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RE: After sales service
Betrifft: Service Reparaturanleitung
Concerne : service technique

Service Manual

Manuel de service

Schematic diagrams and part list

Schémas et liste des pièces

Free Style / Ranger

06.2004

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Safety notice

IMPORTANT !

The interior of the generator or compact contain components carrying dangerous levels of electric charge, even though the unit has been disconnected from the mains or battery supply.

ALWAYS TAKE THE FOLLOWING PRECAUTIONS:

1. **Always disconnect it from mains supply or battery supply, and discharge the unit before (for generator) and after (for compact) removing the outer cover or housing. This is best achieved with a suitable discharge resistor (code 11931 fior220V, 11930 for 110V) and adapter cable (code 11095) fitted to a lamp head plug which may be inserted into a lamp head outlet for generator only. For compact connect the discharge resistor in the flash tube terminals.**

2. **Take care when opening a generator. Always start by connecting a voltmeter across the storage capacitors, as capacitor drainage may not have occurred.**

ACHTUNG GEFAHR !

Auch wenn die Netzspannungsversorgung oder die Batterie Box nicht im Generator steckt, können im Innern des Gerätes noch gefährliche elektrische Spannungen vorhanden sein.

ACHTUNG GEFAEHRLICHE HOCHSPANNUNG:

1. **Bevor Sie ein Blitzgerät öffnen, entfernen Sie den Netzstecker und die Batterie Box und entladen Sie zuerst die Kondensatoren mittels Entladewiderstand (Best.Nr. 11931) und Adapter Kabel für Ranger / Free Style(Best. Nr. 11095).**

2. **Vorsicht beim Öffnen eines Blitzgerätes. Verbinden Sie sofort ein Voltmeter mit den Kondensatoren, denn diese könnten nicht entladen sein.**

ATTENTION DANGER!

Des tensions électriques dangereuses restent présentes dans les condensateurs, même lorsque l'appareil est déconnecté de son mode d'alimentation (secteur 120/230V ou batterie dans le cas des générateurs autonomes « Free Style et Ranger »).

PRUDENCE! LORS DE L'OUVERTURE D'UN GÉNÉRATEUR OU COMPACT.

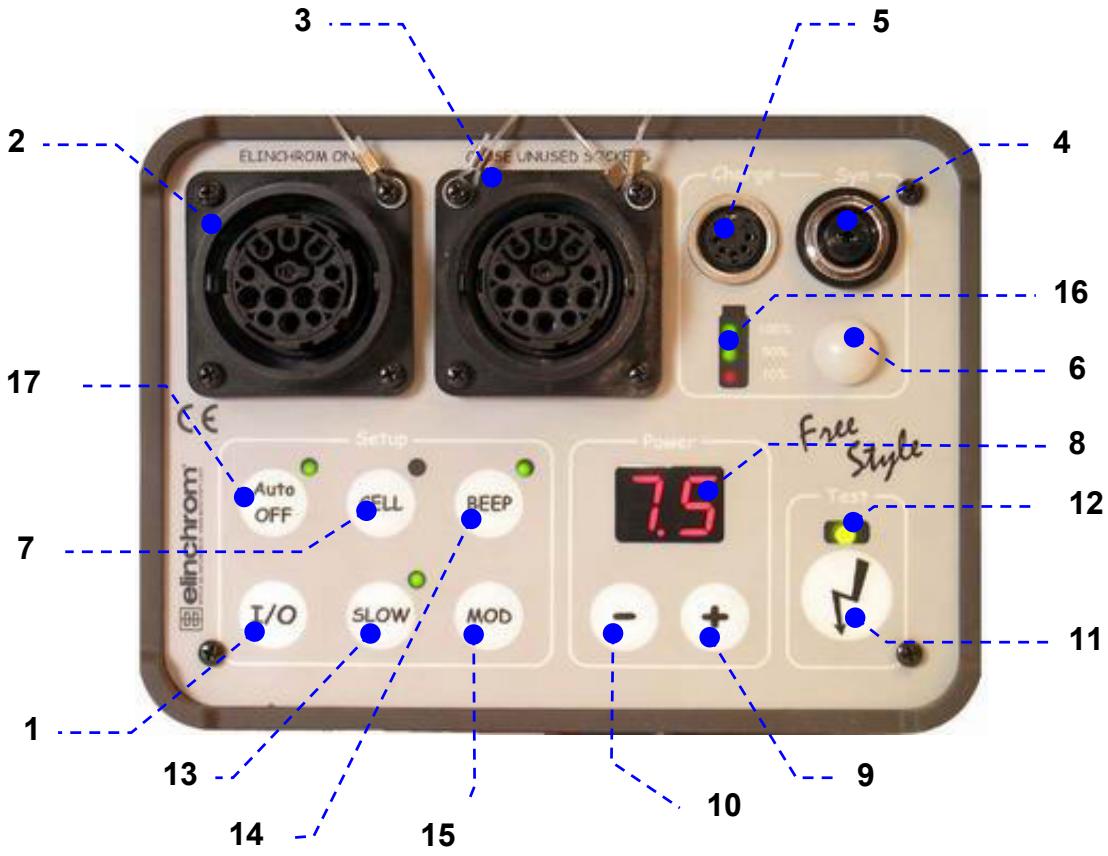
Pour un flash fonctionnant sur le secteur, la première action sera de retirer la fiche d'alimentation.
Avant d'ouvrir un générateur déchargez-le avec un dispositif approprié, (n° de code 11931, version avec une lampe 230V) ou (n° de code 11930 version avec une lampe 120V).

Pour un compact « Style », il faut retirer une partie du boîtier plastique (1/2 coque droite) et ensuite déchargez-le en raccordant le dispositif 11931 (ou une résistance de puissance appropriée) sur les tiges ou les éléments de fixation du tube flash.

Pour un flash fonctionnant sur batterie « Free Style et Ranger »
Avant de l'ouvrir, éjecter la batterie de l'appareil et décharger l'unité en utilisant l'adaptateur 11095 et le dispositif de décharge 11931 ou (11930 version 120V).

Avant toute intervention, vérifier avec un voltmètre la tension aux bornes des condensateurs. La décharge peut ne pas avoir eu lieu, la rupture d'un élément de sécurité ou d'un conducteur peut en être la cause.

Front panel



Operating instructions

1. Check that the battery box is locked correct.
2. Switch unit power (1) OFF (Power display lights off)
3. Connect ELINCHROM lamp heads and lock connectors.
4. Connect Synchro cable to sockets (4)
5. Switch unit on (1)
6. Select Flash power (8 or 9)
7. Check and change configuration buttons, Slave (7), Slow charge mode (13), Audio (14) and Auto Off (17)
8. The green Light in open flash button (12) will light up, indication that the unit is ready for operation.

According to the safety regulation: We draw your attention to the fact that this equipment should be used only in a dry environment; it must be protected from dripping water and from extremely dusty conditions.

INDEX

1. On/Off switch
2. Outlet A (Elinchrom Equipment only)
3. Outlet B (Elinchrom Equipment only)
4. Synchro-socket Amphenol
5. Charge socket
6. Photocell receptor
7. Slave cell switch on/off with LED indicator
8. Digital power display and charge/discharge indicator
9. + Power adjustment in 1/10 f-stops, with ADF
10. - Power adjustment in 1/10 f-stops, with ADF
11. Open-flash
12. Ready indicator
13. Slow charge mode with indicator
14. Acoustic recharging signal (Beep) with indicator
15. Modelling lamp switch (on/off free or prop)
16. Battery Indicator (green: 100%, 50% and red: 10%)
17. Automatic OFF Timer (5 minutes) on/off with indicator

Trouble Seeking Guide for Free Style / Ranger

Important Note

ALWAYS DISCHARGE UNIT BEFORE COMMENCING WORK !
(dèchargez l´appareil avant de commencer la travail)

Known problems

Here is a small list of modifications or solutions with Free Style / Ranger troubles.

1. **A-Head or Ring flash will not fire on low or minimum power**

   ➔ go to **Modifications**

2. **A full recharged battery does not work more than 50 flashes at full power**

   The battery is older than 3 years, the batteries capacity gets worse and worse. Handle the battery always with care and recharge the battery every 6 week to get the maximum battery life and capacity out of it.
   The battery life is up of the use, the temperature, the recharge interval and others conditions. The maximum life of a new battery is approx. 5 years and max. 500 to 2000 recharge cycles.

   ➔ **Replace the battery!**

Error Messages

This error messages are shown by the unit display if an error is detected by the units Micro-Controller.

Error Message Display Value	Description	Possible faults	Note
E.r	Unit switched OFF automatically after Error display and acoustic sound	• Over temperature	1
E.r	Unit shows Error display and acoustic sound, but does not switch OFF	• Over voltage	2
E.r	Unit directly switched OFF without (or very short) Error display and acoustic sound	• Defect Battery	3

Note 1: The unit is temperature controlled. When the internal temperature is higher than 80° C the unit switched automatic after an error message in the power display (E.r) and an acoustic signal (if BEEP is switched on) off. If the internal temperature is lower than 60° C the unit will start working.

Note 2: The capacitor charging of the flash capacitors is controlled and will switch into an error mode if over voltage is detected. The unit disables all power functions and shows Error display (E.r) and an acoustic sound (3x beeps).

Note 3: If the unit is switched ON and switched OFF automatically after some seconds without showing an Error or an Error acoustic sound, check and recharge the battery. If the problem is not solved after recharging try another the battery box or replace the battery.

Repairing Help

1. Fault tracing for blown battery fuse

- Wrong value fuse => 30A (green)
- Power board is part of **« exchange service »**

2. Adjust maximum charge current

- **Adjustment not necessary by service!**
- Do not change the position of the potentiometer P400, locked by glue!
- The maximum charge current out of the 7Ah battery is approx. 26 Amps.

3. To trace for a faulty photo flash capacitor

Check the following with power setting to minimum.
Use two voltmeters, one for group A and one for the group B of the flash capacitors

A. Place the common probe on the neutral point of test on the PB3, or on the neutral point on the PB4 and the other probe on the ½ voltage test point.
B. Place the other Voltmeter on the positive test point on the PB3, and the other probe on the test point ½ voltage (common test point)

Briefly switch the unit "ON" and observe both Voltmeter readings. One side of the charge capacitors will rise, the other will not. This test will determine on which side the faulty component can be found.

4. Replacing a Photo flash capacitor

- Always discharge the unit before commencing work!
- Check that there is no voltage across the new capacitors!

WHEN A PHOTO FLASH CAPACITOR IS BEING REPLACED. IT MUST BE FORMATED

3.1 Formation flash capacitors


clockwise

- Connect two voltmeters for each capacitor group (see point 2. above)
- Set the unit to minimum power
- Flash five times and check capacitor group voltage
- Increase power 1 f-stop higher, flash 5 times and wait 5 minutes
- Increase power 1 f-stop more, flash 5 times again and wait 5 minutes
- Compare flash voltage between group A and B if the difference is smaller than 10V
- If the voltage difference is higher repeat formation.

3.2 Adjust flash voltage


counter clockwise

- Connect two voltmeters for each capacitor group (see point 2. above)
- Set power to minimum
- Turn P401 clockwise to maximum (Over voltage protection)
- Turn P402 counter clockwise to minimum (HTD)
- Set power to maximum
- Adjust P402 clockwise to maximum flash voltage HTD=690V (HTD=voltmeter values A+B)
- The maximum flash voltage of each capacitor group must be smaller than 360V! If it is higher repeat step 3.1.

3.3 Adjust Over voltage protection

- Connect two voltmeters for each capacitor group (see point 2. above)
- Set power to minimum
- Turn P401 clockwise to maximum
- Set power to maximum (only if flash voltage is adjusted before => see step 3.2 above)
- Check if capacitor group voltage A or B is lower than 360V (if not, flash voltage is not adjusted or capacitors are not reformed => see step 3.1)
- Adjust capacitor group voltage A+ B = HTD to maximum 720V with P402 (HTD = 2x360V=720V)
- Adjust P401 counter clockwise until "Er" is shown in the unit display => ERROR MODE = Over voltage detection

- Switch unit off
- Turn P402 counter clockwise to minimum
- Switch unit on and adjust P402 to a maximum flash voltage HTD=690V (HTD=voltmeter values A+B)

5. Modelling lamp circuitry does not function

- Modelling lamp fuse blown (quick acting) ➔ check fuse on Head and on Free Style / Ranger inside Battery drawer

6. Fault tracing for firing faults

- Check connected Head (cracked flashtube)
- Power board: Trigger voltage at capacitors C405 and C406 (0.22µF/400V)
- Flash board: check Trigger Booster diodes D500-D505 (short circuit)
- Check READY LED (if off triggering flash tube is not possible)

CHECK UPGRADE MODIFICATION ON THE POWER BOARD!

