

TECHNICAL DESCRIPTION

PCB 612/613/614 MASTER OSCILLATOR

The three Master Oscillators all consist of the same circuits but have different frequency stabilities determined by the 10.24 MHz Temperature Compensated Crystal Oscillator (TCXO) used. The output signal of the TCXO is split between two reference dividers. One for the 45-75 MHz Synthesizer and one for the 43.6 and 1.4 MHz Synthesizers. The Reference Divider, 45-75 MHz Synthesizer, divides the 10.24 MHz TCXO signal by 250 having a 40.96 kHz reference frequency at two outputs.

The Reference Divider, 43.6 and 1.4 MHz Synthesizer, divides the 10.24 MHz TCXO signal by 8, obtaining a 1.28 MHz signal fed to two outputs. The output signals of the divider are fed to the Check Detector to detect the presence of both. The resulting check signal MO-Check is via the Synthesizer Board 611 fed to the Transceiver Control Board 624.

For Master Oscillator 613 a heater (TCXO Heater 699) is incorporated in order to keep the TCXO ambient temperature above 0 deg. Celcius.

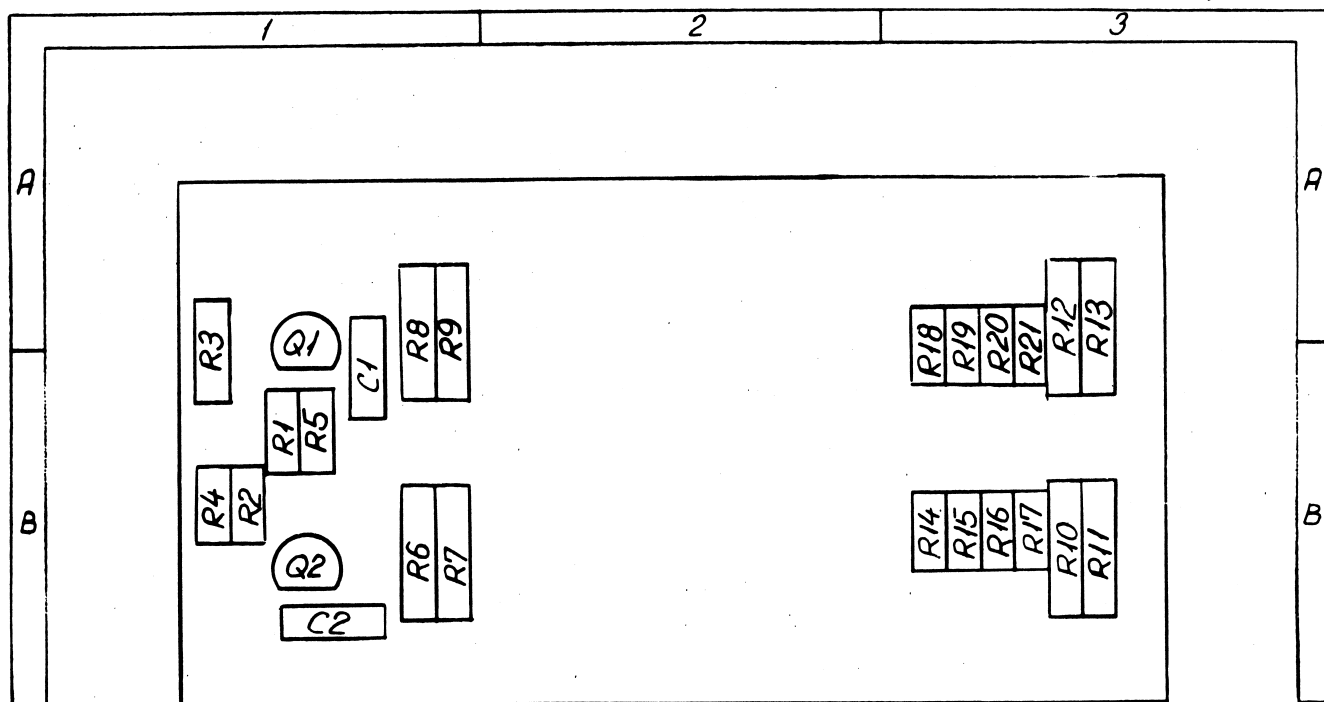
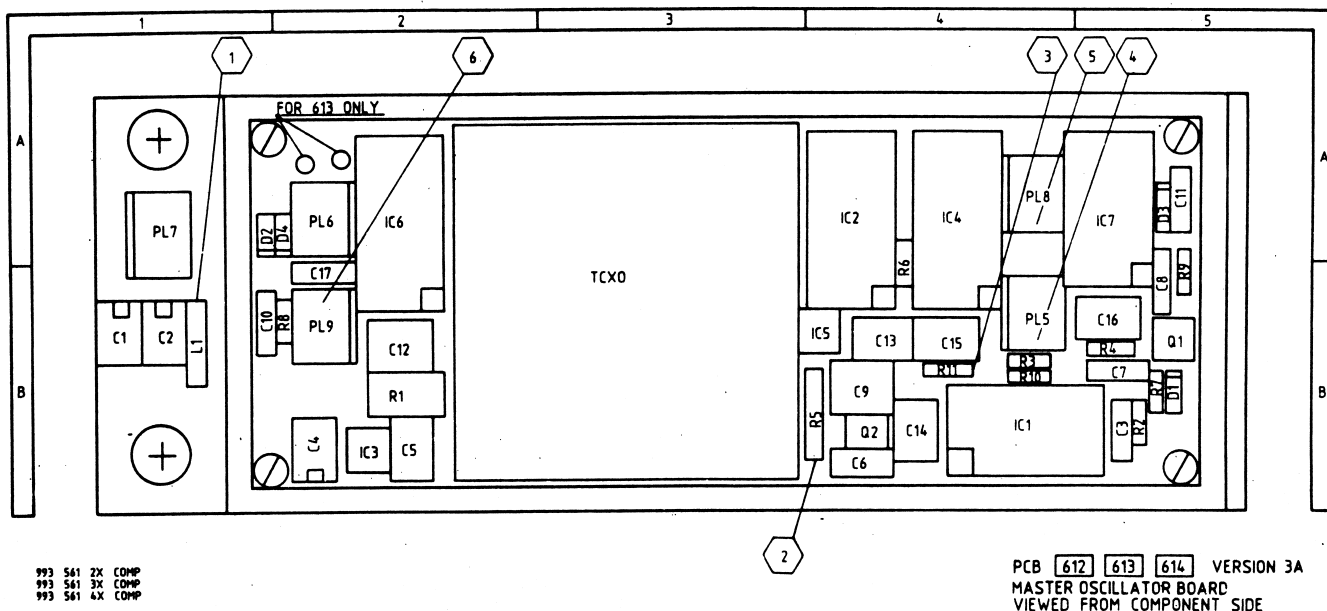
PCB 615/616 MASTER OSCILLATOR

