

Servicing the BBC Micro

Selection Link Survey

7. SELECTION LINK SURVEY

- 7.1. Here is a survey of the options which may be selected on the Microcomputer by Select Links S1 to S33. These links may take the form of tracks on the circuit board to be cut, soldered wire links or shorting jumpers plugging on to the rows of pins. Finally, there is a tabular survey of the options selected in production on the Model A and B Microcomputers.
- 7.2. Option Select Links are as follows:-
1. Used in issue 4 boards onwards only to select printer strobe or direct I/O pin output. Not fitted for issues 1 to 3.
 2. OPEN Enable ECONET NMI
 CLOSED Disable ECONET NMI
Do not fit this link with IC91 in place.
 3. Clock base frequency selection for ECONET (see circuit diagram).
 4. EAST Select 5¼" disc
 WEST Select 8" disc
 5. NORTH Enable ECONET clock
 SOUTH Disable ECONET clock
 6. NORTH Divide ECONET clock by 2
 SOUTH Divide ECONET clock by 4
 7. WEST Applies +5v to pin 30 of disc controller (IC78)
 EAST Applies 0v to pin 30 of disc controller

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5. NORTH Enable ECONET clock
SOUTH Disable ECONET clock

6. NORTH Divide ECONET clock by 2
SOUTH Divide ECONET clock by 4

7. WEST Applies +5v to pin 30 of disc controller (IC78)
EAST Applies 0v to pin 30 of disc controller

8. CLOSED Links disc head load signal to PL8.
OPEN Isolates disc head load signal from PL8
9. CLOSED Disables DISC NMI
OPEN Enables DISC NMI
Do not fit IC78 with this link closed. Due to PCB fault link must be made between pins 9 and 7 of IC27 for issues 1 and 2. Some issue 3 boards have this link as a track on component side which must be cut when NMI from disc is required.
10. WEST Select 5 1/2" disc
EAST Select 8" disc
11. Select Econet station ID (NORTH is LSB)
12. CLOSED Ties ROM select Line A to UV at IC20
OPEN ROM select Line A driven by IC76
Do not fit IC76 with this link closed.
13. CLOSED Ties ROM select line B to 0V at IC20
OPEN ROM select line B driven by IC76
Do not fit IC76 with this link closed.
14. CLOSED Disables ROM output from page FD, enables JIM
OPEN Enables ROM output from page FD, disables JIM
If open then link 16 must be closed.
15. CLOSED Disables fast access to page FD via IC23
OPEN Enables fast access to page FD via IC23
Link 15 must be closed if link 17 is open.
16. CLOSED Disable fast access to page FC via IC23
OPEN Enable fast access to page FC via IC23
Link 16 must be closed if link 14 is open.
17. CLOSED Disable ROM output from page FC, enable FRED
OPEN Enable ROM output from page FC, disable FRED
If link 17 is open then link 15 must be closed.
18. SOUTH Slow access to IC100 ROM
NORTH Fast access to IC100 ROM
19. WEST Slow access to ROM's IC52, IC88 and IC101
EAST Fast access to ROM's IC52, IC88 and IC101
Diodes D10, D11 and D12 may be selectively removed to speed up ROM's IC101, IC88 and IC52 respectively when link 19 is in WEST position.
20. SOUTH High ROM select bit to IC20 decoder from A13
NORTH High ROM select bit to IC20 decoder from ROMSEL 1
21. 2 x NORTH/SOUTH selects blocks A to B in IC51 and blocks C to F in IC's 52, 88, 100 and 101.
2 x EAST/WEST selects blocks C to F in IC51 and blocks A to B in IC's 52, 88, 100 and 101.
22. SOUTH Low ROM select bit to IC20 decoder from A12
NORTH Low ROM select bit to IC20 decoder from ROMSEL 0
23. OPEN RS423 receiver not terminated (DATA)
CLOSED RS423 receiver terminated (DATA)
See interface IC data.

