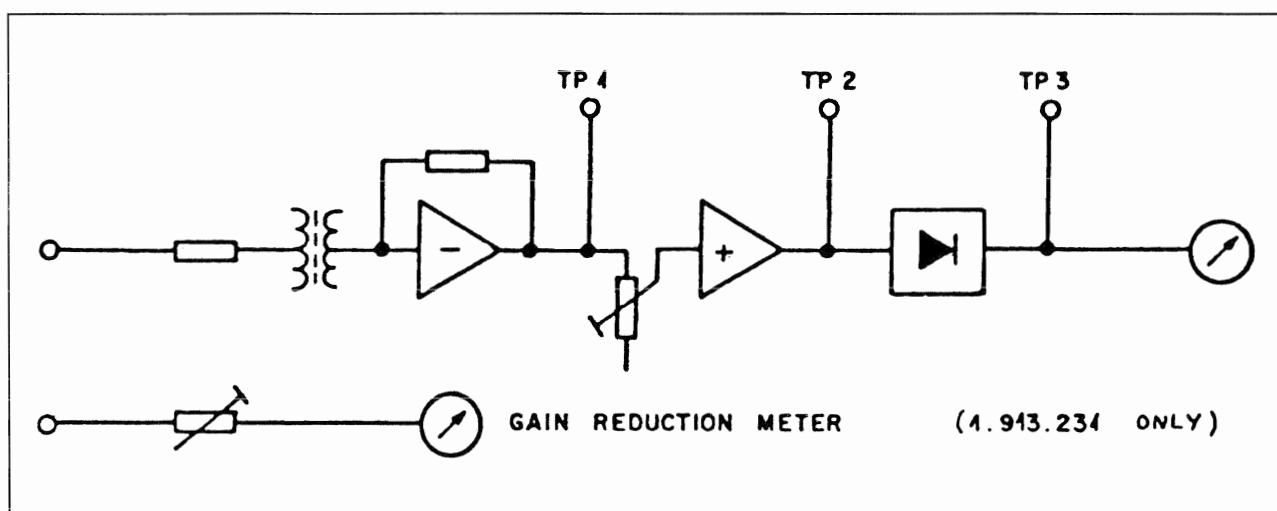
IND DATE NAME
 PH Philips N National Sem.
 RA Raytheon
 TI Texas Instr.
 also valid for PPM with:
 gain reduction meter 1.913.221
 20-8-81
STUDER PEAK PROGRAMME METER 1.913.220 PAGE 3 OF 3

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

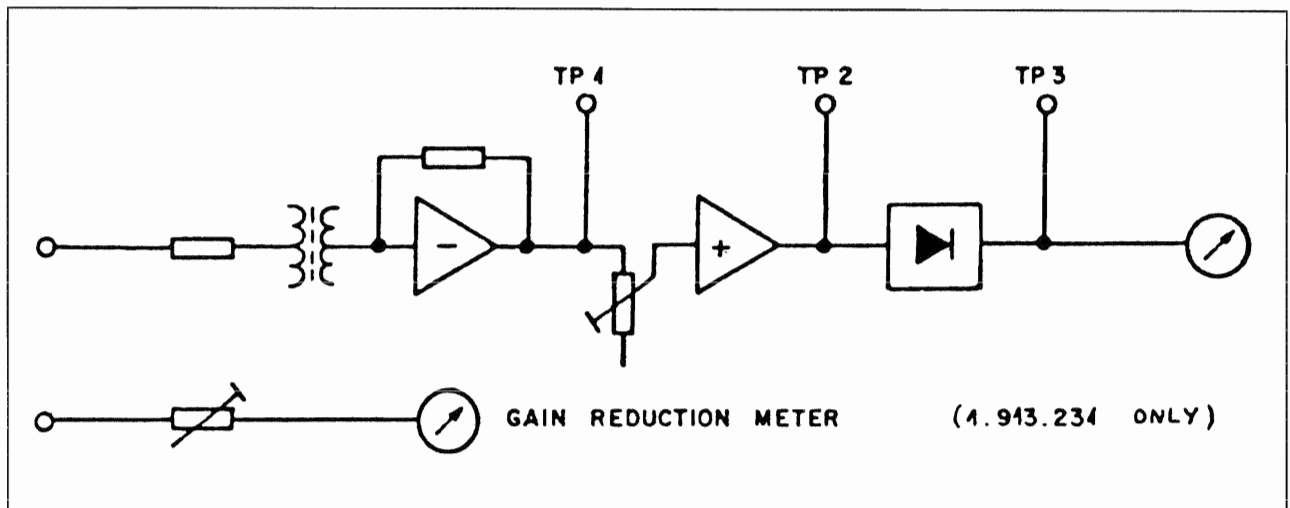
Eingangsempfindlichkeit	für Referenzanzeige (0 VU)	0 dBu ... + 10 dBu
Eingangsimpedanz		> 10 kOhm
Anzeigebereich		- 20 VU ... + 3 VU
Genauigkeit	bei 20°C, 1kHz, -10 VU ... +3 VU	± 0,5 VU
Frequenzgang	für Referenzanzeige 0°C ... 50°C, 31,5 Hz ... 15 kHz	± 0,5 VU
Ansprechzeit	auf - 1 VU	207 ms ± 30 ms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

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

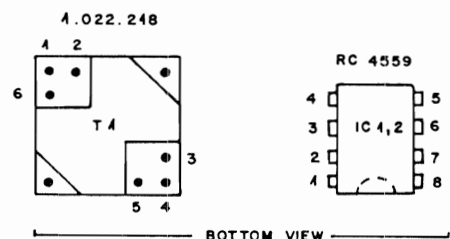
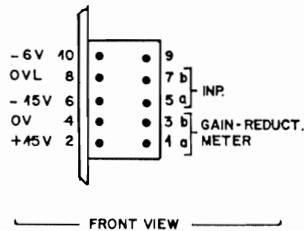
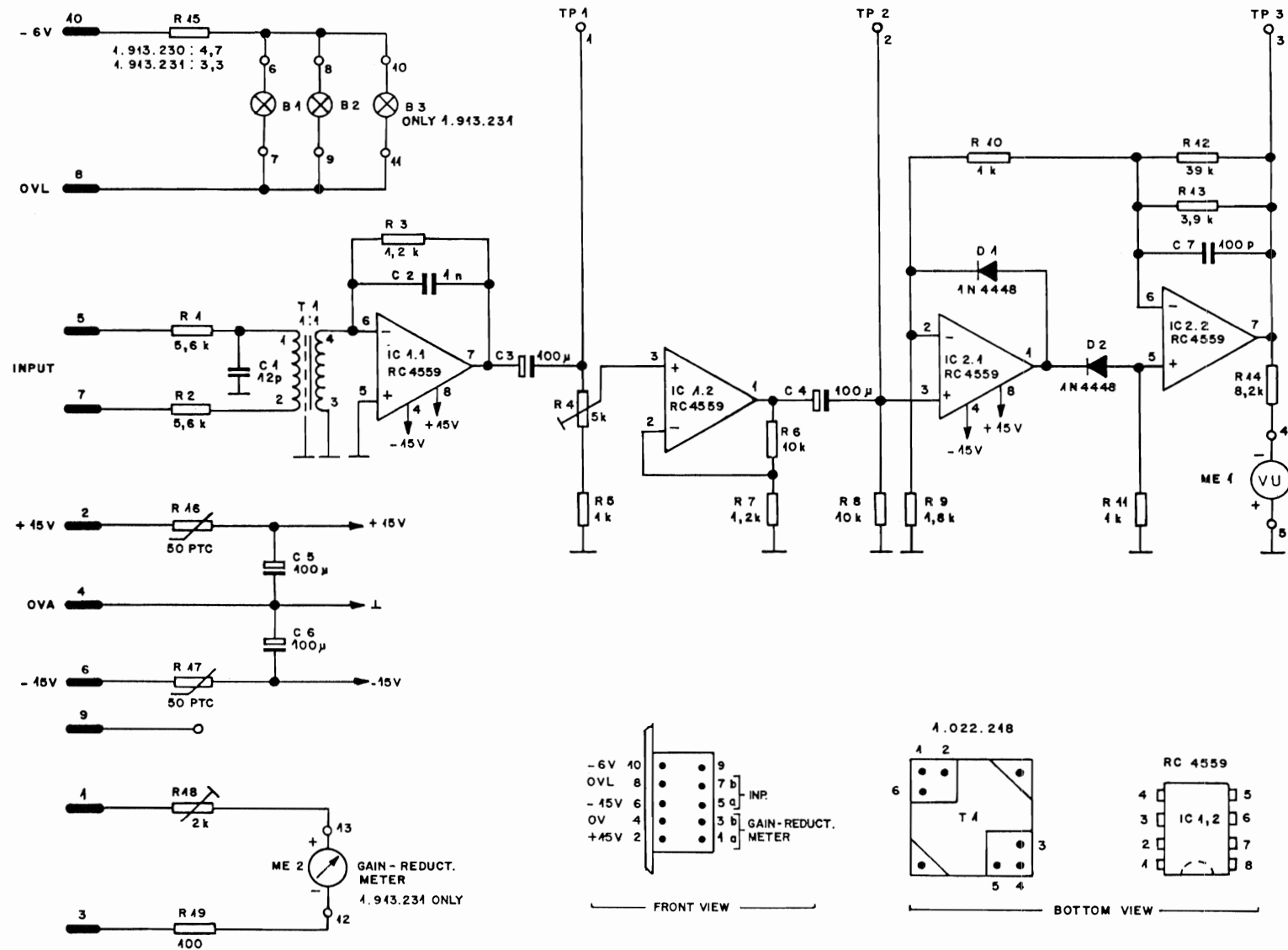


