

LAB 1300C

SERVICEMANUAL

1996 EMC

<u>PAGE</u>	<u>CONTENTS</u>	<u>DRAWING SCHEMATIC</u>	<u>LAYOUT</u>
1-4.1	INPUT AMPLIFIER & LED	L13INP	L13INP
5-7	LF-AMPLIFIER	L1300C	L1300C-P
11.1-14.1.2	POWER SUPPLY <small>FROM SERIAL NO: 980-801</small>	PSU-G PSU-H	PSU-G-P PSU-H-P

OLD VERSIONS

<u>PAGE</u>	<u>CONTENTS</u>	<u>DRAWING SCHEMATIC</u>	<u>LAYOUT</u>
8-10	POWER SUPPLY <small>FROM SERIAL NO. 930-6XX TO 970-2XX</small>	2KPSUA 2KPSUB	2KPSUA-P 2KPSUB-P
11-14	POWER SUPPLY <small>FROM SERIAL NO. 970-2XX TO 980-825</small>	2KPSUC 2KPSUD	2KPSUC-P 2KPSUD-P

SERVICEINFORMATION FOR LAB 1200,1300,1600,2000,4000

New power supply board. PSUG, PSUH

Serial number from:

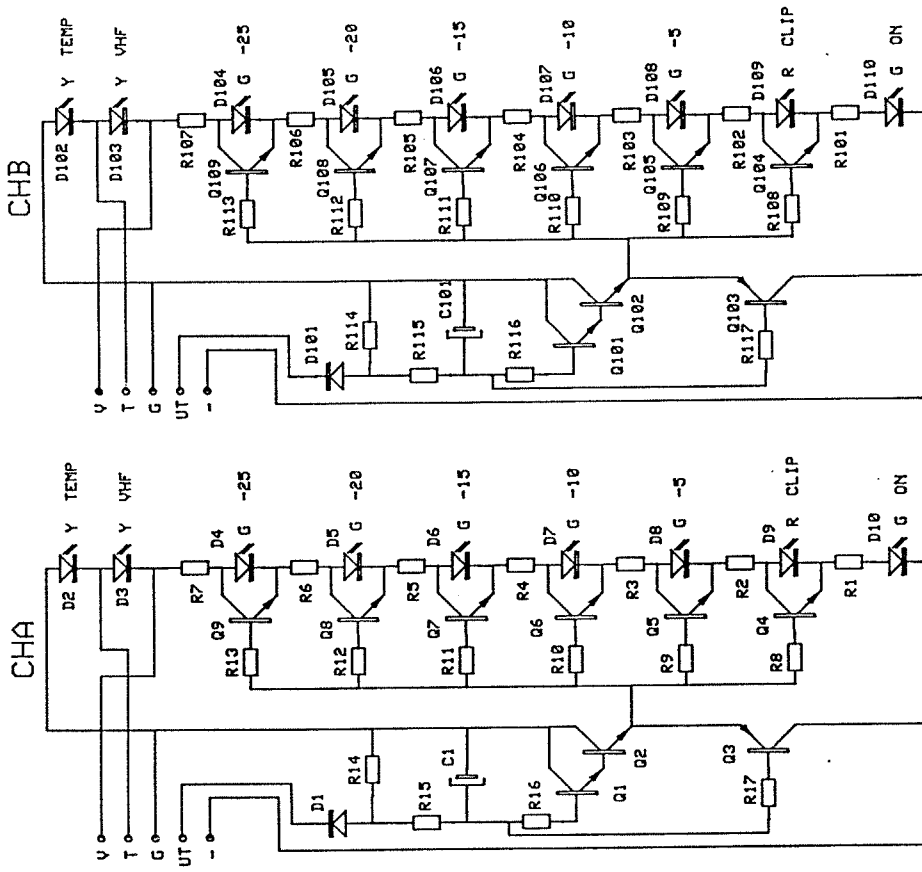
LAB 1200:	980-901
LAB 1300:	980-801
LAB 1600:	980-901
LAB 2000:	980-801
LAB 4000:	990-101

To be able to produce all the power supply on the same print board there have been some small changes done.

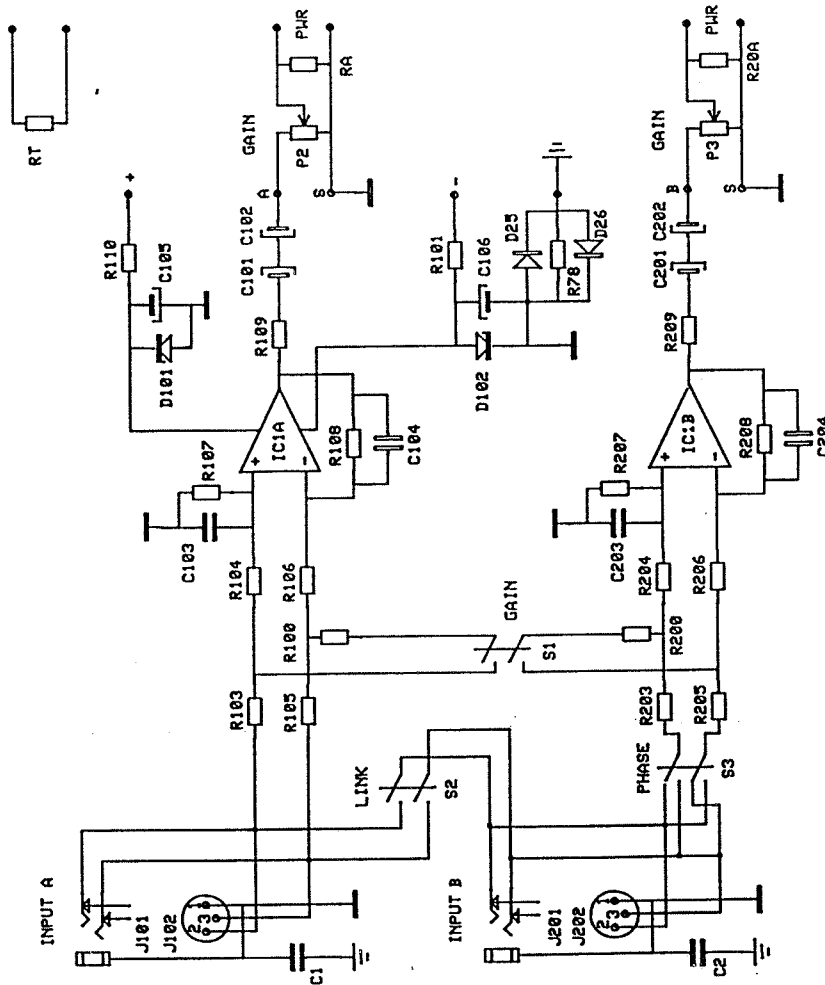
The out put power, and the electrical specification is not effected.

The new boards are called PSUG, and PSUH.

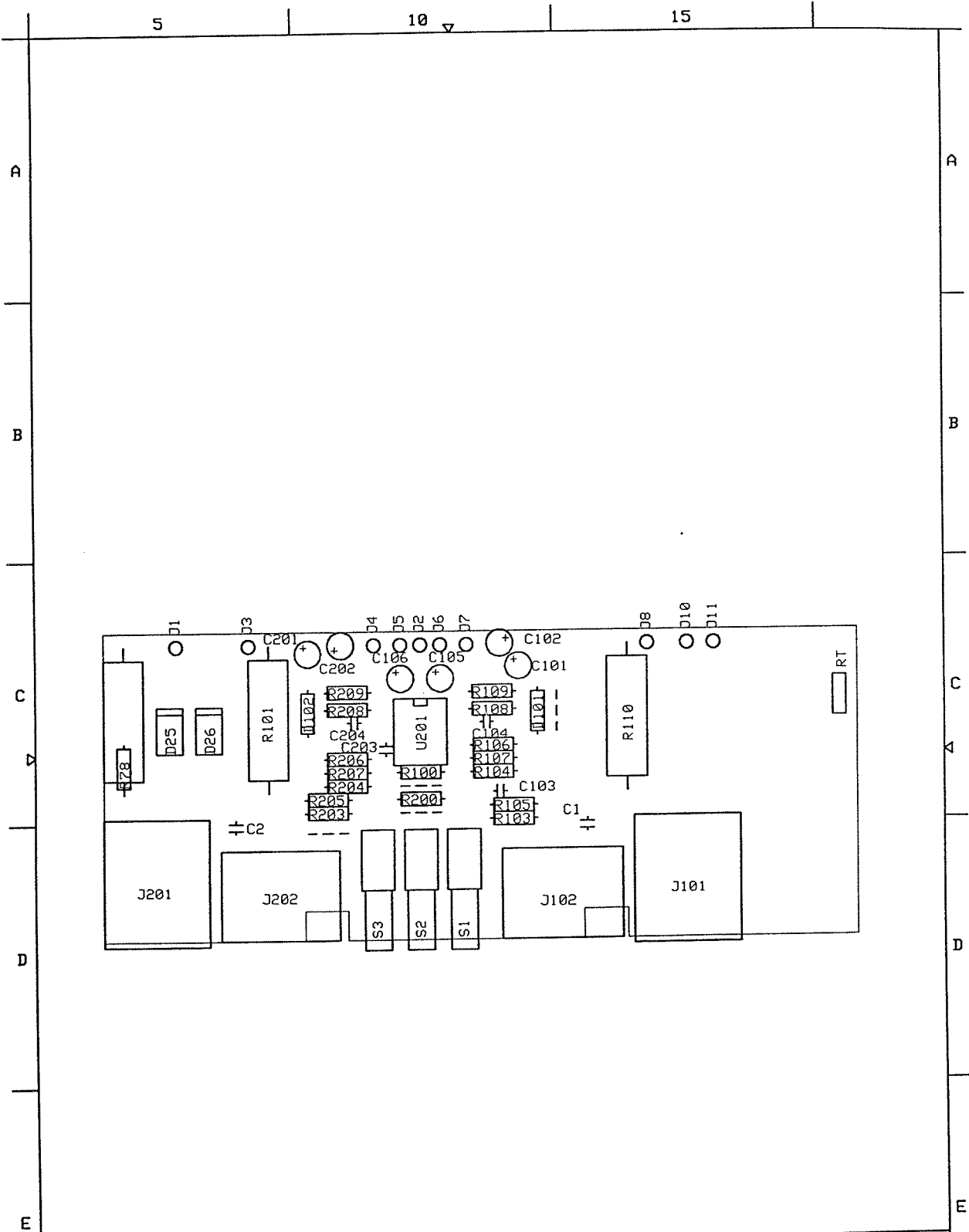
LED



INPUT BUFFER



DET.-NR	ANT	BENÄMNING	MATERIAL	ERSÄTT AV
KONSTR.	RT100	KOP	STAND.	ERSÄTT
	dB		GODK.	AV
LAB.GRUPPEN		POWER AMPLIFIER LAB 1300C		RT1N.-NR
KUNGSBACKA SÄEDEN		INPUT BUFFER & LED SCHEMATIC		DAT
				L131NP

