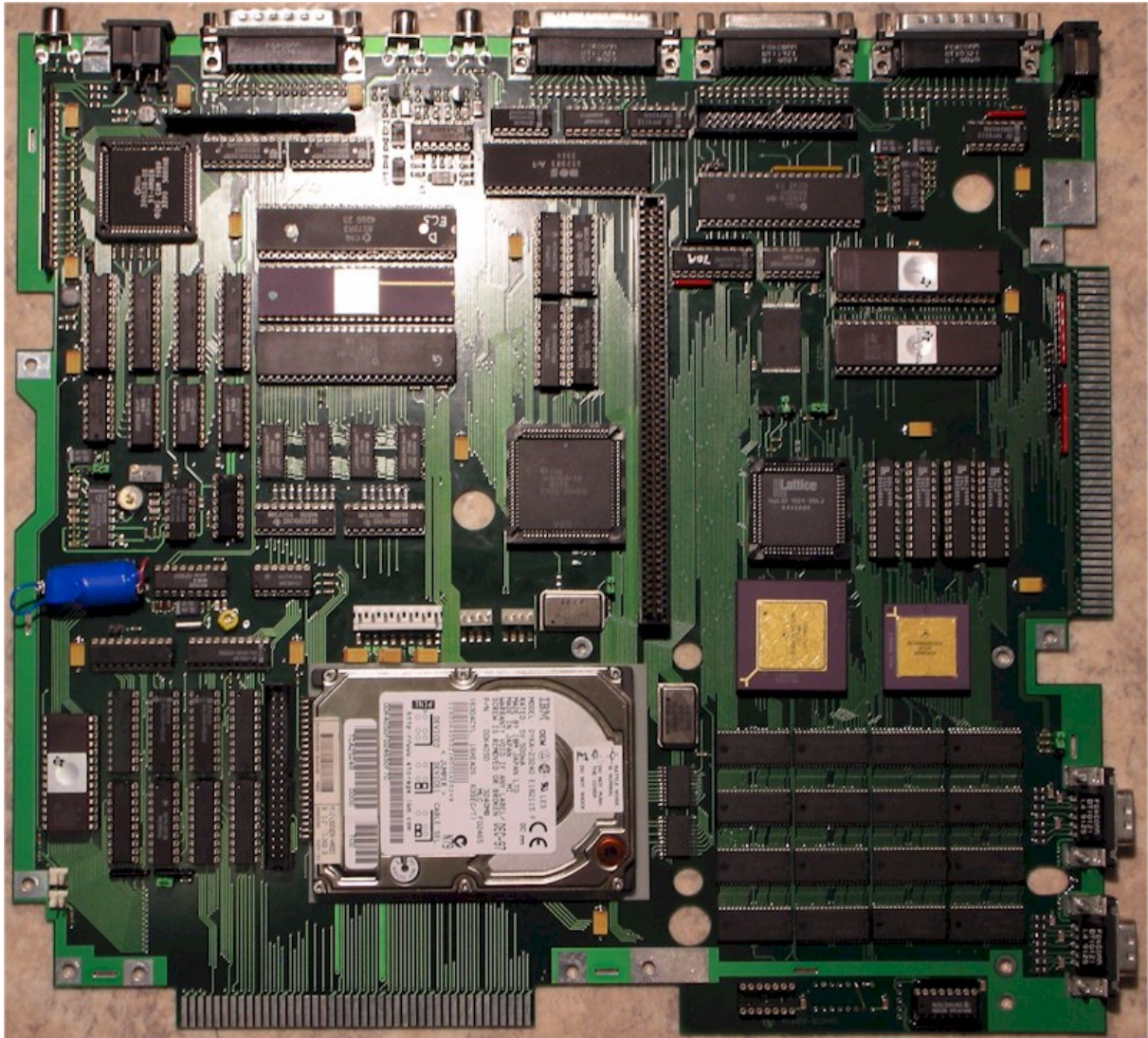


User's Guide

GB A1000 Motherboard



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1 General Information

The developer takes no responsibility for any damage or injuries caused by building and using the motherboard described in this guide. The responsibility of proper construction and usage of the motherboard lies solely on the individual building the motherboard.

When building and fitting the motherboard into the case it is imperative to obey the security guidelines of VDE. This work should only be performed by people skilled within this field.

If the proper procedures are not followed during construction and use, the user of the motherboard risks endangering his life.

No responsibility is taken for errors or printing errors in the following text.

Developer: Georg Braun

Contact: 97816@t-online.de

Translation: Kristian Karlshøj

Additional Editing: Troy Silvey

Lohr, Germany, January 2008

Translation, Mountain View, California, June 2008

2 Uses and Properties of the GB A1000 Motherboard

2.1 Operational Area

The GB A1000 motherboard is a replacement motherboard meant to be installed in the Amiga 1000 case. It has been designed with 2 MB CHIP RAM, an IDE controller, Flicker Fixer and a high performance central processor system.

Note: The Front-Slot of the GB A1000 Motherboard has been constructed to be similar to the side Expansion port. The A1000 256 kB memory expansion can not be used with this motherboard.

2.2 Usable Processors

The GB A1000 motherboard can be used with either MC68EC030 or MC68030 processors (CPU) at clock frequencies between 40 and 50 MHz. The clock frequency is chosen by a quartz-oscillator on the motherboard. The clock frequency used must be adapted to the used CPU.

To increase the performance of floating point applications the GB A1000 motherboard can be equipped with a MC68881/2 co-processor (FPU). For this purpose the PCB is equipped with a 68 pin PGA socket. The FPU uses the same clock frequency as the CPU and therefore does not need its own oscillator

2.3 Memory Specifications

The 32 bit wide, 8 MB, SRAM memory integrated on the GB A1000 motherboard can be included in the 24 bit address space in the auto configuration, or in the 32 bit address space by use of the integrated boot ROM. An increase in memory size is only possible with the addition of a memory expansion on the front, or side expansion slot. Expansion memory does not share the speed of the 32 bit memory.

The GB A1000 motherboard exhibits fast data throughput by use of SRAM despite lacking support for burst cycles. In comparison, similar performance is only reached by noticeably higher clock frequencies.

2.4 Boot ROM

A boot ROM has been included in the GB A1000 motherboard to integrate the SRAM memory into the 32 bit address space. This boot ROM contains 1 MB flash memory and includes additional space for optional software such as additional drivers. At the moment, the logic of the motherboard can only access 512 kB of the flash memory. Expanding access to the entire 1 MB will be implemented at a later time. To achieve this, the PLD chip (IC57) will need to be reprogrammed. Jumper S6 is also used to configure access to the 1 MB memory area. The boot ROM is activated by closing jumper S5. By closing S5 the 24 bit address space mode is switched off and the 32 bit address space is switched on. Working in 32 bit mode allows access to optional user software in the boot ROM. The position of jumpers S5 and S6 are shown in Chapter 3.1.

The boot ROM is deactivated when using the auto configuration. Access to the optional software in the boot ROM is not possible in this mode. Two small programs are at your disposition through the hardware development:

- The program "lösche BootROM" is used to erase the contents of the flash memory. This has to be done before any modification can be made to the boot ROM.
- The program "Einbindung_RAM" installs a driver in the boot ROM integrating the 8 MB SRAM memory in the 32 bit address space.

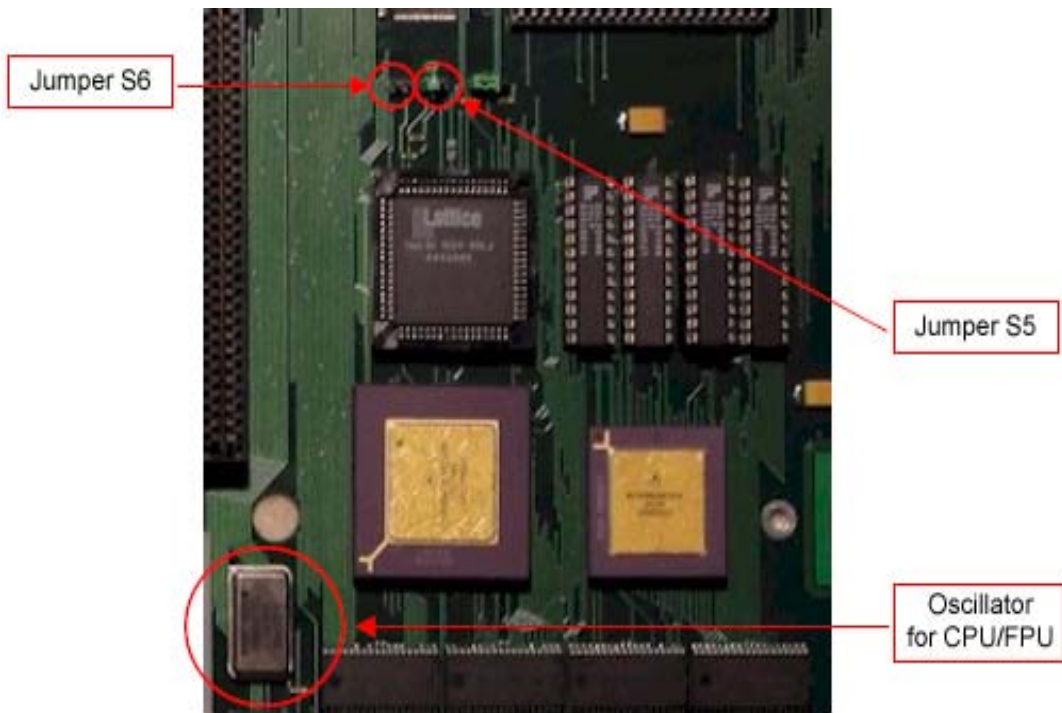
The memory can still be added to the 32 bit address space using the program AddMem even if the Boot ROM does not contain the driver. When using AddMem boot ROM must not contain the driver for RAM integration.

3 The Most Important Circuits on the GB A1000 Motherboard

3.1 Supported Processors

Depending on use, the GB A1000 motherboard can be fitted with processors of various speeds. The PCB supports clock frequencies between 40 and 50 MHz. The optional MC68881/2 co-processor will use the same clock frequency as the MC68030. An additional quartz oscillator for the co-processor is not required. An installed co-processor will automatically be detected by the GB A1000 motherboard. Therefore no jumper setting is required for an existing co-processor.

Caution!: The processors must be placed according to the following picture. By disregarding the orientation of the CPU you can expect to damage the PCB and the processors.



The quartz oscillator must comply with the clock frequency of the processor. If processors of different clock frequencies are used, the oscillator must comply with the processor with the lowest clock frequency.

Note: Over clocking of the processors is not advised. System stability and processor longevity cannot be assured when over clocking.
Oscillators with clock frequencies above 50 MHz cannot be used. The design of the motherboard is not suitable for clock frequencies above 50 MHz.

3.2 GB A1000 Motherboard Custom Chips

For the construction of the GB A1000 motherboard, various Commodore ICs are used. Some of these are difficult to obtain, you may have to get the components from discarded hardware. These ICs are known as the custom chips.

Note: As with all ICs it is important to equip the PCB with the correct ICs in the correct positions. Interchanging the chips by mistake can damage the chip as well as the motherboard.

3.2.1 Gary - IC50

Gary is responsible for the address decoding, control signals and chip line selection. You can find the Gary chip in the A500, A2000 or A3000 marked as 5719.

3.2.2 Paula - IC41

Paula is responsible for the analog signal processing (sound/paddles), floppy control, and the RS232 port. Paula is found in the A500, A1000, A2000 and A3000 marked as 8364R.

3.2.3 Denise - IC26

Denise is responsible for the graphics display and was made in an OCS and an ECS version. The difference lies in the available screen modes.

Denise is found in A500, A1000, A2000 and A3000. The OCS version is marked 8362R and the more powerful ECS version is marked 8373R.

For the GB A1000 motherboard both versions are usable but the use of the ECS version is recommended.

3.2.4 Amber - IC20

Amber contains the control logic for the flicker fixer. It allows the use of multi-sync monitors that support PAL screens at a refresh rate of 50 Hz. Amber was used in the A2320 flicker fixer card and in the A3000. The flicker fixer is an optional part of the GB A1000 motherboard.

3.2.5 Agnus – IC52

Agnus is responsible for controlling chip RAM, supplying the video sync signals (HSY, CSY, VSY) and contains the co-processors for copper and blitter. Agnus also handles DMA logic.

This motherboard requires 2MB chip RAM; using 1MB is not possible.

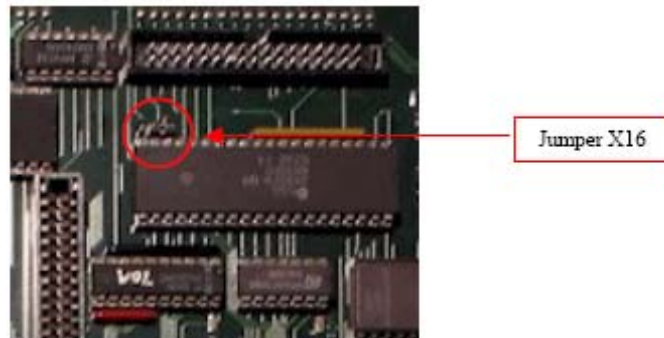
Agnus was made in many versions of which only a few can be used for the GB A1000 motherboard.

