

**AZIMUTH OR TRUE BEARING.**

| LATITUDE 68°. |    |        | DECLINATION—SAME NAME AS—LATITUDE. |        |        |        |        |        |        |        |        |        |        |        |             |        | LATITUDE 68°. |  |  |
|---------------|----|--------|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------------|--------|---------------|--|--|
| Hour Angle.   |    |        | 48°                                | 40°    | 50°    | 51°    | 52°    | 53°    | 54°    | 55°    | 56°    | 57°    | 58°    | 59°    | Hour Angle. |        |               |  |  |
| h.            | m. | s.     | h.                                 | m.     | s.     | h.     | m.     | s.     | h.     | m.     | s.     | h.     | m.     | s.     | h.          | m.     | s.            |  |  |
| 0             | 00 | 180 00 | 180 00                             | 180 00 | 180 00 | 180 00 | 180 00 | 180 00 | 180 00 | 180 00 | 180 00 | 180 00 | 180 00 | 180 00 | 180 00      | 180 00 | 180 00        |  |  |
| 0             | 10 | 175 06 | 174 58                             | 174 48 | 174 38 | 174 28 | 174 18 | 174 12 | 174 06 | 173 56 | 173 46 | 173 36 | 173 26 | 173 16 | 173 06      | 172 56 | 172 46        |  |  |
| 0             | 20 | 170 16 | 169 58                             | 169 39 | 169 17 | 168 54 | 168 27 | 168 05 | 167 37 | 167 01 | 166 14 | 165 33 | 164 57 | 164 16 | 163 33      | 162 49 | 162 04        |  |  |
| 0             | 30 | 165 27 | 165 02                             | 164 34 | 164 03 | 163 28 | 162 49 | 162 15 | 161 34 | 160 48 | 159 58 | 159 08 | 158 18 | 157 28 | 156 37      | 155 45 | 154 52        |  |  |
| 0             | 40 | 160 44 | 160 11                             | 159 35 | 158 55 | 158 10 | 157 20 | 156 26 | 155 19 | 154 06 | 152 82 | 150 53 | 149 44 | 148 25 | 147 05      | 145 84 | 144 62        |  |  |
| 0             | 50 | 156 08 | 155 28                             | 154 44 | 153 56 | 153 03 | 152 04 | 150 50 | 149 21 | 147 45 | 146 03 | 144 15 | 142 22 | 140 25 | 138 26      | 136 25 | 134 22        |  |  |
| 1             | 00 | 151 39 | 150 52                             | 150 03 | 149 07 | 148 07 | 146 59 | 145 44 | 144 20 | 142 44 | 140 56 | 138 51 | 136 27 | 133 27 | 130 25      | 127 22 | 124 18        |  |  |
| 1             | 10 | 147 13 | 146 26                             | 145 31 | 144 31 | 143 24 | 142 10 | 140 48 | 139 17 | 137 34 | 135 38 | 133 27 | 130 25 | 127 22 | 124 18      | 121 13 | 118 07        |  |  |
| 1             | 20 | 143 05 | 142 10                             | 141 10 | 140 04 | 138 53 | 137 34 | 136 07 | 134 31 | 132 43 | 130 32 | 128 12 | 125 10 | 122 04 | 118 55      | 115 44 | 112 31        |  |  |
| 1             | 30 | 139 01 | 138 02                             | 136 59 | 135 50 | 134 35 | 133 13 | 131 43 | 129 02 | 126 12 | 123 03 | 119 53 | 116 32 | 113 09 | 109 44      | 106 17 | 102 48        |  |  |
| 1             | 40 | 135 07 | 134 05                             | 132 58 | 131 47 | 130 30 | 129 04 | 127 32 | 125 50 | 123 59 | 121 57 | 119 40 | 117 10 | 113 55 | 110 34      | 107 07 | 103 37        |  |  |
| 1             | 50 | 131 21 | 130 17                             | 129 10 | 127 56 | 126 36 | 125 11 | 123 36 | 121 54 | 119 53 | 117 42 | 115 20 | 112 08 | 108 44 | 105 17      | 101 48 | 98 18         |  |  |
| 2             | 00 | 127 44 | 126 38                             | 125 29 | 124 15 | 122 54 | 121 27 | 119 53 | 118 11 | 116 20 | 114 22 | 112 12 | 109 44 | 106 17 | 102 48      | 99 18  | 95 47         |  |  |
| 2             | 10 | 124 15 | 123 08                             | 121 59 | 120 43 | 119 13 | 117 36 | 115 52 | 114 42 | 112 52 | 110 54 | 108 44 | 106 17 | 102 48 | 99 18       | 95 47  | 92 16         |  |  |
| 2             | 20 | 120 55 | 119 48                             | 118 38 | 117 22 | 115 01 | 113 15 | 111 23 | 109 52 | 108 14 | 106 30 | 104 37 | 102 36 | 100 26 | 97 41       | 94 40  | 91 38         |  |  |
| 2             | 30 | 117 41 | 116 35                             | 115 24 | 114 09 | 112 49 | 111 23 | 109 52 | 108 14 | 106 30 | 104 37 | 102 36 | 100 26 | 97 41  | 94 40       | 91 38  | 88 35         |  |  |
| 2             | 40 | 114 36 | 113 29                             | 112 19 | 111 04 | 109 45 | 108 21 | 106 51 | 105 15 | 103 32 | 101 44 | 99 47  | 97 06  | 94 05  | 90 55       | 87 34  | 84 12         |  |  |
| 2             | 50 | 111 36 | 110 30                             | 109 21 | 108 07 | 106 49 | 105 26 | 103 58 | 102 24 | 100 45 | 98 59  | 97 06  | 94 05  | 90 55  | 87 34       | 84 12  | 80 89         |  |  |
| 3             | 00 | 108 43 | 107 38                             | 106 29 | 105 17 | 103 59 | 102 38 | 101 12 | 99 41  | 98 05  | 96 22  | 94 32  | 92 36  | 90 11  | 87 05       | 83 37  | 80 08         |  |  |
| 3             | 10 | 105 56 | 104 50                             | 103 43 | 102 32 | 101 16 | 99 57  | 98 33  | 97 04  | 95 30  | 93 37  | 91 40  | 89 38  | 87 11  | 83 59       | 80 26  | 76 52         |  |  |
| 3             | 20 | 103 13 | 102 10                             | 101 03 | 99 52  | 98 39  | 97 21  | 96 00  | 94 33  | 92 52  | 91 07  | 89 16  | 87 05  | 84 44  | 82 13       | 78 37  | 75 00         |  |  |
| 3             | 30 | 100 36 | 99 33                              | 98 26  | 97 18  | 96 06  | 94 52  | 93 31  | 92 07  | 90 37  | 88 51  | 86 57  | 84 50  | 82 33  | 79 57       | 76 15  | 72 27         |  |  |
| 3             | 40 | 98 02  | 97 01                              | 95 57  | 94 49  | 93 39  | 92 25  | 91 08  | 89 47  | 88 21  | 86 39  | 84 40  | 82 33  | 79 57  | 76 15       | 72 27  | 68 34         |  |  |
| 3             | 50 | 95 34  | 94 33                              | 93 30  | 92 24  | 91 16  | 90 04  | 88 49  | 87 30  | 86 07  | 84 20  | 82 33  | 79 57  | 76 15  | 72 27       | 68 34  | 64 37         |  |  |
| 4             | 00 | 93 09  | 92 10                              | 91 08  | 90 04  | 88 58  | 87 43  | 86 34  | 85 16  | 83 57  | 82 34  | 81 05  | 79 32  | 77 34  | 75 40       | 73 48  | 71 57         |  |  |
| 4             | 10 | 90 47  | 89 49                              | 88 48  | 87 46  | 86 41  | 85 33  | 84 22  | 83 07  | 81 50  | 80 29  | 78 58  | 77 05  | 75 10  | 73 16       | 71 24  | 69 32         |  |  |
| 4             | 20 | 88 28  | 87 31                              | 86 30  | 85 33  | 84 29  | 83 23  | 82 14  | 81 01  | 79 46  | 78 28  | 77 05  | 75 10  | 73 16  | 71 24       | 69 32  | 67 40         |  |  |
| 4             | 30 | 86 13  | 85 17                              | 84 16  | 83 21  | 82 19  | 81 14  | 80 08  | 78 58  | 77 45  | 76 30  | 75 10  | 73 16  | 71 24  | 69 32       | 67 40  | 65 48         |  |  |
| 4             | 40 | 84 00  | 83 06                              | 82 10  | 81 12  | 80 12  | 79 09  | 78 05  | 76 57  | 75 40  | 74 25  | 73 05  | 71 24  | 69 32  | 67 40       | 65 48  | 63 56         |  |  |
| 4             | 50 | 81 49  | 80 56                              | 80 02  | 79 06  | 78 07  | 77 07  | 76 03  | 74 58  | 73 50  | 72 40  | 71 24  | 69 32  | 67 40  | 65 48       | 63 56  | 61 64         |  |  |
| 5             | 00 | 79 41  | 78 48                              | 77 56  | 77 01  | 76 04  | 75 05  | 74 04  | 73 01  | 71 55  | 70 46  | 69 35  | 68 20  | 67 05  | 65 45       | 64 30  | 63 15         |  |  |
| 5             | 10 | 77 34  | 76 44                              | 75 52  | 74 59  | 74 04  | 73 07  | 72 07  | 71 06  | 70 02  | 68 50  | 67 36  | 66 20  | 65 05  | 63 50       | 62 35  | 61 20         |  |  |
| 5             | 20 | 75 29  | 74 40                              | 73 50  | 72 58  | 72 05  | 71 10  | 70 13  | 69 12  | 68 11  | 67 07  | 66 00  | 64 51  | 63 42  | 62 33       | 61 24  | 60 15         |  |  |
| 5             | 30 | 73 26  | 72 38                              | 71 49  | 70 59  | 70 07  | 69 14  | 68 18  | 67 20  | 66 21  | 65 19  | 64 14  | 63 07  | 62 00  | 60 51       | 59 42  | 58 33         |  |  |
| 5             | 40 | 71 24  | 70 38                              | 69 50  | 69 02  | 68 12  | 67 19  | 66 25  | 65 29  | 64 31  | 63 32  | 62 29  | 61 25  | 60 17  | 59 08       | 58 00  | 56 51         |  |  |
| 5             | 50 | 69 24  | 68 39                              | 67 53  | 67 06  | 66 17  | 65 27  | 64 34  | 63 40  | 62 45  | 61 46  | 60 45  | 59 42  | 58 33  | 57 24       | 56 15  | 55 06         |  |  |
| 6             | 00 | 67 25  | 66 41                              | 65 57  | 65 10  | 64 23  | 63 34  | 62 44  | 61 51  | 60 57  | 60 02  | 59 03  | 58 03  | 57 02  | 56 00       | 54 59  | 53 57         |  |  |
| 6             | 10 | 65 27  | 64 44                              | 64 01  | 63 17  | 62 31  | 61 43  | 60 54  | 60 04  | 59 11  | 58 17  | 57 21  | 56 23  | 55 24  | 54 25       | 53 25  | 52 24         |  |  |
| 6             | 20 | 63 30  | 62 49                              | 62 07  | 61 24  | 60 40  | 59 54  | 59 06  | 58 17  | 57 27  | 56 34  | 55 41  | 54 44  | 53 47  | 52 49       | 51 50  | 50 51         |  |  |
| 6             | 30 | 61 34  | 60 54                              | 60 13  | 59 31  | 58 48  | 58 03  | 57 18  | 56 30  | 55 42  | 54 52  | 54 00  | 53 07  | 52 13  | 51 19       | 50 24  | 49 29         |  |  |
| 6             | 40 | 59 39  | 58 59                              | 58 19  | 57 39  | 56 58  | 56 15  | 55 31  | 54 45  | 53 58  | 53 10  | 52 19  | 51 26  | 50 33  | 49 39       | 48 44  | 47 49         |  |  |
| 6             | 50 | 57 43  | 57 06                              | 56 28  | 55 48  | 55 08  | 54 27  | 53 44  | 53 01  | 52 15  | 51 29  | 50 40  | 49 50  | 48 55  | 48 00       | 47 05  | 46 10         |  |  |
| 7             | 00 | 55 50  | 55 13                              | 54 36  | 53 58  | 53 19  | 52 40  | 51 58  | 51 16  | 50 32  | 49 47  | 49 00  | 48 12  | 47 24  | 46 35       | 45 46  | 44 57         |  |  |
| 7             | 10 | 53 56  | 53 20                              | 52 44  | 52 06  | 51 31  | 50 52  | 50 12  | 49 31  | 48 49  | 48 06  | 47 22  | 46 38  | 45 53  | 45 08       | 44 23  | 43 38         |  |  |
| 7             | 20 | 52 02  | 51 28                              | 50 54  | 50 18  | 49 43  | 49 06  | 48 27  | 47 48  | 47 08  | 46 26  | 45 44  | 45 01  | 44 18  | 43 35       | 42 52  | 42 09         |  |  |
| 7             | 30 | 50 10  | 49 37                              | 49 04  | 48 30  | 47 55  | 47 20  | 46 43  | 46 05  | 45 26  | 44 46  | 44 06  | 43 25  | 42 44  | 42 03       | 41 22  | 40 41         |  |  |
| 7             | 40 | 48 18  | 47 46                              | 47 14  | 46 42  | 46 08  | 45 33  | 44 58  | 44 24  | 43 48  | 43 11  | 42 34  | 41 56  | 41 19  | 40 42       | 40 05  | 39 28         |  |  |
| 7             | 50 | 46 26  | 45 55                              | 45 24  | 44 53  | 44 21  | 43 48  | 43 14  | 42 39  | 42 03  | 41 26  | 40 48  | 40 11  | 39 34  | 38 57       | 38 20  | 37 43         |  |  |
| 8             | 00 | 44 33  | 44 04                              | 43 35  | 43 05  | 42 34  | 42 02  | 41 29  | 40 56  | 40 21  | 39 46  | 39 10  | 38 33  | 37 57  | 37 20       | 36 43  | 36 06         |  |  |
| 8             | 10 | 42 42  | 42 14                              | 41 46  | 41 17  | 40 47  | 40 17  | 39 46  | 39 14  | 38 41  | 38 07  | 37 32  | 36 57  | 36 22  | 35 47       | 35 21  | 34 46         |  |  |
| 8             | 20 | 40 50  | 40 23                              | 39 56  | 39 29  | 39 01  | 38 31  | 38 01  | 37 31  | 37 00  | 36 28  | 35 54  | 35 21  | 34 49  | 34 17       | 33 44  | 33 12         |  |  |
| 8             | 30 | 38 59  | 38 33                              | 38 07  | 37 41  | 37 14  | 36 47  | 36 18  | 35 49  | 35 21  | 34 49  | 34 17  | 33 44  | 33 12  | 32 39       | 32 06  | 31 33         |  |  |
| 8             | 40 | 37 07  | 36 44                              | 36 19  | 35 54  | 35 28  | 35 03  | 34 35  | 34 07  | 33 39  | 33 10  | 32 39  | 32 06  | 31 33  | 31 02       | 30 30  | 30 00         |  |  |
| 8             | 50 | 35 16  | 34 53                              | 34 30  | 34 06  | 33 42  | 33 17  | 32 51  | 32 25  | 31 58  | 31 30  | 31 02  | 30 33  | 30 06  | 29 38       | 29 11  | 28 44         |  |  |
| 9             | 00 | 33 25  | 33 03                              | 32 41  | 32 19  | 31 56  | 31 32  | 31 08  | 30 43  | 30 17  | 29 51  | 29 24  | 28 56  | 28 29  | 28 02       | 27 35  | 27 08         |  |  |
| 9             | 10 | 31 34  | 31 13                              | 30 52  | 30 31  | 30 10  | 29 47  | 29 24  | 29 00  | 28 36  | 28 12  | 27 46  | 27 20  | 26 54  | 26 28       | 26 02  | 25 36         |  |  |
| 9             | 20 | 29 43  | 29 24                              | 29 04  | 28 44  | 28 23  | 28 02  | 27 41  | 27 18  | 26 56  | 26 32  | 26 06  | 25 40  | 25 14  | 24 48       | 24 22  | 23 56         |  |  |
| 9             | 30 | 27 53  | 27 33                              | 27 15  | 26 56  | 26 37  | 26 18  | 25 57  | 25 36  | 25 15  | 24 53  | 24 31  | 24 09  | 23 47  | 23 25       | 23 03  | 22 41         |  |  |
| 9             | 40 | 26 00  | 25 43                              | 25 26  | 25 09  | 24 51  | 24 33  | 24 14  | 23 54  | 23 34  | 23 14  | 22 53  | 22 31  | 22 10  | 21 48       | 21 27  | 21 05         |  |  |
| 9             | 50 | 24 09  | 23 54                              | 23 38  | 23 21  | 23 04  | 22 47  | 22 29  | 22 11  | 21 53  | 21 35  | 21 15  | 20 55  | 20 35  | 20 15       | 19 55  | 19 35         |  |  |
| 10            | 00 | 22 18  | 22 03                              | 21 48  | 21 33  | 21 18  | 21 03  | 20 46  | 20 29  | 20 12  | 19 55  | 19 38  | 19 19  | 19 00  | 18 42       | 18 24  | 18 06         |  |  |
| 10            | 10 | 20 27  | 20 13                              | 19 59  | 19 43  | 19 28  | 19 18  | 19 03  | 18 47  | 18 31  | 18 15  | 17 59  | 17 43  | 17 26  | 17 10       | 16 54  | 16 38         |  |  |
| 10            | 20 | 18 35  | 18 23                              | 18 11  | 17 59  | 17 46  | 17 33  | 17 19  | 17 05  | 16 50  | 16 36  | 16 21  | 16 06  | 15 50  | 15 35       | 15 20  | 15 05         |  |  |
| 10            | 30 | 16 44  | 16 33                              | 16 22  | 16 11  | 15 59  | 15 47  | 15 35  | 15 23  | 15 10  | 14 57  | 14 43  | 14 30  | 14 17  | 14 04       | 13 51  | 13 38         |  |  |
| 10            | 40 | 14 52  | 14 43                              | 14 33  | 14 24  | 14 13  | 14 02  | 13 51  | 13 40  | 13 29  | 13 17  | 13 05  | 12 54  | 12 42  | 12 30       | 12 18  | 12 06         |  |  |
| 10            | 50 | 13 01  | 12 53                              | 12 44  | 12 35  | 12 26  | 12 17  | 12 08  | 11 58  | 11 48  | 11 38  | 11 28  | 11 17  | 11 07  | 10 57       | 10 47  | 10 37         |  |  |
| 11            | 00 | 11 10  | 11 02                              | 10 54  | 10 47  | 10 40  | 10 32  | 10 24  | 10 15  | 10 07  | 9 58   | 9 49   | 9 41   | 9 32   | 9           |        |               |  |  |

