



T 28020 -

1987 Oct. 25 -

OBSERVERS

EV = E. Vilkki

KC = Kyle Cudworth

SM = Steve Majewski

RR = Rick Rees

JS = John Smetanka

HJDC = Heather Cudworth

| PLATE No.   | OBJECT     | 1950 RA/DEC                                   | UT DATE | UT        | Exp.             | GUIDE STAR |
|-------------|------------|---|---------|-----------|------------------|------------|
|             |            |   | 1987    |           |                  |            |
| $\pi$ 28020 | BD+36°1442 | 6 <sup>h</sup> 25 <sup>m</sup> .4<br>+36°31'  | Oct. 25 | 0941-1001 | 20 <sup>m</sup>  | 102/91     |
| 1           | G193-78    | 7 <sup>h</sup> 51 <sup>m</sup> .9<br>+57°50'  | "       | 1040-1124 | 44 <sup>m</sup>  | 142/92     |
| 2           | BD+36°1442 | 6 <sup>h</sup> 25 <sup>m</sup> .4<br>+36°31'  | Oct. 28 | 0829-0849 | 20 <sup>m</sup>  | 102/92     |
| 3           | BD+36°1442 | 6 <sup>h</sup> 25 <sup>m</sup> .4<br>+36°31'  | "       | 0853-0913 | 20 <sup>m</sup>  | 102/92     |
| 4           | LP 36-98   | 8 <sup>h</sup> 54 <sup>m</sup> .7<br>+73°09'  | "       | 0952-1022 | 30 <sup>m</sup>  | 176/39     |
| 5           | LP 36-98   | 8 <sup>h</sup> 54 <sup>m</sup> .7<br>+73°09'  | "       | 1026-1106 | 40 <sup>m</sup>  | 176/39     |
| 6           | LP 36-98   | 8 <sup>h</sup> 54 <sup>m</sup> .7<br>+73°09'  | Oct. 31 | 0833-0903 | 30 <sup>m</sup>  | 176/39     |
| 7           | LP 36-98   | 8 <sup>h</sup> 54 <sup>m</sup> .7<br>+73°09'  | "       | 0906-0936 | 30 <sup>m</sup>  | 176/39     |
| 8           | F34        | 10 <sup>h</sup> 36 <sup>m</sup> .7<br>+43°21' | "       | 1005-1025 | 2.0 <sup>m</sup> | 137/87     |
| 9           | BD+14°2151 | 9 <sup>h</sup> 46 <sup>m</sup> .2<br>+13°59'  | "       | 1044-1104 | 20 <sup>m</sup>  | 65/89      |

| P.H. | EMUL   | FILT  | P.A. | TEL | SEE  | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS | REMARKS |
|------|--------|-------|------|-----|------|-------|------|------|------|-------|-------|-----|---------|
| 1    | 103a-G | 06530 | S    | W   | 1"   | f     | 4    | 1.5  | +4°  | 5.0+  | -     | EV  |         |
| 2    | "      | "     | N    | W   | 1"   | f     | -    | -    | "    | "     | 5x    | EV  |         |
| 3    | "      | "     | S    | W   | 3"   | f     | 4    | 1.5  | "    | 1.20  | -     | EV  |         |
| 4    | "      | "     | S    | W   | 3"   | f     | 4    | 1.5  | "    | "     | -     | EV  |         |
| 5    | "      | "     | N    | W   | 3"   | f     | -    | -    | +3°  | "     | 3x    | EV  |         |
| 6    | "      | "     | N    | W   | 3"   | f     | -    | -    | "    | "     | -     | EV  |         |
| 7    | "      | "     | N    | W   | 3"   | f     | -    | -    | +8°  | 1.40  | 4x    | EV  |         |
| 8    | "      | "     | N    | W   | 3"   | f     | -    | -    | "    | "     | 4x    | EV  |         |
| 9    | "      | "     | S    | W   | 2-3" | f     | -    | 2.0  | +7°  | "     | 3x    | EV  |         |
| 10   | "      | "     | S    | W   | 3"   | f     | -    | 4.5  | "    | "     | -     | EV  |         |

| PLATE<br>No. | OBJECT      | 1950<br>RA/<br>DEC                            | UT<br>DATE | UT        | Exp.            | GUIDE<br>STAR | H. |
|--------------|-------------|---|------------|-----------|-----------------|---------------|----|
|              |             |   | 1987       |           |                 |               |    |
| 28030        | BD +14°2151 | 9 <sup>h</sup> 46 <sup>m</sup> .2<br>+13°59'  | Oct. 31    | 1107-1127 | 20 <sup>m</sup> | 65/89         | 11 |
| 1            | LP 36-98    | 8 <sup>h</sup> 54 <sup>m</sup> .7<br>+73°09'  | Nov. 4     | 0754-0824 | 30 <sup>m</sup> | 175/38        | 12 |
| 2            | F 34        | 10 <sup>h</sup> 36 <sup>m</sup> .7<br>+43°21' | "          | 0856-0916 | 20 <sup>m</sup> | 140/86        | 1  |
| 3            | LP 36-98    | 8 <sup>h</sup> 54 <sup>m</sup> .7<br>+73°09'  | Nov. 7     | 0807-0837 | 30 <sup>m</sup> | 178/40        | 2  |
| 4            | G 193-78    | 7 <sup>h</sup> 51 <sup>m</sup> .9<br>+57°50'  | "          | 0902-1002 | 60 <sup>m</sup> | 142/91        | 3  |
| 5            | BD +14°2151 | 9 <sup>h</sup> 46 <sup>m</sup> .2<br>+13°59'  | "          | 1027-1047 | 20 <sup>m</sup> | 65/88         | 4  |
| 6            | BD +29°2091 | 10 <sup>h</sup> 44 <sup>m</sup> .6<br>+28°41' | "          | 1109-1129 | 20 <sup>m</sup> | 77/62         | 5  |
| 7            | BD +29°2091 | 10 <sup>h</sup> 44 <sup>m</sup> .6<br>+28°41' | "          | 1131-1151 | 20 <sup>m</sup> | 77/62         | 6  |
| 8            | G 193-78    | 7 <sup>h</sup> 51 <sup>m</sup> .9<br>+57°50'  | Nov. 10    | 0921-1021 | 60 <sup>m</sup> | 140/91        | 7  |
| 9            | BD +14°2151 | 9 <sup>h</sup> 46 <sup>m</sup> .2<br>+13°59'  | "          | 1109-1129 | 20 <sup>m</sup> | 65/89         | 8  |

| E<br>M<br>U<br>L | F<br>I<br>L<br>T | P.A.   | T<br>E<br>L | S<br>E<br>E | T<br>R<br>A<br>N<br>S | G<br>R<br>A<br>T | S<br>E<br>C<br>T | T<br>E<br>M<br>P | F<br>O<br>C<br>U<br>S | F<br>L<br>A<br>S<br>H | O<br>B<br>S | REMARKS |
|------------------|------------------|--------|-------------|-------------|-----------------------|------------------|------------------|------------------|-----------------------|-----------------------|-------------|---------|
| 11               | 103a-G           | OG 530 | S           | W           | 3"                    | f                | -                | 4.5              | +7°                   | 1.40                  | -           | EV      |
| 12               | "                | "      | N           | W           | 2-3"                  | f                | -                | -                | +15°                  | 1.70                  | 3x          | EV      |
| 1                | "                | "      | S           | W           | 2-3"                  | f                | -                | 2.0              | +14°                  | "                     | -           | EV      |
| 2                | "                | "      | N           | W           | 3"                    | f                | -                | -                | +7°                   | 1.40                  | 3x          | EV      |
| 3                | "                | "      | N           | W           | 3"                    | f                | -                | -                | "                     | "                     | 4x          | EV      |
| 4                | "                | "      | S           | W           | 3"                    | f                | -                | 4.5              | "                     | "                     | -           | EV      |
| 5                | "                | "      | W           | W           | 3"                    | f                | -                | 2.5              | "                     | "                     | -           | EV      |
| 6                | "                | "      | W           | W           | 3"                    | f                | -                | 2.5              | "                     | "                     | -           | EV      |
| 7                | "                | "      | N           | W           | 3"                    | f                | -                | -                | 0°                    | 0.90                  | 4x          | EV      |
| 8                | "                | "      | S           | W           | 4"                    | f                | -                | 4.5              | -1°                   | "                     | -           | EV      |

| PLATE No. | OBJECT     | 1950 RA/DEC                                   | UT DATE    | UT        | Exp.            | GUIDE STAR |
|-----------|------------|---|------------|-----------|-----------------|------------|
|           |            |   | 1987       |           |                 |            |
| TI 28040  | G193-78    | 7 <sup>h</sup> 51 <sup>m</sup> .9<br>+57°50'  | Nov. 12    | 0810-0920 | 70 <sup>m</sup> | 141/91     |
| 1         | BD+29°2091 | 10 <sup>h</sup> 44 <sup>m</sup> .6<br>+28°41' | "          | 1009-1029 | 20 <sup>m</sup> | TI/62      |
| 2         | G193-78    | 7 <sup>h</sup> 51 <sup>m</sup> .9<br>+57°50'  | Nov. 14    | 0921-1011 | 50 <sup>m</sup> | 142/91     |
| 3         | G47-18     | 8 <sup>h</sup> 56 <sup>m</sup> .2<br>+33°09'  | "          | 1033-1133 | 60 <sup>m</sup> | 218/81     |
| 4         | BD+28°4211 | 21 <sup>h</sup> 48 <sup>m</sup> .9<br>+28°38' | Nov. 18/19 | 2335-0005 | 30 <sup>m</sup> | 95/86      |
| 5         | "          | "   | Nov. 19    | 0006-0036 | 30 <sup>m</sup> | "          |
| 6         | "          | "   | "          | 0140-0205 | 25 <sup>m</sup> | "          |
| 7         | "          | "   | Nov. 21    | 0000-0025 | 25 <sup>m</sup> | "          |
| 8         | "          | "   | "          | 0027-0057 | 30 <sup>m</sup> | "          |
| 9         | G193-78    | 7 <sup>h</sup> 51 <sup>m</sup> .9<br>+57°50'  | "          | 0744-0808 | 24 <sup>m</sup> | 142/90     |

| P.H. | EMUL   | FILT   | P.A. | TEL  | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBSS                         | REMARKS |
|------|--------|--------|------|------|-----|-------|------|------|------|-------|-------|------------------------------|---------|
| 9    | 103a-G | OG-530 | N W  | 3"   | f   | -     | -    | +3°  | 1.10 | 4X    | EV    |                              |         |
| 10   | "      | "      | W W  | 3'   | f   | -     | 2.5  | +2°  | 4    | -     | EV    |                              |         |
| 11   | "      | "      | N W  | 2"   | f   | -     | -    | +7°  | 1.35 | 4X    | EV    |                              |         |
| 12   | "      | "      | N W  | 2"   | f   | -     | -    | "    | "    | 5X    | EV    |                              |         |
| 1    | "      | "      | S E  | 2-3" | g   | -     | 2.5  | +5°  | 1.75 | 4X    | KC    |                              |         |
| 2    | "      | "      | " "  | 2"   | g   | -     | "    | "    | "    | 4X    | KC    |                              |         |
| 4    | "      | "      | " "  | 2"   | g   | -     | "    | +4°  | 1.50 | 5X    | KC    | 1 <sup>h</sup> gap - refocus |         |
| 1    | "      | "      | " "  | 3"   | f   | -     | "    | -1°  | 1.45 | 4X    | KC    | clouds around                |         |
| 2    | "      | "      | " "  | 3"   | f   | -     | "    | "    | "    | 4X    | KC    | "                            |         |
| 7    | "      | "      | N W  | 2"   | f   | -     | -    | -3°  | 1.10 | 5X    | EV    | clouds                       |         |

PLATE  
No.

OBJECT

1950  
RA/DEC

UT  
DATE

UT

Exp.

GUIDE  
STAR

π 28050

G193-78

7<sup>h</sup>51<sup>m</sup>.9  
+57°50'

1987  
Nov. 21

0843-0933

50<sup>m</sup>

142/90

1 G47-18

8<sup>h</sup>56<sup>m</sup>.2  
+33°09'

"

0958-1108

70<sup>m</sup>

218/80

2 BD+14°2151

9<sup>h</sup>46<sup>m</sup>.2  
+13°59'

"

1130-1150

20<sup>m</sup>

65/90

3 BD+28°4211

21<sup>h</sup>48<sup>m</sup>.9  
+28°38'

Nov. 21

2344-2359

15<sup>m</sup>

95/86

4 "

"  
"

Nov. 22

0000-0020

20<sup>m</sup>

"

5 G193-78

7<sup>h</sup>51<sup>m</sup>.9  
+57°50'

"

0627-0737

70<sup>m</sup>

142/90

6 G47-18

8<sup>h</sup>56<sup>m</sup>.2  
+33°09'

"

0803-0913

70<sup>m</sup>

217/82

7 BD+29°2091

10<sup>h</sup>44<sup>m</sup>.6  
+28°41'

"

0947-1007

20<sup>m</sup>

77/63

8 BD+29°2091

10<sup>h</sup>44<sup>m</sup>.6  
+28°41'

"

1011-1031

20<sup>m</sup>

77/63

9 BD+29°2091

10<sup>h</sup>44<sup>m</sup>.6  
+28°41'

Dec. 5

0952-1012

20<sup>m</sup>

77/62

| EMUL | FILT   | P.A.  | T E L | S E E | T R A N S | G R A T | S E C T | T E M P | F O C U S | F L A S H | O B S | REMARKS |
|------|--------|-------|-------|-------|-----------|---------|---------|---------|-----------|-----------|-------|---------|
| 8    | 103a-6 | 06530 | N     | W     | 3"        | f       | -       | -5°     | 1.00      | 5x        | EV    |         |
| 9    | "      | "     | N     | W     | 3"        | f       | -       | "       | "         | 5x        | EV    |         |
| 10   | "      | "     | S     | W     | 3"        | f       | -       | 4.5     | "         | "         | -     | EV      |
| 1    | "      | "     | S     | E     | 1"        | g       | -       | 2.5     | -1°       | 1.60      | 4x    | KC      |
| 2    | "      | "     | "     | "     | "         | "       | +       | "       | "         | "         | 4x    | KC      |
| 11   | "      | "     | N     | W     | 3"        | f       | -       | 0°      | 1.35      | 5x        | EV    |         |
| 12   | "      | "     | N     | W     | 3"        | f       | -       | "       | "         | "         | 5x    | EV      |
| 1    | "      | "     | W     | W     | 3"        | f       | -       | 2.5     | "         | "         | 3x    | EV      |
| 2    | "      | "     | W     | W     | 3"        | f       | -       | 2.5     | "         | "         | 3x    | EV      |
| 3    | "      | "     | W     | W     | 4"        | f       | -       | 2.5     | -3°       | 1.15      | -     | EV      |

| PLATE No. | OBJECT           | 1950 RA/DEC                                   | UT DATE        | UT        | Exp.            | GUIDE STAR |
|-----------|------------------|---|----------------|-----------|-----------------|------------|
| 28060     | BD +29°2091      | 10 <sup>h</sup> 44 <sup>m</sup> .6<br>+28°41' | 1987<br>Dec. 5 | 1026-1050 | 24 <sup>m</sup> | 77/63      |
| 1         | W 365            | 11 <sup>h</sup> 08 <sup>m</sup> .4<br>+6°42'  | "              | 1122-1132 | 10 <sup>m</sup> | 232/67     |
| 2         | W 365            | 11 <sup>h</sup> 08 <sup>m</sup> .4<br>+6°42'  | "              | 1136-1146 | 10 <sup>m</sup> | 232/67     |
| 3         | Pl. Neb. 158+179 | 6 <sup>h</sup> 15 <sup>m</sup> .4<br>+55°38'  | 1988<br>Jan. 8 | 0227-0312 | 45 <sup>m</sup> | 156/83     |
| 4         | "                | "   | "              | 0313-0358 | 45 <sup>m</sup> | "          |
| 5         | 23 Tau = Merope  | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+23°48'  | Feb. 14        | 0035-0115 | 40 <sup>m</sup> | 178/54     |
| 6         | BD +23°520       | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02'  | Feb. 16        | 0216-0230 | 14 <sup>m</sup> | 128/88     |
| 7         | BD +23°520       | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02'  | "              | 0234-0244 | 10 <sup>m</sup> | 128/88     |
| 8         | BD +39°2947      | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | Feb. 17        | 1040-1100 | 20 <sup>m</sup> | 172/76     |
| 9         | BD +39°2947      | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | "              | 1107-1127 | 20 <sup>m</sup> | 172/76     |

| H. | EMUL   | FILT   | P.A. | TEL | SEE  | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBSS | REMARKS |
|----|--------|--------|------|-----|------|-------|------|------|------|-------|-------|------|---------|
| 4  | 103a-G | OG 530 | W    | W   | 3-4" | f     | -    | 2.5  | -4°  | 1.15  | 3X    | EV   |         |
| 5  | "      | "      | E    | W   | 3"   | f     | -    | 0.5  | "    | "     | -     | EV   |         |
| 6  | "      | "      | E    | W   | 3"   | f     | -    | 0.5  | "    | "     | 3X    | EV   |         |
| 1  | 103a-G | GG 495 | N    | W   | 2"   | f     | -    | -    | -14° | 1.00  | 4X    | KC   |         |
| L  | "      | "      | "    | "   | "    | "     | -    | -    | "    | "     | 4X    | KC   |         |
| 1  | 103a-G | GG 495 | S    | W   | 1-2" | f     | -    | -    | -11° | 1.10  | 3X    | KC   | cirrus  |
| 7  | "      | OG 530 | W    | E   | 2"   | f     | -    | 5.0  | -6°  | 1.10  | -     | EV   |         |
| 8  | "      | "      | W    | E   | 2"   | p     | -    | 5.0  | "    | "     | 4X    | EV   |         |
| 9  | "      | "      | S    | W   | 2-3" | p     | 4    | 3.0  | -4°  | 1.15  | 3X    | EV   |         |
| 10 | "      | "      | S    | W   | 2-3" | f     | 4    | 3.0  | "    | "     | 3X    | EV   |         |

| PLATE No. | OBJECT          | 1950 RA/DEC                                  | UT DATE  | UT        | Exp.            | GUIDE STAR H. |
|-----------|-----------------|--|----------|-----------|-----------------|---------------|
|           |                 |  | 1988     |           |                 |               |
| π 28070   | 23 Tau = Merope | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+23°48' | Feb. 18  | 0027-0057 | 30 <sup>m</sup> | 178/54 1      |
| 1         | θ Ori           | 5 <sup>h</sup> 32 <sup>m</sup> .8<br>-5°24'  | "        | 0112-0118 | 6 <sup>m</sup>  | 93/109 2      |
| 2         | "               | "  | "        | 0126-0129 | 3 <sup>m</sup>  | " 3           |
| 3         | "               | "  | "        | 0130-0138 | 8 <sup>m</sup>  | " 4           |
| 4         | "               | "  | "        | 0139-0209 | 30 <sup>m</sup> | " "           |
| 5         | θ Ori           | 5 <sup>h</sup> 32 <sup>m</sup> .8<br>-5°24'  | Feb. 19  | 0024-0028 | 4 <sup>m</sup>  | 93/109 1      |
| 6         | "               | "  | "        | 0029-0041 | 12 <sup>m</sup> | " 2           |
| 7         | 23 Tau = Merope | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+23°48' | "        | 0113-0138 | 25 <sup>m</sup> | 128/533       |
| 8         | "               | "  | "        | 0139-0204 | 25 <sup>m</sup> | " 5           |
| 9         | BD+23°520       | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02' | Febr. 27 | 0125-0141 | 16 <sup>m</sup> | 128/88 1      |

| EMUL   | FILT  | P.A. | TEL  | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS | REMARKS |
|--------|-------|------|------|-----|-------|------|------|------|-------|-------|-----|---------|
| 103a-G | GG495 | S E  | 1-2" | g   | -     | -    | -1°  | 1.40 | 3X    | KC    |     |         |
| "      | "     | S E  | 1-2" | g   | -     | -    | "    | "    | 3X    | KC    |     |         |
| "      | OG530 | " "  | " "  | "   | -     | -    | "    | "    | 3X    | KC    |     |         |
| "      | "     | " "  | " "  | "   | -     | -    | "    | "    | 3X    | KC    |     |         |
| "      | "     | " "  | " "  | "   | -     | -    | "    | "    | 3X    | KC    |     |         |
| 103a-G | OG530 | S W  | 1"   | f-p | -     | -    | +1°  | 1.40 | 3X    | KC    |     | circus  |
| "      | "     | " "  | " "  | "   | -     | -    | "    | "    | 3X    | KC    |     | "       |
| "      | GG495 | N E  | 1"   | f   | -     | -    | "    | "    | 3X    | KC    |     | "       |
| "      | "     | " "  | " "  | f   | -     | -    | "    | "    | 3X    | KC    |     | "       |
| "      | OG530 | W E  | 2"   | f   | -     | 5.0  | +2°  | 1.50 | -     | EV    |     |         |



| PLATE No. | OBJECT      | 1950 RA/DEC                                   | UT DATE          | UT        | Exp.            | GUIDE STAR |
|-----------|-------------|---|------------------|-----------|-----------------|------------|
| π 28080   | BD+23°52'0  | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02'  | 1988<br>Febr. 27 | 0145-0157 | 12 <sup>m</sup> | 128/88     |
| 1         | BD+39°29'47 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | Febr. 28         | 0954-1014 | 20 <sup>m</sup> | 172/75     |
| 2         | BD+39°29'47 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | "                | 1019-1039 | 20 <sup>m</sup> | 172/75     |
| 3         | BD+74°889   | 20 <sup>h</sup> 52 <sup>m</sup> .1<br>+74°35' | "                | 1108-1128 | 20 <sup>m</sup> | 157/45     |
| 4         | BD+39°29'47 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | Febr. 29         | 0743-0807 | 24 <sup>m</sup> | 172/75     |
| 5         | BD+39°29'47 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | "                | 0810-0830 | 20 <sup>m</sup> | 172/75     |
| 6         | BD+74°889   | 20 <sup>h</sup> 52 <sup>m</sup> .1<br>+74°35' | "                | 0907-0931 | 24 <sup>m</sup> | 156/46     |
| 7         | BD+74°889   | 20 <sup>h</sup> 52 <sup>m</sup> .1<br>+74°35' | "                | 0934-0954 | 20 <sup>m</sup> | 156/46     |
| 8         | BD+39°29'47 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+37°17' | Mar. 5           | 0936-0958 | 22 <sup>m</sup> | 173/75     |
| 9         | BD+39°29'47 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | "                | 1001-1021 | 20 <sup>m</sup> | 173/75     |

| EMUL | FILT   | P.A.   | TEL | SEE  | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS | REMARKS |
|------|--------|--------|-----|------|-------|------|------|------|-------|-------|-----|---------|
| 2    | 103a-G | 06-530 | W E | 2-3" | f     | -    | 5.0  | +2°  | 1.50  | 4X    | EV  |         |
| 3    | "      | "      | S W | 2"   | f     | 4    | 3.0  | -2°  | 1.20  | -     | EV  |         |
| 4    | "      | "      | S W | 2"   | f     | 4    | 3.0  | "    | "     | 3X    | EV  |         |
| 5    | "      | "      | S W | 2-3" | f     | 4    | 1.5  | "    | "     | 3X    | EV  |         |
| 6    | "      | "      | S W | 2-3" | f     | 4    | 3.0  | +1°  | 1.20  | 3X    | EV  |         |
| 7    | "      | "      | S W | 2-3" | f     | 4    | 3.0  | "    | "     | 3X    | EV  |         |
| 8    | "      | "      | S W | 3"   | f     | 4    | 1.5  | 0°   | "     | 3X    | EV  |         |
| 9    | "      | "      | S W | 3"   | f     | 4    | 1.5  | "    | "     | 3X    | EV  |         |
| 10   | "      | "      | S W | 2"   | f     | 4    | 3.0  | -1°  | 1.15  | 3X    | EV  |         |
| 11   | "      | "      | S W | 3"   | f     | 4    | 3.0  | "    | "     | 3X    | EV  |         |

| PLATE No. | OBJECT       | 1950 RA/DEC                                    | UT DATE | UT        | Exp.            | GUIDE STAR |
|-----------|--------------|--|---------|-----------|-----------------|------------|
|           |              |  | 1988    |           |                 |            |
| 97 28090  | BD +74° 889  | 20 <sup>h</sup> 52 <sup>m</sup> .1<br>+74° 35' | Mar. 5  | 1046-1106 | 20 <sup>m</sup> | 156/45     |
| 1         | BD +74° 889  | 20 <sup>h</sup> 52 <sup>m</sup> .1<br>+74° 35' | "       | 1111-1135 | 24 <sup>m</sup> | 156/45     |
| 2         | BD +23° 520  | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24° 02'  | Mar. 6  | 0148-0200 | 12 <sup>m</sup> | 130/88     |
| 3         | BD +23° 520  | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24° 02'  | "       | 0204-0220 | 16 <sup>m</sup> | 130/88     |
| 4         | LS V +46° 21 | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46° 36'  | "       | 0255-0311 | 16 <sup>m</sup> | 107/87     |
| 5         | LS V +46° 21 | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46° 36'  | "       | 0314-0330 | 16 <sup>m</sup> | 107/87     |
| 6         | BD +36° 1442 | 6 <sup>h</sup> 25 <sup>m</sup> .4<br>+36° 31'  | "       | 0451-0511 | 20 <sup>m</sup> | 102/92     |
| 7         | BD +36° 1442 | 6 <sup>h</sup> 25 <sup>m</sup> .4<br>+36° 31'  | "       | 0528-0548 | 20 <sup>m</sup> | 102/92     |
| 8         | BD +39° 2947 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39° 17' | "       | 0657-0727 | 30 <sup>m</sup> | 172/76     |
| 9         | BD +39° 2947 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39° 17' | "       | 0733-0757 | 24 <sup>m</sup> | 172/76     |

| H. | EMUL   | FILT   | P.A. | TEL  | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS | REMARKS |
|----|--------|--------|------|------|-----|-------|------|------|------|-------|-------|-----|---------|
| 12 | 103a-G | 06-530 | S W  | 2-3" | f   | 4     | 1.5  | -2°  | 1.15 | 3X    | EV    |     |         |
| 1  | "      | "      | S W  | 2-3" | f   | 4     | 1.5  | "    | "    | 3X    | EV    |     |         |
| 2  | "      | "      | W E  | 2"   | f   | -     | 5.0  | +2°  | 1.45 | 3X    | EV    |     |         |
| 3  | "      | "      | W E  | 2"   | f   | -     | 5.0  | "    | "    | 3X    | EV    |     |         |
| 4  | "      | "      | N E  | 2"   | f   | -     | -    | "    | "    | 4X    | EV    |     |         |
| 5  | "      | "      | N E  | 2"   | f   | -     | -    | "    | "    | 3X    | EV    |     |         |
| 6  | "      | "      | S E  | 2-3" | f   | 4     | 1.5  | +1°  | 1.35 | 3X    | EV    |     |         |
| 7  | "      | "      | S E  | 2-3" | f   | 4     | 1.5  | "    | "    | 3X    | EV    |     |         |
| 8  | "      | "      | S W  | 3"   | f   | 4     | 3.0  | "    | "    | -     | EV    |     |         |
| 9  | "      | "      | S W  | 3"   | f   | 4     | 3.0  | "    | "    | 3X    | EV    |     |         |

| PLATE No. | OBJECT      | 1950 RA/DEC                                   | UT DATE | UT        | Exp.            | GUIDE STAR |
|-----------|-------------|---|---------|-----------|-----------------|------------|
|           |             |   | 1988    |           |                 |            |
| π 28100   | BD +23°520  | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02'  | Mar. 10 | 0220-0234 | 14 <sup>m</sup> | 128/88     |
| 1         | BD +23°520  | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02'  | "       | 0240-0256 | 16 <sup>m</sup> | 128/88     |
| 2         | BD +39°2947 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | "       | 0950-1014 | 24 <sup>m</sup> | 175/76     |
| 3         | BD +39°2947 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | "       | 1017-1037 | 20 <sup>m</sup> | 175/76     |
| 4         | BD +74°889  | 20 <sup>h</sup> 52 <sup>m</sup> .1<br>+74°35' | "       | 1102-1124 | 22 <sup>m</sup> | 156/44     |
| 5         | BD +36°1442 | 6 <sup>h</sup> 25 <sup>m</sup> .4<br>+36°31'  | Mar. 19 | 0229-0249 | 20 <sup>m</sup> | 100/92     |
| 6         | BD +36°1442 | 6 <sup>h</sup> 25 <sup>m</sup> .4<br>+36°31'  | "       | 0253-0313 | 20 <sup>m</sup> | 100/92     |
| 7         | G 193-78    | 7 <sup>h</sup> 51 <sup>m</sup> .9<br>+57°50'  | "       | 0419-0519 | 60 <sup>m</sup> | 142/90     |
| 8         | LP 36-98    | 8 <sup>h</sup> 54 <sup>m</sup> .7<br>+73°09'  | "       | 0542-0612 | 30 <sup>m</sup> | 176/39     |
| 9         | G 193-78    | 7 <sup>h</sup> 51 <sup>m</sup> .9<br>+57°50'  | Mar. 24 | 0337-0437 | 60 <sup>m</sup> | 143/91     |

| H. | EMUL   | FILT   | P.A. | TEL  | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS | REMARKS |
|----|--------|--------|------|------|-----|-------|------|------|------|-------|-------|-----|---------|
| 10 | 103a-G | OG 530 | W E  | 3"   | f   | -     | 5.0  | +3°  | 1.35 | 3x    | EV    |     |         |
| 11 | "      | "      | W E  | 3"   | f   | -     | 5.0  | "    | "    | 3x    | EV    |     |         |
| 12 | "      | "      | S W  | 2"   | f   | 4     | 3.0  | +1°  | 1.20 | 3x    | EV    |     |         |
| 1  | "      | "      | S W  | 2"   | f   | 4     | 3.0  | "    | "    | 3x    | EV    |     |         |
| 2  | "      | "      | S W  | 2"   | f   | 4     | 1.5  | "    | "    | 3x    | EV    |     |         |
| 3  | "      | "      | S E  | 1-2" | f   | 4     | 1.5  | +1°  | 1.20 | 3x    | EV    |     |         |
| 4  | "      | "      | S E  | 1-2" | f   | 4     | 1.5  | "    | "    | 3x    | EV    |     |         |
| 5  | "      | "      | N E  | 2"   | f   | -     | -    | 0°   | "    | 4x    | EV    |     |         |
| 6  | "      | "      | N E  | 2"   | f   | -     | -    | -1°  | "    | 4x    | EV    |     |         |
| 7  | "      | "      | N E  | 2"   | f   | -     | -    | +8°  | 1.60 | 3x    | EV    |     |         |

| PLATE No. | OBJECT    | 1950 RA/DEC                                   | UT DATE | UT        | Exp.            | GUIDE STAR |
|-----------|-----------|---|---------|-----------|-----------------|------------|
|           |           |   | 1988    |           |                 |            |
| 97 28110  | LP 36-98  | 8 <sup>h</sup> 54 <sup>m</sup> .7<br>+73°09'  | Mar. 24 | 0500-0530 | 30 <sup>m</sup> | 176/39     |
| 1         | G 193-78  | 7 <sup>h</sup> 51 <sup>m</sup> .9<br>+57°50'  | Mar. 31 | 0228-0338 | 70 <sup>m</sup> | 143/91     |
| 2         | LP 36-98  | 8 <sup>h</sup> 54 <sup>m</sup> .7<br>+73°09'  | "       | 0402-0432 | 30 <sup>m</sup> | 177/39     |
| 3         | LP 280-26 | 18 <sup>h</sup> 55 <sup>m</sup> .7<br>+33°53' | Apr. 4  | 0916-1006 | 50 <sup>m</sup> | 173/62     |
| 4         | IC 4756   | 18 <sup>h</sup> 36 <sup>m</sup> .5<br>+5°27'  | "       | 1034-1036 | 2 <sup>m</sup>  | 208/77     |
| 5         | IC 4756   | 18 <sup>h</sup> 36 <sup>m</sup> .5<br>+5°27'  | "       | 1039-1041 | 2 <sup>m</sup>  | 208/77     |
| 6         | G 193-78  | 7 <sup>h</sup> 51 <sup>m</sup> .9<br>+57°50'  | Apr. 7  | 0212-0322 | 70 <sup>m</sup> | 142/92     |
| 7         | LP 36-98  | 8 <sup>h</sup> 54 <sup>m</sup> .7<br>+73°09'  | "       | 0344-0434 | 50 <sup>m</sup> | 177/39     |
| 8         | LP 280-26 | 18 <sup>h</sup> 55 <sup>m</sup> .7<br>+33°53' | "       | 0927-1017 | 50 <sup>m</sup> | 172/62     |
| 9         | IC 4756   | 18 <sup>h</sup> 36 <sup>m</sup> .5<br>+5°27'  | "       | 1035-1038 | 3 <sup>m</sup>  | 208/77     |

