

5.4 FRONT UNIT A4

5.4.1 Description

Diagram 1

The front unit incorporates several keys and a number of rotary knobs that are read by a microcomputer D5001. This microcomputer can communicate with the instrument's main microprocessor on unit A3 via connector X5002. The communication from front unit A4 to unit A3 occurs via buffer D5003. The communication in the opposite direction happens via buffer D5006. The flipflops D5004 are used to facilitate this communication.

If unit A3 wants to write information to front unit A4 the following occurs: D5006 is loaded with 8 bits of information via write pulse UFOWR-LT. This pulse is also applied to flipflop D5004/11 and this makes CPDAV-LT low. This causes an interrupt for the front processor D5001. D5001 reads D5006 via the signal CPURD-LT.

If the front A4 wants to send information to A3 the following occurs: D5003 is loaded with 8 bits of information via write pulse CPUWR-LT. This pulse is also applied to flipflop D5004/3 and this makes UFODAVLT low. This is recognized by the main microprocessor on unit A3. This device reads the contents of D5003 via signal UFORD-LT.

The rotaries and the keys are read via the 4 bit ROT-BUS and the 8 bit SW-BUS respectively. One bit in these busses is made low at a time and via the 8 bit UFOAD-BUS an 8 bit pattern is sent back to processor D5001. This bit pattern incorporates information concerning the keys/rotaries that are activated.

Diagram 2

The keys and rotaries are both grouped in a matrix. The key position is read out by making one of the SW lines low at a time. If a key is pressed, a low level is switched through to one of the 8 input lines of key latch D5002. The other lines stay at a high level via the pull-up resistors R5121 through R5129.

Each rotary can occupy 4 different states. A rotary incorporates a rotor contact that can make contact with one of the two stator contacts. It is also possible that the rotor makes no contact. The last possibility is that the rotor makes contact with both stator contacts. Most of the rotaries are present on front unit A4. Via connector X5001 the rotaries on the CRT controls unit A5 are read out. The rotaries are read out via the ROT-BUS lines RA, RB, RC and RD that are made low one at a time. This results in a certain bit pattern at the input of key latch D5002. This bit pattern is read by the microprocessor via enable signal PSEN--LT.

Diodes are used throughout the key and rotary matrix to guarantee that false information is not read by the microprocessor in case more than one control is operated at a time.

5.4.2 Signal name list A4.

Note: In the signal name list you find the itemnumber of the component that is source or destination. Behind this itemnumber (separated by ":") you find the number of the diagram where the source/destination can be found.

NAME	MEANING	SOURCE	DESTINATION
PSEN-LT	READ SIGNAL FOR KNOBS AND KEYS	D5001:01	D5002:02
UFODAVLT	FRONT WRITES TO MICROPROCESSOR	D5004:01	X5002:01
UFOWR-LT	MICROPROCESSOR WRITES TO FRONT	X5002:01	D5006:01 D5004:01

