

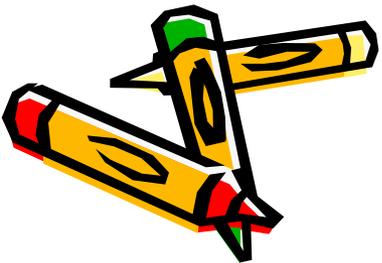
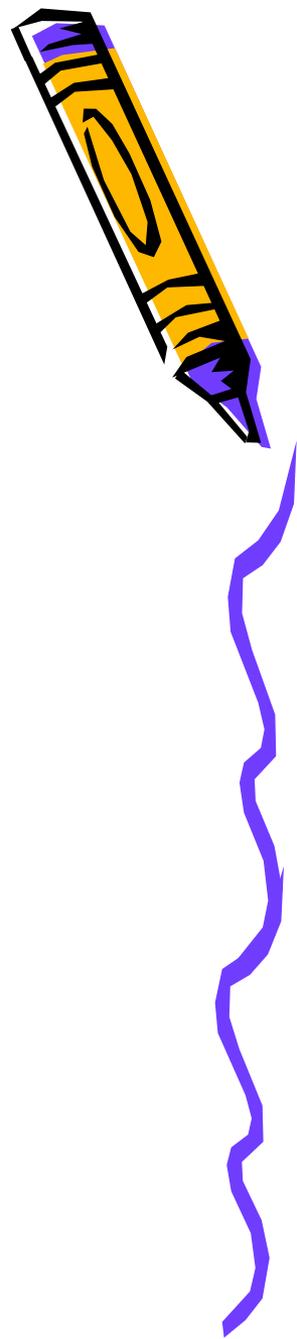
MWD Overview

Steve Grindrod

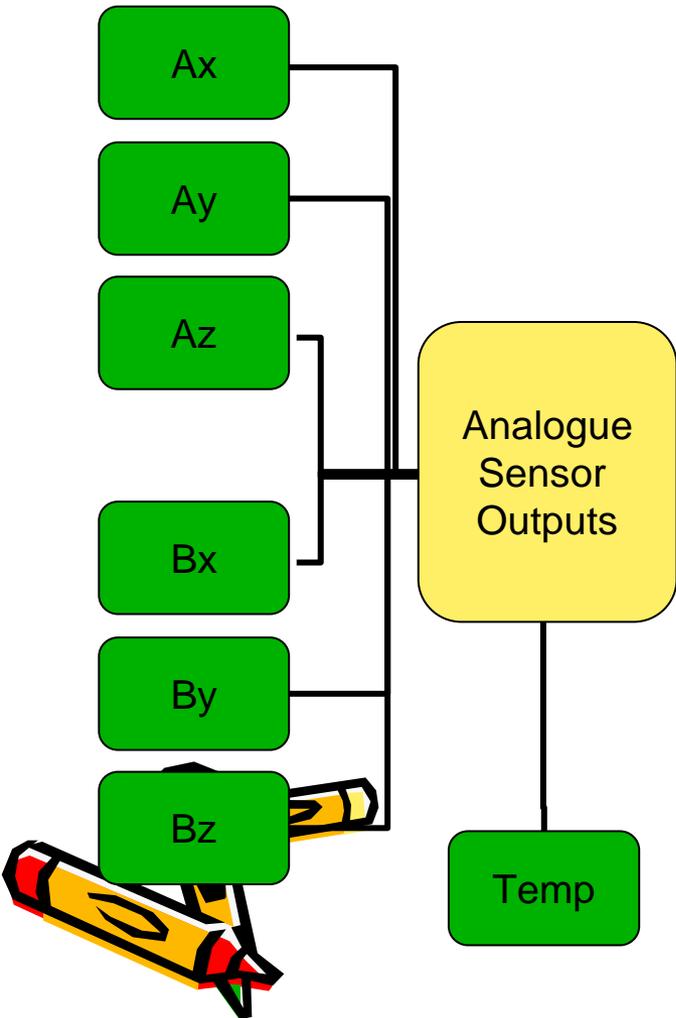
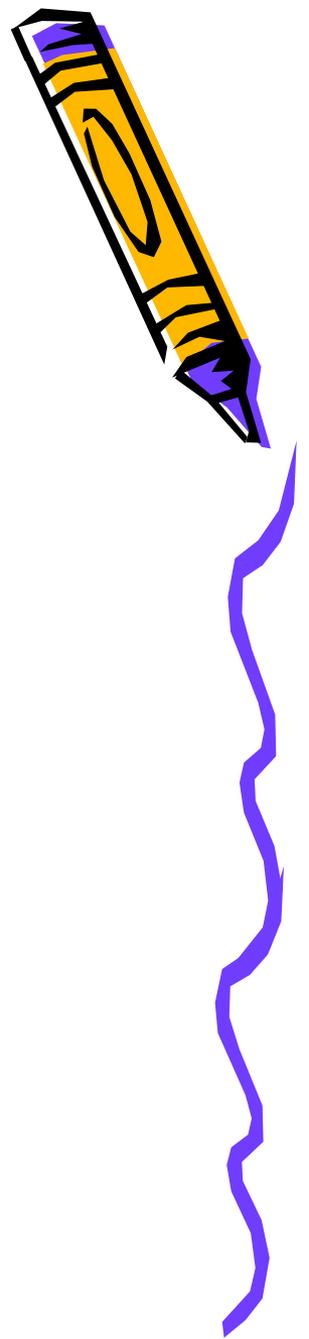


