

Navigating the Heavens

[From Your Own Back Yard]



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Presenting SkyScout

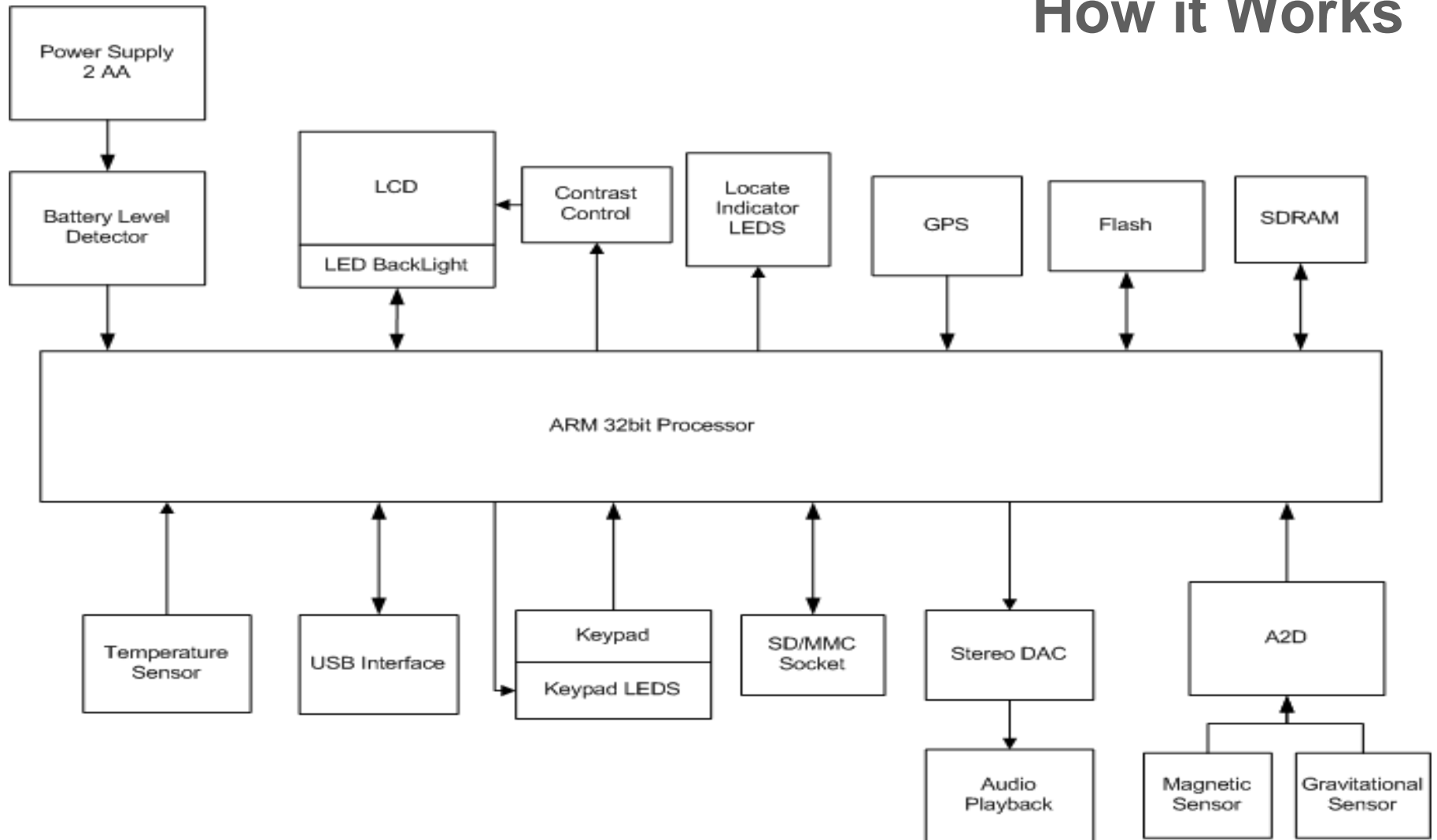


Image From SkyScout Homepage
<http://www.celestron.com>

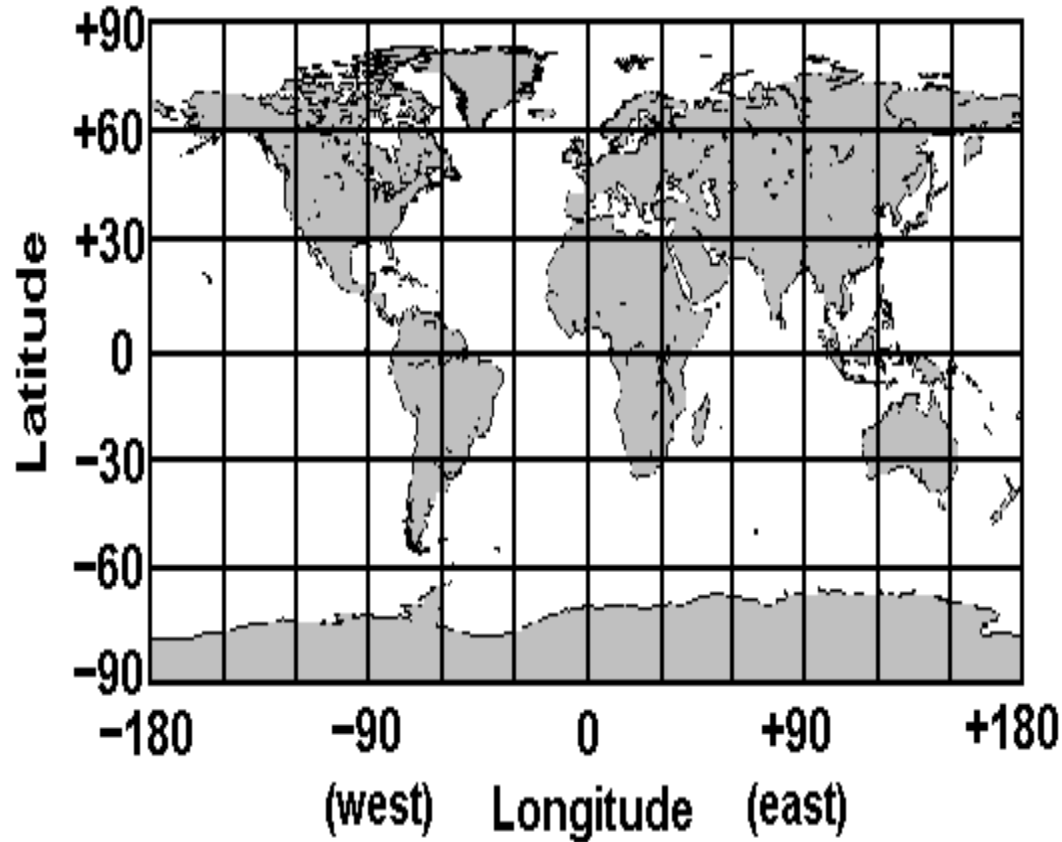
What is SkyScout?

- A device that allows you to easily identify celestial objects in the sky.
- User Friendly, Just Point and Click
- USB Programmable, Update the Device with new celestial information.
- Costly around 440 dollars
- Allows the celestially disinclined a way to identify celestial objects.