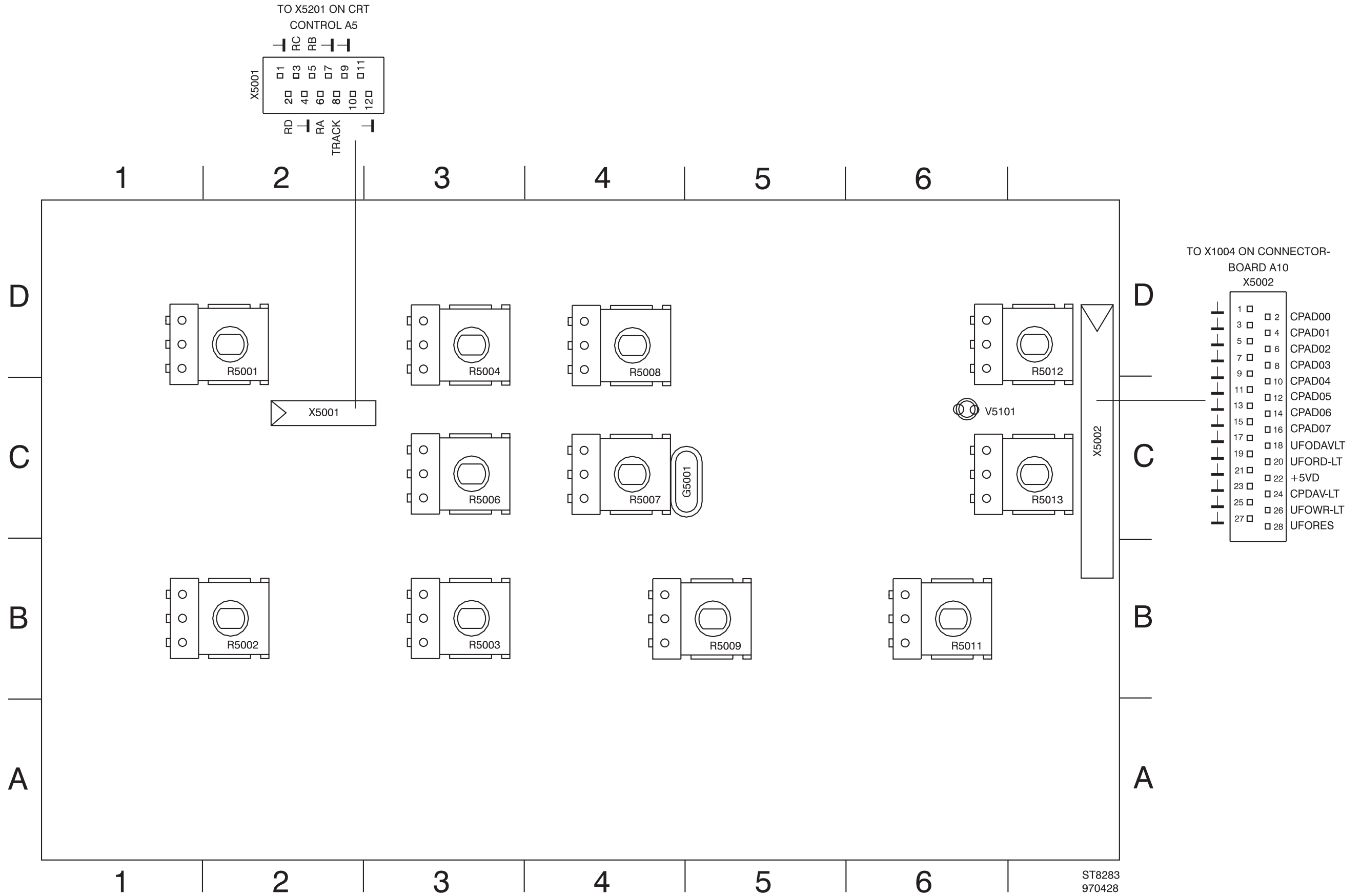
5.4.3 Key switches

Test code is obtained via the UTIL MAINTENANCE menu. Refer to section 8.11.4.2 for detailed information.