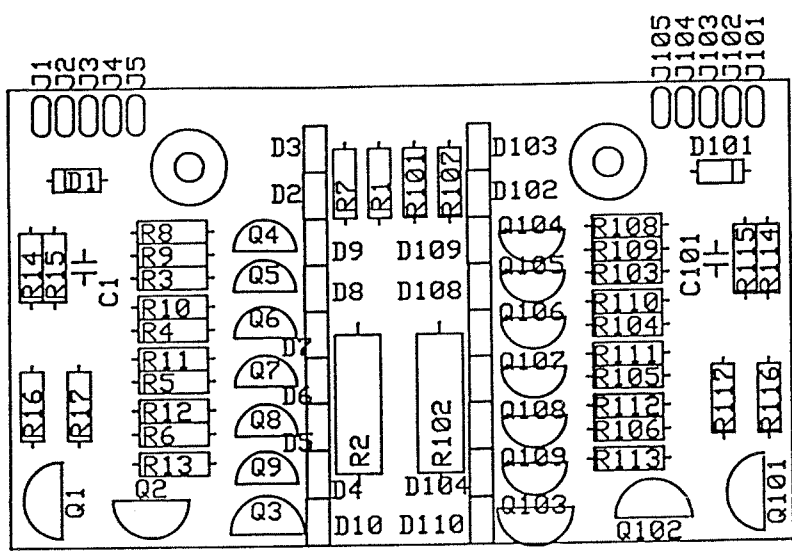


△		Design	Description	Included in	Machine
△			LAB 1300 Input board	LAB 1300C	
△		Drawn		Release ECO	Release date
△		dB			
△		Checked		Replaces	Design rev.
△				Drawing no.	Page
△				L13inp	

LAB.GRUPPEN

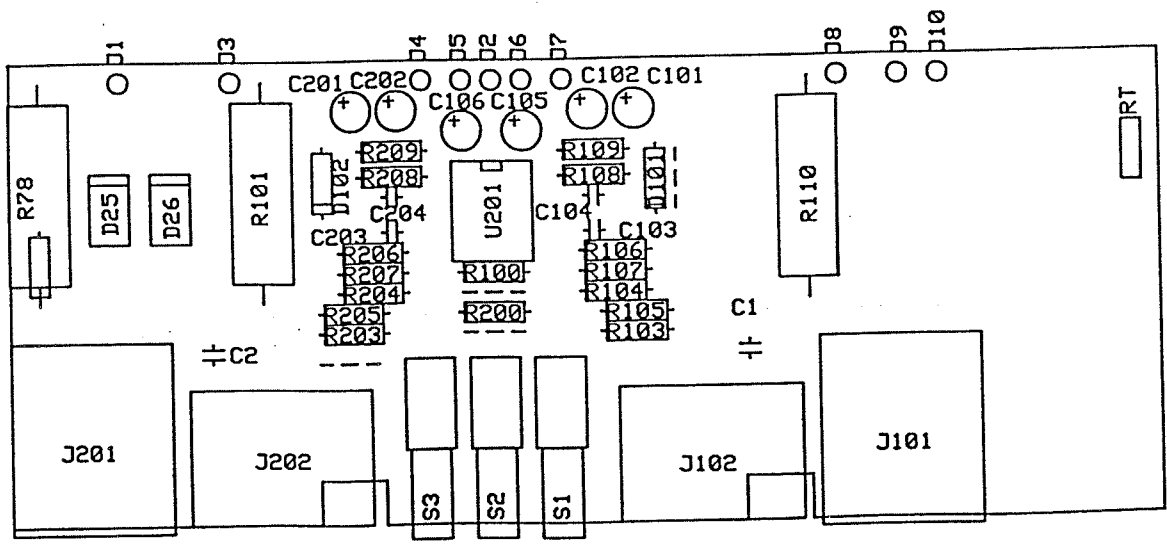
LAB 1300C POWER AMPLIFIER

LED DISPLAY



LAB 1300C POWER AMPLIFIER

INPUT BUFFER & FAN SPEED CONTROL



LAB 500 – 2000C

LED DISPLAY

Component-list

Channel A
(Ch. B add 100)

Resistors

R1	see below
R2	2.7 k Ω 3W
R3	1.2 k Ω 1W
R4	680 Ω
R5	330 Ω
R6	120 Ω
R7	220 Ω
R8	33 k Ω
R9	33 k Ω
R10	33 k Ω
R11	33 k Ω
R12	33 k Ω
R13	33 k Ω
R14	33 k Ω
R15	100 Ω 1%
R16	2.7 k Ω
R17	2.7 k Ω

Capacitors

C1	4.7 μ F 100V
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Diodes

D1	1N 4004
D2	Led Y
D3	Led Y
D4	Led G
D5	Led G
D6	Led G
D7	Led G
D8	Led G
D9	Led R
D10	Led G

Transistors

Q1	MPSA 42
Q2	MPSA 42
Q3	MPSA 92
Q4	BC 547
Q5	BC 547
Q6	BC 547
Q7	BC 547
Q8	BC 547
Q9	BC 547

	500	1000	1300C	1600	2000
R1	1,5 k Ω	820 Ω	680 Ω	680 Ω	680 Ω 1% long legs

LAB 1300C

INPUT AMPLIFIER

Component-list

INPUT AMPLIFIER

Channel A 100

Channel B 200

Resistors

R100,R200	7,5 k Ω 29 dB gain
	2,67 k Ω 23 dB gain
	16,9 k Ω 32 dB gain
R103,R203	10 k Ω 1%
R104,R204	10 k Ω 1%
R105,R205	10 k Ω 1%
R106,R206	10 k Ω 1%
R107,R207	20 k Ω 1%
R108,R208	20 k Ω 1%
R109,R209	100 Ω
R101	4.7 K Ω 3W
R110	4.7 k Ω 3W
R78	10 Ω
RT	220 k Ω 20°

Capacitors

C101,201	47 μ F 25 V
C102,202	47 μ F 25 V
C103,203	150 pF ker
C104,204	150 pF ker
C105	47 μ F 25 V
C106	47 μ F 25 V
C1	0,1 μ F 63V
C2	0,1 μ F 63V

Conectors

J102,202	3 pol XLR Neutrik NC3 FDH BAG
J101,201	3 pol telejack Cliff S2/BBB/PC

Diodes

D101	15V 0.4W Zener
D102	15V 0.4W Zener
D25	1N 5404
D26	1N 5404

Integrated Circuits

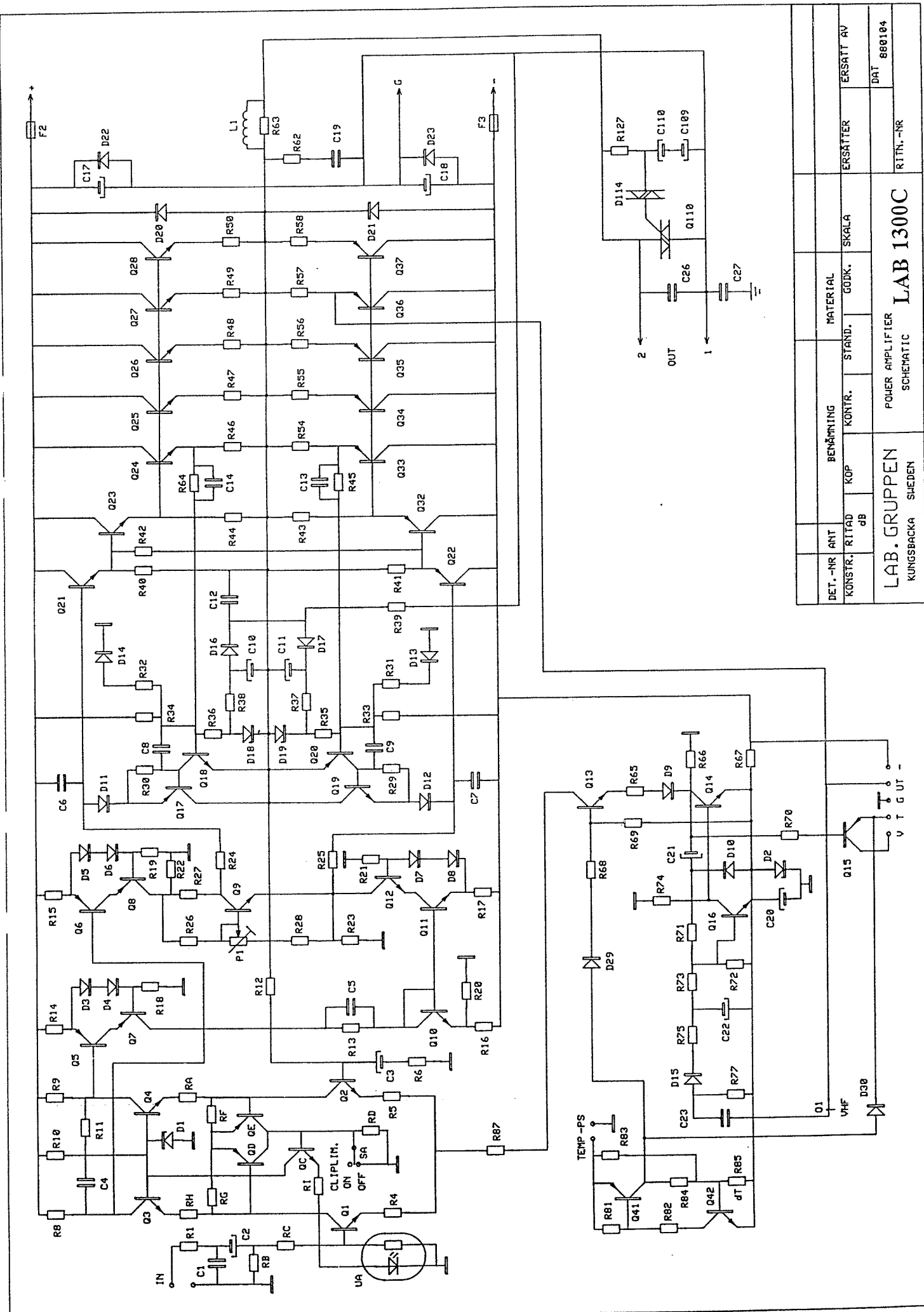
IC1	LF 353
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Switches