MWD Objective

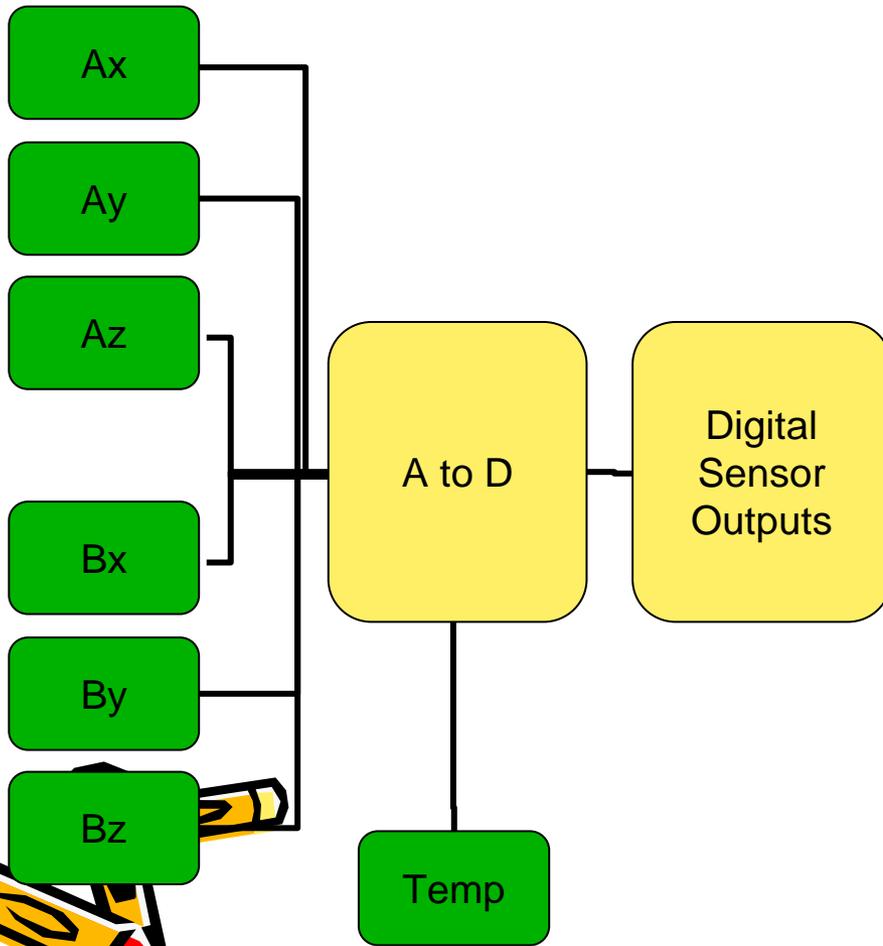
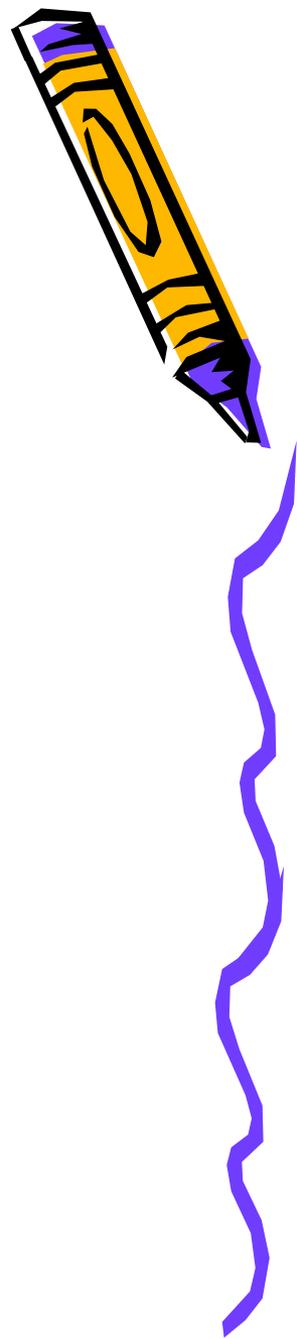
- Get downhole Inclination, Azimuth, Toolface and Data Quality to Directional Driller as quickly as possible.



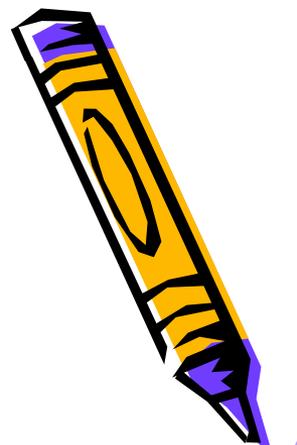
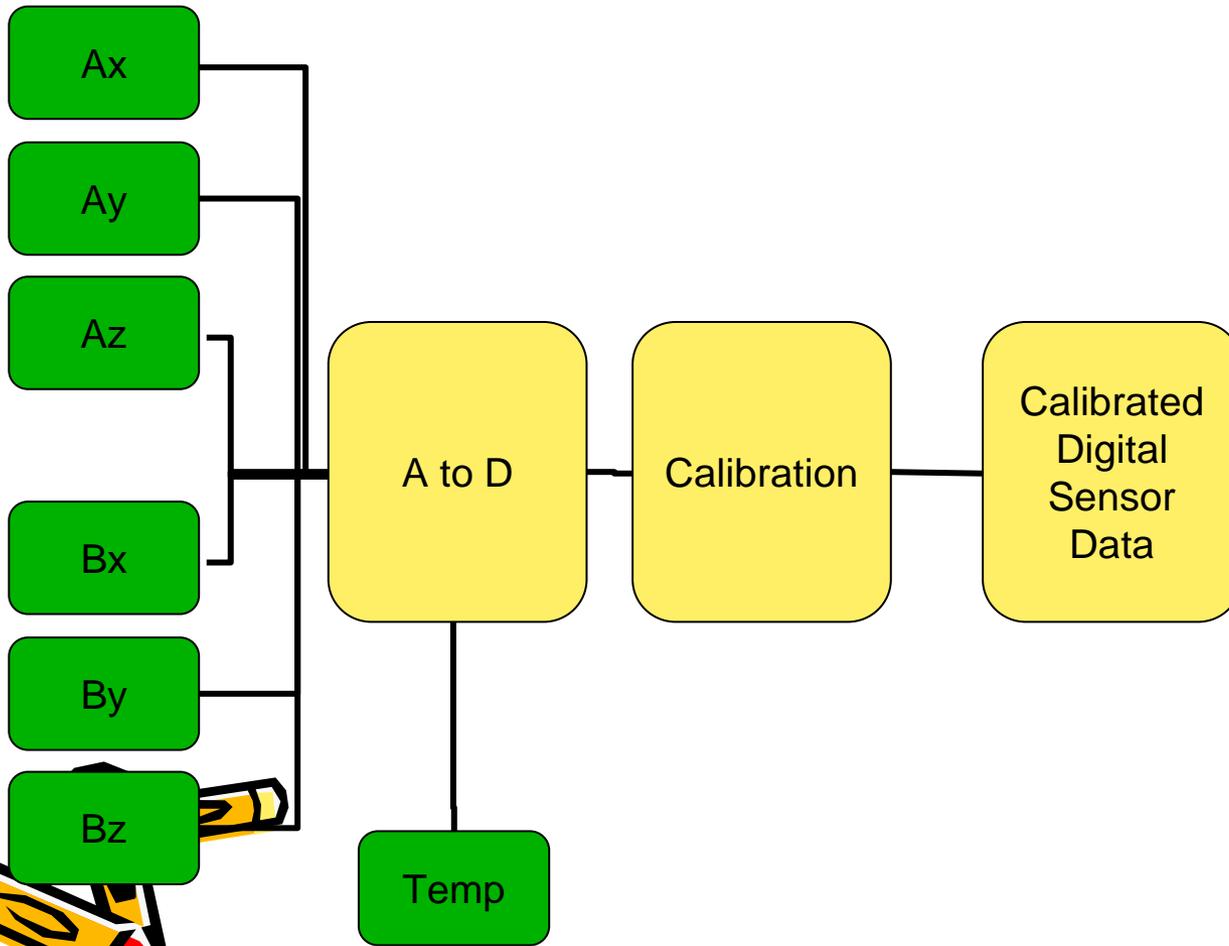
Analogue Sensors