7.3. Options selected in production are:-

No.	Fit Pins	Grid Ref.	Copper Track	Model 'A'	Model 'B'	Memory EPROM	Memory ROM	No.
1		2,108	S	X	X			1
2		2,161						2
3		2,173	E					3
4		12,12						4
5		26,195						5
6		26,205						6
7		30,65	W					7
8		32,15	X					8
9		35,128	X					9
10		45,15	W	X	X			10
11		75,210						11
12		97,70		X				12
13		100,67		X				13
14		101,53	X					14
15		107,97	X					15
16		108,90	X					16
17		108,52	X					17
18		110,52						18
19	3	102,102				S	N	19
20	3	123,55				W	E	20
21	2x2	122,65						21
22	3	127,70				2xN/S	2xE/W	22
23		177,215				S	N	23
24		181,195						24
25	3	215,185		S	N			25
26	3	221,68	W	W	W			26
27		226,95	W					27
28		237,144	W					28
29		237,146	E					29
30		284,20	E					30
31	3	270,170		W	W			31
32	3	295,65				E	W	32
33	3	295,67				E	W	33

X = Wire Link N = North S = South E = East W = West

North is side furthest from keyboard when PCB is viewed from the component side.

24. OPEN RS423 receiver not terminated (CTS)
CLOSED RS423 receiver terminated (CTS)
25. SOUTH Selects CAS for 16K RAM configuration
NORTH Selects CAS for 32K RAM configuration
26. WEST Selects normal video output
EAST Selects inverted video output
27. WEST Select 8 MHz clock for 5¼" disc
EAST Select 16 MHz clock for 8" disc
28. WEST Select base baud rate from baud rate generator
EAST Select 1300 baud cassette rate
If Link 28 is in EAST position RS423 baud rate is also affected.
29. EAST Select base baud rate from baud rate generator
WEST Select 1300 baud cassette rate
If Link 28 is in WEST position RS423 baud rate is also affected.
30. For future options to allow two or more ROM select signals to be 'WIRE-OR'ed.
31. WEST Selects +ve CSYNC to RGB video output
EAST Selects -ve CSYNC to RGB video output
32. WEST Selects A13 input to A13 pin of ROM's IC52 and IC88
EAST Selects +5v input to A13 pin of ROM's IC52 and IC88.
33. WEST Selects A13 input to A13 pin of ROM's IC100 and IC101.
EAST Selects +5v input to A13 pin of ROM's IC100 and IC101.

16. CLOSED Disable fast access to page FC via IC23
OPEN Enable fast access to page FC via IC23

Link 16 must be closed if link 14 is open.

17. CLOSED Disable ROM output from page FC, enable FRED
OPEN Enable ROM output from page FC, disable FRED

If link 17 is open then link 15 must be closed.

18. SOUTH Slow access to IC100 ROM
NORTH Fast access to IC100 ROM

19. WEST Slow access to ROM's IC52, IC88 and IC101
EAST Fast access to ROM's IC52, IC88 and IC101

Diodes D10, D11 and D12 may be selectively removed to speed up ROM's IC101, IC88 and IC52 respectively when link 19 is in WEST position.

20. SOUTH High ROM select bit to IC20 decoder from A13
NORTH High ROM select bit to IC20 decoder from ROMSEL 1

21. 2 x NORTH/SOUTH selects blocks 8 to B in IC51 and blocks C to F in IC's 52, 88, 100 and 101.

2 x EAST/WEST selects blocks C to F in IC51 and blocks 8 to B in IC's 52, 88, 100 and 101.

22. SOUTH Low ROM select bit to IC20 decoder from A12
NORTH Low ROM select bit to IC20 decoder from ROMSEL 0

23. OPEN RS423 receiver not terminated (DATA)
CLOSED RS423 receiver terminated (DATA).

See interface IC data.

