

QUARTZLOCK

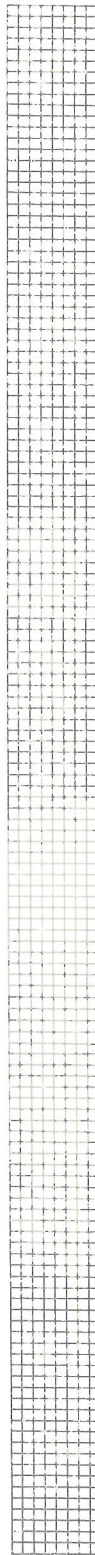
MODEL 282A

HANDBOOK VOLUME 2



QUARTZLOCK
INSTRUMENTS

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Devon TQ9 5LH
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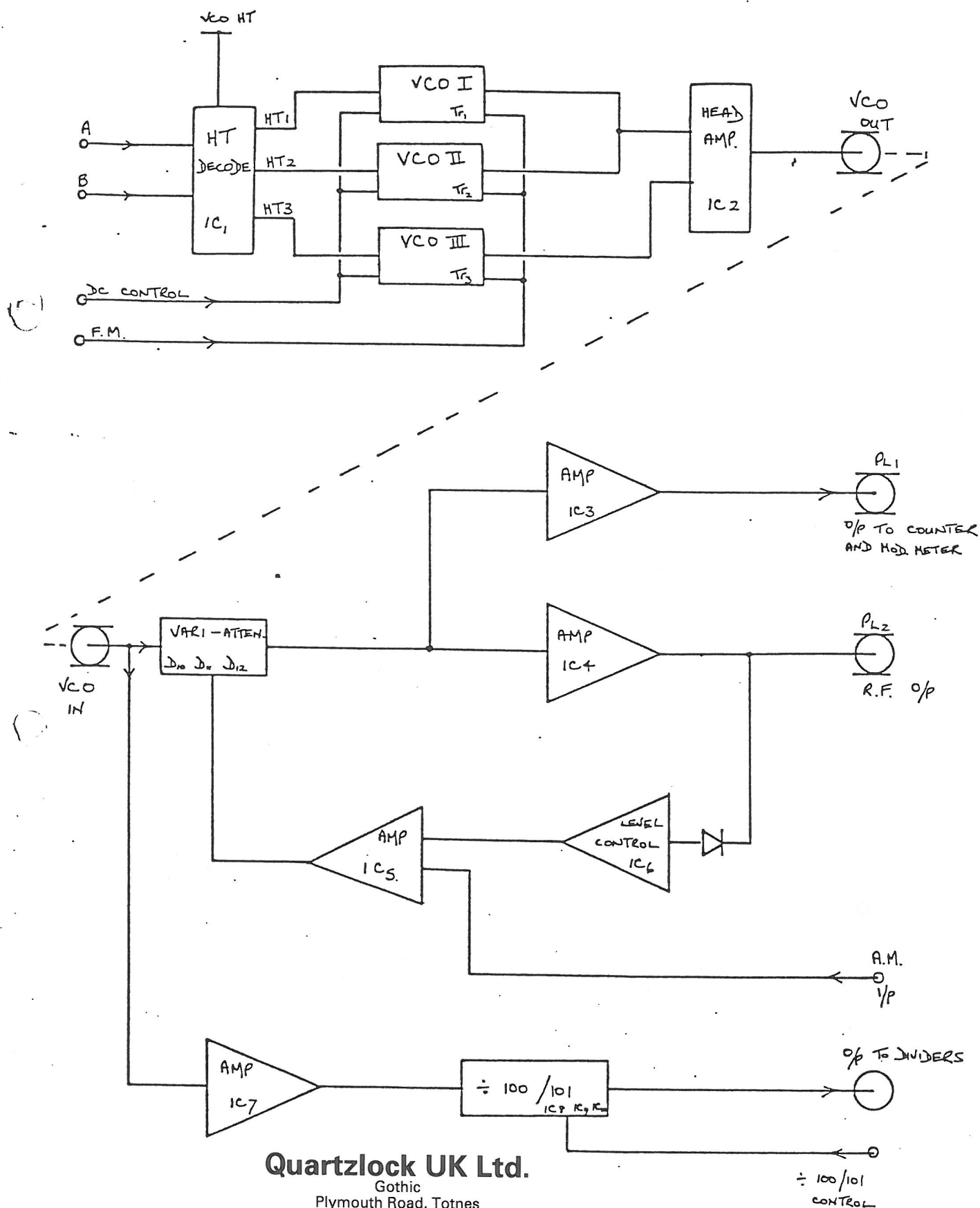
Quartzlock

QUARTZLOCK INSTRUMENTS

Group products include SYNTHESIZED SIGNAL GENERATORS · RADIOTELEPHONY TEST SYSTEMS · PROGRAMMABLE ATTENUATORS & FREQUENCY STANDARDS

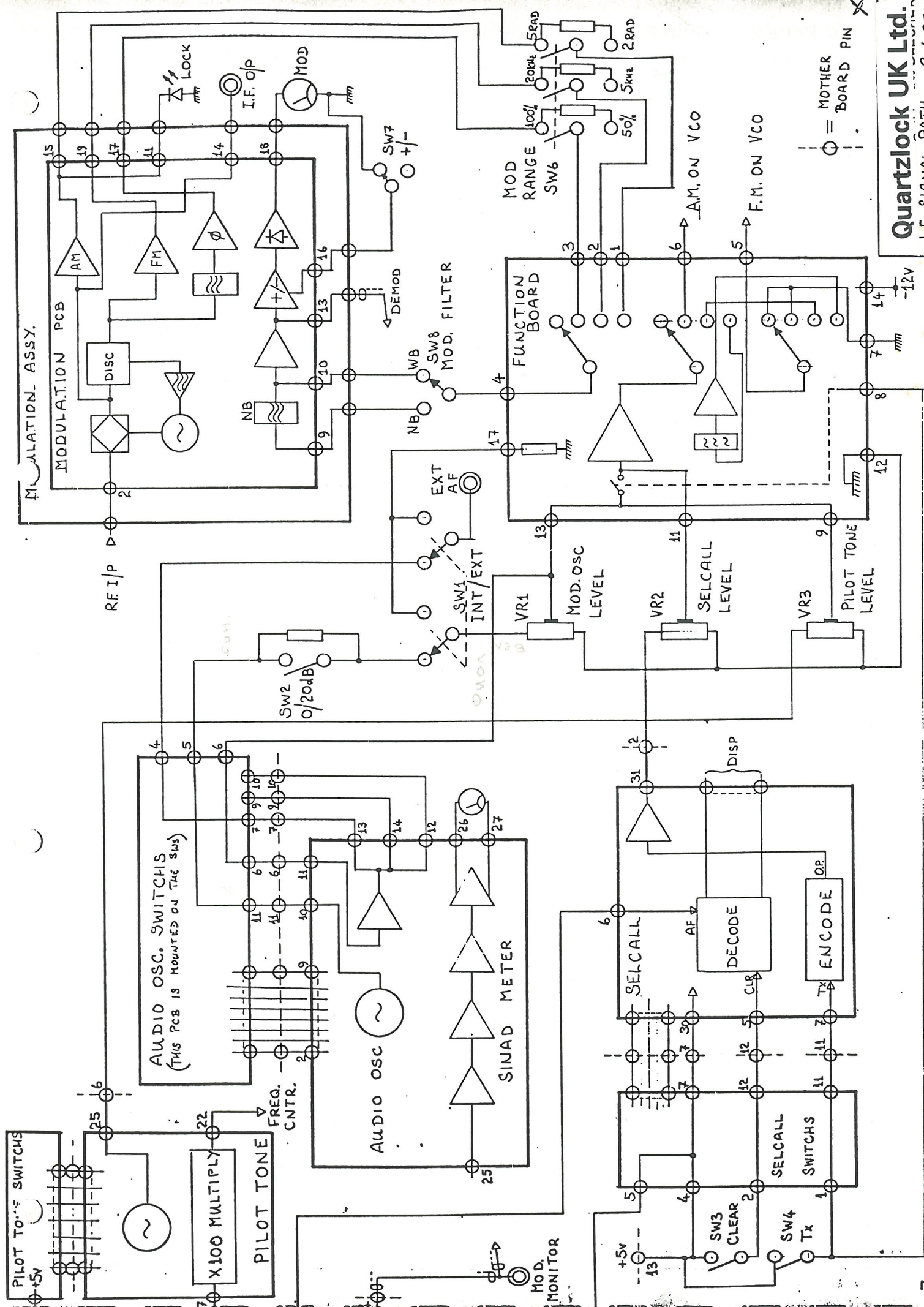


FUNCTION DIAGRAM
R.F. GENERATION
282A



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Quartzlock UK Ltd.
L.E. SIGNAL PATH 3-4-85

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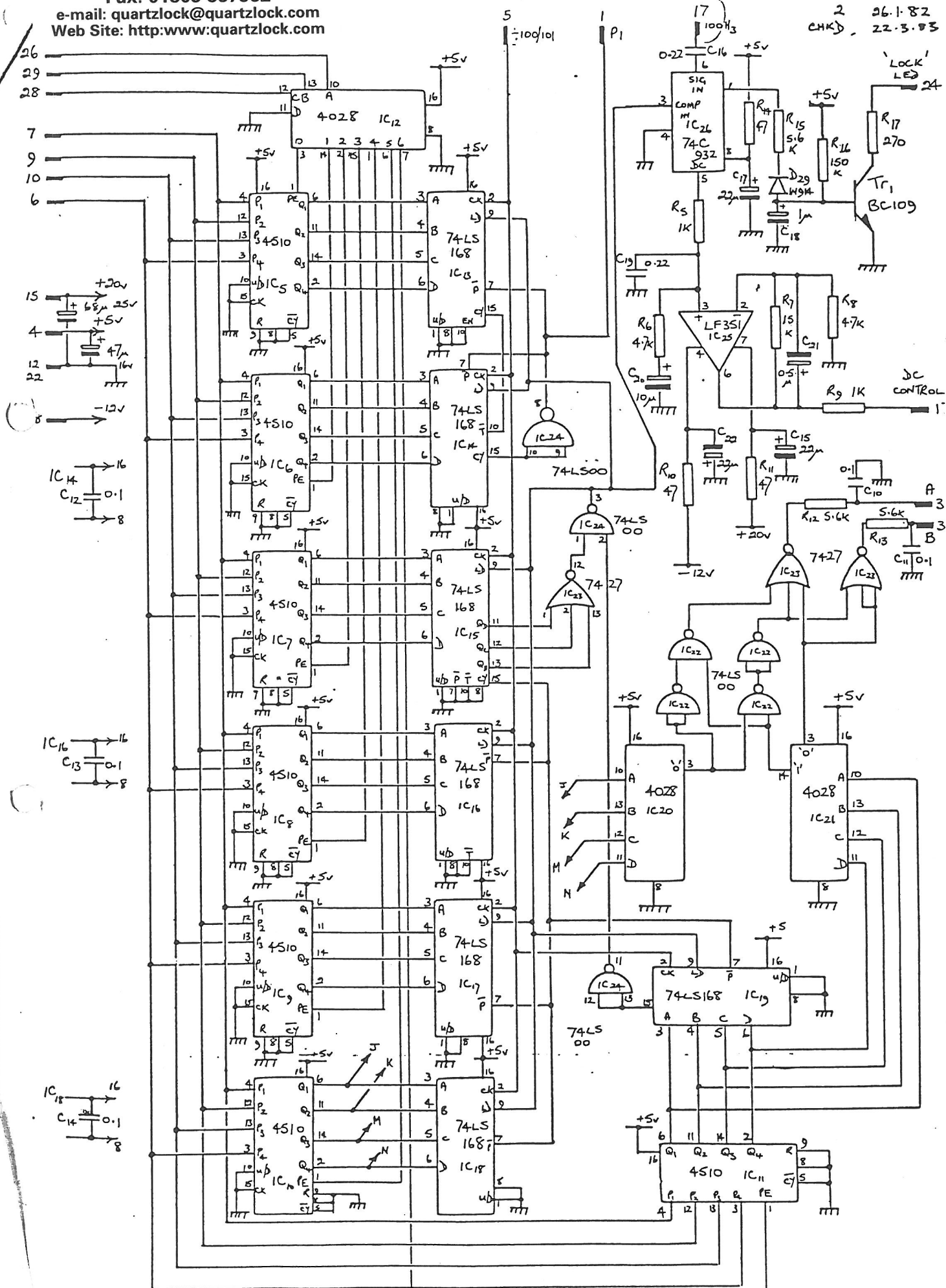
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÷ N, PHASE COMPARATOR
282 A
ISSUE 1 1.8.81
2 26.1.82
CHKD, 22.3.83



Selcall Board Unit 07

Part No.	Description	Qty	Location	Manufactu
01-040	47R * 7 Thick Film Package	1	R4-10	
01-295	82k .3W 5% Metal Film	4	R13-16	Mullard
01-300	100k .3W 5% Metal Film	1	R18	Mullard
01-325	220k .3W 5% Metal Film	1	R19	Mullard
01-330	330k .3W 5% Metal Film	1	R20	Mullard
01-345	560k .3W 5% Metal Film	1	R11	Mullard
01-350	1M .3W 5% Metal Film	5	R1-3,12,17	Mullard
02-050	47p Ceramic 100V	3	C2-4	Mullard
02-105	10n Ceramic 63V	5	C1,5-7,10	Mullard
02-160	10mF Tantalum 16V	1	C8	ITT
02-180	22mF Tantalum 16V	1	C9	ITT
02-235	5-56p Variable	1	CV1	
05-020	4013 Flip Flop	1	IC8	
05-030	4022 Divide 8	1	IC7	
05-140	7407 Buffer/Driver	2	IC4,5	
05-150	741 8 Pin Op Amp	1	IC9	
05-320	FX003 Tone Decoder	1	IC1	CML
05-330	FX323 Display Driver	1	IC2	CML
05-340	FX503C Tone Decoder	1	IC6	CML
05-370	HEF4515 Latch/Decoder	1	IC3	
07-050	560kHz Resonator	1	X1	CML
08-010	8 pin IC Socket	1	IC9	BICC
08-020	14 pin IC Socket	3		BICC
08-030	16 pin IC Socket	2		BICC
08-040	16 pin IC Socket (wide)	1	IC1	BICC
08-050	24 pin IC Socket	1	IC2	BICC
08-060	28 pin IC Socket	1	IC3	BICC
08-230	32 way PCB Connector	1	SK1	Varelco

