Compass Basics and Types

Doug “Due North” Millar
K6JEY

Types

- Boy Scout type “Lensatic”
- Sighting- has a mirror and/or prism
- Transit- for surveyors
- Solar compass- for moving vehicles
- GPS- Fluxgate Compass- need frequent calibration.

Compass Basics

- There are a number of types of compasses, but for our needs a “sighting” or lensatic type is best.
- Look for
  - Fluid filled, jeweled movement
  - Declination adjustment
  - Good mechanics and stability.

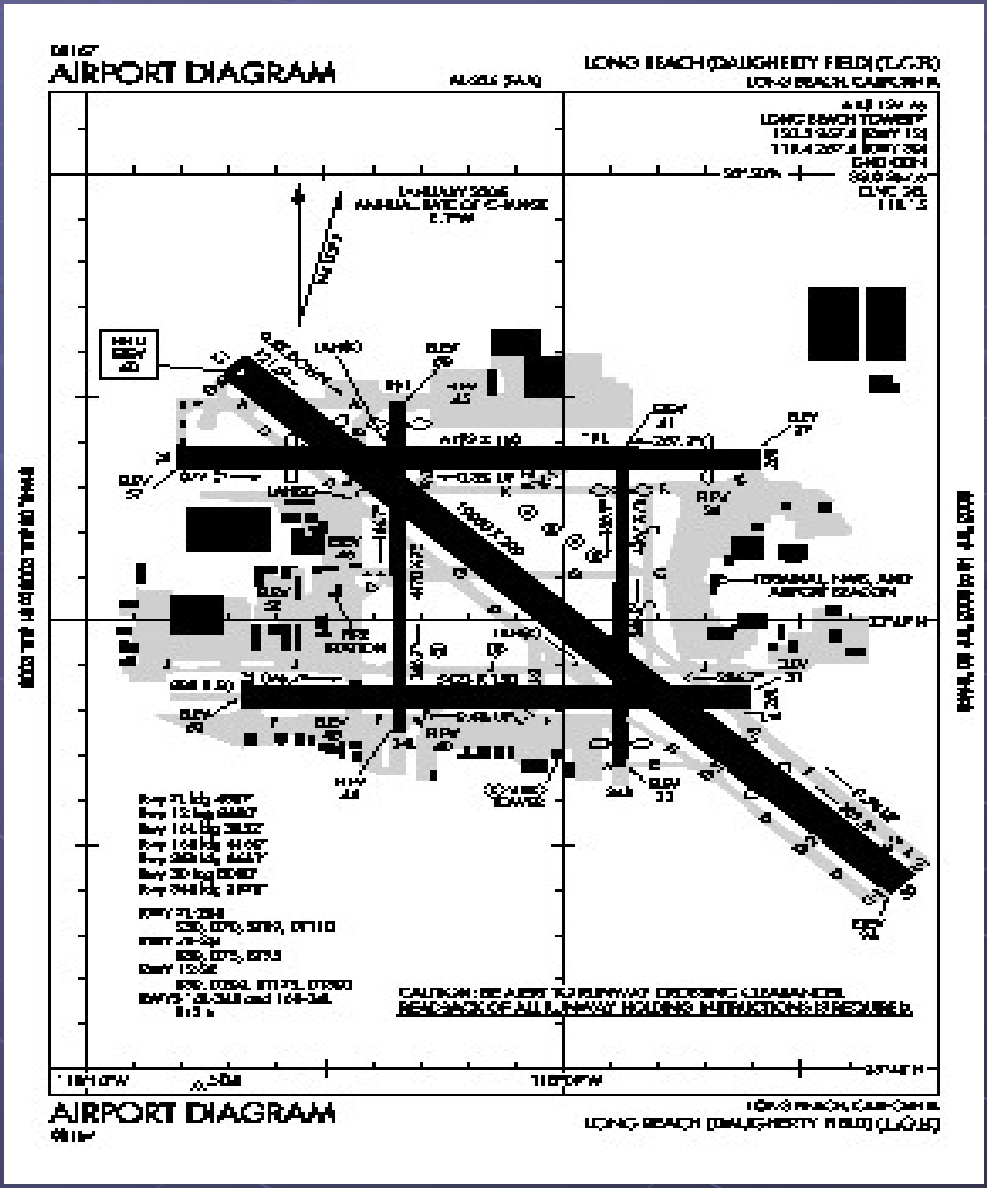
WWI Military Lensatic Type

Calibration Problems

- To find the local isogonic variation look on Aeronautical charts or airport diagrams.

  The variation here changes by .1 degree/year.
- Long Beach is 13.2 W and Camarillo is 14.7
- Setting the variation has to be done accurately.
- Matching the compass with true North is a mechanical problem.
- But local man-made and natural magnetic anomalies are the greatest error.

Airport Diagram
Has isogonic variation per year and dated measurement.



Sighting Compass
Worse than1deg.
Sunto $50

Below ½ Degree

- Below this level of accuracy there are all kinds of variables that come into play and an accurate heading is hard to know. Try for 1deg accuracy.
- One idea is to use a Go To astronomical mount and align it with known objects.
- Another is to use digital setting circles.

The Bad, Good and Strange

- Most inexpensive lensatic types are useless. They don't settle well and calibration moves.
- Sighting compasses with a mirror are very good if the fluid dampens the movement and they are settable. Good ones are $$$
- The Morin is excellent but does not have dec. adjustment. Also $$$$
- The solar compass- great till it's dark

A cheap Lensatic type Read Wrong Guessometer

Typical Inexpensive Compass with few Extras. Accuracy worse than 1deg.

Excellent sighting type
A Brunton 8099 <1deg
$70 plus

Morin sighting type
Better than 1deg
about $100

Solar Compass with Gnomon
Used for vehicles in motion.

Best Bang for the Buck
Chinese Military lensatic type available for
About $20 on Ebay

The Chinese Military lensatic just shown has a number of Important features.

- Magnified viewer with diopter adjustment
- Fluid dampened card
- Excellent sighting and mirror mechanism
- Better than 1 deg resolution
- Built in level
- Built in photo tripod mount
- Case
- Smooth setting bezel and isogonic offset.

Conclusion

- A good enough sighting compass should cost less than $50.
- Don’t put up with a hard to use read-wrong guessometer.
- Don’t expect more than your calibration and information can deliver. If you are within a degree that may be about as good as you can do. Any further and results go up in a linear fashion and money goes up in an exponential fashion.

I brought one of each type to try out and to look at.

References

- Accuracy considerations: http://www.geocities.com/magnetic_declination/#COMPENSATE
- Compass use from a boater's point of view. http://books.google.com/books?id=nfWSxRr8VP4C&pg=PA43&lpg=PA43&dq=isogonic+variation&source=web&ots=z8ZKEZS2TI&sig=vP9TLCKMHCPoEWwZkmj8o1OYDI8&hl=en&sa=X&oi=book_result&resnum=10&ct=result#PPA44,M1

Thanks for Listening
K6JEY

“Due North Doug”