Either an 8372B (318069-03) or 8375 (318069-18, the NTSC version has not been tested on the board). During boot-up the screen mode of the computer can be changed by pressing space. If an 8372B is fitted jumper X17 (not fitted on the standard board) can be used to select PAL (X17 open) or NTSC (X17 closed) mode. If an 8375 Agnus is used jumper X17 must not be fitted.

3.2.6 CIA-A & B – IC40 & IC43

There are two CIA (Complex Interface Adapter) devices in the Amiga. Each has two main tasks to fulfill; First to establish the connection to the outside world via two 8 bit wide ports, and second, to do the internal timekeeping via two 16 bit and one 24 bit timers. The devices contain a bi-directional port (SP) for serial data transfer. The CIAs are marked 8250 and found in A500, A1000, A2000 or A3000.

The TICK signal or the /VSYNC signal can be supplied to the CIA IC40 via jumper X16. Move X16 to the right for TICK or move X16 to the left for /VSYNC. This 50 Hz signal will be used for signal processing in the custom chips and is supplied by the A1000 through the power supply as the TICK signal. In the following models the /VSYNC signal is used. The GB A1000 motherboard can work with either setting. If the power supply does not supply a TICK signal (for instance a replacement power supply) the /VSYNC setting is necessary.



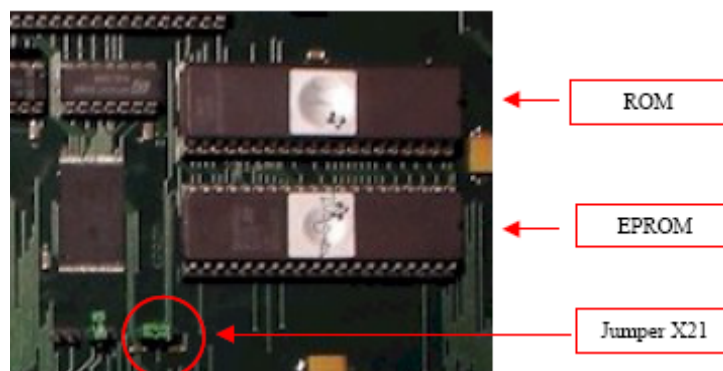
3.3 Kickstart Socket IC12 & IC13

To operate the GB A1000 motherboard an operating system, hereafter referred to as Kickstart, is necessary. The Kickstart is copyrighted and it is not permitted to copy or distribute it. Two sockets for placing Kickstart ROMs are integrated on the GB A1000 motherboard.

- Socket IC12 is available to place an original Kickstart ROM.
- Socket IC13 is available to place a 256 kB x 16 EPROM (for instance type 27C4096).

Jumper X21 is used to select which socket is used. If the right side of X21 is closed, the IC13 (EPROM) is activated. Closing the left side activates the ROM socket (IC12).

The EPROM Socket is intended for use with modified Kickstarts. It is also required that you own an original kickstart.

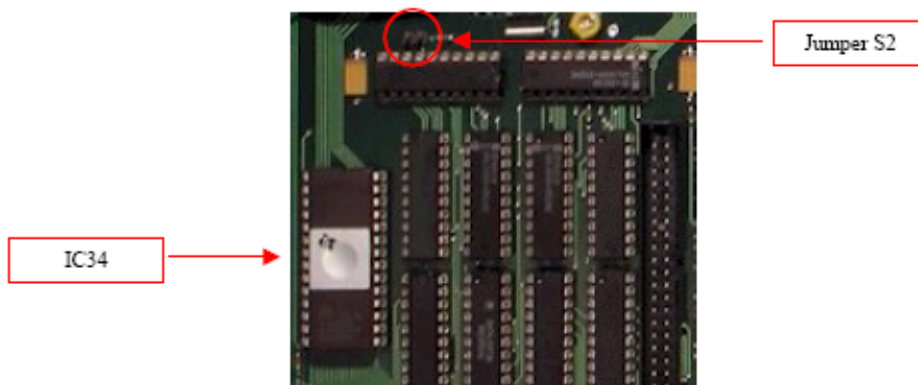


3.4 IDE Controller (Optional)

The GB A1000 motherboard includes an AT bus 2008 IDE controller by BSC. It has no RAM options and it only contains the IDE function of the original circuit. To enable the auto boot feature of the IDE controller, the related AT6.10 driver is used. The driver is loaded into EPROM IC34 (type 27C256). An image of the driver, in hex-file format, is available on the internet at <http://amiga.resource.cx/exp/atbus2008>. Optionally the OKTAPUS device found on Aminet can be used. This improves the functionality of the IDE controller.

Note: This is based on the original circuit from BSC. Due to lack of knowledge of the device, existing deficiencies cannot be corrected. If an unsolvable problem arises I recommend the use of an external IDE controller as for instance the Phoenix-Buddha.

On the GB A1000 motherboard you find two connectors for use of 40 pin and 44 pin IDE equipment. It is possible to use equipment in master-slave operation, but not all device combinations will work. The IDE controller can be switched off by closing jumper S2.



The motherboard can be built without the IDE controller. In this case the auto configuration has to bypass the non-existing IDE controller. This is done by bridging pin 9 and 16 of the socket for IC 19 with a 10 ohm resistor.

3.5 Flicker Fixer (Optional)

The flicker fixer on the GB A1000 motherboard is a copy of the A2320 Display Enhancer by Commodore. The circuitry has the stability of the original circuitry even though it is not an exact replication. Due to lack of documentation, the circuit diagrams of the A3000 were used as a basis. The PLL circuit though is an exact copy of the A2320 circuit. The work lies in doubling the line frequency to allow a multisync monitor to be connected to a GB A1000 motherboard. Furthermore the circuit can suppress the image flicker when interlace resolutions are used.

The motherboard can be built without the flicker fixer; this does not require any changes in the rest of the build.

The output of the flicker fixer connects to an 8 pin DIN connector. Therefore it is not necessary to connect the screen signal shielding to the chassis. The A1000 casing can therefore be left in original condition.

The disadvantage is that it is necessary to construct a VGA cable with a DIN plug. Below is the connection list:

15 pin VGA Plug	8 pin DIN Plug	Signal
Pin 1	Pin 2	R (analog)
Pin 2	Pin 3	G (analog)
Pin 3	Pin 4	B (analog)
Pin 13	Pin 7	/HSYNC
Pin 9	-	not used
Pin 14	Pin 8	/VSYNC
Pin 15	-	not used
Pin 4, 5, 6, 7, 8,10, 11, 12	Pin 1, 5, 6 + Shielding	GND

3.5.1 Supported Screen Resolutions

The GB A1000 VGA supports the following screen resolutions in NTSC or PAL. In this case the new ECS screen resolutions will also be used. Furthermore jumper S1 can be used to de-activate the GB A1000 VGA.

OCS Chip:

- NTSC HighRes 640 x 200 60 Hz 15,734 kHz increased to 31,46 kHz
- NTSC HighRes Interlace 640 x 400 60 Hz 15,734 kHz 31,46 kHz, flicker free
- NTSC LowRes 320 x 200 60 Hz 15,734 kHz increased to 31,46 kHz
- NTSC LowRes Interlace 320 x 400 60 Hz 15,734 kHz 31,46 kHz, flicker free
- PAL HighRes 640 x 256 50 Hz 15,625 kHz increased to 31,25 kHz
- PAL HighRes Interlace 640 x 512 50 Hz 15,625 kHz 31,25 kHz, flicker free
- PAL LowRes 320 x 256 50 Hz 15,625 kHz increased to 31,25 kHz
- PAL LowRes Interlace 320 x 512 50 Hz 15,625 kHz 31,25 kHz, flicker free

ECS Chip:

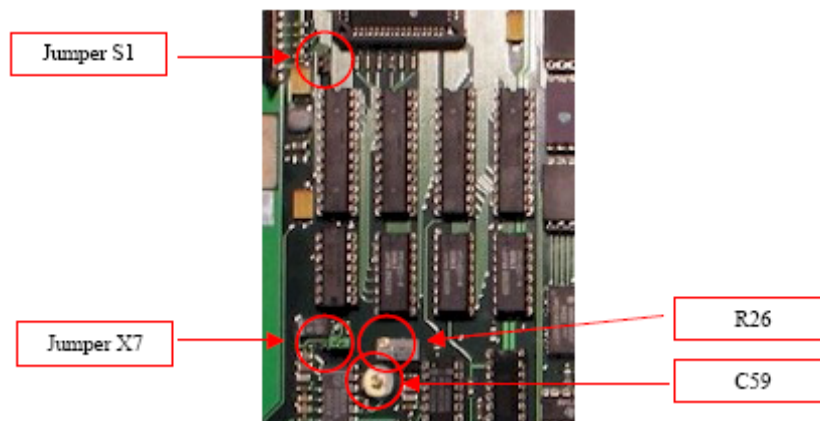
- Multiscan Productivity 640 x 480 60 Hz 31,46 kHz (automatic bypass)
- Multiscan Productivity 640 x 960 60 Hz 31,46 kHz (automatic bypass)
- NTSC SuperHighRes 1280 x 200 60 Hz 15,734 kHz increased to 31,46 kHz
- NTSC SuperHighRes Int. 1280 x 400 60 Hz 15,734 kHz 31,46 kHz, flicker free
- PAL SuperHighRes 1280 x 256 50 Hz 15,625 kHz increased to 31,25 kHz
- PAL SuperHighRes Int. 1280 x 512 50 Hz 15,625 kHz 31,25 kHz, flicker free
- Full support of the overscan resolutions

3.5.2 PLL Circuitry Alignment

The flicker fixer PLL circuitry must be synced to the clock frequency of the GB A1000 motherboard. To do this, close the left side of jumper X7. The PLL circuitry is then enabled for Open-Loop operation. After the jumper is set the computer can be turned on. With use of the trim capacitor C59 it is possible to produce a stable image. When finished, close the right side of jumper X7. Now the regulation (Close-Loop) of the PLL circuit is switched on. Fine adjustment is possible using the trim resistor R26. With the trim resistor, the phase of the PLL output frequency is adjusted. Fine aliases in the lines can thereby be removed.

The adjustment needs to be made after the electronics have warmed up. It is best to turn the computer on for at least 15 minutes before adjusting the signal. For this adjustment a certain level of instinct is required. A re-adjustment may be necessary after a few hours of normal operation. An external switch mounted on the housing and connected to S1 will be needed to bypass VGA function without removing the case.

For the alignment adjustment the A2320 install disks can also be used. Depending on the operating system used, a reboot from the install disk might be required. The available adjustment images are excellent for fine tuning the PLL circuit.



3.6 Clock Circuit

The GB A1000 motherboard contains a clock circuit with a real-time clock. The circuit can be adjusted for accuracy using trim capacitor C80.

The clock circuit is backed up by a battery. A 3.6 V Lithium battery with at least 1200 mAh is recommended. Be aware that the charging circuit requires a certain load resistance supplied by the Li battery if an alternative NiCad battery is used.



3.7 Programmable Logic Devices

The GB A1000 motherboard includes many programmable logic devices, several GALs and a CPLD. The jedec files necessary for programming are available for download in the GB A1000 file. To successfully build a GB A1000 access to a programmer for GAL and CPLD devices is necessary.

Caution!: **Avoid misplacing the programmed devices. Mix-ups can result in damage to the motherboard.**

4 Connectors on the GB A1000 Motherboard

4.1 Overview of the connectors

4.1.1 Connectors on the backside

The GB A1000 motherboard mimics the back side connectors of the A1000. The placement of the connectors is identical to the placement on the original A1000 motherboard and the Phoenix A1000.

The only exception is the DIN jack as it contains the signal from the flicker fixer.

Caution!: Some of the connectors contain supply voltage from the motherboard. It is recommended that no equipment be attached or detached while the computer is switched on. Failure to adhere to this recommendation may result in damage to the motherboard and/or the device being attached or detached.

4.1.2 Expansion Port

The left side 86 pin expansion port is nearly identical to the port in the original A1000. The exception is that pin 5 has the 7 MHz system clock added. Also the 28 MHz system clock has not been added as it was on the Phoenix board.

4.1.3 Front Slot

The 86 pin connector placed on the front of the motherboard is identical to the left side expansion port. In comparison to the Phoenix board, on the GB A1000 motherboard all signals are available. **When the front slot is not used, close jumper S3** to bypass the configuration management. If jumper S3 is not closed and the front slot does not contain an expansion card, the configuration management is interrupted and all subsequent hardware components are not recognized.

Caution!: If an expansion card is plugged in the front slot, S3 must be open! If it is not, the configuration signals of the card will be ignored, the expansion card will not be recognized and the expansion card may be damaged.

4.1.4 Zorro-II-Slot

A Zorro-II slot is built onto the GB A1000 motherboard. It is located in the same position as on the Phoenix board, but unlike the Phoenix board, it is a true Zorro-II slot. Therefore all Zorro-II signals are included in this connector.

