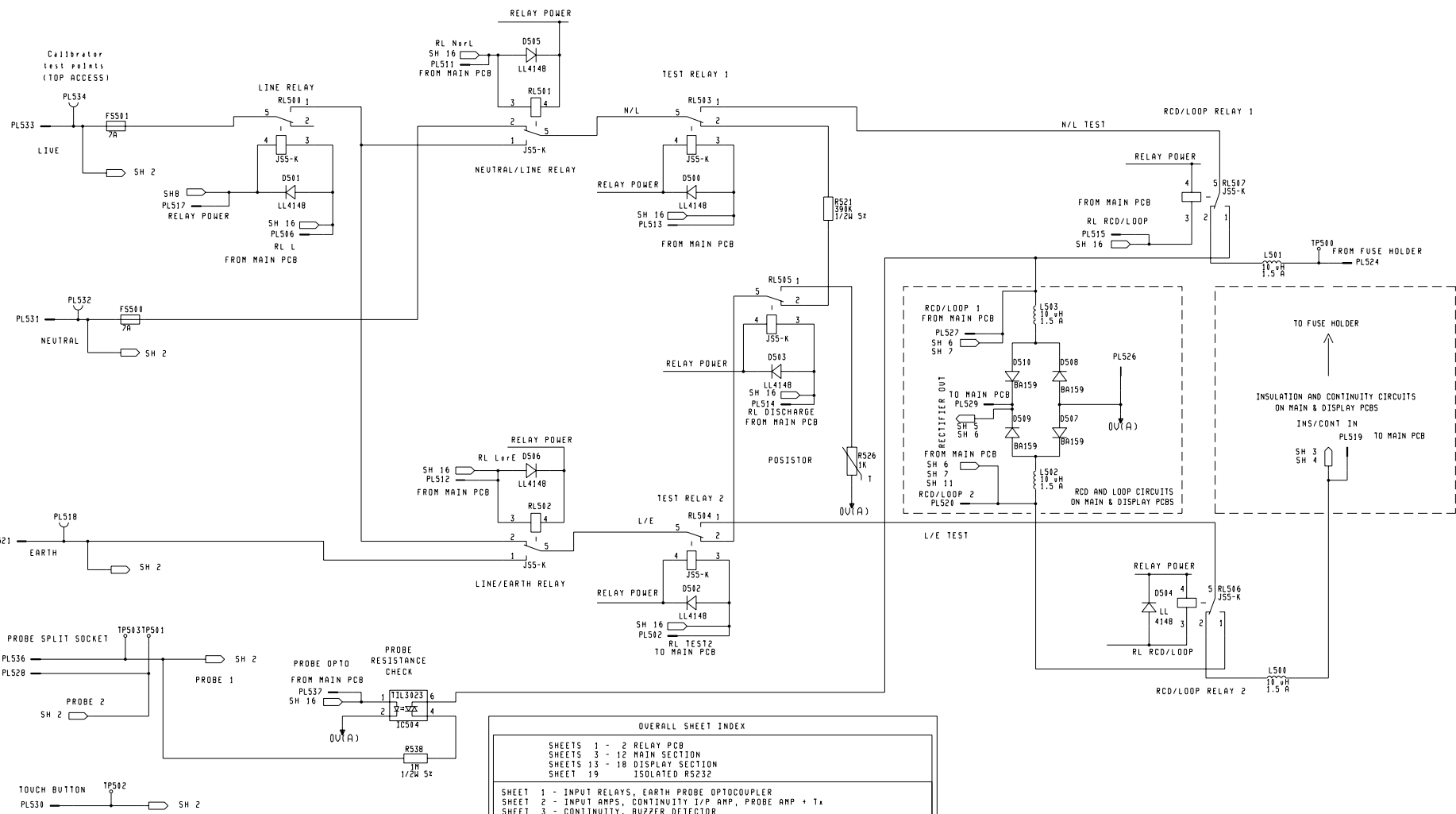


RELAY PCB

RELAYS AND BRIDGE RECTIFIER

INPUT TERMINALS

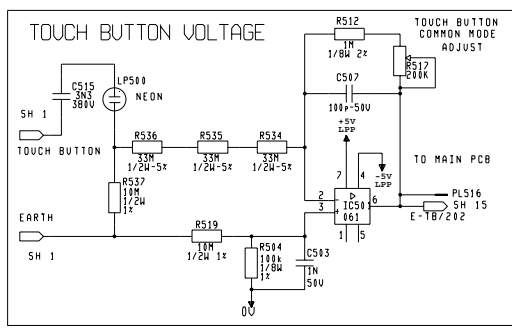
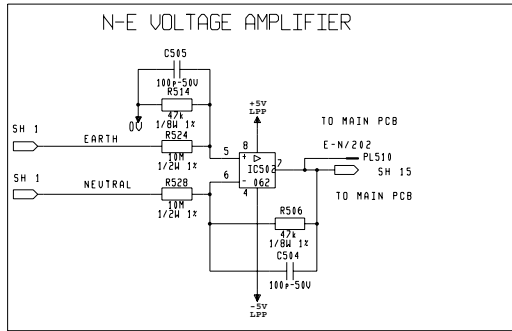
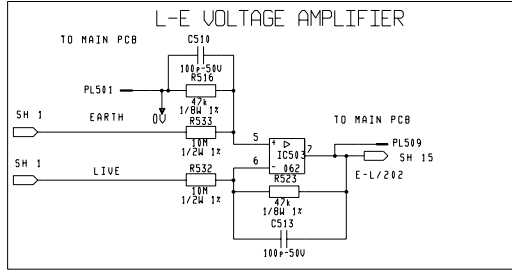
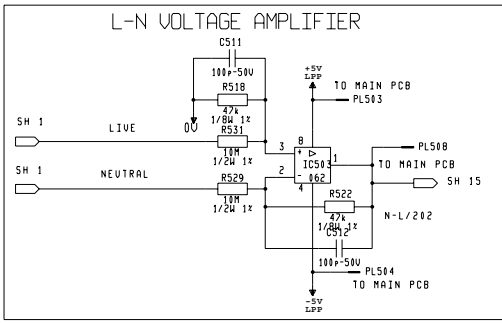


OVERALL SHEET INDEX	
SHEETS 1 - 2	RELAY PCB
SHEETS 3 - 12	MAIN SECTION
SHEETS 13 - 18	DISPLAY SECTION
SHEET 19	ISOLATED RS232
SHEET 1	INPUT RELAYS, EARTH PROBE OPTOCOUPLER
SHEET 2	INPUT AMPS, CONTINUITY I/P AMP, PROBE AMP + 1x
SHEET 3	CONTINUITY, BUZZER DETECTOR
SHEET 4	INSULATION TEST
SHEET 5	RCD/LOOP PSD + AMP
SHEET 6	RCD/LOOP DYNAMIC LOAD
SHEET 7	RCD/LOOP CONTROLLER, 25A LOOP
SHEET 8	5V, 5U LPP, 5U PLD, 20V, AND RELAY SUPPLIES
SHEET 9	ROTARY SWITCH, BUZZER, REMOTE TEST, LED
SHEET 10	OUTPUT EXPANSION (P10)
SHEET 11	7109 MULTIPLEXING, PROBE DETECT, BROWNOUT DETECT
SHEET 12	ZERO CROSS DETECT, AC-DC CONVERTER
SHEET 13	MICROCONTROLLER, 10-BIT A/D MULTIPLEX, PUSH BUTTONS
SHEET 14	DISPLAY + CONTROLLER AND BACKLIGHT
SHEET 15	DIODE LINKS, 10-BIT A/D LEVEL SHIFT, 12-BIT A/D CONVERTER
SHEET 16	RESET CIRCUIT, WATCHDOG, RELAY DRIVERS, ADJUSTERS
SHEET 17	RS232 TRANSCIVER, FREQUENCY MEASUREMENT, -5V LPP GENERATOR
SHEET 18	RCD CIRCUIT
SHEET 19	ISOLATED RS232 TRANSCIVER

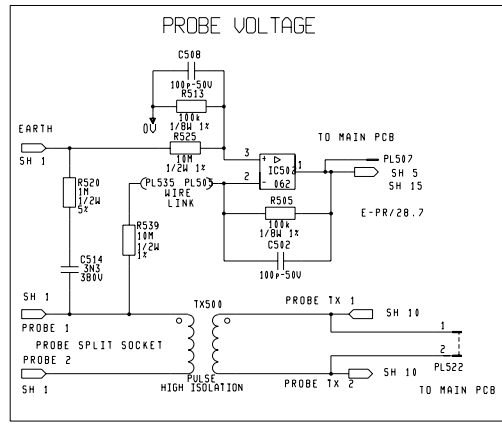
UNUSED SOCKET — PL523	<input type="checkbox"/> U501 <input type="checkbox"/> U506/U500 <input type="checkbox"/> U515
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INPUT CONDITIONING