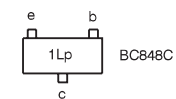
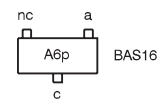
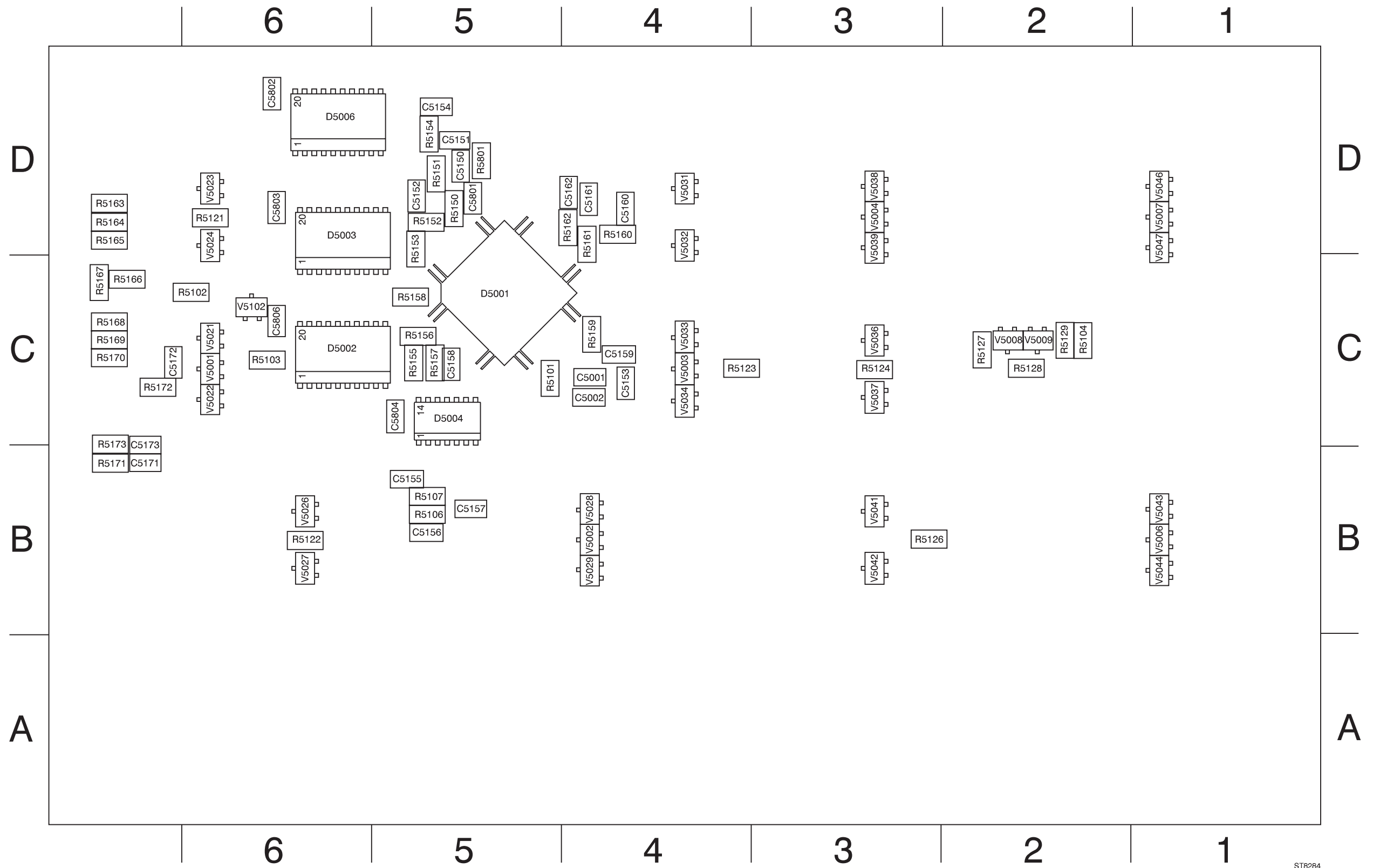
SWITCH	PM33x4A	PM33x2A	PM33x0A	TEST CODE
S5001	DISPLAY	DISPLAY	DISPLAY	70
S5002	MATH	MATH	MATH	60
S5003	MEASURE	MEASURE	MEASURE	50
S5004	RECALL	RECALL	RECALL	40
S5006	SAVE	SAVE	SAVE	30
S5007	ANALOG	ANALOG	ANALOG	20
S5008	UTIL	UTIL	UTIL	10
S5009	CAL	CAL	CAL	00
S5011	HARDCOPY	HARDCOPY	HARDCOPY	71
S5012	MAGNIFY-R	MAGNIFY-R	MAGNIFY-R	61
S5013	MAGNIFY-L	MAGNIFY-L	MAGNIFY-L	51
S5014	TRIGGER	TRIGGER	TRIGGER	41
S5016	ACQUIRE	ACQUIRE	ACQUIRE	31
S5017	pin hole	pin hole	pin hole	(21)
S5018	SETUPS	SETUPS	SETUPS	11
S5019	AUTO SET	AUTO SET	AUTO SET	(01)
S5021	SINGLE	SINGLE	SINGLE	72
S5022	AUTORANGE TB	AUTORANGE TB	AUTORANGE TB	62
S5023	RUN/STOP	RUN/STOP	RUN/STOP	52
S5024	CURSORS	CURSORS	CURSORS	42
S5026	DTB s	DTB s	DTB s	32
S5027	SOFTKEY 2	SOFTKEY 2	SOFTKEY 2	22
S5028	SOFTKEY 1	SOFTKEY 1	SOFTKEY 1	12
S5029	STATUS/LOCAL	STATUS/LOCAL	STATUS/LOCAL	02
S5031	TIME/DIV ns	TIME/DIV ns	TIME/DIV ns	73
S5032	TIME/DIV s	TIME/DIV s	TIME/DIV s	63
S5033	TB MODE	TB MODE	TB MODE	53
S5034	DTB ns	DTB ns	DTB ns	43
S5036	DTB	DTB	DTB	33
S5037	SOFTKEY 3	SOFTKEY 3	SOFTKEY 3	23
S5038	SOFTKEY 4	SOFTKEY 4	SOFTKEY 4	13
S5039	SOFTKEY 5	SOFTKEY 5	SOFTKEY 5	03
S5041	AC/DC GND CH4	AC/DC CH4	AC/DC EXT TRIG	74
S5042	INV CH4	INV CH4		64
S5043	TRIG CH4	TRIG CH4	EXT TRIG	54
S5044	AVERAGE	AVERAGE	AVERAGE	44
S5046	VERTMENU	VERTMENU	VERTMENU	34
S5047	AUTORANGE CH1	AUTORANGE CH1	AUTORANGE CH1	24
S5048	AMPL mV CH1	AMPL mV CH1	AMPL mV CH1	14
S5049	SOFTKEY 6	SOFTKEY 6	SOFTKEY 6	04

