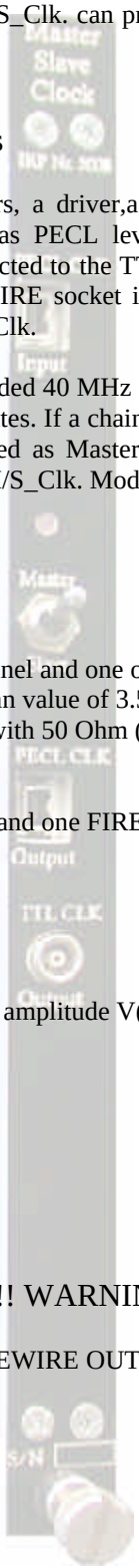
40MHz Clock

IKP Nr. 5006

Module Description

The M/S_Clk. (Master/Slave Clock) module is a single width CAMAC 40 MHz RF generator module. Basically the module is driven by an internal 40 MHz crystal clock, although it may equally be driven by an external PECL or TTL (optionally) clock of 40 MHz frequency. The M/S_Clk. can provide two different waveshapes, a quasi linear PECL and a TTL shape.



Circuit Details

The basic clock pulses pass through a cascade of 4 RC filters, a driver,a RF mini relay and a differential amplifier. There are four biased differential amplifiers used as PECL level drivers, each connected to its FIREWIRE socket and a very fast comparator and driver connected to the TTL LEMO socket. If the module is turned in the Slave Mode of operation, than the fifth FIREWIRE socket is used as input for an externally generated PECL frequency, e.g. a PECL output of another M/S_Clk.

The main application of M/S_Clk. modules is to provide the needed 40 MHz system clock for a large number of DGF-4C (Rev.D) modules, placed even in different CAMAC crates. If a chain of M/S_Clk. modules are used to synchronize the system clock than only one has to be switched as Master and all the others as Slave. The maximum length of FIREWIRE cable between two successive M/S_Clk. Modules is 5 m.

Outputs

No. of PECL differential outputs: 4 per module (three on rear-panel and one on the front panel).
Output Levels: Quasi linear 40 MHz PECL waveshape, with mean value of 3.54 V; Vpk-pk = 1.4 to 1.7 V (optionally up to 2.5 V) into a short 0.05" flat cable terminated with 50 Ohm (DC) and 19 Ohm (AC)
(Connector J19; DGF-4C RevD. specs. /XIA-USA/)

Output sockets: 3 xFIREWIRE (4 pins) placed on the rear-panel and one FIREWIRE (4 pins) on the front-panel.
One 40 MHz TTL output, output impedance: 50 Ohm.

