J3 TESTPOINT — VCC in Rack 38

J4 TESTPOINT — Power ground (common in Racks 5 and 38)

J2 TESTPOINT — VCC in Rack 5

U16D, U16E, U16F: SN7404N — U11B, U11C, U11D: LM339N

U11-6: "+5V" in Rack 5 divided by 2 (nominally 2.50V)
U11-7: normally, 1.731V; if U11-6 goes below 1.731V, positive feedback drives U11-7 up to 1.763V
U11-1: normally low (0.1V); high if input voltage is out of spec

1% resistors

< 3.5V

R83 1.87k, R85 100k, R86 10k, U11A LM339N — [LOW] — U16A [HIGH] — U16B [LOW] — U16C [HIGH] — R59 261 — D38 "< 3.5V" Super Red

No power in Rack 5

U10-10: "+5V" in Rack 5 divided by 2 (nominally 2.50V)
U10-11: normally, 2.750V; if U10-10 goes below 2.750V, positive feedback drives U10-11 down to 2.727V
U10-13: normally high (4.95V); low if input voltage is out of spec

1% resistors

> 5.5V

R73 825, R75 100k, R76 10k, U10D LM339N — [HIGH] — U15C [LOW] — U15D [HIGH] — R57 261 — D36 "> 5.5V" Yellow — U15E [HIGH] — R58 261 — D37 "< 4.5V" Yellow

U10-8: "+5V" in Rack 5 divided by 2 (nominally 2.50V)
U10-9: normally, 2.250V; if U10-8 goes below 2.250V, positive feedback drives U10-9 up to 2.277V
U10-14: normally low (0.1V); high if input voltage is out of spec

U13C SN74LS02N — U15F SN7404N [LOW] — *VCCs differ by more than 0.5V*

1% resistors

"< 4.5V"

R63 1.21k, R65 100k, R66 10k, U10C LM339N — [LOW] — U15A [HIGH] — U15B [LOW]

U10-5: "+5V" in Rack 5 divided by 2 (nominally 2.50V)
U10-4: normally, 2.630V; if U10-4 goes above 2.630V, positive feedback drives U10-5 down to 2.607V
U10-2: normally high (4.95V); low if input voltage is out of spec

1% resistors

"> 5.25V"

R53 909, R55 100k, R56 10k, U10B LM339N — [HIGH] — U12C [LOW] — U12D [HIGH] — R49 261 — D34 "> 5.25V" Yellow — U12E [HIGH] — R50 261 — D35 "< 4.75V" Yellow

U10-6: "+5V" in Rack 5 divided by 2 (nominally 2.50V)
U10-7: normally, 2.368V; if U10-6 goes below 2.368V, positive feedback drives U10-7 up to 2.395V
U10-1: normally low (0.1V); high if input voltage is out of spec

1% resistors

"< 4.75V"

R43 1.10k, R45 100k, R46 10k, U10A LM339N — [LOW] — U12A [HIGH] — U12B [LOW]

R41 499, R42 499, R44 1.00k

U13A SN74LS02N — [HIGH] — U12F SN7404N [LOW] — U14A DM74S140 — [HIGH] — *VCCs differ by more than 0.25V* — D32 Big Yellow LED — R47 121

U14B DM74S140

Normal logic state is in square brackets []

U7C SN74LS02 — [HIGH] — U9A DM74S140 [LOW] — U9B DM74S140

U8 SN74LS30 — [LOW]

D33 Power OK Big Green LED — R48 121 [LOW]

D3 Big Red LED — R31 121 [HIGH]

U6A, U6B, U6C, U6D: SN74LS02 — [HIGH]

U7A, U7B: SN74LS02 — [HIGH]

At least one out of 12 humidity discriminators is above threshold

J1 HEADER 40X2

For bus pin-out, please see the schematic diagram for BATMAN-2

C1–C11, C12–C16: 100nf

U13D, U13B, U7D: SN74LS02N

Broken water sensor cable — D29 Super Red, D30 Green — R29 261, R30 261 — U5C, U5D: SN7404N

US water detector Bar boxes 0 through 5 — D25 Super Red, D26 Green — R25 261, R26 261 — U5F, U5E: SN7404N

US water detector Bar boxes 6 through 11 — D27 Super Red, D28 Green — R27 261, R28 261 — U5A, U5B: SN7404N

Bar box 0 — D1 Super Red, D2 Green — R1 261, R2 261 — U1F, U1E: SN7404N

Bar box 1 — D3 Super Red, D4 Green — R3 261, R4 261 — U1A, U1B: SN7404N

Bar box 2 — D5 Super Red, D6 Green — R5 261, R6 261 — U1C, U1D: SN7404N

Bar box 3 — D7 Super Red, D8 Green — R7 261, R8 261 — U2F, U2E: SN7404N

Bar box 4 — D9 Super Red, D10 Green — R9 261, R10 261 — U2A, U2B: SN7404N

Bar box 5 — D11 Super Red, D12 Green — R11 261, R12 261 — U2C, U2D: SN7404N

Bar box 6 — D13 Super Red, D14 Green — R13 261, R14 261 — U3F, U3E: SN7404N

Bar box 7 — D15 Super Red, D16 Green — R15 261, R16 261 — U3A, U3B: SN7404N

Bar box 8 — D17 Super Red, D18 Green — R17 261, R18 261 — U3C, U3D: SN7404N

Bar box 9 — D19 Super Red, D20 Green — R19 261, R20 261 — U4F, U4E: SN7404N

Bar box 10 — D21 Super Red, D22 Green — R21 261, R22 261 — U4A, U4B: SN7404N

Bar box 11 — D23 Super Red, D24 Green — R23 261, R24 261 — U4C, U4D: SN7404N

Title	BATMAN-3: LED board for monitoring status of humidity discriminators, ultrasonic water sensors, broken water sensor cables, and power in Rack 5	
Size: B	Number: Designed by Sasha Telnov (avtelnov@jbl.gov)	Revision: 1.5
Date: 21-Sep-1998		Sheet of
File: G:\telnov\protel\batman3_5v.Sch		Drawn By: