

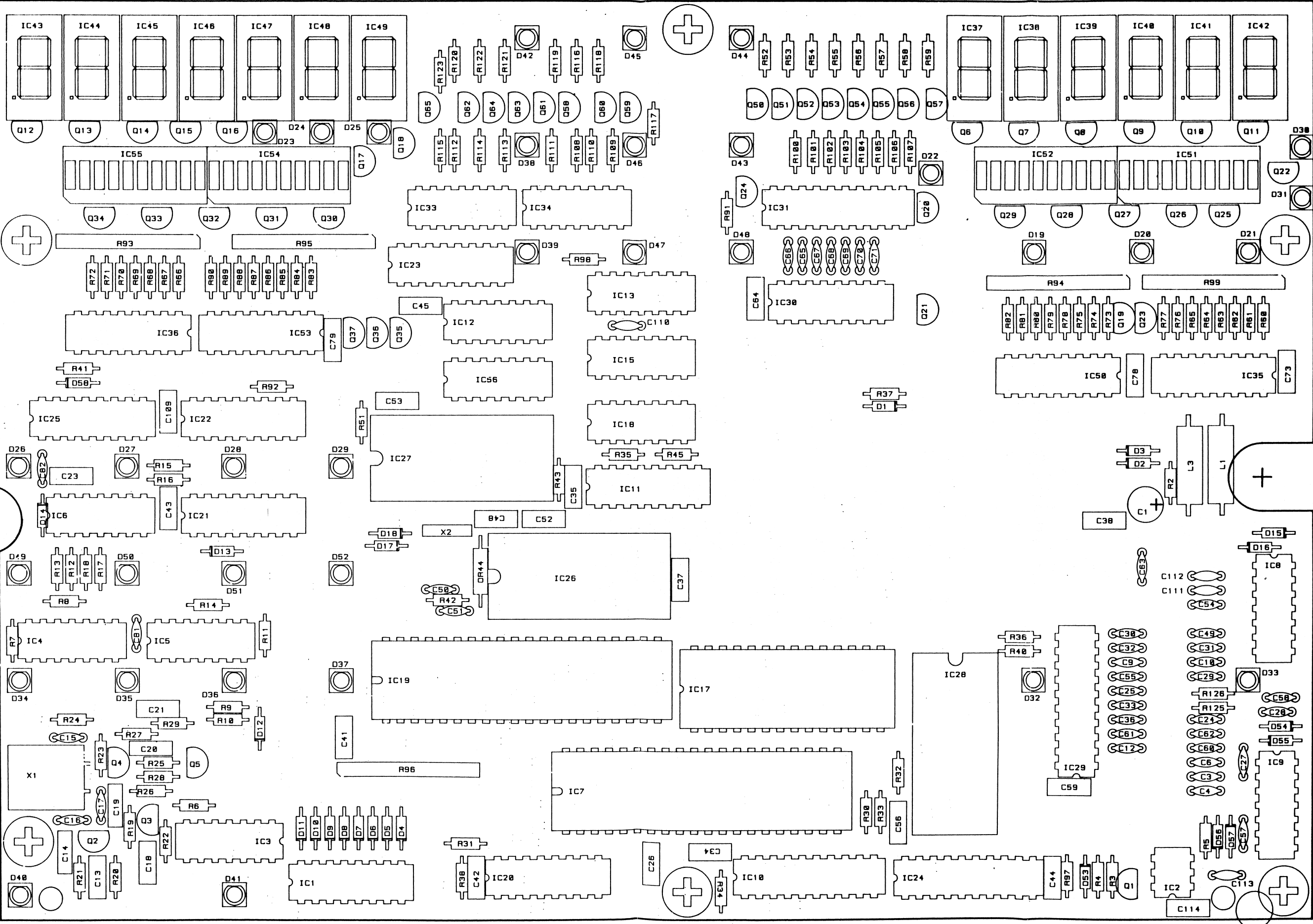
TECHNICAL DESCRIPTION

PCB **600** CONTROL BOARD

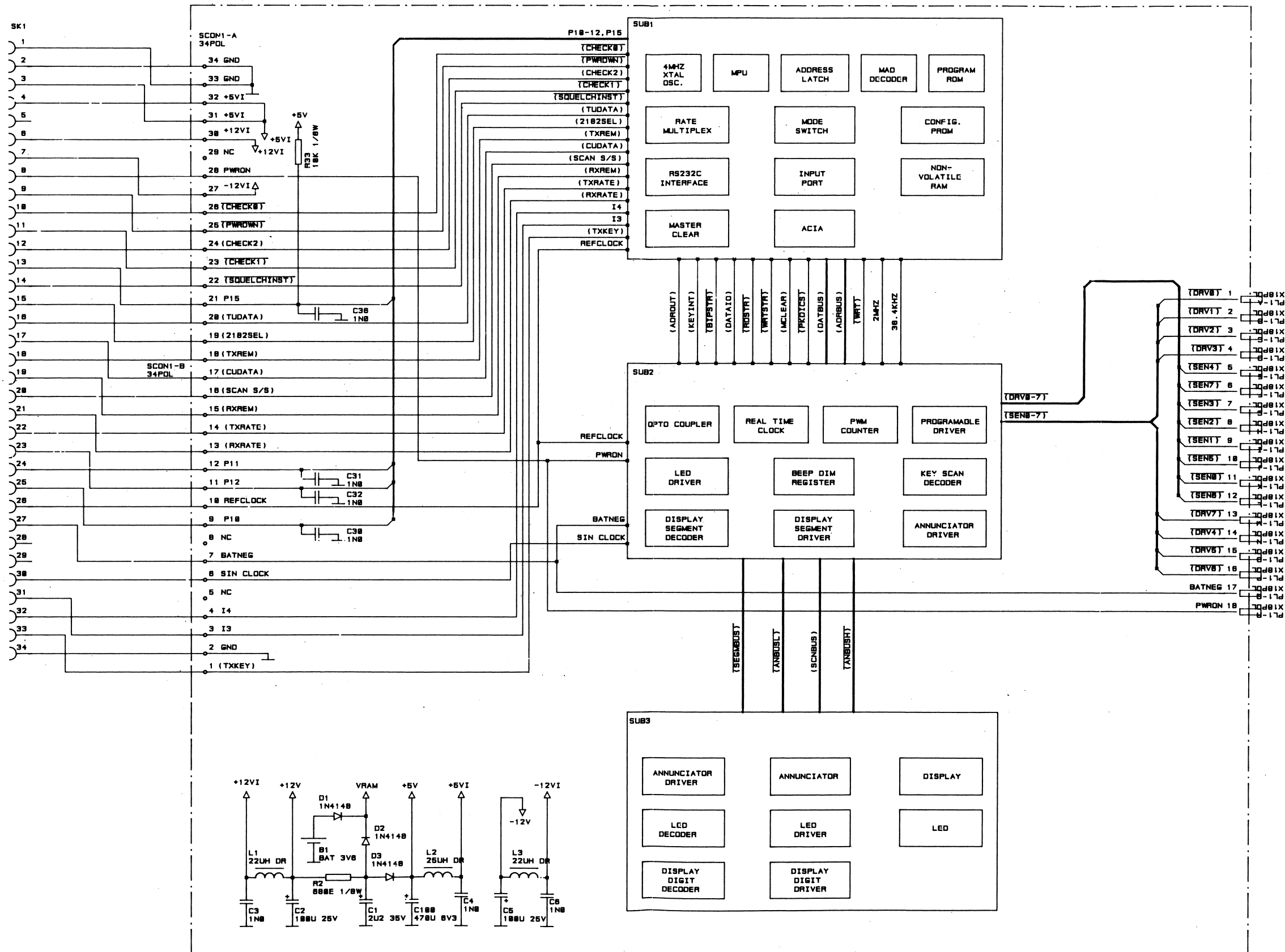
The primary functions of this module are to support the man/machine interface via keyboard and displays, control Audio Processing **601** and communicate with Transceiver Control Board **624** as a master by transmitting commands and receiving acknowledge and status messages in ASCII code according to a fixed protocol. This is accomplished through an embedded computer consisting of a microprocessor ("MPU") with the following onchip facilities: 8 bits CPU, 128 bytes RAM used as buffer area and for saving internal variables, 2 ports of which one handles the transfer of a 16 bits packet to **601** controlling loudspeaker volume, selection of keying and audio signals using the signals (COMDATA), (COMCLOCK) and (COMLOAD), while the other is connected to a serial, asynchronous interface used for communicating at 300 baud via "RS 232C INTERFACE" with **624** using the signals (TUDATA) and (CUDATA), and finally a 16 bits timer used for generating 64 Hz real-time interrupts to switch the microprocessor from back to foreground processing simultaneously measuring the period of the telemetry signals received from **624** representing signal strength and output power (i. e. (RXRATE) and (TXRATE) respectively) through "RATE MULTIPLEXER". The processor is clocked by a signal coming from "4 MHz XTAL OSCILLATOR" and is initialized by "MASTER CLEAR" combined with "MODE SWITCH". Due to "ADDRESS LATCH" being connected to the multiplexed 8 bits wide data/address bus a full 16 bits wide address bus is available for the "MAP DECODER" to select between the connected memories and peripherals, which are the following: "PROGRAM ROM" (up to 16 kbytes of object code in EPROM), "CONFIGURATION PROM" (up to 4 kbytes in EPROM containing a list of up to 1017 permitted TX frequencies and status code for enabled options of the equipment), "NON-VOLATILE RAM" (1 knibbles used for saving up to 76 RX/TX frequency pairs with corresponding modes and the present status of the equipment) powered by a lithium battery during power-off condition together with "REAL TIME CLOCK" which controlled by a 32.768 kHz crystal implements the watch function. By programming the latter it is possible to switch on the entire equipment automatically using the "OPTO COUPLER" to generate the galvanically isolated signal PWRON, which activates SMPS Control **622**.