4.2 Specifications

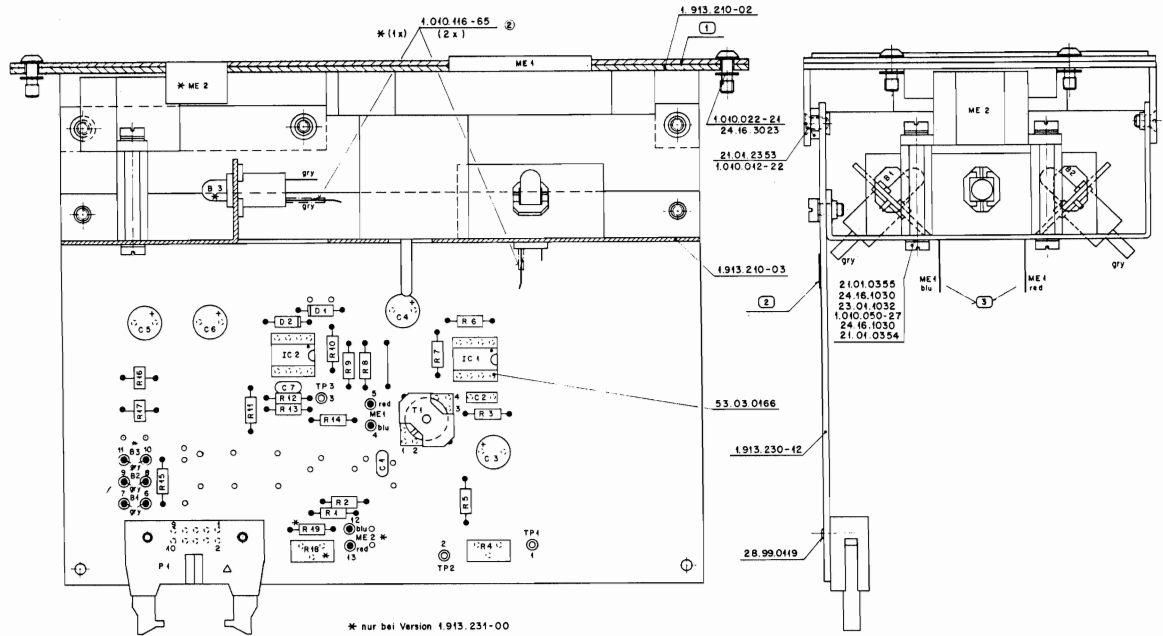
Input sensitivity	for reference indication (0 VU)	0 dBu ... + 10 dBu
Input impedance		> 10 kOhm
Indicating range		- 20 VU ... + 3 VU
Accuracy	at 20°C, 1 kHz, - 10 VU ... + 3 VU	± 0,5 VU
Frequency response	for reference 0°C ... 50°C, 31,5 Hz ... 15 kHz	± 0,5 VU
Attack time	to -1 VU	207 ms ± 30 ms
Supply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

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	1.913.221-01	1.913.231-04	1.913.221-93

INDI POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
C1	593.44.120	.2 pF	5%	
C2	59.04.0102	1 nF	40%	
C3	59.02.5104	100 nF	± 45V	
C4	59.02.5104	100 nF	± 45V	
C5	59.02.5104	100 nF	± 45V	
C6	59.02.5104	100 nF	± 45V	
C7	59.34.1101	100 pF	5%	
D1	50.04.0125	1N4448B		ONY
D2	50.04.0125	1N4448B		ONY
IC1	50.09.0107	RC4558 NB	Dual OP AMP	Ro, TI
IC2	50.09.0107	RC4558 NB	Dual OP AMP	Ro, TI
P1	57.11.3562	5.6k	1%	
R2	57.11.3562	5.6k	1%	
R3	57.11.4422	12k		
R4	58.04.7502	5k	TRIM-POT	
R5	57.11.4402	1k		
R6	57.11.4403	10k		
R7	57.11.4422	12k		
R8	57.11.4403	10k		
R9	57.11.4482	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		

INDI	DATE	NAME
①		
②		
③		
④		
⑤		
⑥		
⑦		
⑧		
⑨		
⑩		
⑪		
⑫		
⑬		
⑭		
⑮		
⑯		
⑰		
⑱		
⑲		
⑳		
㉑		
㉒		
㉓		
㉔		
㉕		
㉖		
㉗		
㉘		
㉙		
㉚		
㉛		
㉜		
㉝		
㉞		
㉟		
㊱		
㊲		
㊳		
㊴		
㊵		
㊶		
㊷		
㊸		
㊹		
㊺		
㊻		
㊼		
㊽		
㊾		
㊿		

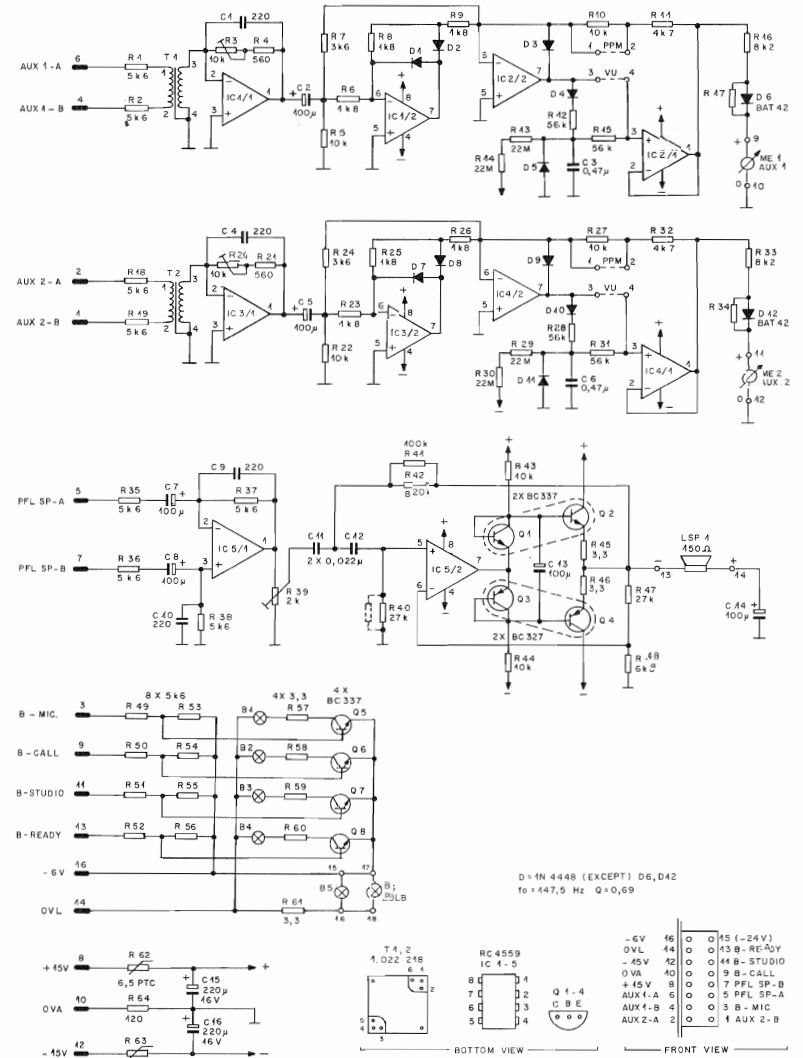
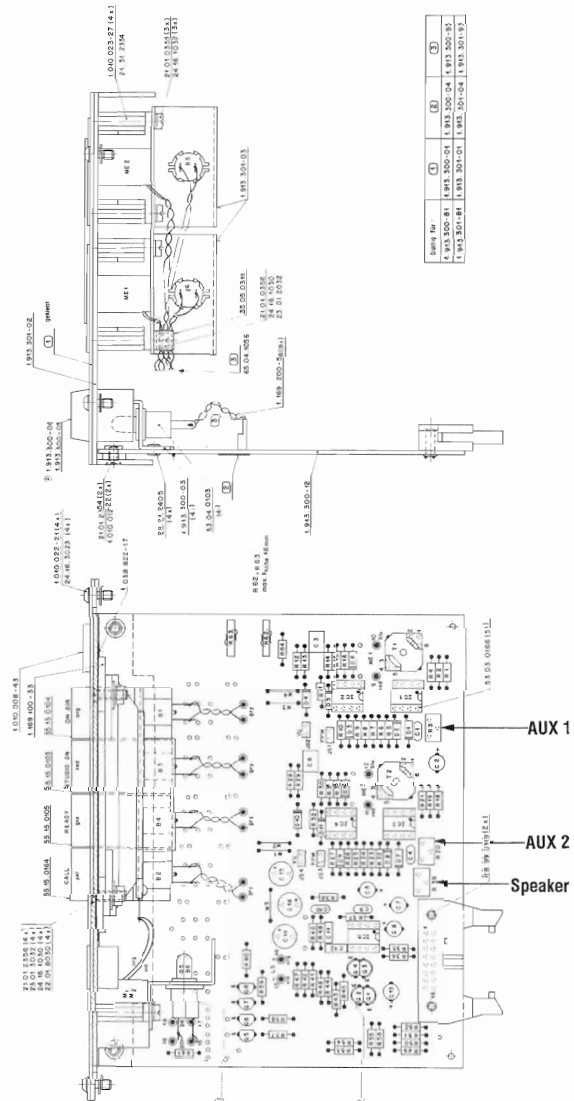
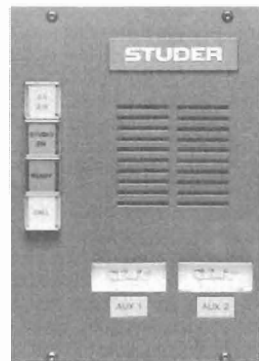
INDI POS NO	PART NO	VALUE	SPECIFICATIONS/EQUIVALENT	MFR
R15	57.11.4479	47Ω	A94334: 33Ω (57.11.4938)	
R16	57.99.0206	50	PTC PHILIPS 2.322.664.84002	
R17	57.99.0206	50	PTC PHILIPS 2.322.664.84002	
R18	58.04.7202	2k	Trim-Pot. (only 1.913.231)	
R19	57.11.4404	100	(only 1.913.231)	
T1	A022.248.00	1:1	Input Trafo	
B1	54.02.0444	6V, 30mA	Lamp	
B2	54.02.0444	6V, 30mA	Lamp	
ME1	A943.001.02		VU-Meter	
ME2	A488.002.02		Gain-Reduction Meter (only 1.913.231)	
P1	54.14.2011		Connector 10 pins	
XC	53.03.0166		IC-Socket 8 pins DIP	
B3	54.02.0444	6V, 30mA	Lamp (only 1.913.231)	

INDI	DATE	NAME
①		
②		
③		
④		
⑤		
⑥		
⑦		
⑧		
⑨		
⑩		
⑪		
⑫		
⑬		
⑭		
⑮		
⑯		
⑰		
⑱		
⑲		
⑳		
㉑		
㉒		
㉓		
㉔		
㉕		
㉖		
㉗		
㉘		
㉙		
㉚		
㉛		
㉜		
㉝		
㉞		
㉟		
㊱		
㊲		
㊳		
㊴		
㊵		
㊶		
㊷		
㊸		
㊹		
㊺		
㊻		
㊼		
㊽		
㊾		
㊿		