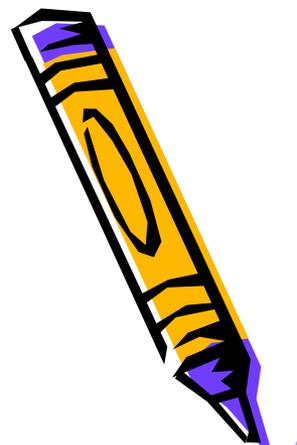
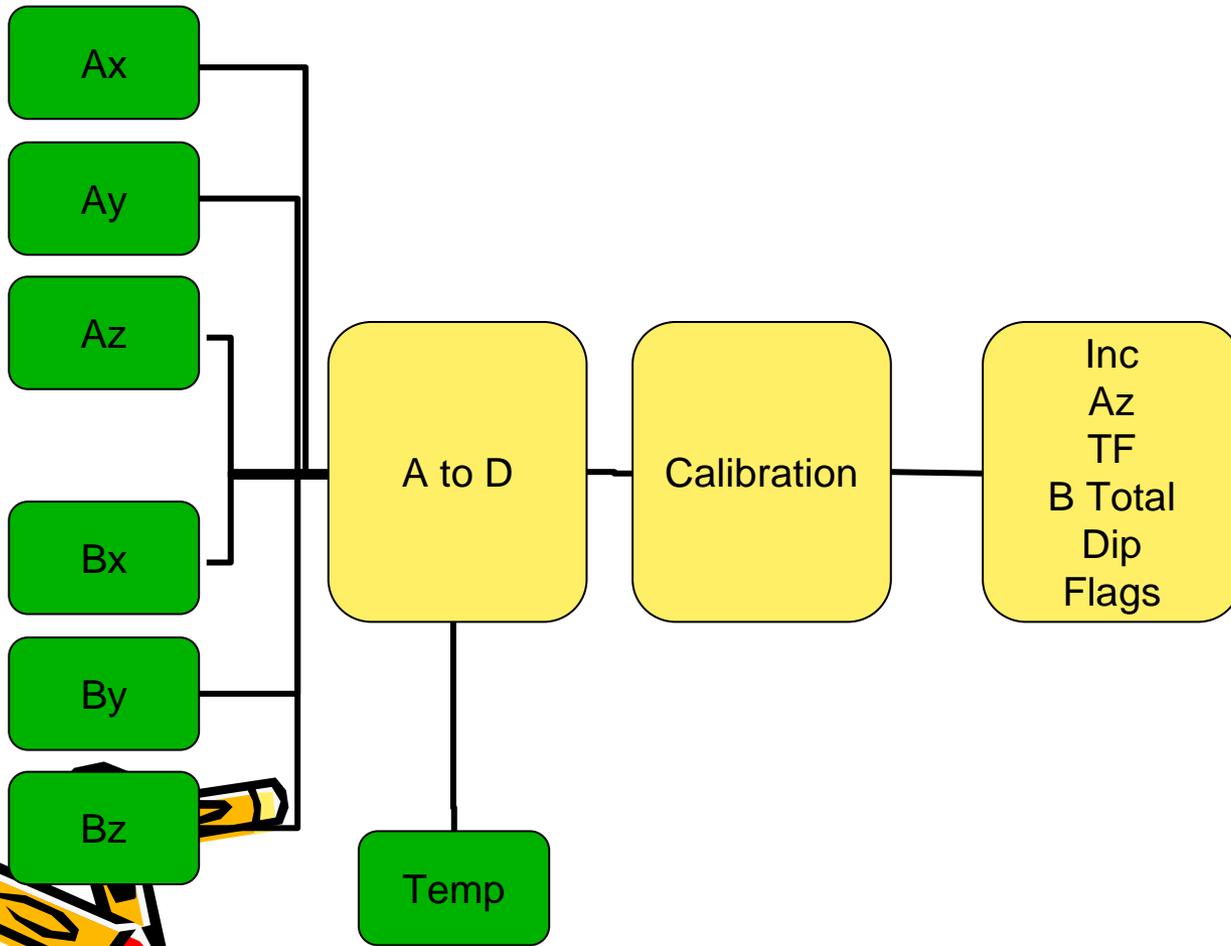
Real Raw Data



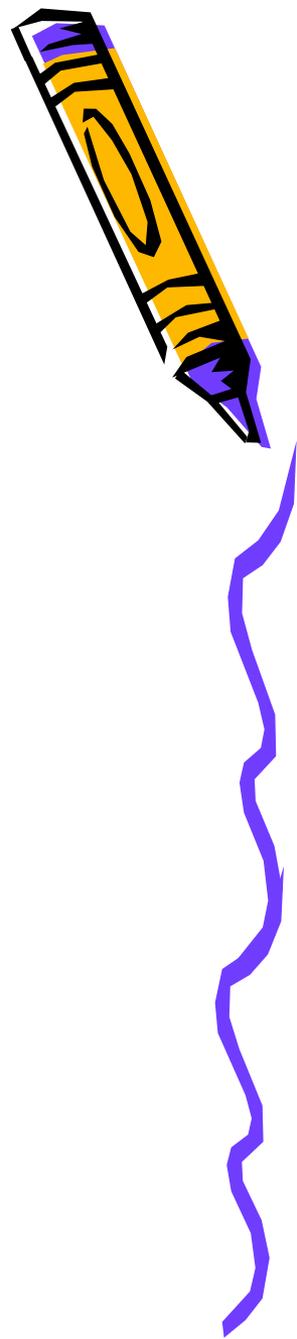
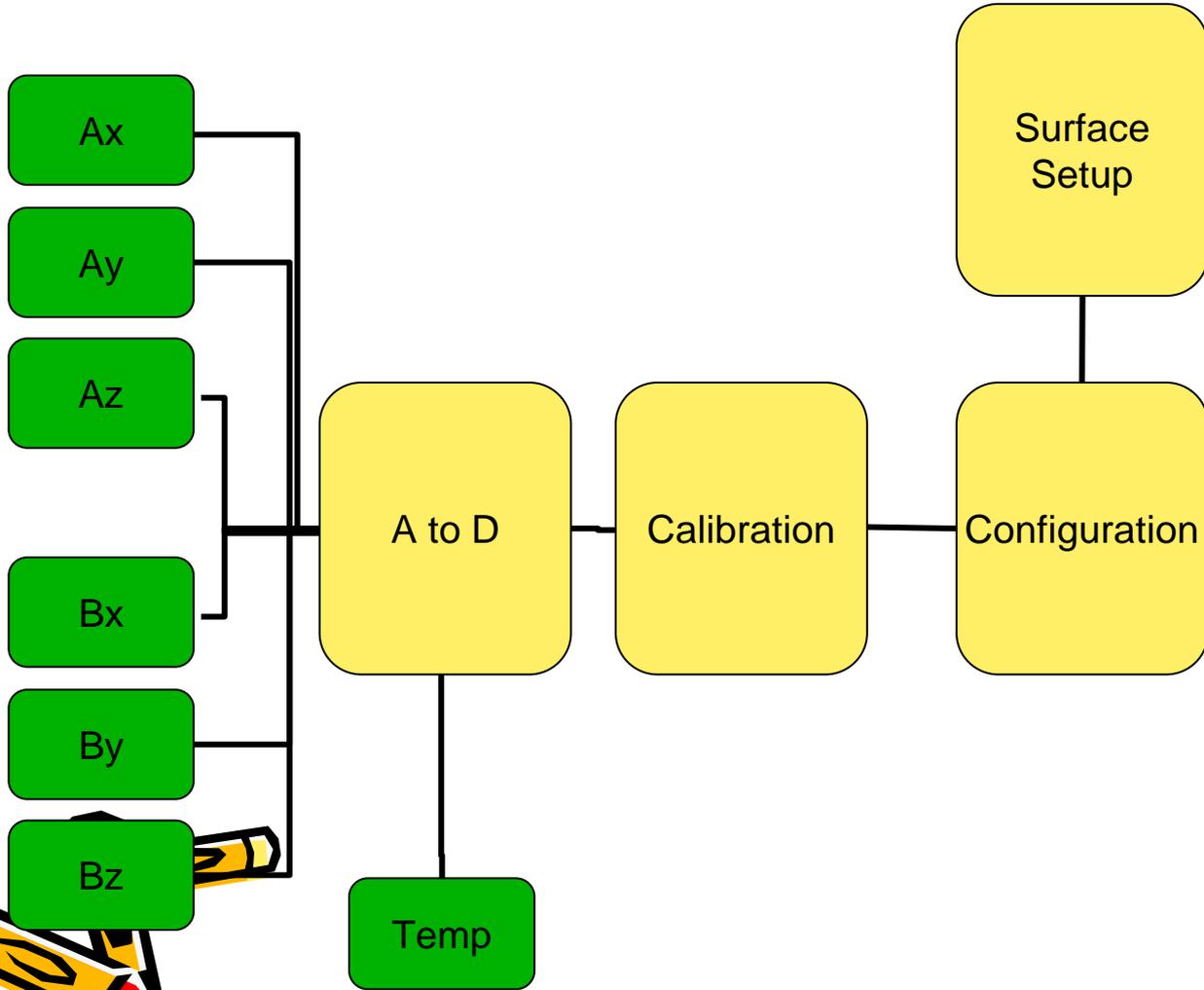
Raw Data