In North latitude, when the star is rising or East of the meridian, the tabulated azimuths are reckoned from North to East; and when the star is setting or West of the meridian, the tabulated azimuths are reckoned from North to West.

In South latitudes, when the star is rising or East of the meridian, the tabulated azimuths are reckoned from North to West; when the star is setting or West of the meridian, the tabulated azimuths are reckoned from South to East; and when the star is rising or East of the meridian, the tabulated azimuths are reckoned from South to West.

When the *latitude* and *declination* are of *different name*, the tables are to be entered with the supplement of the hour angle and the supplement of the tabulated azimuth is to be taken for the required true bearing.

## AZIMUTH OR TRUE BEARING.

| LATITUDE 68°. |           | DECLINATION—SAME NAME AS—LATITUDE. |          |          |          |          |          |          |          |          |          | LATITUDE 68°. |             |
|---------------|-----------|------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---------------|-------------|
| Hour Angle.   |           | 60°                                | 61°      | 62°      | 63°      | 64°      | 65°      | 66°      | 67°      | 68°      | 69°      | 70°           | Hour Angle. |
| <b>h.</b>     | <b>m.</b> | <b>o</b>                           | <b>o</b> | <b>o</b> | <b>o</b> | <b>o</b> | <b>o</b> | <b>o</b> | <b>o</b> | <b>o</b> | <b>o</b> | <b>o</b>      | <b>h.</b>   |
| 0             | 00        | 180 00                             | 180 00   | 180 00   | 180 00   | 180 00   | 180 00   | 180 00   | 180 00   | 180 00   | 180 00   | 180 00        | 0           |
|               | 10        | 171 04                             | 170 07   | 168 52   | 167 09   | 164 36   | 160 28   | 152 49   | 135 07   | 88 50    | 41 21    | 22 58         | 10          |
|               | 20        | 162 25                             | 160 37   | 158 19   | 155 12   | 150 45   | 144 04   | 133 21   | 115 16   | 87 41    | 59 04    | 39 32         | 20          |
|               | 30        | 154 14                             | 151 49   | 148 43   | 144 40   | 139 12   | 131 37   | 120 50   | 105 43   | 86 31    | 66 33    | 49 53         | 30          |
|               | 40        | 146 41                             | 143 46   | 140 14   | 135 42   | 129 52   | 122 16   | 112 27   | 99 59    | 85 22    | 70 08    | 56 14         | 40          |
|               | 50        | 139 50                             | 136 41   | 132 50   | 128 09   | 122 22   | 115 12   | 106 26   | 95 59    | 84 12    | 71 55    | 60 11         | 50          |
| 1             | 00        | 133 38                             | 130 21   | 126 26   | 121 48   | 116 14   | 109 37   | 101 50   | 92 54    | 83 02    | 72 46    | 62 42         | 1           |
|               | 10        | 128 03                             | 124 44   | 120 52   | 116 22   | 111 07   | 105 04   | 98 07    | 90 20    | 81 53    | 73 03    | 64 15         | 10          |
|               | 20        | 123 02                             | 119 45   | 115 59   | 111 42   | 106 48   | 101 14   | 94 59    | 88 07    | 80 43    | 73 00    | 65 12         | 20          |
|               | 30        | 118 30                             | 115 17   | 111 49   | 107 36   | 103 02   | 97 56    | 92 16    | 86 07    | 79 33    | 72 41    | 65 44         | 30          |
|               | 40        | 114 22                             | 111 16   | 107 48   | 103 58   | 99 42    | 95 00    | 89 51    | 84 17    | 78 23    | 72 13    | 65 55         | 40          |
|               | 50        | 110 36                             | 107 37   | 104 20   | 100 42   | 96 43    | 92 22    | 87 39    | 82 35    | 77 13    | 71 38    | 65 52         | 50          |
| 2             | 00        | 107 07                             | 104 16   | 101 08   | 97 43    | 93 59    | 89 57    | 85 36    | 80 58    | 76 03    | 70 55    | 65 39         | 2           |
|               | 10        | 103 55                             | 101 11   | 98 12    | 94 59    | 91 29    | 87 44    | 83 42    | 79 24    | 74 53    | 70 10    | 65 17         | 10          |
|               | 20        | 100 55                             | 98 18    | 95 29    | 92 26    | 88 08    | 85 38    | 81 53    | 77 54    | 73 42    | 69 20    | 64 49         | 20          |
|               | 30        | 98 06                              | 95 36    | 92 56    | 90 02    | 86 57    | 83 39    | 80 09    | 76 26    | 72 32    | 68 27    | 64 15         | 30          |
|               | 40        | 95 27                              | 93 04    | 90 30    | 87 47    | 84 52    | 81 45    | 78 28    | 75 00    | 71 21    | 67 32    | 63 36         | 40          |
|               | 50        | 92 56                              | 90 40    | 88 35    | 85 36    | 82 53    | 79 57    | 76 51    | 73 35    | 70 10    | 66 37    | 62 54         | 50          |
| 3             | 00        | 90 33                              | 88 22    | 86 03    | 83 35    | 80 58    | 78 12    | 75 17    | 72 13    | 68 59    | 65 38    | 62 09         | 3           |
|               | 10        | 88 15                              | 86 10    | 83 57    | 81 37    | 79 07    | 76 30    | 73 45    | 70 51    | 67 48    | 64 38    | 61 21         | 10          |
|               | 20        | 86 03                              | 84 03    | 81 56    | 79 42    | 77 21    | 74 52    | 72 14    | 69 30    | 66 30    | 63 36    | 60 30         | 20          |
|               | 30        | 83 55                              | 82 01    | 79 59    | 77 51    | 75 36    | 73 15    | 70 46    | 68 09    | 65 26    | 62 35    | 59 38         | 30          |
|               | 40        | 81 52                              | 80 01    | 78 06    | 76 03    | 73 55    | 71 40    | 69 18    | 66 49    | 64 14    | 61 32    | 58 43         | 40          |
|               | 50        | 79 52                              | 78 06    | 76 15    | 74 18    | 72 15    | 70 06    | 67 51    | 65 30    | 63 02    | 60 28    | 57 48         | 50          |
| 4             | 00        | 77 56                              | 76 14    | 74 28    | 72 36    | 70 38    | 68 35    | 66 26    | 64 12    | 61 50    | 59 23    | 56 51         | 4           |
|               | 10        | 76 02                              | 74 24    | 72 41    | 70 54    | 69 02    | 67 04    | 65 01    | 62 52    | 60 38    | 58 18    | 55 52         | 10          |
|               | 20        | 74 10                              | 72 30    | 70 58    | 69 16    | 67 27    | 65 35    | 63 37    | 61 34    | 59 26    | 57 12    | 54 53         | 20          |
|               | 30        | 72 21                              | 70 51    | 69 16    | 67 38    | 65 54    | 64 07    | 62 13    | 60 16    | 58 13    | 56 06    | 53 52         | 30          |
|               | 40        | 70 33                              | 69 07    | 67 36    | 66 02    | 64 22    | 62 38    | 60 51    | 58 58    | 57 00    | 54 58    | 52 50         | 40          |
|               | 50        | 68 48                              | 67 24    | 65 57    | 64 26    | 62 50    | 61 12    | 59 28    | 57 40    | 55 47    | 53 50    | 51 48         | 50          |
| 5             | 00        | 67 04                              | 65 43    | 64 19    | 62 51    | 61 20    | 59 45    | 58 06    | 56 22    | 54 34    | 52 41    | 50 44         | 5           |
|               | 10        | 65 20                              | 64 03    | 62 42    | 61 18    | 59 50    | 58 19    | 56 43    | 55 05    | 53 21    | 51 33    | 49 41         | 10          |
|               | 20        | 63 38                              | 62 24    | 61 07    | 59 46    | 58 21    | 56 53    | 55 22    | 53 46    | 52 07    | 50 23    | 48 36         | 20          |
|               | 30        | 61 58                              | 60 46    | 59 31    | 58 13    | 56 52    | 55 28    | 54 00    | 52 28    | 50 53    | 49 14    | 47 30         | 30          |
|               | 40        | 60 18                              | 59 09    | 57 57    | 56 42    | 55 24    | 54 03    | 52 38    | 51 11    | 49 39    | 48 04    | 46 23         | 40          |
|               | 50        | 58 39                              | 57 33    | 56 23    | 55 11    | 53 56    | 52 38    | 51 17    | 49 53    | 48 25    | 46 54    | 45 17         | 50          |
| 6             | 00        | 57 02                              | 55 57    | 54 50    | 53 40    | 52 28    | 51 13    | 49 55    | 48 34    | 47 10    | 45 42    | 44 10         | 6           |
|               | 10        | 55 24                              | 54 22    | 53 17    | 52 10    | 51 01    | 49 49    | 48 34    | 47 16    | 45 55    | 44 31    | 43 02         | 10          |
|               | 20        | 53 47                              | 52 47    | 51 46    | 50 41    | 49 34    | 48 25    | 47 13    | 45 58    | 44 40    | 43 19    | 41 55         | 20          |
|               | 30        | 52 11                              | 51 12    | 50 13    | 49 11    | 48 07    | 47 01    | 45 52    | 44 40    | 43 24    | 42 06    | 40 45         | 30          |
|               | 40        | 50 33                              | 49 38    | 48 41    | 47 41    | 46 40    | 45 36    | 44 30    | 43 21    | 42 09    | 40 54    | 39 36         | 40          |
|               | 50        | 48 58                              | 48 05    | 47 10    | 46 13    | 45 13    | 44 12    | 43 08    | 42 02    | 40 53    | 39 41    | 38 27         | 50          |
| 7             | 00        | 47 23                              | 46 32    | 45 39    | 44 44    | 43 47    | 42 48    | 41 47    | 40 43    | 39 37    | 38 28    | 37 17         | 7           |
|               | 10        | 45 47                              | 44 58    | 44 07    | 43 15    | 42 20    | 41 23    | 40 25    | 39 24    | 38 20    | 37 14    | 36 05         | 10          |
|               | 20        | 44 13                              | 43 25    | 42 36    | 41 45    | 40 53    | 39 59    | 39 02    | 38 04    | 37 03    | 36 01    | 34 55         | 20          |
|               | 30        | 42 37                              | 41 53    | 41 06    | 40 17    | 39 27    | 38 35    | 37 41    | 36 45    | 35 47    | 34 46    | 33 43         | 30          |
|               | 40        | 41 03                              | 40 20    | 39 35    | 38 48    | 38 00    | 37 10    | 36 19    | 35 25    | 34 30    | 33 32    | 32 31         | 40          |
|               | 50        | 39 28                              | 38 47    | 38 04    | 37 20    | 36 34    | 35 46    | 34 57    | 34 06    | 33 12    | 32 18    | 31 19         | 50          |
| 8             | 00        | 37 54                              | 37 14    | 36 33    | 35 51    | 35 07    | 34 21    | 33 34    | 32 45    | 31 54    | 31 02    | 30 06         | 8           |
|               | 10        | 36 20                              | 35 42    | 35 02    | 34 22    | 33 40    | 32 57    | 32 12    | 31 25    | 30 37    | 29 47    | 28 54         | 10          |
|               | 20        | 34 45                              | 34 09    | 33 31    | 32 53    | 32 13    | 31 32    | 30 49    | 30 05    | 29 19    | 28 31    | 27 41         | 20          |
|               | 30        | 33 10                              | 32 36    | 32 01    | 31 24    | 30 46    | 30 07    | 29 27    | 28 45    | 28 01    | 27 15    | 26 27         | 30          |
|               | 40        | 31 37                              | 31 04    | 30 30    | 29 56    | 29 19    | 28 42    | 28 03    | 27 23    | 26 42    | 25 59    | 25 14         | 40          |
|               | 50        | 30 02                              | 29 31    | 28 59    | 28 26    | 27 52    | 27 17    | 26 41    | 26 03    | 25 23    | 24 42    | 24 00         | 50          |
| 9             | 00        | 28 27                              | 27 59    | 27 29    | 26 57    | 26 25    | 25 51    | 25 17    | 24 41    | 24 04    | 23 26    | 22 46         | 9           |
|               | 10        | 26 52                              | 26 25    | 25 57    | 25 28    | 24 58    | 24 26    | 23 54    | 23 21    | 22 46    | 22 09    | 21 31         | 10          |
|               | 20        | 25 19                              | 24 53    | 24 26    | 23 59    | 23 30    | 23 01    | 22 30    | 21 59    | 21 26    | 20 52    | 20 17         | 20          |
|               | 30        | 23 45                              | 23 20    | 22 54    | 22 29    | 22 03    | 21 36    | 21 07    | 20 37    | 20 06    | 19 35    | 19 02         | 30          |
|               | 40        | 22 09                              | 21 47    | 21 24    | 21 00    | 20 35    | 20 09    | 19 42    | 19 15    | 18 47    | 18 17    | 17 46         | 40          |
|               | 50        | 20 34                              | 20 14    | 19 52    | 19 30    | 19 07    | 18 44    | 18 19    | 17 54    | 17 27    | 17 00    | 16 31         | 50          |
| 10            | 00        | 19 61                              | 18 41    | 18 21    | 18 01    | 17 39    | 17 17    | 16 55    | 16 32    | 16 07    | 15 42    | 15 16         | 10          |
|               | 10        | 17 25                              | 17 07    | 16 49    | 16 31    | 16 11    | 15 51    | 15 31    | 15 09    | 14 47    | 14 24    | 14 00         | 20          |
|               | 20        | 15 50                              | 15 35    | 15 18    | 15 01    | 14 43    | 14 25    | 14 06    | 13 47    | 13 27    | 13 06    | 12 43         | 30          |
|               | 30        | 14 16                              | 14 02    | 13 47    | 13 31    | 13 15    | 12 59    | 12 42    | 12 25    | 12 07    | 11 48    | 11 28         | 40          |
|               | 40        | 12 40                              | 12 28    | 12 15    | 12 01    | 11 47    | 11 33    | 11 18    | 11 02    | 10 46    | 10 30    | 10 12         | 50          |
|               | 50        | 11 06                              | 10 55    | 10 44    | 10 31    | 10 18    | 10 06    | 9 53     | 9 40     | 9 26     | 9 12     | 8 56          |             |
| 11            | 00        | 9 31                               | 9 21     | 9 11     | 9 01     | 8 51     | 8 40     | 8 28     | 8 17     | 8 05     | 7 52     | 7 39          | 11          |
|               | 10        | 7 56                               | 7 48     | 7 40     | 7 31     | 7 22     | 7 13     | 7 04     | 6 55     | 6 44     | 6 34     | 6 23          | 10          |
|               | 20        | 6 21                               | 6 15     | 6 08     | 6 01     | 5 54     | 5 47     | 5 39     | 5 31     | 5 23     | 5 15     | 5 07          | 20          |
|               | 30        | 4 46                               | 4 41     | 4 36     | 4 31     | 4 25     | 4 20     | 4 14     | 4 08     | 4 03     | 3 57     | 3 50          | 30          |
|               | 40        | 3 10                               | 3 07     | 3 04     | 3 01     | 2 57     | 2 53     | 2 49     | 2 45     | 2 41     | 2 37     | 2 34          | 40          |
|               | 50        | 1 35                               | 1 34     | 1 32     | 1 30     | 1 28     | 1 27     | 1 25     | 1 23     | 1 21     | 1 19     | 1 16          | 50          |
|               | 00        | 0 00                               | 0 00     | 0 00     | 0 00     | 0 00     | 0 00     | 0 00     | 0 00     | 0 00     | 0 00     | 0 00          | 12          |