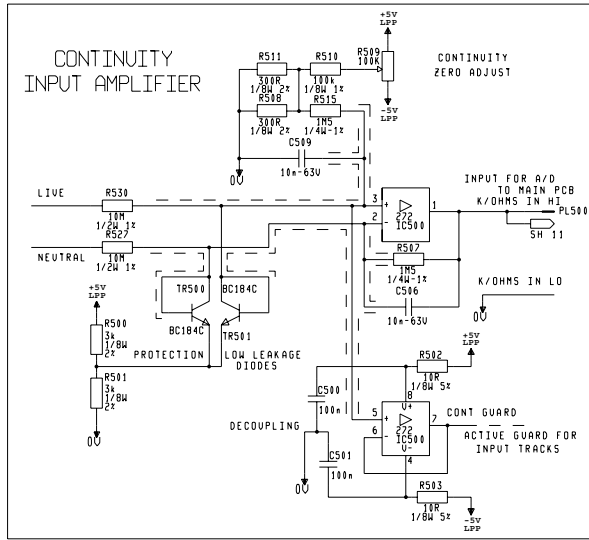
FROM INPUT TERMINALS



FROM INPUT TERMINALS

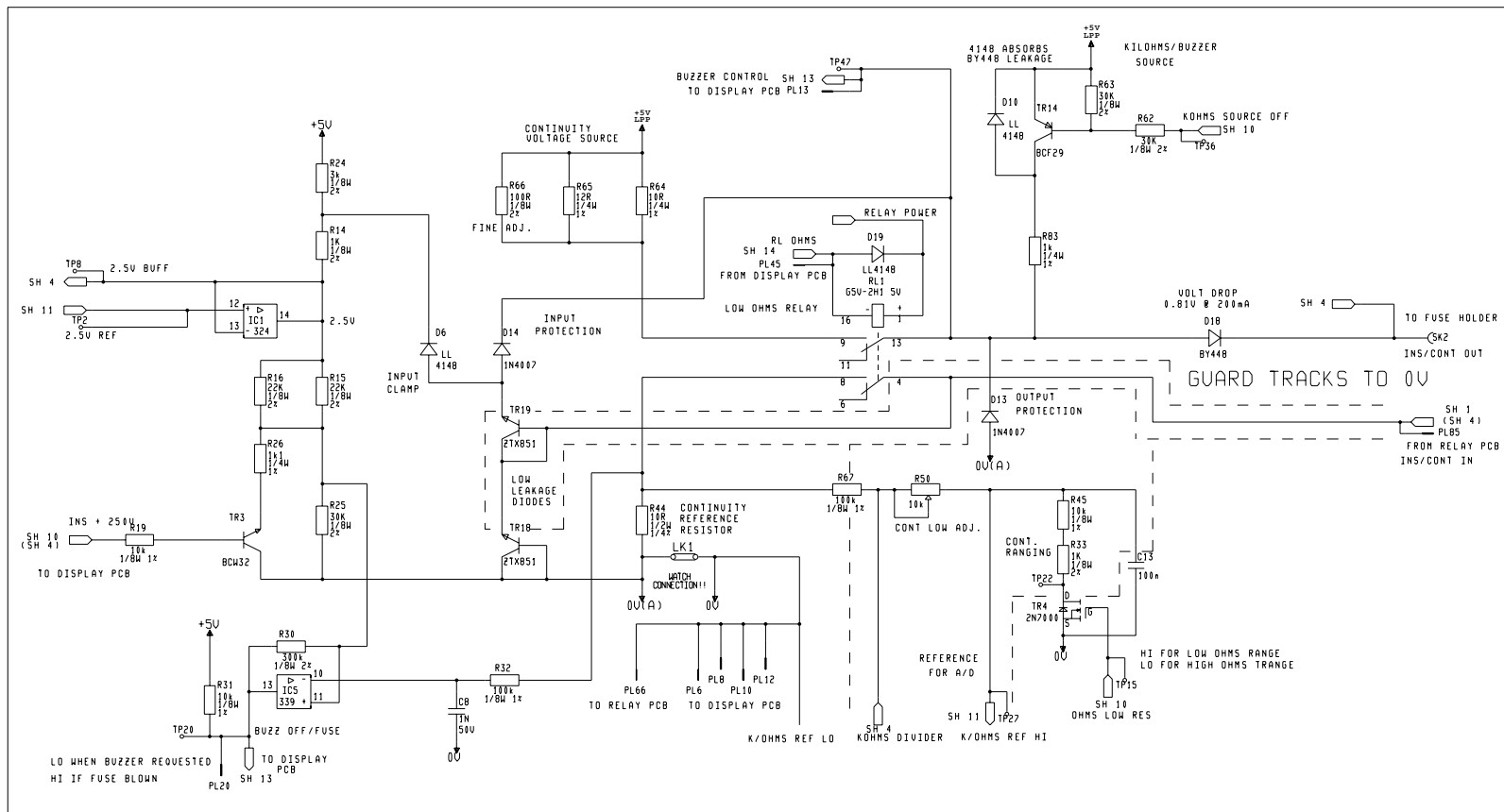


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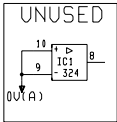


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	ISSUE	DATE	CHKD BY	CAD DRAWING, NO MANUAL CHANGES PERMISSIBLE			DESIGN: CSH/KF		DATE: JAN 98	
	5	11/09/11	21187							
	7	24/02/03	21631						SHT. 2 OF 19 SHTS.	

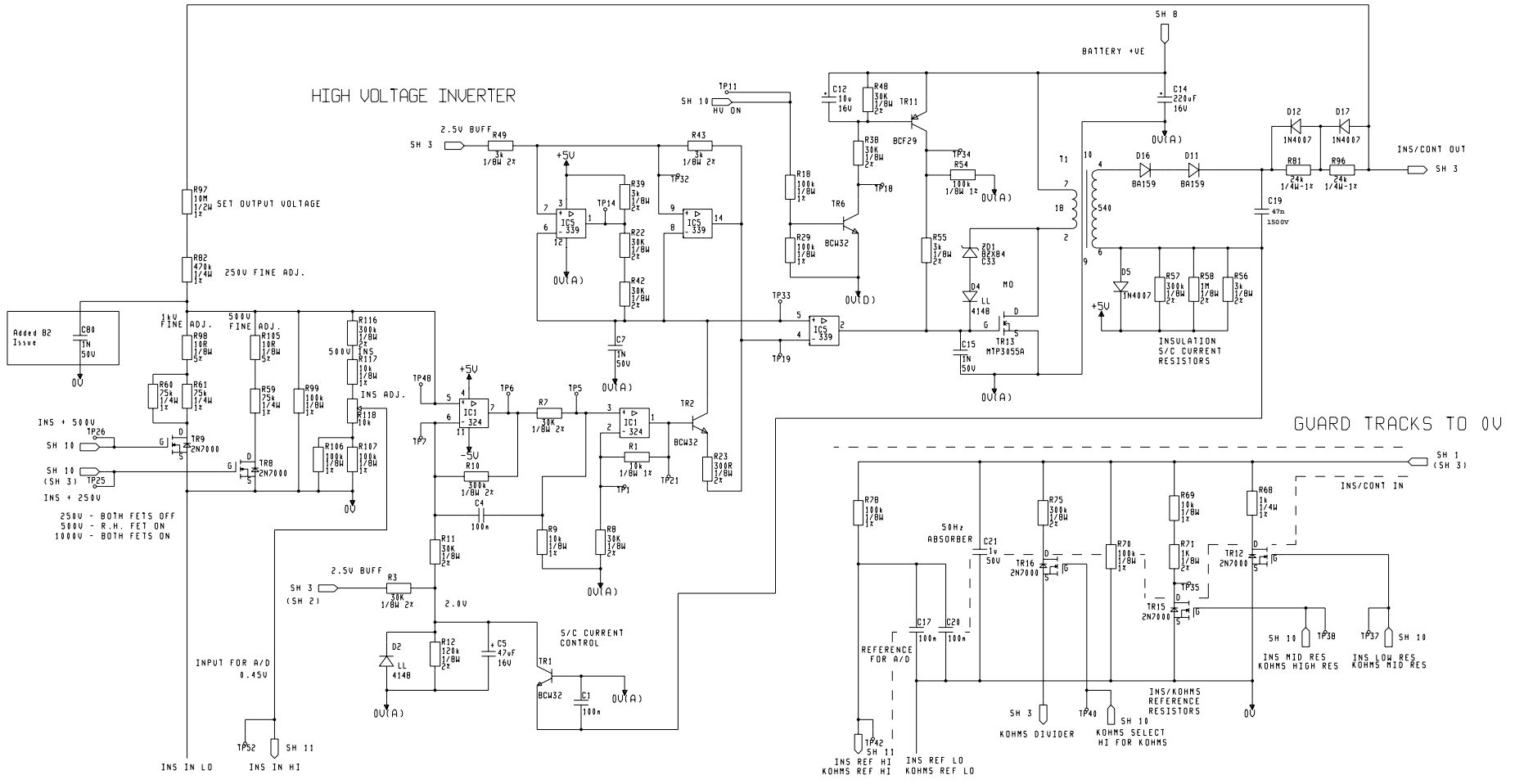
K/OHMS - VOLTAGE SOURCE AND REFERENCE MEASUREMENT



