

MAINFRAME G7

SERVICE MANUAL

GENERAL

THE LAKE PEOPLE MAINFRAME G7 was carefully built, tested and adjusted at the factory. The unit is basically maintenance free. High long term stability is achieved by use of highest range quality components. If problems occur refer to the descriptions and circuit diagrams in this service manual.

If in doubt give us a call!

Most electronic components are built on single sided PCB's with euro-card dimensions to fit in standard 19" / 3HE frames.

The rearmounted audio-connectors are installed on small PCB's and wired via 10-pol connectors to the bus.

Necessary jumpers on the PCB's are made with 4/10" 0-Ohm resistors. The wiring is made via a bus inside the 19" frame. The connectors between the PCB's and the bus are 31-pol male / female connectors according to DIN 41617. The mains-wiring is made in accordance to VDE rules.

The case of the MAINFRAME G7 is connected to earth, there is no interconnection between earth and signal ground.

The cases of the connected SATELLITES are connected to earth via the shield of the multicore-cables and pins 9 and 27 of the centronic plugs. Again, there is no interconnection between earth and signal ground.

WARNING: Do not alter the original position of the PCB's. Serious damages may result !!

More detailed informations are given by the schematics and the component layouts in this manual.

MAINS VOLTAGE

The unit is set to 230 V AC. Mains Fuse ratings: 2.5 AT with linear supply
6.3 AT with switch-mode supply

SAFETY-RELATED WARNING:

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT THE METAL COVERS ARE PROPERLY GROUNDED AND ISOLATED FROM THE POWER SUPPLY BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

DESCRIPTION

- The top-and bottom covers of the MAINFRAME G7 are made of extruded aluminium profiles, the sidewalls consist of 3mm steel sheet metal. The size is 19", 3 HE.
- The case is connected to earth, there is no connection to the signal ground.
- The input ground connection may be cut with the ground-lift switch, located on the rear.
- The torodial transformer is fixed inside the case.
- Mains connection is made with an IEC/CEE mains socket with an integral fuse on the rear side. The 2-pol illuminated Mains-Switch is located on the front.
- Mains wireing is made in accordance to VDE-rules.
- The SATELLITES are connected to the MAINFRAME by a multicore cable with centronics plugs. The system-connectors of the MAINFRAME G7 are mounted to the front and the rear side of the case.
- The SATELLITES are supplied with power by the MAINFRAME in three different ways to support specific setups.
 - The Switch-Mode Supply with variable voltages from +/- 20 to +/- 33 Volt will drive more than ten SATELLITES.
 - The Linear Supply with fixed voltages of +/- 27 Volt will drive up to five SATELLITES.
 - The Linear Supply with fixed voltages of +/- 35 Volt will drive up to five SATELLITES.
- The eight audio-inputs mounted on the rear are XLR-female typs. Optionally 39-pol connectors DIN 41618 may be installed in place or parallel to the XLR inputs.
- Because of the used cables between MAINFRAME and SATELLITES the input signals must be balanced. Even if there are balanced outs from the console it is better to use the activ signal conditioning inside the MAINFRAME. Otherwise CMRR- or impedance-problems might occure due to paralleling the inputs of the SATELLITES.
- The activ version of the MAINFRAME G7 is equipped with electronically balanced inputs or, on request, with transformer balanced inputs.
- The Talkback signal coming from the SATELLITES is buffered in the MAINFRAME and fed to a rearmounted XLR male connector. The buffered outgoing signal is electronically balanced or, on request, transformer balanced.
- The System-Control signals TC and PC are wired to a 1/4" phone jack socket on the rear.

DISASSAMBLY PROCEDURE:

- Pull the Mains Plug !!
- To remove a PCB unscrew the corresponding 2.5 mm screws and draw out the PCB.
- Provisions are made to remove the top of the 19" frame to ease overall servicing works. The bus-frame is only screwed to the bottom of the 19" frame.
- To remove the top, all 2.5 mm screws of the front and the backpanels must be removed. Then unscrew four 4 mm screws on the top of the sidewalls. Now the top may be removed.

GENERAL SETTINGS EX FACTORY

GROUND LIFT

- The ground of the input connectors may be lifted with the aid of the groundlift switch located on the rearpanel.
- The ground of the outgoing talkback signal may be lifted with the aid of the groundlift jumper next to the corresponding XLR connector on the PCB inside the case.
- Ex factory the jumper is set to ground.

ALIGNMENT OF TALKBACK OUTPUT BALANCE

(Only with electronically balanced output)

The semi-fixed resistor is located on the TALKBACK PCB.

Alignment:

1. Feed in a 15 kHz, 0 dB signal to pins 5 and / or 6 of the corresponding female header.
(Balanced input)
2. Connect your preferred balance test equipment to the talkback output XLR connector or to pins 14 and 15 of the female header.
3. Align the semi-fixed resistor so that the test equipment indicates minimum amplitude deviation between both output phases.

GAINSETTING OF THE INPUT STAGES

- Every input differential amplifier is equipped with jumper to set the gain to 0 dB or +6 dB. When the jumper is in place the gain is +6 dB, when it is removed the gain is 0 dB.
- Ex factory the jumper is set to +6 dB.

ABOUT TC AND PC SIGNALS

THE TC-SIGNAL

The TC-signal appears when the Talkback-Button of a SATELLITE is pushed and may be used to indicate that somebody wants to speak, or to switch or root some talkback facilities in the console automatically. The signal is normally low (0 Volt) and changes to high status (+16 Volt) when the talkback button is pushed.

However, the status may be changed from normally high (+16 Volt) to low status (0 Volt) when the talkback button is pushed.

This is made by setting a jumper to another position. The jumper is located close to the relays on the TALKBACK PCB of the MAINFRAME G7.

- Ex factory the TC-Signal status is normally low.

Several milliamperes may be drawn to allow to drive external relays or optocouplers.

WARNING: No provisions are made to limit the current of this outlet. So short-circuits may overload the positive voltage regulator on the TALKBACK PCB.

THE PC-SIGNAL

The PC-Signal allows a remote power-controlling of the connected SATELLITES. Only when the PC-Signal is connected to ground, the SATELLITES may be switched from stand-by to operation. In that way a switch, mounted in a central place, may allow an operator to control the SATELLITES.

WARNING: When the PC-Signal is used, it must be operated before switching off the mains and after switching on the mains. Otherwise the logic control inside the SATELLITES may fail due to incorrect timing.

CONNECTION OF PC- AND TC-SIGNALS

Both signals are wired to a 1/4" stereo phone jack socket. The "Tip" carries the TC-Signal, the "Ring" carries the PC-Signal. The "Ring" is equipped with an NC contact. It provides that the PC-Signal is connected to ground when no phone jack is inserted to the socket.

When a phone jack is plugged in, the ground connection will be cut and PC controlling may be made elsewhere.

Two ways to use the TC-Signal and not the PC-Signal:

1. Use a mono phone jack.
2. Solder a wire from the "Ring" (PC-Signal) to the "Sleeve" (Ground) of a stereo phone jack.

ALIGNMENT OF THE SATELLITE POWERSUPPLY

The semi-fixed resistors are located on the regulator cards and may be adjusted without disassembling through the frontpanel.

Additional testpoints are provided on the linear regulator cards. To clamp probes to the testpoints the frontpanel must be removed.

SWITCH-MODE SUPPLY VERSION

Because of the switch-mode supply thermal losses are negligibile and the voltages may be adjusted to every desired value between 24 and 33 volt.

Alignment:

1. Connect a voltmeter between one of pins 14, 15, 32, 33 (+U) and one of the pins 12, 13, 30, 31 (Ground) of the centronics connector.
2. Align the semi-fixed resistor of the positiv power supply card to the desired voltage.
3. Connect a voltmeter between one of the pins 10, 11, 28, 29 (-U) and one of the pins 12, 13, 30, 31 (Ground) of the centronics connector
4. Align the semi-fixed resistor of the negativ power supply card to match closely the positiv voltage.

Ex factory the voltage is set to +/- 33 volt.

LINEAR SUPPLY VERSION

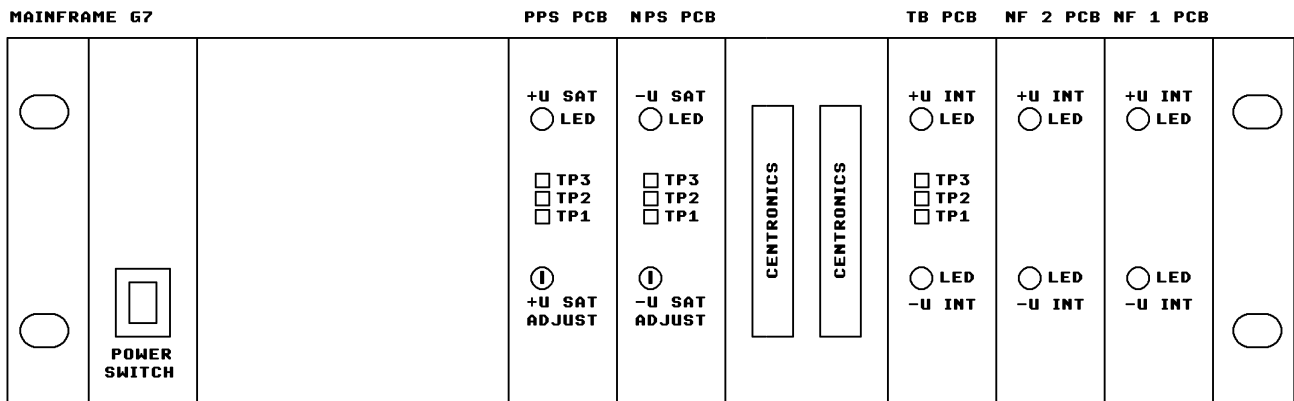
To ensure small thermal losses but guarantee stable operation the supply voltage of the SATELLITES depends on the built-in transformer and the local mains-voltage. The voltage drop across the regulators should not be greater than 7 volt. With this voltage drop AC mains deviation of more than +/-10% will have no influence on the proper operation of the connected SATELLITES, and the thermal effects will be low.