In North latitude, when the star is rising or East of the meridian, the tabulated azimuths are reckoned from North to East; and when the star is setting or West of the meridian, the tabulated azimuths are reckoned from North to West.

In South latitude, when the star is rising or East of the meridian, the tabulated azimuths are reckoned from South to East; and when the star is setting or West of the meridian, the tabulated azimuths are reckoned from South to West.

When the latitude and declination are of different name, the tables are to be entered with the supplement of the hour angle and the supplement of the tabulated azimuth is to be taken for the required true bearing.

## AZIMUTH OR TRUE BEARING.

| LATITUDE 69°. |           | DECLINATION—SAME NAME AS—LATITUDE. |          |          |          |          |          |          |          |          |          |          |          | LATITUDE 69°. |           |
|---------------|-----------|------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---------------|-----------|
| Hour Angle.   |           | 21°                                | 25°      | 26°      | 27°      | 28°      | 29°      | 30°      | 31°      | 32°      | 33°      | 34°      | 35°      | Hour Angle.   |           |
| <b>h.</b>     | <b>m.</b> | <b>0</b>                           | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>h.</b>     | <b>m.</b> |
| 0             | 00        | 180 00                             | 180 00   | 180 00   | 180 00   | 180 00   | 180 00   | 180 00   | 180 00   | 180 00   | 180 00   | 180 00   | 180 00   | 0             | 00        |
|               | 10        | 176 46                             | 176 44   | 176 43   | 176 40   | 176 38   | 176 36   | 176 33   | 176 31   | 176 29   | 176 26   | 176 23   | 176 20   | 1             | 10        |
|               | 20        | 173 33                             | 173 29   | 173 25   | 173 21   | 173 17   | 173 12   | 173 08   | 173 03   | 172 58   | 172 52   | 172 47   | 172 41   |               | 20        |
|               | 30        | 170 20                             | 170 14   | 170 09   | 170 02   | 169 56   | 169 49   | 169 42   | 169 36   | 169 28   | 169 20   | 169 11   | 169 04   |               | 30        |
|               | 40        | 167 07                             | 167 00   | 166 52   | 166 44   | 166 36   | 166 27   | 166 18   | 166 09   | 165 59   | 165 49   | 165 38   | 165 27   |               | 40        |
|               | 50        | 163 56                             | 163 47   | 163 37   | 163 28   | 163 17   | 163 06   | 162 55   | 162 44   | 162 31   | 162 19   | 162 06   | 161 52   |               | 50        |
| 1             | 00        | 160 47                             | 160 35   | 160 24   | 160 12   | 160 00   | 159 48   | 159 34   | 159 21   | 159 06   | 158 52   | 158 35   | 158 19   | 1             | 00        |
|               | 10        | 157 38                             | 157 26   | 157 13   | 156 59   | 156 45   | 156 30   | 156 15   | 155 59   | 155 43   | 155 26   | 155 08   | 154 49   |               | 10        |
|               | 20        | 154 31                             | 154 17   | 154 03   | 153 48   | 153 31   | 153 15   | 152 58   | 152 40   | 152 22   | 152 03   | 151 43   | 151 22   |               | 20        |
|               | 30        | 151 26                             | 151 11   | 150 54   | 150 37   | 150 20   | 150 02   | 149 44   | 149 24   | 149 04   | 148 43   | 148 21   | 147 57   |               | 30        |
|               | 40        | 148 22                             | 148 06   | 147 48   | 147 30   | 147 11   | 146 52   | 146 32   | 146 10   | 145 48   | 145 26   | 145 02   | 144 37   |               | 40        |
|               | 50        | 145 22                             | 145 04   | 144 45   | 144 26   | 144 05   | 143 45   | 143 23   | 143 00   | 142 36   | 142 13   | 141 47   | 141 20   |               | 50        |
| 2             | 00        | 142 23                             | 142 04   | 141 44   | 141 23   | 141 01   | 140 39   | 140 16   | 139 52   | 139 27   | 139 02   | 138 35   | 138 07   | 2             | 00        |
|               | 10        | 139 27                             | 139 06   | 138 45   | 138 23   | 138 00   | 137 37   | 137 13   | 136 48   | 136 22   | 135 54   | 135 27   | 134 58   |               | 10        |
|               | 20        | 136 32                             | 136 11   | 135 49   | 135 26   | 135 02   | 134 37   | 134 13   | 133 46   | 133 20   | 132 51   | 132 22   | 131 51   |               | 20        |
|               | 30        | 133 39                             | 133 18   | 132 55   | 132 31   | 132 06   | 131 41   | 131 15   | 130 47   | 130 20   | 129 51   | 129 20   | 128 49   |               | 30        |
|               | 40        | 130 50                             | 130 27   | 130 03   | 129 39   | 129 12   | 128 47   | 128 20   | 127 52   | 127 23   | 126 53   | 126 22   | 125 50   |               | 40        |
|               | 50        | 128 03                             | 127 39   | 127 15   | 126 49   | 126 23   | 125 56   | 125 29   | 125 00   | 124 31   | 123 59   | 123 28   | 122 55   |               | 50        |
| 3             | 00        | 125 18                             | 124 54   | 124 28   | 124 02   | 123 35   | 123 06   | 122 39   | 122 10   | 121 41   | 121 09   | 120 37   | 120 03   | 3             | 00        |
|               | 10        | 122 34                             | 122 10   | 121 44   | 121 17   | 120 50   | 120 22   | 119 53   | 119 24   | 118 53   | 118 21   | 117 49   | 117 15   |               | 10        |
|               | 20        | 119 53                             | 119 28   | 119 02   | 118 35   | 118 07   | 117 40   | 117 10   | 116 40   | 116 09   | 115 37   | 115 05   | 114 30   |               | 20        |
|               | 30        | 117 15                             | 116 50   | 116 23   | 115 55   | 115 26   | 114 57   | 114 26   | 113 55   | 113 23   | 112 51   | 112 22   | 111 48   |               | 30        |
|               | 40        | 114 39                             | 114 13   | 113 46   | 113 18   | 112 50   | 112 22   | 111 51   | 111 21   | 110 50   | 110 17   | 109 43   | 109 09   |               | 40        |
|               | 50        | 112 05                             | 111 38   | 111 11   | 110 42   | 110 15   | 109 46   | 109 17   | 108 44   | 108 14   | 107 41   | 107 08   | 106 33   |               | 50        |
| 4             | 00        | 109 32                             | 109 06   | 108 38   | 108 10   | 107 41   | 107 12   | 106 43   | 106 11   | 105 40   | 105 08   | 104 34   | 104 00   | 4             | 00        |
|               | 10        | 107 00                             | 106 34   | 106 07   | 105 39   | 105 10   | 104 41   | 104 11   | 103 40   | 103 08   | 102 36   | 102 03   | 101 29   |               | 10        |
|               | 20        | 104 31                             | 104 05   | 103 38   | 103 10   | 102 40   | 102 12   | 101 42   | 101 11   | 100 40   | 100 07   | 99 34    | 99 00    |               | 20        |
|               | 30        | 102 05                             | 101 38   | 101 10   | 100 43   | 100 13   | 99 45    | 99 14    | 98 43    | 98 13    | 97 41    | 97 08    | 96 34    |               | 30        |
|               | 40        | 99 39                              | 99 13    | 98 45    | 98 17    | 97 48    | 97 20    | 96 50    | 96 19    | 95 48    | 95 16    | 94 43    | 94 10    |               | 40        |
|               | 50        | 97 14                              | 96 48    | 96 21    | 95 53    | 95 24    | 94 56    | 94 26    | 93 55    | 93 25    | 92 53    | 92 21    | 91 48    |               | 50        |
| 5             | 00        | 94 51                              | 94 25    | 93 58    | 93 30    | 93 01    | 92 33    | 92 04    | 91 33    | 91 03    | 90 32    | 89 59    | 89 27    | 5             | 00        |
|               | 10        | 92 29                              | 92 03    | 91 36    | 91 09    | 90 40    | 90 13    | 89 43    | 89 13    | 88 43    | 88 11    | 87 41    | 87 06    |               | 10        |
|               | 20        | 90 09                              | 89 43    | 89 16    | 88 49    | 88 20    | 87 52    | 87 24    | 86 54    | 86 25    | 85 54    | 85 23    | 84 52    |               | 20        |
|               | 30        | 87 49                              | 87 24    | 86 56    | 86 30    | 86 01    | 85 34    | 85 06    | 84 36    | 84 06    | 83 37    | 83 07    | 82 35    |               | 30        |
|               | 40        | 85 30                              | 85 05    | 84 38    | 84 11    | 83 44    | 83 17    | 82 49    | 82 19    | 81 52    | 81 21    | 80 51    | 80 21    |               | 40        |
|               | 50        | 83 13                              | 82 48    | 82 22    | 81 56    | 81 28    | 81 02    | 80 34    | 80 05    | 79 37    | 79 07    | 78 38    | 78 07    |               | 50        |
| 6             | 00        | 80 56                              | 80 31    | 80 06    | 79 39    | 79 12    | 78 46    | 78 18    | 77 50    | 77 23    | 76 54    | 76 25    | 75 55    | 6             | 00        |
|               | 10        | 78 39                              | 78 15    | 77 50    | 77 23    | 76 57    | 76 31    | 76 05    | 75 37    | 75 10    | 74 41    | 74 13    | 73 44    |               | 10        |
|               | 20        | 76 25                              | 76 00    | 75 35    | 75 10    | 74 44    | 74 18    | 73 53    | 73 25    | 72 58    | 72 31    | 72 03    | 71 34    |               | 20        |
|               | 30        | 74 09                              | 73 45    | 73 21    | 72 56    | 72 30    | 72 05    | 71 39    | 71 13    | 70 43    | 70 19    | 69 52    | 69 24    |               | 30        |
|               | 40        | 71 54                              | 71 31    | 71 08    | 70 43    | 70 18    | 69 53    | 69 28    | 69 01    | 68 36    | 68 10    | 67 42    | 67 14    |               | 40        |
|               | 50        | 69 41                              | 69 17    | 68 54    | 68 30    | 68 05    | 67 42    | 67 16    | 66 51    | 66 26    | 66 00    | 65 33    | 65 07    |               | 50        |
| 7             | 00        | 67 26                              | 67 04    | 66 41    | 66 17    | 65 53    | 65 30    | 65 06    | 64 41    | 64 17    | 63 51    | 63 25    | 62 59    | 7             | 00        |
|               | 10        | 65 12                              | 64 51    | 64 28    | 64 05    | 63 42    | 63 18    | 62 55    | 62 31    | 62 06    | 61 42    | 61 17    | 60 52    |               | 10        |
|               | 20        | 62 59                              | 62 38    | 62 16    | 61 53    | 61 30    | 61 06    | 60 45    | 60 21    | 59 58    | 59 33    | 59 09    | 58 45    |               | 20        |
|               | 30        | 60 47                              | 60 25    | 60 05    | 59 42    | 59 20    | 58 59    | 58 35    | 58 13    | 57 50    | 57 26    | 57 02    | 56 38    |               | 30        |
|               | 40        | 58 33                              | 58 13    | 57 52    | 57 30    | 57 09    | 56 48    | 56 25    | 56 04    | 55 42    | 55 19    | 54 56    | 54 33    |               | 40        |
|               | 50        | 56 21                              | 56 01    | 55 40    | 55 19    | 54 59    | 54 38    | 54 17    | 53 55    | 53 34    | 53 12    | 52 49    | 52 27    |               | 50        |
| 8             | 00        | 54 07                              | 53 48    | 53 28    | 53 08    | 52 48    | 52 27    | 52 07    | 51 46    | 51 26    | 51 04    | 50 43    | 50 21    | 8             | 00        |
|               | 10        | 51 55                              | 51 35    | 51 17    | 50 57    | 50 37    | 50 18    | 49 58    | 49 38    | 49 18    | 48 58    | 48 37    | 48 16    |               | 10        |
|               | 20        | 49 41                              | 49 24    | 49 04    | 48 46    | 48 27    | 48 08    | 47 49    | 47 29    | 47 11    | 46 50    | 46 31    | 46 10    |               | 20        |
|               | 30        | 47 28                              | 47 10    | 46 53    | 46 35    | 46 16    | 45 58    | 45 40    | 45 21    | 45 02    | 44 44    | 44 24    | 44 05    |               | 30        |
|               | 40        | 45 14                              | 44 58    | 44 41    | 44 23    | 44 06    | 43 48    | 43 31    | 43 12    | 42 55    | 42 37    | 42 19    | 42 00    |               | 40        |
|               | 50        | 43 01                              | 42 45    | 42 29    | 42 12    | 41 54    | 41 38    | 41 22    | 41 04    | 40 47    | 40 30    | 40 12    | 39 54    |               | 50        |
| 9             | 00        | 40 47                              | 40 31    | 40 16    | 39 59    | 39 44    | 39 28    | 39 12    | 38 56    | 38 39    | 38 23    | 38 06    | 37 49    | 9             | 00        |
|               | 10        | 38 33                              | 38 18    | 38 04    | 37 48    | 37 33    | 37 18    | 37 02    | 36 46    | 36 32    | 36 16    | 35 59    | 35 44    |               | 10        |
|               | 20        | 36 18                              | 36 04    | 35 50    | 35 36    | 35 22    | 35 08    | 34 53    | 34 39    | 34 24    | 34 09    | 33 53    | 33 38    |               | 20        |
|               | 30        | 34 04                              | 33 51    | 33 38    | 33 24    | 33 10    | 32 57    | 32 43    | 32 29    | 32 16    | 32 02    | 31 48    | 31 32    |               | 30        |
|               | 40        | 31 49                              | 31 36    | 31 24    | 31 11    | 30 59    | 30 46    | 30 33    | 30 20    | 30 07    | 29 54    | 29 41    | 29 27    |               | 40        |
|               | 50        | 29 34                              | 29 23    | 29 11    | 28 59    | 28 47    | 28 36    | 28 23    | 28 11    | 27 59    | 27 47    | 27 34    | 27 22    |               | 50        |
| 10            | 00        | 27 19                              | 27 08    | 26 57    | 26 46    | 26 36    | 26 24    | 26 14    | 26 02    | 25 51    | 25 39    | 25 28    | 25 16    | 10            | 00        |
|               | 10        | 25 03                              | 24 53    | 24 44    | 24 33    | 24 23    | 24 13    | 24 02    | 23 52    | 23 42    | 23 31    | 23 20    | 23 10    |               | 10        |
|               | 20        | 22 48                              | 22 39    | 22 30    | 22 20    | 22 11    | 22 02    | 21 52    | 21 42    | 21 34    | 21 24    | 21 14    | 21 05    |               | 20        |
|               | 30        | 20 32                              | 20 23    | 20 16    | 20 07    | 19 58    | 19 50    | 19 41    | 19 33    | 19 24    | 19 16    | 19 07    | 18 58    |               | 30        |
|               | 40        | 18 15                              | 18 08    | 18 01    | 17 53    | 17 45    | 17 38    | 17 31    | 17 23    | 17 16    | 17 08    | 17 00    | 16 52    |               | 40        |
|               | 50        | 15 58                              | 15 53    | 15 46    | 15 40    | 15 33    | 15 26    | 15 19    | 15 12    | 15 06    | 14 59    | 14 52    | 14 46    |               | 50        |
| 11            | 00        | 13 42                              | 13 37    | 13 31    | 13 25    | 13 20    | 13 15    | 13 08    | 13 03    | 12 56    | 12 51    | 12 45    | 12 40    | 11            | 00        |
|               | 10        | 11 25                              | 11 21    | 11 16    | 11 11    | 11 07    | 11 02    | 10 57    | 10 52    | 10 48    | 10 43    | 10 38    | 10 33    |               | 10        |
|               | 20        | 9 08                               | 9 05     | 9 01     | 8 57     | 8 54     | 8 50     | 8 46     | 8 42     | 8 38     | 8 35     | 8 30     | 8 27     |               | 20        |
|               | 30        | 6 51                               | 6 49     | 6 46     | 6 43     | 6 40     | 6 37     | 6 35     | 6 31     | 6 28     | 6 26     | 6 23     | 6 20     |               | 30        |
|               | 40        | 4 34                               | 4 32     | 4 30     | 4 28     | 4 27     | 4 25     | 4 23     | 4 21     | 4 19     | 4 18     | 4 15     | 4 13     |               | 40        |
|               | 50        | 2 18                               | 2 16     | 2 16     | 2 14     | 2 14     | 2 12     | 2 11     | 2 11     | 2 09     | 2 09     | 2 07     | 2 07     |               | 50        |
|               | 00        | 0 00                               | 0 00     | 0 00     | 0 00     | 0 00     | 0 00     | 0 00     | 0 00     | 0 00     | 0 00     | 0 00     | 0 00     | 12            | 00        |