Master Oscillator 615 and 616 produces enhanced frequency stabilities of $\pm 0.35\text{ppm}$ and $\pm 0.1\text{ppm}$ respectively. A highly stable oven controlled crystal oscillator (PCB 608 or PCB 609) is mounted in a shielding box on top of the Master Oscillator board. On Master Oscillator 615, PCB 608 is mounted and on 616, PCB 609 is mounted, giving the higher stability. The crystal oscillators produces a temperature stable 20.480000MHz signal giving a total frequency stability of less than either 10Hz or 3Hz for the Transceiver.

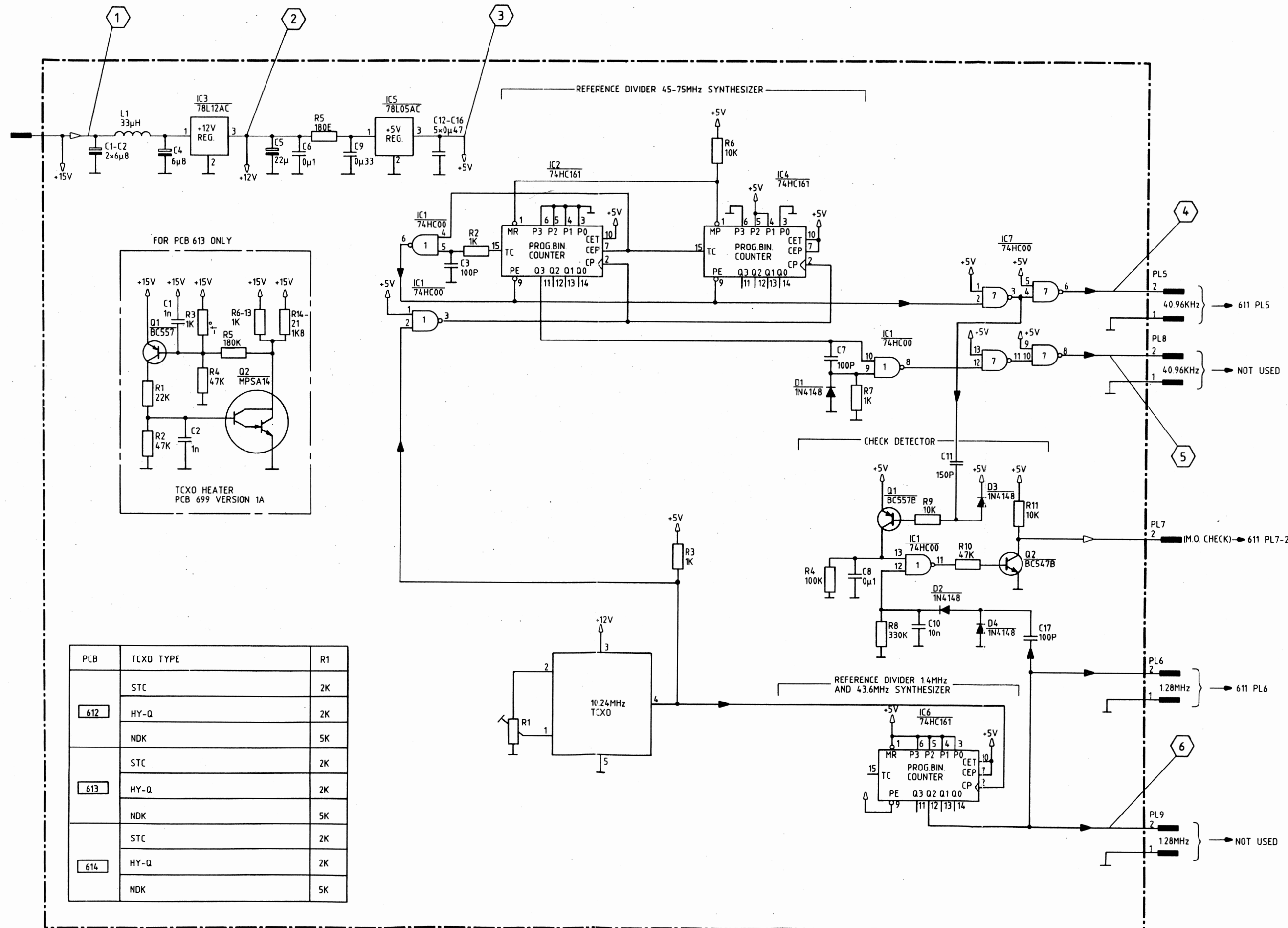
The oscillator signal is led to PCB 615/616 where it is divided by 2. This 10.24MHz signal is split between to divider chains dividing with 250 and 8 resulting in two reference frequencies of 40.96kHz and 1.28MHz respectively.

The 40.96kHz signal is led to PL5 and PL8 and is used as a reference frequency for the 45 to 75MHz synthesizer. Likewise the 1.28MHz signal is led to PL6 and PL9 and is used as reference frequencies for the 43.6MHz and the 1.4MHz synthesizer.

The output signals of the two divider chains are monitored and combined in a check detector, producing a check signal (MO-Check) which via Synthesizer Board 611 is led to the Transceiver Control Board 624. The check signal is used during self-test.