INDI	DATE	NAME
①		
②		
③		
④		
⑤		
⑥		
⑦		
⑧		
⑨		
⑩		
⑪		
⑫		
⑬		
⑭		
⑮		
⑯		
⑰		
⑱		
⑲		
⑳		
㉑		
㉒		
㉓		
㉔		
㉕		
㉖		
㉗		
㉘		
㉙		
㉚		
㉛		
㉜		
㉝		
㉞		
㉟		
㊱		
㊲		
㊳		
㊴		
㊵		
㊶		
㊷		
㊸		
㊹		
㊺		
㊻		
㊼		
㊽		
㊾		
㊿		

5. PFL / SIGN. / AUX Indication Unit

1.913.301.81



① 42 42 85		
STU REGENSDORF ZÜRICH	PFL / SIGN / AUX INDICATION UNIT	SC 4.913.301.81

STUDER AUDIO CONSOLE 970

PFL/SIGNAUX INDICATION UNIT 1.913.301.81

Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER	Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER
B....1	51.02.0143	6 V	166mA W2*4.60		R....51	57.11.4562	5.6 kOhm		
B....2	51.02.0143	6 V	166mA W2*4.60		R....52	57.11.4562	5.6 kOhm		
B....3	51.02.0143	6 V	166mA W2*4.60		R....53	57.11.4562	5.6 kOhm		
B....4	51.02.0143	6 V	166mA W2*4.60		R....54	57.11.4562	5.6 kOhm		
B....5	51.02.0144	6 V	30mA W2*4.60		R....55	57.11.4562	5.6 kOhm		
B....6	51.02.0144	6 V	30mA W2*4.60		R....56	57.11.4562	5.6 kOhm		
C....1	59.34.4221	220 pF	CER		R....57	57.11.4339	3.3 Ohm		
C....2	59.22.3101	100 uF	10V EL		R....58	57.11.4339	3.3 Ohm		
C....3	59.06.0474	470 nF	10% PE		R....59	57.11.4339	3.3 Ohm		
C....4	59.34.4221	220 pF	CER		R....60	57.11.4339	3.3 Ohm		
C....5	59.22.3101	100 uF	10V EL		R....61	57.11.4339	3.3 Ohm		
C....6	59.06.0474	470 nF	10% PE		R....62	57.92.1271	6.5 Ohm PTC		
C....7	59.22.3101	100 uF	10V EL		R....63	57.92.1271	6.5 Ohm PTC		
C....8	59.22.3101	100 uF	10V EL		R....64	57.11.4101	100 Ohm		
C....9	59.34.4221	220 pF	5% CER		T....1	1.022.218.00	input trafo 1:1		St
C....10	59.34.4221	220 pF	5% CER		T....2	1.022.218.00	input trafo 1:1		St
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 pF	16V EL						
C....16	59.22.4221	220 pF	16V EL						
D....1	50.04.0125	1M4448	any						
D....2	50.04.0125	1M4448	any						
D....3	50.04.0125	1M4448	any						
D....4	50.04.0125	1M4448	any						
D....5	50.04.1112	ZD 5V1	any						
D....6	50.04.0127	BA540-O2 (Sie),400mV at 10mA; BAT85 (Ph), BAT42 (Tho)	any						
D....7	50.04.0125	1M4448	any						
D....8	50.04.0125	1M4448	any						
D....9	50.04.0125	1M4448	any						
D....10	50.04.0125	1M4448	any						
D....11	50.04.1112	ZD 5V1	any						
D....12	50.04.0127	BA540-O2 (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							
R....43	57.11.4824	820 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	57.11.4562	6.8 kOhm							
R....49	57.11.4562	5.6 kOhm							
R....50	57.11.4562	5.6 kOhm							

MANUFACTURER: ITT-ITT-Intermetal, Ph=Phillips, Ra-Raytheon, Sie=Siemens, St=Studer,

 * This position list is valid for:
 * Diese Positionsliste ist gueltig fur:
 * - 1.913.300.81 PFL-SIGN-INDICATION UNIT
 * folgende Positionen sind bestueckt:
 * B1-B4, C7-C16, ICS, L31, P1, Q1-Q8, R35-R64 ohne R61
 * - 1.913.301.81 PFL-SIGN-AUX-INDICATION UNIT
 * alle Positionen sind bestueckt

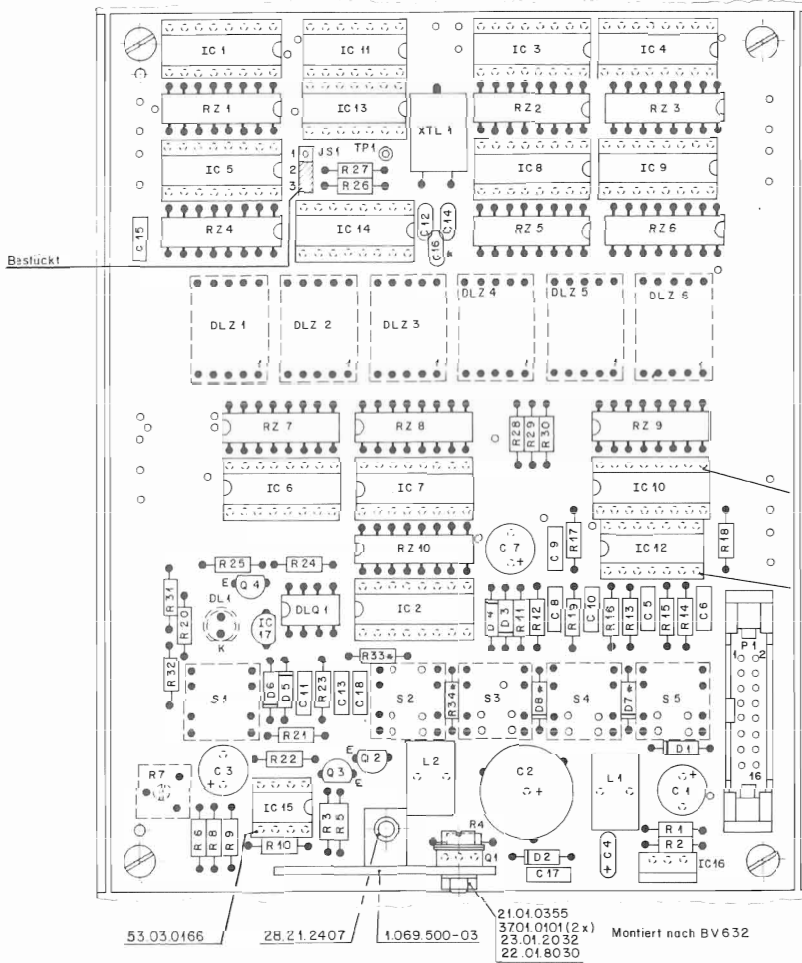
1.913.300.81 PFL-SIGN-INDICATION UNIT WY 86/10/2900

6. Stop Watch Unit

1.913.310.81

Stop watch Unit

1.913.310.81

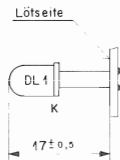


53.03.0168 (11x)

5x 03.0167 (3x)

L1, L2 geklebt nach BV 640

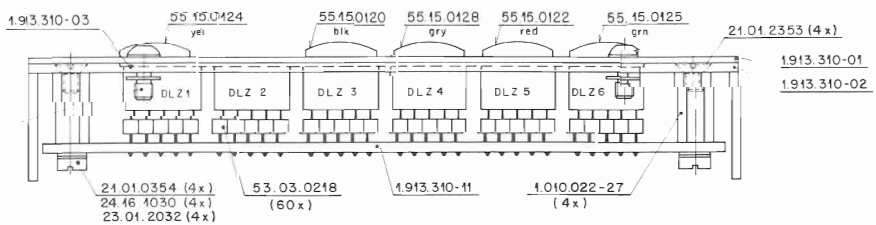
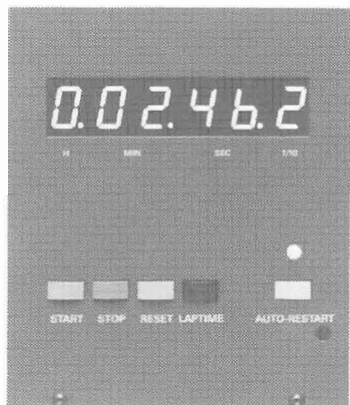
Montiert nach BV 632



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

* D8, D7, R 33, R 34, C 16 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	HDSF 550	3 Display	HP
DLZ...2	73.01.0140	HDSF 550	3 Display	HP
DLZ...3	73.01.0140	HDSF 550	3 Display	HP
DLZ...4	73.01.0140	HDSF 550	3 Display	HP
DLZ...5	73.01.0140	HDSF 550	3 Display	HP
DLZ...6	73.01.0140	HDSF 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	2% 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	