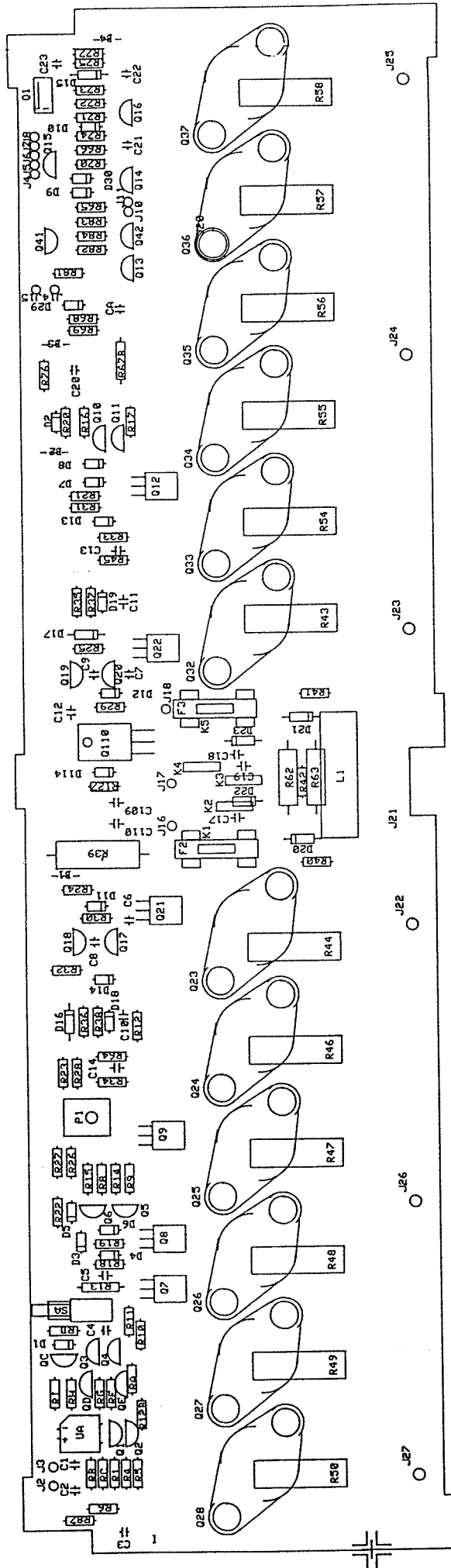
S1	ALPS SPP J3
S2	ALPS SPP J3
S3	ALPS SPP J3

Potentiometers

P2	10 k Ω lin Tokos
P3	10 k Ω lin Tokos
RA	10 k Ω 1%
R20A	10 k Ω 1%



DET.-NR	ANT	BENÄMNING	MATERIAL	ERSÄTT AV
KONSTR.	RITAD	KOP	STAND.	GODK.
dB		KONTR.	SKALA	
LAB. GRUPPEN			POWER AMPLIFIER	
KUNGSBACKA SVEDEN			SCHEMATIC	
			LAB 1300C	
			RITN.-NR	
			DAT 888104	



KONSTR.	RIITAD	KOP	KONTR.	STAND.	GODK.	SKALA	ERSÄTT	ERSÄTT AV
LABGRUPPEN		LAB1000		LAB1300		DAT		
KUNGSBACKA SVELEN		LAB1500		POWER AMPLIFIER		RIITN.-NR		

LAB 1300C

LF-AMPLIFIER

Component-list

Resistors

R1 2.2 k Ω
 R4 47 Ω
 R5 47 Ω
 R6 374 Ω 1%
 R8 1 k Ω 1%
 R9 1 k Ω 1%
 R10 10 k Ω 1% on legs
 R11 1.8 k Ω
 R12 33 k Ω 1%
 R13 12 k Ω 1W
 R14 100 Ω 1%
 R15 100 Ω 1%
 R16 100 Ω 1%
 R17 100 Ω 1%
 R18 82 k Ω
 R19 82 k Ω
 R20 82 k Ω
 R21 82 k Ω
 R22 27 k Ω
 R23 27 k Ω
 R24* 180 Ω
 R25 220 Ω
 R26 10 k Ω
 R27* 47 Ω
 R28* 1.5 k Ω 1%
 R29 4.7 k Ω
 R30 4.7 k Ω
 R31 100 k Ω
 R32 100 k Ω
 R33 1 M Ω
 R34 1 M Ω
 R35 100 k Ω
 R36 100 k Ω
 R37 10 k Ω
 R38 10 k Ω
 R39 820 Ω 5W
 R40 150 Ω
 R41 150 Ω
 R42 100 Ω
 R43 4.7 Ω 5W
 R44 4.7 Ω 5W
 R45 2.2 k Ω
 R46 0.33 Ω 5W
 R47 0.33 Ω 5W
 R48 0.33 Ω 5W
 R49 0.33 Ω 5W
 R50 0.33 Ω 5W
 R54 0.33 Ω 5W
 R55 0.33 Ω 5W
 R56 0.33 Ω 5W
 R57 0.33 Ω 5W
 R58 0.33 Ω 5W
 R62 10 Ω 4W
 R63 10 Ω 4W
 R64 2.2 k Ω

R65 1.5 k Ω 1%
 R66 56 k Ω
 R67 12 k Ω 1W
 R68 100 k Ω
 R69 56 k Ω
 R70 33 k Ω 1%
 R71 220 k Ω
 R72 100 k Ω
 R73 220 k Ω
 R74 56 k Ω
 R75 10 k Ω
 R76 10 Ω
 R77 10 k Ω
 R81 3.3 k Ω
 R82 22 k Ω
 R83 120 k Ω
 R84 1 M Ω
 R87 2.2k Ω
 R127 220 k Ω
 RA 1.5 k Ω 1%
 RB 15 k Ω
 RC 15k Ω
 RD 150 k Ω
 RF 27 k Ω
 RG 27 k Ω
 RH 1.5 k Ω 1%
 RI 1.5 k Ω 1%

Thermistors

R85 150 k Ω NTC

Potentiometers

P1 1 k Ω

Capacitors

C1 150 pF ker
 C2 4.7 μ F 35V
 C3 100 μ F 10V
 C4 680 pF ker
 C5 22 nF 250V
 C6 150 pF ker
 C7 150 pF ker
 C8 470 pF ker
 C9 470 pF ker
 C10 1 μ F 100V
 C11 1 μ F 100V
 C12 22 nF 250V
 C13 1 nF
 C14 1 nF
 C17 4.7 μ F 100V
 C18 4.7 μ F 100V
 C19 0.1 μ F 400V
 C20 220 μ F 16V

C21 10 μ F 50V
 C22 4.7 μ F 50V
 C23 39 pF ker
 C26 10 nF 400V
 C27 2.2 μ F 63V
 C109 4.7 μ F 100V
 C110 4.7 μ F 100V

Diodes

D1 15 V Zener 0.4W
 D2 15 V Zener 0.4W
 D3 1N 4148
 D4 1N 4148
 D5 1N 4148
 D6 1N 4148
 D7 1N 4148
 D8 1N 4148
 D9 1N 4148
 D10 1N 4148
 D11 1N 4148
 D12 1N 4148
 D13 BAV 21
 D14 BAV 21
 D15 1N 4004
 D16 1N 4004
 D17 1N 4004
 D18 27 V Zener 0.4W
 D19 27 V Zener 0.4W
 D20 1N 4004
 D21 1N 4004
 D22 1N 4004
 D23 1N 4004
 D29 1N 4148
 D30 1N 4148
 D114 HS 10, diac 10V

Transistors

Q1 BC 547B selected
 Q2 BC 547B selected
 Q3 MPSA 42
 Q4 MPSA 42
 Q5 BC 557B
 Q6 BC 557B
 Q7 MJE 350
 Q8 MJE 350
 Q9* BD329
 Q10 BC 547B
 Q11 BC 547B
 Q12 MJE 340
 Q13 BC 547B
 Q14 BC 547B
 Q15 BC 557B
 Q16 BC 547B
 Q17 BC 557B

Q18 BC 547B
 Q19 BC 547B
 Q20 BC 557B
 Q21 MJE 340
 Q22 MJE 350
 Q23 MJ 15022
 Q24 MJ 15022
 Q25 MJ 15022
 Q26 MJ 15022
 Q27 MJ 15022
 Q28 MJ 15022
 Q32 MJ 15023
 Q33 MJ 15023
 Q34 MJ 15023
 Q35 MJ 15023
 Q36 MJ 15023
 Q37 MJ 15023
 Q41 BC 557B
 Q42 BC 547B
 QC BC 547
 QD BC 557
 QE BC 557

