

The B-file contains most of the data collected by the Brewer during one day of operation. It contains results from direct sun DS routine, and zenith ZS routine for both O3 and N2 modes and calibration and diagnostic tests as mercury lamp measurement, etc. Also the results from Umkehr measurements are in the file. The counts from UX or UV routine are not in the B-file.

Excerpts from “*Brewer MKIV Spectrophotometer Operator’s Manual OM-BA-C231 REV B*”, August 15, 1999 (page 71-75)

**B Files: BJJJYY.nnn**

‘B’, or Brewer, files contain most of the raw data collected by the Brewer.

B files begin with the characters “version”. The beginning of a B file contains three sections: the version string, a data header, and the instrument constants. Following is a description of the format of each B file section.

**Data Header – B file**

Each B file begins with a data header.

Example	Name
Version=2	B file version number
Dh	Header
25	Day
11	Month
98	Year
Saskatoon	location name
52.108	latitude
106.713	Longitude
3.45	Temperature in volts
Pr	Pressure header
1000	Mean Pressure

Temperature, in volts (TE%) - Read from the PMT thermistor. The temperature in °C is calculated using the equation:  $Temp(C) = -33.27 + TE\% \times 18.64$

**Instrument Constants – B file**

This section of the B file starts with the header “inst”. See Appendix B for the format of ICFJJJYY.nnn.

**Dispersion constants – B file**

This section of the B file starts with the header “disp”. See Appendix B for the format of DCFJJJYY.nnn.

**Zenith Sky Constants - B file**

This section of the B file starts with the header “zeni”. See Appendix B for the format of ZSFJJJYY.nnn.

**Comment Block – B file**

Comments may be generated by the user with the CO command, and may also be automatically generated by some routines.

EXAMPLE	Name
Co	Comment header
13:20:14	Time comment was logged
User: text	Comment source: comment text

**Direct Sun, Focused Moon, or Zenith Sky Data – B file**

NOTE: line 8 is omitted in the Focused Moon B file.

#	Example	Name
1	ds	type of measurement
2	a	Filter
3	64	ND filter position of #2 Filterwheel (in steps)
4	978.87	time – minutes since 00:00 hrs
5	0	lower slit mask position (1=dark)
6	6	upper slit mask position (6=slit 5)
7	20	# of cycles
8	625382	raw counts wavelength #0
9	11	dark count
10	13879	raw counts wavelength #1
11	345676	raw counts wavelength #2
12	437926	raw counts wavelength #3
13	728264	raw counts wavelength #4
14	805262	raw counts wavelength #5
15	rat	ratio header
16	15671	single ratio #1 MS(4)
17	8345	single ratio #2 MS(5)
18	2820	single ratio #3 MS(6)
19	1	single ratio #4 MS(7)

The above 19 lines are repeated for 5 times for DS or FM measurements and 7 times for ZS measurements; the multiple measurements are then averaged in the summary shown below.

#	Example	Name
1	Summary	Summary header
2	16:20:02	Time
3	mar	Month
4	08/	Day
5	92	Year
6	68.024	zenith angle
7	2.617	Airmass
8	-5	Temperature (°C)
9	ds	type of measurement
10	1	ND filter pos'n
11	15578	single ratio #1 MS(4)
12	8312	single ratio #2 MS(5)
13	2801	single ratio #3 MS(6)
14	-5	single ratio #4 MS(7)
15	15594	double ratio #1 MS(8)
16	6920	double ratio #2 MS(9)
17	.3	SO <sub>2</sub> value MS(10)
18	404.4	O <sub>3</sub> value MS(11)
19	71	st'd dev. Single ratio #1
20	28	st'd dev. Single ratio #2
21	16	st'd dev. Single ratio #3
22	5	st'd dev. Single ratio #4
23	56	st'd dev. Double ratio #1
24	11	st'd dev. Double ratio #2
25	.4	SO <sub>2</sub> st'd dev.
26	.6	O <sub>3</sub> st'd dev.