| EMUL | FILT   | P.A.   | TEL | SEE  | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS | REMARKS |
|------|--------|--------|-----|------|-------|------|------|------|-------|-------|-----|---------|
| 8    | 103a-G | 06-530 | N E | 2"   | f     | -    | -    | +8°  | 1.60  | 3x    | EV  |         |
| 9    | "      | "      | N E | 3"   | f     | -    | -    | +6°  | 1.55  | 3x    | EV  |         |
| 10   | "      | "      | N E | 3"   | f     | -    | -    | +5°  | "     | 3x    | EV  |         |
| 11   | "      | "      | N W | 2"   | f     | -    | -    | +8°  | 1.50  | 3x    | EV  |         |
| 12   | "      | "      | S W | 2"   | f     | -    | -    | "    | "     | 3x    | EV  |         |
| 1    | "      | "      | S W | 2"   | f     | -    | -    | "    | "     | 3x    | EV  |         |
| 2    | "      | "      | N E | 2-3" | f     | -    | -    | +10° | 1.55  | 4x    | EV  |         |
| 3    | "      | "      | N E | 3"   | f     | -    | -    | +9°  | "     | 4x    | EV  |         |
| 4    | "      | "      | N W | 3-4" | f     | -    | -    | +7°  | 1.35  | 4x    | EV  |         |
| 5    | "      | "      | S W | 4"   | f     | -    | -    | "    | "     | -     | EV  |         |

| PLATE No. | OBJECT | 1950 RA/DEC                                   | UT DATE | UT        | Exp.            | GUIDE STAR |
|-----------|--------|---|---------|-----------|-----------------|------------|
|           |        |   | 1988    |           |                 |            |
| 28120     | M 3    | 13 <sup>h</sup> 39. <sup>m</sup> 9<br>+28°38' | Apr. 8  | 0325-0345 | 20 <sup>m</sup> | 175/60     |
| 1         | "      | "   | "       | 0346-0406 | 20 <sup>m</sup> | "          |
| 2         | "      | "   | "       | 0409-0456 | 47 <sup>m</sup> | "          |
| 3         | "      | "   | "       | 0502-0547 | 45 <sup>m</sup> | "          |
| 4         | M 5    | 15 <sup>h</sup> 16. <sup>m</sup> 0<br>+2°16'  | "       | 0605-0635 | 30 <sup>m</sup> | 150/102    |
| 5         | M 13   | 16 <sup>h</sup> 39. <sup>m</sup> 9<br>+36°33' | "       | 0653-0700 | 7 <sup>m</sup>  | 112/88     |
| 6         | "      | "   | "       | 0701-0707 | 6 <sup>m</sup>  | "          |
| 7         | "      | "   | "       | 0708-0738 | 30 <sup>m</sup> | "          |
| 8         | "      | "   | "       | 0742-0812 | 30 <sup>m</sup> | "          |
| 9         | "      | "   | "       | 0814-0821 | 7 <sup>m</sup>  | "          |

| H. | EMUL   | FILT  | P.A. | TEL | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS | REMARKS |
|----|--------|-------|------|-----|-----|-------|------|------|------|-------|-------|-----|---------|
| 1  | 103a-G | GG495 | S W  | 1"  | g   | -     | -    | +10° | 1.90 | 4X    | KC    |     |         |
| 2  | "      | "     | "    | "   | "   | -     | -    | "    | "    | 4X    | KC    |     |         |
| 3  | "      | "     | "    | "   | 1"  | g     | -    | -    | "    | "     | 4X    | KC  |         |
| 4  | "      | "     | "    | "   | 1"  | g     | -    | -    | "    | "     | 4X    | KC  |         |
| 5  | "      | "     | S W  | 1"  | g   | -     | -    | "    | "    | 4X    | KC    |     |         |
| 6  | "      | "     | S W  | 1"  | f   | -     | -    | "    | "    | 3X    | KC    |     |         |
| 7  | "      | "     | "    | "   | "   | f     | -    | -    | "    | "     | 3X    | KC  |         |
| 8  | "      | "     | "    | "   | "   | f     | -    | -    | "    | "     | 3X    | KC  |         |
| 9  | "      | "     | "    | "   | 1"  | f     | -    | -    | +10° | "     | 3X    | KC  |         |
| 0  | "      | "     | "    | "   | "   | f     | -    | -    | "    | "     | 3X    | KC  |         |

| PLATE No. | OBJECT    | 1950 RA / DEC                                 | UT DATE        | UT        | Exp.            | GUIDE STAR | H. |
|-----------|-----------|---|----------------|-----------|-----------------|------------|----|
| 28130     | M 92      | 17 <sup>h</sup> 15.6<br>+43°12'               | 1988<br>Apr. 8 | 0836-0841 | 5 <sup>m</sup>  | 228/81     | 1  |
| 1         | "         | "   | "              | 0842-0912 | 30 <sup>m</sup> | "          | 2  |
| 2         | LP 280-26 | 18 <sup>h</sup> 55 <sup>m</sup> .7<br>+33°53' | Apr. 12        | 0825-0925 | 60 <sup>m</sup> | 171/62     | 1  |
| 3         | IC 4756   | 18 <sup>h</sup> 36 <sup>m</sup> .5<br>+5°27'  | "              | 1002-1005 | 3 <sup>m</sup>  | 208/77     | 2  |
| 4         | LP 36-98  | 8 <sup>h</sup> 54 <sup>m</sup> .7<br>+73°09'  | Apr. 13        | 0233-0313 | 40 <sup>m</sup> | 178/41     | 3  |
| 5         | IC 4756   | 18 <sup>h</sup> 36 <sup>m</sup> .5<br>+5°27'  | "              | 0833-0835 | 2 <sup>m</sup>  | 208/76     | 4  |
| 6         | LP 690-10 | 18 <sup>h</sup> 26 <sup>m</sup> .5<br>-4°32'  | "              | 0859-0959 | 60 <sup>m</sup> | 70/105     | 5  |
| 7         | LP 690-10 | 18 <sup>h</sup> 26 <sup>m</sup> .5<br>-4°32'  | Apr. 19        | 0855-0955 | 60 <sup>m</sup> | 88/88      | 7  |
| 8         | LP 690-10 | 18 <sup>h</sup> 26 <sup>m</sup> .5<br>-4°32'  | Apr. 21        | 0815-0905 | 50 <sup>m</sup> | 88/88      | 8  |
| 9         | LP 690-10 | 18 <sup>h</sup> 26 <sup>m</sup> .5<br>-4°32'  | "              | 0912-0952 | 40 <sup>m</sup> | 88/88      | 9  |

| EMUL   | FILT   | PA. | TEL  | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OB | REMARKS |
|--------|--------|-----|------|-----|-------|------|------|------|-------|-------|----|---------|
| 103a-6 | GG 495 | S W | 1"   | f   | -     | -    | +10° | 1.90 | 3X    | KC    |    |         |
| "      | "      | "   | 1"   | f   | -     | -    | "    | "    | 3X    | KC    |    |         |
| "      | OG 530 | N W | 3"   | f   | -     | -    | +7°  | 1.35 | 3X    | EV    |    |         |
| "      | "      | S W | 4"   | f   | -     | -    | +6°  | "    | -     | EV    |    |         |
| "      | "      | N E | 2"   | f   | -     | -    | +11° | 1.70 | 3X    | EV    |    |         |
| "      | "      | S W | 2"   | f   | -     | -    | +9°  | 1.50 | 3X    | EV    |    |         |
| "      | "      | W W | 3"   | f   | -     | -    | "    | "    | 5X    | EV    |    |         |
| "      | "      | N W | 4"   | f   | -     | -    | +4°  | 1.35 | 4X    | EV    |    |         |
| "      | "      | N W | 3"   | f   | -     | -    | "    | 1.30 | 5X    | EV    |    |         |
| "      | "      | N W | 2-3" | f   | -     | -    | "    | "    | 5X    | EV    |    |         |

| PLATE No. | OBJECT      | 1950 RA / DEC                                  | UT DATE         | UT        | Exp.              | GUIDE STAR |
|-----------|-------------|--|-----------------|-----------|-------------------|------------|
| π 28140   | BD+14° 2151 | 9 <sup>h</sup> 46. <sup>m</sup> 2<br>+13° 59'  | 1988<br>Apr. 29 | 0209-0229 | 20 <sup>m</sup>   | 63/90      |
| 1         | HD 93521    | 10 <sup>h</sup> 45.6<br>+37° 50'               | "               | 0311-0336 | 2x12 <sup>m</sup> | 16/111     |
| 2         | "           | "  | "               | 0337-0402 | 2x12 <sup>m</sup> | "          |
| 3         | M 3         | 13 <sup>h</sup> 39. <sup>m</sup> 9<br>+28° 38' | "               | 0439-0451 | 12 <sup>m</sup>   | 175/60     |
| 4         | "           | "  | "               | 0452-0504 | 12 <sup>m</sup>   | "          |
| 5         | M 13        | 16 <sup>h</sup> 39. <sup>m</sup> 9<br>+36° 33' | "               | 0517-0547 | 30 <sup>m</sup>   | 112/88     |
| 6         | "           | "  | "               | 0552-0622 | 30 <sup>m</sup>   | "          |
| 7         | "           | "  | "               | 0624-0629 | 5 <sup>m</sup>    | "          |
| 8         | "           | "  | "               | 0630-0635 | 5 <sup>m</sup>    | "          |
| 9         | "           | "  | "               | 0636-0641 | 5 <sup>m</sup>    | "          |

| P.H. | EMUL   | FILT  | P.A. | TEL | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS | REMARKS |
|------|--------|-------|------|-----|-----|-------|------|------|------|-------|-------|-----|---------|
| 1    | 103a-G | 0G530 | S W  | 2"  | f   | -     | 4.5  | +10° | 1.80 | 2X    | KC    |     |         |
| 2    | "      | GG495 | S E  | 1"  | f   | 4     | 3.0  | +10° | "    | 3X    | KC    |     |         |
| 3    | "      | "     | "    | "   | "   | 4     | 3.0  | "    | "    | 2X    | KC    |     |         |
| 4    | "      | "     | S W  | 1"  | f   | -     | -    | +10° | 1.80 | 2X    | KC    |     |         |
| 5    | "      | "     | "    | "   | "   | -     | -    | "    | "    | 2X    | KC    |     |         |
| 6    | "      | "     | S W  | 1"  | f   | -     | -    | +10° | "    | 2X    | KC    |     |         |
| 7    | "      | "     | "    | "   | 1"  | f     | -    | "    | "    | 2X    | KC    |     |         |
| 8    | "      | "     | "    | "   | 1"  | f     | -    | "    | "    | 3X    | KC    |     |         |
| 9    | "      | "     | "    | "   | 1"  | f     | -    | "    | "    | 3X    | KC    |     |         |
| 10   | "      | "     | "    | "   | 1"  | f     | -    | "    | "    | 3X    | KC    |     |         |

| PLATE No. | OBJECT     | 1950 RA/DEC                                   | UT DATE | UT        | Exp.              | GUIDE STAR |
|-----------|------------|---|---------|-----------|-------------------|------------|
|           |            |   | 1988    |           |                   |            |
| π 28150   | p Leo      | 10 <sup>h</sup> 30 <sup>m</sup> .2<br>+9°34'  | Apr. 30 | 0215-0247 | 2x15 <sup>m</sup> | 70/92      |
| 1         | HD 93521   | 10 <sup>h</sup> 45 <sup>m</sup> .6<br>+37°50' | "       | 0302-0333 | 2x15 <sup>m</sup> | 161/111    |
| 2         | F 34       | 10 <sup>h</sup> 36 <sup>m</sup> .7<br>+43°21' | "       | 0405-0425 | 20 <sup>m</sup>   | 135/87     |
| 3         | "          | "   | "       | 0426-0446 | 20 <sup>m</sup>   | "          |
| 4         | BD+29°2091 | 10 <sup>h</sup> 44 <sup>m</sup> .6<br>+28°41' | "       | 0508-0528 | 20 <sup>m</sup>   | 77/62      |
| 5         | "          | "   | "       | 0529-0549 | 20 <sup>m</sup>   | "          |
| 6         | p Leo      | 10 <sup>h</sup> 30 <sup>m</sup> .2<br>+9°34'  | May 1   | 0200-0231 | 2x15 <sup>m</sup> | 70/92      |
| 7         | BD+14°2151 | 9 <sup>h</sup> 46 <sup>m</sup> .2<br>+13°59'  | "       | 0303-0323 | 20 <sup>m</sup>   | 63/90      |
| 8         | "          | "   | "       | 0324-0344 | 20 <sup>m</sup>   | "          |
| 9         | BD+29°2091 | 10 <sup>h</sup> 44 <sup>m</sup> .6<br>+28°41' | "       | 0407-0427 | 20 <sup>m</sup>   | 77/62      |

| P.H. | E<br>M<br>U<br>L | F<br>I<br>L<br>T | P.A. | T<br>E<br>L | S<br>E<br>E | T<br>R<br>A<br>N<br>S | G<br>R<br>A<br>T | S<br>E<br>C<br>T | T<br>E<br>M<br>P | F<br>O<br>C<br>U<br>S | F<br>L<br>A<br>S<br>H | O<br>B<br>S | REMARKS |
|------|------------------|------------------|------|-------------|-------------|-----------------------|------------------|------------------|------------------|-----------------------|-----------------------|-------------|---------|
| 1    | 1030-G           | GG495            | S E  | 1-2"        | g           | 4                     | 6.0+13°          | 2.17             | -                | KC                    |                       |             |         |
| 2    | "                | "                | S E  | 1-2"        | g           | 4                     | 3.0+13°          | "                | 2X               | KC                    |                       |             |         |
| 3    | "                | OG530            | S E  | 1-2"        | g           | -                     | 2.0+13°          | "                | 2X               | KC                    |                       |             |         |
| 4    | "                | "                | S E  | 1-2"        | g           | -                     | 2.0+13°          | "                | 2X               | KC                    |                       |             |         |
| 5    | "                | "                | W E  | 1-2"        | g           | -                     | 2.5+13°          | "                | 2X               | KC                    |                       |             |         |
| 6    | "                | "                | W E  | 1-2"        | g           | -                     | 2.5+13°          | "                | 2X               | KC                    |                       |             |         |
| 1    | 1030-G           | GG495            | S W  | 1"          | f           | 4                     | 6.0+14°          | 2.00             | -                | KC                    |                       |             |         |
| 2    | "                | OG530            | S E  | 1-2"        | g           | -                     | 4.5 "            | "                | 2X               | KC                    |                       |             |         |
| 3    | "                | "                | " "  | "           | g           | -                     | 4.5 "            | "                | 2X               | KC                    |                       |             |         |
| 4    | "                | "                | W E  | 1-2"        | g           | -                     | 2.5 "            | "                | 2X               | KC                    |                       |             |         |



PLATE No.

OBJECT

1950 RA/DEC

UT DATE

UT

Exp.

GUIDE STAR

?H.

TT 28160

BD+29°2091

10<sup>h</sup>44<sup>m</sup>.6  
+28°41'

1988 May 1

0428-0448

20<sup>m</sup>

77/62

1 W365

11<sup>h</sup>08<sup>m</sup>.4  
+6°42'

May 6

0213-0223

10<sup>m</sup>

230/67

2 "

"

"

0224-0234

10<sup>m</sup>

"

3 BD+14°2151

9<sup>h</sup>46<sup>m</sup>.2  
+13°59'

"

0247-0304

17<sup>m</sup>

63/90

4 "

"

"

0310-0327

"

"

5 W365

11<sup>h</sup>08<sup>m</sup>.4  
+6°42'

May 14

0229-0241

12<sup>m</sup>

230/67

6 "

"

"

0242-0254

12<sup>m</sup>

"

7 BD+29°2091

10<sup>h</sup>44<sup>m</sup>.6  
+28°41'

"

0347-0412

25<sup>m</sup>

77/62

8 W365

11<sup>h</sup>08<sup>m</sup>.4  
+6°42'

May 20

0232-0241

9<sup>m</sup>

230/67

9 "

"

"

0242-0252

10<sup>m</sup>

"

E M U L

F I L T

P.A.

T E L

S E E

T R A N S

G R A T

S E C T

T E M P

F O C U S

F L A S H

O B S

REMARKS

5

103a-G

06530

W

E

1-2"

g

-

2.5+14°

2.00

-

KC

1

103a-G

06530

E

E

1"

g

-

0.5+17°

7.0  
1.95

3X

KC

2

"

"

"

"

"

"

-

0.5

"

"

3X

KC

3

"

"

S

E

1"

g

-

4.5

"

"

4X

KC

sector stopped during exposure

4

"

"

"

"

"

g

-

4.5

"

"

4X

KC

1

103a-G

06530

E

E

3"

f

-

0.5+13°

8.0  
1.20

5X

KC

2

"

"

"

"

"

"

-

0.5

"

"

5X

KC

3

"

"

W

E

3"

f

-

2.5

"

"

5X

KC

1

103a-G

06530

E

E

1"

f

-

0.5+18°

1.40

5X

KC

2

"

"

"

"

"

f

-

0.5

"

"

5X

KC

| PLATE No | OBJECT             | 1950 RA/DEC                                   | UT DATE | UT        | Exp.              | GUIDE STAR |
|----------|--------------------|---|---------|-----------|-------------------|------------|
|          |                    |   | 1988    |           |                   |            |
| TT 28170 | BD+29°2091         | 10 <sup>h</sup> 44. <sup>m</sup> 6<br>+28°41' | May 20  | 0311-0331 | 20 <sup>m</sup>   | 77/62      |
| 1        | F 34               | 10 <sup>h</sup> 36. <sup>m</sup> 7<br>+43°21' | "       | 0353-0413 | 20 <sup>m</sup>   | 135/87     |
| 2        | M 28 =<br>NGC 6626 | 18 <sup>h</sup> 21. <sup>m</sup> 5<br>-24°54' | "       | 0747-0837 | 50 <sup>m</sup>   | 220/103    |
| 3        | M 28 =<br>NGC 6626 | 18 <sup>h</sup> 21. <sup>m</sup> 5<br>-24°54' | May 21  | 0738-0748 | 10 <sup>m</sup>   | 220/103    |
| 4        | "                  | "   | "       | 0749-0904 | 75 <sup>m</sup>   | "          |
| 5        | "                  | "   | "       | 0912-0922 | 10 <sup>m</sup>   | "          |
| 6        | BD+2°2538          | 12 <sup>h</sup> 23. <sup>m</sup> 0<br>+1°34'  | June 4  | 0249-0319 | 30 <sup>m</sup>   | 123/76     |
| 7        | "                  | "   | "       | 0321-0351 | 30 <sup>m</sup>   | "          |
| 8        | G 93-1             | 21 <sup>h</sup> 16. <sup>m</sup> 0<br>+2°24'  | "       | 0725-0805 | 2x20 <sup>m</sup> | 218/63     |
| 9        | HD 216411          | 22 <sup>h</sup> 49. <sup>m</sup> 5<br>+58°57' | "       | 0827-0859 | 3x10 <sup>m</sup> | 204/66     |

| E M U L | F I L T | P.A. | T E L | S E E | T R A N S | G R A T | S E C T | T E M P | F O C U S | F L A S H | O B S          | REMARKS |
|---------|---------|------|-------|-------|-----------|---------|---------|---------|-----------|-----------|----------------|---------|
| 103a-G  | 06530   | W E  | 1"    | f     | -         | 2.5     | +18°    | 1.40    | 5X        | KC        |                |         |
| "       | "       | S E  | 1"    | f     | -         | 2.0     | "       | "       | 5X        | KC        |                |         |
| 103a-G  | GG495   | S W  | 1-2"  | f-p   | -         | "       | "       | "       | 6X        | KC        | passing clouds |         |
| 103a-G  | GG495   | S W  | 1-2"  | g     | -         | "       | +18°    | 1.30    | 6X        | KC        |                |         |
| "       | "       | "    | "     | g     | -         | "       | "       | "       | 6X        | KC        |                |         |
| "       | "       | S W  | 1-2"  | g     | -         | "       | "       | "       | 4X        | KC        |                |         |
| 103a-G  | 06530   | W E  | 1-2"  | f     | -         | 4.0     | +19°    | 1.30    | 5X        | KC        |                |         |
| "       | "       | "    | "     | f     | -         | 4.0     | "       | "       | 5X        | KC        |                |         |
| 103a-G  | GG495   | S W  | 1-2"  | f     | -         | "       | +18°    | "       | 2X        | KC        |                |         |
| "       | "       | S W  | "     | f     | -         | 5.0     | "       | "       | 3X        | KC        |                |         |

| PLATE No. | OBJECT      | 1950 RA/DEC                                   | UT DATE | UT        | Exp.              | GUIDE STAR |
|-----------|-------------|---|---------|-----------|-------------------|------------|
|           |             |   | 1988    |           |                   |            |
| 28180     | HD216411    | 22 <sup>h</sup> 49 <sup>m</sup> .5<br>+58°45' | June 11 | 0719-0751 | 3x10 <sup>m</sup> | 204/64     |
| 1         | BD+28°42.11 | 21 <sup>h</sup> 48 <sup>m</sup> .9<br>+28°37' | "       | 0839-0904 | 25 <sup>m</sup>   | 94/86      |
| 2         | BD+2°2538   | 12 <sup>h</sup> 23 <sup>m</sup> .0<br>+1°34'  | June 12 | 0250-0320 | 30 <sup>m</sup>   | 123/76     |
| 3         | R974        | 12 <sup>h</sup> 59 <sup>m</sup> .4<br>-1°49'  | "       | 0336-0352 | 16 <sup>m</sup>   | 113/88     |
| 4         | BD+28°42.11 | 21 <sup>h</sup> 48 <sup>m</sup> .9<br>+28°37' | June 14 | 0808-0829 | 21 <sup>m</sup>   | 94/86      |
| 5         | "           | "   | "       | 0830-0855 | 25 <sup>m</sup>   | "          |
| 6         | BD+34°2476  | 13 <sup>h</sup> 57 <sup>m</sup> .0<br>+34°06' | June 28 | 0459-0549 | 50 <sup>m</sup>   | 120/71     |
| 7         | BD+34°2476  | 13 <sup>h</sup> 57 <sup>m</sup> .0<br>+34°06' | July 3  | 0435-0515 | 40 <sup>m</sup>   | 120/72     |
| 8         | BD+39°2947  | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | July 12 | 0614-0644 | 30 <sup>m</sup>   | 173/75     |
| 9         | BD+74°889   | 20 <sup>h</sup> 52 <sup>m</sup> .1<br>+74°35' | "       | 0736-0806 | 30 <sup>m</sup>   | 157/45     |

| EMUL   | FILT  | P.A. | TEL  | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | DBS | REMARKS |
|--------|-------|------|------|-----|-------|------|------|------|-------|-------|-----|---------|
| 103a-G | GG495 | S W  | 2-3" | g   | -     | 5.0  | +18° | 1.45 | 4X    | KC    |     |         |
| "      | 06530 | S W  | 3"   | g   | -     | 2.5  | "    | "    | 3X    | KC    |     |         |
| "      | 06530 | W E  | 1"   | f   | -     | 4.0  | +23° | 1.75 | 3X    | KC    |     |         |
| "      | "     | S E  | 1"   | f   | -     | "    | "    | "    | 5X    | KC    |     |         |
| "      | 06530 | S W  | 2"   | f   | -     | 2.5  | +23° | 1.70 | 5X    | KC    |     |         |
| "      | "     | "    | "    | "   | -     | "    | "    | "    | 3X    | KC    |     |         |
| "      | "     | E E  | 3"   | f   | -     | 3.5  | +22° | 1.60 | 2X    | EV    |     |         |
| "      | "     | E E  | 3"   | f   | -     | 3.5  | +21° | 1.50 | 3X    | EV    |     |         |
| "      | "     | S E  | 2-3" | f   | 4     | 3.0  | +22° | 1.55 | 3X    | EV    |     |         |
| "      | "     | S E  | 2-3" | f   | 4     | 1.5  | "    | "    | 3X    | EV    |     |         |

| PLATE No. | OBJECT     | 1950 RA/DE                                    | UT DATE      | UT        | Exp.                              | GUIDE STAR |
|-----------|------------|---|--------------|-----------|-----------------------------------|------------|
| TT 28190  | BD+74°889  | 20 <sup>h</sup> 52 <sup>m</sup> .1<br>+74°35' | July 12 1988 | 0812-0842 | 30 <sup>m</sup>                   | 157/45     |
| 1         | BD+39°2947 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | July 13      | 0437-0452 | 15 <sup>m</sup>                   | 173/75     |
| 2         | BD+28°4211 | 21 <sup>h</sup> 48 <sup>m</sup> .9<br>+28°38' | "            | 0625-0649 | 24 <sup>m</sup>                   | 95/85      |
| 3         | G 34-15    | 1 <sup>h</sup> 13 <sup>m</sup> .7<br>+24°04'  | "            | 0753-0913 | 80 <sup>m</sup>                   | 88/51      |
| 4         | BD+39°2947 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | July 23      | 0414-0450 | 36 <sup>m</sup>                   | 173/76     |
| 5         | BD+39°2947 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | "            | 0458-0538 | 40 <sup>m</sup>                   | 173/76     |
| 6         | BD+74°889  | 20 <sup>h</sup> 52 <sup>m</sup> .1<br>+74°35' | "            | 0643-0713 | 30 <sup>m</sup>                   | 156/45     |
| 7         | G 34-15    | 1 <sup>h</sup> 13 <sup>m</sup> .7<br>+24°04'  | "            | 0807-0927 | 80 <sup>m</sup>                   | 88/51      |
| 8         | G 93-1     | 21 <sup>h</sup> 16 <sup>m</sup> .0<br>+2°24'  | Sept. 11     | 0214-0325 | 30 <sup>m</sup> , 40 <sup>m</sup> | 218/63     |
| 9         | BD+39°2947 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | 1989 Mar. 1  | 1137-1141 | 4 <sup>m</sup>                    | 175/77     |

| H. | EMUL   | FILT   | PA. | TEL  | SEE | TRANS | GRAT | SECT | TEMP        | FOCUS | FLASH | OBSS           | REMARKS |
|----|--------|--------|-----|------|-----|-------|------|------|-------------|-------|-------|----------------|---------|
| 11 | 103a-G | OG 530 | S E | 2-3" | f   | 4     | 1.5  | +21° | 1.50        | 3X    | EV    |                |         |
| 12 | "      | "      | S E | 3"   | f   | 4     | 3.0  | +21° | 1.40        | 3X    | EV    | rector stopped |         |
| 1  | "      | "      | S W | 2-3" | f   | -     | 2.5  | +20° | "           | 3X    | EV    |                |         |
| 2  | "      | "      | S W | 2-3" | f   | -     | -    | "    | "           | 5X    | EV    |                |         |
| 3  | "      | "      | S E | 2-3" | f   | 4     | 3.0  | +23° | 1.55        | 3X    | EV    |                |         |
| 4  | "      | "      | S E | 2-3" | f   | 4     | 3.0  | +22° | "           | 3X    | EV    |                |         |
| 5  | "      | "      | S E | 2"   | f   | 4     | 1.5  | "    | "           | 3X    | EV    |                |         |
| 6  | "      | "      | S W | 2"   | f   | -     | -    | +21° | 1.45        | 5X    | EV    |                |         |
| 1  | 103a-G | GG 495 | S W | 2"   | f   | -     | -    | +22° | 1.65        | 5X    | KC    | SKY smoky      |         |
| 1  | "      | OG 530 | S W | 3"   | f   | 4     | 3.0  | -9°  | 5.0<br>1.20 | -     | EV    |                |         |

| PLATE No. | OBJECT     | 1950 RA/DEC                                   | UT DATE | UT        | Exp.                              | GUIDE STAR |
|-----------|------------|---|---------|-----------|-----------------------------------|------------|
|           |            |   | 1989    |           |                                   |            |
| π 28200   | G112-1     | 7 <sup>h</sup> 09. <sup>m</sup> 5<br>+6°12'   | Mar 23  | 0120-0200 | 40 <sup>m</sup>                   | 100/82     |
| 1         | "          | "   | "       | 0203-0253 | 30 <sup>m</sup> , 20 <sup>m</sup> | "          |
| 2         | BD+36°1442 | 6 <sup>h</sup> 25 <sup>m</sup> .4<br>+36°31'  | Apr. 9  | 0240-0300 | 20 <sup>m</sup>                   | 102/93     |
| 3         | BD+36°1442 | 6 <sup>h</sup> 25 <sup>m</sup> .4<br>+36°31'  | "       | 0316-0336 | 20 <sup>m</sup>                   | 102/93     |
| 4         | BD+36°1442 | 6 <sup>h</sup> 25 <sup>m</sup> .4<br>+36°31'  | Apr. 13 | 0335-0355 | 20 <sup>m</sup>                   | 102/93     |
| 5         | LP 690-10  | 18 <sup>h</sup> 26 <sup>m</sup> .5<br>-4°32'  | Apr. 15 | 0914-1014 | 60 <sup>m</sup>                   | 90/90      |
| 6         | BD+36°1442 | 6 <sup>h</sup> 25 <sup>m</sup> .4<br>+36°31'  | Apr. 16 | 0209-0229 | 20 <sup>m</sup>                   | 102/93     |
| 7         | LP 690-10  | 18 <sup>h</sup> 26 <sup>m</sup> .5<br>-4°32'  | Apr. 19 | 0832-0932 | 60 <sup>m</sup>                   | 90/90      |
| 8         | LP 690-10  | 18 <sup>h</sup> 26 <sup>m</sup> .5<br>-4°32'  | "       | 0942-1022 | 40 <sup>m</sup>                   | 90/90      |
| 9         | NGC 6171   | 16 <sup>h</sup> 29. <sup>m</sup> 7<br>-12°57' | May 3   | 0622-0732 | 70 <sup>m</sup>                   | 121/69     |

| H. | EMUL   | FILT  | P.A. | T E L | S E E | T R A N S | G R A T | S E C T | T E M P | F O C U S | F L A S H | O B S                             | REMARKS |
|----|--------|-------|------|-------|-------|-----------|---------|---------|---------|-----------|-----------|-----------------------------------|---------|
| 1  | 103a-G | GG495 | S W  | 1-2"  | f     | -         | -       | +2°     | 1.40    | 2X        | KC        |                                   |         |
| 2  | "      | "     | "    | "     | f     | -         | -       | "       | "       | 2X        | KC        |                                   |         |
| 1  | "      | 0G530 | S E  | 3"    | f     | 4         | 1.5     | +3°     | 1.30    | 3X        | EV        |                                   |         |
| 2  | "      | "     | S E  | 2"    | f     | 4         | 1.5     | +2°     | "       | 3X        | EV        |                                   |         |
| 3  | "      | "     | S E  | 2"    | f     | 4         | 1.5     | +4°     | 1.45    | -         | EV        |                                   |         |
| 4  | "      | "     | N W  | 2"    | f     | -         | -       | +6°     | 1.55    | 4X        | EV        |                                   |         |
| 5  | "      | "     | S E  | 3"    | f     | 4         | 1.5     | +10°    | 1.75    | 3X        | EV        |                                   |         |
| 7  | "      | "     | N W  | 2"    | f     | -         | -       | +6°     | 1.55    | 3X        | EV        |                                   |         |
| 8  | "      | "     | N W  | 2"    | f     | -         | -       | "       | "       | 3X        | EV        |                                   |         |
| L  | "      | GG495 | S W  | 2"    | f-p   | -         | -       | +8°     | 1.70    | 6X        | KC        | clouds<br>last<br>30 <sup>m</sup> |         |

| PLATE No. | OBJECT    | 1950 RA/DEC                                   | UT DATE | UT              | Exp.              | GUIDE STAR |
|-----------|-----------|---|---------|-----------------|-------------------|------------|
|           |           |   | 1989    |                 |                   |            |
| 11 28210  | NGC 6171  | 16 <sup>h</sup> 29 <sup>m</sup> .7<br>-12°57' | May 4   | 0525-0655       | 90 <sup>m</sup>   | 121/69     |
| 1         | "         | "   | "       | 0657-0712       | 75 <sup>m</sup>   | "          |
| 2         | "         | "   | May 10  | 0515-0715       | 2 <sup>h</sup>    | "          |
| 3         | NGC 6171  | 16 <sup>h</sup> 29 <sup>m</sup> .7<br>-12°57' | June 2  | 0349-0541       | 2 <sup>h</sup>    | "          |
| 4         | M 28      | 18 <sup>h</sup> 21 <sup>m</sup> .5<br>-24°54' | "       | 0620-0750       | 90 <sup>m</sup>   | 221/103    |
| 5         | "         | "   | "       | 0753-0908       | 75 <sup>m</sup>   | "          |
| 6         | HD 216411 | 22 <sup>h</sup> 49 <sup>m</sup> .5<br>+58°45' | June 7  | 0650-0737       | 3x15 <sup>m</sup> | 204/66     |
| 7         | G 233-27  | 22 <sup>h</sup> 42 <sup>m</sup> .1<br>+56°28' | June 20 | 0525-0655       | 90 <sup>m</sup>   | 111/110    |
| 8         | G 93-1    | 21 <sup>h</sup> 16 <sup>m</sup> .0<br>+2°24'  | "       | 0717-0818       | 2x30 <sup>m</sup> | 218/63     |
| 9         | G 233-27  | 22 <sup>h</sup> 42 <sup>m</sup> .1<br>+56°28' | June 21 | 0524-0654 (90°) |                   | 111/110    |

