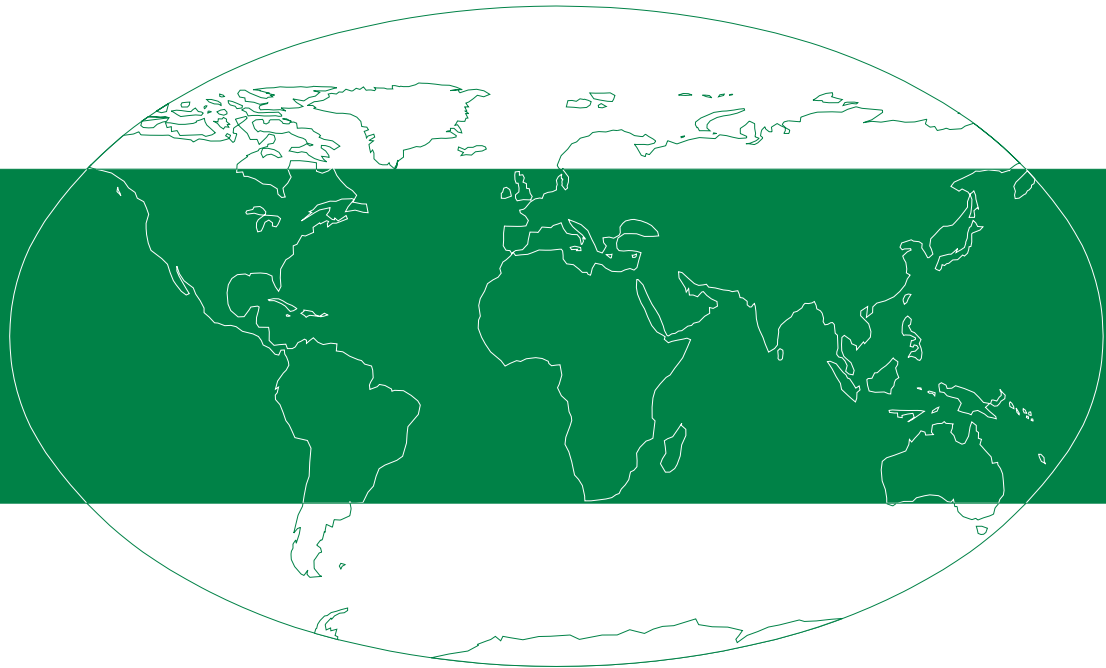


# SAILOR



TECHNICAL MANUAL  
FOR  
H1252B DC PRINTER



S.P. RADIO A/S · AALBORG · DENMARK

## **Please note**

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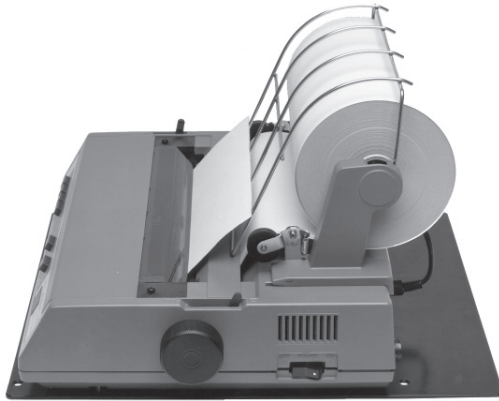
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## 1 GENERAL INFORMATION

H1252B Hardcopy printer is an OKI MICROLINE 182/280 printer with built-in DC power supply for 10.5-32V DC operation. H1252B is as standard delivered with a Roll Paper Stand, other paper types can also be used, please refer to the OKI manual for detailed information.

H1252B is as standard delivered with the mounting kit H1250, it can also be mounted on the H2192 GMDSS Console using the mounting plate which is delivered together with the H2192 GMDSS Console. Paper roll, Power cable and Centronics cable are supplied with the H1252B.



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### 1.1 OKI DOCUMENTATION





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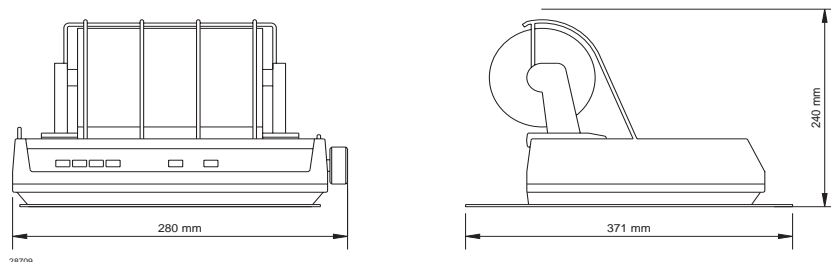
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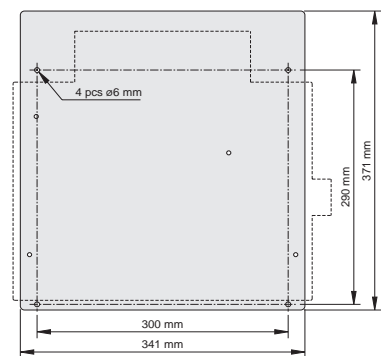
## 2 INSTALLATION

### 2.1 MOUNTING POSSIBILITIES, DIMENSIONS AND DRILLING PLAN

#### Mounting kit H1250

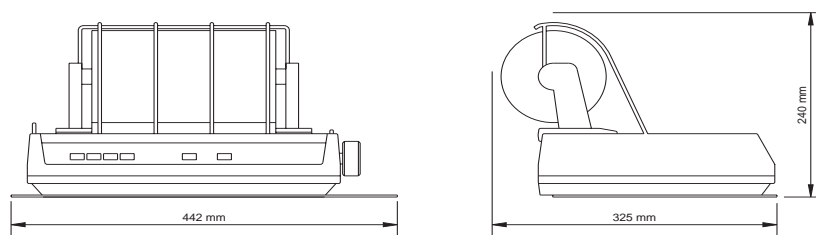


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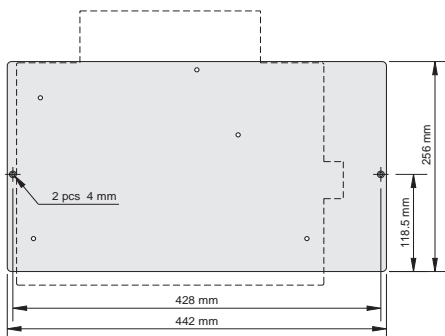


