

NO. 162 ARIZONA-NASA ATLAS OF INFRARED SOLAR SPECTRUM, REPORT VI

by G. P. KUIPER, A. B. THOMSON, L. A. BIJL, AND D. C. BENNER

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ABSTRACT

In this paper we reproduce the solar spectrum as recorded with the LPL B-Spectrometer on the NASA CV-990, using the 1- μ grating (1200 lines/mm). The resolution is about 4 times lower than in the corresponding records obtained with the LPL 4-m spectrometer.

During the July-August 1968 flights of the NASA CV-990 Jet two LPL spectrometers were recording the solar spectrum: the 4-m spectrometer (*Comm. LPL* No. 126), of which records have been published in *Comm. LPL* Nos. 123, 124, 125, 160, and 161; and the B-spectrometer (a scaled-up version of the A-spectrometer, *Comm. LPL* No. 16, of about $1.5 \times$ larger dimensions). Part of the B-spectrometer records are published herewith.

The same type of auxiliary equipment (gratings, detectors, electronics) and cell widths, were used here as with the 4-m spectrometer. With the on-board vibration problems having essentially been solved, the lower resolving power of the B-spectrometer is found to be just in proportion to the shorter focal lengths of its camera mirror, 0.95 m vs. 3.92 m, a ratio of 4.1. The resolution in the spectra here reproduced is indeed 4 times lower than that in the corresponding 4-m spectra, *Comm. LPL* Nos. 123, 124, and 160.

The wavelength scale and classification of absorption lines are adapted from the 4-m spectra,

whose scale in turn was based on Babcock-Moore's *The Solar Spectrum $\lambda 6600-\lambda 13495$* and Mohler's *Table of Solar Spectrum Wavelengths 11984A-25578A*. The symbols in the spectra have the same meaning as before: a numbered dot *below* the spectral trace to be used for later reference; a dot *above* the trace for a water-vapor absorption; and vertical lines for O_2 and CO_2 absorptions. The observational data on Figs. 1-9 are listed in Table 1.

The continuum is sometimes distorted by minor interference fringes of the filter used, or else by guiding errors, which this time we have not indicated since for each spectral interval we were able to give independent traces.

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TABLE 1
 SOLAR SPECTRUM RECORDS, LPL B-SPECTROMETER, NASA CV 990 JET
 1 μ GRATING (1200 L/MM), SLIT AND CELL 0.10 MM, $\tau = 0.12$, 1 μ FILTER

FIG.	CHART	λ (\AA)	1968 DATE	UT	ALT. (FT.)	OUTSIDE TEMP. ($^{\circ}\text{C}$)	ALT. (FT.) CABIN	GAIN
1.	B1 a	8205- 8616	July 18	18:52	39,000	-56	8500	4-2
	b	8199- 8616	July 18	18:26	39,000	-56	8500	4-2
	c	8616- 9025	July 18	18:56	39,000	-56	8500	4-2
	d	8616- 9025	July 18	18:29	39,000	-56	8500	4-2
2.	B2 a	9025- 9424	July 18	18:59	39,000	-56	8500	4-2
	b	9025- 9424	July 18	18:33	39,000	-56	8500	4-2
	c	9424- 9815	July 18	19:02	39,000	-56	8500	4-2
	d	9424- 9815	July 18	18:37	39,000	-56	8500	4-2
3.	B3 a	9815-10192	July 18	19:05	39,000	-56	8500	4-2
	b	9815-10192	July 18	18:40	39,000	-56	8500	4-2
	c	10192-10565	July 18	19:09	39,000	-56	8500	4-2
	d	10192-10565	July 18	18:43	39,000	-56	8500	4-2
4.	B4 a	10565-10925	July 18	19:30	39,000	-56	8500	4-2
	b	10565-10925	July 18	19:12	39,000	-56	8500	4-2
	c	10925-11275	July 18	19:34	39,000	-56	8500	4-2
	d	10925-11275	July 18	19:14, 19:48	39,000	-56	8500	4-2
5.	B5 a	11275-11624	July 18	19:37	39,000	-56	8500	4-2
	b	11275-11624	July 18	19:51	39,000	-56	8500	4-2
	c	11624-11958	July 18	19:40	39,000	-56	8500	4-2
	d	11624-11958	July 18	20:02	39,000	-56	8500	4-2
6.	B6 a	11958-12264	July 18	20:05	39,000	-56	8500	4-2
	b	11958-12264	July 18	20:15	39,000	-56	8500	4-2
	c	12264-12560	July 18	20:08	39,000	-56	8500	4-2
	d	12264-12560	July 18	20:18	39,000	-56	8500	4-2, 4-3
7.	B7 a	12560-12844	July 19	18:26	39,000	-54	8500	5-1
	b	12560-12844	July 18, 19	20:21, 18:47	39,000	-55	8500	4-3, 5-1
	c	12844-13121	July 19	18:29	39,000	-54	8500	5-1
	d	12844-13121	July 19	18:50	39,000	-53	8500	5-1
8.	B8 a	13121-13387	July 19	18:32	39,000	-54	8500	5-1
	b	13121-13387	July 19	18:53	39,000	-53	8500	5-1
	c	13387-13642	July 19	18:35	39,000	-54	8500	5-1
	d	13387-13642	July 19	18:56	39,000	-53	8500	5-1
9.	B9 a	13642-13887	July 19	18:59	39,000	-53	8500	5-2
	b	13642-13887	July 19	18:38	39,000	-54	8500	5-1, 5-2
	c	13887-14098	July 19	19:02	39,000	-53	8500	5-2
	d	13887-13994	July 19	18:41	39,000	-54	8500	5-2