| E M U L | F I L T | P.A. | T E L | S E E | T R A N S | G R A T | S E C T | T E M P     | F O C U S | F L A S H | O B S                       | REMARKS |
|---------|---------|------|-------|-------|-----------|---------|---------|-------------|-----------|-----------|-----------------------------|---------|
| 103a-G  | GG 495  | S W  | 1-2"  | f     | -         | -       | +11°    | 1.90        | 6X        | KC        |                             |         |
| "       | "       | "    | 1"    | f-p   | -         | -       | "       | "           | 6X        | KC        | clouds last 25 <sup>m</sup> |         |
| "       | "       | S W  | 2"    | g     | -         | -       | +10°    | 1.70        | 6X        | KC        |                             |         |
| 103a-G  | GG 495  | S W  | 1-2"  | g     | -         | -       | +19°    | 2.20        | 6X        | KC        |                             |         |
| "       | "       | S W  | 2"    | g     | -         | -       | +20     | "           | 6X        | KC/SM     |                             |         |
| "       | "       | "    | "     | "     | -         | -       | +19.5   | "           | 6X        | SM/KC     |                             |         |
| 103e-G  | GG 495  | S W  | 3"    | f     | -         | 5.0     | +22°    | 8.0<br>1.25 | 4X        | KC        |                             |         |
| 103a-G  | GG 495  | S W  | 1"    | f     | -         | -       | +20°    | 1.50        | 3X        | KC        |                             |         |
| "       | "       | "    | 1"    | f     | -         | -       | "       | "           | 2X        | KC        |                             |         |
| "       | "       | "    | 1-2"  | f-p   | -         | -       | +19°    | 1.45        | 3X        | KC        | Fog                         |         |

| PLATE No. | OBJECT     | 1950 RA/DEC                                   | UT DATE | UT         | Exp.                             | GUIDE STAR |
|-----------|------------|---|---------|------------|----------------------------------|------------|
|           |            |   | 1989    |            |                                  |            |
| T 28220   | NGC 6171   | 16 <sup>h</sup> 29 <sup>m</sup> .7<br>-12°57' | June 24 | 0302-0552  | 2 <sup>h</sup> 50 <sup>m</sup>   | 121/69     |
| 1         | M28        | 18 <sup>h</sup> 21 <sup>m</sup> .5<br>-24°54' | "       | 0607-0810  | (2 <sup>h</sup> 3 <sup>m</sup> ) | 220/103    |
| 2         | M28        | "   | June 28 | 0449-0719  | 2 <sup>h</sup> 30 <sup>m</sup>   | 220/103    |
| 3         | M28        | 18 <sup>h</sup> 21 <sup>m</sup> .5<br>-24°54' | July 5  | 0358-0633  | 2 <sup>h</sup> 35 <sup>m</sup>   | 220/103    |
| 4         | NGC 6171   | 16 <sup>h</sup> 29 <sup>m</sup> .7<br>-12°57' | July 6  | 0305-0540  | 2 <sup>h</sup> 35 <sup>m</sup>   | 121/69     |
| 5         | BD+39°2947 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | Aug. 1  | 0334-0404  | 30 <sup>m</sup>                  | 175/78     |
| 6         | BD+39°2947 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | "       | 0410-0440  | 30 <sup>m</sup>                  | 175/78     |
| 7         | BD+39°2947 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | Aug. 3  | 0302.-0332 | 30 <sup>m</sup>                  | 175/78     |
| 8         | BD+39°2947 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | "       | 0340-0410  | 30 <sup>m</sup>                  | 175/78     |
| 9         | BD+39°2947 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | "       | 0446-0526  | 40 <sup>m</sup>                  | 175/78     |

| P.H. | EMUL   | FILT   | P.A. | TEL  | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS | REMARKS  |
|------|--------|--------|------|------|-----|-------|------|------|------|-------|-------|-----|--|
| 1    | 103a-G | GG495  | S W  | 1-2" | f   | -     | -    | +26° | 1.85 | 6X    | KC    |     | circus last 20"                                  |
| 2    | "      | "      | S W  | 2"   | f   | -     | -    | +24° | "    | 4X    | KC    |     | interrupted ~20" clouds may have lost guide star |
| 1    | "      | "      | S W  | 2"   | g   | -     | -    | +23° | 1.65 | 6X    | KC    |     |  |
| 1    | 103a-G | GG495  | S W  | 2"   | g   | -     | -    | +25° | 1.75 | 6X    | KC/RR |     |  |
| 1    | "      | "      | S E  | 1-2" | f   | -     | -    | +26° | 2.10 | 6X    | KC/RR |     |  |
| 1    | "      | OG-530 | S E  | 1-2" | p   | 4     | 3.0  | +22° | 1.55 | 3X    | EV    |     |  |
| 2    | "      | "      | S E  | 2"   | p   | 4     | 3.0  | +21° | "    | 3X    | EV    |     |  |
| 3    | "      | "      | S E  | 2"   | p   | 4     | 3.0  | +25° | 1.70 | 3X    | EV    |     |  |
| 4    | "      | "      | S E  | 2"   | p   | 4     | 3.0  | "    | "    | 3X    | EV    |     |  |
| 5    | "      | "      | S E  | 3"   | p   | 4     | 3.0  | "    | "    | 4X    | EV    |     |  |

| PLATE No. | OBJECT     | 1950 RA / DEC                                 | UT DATE     | UT        | Exp.            | GUIDE STAR |
|-----------|------------|---|-------------|-----------|-----------------|------------|
| 97 28230  | BD+39°2947 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | 1989 Aug. 8 | 0414-0444 | 30 <sup>m</sup> | 175/78     |
| 1         | BD+39°2947 | 16 <sup>h</sup> 03 <sup>m</sup> .2<br>+39°17' | "           | 0455-0531 | 36 <sup>m</sup> | 175/78     |
| 2         | G34-15     | 1 <sup>h</sup> 13 <sup>m</sup> .7<br>+24°04'  | "           | 0749-0919 | 90 <sup>m</sup> | 88/52      |
| 3         | G34-15     | 1 <sup>h</sup> 13 <sup>m</sup> .7<br>+24°04'  | Aug. 10     | 0836-0950 | 74 <sup>m</sup> | 88/52      |
| 4         | LP744-40   | 16 <sup>h</sup> 15 <sup>m</sup> .1<br>-15°28' | Aug. 11     | 0210-0240 | 30 <sup>m</sup> | 200/90     |
| 5         | G34-15     | 1 <sup>h</sup> 13 <sup>m</sup> .7<br>+24°04'  | "           | 0841-0951 | 70 <sup>m</sup> | 88/52      |
| 6         | LP744-40   | 16 <sup>h</sup> 15 <sup>m</sup> .1<br>-15°28' | Aug. 17     | 0202-0242 | 40 <sup>m</sup> | 200/90     |
| 7         | LP744-40   | 16 <sup>h</sup> 15 <sup>m</sup> .1<br>-15°28' | Aug. 18     | 0158-0238 | 40 <sup>m</sup> | 202/90     |
| 8         | LP744-40   | 16 <sup>h</sup> 15 <sup>m</sup> .1<br>-15°28' | Aug. 19     | 0152-0232 | 40 <sup>m</sup> | 201/89     |
| 9         | BD+45°992  | 4 <sup>h</sup> 48 <sup>m</sup> .0<br>+45°45'  | "           | 0803-0819 | 16 <sup>m</sup> | 117/37     |

| P.H. | E M U L | F I L T | P.A. | T E L | S E E | T R A N S | G R A T | S E C T | T E M P | F O C U S | F L A S H | O B S | REMARKS |
|------|---------|---------|------|-------|-------|-----------|---------|---------|---------|-----------|-----------|-------|---------|
| 7    | 103a-G  | OG530   | S E  | 2"    | f     | 4         | 3.0     | +18°    | 1.45    | 4X        | EV        |       |         |
| 8    | "       | "       | S E  | 2"    | f     | 4         | 3.0     | +17°    | "       | 4X        | EV        |       |         |
| 9    | "       | "       | S W  | 3"    | f     | -         | -       | +16°    | 1.35    | 5X        | EV        |       |         |
| 10   | "       | "       | S W  | 2-3"  | f     | -         | -       | +20°    | 1.40    | 5X        | EV        |       |         |
| 11   | "       | "       | N E  | 2-3"  | f     | -         | -       | +23°    | 1.65    | 2X        | EV        |       |         |
| 12   | "       | "       | S W  | 2"    | f     | -         | -       | +21°    | 1.40    | 5X        | EV        |       |         |
| 1    | "       | "       | N E  | 3"    | f     | -         | -       | +22°    | 1.40    | 5X        | EV        |       |         |
| 2    | "       | "       | N E  | 3"    | f     | -         | -       | +22°    | 1.50    | 4X        | EV        |       |         |
| 3    | "       | "       | N E  | 2-3"  | f     | -         | -       | +22°    | 1.45    | 4X        | EV        |       |         |
| 4    | "       | "       | N W  | 3"    | f     | -         | 5.5     | +18°    | 1.35    | 3X        | EV        |       |         |



PLATE  
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TT 28240

BD+45°992

4<sup>h</sup>48<sup>m</sup>.0  
+45°45'1989  
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0826-0842

16<sup>m</sup>

117/37

1

LS V +46°21

4<sup>h</sup>39<sup>m</sup>.7  
+46°36'

"

0915-0935

20<sup>m</sup>

107/86

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LS V +46°21

4<sup>h</sup>39<sup>m</sup>.7  
+46°36'

"

0939-0959

20<sup>m</sup>

107/86

3

LS V +46°21

4<sup>h</sup>39<sup>m</sup>.7  
+46°36'

Aug. 25

0838-0858

20<sup>m</sup>

107/87

4

BD+45°992

4<sup>h</sup>48<sup>m</sup>.0  
+45°45'

Aug. 31

0840-0856

16<sup>m</sup>

117/36

5

LS V +46°21

4<sup>h</sup>39<sup>m</sup>.7  
+46°36'

"

0917-0937

20<sup>m</sup>

107/87

6

BD+23°520

3<sup>h</sup>43<sup>m</sup>.3  
+24°02'

"

1002-1022

20<sup>m</sup>

130/89

7

LS V +46°21

4<sup>h</sup>39<sup>m</sup>.7  
+46°36'

Sept. 3

0821-0841

20<sup>m</sup>

107/87

8

LS V +46°21

4<sup>h</sup>39<sup>m</sup>.7  
+46°36'

"

0846-0906

20<sup>m</sup>

107/87

9

BD+45°992

4<sup>h</sup>48<sup>m</sup>.0  
+45°45'

"

0924-0944

20<sup>m</sup>

117/36

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REMARKS

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103a-G

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EV

| PLATE<br>No | OBJECT              | 1950<br>RA/<br>DEC                            | UT<br>DATE       | UT        | Exp.            | GUIDE<br>STAR | P.H. | E<br>M<br>U<br>L | F.<br>I<br>L<br>T | P.A. | T<br>E<br>L | S<br>E<br>E | T<br>R<br>A<br>N<br>S | G<br>R<br>A<br>T | S<br>E<br>C<br>T | T<br>E<br>M<br>P | F<br>O<br>C<br>U<br>S | F<br>L<br>A<br>S<br>H | O<br>B<br>S | REMARKS |
|-------------|---------------------|---|------------------|-----------|-----------------|---------------|------|------------------|-------------------|------|-------------|-------------|-----------------------|------------------|------------------|------------------|-----------------------|-----------------------|-------------|---------|
| $\pi$ 28250 | LP 690-10           | 18 <sup>h</sup> 26 <sup>m</sup> .5<br>-4°32'  | 1989<br>Sept. 16 | 0219-0319 | 60 <sup>m</sup> | 90/89         | 3    | 103a-G           | OG 530            | N E  | 3"          | f           | -                     | -                | +16°             | 1.25             | 3X                    | EV                    |             |         |
| 1           | LP 280-26           | 18 <sup>h</sup> 55 <sup>m</sup> .7<br>+33°53' | "                | 0418-0518 | 60 <sup>m</sup> | 173/62        | 4    | "                | "                 | N E  | 2-3"        | f           | -                     | -                | +15°             | "                | 3X                    | EV                    |             |         |
| 2           | LS $\bar{V}$ +46°21 | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46°36'  | "                | 0757-0817 | 20 <sup>m</sup> | 107/88        | 5    | "                | "                 | N W  | 2"          | f           | -                     | -                | +14°             | "                | 3X                    | EV                    |             |         |
| 3           | BD +45°992          | 4 <sup>h</sup> 48 <sup>m</sup> .0<br>+45°45'  | "                | 0840-0858 | 18 <sup>m</sup> | 116/36        | 6    | "                | "                 | N W  | 2"          | f           | -                     | 5.5              | "                | "                | -                     | EV                    |             |         |
| 4           | BD +23°520          | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02'  | "                | 0932-0950 | 18 <sup>m</sup> | 130/89        | 7    | "                | "                 | W W  | 2"          | f           | -                     | 5.0              | "                | "                | -                     | EV                    |             |         |
| 5           | LS $\bar{V}$ +46°21 | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46°36'  | Sept. 18         | 0752-0812 | 20 <sup>m</sup> | 107/87        | 8    | "                | "                 | N W  | 3"          | f           | -                     | -                | +17°             | 1.35             | 3X                    | EV                    |             |         |
| 6           | LS $\bar{V}$ +46°21 | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46°36'  | "                | 0839-0859 | 20 <sup>m</sup> | 107/87        | 9    | "                | "                 | N W  | 3"          | f           | -                     | -                | "                | "                | -                     | EV                    |             |         |
| 7           | BD +23°520          | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02'  | "                | 0922-0942 | 20 <sup>m</sup> | 130/89        | 10   | "                | "                 | W W  | 3"          | f           | -                     | 5.0              | "                | "                | -                     | EV                    |             |         |
| 8           | LP 690-10           | 18 <sup>h</sup> 26 <sup>m</sup> .5<br>-4°32'  | Sept. 25         | 0207-0307 | 60 <sup>m</sup> | 90/89         | 11   | "                | "                 | N E  | 2-3"        | f           | -                     | -                | +12°             | 1.15             | 5X                    | EV                    |             |         |
| 9           | LP 690-10           | 18 <sup>h</sup> 26 <sup>m</sup> .5<br>-4°32'  | Sept. 28         | 0124-0224 | 60 <sup>m</sup> | 89/90         | 12   | "                | "                 | N E  | 3"          | f           | -                     | -                | +14°             | 1.25             | 5X                    | EV                    |             |         |

| PLATE<br>No. | OBJECT     | 1950<br>RA<br>/DEC                            | UT<br>DATE    | UT        | Exp.             | GUIDE<br>STAR |
|--------------|------------|---|---------------|-----------|------------------|---------------|
| 28260        | LP 280-26  | 18 <sup>h</sup> 55 <sup>m</sup> .7<br>+33°53' | Sept. 28 1989 | 0312-0412 | 60 <sup>m</sup>  | 173/62        |
| 1            | G 39-27    | 4 <sup>h</sup> 33 <sup>m</sup> .6<br>+27°04'  | Sept. 30      | 0829-0949 | 80 <sup>m</sup>  | 158/36        |
| 2            | G 39-27    | 4 <sup>h</sup> 33 <sup>m</sup> .6<br>+27°04'  | Oct. 1        | 0755-0955 | 120 <sup>m</sup> | 158/36        |
| 3            | LP 280-26  | 18 <sup>h</sup> 55 <sup>m</sup> .7<br>+33°53' | Oct. 9        | 0153-0313 | 80 <sup>m</sup>  | 173/62        |
| 4            | LP 690-10  | 18 <sup>h</sup> 26 <sup>m</sup> .5<br>-4°32'  | Oct. 13       | 0059-0159 | 60 <sup>m</sup>  | 92/89         |
| 5            | LP 280-26  | 18 <sup>h</sup> 55 <sup>m</sup> .7<br>+33°53' | "             | 0236-0336 | 60 <sup>m</sup>  | 173/63        |
| 6            | BD+29°2091 | 10 <sup>h</sup> 44 <sup>m</sup> .6<br>+28°41' | Nov. 26       | 0950-1010 | 20 <sup>m</sup>  | 77/62         |
| 7            | BD+29°2091 | 10 <sup>h</sup> 44 <sup>m</sup> .6<br>+28°41' | "             | 1018-1038 | 20 <sup>m</sup>  | 77/62         |
| 8            | BD+28°4211 | 21 <sup>h</sup> 48 <sup>m</sup> .9<br>+28°38' | Nov. 29       | 0255-0321 | 26 <sup>m</sup>  | 95/86         |
| 9            | BD+29°2091 | 10 <sup>h</sup> 44 <sup>m</sup> .6<br>+28°41' | "             | 1126-1150 | 24 <sup>m</sup>  | 77/63         |

| P.H. | E<br>M<br>U<br>L | F<br>I<br>L<br>T | P.A. | T<br>E<br>L | S<br>E<br>E | T<br>R<br>A<br>N<br>S | G<br>R<br>A<br>T | S<br>E<br>C<br>T | T<br>E<br>M<br>P | F<br>O<br>C<br>U<br>S | F<br>L<br>A<br>S<br>H | O<br>B<br>S | REMARKS |
|------|------------------|------------------|------|-------------|-------------|-----------------------|------------------|------------------|------------------|-----------------------|-----------------------|-------------|---------|
| 1    | 103a-G           | OG-530           | N E  | 2-3"        | f           | -                     | -                | +13°             | 1.25             | 4X                    | EV                    |             |         |
| 2    | "                | "                | N W  | 2-3"        | f           | -                     | -                | +14°             | 1.25             | 5X                    | EV                    |             |         |
| 3    | "                | "                | N W  | 2-3"        | f           | -                     | -                | +16°             | 1.30             | 5X                    | EV                    |             |         |
| 4    | "                | "                | N E  | 3"          | f           | -                     | -                | +9°              | 1.05             | 5X                    | EV                    |             |         |
| 5    | "                | "                | N E  | 2"          | f           | -                     | -                | +17°             | 1.30             | 4X                    | EV                    |             |         |
| 6    | "                | "                | N E  | 2-3"        | f           | -                     | -                | +16°             | "                | 4X                    | EV                    |             |         |
| 7    | "                | "                | W W  | 2-3"        | f           | -                     | 2.5              | +1°              | 5.0+<br>1.15     | -                     | EV                    |             |         |
| 8    | "                | "                | W W  | 2-3"        | f           | -                     | 2.5              | "                | "                | -                     | EV                    |             |         |
| 9    | "                | "                | S E  | 3"          | f           | -                     | 2.5              | -5°              | 1.05             | -                     | EV                    |             |         |
| 10   | "                | "                | W W  | 4"          | f           | -                     | 2.5              | -8°              | 1.00             | 3X                    | EV                    |             |         |

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REMARKS

π 28 270 BD+29°2091 10<sup>h</sup>44<sup>m</sup>.6 1989 Nov. 30 0956-1016 20<sup>m</sup> 77/62

+28°41'

1 W 365 11<sup>h</sup>08<sup>m</sup>.4 " 1045-1057 12<sup>m</sup> 233/68

+6°42'

2 W 365 11<sup>h</sup>08<sup>m</sup>.4 " 1109-1119 10<sup>m</sup> 233/68

+6°42'

3 W 365 11<sup>h</sup>08<sup>m</sup>.4 " 1124-1134 10<sup>m</sup> 233/68

+6°42'

4 BD+28°4211 21<sup>h</sup>48<sup>m</sup>.9 Dec. 1 0040-0100 20<sup>m</sup> 95/86

+28°38'

5 W 365 11<sup>h</sup>08<sup>m</sup>.4 " 1112-1122 10<sup>m</sup> 233/68

+6°42'

6 W 365 11<sup>h</sup>08<sup>m</sup>.4 " 1131-1141 10<sup>m</sup> 233/68

+6°42'

7 Praesepe 8<sup>h</sup>37<sup>m</sup>.5 Dec. 9 0627-0642 15<sup>m</sup> 107/101

+19°52'

8 W 365 11<sup>h</sup>08<sup>m</sup>.4 1990 Jan. 2 0951-1001 10<sup>m</sup> 233/68

+6°42'

9 W 365 11<sup>h</sup>08<sup>m</sup>.4 " 1006-1016 10<sup>m</sup> 233/68

+6°42'

11/03a-G 06530 W W 3" f - 2.5 -2° 1.15 - EV

12 " " E W 3" f - 0.5 " " - EV

1 " " E W 3" f - 0.5 " " 4X EV

2 " " E W 3" f - 0.5 " " - EV

3 " " S E 2" f - 2.5 +2° 1.45 4X EV

4 " " E W 2" f - 0.5 -1° 1.10 - EV

5 " " E W 2" f - 0.5 " " - EV

6 " " S W 2-3" f - - -5° 1.10 - EV

7 " " E W 3" f - 0.5 -6° 1.10 - EV

8 " " E W 3" f - 0.5 " " - EV

The telescope  
stopped following  
the mid-motion  
faulty clamp.

PLATE  
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REMARKS

| PLATE No. | OBJECT      | 1950 RA / DEC                                 | UT DATE | UT        | Exp.                           | GUIDE STAR | P.H. | E M U L | F I L T | P.A. | T E L | S E E | T R A N S | G R A T | S E C T | T E M P | F O C U S | F L A S H | O B S          | REMARKS |
|-----------|-------------|---|---------|-----------|--------------------------------|------------|------|---------|---------|------|-------|-------|-----------|---------|---------|---------|-----------|-----------|----------------|---------|
| 7 28280   | BD +2°2538  | 12 <sup>h</sup> 23 <sup>m</sup> .0<br>+1°34'  | Jan. 2  | 1106-1136 | 30 <sup>m</sup>                | 122/75     | 9    | 103a-G  | 06530   | W W  | 4"    | f     | -         | 4.0     | -6°     | 1.05    | 4X        | EV        |                |         |
| 1         | BD +2°2538  | 12 <sup>h</sup> 23 <sup>m</sup> .0<br>+1°34'  | "       | 1143-1213 | 30 <sup>m</sup>                | 122/75     | 10   | "       | "       | W W  | 4"    | f     | -         | 4.0     | "       | "       | 4X        | EV        |                |         |
| 2         | G 34-15     | 1 <sup>h</sup> 13 <sup>m</sup> .7<br>+24°04'  | Jan. 3  | 0136-0236 | 60 <sup>m</sup>                | 208/65     | 11   | "       | "       | W E  | 4"    | f     | -         | -       | -1°     | 1.15    | 4X        | EV        |                |         |
| 3         | G 34-15     | 1 <sup>h</sup> 13 <sup>m</sup> .7<br>+24°04'  | "       | 0256-0356 | 60 <sup>m</sup>                | 210/65     | 12   | "       | "       | W E  | 4"    | f     | -         | -       | "       | "       | 4X        | EV        |                |         |
| 4         | BD +34°2476 | 13 <sup>h</sup> 57 <sup>m</sup> .0<br>+34°06' | "       | 1034-1104 | 30 <sup>m</sup>                | 122/70     | 1    | "       | "       | E W  | 3"    | f     | -         | 3.5     | "       | 1.20    | 4X        | EV        |                |         |
| 5         | BD +34°2476 | 13 <sup>h</sup> 57 <sup>m</sup> .0<br>+34°06' | "       | 1112-1142 | 30 <sup>m</sup>                | 122/70     | 2    | "       | "       | E W  | 3"    | f     | -         | 3.5     | "       | "       | 4X        | EV        |                |         |
| 6         | R 974       | 12 <sup>h</sup> 59 <sup>m</sup> .4<br>-1°49'  | "       | 1211-1225 | 14 <sup>m</sup>                | 112/88     | 3    | "       | "       | S W  | 3"    | f     | -         | -       | "       | "       | 4X        | EV        |                |         |
| 7         | NGC 2242    | 6 <sup>h</sup> 30 <sup>m</sup> .4<br>+44°48'  | Jan. 5  | 0157-0357 | 2 <sup>h</sup>                 | 96/111     | 1    | 103a-G  | 06530   | S W  | 2"    | f     | -         | -       | -2°     | 1.45    | 4X        | KC        |                |         |
| 8         | "           | "   | "       | 0411-0541 | 90 <sup>m</sup>                | "          | 5    | "       | 66495   | "    | "     | "     | -         | -       | -3°     | "       | 4X        | KC        |                |         |
| 9         | "           | "   | "       | 0610-0820 | 2 <sup>h</sup> 10 <sup>m</sup> | "          | 3    | "       | "       | N E  | 2"    | f     | -         | -       | -4°     | "       | 4X        | KC        | "wet"<br>plate |         |

PLATE  
No.

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STAR

π 28290

W 365

11<sup>h</sup>08<sup>m</sup>.4  
+6°42'1990  
Jan. 5

1051-1101

10<sup>m</sup>

233/67

1 BD+2°2538

12<sup>h</sup>23<sup>m</sup>.0  
+1°34'

"

1127-1157

30<sup>m</sup>

123/75

2 BD+2°2538

12<sup>h</sup>23<sup>m</sup>.0  
+1°34'

Jan. 6

1010-1040

30<sup>m</sup>

122/75

3 BD+2°2538

12<sup>h</sup>23<sup>m</sup>.0  
+1°34'

"

1046-1116

30<sup>m</sup>

122/75

4 R 974

12<sup>h</sup>59<sup>m</sup>.4  
-1°49'

"

1139-1155

16<sup>m</sup>

112/87

5 NGC 2242

6<sup>h</sup>30<sup>m</sup>.4  
+44°48'

Jan. 7

0207-0457

2<sup>h</sup>50<sup>m</sup>

96/111

6 "

"

"

0520-0815

2<sup>h</sup>55<sup>m</sup>

133/85

7 BD+34°2476

13<sup>h</sup>57<sup>m</sup>.0  
+34°06'

"

1004-1034

30<sup>m</sup>

120/72

8 BD+34°2476

13<sup>h</sup>57<sup>m</sup>.0  
+34°06'

"

1041-1111

30<sup>m</sup>

120/72

9 BD+34°2476

13<sup>h</sup>57<sup>m</sup>.0  
+34°06'

Jan. 8

0821-0851

30<sup>m</sup>

120/72

| P.H. | E<br>M<br>U<br>L | F<br>i<br>L<br>T | P.A. | T<br>E<br>L | S<br>E<br>E | T<br>R<br>A<br>N<br>S | G<br>R<br>A<br>T | S<br>E<br>C<br>T | T<br>E<br>M<br>P | F<br>O<br>C<br>U<br>S | F<br>L<br>A<br>S<br>H | O<br>B<br>S | REMARKS |
|------|------------------|------------------|------|-------------|-------------|-----------------------|------------------|------------------|------------------|-----------------------|-----------------------|-------------|---------|
| 7    | 103a-G           | OG 530           | E W  | 2"          | f           | -                     | 0.5              | -4°              | 1.15             | -                     | EV                    |             |         |
| 8    | "                | "                | W W  | 2"          | f           | -                     | 4.0              | "                | "                | 4X                    | EV                    |             |         |
| 9    | "                | "                | W W  | 3"          | f           | -                     | 4.0              | -2°              | 1.15             | 4X                    | EV                    |             |         |
| 10   | "                | "                | W W  | 3"          | f           | -                     | 4.0              | "                | "                | 4X                    | EV                    |             |         |
| 11   | "                | "                | S W  | 3"          | f           | -                     | -                | -3°              | "                | 4X                    | EV                    |             |         |
| 1    | 103a-G           | GG 495           | S W  | 2"          | f           | -                     | -                | -3°              | 1.35             | 2X                    | KC                    | br. moon    |         |
| 2    | "                | "                | N E  | 2"          | f           | -                     | -                | "                | "                | 2X                    | KC                    | "           |         |
| 12   | "                | OG 530           | E W  | 4"          | f           | -                     | 3.5              | -2°              | 1.10             | 4X                    | EV                    |             |         |
| 7    | "                | "                | E W  | 4"          | f           | -                     | 3.5              | "                | "                | 4X                    | EV                    |             |         |
| 8    | "                | "                | E W  | 3"          | f           | -                     | 3.5              | 0°               | 1.15             | 3X                    | EV                    |             |         |

PLATE  
No.

OBJECT

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DEC

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DATE

UT

Exp.

GUIDE  
STAR

| PLATE No. | OBJECT      | 1950 RA/DEC                                   | UT DATE        | UT        | Exp.                           | GUIDE STAR |
|-----------|-------------|---|----------------|-----------|--------------------------------|------------|
| 97 28300  | BD +34°2476 | 13 <sup>h</sup> 57 <sup>m</sup> .0<br>+34°06' | 1990<br>Jan. 8 | 0856-0926 | 30 <sup>m</sup>                | 120/72     |
| 1         | R 974       | 12 <sup>h</sup> 59 <sup>m</sup> .4<br>-1°49'  | "              | 0958-1018 | 20 <sup>m</sup>                | 240/51     |
| 2         | BD +2°2538  | 12 <sup>h</sup> 23 <sup>m</sup> .0<br>+1°34'  | Jan. 13        | 0935-1005 | 30 <sup>m</sup>                | 122/75     |
| 3         | BD +2°2538  | 12 <sup>h</sup> 23 <sup>m</sup> .0<br>+1°34'  | "              | 1009-1039 | 30 <sup>m</sup>                | 122/75     |
| 4         | BD +2°2538  | 12 <sup>h</sup> 23 <sup>m</sup> .0<br>+1°34'  | Jan. 15        | 1028-1056 | 28 <sup>m</sup>                | 122/74     |
| 5         | BD +2°2538  | 12 <sup>h</sup> 23 <sup>m</sup> .0<br>+1°34'  | "              | 1059-1127 | 28 <sup>m</sup>                | 122/74     |
| 6         | R 974       | 12 <sup>h</sup> 59 <sup>m</sup> .4<br>-1°49'  | "              | 1156-1212 | 16 <sup>m</sup>                | 140/50     |
| 7         | G 34-15     | 1 <sup>h</sup> 13 <sup>m</sup> .7<br>+24°04'  | Jan. 16        | 0120-0220 | 60 <sup>m</sup>                | 208/65     |
| 8         | G 34-15     | 1 <sup>h</sup> 13 <sup>m</sup> .7<br>+24°04'  | "              | 0230-0340 | 70 <sup>m</sup>                | 208/65     |
| 9         | NGC 2242    | 6 <sup>h</sup> 30 <sup>m</sup> .4<br>+44°48'  | Jan. 19        | 0200-0430 | 2 <sup>h</sup> 30 <sup>m</sup> | 96/111     |

| P.H. | E<br>M<br>U<br>L | F<br>I<br>L<br>T | P.A. | T<br>E<br>L | S<br>E<br>E | T<br>R<br>A<br>N<br>S | G<br>R<br>A<br>T | S<br>E<br>C<br>T | T<br>E<br>M<br>P | F<br>O<br>C<br>U<br>S | F<br>L<br>A<br>S<br>H | O<br>B<br>S | REMARKS |
|------|------------------|------------------|------|-------------|-------------|-----------------------|------------------|------------------|------------------|-----------------------|-----------------------|-------------|---------|
| 9    | 103a-G           | OG 530           | E W  | 3"          | f           | -                     | 3.5              | 0°               | 1.15             | 3x                    | EV                    |             |         |
| 11   | "                | "                | E W  | 3"          | f           | -                     | "                | "                | "                | 3x                    | EV                    |             |         |
| 1    | "                | "                | W W  | 3"          | f           | -                     | 4.0              | -6°              | 1.05             | -                     | EV                    |             |         |
| 2    | "                | "                | W W  | 3"          | f           | -                     | 4.0              | "                | "                | 3x                    | EV                    |             |         |
| 3    | "                | "                | W W  | 2-3"        | f           | -                     | 4.0              | 0°               | 1.10             | -                     | EV                    |             |         |
| 4    | "                | "                | W W  | 2-3"        | f           | -                     | 4.0              | "                | "                | 3x                    | EV                    |             |         |
| 5    | "                | "                | E W  | 2-3"        | f           | -                     | "                | "                | "                | 3x                    | EV                    |             |         |
| 6    | "                | "                | W E  | 2"          | f           | -                     | -                | +4°              | 1.50             | 4x                    | EV                    |             |         |
| 7    | "                | "                | W E  | 2"          | f           | -                     | -                | "                | "                | 5x                    | EV                    |             |         |
| 1    | 103a-G           | GG 495           | S W  | 2"          | f           | -                     | -                | 0°               | 1.45             | 4x                    | KC                    | "wet" plate |         |

PLATE  
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FLASH

OBS

REMARKS

| PLATE No. | OBJECT      | 1950<br>RA<br>/ DEC                           | UT<br>DATE | UT        | Exp.                           | GUIDE<br>STAR | PH. | EMUL   | FIL<br>T | PA. | TEL | SEE | TRAN<br>S | GRAT | SECT | TEMP | FOCUS | FLASH | OBS  | REMARKS |
|-----------|-------------|---|------------|-----------|--------------------------------|---------------|-----|--------|----------|-----|-----|-----|-----------|------|------|------|-------|-------|------|---------|
|           |             |   | 1990       |           |                                |               |     |        |          |     |     |     |           |      |      |      |       |       |      |         |
| π 28 310  | NGC 2242    | 6 <sup>h</sup> 30 <sup>m</sup> .4<br>+44°48'  | Jan. 19    | 0503-0733 | 2 <sup>h</sup> 30 <sup>m</sup> | 133/85        | 2   | 103a-G | GG495    | N E | 2"  | f   | -         | -    | 0°   | 1.45 | 4X    | KC    |      |         |
| 1         | BD +34°2476 | 13 <sup>h</sup> 57 <sup>m</sup> .0<br>+34°06' | "          | 0902-0932 | 30 <sup>m</sup>                | 120/70        | 7   | "      | OG 530   | E W | 2"  | f   | -         | 3.5  | -2°  | 1.15 | 3X    | EV    |      |         |
| 2         | BD +2°2538  | 12 <sup>h</sup> 23 <sup>m</sup> .0<br>+1°34'  | "          | 1004-1040 | 36 <sup>m</sup>                | 122/74        | 8   | "      | "        | W W | 3"  | f   | -         | 4.0  | -3°  | "    | 3X    | EV    |      |         |
| 3         | BD +2°2538  | 12 <sup>h</sup> 23 <sup>m</sup> .0<br>+1°34'  | Jan. 28    | 0958-1028 | 30 <sup>m</sup>                | 123/76        | 9   | "      | "        | W W | 3"  | f   | -         | 4.0  | -4°  | 1.10 | 3X    | EV    |      |         |
| 4         | NGC 2242    | 6 <sup>h</sup> 30 <sup>m</sup> .4<br>+44°48'  | Jan. 29    | 0022-0352 | 3 <sup>h</sup> 30 <sup>m</sup> | 96/111        | 1   | "      | GG495    | S W | 2"  | f   | -         | -    | -1°  | 1.45 | 3X    | KC    |      |         |
| 5         | BD +2°2538  | 12 <sup>h</sup> 23 <sup>m</sup> .0<br>+1°34'  | "          | 0918-0948 | 30 <sup>m</sup>                | 122/74        | 10  | "      | OG 530   | W W | 3"  | f   | -         | 4.0  | -2°  | 1.00 | 3X    | EV    |      |         |
| 6         | R 974       | 12 <sup>h</sup> 59 <sup>m</sup> .4<br>-1°49'  | "          | 1011-1027 | 16 <sup>m</sup>                | 102/83        | 11  | "      | "        | N W | 3"  | f   | -         | -    | -3°  | "    | 3X    | EV    |      |         |
| 7         | R 974       | 12 <sup>h</sup> 59 <sup>m</sup> .4<br>-1°49'  | "          | 1030-1046 | 16 <sup>m</sup>                | 102/83        | 12  | "      | "        | N W | 3"  | f   | -         | -    | "    | "    | 3X    | EV    |      |         |
| 8         | R 974       | 12 <sup>h</sup> 59 <sup>m</sup> .4<br>-1°49'  | Febr. 5    | 0929-0945 | 16 <sup>m</sup>                | 103/83        | 1   | "      | "        | N W | 3"  | f   | -         | -    | 0°   | 1.15 | 3X    | EV    | wind |         |
| 9         | R 974       | 12 <sup>h</sup> 59 <sup>m</sup> .4<br>-1°49'  | "          | 0950-1006 | 16 <sup>m</sup>                | 103/83        | 2   | "      | "        | N W | 3"  | f   | -         | -    | "    | "    | 3X    | EV    | "    |         |



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PT 28320

R 974

12<sup>h</sup>59<sup>m</sup>.4  
-1°49'

1990  
Febr. 6

0913-0929

16<sup>m</sup>

123/83

1 R 974

12<sup>h</sup>59<sup>m</sup>.4  
-1°49'

4

0943-0959

16<sup>m</sup>

123/84

2 LSI+46°21

4<sup>h</sup>39<sup>m</sup>.7  
+46°36'

Feb. 18

0129-0145

16<sup>m</sup>

107/90

3 " "

"  
"

"

0146-0202

16<sup>m</sup>

"

4 BD+45°999

4<sup>h</sup>50<sup>m</sup>.9  
+45°36'

"

0225-0240

15<sup>m</sup>

116/38

5 " "

"  
"

"

0256-0311

15<sup>m</sup>

"

6 BD+23°520

3<sup>h</sup>43<sup>m</sup>.3  
+24°02'

Febr. 19

0236-0250

14<sup>m</sup>

130/89

7 BD+23°520

3<sup>h</sup>43<sup>m</sup>.3  
+24°02'

"

0253-0307

14<sup>m</sup>

130/89

8 BD+45°992

4<sup>h</sup>48<sup>m</sup>.0  
+45°45'

"

0413-0429

16<sup>m</sup>

117/36

9 BD+45°992

4<sup>h</sup>48<sup>m</sup>.0  
+45°45'

"

0438-0450

12<sup>m</sup>

117/36

P.H.