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#### Mounting kit H2192



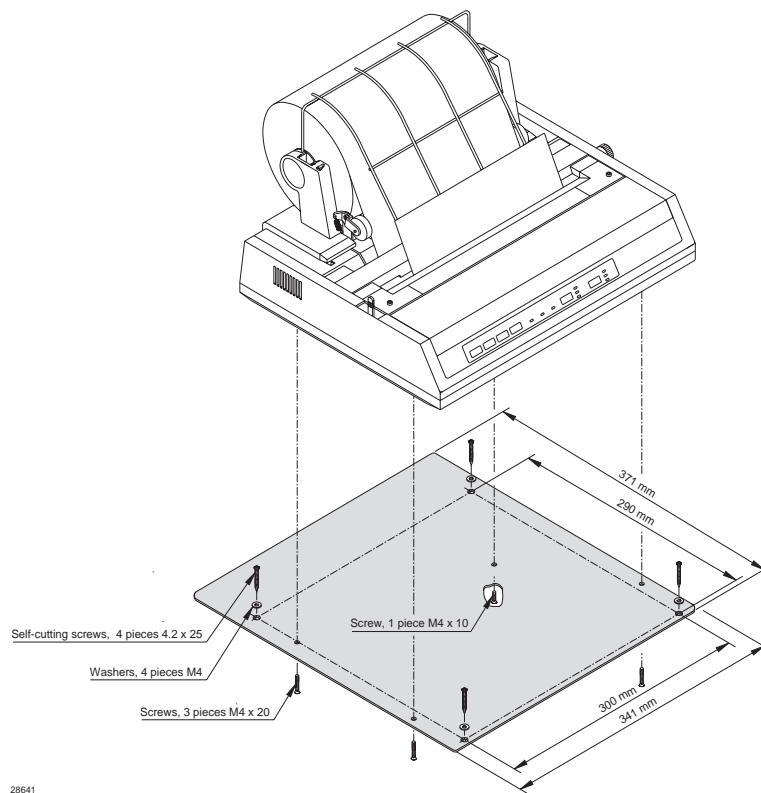
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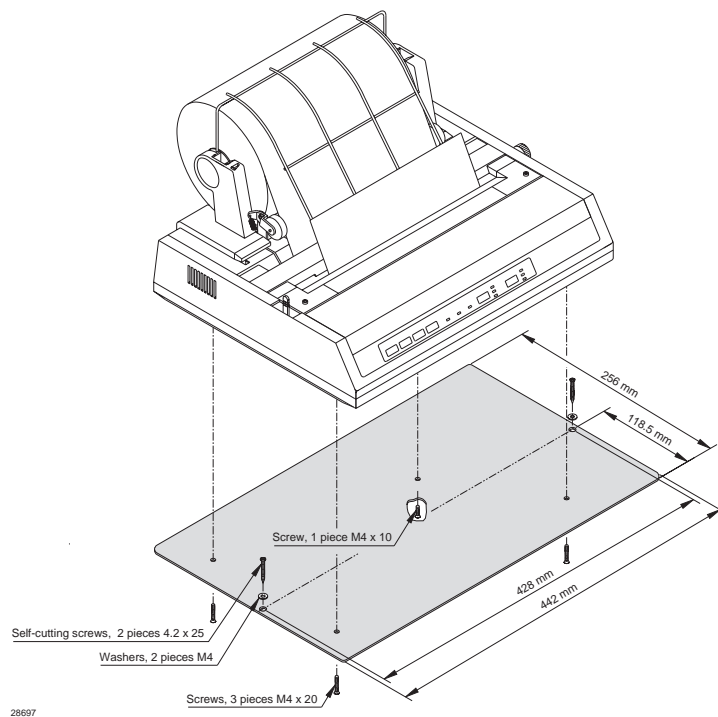
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## 2.2 H1252B PRINTER WITH MOUNTING KIT H1250 OR GMDSS CONSOLE H2192

### H1252B printer with H1250



### H1252B printer with H2192



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### 3 PARTS LIST

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**OKI MICROLINE u182/280 WITH 24V DC POWER SUPPLY**
**ECI A/S****821252**


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<u>POSITION</u>	<u>DESCRIPTION</u>		<u>MANUFACTOR</u>	<u>TYPE</u>	<u>PART NO.</u>
VARIOUS	BOTTOM PLATE PRINTER 182	H1250	ECI A/S	1-0-24747 / 140.956	200606
VARIOUS	TELEX ROLL B=20.9cm	L=120m SINGLE LAYER	NCR	Art.Nr: 230.100	47.830
VARIOUS	INTERCONNECTION CABLE	25 POLES SUB D-CENTRONIC	RADIO PARTS	Art.Nr: 393535	56.013
VARIOUS	POWER CABLE 3 POLE H1252B	2000mm (T&T M061-101028)	MONTRONICS	3-0-28478	56.066
				Art.Nr: M024	
VARIOUS	SCREW KIT		ECI A/S	700654	700654
VARIOUS	SPARE FUSES FOR H1252B	H1252B	ECI A/S	0-0-27246	727246
VARIOUS	10.5-32V DC POWER SUPPLY	FOR OKI PRINTER u182/u280	ECI A/S	0-0-28515	728515
VARIOUS	MANUAL FOR H1252B ENGLISH		ECI A/S		M1252BGB





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## 1 GENERAL INFORMATION

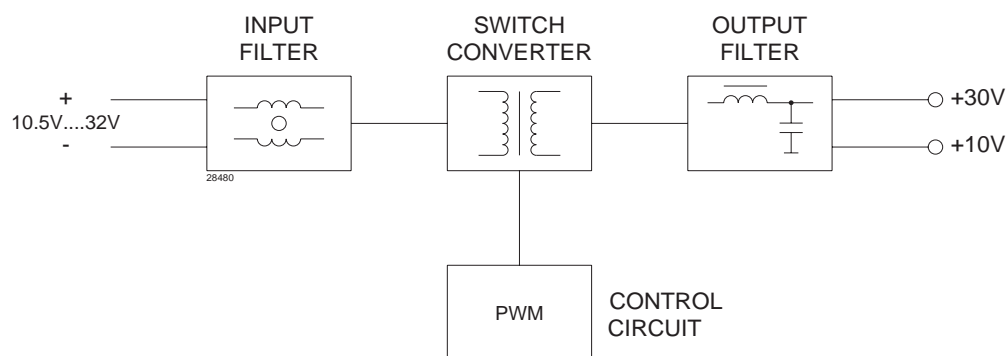
### 1.1 INTRODUCTION

This section gives you all the necessary informations to maintain the DC power supply module. It also specify how to modify the printer to operate on DC supply instead of AC supply.