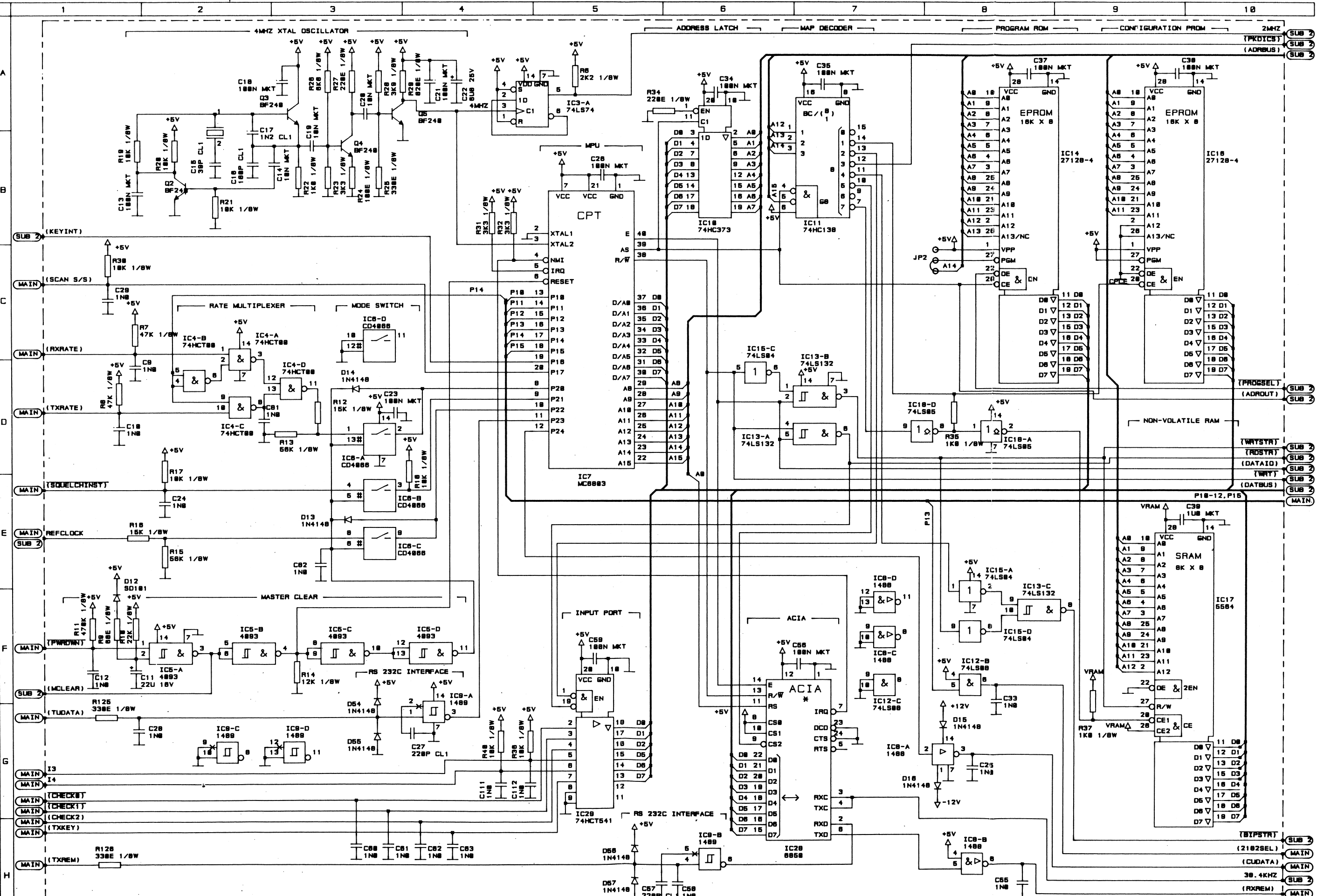
Another peripheral circuit is the "KEYBOARD DISPLAY CONTROLLER", which constantly scans the membrane keyboard (organized as an 8x8 matrix) through "KEY SCAN DECODER" using the signals (DRV0--7) and (SENO--7), while it simultaneously refreshes the entire display at a rate of 588 Hz (duty cycle 1/16) by utilizing "LED DECODER/LED DRIVER" and "DISPLAY DIGIT DECODER/DISPLAY DIGIT DRIVER" for multiplexing the annunciators and seven segment displays respectively. The segments are driven from "DISPLAY SEGMENT DRIVER" and "DISPLAY SEGMENT DECODER" (performing the conversion from BCD-code). The displays may be dimmed through the last peripheral, "BEEP DIM REGISTER", by pulse width modulation via "PWM COUNTER". "BEEP DIM REGISTER" is also capable of controlling "PROGRAMMABLE DIVIDER" generating the signal SINCLOCK used by **601** to synthesize sinusoidal signals for modulation purposes and "beeping" (acoustic feedback to the operator signaling a key closure). In order to permit remote control, another "RS 232C INTERFACE" is available connected to a serial, asynchronous interface implemented by "ACIA". Both serial interfaces