Close jumper S7 to bypass the configuration manager when the Zorro-II slot is unused. If this jumper is open and no expansion card is inserted in the Zorro-II slot, the configuration manager is interrupted and all following hardware components are not recognized.

Caution!: If the jumper S7 is closed and an expansion card is plugged into the Zorro-II slot, the configuration signals of the expansion card will be suppressed, the expansion card will not be recognized and it may be damaged.



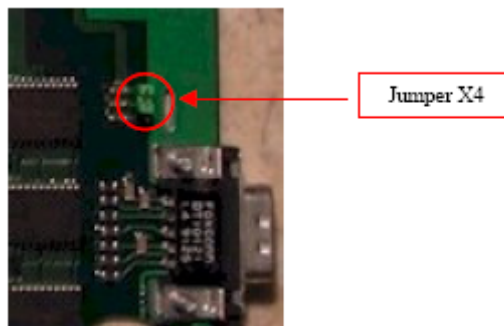
4.1.5 LED Connections

Connectors X13 and X26 are used to connect the LEDs for Power and HD-access. X13 connects the power LED and X26 is for the HD-LED.

X13 Power- LED / X26 HD-LED	
Pin	LED-Connection
1	A
2	K

4.1.6 Game and Mouse Port

On the left side are two 9 pin D-SUB connectors for a mouse and joystick. Both connectors are equivalent to the connectors on the A500. On the GB A1000 motherboard the port can be used to operate a light pen by using jumper X4. This function is the same as on the Phoenix board. If jumper X4 is closed in the upper position, the game port is selected for a light pen. If the jumper is closed in the lower position, the mouse port will be used.



4.2 Connector Pinouts

4.2.1 VGA Output DIN Plug

8 pin DIN Plug	
Pin	Signal
1	GND
2	R (analog)
3	G (analog)
4	B (analog)
5	GND
6	GND
7	/HSYNC
8	/VSYNC
Shield	GND

4.2.2 RGB Output

23 pin D-SUB Plug			
Pin	Signal	Pin	Signal
1	n.c.	14	PSWB
2	n.c.	15	/CCKB
3	R (analog)	16	GND
4	G (analog)	17	GND
5	B (analog)	18	GND
6	DI	19	GND
7	DB	20	GND
8	DG	21	-5 V
9	DR	22	+12 V
10	/CSYNC	23	+5 V
11	/HSYNC		
12	/VSYNC		
13	GND		

4.2.3 RS232 Interface

25 pin D-SUB Plug			
Pin	Signal	Pin	Signal
1	GND	14	-5 V
2	TxD	15	Audio-O
3	RxD	16	Audio-I
4	RTS	17	E-Clock
5	CTS	18	/INT2
6	DSR	19	n.c.
7	GND	20	DTR
8	CD	21	+5 V
9	n.c.	22	n.c.
10	n.c.	23	+12 V
11	n.c.	24	/CCKQ
12	n.c.	25	/SRESET
13	n.c.		

4.2.4 External Disk Drive

23 pin D-SUB Plug			
Pin	Signal	Pin	Signal
1	/RDY	14	/WPRO
2	/DKRD	15	/TRK0
3	GND	16	/DWE
4	GND	17	/DWD
5	GND	18	/STEP
6	GND	19	DIR
7	GND	20	/SEL3
8	/MTRXD	21	/SEL1
9	/SEL2	22	/INDEX
10	/DRESET	23	+12 V
11	/CHNG		
12	+5 V		
13	/SIDE		

4.2.5 Parallel Interface

25 pin D-SUB Plug			
Pin	Signal	Pin	Signal
1	/STROBE	14	GND
2	D0	15	GND
3	D1	16	GND
4	D2	17	GND
5	D3	18	GND
6	D4	19	GND
7	D5	20	GND
8	D6	21	GND
9	D7	22	GND
10	/ACK	23	+5 V
11	/BUSY	24	n.c.
12	POUT	25	/IORESET
13	SEL		

4.2.6 Mouse and Joystick Port

9 pin D-SUB Plug (Mouse)			
Pin	Signal	Pin	Signal
1	MOUSE V	6	BUTTON 1
2	MOUSE H	7	+5 V
3	MOUSE VQ	8	GND
4	MOUSE HQ	9	BUTTON 2
5	BUTTON 3		

9 pin D-SUB Plug (Joystick)			
Pin	Signal	Pin	Signal
1	/FORWARD	6	/FIRE
2	/BACK	7	+5 V
3	/LEFT	8	GND
4	/RIGHT	9	POT Y
5	POT X		

5 Known Application Problems

5.1 Memory Integration through use of the AddMem Command

If the 32 bit SRAM is allocated by use of the AddMem command, there will be a noticeable drastic drop in the access speed and performance of the IDE controller compared to the memory is allocated using the auto configuration.

The reason is that during auto configuration, access of the IDE interface and other important parts of the OS are mapped in chip RAM. The only remedy is to have auto configuration map the FAST RAM to 32 bit SRAM at the system startup via a boot ROM driver before the operating system is loaded.

5.2 Memory Integration through use of a Boot ROM Driver

By allocating the 32 bit SRAM through a boot ROM driver, there will be noticeably slower file access and slower screen updates.

The reason is an unfavorable transfer rate for the file system from the hard drive. Using the HD-Toolbox, the transfer rate and the screen updating can be drastically improved by changing the File-System-Mask from 0X00FFFFFFE (default) to 0XFFFFFFFC.

1. Open HD-Toolbox
2. Select "Partition Drive"
3. Select partition and "Advanced Options"
4. Select "Change File System for Partition"
5. Change the mask # to "Mask = 0XFFFFFFFC" and exit the menu by clicking "Ok"
6. Exit partition menu by clicking "Ok"
7. Save the changes by clicking "Save Changes to Drive" and exit HD-Toolbox by clicking "Exit"
8. Reboot computer

Repeat step 3 to 5 for every partition on your hard drive. Further information about HD-Toolbox can be found in the HD-Toolbox guide.

Caution!: Wrongful entries in HD-Toolbox can result in loss of data, it is therefore recommended that data is backed up prior to manipulating the HD entries.

6 Technical Data

6.1 Memory Map

- RAM 24 Bit Address space: Address \$200000 to \$9FFFFFF
- RAM 32 Bit Address space: Address \$1200000 to \$19FFFFFF
- Boot ROM: Address \$F00000 to \$F7FFFF

6.2 Protection Bits

The flash memory (boot ROM) on the motherboard is protected against accidental write and deletion processes. Furthermore the configuration data can be exported when the boot ROM is active. Using a write operation to the addresses below, the mentioned operations are activated. The addresses and descriptions are as follows:

- Read configuration data: Address \$1FA0004
- Write to / Erase flash: Address \$1FA0002
- Reset protection bits: Address \$1FA0000

6.3 Other Data

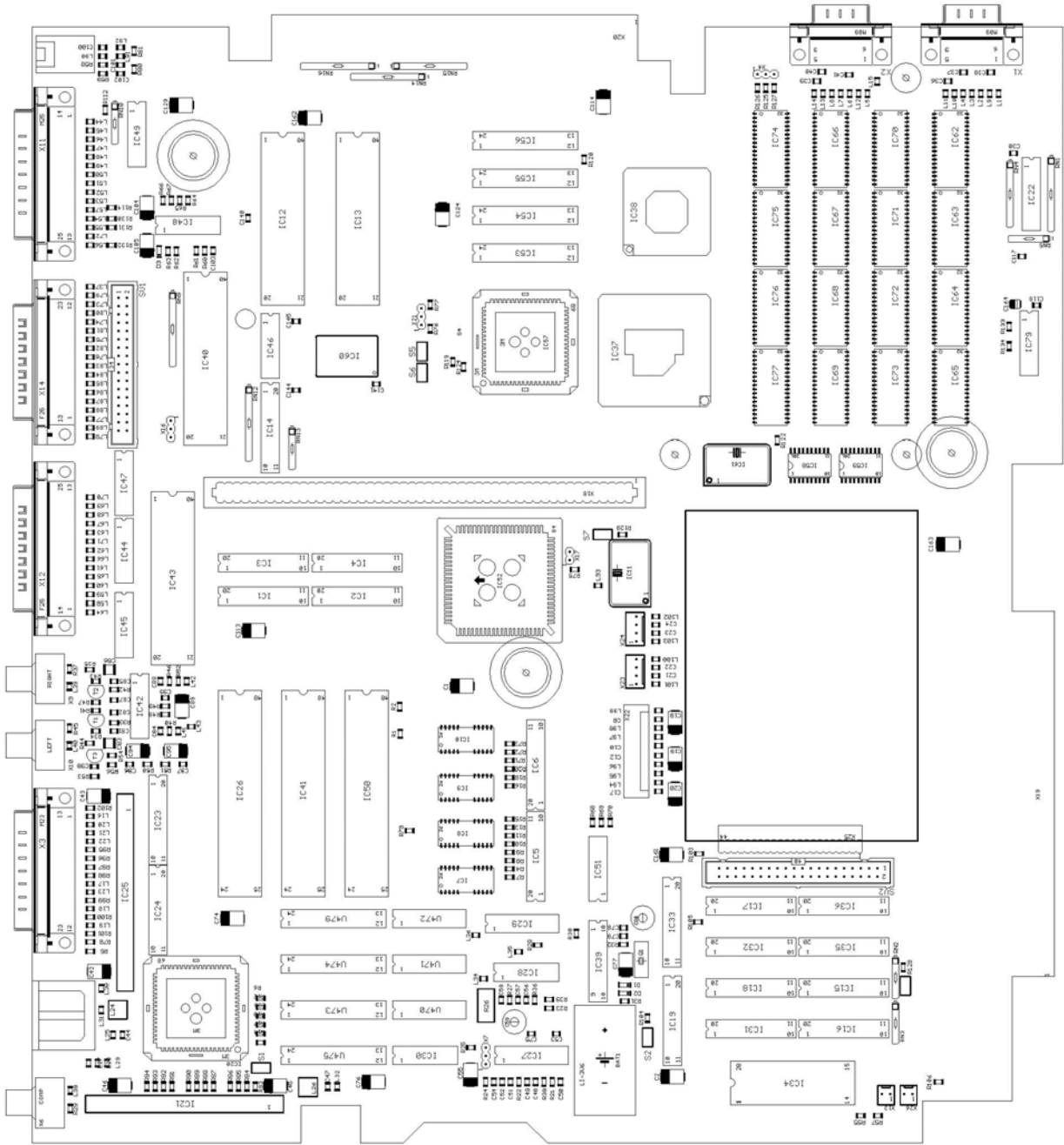
- Measurements: 314 x 341 x 23 mm (L x W x D)
- Maximal Clock frequency: 50 MHz
- Minimal Clock frequency: 40 MHz
- CPU: MC68030 or MC68EC030
- FPU: MC68881 or MC68882
- SRAM: 8 MB; Access in two clock cycles

6.4 Configuration Order

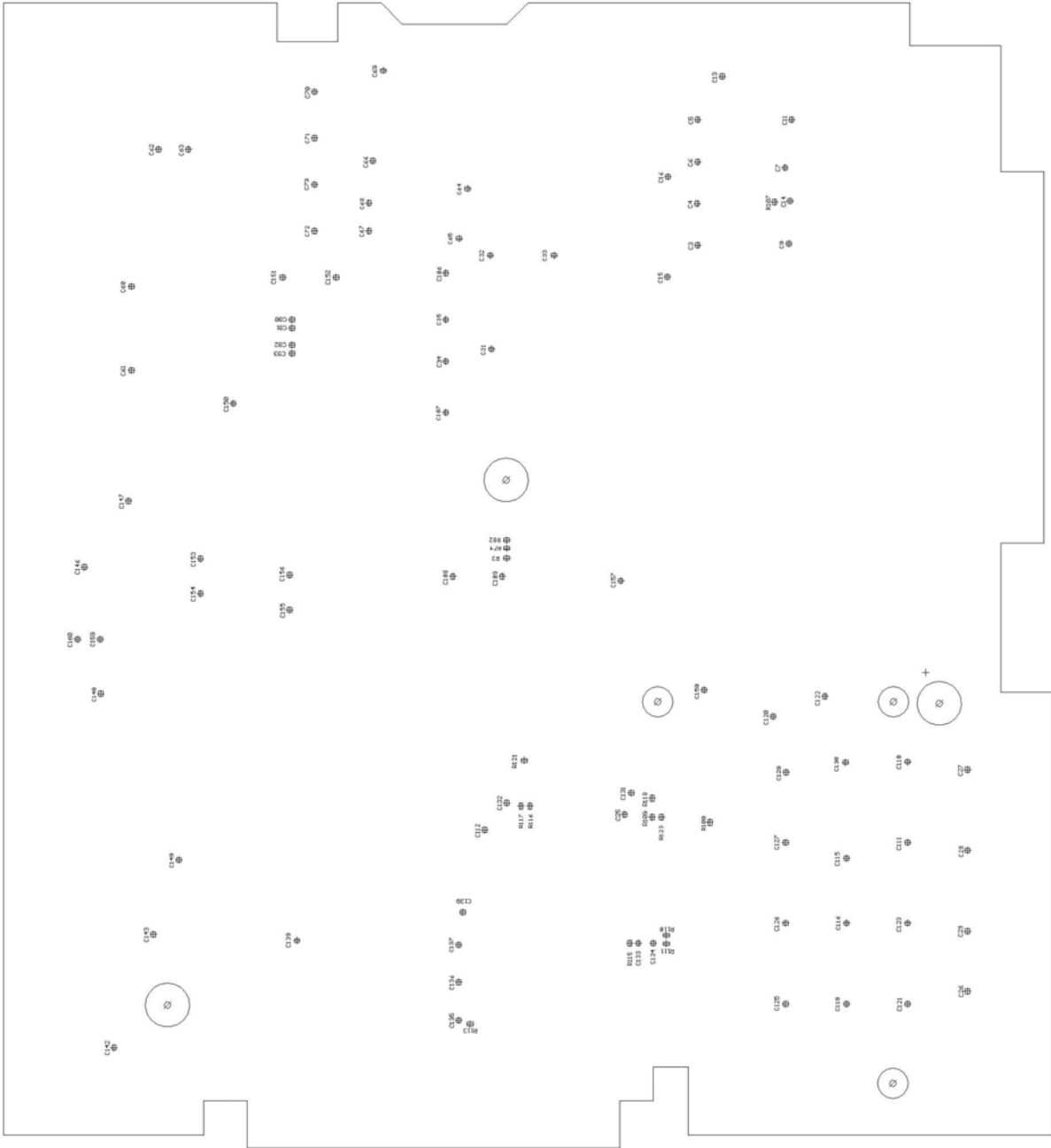
- 1 Front slot; For instance IDE controller or memory expansion
- 2 On-board IDE controller
- 3 Zorro-II slot; For instance SCSI-, IDE interfaces
- 4 32Bit RAM
- 5 Expansion port; For instance IDE controller or memory expansion