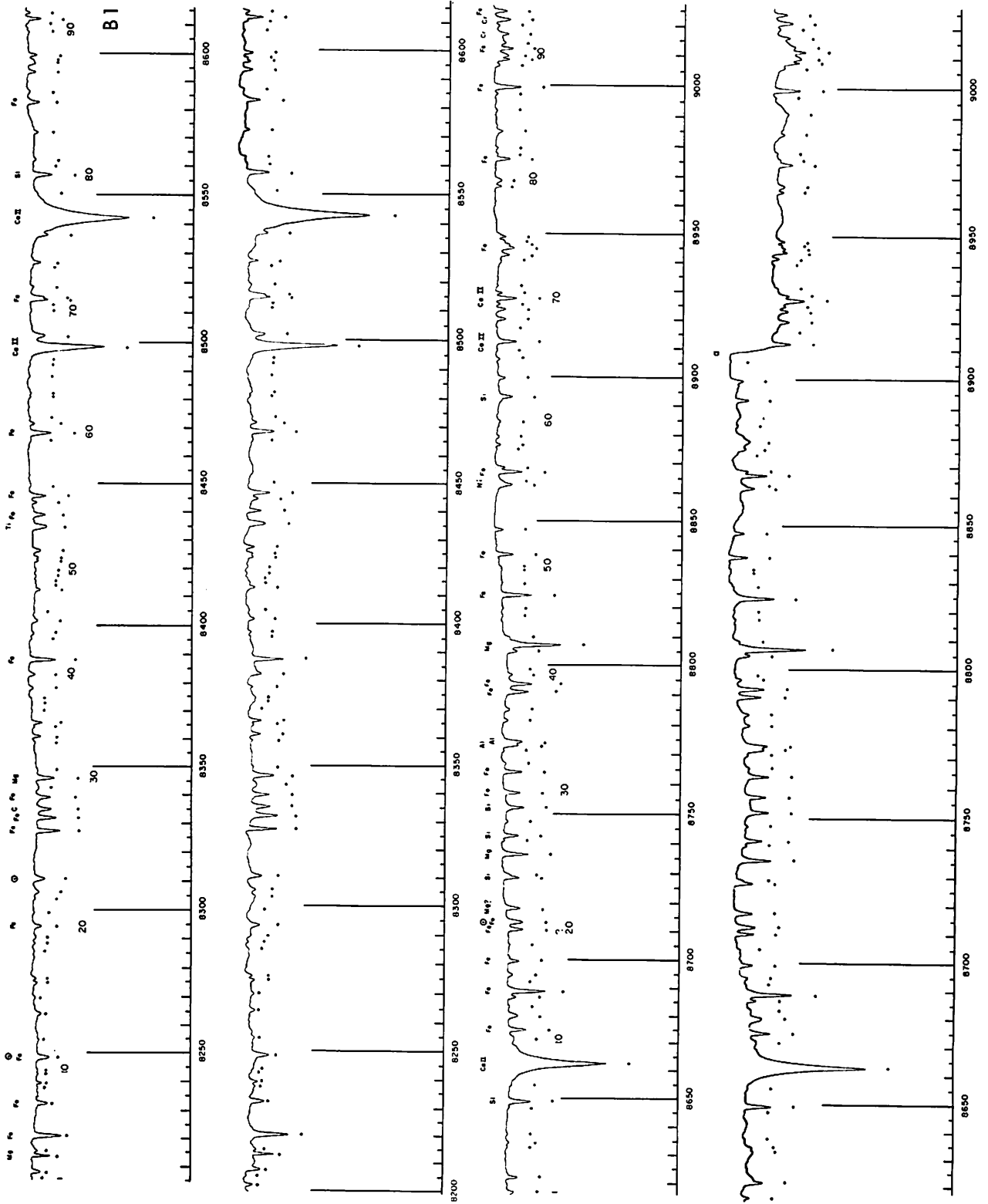


Fig. 1 B-spectrometer record of solar spectrum $\lambda\lambda 8199-9025$. "a" is slit length changed.

