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FAR-ULTRAVIOLET STELLAR PHOTOMETRY: FIELDS CENTERED ON ρ OPHIUCHI AND THE GALACTIC CENTER

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ABSTRACT

Far-ultraviolet photometry is presented for 121 objects in a 20° diameter field centered on ρ Oph and for 649 objects in a field covering the Galactic center. Broadband magnitudes with effective wavelengths of 1375 Å and 1781 Å are given. The Galactic center field overlaps two fields which were discussed in an earlier paper. Eighty-eight percent of the ultraviolet objects in the ρ Oph field were identified with visible stars using the SIMBAD database, while only 9% of the objects are blends of early-type stars too close together to separate with our resolution. The photometric calibration was studied in detail, and corrections for nonlinearity were derived for the fields analyzed earlier as well as those discussed here. For stars in common between the Galactic center field and the previous fields, a comparison of the magnitudes yielded estimates of the internal errors of the magnitudes of $\sigma_{1375} = 0.13$ mag and $\sigma_{1781} = 0.21$ mag. A collated list of stars in the fields covering the Galactic center and incorporating the revised calibration is presented and compared with the S201 data of the same region. The properties of the sample of ultraviolet objects in the ρ Oph field are briefly commented upon.

Subject headings: Galaxy: center — ISM: individual (ρ Ophiuchi) — stars: fundamental parameters — surveys — ultraviolet: stars

1. INTRODUCTION

In previous papers (Schmidt & Carruthers 1993a [hereafter Paper I], b [hereafter Paper II], 1995 [hereafter Paper III]), we presented far-ultraviolet stellar photometry for four celestial fields. In this paper we present broadband magnitudes for two more fields. The far-ultraviolet magnitudes have effective wavelengths of 1375 Å and 1781 Å, as was the case for the photometry of Paper III.

One field covers the region of the Galactic center and bridges the area between the fields discussed in Paper III. The other includes upper Scorpius and part of Ophiuchus with its center near ρ Oph. Gordon et al. (1994) studied the properties of the reflection nebula in this region using some of the same images as analyzed here.

The Galactic center field was selected for several reasons. Because it overlaps two previously studied fields, comparisons of the magnitudes for stars in common allow an objective estimate of the internal accuracy. In addition, the three fields provide coverage of a continuous strip of sky slightly over 40° in length along the Galactic plane and 13° in width at its narrowest point. Since this region exhibits a large range of extinction (see Paper III), it will be very useful for studies of the variation of the interstellar extinction law with location.

The ρ Oph field was selected for study because of the dust clouds in that region. In addition, photometry for the stars will be a useful supplement to the study by Gordon et al. (1994) of the upper Scorpius reflection nebula.

2. THE OBSERVATIONS

As was the case for the images discussed in Paper III, the data used here were obtained with two NRL Far-Ultraviolet Cameras (FUV Cam) flown aboard Space Shuttle mission STS-39 in 1991 April and May. These cameras had broadband spectral sensitivity with effective wavelengths of 1375 Å (camera 1) and 1781 Å (camera 2). Both have fields nearly 20° in diameter. Further details regarding the instrumentation can be found in Paper III and references given there. The details of the mission and the instrumentation can also be found on the World Wide Web at http://bradbury.nrl.navy.mil/bdchome.html.

The attributes of the images are listed in Table 1. The first three columns list the identification of the fields and the UT date and time of the middle of the exposure sequences. The celestial coordinates of the field centers are given in columns (4) and (5). Column (7) lists the exposure times for the frames used in this investigation. Finally, the last two columns give information on the calibration and are discussed below. Figure 1 (Plates 2–5) presents prints of both fields taken with each of the cameras.

The methods used in the extraction of the data were nearly identical with those used previously. The reader should consult Papers I–III for the details. The few departures from the earlier data treatment are described after the next paragraph.

In Tables 2 and 3 we list the ultraviolet objects found in the two fields. The first column is a running number for reference

TABLE 1

LOG OF OBSERVATIONS

Field (1)	Date (2)	Time (3)	α_{1950} (4)	δ_{1950} (5)	Camera (6)	Exposure (7)	n (8)	σ (9)
Galactic center	1991 May 5	19:15	17^h51^m	−29°24′	1	3, 10, 30, 100	7	0.19
					2	3, 10, 30	9	0.22
ρ Oph	1991 May 5	2:50	16 23	−22 50	1	3, 10, 30	22	0.11
					2	3, 10	24	0.19

purposes, while columns (2) and (3) contain the coordinates of the objects determined from our images. Columns (4) and (5) contain the ultraviolet magnitudes, while column (6) lists optical objects identified with the ultraviolet sources. The remainder of the table gives the magnitudes, colors, and spectral types for the stars identified with the ultraviolet objects. As before, coordinates from the FUV Cam images were used to interrogate the SIMBAD database and thus identify visible stars with the ultraviolet objects and retrieve the photometry and spectral types. When the database contained more than one spectral type for a star, we have adopted that from the Michigan Spectral Survey (Houk 1982; Houk & Smith-Moore 1988). The colors are only given when photoelectric photometry on the *UBV* system is available.

It can be seen in Table 2 that nearly all the ultraviolet objects, 88%, are identified with visible stars, while only 9% are blends of multiple objects. This high rate of unblended images compared to previous fields is the consequence of this being the least crowded field we have analyzed.

For the Galactic center field, the transformation of the image coordinates (x, y) to celestial coordinates (α_{1950}, δ_{1950}) presented greater difficulties than had been the case for other fields. While a quadratic polynomial in x and y with cross terms up to x^2y and xy^2 was adequate previously, a cubic polynomial with cross terms up to x^2y^2 was needed for the Galactic center frames. We attribute this to variable image distortion in camera 2. As can be seen in Figure 1, the field for that camera is compressed on one side compared with the round field of camera 1. This was due to the magnetic field of the adjacent camera. An additional variable component probably arises from electrostatic charging of the camera due to overexposure. The Galactic center frames followed a day thruster firing which produced gross overexposure of the camera.

When we had images from both camera 1 and camera 2, the coordinates are accurate to about 14^s in right ascension and 0′.6 in declination. On the other hand, for stars in the Galactic center field with only camera 2 magnitudes, the errors in the coordinates given in Table 3 can be several times this amount, particularly toward the eastern edge of the field. Because the field is rather crowded, this will render the identifications with visible stars less certain for such objects. Under these circumstances, when there was doubt regarding the inclusion of nearby stars in the ultraviolet object, we tended to err on the side of including them in a blend. This circumstance has also no doubt resulted in a somewhat higher rate of stars with no plausible identification in Table 3 than for the other fields.

As before, *IUE* spectra of stars in our fields were folded into the FUV Cam response functions to provide a photometric calibration. Care was exercised to avoid using stars which were blends in our images. Previously, the *IUE* spectra from the original *IUE* archive were used. These were processed by the IUESIPS software. However, here only spectra from the final archives which have been reprocessed with the NEWSIPS software were included. This should provide a more uniform set of calibrators.

The number of calibrating stars for each field and each camera is listed in column (8) of Table 1. While the Galactic center field had a similar number of calibrators to those studied in Paper III (referred to here as the Scorpius and Sagittarius fields), the ρ Oph field had several times more suitable objects. In Figure 2 we plot the difference between the raw FUV Cam magnitudes (the weighted means of the magnitudes extracted from the various frames by IRAF; see Paper III) and the magnitudes calculated from the *IUE* spectra. It can be seen that the difference depends on the magnitude level. Although the calibrators in the Scorpius, Sagittarius, and Galactic center fields are not sufficient to reveal the presence of this scale error, it is clear that they are consistent with the trend shown by the ρ Oph calibrators. There are, however, zero-point offsets between the various fields.

Nonlinearities have been reported in various electrographic emulsions at densities above about 1.5. In addition, the process of microdensitometry is a possible source of nonlinearity. In view of this, it is clear that the small differences shown in Figure 2 originate in our electrographic data.

In Paper III, our photometry for Scorpius and Sagittarius was compared to photometry from *TD-1*, *OAO*, and the *Astronomical Netherlands Satellite* (*ANS*) but did not clearly reveal the scale errors. An examination of the comparisons (Figs. 3 and 4 of Paper III) shows that the scatter in the plots is sufficient to make this effect unnoticeable; a scale error of the size shown in Figure 2 can clearly be accommodated within the scatter.

Least-squares fits to the data in Figure 2 yield slopes of −0.100 and −0.135 for cameras 1 and 2, respectively (with several deviant points omitted). We will adopt this as the correction for the scale error for all the fields, but we will determine the zero points for each field individually. The solid lines in Figure 2 show the relations for the ρ Oph stars.

The FUV Cam magnitudes for the Galactic center and ρ Oph fields were transformed to the ultraviolet magnitude scale (defined such that m_{uv} = 10.0 corresponds to a flux of $F_\lambda = 3.6 \times 10^{-13}$ ergs cm^{-2} s^{-1} Å^{-1}) using the above slopes and zero points determined from the *IUE* calibration stars. These magnitudes are listed in columns (4)–(5) of Tables 2 and 3. The rms scatter of the individual calibrating stars is given in

TABLE 2

ULTRAVIOLET OBJECTS IN THE ρ OPHIUCHI FIELD

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	$(V-B)$	Spectral Type
1	15:36:20	-19:42	...	6.90	HD 139486	7.63	0.04	B9V
2	15:36:29	-23:06	...	6.05	HD 139518	6.34	0.02	B9.5V
3	15:42:04	-21:43	...	6.79	HD 140543	8.90	-0.01	B1Iab/Ib
4	15:44:56	-25:04	...	6.86	HD 141091	7.30	...	A0V
5	15:45:29	-27:24	...	7.20	HD 141180	8.28	-0.04	B8V
6	15:45:32	-23:43	...	6.87	HD 141164	6.70	...	A2IV/V
7	15:47:58	-25:35	1.63	2.26	HD 141637	4.70	-0.11	B1.5Vn
8	15:50:27	-20:02	2.37	2.97	HD 142096	5.03	-0.01	B3V
9	15:50:34	-25:11	1.71	2.09	HD 142114	4.59	-0.07	B2.5Vn
10	15:50:54	-24:23	3.37	3.82	HD 142165	5.40	-0.03	B5V
11	15:50:56	-23:50	2.91	3.37	HD 142184	5.42	-0.04	B2V
12	15:51:26	-27:11	3.98	4.35	HD 142250	6.10	-0.03	B6Vp
13	15:51:36	-25:06	2.80	...	HD 142301	5.87	-0.06	B8III/IV
14	15:51:42	-22:38	5.64	6.14	HD 142315	6.86	0.04	B9V
15	15:52:08	-19:14	3.48	4.11	HD 142378	5.94	-0.01	B2/B3V
16	15:53:48	-14:43	...	7.21	HD 142703	6.13	0.23	A2Ib/II
17	15:53:51	-29:03	0.26	1.12	HD 142669	3.90	-0.22	B2IV-V
18	15:54:19	-21:20	6.87	...	HD 142805	7.14	0.16	A0IV
19	15:54:44	-20:50	3.58	4.19	HD 142883	5.90	-0.03	B3V
20	15:54:47	-23:23	5.18	5.36	HD 142884	6.80	0.00	B8/B9III
21	15:55:26	-14:10	...	3.18	HD 142983	4.88	-0.10	B8Ia/Iab
22	15:55:33	-24:41	2.86	3.29	HD 142990	5.44	-0.10	B5V
23	15:55:55	-26:00	-0.77	0.39	HD 143018	2.89	-0.19	B1V
24	15:57:25	-22:30	-1.01	0.20	HD 143275	2.30	-0.10	B0.2IV
25	15:58:56	-21:51	4.88	...	HD 143567	7.20	0.07	B9V
26	15:59:46	-24:52	...	7.36	HD 143715	6.90	...	A0V
27	16:02:42	-19:40	-0.66	0.35	Blend	1.4P	...	B2,B2V,B1V,B2V
28	16:03:06	-23:28	3.63	4.04	HD 144334	5.92	-0.08	B8V
29	16:03:52	-20:31	0.82	1.51	HD 144470	3.96	-0.04	B1V
30	16:04:39	-30:30	7.50	7.89	HD 144612	8.40	...	A0
31	16:04:51	-24:20	4.14	4.63	HD 144661	6.32	-0.05	B8IV/V
32	16:05:01	-12:44	...	5.07	HD 144708	5.78	0.01	B9V
33	16:05:42	-23:33	4.37	4.71	HD 144844	5.87	0.03	B9V
34	16:06:44	-13:03	...	8.28	HD 145057	7.13	0.22	A5IV
35	16:07:08	-24:27	6.84	6.26	HD 145127	6.60	...	A0V
36	16:07:11	-26:47	5.80	6.05	HD 145102	6.65	0.01	B9p
37	16:07:20	-22:01	6.61	6.73	HD 145188	7.00	...	A0V
38	16:08:29	-27:02	6.21	6.66	HD 145353	6.95	0.10	B9IV
39	16:08:59	-19:18	1.07	1.73	HD 145502 [a]	4.01	0.04	B2IV
40	16:09:11	-28:18	4.40	4.42	Blend	4.93	...	B9Vvar,B9V
41	16:09:15	-27:48	1.23	1.72	HD 145482	4.59	-0.16	B2V
42	16:10:45	-24:18	4.20	4.40	HD 145792	6.41	0.04	B6IV
43	16:11:29	-20:58	5.38	5.54	HD 145964	6.42	-0.02	B9V
44	16:11:52	-25:22	4.09	4.51	HD 146001	6.05	0.04	B8V
45	16:11:53	-22:15	6.74	6.82	HD 146029	7.38	0.07	B9V
46	16:12:56	-12:42	...	8.16	HD 146214	7.52	0.15	A1V
47	16:13:01	-14:45	5.81	6.13	HD 146254	6.09	0.06	A0III
48	16:13:23	-24:53	6.73	7.15	Blend	7.54	...	B8V,A1V
49	16:13:25	-24:10	5.97	5.94	HD 146284	6.70	0.16	B9III/IV
50	16:13:41	-29:36	...	7.34	HD 146332	7.60	0.19	B5II
51	16:14:00	-21:10	5.56	5.65	HD 146416	6.63	0.00	B9V
52	16:15:12	-27:55	6.49	6.47	HD 146606	7.09	...	A0V
53	16:15:14	-28:30	5.32	4.40	HD 146624	4.80	0.00	A0V
54	16:15:27	-23:09	7.04	7.12	HD 146706	7.52	0.17	B9V
55	16:17:17	-19:56	6.20	6.14	Blend	6.28	...	B9II/III,A0V,B9.5,B9.5V
56	16:18:14	-25:30	0.28	0.78	HD 147165	2.88	0.13	B1III
57	16:18:19	-23:35	6.61	6.64	HD 147196	7.04	0.17	B6/B7Vn
58	16:19:28	-21:04	...	8.46	...	...	...	...
59	16:21:16	-12:20	...	7.96	LS IV-12 47	12.6P	...	B
60	16:21:26	-27:02	6.76	7.01	HD 147703	7.51	0.14	B9Vn
61	16:21:50	-31:18	6.73	6.36	HD 147779	7.15	...	A0V
62	16:22:30	-31:51	7.24	...	HD 147857	7.39	...	F3V
63	16:22:35	-23:20	2.08	2.33	Blend	3.76	...	BIV,B2/B3V,B2V,B3/B4V,B5V
64	16:24:05	-18:20	2.50	2.68	HD 148184	4.42	0.28	B2Vne
65	16:24:17	-29:10	7.62	6.46	HD 148199	7.01	0.09	B8Vp
66	16:26:23	-26:20	2.32	2.70	HD 148479 [a]	7.00	...	B2.5V
67	16:27:11	-25:00	1.57	1.83	HD 148605	4.80	-0.12	B3V
68	16:27:12	-27:48	5.76	5.87	HD 148594	6.89	0.10	B8Vnn
69	16:29:14	-21:21	...	5.28	HD 148898	4.45	0.13	A7p
70	16:29:49	-12:32	...	6.78	Blend	9.85	...	M0,M0V:
71	16:30:58	-31:07	...	7.17	Blend	7.34	...	A0V,A0
72	16:32:39	-28:04	-1.01	1.77	HD 149438	2.82	-0.25	B0V
73	16:32:47	-31:20	...	7.52	Blend	7.99	...	B9III,B9IV,A0
74	16:35:48	-18:10	6.35	7.30	HD 149914	6.70	...	B9.5IV
75	16:37:48	-25:51	5.87	...	...	...	...	...
76	16:38:29	-17:57	...	7.54	HD 150365	6.60	...	A3III
77	16:38:38	-24:22	...	7.55	HD 150366	6.09	0.20	A7III
78	16:40:30	-32:03	4.52	...	HD 150638	6.48	-0.10	B8V
79	16:40:41	-29:24	...	7.24	HD 150700	8.20	...	B9III/IV
80	16:40:42	-22:38	7.68	7.08	HD 150714	7.59	...	Ap
81	16:41:16	-27:21	...	6.93	HD 150768	6.58	0.10	A2V
82	16:41:20	-22:25	7.04	6.98	HD 150814	7.60	...	B9.5V
83	16:41:54	-28:22	...	6.56	HD 150894	6.02	0.09	A3IV
84	16:42:45	-26:33	6.67	6.47	HD 151012	6.90	...	B9.5V
85	16:44:19	-25:10	7.73	...	HD 151296	9.50	...	G8/K0III
86	16:44:30	-22:05	6.93	...	HD 151310	9.40	0.03	B3IV
87	16:45:11	-30:11	...	7.24	HD 151418	8.10	...	B9IV
88	16:45:14	-14:57	6.29	6.06	HD 151527	6.03	0.20	A0IV/V
89	16:45:13	-31:08	4.32	...	HD 151395	6.81	-0.05	B4V
90	16:46:36	-15:33	...	7.68	HD 151676	6.08	0.35	A3V

