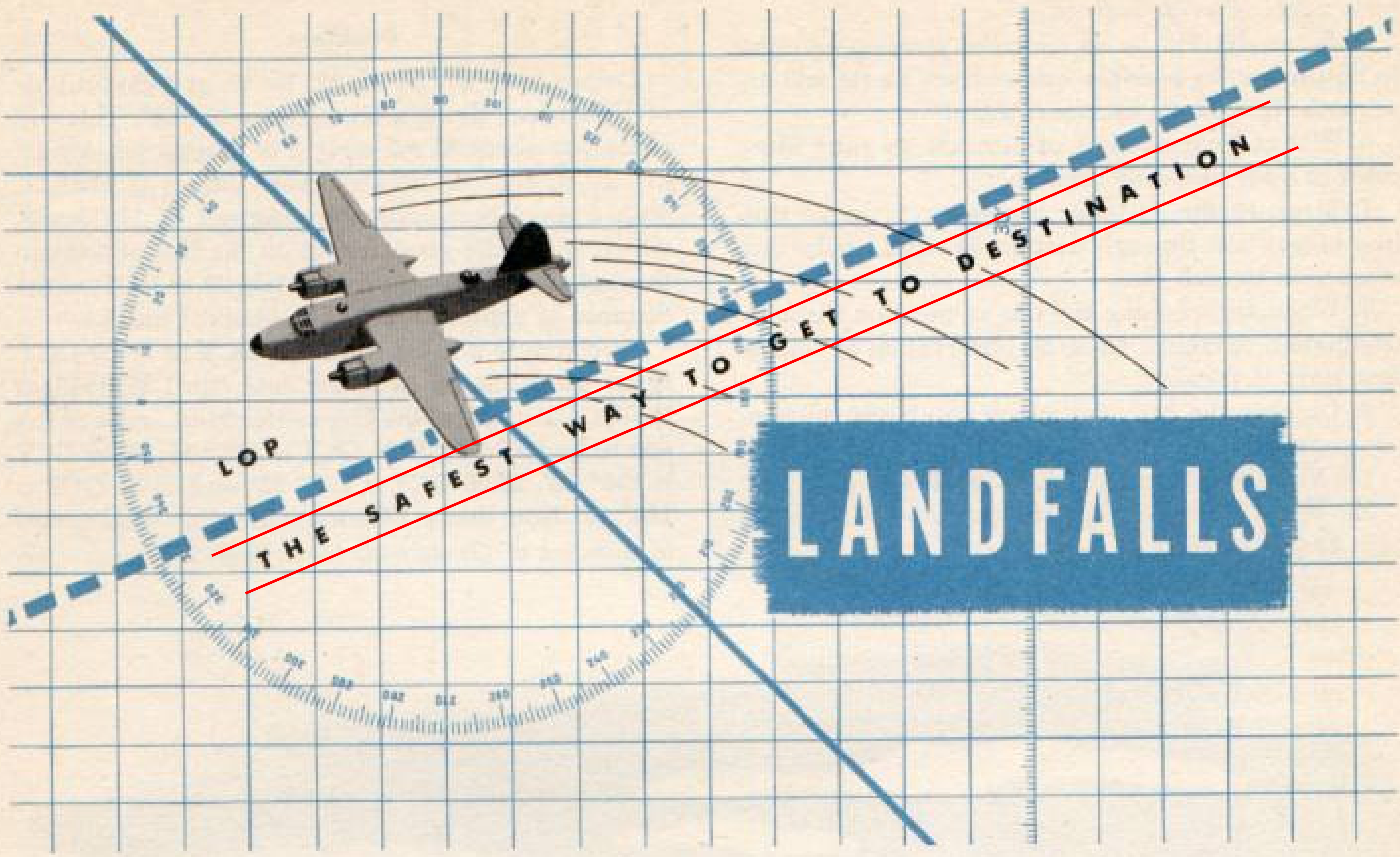



Landfalls are of two types: course line landfalls and speed line landfalls.

### Course Line Landfall

The easiest landfall to fly and things being equal, the most accurate, is the course line landfall.

1. Observe a celestial body that gives a course line, line of position. Plot it on your Mercator chart.
2. Advance the line of position through destination parallel to the one you just plotted.
3. Fly directly to the line of position through destination and turn toward destination.
4. Stay on this line of position until another line of position shows you to be off course.
5. Then repeat the process. But stay on a line of position through destination. There is no ETA in a landfall other than your best known groundspeed.

### Speed Line Landfall

Because a course line is at times the more difficult type of line of position to observe, and because sometimes only speed lines are available, you will also fly a speed line landfall.

In this type of landfall fly definitely to one side of destination. When you reach the speed line through destination, turn and fly into destination.

Precomputed landfalls, intersection of Ho-Hc curves, and double Ho-Hc curves are variations of the simple landfall. Use these for speed line landfalls ordinarily. The double Ho-Hc curve is really a series of precomputed fixes. But it is used as a landfall.

In actual combat the use of landfalls is limited, for you must make most base approaches from certain bearings and at certain altitudes. To keep from arousing the interceptors on particular bases each time you approach them, you must give definite ETA's. This is impossible when flying a landfall.

In the interest of precomputed work, the following HO 218 precomputed landfall is a definite time saver.

### HO 218 Precomputed Landfall

No curves to be drawn. No long hours of precomputed work. All work accomplished during the flight in your spare time. It is easy and accurate.

### Here's How

1. Figure an approximate ETA for destination.
2. Pick a body that will give a good speed line.
3. Find the Greenwich hour angle of that body at 20 minute intervals. Each Greenwich hour angle will end in approximately the same number of minutes.
4. Use an assumed longitude to give you a local

hour angle of even degrees.

5. Enter HO 218 by an assumed position as close to destination as possible, and extract an Hc and an azimuth for each 20 minute interval.

6. Plot at least one line of position on your Mercator at your assumed position.

7. Measure the distance necessary to move this line of position through destination, and apply this correction to each Hc.

8. When approaching the line of position through destination, establish track by observation of course line stars if possible.

9. Observe the body for which you made the precomputation.

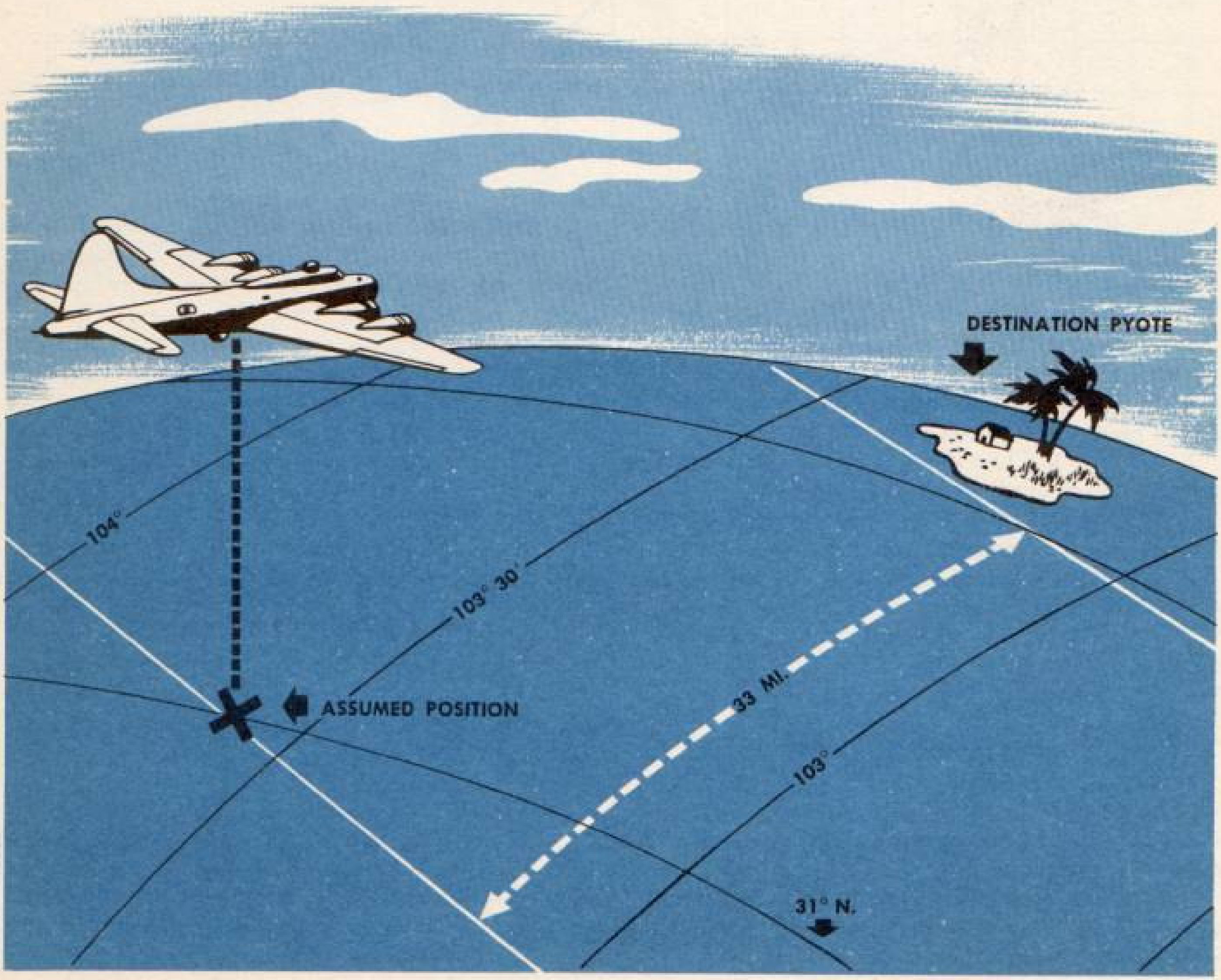
10. Visually compare Ho's with Hc's.