Tyristors

Q110 Q4015L5

Optoresistors

UA VTL5C4

Inductors

L1 -

Fuses

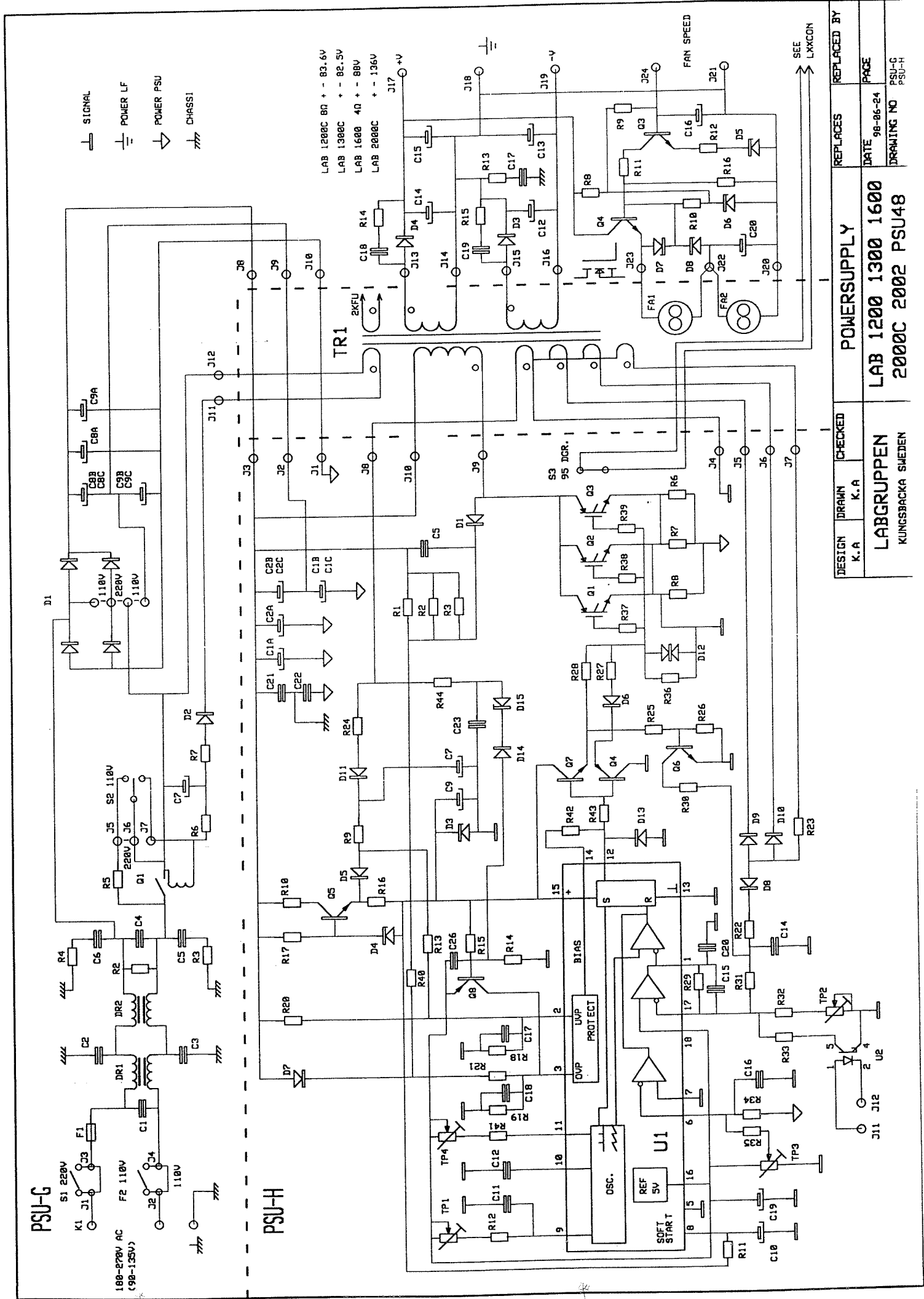
F1 T10A
 F2 T10A

Switches

SA SPPJ3 Alps
 O1 A1347 Siemens

* **Until 9801**

R24 120 Ω
 R27 82 Ω
 R28 1.8 k Ω
 Q9 MJE 340



- SIGNAL
- POWER LF
- POWER PSU
- CHASSI

- LAB 1200C 80 + - 83.6V
- LAB 1300C + - 82.5V
- LAB 1600 40 + - 88V
- LAB 2000C + - 136V

DESIGN	DRAWN	CHECKED	REPLACES	REPLACED BY
K. A	K. A		POWER SUPPLY	
LABGRUPPEN KUNGSBACKA SJEDEN			LAB 1200 1300 1600 2000C 2002 PSU48	
			DATE 98-06-24	PAGE
			DRAWING NO	PSU-C PSU-H

SEE LXXCON

PSU-G

PSU-H

J11 J12

U2

OSC.

REF 5V

LVP PROTECT

BIAS

SOFT START

U1

TP1 TP2 TP3 TP4

9 10 11 12 13 14 15 16 17 18 19

20 21 22 23 24 25 26 27 28 29 30

31 32 33 34 35 36 37 38 39 40

41 42 43 44 45 46 47 48 49 50

51 52 53 54 55 56 57 58 59 60

61 62 63 64 65 66 67 68 69 70

71 72 73 74 75 76 77 78 79 80

81 82 83 84 85 86 87 88 89 90

91 92 93 94 95 96 97 98 99 100

101 102 103 104 105 106 107 108 109 110

111 112 113 114 115 116 117 118 119 120

121 122 123 124 125 126 127 128 129 130

131 132 133 134 135 136 137 138 139 140

141 142 143 144 145 146 147 148 149 150

151 152 153 154 155 156 157 158 159 160

161 162 163 164 165 166 167 168 169 170

171 172 173 174 175 176 177 178 179 180

181 182 183 184 185 186 187 188 189 190

191 192 193 194 195 196 197 198 199 200

201 202 203 204 205 206 207 208 209 210

211 212 213 214 215 216 217 218 219 220

221 222 223 224 225 226 227 228 229 230

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391 392 393 394 395 396 397 398 399 400

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421 422 423 424 425 426 427 428 429 430

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501 502 503 504 505 506 507 508 509 510

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531 532 533 534 535 536 537 538 539 540

541 542 543 544 545 546 547 548 549 550

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581 582 583 584 585 586 587 588 589 590

591 592 593 594 595 596 597 598 599 600

601 602 603 604 605 606 607 608 609 610

611 612 613 614 615 616 617 618 619 620

621 622 623 624 625 626 627 628 629 630

631 632 633 634 635 636 637 638 639 640

641 642 643 644 645 646 647 648 649 650

651 652 653 654 655 656 657 658 659 660

661 662 663 664 665 666 667 668 669 670

671 672 673 674 675 676 677 678 679 680

681 682 683 684 685 686 687 688 689 690

691 692 693 694 695 696 697 698 699 700

701 702 703 704 705 706 707 708 709 710

711 712 713 714 715 716 717 718 719 720

721 722 723 724 725 726 727 728 729 730

731 732 733 734 735 736 737 738 739 740

741 742 743 744 745 746 747 748 749 750

751 752 753 754 755 756 757 758 759 760

761 762 763 764 765 766 767 768 769 770

771 772 773 774 775 776 777 778 779 780

781 782 783 784 785 786 787 788 789 790

791 792 793 794 795 796 797 798 799 800

801 802 803 804 805 806 807 808 809 810

811 812 813 814 815 816 817 818 819 820

821 822 823 824 825 826 827 828 829 830

831 832 833 834 835 836 837 838 839 840

841 842 843 844 845 846 847 848 849 850

851 852 853 854 855 856 857 858 859 860

861 862 863 864 865 866 867 868 869 870

871 872 873 874 875 876 877 878 879 880

881 882 883 884 885 886 887 888 889 890

891 892 893 894 895 896 897 898 899 900

901 902 903 904 905 906 907 908 909 910

911 912 913 914 915 916 917 918 919 920

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941 942 943 944 945 946 947 948 949 950

