Interface

Service Manual

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CONTENTS

SAFETY REGULATIONS

When carrying out repair work on the appliance the safety regula tions in accordance with VDE 0860/ IEC 65 are to be noted and observed.

The specified air gaps and creeping distances on the primary windings are to be observed by all means:

1. The minimum distance between voltage carrying and metal parts (e.g. chassis) is 6 mm.

2. The minimum distance between the mains terminals is 3 mm.

In addition we would like to point our that because of their construction special components must only be replaced by original parts and no alterations to the wiring should be undertaken.

Furthermore the safety regulations of the professional associa tions concerning the handling of these appliances are to be observed at the workshop where repairs are carried out. Included here are the features of the place of work.

Knowledge of these regulations is a pre-requisite for proper servicing of these appliances.

Observe **MOS** components handling instructions when servicing!

SPECIFICATIONS INTERFACE

1. All **Specifications INTEFACE complete unit** are valid for frame configuration as follows:

   * 16 x Input Module 2802
   * 4 x Group Module 2808
   * 1 x Master Module 2810

2. All **Specifications INTEFACE complete unit** were determined with the frame configuration of point 1. The measured module replaces the according input or output module.

3. The **Nominal Output Level** of the mixing console is **+ 4 dBu**. All input sensitivities are related to this nominal output level.

   Nominal setting:

   - All Faders into position "0" (Zero)
   - Gain control "0" (Zero)
   - Panpot into centre position

3. The **Gain control marking '0'** means:

   * LINE: E(I) = + 4 dBu — MIX/GROUP OUT: E(O) = + 4 dBu

   at nominal setting.

4. All **Noise Voltages** were measured according to IEC 268 - 1 (RMS, unweighted, 22 Hz ... 22 kHz).

   The noise figures of the mixing console are to be assessed as follows:

   * **Residual Mix Bus Noise :** Noise level at any output with no input routet.

   * **Mix Bus Noise :** Noise level at any output with 16 inputs routet.

     Channel Fader closed.

   * **Typ. Mix Output Noise :** Noise level at any output with 16 inputs routet. All Faders to 0, Gain control to 0 and terminated with 50 ohms.

   * **Equivalent Input Noise** of one input channel:

     MIC : R(Q) = 150 ohms, Gain max.

     LINE : R(Q) = 50 ohms, Gain control into zero Position

     The measured noise voltage at the output is to be related to the input.

5. **Distortion (THD)**

* **THD + Noise** is measured with RMS weighting over a frequency range of 10 Hz ... 80 kHz.
* E(I) = + 16 dBu (at Line Input with Gain control into zero position)
* E(I) = - 14 dBu (at MIC Input with Gain = 30 dB)
* E(O) = + 16 dBu at output to be measured
* Mixing console in nominal position

6. **Frequency Response and EQ Plots**

* E(I) = + 0 dBu (at Line Input with Gain control into zero position)
* E(O) = + 0 dBu at output to be measured
* All measurements related to 0 dBu relative.

7. **Crosstalk and Muting**

* E(I) = + 16 dBu (at Line Input with Gain control in zero position)
* E(O) = + 16 dBu at output of the active signal path.
* The figures are in dB and are relative to + 16 dBu.
* All measurements are performed with 16 routed input channels if possible.
* Mixing console in nominal position

8. All measurements are performed with **load impedance of 100 kohms**

9. Common Mode Rejection Ratio **CMRR**

* MIC : Gain max., E(I) = - 50 dBu
  E(O) = at next possible output point
* LINE : Unity Gain, E(I) = + 16 dBu
  E(O) = at next possible output point

SPECIFICATIONS: Complete Unit INTERFACE

* 0 dBu = 0.775 V (RMS)
* Note enclosure: Measurement Conditions INTERFACE
* All specifications are valid for following frame constellation:

- 16 x Input Module 2802
- 4 x Group Module 2808
- 1 x Master Module 2810

Input and Output Levels

INPUT

MIC Input Sensitivity		:	- 2 dBu ... - 72 dBu
LINE Input Sensitivity		:	- 16 dBu ... + 14 dBu
Max. MIC Input Level	PAD OFF	:	+ 13 dBu
	PAD ON	:	+ 33 dBu
Max. LINE Input Level		:	+ 28 dBu Max.
DIRECT OUT Level		:	+ 22 dBu
DIRECT OUT Nominal Level		:	- 2 dBu
INSERT Nominal Level		:	- 2 dBu

GROUP

GROUP OUT Nominal Level	:	- 10 dBV / + 4 dBu
Max. GROUP OUT Level	:	+ 25 dBu
GROUP INSERT Nominal Level	:	- 2 dBu
Max. RETURN A/B Level	:	+ 27 dBu
RETURN A/B Nominal Level	:	- 10 dBV / + 4 dBu

MASTER

MIX OUT Nominal Level	:	- 10 dBV / + 4 dBu
Max. MIX OUT Level	:	+ 27 dBu
Max. AUX SEND Level	:	+ 22 dBu
AUX SEND Nominal Level	:	+ 4 dBu
MIX INSERT Nominal Level	:	- 2 dBu
Max. SPEAKER OUT Level	:	+ 22 dBu
SPEAKER OUT Nominal Level	:	+ 4 dBu
Max. TAPE/RET. Level	:	+ 27 dBu
TAPE/RET. Nominal Level	:	- 10 dBV / + 4 dBu
Max. HEADPHONES Level		
R(L) = 2 X 600 ohms	:	+ 20 dBu

General Specifications

Internal operating Level	:	- 2 dBu
Max. INSERT SEND Level	:	+ 20 dBu
INSERT SEND Nominal Level	:	- 2 dBu
Max. Oscillator Level on GROUP / MASTER OUT	:	+ 17 dBu

Input and Output Impedances

MIC INPUT, electr. balanced (Transformer can be retrofitted)	:	> 1.6 kohms
LINE INPUT, electr. balanced	:	> 10 kohms
INSERT SEND	:	75 ohms
INSERT RETURN	:	10 kohms
GROUP OUT	:	75 ohms
MIX OUT (Transformer as option)	:	75 ohms
AUX SEND (Transformer as option)	:	75 ohms
DIRECT OUT (Transformer as option)	:	75 ohms

Distortion (THD)

* E(O) = 20 dBu at measured output, (RMS)
* Test Bandwidth: f = 10 Hz ... 80 kHz

		f = 1 kHz	f = 10 kHz
GROUP OUT	:	0.002 %	0.007 %
MIX OUT	:	0.002 %	0.002 %
AUX SEND	:	0.008 %	0.06 %
INPUT –> MIX OUT	:	0.005 %	0.02 %
INPUT –> GROUP OUT	:	0.005 %	0.02 %
INPUT –> DIRECT OUT	:	0.002 %	0.01 %
Oscillator –> GROUP OUT (+16 dBu)	:	0.7 %	——

Crosstalk and Muting

* Test frequency:		f = 1 kHz	f = 10 kHz
Max. Fader Attenuation (OFF)	:	> 100 dB	> 90 dB
Muting "ON" Switch	:	> 95 dB	> 75 dB
Muting "Routing" Switch (CHANNEL –> GROUP)	:	> 80 dB	> 75 dB
Panpot Isolation (L/R)	:	> 70 dB	> 65 dB

(Channel –> Group)			
AUX SEND Fader Attenuation	:	> 90 dB	> 90 dB
CMRR MIC (max. Gain)	:	> 80 dB	
CMRR LINE (Unity Gain)	:	> 45 dB	

Noise Voltages

* Test Bandwidth: f = 22 Hz ... 22 kHz
* Noise Voltage according IEC 268-1, RMS

EIN: MIC INPUT, R(Q) = 150 ohms (Gain max.)	:	<- 127.5 dBu
EIN: LINE INPUT, R(Q) = 50 ohms (Gain max.)	:	<- 92 dBu
MIX Bus Noise	:	<- 79 dBu
Typ. Mix Output Noise	:	<- 75.5 dBu
AUX Bus Noise	:	<- 75 dBu

Frequency Response

INPUT –> any Output	:	20 Hz...20 kHz +0dB/-0.5dB

Metering

* 20 Segment LED Bargraph

Reading selectable	:	Peak	Average
Rise Time to 0 dBu	:	1 ms	150 ms
Release Time to -20 dBu	:	2 s	250 ms
Rel. Accuracy related to 0 dB	:	+/- 0.5 dB	
Calibration Range (0 dB)	:	E(O) = - 1 dBu to + 12 dBu	
Factory Preset	:	E(O) = + 4 dBu – "0" dB	
Weight	:	31 kg	

SPECIFICATIONS: Complete Unit INTERFACE

General measuring conditions if not noted elsewhere otherwise:

* All specifications are valid for following frame constellation:

- 16 x Input Module 2802
- 4 x Group Module 2808
- 1 x Master Module 2810

* Measuring Tolerance	:	**/\X = ± 1.5 dB**
* Measuring Frequency	:	**f = 1 kHz**
* All Levels related to	:	**E = 775 mV (0dBu)**
* Gain Control in position 0dB (LINE)	:	**Unity Gain**
* EQ Controls in centre Position		
* Pan pot in centre Position		
* All Faders in Position 0 (Zero)		
* Pin Assignment of XLR socket	:	PIN 1 = GND PIN 2 = + SIGNAL PIN 3 = - SIGNAL
* Pin Assignment INSERT Jack	:	TIP = SEND RING = RETURN SLEEVE = GND
* Pin Assignment Jacks	:	TIP = + SIGNAL RING = - SIGNAL SLEEVE = GND
* Source Impedance with feed in via INSERT RETURN and LINE	:	R(Q) = 50 ohms
* Source Impedance with feed in via MIC XLR socket	:	R(Q) = 150 ohms

1. Operating Voltage (selectable)

with Power Supply 2835 : 240/230/220/120/100/90 V

2. Weight

- Mixing Desk complete (16/4/2) : 31 kg
- Power Supply PSI 2835 : 7 kg / 7.8 kg

3. Power Consumption

3.1. Rated Power Consumption : P(rat.) = 110 W

3.2. Max. Power Consumption : P(max.) = 115 W

Note: Tolerance here ± 10 %

4.1. Input and Output Voltages

* Mixing Desk encoded to + 4 dBu
* Measurement via MIC INPUT: Gain max.

Input	E(I)	Test Point	E(O)	Note
MIC	- 60 dBu	MIX - OUT L/R	+ 16 dBu	
INSERT RET.	- 2 dBu	MIX - OUT L/R	+ 4 dBu	
RET. A/B	+ 4 dBu	MIX - OUT L/R	+ 14 dBu	ON, RET.LEV
TAPE RET.	+ 4 dBu	SPEAKER L/R	+ 4 dBu	2TRK, MONIT.LEV.
LINE	+ 4 dBu	MIX - OUT L/R	+ 4 dBu	
LINE	+ 4 dBu	MONO OUT	+8.5 dBu	MONO LEVEL
LINE	+ 4 dBu	GROUP 1-4 OUT	+ 4 dBu	
LINE	+ 4 dBu	SPEAKER L/R	+ 4 dBu	MONIT.LEV.
LINE	+ 4 dBu	AUX 1-2 SEND	+ 14 dBu	AUX1-2 fully open
LINE	+ 4 dBu	AUX 3-6 SEND	+ 14 dBu	AUX3-4 fully open,5-6
LINE	+ 4 dBu	DIRECT OUT	- 2 dBu	
LINE	+ 4 dBu	INSERT SEND	- 2 dBu	
LINE	+ 4 dBu	HEADPHONES L/R	+ 12 dBu	R(L)=2x200 ohms

4.2. Oscillator and Talkback

* For Measurement with Oscillator: OSCILLATOR ON, turn on OSCILLATOR LEVEL so that MIX OUT E(O)= + 4 dBu

Input	E(I)	Test Point	E(O)	Note
OSCILLATOR	—	GROUP OUT	+ 4 dBu	
OSCILLATOR	—	AUX 1-6	+ 7.3 dBu	AUX 1-6
OSCILLATOR	—	MONO OUT	+ 8.5 dBu	MONO LEV.
TALKBACK	-42 dBu	MIX OUT L/R	+ 4 dBu	ALL,TB GAIN,

5. Distortion (THD)

* Input : LINE
* measured with AUDIO PRECISION SYSTEM ONE, R(L) = 100 kohms

5.1. Measured at MIX - OUT L/R / GROUP OUT

* E(I) = + 16 dBu , E(O) = + 16 dBu

f = 1 kHz : k = 0.005 %

f = 10kHz : k = 0.02 %

5.2. Measured at AUX SEND 1-6

* E(I) = + 10 dBu , E(O) = + 20 dBu

f = 1 kHz : k = 0.008 %

f = 10kHz : k = 0.06 %

6. Noise Voltages

- measured at MIX - OUT L/R or AUX SEND 1-6
- measured with AUDIO PRECISION SYSTEM ONE
- E(F) = Noise voltage, RMS, 22 Hz ... 22 kHz
- E(G) = Noise voltage, frequ.weighted acc. CCIR 468, Q-PEAK

		E(F)	E(G)
6.1.	MIC INPUT (max.Gain,Fader +10dB,R(Q)=150 ohms)	< 6.5 mV	< 21.5 mV
	–> EIN = -127.6 dBu (RMS)		
6.2.	LINE INPUT (max Gain,Fader +10dB,R(Q)=50 ohms)	< 600 uV	< 2.2 mV
	–> EIN = -92.1 dBu (RMS)		
6.3.	Mix Bus Noise (16 Channels rout., Fad.closed)	< 80 uV	< 270 uV
	–> NOISE = -79.7 dBu (RMS)		
6.4.	Mix Output Noise typ.(16Channels rout.,Fad.0dB)	< 130 uV	< 450 uV
	–> NOISE = -75.5 dBu		
6.5.	AUX Bus Noise (AUX in Master opened)	< 135 uV	< 470 uV
	–> NOISE = -75.1 dBu		
6.6.	GROUP Bus Noise (16 Chan.routed,Fad.closed)	< 70 u V	< 240 u V
	–> NOISE = -80.8 dBu		

7. Phantom Power Supply

If switch + 48 V is ON, the voltage between PIN 2 and PIN 1 or PIN 3 and PIN 1 of the XLR socket must be E(DC) = + 48 V.

8. Frequency response

8.1. LINE INPUT –> any output : 20 Hz...20 kHz +0dB/-0.5dB

8.2. MIC INPUT (Gain< dB) –> any outp. : 20 Hz...20 kHz +0dB/-0.5dB

8.3. Frequency response plots —> see Specifications Modules

9. Factory Preset

* Code jumpers inputs/outputs to + **4 dBu**
* Code jumper meter to **PEAK**
* MIC TALKBACK not encoded to **+48 V**

INTERFACE

INPUT MODULE 2802

SPECIFICATIONS: INPUT Module 2802

* 0 dBu = 0.775 V (RMS)
* Note enclosure: Measurement conditions

MICROPHONE INPUT

* Electronically balanced.
* Transformer can be retrofitted.

Input Impedance	:	> 1.6 kohms
Input Sensitivity Range at Output Level +4 dBu	:	- 2 dBu ... - 72 dBu
Input Sensitivity Range with PAD ON at Output Level +4 dBu	:	+ 22 dBu ... - 52 dBu
Max. Input Level PAD OFF / PAD ON	:	+ 13 dBu / 33 dBu
Common Mode Rejection Ratio (CMRR) with max. Gain, f = 1kHz	:	> 80 dB
Equivalent Input Noise R(Q) = 150 ohms, 22 Hz ... 22 kHz, with max. Gain	:	- 127.5 dBu

LINE INPUT

* Electronically balanced.

Input Impedance	:	> 10 kohms
Input Sensitivity Range at Output Level +4 dBu	:	- 16 dBu ... + 14 dBu
Max. Input Level	:	+ 28 dBu
Common Mode Rejection Ratio (CMRR) with max. Gain, f = 1kHz	:	> 45 dB
Equivalent Input Noise R(Q) = 50 ohms, 22 Hz ... 22 kHz, Unity Gain	:	- 92 dBu

GENERAL SPECIFICATIONS

INSERT RETURN (input impedance)	:	10 kohms	
INSERT SEND (nominal level)	:	- 2 dBu, unbalanced	
INSERT SEND (max. output level)	:	+ 20 dBu	
DIRECT OUT (nominal level)	:	- 2 dBu	
DIRECT OUT (max. output level)	:	+ 22 dBu	
		f = 1 kHz	**f = 10 kHz**
Channel Muting "ON" switch	:	> 95 dB	> 75 dB
Fader Rejection (OFF)	:	> 100 dB	> 90 dB
Panpot Isolation (L/R)	:	> 70 dB	> 65 dB

Muting "Routing" Switch	:	> 80 dB	> 75 dB
MAX. AUX SEND Attenuation	:	> 90 dB	> 90 dB
THD (LINE – DIRECT OUT) (Gain 0 dB)	:	0.002 %	0.01 %
THD (MIC – DIRECT OUT) (Gain 30 dB)	:	0.004 %	0.02 %
Weight	:	690 g	

FREQUENCY RESPONSE EQ

Boost/Cut : +/- 15 dB

Filter Frequencies : HF 12 kHz (shelving)

HMF 470 Hz ... 15 kHz
(peaking with Q = 1.3)

LMF 70 Hz ... 2.2 kHz
(peaking with Q = 1.3)

LF 50 Hz (shelving with
VLF rolloff at 25 Hz)

HIGHPASS FILTER -3 dB at
80 Hz, 2. order

SPECIFICATIONS: INPUT Module 2802

General measuring conditions if not noted elsewhere otherwise:

* Module not plugged into the ribbon cable. Operating voltage supplied externally.

* Measuring Tolerance	:	**ΔX = ± 1.5 dB**
* Measuring Frequency	:	**f = 1 kHz**
* All Levels related to	:	**E = 775 mV (0dBu)**
* Gain Control fully counterclockwise		
* EQ Controls into centre Position		
* Panpot into centre Position		
* Pin Assignment of XLR Socket	:	PIN 1 = GND PIN 2 = + INPUT PIN 3 = - INPUT
* Pin Assignment INSERT Jack	:	TIP = SEND RING = RETURN SLEEVE = GND
* Pin Assignment LINE Jack	:	TIP = + SIGNAL RING = - SIGNAL SLEEVE = GND

* Pin Assignment DIRECT OUT Jack	:	TIP = + SIGNAL RING = GND SLEEVE = GND
* Source Impedance with feed in via LINE, INSERT RETURN	:	R(Q) = 50 ohms
* Source Impedance with feed in via XLR socket	:	R(Q) = 150 ohms
* Load Impedance	:	R(L) = 100 kohms
1. Operating Voltage	:	**E(B) = +/- 17 V**
2. Current Input (max.)	:	**I(B) = 60 mA**

3. Input and Output Voltages

* The controls and switches listed under notes must be opened full or must be pushed.
* J are the jumpers on the PCB which must be plugged in for the specified measurement.
* Outputs terminated with R(L) = 100 kohms.
* All switches and controls not mentioned in position OFF.

Input	E(I)	Testpoint	E(O)	Note
MIC	+10 dBu	INSERT SEND	+10 dBu	
MIC	+10 dBu	INSERT SEND	-11 dBu	PAD ON
LINE	+10 dBu	INSERT SEND	- 6 dBu	LINE ON
LINE	+10 dBu	INSERT SEND	- 6 dBu	LINE ON,HPF ON, PHASE ON,EQ ON
LINE	+10 dBu	CN2.27	- 6 dBu	LINE ON, AUX3, J2 SEL.
LINE	+10 dBu	CN2.29	- 6 dBu	LINE ON, PRE ON, J 1=PREEQ, AUX2
INS.RET.	+10 dBu	DIRECT OUT	+20 dBu	ON,CHAN.FAD.open
INS.RET	+10 dBu	DIRECT OUT	+20 dBu	AUX1,DIR ON
INS.RET.	+10 dBu	CN2.4	+19 dBu	PFL ON, J5=AFL, ON, CHAN.FAD.opened
INS.RET.	+10 dBu	CN2.4	+ 9 dBu	PFL ON, J5=PFL
----------		CN2.2	-10 V(DC)	PFL ON, R(L) = 100k Channel without signal
INS.RET.	+10 dBu	CN2.17/.19	+19 dBu	MIX ON R/L
INS.RET.	+10 dBu	CN2.13/.15	+19 dBu	1-2 ON
INS.RET.	+10 dBu	CN2.9 /.11	+19 dBu	3-4 ON
INS.RET	+10 dBu	CN2.27	+ 9 dBu	AUX3,J4
INS.RET	+10 dBu	CN2.29	+ 9 dBu	AUX2,PRE ON,J1=PREFAD.
INS.RET	+10 dBu	CN2.31	+19 dBu	AUX1,ON,CHAN.FAD.open
INS.RET	+10 dBu	CN2.27	+19 dBu	AUX3,J3
INS.RET	+10 dBu	CN2.25	+19 dBu	AUX4,J3
INS.RET	+10 dBu	CN2.23	+19 dBu	AUX3,J3, 5-6 ON
INS.RET	+10 dBu	CN2.21	+19 dBu	AUX4,J3, 5-6 ON

4. Metering

* Feed in signal via LINE.
* Measured at INSERT SEND.
* Note: Tolerance here +/- 1 dB

E(O) INSERT SEND	LED VALUE
- 13 dBu	- 13 dB
- 7 dBu	- 7 dB
0 dBu	0 dB
+ 10 dBu	+ 10 dB
+ 17 dBu	+ 17 dB

5. Gain Control Range

Input	E(I)	Test point	E(O)	Note
LINE	+ 4 dBu	INSERT SEND	-11.5 dBu	GAIN min.,LINE ON
LINE	+ 4 dBu	INSERT SEND	+18.5 dBu	GAIN max.,LINE ON
MIC	- 2 dBu	INSERT SEND	- 2.5 dBu	GAIN min.
MIC	-60 dBu	INSERT SEND	+ 10 dBu	GAIN max., Tol.+/-2dB

6. Common Mode Rejection Ratio

* E(O) = INSERT SEND
* R(Q) = 150 ohms, gain control fully opened
* Perform measurement with bandpass 1 kHz.

* Measurement 1:

PIN1 and PIN3 of XLR socket to ground.

Feed in a signal with - 55 dBu to PIN2 ==> E(O1).

* Measurement 2:

Disconnect PIN3 from ground and connect with PIN 2.

Feed in a signal with - 55 dBu to PIN2/3 ==> E(O2).

$$CMRR = |20\ LG\ (\ E(O1)/E(O2)\ )|$$

CMRR: **> 80dB**

7. Noise Voltages

- measured at CN2.17/19
- measured with AUDIO PRECISION SYSTEM ONE
- MIC : R(Q) = 150 ohms
- LINE: R(Q) = 50 ohms
- R(L) = 100 kohms
- E(F) = Noise voltage, RMS, 22 Hz ... 22 kHz
- Gain fully opened

* Measurement **equivalent input noise EIN** :

1. Determine gain from input to output —> V
2. Measure noise voltage E(F)
3. N = 20 * LG (E(F)/0.775V)
4. EIN = N - V

7.1. MIC

7.1.1. Fader closed:	**E(F)**	**≤ 10 uV**
7.1.2. Fader opened:	**EIN**	**≤ - 128 dBu**

7.2. LINE

7.2.1. Fader closed:	**E(F)**	**≤ 10 uV**
7.2.2. Fader opened:	**EIN**	**≤ - 93 dBu**

8. Distortion (THD)

- measured at CN2.17/19
- measured with AUDIO PRECISION SYSTEM ONE
- R(L) = 100 kohms
- CHAN.FADER fully opened
- Adjust gain control accordingly

Input	**E(I)**	**Test point**	**E(O)**	**Distortion**	
				f=1kHz	**f=10kHz**
LINE	+10 dBu	CN2.17/.19	+16 dBu	0.003 %	0.02 %
MIC	-14 dBu	CN2.17/.19	+16 dBu	0.003 %	0.02 %

9. Phase Relationship

- Feed in E(I) to LINE input
- Measure E(O) at DIRECT OUT
- Phase switch OFF: Input and output are in phase.
- Phase switch ON : Input and output are out of phase.

10. Panpot Isolation

- Drive channel nearly to PEAK level.
- measure at CN2.17 or CN2.19

10.1.	**Panpot isolation L/R**	:	**> 65 dB**
10.2.	**Panpot boost in centre position – L or R**	:	**Δ L = 4.5 dB**
	Note: Tolerance here +/- 0.5 dB		

11. Phantom Power Supply

If switch +48 V is pressed, the voltage between PIN 2 and PIN 1 or PIN 3 and PIN 1 of the XLR socket must be E(DC) = + 48 V.

12. Frequency Response

- Feed in E(I) to LINE input, measure E(O) at DIRECT OUT
- All not mentioned switches OFF

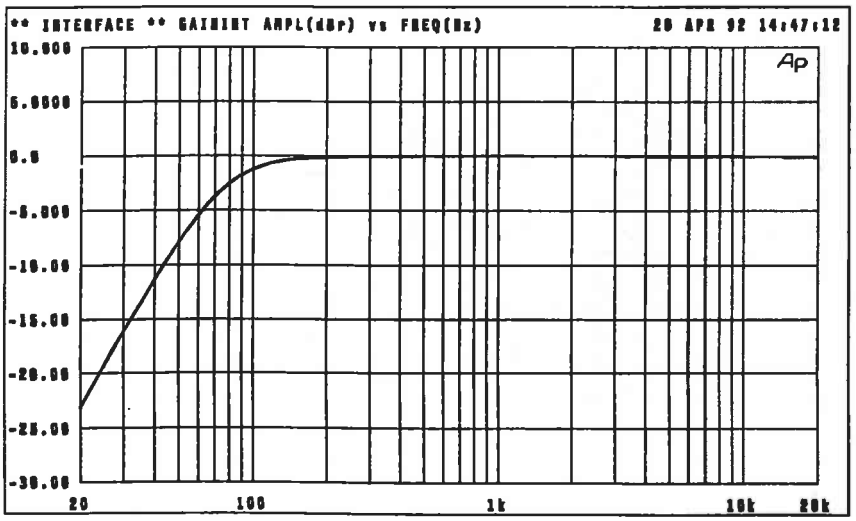
A : Cut-off frequency (- 3dB)

- Gain fully opened

MIC	–>	DIRECT OUT	: **fl(-3dB) = 18 Hz**	**fu(-3dB) = 140 kHz**
LINE	–>	DIRECT OUT	: **fl(-3dB) = <10Hz**	**fu(-3dB) = 57 kHz**
LINE	–>	I6 PIN1/7	: **fl(-3dB) = <10 Hz**	**fu(-3dB) = 57 kHz**

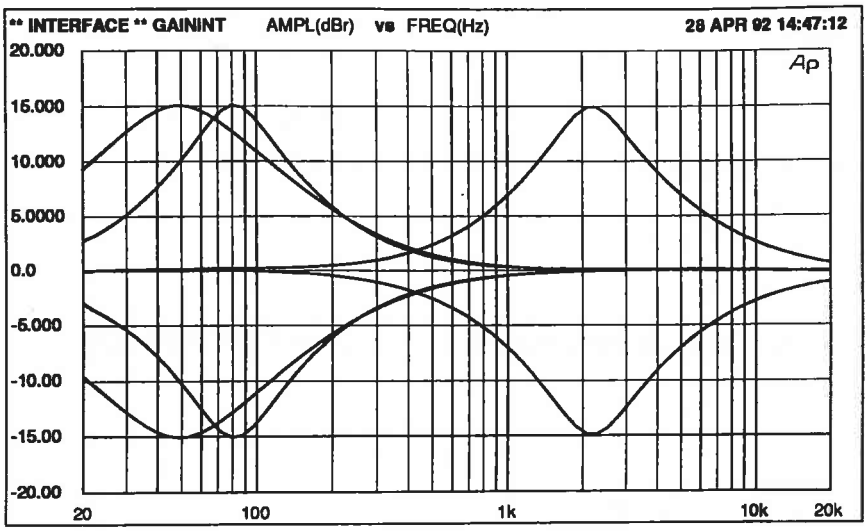
B : HPF MODULE 2802 (high-pass filter 80 Hz)

- LINE ON and HPF ON



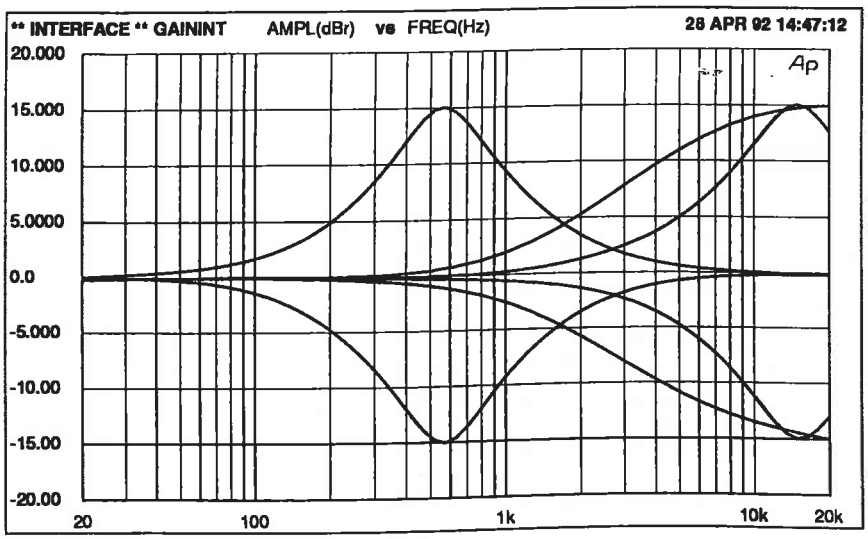
C : EQ MODULE 2802 (LO Section)

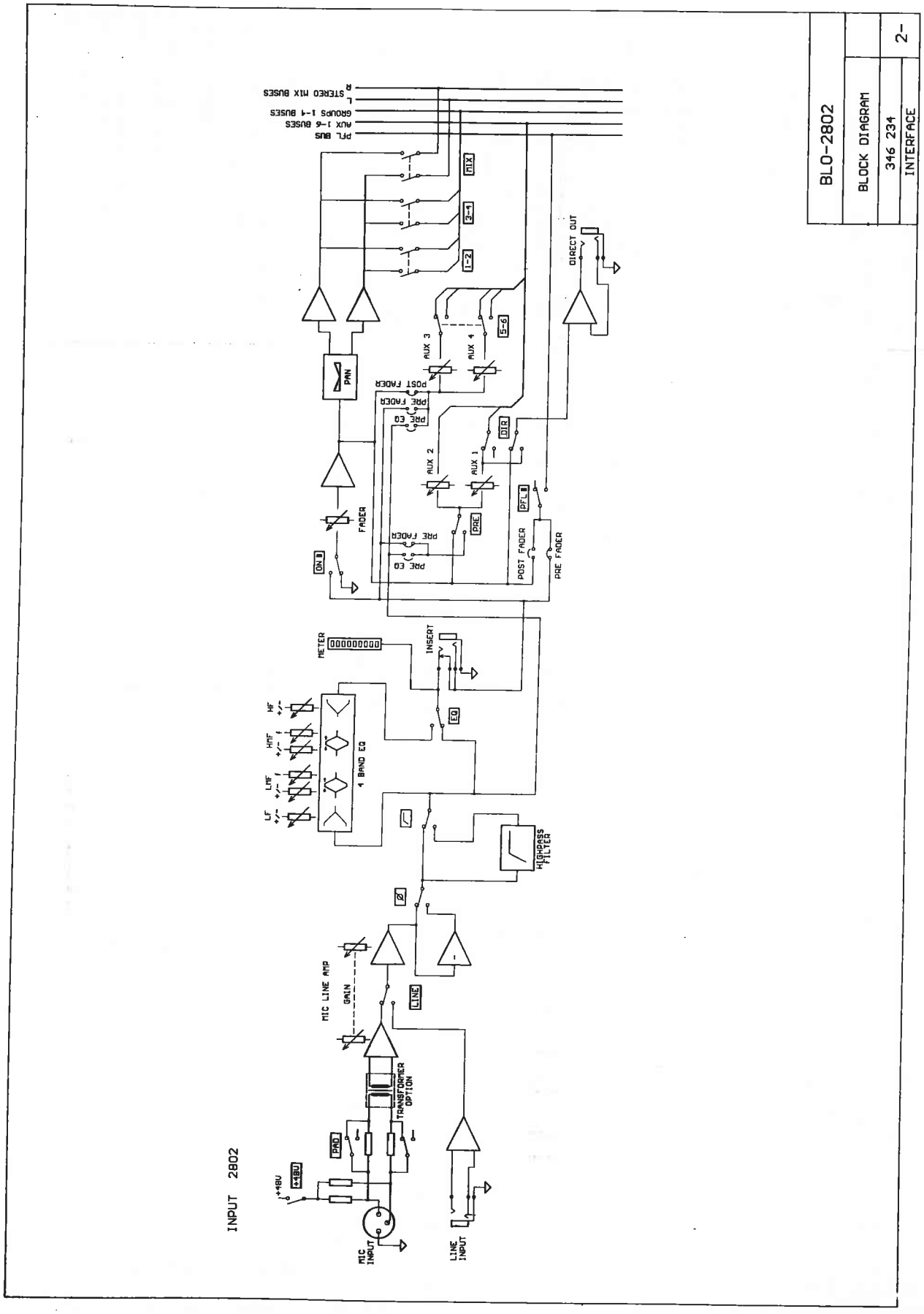
LINE ON and EQ ON

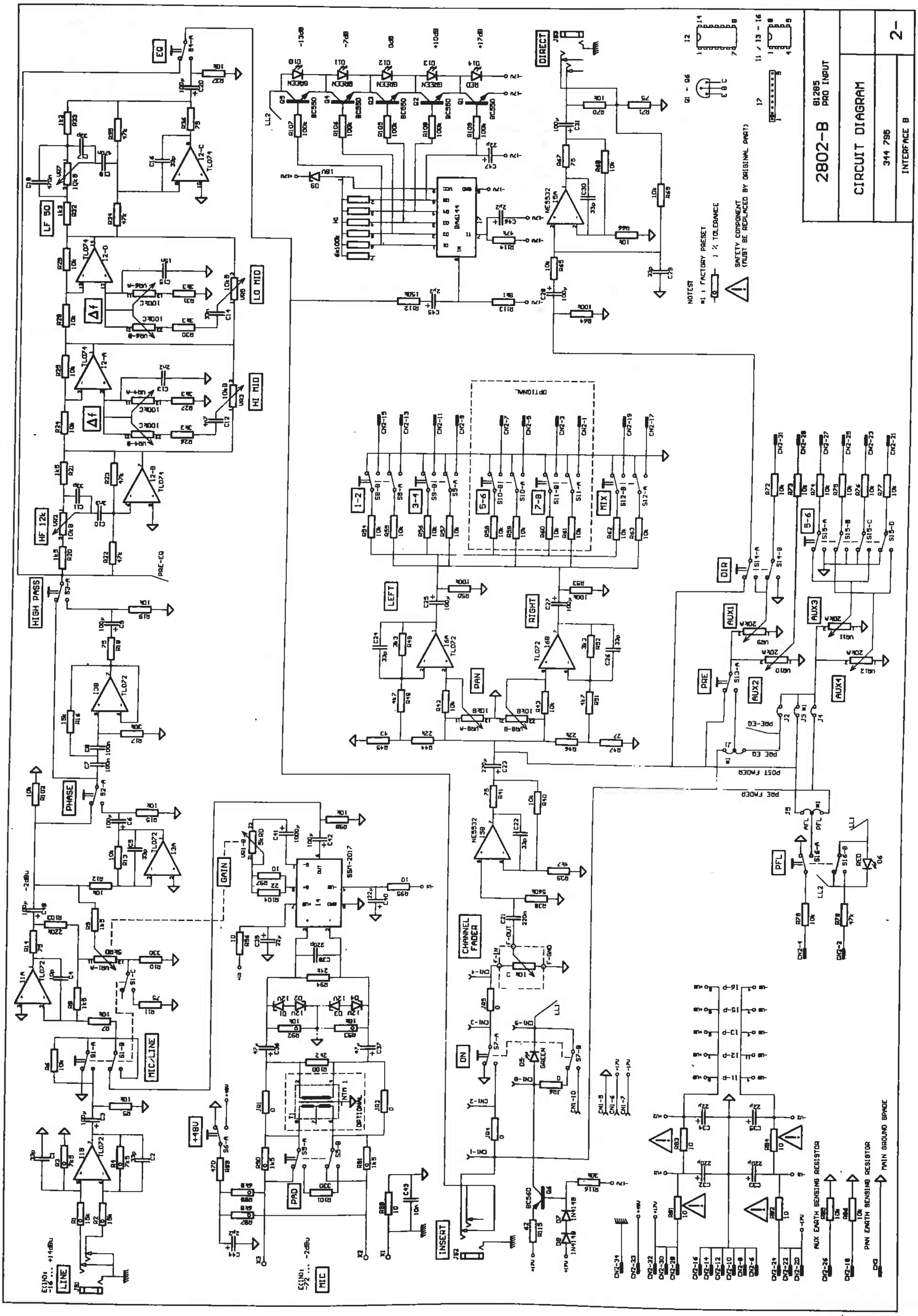


D : EQ MODULE 2802 (HI Section)

LINE ON und EQ ON

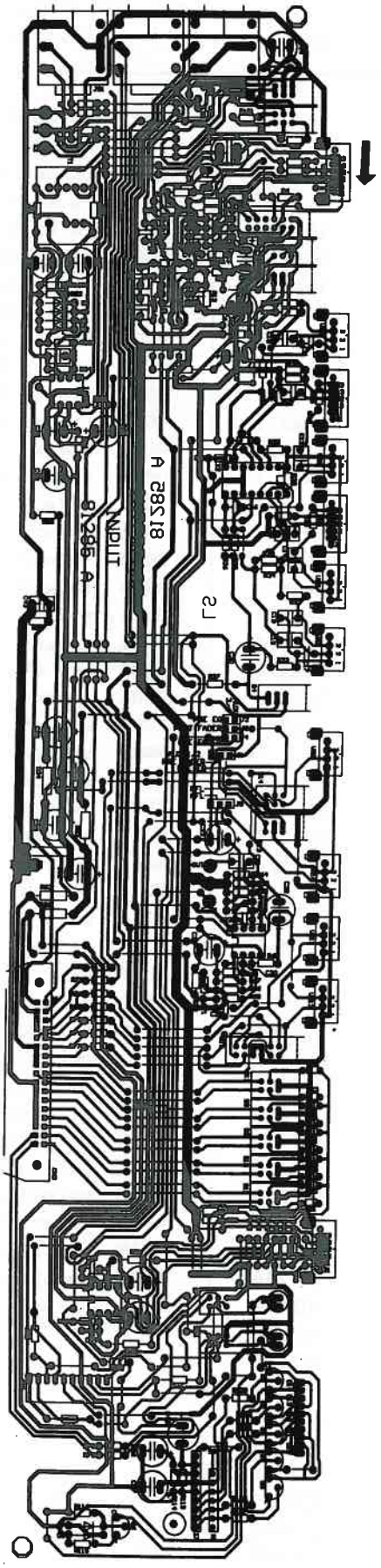



BLO-2802
BLOCK DIAGRAM
346 234
INTERFACE
2-
INPUT 2802
PFL BUS
AUX 1-6 BUSES
GROUPS 1-4 BUSES
STEREO MIX BUSES
L
R
MIX
3-4
1-2
5-6
DIRECT OUT
AUX 3
AUX 4
POST FADER
PRE FADER
PRE EQ
PAN
AUX 2
AUX 1
DIR
PFL
PRE
FADER
ON
POST FADER
PRE FADER
METER
INSERT
EQ
HF
HMF
LMF
LF
4 BAND EQ
HIGHPASS FILTER
MIC LINE AMP
GAIN
LINE
TRANSFORMER OPTION
PAD
+48V
MIC INPUT
LINE INPUT


2802-B
81285
PRO INPUT
CIRCUIT DIAGRAM
344 796
INTERFACE B
2-
NOTES:
#1 : FACTORY PRESET
1 % TOLERANCE
SAFETY COMPONENT
(MUST BE REPLACED BY ORIGINAL PART)

IPM 2802

COMPONENT SIDE



Pos. in diagram	description	Part-No.
B0010	socket XLR 3pol.	347014
00010	socket XLR 3pol.	343538
R0010	fader 10 kohm log	343418
00020	rotary knob black/bl	344610
00030	rotary knob black/rd	344611
00040	rotary knob black/gr	344228
00050	rotary knob black/bl	344612
00060	rotary knob sw/li	344227
00080	fader knob bl/wt 4mm	344619
00090	push button +48V	344570
00091	push button PAD	345441
00092	push button LINE	344571
00094	push button PHASE	344572
00096	push button LOW-CUT	344573
00098	push button EQ	344581
00099	push button DIR	345574
00100	push button 5-6	344575
00101	push button PRE	345575
00102	push button ON	344587
00104	push button PFL	344586
00106	push button MIX	344574
00108	push button 1-2	344576
00110	push button 3-4	344577
0010	PCB INTERFACE B 2802 B	812858
C023	KO-EL 220 MF 25V	343533
C032	KO-EL 220 MF 25V	343533
C033	KO-EL 220 MF 25V	343533
C034	KO-EL 22MF 25V	327815
C035	KO-EL 22MF 25V	327815
C039	KO-EL 22MF 25V	327815
C040	KO-EL 22MF 25V	327815
C044	KO-EL 2.2MF 50V	304986
C045	KO-EL 2.2MF 50V	304986
C046	KO-EL 2.2MF 50V	304986
C047	KO-EL 22MF 25V	327815
D001	diode zener ZPD 12V 0,5W	305738
D002	diode zener ZPD 12V 0,5W	305738
D003	diode zener ZPD 12V 0,5W	305738
D004	diode zener ZPD 12V 0,5W	305738
D005	LED green 3mm	336398
D006	LED red 3mm	336399
D007	diode 1N 4148	301254
D008	diode 1N 4148	301254
D009	diode zener ZPD 18V	301277
D010	LED green 3mm	336398
D011	LED green 3mm	336398
D012	LED green 3mm	336398
D013	LED green 3mm	336398
D014	LED red 3mm	336399
H001	resistor netw. SIL 006	339702
I001	IC TL 072 CP	331340
I002	IC TL 074 CN	332985
I003	IC TL 072 CP	331340
I004	IC SSM 2017 P	345485
I005	IC NE 5532 N	327197
I006	IC TL 072 CP	331340
I007	IC BA 6144	338606
JS01	jack koax	343481
JS02	jack koax	343481
JS03	jack koax	343481
Q001	trans. BC 550 B	301184
Q002	trans. BC 550 B	301184
Q003	trans. BC 550 B	301184
Q004	trans. BC 550 B	301184
Q005	trans. BC 550 B	301184
Q006	trans. BC 560 B	306928
R081	safety resistor 10 ohm	329215
R082	safety resistor 10 ohm	329215
R083	safety resistor 10 ohm	329215
R084	safety resistor 10 ohm	329215
S001	switch	344038
S002	switch	344037
S003	switch	344037
S004	switch	344037
S005	switch	344037
S006	switch	344037
S007	switch	344037
S008	switch	344037
S009	switch	344037
S012	switch	344037
S013	switch	344037
S014	switch	344037
S015	switch	344038
S016	switch	344037
VR01	potentiometer 2x5 kohm log	344034
VR02	potentiometer 10kohm lin	343261
VR03	potentiometer 10kohm lin	343261
VR04	potentiometer 2x100kohm log	344033
VR05	potentiometer 10kohm lin	343261
VR06	potentiometer 2x100kohm log	344033
VR07	potentiometer 10kohm lin	343261
VR08	potentiometer 2x10kohm lin	343549
VR09	potentiometer 20kohm log	344032
VR10	potentiometer 20kohm log	344032
VR11	potentiometer 20kohm log	344032
VR12	potentiometer 20kohm log	344032

INTERFACE

INPUT MODULE 2804

SPECIFICATIONS: INPUT Module 2804

* 0 dBu = 0.775 V (RMS)

* Note Enclosure: Measurement Conditions

MICROPHONE INPUT

* Electronically balanced.

