AESCULAP®
MEDITEC

MQL 10 DIRECTIONS FOR ALIGNMENT AND CHECKS

GENERAL

- Layout of parts see sketch.
- Before adjusting the MQL 10 attachment, check if slit lamp is adjusted properly i.e. slit projection and focal plane must be in the rotation center (focal stick) of the slit lamp.

OPTICAL ADJUSTMENT OF THE MQL 10 ATTACHMENT

HeNe Aiming beam adjustment

1. The HeNe is put centric through the HeNe beam expander (3) together with the beam doubler (2).

2. Lens of the HeNe beam expander in central setting.

3. The two subbeams are adjusted symmetrically with the HeNe passive reflector (4) towards the center of the expanding lens (5). The test is performed with a piece of transparent graph paper. While being illuminated adequately (from underneath) the lens holder is drawn as a dark rim and permets an exact setting of the two HeNe beams.

4. After putting the transparent graph paper away, both HeNe subbeams have to hit the achromat (6) symmetrically in the center. The testing is performed with an adequate piece of transparent paper, again.

5. By reciprocal displacement of beam doubler (2) and passive reflector (4) it must be achieved that the beam is directed perfectly. The two HeNe beams should leave the MQL 10 housing mainly parallel.

6. By using the HeNe YAG passive reflector (11) the aiming beam is directed onto the slit lamp center. The HeNe has to be within the smallest aperture of the slit lamp.

7. By shifting the expanding lens (5) the HeNe aiming beam is to be directed onto the focal stick.

To be continued.../2

YAG Adjustment

1. Adjujst beam with YAG mirror (8) through the filter wheel on the beam divider (10), and check the centric pass on the filter wheel with burn paper.

2. The YAG beam has to hit the expander lens exactly in the center between the two HeNe spots. Check with burn paper.

3. Position of the expander beam has to be controlled in front of the achromat (6) by aid of IR Phosphor card.

4. At inclined pass, correct with YAG mirror (8) and beam divider (10).

5. Check the YAG focus with burn paper at min. energy level. The YAG focus must coincide with HeNe focus and focal plane. Minor YAG variations (to the rear) are permissable.

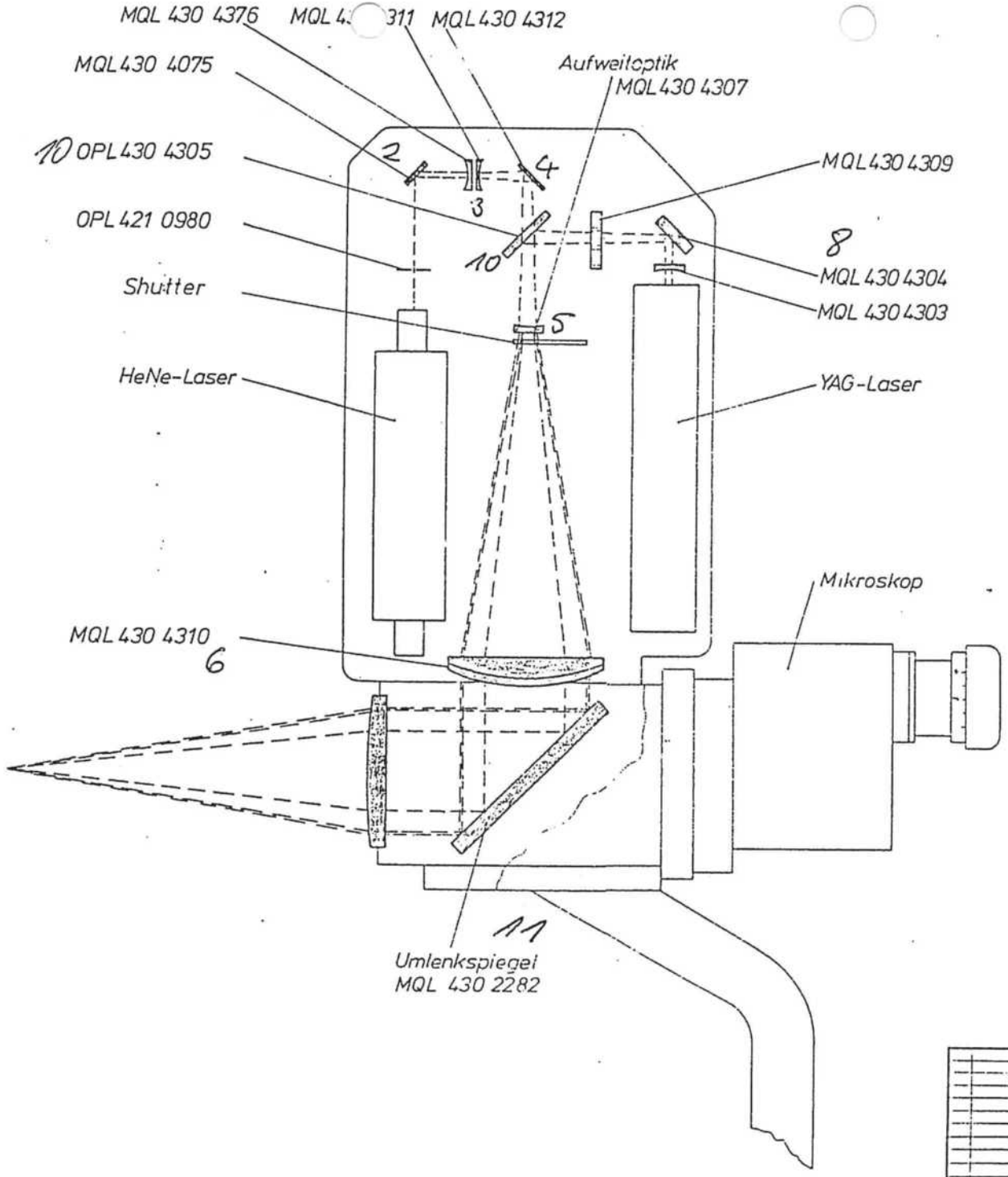
6. Micro correction of the YAG/HeNe focus concruence is performed by displacing the HeNe expander lenses (3) to each other.

7. If YAG and HeNe are centricly adjujsted no x/y variations must be visible on the burn paper.

8. At the max. energy level an optical breakdown must be perceptible in the air.

9. Control of the energy distribution 1 cm in front of the focus with burn paper.

   Energy distribution has to be cyclic and symmetrical.



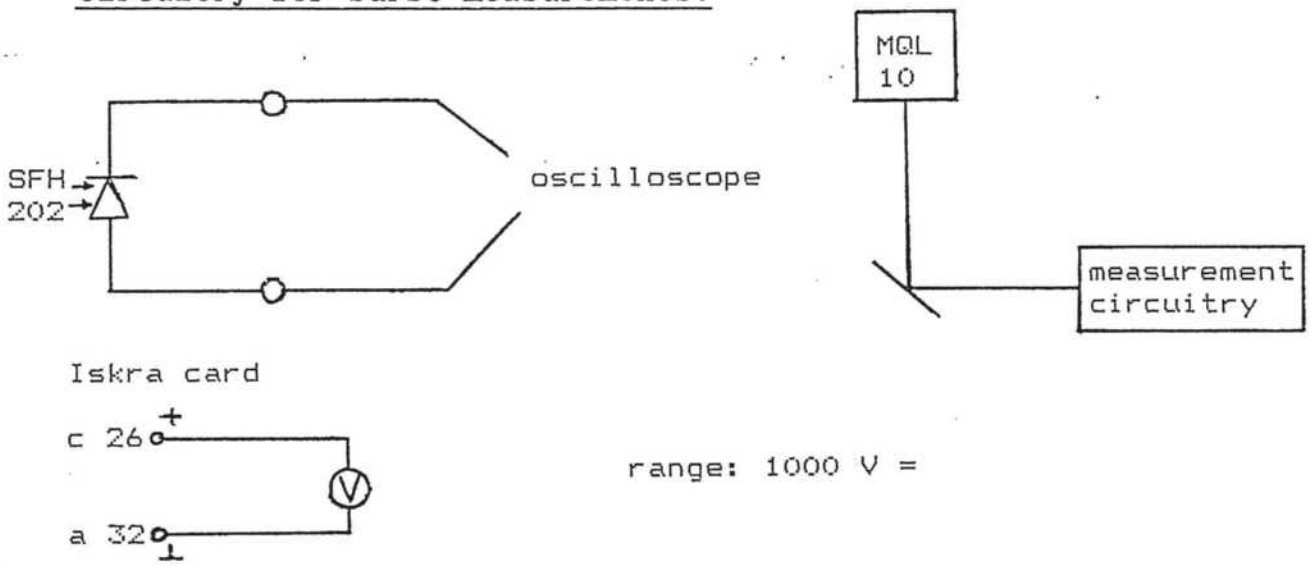
		MEGITEC REINHARDT THYZEL	Obere Bergstraße 1 8501 Heroldsberg
	Tag / Name	Strahlenverlauf v. MQL10 (TOPCON SL-2E)	Maßst.
Änderung / Tag / Name	MQL 330 4379		3

E L E C T R O N I C A D J U S T M E N T O F M Q L 1 0

ATTENTION when opening the MQL 10:

At the HeNe cavity there may still be high voltage.
It must be discharged, but not directly by short circuit, because this may damage the power supply.
Discharge it by resistor (> 100 'kOhm).

1. Adjustment of the voltages for burst 1, 2, 3
Circuitry for burst measurements:



Connect the voltmeter to the Iskra-card PIN 26c (+) and 32a (-).
(Attention: range 1000 V =).
Arrange the measuring circuitry in the beam path of the laser.
(Even a Joulemeter can be used, because at 2 bursts the energy will be double, at 3 bursts three times as much.) Connect The foot switch, put the energy selector (handwheel) in position 10.
Switch on the device and activate the "ready" switch.

a) **Adjustment of voltage at burst 1**

Adjust the voltage between PIN 26 c and 32a by potentiometer P4, so that one burst is produced (note this voltage). After that determine the upper limit of voltage at which just two shots per burst are produced (note down this voltage, too). Adjust the voltage midway between both determined limits by the help of P4.