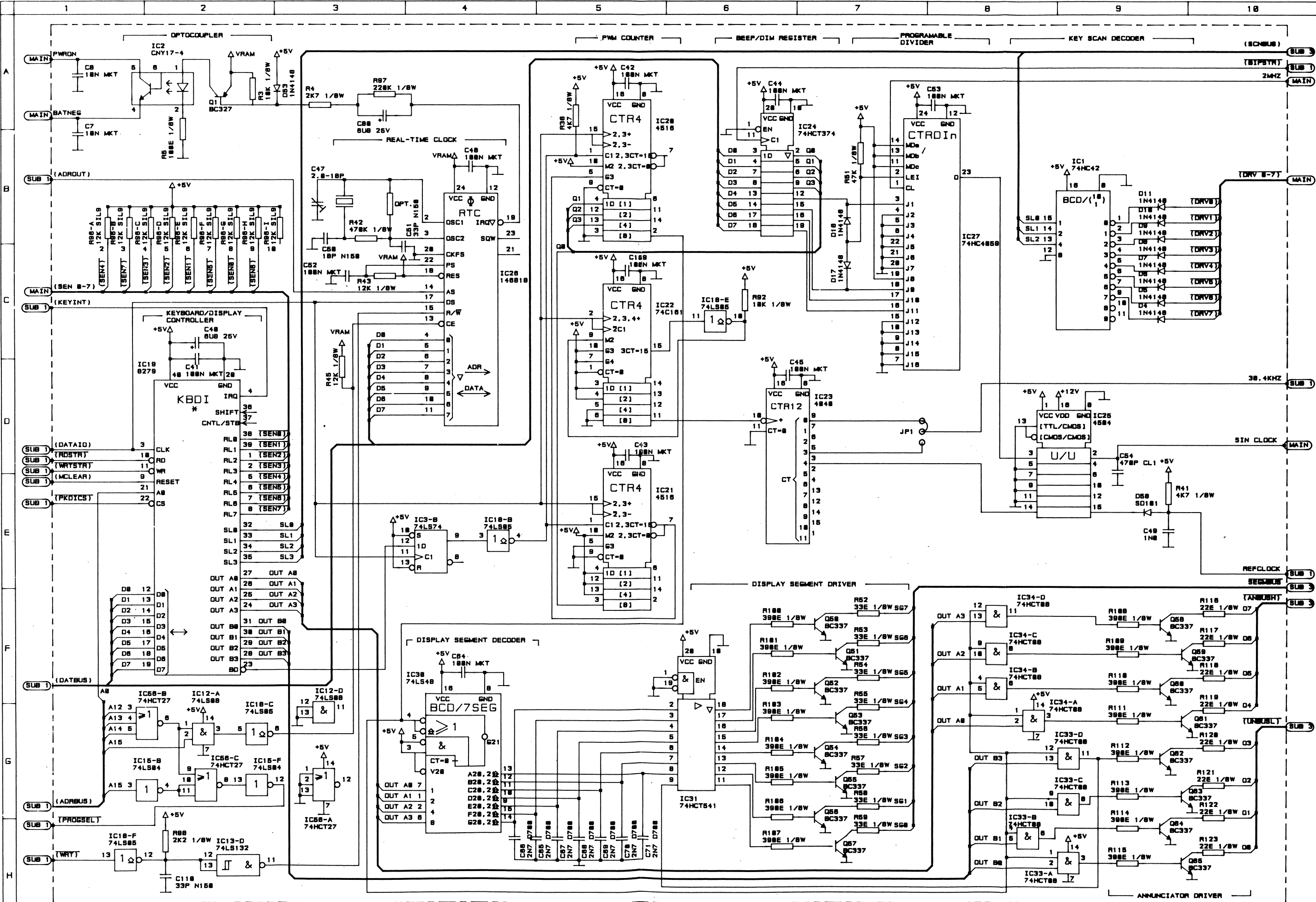
are clocked by "BAUD RATE DIVIDER", which is fed by a 1 MHz clock from "MPU".
Baud rate may be set to 300 or 2400 bits/s selectable by jumper setting.