Calculations

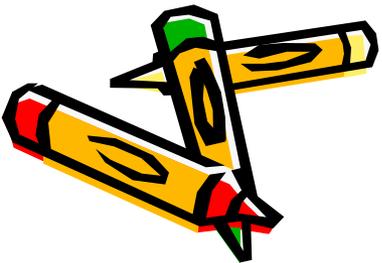
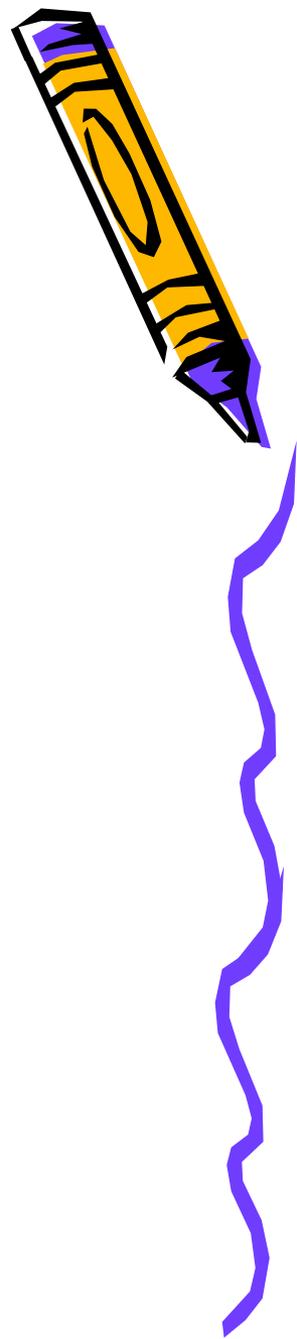


Surface Setup



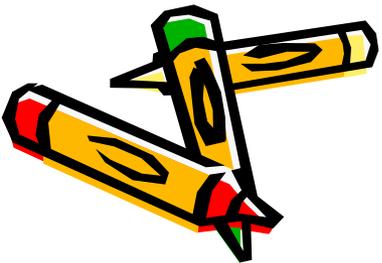
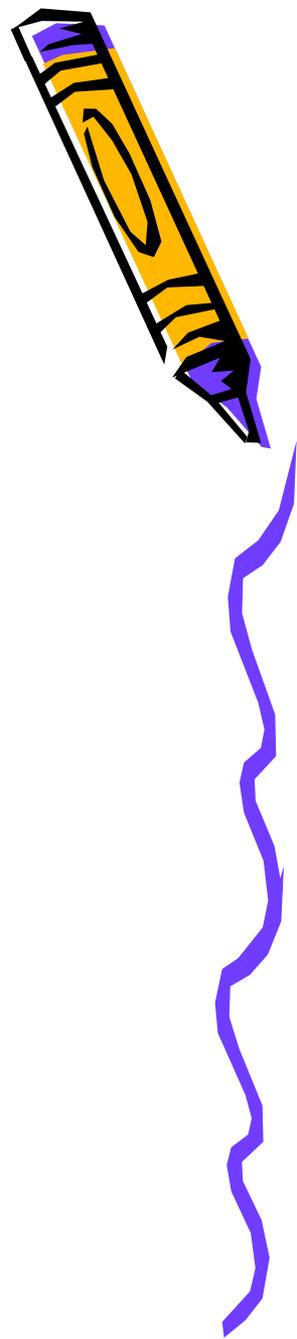
Minimum Survey