To be continued.../5

If you want to ascertain the number of shots per burst, you have to trigger one laser pulse by pressing the foot switch.

b) **Adjustment of voltage at burst 2**

Press the "burst" button once. (burst indicator LED 2 is now illuminated).

Adjust the voltage between PIN 26c and 32a by potentiometer P3 so that just three shots per burst are emitted (note this voltage). The lower limit was already determined at burst 1.

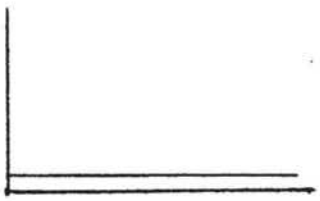
Set the voltage midway between both limits by the help of potentiometer P3.

c) **Adjustment of voltage at burst 3**

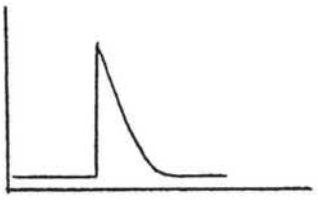
Press the "burst" button once again. (Burst indicator LED 3 is now illuminated).

Adjust maximum voltage (1000 V) between PIN 26c and 32a by potentiometer P2. If 4 shots per burst can be measured now, reduce voltage until only 3 shots are emitted. The lower limit was already determined at burst 2. Adjust voltage midway between these limits by P2.

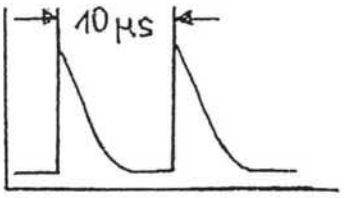
If potentiometer P2 stands at stop (max. voltage) and you can only measure 3 shots per burst, adjust voltage by potentiometer P2 midway between maximum and voltage determined at burst 2.



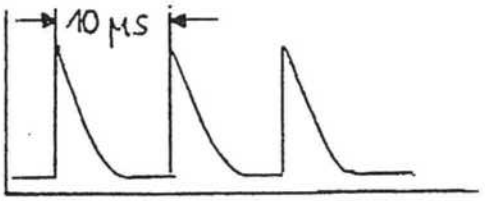
no burst
voltage too low



burst 1



burst 2



burst 3

Oscillogramm
(push foot switch)

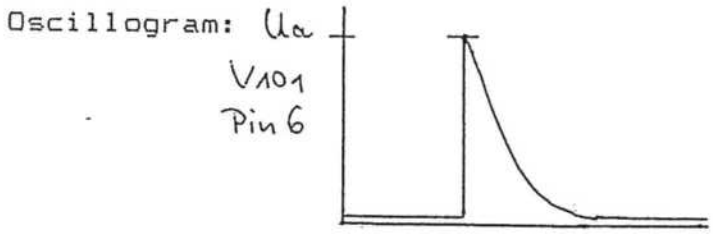
To be continued.../6

2. Adjustment of energy check indicator

Connect footswitch, put the laser energy selector in position 10, switch on the instrument and deactivate the "ready" switch.

a) Adjustment of the preamplifier V101

Connect oscilloscope at JC 101 PIN 6. Push energy check button. Adjust output voltage to 13 V by R 106. (Only necessary at factory.)



b) Adjustment of the energy check indicator for 10 mJ

Put the laser energy selector in position 10. Push energy check button. Align threshold by R 117 so that LED for 10 mJ is surely illuminated. (Press energy check button three times; LED for 10 mJ has to glow each time).

c) Adjustment of the energy check indicator for 0.5 mJ

Put the laser energy selector in position 0.5. Push energy check button. Adjust threshold by R 128 so that LED for 0.5 mJ is surely illuminated. (Same check as under b).

d) Adjustment of the energy check indicator for 1 mJ

Put the laser energy selector in position 1. Push energy check button. Adjust threshold by R 127 so that LED for 1 mJ is surely illuminated. (Same check as under b).

e) Adjustment of the energy check indicator for 2 mJ

Put the laser energy selector in position 2. Push energy check button. Adjust threshold by R 126 so that LED for 2 mJ is surely illuminated. (Same check as under b).

To be continued.../7

f) **Adjustment of the energy check indicator for 4 mJ**

Put the laser energy selector in position 4. Push energy check button. Adjust threshold by R 125 so that LED for 4 mJ is surely illuminated. (Same check as under b).

g) **Adjustment of the energy check indicator for 7 mJ**

Put the laser energy selector in position 7. Push energy check button. Adjust threshold by R 124 so that LED for 7 mJ is surely illuminated. (Same check as under b).

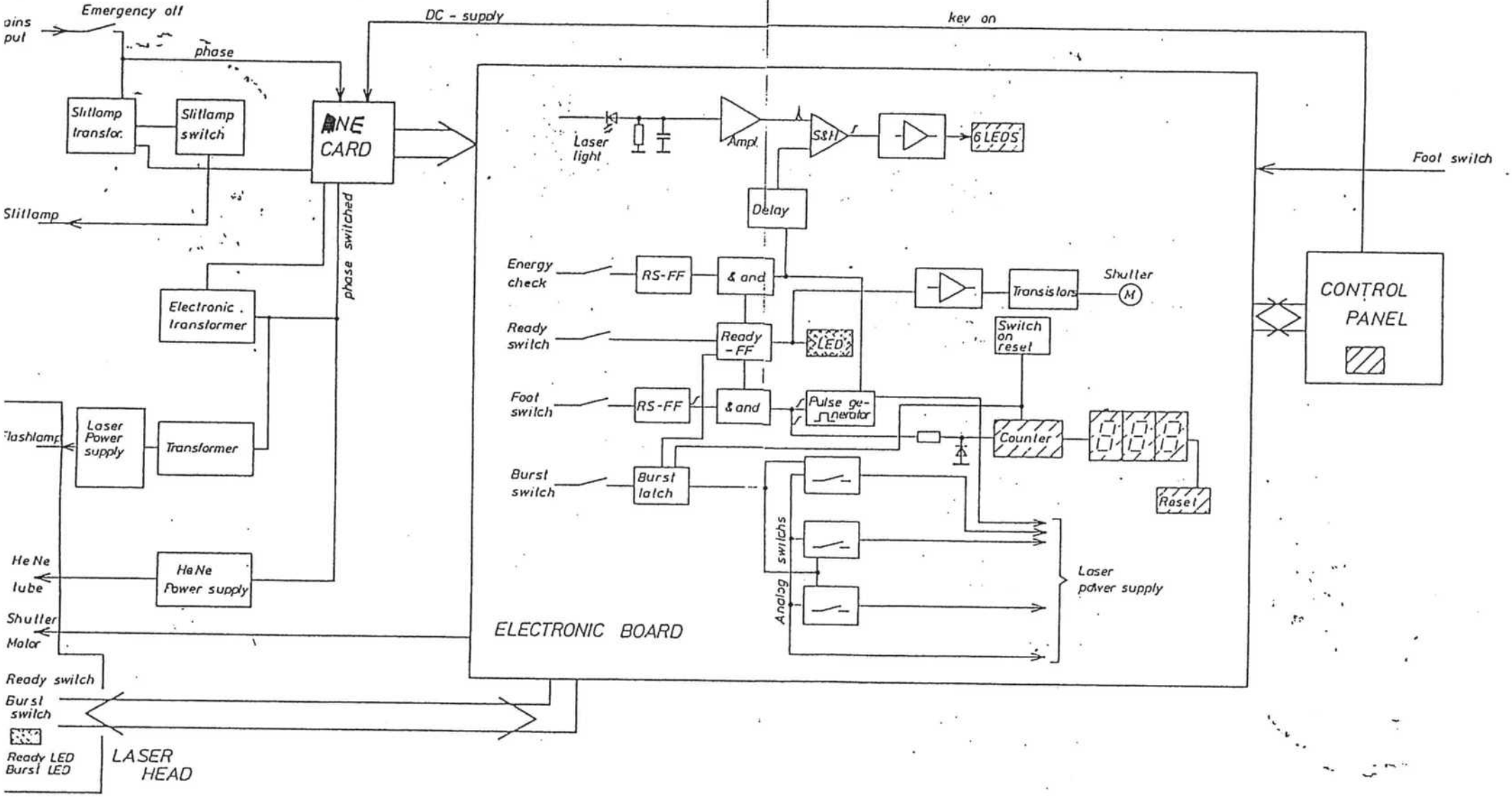
3. Test of the entire machine

a) After adjustment of the energy check indicator, the energy check has to be tested once more. If you turn the energy selector to position 0.5 and you push the energy check button, only the LED for 0.5 mJ must be illuminiated. Otherwise you have to adjust the thresholds again.

b) Energy selector in position 10. Push energy check button. After approx. 8 sec. all LEDs have to switch off.

c) Energy selector in position 10. Push energy check button. Activate "ready" switch. All LEDs should switch off immediately.

d) Device is in Ready position. Energy selector is in position 10. Push energy check button - none of the energy check LEDs must glow.