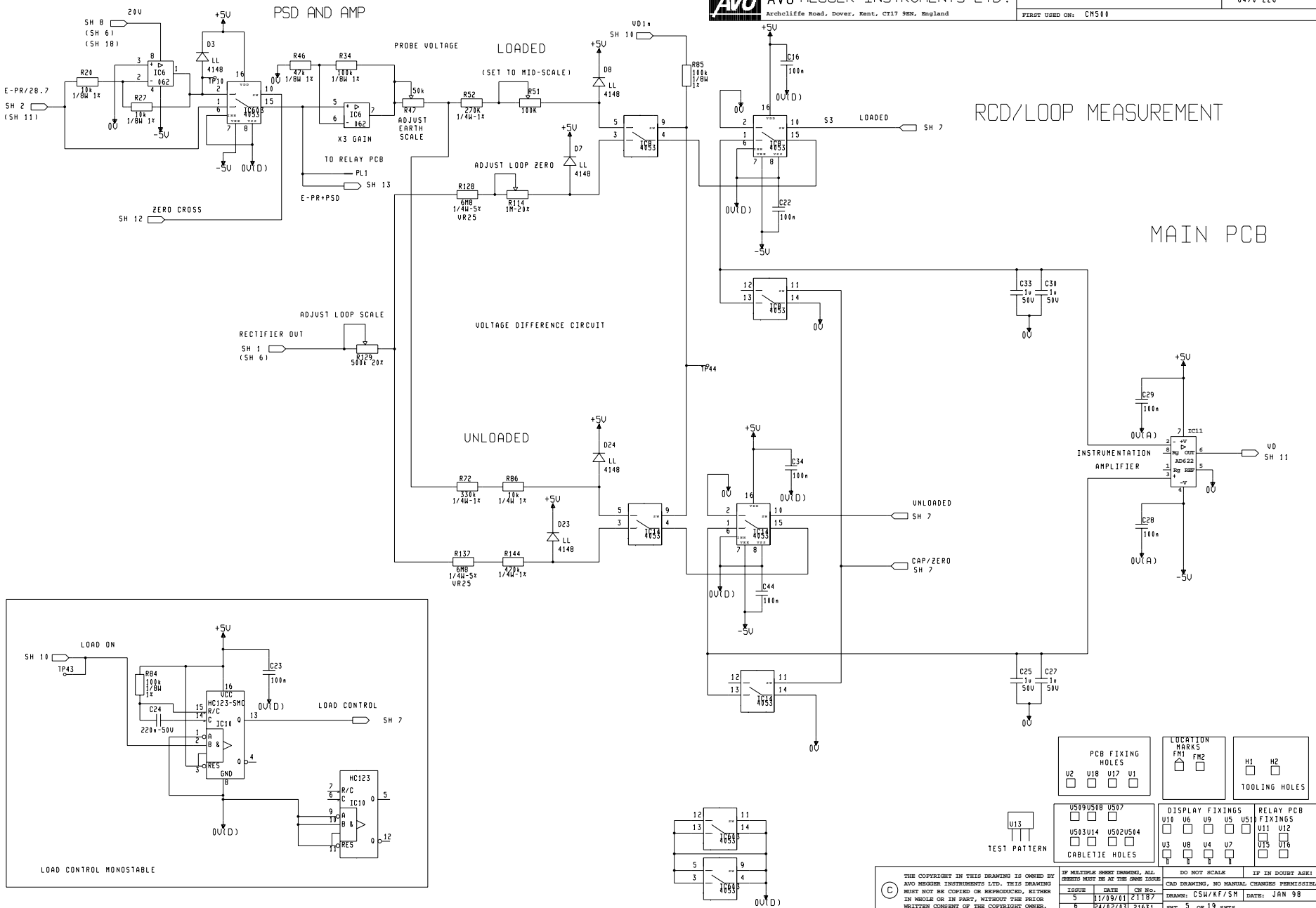
MAIN PCB



INSULATION - VOLTAGE SOURCE AND MEASUREMENT



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	ISSUE: 5 DATE: 11-08-81 CN NO.: 21187	CAD DRAWING, NO MANUAL CHANGES PERMISSIBLE	DRAWN: KF DATE: JAN 98
	6 24/02/83 21631	7 1	8 4 OF 19 SHEETS

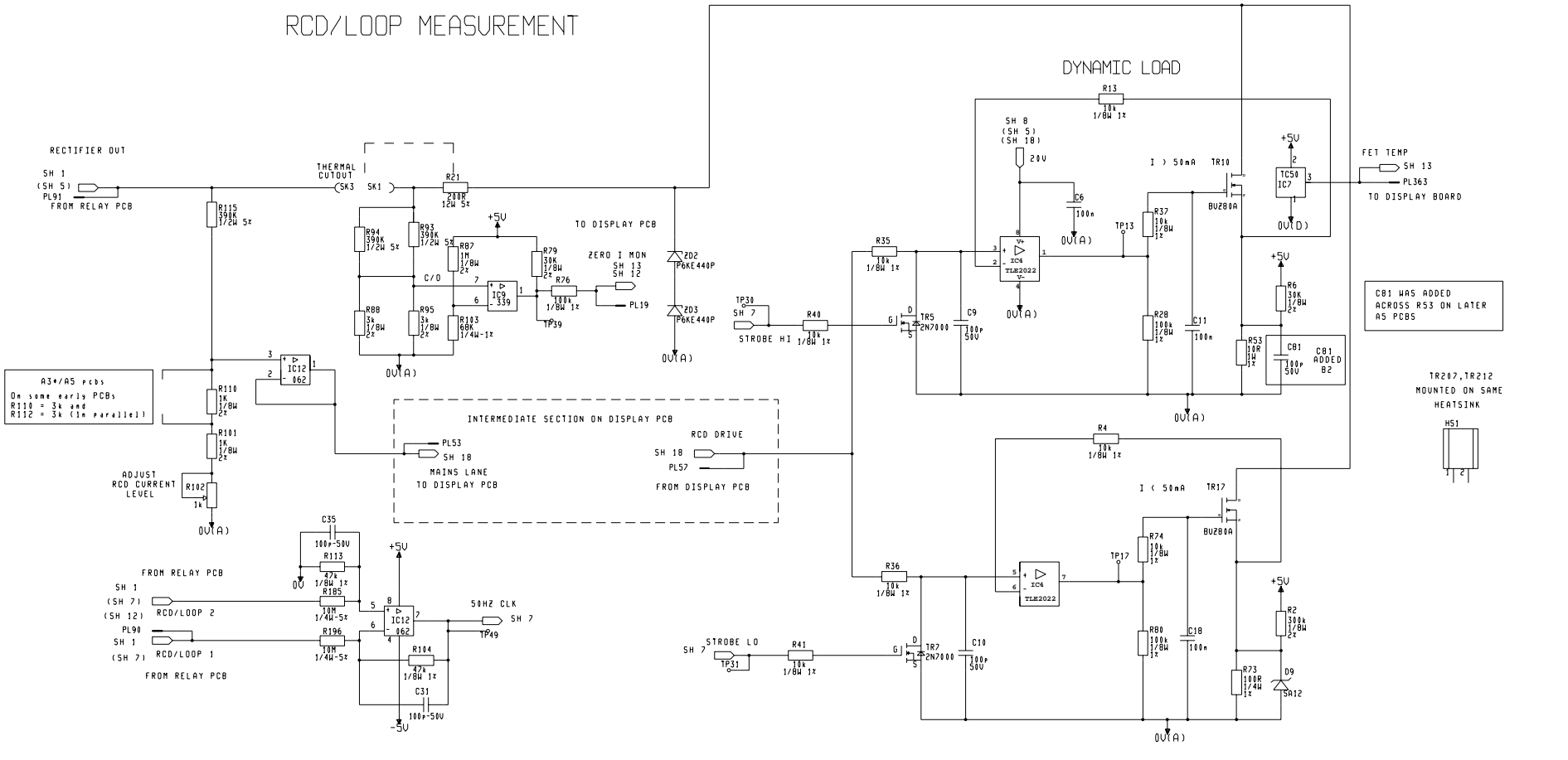


PCB FIXING HOLES U2 U18 U17 U1	LOCATION MARKS FM1 FM2 H1 H2	TOOLING HOLES
US9/US18 US9 U18 U6 U9 U5 U11 US3/US14 US2/US4 CABLETIE HOLES	DISPLAY FIXINGS U3 U8 U4 U7	RELAY PCB FIXINGS U11 U12 U15 U16

IF MULTIPLE SHEET DRAWING, ALL SHEETS MUST BE AT THE SAME LEVEL
 CAD DRAWING, NO MANUAL CHANGES PERMISSIBLE
 DATE: 11/03/01
 DRAWN: CSW/KF/SH
 DATE: JAN 98
 SHEET: 5 OF 19 SHEETS

MAIN PCB

RCD/LOOP MEASUREMENT

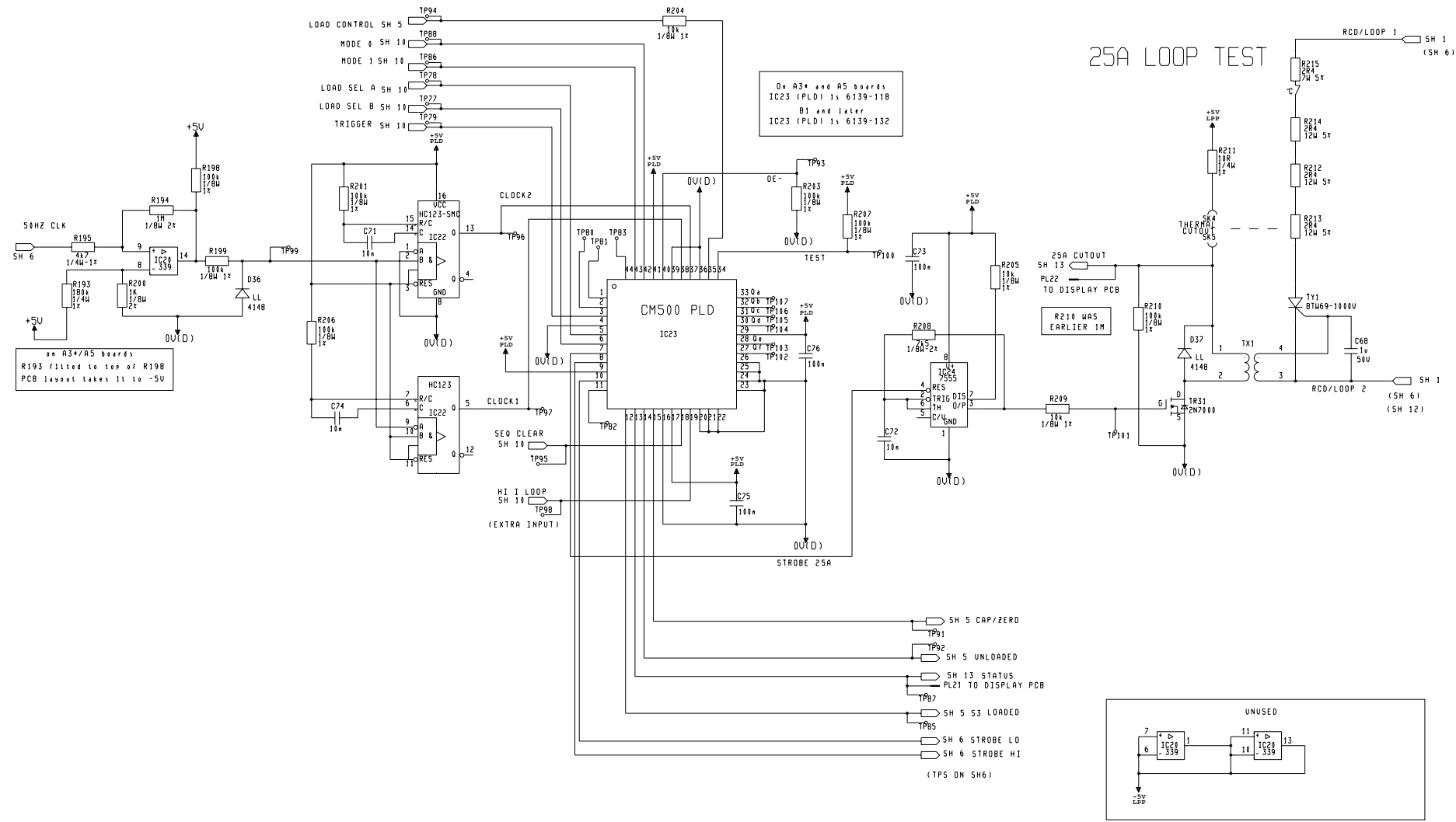


C81 HAS ADDED ACROSS R53 ON LATER AS PCBs

TR207, TR212 MOUNTED ON SAME HEATSINK

NOTE: HEATSINK ON FETS

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	6	24/02/13	21631	EST. 6 OF 19 SHEETS.						