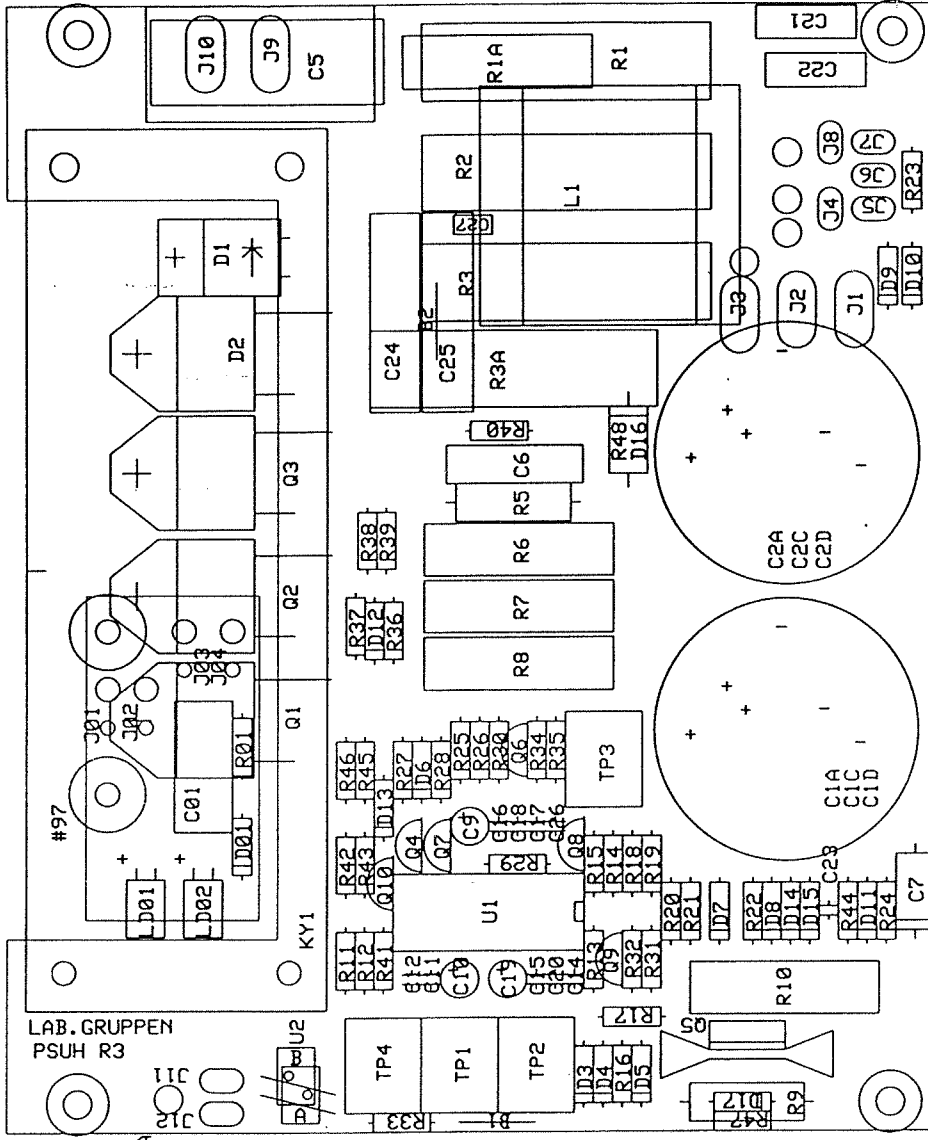
951 952 953 954 955 956 957 958 959 960

961 962 963 964 965 966 967 968 969 970

971 972 973 974 975 976 977 978 979 980

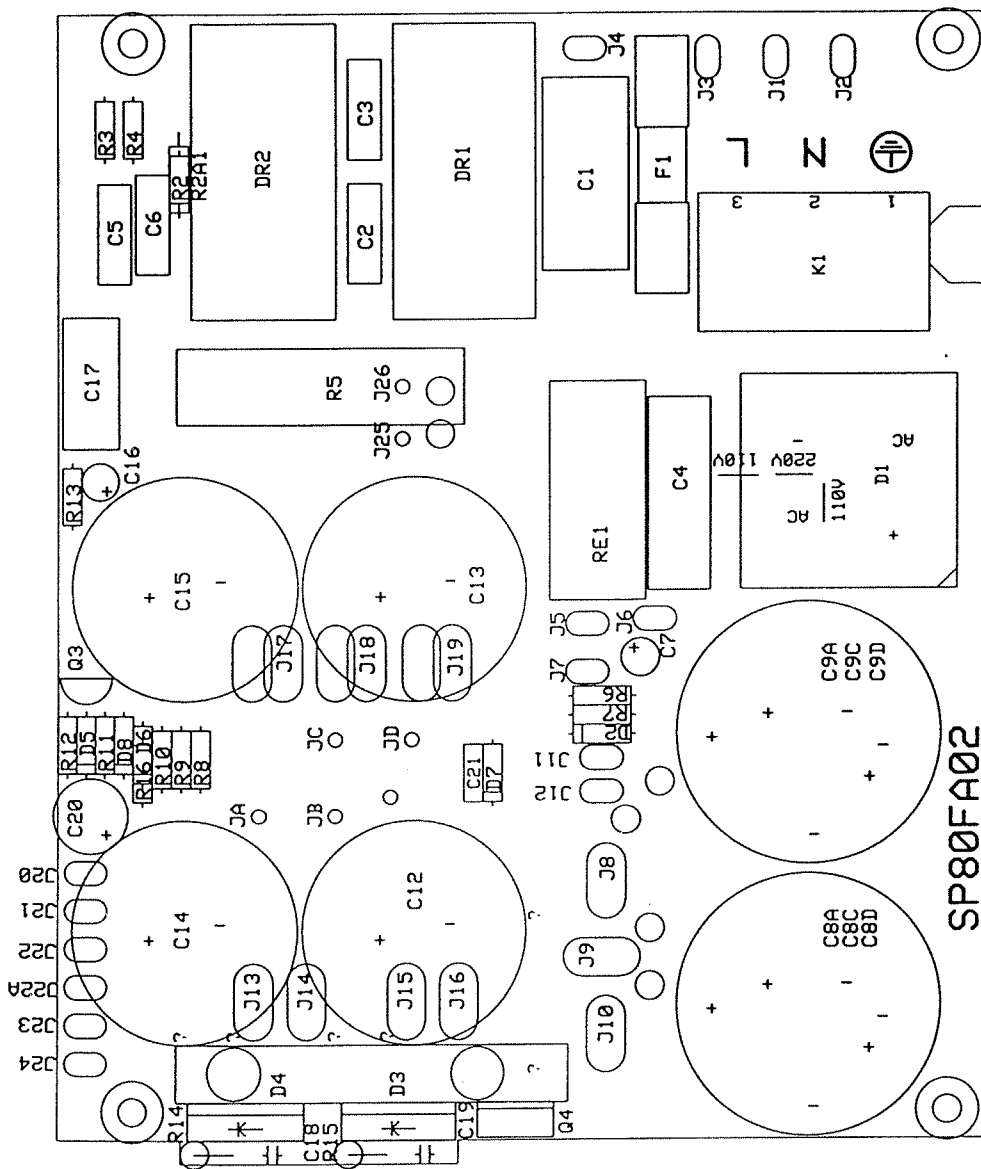
981 982 983 984 985 986 987 988 989 990

991 992 993 994 995 996 997 998 999 1000



LAB. GRUPPEN
PSUH R3

DESIGN K.A	DRAWN K.A	CHECKED K.A	POWER SUPPLY H	REPLACES 99 09 18	REPLACED BY
LABGRUPPEN			LAB 1200 1300 1600	DATE 00 03 02	PAGE
KUNGSBACKA SWEDEN			2000C 2002 4000 PSU48	DRAWING NO	PSUHR3-P



4 rectangles in milling type 1 = hole plated

DESIGN K.A	DRAWN K.A	CHECKED	POWER SUPPLY SP80FA	REPLACES 01 04 13	REPLACED BY
LABGRUPPEN			LAB 1200 1300 1600	DATE 01 05 04	PAGE
KUNGSBACKA SWEDEN			2000C 2002 4000 PSU48	DRAWING NO	SP80FA02-P

POWER SUPPLY, BOARD PSUG component-list

Resistors

R1-
R2 1 M Ω 1%
R3 33 Ω
R4 33 Ω
R5# 47 Ω 9W
R6 33 Ω
R7 2.2 Ω 1W
R8 See below
R9 See below
R10 See below
R11 See below
R12 See below
R13 4.7 Ω
R14 See below
R15 See below
R16 See below

Capacitors

C1 0.47 μ F
C2# 1.5 nF Y
C3# 1.5 nF Y
C4 0.22 μ F
C5# 1.5 nF Y
C6# 1.5 nF Y
C7 100 μ F 50V
C8a# See below
C9a# See below

C12 See below
C13 See below
C14 See below
C15 See below
C16 22 μ F 16V
C17 2.2 μ F 63V
C18 See below
C19 See below
C20 See below
C21 See below

Diodes

D1 600V 35A
D2 BYW26C
D3 STTB3006PI
D4 STTB3006PI
D5 5.6V Zener
D6 See below
D7 See below
D8 See below

Transistors

Q3 BC 546
Q4 See below

Relays

RE1 FEME MZF 0014816

Fuses

FU1 See below

Coils

DR1# See below
DR2# See below

Switches

S1# See below
S2# See below
S3 Comepa 4JT95 ARIUI 95°C

Relays

RE1 FEME MZF 0014816

Socket

K1 MKDSP10/3-10,16

110V AC

R5 22 Ω 9W
C2 2,2 nF Y
C3 2,2 nF Y
C5 2,2 nF Y
C6 2,2 nF Y

* Until 9708

Q4 BDX53F
D7 -
D8 -

POWER SUPPLY, BOARD PSUG

	LAB 1200C	LAB 1300C	LAB 1600	LAB 2000C	LAB 4000	PSU48-8
R8	4.7 k Ω 1%	Jumper	8.2 k Ω 1%	Jumper	27 k Ω 1% long leg	4,7 k Ω 1%
R9	1 M Ω	470 k Ω	150 k Ω	390 k Ω	180 k Ω 1%	470 k Ω
R10	39 k Ω 1%	4.7 k Ω 1% long leg	39 k Ω 1%	47 k Ω 1%	39 k Ω 1%	10 k Ω 1%
R11	18 k Ω 1%	1.8 k Ω	18 k Ω 1%	6.8 k Ω	18 k Ω 1%	4,7 k Ω 1%
R12	4.7 k Ω 1%	Jumper	4.7 k Ω	1.8 k Ω	4.7 k Ω 1%	Jumper
R14	2.2 Ω 2W	-	2.2 Ω 2W	-	-	-
R15	2.2 Ω 2W	-	2.2 Ω 2W	-	-	-
R16	-	18 k Ω 1%	-	39 k Ω 1%	-	-
C8a	220uF 385V	220uF 385V	220uF 385V	220uF 385V		220uF 385V
C9a	220uF 385V	220uF 385V	220uF 385V	220uF 385V		220uF 385V
C8b	-	-	-	-	1500 uF 200V	-
C9b	-	-	-	-	1500 uF 200V	-
C12	3900 uF 100V	3900 uF 100V	3900 uF 100V	1800 uF 160V	1800 uF 160V	3900 uF 100V
C13	3900 uF 100V	3900 uF 100V	3900 uF 100V	1800 uF 160V	1800 uF 160V	3900 uF 100V
C14	3900 uF 100V	3900 uF 100V	3900 uF 100V	1800 uF 160V	1800 uF 160V	3900 uF 100V
C15	3900 uF 100V	3900 uF 100V	3900 uF 100V	1800 uF 160V	1800 uF 160V	3900 uF 100V
C18	4.7 nF 400V	-	4.7 nF 400V	-	-	-
C19	4.7 nF 400V	-	4.7 nF 400V	-	-	-
C20	100 uF 50V	100 uF 50V	100 uF 50V	100 uF 50V	100 uF 50V	-
C21	-	-	-	680 pF/400V	680 pF/400V	-
D6	62 V \pm 2% Zener	-	62 V \pm 2% Zener	-	62 V \pm 2% Zener	27V Zener
D7	-	-	-	15V Zener	15V Zener	-
D8	-	-	-	39V \pm 2% Zener	39V \pm 2% Zener	-
Q4	TIP132	TIP41	TIP132	*IRF730	*IRF730	BDX53F
F1	T10AH250V	T8AH250V	T10AH250V	T10AH250V	T15AH250V	T10AH250V
DR1	2.7mH 8A 220V	2.7mH 8A 220V	2.7mH 8A 220V	2.7mH 8A 220V	1.4mH 16A 110V	2.7mH 8A 220V
DR2	2.7mH 8A 220V	2.7mH 8A 220V	2.7mH 8A 220V	2.7mH 8A 220V	1.4mH 16A 110V	2.7mH 8A 220V
S1	8550VB	8550VB	8550VB	8550VB	Jumper	8550VB
S2	-	-	-	-	H8610VBBB	-
B1	JB-JC, D1,2	-	-	-	-	-
B2	-	-	-	-	-	JA-JB, D1,2
B3	-	-	-	-	-	JC-JD, D1,2
B4	J5-J6	J5-J6	J5-J6	J5-J6	-	J5-J6
B5#	Rectifier 220V	Rectifier 220V	Rectifier 220V	Rectifier 220V	Rectifier 220V	Rectifier 220V

110V

C8b#	1500 uF 200V	1500 uF 200V	1500 uF 200V	1500 uF 200V	-	1500 uF 200V
C9b#	1500 uF 200V	1500 uF 200V	1500 uF 200V	1500 uF 200V	-	1500 uF 200V
C8d#	-	-	-	-	2200 uF 200V	-
C9d#	-	-	-	-	2200 uF 200V	-
F1#	T20A	T20A	T20A	T20A	T30A	T20A
DR1#	1.4mH16A110V	1.4mH16A110V	1.4mH16A110V	1.4mH16A110V	1.4mH25A110V	1.4mH16A110V
DR2#	1.4mH25A110V	1.4mH16A110V	1.4mH16A110V	1.4mH16A110V	1.4mH25A110V	1.4mH16A110V
S1	Jumper	Jumper	Jumper	Jumper	Jumper	Jumper
S2#	H8610VBBB	H8610VBBB	H8610VBBB	H8610VBBB	H8610VBBB	H8610VBBB
B5	Rectifier 110V	Rectifier 110V	Rectifier 110V	Rectifier 110V	Rectifier 110V	Rectifier 110V
B6	Rectifier 110V	Rectifier 110V	Rectifier 110V	Rectifier 110V	Rectifier 110V	Rectifier 110V

POWER SUPPLY, BOARD PSUH

component-list

Resistors

R1 See below
 R2 See below
 R3 See below
 R4 -
 R5 See below
 R6 0.1 Ω 4W
 R7 0.1 Ω 4W
 R8 0.1 Ω 4W
 R9 See below
 R10 4.7 k Ω 5W
 R11 680 k Ω 5%
 R12 33 k Ω 1%
 R13 100 k Ω 1%
 R14 10 k Ω 1%
 R15 18 k Ω 1%
 R16 180 Ω 1%
 R17 120 k Ω 2W
 R18# 8.2 k Ω 1% (110V see below)
 R19 See below
 R20 432 k Ω 1% highvoltage
 R21 750 k Ω 1%
 R22 4.7 Ω
 R23 See below
 R24 4.7 Ω
 R25 15 k Ω 1%
 R26 1 k Ω 1%
 R27 See below
 R28 82 Ω
 R29 4.7 M Ω
 R30 See below
 R31 220 k Ω 1%
 R32 See below
 R33 See below
 R34 See below
 R35 See below
 R36 15 k Ω 1%
 R37 See below
 R38 See below
 R39 See below
 R40 See below
 R41 18 k Ω 1%
 R42* -
 R43* Jumper
 R44 See below
 R45 See below
 R46 See below
 R47 See below
 R48 See Below

Capacitors

C1a# See below
 C2a# See below
 C5 0.68 μ F 250V
 C6 -
 C7 10 μ F 63V
 C8 -
 C9 10 μ F 50V
 C10 22 μ F 50V
 C11* 470 pF NPO
 C12 1 nF
 C13 -
 C14 10 nF
 C15 See below
 C16 330 pF
 C17 -
 C18 1 nF
 C19 10 μ F 50V
 C20 -
 C21# 1.5 nF Y
 C22# 1.5 nF Y
 C23 1 nF
 C24 See below
 C25 See below
 C26 1 nF
 C27 See Below

Diodes

D1 BYT 12PI 1000
 D2 See below
 D3 15V 1.3W Zener
 D4 5.6V 0.4W Zener
 D5 1N 4148
 D6 BYW 26C
 D7 1N 4004
 D8 1N 4148
 D9 1N 4148
 D10 1N 4148
 D11 BYW 26C
 D12 BZW 06P15B
 D13 BAT 85
 D14 1N 4148
 D15 See below
 D16 See below
 D17 See below