611 PL7 - 1



PCB	TCXO TYPE	R1
612	STC	2K
	HY-Q	2K
	NDK	5K
613	STC	2K
	HY-Q	2K
	NDK	5K
614	STC	2K
	HY-Q	2K
	NDK	5K

PARTS LIST FOR MASTER OSCILLATOR BOARD 612 VERSION 3A

PARTS LIST FOR MASTER OSCILLATOR BOARD 613 VERSION 3A

nted Circuit Board Complete 612		107 561 21	Printed Circuit Board Complete 613		107 561 31
IC1,7	MC74HC00N	850 740 04	IC1,7	MC74HC00N	850 740 04
IC2,4,6	MC74HC161N	857 416 10	IC2,4,6	MC74HC161N	857 416 10
IC3	LM78L12ACP	850 741 20	IC3	LM78L12ACP	850 741 20
IC5	LM78L05ACP	850 780 52	IC5	LM78L05ACP	850 780 52
Q1	BC557B	840 055 70	Q1	BC557B	840 055 70
Q2	BC547B	840 054 70	Q2	BC547B	840 054 70
D1-4	1N4148	830 414 80	D1-4	1N4148	830 414 80
R2-3,7	1 kohm	500 310 00	R2-3,7	1 kohm	500 310 00
R4	100 kohm	500 510 00	R4	100 kohm	500 510 00
R5	180 ohm	501 218 00	R5	180 ohm	501 218 00
R6,9,11	10 kohm	500 410 00	R6,9,11	10 kohm	500 410 00
R8	330 kohm	500 533 00	R8	330 kohm	500 533 00
R10	47 kohm	500 447 00	R10	47 kohm	500 447 00
C1,2,4	6.8 uF	652 668 01	C1,2,4	6.8 uF	652 668 01
C3,7,17	100 pF	602 210 00	C3,7,17	100 pF	602 210 00
C5	22 uF	652 722 00	C5	22 uF	652 722 00
C6,8	0.1 uF	622 510 00	C6,8	0.1 uF	622 510 00
C9	0.33 uF	622 533 01	C9	0.33 uF	622 533 01
C10	10 nF	602 410 01	C10	10 nF	602 410 01
C11	150 pF	602 215 00	C11	150 pF	602 215 00
C12-16	0.47 uF	622 457 01	C12-16	0.47 uF	622 457 01
L1	33 uH	740 133 01	L1	33 uH	740 133 01
TCXO	10.24 MHz	383 570 11	TCXO	10.24 MHz	383 570 21
PL5,6,8,9	2 POL	750 001 45	TCXO HEATER PCB 699		107 569 91
PL7	2 POL	750 001 46	PL5,6,8,9	2 POL	750 001 45
			PL7	2 POL	750 001 46

PARTS LIST FOR MASTER OSCILLATOR BOARD 614 VERSION 3A

PARTS LIST FOR TCXO HEATER PCB 699 VERSION 1A

Printed Circuit Board Complete 614

107 561 41

Printed Circuit Board Complete 699

107 569 91

IC1,7 MC74HC00N
IC2,4,6 MC74HC161N
IC3 LM78L12ACP
IC5 LM78L05ACP

850 740 04
857 416 10
850 741 20
850 780 52

Q1 BC557B
Q2 BC547B
D1-4 1N4148

840 055 70
840 054 70
830 414 80

R2-3,7 1 kohm
R4 100 kohm
R5 180 ohm
R6,9,11 10 kohm
R8 330 kohm
R10 47 kohm

500 310 00
500 510 00
501 218 00
500 410 00
500 533 00
500 447 00

C1,2,4 6.8 uF
C3,7,17 100 pF
C5 22 uF
C6,8 0.1 uF
C9 0.33 uF
C10 10 nF
C11 150 pF
C12-16 0.47 uF

652 668 01
602 210 00
652 722 00
622 510 00
622 533 01
602 410 01
602 215 00
622 457 01