### 1.2 PRINCIPLE OF OPERATION

The power supply module is constructed to operate from a battery voltage of 10.5V DC to 32V DC to deliver the necessary voltages for the printer. The voltage conversion takes place in a "flyback" switch converter, which is controlled by a current mode controller. The regulation of the output voltage is controlled via a separate winding of the transformer, which also delivers the power for the control circuit. At the input and at the output are placed filters to suppress the switch noise.

#### BLOCKDIAGRAM



### 1.3 TECHNICAL DATA

Input voltage range	: 10.5V DC to 32V DC
Current consumption	: max. 4.5A (fuse = 6.3AT)
Output voltages	: 10V DC / 0.3A
	: 30V DC / 0.8A
Noise from input terminals	: better than CEPT Rec. T/R 34-01
On/off	: by switch
Operating temperature	: -15° C to +55° C



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## 2 MAINTENANCE/MODIFICATION

This section is intended for use when modifying the printer to operate from DC supply instead of 220V AC supply.

### 2.1 DISASSEMBLING TO REMOVE THE MAINS TRANSFORMER

Remove the access cover by lifting up rear edge.

Pull out the platen knob.

Remove the two screws.

Remove the top cover by lifting up the front and pushing it backward.

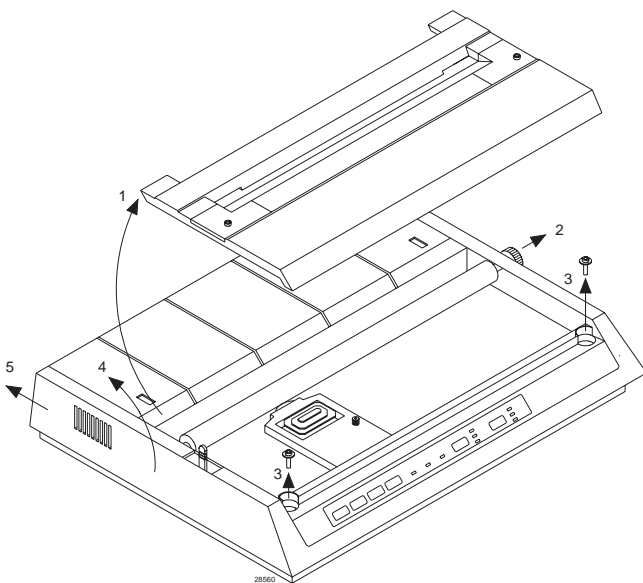
Remove the transformer output cable from the printer Main Control Board.

Remove the ground strap screw, but keep it for later use.

Remove the two screws, that fix the transformer, but keep them for later use.

Remove the transformer assembly with power PCB and AC cord receptacle by lifting upwards.

Remove the 220V~ label located at the panel cut out for the AC cord receptable.



### 2.2 DISASSEMBLING AND MOUNTING OF THE ON-OFF SWITCH

It is necessary to remove the ON-OFF switch from the transformer assembly to use it again on the DC power supply module.

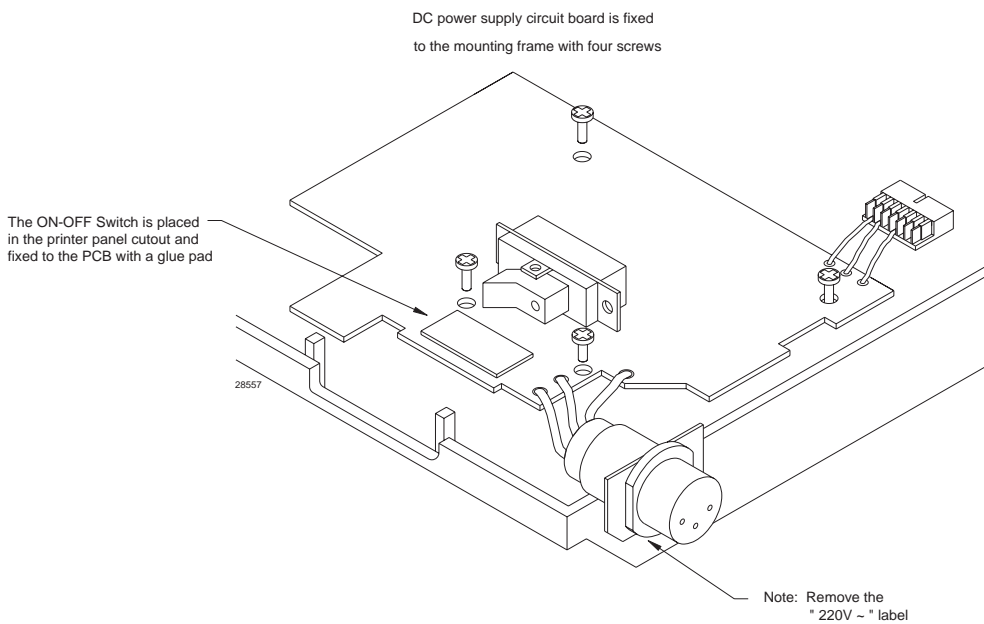
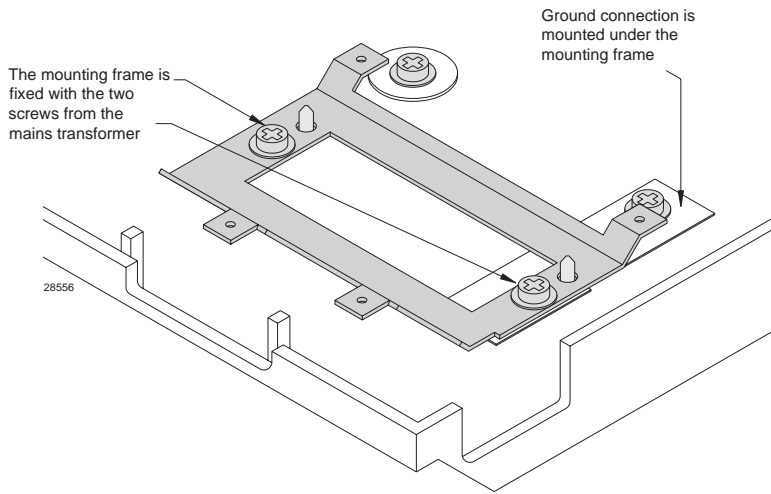
Remove the filter and switch board from the transformer by pulling it off.

