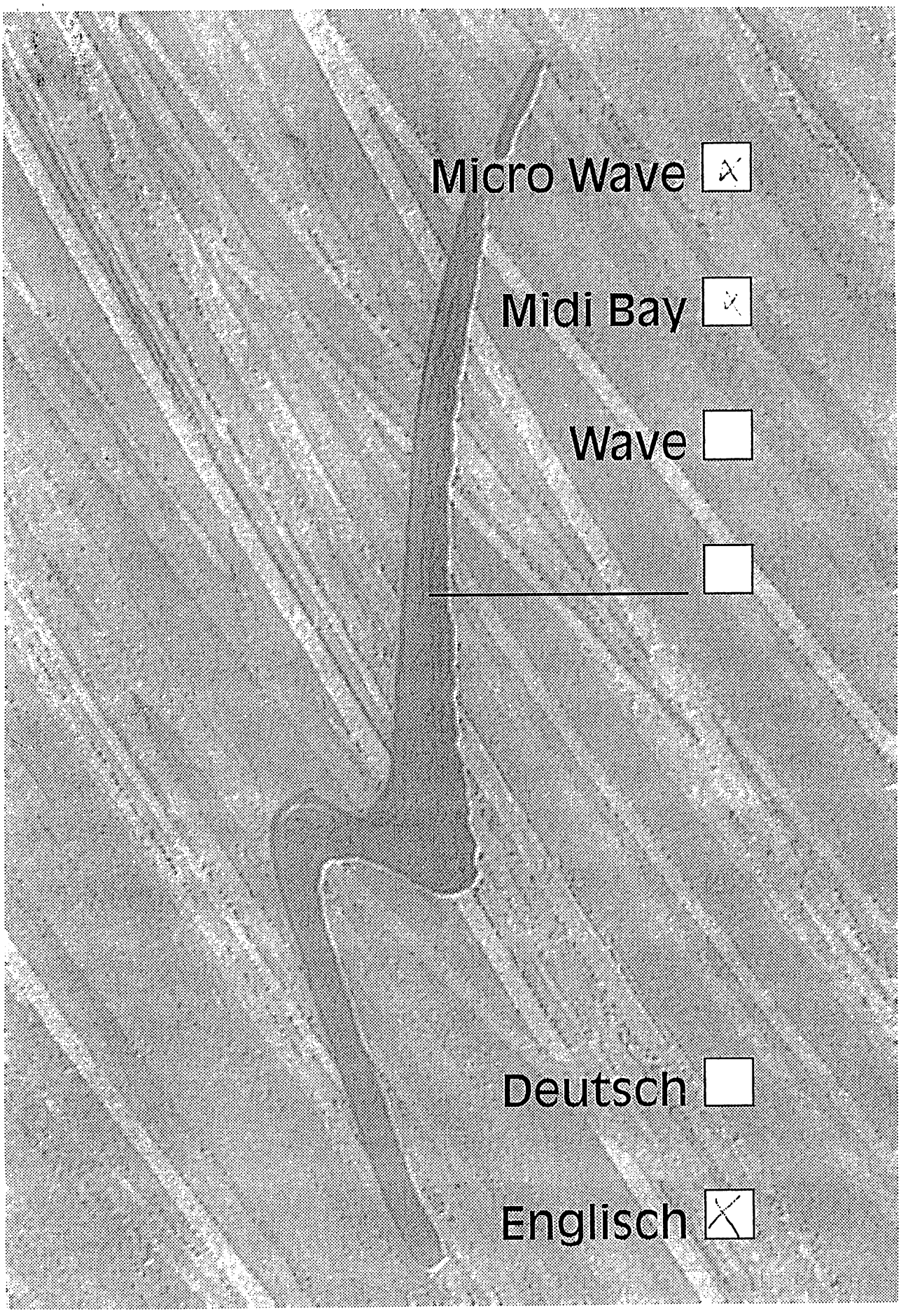
Service Manual



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Technical documentation 4

Manual for the MicroWaves's Service-mode

Connect the MicroWave's audio-output "Left" and "Right" to an amplification system.

To get into Service mode hold the *Mode-button* when powering up and release it immedietly when the message

> Welcome to the Microwave <

is displayed.

Now the display will read

> Warning! Entering this mode will destroy all stored data... <.

- Press the *OK button*.

  > Software Version <
  > V X.XX - YY/MM/DD < (version - release date year/month/day)

  will be displayed.

HINT: by pressing the *Mode button* each test-routine can be directly selected. You have to repeatedly press the button to reach a certain test; should you pass by the desired test, keep on pressing - the test-routines will cycle.

- Press the *Mode button*.

  > System Runtime: <
  > hhhhhhh:mm < (hours:minutes)

  will be displayed.

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- Press *Mode button*.

> Memory Init & Test <
> Status: WRAM: ? <

This test-routine must only be done after exchanging the batteries, since all system-programming has been done prior by the factory. Should for whatever reason an initialization be mandatory, do the following steps:

- ATTENTION!! Back up all internal memory to a cartrige. Consult the manual under "Data Transfer" for details.

- ATTENTION!! Use a different card for the following test-routine. You MUST insert a card, otherwise the test will fail and the op-sys will crash!

- Acknowledge the routine by pressing the *OK button*.

  > Status : ICRT: ? < Internal Sound-RAM-check

- Acknowledge the routine by pressing the *OK button*.

  > Status : INIT: ? < Initializing the Sound-RAM.

- Acknowledge the routine by pressing the *OK button*.

  > Status : ECRT: ? < External Card test.
  If the Write-protect switch is set to "ON" the Card cannot be written to; An "ERR" will be displayed.

- Acknowledge the routine by pressing the *OK button*.

  > Status : COPY: ? < Datacopy from Card to RAM

- Acknowledge the routine by pressing the *OK button*.

End of Memory-Test.

- Press the *Mode button*.

  > Keyboard Test <

  will be displayed.

  - Press each button and watch for a corresponding display-message (see figure for details)

    HINT: press the *Mode button* last, since it will forward you to the next test-routine.

- Press the *Mode button*.

  > LED Test   <

  will be displayed.

  - Press the *OK button* to step through and iluminate each LED. (see figure for details)

- Press the *Mode button*.

  > Midi Test   <
  > Status: <

  will be displayed.

  - Connect the MicroWave's MIDI-IN port to it's own MIDI-OUT port.

  - Acknowledge the routine by pressing the *OK button*.

- Press the *Mode button*.

  > Voice Test   <
  > Voice # X to Out # Y <

  will be displayed.

  - Press the *OK button* repeatedly to connect all eight voices sequentially to the Left and Right audio-output. Voices #1 through #4 will additionally be output at their respective Single-out's. To check those, connect the Left-output cable momentarily to the desired Single-output.

    You will hear a sine-wave of 123,5 Hz.

- Press the *Mode button*.

  > Filter Freq.Adj <
  > Voice # X   <

  will be displayed.

  HINT: Only tune the filters after the MicroWave has reached it's working-temprature.

  - Connect a tuner to one of the audio-outputs. The tuner must be able to display A 2 = 440 Hz.

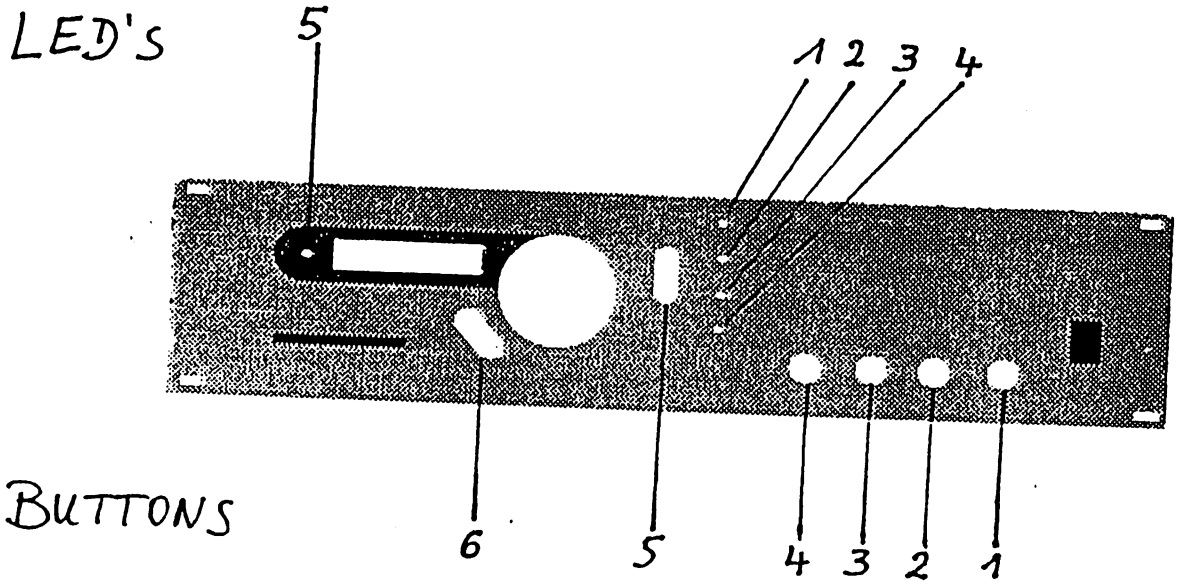
  - Press the *OK button* to select the first voice.

  - Use the *Alpha dial* to finetune the filter-frequency of this voice. When the tuner displays 440 Hz (A 2), the filter is tuned. The *Alpha dial* covers a range og +/- a semitone.

    Should that not be enough, you must open the unit recalibrate the coarse-tuning of the filter. Use Pot R 5 for voice #1, Pot R 12 for voice #2, R 19 for voice #3 and the like.

- If you didnt' forget to check the Single-Outputs your done. Have coffee.

End of MicroWave test-routines


LED'S
5
1 2 3 4
BUTTONS
6
5
4 3 2 1

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TECHNICAL INFO 5

Checking the display

- Failure: No display illumination (Flickering)

The MicroWave's display is powered by the frontboard.
The upper wire-connection on the right-hand side of the display must carry + 5 V.
The lower wire-connection is made to ground.
The wire-connections must be passed through the upper board on the display as well as being soldered to the second smaller board.

The sixteen-core flat line carries the needed voltage from the front- to the digital-board. Pin 1 (+ 5 V) and Pin 2 (Ground).

Pin identification of the flat line to the front board:
Component side, Midi sockets at the rear, Pin 1 is always to the right.

The 4th ten-core flat line carries the voltage between the digital- and the analog-board (Pin 40/39 Ground, Pin 38/37 + 5 V).

Pin identification of the flat line to the Analog board:
Component side, Midi sockets at the rear. Pin 40 Midi socket side, Pin 1 front board side.

+ 5 V will be generated from the power pack (power regulator 7805 on the cooling plate). Check if the power regulator is well fixed to the cooling plate (Ground).

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Checking the Display

- Failure: Empty display (after Eprom change)

1. The position of the Eproms has changed from Serial No. 91 2 1682 caused by a Digital-board re-design.
   The Low- and High-Eproms are interchanged. If nessesary, change.

2. The Eprom notches must face into the unit.

3. Check that all pins are in the IC socket.

4. Try the original, or a different Eprom set. If the fault is removed, the new Eproms are probably defective.

5. Check if the board trace below the sockets are accidentally been damaged by changing the Eproms.

6. If the fault cannot be removed, check if all signals are received by the display.

   As specified in the circuit diagramm, the data lines D7/Pin 14 to DO/Pin 7 are at the display. In addition, at Pin 6 is the enable-line, at Pin 5 is the Read/Write lead, and at Pin 4 the adress-line A1.
   Pin 3 and Pin 1 are at ground and at Pin 2 the 5 V power supply.

   If one ore more signals cannot be measured, check the flat line to the display and the digital-board for breaks, dry junctions or solder bridging.

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TECHNICAL INFO 6

Manual for the Service mode of the MidiBay

To get into the Service mode hold both the Mode- and Panic-buttons when powering up.
When two horizontal lines are displayed release the Mode-button first and then the Panic-button.

- Press the Down-button.

  * L t (LED test) will be displayed.

Start test with the Up-button.

One after the other, all display elements and the two LED's must illuminate shortly.

ADVICE: The Mode-button allowes every test to be adressed directly.

- Press the Down-button.

  * S t (Switch test) will be displayed.

Start test with the Up-button.

  * P 1 will be displayed. Confirm with Mode button.
  * P 2 will be displayed. Confirm with Down button.
  * P 3 will be displayed. Confirm with Up button.
  * P 4 will be displayed. Confirm with Panic button.

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* t o (Test o.k.) will be displayed shortly, then again

* S t (Switch Test).

- Press the Down-button.

* i o (In/Out test) will be displayed.

This test checks the remote-control and footswitch-port on the front board, but can only be made with the assistance of special adaptors.
This test is irrelevant for the normal function of the MidiBay.

The function of the footswitch-port can be checked during normal operation with a footswitch.

- Press the Down-button.

* M t (Midi test) will be displayed.