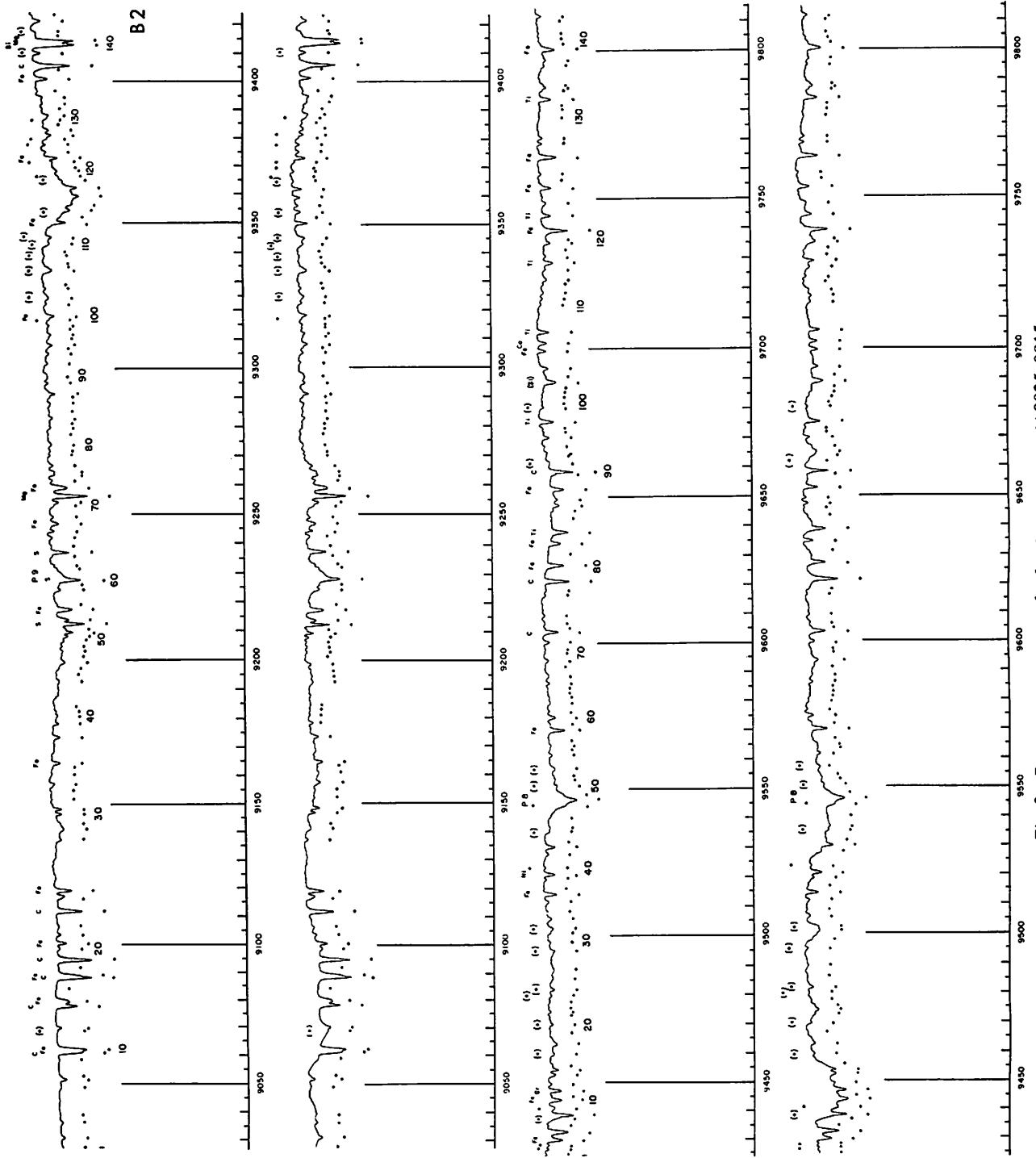


Fig. 2 B-spectrometer record of solar spectrum λ 9025-9815.

