supply

supply.sch

temperature

temp_measure
iron_switch

temperature.sch

GND +5V

DIODE
R9
R

D4 and R9
are not assembled
on the board.

heater

current_measure
heater_on

heater.sch

U1

+5V

7 VCC

R12
33

20 AVCC

21 AREF

2.5 V

47 µF / 16 V
C7

GND

R11
100

U3
TL431

1

3

2

GND

22 GND
8 GND

GND

C1b
10 nF

+5V

Fix:
C1b was added, because C1 is far away from VCC/GND pins
in older through-hole models.

(PCINT0/CLK0/ICP1)PB0 14
(PCINT1/OC1A)PB1 15
(PCINT2/OC1B/SS)PB2 16
(PCINT3/OC2A/MOSI)PB3 17
(PCINT4/MISO)PB4 18
(PCINT5/SCK)PB5 19
(PCINT6/XTAL1/TOSC1)PB6 9
(PCINT7/XTAL2/TOSC2)PB7 10

(PCINT8/ADC0)PC0 23
(PCINT9/ADC1)PC1 24
(PCINT10/ADC2)PC2 25
(PCINT11/ADC3)PC3 26
(PCINT12/SDA/ADC4)PC4 27
(PCINT13/SCL/ADC5)PC5 28
(PCINT14/RESET)PC6 1

(PCINT16/RXD)PD0 2
(PCINT17/TXD)PD1 3
(PCINT18/INT0)PD2 4
(PCINT19/OC2B/INT1)PD3 5
(PCINT20/XCK/T0)PD4 6
(PCINT21/OC0B/T1)PD5 11
(PCINT22/OC0A/AIN0)PD6 12
(PCINT23/AIN1)PD7 13

DIL28

ATMEGA88PA-PU
labled as 'HS-K67121'
can be replaced by ATMEGA328P

user_interface

sw_set
sw_minus
sw_plus

GND

C1
100 nF

R8
10 k

+5V

big: b; small: f a/f
big: g; small: a g/a
big: c; small: d c/d
big: dp; small: e dp/e
big: d; small: c d/c
big: e; small: dp e/dp
big: f; small: b f/b
big: a; small: g a/g

anode, small digit anode_small
anode, big digit, left anode_big_left
anode, big digit, center anode_big_center
anode, big digit, right anode_big_right