7 Appendix

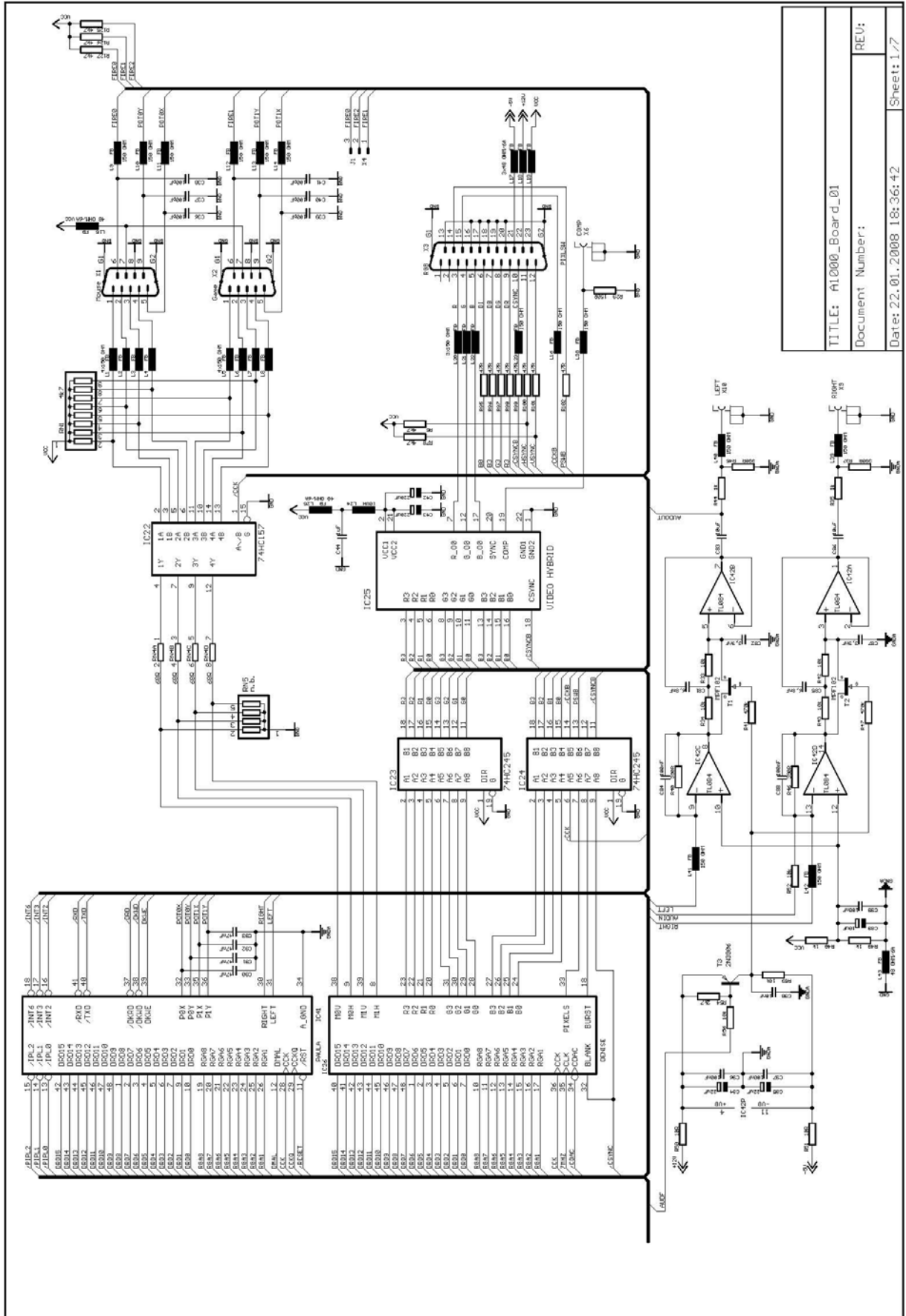
7.1 Silk Screen Side B



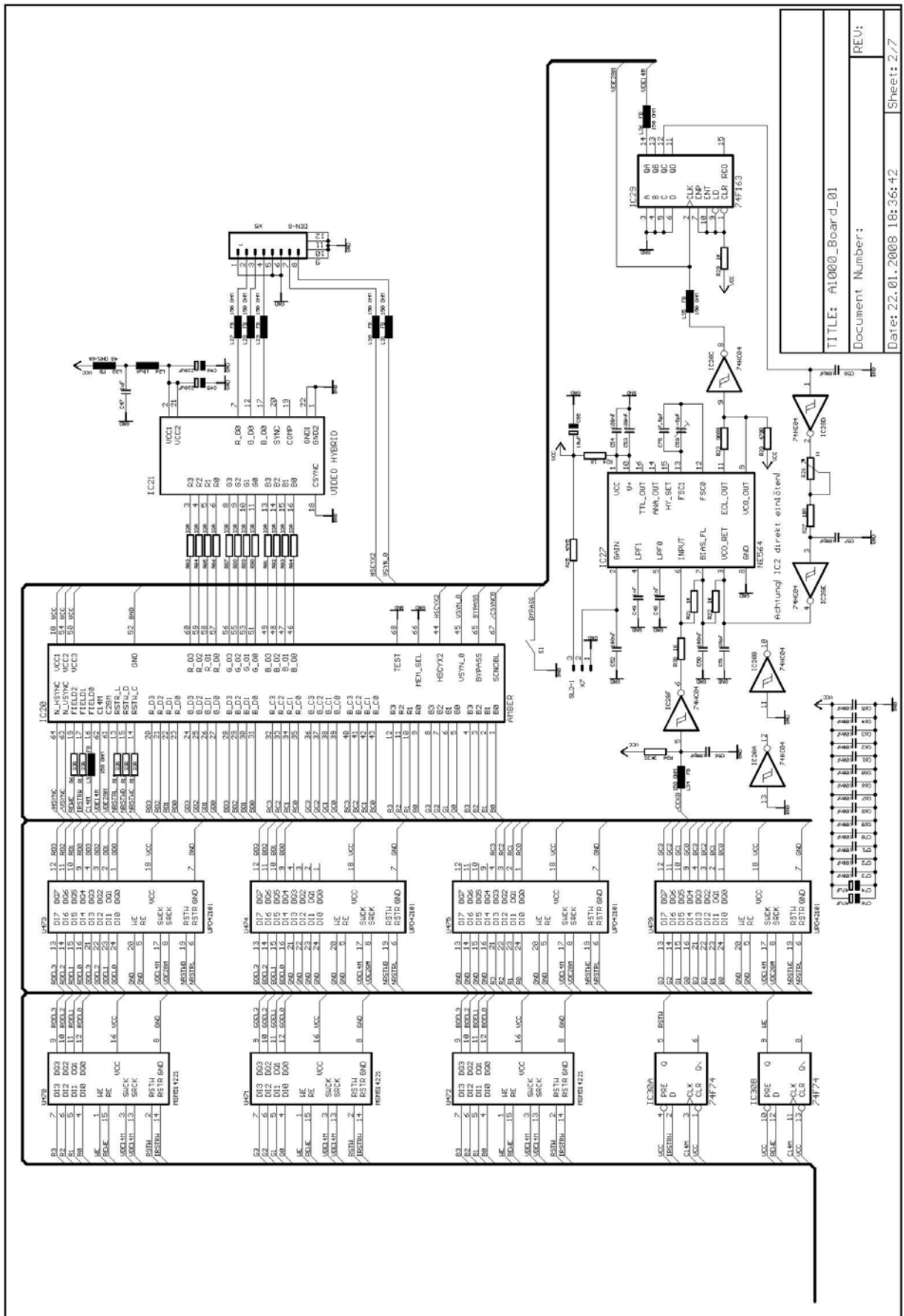
7.2 Silk Screen Side L



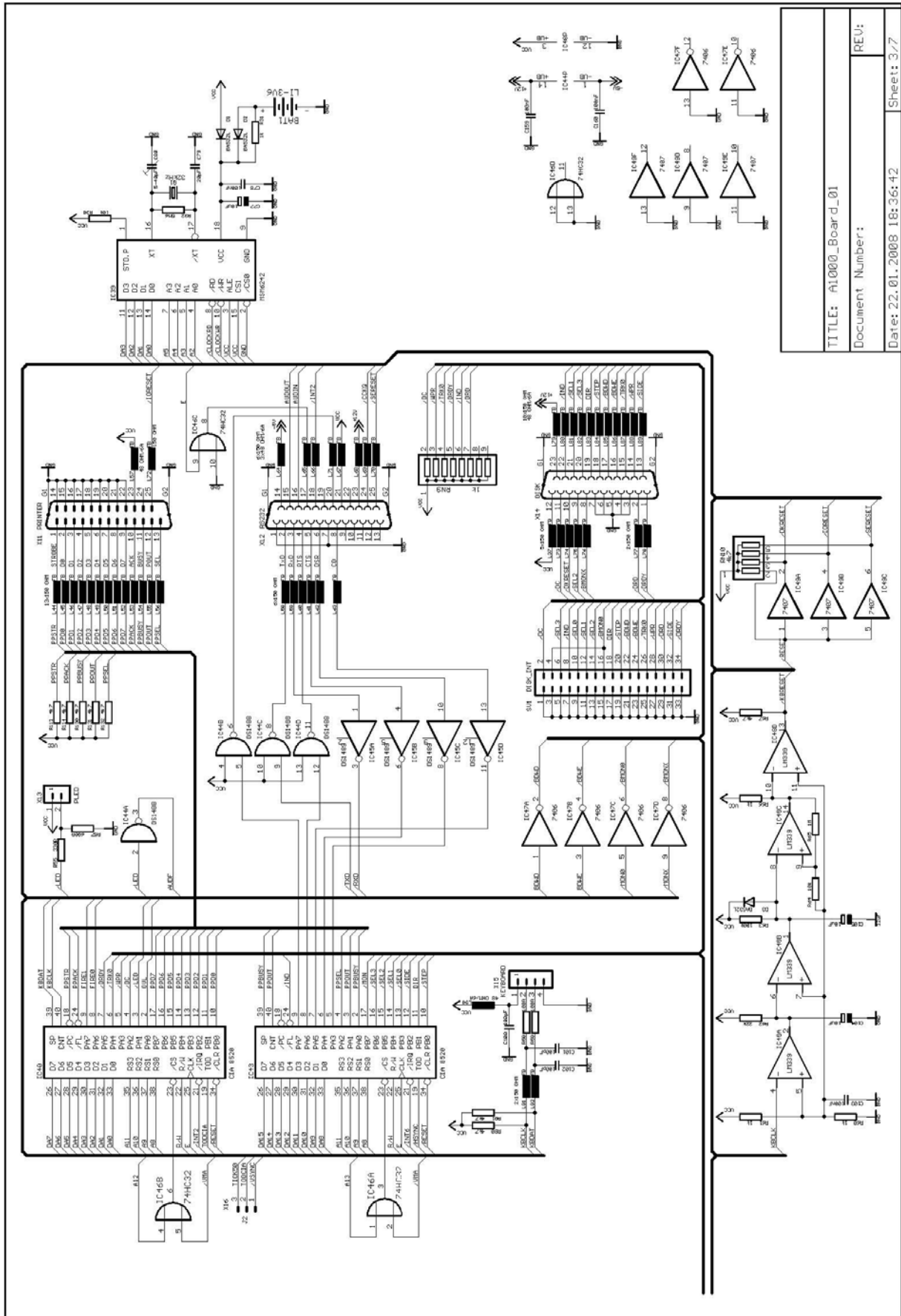
7.3 Circuit Diagram



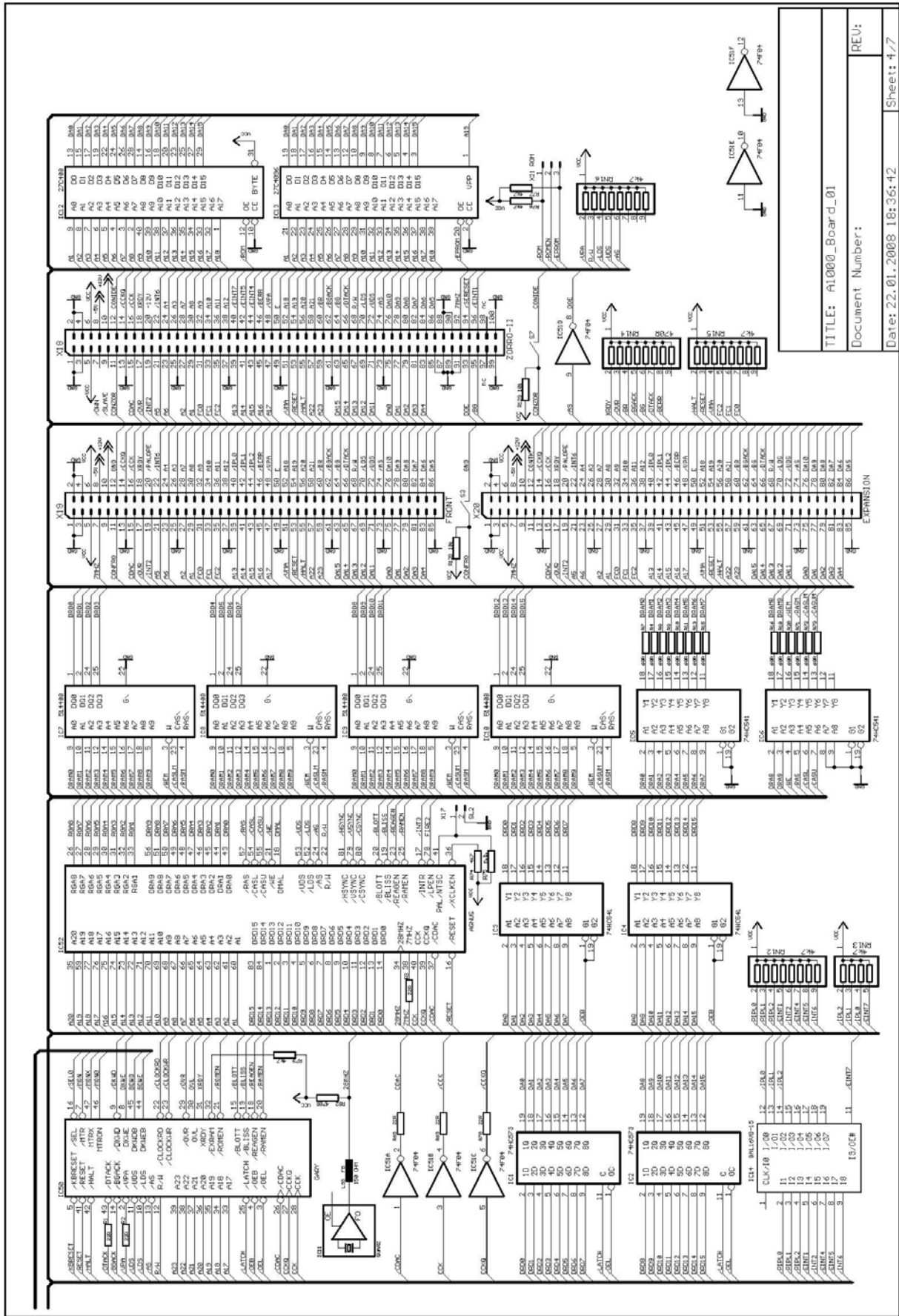
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 Document Number:
 Date: 22.01.2008 18:36:42
 Sheet: 1/7
 REV:



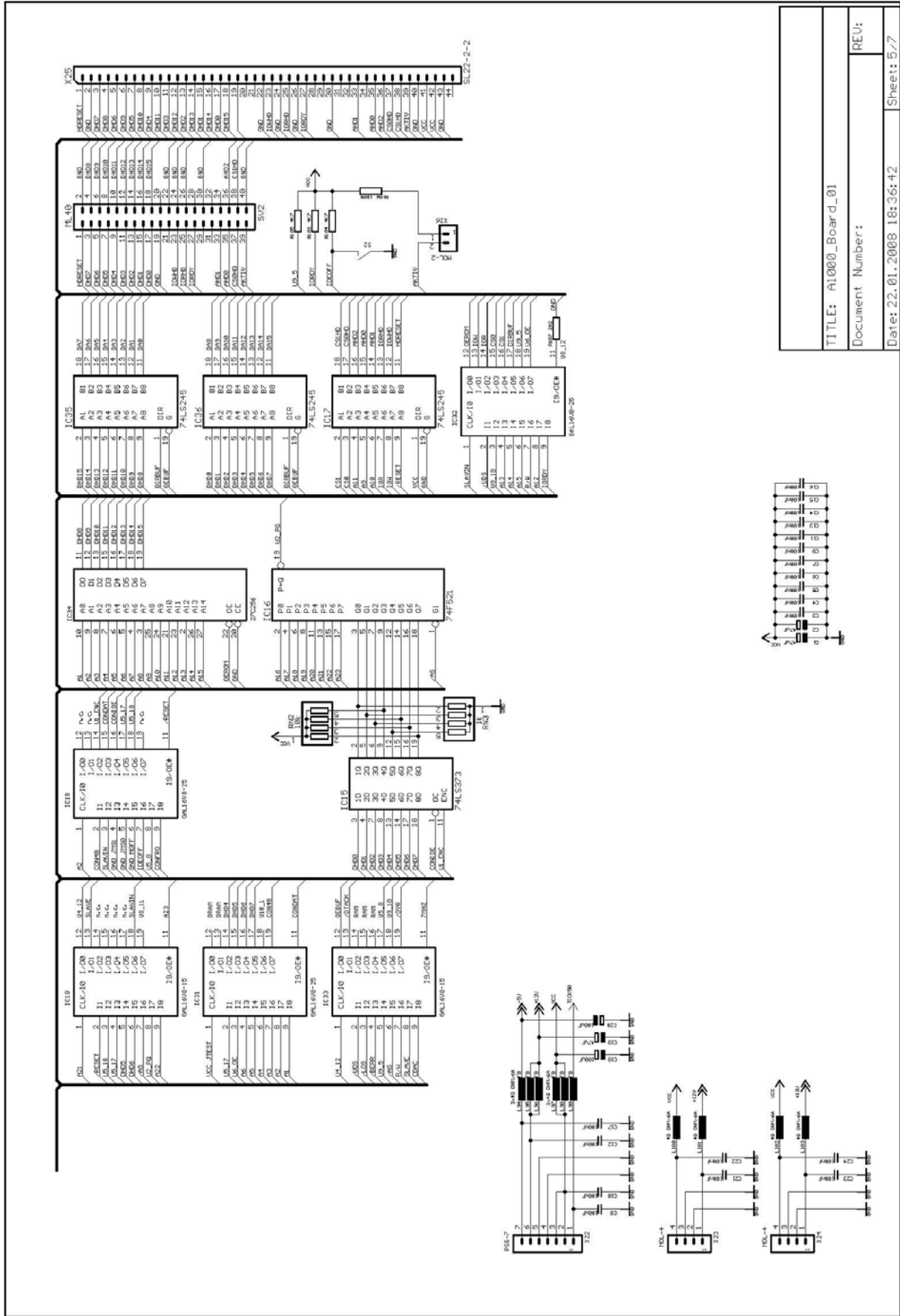