TABLE 2—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	$(V-B)$	Spectral Type
91	16:46:45	-24:34	...	7.14	HD 151659	7.10	...	A1m
92	16:47:58	-16:28	5.82	6.20	HD 151884	7.00	...	B5V
93	16:48:01	-28:54	...	8.51	HD 151857	9.10	...	B9IV/V
94	16:48:44	-30:48	6.00	...	HD 152018	10.00	...	B9IV/V
95	16:49:12	-25:31	6.92	6.49	HD 152071	6.90	...	A0V
96	16:50:26	-28:17	...	8.48	HD 152286	9.67	0.02	B2III
97	16:50:39	-28:50	...	8.62	HD 152346	8.10	...	A0V
98	16:50:56	-25:01	...	7.45	Blend	7.95	...	Ap,A0III/IV
99	16:51:00	-15:38	6.18	...	...	...	...	...
100	16:51:40	-21:49	5.82	6.19	HD 152516	8.04	0.08	B2III
101	16:52:10	-18:46	...	7.23	Blend	7.67	...	B9.5II/I,B9V
102	16:52:34	-21:30	5.50	5.79	HD 152655	6.90	...	B9III
103	16:52:39	-25:28	6.52	6.34	HD 152657	7.40	...	B8II
104	16:53:45	-23:06	5.30	4.79	HD 152849	5.58	-0.02	A0V
105	16:53:49	-26:53	...	8.71	HD 152834	9.20	...	A0
106	16:54:07	-19:28	4.90	4.92	Blend	6.11	...	B7/B8III,B7V
107	16:54:42	-27:33	...	8.54	HD 152989	7.60	...	A1III/IV
108	16:55:16	-29:18	5.13	...	HD 153084	8.49	0.00	B2V
109	16:55:18	-19:09	6.86	7.29	SAO 160194	9.69	0.05	B0
110	16:55:27	-26:20	...	7.14	HD 153083	9.20	...	B9IV/V
111	16:56:18	-26:22	...	7.10	HD 153255	8.30	...	B9V
112	16:57:41	-20:31	6.94	6.86	HD 153480	8.90	...	B9III
113	16:58:17	-20:22	6.69	6.48	HD 153609	7.20	...	B7/B8V
114	16:58:57	-25:06	...	7.88	HD 153707	8.45	...	Ap
115	17:00:39	-24:53	...	8.09	HD 153977	9.42	0.09	B5II/III
116	17:00:58	-25:38	4.98	4.79	HD 154021	6.70	...	B9IV/V
117	17:01:18	-21:03	...	7.25	HD 154103	8.90	...	B8II/III
118	17:01:46	-20:24	4.23	4.45	HD 154204	6.30	-0.02	B7IV/V
119	17:02:30	-22:00	5.00	5.25	HD 154293	7.04	0.10	B5III
120	17:03:47	-24:30	6.47	...	HD 154499	9.10	...	B5IV/V
121	17:03:55	-23:37	3.92	...	...	...	...	...

[a] There are five B stars within a few arcminutes of the ultraviolet object in addition to HD 145502. However, all are of spectral type B8 or B9 (as compared with B2 for HD 145502) and are fainter. Hence, HD 145502 should be the source of most of the ultraviolet flux.

[b] The ultraviolet source is the hot, main-sequence companion of Alpha Sco.

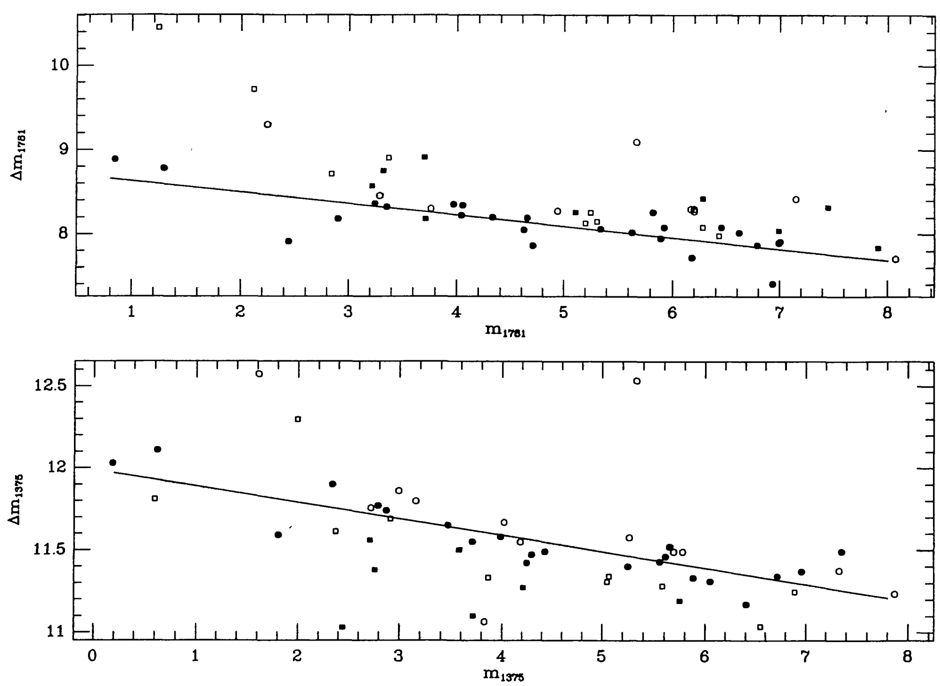

FIG. 2.—A comparison of the raw ultraviolet magnitudes from the FUV cameras with magnitudes calculated from *IUE* spectra. The symbols indicate the four fields as follows: *filled squares,* the Galactic center; *filled circles,* the ρ Oph; *open squares,* Scorpius; *open circles,* Saggitarius. The solid lines have slopes of −0.100 and −0.135 and are fitted to the ρ Oph points.

TABLE 3

Ultraviolet Objects in the Galactic Center Field

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	$(V-B)$	Spectral Type
1	17:02:42	-28:39	...	7.18	HD 154333	7.40	...	B9.5V
2	17:05:06	-33:45	...	6.92	HD 154664	8.73	0.04	B2V
3	17:05:14	-29:54	...	8.24	HD 154754	9.30	...	B7III/IV
4	17:05:32	-30:18	...	7.98	HD 154783	5.93	0.29	Am
5	17:06:44	-30:45	...	7.84	HD 154978	7.90	...	A2IV/V
6	17:07:09	-32:32	...	7.97	HD 155014	8.60	...	B8/B9II
7	17:07:13	-32:54	...	7.62	Blend	8.51	...	B8/B9II/III,B8/B9I
8	17:08:24	-32:09	5.70	5.90	HD 155217	8.65	...	B1V
9	17:08:34	-29:35	...	8.73	HD 155311	9.70	...	B8II/III
10	17:08:56	-33:30	...	5.10	HD 155273	8.90	...	B3IV
11	17:09:08	-34:17	...	6.62	HD 155320	8.35	0.09	B0.5V
12	17:09:13	-27:43	5.29	5.18	HD 155401	6.14	-0.04	B9Vn
13	17:09:14	-25:33	...	8.25	HD 155334	8.20	...	A1V
14	17:09:39	-33:17	3.97	4.46	HD 155402	7.75	-0.04	B2II
15	17:09:44	-32:22	3.82	3.68	HD 155450	6.01	0.07	B1II
16	17:09:44	-33:35	...	5.45	HD 155403	8.20	-0.03	B2V
17	17:10:12	-33:16	3.93	4.39	HD 155506	7.75	-0.06	B1V
18	17:10:28	-32:47	6.09	6.56	HD 155550	8.01	0.06	B6V
19	17:10:33	-32:11	...	5.53	HD 155600	7.93	0.15	B7V
20	17:10:50	-33:11	4.58	3.88	Blend	8.34	...	B2Vnn,B7Vn
21	17:11:54	-33:11	...	3.66	Blend	8.08	...	B7IV,B8V
22	17:12:07	-33:29	2.23	2.63	HD 155806	5.53	-0.01	O8Ve
23	17:12:20	-32:38	5.62	6.19	HD 155851	8.19	0.13	B0Vn
24	17:12:23	-31:57	6.69	6.92	Blend	7.93	...	B6V,B2V
25	17:12:30	-33:41	2.50	3.03	HD 155889	6.54	...	O9V
26	17:12:30	-33:59	6.26	...	HD 155890	9.35	0.05	B5V
27	17:12:38	-30:09	5.96	5.61	HD 155940	6.21	-0.03	B9.5V
28	17:12:41	-33:38	...	2.75	HD 155888	8.69	0.06	B3V
29	17:13:00	-26:04	...	7.94	HD 155983	9.40	...	B8V
30	17:13:21	-32:17	5.16	5.69	HD 156004	7.82	...	B4III
31	17:13:48	-31:24	...	9.65	HD 156118	9.66	0.13	B3III
32	17:13:53	-33:13	...	6.82	HD 156099	8.50	0.09	B8IV
33	17:14:08	-35:30	...	7.89	Bochum 13 [a]	6.50	...	...
34	17:14:14	-27:42	...	7.92	HD 156212	7.91	0.54	B0Iab
35	17:14:19	-32:07	5.61	5.72	HD 156187	9.21	0.08	B3V
36	17:14:30	-31:56	...	6.72	HD 156254	9.25	0.10	B9V
37	17:14:33	-26:35	6.09	6.02	HD 156252	6.81	0.02	B9.5V
38	17:14:44	-33:10	7.31	6.91	HD 156269	9.44	0.04	B2III
39	17:14:45	-34:10	5.99	6.21	Blend	7.65	...	B3V,B8V,B2/B3III
40	17:15:08	-32:27	4.73	4.71	Blend	6.12	...	B5Vne,B2V,B,B
41	17:15:11	-32:18	4.36	4.62	Blend	6.81	...	Seven B stars
42	17:15:46	-31:04	5.76	6.13	Blend	7.57	...	B4/B5V:,B9II:
43	17:15:54	-31:17	...	6.54	HD 156506	7.01	0.12	A2V
44	17:16:59	-27:43	...	9.28	HD 156684	8.62	0.19	A1V
45	17:17:10	-29:18	...	6.98	Blend	6.51	...	A1V,A0V
46	17:17:22	-37:59	...	5.98	HD 156688	7.20	0.08	B2III
47	17:18:02	-31:32	...	8.28	HD 156883	7.60	0.18	A5IV
48	17:18:18	-26:27	...	7.60	Blend	7.43	...	A2V,A9V
49	17:18:54	-30:28	5.96	6.66	HD 157016	7.18	0.10	B8V
50	17:18:56	-29:22	...	10.25	...	...	...	...
51	17:19:03	-24:57	...	0.62	HD 157056	3.27	-0.22	B2IV
52	17:19:21	-38:10	...	8.85	HD 157040	7.90	...	B9.5IV
53	17:19:47	-31:27	...	8.08	HD 157189	9.04	0.08	B9V
54	17:20:14	-37:04	...	7.53	Blend	8.14	...	B9II/III,O
55	17:20:45	-37:58	...	8.46	SAO 208767	9.30	...	B2/B3IV:
56	17:20:54	-22:58	...	6.93	HD 157282	7.40	...	B8/B9V
57	17:21:02	-33:12	...	8.11	HD 157383	7.90	...	B9.5V
58	17:21:05	-29:50	6.37	7.00	HD 157416	7.63	0.05	B9III
59	17:21:05	-28:36	...	8.57	HD 157434	8.07	0.28	B9.5IV/V
60	17:21:28	-36:43	...	8.83	HD 157419	9.70	...	B4V
61	17:21:31	-32:28	...	8.64	HD 157473	9.61	0.11	B8/B9II/III
62	17:21:47	-34:38	6.48	5.99	HD 157486	6.16	0.02	A0Vs
63	17:22:10	-29:39	...	7.69	HD 157611	6.70	...	A2/A3IV
64	17:22:45	-32:51	...	8.04	HD 157673	8.50	...	B8V
65	17:22:49	-37:34	...	7.20	HD 157644	8.50	...	B9
66	17:22:57	-27:34	6.92	7.15	HD 157736	7.50	0.09	B9/B9.5V
67	17:23:22	-34:04	...	8.05	HD 157751	7.66	...	B9
68	17:23:34	-30:03	...	7.43	HD 157829	8.80	...	B3III/IV
69	17:23:36	-24:09	...	6.56	HD 157792	4.17	0.28	A3m
70	17:23:46	-26:18	...	7.15	HD 157865	7.40	...	B8/B9III
71	17:23:52	-25:55	5.61	5.42	HD 157864	6.43	-0.05	B9.5/A0V
72	17:23:56	-28:44	...	7.65	Blend	7.61	...	A0V,B8IV
73	17:24:23	-29:42	5.82	5.52	HD 157955	6.00	...	B9IV
74	17:24:25	-28:19	...	8.09	HD 157988	8.10	0.16	B8/B9III
75	17:24:53	-38:43	...	6.04	HD 157940	9.00	...	B3III/IV
76	17:25:15	-38:41	...	6.16	HD 157972	8.30	...	B3Vn
77	17:25:17	-30:52	...	7.71	Blend	7.31	...	A0III,B9IV/V,B9I
78	17:25:20	-33:34	...	7.02	HD 158073	9.00	0.20	B2IIp
79	17:25:26	-38:16	...	6.90	...	...	...	...
80	17:25:39	-33:00	...	7.97	HD 158155	8.25	0.39	B1III
81	17:25:57	-31:30	4.11	4.55	HD 158186	7.00	0.03	O9.5V
82	17:26:05	-38:29	...	7.64	HD 158156	6.39	0.09	A2V
83	17:26:22	-28:38	...	7.52	Blend	8.49	...	B3III,B9II/III
84	17:26:29	-38:27	...	6.78	...	...	...	...
85	17:26:50	-33:40	4.68	5.01	HD 158320	6.67	0.13	B0.5Ib
86	17:26:53	-38:35	...	10.80	HD 158305	8.70	...	B9.5V
87	17:27:27	-37:13	-0.74	0.36	HD 158408	2.70	-0.23	B2IV
88	17:28:07	-31:56	6.28	6.68	HD 158563	8.08	0.04	B3II
89	17:28:15	-38:37	...	7.88	HD 158530	7.90	...	B8/B9III
90	17:28:25	-23:10	...	9.06	HD 158581:	9.00	...	B7III