Trim potentiometers

TP1 10 k Ω
 TP2 25 k Ω
 TP3 10 k Ω
 TP4* 15 k Ω Resistor

Integrated circuits

U1 UC 3851 alt. UC 3841
 U2 See below

Transistors

Q1 See below
 Q2 See below
 Q3 See below
 Q4 BC 327
 Q5 TIP 50
 Q6 BC 547
 Q7* Jumper b-e
 Q8 BC 557
 Q9 See below
 Q10 See below

Switches

S2 Temp switch 95°

Inductors

L1 See below

Jumpers

B1 See below
 B2 See below

110V

C1b See below
 C2b See below
 C21 2,2nF Y
 C22 2,2nF Y
 R18 10k Ω 1%

* UC3841

R42 4.7 k Ω
 R43 82 Ω
 TP4 10 k Ω
 C11 1 nF
 Q7 BC 337

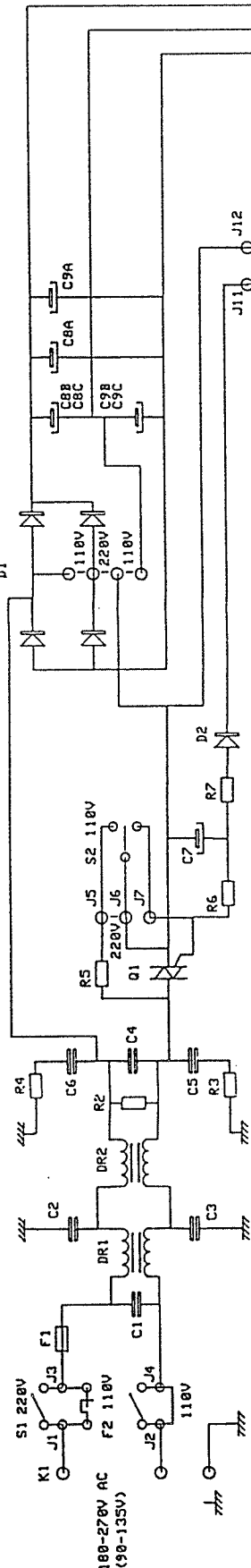
POWER SUPPLY, BOARD PSUH

	LAB 1200C	LAB 1300C	LAB 1600	LAB 2000C	LAB 4000	PSU 48-8
R1	18 kΩ 9W	18 kΩ 9W	18 kΩ 9W	18 kΩ 9W	33 kΩ 9W	18 kΩ 9W
R2	18 kΩ 9W	18 kΩ 9W	18 kΩ 9W	18 kΩ 9W	-	18 kΩ 9W
R3	18 kΩ 9W	18 kΩ 9W	18 kΩ 9W	18 kΩ 9W	-	18 kΩ 9W
R5	-	-	-	-	330 Ω 2W	-
R9	1.5 kΩ 2W	1.5 kΩ 2W	1.5 kΩ 2W	1.5 kΩ 2W	1 kΩ 3W	1.5 kΩ 2W
R19	5.62 kΩ 1%	5.62 kΩ 1%	5.62 kΩ 1%	5.62 kΩ 1%	5.9 kΩ 1%	5.62 kΩ 1%
R23	8,2 kΩ 1%	6.8 kΩ 1%	6.8 kΩ 1%	6.8 kΩ 1%	6.8 kΩ 1%	10 kΩ 1%
R27	4.7 Ω	4.7 Ω	4.7 Ω	4.7 Ω	jumper	4.7 Ω
R30	56 kΩ 1%	56 kΩ 1%	56 kΩ 1%	56 kΩ 1%	180 kΩ 1%	56 kΩ 1%
R32	133 kΩ 1%	88.7 kΩ 1%	169 kΩ 1%	88.7 kΩ 1%	88.7 kΩ 1%	-
R33	270 kΩ 1%	-	330 kΩ 1%	-	1 kΩ 1%	-
R34	2,2 kΩ 1%	2,0 kΩ 1%	2,2 kΩ 1%	2,2 kΩ 1%	2,4 kΩ 1%	-
R35	4.7 kΩ 1%	4.7 kΩ 1%	4.7 kΩ 1%	4.7 kΩ 1%	3,3 kΩ 1%	4.7 kΩ 1%
R37	4.7 Ω	4.7 Ω	4.7 Ω	4.7 Ω	2.2 Ω	-
R38	4.7 Ω	4.7 Ω	4.7 Ω	4.7 Ω	2.2 Ω	4.7 Ω
R39	4.7 Ω	4.7 Ω	4.7 Ω	4.7 Ω	2.2 Ω	4.7 Ω
R40	1 MΩ 1%	1 MΩ 1%	1 MΩ 1%	1 MΩ 1%	1,2 MΩ 1%	1 MΩ 1%
R44	470 Ω	470 Ω	470 Ω	470 Ω	560 Ω	470 Ω
R45	-	-	-	-	698 Ω 1%	-
R46	-	-	-	-	196 Ω 1%	-
R47	-	-	-	-	820 Ω	-
R48	2,2Ω 2W	2,2Ω 2W	2,2Ω 2W	2,2Ω 2W	-	2,2Ω 2W
C1a#	220 uF 385V	220 uF 385V	220 uF 385V	220 uF 385V	-	220 uF 385V
C2a#	220 uF 385V	220 uF 385V	220 uF 385V	220 uF 385V	-	220 uF 385V
C1b#	-	-	-	-	1500 uF 200V	-
C2b#	-	-	-	-	1500 uF 200V	-
C6	-	-	-	-	1 nF 1.5 kV	-
C15	330 pF	330 pF	330 pF	330 pF	330 pF	1 nF
C24	-	-	-	-	22 nF 1kV	-
C25	-	-	-	-	22 nF 1kV	-
C27	100pF/1600V	100pF/1600V	100pF/1600V	100pF/1600V	-	100pF/1600V
D2	-	-	-	-	STTA 1512PI	-
D15	43V 2% Zener	43V 2% Zener	39V 2% Zener	43V 2% Zener	43V 2% Zener	30V 2% Zener
D16	-	-	-	-	BYM 26E	-
D17	-	-	-	-	1N4148	-
Q1	BUP 307	BUP 307	BUP 307	BUP 307	BUP 314S	BUP 307
Q2	BUP 307	BUP 307	BUP 307	BUP 307	BUP 314S	-
Q3	BUP 307	BUP 307	BUP 307	BUP 307	BUP 314S	-
Q9	Jumper b-c	-	Jumper b-c	-	BC557	-
Q10	-	-	-	-	BC547	-
U2	PC 113	-	PC 113	-	Jumper 1-5	PC 113
U2	-	-	-	-	Jumper 2-4	-
L1	-	-	-	-	400 uH LAB	-
B1	-	-	-	-	-	jumper
B2	-	-	-	-	-	jumper
# 110V						
C1b#	1500 uF 200V	1500 uF 200V	1500 uF 200V	1500 uF 200V	-	1500 uF 200V
C2b#	1500 uF 200V	1500 uF 200V	1500 uF 200V	1500 uF 200V	-	1500 uF 200V
C1d#	-	-	-	-	2200 uF 200V	-
C2d#	-	-	-	-	2200 uF 200V	-
R18	10 kΩ 1%	10 kΩ 1%	10 kΩ 1%	10 kΩ 1%	-	-
AFS IND.						
R01	-	-	-	-	4,7 kΩ 1%	-
C01	-	-	-	-	0,1uF 400V	-
D01	-	-	-	-	1N4148	-
LD01	-	-	-	-	green 2,5x5mm	red 2,5x5mm
LD02	-	-	-	-	red 2,5x5mm	green 2,5x5mm

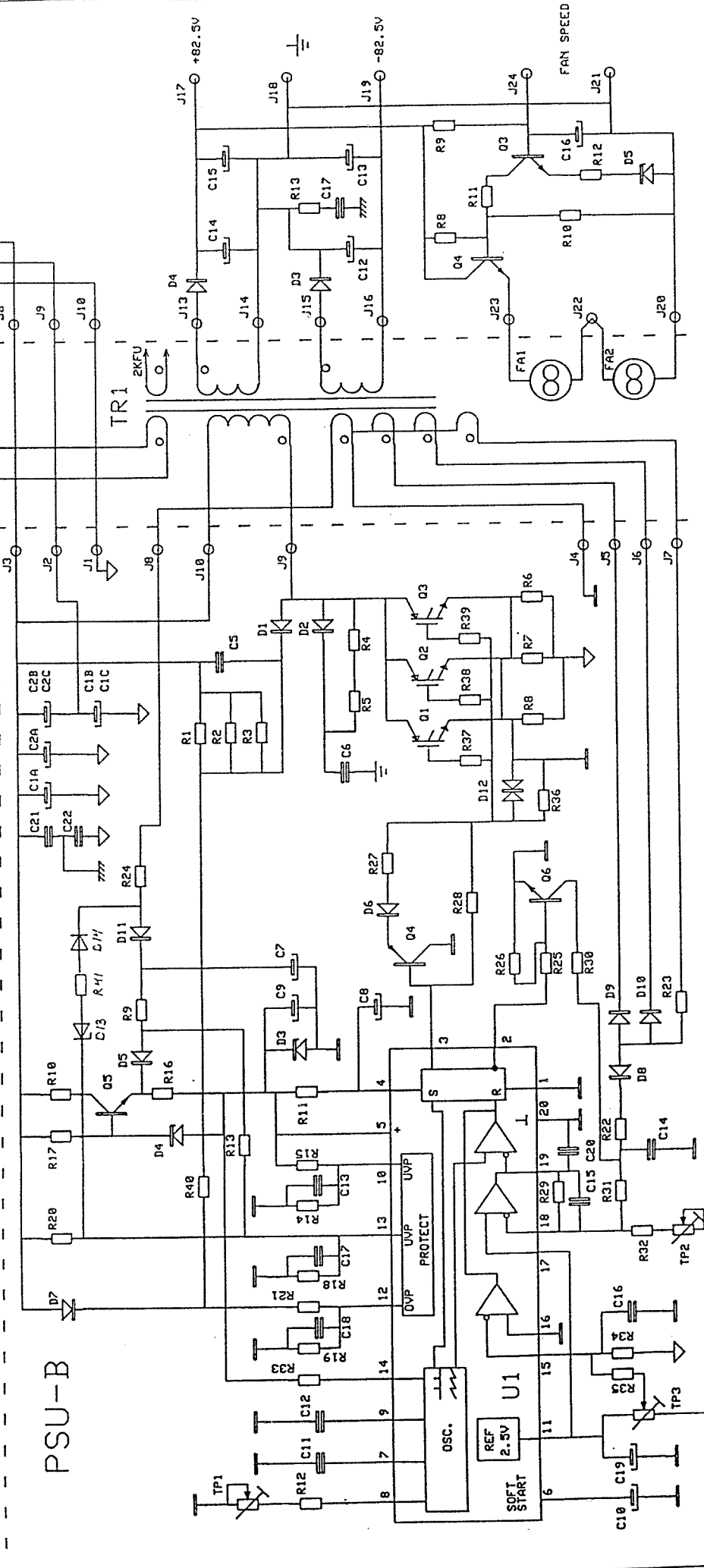
Old versions Lab 1300C

<u>PAGE</u>	<u>CONTENTS</u>	<u>DRAWING SCHEMATIC</u>	<u>LAYOUT</u>
8-10	POWER SUPPLY <small>FROM SERIAL NO. 9777777 TO 970-2XX</small>	2KPSUA 2KPSUB	2KPSUA-P 2KPSUB-P
11-14	POWER SUPPLY <small>FROM SERIAL NO. 950-401 TO 980-825</small>	2KPSUC 2KPSUD	2KPSUC-P 2KPSUD-P