24. OPEN RS423 receiver not terminated (CTS)
CLOSED RS423 receiver terminated (CTS)
25. SOUTH Selects CAS for 16K RAM configuration
NORTH Selects CAS for 32K RAM configuration
26. WEST Selects normal video output
EAST Selects inverted video output
27. WEST Select 8 MHz clock for 5¼" disc
EAST Select 16 MHz clock for 8" disc
28. WEST Select base baud rate from baud rate generator
EAST Select 1300 baud cassette rate
If link 28 is in EAST position RS423 baud rate is also affected.
29. EAST Select base baud rate from baud rate generator
WEST Select 1300 baud cassette rate
If link 28 is in WEST position RS423 baud rate is also affected.
30. For future options to allow two or more ROM select signals to be 'WIRE-OR'ed.
31. WEST Selects +ve CSYNC to RGB video output
EAST Selects -ve CSYNC to RGB video output
32. WEST Selects A13 input to A13 pin of ROM's IC52
and IC88
EAST Selects +5v input to A13 pin of ROM's IC52
and IC88.
33. WEST Selects A13 input to A13 pin of ROM's IC100
and IC101.
EAST Selects +5v input to A13 pin of ROM's IC100
and IC101.

Servicing the BBC Micro
Component Location Tables

TABLE NUMBER 1.- INTEGRATED CIRCUITS

IC No:	TYPE	PCB POSITION:	CIRCUIT DIAGRAM:	REMARKS
1	:6502A	: 160, 85	: J, 6	:
2	:6845	: 160,140	: D, 3	: CRT CONTROLLER:
3	:6522	: 90, 75	: E, 9	: INTERNAL VIA
4	:6850	: 128,141	: K, 5	: ACIA
5	:SAA5050	: 187,102	: J, 2	: TELETXT ROM
6	:5C094	: 214, 71	: G, 6 J, 1	: VIDEO ULA
7	:2C199	: 128,182	: L, 4	: SERIAL ULA
8	:81LS95	: 241, 62	: E, 1	:
9	:81LS95	: 241, 93	: E, 2	:
10	:81LS95	: 252, 63	: E, 3	:
11	:81LS95	: 252, 93	: E, 4	:
12	:81LS95	: 275, 62	: E, 4	:
13	:81LS95	: 264, 62	: E, 5	:
14	:74LS245	: 184, 71	: I, 4	:
15	:74LS273	: 196, 71	: I, 2	:
16	:LM555 CN:	: 7,210	: F, 7	:
17	:LM324N	: 6, 28	: D, 6	:
18	:76489 AN:	: 22, 44	: E, 7	: SOUND GEN'TOR
19	:LM386N-1:	: 52, 23	: E, 5	:
20	:74LS139	: 120, 23	: G,10 I, 8	:
21	:74LS00	: 120, 55	: J, 8	:
22	:74LS30	: 137, 55	: F,10	:
23	:74LS30	: 120, 80	: H, 9	:
24	:74LS138	: 135, 78	: F, 9	:
25	:74LS20	: 120,108	: G,10 J, 7	:
26	:74LS139	: 137,105	: F, 8 F, 9	:
27	:7438	: 3,124	: B, 5 D, 2	:
			: D,10 L, 7	:
28	:74LS51	: 50,143	: G, 7 I, 6	:
29	:74LS32	: 65,143	: E,6 H,7 H,8	:
30	:74LS74	: 78,143	: H, 6	:
31	:74LS34	: 90,143	: E, 9 H, 7	:
32	:74LS259	: 105,143	: E,10	:
33	:74LS04	: 58,164	: D,9 J,3 J,5	:
34	:74LS74	: 71,164	: I, 7	:
35	:LM324N	: 151,205	: M, 5	:
36	:74LS10	: 215,122	: D, 2 J, 3	:
37	:74LS04	: 228,122	: H,6 J,3 J,6	:
38	:74LS86	: 241,122	: E, 3	:
39	:74LS283	: 197,145	: D, 2	:
40	:74S00	: 206,149	: D,2 F,6 H,6	: WAS 74LS00
41	:74LS02	: 228,149	: D, 4 G, 4	:
42	:74LS163	: 241,158	: K, 6	:
43	:74S04	: 187,174	: G, 6 H, 5	:
44	:74LS74	: 206,174	: L, 1	:

TABLE NUMBER 1 CONT'D.- INTEGRATED CIRCUITS

IC No:	TYPE	PCB POSITION:	CIRCUIT DIAGRAM:	REMARKS
45	:74S139	: 228,172	: G, 5	:
46	:74S74	: 252,183	: L, 2	:
47	:74LS86	: 264,183	: M, 2	:
48	:74LS86	: 275,183	: L,1 M,1 M,2	:
49	:74LS00	: 286,183	: M, 1 M, 2	:
50	:74LS00	: 298,183	: L, 6 M, 1	:
51	:(27128)	: 214, 24	: H, 9	: OP.SYS.ROM
52	:(27128)	: 233, 24	: I, 9	: BASIC ROM
53	:4816AP-3	: 287, 69	: H, 2	:
54	:4816AP-3	: 287, 93	: H, 2	:
55	:4816AP-3	: 275, 93	: H, 3	:
56	:4816AP-3	: 298,146	: H, 4	:
57	:4816AP-3	: 287,146	: H, 2	:
58	:4816AP-3	: 275,146	: H, 2	:
59	:4816AP-3	: 264,146	: H, 3	:
60	:4816AP-3	: 252,146	: H, 4	:
61	:4816AP-3	: 298, 68	: F, 2	:
62	:4816AP-3	: 298, 93	: F, 2	:
63	:4816AP-3	: 264, 93	: F, 3	:
64	:4816AP-3	: 298,122	: F, 4	:
65	:4816AP-3	: 287,122	: G, 2	:
66	:4816AP-3	: 275,122	: G, 2	:
67	:4816AP-3	: 264,122	: G, 3	:
68	:4816AP-3	: 252,122	: G, 4	:
69	:6522	: 160, 29	: B, 5	: EXTERNAL VIA
70	:74LS244	: 137, 24	: B, 6	:
71	:74LS244	: 184, 29	: B, 4	:
72	:74LS245	: 199, 29	: B, 3	:
73	:uFD7002	: 100,173	: N, 6	: ADC CONVERTOR
74	:88LS120	: 183,201	: M, 4	:
75	:3691	: 207,199	: N, 4	:
76	:74LS163	: 70, 44	: J, 8	:
77	:74S00	: 38,143	: D, 8 D, 9	:
78	:8271	: 60, 75	: C, 9	: DISC CONT'LER
79	:7438	: 40, 26	: B, 9	:
80	:7438	: 57, 46	: B, 9	:
81	:74LS393	: 82, 46	: B, 8	:
82	:74LS10	: 97, 46	: C, 8	:
83	:4013	: 67, 24	: C, 7 D, 7	:
84	:4013	: 82, 24	: C, 7	:
85	:4020	: 97, 21	: B, 7	:
86	:74LS393	: 108, 23	: B, 7	:
87	:74LS123	: 43,164	: B,10 L, 8	:
88	:2764	: 252, 24	: I, 9	:
89	:68B54	: 15,125	: L, 8	: ADLC ECONET

TABLE NUMBER 1 CONT'D.- INTEGRATED CIRCUITS

IC No:	TYPE	PCB POSITION:	CIRCUIT DIAGRAM:	REMARKS
90	40178	16,162	M,10	:NOT FITTED
91	74LS132	27,166	L, 7 N, 9	
92	74LS74	16,188	N,10 O,10	:NOT FITTED
93	75159	13,166	N, 9	
94	LM319	45, 93	M, 8 M, 9	
95	LM319	20,193	M, 7 M, 8	
96	74LS244	82,185	L,10	
97	74LS74	4,171	L, 9	
98	TMS6100	15, 75	D, 8	:SPEECH ROM
99	TMS5220	35, 75	E, 7	:SPEECH GEN'TOR:
100	(Z128)	272, 24	J, 9	:SIDEWAYS ROM
101	(Z128)	290, 24	K, 9	

TABLE NUMBER 2 - TRANSISTORS

TRANS.No:	TYPE	CIRCUIT DIAGRAM:
Q 1	BC239	M, 5
Q 2	BC239	M, 5
Q 3	BC239	L, 5
Q 4	BC239	K, 3
Q 5	BC239	L, 3
Q 6	BC239	K, 3
Q 7	BC309	N, 2
Q 8	BC309	M, 2
Q 9	BC239	N, 1
Q10	2N3906	K, 2
Q11	BC239	A, 4