TABLE 3—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	(V − B)	Spectral Type
91	17:28:28	-30:13	6.28	...	HD 158618	7.98	0.22	B1Ib:n
92	17:28:29	-23:56	5.08	4.54	HD 158643	4.81	...	A0V
93	17:28:30	-32:52	...	7.49	HD 158644	8.85	0.26	B3II
94	17:28:36	-30:21	6.41	6.65	HD 158681	8.20	0.07	B6V
95	17:28:39	-26:14	4.64	4.72	HD 158704	6.06	-0.07	B9II/III
96	17:29:21	-35:01	...	8.68	HD 158775	8.90	...	B5II/III
97	17:29:45	-29:38	...	7.94	HD 158902	7.21	0.36	B3II
98	17:29:47	-33:02	6.36	6.39	HD 158859	7.27	0.17	B5V
99	17:30:00	-37:10	-1.71	0.06	HD 158926	1.60	-0.19	B1.5IV+B
100	17:30:47	-30:23	5.29	5.66	HD 159090	7.40	0.17	B0III
101	17:30:55	-35:44	...	6.42	HD 159091	7.60	...	B7III
102	17:31:06	-32:09	5.86	4.08	Blend	8.90	...	B2III,B5
103	17:31:24	-32:33	2.77	3.13	NGC 6383 [b]	5.68	0.06	O5/6(e)
104	17:31:27	-34:53	6.84	7.23	HD 159193	8.00	...	B6/B7III
105	17:31:51	-32:47	5.04	...	HD 159256	10.10	...	B2III
106	17:31:58	-31:49	...	7.42	HD 159310	9.28	0.08	B9V+B(9)
107	17:32:02	-38:48	...	9.39	Blend	8.14	...	A0V,B8IV/V
108	17:32:07	-21:59	6.10	5.87	HD 159376	6.50	0.08	Ap
109	17:32:12	-37:22	3.28	...	Blend	6.32	...	A0V,B2II/III
110	17:32:52	-39:38	...	12.70	HD 159381	9.40	...	B4III:
111	17:32:59	-32:41	6.41	...	HD 159473	9.10	...	B6/B7III
112	17:33:20	-28:58	...	8.64	HD 159571	9.11	0.15	B8V
113	17:33:39	-32:08	...	6.97	Blend	6.74	...	A2V,B9V
114	17:33:47	-22:28	...	7.77	HD 159593	9.30	...	B8IV
115	17:33:48	-35:46	...	8.19	...	...	...	...
116	17:33:58	-38:46	...	8.78	HD 159573	8.44	0.28	B3III
117	17:34:07	-35:42	...	8.32	HD 159652	8.30	...	B3IV
118	17:34:20	-40:18	...	6.46	HD 159574	7.70	...	B9Ib
119	17:34:29	-28:26	...	8.03	HD 159782	7.98	0.23	B9III
120	17:34:33	-28:40	...	8.24	HD 159783	9.05	0.19	B6III
121	17:34:55	-32:53	...	7.00	HD 159846	7.80	...	B9
122	17:35:22	-33:01	6.81	...	Blend	7.64	...	B9III/IV,A0IV/V
123	17:35:49	-39:49	...	9.15	HD 159938	9.50	...	B8/B9II
124	17:36:10	-33:32	6.13	6.97	Blend	7.87	...	B,B3V
125	17:36:10	-29:56	5.54	6.02	HD 160109	7.47	0.02	B5IV
126	17:36:12	-38:27	...	6.93	...	...	...	...
127	17:36:26	-33:08	...	7.89	Blend	8.25	...	A0V,B9IV
128	17:36:33	-32:17	3.49	3.64	NGC 6405 [c]	...	...	...
129	17:36:46	-40:15	...	7.07	HD 160069	7.90	...	B7/B8II
130	17:36:50	-32:12	3.27	...	NGC 6405 [c]	...	...	...
131	17:37:05	-24:55	...	12.09	...	...	...	...
132	17:37:10	-28:54	6.57	6.70	HD 160319	7.18	0.21	B3Vne
133	17:37:12	-32:44	6.23	6.48	HD 160281	8.20	...	B4V
134	17:37:16	-20:43	...	9.36	...	...	...	...
135	17:37:30	-27:52	...	8.12	HD 160370	7.60	...	B9V
136	17:38:00	-23:50	...	7.82	HD 160430	7.91	0.35	B2II
137	17:38:21	-32:06	5.19	...	NGC 6405 [c]	7.56	...	...
138	17:38:57	-35:47	8.06	7.84	HD 160575	7.61	0.36	B1/B2II
139	17:39:02	-35:30	...	8.21	HD 160592	7.70	...	A1IV
140	17:39:11	-34:18	...	8.25	HD 160644	8.10	...	A0Ib/II
141	17:39:16	-38:56	...	0.05	HD 160578	2.40	-0.21	B1.5III
142	17:40:03	-27:52	...	8.35	HD 160839	6.41	0.42	A9V:
143	17:40:12	-32:15	...	7.51	NGC6416 367	8.43	0.17	B9V
144	17:40:14	-38:13	...	6.32	HD 160812	8.06	0.14	B3IV
145	17:40:15	-34:04	7.24	7.31	HD 160841	7.80	...	B9III
146	17:40:24	-34:58	...	8.10	Blend	8.07	...	B8/B9V,A2IV
147	17:40:30	-35:29	6.41	6.85	HD 160872	8.21	0.18	B1/B2III
148	17:40:56	-21:43	...	9.46	...	...	...	...
149	17:41:06	-27:24	...	7.71	HD 161004	8.75	0.21	B9IVe
150	17:41:10	-40:16	...	6.94	HD 160895	8.60	...	B2/B3
151	17:41:24	-22:07	...	8.42	SAO 185668	9.58	0.42	B3
152	17:41:30	-27:11	...	8.08	HD 161103	8.69	0.44	Be
153	17:41:31	-23:40	...	9.32	HD 161038	7.10	...	F0V
154	17:41:33	-34:13	...	8.13	HD 161085	8.50	...	B8V
155	17:41:42	-35:31	5.83	6.23	HD 161086	7.00	...	B9V
156	17:41:42	-22:11	...	8.17	HD 161083	6.60	...	F0V
157	17:41:48	-21:28	...	9.17	HD 161082	9.30	...	B6II
158	17:42:03	-27:27	...	8.25	Blend	8.50	...	A0,B8
159	17:42:04	-28:26	...	8.08	HD 316204	9.29	0.32	B2III
160	17:42:15	-28:02	6.52	6.79	Blend	7.58	...	B7IV/V,B4IV
161	17:42:17	-40:46	...	7.15	HD 161141	9.21	-0.01	B2II/III
162	17:42:23	-22:54	...	8.76	HD 161187	9.30	...	B8/B9II
163	17:42:45	-36:39	6.07	6.56	HD 161249	8.45	-0.09	B3V
164	17:42:50	-39:16	...	5.76	HD 161277	7.08	...	B9V
165	17:43:08	-34:52	6.40	6.63	HD 320641:	10.0P	...	A
166	17:43:19	-22:40	...	8.50	Blend	8.53	...	B8IIIp,B2/B3II,?
167	17:43:40	-32:24	6.67	7.35	HD 161434	8.30	...	B6V
168	17:43:42	-38:06	5.04	5.51	HD 161390	6.43	-0.02	A0V
169	17:43:57	-40:52	...	5.89	Blend	7.56	...	B8II,B3III,B2/B3
170	17:44:10	-22:12	...	9.61	Blend	9.21	...	B9III,A2
171	17:44:13	-40:11	...	6.79	HD 161471	3.00	0.54	F2Iae
172	17:44:19	-35:13	6.23	6.36	HD 161561	7.50	...	B8II
173	17:44:28	-34:18	6.67	6.70	HD 161575	7.00	...	B9IIIsp
174	17:44:29	-26:22	...	8.08	HD 161610	9.20	...	B5II
175	17:44:36	-40:58	...	5.97	HD 161531	9.06	-0.04	B2/B3Ib/II
176	17:44:51	-34:34	6.69	7.01	HD 161649	7.80	...	B8/B9Ib/II
177	17:44:52	-36:43	8.40	7.21	HD 161629	8.50	...	B5/B6V
178	17:44:59	-35:52	5.96	6.40	HD 161628	7.20	...	B9V
179	17:45:01	-32:39	...	8.68	HD 161665	7.40	...	A3V
180	17:45:12	-38:07	4.58	5.10	Blend	6.66	...	B0.5Iab,B9IV