Alignment:

1. Remove the frontpannels of the regulator cards.
2. Connect 2 to 4 SATELLITES to the MAINFRAME G7, (or just your normal setup), and switch them on.
3. Connect a voltmeter between TP 1 and TP 2 of the positiv regulator card
4. Adjust the voltage that the voltmeter indicates aproximately 7 volts.

5. Connect the voltmeter between TP 1 and TP 3 of the positiv regulator card. Registrare the reading.
6. Connect a voltmeter between TP 1 and TP 3 of the negativ regulator card. Adjust the negativ voltage to closely match the positive voltage.

Ex factory the voltage is adjusted to +/- 27 or +/- 35 volt (depending on the mains transformer), what corresponds to a mains voltage of 230 Volt AC.



LOCATION AND MEANING OF THE TESTPOINTS

POSITIV AND NEGATIV POWER SUPPLY PCB

TP 1: Stabilized outgoing voltage

TP 2: Rectified incoming voltage

TP 3: Ground

TALKBACK PCB

TP 1: Negativ internal voltage (+16 Volt +/- 0.3 Volt)

TP 2: System Ground

TP 3: Positiv internal voltage (-16 Volt +/- 0.3 Volt)

TECHNICAL DATA MAINFRAME G7

SWITCH-MODE POWERSUPPLY VERSION

Mains voltage	200 - 240 Volt AC
SATELLITES supply voltage	+/- 20...+/- 33 Volt var.
Current	> +/- 5 Amp.

LINEAR POWERSUPPLY VERSION

Mains voltage	200 - 240 Volt AC
SATELLITES supply voltage (depending on Mains)	+/- 27 Volt fixed or +/- 35 Volt fixed
Current	> +/- 2 Amp.

SIGNAL CONDITIONING SECTION

Internal supply voltage	+/- 16 Volt
-------------------------	-------------

INPUT SIGNAL CONDITIONING SECTION

Input channels	8, electronically or transformer balanced
Impedance	20 kOhm, balanced
max. Input level	> +21 dBm
Gain	0 dB or +6 dB
Input CMRR (15kHz)	> 60 dB
Frequency range elec. bal.	20 Hz - 20 kHz (-0.5 dB)
Frequency range trafo. bal.	40 Hz - 18 kHz (-0.5 dB)
max. Output level (R _L 600 Ohm)	+ 21 dBm
Output CMRR (15kHz)	> 50 dB
THD + N	< 0.02 %
Noise	< -90 dBm

TALKBACK SIGNAL CONDITIONING SECTION

Input Impedance	20 kOhm, balanced
max. Input level	> +21 dBm
Gain	0 dB
Input CMRR (15 kHz)	> 60 dB
Frequency range elec. bal.	20 Hz - 20 kHz (-0.5 dB)
Frequency range trafo. bal.	60 Hz - 18 kHz (-0.5 dB)
max. Output level	+21 dBm
Output CMRR (15 kHz)	> 50 dB
THD + N	< 0.02 %
Noise	< -90 dBm

SYSTEM CONTROL SIGNALS

TC Signal (Talkback control)	activ high or activ low, wired to "Tip" contact of 1/4" phone jack socket
PC Signal (Power control)	must be grounded to have "stand-by" mode on SATELLITES, wired to "Ring" contact of 1/4" phone jack socket

CONNECTION OF 39-PIN SIEMENS-PLUG (WDR VERSION)

Pin-No. of 39-pin Plug

ROW	No.	Signal Name	internal Color Code
a	1	Input Channel 1 (+)	light brown
b	1	GND	light brown/green
c	1	Input Channel 2 (+)	light brown
a	2	Input Channel 1 (-)	brown
b	2	GND	light brown/green
c	2	Input Channel 2 (-)	red
a	3	GND	light brown/green
b	3	Input Channel 3 (+)	light brown
a	4	GND	light brown/green
b	4	Input Channel 3 (-)	orange
c	4	GND	light brown/green
a	5	Input Channel 4 (+)	light brown
b	5	GND	light brown/green
c	5	Input Channel 5 (+)	light brown
a	6	Input Channel 4 (-)	yellow
b	6	GND	light brown/black
c	6	Input Channel 5 (-)	blue
a	7	GND	light brown/black
b	7	GND	light brown/black
c	7	GND	light brown/black
a	8	Input Channel 6 (+)	light brown
b	8	GND	light brown/black
c	8	Input Channel 7 (+)	light brown
a	9	Input Channel 6 (-)	violett
b	9	GND	light brown/black
c	9	Input Channel 7 (-)	grey
a	10	GND	light brown/black
b	10	Input Channel 8 (+)	light brown
c	10	GND	light brown/black
a	11	GND	light brown/black
b	11	Input Channel 8 (-)	white
c	11	GND	light brown/black
a	12	TC-Signal	light brown
b	12	GND	light brown/black
c	12	Output Talkback (+)	light brown
a	13	PC-Signal	brown
b	13	GND for TC- and PC Signal	light brown/red
c	13	Output Talkback (-)	green

Please Note:

All GND-connections may be cut with the aid of the Ground-Lift Switch with the exception of the ground connected to Pin 13 / Row (b). This is necessary for the proper working of the TC- and PC-Signals if desired.

To enable the PC-Signal function on the Siemens-plug, please insert an empty Stereo (!) Phone-Jack to the normal control-connector on the back of the Mainframe

CENTRONICS PLUGS, CABLES, WIREING

The connectors used in the G7 system are 36-pol centronic typs.

The sending and receiving connectors are female. The cables are fitted with male types.

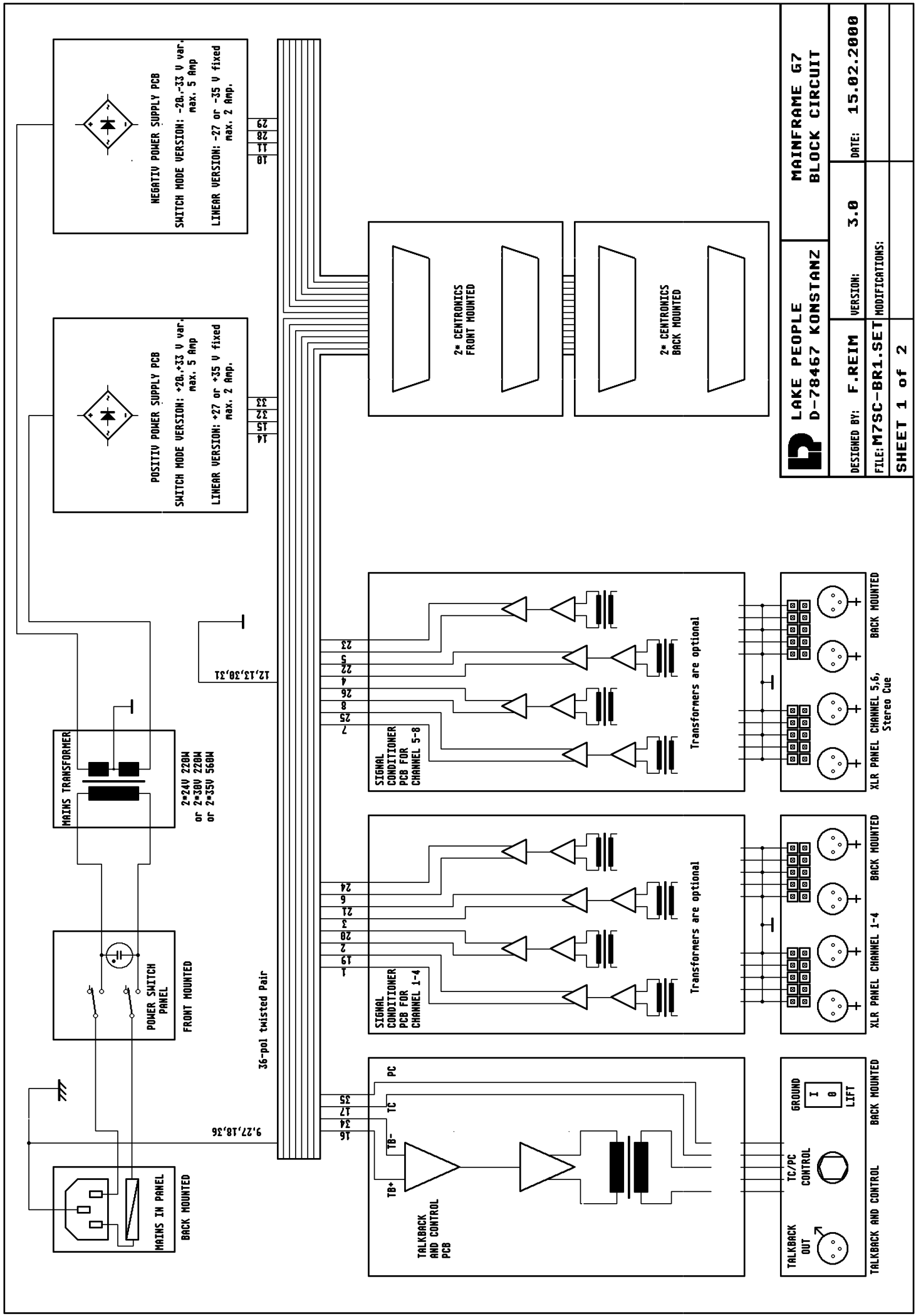
The cables are standard data transmission cables consisting of 18 or 20 twisted pairs and a common shield.