TABLE NUMBER 3 - DIODES

DIODE No:	TYPE	CIRCUIT DIAGRAM:	REMARKS
D 1	IN4148	F, 8	
D 2	IN4148	D, 6	
D 3	IN4148	N, 7	
D 4	IN4148	J, 8	:NOT FITTED
D 5	IN4148	J, 8	:NOT FITTED
D 6	IN4148	N, 6	

TABLE NUMBER 3 CONTINUED- DIODES

:DIODE No:	TYPE	:CIRCUIT DIAGRAM:	REMARKS
: D 7:	IN4148:	N, 6	:
: D 8:	IN4148:	N, 6	:
: D 9:	IN4148:	L, 5	:NOT FITTED
: D10:	IN4148:	H, 8	:NOT FITTED ISSUE 7 ON.
: D11:	IN4148:	H, 8	:NOT FITTED ISSUE 7 ON.
: D12:	IN4148:	H, 8	:NOT FITTED ISSUE 7 ON.
: D13:	IN4148:	M, 5	:
: D14:	IN4148:	C, 3	:
: D15:	IN4148:	C, 3	:
: D16:	IN4002:	K, 1	:
: D17:	IN4002:	K, 1	:
: D18:	IN4002:	K, 1	:
: D19:	IN4148:	M, 1	:
: D20:	IN4148:	L, 3	:
: D21:	IN4148:	L, 3	:
: D22:	IN4148:	L, 3	:

TABLE NUMBER 4 - CAPACITORS

:CAP.No:	TYPE	:CIRCUIT DIAGRAM:
: C 1:	2n2F PLATE CERAMIC	: D, 6
: C 2:	4u7F 16V RADIAL ELEC.	: D, 6
: C 3:	2n2F PLATE CERAMIC	: D, 6
: C 4:	NOT USED	: M, 9
: C 5:	10uF 16V RADIAL ELEC.	: D, 5
: C 6:	100nF DISC CERAMIC	: F, 7
: C 7:	2n2F PLATE CERAMIC	: D, 5
: C 8:	100nF DISC CERAMIC	: F, 7
: C 9:	10uF 16V RADIAL ELEC.	: D, 5
: C10:	10nF PLATE CERAMIC	: F, 8
: C11:	2n2F PLATE CERAMIC	: D, 5
: C12:	10pF PLATE CERAMIC	: E, 7
: C13:	1nF PLATE CERAMIC	: B,10
: C14:	47uF 10V AXIAL ELEC.	: C, 1
: C15:	100nF DISC CERAMIC	: D, 5
: C16:	47uF 10V AXIAL ELEC.	: E, 5
: C17:	2n2F PLATE CERAMIC	: L, 9
: C18:	10uF 10V TANTALUM	: N, 8
: C19:	NOT USED	:
: C20:	47nF DISC CERAMIC	: E, 5

TABLE NUMBER 4 CONTINUED- CAPACITORS

CAP.No:	TYPE	CIRCUIT DIAGRAM:
C21:	100nF DISC CERAMIC	E, 7
C22:	NOT USED	
C23:	10nF PLATE CERAMIC	L, 8
C24:	100nF DISC CERAMIC	F, 7
C25:	33nF POLYESTER	N, 6
C26:	47uF 10V AXIAL ELEC.	D, 1
C27:	1uF 35V TANTALUM	N, 6
C28:	4u7F 10V TANTALUM	L, 5
C29:	2n2F PLATE CERAMIC	M, 5
C30:	10uF 10V TANTALUM	L, 5
C31:	820pF PLATE CERAMIC	N, 5
C32:	4n7F PLATE CERAMIC	N, 5
C33:	4n7F PLATE CERAMIC	M, 5
C34:	200/220nF	N, 5
C35:	820pF PLATE CERAMIC	O, 5
C36:	47uF 10V TANTALUM	D, 1
C37:	33pF PLATE CERAMIC	F, 6
C38:	2n2F PLATE CERAMIC	M, 3
C39:	2n2F PLATE CERAMIC	M, 3
C40:	10nF PLATE CERAMIC	G, 6
C41:	220pF PLATE CERAMIC	H, 6
C42:	33pF PLATE CERAMIC	F, 5
C43:	47pF PLATE CERAMIC	N, 4
C44:	NOT USED	H, 6
C45:	10nF PLATE CERAMIC	M, 1
C46:	47pF PLATE CERAMIC	N, 4
C47:	10uF 10V TANTALUM	K, 1
C48:	270pF PLATE CERAMIC	H, 5
C49:	150pF PLATE CERAMIC	M, 2
C50:	47pF PLATE CERAMIC	N, 2
C51:	15/22pF PLATE CERAMIC	K, 2
C52:	390pF PLATE CERAMIC	K, 2
C53:	100pF PLATE CERAMIC	K, 2
C54:	47uF 10V TANTALUM	D, 1
C55:	100pF PLATE CERAMIC	K, 1
C56:	39pF PLATE CERAMIC	N, 1
C57:	10uF 10V TANTALUM	D, 1
C58:	470pF PLATE CERAMIC	N, 2
C59:	220nF	M, 5
C60:	4u7F 10V TANTALUM	D, 1