Connect all inputs to their respective outputs with MIDI leads.
In other words, connect Destination 1 with Source 1, Destination 2 with Source 2, Destination 3 with Source 3, etc.

Start the test with the Up-button.

The numbers * 1 - 15 will be displayed rapidly , then
* t o (Test o.k.) and the green LED will illuminate.

If there is a faulty In/Output * E (Error)
will be displayed with the corresonding In/Output number.
The red LED will illuminate.

ADVICE: In/Out-port 15 and MIDI Aux-port (15) on the frontboard are switched in parallel, and must therefore also be checked with the help of a MIDI cable.

The MIDI-ports situated on the frontboard have higher priority, since behind the Source-port a switch is installed which interrupts the corresponding In/Outputs situated on the back panel.

- Press the Down-button.

* r t (Ram Test) will be displayed.

Confirm with the Up-button.
If no failure in the RAM can be located,

* t o (Test o.k.) will be displayed.

- Press the Down-button.

* c r (Clear Ram) will be displayed.

Confirm with the Up-button.

By executing this function, the unit will be initialised.
This means that all programms will be set into an exactly defined zeroposition. (Only necessary after battery or RAM changes).

ADVICE: All user programms will be lost.

All tests finished. The unit will leave the Service mode and return to normal operation condition.

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TECHNICAL INFO 7

Storage loss in MidiBay

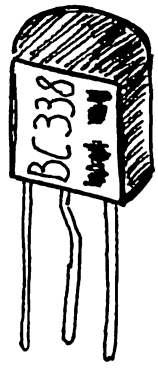
Fault: After switching on the unit, loss of stored data in the internal RAM.

Solution: Stabilisation of the reset circuit by installation of a transistor (BC 338) and a resistor (2K1).

Installation hints:

Solder the collector of the transistor to Pin 4 of IC LS/HCT 04 (U 8).
Solder the base via a 2K1 resistor to Pin 2 of IC LS 14 (U 16).
Solder the emitter against ground to Pin 7 of IC LS/HCT 04 (U 8).

Positioning the transistor:



C B E

Initialisation must follow after installation.
(See technical info 6)

T/I MB 7

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TECHNICAL INFO 8

Checking the cardridge

Failure: No data (sounds/multis) readeble from cardridge.
After transporting the unit the card-holder came loose and must be fixed again.

Solution: Open the unit and insert cardridge.
A 34-core frame connector is situated on the left hand side of the card-holder board.
This frame-connector is soldered underneath the board and stucks into a 34-core socket-ledge.

Hint: At this ledge Pin 1,2 & 4 are not used. For that reason some boards are only fitted with a 32-pole connection.

- Pin identification additional to the circuit diagramm:
Component side, open side of the card-holder in front, frame-connector on the left-hand side.
Pin 1 at the back, left. Pin 2 at the back, right. Pin 3 next line, left.

Unscrew and remove the board from the unit.
Check the frame-connector for dry junctions or shorts.
Plug in the board again and fix it tight to the socket-ledge.
Insert a cardridge, adjust the board and screw tight.

If there is no more defect to find, the screws should be fixed with nail-varnish or the like.

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TECHNICAL INFO 9

MicroWave reset problems

(MW-serialnumbers 9211997 until 9222320 only!)

Failure: After switching on the unit, no display contens.

Solution: Wiring change of the reset circuit (Digital-board)

Installation hints:

- Exchange 10K resistor between pin 5 & 8 of IC 34 (TL 7705) for 1K resistor.
- Solder 1K resistor between pin 4 & 6 of IC 34.
- Exchange R 100 (10K resistor and 6K8 resistor) for one 4K7 resistor. (Next to IC 13/LS 14)

After changes have been done unit must be initialised.
(see technical info 4)

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#10

Waldorf, January '93

Dear MicroWave Service Technician

We have re-designed the MicroWave analogue board. This analogue board will be installed from ser.# 9242517 onwards.
Attached you will find the respective service information.

The board is technically and soundwise fully compatible to the existing analogue boards.
Should the case occur that you have to replace an old analogue board against a new one, you will have to consider the following changes:

- R 007/3K3 on the digital board must be removed.
  (Resistance is situated next to transistor Q 01/BC328).

- Filter resonance must be balanced with the help of Pot R 1164 on the analogue board.
  To do that select voice test in the service mode and adjust with multimeter 5V at Pin 13 of CEM 3387.

- Individual outputs will now be tested in voice test mode 1-1, 2-2, 3-3, 4-4 and not any more in filter test.

For any further information or questions please contact us.

Best regards
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(Joachim Rehbein)

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T E C H N I C A L I N F O 1 4

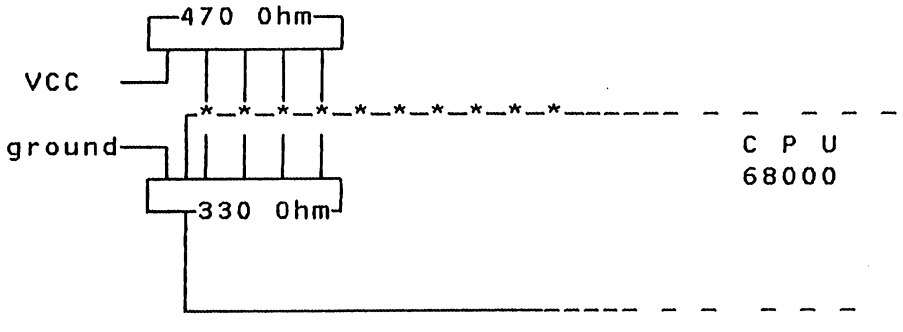
Digital board modification - MicroWave

Error: System crash when using the new software (V 2.0) (a black bar or "ILL ..." appears in the display)

What to do: Terminate the adress-pins A1 - A4 (pins 29 - 32) on the CPU 68000 with a 470 Ohm R-net, 5 pins (all connected to VCC) and a 330 Ohm R-net, 5 pins (all connected to ground).

Note: First solder the R-nets together and then join it directly to the CPU.

The modification should only be done by qualified personell.



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We will try to help you as fast as possible.

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(archive-server@waldorf-gmbh.de)

You're looking for sounds, tools or documentation ?
Our archive probably has everything you need. You can retrieve files by sending mail to our automated server.

User Forum
(user-forum@waldorf-gmbh.de)

Do you like to contact other Waldorf customers to get hints or to discuss wishes, features, problems... ?
Join our mailing list and get in touch with Waldorf customers all over the world.

How to do ?

What you need is a computer (you probably already have one), a modem, a piece of freely available software and access to the Internet or to any mailbox system, providing at least email service and a link to the Internet.

What else is it good for ?

The Internet is a world-wide network with probably millions of users. It provides a lot of services, such as archive-servers with gigabytes of freely available software, an electronic news system organized in groups, incl. music-related ones, information retrieval systems, and last but not least electronic mail.

Who offers Internet access ?

We can't tell you about all possibilities. Here are just a few network organisations offering access to the world-wide Internet. In case you live in a country not listed here, please contact us, or ask someone at the next university.

Argentina:
ARNET
Jorge Marcelo Amodio
UNDP Project ARG-86-026
Ministerio de Relaciones Exteriores y Culto
Reconquista 1088 1er. Piso - Informatica
(1003) Capital Federal
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Phone: +44 235 44 5517

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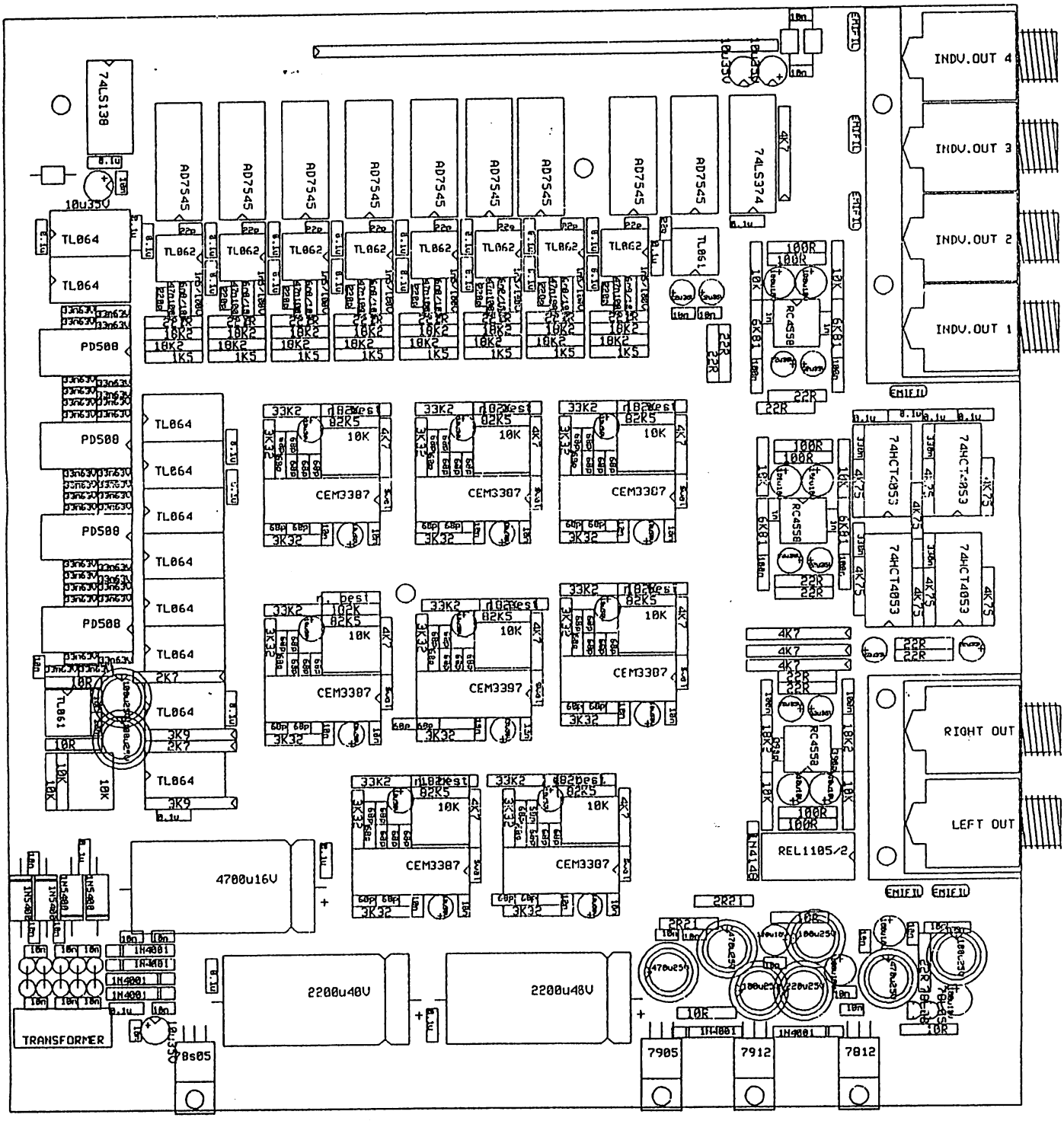
Internet - Global Network of Networks
InterNIC Information Services
c/o General Atomics
P.O. Box 85608
San Diego, CA 92186-9784
USA
Phone: +1 619 455 4600
+1 800 444 4345 (US only)

GLOBAL Networks:

CompuServe
Internet Postmaster
CompuServe Incorporated
5000 Arlington Centre Blvd
Columbus, OH 43220
USA
Phone: +1 614 457 0348

FidoNet
Tim Pozar
Late Night Software
674 Vermont Street
San Francisco, CA 94107
USA
Phone: +1 415 695 7727