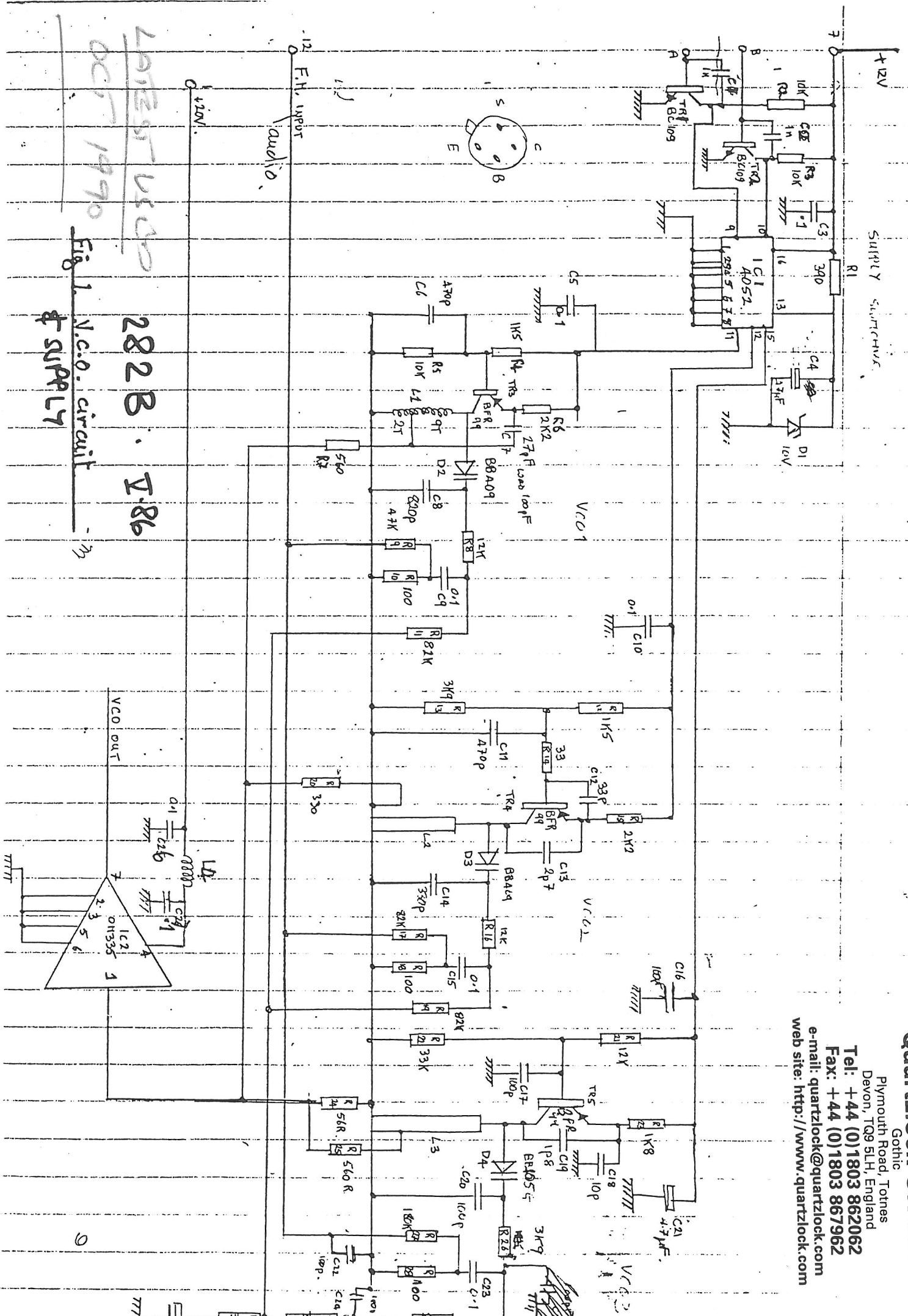
Audio & SINAD Board

Unit 08

Part No.	Description	Qty	Location	Manufacturer
01-055	56R .3W 5% Metal Film	2	R5,6	Mullard
01-065	82R .3W 5% Metal Film	2	R11,12	Mullard
01-085	150R .3W 5% Metal Film	1	R2	Mullard
01-130	470R .3W 5% Metal Film	2	R44,52	Mullard
01-132	510R .4W 2% Metal Film	1	R14	Mullard
01-135	560R .3W 5% Metal Film	2	R10,13	Mullard
01-152	750R .5W 0.5% Metal Film	2	R17,18	Holsworthy
01-165	1k .3W 5% Metal Film	2	R81,82	Mullard
01-172	1k5 .5W 0.5% Metal Film	2	R15,16	Holsworthy
01-175	1k5 .3W 5% Metal Film	1	R50	Mullard
01-195	2k7 .3W 5% Metal Film	1	R73	Mullard
01-197	3k02 .5W 0.5% Metal Film	2	R21,22	Holsworthy
01-200	3k3 .3W 5% Metal Film	2	R42,63	Mullard
01-202	3k9 .3W 5% Metal Film	1	R8	Mullard
01-205	4k7 .3W 5% Metal Film	1	R69	Mullard
01-210	5k6 .3W 5% Metal Film	2	R4,60	Mullard
01-212	6k04 .5W 0.5% Metal Film	2	R19,20	Holsworthy
01-217	7k5 .5W 0.5% Metal Film	2	R25,26	Holsworthy
01-235	10k .3W 5% Metal Film	13	R7,9,47,51,56-58, 61,67,68,79,80,83	Mullard
01-243	15k .5W 0.5% Metal Film	2	R23,24	Holsworthy
01-255	22k .3W 5% Metal Film	2	R1,43	Mullard
01-260	24k .4W 2% Metal Film	1	R74	Mullard
01-265	27k .3W 5% Metal Film	2	R3,75	Mullard
01-272	30k1 .5W 0.5% Metal Film	2	R29,30	Holsworthy
01-280	47k .3W 5% Metal Film	4	R62,70-72	Mullard
01-285	56k .3W 5% Metal Film	2	R64,66	Mullard
01-287	61k9 .5W 0.5% Metal Film	2	R27,28	Holsworthy
01-300	100k .3W 5% Metal Film	7	R45,46,48,49,53,55, 77	Mullard
01-310	120k .3W 5% Metal Film	1	R59	Mullard
01-320	180k .3W 5% Metal Film	1	R65	Mullard
01-325	220k .3W 5% Metal Film	2	R76,78	Mullard
01-340	470k .3W 5% Metal Film	1	R41	Mullard
01-352	1M2 .25W 5% Metal Glaze	1	R54	Mullard
01-390	10k Cermet Vertical	3	RV1-3	Bourns
02-055	56pF Ceramic 100V	1	C3	Mullard
02-065	100pF Ceramic 100V	1	C13	Mullard
02-085	1nF Ceramic 100V	1	C2	Mullard
02-097	4.7nF Polyester 63V	2	C28,29	Wima
02-105	10nF Ceramic 63V	2	C24,37	Mullard
02-107	22nF Ceramic 63V	2	C7,10	Mullard
02-110	0.022uF Polyester 63V	2	C8,9	Wima
02-120	0.1uF Ceramic 50V	1	C21	Unitrode
02-125	0.22uF Polyester 63V	1	C26	Siemens
02-135	1uF Tantalum 35V	2	C27,32	ITT
02-147	2.2uF Tantalum 35V	1	C23	ITT
02-150	3.3uF Tantalum 25V	1	C30	ITT
02-165	10uF Tantalum 25V	1	C15	ITT
02-180	22uF Tantalum 16V	6	C4,5,11,12,22,31	ITT
02-188	47uF Tantalum 10V	1	C1	ITT
02-195	68uF Tantalum 25V	1	C36	ITT
03-010	1N4148 General Purpose Diode	16	D1-8,11-18	
04-040	2N3972 <i>NET</i>	2	TR4,5	
04-070	BC548 General Purpose NPN <i>NET</i>	2	TR1,2	Mullard
04-080	BCY70 Small Signal Transistor <i>NET</i>	1	TR3	

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282B VCO

282B VCO

Fig. 1. V.C.O. circuit

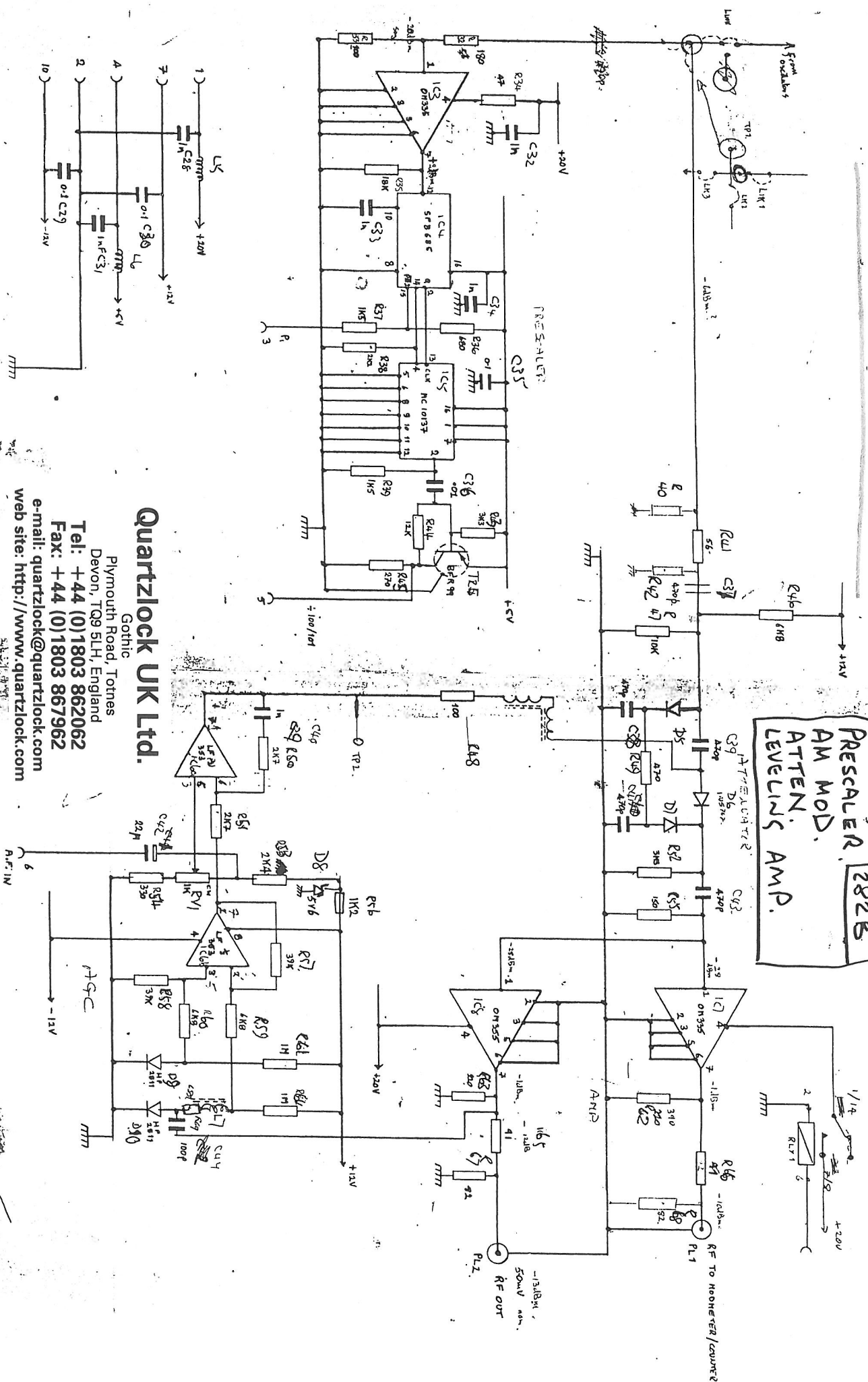
282B VCO

282B VCO

LATEST USED OCT 1990

I.86

PRESALER
AM MOD.
ATTEN.
LEVELING AMP.



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NEW OSCILLATOR (M2) 500K

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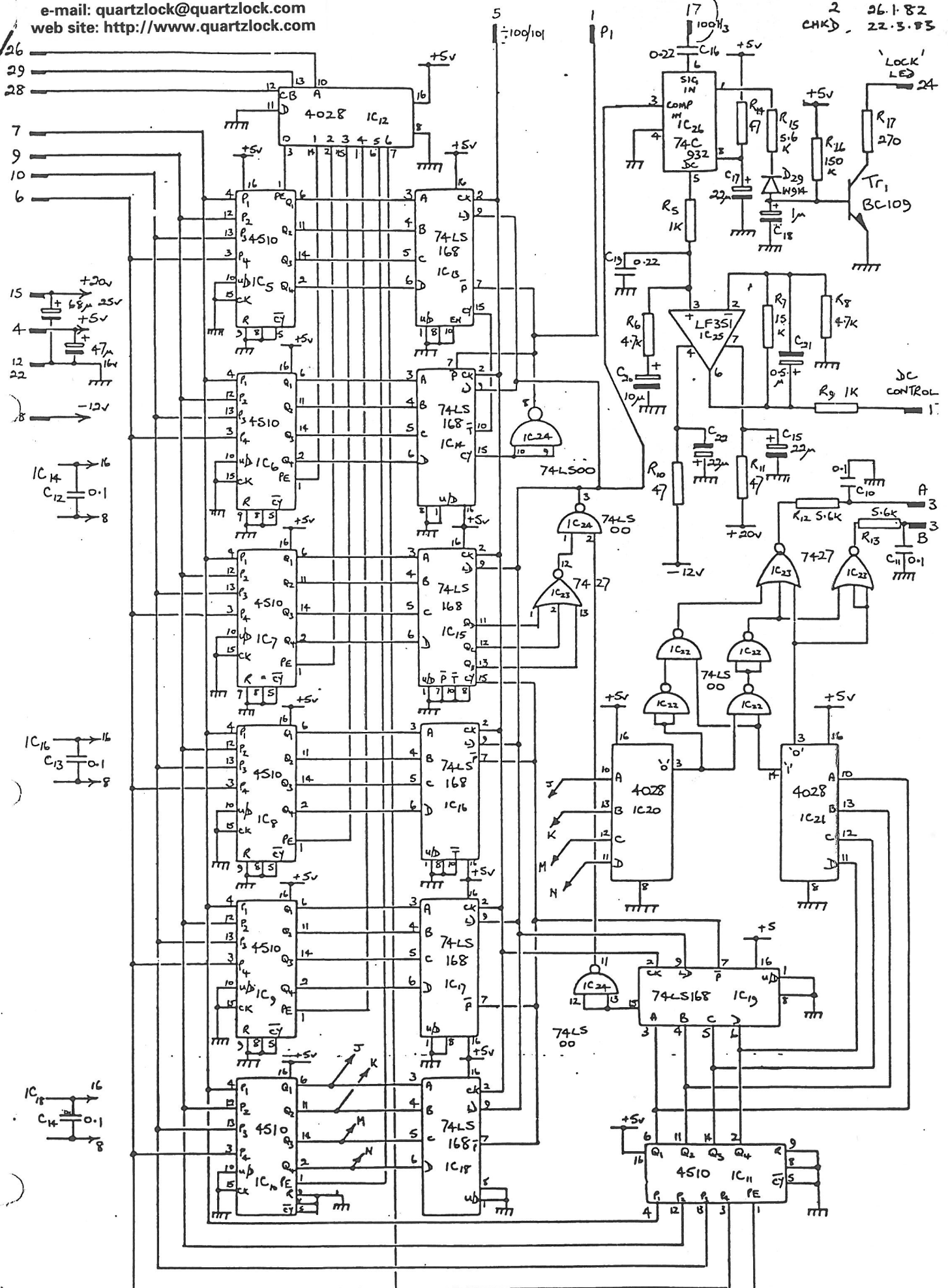
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26.1.82

CHKD 22.3.83



03-130	BZY88 6V2 Zener Diode	1	D1	
04-070	BC548 General Purpose NPN	2	TR4,5	ITT
04-100	BFR99 RF Transistor	4	TR1-3,6	Mullard
05-070	4052 Multiplexer	1	IC1	Motorola
05-120	709 8 Pin Op Amp	1	IC5	
05-150	741 8 Pin Op Amp	1	IC6	
05-430	MC10137 Counter	1	IC9	
05-450	OM335 RF Monolithic Amplifier	4	IC2-4,7	Mullard
05-470	SP8685 Divide by 10/11	1	IC8	Plessey
07-060	FX1115 + 1.5 turns	4	CH2-5	
07-090	Miniature Co-ax (mm)	310		
07-100	Printed Circuit Board Pins	25		
07-130	Tinned Copper Wire 18swg (mm)	150	L3	
07-150	UT141A Semi Rigid Co-ax (mm)	140	L1,2	
08-010	8 pin IC Socket	2	IC5,6	BICC
08-030	16 pin IC Socket	2	IC1,9	BICC
08-300	14 pin Latching DIL Socket	1	SK1	
08-400	4mm Through Terminals	2	TM1,2	
08-265	SMA Free Plug	2	PL1,2	Johnson

Pre-Scaler Board

Unit 03b

Part No.	Description	Qty	Location	Manufacturer
01-075	100R .3W 5% Metal Film	2	R4,16	Mullard
01-085	150R .3W 5% Metal Film	1	R12	Mullard
01-135	560R .3W 5% Metal Film	8	R2,3,5-7,9,15,17	Mullard
01-165	1k .3W 5% Metal Film	1	R18	Mullard
01-185	2k2 .3W 5% Metal Film	1	R8	Mullard
01-195	2k7 .3W 5% Metal Film	1	R10	Mullard
01-235	10k .3W 5% Metal Film	2	R1,13	Mullard
01-245	15k .3W 5% Metal Film	1	R11	Mullard
01-320	180k .3W 5% Metal Film	1	R14	Mullard
02-065	100pF Ceramic 100V	1	C9	Mullard
02-075	470pF Ceramic 100V	1	C19	Mullard
02-100	4.7nF Ceramic 100V	4	C11-14	Mullard
02-120	0.1uF Ceramic 50V	8	C2-8,15	Unitrode
02-180	22uF Tantalum 16V	5	C1,10,16-18	ITT
03-120	BZY88 5V6 Zener Diode	1	D1	ITT
05-410	MC10116P Receiver	1	IC4	
05-420	MC10125P Translator	1	IC3	
05-450	OM335 RF Monolithic Amplifier	1	IC1	Mullard
05-460	SP8630B 600MHz Divide by 10	1	IC2	Plessey
07-040	4057/500HR + 20 turns 30swg	3	L-3	Neosid
07-100	Printed Circuit Board Pins	18		