Emergency off
DC - supply
key on
phase
Slitlamp transfor.
Slitlamp switch
ANE CARD
Slitlamp
phase switched
Laser light
Ampl.
S&H
6 LEDS
Foot switch
Delay
Energy check
RS-FF
& and
Transistors
Shutter
M
CONTROL PANEL
Ready switch
Ready -FF
LED
Switch on reset
Foot switch
RS-FF
& and
Pulse ge-nerator
Electronic transformer
Laser Power supply
Transformer
Counter
Burst switch
Burst latch
Reset
Analog switchs
Laser power supply
ELECTRONIC BOARD
He Ne tube
He Ne Power supply
Shutter Motor
Ready switch
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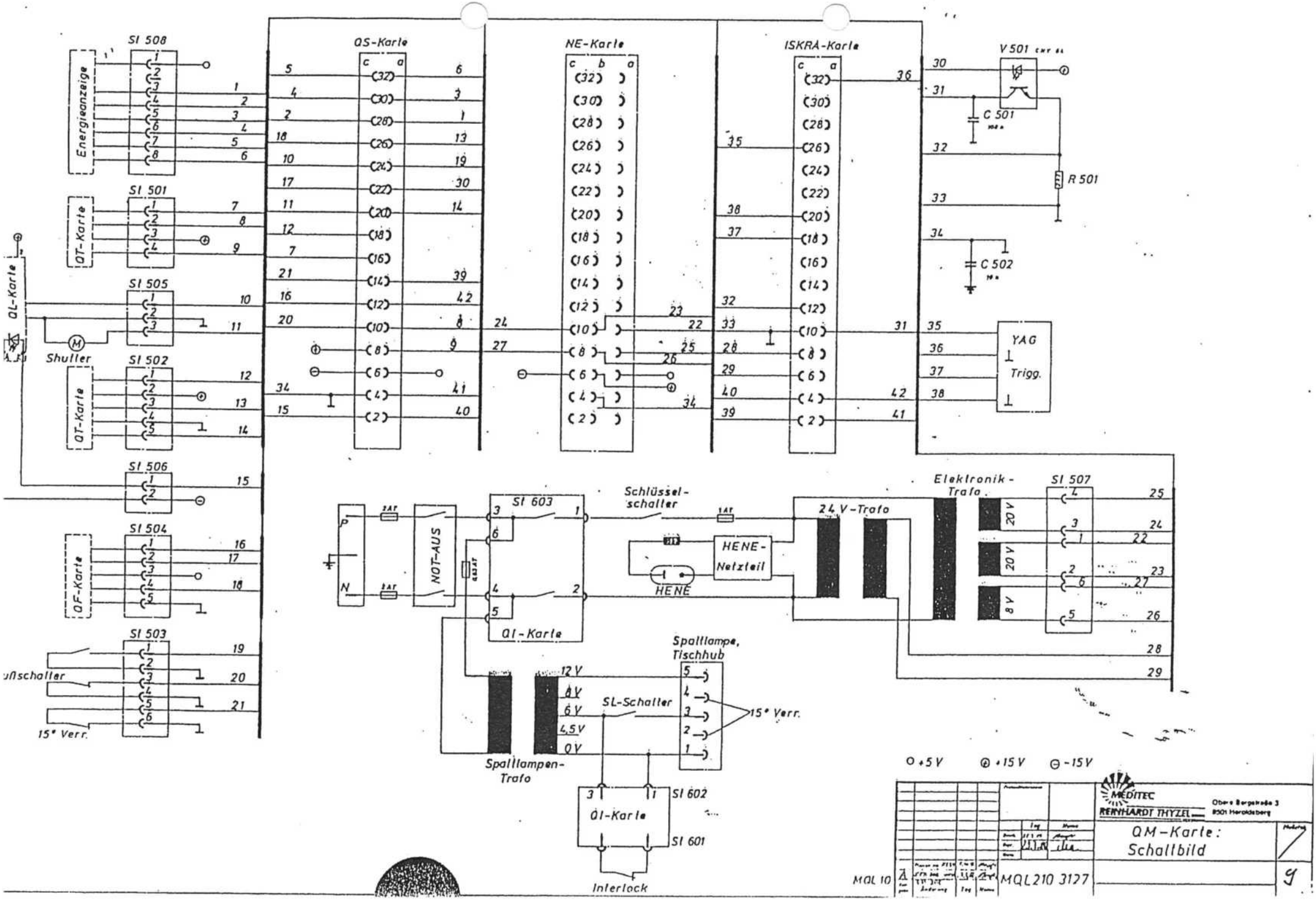
Ready LED
Burst LED
LASER HEAD
Blockschaltbild MOL 10
MOL 2104.577
8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NE-Karte
ISKRA-Karte
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C 501
R 501
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Sl 505
Shutter
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Sl 506
Sl 504
QF-Karte
Sl 503
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15° Verr.
Sl 603
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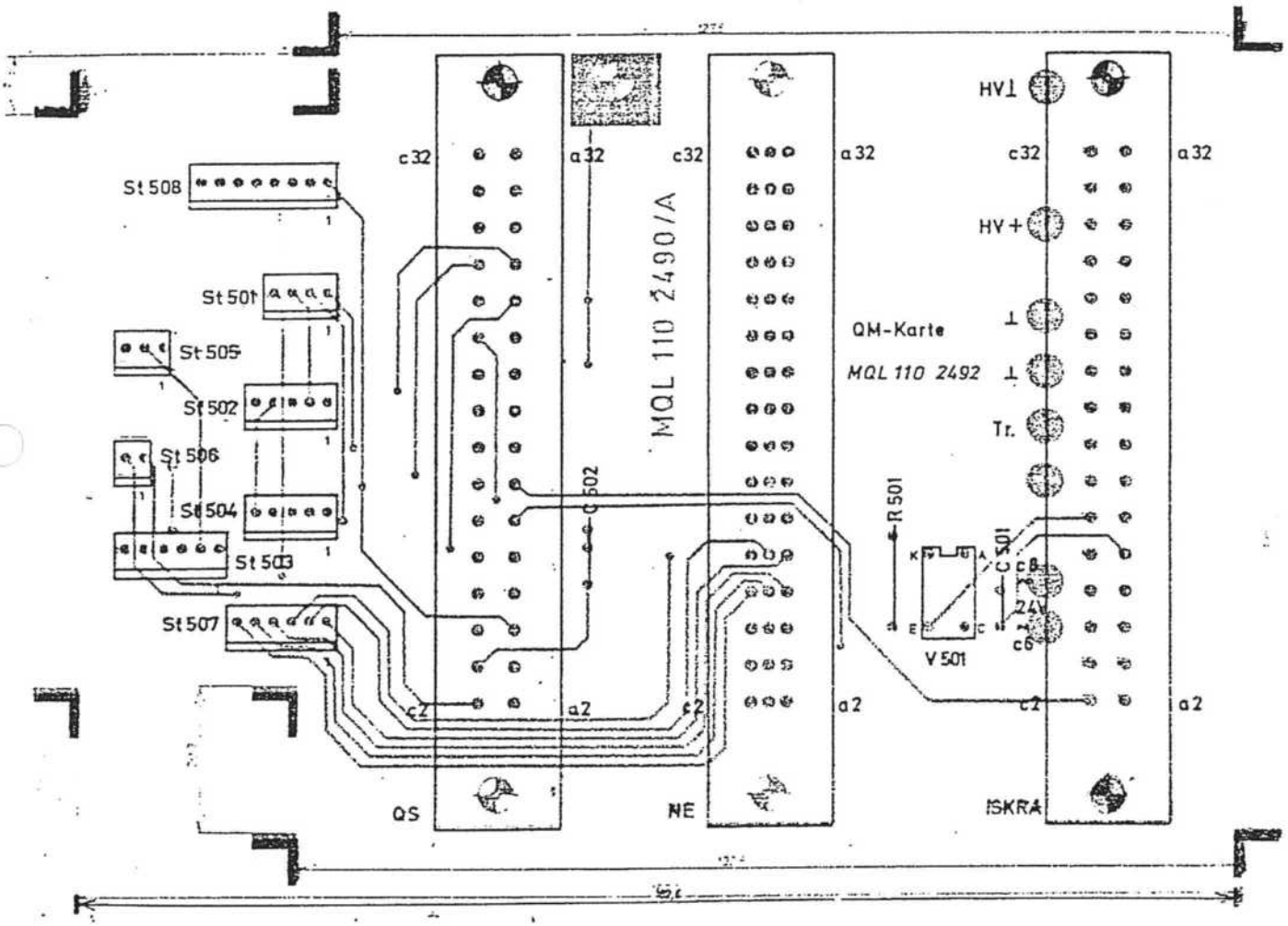
QI-Karte
Schlüssel-
schalter
HENE-
Netzteil
HENE
24 V-Trafo
Elektronik-
Trafo
Sl 507
20 V
20 V
8 V
YAG
Trigg.
Spaltlampe,
Tischhub
12 V
8 V
6 V
4,5 V
0 V
SL-Schalter
15° Verr.
Spaltlampen-
Trafo
Sl 602
QI-Karte
Sl 601
Interlock
○ +5 V
⊕ +15 V
⊖ -15 V
MEDITEC
REINHARDT THYZEL
Obere Bergstraße 3
8501 Heroldsberg
QM-Karte:
Schaltbild
MQL210 3127
MQL 10
9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St 505
St 502
St 506
St 504
St 503
St 507
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c2
a2
QS
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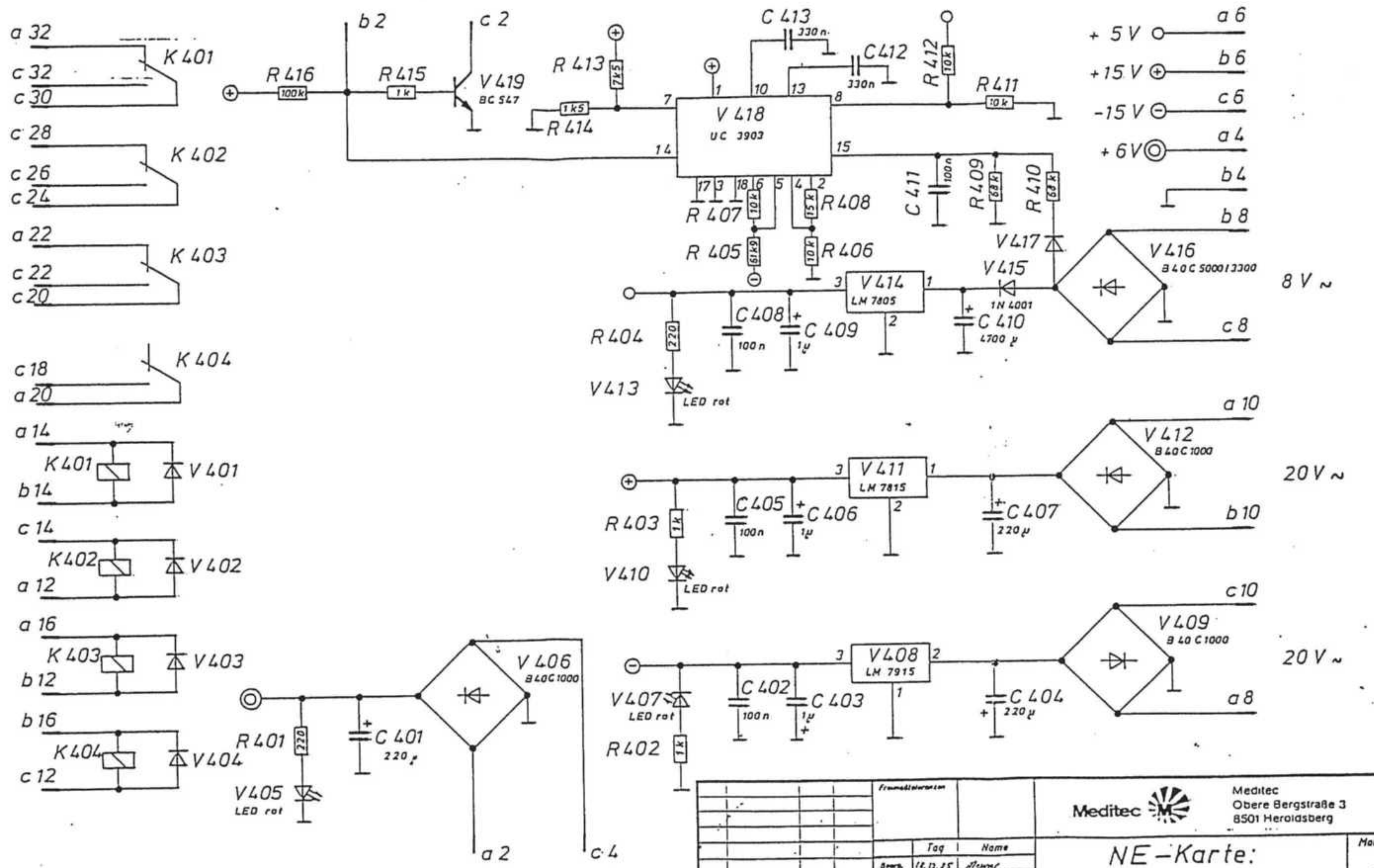
C 502
NE
QM-Karte
MQL 110 2492
R 501
V 501
C 501
HV⊥
HV+
⊥
Tr.
c8
24V
c6
ISKRA