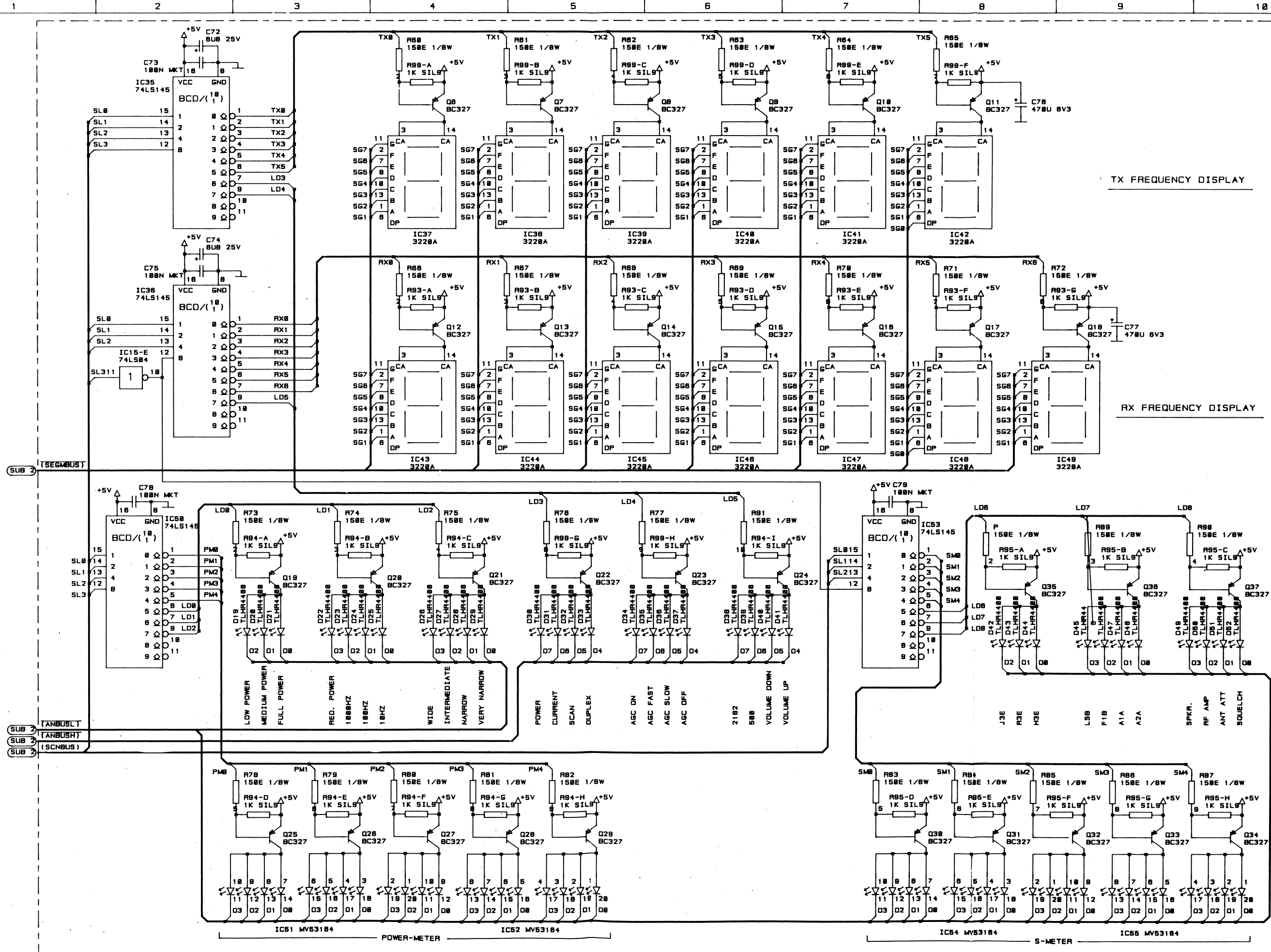
CONTROL BOARD 600
VERSION B2
VIEWED FROM TOP SIDE







PCB 600 CONTROL BOARD
VERSION B2 SUB DIAGRAM 2 OF 3



TEST POINTS FOR [600] CU CONTROL BOARD.