- Inclination
- Azimuth
- Toolface
- Data Quality Flag

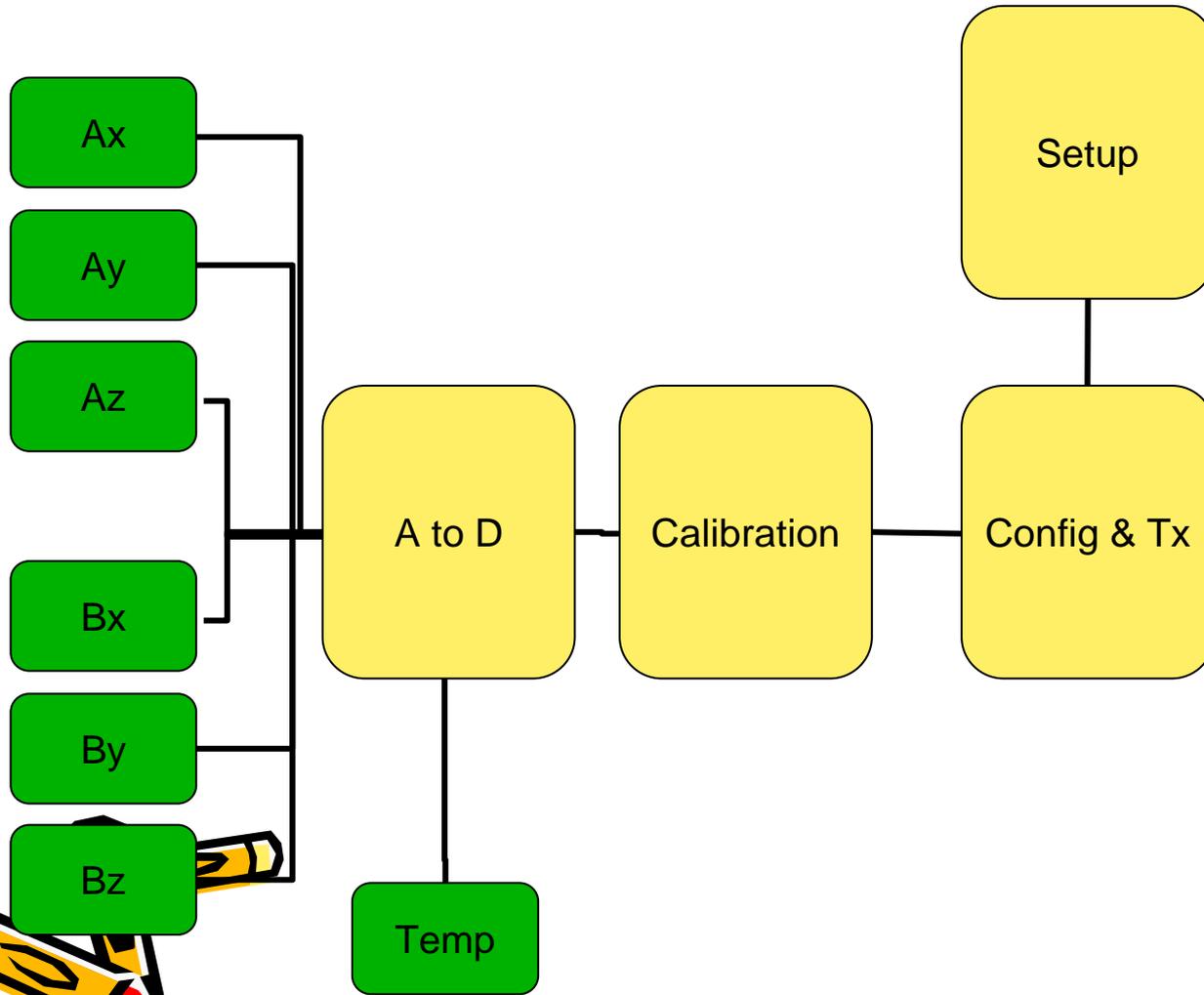


Long Survey

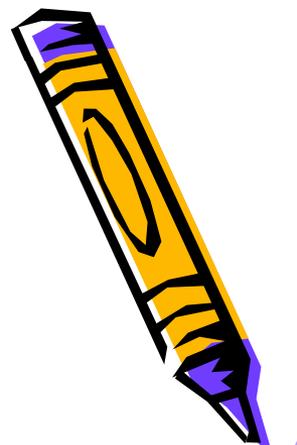
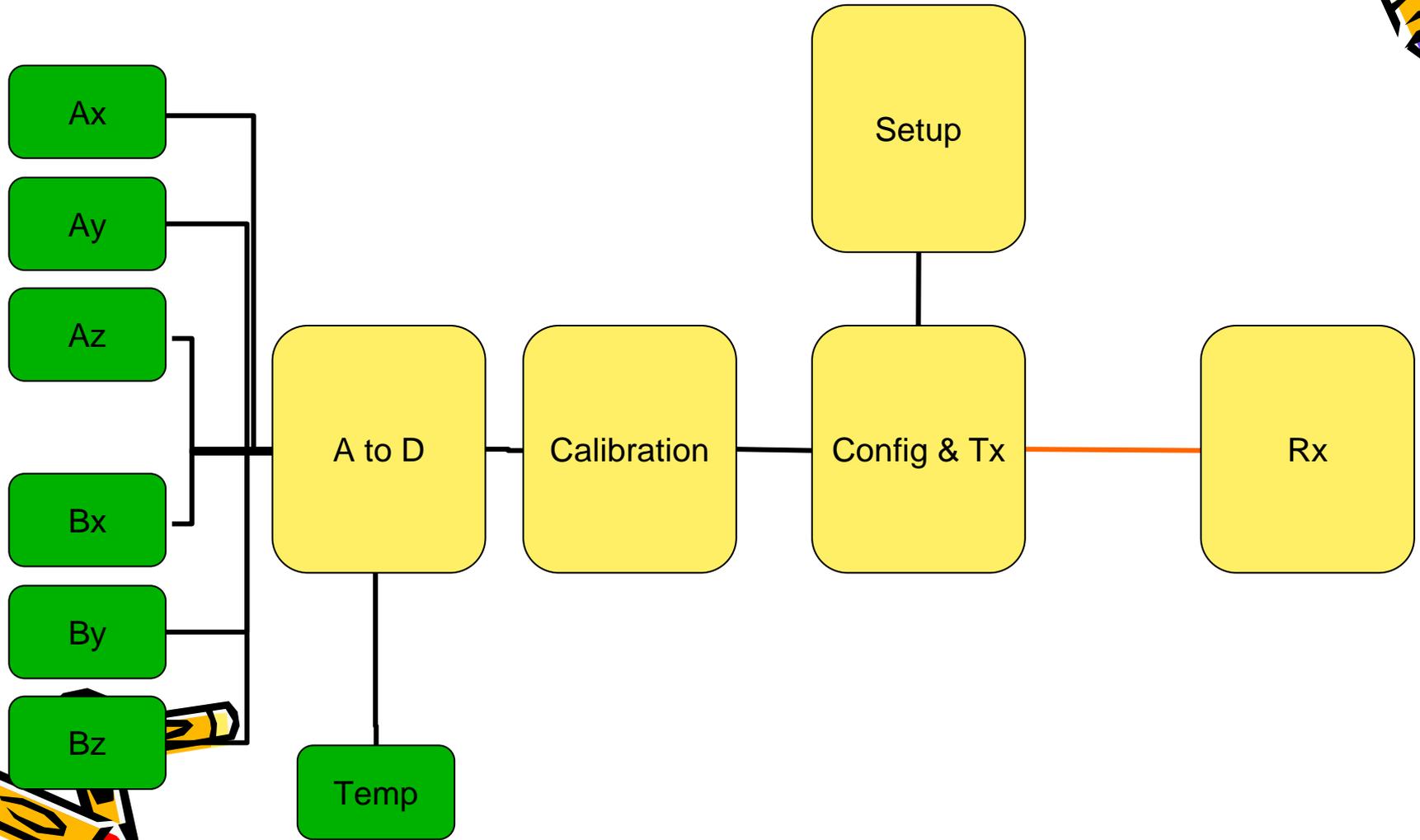
- Ax
- Ay
- Az
- Bx
- By
- Bz