PSU-A

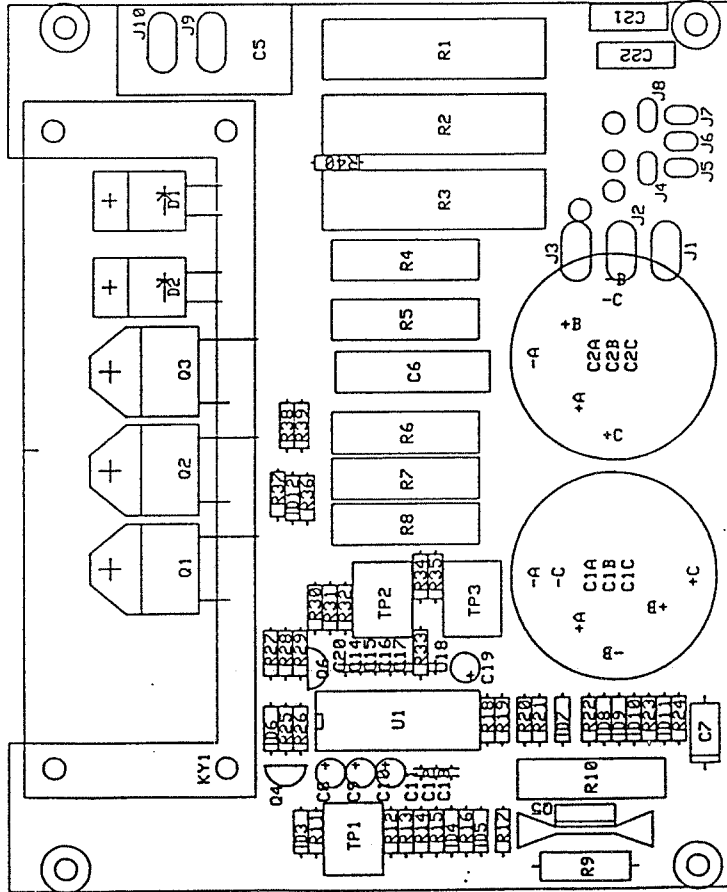
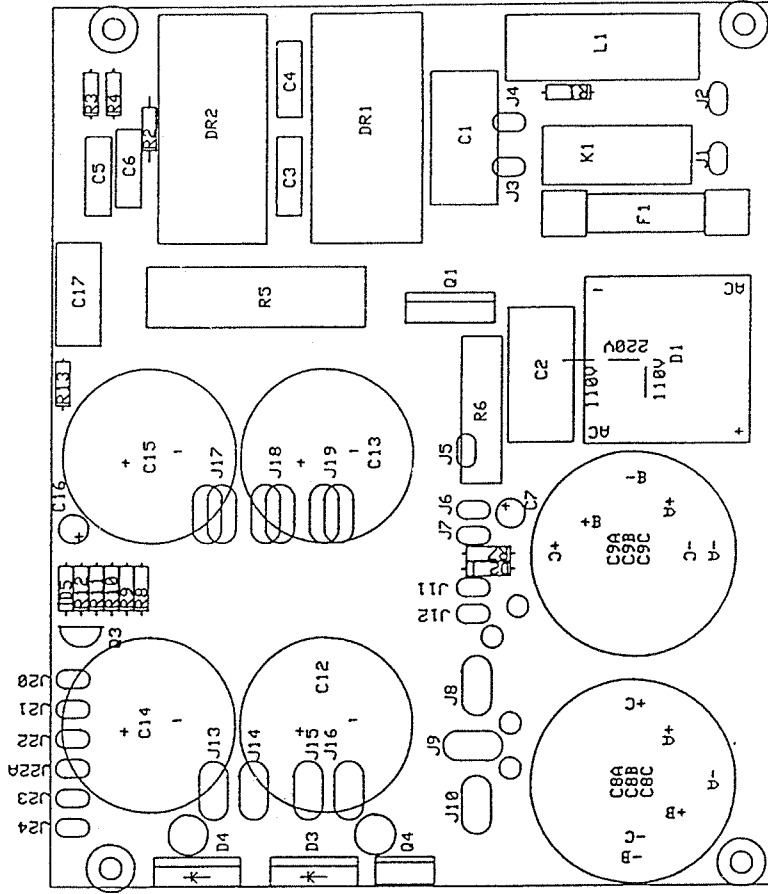


PSU-B



- SIGNAL
- POLER LF
- POLER PSU
- CHASSI

KONSTR. K.A	RITAD K.A	KOP K.A	KONTR.	STAND.	GODK. SKALA	ERSATT	ERSATT AV
LABGRUPPEN			LAB 1300C			ERSATT AV	
KUNGSBACKA SVELEN			POERSUPPLY			DAT 90-12-01	
						RITN.-NR 2KFSU-A	
						2KFSU-B	



D13, D14, R41 Solder Side

KONSTR. K.A	RITAD K.A	KOP	KONTR.	STAND.	GODK.	SKALA	ERSÄTT	ERSÄTT AV
						LAB 1300C POWERSUPPLY		
								DAT 98-12-01 2KPSU-A-P 2KPSU-B-P

LAB 1300C, LAB 2000C POWER SUPPLY, BOARD PSUB component-list

LAB 1300 until 970-2xx

LAB 2000 until 970-1xx

Resistors

R1 18 k Ω 9W
 R2 18 k Ω 9W
 R3 18 k Ω 9W
 R4 100 Ω 5W
 R5 100 Ω 5W
 R6 0.1 Ω 4W
 R7 0.1 Ω 4W
 R8 0.1 Ω 4W
 R9 1.5 k Ω 2W
 R10 4.7 k Ω 5W
 R11 4.7 Ω
 R12 15 k Ω 1%
 R13 82 k Ω 1%
 R14 36.5 k Ω 1%
 R15 15 k Ω 1%
 R16 180 Ω
 R17* 120 k Ω 2W (long legs)
 R18 4.7 k Ω 1%
 R19 4.7 k Ω 1%
 R20 432 k Ω 1%
 R21 750 k Ω 1%
 R22 See below
 R23 "
 R24 4.7 Ω
 R25 15 k Ω 1%
 R26 1 k Ω 1%
 R27 4.7 Ω
 R28 33 Ω
 R29 1 M Ω 1%
 R30 30 k Ω
 R31 220 k Ω 1%
 R32 36.5 k Ω 1%
 R33* 294 k Ω 1%
 R34* 3.3 k Ω 1%
 R35* 3.3 k Ω 1%
 R36 15 k Ω 1%
 R37 4.7 Ω
 R38 4.7 Ω
 R39 4.7 Ω
 R40 1 M Ω 1%

Trim potentiometers

TP1 10 k Ω
 TP2 10 k Ω
 TP3* 10 k Ω

Capacitors

C1a# 220 μ F 385V
 C2a# 220 μ F 385V
 C5 0.6 μ F 500V
 C6 2.2 nF 1.5 kV
 C7 10 μ F 63V
 C8 10 μ F 50V
 C9 10 μ F 50V
 C10 4.7 μ F 50V
 C11 1 nF
 C12 330 pF
 C13 10 nF
 C14 10 nF
 C15 330 pF
 C16* 330 pF
 C17 10 nF
 C18 1 nF
 C19 10 μ F 50V
 C20 1 nF
 C21*# 1.5 nF Y
 C22*# 1.5 nF Y

Diodes

D1 BYT 12PI 1000
 D2* BYR 29-800F
 D3 15V 1.3W Zener
 D4 5.6V 0.4W Zener
 D5 1N 4148
 D6 BYW 26C
 D7 1N 4004
 D8 1N 4148
 D9 1N 4148
 D10 1N 4148
 D11 BYW 26C
 D12 BZW06P15B