7. Open Free Style / Ranger unit

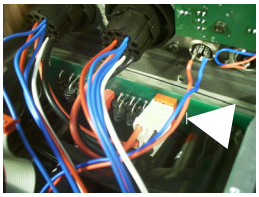
Before you start remove battery box and discharge flash capacitors (see SAFTY NOTICE)

1

2

3

4



5

1. Open strap holder screws left and right housing side (2x on each side)
2. Open front panel screws (5x)
3. Disconnect front panel flat cable and lift module
4. Disconnect Outlet cables from flash and power board and remove front panel module
5. Lift Free Style housing

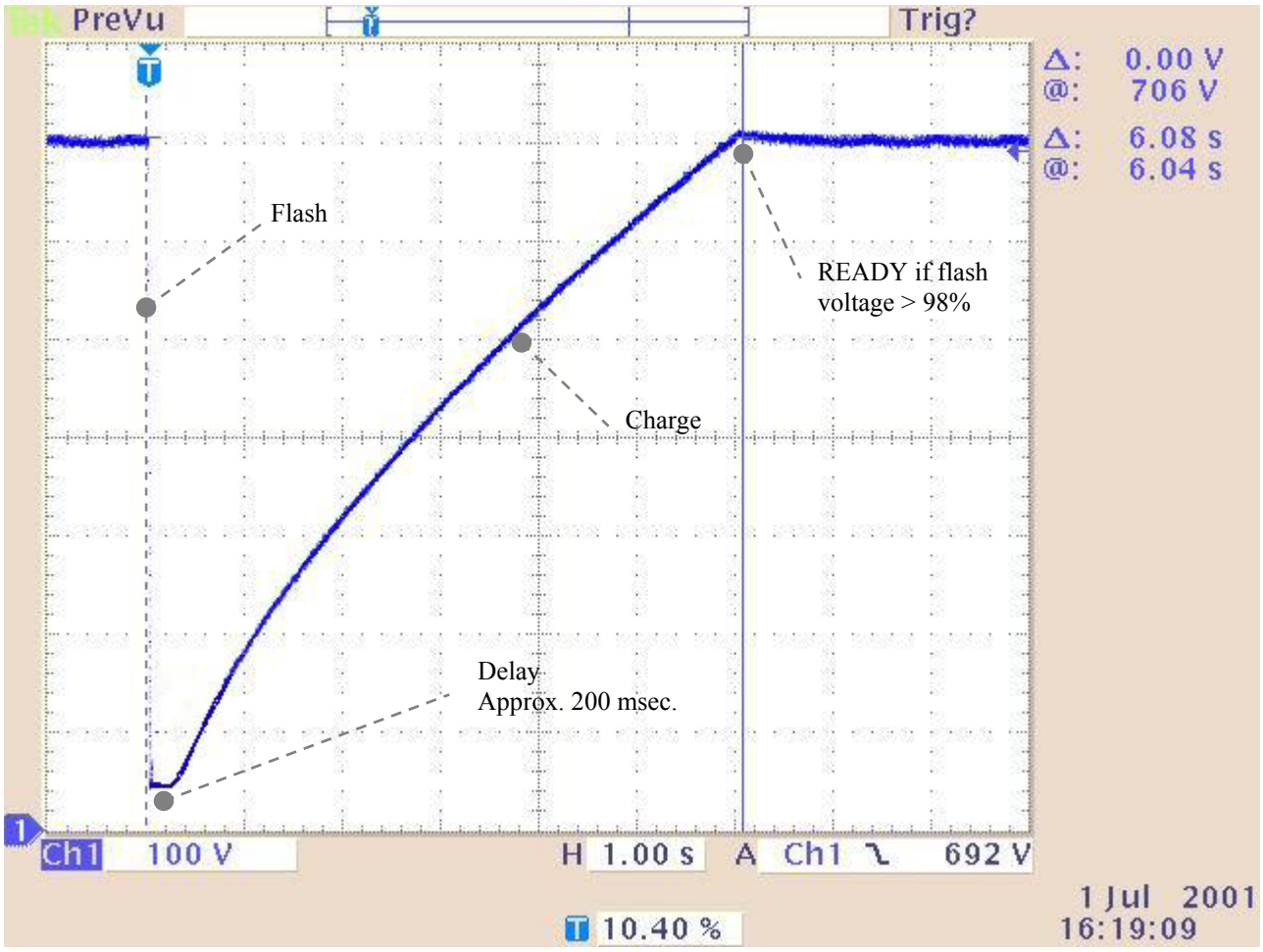
Special circuitry and Graphs

MOSFET charge circuitry

ATTENTION:
Measurement GND (-) is HIGH VOLTAGE

Flash voltage HTD (Flash board)

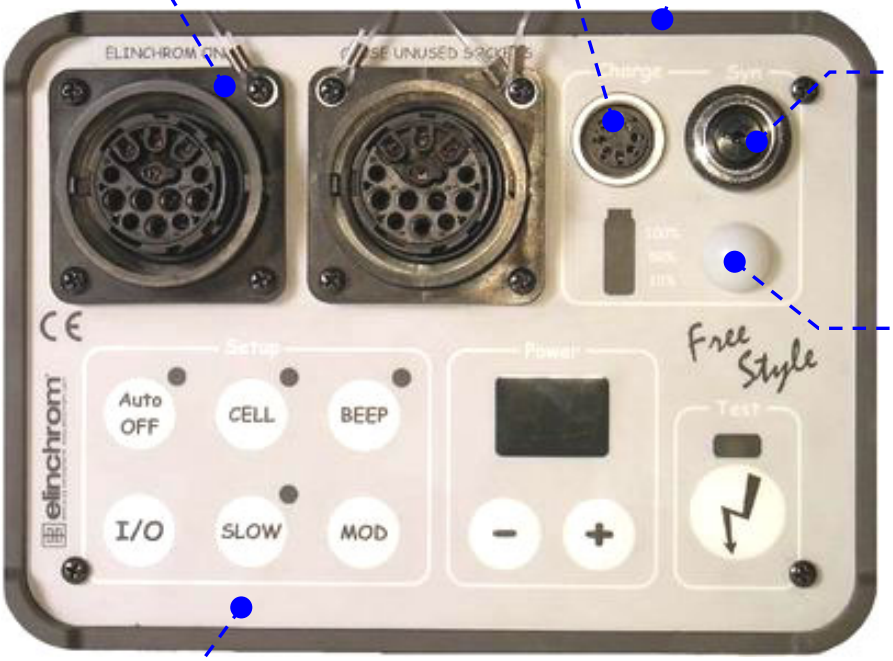
The Style RX series has a absolute stabile flash voltage and f-stop stability. The READY signal is generated only if the flash voltage is greater than 98% of the f-stop setting.



Mechanics

Generator

Front panel view Free Style / Ranger



Charge socket
complete with cable
225.013
Charge socket cap
225.021

All round protector
225.001

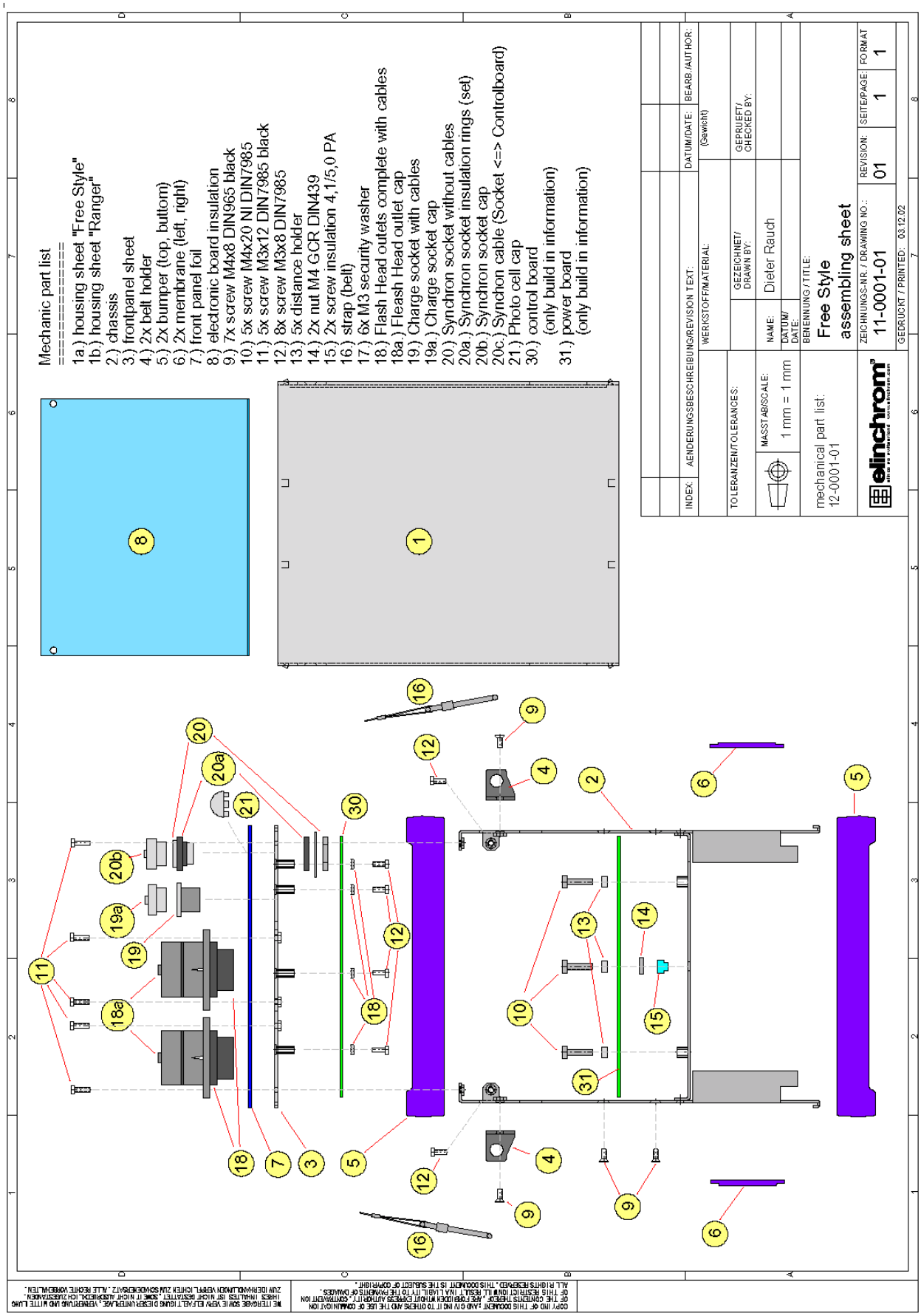
Outlet sockets
Complete with cable
225.011
Outlet cap
225.017

Synchro Amphenol
complete with cable
12076
Amphenol cap
225.031

Photo Cell Cap
204.115

Front Panel sheet
225.026C
Front panel foil
225.006

Explosion drawing

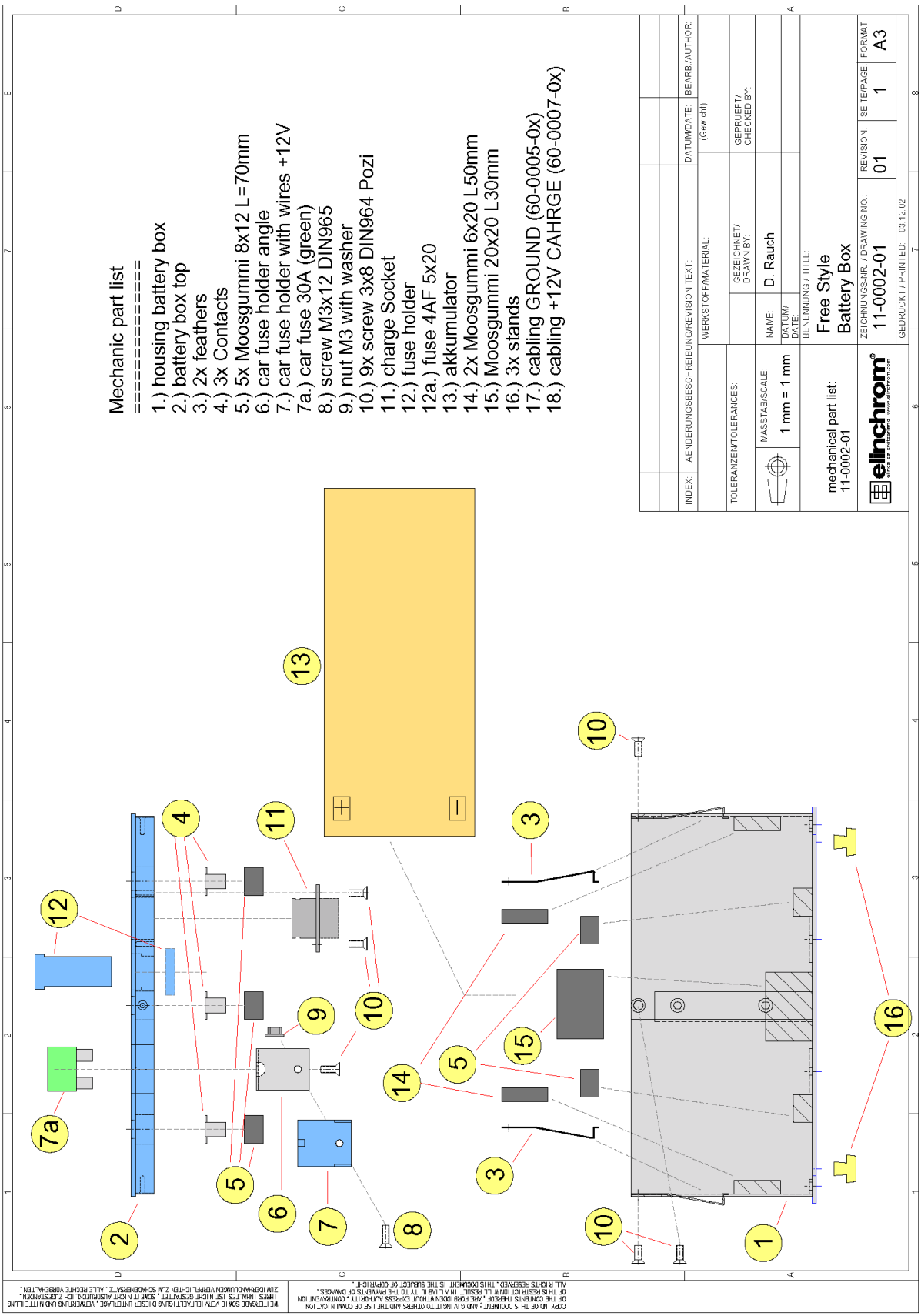


Mechanical part list

Pos.	Description	Used	ELINCA_NO
1a	housing sheet "Free Style"	1	225.026B1 "Free Style"
1b	housing sheet "Ranger"	1	225.026B2 "Ranger"
2	chassis complete	1	225.026A
3	front panel sheet	1	225.026C
4	Belt holder	2	225.026D
5	bumper	2	225.001
6	membrane	2	225.002
7	front panel foil	1	225.006
8	electronic board insulation	1	225.008
9	screw M4x8 DIN965 black	7	211.887
10	screw M4x20 NI DIN7985	5	211.888
11	screw M3x12 DIN7985 black	11	211.886
12	screw M3x8 DIN7985	8	211.203
13	distance holder	5	209.138
14	nut M4 GCR DIN439	2	203.029
15	insulation 4,1/5,0 PA	2	204.142
16	strap (belt)	1	19289
17	M3 security washer	6	210.002
18	Flash Head outlets with cables	2	225.011
18a	Flash Head outlet cap	2	225.017
19	Charge socket with cables	1	225.013
19a	Charge socket cap	1	225.021
20	Synchron socket complete without cables	1	12076
20a	Synchron socket insulation rings (set)	1	14485
20b	Synchron socket cap	1	225.031
20c	Synchron cable (socket <=> Control board)	1	501.055
21	Photo cell cap	1	204.115