1) St. 508/3 -------- QS a 28
2) St. 508/4 -------- QS c 28
3) St. 508/5 -------- QS a 30
4) St. 508/6 -------- QS c 30
5) St. 508/7 -------- QS c 32
6) St. 508/8 -------- QS a 32
7) St. 501/1 -------- QS c 16
8) St. 501/2 -------- QS a 10
9) St. 501/4 -------- QS a 8
10) St. 505/1 -------- QS c 24
11) St. 505/3 -------- QS c 20
12) St. 502/1 -------- QS c 18
13) St. 502/3 -------- QS a 26
14) St. 502/5 -------- QS a 20
15) St. 506/1 -------- QS c 2
16) St. 504/1 -------- QS C 12
17) St. 504/2 -------- QS c 22
18) St. 504/4 -------- QS c 26
19) St. 503/1 -------- QS a 24
20) St. 503/3 -------- QS C 10
21) St. 503/5 -------- QS C 14
22) St. 507/1 -------- NE a 10
23) St. 507/2 -------- NE b 10
24) St. 507/3 -------- NE c 10
25) St. 507/4 -------- NE a 8
26) St. 507/5 -------- NE b 8
27) St. 507/6 -------- NE c 8
28) 24V-Trafo oben ----- ISKRA c 8
29) 24V-Trafo unten ----- ISKRA c 6
30) V 501 ---------- QS a 22

31) V 501 ---------- ISKRA a 10
32) R 501 ---------- ISKRA c 12
33) R 501 ---------- ISKRA c 10
34) C 502 ---------- QS c 4
35) YAG Trigger -------- ISKRA c 26
36) YAG ---------- ISKRA a 32
37) YAG ---------- ISKRA c 18
38) YAG ---------- ISKRA c 20
39) ISKRA c 2 --------- QS a 14
40) ISKRA c 4 --------- QS a 2
41) ISKRA a 2 --------- QS a 4
42) ISKRA a 4 --------- QS a 12



Alle Dioden 1N4148

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Gepr.	18.11.65	
Norm.		

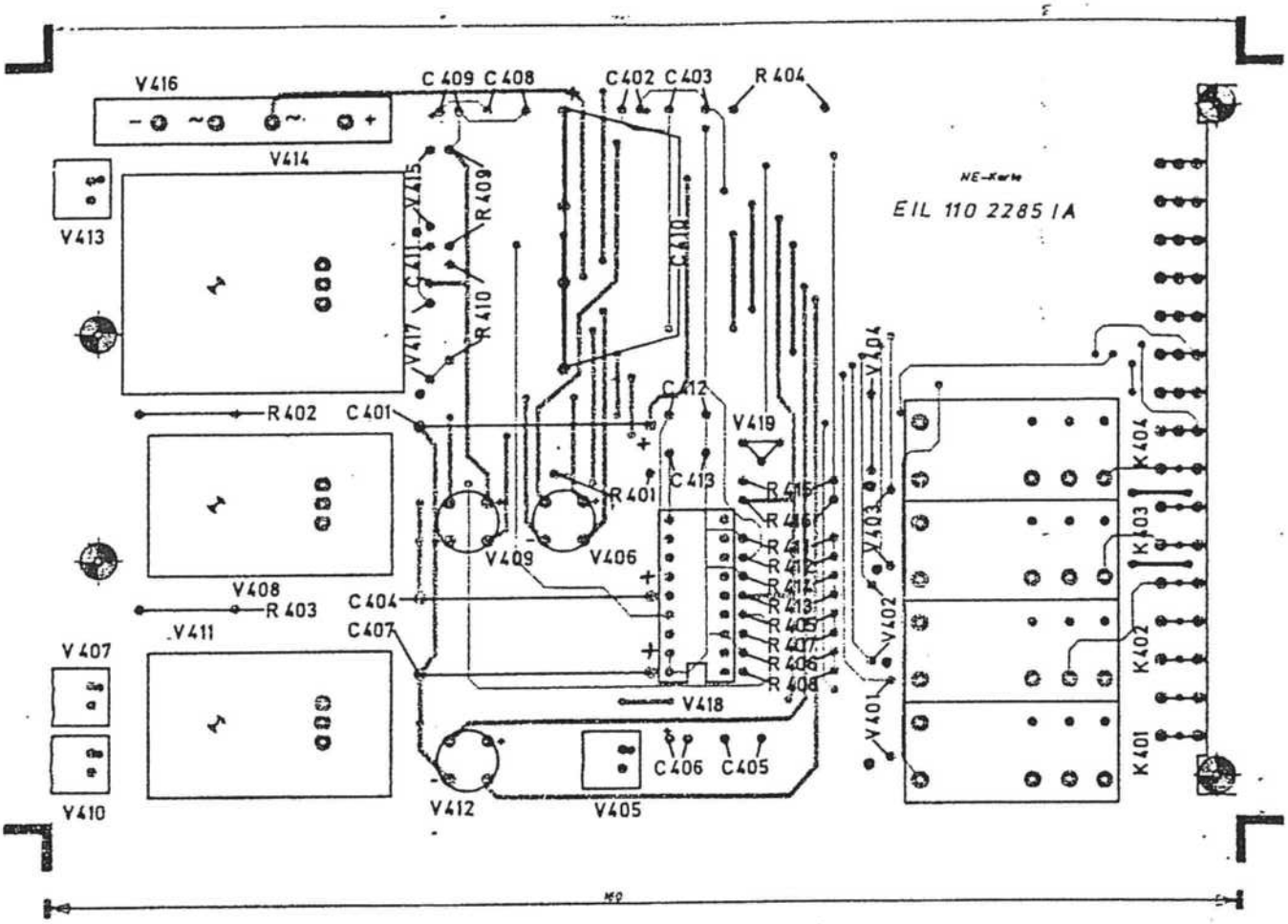
Meditec
Meditec
Obere Bergstraße 3
8501 Heroldsberg