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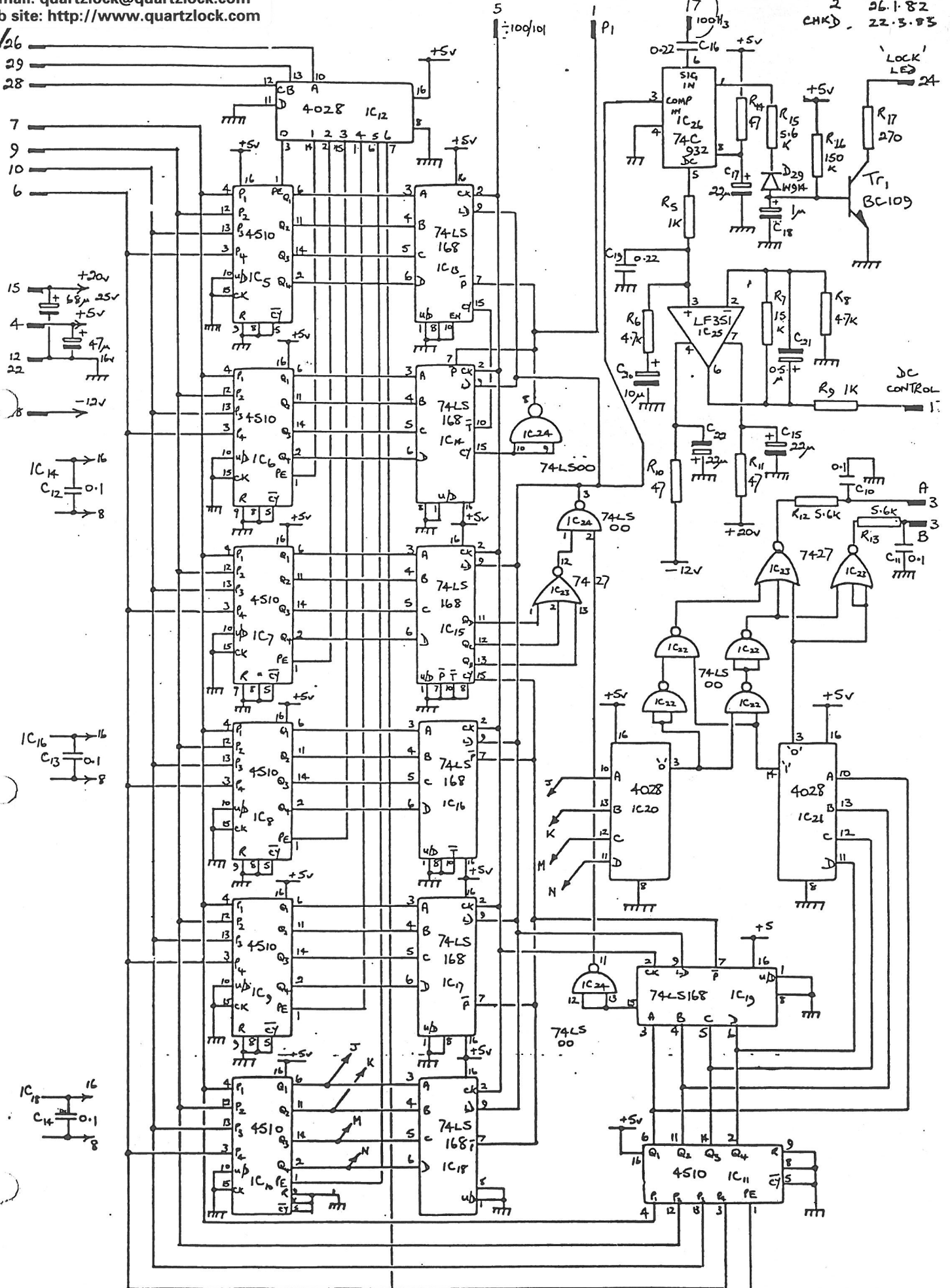
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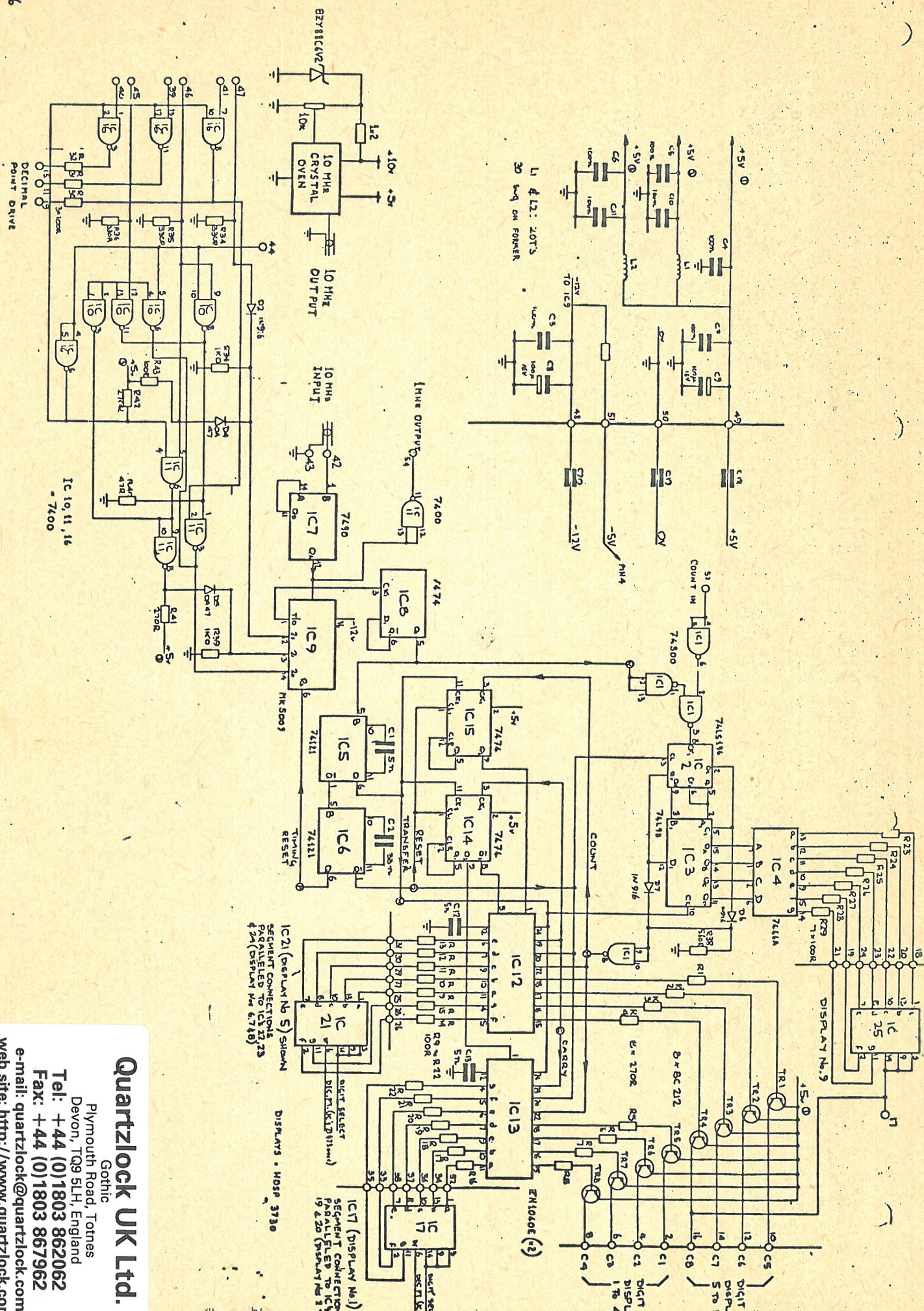


Fig 16

N	MILITATION	CHECKDOWN		

RT. TEST SET
500 MHz FREQUENCY METER CIRCUIT DIAGRAM

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Power Supply Board Unit 04

Part No.	Description	Qty	Location	Manufactu
01-005	6R8 6W Wirewound	1	[R3]	
01-095	180R 6W Wirewound	1	[R4]	
01-385	10k Cermet Vertical	2	R1,2	
02-135	1uF Tantalum 35V	10	C1-10	ITT
02-215	2200uF Electrolytic 40V, Axial	4	C12-15	
02-220	6800uF Electrolytic 25V, Radial	1	C11	Philips
03-030	1N5401 3A Rectifier	2	D1,2	
03-070	200V 2A Bridge Rectifier	2	D3,4	
03-080	200V 6A Diode	1	[D5]	
04-120	TIP33A Power Transistor NPN	2	[TR1,2]	
05-270	7812 +12V Regulator	1	IC2	
05-280	7815 +15V Regulator	1	IC4	
05-290	7912 -12V Regulator	1	IC3	
05-300	7915 -15V Regulator	1	IC5	
05-390	LM309K 5V Regulator	1	IC1	
07-100	Printed Circuit Board Pins	20		
08-220	32 way PCB Connector	1	SK1	Varelco
08-610	3 pole 4 way Rotary Switch	1	SW1	Lorlin

Multiplex Board Unit 05

Part No.	Description	Qty	Location	Manufact
01-110	270R .3W 5% Metal Film	3	R5-7	Mullard
01-300	100k .3W 5% Metal Film	4	R1-4	Mullard
02-120	0.1uF Ceramic 50V	1	C1	Unitrode
02-165	10uF Tantalum 25V	1	C2	ITT
04-140	ZTX302 General Purpose NPN <i>ACT</i>	3	TR1-3	
05-040	4028 BCD To Decimal Converter	1	IC1	
05-050	4029 Binary Counter	1	IC2	
05-090	4518 BCD Counter	2	IC3,4	
08-030	16 pin IC Socket	4	IC1-4	BICC
08-230	4mm Socket Red	1	SK1	

Pilot Tone Board Unit 06

Part No.	Description	Qty	Location	Manufacturer
01-010	10R .3W 5% Metal Film	2	R24,25	Mullard
01-035	47R .3W 5% Metal Film	1	R32	Mullard
01-165	1k .3W 5% Metal Film	1	R17	Mullard
01-175	1k5 .3W 5% Metal Film	1	R38	Mullard
01-205	4k7 .3W 5% Metal Film	3	R18,31,37	Mullard
01-220	8k2 .3W 5% Metal Film	2	R19,21	Mullard
01-235	10k .3W 5% Metal Film	1	R29	Mullard
01-245	15k .3W 5% Metal Film	1	R22	Mullard
01-270	30k .4W 2% Metal Film	1	R33	Mullard
01-280	47k .3W 5% Metal Film	2	R34,35	Mullard
01-285	56k .3W 5% Metal Film	1	R23	Mullard
01-290	68k .3W 5% Metal Film	2	R26,36	Mullard
01-300	100k .3W 5% Metal Film	2	R27,41	Mullard
01-305	100k * 8 Thick Film Package	2	R1-8,9-16	
01-325	220k .3W 5% Metal Film	1	R39	Mullard
01-330	330k .3W 5% Metal Film	1	R40	Mullard
01-340	470k .3W 5% Metal Film	1	R30	Mullard
01-350	1M .3W 5% Metal Film	2	R20,28	Mullard
01-375	1k Cermet Vertical	1	RV1	Bourns
01-395	100k Cermet Vertical	2	RV2,3	Bourns
02-075	470p Ceramic 100V	1	C12	Mullard
02-085	1n Ceramic 100V	1	C7	Mullard
02-115	0.033mF Polyester 63V	1	C6	Wima
02-117	0.047mF Polyester 63V	1	C2	Wima
02-120	0.1mF Ceramic 50V	3	C9-11	Unitrode
02-150	3.3mF Tantalum 25V	1	C13	ITT
02-165	10mF Tantalum 25V	4	C3,5,8,14	ITT
02-170	10mF Electrolytic 25V, Axial	1	C5	
02-185	33mF Tantalum 16V	1	C1-	ITT
03-010	1N4148 General Purpose Diode	2	D1,2	
04-070	BC548 General Purpose NPN	3	TR1-3	
05-060	4046 Phase Locked Loop	1	IC9	
05-090	4518 BCD Counter	3	IC5,6,10	
05-100	4527 BCD Multiplexer	4	IC1-4	
05-150	741 8 Pin Op Amp	1	IC11	
05-190	74C932 Phase Comparator	1	IC7	
05-310	8038	1	IC8	Intersil
08-010	8 pin IC Socket	2	IC7,11	BICC
08-020	14 pin IC Socket	1		BICC
08-030	16 pin IC Socket	8		BICC
08-230	32 way PCB Connector	1	SK1	Varelco

Frequency Meter

Unit 03

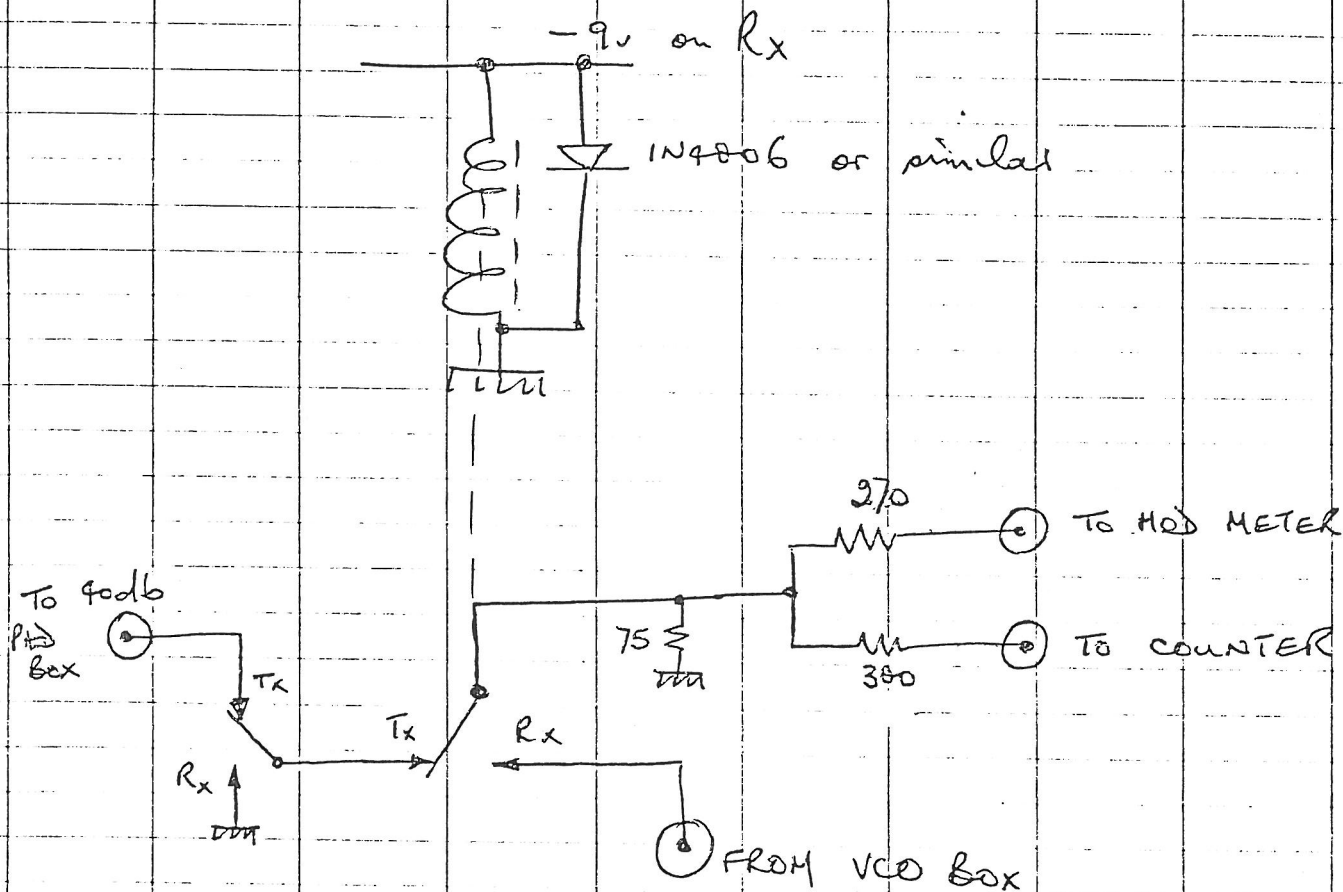
Part No.	Description	Qty	Location	Manufact
01-035	47R .3W 5% Metal Film	1	R40	Mullard
01-050	51R 1W 2% Metal Oxide	1	R37	Mullard
01-075	100R .3W 5% Metal Film	25	R9-32,43	Mullard
01-110	270R .3W 5% Metal Film	10	R1-8,41,42	Mullard
01-115	330R .3W 5% Metal Film	4	R34-36,50	Mullard
01-135	560R .3W 5% Metal Film	1	R38	Mullard
01-165	1k .3W 5% Metal Film	2	R33,39	Mullard
01-185	2k2 .3W 5% Metal Film	1	[R48]	Mullard
01-370	10k Cermet Horizontal	1	[R49]	Bourns
02-100	4.7nF Ceramic 100V	3	C1,12,13	Mullard
02-115	0.033uF Polyester 63V	1	C2	Wima
02-120	0.1uF Ceramic 50V	7	C3-7,10,11	Unitrode
02-205	100uF Tantalum 16V	2	C8,9	ITT
03-010	1N4148 General Purpose Diode	4	D1,2,6,7	
03-130	BZY88 6V2 Zener Diode	1	[D9]	ITT
03-170	0A47 Gold Bond Diode	2	D4,5	
04-060	BC212 General Purpose NPN KT3107	8	TR1-8	National
05-130	7400 4 * 2 NAND	3	IC10,11,16	
05-160	74121N Multivibrator	2	IC5,6	
05-170	7474 Flip Flop	3	IC8,14,15	
05-180	7490 Counter	1	IC7	
05-200	74L46N BCD/7 Segment Convert	1	IC4	
05-210	74L98N Register	1	IC3	
05-240	74LS196 Counter	1	IC2	
05-260	74S00N 4 * 2 NAND	1	IC1	
05-360	HDSP3730 7 Segment Display	9	IC17-25	HP
05-390	LM309K 5V Regulator	1	[IC26]	
05-440	MK5009N Timer	1	IC9	
05-480	ZN1040E Display Driver	2	IC12,13	Ferranti
07-020	10MHz Crystal Oscillator	1	[X1]	Cathodec
07-040	4057/500HR + 20 turns 30swg	2	L1,2	Neosid
07-100	Printed Circuit Board Pins	80		
08-020	14 pin IC Socket	9		BICC
08-030	16 pin IC Socket	2		BICC
08-060	28 pin IC Socket	2	IC12,13	BICC

MODIFICATION TO RELAY BOX

13.8.82

— TO REMOVE SURPLUS Hi G. RELAY

NEW CIRCUIT :-



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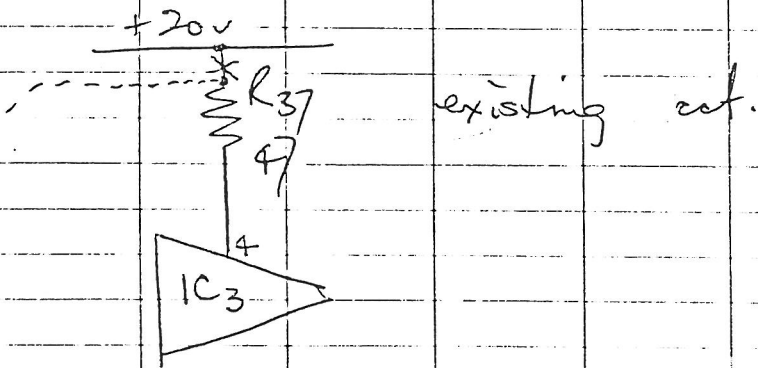
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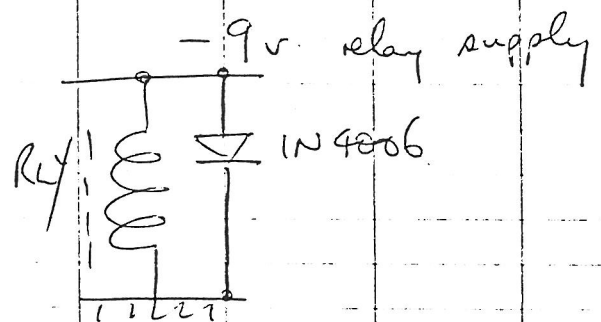
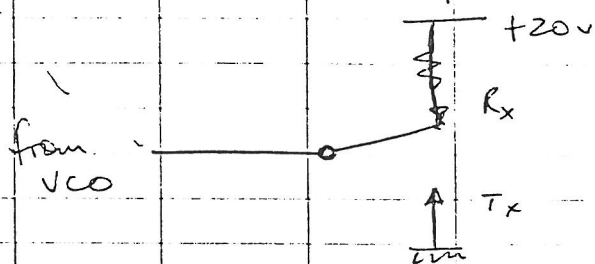
① VCO removal from counter when Tx under test is on.