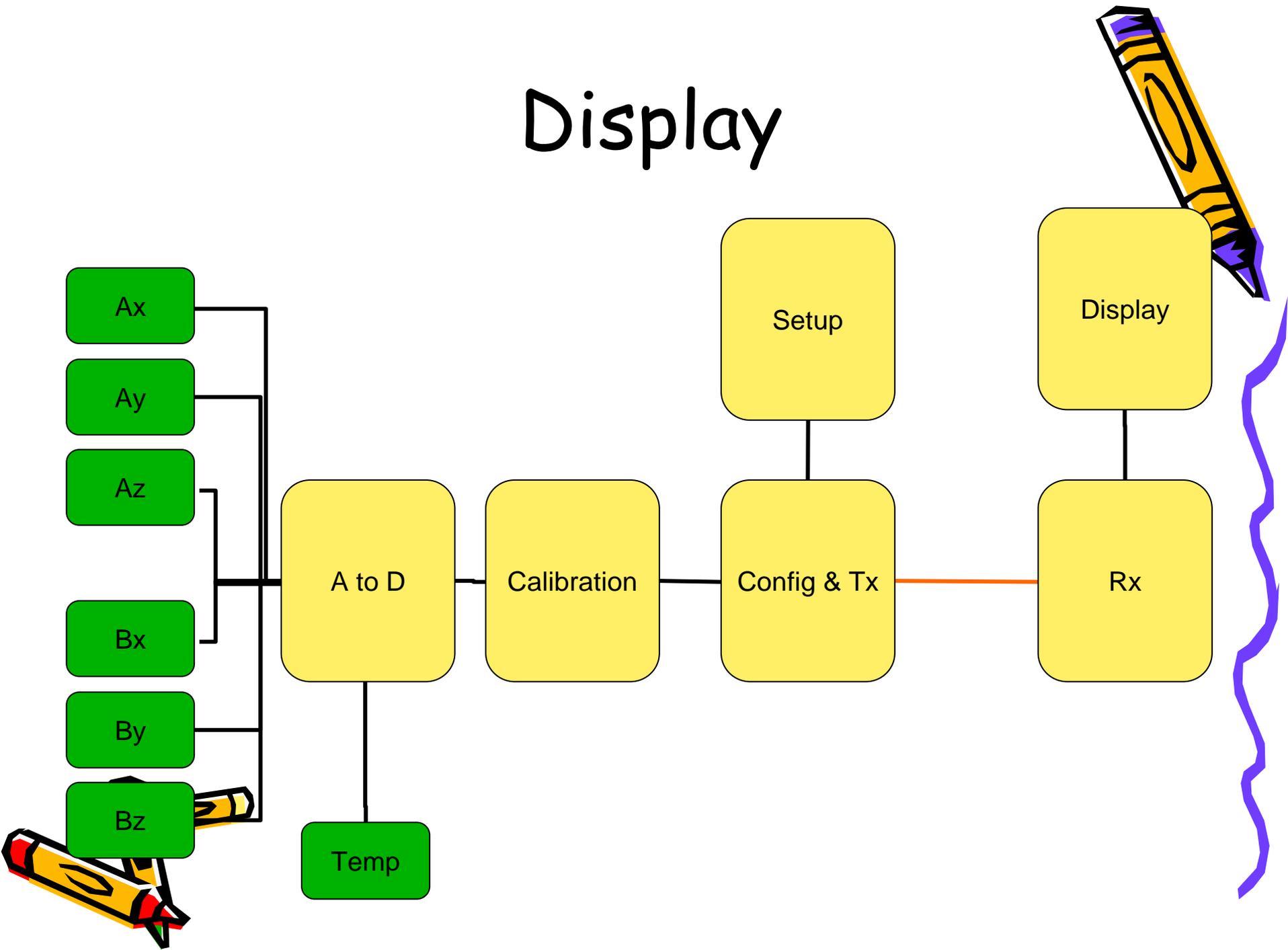
Encoding and Transmission



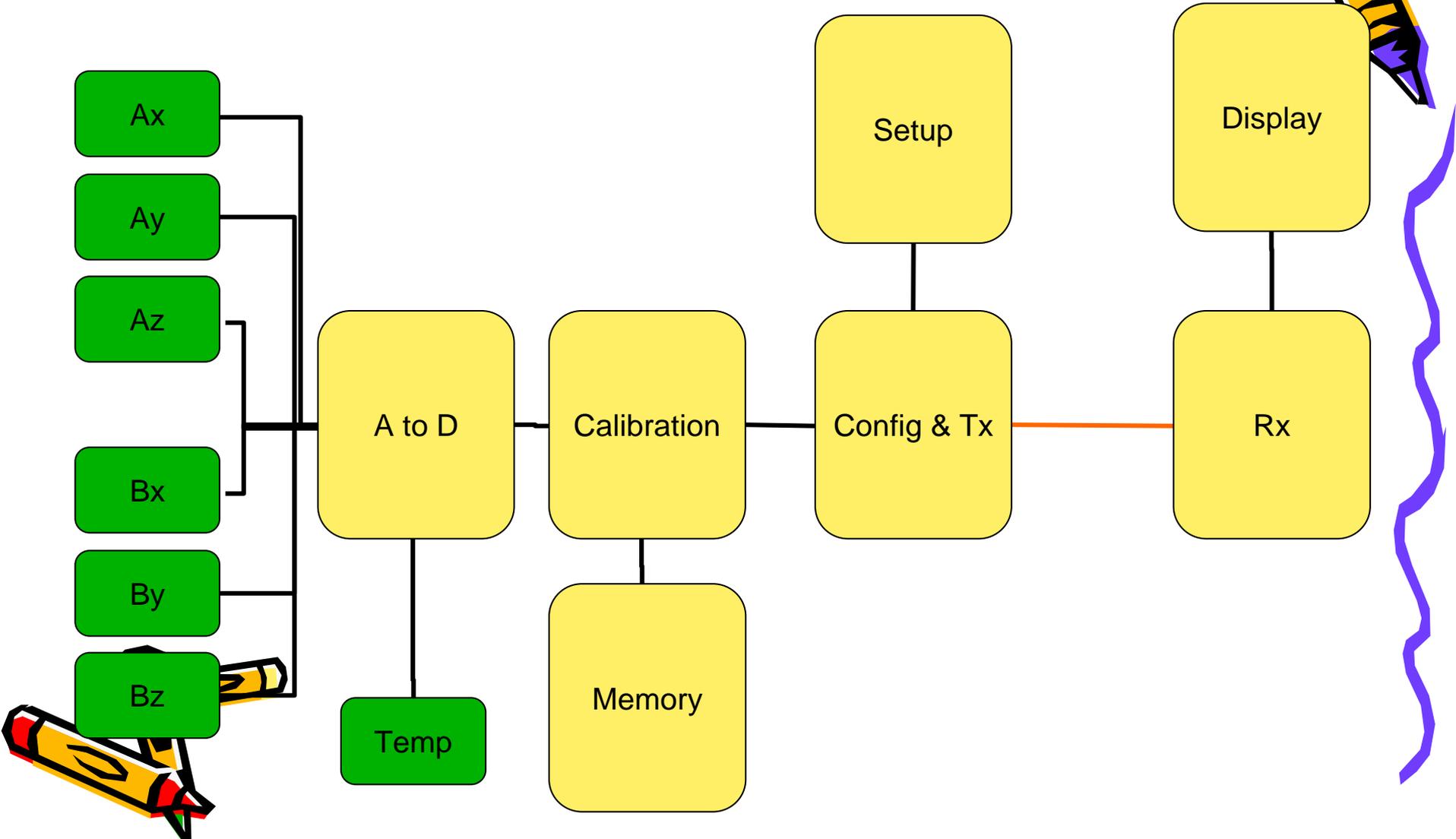
Receiving and Decoding



Display

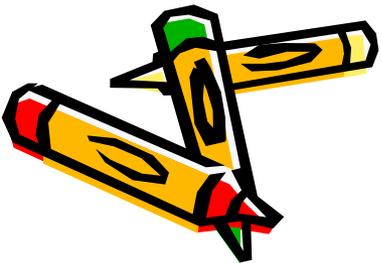
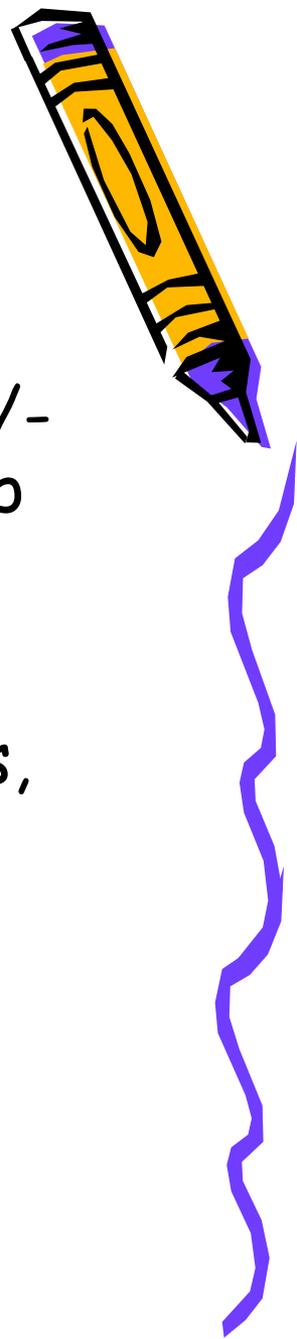