COLORCODE AND FUNCTION

Centr. Pin No. (SAT. G7 Mk I)	Centr. Pin No. (SAT. G7 Mk II)	Function (MAINFR. G7)	Color (36-pol)	Color (40-pol)
1	1	CH 1+	white-red	white-red
3	2	CH 2+	white-blue	white-blue
5	3	CH 3+	white-green	white-green
7	4	CH 4+	white-yellow	white-yellow
23	5	CH 5+	white-grey	white-grey
25	6	CH 6+	white-black	white-black
19	7	CH 7+	white-pink	white-pink
21	8	CH 8+	white	white
9	9	Earth	green	green
10	10	U-	green-blue	green-blue
11	11	U-	yellow-grey	pink-blue
12	12	GND	green-black	green-black
13	13	GND	green-pink	green-pink
14	14	U+	green-red	green-red
15	15	U+	yellow-pink	red-pink
16	16	TB+	red-blue	red-blue
34	17	TC	red	red
18	18	Shield	Shield	Shield
2	19	CH 1-	brown-red	brown-red
4	20	CH 2-	brown-blue	brown-blue
6	21	CH 3-	brown-green	brown-green
8	22	CH 4-	brown-yellow	brown-yellow
24	23	CH 5-	brown-grey	brown-grey
26	24	CH 6-	brown-black	brown-black
20	25	CH 7-	brown-pink	brown-pink
22	26	CH 8-	brown	brown
27	27	Earth	yellow	yellow
28	28	U-	yellow-blue	yellow-blue
29	29	U-	blue	grey-blue
30	30	GND	yellow-black	yellow-black
31	31	GND	grey-green	grey-green
32	32	U+	yellow-red	yellow-red
33	33	U+	grey	grey-red
17	34	TB-	grey-pink	grey-pink
35	35	PC	black	black
36	36	Shield	Shield	Shield

Not connected (36-pol cable): violet, pink

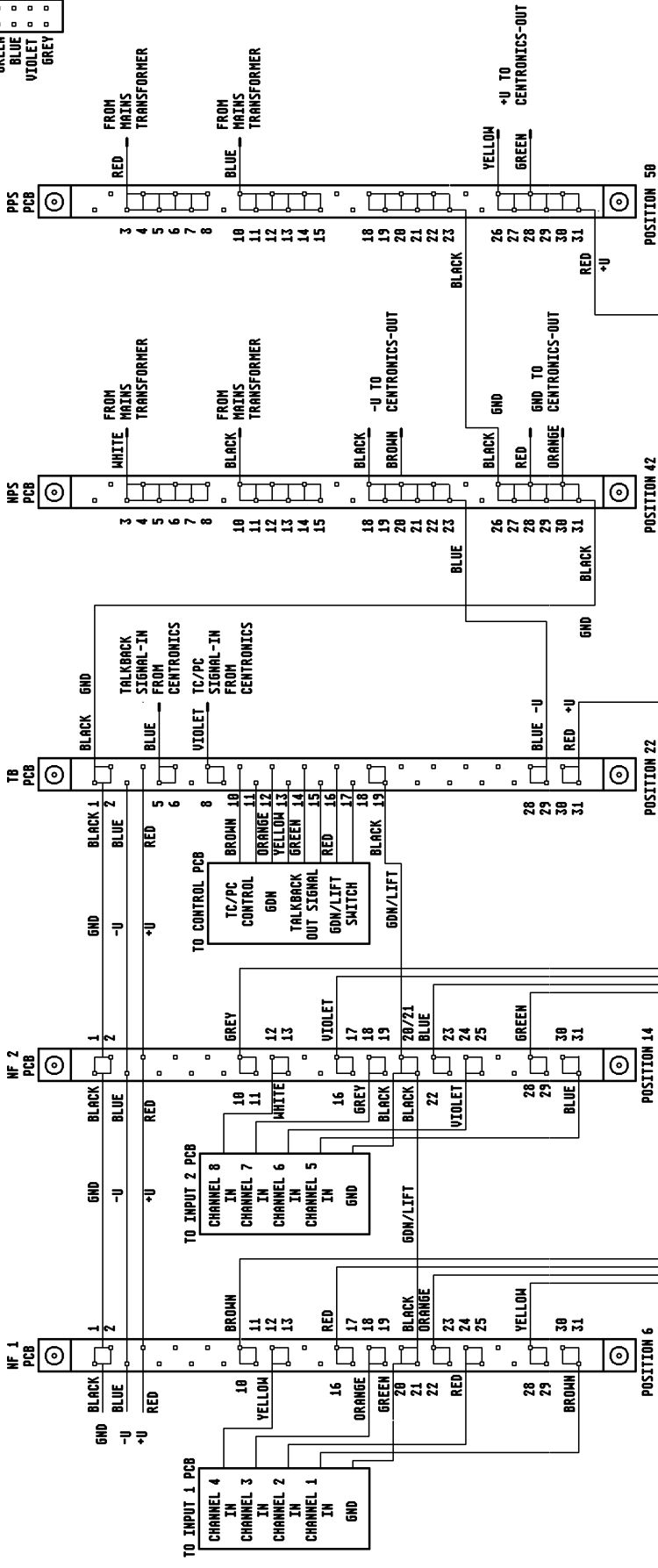
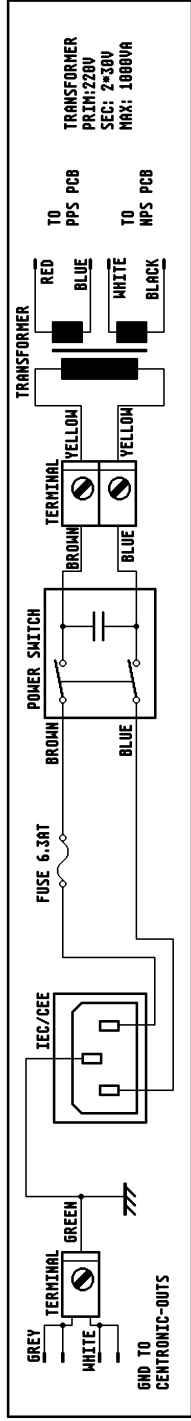
(40-pol cable): violet, pink, blue, grey, yellow-pink, yellow-grey



LAKE PEOPLE D-78467 KONSTANZ	MAINFRAME G7	
	BLOCK CIRCUIT	
DESIGNED BY: F. REIM	VERSION: 3.0	DATE: 15.02.2000
FILE: M7SC-BR1.SET MODIFICATIONS:		
SHEET 1 of 2		

CENTRONICS-OUT
TO G7

- BROWN □ CHANNEL 1 OUT
- RED □ CHANNEL 2 OUT
- ORANGE □ CHANNEL 3 OUT
- YELLOW □ CHANNEL 4 OUT
- GREEN □ CHANNEL 5 OUT
- BLUE □ CHANNEL 6 OUT
- VIOLET □ CHANNEL 7 OUT
- GREY □ CHANNEL 8 OUT
- WHITE □ GND
- BLACK □ -U
- BROWN □ +U
- RED □ GND
- ORANGE □ GND
- YELLOW □ +U
- GREEN □ +U
- BLUE □ TALKBACK-IN
- VIOLET □ TC/PC SIGNAL-IN
- GREY □ GND



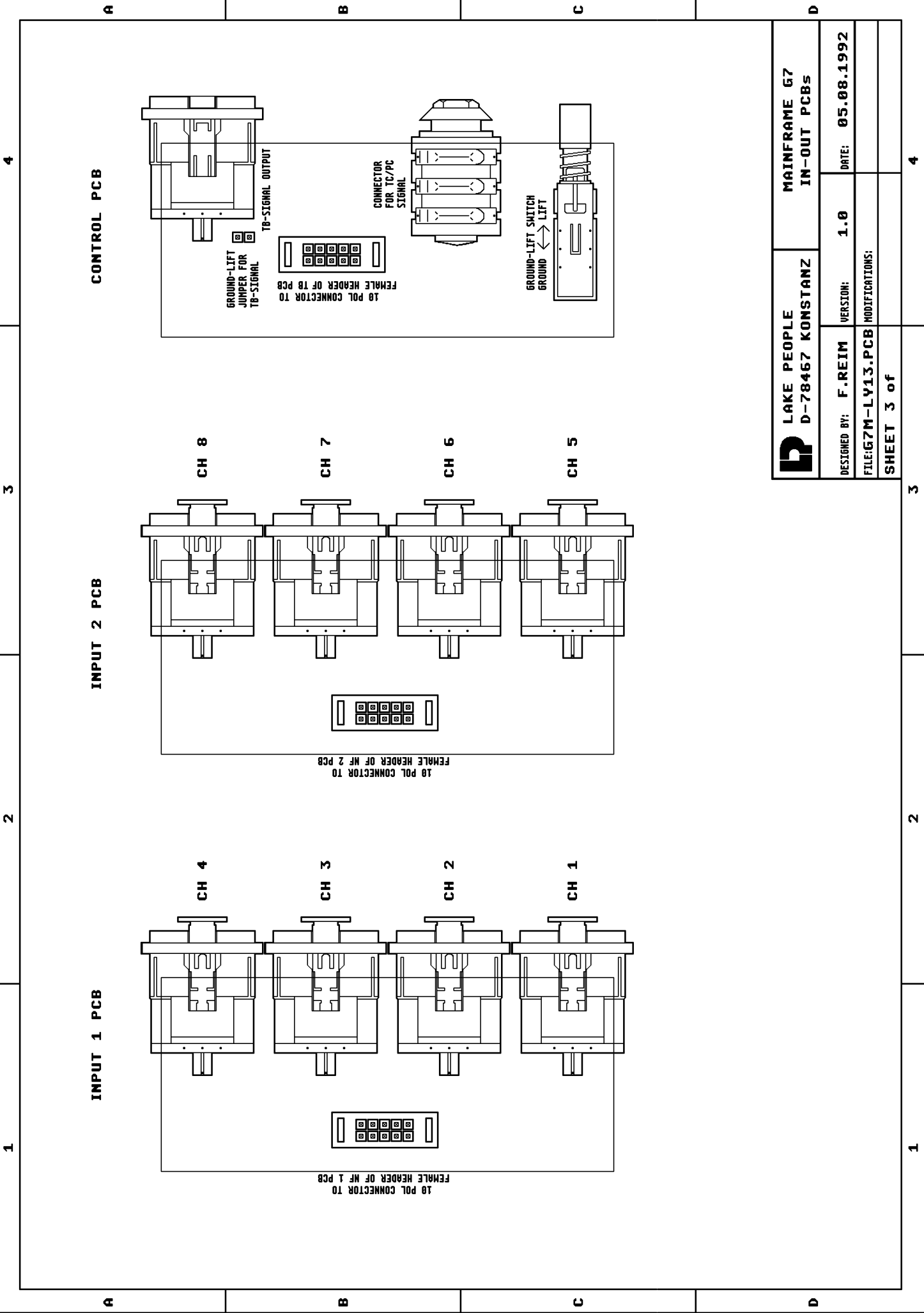
- TO CENTRONICS
- GREY CHANNEL 8 OUT
- VIOLET CHANNEL 7 OUT
- BLUE CHANNEL 6 OUT
- GREEN CHANNEL 5 OUT
- YELLOW CHANNEL 4 OUT
- ORANGE CHANNEL 3 OUT
- RED CHANNEL 2 OUT
- BROWN CHANNEL 1 OUT