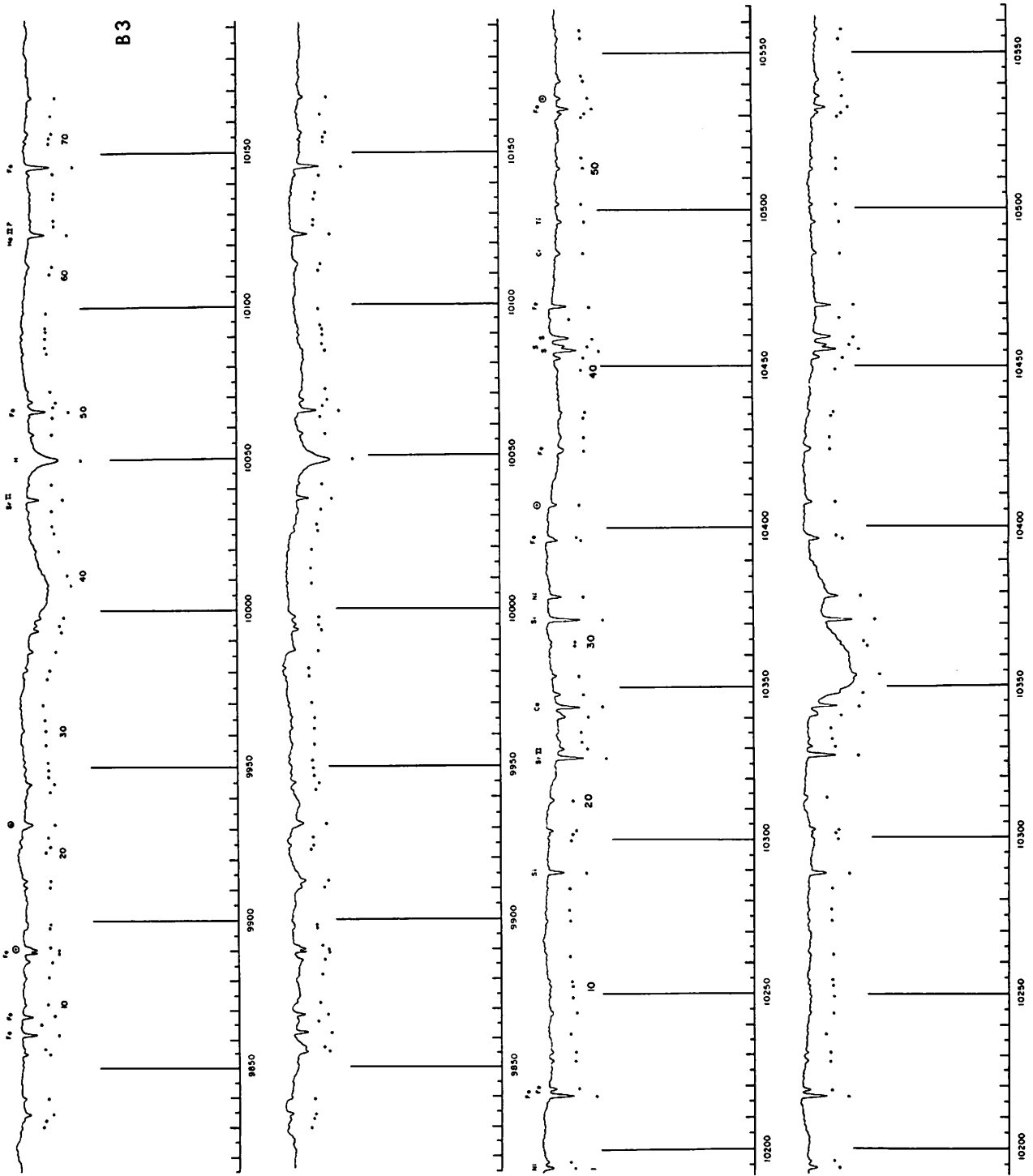


Fig. 3 B-spectrometer record of solar spectrum $\lambda\lambda 9815-10565$.

