

Fluke 801BR/AG diff dc voltmeter

Ser. 1095

Clean complete condition. Dials rotate fine.

Hardwired for 230Vac input. PE ok. Megger 1kV primary to PE at 180Meg. Mains 0.21A nominal, so 2A fuse ok.

Rack version of 801B, and contains a Zener diode reference.

- Differential Voltmeter 801B has a standard cell; the 801B/AG has a Zener diode.
- AN/USM-98 is the military designation for the 801. 801R is a rack-mounted version.
- AN/USM-98A is the military designation for the 801B and 801B/AG.
- AN/USM-98B is similar to the 801B. 801BR is the rack-mounted version of the 801B.
- 825A/AG is a premium version of the 801B with a 1mV null detector vs 10mV.

- <https://www.eevblog.com/forum/testgear/fluke-801br-partial-teardown-and-a-bit-of-repair/>

- <https://www.eevblog.com/forum/testgear/old-fluke-multimeters/msg2658522/#msg2658522>

- [http://dg3hda.de/doku.php?id=fluke\\_801br](http://dg3hda.de/doku.php?id=fluke_801br)

Fig 5 – 8.1 USM98B schematic doesn't show C208 0.1uF coupling cap from V202 to V203A on 803B-210 pcb – see 803 schematic.

TM 11-6625-599-12

TM 11-6625-599-40P-2.

TM 9 4935 282 34 ([http://bee.mif.pg.gda.pl/ciasteczkowypotwor/Fluke/803D\\_Army.pdf](http://bee.mif.pg.gda.pl/ciasteczkowypotwor/Fluke/803D_Army.pdf))

TM 9 6625 1866 50

([https://www.eserviceinfo.com/preview.php?fileid=39752&file=Fluke\\_801\\_Army.gif](https://www.eserviceinfo.com/preview.php?fileid=39752&file=Fluke_801_Army.gif))

Pcb heat stress under 6BQ5

6BQ5            kM1 B6B2 (kM=EL84; Blackburn, 1966 Feb)

12AX7           I65 Δ513    (I6=12AX7; Herlen 1965)

12AX7           I63 B6A3    (I6=12AX7; Blackburn, 1966 Jan)

6AW8A

EF86            8Y1 B5K5    (8Y=EF86; Blackburn, 1965 Nov)

OA2

Zener Diode 871A-412            Release date 5-2-66

Chopper relay Airpax 190 (50Hz 6.3V, 155Ω coil 170Ω measured), [175 series for 60Hz]

801B-307 Rev9 pcb – marked 801B-423 500V REF SUPPLY 1-8-62

803B-310 Rev3 pcb null detector

803B-318 Rev4 pcb

Range 500 DL1 indicator bulb blown: GE47            X2051

chopper relays in the differential VM, like 801/803 have limited life span, and are unobtainium today.

Mains input resistance 8.2R, and 1100Meg IR at 1kVdc. But rivet oxidation between metal panels/chassis shows up high protective earthing resistance between different chassis panels, and PE connection is to an internal panel that has suspect low resistance to other panels.

+/- input terminals – null switch influence – input voltage divider :

- VTVM – 51.6Mohm from  $4 \times 10^9 + 1 = 50M$ , with some minor change due to range switch, and due to operate switch for 0.5 range – as expected.

[Dalmura.com.au](http://Dalmura.com.au)

- 10 null – 10.22Mohm from 9+1.
- 0.1 null – 9.98M or 10.22M from 9 + 1// input to operate/cal
- 0.01 null – 773k or 1.019M from 1M // input to operate.

Valve socket/pins cleaned/lubricated.

Null detector pcb C214A/B 20+20uF 450V caps were reformed to 450V, and OA2 checked to operate at 145V for 200Vdc in, and nominal leakage on R209 and R214.

500V REF Supply pcb: C103 is 400V rated. V104/85A2 OG3 is 85V nom and measured at 90V. C101 and C102 (20uF 500V) reformed to 485V, but C102 leakage starting to increase above 400V, so both replaced by 47uF 450V 105C new ecaps. C106 (1500uF 16V) with <16uA leakage at 15V. V105 dc heater circuit checked ok for 300mA.

Operation idle checks:

220Vac mains:

V105 heater voltage at 6.0Vdc; C101/C102 mid-point at 50%; V105 cathode R117 at 87V; V106 cathode R116 at 192V.

C214A at 248V; C214B at 199V; V204 at 146V; V202/203 B+ at 137V; V202 anode at 46V; V203A anode at 37V; V203B anode at 100V.

At 240Vac mains the heaters are both 6.3Vrms.

### Remedial changes:

Added extra protective earth links to various metal panels.

Added 1M bleeder across C20B on null detector pcb.

Added reverse bias protection 1N4007 diodes across C101 and C102.

Calibration as per Fluke\_801\_Army section III.

Limited by uncal Picotest M3510A. Need to use HP 738BR.

68M $\Omega$  (measured as 68.6 via Picotest) measured as 74M $\Omega$ , so some tolerance likely.

Rear recorder terminals not tested.

Check self calibration frequently if needed.

Need 1x GE47 6V3 incandescent bulb.