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 Document Number:
 Date: 22.01.2008 18:36:42
 Sheet: 2/7

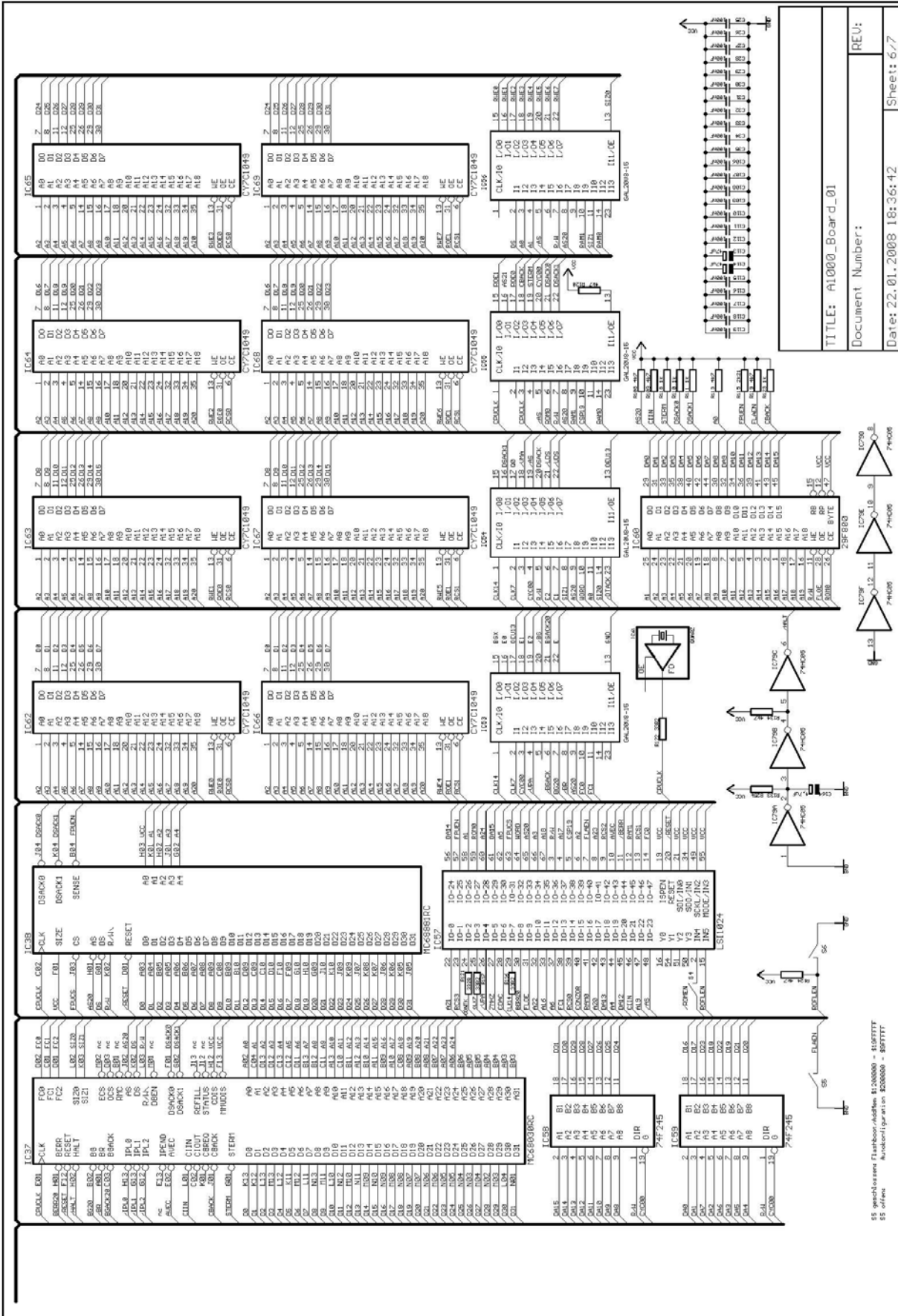


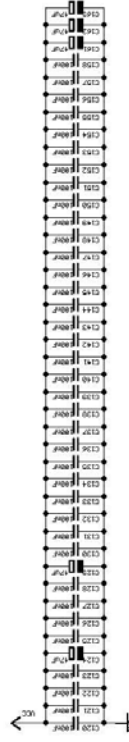
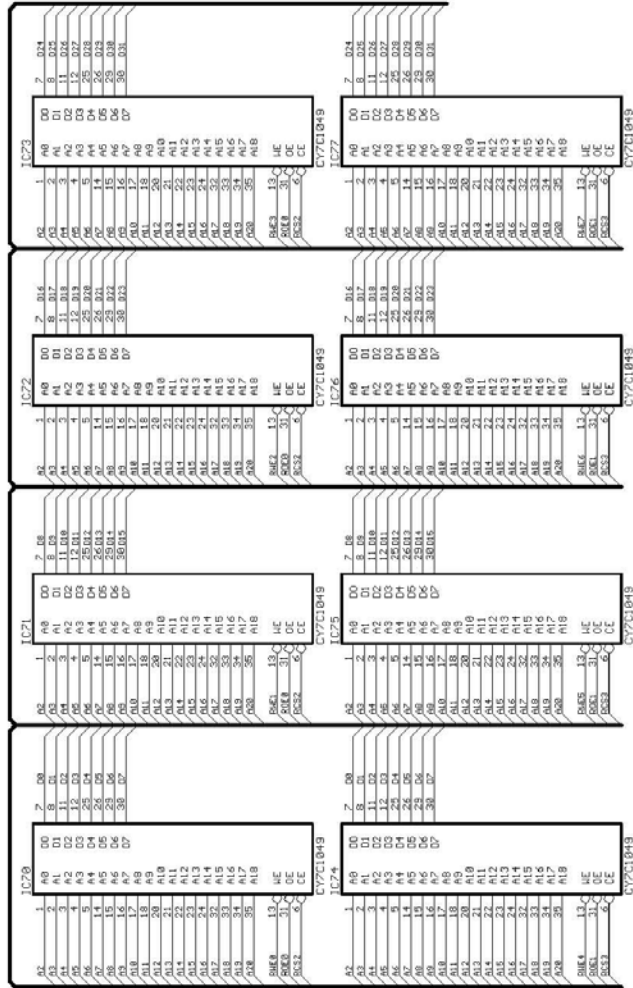
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 Document Number:
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7.4 Component List