### Focused Moon – B file

See “Direct Sun, Focused Moon, or Zenith Sky Data – B file”

NOTE: line 8 (raw counts wavelength #0) is omitted in the Focused Moon B file.

### HG Calibration Data – B file

Example	Name
Hg	Type of measurement
12:10:22	Time of measurement
.9995	Correlation value
287.1829	Calculated micrometer step
287	Micrometer set to this step #
190255	Peak intensity of the HG scan
28	Temperature (deg. C)

Correlation Value: The correlation between the stored and measured spectra.

Calculated Micrometer Step number: The micrometer position of the HG peak

### Standard Lamp Test Data – B file

#	Example	Name
1	SI	Type of measurement
2	A	Filter
3	0	ND filter position of filterwheel #2 (in steps)
4	737.41	Time – minutes since 00:00 hrs
5	0	Lower slit mask position (1=dark)
6	6	Upper slit mask position (6=slit 5)
7	20	# of cycles
8	625382	Raw counts wavelength #0
9	43	Dark count
10	644575	Raw counts wavelength #1
11	710539	Raw counts wavelength #2
12	839228	Raw counts wavelength #3
13	914419	Raw counts wavelength #4
14	981043	Raw counts wavelength #5
15	Rat	Ratios header
16	1543	Single ratio #1 MS(4)
17	1116	Single ratio #2 MS(5)
18	385	Single ratio #3 MS(6)
19	300	Single ratio #4 MS(7)

These lines are repeated for a total of 7 sets of data per SL test. This data is then averaged in the following summary.

#	Example	Name
1	Summary	Summary header
2	12:19:09	Time
3	mar	Month
4	08/	Day
5	98	Year
6	104.612	mean zenith angle during measurement
7	3.777	mean airmass

8	6	temperature (°C)
9	sl	type of measurement
10	0	ND filter position (in steps)
11	1523	mean single ratio #1 R1 MS(4)
12	662	mean single ratio #2 R2 MS(5)
13	-126	mean single ratio #3 R3 MS(6)
14	-783	mean single ratio #4 R4 MS(7)
15	4028	mean double ratio #1 R5 MS(8)
16	2056	mean double ratio #2 R6 MS(9)
17	824997.5	mean of counts from wavelength #1
18	971515.6	mean of counts from wavelength #5
19	2	standard deviation of single ratio #1
20	3	standard deviation of single ratio #2
21	4	standard deviation of single ratio #3
22	4	standard deviation of single ratio #4
23	13	standard deviation of double ratio #1
24	8	standard deviation of double ratio #2
25	387	standard deviation of counts wavelength #1
26	632	standard deviation of counts wavelength #5

**Umkehr Data – B file**

Umkehr data taken alternately at 5 ‘short’ wavelengths and 5 ‘long’ wavelengths. The short/long wavelength measurement sequence is repeated for as long as the UM command is engaged.

The following data is from a measurement at short wavelengths.

#	Example	Name
1	Um	type of measurement
2	25	Day
3	11	Month
4	98	Year
5	Saskatoon	location name
6	52.1	Latitude
7	106.7	Longitude
8	3.49	last temperature (volts)
9	pr	Pressure header
10	1000	Mean pressure (mill bars)
11	0	ND filter position
12	1157.87	time - minutes since 00:00 hrs.
13	1	lower slit mask position
14	6	upper slit mask
15	40	# of slitmask cycles
16	625382	raw counts wavelength #0
17	120	dark count
18	97706	raw counts wavelength #1
19	294523	raw counts wavelength #2
20	759956	raw counts wavelength #3
21	1087648	raw counts wavelength #4
22	962462	raw counts wavelength #5
23	rat	Ratio
24	105525	Single ratio #1 MS(4)
25	5722	Single ratio #2 MS(5)
26	1572	Single ratio #3 MS(6)
27	-574	Single ratio #4 MS(7)

Incorrect! This record (line 16) is not printed into a B-file.