How it Works



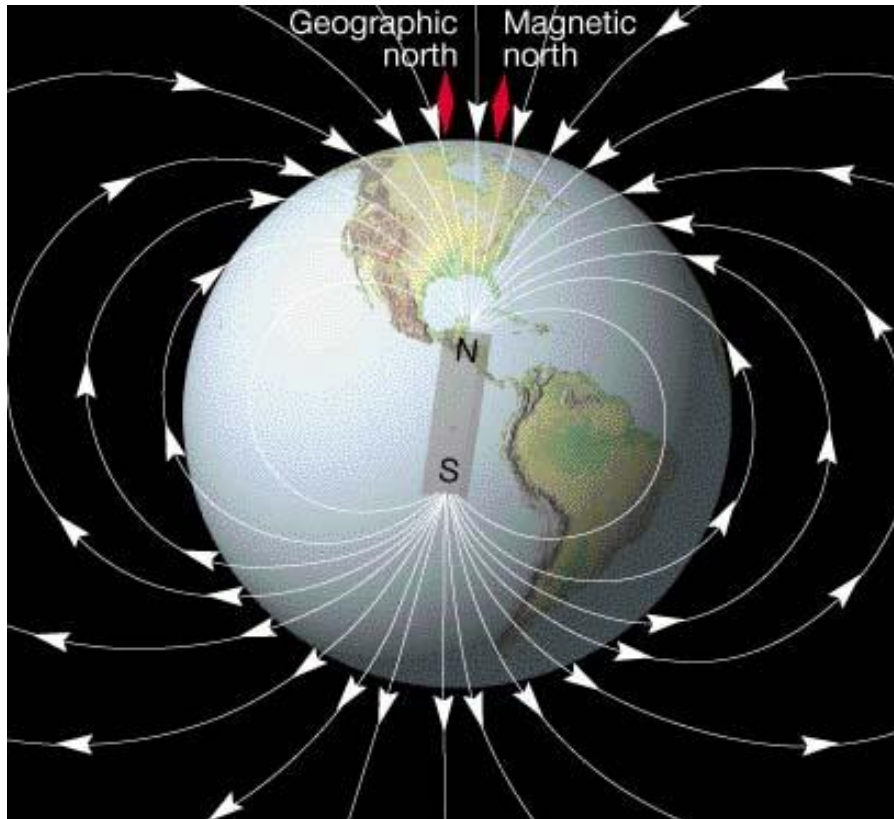
Navigating the Stars by First Looking at GPS



- Get The Hemisphere Your in
- Get The Location (Lat, Lon)
- Get The Time

Problem: Not Good For Getting Heading Information, This would require movement

The Answer Magnetic Sensors Get the Heading



http://www.calstatela.edu/faculty/acolvil/plates/magnetic_field.jpg

With GPS and compass
Information you can know
where your at and what
direction your facing and
what time it is

Problem: You still don't know where
your looking in the sky

Aside: Magnetic North is not
Geographical North and it changes,
Computing power is required to
compensate, Possible Firmware updates
Are required to adjust for magnetic
changes.

The Answer A Gravitational Sensor (Tilt Sensor)

- Can Detect the Orientation of the Device
- Can Detect what angle the device is pointed at in the sky

Problem: both Magnetic Sensors and Tilt Sensors can be very touchy about temperature.

Answer: A temperature sensor with a calibration algorithm is required to account for temperature changes.

Putting it all Together

1. Hemisphere Information Narrows down what objects can be seen
2. Position Information Narrows down what objects are visible when they are visible and how long they will be visible as the earth rotates
3. Time data Narrows down what is visible at a given moment
4. Compass Data Narrows down what is visible in a given area,
5. Tilt Information Narrows down what sector of the sky is being looked at

A USB update is required from time to time to handle

The movement of the earth and other objects from time to time .

A Real Time Clock and a compensation algorithm can approximate

This over a short time period. But wont for long lengths of time

Other Considerations

- The Device keeps a Database of Objects in the Sky
 - This can be updated via USB
 - Objects that are far away from the earth and appear to never move thus are considered static by the device. this save on processing power.
 - Closer objects who's position change regularly, like the planets have to have there current locations calculated at run time.
- Uses a ARM9 S3C24310(?) 32bit processor
 - Built in Support for
 - USB
 - LCD
 - SD

More Goodies

SkyScout can not only find a object in the sky

It can also tell you information about it, like

- The name of the object,
- When it was discovered
- Mythology about
- General Location Information

Even More Goodies

- SkyScout has the ability to play sound clips Like
 - About the object your looking at
 - Or Helpful information if you have trouble with the device.
- SkyScout has user friendly visual aids Like
 - Nice backlit LCD and Buttons
 - A LED ring to indicate what direction you need to move to find a object in the sky
- SkyScout Works both day and night