NE-Karte:
Schaltbild

EIL 310 2426

Maßstab /

12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C 402 C 403
R 404
V414
V413
V415
R 409
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C 410
V417
R 410
NE-Karte
EIL 110 2285 IA
V104
C 412
R 402
C 401
V419
K 404
R 401
C 413
R 415
R 416
V403
K 403
V409
V406
V408
R 403
C 404
R 412
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R 405
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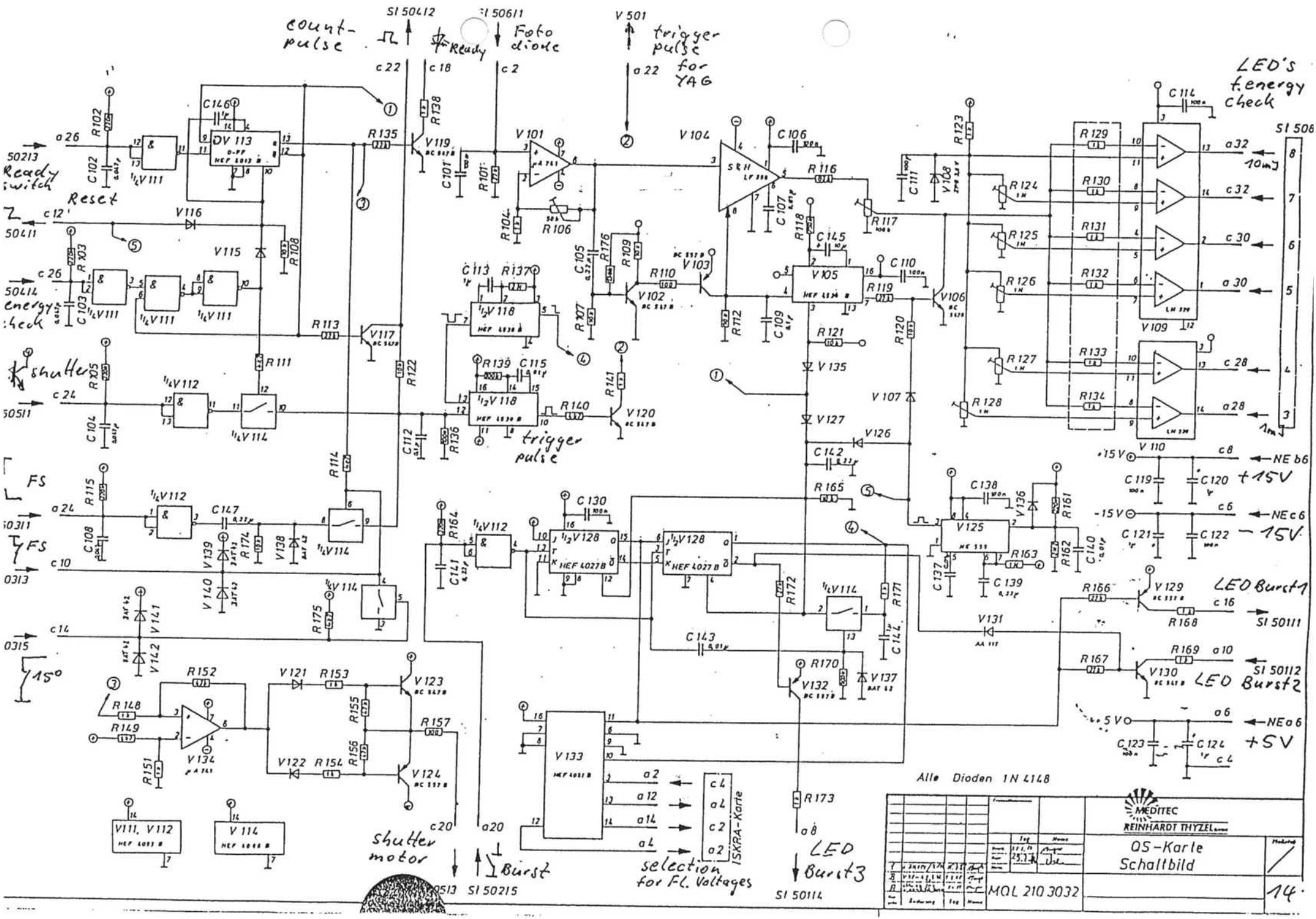
count-pulse
Ready
Foto diode
trigger pulse for YAG
LED's f. energy check
Ready switch
Reset
energy check
shutter
trigger pulse
FS
FS
15°
shutter motor
Burst
selection for FL. Voltages
ISKRA-Karte
LED Burst3
LED Burst1
LED Burst2
+15V
-15V
+5V
Alle Dioden 1N 4148
MEDITEC
REINHARDT THYZEL
OS-Karte
Schaltbild
MQL 210 3032
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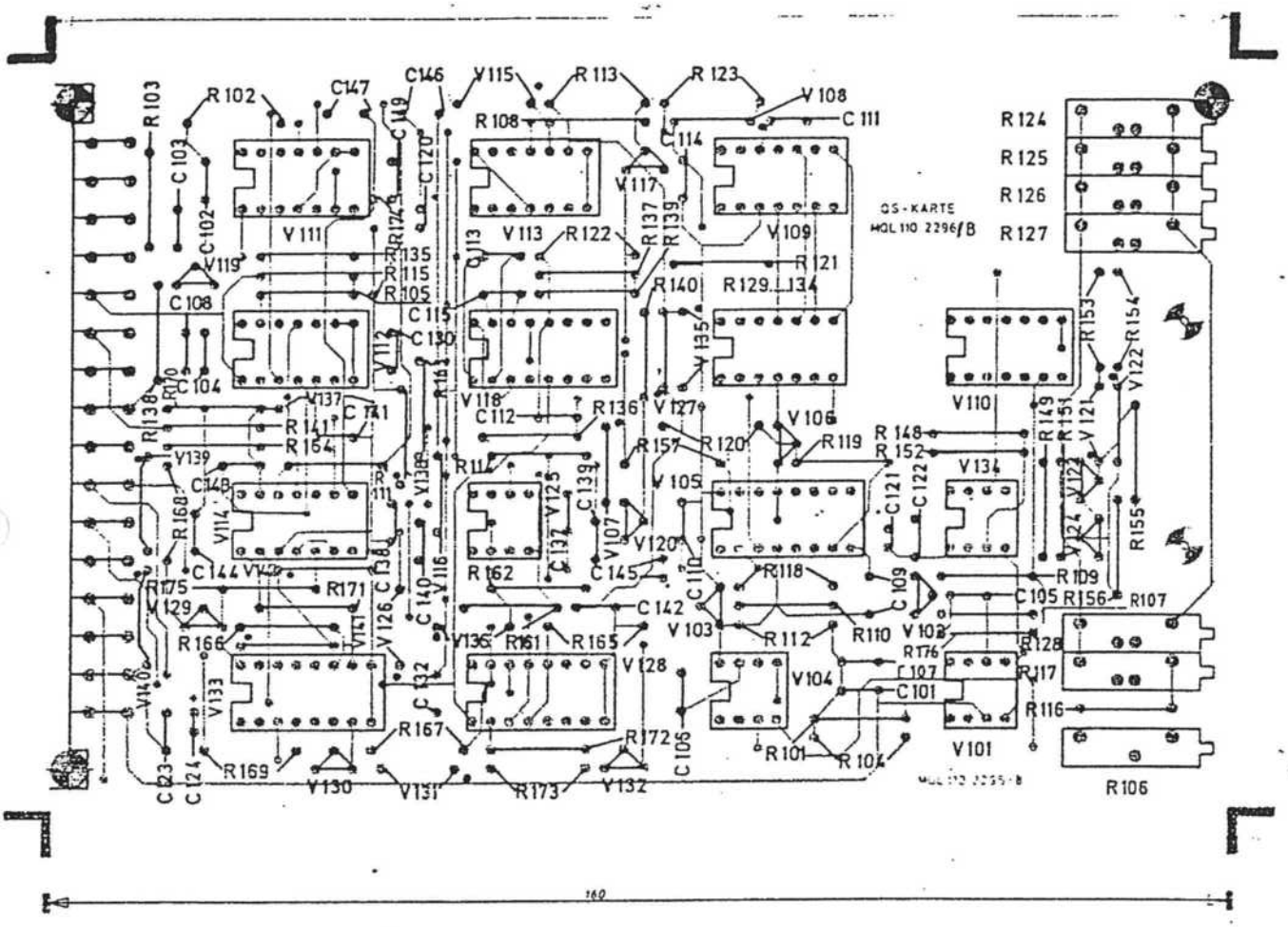
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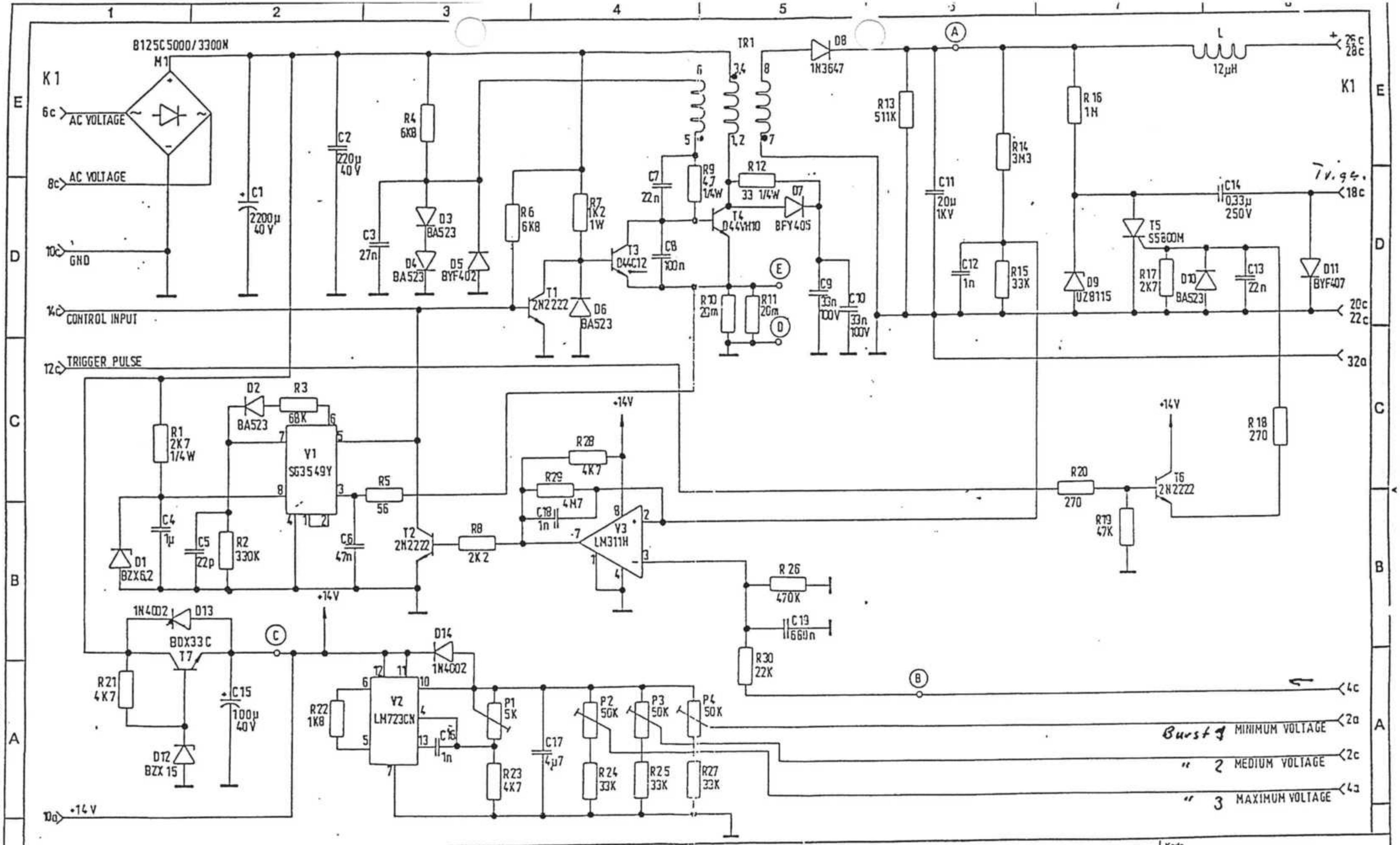