(i) VCO section :-

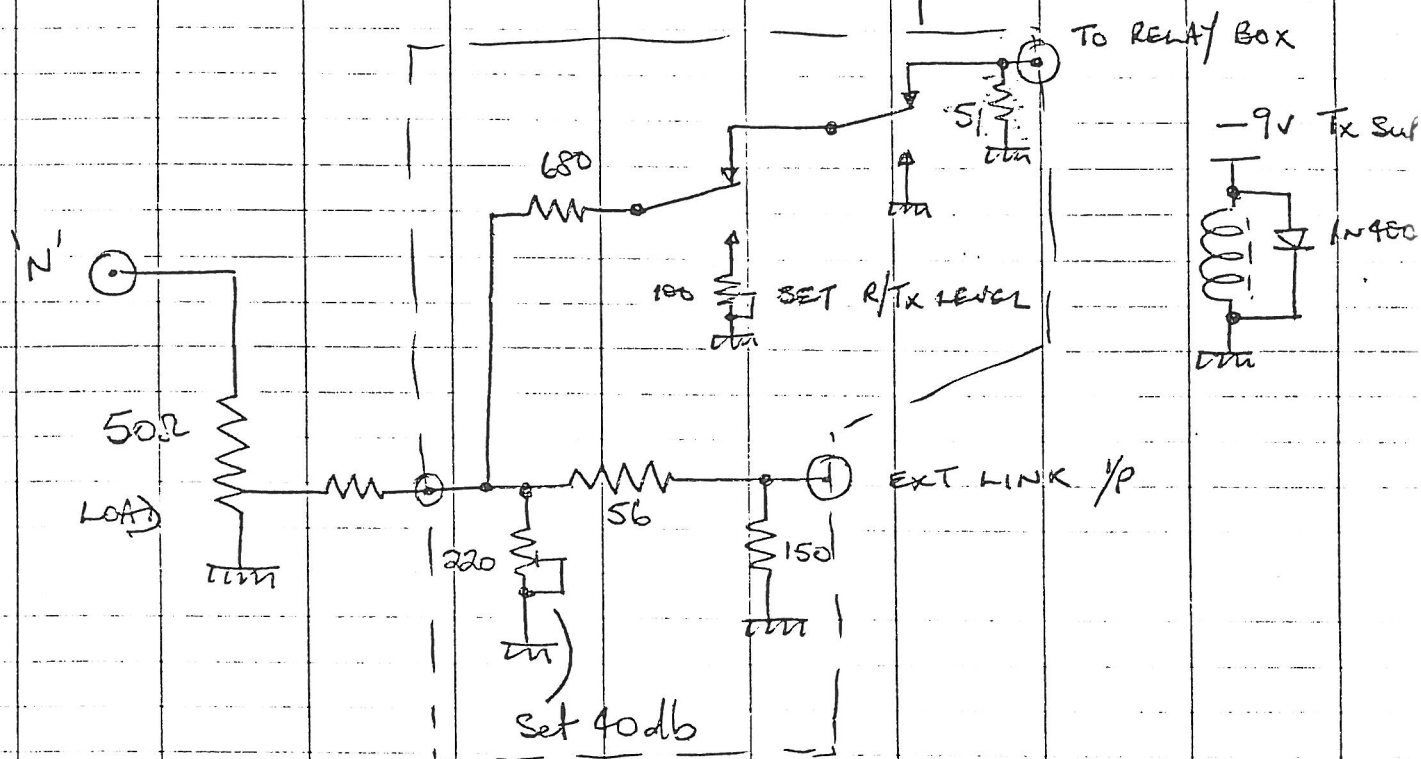


(ii) Remove R37 +20V end and take via f/t systems to outside VCO enclosure.

(iii) wire to relay :-



(ii) New 'Pad' box circuit with UHF relay :-



N.B. Set Rx level to be same as Tx level at 450M
or near freq.
-9V is OFF on Tx position

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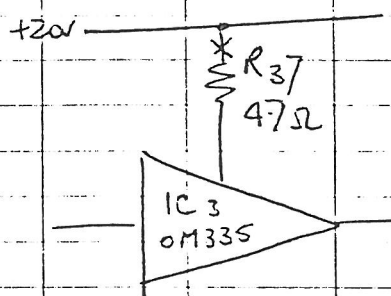
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Problems

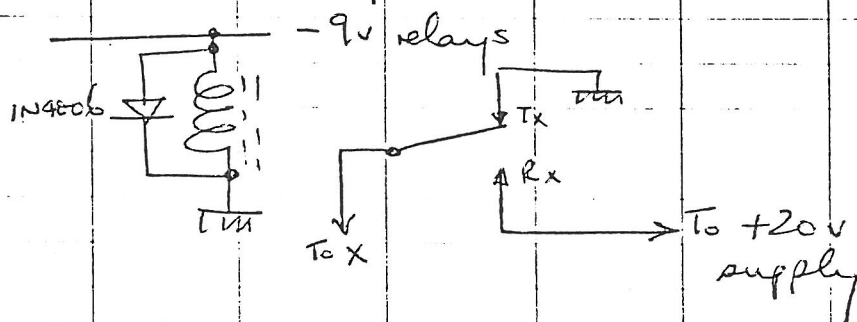
- (a) throughput leakage from counter/Mod Meter when Tx under test is on.
- (b) change in Sig GEN level at 'N' socket between Rx and Tx condition.

(a) Remove VCO output to RELAY Box [hence counter/Mod. METER] when external Tx is on.

(i) VCO box output circuit :-



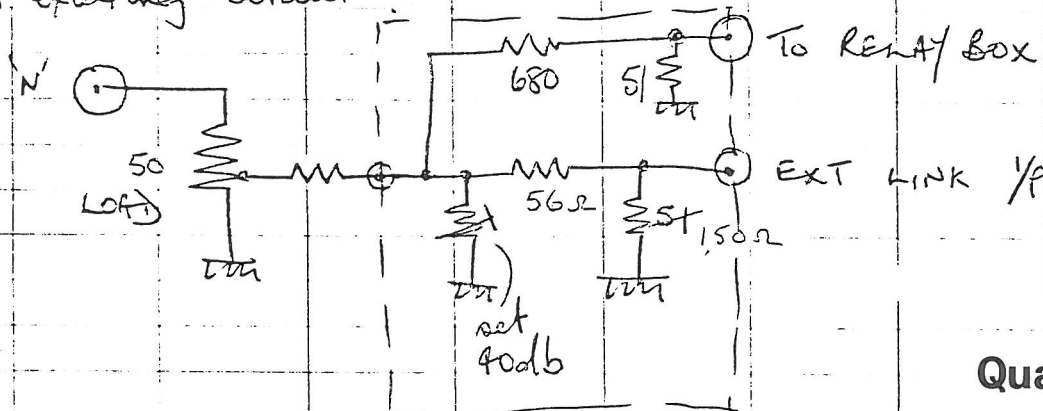
Disconnect R₃₇ at X
Connect R₃₇ (X point) to F/T and hence outside VCO box
Add new relay :-



N.B. Any 50mA contact rated relay 8V - 12V operation
-9V is OFF on Tx 1/p

(b) Add relay to 40db pad box

(i) existing circuit :-



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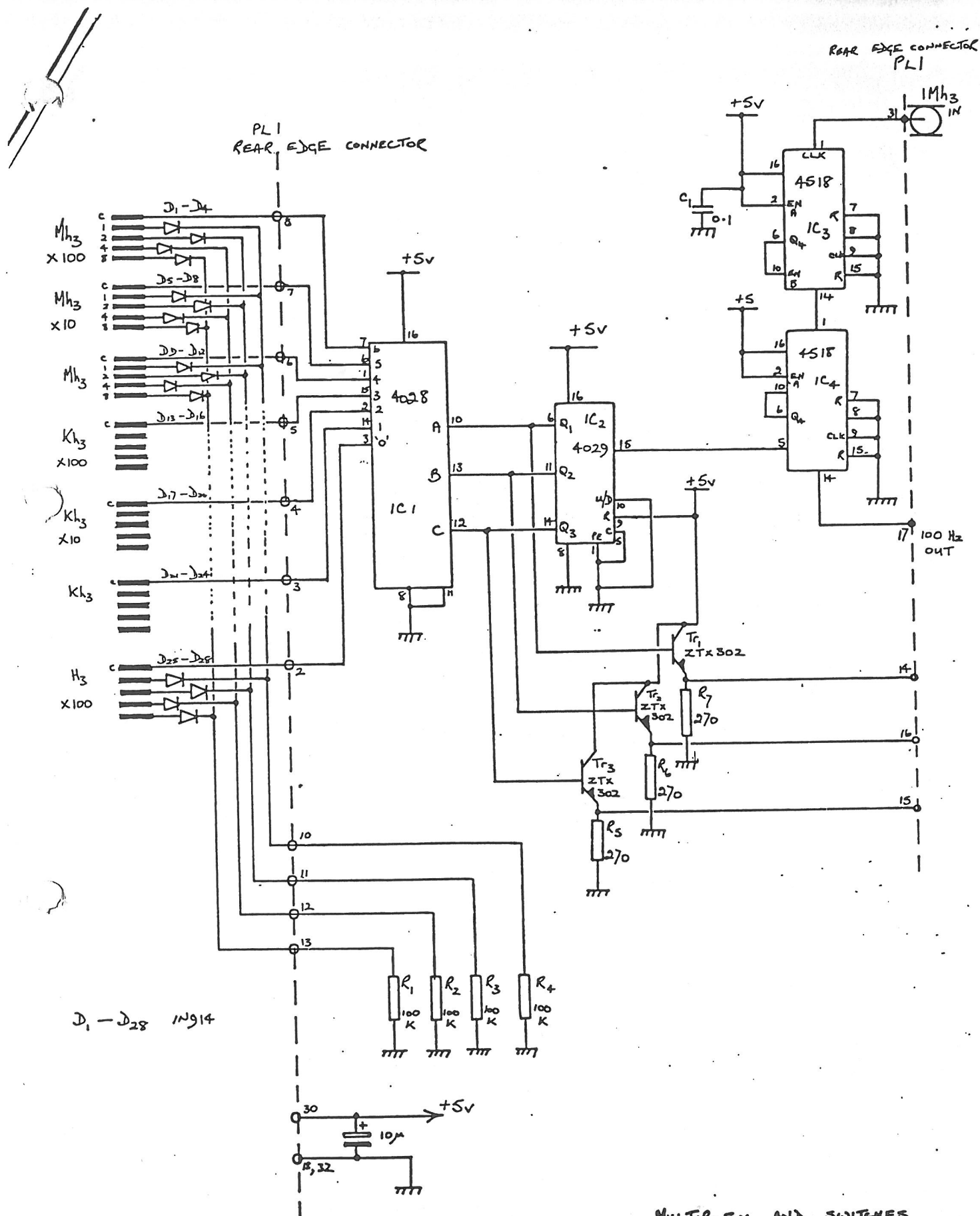
Plymouth Road, Totnes
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Fax: +44 (0)1803 867962

e-mail: quartzlock@quartzlock.com

web site: <http://www.quartzlock.com>



MULTIPLEX AND SWITCHES

÷ 10⁴ REFERENCE

282 A

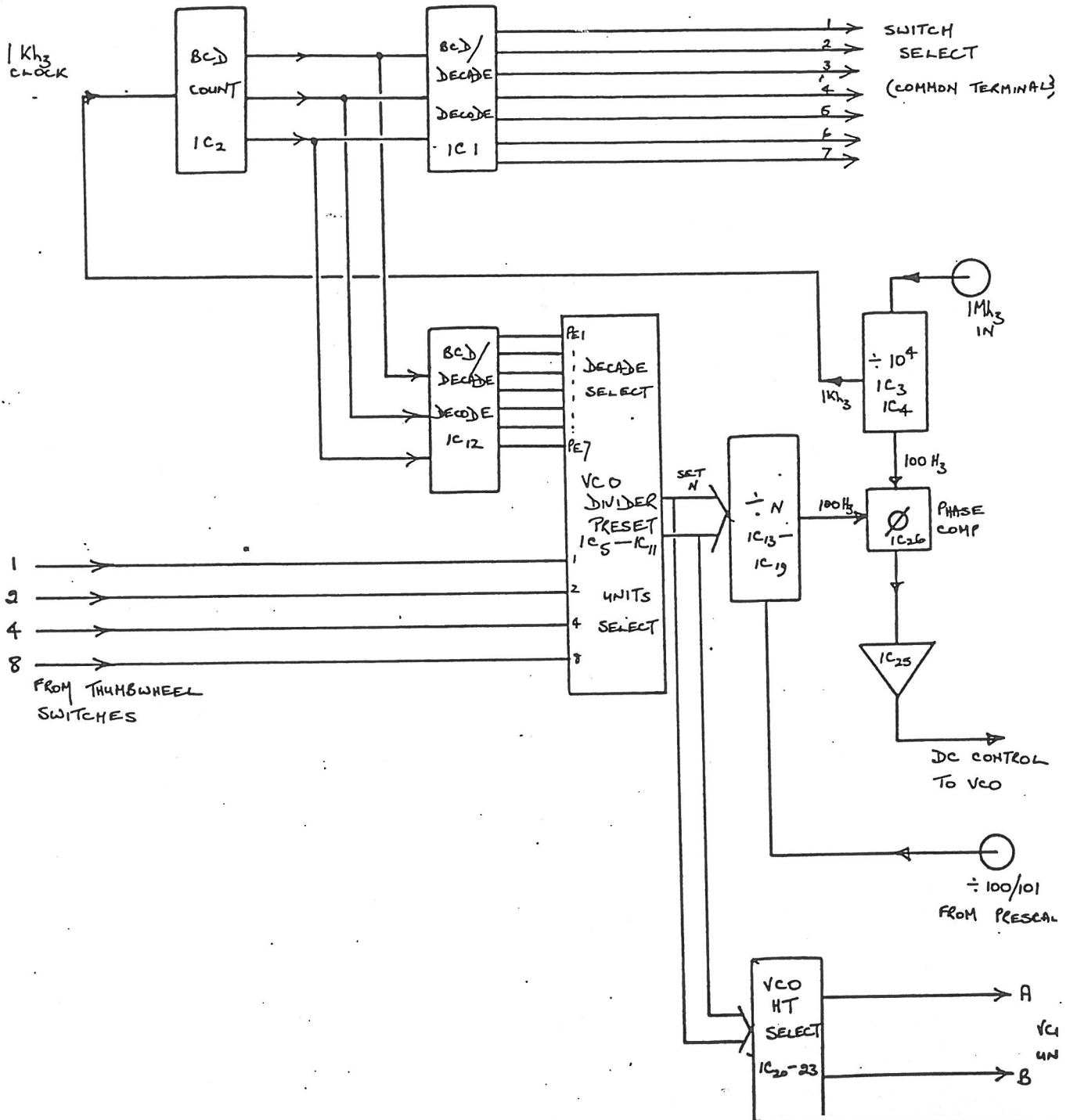
ISSUE 2 27.1.82

CHKD 22.3.83

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SWITCH MULTIPLEXING
PHASE COMP.
282 A



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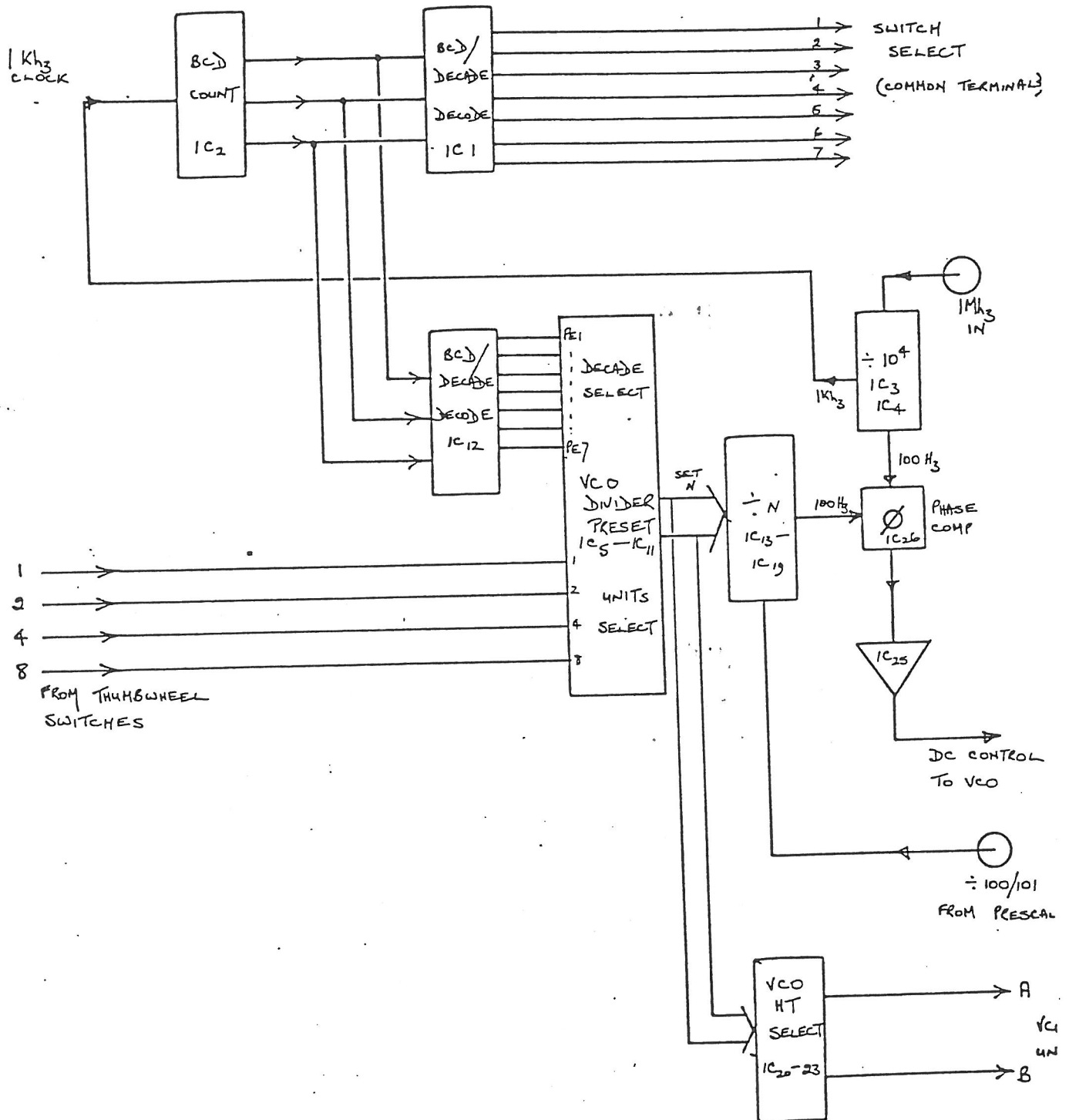
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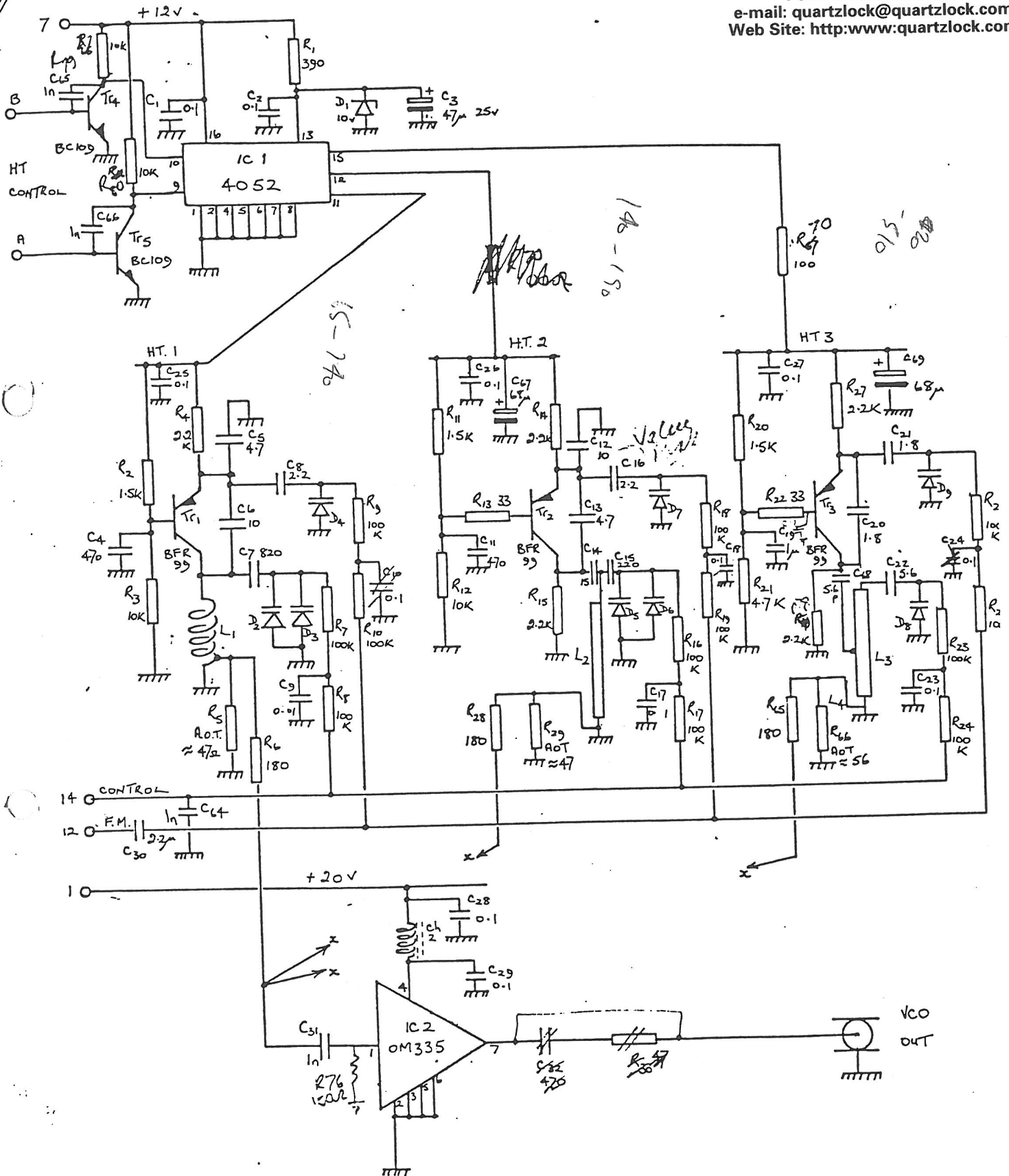
Plymouth Road, Totnes