Unsolder the ON-OFF Switch.

Solder the switch to the two loose wires on the DC power supply module. Then twist the wires to the switch to suppress noise.

## 2.3 MOUNTING THE DC POWER SUPPLY AND REASSEMBLING

Remove the cover on the glue pad and when the power supply module is placed properly, the switch is placed in the slots in the cabinet and is pressed down to the glue pad.



### 2.3.1 MOUNTING OF THE DC POWER SUPPLY

Place the ground connection over the rear transformer hole, and fix it with the ground screw.

Place the mounting frame where the transformer was mounted, and fix it with the two screws from the transformer.

Then place the DC power supply module on the mounting frame, and fix it with four screws.

Be sure the power ON-OFF switch is correctly placed in the panel cut out slot.

Press the plate with the DC input connector in to the panel cut out the formen AC cord receptable.

Connect the output cable to the printer Main Control Board.



### 2.3.2 MODIFICATION OF THE PRINTER MAIN CONTROL BOARD

If the printer is equipped with a DC power supply module of other type than from ECI, it is necessary to modify the printer main board. As seen below, the diode D28 (D10) on the printer main board is short circuited.

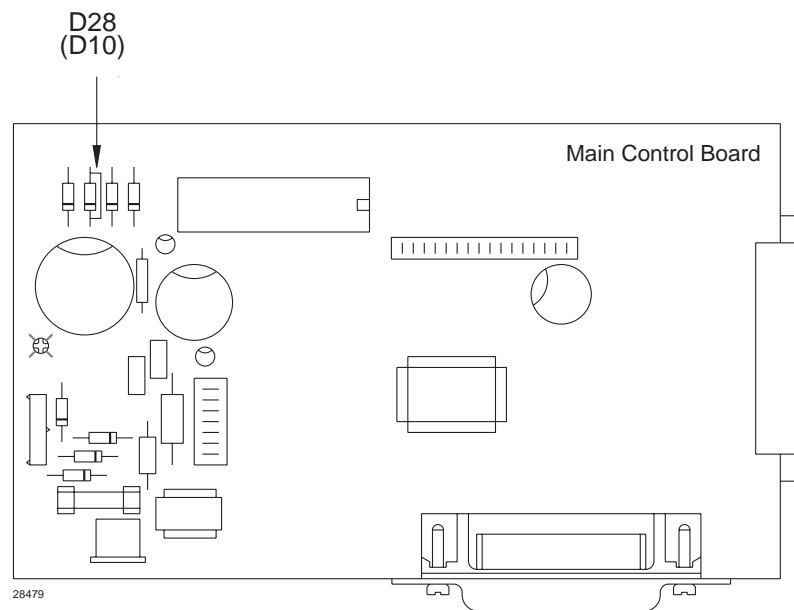
If the printer is equipped with a DC power supply module from ECI, module no. 628471 it is **not** recommended to short circuit the diode D28 (D10) on the printer main board.

Run the printer selftest programme.

Switch on the ON-OFF switch and simultaneously press down the "line feed" button.

After a few seconds (at low input voltage) the printer starts the selftest printing routine, which means that the DC power supply is OK.

Switch off the printer.