L1 33 uH

740 133 01

TCXO (0.4 ppm) 10.24 MHz

383 570 31

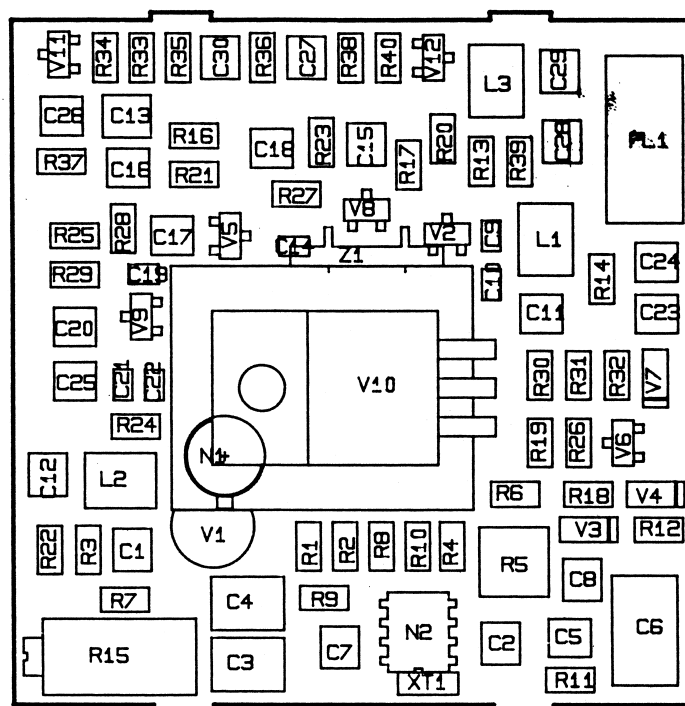
PL5,6,8,9 2 POL
PL7 2 POL

750 001 45
750 001 46

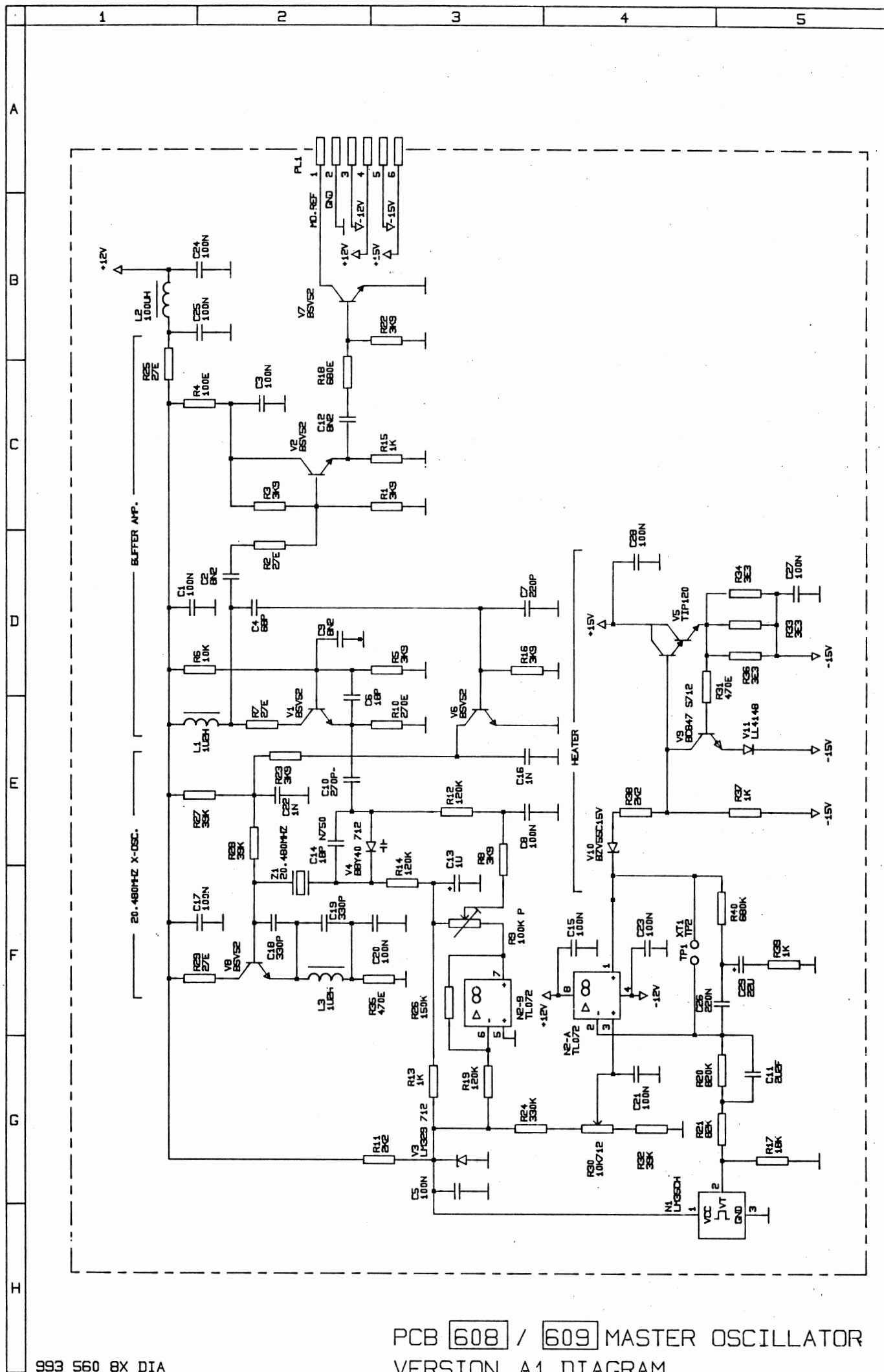
Q1 BC557B
Q2 MPSA14

R1 22 kohm 5% 1/8W MF
R2,4 47 kohm 5% 1/8W MF
R3 1 kohm +-10% NTC
R5 180 kohm 5% 1/8W MF
R6-13 1 kohm 5% 1/8W MF
R14-21 1.8 kohm 5% 1/8W MF
C1-2 1 nF 10% 100V Cer.