Inputs

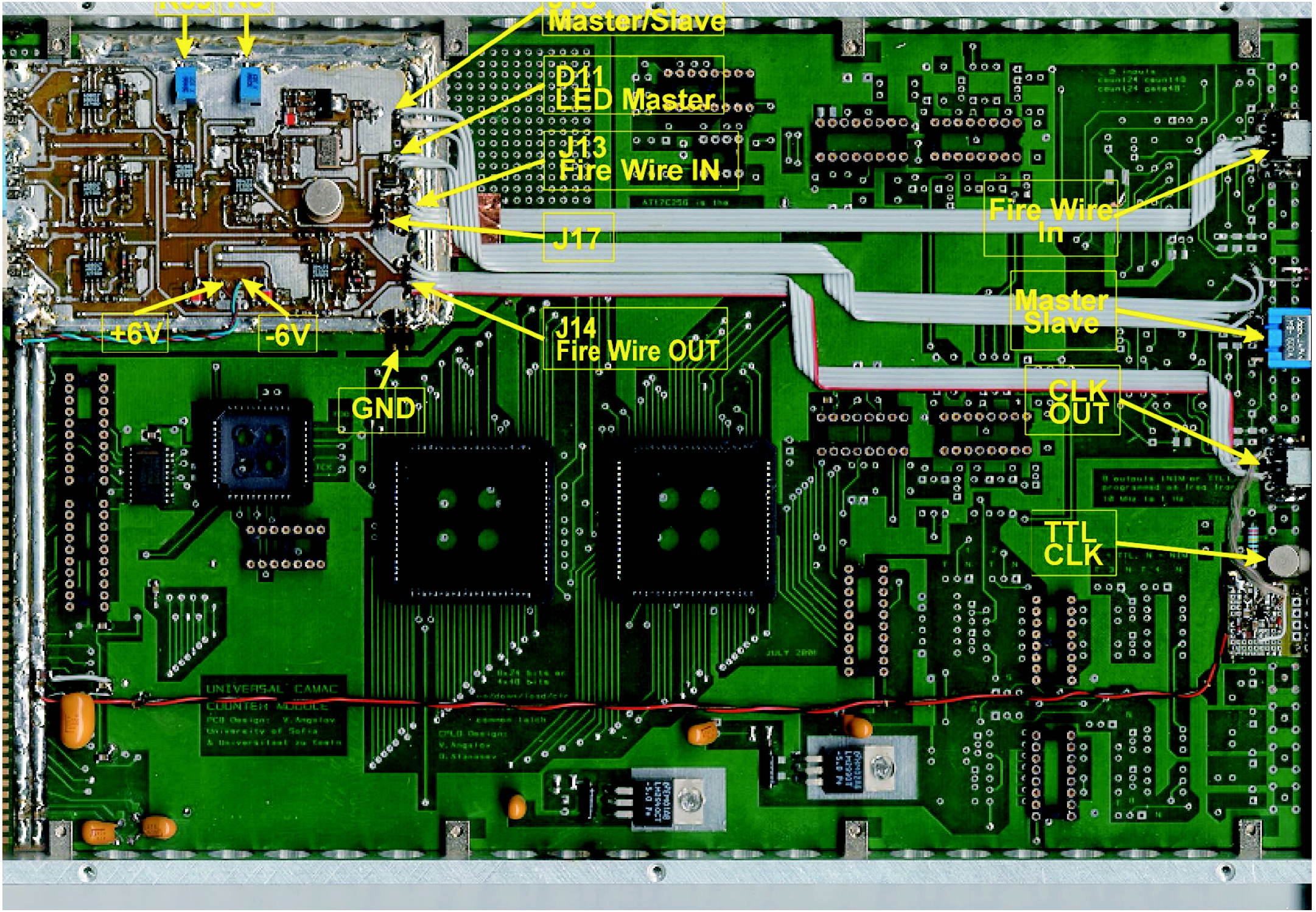
One FIREWIRE input socket, PECL input, quasi linear 40 MHz, amplitude V(pk-pk) ~ 1.4 V into 100 Ohm.