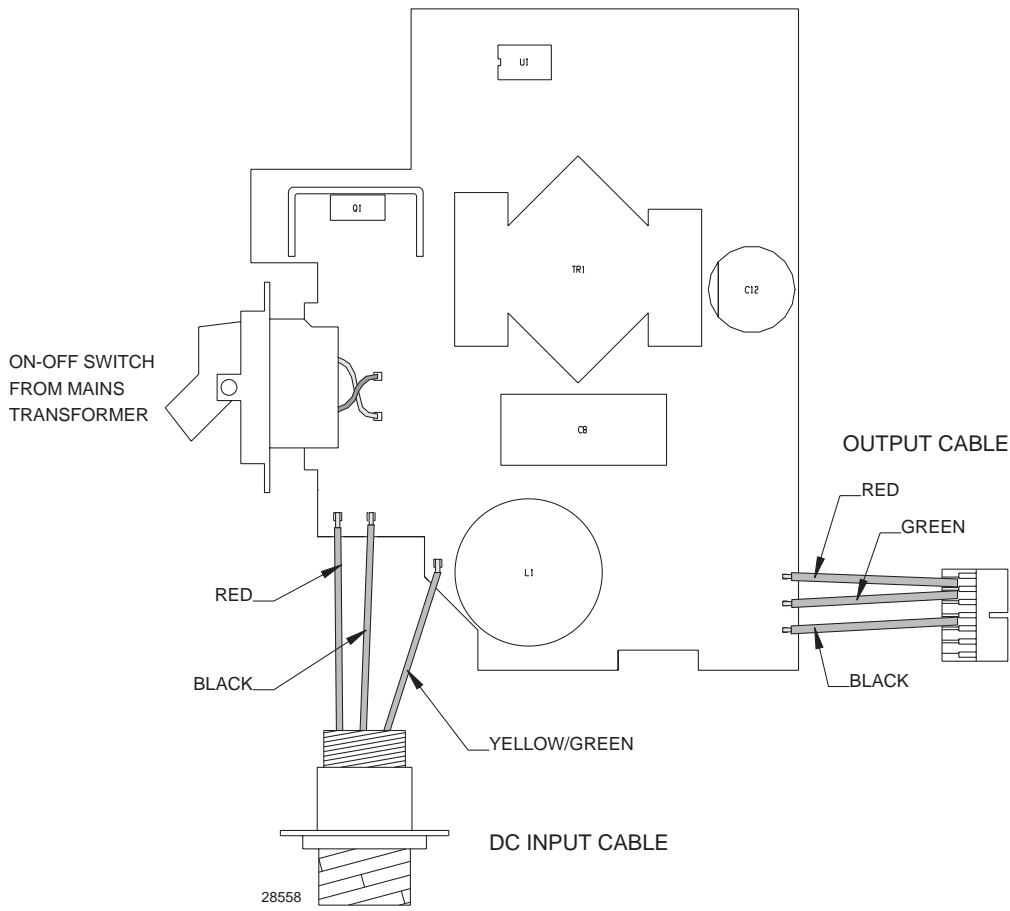
### 2.3.3 REASSEMBLING OF THE PRINTER

Place the top cover by lifting the front end and place holes in the rear end into the two small hooks in the bottom cabinet.

To reassemble the printer, do the reverse procedure of the disassembling.

Then run the selftest programme of the printer. (See above)

## 2.4 ELECTRICAL CONNECTIONS



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## **3 SERVICE**

### **3.1 PRINTER SELFTEST**

To do a performance test of the DC power supply, a selftest programme in the printer can be used. Connect a DC power source of 10.5V to 32V to the DC input connector. Switch on the ON-OFF switch and simultaneously press down the "line feed" button. After a few seconds (at low input voltage) the printer starts the selftest a printing routine, which means that the power supply is OK. Switch off the printer.

### **3.2 MODULE CHECK OF THE DC POWER SUPPLY**

Connect a dummy load of  $33\Omega/30W$  to 30V output.  
Connect a dummy load of  $33\Omega/5W$  to 10V output.

Connect a DC power source of 10.5V to the DC input connector.  
Switch on the power supply module. The module has to start up within 4 seconds.  
Connect a voltmeter to the 30V output and read  $28 \pm 2V$ .  
Connect a voltmeter to the 10V output and read  $9V \pm 1V$ .

Connect a DC power source of 32V to the DC input connector.  
Switch on the power supply module. The module has to start up within 1 second.  
Connect a voltmeter to the 30V output and read  $33V \pm 2V$ .  
Connect a voltmeter to the 10V output and read  $10V \pm 1V$ .

Disconnect the dummy load from the 30V output and read the voltage to  $39V \pm 2V$ .

### **3.3 CHECK AFTER REPAIR**

If any repair has occurred to the power supply module, then perform chapter 3.2 MODULE CHECK OF THE DC POWER SUPPLY.



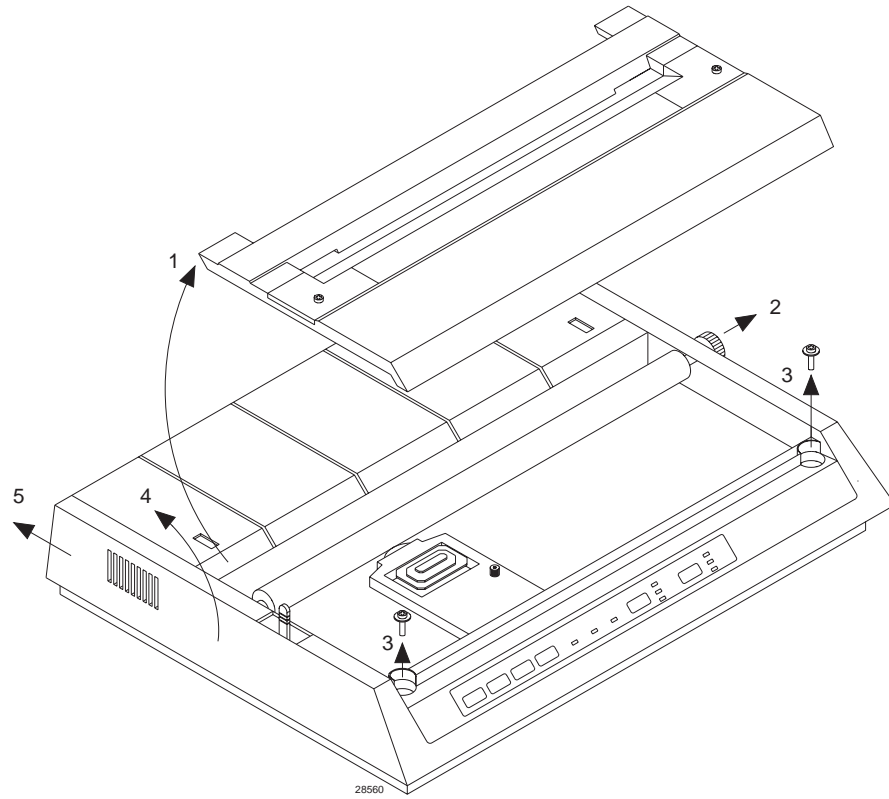
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## 4 MECHANICAL DISASSEMBLING OF PRINTER





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## 5 CIRCUIT DESCRIPTION

### 5.1 DC POWER SUPPLY

To suppress noise on the supply wires a filter is build around the current compensated choke L1. Furthermore the RC snubbers across the transformer prevent unwanted oscillations during transition time. The diode D7 in conjunction with R16 and C19 clamps the transient voltage spikes across the switch transistor Q1.

When the supply is switched on, the capacitor C6 is charged by means of R1 and when the voltage exceeds approx. 8.7V the controller U1 turns on. After a few cycles power is delivered from the bootstrap winding of the transformer to maintain the supply to the controller U1. When switching of the supply voltage, the power from the transformer disappears. This means the supply voltage to U1 decreases to approx. 7.6V and the controller U1 switches off.