user_interface.sch
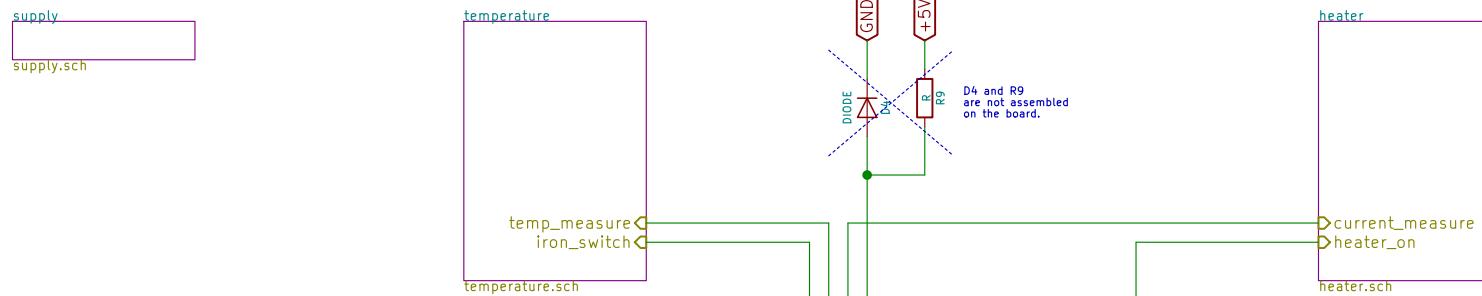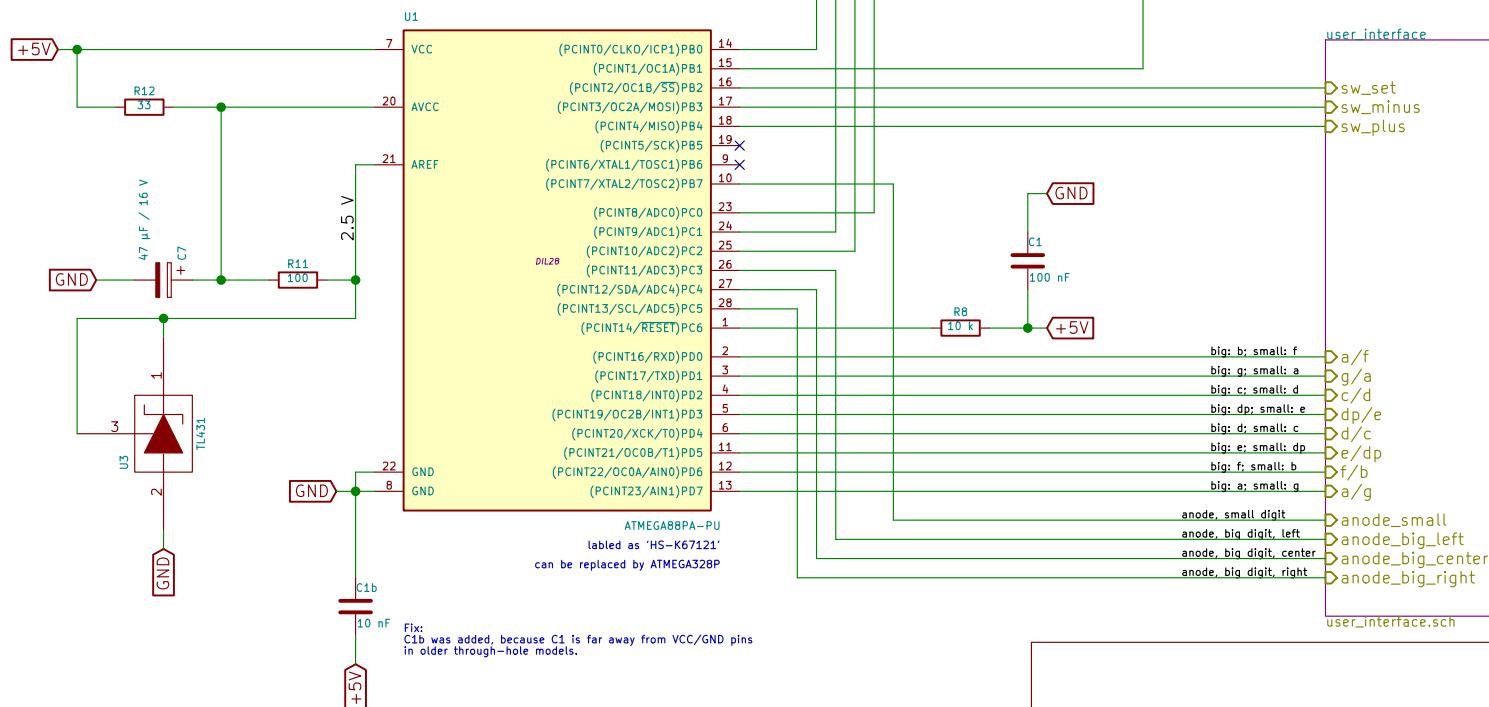
Reverse engineered
Michael Büsch <m@bues.ch>

Sheet: /
File: lf1600.sch

Title: Xytronic LF-1600

Size: A4   Date:
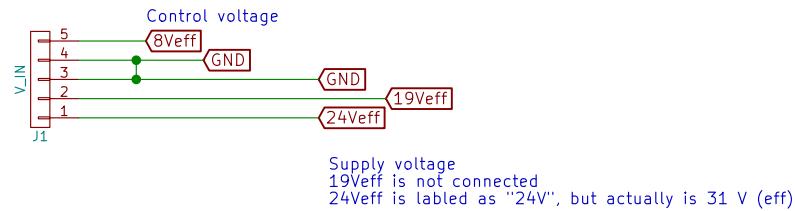
KiCad E.D.A. kicad 4.0.5+dfsg1-4

