

## HLN9809B R1\*K Circuit Board

| REFERENCE<br>NUMBER | MOTOROLA<br>PART NO. | DESCRIPTION |
|---------------------|----------------------|-------------|
|---------------------|----------------------|-------------|

Capacitors, chip, 5%, 50V unless otherwise indicated

|     |             |                     |
|-----|-------------|---------------------|
| C1  | 08-11051A19 | poly 1 uF 63V       |
| C2  | 23-11048B19 | lytic 47 uF 20% 16V |
| C3  | 23-11048B19 | lytic 47 uF 20% 16V |
| C5  | 21-13741B69 | .1 uF               |
| C6  | 21-13740B65 | 470 pF              |
| C7  | 21-13740B65 | 470 pF              |
| C8  | 21-13741B69 | .1 uF               |
| C9  | 23-11048B06 | lytic 2.2 uF 20%    |
| C10 | 23-11048B06 | lytic 2.2 uF 20%    |
| C11 | 23-11048B06 | lytic 2.2 uF 20%    |
| C12 | 23-11048B06 | lytic 2.2 uF 20%    |

Diodes (see note)

|     |             |                     |
|-----|-------------|---------------------|
| CR1 | 48-88245C22 | light emitting, GRN |
| CR2 | 48-88245C24 | light emitting, RED |
| CR3 | 48-88245C23 | light emitting, YEL |
| CR4 | 48-05129M76 | silicon MMBD914     |
| CR5 | 48-05129M76 | silicon MMBD914     |
| CR6 | 48-84616A01 | hot carrier         |
| CR7 | 48-05129M76 | silicon MMBD914     |
| CR8 | 48-05129M76 | silicon MMBD914     |
| CR9 | 48-80008E01 | silicon 1N4005      |

Fuse

|    |             |       |
|----|-------------|-------|
| F1 | 65-05214E04 | 2 amp |
|----|-------------|-------|

Jumpers

|     |             |                |
|-----|-------------|----------------|
| JU1 | 09-84181L01 | push-on, 2-pin |
|-----|-------------|----------------|

Connectors

|    |             |               |
|----|-------------|---------------|
| J1 | 09-83112N01 | 6-pin "TELCO" |
| J2 | 09-83112N01 | 6-pin "TELCO" |
| J3 | 28-80923V01 | male, 16-pin  |
| J4 | 28-80923V01 | male, 16-pin  |
| J5 | 28-80923V01 | male, 16-pin  |
| J6 | 28-80002R03 | 3-pin header  |

Transistors (see note)

|     |             |                           |
|-----|-------------|---------------------------|
| Q1  | 48-80214G01 | PNP; type MMBT3906        |
| Q2  | 48-00869681 | PNP; type M9681           |
| Q3  | 48-80214G02 | NPN; type MMBT3904        |
| Q4  | 48-80214G02 | NPN; type MMBT3904        |
| Q5  | 48-80214G02 | NPN; type MMBT3904        |
| Q6  | 48-80214G02 | NPN; type MMBT3904        |
| Q7  | 48-80214G02 | NPN; type MMBT3904        |
| Q8  | 48-00869660 | field effect; type 2N5461 |
| Q9  | 48-80214G01 | PNP; type MMBT3906        |
| Q10 | 48-80214G01 | PNP; type MMBT3906        |
| Q11 | 48-80214G02 | NPN; type MMBT3904        |
| Q12 | 48-80214G02 | NPN; type MMBT3904        |
| Q13 | 48-80214G01 | PNP; type MMBT3906        |
| Q14 | 48-80214G01 | PNP; type MMBT3906        |
| Q15 | 48-80214G02 | NPN; type MMBT3904        |