In North latitude, when the star is rising or East of the meridian, the tabulated azimuths are reckoned from North to East; and when the star is setting or West of the meridian, the tabulated azimuths are reckoned from North to West.

In South latitude, when the star is rising or East of the meridian, the tabulated azimuths are reckoned from South to East; and when the star is setting or West of the meridian, the tabulated azimuths are reckoned from South to West.

When the latitude and declination are of different name, the tables are to be entered with the supplement of the hour angle and the supplement of the tabulated azimuth is to be taken for the required true bearing.

In North latitude, when the star is rising or East of the meridian, the tabulated azimuths are reckoned from North to East; and when the star is setting or West of the meridian, the tabulated azimuths are reckoned from North to West.

In South latitude, when the star is rising or East of the meridian, the tabulated azimuths are reckoned from South to East; and when the star is setting or West of the meridian, the tabulated azimuths are reckoned from South to West.

When the latitude and declination are of different name, the tables are to be entered with the supplement of the hour angle and the supplement of the tabulated azimuth is to be taken for the required true bearing.

In North latitude, when the star is rising or East of the meridian, the tabulated azimuths are reckoned from North to East; and when the star is setting or West of the meridian, the tabulated azimuths are reckoned from North to West.

In South latitude, when the star is rising or East of the meridian, the tabulated azimuths are reckoned from South to East; and when the star is setting or West of the meridian, the tabulated azimuths are reckoned from South to West.

When the latitude and declination are of different names the tables are to be entered with the supplement of the hour angle and the supplement of the tabulated azimuth is to be taken for the required true bearing.