NOTIZEN - NOTES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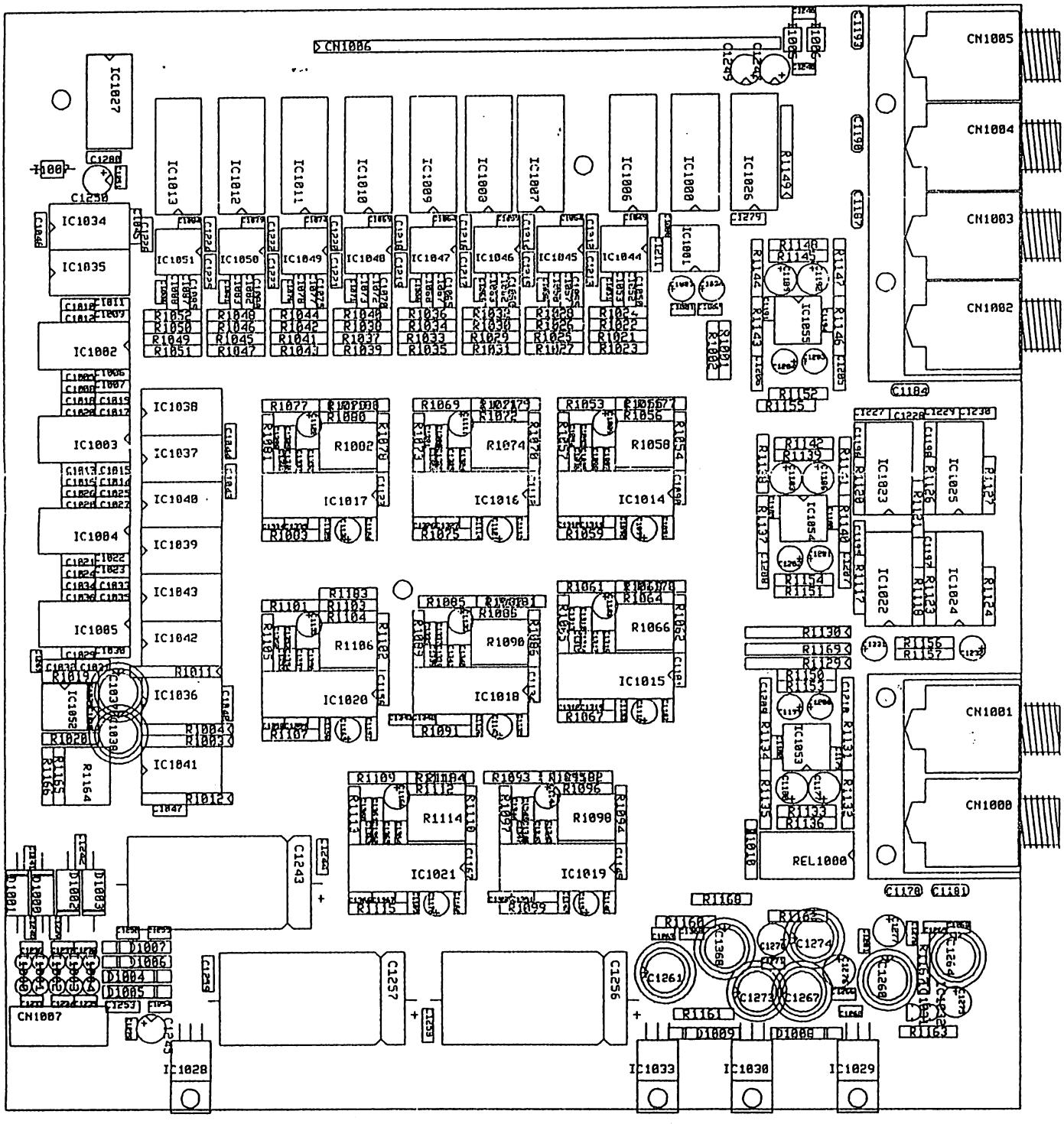
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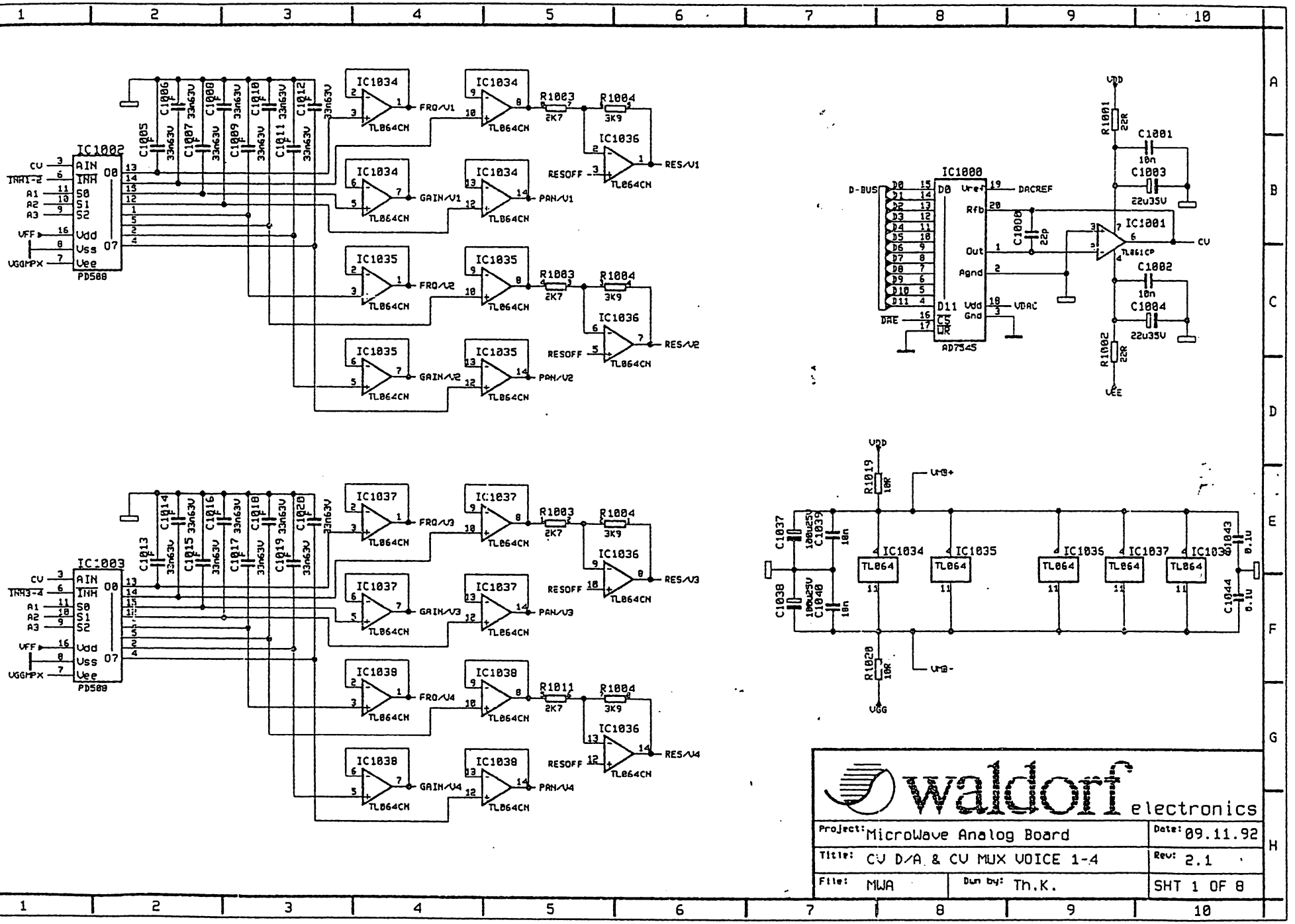
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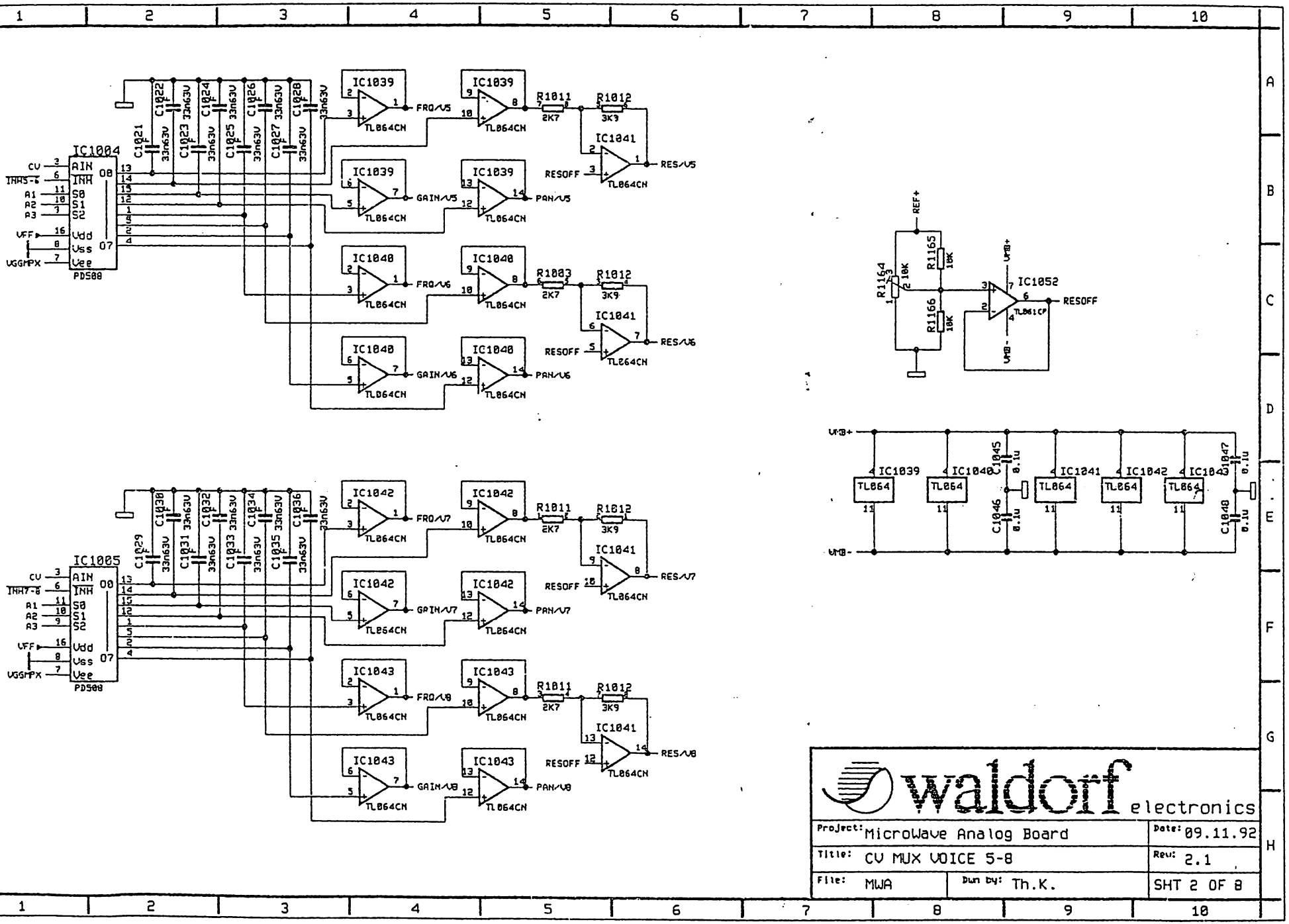
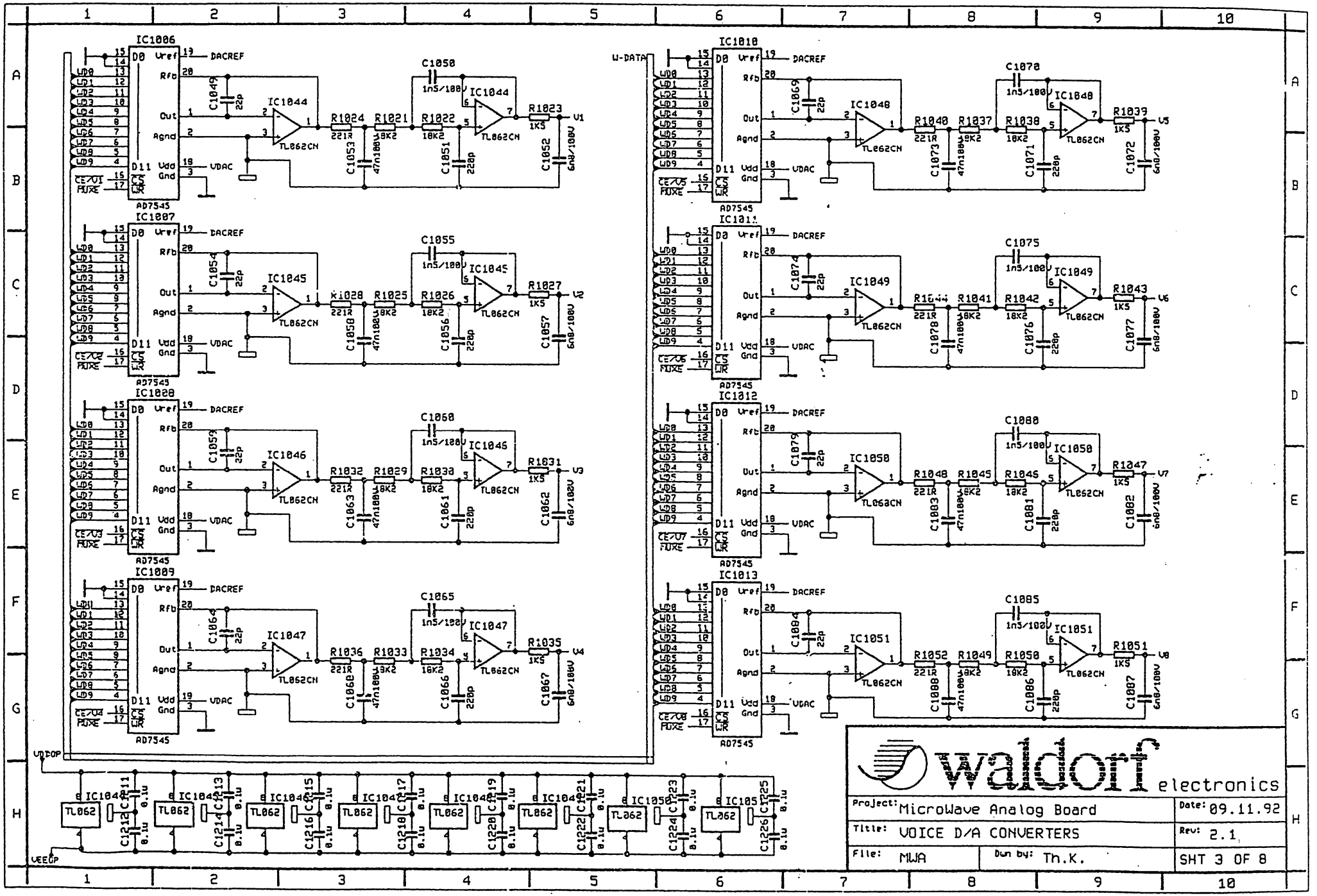
R1011
FRQ/V1
GAIN/V1
PAN/V1
RES/V1
RESOFF
FRQ/V2
GAIN/V2
PAN/V2
RES/V2
FRQ/V3
GAIN/V3
PAN/V3
RES/V3
FRQ/V4
GAIN/V4
PAN/V4
RES/V4
IC1000
AD7545
IC1001
TL861CP
DACREF
VDAC
D-BUS
DAE
CV
VDD
VEE
VGG
R1001
22R
R1002
22R
R1019
10R
R1020
10R
C1001
C1002
C1003
C1004
22u35V
C1008
22p
TL064
Project: MicroWave Analog Board
Date: 09.11.92
Title: CV D/A & CV MUX VOICE 1-4
Rev: 2.1
File: MWA
Drawn by: Th.K.
SHT 1 OF 8