- LOAD CONTROL SH 5 TP94
- MODE 0 SH 10 TP88
- MODE 1 SH 10 TP86
- LOAD SEL A SH 10 TP78
- LOAD SEL B SH 10 TP77
- TRIGGER SH 10 TP79

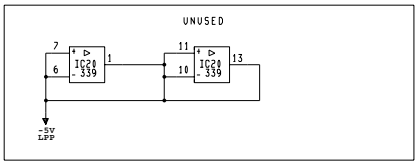
On A3* and A5 boards
 IC23 (PLD) is 6139-118
 B1 and later
 IC23 (PLD) is 6139-132

on A3*/A5 boards
 R193 fitted to top of R198
 PCB layout takes it to -5V

25A LOOP TEST

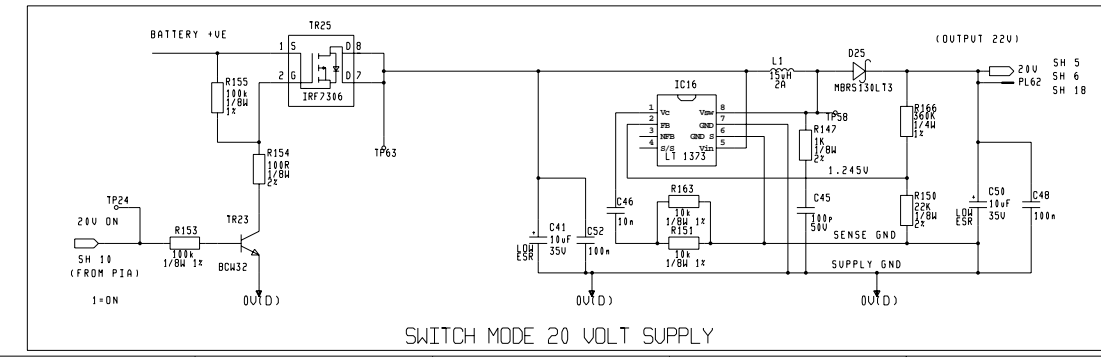
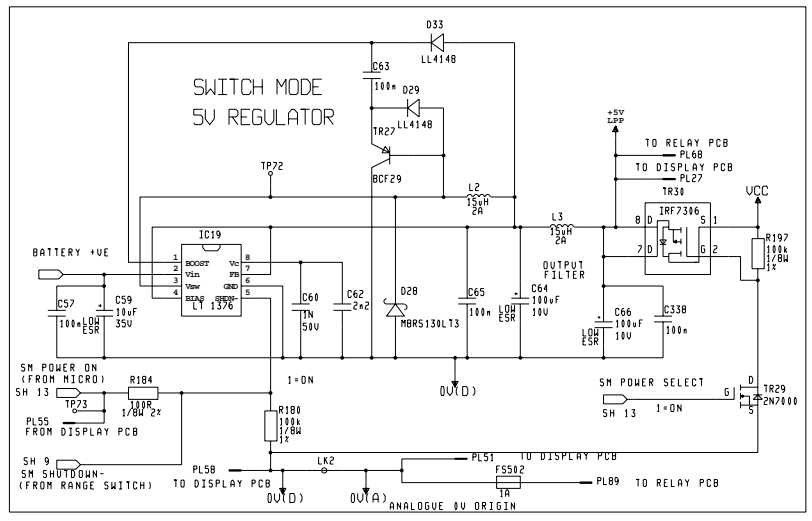
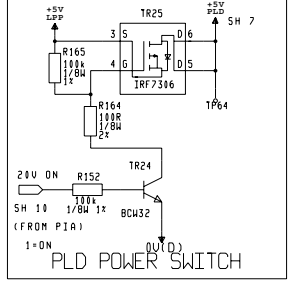
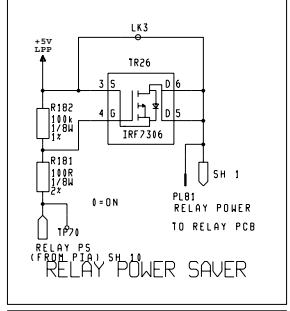
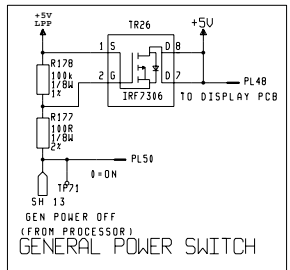
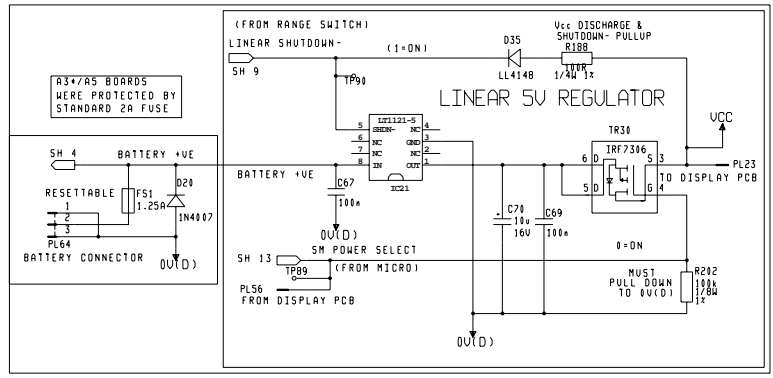
R210 WAS
 EARLIER 1M

(TPS ON SH6)

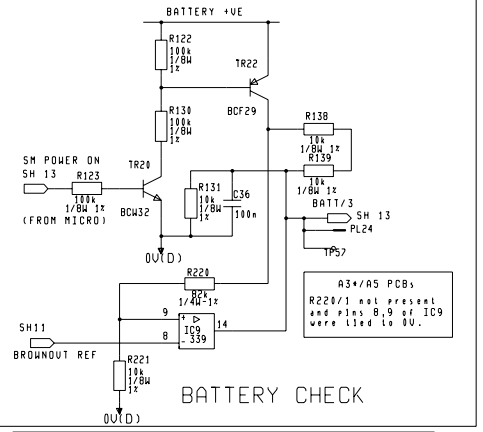
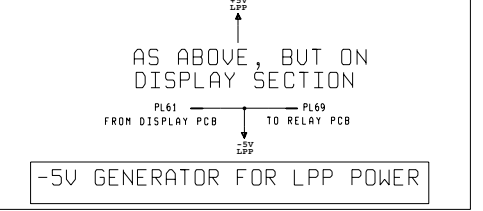
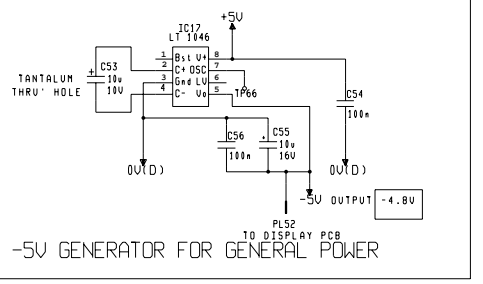


MAIN PCB

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	CAD DRAWING, NO MANUAL CHANGES PERMISSIBLE	ISSUE: 5 DATE: 11/09/81 DRAWN: CSM/SH EST. 7 OF 19 SHEETS.	DRAWING NO.: 21187 DATE: JAN 98



MAIN PCB



POWER SUPPLIES

VCC - FOR MICROCONTROLLER SYSTEM AT STARTUP/SHUTDOWN
 +/-5V LPP - FOR LOW POWER (QUIESCENT) PRETEST
 +/-5V - MAIN POWER, FOR (ACTIVE) PRETEST AND TEST
 +5V PLD - PLO ETC. FOR RCD AND LOOP TESTS
 RELAY POWER - 5V REDUCABLE TO 3.8V TO SAVE POWER
 20V - RCD/LOOP ANALOG CIRCUITS