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VCO / HEAD AMP.

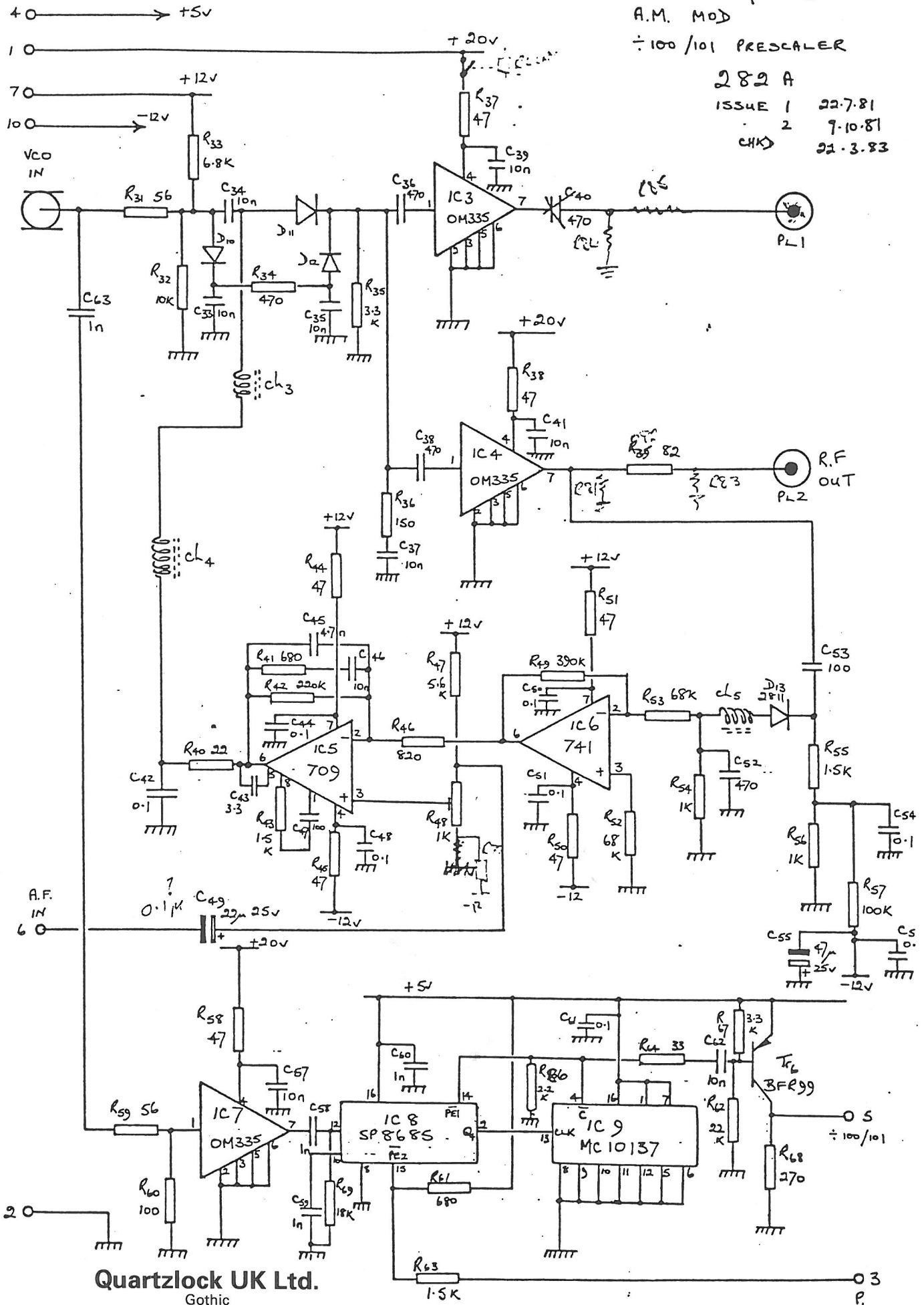
282 A

ISSUE 1 29.7.81 CHKD 22

2 9.10.81

LEVELLING AMP
A.M. MOD
÷ 100 / 101 PRESCALER

282 A
ISSUE 1 22.7.81
2 7.10.81
CHKD 21.3.83



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Tel: 01803 862062

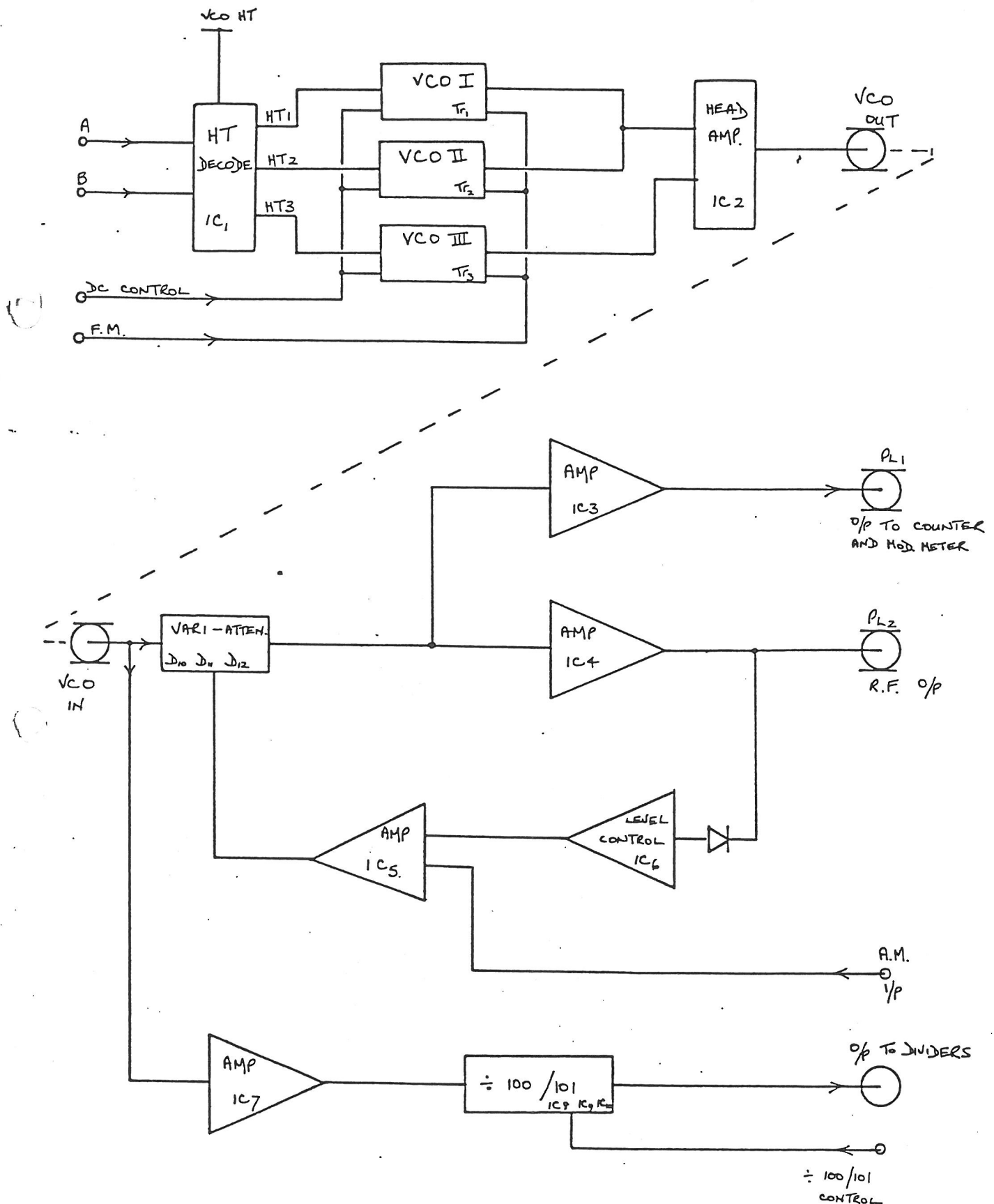
Fax: 01803 867962

e-mail: quartzlock@quartzlock.com

Quartzlock UK Ltd.

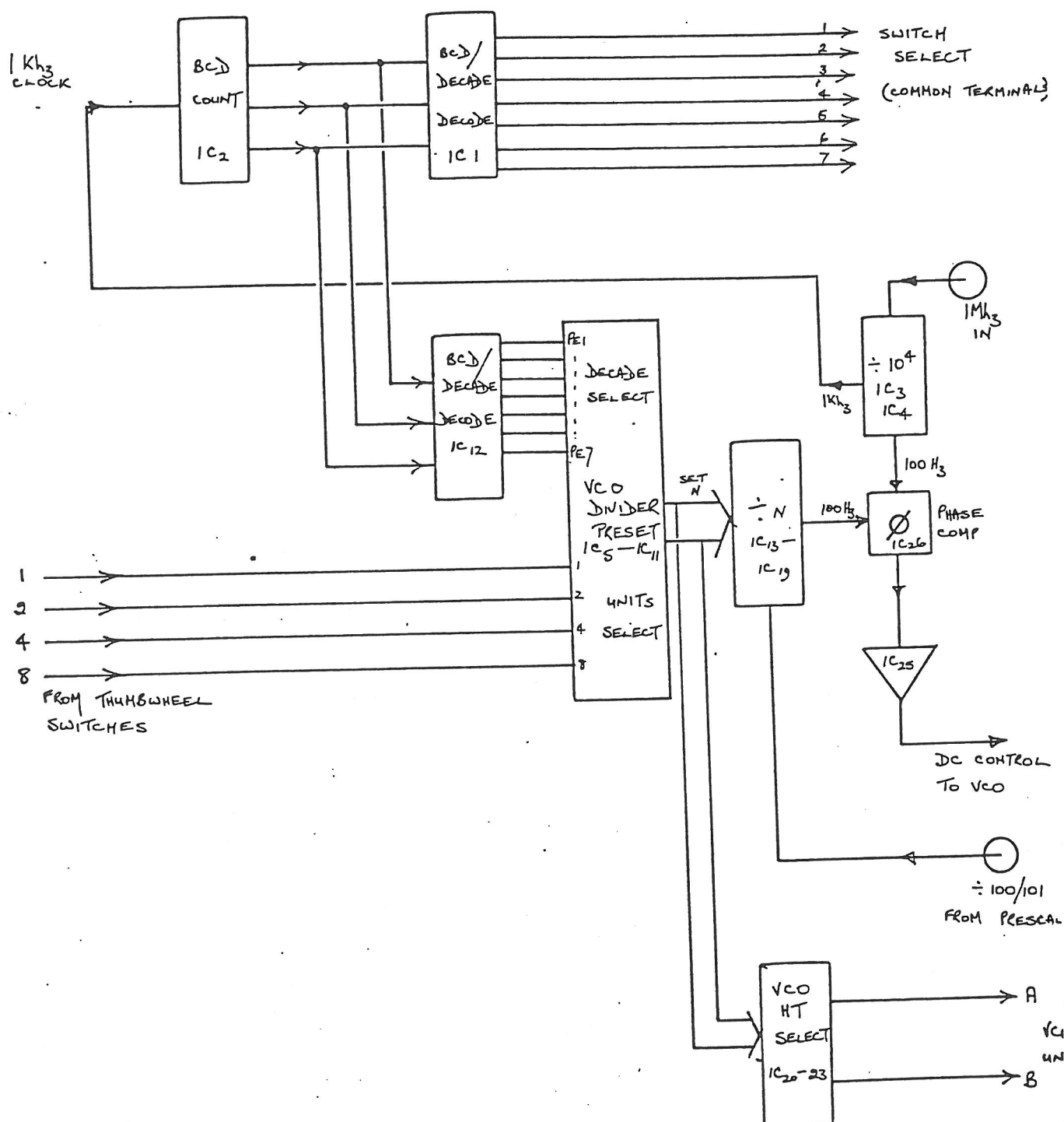
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Web Site: http://www.quartzlock.com

FUNCTION DIAGRAM R.F. GENERATION 282 A



web site: <http://www.quartzlock.com>

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STABILISED POWER SUPPLY BOARD