SWITCH	PM33x4A	PM33x2A	PM33x0A	TEST CODE
S5051	ON CH4	ON CH4	TRIG VIEW	75
S5052	AUTORANGE CH4	AMPL	AMPL	65
S5053	TRIG CH3	TRIG CH3		55
S5054	TRIG CH2	TRIG CH2	TRIG CH2	45
S5056	TRIG CH1	TRIG CH1	TRIG CH1	35
S5057	ON CH1	ON CH1	ON CH1	25
S5058	AMPL V CH1	AMPL V CH1	AMPL V CH1	15
S5059	TEXT OFF	TEXT OFF	TEXT OFF	05
S5061	AMPL mV CH4			76
S5062	CH3+CH4	CH3+CH4		66
S5063	AUTORANGE CH3	AMPL		56
S5064	AMPL mV CH3			46
S5066	INV CH2	INV CH2	INV CH2	36
S5067	AUTORANGE CH2	AUTORANGE CH2	AUTORANGE CH2	26
S5068	AMPL mV CH2	AMPL mV CH2	AMPL mV CH2	16
S5069	CH1+CH2	CH1+CH2	CH1+CH2	06
S5071	AMPL V CH4			77
S5072	AC/DC/GND CH3	AC/DC CH3		67
S5073	ON CH3	ON CH3		57
S5074	AMPL V CH3			47
S5076	AC/DC/GND CH2	AC/DC/GND CH2	AC/DC/GND CH2	37
S5077	ON CH2	ON CH2	ON CH2	27
S5078	AMPL V CH2	AMPL V CH2	AMPL V CH2	17
S5079	AC/DC/GND CH1	AC/DC/GND CH1	AC/DC/GND CH1	07
R5001	TRACK	TRACK	TRACK	.A
R5002	POS 1	POS 1	POS 1	.B
R5003	POS 2	POS 2	POS 2	.3
R5004	DELTA	DELTA	DELTA	.C
R5006	DELAY	DELAY	DELAY	.4
R5007	TRIGGER POSITION	TRIGGER POSITION	TRIGGER POSITION	.D
R5008	HOLD OFF	HOLD OFF	HOLD OFF	.5
R5009	POS 3	POS 3		.E
R5011	POS 4	POS 4		.6
R5012	X-POS	X-POS	X-POS	.F
R5013	TRIGGER LEVEL	TRIGGER LEVEL	TRIGGER LEVEL	.7