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REMARKS

3

103a-G

06530

N W

2"

f

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+2°

1.25

3X

EV

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N W

2"

f

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3X

EV

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103a-G

06530

N E

2"

f

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-6°

1.45

4X

KC

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4X

KC

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2-3"

f

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4X

KC

circus -  
may have  
lost guide  
star

5

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4X

KC

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2-3"

f

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0°

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EV

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W E

2-3"

f

-

5.0

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"

-

EV

9

"

"

N E

3"

f

-

5.5

-1°

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1.25

-

EV

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N E

3"

f

-

5.5

"

"

3X

EV

| PLATE No. | OBJECT               | 1950 RA/DEC                                  | UT DATE       | UT        | Exp.            | GUIDE STAR |
|-----------|----------------------|--|---------------|-----------|-----------------|------------|
| Π 28330   | BD+23°520            | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02' | 1990 Febr. 20 | 0201-0217 | 16 <sup>m</sup> | 130/89     |
| 1         | LSV +46°21           | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46°36' | "             | 0347-0403 | 16 <sup>m</sup> | 106/88     |
| 2         | BD+45°992            | 4 <sup>h</sup> 48 <sup>m</sup> .0<br>+45°45' | "             | 0439-0455 | 16 <sup>m</sup> | 117/36     |
| 3         | LSV +46°21           | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46°36' | Febr. 21      | 0151-0207 | 16 <sup>m</sup> | 107/88     |
| 4         | BD+45°992            | 4 <sup>h</sup> 48 <sup>m</sup> .0<br>+45°45' | "             | 0238-0252 | 14 <sup>m</sup> | 116/36     |
| 5         | LSV +46°21           | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46°36' | Feb 27        | 0058-0113 | 15 <sup>m</sup> | 108/70     |
| 6         | "                    | "  | "             | 0114-0129 | 15 <sup>m</sup> | "          |
| 7         | K2-2 = PN<br>204+4°1 | 6 <sup>h</sup> 49 <sup>m</sup> .7<br>+10°02' | "             | 0200-0300 | 1 <sup>h</sup>  | 224/58     |
| 8         | LSV +46°21           | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46°36' | Feb. 28       | 0125-0137 | 12 <sup>m</sup> | 242/104    |
| 9         | "                    | "  | "             | 0138-0150 | 12 <sup>m</sup> | "          |

| P.H. | EMUL   | FILT  | P.A. | TEL  | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS | REMARKS |
|------|--------|-------|------|------|-----|-------|------|------|------|-------|-------|-----|---------|
| 11   | 103a-G | OG530 | W E  | 3-4" | f   | -     | 5.0  | -3°  | 1.10 | 3X    | EV    |     |         |
| 12   | "      | "     | N E  | 3"   | f   | -     | -    | -5°  | "    | 4X    | EV    |     |         |
| 1    | "      | "     | N E  | 3"   | f   | -     | 5.5  | -6°  | "    | -     | EV    |     |         |
| 2    | "      | "     | N E  | 3"   | f   | -     | -    | -3°  | 1.20 | 4X    | EV    |     |         |
| 3    | "      | "     | N E  | 3"   | f   | -     | 5.5  | "    | "    | 3X    | EV    |     |         |
| 1    | "      | "     | N E  | 1-2" | f   | -     | -    | -3   | 1.30 | 3X    | KC    |     |         |
| 2    | "      | "     | "    | "    | "   | -     | -    | "    | "    | 3X    | KC    |     |         |
| 3    | "      | GG495 | S E  | 2"   | f   | -     | -    | "    | 1.30 | 4X    | KC    |     |         |
| 1    | "      | OG530 | S E  | 1-2" | f   | -     | -    | -1   | 1.50 | 3X    | KC    |     |         |
| 2    | "      | "     | "    | "    | f   | -     | -    | "    | "    | 3X    | KC    |     |         |

| PLATE No. | OBJECT                  | 1950 RA/DEC                                  | UT DATE | UT        | Exp.                           | GUIDE STAR |
|-----------|-------------------------|--|---------|-----------|--------------------------------|------------|
|           |                         |  | 1990    |           |                                |            |
| PT 28340  | NGC 2242                | 6 <sup>h</sup> 30 <sup>m</sup> .4<br>+44°48' | Feb. 28 | 0214-0439 | 2 <sup>h</sup> 25 <sup>m</sup> | 96/111     |
| 1         | Abell 31 =<br>219+31°1  | 8 <sup>h</sup> 51 <sup>m</sup> .5<br>+9°06'  | "       | 0515-0625 | 1 <sup>h</sup> 10 <sup>m</sup> | 203/108    |
| 2         | W536 =<br>G66-18        | 14 <sup>h</sup> 35 <sup>m</sup> .6<br>-0°38' | "       | 0701-0732 | 2x20"                          | 176/83     |
| 3         | Pluto                   | 15 <sup>h</sup> 16 <sup>m</sup> .5<br>-1°52' | "       | 0753-0853 | 1 <sup>h</sup>                 | 182/63     |
| 4         | W624 =<br>G16-25        | 15 <sup>h</sup> 58 <sup>m</sup> .9<br>+5°32' | "       | 0909-0950 | 2x20"                          | 133/67     |
| 5         | Merope =<br>23 Tau      | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+23°48' | Mar. 1  | 0045-0120 | 35 <sup>m</sup>                | 178/54     |
| 6         | "                       | "  | "       | 0124-0159 | 35 <sup>m</sup>                | "          |
| 7         | Abell 24 =<br>217+14°1  | 7 <sup>h</sup> 49 <sup>m</sup> .1<br>+3°08'  | "       | 0236-0406 | 90 <sup>m</sup>                | 122/105    |
| 8         | Abell 130 =<br>208+33°1 | 8 <sup>h</sup> 44.0<br>+18°04'               | "       | 0440-0610 | 90 <sup>m</sup>                | 148/53     |
| 9         | Abell 31 =<br>219+31°1  | 8 <sup>h</sup> 51 <sup>m</sup> .5<br>+9°06'  | "       | 0625-0725 | 1 <sup>h</sup>                 | 203/108    |

| P.H. | EMUL   | FILT  | P.A. | TEL  | SEE  | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS | REMARKS |
|------|--------|-------|------|------|------|-------|------|------|------|-------|-------|-----|---------|
| 3    | 103a-G | GG495 | S E  | 1-2" | f    | -     | -    | -1°  | 1.50 | 3X    | KC    |     |         |
| 4    | "      | "     | "    | "    | 1-2" | f     | -    | -1°  | "    | 4X    | KC    |     |         |
| 5    | "      | "     | E W  | 1-2" | f    | -     | -    | -2°  | "    | 3X    | KC    |     |         |
| 7    | "      | "     | S W  | 2"   | f    | -     | -    | -2°  | "    | 2X    | KC    |     |         |
| 6    | "      | "     | S W  | 2"   | f    | -     | -    | -3°  | "    | 3X    | KC    |     |         |
| 1    | "      | GG495 | S E  | 1"   | g    | -     | -    | -2°  | 1.50 | 2X    | KC    |     |         |
| 2    | "      | "     | "    | "    | "    | -     | -    | "    | "    | 2X    | KC    |     |         |
| 3    | "      | "     | S E  | 1-2" | g    | -     | -    | -1°  | "    | 4X    | KC    |     |         |
| 4    | "      | "     | S E  | "    | "    | -     | -    | -1°  | "    | 4X    | KC    |     |         |
| 5    | "      | "     | S E  | 1-2" | g    | -     | -    | -1°  | "    | 3X    | KC    |     |         |

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|---------|-------------------------|--|---------|-----------|--------------------------------|---------|---|--------|-------|----------|---|---|-----|------|------|----|----|--------------------------------|
| ☿ 28350 | Pluto                   | 15 <sup>h</sup> 16. <sup>m</sup> 5           | Mar. 1  | 0751-0841 | 50 <sup>m</sup>                | 182/63  | 6 | 1032-G | GG495 | S E 2"   | f | - | -   | -1°  | 1.50 | 2X | KC |                                |
| 1       | K2-2 =<br>204+2°1       | 6 <sup>h</sup> 49. <sup>m</sup> 7<br>+10°02' | Mar. 2  | 0134-0239 | 1 <sup>h</sup> 25 <sup>m</sup> | 224/58  | 1 | "      | "     | S W 2-3" | f | - | -   | +1°  | 1.60 | 3X | KC |                                |
| 2       | Abell 21 =<br>205+14°1  | 7 <sup>h</sup> 26. <sup>m</sup> 2<br>+13°21' | Mar. 3  | 0054-0154 | 1 <sup>h</sup>                 | 113/98  | 2 | "      | "     | S W 1"   | f | - | -   | +4°  | 1.80 | 3X | KC |                                |
| 3       | Abell 24 =<br>217+14°1  | 7 <sup>h</sup> 49. <sup>m</sup> 1<br>+3°08'  | "       | 0204-0310 | 1 <sup>h</sup> 06 <sup>m</sup> | 122/105 | 1 | "      | "     | " " 1"   | f | - | -   | +5°  | "    | 4X | KC | stopped<br>by power<br>failure |
| 4       | BD+45°992               | 4448 <sup>m</sup> .0<br>+45°45'              | Mar. 13 | 0224-0236 | 12 <sup>m</sup>                | 116/36  | 7 | "      | 0G530 | N E 3"   | f | - | 5.5 | +16° | 1.95 | 3X | EV |                                |
| 5       | BD+45°992               | 4448 <sup>m</sup> .0<br>+45°45'              | "       | 0241-0255 | 14 <sup>m</sup>                | 116/36  | 8 | "      | "     | N E 3"   | f | - | 5.5 | "    | "    | 3X | EV |                                |
| 6       | Abell 21 =<br>205°+14°1 | 7 <sup>h</sup> 26. <sup>m</sup> 2<br>+13°21' | Mar. 20 | 0118-0208 | 1 <sup>h</sup> 50 <sup>m</sup> | 113/98  | 1 | "      | GG495 | S W 2"   | f | - | -   | 0°   | 1.80 | 3X | KC |                                |
| 7       | Abell 31 =<br>219+31°1  | 8 <sup>h</sup> 51. <sup>m</sup> 5<br>+9°06'  | "       | 0325-0445 | 1 <sup>h</sup> 20 <sup>m</sup> | 203/108 | 2 | "      | "     | S W 2"   | f | - | -   | 0°   | "    | 3X | KC |                                |
| 8       | NGC 2392                | 7 <sup>h</sup> 26. <sup>m</sup> 2<br>+21°01' | Mar. 27 | 0132-0232 | 1 <sup>h</sup>                 | 166/90  | 1 | "      | "     | S E 1-2" | f | - | 4.5 | +2°  | 1.60 | 3X | KC |                                |
| 9       | "                       | "  | "       | 0238-0238 | 1 <sup>h</sup>                 | "       | 2 | "      | "     | " " "    | f | - | "   | "    | "    | 3X | KC |                                |

| PLATE No. | OBJECT    | 1950 RA/DEC                                   | UT DATE        | UT        | Exp.            | GUIDE STAR | P.H. | EMUL   | FILT  | P.A. | TEL  | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS | REMARKS |
|-----------|-----------|---|----------------|-----------|-----------------|------------|------|--------|-------|------|------|-----|-------|------|------|------|-------|-------|-----|---------|
| 74 28360  | LP 690-10 | 18 <sup>h</sup> 26 <sup>m</sup> .5<br>-4°32'  | 1990<br>Apr. 6 | 0930-1030 | 60 <sup>m</sup> | 90/90      | 1    | 103a-G | OG530 | N W  | 3"   | f   | -     | -    | -1°  | 1.20 | 4X    | EV    |     |         |
| 1         | LP 690-10 | 18 <sup>h</sup> 26 <sup>m</sup> .5<br>-4°32'  | Apr. 13        | 0855-0945 | 50 <sup>m</sup> | 90/90      | 2    | "      | "     | N W  | 2-3" | f   | -     | -    | +2°  | 1.35 | 3X    | EV    |     |         |
| 2         | Slo 1     | 17 <sup>h</sup> 35 <sup>m</sup> .6<br>+18°36' | Apr. 16        | 0845-0853 | 8 <sup>m</sup>  | 105/96     | 3    | "      | "     | S W  | 3"   | p   | -     | -    | +7°  | 1.45 | -     | EV    |     |         |
| 3         | Praesepe  | 8 <sup>h</sup> 37 <sup>m</sup> .5<br>+19°51'  | Apr. 18        | 0223-0228 | 5 <sup>m</sup>  | 107/101    | 4    | "      | "     | S E  | 2"   | f   | -     | -    | +5°  | 1.45 | -     | EV    |     |         |
| 4         | Praesepe  | 8 <sup>h</sup> 37 <sup>m</sup> .5<br>+19°51'  | "              | 0232-0242 | 10 <sup>m</sup> | 107/101    | 5    | "      | "     | S E  | 2"   | f   | -     | -    | "    | "    | -     | EV    |     |         |
| 5         | Praesepe  | 8 <sup>h</sup> 37 <sup>m</sup> .5<br>+19°51'  | "              | 0245-0305 | 20 <sup>m</sup> | 107/101    | 6    | "      | "     | S E  | 2"   | f   | -     | -    | "    | "    | -     | EV    |     |         |
| 6         | LP 690-10 | 18 <sup>h</sup> 26 <sup>m</sup> .5<br>-4°32'  | Apr. 22        | 0819-0909 | 50 <sup>m</sup> | 90/90      | 7    | "      | "     | N W  | 2"   | f   | -     | -    | +12° | 1.70 | 4X    | EV    |     |         |
| 7         | LP 690-10 | 18 <sup>h</sup> 26 <sup>m</sup> .5<br>-4°32'  | "              | 0913-0953 | 40 <sup>m</sup> | 90/90      | 8    | "      | "     | N W  | 2"   | f   | -     | -    | "    | "    | 4X    | EV    |     |         |
| 8         | Praesepe  | 8 <sup>h</sup> 37 <sup>m</sup> .5<br>+19°51'  | Apr. 23        | 0221-0225 | 4 <sup>m</sup>  | 107/101    | 9    | "      | "     | S E  | 2-3" | f   | -     | -    | +16° | 1.90 | -     | EV    |     |         |
| 9         | Praesepe  | 8 <sup>h</sup> 37 <sup>m</sup> .5<br>+19°51'  | "              | 0229-0249 | 20 <sup>m</sup> | 107/101    | 10   | "      | "     | S E  | 2-3" | f   | -     | -    | "    | "    | -     | EV    |     |         |

| PLATE No. | OBJECT      | 1950 RA/DEC          | UT DATE | UT        | Exp. | GUIDE STAR |
|-----------|-------------|----------------------|---------|-----------|------|------------|
| PT 28370  | Praesepe    | 8h 37m.5<br>+19° 51' | Apr. 23 | 0254-0256 | 2m   | 107/101    |
| 1         | BD+49° 1766 | 8h 42m.3<br>+49° 04' | May 7   | 0220-0320 | 1h   | 116/86     |
| 2         | W365        | 11h 08m.4<br>+6° 42' | "       | 0429-0441 | 12m  | 230/67     |
| 3         | "           | "                    | "       | 0442-0454 | "    | "          |
| 4         | Pal 5       | 15h 13m.5<br>+0° 04' | "       | 0525-0725 | 2h   | 85/85      |
| 5         | W365        | 11h 08m.4<br>+6° 42' | May 29  | 0225-0235 | 10m  | 230/67     |
| 6         | BD+2° 2538  | 12h 23m.0<br>+1° 34' | "       | 0257-0327 | 30m  | 123/76     |
| 7         | "           | "                    | "       | 0330-0405 | 38m  | "          |
| 8         | BD+2° 2538  | 12h 23m.0<br>+1° 34' | May 31  | 0321-0351 | 30m  | 123/76     |
| 9         | "           | "                    | "       | 0357-427  | 30m  | "          |

| P.H. | EMUL   | FILT   | P.A. | TEL | SEE  | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OB S  | REMARKS                         |
|------|--------|--------|------|-----|------|-------|------|------|------|-------|-------|-------|---------------------------------|
| 11   | 103a-G | OG 530 | S    | E   | 3"   | f     | -    | -    | +15° | 1.90  | -     | EV    |                                 |
| 1    | "      | GG 495 | N    | E   | 2"   | f     | 4    | -    | +15° | 1.70  | 2X    | KC+RR |                                 |
| 3    | "      | OG 530 | E    | E   | 2"   | f     | -    | 0.5  | +15° | "     | -     | KC+RR |                                 |
| 4    | "      | "      | "    | "   | "    | "     | -    | "    | "    | "     | -     | KC+RR |                                 |
| 2    | "      | GG 495 | W    | E   | 2"   | f     | -    | -    | "    | "     | -     | KC+RR |                                 |
| 1    | "      | OG 530 | E    | E   | 1-2" | f     | -    | 0.5  | +19° | 1.55  | 3X    | KC    |                                 |
| 2    | "      | "      | W    | E   | 2"   | f     | -    | 4.0  | "    | "     | 3X    | KC    |                                 |
| 3    | "      | "      | "    | "   | 2-3" | f     | -    | "    | "    | "     | 2X    | KC/RR |                                 |
| 1    | "      | OG 530 | W    | E   | 2-3" | f     | -    | 4.0  | 16°  | 1.34  | -     | RR    | Moon guider diaphragm left open |
| 3    | "      | "      | "    | "   | "    | f     | -    | "    | "    | "     | -X    | RR    | MOON                            |

| PLATE No. | OBJECT     | 1950 RA/DEC                                   | UT DATE | UT        | Exp.                                 | GUIDE STAR |
|-----------|------------|---|---------|-----------|--------------------------------------|------------|
|           |            |   | 1990    |           |                                      |            |
| TT 28380  | BD+68°946  | 17 <sup>h</sup> 36 <sup>m</sup> .7<br>+68°23' | July 24 | 0306-0329 | 2x8 <sup>m</sup><br>+5 <sup>m</sup>  | 170/94     |
| 1         | W 1062     | 19 <sup>h</sup> 09 <sup>m</sup> .6<br>+2°48'  | "       | 0447-0505 | 18 <sup>m</sup>                      | 140/90     |
| 2         | G 24-16    | 20 <sup>h</sup> 27 <sup>m</sup> .4<br>+9°31'  | "       | 0603-0621 | 18 <sup>m</sup>                      | 200/104    |
| 3         | BD+43°4305 | 22 <sup>h</sup> 44 <sup>m</sup> .7<br>+44°05' | "       | 0741-0751 | 10 <sup>m</sup>                      | 145/77     |
| 4         | BD+43°4305 | 22 <sup>h</sup> 44 <sup>m</sup> .7<br>+44°05' | "       | 0820-0845 | 2x10 <sup>m</sup><br>+3 <sup>m</sup> | 145/77     |
| 5         | BD+68°946  | 17 <sup>h</sup> 36 <sup>m</sup> .7<br>+68°23' | July 25 | 0253-0310 | 2x8 <sup>m</sup>                     | 170/94     |
| 6         | W 1062     | 19 <sup>h</sup> 09 <sup>m</sup> .6<br>+2°48'  | "       | 0419-0455 | 20 <sup>m</sup><br>+15 <sup>m</sup>  | 140/90     |
| 7         | G 24-16    | 20 <sup>h</sup> 27 <sup>m</sup> .4<br>+9°31'  | "       | 0547-0607 | 20 <sup>m</sup>                      | 200/104    |
| 8         | BD+68°946  | 17 <sup>h</sup> 36 <sup>m</sup> .7<br>+68°23' | Aug. 3  | 0236-0244 | 8 <sup>m</sup>                       | 170/94     |
| 9         | BD+68°946  | 17 <sup>h</sup> 36 <sup>m</sup> .7<br>+68°23' | "       | 0247-0255 | 8 <sup>m</sup>                       | 170/94     |

| PH. | EMUL   | FILT  | PA. | TEL | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS | REMARKS |
|-----|--------|-------|-----|-----|-----|-------|------|------|------|-------|-------|-----|---------|
| 1   | 103a-G | 06530 | S   | W   | 2"  | f     | -    | 3.5  | +22° | 1.55  | -     | EV  |         |
| 2   | "      | "     | S   | W   | 2"  | f     | -    | 2.0  | +21° | "     | -     | EV  |         |
| 3   | "      | "     | S   | W   | 2"  | f     | -    | -    | "    | "     | -     | EV  |         |
| 4   | "      | "     | W   | W   | 2"  | f     | -    | 2.5  | +20° | "     | -     | EV  |         |
| 5   | "      | "     | W   | W   | 2"  | f     | -    | 2.5  | "    | "     | -     | EV  |         |
| 6   | "      | "     | S   | W   | 2"  | f     | -    | 3.5  | +23° | 1.60  | -     | EV  |         |
| 7   | "      | "     | S   | W   | 2"  | f     | -    | 2.0  | +22° | "     | -     | EV  |         |
| 8   | "      | "     | S   | W   | 3"  | f     | -    | -    | +21° | 1.55  | -     | EV  |         |
| 9   | "      | "     | S   | W   | 2"  | f     | -    | 3.5  | +23° | 1.50  | -     | EV  |         |
| 10  | "      | "     | S   | W   | 2"  | f     | -    | 3.5  | "    | "     | -     | EV  |         |

| PLATE No. | OBJECT     | 1950 RA/DEC  | UT DATE | UT        | Exp.                                 | GUIDE STAR |
|-----------|------------|--|---------|-----------|--------------------------------------|------------|
|           |            |  | 1990    |           |                                      |            |
| 7128390   | W 1062     | 19 <sup>h</sup> 09 <sup>m</sup> .6<br>+20 <sup>o</sup> 48' | Aug. 3  | 0338-0400 | 22 <sup>m</sup>                      | 140/90     |
| 1         | G24-16     | 20 <sup>h</sup> 27 <sup>m</sup> .4<br>+9 <sup>o</sup> 31'  | "       | 0448-0506 | 18 <sup>m</sup>                      | 200/104    |
| 2         | BD+68°946  | 17 <sup>h</sup> 36 <sup>m</sup> .7<br>+68°23'              | Aug. 5  | 0232-0249 | 2x6 <sup>m</sup><br>+3 <sup>m</sup>  | 170/94     |
| 3         | W 1062     | 19 <sup>h</sup> 09 <sup>m</sup> .6<br>+20 <sup>o</sup> 48' | "       | 0345-0412 | 16 <sup>m</sup> , 10 <sup>m</sup>    | 142/89     |
| 4         | BD+68°946  | 17 <sup>h</sup> 36 <sup>m</sup> .7<br>+68°23'              | Aug. 7  | 0237-0251 | 8 <sup>m</sup> , 5 <sup>m</sup>      | 170/94     |
| 5         | W 1062     | 19 <sup>h</sup> 09 <sup>m</sup> .6<br>+20 <sup>o</sup> 48' | "       | 0344-0402 | 18 <sup>m</sup>                      | 140/89     |
| 6         | G24-16     | 20 <sup>h</sup> 27 <sup>m</sup> .4<br>+9 <sup>o</sup> 31'  | "       | 0433-0451 | 18 <sup>m</sup>                      | 200/104    |
| 7         | G24-16     | 20 <sup>h</sup> 27 <sup>m</sup> .4<br>+9 <sup>o</sup> 31'  | "       | 0452-0508 | 16 <sup>m</sup>                      | 200/104    |
| 8         | BD+43°4305 | 22 <sup>h</sup> 44 <sup>m</sup> .7<br>+44°05'              | "       | 0714-0750 | 3x10 <sup>m</sup><br>+3 <sup>m</sup> | 145/77     |
| 9         | Abell 43   | 17 <sup>h</sup> 51.2<br>+10°38'                            | Aug. 9  | 0225-0355 | 90 <sup>m</sup>                      | 152/102    |

| P.H. | EMUL   | FILT  | P.A. | TEL | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OB | REMARKS |
|------|--------|-------|------|-----|-----|-------|------|------|------|-------|-------|----|---------|
| 11   | 103a-G | OG530 | S    | W   | 2"  | ∅     | -    | 2.0  | +22° | 1.50  | -     | EV |         |
| 12   | "      | "     | S    | W   | 3"  | ∅     | -    | -    | +21° | "     | -     | EV |         |
| 1    | "      | "     | S    | W   | 2"  | ∅     | -    | 3.5  | +24° | 1.60  | -     | EV |         |
| 2    | "      | "     | S    | W   | 2"  | ∅     | -    | 2.0  | +23° | "     | -     | EV |         |
| 3    | "      | "     | S    | W   | 3"  | ∅     | -    | 3.0  | +18° | 1.35  | -     | EV |         |
| 4    | "      | "     | S    | W   | 3"  | ∅     | -    | 2.0  | +17° | "     | -     | EV |         |
| 5    | "      | "     | S    | W   | 3"  | ∅     | -    | -    | "    | "     | -     | EV |         |
| 6    | "      | "     | S    | W   | 3"  | ∅     | -    | -    | "    | "     | -     | EV |         |
| 7    | "      | "     | W    | W   | 3"  | ∅     | -    | 2.5  | +16° | "     | -     | EV |         |
| 1    | "      | GG495 | S    | E   | 1"  | ∅     | -    | -    | +22° | 1.60  | 3X    | KC |         |



| PLATE No. | OBJECT                  | 1950 RA/DEC                                   | UT DATE | UT        | Exp.                           | GUIDE STAR |
|-----------|-------------------------|---|---------|-----------|--------------------------------|------------|
|           |                         |   | 1990    |           |                                |            |
| 28400     | Abell 43                | 17 <sup>h</sup> 51. <sup>m</sup> 2<br>+10°38' | Aug. 9  | 0358-0528 | 90 <sup>m</sup>                | 152/102    |
| 1         | HD216411                | 22 <sup>h</sup> 49. <sup>m</sup> 5<br>+58°45' | "       | 0556-0628 | 3x10 <sup>m</sup>              | 113/92     |
| 2         | DHW 5 =<br>PN 111°+11°1 | 22 <sup>h</sup> 18. <sup>m</sup> 4<br>+70°41' | "       | 0659-0759 | 1 <sup>h</sup>                 | 235/85     |
| 3         | Abell 39                | 16 <sup>h</sup> 25. <sup>m</sup> 5<br>+28°01' | Aug. 14 | 0213-0416 | 2 <sup>h</sup> 03 <sup>m</sup> | 146/83     |
| 4         | HD216411                | 22 <sup>h</sup> 49. <sup>m</sup> 5<br>+58°45' | "       | 0444-0522 | 3x12 <sup>m</sup>              | 113/92     |
| 5         | DHW 5 =<br>PN 111+11°1  | 22 <sup>h</sup> 18. <sup>m</sup> 4<br>+70°41' | "       | 0540-0710 | 90 <sup>m</sup>                | 235/85     |
| 6         | Abell 39                | 16 <sup>h</sup> 25. <sup>m</sup> 5<br>+28°01' | Aug. 16 | 0220-0420 | 2 <sup>h</sup>                 | 146/83     |
| 7         | "                       | "   | Aug. 24 | 0214-0414 | 2 <sup>h</sup>                 | 146/83     |
| 8         | Abell 78                | 21 <sup>h</sup> 33. <sup>m</sup> 4<br>+31°28' | Aug. 26 | 0201-0511 | 3 <sup>h</sup> 10 <sup>m</sup> | 126/63     |
| 9         | BD+23°520               | 3 <sup>h</sup> 43. <sup>m</sup> 3<br>+24°02'  | "       | 0847-0903 | 16 <sup>m</sup>                | 130/86     |

| P.H. | EMUL   | FILT   | P.A. | TEL  | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OB   | REMARKS |
|------|--------|--------|------|------|-----|-------|------|------|------|-------|-------|------|---------|
| 2    | 103a-G | GG495  | S E  | 1"   | f   | -     | -    | +21° | 1.60 | 3X    | KC    |      |         |
| 3    | "      | "      | N W  | 1-2" | f   | -     | 5.0  | +20° | "    | 2X    | KC    |      |         |
| 4    | "      | "      | N E  | 1-2" | f   | -     | -    | +20° | "    | 2X    | KC    |      |         |
| 1    | "      | "      | S E  | 2-3" | g   | -     | -    | +20° | 1.60 | 5X    | KC    |      |         |
| 3    | "      | "      | N W  | 2"   | g   | -     | 5.0  | +18° | "    | 2X    | KC    |      |         |
| 4    | "      | "      | " "  | 2"   | g   | -     | -    | +18° | "    | 5X    | KC/RR |      |         |
| 1    | "      | "      | S E  | 1"   | f   | -     | -    | +24° | 1.85 | 6X    | KC/RR |      |         |
| 1    | "      | "      | S E  | 1"   | f-p | -     | -    | +21° | 1.50 | 6X    | KC    | lazy |         |
| 1    | "      | "      | E W  | 1"   | f   | 4     | -    | +25° | 1.80 | 8X    | KC    | lazy |         |
| 7    | "      | OG 530 | W W  | 3"   | f   | -     | 5.0  | +23° | 1.45 | -     | EV    |      |         |

PLATE  
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|----------|------------|--|---------|-----------|--------------------------------|---------|
| 97 28410 | BD+23°520  | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02' | Aug. 26 | 0907-0927 | 20 <sup>m</sup>                | 130/86  |
| 1        | BD+23°520  | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02' | Aug. 28 | 0836-0858 | 22 <sup>m</sup>                | 130/87  |
| 2        | BD+23°520  | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02' | "       | 0903-0925 | 22 <sup>m</sup>                | 130/87  |
| 3        | Abell 43   | 17 <sup>h</sup> 51.2<br>+10°38'              | Aug. 30 | 0152-0432 | 2 <sup>h</sup> 30 <sup>m</sup> | 152/102 |
| 4        | BD+23°520  | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02' | "       | 0851-0909 | 18 <sup>m</sup>                | 130/87  |
| 5        | LSV +46°21 | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46°36' | Sept. 1 | 0855-0913 | 18 <sup>m</sup>                | 107/88  |
| 6        | LSV +46°21 | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46°36' | "       | 0927-0947 | 20 <sup>m</sup>                | 107/88  |
| 7        | BD+23°520  | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02' | "       | 1012-1030 | 18 <sup>m</sup>                | 130/87  |
| 8        | LSV +46°21 | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46°36' | Sept. 3 | 0911-0931 | 20 <sup>m</sup>                | 107/88  |
| 9        | LSV +46°21 | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46°36' | "       | 0950-1010 | 20 <sup>m</sup>                | 107/88  |