Battery Box

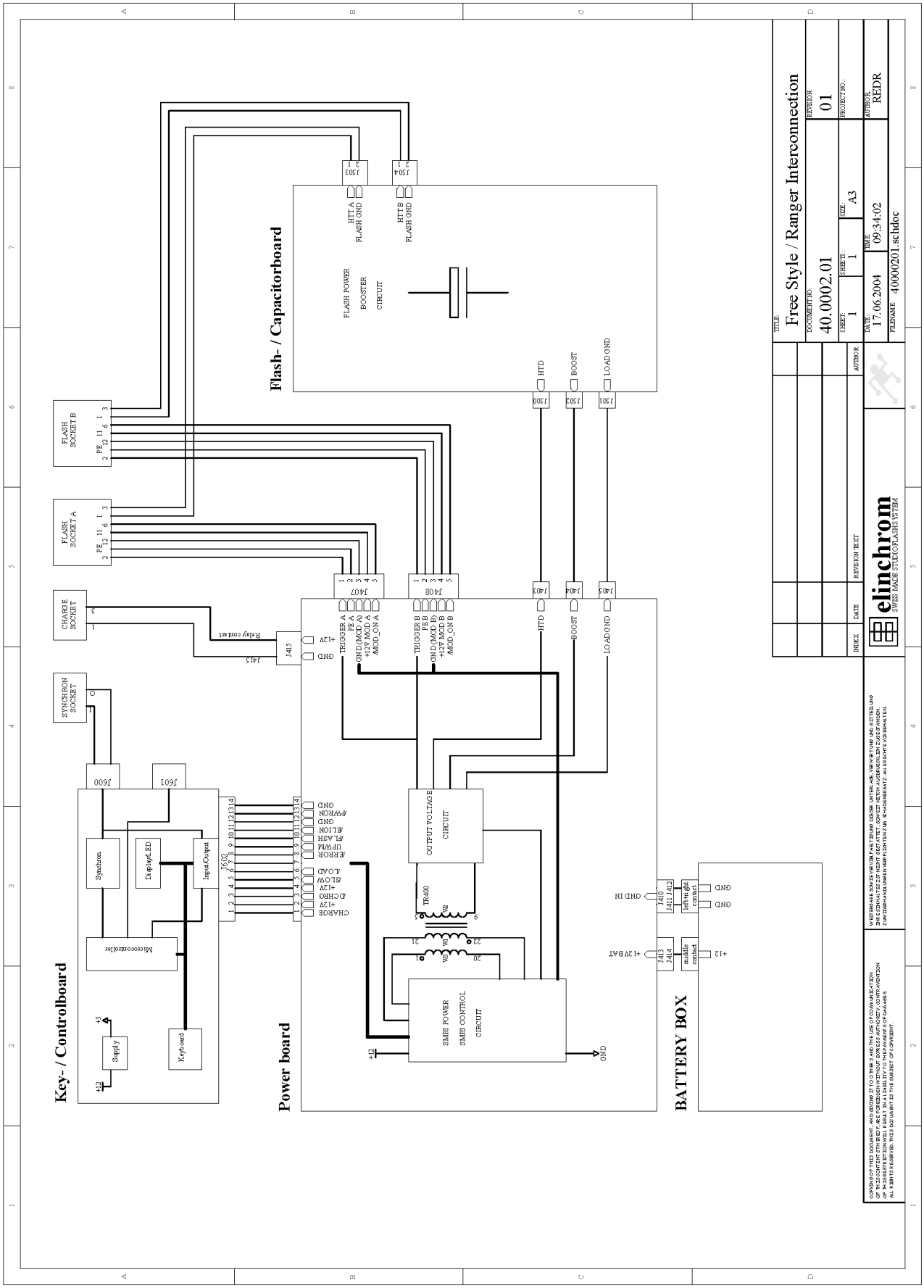
Explosion drawing



Mechanical part list

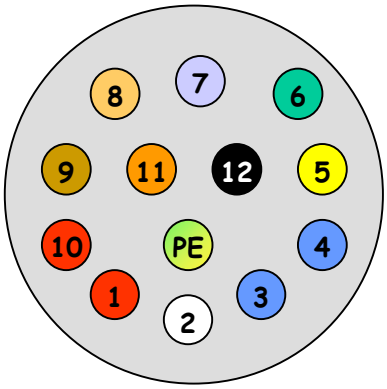
Pos.	Description	Used	ELINCA_NO
1	housing battery box	1	225.027
2	battery box top	1	225.009
3	feathers	2	225.029
4	Contacts	3	225.030
5	Foam 8x12 L=70mm	0,35 m	225.003
6	car fuse holder angle	1	225.028
7	car fuse holder with wires (+12V)	1	225.015
7a	car fuse 30A (green)	1	106.053
8	screw M3x12 DIN965	1	211.602
9	nut m3 with washer	1	203.031
10	screw 3x8 KA30x8	9	211.840
11	charge Socket	1	110.141
12	fuse holder	1	14.651
12a	fuse 4AF 5x20	1	19035.PC
13	Battery 12V 7Ah	1	225.007
14	foam 6x20 (2x L50mm)	0,1 m	225.004
15	foam 20x20 L30mm	0,03 m	225.005
16	stands	4	204.143
17	cabling GROUND (60-0005-0x)	1	225.014
18	cabling +12V CAHRGE (60-0007-0x)	1	225.016

Interconnection diagram



Cable Sockets

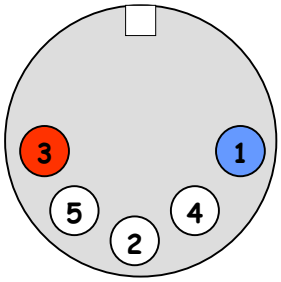
Round Outlet socket (12 pin + PE)



PE. Ground (=GND)
1. **+ Flash Power pos. pole**
2. **Trigger**
3. **– Flash Power neg. pole**
4. >do not connect<
5. >do not connect<
6. **Modelling On***
7. >do not connect<
8. >do not connect<
9. >do not connect<
10. >do not connect<
11. **+ 12VDC switched**
12. **GND**

*push button signal (low impulse will switch on modelling lamp)

Charge socket (5 pin)



1. **GND**
2. (not used)
3. **+ 12VDC (Charge in or supply out)**
4. (not used)
5. (not used)

Printed boards

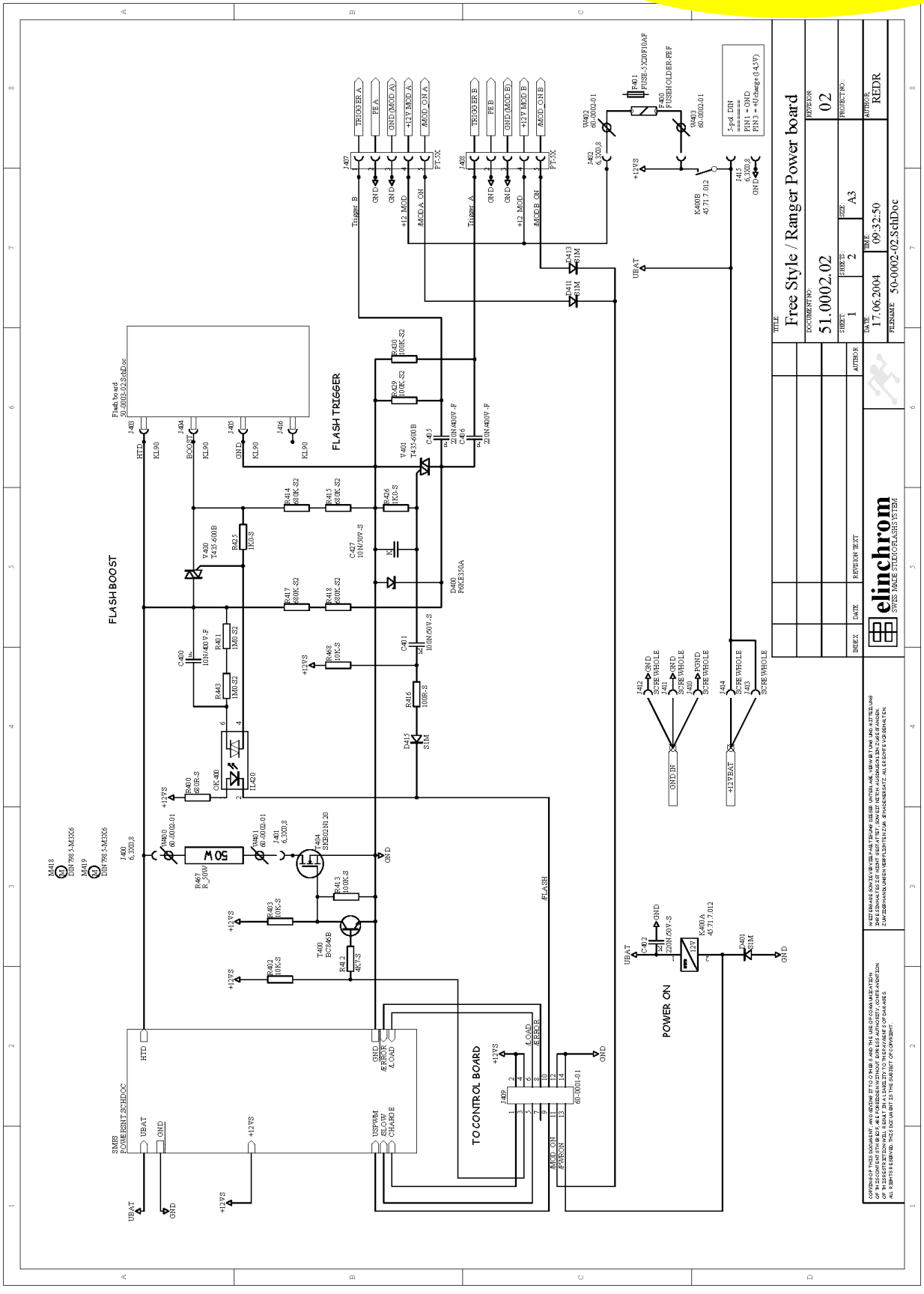
Overview

Board	Code No.	Name	Description
PB1	225.032B	CAP / POWER	Capacitor bank 1200 Ws
PB2	225.032A	CTRL	Power board
PB3	225.033	KBD	Key board

Power board (225.032A)

Note !
The electronic board is part of Exchange Service

Schematics



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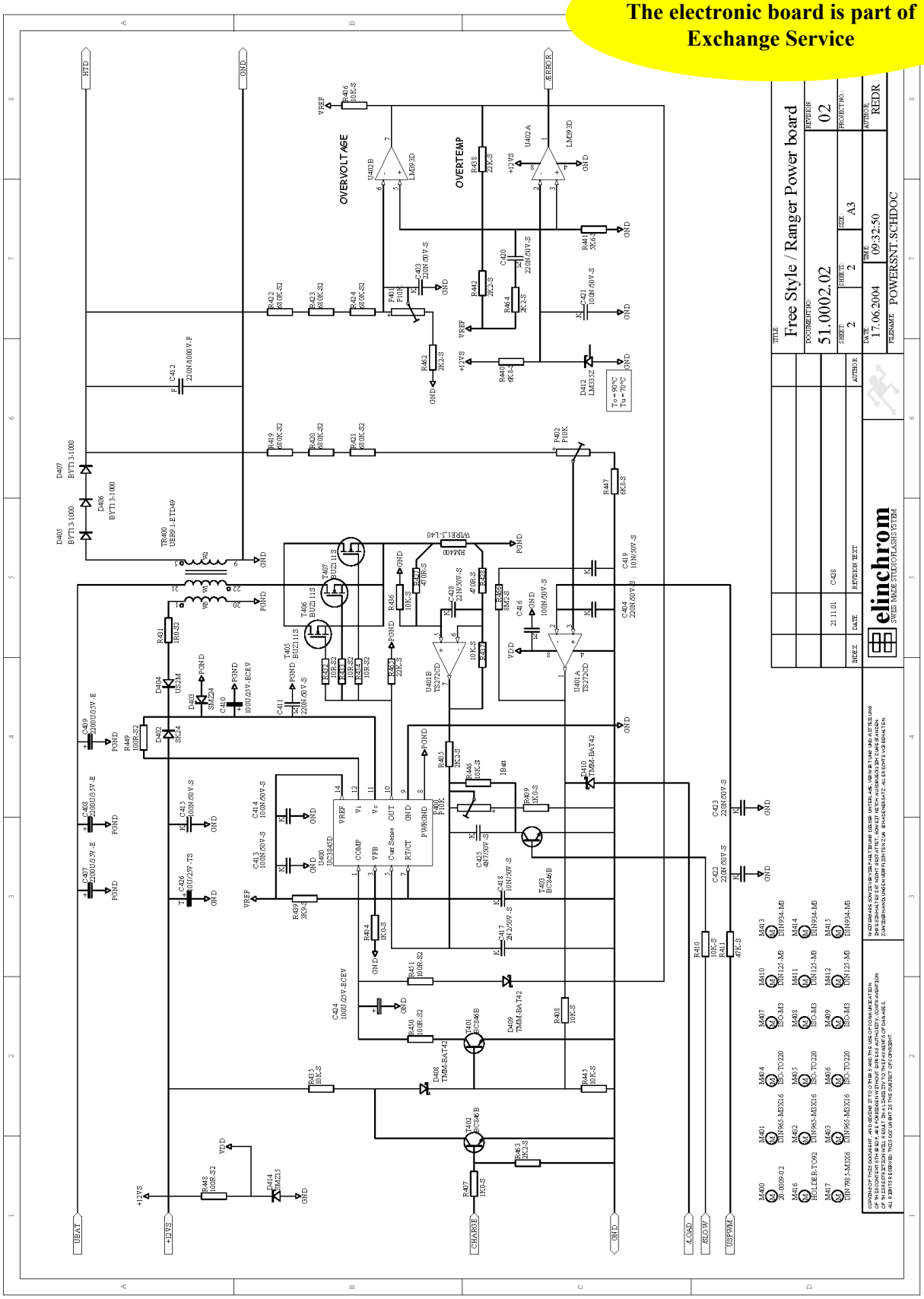
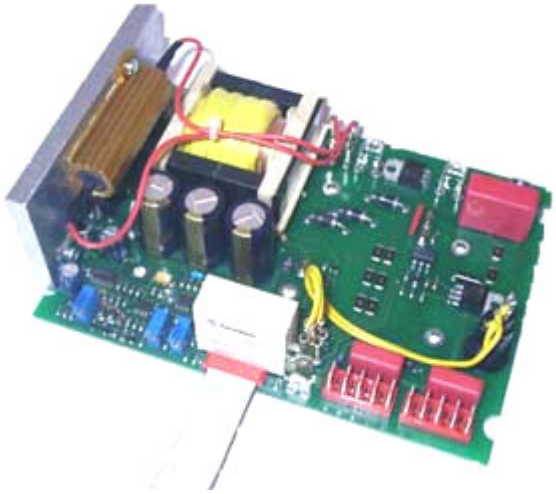