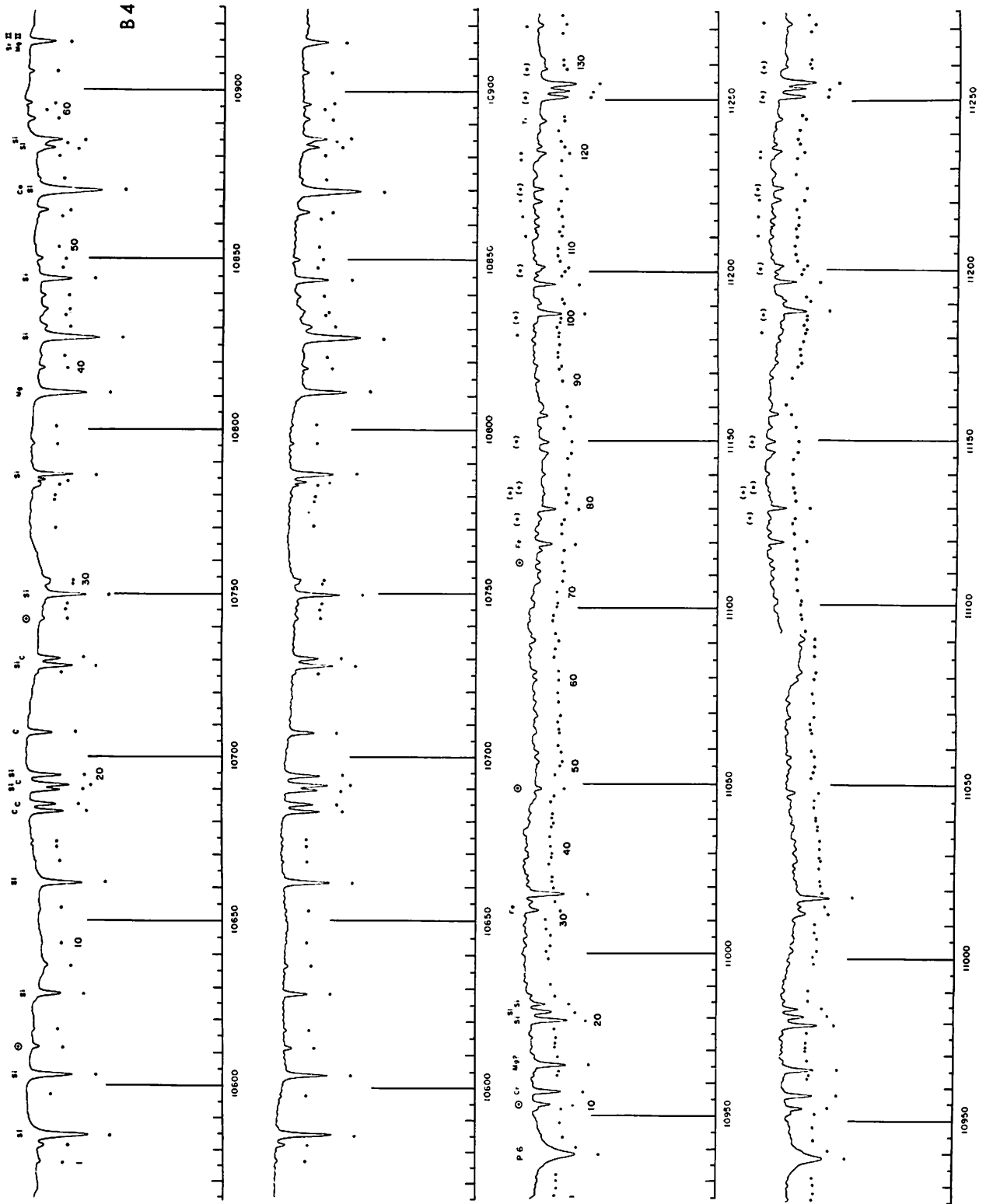


Fig. 4 B-spectrometer record of solar spectrum λ 10565–11275.

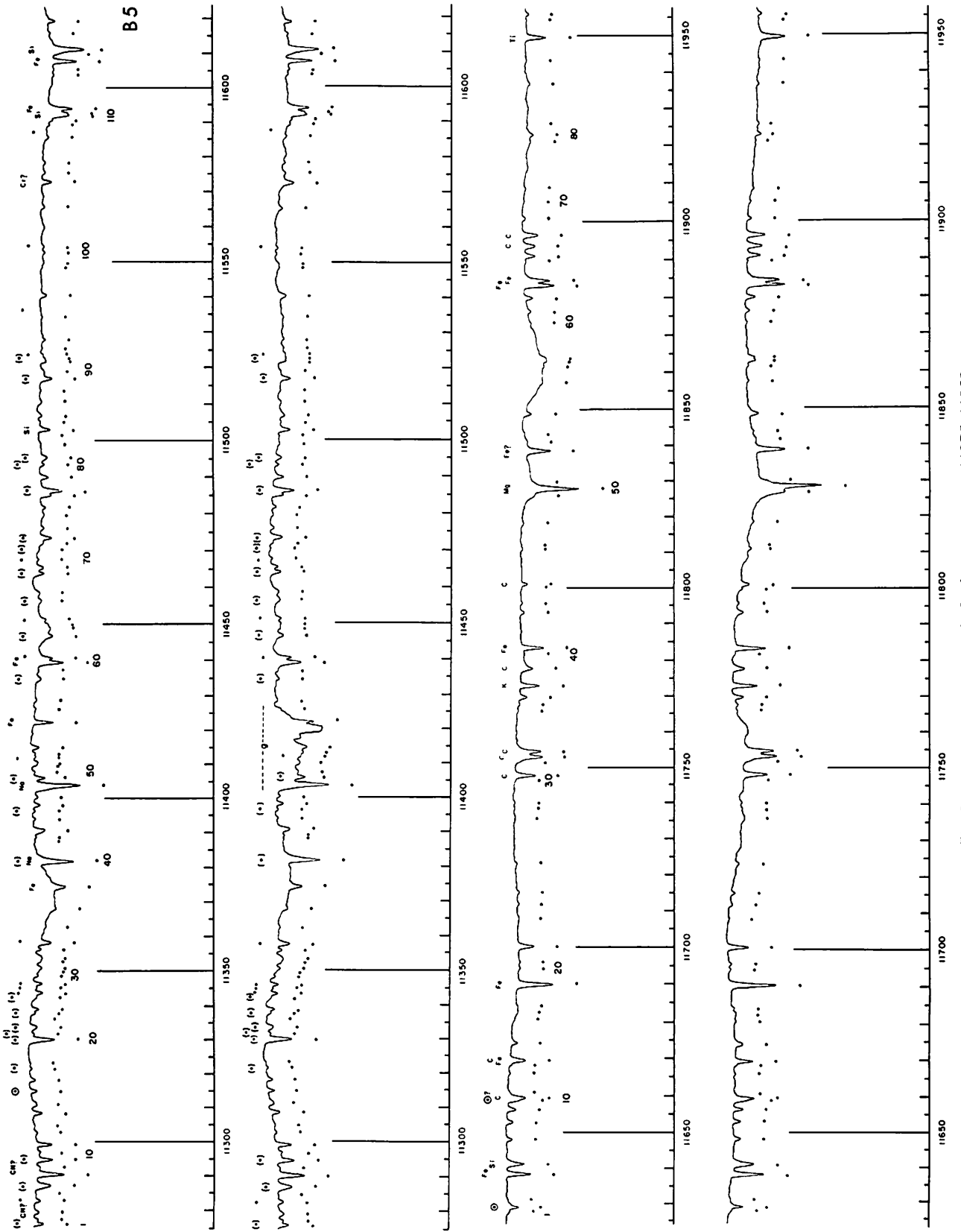


Fig. 5 B-spectrometer record of solar spectrum λ 11275-11958.

