

2.693 (13.998) Lab 5: Compass, Tilt, Motion, Acoustic Releases, etc.

1. Materials discussion continued with corrosion

2. Supporting sensors:

- a. Compass:
 - i. Geodyne 850 with 'light pipes' and grey scale readout (compass and vane follower)
 - ii. VACM with magnetic damping (on BASS)
 - iii. Aanderaa - clamped potentiometer – limited tilts acceptable
 - iv. KVH fluxgate
 1. AC75 with fixed sensors – sine and cosine output – low tilts only
 2. With gimbale sensors for higher tilts, better accuracy
 - v. Precision Navigation – 3 axis fluxgate with fluid tilt -
 - vi. Precision Navigation (Sandy's Versions)
 1. 3 axis fixed
 2. 2 axis gimbale
- b. Tilt:
 - i. Mercury pool in hemisphere – from Geodyne current meter
 - ii. Humphreys pendulum (on BASS)
 - iii. Schavitz liquid – one axis only
 - iv. Three axis fluxgate with liquid – Precision Navigation version
 - v. MAVS new solid state
- c. Motion
 - i. Accelerometers – Summit Instruments, Crossbow and Colombia Research
 - ii. Motion packages with three axis motion plus three of rotation
 1. Gene Terray's with Columbia accelerometer – Precision Navigation fluxgate orientation – BEI rate gyros.
 2. Systron Donner 6-axis motion package with filters and PC-104
 - iii. Triaxys motion package – directional wave measurements -

3. Acoustics Support Hardware:

- a. Acoustic Releases
 - i. Old InterOcean –
 - ii. AMF and Benthos – s
 - iii. Sandy Williams (IOS) type – timed ping
 - iv. EdgeTech BACS and AM2000 – digital transmission
- b. Pingers
 - i. Benthos
 - ii. OIS
- c. Acoustic locators
 - i. Snodgrass towed directional array
 - ii. Ranging on release or pinger – slant range, depends on speed of sound, from depth and slant range, get horizontal range. Use GPS and ships position to get range from several positions and position bottom instrument.
 - iii. Shortbaseline shipboard – heading and range
 - iv. Benthos Diver location