Volume 2, Issue 1 | January 2010

THE READOUT

WHAT'S NEW

HONEYWELL KAP 100 / KFC 150 AUTOPILOTS

We have full depot level repair capabilities for the popular components comprising these autopilot systems. Included are the following:

- KC 190/191/192 Computers
- KS 270( ) / KS 271( ) / KX 272( ) Servos
- KAS 297( ) Altitude Preselects
- KA 285/285A Annunciator Panels

KS 27X Servo

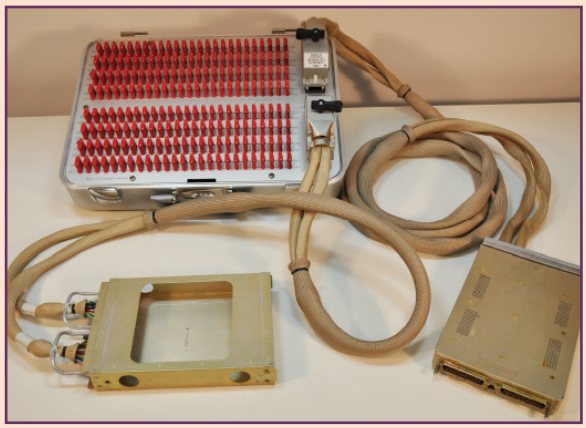
KAS 297

KC 192

Want to know more?
Contact Al Ingle, General Manager
(850) 575-4028 ext 105
al@capitalavionics.com

S-TEC (COBHAM) SYSTEM 55/55X/550 FLIGHTLINE MAINTENANCE

We are pleased to announce the addition of the S-Tec (Cobham) System 55/55X/550 breakout cable for the CA-323 Test Set. This new cable allows the technician to effectively troubleshoot and isolate faults to the individual pin associated with the Computer Programmer.



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

In This Issue:

capital avionics INCORPORATED
Quality | Service | Innovation

3701 Hartsfield Road
Tallahassee, FL 32303

Phone: 850-575-4028
Fax: 850-575-7441
info@capitalavionics.com

FAA 145 CRS NS4R399M
EASA CRS 145-4290

VISIT US ON THE WEB:
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The Earth's Magnetic Field - part 3

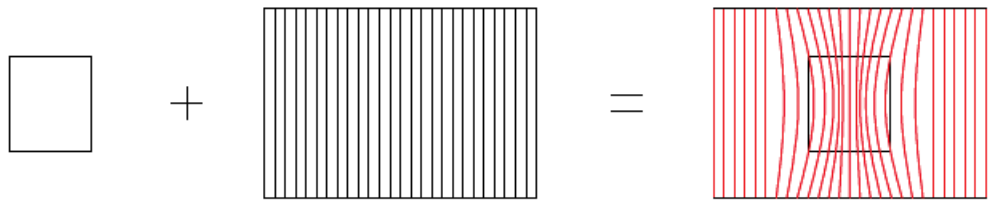
NOTE: *During the design and construction of this company's CA-320 digital compass, we were surprised at how little we knew about the Earth's magnetic field. This turns out to be important from an aircraft maintenance standpoint and therefore will be the subject of a multipart series, ending with this edition.*

In previous Newsletters we have explored the concept of ***permeability***, or ***μ*** and one of the errors, ***hard iron***, created when the permeability changes while passing through an aircraft structure. This edition will cover the other error that we must recognize and correct in our compass systems – ***soft iron errors***.

Ferrous metals tend to be iron, steel, nickel and cobalt and when they have no inherent magnetization, distort the Earth's magnetic field in the vicinity of the material. The bending and concentration of the magnetic lines of flux are different from the hard iron errors discussed previously and therefore the two errors tend to add to the overall distortion. Some of the characteristics of soft iron errors are as follows:

- The amount of distortion depends upon the compass orientation.
- They influence the field values measured by the X and Y sensors but do not disturb the origin.
- They affect a relatively small area; a rule of thumb is a volume 1.5 times the diameter of the offending material.
- If plotted in a circle, the errors appear as an ellipse with the origin unchanged and are commonly called ***two-cycle errors***.

To compensate for soft iron errors, one must rotate the readings by 45°, scale the major axis to change the ellipse to a circle, then rotate the reading back by 45°. Electronic systems can then store the errors for a given heading and correct accordingly. For flux valve based systems, this effect cannot easily be removed because the available adjustments, E-W, N-S and circumferential rotation, simply add the error in one direction or another. The best solution is to remove the offending soft iron in the vicinity of the sensor and deal with the hard iron effects directly. Degaussing the local area is a good universal corrective action.



This concludes our study of compass systems and their inherent errors. We will explore other maintenance issues in subsequent editions of ***The READOUT***.