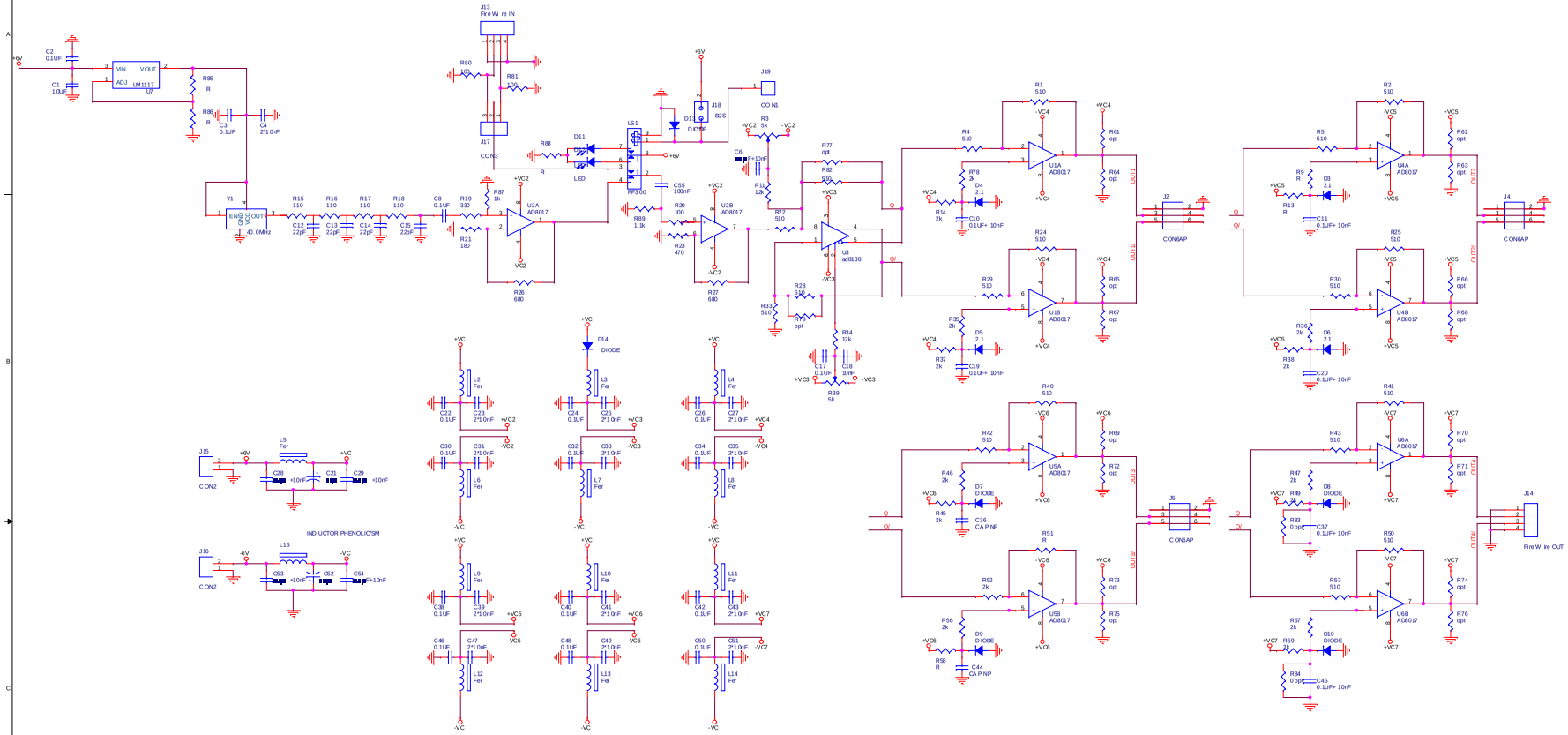
General

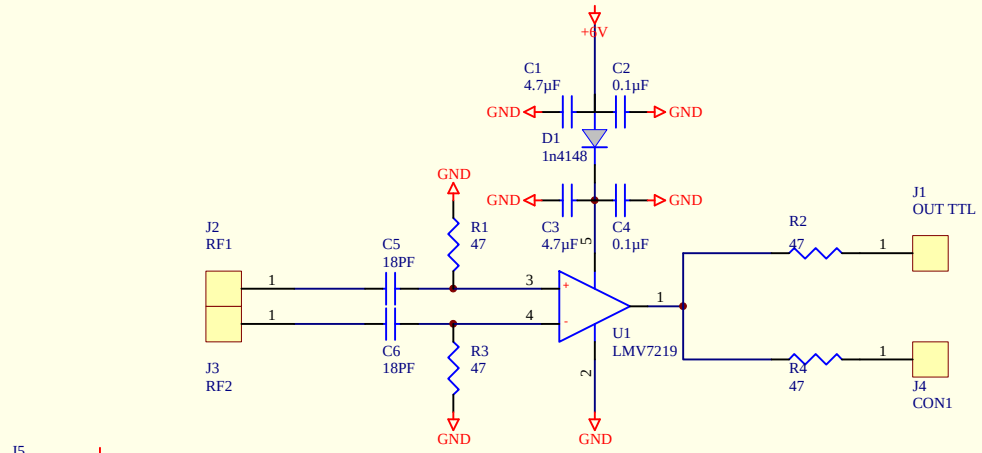
CAMAC module with no N,A,F commands.
Power requirements: 200 mA at +6V, 120 mA at -6V

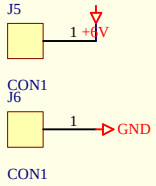
WARNINGS !!! WARNINGS !!! WARNINGS !!!

Do not connect a FIREWIRE OUTPUT socket with another FIREWIRE OUTPUT socket, it will damage the driver stage!qwer


Master/Slave
D11
LED Master
J13
Fire Wire IN
J17
Fire Wire In
Master Slave
+6V
-6V
J14
Fire Wire OUT
GND
CLK OUT
TTL CLK
UNIVERSAL CAMAC
COUNTER MODULE