Part	Value	Package	Type	Suggested Source	Item No. (From Source)	Price (€)
BAT1	LI-3V6	LI-3V6	BATTERY	elpro - Elektronik	LS 14250 Drahtanschluss	4.87
C1	47uF	7243	SMD	elpro - Elektronik	T-SMD 20V 47uF BF:D	0.34
C2	47uF	7243	SMD	elpro - Elektronik	T-SMD 20V 47uF BF:D	0.34
C3	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C4	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C5	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C6	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C7	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C8	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C9	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C10	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C11	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C12	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C13	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C14	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C15	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C16	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C17	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C18	100uF	7243	SMD	elpro - Elektronik	T-SMD 16V 100uF BF:D	0.22
C19	47uF	7243	SMD	elpro - Elektronik	T-SMD 20V 47uF BF:D	0.34
C20	100uF	7243	SMD	elpro - Elektronik	T-SMD 16V 100uF BF:D	0.22
C21	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C22	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C23	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C24	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C25	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C26	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C27	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C28	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C29	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C30	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C31	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C32	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C33	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C34	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C35	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C36	100pF	1206	SMD	elpro - Elektronik	K-SMD 100 pF 1206	0.11
C37	100pF	1206	SMD	elpro - Elektronik	K-SMD 100 pF 1206	0.11
C38	100pF	1206	SMD	elpro - Elektronik	K-SMD 100 pF 1206	0.11
C39	100pF	1206	SMD	elpro - Elektronik	K-SMD 100 pF 1206	0.11
C40	100pF	1206	SMD	elpro - Elektronik	K-SMD 100 pF 1206	0.11
C41	100pF	1206	SMD	elpro - Elektronik	K-SMD 100 pF 1206	0.11
C42	220uF	7243	SMD	elpro - Elektronik	T-SMD 6,3V 220uF BF:D	0.45
C43	220uF	7243	SMD	elpro - Elektronik	T-SMD 6,3V 220uF BF:D	0.45
C44	1uF	1206	SMD	elpro - Elektronik	K-SMD 1uF 1206	0.12
C45	220uF	7243	SMD	elpro - Elektronik	T-SMD 6,3V 220uF BF:D	0.45
C46	220uF	7243	SMD	elpro - Elektronik	T-SMD 6,3V 220uF BF:D	0.45
C47	1uF	1206	SMD	elpro - Elektronik	K-SMD 1uF 1206	0.12
C48	1nF	1206	SMD	elpro - Elektronik	K-SMD 1000 pF 1206	0.11
C49	1nF	1206	SMD	elpro - Elektronik	K-SMD 1000 pF 1206	0.11
C50	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11

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Part	Value	Package	Type	Suggested Source	Item No. (From Source)	Price (€)
C51	39pF	1206	SMD	elpro - Elektronik	K-SMD 39 pF 1206	0.11
C52	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C53	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C54	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C55	10uF	7243	SMD	elpro - Elektronik	T-SMD 25V 10uF BF:D	0.24
C56	100pF	1206	SMD	elpro - Elektronik	K-SMD 100 pF 1206	0.11
C57	100pF	1206	SMD	elpro - Elektronik	K-SMD 100 pF 1206	0.11
C58	100pF	1206	SMD	elpro - Elektronik	K-SMD 100 pF 1206	0.11
C59	1-5pF	C-TRIM-1	RCD	elpro - Elektronik	808-1 1,4-5,5 pF	0.36
C60	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C61	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C62	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C63	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C64	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C65	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C66	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C67	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C68	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C69	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C70	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C71	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C72	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C73	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C74	47uF	7243	SMD	elpro - Elektronik	T-SMD 20V 47uF BF:D	0.34
C75	7,5pF	1206	SMD	elpro - Elektronik	K-SMD 8,2 pF 1206	0.11
C76	47uF	7243	SMD	elpro - Elektronik	T-SMD 20V 47uF BF:D	0.34
C77	10uF	7243	SMD	elpro - Elektronik	T-SMD 25V 10uF BF:D	0.24
C78	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C79	20pF	1206	SMD	elpro - Elektronik	K-SMD 22 pF 1206	0.11
C80	5-40pF	C-TRIM-1	RCD	elpro - Elektronik	808-1 3-40 pF	0.40
C81	6,8nF	1206	SMD	elpro - Elektronik	K-SMD 6800 pF 1206	0.11
C82	3,9nF	1206	SMD	elpro - Elektronik	K-SMD 3900 pF 1206	0.11
C83	10uF	1812	SMD	elpro - Elektronik	T-SMD 25V 10uF BF:D	0.24
C84	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C85	6,8nF	1206	SMD	elpro - Elektronik	K-SMD 6800 pF 1206	0.11
C86	10uF	1812	SMD	elpro - Elektronik	T-SMD 25V 10uF BF:D	0.24
C87	3,9nF	1206	SMD	elpro - Elektronik	K-SMD 3900 pF 1206	0.11
C88	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C89	10uF	7243	SMD	elpro - Elektronik	T-SMD 25V 10uF BF:D	0.24
C90	47nF	1206	SMD	elpro - Elektronik	K-SMD 0,047uF 1206	0.11
C91	47nF	1206	SMD	elpro - Elektronik	K-SMD 0,047uF 1206	0.11
C92	47nF	1206	SMD	elpro - Elektronik	K-SMD 0,047uF 1206	0.11
C93	47nF	1206	SMD	elpro - Elektronik	K-SMD 0,047uF 1206	0.11
C94	22uF	7243	SMD	elpro - Elektronik	T-SMD 25V 22uF BF:D	0.30
C95	22uF	7243	SMD	elpro - Elektronik	T-SMD 25V 22uF BF:D	0.30
C96	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C97	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C98	10nF	1206	SMD	elpro - Elektronik	K-SMD 0,01uF 1206	0.11
C99	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C100	100pF	1206	SMD	elpro - Elektronik	K-SMD 100 pF 1206	0.11
C101	100pF	1206	SMD	elpro - Elektronik	K-SMD 100 pF 1206	0.11
C102	100pF	1206	SMD	elpro - Elektronik	K-SMD 100 pF 1206	0.11
C103	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11

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Part	Value	Package	Type	Suggested Source	Item No. (From Source)	Price (€)
C104	10uF	7243	SMD	elpro - Elektronik	T-SMD 25V 10uF BF:D	0.24
C105	10uF	7243	SMD	elpro - Elektronik	T-SMD 25V 10uF BF:D	0.24
C106	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C107	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C108	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C109	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C110	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C111	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C112	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C113	47uF	7243	SMD	elpro - Elektronik	T-SMD 20V 47uF BF:D	0.34
C114	47uF	7243	SMD	elpro - Elektronik	T-SMD 20V 47uF BF:D	0.34
C115	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C116	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C117	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C118	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C119	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C120	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C121	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C122	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C123	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C124	47uF	7243	SMD	elpro - Elektronik	T-SMD 20V 47uF BF:D	0.34
C125	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C126	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C127	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C128	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C129	47uF	7243	SMD	elpro - Elektronik	T-SMD 20V 47uF BF:D	0.34
C130	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C131	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C132	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C133	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C134	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C135	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C136	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C137	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C138	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C139	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C140	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C141	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C142	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C143	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C144	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C145	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C146	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C147	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C148	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C149	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C150	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C151	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C152	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C153	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C154	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C155	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C156	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11

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Part	Value	Package	Type	Suggested Source	Item No. (From Source)	Price (€)
C157	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C158	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C159	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C160	100nF	1206	SMD	elpro - Elektronik	K-SMD 0,1uF 1206	0.11
C161	47uF	7243	SMD	elpro - Elektronik	T-SMD 20V 47uF BF:D	0.34
C162	47uF	7243	SMD	elpro - Elektronik	T-SMD 20V 47uF BF:D	0.34
C163	47uF	7243	SMD	elpro - Elektronik	T-SMD 20V 47uF BF:D	0.34
C164	4,7uF	3528	SMD	elpro - Elektronik	T-SMD 16V 4,7uF BF:B	0.15
D1	BAS32L	SOD-80	SMD	elpro - Elektronik	BAS32 L SMD	0.09
D2	BAS32L	SOD-80	SMD	elpro - Elektronik	BAS32 L SMD	0.09
D3	BAS32L	SOD-80	SMD	elpro - Elektronik	BAS32 L SMD	0.09
IC1	74HC573	DIP20	DIL-IC	elpro - Elektronik	74 HC 573	0.15
IC2	74HC573	DIP20	DIL-IC	elpro - Elektronik	74 HC 573	0.15
IC3	74HC541	DIP20	DIL-IC	elpro - Elektronik	74 HC 541	0.19
IC4	74HC541	DIP20	DIL-IC	elpro - Elektronik	74 HC 541	0.19
IC5	74HC541	DIP20	DIL-IC	elpro - Elektronik	74 HC 541	0.19
IC6	74HC541	DIP20	DIL-IC	elpro - Elektronik	74 HC 541	0.19
IC7	514400	SOJ26/20	SMD-IC	Kessler electronic	514400-60SOJ	4.98
IC8	514400	SOJ26/20	SMD-IC	Kessler electronic	514400-60SOJ	4.98
IC9	514400	SOJ26/20	SMD-IC	Kessler electronic	514400-60SOJ	4.98
IC10	514400	SOJ26/20	SMD-IC	Kessler electronic	514400-60SOJ	4.98
IC11	28,3751 MHz	Oscillator	DIL-IC	Amiga-Hardware		0.00
IC12	27C400	DIP40-6	DIL-IC	Kickstart-ROM		0.00
IC13	27C4096	DIP40-6	DIL-IC	n.b.		0.00
IC14	GAL16V8-15	DIP20	DIL-IC	elpro - Elektronik	GAL 16 V 8 D-15 LP	0.70
IC15	74LS373	DIP20	DIL-IC	Reichelt - Elektronik	74LS 373	0.22
IC16	74F521	DIP20	DIL-IC	Reichelt - Elektronik	74F 521	0.40
IC17	74LS245	DIP20	DIL-IC	Reichelt - Elektronik	74LS 245	0.20
IC18	GAL16V8-15	DIP20	DIL-IC	elpro - Elektronik	GAL 16 V 8 D-15 LP	0.70
IC19	GAL16V8-25	DIP20	DIL-IC	elpro - Elektronik	GAL 16 V 8 D-25 LP	0.70
IC20	AMBER	PLCC68	DIL-IC	Amiga-Hardware		0.00
IC21	VIDEO_H	SIP22	DIL-IC	Amiga-Hardware		0.00
IC22	74HC157	DIP16	DIL-IC	Reichelt - Elektronik	74HC 157	0.15
IC23	74HC245	DIP20	DIL-IC	Reichelt - Elektronik	74HC 245	0.20
IC24	74HC245	DIP20	DIL-IC	Reichelt - Elektronik	74HC 245	0.20
IC25	VIDEO_H	SIP22	DIL-IC	Amiga-Hardware		0.00
IC26	DENISE	DIP48-6	DIL-IC	Amiga-Hardware		0.00
IC27	NE564	DIP16	DIL-IC	Reichelt - Elektronik	NE 564 DIL	1.50
IC28	74HC04	DIP14	74XXSMD	Reichelt - Elektronik	74HC 04	0.12
IC29	74F163	DIP16	74XX	Kessler electronic	74F163	0.84
IC30	74F74	DIP14	74XX	Reichelt - Elektronik	74F 74	0.31
IC31	GAL16V8-25	DIP20	DIL-IC	elpro - Elektronik	GAL 16 V 8 D-25 LP	0.70
IC32	GAL16V8-25	DIP20	DIL-IC	elpro - Elektronik	GAL 16 V 8 D-25 LP	0.70
IC33	GAL16V8-15	DIP20	DIL-IC	elpro - Elektronik	GAL 16 V 8 D-15 LP	0.70
IC34	27C256	DIP28-6	DIL-IC	Reichelt - Elektronik	27C256-70	2.05
IC35	74LS245	DIP20	DIL-IC	Reichelt - Elektronik	74LS 245	0.20
IC36	74LS245	DIP20	DIL-IC	Reichelt - Elektronik	74LS 245	0.20
IC37	MC68030RC	PGA-128	M68000	eBay		20.00
IC38	MC68881RC	PGA-68	M68000	eBay		20.00
IC39	MSM6242	DIP18	DIL-IC	Amiga-Hardware		0.00
IC40	CIA_8520	DIP40-6	DIL-IC	Amiga-Hardware		0.00
IC41	PAULA	DIP48-6	DIL-IC	Amiga-Hardware		0.00
IC42	TL084	DIP14	DIL-IC	Reichelt - Elektronik	TL 074 DIL	0.15