TABLE 3—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	$(V-B)$	Spectral Type
181	17:45:17	-39:54	...	6.48	HD 161667	6.99	-0.03	B8Ib/II
182	17:45:19	-26:57	5.13	5.25	HD 161756	6.35	0.12	B4IVe
183	17:45:26	-35:03	5.74	6.63	HD 161741	7.50	0.20	B3III
184	17:45:29	-33:52	...	7.71	HD 161774	8.72	0.22	B5V:nne
185	17:45:45	-36:31	6.52	6.80	HD 161791	8.40	-0.03	B3V
186	17:45:54	-31:41	3.68	3.71	HD 161840	4.80	-0.01	B8V
187	17:45:56	-25:44	...	8.21	HD 161851	8.50	...	Ap
188	17:46:00	-31:15	6.00	6.21	HD 161853	7.91	0.26	B0.5II
189	17:46:12	-35:22	7.53	8.05	HD 161855	7.44	0.06	B9.5V
190	17:46:07	-38:57	4.03	4.75	HD 161807	7.01	-0.08	B3Vne
191	17:46:11	-27:27	...	8.27	HD 161906	8.90	...	B1/B2III
192	17:46:26	-40:07	...	8.28	HD 161912	4.81	0.26	A2Ib
193	17:46:28	-24:18	...	8.65	Blend	8.80	...	B9.5V,B7Ib/II
194	17:46:33	-25:58	...	8.04	HD 161984	9.60	...	B9III
195	17:46:39	-38:07	6.64	...	HD 161929	8.73	0.08	B2Vn
196	17:46:58	-40:05	...	9.12	...	...	...	...
197	17:47:06	-34:21	...	7.06	Blend	6.87	...	five B and A stars
198	17:47:08	-39:51	...	8.40	HD 162032	9.20	...	B9
199	17:47:11	-26:18	6.43	6.91	HD 162082	8.00	...	B7/B8V
200	17:47:21	-38:28	7.46	7.03	HD 162047	8.04	0.04	B2/B3III
201	17:47:25	-23:08	...	7.87	HD 162099	8.20	...	B3IV
202	17:47:26	-39:39	...	9.42	HD 162106	9.00	...	B8II
203	17:47:26	-35:41	...	7.17	HD 162067	9.19	0.08	B6II/III
204	17:47:29	-35:30	6.01	5.91	HD 162085	7.79	0.02	B8II
205	17:47:42	-35:04	7.19	...	NGC6475 131	7.62	-0.02	A0III/IV
206	17:47:47	-20:03	...	8.98	...	...	...	...
207	17:47:50	-30:57	...	7.95	Blend	8.0P	...	B9IV,B9
208	17:47:58	-30:33	5.93	5.98	Blend	6.40	...	A0Vn,B9.5V
209	17:48:00	-27:50	6.80	7.17	HD 162237	8.60	...	B7/B8III
210	17:48:01	-35:20	5.77	5.74	Blend	6.29	...	B9III,B9IV,A0
211	17:48:16	-30:18	...	6.79	HD 162271	8.80	...	B8/B9II
212	17:48:29	-27:56	6.87	7.24	HD 316375	9.3P	...	B8
213	17:48:41	-28:36	5.99	6.31	HD 162372	8.60	...	B3II/III
214	17:48:56	-37:46	6.19	6.46	Blend	8.12	...	A0,B3II/III
215	17:48:51	-36:23	...	9.49	HD 162350	8.70	...	B8/B9III
216	17:48:53	-40:07	...	6.82	HD 162376	9.17	-0.04	B3III
217	17:48:55	-26:53	6.20	6.66	HD 162437	8.10	...	B5III
218	17:48:56	-34:47	3.14	3.44	NGC 6475 26	5.90	-0.10	B6V
219	17:49:01	-38:51	5.48	5.54	HD 162356	8.26	...	B2Ib/II
220	17:49:08	-38:22	6.49	6.57	HD 162394	8.98	0.02	B2V
221	17:49:19	-38:38	5.22	5.57	HD 162418	7.76	...	B2II
222	17:49:22	-40:04	...	6.95	...	...	...	...
223	17:49:25	-27:04	6.64	6.58	HD 162540	8.10	...	B5III
224	17:49:28	-39:37	...	6.96	Blend	8.53	...	B3II/III,B5Ib/II
225	17:49:29	-31:38	6.51	7.13	HD 162494	8.60	...	B2/B3V
226	17:49:29	-40:14	...	7.16	HD 162518	9.40	...	B5Ib
227	17:49:30	-22:41	...	9.62	HD 162492	7.30	...	A5IV/V
228	17:49:38	-34:58	4.81	3.25	NGC 6475 [d]	5.76	...	Several B and A stars
229	17:49:55	-28:52	...	7.23	HD 162606	9.40	...	B8IV
230	17:50:05	-27:39	...	8.05	HD 162655	7.70	...	A4IV
231	17:50:06	-36:30	...	8.10	CPD-36 7735	7.90	...	A0
232	17:50:07	-34:44	3.37	2.80	NGC 6575 [d]	5.00	...	Several B and A stars
233	17:50:09	-28:02	7.11	7.46	HD 162677	8.30	...	B8/B9II
234	17:50:14	-26:00	...	8.47	HD 162696	10.60	...	B8/B9Ib/II
235	17:50:17	-36:48	6.50	7.15	HD 162633	8.99	-0.05	B5Vn
236	17:50:25	-34:44	...	3.42	Blend	4.89	...	Several B and A stars
237	17:50:26	-27:16	...	7.34	HD 162719	6.80	...	A3III/IV
238	17:50:28	-22:20	...	9.20	Blend	9.56	...	B8Ib/II,B8II
239	17:50:33	-39:38	...	7.14	HD 162727	8.80	...	A0
240	17:50:39	-38:56	7.22	8.24	HD 162657	9.10	...	B3III
241	17:50:51	-35:53	6.97	7.50	HD 162762	8.10	...	B9II/III
242	17:50:54	-30:14	...	8.62	HD 162801	10.30	...	B2/B3Ib/II
243	17:51:16	-34:29	5.78	5.01	NGC 6475 [d]	5.50	...	Several B and A stars
244	17:51:21	-33:56	6.62	6.53	Blend	6.79	...	B9IV/V,B9.5V,A0V
245	17:51:36	-33:11	7.09	7.74	HD 162910	9.11	0.14	B2II/III
246	17:51:42	-36:28	6.22	6.47	HD 162926	6.06	0.08	B9.5III
247	17:51:50	-24:52	3.52	3.81	HD 162978	6.20	0.04	O8III
248	17:51:59	-34:16	...	6.28	HD 162981	10.00	...	B4III
249	17:52:01	-26:08	...	8.04	LS 4483	10.8P	...	B
250	17:52:05	-26:18	...	7.84	HD 163039	8.70	...	B7/B8III
251	17:52:09	-22:59	...	8.09	HD 163017	8.30	...	B2II/III
252	17:52:15	-28:21	...	9.22	HD 163040	9.80	...	B5II/III
253	17:52:26	-38:40	5.79	5.96	HD 163004	8.10	-0.10	B3V
254	17:52:29	-30:34	6.62	6.60	Blend	6.95	...	B9.5II/I,B1Iab,B
255	17:52:36	-31:49	...	7.86	Blend	8.6P	...	B9III,B8/B9III,A
256	17:52:41	-24:04	...	8.71	HD 163118	9.50	...	B4Ib/II
257	17:52:43	-34:15	...	6.53	HD 163109	8.00	...	B9IV
258	17:52:50	-35:03	5.84	5.94	Blend	6.38	...	B9.5III,A0IV/V
259	17:53:00	-32:28	...	6.87	HD 163181	6.43	0.50	B0Ia
260	17:53:03	-39:57	...	7.06	Blend	7.00	...	K1/K2III,G5/G6
261	17:53:09	-25:39	6.72	6.73	HD 163227	8.00	...	B6/B7III
262	17:53:29	-35:12	5.68	5.71	HD 163251	7.60	...	B7II/III
263	17:53:29	-29:55	7.81	7.83	HD 163301	8.20	...	B9.5III/IV
264	17:53:32	-31:31	...	7.21	Blend	7.7P	...	Five B and A stars
265	17:53:33	-28:03	...	7.00	Blend	5.75	...	A7V:,A1/A2V
266	17:53:33	-32:41	7.19	6.77	HD 163274	6.70	...	B9III/IV
267	17:53:33	-39:55	...	7.10	SAO 209513	9.20	...	A9V
268	17:53:34	-21:58	...	7.73	HD 163296	6.85	0.08	A1V
269	17:53:38	-40:48	...	8.02	HD 163235	8.80	...	B8III/IV
270	17:53:39	-30:17	7.42	7.65	HD 163338	8.51	0.26	B1/B2II:

TABLE 3—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	$(V-B)$	Spectral Type
271	17:53:45	-27:08	...	7.12	HD 163370	8.30	...	B5II
272	17:53:47	-38:47	6.02	6.24	HD 163304	7.60	...	B7III
273	17:53:48	-33:25	...	8.49	HD 163320	8.10	...	B9.5III
274	17:53:48	-31:31	6.24	6.72	Blend	7.89	...	B8III,B2/B3III,A
275	17:53:57	-30:39	7.00	7.40	Blend	8.47	...	B5III,B2II
276	17:54:06	-25:00	6.81	6.97	HD 163429	8.60	...	B3V
277	17:54:10	-39:08	...	5.47	Blend	5.72	...	A0IV-V,A0IV/V
278	17:54:12	-32:03	5.56	6.21	HD 163430	8.18	-0.04	B2II
279	17:54:16	-31:01	6.74	7.16	HD 163454	8.24	0.30	O/Be
280	17:54:20	-25:21	...	9.87	HD 163479	11.10	...	B4ne
281	17:54:25	-23:09	...	10.24	HD 163451	10.10	...	B3II/III
282	17:54:32	-29:34	...	8.75	Blend	9.16	...	B7III,B1II:n
283	17:54:35	-33:57	...	8.78	HD 163519	8.20	...	B9V
284	17:54:36	-39:07	...	5.58	HD 163375	6.70	...	A0IV/V
285	17:54:36	-36:00	...	6.64	HD 163482	6.70	...	A0III/IV
286	17:54:39	-40:04	...	7.46	HD 163540	8.40	...	B8Ib
287	17:54:50	-30:03	6.58	6.80	HD 163555	7.63	-0.04	Asp
288	17:54:53	-32:59	7.62	8.70	HD 163557	10.40	...	B5III
289	17:54:53	-29:04	6.61	...	SAO 186005	9.40	...	B6V
290	17:54:59	-28:09	6.67	6.95	HD 163613	8.52	0.33	B1Iab:
291	17:55:10	-32:25	...	11.24	SAO 209536	8.90	...	B9V
292	17:55:12	-29:14	...	7.50	SAO 186016	9.60	...	B9III
293	17:55:24	-31:49	...	8.29	HD 163667	8.71	0.47	B0.5III
294	17:55:25	-27:30	6.43	6.87	Blend	8.14	...	B5III/IV,B8
295	17:55:29	-28:45	3.62	3.91	HD 163685	6.01	-0.08	B3IV
296	17:55:31	-30:55	...	7.40	HD 163687	10.40	...	B2/B3Ib
297	17:55:37	-38:49	...	6.68	SAO 209547	7.60	...	B9IV
298	17:55:45	-36:57	...	7.47	HD 163708	6.80	0.20	A3III
299	17:55:50	-20:05	7.87	7.99	HD 163848	8.00	...	B8V
300	17:56:02	-21:46	...	8.79	HD 313481	10.0P	...	B9
301	17:56:08	-23:19	6.61	6.50	HD 163811	8.30	...	B3III
302	17:56:08	-30:40	...	7.71	Blend	8.19	...	B9,B8
303	17:56:10	-36:01	5.44	5.42	HD 163758	7.32	0.02	O5
304	17:56:10	-25:49	6.68	6.86	HD 163813	7.99	0.05	B6III
305	17:56:12	-22:30	3.97	4.40	HD 163800	7.01	0.31	O7/O8
306	17:56:17	-26:24	...	8.38	SAO 186050	9.30	...	B8
307	17:56:33	-22:30	...	4.04	HD 163892	7.45	0.10	B0.5/B1I
308	17:56:39	-33:53	...	7.61	HD 163899	8.32	0.21	B2Ib/II
309	17:56:42	-33:24	4.92	5.38	HD 163868	7.38	...	B5Ve
310	17:56:45	-23:49	4.98	4.51	HD 163955	4.76	-0.04	B9V
311	17:56:48	-35:39	6.27	6.75	HD 163924	8.96	-0.01	B2III
312	17:56:52	-37:54	6.48	6.92	SAO 209572	8.40	...	B5V
313	17:56:52	-37:24	5.74	6.12	HD 163900	7.10	...	B8/B9II
314	17:56:59	-22:33	3.98	4.40	HD 164002	7.42	0.01	B1/B2II
315	17:57:01	-25:04	...	7.64	Blend	7.74	...	B8II/III,A0Iab/I
316	17:57:11	-29:49	5.11	5.51	Blend	7.06	...	B1Ib,B3IV
317	17:57:14	-23:18	6.63	7.07	Blend	10.37	...	B5III,O
318	17:57:20	-27:42	...	7.22	Blend	9.48	...	B9,B9
319	17:57:25	-23:30	6.59	6.76	HD 313618	9.30	...	B5V
320	17:57:33	-28:42	6.40	6.53	SAO 186085	9.30	...	B5III
321	17:57:39	-24:40	6.10	6.29	HD 164105	8.46	0.09	B2III
322	17:57:46	-40:19	...	6.36	HD 164050	7.50	...	B8V
323	17:57:48	-37:30	5.93	6.14	SAO 209593	8.30	...	B8II
324	17:57:50	-24:12	4.77	5.08	Blend	7.78	...	B2II/III,B3II/II
325	17:58:01	-31:59	...	7.57	HD 164151	10.60	...	B8/B9II
326	17:58:02	-38:05	6.33	6.49	HD 164129	7.00	...	B9III
327	17:58:07	-23:32	...	7.60	HD 164226	9.00	...	B9IV
328	17:58:10	-22:16	...	5.45	Blend	8.78	...	B3III,O
329	17:58:13	-39:40	...	8.16	HD 164246	9.13	-0.06	B8/B9IV
330	17:58:14	-29:35	7.74	6.65	SAO 186109	7.40	...	B9III
331	17:58:21	-32:43	...	7.61	Blend	8.20	...	B9V,WC
332	17:58:21	-35:00	...	8.41	SAO 209605	8.50	...	B9IV
333	17:58:26	-27:40	...	6.04	HD 164295	9.10	...	B9.5V
334	17:58:30	-27:57	...	7.82	SAO 186120	10.90	...	B7/B8Ib/II
335	17:58:33	-36:22	4.43	4.85	Blend	5.90	...	B7IV,B5II/III,B8
336	17:58:39	-22:09	4.51	4.95	HD 164359	7.53	0.01	B1II
337	17:58:45	-35:39	5.77	6.18	HD 164320	7.57	-0.04	B7II
338	17:58:47	-32:03	...	7.54	SAO 209617	8.60	...	A0III
339	17:58:47	-23:10	3.96	4.05	HD 164384	8.27	-0.03	B1/B2Ib/II
340	17:58:51	-24:10	3.78	3.95	HD 164385	8.04	...	B2III
341	17:58:54	-27:30	5.43	6.20	HD 164404	8.00	-0.04	B2V
342	17:58:54	-22:47	2.83	3.00	NGC 6514 55	5.84	0.01	B0Iab/Ib
343	17:59:02	-34:12	...	6.85	SAO 209626	8.90	...	A0Ib/II
344	17:59:08	-40:05	...	6.64	HD 164340	9.30	-0.13	B0III:
345	17:59:23	-23:02	3.38	3.44	NGC6514 145	7.30	0.02	O6
346	17:59:28	-33:53	4.78	5.31	HD 164455	7.42	-0.07	B2.5III
347	17:59:37	-24:15	3.30	3.50	NGC 6530 e	6.87	...	O9III:,B
348	17:59:37	-29:22	5.19	5.45	HD 164516	7.91	-0.04	B3II
349	17:59:39	-31:00	...	8.45	SAO 209635	8.60	...	B9IV
350	17:59:40	-38:49	...	10.02	HD 164521	9.80	...	B9
351	17:59:40	-20:45	4.67	5.05	HD 164581	6.81	0.11	B2/B3II
352	17:59:47	-35:37	6.03	6.33	Blend	7.65	...	B8IV,A1Ib,A0III/IV
353	17:59:47	-38:05	...	8.51	SAO 209644	8.00	...	A1V
354	17:59:51	-21:31	...	8.60	HD 164582	8.20	...	A0IV
355	17:59:53	-26:18	6.81	6.93	Blend	7.06	...	A0III/IV,B7III
356	17:59:54	-37:15	...	8.90	SAO 209643	8.90	...	B8V
357	18:00:01	-22:43	3.06	3.25	HD 164637	6.74	-0.05	B0Ib/II
358	18:00:17	-27:51	...	7.82	Blend	8.95	...	B8,B9.5III
359	18:00:31	-26:52	...	7.40	HD 164719	7.99	0.18	B3Ib
360	18:00:37	-28:44	...	8.17	SAO 186192	7.90	...	B9IV