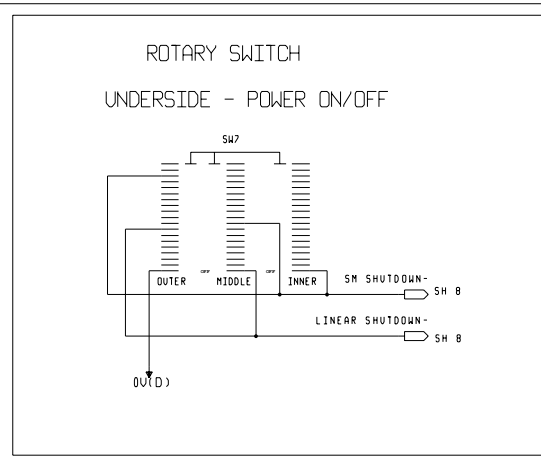
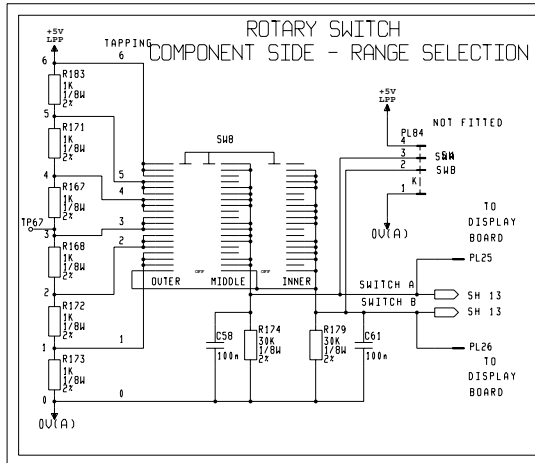
0V(D) IS DIGITAL CIRCUITS POWER SUPPLY GROUND
 0V(A) IS ANALOG CIRCUITS POWER GROUND
 0V IS ANALOG SIGNALS GROUND REFERENCE

POWER SUPPLIES

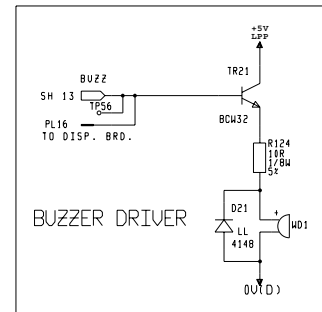
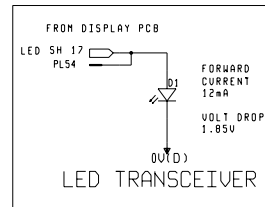
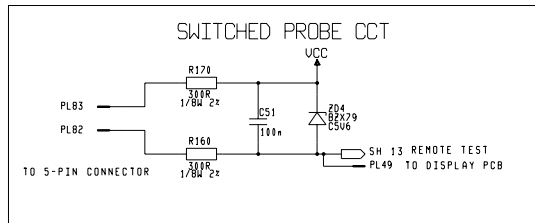
ROTARY SWITCH + SUNDRIES

SWITCH POSITIONS		
A	B	FUNCTION
6	0	DIAGS
6	6	RCD 150
0	6	RCD 1000
0	5	RCD 500
5	5	RCD 500
5	0	RCD 100
4	0	RCD 30
4	4	RCD VARIABLE I
0	4	LOOP LN
0	3	LOOP LE/EARTH
3	3	LOOP 15mA
3	0	INS NE
2	0	INS LN
2	2	INS LE
0	2	BUZZER
0	1	OHMS LEAD NULL
1	1	OHMS/KOHMS
1	0	DOWNLOAD
0	0	STANDBY

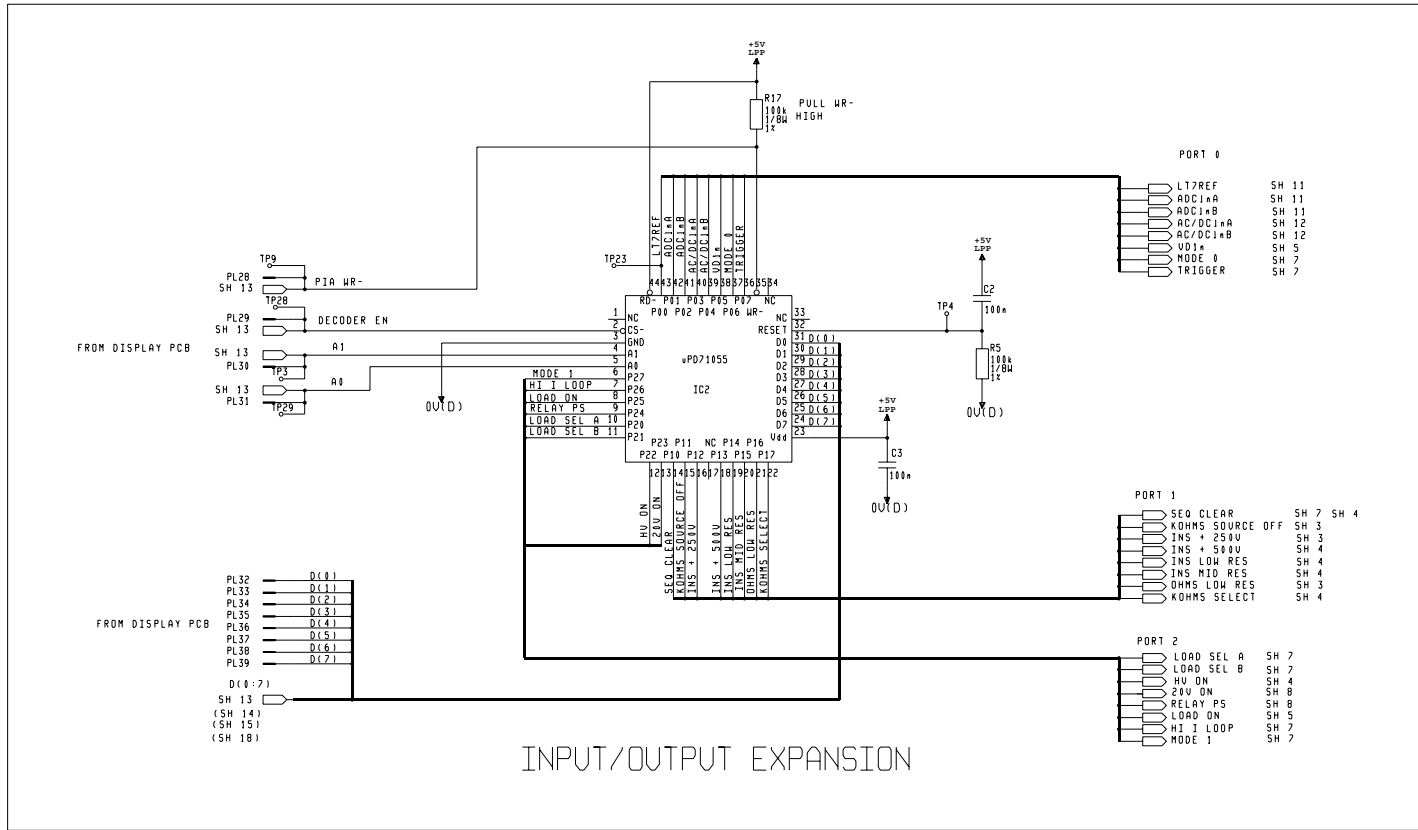
TAPPING	VOLTAGE
6	5.00V
5	4.11V
4	3.26V
3	2.44V
2	1.63V
1	0.82V
0	0.00V



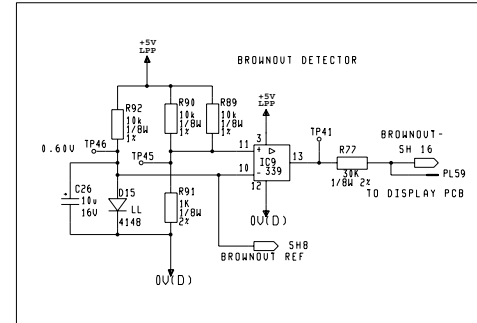
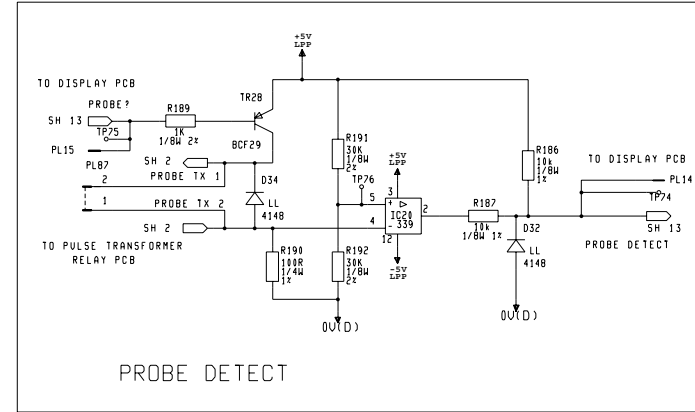
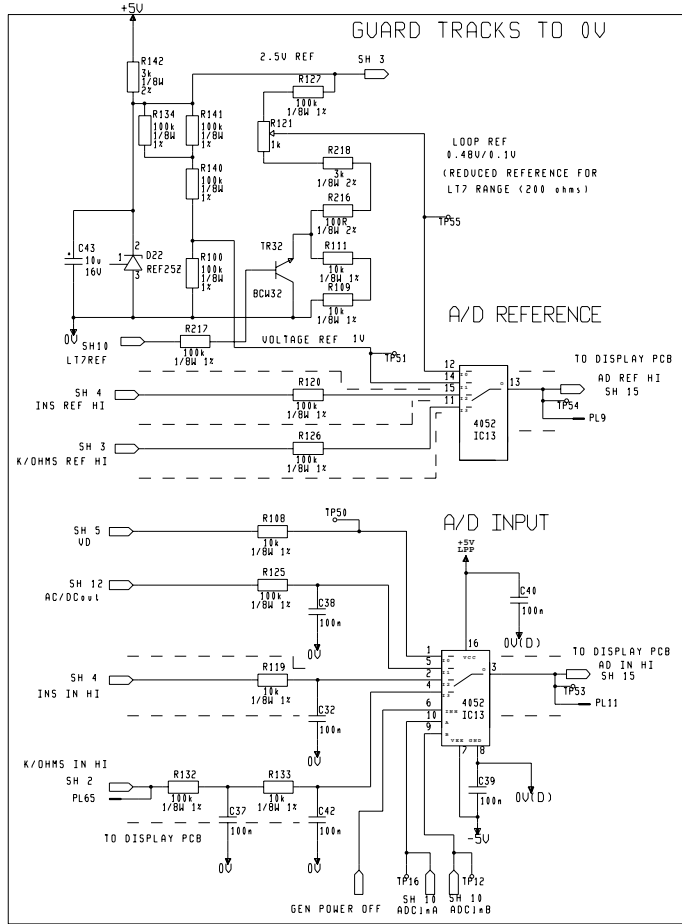
THROUGH-CONNECTIONS			
RELAY PCB - DISPLAY PCB VIA MAIN PCB			
FROM DISPLAY PCB		TO RELAY PCB	
PL7	RL L	PL78	SH 14
SH 1	RL N+rL	PL75	SH 14
PL43	RL L+rE	PL76	SH 14
SH 1	RL L+rE	PL76	SH 14
PL44	RL DISCHARGE	PL78	SH 14
SH 1	RL DISCHARGE	PL78	SH 14
SH 1	RL TEST1	SH 14	SH 14
PL42	RL TEST1	PL77	SH 14
SH 1	RL TEST2	PL77	SH 14
PL40	RL TEST2	PL67	SH 14
SH 1	RL RCD/LOOP	SH 14	SH 14
PL46	RL RCD/LOOP	PL79	SH 14
SH 1	PROBE OPTO	PL92	SH 14
PL47	PROBE OPTO	PL92	SH 14
SH 1	E-TB/212	SH 14	SH 14
PL4	E-TB/212	PL88	SH 13
SH 2	E-TB/212	SH 13	SH 13