1 12V


2 5V

3 5V @ POWER ON
3V @ POWER OFF

4 -12V

5 4MHz  5V
0V

6 1MHz, 50% d.c.  5V
0V

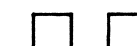
7 1MHz 25% d.c.  5V
0V

8 -11V (passive state)


9 -12V (passive state when connected to TU)

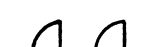
10 -11V (passive state)

11 5V (passive state)

12 8192 Hz 50% d.c.  5V
0V

13 38462 Hz 50% d.c.  5V
0V

14 2404 Hz 50% d.c.  4V
0V

15 2 MHz 50% d.c.  9V
0V

PARTS LIST FOR CONTROL BOARD 600 VERSION B2

PARTS LIST FOR CONTROL BOARD 600 VERSION B2

D20	LED (RED)	823 000 00	IC15	74LS04	850 740 41
D21	LED (RED)	823 000 00	IC16	27128-4 (unprogrammed)	852 712 84
D22	LED (RED)	823 000 00	IC17	5564	850 556 40
D23	LED (RED)	823 000 00	IC18	74LS05	850 740 51
D24	LED (RED)	823 000 00	IC19	8279-5	850 827 90
D25	LED (RED)	823 000 00	IC2	CNY17-4	825 000 01
D26	LED (RED)	823 000 00	IC20	CD4516BC	850 451 60
D27	LED (RED)	823 000 00	IC21	CD4516BC	850 451 60
D28	LED (RED)	823 000 00	IC22	74C161	857 416 11
D29	LED (RED)	823 000 00	IC23	CD4040BC	850 404 00
D3	1N4148	830 414 80	IC24	74HCT374	857 437 42
D30	LED (RED)	823 000 00	IC25	4504	850 450 40
D31	LED (RED)	823 000 00	IC26	146818	851 468 18
D32	LED (RED)	823 000 00	IC27	74HC4059	857 440 59
D33	LED (RED)	823 000 00	IC28	6850	850 685 00
D34	LED (RED)	823 000 00	IC29	74HCT541	857 454 10
D35	LED (RED)	823 000 00	IC3	74LS74	850 747 40
D36	LED (RED)	823 000 00	IC30	74LS48	850 744 81
D37	LED (RED)	823 000 00	IC31	74HCT541	857 454 10
D38	LED (RED)	823 000 00	IC32	ULN2803	850 280 30
D39	LED (RED)	823 000 00	IC33	74HCT08	850 740 82
D4	1N4148	830 414 80	IC34	74HCT08	850 740 82
D40	LED (RED)	823 000 00	IC35	74LS145	857 414 50
D41	LED (RED)	823 000 00	IC36	74LS145	857 414 50
D42	LED (RED)	823 000 00	IC37	DISPLAY (RED)	824 000 02
D43	LED (RED)	823 000 00	IC38	DISPLAY (RED)	824 000 02
D44	LED (RED)	823 000 00	IC39	DISPLAY (RED)	824 000 02
D45	LED (RED)	823 000 00	IC4	74HCT00	850 740 05
D46	LED (RED)	823 000 00	IC40	DISPLAY (RED)	824 000 02
D47	LED (RED)	823 000 00	IC41	DISPLAY (RED)	824 000 02
D48	LED (RED)	823 000 00	IC42	DISPLAY (RED)	824 000 02
D49	LED (RED)	823 000 00	IC43	DISPLAY (RED)	824 000 02
D5	1N4148	830 414 80	IC44	DISPLAY (RED)	824 000 02
D50	LED (RED)	823 000 00	IC45	DISPLAY (RED)	824 000 02
D51	LED (RED)	823 000 00	IC46	DISPLAY (RED)	824 000 02
D52	LED (RED)	823 000 00	IC47	DISPLAY (RED)	824 000 02
D53	1N4148	830 414 80	IC48	DISPLAY (RED)	824 000 02
D54	1N4148	830 414 80	IC49	DISPLAY (RED)	824 000 02
D55	1N4148	830 414 80	IC5	4093BC	850 409 30
D56	1N4148	830 414 80	IC50	74LS145	857 414 50
D57	1N4148	830 414 80	IC51	BAR-GRAPH (RED)	824 000 01
D58	SD101C	830 010 10	IC52	BAR-GRAPH (RED)	824 000 01
D6	1N4148	830 414 80	IC53	74LS145	857 414 50
D7	1N4148	830 414 80	IC54	BAR-GRAPH (RED)	824 000 01
D8	1N4148	830 414 80	IC55	BAR-GRAPH (RED)	824 000 01
D9	1N4148	830 414 80	IC56	74HCT27	850 742 71
IC1	74HC42	850 744 21	IC6	CD4066BC	850 406 60
IC10	74HC373	857 437 31	IC7	6803	850 680 30
IC11	74H138	857 413 81	IC8	1488P	850 148 80
IC12	74LS08	850 740 80	IC9	1489P	850 148 90
IC13	74LS132	857 413 21	JPI	consisting of PLUG and SOCKET	750 000 45
IC14	TMS27256-45 (XX denotes program version number)	383 65X X1			750 000 31

