



THE READOUT

DID YOU KNOW?

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- CA-320 Digital Compass
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MONTHLY SPECIAL

Send us any radar component during the month of October, mention this ad and we will include with the repaired unit a

HONEYWELL RADAR TILT ANGLE CALCULATOR.

This handy slide rule shows typical radar range versus altitude for 10", 12" and 18" antennas.

CA-320 DIGITAL COMPASS

Looking for an improved method of testing and calibrating aircraft compass systems? You may want to look at our state-of-the-art CA-320 Digital Compass. Integrating magneto-resistive sensors with a high visibility laser and a multichannel transmitter/receiver, the CA-320 brings a new dimension of accuracy and ease of measurement when compared to the previously used ground based compass roses and hand held sight compasses.



Highlights of the CA-320 Digital Compass:

- Calibrated, stand alone system needs no ground based references
- Class IIIA, 532 nm (green) laser with tight beam convergence
- Clear, backlit digital display eliminates guessing and interpretation errors
- Eight channels selectable in the 900 MHz band
- Standard or custom wing mounts available

Want to know more?

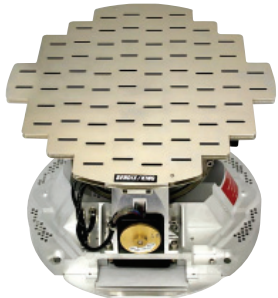
Contact David Wood, Test Equipment Manager
(850) 575-4028 ext 106
david@capitalavionics.com

RADAR DEPOT LEVEL REPAIRS

We have been repairing airborne radars since 1985 and have factory trained technicians that can quickly diagnose and repair many popular models.

They include:

- ART 2000/2100
- RDR – 130/160/1100/1200/1300/1400
- RDS – 81/82/84
- Primus – 30/40/100/150/200/300/400
- WXR – 200/250/300
- Weatherscout I & II
- KWX – 56/58



Want to know more?

Contact Al Ingle, General Manager
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FAA 145 CRS NS4R399M
EASA CRS 145-4290

VISIT US ON THE WEB:
CapitalAvionics.com

TECHtips Example:

Magnetic Characteristics
for Tallahassee, Florida
Regional Airport

Location:

30° 23.8 north latitude
84° 21.0 west longitude

Declination:

-3.9° (Variation)

Inclination:

60.0°

X Component:

23,955 nT

Y Component:

-1,642 nT

Horizontal Intensity:

24,011 nT

Total Intensity:

48,057 nT

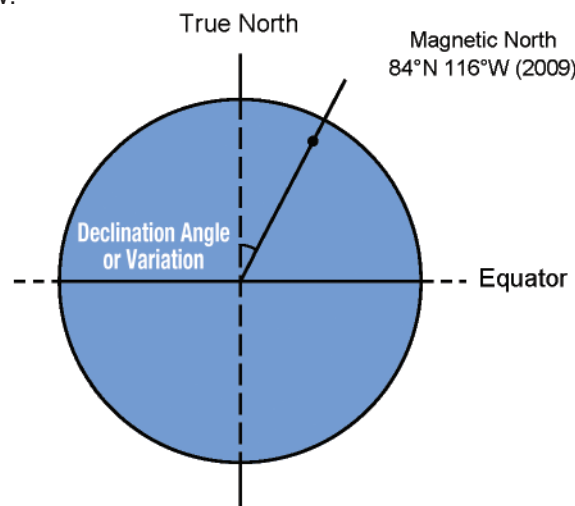
Note: Gauss and Torres
are means of expressing
magnetic field strength.

1 G = 10⁻⁴ T

The magnetic heading of an aircraft is the most fundamental navigational information used by pilots. If all other systems fail, the wet compass provides directional information without reliance on any other external inputs. A wet compass suffers some deficiencies, however, including instability and the potential for large errors. A stabilized, accurate indication of magnetic heading is typically provided by a slaved electronic compass system utilizing a flux detector or AHRS (Attitude and Heading Reference System).

Regardless of how the magnetic heading is derived and displayed, it is important to distinguish between it and true heading. The earth can be thought of as a big round bar magnet with its north and south poles analogous to the earth's north and south poles. Unfortunately, the earth's magnetic and geographical poles do not line up. Currently, the magnetic north pole is located near Ellesmere Island, in Northern Canada, at about 84° north latitude and 116° west longitude. It is moving in a northwesterly direction at 41 km/year and has moved 1100 km in the 20th century alone. This is why ground-based compass roses need to be calibrated every year – our magnetic reference changes.

See the figure below:



The difference between magnetic heading and true heading is called the variation or declination angle (used interchangeably). This angle varies with location and can be quite significant at the extreme latitudes. Therefore:

$$\text{MAGNETIC HEADING} \pm \text{VARIATION} = \text{TRUE HEADING}$$

Note that aeronautical charts and related databases reference true north but ground based navigational aids are referenced to magnetic north. To aid the pilot in conversion, lines of equal variation, or isogonic lines, are printed in an easily recognized form. GPS navigation, which is space based, presents information in both formats allowing the pilot to choose either a magnetic or true reference.

Another interesting feature of our magnetic field is its inclination angle where it enters/leaves the earth's surface. In Tallahassee, Florida, located at 30° north latitude, the inclination angle is 60°. This means that about 86% of the magnetic field provides no directional information whatsoever! This is why many magnetic sensors are mounted on gimbals – to keep them more or less level and to minimize the "Z" axis errors. To learn the characteristics of the magnetic field where you live, go to <http://www.ngdc.noaa.gov/geomagmodels>.