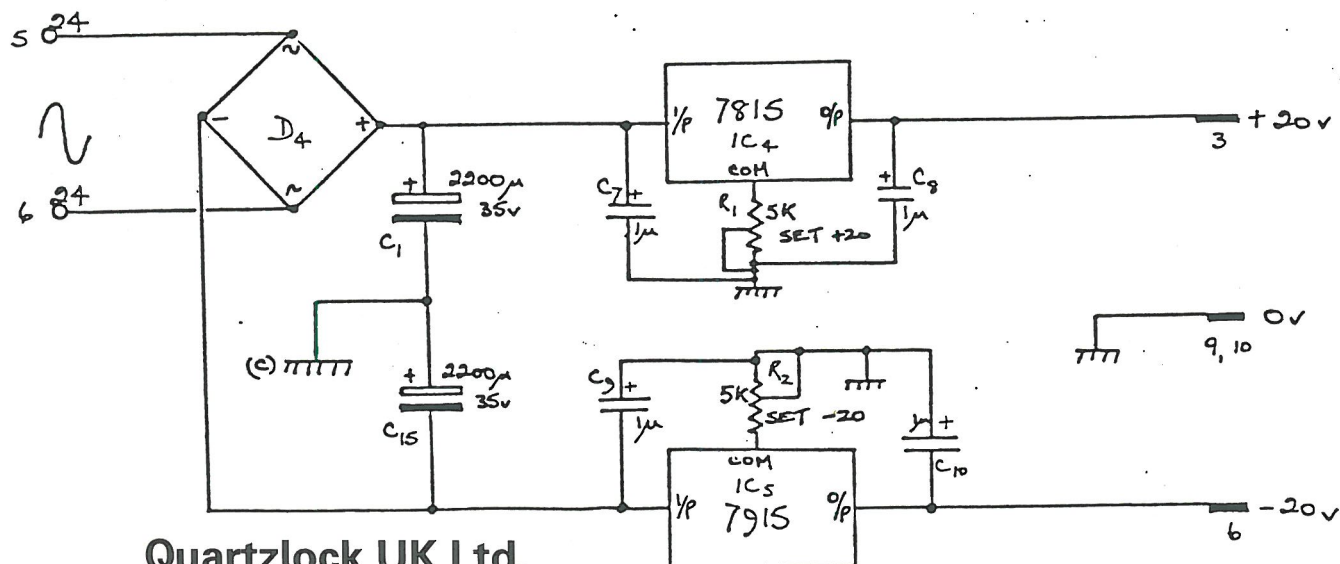
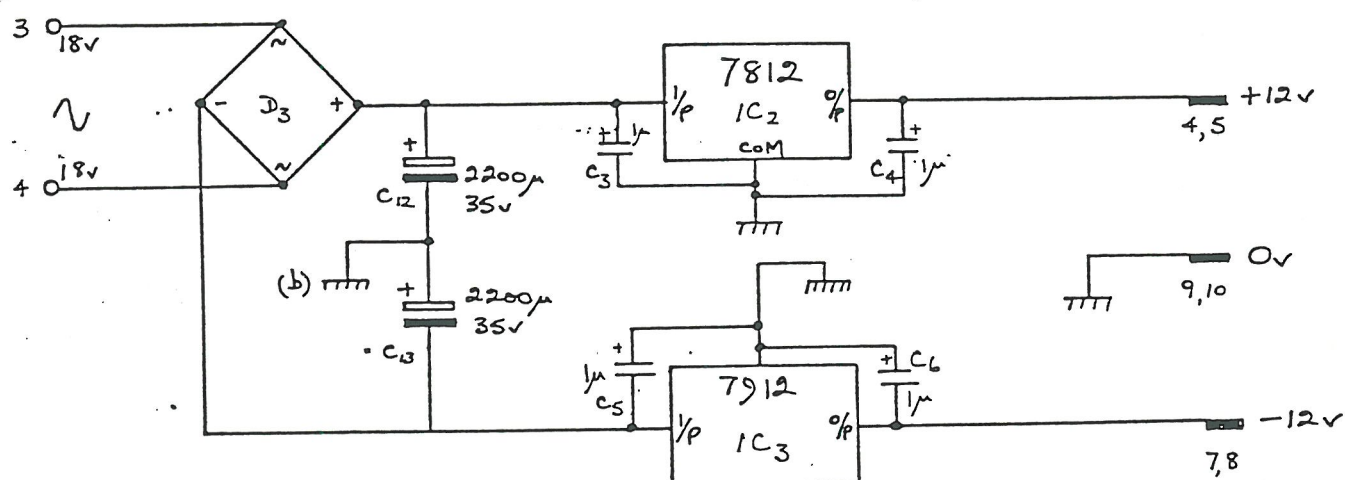
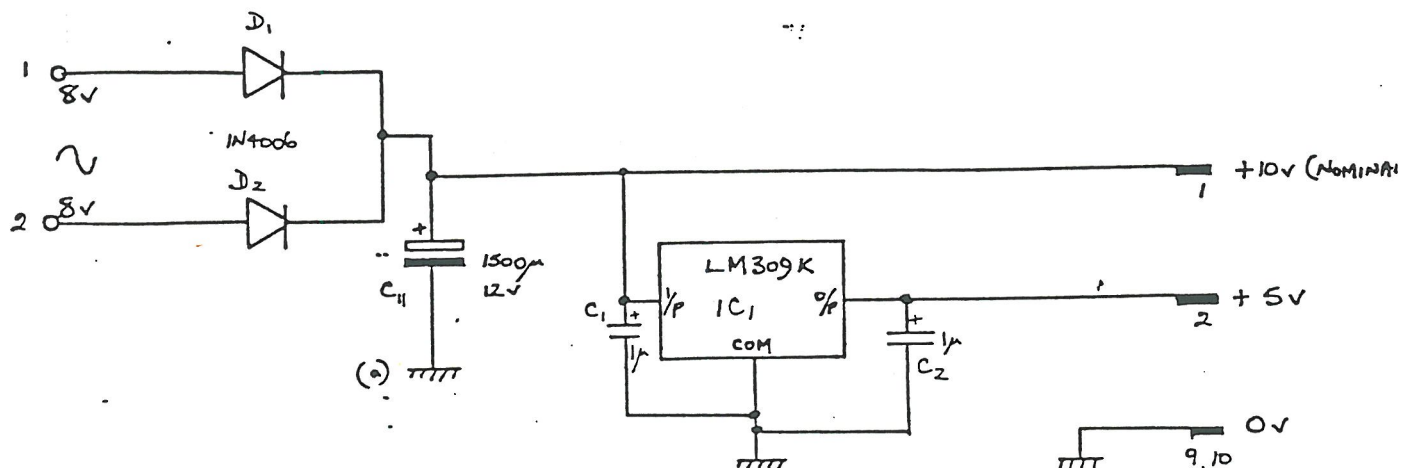
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CHKD

22.3.83



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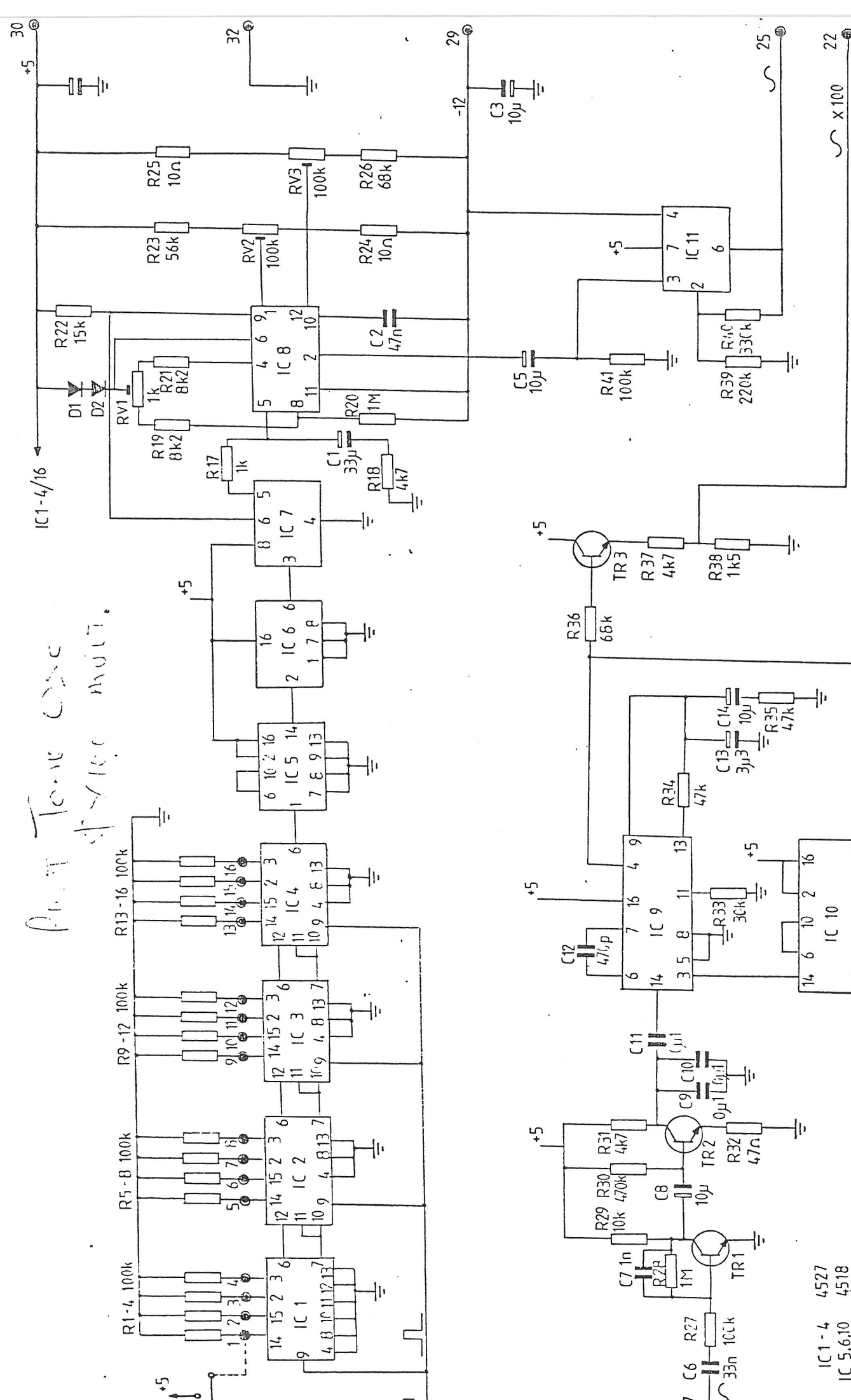
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e-mail: quartzlock@quartzlock.com

Part Ten Osc
of 100 MHz



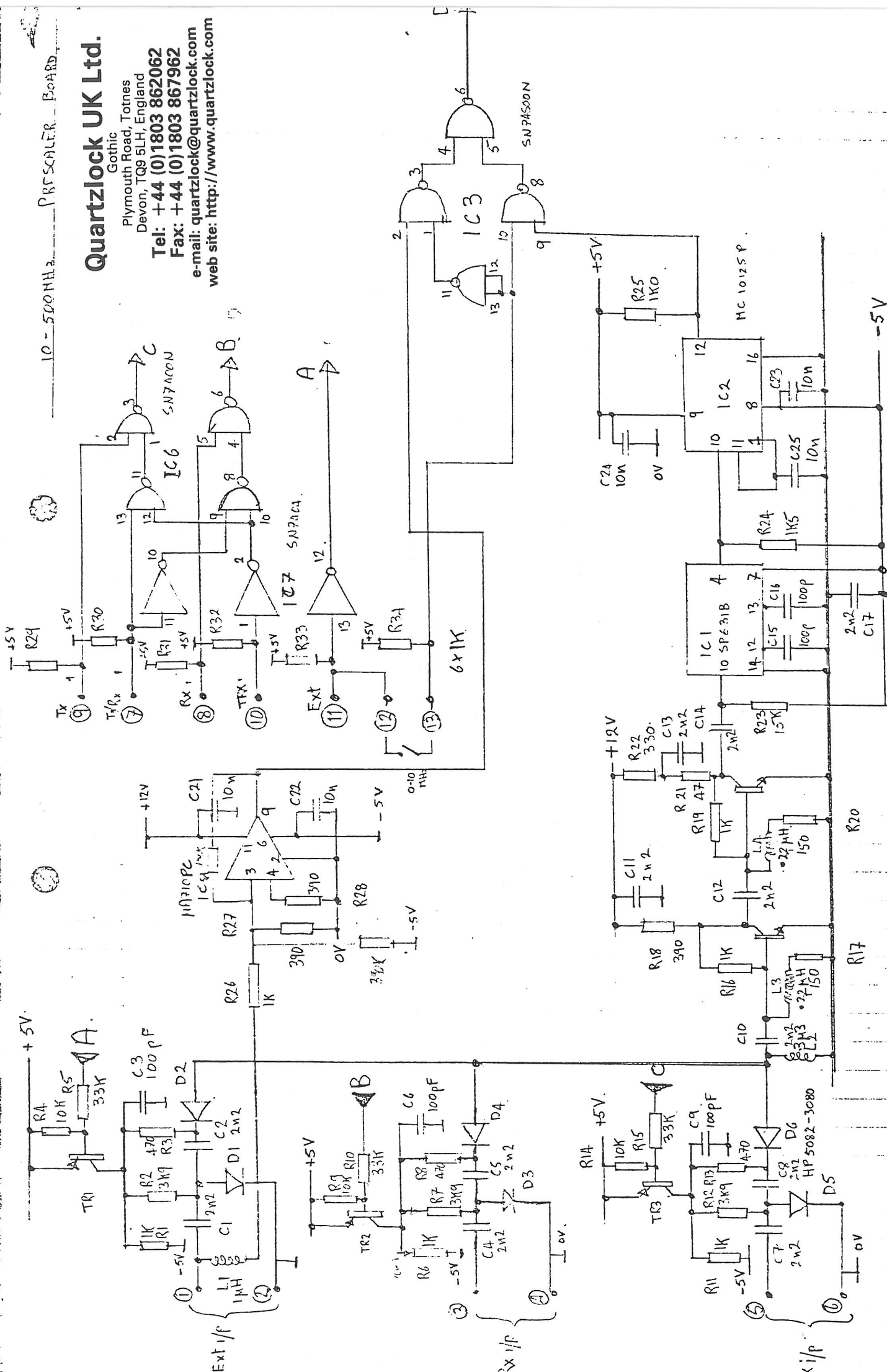
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- IC1-4 4527
- IC5,6,10 4518
- IC7 74C932
- IC9 8058
- IC9 4046
- IC11 741
- TD1-3 RC51A

10-500MHz PRESCALER BOARD

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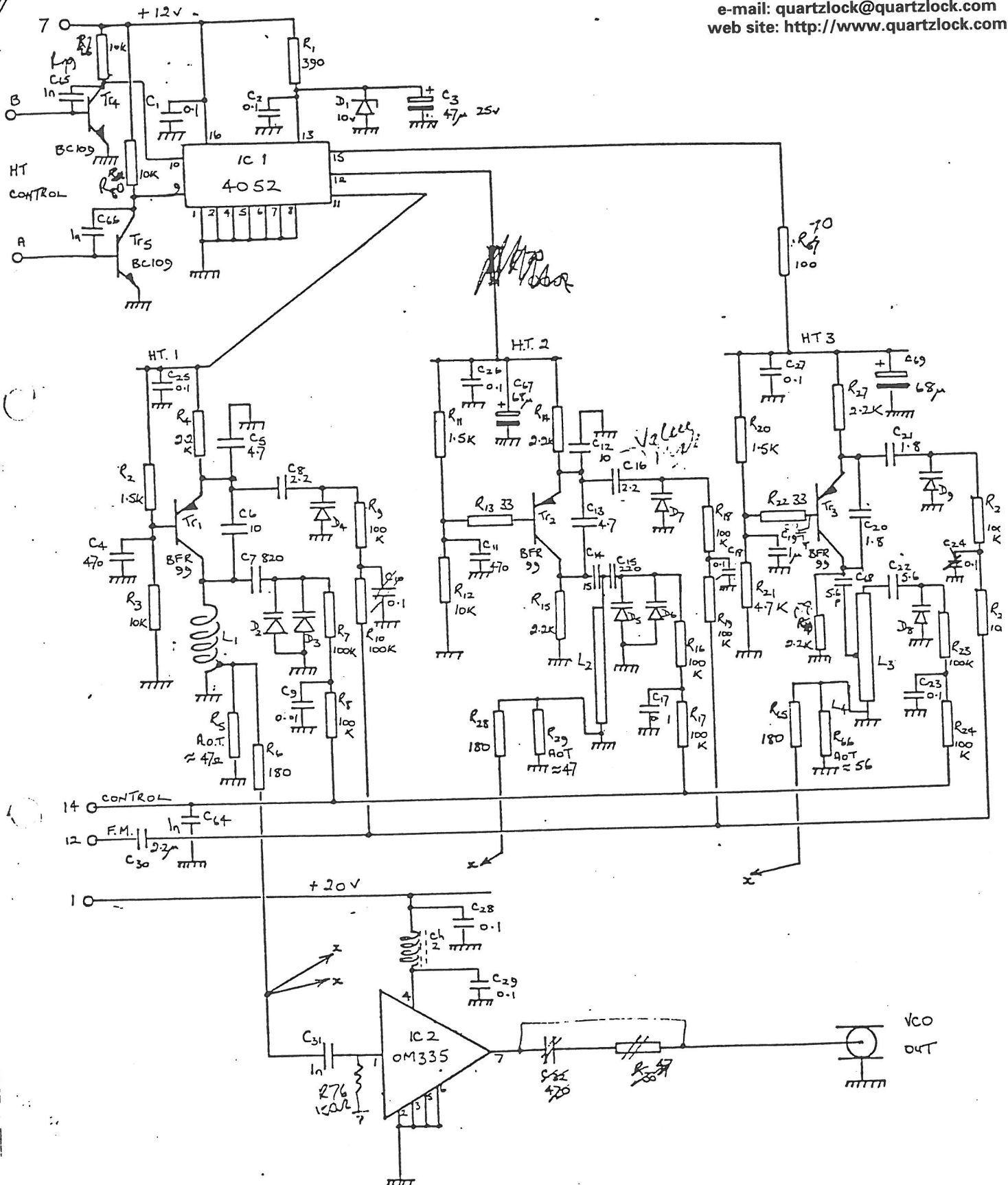
Quartzlock UK Ltd.

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VCO / HEAD AMP.

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ISSUE 1

22.7.81

CHKD 22

2 9.10.81

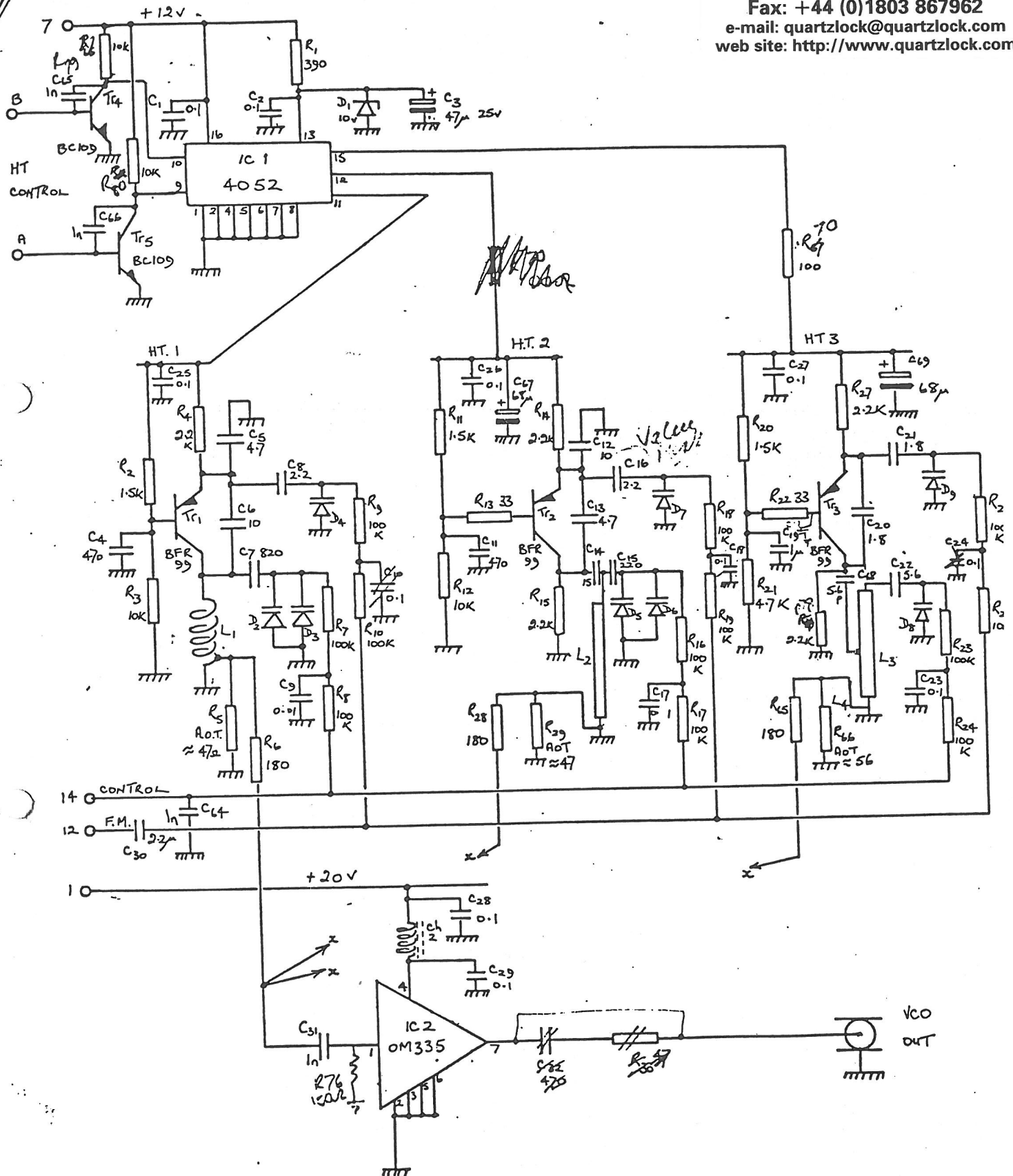
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VCO / HEAD AMP.