waldorf electronics

Project: MicroWave Analog Board		Date: 09.11.92
Title: CV MUX VOICE 5-8		Rev: 2.1
File: MWA	Dwn by: Th.K.	SHT 2 OF 8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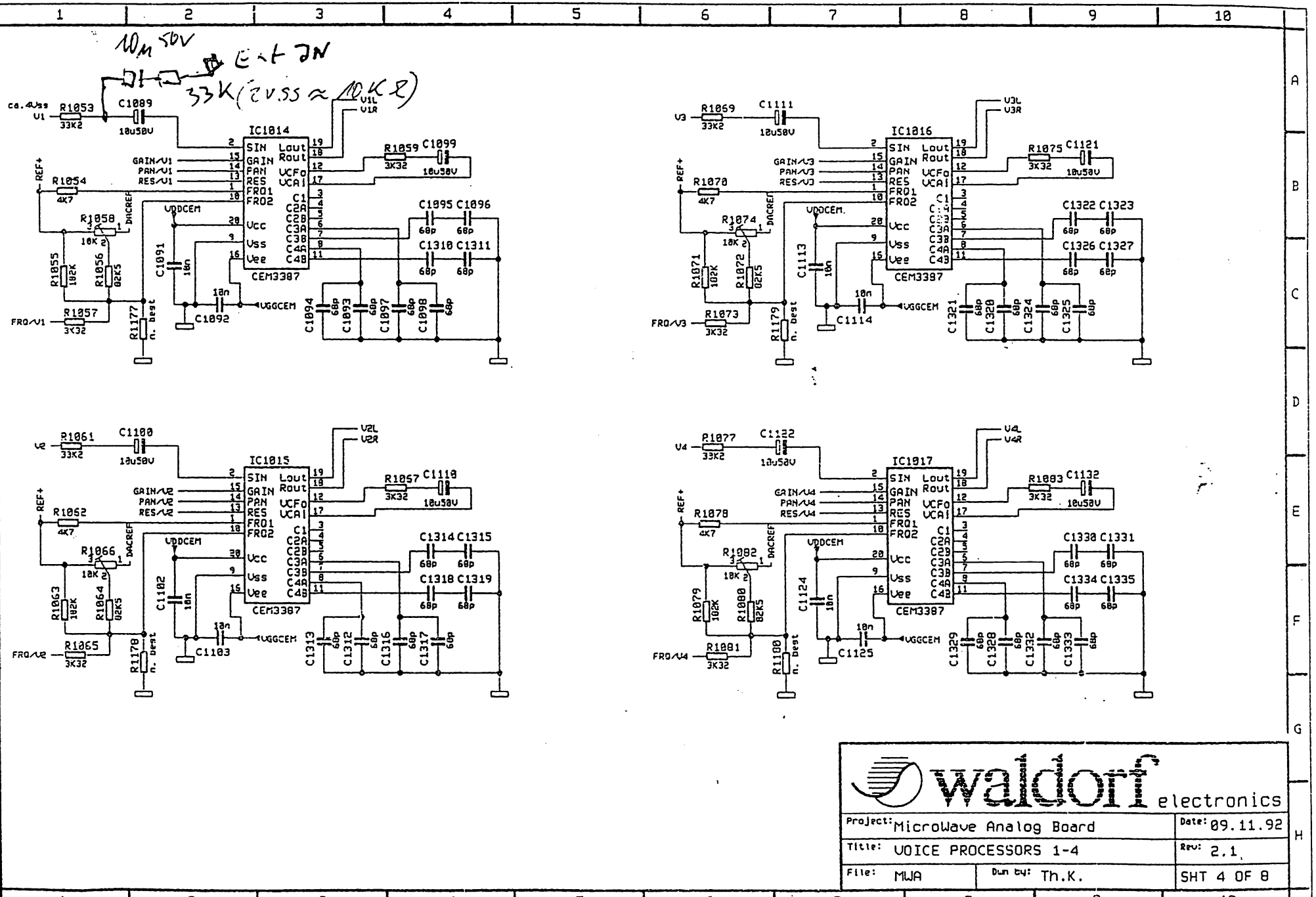
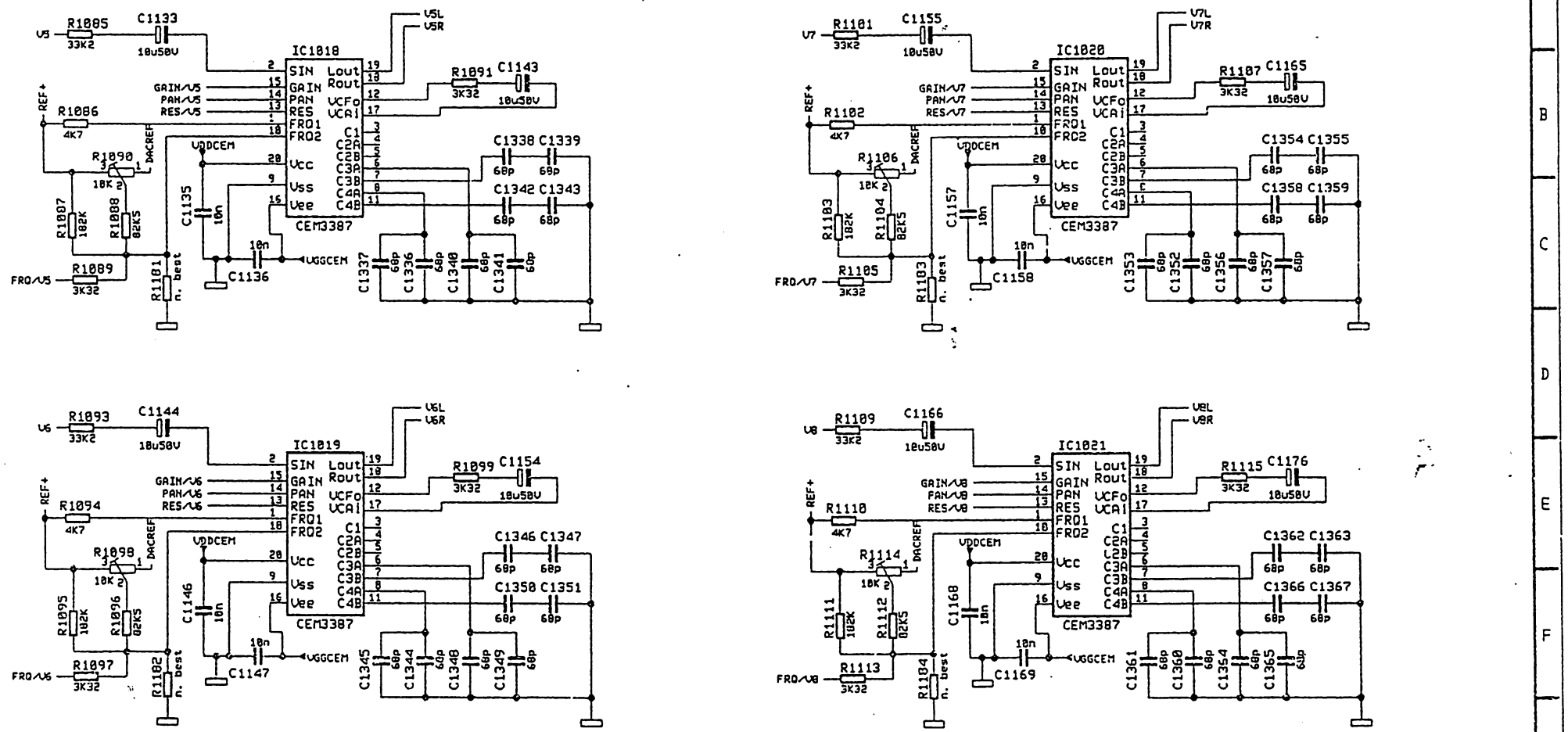
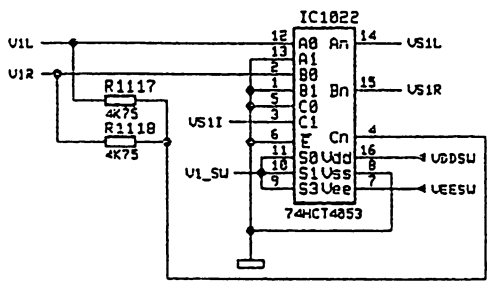
VDAC
W-DATA
TL862CN
VDDP
VEEP
Project: MicroWave Analog Board
Title: VOICE D/A CONVERTERS
File: MWA
Drn by: Th.K.
Date: 09.11.92
Rev: 2.1
SHT 3 OF 8
Wadcor electronics

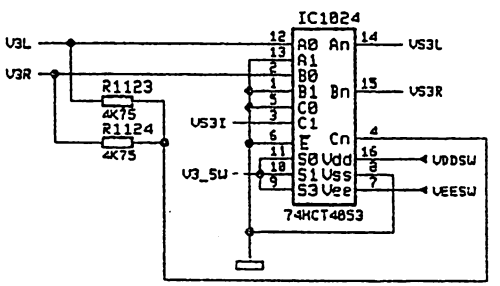


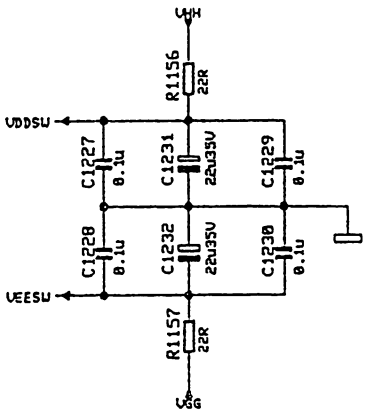
waldorf electronics			
Project: MicroWave Analog Board			Date: 09.11.92
Title: VOICE PROCESSORS 1-4			Rev: 2.1
File: MWA	Dwn by: Th.K.		SHT 4 OF 8

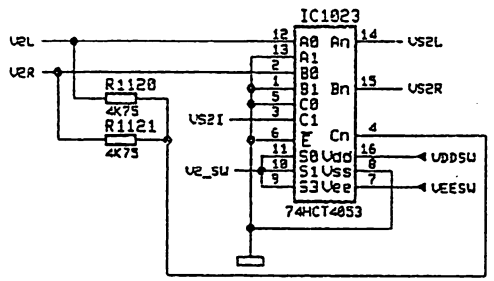


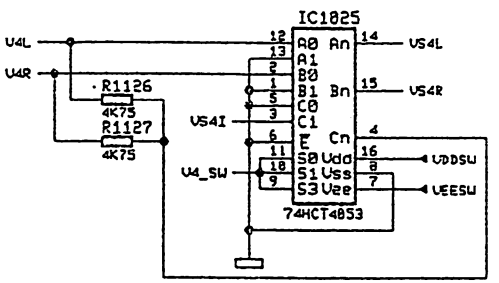
Project: MicroWave Analog Board		Date: 09.11.92
Title: VOICE PROCESSORS 5-8		Rev: 2.1
File: MWA	Dwn by: Th.K.	SHT 5 OF 8