* Transformer can be retrofitted.

Input Impedance	:	> 1.6 kohms
Input Sensitivity Range at Output Level +4 dBu	:	-12 dBu ... - 62 dBu
Max. Input Level	:	+ 10 dBu
Common Mode Rejection Ratio (CMRR) with max. Gain, f = 1kHz	:	> 80 dB
Equivalent Input Noise R(Q) = 150 ohms, 22 Hz ... 22 kHz, with max. Gain	:	< - 127.5 dBu

LINE INPUT

* Electronically balanced.

* Transformer can be retrofitted.

Input Impedance	:	> 10 kohms
Input Sensitivity Range at Output Level +4 dBu	:	- 16 ... + 14 dBu
Max. Input level	:	+ 30 dBu
Common Mode Rejection Ratio (CMRR) with max. Gain, f = 1kHz	:	> 45 dB
Equivalent Input Noise R(Q) = 50 ohms, 22 Hz ... 22 kHz, with max. Gain	:	< - 92 dBu

GENERAL SPECIFICATIONS

Control Range BALANCE : +/- 3 dB

		f = 1 kHz	f = 10 kHz
Muting Input B Switch	:	> 95 dB	> 80 dB
Muting CUT L/R Switch	:	> 100 dB	> 100 dB
Channel Muting "ON" Switch	:	> 90 dB	> 70 dB
Fader Rejection (OFF)	:	> 100 dB	> 85 dB
Muting "Routing" Switch	:	> 90 dB	> 70 dB
Max. AUX SEND Attenuation	:	> 90 dB	> 80 dB
THD (Unity gain, Line)	:	0.004 %	0.01 %
Weight	:	550 g	

FREQUENCY RESPONSE EQ

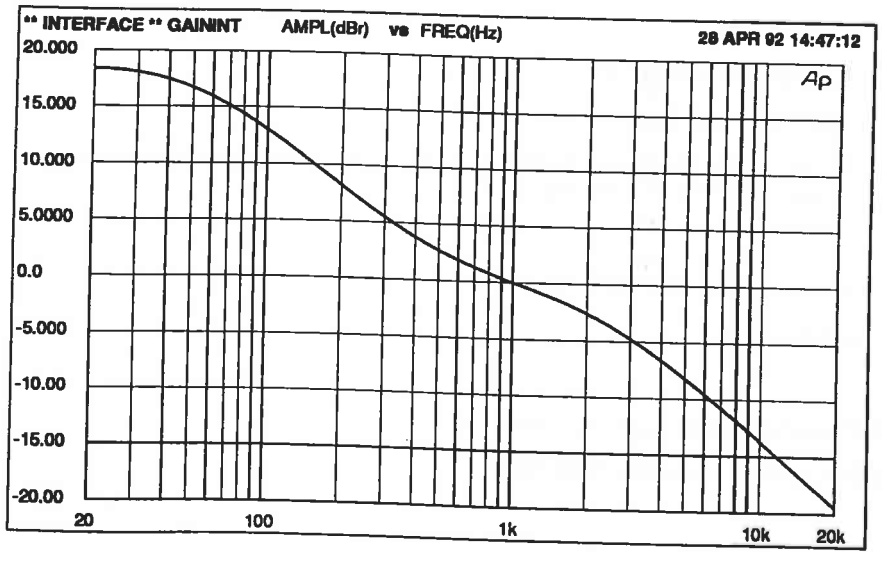
Boost/Cut	:	+/- 15 dB (LF +/- 13 dB)
Filter Frequencies	:	HF 12 kHz (shelving)
		HMF 470 Hz ... 15 kHz (peaking with Q = 0.75)
		LMF 95 Hz ... 1.1 kHz (peaking with Q = 0.75)
		LF 50 Hz (shelving with VLF rolloff at 25 Hz)

RIAA PHONO EQ (option)

Input Impedance	:	47 kohms / 100 pF
Input Sensitivity at 1 kHz with max. Gain	:	2 mV (- 52 dBu)
Headroom	:	+ 20 dB
Crosstalk R/L	:	- 65 dB
Frequency Response Accuracy	:	+/- 1 dB
Signal-to-Noise Ratio	:	> 66 dB

Frequency Response with RIAA Phono Equaliser PCB 81282

- Feed in E(I) to Input LINE B
- max. Deviation +/- 1 dB



SPECIFICATIONS: INPUT Module 2804

* Main PCB	:	81286
* RIAA Phono Equaliser (option)	:	81282

General measuring conditions if not noted elsewhere otherwise:

* Module not plugged into the ribbon cable. Operating voltage supplied externally.

* Measuring Tolerance	:	**ΔX = ± 1.5 dB**
* Measuring Frequency	:	**f = 1 kHz**
* All Levels related to	:	**E = 775 mV (0dBu)**
* Gain Control fully counterclockwise		
* EQ Controls into Centre Position		
* Panpot into Centre Position		
* Pin Assignment of XLR Socket	:	PIN 1 = GND
		PIN 2 = + INPUT
		PIN 3 = - INPUT
* Pin Assignment LINE Jack	:	TIP = + SIGNAL
		RING = - SIGNAL
		SLEEVE = GND
* Source Impedance with feed in via LINE	:	R(Q) = 50 ohms
* Source Impedance with feed in via XLR Socket	:	R(Q) = 150 ohms
* Load Impedance	:	R(L) = 100 kohms
1. Operating Voltage	:	**E(B) = +/- 17 V**
2. Current Input (max.)	:	**I(B) = 145 mA**

3. Input and Output Voltages

* The controls and switches listed under notes must be opened full or must be pushed.
* Outputs terminated with R(L) = 100 kohms.
* All switches and controls not mentioned in position OFF.
* FADER fully open, CHANNEL, MIX, 1-2, 3-4, B button ON.
* J are the jumpers on the PCB which must be plugged in for the specified measurement (FP = FACTORY PRESET, NFP = not FACTORY PRESET).

FACTORY PRESET (FP) of AUX and PFL jumpers (J1..J4):

J1 : POST ... AUX3/4 POST FADER MONO

J2 : PRE ... PFL PRE FADER

J3 : MONO ... AUX1 MONO (FP = symbol half circle on 81268)

J4 : MONO ... AUX2 MONO (FP = symbol half circle on 81268)

Input	E(I)	Test point	E(O)	Note
LINE R/L	+14 dBu	CN6.17/.19	+ 7 dBu	
LINE R/L	-16 dBu	CN6.17/.19	+ 7 dBu	GAIN max.
LINE R/L	+14 dBu	CN6.13/.15	+ 7 dBu	1-2 on
LINE R/L	+14 dBu	CN6.9 /.11	+ 7 dBu	3-4 on
MIC R/L	-12 dBu	CN6.17/.19	+ 7 dBu	B off
MIC R/L	-62 dBu	CN6.17/.19	+ 7 dBu	GAIN max., B off
LINE R/L	+14 dBu	CN6.17	+10 dBu	L CUT + R CUT on = MONO
LINE R/L	+14 dBu	CN6.19	+10 dBu	L CUT + R CUT on = MONO
LINE R/L	+14 dBu	CN6.17	<-20 dBu	PHASE + R CUT on = MS
LINE R/L	+14 dBu	CN6.19	+10 dBu	PHASE + R CUT on = MS
LINE L	+14 dBu	CN6.31	+ 7 dBu	J3=NFP,AUX1 open
LINE R	+14 dBu	CN6.29	+ 7 dBu	J4=NFP,AUX2 open
LINE R/L	+14 dBu	CN6.31	+10 dBu	J3=FP,AUX1 open
LINE R/L	+14 dBu	CN6.29	+10 dBu	J4=FP,AUX2 open
LINE R/L	+14 dBu	CN6.31	0 dBu	PRE,J3=FP,AUX1 open
LINE R/L	+14 dBu	CN6.29	0 dBu	PRE,J4=FP,AUX2 open
LINE R/L	+14 dBu	CN6.27	0 dBu	J1=NFP,AUX3 open
LINE R/L	+14 dBu	CN6.25	0 dBu	J1=NFP,AUX4 open
LINE R/L	+14 dBu	CN6.23	0 dBu	J1=NFP,AUX3 open,5-6
LINE R/L	+14 dBu	CN6.21	0 dBu	J1=NFP,AUX4 open,5-6
LINE R/L	+14 dBu	CN6.27	+10 dBu	J1=FP,AUX3 open
LINE R/L	+14 dBu	CN6.25	+10 dBu	J1=FP,AUX4 open
LINE R/L	+14 dBu	CN6.4	0 dBu	J2=FP,PFL on
LINE R/L	+14 dBu	CN6.4	+10 dBu	J2=NFP,PFL on
————		CN6.2	-10 V(DC)	PFL ON,R(L) = 100k
				channel without signal
———— with RIAA Equaliser PCB 81282 ————				
LINE R/L	2 mV	CN6.17/.19	+ 7 dBu	B

4. Level Meter

* Feed in signal via LINE (INPUT B).
* Note: Tolerance here +/- 1 dB
* Gain control max. (20 dB).

E(I) LINE INPUT B	LED VALUE
- 21 dBu	- 13 dB
- 15 dBu	- 7 dB
- 8 dBu	0 dB
+ 2 dBu	+ 10 dB
+ 9 dBu	+ 17 dB

5. Common Mode Rejection Ratio

* E(O) = J1/J11 to Pin 6
* R(Q) = 150 ohms, gain control fully opened.
* Perform measurement with bandpass 1 kHz.
* Measurement 1:

PIN1 and PIN3 of XLR socket to ground.

Feed in a signal with - 45 dBu to PIN2 ==> E(O1).

* Measurement 2:

Disconnect PIN3 from ground and connect with PIN 2.

Feed in a signal with - 45 dBu to PIN2/3 ==> E(O2).

$$CMRR = |20\ LG\ (E(O1)/E(O2))|$$

CMRR MIC : > 80 dB

6. Noise Voltages

- measured at CN6.17/19
- measured with AUDIO PRECISION SYSTEM ONE
- MIC: R(Q) = 150ohms - LINE: R(Q) = 50ohms - R(L) = 100kohms
- E(F) = Noise voltage, RMS, 22 Hz ... 22 kHz
- Gain fully opened

* Measurement **equivalent input noise EIN** :

1. Determine gain from input to output ---> V
2. Measure noise voltage E(F)
3. N = 20 * LG (E(F)/0.775V)
4. EIN = N - V

7.1. MIC

7.1.1. Fader closed:	**E(F)**	**≤ 10 µV**
7.1.2. Fader opened:	**EIN**	**≤ - 128 dBu**

7.2. LINE

7.2.1. Fader closed:	**E(F)**	**≤ 10 µV**
7.2.2. Fader opened:	**EIN**	**≤ - 93 dBu**

7.3. RIAA Phono equaliser (option)

7.3.1. Fader closed:	**E(F)**	**≤ 10 µV**
7.3.2. Fader opened:	**E(F)**	**≤ 900 µV**

8. Distortion (THD)

- measured at CN6.17/19
- measured with AUDIO PRECISION SYSTEM ONE
- R(L) = 100 kohms
- CHAN.FADER fully opened
- Adjust gain control accordingly

Input	E(I)	Test point	E(O)	Distortion	
				f=1kHz	f=10kHz
LINE	+10 dBu	CN6.17/.19	+16 dBu	0.004 %	0.010 %
MIC	-14 dBu	CN6.17/.19	+16 dBu	0.02 %	0.02 %

9. BALANCE Control

BALANCE R/L : +/- 3 dB

Note: Tolerance here +/- 0.5 dB

10. Phantom Power Supply

If switch +48 V is pressed, the voltage between PIN 2 and PIN 1 or PIN 3 and PIN 1 of the XLR socket must be E(DC) = + 48 V.

11. Frequency Response

- All not mentioned switches OFF

Cut-off Frequency (- 3dB)

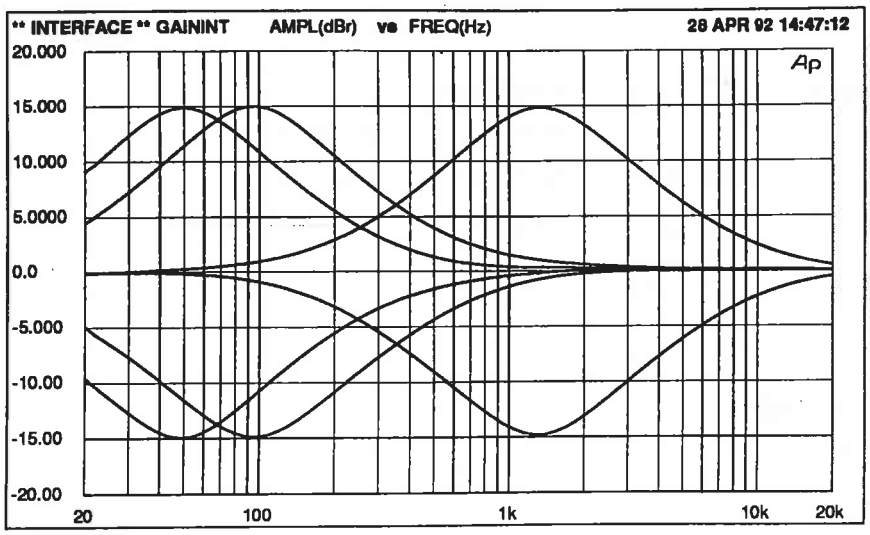
- Gain max.
- with measurement via LINE INPUT press switch B

MIC --> I8 PIN1/7 : **fl(-3dB) = 18 Hz fu(-3dB) = 63 kHz**

LINE --> I8 PIN1/7 : **fl(-3dB) = 3 Hz fu(-3dB) = 63 kHz**

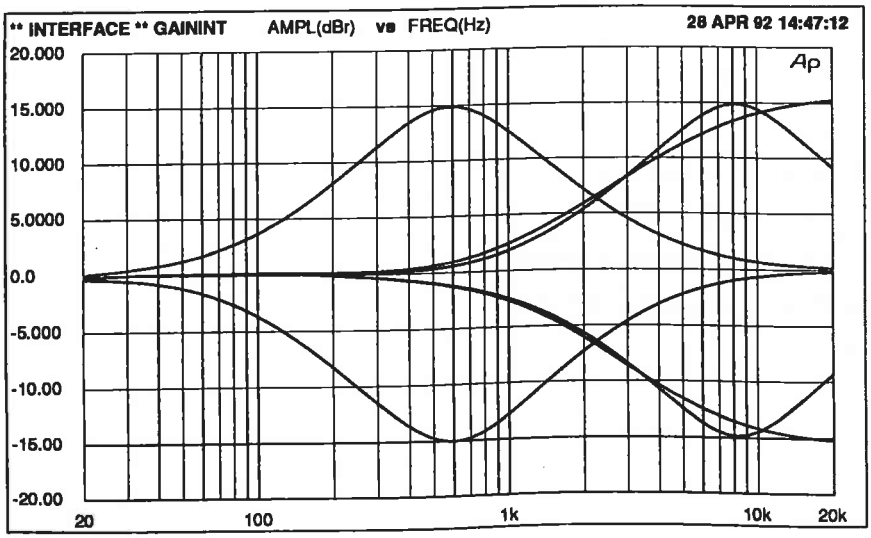
EQ MODULE 2804 (LO Section)

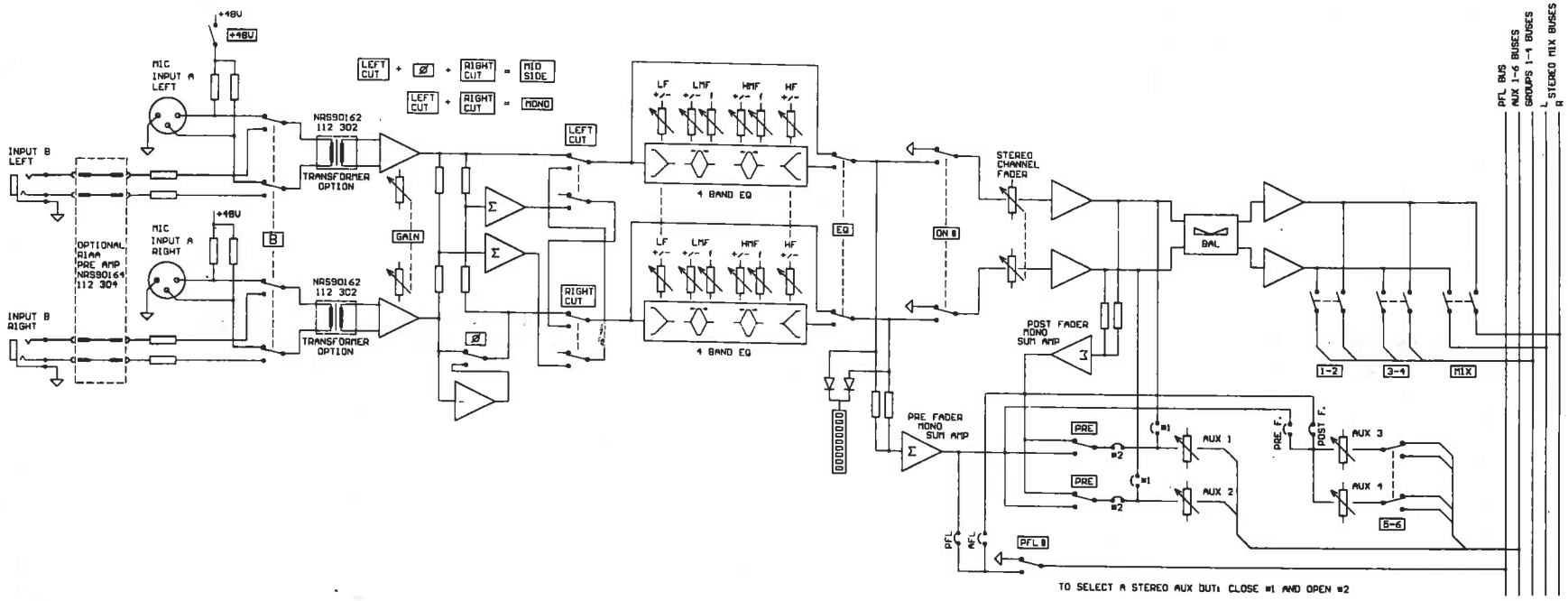
- INPUT B ON and EQ ON
- E(I) = INPUT B
- E(O) = I8 Pin 1/7



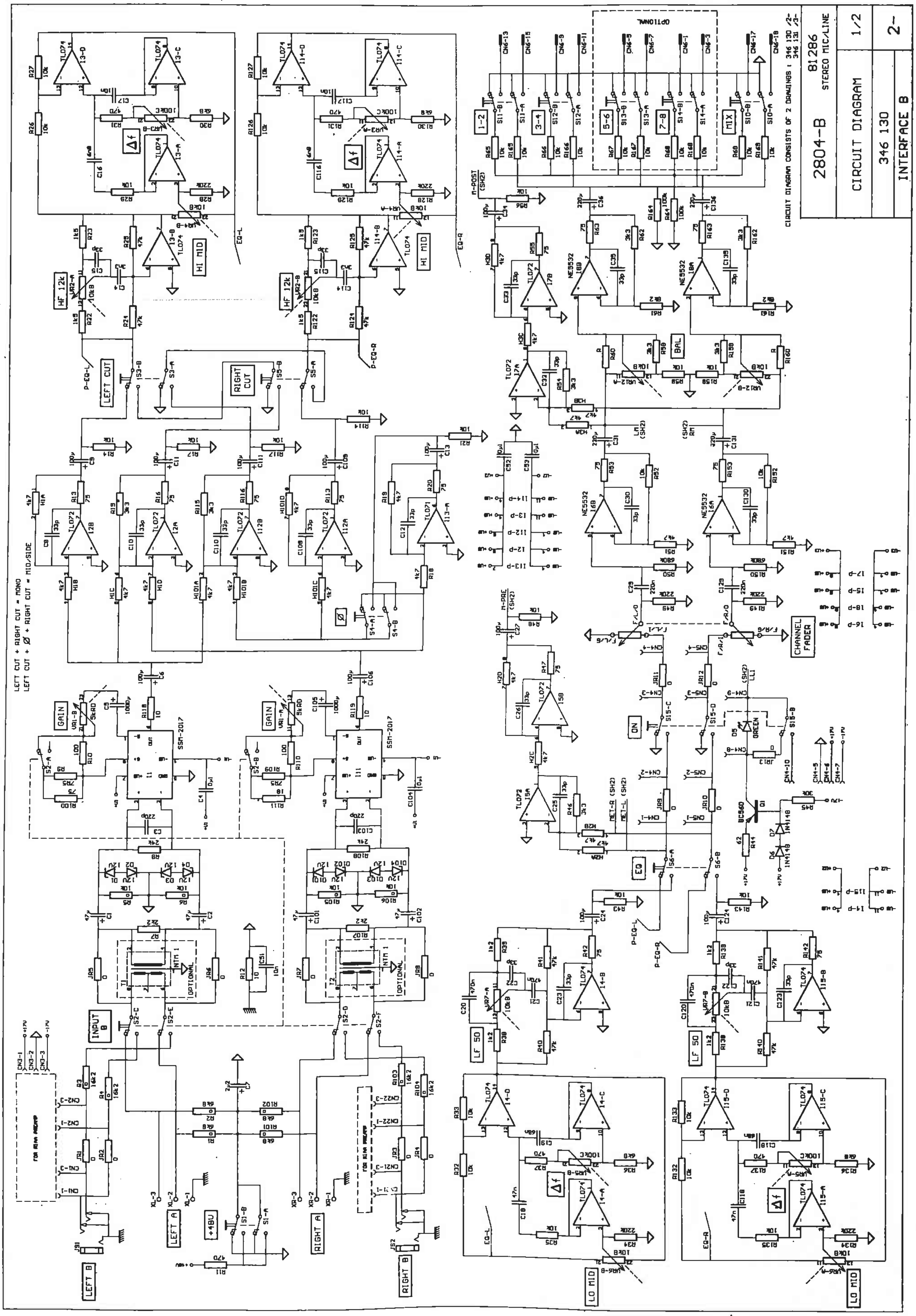
EQ MODULE 2804 (HI Section)

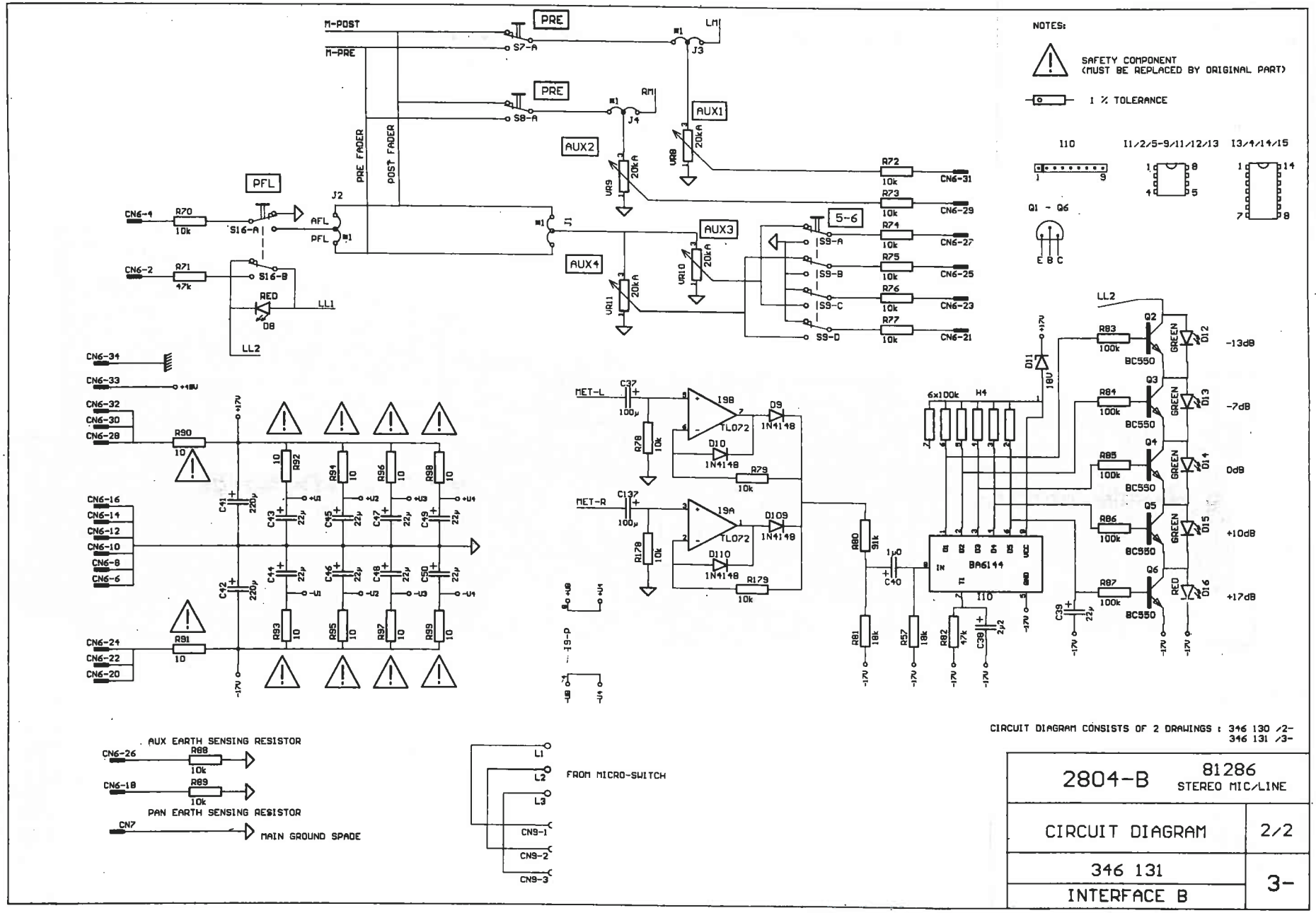
- INPUT B ON and EQ ON
- E(I) = INPUT B
- E(O) = I8 Pin 1/7





BLO-2804	
BLOCK DIAGRAM	
346 236	2-
INTERFACE	

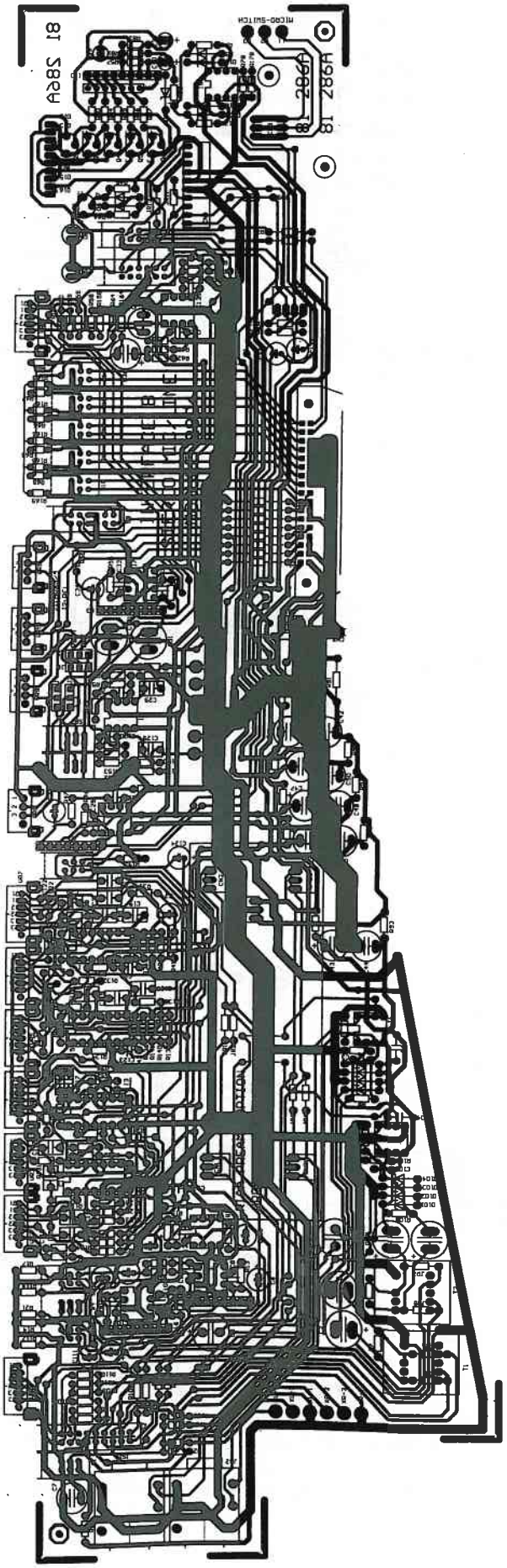

2804-B
81286
STEREO MIC/LINE
1/2
CIRCUIT DIAGRAM
346 130
INTERFACE B
2-
CIRCUIT DIAGRAM CONSISTS OF 2 DRAWINGS : 346 130 /2- 346 131 /3-
LEFT CUT + RIGHT CUT = MONO
LEFT CUT + Ø + RIGHT CUT = MID/SIDE



CIRCUIT DIAGRAM CONSISTS OF 2 DRAWINGS : 346 130 /2-
346 131 /3-

2804-B 81286 STEREO MIC/LINE	
CIRCUIT DIAGRAM	2/2
346 131	3-
INTERFACE B	

COMPONENT SIDE



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00092	push button grey	344280
00094	push button PHASE	344572
00096	push button EQ	344581
00098	push button 5-6	344575
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00102	push button PFL	344586
00104	push button MIX	344574
00106	push button 1-2	344576
00108	push button 3-4	344577
00110	push button PRE	345575
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C0031	KO-EL 220 MF 25V	343533
C0036	KO-EL 220 MF 25V	343533
C0040	KO-EL 1 MF 50V	340520
C0041	KO-EL 220 MF 25V	343533
C0042	KO-EL 220 MF 25V	343533
C0043	KO-EL 22MF 25V	327815
C0044	KO-EL 22MF 25V	327815
C0045	KO-EL 22MF 25V	327815
C0046	KO-EL 22MF 25V	327815
C0047	KO-EL 22MF 25V	327815
C0048	KO-EL 22MF 25V	327815
C0049	KO-EL 22MF 25V	327815
C0050	KO-EL 22MF 25V	327815
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D0006	diode 1N 4148	301254
D0007	diode 1N 4148	301254
D0008	LED red 3mm	336399
D0009	diode 1N 4148	301254
D0010	diode 1N 4148	301254
D0011	diode zener ZPD 18V	301277
D0012	LED green 3mm	336398
D0013	LED green 3mm	336398
D0014	LED green 3mm	336398
D0015	LED green 3mm	336398
D0016	LED red 3mm	336399
D0101	diode zener ZPD 12V 0,5W	305738
D0102	diode zener ZPD 12V 0,5W	305738
D0103	diode zener ZPD 12V 0,5W	305738
D0104	diode zener ZPD 12V 0,5W	305738
D0109	diode 1N 4148	301254
D0110	diode 1N 4148	301254
H0001	res.network RKL 8A 472J	343456
H0002	res.network RKL 8A 472J	343456
H0003	res.network RKL 8A 472J	343456
H0004	resistor netw. SIL 006	339702
H0101	res.network RKL 8A 472J	343456
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I0002	IC TL 072 CP	331340
I0003	IC TL 074 CN	332985
I0004	IC TL 074 CN	332985
I0005	IC TL 072 CP	331340
I0006	IC NE 5532 N	327197
I0007	IC TL 072 CP	331340
I0008	IC NE 5532 N	327197
I0009	IC TL 072 CP	331340
I0010	IC BA 6144	338606
I0011	IC SSM 2017 P	345485
I0012	IC TL 072 CP	331340
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Q0002	trans. BC 550 B	301184
Q0003	trans. BC 550 B	301184
Q0004	trans. BC 550 B	301184
Q0005	trans. BC 550 B	301184
Q0006	trans. BC 550 B	301184
R0090	safety resistor 10 ohm	329215
R0091	safety resistor 10 ohm	329215
S0001	switch	344037
S0002	switch	343458
S0003	switch	344037
S0004	switch	344037
S0005	switch	344037
S0006	switch	344037
S0007	switch	344037
S0008	switch	344037
S0009	switch	344038
S0010	switch	344037
S0011	switch	344037
S0012	switch	344037
S0015	switch	344038
S0016	switch	344037
VR001	potentiometer 2x5 kohm log	344034
VR002	potentiometer 2x10kohm lin	343260

Pos. in diagram	description	Part-No.
VR003	potentiometer 2x100kohm log	344033
VR004	potentiometer 2x10kohm lin	343260
VR005	potentiometer 2x100kohm log	344033
VR006	potentiometer 2x10kohm lin	343260
VR007	potentiometer 2x10kohm lin	343260
VR008	potentiometer 20kohm log	344032
VR009	potentiometer 20kohm log	344032
VR010	potentiometer 20kohm log	344032
VR011	potentiometer 20kohm log	344032
VR012	potentiometer 2x10kohm lin	343549

Pos. in diagram	description	Part-No.