TABLE 3—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	$(V-B)$	Spectral Type
361	18:00:40	-22:51	3.33	3.40	Blend	6.78	...	B1/B2II/III,B2II
362	18:00:42	-23:21	6.16	6.24	Blend	8.39	...	B5V,B4III:
363	18:00:44	-27:45	...	7.83	Blend	9.54	...	B8,A0IV:
364	18:00:44	-25:19	...	7.77	HD 164741	9.00	0.29	B2Ib/II
365	18:00:50	-27:19	6.08	6.36	HD 164769	9.25	-0.07	B2III
366	18:00:51	-25:29	...	7.76	Blend	9.74	...	B8/B9III,B8II/II
367	18:00:52	-35:06	...	8.02	SAO 209663	8.10	...	B9.5IV
368	18:00:54	-24:21	2.00	2.19	NGC 6530 [f]	5.64	...	O8Iab:,B2IV/V
369	18:00:55	-39:47	...	9.32	HD 164821	10.20	...	B9
370	18:01:01	-31:39	7.53	7.16	HD 164798	8.07	0.12	B2/B3II
371	18:01:10	-27:23	6.01	...	HD 164867	7.79	0.03	B9II/III
372	18:01:10	-22:31	3.17	3.54	NGC 6531 [g]	6.90	...	B,B1/B2III
373	18:01:17	-30:53	...	8.75	HD 164868	9.66	...	B3II/III
374	18:01:29	-28:36	...	7.91	SAO 186234	10.40	...	B7/B8V
375	18:01:41	-38:17	...	9.14	HD 164937	10.70	...	B9II/III
376	18:01:43	-30:14	...	8.19	SAO 209678	8.50	...	B9III/IV
377	18:01:47	-20:58	...	8.21	HD 164991	9.90	...	B2/B3II
378	18:01:51	-23:37	5.07	5.67	HD 164993	9.11	0.12	B2/B3II
379	18:01:53	-24:40	4.01	3.89	HD 165016	7.33	-0.04	B2Ib
380	18:01:57	-24:23	2.81	2.76	NGC 6530 [e]	4.60	0.14	...
381	18:02:17	-36:35	5.41	5.95	HD 165063	7.46	-0.07	B8
382	18:02:18	-22:58	...	7.40	HD 313846	10.16	0.68	WN
383	18:02:25	-23:43	4.99	5.58	HD 165132	8.07	0.08	B5/B6Ib
384	18:02:37	-21:09	...	9.61	HD 165151	8.90	...	B9III
385	18:02:41	-21:59	...	7.18	HD 165152	10.60	...	B8II
386	18:02:50	-26:58	5.93	6.41	HD 165225	8.39	...	B2II/III
387	18:02:50	-31:30	6.71	6.86	Blend	8.09	...	B8,B8
388	18:02:52	-29:26	5.20	5.54	HD 165207	8.26	-0.12	B2IV
389	18:02:58	-24:12	4.38	4.56	HD 165246	7.72	0.09	O9III:
390	18:02:58	-22:11	6.02	6.51	Blend	8.12	...	B4V,B3V
391	18:03:00	-34:20	6.08	6.34	SAO 209711	7.90	...	B5III/IV
392	18:03:08	-34:29	6.10	6.29	Blend	8.17	...	B8II,B4V
393	18:03:09	-39:01	...	7.54	SAO 209709	9.20	...	B5III/IV
394	18:03:11	-22:28	6.42	6.83	Blend	8.8P	...	B2III,B8
395	18:03:22	-21:42	...	6.53	HD 313792	9.93	0.08	B5
396	18:03:23	-22:43	...	8.26	Blend	8.0P	...	Six A and B stars
397	18:03:28	-32:23	...	7.83	SAO 209720	8.80	...	B7II
398	18:03:36	-28:22	5.94	6.19	HD 165365	8.00	...	B7/B8III
399	18:03:41	-36:36	...	6.84	CPD-36 7998	8.20	...	A0V
400	18:03:43	-29:04	6.56	6.47	Blend	7.24	...	B9III,A0II/III
401	18:03:54	-37:31	...	8.13	SAO 209728	9.30	...	B8II/III
402	18:03:52	-26:07	6.24	6.75	Blend	9.14	...	B4II,B2III
403	18:03:52	-20:28	...	7.39	Blend	8.60	...	B3II,B8Ib
404	18:04:00	-22:34	...	7.90	Blend	8.6P	...	B8,B8,A0
405	18:04:09	-30:40	6.92	7.39	SAO 209733	8.80	...	B5II/III
406	18:04:11	-21:27	4.09	4.45	HD 165516	6.28	0.12	B1/2Ib
407	18:04:21	-25:07	...	8.05	HD 165517	8.44	0.48	B0Ia
408	18:04:26	-38:48	...	5.99	SAO 209738	8.30	...	B8/B9III
409	18:04:31	-35:02	7.53	7.66	SAO 209746	8.60	...	B8/B9II
410	18:04:31	-25:35	6.94	6.49	HD 165555	8.80	...	B7II/III
411	18:04:32	-38:34	4.54	5.22	HD 165470	7.34	-0.17	B2III
412	18:04:34	-22:07	5.34	5.60	Blend	8.72	...	B3,B5III
413	18:04:43	-23:06	6.38	6.25	HD 165613	8.40	...	B9III
414	18:04:48	-27:08	...	7.96	SAO 186327	10.60	...	B8III
415	18:04:48	-22:54	5.99	6.14	Blend	8.07	...	B2III,B5,?
416	18:04:57	-34:33	6.79	7.05	Blend	7.80	...	B9II,B1Ib
417	18:04:59	-27:19	6.87	7.43	SAO 186331	8.80	...	B8/B9III
418	18:05:04	-36:21	6.98	7.35	SAO 209758	9.00	...	B8/B9V
419	18:05:04	-25:22	5.38	...	HD 165655	8.16	0.31	B1Ia/Iab
420	18:05:12	-22:17	4.34	4.69	Blend	8.51	...	B2IV,B5
421	18:05:22	-23:26	6.17	6.69	HD 165705	9.59	0.16	B2III
422	18:05:29	-21:16	4.37	4.95	HD 165763	7.78	-0.25	WC
423	18:05:35	-22:43	6.46	6.57	HD 165765	10.00	...	B2III
424	18:05:41	-31:11	6.74	6.87	Blend	7.50	...	B9V,B6Ib/II,B9
425	18:05:45	-22:11	4.32	4.76	HD 165812	7.95	-0.01	B1/B2II
426	18:05:48	-25:28	4.73	4.93	HD 165814	6.61	0.02	B4IV
427	18:05:59	-23:26	5.71	6.28	Blend	9.00	...	?,B3II/III
428	18:06:01	-36:40	4.37	4.88	HD 165793	6.58	-0.03	B1II
429	18:06:02	-34:01	...	6.34	SAO 209777	9.20	...	B4III
430	18:06:11	-22:47	6.61	6.87	HD 165894	9.60	...	B3IV/V
431	18:06:14	-24:00	4.34	4.70	C 367 [h]	7.28	0.12	B6III:
432	18:06:20	-24:40	...	7.69	Blend	8.82	...	B9IIp,B5IV
433	18:06:23	-38:34	...	8.02	SAO 209793	8.30	...	A1V
434	18:06:23	-21:31	...	6.82	Blend	8.51	...	B5Ib,B9Ib
435	18:06:23	-26:19	...	8.66	SAO 186372	9.60	...	B6V
436	18:06:36	-35:32	...	7.08	Blend	7.89	...	B8,A1/A2V,B8
437	18:06:37	-34:52	6.53	7.51	HD 165955	9.18	-0.02	B3Vn
438	18:06:39	-32:34	7.56	7.99	SAO 209791	9.10	...	B9III
439	18:06:45	-22:04	...	6.38	HD 166054	10.10	...	B3
440	18:06:46	-24:05	...	4.84	Blend	9.39	...	B4Ib,B
441	18:06:49	-32:10	...	8.76	HD 166003	7.70	...	A1V
442	18:06:55	-23:44	3.87	4.45	Blend	7.71	...	B9II:,B1V,B0.5V,B1V
443	18:07:06	-23:49	...	4.40	HD 166107	7.95	0.08	B2V
444	18:07:19	-24:26	...	8.18	HD 315259	10.21	0.16	B9
445	18:07:19	-21:37	...	7.55	HD 313936	10.0P	...	A
446	18:07:20	-32:50	8.39	7.81	HD 166113	10.80	...	B5Ib/II
447	18:07:22	-22:24	...	7.83	Blend	8.8P	...	B8II,B3,B3
448	18:07:25	-25:20	...	8.73	HD 166193	10.40	...	B9III
449	18:07:26	-29:54	...	7.54	SAO 186397	9.00	...	B8V
450	18:07:27	-23:55	4.43	...	HD 166192	8.52	0.20	B2II

TABLE 3—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	$(V-B)$	Spectral Type
451	18:07:39	-33:48	2.91	3.45	HD 166197	6.16	-0.14	B1V
452	18:07:39	-22:13	...	7.37	HD 313961	10.4P	...	B3
453	18:07:43	-23:27	...	7.06	...	...	...	...
454	18:07:47	-22:55	...	10.12	HD 166294	10.10	...	B7II/III
455	18:07:47	-21:19	6.26	6.50	HD 166293	8.30	0.09	B3/B4III
456	18:08:16	-35:02	6.72	6.88	HD 166326	6.90	...	B9III
457	18:08:24	-32:25	7.12	7.39	HD 166345	8.72	-0.03	B3Vne
458	18:08:29	-29:52	6.86	6.92	Blend	7.98	...	A0IV/V,B7II/III
459	18:08:29	-37:02	...	8.49	SAO 209840	8.50	...	A0V
460	18:08:30	-20:44	6.10	6.12	HD 166443	8.72	0.21	B0.5Iab:ne
461	18:08:36	-26:01	...	7.76	Blend	8.59	...	B5II/III,B5II/III
462	18:08:38	-23:59	...	6.95	Blend	9.44	...	B8II,B8II/III
463	18:08:39	-32:40	6.92	7.01	HD 166425	8.23	-0.05	B6III
464	18:08:41	-34:36	...	8.57	SAO 209838	8.40	...	B9.5V
465	18:08:45	-23:52	...	7.14	HD 166503	9.60	...	B9II
466	18:08:49	-28:54	6.27	5.98	HD 166469	6.51	-0.01	B9IVspe
467	18:08:50	-20:26	4.08	...	HD 166546	7.22	0.08	B1Ib
468	18:08:50	-29:35	7.28	7.23	SAO 186445	7.90	...	B9V
469	18:08:51	-34:05	5.11	5.35	HD 166450	7.30	...	B4III
470	18:08:52	-26:23	...	9.02	SAO 186449	8.80	...	A0V
471	18:09:01	-27:26	...	8.50	HD 166530	10.90	...	B5IV
472	18:09:03	-39:20	...	5.28	Blend	6.82	...	B5III,B8/B9V+B/A
473	18:09:10	-36:28	...	8.39	SAO 209851	8.20	...	A0V
474	18:09:13	-27:57	...	7.77	Blend	9.19	...	A0V+,B9
475	18:09:28	-28:15	6.16	6.41	HD 166612	7.39	0.36	A2/A3V+A9/F0
476	18:09:30	-35:13	...	7.73	SAO 209856	8.70	...	B9V
477	18:09:40	-20:59	5.46	...	HD 166693	9.00	...	B2III
478	18:09:48	-32:22	...	7.07	SAO 209862	9.30	...	B7V
479	18:09:52	-22:28	...	7.94	Blend	8.7P	...	B8/B9V,B9
480	18:10:07	-29:23	...	9.37	Blend	8.34	...	B9,B8II
481	18:10:10	-27:13	6.14	6.35	HD 166789	8.06	-0.02	B6III
482	18:10:19	-34:54	...	9.03	SAO 209871	9.20	...	B9IV/V
483	18:10:23	-22:43	6.94	7.27	HD 166852	8.53	0.26	B0Ia/ab
484	18:10:25	-31:59	5.33	5.58	HD 166790	6.90	...	B7II
485	18:10:26	-38:24	...	6.46	HD 166810	7.20	...	B8/B9III
486	18:10:30	-37:38	...	7.53	SAO 209876	9.70	...	B9
487	18:10:32	-25:09	...	7.17	HD 166807	7.60	...	A0III/IV
488	18:10:39	-23:39	...	8.82	Blend	9.70	...	B9V,B9III
489	18:10:41	-34:18	6.69	6.85	SAO 209885	7.80	...	B8/B9III
490	18:10:45	-36:53	...	6.63	HD 166832	8.40	-0.05	B8III
491	18:10:49	-21:04	3.54	3.24	HD 166937	3.85	0.22	B2III:
492	18:10:56	-37:36	...	7.43	SAO 209886	7.70	...	A0V
493	18:11:03	-25:19	6.33	6.88	HD 166967	8.39	0.08	B2II
494	18:11:03	-27:31	5.82	6.12	HD 166968	7.16	-0.02	B8II/III
495	18:11:08	-23:41	...	9.08	HD 167014	9.40	...	B3III
496	18:11:24	-28:51	6.39	6.45	HD 167016	7.95	-0.02	B8III/IV
497	18:11:25	-29:33	...	9.55	Blend	9.93	...	B9IV/V,B9V
498	18:11:25	-28:24	6.96	7.15	SAO 186514	9.60	...	B7II
499	18:11:29	-33:09	5.00	5.42	HD 167003	8.48	-0.12	B0.5III
500	18:11:37	-21:51	...	8.61	HD 167115	9.90	...	B9II/III
501	18:11:43	-31:24	...	8.06	SAO 209904	8.60	...	B7II/III
502	18:11:58	-24:00	...	8.13	HD 167203	8.28	0.18	B7III/IV
503	18:12:02	-22:28	6.06	6.68	HD 167200	9.50	...	B5
504	18:12:04	-38:11	...	7.73	HD 167074	9.70	...	B7/B8III
505	18:12:06	-34:36	5.87	6.20	HD 167147	6.80	...	B9IV
506	18:12:11	-20:45	2.02	...	HD 167264	5.38	0.07	B0.5Ia/I
507	18:12:20	-23:07	...	8.65	HD 167288	9.00	...	Ap
508	18:12:25	-33:07	5.47	5.67	HD 167230	6.80	...	B9V
509	18:12:26	-35:39	...	7.77	SAO 209923	7.30	...	A0IV
510	18:12:31	-36:35	4.42	4.93	HD 167233	7.01	-0.10	B3III
511	18:12:31	-28:06	6.93	7.05	Blend	8.75	...	B8/B9Ib/II,B9.5V,B9.5II
512	18:12:48	-22:31	...	7.42	HD 167414	10.80	...	B9Ib
513	18:12:48	-38:18	...	8.54	HD 167344	8.90	...	A2IV
514	18:12:53	-29:09	6.72	7.00	Blend	8.31	...	B5II/III,B4II/II
515	18:12:54	-25:34	...	7.42	Blend	9.11	...	B9II/III,B7II
516	18:12:55	-38:55	...	7.90	Blend	8.64	...	B9II,A0V
517	18:12:56	-31:11	6.19	6.42	HD 167363	7.65	0.04	B7II
518	18:13:05	-30:08	6.73	6.62	HD 167402	8.96	...	O9.5/B0Ib/II
519	18:13:09	-25:50	...	7.58	Blend	10.07	...	B8II,B9V
520	18:13:10	-23:29	...	9.00	HD 314178	9.20	...	F0
521	18:13:18	-30:25	6.94	6.99	HD 167441	7.78	0.07	B8III/IV
522	18:13:29	-38:09	...	8.32	SAO 209948	9.20	...	B9V
523	18:13:35	-29:52	5.94	6.31	SAO 186576	9.10	...	B3II/III
524	18:13:57	-35:34	...	8.36	SAO 209954	9.40	...	B8IV/V
525	18:13:58	-32:58	6.79	6.91	SAO 209952	8.30	...	B5III
526	18:14:00	-31:19	6.21	6.26	HD 167599	7.33	0.38	B7/B8II
527	18:14:07	-28:41	...	7.97	HD 167666	6.18	0.19	A7V:
528	18:14:19	-34:07	3.50	3.99	HD 167647	6.16	-0.11	B3/B4IV/V
529	18:14:25	-23:33	...	7.01	HD 167750	9.10	...	B9/B9.5V
530	18:14:27	-27:54	6.52	6.73	Blend	7.74	...	A0IV,B5III
531	18:14:31	-30:12	7.57	7.49	SAO 209964	9.50	...	B6III
532	18:14:31	-33:25	6.09	6.19	HD 167686	7.02	-0.08	B8II
533	18:14:43	-29:16	6.79	7.23	HD 167775	8.60	-0.04	B5IV/Vne
534	18:14:45	-23:18	6.34	6.33	HD 167795	7.67	0.05	B8V
535	18:14:46	-36:22	6.71	7.18	SAO 209970	9.00	...	B8Ib/II
536	18:14:49	-25:10	...	8.12	Blend	8.59	...	B8/B9Ib/II,B5
537	18:14:50	-29:44	...	7.91	SAO 186615	9.10	...	B8II
538	18:14:52	-23:38	...	7.75	HD 167865	9.80	...	B9II/III
539	18:14:53	-27:27	...	9.52	SAO 186616	9.80	...	B7III
540	18:15:09	-22:02	...	10.91	Blend	9.27	...	B8/B9IV,A0IV/V