5.4.4 Unit lay-outs

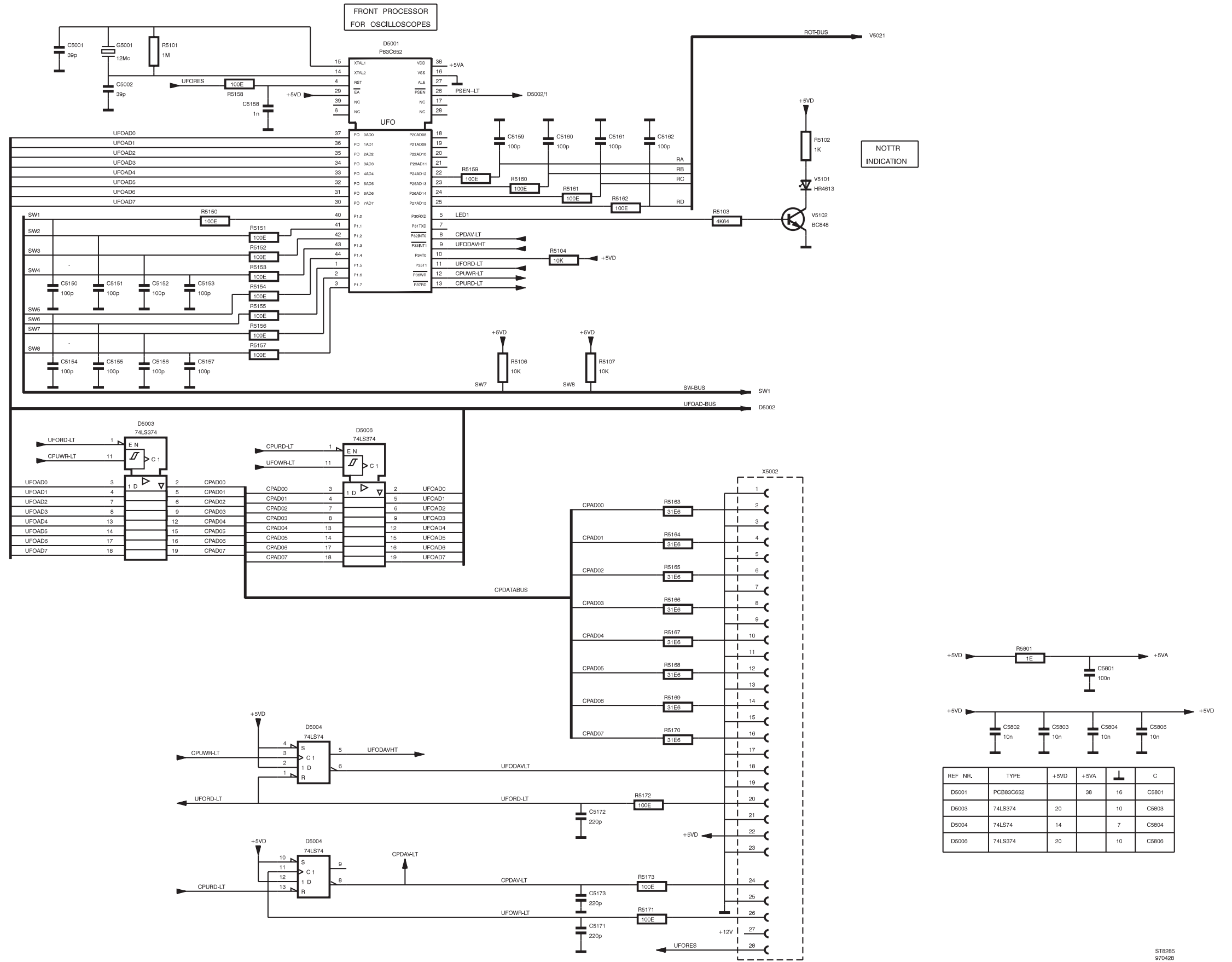


Lay-out 1 - Large component side of front unit A4



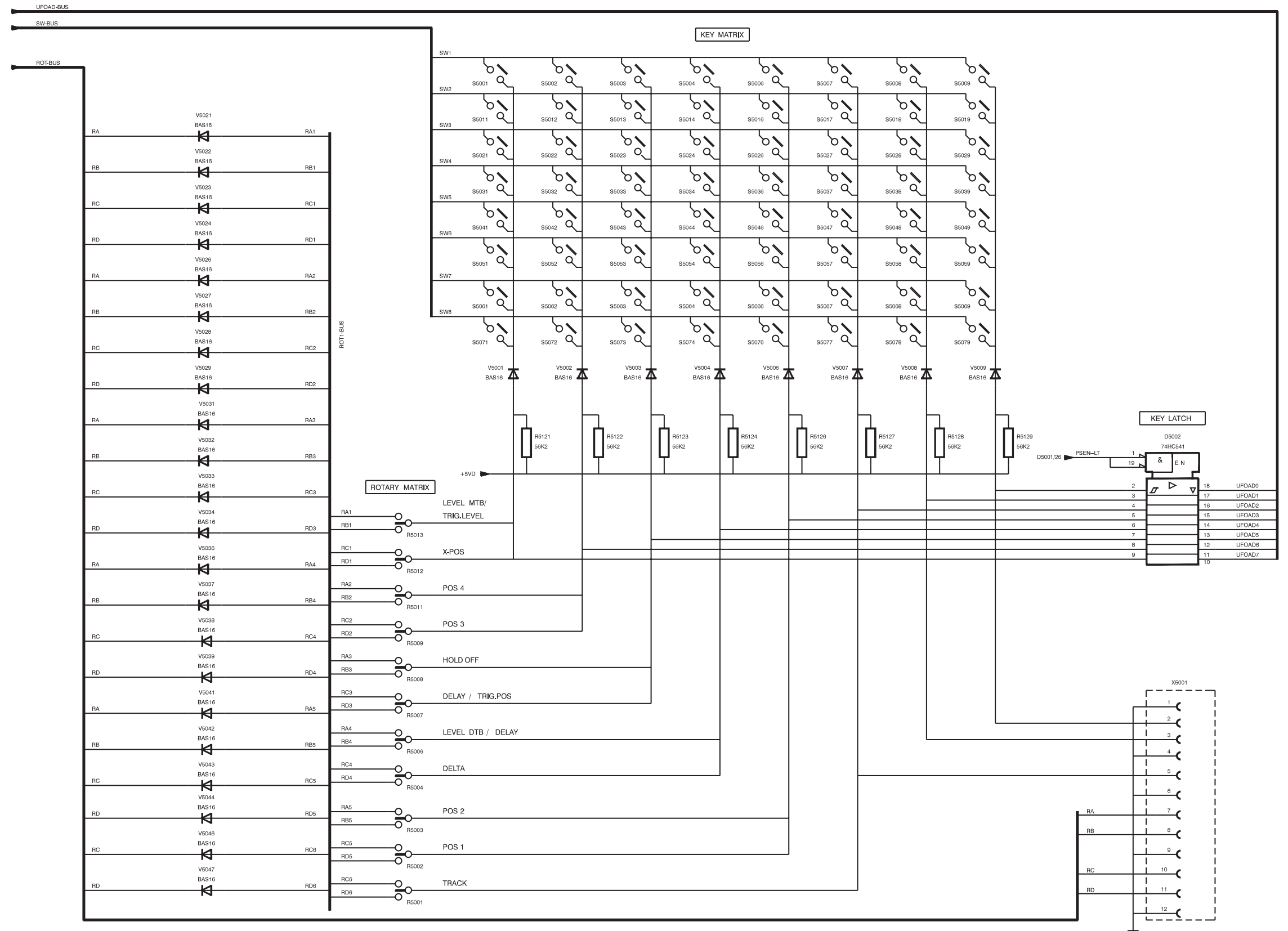
Lay-out 2 - Small component side of front unit A4

5.4.5 Circuit diagrams



REF NR.	TYPE	+5VD	+5VA	C	
D5001	PC83C652		38	16	C5801
D5003	74LS374	20		10	C5803
D5004	74LS74	14		7	C5804
D5006	74LS374	20		10	C5806