MAIN PCB



A/D MULTIPLEXING, BROWNOUT DETECT AND PROBE DETECT

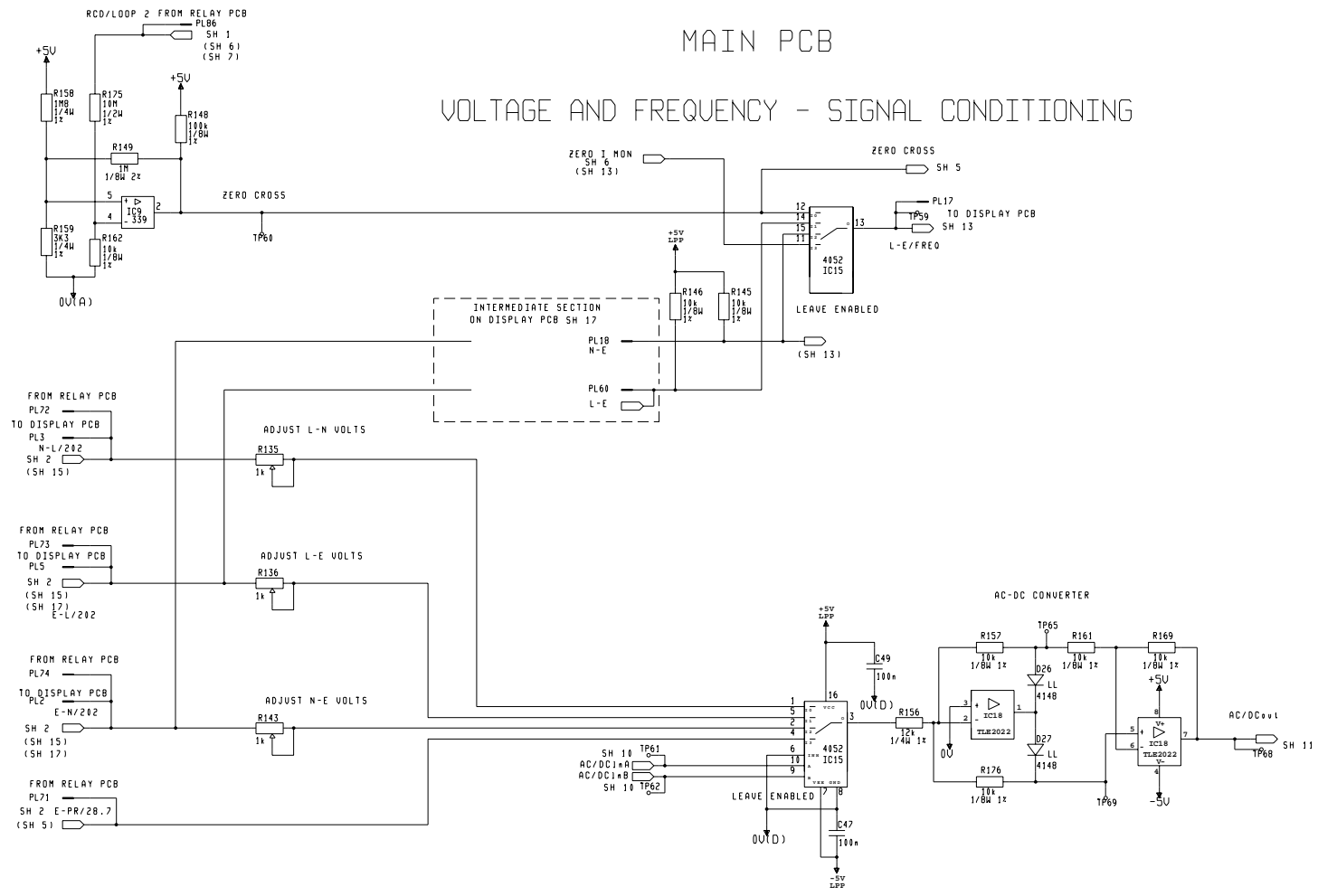


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	5 11/08/01 21187	DESIGN: C54/KF	DATE: JAN 98
	6 24/02/03 21631	EST. 11 OF 19 SHEETS	