TABLE 3—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	$(V-B)$	Spectral Type
541	18:15:12	-34:42	5.50	5.79	HD 167846	6.92	-0.07	B7/B8III
542	18:15:23	-24:24	...	8.35	Blend	9.65	...	B7/B8II,B8/B9III
543	18:15:27	-22:35	...	7.73	HD 168002	9.50	...	B7II
544	18:15:40	-37:48	...	8.48	HD 167982	10.30	...	B7/B8IV
545	18:15:52	-29:41	...	7.80	Blend	8.60	...	A1/A2IV,A0
546	18:15:53	-28:15	7.39	8.06	HD 168056	8.89	0.08	B8IV
547	18:16:05	-25:43	...	9.06	HD 168140	10.90	...	B8/B9II
548	18:16:08	-37:37	...	8.55	SAO 209993	8.90	...	A1V
549	18:16:12	-29:01	6.99	7.71	SAO 186642	8.60	...	B8/B9III
550	18:16:20	-28:28	...	7.77	SAO 186652	9.90	...	B5II/III
551	18:16:34	-36:04	6.43	6.85	SAO 209996	8.60	...	B2/B3III
552	18:16:42	-24:37	...	8.26	Blend	8.8P	...	B5Ib,B8,B8Ib
553	18:16:45	-34:48	6.43	6.80	SAO 210002	7.80	...	B8V
554	18:16:51	-26:12	...	9.55	SAO 186663	9.30	...	B9.5V
555	18:16:53	-32:22	6.34	6.48	Blend	7.43	...	B8III/IV,B9III,B8II/III
556	18:16:53	-24:57	...	8.47	HD 168331	9.27	0.15	B6/B7III
557	18:16:58	-35:27	5.28	5.64	HD 168236	6.80	...	B5III
558	18:17:06	-24:08	...	8.92	Blend	9.70	...	B9IV,B9
559	18:17:07	-22:10	...	8.66	HD 168422	10.00	...	B9IV
560	18:17:23	-23:20	...	8.73	HD 168434	10.40	...	B9.5III
561	18:17:31	-25:32	...	7.65	HD 168435	9.70	...	B8/B9II
562	18:17:32	-33:23	...	8.54	HD 168400	7.00	...	A2IV/V
563	18:17:37	-28:23	...	8.36	SAO 186684	9.30	...	B8/B9V
564	18:17:53	-23:30	...	9.47	...	...	...	...
565	18:17:56	-33:39	...	8.09	SAO 210031	9.50	...	B8II
566	18:17:58	-37:17	6.29	6.76	Blend	8.17	...	B7III,B9V
567	18:17:58	-26:07	...	8.29	HD 168525	6.70	...	A6V
568	18:17:59	-22:56	...	6.66	HD 168523	11.00	...	B6Ib
569	18:18:02	-30:58	5.87	6.11	HD 168493	6.90	...	B6V
570	18:18:04	-32:15	...	7.07	Blend	6.96	...	A5IV,B9II/III
571	18:18:43	-28:28	...	7.84	HD 168646	6.16	0.26	A3III
572	18:18:47	-25:22	...	8.79	HD 168680	9.40	...	B8II
573	18:18:48	-33:35	...	8.41	SAO 210052	9.30	...	A1V
574	18:18:51	-28:13	...	8.85	SAO 186723	8.80	...	A4IV
575	18:18:57	-24:55	...	9.00	HD 168709	8.80	0.16	B9.5II
576	18:19:02	-22:56	6.00	6.18	HD 168708	7.90	...	B8IV
577	18:19:11	-26:26	6.10	6.62	HD 168750	8.27	0.08	B1Ib
578	18:19:14	-26:57	...	7.44	Blend	8.13	...	A0,B9III
579	18:19:30	-36:41	3.81	4.08	HD 168733	5.34	-0.14	B7Ib/II
580	18:19:31	-30:10	5.88	6.49	HD 168785	8.49	0.05	B2IIIp
581	18:20:04	-27:33	...	8.62	HD 168942	7.90	...	B9.5V
582	18:20:14	-26:59	6.72	7.24	HD 168941	9.34	0.04	O9.5II
583	18:20:17	-23:04	...	7.40	HD 168989	9.60	...	B7/B8III
584	18:20:43	-26:10	...	8.28	HD 315643	10.01	0.07	B2
585	18:20:51	-34:25	2.09	1.95	HD 169022	1.80	0.02	B9.5III
586	18:20:52	-37:14	...	7.89	Blend	7.49	...	A3V,B8/B9II
587	18:21:05	-30:44	...	8.40	SAO 210101	8.00	...	A1V
588	18:21:10	-33:20	...	8.05	SAO 210102	8.40	...	A0V
589	18:21:29	-26:31	7.70	7.89	SAO 186780	9.00	...	B4III
590	18:21:33	-36:03	...	9.12	...	...	...	...
591	18:21:47	-36:46	...	8.14	SAO 210121	9.30	...	B8V
592	18:21:49	-24:26	...	8.73	HD 169292	8.50	0.22	B9III/IV
593	18:21:59	-30:58	7.42	7.54	SAO 210120	8.40	...	B6III
594	18:22:02	-33:10	...	8.58	Blend	8.23	...	A1V,B8V,B9V
595	18:22:11	-37:10	...	7.83	SAO 210122	8.00	...	A0V
596	18:22:36	-33:58	4.20	4.48	HD 169398	6.30	-0.08	B5IV
597	18:22:37	-31:48	5.78	6.10	HD 169425	7.37	0.04	B5III
598	18:22:38	-27:22	...	7.72	SAO 186803	8.80	...	B8V
599	18:23:15	-35:25	...	9.07	Blend	8.30	...	A0,A2III
600	18:23:20	-23:26	...	6.13	Blend	7.89	...	B5II,B3III
601	18:23:39	-26:35	...	7.71	HD 169697	10.20	...	B8III/IV
602	18:23:41	-29:34	...	8.25	SAO 186825	8.60	...	B9V
603	18:23:53	-24:50	...	9.55	HD 169731	10.30	...	B9.5III
604	18:24:06	-36:03	5.67	5.92	HD 169679	7.12	-0.04	B8/B9III
605	18:24:07	-36:54	...	7.77	SAO 210171	8.40	...	B8/B9V
606	18:24:13	-26:58	...	7.30	...	...	...	...
607	18:24:41	-26:47	...	6.38	Blend	6.22	...	A3/A4V,B9IV/V
608	18:24:41	-36:01	...	5.94	HD 169832	7.90	...	B8IV
609	18:24:43	-24:36	...	9.03	HD 169937	8.00	...	B9.5IV
610	18:24:44	-26:14	...	8.58	SAO 186846	9.10	...	B8/B9II
611	18:24:45	-25:21	...	7.03	...	...	...	...
612	18:24:45	-33:25	...	7.91	HD 169873	8.74	0.02	B8/B9III
613	18:24:50	-32:31	6.62	6.94	HD 169872	7.77	...	B8II
614	18:25:01	-27:42	...	10.05	HD 170018	10.40	...	B8III:
615	18:25:31	-27:20	...	8.75	HD 170122	8.86	0.15	B9III
616	18:25:34	-26:38	...	6.60	HD 170141	6.50	0.11	A3III
617	18:25:46	-34:36	...	7.95	SAO 210218	8.90	...	B9IV/V
618	18:25:48	-35:51	...	11.91	SAO 210221	9.20	...	A0V
619	18:26:01	-31:32	...	8.95	HD 170100	11.00	...	A2III
620	18:26:05	-32:51	...	8.77	SAO 210224	8.40	...	A0V
621	18:26:07	-26:43	...	6.95	SAO 186878	9.80	...	B2/B3III
622	18:26:15	-25:17	4.30	4.77	HD 170235	6.59	0.07	B2Vnne
623	18:26:17	-32:17	7.06	7.79	HD 170182	10.30	...	B2III
624	18:26:18	-33:59	5.78	6.04	HD 170213	6.90	...	B8V
625	18:26:18	-25:34	...	6.08	Blend	6.45	...	A3III,B8/B9III
626	18:26:37	-33:33	5.91	6.33	Blend	7.57	...	B8V,B9IV
627	18:26:50	-33:10	...	6.86	Blend	6.81	...	A3III,B9IV/V
628	18:27:02	-26:59	...	9.47	SAO 186890	8.70	...	B9V
629	18:27:05	-28:52	...	8.35	HD 170415	7.50	...	A1IV/V
630	18:27:20	-31:26	...	8.88	HD 170460	10.30	...	B8II

TABLE 3—*Continued*

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	$(V-B)$	Spectral Type
631	18:27:34	-33:04	...	6.65	HD 170479	5.34	0.16	A5V
632	18:28:12	-24:53	6.79	6.63	HD 170531	7.50	...	B4III
633	18:28:31	-30:08	6.19	6.60	HD 170638	8.62	...	B3II/III
634	18:28:40	-29:12	...	8.70	SAO 186924	9.40	...	B7/B8Ib/II
635	18:28:52	-32:41	...	7.61	SAO 210281	8.40	...	B9V
636	18:29:00	-27:16	6.60	6.77	HD 170770	7.76	0.12	B5IV
637	18:29:18	-31:34	...	10.51	Blend	9.21	...	A0,B9V
638	18:29:47	-26:30	...	8.77	HD 170956	10.90	...	B8Ib/II
639	18:29:50	-30:11	...	8.34	Blend	8.00	...	A0V,A0,B9IV/V
640	18:30:07	-27:34	...	8.69	HD 171032	8.91	0.15	B8III
641	18:30:39	-33:04	2.49	2.95	HD 171034	5.28	-0.11	B2IV-V
642	18:30:52	-31:14	...	7.52	SAO 210322	8.90	...	A0V
643	18:30:57	-30:57	6.73	6.58	HD 171117	7.30	...	B9IV
644	18:31:13	-25:23	6.53	...	Blend	8.44	...	B9.5IV/V,B2II/III,B8IV/V
645	18:32:31	-30:57	...	8.36	SAO 210354	9.20	...	B8II
646	18:32:53	-32:43	...	7.45	SAO 210358	8.90	...	B8/B9Ib/II
647	18:34:40	-28:01	6.54	...	HD 171757	8.95	0.11	B3IIIe
648	18:35:46	-30:33	6.87	...	HD 171963	7.60	...	B8/B9III
649	18:36:45	-29:22	6.56	...	HD 172140	9.94	-0.02	B0.5III

[a] This object is an unresolved clump of star in the cluster Bochum 13.
[b] This object is an unresolved clump of stars in the cluster NGC 6383. The magnitude and spectrum refer to the brightest star, HD 159176, which should dominate the ultraviolet flux.
[c] These objects are unresolved clumps of stars in the cluster NGC 6405.
[d] These objects are unresolved clumps of stars in the cluster NGC 6475.
[e] These objects are unresolved clumps of stars in the cluster NGC 6530.
[f] This object consists of a number of stars in the cluster NGC 6530, but the ultraviolet is likely to be dominated by HD 164794 and NGC 6530-9. The V magnitude is a combination of those two stars.
[g] This object is an unresolved clump of stars in the cluster NGC 6531.
[h] This object is an unresolved group of stars in the cluster Colinder 367. The magnitude and spectrum refer to HD 165921, which should dominate the ultraviolet flux.

the last column of Table 1. Note that these standard deviations together with the number of stars used imply that the standard errors of the mean zero points are all smaller than 0.07 mag.

From Figure 2 and the previously adopted zero point, we derived the scale corrections to the magnitudes of Paper III. They are

$$m_{1375} = 1.111m'_{1375} - 0.44, \quad (1)$$

$$m_{1781} = 1.156m'_{1781} - 0.94, \quad (2)$$

for the Scorpius field, and

$$m_{1375} = 1.111m'_{1375} - 0.57, \quad (3)$$

$$m_{1781} = 1.156m'_{1781} - 0.96, \quad (4)$$

for the Sagittarius field, where m'_{1375} and m'_{1781} are the ultraviolet magnitudes listed in Paper III, while m_{1375} and m_{1781} are the corrected values.