+6V
C2 0.1UF
C1 10UF
VIN
VOUT
ADJ
LM1117
U7
R85 R
R86 R
C3 0.1UF
C4 2*10nF
J13 Fire W ire IN
J17 CON3
R80 10k
R81 10k
R88 R
D11 RED LED
LS1
RF300
+6V
D12 DIODE
J18 B2S
J19 CON S1
R3 5k
+VC2
-VC2
C6 1*10nF
R77 opt
R82 opt
R79 opt
+VC3
-VC3
R11 12k
R22 510
R28 510
R70 opt
R34 12k
C17 0.1UF
C18 10nF
R39 5k
C55 100nF
R20 300
R23 470
R89 1.1k
R27 680
R26 680
R87 1k
R21 180
U2A AD8017
U2B AD8017
Y1 40.0MHz
R15 110
R16 110
R17 110
R18 110
C8 0.1UF
R19 330
C12 22µF
C13 22µF
C14 22µF
C16 22µF
U3 ad8138
R1 510
R4 510
R78 2k
D4 2.1
C10 0.1UF+ 10nF
R14 2k
U1A AD8017
R61 opt
R64 opt
OUT1
R24 510
R29 510
R35 2k
D5 2.1
C19 0.1UF+ 10nF
R37 2k
U1B AD8017
R65 opt
R67 opt
OUT4
J2 CON6AP
R2 510
R5 510
R9 R
D3 2.1
R13 R
C11 0.1UF+ 10nF
U4A AD8017
R62 opt
R63 opt
OUT2
R25 510
R30 510
R36 2k
D6 2.1
C20 0.1UF+ 10nF
R38 2k
U4B AD8017
R66 opt
R68 opt
OUT5
J4 CON6AP
R40 510
R42 510
R46 2k
D7 DIODE
C36 CAP NP
R48 2k
U5A AD8017
R69 opt
R72 opt
OUT3
R51 R
R52 2k
R56 2k
D9 DIODE
R58 R
C44 CAP NP
U5B AD8017
R73 opt
R75 opt
OUT6
J5 CON6AP
R41 510
R43 510
R47 2k
D8 DIODE
R49 R
R83 0 opt
C37 0.1UF+ 10nF
U6A AD8017
R70 opt
R71 opt
OUT7
R50 510
R53 510
R57 2k
D10 DIODE
R59 R
R84 0 opt
C45 0.1UF+ 10nF
U6B AD8017
R74 opt
R76 opt
OUT8
J14 Fire W ire OUT
D14 DIODE
L2 Fer
L3 Fer
L4 Fer
L6 Fer
L7 Fer
L8 Fer
L9 Fer
L10 Fer
L11 Fer
L12 Fer
L13 Fer
L14 Fer
C22 0.1UF
C23 2*10nF
C24 0.1UF
C25 2*10nF
C26 0.1UF
C27 2*10nF
C30 0.1UF
C31 2*10nF
C32 0.1UF
C33 2*10nF
C34 0.1UF
C35 2*10nF
C38 0.1UF
C39 2*10nF
C40 0.1UF
C41 2*10nF
C42 0.1UF
C43 2*10nF
C46 0.1UF
C47 2*10nF
C48 0.1UF
C49 2*10nF
C50 0.1UF
C51 2*10nF
J15 CON2
J16 CON2
L5 Fer
L15 IND UCTOR PHENOLIC/SM
C28 +10nF
C29 +10nF
C31 +10nF
C54 +10nF