Downhole Memory

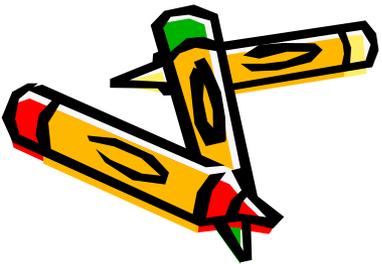
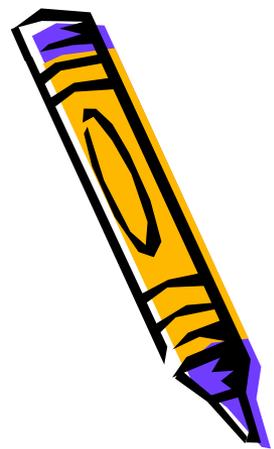
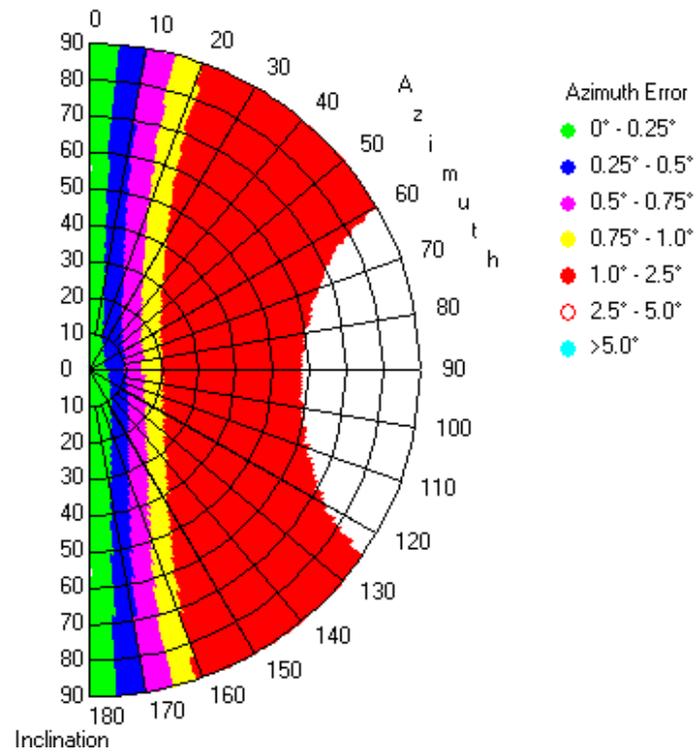


Basic Issues

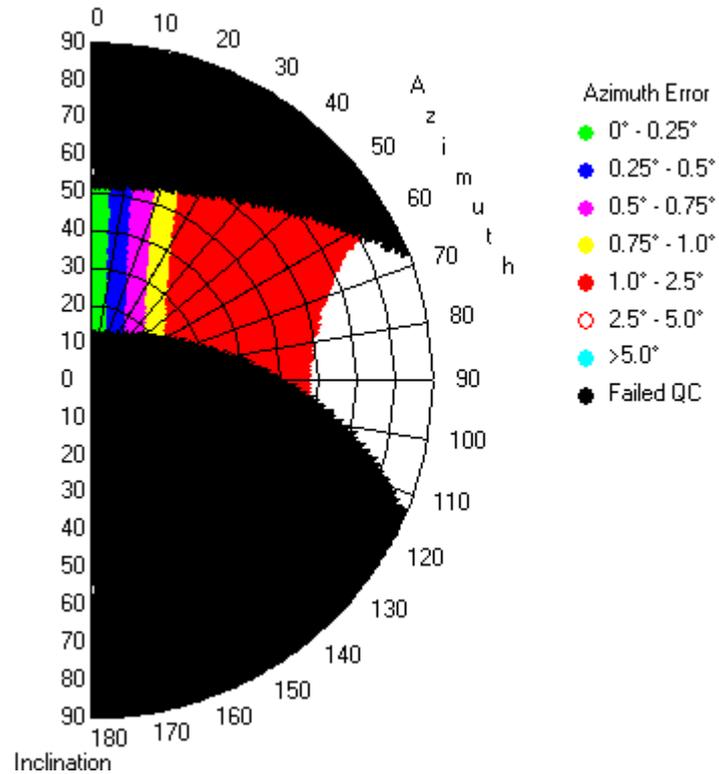
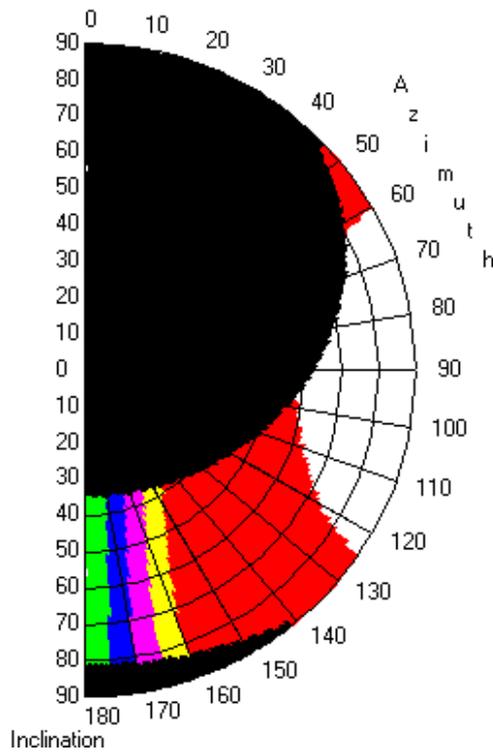
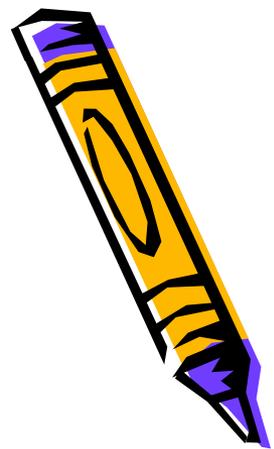
- Default Quality Limits - Often very large +/- 5000 nt on B Total and +/- 5 degrees on Dip
- Fail 'good' surveys
- Pass 'bad' surveys
- Hardware modified (Frankentools) [Sensors, Electronics, Power Supply]
- Hardware and firmware limited