11. When Ho is equal to Hc, turn on the azimuth plus or minus 90°.

**Problem**

Depart from 34° 30′ N, 99° 30′ W, at flight altitude of 10,000 feet, flying a true course of 233°. This will place you about 35 miles right of destination, Pyote, 31° 31′ N, 103° 09′ W. Departure time is 18:50 GCT, with a dead reckoning groundspeed of 170 knots, which will make your arrival on the line of position through destination approximately 20:17 GCT, as the distance is approximately 248 nautical miles.

Precompute a table for 20:00 GCT to 21:20 GCT. Enter the Almanac as of the date April 26, 1943, at 20:00 GCT and find the Greenwich hour angle of the sun to be 120° 33′; 20:20 GCT is 125° 33′, 20:40 GCT is 130° 33′, 21:00 GCT is 135° 33′, and 21:20 GCT is 140° 33′. Note that at 20 minute intervals the number of minutes of Greenwich hour angle of the sun al-



ways agrees within a mile or two, which presents no great difficulties.

Then, assume a position of 31° N, 103° 33′ W, in order to work the solutions by HO 218.

Applying your assumed longitude to the Greenwich hour angle of the sun, you have local hour angles of 17° W for 20:00 GCT, 22° W for 20:20 GCT, 27° W for 20:40 GCT, 32° W for 21:00 GCT, and 37° W for 21:20 GCT.

Then enter the HO 218 solution book, under declination N13° 26′, and extract the Hc's and azimuth for the body.

| | Hc | Azimuth |
|---|---|---|
| 20:00 GCT | 66°29′ | 225° |
| 20:20 GCT | 63°13′ | 233° |
| 20:40 GCT5 | 59°36′ | 240° |
| 21:00 GCT | 55°45′ | 246° |
| 21:20 GCT | 51°46′ | 250° |

Extract them all by opening the book but once.

You now have the change of altitude and azimuth of the body at the position of 31° N, 103° 33′ W. You want the altitude of the body at destination, Pyote, 31° 31′ N, 103° 09′ W.

To obtain this, draw the line of position through the assumed position for each of the time intervals, and measure the distance required to move each line of position through destination, Pyote. Apply the proper sign to the correction by noting whether this action is increasing or decreasing the altitude of the body. This is done as follows:

| | Hc | Correction | Corrected Hc |
|---|---|---|---|
| 20:00 GCT | 66°29′ | −36′ | 65°53′ |
| 20:20 GCT | 63°13′ | −35′ | 62°38′ |
| 20:40 GCT | 59°36′ | −33′ | 59°03′ |
| 21:00 GCT | 55°46′ | −32′ | 55°14′ |
| 21:20 GCT | 51°46′ | −30′ | 51°16′ |

You now have the altitude of the sun for 1 hour and 20 minutes at destination. When you approach the line of position through destination, start shooting.

As you shoot, visually interpolate between the Hc's you have computed, in order to compare your observations with your precomputed solutions. You can break down your Hc's to 5 minute intervals to make your interpolation easier, as below.

| | |
|---|---|
| 20:00 GCT | 65°53′ (difference 49′) |
| 20:05 GCT | 65°04′ (difference 49′) |
| 20:10 GCT | 64°15′ (difference 49′) |
| 20:15 GCT | 63°26′ (difference 48′) |
| 20:20 GCT | 62°38′ (difference 54′) |
| 20:25 GCT | 61°44′ (difference 54′) |
| 20:30 GCT | 60°50′ (difference 54′) |
| 20:35 GCT | 59°56′ (difference 53′) |
| 20:40 GCT | 59°56′ (difference etc.) |

Then start shooting. Your shots fall as follows:

| | Ho | Hc |
|---|---|---|
| 20:03 GCT | 63°53′ | 65°23′ |
| 20:12 GCT | 62°45′ | 63°55′ |
| 20:19 GCT | 62°01′ | 62°45′ |
| 20:27 GCT | 61°00′ | 61°22′ |
| 20:31 GCT | 60°28′ | 60°39′ |
| 20:33 GCT | 60°12′ | 60°17′ |

At 20:33 GCT you see that you are within 5 miles of the line of position through destination, so at 20:35 you turn on the line of position and continue to observe the body to make sure that you stay on it.

**Remember**

Find an assumed position as close to your destination as possible that will give you latitude and local hour angle of an integral degree.

Then solve for azimuth and altitude from this position for a time period in which you are sure you will reach the line of position through destination.

Draw the line of position through your assumed position, and measure the distances necessary to move them through destination. Bearing in mind whether you are correcting away from or toward the body, apply the proper sign to the correction. Apply these corrections to the computed altitudes.

As you approach the line of position through destination, take repeated observations on the body, visually interpolating to check the difference between Ho and Hc. When the Ho coincides with the Hc, turn on the azimuth plus or minus 90°.