Resistors, chip, 5%, 1/8 watt

|    |             |      |
|----|-------------|------|
| R1 | 06-11077B15 | 47k  |
| R2 | 06-11077A98 | 10k  |
| R3 | 06-11077A98 | 10k  |
| R4 | 06-11077A98 | 10k  |
| R5 | 06-11077A84 | 2.7k |
| R6 | 06-11077A78 | 1.5k |
| R7 | 06-11077A78 | 1.5k |
| R8 | 06-11077B15 | 47k  |
| R9 | 06-11077B15 | 47k  |

|     |             |                |
|-----|-------------|----------------|
| R10 | 06-11077A98 | 10k            |
| R11 | 06-11077A98 | 10k            |
| R12 | 06-11077B15 | 47k            |
| R13 | 06-11077B15 | 47k            |
| R14 | 06-11077A78 | 1.5k           |
| R15 | 06-11077B15 | 47k            |
| R16 | 06-11077B15 | 47k            |
| R17 | 06-11077B15 | 47k            |
| R18 | 06-11077A98 | 10k            |
| R19 | 06-11077B15 | 47k            |
| R20 | 06-11077A98 | 10k            |
| R21 | 06-11077A98 | 10k            |
| R22 | 06-11077B15 | 47k            |
| R23 | 18-05500L05 | variable, 4.7k |
| R24 | 18-05500L05 | variable, 4.7k |
| R25 | 06-11077A78 | 1.5k           |
| R26 | 06-11077A78 | 1.5k           |
| R27 | 06-11077B15 | 47k            |
| R28 | 06-11077A78 | 1.5k           |
| R29 | 06-11077A84 | 2.7k           |
| R30 | 06-11077B15 | 47k            |
| R31 | 06-11077A98 | 10k            |
| R32 | 06-11077A50 | 100            |
| R33 | 06-11077A90 | 4.7k           |
| R34 | 06-11077A90 | 4.7k           |
| R35 | 06-11077B15 | 47k            |
| R36 | 06-11077A84 | 2.7k           |
| R37 | 06-11077A78 | 1.5k           |
| R38 | 06-11077A84 | 2.7k           |
| R39 | 06-11077B15 | 47k            |
| R40 | 06-11077B15 | 47k            |
| R41 | 06-11077B15 | 47k            |
| R42 | 06-11077B15 | 47k            |
| R43 | 06-11077A84 | 2.7k           |
| R44 | 06-11077B15 | 47k            |
| R45 | 06-11077A50 | 100            |
| R46 | 06-11077B15 | 47k            |
| R47 | 06-11077A78 | 1.5k           |
| R48 | 06-11077A78 | 1.5k           |
| R49 | 06-11077B15 | 47k            |
| R50 | 06-11077A90 | 4.7k           |
| R51 | 06-11077A90 | 4.7k           |
| R52 | 06-11077A98 | 10k            |
| R53 | 06-11077A98 | 10k            |
| R54 | 06-11077A98 | 10k            |
| R55 | 06-11077A90 | 4.7k           |
| R56 | 06-11077A90 | 4.7k           |
| R57 | 06-11077B15 | 47k            |

Switches

|    |             |               |
|----|-------------|---------------|
| S1 | 40-84324C10 | 4PDT          |
| S2 | 40-83022M04 | SPST (12 pos) |
| S3 | 40-80065E02 | DPDT          |

Integrated circuits (see note)

|    |             |                               |
|----|-------------|-------------------------------|
| U1 | 51-84887K13 | MC14013 CMOS dual D flip-flop |
| U2 | 51-84621K73 | MC78L08P 8 volt regulator     |

Voltage regulator, 250 mW (see note)

|     |             |                      |
|-----|-------------|----------------------|
| VR1 | 48-80140L11 | zener diode 7.5V SOT |
| VR2 | 48-80140L11 | zener diode 7.5V SOT |
| VR3 | 48-80140L11 | zener diode 7.5V SOT |
| VR4 | 48-80140L11 | zener diode 7.5V SOT |
| VR5 | 48-80140L11 | zener diode 7.5V SOT |

Non-referenced items

|             |  |
|-------------|--|
| 14-84360C01 | insulator (two used under S1, one used under S3) |
|-------------|--|

Note: For optimum performance, diodes, transistors and integrated circuits must be ordered by Motorola part numbers.