## AZIMUTH OR TRUE BEARING.

| LATITUDE 69°. |           | DECLINATION—SAME NAME AS—LATITUDE. |          |          |          |          |          |          |          |          |          | LATITUDE 69°. |             |
|---------------|-----------|------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---------------|-------------|
| Hour Angle.   |           | 60°                                | 61°      | 62°      | 63°      | 64°      | 65°      | 66°      | 67°      | 68°      | 69°      | 70°           | Hour Angle. |
| <b>h.</b>     | <b>m.</b> | <b>o</b>                           | <b>o</b> | <b>o</b> | <b>o</b> | <b>o</b> | <b>o</b> | <b>o</b> | <b>o</b> | <b>o</b> | <b>o</b> | <b>o</b>      | <b>h.</b>   |
| 0             | 00        | 180 00                             | 180 00   | 180 00   | 180 00   | 180 00   | 180 00   | 180 00   | 180 00   | 180 00   | 180 00   | 0 00          | 0           |
|               | 10        | 172 02                             | 171 20   | 170 26   | 169 13   | 167 34   | 165 07   | 161 09   | 153 44   | 136 19   | 88 50    | 40 03         | 1           |
|               | 20        | 164 16                             | 162 55   | 161 12   | 158 58   | 155 57   | 151 39   | 145 08   | 134 33   | 116 16   | 87 40    | 57 56         | 2           |
|               | 30        | 156 49                             | 154 58   | 152 35   | 149 35   | 145 37   | 140 17   | 132 46   | 121 56   | 106 29   | 86 30    | 65 40         | 3           |
|               | 40        | 149 49                             | 147 31   | 144 43   | 141 12   | 136 45   | 130 59   | 123 24   | 113 24   | 100 34   | 85 20    | 69 25         | 4           |
|               | 50        | 143 20                             | 140 45   | 137 39   | 133 53   | 129 14   | 123 26   | 116 12   | 107 15   | 96 27    | 84 10    | 71 20         | 5           |
| 1             | 00        | 137 21                             | 134 37   | 131 21   | 127 29   | 122 51   | 117 14   | 110 31   | 102 31   | 93 16    | 83 00    | 72 15         | 1           |
|               | 10        | 131 53                             | 129 02   | 125 45   | 121 53   | 117 21   | 112 03   | 105 52   | 98 43    | 90 39    | 81 49    | 72 36         | 2           |
|               | 20        | 126 53                             | 124 01   | 120 44   | 116 57   | 112 37   | 107 39   | 101 57   | 95 31    | 88 22    | 80 39    | 72 34         | 3           |
|               | 30        | 122 16                             | 119 26   | 116 13   | 112 35   | 108 27   | 103 48   | 98 34    | 92 44    | 86 20    | 79 29    | 72 19         | 4           |
|               | 40        | 118 04                             | 115 17   | 112 09   | 108 40   | 104 46   | 100 23   | 95 34    | 90 15    | 84 29    | 78 18    | 71 51         | 5           |
|               | 50        | 114 12                             | 111 28   | 108 28   | 105 07   | 101 26   | 97 21    | 92 53    | 88 00    | 82 43    | 77 08    | 71 16         |             |
| 2             | 00        | 110 35                             | 107 57   | 105 03   | 101 53   | 98 23    | 94 34    | 90 25    | 85 55    | 81 05    | 75 57    | 70 36         | 2           |
|               | 10        | 107 14                             | 104 42   | 101 55   | 98 53    | 95 35    | 92 00    | 88 08    | 83 57    | 79 30    | 74 47    | 69 51         | 3           |
|               | 20        | 104 05                             | 101 39   | 99 00    | 96 07    | 93 00    | 89 37    | 86 00    | 82 06    | 77 58    | 73 36    | 69 02         | 4           |
|               | 30        | 101 09                             | 98 47    | 96 15    | 93 31    | 90 34    | 87 22    | 83 59    | 80 20    | 76 29    | 72 25    | 68 10         | 5           |
|               | 40        | 98 22                              | 96 06    | 93 40    | 91 03    | 88 15    | 85 15    | 82 04    | 78 39    | 75 02    | 71 14    | 67 15         |             |
|               | 50        | 95 42                              | 93 32    | 91 13    | 88 44    | 86 04    | 83 14    | 80 13    | 77 00    | 73 37    | 70 03    | 66 19         |             |
| 3             | 00        | 93 12                              | 91 07    | 88 53    | 86 31    | 83 59    | 81 17    | 78 26    | 75 24    | 72 12    | 68 51    | 65 21         | 3           |
|               | 10        | 90 47                              | 88 46    | 86 39    | 84 22    | 81 58    | 79 24    | 76 42    | 73 51    | 70 50    | 67 40    | 64 22         | 4           |
|               | 20        | 88 28                              | 86 32    | 84 29    | 82 20    | 80 02    | 77 36    | 75 02    | 72 19    | 69 28    | 66 28    | 63 20         | 5           |
|               | 30        | 86 13                              | 84 22    | 82 25    | 80 20    | 78 09    | 75 50    | 73 24    | 70 49    | 68 07    | 65 17    | 62 18         |             |
|               | 40        | 84 03                              | 82 17    | 80 24    | 78 25    | 76 20    | 74 07    | 71 48    | 69 21    | 66 46    | 64 05    | 61 16         |             |
|               | 50        | 81 57                              | 80 15    | 78 27    | 76 33    | 74 33    | 72 26    | 70 13    | 67 53    | 65 26    | 62 53    | 60 12         |             |
| 4             | 00        | 79 55                              | 78 17    | 76 33    | 74 44    | 72 49    | 70 48    | 68 40    | 66 27    | 64 07    | 61 40    | 59 08         | 4           |
|               | 10        | 77 56                              | 76 21    | 74 41    | 72 56    | 71 06    | 69 10    | 67 09    | 65 01    | 62 48    | 60 28    | 58 02         | 5           |
|               | 20        | 76 00                              | 74 27    | 72 52    | 71 11    | 69 25    | 67 35    | 65 39    | 63 36    | 61 28    | 59 15    | 56 56         |             |
|               | 30        | 74 05                              | 72 37    | 71 05    | 69 28    | 67 47    | 66 00    | 64 09    | 62 12    | 60 10    | 58 02    | 55 49         |             |
|               | 40        | 72 13                              | 70 48    | 69 20    | 67 47    | 66 09    | 64 27    | 62 41    | 60 48    | 58 52    | 56 50    | 54 42         |             |
|               | 50        | 70 23                              | 69 01    | 67 36    | 66 06    | 64 33    | 62 55    | 61 13    | 59 25    | 57 34    | 55 36    | 53 35         |             |
| 5             | 00        | 68 34                              | 67 15    | 65 54    | 64 27    | 62 57    | 61 23    | 59 46    | 58 02    | 56 15    | 54 23    | 52 26         | 5           |
|               | 10        | 66 47                              | 65 31    | 64 13    | 62 50    | 61 23    | 59 53    | 58 18    | 56 39    | 54 57    | 53 09    | 51 17         |             |
|               | 20        | 65 02                              | 63 49    | 62 32    | 61 13    | 59 50    | 58 23    | 56 53    | 55 18    | 53 39    | 51 55    | 50 08         |             |
|               | 30        | 63 17                              | 62 07    | 60 54    | 59 37    | 58 17    | 56 53    | 55 27    | 53 55    | 52 20    | 50 41    | 48 58         |             |
|               | 40        | 61 34                              | 60 26    | 59 15    | 58 02    | 56 44    | 55 21    | 54 00    | 52 33    | 51 02    | 49 27    | 47 48         |             |
|               | 50        | 59 52                              | 58 46    | 57 37    | 56 27    | 55 13    | 53 56    | 52 35    | 51 11    | 49 44    | 48 13    | 46 38         |             |
| 6             | 00        | 58 11                              | 57 06    | 56 02    | 54 53    | 53 42    | 52 27    | 51 11    | 49 49    | 48 26    | 46 58    | 45 26         | 6           |
|               | 10        | 56 30                              | 55 28    | 54 25    | 53 19    | 52 11    | 50 59    | 49 46    | 48 27    | 47 07    | 45 43    | 44 15         |             |
|               | 20        | 54 50                              | 53 51    | 52 50    | 51 47    | 50 40    | 49 32    | 48 21    | 47 06    | 45 49    | 44 28    | 43 04         |             |
|               | 30        | 53 10                              | 52 13    | 51 15    | 50 14    | 49 11    | 48 05    | 46 56    | 45 44    | 44 30    | 43 12    | 41 52         |             |
|               | 40        | 51 32                              | 50 36    | 49 41    | 48 42    | 47 41    | 46 37    | 45 31    | 44 22    | 43 12    | 41 57    | 40 39         |             |
|               | 50        | 49 53                              | 49 00    | 48 06    | 47 10    | 46 11    | 45 10    | 44 08    | 43 00    | 41 53    | 40 41    | 39 26         |             |
| 7             | 00        | 48 15                              | 47 24    | 46 32    | 45 38    | 44 42    | 43 43    | 42 42    | 41 39    | 40 34    | 39 28    | 38 13         | 7           |
|               | 10        | 46 37                              | 45 48    | 44 59    | 44 06    | 43 12    | 42 16    | 41 18    | 40 17    | 39 14    | 38 08    | 37 00         |             |
|               | 20        | 44 59                              | 44 13    | 43 25    | 42 35    | 41 43    | 40 49    | 39 54    | 38 55    | 37 55    | 36 52    | 35 47         |             |
|               | 30        | 43 23                              | 42 38    | 41 51    | 41 04    | 40 14    | 39 23    | 38 29    | 37 33    | 36 36    | 35 35    | 34 33         |             |
|               | 40        | 41 45                              | 41 02    | 40 19    | 39 32    | 38 45    | 37 55    | 37 05    | 36 11    | 35 16    | 34 18    | 33 18         |             |
|               | 50        | 40 09                              | 39 27    | 38 45    | 38 02    | 37 16    | 36 29    | 35 41    | 34 49    | 33 57    | 33 01    | 32 04         |             |
| 8             | 00        | 38 31                              | 37 53    | 37 12    | 36 30    | 35 47    | 35 02    | 34 16    | 33 26    | 32 36    | 31 44    | 30 50         | 8           |
|               | 10        | 36 56                              | 36 18    | 35 40    | 34 59    | 34 18    | 33 35    | 32 51    | 32 04    | 31 17    | 30 28    | 29 35         |             |
|               | 20        | 35 19                              | 34 44    | 34 07    | 33 29    | 32 50    | 32 08    | 31 26    | 30 41    | 29 57    | 29 09    | 28 19         |             |
|               | 30        | 33 43                              | 33 08    | 32 34    | 31 58    | 31 20    | 30 41    | 30 01    | 29 19    | 28 36    | 27 51    | 27 04         |             |
|               | 40        | 32 06                              | 31 34    | 31 02    | 30 27    | 29 51    | 29 14    | 28 37    | 27 57    | 27 15    | 26 32    | 25 48         |             |
|               | 50        | 30 30                              | 29 59    | 29 28    | 28 55    | 28 22    | 27 47    | 27 11    | 26 34    | 25 55    | 25 14    | 24 32         |             |
| 9             | 00        | 28 54                              | 28 25    | 27 55    | 27 25    | 26 53    | 26 20    | 25 46    | 25 10    | 24 34    | 23 55    | 23 15         | 9           |
|               | 10        | 27 18                              | 26 50    | 26 23    | 25 54    | 25 24    | 24 52    | 24 20    | 23 47    | 23 13    | 22 37    | 22 00         |             |
|               | 20        | 25 42                              | 25 16    | 24 50    | 24 23    | 23 55    | 23 26    | 22 56    | 22 24    | 21 52    | 21 18    | 20 43         |             |
|               | 30        | 24 05                              | 23 41    | 23 17    | 22 52    | 22 26    | 21 58    | 21 30    | 21 00    | 20 31    | 19 59    | 19 26         |             |
|               | 40        | 22 29                              | 22 07    | 21 45    | 21 21    | 20 56    | 20 31    | 20 04    | 19 36    | 19 09    | 18 40    | 18 09         |             |
|               | 50        | 20 53                              | 20 32    | 20 11    | 19 49    | 19 27    | 19 03    | 18 38    | 18 14    | 17 48    | 17 20    | 16 52         |             |
| 10            | 00        | 19 17                              | 18 58    | 18 39    | 18 18    | 17 57    | 17 35    | 17 13    | 16 50    | 16 26    | 16 01    | 15 35         | 10          |
|               | 10        | 17 40                              | 17 23    | 17 05    | 16 47    | 16 27    | 16 08    | 15 48    | 15 26    | 15 04    | 14 41    | 14 17         |             |
|               | 20        | 16 05                              | 15 49    | 15 32    | 15 15    | 14 58    | 14 40    | 14 22    | 14 03    | 13 42    | 13 22    | 13 00         |             |
|               | 30        | 14 29                              | 14 14    | 14 00    | 13 44    | 13 29    | 13 13    | 12 56    | 12 38    | 12 20    | 12 02    | 11 42         |             |
|               | 40        | 12 51                              | 12 39    | 12 26    | 12 13    | 11 58    | 11 44    | 11 30    | 11 14    | 10 58    | 10 42    | 10 25         |             |
|               | 50        | 11 15                              | 11 04    | 10 53    | 10 41    | 10 29    | 10 16    | 10 03    | 9 50     | 9 37     | 9 22     | 9 07          |             |
| 11            | 00        | 9 38                               | 9 30     | 9 20     | 9 09     | 8 59     | 8 48     | 8 37     | 8 26     | 8 14     | 8 02     | 7 49          | 11          |
|               | 10        | 8 03                               | 7 54     | 7 46     | 7 36     | 7 29     | 7 21     | 7 12     | 7 02     | 6 52     | 6 41     | 6 31          |             |
|               | 20        | 6 28                               | 6 20     | 6 13     | 6 07     | 6 00     | 5 53     | 5 46     | 5 37     | 5 29     | 5 21     | 5 12          |             |
|               | 30        | 4 49                               | 4 45     | 4 40     | 4 35     | 4 30     | 4 24     | 4 19     | 4 14     | 4 07     | 4 01     | 3 54          |             |
|               | 40        | 3 13                               | 3 10     | 3 07     | 3 03     | 2 59     | 2 56     | 2 52     | 2 49     | 2 45     | 2 41     | 2 36          |             |
|               | 50        | 1 37                               | 1 35     | 1 33     | 1 32     | 1 30     | 1 28     | 1 26     | 1 25     | 1 23     | 1 20     | 1 18          |             |
|               | 00        | 0 00                               | 0 00     | 0 00     | 0 00     | 0 00     | 0 00     | 0 00     | 0 00     | 0 00     | 0 00     | 0 00          | 12          |

In North latitude, when the star is rising or East of the meridian, the tabulated azimuths are reckoned from North to East; and when the star is setting or West of the meridian, the tabulated azimuths are reckoned from North to West.

In South latitude, when the star is rising or East of the meridian, the tabulated azimuths are reckoned from South to East; and when the star is setting or West of the meridian, the tabulated azimuths are reckoned from South to West.

When the latitude and declination are of different name, the tables are to be entered with the supplement of the hour angle and the supplement of the tabulated azimuth is to be taken for the required true bearing.