A4 - Diagram 1; front processor



REF N°	TYPE	+5V	↓	C
D5002	74HC541	20	10	C5802

ST8286
970428

A4 - Diagram 2; Key matrix

Item	Description		Ordering code
5.4.6 Parts list			
CAPACITORS			
C5001	CAP.CERAMIC	AP 63V 5% 39PF	5322 122 32966
C5002	CAP.CERAMIC	AP 63V 5% 39PF	5322 122 32966
C5150	CAP.CHIP	AP 63V 5% 100PF	5322 122 32531
C5151	CAP.CHIP	AP 63V 5% 100PF	5322 122 32531
C5152	CAP.CHIP	AP 63V 5% 100PF	5322 122 32531
C5153	CAP.CHIP	AP 63V 5% 100PF	5322 122 32531
C5154	CAP.CHIP	AP 63V 5% 100PF	5322 122 32531
C5155	CAP.CHIP	AP 63V 5% 100PF	5322 122 32531
C5156	CAP.CHIP	AP 63V 5% 100PF	5322 122 32531
C5157	CAP.CHIP	AP 63V 5% 100PF	5322 122 32531
C5158	CAP.CHIP	AP 63V 5% 1NF	5322 126 10511
C5159	CAP.CHIP	AP 63V 5% 100PF	5322 122 32531
C5160	CAP.CHIP	AP 63V 5% 100PF	5322 122 32531
C5161	CAP.CHIP	AP 63V 5% 100PF	5322 122 32531
C5162	CAP.CHIP	AP 63V 5% 100PF	5322 122 32531
C5171	CAP.CHIP	AP 63V 5% 220PF	4822 122 33575
C5172	CAP.CHIP	AP 63V 5% 220PF	4822 122 33575
C5173	CAP.CHIP	AP 63V 5% 220PF	4822 122 33575
C5801	CAP.CHIP	AP 63V 10% 100NF	4822 122 33496
C5802	CAP.CHIP	AP 63V 10% 10NF	5322 122 34098
C5803	CAP.CHIP	AP 63V 10% 10NF	5322 122 34098
C5804	CAP.CHIP	AP 63V 10% 10NF	5322 122 34098
C5806	CAP.CHIP	AP 63V 10% 10NF	5322 122 34098
INTEGRATED CIRCUITS			
D5001	INTEGR.CIRCUIT	P83C652EBB/077	5322 209 90095
D5002	I.C. INTERFACE	PC74HC541T PEL	4822 209 63763
D5003	INTEGR.CIRCUIT	SN74LS374DW MOT	5322 209 32773
D5004	INTEGR.CIRCUIT	SN74LS74ADR2 MOT	5322 209 52443
D5006	INTEGR.CIRCUIT	SN74LS374DW MOT	5322 209 32773
RESISTORS			
R5101	RES.CHIP	RC-02H 1% 1M	4822 051 10105
R5102	RES.CHIP	RC-02H 1% 1K	4822 051 10102
R5103	RES.CHIP	RC-02H 1% 4K64	4822 051 54642
R5104	RES.CHIP	RC-02H 1% 10K	4822 051 10103
R5106	RES.CHIP	RC-02H 1% 10K	4822 051 10103
R5107	RES.CHIP	HIP RC-02H 1% 10K	4822 051 10103
R5121	RES.METAL FILM	HIP RC-02H 1% 56K2	5322 117 10574
R5122	RES.METAL FILM	HIP RC-02H 1% 56K2	5322 117 10574
R5123	RES.METAL FILM	HIP RC-02H 1% 56K2	5322 117 10574
R5124	RES.METAL FILM	HIP RC-02H 1% 56K2	5322 117 10574
R5126	RES.METAL FILM	HIP RC-02H 1% 56K2	5322 117 10574
R5127	RES.METAL FILM	HIP RC-02H 1% 56K2	5322 117 10574

Item	Description		Ordering code
R5128	RES.METAL FILM	HIP RC-02H 1% 56K2	5322 117 10574
R5129	RES.METAL FILM	HIP RC-02H 1% 56K2	5322 117 10574
R5150	RES.CHIP	HIP RC-02H 1% 100E	4822 051 10101
R5151	RES.CHIP	HIP RC-02H 1% 100E	4822 051 10101
R5152	RES.CHIP	HIP RC-02H 1% 100E	4822 051 10101
R5153	RES.CHIP	HIP RC-02H 1% 100E	4822 051 10101
R5154	RES.CHIP	HIP RC-02H 1% 100E	4822 051 10101
R5155	RES.CHIP	HIP RC-02H 1% 100E	4822 051 10101
R5156	RES.CHIP	HIP RC-02H 1% 100E	4822 051 10101
R5157	RES.CHIP	HIP RC-02H 1% 100E	4822 051 10101
R5158	RES.CHIP	HIP RC-02H 1% 100E	4822 051 10101
R5159	RES.CHIP	HIP RC-02H 1% 100E	4822 051 10101
R5160	RES.CHIP	HIP RC-02H 1% 100E	4822 051 10101
R5161	RES.CHIP	HIP RC-02H 1% 100E	4822 051 10101
R5162	RES.CHIP	HIP RC-02H 1% 100E	4822 051 10101
R5163	RES.MET.GLAZED	RMC1/8 1% 31E6	5322 116 82895
R5164	RES.MET.GLAZED	RMC1/8 1% 31E6	5322 116 82895
R5165	RES.MET.GLAZED	RMC1/8 1% 31E6	5322 116 82895
R5166	RES.MET.GLAZED	RMC1/8 1% 31E6	5322 116 82895
R5167	RES.MET.GLAZED	RMC1/8 1% 31E6	5322 116 82895
R5168	RES.MET.GLAZED	RMC1/8 1% 31E6	5322 116 82895
R5169	RES.MET.GLAZED	RMC1/8 1% 31E6	5322 116 82895
R5170	RES.MET.GLAZED	RMC1/8 1% 31E6	5322 116 82895
R5171	RES.CHIP	HIP RC-02H 1% 100E	4822 051 10101
R5172	RES.CHIP	HIP RC-02H 1% 100E	4822 051 10101
R5173	RES.CHIP	HIP RC-02H 1% 100E	4822 051 10101
R5801	RES.CHIP	HIP RC-01 5% 1E	4822 051 10108

SEMICONDUCTORS

V5001	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5002	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5003	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5004	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5006	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5007	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5008	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5009	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5021	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5022	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5023	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5024	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5026	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5027	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5028	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5029	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5031	DIODE,CHIP	BAS16 PEL	5322 130 31928

Item	Description		Ordering code
V5032	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5033	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5034	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5036	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5037	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5038	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5039	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5041	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5042	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5043	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5044	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5046	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5047	DIODE,CHIP	BAS16 PEL	5322 130 31928
V5102	TRANSISTOR,CHIP	BC848C PEL	5322 130 42136

MISCELLANEOUS

G5004	RESONATOR	XTAL 12MHZ KYO	5322 242 71444
H5101	LED	TLHR4613 AEG	5322 130 81522

ROTARY SWITCHES

R5001	POTM.+SWI.TAND.	PHILICODER 15-SL	5322 105 90036
R5002	POTM.+SWI.TAND.	PHILICODER 15-SL	5322 105 90036
R5003	POTM.+SWI.TAND.	PHILICODER 15-SL	5322 105 90036
R5004	POTM.+SWI.TAND.	PHILICODER 15-SL	5322 105 90036
R5006	POTM.+SWI.TAND.	PHILICODER 15-SL	5322 105 90036
R5007	POTM.+SWI.TAND.	PHILICODER 15-SL	5322 105 90036
R5008	POTM.+SWI.TAND.	PHILICODER 15-SL	5322 105 90036
R5009	POTM.+SWI.TAND.	PHILICODER 15-SL	5322 105 90036
R5011	POTM.+SWI.TAND.	PHILICODER 15-SL	5322 105 90036
R5012	POTM.+SWI.TAND.	PHILICODER 15-SL	5322 105 90036
R5013	POTM.+SWI.TAND.	PHILICODER 15-SL	5322 105 90036

CONDUCTORS

X5001	CONNECTOR	12-P 1.25MM STR	4822 267 50668
X5002	CONNECTOR	28-P 1.25MM STR	5322 267 60311