INTERFACE

DUAL LINE MODULE 2806

SPECIFICATIONS: DUAL LINE Module 2806

* 0 dBu = 0.775 V (RMS)

* Note enclosure: Measurement conditions

LINE INPUT

* Electronically balanced.

Input Impedance	:	> 10 kohms
Input Sensitivity Range at Output Level +4 dBu	:	- 16 dBu ... + 14 dBu
Max. Input Level	:	+ 28 dBu
Common Mode Rejection Ratio (CMRR) with max. Gain, f = 1kHz	:	> 45 dB
Equivalent Input Noise R(Q) = 50 ohms, 22 Hz ... 22 kHz, Gain max.	:	< - 92 dBu

GENERAL SPECIFICATIONS

		f = 1 kHz	f = 10 kHz
Channel Muting "ON" switch	:	> 85 dB	> 70 dB
Fader Rejection (OFF)	:	> 90 dB	> 85 dB
Panpot Isolation (L/R)	:	> 70 dB	> 65 dB
Muting "Routing" Switch	:	> 80 dB	> 70 dB
MAX. AUX SEND Attenuation	:	> 90 dB	> 85 dB
THD (LINE -- MIX OUT) (Gain 0 dB)	:	0.005 %	0.02 %
Weight	:	660 g	

FREQUENCY RESPONSE EQ

Boost/Cut	:	+/- 15 dB
Filter Frequencies	:	HF 12 kHz (shelving)
		MF 240 Hz ... 7 kHz (peaking with Q = 1.4)
		LF 50 Hz (shelving with VLF rolloff at 25 Hz)

SPECIFICATIONS: DUAL LINE Module 2806

General measuring conditions if not noted elsewhere otherwise:

* Module not plugged into the ribbon cable. Operating voltage supplied externally.
* Measuring Tolerance : **Δ X = ± 1.5 dB**
* Measuring Frequency : **f = 1 kHz**
* All Levels related to : **E = 775 mV (0dBu)**
* All Bus Outputs terminated with : **R(L) = 100 kohms**
* Gain Control fully counterclockwise
* EQ Controls into centre Position
* Panpot into centre Position
* All AUX controls (channel A/B) fully open
* LEVEL control fully open
* Pin Assignment LINE Jack : TIP = + SIGNAL
  RING = - SIGNAL
  SLEEVE = GND
* Source Impedance with feed in via LINE : R(Q) = 50 ohms

1. Operating Voltage : **E(B) = +/- 17 V**

2. Current Input (max.) : **I(B) = 70 mA**

3. Input and Output Voltages

* Gain control fully counterclockwise

* The controls and switches listed under notes must be opened full or must be pushed. *
J are the jumpers on the PCB which must be plugged in for the specified measurement.

Input	E(I)	Testpoint	E(O)	Note
XLR -A/B	+14 dBu	CN2.17/.19	+ 7 dBu	ON,LEV,MIX
LINE-A/B	+14 dBu	CN2.17/.19	+ 7 dBu	ON,LEV,MIX
LINE-A/B	+14 dBu	CN2.13/.15	+ 7 dBu	ON,LEV,1-2
LINE-A/B	+14 dBu	CN2.9/.11	+ 7 dBu	ON,LEV,3-4
LINE-A/B	-16 dBu	CN2.17/.19	+ 7 dBu	ON,LEV,MIX,Gain max.
LINE-A/B	+14 dBu	CN2.31	- 9 dBu	AUX1,J2
LINE-A/B	+14 dBu	CN2.31	- 9 dBu	AUX1,J3
LINE-A/B	+14 dBu	CN2.31	+ 1 dBu	AUX1,J4,ON,LEV
LINE-A/B	+14 dBu	CN2.29	+ 1 dBu	AUX2,J4,ON,LEV
LINE-A/B	+14 dBu	CN2.27	- 9 dBu	AUX3,J5
LINE-A/B	+14 dBu	CN2.27	- 9 dBu	AUX3,J6
LINE-A/B	+14 dBu	CN2.27	+ 1 dBu	AUX3,J7,ON,LEV
LINE-A/B	+14 dBu	CN2.25	+ 1 dBu	AUX4,J7,ON,LEV
LINE-A/B	+14 dBu	CN2.4	- 9 dBu	PFL ON,J1=PFL
———	———	CN2.2	-10 V(DC)	PFL ON,R(L) = 100k

4. Panpot

- Drive channel nearly to PEAK.
- measure tn I4.1/.7 or I14.1/.7.

4.1. Panpot Isolation L/R	:	**> 65 dB**
4.2. Panpot Boost centre Position – L bzw. R	:	**Δ L = 4.5 dB**

Note: Tolerance here +/- 0.5 dB

5. Noise Voltages

- measured at CN2.17/19
- measured with AUDIO PRECISION SYSTEM ONE
- R(Q) = 50 ohms, R(L) = 100 kohms
- E(F) = Noise voltage, RMS, 22 Hz ... 22 kHz
- Gain control fully opened, LEVEL control fully opened

* Measurement **equivalent input noise EIN** :

1. Determine gain from input to output —> V
2. Measure noise voltage E(F)
3. N = 20 * LG (E(F)/0.775V)
4. EIN = N - V

LINE A/B

LEVEL control closed:	$E_{(F)}$	**≤ 12 uV**
LEVEL control opened:	E_{IN}	**≤ - 93 dBu**

6. Distortion (THD)

- measured at CN2.17/19
- measured with AUDIO PRECISION SYSTEM ONE
- R(L) = 100 kohms
- LEVEL control fully opened
- Gain control fully counterclockwise

Input	**E(I)**	**Test point**	**E(O)**	**Distortion**	
				f=1kHz	**f=10kHz**
LINE	+22 dBu	CN2.17/.19	+16 dBu	0.003 %	0.01 %

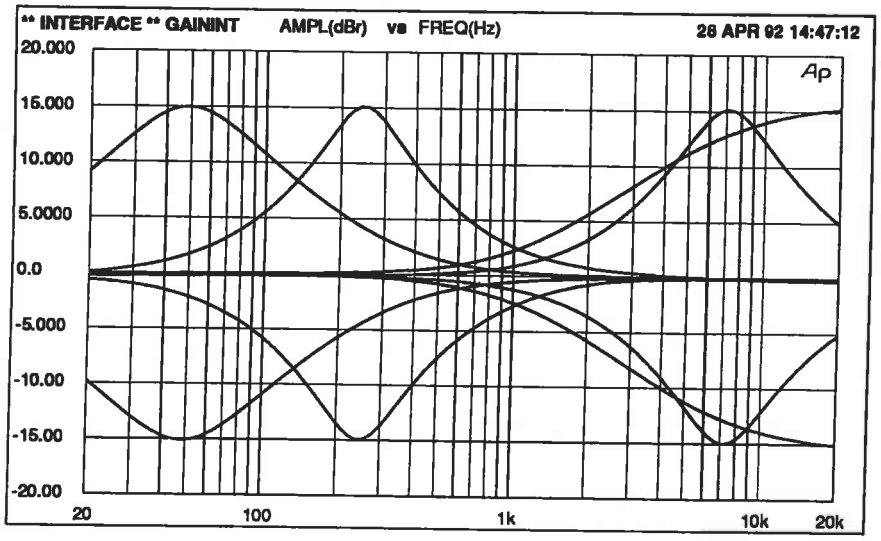
7. Frequency Response

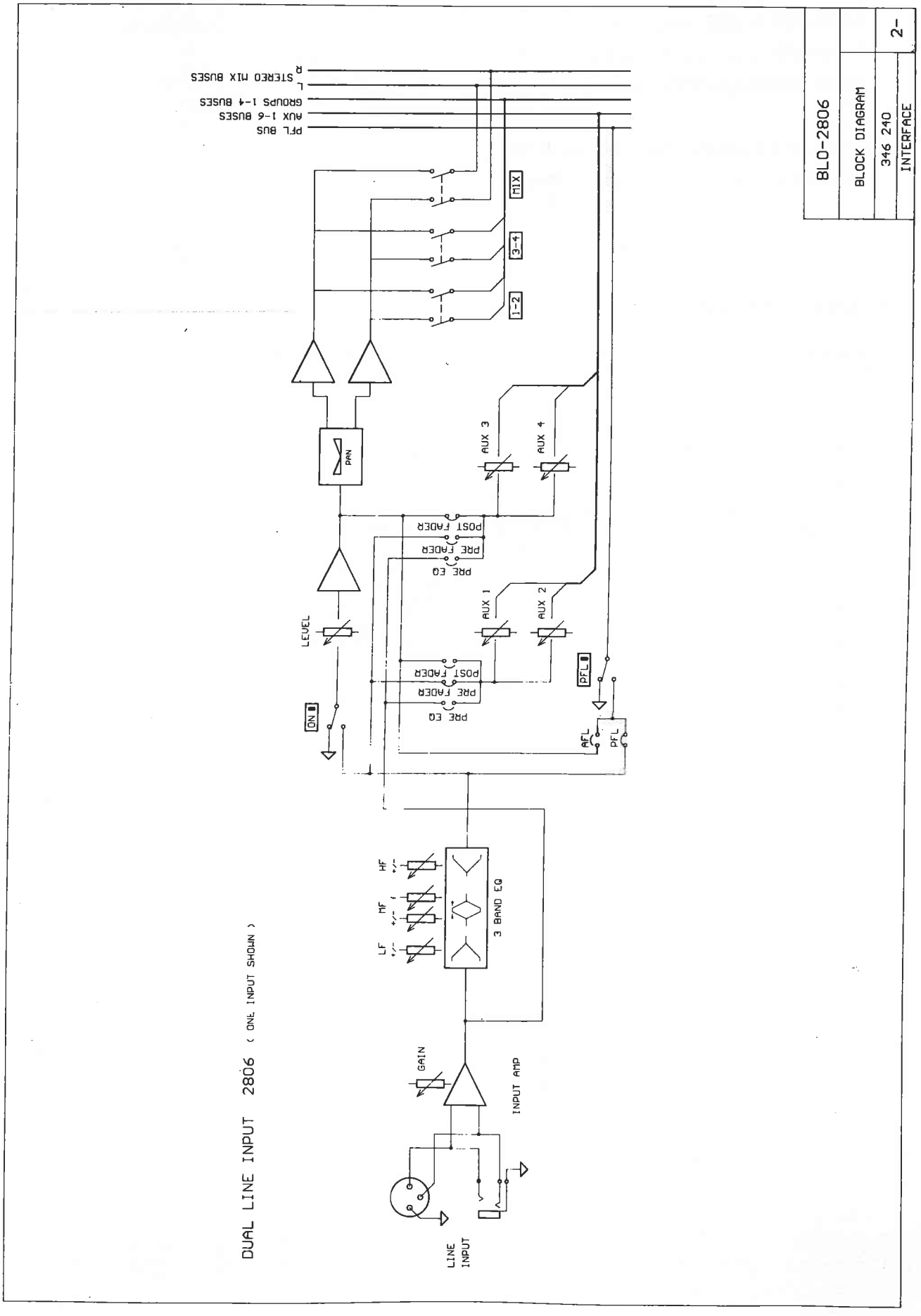
- Feed in E(I) to LINE input
- Measure E(O) at I14.1/.7 or I4.1/.7
- All not mentioned EQ controls into centre position

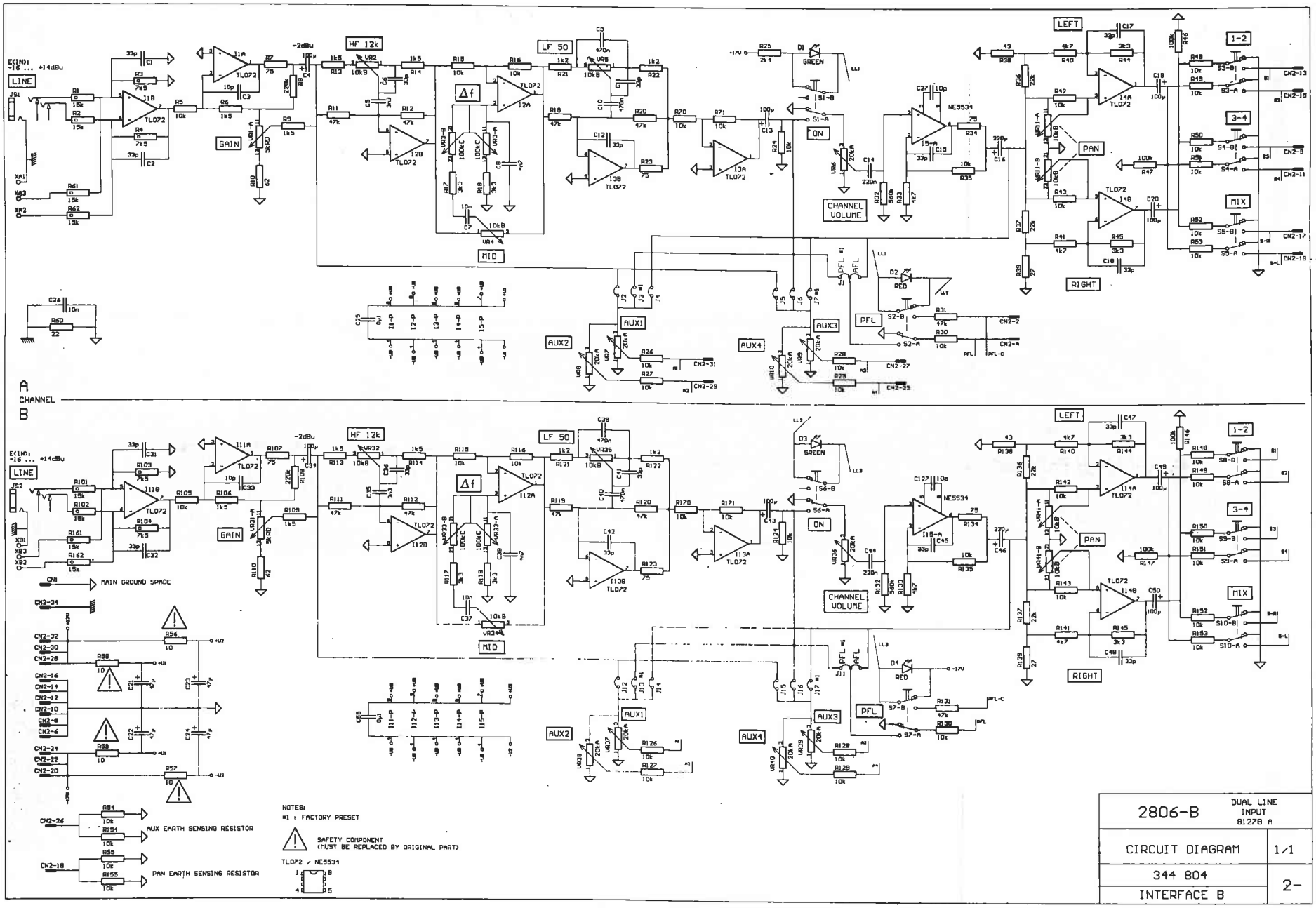
7.1. Cut-off frequency (- 3dB) with linear EQ

fl(-3dB) = 4 Hz **fu(-3dB) = 50 kHz**

7.2. EQ MODULE 2806

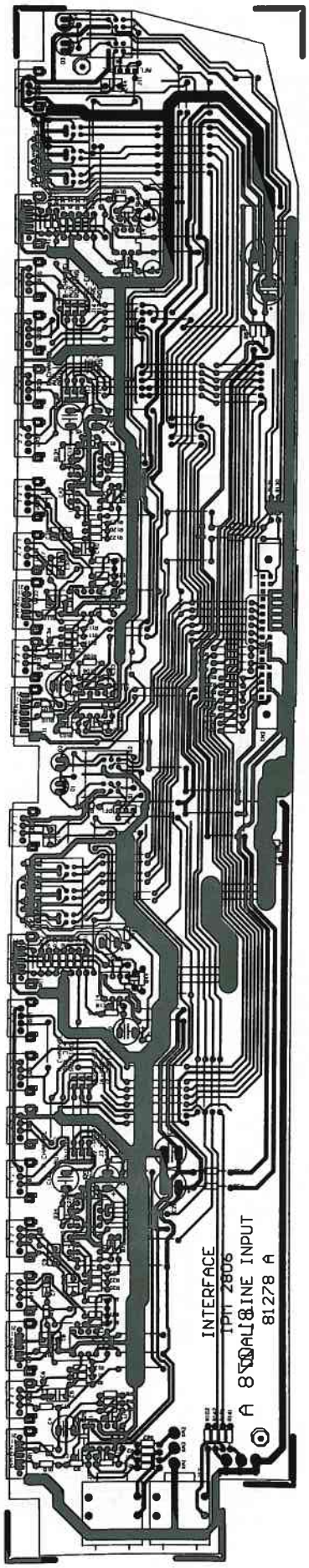



BLO-2806
BLOCK DIAGRAM
346 240
INTERFACE
2-
DUAL LINE INPUT 2806 (ONE INPUT SHOWN)
R STEREO MIX BUSES
L
GROUPS 1-4 BUSES
AUX 1-6 BUSES
PFL BUS
MIX
3-4
1-2
PAN
AUX 3
AUX 4
POST FADER
PRE FADER
PRE EQ
AUX 1
AUX 2
LEVEL
ON
PFL
AFL
PFL
HF
MF
LF
3 BAND EQ
GAIN
INPUT AMP
LINE INPUT


A
CHANNEL
B
LINE
GAIN
HF 12k
LF 50
Δf
MID
ON
CHANNEL VOLUME
LEFT
RIGHT
PAN
PFL
AUX1
AUX2
AUX3
AUX4
1-2
3-4
MIX
MAIN GROUND SPADE
AUX EARTH SENSING RESISTOR
PAN EARTH SENSING RESISTOR
NOTES:
=1 : FACTORY PRESET
SAFETY COMPONENT
(MUST BE REPLACED BY ORIGINAL PART)
TL072 / NE5534
2806-B
DUAL LINE INPUT
81278 A
CIRCUIT DIAGRAM
1/1
344 804
2-
INTERFACE B

IPM 2806

COMPONENT SIDE



Pos. in diagram	description	Part-No.
B0010	socket XLR 3pol.	347014
00010	socket XLR 3pol.	343538
00020	rotary knob black/bl	344610
00030	rotary knob black/rd	344611
00040	rotary knob black/gr	344228
00050	rotary knob black/bl	344612
00060	rotary knob sw/li	344227
00090	push button MIX	344574
00092	push button 1-2	344576
00094	push button 3-4	344577
00096	push button PFL	344586
00098	push button ON	344587
00005	PCB INTERFACE B 2806 B	812788
C0016	KO-EL 220 MF 25V	343533
C0021	KO-EL 47MF 50V	343530
C0022	KO-EL 47MF 50V	343530
C0023	KO-EL 47MF 50V	343530
C0024	KO-EL 47MF 50V	343530
C0046	KO-EL 220 MF 25V	343533
D0001	LED green 3mm	336398
D0002	LED red 3mm	336399
D0003	LED green 3mm	336398
D0004	LED red 3mm	336399
I0001	IC TL 072 CP	331340
I0002	IC TL 072 CP	331340
I0003	IC TL 072 CP	331340
I0004	IC TL 072 CP	331340
I0005	IC NE 5534	309446
I0011	IC TL 072 CP	331340
I0012	IC TL 072 CP	331340
I0013	IC TL 072 CP	331340
I0014	IC TL 072 CP	331340
I0015	IC NE 5534	309446
JS001	jack koax	343481
JS002	jack koax	343481
R0056	safety resistor 10 ohm	329215
R0057	safety resistor 10 ohm	329215
R0058	safety resistor 10 ohm	329215
R0059	safety resistor 10 ohm	329215
S0001	switch	344037
S0002	switch	344037
S0003	switch	344037
S0004	switch	344037
S0005	switch	344037
S0006	switch	344037
S0007	switch	344037
S0008	switch	344037
S0009	switch	344037
S0010	switch	344037
VR001	potentiometer 2x5 kohm log	344034
VR002	potentiometer 10kohm lin	343261
VR003	potentiometer 2x100kohm log	344033
VR004	potentiometer 10kohm lin	343261
VR005	potentiometer 10kohm lin	343261
VR006	potentiometer 20kohm log	344032
VR007	potentiometer 20kohm log	344032
VR008	potentiometer 20kohm log	344032
VR009	potentiometer 20kohm log	344032
VR010	potentiometer 20kohm log	344032
VR011	potentiometer 2x10kohm lin	343549
VR031	potentiometer 2x5 kohm log	344034
VR032	potentiometer 10kohm lin	343261
VR033	potentiometer 2x100kohm log	344033
VR034	potentiometer 10kohm lin	343261
VR035	potentiometer 10kohm lin	343261
VR036	potentiometer 20kohm log	344032
VR037	potentiometer 20kohm log	344032
VR038	potentiometer 20kohm log	344032
VR039	potentiometer 20kohm log	344032
VR040	potentiometer 20kohm log	344032
VR041	potentiometer 2x10kohm lin	343549

INTERFACE

GROUP OUTPUT MODULE 2808

SPECIFICATIONS: GROUP OUTPUT Module 2808

* 0 dBu = 0.775 V (RMS)
* Note Enclosure: Measurement Conditions

GROUP Output

* Electronically balanced

		f = 1 kHz	f = 10 kHz
INSERT RETURN (Input Imped.)	:	10 kohms	
INSERT SEND (Nom. Level)	:	- 2 dBu	
INSERT SEND (max. Output Level)	:	+ 21 dBu	
GROUP Nominal Output Level	:	+ 4 dBu / - 10 dBV	
Max. Output Level	:	+ 25 dBu	
GROUP Output Impedance	:	75 ohms	
Residual Bus Noise	:	< - 94 dBu	
Mix Bus Noise	:	< - 81 dBu	
Typ. Mix Output Noise	:	< - 76 dBu	
Crosstalk (Group to Group)	:	< - 90 dB	< - 75 dB
Fader Attenuation (OFF)	:	> 95 dB	> 95 dB
THD (INS. – GROUP OUT)	:	0.003 %	0.007 %
Factory Preset Output Level	:	+ 4 dBu	

TAPE/EFFECT RETURN

Input Impedance	:	> 22 kohms
Nominal Input Level	:	+ 4 dBu / - 10 dBV
Max. Input Level	:	+ 27 dBu
Panpot Isolation	:	> 55 dB > 55 dBu

Frequency Response EQ

Boost/Cut	:	+/- 15 dB
Filter Frequencies	:	HF 8 kHz (shelving)
		LF 60 Hz (shelving)

Metering

* 20 Segment LED Bargraph

		Peak	Average
Reading selectable	:		
Rise Time to 0 dBu	:	1 ms	150 ms
Release Time to -20 dBu	:	2 s	250 ms
Rel. Accuracy related to 0 dB	:	+/- 0.5 dB	

Calibration Range (0 dB)	:	E(O) = - 1 dBu to + 12 dBu
Factory Preset	:	E(O) = + 4 dBu for reading 0 dB (Encoding PEAK)
Weight	:	670 g

SPECIFICATIONS: GROUP Module 2808

General measuring conditions if not noted elsewhere otherwise:

* Module not plugged into the ribbon cable. Operating voltage supplied externally.

* Measuring Tolerance	:	**/X = ± 1.5 dB**
* Measuring Frequency	:	**f = 1 kHz**
* All Levels related to	:	**E = 775 mV (0dBu)**
* EQ controls into centre Position		
* Panpot into centre Position		
* Pin Assignment of XLR socket	:	PIN 1 = GND PIN 2 = + OUTPUT PIN 3 = - OUTPUT
* Pin Assignment INSERT Jack	:	TIP = SEND RING = RETURN SLEEVE = GND
* Pin Assignment RET. Jack	:	TIP = + INPUT RING = - INPUT SLEEVE = GND
* Source Impedance with feed in		
via INSERT RETURN, RET A/B	:	R(Q) = 50 ohms

* Connect CN1.18 (GND SENSING) with CN1.16 (MIX EARTH)

1. Operating Voltage : E(B) = +/- 17 V

2. Current Input with Level Meter : I(B) = 85 mA

3. Input and Output Voltages

* EQ controls and Panpot into centre Position.
* Bus Outputs terminated with R(L) = 100 kohms.
* Feed in to Bus Inputs with R(I) = 10 kohms.
* The Switches/Controls listed under notes must be pushed/opened full.
* J = Code jumper, Factory preset + 4 dBu (J24)

Input	E(I)	Test point	E(O)	Notes
RET. A/B	+ 6 dBu	CN1.17/19	+ 10 dBu	ON,RET.LEV.,-10dBV(J25,J26)
RET. A/B	+ 6 dBu	CN1.17/19	+ 2 dBu	ON,PAN L/R,RET.LEV.
RET. A/B	+ 6 dBu	CN1.17/19	- 2 dBu	ON,RET.LEV.
RET. A/B	+ 6 dBu	CN1.31	- 6 dBu	AUX1
RET. A/B	+ 6 dBu	CN1.4	- 6 dBu	PFL
----------		CN1.2	- 10 V(DC)	PFL
RET. /B	+ 6 dBu	CN1.17/.19	- 2 dBu	RET.TAPE,RET.LEV.,ON,FAD
RET. /B	+ 6 dBu	INSERT SEND	0 dBu	RET.TAPE,J1/J11
RET. /B	+ 6 dBu	INSERT SEND	0 dBu	RET.TAPE,J2/J12
RET. /B	+ 6 dBu	INSERT SEND	0 dBu	RET.TAPE,J3/J13
RET. /B	+ 6 dBu	INSERT SEND	0 dBu	RET.TAPE,J4/J14
RET. /B	+ 6 dBu	INSERT SEND	OFF RET.	TAPE,PA.REC.,J4/J14
RET. /B	+ 6 dBu	INSERT SEND	METER ON	PA.REC.
INS.RET	+ 6 dBu	XLR GROUP	+ 12 dBu	FAD
INS.RET	+ 6 dBu	XLR GROUP	+ 1 dBu	FAD, -10 dBV(J24)
INS.RET	+ 6 dBu	CN1.17	- 5.4 dBu	FAD,MIX R
INS.RET	+ 6 dBu	CN1.19	- 5.4 dBu	FAD,MIX L
INS.RET	+ 6 dBu	CN1.17/19	- 5.8 dBu	FAD,MIX R,MIX L

4. Balance Adjustment GROUP OUT

* The Balance adjustment can be performed as follows:

- Feed in signal via INSERT
- Measure output voltage balanced --> E1
- Sum XLR PIN2 and XLR PIN3 via high-precision resistors (< 10 kohms /< 0,5%) to input of measuring instrument and adjust with trimmer R83 to minimum --> E2

Rejection factor = lg (E1/E2) = > 35 dB

5. Meter Calibration

* Plug code jumper J20 to PEAK.

- Levelset:

* Drive XLR - Group output to + 4 dBu (J24 plugged).
* Adjust meter with trimmer R91 so that the first yellow LED will begin to light up.

- Offset adjustment:

* Drive XLR - Group output to - 23 dBu (J24 plugged).
* Adjust meter with trimmer R68 so that the first green LED will begin to light up.
* Drive circuit with different levels and check.

(max. deviation: +/- 1.0 dB)

e.g.: E(O) = +16 dBu —> Meter indication +12 dB
E(O) = -14 dBu —> Meter indication -18 dB

- Check the Reading Characteristic
  (switch signal on and off)
* Code jumper J20 to AVERAGE
  --> Rise time : slow (150ms) / Release Time : fast (250ms)
* Code jumper J20 to PEAK
  --> Rise time : fast (1ms) / Release Time : slow (2s)
- Factory preset : Code jumper J20 to PEAK

6. Noise Voltages

- measured at XLR GROUP OUT
- measured with AUDIO PRECISION SYSTEM ONE
- R(L) = 100 kohms
- E(F) = Noise voltage, RMS, 22 Hz ... 22 kHz
- E(G) = Noise voltage, frequ.weighted acc. CCIR 468, Q - PEAK
- Code jumper J24 at module to + 4 dBu

6.1. Fader opened:	**E(F) ≤ 16 uV**	**E(G) ≤ 50 uV**
6.2. Fader closed:	**E(F) ≤ 8 uV**	**E(G) ≤ 30 uV**

7. Distortion (THD)

- Feed in E(I) = 16 dBu at CN1.9/.11/.13/.15 (depending on code jumper pos.) via 10 kohms.
- Measure E(O) at XLR GROUP OUT, R(L) = 100 kohms

f = 1 kHz: **k < 0.004 %**

8. Factory Preset

* Code jumpers inputs/outputs to + **4 dBu**
* Code jumper meter to **PEAK**

9. Frequency Response Curves

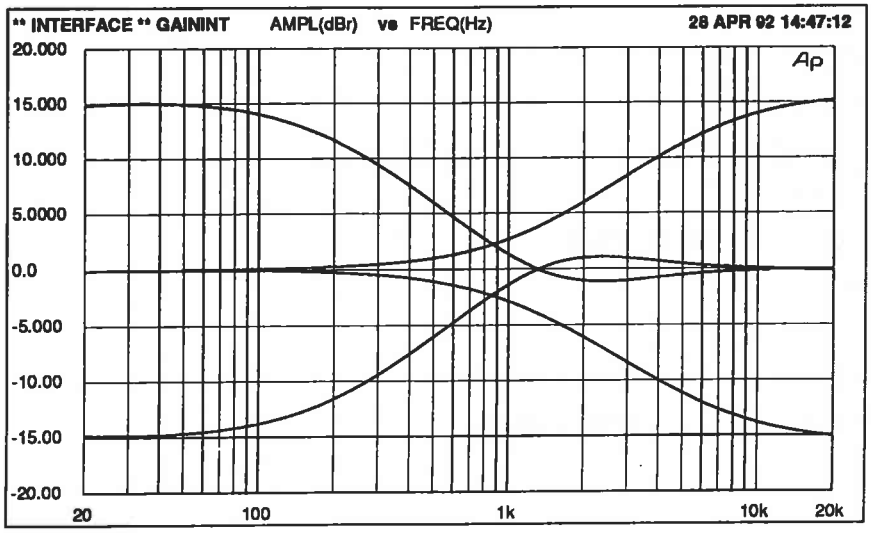
9.1. Frequency Response SUB CHANNEL

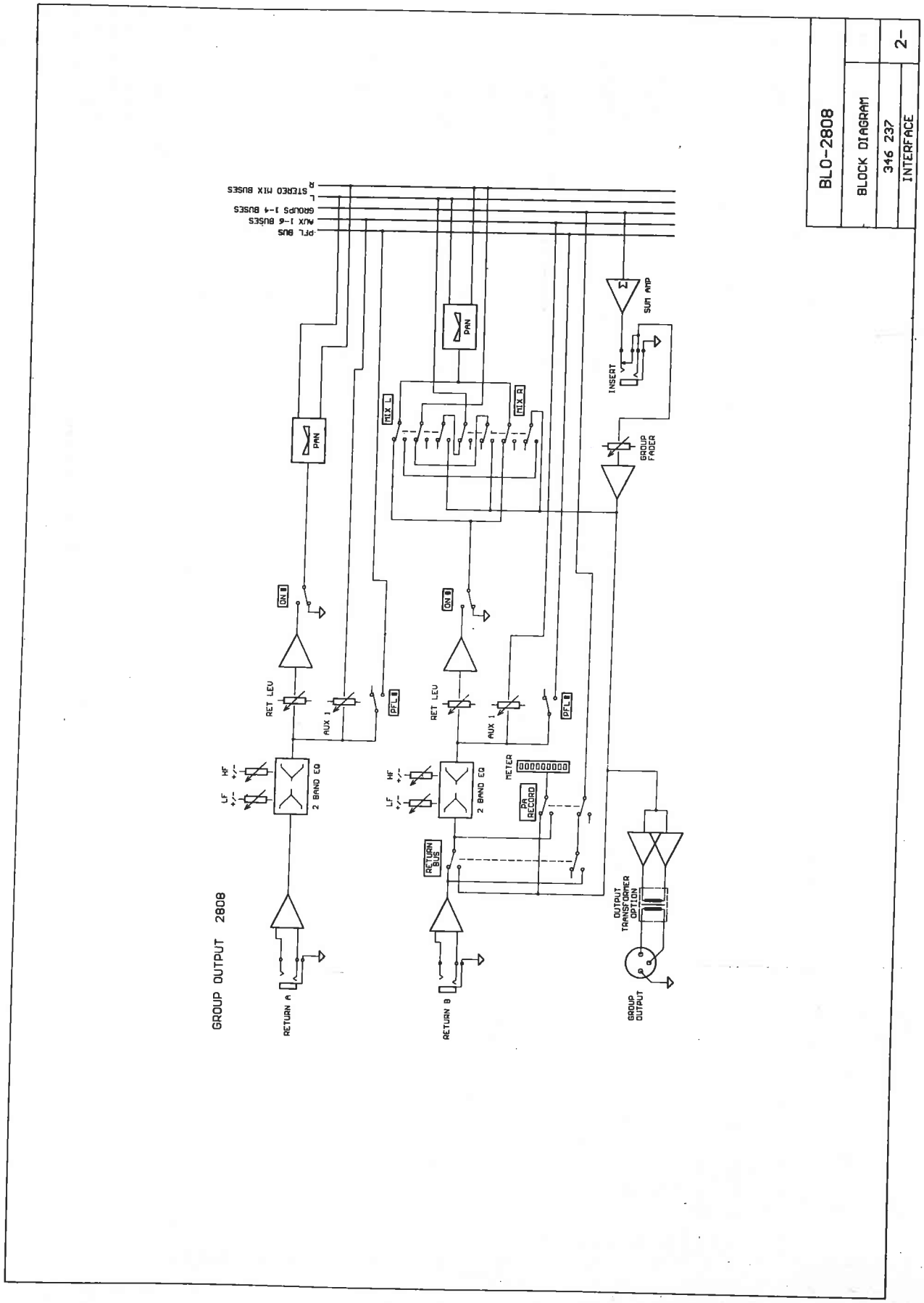
- Feed in E(I) to CN1.9/.11/.13/.15 (depending on code) via 10 kohms
- Measure E(O) at XLR GROUP OUT, R(L) = 100 kohms

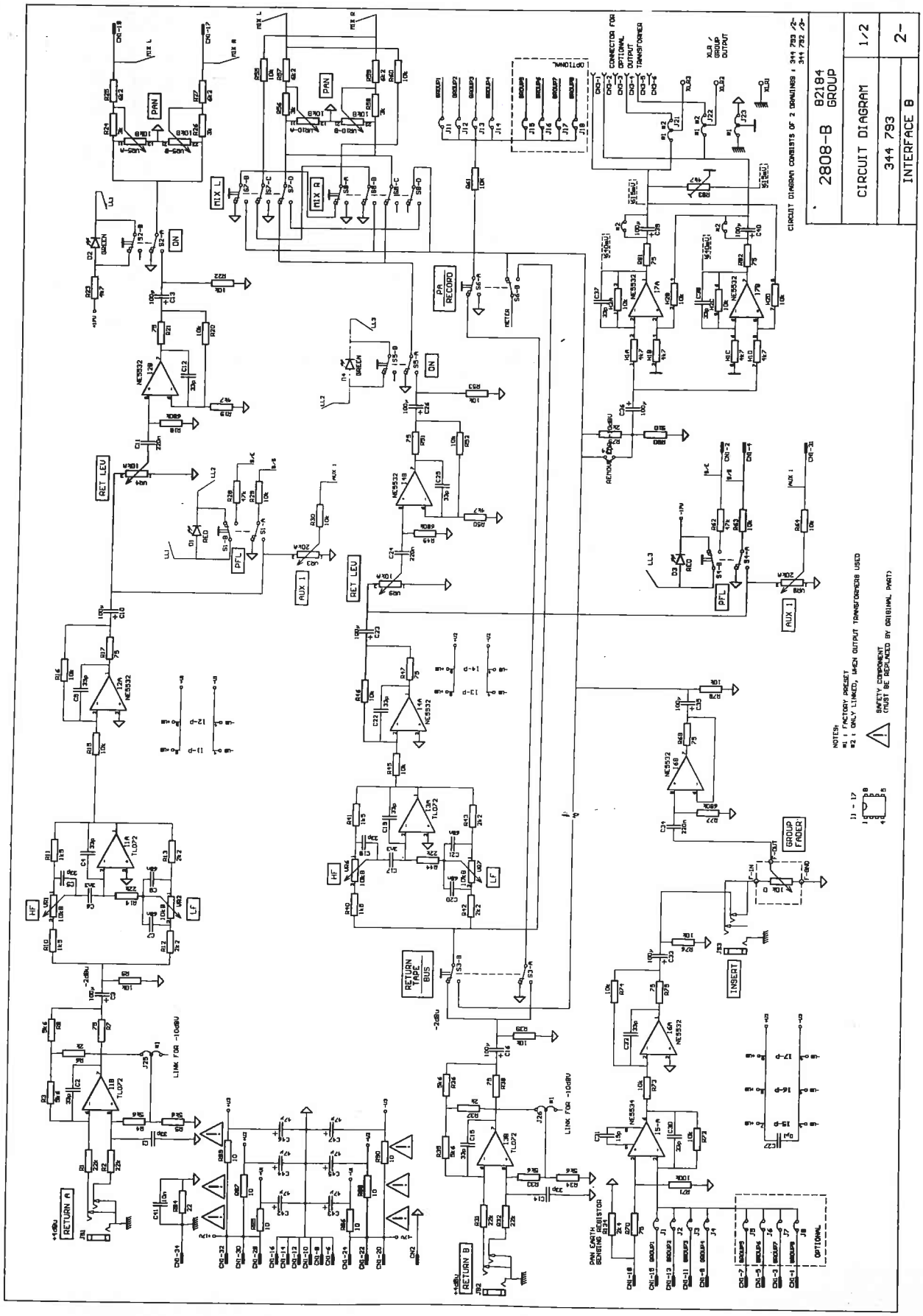
fl(-3dB) < 10 Hz **fu(-3dB) = 200 kHz**

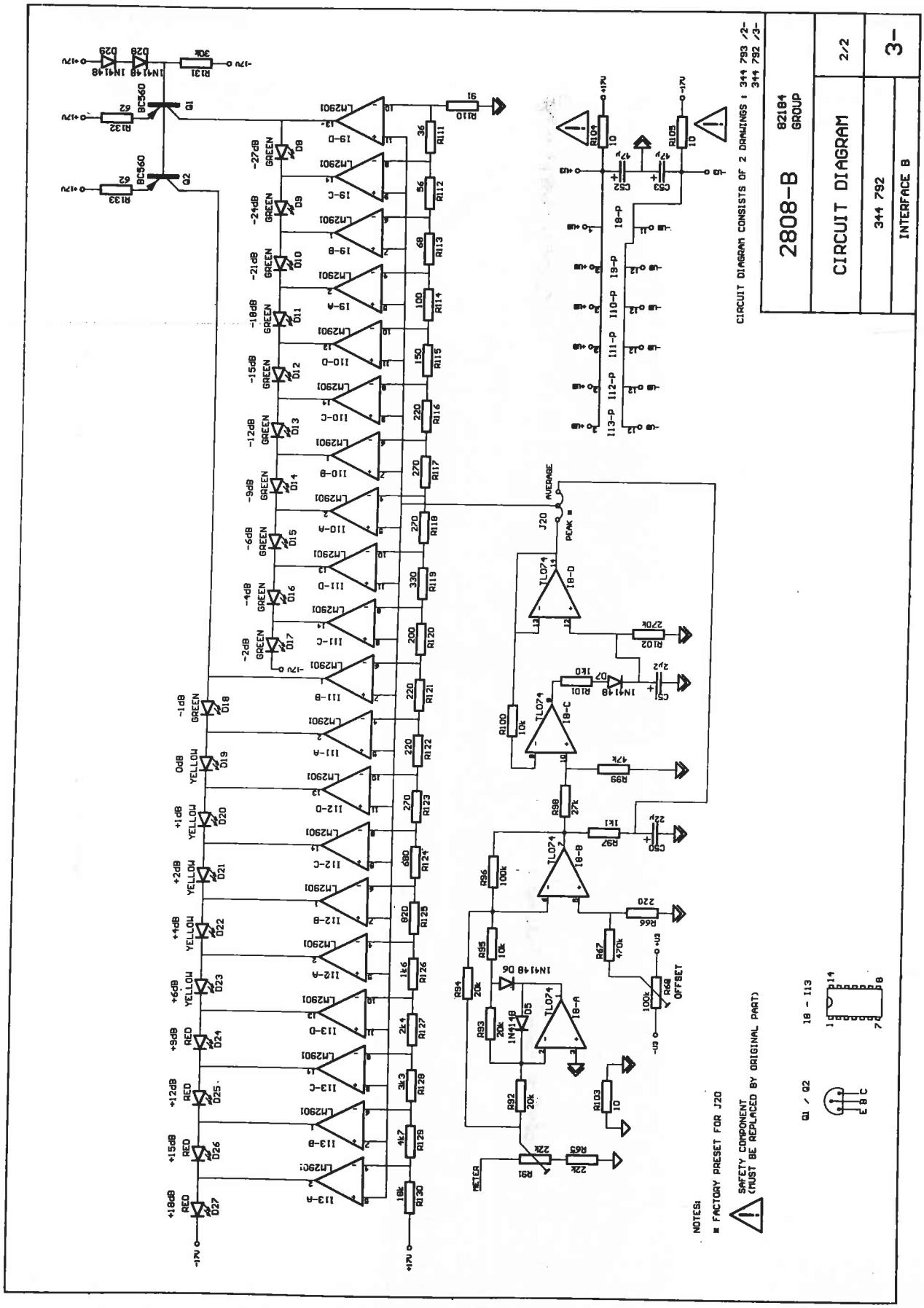
9.2. Frequency Response EQ RETURN A/B

- Feed in E(I) to input RETURN A/B
- Measure E(O) at CN1.17/19
- R(L) = 100 kohms
- Not mentioned EQ controls into centre position