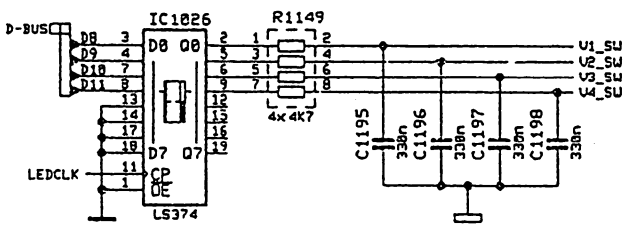




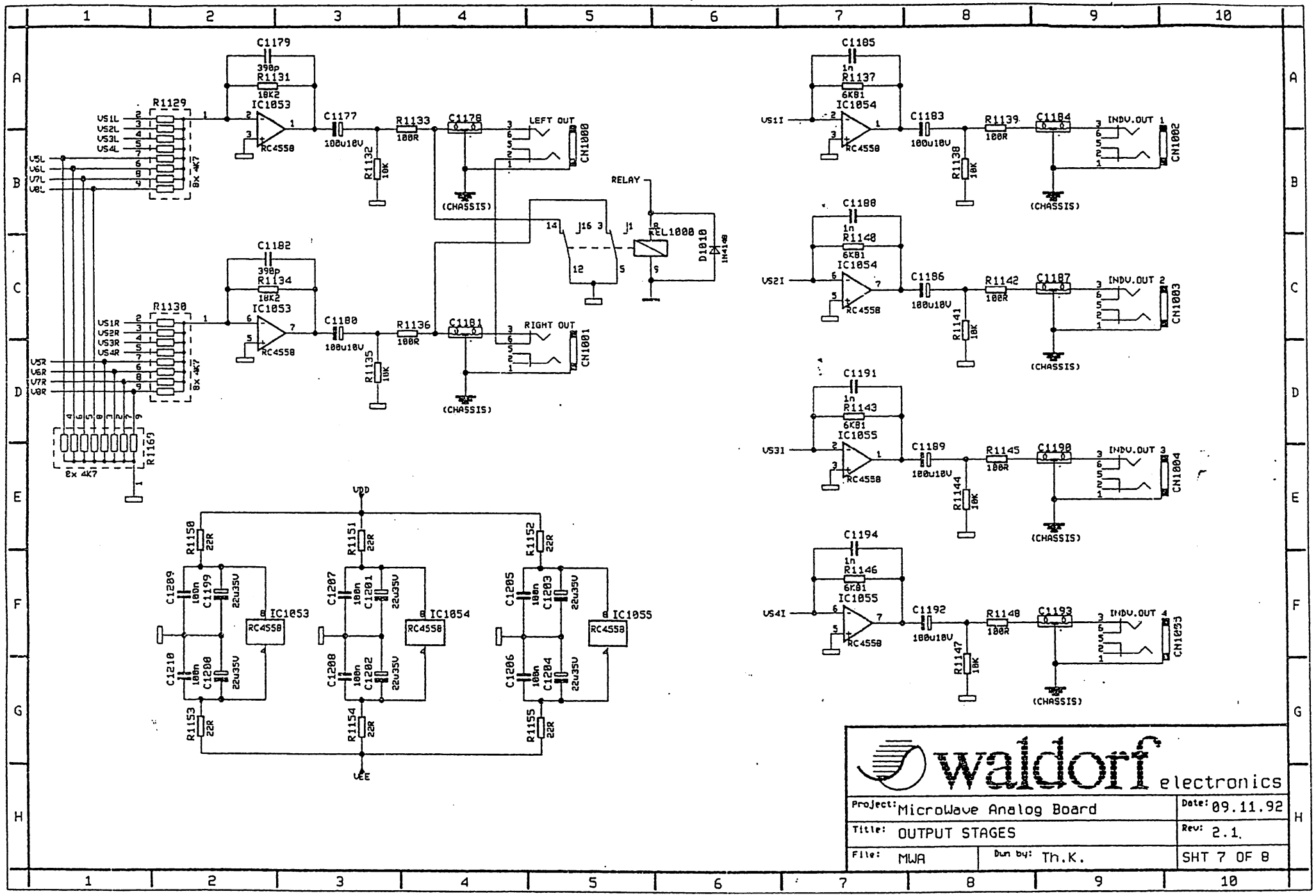






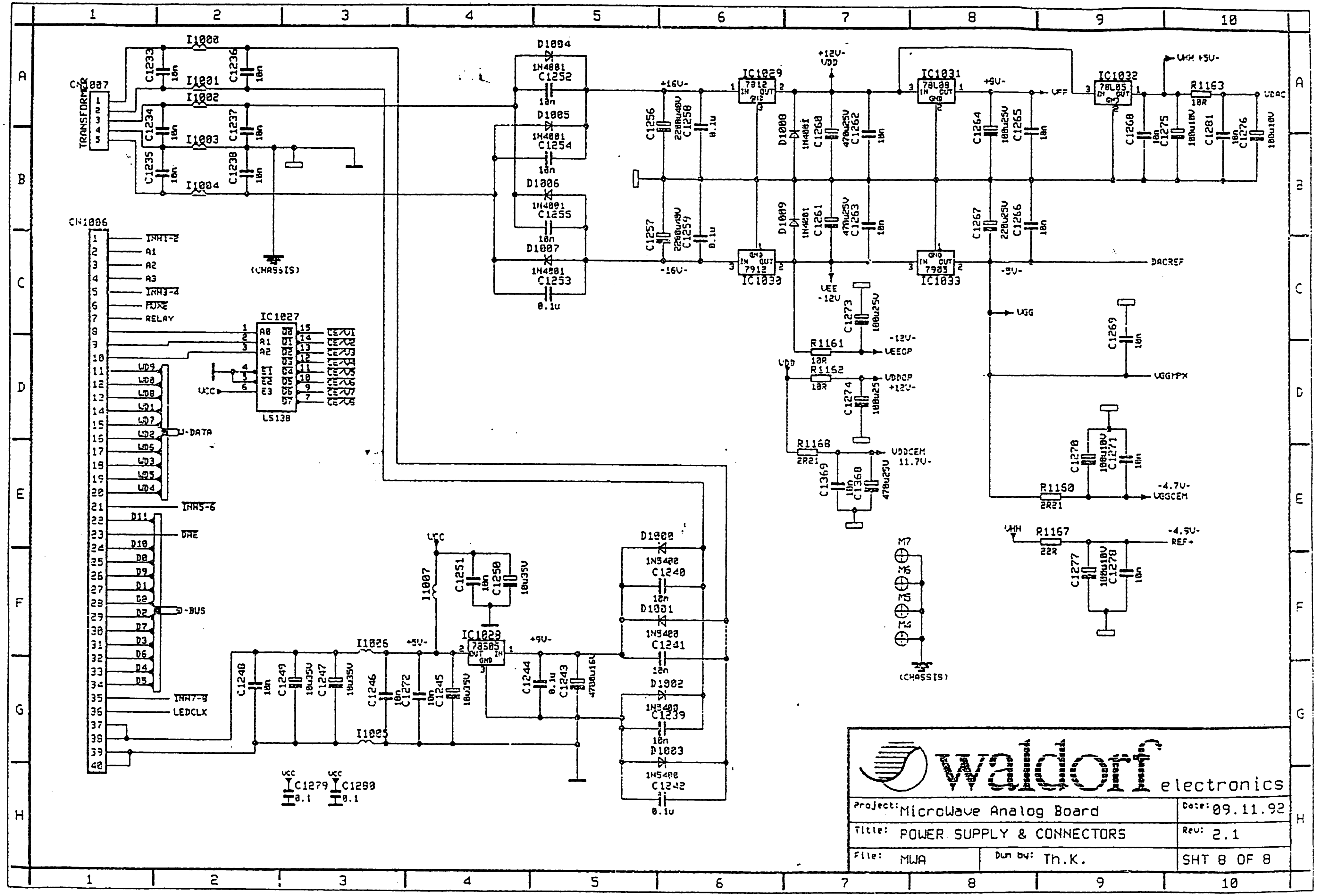


waldorf electronics			
Project: MicroWave Analog Board			Date: 09.11.92
Title: INDIVIDUAL OUTPUT SWITCHES			Rev: 2.1
File: MWA	Drn by: Th.K.		SHT 6 OF 8



waldorf electronics

Project: MicroWave Analog Board		Date: 09.11.92
Title: OUTPUT STAGES		Rev: 2.1.
File: MWA	Dwn by: Th.K.	SHT 7 OF 8



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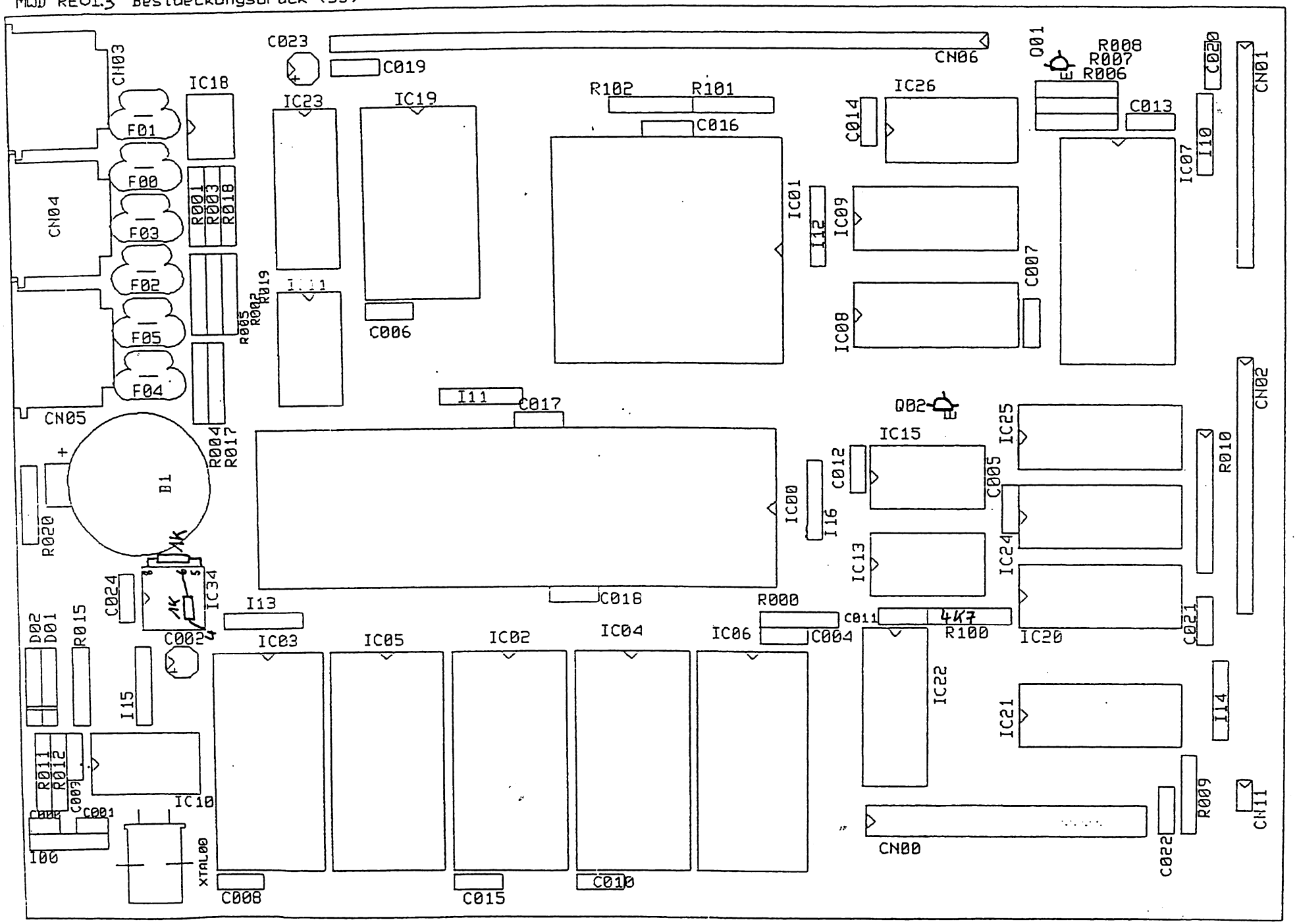
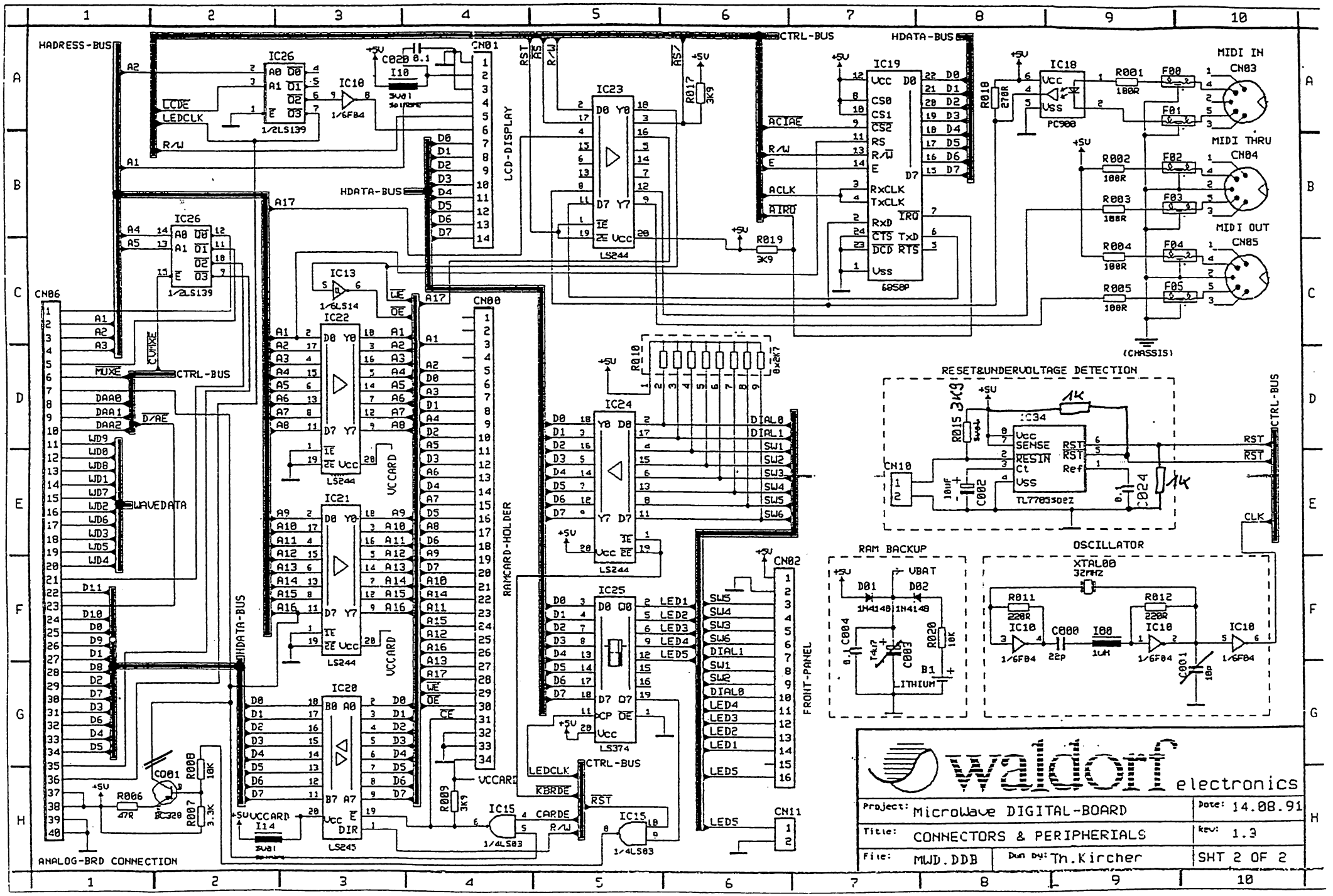
IC1032
78L05
IC1033
7905
(CHASSIS)
D-DATA
D-BUS
RELAY
LEDCLK
DACREF
VGG
VGGMPX
VGGCEM
VDDCEM
11.7V-
VEEOP
VDDOP
-4.7V-
-4.5V-
REF+
+16V-
-16V-
+12V-
-12V
+5V-
-5V-
waldorf electronics
Project: MicroWave Analog Board
Title: POWER SUPPLY & CONNECTORS
File: MWA
Dwn by: Th.K.
Date: 09.11.92
Rev: 2.1
SHT 8 OF 8