LAKE PEOPLE
D-78467 KONSTANZ

MAINFRAME G7
BUS

DESIGNED BY: F. REIM	VERSION: 1.0	DATE: 05.08.1992
FILE: G7M-SC12.PCB MODIFICATIONS:		

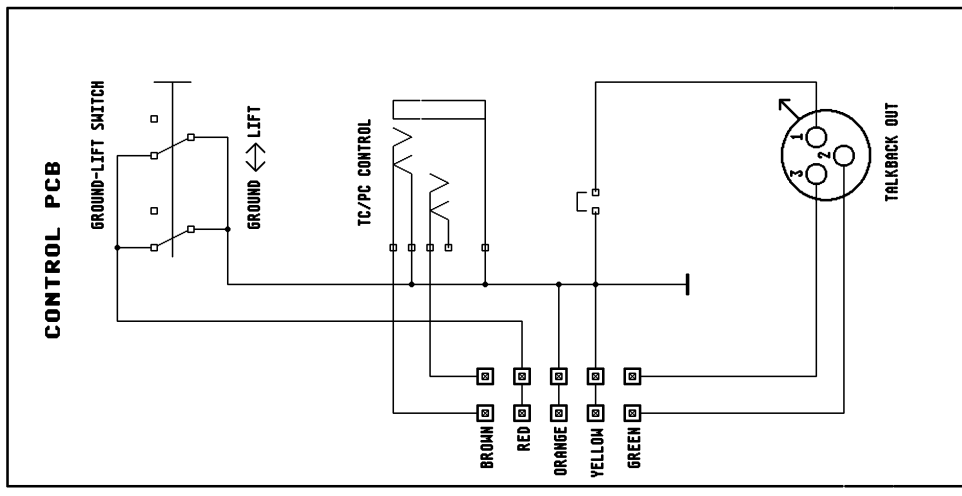
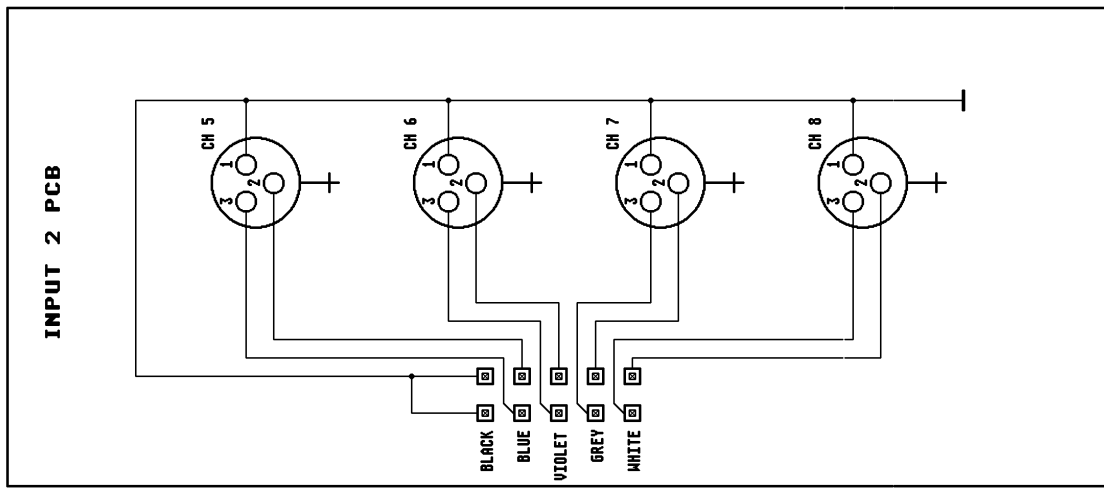
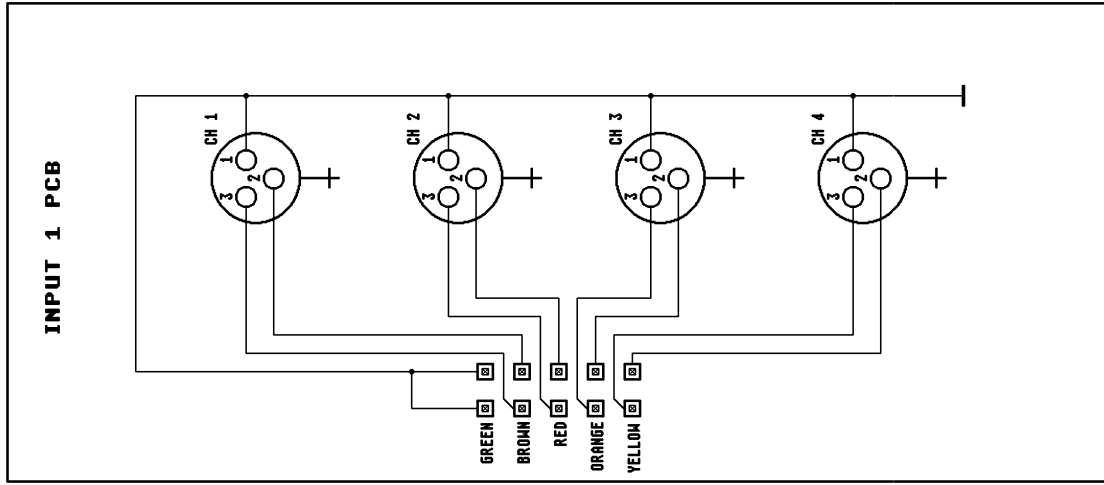
SHEET 2 of