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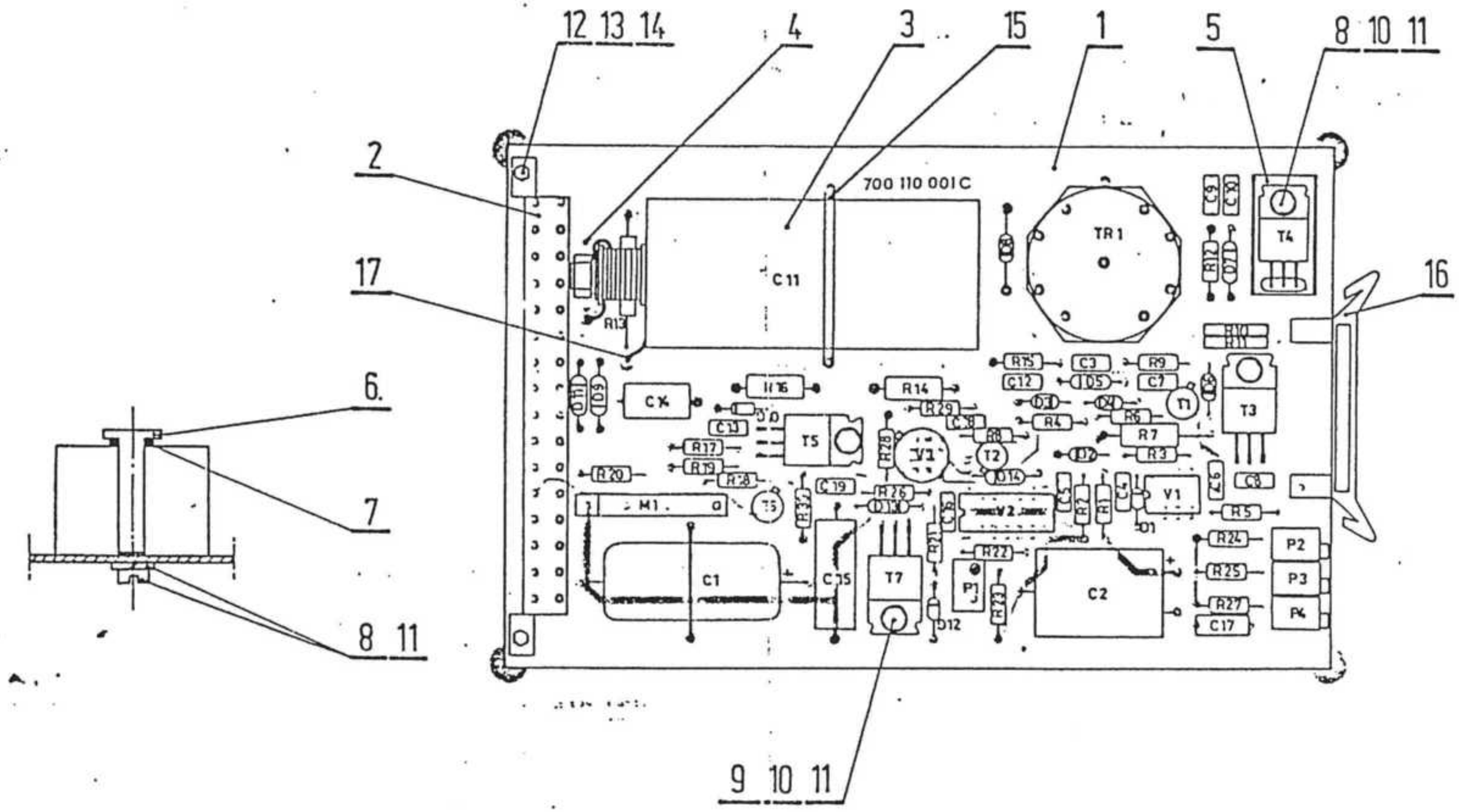
Konstr.	NAHTIGAL	Izdaja	1	2					Pripadnost
Projekt.		Znak	NR	NI			Iskra Center za elektrooptiko Ljubljana		700 110 000
Pregled.	MERCINA	St. obv.	L-1001						
St. stand.		Datum	19.2.86	12.3.88				Izdelek YAG 02	Merilo / List / Strani / Arhiv
Tehnolog		Podpis							

A-b



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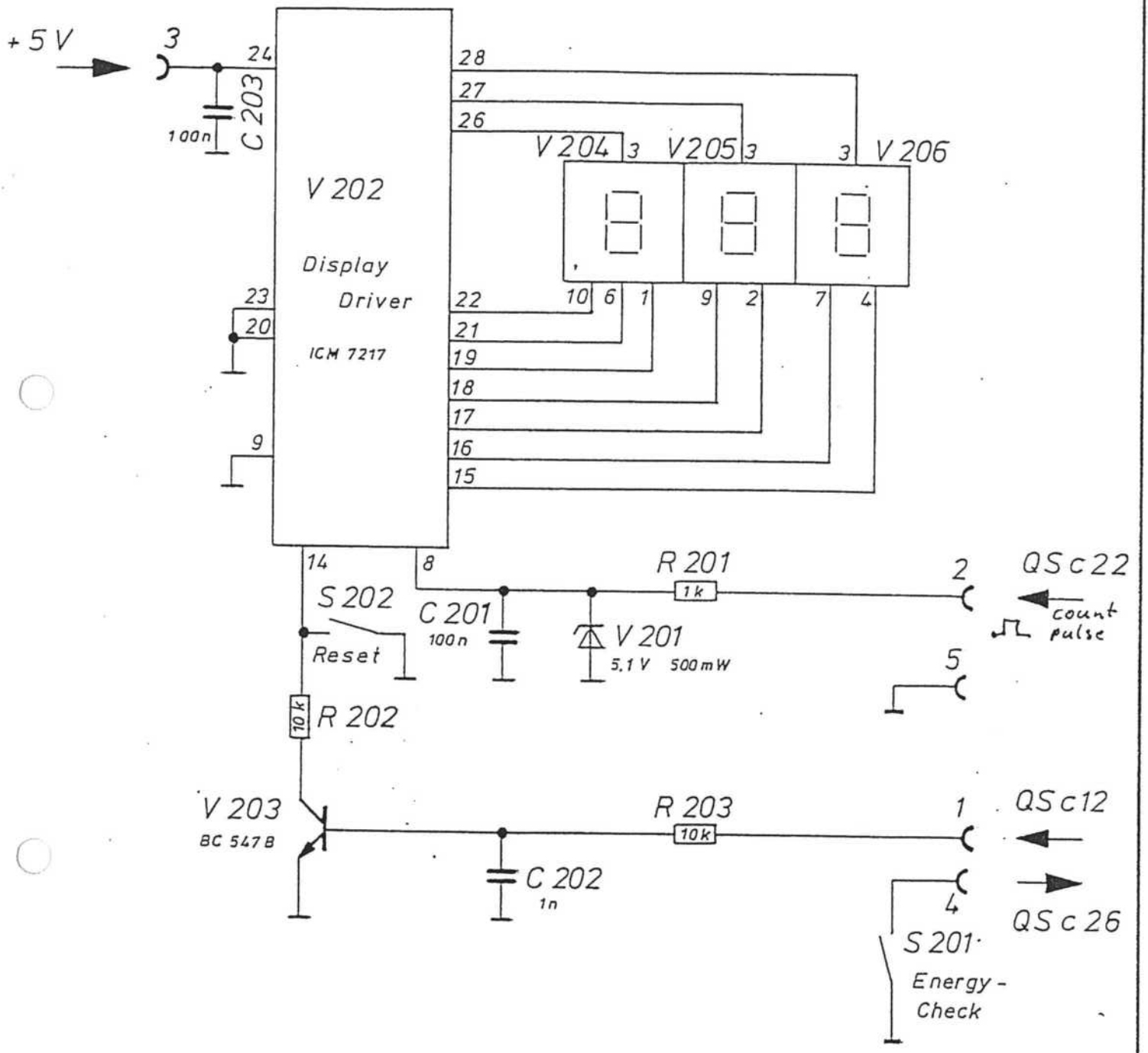
Pregled. A MERCINA	Zmik H R				Pripadnost: 700 100 000
St. stand.	St. obr. L-100				Merilo 1:1
Tehnolog	Datum 17.1.86				List / Stran / Arhiv 17
	Podpis				Izdelek