MWD REV1.3 Bestueckungsdruck (S5)

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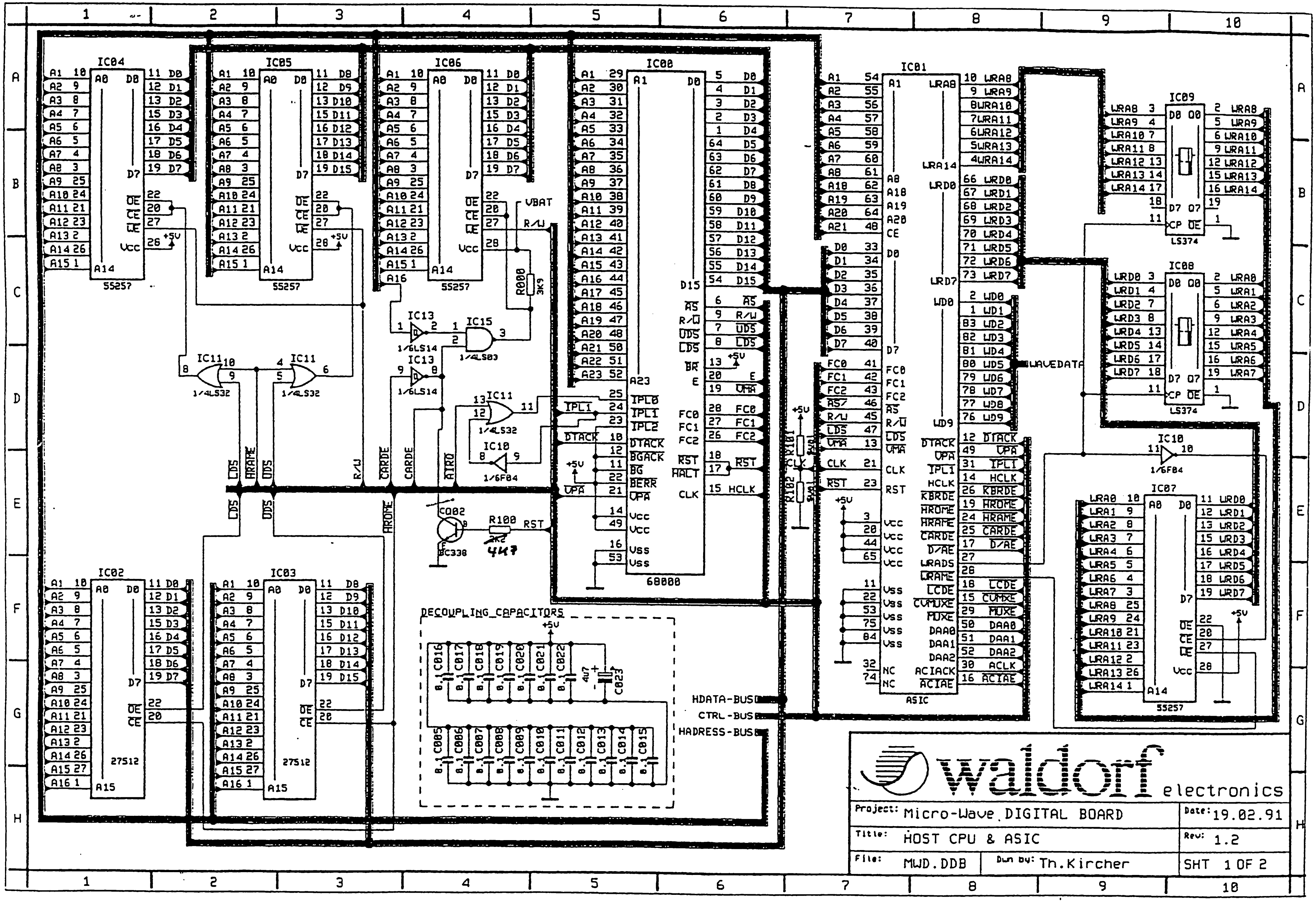
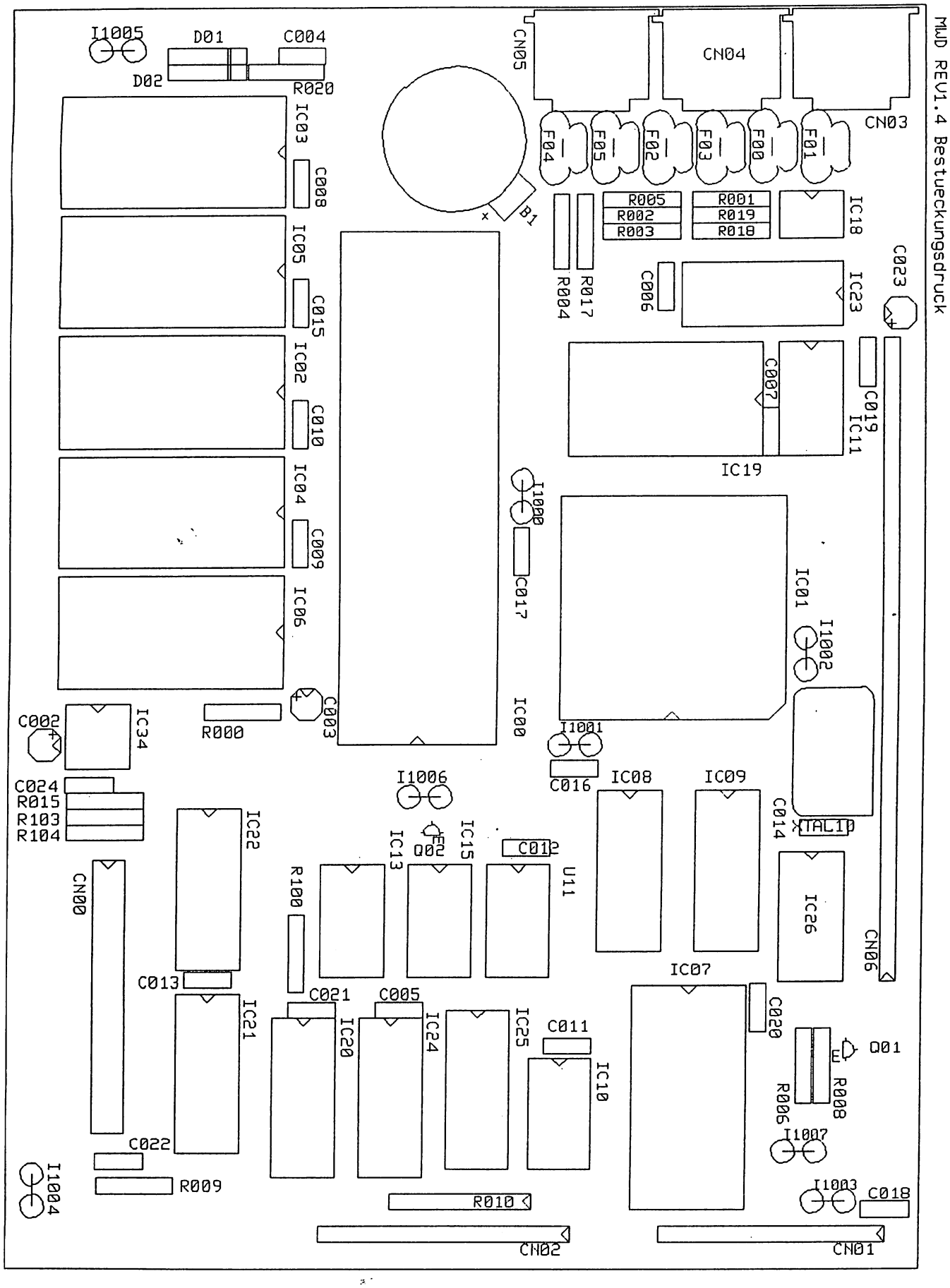
HDATA-BUS
CTRL-BUS
LCD-DISPLAY
RAMCARD-HOLDER
FRONT-PANEL
WAVEDATA
ANALOG-BRD CONNECTION
MIDI IN
MIDI THRU
MIDI OUT
(CHASSIS)
RESET&UNDERVOLTAGE DETECTION
RAM BACKUP
OSCILLATOR
XTAL00
32MHZ
VBAT
LITHIUM
waldorf electronics
Project: MicroWave DIGITAL-BOARD
Date: 14.08.91
Title: CONNECTORS & PERIPHERIALS
Rev: 1.3
File: MWD.DDB
Drawn by: Th.Kircher
SHT 2 OF 2



waldorf electronics

Project:	Micro-Wave DIGITAL BOARD	Date:	19.02.91
Title:	HOST CPU & ASIC	Rev:	1.2
File: MWD.DDB	Dwn by: Th.Kircher	SHT 1 OF 2	