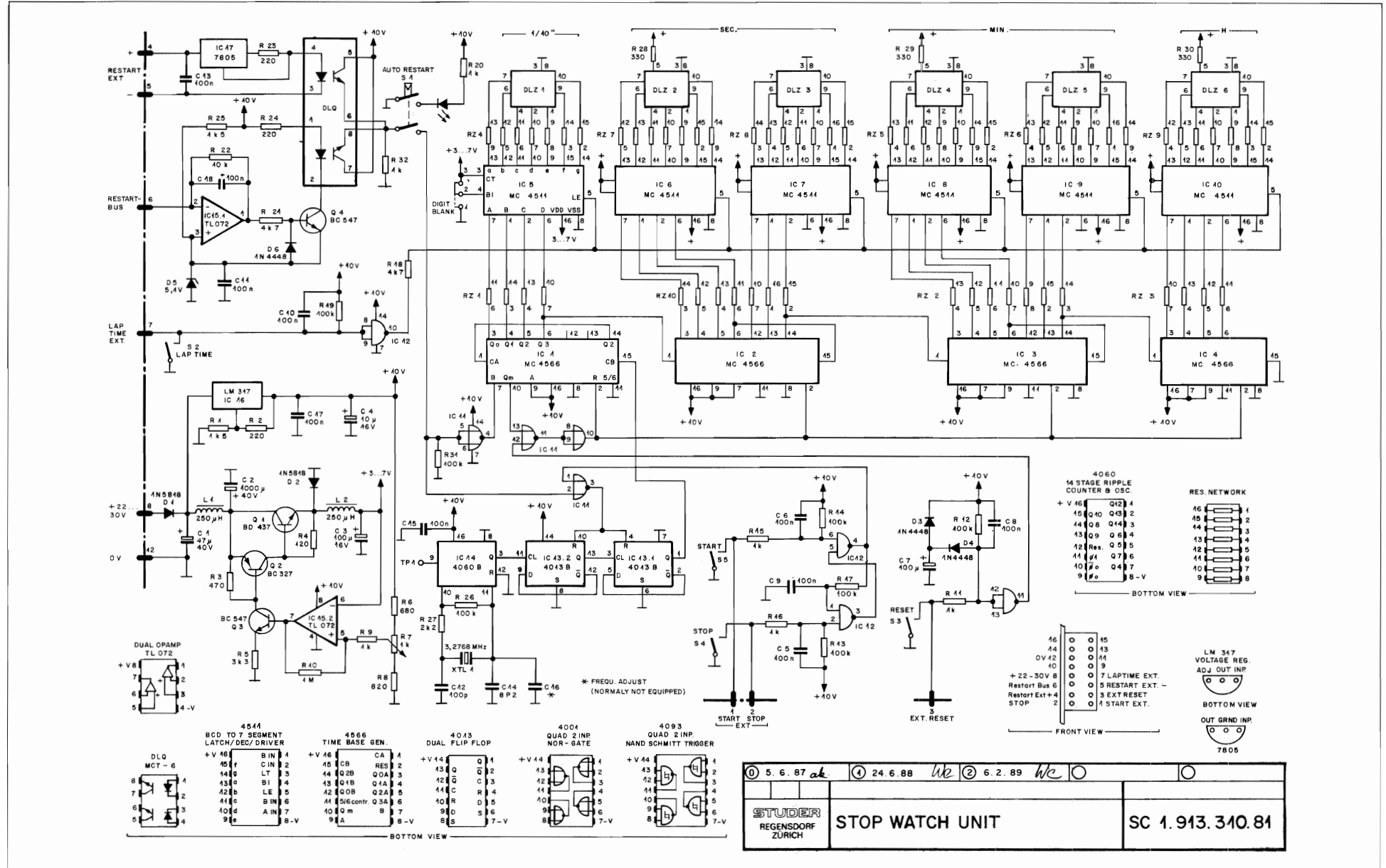
Ad	..POS...	..REF.No...	DESCRIPTION.....	MANUFACTURER
R....29	57.11.4331	330 Ohm	5% 0.25W	
R....30	57.11.4331	330 Ohm	5% 0.25W	
R....31	57.11.4104	100 kOhm	5% 0.25W	
R....32	57.11.4104	100 kOhm	5% 0.25W	
01 R....32	57.11.3102	1 kOhm	5% 0.25W	
R....33	.	.	not used	
R....34	.	.	not used	
RZ....1	57.88.3473	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=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

Stop watch Unit 1.913.310.81



CONTENTS

1	Introduction.....	3
2	MSC System.....	4
2.1	Modular Sub-Cards (MSCs).....	5
2.1.1	Motherboard for 1 MS-Card	1.914.500.....5
2.1.2	Breadboarding Card	1.914.529.....5
2.1.3	Line Output Amplifier	1.914.501.....6
2.1.4	High-Level Input Amplifier	1.914.502/504.....8
2.1.5	Loudspeaker Amplifier	1.914.505.....10
2.1.6	Microphone Pre-Amplifiers	1.914.506/507.....11
2.1.7	VCA with Electronically Balanced Connections	1.914.515.....13
2.1.8	VCA with 1 or 3 Control Ports	1.914.518/528.....15
2.1.9	Limiter Voltage Processor	1.914.519.....17
2.1.10	1900 Hz Signal Generator	1.914.520.....19
2.1.11	Call Decoder 20...60 Hz	1.914.521.....20
2.1.12	Call Decoder 1900 Hz	1.914.522.....21
2.1.13	Relay Sub-Cards	1.914.523/524/525/526.....22
2.1.14	0-Ω Input Amplifier with PFL Facility	1.914.530.....23
2.1.15	High Level Input with PFL Facility	1.914.531.....24
2.1.16	Flip-flop Unit	1.914.532.....25
2.1.17	90° Filter	1.914.533.....26
2.1.18	Dual Vox Detector	1.914.534.....28
2.1.19	Microphone Amplifier with Limiter	1.914.539.....29
2.1.20	Dual Fader/VCA Control Voltage Interface	1.914.540 /541.....31
2.2	Euro-Cards.....	32
2.2.1	Motherboard for 4 MS-Cards	1.915.770.....32
2.2.2	Power Supply	1.915.100.....33
2.2.3	Audio Generator	1.915.200.....35
2.2.4	Monitor Amplifier and Switching Relays (Studio/CR)	1.915.304.....37
2.2.5	Distribution Amplifier	1.915.307/308.....39
2.2.6	5 W Power Amplifier	1.915.410/415.....41
2.2.7	40 W Power Amplifier	1.915.440/441.....43
2.2.8	Monitor Switching Relays	1.915.601/602.....45
2.2.9	Transistor-Driven Relays (7+2)	1.915.603.....47
2.2.10	Dual Limiter	1.915.700.....49
2.2.11	Telephone Hybrid	1.915.760/764.....51
2.2.12	Line Equalizer	1.915.776/777/779.....53
2.2.13	Dual Balancing Unit/Dual Line Amplifier	1.915.904.....56
2.3	Racks and Frames	59
2.3.1	19" Mounting Frame for 3 Euro-Cards	1.918.100.....59
2.3.2	19" Ventilation Unit/19" Blank Panels	1.918.119/0XX.....61
2.3.3	19" Euro-Card Mounting Frames	1.918.318/319.....62
2.3.4	19" Euro-Card Mounting Accessories	63

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

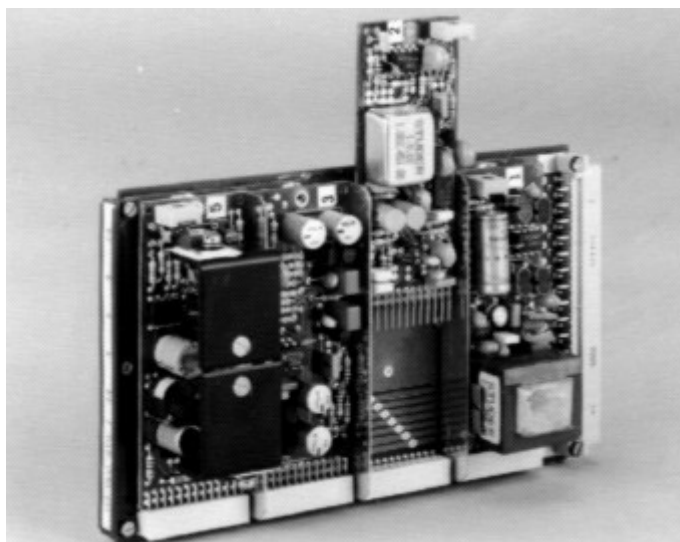
We reserve the right to change the design and the performance specifications of the products listed here as technical progress may warrant.

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 4×6 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° 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.

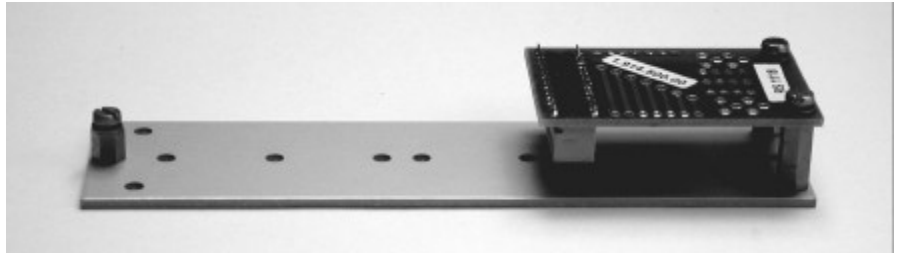
2.1 Modular Sub-Cards (MSCs)

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**

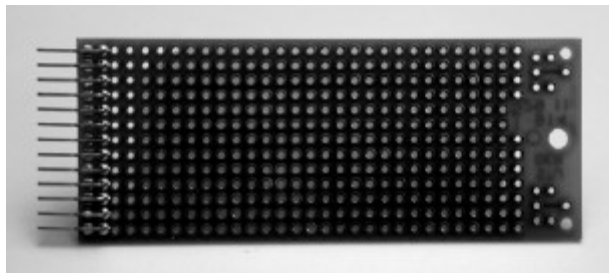
Motherboard for 1 MS-card

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:**

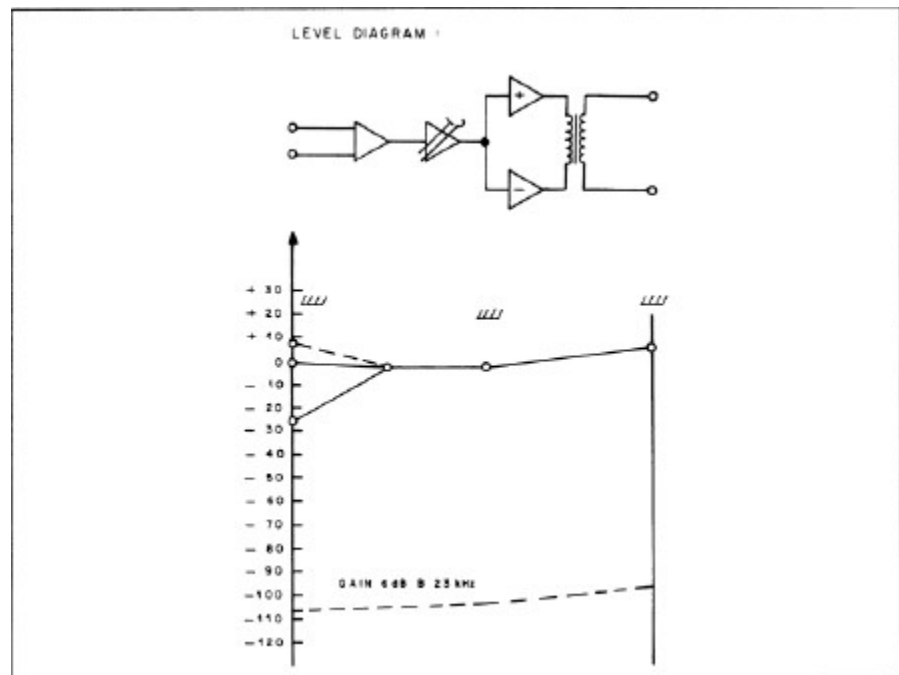
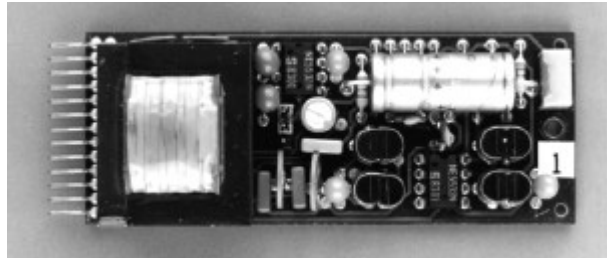
Breadboarding card