Bill of materials (225.032A)

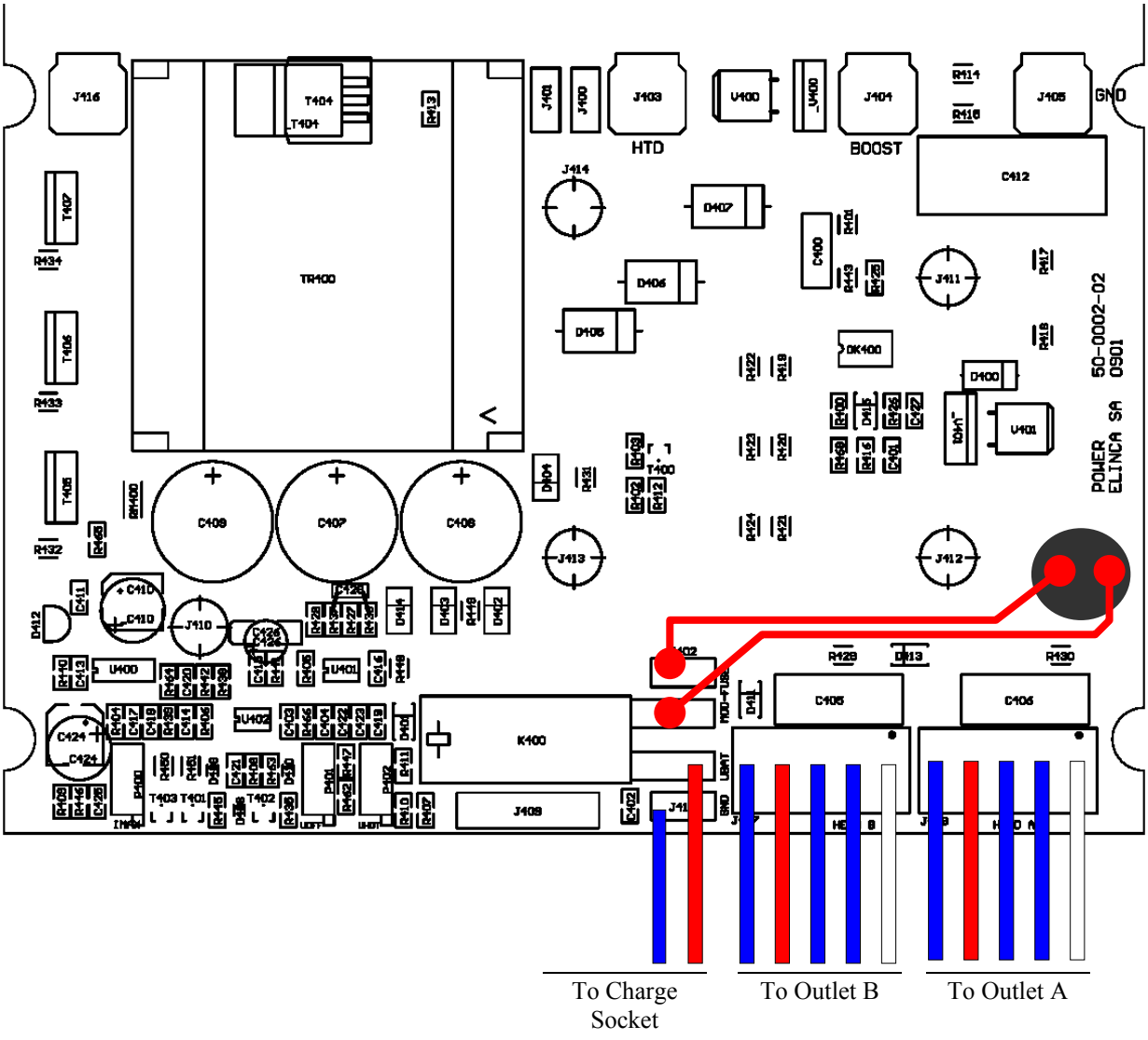
Pos.	Quantity	DESIGNATOR	PARTTYPE	ELINCA_NO	DESCRIPTION
1	1	C400	10N/400V-F		Capacitor MKP4
2	6	C401, C413, C414, C415, C416, C421	100N/50V-S		Capacitor SMD
3	7	C402, C403, C404, C411, C420, C422, C423	220N/50V-S		Capacitor SMD
4	2	C405, C406	220N/400V-F		Capacitor MKP4
5	3	C407, C408, C409	2200U/35V-E	104.056	ELKO SNT
6	2	C410, C424	100U/25V-ECEV		ELKO SMD 8x6,2mm
7	1	C412	220N/1000V-F		Capacitor MKP4
8	1	C417	2N2/50V-S		Capacitor SMD
9	3	C418, C419, C427	10N/50V-S		Capacitor SMD
10	1	C425	4N7/50V-S		Capacitor SMD
11	1	C426	10U/25V-TS		Capacitor Tantal SMD
12	1	C428	22N/50V-S		Capacitor SMD
13	1	D400	P6KE350A		Diode
14	4	D401, D411, D413, D415	S1M		Diode 1A 1000V SMD
15	1	D402	SK24		Shottky 2A 40V
16	1	D403	SMZ24		Z-Diode 24V SMD
17	1	D404	US2M		Diode 2A 1000V SMD
18	3	D405, D406, D407	BYT13-1000		Diode
19	3	D408, D409, D410	TMM-BAT42		Shottky SMD
20	1	D412	LM335Z	105.201	Sensor Temp.
21	1	D414	SMZ15		Z-Diode 15V SMD
22	1	F400	FUSEHOLDER-FEF		Fuseholder FEF
23	1	F401	FUSE-5X20F10AF		Fuse 5x20 10AF
24	4	J400, J401, J402, J415	6,3X0,8	112.078	6,3x0,8 stehend
25	4	J403, J404, J405, J416	KL90		LP-Screw-Connector
26	2	J407, J408	PT-5X		Connector 6,3mm
27	1	J409	60-0001-01		Flat Cable 14P AWG28 200mm
28	1	K400	45.71.7.012		Relais 12V 10A
29	1	M400	20-0009-02		Heat Sink
30	3	M401, M402, M403	DIN965-M3X16		SCREW DIN965 M3x16
31	3	M404, M405, M406	ISO-TO220		Insulation TO220
32	3	M407, M408, M409	ISO-M3		Insulation TO220 M3
33	3	M410, M411, M412	DIN125-M3		Washer M3
34	3	M413, M414, M415	DIN934-M3	203.031	Nut DIN934-M3
35	1	M416	HOLDER-TO92		Holder for TO92 4mm
36	3	M417, M418, M419	DIN7985-M3X6	211.139	SCREW DIN7985 M3x6
37	1	OK400	IL420		Optokoppler

38	3	P400, P401, P402	P10K	Trimmer
39	1	R400	680R-S	Resistor 1% SMD
40	2	R401, R443	1M0-S2	Resistor 5% 1W SMD
41	11	R402, R403, R406, R408, R410, R435, R436, R437, R445, R446, R468	10K-S	Resistor 1% SMD
42	5	R404, R407, R409, R425, R426	1K0-S	Resistor 1% SMD
43	5	R405, R442, R462, R463, R464	2K2-S	Resistor 1% SMD
44	1	R411	47K-S	Resistor 1% SMD
45	1	R412	4K7-S	Resistor 1% SMD
46	1	R413	100K-S	Resistor 1% SMD
47	10	R414, R415, R417, R418, R419, R420, R421, R422, R423, R424	680K-S2	Resistor 5% 1W SMD
48	1	R416	100R-S	Resistor 1% SMD
49	2	R427, R428	470R-S	Resistor 1% SMD
50	2	R429, R430	100K-S2	Resistor 5% 1W SMD
51	1	R431	1R0-S2	Resistor 5% 1W SMD
52	3	R432, R433, R434	10R-S2	Resistor 5% 1W SMD
53	2	R438, R465	22K-S	Resistor 1% SMD
54	1	R439	3K9-S	Resistor 1% SMD
55	2	R440, R447	6K8-S	Resistor 1% SMD
56	1	R441	5K6-S	Resistor 1% SMD
57	4	R448, R449, R450, R451	100R-S2	Resistor 5% 1W SMD
58	1	R466	8M2-S	Resistor 1% SMD
59	1	R467	R_50W	Resistor 50W
60	1	RM400	WIRE1,5-L40	Wire 1,5qmm L40
61	4	T400, T401, T402, T403	BC846B	Transistor SMD
62	1	T404	SKB02N120	MOSFET 1200V 2A
63	3	T405, T406, T407	BUZ111S	MOSFET
64	1	TR400	UER9.1-ETD49	Transformer
65	1	U400	UC3845D	SNT-IC SMD
66	1	U401	TS272CD	High Speed OP SMD
67	1	U402	LM393D	COMP SMD
68	2	V400, V401	T435-600B	Triac SMD
69	4	W400, W401, W402, W403	60-0002-01	Cable 1mm2 150mm

Assembly drawing (225.032A)



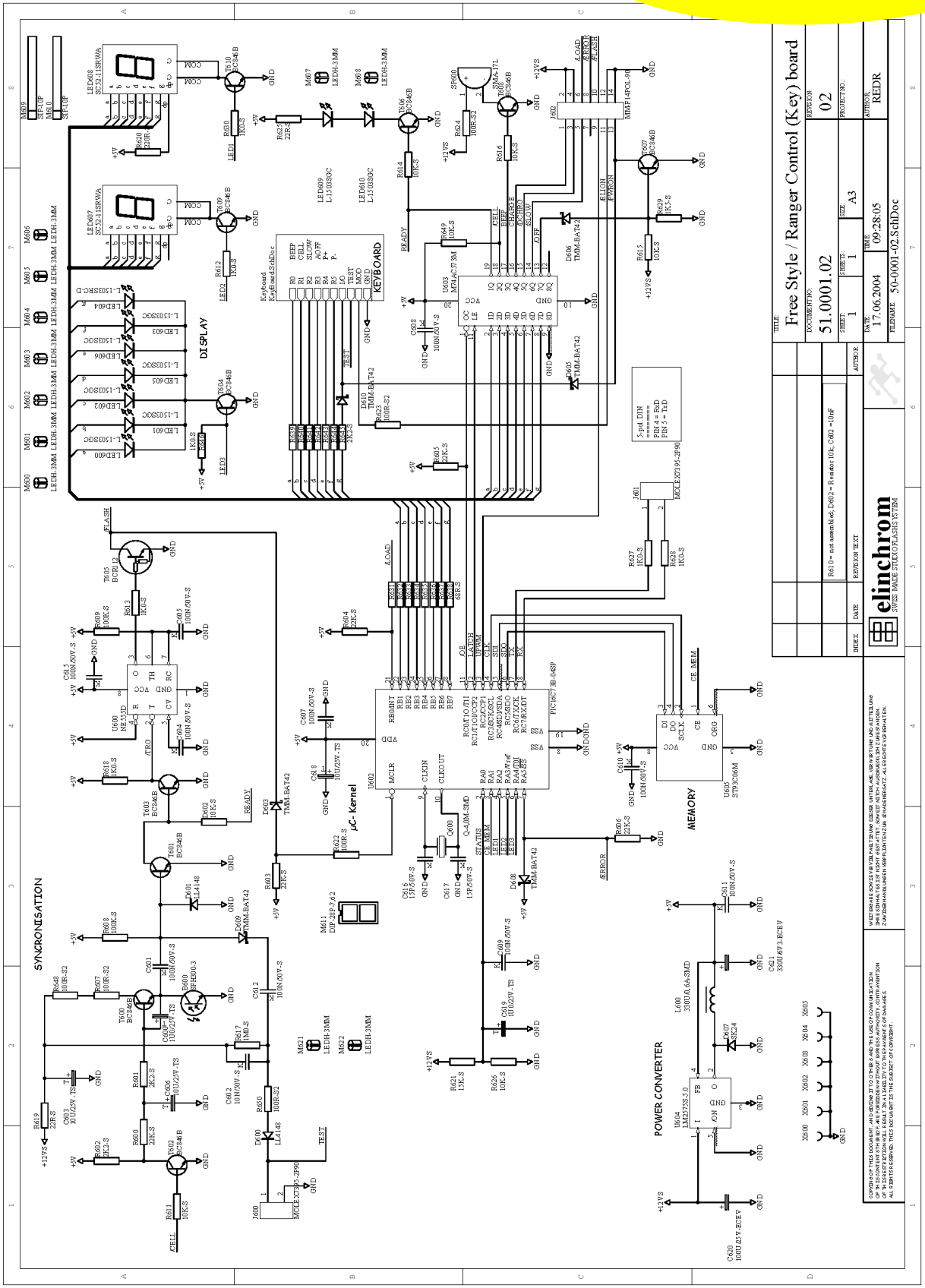
Note !
The electronic board is part of Exchange Service