50/50 ZERO CROSSING

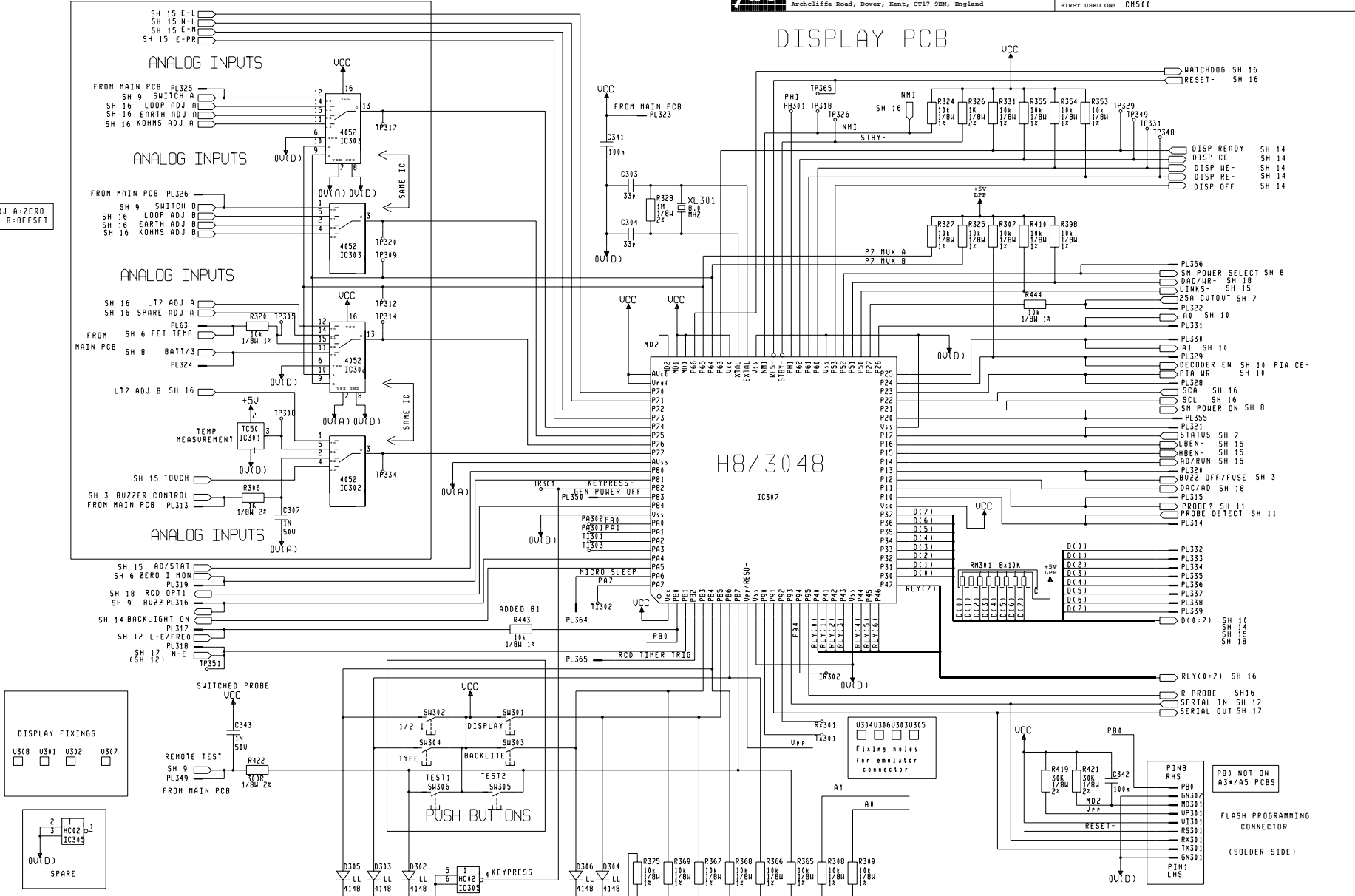
MAIN PCB

VOLTAGE AND FREQUENCY - SIGNAL CONDITIONING



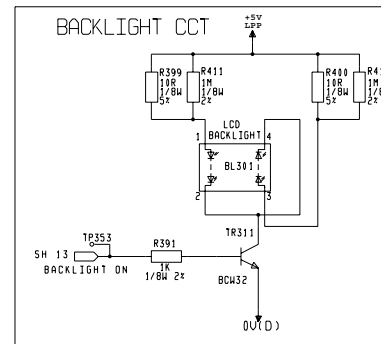
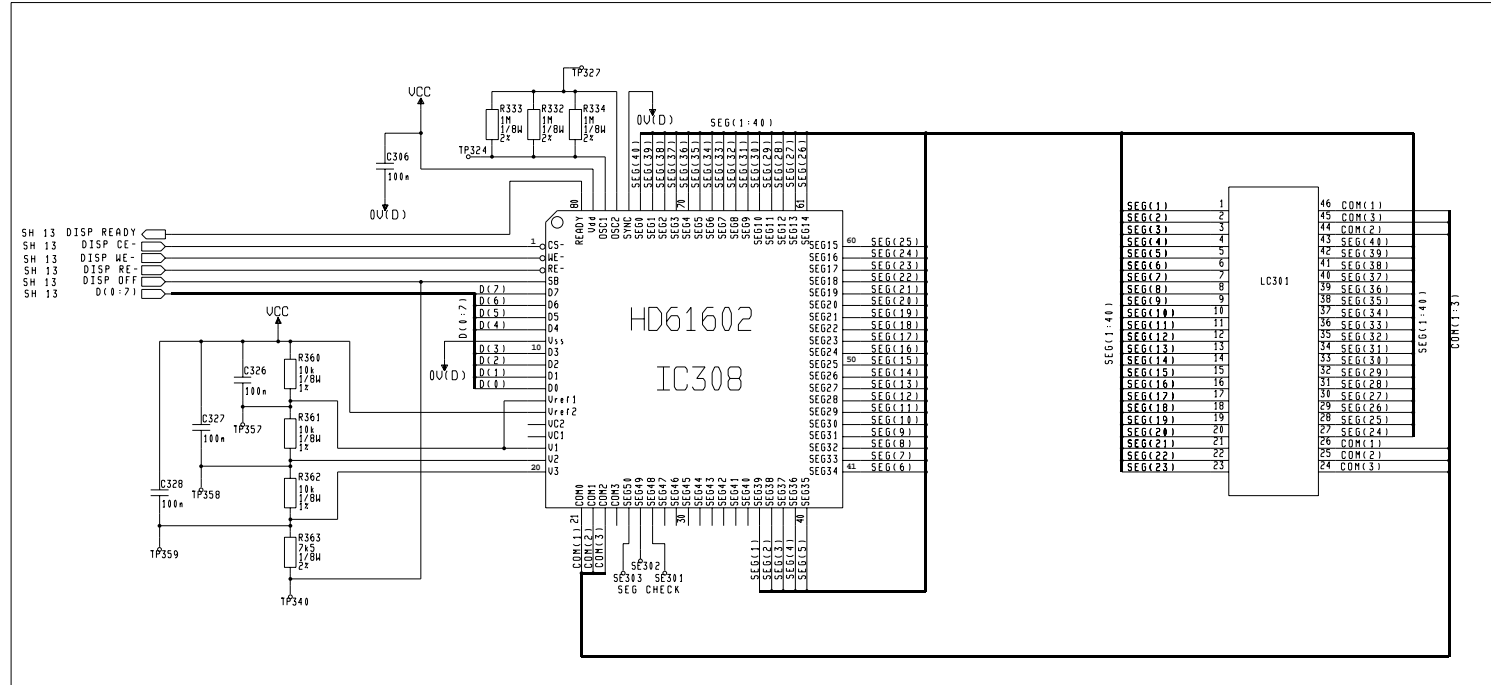
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	ISSUE	DATE	CHK NO.	DESIGN	DATE	
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	6	24/02/13	21631			EST. 12 OF 19 SHEETS.

DISPLAY PCB



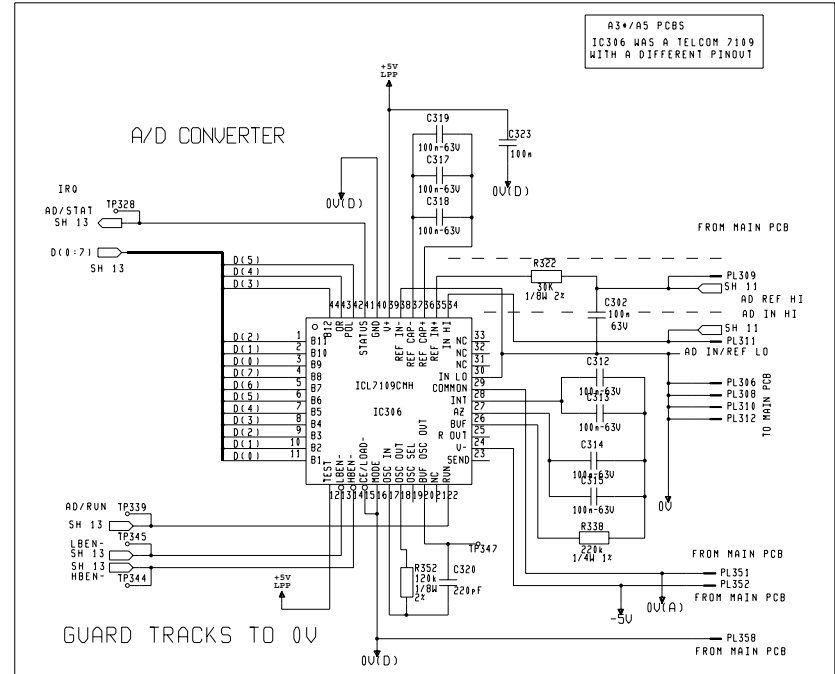
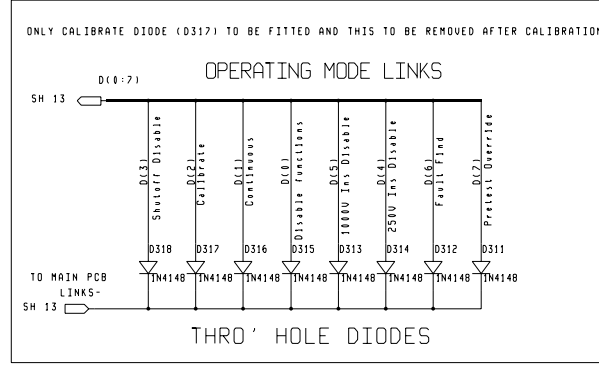
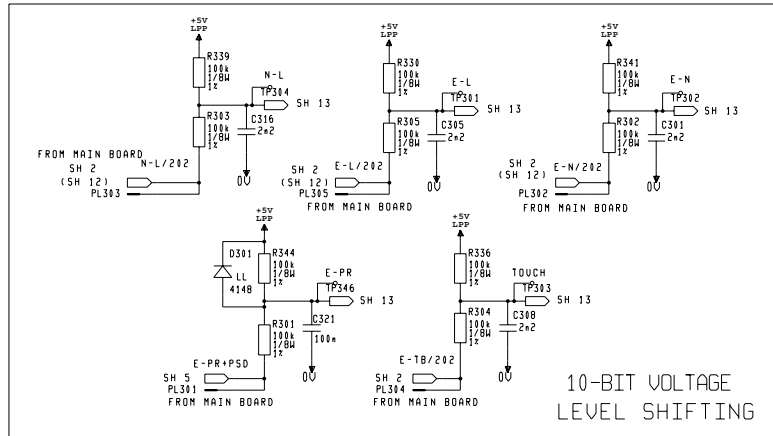
MICROCONTROLLER CIRCUIT

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ISSUE	DATE	ON HO.	CAD DRAWING, NO MANUAL CHANGES PERMISSIBLE	
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6	24/02/13	21631		REV. 13 OF 19 SHEETS.