The rectified voltage from the bootstrap winding is also used to regulate the output voltages, which mainly is determined by R8 and R11. The feedback voltage is led to U1 pin 2. The resistors R10 and R9 and the capacitor C17 form the compensating circuit for the voltage regulation.

The controller is working at a fixed frequency of approx. 100 kHz, determined by R7 and C16.

The switch current is sensed by R15 and led to U1 pin 3 after being filtered by R14 and C18. The current sense voltage is a ramp voltage, which is compared to a DC level determined by the voltage regulation circuit. When the ramp exceeds the DC level, the controller U1 switch off the FET Q1. This current sense circuit forms a current regulation loop, which is stabilizing the over all regulation and prevents high current to damage the switch transistor Q1.

When Q1 is on, the output diodes D3 and D4 is reversed biased and current to the load is delivered from the capacitors C12 and C13. During the off time of Q1, the transformer outputs deliver the currents to the capacitors C12 and C13 and to the load.

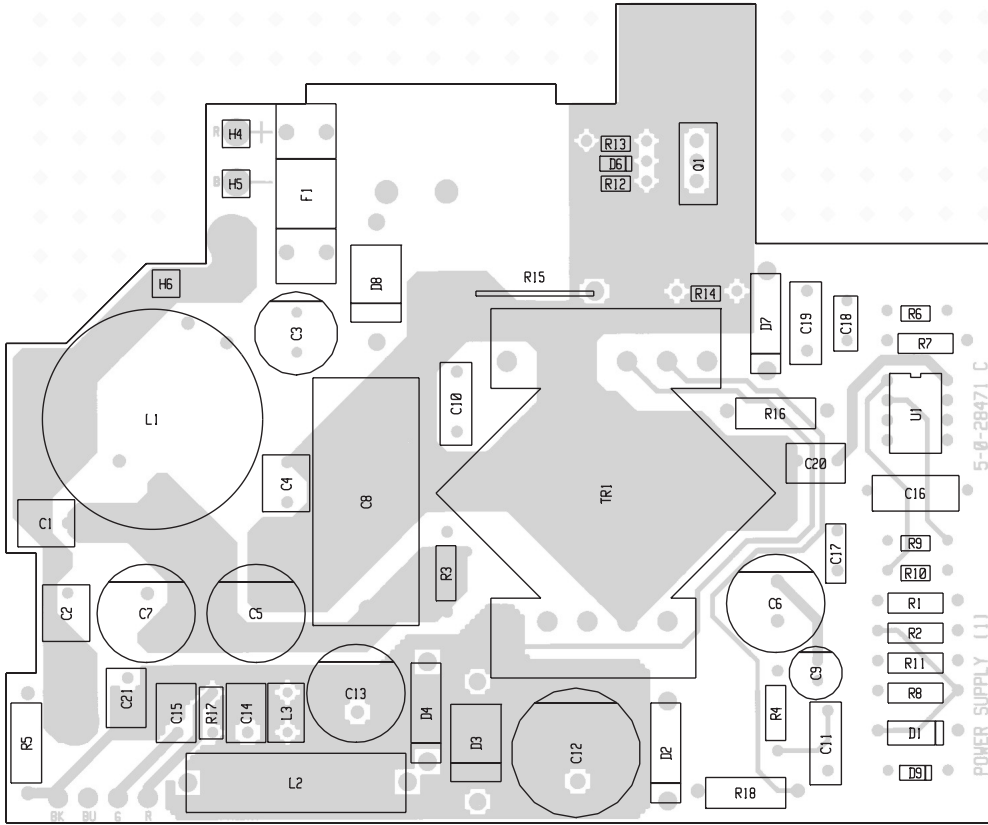
The chokes L2 and L3 are parts of lowpass filters to suppress voltage spikes.

Because of the converter principle, which is a ringing choke flyback type, without direct feedback from the output the voltages, the output voltages are load dependent.

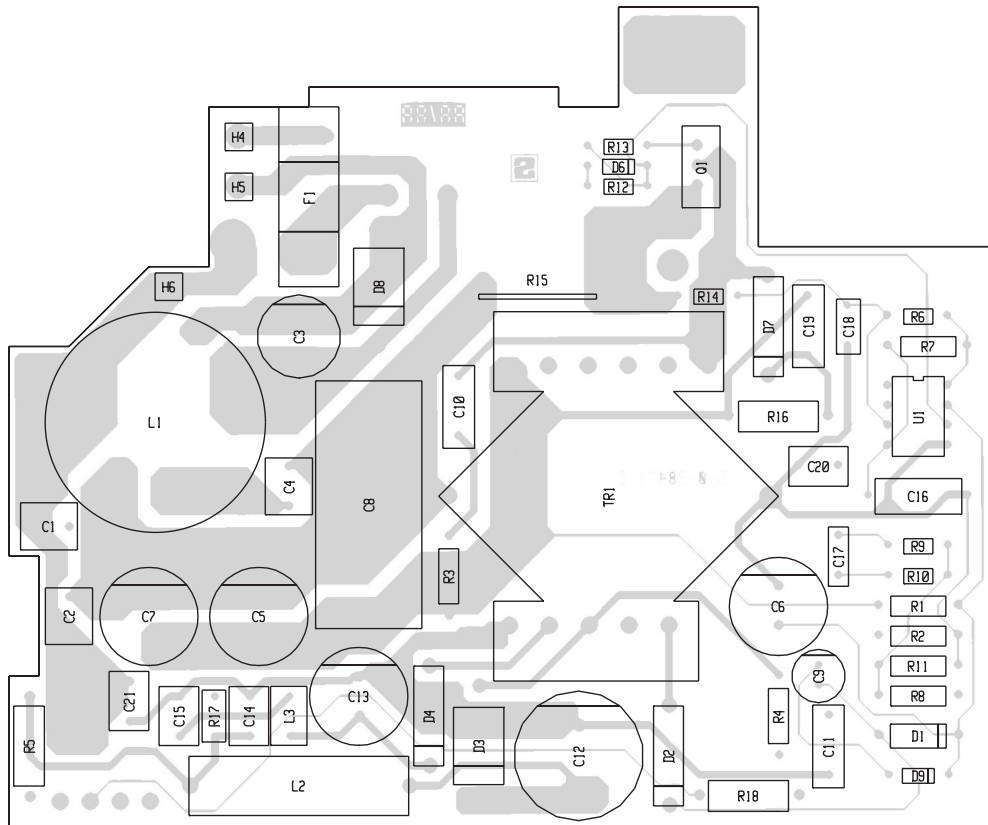
At input voltage under approx. 15V and at full load, the converter "changes frequency" and gets an irregular duty-cycle. That is normal behaviour.