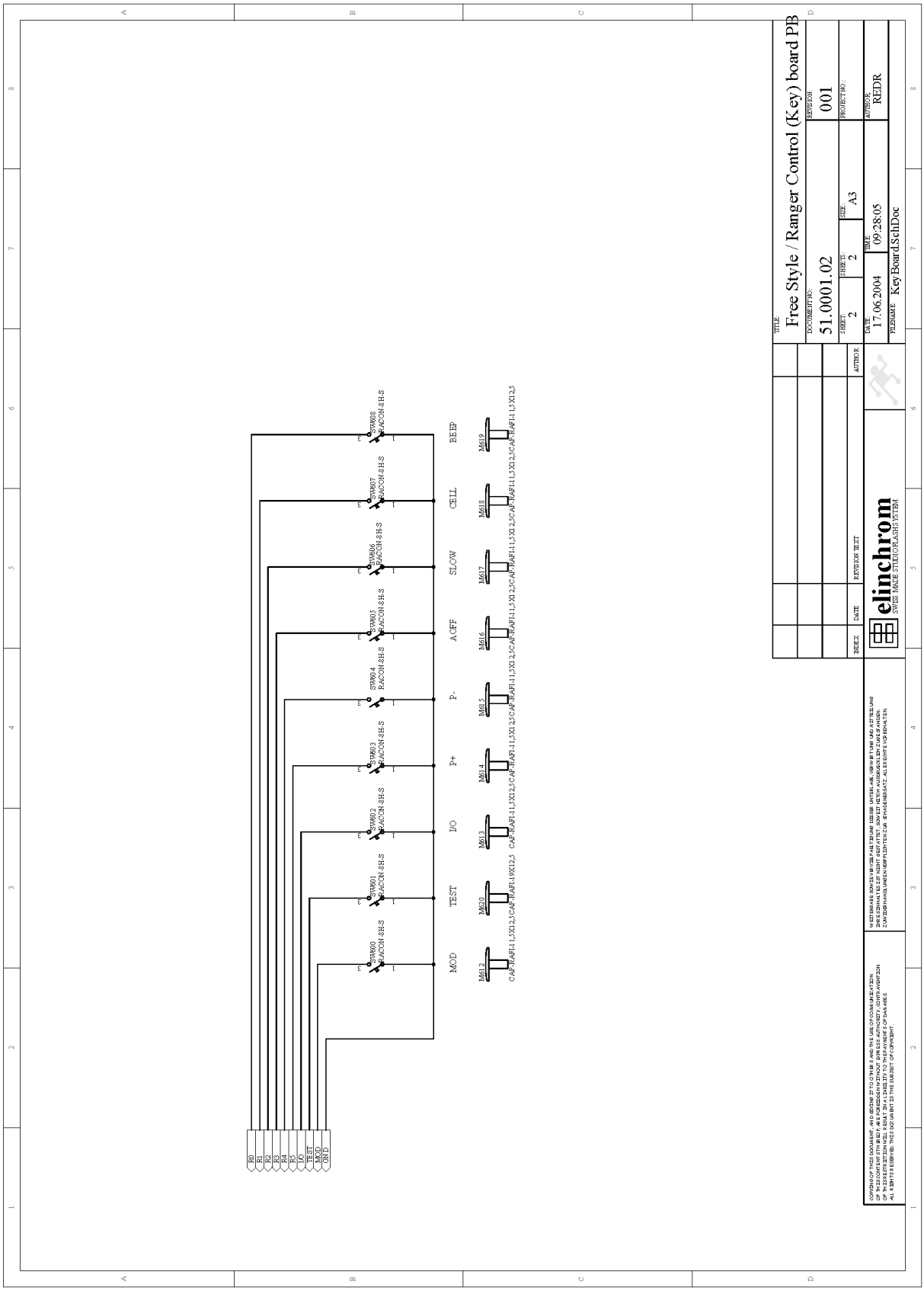


Key board

Schematics (225.033)

Note !
The electronic board is part of Exchange Service




Free Style / Ranger Control (Key) board PB
51.0001.02
001
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09:28:05
REDR
Key Board.SchDoc
elinchrom
SWISS MADE STUDIOFLASH SYSTEM
MOD
TEST
I/O
P+
P-
AOFF
SLOW
CELL
BEEP

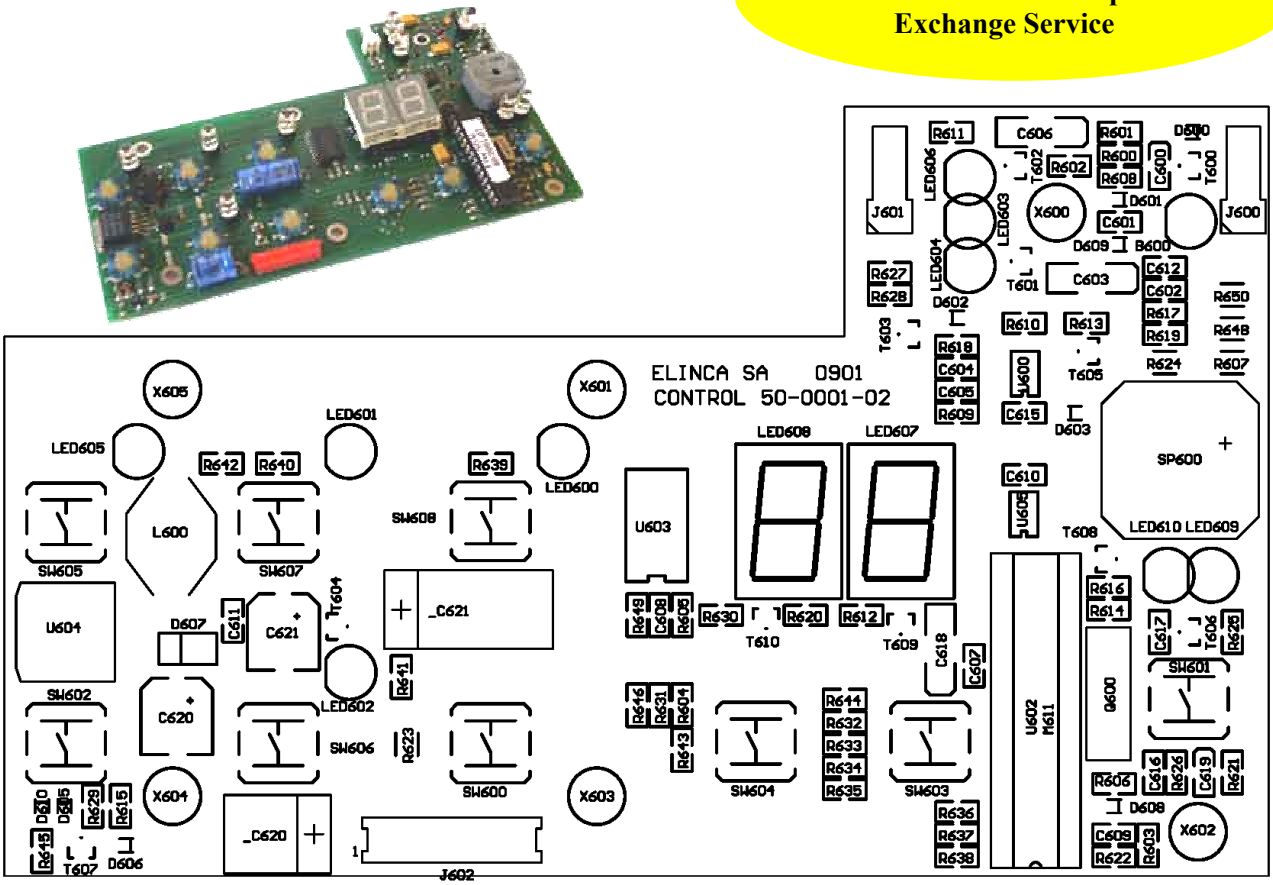
Bill of materials (225.032)

Pos.	Quantity	DESIGNATOR	PARTTYPE	ELINCA_NO	DESCRIPTION
1	1	B600	SFH300-3		Phototransistor
2	2	C600, C619	1U0/25V-TS		Capacitor Tantal SMD
3	10	C601, C604, C605, C607, C608, C609, C610, C611, C612, C615	100N/50V-S		Capacitor SMD
4	1	C602	10N/50V-S		Capacitor SMD
5	3	C603, C606, C618	10U/25V-TS		Capacitor Tantal SMD
6	2	C616, C617	15P/50V-S		Capacitor SMD
7	1	C620	100U/25V-ECEV		ELKO SMD 8x6,2mm
8	1	C621	330U/6V3-ECEV		ELKO SMD 8x6,3mm
9	2	D600, D601	LL4148		Diode SMD
10	7	D602, R611, R614, R615, R616, R626, R649	10K-S		Resistor 1% SMD
11	6	D603, D605, D606, D608, D609, D610	TMM-BAT42		Shottky SMD
12	1	D607	SK24		Shottky 2A 40V
13	2	J600, J601	MOLEX7395-2P90		Connector 2P LP 90°
14	1	J602	MM-F14POL-90		Mico Match Federleite 14POL 90°
15	1	L600	330U/0,6A-SMD		Inductor
16	8	LED600, LED601, LED602, LED603, LED605, LED606, LED609, LED610	L-1503SGC		LED 5mm green super bright
17	1	LED604	L-1503SRC-D		LED 5mm red super bright
18	2	LED607, LED608	SC52-11SRWA		LED 7SEG red
19	11	M600, M601, M602, M603, M604, M605, M606, M607, M608, M621, M622	LEDH-3MM		LED distance holder h=3mm
20	2	M609, M610	SIP-10P		Single Inline Socket 10P
21	1	M611	DIP-28P-7,62		Dual Inline Socket 28P 7,62mm
22	8	M612, M613, M614, M615, M616, M617, M618, M619	CAP-RAFI-11,5X12,5		Push button cap 11,5mm
23	1	M620	CAP-RAFI-19X12,5		Push button cap 19mm
24	1	Q600	Q-4,0M-SMD		Quarz SMD
25	5	R600, R603, R604, R605, R606	22K-S		Resistor 1% SMD
26	9	R601, R602, R639, R640, R641, R642, R643, R644, R645	2K2-S		Resistor 1% SMD
27	5	R607, R623, R624, R648, R650	100R-S2		Resistor 5% 1W SMD
28	2	R608, R609	100K-S		Resistor 1% SMD
29	7	R612, R613, R618, R627, R628, R630, R646	1K0-S		Resistor 1% SMD
30	1	R617	1M0-S		Resistor 1% SMD
31	2	R619, R625	22R-S		Resistor 1% SMD
32	1	R620	220R-S		Resistor 1% SMD
33	1	R621	15K-S		Resistor 1% SMD
34	1	R622	100R-S		Resistor 1% SMD
35	1	R629	1K5-S		Resistor 1% SMD

36	8	R631, R632, R633, R634, R635, R636, R637, R638	68R-S		Resistor 1% SMD
37	1	SP600	SMA-17L	107.019	Buzzer 12V
38	9	SW600, SW601, SW602, SW603, SW604, SW605, SW606, SW607, SW608	RACON-8H-S		Push button SMD
39	10	T600, T601, T602, T603, T604, T606, T607, T608, T609, T610	BC846B		Transistor SMD
40	1	T605	BCR112		Transistor SMD R1/R2=4k7
41	1	U600	NE555D		TIMER SMD
42	1	U602	PIC16F73-I/SP		uC Microchip 28 pol. Out +/- 200mA
43	1	U603	M74AC573M		Latch SMD
44	1	U604	LM2575S-5.0		DC-Converter SMD
45	1	U605	ST93C06M		EEPROM SMD

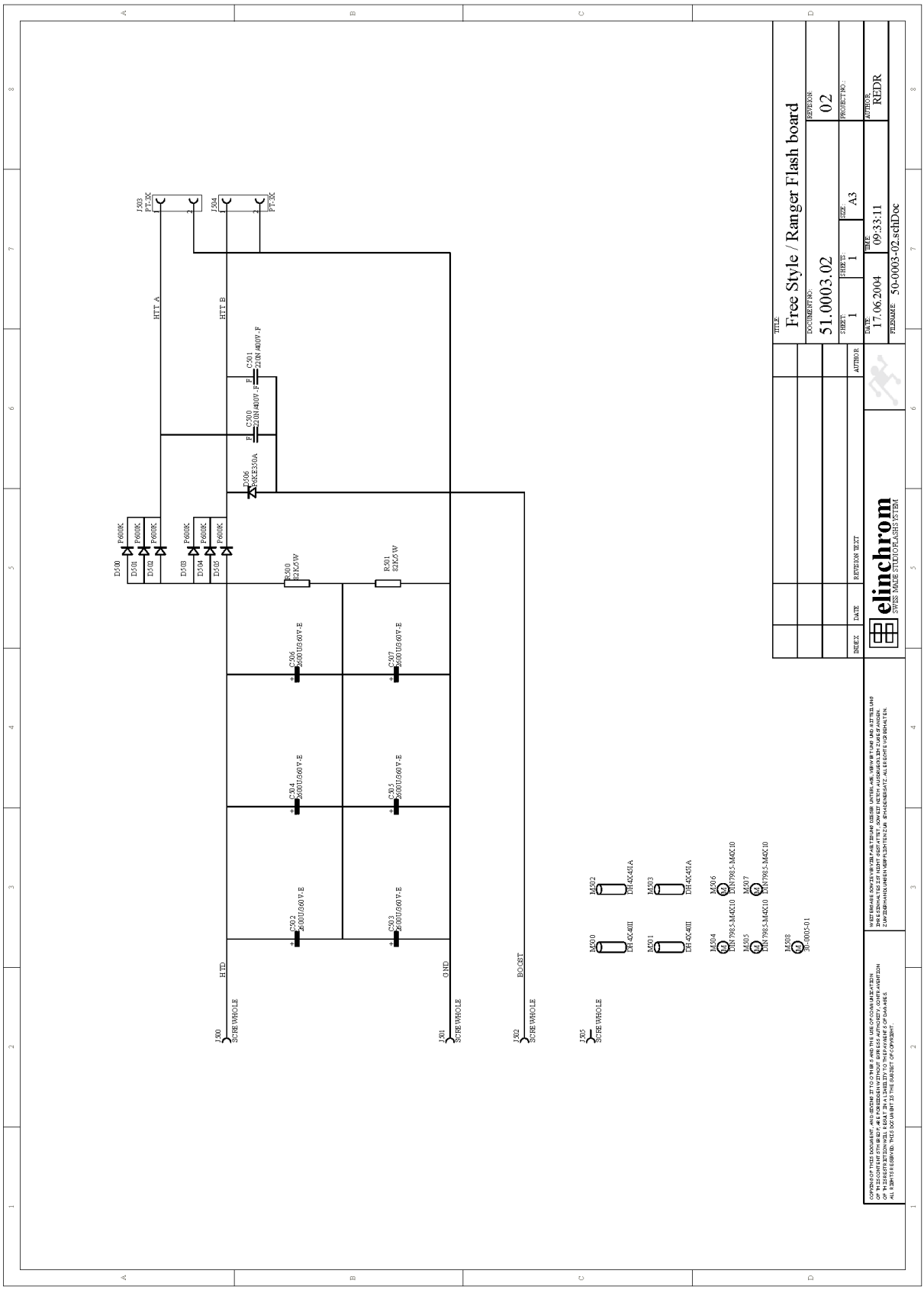
Assembly drawing (225.032)

Note !
The electronic board is part of Exchange Service



Flash board (225.032B)

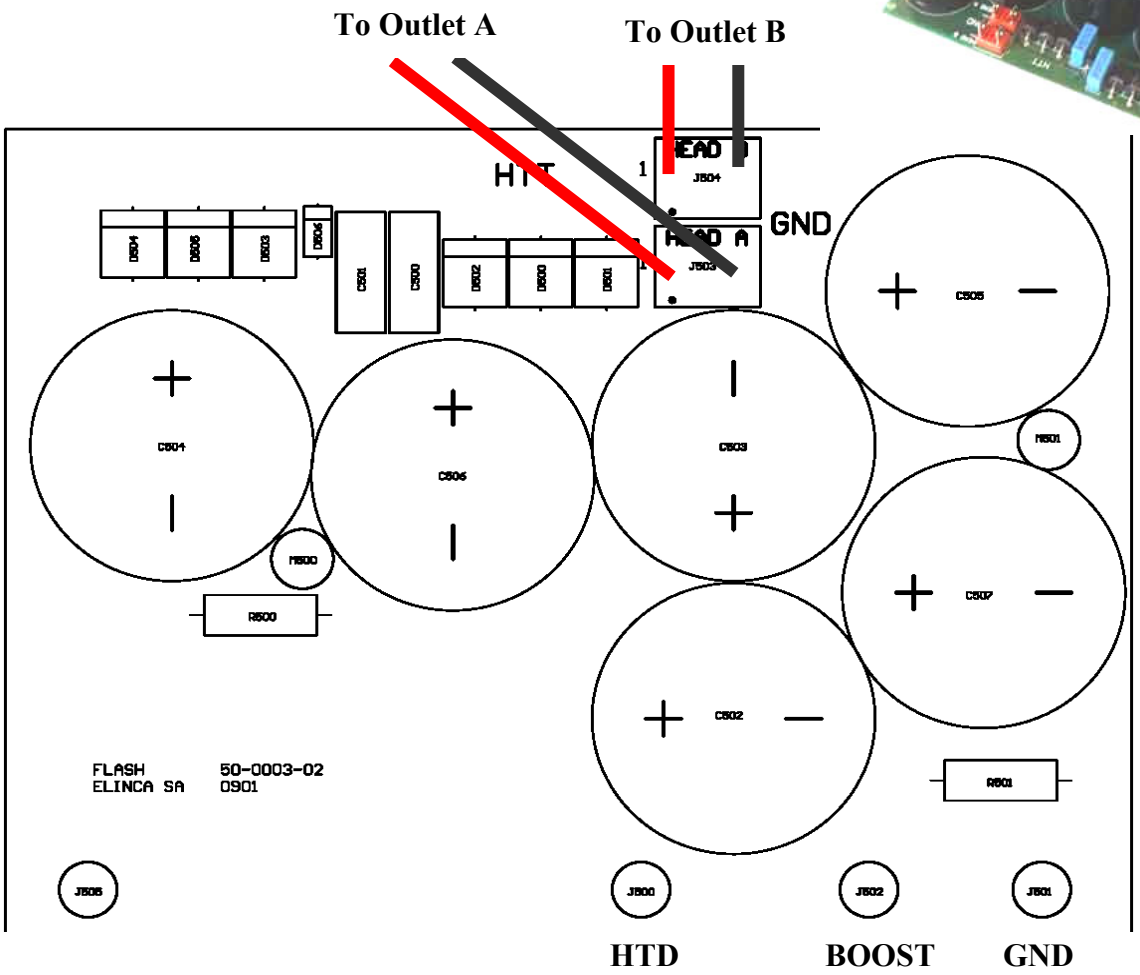
Schematics (225.032B)



Bill of materials (225.032B)

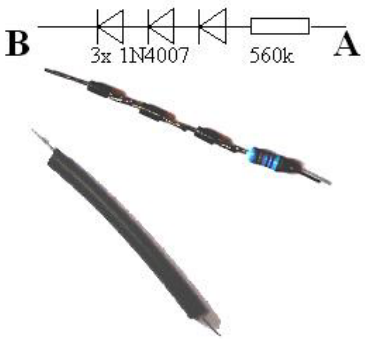
Pos.	Quantity	DESIGNATOR	PARTTYPE	ELINCA_NO	DESCRIPTION
1	2	C500, C501	220N/400V-F		Capacitor MKP4
2	6	C502, C503, C504, C505, C506, C507	2600U/360V-E	14342	FLASH Capacitor
3	6	D500, D501, D502, D503, D504, D505	RWB080B	105.050EDI	Diode
4	1	D506	P6KE350A		Diode
5	2	J503, J504	PT-3X		Connector 6,3mm
6	2	M500, M501	DH4X40II	209.136	Distance holder4x 40mm II
7	2	M502, M503	DH4X45IA	209.137	Distance holder 4x45mm IA
8	4	M504, M505, M506, M507	DIN7985-M4X10	211.211	SCREW DIN7985 M4x10
9	1	M508	30-0005-01	225.035	Pertinax sheet 1,5mm
10	2	R500, R501	82K/5W		Resistor 5% 5W

Assembly drawing (225.032B)



Modifications

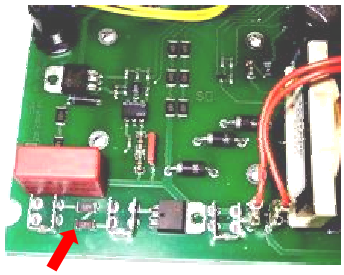
Power board (50.0002.02)



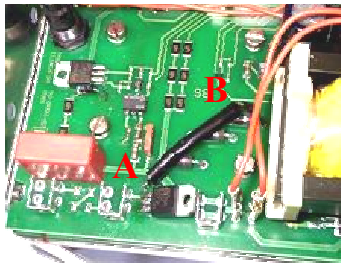
Prepare Diode module with

3x diode 1N4007 (code 14009)
1x resistor 560k / 2500V (code 121.564PC)
5cm insulation pipe (code 500.504)

Solder the components shown in the schematic and cover with insulation pipe



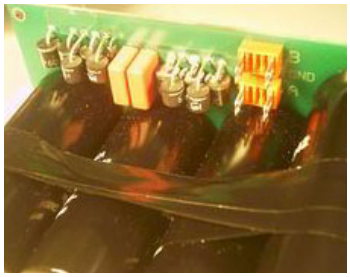
Remove Resistors R414 and R415 on Power board (not used anymore)



Insert modification module to the power board as shown in the picture.

Solder end A to the connector J404 or pin 1 of V400 (A1) and end B to the anode of the diode D405.
Check polarity ends A and B !

Flash board (50.0003.02)

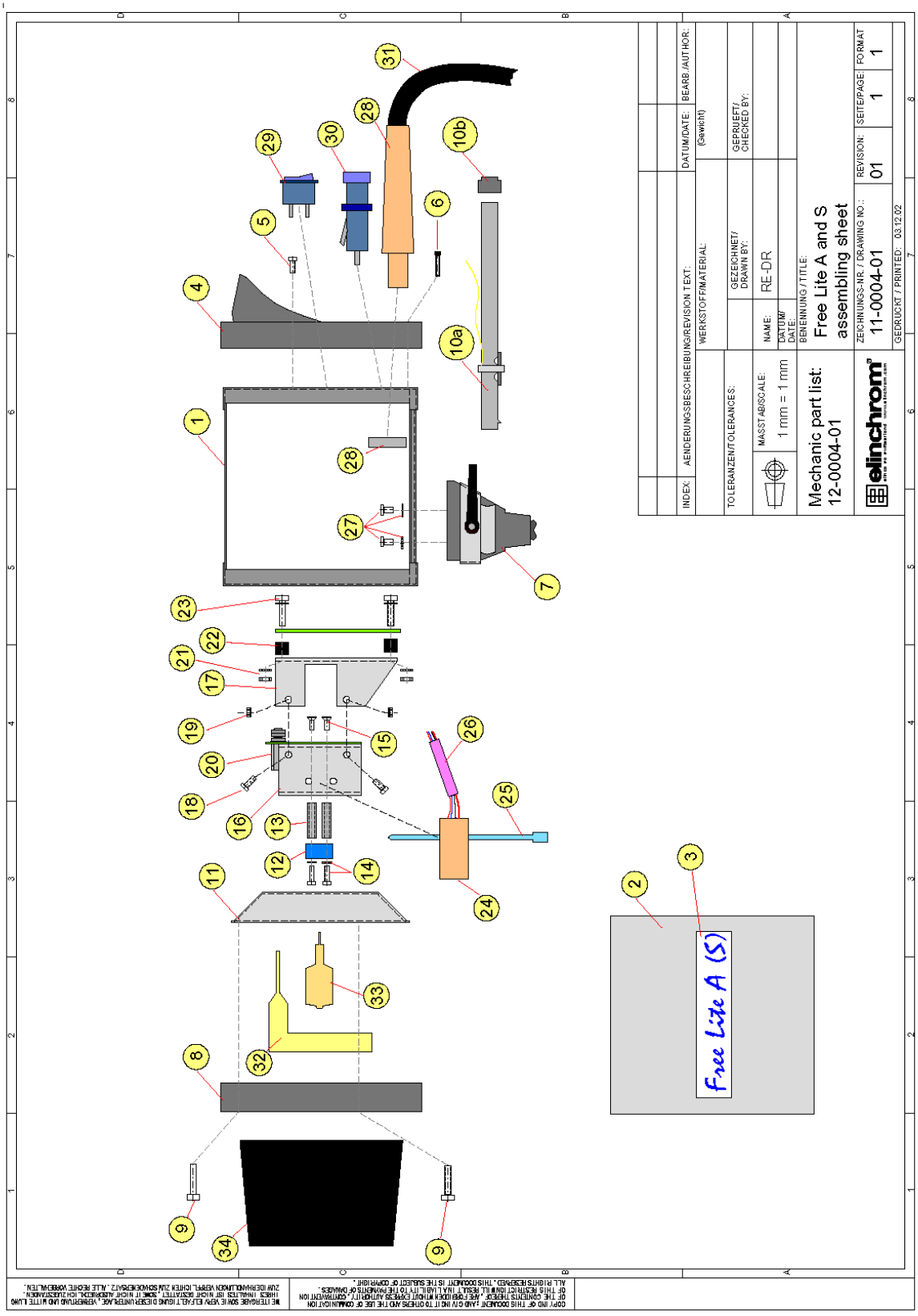


Add 2x power booster diodes (code 105.050EDI) on each channel!
First Check if the existing power booster diodes are working (check with diode meter), replace them when are defect.
Add four power booster diodes to the existing booster Diodes with the same polarity (D500..D505)