PARTS LIST FOR CONTROL BOARD 600 VERSION B2

PARTS LIST FOR CONTROL BOARD 600 VERSION B2

JP2	consisting of PLUG and SOCKET	750 000 45 750 000 31	Q61 Q62 Q63 Q64 Q65 Q7 Q8 Q9	BC337-40 BC337-40 BC337-40 BC337-40 BC337-40 BC327 BC327 BC327	840 033 70 840 033 70 840 033 70 840 033 70 840 033 70 840 032 70 840 032 70 840 032 70
L1	22 uH	740 122 00			
L2	25 uH	740 125 00			
L3	22 uH	740 122 00			
PL1	18 Pol.	751 001 25			
Q1	BC327	840 032 70	R10	22 kohm	5%
Q10	BC327	840 032 70	R100	390 ohm	5%
Q11	BC327	840 032 70	R101	390 ohm	5%
Q12	BC327	840 032 70	R102	390 ohm	5%
Q13	BC327	840 032 70	R103	390 ohm	5%
Q14	BC327	840 032 70	R104	390 ohm	5%
Q15	BC327	840 032 70	R105	390 ohm	5%
Q16	BC327	840 032 70	R106	390 ohm	5%
Q17	BC327	840 032 70	R107	390 ohm	5%
Q18	BC327	840 032 70	R108	390 ohm	5%
Q19	BC327	840 032 70	R109	390 ohm	5%
Q2	BF240	840 024 00	R11	470 kohm	5%
Q20	BC327	840 032 70	R110	390 ohm	5%
Q21	BC327	840 032 70	R111	390 ohm	5%
Q22	BC327	840 032 70	R112	390 ohm	5%
Q23	BC327	840 032 70	R113	390 ohm	5%
Q24	BC327	840 032 70	R114	390 ohm	5%
Q25	BC327	840 032 70	R115	390 ohm	5%
Q26	BC327	840 032 70	R116	22 ohm	5%
Q27	BC327	840 032 70	R117	22 ohm	5%
Q28	BC327	840 032 70	R118	22 ohm	5%
Q29	BC327	840 032 70	R119	22 ohm	5%
Q3	BF240	840 024 00	R12	15 kohm	5%
Q30	BC327	840 032 70	R120	22 ohm	5%
Q31	BC327	840 032 70	R121	22 ohm	5%
Q32	BC327	840 032 70	R122	22 ohm	5%
Q33	BC327	840 032 70	R123	22 ohm	5%
Q34	BC327	840 032 70	R125	330 ohm	5%
Q35	BC327	840 032 70	R126	330 ohm	5%
Q36	BC327	840 032 70	R13	56 kohm	5%
Q37	BC327	840 032 70	R14	12 kohm	5%
Q4	BF240	840 024 00	R15	56 kohm	5%
Q5	BF240	840 024 00	R16	15 kohm	5%
Q50	BC337-40	840 033 70	R17	10 kohm	5%
Q51	BC337-40	840 033 70	R18	10 kohm	5%
Q52	BC337-40	840 033 70	R19	10 kohm	5%
Q53	BC337-40	840 033 70	R2	680 ohm	5%
Q54	BC337-40	840 033 70	R20	10 kohm	5%
Q55	BC337-40	840 033 70	R21	10 kohm	5%
Q56	BC337-40	840 033 70	R22	1 kohm	5%
Q57	BC337-40	840 033 70	R23	3.3 kohm	5%
Q58	BC337-40	840 033 70	R24	100 ohm	5%
Q59	BC337-40	840 033 70	R25	330 ohm	5%
Q6	BC327	840 032 70	R26	6.8 kohm	5%
Q60	BC337-40	840 033 70	R27	220 ohm	5%