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Part	Value	Package	Type	Suggested Source	Item No. (From Source)	Price (€)
IC43	CIA_8520	DIP40-6	DIL-IC	Amiga-Hardware		0.00
IC44	DS1488	DIP14	DIL-IC	Kessler electronic	MC1488	0.25
IC45	DS1489	DIP14	DIL-IC	Kessler electronic	MC1489	0.19
IC46	74HC32	DIP14	DIL-IC	Reichelt - Elektronik	74HC 32	0.15
IC47	7406	DIP14	DIL-IC	Reichelt - Elektronik	74LS 06	0.39
IC48	LM339	DIP14	DIL-IC	Reichelt - Elektronik	LM 339 DIL	0.10
IC49	7407	DIP14	DIL-IC	Reichelt - Elektronik	74LS 07	0.17
IC50	GARY	DIP48-6	DIL-IC	Amiga-Hardware		0.00
IC51	74F04	DIP14	DIL-IC	Reichelt - Elektronik	74F 04	0.22
IC52	AGNUS	PLCC84	DIL-IC	Amiga-Hardware		0.00
IC53	GAL20V8-15	DIP24-3	DIL-IC	elpro - Elektronik	GAL 20 V 8 B-15 LP	0.93
IC54	GAL20V8-15	DIP24-3	DIL-IC	elpro - Elektronik	GAL 20 V 8 B-15 LP	0.93
IC55	GAL20V8-15	DIP24-3	DIL-IC	elpro - Elektronik	GAL 20 V 8 B-15 LP	0.93
IC56	GAL20V8-15	DIP24-3	DIL-IC	elpro - Elektronik	GAL 20 V 8 B-15 LP	0.93
IC57	LSI1024	PLCC68	DIL-IC	elpro - Elektronik	ISPLSI 1024-60 LJ PLCC	10.85
IC58	74F245	SO20L	74XXSMD	elpro - Elektronik	74 F 245 SMD	0.40
IC59	74F245	SO20L	74XXSMD	elpro - Elektronik	74 F 245 SMD	0.40
IC60	29F800	TSOP48	SMD-IC	RS Components GmbH	414-9597	11.80
IC61	48 MHz	Oscillator	DIL-IC	Conrad Elektronik	158240	5.22
IC62	CY7C1049	SOJ36/4	SMD-IC	Kessler electronic	614008-10J	3.80
IC63	CY7C1049	SOJ36/4	SMD-IC	Kessler electronic	614008-10J	3.80
IC64	CY7C1049	SOJ36/4	SMD-IC	Kessler electronic	614008-10J	3.80
IC65	CY7C1049	SOJ36/4	SMD-IC	Kessler electronic	614008-10J	3.80
IC66	CY7C1049	SOJ36/4	SMD-IC	Kessler electronic	614008-10J	3.80
IC67	CY7C1049	SOJ36/4	SMD-IC	Kessler electronic	614008-10J	3.80
IC68	CY7C1049	SOJ36/4	SMD-IC	Kessler electronic	614008-10J	3.80
IC69	CY7C1049	SOJ36/4	SMD-IC	Kessler electronic	614008-10J	3.80
IC70	CY7C1049	SOJ36/4	SMD-IC	Kessler electronic	614008-10J	3.80
IC71	CY7C1049	SOJ36/4	SMD-IC	Kessler electronic	614008-10J	3.80
IC72	CY7C1049	SOJ36/4	SMD-IC	Kessler electronic	614008-10J	3.80
IC73	CY7C1049	SOJ36/4	SMD-IC	Kessler electronic	614008-10J	3.80
IC74	CY7C1049	SOJ36/4	SMD-IC	Kessler electronic	614008-10J	3.80
IC75	CY7C1049	SOJ36/4	SMD-IC	Kessler electronic	614008-10J	3.80
IC76	CY7C1049	SOJ36/4	SMD-IC	Kessler electronic	614008-10J	3.80
IC77	CY7C1049	SOJ36/4	SMD-IC	Kessler electronic	614008-10J	3.80
IC79	74HC05	DIP14	DIL-IC	elpro - Elektronik	74HC 05	0.44
L1	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L2	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L3	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L4	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L5	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L6	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L7	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L8	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L9	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L10	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L11	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L12	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L13	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L14	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L15	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L16	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L17	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05

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Part	Value	Package	Type	Suggested Source	Item No. (From Source)	Price (€)
L18	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L19	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L20	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L21	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L22	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L23	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L24	10UH	L-10UH	SMD	elpro - Elektronik	LQH 4 N 10 uH	0.40
L25	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L26	10uH	L-10UH	SMD	elpro - Elektronik	LQH 4 N 10 uH	0.40
L27	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L28	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L29	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L30	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L31	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L32	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L33	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L34	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L35	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L36	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L37	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L38	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L39	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L40	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L41	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L42	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L43	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L44	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L45	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L46	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L47	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L48	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L49	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L50	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L51	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L52	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L53	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L54	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L55	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L56	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L57	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L58	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L59	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L60	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L61	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L62	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L63	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L64	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L65	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L66	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L67	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L68	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L69	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L70	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05

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Part	Value	Package	Type	Suggested Source	Item No. (From Source)	Price (€)
L71	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L72	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L73	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L74	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L75	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L76	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L77	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L78	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L79	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L80	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L81	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L82	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L83	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L84	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L85	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L86	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L87	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L88	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L89	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L90	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L91	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L92	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L93	150 OHM	1206	SMD	Würth Elektronik GmbH	74279212	0.05
L94	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L95	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L96	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L97	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L98	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L99	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L100	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L101	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L102	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
L103	48 OHM/6A	1206	SMD	Würth Elektronik GmbH	742792117	0.05
Q1	32kHz	Q-UHR	DIL-IC	elpro - Elektronik	Q32,768 kHz TC 38	0.45
R1	22R	204	SMD	elpro - Elektronik	1206-SMD 1% 22R	0.15
R2	22R	204	SMD	elpro - Elektronik	1206-SMD 1% 22R	0.15
R3	22R	204	SMD	elpro - Elektronik	1206-SMD 1% 22R	0.15
R4	68R	204	SMD	elpro - Elektronik	1206-SMD 1% 68R	0.15
R5	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R6	33R	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R7	68R	204	SMD	elpro - Elektronik	1206-SMD 1% 68R	0.15
R8	68R	204	SMD	elpro - Elektronik	1206-SMD 1% 68R	0.15
R9	68R	204	SMD	elpro - Elektronik	1206-SMD 1% 68R	0.15
R10	68R	204	SMD	elpro - Elektronik	1206-SMD 1% 68R	0.15
R11	68R	204	SMD	elpro - Elektronik	1206-SMD 1% 68R	0.15
R12	33R	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R13	68R	204	SMD	elpro - Elektronik	1206-SMD 1% 68R	0.15
R14	33R	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R15	68R	204	SMD	elpro - Elektronik	1206-SMD 1% 68R	0.15
R16	68R	204	SMD	elpro - Elektronik	1206-SMD 1% 68R	0.15
R17	33R	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R18	68R	204	SMD	elpro - Elektronik	1206-SMD 1% 68R	0.15
R19	33R	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15

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Part	Value	Package	Type	Suggested Source	Item No. (From Source)	Price (€)
R20	68R	204	SMD	elpro - Elektronik	1206-SMD 1% 68R	0.15
R21	1K	204	SMD	elpro - Elektronik	1206-SMD 1% 1k	0.15
R22	1K	204	SMD	elpro - Elektronik	1206-SMD 1% 1k	0.15
R23	90R9	204	SMD	elpro - Elektronik	1206-SMD 1% 91R	0.15
R24	1R	204	SMD	elpro - Elektronik	1206-SMD 1% 1R	0.15
R25	47K5	204	SMD	elpro - Elektronik	1206-SMD 1% 47,5k	0.15
R26	1k	R-POT-G	RCD	elpro - Elektronik	64 Y 1 k	0.70
R27	10R	204	SMD	elpro - Elektronik	1206-SMD 1% 10R	0.15
R28	1K	204	SMD	elpro - Elektronik	1206-SMD 1% 1k	0.15
R29	150R	204	SMD	elpro - Elektronik	1206-SMD 1% 150R	0.15
R30	10k	204	SMD	elpro - Elektronik	1206-SMD 1% 10k	0.15
R31	1k	204	SMD	elpro - Elektronik	1206-SMD 1% 1k	0.15
R32	5M6	204	SMD	elpro - Elektronik	1206-SMD 1% 10k	0.15
R33	10k	204	SMD	elpro - Elektronik	1206-SMD 1% 10k	0.15
R34	10k	204	SMD	elpro - Elektronik	1206-SMD 1% 10k	0.15
R35	1k	204	SMD	elpro - Elektronik	1206-SMD 1% 1k	0.15
R36	3K32	204	SMD	elpro - Elektronik	1206-SMD 1% 3,32k	0.15
R37	390R	204	SMD	elpro - Elektronik	1206-SMD 1% 390R	0.15
R38	1K	204	SMD	elpro - Elektronik	1206-SMD 1% 1k	0.15
R39	470R	204	SMD	elpro - Elektronik	1206-SMD 1% 470R	0.15
R40	390R	204	SMD	elpro - Elektronik	1206-SMD 1% 390R	0.15
R41	470k	204	SMD	elpro - Elektronik	1206-SMD 1% 470k	0.15
R42	10k	204	SMD	elpro - Elektronik	1206-SMD 1% 10k	0.15
R43	10k	204	SMD	elpro - Elektronik	1206-SMD 1% 10k	0.15
R44	1k	204	SMD	elpro - Elektronik	1206-SMD 1% 1k	0.15
R45	390R	204	SMD	elpro - Elektronik	1206-SMD 1% 390R	0.15
R46	390R	204	SMD	elpro - Elektronik	1206-SMD 1% 390R	0.15
R47	470k	204	SMD	elpro - Elektronik	1206-SMD 1% 470k	0.15
R48	1k	204	SMD	elpro - Elektronik	1206-SMD 1% 1k	0.15
R49	1k	204	SMD	elpro - Elektronik	1206-SMD 1% 1k	0.15
R50	10R	204	SMD	elpro - Elektronik	1206-SMD 1% 10R	0.15
R51	10R	204	SMD	elpro - Elektronik	1206-SMD 1% 10R	0.15
R52	10k	204	SMD	elpro - Elektronik	1206-SMD 1% 10k	0.15
R53	10k	204	SMD	elpro - Elektronik	1206-SMD 1% 10k	0.15
R54	2k7	204	SMD	elpro - Elektronik	1206-SMD 1% 2,7k	0.15
R55	330R	204	SMD	elpro - Elektronik	1206-SMD 1% 330R	0.15
R56	10k	204	SMD	elpro - Elektronik	1206-SMD 1% 10k	0.15
R57	680R	204	SMD	elpro - Elektronik	1206-SMD 1% 680R	0.15
R58	100R	204	SMD	elpro - Elektronik	1206-SMD 1% 100R	0.15
R59	100R	204	SMD	elpro - Elektronik	1206-SMD 1% 100R	0.15
R60	1k	204	SMD	elpro - Elektronik	1206-SMD 1% 1k	0.15
R61	1k	204	SMD	elpro - Elektronik	1206-SMD 1% 1k	0.15
R62	22k	204	SMD	elpro - Elektronik	1206-SMD 1% 22k	0.15
R63	100k	204	SMD	elpro - Elektronik	1206-SMD 1% 10k	0.15
R64	10k	204	SMD	elpro - Elektronik	1206-SMD 1% 100k	0.15
R65	1M	204	SMD	elpro - Elektronik	1206-SMD 1% 1M	0.15
R66	1k	204	SMD	elpro - Elektronik	1206-SMD 1% 1k	0.15
R67	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R68	22R	204	SMD	elpro - Elektronik	1206-SMD 1% 22R	0.15
R69	22R	204	SMD	elpro - Elektronik	1206-SMD 1% 22R	0.15
R70	22R	204	SMD	elpro - Elektronik	1206-SMD 1% 22R	0.15
R71	68R	204	SMD	elpro - Elektronik	1206-SMD 1% 68R	0.15
R72	68R	204	SMD	elpro - Elektronik	1206-SMD 1% 68R	0.15