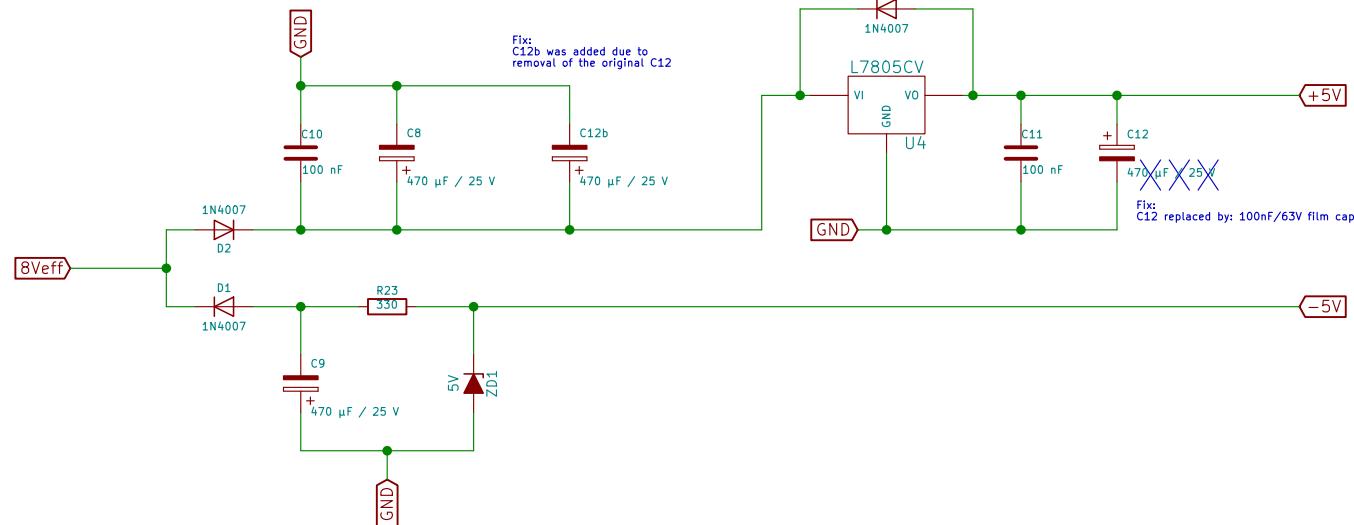Rev: 1.1

Id: 1/5

Control voltage

5 — 8Veff
4 — GND
3 — GND
2 — 19Veff
1 — 24Veff

J1
V_IN

Supply voltage
19Veff is not connected
24Veff is labled as "24V", but actually is 31 V (eff)

GND

D3
1N4007

L7805CV

Fix:
C12b was added due to
removal of the original C12

C10
100 nF

C8
470 µF / 25 V

C12b
470 µF / 25 V

VI VO
GND
U4

C11
100 nF

+ C12
470 µF / 25 V

+5V

Fix:
C12 replaced by: 100nF/63V film cap

GND

8Veff

1N4007
D2

D1
1N4007

R23
330

−5V

C9
470 µF / 25 V

5V
ZD1

GND

Reverse engineered
Michael Büsch <m@bues.ch>
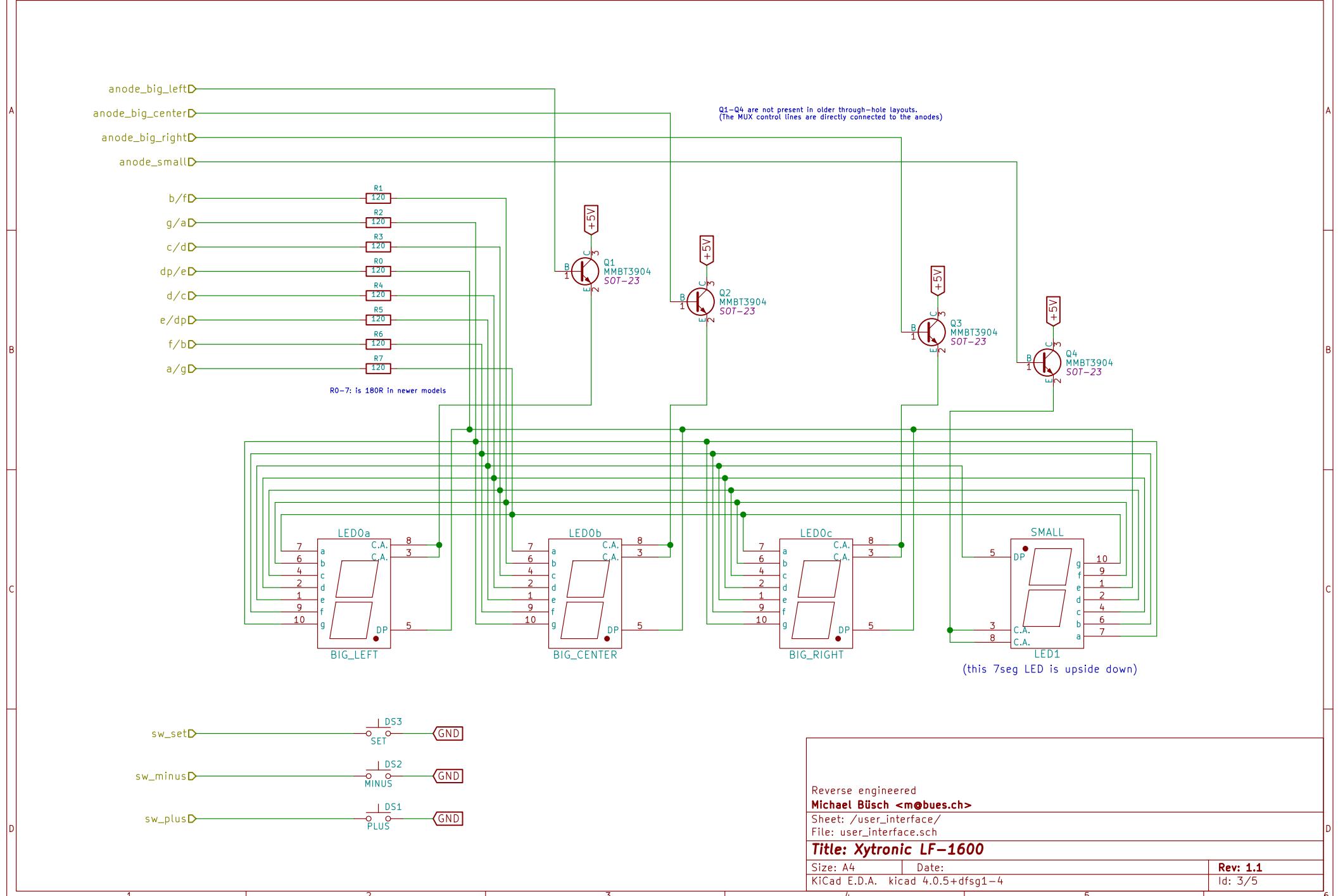
Sheet: /supply/
File: supply.sch