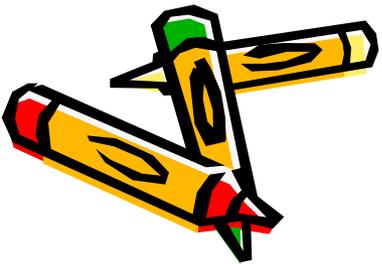
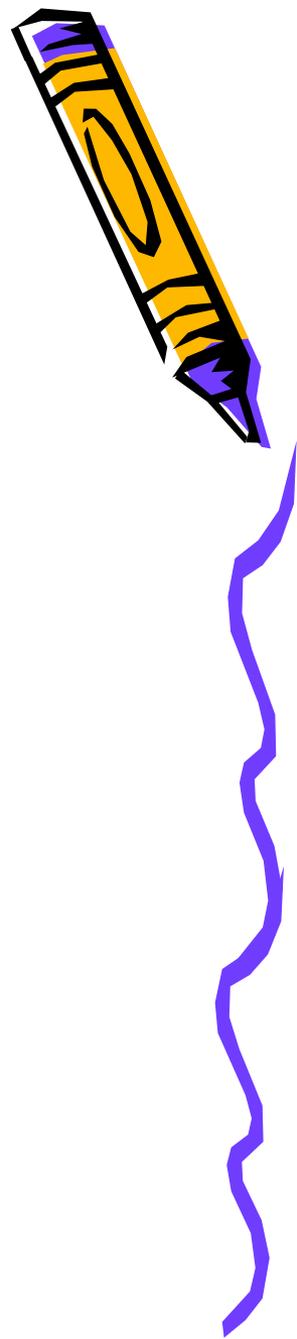
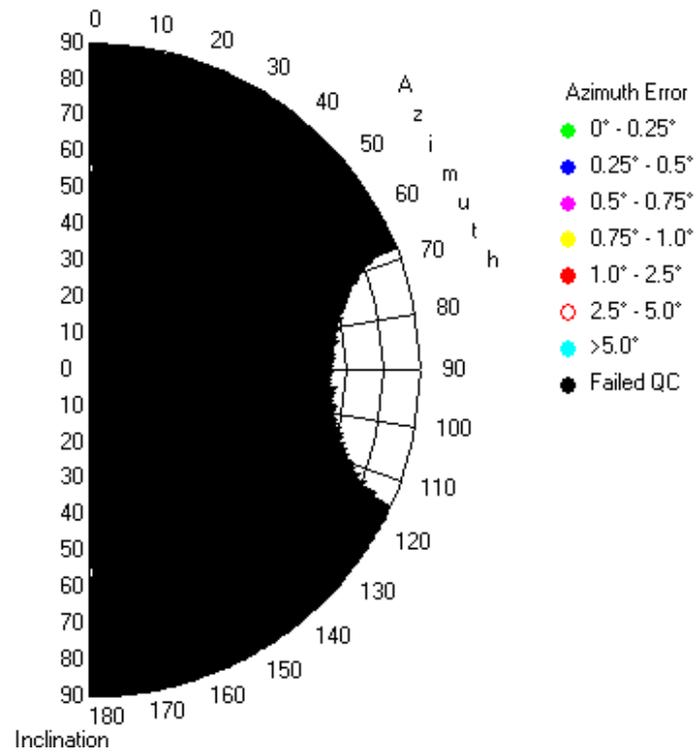
Expected Azimuth Error



B Total and Dip QC Limits

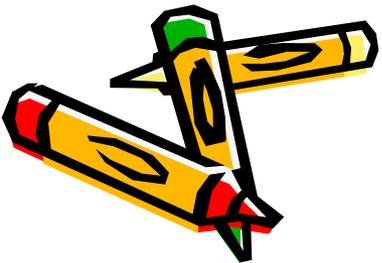
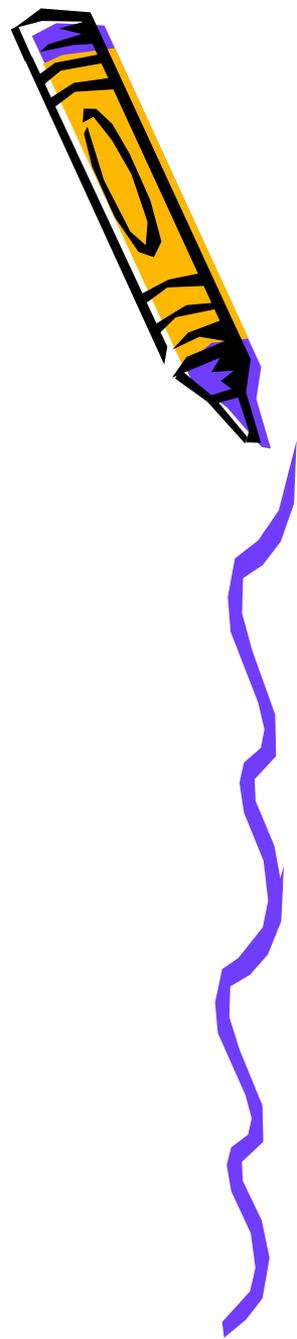


BTotal.Dip QC Limit

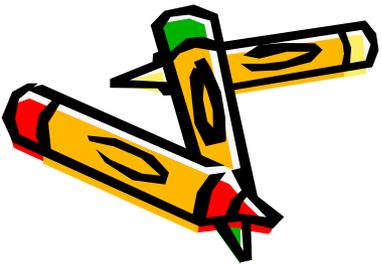
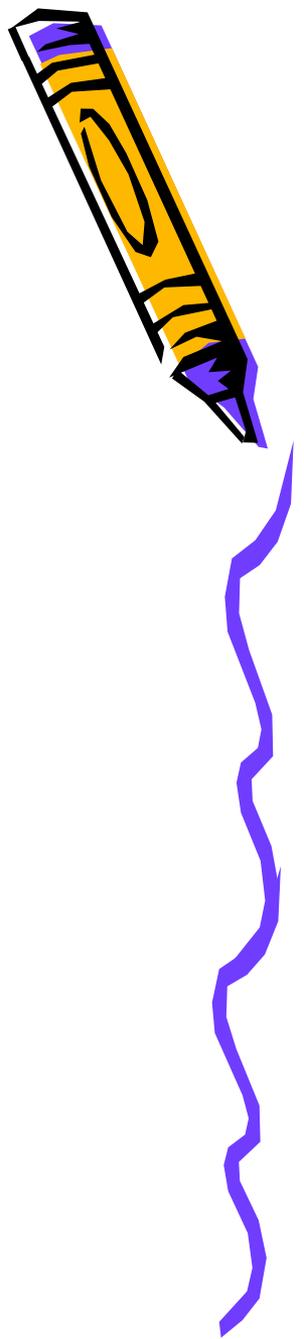


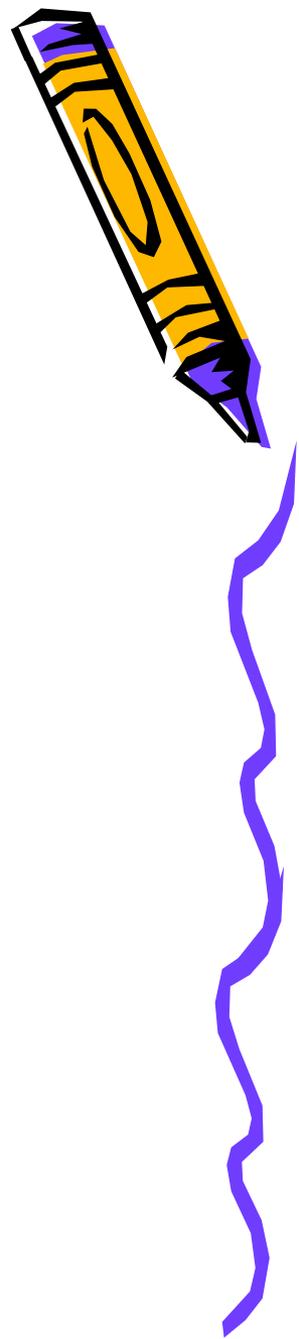
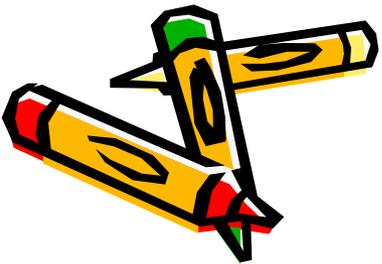
Advanced Issues

- Azimuth Correction
- Multi-Station Correction
- Magnetic Mud



Any Questions





Master