1.914.529.xx

2.1.3 Line Output Amplifier

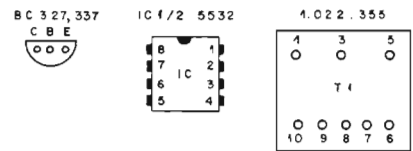
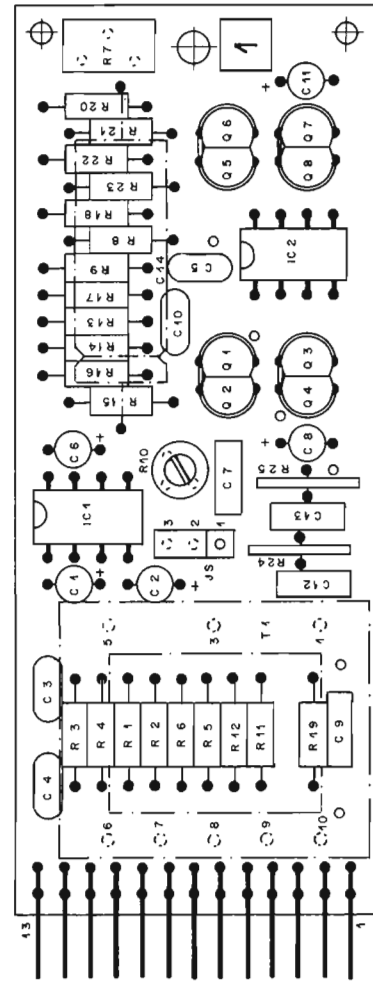
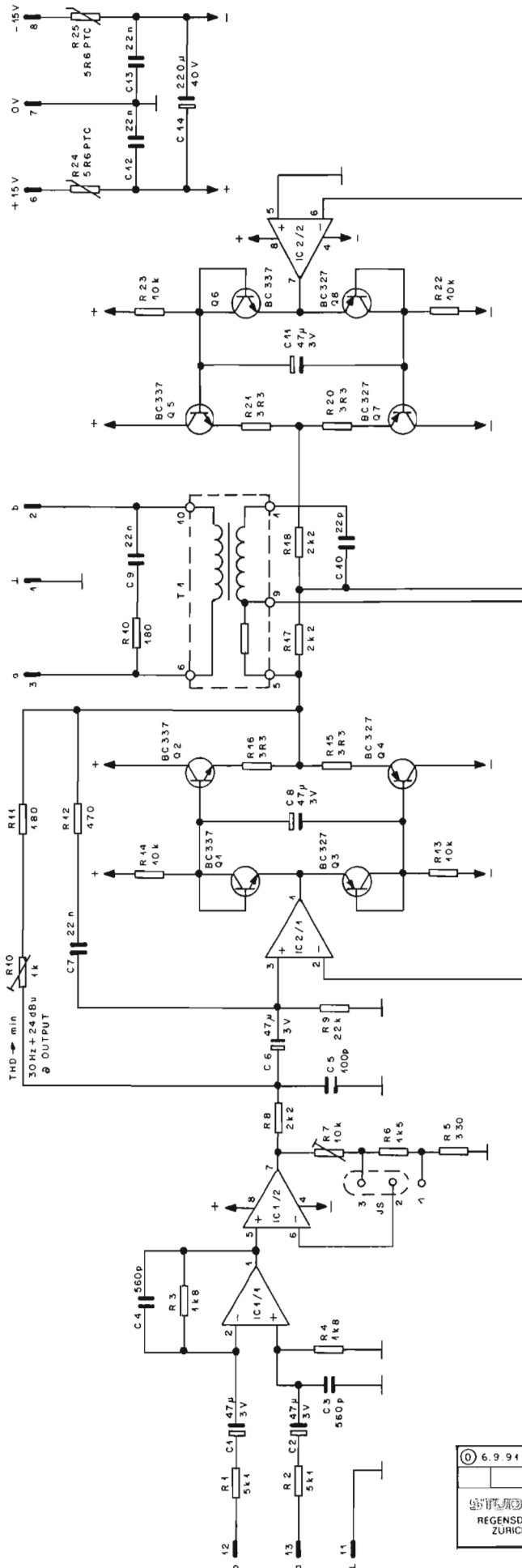
1.914.501

Designed for operation at a nominal line level of +6 dBu (1.55 V_{rms}), this amplifier can handle levels of up to +24 dBu (12.3 V_{rms}), 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

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



PIN	1	2	3	4	5	6	7	8	9	10	11	12	13
INP a	1	7	21	27									
INP b	2	8	22	28									
⊥	3	9	23	29									
OUT a	4	10	24	30									
OUT b	5	11	25	31									
⊥	6	12	26	32									
+ 15V	16												
0V	15												
- 15V	14												

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

MSC LINE AMPLIFIER

Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER
Ⓞ	C....1	59.30.1470	47µ 3V	TA
Ⓞ	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
	JSJ	54.01.0021	JUMPER JACK	
	JSP	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	8C327 PNP IC 0,8A	] MATCHED ST
	Q....4	50.03.0625	8C327 PNP IC 0,8A		ST
	Q....5	50.03.0516	8C337 NPN IC 0,8A	] MATCHED ST
	Q....6	50.03.0516	8C337 NPN IC 0,8A		ST
	Q....7	50.03.0625	8C327 PNP IC 0,8A	] MATCHED ST
	Q....8	50.03.0625	8C327 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
	T....1	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) Ⓞ FRI 17/11/83

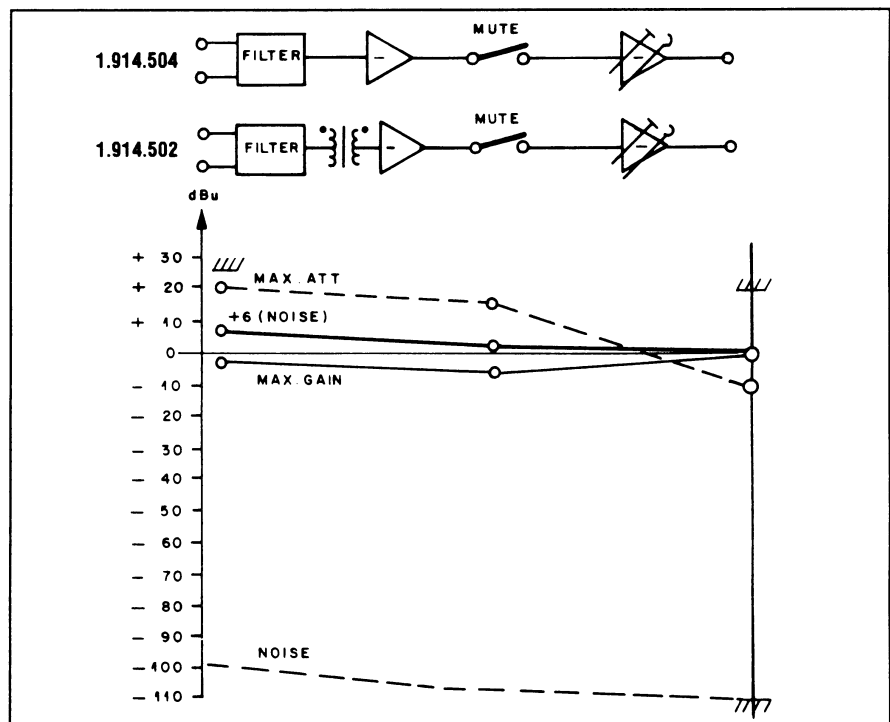
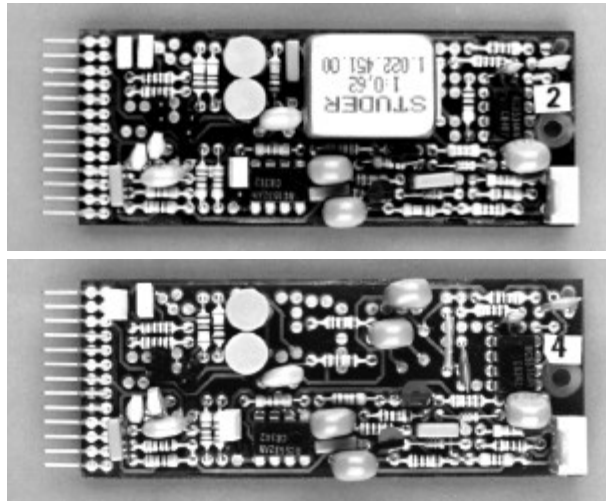
END

→

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.



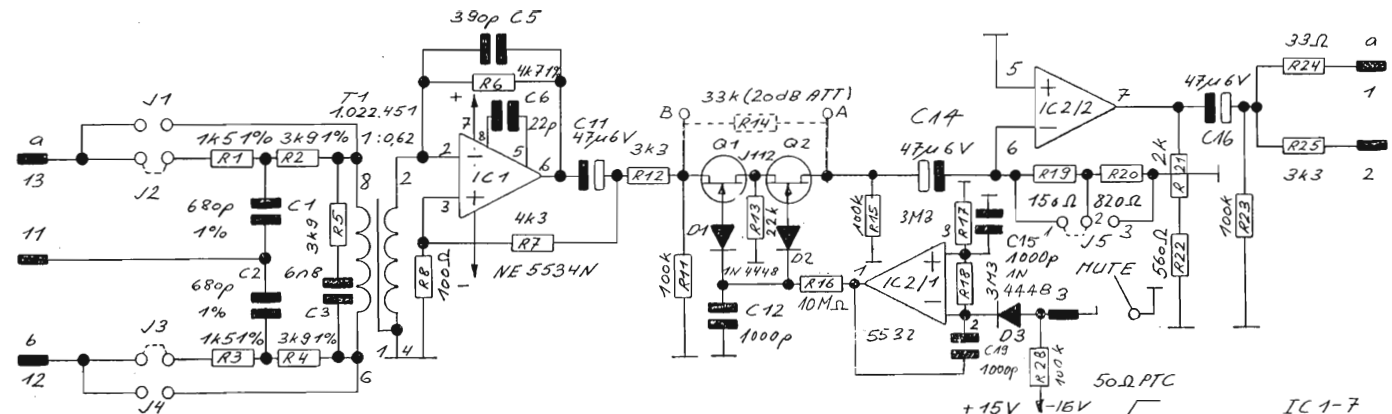
The amplifier may be used, for example, to work into a 600 Ω load, or into the input of a 0- Ω input amplifier of another summing circuit.