Free Lite S and A head

Mechanics

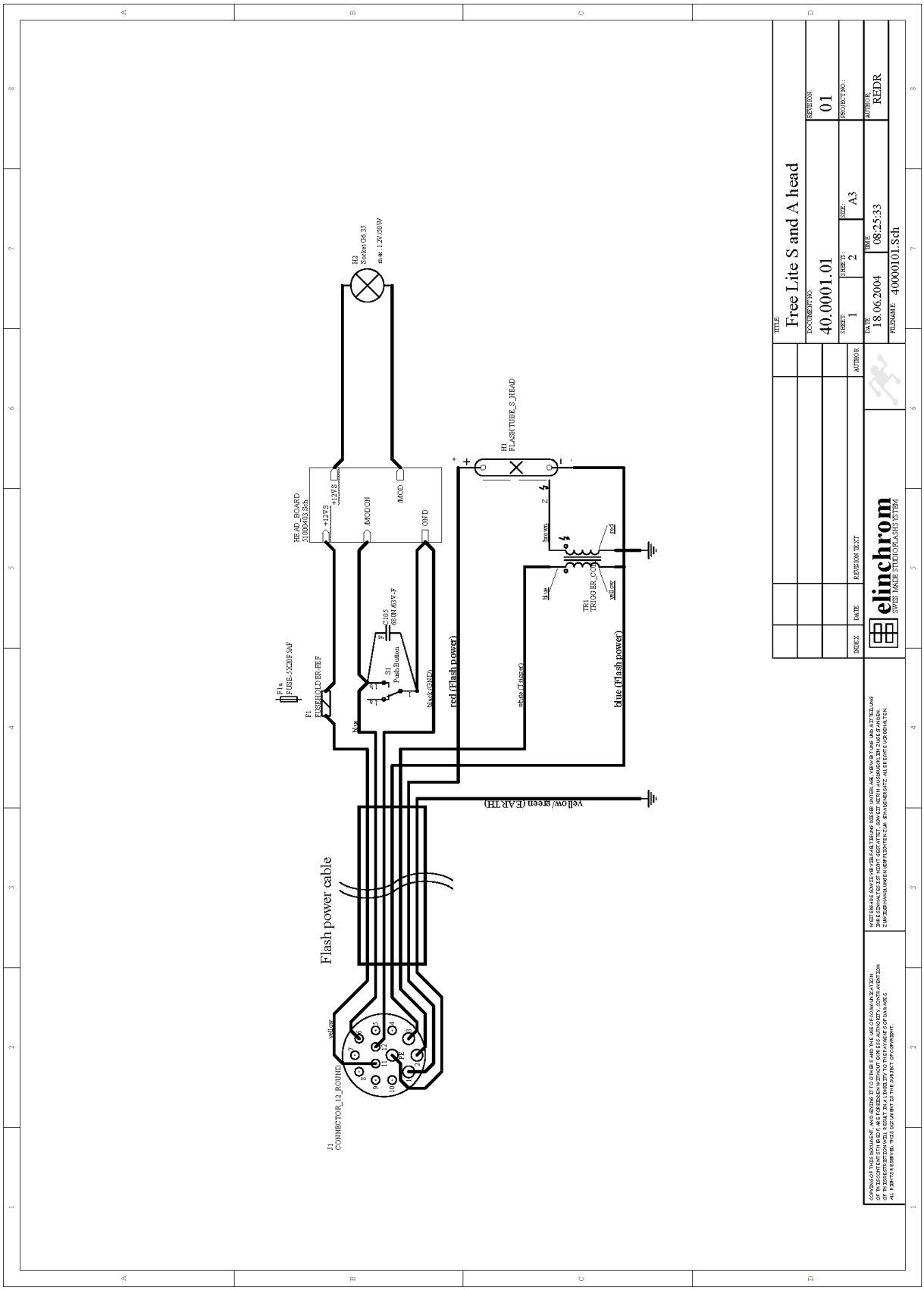
Explosion drawing



Mechanical Part List

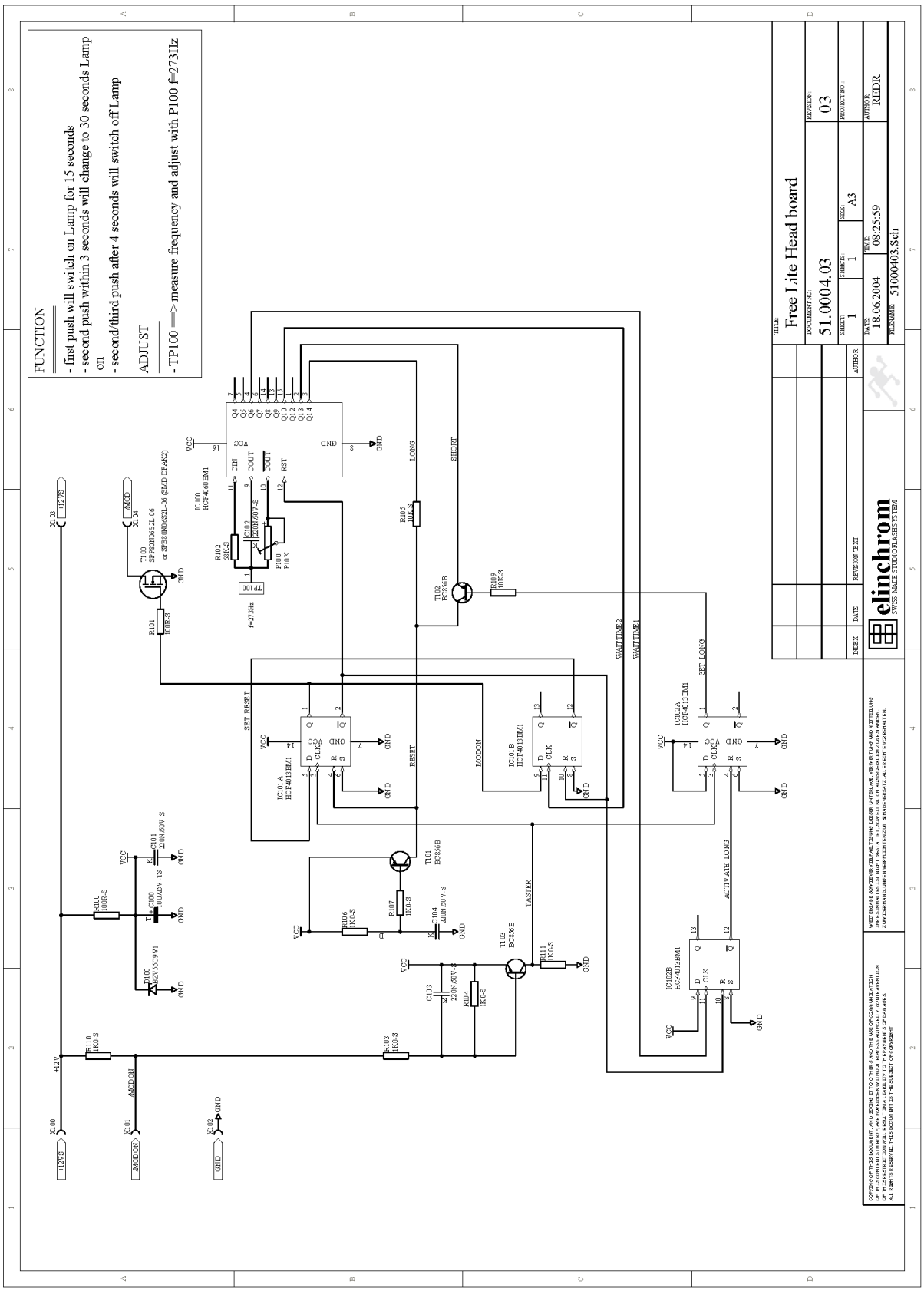
Pos.	Description	Used	ELINCA_NO
1	Metal chassis	1	223.001
2	Housing without label for Free Lite A and S	1	223.002
3a	Label Free Lite S	1	205.237
3b	Label Free Lite A	1	205.238
4	Rear handle	1	22056
5	screw M3x8 mm for handle	2	211.601
6	screw M3x12 mm for handle	1	211.602
7	**Tilthead**	**1**	**901.201**
7a	Fix part	1	201.661
7b	Mobile part	1	201.656
7c	Plastic level	1	14492
7d	Bolt M8 for handle	1	209.093
7e	Locking universal metal plate for umbrella	1	201.295
8	**Set front ring + locking device**	**1**	**22055**
8a	Front locking	1	22054
8b	Front ring bayonet	1	204.090
8c	locking spring	1	212.203
9	Screw for front ring M3x20 mm	3	211.207
10a	Umbrella tube	1	223.004
10b	Ring for umbrella tube	1	14594
11a	Inner Reflector Free Lite A	1	201.081
11b	Inner Reflector Free Lite S	1	201.080
12	Lamp holder G6,35	1	201.500
13	distance holder M3x30	2	209.135
14a	screw M3x12 mm	2	211.106
14b	Isolation washer M3	2	210.116
15	Screw M3x8	2	211.203
16	Light contact plate complete	2	223.003
17	electronic board holder (Fan holder)	1	223.008
18	Screw M3x8 mm	2	211.203
19	Nut with washer M3	2	203.031
20	Set terminal for flash tube (510.020)	1	510.020SAV
20+	terminal for flash tube (Set of 6 units)		14209
21	Nut M4 with washer	2	203.032
22	Isolation distance holder M4x10	2	209.103
23a	Screw M4x10	2	211.212
23b	Washer M4	2	210.003
24a	Trigger coil	1	25001
24b	2m Trigger vire diam. 0,4 (101.124)	1	14214
25	Strip holder	1	101,081
25	Nylon attachment for coil	1	101.077
27	Screw M4x10	4	211.212
28	Protective cable entry	1	101.083
29a	Modelling lamp switch	1	103.085
29b	Capacitor 330nF/63V ????	2	104,064
30a	Fuse holder	1	14651
30b	Fuse 5AF for modelling lamp 50W (set of 10)	1	19036
31a	Flash cable for Free Lite with connector 3m	1	501,011
31b	Extension cable 4m	1	11096
32a	Flash tube A head	1	24053
32b	Flash tube S head	1	24034
33	modelling lamp 12V/50W	1	23044
34	Protective hood	1	26124

Interconnection



Head board (225.034)

Schematic (225.034)

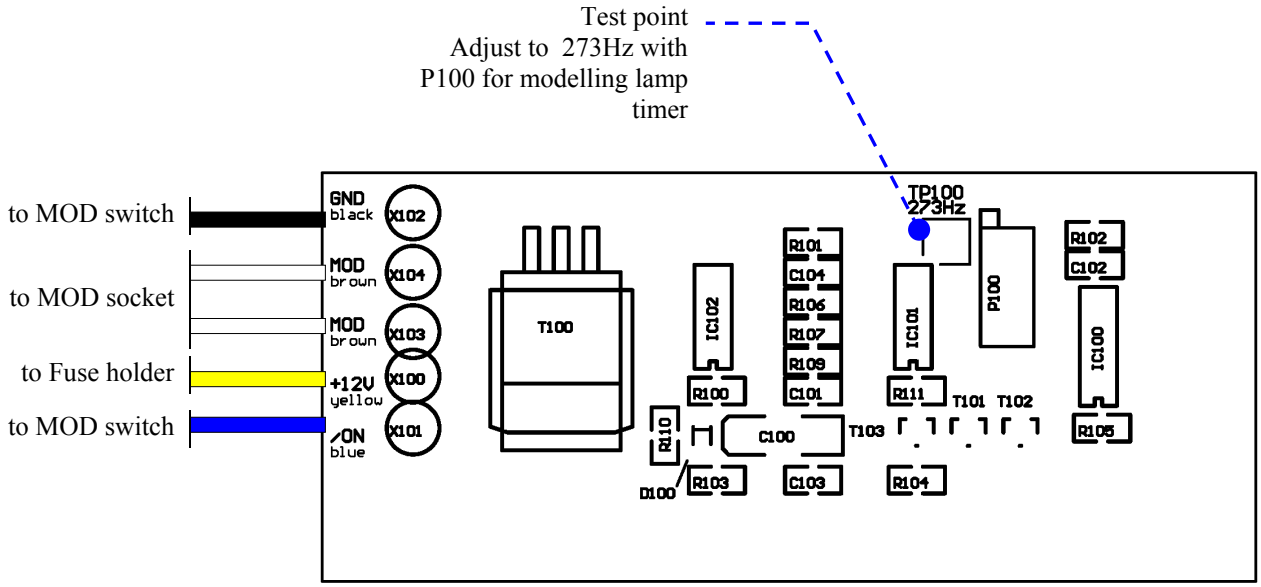


Bill of materials (225.034)

Pos.	Quantity	DESIGNATOR	PARTTYPE	ELINCA_NO	DESCRIPTION
1	1	C100	10U/25V-TS		Capacitor Tantal SMD
2	4	C101, C102, C103, C104	220N/50V-S		Capacitor SMD
3	1	D100	BZV55C9V1		Diode Zehner
4	1	IC100	HCF4060BM1		COUNTER SMD
5	2	IC101, IC102	HCF4013BM1		4x LATCH SMD
6	1	P100	P10K		Trimmer
7	2	R100, R101	100R-S		Resistor 1% SMD
8	1	R102	68K-S		Resistor 1% SMD
9	5	R103, R104, R106, R107, R111	1K0-S		Resistor 1% SMD
10	2	R105, R109	10K-S		Resistor 1% SMD
11	1	R110	1K0	121.102	Resistor 1%
12	1	T100	SPP80N06S2L-06		MOSFET
13	3	T101, T102, T103	BC856B		Transistor SMD

Assembly drawing (225.034)

(head board 50.0005.03)