At low input voltage the start up time can be as long as 4 seconds, depending on the load.

COMPONENT LOCATION DC POWER SUPPLY

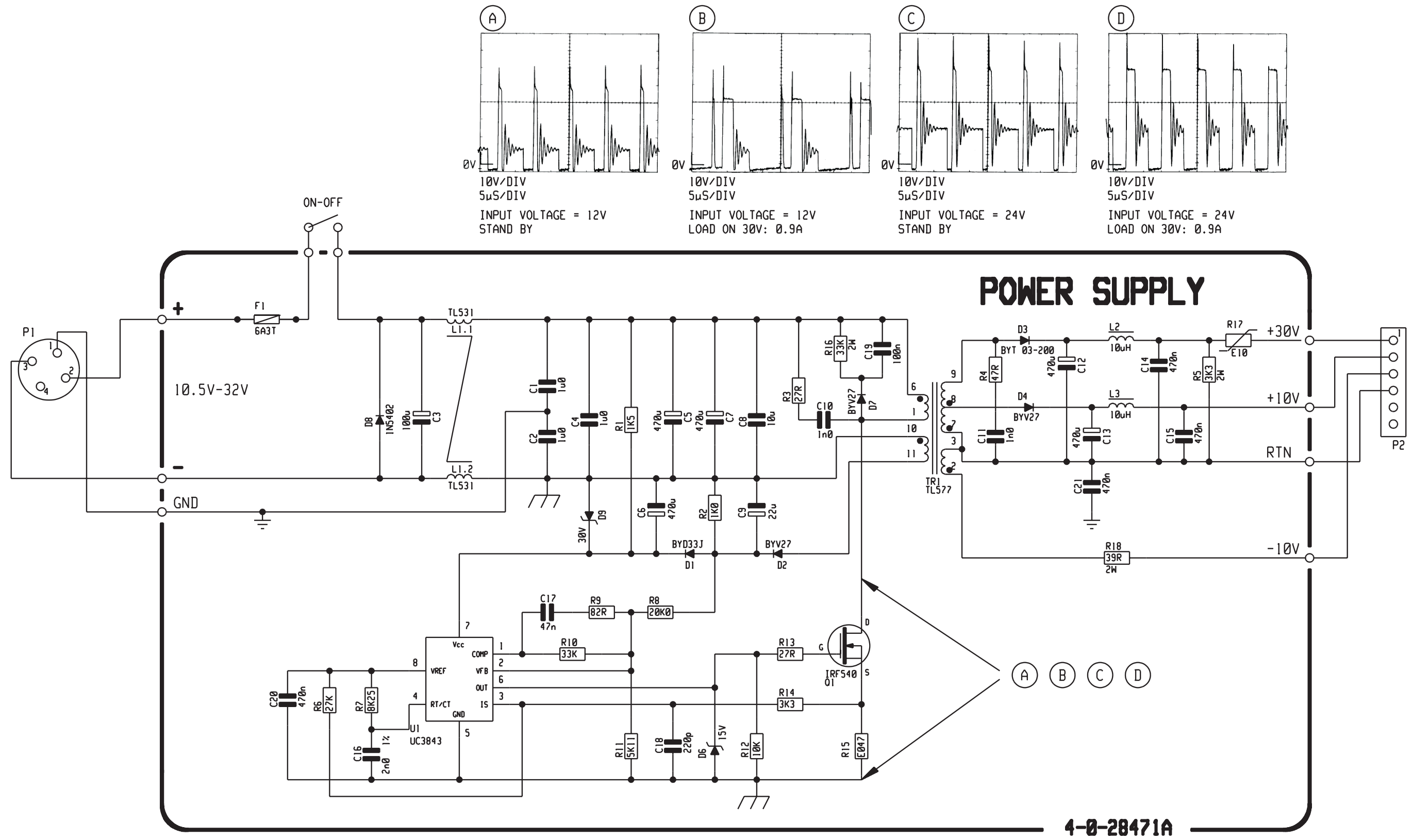


View from component side with upper side tracks.



View from component side with lower side tracks.

**SCHEMATIC DIAGRAM DC POWER SUPPLY**







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**6 PARTS LIST**

**6-1**



## 6 PARTS LIST

**10.5-32V DC POWER SUPPLY FOR OKI PRINTER u182/u280 ECI A/S 0-0-28515 728515**

POSITION	DESCRIPTION		MANUFACTURER	TYPE	PART NO.
VARIOUS	GROUND CONNECTION FOR	DC POWER SUPPLY H1252B	ECI A/S	1-0-28529	228259
VARIOUS	MOUNTING FRAME FOR PCB	H1252B	ECI A/S	1-0-28473	228473
VARIOUS	POWER CABLE 3 POLE 3x0.75	2000mm (T&T M061-101028)	MONTRONICS	3-0-28478	56.066
VARIOUS	SCREW M3x4mm		WULCAN	Art.Nr: M024-56.066 HFC 9041 M3x4 PHJX-Z DIN 7985	86.951
-1	POWER SUPPLY FOR PRINTER	(MODULE 1) H1252B	ECI A/S	5-0-28471C / 4-0-28471A	628471