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REMARKS

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|----|--------|-------|-----|------|---|---|-----|------|------|----|-----------|
| 8  | 103a-G | 06530 | W W | 3"   | f | - | 5.0 | +23° | 1.45 | -  | EV        |
| 9  | "      | "     | W W | 3"   | f | - | 5.0 | +25° | 1.60 | 4X | EV        |
| 10 | "      | "     | W W | 3"   | f | - | 5.0 | "    | "    | 4X | EV        |
| 1  | "      | GG495 | S E | 2-3" | g | - | -   | +23° | 1.50 | 3X | KC/RR     |
| 11 | "      | OG530 | W W | 2-3" | f | - | 5.0 | +20° | 1.40 | 4X | EV        |
| 12 | "      | "     | N W | 2"   | f | - | -   | +21° | 1.50 | 4X | EV clouds |
| 7  | "      | "     | N W | 2"   | f | - | -   | "    | "    | 4X | EV        |
| 8  | "      | "     | W W | 3"   | f | - | 5.0 | "    | "    | 4X | EV        |
| 9  | "      | "     | N W | 3"   | f | - | -   | +19° | 1.20 | 4X | EV        |
| 10 | "      | "     | N W | 3"   | f | - | -   | "    | "    | 4X | EV        |

| PLATE No. | OBJECT             | 1950 RA/DEC                                   | UT DATE       | UT        | Exp.                           | GUIDE STAR |
|-----------|--------------------|---|---------------|-----------|--------------------------------|------------|
| π 28420   | BD+23°520          | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02'  | Sept. 11 1990 | 0806-0836 | 30 <sup>m</sup>                | 130/87     |
| 1         | BD+23°520          | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02'  | "             | 0849-0919 | 30 <sup>m</sup>                | 130/87     |
| 2         | LSV +46°21         | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46°36'  | "             | 1005-1035 | 30 <sup>m</sup>                | 107/87     |
| 3         | Abell 78           | 21 <sup>h</sup> 35 <sup>m</sup> .4<br>+31°28' | Sept. 13      | 0110-0425 | 3 <sup>h</sup> 15 <sup>m</sup> | 290/90     |
| 4         | IW2 =<br>PN 107+7° | 22 <sup>h</sup> 11 <sup>m</sup> .9<br>+65°39' | "             | 0513-0813 | 3 <sup>h</sup> 00 <sup>m</sup> | 120/43     |
| 5         | BD+23°520          | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02'  | "             | 0934-0954 | 20 <sup>m</sup>                | 130/87     |
| 6         | BD+23°520          | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02'  | "             | 0958-1022 | 24 <sup>m</sup>                | 130/87     |
| 7         | LP 690-10          | 18 <sup>h</sup> 26 <sup>m</sup> .5<br>-4°32'  | Sept. 26      | 0116-0216 | 60 <sup>m</sup>                | 92/90      |
| 8         | G 24-16            | 20 <sup>h</sup> 27 <sup>m</sup> .4<br>+9°31'  | "             | 0324-0344 | 20 <sup>m</sup>                | 200/105    |
| 9         | BD+43°4305         | 22 <sup>h</sup> 44 <sup>m</sup> .7<br>+44°05' | "             | 0426-0436 | 10 <sup>m</sup>                | 145/77     |

| P.H. | EMUL   | FILT  | P.A. | TEL | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH   | DBS | REMARKS |
|------|--------|-------|------|-----|-----|-------|------|------|------|-------|---------|-----|---------|
| 7    | 103a-G | OG530 | W W  | 3"  | p   | -     | 5.0  | +21° | 1.35 | 2X    | EV      |     |         |
| 8    | "      | "     | W W  | 3"  | p   | -     | 5.0  | +20° | "    | 3X    | EV      |     |         |
| 9    | "      | "     | N W  | 2"  | p   | -     | -    | "    | "    | 3X    | EV      |     |         |
| 1    | 103a-G | GG495 | S W  | 1"  | f   | 4     | -    | +25° | 1.65 | 6X    | KC      |     |         |
| 2    | "      | "     | N E  | 1"  | f   | -     | -    | +23° | "    | 6X    | KC/s.s. |     |         |
| 10   | "      | OG530 | W W  | 2"  | f   | -     | 5.0  | +22° | 1.50 | 4X    | EV      |     |         |
| 11   | "      | "     | W W  | 2"  | f   | -     | 5.0  | "    | "    | 4X    | EV      |     |         |
| 1    | "      | "     | N E  | 2"  | f   | -     | -    | +19° | "    | 4X    | EV      |     |         |
| 2    | "      | "     | S E  | 2"  | f   | -     | -    | +18° | 1.40 | 4X    | EV      |     |         |
| 3    | "      | "     | W W  | 2"  | f   | -     | 2.5  | "    | "    | 4X    | EV      |     |         |

| PLATE No. | OBJECT             | 1950 RA/DEC                                  | UT DATE          | UT        | Exp.                           | GUIDE STAR |
|-----------|--------------------|--|------------------|-----------|--------------------------------|------------|
| PT 28430  | BD +23°520         | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02' | 1990<br>Sept. 26 | 0708-0738 | 30 <sup>m</sup>                | 130/87     |
| 1         | BD +23°520         | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02' | "                | 0745-0805 | 20 <sup>m</sup>                | 130/87     |
| 2         | LS V +46°21        | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46°36' | "                | 0853-0913 | 20 <sup>m</sup>                | 107/87     |
| 3         | LS V +46°21        | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46°36' | "                | 0916-0940 | 24 <sup>m</sup>                | 107/87     |
| 4         | LP 690-10          | 18 <sup>h</sup> 26 <sup>m</sup> .5<br>-4°32' | Sept. 27         | 0107-0207 | 60 <sup>m</sup>                | 90/90      |
| 5         | LS V +46°21        | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46°36' | Oct. 2           | 0838-0858 | 20 <sup>m</sup>                | 107/88     |
| 6         | LS V +46°21        | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46°36' | "                | 0905-0923 | 18 <sup>m</sup>                | 107/88     |
| 7         | NGC 6853           | 19 <sup>h</sup> 57.4<br>+22°35'              | Oct. 12          | 0027-0157 | 90 <sup>m</sup>                | 211/93     |
| 8         | Abell 78           | 21 <sup>h</sup> 33.4<br>+31°28'              | "                | 0232-0522 | 2 <sup>h</sup> 50 <sup>m</sup> | 240/90     |
| 9         | 23 Tau =<br>Merope | 3 <sup>h</sup> 43.4<br>+23°48'               | "                | 0610-0635 | 25 <sup>m</sup>                | 178/54     |

| P.H. | EMUL   | FILT   | PA. | TEL | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS | REMARKS |
|------|--------|--------|-----|-----|-----|-------|------|------|------|-------|-------|-----|---------|
| 4    | 103a-G | OG 530 | W   | W   | 3"  | f     | -    | 5.0  | +17  | 1.25  | 4x    | EV  |         |
| 5    | "      | "      | W   | W   | 3"  | f     | -    | 5.0  | "    | "     | 4x    | EV  |         |
| 6    | "      | "      | N   | W   | 3"  | f     | -    | -    | "    | "     | 4x    | EV  |         |
| 7    | "      | "      | N   | W   | 3"  | f     | -    | -    | "    | "     | 4x    | EV  |         |
| 8    | "      | "      | N   | E   | 2"  | f     | -    | -    | +20° | 1.50  | 4x    | EV  |         |
| 9    | "      | "      | N   | W   | 3"  | f     | -    | -    | +14° | 1.10  | 4x    | EV  |         |
| 10   | "      | "      | N   | W   | 3"  | f     | -    | -    | +13° | "     | 4x    | EV  |         |
| 1    | "      | GG 495 | S   | E   | 1"  | g     | -    | -    | +11° | 1.30  | 4x    | KC  |         |
| 2    | "      | "      | S   | E   | 1"  | g     | 4    | -    | "    | "     | 5x    | KC  |         |
| 3    | "      | "      | S   | W   | 1"  | g     | -    | -    | +9°  | "     | 3x    | KC  |         |

| PLATE No | OBJECT                 | 1950 RA/DEC                                   | UT DATE      | UT        | Exp.                           | GUIDE STAR | P.H. |
|----------|------------------------|---|--------------|-----------|--------------------------------|------------|------|
| PT 28440 | NGC 6853               | 19 <sup>h</sup> 57. <sup>m</sup> 8<br>+22°35' | 1990 Oct. 23 | 0010-0135 | 85 <sup>m</sup>                | 211/93     | 1    |
| 1        | Abell 78               | 21 <sup>h</sup> 33. <sup>m</sup> 4<br>+31°28' | "            | 0154-0444 | 2 <sup>h</sup> 50 <sup>m</sup> | 240/90     | 2    |
| 2        | 23 Tau =<br>Merope     | 3 <sup>h</sup> 43. <sup>m</sup> 4<br>+23°48'  | "            | 0518-0548 | 30 <sup>m</sup>                | 178/54     | 3    |
| 3        | BD+28°4211             | 21 <sup>h</sup> 48. <sup>m</sup> 9<br>+28°37' | Nov. 7/8     | 2345-0015 | 30 <sup>m</sup>                | 94/88      | 1    |
| 4        | "                      | "   | Nov. 8       | 0016-0046 | 30 <sup>m</sup>                | "          | 2    |
| 5        | HFG 1 =<br>PN 136°+5°1 | 2 <sup>h</sup> 59. <sup>m</sup> 6<br>+64°44'  | "            | 0337-0437 | 60 <sup>m</sup>                | 75/48      | 3    |
| 6        | "                      | "   | "            | 0438-0538 | 60 <sup>m</sup>                | "          | 4    |
| 7        | BD+28°4211             | 21 <sup>h</sup> 48. <sup>m</sup> 9<br>+28°37' | Nov. 10/11   | 2346-0006 | 20 <sup>m</sup>                | 94/88      | 1    |
| 8        | "                      | "   | Nov. 11      | 0007-0027 | 20 <sup>m</sup>                | "          | 2    |
| 9        | S188 =<br>PN 128-4°1   | 1 <sup>h</sup> 27. <sup>m</sup> 6<br>+58°20'  | "            | 0130-0425 | 2 <sup>h</sup> 55 <sup>m</sup> | 190/80     | 3    |

| E M U L | F I L T | P.A. | T E L | S E E | T R A N S | G R A T | S E C T | T E M P | F O C U S | F L A S H | O B S | REMARKS |
|---------|---------|------|-------|-------|-----------|---------|---------|---------|-----------|-----------|-------|---------|
| 103a-G  | GG495   | S E  | 1"    | g     | -         | -       | +10°    | 1.15    | 5X        | KC        |       |         |
| "       | "       | S E  | 1"    | g     | -         | -       | +9°     | "       | 6X        | KC        |       |         |
| "       | "       | S W  | 1"    | g     | -         | -       | +8°     | "       | 3X        | KC        |       |         |
| 103a-G  | OG530   | S W  | 3"    | g     | -         | -       | 2.5+2°  | 0.95    | 4X        | KC        |       |         |
| "       | "       | S W  | 3"    | g     | -         | -       | 2.5 "   | "       | 4X        | KC        |       |         |
| "       | GG495   | S W  | 3"    | g     | -         | -       | +1°     | "       | 5X        | KC        |       |         |
| "       | "       | S W  | 3"    | g     | -         | -       | 0°      | "       | 5X        | KC        |       |         |
| "       | OG530   | S W  | 1-2"  | g     | -         | -       | 2.5+5°  | 1.05    | 3X        | KC        |       |         |
| "       | "       | "    | "     | "     | -         | -       | "       | "       | 3X        | KC        |       |         |
| "       | GG495   | S W  | 2"    | g     | -         | -       | 4°      | "       | 4X        | KC        |       |         |

| PLATE NO. | OBJECT               | 1950 RA/DEC                                   | UT DATE   | UT   | Exp.      | GUIDE STAR                            | P.H. | E M U L | F I L T | P.A. | T E L | S E E | T R A N S | G R A T | S E C T | T E M P | F O C U S | F L A S H         | O B S | REMARKS |
|-----------|----------------------|---|-----------|------|-----------|---------------------------------------|------|---------|---------|------|-------|-------|-----------|---------|---------|---------|-----------|-------------------|-------|---------|
| 9T 28450  | BD+28°42'11          | 21 <sup>h</sup> 48 <sup>m</sup> .9<br>+28°37' | Nov. 11   | 1990 | 2333-2353 | 20 <sup>m</sup> 94/88                 | 1    | 103a-G  | 0653D   | S W  | 1-2"  | f     | -         | 2.5+5°  | 1.05    | 3X      | KC        |                   |       |         |
| 1         | "                    | "   | Nov. 11/2 |      | 2354-0014 | 20 <sup>m</sup> "                     | 2    | "       | "       | " "  | "     | f     | -         | "       | "       | "       | 3X        | KC                |       |         |
| 2         | S188 =<br>PN 128-4°1 | 1 <sup>h</sup> 27 <sup>m</sup> .6<br>+58°08'  | Nov. 12   |      | 0049-0331 | 2 <sup>h</sup> 42 <sup>m</sup> 190/80 | 3    | "       | GG495   | S W  | 2"    | f     | -         | +4°     | "       | 5X      | KC        | passing<br>cirrus |       |         |
| 3         | HW4 =<br>PN 149-9°1  | 3 <sup>h</sup> 23 <sup>m</sup> .8<br>+45°14'  | "         |      | 0357-0557 | 2 <sup>h</sup> 100/52                 | 4    | "       | "       | " "  | 2"    | f     | -         | +3°     | "       | 5X      | KC        | "                 |       |         |
| 4         | "                    | "   | "         |      | 0628-0838 | 2 <sup>h</sup> 10 <sup>m</sup> 86/61  | 7    | "       | "       | N E  | 2"    | f     | -         | +2°     | "       | 5X      | KC        | clouds<br>at end  |       |         |
| 5         | Praesepe (NE)        | 8 <sup>h</sup> 38 <sup>m</sup> .6<br>+20°05'  | Nov. 20   |      | 1037-1047 | 10 <sup>m</sup> 121/85                | 7    | "       | 06530   | N W  | 2"    | f     | -         | +6°     | 0.90    | -       | EV        |                   |       |         |
| 6         | Praesepe (SE)        | 8 <sup>h</sup> 38 <sup>m</sup> .6<br>+19°41'  | "         |      | 1121-1131 | 10 <sup>m</sup> 83/103                | 8    | "       | "       | S W  | 2"    | f     | -         | "       | "       | -       | EV        |                   |       |         |
| 7         | Praesepe (NW)        | 8 <sup>h</sup> 36 <sup>m</sup> .6<br>+20°04'  | Nov. 26   |      | 0917-0927 | 10 <sup>m</sup> 113/94                | 9    | "       | "       | N W  | 4"    | f     | -         | +3°     | 0.75    | -       | EV        |                   |       |         |
| 8         | Praesepe (SW)        | 8 <sup>h</sup> 36 <sup>m</sup> .6<br>+19°39'  | "         |      | 1002-1012 | 10 <sup>m</sup> 170/64                | 10   | "       | "       | S W  | 4"    | f     | -         | "       | "       | -       | EV        |                   |       |         |
| 9         | Praesepe (SE)        | 8 <sup>h</sup> 38 <sup>m</sup> .4<br>+19°39'  | "         |      | 1021-1029 | 8 <sup>m</sup> 98/92                  | 11   | "       | "       | S W  | 4"    | f     | -         | "       | "       | -       | EV        |                   |       |         |

| PLATE No. | OBJECT       | 1950 RA/DEC                                   | UT DATE         | UT        | Exp.                                | GUIDE STAR | H. | E M U L | F I L T | P.A. | T E L | S E E | T R A N S | G R A T | S E C T | T E M P | F O C U S | F L A S H | O B S | REMARKS |
|-----------|--------------|---|-----------------|-----------|-------------------------------------|------------|----|---------|---------|------|-------|-------|-----------|---------|---------|---------|-----------|-----------|-------|---------|
| 28460     | Praesep (NE) | 8 <sup>h</sup> 38 <sup>m</sup> ,4<br>+20°04'  | 1990<br>Nov. 30 | 0943-0953 | 10 <sup>m</sup>                     | 105/94     | 12 | 103a-G  | 06530   | N W  | 3"    | f     | -         | -       | 0°      | 0,65    | -         |           | EV    |         |
| 1         | Praesep (NW) | 8 <sup>h</sup> 36 <sup>m</sup> ,6<br>+20°03'  | "               | 1011-1021 | 10 <sup>m</sup>                     | 113/94     | 7  | "       | "       | N W  | 3"    | f     | -         | -       | "       | "       | -         |           | EV    |         |
| 2         | Praesep (SW) | 8 <sup>h</sup> 36 <sup>m</sup> ,6<br>+19°39'  | "               | 1038-1048 | 10 <sup>m</sup>                     | 177/64     | 8  | "       | "       | S W  | 3"    | f     | -         | -       | "       | "       | -         |           | EV    |         |
| 3         | Praesep (SE) | 8 <sup>h</sup> 38 <sup>m</sup> ,4<br>+19°39'  | "               | 1102-1112 | 10 <sup>m</sup>                     | 105/80     | 9  | "       | "       | S W  | 3"    | f     | -         | -       | "       | "       | -         |           | EV    |         |
| 4         | BD+43°4305   | 22 <sup>h</sup> 44 <sup>m</sup> ,7<br>+44°05' | Dec. 7          | 0130-0150 | 12 <sup>m</sup><br>+6 <sup>m</sup>  | 147/77     | 10 | "       | "       | W E  | 3"    | f     | -         | 2,5     | -2°     | 0,50    | 3x        |           | EV    |         |
| 5         | BD+43°4305   | 22 <sup>h</sup> 44 <sup>m</sup> ,7<br>+44°05' | "               | 0158-0208 | 10 <sup>m</sup>                     | 147/77     | 11 | "       | "       | W E  | 3"    | f     | -         | 2,5     | "       | "       | 4x        |           | EV    |         |
| 6         | G24-16       | 20 <sup>h</sup> 27 <sup>m</sup> ,4<br>+9°31'  | Dec. 9          | 0012-0032 | 20 <sup>m</sup>                     | 182/72     | 12 | "       | "       | N E  | 3"    | f     | -         | -       | +2°     | 0,95    | 3x        |           | EV    |         |
| 7         | BD+43°4305   | 22 <sup>h</sup> 44 <sup>m</sup> ,7<br>+44°05' | "               | 0131-0202 | 4x6 <sup>m</sup><br>+3 <sup>m</sup> | 147/77     | 1  | "       | "       | W E  | 3"    | f     | -         | 2,5     | +1°     | 0,85    | -         |           | EV    |         |
| 8         | BD+43°4305   | 22 <sup>h</sup> 44 <sup>m</sup> ,7<br>+44°05' | "               | 0213-0237 | 3x6 <sup>m</sup><br>+3 <sup>m</sup> | 147/77     | 2  | "       | "       | W E  | 3"    | f     | -         | 2,5     | "       | "       | 3x        |           | EV    |         |
| 9         | BD+43°4305   | 22 <sup>h</sup> 44 <sup>m</sup> ,7<br>+44°05' | "               | 0253-0310 | 2x6 <sup>m</sup><br>+3 <sup>m</sup> | 147/77     | 3  | "       | "       | W E  | 3"    | f     | -         | 2,5     | "       | "       | 3x        |           | EV    |         |

| PLATE No. | OBJECT        | 1950 RA/DEC                                   | UT DATE      | UT        | Exp.                                | GUIDE STAR |
|-----------|---------------|---|--------------|-----------|-------------------------------------|------------|
| TT 28470  | G24-16        | 20 <sup>h</sup> 27 <sup>m</sup> .4<br>+9°31'  | 1990 Dec. 10 | 0003-0019 | 16 <sup>m</sup>                     | 200/104    |
| 1         | G24-16        | 20 <sup>h</sup> 27 <sup>m</sup> .4<br>+9°31'  | "            | 0021-0041 | 20 <sup>m</sup>                     | 200/104    |
| 2         | BD+43°4305    | 22 <sup>h</sup> 44 <sup>m</sup> .7<br>+44°05' | "            | 0127-0150 | 3x6 <sup>m</sup><br>+2 <sup>m</sup> | 147/76     |
| 3         | BD+43°4305    | 22 <sup>h</sup> 44 <sup>m</sup> .7<br>+44°05' | "            | 0157-0220 | 3x6 <sup>m</sup><br>+2 <sup>m</sup> | 147/76     |
| 4         | Praesepe (N)  | 8 <sup>h</sup> 37 <sup>m</sup> .5<br>+20°11'  | Dec. 11      | 0752-0802 | 10 <sup>m</sup>                     | 113/90     |
| 5         | Praesepe (NE) | 8 <sup>h</sup> 38 <sup>m</sup> .4<br>+20°03'  | "            | 0822-0832 | 10 <sup>m</sup>                     | 220/103    |
| 6         | Praesepe (NW) | 8 <sup>h</sup> 36 <sup>m</sup> .6<br>+20°03'  | "            | 0849-0859 | 10 <sup>m</sup>                     | 183/81     |
| 7         | Praesepe (SW) | 8 <sup>h</sup> 36 <sup>m</sup> .6<br>+19°39'  | "            | 0912-0922 | 10 <sup>m</sup>                     | 195/89     |
| 8         | Praesepe (SE) | 8 <sup>h</sup> 38 <sup>m</sup> .4<br>+19°39'  | "            | 0933-0943 | 10 <sup>m</sup>                     | 97/91      |
| 9         | Praesepe      | 8 <sup>h</sup> 37 <sup>m</sup> .5<br>+19°51'  | "            | 1000-1010 | 10 <sup>m</sup>                     | 107/101    |

| E M U T | F I L T | P.A.  | T E L | S E E | T R A N S | G R A T | S E C T | T E M P | F O C U S | F L A S H | O B S | REMARKS |
|---------|---------|-------|-------|-------|-----------|---------|---------|---------|-----------|-----------|-------|---------|
| 4       | 103a-G  | OG530 | S E   | 3"    | f         | -       | -       | +4°     | 1.00      | 4X        | EV    |         |
| 5       | "       | "     | S E   | 3"    | f         | -       | -       | "       | "         | 4X        | EV    |         |
| 6       | "       | "     | W E   | 2"    | f         | -       | 2.5     | "       | "         | -         | EV    |         |
| 7       | "       | "     | W E   | 2"    | f         | -       | 2.5     | "       | "         | 4X        | EV    |         |
| 8       | "       | "     | N W   | 3"    | f         | -       | -       | +2°     | 0.65      | -         | EV    |         |
| 9       | "       | "     | N W   | 3"    | f         | -       | -       | "       | "         | -         | EV    |         |
| 10      | "       | "     | N W   | 3"    | f         | -       | -       | "       | "         | -         | EV    |         |
| 11      | "       | "     | S W   | 3"    | f         | -       | -       | "       | "         | -         | EV    |         |
| 12      | "       | "     | S W   | 3"    | f         | -       | -       | "       | "         | -         | EV    |         |
| 1       | "       | "     | S W   | 3"    | f         | -       | -       | "       | "         | -         | EV    |         |



| PLATE No. | OBJECT      | 1950 RA/DEC                                   | UT DATE      | UT        | Exp.                                 | GUIDE STAR |
|-----------|-------------|---|--------------|-----------|--------------------------------------|------------|
| TT 28480  | Praesepe    | 8 <sup>h</sup> 37 <sup>m</sup> .5<br>+19°51'  | 1990 Dec. 11 | 1014-1024 | 16 <sup>m</sup>                      | 107/101    |
| 1         | BD+43°43'05 | 22 <sup>h</sup> 44 <sup>m</sup> .7<br>+44°05' | Dec. 12      | 0045-0122 | 3x10 <sup>m</sup><br>+4 <sup>m</sup> | 147/11     |
| 2         | NGC 2419    | 7 <sup>h</sup> 34 <sup>m</sup> .8<br>+39°00'  | Dec. 14      | 0512-0712 | 2 <sup>h</sup>                       | 137/82     |
| 3         | BD+23°52'0  | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02'  | 1991 Febr. 8 | 0138-0154 | 16 <sup>m</sup>                      | 131/90     |
| 4         | BD+23°52'0  | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02'  | "            | 0156-0216 | 20 <sup>m</sup>                      | 131/90     |
| 5         | BD+23°52'0  | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02'  | Febr. 12     | 0135-0155 | 20 <sup>m</sup>                      | 130/87     |
| 6         | BD+23°52'0  | 3 <sup>h</sup> 43 <sup>m</sup> .3<br>+24°02'  | "            | 0157-0217 | 20 <sup>m</sup>                      | 130/87     |
| 7         | LSV +46°21  | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46°36'  | "            | 0314-0332 | 18 <sup>m</sup>                      | 107/88     |
| 8         | LSV +46°21  | 4 <sup>h</sup> 39 <sup>m</sup> .7<br>+46°36'  | "            | 0335-0351 | 16 <sup>m</sup>                      | 107/88     |
| 9         | Praesepe    | 8 <sup>h</sup> 37 <sup>m</sup> .5<br>+19°51'  | "            | 0437-0445 | 8 <sup>m</sup>                       | 105/101    |

| E M U L | F I L T | P.A.  | T E L | S E E | T R A N S | G R A T | S E C T | T E M P | F O C U S | F L A S H | O B S | REMARKS |
|---------|---------|-------|-------|-------|-----------|---------|---------|---------|-----------|-----------|-------|---------|
| 2       | 103a-G  | OG530 | S W   | 3"    | f         | -       | -       | +2°     | 0.65      | -         | EV    |         |
| 3       | "       | "     | W E   | 2"    | f         | -       | 2.5     | +6°     | 1.00      | 4X        | EV    |         |
| 1       | "       | GG495 | S W   | 2"    | f-p       | -       | -       | -3°     | 0.75      | 3X        | JS/KC |         |
| 1       | "       | OG530 | W E   | 2"    | f         | -       | 5.0     | +3°     | 1.40      | 4X        | EV    |         |
| 2       | "       | "     | W E   | 2"    | f         | -       | 5.0     | "       | "         | 4X        | EV    |         |
| 3       | "       | "     | W E   | 4"    | f         | -       | 5.0     | -5°     | 1.00      | 4X        | EV    |         |
| 4       | "       | "     | W E   | 4"    | f         | -       | 5.0     | "       | "         | 4X        | EV    |         |
| 5       | "       | "     | N E   | 3"    | f         | -       | "       | "       | "         | 4X        | EV    |         |
| 6       | "       | "     | N E   | 3"    | f         | -       | "       | "       | "         | 5X        | EV    |         |
| 7       | "       | "     | S W   | 4"    | f         | -       | -       | -6°     | "         | -         | EV    |         |

| PLATE No. | OBJECT     | 1950 RA/DEC                       | UT DATE  | UT        | Exp             | GUIDE STAR |
|-----------|------------|-----------------------------------|----------|-----------|-----------------|------------|
|           |            |                                   | 1991     |           |                 |            |
| TT 28490  | BD+23°520  | 3 <sup>h</sup> 43 <sup>m</sup> .3 | Febr. 26 | 0154-0214 | 20 <sup>m</sup> | 130/89     |
|           |            | +24°02'                           |          |           |                 |            |
| 1         | BD+23°520  | 3 <sup>h</sup> 43 <sup>m</sup> .3 | "        | 0219-0239 | 20 <sup>m</sup> | 130/89     |
|           |            | +24°02'                           |          |           |                 |            |
| 2         | LSV +46°21 | 4 <sup>h</sup> 39 <sup>m</sup> .7 | "        | 0350-0406 | 16 <sup>m</sup> | 107/87     |
|           |            | +46°36'                           |          |           |                 |            |
| 3         | BD+23°520  | 3 <sup>h</sup> 43 <sup>m</sup> .3 | Mar. 5   | 0145-0201 | 16 <sup>m</sup> | 130/89     |
|           |            | +24°02'                           |          |           |                 |            |
| 4         | BD+23°520  | 3 <sup>h</sup> 43 <sup>m</sup> .3 | "        | 0204-0214 | 10 <sup>m</sup> | 130/89     |
|           |            | +24°02'                           |          |           |                 |            |
| 5         | LSV +46°21 | 4 <sup>h</sup> 39 <sup>m</sup> .7 | "        | 0304-0320 | 16 <sup>m</sup> | 107/87     |
|           |            | +46°36'                           |          |           |                 |            |
| 6         | Praesepe   | 8 <sup>h</sup> 37 <sup>m</sup> .5 | "        | 0354-0356 | 2 <sup>m</sup>  | 107/100    |
|           |            | +19°51'                           |          |           |                 |            |
| 7         | Praesepe   | 8 <sup>h</sup> 37 <sup>m</sup> .5 | "        | 0414-0422 | 8 <sup>m</sup>  | 107/100    |
|           |            | +19°51'                           |          |           |                 |            |
| 8         | Praesepe   | 8 <sup>h</sup> 37 <sup>m</sup> .5 | "        | 0429-0445 | 16 <sup>m</sup> | 107/100    |
|           |            | +19°51'                           |          |           |                 |            |
| 9         | Praesepe   | 8 <sup>h</sup> 37 <sup>m</sup> .5 | "        | 0447-0451 | 4 <sup>m</sup>  | 107/100    |
|           |            | +19°51'                           |          |           |                 |            |

| P.H. | EMUL   | FILT  | P.A. | TEL | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS    | REMARKS |
|------|--------|-------|------|-----|-----|-------|------|------|------|-------|-------|--------|---------|
| 8    | 103a-G | OG530 | W E  | 4"  | f   | -     | 5.0  | -5°  | 1.10 | 3X    | EV    |        |         |
| 9    | "      | "     | W E  | 4"  | f   | -     | 5.0  | "    | "    | 3X    | EV    |        |         |
| 10   | "      | "     | N E  | 3"  | f   | -     | -    | -6°  | 1.00 | 3X    | EV    |        |         |
| 11   | "      | "     | W E  | 2"  | f   | -     | 5.0  | +1°  | 1.25 | 3X    | EV    |        |         |
| 12   | "      | "     | W E  | 2"  | f   | -     | 5.0  | "    | "    | 3X    | EV    | clouds |         |
| 1    | "      | "     | N E  | 2"  | f   | -     | -    | 0°   | "    | 3X    | EV    |        |         |
| 2    | "      | "     | S W  | 2"  | f   | -     | -    | "    | "    | 3X    | EV    | trail  |         |
| 3    | "      | "     | S W  | 2"  | f   | -     | -    | "    | "    | 3X    | EV    |        |         |
| 4    | "      | "     | S W  | 2"  | f   | -     | -    | "    | "    | 3X    | EV    |        |         |
| 5    | "      | "     | S W  | 2"  | f   | -     | -    | "    | "    | 3X    | EV    |        |         |

PLATE  
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REMARKS

TT 28500

BD+23°520

3<sup>h</sup>43<sup>m</sup>.3  
+24°02'

1991

Mar. 15

0148-0208

20<sup>m</sup>

130/89

1

103a-G

06530

W

E

3"

f

-

5.0

+2°

1.30

3X

EV

1

LSV+46°21

4<sup>h</sup>39<sup>m</sup>.7  
+46°36'

"

0245-0301

16<sup>m</sup>

107/87

2

"

"

N

E

2"

f

-

-

+1°

"

3X

EV

2

LSI+46°21

4<sup>h</sup>39<sup>m</sup>.7  
+46°36'

"

0306-0322

16<sup>m</sup>

107/87

3

"

"

N

E

2"

f

-

-

"

"

3X

EV

3

Praesepe

8<sup>h</sup>37<sup>m</sup>.5  
+19°51'

"

0411-0414

3<sup>m</sup>

105/101

4

"

"

S

E

2"

f

-

-

0°

1.25

-

EV

4

Praesepe

8<sup>h</sup>37<sup>m</sup>.5  
+19°51'

"

0419-0449

30<sup>m</sup>

105/101

5

"

"

S

E

2"

f

-

-

"

"

4X

EV

5

BD+28°4211

21<sup>h</sup>48<sup>m</sup>.9  
+28°38'

June 5

0904-0920

16<sup>m</sup>

95/85

7

"

"

S

W

3"

p

-

2.5

+15°

8.0+

1.15

3X

EV clouds

6

BD+28°4211

21<sup>h</sup>48<sup>m</sup>.9  
+28°38'

June 6

0840-0900

20<sup>m</sup>

95/85

8

"

"

S

W

3"

f

-

2.5

+16°

1.20

4X

EV

7

BD+28°4211

21<sup>h</sup>48<sup>m</sup>.9  
+28°38'

"

0902-0922

20<sup>m</sup>

95/85

9

"

"

S

W

3"

f

-

2.5

"

"

3X

EV

8

BD+28°4211

21<sup>h</sup>48<sup>m</sup>.9  
+28°38'

June 8

0835-0855

20<sup>m</sup>

96/85

10

"

"

S

W

2"

f

-

2.5

+19°

1.35

3X

EV

9

BD+28°4211

21<sup>h</sup>48<sup>m</sup>.9  
+28°38'

"

0857-0917

20<sup>m</sup>

96/85

11

"

"

S

W

2"

f

-

2.5

"

"