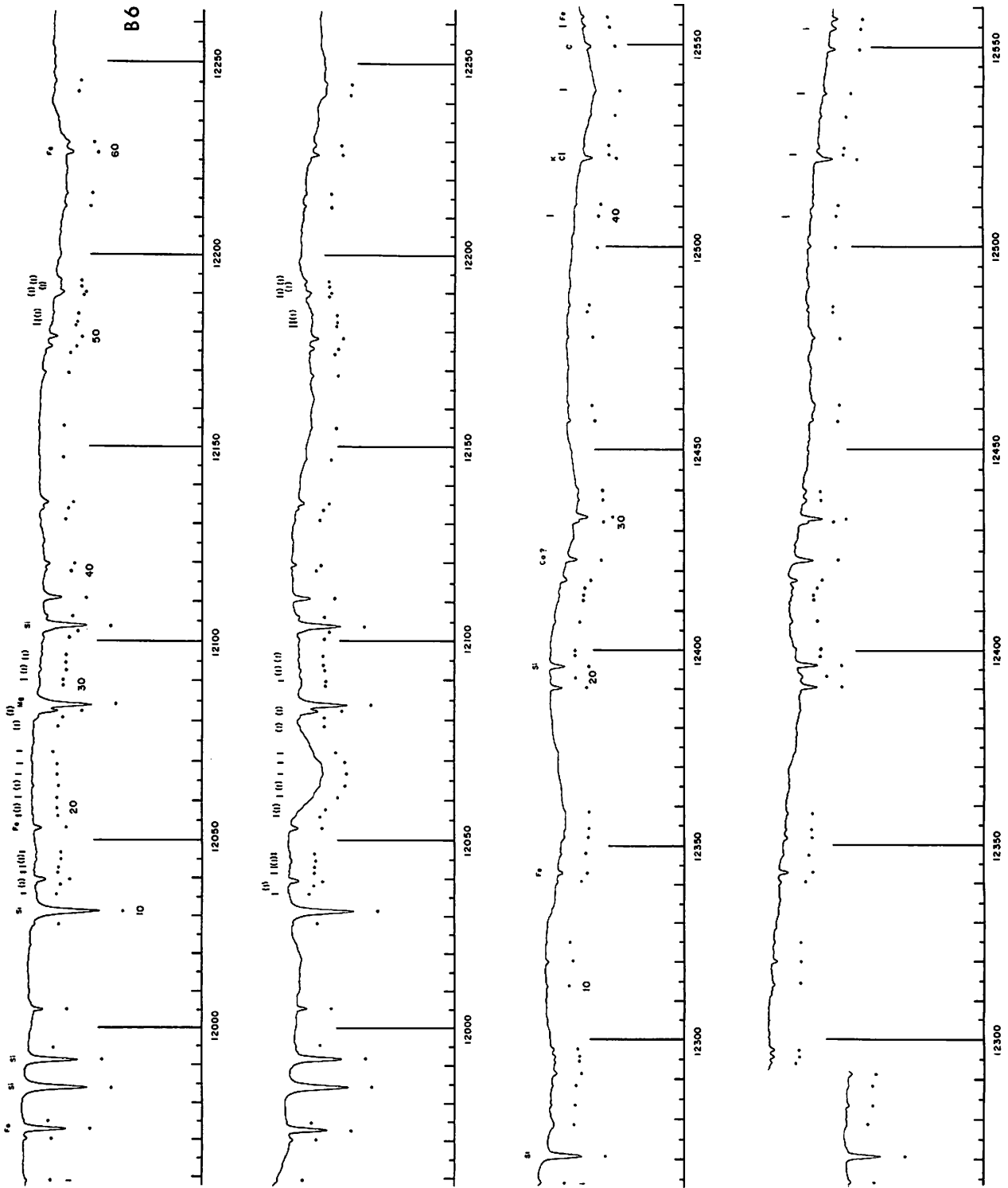


Fig. 6 B-spectrometer record of solar spectrum $\lambda\lambda 11958-12560$.