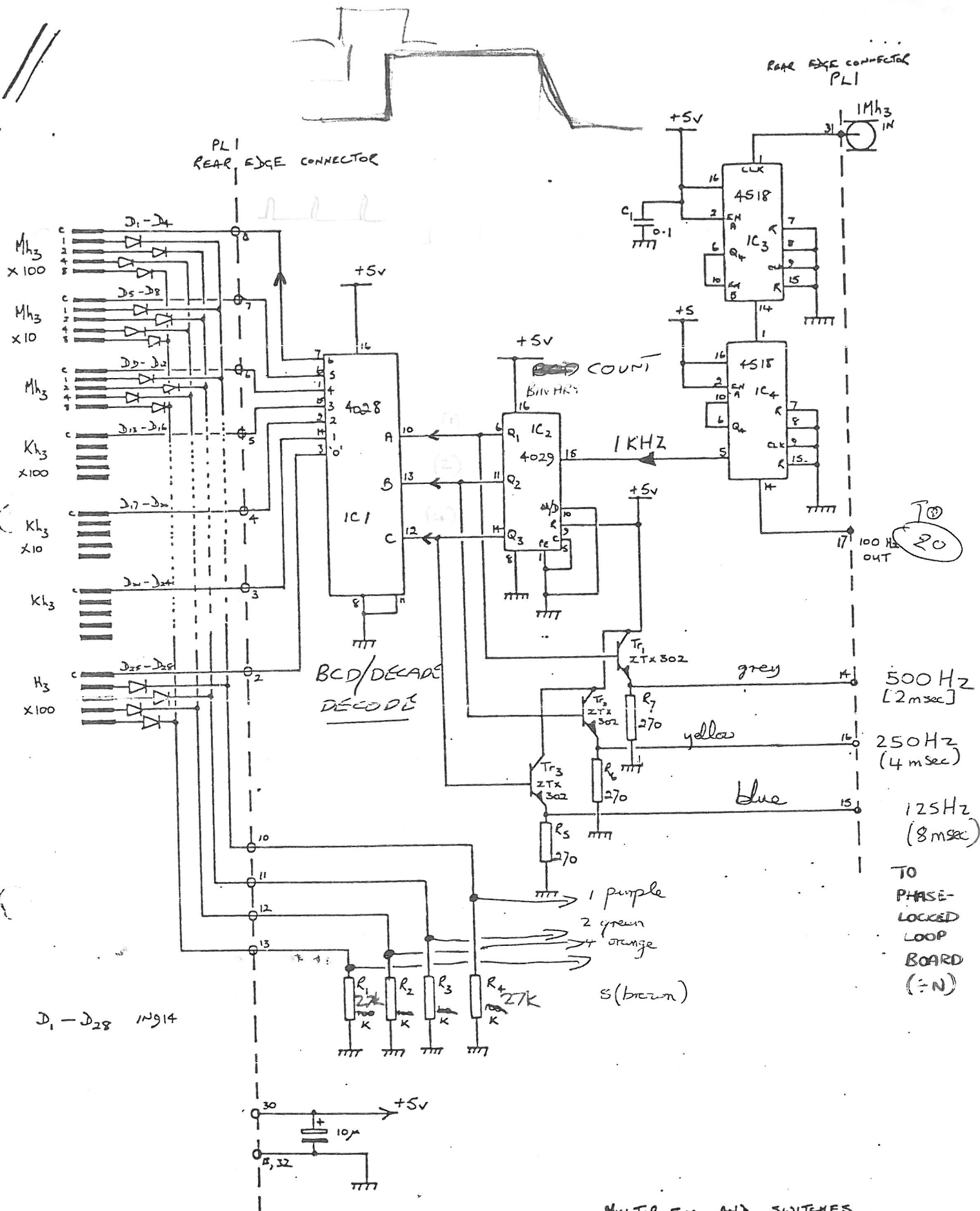
282 A

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MULTIPLEX AND SWITCHES

÷ 10⁴ REFERENCE

282 A

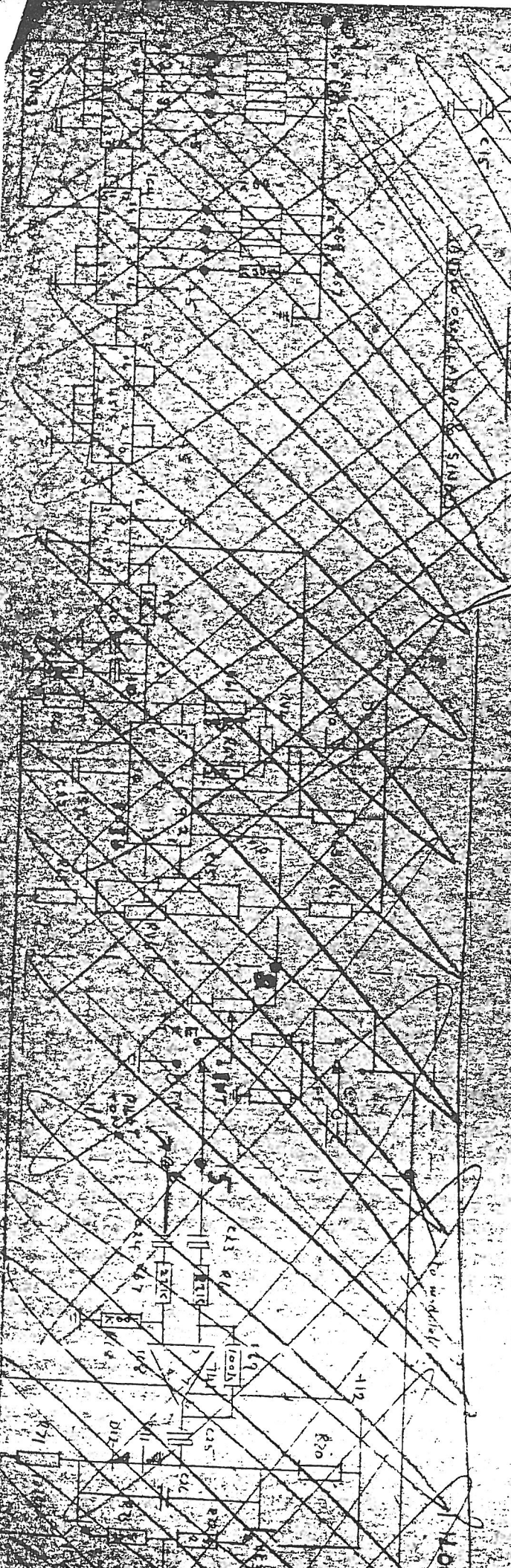
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CHKD

27.1.82

22.3.83

103.44-44444 C



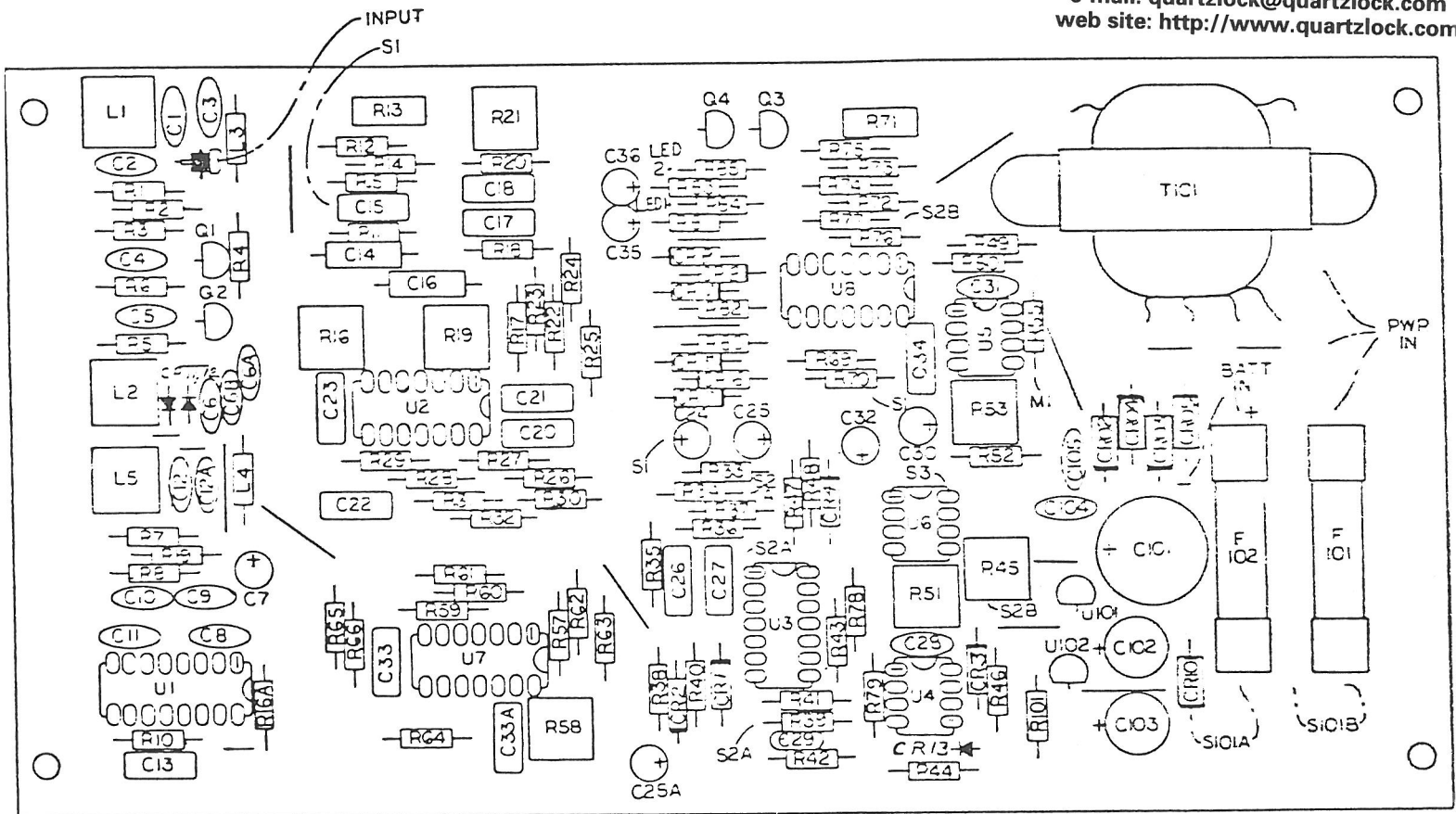
Quartzlock UK Ltd.

Gothic
Plymouth Road, Totnes
Devon, TQ9 5LH, England

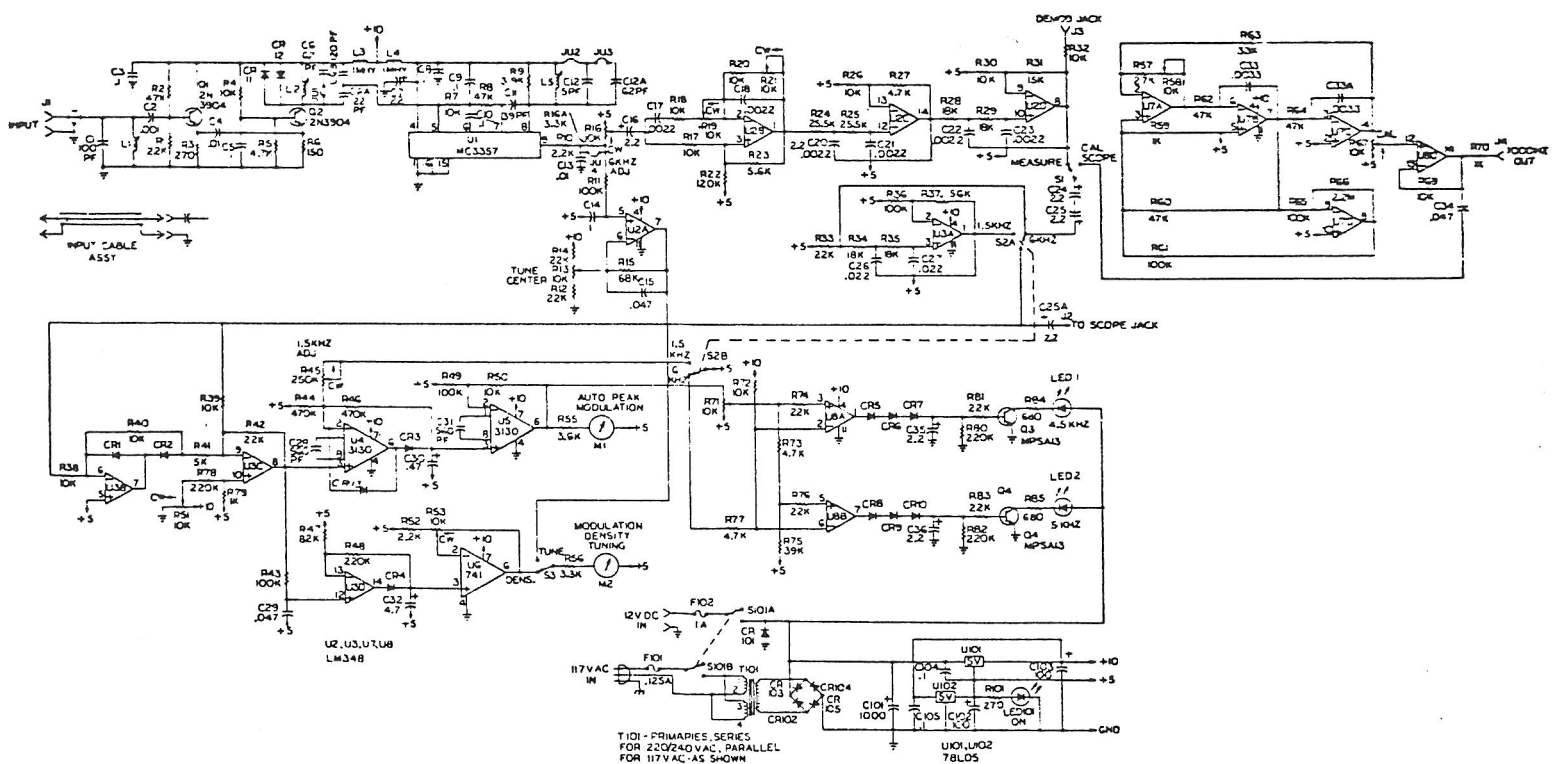
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e-mail: quartzlock@quartzlock.com
web site: <http://www.quartzlock.com>



COMPONENTS PLACEMENT



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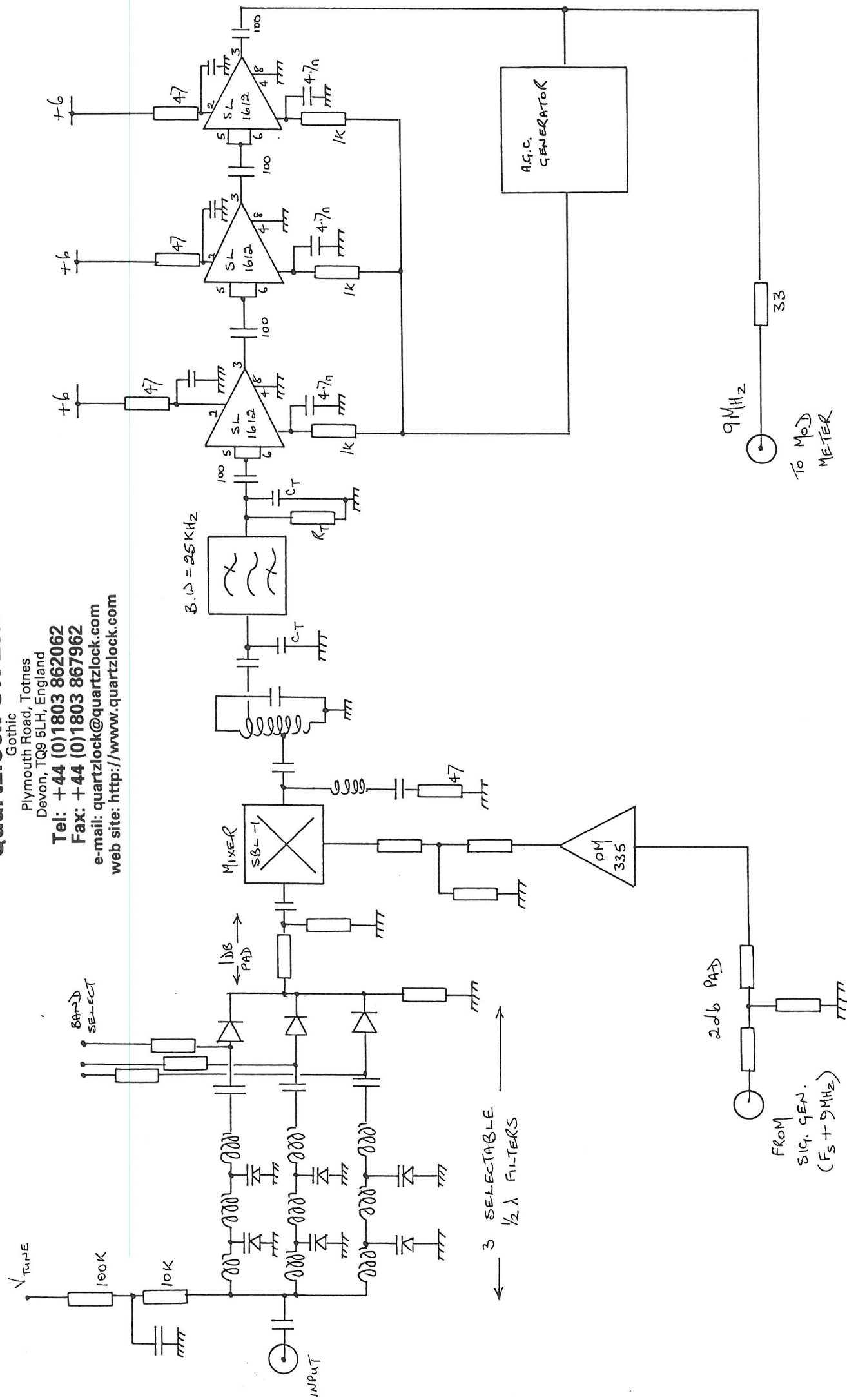
Gothic
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e-mail: quartzlock@quartzlock.com