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		Norm.			
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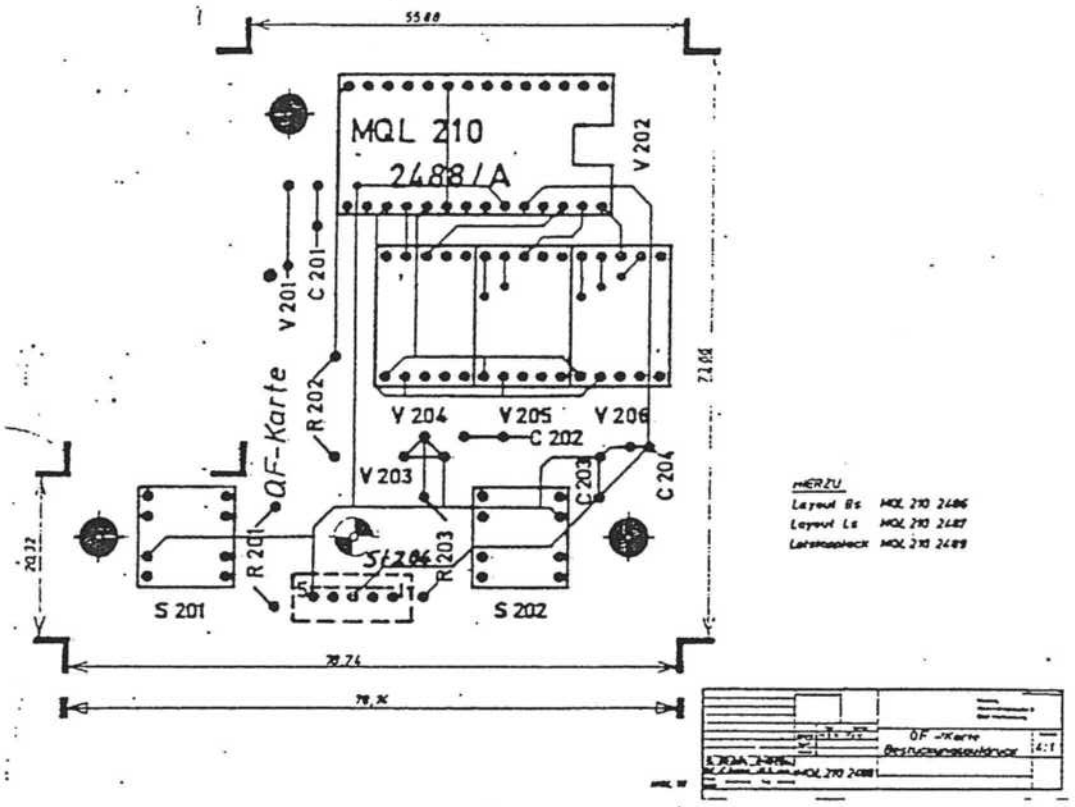
1QL 10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S 206
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MERZU
Layout Bs MQL 210 2486
Layout Ls MQL 210 2487
Lötstopplack MQL 210 2489
QF-Karte
Bestückungsseite
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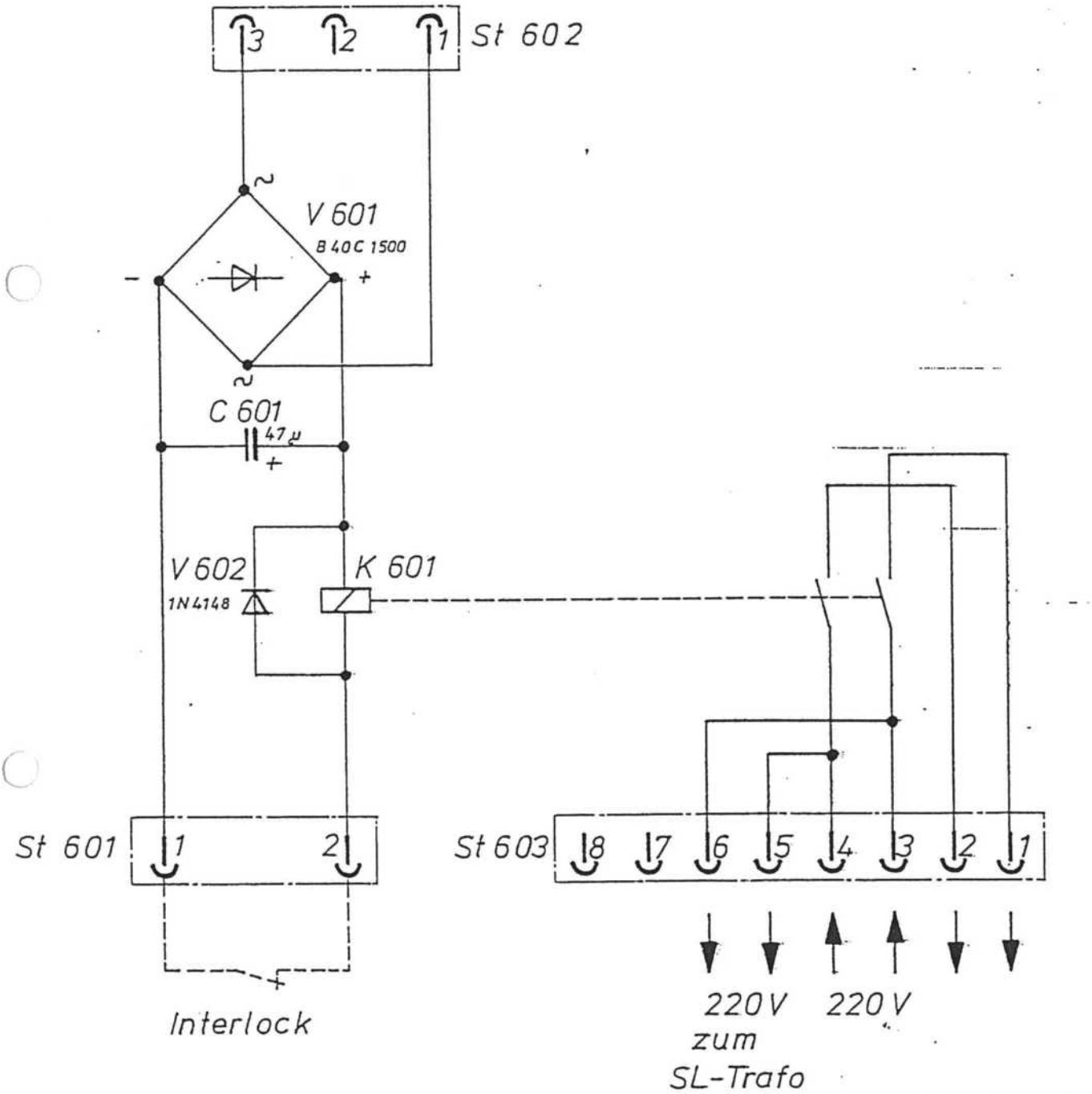
Spaltlampentrafo

6V ~ 0V



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1QL
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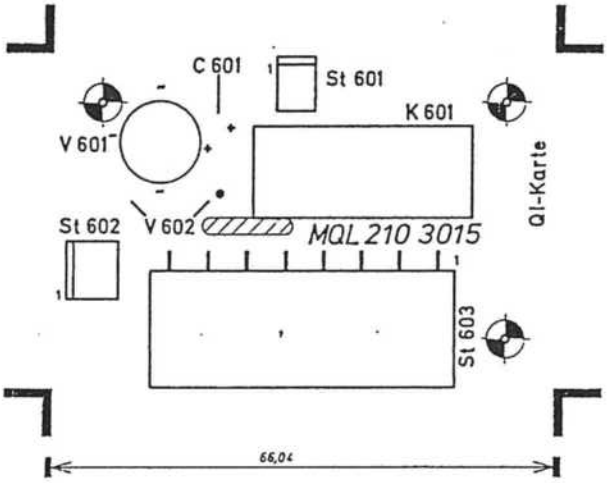

HIERZU:
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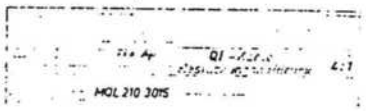
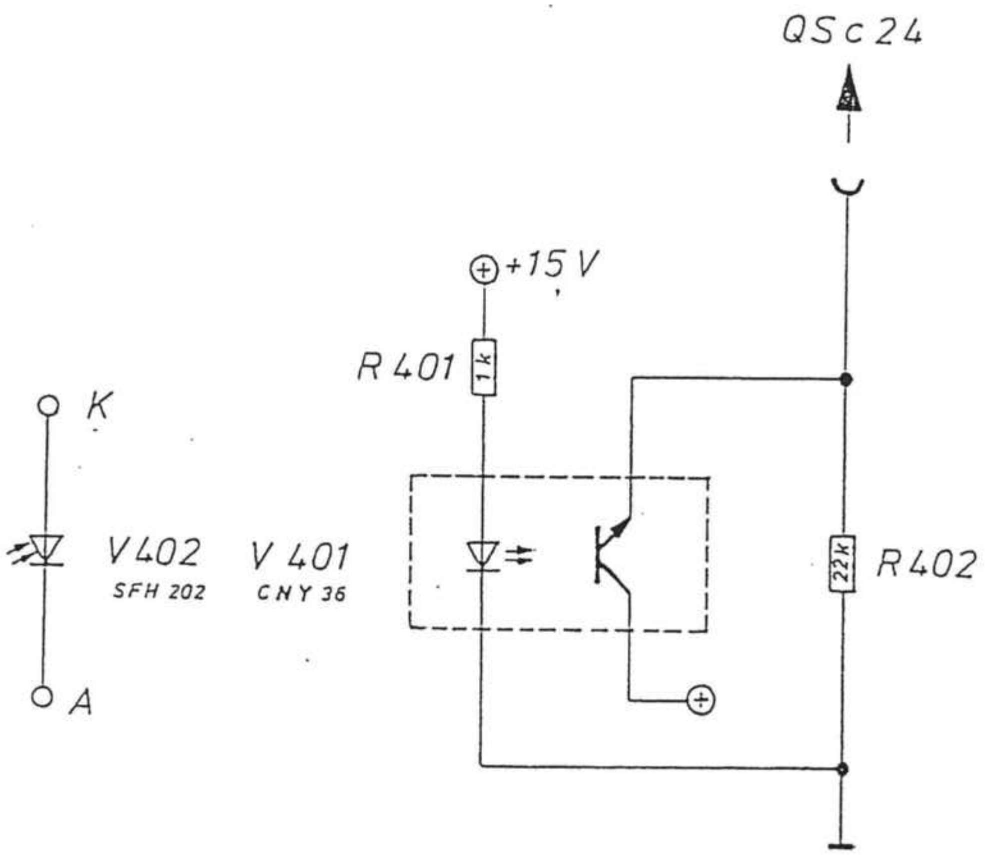
Leitstopplack MQL 210 3016