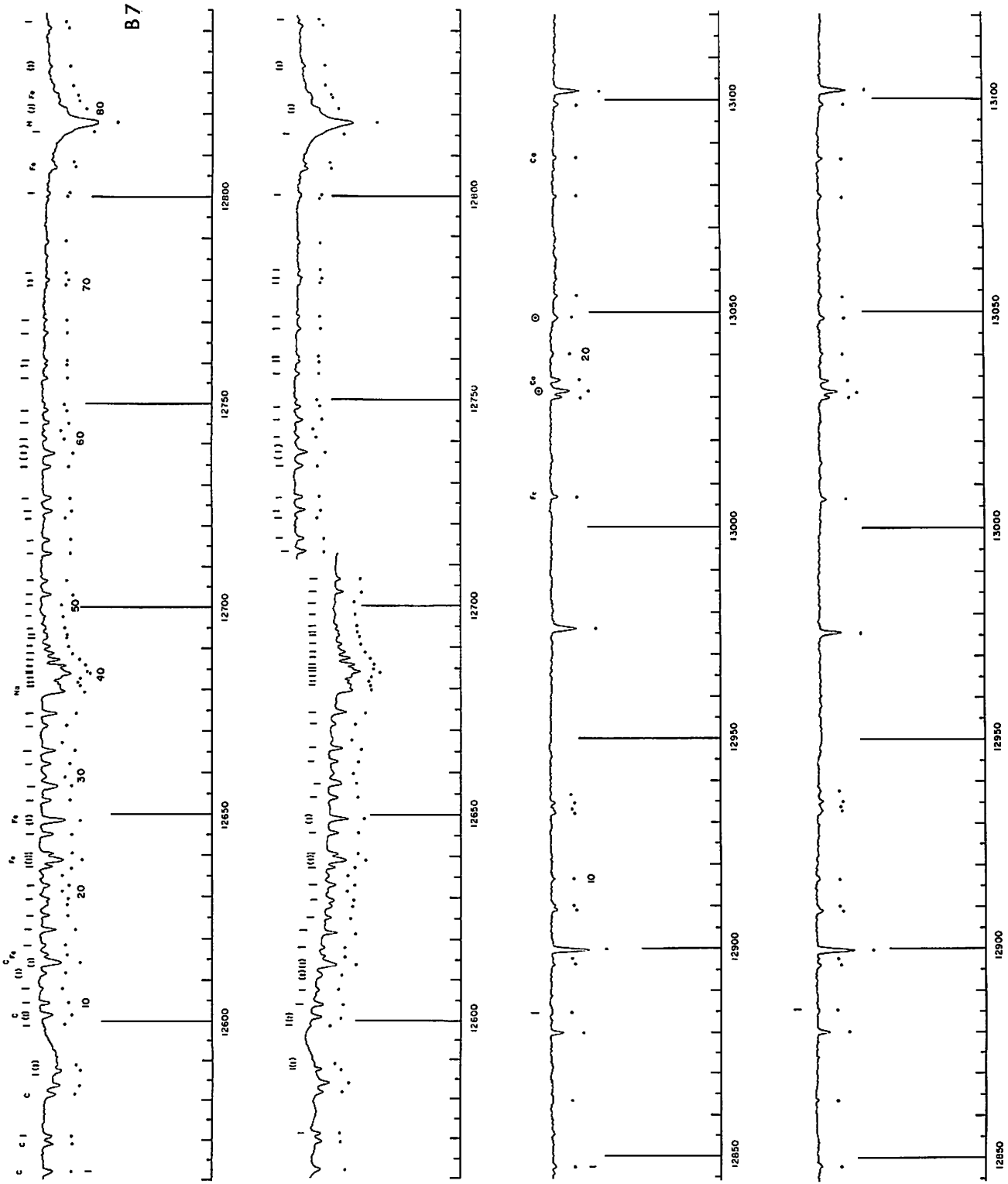


Fig. 7 B-spectrometer record of solar spectrum λ 12560-13121.