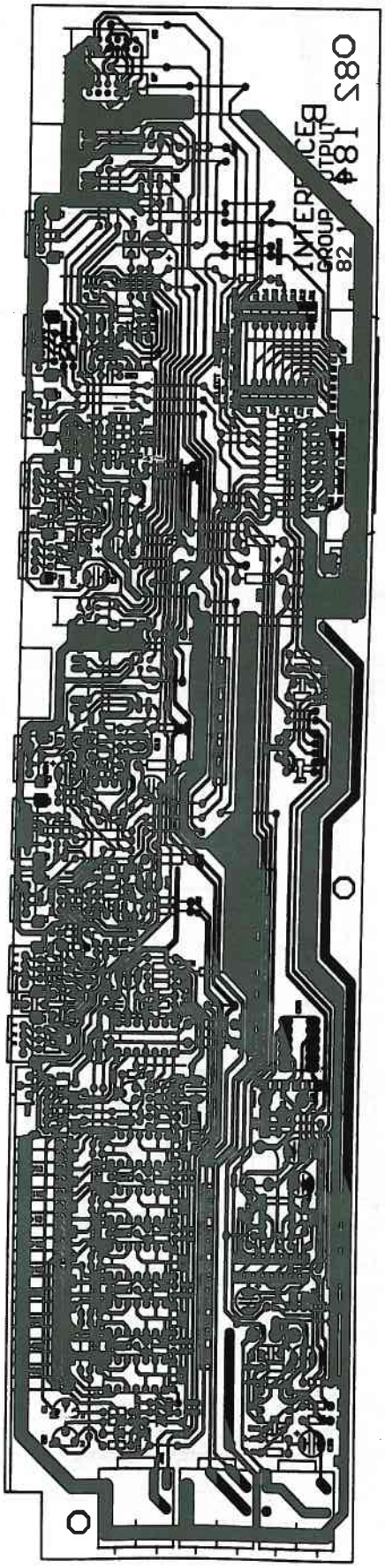

BLO-2808
BLOCK DIAGRAM
346 237
INTERFACE
2-
PFL BUS
AUX 1-6 BUSES
GROUPS 1-4 BUSES
L
R STEREO MIX BUSES
PAN
MIX L
MIX R
SUM AMP
INSERT
GROUP FADER
ON
RET LEV
AUX 1
PFL
HF +/-
LF +/-
2 BAND EQ
METER
PA RECORD
RETURN BUS
OUTPUT TRANSFORMER OPTION
GROUP OUTPUT
RETURN A
RETURN B
GROUP OUTPUT 2808


2808-B 82184
GROUP
CIRCUIT DIAGRAM
1/2
344 793
2-
INTERFACE B
CIRCUIT DIAGRAM CONSISTS OF 2 DRAWINGS : 344 793 /2-
344 792 /2-
CONNECTOR FOR OPTIONAL OUTPUT TRANSFORMER
XLR GROUP OUTPUT
OPTIONAL
MIX L
MIX R
PAN
PR RECORD
RET LEV
AUX 1
PFL
RETURN TAPE BUS
GROUP FADER
INSERT
RETURN A
RETURN B
LINK FOR -10dBV
PAN CENTRE RESISTOR
HF
LF
NOTES:
#1 : FACTORY PRESET
#2 : ONLY LINKED, WHEN OUTPUT TRANSFORMERS USED
SAFETY COMPONENT
(MUST BE REPLACED BY ORIGINAL PART)


2808-B
82184 GROUP
CIRCUIT DIAGRAM
2/2
344 792
3-
INTERFACE B
CIRCUIT DIAGRAM CONSISTS OF 2 DRAWINGS : 344 793 /2- 344 792 /3-
NOTES:
* FACTORY PRESET FOR J20
SAFETY COMPONENT (MUST BE REPLACED BY ORIGINAL PART)
Q1 / Q2
18 - 113
E B C
AVERAGE
PEAK *
METER
OFFSET

GRM 2808

COMPONENT SIDE



Pos. in diagram	description	Part-No.
B0010	connector XLR 3pol.	343539
R0010	fader 10 kohm log	343418
00020	plexiglas panel GRP-2808	345600
00030	rotary knob black/bl	344610
00040	rotary knob black/rd	344611
00050	rotary knob black/gr	344228
00060	rotary knob sw/li	344227
00080	fader knob bl/red 4mm	343164
00090	push button PFL	344586
00100	push button ON	344587
00110	push button grey	344280
00120	push button MIX	344574
0010	PCB INTERFACE B 2808 B	821848
C042	KO-EL 47MF 50V	343530
C043	KO-EL 47MF 50V	343530
C044	KO-EL 47MF 50V	343530
C045	KO-EL 47MF 50V	343530
C046	KO-EL 47MF 50V	343530
C047	KO-EL 47MF 50V	343530
C050	KO-EL 22MF 25V	327815
C051	KO-EL 2.2MF 50V	304986
C052	KO-EL 47MF 50V	343530
C053	KO-EL 47MF 50V	343530
D001	LED red 3mm	336399
D002	LED green 3mm	336398
D003	LED red 3mm	336399
D004	LED green 3mm	336398
D005	diode 1N 4148	301254
D006	diode 1N 4148	301254
D007	diode 1N 4148	301254
D010	LED 4xred+5xyel+11xgreen	344533
D028	diode 1N 4148	301254
D029	diode 1N 4148	301254
H001	res.network RKL 8A 472J	343456
H002	res.network RKL 8A 103J	343457
I001	IC TL 072 CP	331340
I002	IC NE 5532 N	327197
I003	IC TL 072 CP	331340
I004	IC NE 5532 N	327197
I005	IC NE 5534	309446
I006	IC NE 5532 N	327197
I007	IC NE 5532 N	327197
I008	IC TL 074 CN	332985
I009	IC LM 2901	343502
I010	IC LM 2901	343502
I011	IC LM 2901	343502
I012	IC LM 2901	343502
I013	IC LM 2901	343502
JS01	jack koax	343481
JS02	jack koax	343481
JS03	jack koax	343481
J001	connector 2x4pol.	335777
J011	connector 2x4pol.	335777
Q001	trans. BC 560 B	306928
Q002	trans. BC 560 B	306928
R068	trim. pot. 100k lin	338893
R083	trim. pot. 4,7 kOhm lin	327030
R085	safety resistor 10 ohm	329215
R086	safety resistor 10 ohm	329215
R087	safety resistor 10 ohm	329215
R088	safety resistor 10 ohm	329215
R089	safety resistor 10 ohm	329215
R090	safety resistor 10 ohm	329215
R091	trim. pot. 20kohm lin	343417
R104	safety resistor 10 ohm	329215
R105	safety resistor 10 ohm	329215
S001	switch	344037
S002	switch	344037
S003	switch	344037
S004	switch	344037
S005	switch	344037
S006	switch	344037
S007	switch	344038
S008	switch	344038
VR01	potentiometer 10kohm lin	343261
VR02	potentiometer 10kohm lin	343261
VR03	potentiometer 20kohm log	344032
VR04	potentiometer 10 kohm log	344035
VR05	potentiometer 2x10kohm lin	343549
VR06	potentiometer 10kohm lin	343261
VR07	potentiometer 10kohm lin	343261
VR08	potentiometer 20kohm log	344032
VR09	potentiometer 10 kohm log	344035
VR10	potentiometer 2x10kohm lin	343549

INTERFACE

MASTER MODULE 2810

SPECIFICATIONS: MASTER Module 2810

* 0 dBu = 0.775 V (RMS)
* Note Enclosure: Measurement Conditions INTERFACE

AUXILIARY SEND Output

* Electronically balanced
* Transformer can be retrofitted

		f = 1 kHz	f = 10 kHz
Nominal Output Level	:	+ 4 dBu Max.	
Output Level	:	+ 22 dBu	
Output Impedance	:	75 ohms	
Crosstalk (AUX - AUX)	:	< - 70 dB	< - 50 dB
Mix Bus Noise	:	< - 75 dBu	
THD	:	0.008 %	0.06 %
Rejection Factor at 1 kHz	:	> 35 dB	

MIX L/R Output

* Electronically balanced
* Transformer can be retrofittet

INSERT RETURN (Input Imped.)	:	< 10 kohms	
INSERT SEND (Nom. Level)	:	- 2 dBu	
INSERT SEND (max. Output Level)	:	+ 20 dBu	
STEREO MIX Nominal Output Level	:	+ 4 dBu / - 10 dBV	
STEREO MIX Max. Output Level	:	+ 27 dBu	
MONO Nominal Output Level	:	+ 4 dBu / - 10 dBV	
MONO Max. Output Level	:	+ 25 dBu	
Output Impedance	:	75 ohms	
Crosstalk (L/R)	:	< - 80 dB	< - 70 dB
Max. Fader Attenuation	:	> 90 dB	> 85 dB
Residual Bus Noise (Fader open)	:	< - 87 dBu	
THD (INSERT – MIX OUT)	:	0.002 %	0.002 %
Rejection Factor at 1 kHz	:	> 35 dB	

SPEAKER Output

* Ground compensated

SPEAKER Nominal Output Level	:	+ 4 dBu
SPEAKER Max. Output Level	:	+ 22 dBu
Output Impedance	:	75 ohms
Headphones Nominal Output Level	:	+ 14 dBu
Headphones Max. Output Level	:	+ 22 dBu at 100 kohms
		+ 20 dBu at 600 ohms
		+ 16 dBu at 150 ohms
TAPE RETURN Nominal Input Level	:	+ 4 dBu / 10 dBV
TAPE RETURN Max. Input Level	:	+ 27 dBu
Crosstalk (TAPE RET. - MIX OUT)	:	< - 70 dB < - 70 dB

Oscillator

Max. Output Level at MIX OUT L/R	:	+ 17 dBu
Frequency	:	1 kHz +/- 10 %
THD	:	< 0.7 %

Metering

* 20 Segment LED Bargraph

Reading	:	Peak	Average
selectable			
Rise Time to 0 dBu	:	1 ms	150 ms
Release Time to -20 dBu	:	2 s	250 ms
Rel. Accuracy	:	+/- 0.5 dB	
related to 0 dB			
Calibration Range (0 dB)	:	E(O) = - 1 dBu to + 12 dBu	
Factory Preset	:	E(O) = + 4 dBu	
Weight	:	1400 g	

SPECIFICATIONS: MASTER Module 2810

General measuring conditions if not noted elsewhere otherwise:

* Module not plugged into the ribbon cable. Operating voltage supplied externally.

* Measuring Tolerance	:	**ΛX = ± 1.5 dB**
* Measuring Frequency	:	**f = 1 kHz**
* All Levels related to	:	**E = 775 mV (0dBu)**
* PCB R	:	82186
* PCB L	:	82185
* Pin Assignment of XLR socket	:	PIN 1 = GND
		PIN 2 = + OUTPUT
		PIN 3 = - OUTPUT
* Pin Assignment INSERT Jack	:	TIP = SEND
		RING = RETURN
		SLEEVE = GND
* Pin Assignment Jack	:	TIP = + SIGNAL
		RING = - SIGNAL
		SLEEVE = GND

* Connect CN1.34 (METAL WORK) with CN1.16 (MIX EARTH)
* CN7.7 (82186) via 100 ohms to +17 V

1. Operating Voltage : **E(B) = +/- 17 V**

2. Current Input

2.1. Current Input	:	300 mA	300 mA
2.2. max. Current Input (with Lamp)	:	300 mA	610 mA

3. Balance Adjustment OUTPUT

3.1. MIX L/R and MONO

- The balance adjustment can be performed as follows:
* Measure output voltage balanced --> E1
* Sum XLR PIN2 and XLR PIN3 via high-precision resistors (< 10 kohms / < 0,5 %) to input of measuring instrument and adjust with trimmers R16(L), R38(R), R51(MONO) to minimum --> E2

Rejection factor = lg (E1/E2) = 35 dB

3.2. AUX

- The balance adjustment can be performed as follows:
* Feed in signal via 10k ohms to CN1.31/CN1.29/CN1.27/CN1.25/CN1.23 or CN1.21.
* Open AUX control
* Measure output voltage balanced –> E1
* Sum signal on TIP and RING of the AUX jacks via high-precision resistors (< 10 kohms / < 0,5 %) to input of measuring instrument and adjust with R17/R37/R57/R77/R97 or R117 to minimum –> E2

Rejection factor = lg (E1/E2) = > 35 dB

4. MIX, TAPE, CR MONITOR Input and Output Voltages

* Outputs terminated with R(L) = 100 kohms.
* Headphones Outputs terminated with R(L) = 2 x 200 ohms.
* Feed in to Bus Inputs with R(I) = 10 kohms.
* The Switches/Controls listed under notes must be pushed/opened full.
* Code jumpers on module to - 10 dBV: remove J1,J2,J9, insert J13,J14.

Input	E(I)	Test point	E(O)	Notes
CN1.17/.19	-2 dBu	MIX OUT L/R	-7.8 dBu	FADER
CN1.17/.19	0 dBu	MIX OUT MONO	+4.7 dBu	FADER,MONO LEVEL
TAPE RETL/R	-7.8 dBu	SPEAKER OUT	+ 4 dBu	2TRACK,MONIT

* Code jumpers on module to + 4 dBu (J1/J2/J3/J13/J14).

Input	E(I)	Test point	E(O)	Notes
CN1.17	0 dBu	INS.SEND R	0 dBu	
CN1.19	0 dBu	INS.SEND L	0 dBu	
INS.RET.L/R	0 dBu	MIX OUT L/R	+6 dBu	FADER
CN1.17/.19	0 dBu	MIX OUT MONO	+4.7dBu	FADER,MONO LEVEL,PRE
CN1.17/.19	0 dBu	HEADPH. L/R	+12 dBu	FADER,MONIT,HEADPHONES
TAPE RETL/R	0 dBu	SPEAKER OUT	-0.5dBu	2TRACK,MONIT
CN1.27	0 dBu	SPEAKER OUT	+5.5dBu	AFL button(AUX1-6),MONIT

5. AUX 1 - 6 Input and Output Voltages

* Outputs terminated with R(L) = 100 kohms.
* Feed in to Bus Inputs with R(I) = 10 kohms.
* The Switches/Controls listed under notes must be pushed/opened full.
* J = Code jumper
* Press the according AFL button and check function of level meter.

Input	E(I)	Test point	E(O)	Notes
CN1.31	0 dBu	AUX1 socket	+16 dBu	AUX1
CN1.31	0 dBu	AUX1 socket	+4.5 dBu	AUX1,J1(-10dBV)
CN1.31	0 dBu	CN1.4	- 6 dBu	AUX1,AFL
CN1.29	0 dBu	AUX2 socket	+16 dBu	AUX2
CN1.29	0 dBu	AUX2 socket	+4.5 dBu	AUX2,J21(-10dBV)
CN1.29	0 dBu	CN1.4	- 6 dBu	AUX2,AFL
CN1.27	0 dBu	AUX3 socket	+16 dBu	AUX3
CN1.27	0 dBu	AUX3 socket	+4.5 dBu	AUX3,J41(-10dBV)
CN1.27	0 dBu	CN1.4	- 6 dBu	AUX3,AFL
CN1.25	0 dBu	AUX4 socket	+16 dBu	AUX4
CN1.25	0 dBu	AUX4 socket	+4.5 dBu	AUX4,J61(-10dBV)
CN1.25	0 dBu	CN1.4	- 6 dBu	AUX4,AFL
CN1.23	0 dBu	AUX5 socket	+16 dBu	AUX5
CN1.23	0 dBu	AUX5 socket	+4.5 dBu	AUX5,J81(-10dBV)
CN1.23	0 dBu	CN1.4	- 6 dBu	AUX5,AFL
CN1.21	0 dBu	AUX6 socket	+16 dBu	AUX6
CN1.21	0 dBu	AUX6 socket	+4.5 dBu	AUX6,J101(-10dBV)
CN1.21	0 dBu	CN1.4	- 6 dBu	AUX6,AFL

6. Oscillator

* Switch oscillator ON, OSC LEVEL fully opened, R(L) = 100 kohms

Test point	E(O)	Note
CN1.1/.3/.5/.7/.9/.11/.13/.15	+19.5 dBu	
MIX OUT L/R	+17.5 dBu	f = 1 kHz +/-10%
AUX 1-6	+ 21 dBu	AUX 1-6
MONO OUT	+ 22 dBu	MONO LEVEL

7. Talkback

* Terminate outputs with R(L) = 100 kohms.
* The Switches/Controls listed under notes must be pushed/opened full.
* R(Q) = 150 ohms for INPUT TALKBACK MIC.

Input	E(I)	Test point	E(O)	Notes
MIC TALKB.	-42 dBu	AUX 1/2 SEND	+10 dBu	1-2,AUX 1/2,TB GAIN
MIC TALKB.	-42 dBu	AUX 1-6 SEND	+10 dBu	ALL,AUX 1-6,TB GAIN
MIC TALKB.	-42 dBu	MIX OUT L/R	+ 6 dBu	FADER,ALL,TB GAIN
INS.RET L/R	0 dBu	SPEAKER L/R	-- OFF --	ALL,FADER,MONIT.

8. Meter Calibration

* Plug code jumper J2(L), J16(R) to PEAK.

- Levelset:

* Feed in signal to CN1.17/.19 via 10 kohms so that + 4 dBu can be measured at MIX OUT.
* Adjust meter with trimmer R130(L) / R190(R) so that the first yellow LED will begin to light up.

- Offset adjustment:

* Feed in signal to CN1.17/.19 via 10 kohms so that - 23 dBu can be measured at MIX OUT.
* Adjust meter with trimmer R126(L) / R238(R) so that the first green LED will begin to light up.

* Drive meter circuit with different levels and check.
* e.g.: E(O) = +16 dBu —> Meter indication +12 dB
  E(O) = - 14 dBu —> Meter indication -18 dB
  (max. deviation: +/- 1.0 dB)

- Check the Reading Characteristic: switch signal on and off

* Code jumper J2(L) / J16(R) to AVERAGE
  —> Rise time : slow (150ms)
  Release Time : fast (250ms)
* Code jumper J2(L) / J16(R) to PEAK

  —> Rise time : fast (1ms)
  Release Time : slow (2s)

- Factory preset : Code jumper J2(L) / J16(R) to PEAK

9. Distortion (THD)

* Feed in to Bus Points with R(I) = 10 kohms.
* AUX SUM = CN1.21/.23/.25/.27/.29/.31

Input	E(I)	Test point	E(O)	THD	Notes
AUX SUM	+ 4dBu	AUX1-6	+20dBu	0.005%	f=1kHz,AUX1-6
AUX SUM	+ 4dBu	AUX1-6	+20dBu	0.02 %	f=10kHz,AUX1-6
CN1.17/.19	+14dBu	MIX O/P	+20dBu	0.002%	f=1kHz,FADER
CN1.17/.19	+14dBu	MIX O/P	+20dBu	0.005%	f=10kHz,FADER

10. Max. Output Level

* Vary E(I) and control so that max. output level is reached.
* AUX SUM = CN1.21/.23/.25/.27/.29/.31

Input	E(I)	Test point	E(O)	R(L)	Notes
CN1.17/.19	var.	INS.SEND	> +21dBu	600 ohms	
CN1.17/.19	var.	MIX OUT	> +25dBu	600 ohms	FADER
CN1.17/.19	var.	MIX MONO	> +24dBu	600 ohms	FADER,MONO LEVEL
CN1.17/.19	var.	SPEAKER L/R	> +21dBu	5 kohms	FADER,MONIT.LEVEL
AUX SUM	var.	AUX 1-6	> +22dBu	600 ohms	AUX 1-6
CN1.17/.19	var.	HEADPHONES	> +17dBu	200 ohms	FADER,MONIT.LEV.HEAD.

11. Frequency Response

* AUX SUM = CN1.21/.23/.25/.27/.29/.31
* Cut-off frequency is measured at - 3 dB

Input	Test point	fl(-3dB)	fu(-3dB)
AUX SUM	AUX SEND 1-6	< 10 Hz	160 kHz
CN1.17/.19	MIX OUT L/R/MONO	< 10 Hz	> 200 kHz
TAPE RETURN	SPEAKER L/R	1< 0 Hz	120 kHz

12. Noise Voltages

- measured with AUDIO PRECISION SYSTEM ONE
- R(L) = 100 kohms
- E(F) = Noise voltage, RMS, 22 Hz ... 22 kHz
- E(G) = Noise voltage, frequ.weighted acc. CCIR 468, Q - PEAK
- Code jumper J24 at module to + 4 dBu

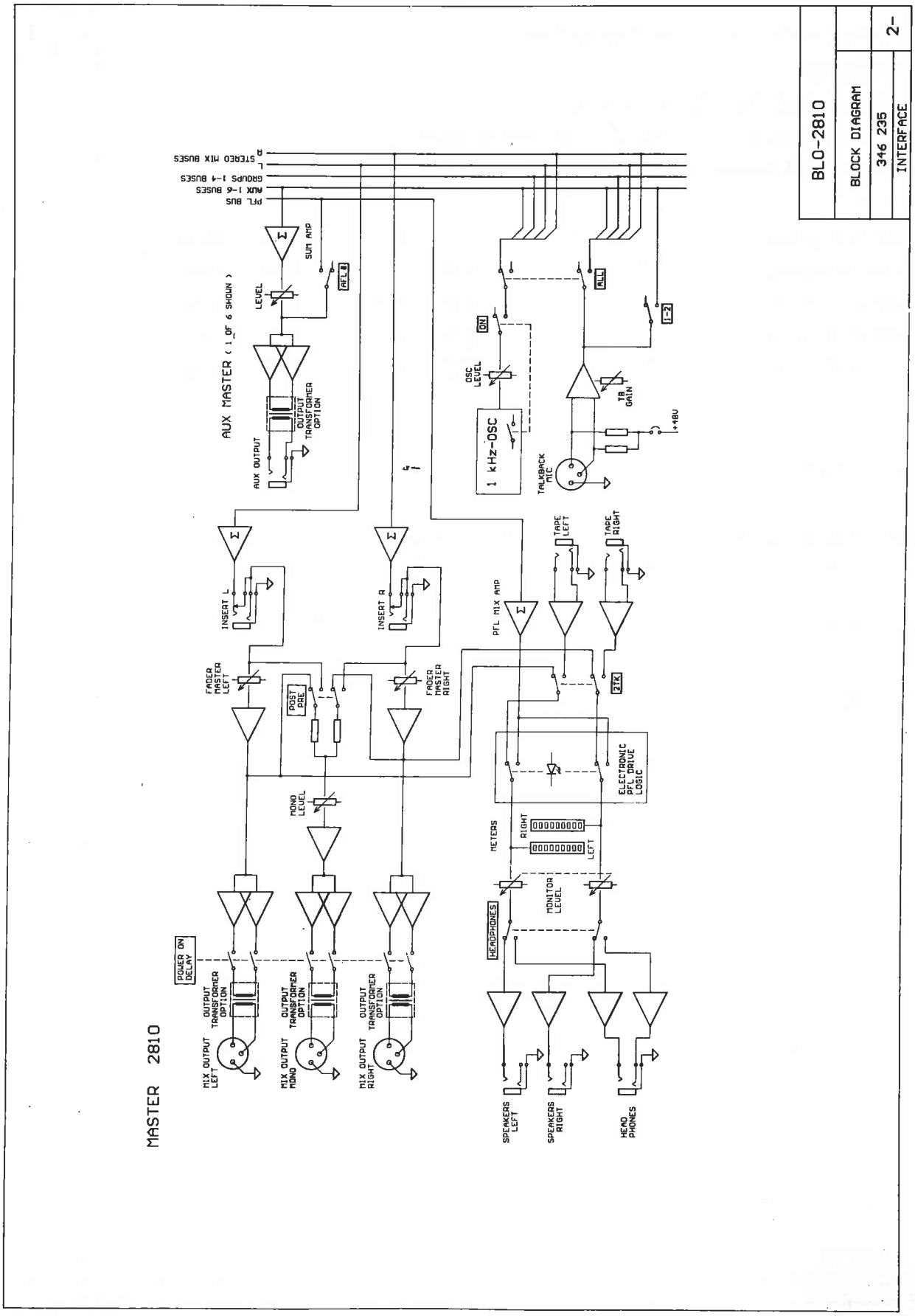
12.1. AUX 1-6 opened:	**E(F) ≤ 55 uV**	**E(G) ≤ 180 uV**
12.2. AUX 1-6 closed:	**E(F) ≤ 20 uV**	**E(G) ≤ 70 uV**
12.3. MIX OUT L/R Fader closed	**E(F) ≤ 6 uV**	**E(G) ≤ 20 uV**
12.4. MIX OUT L/R Fader open	**E(F) ≤ 20 uV**	**E(G) ≤ 60 uV**
12.5. MIX OUT MONO Fader open,Regler open	**E(F) ≤ 25 uV**	**E(G) ≤ 85 uV**

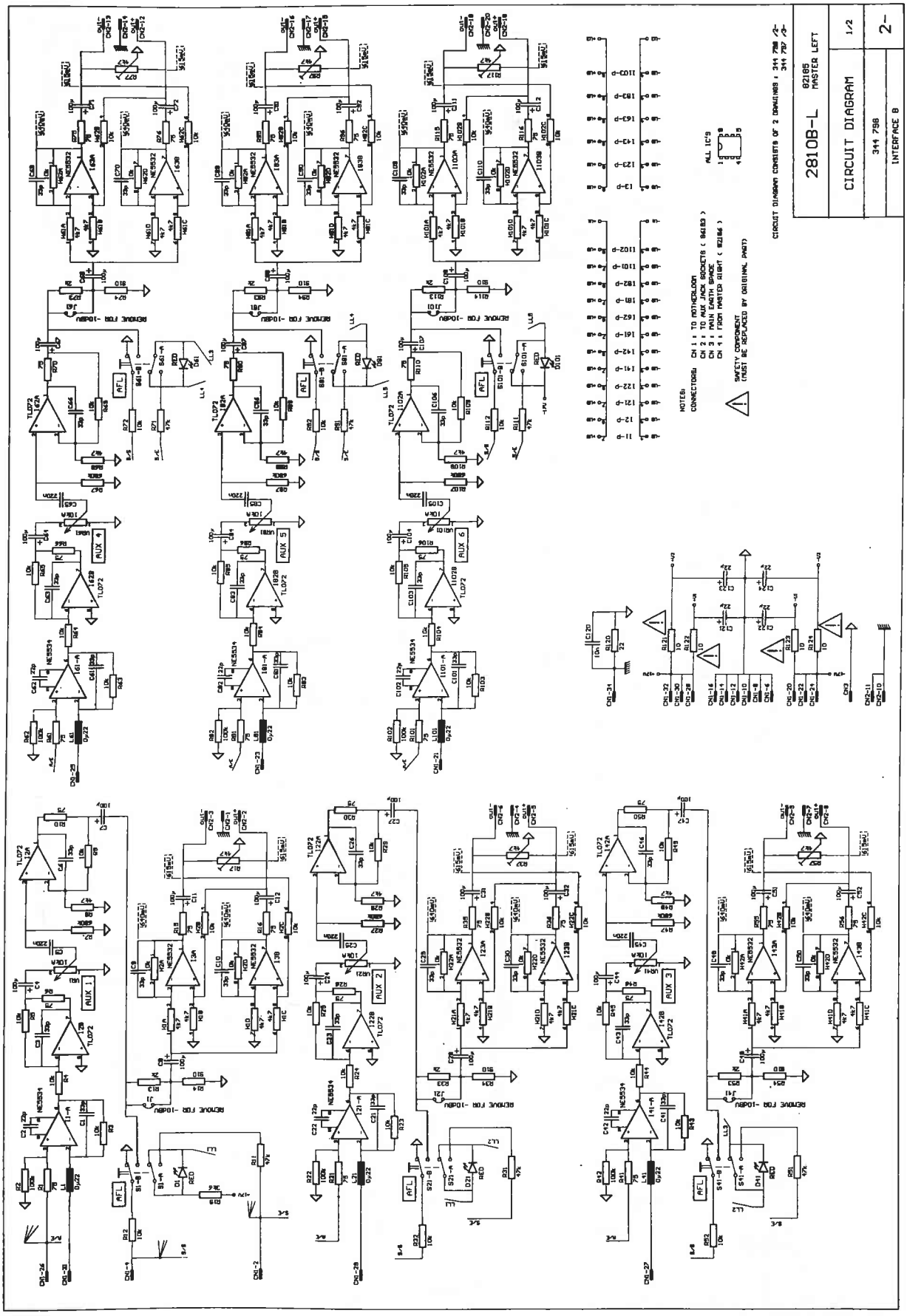
13. Phantom Power Supply

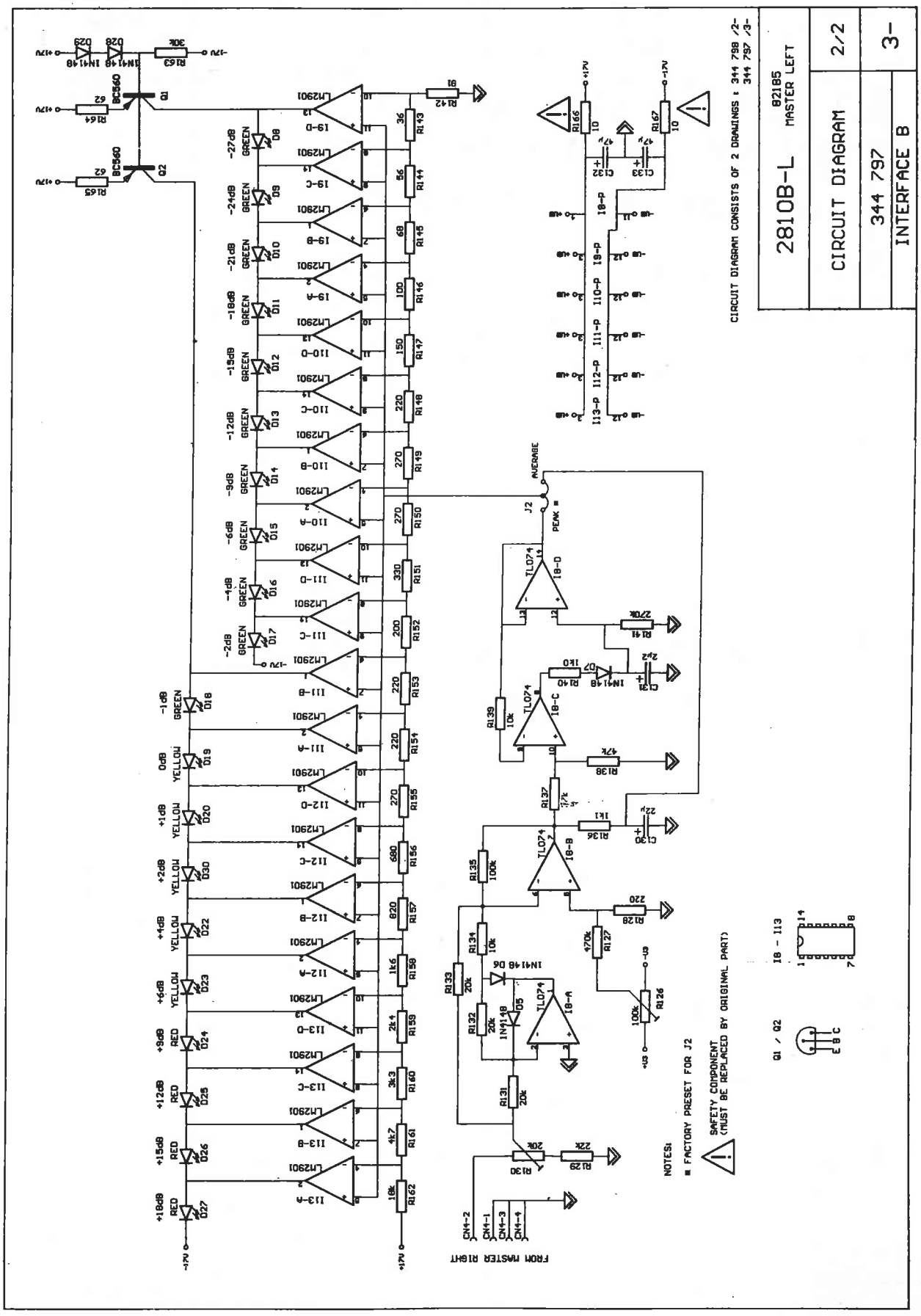
In position code jumper (J15) PHANTOM POWER ON the voltage between PIN 2 and PIN 1 or PIN 3 and PIN 1 of the TALKBACK MIC socket must be E(DC) = + 48 V.