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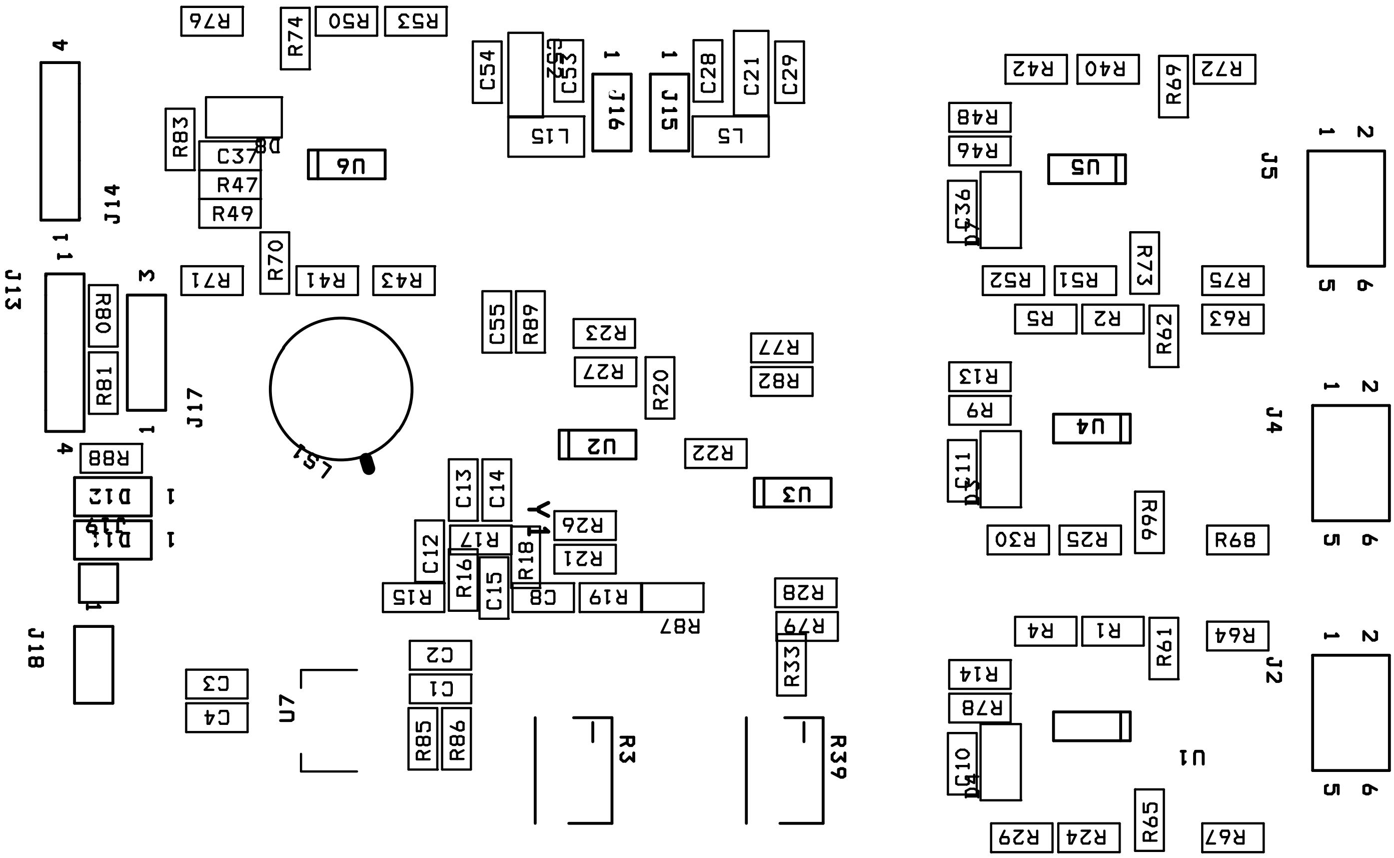
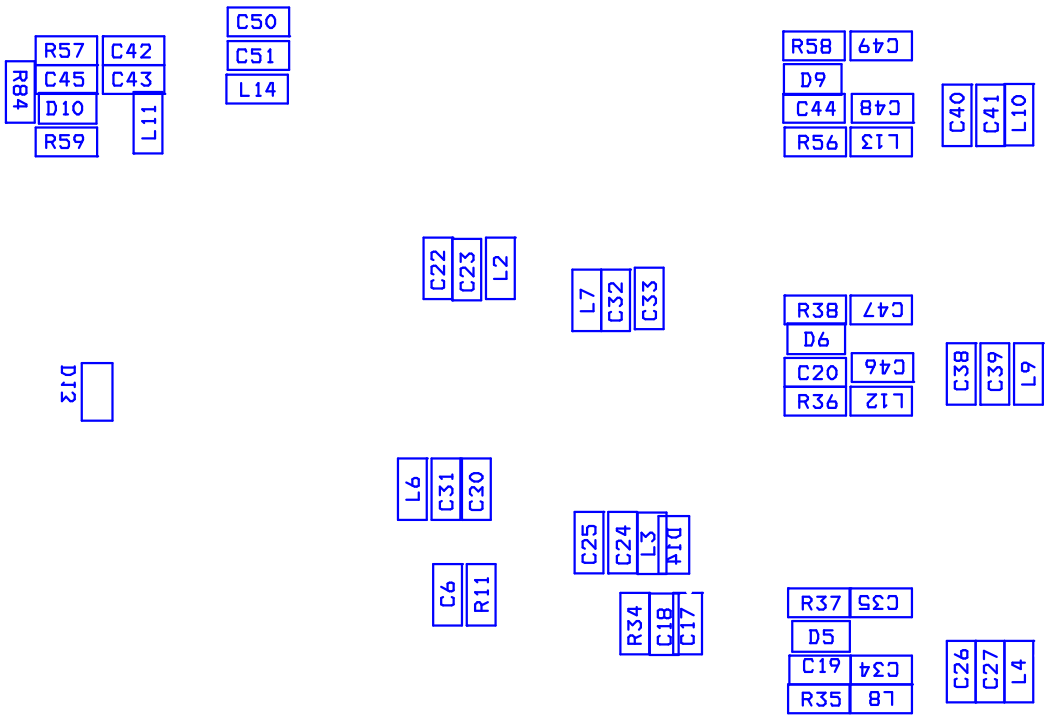