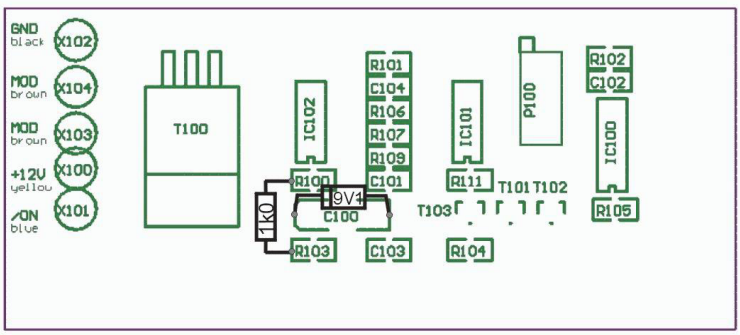


Modifications Free Lite Head board 50.0005.02

board 50.0005.02 only

Fault: Modelling lamp automatically switched on after flash

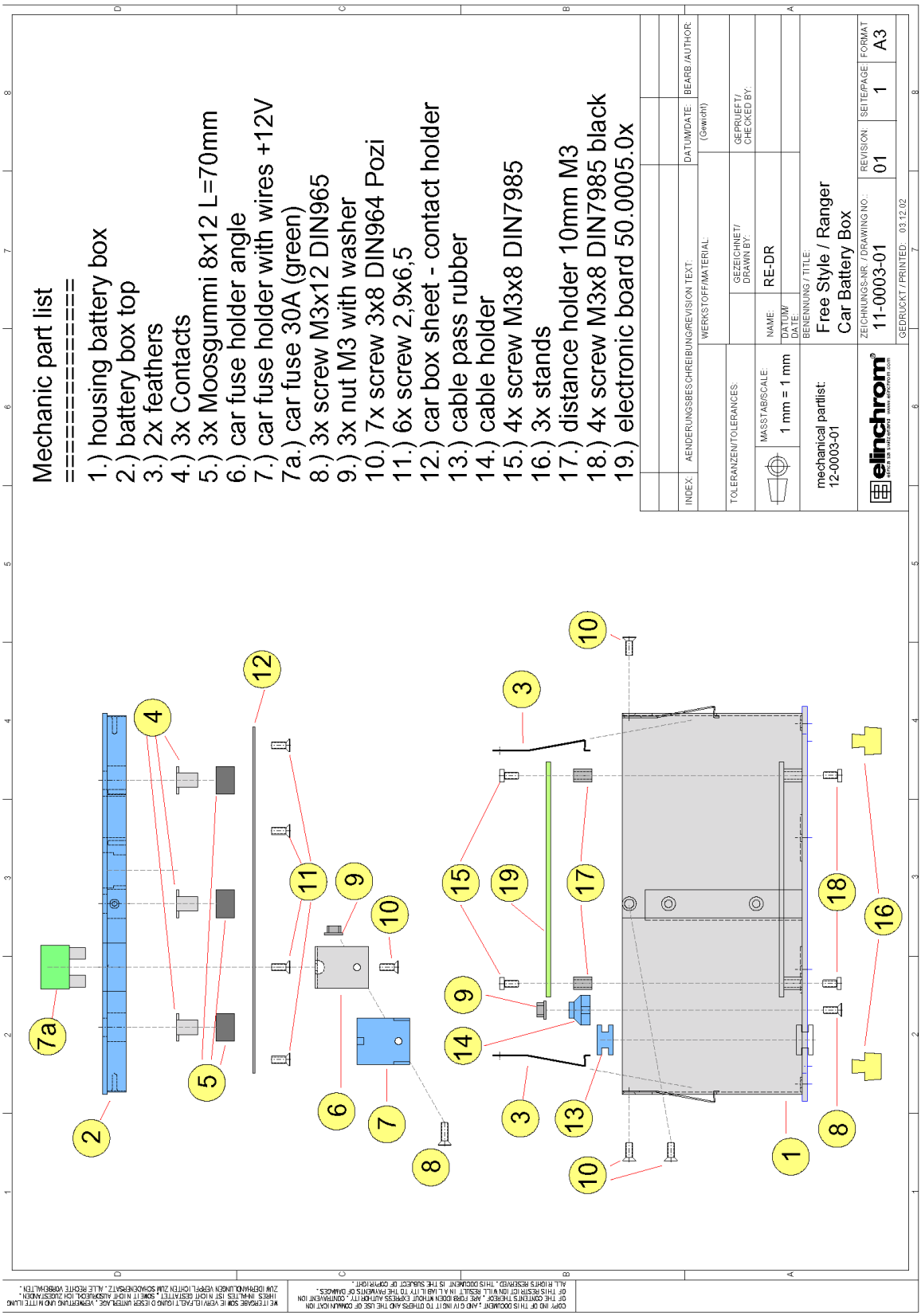
Solution: Add an 1k0 resistor and a 9V1 Z-diode shown in the assembling drawing!



Car Box

Mechanic

Explosion drawing

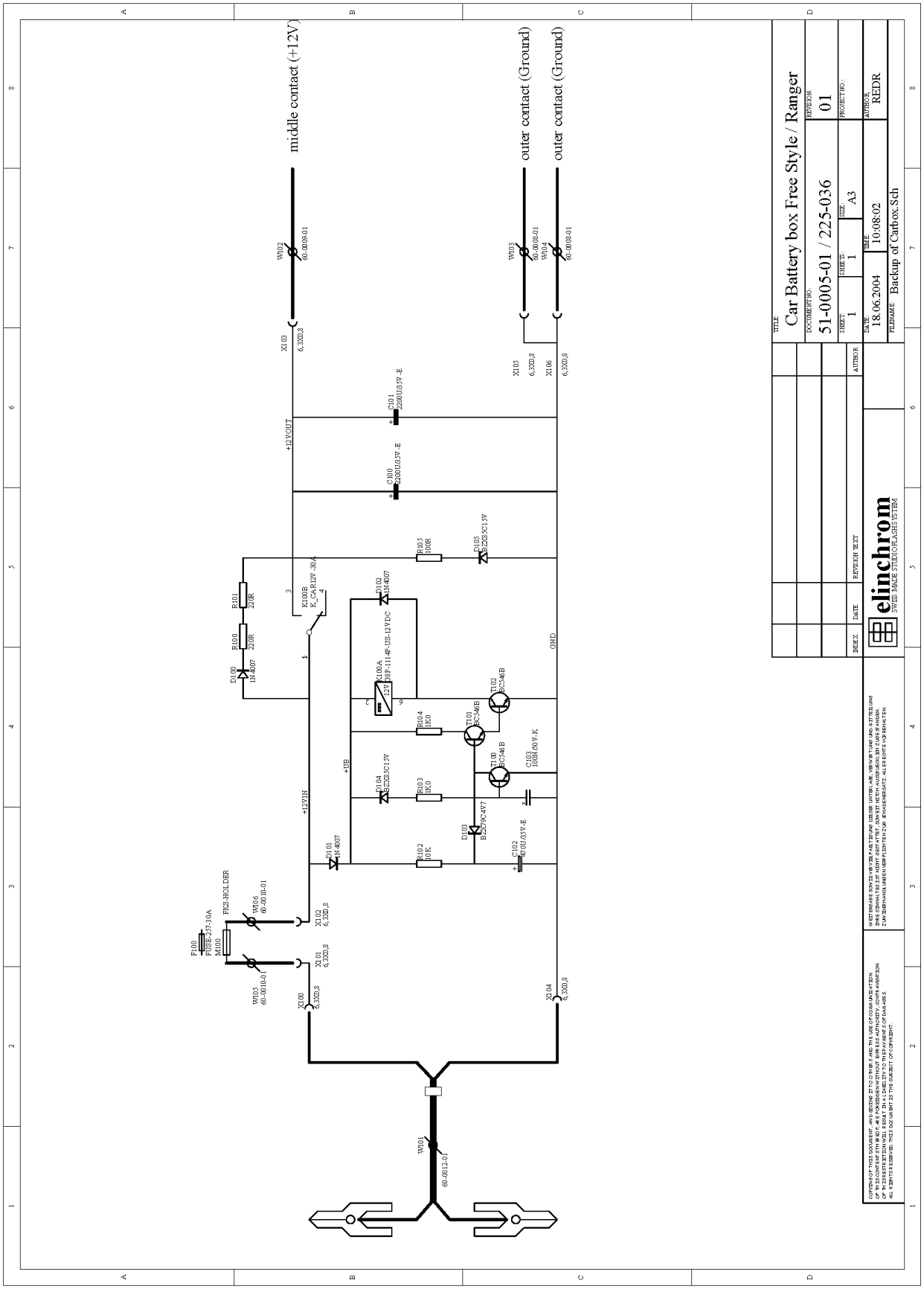


Mechanical Part list

Pos.	Description	Used	ELINCA_NO
1	housing battery box	1	225.027
2	battery box top	1	225.009
3	feathers	2	225.029
4	Contacts	3	225.030
5	foam 8x12 (3x L=70mm)	0,21 m	225.003
6	car fuse holder angle	1	225.028
7	car fuse holder with wires (2x 60-0010-01)	1	225.053(1x) 101.131 (2x) 110.033 (2x)
7a	car fuse 30A (green)	1	106.053
8	screw M3x12 DIN965	3	211.602
9	nut M3 with washer	3	203.031
10	screw 3x8 KA30x8	7	211.840
11	screw 2,9x6,5	6	211.835
12	car box sheet - contact holder (20-0013-01)	1	
13	cable pass (rubber)	1	101.165
14	cable holder	1	101.074
15	screw M3x8 DIN7985	4	211.855
16	stands	4	204.144
17	distance holder 10mm M3	4	209.095
18	screw M3x8 DIN7985 black	4	211.882
19	electronic board 50.0005.0x	1	660.010
20	cabling 60-0008-01	2	101.162 (1x) 110.033 (2x)
21	cabling 60-0009-01	1	101.131 (1x) 110.033 (2x)
22	cabling 60-0012-01	1	225.051

Electronic (225.036)

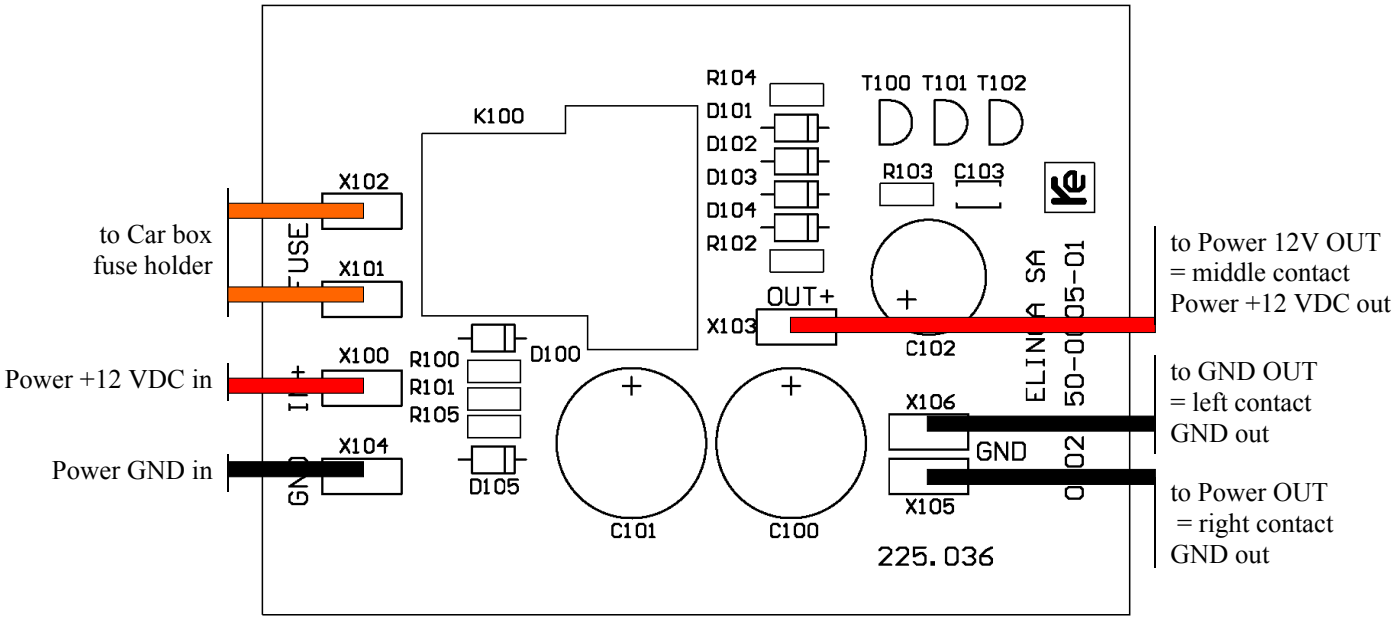
Car box board (225.036)



Bill of Materials (225.036)

Pos.	Quantity	DESIGNATOR	PARTTYPE	ELINCA_NO	DESCRIPTION
1	2	C100, C101	2200U/35V-E	104.056	ELKO SNT
2	1	C102	470U/35V-E	104.055	ELKO
3	1	C103	100N/50V-K	104.015	Capacitor Keramik B37987-F5
4	3	D100, D101, D102	1N4007	14009	Diode
5	1	D103	BZX79C4V7	105.117	Diode Zehner
6	2	D104, D105	BZX85C15V	105.163	Diode Zehner
7	1	F100	FUSE-257-30A	106.053	Car Fuse 30A green
8	1	K100	G8P-1114P-US-12VDC	225.052	Relais 12V 30A
9	1	M100	FKS-HOLDER	225.053	Fuse Holder FKS car fuse
10	2	R100, R101	220R	121.221	Resistor 1%
11	1	R102	10K	121.103	Resistor 1%
12	2	R103, R104	1K0	121.102	Resistor 1%
13	1	R105	100R	121.101	Resistor 1%
14	3	T100, T101, T102	BC546B		Transistor
15	1	W101	60-0012-01	225.051	2x2,5mm2 Car battery connector 3,5m
16	1	W102	60-0009-01		2,5mm2 black L=150 E1:6,3mm E2:6,3mm
17	2	W103, W104	60-0008-01		2,5mm2 black L=150 E1:6,3mm E2:6,3mm
18	2	W105, W106	60-0010-01		2,5mm2 black L=150 E1:6,3mm E2:soldered
19	7	X100, X101, X102, X103, X104, X105, X106	6,3X0,8	112.078	6,3x0,8 male

Assembling drawing (225.036)



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