NOTE: CAPACITOR MARKED * = SELECT ON TEST.

TABLE NUMBER 5 - RESISTORS

RESISTOR No.:	VALUE	CIRCUIT DIAGRAM:	REMARKS
R 1	:10k	D, 6	
R 2	:10k	D, 6	
R 3	:10k	E, 6	
R 4	:22k	D, 6	
R 5	:100k	C, 6	
R 6	:4k7	A, 5	
R 7	:100k	C, 6	
R 8	:10k	D, 6	
R 9	:39k	D, 6	
R 10	:3k3	D, 2	
R 11	:100k	C, 6	
R 12	:220k	C, 6	
R 13	:1M	F, 7	
R 14	:10R	D, 5	
R 15	:39k	C, 6	
R 16	:22K	D, 5	
R 17	:10k	D, 5	
R 18	:10R	D, 5	
R 19	:	N,10	:NOT USED
R 20	:1M	F, 8	
R 21	:1M	F, 7	
R 22	:150R	C,10	
R 23	:150R	C,10	
R 24	:39k	D, 5	
R 25	:		:NOT USED
R 26	:		:NOT USED
R 27	:10k	C, 5	
R 28	:4k7	C, 5	
R 29	:1k	C, 5	
R 30	:10k	D, 6	
R 31	:4k7	E, 7	
R 32	:150k	E, 7	
R 33	:1k	E,10	
R 34	:10k 2%	N, 8	
R 35	:10k 2%	N, 8	
R 36	:1M5	M, 8	
R 37	:1k	E,10	
R 38	:100k 2%	N, 8	
R 39	:100k 2%	N, 8	
R 40	:100k 2%	N, 8	
R 41	:100k 2%	N, 8	
R 42	:		:NOT USED
R 43	:		:NOT USED
R 44	:1M5	M, 9	
R 45	:10k 2%	M, 8	

TABLE NUMBER 5 CONTINUED - RESISTORS

RESISTOR No.:	VALUE	CIRCUIT DIAGRAM:	REMARKS
R 46	:1k	M, 8	
R 47	:1k5 2%	N, 8	
R 48	:1k 2%	N, 8	
R 49	:150R	E, 10	
R 50	:39k	L, 9	
R 51	:10k 2%	N, 8	
R 52	:1k	M, 9	
R 53	:1k	D, 7	
R 54	:		:NOT USED
R 55	:3k3	H, 8	:NOT USED,ISS.7 ON
R 56	:		
R 57	:10R	E, 5	
R 58	:150R	A, 8	
R 59	:56k 2%	M, 8	
R 60	:56k 2%	M, 7	
R 61	:1k	M, 8	
R 62	:56k 2%	M, 7	
R 63	:56k 2%	M, 7	
R 64	:1M5	M, 7	
R 65	:3k3	C, 10	
R 66	:10k	E, 10	
R 67	:10k	E, 10	
R 68	:3k3	E, 7	
R 69	:3k3	J, 8	
R 70	:3k3	E, 7	
R 71	:2k7	N, 6	
R 72	:3k3	H, 10	:NOT USED,ISS.7 ON
R 73	:3k3	G, 10	:NOT USED,ISS.7 ON
R 74	:2k2	L, 5	
R 75	:82k	L, 5	
R 76	:10k	M, 5	
R 77	:100k	M, 5	
R 78	:150k	N, 5	
R 79	:820k	N, 5	
R 80	:39k	N, 5	
R 81	:3k3	J, 6	
R 82	:150k	N, 5	
R 83	:4k7	E, 4	
R 84	:10k	M, 5	
R 85	:3k3	J, 6	
R 86	:220k	N, 5	
R 87	:8k2	N, 5	
R 88	:8k2	M, 5	
R 89	:4k7	M, 5	
R 90	:4k7	M, 5	