**POWER SUPPLY FOR PRINTER (MODULE 1) H1252B ECI A/S 5-0-28471C / 4-0-28471A 628471**

POSITION	DESCRIPTION		MANUFACTURER	TYPE	PART NO.
C1	CAPACITOR MKT	1uF 10% 63VDC	ERO	MKT 1826-510/06 5-G	11.137
C2	CAPACITOR MKT	1uF 10% 63VDC	ERO	MKT 1826-510/06 5-G	11.137
C3	CAPACITOR ELECTROLYTIC	100uF -20/+50% 63VDC	ELNA	RJ2-63-V-101-M-F	14.620
C4	CAPACITOR MKT	1uF 10% 63VDC	ERO	MKT 1826-510/06 5-G	11.137
C5	CAPACITOR ELECTROLYTIC	470uF -20/+50% 40VDC	ELNA	RJ3-50-471-M-F	14.649
C6	CAPACITOR ELECTROLYTIC	470uF -20/+50% 40VDC	ELNA	RJ3-50-471-M-F	14.649
C7	CAPACITOR ELECTROLYTIC	470uF -20/+50% 40VDC	ELNA	RJ3-50-471-M-F	14.649
C8	CAPACITOR MKT	10uF 10% 63VDC	ERO	MKT 1822-610/06 5	11.086
C9	CAPACITOR ELECTROLYTIC	22uF 20% 35VDC	ELNA	RJ2-35-V-220-M-F1	14.516
C10	CAPACITOR MKT	1000pF 10% 400VDC	ERO	MKT 1818-210/63 5-G	11.139
C11	CAPACITOR MKT	1000pF 10% 400VDC	ERO	MKT 1818-210/63 5-G	11.139
C12	CAPACITOR ELECTROLYTIC	470uF -20/+30% 63VDC	PHILIPS	2222 035 68471	14.604
C13	CAPACITOR ELECTROLYTIC	470uF -20/+50% 40VDC	ELNA	RJ3-50-471-M-F	14.649
C14	CAPACITOR MKT	470nF 20% 63VDC	ERO	MKT 1826-447/06 6-G	11.188
C15	CAPACITOR MKT	470nF 20% 63VDC	ERO	MKT 1826-447/06 6-G	11.188
C16	CAPACITOR POLYSTYRENE	2nF 1% 160V	PHILIPS	2222 429 82002	10.283
C17	CAPACITOR MKT	47nF 5% 63VDC	PHILIPS	2222 370 79473	11.156
C18	CAPACITOR CERAMIC	220pF 2% N750 100VDC	PHILIPS	2222 683 58221	16.075
C19	CAPACITOR MKT	100nF 10% 100VDC	ERO	MKT 1818-410/01 5-G	11.180
C20	CAPACITOR MKT	470nF 20% 63VDC	ERO	MKT 1826-447/06 6-G	11.188
C21	CAPACITOR MKT	470nF 20% 63VDC	ERO	MKT 1826-447/06 6-G	11.188
D1	DIODE FAST RECOVERY	600VDC/1A	PHILIPS	BYD 33 J	27.150
D2	DIODE V.F.R.	100VDC 2A(AV) BYV27-100	PHILIPS	BYV27-100	27.114
D3	DIODE FAST RECOVERY	200V/3A BYT03-200/MUR420	THOMSON	BYT 03-200 TAPED	25.210
D4	DIODE V.F.R.	100VDC 2A(AV) BYV27-100	PHILIPS	BYV27-100	27.114
D6	DIODE ZENER	15V 5% 0.4W BZX79C15	PHILIPS	BZX79C15	26.561
D7	DIODE V.F.R.	100VDC 2A(AV) BYV27-100	PHILIPS	BYV27-100	27.114
D8	DIODE RECTIFIER	1N5402 200V/3A	PROMAX	1N5402	25.116
D9	DIODE ZENER	30V 5% 0.4W BZX79C30	PHILIPS	BZX79C30	26.578
F1	FUSE	5x20mm 6A3 T 250V	ELU	17912006300	45.510
L1	CHOKE	TL531	TRANS-ELECTRO	6-0-26309A	400531
L2	CHOKE FIXED	10uH 20% 6Amp	SIEMENS	B82133-A5302-M	20.290
L3	CHOKE FIXED	10uH 5%	NEOSID	00 6122 00	20.118
Q1	TRANS.POW.MOSFET N-CHANN.	100V/27A/85mOHM IRF540	MOTOROLA	IRF540	29.402
R1	RESISTOR MF	1k5 OHM 5% 0.4W	PHILIPS	2322 181 53152	01.204
R2	RESISTOR MF	1k0 OHM 5% 0.4W	PHILIPS	2322 181 53102	01.200
R3	RESISTOR MF	27 OHM 5% 0.4W	PHILIPS	2322 181 53279	01.160
R4	RESISTOR MF	47 OHM 5% 0.4W	PHILIPS	2322 181 53479	01.166
R5	RESISTOR PMF	3k3 OHM 5% 2W	PHILIPS	2322 194 13332	04.209
R6	RESISTOR MF	27k OHM 5% 0.33W	PHILIPS	2322 187 73273	02.506
R7	RESISTOR MF	8k25 OHM 1% 0.6W	PHILIPS	2322 156 18252	03.423
R8	RESISTOR MF	20k0 OHM 1% 0.6W	PHILIPS	2322 156 12003	03.452
R9	RESISTOR MF	82 OHM 5% 0.33W	PHILIPS	2322 187 73829	02.446
R10	RESISTOR MF	33k OHM 5% 0.33W	PHILIPS	2322 187 73333	02.508
R11	RESISTOR MF	5k11 OHM 1% 0.6W	PHILIPS	2322 156 15112	03.414
R12	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 187 73103	02.496
R13	RESISTOR MF	27 OHM 5% 0.33W	PHILIPS	2322 187 73279	02.434
R14	RESISTOR MF	3k3 OHM 5% 0.33W	PHILIPS	2322 187 73332	02.484
R15	RESISTOR	47m OHM 5% 0.6W	MODULOHM I/S	98247/47U-J-MI-A-1	06.233
R16	RESISTOR PMF	33k OHM 5% 2W	PHILIPS	2322 194 13333	04.229
R17	RESISTOR PTC	100m OHM 0.7W	BOURNS	MF-R110	07.162
R18	RESISTOR PMF	39 OHM 5% 2W	PHILIPS	2322 191 33909	04.145
TR1	SMPS TRAF0 FOR PRINTER H1	TL577	ECI A/S	6-0-28472B	400577
U1	PWM CONTROLLER	CURRENT MODE, UC3843	TEXAS	UC3843P (UC2843P)	31.177