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PROPOSED 'off air' unit
c.d. 25.2.84

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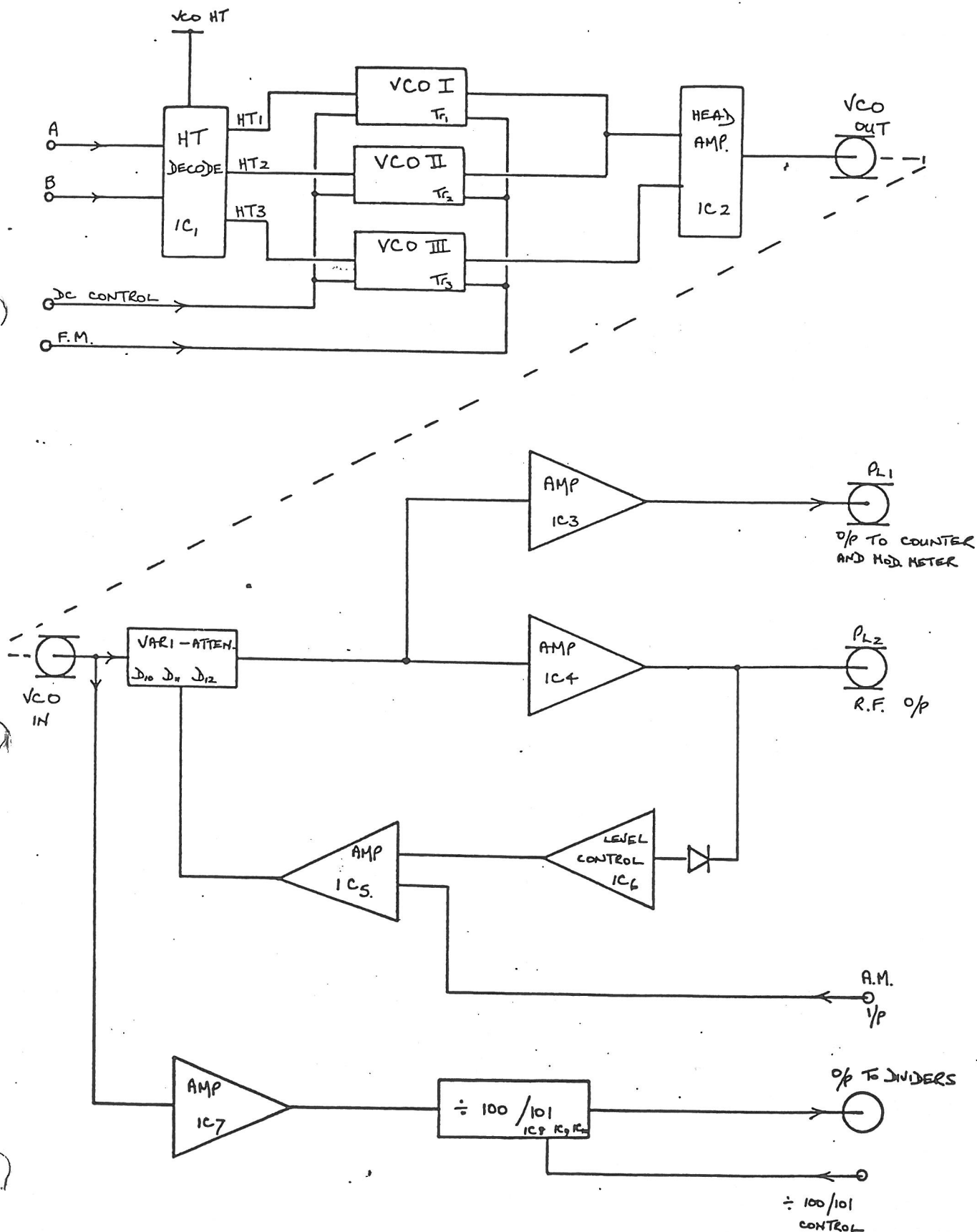
e-mail: quartzlock@quartzlock.com

web site: http://www.quartzlock.com

FUNCTION DIAGRAM

R.F. GENERATION

282 A



05-110	709 14 Pin Op Amp	1	IC1	
05-400	LM324N Quad Operational Amp.	2	IC2,3	
07-025	12V HB2 Relay	8	RLY1-8	Matsushit
07-100	Printed Circuit Board Pins	2		
07-145	U23UD Thermistor	1	TH1	
08-020	14 pin IC Socket	3	IC1-3	BICC
08-230	4mm Socket Red	1	SK1	

IF Oscillator

Unit 09

Part No.	Description	Qty	Location	Manufact
01-035	47R .3W 5% Metal Film	2	R10,11	Mullard
01-065	82R .3W 5% Metal Film	1	R6	Mullard
01-130	470R .3W 5% Metal Film	1	R9	Mullard
01-200	3k3 .3W 5% Metal Film	1	R7	Mullard
01-210	5k6 .3W 5% Metal Film	1	R3	Mullard
01-235	10k .3W 5% Metal Film	1	R8	Mullard
01-245	15k .3W 5% Metal Film	1	R2	Mullard
01-255	22k .3W 5% Metal Film	2	R4,5	Mullard
01-325	220k .3W 5% Metal Film	1	R1	Mullard
02-020	4p7 Ceramic 100V	1	C16	Mullard
02-030	10p Ceramic 100V	1	C6	Mullard
02-050	47p Ceramic 100V	1	C9	Mullard
02-070	220p Ceramic 100V	1	C14	Mullard
02-075	470p Ceramic 100V	1	C10	Mullard
02-085	1n Ceramic 100V	1	C1	Mullard
02-105	10n Ceramic 63V	4	C11-13,15	Mullard
02-120	0.1mF Ceramic 50V	2	C7,8	Unitrode
02-230	2-22p Variable	1	C2 [2-4 as reqd]	
04-070	BC548 General Purpose NPN <i>KT3102</i>	2	TR2,3	
04-130	TIS88A VHF F.E.T <i>RET</i>	1	TR1	
07-010	10.7MHz Crystal	1	XL1 [2-4 A/R]	IQD
07-100	Printed Circuit Board Pins	12		
08-600	1 pole 12 way Rotary Switches	1	SW1 [stop = 6]	

RF Power Meter Unit 10

Part No.	Description	Qty	Location	Manufactu
01-015	15R 3W Wirewound	1	R18A	
01-035	47R .3W 5% Metal Film	1	[R33]	Mullard
01-055	56R .3W 5% Metal Film	1	[R31]	Mullard
01-075	100R .3W 5% Metal Film	2	R1,2	Mullard
01-085	150R .3W 5% Metal Film	1	[R30]	Mullard
01-105	220R .3W 5% Metal Film	1	R18	Mullard
01-160	910R .4W 2% Metal Film	1	R4	Mullard
01-165	1k .3W 5% Metal Film	1	R14	Mullard
01-195	2k7 .3W 5% Metal Film	1	R5	Mullard
01-215	6k8 .3W 5% Metal Film	1	R12	Mullard
01-220	8k2 .3W 5% Metal Film	1	R6	Mullard
01-245	15k .3W 5% Metal Film	1	R7	Mullard
01-275	33k .3W 5% Metal Film	1	R17	Mullard
01-285	56k .3W 5% Metal Film	1	R19	Mullard
01-300	100k .3W 5% Metal Film	2	R3,13	Mullard
01-340	470k .3W 5% Metal Film	1	R15	Mullard
01-360	220R Cermet Horizontal	1	[R32]	
01-400	1k Trimpot	1	R8	Mullard
01-405	2k Trimpot	1	R9	Mullard
01-410	5k Trimpot	1	R10	Mullard
01-415	10k Trimpot	2	R11,16	Mullard
01-420	20k Trimpot	1	R20	Mullard
02-085	1nF Ceramic 100V	2	C1,2	Mullard
02-120	0.1uF Ceramic 50V	1	C4	Unitrode
02-175	10uF Electrolytic 50V, Radial	1	C3	
03-010	1N4148 General Purpose Diode	6	D2-7	
03-020	1N5339B Zener 5V6 5W	1	D8	
03-050	1N5713 Diode	1	D1	HP
04-110	BFX88 Medium Power PNP HET	1	TR1	
05-150	741 8 Pin Op Amp	1	IC1	
07-100	Printed Circuit Board Pins	15		
07-140	Transistor Heatsink	1	TR1	
08-010	8 pin IC Socket	1	IC1	BICC
08-210	12 pin Burndy Socket	1	PL1	Burndy
08-600	1 pole 12 way Rotary Switch	1	SW1 [stops = 6]	Lorlin

AF Level Board Unit 11

Part No.	Description	Qty	Location	Manufacturer
01-010	10R .3W 5% Metal Film	1	R16 (// with 01-025)	Mullard
01-020	21R .5W 0.5% Metal Film	1	R15	Holsworth
01-025	22R .3W 5% Metal Film	1	R16 (// with 01-010)	Mullard
01-045	51R .4W 2% Metal Film	1	R8	Mullard
01-060	66R5 .5W 5% Metal Film	1	R14	Holsworth
01-100	210R .5W 0.5% Metal Film	1	R13	Mullard
01-150	681R .5W 0.5% Metal Film	1	R12	Holsworth
01-190	2k32 .5W 0.5% Metal Film	1	R11	Mullard
01-230	9k76 .5W 0.5% Metal Film	1	R10	Holsworth
01-235	10k .3W 5% Metal Film	1	R4	Mullard
01-255	22k .3W 5% Metal Film	1	R1	Mullard
01-285	56k .3W 5% Metal Film	1	R9	Mullard
01-300	100k .3W 5% Metal Film	1	R3	Mullard
01-355	2M2 .3W 5% Metal Glaze	2	R2,7	Mullard
01-400	1k Trimpot	1	R6	Mullard
02-030	10p Ceramic 100V	1	C5	Mullard
02-040	22p Ceramic 100V	1	C6	Mullard
02-085	1n Ceramic 100V	1	C9	Mullard
02-135	1mF Tantalum 35V	1	C3	ITT
02-155	4.7mF Tantalum 35V	2	C7,8	ITT
02-180	22mF Tantalum 16V	4	C1,2,10,11	ITT
02-200	100mF Tantalum 3V	1	C4	ITT
03-010	1N4148 General Purpose Diode	4	D1-4	
03-170	0A47 Gold Bond Diode	4	D5-8	
04-070	BC548 General Purpose NPN <i>KT 3102</i>	2	TR1,2	
05-110	709 14 Pin Op Amp	1	IC1	
07-100	Printed Circuit Board Pins	10		
08-020	14 pin IC Socket	1	IC1	BICC
08-600	1 pole 12 way Rotary Switches	1	SW1 [stops = 8]	

Divide by 'N' Board Unit 12

Part No.	Description	Qty	Location	Manufact
01-035	47R .3W 5% Metal Film	3	R10,11,14	Mullard
01-110	270R .3W 5% Metal Film	1	R17	Mullard
01-165	1k .3W 5% Metal Film	2	R5,9	Mullard
01-205	4k7 .3W 5% Metal Film	2	R6,8	Mullard
01-210	5k6 .3W 5% Metal Film	3	R12,13,15	Mullard
01-245	15k .3W 5% Metal Film	1	R7	Mullard
01-315	150k .3W 5% Metal Film	1	R16	Mullard
02-120	0.1uF Ceramic 50V	5	C10-14	Unitrode
02-125	0.22uF Polyester 63V	2	C16,19	Siemens
02-130	0.47uF Tantalum 35V	1	C21	ITT
02-135	1uF Tantalum 35V	1	C18	ITT
02-165	10uF Tantalum 25V	1	C20	ITT
02-180	22uF Tantalum 16V	3	C15,17,22	ITT
02-190	47uF Tantalum 16V	1	C23	ITT
02-195	68uF Tantalum 25V	1	C24	ITT
03-010	1N4148 General Purpose Diode	1	D29	
04-070	BC548 General Purpose NPN ^{KT3102}	1	TR1	Mullard
05-040	4028 BCD To Decimal Converter	3	IC12,20,21	
05-080	4510 U/D Counter	7	IC5-11	
05-190	74C932 Phase Comparator	1	IC26	
05-220	74LS00 4 * 2 NAND	2	IC22,24	
05-230	74LS168 U/D Counter	7	IC13-19	
05-250	74LS27 3 * 3 NOR Gates	1	IC23	
05-380	LF351 Operational Amplifier	1	IC25	
08-010	8 pin IC Socket	2	IC25,26	BICC
08-020	14 pin IC Socket	3	IC22-24	BICC
08-030	16 pin IC Socket	17	IC5-21	BICC
08-230	4mm Socket Red	1	SK1	

LEVELLING AMP

A.M. MOD

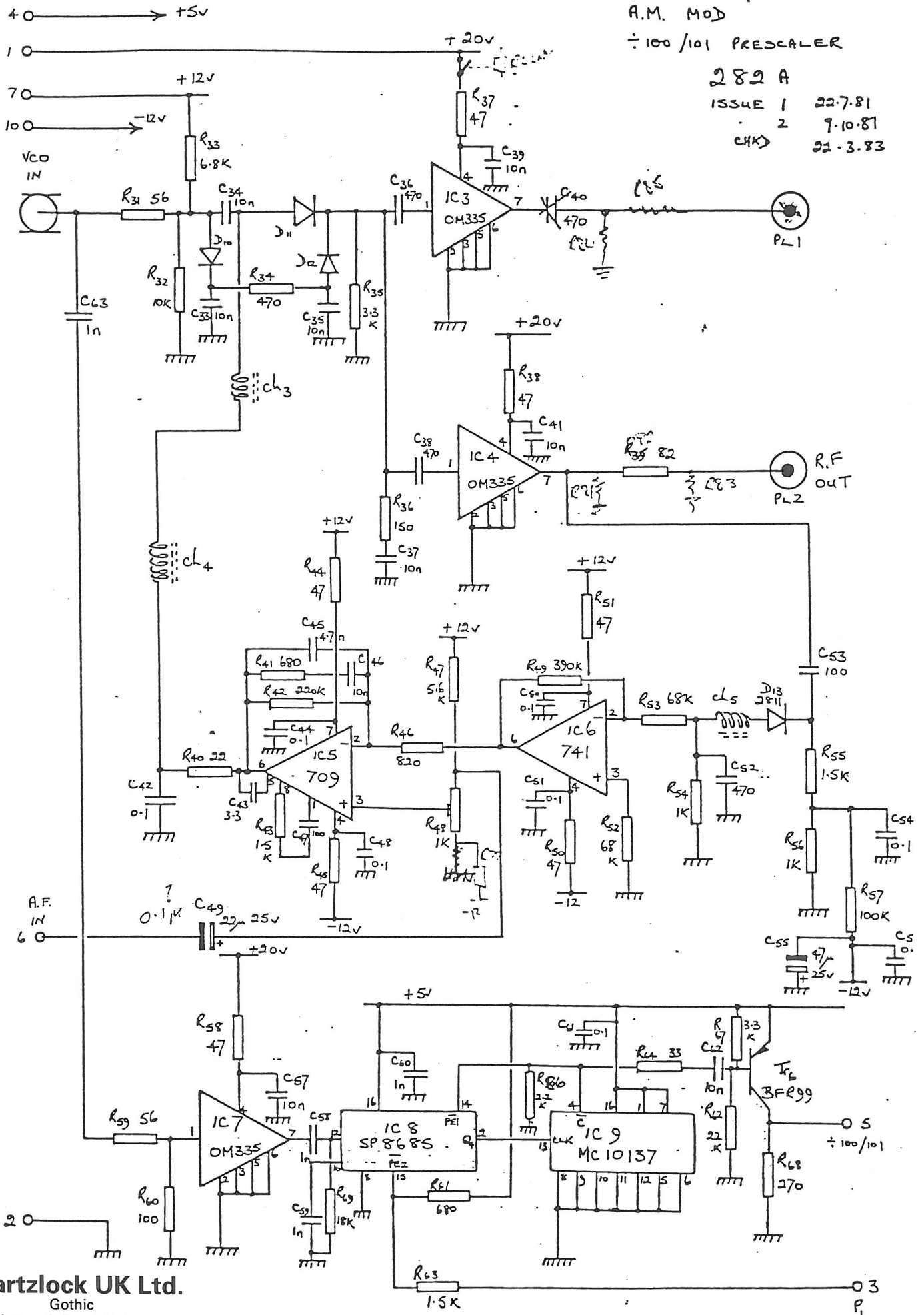
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15/3/91

→ N IC'S

5, 6, 7, 8, 9, 10, 11,	= CD 4510B
13, 14, 15, 16, 17, 18, 19,	= 74LS168AN
12, 20, 21,	= CD 4028B
22, 24,	= 74LS00N
23,	= 74LS27N
26,	= 74C932N
25/27	= LF351N

SWITCH MULTIPLEXING 4001 ISSUE 1

IC 1 = 4028B

2 = 4029B

3/4 = MC14518B

<http://www.ccsenet.org/journal/view.php?id=7068>



15/3/91

Mother Boards Unit 13

Part No.	Description	Qty	Location	Manufact
03-010	1N4148 General Purpose Diode	52	D1-52	HP
05-350	HDSP3533 7 Segment Display	8	IC1-8	
07-100	Printed Circuit Board Pins	38		Varelco
08-200	8 pin Switch Socket	12	SK1-12	
08-240	32 way PCB Connector	4	PL1-4	
08-300	14 pin Latching DIL Socket	2	SK14, 15	
08-310	16 pin Latching DIL Socket	3	SK16-18	
08-510	SMA PCB Mounted Socket	1	SK13	

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