R76
R74
R50
R53
C54
C52
C53
J16
J15
C28
C21
C29
L15
L5
R83
C37
R47
R49
D8
U6
J14
J13
R80
R81
J17
R70
R71
R41
R43
LS1
C55
R89
R23
R27
R20
U2
R77
R82
R22
U3
R88
D12
D11
J19
J18
C13
C14
Y1
R26
R21
C12
R17
R16
C15
R18
R15
C8
R19
R87
R28
R79
R33
C2
C1
C3
C4
U7
R85
R86
R3
R39
R42
R40
R69
R72
R48
R46
U5
J5
C36
D7
R73
R52
R51
R75
R5
R2
R62
R63
R13
R9
U4
J4
C11
D5
R66
R30
R25
R68
R4
R1
R91
R64
R14
R78
J2
U1
C10
D4
R65
R29
R24
R67


C50
C51
L14
R57
C42
R84
C45
C43
D10
L11
R59
R58
C49
D9
C44
C48
C40
C41
L10
R56
L13
C22
C23
L2
L7
C32
C33
R38
C47
D6
C20
C46
C38
C39
L9
R36
L12
D12
L6
C31
C30
C25
C24
L3
D14
C6
R11
R34
C18
C17
R37
C35
D5
C19
C34
C26
C27
L4
R35
L8

Revised: Thursday, March 28, 2002
Revision:

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Item	Quantity	Reference	Part
1	1	C1	10UF
2	16	C2,C3,C8,C17,C22,C24,C26, C30,C32,C34,C38,C40,C42, C46,C48,C50	0.1UF
3	13	C4,C23,C25,C27,C31,C33, C35,C39,C41,C43,C47,C49, C51	2*10nF
4	4	C6,C28,C53,C54	0.1µF+10nF
5	6	C10,C11,C19,C20,C37,C45	0.1UF+10nF
6	4	C12,C13,C14,C15	22pF
7	1	C18	10nF
8	2	C52,C21	10µF
9	1	C29	0.1µF +10nF
10	2	C44,C36	CAP NP
11	1	C55	100nF
12	4	D3,D4,D5,D6	2.1
13	6	D7,D8,D9,D10,D13,D14	DIODE
14	2	D11,D12	LED
15	3	J2,J4,J5	CON6AP
16	1	J13	Fire Wire IN
17	1	J14	Fire Wire OUT
18	2	J16,J15	CON2
19	1	J17	CON3
20	1	J18	B2S
21	1	J19	CON1
22	1	LS1	RF300
23	13	L2,L3,L4,L5,L6,L7,L8,L9, L10,L11,L12,L13,L14	Fer
24	1	L15	INDUCTOR PHENOLIC/SM
25	18	R1,R2,R4,R5,R22,R24,R25, R28,R29,R30,R33,R40,R41, R42,R43,R50,R53,R82	510
26	2	R39,R3	5k
27	7	R9,R13,R51,R58,R85,R86, R R88	
28	2	R34,R11	12k
29	14	R14,R35,R36,R37,R38,R46, R47,R48,R49,R52,R56,R57, R59,R78	2k
30	4	R15,R16,R17,R18	110
31	1	R19	330
32	3	R20,R80,R81	100
33	1	R21	180
34	1	R23	470
35	2	R27,R26	680
36	18	R61,R62,R63,R64,R65,R66, R67,R68,R69,R70,R71,R72, R73,R74,R75,R76,R77,R79	opt
37	2	R84,R83	0 opt
38	1	R87	1k
39	1	R89	1.1k
40	5	U1,U2,U4,U5,U6	AD8017

41	1	U3	ad8138
42	1	U7	LM1117
43	1	Y1	40.0MHz