Title: Xytronic LF-1600

Size: A4   Date: Rev: 1.1
KiCad E.D.A. kicad 4.0.5+dfsg1-4   Id: 2/5

anode_big_left

anode_big_center

anode_big_right

anode_small

Q1-Q4 are not present in older through-hole layouts.
(The MUX control lines are directly connected to the anodes)

b/f R1 120
g/a R2 120
c/d R3 120
dp/e R0 120
d/c R4 120
e/dp R5 120
f/b R6 120
a/g R7 120

R0-7: is 180R in newer models

+5V Q1 MMBT3904 SOT-23
+5V Q2 MMBT3904 SOT-23
+5V Q3 MMBT3904 SOT-23
+5V Q4 MMBT3904 SOT-23

LED0a BIG_LEFT
LED0b BIG_CENTER
LED0c BIG_RIGHT
SMALL LED1
(this 7seg LED is upside down)

sw_set — DS3 SET — GND

sw_minus — DS2 MINUS — GND

sw_plus — DS1 PLUS — GND

heater_on

Heater element
R = 3.5 Ohms @ 20 °C

+5V

24V

24V

24V

U5
MOC3041
DIP6

R20 390
R21 51
R22 100

D?
BTA12-600C

0.1 µF / 100 V
C6

V_OUT
J2

R24 0.1
shunt

GND

D7 DIODE

R25 10 M
C13 1 µF / 50 V / NP
R26 10 k
R27 100 k
C14 100 nF
R28 10 k

GND

Fix:
The input to the ADC needs to be of low impedance
to help charging the ADC capacitor quickly.
So R28 was removed (bridged).