MWD REV1.4 Bestueckungsdruck
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D02
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CN05
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F05
F02
F03
F00
F01
B1
R005
R002
R003
R001
R019
R018
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IC05
C015
R004
R017
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IC02
C010
C007
C019
IC11
IC19
IC04
C009
I1000
C017
IC06
IC01
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C003
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IC22
IC13
Q02
IC15
C012
U11
C014
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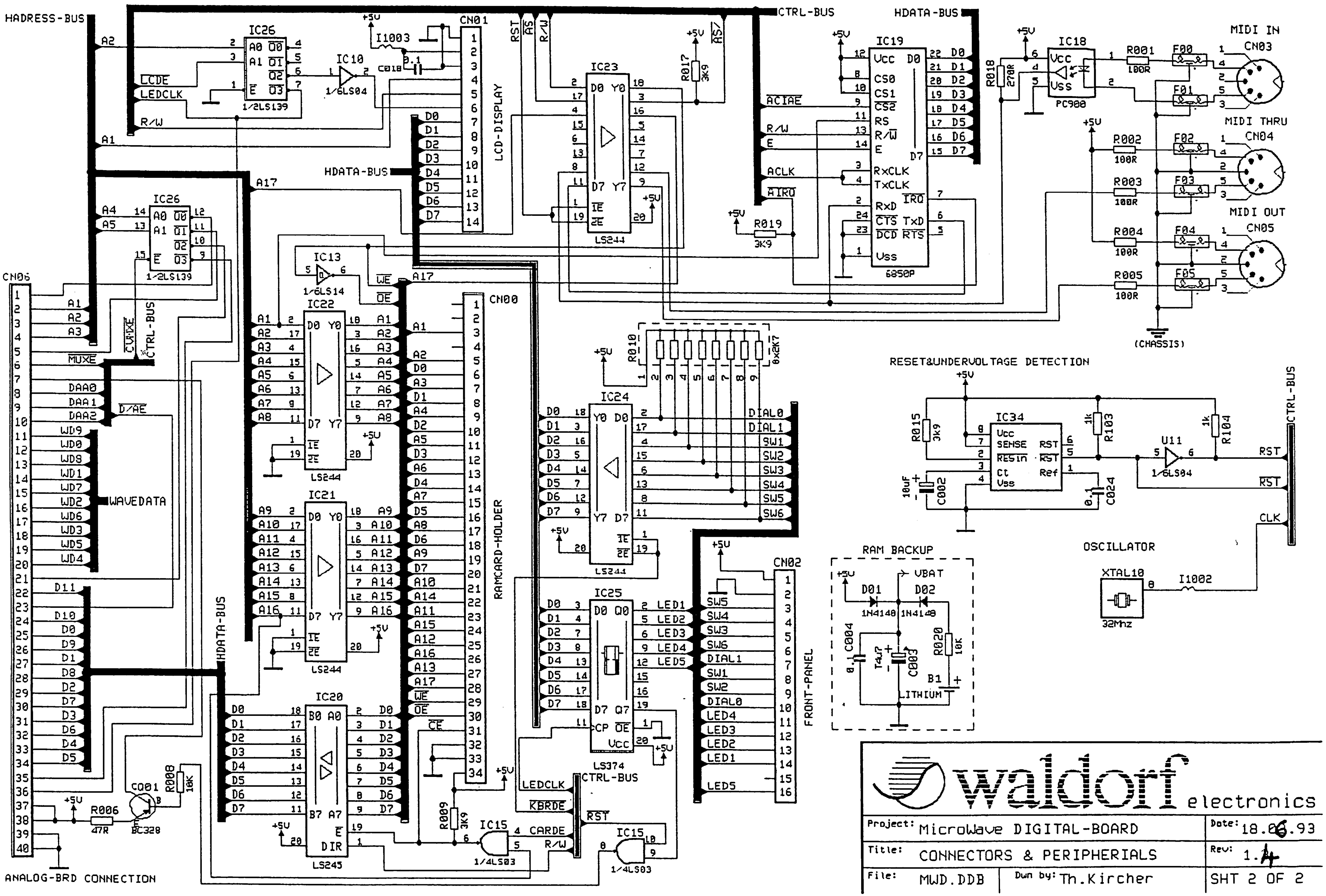
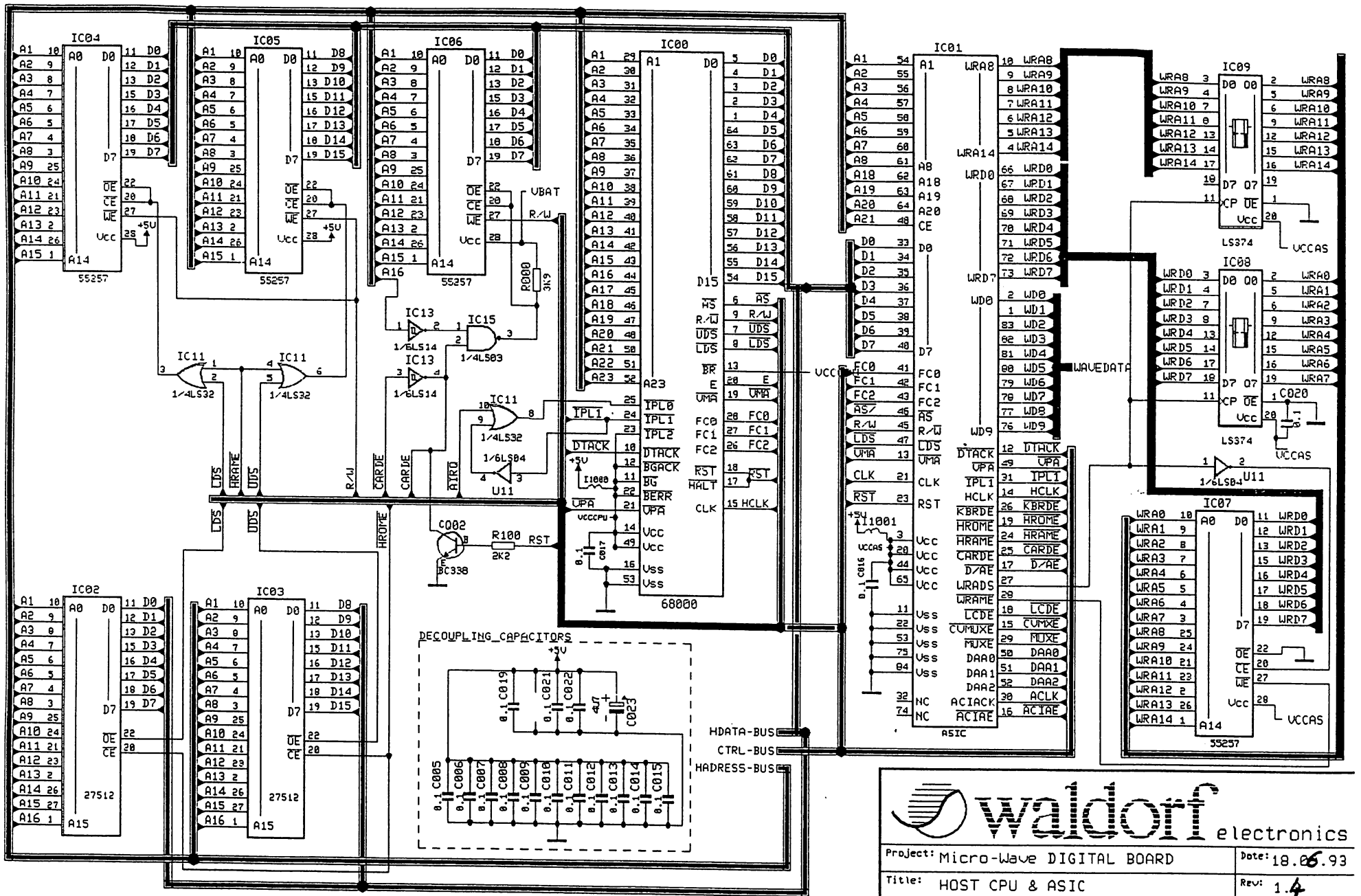
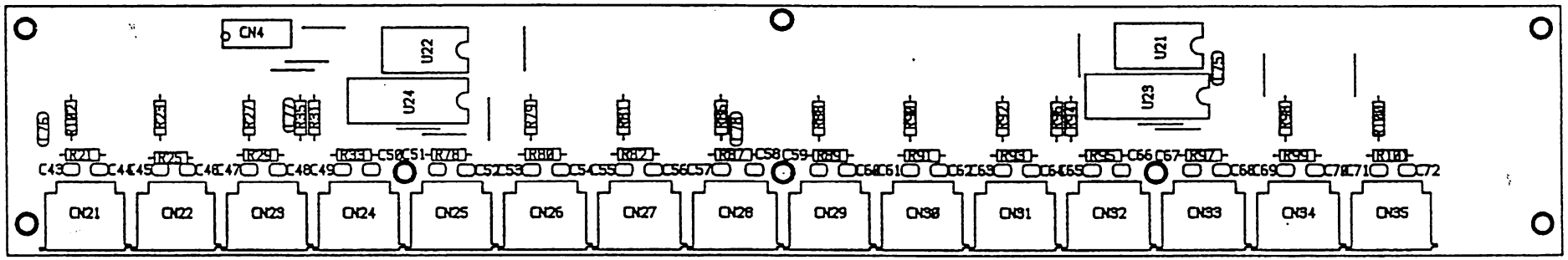

HADRESS-BUS
CTRL-BUS
HDATA-BUS
LCD-DISPLAY
MIDI IN
MIDI THRU
MIDI OUT
(CHASSIS)
RAMCARD-HOLDER
RESET&UNDERVOLTAGE DETECTION
RAM BACKUP
OSCILLATOR
FRONT-PANEL
WAVEDATA
ANALOG-BRD CONNECTION
waldorf electronics
Project: MicroWave DIGITAL-BOARD
Date: 18.06.93
Title: CONNECTORS & PERIPHERIALS
Rev: 1.4
File: MWD.DDB
Dwn by: Th.Kircher
SHT 2 OF 2



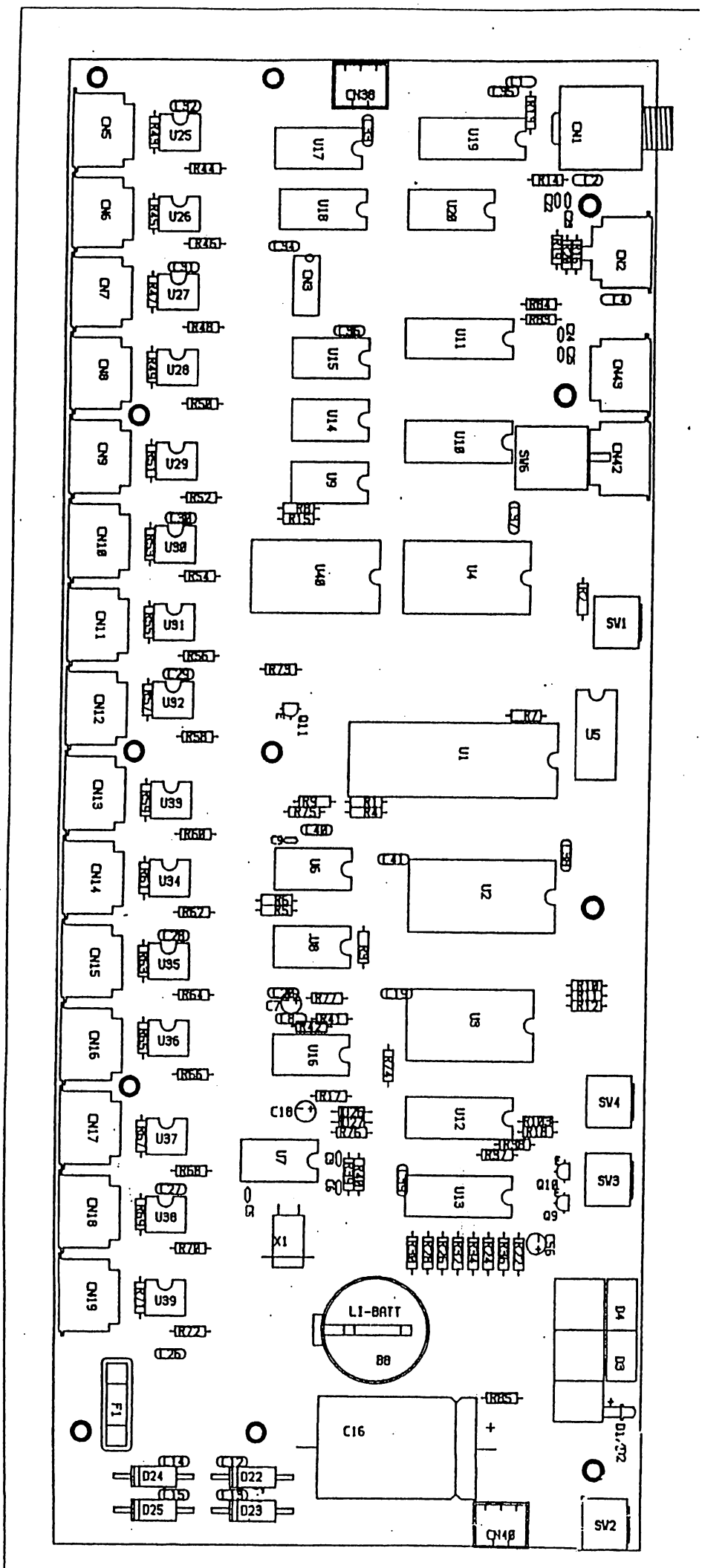
walDorf electronics

Project:	Micro-Wave DIGITAL BOARD	Date:	18.06.93
Title:	HOST CPU & ASIC	Rev:	1.4
File:	MWD.DDB	Drwn by: Th.Kircher	SHT 1 OF 2