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

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

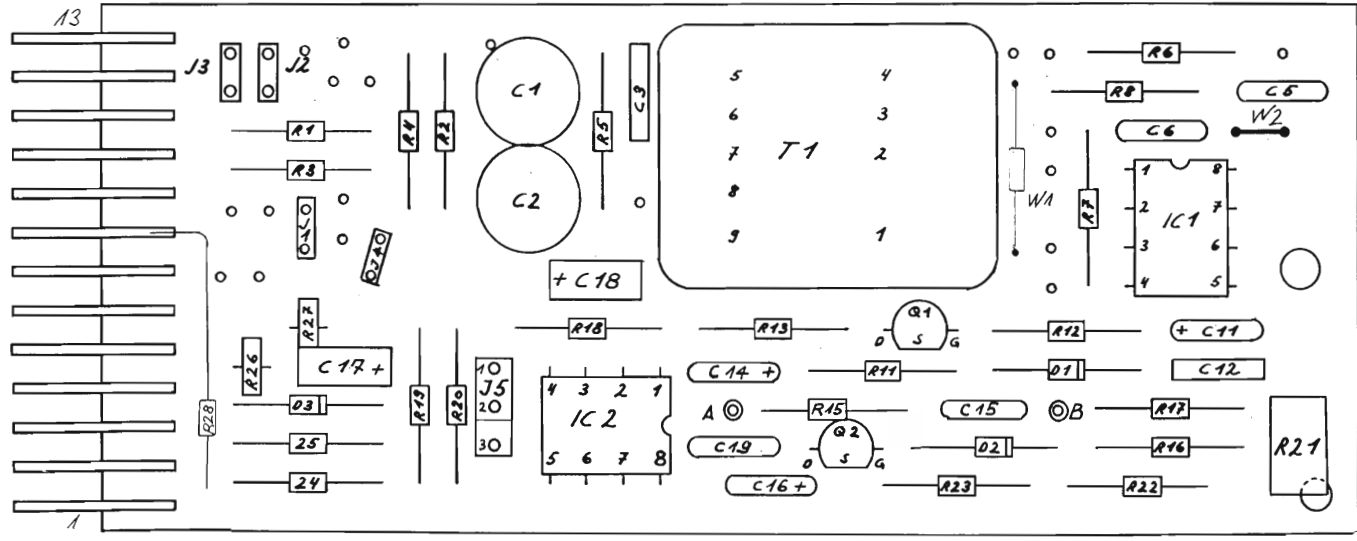
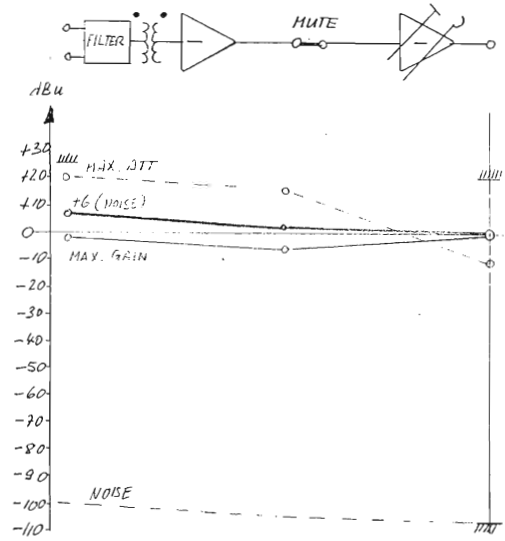
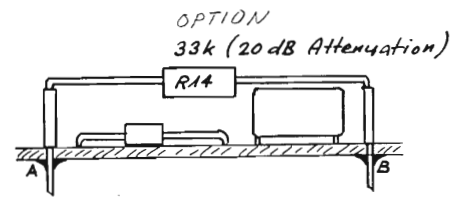
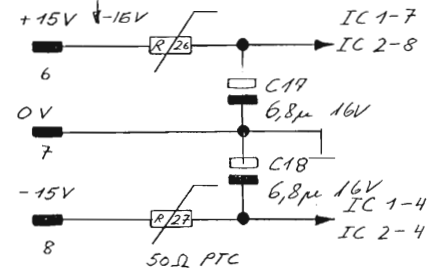


GAIN
Adjustable (see level diagram)
Max. gain $V_{max} = +1 \text{ dB}$
Max. attenuation $V_{min} = -30 \text{ dB}$

GENERAL
Frequency response 30Hz ... 16kHz $\pm 0,3 \text{ dB}$
THD amplifier 30Hz ... 16kHz $\text{THD} \leq -70 \text{ dB}$
Noise (B 23kHz), gain -6 dB $U_{NOISE} = -106 \text{ dBu}$

ATTENUATOR
Mute switch, with resistor programmable to a attenuator of 20 dB

SUPPLY
Supply voltage $U = \pm 15 \text{ V}$
Idle current $I = 11 \text{ mA}$



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	Schalt draht Cu					

End of List

Comments:

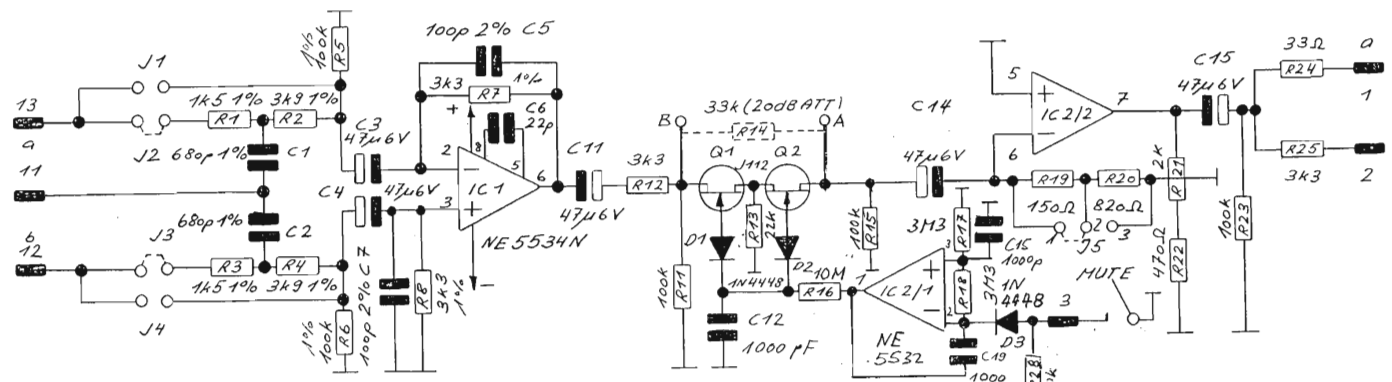
(01) W1, W2 added

STUDER
 HL INPUT AMP. BALANCED (WR4)
 1.914.504.81
 300
 PAGE 1 OF 1

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

INPUT
 Balanced, RF-filter
 Input impedance $R_i > 10 \text{ k}\Omega$
 0 Ω 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 Ω amp.) $R_{out} = 3 \text{ k}\Omega$

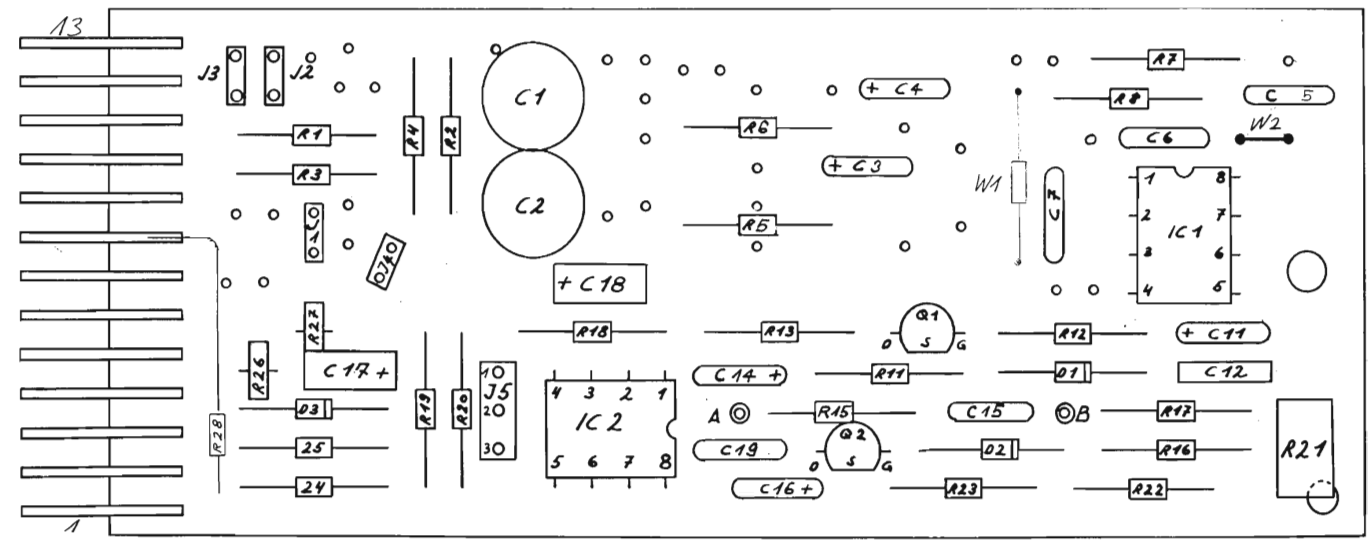
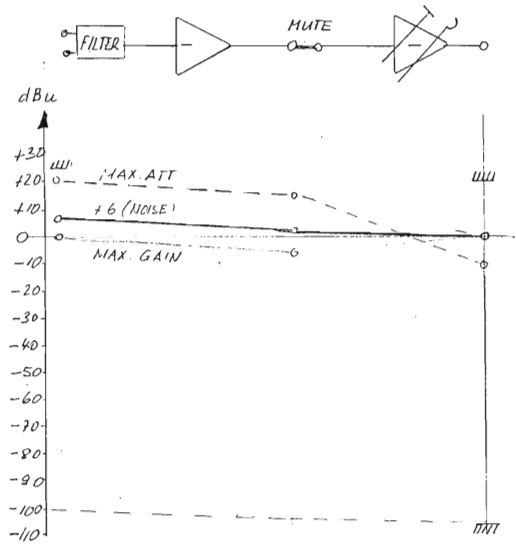
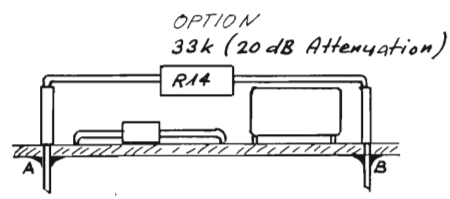
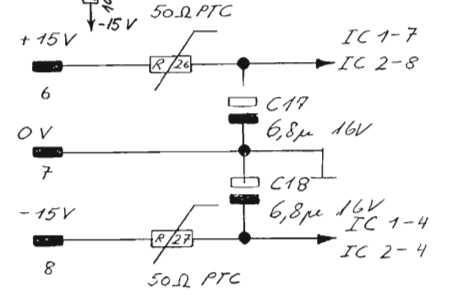