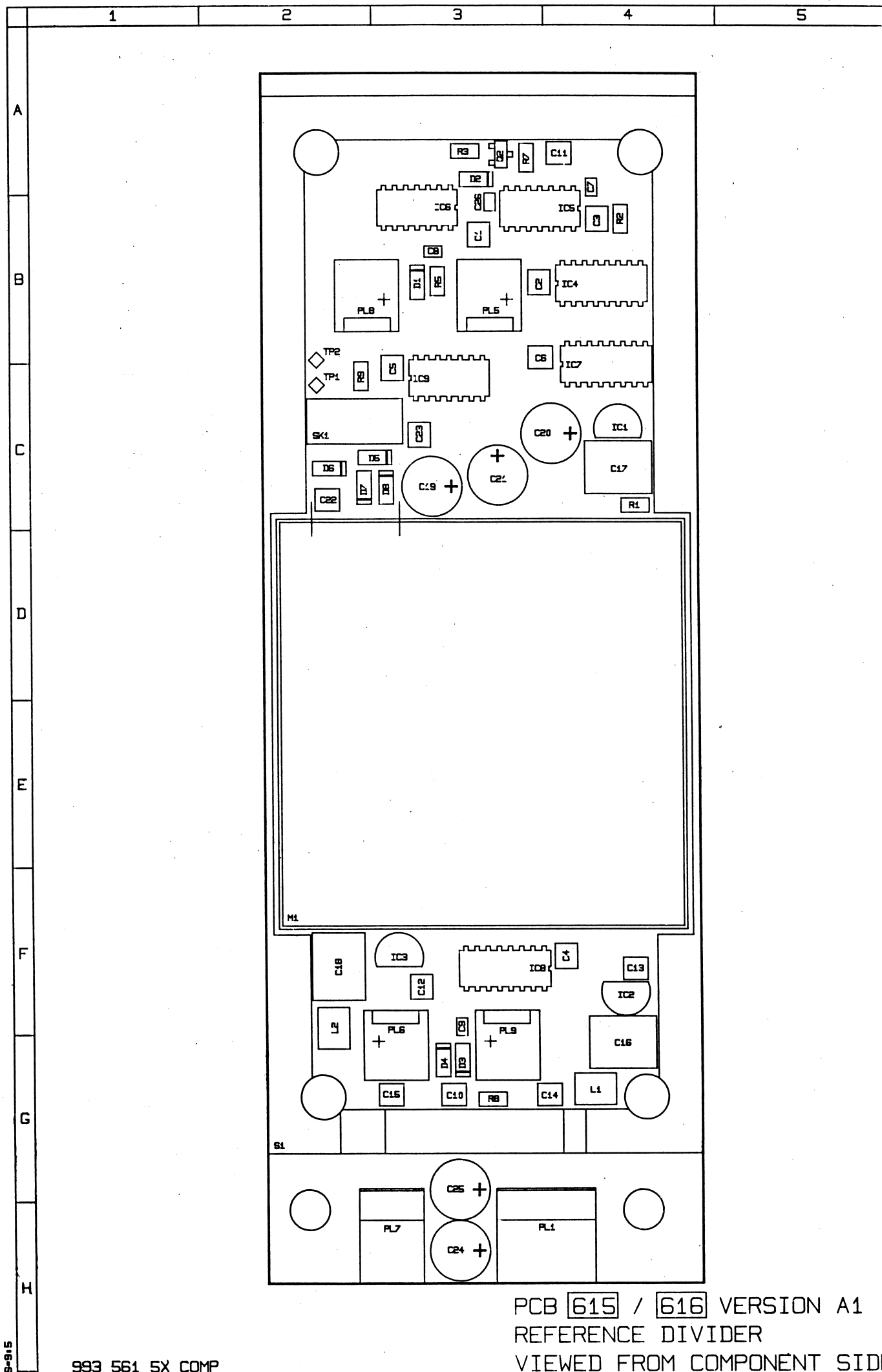
500 422 00
500 447 00
591 310 00
500 518 00
501 310 00
500 318 00
602 310 02