3X

EV

| PLATE No. | OBJECT        | 1950 RA/DEC                                   | UT DATE     | UT        | Exp.                           | GUIDE STAR |
|-----------|---------------|---|-------------|-----------|--------------------------------|------------|
| 97 28510  | BD+28°4211    | 21 <sup>h</sup> 48 <sup>m</sup> .9<br>+28°38' | June 9 1991 | 0835-0901 | 26 <sup>m</sup>                | 95/85      |
| 1         | NGC 6369      | 17 <sup>h</sup> 26 <sup>m</sup> .3<br>-23°43' | June 17     | 0416-0541 | 1 <sup>h</sup> 25 <sup>m</sup> | 218/95     |
| 2         | PN 7-32 field | 18 <sup>h</sup> 17.2<br>-24°03'               | "           | 0611-0731 | 1 <sup>h</sup> 20 <sup>m</sup> | 196/106    |
| 3         | BD+28°4211    | 21 <sup>h</sup> 48 <sup>m</sup> .9<br>+28°38' | "           | 0838-0902 | 24 <sup>m</sup>                | 95/85      |
| 4         | HD 149881     | 16 <sup>h</sup> 34 <sup>m</sup> .7<br>+14°35' | June 18     | 0411-0502 | 2x25 <sup>m</sup>              | 113/94     |
| 5         | NGC 6369      | 17 <sup>h</sup> 26 <sup>m</sup> .3<br>-23°43' | "           | 0532-0702 | 90 <sup>m</sup>                | 218/95     |
| 6         | BD+28°4211    | 21 <sup>h</sup> 48 <sup>m</sup> .9<br>+28°38' | "           | 0819-0843 | 24 <sup>m</sup>                | 95/85      |
| 7         | HD 137569     | 15 <sup>h</sup> 24 <sup>m</sup> .0<br>+14°52' | June 19     | 0306-0357 | 2x25 <sup>m</sup>              | 183/116    |
| 8         | "             | "   | "           | 0359-0450 | 2x25 <sup>m</sup>              | "          |
| 9         | NGC 6369      | 17 <sup>h</sup> 26 <sup>m</sup> .3<br>-23°43' | "           | 0522-0652 | 90 <sup>m</sup>                | 218/95     |

| E M U L | F I L T | P.A. | T E L | S E E | T R A N S | G R A T | S E C T | T E M P | F O C U S | F L A S H | O B S | REMARKS       |
|---------|---------|------|-------|-------|-----------|---------|---------|---------|-----------|-----------|-------|---------------|
|         |         |      |       |       | f         | -       | 2.5     | +21°    | 1.35      | 4x        | EV    |               |
|         |         |      |       |       | f-p       | -       | -       | +22°    | 1.85      | 4x        | KC    | circus        |
|         |         |      |       |       | g         | -       | -       | +20°    | "         | 5x        | KC    |               |
|         |         |      |       |       | f         | -       | 2.5     | "       | 1.50      | 3x        | EV    |               |
|         |         |      |       |       | f-g       | 4       | 3.0     | +22°    | 1.70      | 3x        | KC    |               |
|         |         |      |       |       | g         | -       | -       | "       | "         | 5x        | KC    |               |
|         |         |      |       |       | f         | -       | 2.5     | +21°    | 1.35      | 4x        | EV    |               |
|         |         |      |       |       | f         | 4       | 2.0     | +24°    | 1.75      | 3x        | KC    |               |
|         |         |      |       |       | g         | "       | "       | "       | "         | 3x        | KC    |               |
|         |         |      |       |       | f         | -       | -       | +23°    | "         | 5x        | KC    | circus at end |

| PLATE No. | OBJECT    | 1950 RA/DEC                      | UT DATE      | UT        | Exp.           | GUIDE STAR P.H. | EMUL   | FILT   | P.A. | TEL  | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS    | REMARKS |
|-----------|-----------|----------------------------------|--------------|-----------|----------------|-----------------|--------|--------|------|------|-----|-------|------|------|------|-------|-------|--------|---------|
| 7 28520   | HD 149881 | 16 <sup>h</sup> 34.7<br>+14° 35' | 1991 July 14 | 0354-0446 | 2x25"          | 113/94 1        | 1030-G | GG 495 | SE   | 2"   | f   | 4     | 3.0  | 21°  | 1.66 | 3X    | KC    |        |         |
| 1         | HD 156110 | 17 <sup>h</sup> 12.0<br>+45° 26' | " "          | 0506-0557 | 2x25"          | 215/63 2        | "      | "      | SE   | 2"   | f   | 4     | 2.5  | 20°  | "    | 3X    | KC    | aurora |         |
| 2         | HD 149881 | 16 <sup>h</sup> 34.7<br>+14° 35' | July 15      | 0250-0341 | 2x25"          | 113/94 1        | "      | "      | SE   | 1"   | g   | 4     | 3.0  | 21°  | 1.60 | 3X    | KC    |        |         |
| 3         | HD 156110 | 17 <sup>h</sup> 12.0<br>+45° 26' | " "          | 0359-0450 | 2x25"          | 215/61 2        | "      | "      | SE   | 1"   | g   | 4     | 2.5  | "    | "    | 3X    | KC    |        |         |
| 4         | "         | "                                | " "          | 0453-0544 | 2x25"          | " 3             | "      | "      | "    | "    | "   | "     | "    | 20°  | "    | 3X    | KC    |        |         |
| 5         | HD 206144 | 21 <sup>h</sup> 37.8<br>-17° 50' | " "          | 0628-0729 | 2x30"          | 120/113 4       | "      | "      | SW   | 1-2" | g   | 4     | -    | "    | "    | 5X    | KC    |        |         |
| 6         | NGC 6369  | 17 <sup>h</sup> 26.3<br>-23° 43' | July 16      | 0250-0450 | 2 <sup>h</sup> | 218/95 1        | "      | "      | SW   | 2"   | g   | -     | -    | 24°  | 1.80 | 5X    | KC    |        |         |
| 7         | HD 206144 | 21 <sup>h</sup> 37.8<br>-17° 50' | " "          | 0622-0723 | 2x30"          | 120/113 2       | "      | "      | SW   | 2"   | g   | 4     | -    | 21°  | "    | 5X    | KC    |        |         |
| 8         | HD 206144 | 21 <sup>h</sup> 37.8<br>-17° 50' | Aug. 13      | 0532-0633 | 2x30"          | 120/113 1       | "      | "      | SW   | 2"   | f   | 4     | -    | 22°  | 1.70 | 5X    | KC    |        |         |
| 9         | HD 220787 | 23 <sup>h</sup> 24.2<br>-11° 18' | " "          | 0657-0748 | 2x25"          | 228/86 2        | "      | "      | SW   | 2"   | f   | 4     | 1.5  | 21°  | "    | 3X    | KC    |        |         |

| PLATE No. | OBJECT    | 1950 RA/DEC                                   | UT DATE | UT        | Exp.              | GUIDE STAR | P.H. |
|-----------|-----------|---|---------|-----------|-------------------|------------|------|
|           |           |   | 1991    |           |                   |            |      |
| 9128530   | HD 220787 | 23 <sup>h</sup> 24. <sup>m</sup> 2<br>-11°18' | Aug. 13 | 0749-0840 | 2x25 <sup>m</sup> | 228/86     | 3    |
| 1         | NGC 6822  | 19 <sup>h</sup> 42. <sup>m</sup> 1<br>-14°53' | Aug. 14 | 0306-0506 | 2 <sup>h</sup>    | 108/82     | 1    |
| 2         | HD 214080 | 22 <sup>h</sup> 33. <sup>m</sup> 4<br>-16°39' | "       | 0537-0628 | 2x25 <sup>m</sup> | 175/87     | 2    |
| 3         | "         | "   | "       | 0629-0720 | 2x25 <sup>m</sup> | "          | 3    |
| 4         | HD 203664 | 21 <sup>h</sup> 21. <sup>m</sup> 0<br>+9°43'  | Aug. 15 | 0438-0519 | 2x20 <sup>m</sup> | 111/93     | 1    |
| 5         | "         | "   | "       | 0521-0602 | 2x20 <sup>m</sup> | "          | 2    |
| 6         | "         | "   | Oct. 8  | 0030-0111 | 2x20 <sup>m</sup> | "          | 1    |
| 7         | HD 214930 | 22 <sup>h</sup> 39. <sup>m</sup> 0<br>+23°35' | "       | 0133-0214 | 2x20 <sup>m</sup> | 206/70     | 2    |
| 8         | "         | "   | "       | 0215-0255 | 2x20 <sup>m</sup> | "          | 3    |
| 9         | HD 219188 | 23 <sup>h</sup> 11. <sup>m</sup> 5<br>+4°43'  | Nov. 5  | 0221-0302 | 2x20 <sup>m</sup> | 147/89     | 1    |

| EMUL   | FILT  | P.A. | TEL  | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS    | REMARKS |
|--------|-------|------|------|-----|-------|------|------|------|-------|-------|--------|---------|
| 103a-G | GG495 | S W  | 2"   | F   | 4     | 1.5  | 20°  | 1.70 | 3X    | KC    |        |         |
| "      | "     | S W  | 2"   | F   | -     | -    | 22°  | 1.75 | 5X    | KC    |        |         |
| "      | "     | S W  | 2"   | F   | 4     | 2.5  | 21°  | "    | 3X    | KC    |        |         |
| "      | "     | S W  | 2"   | F   | 4     | 2.5  | 21°  | "    | 3X    | KC    |        |         |
| "      | "     | S W  | 1"   | F   | 4     | 1.5  | 24°  | 1.85 | 3X    | KC    |        |         |
| "      | "     | " "  | 1"   | F   | 4     | 1.5  | 23°  | "    | 3X    | KC    | clouds |         |
| "      | "     | S W  | 1-2" | F   | 4     | 1.5  | 10°  | 1.70 | 3X    | KC    | circus |         |
| "      | "     | S W  | 1-2" | F   | 4     | 2.5  | +10° | "    | 3X    | KC    |        |         |
| "      | "     | " "  | " "  | " " | " "   | " "  | " "  | " "  | 3X    | KC    |        |         |
| "      | "     | S W  | 2-3" | F   | 4     | 3.0  | -5°  | 1.84 | 3X    | KC    |        |         |

PLATE  
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REMARKS

PT 28540

HD 219188

23<sup>h</sup> 11.5<sup>m</sup>  
+4° 43'

1991

Nov. 5

0304-0344

2x20<sup>m</sup>

147/89

2

103a-G

GG 495

S W

2 1/3

f

4

3.0 -5°

1.84

3X

KC

1 18 Pog

21<sup>h</sup> 57.6<sup>m</sup>  
+6° 29'

Nov. 7/8

2340-0040

2x30<sup>m</sup>

165/79

1

"

"

"

"

2-3"

g

4

4.0 -5°

1.60

3X

KC

2 "

"  
"

Nov. 8

0041-0141

2x30<sup>m</sup>

"

2

"

"

"

"

"

"

"

-6°

"

3X

KC

3 HD 215733

22<sup>h</sup> 44.6<sup>m</sup>  
+16° 58'

"

0159-0259

2x30<sup>m</sup>

175/70

3

"

"

"

"

2-3"

g

4

2.5 -6°

"

3X

KC

4 HD 14633

2<sup>h</sup> 19.8<sup>m</sup>  
+41° 15'

"

0321-0422

2x30<sup>m</sup>

120/100

4

"

"

"

"

3"

g

4

2.5 -7°

"

3X

KC

5 18 Pog

21<sup>h</sup> 57.6<sup>m</sup>  
+6° 29'

Nov. 8/9

2335-0006

2x15<sup>m</sup>

165/80

1

"

"

"

"

1"

g

4

4.0 -3°

1.90

3X

KC

aurora  
over entire  
sky!

6 HD 215733

22<sup>h</sup> 44.6<sup>m</sup>  
+16° 58'

Nov. 9

0017-0048

2x15<sup>m</sup>

175/70

2

"

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g

4

2.5 "

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3X

KC

7 "

"  
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0049-0129

2x20<sup>m</sup>

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4

2.5 "

"

3X

KC

8 HD 219188

23<sup>h</sup> 11.5<sup>m</sup>  
+4° 43'

"

0144-0215

2x15<sup>m</sup>

147/89

4

"

"

"

"

1"

g

4

3.0 -4°

"

3X

K

9 HD 14633

2<sup>h</sup> 19.8<sup>m</sup>  
+41° 15'

"

0335-0416

2x20<sup>m</sup>

120/100

5

"

"

"

"

1-2"

g

4

2.5 "

"

3X

KC

| PLATE No. | OBJECT               | 1950 RA / DEC                                 | UT DATE            | UT        | Exp.               | GUIDE STAR |
|-----------|----------------------|---|--------------------|-----------|--------------------|------------|
| 9/ 28550  | HD14633              | 2 <sup>h</sup> 19. <sup>m</sup> 8<br>+41° 15' | 1991/2<br>Nov. 9   | 0418-0508 | 2x25"              | 120/100    |
| 1         | "                    | "   | 1992<br>Jan. 10-11 | 2346-0027 | 2x20"              | 120/100    |
| 2         | HD28497              | 4 <sup>h</sup> 26. <sup>m</sup> 8<br>-13° 09' | Jan. 11            | 0109-0150 | 2x20"              | 106/79     |
| 3         | "                    | "   | "                  | 0155-0236 | 2x20"              | "          |
| 4         | "                    | "   | Feb. 2<br>0041-    | 0041-0122 | 2x20"              | "          |
| 5         | A 24<br>(PN 217+14°) | 7 <sup>h</sup> 49. <sup>m</sup> 1<br>+3° 08'  | "                  | 0214-0359 | 1 <sup>h</sup> 45" | 138/52     |
| 6         | A 30<br>(PN 208+33°) | 8 <sup>h</sup> 44. <sup>m</sup> 0<br>+18° 04' | "                  | 0416-0601 | 1 <sup>h</sup> 45" | 148/53     |
| 7         | θ <sup>1</sup> Ori   | 5 <sup>h</sup> 32. <sup>m</sup> 8<br>-5° 24'  | 1993<br>Feb. 3     | 0322-0328 | 6 <sup>m</sup>     | 93/100     |
| 8         | NGC 2158             | 6 <sup>h</sup> 04. <sup>m</sup> 4<br>+24° 06' | Feb. 28            | 0059-0220 | 1 <sup>h</sup> 21" | 205/70     |
| 9         | NGC 2158             | 6 <sup>h</sup> 04. <sup>m</sup> 4<br>+24° 06' | 1994<br>Mar. 5     | 0106-0306 | 2 <sup>h</sup>     | 205/70     |

| P.H. | EMUL   | FILT  | P.A. | TEL  | SEE  | TRANS | GRAT | SECT | TEMP         | FOCUS | FLASH | OBS | REMARKS                         |
|------|--------|-------|------|------|------|-------|------|------|--------------|-------|-------|-----|---------------------------------|
| 6    | 103a-G | GG495 | S W  | 1-2" | g    | 4     | 2.5  | -4°  | 1.90         | 3X    | KC    |     | bright aurora                   |
| 1    | "      | "     | "    | "    | 1-2" | f     | 4    | 2.5  | -1°          | 2.00  | 3X    | KC  | 5-day old moon                  |
| 2    | "      | "     | "    | "    | 2-3" | f     | 4    | 4.0  | -1°          | "     | 3X    | KC  | circus<br>wind increasing       |
| 3    | "      | "     | "    | "    | "    | f     | 4    | 4.0  | -1°          | "     | 3X    | KC  | "                               |
| 1    | "      | "     | "    | "    | 1"   | f     | 1    |      |              |       |       |     |                                 |
| 1    | "      | "     | "    | "    | 1"   | f     | 4    | 4.0  | -1°          | 2.05  | 3X    | KC  |                                 |
| 2    | "      | "     | E W  | 1"   | f    | -     | -    | "    | "            | "     | 4X    | KC  |                                 |
| 3    | "      | "     | S W  | 1"   | f    | -     | -    | -2°  | "            | "     | 4X    | KC  |                                 |
| 1    | "      | "     | S W  | 1-2" | p    | -     | -    | 0°   | 5.0+         | 1.40  | -     | KC  | test of new drive               |
| 1    | "      | "     | S W  | 1"   | f    | -     | -    | -5°  | 1.40         | 1X    | KC    |     | lost guide +<br>drive too weak! |
| 1    | "      | "     | S E  | 1"   | g    | -     | -    | +3°  | 6.0+<br>1.55 | 3X    | KC    |     | seeing poorer at end            |



| PLATE No. | OBJECT         | RA/DEC  | UT DATE | UT        | Exp.              | GUIDE STAR |
|-----------|----------------|---|---------|-----------|-------------------|------------|
|           |                |   | 1994    |           |                   |            |
| π 28560   | Pal 4          | 11 <sup>h</sup> 26.6 <sup>m</sup>                       | Mar. 5  | 0355-0555 | 2 <sup>h</sup>    | 147/52     |
| *         | 1 θ Ori<br>M35 | +29° 15'<br>5 <sup>h</sup> 32.8 <sup>m</sup><br>-5° 24' | Mar. 12 | 0106-0116 | 10 <sup>m</sup>   | 93/109     |
|           |                | 6 <sup>h</sup> 05.8 <sup>m</sup><br>+24° 20'            |         | 0052-0054 | 2 <sup>m</sup>    | 133/85     |
| *         | 2 θ Ori<br>M35 | "   | "       | 0117-0127 | 10 <sup>m</sup>   | "          |
|           |                | "   | "       | 0055-0057 | 2 <sup>m</sup>    | "          |
| *         | 3 θ Ori<br>M35 | "   | "       | 0128-0138 | 10 <sup>m</sup>   | "          |
|           |                | "   | "       | 0009-0210 | 2 <sup>m</sup>    | "          |
| *         | 4 θ Ori<br>M35 | "   | "       | 0139-0149 | 10 <sup>m</sup>   | "          |
|           |                | "   | "       | 0212-0214 | 2 <sup>m</sup>    | "          |
|           | 5 HD 97991     | 11 <sup>h</sup> 13.7 <sup>m</sup>                       | Mar. 17 | 0507-0540 | 2x16 <sup>m</sup> | 163/97     |
|           |                | -3° 12'   |         |           |                   |            |
|           | 6 "            | "   | "       | 0542-0615 | "                 | "          |
|           |                | "   | "       |           |                   |            |
|           | 7 HD 119608    | 13 <sup>h</sup> 41.8 <sup>m</sup>                       | "       | 0646-0727 | 2x20 <sup>m</sup> | 201/52     |
|           |                | -17° 41'  |         |           |                   |            |
|           | 8 "            | "   | "       | 0739-0842 | 3x20 <sup>m</sup> | "          |
|           |                | "   | "       |           |                   |            |
|           | 9 HD 121800    | 13 <sup>h</sup> 53.9 <sup>m</sup>                       | Mar. 19 | 0606-0653 | 3x15 <sup>m</sup> | 150/113    |
|           |                | +66° 22'  |         |           |                   |            |

\* θ Ori/M35 double-exposed 2<sup>nd</sup> epoch  
for Ori cluster expansion - see  
1980 for 1<sup>st</sup> epoch

| P.H. | E M U L | F I L T | P.A. | T E L | S E E | T R A N S | G R A T | S E C T | T E M P | F O C U S | F L A S H | O B S                                 | REMARKS |
|------|---------|---------|------|-------|-------|-----------|---------|---------|---------|-----------|-----------|---------------------------------------|---------|
| 2    | 103a-G  | GG495   | S W  | 1-2"  | f-g   | -         | -       | +3°     | 1.55    | 3X        | KC        |                                       |         |
| 1    | 103a-G  | OG530   | S W  | 1"    | f     | -         | -       | 0°      | 1.40    | 3X        | KC        |                                       |         |
| 1    | 103a-G  | OG530   | S W  | 1"    | f     | -         | -       |         | 1.40    | 3X        | KC        |                                       |         |
| 2    | "       | "       | "    | "     | "     | -         | -       | "       | "       | 3X        | KC        |                                       |         |
| 2    | "       | "       | "    | "     | "     | -         | -       | "       | "       |           |           |                                       |         |
| 3    | "       | "       | "    | "     | 2"    | -         | -       | "       | "       | 3X        | KC        |                                       |         |
| 4    | "       | "       | "    | "     | 2"    | -         | -       | "       | "       | 3X        | KC        |                                       |         |
| 1    | "       | GG495   | S W  | 1-2"  | f     | 4         | 2.5     | -3°     | 1.20    | 3X        | KC        |                                       |         |
| 2    | "       | "       | "    | "     | "     | "         | "       | "       | "       | 3X        | KC        |                                       |         |
| 3    | "       | "       | "    | "     | 2"    | "         | "       | 2.0-4°  | "       | 3X        | KC        | lost guide<br>* 2 <sup>nd</sup> exp.? |         |
| 4    | "       | "       | "    | "     | "     | "         | "       | "       | "       | 3X        | KC        |                                       |         |
| 1    | "       | "       | E W  | 1-2"  | f     | 4         | -       | 0       | 1.30    | 3X        | KC        |                                       |         |

| PLATE No. | OBJECT     | 1950 RA/DEC                                   | UT DATE | UT        | Exp.            | GUIDE STAR |
|-----------|------------|---|---------|-----------|-----------------|------------|
|           |            |   | 1994    |           |                 |            |
| PT 28570  | HD 121800  | 13 <sup>h</sup> 53. <sup>m</sup> 9<br>+66°22' | Mar. 19 | 0655-0736 | 2x20"           | 150/113    |
| 1         | HD 148265  | 16 <sup>h</sup> 23. <sup>m</sup> 9<br>+26°15' | "       | 0830-0901 | 2x15"           | 183/110    |
| 2         | "          | "   | "       | 0903-0935 | 2x15"           | "          |
| 3         | Moon       | ~8 <sup>h</sup> 15 <sup>m</sup><br>+15°       | Mar. 23 | 0255      | <1 <sup>s</sup> | -          |
| 4         | "          | "   | "       | 0256      | ~1 <sup>s</sup> | -          |
| 5         | "          | "   | "       | 0258      | ~3 <sup>s</sup> | -          |
| 6         | HD 120086  | 13 <sup>h</sup> 44. <sup>m</sup> 7<br>-2°12'  | Apr. 20 | 0354-0425 | 2x15"           | 231/49     |
| 7         | "          | "   | "       | 0428-0435 | ~7 <sup>m</sup> | "          |
| 8         | BD+23°2769 | 15 <sup>h</sup> 02. <sup>m</sup> 9<br>+23°11' | "       | 0535-0650 | 3x25"           | 210/91     |
| 9         | "          | "   | Apr. 23 | 0455-0630 | 3x30"           | 210/91     |

| P.H. | EMUL           | FILM   | P.A.  | TEL  | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS                        | REMARKS |
|------|----------------|--------|-------|------|-----|-------|------|------|------|-------|-------|----------------------------|---------|
| 2    | 103a-G         | GG 495 | E W   | 1-2" | f   | 4     | -    | 0    | 1.30 | 3X    | KC    |                            |         |
| 3    | "              | "      | E W   | 1-2" | f   | 4     | -    | 0    | "    | 3X    | KC    |                            |         |
| 4    | "              | "      | "     | "    | "   | f     | 4    | -    | 0    | "     | 3X    | KC                         |         |
| 1    | T-Max 100 film | "      | (N) E | 1"   | f   | -     | -    | +10° | 1.85 | -     | KC    | lens stopped to 13 inches  |         |
| 2    | "              | "      | "     | "    | "   | -     | -    | "    | "    | -     | KC    | "                          |         |
| 3    | "              | "      | "     | "    | "   | -     | -    | "    | "    | -     | KC    | "                          |         |
| 1    | 103a-G         | GG 495 | E W   | 1-2" | g   | 4     | 2.0  | +12° | 1.80 | 2X    | KC    | moonlight                  |         |
| 2    | "              | "      | "     | "    | g   | "     | "    | "    | "    | 1X    | KC    | guide went crazy moonlight |         |
| 3    | "              | "      | S W   | 1-2" | g   | 4     | -    | +11° | "    | 2X    | KC    | moonlight                  |         |
| 1    | "              | "      | S W   | 1-2" | g   | -     | 3.5  | +10° | 1.75 | 3X    | KC    | lost guide x on 2nd exp.   |         |

| PLATE No. | OBJECT           | RA/DEC  | UT DATE | UT          | Exp.  | GUIDE STAR |
|-----------|------------------|---|---------|-------------|---|------------|
|           |                  |   | 1950    |             |   |            |
| PT 28580  | NGC 6171 = M 107 | 16 <sup>h</sup> 29. <sup>m</sup> 7<br>-12°57'       | Apr. 23 | 0715-0915   | 2 <sup>h</sup>  | 121/69     |
| 1         | HD120086         | 13 <sup>h</sup> 44. <sup>m</sup> 7<br>-2°12'        | May 13  | 0218-0336   | 30 <sup>m</sup> , 12 <sup>m</sup> , 30 <sup>m</sup>               | 231/49     |
| 2         | "                | "   | May 16  | 0355-0446   | 2x25 <sup>m</sup>   | 183/81     |
| 3         | "                | "   | "       | 0449-0604   | +30 <sup>m</sup> , 25 <sup>m</sup>                                | "          |
| 4         | BD+23° 2769      | 15 <sup>h</sup> 02. <sup>m</sup> 9<br>+23°11'       | "       | 0632-0757   | 2x25 <sup>m</sup>   | 208/91     |
| 5         | HD 151809        | 16 <sup>h</sup> 45. <sup>m</sup> 6<br>+56°28'       | "       | 0820-0925   | 25 <sup>m</sup> , 40 <sup>m</sup>                                 | 135/103    |
| 6         | Jupiter          | ~14 <sup>h</sup> 21. <sup>m</sup><br>-12°37' (1994) | May 21  | 0255        | <1 <sup>m</sup> , 1 <sup>m</sup> , 3 <sup>m</sup>                 | -          |
| 7         | Pal 14 field     | 16 <sup>h</sup> 08. <sup>m</sup> 8<br>+15°05'       | "       | 0327-(0610) | (~70 <sup>m</sup> )<br>shutter closed ~1/5 while guider was crazy | 208/40     |
| 8         | BD+23° 2769      | 15 <sup>h</sup> 02. <sup>m</sup> 9<br>+23° 11'      | July 11 | 0252-0403   | 30 <sup>m</sup> , 40 <sup>m</sup>                                 | 208/91     |
| 9         | HD 151809        | 16 <sup>h</sup> 45. <sup>m</sup> 6<br>+56°28'       | July 18 | 0324-0425   | 2x30 <sup>m</sup>   | 135/103    |

guider repaired

| P.H. | EMUL     | FILT  | P.A. | TEL  | SEE | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS | REMARKS                                |
|------|----------|-------|------|------|-----|-------|------|------|------|-------|-------|-----|--|
| 2    | 103a-G   | GG495 | S W  | 2"   | F   | -     | -    | +9°  | 1.75 | 3X    | KC    |     | moonlight                              |
| 1    | 103a-G   | GG495 | E W  | 2-3" | F   | 4     | 2.0  | +12° | 1.85 | 3X    | KC    |     | lost x on #2 seeing v. poor at end     |
| 3    | "        | "     | W E  | 1-2" | F   | 4     | 2.0  | +16° | 2.05 | 5X    | KC    |     |  |
| 1    | "        | "     | " "  | 2"   | f-p | "     | "    | +15° | "    | 4X    | KC    |     | passing clouds interrupted exposure #1 |
| 2    | "        | "     | S E  | 2"   | F   | "     | 3.5  | +13° | "    | 3X    | KC    |     | lost 30m guider crazy                  |
| 4    | "        | "     | S E  | 2"   | F   | 4     | -    | +12° | 1.95 | 4X    | KC    |     | passing clouds in #2                   |
| 1    | TMax 100 | "     | S W  | 1"   | f   | -     | -    | +21° | 2.20 | -     | KC    |     | full aperture                          |
| 2    | 103a-G   | "     | E W  | 1"   | f   | -     | -    | "    | "    | 3X    | KC    |     | moon cirrus guider failed lost x       |
| 1    | "        | "     | S E  | 1-2" | f   | -     | 3.5  | +20° | 1.85 | 4X    | KC    |     | 8.0+                                   |
| 1    | "        | "     | S E  | 1"   | f   | 4     | -    | +23° | 1.95 | 5X    | KC    |     |  |

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REMARKS

28590

HD 238846

18<sup>h</sup> 17.<sup>m</sup> 4  
+55° 26'

1994  
July 18

0446-0547

2x30"

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103a-G

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2

35 Apr

22<sup>h</sup> 06.<sup>m</sup> 2  
-18° 46'

"

0722-0823

2x30"

174/106

4

"

"

S

E

2"

g

4

3.5

+21°

"

4X

KC

3

M10 =  
NGC 6254

16<sup>h</sup> 54.<sup>m</sup> 5  
-4° 03'

July 28

0301-0331

30"

177/56

1

"

"

W

E

1"-2"

f

-

-

+19.5

1.71

4x

RR

2, maybe 3 faint spots on Jupiter  
scattered clouds

4

35 Apr

22<sup>h</sup> 06.<sup>m</sup> 2  
-18° 46'

Sept. 7

0341-0442

2x30"

174/108

1

"

"

S

W

2"

g

4

3.5

+18°

1.55

4X

KC

5

HD 219188

23<sup>h</sup> 11.<sup>m</sup> 5  
+4° 43'

"

0500-0601

2x30"

147/89

2

"

"

"

1"

g

4

3.0

+17°

"

4X

KC

6

HD 215733

22<sup>h</sup> 44.<sup>m</sup> 6  
+16° 58'

"

0624-0725

2x30"

175/70

3

"

"

"

E

1"

g

4

2.5

+17°

"

4X

KC

7

M71 =  
NGC 6838

19<sup>h</sup> 51.<sup>m</sup> 5  
+18° 39'

Sept. 19

0104-0149

45"

130/105

1

"

"

S

W

1"

g

-

-

+22°

1.95

2X

KC

full moon

8

"

"

"

0204-0404

2"

"

2

"

"

S

E

1"

g

-

-

+21°

"

2X

KC

"

9

"

"

Sept 20

0104-0134

30"

"

1

"

"

S

W

1"

g

-

-

+23°

1.95

2X

KC

"

| PLATE NO. | OBJECT            | 1950 RA/DEC   | UT DATE | UT        | EXP                            | Guide STAR | P.H. |
|-----------|-------------------|---|---------|-----------|--------------------------------|------------|------|
|           |                   |   | 1994    |           |                                |            |      |
| TI 28600  | M71 =<br>NGC 6838 | 19 <sup>h</sup> 51. <sup>m</sup> 5<br>+18° 39'        | Sept 20 | 0150-0400 | 2 <sup>h</sup> 10 <sup>m</sup> | 130/105    | 2    |
| 1         | "                 | "   | "       | 0404-0419 | 15 <sup>m</sup>                | "          | 3    |
| 2         | Moon              | ~23 <sup>h</sup> 58 <sup>m</sup><br>+3° 10'<br>(1994) | "       | ~0445     | < 1 <sup>s</sup>               | -          | 4    |
| 3         | Moon              | "   | "       | 0446      | ~1.5 <sup>s</sup>              | -          | 5    |
| * 4       | M35<br>θ Ori      | 6:05.8<br>+24° 21'<br>5:32.8<br>-5° 24'               | Oct. 11 | 0849-0852 | 3 <sup>m</sup>                 | 133/85     | 1    |
| * 5       | M35<br>θ Ori      | 5:35.   | "       | 0853-0856 | 3 <sup>m</sup>                 | "          | 2    |
| * 6       | θ Ori<br>M35      | "   | "       | 0921-0936 | 15 <sup>m</sup>                | "          | 3    |
| * 7       | θ Ori<br>M35      | "   | "       | 0938-0953 | 15 <sup>m</sup>                | "          | 4    |
| 8         | M35               | 6 <sup>h</sup> 05. <sup>m</sup> 8<br>+24° 21'         | "       | 1017-1020 | 3 <sup>m</sup>                 | "          | 5    |
| 9         | "                 | "   | "       | 1021-1024 | 3 <sup>m</sup>                 | "          | 6    |
|           |                   |   |         | 1025-1028 | 3 <sup>m</sup>                 | 133/85     | 5    |
|           |                   |   |         | 1035-1044 | 9 <sup>m</sup>                 | "          | 6    |

\* M35/θ Ori plates double exposed  
See 1980 for 1<sup>st</sup> epoch

| EMUL                 | FILT  | P.A. | TEL | SEE  | TRANS | GRAT | SPECT | TEMP | FOCUS | FLASH | OBS | REMARKS                                |
|----------------------|-------|------|-----|------|-------|------|-------|------|-------|-------|-----|--|
| 103a-G               | GG495 | S    | E   | 1"   | g     | -    | -     | 22°  | 1.95  | 2X    | KC  | full moon                              |
| T-Max<br>100<br>film | "     | "    | "   | 1"   | g     | -    | -     | 21°  | "     | 7X    | KC  | "                                      |
| "                    | "     | S    | W   | 1"   | g     | -    | -     | "    | "     | -     | KC  | } lens<br>stopped<br>down<br>to ~8 in. |
| "                    | "     | S    | W   | 1"   | g     | -    | -     | "    | "     | -     | KC  |  |
| 103a-G               | OG530 | S    | W   | 1-2" | g     | -    | -     | +9°  | 1.50  | 4X    | KC  |  |
| "                    | "     | S    | W   | 1-2" | g     | -    | -     | "    | "     | "     | KC  |  |
| "                    | "     | "    | "   | 1-2" | g     | -    | -     | +9°  | "     | 3X    | KC  |  |
| "                    | "     | "    | "   | "    | "     | -    | -     | "    | "     | 3X    | KC  |  |
| TMax<br>100<br>film  | "     | "    | "   | "    | "     | -    | -     | "    | "     | 10X   | KC  |  |
| "                    | "     | "    | "   | "    | "     | -    | -     | "    | "     | 10X   | KC  |  |

PLATE NO.

OBJECT

1950  
RA/DEC

UT DATE

UT

EXP.

GUIDE STAR

P.H.

LUM

FILT

P.A.