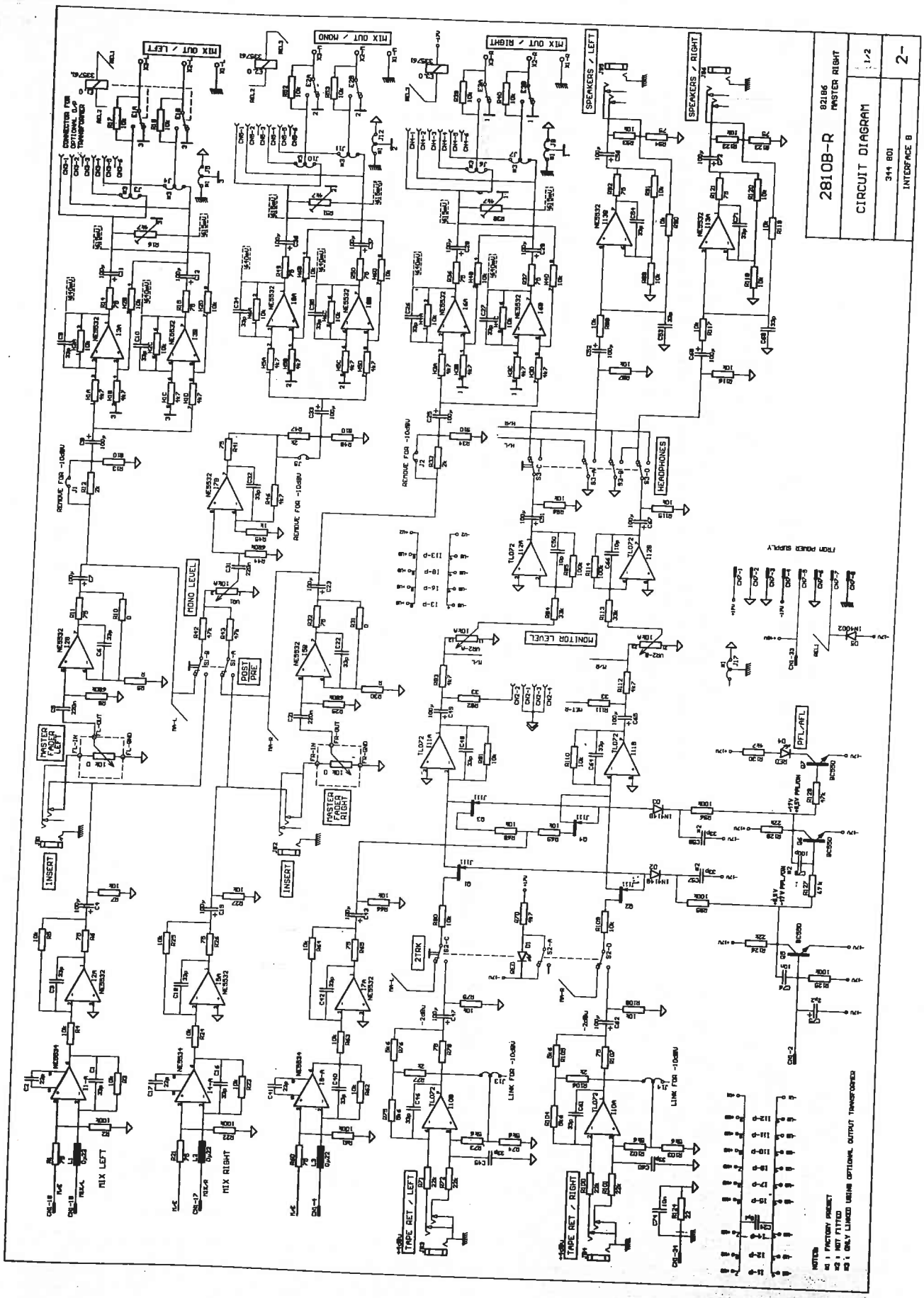
14. Factory Preset

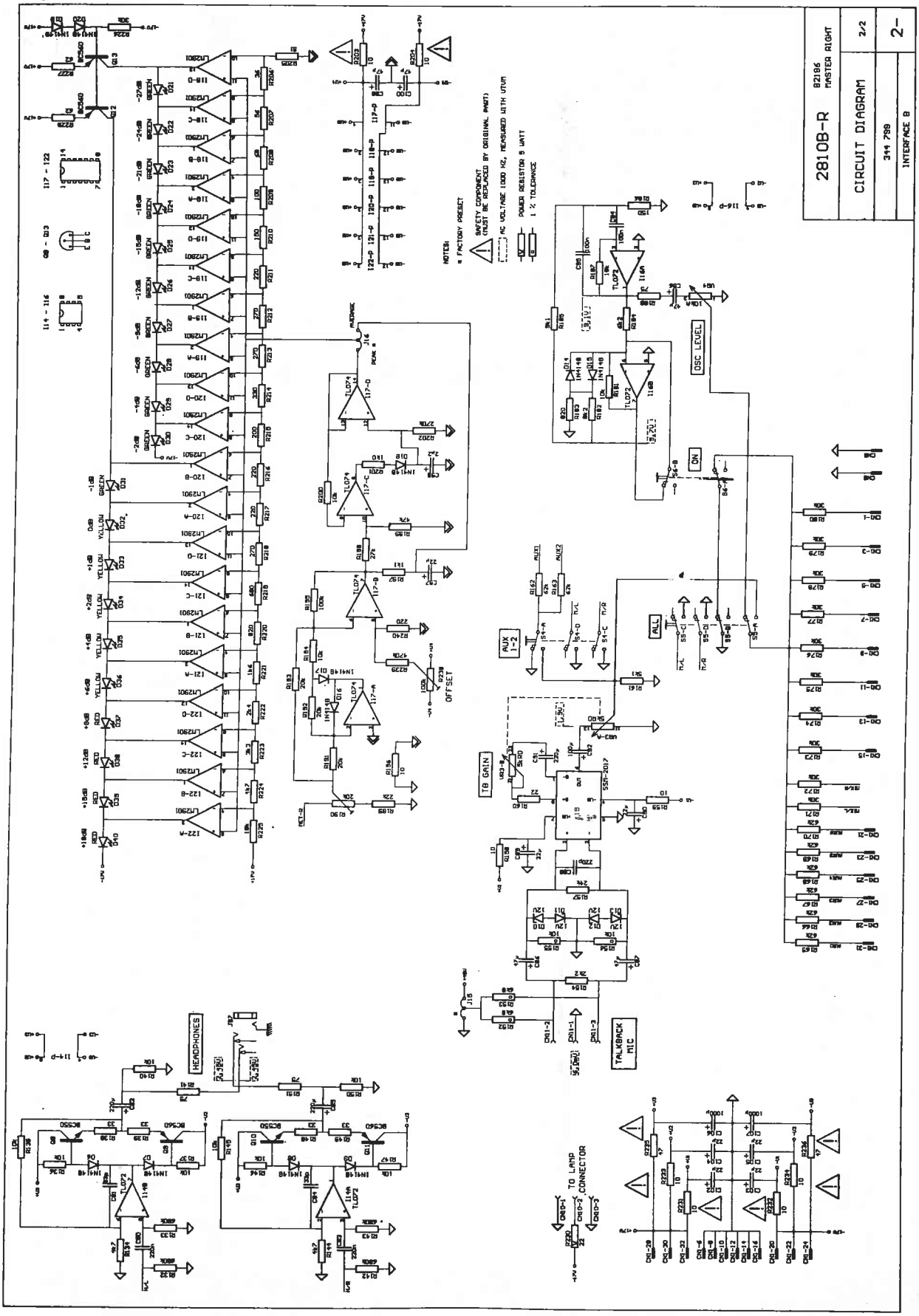
* Code jumpers inputs/outputs to + **4 dBu**
* Code jumper meter to **PEAK**
* MIC TALKBACK not encoded to **+48 V**


BLO-2810
BLOCK DIAGRAM
346 235
2-
INTERFACE
MASTER 2810
STEREO MIX BUSES
GROUPS 1-4 BUSES
AUX 1-6 BUSES
PFL BUS
SUM AMP
AUX MASTER (1 OF 6 SHOWN)
LEVEL
AFL
AUX OUTPUT
OUTPUT TRANSFORMER OPTION
OSC LEVEL
ON
1 kHz-OSC
TALKBACK MIC
TB GAIN
+48V
ALL
1-2
INSERT L
INSERT R
PFL MIX AMP
TAPE LEFT
TAPE RIGHT
FADER MASTER LEFT
FADER MASTER RIGHT
POST PRE
21K
ELECTRONIC PFL DRIVE LOGIC
MONO LEVEL
METERS
RIGHT
LEFT
MONITOR LEVEL
HEADPHONES
POWER ON DELAY
MIX OUTPUT LEFT
MIX OUTPUT MONO
MIX OUTPUT RIGHT
SPEAKERS LEFT
SPEAKERS RIGHT
HEAD PHONES


2810B-L
82165
MASTER LEFT
CIRCUIT DIAGRAM
1/2
344 796
2-
INTERFACE B
CIRCUIT DIAGRAM CONSISTS OF 2 DRAWINGS : 344 796
344 797
NOTES:
CONNECTORS: CH 1 : TO MOTHERBOARD
CH 2 : TO AUX JACK SOCKETS (84183)
CH 3 : MAIN EARTH SPACE
CH 4 : FROM MASTER RIGHT (82164)
ALL IC'S
SAFETY COMPONENT
(MUST BE REPLACED BY ORIGINAL PART)
REMOVE FOR -10dBV
AUX 1
AUX 2
AUX 3
AUX 4
AUX 5
AUX 6
AFL
RED

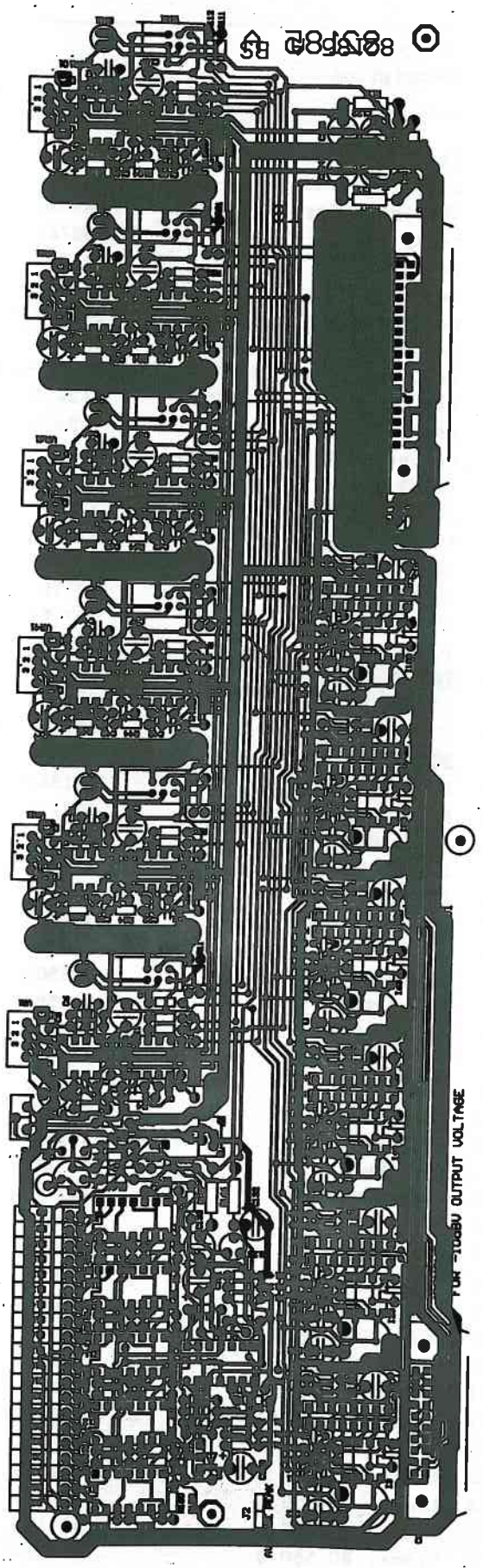

2810B-L
82185
MASTER LEFT
CIRCUIT DIAGRAM
2/2
344 797
3-
INTERFACE B
CIRCUIT DIAGRAM CONSISTS OF 2 DRAWINGS : 344 798 /2-
344 797 /3-
NOTES:
■ FACTORY PRESET FOR J2
SAFETY COMPONENT
(MUST BE REPLACED BY ORIGINAL PART)
FROM MASTER RIGHT
AVERAGE
PEAK ■
Q1 / Q2
I8 - I13


2810B-R 02186 MASTER RIGHT
CIRCUIT DIAGRAM
344 801
INTERFACE B
2-
1-2
MIX OUT / LEFT
MIX OUT / MONO
MIX OUT / RIGHT
SPEAKERS / LEFT
SPEAKERS / RIGHT
HEADPHONES
MONO LEVEL
MONITOR LEVEL
MASTER FADER LEFT
MASTER FADER RIGHT
INSERT
POST PRE
PFL/AFL
2TRK
TAPE RET / LEFT
TAPE RET / RIGHT
MIX LEFT
MIX RIGHT
FROM POWER SUPPLY
NOTES

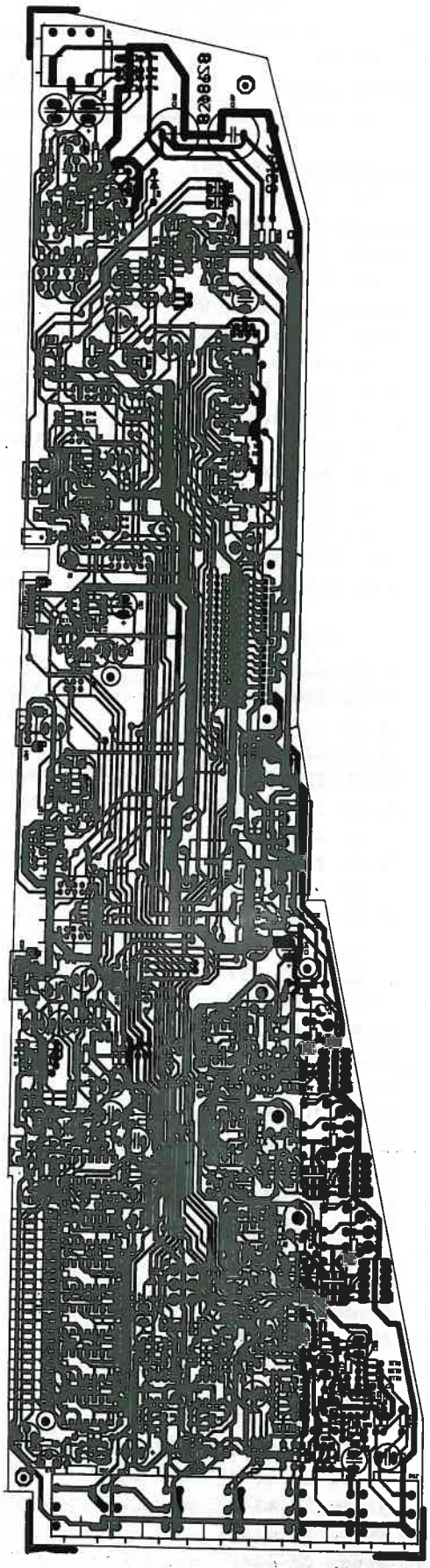

2810B-R
B2186
MASTER RIGHT
CIRCUIT DIAGRAM
2/2
344 798
2-
INTERFACE B
NOTES:
* FACTORY PRESET
SAFETY COMPONENT
(MUST BE REPLACED BY ORIGINAL PART)
AC VOLTAGE 1000 Hz, MEASURED WITH VTVM
POWER RESISTOR 5 WATT
1 % TOLERANCE
OSC LEVEL
ON
ALL
AUX 1-2
TB GAIN
OFFSET
HEADPHONES
TALKBACK MIC
TO LAMP CONNECTOR

COMPONENT SIDE

MASTER L 82185



MASTER R 82186



Pos. in diagram	description	Part-No.
B0010	connector XLR 3pol.	343539
B0020	socket XLR 3pol.	347014
00010	socket XLR 3pol.	343538
B0030	socket BNC 50 OHM	332374
R0010	fader 10 kohm log	343418
00020	plexiglas panel GRP-2808	345600
00030	rotary knob black/bl	344610
00040	rotary knob black/rd	344611
00080	fader knob bl/red 4mm	343164
00090	pusch button AFL	344588
00100	push button 1-2	344576
00110	pusch button ON	344578
00120	pusch button ALL	344579
00130	pusch button 2TRK	345578
00132	push button PRE	345575
00134	push button grey	344280
0010	PCB INTERFACE B 2810 B	821868
C075	KO-EL 2.2MF 50V	304986
C082	KO-EL 220 MF 25V	343533
C085	KO-EL 220 MF 25V	343533
C089	KO-EL 22MF 25V	327815
C090	KO-EL 22MF 25V	327815
C091	KO-EL 220 MF 25V	343533
C096	KO-EL 47MF 50V	343530
C097	KO-EL 22MF 25V	327815
C098	KO-EL 2.2MF 50V	304986
C099	KO-EL 47MF 50V	343530
C100	KO-EL 47MF 50V	343530
C102	KO-EL 22MF 25V	327815
C103	KO-EL 22MF 25V	327815
C104	KO-EL 22MF 25V	327815
C105	KO-EL 22MF 25V	327815
C106	KO-EL 1000MF 25V	337597
C107	KO-EL 1000MF 25V	337597
D001	LED red 3mm	336399
D002	diode 1N 4148	301254
D003	diode 1N 4148	301254
D004	LED red 3mm	342073
D005	diode 1N 4002	304360
D006	diode 1N 4148	301254
D007	diode 1N 4148	301254
D008	diode 1N 4148	301254
D009	diode 1N 4148	301254
D010	diode zener ZPD 12V 0,5W	305738
D011	diode zener ZPD 12V 0,5W	305738
D012	diode zener ZPD 12V 0,5W	305738
D013	diode zener ZPD 12V 0,5W	305738
D014	diode 1N 4148	301254
D015	diode 1N 4148	301254
D016	diode 1N 4148	301254
D017	diode 1N 4148	301254
D018	diode 1N 4148	301254
D019	diode 1N 4148	301254
D020	diode 1N 4148	301254
D021	LED 4xred+5xyel+11xgreen	344533
E001	relay A101	335761
E002	relay A101	335761
E003	relay A101	335761
H001	res.network RKL 8A 472J	343456
H002	res.network RKL 8A 103J	343457
H003	res.network RKL 8A 472J	343456
H004	res.network RKL 8A 103J	343457
H005	res.network RKL 8A 472J	343456
H006	res.network RKL 8A 103J	343457
I001	IC NE 5534	309446
I002	IC NE 5532 N	327197
I003	IC NE 5532 N	327197
I004	IC NE 5534	309446
I005	IC NE 5532 N	327197
I006	IC NE 5532 N	327197
I007	IC NE 5532 N	327197
I008	IC NE 5532 N	327197
I009	IC NE 5534	309446
I010	IC TL 072 CP	331340
I011	IC TL 072 CP	331340
I012	IC TL 072 CP	331340
I013	IC NE 5532 N	327197
I014	IC TL 072 CP	331340
I015	IC SSM 2017 P	345485
I016	IC TL 072 CP	331340
I017	IC TL 074 CN	332985
I018	IC LM 2901	343502
I019	IC LM 2901	343502
I020	IC LM 2901	343502
I021	IC LM 2901	343502
I022	IC LM 2901	343502
JS01	jack koax	343481
JS02	jack koax	343481
JS03	jack koax	343481
JS04	jack koax	343481
JS05	jack koax	343481
JS06	jack koax	343481
JS07	jack koax	343481
L001	coil 0,22 UH	343475
L002	coil 0,22 UH	343475
L003	coil 0,22 UH	343475
Q001	trans. J 111 A	330264
Q002	trans. J 111 A	330264
Q003	trans. J 111 A	330264
Q004	trans. J 111 A	330264
Q005	trans. BC 550 B	301184
Q006	trans. BC 550 B	301184
Q007	trans. BC 550 B	301184
Q008	trans. BC 550 B	301184
Q009	trans. BC 560 B	306928

Pos. in diagram	description	Part-No.
Q010	trans. BC 550 B	301184
Q011	trans. BC 560 B	306928
Q012	trans. BC 560 B	306928
Q013	trans. BC 560 B	306928
R016	trim. pot. 4,7 kOhm lin	327030
R038	trim. pot. 4,7 kOhm lin	327030
R051	trim. pot. 4,7 kOhm lin	327030
R190	trim. pot. 20kohm lin	343417
R203	safety resistor 10 ohm	329215
R204	safety resistor 10 ohm	329215
R230	wire-wound resistor 22 ohm	301726
R231	safety resistor 10 ohm	329215
R232	safety resistor 10 ohm	329215
R233	safety resistor 10 ohm	329215
R234	safety resistor 10 ohm	329215
R235	safety resistor 33 Ohm	328770
R236	safety resistor 33 Ohm	328770
R238	trim. pot. 100k lin	338893
S001	switch	344037
S002	switch	344038
S003	switch	344038
S004	switch	344038
S005	switch	344038
S006	switch	344037
VR01	potentiometer 10 kohm log	344035
VR02	potentiometer 2x10 kohm log	344036
VR03	potentiometer 2x5 kohm log	344034
VR04	potentiometer 10 kohm log	344035
0020	PCB INTERFACE B 2810 B	821858
C121	KO-EL 22MF 25V	327815
C122	KO-EL 22MF 25V	327815
C123	KO-EL 22MF 25V	327815
C124	KO-EL 22MF 25V	327815
C130	KO-EL 22MF 25V	327815
C131	KO-EL 2.2MF 50V	304986
C132	KO-EL 47MF 50V	343530
C133	KO-EL 47MF 50V	343530
D 1	LED red 3mm	336399
D 5	diode 1N 4148	301254
D 6	diode 1N 4148	301254
D 7	diode 1N 4148	301254
D 21	LED red 3mm	336399
D 28	diode 1N 4148	301254
D 29	diode 1N 4148	301254
D 41	LED red 3mm	336399
D 61	LED red 3mm	336399
D 81	LED red 3mm	336399
D101	LED red 3mm	336399
H 1	res.network RKL 8A 472J	343456
H 2	res.network RKL 8A 103J	343457
H 21	res.network RKL 8A 472J	343456
H 22	res.network RKL 8A 103J	343457
H 41	res.network RKL 8A 472J	343456
H 42	res.network RKL 8A 103J	343457
H 61	res.network RKL 8A 472J	343456
H 62	res.network RKL 8A 103J	343457
H 81	res.network RKL 8A 472J	343456
H 82	res.network RKL 8A 103J	343457
H101	res.network RKL 8A 472J	343456
H102	res.network RKL 8A 103J	343457
I 1	IC NE 5534	309446
I 2	IC TL 072 CP	331340
I 3	IC NE 5532 N	327197
I 8	IC TL 074 CN	332985
I 9	IC LM 2901	343502
I 10	IC LM 2901	343502
I 11	IC LM 2901	343502
I 12	IC LM 2901	343502
I 13	IC LM 2901	343502
I 21	IC NE 5534	309446
I 22	IC TL 072 CP	331340
I 23	IC NE 5532 N	327197
I 41	IC NE 5534	309446
I 42	IC TL 072 CP	331340
I 43	IC NE 5532 N	327197
I 61	IC NE 5534	309446
I 62	IC TL 072 CP	331340
I 63	IC NE 5532 N	327197
I 81	IC NE 5534	309446
I 82	IC TL 072 CP	331340
I 83	IC NE 5532 N	327197
I101	IC NE 5534	309446
I102	IC TL 072 CP	331340
I103	IC NE 5532 N	327197
L 1	coil 0,22 UH	343475
L 21	coil 0,22 UH	343475
L 41	coil 0,22 UH	343475
L 61	coil 0,22 UH	343475
L 81	coil 0,22 UH	343475
L101	coil 0,22 UH	343475
Q 1	trans. BC 560 B	306928
Q 2	trans. BC 560 B	306928
R 17	trim. pot. 4,7 kOhm lin	327030
R 37	trim. pot. 4,7 kOhm lin	327030
R 57	trim. pot. 4,7 kOhm lin	327030
R 77	trim. pot. 4,7 kOhm lin	327030
R 97	trim. pot. 4,7 kOhm lin	327030
R117	trim. pot. 4,7 kOhm lin	327030
R121	safety resistor 10 ohm	329215
R122	safety resistor 10 ohm	329215
R123	safety resistor 10 ohm	329215
R124	safety resistor 10 ohm	329215
R126	trim. pot. 100k lin	338893
R130	trim. pot. 20kohm lin	343417
R166	safety resistor 10 ohm	329215

Pos. in diagram	description	Part-No.	Pos. in diagram	description	Part-No.
R167	safety resistor 10 ohm	329215			
S 1	switch	344037			
S 21	switch	344037			
S 41	switch	344037			
S 61	switch	344037			
S 81	switch	344037			
S101	switch	344037			
0020	LED 4xred+5xyel+11xgreen	344533			
VR 1	potentiometer 10 kohm log	344035			
VR 21	potentiometer 10 kohm log	344035			
VR 41	potentiometer 10 kohm log	344035			
VR 61	potentiometer 10 kohm log	344035			
VR 81	potentiometer 10 kohm log	344035			
VR101	potentiometer 10 kohm log	344035			

INTERFACE

6 IN 1 INPUT MODULE 2816

SPECIFICATIONS: 6 > 1 MIC INPUT Module 2816

* 0 dBu = 0.775 V (RMS)
* Note enclosure: Measurement conditions
* VOL control into position 7

MICROPHONE INPUT

* Electronically balanced.
* Transformer can be retrofitted.

Input Impedance	:	> 1.6 kohms
Input Sensitivity Range at Output Level +4 dBu	:	- 2 dBu ... - 72 dBu
Max. Input Level	:	+ 13 dBu
Common Mode Rejection Ratio (CMRR) with max. Gain, f = 1kHz	:	> 80 dB
Equivalent Input Noise R(Q) = 150 ohms, 22 Hz ... 22 kHz, with max. Gain	:	< - 127.5 dBu

GENERAL SPECIFICATIONS

		f = 1 kHz	f = 10 kHz
Channel Muting MIC 1-6	:	> 90 dB	> 80 dB
Channel Muting "ON" switch	:	> 90 dB	> 70 dB
Fader Rejection (OFF)	:	> 100 dB	> 85 dB
Panpot Isolation (L/R)	:	> 90 dB	> 65 dB
Muting "Routing" Switch	:	> 100 dB	> 85 dB
MAX. AUX SEND Attenuation	:	> 85 dB	> 75 dB
THD (MIC – MIX OUT) (Gain 30 dB)	:	< 0.005 %	< 0.02 %
Weight	:	1300 gr.	

FREQUENCY RESPONSE EQ

Boost/Cut	:	+/- 15 dB
Filter Frequencies	:	HF 12 kHz (shelving)

HMF 470 Hz ... 15 kHz
(peaking with Q = 1.3)

LMF 70 Hz ... 2.2 kHz
(peaking with Q = 1.3)

LF 50 Hz (shelving with
VLF rolloff at 25 Hz)

HIGHPASS FILTER -3 dB at
80 Hz, 2. order

SPECIFICATIONS: 6 > 1 MIC INPUT Module 2816

General measuring conditions if not noted elsewhere otherwise:

* Module not plugged into the ribbon cable. Operating voltage supplied externally.
* Measuring Tolerance : **$\Delta X = \pm 1.5$ dB**
* Measuring Frequency : **f = 1 kHz**
* All Levels related to : **E = 775 mV (0dBu)**
* CN2.XX is located on PCB.81281
* Gain Control fully counterclockwise
* EQ Controls into centre Position
* Panpot into centre Position
* Pin Assignment of XLR Socket :
  PIN 1 = GND
  PIN 2 = + INPUT
  PIN 3 = - INPUT
* Source Impedance with feed in via XLR socket : R(Q) = 150 ohms

1. Operating Voltage : **E(B) = +/- 17 V**

2. Current Input : **I(B) = 230 mA**

3. Input and Output Voltages

* The controls and switches listed under notes must be opened full or must be pushed.
* J are the jumpers on the PCB which must be plugged in for the specified measurement.
* Outputs terminated with R(L) = 100 kohms.
* All switches and controls not mentioned into position OFF.
* VOL max., FADER max., GAIN min., MIC on, CHAN. on, MIX on

Input	E(I)	Test point	E(O)	Note
MIC 1-6	+ 0 dBu	CN2.17/.19	+15 dBu	MIX ON
MIC 1	+ 0 dBu	CN2.17/.19	+15 dBu	HPF ON,PHASE ON,EQ ON
MIC 1	+ 0 dBu	CN2.27	+ 5 dBu	AUX3,J2 SEL.
MIC 1	+ 0 dBu	CN2.29	+ 5 dBu	PRE ON,J1=PREEQ,AUX2
MIC 1	+ 0 dBu	CN2.4	+15 dBu	PFL ON,J5=AFL
MIC 1	+ 0 dBu	CN2.4	+ 5 dBu	PFL ON,J5=PFL
----------		CN2.2	-10 V(DC)	PFL ON,R(L) = 100k
MIC 1	+ 0 dBu	CN2.15/.13	+15 dBu	1-2 ON
MIC 1	+ 0 dBu	CN2.9 /.11	+15 dBu	3-4 ON
MIC 1	+ 0 dBu	CN2.27	+ 5 dBu	AUX3,J4 SEL.
MIC 1	+ 0 dBu	CN2.29	+ 5 dBu	AUX2,PRE ON,J1=PREFAD
MIC 1	+ 0 dBu	CN2.31	+15 dBu	AUX1,PRE OFF
MIC 1	+ 0 dBu	CN2.27	+15 dBu	AUX3,J3 SEL.
MIC 1	+ 0 dBu	CN2.25	+15 dBu	AUX4,J3 SEL.
MIC 1	+ 0 dBu	CN2.23	+15 dBu	AUX3,J3, 5-6 ON
MIC 1	+ 0 dBu	CN2.21	+15 dBu	AUX4,J3, 5-6 ON

4. Metering

- Gain min, EQ off

4.1. MIC INPUT Indicator

E(I) MIC	LED INDICATOR
-18 dBu	SIG lights up
+12 dBu	PK lights up

4.2. CHANNEL Indicator

* Note: Tolerance here +/- 1 dB

E(I) MIC 1-6	LED INDICATION
- 18 dBu	- 13 dB
- 12 dBu	- 7 dB
- 5 dBu	0 dB
+ 5 dBu	+ 10 dB
+ 12 dBu	+ 17 dB

5. Gain Control Range

* VOL max., FADER max., GAIN var., MIC on, CHAN. on

Input	E(I)	Test Point	E(O)	Note
MIC	+ 0 dBu	CN2.17/.19	+ 15 dBu	GAIN min.
MIC	-70 dBu	CN2.17/.19	+ 15 dBu	GAIN max., Tol.+/-2dB

6. Common Mode Rejection Ratio MIC Input

* E(O) = CN2.1 (PCB 81280), R(Q) = 150 Ohm, Gain control fully opened.

* Perform measurement with bandpass 1 kHz.

* Measurement 1:

PIN1 and PIN3 of XLR socket to ground.

Feed in a signal with - 55 dBu to PIN2 ==> E(O1).

* Measurement 2:

Disconnect PIN3 from ground and connect with PIN 2.

Feed in a signal with - 55 dBu to PIN2/3 ==> E(O2).

$$CMRR = |20\ LG\ (\ E(O1)/E(O2)\ )|$$

CMRR : > 80 dB

7. Noise Voltages

- measured at CN2.17/19
- measured with AUDIO PRECISION SYSTEM ONE
- MIC : R(Q) = 150 ohms
- R(L) = 100 kohms
- E(F) = Noise voltage, RMS, 22 Hz ... 22 kHz
- Gain fully opened, FADER and VOL max.

* Measurement **equivalent input noise EIN :**

1. Determine gain from input to output —> V
2. Measure noise voltage E(F)
3. N = 20 * LG (E(F)/0.775V)
4. EIN = N - V

EIN ≤ - 128 dBu

8. Distortion (THD)

- measured at CN2.17/19
- measured with AUDIO PRECISION SYSTEM ONE
- R(L) = 100 kohms
- FADER and VOL fully opened, GAIN control min.

Input	E(I)	Test point	Distortion	
			f=1kHz	f=10kHz
MIC	0 dBu	CN2.17/.19	0.003 %	0.02 %

9. Phase Relationship

- Feed in E(I) to MIC input
- Measure E(O) at CN2.17/.19
- Phase switch OFF: Input and output are in phase.
- Phase switch ON : Input and output are out of phase.

10. Panpot Isolation

- Drive channel nearly to PEAK level.
- measure at CN2.17 or CN2.19

10.1. **Panpot isolation L/R** : **> 65 dB**

10.2. **Panpot boost in centre position – L or R** : **Δ L = 4.5 dB**

Note: Tolerance here +/- 0.5 dB

11. Phantom Power Supply

If switch +48 V is pressed, the voltage between PIN 2 and PIN 1 or PIN 3 and PIN 1 of the XLR socket must be E(DC) = + 48 V.

12. Frequency Response

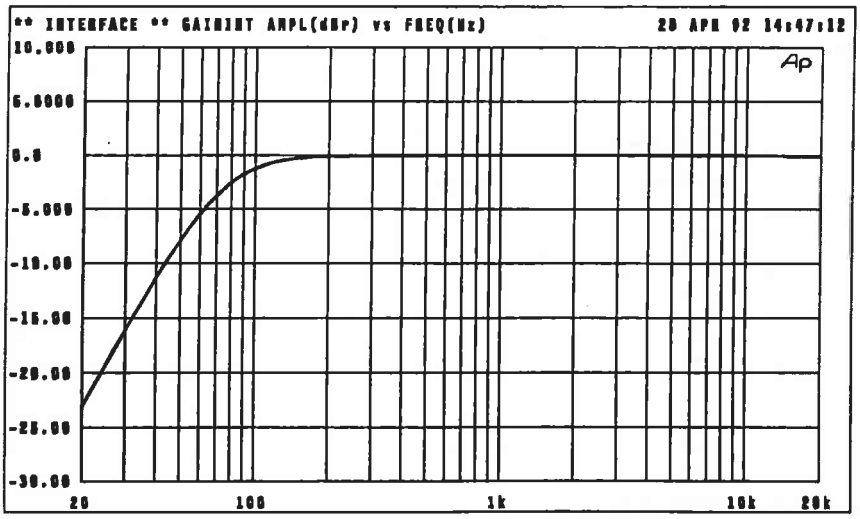
- GAIN fully opened

MIC – I6.1/.7 : **fl(-3dB) = 18 Hz fu(-3dB) = 95 kHz**

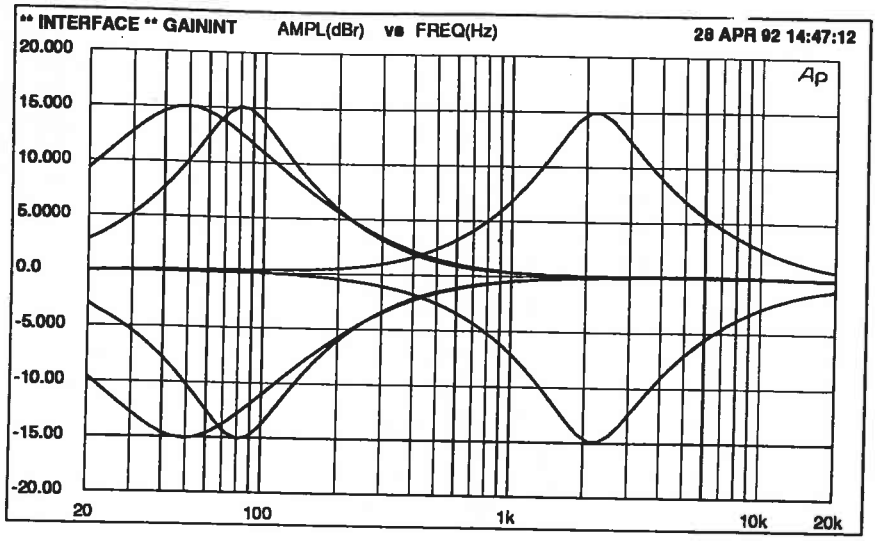
13. Frequency Response Plots

- measured at I6.1/.7

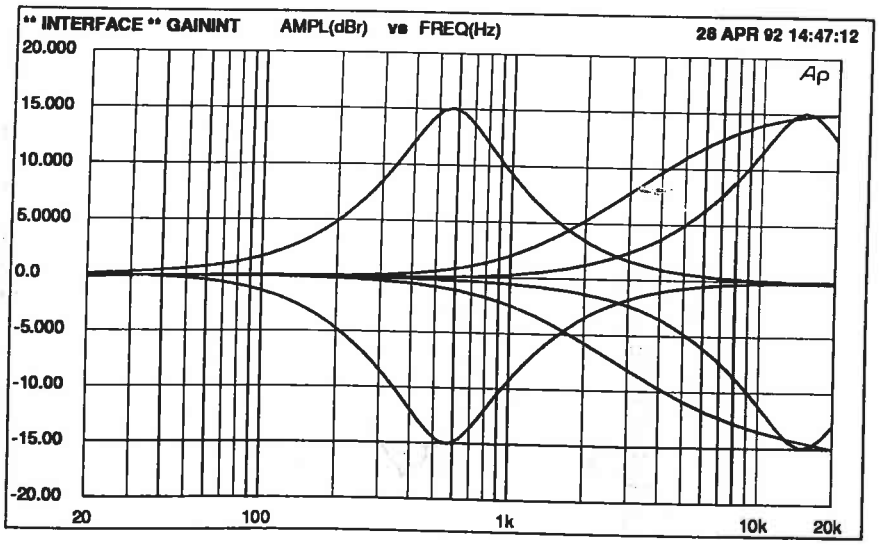
HPF MODULE 2816 (high-pass filter 80 Hz)

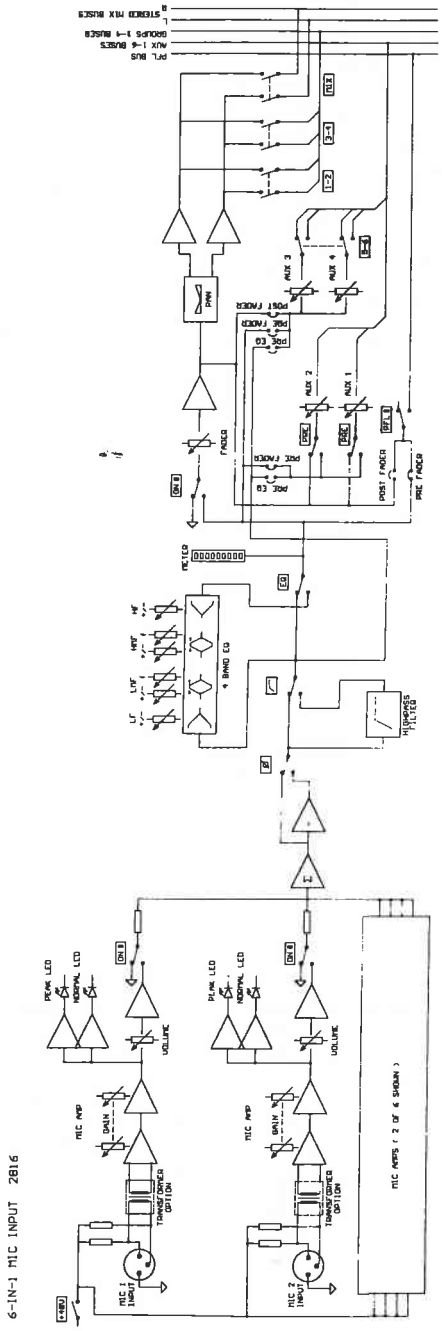


EQ MODULE 2816 (LO Section)