Integrated circuits

U1 TDA 4718A

Transistors

Q1 BUP 307
 Q2 BUP 307
 Q3 BUP 307
 Q4 BC 327
 Q5 TIP 50
 Q6 BC547

Switches

S2 Tempswitch 95°C

#110V AC

C1b 1500 μ F 200V
 C2b 1500 μ F 200V
 C21 2.2 nF Y
 C22 2.2 nF Y

*** Until 9410**

R34 1 k Ω
 R35 1 k Ω
 TP3 2.5 k Ω
 C16 1 nF
 C21 2.2 nF Y
 C22 2.2 nF Y

*** Until 94xx**

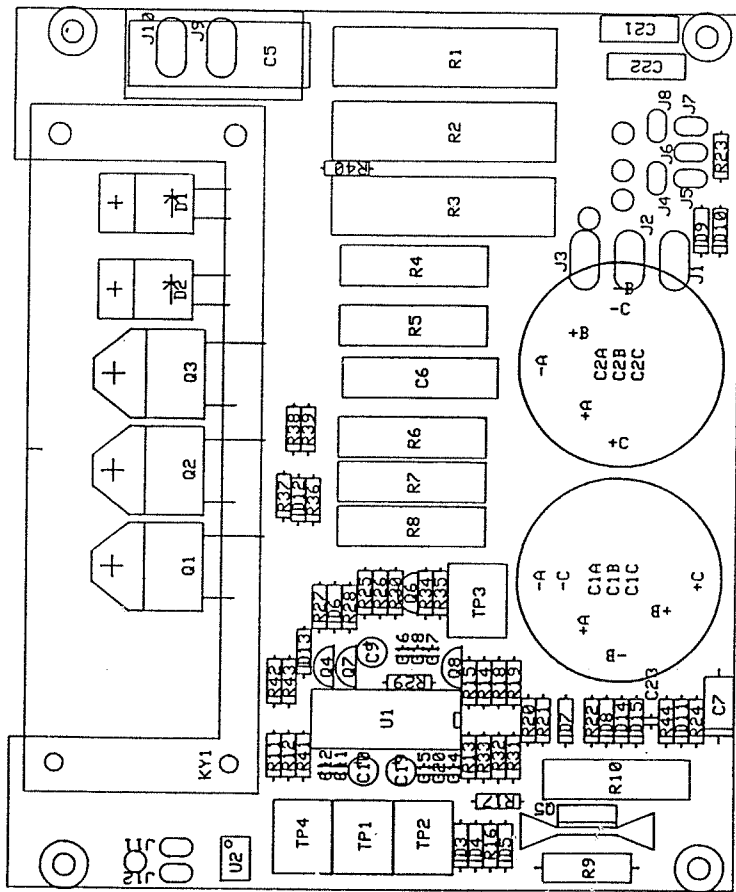
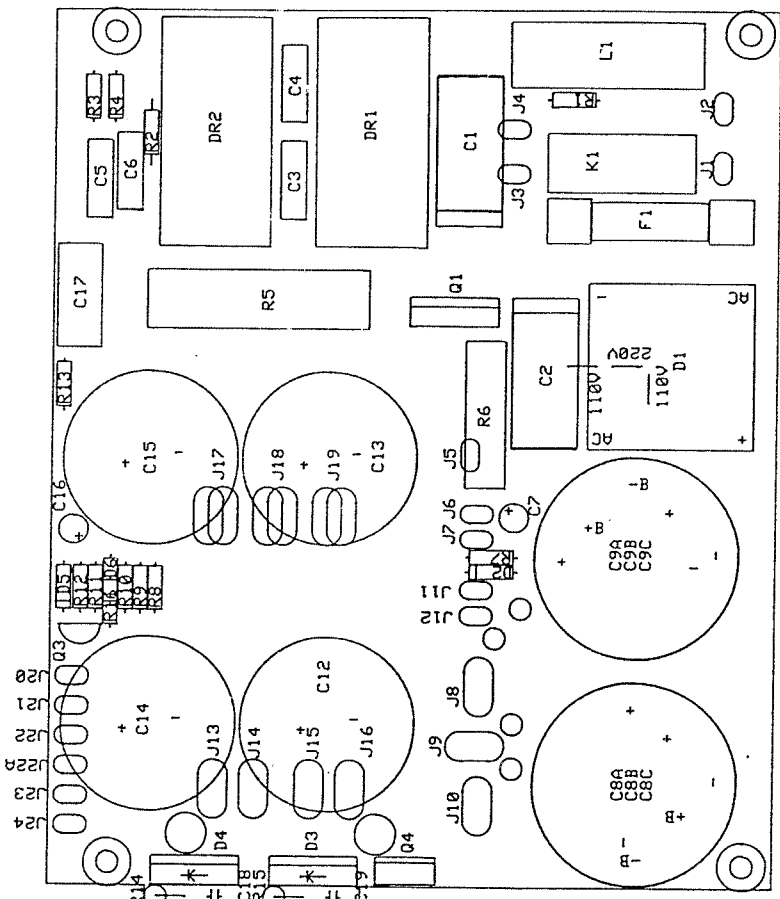
D2 BYR 29-800F

*** Until 9506**R33 270 K Ω 1%*** Until 9606**R17 220 k Ω 1% (long legs)**LAB 1300C**

R22 4.7 Ω
 R23 6.8 K Ω
 R41 2.2 K Ω
 D13 43V 0.4W 2% ZENER
 D14 1N4148

LAB 2000C

82 Ω
 2.2 K Ω



KONSTR. K.A.	RITAD K.A.	KÖP	KONTR.	STAND.	GÖDK.	SKALA	ERSÄTT	ERSÄTT AV
LABGRUPPEN			LAB		1200	1300		
KUNGSBACKA SVEDEN			1600		2000			
			POWERSUPPLY					
			RITN.-NR					
			DAT 94 07 89					
			2KPSU-C-P					
			2KPSU-D-P					

LAB 1200C, LAB 1300C, LAB 1600, LAB 2000C

POWER SUPPLY, BOARD PSUC

component-list

Resistors

R1-
 R2 1 M Ω 1%
 R3 33 Ω
 R4 33 Ω
 R5# 47 Ω 9W
 R6# 150 Ω 5W
 R7 2.2 Ω 1W
 R8 See below
 R9 "
 R10 "
 R11 "
 R12 "
 R13 4.7 Ω
 R14 See below
 R15 "
 R16 "

Capacitors

C1 0.47 μ F
 C2# 1.5 nF Y
 C3# 1.5 nF Y
 C4 0.22 μ F
 C5# 1.5 nF Y
 C6# 1.5 nF Y
 C7 100 μ F 50V
 C8a# 220 μ F 385V
 C9a# 220 μ F 385V
 C12 See below
 C13 "
 C14 "
 C15 "

C16 22 μ F 16V
 C17 2.2 μ F 63V
 C18 See below
 C19 "

Diodes

D1 600V 35A
 D2 BYW26C
 D3 BYT30PI400
 D4 BYT30PI400
 D5 5.6V Zener
 D6 See below

Fuses

F1# See below

Transistors

Q1# Q6025J6
 Q2 -
 Q3 BC 546
 Q4 See below

Coils

DR1# 2.7mH 8A 220V
 DR2# 2.7mH 8A 220V

Switches

S1 Arcoelectric 8550VB
 S3 Comepa 4JT95 ARIUI 95°C

110V AC

R5 22 Ω 9W
 R6 180 Ω 0.7W
 C2 2,2 nF Y
 C3 2,2 nF Y
 C5 2,2 nF Y
 C6 2,2 nF Y
 C8b 1500 μ F 200V
 C9b 1500 μ F 200V
 Q1 Relay SDS JrlaF-TM-24
 S2 Marquart 1803.0102
 DR1 1.4mH 16A 110V
 DR2 1.4mH 16A 110V

	LAB 1200C	LAB 1300C	LAB 1600	LAB 2000C
R8	4.7 k Ω 1%	0 Ω	8.2 k Ω 1%	0 Ω
R9	1 M Ω	470 k Ω	150 k Ω	390 k Ω
R10	39 k Ω 1%	4.7 k Ω 1% 0.7W long leg	39 k Ω 1%	47 k Ω 1%
R11	18 k Ω 1%	1.8 k Ω	18 k Ω 1%	6.8 k Ω
R12	4.7 k Ω 1%	0 Ω	4.7 k Ω	1.8 k Ω
R14	2.2 Ω 2W	-	2.2 Ω 2W	-
R15	2.2 Ω 2W	-	2.2 Ω 2W	-
R16	-	18 k Ω 1%	-	39 k Ω 1%
C12	3900 μ F 100V	3900 μ F 100V	3900 μ F 100V	1800 μ F 160V
C13	3900 μ F 100V	3900 μ F 100V	3900 μ F 100V	1800 μ F 160V
C14	3900 μ F 100V	3900 μ F 100V	3900 μ F 100V	1800 μ F 160V
C15	3900 μ F 100V	3900 μ F 100V	3900 μ F 100V	1800 μ F 160V
C18	4.7 nF 400V	-	4.7 nF 400V	-
C19	4.7 nF 400V	-	4.7 nF 400V	-
D6	62 V \pm 2% Zener	-	62 V \pm 2% Zener	-
F1 220V	T10AH250V	T8AH250V	T10AH250V	T10AH250V
F1# 110V	T20A	T20A	T20A	T30A
Q4	BDX53F	TIP41	BDX53F	BDX53F

LAB1200C, LAB 1300C, LAB 1600, LAB 2000C

POWER SUPPLY, BOARD PSUD

component-list

UC 3851

Resistors

R1 18 k Ω 9W
 R2 18 k Ω 9W
 R3 18 k Ω 9W
 R4 100 Ω 5W
 R5 100 Ω 5W
 R6 0.1 Ω 4W
 R7 0.1 Ω 4W
 R8 0.1 Ω 4W
 R9 1.5 k Ω 2W
 R10 4.7 k Ω 5W
 R11 680 k Ω 5%
 R12 33 k Ω 1%
 R13 100 k Ω 1%
 R14 10 k Ω 1%
 R15 18 k Ω 1%
 R16 180 Ω 1%
 R17 120 k Ω 2W
 R18 8.2 k Ω 1%
 R19 5.62 k Ω 1%
 R20 432 k Ω 1% highvolt
 R21 750 k Ω 1%
 R22 4.7 Ω
 R23 6.8 k Ω 1%
 R24 4.7 Ω
 R25 15 k Ω 1%
 R26 1 k Ω 1%
 R27 4.7 Ω
 R28 82 Ω 1%
 R29 4.7 M Ω
 R30 56 k Ω 1%
 R31 220 k Ω 1%
 R32 See below
 R33 "
 R34 "
 R35 4.7 k Ω 1%
 R36 15 k Ω 1%
 R37 4.7 Ω
 R38 4.7 Ω
 R39 4.7 Ω
 R40 1 M Ω 1%
 R41 18 k Ω 1%
 R42* -
 R43* Jumper
 R44 470 Ω

Capacitors

C1a# 220 μ F 385V
 C2a# 220 μ F 385V
 C5 0.6 μ F 500V
 C6 2.2 nF 1.5 kV
 C7 10 μ F 63V
 C8 -
 C9 10 μ F 50V
 C10 22 μ F 50V
 C11* 470 pF NPO
 C12 1 nF
 C13 -
 C14 10 nF
 C15 330 pF
 C16 330 pF
 C17 -
 C18 1 nF
 C19 10 μ F 50V
 C20 -
 C21# 1.5 nF Y
 C22# 1.5 nF Y
 C23 1 nF

Diodes

D1 BYT 12PI 1000
 D2 BYT 12PI 1000
 D3 15V 1.3W Zener
 D4 5.6V 0.4W Zener
 D5 1N 4148
 D6 BYW 26C
 D7 1N 4004
 D8 1N 4148
 D9 1N 4148
 D10 1N 4148
 D11 BYW 26C
 D12 BZW 06P15B
 D13 BAT 85
 D14 1N 4148
 D15 See below

Trim potentiometers

TP1 10 k Ω
 TP2 25 k Ω
 TP3 10 k Ω
 TP4* 15 k Ω Resistor

Integrated circuits

U1 UC 3851 alt. UC 3841
 U2 See below

Transistors

Q1 BUP 307
 Q2 BUP 307
 Q3 BUP 307
 Q4 BC 327
 Q5 TIP 50
 Q6 BC 547
 Q7* Jumper b-e
 Q8 BC 557

Switches

S2 Temp switch 95°

110V

C1b 1500 μ F 200V
 C2b 1500 μ F 200V
 C21 2,2nF Y
 C22 2,2nF Y

*** UC3841**

R42 4.7 k Ω
 R43 82 Ω
 TP4 10 k Ω
 C11 1 nF
 Q7 BC 337

	LAB 1200C	LAB 1300C	LAB 1600	LAB 2000C
R32	133 k Ω 1%	88.7 k Ω 1%	169 k Ω 1%	88.7 k Ω 1%
R33	270 k Ω 1%	-	330 k Ω 1%	-
R34	2,2 k Ω 1%	2,0 k Ω 1%	2,2 k Ω 1%	2,2 k Ω 1%
D15	43V 2% Zener	43V 2% Zener	39V 2% Zener	43V 2% Zener
U2	PC 113	-	PC113	-