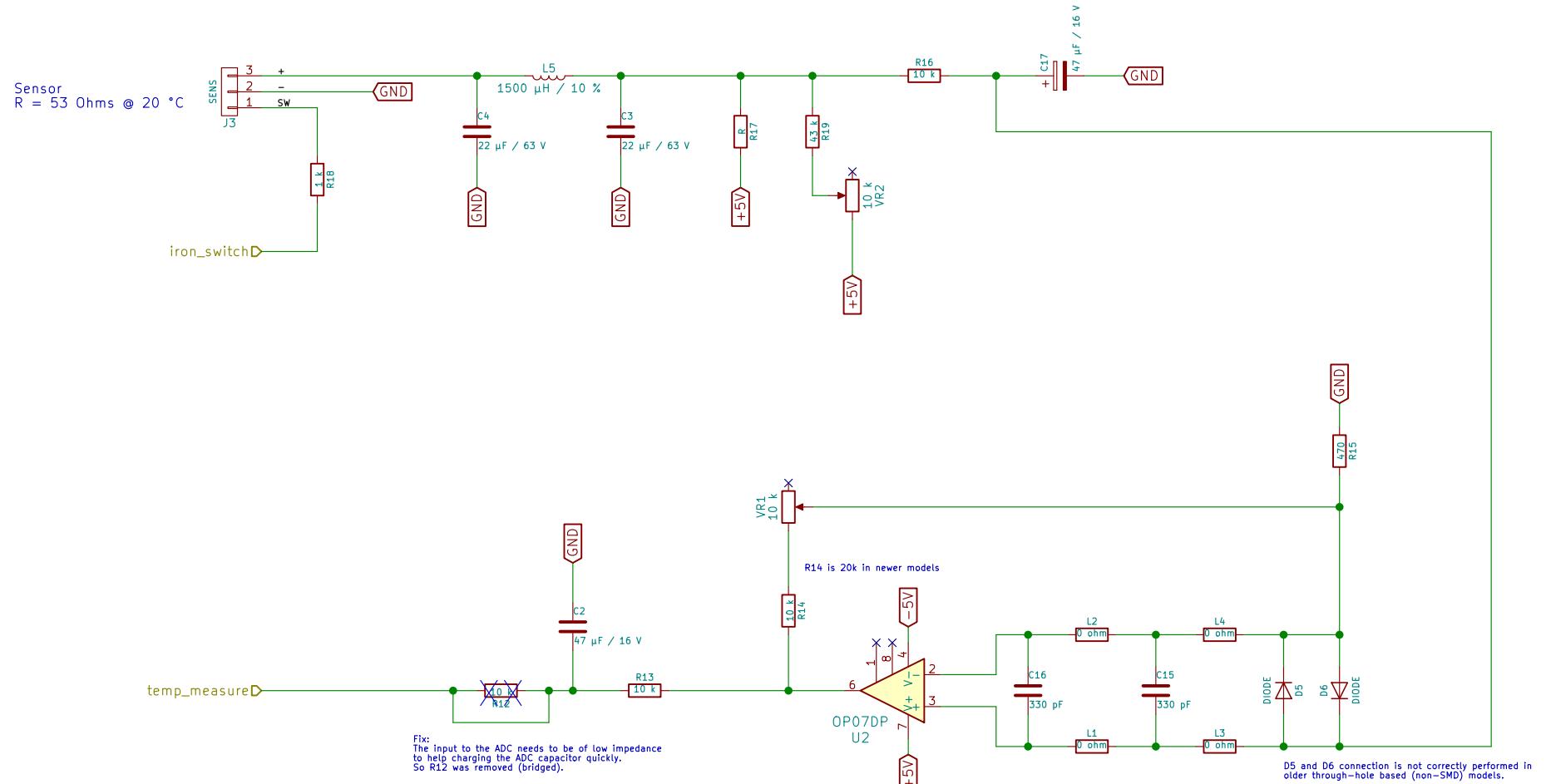
current_measure

Reverse engineered
Michael Büsch <m@bues.ch>
Sheet: /heater/
File: heater.sch
Title: Xytronic LF-1600
Size: A4   Date:
Rev: 1.1
KiCad E.D.A. kicad 4.0.5+dfsg1-4
Id: 4/5

Sensor
R = 53 Ohms @ 20 °C

J3
SENS
3 +
2 −
1 SW

GND

iron_switch

R18 1 k

C4 22 µF / 63 V
GND

L5 1500 µH / 10 %

C3 22 µF / 63 V
GND

R17 R
+5V

R19 43 k

VR2 10 k
+5V

R16 10 k

C17 47 µF / 16 V
GND
GND

GND
R15 470

VR1 10 k

R14 is 20k in newer models

temp_measure

R12 10 k

C2 47 µF / 16 V
GND

R13 10 k

R14 10 k

U2 OP07DP
6 V−
2
3 V+
1
8
4 −5V
7 +5V

C16 330 pF
C15 330 pF

L2 0 ohm
L4 0 ohm
L1 0 ohm
L3 0 ohm

D5 DIODE
D6 DIODE

Fix:
The input to the ADC needs to be of low impedance
to help charging the ADC capacitor quickly.
So R12 was removed (bridged).

D5 and D6 connection is not correctly performed in
older through-hole based (non-SMD) models.

Reverse engineered
Michael Büsch <m@bues.ch>
Sheet: /temperature/
File: temperature.sch
Title: Xytronic LF-1600
Size: A4   Date: **Rev: 1.1**
KiCad E.D.A. kicad 4.0.5+dfsg1-4   Id: 5/5