## AZIMUTH OR TRUE BEARING.

| LATITUDE 70°. |    | DECLINATION—SAME NAME AS—LATITUDE. |        |        |        |        |        |        |        |        |        |        |        | LATITUDE 70°. |    |
|---------------|----|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------------|----|
| Hour Angle.   |    | 24°                                | 25°    | 26°    | 27°    | 28°    | 29°    | 30°    | 31°    | 32°    | 33°    | 34°    | 35°    | Hour Angle.   |    |
| h.            | m. | °                                  | °      | °      | °      | °      | °      | °      | °      | °      | °      | °      | °      | h.            | m. |
|               | 0  | 00                                 | 00     | 00     | 00     | 00     | 00     | 00     | 00     | 00     | 00     | 00     | 00     |               | 00 |
|               | 10 | 176 49                             | 176 48 | 176 46 | 176 44 | 176 42 | 176 40 | 176 38 | 176 36 | 176 33 | 176 31 | 176 29 | 176 26 |               | 10 |
|               | 20 | 173 40                             | 173 38 | 173 35 | 173 32 | 173 29 | 173 27 | 173 24 | 173 21 | 173 17 | 173 14 | 173 11 | 172 52 |               | 20 |
|               | 30 | 170 29                             | 170 24 | 170 19 | 170 14 | 170 08 | 170 02 | 169 56 | 169 49 | 169 42 | 169 34 | 169 27 | 169 20 |               | 30 |
|               | 40 | 167 20                             | 167 13 | 167 06 | 166 59 | 166 51 | 166 43 | 166 35 | 166 26 | 166 17 | 166 08 | 165 58 | 165 47 |               | 40 |
|               | 50 | 164 13                             | 164 04 | 163 55 | 163 46 | 163 36 | 163 26 | 163 16 | 163 05 | 162 54 | 162 43 | 162 31 | 162 18 |               | 50 |
| 1             | 00 | 161 06                             | 160 55 | 160 45 | 160 34 | 160 23 | 160 11 | 159 58 | 159 46 | 159 33 | 159 19 | 159 05 | 158 50 | 1             | 00 |
|               | 10 | 158 00                             | 157 48 | 157 36 | 157 23 | 157 10 | 156 57 | 156 43 | 156 28 | 156 13 | 155 58 | 155 41 | 155 24 |               | 10 |
|               | 20 | 154 56                             | 154 42 | 154 28 | 154 14 | 154 00 | 153 45 | 153 29 | 153 13 | 152 56 | 152 38 | 152 20 | 152 00 |               | 20 |
|               | 30 | 151 52                             | 151 37 | 151 22 | 151 07 | 150 51 | 150 34 | 150 17 | 150 00 | 149 41 | 149 22 | 149 01 | 148 40 |               | 30 |
|               | 40 | 148 50                             | 148 35 | 148 19 | 148 02 | 147 45 | 147 27 | 147 08 | 146 48 | 146 28 | 146 08 | 145 46 | 145 23 |               | 40 |
|               | 50 | 145 52                             | 145 35 | 145 18 | 144 59 | 144 41 | 144 21 | 144 01 | 143 41 | 143 19 | 142 57 | 142 33 | 142 09 |               | 50 |
| 2             | 00 | 142 55                             | 142 37 | 142 18 | 141 59 | 141 39 | 141 19 | 140 57 | 140 35 | 140 12 | 139 48 | 139 23 | 138 57 | 2             | 00 |
|               | 10 | 140 00                             | 139 40 | 139 21 | 139 01 | 138 40 | 138 17 | 137 55 | 137 33 | 137 08 | 136 43 | 136 17 | 135 50 |               | 10 |
|               | 20 | 137 07                             | 136 47 | 136 26 | 136 05 | 135 42 | 135 20 | 134 56 | 134 32 | 134 07 | 133 41 | 133 14 | 132 45 |               | 20 |
|               | 30 | 134 15                             | 133 55 | 133 33 | 133 11 | 132 48 | 132 25 | 132 00 | 131 35 | 131 08 | 130 41 | 130 13 | 129 44 |               | 30 |
|               | 40 | 131 26                             | 131 04 | 130 42 | 130 19 | 129 55 | 129 31 | 129 06 | 128 40 | 128 13 | 127 45 | 127 16 | 126 46 |               | 40 |
|               | 50 | 128 40                             | 128 18 | 127 54 | 127 30 | 127 06 | 126 41 | 126 15 | 125 48 | 125 21 | 124 53 | 124 23 | 123 51 |               | 50 |
| 3             | 00 | 125 55                             | 125 32 | 125 08 | 124 44 | 124 19 | 123 53 | 123 26 | 122 59 | 122 31 | 122 03 | 121 32 | 121 00 | 3             | 00 |
|               | 10 | 123 12                             | 122 48 | 122 24 | 122 00 | 121 34 | 121 08 | 120 41 | 120 13 | 119 44 | 119 15 | 118 44 | 118 12 |               | 10 |
|               | 20 | 120 31                             | 120 07 | 119 42 | 119 17 | 118 52 | 118 25 | 117 57 | 117 29 | 117 00 | 116 30 | 115 59 | 115 27 |               | 20 |
|               | 30 | 117 53                             | 117 28 | 117 04 | 116 38 | 116 11 | 115 44 | 115 16 | 114 48 | 114 18 | 113 48 | 113 17 | 112 45 |               | 30 |
|               | 40 | 115 16                             | 114 51 | 114 26 | 114 00 | 113 34 | 113 07 | 112 38 | 112 09 | 111 39 | 111 09 | 110 37 | 110 05 |               | 40 |
|               | 50 | 112 41                             | 112 16 | 111 51 | 111 24 | 110 57 | 110 30 | 110 01 | 109 33 | 109 03 | 108 32 | 108 00 | 107 28 |               | 50 |
| 4             | 00 | 110 09                             | 109 43 | 109 17 | 108 50 | 108 24 | 107 57 | 107 28 | 106 59 | 106 29 | 105 58 | 105 26 | 104 54 | 4             | 00 |
|               | 10 | 107 36                             | 107 11 | 106 46 | 106 19 | 105 51 | 105 23 | 104 56 | 104 27 | 103 56 | 103 26 | 102 54 | 102 22 |               | 10 |
|               | 20 | 105 07                             | 104 41 | 104 16 | 103 49 | 103 22 | 102 54 | 102 25 | 101 56 | 101 26 | 100 56 | 100 24 | 99 51  |               | 20 |
|               | 30 | 102 39                             | 102 13 | 101 47 | 101 20 | 100 53 | 100 26 | 99 57  | 99 28  | 98 59  | 98 29  | 97 57  | 97 24  |               | 30 |
|               | 40 | 100 13                             | 99 46  | 99 21  | 98 54  | 98 27  | 97 59  | 97 31  | 97 03  | 96 33  | 96 03  | 95 31  | 94 59  |               | 40 |
|               | 50 | 97 47                              | 97 21  | 96 56  | 96 29  | 96 02  | 95 34  | 95 06  | 94 38  | 94 08  | 93 39  | 93 07  | 92 35  |               | 50 |
| 5             | 00 | 95 23                              | 94 57  | 94 31  | 94 05  | 93 38  | 93 11  | 92 42  | 92 14  | 91 45  | 91 16  | 90 45  | 90 13  | 5             | 00 |
|               | 10 | 93 00                              | 92 35  | 92 09  | 91 42  | 91 15  | 90 49  | 90 21  | 89 53  | 89 23  | 88 54  | 88 24  | 87 53  |               | 10 |
|               | 20 | 90 39                              | 90 13  | 89 48  | 89 21  | 88 55  | 88 28  | 88 01  | 87 33  | 87 04  | 86 35  | 86 05  | 85 34  |               | 20 |
|               | 30 | 88 17                              | 87 52  | 87 27  | 87 01  | 86 35  | 86 08  | 85 41  | 85 13  | 84 45  | 84 17  | 83 47  | 83 16  |               | 30 |
|               | 40 | 85 57                              | 85 32  | 85 07  | 84 42  | 84 16  | 83 49  | 83 22  | 82 55  | 82 27  | 81 59  | 81 30  | 81 00  |               | 40 |
|               | 50 | 83 39                              | 83 15  | 82 49  | 82 24  | 81 59  | 81 33  | 81 06  | 80 39  | 80 11  | 79 44  | 79 15  | 78 46  |               | 50 |
| 6             | 00 | 81 21                              | 80 57  | 80 32  | 80 07  | 79 42  | 79 16  | 78 50  | 78 24  | 77 56  | 77 30  | 77 01  | 76 32  | 6             | 00 |
|               | 10 | 79 02                              | 78 39  | 78 15  | 77 50  | 77 25  | 77 00  | 76 35  | 76 09  | 75 42  | 75 15  | 74 47  | 74 18  |               | 10 |
|               | 20 | 76 47                              | 76 23  | 76 00  | 75 35  | 75 11  | 74 46  | 74 21  | 73 55  | 73 29  | 73 02  | 72 35  | 72 07  |               | 20 |
|               | 30 | 74 30                              | 74 07  | 73 44  | 73 20  | 72 56  | 72 32  | 72 06  | 71 41  | 71 16  | 70 50  | 70 24  | 69 56  |               | 30 |
|               | 40 | 72 14                              | 71 51  | 71 29  | 71 05  | 70 41  | 70 18  | 69 53  | 69 28  | 68 59  | 68 33  | 68 07  | 67 46  |               | 40 |
|               | 50 | 69 59                              | 69 37  | 69 14  | 68 51  | 68 28  | 68 05  | 67 41  | 67 17  | 66 52  | 66 28  | 66 02  | 65 36  |               | 50 |
| 7             | 00 | 67 44                              | 67 22  | 67 00  | 66 38  | 66 15  | 65 52  | 65 29  | 65 05  | 64 41  | 64 17  | 63 52  | 63 27  | 7             | 00 |
|               | 10 | 65 29                              | 65 08  | 64 46  | 64 24  | 64 02  | 63 39  | 63 16  | 62 53  | 62 29  | 62 04  | 61 42  | 61 17  |               | 10 |
|               | 20 | 63 14                              | 62 54  | 62 32  | 62 11  | 61 50  | 61 28  | 61 05  | 60 43  | 60 20  | 59 58  | 59 34  | 59 10  |               | 20 |
|               | 30 | 61 01                              | 60 40  | 60 20  | 60 00  | 59 39  | 59 18  | 58 54  | 58 33  | 58 11  | 57 49  | 57 26  | 57 02  |               | 30 |
|               | 40 | 58 47                              | 58 26  | 58 06  | 57 46  | 57 26  | 57 06  | 56 44  | 56 22  | 56 01  | 55 40  | 55 17  | 54 55  |               | 40 |
|               | 50 | 56 32                              | 56 13  | 55 54  | 55 34  | 55 14  | 54 54  | 54 34  | 54 13  | 53 53  | 53 31  | 53 10  | 52 48  |               | 50 |
| 8             | 00 | 54 18                              | 53 59  | 53 41  | 53 22  | 53 02  | 52 43  | 52 23  | 52 03  | 51 43  | 51 23  | 51 02  | 50 40  | 8             | 00 |
|               | 10 | 52 05                              | 51 47  | 51 29  | 51 10  | 50 51  | 50 32  | 50 13  | 49 54  | 49 35  | 49 15  | 48 55  | 48 34  |               | 10 |
|               | 20 | 49 50                              | 49 33  | 49 15  | 48 57  | 48 39  | 48 21  | 48 03  | 47 44  | 47 25  | 47 07  | 46 48  | 46 27  |               | 20 |
|               | 30 | 47 37                              | 47 19  | 47 02  | 46 45  | 46 28  | 46 11  | 45 53  | 45 35  | 45 17  | 44 59  | 44 40  | 44 22  |               | 30 |
|               | 40 | 45 23                              | 45 06  | 44 50  | 44 33  | 44 16  | 43 59  | 43 42  | 43 25  | 43 08  | 42 51  | 42 33  | 42 14  |               | 40 |
|               | 50 | 43 08                              | 42 52  | 42 36  | 42 21  | 42 05  | 41 49  | 41 32  | 41 16  | 40 59  | 40 43  | 40 25  | 40 09  |               | 50 |
| 9             | 00 | 40 53                              | 40 38  | 40 23  | 40 06  | 39 53  | 39 37  | 39 22  | 39 06  | 38 51  | 38 35  | 38 19  | 38 02  | 9             | 00 |
|               | 10 | 38 39                              | 38 24  | 38 10  | 37 55  | 37 41  | 37 26  | 37 11  | 36 56  | 36 41  | 36 27  | 36 11  | 35 55  |               | 10 |
|               | 20 | 36 24                              | 36 10  | 35 57  | 35 43  | 35 30  | 35 16  | 35 02  | 34 47  | 34 33  | 34 19  | 34 04  | 33 50  |               | 20 |
|               | 30 | 34 08                              | 33 56  | 33 43  | 33 30  | 33 17  | 33 04  | 32 50  | 32 37  | 32 25  | 32 11  | 31 57  | 31 43  |               | 30 |
|               | 40 | 31 53                              | 31 42  | 31 29  | 31 17  | 31 04  | 30 52  | 30 40  | 30 28  | 30 15  | 30 03  | 29 50  | 29 36  |               | 40 |
|               | 50 | 29 38                              | 29 26  | 29 15  | 29 04  | 28 53  | 28 41  | 28 29  | 28 18  | 28 07  | 27 55  | 27 43  | 27 30  |               | 50 |
| 10            | 00 | 27 22                              | 27 12  | 27 01  | 26 51  | 26 40  | 26 29  | 26 19  | 26 08  | 25 57  | 25 46  | 25 34  | 25 23  | 10            | 00 |
|               | 10 | 25 06                              | 24 56  | 24 46  | 24 36  | 24 27  | 24 17  | 24 07  | 23 57  | 23 48  | 23 38  | 23 27  | 23 17  |               | 10 |
|               | 20 | 22 50                              | 22 41  | 22 32  | 22 23  | 22 14  | 22 06  | 21 57  | 21 48  | 21 39  | 21 29  | 21 20  | 21 10  |               | 20 |
|               | 30 | 20 33                              | 20 26  | 20 18  | 20 10  | 20 02  | 19 54  | 19 46  | 19 38  | 19 29  | 19 21  | 19 12  | 19 04  |               | 30 |
|               | 40 | 18 17                              | 18 10  | 18 02  | 17 55  | 17 48  | 17 41  | 17 34  | 17 27  | 17 20  | 17 12  | 17 04  | 16 57  |               | 40 |
|               | 50 | 16 00                              | 15 54  | 15 48  | 15 42  | 15 35  | 15 29  | 15 23  | 15 16  | 15 10  | 15 03  | 14 56  | 14 50  |               | 50 |
| 11            | 00 | 13 43                              | 13 38  | 13 33  | 13 27  | 13 22  | 13 16  | 13 10  | 13 05  | 13 00  | 12 54  | 12 49  | 12 43  | 11            | 00 |
|               | 10 | 11 26                              | 11 22  | 11 18  | 11 13  | 11 08  | 11 04  | 10 59  | 10 54  | 10 50  | 10 46  | 10 41  | 10 36  |               | 10 |
|               | 20 | 9 09                               | 9 05   | 9 02   | 8 58   | 8 55   | 8 51   | 8 47   | 8 44   | 8 40   | 8 36   | 8 32   | 8 28   |               | 20 |
|               | 30 | 6 52                               | 6 50   | 6 47   | 6 44   | 6 41   | 6 38   | 6 36   | 6 33   | 6 30   | 6 27   | 6 24   | 6 21   |               | 30 |
|               | 40 | 4 35                               | 4 33   | 4 31   | 4 29   | 4 28   | 4 26   | 4 24   | 4 22   | 4 20   | 4 18   | 4 16   | 4 14   |               | 40 |
|               | 50 | 2 18                               | 2 17   | 2 16   | 2 15   | 2 14   | 2 13   | 2 12   | 2 11   | 2 10   | 2 09   | 2 08   | 2 07   |               | 50 |
| 12            | 00 | 0 00                               | 0 00   | 0 00   | 0 00   | 0 00   | 0 00   | 0 00   | 0 00   | 0 00   | 0 00   | 0 00   | 0 00   | 12            | 00 |

In North latitude, when the star is rising or East of the meridian, the tabulated azimuths are reckoned from North to East; and when the star is setting or West of the meridian, the tabulated azimuths are reckoned from North to West.

In South latitude, when the star is rising or East of the meridian, the tabulated azimuths are reckoned from South to East; and when the star is setting or West of the meridian, the tabulated azimuths are reckoned from South to West.

When the latitude and declination are of different name, the tables are to be entered with the supplement of the hour angle and the supplement of the tabulated azimuth is to be taken for the required true bearing.

When the latitude and declination are of different name, the tables are to be entered with the supplement of the hour angle and the supplement of the tabulated azimuth is to be taken for the required true bearing.