PARTS LIST FOR CONTROL BOARD 600 VERSION B2

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R28	3.9 kohm	5%	1/8W	MF	500 339 00	R82	150 ohm	5%	1/8W	MF	500 215 00
R29	820 ohm	5%	1/8W	MF	500 282 00	R83	150 ohm	5%	1/8W	MF	500 215 00
R3	10 kohm	5%	1/8W	MF	500 410 00	R84	150 ohm	5%	1/8W	MF	500 215 00
R30	10 kohm	5%	1/8W	MF	500 410 00	R85	150 ohm	5%	1/8W	MF	500 215 00
R31	3.3 kohm	5%	1/8W	MF	500 333 00	R86	150 ohm	5%	1/8W	MF	500 215 00
R32	3.3 kohm	5%	1/8W	MF	500 333 00	R87	150 ohm	5%	1/8W	MF	500 215 00
R33	10 kohm	5%	1/8W	MF	500 410 00	R88	150 ohm	5%	1/8W	MF	500 215 00
R34	220 ohm	5%	1/8W	MF	500 222 00	R89	150 ohm	5%	1/8W	MF	500 215 00
R35	1 kohm	5%	1/8W	MF	500 310 00	R9	68 ohm	5%	1/8W	MF	500 168 00
R36	10 kohm	5%	1/8W	MF	500 410 00	R90	150 ohm	5%	1/8W	MF	500 215 00
R37	1 kohm	5%	1/8W	MF	500 310 00	R91	150 ohm	5%	1/8W	MF	500 215 00
R38	4.7 kohm	5%	1/8W	MF	500 347 00	R92	10 kohm	5%	1/8W	MF	500 410 00
R4	2.7 kohm	5%	1/8W	MF	500 327 00	R93	9x1 kohm	SIL.		SIL.	530 000 10
R40	10 kohm	5%	1/8W	MF	500 410 00	R94	9x1 kohm	SIL.		SIL.	530 000 10
R41	4.7 kohm	5%	1/8W	MF	500 347 00	R95	9x1 kohm	SIL.		SIL.	530 000 10
R42	470 kohm	5%	1/8W	MF	500 547 00	R96	9x12 kohm	SIL.		SIL.	530 000 09
R43	12 kohm	5%	1/8W	MF	500 412 00	R97	220 kohm	Car.	1/8W	500 522 00	
R44	10 Mohm	5%	1/4W	Car.	501 710 00	R98	2.2 kohm	MF	1/8W	500 322 00	
R45	12 kohm	5%	1/8W	MF	500 412 00	R99	9x12 kohm	SIL.		530 000 09	
R5	100 ohm	5%	1/8W	MF	500 210 00						
R51	47 kohm	5%	1/8W	MF	500 447 00	X1	4MHz	CRYSTAL		812 000 00	
R52	33 ohm	5%	1/8W	MF	500 133 00	X2	32.768KHz	CRYSTAL		812 000 01	
R53	33 ohm	5%	1/8W	MF	500 133 00						
R54	33 ohm	5%	1/8W	MF	500 133 00						
R55	33 ohm	5%	1/8W	MF	500 133 00						
R56	33 ohm	5%	1/8W	MF	500 133 00						
R57	33 ohm	5%	1/8W	MF	500 133 00						
R58	33 ohm	5%	1/8W	MF	500 133 00						
R59	33 ohm	5%	1/8W	MF	500 133 00						
R6	2.2 kohm	5%	1/8W	MF	500 322 00						
R60	150 ohm	5%	1/8W	MF	500 215 00						
R61	150 ohm	5%	1/8W	MF	500 215 00						
R62	150 ohm	5%	1/8W	MF	500 215 00						
R63	150 ohm	5%	1/8W	MF	500 215 00						
R64	150 ohm	5%	1/8W	MF	500 215 00						
R65	150 ohm	5%	1/8W	MF	500 215 00						
R66	150 ohm	5%	1/8W	MF	500 215 00						
R67	150 ohm	5%	1/8W	MF	500 215 00						
R68	150 ohm	5%	1/8W	MF	500 215 00						
R69	150 ohm	5%	1/8W	MF	500 215 00						
R7	47 kohm	5%	1/8W	MF	500 447 00						
R70	150 ohm	5%	1/8W	MF	500 215 00						
R71	150 ohm	5%	1/8W	MF	500 215 00						
R72	150 ohm	5%	1/8W	MF	500 215 00						
R73	150 ohm	5%	1/8W	MF	500 215 00						
R74	150 ohm	5%	1/8W	MF	500 215 00						
R75	150 ohm	5%	1/8W	MF	500 215 00						
R76	150 ohm	5%	1/8W	MF	500 215 00						
R77	150 ohm	5%	1/8W	MF	500 215 00						
R78	150 ohm	5%	1/8W	MF	500 215 00						
R79	150 ohm	5%	1/8W	MF	500 215 00						
R8	47 kohm	5%	1/8W	MF	500 447 00						
R80	150 ohm	5%	1/8W	MF	500 215 00						
R81	150 ohm	5%	1/8W	MF	500 215 00						