TEL

SEE

TRANS

GRAT

SECT

TEMP

FOCUS

FLASH

OBS

REMARKS

| PLATE NO. | OBJECT         | 1950 RA/DEC                                    | UT DATE         | UT        | EXP.                            | GUIDE STAR | P.H. | LUM    | FILT  | P.A. | TEL | SEE   | TRANS | GRAT | SECT | TEMP | FOCUS | FLASH | OBS                                      | REMARKS                             |
|-----------|----------------|--|-----------------|-----------|---------------------------------|------------|------|--------|-------|------|-----|-------|-------|------|------|------|-------|-------|--|-------------------------------------|
| π 28610   | M71 = NGC 6838 | 19 <sup>h</sup> 51. <sup>m</sup> 5<br>+18° 39' | 1994<br>Oct. 21 | 0012-0247 | ~2 <sup>h</sup> 15 <sup>m</sup> | 130/105    | L    | 1030-G | GG495 | S E  | 1"  | g/p   | -     | -    | +15° | 1.55 | 2X    | KC    | full moon shutter closed ~20" for clouds |                                     |
| 1         | "              | "  | Oct. 28         | 0003-0218 | 2 <sup>h</sup> 15 <sup>m</sup>  | "          | 1    | "      | "     | "    | "   | 1"-3" | g     | -    | -    | +11° | 1.45  | 4X    | KC                                       | wind increased seeing poorer        |
|           |                |  | 1995            |           |                                 |            |      |        |       |      |     |       |       |      |      | 5.0+ |       |       |  |                                     |
| *         | 2 M35/θ Ori    | 6:05.8<br>+24° 21'<br>5:32.8<br>-5° 24'        | Jan. 26         | 0150-0153 | 3 <sup>m</sup>                  | 133/85     | 1    | "      | 06530 | "    | "   | 1-2"  | g     | -    | -    | -6°  | 1.25  | 3X    | KC                                       | guider may not be reliable tonight? |
| *         | 3 M35          | "  | "               | 0154-0157 | 3 <sup>m</sup>                  | 133/85     | 2    | "      | "     | "    | "   | "     | "     | -    | -    | "    | "     | 3X    | KC                                       | plates good so guider was OK        |
| *         | 4 θ Ori        | "  | "               | 0228-0258 | 30 <sup>m</sup>                 | 93/109     | 3    | "      | "     | "    | "   | "     | "     | -    | -    | -6   | "     | 3X    | KC                                       |                                     |
|           | M35            | "  | "               | 0355-0358 | 3 <sup>m</sup>                  | 133/85     |      | "      | "     | "    | "   | "     | "     | -    | -    | "    | "     | 3X    | KC                                       |                                     |
| *         | 5 θ Ori        | "  | "               | 0341-0346 | 5 <sup>m</sup>                  | 93/109     | 4    | "      | "     | "    | "   | "     | "     | -    | -    | "    | "     | 3X    | KC                                       |                                     |
|           | M35            | "  | "               | 0359-0402 | 3 <sup>m</sup>                  | 133/85     |      | "      | "     | "    | "   | "     | "     | -    | -    | "    | "     | 3X    | KC                                       |                                     |
| *         | 6 M35          | "  | Feb 17          | 0019-0022 | 3 <sup>m</sup>                  | 133/85     | 1    | "      | "     | S W  | 1"  | g     | -     | -    | -3°  | 1.55 | 3X    | KC    |  |                                     |
|           | θ Ori          | "  | "               | 0036-0106 | 30 <sup>m</sup>                 | 93/109     |      | "      | "     | "    | "   | 1-2"  | "     | -    | -    | "    | "     | 3X    | KC                                       |                                     |
| *         | 7 M35          | "  | "               | 0023-0026 | 3 <sup>m</sup>                  | 133/85     | 2    | "      | "     | "    | "   | "     | "     | -    | -    | "    | "     | 3X    | KC                                       |                                     |
|           | θ Ori          | "  | "               | 0107-0137 | 30 <sup>m</sup>                 | 93/109     |      | "      | "     | "    | "   | "     | "     | -    | -    | "    | "     | 3X    | KC                                       |                                     |
| *         | 8 θ Ori        | "  | "               | 0138-0158 | 20 <sup>m</sup>                 | 93/109     | 3    | "      | "     | "    | "   | "     | "     | -    | -    | "    | "     | 3X    | KC                                       |                                     |
|           | M35            | "  | "               | 0226-0229 | 3 <sup>m</sup>                  |            |      | "      | "     | "    | "   | "     | "     | -    | -    | "    | "     | 3X    | KC                                       |                                     |
| *         | 9 θ Ori        | "  | "               | 0159-0219 | 20 <sup>m</sup>                 | 93/109     | 4    | "      | "     | "    | "   | "     | "     | -    | -    | -4°  | "     | 3X    | KC                                       |                                     |
|           | M35            | "  | "               | 0230-0233 | 3 <sup>m</sup>                  |            |      | "      | "     | "    | "   | "     | "     | -    | -    | "    | "     | 3X    | KC                                       |                                     |

\* See p. 122

| PLATE NO. | OBJECT               | 1950 RA/DEC  | UT DATE     | UT                     | EXP                               | GUIDE STAR       | P.H. | EMUL                       | FILT  | P.A. | T<br>E<br>L | S<br>E<br>E | T<br>R<br>A<br>N<br>S | G<br>R<br>A<br>T | S<br>E<br>C<br>T | T<br>E<br>M<br>P | F<br>O<br>C<br>U<br>S | F<br>L<br>A<br>S<br>H | O<br>B<br>S                     | REMARKS |
|-----------|----------------------|--|-------------|------------------------|-----------------------------------|------------------|------|----------------------------|-------|------|-------------|-------------|-----------------------|------------------|------------------|------------------|-----------------------|-----------------------|---------------------------------|---------|
| π 28620   | NGC 2158             | 6 <sup>h</sup> 04. <sup>m</sup> 3                                    | 1995 Feb 17 | 0258-0513              | 2 <sup>h</sup> 15 <sup>m</sup>    | 205/70           | 5    | 103a-G                     | GG495 | S E  | 1"2         | g           | -                     | -                | -4°              | 1.55             | 3X                    | KC                    | moon                            |         |
| 1         | NTT 045251<br>+ 3016 | 4 <sup>h</sup> 52 <sup>m</sup> 51 <sup>s</sup><br>+24°06'<br>+30°16' | Mar. 1      | 0116-0221              | 1 <sup>h</sup> 05 <sup>m</sup>    | 143/77           | 1    | 103a-G                     | GG495 | S E  | 2"          | g           | -                     | -                | 0°               | 1.70             | 2X                    | KC                    | for Bob Mathieu                 |         |
| * 2       | M 35<br>θ Ori        | 6:05.8<br>+24°21'<br>5:32.8<br>-5°24'                                | Mar. 3      | 0035-0038<br>0051-0031 | 3 <sup>m</sup><br>40 <sup>m</sup> | 133/85<br>93/109 | 1    | "                          | OG530 | S W  | 1"          | f           | -                     | -                | -5°              | 1.70             | 3X                    | KC                    |                                 |         |
| * 3       | M 35<br>θ Ori        | 6.5"<br>"  | "           | 0039-0042<br>0132-0212 | 3 <sup>m</sup><br>40 <sup>m</sup> | 133/85<br>93/109 | 2    | "                          | "     | " "  | 1"          | f           | -                     | -                | "                | "                | 3X                    | KC                    |                                 |         |
| 4         | NGC 2158             | 6 <sup>h</sup> 04. <sup>m</sup> 4<br>+24°06'                         | "           | 0230-0435              | 2 <sup>h</sup> 05 <sup>m</sup>    | 205/70           | 3    | "                          | GG495 | S E  | 1"          | g           | -                     | -                | -6°              | "                | 3X                    | KC                    |                                 |         |
| * 5       | θ Ori<br>M 35        | 5:32.8<br>-5°24'<br>6:05.8<br>+24°21'                                | Mar. 4      | 0047-0057<br>0218-0221 | 40 <sup>m</sup><br>3 <sup>m</sup> | 93/109<br>133/85 | 1    | "                          | OG530 | S E  | 1"          | g           | -                     | -                | -2°              | 1.85             | 3X                    | KC                    |                                 |         |
| * 6       | θ Ori<br>M 35        | "<br>"   | "           | 0128-0208<br>0222-0225 | 40 <sup>m</sup><br>3 <sup>m</sup> | 93/109<br>133/85 | 2    | "                          | "     | " "  | "           | g           | -                     | -                | "                | "                | 3X                    | KC                    |                                 |         |
| 7         | NGC 2158             | 6 <sup>h</sup> 04. <sup>m</sup> 4<br>+24°06'                         | "           | 0235-0445              | 2 <sup>h</sup> 10 <sup>m</sup>    | 205/70           | 3    | "                          | GG495 | S E  | 1"          | g           | -                     | -                | -3°              | 1.85             | 3X                    | KC                    |                                 |         |
| 8         | θ Ori                | 5 <sup>h</sup> 32. <sup>m</sup> 8<br>-5°24'                          | Mar. 17     | 0128-0158              | 30 <sup>m</sup>                   | 93/109           | 1    | TMax <sup>80</sup><br>film | "     | S W  | 2-3"        | f           | -                     | -                | +13°             | 1.95             | 3X                    | KC                    | (moon)                          |         |
| 9         | M 67                 | 8 <sup>h</sup> 48 <sup>m</sup><br>+12°00'                            | Mar. 22     | 0142-0152              | 10 <sup>m</sup>                   | 145/95           | 1    | 103a-G                     | GG495 | S W  | 2"          | f           | -                     | -                | +5°              | 1.65             | 3X                    | KC                    | offset<br>~15'N<br>of cl. cent. |         |

\* see p. 122

| Plate No. | Object              | RA/Dec  | UT Date  | UT        | Exp.                           | Guide star |
|-----------|---------------------|---|----------|-----------|--------------------------------|------------|
|           |                     |   | 1950     |           |                                |            |
| π 28630   | M 67                | 8 <sup>h</sup> 48 <sup>m</sup><br>+12°00'     | Mar 22   | 0153-0203 | 10 <sup>m</sup>                | 145/95     |
| 1         | "                   | "   | "        | 0204-0209 | 5 <sup>m</sup>                 | "          |
| 2         | NGC 6171<br>= M 107 | 16 <sup>h</sup> 29 <sup>m</sup> .7<br>-12°57' | May 6    | 0548-0748 | 2 <sup>h</sup>                 | 121/69     |
| 3         | "                   | "   | May 20   | 0501-0646 | 1 <sup>h</sup> 45 <sup>m</sup> | 121/69     |
| 4         | NGC 7293            | 22 <sup>h</sup> 26 <sup>m</sup> .7<br>-21°03' | Sept. 28 | 0242-0337 | 55 <sup>m</sup>                | 121/44     |
|           |                     |   | 1996     | 0338-0428 | 50 <sup>m</sup>                | 123/44     |
| 5         | M 71                | 19 <sup>h</sup> 51 <sup>m</sup> .5<br>+18°39' | Aug. 25  | 0228-0243 | 15 <sup>m</sup>                | 130/105    |
| 6         | θ Ori               | 5 <sup>h</sup> 32 <sup>m</sup> .8<br>-5°24'   | Mar. 16  | 0159-0204 | 5 <sup>m</sup>                 | 93/109     |
| 7         | "                   | "   | "        | 0205-0215 | 10 <sup>m</sup>                | "          |
| 8         | "                   | "   | "        | 0216-0246 | 30 <sup>m</sup>                | "          |
| 9         | Moon                | ~6 <sup>h</sup><br>+17°                       | "        | ~0305     | ~1 <sup>s</sup>                | -          |

| P.H. | Emul.                       | Filt. | P.A. | T.E.L. | S.E.T.E. | T.R.A.N.S. | G.R.A.T. | S.A.M.P. | T.E.M.P. | F.O.C.U.S. | F.L.A.S.H. | O.B.S.                              | Remarks |
|------|-----------------------------|-------|------|--------|----------|------------|----------|----------|----------|------------|------------|-------------------------------------|---------|
| 2    | 103a-G                      | GG495 | S W  | 2"     | f        | -          | -        | +5°      | 1.65     | 3X         | KC         | offset<br>~15' N of<br>cl. cent.    |         |
| 3    | "                           | "     | "    | 2"     | f        | -          | -        | "        | "        | 3X         | KC         | "                                   |         |
| 1    | "                           | "     | "    | 2"     | f        | -          | -        | +9°      | 1.85     | 3X         | KC         |                                     |         |
|      |                             |       |      |        |          |            |          |          | 8.0+     |            |            |                                     |         |
| 7    | "                           | "     | "    | 3"     | f        | -          | -        | +12°     | 1.45     | 2X         | KC         |                                     |         |
| 1    | "                           | "     | "    | 2"     | f        | -          | -        | +19°     | 1.60     | 3X         | KC         | passing<br>clouds                   |         |
| L    | TMax<br>film <sup>100</sup> | GG495 | S W  | 1"     | g        | -          | -        | +24°     | 1.41     | 8X         | KC         | ~50% of<br>plate flash<br>brt. moon |         |
| L    | TMax<br>film <sup>400</sup> | "     | S E  | 2-3"   | g        | -          | -        | -8°      | 5.0+     | 1X         | KC         | brt. moon<br>wind                   |         |
| 2    | "                           | "     | "    | "      | "        | -          | -        | "        | "        | "          | KC         | "                                   |         |
| 3    | "                           | "     | "    | "      | "        | -          | -        | "        | "        | "          | KC         | "                                   |         |
| 4    | TMax<br>film <sup>100</sup> | "     | "    | 2"     | "        | -          | -        | "        | "        | -          | KC         | lens at<br>~8 in.                   |         |



| Plate No. | Object             | RA/Dec   | UT Date         | UT                           | Exp.                           | Guide star |
|-----------|--------------------|--|-----------------|------------------------------|--------------------------------|------------|
| π 28640   | Moon               | ~6 <sup>h</sup><br>+17°                            | 1997<br>Mar. 16 | ~0306                        | ~1 <sup>s</sup>                | -          |
| 1         | "                  | "  | "               | "                            | ~1 <sup>s</sup>                | -          |
| 2         | NGC 2419           | 7 <sup>h</sup> 34.8<br>+39°00'                     | "               | <del>0344</del><br>0344-0539 | 1 <sup>h</sup> 55 <sup>m</sup> | 137/82     |
| 3         | Comet<br>Hale-Bopp | 2 <sup>h</sup> 45 <sup>m</sup><br>+41° (52000)     | Apr. 8          | 0142                         | 10 <sup>s</sup>                | -          |
| 4         | "                  | "  | "               | 0143                         | 40 <sup>s</sup>                | -          |
| 5         | "                  | 2 <sup>h</sup> 52 <sup>m</sup><br>+40.5 (2000)     | Apr. 9          | 0131-0132                    | 45 <sup>s</sup>                | -          |
| 6         | "                  | "  | "               | 0133-0135                    | 2 <sup>m</sup>                 | -          |
| 7         | "                  | "  | "               | 0217-0218                    | 48 <sup>s</sup>                | -          |
| 8         | "                  | 4 <sup>h</sup> 06.5 <sup>m</sup><br>+31°51' (2000) | Apr. 22         | "                            | 45 <sup>s</sup>                | -          |
| 9         | "                  | "  | "               | "                            | 45 <sup>s</sup>                | -          |

| P.H. | Emul.               | Filt. | P.A. | Tel. | See | Trans. | Gain | Set | Top  | Focus | Flash | Obs.              | Remarks |
|------|---------------------|-------|------|------|-----|--------|------|-----|------|-------|-------|-------------------|---------|
| 5    | TMAX<br>100<br>film | GG495 | S E  | 2"   | g   | -      | -    | -8° | 1.20 | -     | KC    | lens at<br>~8 in. |         |
| 6    | "                   | "     | "    | "    | "   | -      | -    | "   | "    | -     | KC    | "                 |         |
| 7    | TMAX<br>400<br>film | "     | S E  | 1-2" | g   | -      | -    | -8° | "    | 1X    | KC    | bri.<br>moon      |         |
| 1    | "                   | "     | S E  | 3"   | g   | -      | -    | "   | 1.50 | 1X    | KC    | unguided          |         |
| 2    | "                   | "     | "    | 3"   | g   | -      | -    | "   | "    | "     | KC    | "                 |         |
| 1    | "                   | "     | "    | 3"   | g   | -      | -    | -2° | 1.35 | 1X    | KC    | "                 |         |
| 2    | "                   | "     | "    | 3"   | g   | -      | -    | "   | "    | "     | KC    | "                 |         |
| 3    | "                   | "     | "    | 3"   | g   | -      | -    | "   | "    | 1X    | KC    | "                 |         |
| 1    | "                   | "     | "    | 2-3" | f-g | -      | -    | +9° | 1.70 | 1X    | KC    | "                 |         |
| 2    | "                   | "     | "    | "    | f-g | -      | -    | "   | "    | 1X    | KC    | "                 |         |

| Plate No. | Object          | RA/DEC  | UT DATE       | UT        | EXP.            | Guide Star |
|-----------|-----------------|---|---------------|-----------|-----------------|------------|
|           |                 |   | 1997          |           |                 |            |
| π 28650   | CV5             | 12 <sup>h</sup> 20 <sup>m</sup> .5<br>+ 21° 22' | May 4         | 0330-0400 | 30 <sup>m</sup> | 83/96      |
| 1         | M5              | 15 <sup>h</sup> 16.0<br>+ 2° 16'                | 1997<br>May 7 | 0451-0521 | 30 <sup>m</sup> | 150/102    |
| * 2       | CV5             | 12 <sup>h</sup> 20 <sup>m</sup> .5<br>+ 21° 22' | May 22        | 0225-0355 | 90 <sup>m</sup> | 83/108     |
| 3         | "               | "   | June 4        | 0233-0433 | 2 <sup>h</sup>  | 83/100     |
| 4         | M5              | 15 <sup>h</sup> 16 <sup>m</sup> .0<br>+ 2° 16'  | "             | 0454-0539 | 45 <sup>m</sup> | 150/102    |
| 5         | "               | "   | June 10       | 0236-0321 | 45 <sup>m</sup> | "          |
| 6         | "               | "   | "             | 0322-0407 | 45 <sup>m</sup> | "          |
| 7         | "               | "   | June 11       | 0249-0334 | 45 <sup>m</sup> | "          |
| 8         | "               | "   | "             | 0336-0416 | 40 <sup>m</sup> | "          |
| 9         | M12<br>=NGC6218 | 16 <sup>h</sup> 44 <sup>m</sup> .6<br>- 1° 52'  | "             | 0435-0510 | 35 <sup>m</sup> | 196/65     |

| P.H. | Emul.         | Filt. | P.A. | T E L. | S E E.              | T R A N S. | G R A T. | S E C T. | T E M P. | F O C U S        | F L A S H | Obs. | Remarks              |
|------|---------------|-------|------|--------|---------------------|------------|----------|----------|----------|------------------|-----------|------|----------------------|
| 2    | TMax 400 film | GG495 | W    | W      | 1"-2"               | g          | -        | -        | +10°     | 1.90             | 3X        | KC   | dwarf?<br>C*         |
| 1    | Tmax 400 film | GG495 | W    | W      | 1"-2"<br>Occ. worse | f          | -        | -        | +13°     | 2.17             | 3X        | RR   | preflash time wrong? |
| 1    | TMax 400 film | "     | W    | E      | 1-2"                | g          | -        | -        | +10°     | 1.90             | 1X        | KC   | full moon            |
| 2    | "             | "     | "    | "      | 1"                  | f          | -        | -        | +18°     | 8.0<br>+<br>1.60 | 3X        | KC   |                      |
| 3    | "             | "     | S    | E      | 1"                  | f          | -        | -        | +17°     | "                | 3X        | KC   |                      |
| 1    | "             | "     | S    | W      | 1"                  | g          | -        | -        | +17°     | 1.80             | 3X        | KC   |                      |
| 2    | "             | "     | "    | "      | "                   | "          | -        | -        | "        | "                | 3X        | KC   |                      |
| 3    | "             | "     | "    | "      | 1"                  | f          | -        | -        | +21°     | 1.70             | 3X        | KC   |                      |
| 4    | "             | "     | "    | "      | "                   | "          | -        | -        | "        | "                | 4X        | KC   |                      |
| 5    | 103a-G        | "     | "    | "      | 1"                  | "          | -        | -        | +20°     | "                | 4X        | KC   |                      |

\* Tonight is the centennial of first light with this telescope: evening of May 21, 1897

The second century begins!

| PLATE NO. | OBJECT            | 1950 RA/DEC.                                 | UT DATE         | UT        | EXP.            | GUIDE STAR |
|-----------|-------------------|--|-----------------|-----------|-----------------|------------|
| TI 28660  | M10 =<br>NGC 6254 | 16 <sup>h</sup> 54. <sup>m</sup> 5<br>-4°02' | 1997<br>June 11 | 0524-0554 | 30 <sup>m</sup> | 72/99      |
| 1         | "                 | "  | June 24         | 0253-0333 | 40 <sup>m</sup> | 72/99      |
| 2         | "                 | "  | "               | 0334-0414 | 40 <sup>m</sup> | "          |
| 3         | "                 | "  | "               | 0416-0446 | 30 <sup>m</sup> | "          |
| 4         | "                 | "  | June 27         | 0245-0320 | 35 <sup>m</sup> | "          |
| 5         | "                 | "  | "               | 0322-0342 | 20 <sup>m</sup> | "          |
| 6         | "                 | "  | "               | 0344-0404 | 20 <sup>m</sup> | "          |
| 7         | M12 =<br>NGC 6218 | 16 <sup>h</sup> 44. <sup>m</sup> 6<br>-1°52' | "               | 0431-0511 | 40 <sup>m</sup> | 196/67     |
| 8         | "                 | "  | "               | 0512-0532 | 20 <sup>m</sup> | "          |
| 9         | "                 | "  | June 28         | 0327-0402 | 35 <sup>m</sup> | "          |

| P.H. | Emul.         | Filt. | P.A. | T.E. | S.E. | TRANS. | GRAT. | S.E.F. | TEMP. | FOCUS | FLASH | OBS. | REMARKS |
|------|---------------|-------|------|------|------|--------|-------|--------|-------|-------|-------|------|---------|
| 6    | 103a-G        | GG495 | E W  | 1"   | f    | -      | -     | +20°   | 1.70  | 4X    | KC    |      |         |
| L    | "             | "     | E W  | 1"   | f    | -      | -     | +27°   | 2.10  | 4X    | KC    |      |         |
| 2    | "             | "     | "    | "    | "    | -      | -     | "      | "     | 3X    | KC    |      |         |
| 3    | TMax 400 film | "     | "    | "    | "    | -      | -     | +27°   | "     | 2X    | KC    | MOON |         |
| 1    | 103a-G        | "     | "    | "    | 1"   | g      | -     | +24°   | 1.90  | 3X    | KC    |      |         |
| 3    | TMax 400 film | "     | "    | "    | "    | -      | -     | "      | "     | 3X    | KC    |      |         |
| 4    | "             | "     | "    | "    | "    | g      | -     | +24°   | "     | 3X    | KC    |      |         |
| 5    | 103a-G        | "     | S E  | 1"   | g    | -      | -     | +23°   | "     | 3X    | KC    |      |         |
| 6    | TMax 400 film | "     | "    | "    | "    | -      | -     | "      | "     | 3X    | KC    |      |         |
| 1    | 103a-G        | "     | S W  | 1"   | g    | -      | -     | +24°   | 1.95  | 3X    | KC    |      |         |

| Plate No. | OBJECT             | 1950 RA/DEC                                   | UT DATE | UT        | Exp.            | Guide STAR |
|-----------|--------------------|---|---------|-----------|-----------------|------------|
|           |                    |   | 1997    |           |                 |            |
| π 28670   | M 12 =<br>NGC 6218 | 16 <sup>h</sup> 44. <sup>m</sup> 6<br>-1°52'  | June 28 | 0423-0513 | 50 <sup>m</sup> | 196/67     |
| 1         | "                  | "   | July 10 | 0321-0340 | 19 <sup>m</sup> | "          |
| 2         | M 10 =<br>NGC 6254 | 16 <sup>h</sup> 54.5<br>-4°02'                | "       | 0356-0416 | 20 <sup>m</sup> | 177/56     |
| 3         | M 71 =<br>NGC 6838 | 19 <sup>h</sup> 51. <sup>m</sup> 5<br>+18°39' | "       | 0442-0452 | 10 <sup>m</sup> | 130/105    |
| 4         | M 12 =<br>NGC 6218 | 16 <sup>h</sup> 44. <sup>m</sup> 6<br>-1°52'  | July 31 | 0230-0300 | 30 <sup>m</sup> | 196/67     |
| 5         | "                  | "   | "       | 0302-0337 | 35 <sup>m</sup> | "          |
| 6         | M 10 =<br>NGC 6254 | 16 <sup>h</sup> 54. <sup>m</sup> 5<br>-4°02'  | "       | 0349-0424 | 35 <sup>m</sup> | 177/56     |
| 7         | "                  | "   | Aug. 6  | 0241-0316 | 35 <sup>m</sup> | "          |
| 8         | "                  | "   | "       | 0317-0337 | 20 <sup>m</sup> | "          |
| 9         | M 15               | 21 <sup>h</sup> 27. <sup>m</sup> 6<br>+11°57' | Aug. 30 | 0233-0243 | 10 <sup>m</sup> | 89/72      |

| P.H. | EMUL.         | FILT. | P.A. | T.E.L. | S.E.E. | TRANS. | GRAT. | SECT. | TEMP. | FOCUS | FLASH | OBS.   | REMARKS |
|------|---------------|-------|------|--------|--------|--------|-------|-------|-------|-------|-------|--------|---------|
| 3    | TMax 100 film | GG495 | S E  | 1"     | g      | -      | -     | +24°  | 1.95  | 10X   | KC    |        |         |
| 1    | TMax 400 film | "     | S W  | 1"     | f      | -      | -     | +18   | 1.75  | 3X    | KC    | circus |         |
| 3    | "             | "     | W W  | 1"     | g      | -      | -     | "     | "     | 3X    | KC    |        |         |
| 2    | "             | "     | S W  | 1"     | g      | -      | -     | +17°  | "     | 3X    | KC    |        |         |
| 1    | 1032-G        | GG495 | S E  | 1"     | g      | -      | -     | +20°  | 1.70  | 3X    | KC    |        |         |
| 3    | "             | "     | "    | 1"     | g      | -      | -     | "     | "     | 4X    | KC    |        |         |
| 5    | "             | "     | W E  | 1"     | g      | -      | -     | "     | "     | 4X    | KC    |        |         |
| 1    | "             | "     | "    | 1"     | g      | -      | -     | +19°  | 1.70  | 4X    | KC    |        |         |
| 2    | TMax 400 film | "     | "    | "      | "      | -      | -     | "     | "     | 4X    | KC    |        |         |
| 1    | "             | "     | S W  | 1-2"   | g      | -      | -     | +18°  | 1.60  | 1X    | KC    | HSDC   | wind    |

| PLATE NO. | OBJECT | 1950 RA/DEC                                  | UT DATE | UT        | EXP             | GUIDE STAR | P.H. | EMUL.               | FILT. | P.A. | T E L. | S E E. | T R A N S. | G R A T. | S E C T. | T E M P. | F O C U S | F L A S H | OBS.       | REMARKS                   |
|-----------|--------|--|---------|-----------|-----------------|------------|------|---------------------|-------|------|--------|--------|------------|----------|----------|----------|-----------|-----------|------------|---------------------------|
|           |        |  | 1997    |           |                 |            |      |                     |       |      |        |        |            |          |          |          |           |           |            |                           |
| π 28680   | M15    | 21 <sup>h</sup> 27.6 <sup>m</sup><br>+11°57' | Aug. 30 | 0248-0258 | 10 <sup>m</sup> | 89/72      | 2    | TMax<br>400<br>film | G6495 | S    | W      | 1-2"   | g          | -        | -        | +18°     | 1.60      | IX        | KC         | wind                      |
| 1         | "      | "  | "       | 0308-0323 | 15 <sup>m</sup> | "          | 3?   | "                   | "     | "    | "      | "      | "          | -        | -        | "        | "         | IX        | KC<br>HJDC | "<br>blank -<br>discarded |
| 2         | "      | "  | "       | 0327-0342 | 15 <sup>m</sup> | "          | 4?   | "                   | "     | "    | "      | "      | "          | -        | -        | "        | "         | "         | KC<br>HJDC | "<br>double<br>exposure   |
| 3         | "      | "  | "       | 0344-0359 | 15 <sup>m</sup> | "          | 5    | "                   | "     | "    | "      | "      | "          | -        | -        | "        | "         | IX        | KC         | "                         |
| 4         | "      | "  | Sept. 1 | 0221-0231 | 10 <sup>m</sup> | "          | 1    | "                   | "     | "    | "      | 1"     | g          | -        | -        | +21°     | 1.85      | -         | KC         |                           |
| 5         | "      | "  | "       | 0232-0242 | 10 <sup>m</sup> | "          | 2    | "                   | "     | "    | "      | "      | "          | -        | -        | "        | "         | -         | KC         |                           |
| 6         | "      | "  | "       | 0246-0316 | 30 <sup>m</sup> | "          | 3    | "                   | "     | "    | "      | 1"     | g          | -        | -        | +21°     | "         | 3X        | KC         |                           |
| 7         | "      | "  | "       | 0317-0337 | 20 <sup>m</sup> | "          | 4    | "                   | "     | "    | "      | "      | "          | -        | -        | "        | "         | 3X        | KC         |                           |
| 8         | "      | "  | "       | 0339-0354 | 15 <sup>m</sup> | "          | 5    | "                   | "     | "    | "      | 1"     | "          | -        | -        | +20°     | "         | -         | KC         |                           |
| 9         | "      | "  | "       | 0355-0410 | 15 <sup>m</sup> | "          | 6    | "                   | "     | "    | "      | "      | "          | -        | -        | "        | "         | -         | KC         |                           |

| PLATE NO. | OBJECT             | 1950 RA/DEC                                    | UT DATE          | UT        | EXP             | GUIDE STAR | P.H. | EMUL.            | FILT  | P.A. | TEL | SEG | TRANS | DECT | SUBT | HAIR P | FOCUS            | LENS | OBS        | REMARKS                    |
|-----------|--------------------|--|------------------|-----------|-----------------|------------|------|------------------|-------|------|-----|-----|-------|------|------|--------|------------------|------|------------|----------------------------|
| π 28690   | M 15               | 21 <sup>h</sup> 27. <sup>m</sup> 6<br>+11° 57' | 1997<br>Sept. 12 | 0141-0151 | 10 <sup>m</sup> | 89/72      | 1    | TMax 400<br>film | G4495 | S    | W   | 1"  | g     | -    | -    | +17°   | 7.0<br>+<br>1.75 | -    | KC         | destroyed<br>in processing |
| 1         | "                  | "  | "                | 0152-0202 | "               | "          | 2    | "                | "     | "    | "   | "   | "     | -    | -    | "      | "                | -    | KC         | moon<br>near by<br>tonight |
| 2         | "                  | "  | "                | 0203-0213 | "               | "          | 3    | "                | "     | "    | "   | "   | g     | -    | -    | "      | "                | -    | KC         |                            |
| 3         | "                  | "  | "                | 0214-0224 | "               | "          | 4    | "                | "     | "    | "   | "   | "     | -    | -    | "      | "                | -    | KC         |                            |
| 4         | "                  | "  | "                | 0227-0232 | 5 <sup>m</sup>  | "          | 5    | "                | "     | "    | "   | 1"  | g     | -    | -    | +17°   | "                | -    | KC<br>HJDC |                            |
| 5         | "                  | "  | "                | 0233-0238 | "               | "          | 6    | "                | "     | "    | "   | "   | "     | -    | -    | "      | "                | -    | KC<br>HJDC |                            |
| 6         | "                  | "  | "                | 0239-0309 | 30 <sup>m</sup> | "          | 7    | "                | "     | "    | "   | "   | "     | -    | -    | "      | "                | 1X   | KC         |                            |
| 7         | "                  | "  | "                | 0310-0340 | "               | "          | 8    | "                | "     | "    | "   | "   | "     | -    | -    | "      | "                | 2X   | KC         |                            |
| 8         | M 71 =<br>NGC 6838 | 19 <sup>h</sup> 51. <sup>m</sup> 5<br>+18° 39' | "                | 0407-0422 | 15 <sup>m</sup> | 130/105    | 9    | "                | "     | S    | E   | 1"  | g     | -    | -    | +17°   | "                | 2X   | KC         |                            |
| 9         | "                  | "  | "                | 0423-0438 | "               | "          | 10   | "                | "     | "    | "   | "   | f     | -    | -    | "      | "                | 1X   | KC         | passing<br>clouds          |

| PLATE NO. | OBJECT             | 1950 RA/DEC                                    | UT DATE  | UT        | EXP.            | GUIDE STAR |
|-----------|--------------------|--|----------|-----------|-----------------|------------|
|           |                    |  | 1997     |           |                 |            |
| π 28700   | M 71 =<br>NGC 6838 | 19 <sup>h</sup> 51. <sup>m</sup> 5<br>+18° 39' | Sept. 13 | 0113-0123 | 10 <sup>m</sup> | 130/105    |
| 1         | "                  | "  | "        | 0124-0134 | 10 <sup>m</sup> | "          |
| 2         | M 15               | 21 <sup>h</sup> 27. <sup>m</sup> 6<br>+11° 57' | "        | 0147-0157 | 10 <sup>m</sup> | 91/72      |
| 3         | "                  | "  | "        | 0158-0208 | "               | "          |
| 4         | "                  | "  | Sept. 18 | 0201-0211 | 10 <sup>m</sup> | 89/72      |
| 5         | "                  | "  | "        | 0212-0222 | 10 <sup>m</sup> | "          |
| 6         | M 71 =<br>NGC 6838 | 19 <sup>h</sup> 51. <sup>m</sup> 5<br>+18° 39' | Oct. 5   | 0311-0321 | 10 <sup>m</sup> | 130/105    |
| 7         | "                  | "  | "        | 0322-0332 | 10 <sup>m</sup> | "          |
| 8         | M 15               | 21 <sup>h</sup> 27. <sup>m</sup> 6<br>+11° 57' | Nov. 19  | 0000-0003 | 3 <sup>m</sup>  | 89/72      |
| 9         | "                  | "  | "        | 0004-0008 | 4 <sup>m</sup>  | "          |