waldorf electronics

Projects: MIDI BAY		Page Titles: MIDI OUT PCB	
Drawn by: Th. Kircher		Dates: 19.02.90	REV 1.0
Files: PMPBOUT	Nr: 382 100 0301	SHT	OF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U19
U20
U11
U10
U4
U1
U2
U3
CN1
CN2
CN43
CN42
SW6
SV1
SV4
SV3
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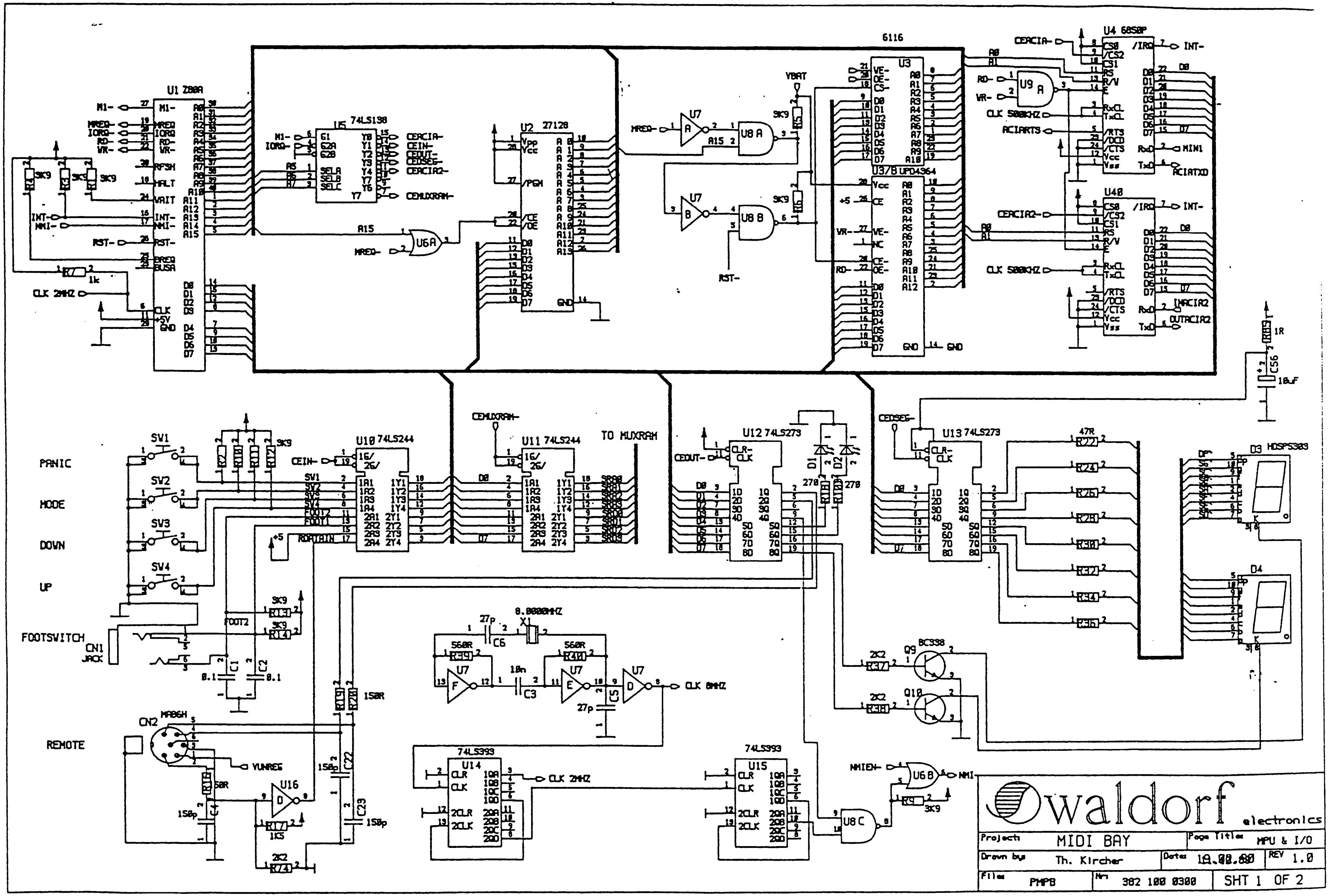

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U6B
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U8B
U8C
U9A
U10 74LS244
U11 74LS244
U12 74LS273
U13 74LS273
U14 74LS393
U15 74LS393
U16
TO MUXRAM
PANIC
MODE
DOWN
UP
FOOTSWITCH
CN1 JACK
REMOTE
CN2 MAB6H
SV1
SV2
SV3
SV4
VUNREG
8.0000MHZ X1
CLK 8MHZ
CLK 2MHZ
CLK 500KHZ
BC338
Q9
Q10
D3 HDSP5303
D4
CERCIA-
CERCIA2-
CEIN-
CEOUT-
CEDSEG-
CEMUXRAM-
INT-
NMI-
MIN1
ACIATXD
ACIARTS
INACIA2
OUTACIA2
NMIEN-
VBAT
RST-
MREQ-
IORQ-
RD-
WR-
M1-
waldorf electronics
Project: MIDI BAY
Page Title: MPU & I/O
Drawn by: Th. Kircher
Date: 10.08.88
REV 1.0
File: PMPB
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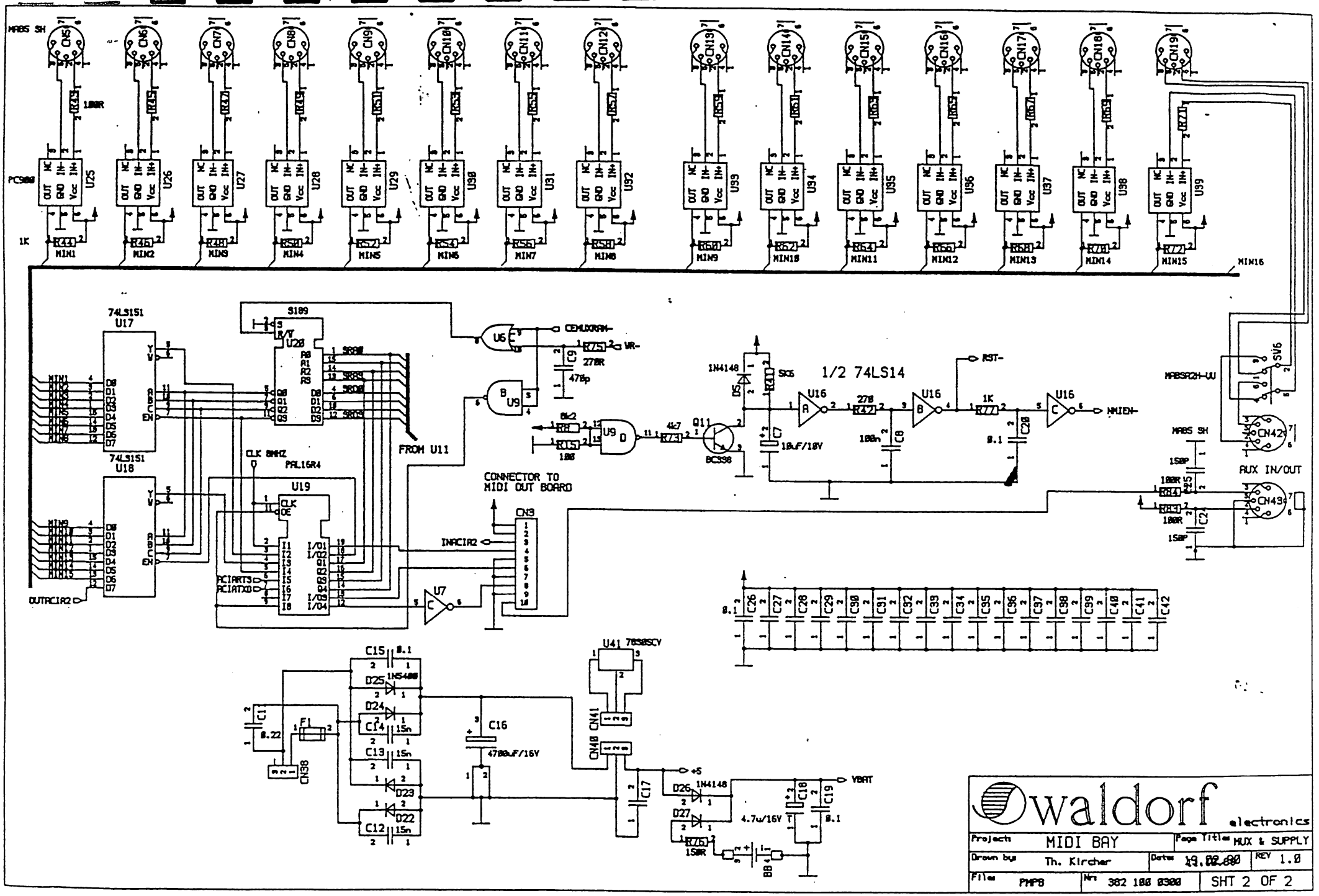
SHT 1 OF 2



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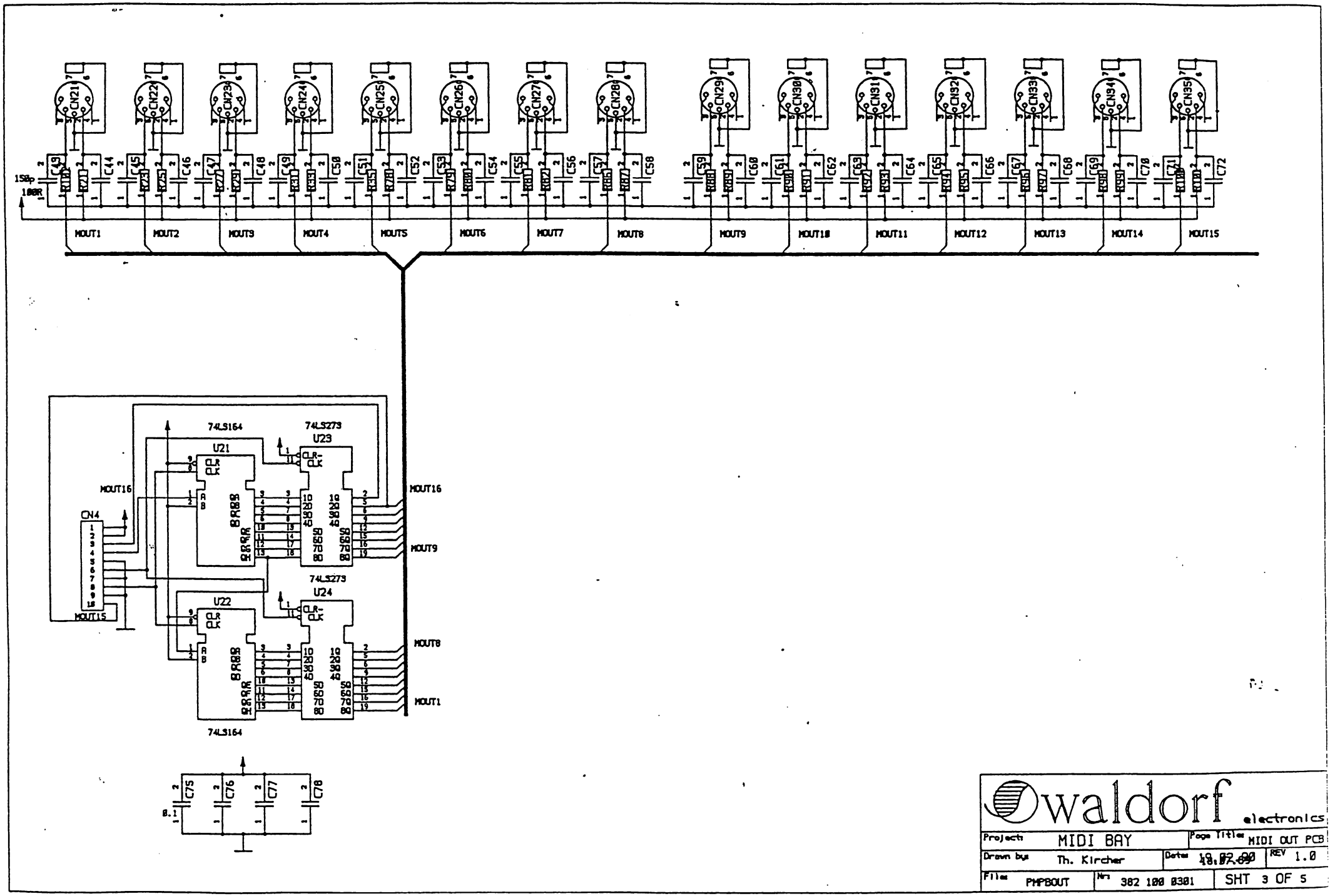
Project: MIDI BAY		Page Title: MUX & SUPPLY	
Drawn by: Th. Kircher		Date: 19.02.88	REV 1.0
File: PMPB	Nr: 382 100 0300		SHT 2 OF 2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MOUT14
MOUT15
MOUT16
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74LS273
U21
U22
U23
U24
CN4
150p
100R
0.1
waldorf electronics
Project: MIDI BAY
Page Title: MIDI OUT PCB
Drawn by: Th. Kircher
Date: 10.02.00
REV 1.0
File: PMPBOUT
Nr: 382 100 0301
SHT 3 OF 5