3. COMBINATION OF THE GALACTIC CENTER DATA WITH THE OVERLAPPING FIELDS

A detailed comparison was made of the magnitudes from Table 3 with those from Paper III (after applying the corrections given in eqs. [1]–[4]). Table 4 summarizes this comparison. Column (3) lists the number of stars in common between the Galactic center field and the fields from Paper III, while the mean differences for all the stars in common are listed in column (4). Column (5) gives the standard errors of the means. The sense of all the differences is that the Galactic center magnitudes are fainter. It can been that all except one of the differences are statistically significant.

There are several possible causes of the differences between the various data sets. Since the cameras were positioned differently from one field to another and more significantly, rotated, individual stars fall on different locations of the camera cathode for the different fields. Thus, sensitivity variations across the field could produce differences of the type seen here. However, a plot of the residuals versus location in the field failed to show any convincing trend. A second possibility is that the calibration differences arise from the use here of the *IUE* spectra from the final archive and processed by the NEWSIPS software. Since the final archive should be more homogeneous and

TABLE 4

COMPARISON OF OVERLAPPING FIELDS WITH THE GALACTIC CENTER FIELD

Field (1)	Camera (2)	n (3)	$\langle\Delta\rangle$ (4)	σ (5)
Sagittarius	1	111	0.145	0.019
	2	203	0.087	0.022
Scorpius	1	10	0.017	0.045
	2	17	0.218	0.076

represents the final calibration of the *IUE* data, we have chosen to place all the data in the scale of the Galactic center photometry. Accordingly, the values in column (4) of Table 4 were subtracted from the corresponding corrected magnitudes from Paper III.

The differences for stars in common between the Paper III magnitudes (after the application of eqs. [1]–[4] and the adjustment of the zero points described in the previous paragraph) and the magnitudes from Table 3 were used to estimate the uncertainties. The standard deviations of individual magnitudes are $\sigma_{1375} = 0.13$ and $\sigma_{1781} = 0.21$. These should be taken as our best estimate of the internal accuracy of the ultraviolet photometry. They are somewhat smaller than the errors estimated in Paper III. This is reasonable, since the earlier estimates were known to be upper limits.

A collated list of the magnitudes for the three fields covering the Galactic center was formed after correcting the earlier magnitudes as detailed above. It contains 1500 objects. This list is presented in Table 5. This table will appear in AAS CD-ROM Series, Vol. 6, 1996. The first part is printed here for guidance as to form and content.

4. DISCUSSION

In Paper III we compared our ultraviolet photometry with previous observations. In view of the recalibration of the photometry discussed in the previous section, it is of interest to revisit this question. Accordingly, we searched the S201 catalog (Page, Carruthers, & Heckathorn 1982) for stars in common with Table 5. A total of 154 stars with both m_{1375} and S201 magnitudes were found, and the magnitudes are plotted in Figure 3. As was the case in Paper III, the scatter is larger for the S201 m_L magnitudes than for the m_C magnitudes. For the latter, the five low points between $m_{1375} = 6$ and $m_{1375} = 8$ had large interframe discrepancies in the S201 catalog. Accordingly, they were omitted from consideration. Fitting to the remaining points, we obtained the relationship $m_C = 0.99m_{1375} + 0.30$ with a scatter about the fit of 0.43 mag. Thus, the 11% scale difference between the two sets of data found in Paper III is resolved by the recalibration, and the zero-point offset has been reduced by about 0.2 mag. The data from the two missions are now in satisfactory agreement.

Since the Galactic center field overlaps the Scorpius and Sagittarius fields to a large degree, the characteristics of the stars are essentially the same as discussed in Paper III. Hence, we will not discuss this field further here.

Figure 4 shows the frequency distributions of the stars in the ρ Oph field with respect to the ultraviolet magnitudes. A comparison of this diagram with Figure 5 of Paper III shows that while all three fields have a few stars per magnitude at bright levels, the Scorpius and Sagittarius fields have roughly 6 times more stars at fainter levels (say between $m_{1375} = 5.5$ and 7.0

TABLE 5

COLLATED LIST OF OBJECTS FROM THE SCORPIUS, SAGITTARIUS, AND GALACTIC CENTER FIELDS

No.	α_{1950}	δ_{1950}	m_{1375}	m_{1781}	Identification	V	$(V-B)$	Spectral Type
1	15:57:51	-40:17	···	6.19	HD 143248	6.21	0.01	A0V
2	15:59:43	-43:17	···	7.16	Blend	7.29	···	B9V,A0V
3	16:01:08	-40:42	···	8.18	HD 143824	7.70	···	A1V
4	16:01:36	-37:40	···	5.67	Blend	7.13	···	B8/B9V,A1V
5	16:01:37	-39:18	···	6.30	HD 143939	7.10	···	B9p
6	16:02:41	-39:41	···	8.66	Blend	7.78	···	A5,B6IV/V
7	16:03:07	-45:01	···	6.65	HD 144197	4.72	0.23	Am
8	16:03:15	-36:39	···	1.63	HD 144294	4.20	-0.14	B2.5Vn
9	16:03:25	-39:06	···	10.40	SAO 207329	8.00	···	A1V
10	16:04:03	-43:09	···	8.98	HD 144351	7.10	···	A1V
11	16:04:51	-44:43	···	8.47	Blend	9.29	···	B7III/IV,A2
12	16:04:51	-43:42	···	8.89	HD 144478	7.90	···	B9V
13	16:04:55	-36:06	···	5.41	HD 144591	6.90	···	B9V
14	16:05:19	-38:58	···	5.29	Blend	6.08	···	A1.5III,A7IV
15	16:06:02	-44:50	···	8.14	GC 21695	9.8	···	B9II
16	16:06:27	-44:41	···	7.72	HD 144851	8.73	0.08	B8V
17	16:06:50	-40:00	5.74	6.49	HD 144965	7.06	0.15	B3Vne
18	16:06:56	-42:41	···	8.43	Blend	7.60	···	B9V,B9V,A2,A
19	16:08:01	-41:00	···	8.40	HD 145191	5.86	0.27	F0IV
20	16:10:50	-43:36	7.36	···	Blend	9.31	···	B9II/III,B9
21	16:11:35	-39:30	6.81	6.70	Blend	6.88	···	B9.5V,A3V
22	16:11:35	-47:14	···	3.60	HD 145842	5.14	-0.13	B8V
23	16:14:09	-42:54	8.01	8.64	HD 146335	8.20	0.19	B6III
24	16:14:59	-45:44	···	8.62	Blend	8.9P	···	B2III,B8
25	16:15:54	-42:35	···	6.64	HD 146667	5.45	0.10	A3Vn
26	16:16:32	-43:14	8.06	8.34	Blend	7.49	···	B8V,A0V,A1V
27	16:16:39	-46:14	···	7.91	Blend	7.7P	···	A0V,B9III/IV
28	16:17:05	-39:19	4.47	4.92	Blend	5.78	···	B9V,B9V
29	16:17:47	-47:00	···	8.33	Blend	7.70	···	A0IV,B3III
30	16:17:47	-48:03	···	5.43	HD 147001	6.52	-0.05	B7V

NOTE.—Table 5 is presented in its entirety in computer-readable form in the AAS CD-ROM Series, Vol. 6, 1996. The first part is presented here for guidance regarding its form and content.

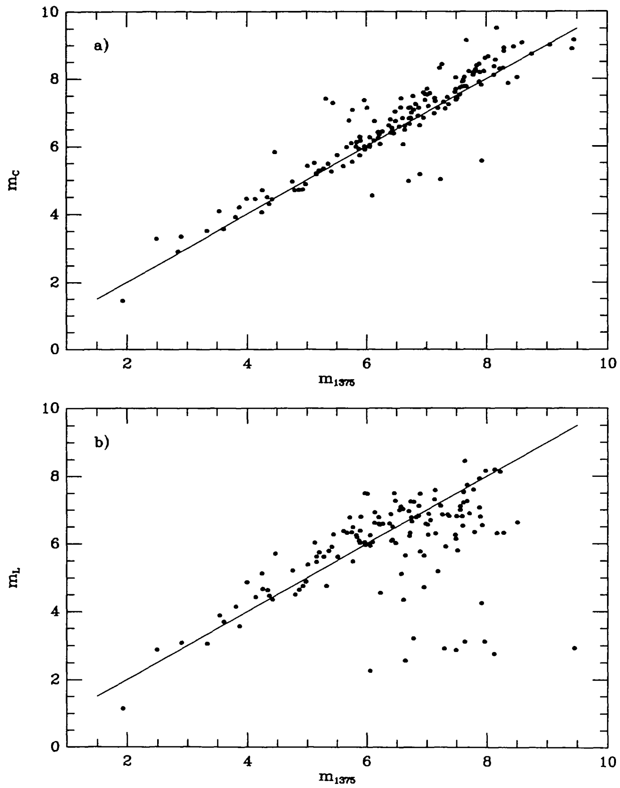

FIG. 3.—Comparison of m_{1375} with the S201 magnitudes for the Galactic center field.

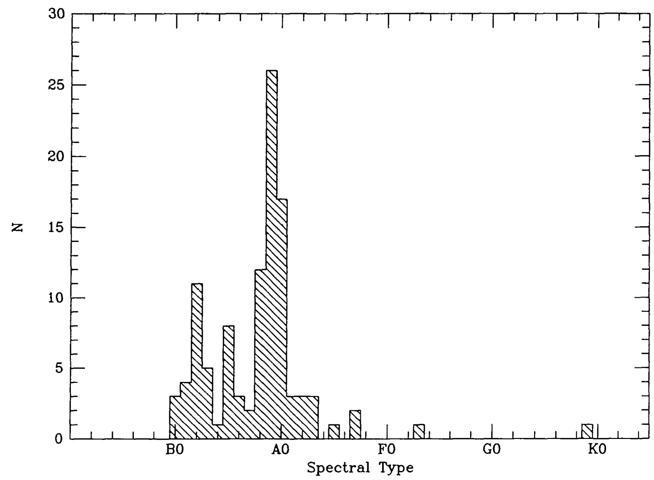

FIG. 5.—The frequency distribution of stars in the ρ Oph field with respect to spectral type.

and m_{1781} = 6.0 and 7.5). We attribute this difference in the distributions and the relatively small total number of stars in the ρ Oph field to the fact that this field is away from the Galactic plane ($b^{\rm II}$ = 18° at the field center). Hence, there are few distant OB stars.

Finally, Figure 5 presents the distribution of stars in the ρ Oph field with respect to spectral type. As in other fields, early A stars are the most numerous. However, the proportion of

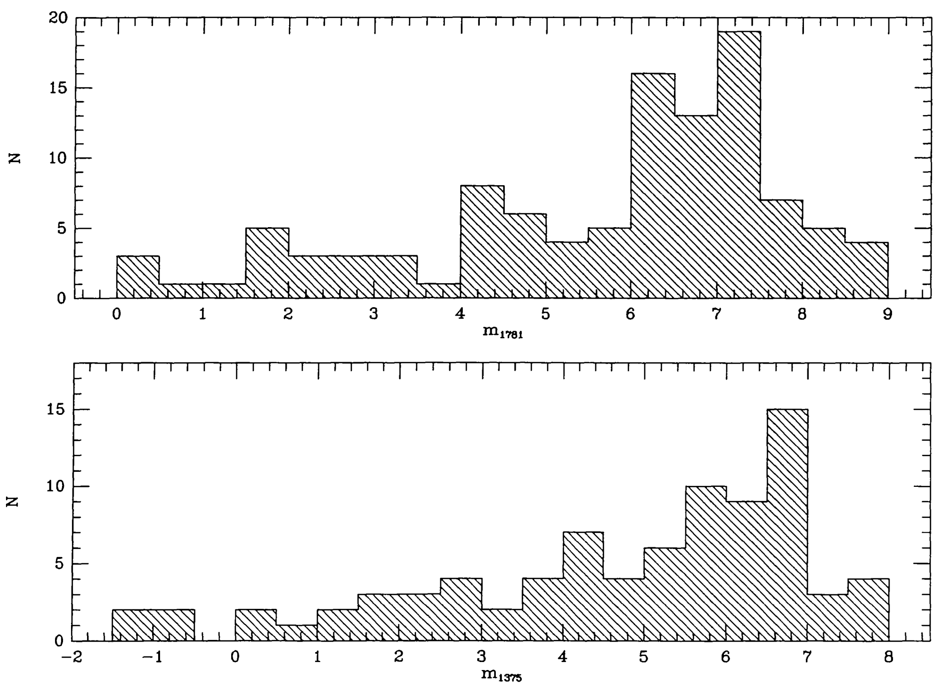

FIG. 4.—The frequency distribution of stars with respect to m_{1781} and m_{1375} for the ρ Oph field

early B stars is smaller than in the Scorpius and Sagittarius fields (Paper III) but comparable to the Monoceros and Orion fields (Papers I and II). In Paper III, we attributed the abundance of hot stars in Scorpius and Sagittarius to the presence of OB associations in those regions.