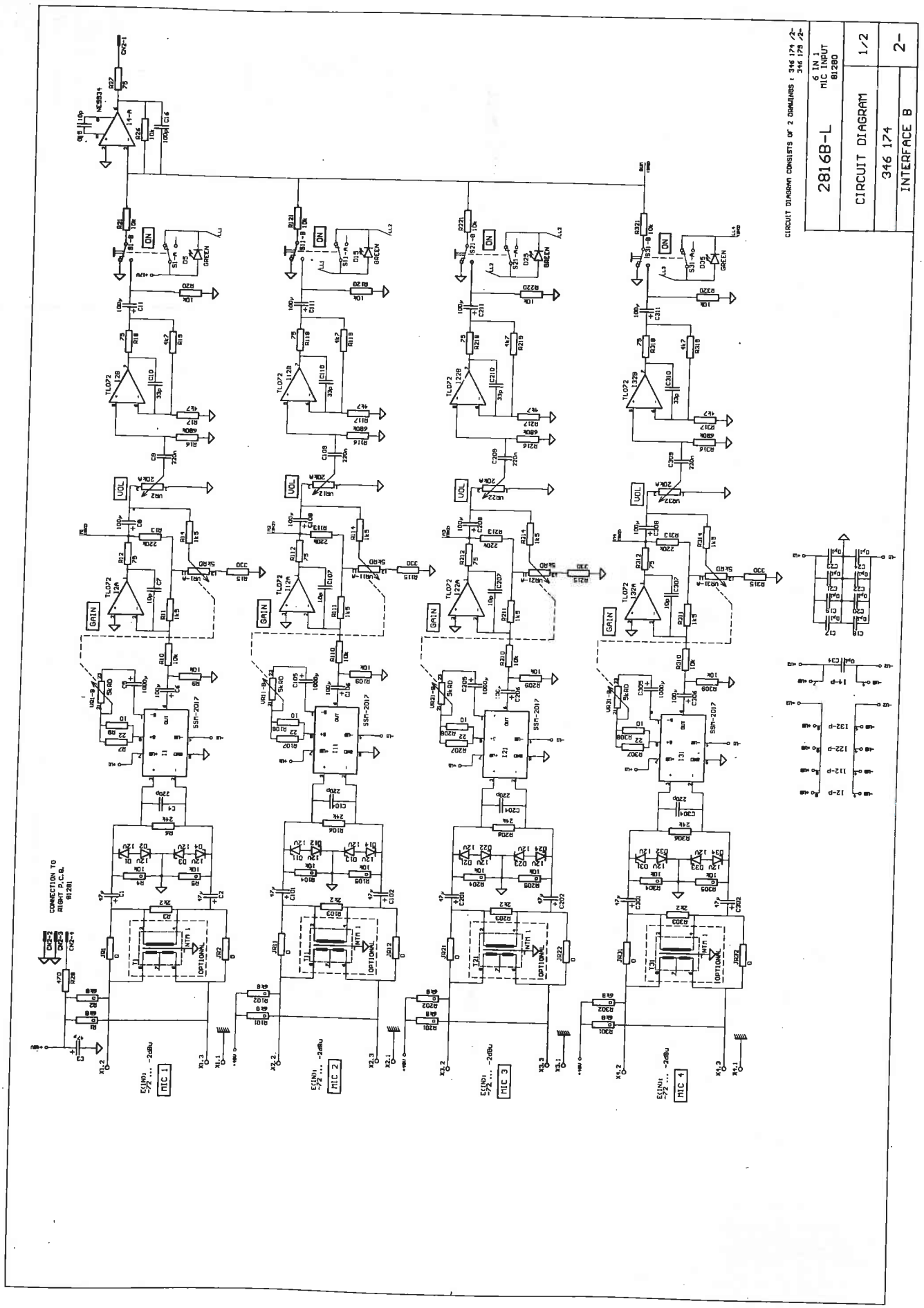


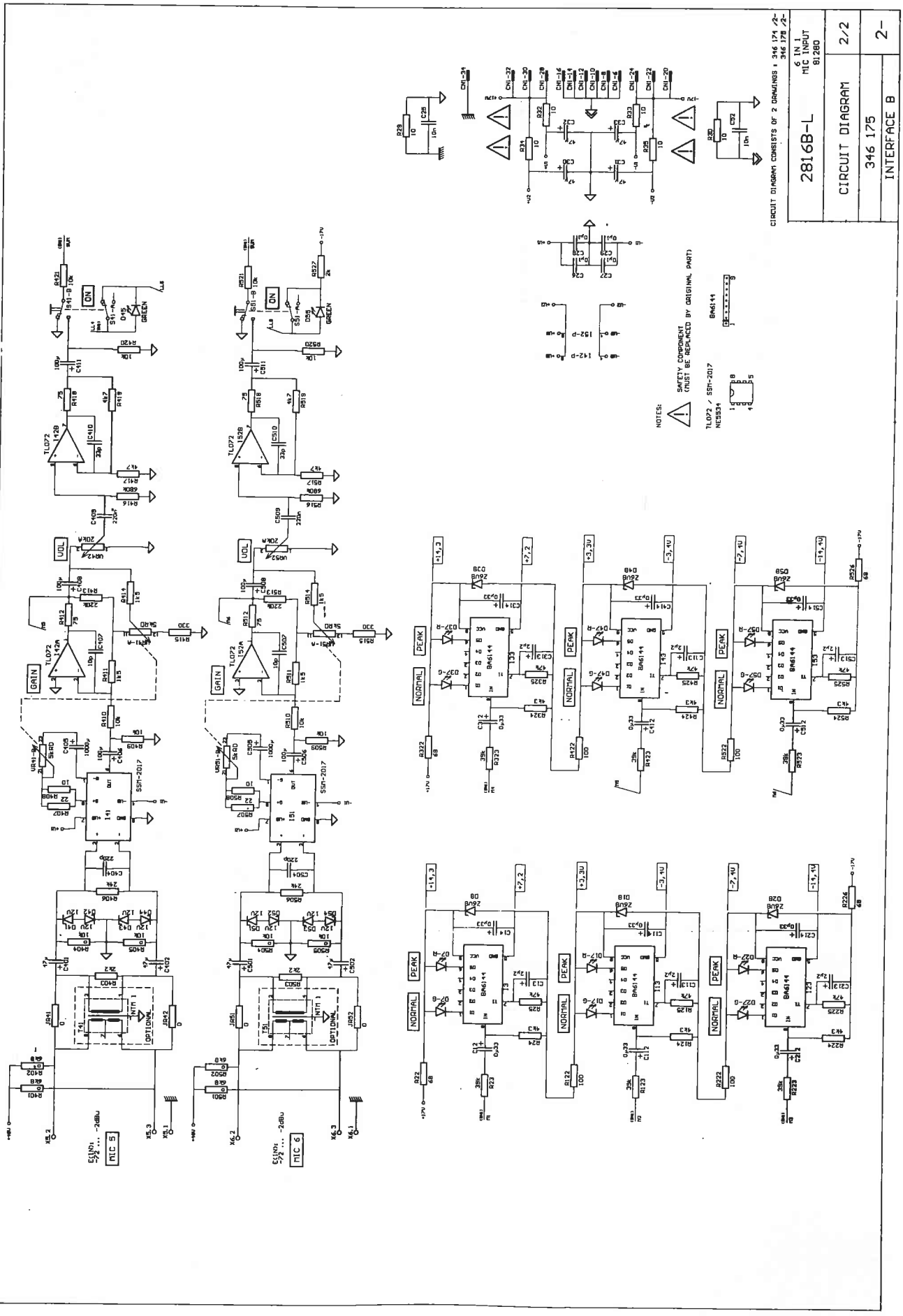
EQ MODULE 2816 (HI Section)

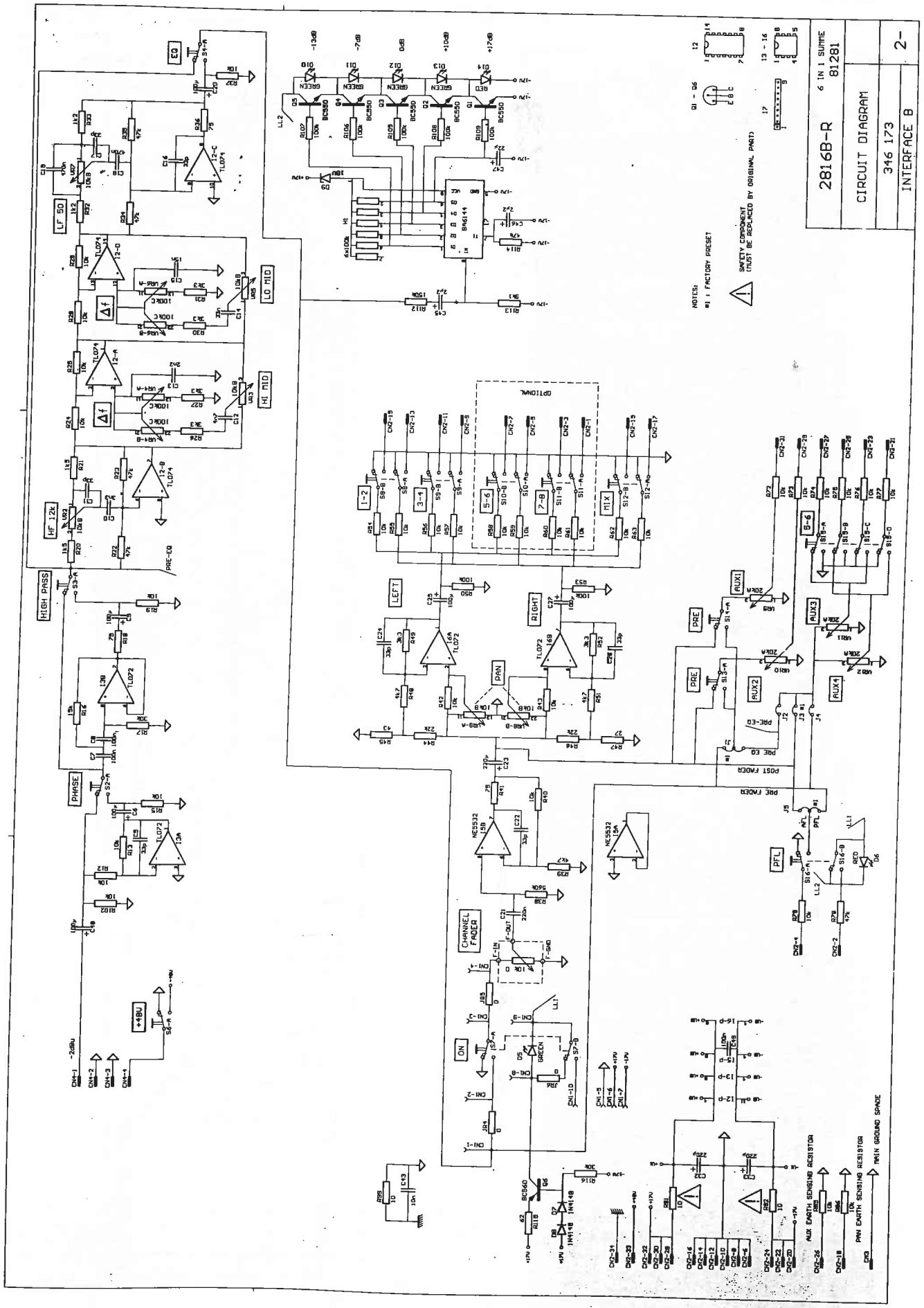




BLO-2816		
BLOCK DIAGRAM		
346 238		2-
INTERFACE		


CIRCUIT DIAGRAM CONSISTS OF 2 DRAWINGS : 346 174 /2-
346 175 /2-
2816B-L
6 IN 1
MIC INPUT
81280
CIRCUIT DIAGRAM
1/2
346 174
2-
INTERFACE B
CONNECTION TO
RIGHT P.C.B.
81281
MIC 1
MIC 2
MIC 3
MIC 4
GAIN
VOL
ON
OPTIONAL
SSM-2017
TL072
GREEN

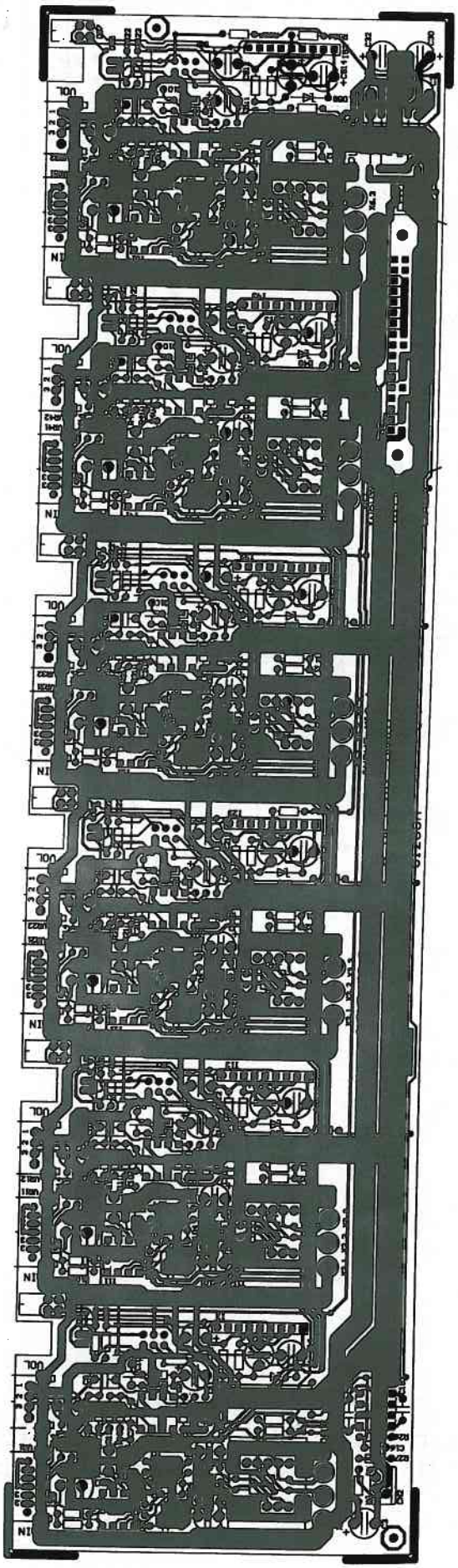

2816B-L
6 IN 1
MIC INPUT
81280
CIRCUIT DIAGRAM
2/2
346 175
2-
INTERFACE B
CIRCUIT DIAGRAM CONSISTS OF 2 DRAWINGS : 346 174 /2-
346 175 /2-
NOTES:
SAFETY COMPONENT
(MUST BE REPLACED BY ORIGINAL PART)
TL072 / SSM-2017
NE5534
BA6144
MIC 5
MIC 6
GAIN
VOL
PEAK
NORMAL
ON
GREEN
OPTION
+14,3
+7,2
+3,3V
-3,4V
-7,4V
-14,4V


2816B-R
6 IN 1 SUMME
81281
CIRCUIT DIAGRAM
346 173
2-
INTERFACE B
EQ
LF 50
LO MID
HI MID
HF 12k
HIGH PASS
PHASE
PRE-EQ
LEFT
RIGHT
PAN
CHANNEL FADER
ON
PFL
AUX1
AUX2
AUX3
AUX4
PRE
PRE FADER
POST FADER
+48V
-24dBu
1-2
3-4
5-6
7-8
MIX
NOTES:
#1 : FACTORY PRESET
SAFETY COMPONENT
(MUST BE REPLACED BY ORIGINAL PART)
AUX EARTH SENSING RESISTOR
PAN EARTH SENSING RESISTOR
MAIN GROUND SPADE

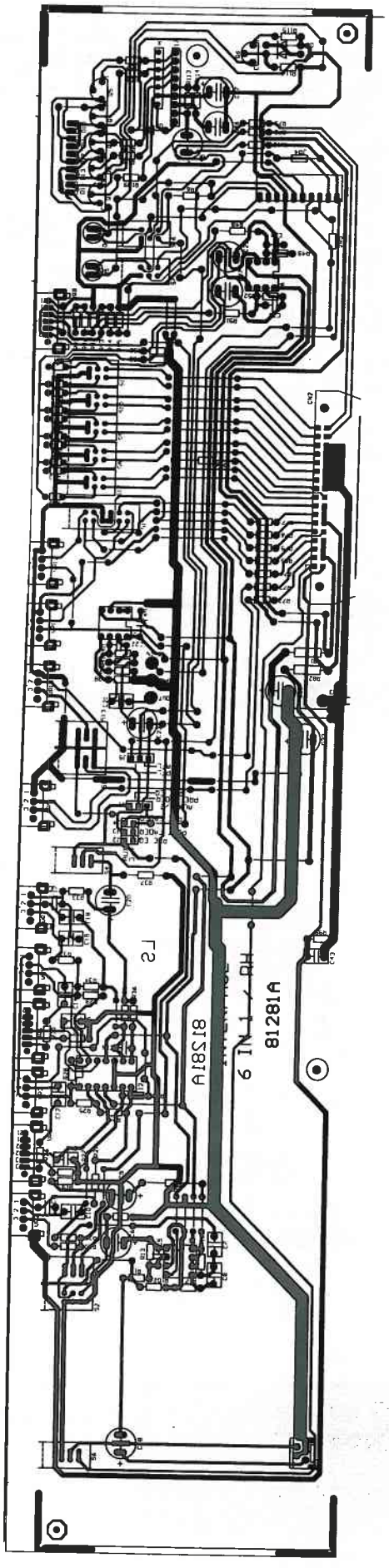
IPM 2816

COMPONENT SIDE

81280



81281



Pos.	description	Part-No.
B0010	socket XLR 3pol.	347014
00010	socket XLR 3pol.	343538
R0010	fader 10 kohm log	343418
00020	rotary knob black/bl	344610
00030	rotary knob black/rd	344611
00040	rotary knob black/gr	344228
00050	rotary knob black/bl	344612
00060	rotary knob sw/li	344227
00080	fader knob bl/wt 4mm	344619
00085	push button +48V	344570
00094	push button PHASE	344572
00096	push button LOW-CUT	344573
00098	push button EQ	344581
00100	push button 5-6	344575
00101	push button PRE	345575
00102	push button ON	344587
00104	push button PFL	344586
00106	push button MIX	344574
00108	push button 1-2	344576
00110	push button 3-4	344577
00005	PCB INTERFACE B 2816 B	812808
C 3	KO-EL 47MF 50V	343530
C 12	KO-EL 0.330MF 50V	333249
C 13	KO-EL 2.2MF 50V	304986
C 14	KO-EL 0.330MF 50V	333249
C 30	KO-EL 47MF 50V	343530
C 31	KO-EL 47MF 50V	343530
C 32	KO-EL 47MF 50V	343530
C 33	KO-EL 47MF 50V	343530
C112	KO-EL 0.330MF 50V	333249
C113	KO-EL 2.2MF 50V	304986
C114	KO-EL 0.330MF 50V	333249
C212	KO-EL 0.330MF 50V	333249
C213	KO-EL 2.2MF 50V	304986
C214	KO-EL 0.330MF 50V	333249
C312	KO-EL 0.330MF 50V	333249
C313	KO-EL 2.2MF 50V	304986
C314	KO-EL 0.330MF 50V	333249
C412	KO-EL 0.330MF 50V	333249
C413	KO-EL 2.2MF 50V	304986
C414	KO-EL 0.330MF 50V	333249
C512	KO-EL 0.330MF 50V	333249
C513	KO-EL 2.2MF 50V	304986
C514	KO-EL 0.330MF 50V	333249
D 1	diode zener ZPD 12V 0,5W	305738
D 2	diode zener ZPD 12V 0,5W	305738
D 3	diode zener ZPD 12V 0,5W	305738
D 4	diode zener ZPD 12V 0,5W	305738
D 5	LED green 3mm	336398
D 7	LED red/green 3mm	343537
D 8	break down diode ZPD 6V8	304992
D 11	diode zener ZPD 12V 0,5W	305738
D 12	diode zener ZPD 12V 0,5W	305738
D 13	diode zener ZPD 12V 0,5W	305738
D 14	diode zener ZPD 12V 0,5W	305738
D 15	LED green 3mm	336398
D 17	LED red/green 3mm	343537
D 18	break down diode ZPD 6V8	304992
D 21	diode zener ZPD 12V 0,5W	305738
D 22	diode zener ZPD 12V 0,5W	305738
D 23	diode zener ZPD 12V 0,5W	305738
D 24	diode zener ZPD 12V 0,5W	305738
D 25	LED green 3mm	336398
D 27	LED red/green 3mm	343537
D 28	break down diode ZPD 6V8	304992
D 31	diode zener ZPD 12V 0,5W	305738
D 32	diode zener ZPD 12V 0,5W	305738
D 33	diode zener ZPD 12V 0,5W	305738
D 34	diode zener ZPD 12V 0,5W	305738
D 35	LED green 3mm	336398
D 37	LED red/green 3mm	343537
D 38	break down diode ZPD 6V8	304992
D 41	diode zener ZPD 12V 0,5W	305738
D 42	diode zener ZPD 12V 0,5W	305738
D 43	diode zener ZPD 12V 0,5W	305738
D 44	diode zener ZPD 12V 0,5W	305738
D 45	LED green 3mm	336398
D 47	LED red/green 3mm	343537
D 48	break down diode ZPD 6V8	304992
D 51	diode zener ZPD 12V 0,5W	305738
D 52	diode zener ZPD 12V 0,5W	305738
D 53	diode zener ZPD 12V 0,5W	305738
D 54	diode zener ZPD 12V 0,5W	305738
D 55	LED green 3mm	336398
D 57	LED red/green 3mm	343537
D 58	break down diode ZPD 6V8	304992
I 1	IC SSM 2017 P	345485
I 2	IC TL 072 CP	331340
I 3	IC BA 6144	338606
I 4	IC NE 5534	309446
I 11	IC SSM 2017 P	345485
I 12	IC TL 072 CP	331340
I 13	IC BA 6144	338606
I 21	IC SSM 2017 P	345485
I 22	IC TL 072 CP	331340
I 23	IC BA 6144	338606
I 31	IC SSM 2017 P	345485
I 32	IC TL 072 CP	331340
I 33	IC BA 6144	338606
I 41	IC SSM 2017 P	345485
I 42	IC TL 072 CP	331340
I 43	IC BA 6144	338606
I 51	IC SSM 2017 P	345485
I 52	IC TL 072 CP	331340
I 53	IC BA 6144	338606

Pos. in diagram	description	Part-No.
R 32	safety resistor 10 ohm	329215
R 33	safety resistor 10 ohm	329215
R 34	safety resistor 10 ohm	329215
R 35	safety resistor 10 ohm	329215
S 1	switch	344037
S 11	switch	344037
S 21	switch	344037
S 31	switch	344037
S 41	switch	344037
S 51	switch	344037
VR 1	potentiometer 2x5 kohm log	344034
VR 2	potentiometer 20kohm log	344032
VR11	potentiometer 2x5 kohm log	344034
VR12	potentiometer 20kohm log	344032
VR21	potentiometer 2x5 kohm log	344034
VR22	potentiometer 20kohm log	344032
VR31	potentiometer 2x5 kohm log	344034
VR32	potentiometer 20kohm log	344032
VR41	potentiometer 2x5 kohm log	344034
VR42	potentiometer 20kohm log	344032
VR51	potentiometer 2x5 kohm log	344034
VR52	potentiometer 20kohm log	344032
00010	PCB INTERFACE B 2816 B	812818
C023	KO-EL 220 MF 25V	343533
C032	KO-EL 220 MF 25V	343533
C033	KO-EL 220 MF 25V	343533
C045	KO-EL 2.2MF 50V	304986
C046	KO-EL 2.2MF 50V	304986
C047	KO-EL 22MF 25V	327815
D005	LED green 3mm	336398
D006	LED red 3mm	336399
D007	diode 1N 4148	301254
D008	diode 1N 4148	301254
D009	diode zener ZPD 18V	301277
D010	LED green 3mm	336398
D011	LED green 3mm	336398
D012	LED green 3mm	336398
D013	LED green 3mm	336398
D014	LED red 3mm	336399
H001	resistor netw. SIL 006	339702
I002	IC TL 074 CN	332985
I003	IC TL 072 CP	331340
I005	IC NE 5532 N	327197
I006	IC TL 072 CP	331340
I007	IC BA 6144	338606
Q001	trans. BC 550 B	301184
Q002	trans. BC 550 B	301184
Q003	trans. BC 550 B	301184
Q004	trans. BC 550 B	301184
Q005	trans. BC 550 B	301184
Q006	trans. BC 560 B	306928
R081	safety resistor 10 ohm	329215
R082	safety resistor 10 ohm	329215
S002	switch	344037
S003	switch	344037
S004	switch	344037
S006	switch	344037
S007	switch	344037
S008	switch	344037
S009	switch	344037
S012	switch	344037
S013	switch	344037
S014	switch	344037
S015	switch	344038
S016	switch	344037
VR02	potentiometer 10kohm lin	343261
VR03	potentiometer 10kohm lin	343261
VR04	potentiometer 2x100kohm log	344033
VR05	potentiometer 10kohm lin	343261
VR06	potentiometer 2x100kohm log	344033
VR07	potentiometer 10kohm lin	343261
VR08	potentiometer 2x10kohm lin	343549
VR09	potentiometer 20kohm log	344032
VR10	potentiometer 20kohm log	344032
VR11	potentiometer 20kohm log	344032
VR12	potentiometer 20kohm log	344032

INTERFACE

DIGITAL INPUT MODULE 2824

SPECIFICATIONS: INPUT Module 2824

* 0 dBu = 0.775 V (RMS)

* Note Enclosure: Measurement Conditions

LINE INPUT

Input Impedance	:	> 10 kohms
Input Sensitivity Range at Output Level +4 dBu	:	- 20 dBu ... + 10 dBu
Max. Input Level	:	+ 27 dBu
Equivalent Input Noise R(Q) = 50 ohms, 22 Hz ... 22 kHz, with max. Gain	:	< - 96 dBu
THD (1kHz/10kHz)	:	< 0.005 % / < 0.02 %

CD INPUT

Input Impedance	:	> 10 kohms
Input Sensitivity Range at Output Level +4 dBu	:	- 20 dBu ... + 10 dBu
Max. Input Level	:	+ 27 dBu
Equivalent Input Noise R(Q) = 50 ohms, 22 Hz ... 22 kHz, with max. Gain	:	< - 96 dBu
THD (1kHz/10kHz)	:	< 0.005 % / < 0.02 %

RIAA PHONO INPUT

Input Impedance	:	47 kOhm / 100 pF
Input Sensitivity Range at Output Level +4 dBu	:	- 54 dBu ... - 24 dBu
Frequency Response Accuracy	:	+/- 1 dB
Nominal Signal-to-Noise Ratio Gain max., Output Level + 4 dBu	:	66 dB
THD (1kHz/10kHz)	:	< 0.01 % / < 0.05 %

DIGITAL INPUT OPTICAL / COAXIAL

Connection	:	OPTICAL / COAXIAL
Digital Interface	:	SPDIF
Sampling Rate	:	44.1 kHz / 48 kHz
DA Converter	:	18 bit / linear
Oversampling	:	8 times
Frequency Response Linearity	:	+/- 0.5 dB (20 Hz .... 20 kHz)
Input Sensitivity Range	:	0 dBFS .... - 28 dBFS
at Output Level +4 dBu		
Nominal Signal-to-Noise Ratio	:	100 dB (Emphasis off)/
with max. Output Level		102 dB (Emphasis on)
THD (1kHz/10kHz)	:	< 0.007 % / < 0.07 %

GENERAL SPECIFICATIONS

		f = 1 kHz	f = 10 kHz
Muting Input Selector	:	> 100 dB	> 85 dB
Channel Muting "ON" Switch	:	> 95 dB	> 75 dB
Fader Rejection (OFF)	:	> 100 dB	> 80 dB
Muting			
"Routing" Switch	:	> 90 dB	> 70 dB
Max. AUX SEND Attenuation	:	> 90 dB	> 85 dB
Weight	:	900 g	

FREQUENCY RESPONSE EQ

Boost/Cut : +/- 12 dB

Filter Frequencies : HF 12 kHz (shelving)

HMF 3 kHz
(peaking with Q = 0.75)

LMF 300 Hz
(peaking with Q = 0.75)

LF 40 Hz (shelving with
VLF rolloff at 20 Hz)

SPECIFICATIONS: DIGITAL INPUT Module 2824

General measuring conditions if not noted elsewhere otherwise:

* Module not plugged into the ribbon cable. Operating voltage supplied externally.

* Measuring Tolerance	:	**Δ X = ± 1.5 dB**
* Measuring Frequency	:	**f = 1 kHz**
* All Levels related to	:	**E = 775 mV (0dBu)**
* Gain Control fully counterclockwise		
* EQ Controls into centre Position		
* Panpot into centre Position		
* Source Impedance with feed in via LINE/PHONO/CD	:	R(Q) = 50 ohms
* Load Impedance	:	R(L) = 100 kohms
* Digital Input Format	:	SPDIF

* Input COAXIAL or OPTICAL only via CD - Player with Test CD
* 0 dBFS = Full Modulation
* Test CD : DENON AUDIO TECHNICAL CD (C39-7147-EX)

1. Operating Voltage	:	**E(B) = +/- 17 V**
2. Current Input (max.)	:	**I(B-) = 155 mA**
		I(B+) = 195 mA

3. Input and Output Voltages

* The controls and switches listed under notes must be opened full or must be pushed, Outputs terminated with R(L) = 100 kohms.

* GAIN min., FADER fully open, CHANNEL ON, MIX , 1-2 , 3-4 ON.

* J are the jumpers on the PCB which must be plugged in for the specified measurement (FP = FACTORY PRESET, NFP = not FACTORY PRESET). * TR = TRACK on Test CD

Input	E(I)	Test Point	E(O)	Note
OPTICAL	0 dBFS	CN3.17/.19	+ 5 dBu	OPTICAL,TR 49
COAXIAL	0 dBFS	CN3.17/.19	+ 5 dBu	COAXIAL,TR 49
OPTICAL	-20 dBFS	CN3.17/.19	-15 dBu	OPTICAL,TR 57
COAXIAL	-20 dBFS	CN3.17/.19	-15 dBu	COAXIAL,TR 57
LINE R/L	-20 dBu	CN3.17/.19	+ 7 dBu	GAIN max.
LINE R/L	+10 dBu	CN3.17/.19	+ 7 dBu	
CD R/L	+10 dBu	CN3.17/.19	+ 7 dBu	
PHONO R/L	-24 dBu	CN3.17/.19	+ 7 dBu	
LINE R/L	+10 dBu	CN3.17/.19	+ 7 dBu	EQ
LINE R/L	+10 dBu	CN3.13/.15	+ 7 dBu	1-2 on
LINE R/L	+10 dBu	CN3.9 /.11	+ 7 dBu	3-4 on
LINE L	+10 dBu	CN3.31	+ 7 dBu	J9=NFP,AUX1 open
LINE R	+10 dBu	CN3.29	+ 7 dBu	J10=NFP,AUX2 open
LINE R+L	+10 dBu	CN3.31	+11 dBu	J9=FP,AUX1 open
LINE R+L	+10 dBu	CN3.29	+11 dBu	J10=FP,AUX2 open
LINE R+L	+10 dBu	CN3.31	+ 1 dBu	PRE,J9=FP,AUX1 open
LINE R+L	+10 dBu	CN3.29	+ 1 dBu	PRE,J10=FP,AUX2 open
LINE R+L	+10 dBu	CN3.27	+ 1 dBu	J7=NFP,AUX3 open
LINE R+L	+10 dBu	CN3.25	+ 1 dBu	J7=NFP,AUX4 open
LINE R/L	+10 dBu	CN3.23	+ 1 dBu	J7=NFP,AUX3 open,5-6
LINE R/L	+10 dBu	CN3.21	+ 1 dBu	J7=NFP,AUX4 open,5-6
LINE R/L	+10 dBu	CN3.27	+11 dBu	J7=FP,AUX3 open
LINE R/L	+10 dBu	CN3.25	+11 dBu	J7=FP,AUX4 open
LINE R/L	+10 dBu	CN3.4	+ 1 dBu	J8=FP,PFL on (PFL)
LINE R/L	+10 dBu	CN3.4	+11 dBu	J8=NFP,PFL on (AFL)
————————		CN3.2	-10 V(DC)	PFL ON,R(L) = 100k
				Channel without signal

4. FACTORY PRESET of Code Jumpers

J1 - J5 : LINE ..... J3 plugged

J6 : GND

J7 : POST ..... AUX3/4 POST FADER

J8 : PFL ..... PFL button PRE FADER

J9 : MONO ..... AUX1 MONO

J10 : MONO ..... AUX2 MONO

5. Level Meter

* Feed in signal via LINE L or R.
* Note: Tolerance here +/- 1 dB
* Gain control max. (24 dB).

E(I) LINE	LED VALUE
- 32 dBu	- 13 dB
- 26 dBu	- 7 dB
- 19 dBu	0 dB
- 9 dBu	+ 10 dB
- 2 dBu	+ 17 dB

6. Noise Voltages

- measured at CN3.17/19
- measured with AUDIO PRECISION SYSTEM ONE
- E(G) = Noise voltage, frequ.weighted acc. CCIR 468, Q-PEAK
- E(F) = Noise voltage, RMS, 22 Hz ... 22 kHz
- Gain fully opened, Fader fully up

* Measurement **equivalent input noise EIN** :

1. Determine gain from input to output —> V
2. Measure noise voltage E(F)
3. N = 20 * LG (E(F)/0.775V)
4. EIN = N - V

7.1. LINE/CD : **EIN ≤ - 97 dBu**

7.2. PHONO : **E(F) ≤ 1.1 mV E(G) ≤ 1.9 mV**

7.3. OPTICAL/DIGITAL

* Feed in with CD-Player via DIGITAL INPUT

7.3.1.Select Track 34 (Emphasis off): **E(F) ≤ 310 µV E(G) ≤ 1.2 mV**

7.3.2.Select Track 35 (Emphasis on) : **E(F) ≤ 245 µV E(G) ≤ 950 µV**

8. Distortion (THD)

- measured at CN3.17/19
- measured with AUDIO PRECISION SYSTEM ONE
- R(L) = 100 kohms, CHAN.FADER fully opened

8.1. Analog

Input	E(I)	Test Point	THD at:	f=1kHz	f=10kHz
LINE/CD	+16 dBu	CN3.17/.19		< 0.004 %	< 0.005 %
PHONO	-20 dBu	CN3.17/.19		< 0.04 %	——

8.2. Digital

8.2.1. THD Adjustment

* Feed in at DIGITAL Input with CD Player (Track 18) and determine THD at CN3.19.
* Adjust to min. THD with Trimmer VR2.
* Feed in at DIGITAL Input with CD Player (Track 19) and determine THD at CN3.17.
* Adjust to min. THD with Trimmer VR1.

8.2.2. Measuring Data

Input	E(I)	TRACK	Test Point	E(O)	THD
OPTICAL	0 dBFS	19	CN3.17	+16 dBu	< 0.02 % (1kHz)
OPTICAL	0 dBFS	18	CN3.19	+16 dBu	< 0.02 % (1kHz)

9. BALANCE Control

BALANCE R/L : +/- 3 dB

Note: Tolerance here +/- 0.5 dB

10. Frequency Response

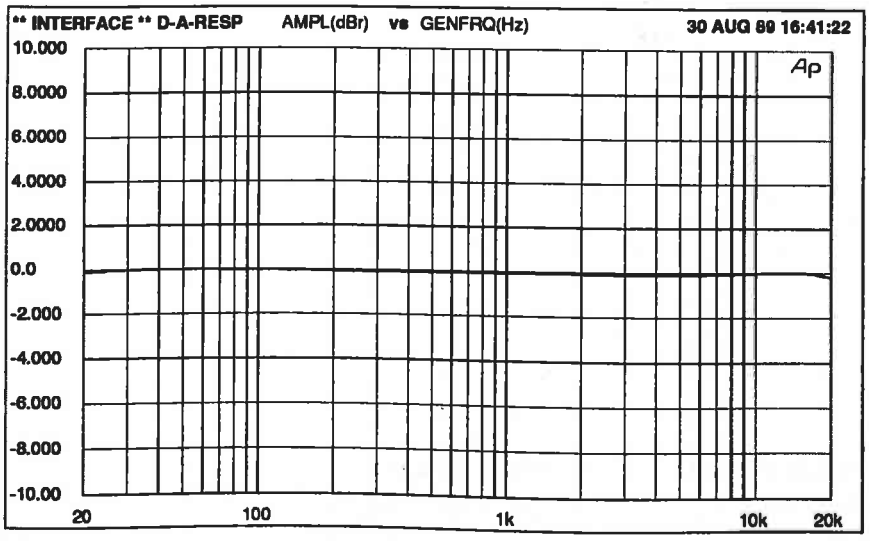
- All not mentioned switches OFF

Input	Test Point	fl(-3db)	fu(-3dB)	Note
LINE/CD	I16 Pin 1/7	10 Hz	75 kHz	LINE/CD

11. Frequency Response Plots

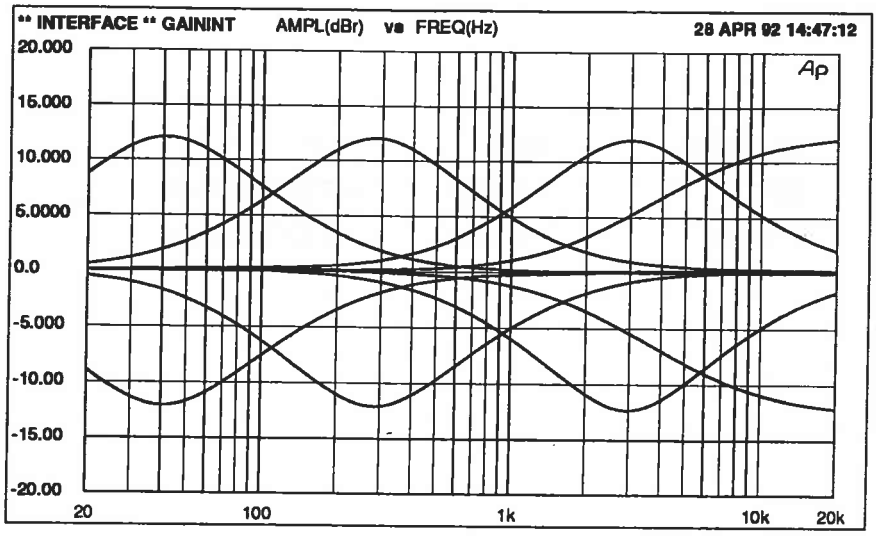
DIGITAL/OPTICAL 20 Hz ... 20 kHz

- Gain max., ON, MIX, FADER max.
- Input CD Player with Track 36 (L), 37 (R), **Emphasis off**
- Input CD Player with Track 38 (L), 39 (R), **Emphasis on**
- E(O) at CN3.17/.19



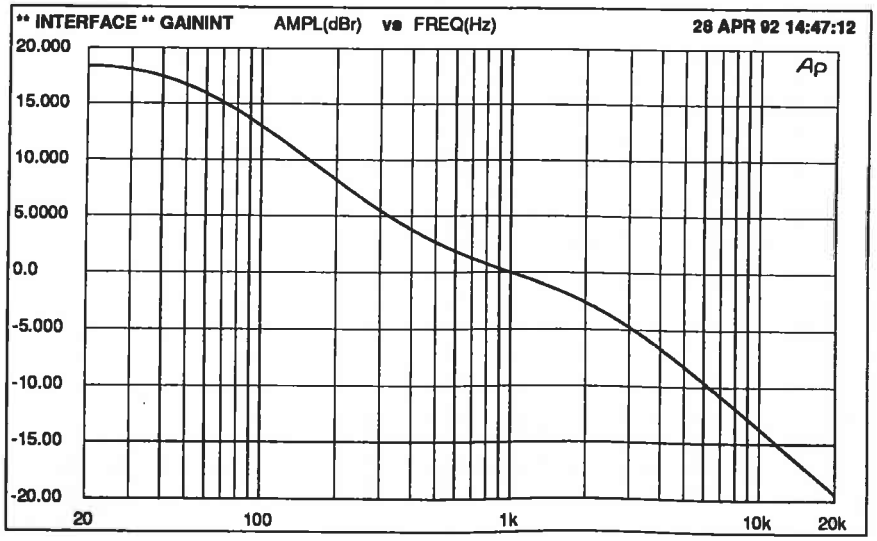
EQ MODULE 2824

- INPUT LINE ON and EQ ON
- E(I) = LINE L/R
- E(O) = CN3.17/.19

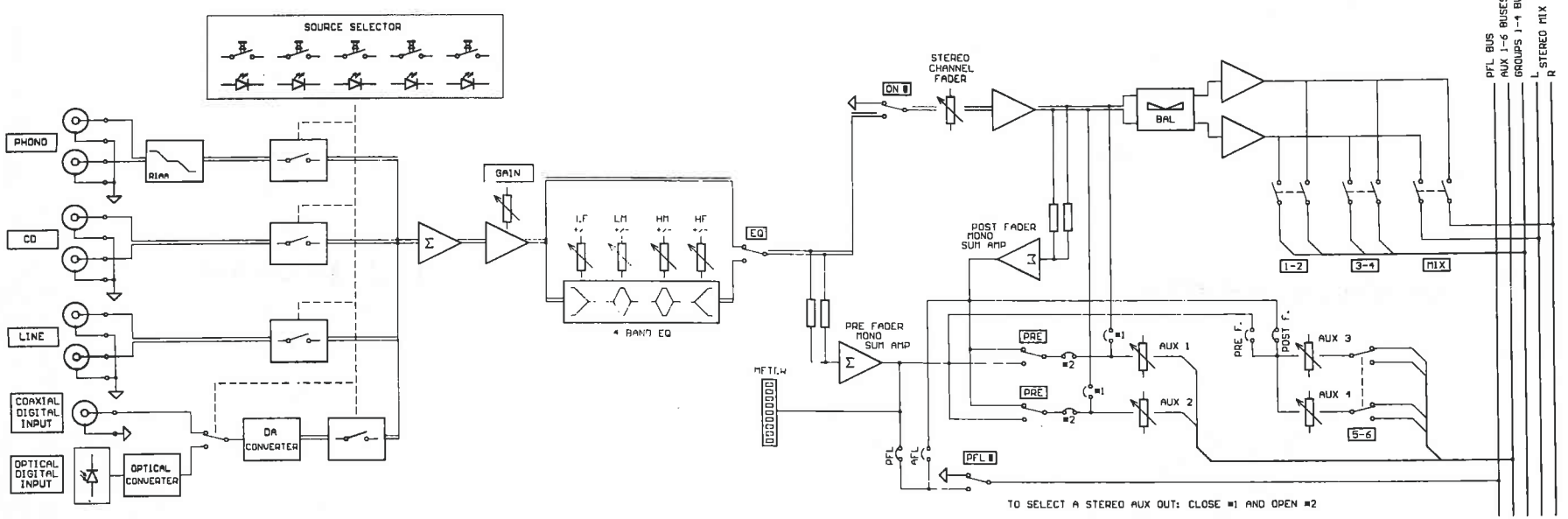


Frequency Response RIAA Phono Equaliser

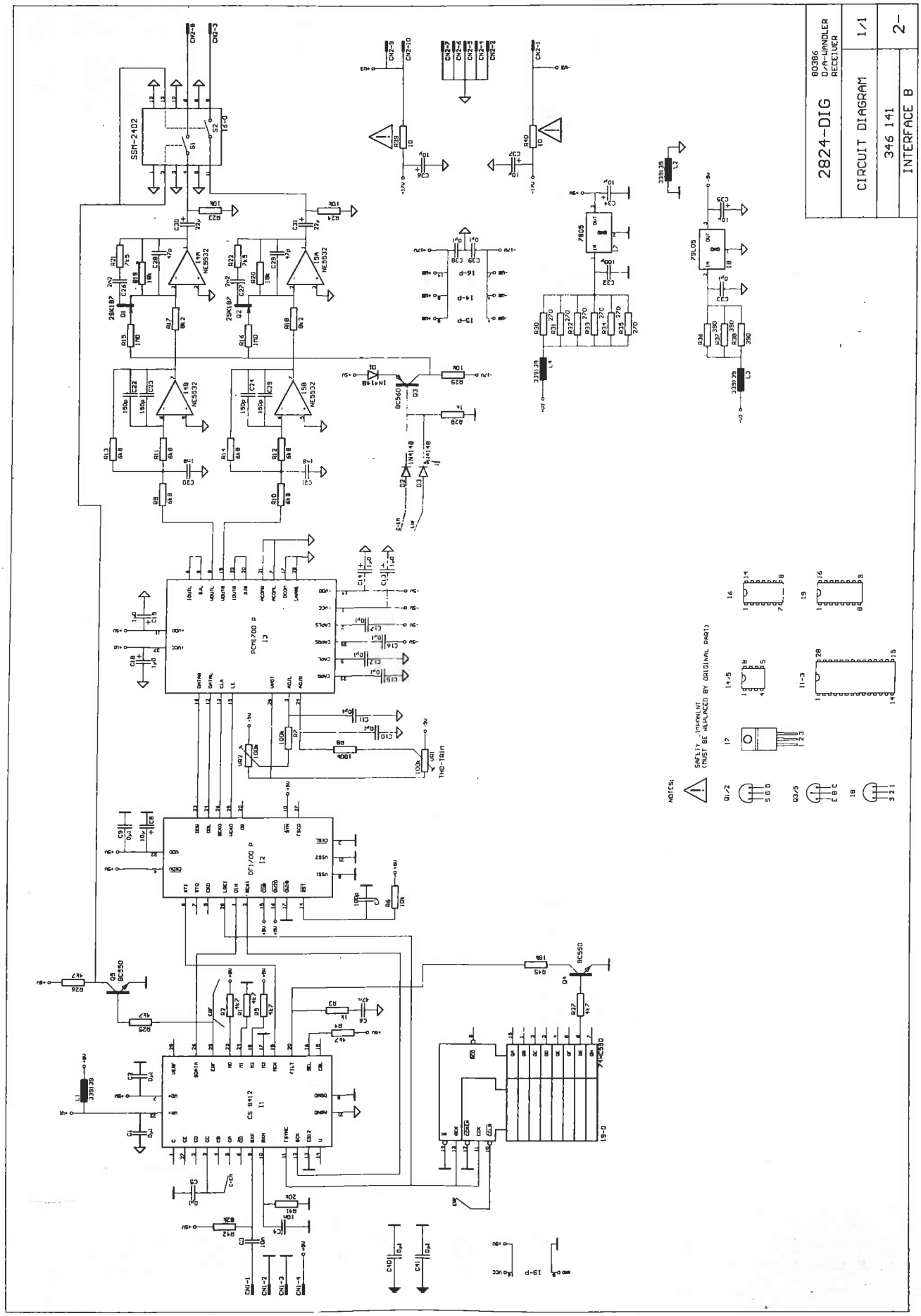
- Feed in E(I) to Input PHONO
- max. Deviation +/- 1 dB
- E(O) at CN3.17/.19

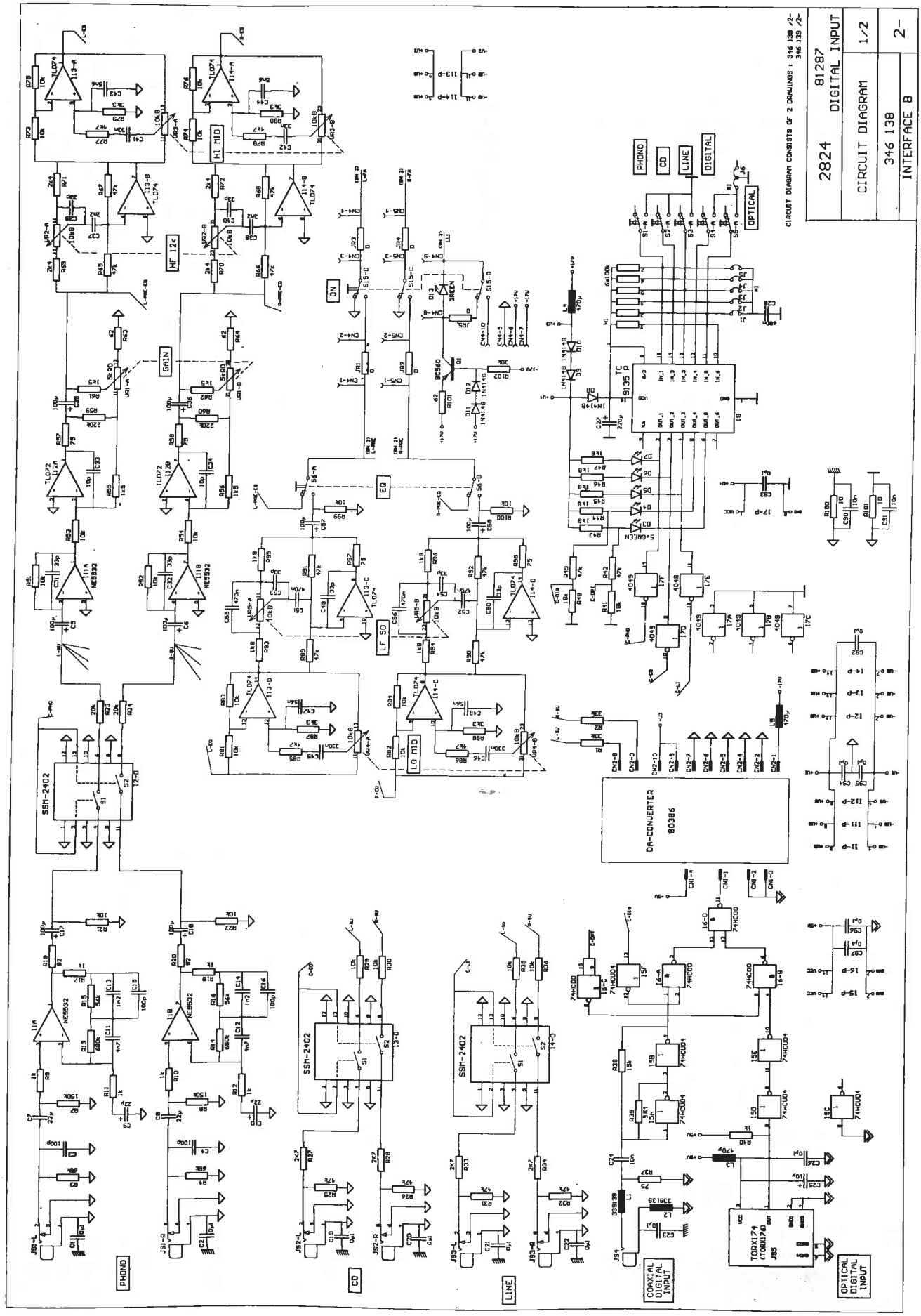


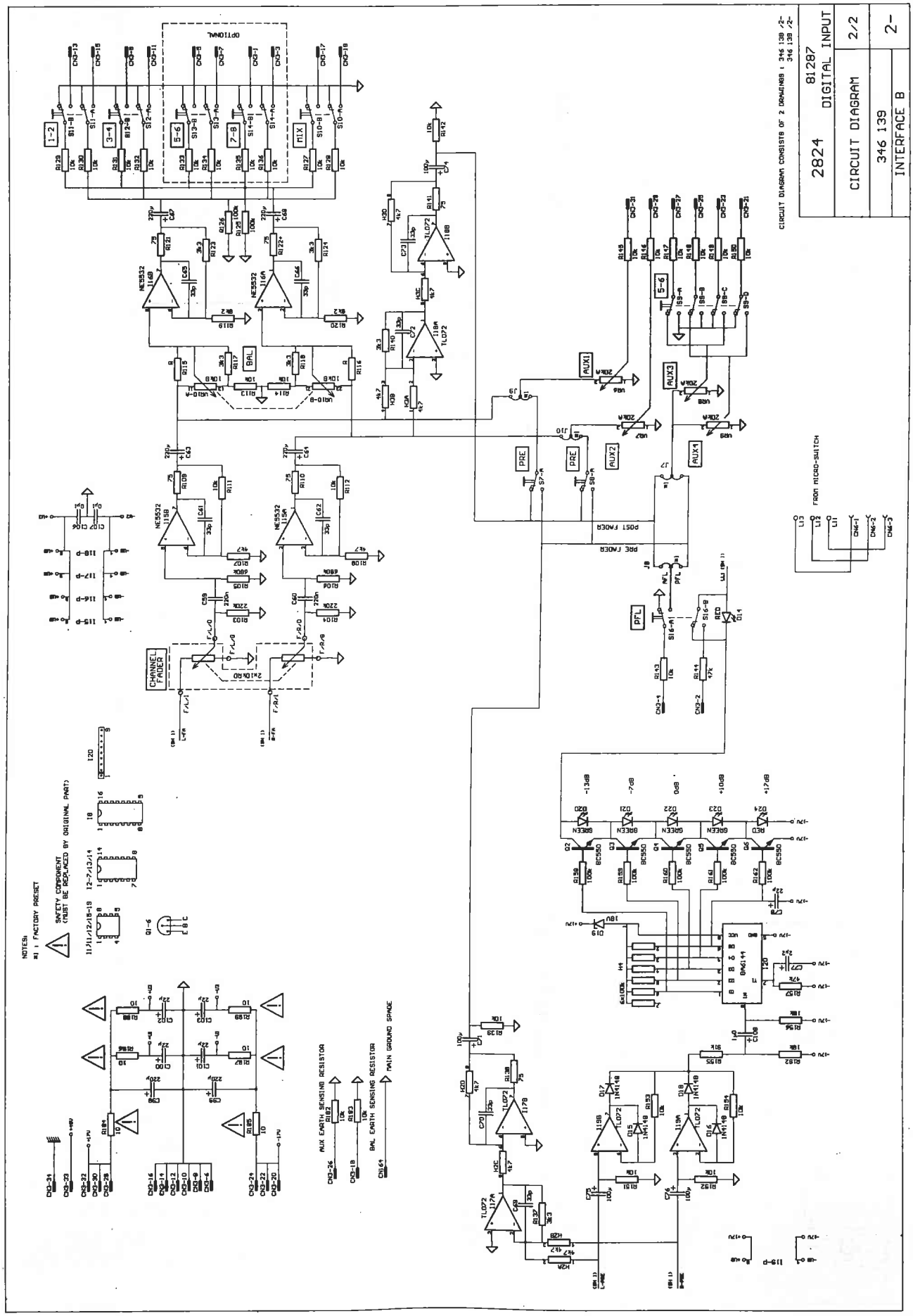
DIGITAL STEREO INPUT 2824



BLO-2824	
BLOCK DIAGRAM	
346 239	2-
INTERFACE	


2824-DIG
80386
D/A-HANDLER
RECEIVER
CIRCUIT DIAGRAM
1/1
346 141
2-
INTERFACE B

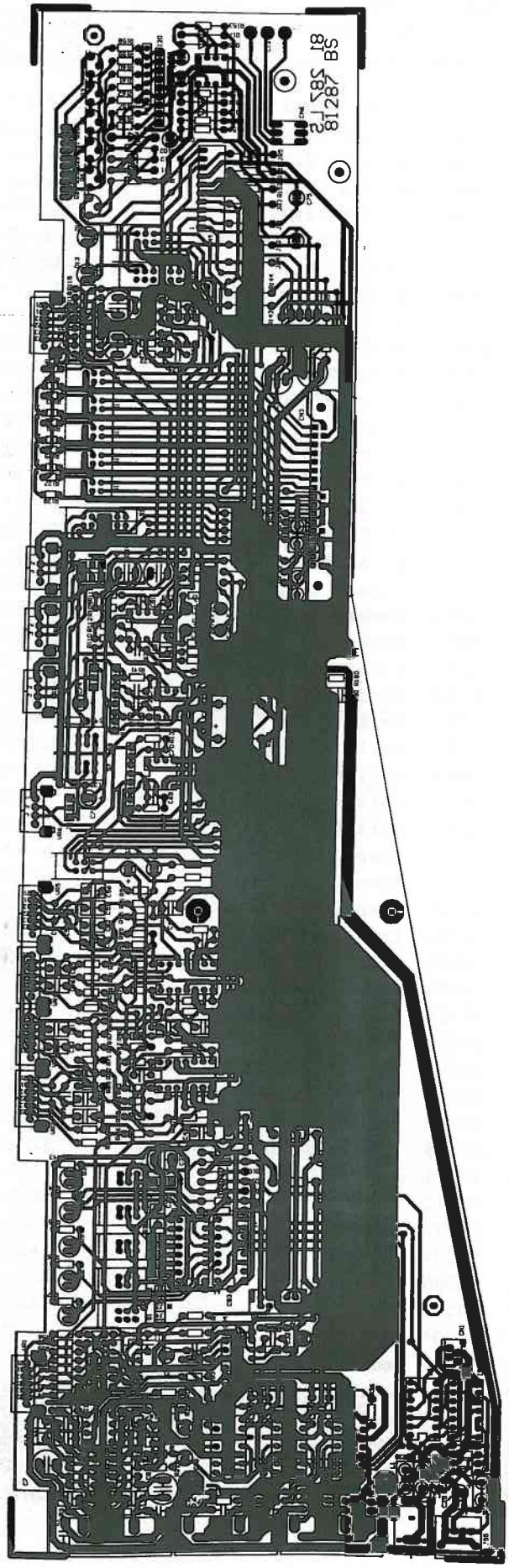

2824 81287 DIGITAL INPUT
CIRCUIT DIAGRAM 1/2
346 138 2-
INTERFACE B
CIRCUIT DIAGRAM CONSISTS OF 2 DRAWINGS : 346 138 /2-
346 139 /2-
PHONO
CD
LINE
DIGITAL
OPTICAL
HI MID
LO MID
HF 12k
LF 50
GAIN
EQ
ON
SSM-2402
DA-CONVERTER
80386
TC 9135 P
COAXIAL DIGITAL INPUT
OPTICAL DIGITAL INPUT


2824 81287
DIGITAL INPUT
CIRCUIT DIAGRAM 2/2
346 139 2-
INTERFACE B
CIRCUIT DIAGRAM CONSISTS OF 2 DRAWINGS : 346 138 /2-
346 139 /2-
NOTES:
(1) : FACTORY PRESET
SAFETY COMPONENT
(MUST BE REPLACED BY ORIGINAL PART)
OPTIONAL
CHANNEL FADER
AUX1
AUX2
AUX3
AUX4
PRE
PFL
FROM MICRO-SWITCH
AUX EARTH SENSING RESISTOR
BAL EARTH SENSING RESISTOR
MAIN GROUND SPADE

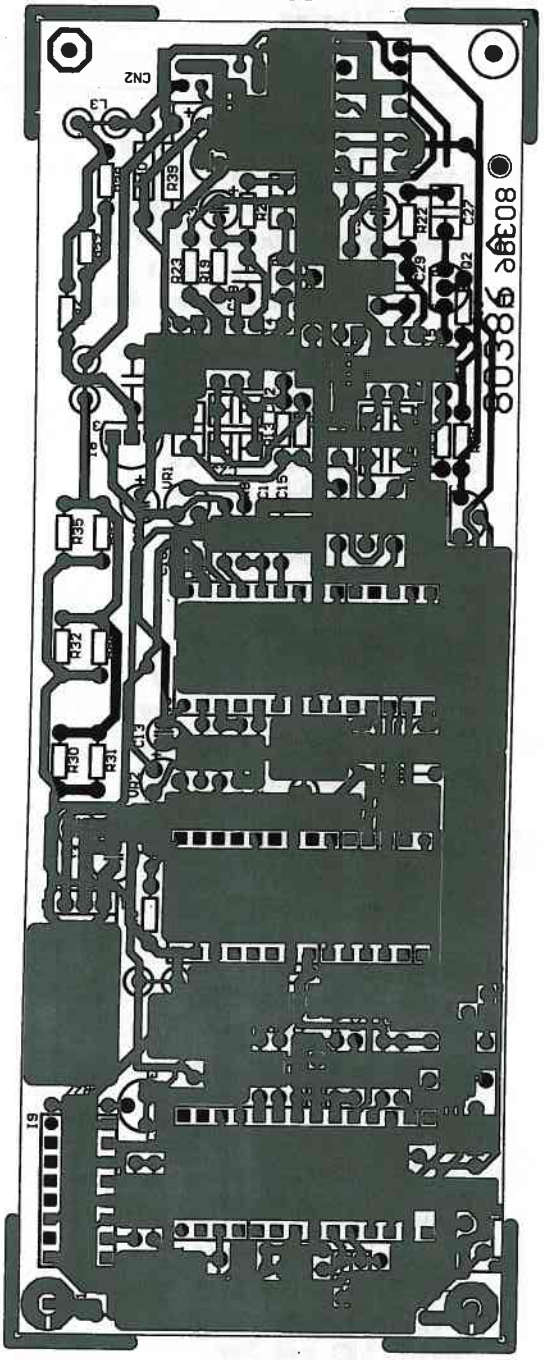
IPM 2824

COMPONENT SIDE

81287



80386



Pos. in diagram	description	Part-No.
R0010	fader 2x10 kohm log	343420
00020	rotary knob black/bl	344610
00030	rotary knob black/rd	344611
00040	rotary knob black/gr	344228
00060	rotary knob sw/li	344227
00080	fader knob bl/wt 4mm	344619
00085	push button	344281
00096	push button EQ	344581
00098	push button 5-6	344575
00100	push button ON	344587
00102	push button PFL	344586
00104	push button MIX	344574
00106	push button 1-2	344576
00108	push button 3-4	344577
00110	push button PRE	345575
00005	PCB IPM 2824 B	812878
C0027	KO-EL 220 MF 25V	343533
C0045	KO-FOL 0.33MF 63V	340244
C0046	KO-FOL 0.33MF 63V	340244
C0063	KO-EL 220 MF 25V	343533
C0064	KO-EL 220 MF 25V	343533
C0067	KO-EL 220 MF 25V	343533
C0068	KO-EL 220 MF 25V	343533
C0098	KO-EL 220 MF 25V	343533
C0099	KO-EL 220 MF 25V	343533
C0108	KO-EL 1 MF 50V	340520
D0003	LED green 3mm	336398
D0004	LED green 3mm	336398
D0005	LED green 3mm	336398
D0006	LED green 3mm	336398
D0007	LED green 3mm	336398
D0008	diode 1N 4148	301254
D0009	diode 1N 4148	301254
D0010	diode 1N 4148	301254
D0011	diode 1N 4148	301254
D0012	diode 1N 4148	301254
D0013	LED green 3mm	336398
D0014	LED red 3mm	336399
D0015	diode 1N 4148	301254
D0016	diode 1N 4148	301254
D0017	diode 1N 4148	301254
D0018	diode 1N 4148	301254
D0019	diode zener ZPD 18V	301277
D0020	LED green 3mm	336398
D0021	LED green 3mm	336398
D0022	LED green 3mm	336398
D0023	LED green 3mm	336398
D0024	LED red 3mm	336399
H0001	resistor netw. SIL 006	339702
H0002	res.network RKL 8A 472J	343456
H0003	res.network RKL 8A 472J	343456
H0004	resistor netw. SIL 006	339702

Pos. in diagram	description	Part-No.
I0001	IC NE 5532 N	327197
I0002	IC SSM 2402 P	345467
I0003	IC SSM 2402 P	345467
I0004	IC SSM 2402 P	345467
I0005	IC SSM 2402 P	341951
I0006	IC MC 74 HC 00 N	331920
I0007	IC MC 14049 UBCP	307838
I0008	IC MC 14049 UBCP	346036
I0011	IC NE 5532 N	327197
I0012	IC TL 072 CP	331340
I0013	IC TL 074 CN	332985
I0014	IC TL 074 CN	332985
I0015	IC NE 5532 N	327197
I0016	IC NE 5532 N	327197
I0017	IC TL 072 CP	331340
I0018	IC TL 072 CP	331340
I0019	IC TL 072 CP	331340
I0020	IC BA 6144	338606
JS001	socket cinch	344929
JS002	socket cinch	344929
JS003	socket cinch	344929
JS004	socket cinch RCA	335480
JS005	IC TORX 176	346034
L0001	coil	339139
L0002	coil	339139
L0003	coil 470 UH	340680
L0004	coil 470 UH	340680
L0005	coil 470 UH	340680
Q0001	trans. BC 560 B	306928
Q0002	trans. BC 550 B	301184
Q0003	trans. BC 550 B	301184
Q0004	trans. BC 550 B	301184
Q0005	trans. BC 550 B	301184
Q0006	trans. BC 550 B	301184
R0184	safety resistor 10 ohm	329215
R0185	safety resistor 10 ohm	329215
R0186	safety resistor 10 ohm	329215
R0187	safety resistor 10 ohm	329215
R0188	safety resistor 10 ohm	329215
R0189	safety resistor 10 ohm	329215
S0001	switch	346243
S0002	switch	346243
S0003	switch	346243
S0004	switch	346243
S0005	switch	346243
S0006	switch	344037
S0007	switch	344037
S0008	switch	344037
S0009	switch	344038
S0010	switch	344037
S0011	switch	344037
S0012	switch	344037
S0015	switch	344038

Pos. in diagram	description	Part-No.
S0016	switch	344037
VR001	potentiometer 2x5 kohm log	344034
VR002	potentiometer 2x10kohm lin	343260
VR003	potentiometer 2x10kohm lin	343260
VR004	potentiometer 2x10kohm lin	343260
VR005	potentiometer 2x10kohm lin	343260
VR006	potentiometer 20kohm log	344032
VR007	potentiometer 20kohm log	344032
VR008	potentiometer 20kohm log	344032
VR009	potentiometer 20kohm log	344032
VR010	potentiometer 2x10kohm lin	343260
00010	PCB IPM 2824 B	803868
C0013	KO-EL 1 MF 50V	340520
C0014	KO-EL 1 MF 50V	340520
C0018	KO-EL 1 MF 50V	340520
C0019	KO-EL 1 MF 50V	340520
D0001	diode 1N 4148	301254
D0002	diode 1N 4148	301254
D0003	diode 1N 4148	301254
I0001	IC CS 8412 CP	346033
I0002	IC DF 1700 P	346032
I0003	IC DF 1700 P	346031
I0004	IC NE 5532 N	327197
I0005	IC NE 5532 N	327197
I0006	IC SSM 2402 P	345467
I0007	IC MC 7805 C	309719
I0008	IC MC 79 L 05 ACP	309721
I0009	IC TC 74 HC590 P	338393
L0001	coil	339139
L0002	coil	339139
L0003	coil	339139
L0004	coil	339139
Q0001	trans. 2SK 187	338384
Q0002	trans. 2SK 187	338384
Q0003	trans. BC 560 B	306928
Q0004	trans. BC 550 B	301184
Q0005	trans. BC 550 B	301184
R0039	safety resistor 10 ohm	329215
R0040	safety resistor 10 ohm	329215
VR001	trim. pot. 100k lin	338893
VR002	trim. pot. 100k lin	338893

Pos. in diagram	description	Part-No.

INTERFACE

4x4 MATRIX OUTPUT MODULE 2844

SPECIFICATIONS: MATRIX OUTPUT Module 2844

* 0 dBu = 0.775 V (RMS)

* Note Enclosure: Measurement Conditions INTERFACE

MATRIX Output
* electronically balanced

		f = 1 kHz	f = 10 kHz
MATRIX Nominal Output Level	:	+ 4 dBu or - 10 dBV	
Max. Output Level	:	+ 27 dBu	
MATRIX Output Impedance	:	75 ohms	
Residual Bus Noise	:	<- 94 dBu	
Mix Bus Noise	:	<- 81 dBu	
MATRIX LEVEL attenuation	:	> 85 dB	> 85 dB
MATRIX SEND 1-4 attenuation	:	85 dB	> 85 dB
Crosstalk (Matrix to Matrix)	:	<- 80 dB	<- 80 dB
Channel Muting "ON"	:	> 105 dB	> 105 dB
Rejection Factor	:	> 35 dB	> 35 dB
THD (EXT.INP. – MATRIX OUT)	:	< 0.003 %	< 0.01 %
Factory Preset Output Level	:	+ 4 dBu	

GROUP Output

* electronically balanced

		f = 1 kHz	f = 10 kHz
INSERT RETURN (Input Imped.)	:	10 kohms	
INSERT SEND (Nom. Level)	:	- 2 dBu	
INSERT SEND (max. Output Level)	:	+ 21 dBu	
GROUP Nominal Output Level	:	+ 4 dBu / - 10 dBV	
Max. Output Level	:	+ 27 dBu	
GROUP Output Impedance	:	75 ohms	
Residual Bus Noise	:	< - 94 dBu	
Mix Bus Noise	:	<- 81 dBu	
Typ. Mix Output Noise	:	< - 76 dBu	
THD (INS. – GROUP OUT)	:	0.002 %	0.003 %
THD (EXT. – GROUP OUT)	:	0.004 %	0.01 %
Crosstalk (Group to Group)	:	< - 85 dB	< - 75 dB
GROUP Fader Attenuation (OFF)	:	> 95 dB	> 95 dB
SUB Switch Muting	:	> 95 dB	> 90 dB
ON Switch Muting	:	>100 dB	> 100 dB
Panpot Isolation	:	> 50 dB	> 50 dB
Rejection Factor	:	> 35 dB	> 35 dB
Factory Preset Output Level	:	+ 4 dBu	

EXTERNAL INPUT

		f = 1 kHz	f = 10 kHz
Input Impedance	:	22 kohms	
Nominal Input Level	:	+ 4 dBu / - 10 dBV	
Max. Input Level	:	+ 27 dBu	
GROUP/MATRIX Switch Muting	:	> 80 dB	> 75 dB
LEVEL Control Attenuation	:	> 85 dB	> 85 dB
ON Switch Muting	:	> 95 dB	> 80 dB

Frequency Response EQ

Boost/Cut	:	+/- 15 dB
Filter Frequencies	:	HF 8 kHz (shelving)
		LF 60 Hz (shelving)

Metering

* 20 Segment LED Bargraph

		Peak	Average
Reading selectable	:		
Rise Time to 0 dBu	:	1 ms	150 ms
Release Time to -20 dBu	:	2 s	250 ms
Rel. Accuracy related to 0 dB	:	+/- 0.5 dB	

Calibration Range (0 dB)	:	E(O) = - 1 dBu to + 12 dBu
Factory Preset	:	E(O) = + 4 dBu for reading 0 dB
		(Encoding PEAK)
Weight	:	700 g

SPECIFICATIONS: MATRIX Module 2844

General measuring conditions if not noted elsewhere otherwise:

* Module not plugged into the ribbon cable. Operating voltage supplied externally.
* Measuring Tolerance : **Δ X = ± 1.5 dB**
* Measuring Frequency : **f = 1 kHz**
* All Levels related to : **E = 775 mV (0dBu)**
* EQ controls into centre Position
* Panpot into centre Position
* Pin Assignment of XLR socket :
  PIN 1 = GND
  PIN 2 = + OUTPUT
  PIN 3 = - OUTPUT
* Pin Assignment INSERT Jack :
  TIP = SEND
  RING = RETURN
  SLEEVE = GND
* Pin Assignment EXTERNAL INPUT Jack :
  TIP = + INPUT
  RING = - INPUT
  SLEEVE = GND
* Source Impedance with feed in
  via INSERT RETURN, EXTERNAL INPUT : R(Q) = 50 ohms
* Connect CN1.18 (GND SENSING) with CN1.16 (MIX EARTH)

1. Operating Voltage : E(B) = +/- 17 V

2. Current Input with Level Meter : I(B) = 115 mA

3. Input and Output Voltages

* EQ controls and Panpot into centre Position.
* Bus Outputs terminated with R(L) = 100 kohms.
* Feed in to Bus Inputs with R(I) = 10 kohms.
* The Switches/Controls listed under notes must be pushed/opened full.
* J = Code jumper, FP=Factory Preset, NFP=Not Factory Preset
* Setting: GROUP ON,MATRIX ON,EXTERNAL LEVEL,GROUP FADER and MATRIX LEVEL max., all Code Jumpers FP

Input	E(I)	Test point	E(O)	Notes
INS.RET.	- 2 dBu	GROUP OUT	+ 14 dBu	
INS.RET.	- 2 dBu	GROUP OUT	+ 3 dBu	J5 NFP
INS.RET.	- 2 dBu	CN1.4	+ 1 dBu	GROUP AFL ON
————		CN1.2	- 10 V(DC)	GROUP AFL ON
————		CN1.2	- 10 V(DC)	MATR.AFL ON
EXT.INP.	+ 4 dBu	CN1.4	+ 11 dBu	MATR.AFL ON,MATR.SEL. EXT.INP. ON
INS.RET.	- 2 dBu	CN1.17/.19	+ 4 dBu	SUB ON
CN1.15	- 2 dBu	GROUP OUT	+ 14 dBu	RE=10k,J1 SEL.
CN1.13	- 2 dBu	GROUP OUT	+ 14 dBu	RE=10k,J2 SEL.
CN1.11	- 2 dBu	GROUP OUT	+ 14 dBu	RE=10k,J3 SEL.
CN1.9	- 2 dBu	GROUP OUT	+ 14 dBu	RE=10k,J4 SEL.
EXT.INP.	- 2 dBu	GROUP OUT	+ 14 dBu	EXT.ON,GROUP SEL.
EXT.INP.	-17 dBu	GROUP OUT	+ 14 dBu	EXT.ON,GROUP SEL.,J15 NFP
EXT.INP.	- 2 dBu	MATRIX OUT	+ 18 dBu	EXT.ON,MATR.SEL.
EXT.INP.	- 2 dBu	MATRIX OUT	+ 6 dBu	EXT.ON,MATR.SEL.,J12 NFP
INS.RET.	- 2 dBu	MATRIX OUT	+ 24 dBu	MATRIX 1 max.,J8 SEL.
INS.RET.	- 2 dBu	MATRIX OUT	+ 24 dBu	MATRIX 2 max.,J9 SEL.
INS.RET.	- 2 dBu	MATRIX OUT	+ 24 dBu	MATRIX 3 max.,J10 SEL.
INS.RET.	- 2 dBu	MATRIX OUT	+ 24 dBu	MATRIX 4 max.,J11 SEL.

4. Balance Adjustment

* The Balance adjustment can be performed as follows:

- Drive according output up to +20 dBu.

- Measure output voltage balanced –> E1

- Sum XLR PIN2 and XLR PIN3 via high-precision resistors (< 10kohms / < 0.5%) to input of measuring instrument and adjust with trimmer R25 or R47 to minimum –> E2

4.1. GROUP OUT: Rejection factor = lg (E1/E2) = > 35 dB

4.1. MATRIX OUT: Rejection factor = lg (E1/E2) = > 35 dB

5. Meter Calibration

* Plug code jumper J16 to PEAK.

- Levelset:

* Drive XLR - Group output to + 4 dBu.

* Adjust meter with trimmer R80 so that the first yellow LED will begin to light up.

- Offset adjustment:

* Drive XLR - Group output to - 23 dBu.
* Adjust meter with trimmer R88 so that the first green LED will begin to light up.
* Drive circuit with different levels and check.
  (max. deviation: +/- 1.0 dB)
  e.g.: E(O) = +16 dBu —> Meter indication +12 dB
  E(O) = - 14 dBu —> Meter indication -18 dB
* Switch meter to Matrix and check function.

- Check Reading Characteristic
  (switch signal on and off)
* Code jumper J16 to AVERAGE
  -- Rise time : slow (150ms) / Release Time : fast (250ms)
* Code jumper J16 to PEAK
  -- Rise time : fast (1ms) / Release Time : slow (2s)

- Factory preset : Code jumper J16 to PEAK

6. Noise Voltages

- measured with AUDIO PRECISION SYSTEM ONE
- R(L) = 100 kohms
- E(F) = Noise voltage, RMS, 22 Hz ... 22 kHz
- E(G) = Noise voltage, frequ.weighted acc. CCIR 468, Q - PEAK

6.1. MATRIX OUT via EXTERNAL INPUT

- MATRIX ON, Encoding FP, EXTERNAL INPUT ON and LEVEL max.