## AZIMUTH OR TRUE BEARING.

| LATITUDE 70°. |    |     |     | DECLINATION—SAME NAME AS—LATITUDE. |     |     |     |     |     |     |     |     |     |             |    | LATITUDE 70°. |    |  |  |
|---------------|----|-----|-----|------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------|----|---------------|----|--|--|
| Hour Angle.   |    | 48° | 49° | 50°                                | 51° | 52° | 53° | 54° | 55° | 56° | 57° | 58° | 59° | Hour Angle. |    |               |    |  |  |
| h.            | m. | °   | '   | °                                  | '   | °   | '   | °   | '   | °   | '   | °   | '   | °           | '  | h.            | m. |  |  |
| 0             | 00 | 180 | 00  | 180                                | 00  | 180 | 00  | 180 | 00  | 180 | 00  | 180 | 00  | 180         | 00 | 0             | 00 |  |  |
| 0             | 10 | 175 | 32  | 175                                | 25  | 175 | 18  | 174 | 51  | 174 | 40  | 173 | 57  | 173         | 38 | 0             | 10 |  |  |
| 0             | 20 | 171 | 06  | 170                                | 53  | 170 | 38  | 169 | 46  | 168 | 59  | 168 | 31  | 167         | 59 | 0             | 20 |  |  |
| 0             | 30 | 166 | 41  | 166                                | 22  | 166 | 01  | 165 | 37  | 164 | 43  | 163 | 05  | 162         | 08 | 0             | 30 |  |  |
| 0             | 40 | 162 | 21  | 161                                | 55  | 161 | 28  | 160 | 57  | 159 | 47  | 158 | 19  | 156         | 28 | 0             | 40 |  |  |
| 0             | 50 | 158 | 04  | 157                                | 33  | 157 | 00  | 156 | 23  | 155 | 43  | 154 | 09  | 151         | 01 | 0             | 50 |  |  |
| 1             | 00 | 153 | 52  | 153                                | 17  | 152 | 38  | 151 | 56  | 150 | 18  | 149 | 21  | 148         | 19 | 1             | 00 |  |  |
| 1             | 10 | 149 | 47  | 149                                | 07  | 148 | 24  | 147 | 36  | 146 | 44  | 145 | 47  | 144         | 45 | 1             | 10 |  |  |
| 1             | 20 | 145 | 48  | 145                                | 04  | 144 | 16  | 143 | 24  | 142 | 29  | 141 | 27  | 140         | 20 | 1             | 20 |  |  |
| 1             | 30 | 141 | 55  | 141                                | 07  | 140 | 17  | 139 | 22  | 138 | 22  | 137 | 16  | 136         | 05 | 1             | 30 |  |  |
| 1             | 40 | 138 | 08  | 137                                | 18  | 136 | 25  | 135 | 27  | 134 | 24  | 133 | 15  | 132         | 02 | 1             | 40 |  |  |
| 1             | 50 | 134 | 30  | 133                                | 37  | 132 | 41  | 131 | 41  | 130 | 35  | 129 | 26  | 128         | 10 | 1             | 50 |  |  |
| 2             | 00 | 130 | 57  | 130                                | 03  | 129 | 06  | 128 | 04  | 126 | 56  | 125 | 44  | 124         | 27 | 2             | 00 |  |  |
| 2             | 10 | 127 | 31  | 126                                | 36  | 125 | 38  | 124 | 34  | 123 | 26  | 122 | 13  | 120         | 55 | 2             | 10 |  |  |
| 2             | 20 | 124 | 12  | 123                                | 16  | 122 | 16  | 121 | 12  | 120 | 04  | 118 | 51  | 117         | 32 | 2             | 20 |  |  |
| 2             | 30 | 120 | 59  | 120                                | 02  | 119 | 02  | 117 | 57  | 116 | 49  | 115 | 36  | 114         | 18 | 2             | 30 |  |  |
| 2             | 40 | 117 | 52  | 116                                | 55  | 115 | 54  | 114 | 50  | 113 | 41  | 112 | 29  | 111         | 11 | 2             | 40 |  |  |
| 2             | 50 | 114 | 51  | 113                                | 54  | 112 | 53  | 111 | 50  | 110 | 41  | 109 | 28  | 108         | 12 | 2             | 50 |  |  |
| 3             | 00 | 111 | 56  | 110                                | 58  | 109 | 58  | 108 | 54  | 107 | 46  | 106 | 35  | 105         | 20 | 3             | 00 |  |  |
| 3             | 10 | 109 | 05  | 108                                | 08  | 107 | 08  | 106 | 05  | 104 | 58  | 103 | 47  | 102         | 33 | 3             | 10 |  |  |
| 3             | 20 | 106 | 19  | 105                                | 21  | 104 | 23  | 103 | 20  | 102 | 15  | 101 | 05  | 99          | 53 | 3             | 20 |  |  |
| 3             | 30 | 103 | 37  | 102                                | 41  | 101 | 42  | 100 | 41  | 99  | 36  | 98  | 26  | 97          | 17 | 3             | 30 |  |  |
| 3             | 40 | 100 | 59  | 100                                | 04  | 99  | 07  | 98  | 07  | 97  | 02  | 95  | 55  | 94          | 46 | 3             | 40 |  |  |
| 3             | 50 | 98  | 26  | 97                                 | 32  | 96  | 35  | 95  | 35  | 94  | 32  | 93  | 28  | 92          | 19 | 3             | 50 |  |  |
| 4             | 00 | 95  | 57  | 95                                 | 03  | 94  | 07  | 93  | 08  | 92  | 07  | 91  | 04  | 89          | 57 | 4             | 00 |  |  |
| 4             | 10 | 93  | 28  | 92                                 | 36  | 91  | 42  | 90  | 45  | 89  | 45  | 88  | 42  | 87          | 37 | 4             | 10 |  |  |
| 4             | 20 | 91  | 05  | 90                                 | 14  | 89  | 24  | 88  | 24  | 87  | 25  | 86  | 25  | 85          | 21 | 4             | 20 |  |  |
| 4             | 30 | 88  | 44  | 87                                 | 54  | 87  | 02  | 86  | 06  | 85  | 09  | 84  | 10  | 83          | 09 | 4             | 30 |  |  |
| 4             | 40 | 86  | 26  | 85                                 | 37  | 84  | 46  | 83  | 52  | 82  | 56  | 81  | 59  | 80          | 59 | 4             | 40 |  |  |
| 4             | 50 | 84  | 11  | 83                                 | 22  | 82  | 33  | 81  | 40  | 80  | 45  | 79  | 49  | 78          | 51 | 4             | 50 |  |  |
| 5             | 00 | 81  | 56  | 81                                 | 09  | 80  | 21  | 79  | 30  | 78  | 36  | 77  | 42  | 76          | 46 | 5             | 00 |  |  |
| 5             | 10 | 79  | 45  | 78                                 | 59  | 78  | 11  | 77  | 21  | 76  | 30  | 75  | 36  | 74          | 41 | 5             | 10 |  |  |
| 5             | 20 | 77  | 36  | 76                                 | 51  | 76  | 04  | 75  | 16  | 74  | 25  | 73  | 34  | 72          | 40 | 5             | 20 |  |  |
| 5             | 30 | 75  | 27  | 74                                 | 44  | 73  | 58  | 73  | 11  | 72  | 22  | 71  | 31  | 70          | 40 | 5             | 30 |  |  |
| 5             | 40 | 73  | 21  | 72                                 | 38  | 71  | 53  | 71  | 07  | 70  | 20  | 69  | 30  | 68          | 40 | 5             | 40 |  |  |
| 5             | 50 | 71  | 16  | 70                                 | 35  | 69  | 52  | 69  | 07  | 68  | 21  | 67  | 33  | 66          | 45 | 5             | 50 |  |  |
| 6             | 00 | 69  | 12  | 68                                 | 31  | 67  | 50  | 67  | 06  | 66  | 21  | 65  | 36  | 64          | 48 | 6             | 00 |  |  |
| 6             | 10 | 67  | 09  | 66                                 | 30  | 65  | 49  | 65  | 07  | 64  | 24  | 63  | 39  | 62          | 53 | 6             | 10 |  |  |
| 6             | 20 | 65  | 08  | 64                                 | 30  | 63  | 50  | 63  | 10  | 62  | 27  | 61  | 44  | 60          | 59 | 6             | 20 |  |  |
| 6             | 30 | 63  | 08  | 62                                 | 31  | 61  | 52  | 61  | 12  | 60  | 31  | 59  | 49  | 59          | 07 | 6             | 30 |  |  |
| 6             | 40 | 61  | 07  | 60                                 | 32  | 59  | 56  | 59  | 16  | 58  | 36  | 57  | 55  | 57          | 14 | 6             | 40 |  |  |
| 6             | 50 | 59  | 09  | 58                                 | 33  | 57  | 58  | 57  | 20  | 56  | 42  | 55  | 03  | 55          | 23 | 6             | 50 |  |  |
| 7             | 00 | 57  | 10  | 56                                 | 37  | 55  | 52  | 55  | 27  | 54  | 49  | 54  | 11  | 53          | 32 | 7             | 00 |  |  |
| 7             | 10 | 55  | 13  | 54                                 | 40  | 53  | 51  | 52  | 55  | 52  | 20  | 51  | 42  | 51          | 03 | 7             | 10 |  |  |
| 7             | 20 | 53  | 16  | 52                                 | 45  | 52  | 12  | 51  | 38  | 50  | 18  | 49  | 53  | 49          | 15 | 7             | 20 |  |  |
| 7             | 30 | 51  | 19  | 50                                 | 49  | 50  | 18  | 49  | 45  | 48  | 39  | 48  | 03  | 47          | 27 | 7             | 30 |  |  |
| 7             | 40 | 49  | 24  | 48                                 | 54  | 48  | 25  | 47  | 53  | 47  | 21  | 46  | 48  | 46          | 15 | 7             | 40 |  |  |
| 7             | 50 | 47  | 28  | 46                                 | 59  | 46  | 31  | 45  | 50  | 45  | 30  | 44  | 59  | 44          | 27 | 7             | 50 |  |  |
| 8             | 00 | 45  | 33  | 45                                 | 06  | 44  | 37  | 44  | 08  | 43  | 39  | 43  | 09  | 42          | 38 | 8             | 00 |  |  |
| 8             | 10 | 43  | 37  | 43                                 | 12  | 42  | 45  | 42  | 17  | 41  | 49  | 41  | 21  | 40          | 51 | 8             | 10 |  |  |
| 8             | 20 | 41  | 43  | 41                                 | 18  | 40  | 45  | 40  | 26  | 39  | 59  | 39  | 32  | 39          | 03 | 8             | 20 |  |  |
| 8             | 30 | 39  | 48  | 39                                 | 24  | 39  | 00  | 38  | 35  | 38  | 09  | 37  | 43  | 37          | 16 | 8             | 30 |  |  |
| 8             | 40 | 37  | 54  | 37                                 | 32  | 37  | 08  | 36  | 44  | 36  | 19  | 35  | 54  | 35          | 39 | 8             | 40 |  |  |
| 8             | 50 | 36  | 00  | 35                                 | 39  | 35  | 16  | 34  | 53  | 34  | 30  | 34  | 07  | 33          | 42 | 8             | 50 |  |  |
| 9             | 00 | 34  | 05  | 33                                 | 45  | 33  | 24  | 33  | 03  | 32  | 18  | 31  | 55  | 31          | 32 | 9             | 00 |  |  |
| 9             | 10 | 32  | 12  | 31                                 | 53  | 31  | 33  | 31  | 12  | 30  | 51  | 30  | 30  | 29          | 26 | 9             | 10 |  |  |
| 9             | 20 | 30  | 18  | 30                                 | 00  | 29  | 41  | 29  | 22  | 29  | 03  | 28  | 43  | 28          | 36 | 9             | 20 |  |  |
| 9             | 30 | 28  | 24  | 28                                 | 08  | 27  | 50  | 27  | 32  | 27  | 13  | 26  | 54  | 26          | 46 | 9             | 30 |  |  |
| 9             | 40 | 26  | 31  | 26                                 | 15  | 25  | 59  | 25  | 42  | 25  | 24  | 25  | 07  | 24          | 49 | 9             | 40 |  |  |
| 9             | 50 | 24  | 37  | 24                                 | 22  | 24  | 07  | 23  | 52  | 23  | 35  | 23  | 30  | 23          | 03 | 9             | 50 |  |  |
| 10            | 00 | 22  | 44  | 22                                 | 30  | 22  | 16  | 22  | 02  | 21  | 46  | 21  | 52  | 21          | 32 | 10            | 00 |  |  |
| 10            | 10 | 20  | 50  | 20                                 | 37  | 20  | 24  | 20  | 11  | 19  | 58  | 19  | 44  | 19          | 30 | 10            | 10 |  |  |
| 10            | 20 | 18  | 57  | 18                                 | 45  | 18  | 33  | 18  | 21  | 18  | 59  | 17  | 57  | 17          | 44 | 10            | 20 |  |  |
| 10            | 30 | 17  | 03  | 18                                 | 52  | 16  | 42  | 16  | 31  | 16  | 20  | 16  | 09  | 15          | 58 | 10            | 30 |  |  |
| 10            | 40 | 15  | 09  | 15                                 | 00  | 14  | 50  | 14  | 41  | 14  | 31  | 14  | 21  | 14          | 11 | 10            | 40 |  |  |
| 10            | 50 | 13  | 16  | 13                                 | 08  | 13  | 00  | 12  | 51  | 12  | 43  | 12  | 34  | 12          | 25 | 10            | 50 |  |  |
| 11            | 00 | 11  | 22  | 11                                 | 15  | 11  | 01  | 10  | 53  | 10  | 46  | 10  | 38  | 10          | 30 | 11            | 00 |  |  |
| 11            | 10 | 9   | 28  | 9                                  | 22  | 9   | 17  | 9   | 04  | 8   | 59  | 8   | 52  | 8           | 45 | 11            | 10 |  |  |
| 11            | 20 | 7   | 35  | 7                                  | 30  | 7   | 25  | 7   | 16  | 7   | 10  | 7   | 05  | 7           | 00 | 11            | 20 |  |  |
| 11            | 30 | 5   | 41  | 5                                  | 38  | 5   | 34  | 5   | 27  | 5   | 23  | 5   | 19  | 5           | 15 | 11            | 30 |  |  |
| 11            | 40 | 3   | 48  | 3                                  | 45  | 3   | 43  | 3   | 37  | 3   | 35  | 3   | 33  | 3           | 30 | 11            | 40 |  |  |
| 11            | 50 | 1   | 54  | 1                                  | 53  | 1   | 51  | 1   | 49  | 1   | 47  | 1   | 46  | 1           | 45 | 11            | 50 |  |  |
| 12            | 00 | 0   | 00  | 0                                  | 00  | 0   | 00  | 0   | 00  | 0   | 00  | 0   | 00  | 0           | 00 | 12            | 00 |  |  |