PCB 608 / 609 VERSION A1
 MASTER OSCILLATOR
 VIEWED FROM COMPONENT SIDE

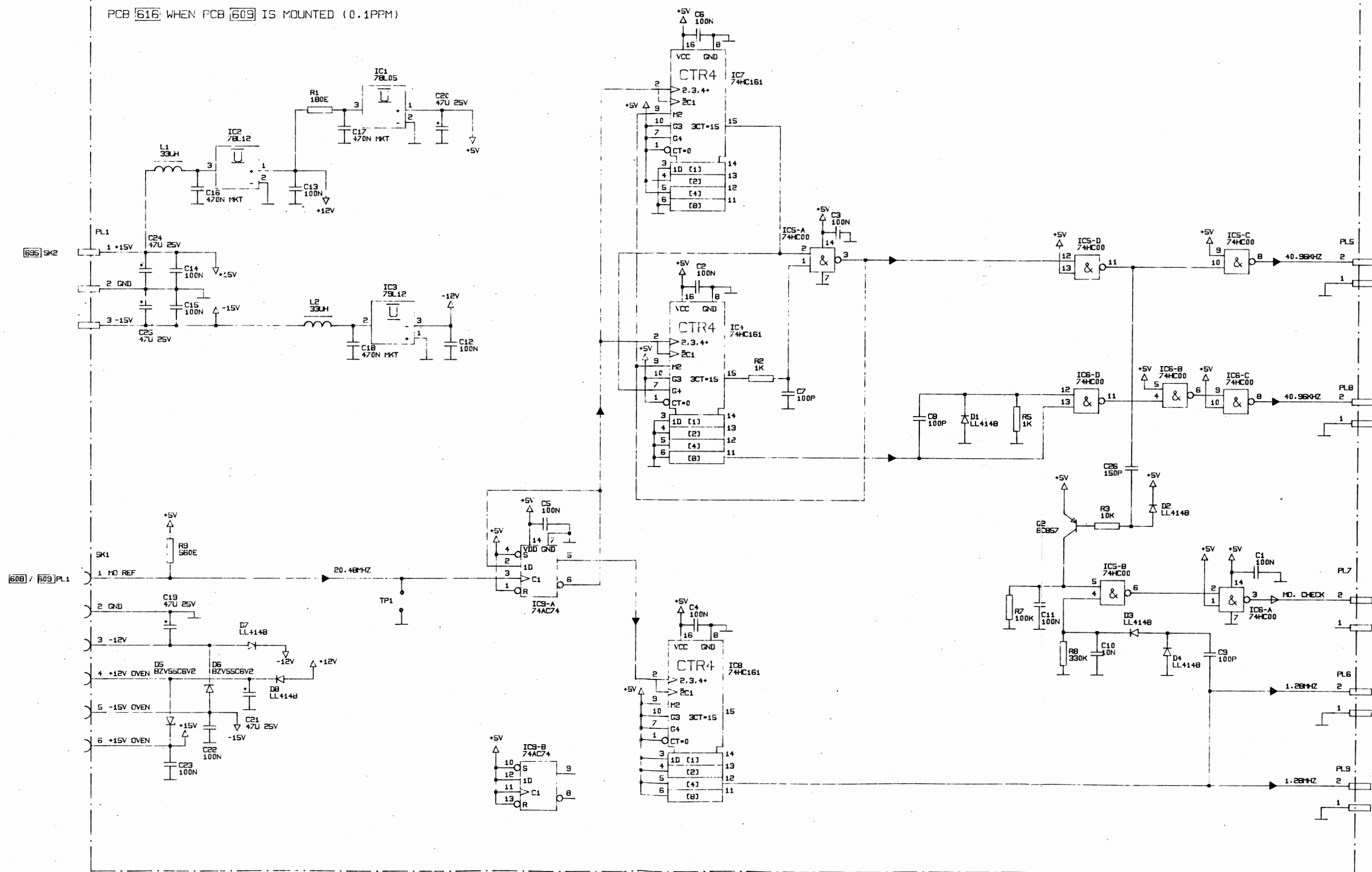


PCB 608 / 609 MASTER OSCILLATOR
VERSION A1 DIAGRAM



PCB [615] WHEN PCB [608] IS MOUNTED (0.35PPM)

PCB [616] WHEN PCB [609] IS MOUNTED (0.1PPM)



PCB [615] / [616] REFERENCE DIVIDER
VERSION A1 DIAGRAM

PARTS LIST FOR PCB 608 / 609 MASTER OSCILLATOR

57002000	SMD RESISTOR 2K2 5%	2
57004200	SMD RESISTOR 120K 5%	3
57001800	SMD RESISTOR 1K0 5%	4
57003000	SMD RESISTOR 18K 5%	1
57007300	SMD RESISTOR 680E 5%	1
57000400	SMD RESISTOR 27E 5%	4
57005900	SMD RESISTOR 820K 5%	1
57003800	SMD RESISTOR 82K 5%	1
57004400	SMD RESISTOR 330K 5%	1
57003900	SMD RESISTOR 150K 5%	1
57003400	SMD RESISTOR 39K 5%	3
57300100	POTENTIOMETER SMD 10K	1
57001500	SMD RESISTOR 470E 5%	2
57006700	SMD RESISTOR 3E3 5%	3
57001000	SMD RESISTOR 100E 5%	1
57007600	SMD RESISTOR 680K 5%	1
57002800	SMD RESISTOR 10K 5%	1
58251000	MULTITURN 100K	1
84720600	TRANS BSV52 NPN 20V SOT23	3
83730500	DIODE SOD80 BZV55C15V ZENER	1
83710000	DIODE LL4148 GEN-PUR SOD80	1
84720600	TRANS BSV52 NPN 20V SOT23	2
83003290	ZENERDIODE LM329	1
83750100	CAP. DIODE BBY40	1
84201200	DARLINGTON TRANSISTOR TIP120	1
84720000	TRANSISTOR BC847	1
38373551	CRYSTAL SPEC.20.48000MHZ	1