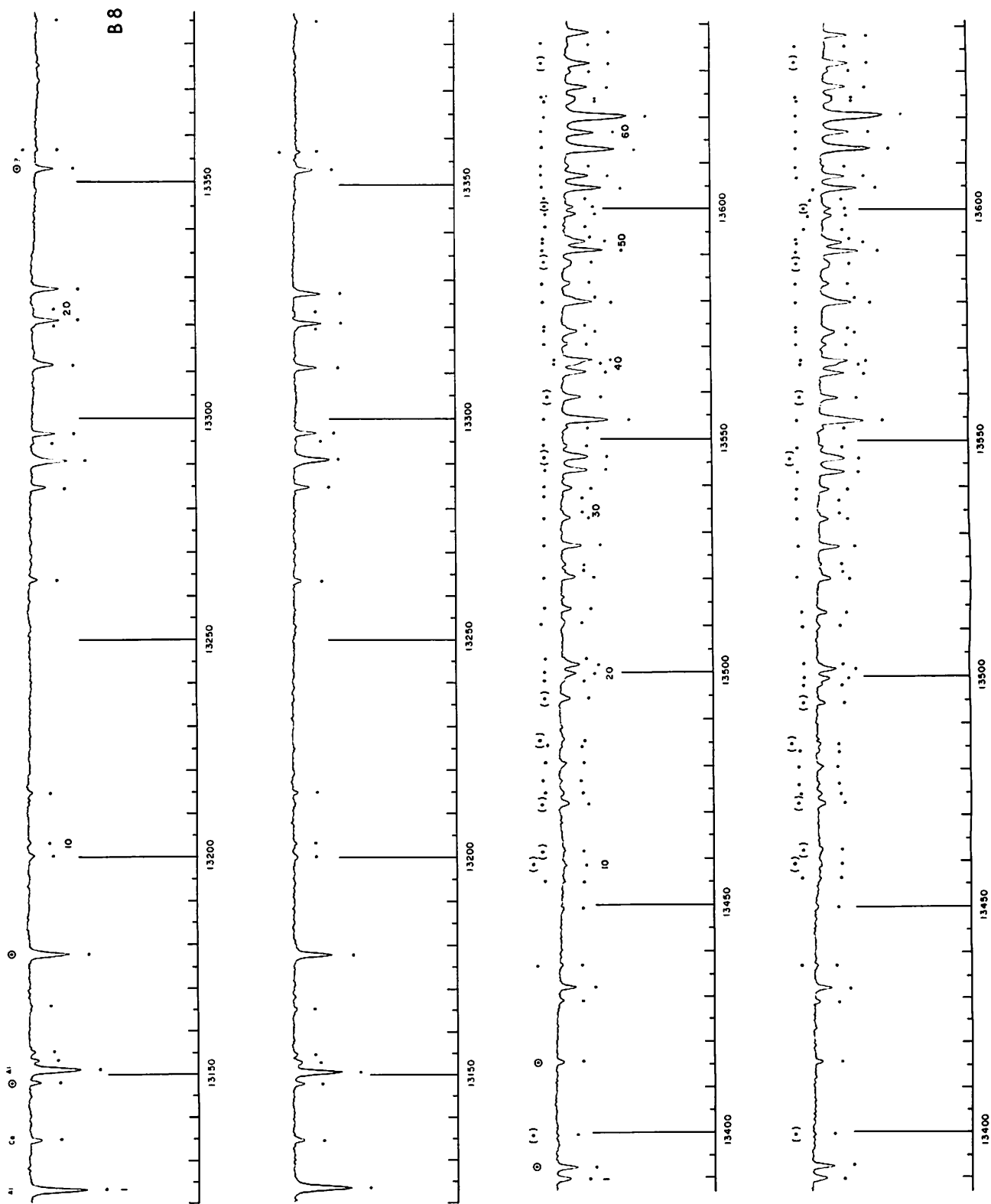


Fig. 8 B-spectrometer record of solar spectrum $\lambda\lambda 1311-13642$.

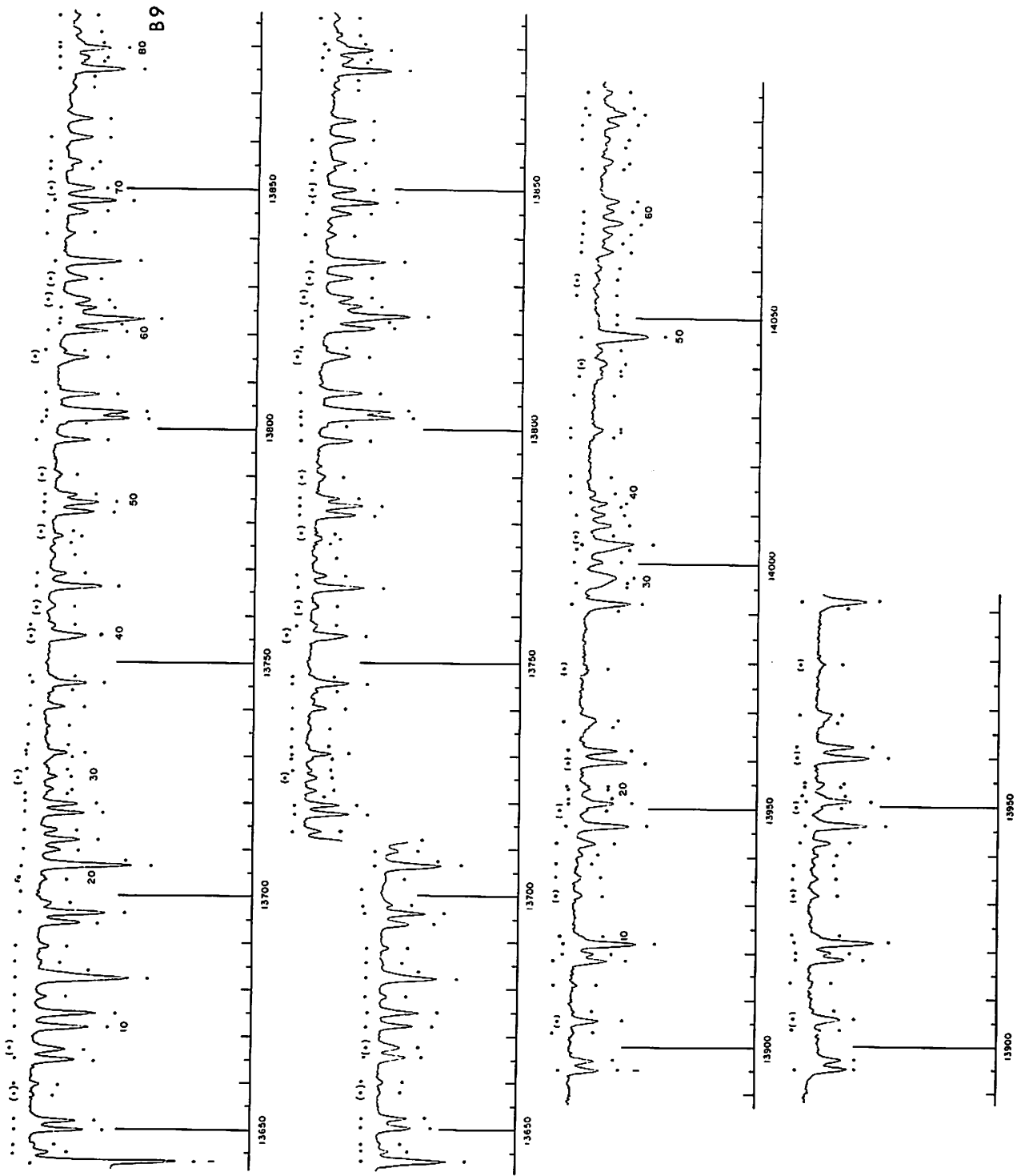


Fig. 9 B-spectrometer record of solar spectrum λ 13642-14098.

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