## AZIMUTH OR TRUE BEARING.

| LATITUDE 70°. |    |        | DECLINATION—SAME NAME AS—LATITUDE. |        |        |        |        |        |        |        |        |        | LATITUDE 70°. |             |    |        |
|---------------|----|--------|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------------|-------------|----|--------|
| Hour Angle.   |    |        | 60°                                | 61°    | 62°    | 63°    | 64°    | 65°    | 66°    | 67°    | 68°    | 69°    | 70°           | Hour Angle. |    |        |
| h.            | m. | o /    | o /                                | o /    | o /    | o /    | o /    | o /    | o /    | o /    | o /    | o /    | o /           | h.          | m. | o /    |
| 0             | 00 | 180 00 | 180 00                             | 180 00 | 180 00 | 180 00 | 180 00 | 180 00 | 180 00 | 180 00 | 180 00 | 180 00 | 180 00        | 0           | 00 | 180 00 |
|               | 10 | 172 50 | 172 17                             | 171 36 | 170 44 | 169 36 | 168 01 | 165 39 | 161 51 | 154 42 | 137 37 | 88 49  | 18 10         |             | 10 | 172 50 |
|               | 20 | 165 46 | 164 43                             | 163 26 | 161 47 | 159 39 | 156 44 | 152 34 | 146 14 | 135 48 | 117 22 | 87 39  | 20 20         |             | 20 | 165 46 |
|               | 30 | 158 57 | 157 29                             | 155 39 | 153 23 | 150 29 | 146 38 | 141 23 | 133 59 | 123 07 | 107 18 | 86 26  | 30 30         |             | 30 | 158 57 |
|               | 40 | 152 28 | 150 37                             | 148 23 | 145 39 | 142 14 | 137 52 | 132 09 | 124 34 | 114 26 | 101 13 | 85 18  | 40 40         |             | 40 | 152 28 |
|               | 50 | 146 21 | 144 14                             | 141 42 | 138 40 | 134 58 | 130 22 | 124 35 | 117 17 | 108 09 | 96 57  | 84 07  | 50 50         |             | 50 | 146 21 |
| 1             | 00 | 140 37 | 138 19                             | 135 38 | 132 25 | 128 35 | 123 57 | 118 19 | 111 30 | 103 17 | 93 41  | 82 57  | 1 00          |             | 00 | 140 37 |
|               | 10 | 135 18 | 132 52                             | 130 05 | 126 48 | 122 58 | 118 25 | 113 03 | 106 46 | 99 23  | 91 00  | 81 46  | 10 10         |             | 10 | 135 18 |
|               | 20 | 130 21 | 127 53                             | 125 03 | 121 46 | 117 59 | 113 37 | 108 34 | 102 44 | 96 06  | 88 40  | 80 35  | 20 20         |             | 20 | 130 21 |
|               | 30 | 125 46 | 123 17                             | 120 27 | 117 14 | 113 34 | 109 24 | 104 38 | 99 16  | 93 15  | 86 34  | 79 24  | 30 30         |             | 30 | 125 46 |
|               | 40 | 121 32 | 119 02                             | 116 14 | 113 07 | 109 35 | 105 38 | 101 09 | 96 11  | 90 41  | 84 41  | 78 14  | 40 40         |             | 40 | 121 32 |
|               | 50 | 117 35 | 115 08                             | 112 24 | 109 22 | 105 59 | 102 14 | 98 04  | 93 28  | 88 24  | 82 54  | 77 03  | 50 50         |             | 50 | 117 35 |
| 2             | 00 | 113 53 | 111 28                             | 108 50 | 105 54 | 102 41 | 99 08  | 95 12  | 90 55  | 86 15  | 81 13  | 75 52  | 2 00          |             | 00 | 113 53 |
|               | 10 | 110 26 | 108 05                             | 105 31 | 102 44 | 99 39  | 95 17  | 92 35  | 88 35  | 84 15  | 79 36  | 74 41  | 10 10         |             | 10 | 110 26 |
|               | 20 | 107 12 | 104 55                             | 102 27 | 99 45  | 96 49  | 93 38  | 90 10  | 86 25  | 82 23  | 78 03  | 73 29  | 20 20         |             | 20 | 107 12 |
|               | 30 | 104 07 | 101 55                             | 99 32  | 96 57  | 94 10  | 91 08  | 87 52  | 84 21  | 80 35  | 76 35  | 72 18  | 30 30         |             | 30 | 104 07 |
|               | 40 | 101 12 | 99 05                              | 96 48  | 94 20  | 91 39  | 88 47  | 85 41  | 82 23  | 78 51  | 75 05  | 71 06  | 40 40         |             | 40 | 101 12 |
|               | 50 | 98 27  | 96 25                              | 94 12  | 91 49  | 89 17  | 86 33  | 83 38  | 80 30  | 77 10  | 73 39  | 69 55  | 50 50         |             | 50 | 98 27  |
| 3             | 00 | 95 49  | 93 51                              | 91 44  | 89 27  | 87 01  | 84 26  | 81 40  | 78 42  | 75 33  | 72 14  | 68 43  | 3 00          |             | 00 | 95 49  |
|               | 10 | 93 18  | 91 23                              | 89 21  | 87 10  | 84 51  | 82 22  | 79 44  | 76 57  | 73 59  | 70 49  | 67 31  | 10 10         |             | 10 | 93 18  |
|               | 20 | 90 51  | 88 42                              | 86 34  | 84 59  | 82 46  | 80 24  | 77 54  | 75 14  | 72 26  | 69 28  | 66 20  | 20 20         |             | 20 | 90 51  |
|               | 30 | 88 32  | 86 45                              | 84 52  | 82 52  | 80 45  | 78 30  | 76 07  | 73 35  | 70 54  | 68 06  | 65 07  | 30 30         |             | 30 | 88 32  |
|               | 40 | 86 16  | 84 33                              | 82 44  | 80 49  | 78 48  | 76 39  | 74 22  | 71 58  | 69 23  | 66 44  | 63 55  | 40 40         |             | 40 | 86 16  |
|               | 50 | 84 04  | 82 26                              | 80 41  | 78 51  | 76 54  | 74 50  | 72 39  | 70 22  | 67 56  | 65 23  | 62 43  | 50 50         |             | 50 | 84 04  |
| 4             | 00 | 81 57  | 80 22                              | 78 41  | 76 55  | 75 03  | 73 05  | 71 00  | 68 48  | 66 29  | 64 03  | 61 31  | 4 00          |             | 00 | 81 57  |
|               | 10 | 79 52  | 78 20                              | 76 43  | 75 01  | 73 14  | 71 20  | 69 21  | 67 16  | 65 02  | 62 43  | 60 18  | 10 10         |             | 10 | 79 52  |
|               | 20 | 77 50  | 76 21                              | 74 48  | 73 10  | 71 27  | 69 39  | 67 44  | 65 44  | 63 37  | 61 24  | 59 05  | 20 20         |             | 20 | 77 50  |
|               | 30 | 75 51  | 74 26                              | 72 56  | 71 22  | 69 42  | 67 58  | 66 08  | 64 13  | 62 12  | 60 05  | 57 52  | 30 30         |             | 30 | 75 51  |
|               | 40 | 73 55  | 72 32                              | 71 06  | 69 35  | 68 00  | 66 20  | 64 34  | 62 44  | 60 48  | 58 46  | 56 39  | 40 40         |             | 40 | 73 55  |
|               | 50 | 72 01  | 70 41                              | 69 17  | 67 50  | 66 18  | 64 42  | 63 01  | 61 16  | 59 24  | 57 27  | 55 25  | 50 50         |             | 50 | 72 01  |
| 5             | 00 | 70 08  | 68 51                              | 67 30  | 66 06  | 64 38  | 63 05  | 61 28  | 59 47  | 58 00  | 56 09  | 54 12  | 5 00          |             | 00 | 70 08  |
|               | 10 | 68 17  | 67 03                              | 65 45  | 64 23  | 62 58  | 61 30  | 59 57  | 58 20  | 56 37  | 54 50  | 52 58  | 10 10         |             | 10 | 68 17  |
|               | 20 | 66 27  | 65 15                              | 64 01  | 62 42  | 61 21  | 59 56  | 58 26  | 56 53  | 55 14  | 53 31  | 51 44  | 20 20         |             | 20 | 66 27  |
|               | 30 | 64 39  | 63 30                              | 62 18  | 61 02  | 59 44  | 58 22  | 56 56  | 55 26  | 53 52  | 52 13  | 50 30  | 30 30         |             | 30 | 64 39  |
|               | 40 | 62 52  | 61 45                              | 60 36  | 59 23  | 58 08  | 56 48  | 55 25  | 53 59  | 52 29  | 50 54  | 49 15  | 40 40         |             | 40 | 62 52  |
|               | 50 | 61 07  | 60 03                              | 58 55  | 57 45  | 56 33  | 55 17  | 53 57  | 52 34  | 51 07  | 49 36  | 48 02  | 50 50         |             | 50 | 61 07  |
| 6             | 00 | 59 21  | 58 20                              | 57 15  | 56 07  | 54 57  | 53 44  | 52 27  | 51 08  | 49 44  | 48 18  | 46 47  | 6 00          |             | 00 | 59 21  |
|               | 10 | 57 37  | 56 37                              | 55 35  | 54 30  | 53 23  | 52 13  | 50 59  | 49 43  | 48 23  | 46 59  | 45 32  | 10 10         |             | 10 | 57 37  |
|               | 20 | 55 54  | 54 57                              | 53 57  | 52 55  | 51 50  | 50 43  | 49 32  | 48 18  | 47 01  | 45 40  | 44 16  | 20 20         |             | 20 | 55 54  |
|               | 30 | 54 12  | 53 17                              | 52 19  | 51 19  | 50 17  | 49 12  | 48 03  | 46 53  | 45 39  | 44 21  | 43 01  | 30 30         |             | 30 | 54 12  |
|               | 40 | 52 30  | 51 37                              | 50 41  | 49 43  | 48 44  | 47 41  | 46 36  | 45 28  | 44 16  | 43 02  | 41 45  | 40 40         |             | 40 | 52 30  |
|               | 50 | 50 49  | 49 58                              | 49 04  | 48 08  | 47 11  | 46 11  | 45 09  | 44 03  | 42 55  | 41 44  | 40 29  | 50 50         |             | 50 | 50 49  |
| 7             | 00 | 49 09  | 48 19                              | 47 28  | 46 34  | 45 39  | 44 41  | 43 40  | 42 38  | 41 33  | 40 25  | 39 13  | 7 00          |             | 00 | 49 09  |
|               | 10 | 47 28  | 46 41                              | 45 51  | 45 00  | 44 07  | 43 11  | 42 13  | 41 14  | 40 11  | 39 05  | 37 57  | 10 10         |             | 10 | 47 28  |
|               | 20 | 45 48  | 45 03                              | 44 15  | 43 26  | 42 34  | 41 42  | 40 46  | 39 49  | 38 49  | 37 46  | 36 41  | 20 20         |             | 20 | 45 48  |
|               | 30 | 44 08  | 43 25                              | 42 39  | 41 54  | 41 03  | 40 12  | 39 19  | 38 25  | 37 27  | 36 26  | 35 24  | 30 30         |             | 30 | 44 08  |
|               | 40 | 42 29  | 41 47                              | 41 04  | 40 18  | 39 32  | 38 43  | 37 52  | 37 00  | 36 05  | 35 08  | 34 07  | 40 40         |             | 40 | 42 29  |
|               | 50 | 40 50  | 40 10                              | 39 29  | 38 46  | 38 01  | 37 14  | 36 25  | 35 35  | 34 43  | 33 48  | 32 51  | 50 50         |             | 50 | 40 50  |
| 8             | 00 | 39 11  | 38 33                              | 37 53  | 37 12  | 36 29  | 35 45  | 34 58  | 34 11  | 33 20  | 32 27  | 31 33  | 8 00          |             | 00 | 39 11  |
|               | 10 | 37 32  | 36 57                              | 36 19  | 35 39  | 34 58  | 34 16  | 33 32  | 32 46  | 31 58  | 31 08  | 30 16  | 10 10         |             | 10 | 37 32  |
|               | 20 | 35 55  | 35 19                              | 34 43  | 34 05  | 33 26  | 32 47  | 32 05  | 31 21  | 30 35  | 29 48  | 28 58  | 20 20         |             | 20 | 35 55  |
|               | 30 | 34 15  | 33 43                              | 33 08  | 32 33  | 31 56  | 31 17  | 30 37  | 29 56  | 29 13  | 28 27  | 27 41  | 30 30         |             | 30 | 34 15  |
|               | 40 | 32 38  | 32 07                              | 31 33  | 30 59  | 30 24  | 29 49  | 29 10  | 28 31  | 27 50  | 27 07  | 26 23  | 40 40         |             | 40 | 32 38  |
|               | 50 | 31 00  | 30 31                              | 29 59  | 29 27  | 28 53  | 28 19  | 27 43  | 27 06  | 26 28  | 25 47  | 25 05  | 50 50         |             | 50 | 31 00  |
| 9             | 00 | 29 22  | 28 54                              | 28 24  | 27 54  | 27 23  | 26 50  | 26 15  | 25 41  | 25 04  | 24 27  | 23 47  | 9 00          |             | 00 | 29 22  |
|               | 10 | 27 43  | 27 17                              | 26 49  | 26 20  | 25 51  | 25 20  | 24 48  | 24 16  | 23 41  | 23 05  | 22 28  | 10 10         |             | 10 | 27 43  |
|               | 20 | 26 06  | 25 41                              | 25 15  | 24 48  | 24 21  | 23 52  | 23 22  | 22 51  | 22 19  | 21 45  | 21 10  | 20 20         |             | 20 | 26 06  |
|               | 30 | 24 28  | 24 04                              | 23 40  | 23 16  | 22 49  | 22 23  | 21 55  | 21 25  | 20 56  | 20 24  | 19 51  | 30 30         |             | 30 | 24 28  |
|               | 40 | 22 50  | 22 28                              | 22 06  | 21 42  | 21 18  | 20 53  | 20 27  | 20 00  | 19 32  | 19 03  | 18 32  | 40 40         |             | 40 | 22 50  |
|               | 50 | 21 12  | 20 52                              | 20 31  | 20 09  | 19 47  | 19 24  | 18 59  | 18 35  | 18 09  | 17 42  | 17 13  | 50 50         |             | 50 | 21 12  |
| 10            | 00 | 19 35  | 19 16                              | 18 57  | 18 37  | 18 16  | 17 55  | 17 33  | 17 10  | 16 46  | 16 21  | 15 55  | 10 10         |             | 00 | 19 35  |
|               | 10 | 17 56  | 17 40                              | 17 23  | 17 04  | 16 45  | 16 25  | 16 04  | 15 44  | 15 22  | 14 59  | 14 35  | 10 10         |             | 10 | 17 56  |
|               | 20 | 16 19  | 16 04                              | 15 48  | 15 31  | 15 14  | 14 56  | 14 37  | 14 18  | 13 58  | 13 36  | 13 16  | 20 20         |             | 20 | 16 19  |
|               | 30 | 14 41  | 14 27                              | 14 12  | 13 58  | 13 42  | 13 26  | 13 10  | 12 53  | 12 34  | 12 16  | 11 57  | 30 30         |             | 30 | 14 41  |
|               | 40 | 13 03  | 12 51                              | 12 38  | 12 25  | 12 11  | 11 57  | 11 42  | 11 27  | 11 10  | 10 54  | 10 37  | 40 40         |             | 40 | 13 03  |
|               | 50 | 11 25  | 11 14                              | 11 03  | 10 52  | 10 40  | 10 27  | 10 14  | 10 01  | 9 48   | 9 33   | 9 18   | 50 50         |             | 50 | 11 25  |
| 11            | 00 | 9 48   | 9 39                               | 9 29   | 9 18   | 9 09   | 8 58   | 8 46   | 8 35   | 8 23   | 8 11   | 7 58   | 11 00         |             | 00 | 9 48   |
|               | 10 | 8 10   | 8 01                               | 7 54   | 7 46   | 7 37   | 7 28   | 7 19   | 7 10   | 6 59   | 6 49   | 6 39   | 10 10         |             | 10 | 8 10   |
|               | 20 | 6 32   | 6 26                               | 6 19   | 6 12   | 6 06   | 5 58   | 5 51   | 5 43   | 5 36   | 5 28   | 5 19   | 20 20         |             | 20 | 6 32   |
|               | 30 | 4 54   | 4 49                               | 4 45   | 4 40   | 4 34   | 4 29   | 4 23   | 4 18   | 4 12   | 4 06   | 3 59   | 30 30         |             | 30 | 4 54   |
|               | 40 | 3 16   | 3 12                               | 3 10   | 3 06   | 3 03   | 2 59   | 2 56   | 2 52   |        |        |        |               |             |    |        |

In North latitude, when the star is rising or East of the meridian, the tabulated azimuths are reckoned from North to East; and when the star is setting or West of the meridian, the tabulated azimuths are reckoned from North to West.

In South latitude, when the star is rising or East of the meridian, the tabulated azimuths are reckoned from South to East; and when the star is setting or West of the meridian, the tabulated azimuths are reckoned from South to West.

When the latitude and declination are of different name, the tables are to be entered with the supplement of the hour angle and the supplement of the tabulated azimuth is to be taken for the required true bearing.