Freimaßtoleranzen			MEDITEC REINHARDT THYZEL GmbH	Obere Bergstraße 3 8501 Heroldsberg	
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Bearb.	16.5.86	Metzger			
Gepr.					
Norm.					
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MQL
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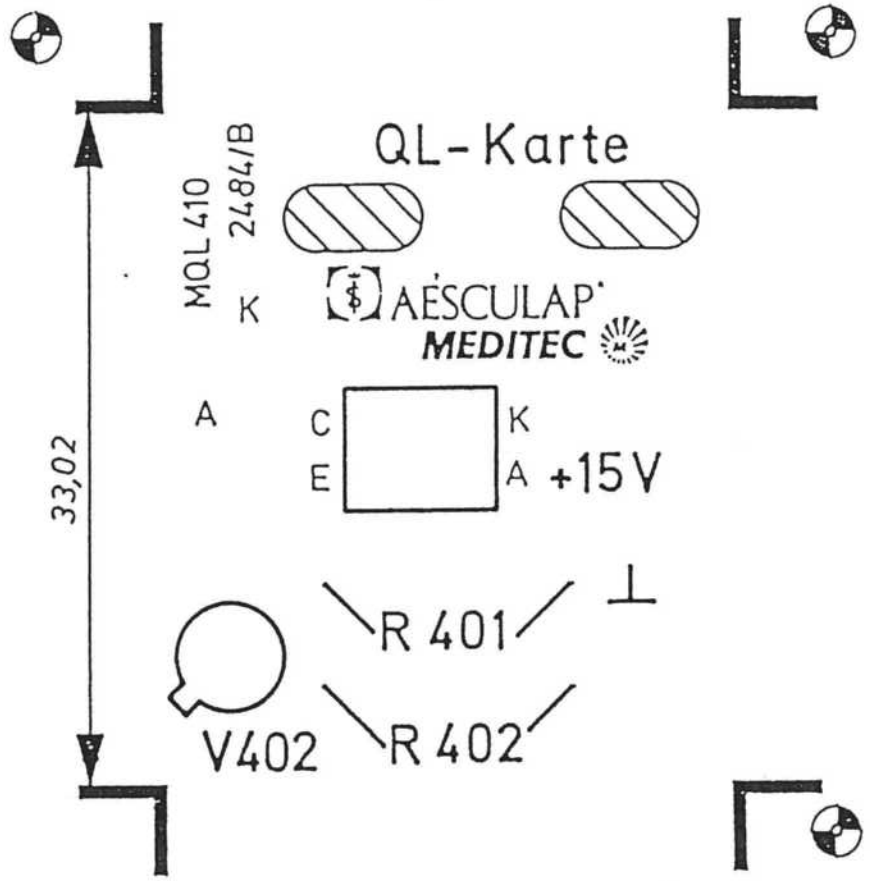

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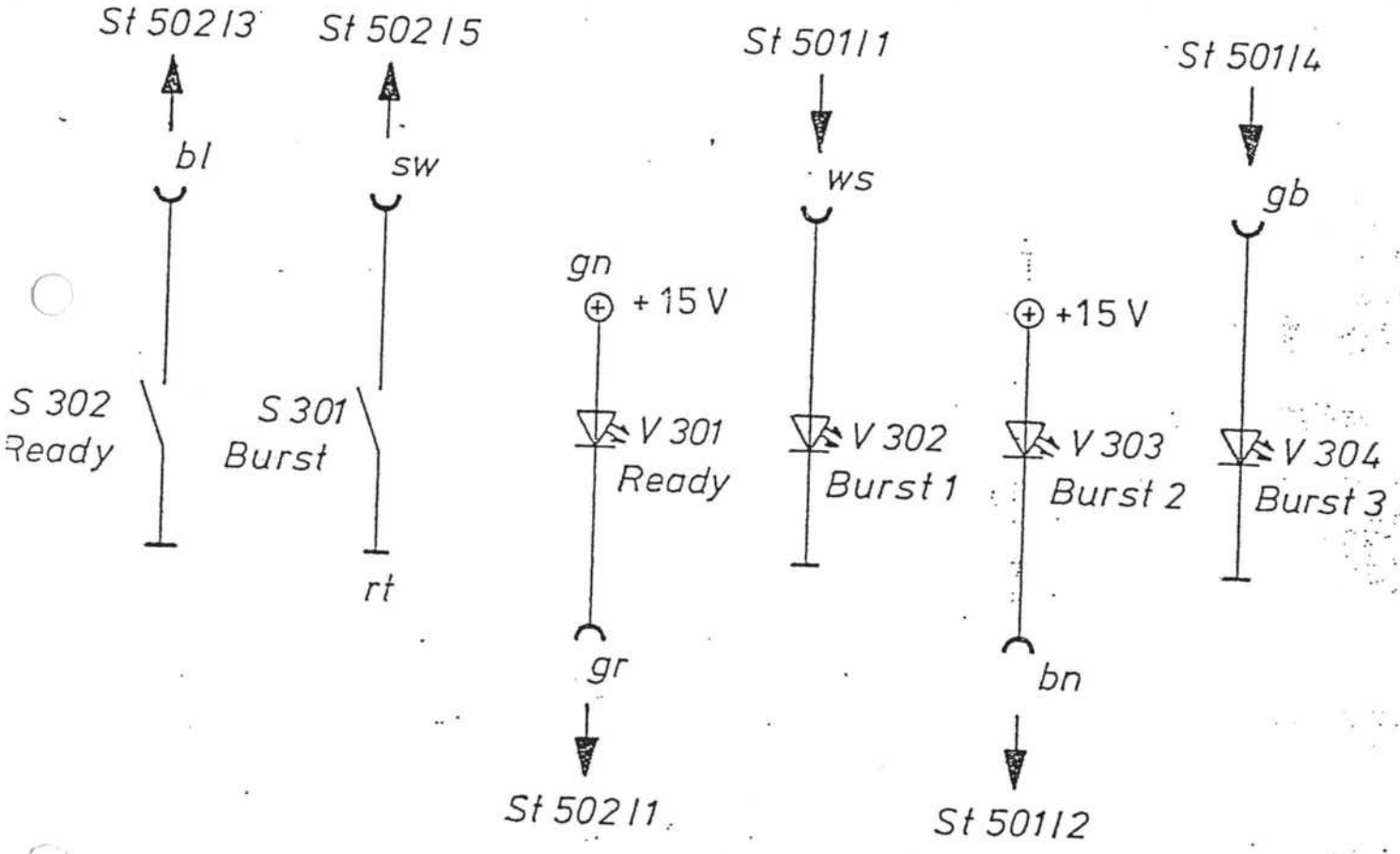
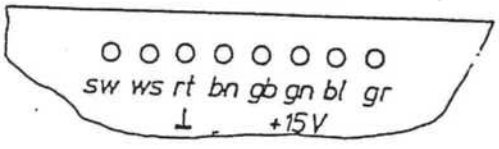
Lötstopplack MQL 410 2485 / B





Sicht auf Bestückungsseite

		Freimaßtoleranzen		Meditec Meditec Obere Bergstraße 3 8501 Heroldsberg	
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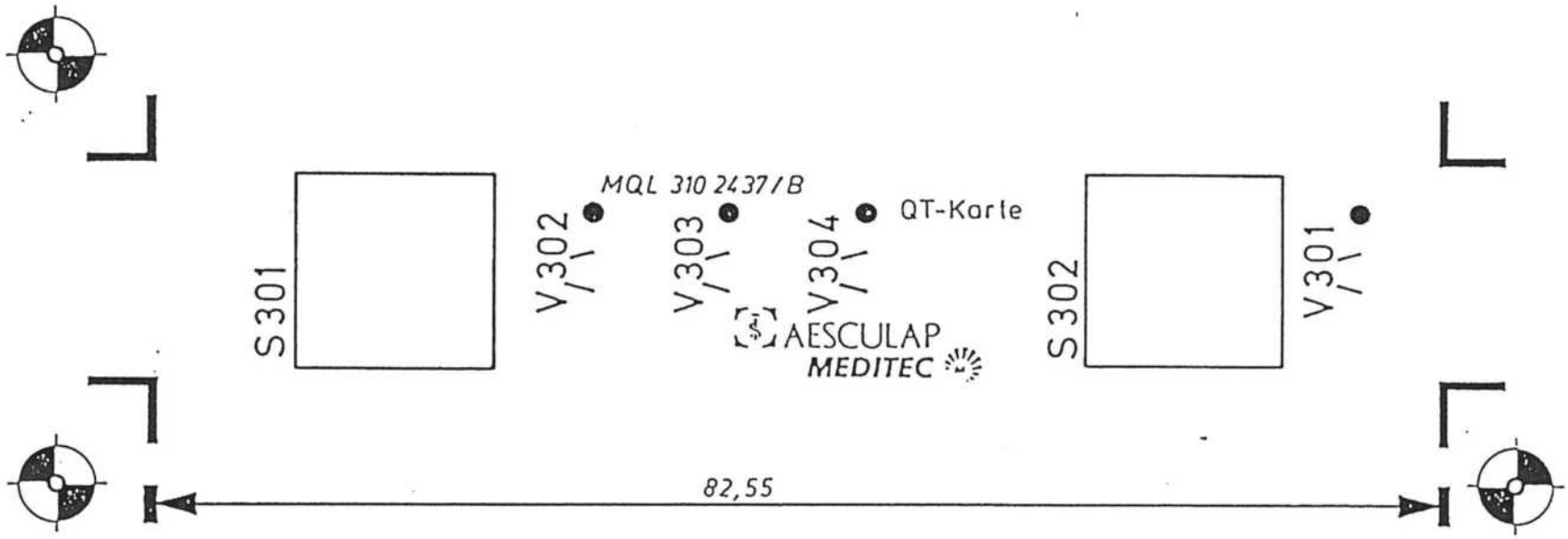
		Gepr.	19.7.86		
		Norm.			
A	Anstatt		24.3.88 Mayer	MQL 410 3031	2.4



HIERZU :

Layout Ls MQL 310 2436 / B

Lötstopplack MQL 310 2438 / B