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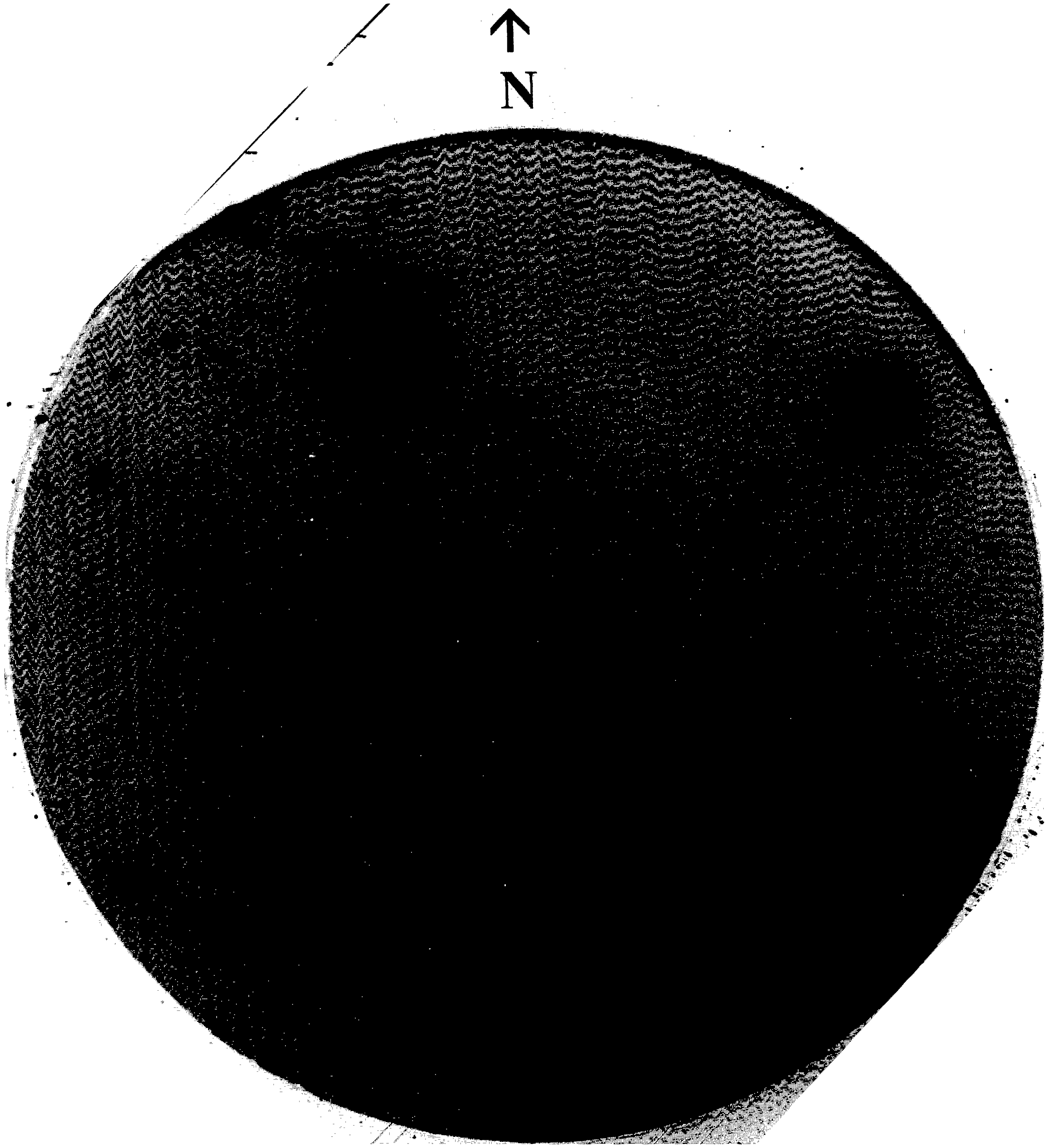

FIG. 1*a*

FIG. 1.—Prints of the far-UV images of the two fields: (*a*) Galactic center, camera 1 (λ_{eff} = 1375 Å); (*b*) Galactic center, camera 2 (λ_{eff} = 1781 Å); (*c*) ρ Oph field, camera 1; (*d*) ρ Oph field, camera 2.

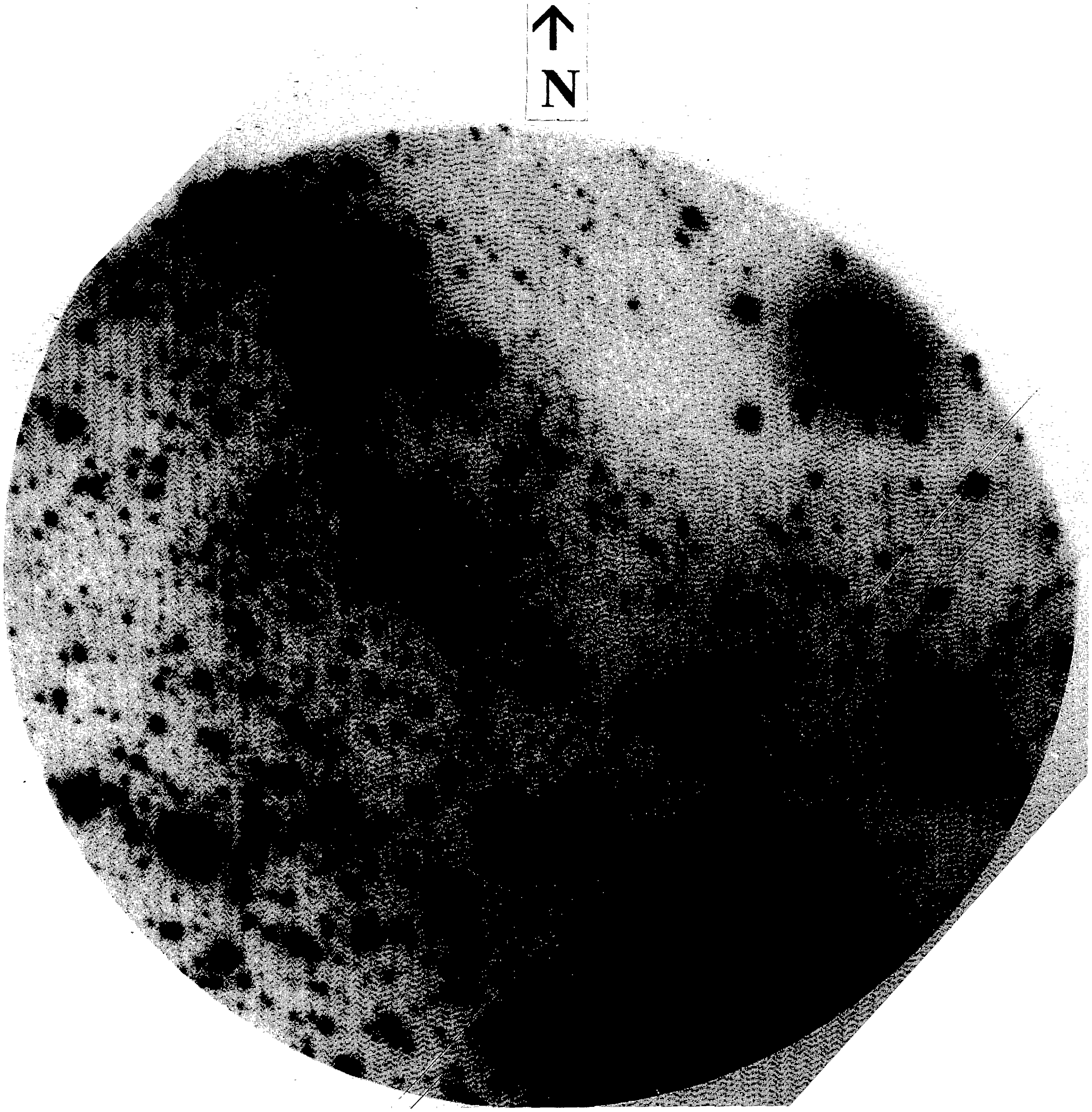

FIG. 1*b*

SCHMIDT & CARRUTHERS (see 104, 101)

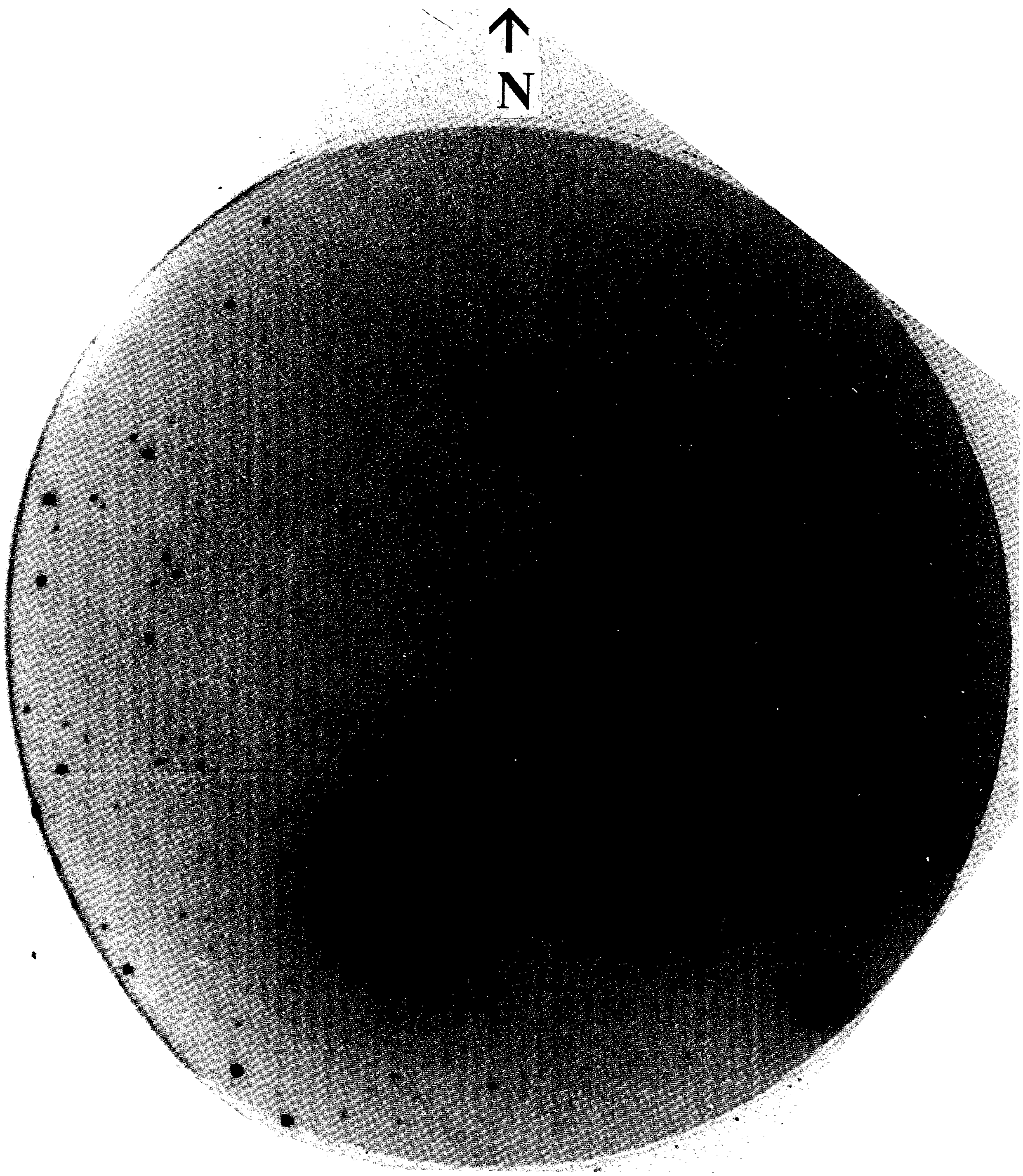

FIG. 1*c*

SCHMIDT & CARRUTHERS (see 104, 101)

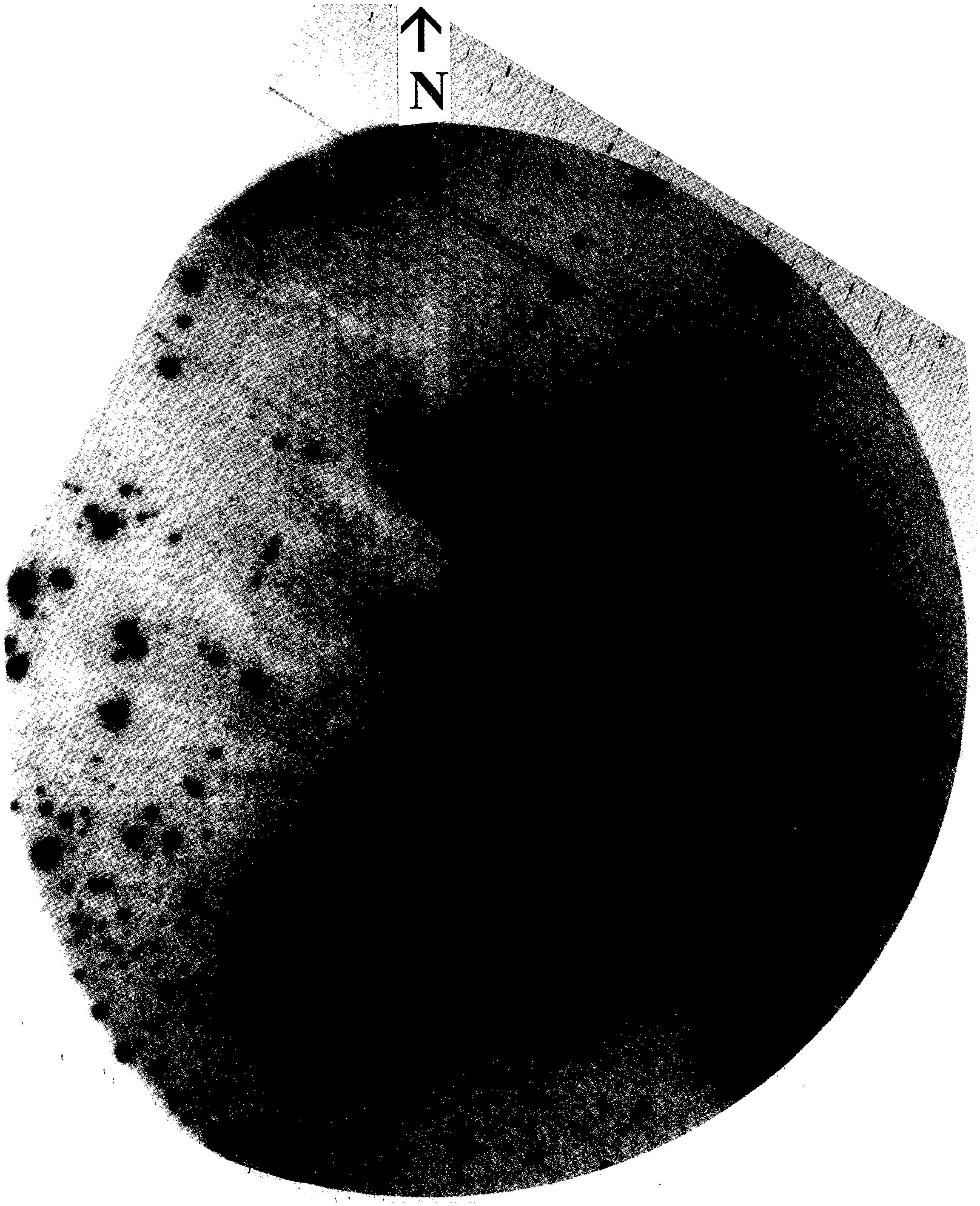

FIG. 1*d*

SCHMIDT & CARRUTHERS (see 104, 101)