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Part	Value	Package	Type	Suggested Source	Item No. (From Source)	Price (€)
R73	68R	204	SMD	elpro - Elektronik	1206-SMD 1% 68R	0.15
R74	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R75	n.b.	204	SMD			
R76	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R77	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R78	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R79	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R80	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R81	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R82	470R	204	SMD	elpro - Elektronik	1206-SMD 1% 470R	0.15
R83	33R	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R84	33R	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R85	33R	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R86	33R	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R87	33R	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R88	33R	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R89	33R	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R90	33R	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R91	33R	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R92	33R	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R93	33R	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R94	33R	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R95	47R	204	SMD	elpro - Elektronik	1206-SMD 1% 47R	0.15
R96	47R	204	SMD	elpro - Elektronik	1206-SMD 1% 47R	0.15
R97	47R	204	SMD	elpro - Elektronik	1206-SMD 1% 47R	0.15
R98	47R	204	SMD	elpro - Elektronik	1206-SMD 1% 47R	0.15
R99	47R	204	SMD	elpro - Elektronik	1206-SMD 1% 47R	0.15
R100	47R	204	SMD	elpro - Elektronik	1206-SMD 1% 47R	0.15
R101	47R	204	SMD	elpro - Elektronik	1206-SMD 1% 47R	0.15
R102	47R	204	SMD	elpro - Elektronik	1206-SMD 1% 47R	0.15
R103	4K7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R104	4K7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R105	4K7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R106	180R	204	SMD	elpro - Elektronik	1206-SMD 1% 180R	0.15
R107	2K2	204	SMD	elpro - Elektronik	1206-SMD 1% 2,21k	0.15
R108	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R109	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R110	1k	204	SMD	elpro - Elektronik	1206-SMD 1% 1k	0.15
R111	1k	204	SMD	elpro - Elektronik	1206-SMD 1% 1k	0.15
R112	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R113	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R114	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R115	2k21	204	SMD	elpro - Elektronik	1206-SMD 1% 2,21k	0.15
R116	33R2	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R117	33R2	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R118	1k	204	SMD	elpro - Elektronik	1206-SMD 1% 1k	0.15
R119	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R120	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R121	332R	204	SMD	elpro - Elektronik	1206-SMD 1% 332R	0.15
R122	33R2	204	SMD	elpro - Elektronik	1206-SMD 1% 33R	0.15
R123	1k	204	SMD	elpro - Elektronik	1206-SMD 1% 1k	0.15
R124	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R125	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15

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Part	Value	Package	Type	Suggested Source	Item No. (From Source)	Price (€)
R126	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R127	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R128	10k	204	SMD	elpro - Elektronik	1206-SMD 1% 10k	0.15
R129	10k	204	SMD	elpro - Elektronik	1206-SMD 1% 10k	0.15
R130	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R131	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R132	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
R133	825k	204	SMD	elpro - Elektronik	1206-SMD 1% 825k	0.15
R134	4k7	204	SMD	elpro - Elektronik	1206-SMD 1% 4,7k	0.15
RN1	4k7	SIL9	R-SIL	elpro - Elektronik	NW 09-1 4,7 k	0.11
RN2	10k	SIL5	R-SIL	elpro - Elektronik	NW 05-1 10 k	0.11
RN3	1k	SIL5	R-SIL	elpro - Elektronik	NW 05-1 1 k	0.11
RN4	68R	SIL8	R-SIL	elpro - Elektronik	NW 08-3 68 R	0.11
RN5	n.b.	SIL5	R-SIL			
RN9	1k	SIL9	R-SIL	elpro - Elektronik	NW 09-1 1 k	0.11
RN10	4k7	SIL5	R-SIL	elpro - Elektronik	NW 05-1 4,7 k	0.11
RN12	4k7	SIL9	R-SIL	elpro - Elektronik	NW 09-1 4,7 k	0.11
RN13	4k7	SIL5	R-SIL	elpro - Elektronik	NW 05-1 4,7 k	0.11
RN14	470R	SIL9	R-SIL	elpro - Elektronik	NW 09-1 470 R	0.11
RN15	4k7	SIL9	R-SIL	elpro - Elektronik	NW 09-1 4,7 k	0.11
RN16	4k7	SIL9	R-SIL	elpro - Elektronik	NW 09-1 4,7 k	0.11
S1	JUM-BR	JUMPER	Plug	Reichelt - Elektronik	SL 1X50G 2,54	0.68
S2	JUM-BR	BRIDGE-S	Plug	Reichelt - Elektronik	SL 1X50G 2,54	0.68
S3	JUM-BR	BRIDGE-S	Plug	Reichelt - Elektronik	SL 1X50G 2,54	
S4	SMD-BR	BRIDGE	Plug	Reichelt - Elektronik	SL 1X50G 2,54	
S5	JUM-BR	JUMPER	Plug	Reichelt - Elektronik	SL 1X50G 2,54	
S6	JUM-BR	JUMPER	Plug	Reichelt - Elektronik	SL 1X50G 2,54	
S7	JUM-BR	BRIDGE-S	Plug	Reichelt - Elektronik	SL 1X50G 2,54	
SV1	DISK_INT	ML34	Flachba	Reichelt - Elektronik	WSL 34G	0.08
SV2	ML40	ML40	Flachba	Reichelt - Elektronik	WSL 40G	0.10
T1	MPF102	MPF102	Transistor	Amiga-Hardware		0.00
T2	MPF102	MPF102	Transistor	Amiga-Hardware		0.00
T3	2N3906	MPF102	Transistor	elpro - Elektronik	2 N 3906	0.08
U470	MSM514221	DIP16	DIL-IC	Amiga-Hardware		0.00
U471	MSM514221	DIP16	DIL-IC	Amiga-Hardware		0.00
U472	MSM514221	DIP16	DIL-IC	Amiga-Hardware		0.00
U473	UPD42101	DIP24-3	DIL-IC	Amiga-Hardware		0.00
U474	UPD42101	DIP24-3	DIL-IC	Amiga-Hardware		0.00
U475	UPD42101	DIP24-3	DIL-IC	Amiga-Hardware		0.00
U479	UPD42101	DIP24-3	DIL-IC	Amiga-Hardware		0.00
X1	Mouse	M09H_FC	SUBD-A	Amiga-Hardware		0.00
X2	Game	M09H_FC	SUBD-A	Amiga-Hardware		0.00
X3	RGB	M23H_FC	SUBD-A	Amiga-Hardware		0.00
X4	J1	SL3-1	Plug	Reichelt - Elektronik	SL 1X50G 2,54	
X5	DIN-8	DIN-8	Plug	Reichelt - Elektronik	MABP 8SN	0.40
X6	COMP	CINCH-B	Plug	Reichelt - Elektronik	CBP-5	0.24
X7	SL3-1	SL3-1	Plug	Reichelt - Elektronik	SL 1X50G 2,54	
X9	RIGHT	CINCH-B	Plug	Reichelt - Elektronik	CBP-5	0.24
X10	LEFT	CINCH-B	Plug	Reichelt - Elektronik	CBP-5	0.24
X11	PRINTER	M25H_FC	SUBD-A	Amiga-Hardware		0.00
X12	RS232	F25H_FC	SUBD-A	Amiga-Hardware		0.00
X13	PLED	MOL-2	Plug	elpro - Elektronik	PSG 2,54 2-pol.	0.08
X14	DISK	F23H_FC	SUBD-A	Amiga-Hardware		0.00

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Part	Value	Package	Type	Suggested Source	Item No. (From Source)	Price (€)
X15	KEYBOARD	RJ10	Plug	Reichelt - Elektronik	MEBP 4-4S	0.37
X16	J2	SL3-1	Plug	Reichelt - Elektronik	SL 1X50G 2,54	
X17	SL2	SL2-1	Plug	Reichelt - Elektronik	SL 1X50G 2,54	
X18	ZORRO-II	SLOT-100	Plug	Amiga-Hardware		0.00
X19	FRONT	LKOT-43	Plug			
X20	EXPANSION	LKOT-43	Plug			
X21	ROM	SL3-1	Plug	Reichelt - Elektronik	SL 1X50G 2,54	
X22	PSG-7	PSG-7	Plug	Amiga-Hardware		0.00
X23	MOL-4	MOL-4	Plug	elpro - Elektronik	PSG 2,54 4-pol.	0.12
X24	MOL-4	MOL-4	Plug	elpro - Elektronik	PSG 2,54 4-pol.	0.12
X25	SL22-2-2	SL22-2-2	Plug	Reichelt - Elektronik	BL 2x32W 2,00	3.95
X26	MOL-2	MOL-2	Plug	elpro - Elektronik	PSG 2,54 2-pol.	0.08
IC37	Socket PGA 128					
IC38	Socket PGA 68					
IC20	Socket PLCC 68			elpro - Elektronik	PLCC 68	0.55
IC57	Socket PLCC 68			elpro - Elektronik	PLCC 68	0.55
IC52	Socket PLCC 84			elpro - Elektronik	PLCC 84	0.65
U470	Socket DIL-16			elpro - Elektronik	PF 16	0.22
U471	Socket DIL-16			elpro - Elektronik	PF 16	0.22
U472	Socket DIL-16			elpro - Elektronik	PF 16	0.22
U473	Socket DIL-24 narrow			elpro - Elektronik	PF 24 schmal	0.28
U474	Socket DIL-24 narrow			elpro - Elektronik	PF 24 schmal	0.28
U475	Socket DIL-24 narrow			elpro - Elektronik	PF 24 schmal	0.28
U479	Socket DIL-24 narrow			elpro - Elektronik	PF 24 schmal	0.28
IC1	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC2	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC3	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC4	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC5	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC6	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC12	Socket DIL-40			elpro - Elektronik	PF 40	0.80
IC13	Socket DIL-40			elpro - Elektronik	PF 40	0.80
IC14	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC15	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC16	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC17	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC18	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC19	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC22	Socket DIL-16			elpro - Elektronik	PF 16	0.22
IC23	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC24	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC26	Socket DIL-48			elpro - Elektronik	PF 48	0.8
IC28	Socket DIL-14			elpro - Elektronik	PF 14	0.22
IC29	Socket DIL-16			elpro - Elektronik	PF 16	0.22
IC30	Socket DIL-14			elpro - Elektronik	PF 14	0.22
IC31	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC32	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC33	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC34	Socket DIL-40			elpro - Elektronik	PF 40	0.80
IC35	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC36	Socket DIL-20			elpro - Elektronik	PF 20	0.28
IC39	Socket DIL-18			elpro - Elektronik	PF 18	0.26
IC40	Socket DIL-40			elpro - Elektronik	PF 40	0.80

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Part	Value	Package	Type	Suggested Source	Item No. (From Source)	Price (€)
IC41	Socket DIL-48			elpro - Elektronik	PF 48	0.80
IC42	Socket DIL-14			elpro - Elektronik	PF 14	0.22
IC43	Socket DIL-40			elpro - Elektronik	PF 40	0.80
IC44	Socket DIL-14			elpro - Elektronik	PF 14	0.22
IC45	Socket DIL-14			elpro - Elektronik	PF 14	0.22
IC46	Socket DIL-14			elpro - Elektronik	PF 14	0.22
IC47	Socket DIL-14			elpro - Elektronik	PF 14	0.22
IC48	Socket DIL-14			elpro - Elektronik	PF 14	0.22
IC49	Socket DIL-14			elpro - Elektronik	PF 14	0.22
IC50	Socket DIL-48			elpro - Elektronik	PF 48	0.80
IC51	Socket DIL-14			elpro - Elektronik	PF 14	0.22
IC53	Socket DIL-24 narrow			elpro - Elektronik	PF 24 schmal	0.28
IC54	Socket DIL-24 narrow			elpro - Elektronik	PF 24 schmal	0.28
IC55	Socket DIL-24 narrow			elpro - Elektronik	PF 24 schmal	0.28
IC56	Socket DIL-24 narrow			elpro - Elektronik	PF 24 schmal	0.28
IC79	Socket DIL-14			elpro - Elektronik	PF 14	0.22

7.5 GAL Programming Files

The files that must be programmed in the GAL chips can be found in the zip file on Georg's homepage containing all the information about this motherboard (<http://www.gb97816.homepage.t-online.de/download/a1kboard.zip>).

Following is a list of the files:

IC#	File to Program into the GAL chip
14	IC14_15ns.jed
18	IC18_15ns.jed
19	IC19_25ns.jed
31	IC31_25ns.jed
32	IC32_25ns.jed
33	IC33_15ns.jed
53	IC53_15ns.jed
54	IC54_15ns.jed
55	IC55_15ns.jed
56	IC56_15ns.jed
57	IC57_60MHz.jed

7.6 Power Supply Pinout

Pin No.	Designation
1	Tick
2	+5V
3	+5V
4	GND
5	GND
6	+12V
7	-5V