

**Calibration Report:
Brewer #076, China – April 11-15, 2002**

Introduction:

Ozone calibration on three Brewers from China was carried out at Haidain Region of Beijing during period April 11-15/02. This Brewer from Longfenshan was last calibrated three years ago. The weather co-operated for parts of three days and comparative ozone measurements with the traveling standard Brewer #017 were made. The instrument had changed (standard lamp ratios up ~10%) on arrival and the reason is assumed to be due to small scratch marks on grating.

Ozone Calibration Results:

The instrument's constants in use were set at values from last calibration in 1999: ETC's = 3105/3390; absorption coefficients = 0.34719/1.159. Using these constants the ozone results from #076 were high by ~10% compared to standard instrument #017. The instrument's standard lamp (SL) ratios R6/R5 were at 2225/4260, a change of +240/+360) from last calibration and from last operation in Longfenshan in April. Applying this change to ETC constants made the results too low and further adjustment left poor operation at high air mass values. A complete new set of constants were calculated and much better results were achieved as noted below and graph on last page.

After collecting some sun scan test results, the cal step for HG wavelength calibration was adjusted to 297 from step 300.

	day	O3	dev	SO2	dev	#/tot	mu	hr
#017 standard	10202	390.1	+4.7	0.9	+0.6	69/117	141	4
	10302	348.9	+4.0	3.3	+0.7	65/111	141	3
#076 initial - with 1999 constants	10102	431.4	+15	-4.4	+1.3	38/ 63	135	3
#076 with ETC's = 3390/4275	10102	397.3	+9.0	5.8	+1.7	32/ 60	138	2
Absn. = 0.32/1.02, and DT=40ns.	10202	388.9	+3.7	2.8	+1.9	49/ 74	145	5
	10302	350.3	+4.4	2.8	+0.8	26/ 87	146	3

Other Lamp Calibration checks:

Dispersion test was done on HG and Cd lamps (5 lines) and new dispersion constants (ref file DCF10302.076) were made. These constants produced ~10 step differences on some slit positions and so the new file is recommended for future use. Reference dispersion test processed results in file LVF10302.076 and graph of slit function.

Servicing:

Servicing included lubricating pushrod bearing and zenith gear. Rubber seals under shock mounts and on lip of cover base were replaced. This instrument still has old style Hammond power supply without diodes on 5 volt lines and so some voltages are high but instrument is running properly.

The pin (D) that has broke off in computer connector on instrument is not used and so wire that was being used in substitute was pulled back and not used now.

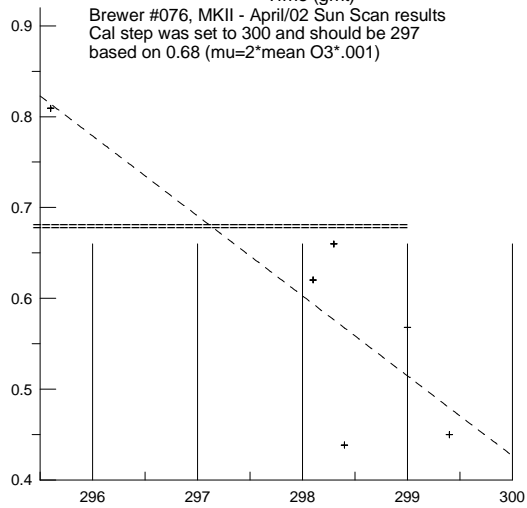
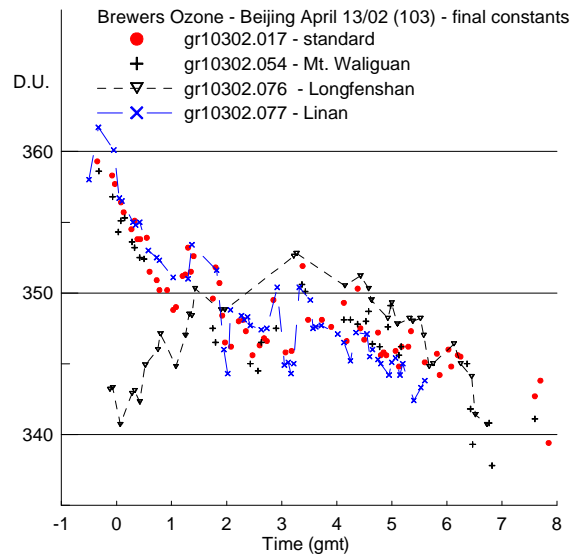
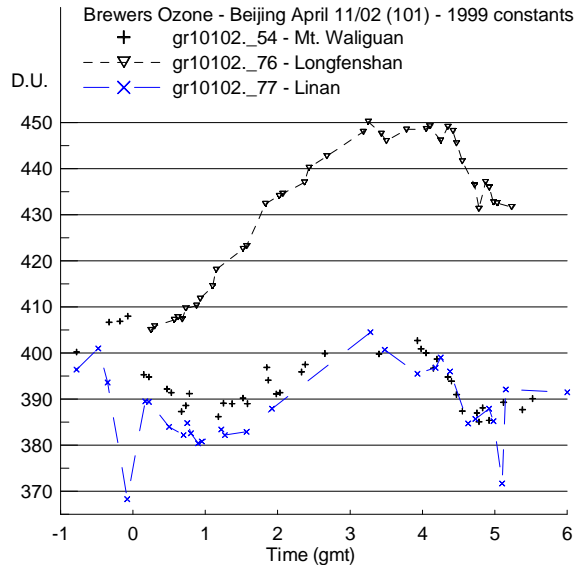
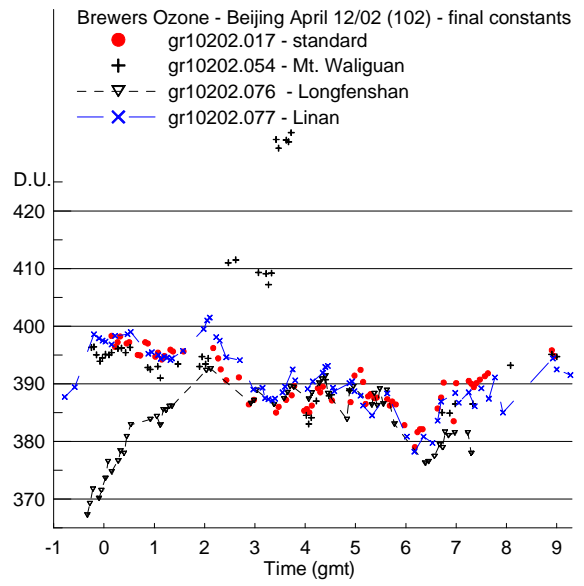
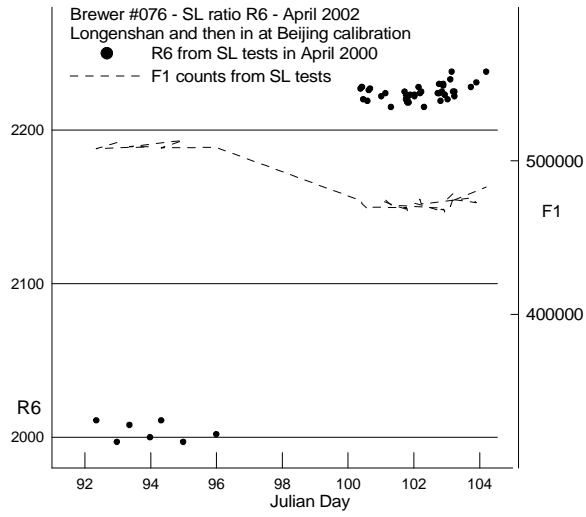
Recommendations and Software Changes:

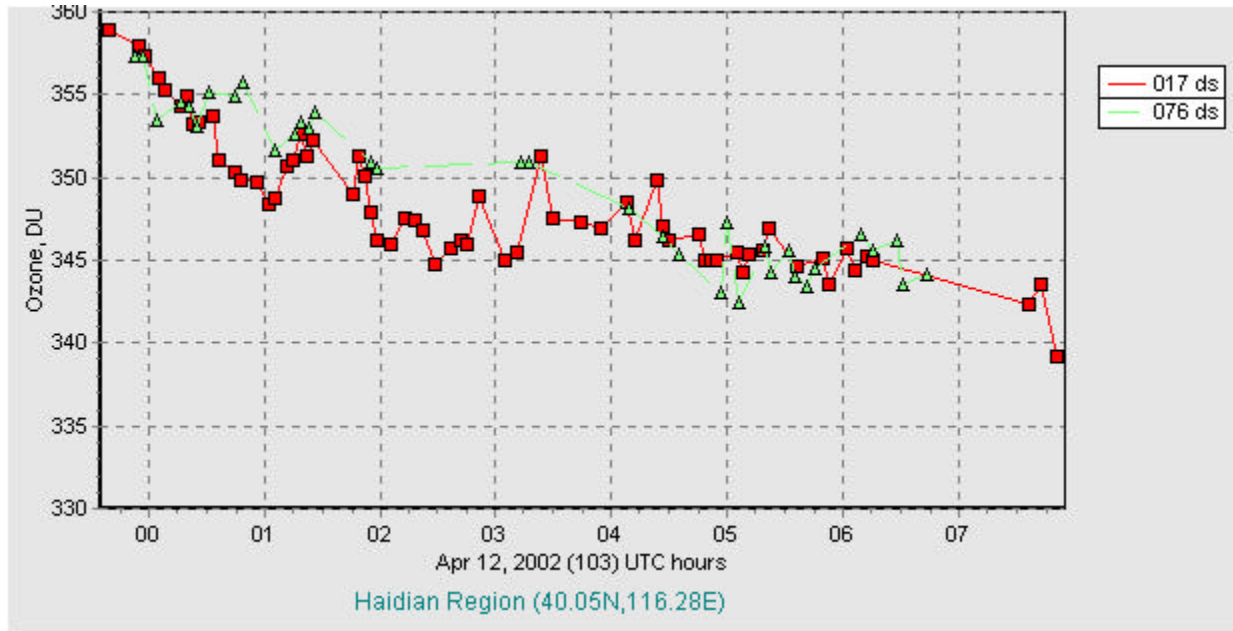
1. Operating Software changes recommended are: main program (main.bas) was upgraded to V3.7c+ which has added display features in screen box and can not change the computer date. IOS program 'setdate.exe' is set to operate in batch file just before Brewer programs are started. Setdate reads the date from computer and records it into op_st.090 file along with setting A/D option to ON.

Graphical Results:

The SL ratio graph shows the large shift in R6 between Longfenshan and Beijing. Note the high ozone results from this instrument on first day (101) using 1999 constants. The sun scan test results graph shows that step 143 is now the proper wavelength cal. The ozone results using final constants

except for #076 which were ETC corrected only for days 102, 103 below. Note #076 is lower at low zenith angles. On page 3 is day 103 reprocessed with final constants versus #017.





Below are graphs of slit function - scan of 2967 mercury lamp spectral line and Standard Lamp scan test results. The slit function is still normal. The SL scan from 1999 may not be representative of final operation of instrument.