6.1.1. MATRIX LEVEL open:	**U(F) ≤ 180 uV**	**U(G) ≤ 510 uV**
6.1.2. MATRIX LEVEL closed:	**U(F) ≤ 17 uV**	**U(G) ≤ 40 uV**

6.2. GROUP OUT via EXTERNAL INPUT

- GROUP ON, Encoding FP, EXTERNAL INPUT ON, GROUP FADER open

6.2.1. EXT.LEVEL open:	**U(F) ≤ 180 uV**	**U(G) ≤ 510 uV**
6.2.2. EXT.LEVEL closed:	**U(F) ≤ 17 uV**	**U(G) ≤ 37 uV**

7. Distortion (THD)

7.1. THD GROUP OUT via EXTERNAL INPUT

- Feed in E(I) = 0 dBu at EXTERNAL INPUT.
- Measure E(O) at XLR GROUP OUT, R(L) = 100 kohms
- All gain controls fully open

f = 1 kHz: **k < 0.004 %** f = 10 kHz: **k < 0.01 %**

7.2. THD MATRIX OUT via EXTERNAL INPUT

- Feed in E(I) = 0 dBu at EXTERNAL INPUT.
- Measure E(O) at XLR MATRIX OUT, R(L) = 100 kohms
- All gain controls fully open

f = 1 kHz: **k < 0.003 %** f = 10 kHz: **k < 0.01 %**

8. Factory Preset

* Code jumpers inputs/outputs to + **4 dBu**
* Code jumper meter to **PEAK**

9. Frequency Response Curves

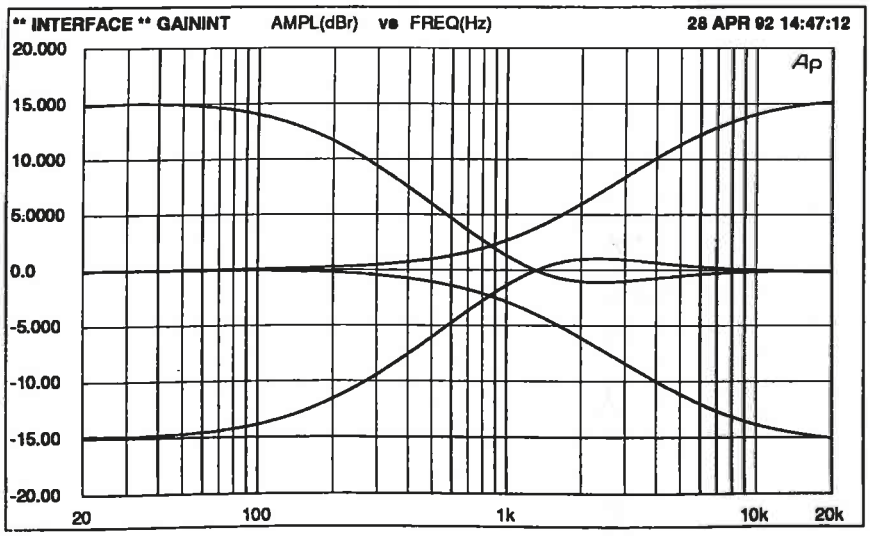
9.1. Cut-off frequencies

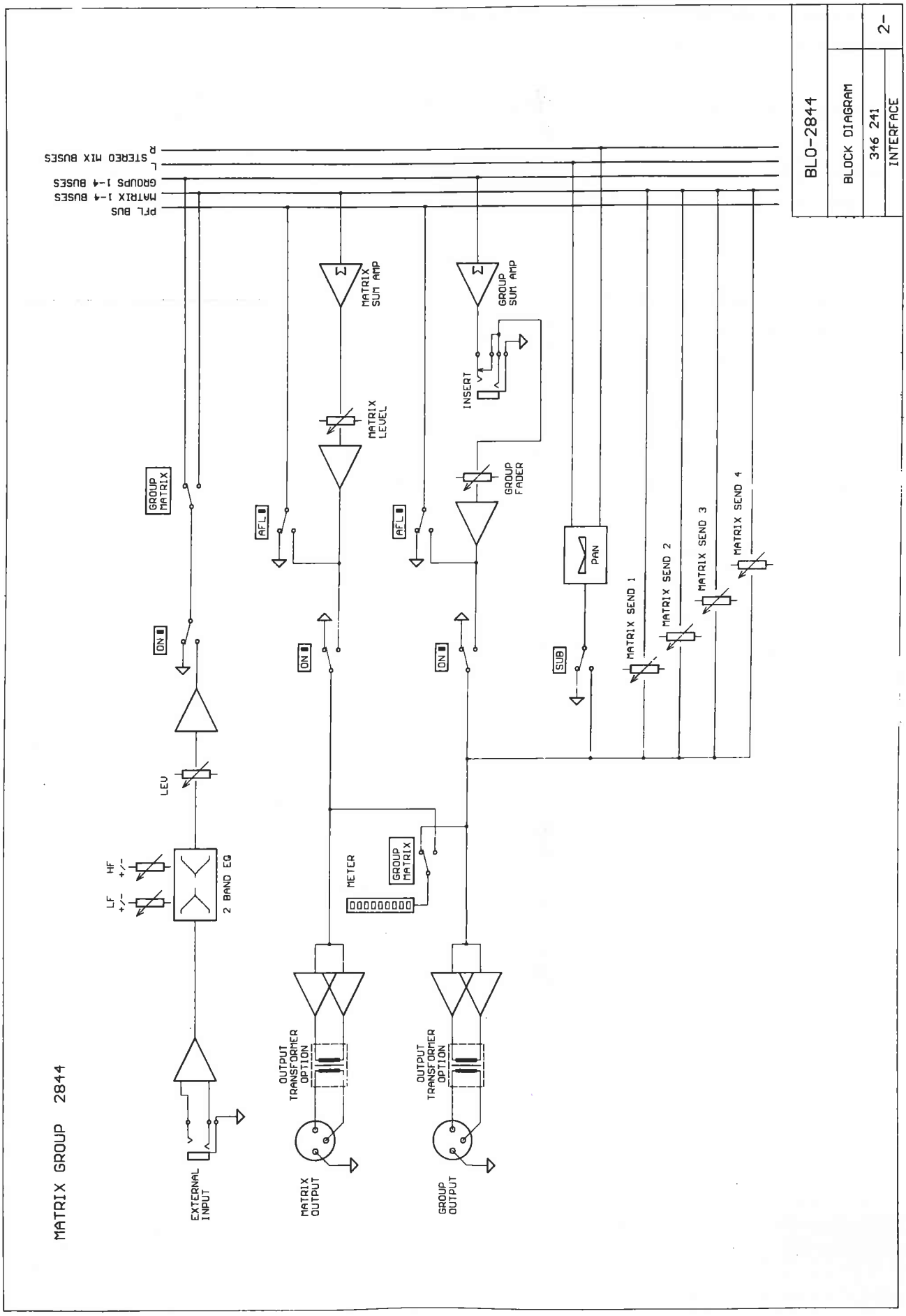
- Feed in to summing point via 10 kohms.

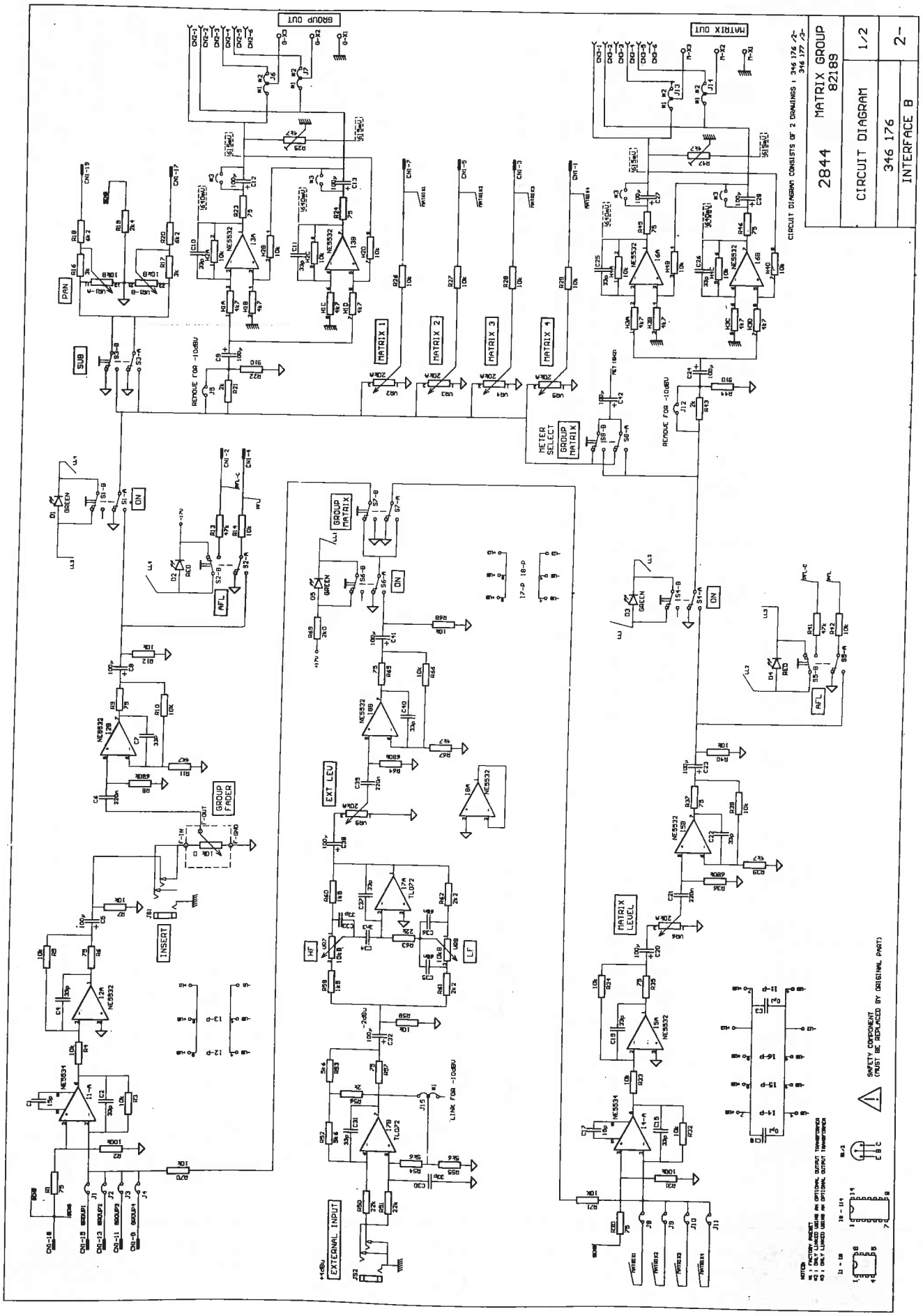
Input	Test Point	fl(-3dB)	fu(-3dB)	Note
Bus GROUP	GROUP OUT	4 Hz	230 kHz	
EXTERNAL INP.	MATRIX OUT	4 Hz	150 kHz	

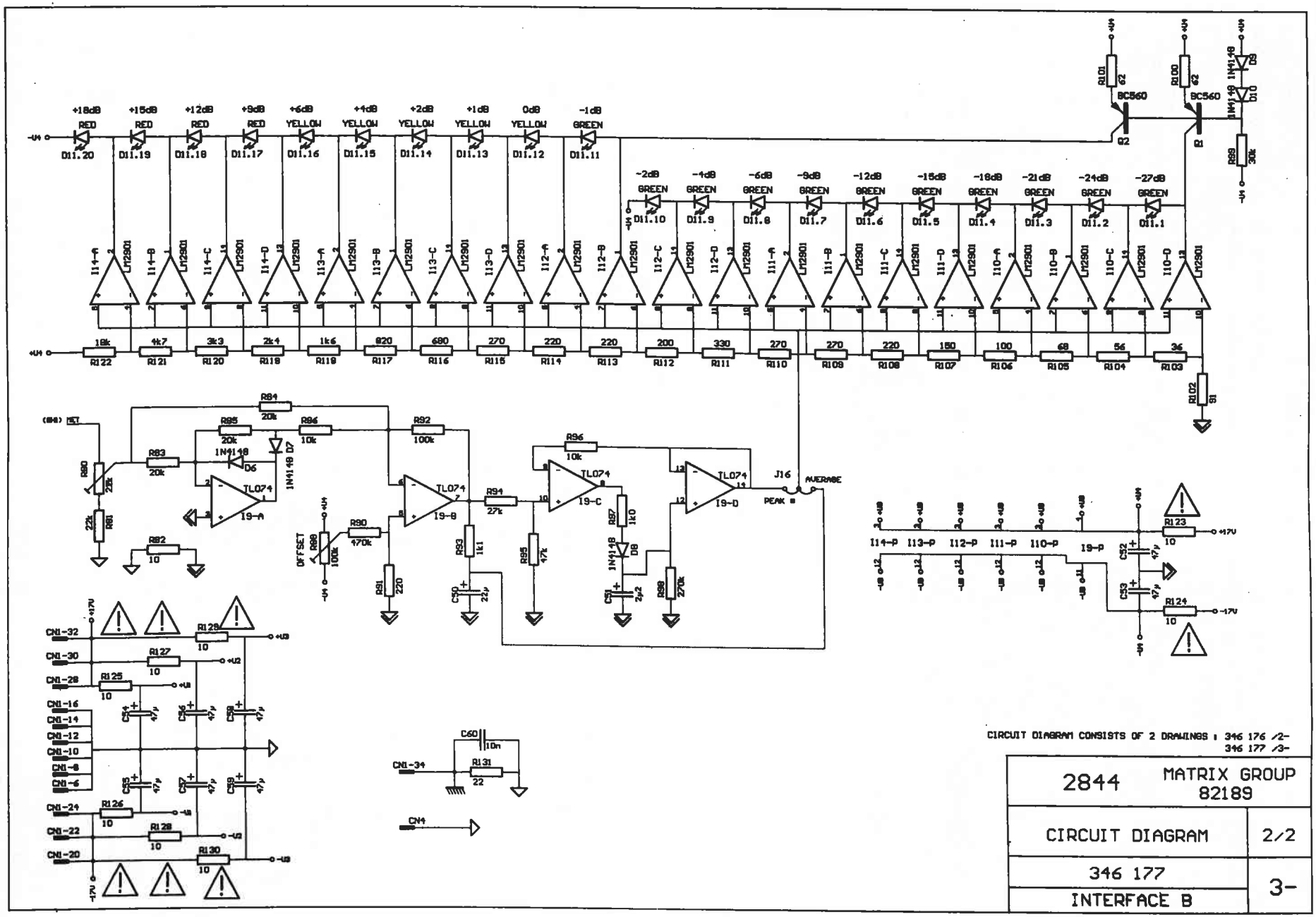
9.2. Frequency Response EQ EXTERNAL INPUT

- Feed in E(I) to input EXTERNAL INPUT
- Measure E(O) at MATRIX OUT
- R(L) = 100 kohms, not mentioned EQ controls into centre position




BLO-2844
BLOCK DIAGRAM
346 241
INTERFACE
2-
MATRIX GROUP 2844
PFL BUS
MATRIX 1-4 BUSES
GROUPS 1-4 BUSES
STEREO MIX BUSES
L
R
EXTERNAL INPUT
GROUP MATRIX
ON
LEV
HF +/-
LF +/-
2 BAND EQ
AFL
MATRIX SUM AMP
MATRIX LEVEL
GROUP SUM AMP
INSERT
GROUP FADER
PAN
SUB
MATRIX SEND 1
MATRIX SEND 2
MATRIX SEND 3
MATRIX SEND 4
METER
OUTPUT TRANSFORMER OPTION
MATRIX OUTPUT
GROUP OUTPUT

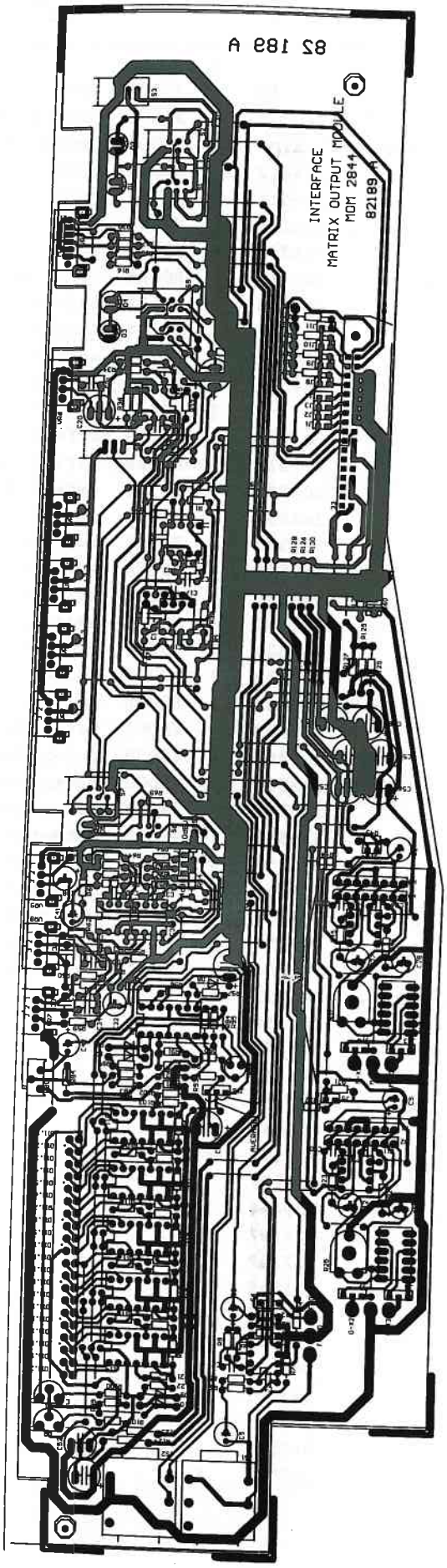

2844 MATRIX GROUP 82189
CIRCUIT DIAGRAM 1/2
346 176 2-
INTERFACE B
CIRCUIT DIAGRAM CONSISTS OF 2 DRAWINGS : 346 176 /2- 346 177 /3-
GROUP OUT
MATRIX OUT
PAN
SUB
MATRIX 1
MATRIX 2
MATRIX 3
MATRIX 4
METER SELECT GROUP MATRIX
ON
AFL
GROUP FADER
INSERT
EXT LEV
HF
LF
MATRIX LEVEL
EXTERNAL INPUT
SAFETY COMPONENT (MUST BE REPLACED BY ORIGINAL PART)



CIRCUIT DIAGRAM CONSISTS OF 2 DRAWINGS : 346 176 /2-
346 177 /3-

2844	MATRIX GROUP 82189	
CIRCUIT DIAGRAM		2/2
346 177		3-
INTERFACE B		

COMPONENT SIDE



Pos. in diagram	description	Part-No.
B0010	connector XLR 3pol.	343539
R0010	fader 10 kohm log	343418
00020	plexiglas panel GRP-2808	345600
00030	rotary knob black/bl	344612
00040	rotary knob black/rd	344611
00050	rotary knob black/gr	344228
00060	rotary knob sw/li	344227
00080	fader knob bl/red 4mm	343164
00090	pusch button AFL	344588
00100	push button ON	344587
00110	push button grey	344280
00120	push button SUB	344584
00005	PCB MOM 2844-B	821898
C0050	KO-EL 22MF 25V	327815
C0051	KO-EL 2.2MF 50V	304986
C0052	KO-EL 47MF 50V	343530
C0053	KO-EL 47MF 50V	343530
C0054	KO-EL 47MF 50V	343530
C0055	KO-EL 47MF 50V	343530
C0056	KO-EL 47MF 50V	343530
C0057	KO-EL 47MF 50V	343530
C0058	KO-EL 47MF 50V	343530
C0059	KO-EL 47MF 50V	343530
D0001	LED green 3mm	336398
D0002	LED red 3mm	336399
D0003	LED green 3mm	336398
D0004	LED red 3mm	336399
D0005	LED green 3mm	336398
D0006	diode 1N 4148	301254
D0007	diode 1N 4148	301254
D0008	diode 1N 4148	301254
D0009	diode 1N 4148	301254
D0010	diode 1N 4148	301254
D0011	LED 4xred+5xyel+11xgreen	344533
H0001	res.network RKL 8A 472J	343456
H0002	res.network RKL 8A 103J	343457
H0003	res.network RKL 8A 472J	343456
H0004	res.network RKL 8A 103J	343457
I0001	IC NE 5534	309446
I0002	IC NE 5532 N	327197
I0003	IC NE 5532 N	327197
I0004	IC NE 5534	309446
I0005	IC NE 5532 N	327197
I0006	IC NE 5532 N	327197
I0007	IC TL 072 CP	331340
I0008	IC NE 5532 N	327197
I0009	IC TL 074 CN	332985
I0010	IC LM 2901	343502
I0011	IC LM 2901	343502
I0012	IC LM 2901	343502
I0013	IC LM 2901	343502
I0014	IC LM 2901	343502

Pos. in diagram	description	Part-No.
JS001	jack koax	343481
JS002	jack koax	343481
Q0001	trans. BC 560 B	306928
Q0002	trans. BC 560 B	306928
R0025	trim. pot 4.7kohm lin	337584
R0047	trim. pot 4.7kohm lin	337584
R0080	trim. pot. 25.00kohm lin	342955
R0088	trim. pot. 100k lin	338893
R0123	safety resistor 10 ohm	329215
R0124	safety resistor 10 ohm	329215
R0125	safety resistor 10 ohm	329215
R0126	safety resistor 10 ohm	329215
R0127	safety resistor 10 ohm	329215
R0128	safety resistor 10 ohm	329215
R0129	safety resistor 10 ohm	329215
R0130	safety resistor 10 ohm	329215
S0001	switch	344037
S0002	switch	344037
S0003	switch	344037
S0004	switch	344037
S0005	switch	344037
S0006	switch	344037
S0007	switch	344037
S0008	switch	344037
VR001	potentiometer 2x10kohm lin	343549
VR002	potentiometer 20kohm log	344032
VR003	potentiometer 20kohm log	344032
VR004	potentiometer 20kohm log	344032
VR005	potentiometer 20kohm log	344032
VR006	potentiometer 20kohm log	344032
VR007	potentiometer 10kohm lin	343261
VR008	potentiometer 10kohm lin	343261
VR009	potentiometer 20kohm log	344032
00130	connector 2x4pol.	335777

INTERFACE

POWER SUPPLY PSI 2835

SPECIFICATIONS: POWER SUPPLY PSI 2835 - INTERFACE

1. Mains voltage (switchable)

240V/230V/220V/120V/100V/90V

2. Mains frequency: **f = 50 Hz ... 60 Hz**

3. Power consumption (max.): **P (max.) = 300 W**

4. Tolerance of mains voltage: **+/- 10 %**

5. Outputs

Output voltage	Load current (max.)	Noise level
+ 17 V	3.5 A	- 70 dBu
- 17 V	3.5 A	- 70 dBu
+ 48 V	0.35 A	- 80 dBu

6. Fuse

Voltage	Fuse value
240 V	3.15 A
230 V	3.15 A
220 V	3.15 A
120 V	6.30 A
100 V	6.30 A
LOW (90 V)	6.30 A

7. Dimensions

Height	:	89 mm (2 HU)
Depth	:	265 mm
Width (front panel)	:	483 mm
Width (housing)	:	438 mm

8. Weight : **7.8** kg/ 17.2lbs

MEASURING DATA: POWER SUPPLY PSI 2835 - INTERFACE

1. Mains voltage (switchable)

- via switches S2 - S5

240V/230V/220V/120V/100V/LOW (90V)

2. Mains frequency **f = 50 Hz**

3. Power consumption (max.) **P (max.) = 300 W**

4. Mains voltage selection

The setting of S2 - S5 should be made according to the required mains voltage.

5. Wiring of the 6-pole output socket

PIN	Function
1	Power-on delay for Master relay
2	+ 17 V
3	- 17 V
4	GND
5	+ 48 V
6	GND/chassis (Ground Lift)

6. Adjust of output voltages

- Select 230V with mains selector switches
- Feed in power via regulating transformer
- Outputs without load
- Tolerance : + 0.1 V

PCB	Trimmer	Test Point	E(O)
85215/right	R006	Output socket PIN 2	+ 17.0 V
85215/left	R006	Output socket PIN 3	- 17.0 V
85213	R4	Output socket PIN 5	+ 48 V

7. Checking the mains voltages

Set all possible input voltage with S2 - S5 one after the other.

Feed in the selected voltage with regulating transformer and check the output voltages from point 6. (Tolerance + 0.1 V).

8. Power-on delay

Switch on unit. After approx. 2 seconds the output voltage at Pin 1 of the output voltage must raise from 0 V to 31 V.

9. Output voltages at max. load

- Ddjust mains voltage to 230 V.
- Terminate each output with a load resistor.

Test Point	Load current	Output voltage
Output socket PIN 2	3.5 A	+ 17.0 V
Output socket PIN 3	3.5 A	- 17.0 V
Output socket PIN 5	0.35 A	+ 48 V

10. Short-circuit current

- Test only for short periods
- Short PIN 2 or PIN 3 to GND (PIN 4)

4.5 A < I(K) < 5.5 A

11. Noise Voltages

- Terminate each output with load resistor
- Measured with SENNHEISER UPM 550-1.
- E(F) = Noise Voltage, RMS, 22 Hz ... 22 kHz

11.1. Output socket PIN 2 mit I(L) = 3.5 A : **U(F) ≤ 150 uV**

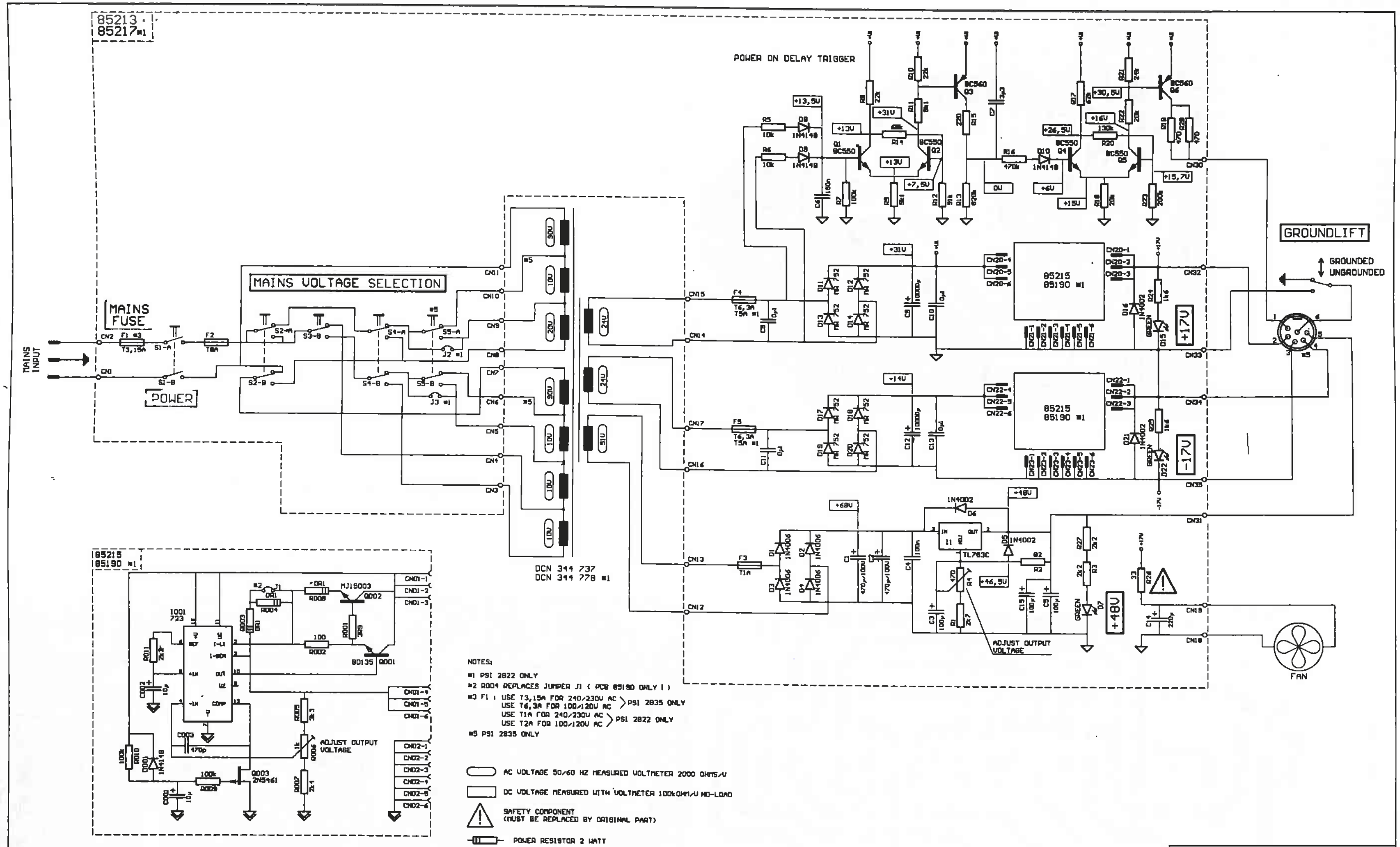
11.2. Output socket PIN 3 mit I(L) = 3.5 A : **U(F) ≤ 150 uV**

11.3. Output socket PIN 5 mit I(L) = 0.35 A : **U(F) ≤ 40 uV**

11.4. Output socket PIN 2 mit I(L) = 2.2 A : **U(F) ≤ 120 uV**

11.5. Output socket PIN 3 mit I(L) = 2.2 A : **U(F) ≤ 120 uV**

11.6. Output socket PIN 5 mit I(L) = 125 mA : **U(F) ≤ 40 uV**



NOTES:

*1 PSI 2822 ONLY

*2 R004 REPLACES JUMPER J1 (PCB 85190 ONLY !)

*3 F1 : USE T3,15A FOR 240/230V AC, USE T6,3A FOR 100/120V AC > PSI 2835 ONLY; USE T1A FOR 240/230V AC, USE T2A FOR 100/120V AC > PSI 2822 ONLY

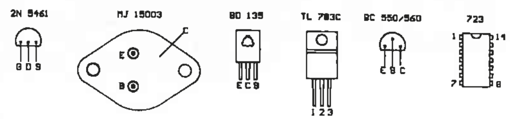
*5 PSI 2835 ONLY

AC VOLTAGE 50/60 HZ MEASURED VOLTMETER 2000 OHMS/V

DC VOLTAGE MEASURED WITH VOLTMETER 100kOHM/V NO-LOAD

SAFETY COMPONENT (MUST BE REPLACED BY ORIGINAL PART)

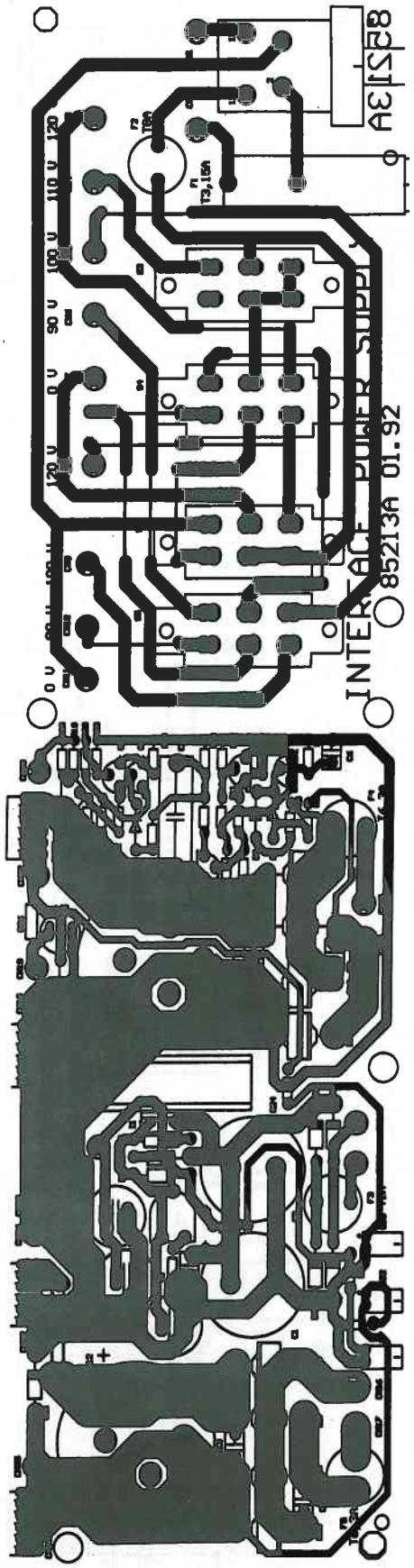
POWER RESISTOR 2 WATT



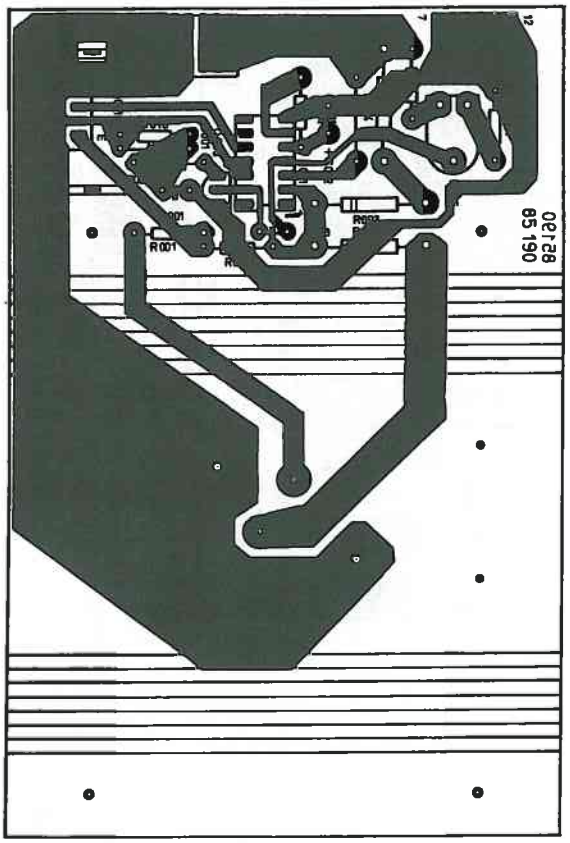
PSI2835A	85213 85215	
CIRCUIT DIAGRAM	1/1	
344 803	2-	
INTERFACE		

COMPONENT SIDE

85 213



85 215

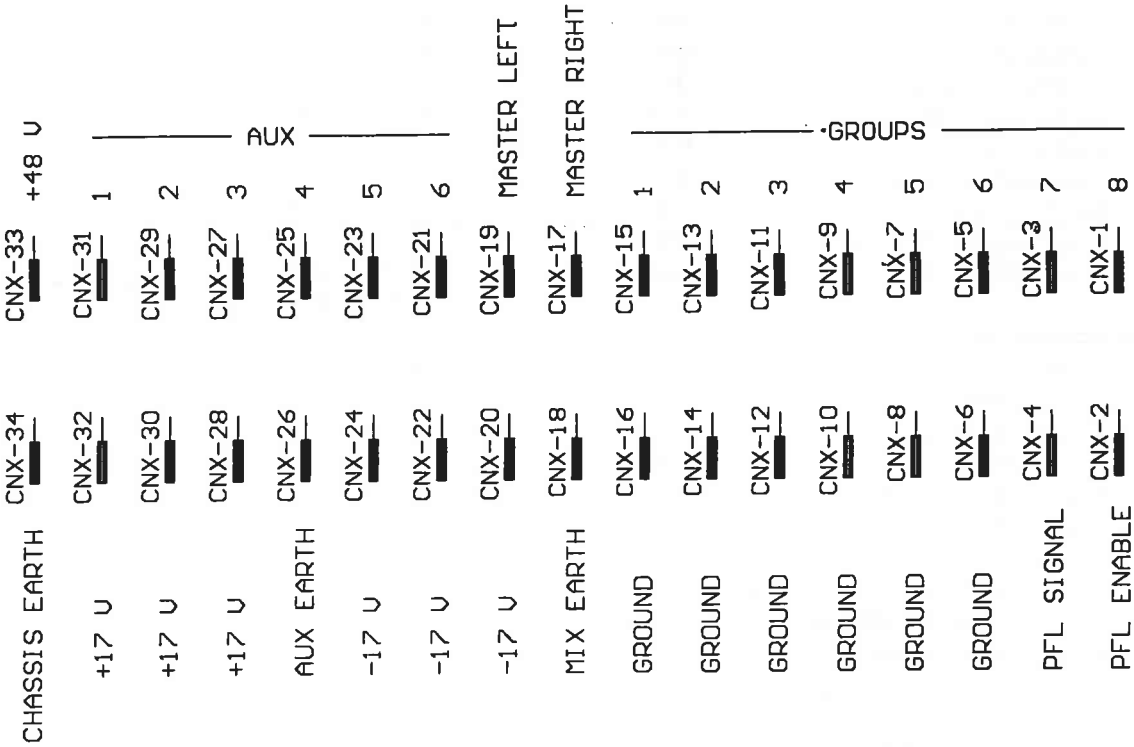


Pos. in diagram	description	Part-No.
B0001	mains connector	303076
B0002	socket XLR 6pol	341591
S0001	sliding switch	335941
Z0090	connector XLR 6pol	341593
Z0120	rubber foot	335589
00030	push button black 12,5x7	337059
00455	fan TYP 8314 24V/DC	341614
00010	front panel PSI 2835	345005
00020	cover PSI 2835	345008
00010	PCB PSI 2835	852158
C0001	KO-EL 10MF 35V	307445
C0002	KO-EL 10MF 35V	307445
D0001	diode 1N 4148	301254
I0001	IC TL 3723 C	306502
Q0001	trans. BD 135-16	307906
Q0002	trans. MJ 15003	328889
Q0003	trans. 2N 5461 P.-CH.-FET	304614
R0003	wire wound-resistor 0,10hm	333723
R0006	min.pre set 1KOHM 1in	305742
R0008	wire wound-resistor 0,10hm	333723
00020	PCB PSI 2835	852138
C0009	capacitor 10000MF 40V	330475
C0012	capacitor 10000MF 40V	330475
D0001	diode 1N 4006	305739
D0002	diode 1N 4006	305739
D0003	diode 1N 4006	305739
D0004	diode 1N 4006	305739
D0005	diode 1N 4002	304360
D0006	diode 1N 4002	304360
D0007	LED green 3mm	341823
D0008	diode 1N 4148	301254
D0009	diode 1N 4148	301254
D0010	diode 1N 4148	301254
D0011	diode MR 752	328769
D0012	diode MR 752	328769
D0013	diode MR 752	328769
D0014	diode MR 752	328769
D0015	LED green 3mm	341823
D0016	diode 1N 4002	304360
D0017	diode MR 752	328769
D0018	diode MR 752	328769
D0019	diode MR 752	328769
D0020	diode MR 752	328769
D0021	diode 1N 4002	304360
D0022	LED green 3mm	341823
Q0001	trans. BC 550 B	301184
Q0002	trans. BC 550 B	301184
Q0003	trans. BC 560 B	306928
Q0004	trans. BC 550 B	301184
Q0005	trans. BC 550 B	301184
Q0006	trans. BC 560 B	306928

Pos. in diagram	description	Part-No.
R0004	Res. trimpot 470 ohm 1in	331427
R0026	safety resistor 33 Ohm	328770
S0001	mains switch	331175
S0002	sliding switch	335941
S0003	sliding switch	335941
S0004	sliding switch	335941
S0005	sliding switch	335941
00010	fuse holder	306838
00020	fuse holder	328390
00025	cop of fuse holder	328391
00080	push button black 12,5x7	337059
00030	mains transformer	344737

INTERFACE B BUS CONNECTOR

MOTHERLOOM 34 WAY IDC



AUX OUTPUTS 20 WAY IDC