| P.H. | EMUL.         | FILT.  | P.A. | TEL | SEE  | TRANS | OBJ. T | SUB. T | TOP  | SCOT.        | FLASH | OBS. | REMARKS             |
|------|---------------|--------|------|-----|------|-------|--------|--------|------|--------------|-------|------|---------------------|
| 1    | TMax 400 film | GG 495 | S    | W   | 1"   | g     | -      | -      | +19° | 1.80         | 1X    | KC   | moon nearby tonight |
| 2    | "             | "      | "    | "   | 1-2" | "     | -      | -      | "    | "            | 1X    | KC   | wind increasing     |
| 3    | "             | "      | "    | "   | 1-2" | g     | -      | -      | "    | "            | -     | KC   |                     |
| 4    | "             | "      | "    | "   | "    | "     | -      | -      | "    | "            | -     | KC   |                     |
| 1    | "             | "      | "    | "   | 1-2" | g     | -      | -      | +21° | 2.15         | -     | KC   | wind                |
| 2    | "             | "      | "    | "   | "    | "     | -      | -      | "    | "            | -     | KC   |                     |
| 3    | "             | "      | S    | E   | 1"   | g     | -      | -      | +20° | 1.95         | 3X    | KC   |                     |
| 4    | "             | "      | "    | "   | "    | g     | -      | -      | "    | "            | 2X    | KC   |                     |
| 1    | "             | "      | "    | E   | 1"   | g     | -      | -      | +1°  | 5.0+<br>1.80 | -     | KC   |                     |
| 2    | "             | "      | "    | "   | "    | "     | -      | -      | "    | "            | -     | KC   |                     |

| PLATE NO. | OBJECT             | RA/DEC  | UT DATE         | UT        | EXP.            | GUIDE STAR |
|-----------|--------------------|---|-----------------|-----------|-----------------|------------|
|           |                    |   | 1997            |           |                 |            |
| π 28710   | M15                | 21 <sup>h</sup> 27.6 <sup>m</sup><br>+11° 57' | Nov. 19         | 0013-0016 | 3 <sup>m</sup>  | 89/72      |
| 1         | "                  | "   | "               | 0016-0020 | 4 <sup>m</sup>  | "          |
| 2         | 23 Tau =<br>Merope | 3 <sup>h</sup> 43.3 <sup>m</sup><br>+23° 48'  | 1998<br>Jan. 27 | 0024-0039 | 15 <sup>m</sup> | 178/54     |
| 3         | "                  | "   | Feb. 13         | 0020-0045 | 25 <sup>m</sup> | "          |
| 4         | "                  | "   | "               | 0046-0126 | 40 <sup>m</sup> | "          |
| 5         | Orion Neb.         | 5 <sup>h</sup> 32.9 <sup>m</sup><br>-5° 24'   | "               | 0142-0147 | 5 <sup>m</sup>  | 93/109     |
| 6         | "                  | "   | "               | 0148-0233 | 45 <sup>m</sup> | "          |
| 7         | "                  | "   | "               | 0234-0249 | 15 <sup>m</sup> | "          |
| 8         | Moon               | ~7 <sup>h</sup> 30 <sup>m</sup><br>+19°       | 1999<br>Jan. 30 | 0322      | ~3 <sup>s</sup> | -          |
| 9         | "                  | "   | "               | "         | ~1 <sup>s</sup> | -          |

| P.H. | EMUL.               | FILT. | P.A. | TEL  | SEEING | TRANS | GRAT | SECT | TEMP. | FOCUS        | FLASH | OBS. | REMARKS                     |
|------|---------------------|-------|------|------|--------|-------|------|------|-------|--------------|-------|------|-----------------------------|
| 3    | Tmax<br>400<br>film | GG495 | S E  | 1"   | 1"     | g     | -    | -    | +1°   | 1.80         | -     | KC   | wind increasing,<br>seeing? |
| 4    | "                   | "     | "    | "    | "      | "     | -    | -    | "     | "            | -     | KC   |                             |
| 1    | "                   | "     | "    | W    | 1"     | p     | -    | -    | 0°    | 1.65         | -     | KC   | stopped<br>by fog           |
| 1    | "                   | "     | S E  | 1"   | 1"     | g     | -    | -    | +1°   | 1.60         | 1X    | KC   |                             |
| 2    | "                   | "     | "    | "    | "      | g     | -    | -    | "     | "            | 1X    | KC   | art. moon<br>rising         |
| 3    | "                   | "     | S E  | 1-2" | 1"     | g     | -    | -    | +1°   | "            | 1X    | KC   |                             |
| 4    | "                   | "     | "    | "    | "      | g     | -    | -    | "     | "            | 1X    | KC   |                             |
| 5    | "                   | "     | "    | "    | "      | f     | -    | -    | "     | "            | 1X    | KC   |                             |
| 1    | Tmax<br>100         | "     | S W  | 2"   | 2"     | f     | -    | -    | -1°   | 5.0<br>+1.46 | -     | KC   | 6-in<br>screen              |
| 2    | "                   | "     | "    | W    | "      | "     | -    | -    | "     | "            | -     | KC   | "                           |



| PLATE NO. | OBJECT | 1950 RA/DEC                | UT DATE | UT    | EXP.            | GUIDE STAR |
|-----------|--------|----------------------------|---------|-------|-----------------|------------|
|           |        |                            | 1989    |       |                 |            |
| π 28720   | Moon   | ~7 <sup>h</sup> 30<br>+19° | Jan. 30 | 03:27 | ~1 <sup>s</sup> | -          |
| 1         | "      | "                          | "       | "     | ~3 <sup>s</sup> |            |
| 2         | "      | "                          | "       | 0342  | ~1 <sup>s</sup> | -          |
| 3         | "      | "                          | "       | "     | ~3 <sup>s</sup> | -          |
| 4         | "      | "                          | "       | 0347  |                 | -          |
| 5         | "      | "                          | "       | "     |                 | -          |
| 6         | Moon   | ~15 <sup>h</sup><br>-12°   | May 1   | 0435  | ~1 <sup>s</sup> | -          |
| 7         | "      | "                          | "       | "     | "               | -          |
| 8         | "      | "                          | "       | 0445  | "               | -          |
| 9         | "      | "                          | "       | "     | "               | -          |

| P.H. | EMUL.         | FILT. | P.A. | TEL. | SEE | TRANS | GRAT | SCOT | TEMP. | SCOT | FLASH | OBS. | REMARKS       |
|------|---------------|-------|------|------|-----|-------|------|------|-------|------|-------|------|---------------|
| 3    | TMax 100 film | GG495 | S    | W    | ~2" | f     | -    | -    | -1°   | 1.46 | -     | KC   | 6 inch screen |
| 4    | "             | "     | "    | "    | "   | "     | -    | -    | "     | "    | -     | KC   | "             |
| 9    | TMax 400 film | OG530 | "    | "    | "   | "     | -    | -    | "     | "    | -     | KC   | "             |
| 10   | "             | "     | "    | "    | "   | "     | -    | -    | "     | "    | -     | KC   | "             |
| 5    | "             | "     | "    | "    | "   | "     | -    | -    | "     | "    | -     | KC   | "             |
| 6    | "             | "     | "    | "    | "   | "     | -    | -    | "     | "    | -     | KC   | "             |
| 1    | TMax 100 film | GG495 | "    | "    | 1"  | f     | -    | -    |       | 2.15 | -     | KC   | "             |
| 2    | "             | "     | "    | "    | "   | "     | -    | -    |       | "    | -     | "    | "             |
| 3    | "             | "     | "    | "    | "   | "     | -    | -    |       | "    | -     | "    | "             |
| 4    | "             | "     | "    | "    | "   | "     | -    | -    |       | "    | -     | "    | "             |

| Plate No. | Object       | 1950 RA/DEC                                    | UT Date | UT        | Exp.            | Guide Star |
|-----------|--------------|--|---------|-----------|-----------------|------------|
|           |              |  | 1999    |           |                 |            |
| π 28730   | M 13         | 16 <sup>h</sup> 39. <sup>m</sup> 9<br>+36° 33' | July 7  | 0248-0328 | 40 <sup>m</sup> | 112/88     |
| 1         | "            | "  | "       | 0348-0413 | 25 <sup>m</sup> | "          |
| 2         | "            | "  | "       | 0421-0521 | 60 <sup>m</sup> | "          |
| 3         | M 13         | "  | July 8  | 0341-0347 | 6 <sup>m</sup>  | "          |
| 4         | "            | "  | "       | 0348-0354 | 6 <sup>m</sup>  | "          |
| 5         | "            | "  | "       | 0357-0417 | 20 <sup>m</sup> | "          |
| 6         | "            | "  | "       | 0420-0445 | 25 <sup>m</sup> | "          |
| 7         | Pal 14 field | 16 <sup>h</sup> 08. <sup>m</sup> 8<br>+15° 05' | July 12 | 0301-0501 | 2 <sup>h</sup>  | 184/50     |
| 8         | M 13         | 16 <sup>h</sup> 39. <sup>m</sup> 9<br>+36° 33' | July 25 | 0429-0435 | 6 <sup>m</sup>  | 112/88     |
| 9         | "            | "  | "       | 0436-0456 | 20 <sup>m</sup> | "          |

\* 28730/1/2 1/8<sup>s</sup> flash - new bulb - try 1/15<sup>s</sup> (3X?)  
 \*\* 1/15<sup>s</sup> flash 28733 onward

| P.H. | Emul.         | Filt. | P.A. | Tel. | See   | Lens | GT | Sec | Temp | Focus | Flash | Obs. | Remarks                |
|------|---------------|-------|------|------|-------|------|----|-----|------|-------|-------|------|------------------------|
|      |               |       |      |      |       |      |    |     |      | 8.0+  |       |      |                        |
| 1    | +Max 400 film | GG495 | S    | W    | 1"-2" | g    | -  | -   | +24° | 1.88  | 2X*   | KC   |                        |
| 2    | "             | "     | S    | E    | 1"-2" | g    | -  | -   | +23° | "     | 2X*   | KC   |                        |
| 3    | "             | "     | "    | "    | 1-2"  | g    | -  | -   | +23° | "     | 2X*   | KC   | seeing worse at end    |
| 1    | "             | "     | S    | E    | 1"    | g    | -  | -   | +24° | 1.90  | 3X**  | KC   |                        |
| 2    | "             | "     | "    | "    | "     | "    | -  | -   | "    | "     | 3X    | KC   |                        |
| 3    | "             | "     | "    | "    | 1"    | g    | -  | -   | +24° | "     | 4X    | KC   |                        |
| 5    | "             | "     | "    | "    | 1"    | g    | -  | -   | "    | "     | 4X    | KC   |                        |
| 1    | "             | "     | W    | E    | 1-2"  | g    | -  | -   | +22° | 1.82  | 4X    | KC   |                        |
| 1    | "             | "     | S    | E    | 1"    | g    | -  | -   | +25° | 2.00  | 2X    | KC   | but, moon + light wind |
| 2    | "             | "     | "    | "    | "     | "    | -  | -   | "    | "     | 2X    | KC   |                        |

| Plate No. | Object | 1950 RA/Dec.                                  | UT Date      | UT        | Exp.                           | Guide Star |
|-----------|--------|---|--------------|-----------|--------------------------------|------------|
| TT 28740  | M 13   | 16 <sup>h</sup> 39 <sup>m</sup> .9<br>+36°33' | 1999 July 29 | 0301-0307 | 6 <sup>m</sup>                 | 112/88     |
| 1         | "      | "   | "            | 0308-0328 | 20 <sup>m</sup>                | "          |
| 2         | "      | "   | Sept. 4      | 0149-0155 | 6 <sup>m</sup>                 | "          |
| 3         | "      | "   | "            | 0156-0203 | 7 <sup>m</sup>                 | "          |
| 4         | "      | "   | "            | 0206-0230 | 24 <sup>m</sup>                | "          |
| 5         | "      | "   | "            | 0233-0239 | 6 <sup>m</sup>                 | "          |
| 6         | M 15   | 21 <sup>h</sup> 27 <sup>m</sup> .6<br>+11°57' | "            | 0258-0320 | 22 <sup>m</sup>                | 89/72      |
| 7         | Tr. 5  | 6 <sup>h</sup> 33.7<br>+9°31'                 | 2000 Mar. 6  | 0143-0423 | 2 <sup>h</sup> 40 <sup>m</sup> | 230/42     |
| 8         | M 3    | 13 <sup>h</sup> 39 <sup>m</sup> .9<br>+28°38' | Mar. 30      | 0511-0541 | 30 <sup>m</sup>                | 175/57     |
| 9         | "      | "   | Apr. 27      | 0216-0246 | 30 <sup>m</sup>                | "          |

| P.H. | Emul.         | Filt. | P.A. | Tel. | See. | Trans | Gat | SECT. | TEMP. | FCS  | FLASH | Obs. | Remarks             |
|------|---------------|-------|------|------|------|-------|-----|-------|-------|------|-------|------|---------------------|
| 4    | Tmax 400 film | GG495 | S    | E    | 1"   | g     | -   | -     | +28°  | 1.98 | 2X    | KC   | Full moon some wind |
| 3    | "             | "     | "    | "    | "    | g     | -   | -     | "     | "    | 1X    | KC   |                     |
| 1    | "             | "     | S    | E    | 1"   | f     | -   | -     | +26°  | 2.00 | 2X    | KC   |                     |
| 2    | "             | "     | "    | "    | "    | "     | -   | -     | "     | "    | 2X    | KC   |                     |
| 3    | "             | "     | "    | "    | "    | "     | -   | -     | "     | "    | 3X    | KC   |                     |
| 4    | "             | "     | "    | "    | "    | "     | -   | -     | +26°  | "    | 3X    | KC   |                     |
| 5    | "             | "     | S    | W    | 1"   | f     | -   | -     | +26°  | "    | 4X    | KC   | killed by clouds    |
| 1    | "             | "     | S    | E    | 1"   | g     | -   | -     | +12°  | 2.10 | 4X    | KC   | 5.0+                |
| 1    | "             | "     | S    | W    | 1-2" | g     | -   | -     | +3°   | 0.70 | 3X    | KC   | 5.0+                |
| 1    | "             | "     | S    | W    | 1"   | g     | -   | -     | +16°  | 1.50 | 3X    | KC   | 8.0+                |

| Plate No. | Object   | RA/DEC  | UT Date | UT        | Exp.            | Guide Star |
|-----------|----------|---|---------|-----------|-----------------|------------|
|           |          |   | 1950    |           |                 |            |
|           |          |   | 2000    |           |                 |            |
| π28750    | M3       | 13 <sup>h</sup> 39. <sup>m</sup> 9<br>+28°38' | Apr. 26 | 0246-0306 | 20 <sup>m</sup> | 175/57     |
| 1         | "        | "   | "       | 0308-0328 | 20 <sup>m</sup> | "          |
| 2         | M53      | 13 <sup>h</sup> 10. <sup>m</sup> 5<br>+18°26' | Apr. 30 | 0207-0307 | 1 <sup>h</sup>  | 100/58     |
| *3        | M5       | 15 <sup>h</sup> 16. <sup>m</sup> 0<br>+2°16'  | May 29  | 0449-0529 | 40 <sup>m</sup> | 150/102    |
| 4         | M3       | 13 <sup>h</sup> 39. <sup>m</sup> 9<br>+28°38' | June 3  | 0324-0354 | 30 <sup>m</sup> | 175/57     |
| 5         | NGC 5053 | 13 <sup>h</sup> 14. <sup>m</sup> 0<br>+18°00' | June 6  | 0305-0355 | 50 <sup>m</sup> | 227/46     |
| 6         | "        | "   | "       | 0356-0456 | 60 <sup>m</sup> | "          |
| 7         | NGC 5466 | 14 <sup>h</sup> 03. <sup>m</sup> 2<br>+28°46' | June 9  | 0323-0423 | 60 <sup>m</sup> | 123/112    |
| 8         | "        | "   | "       | 0430-0530 | "               | "          |
| 9         | M53      | 13 <sup>h</sup> 10. <sup>m</sup> 5<br>+18°26' | June 10 | 0353-0453 | 60 <sup>m</sup> | 100/60     |

\* 100<sup>x</sup> (+2<sup>d</sup>) since plate FRy-1 (also M5) - first recorded stellar plate with this telescope (clouds last 2 nights prevented observing on centennial night)

| P.H. | Emul.         | Filt. | P.A. | Tel. | See. | Trans. | Grat. | Sec. | Temp. | Focus | Flash | Obs. | Remarks                |
|------|---------------|-------|------|------|------|--------|-------|------|-------|-------|-------|------|------------------------|
| 3    | Tmax 400 film | GG495 | S    | W    | 1"   | g      | -     | -    | +15°  | 1.50  | 3X    | KC   |                        |
| 2    | "             | "     | "    | "    | "    | "      | -     | -    | "     | "     | 3X    | KC   |                        |
| 1    | "             | "     | S    | W    | 1-2" | f      | -     | -    | +12°  | 1.25  | 3X    | KC   |                        |
| 1    | "             | "     | S    | W    | 2-3" | f-p    | -     | -    | +12°  | 1.20  | 3X    | KC   |                        |
| 2    | "             | "     | S    | E    | 1"   | g      | -     | -    | +17°  | 1.70  | 3X    | KC   |                        |
| 1    | "             | "     | S    | E    | 1-2" | g      | -     | -    | +14°  | 1.25  | 4X    | KC   |                        |
| 2    | "             | "     | "    | E    | "    | g      | -     | -    | 14°   | "     | 4X    | KC   |                        |
| 1    | "             | "     | E    | E    | 1-2" | g      | -     | -    | 25°   | 2.00  | 3X    | KC   | wind                   |
| 2    | "             | "     | "    | "    | 1-2" | g      | -     | -    | 25°   | "     | 3X    | KC   | "                      |
| 1    | "             | "     | E    | S    | 1-2" | f      | -     | -    | 25°   | 2.00  | 2X    | KC   | wind<br>moon<br>cirrus |

| Plate No. | Object             | RA/DEC                                      | UT Date | UT        | Exp.            | Guide star |
|-----------|--------------------|---|---------|-----------|-----------------|------------|
|           |                    | 1950  |         |           |                 |            |
| π 28760   | M 80               | 16 <sup>h</sup> 14. <sup>m</sup><br>-22°51' | June 10 | 0415-0515 | 60 <sup>m</sup> | 97/64      |
| 1         | "                  | "   | June 23 | 0411-0511 | 60 <sup>m</sup> | "          |
| 2         | NGC 6760           | 19 <sup>h</sup> 08. <sup>m</sup><br>+0°57'  | June 27 | 0443-0503 | 20 <sup>m</sup> | 165/107    |
| 3         | NGC 6356           | 17 <sup>h</sup> 20.7<br>-17°46'             | July 17 | 0257-0327 | 90 <sup>m</sup> | 140/52     |
| 4         | NGC 6760           | 19 <sup>h</sup> 08.6<br>+0°57'              | July 23 | 0250-0405 | 75 <sup>m</sup> | 165/107    |
| 5         | "                  | "   | "       | 0410-0525 | 75 <sup>m</sup> | "          |
| 6         | NGC 6402<br>= M 14 | 17 <sup>h</sup> 35. <sup>m</sup><br>-3°13'  | July 24 | 0243-0343 | 60 <sup>m</sup> | 144/82     |
| 7         | NGC 6760           | 19 <sup>h</sup> 08.6<br>+0°57'              | "       | 0356-0511 | 75 <sup>m</sup> | 165/107    |
| * 8       | M 13               | 16 <sup>h</sup> 39. <sup>m</sup><br>+36°30' | Aug. 5  | 0346-0352 | 6 <sup>m</sup>  | 112/88     |
| * 9       | "                  | "   | "       | 0353-0359 | 6 <sup>m</sup>  | "          |

| P.H. | Emul.        | Filt. | P.A. Tel. | Sec. | SLASH S. | SLASH t. | SLASH t. | Temp. | FOCUS | FLASH | Obs. | Remarks                          |
|------|--------------|-------|-----------|------|----------|----------|----------|-------|-------|-------|------|----------------------------------|
| 2    | TMax400 film | GG495 | S E       | 2"   | f        | -        | -        | 24°   | 2.00  | 2X    | KC   | moon<br>wind                     |
| 1    | "            | "     | S W       | 1-2" | g-p      | -        | -        | 22°   | 1.60  | 3X    | KC   | lost guide<br>* in small cloud   |
| 2    | "            | "     | S W       | 1-2" | g-p      | -        | -        | 21°   | 1.60  | 3X    | KC   | scattered clouds<br>became worse |
| 3    | "            | "     | S W       | 2"   | g        | -        | -        | 25°   | 1.98  | -     | KC   | Full moon                        |
| 1    | "            | "     | S W       | 1-2" | g        | -        | -        | 18°   | 1.86  | 3X    | KC   |                                  |
| 2    | "            | "     | " "       | 1-2" | g        | -        | -        | 17°   | "     | 3X    | KC   |                                  |
| 1    | "            | "     | S W       | 2"   | g        | -        | -        | 19°   | 1.80  | 3X    | KC   |                                  |
| 2    | "            | "     | " "       | 2"   | g        | -        | -        | 19°   | 1.80  | 3X    | KC   |                                  |
| 3    | "            | "     | S E       | 1"   | f        | -        | -        | 22°   | 1.75  | 3X    | KC   |                                  |
| 4    | "            | "     | " "       | "    | "        | -        | -        | "     | "     | 3X    | KC   |                                  |

Centennial Tonight of Fty-2 - first M13 plate with this telescope!

| Plate No. | Object            | RA/DEC  | UT Date        | UT        | Exp.            | Guide * | P.M. | Emul.            | Filt. | P.A. | Tel  | Sec | T <sub>2</sub> | T <sub>3</sub> | T <sub>4</sub> | T <sub>5</sub> | F  | Obs. | Remarks                      |
|-----------|-------------------|---|----------------|-----------|-----------------|---------|------|------------------|-------|------|------|-----|----------------|----------------|----------------|----------------|----|------|------------------------------|
| π 28770 * | M13               | 1950<br>16 <sup>h</sup> 39. <sup>m</sup> 9<br>+36°30' | 2000<br>Aug. 5 | 0409-0419 | 10 <sup>m</sup> | 112/88  | 5    | TMax 400<br>film | GG495 | S E  | 1"   | f   | -              | -              | 22°            | 1.75           | 3X | KC   | cirrus                       |
| * 1       | "                 | "   | "              | 0420-0430 | "               | "       | 6    | "                | "     | "    | "    | f-p | -              | -              | "              | "              | 3X | KC   | cirrus getting worse         |
| 2         | M13               | "   | Aug. 9         | 0341-0416 | 35 <sup>m</sup> | "       | 1    | "                | "     | S E  | 1"   | f-p | -              | -              | 25°            | 1.75           | 2X | KC   | haze moon some clouds        |
| 3         | (382) Olympia     | 17 <sup>h</sup> 33. <sup>m</sup> 5<br>+9°16'          | Aug. 10        | 0333-0343 | 10 <sup>m</sup> | 77/62   | 3    | "                | "     | S W  | 2"   | f   | -              | -              | 24°            | 1.75           | 2X | KC   | 2000 coords scattered clouds |
| 4         | "                 | "   | "              | 0355-0410 | 15 <sup>m</sup> | "       | 4    | "                | "     | "    | "    | f   | -              | -              | "              | "              | 2X | KC   | "                            |
| 5         | M13               | 16 <sup>h</sup> 39. <sup>m</sup> 9<br>+36°30'         | Aug 11         | 0407-0413 | 6 <sup>m</sup>  | 112/88  | 1    | "                | "     | " E  | 1"   | g   | -              | -              | 24°            | 2.00           | 2X | KC   |                              |
| 6         | NGC 6402<br>= M14 | 17 <sup>h</sup> 35. <sup>m</sup> 0<br>-3°13'          | Aug 19         | 0204-0304 | 60 <sup>m</sup> | 144/80  | 2    | "                | "     | S W  | 2"   | f   | -              | -              | 21°            | 1.70           | 4X | KC   |                              |
| 7         | "                 | "   | Aug. 21        | 0203-0208 | 65 <sup>m</sup> | "       | 3    | "                | "     | S W  | 2"   | g   | -              | -              | 18°            | 1.65           | 3X | KC   |                              |
| 8         | NGC 6535          | 18 <sup>h</sup> 01. <sup>m</sup> 3<br>-0°18'          | "              | 0332-0447 | 75 <sup>m</sup> | 85/55   | 4    | "                | "     | S W  | 2"   | f   | -              | -              | "              | "              | 3X | KC   | passing clouds               |
| 9         | Barnard's Star    | 17 <sup>h</sup> 55.3<br>+4°42'                        | Sept. 3        | 0139-0154 | 15 <sup>m</sup> | 109/89  | 1    | "                | "     | W E  | 1-2" | g   | -              | -              | 24°            | 1.60           | 3X | KC   |                              |

\* See previous page

| Plate No. | Object             | 1950 RA/DEC                                   | UT Date  | UT        | Exp.            | Guide # | P.H. | Emul.               | Filt. | P.A. | Tel. | Sec  | T <sub>max</sub> | Grat | Sec <sub>t</sub> | Temp | Focus | Flash | Obs. | Remarks               |
|-----------|--------------------|---|----------|-----------|-----------------|---------|------|---------------------|-------|------|------|------|------------------|------|------------------|------|-------|-------|------|-----------------------|
|           |                    |   | 2000     |           |                 |         |      |                     |       |      |      |      |                  |      |                  |      |       |       |      |                       |
| π 28780   | Barward's Star     | 17 <sup>h</sup> 55. <sup>m</sup> 3<br>+4°42'  | Sept. 3  | 0155-0210 | 15 <sup>m</sup> | 109/80  | 2    | TMax<br>400<br>film | GG495 | W E  |      | 1-2" | g                | -    | -                | 24°  | 1.60  | 3X    | KC   |                       |
| 1         | "                  | "   | Sept. 6  | 0128-0143 | 15 <sup>m</sup> | 177/66  | 3    | "                   | "     | E W  |      | 2-3" | g                | -    | 4                | 17°  | 1.40  | 2X    | KC   | first moon<br>25° S   |
| 2         | "                  | "   | "        | 0216-0231 | 15 <sup>m</sup> | 109/89  | 4    | "                   | "     | W W  |      | 2-3" | g                | 4    | -                | "    | "     | 2X    | KC   | "                     |
| 3         | M 56 =<br>NGC 6779 | 19 <sup>h</sup> 14. <sup>m</sup> 6<br>+30°06' | "        | 0310-0420 | 70 <sup>m</sup> | 198/117 | 5    | "                   | "     | S E  |      | 2-3" | g                | -    | -                | 16°  | "     | 3X    | KC   |                       |
| 4         | M 13               | 16 <sup>h</sup> 39. <sup>m</sup> 9<br>+36°30' | Sept. 7  | 0121-0146 | 25 <sup>m</sup> | 112/88  | 1    | "                   | "     | S E  |      | 1"   | g                | -    | -                | 19°  | 1.50  | 3X    | KC   | cirrus<br>around      |
| 5         | "                  | "   | "        | 0148-0154 | 6 <sup>m</sup>  | "       | 2    | "                   | "     | " "  |      | 1"   | g                | -    | -                | "    | "     | 3X    | KC   | SE wind<br>increasing |
| 6         | "                  | "   | "        | 0155-0220 | 25 <sup>m</sup> | "       | 3    | "                   | "     | " "  |      | 1-2" | g                | -    | -                | "    | "     | 3X    | KC   | "                     |
| 7         | M 56 =<br>NGC 6779 | 19 <sup>h</sup> 14. <sup>m</sup> 6<br>+30°06' | "        | 0242-0342 | 60 <sup>m</sup> | 198/117 | 4    | "                   | "     | " "  |      | 2"   | g                | -    | -                | 18°  | "     | 3X    | KC   |                       |
| 8         | NGC 6535           | 18 <sup>h</sup> 01. <sup>m</sup> 3<br>-0°18'  | Sept 13  | 0156-0256 | 60 <sup>m</sup> | 85/35   | 1    | "                   | "     | S W  |      | 1"   | g                | -    | -                | 19°  | 1.40  | 2X    | KC   |                       |
| 9         | M 30 =<br>NGC 7099 | 21 <sup>h</sup> 37. <sup>m</sup> 5<br>-23°24' | Sept. 18 | 0235-0335 | 60 <sup>m</sup> | 123/60  | 2    | "                   | "     | S E  |      | 1-2" | g                | -    | -                | 20°  | 1.70  | 3X    | KC   | lost<br>guide x       |

2000

π 28790

M 30 =

21<sup>h</sup>37.<sup>m</sup>5

Sept. 18

0340-0440

60<sup>m</sup>

123/60

3

TMax 400  
film

GG 495

S E

1-2"

g

-

-

20°

1.70

2X

KC

NGC 7099

-23°24'

1 NGC 288

0<sup>h</sup>50.<sup>m</sup>3

"

0544-0634

50<sup>m</sup>

161/107

4

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1-2"

g

-

-

20°

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2X

KC

2 Moon

~3<sup>h</sup>18<sup>m</sup>

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0707

~2<sup>s</sup>

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g

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KC

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KC

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28799



| PLATE NO. | OBJECT     | RA/DEC                          | UT DATE | UT        | EXP.                           | Guide * | P.H. | Emul.        | Filt  | P.A. | Tel. | Sec. | TRANS. | START | SECT | TEMP | FOCUS | FLASH | Obs. | Remarks     |
|-----------|------------|---------------------------------|---------|-----------|--------------------------------|---------|------|--------------|-------|------|------|------|--------|-------|------|------|-------|-------|------|-------------|
|           |            |                                 | 2001    |           |                                |         |      |              |       |      |      |      |        |       |      |      | 8.0+  |       |      |             |
| π 28800   | M3         | 13 <sup>h</sup> 39.9<br>+28°38' | June 9  | 0308-0338 | 30 <sup>m</sup>                | 175/5   | 1    | Max 400 film | GG495 | S    | E    | 1"   | g      | -     | -    | +18° | 1.50  | 3X    | KC   |             |
| 1         | "          | "                               | "       | 0339-0409 | "                              | "       | 2    | "            | "     | "    | "    | "    | "      | -     | -    | "    | "     | 3X    | KC   | moon rising |
| 2         | Barnard's* | 17 <sup>h</sup> 55.3<br>+40°42' | "       | 0449-0504 | 15 <sup>m</sup>                | 177/6b  | 3    | "            | "     | E    | W    | 1"   | g      | -     | -    | +18° | "     | 3X    | KC   |             |
| 3         | M3         | 13 <sup>h</sup> 39.9<br>+28°38' | June 23 | 0305-0335 | 30 <sup>m</sup>                | 175/5   | 1    | "            | "     | S    | E    | 1-2" | g      | -     | -    | +18° | 1.80  | 3X    | KC   |             |
| 4         | "          | "                               | "       | 0341-0411 | 30 <sup>m</sup>                | "       | 2    | "            | "     | "    | "    | "    | "      | -     | -    | "    | "     | 3X    | KC   |             |
| 5         | "          | "                               | June 24 | 0243-0313 | 30 <sup>m</sup>                | "       | 1    | "            | "     | "    | "    | 1"   | g      | -     | -    | +20° | 2.20  | 2X    | KC   |             |
| 6         | "          | "                               | "       | 0315-0345 | "                              | "       | 2    | "            | "     | "    | "    | 1"   | g-f    | -     | -    | "    | "     | 3X    | KC   |             |
| 7         | NGC 6791   | 19 <sup>h</sup> 19.0<br>+37°45' | July 14 | 0250-0540 | 2 <sup>h</sup> 50 <sup>m</sup> | 140/110 | 1    | "            | "     | S    | W    | 1"   | g      | -     | -    | +23° | 1.85  | 3X    | KC   |             |
| 8         | M71        | 19 <sup>h</sup> 51.5<br>+18°39' | Aug. 12 | 0215-0340 | 1 <sup>h</sup> 25 <sup>m</sup> | 130/105 | 2    | "            | "     | S    | W    | 1"   | g      | -     | -    | +23° | 1.55  | 3X    | KC   |             |
| 9         | NGC 6791   | 19 <sup>h</sup> 19.0<br>+37°45' | "       | 0409-0709 | 3 <sup>h</sup>                 | 140/105 | 3    | "            | "     | S    | E    | 1"   | g      | -     | -    | +22° | "     | 3X    | KC   |             |



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oh

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16

2<sup>h</sup>

3<sup>h</sup>

4h

5h

286

6<sup>h</sup>

7<sup>h</sup>

287

84

94



290

10<sup>h</sup>

291

11<sup>h</sup>

292

12<sup>h</sup>

293

13<sup>h</sup>

14<sup>h</sup>

15<sup>h</sup>

296

16<sup>h</sup>

17<sup>h</sup>

297

18<sup>h</sup>

19<sup>h</sup>

20<sup>h</sup>

21<sup>h</sup>

302

22<sup>h</sup>

23<sup>h</sup>

303