GAIN
 Adjustable (see level diagram)
 Max. gain $V_{max} = +1 \text{ dB}$
 Max. attenuation $V_{min} = -30 \text{ dB}$

GENERAL
 Frequency response 30Hz ... 16kHz $\pm 0,3 \text{ dB}$
 THD amplifier 30Hz ... 16kHz $\text{THD} < 80 \text{ dB}$
 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 $I = 11 \text{ mA}$



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	Schaltdraht Cu					

End of List

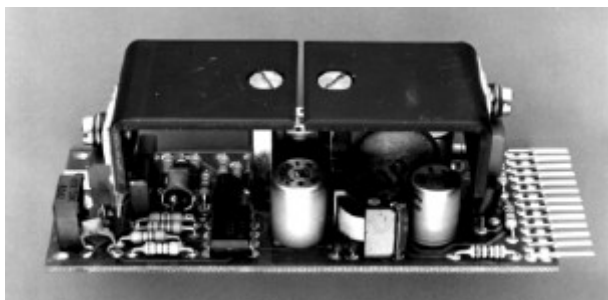
Comments:

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

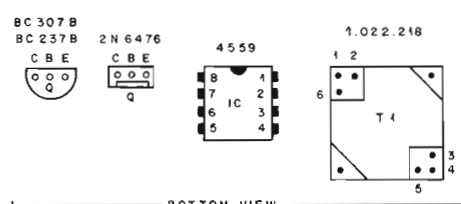
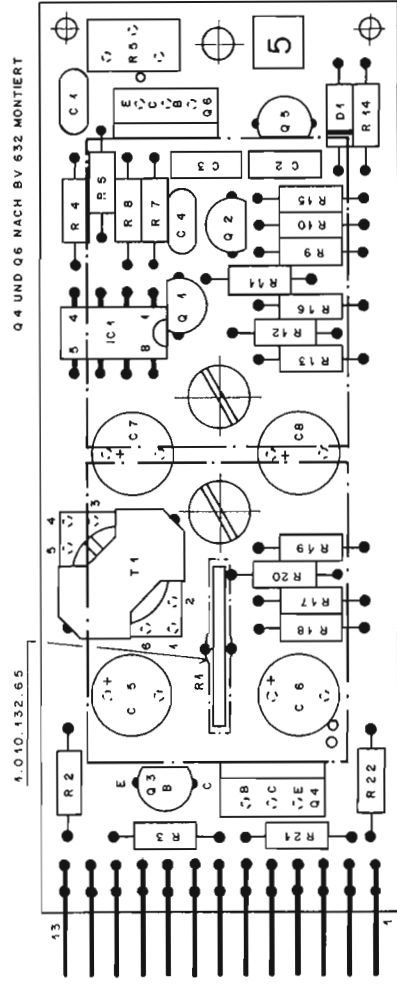
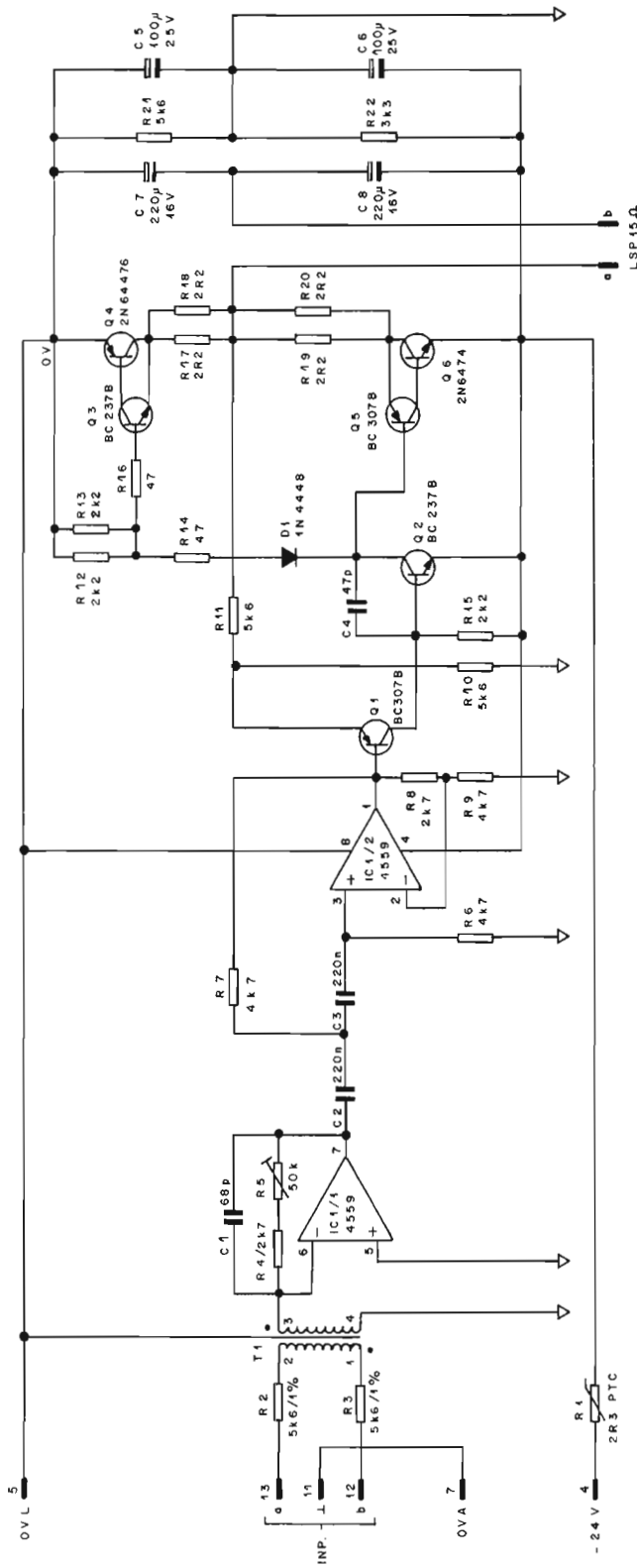
Supply: -24 V (40 mA idling, max. 220 mA fully driven)

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	24	27
INP b	12	2	8	22	28
(L)	11	3	9	23	29
	10				
(L)	9				
	8				
	7				
	6				
0V	5	19			
-24V	4	20			
OUT a	3	4	10	24	30
OUT b	2	5	11	25	31
	1				

13.9.94			
STUDER REGENDORF 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	2,3Ω	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

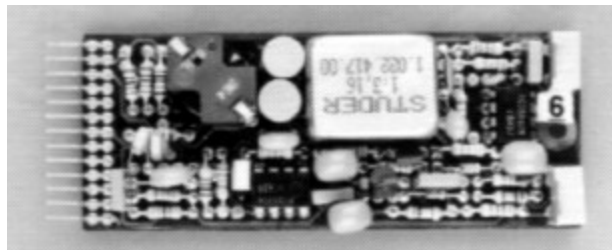
1.914.506/507

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.

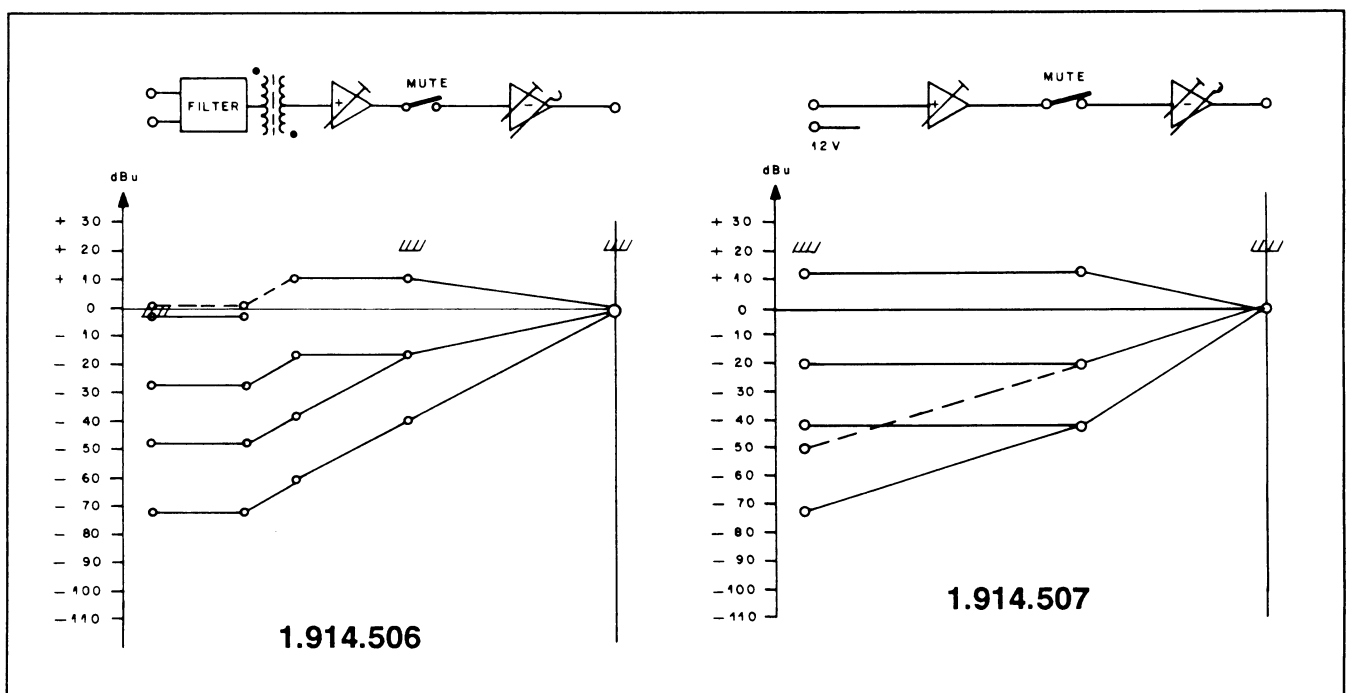
1.914.507 is designed for unbalanced electret microphones requiring a 12 V supply.

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.