LAKE PEOPLE
D-78467 KONSTANZ

MAINFRAME G7
IN-OUT PCBs

DESIGNED BY: F. REIM	VERSION: 1.0	DATE: 05.08.1992
FILE:G7M-LY13.PCB MODIFICATIONS:		
SHEET 3 of 4		



A

B

C

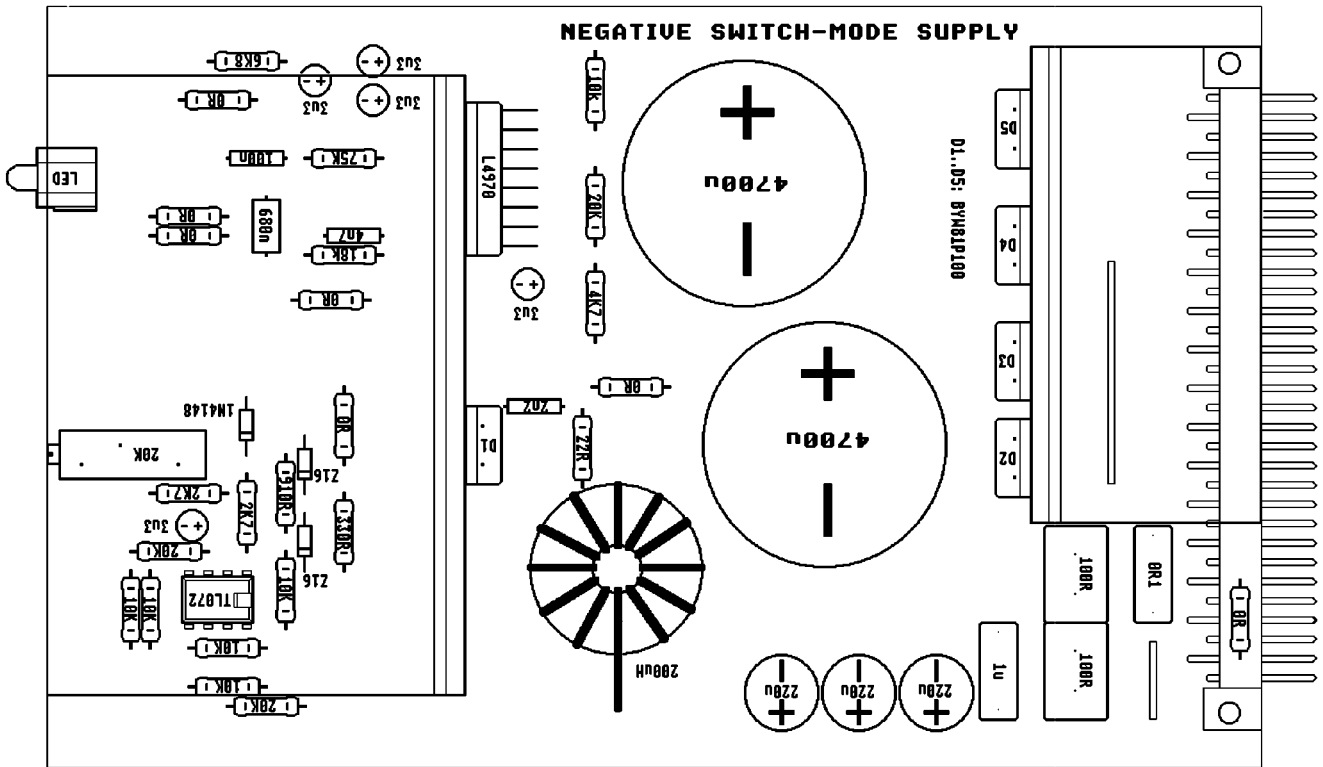
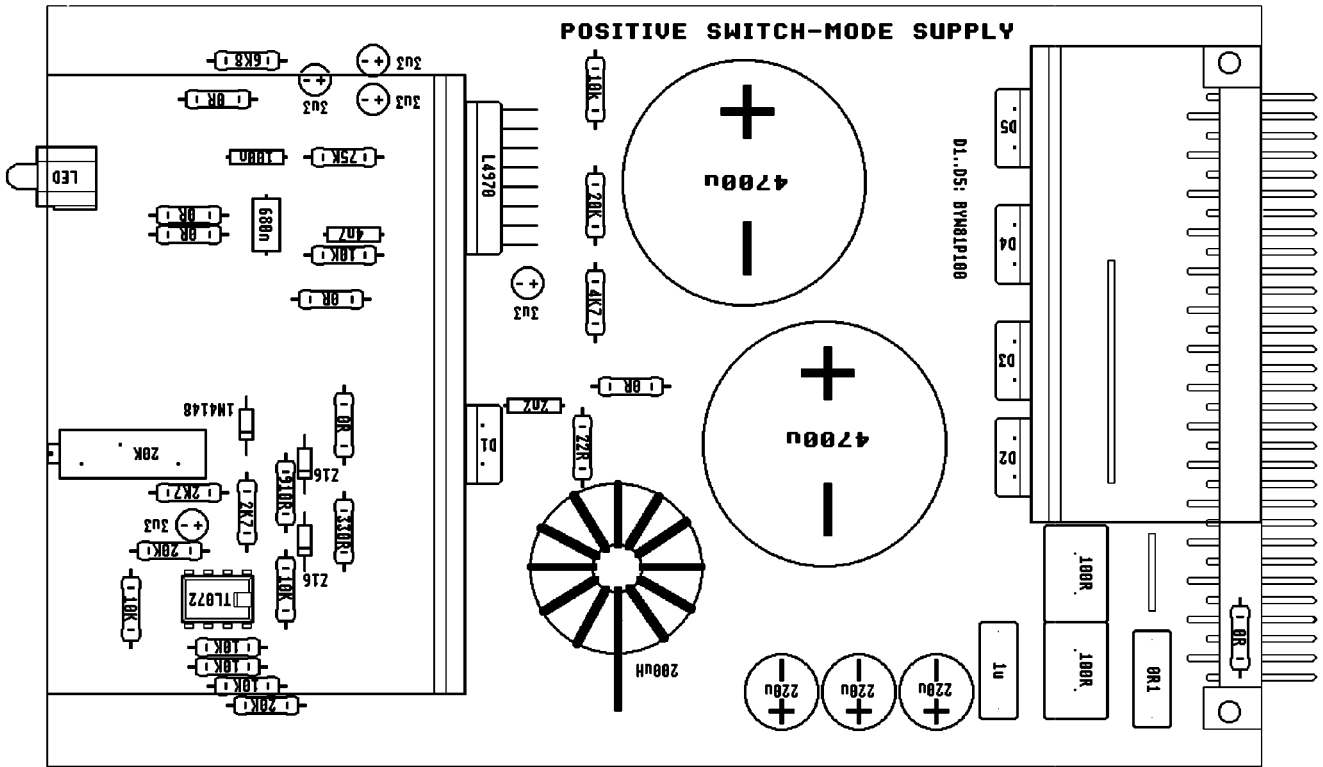
D

LAKE PEOPLE
D-78467 KONSTANZ

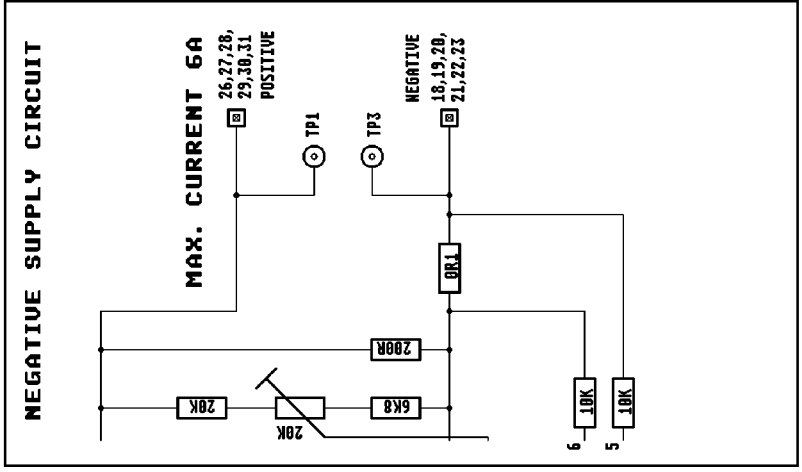
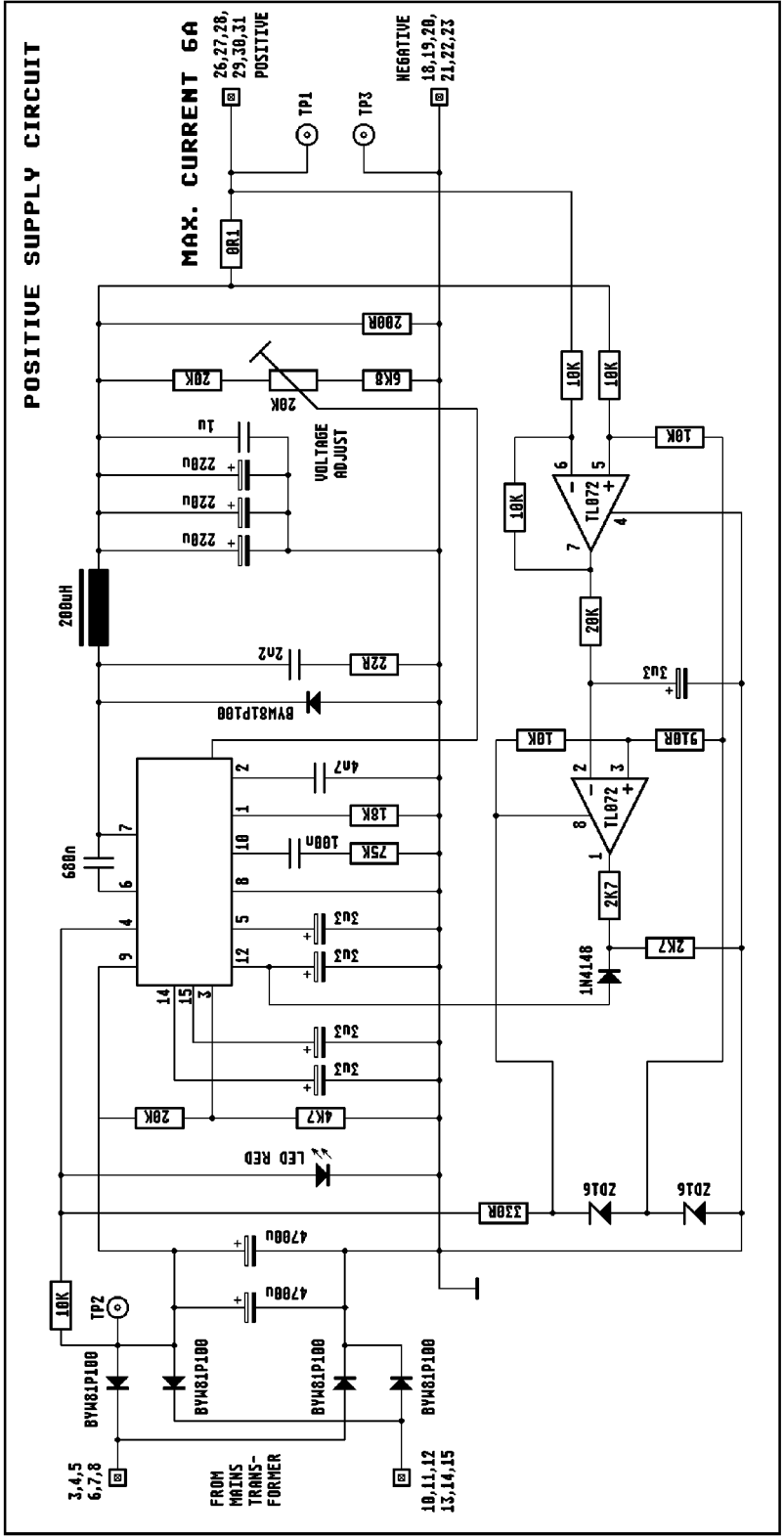
MAINFRAME G7
CONNECTORS