TABLE NUMBER 5 CONTINUED - RESISTORS

RESISTOR No.:	VALUE	CIRCUIT DIAGRAM:	REMARKS
R 91	:820R	G, 6	
R 92	:820R	G, 6	
R 93	:3k3	N, 4	
R 94	:100R	H, 6	
R 95	:2k2	N, 4	
R 96	:3k3	N, 4	
R 97	:2k2	N, 4	
R 98	:1k2	G, 5	
R 99	:1k2	J, 2	
R100	:1k2	J, 2	
R101	:1k0	K, 2	
R102	:100R	F, 5	
R103	:1k0	J, 3	
R104	:100R	I, 8	:NOT USED,ISS.4 ON
R105	:100R	H, 6	
R106	:56R	H, 4	
R107	:1k0	G, 5	
R108	:3k3	C, 3	
R109	:1k8/2k7	L, 1	:SELECT ON TEST
R110	:68R	N, 3	
R111	:68R	N, 3	
R112	:68R	N, 3	
R113	:68R	N, 3	
R114	:18R 1W	K, 1	
R115	:1k0	N, 3	
R116	:3k9	N, 3	
R117	:2k2	M, 3	
R118	:1k0	N, 3	
R119	:100R	H, 5	
R120	:82R	L, 3	
R121	:82R	K, 3	
R122	:82R	K, 3	
R123	:470R	N, 2	
R124	:56R	G, 4	
R125	:100R	I, 8	:NOT USED,ISS.4 ON
R126	:3k9	N, 2	
R127	:1k5	N, 2	
R128	:470R	M, 2	
R129	:68R	N, 2	
R130	:68R	M, 3	
R131	:56R	G, 4	
R132	:120k	N, 1	
R133	:120k	N, 1	
R134	:1k0	N, 2	
R135	:1k0	N, 1	

TABLE NUMBER 5 CONTINUED - RESISTORS

RESISTOR No.:	VALUE	CIRCUIT DIAGRAM:	REMARKS
R136	:2k2	M, 3	
R137	:3k9	M, 3	
R138	:1k5	M, 3	
R139	:1k0	M, 3	
R140	:1k0	N, 2	
R141	:2k7	N, 2	
R142	:100R	I, 8	:NOT USED,ISS.4 ON
R143	:12k	K, 2	
R144	:15k	K, 2	
R145	:1k0	K, 2	
R146	:1k5	K, 1	
R147	:3k9	K, 1	
R148	:820R	N, 2	
R149	:100R	I, 8	:NOT USED,ISS.4 ON
R150	:680R	N, 2	
R151	:470R	N, 1	
R152	:2k2	N, 2	
R153	:100R	I, 8	:NOT USED,ISS.4 ON
R154	:1k2	N, 1	
R155	:680R	N, 1	
R156	:3k3	N, 1	
R157	:680R	N, 1	
R158	:470R	N, 2	
R159	:270k	M, 5	
R160	:3k3	L, 5	
R161	:5k6	M, 4	
R162	:4k7	A, 6	
R163	:		:NOT USED
R164	:		:NOT USED
R165	:		:NOT USED
R166	:		:NOT USED
R167	:		:NOT USED
R168	:		:NOT USED
R169	:		:NOT USED
R170	:2k2	B, 5	
R171	:100R	M, 7	
R172	:10k	D, 6	
R173	:4k7	L, 8	
R174	:22k	L, 3	