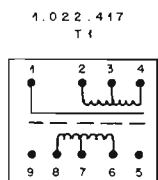
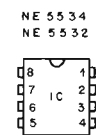
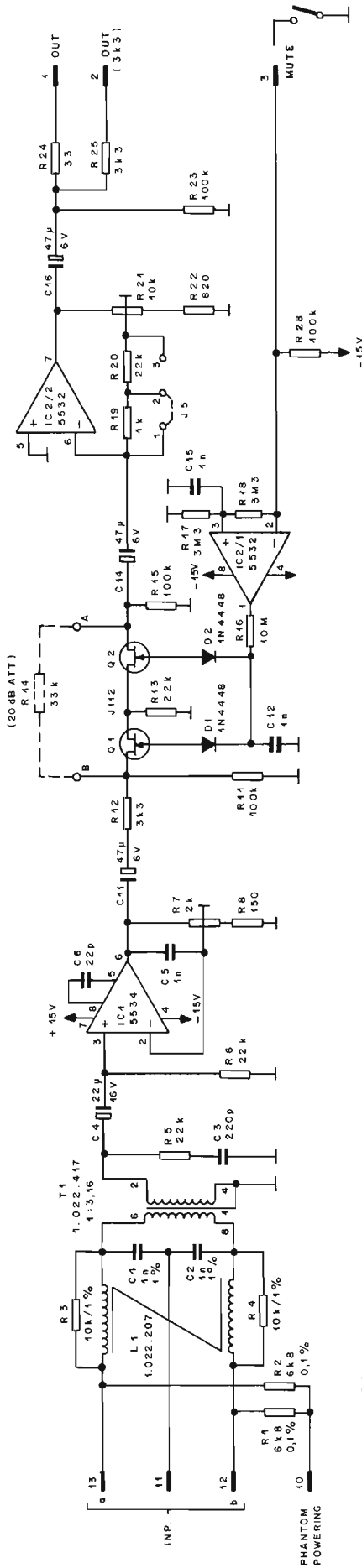
The amplifier's two outputs are unbalanced, with impedances of 3.3 kΩ or 33 Ω, respectively.



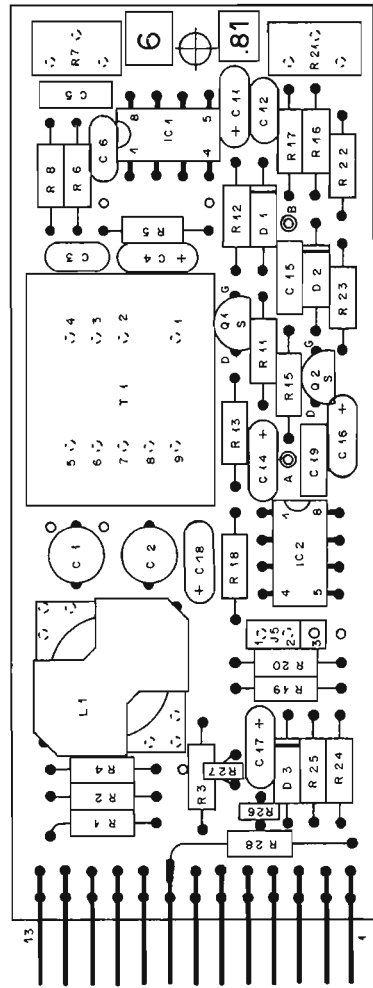
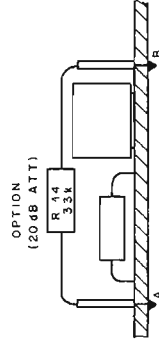
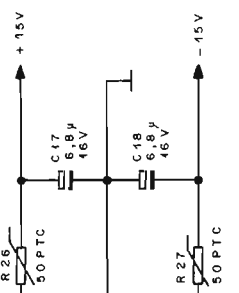
Technical Specifications

Input:	Transformer-balanced and floating, with RF filter	(1.914.506)
	Unbalanced, with RF filter and electret supply	(1.914.507)
Impedance	> 1 kW , for microphones with an impedance of 200 Ω or less.	
Max. input level	-2 dBu (615 mV _{rms}); THD at 30 Hz: approx. 1%	
Common mode rejection	> 60 dB , unbalanced, to ground	
Output:	Max. level	+20 dBu (7.75 V _{rms})
	Nominal level	0 dBu (0.775 V _{rms})
	Impedance	33 W (pin1)
		3.3 kW (pin2; to a 0- Ω amp.)
	Minimum load	600 W
	Max. gain	71 dB (see level diagram)
Frequency response	± 0.5 dB , 30 Hz...16 kHz	
THD	< 0.3% , 30 Hz...16 kHz at 20 dB gain	
Noise figure, linear	< 4.5 dB , input terminated with 200 Ω	
Supply:	± 15 V (11 mA idling)	
	+48 V (1.914.506, only if phantom powering required)	
Dimensions:	MS-card , 34 \times 85 mm	
Ordering Information:	<ul style="list-style-type: none">• Microphone pre-amplifier for dynamic microphones• Microphone pre-amplifier for electret microphones	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	1	7	24	27
IN b	12	2	8	22	28
IN L	11	3	9	23	29
PHANTOM	10	17	17	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	NE5534AN LOW NOISE OP AMP	SIG
IC.....2		50.09.0106	NE5532AN 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 (15)	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	TRAF0	ST

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

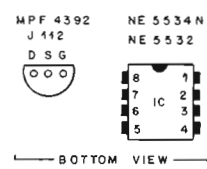
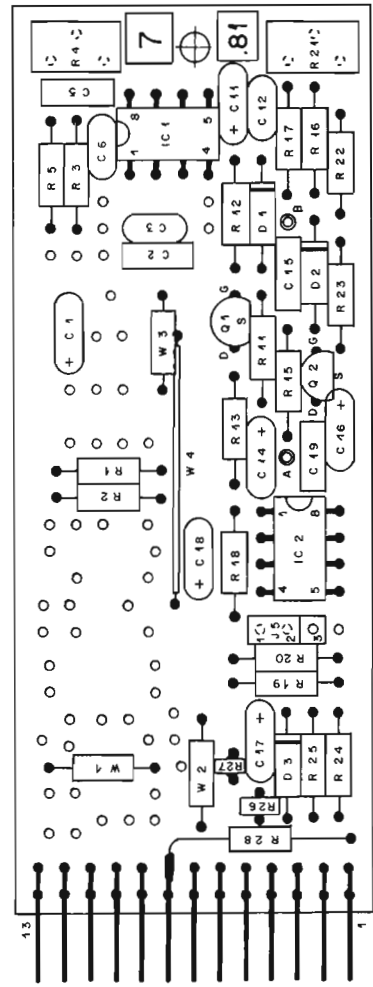
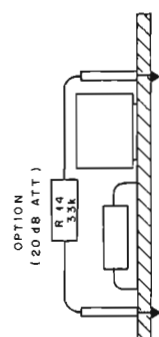
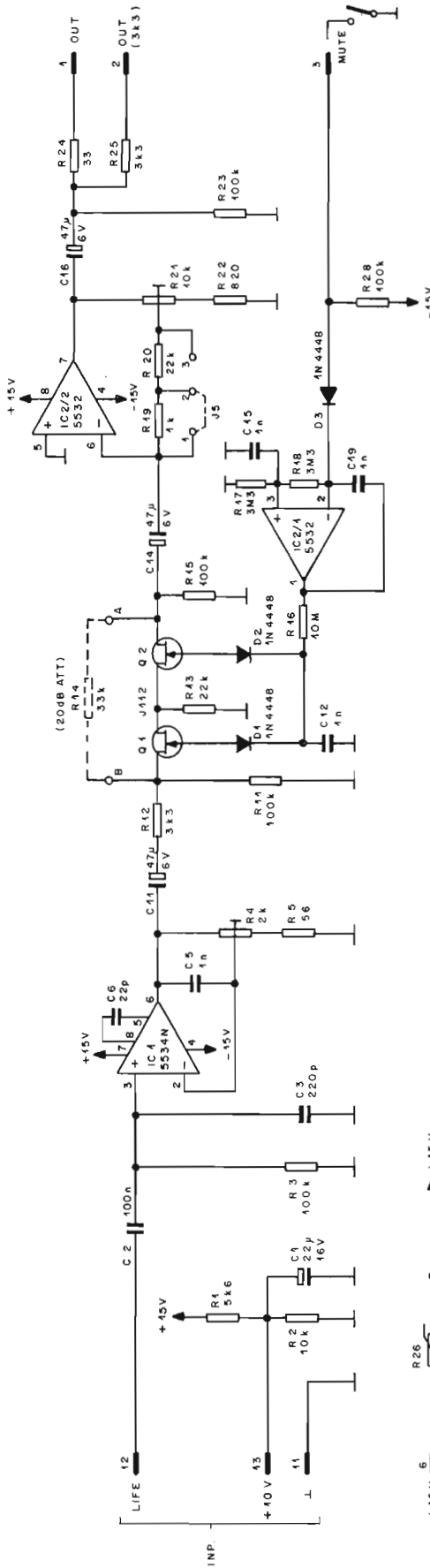
MANUFACTURER: ST=Studer, SIG=Signetics, PH=Philips

1.914.506.81 MIC. AMPLIFIER, FLOATING (Nr. 6)

FRI 19/04/85

END

→



CIS	PIN	EURO 32 PIN			
		(A)	(B)	(C)	(D)
+ 10 V	13	4	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			
+ 15 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 ZURICH	ELECTRET MIC. AMP. (NR. 7)	1.914.507.81
---------	---------------------------------------	---------------------------------------	---------------------

MICROPHONE PRE-AMP. MSC

Ad	POS.	REF.No.	DESCRIPTION	MANUFACTURER	
C	...	1	59.30.4220	22µF 16V TA	
C	...	2	59.06.5104	0,1µF 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	47µF 6,3V SAL	
C	...	12	59.32.4102	1000p CER	
C	...	13			
C	...	14	59.26.0470	47µF 6,3V SAL	
C	...	15	59.06.0102	1000pF PE	
C	...	16	59.26.0470	47µF 6,3V SAL	
C	...	17	59.26.2689	6,8µF 16V SAL	
C	...	18	59.26.2689	6,8µF 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	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	5,6kΩ	
R	...	2	57.11.4103	10kΩ	
R	...	3	57.11.4104	100kΩ	
R	...	4	58.01.9202	2kΩ POT	
R	...	5	57.11.4560	56kΩ	
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	820kΩ	
R	...	23	57.11.4104	100kΩ	
R	...	24	57.11.4330	33kΩ	
R	...	25	57.11.4332	3,3kΩ	
R	...	26	57.99.0206	50kΩ PTC	
R	...	27	57.99.0206	50kΩ PTC	
R	...	28	57.11.4104	100kΩ	
Ⓞ	W	...	1	57.11.4000	0Ω LINK
Ⓞ	W	...	2	57.11.4000	0Ω LINK
Ⓞ	W	...	3	57.11.4000	0Ω LINK
Ⓞ	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)

Ⓞ FRI 14/10/85

END

→