DESIGNED BY: F. REIM	VERSION: 1.0	DATE: 05.08.1992
FILE: G7M-SC13.PCB MODIFICATIONS:		
SHEET 3 of 4		

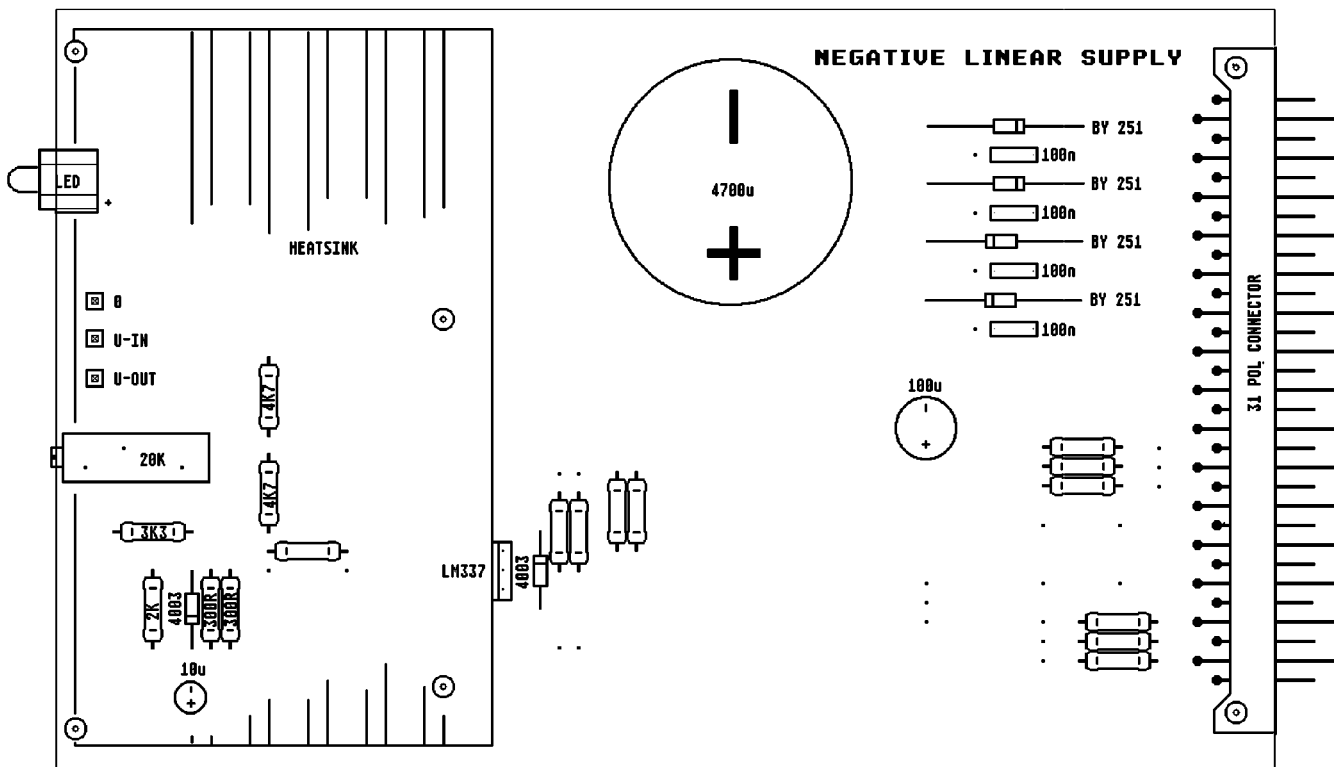
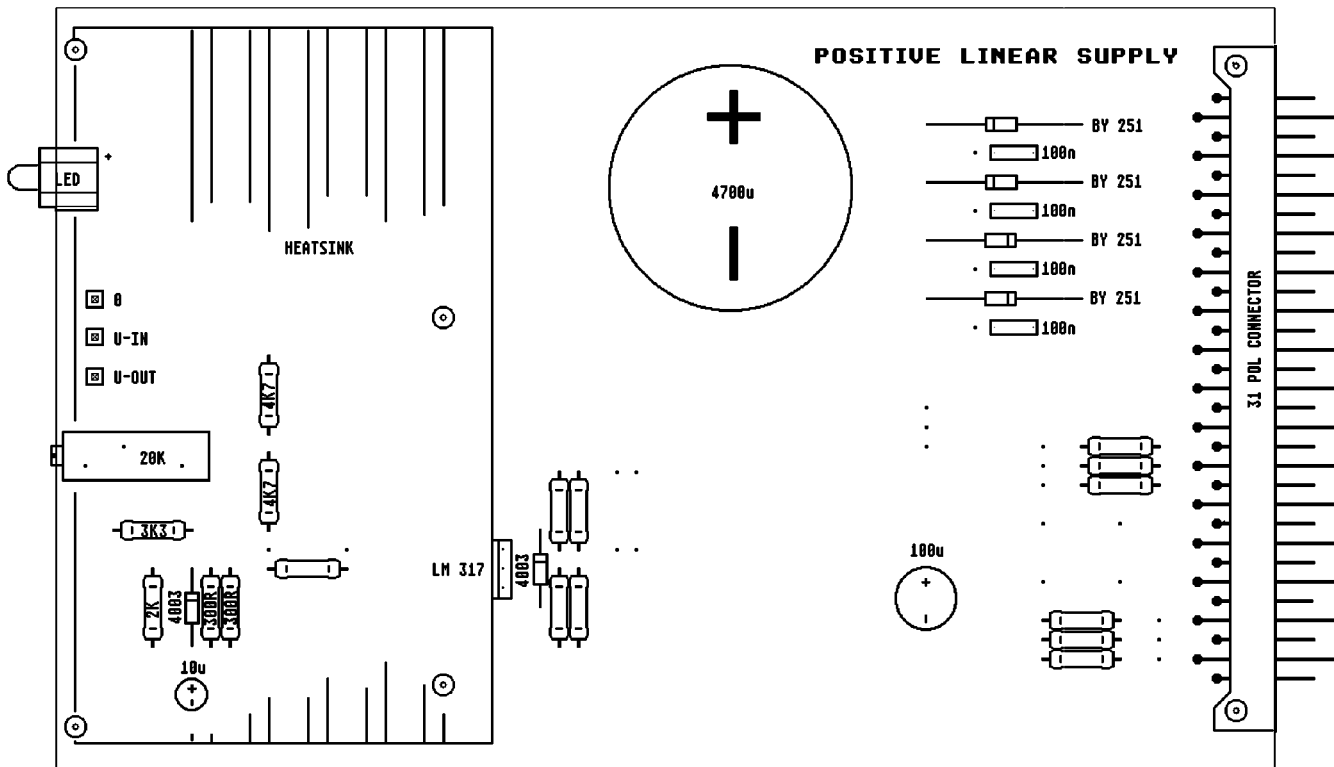
xx PIN AND COLOR OF
 10-POL CONNECTOR



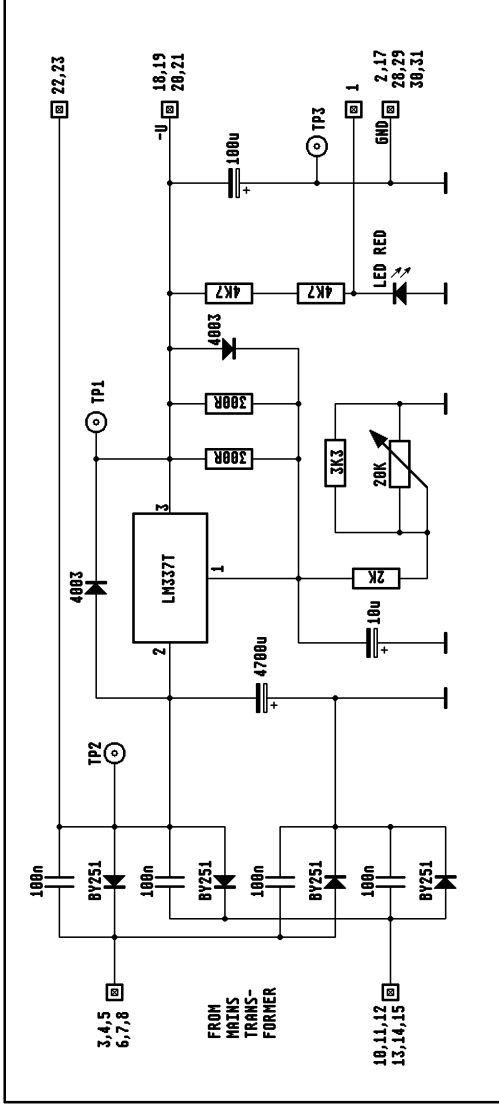
LAKE PEOPLE D-78467 KONSTANZ	MAINFRAME G7	DESIGNED BY: F. REIM	VERSION:	DATE: 16.02.2000
	SWITCH-MODE SUPPLY	FILE: M7-LY--1.SET	MODIFICATIONS:	
	CIRCUIT LAYOUT	SHEET 2 of 3		



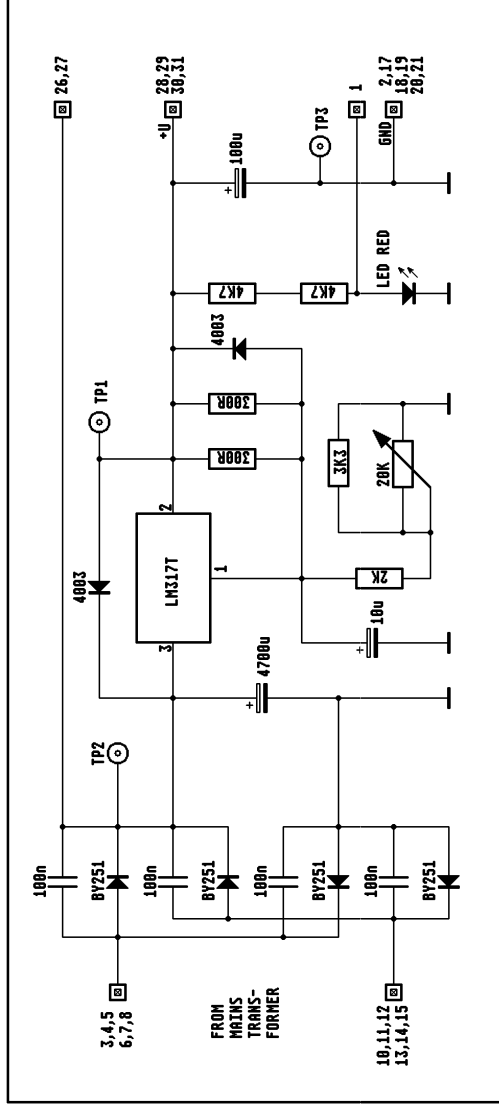
UN
 PIN NUMBER OF 31-POL MALE HEADER



CIRCUIT OF NEGATIV LINEAR POWER SUPPLY PCB MAXIMUM CURRENT 2AMP.



CIRCUIT OF POSITIV LINEAR POWER SUPPLY PCB MAXIMUM CURRENT 2AMP.