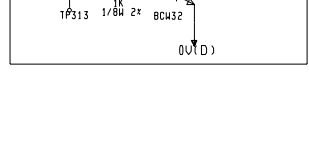
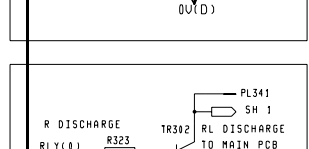
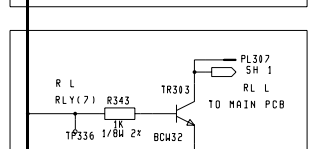
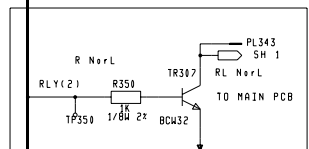
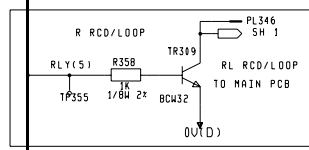
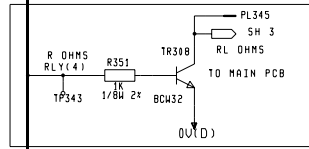
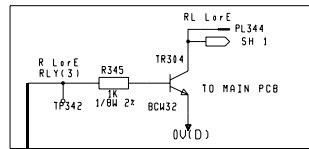
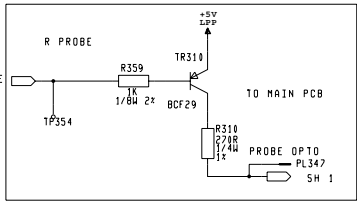
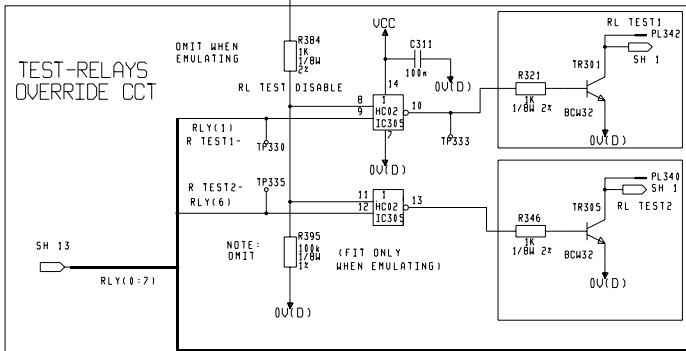
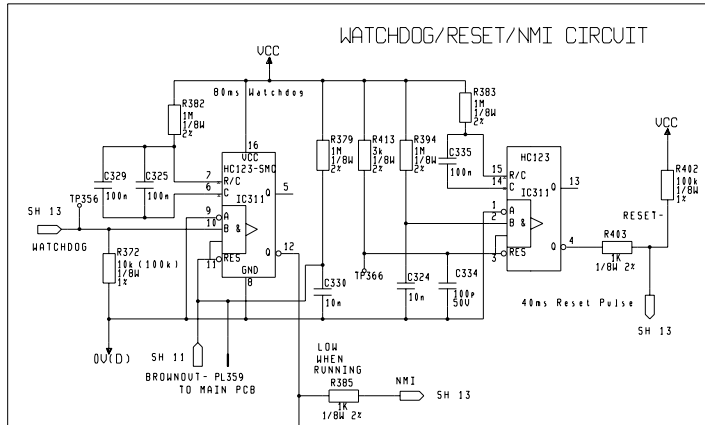
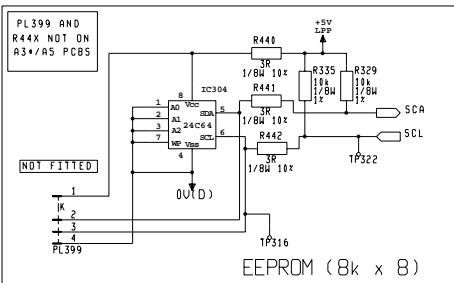
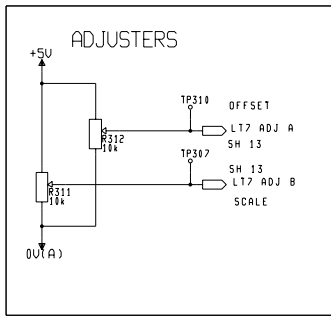
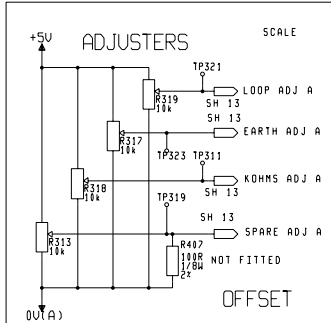
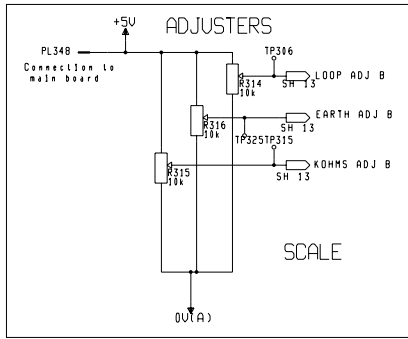


DISPLAY, DRIVER, AND BACKLIGHT

DISPLAY PCB

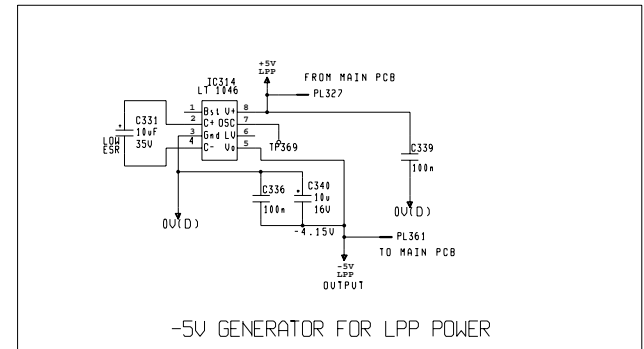
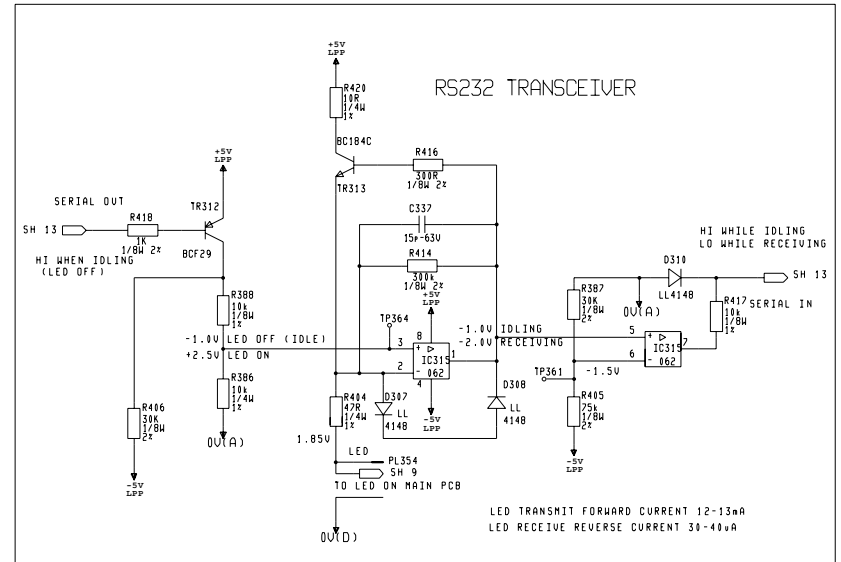
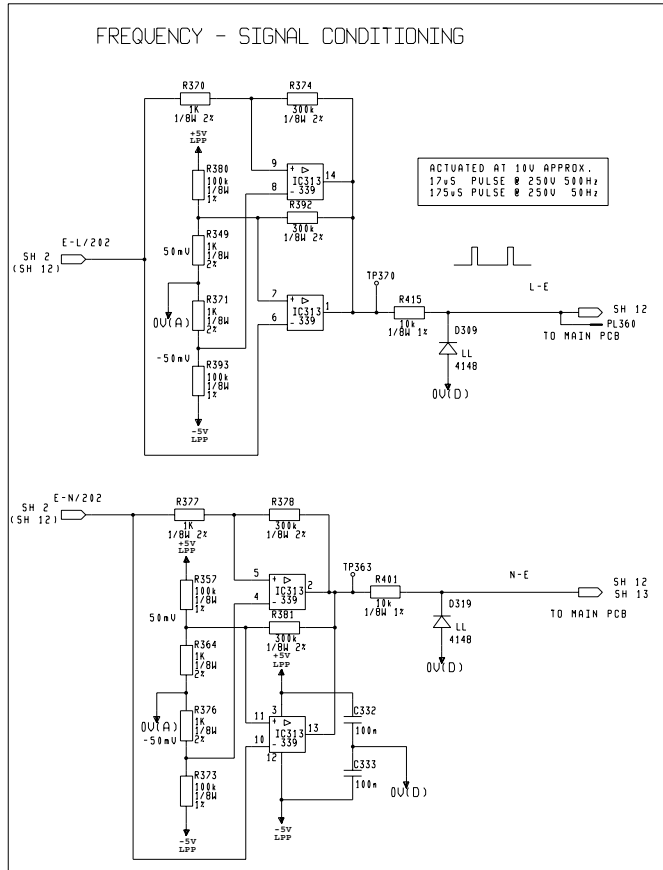


DISPLAY PCB



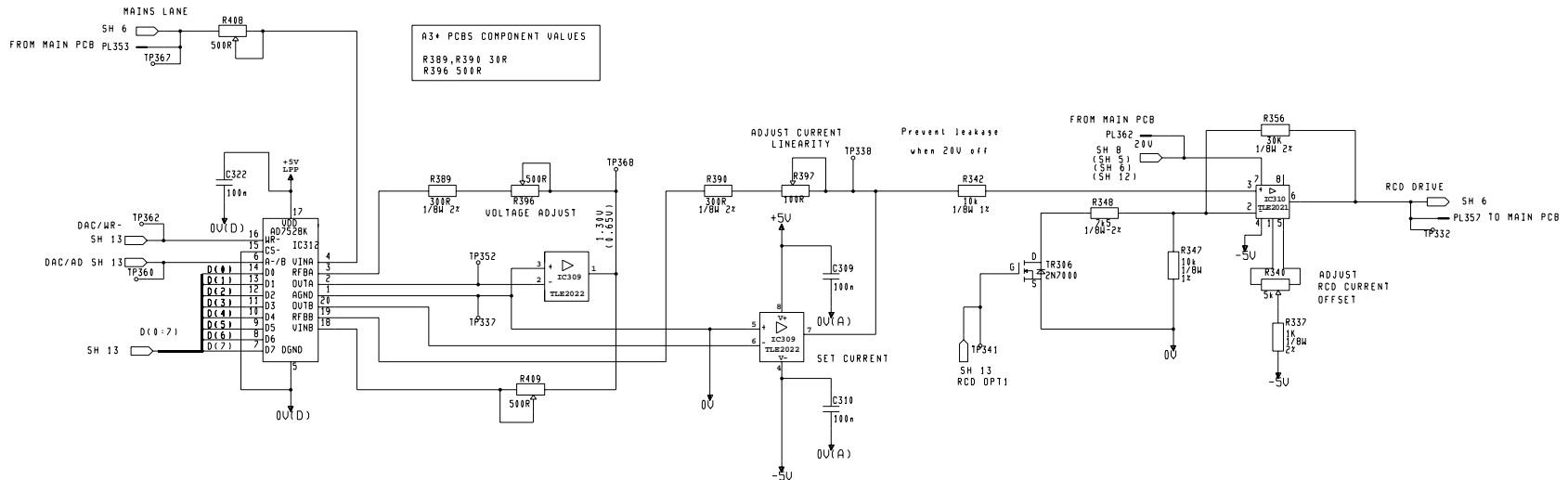
RELAY DRIVERS

DISPLAY PCB



DISPLAY PCB

RCD CIRCUIT



A3+ PCBs COMPONENT VALUES
 R309, R390 30R
 R396 510R

VOLTAGE ADJUST
 1.320V
 (±0.05V)

ADJUST CURRENT LINEARITY

Prevent leakage when 20V off

FROM MAIN PCB

ADJUST RCD CURRENT OFFSET

RCD DRIVE SH 6
 PL357 TO MAIN PCB
 TP332