**LAKE PEOPLE
D-78467 KONSTANZ**

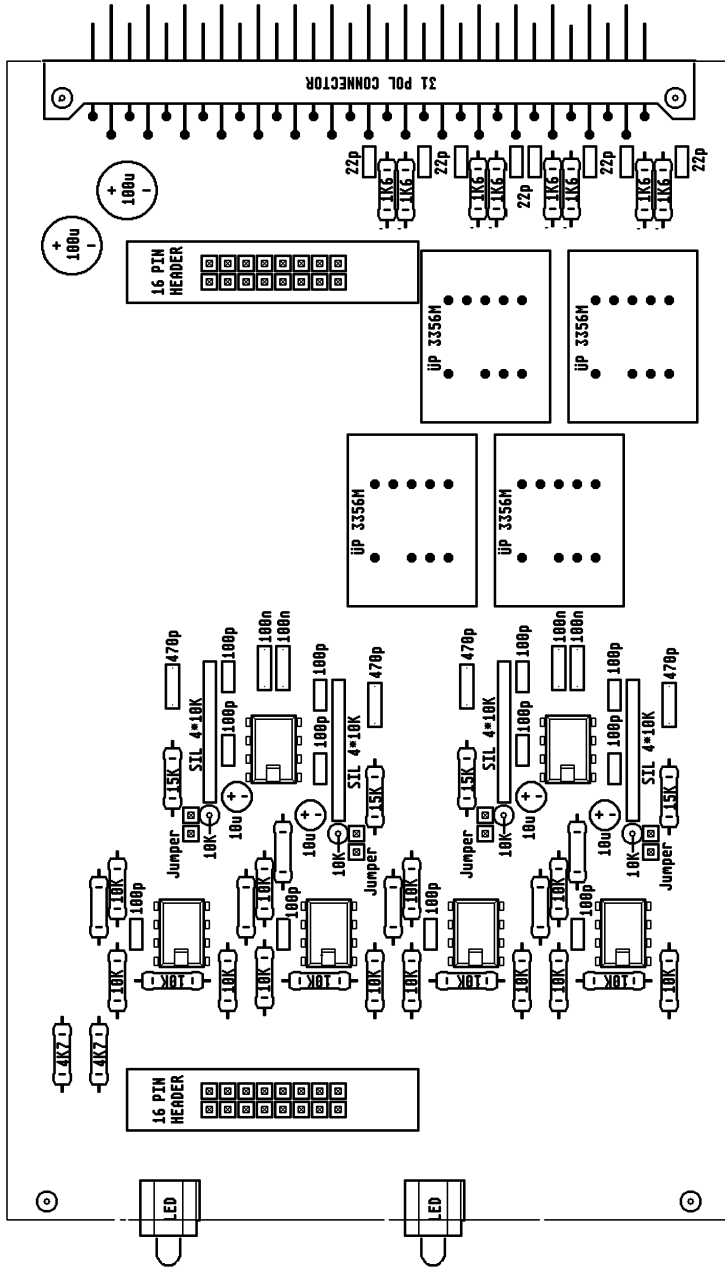
**MAINFRAME G7
LINEAR POWER SUPPLY**

DESIGNED BY: **F. REIM** VERSION: **1.0** DATE: **05.08.1992**

FILE: **G7M-SC21.PCB** MODIFICATIONS:

SHEET 1 of 1

nm 31-POL MALE HEADER



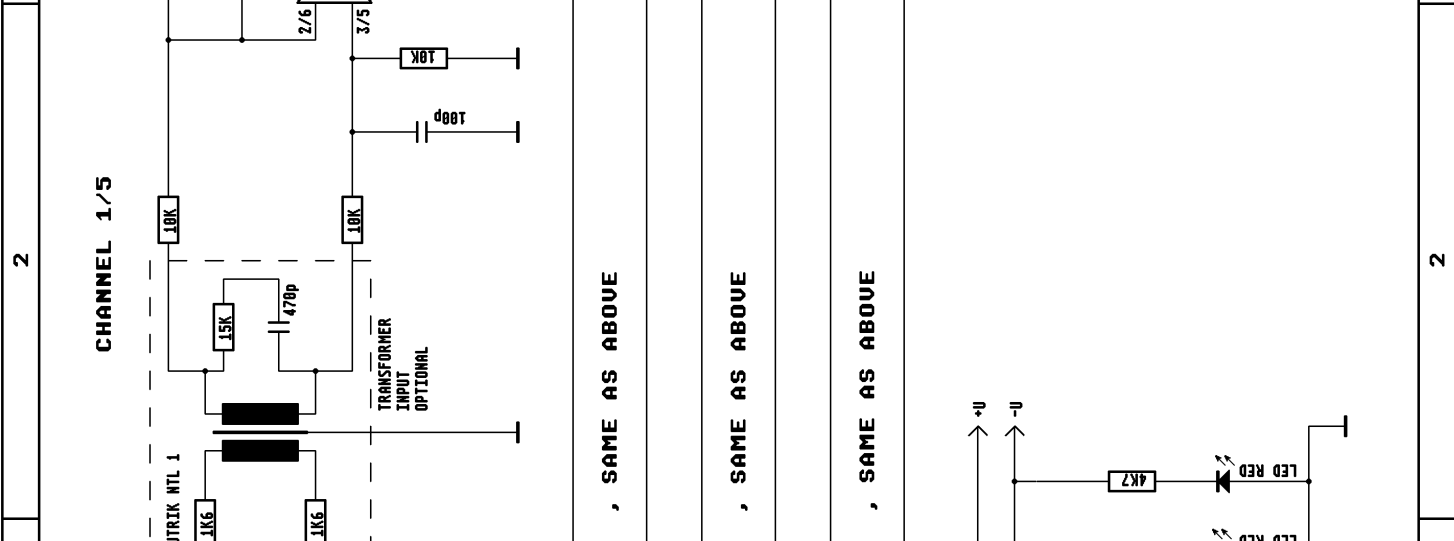
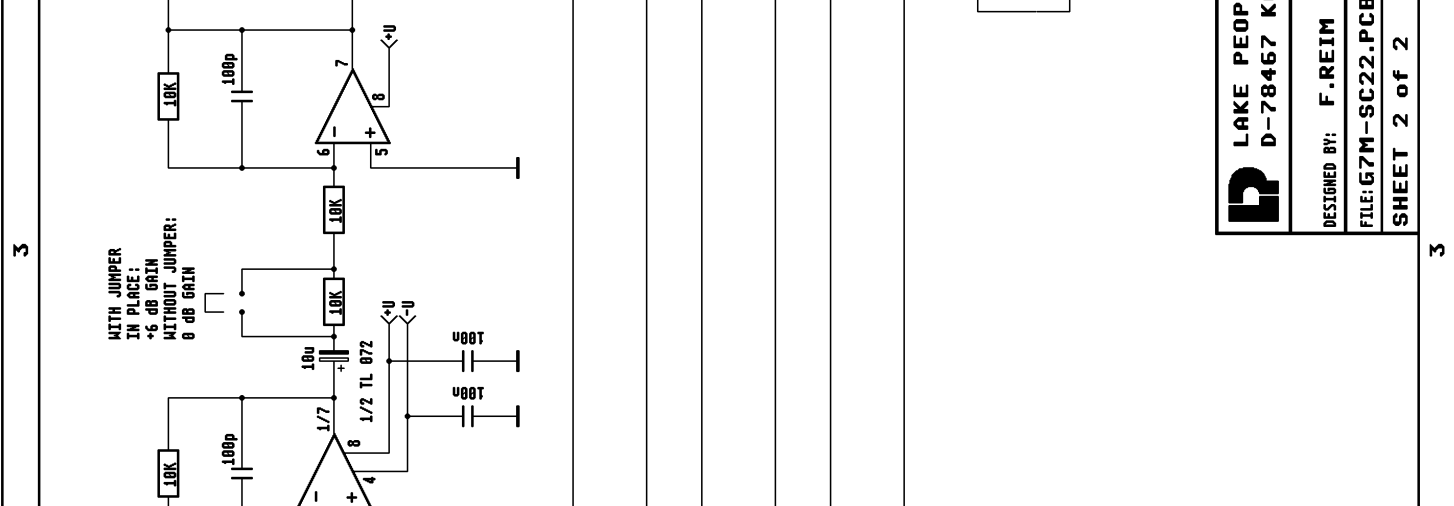
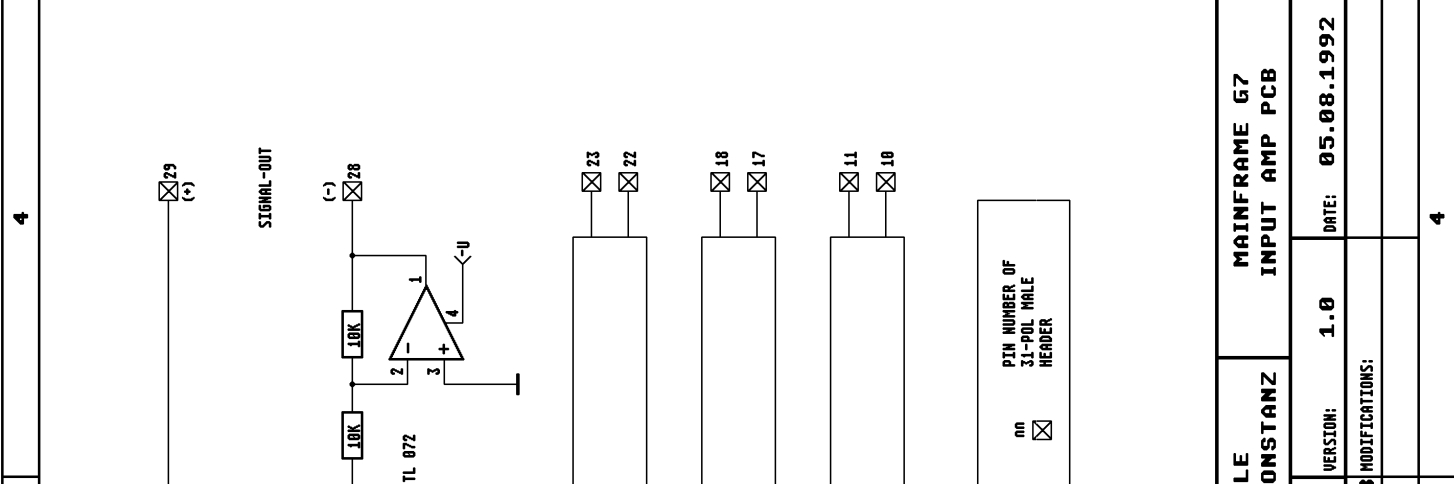
LAKE PEOPLE
D-78467 KONSTANZ

MAINFRAME G7
INPUT AMP PCB

DESIGNED BY: **F. REIM** VERSION: **1.0** DATE: **05.08.1992**

FILE: **G7M-LY43.PCB** MODIFICATIONS:

SHEET **1** of **2**



LAKE PEOPLE
D-78467 KONSTANZ

MAINFRAME G7
INPUT AMP PCB

DESIGNED BY: F. REIM VERSION: 1.0 DATE: 05.08.1992

FILE: G7M-SC22.PCB MODIFICATIONS:

SHEET 2 of 2

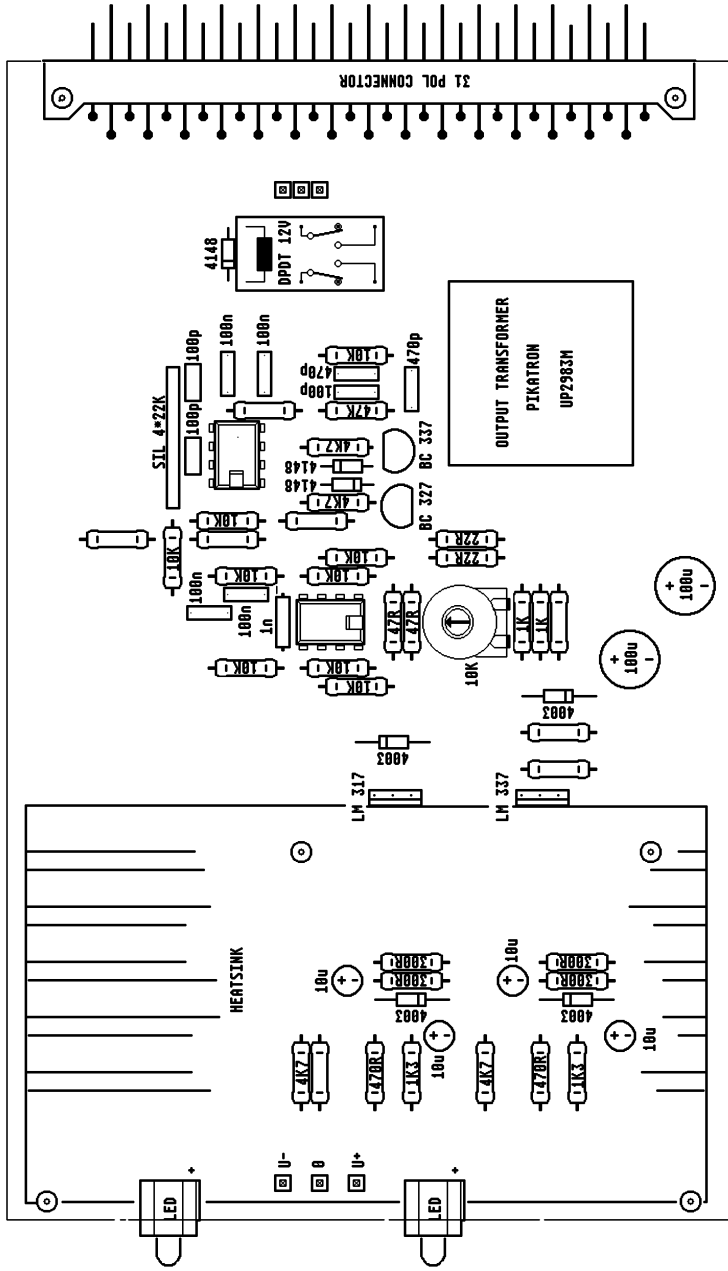
A B C D

4

3

2

1



A

B

C

D



LAKE PEOPLE
D-78467 KONSTANZ

MAINFRAME G7
TALKBACK PCB

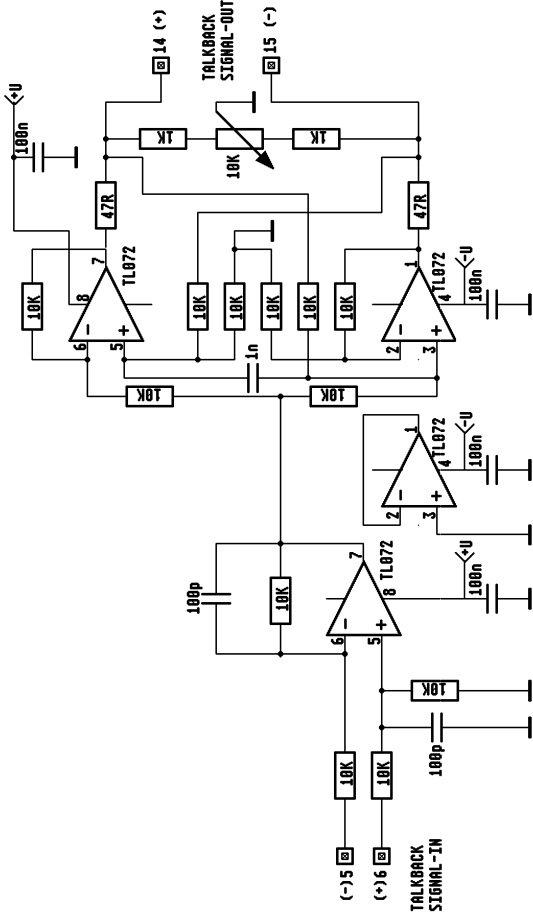
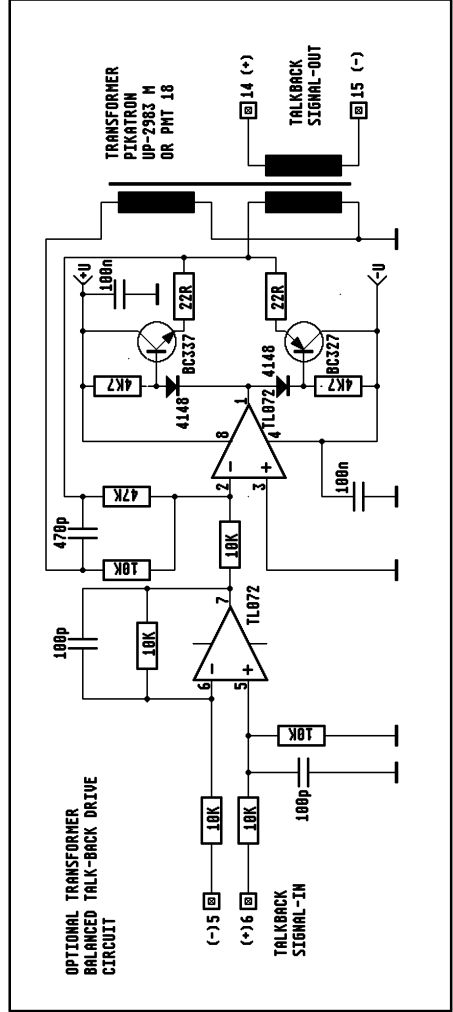
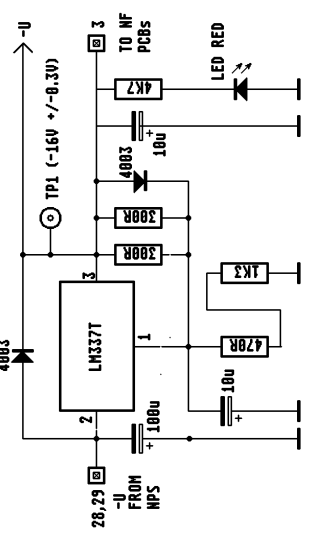
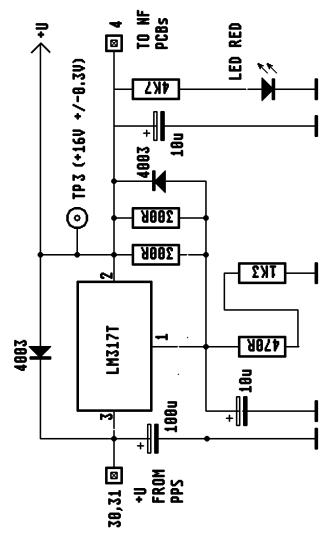
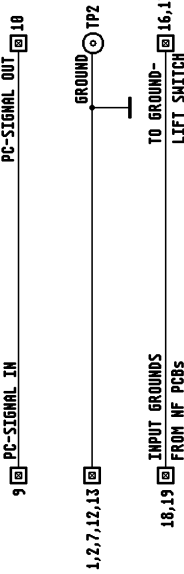
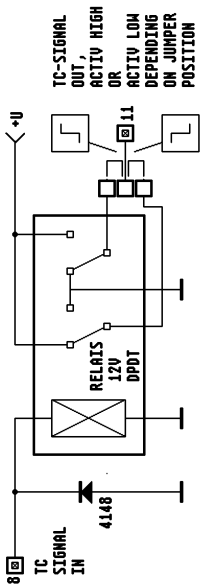
DESIGNED BY: F. REIM	VERSION: 1.0	DATE: 05.08.1992
FILE:G7M-LY53.PCB	MODIFICATIONS:	
SHEET 1 of 2		

3

2

1

4



nm
 31-POL MALE HEADER

	LAKE PEOPLE	MAINFRAME G7
	D-78467 KONSTANZ	TALKBACK PCB
DESIGNED BY: F. REIM	VERSION: 1.0	DATE: 05.08.1992
FILE: G7M-SC23.PCB	MODIFICATIONS:	
SHEET 2 of 2		

