

The Raster Data Centre

Raster and Paper Chart Processing for the Australian Hydrographic Service, RAN

browse_shell

Control Point Browser

< Prev Next >

Point No 8

Remove Point Close Browser

report_shell

Residuals

| Point | Residual |
|-------|----------|
| 1 | 0.516 |
| 2 | 1.465 |
| 3 | 1.461 |
| 4 | 0.805 |
| 5 | 1.035 |
| 6 | 0.323 |
| 7 | 0.350 |
| 8 | 1.413 |
| 9 | 1.157 |
| 10 | 0.923 |

**Raster Data Capture
Geo-Reference
AUS00830**

Inset: 0
Port Douglas

Next Graticule Setup Graticules

Latitude
-16 45 0.00000000

Longitude
145 45 0.00000000

Store Control Point Browse Control Points

Points Selected 22

Zoom out 50%
Zoom Out All
Report
OK
Cancel

Raster Data Centre

- **HSA's Raster Data Centre has provided a means of capturing and maintaining the entire Australian Paper Chart series (approx. 400 charts) digitally**
 - **Substantially improving the efficiency of paper chart production while decreasing costs. Including Print On Demand.**
 - **Producing an Australian wide digital chart base in a very short time**
 - **Providing critically needed official digital chart products to both defence and civil users**
 - **Providing a valuable source of data for use within the Hydrographic Service for QA and reference**
 - **The Raster Data Centre incorporates Australian-developed world leading technology with best practices in cartographic work**



The Problem

- **The Hydrographic Service were faced with a number of challenges in supporting their existing paper charts:**
 - **Paper chart corrections and updates are essential for safe navigation but very labour intensive and consequently expensive**
 - **The traditional film media for maintaining paper charts (repromats) deteriorates with time**
 - **The repromats are the archive of accumulated hydrographic activities but are susceptible to damage**
 - **There is increasing demand for digital products for use within computer based navigation and tactical systems which was not being met**
 - **The Hydrographic Service plans to produce vector ENC data (IHO S-57 and NIMA DNC). This production process will take several years to complete at considerable expense**

The Raster Solution

- **The Raster Data Centre scans film images (repromats) of the paper charts**
 - This is done at very high resolution (1600 dots per inch)
 - The data is digitally aligned and attributes are collected from it and maintained in a database
- **The data is then updated and maintained digitally**
 - This is far more efficient than manual techniques
- **Because the data is maintained digitally it can be easily archived**
 - Multiple copies of the database can be saved and stored off site
- **Multiple products are produced from the one database**
 - Traditional paper charts and Print On Demand Service
 - Raster Navigation Chart (RNC) products (e.g. HCRF Seafarer)
 - Raster products (e.g. DIGEST raster data ASRP, GeoTIFF, TIFF, PDF)
 - Regular corrections and updates



The Benefits

- It has advanced the introduction of official digital chart data required for navigational and tactical applications
- It has cut substantially the cost of paper chart maintenance compared to the traditional manual methods
- The quality of the chart images (repromats) that were deteriorating is now stable and for most charts restored
- It has provided a safe archive for the chart images
- Where previously the Hydrographic Office was providing one product (the paper chart) it is now able to offer a range of both paper and digital products



HSA's Role

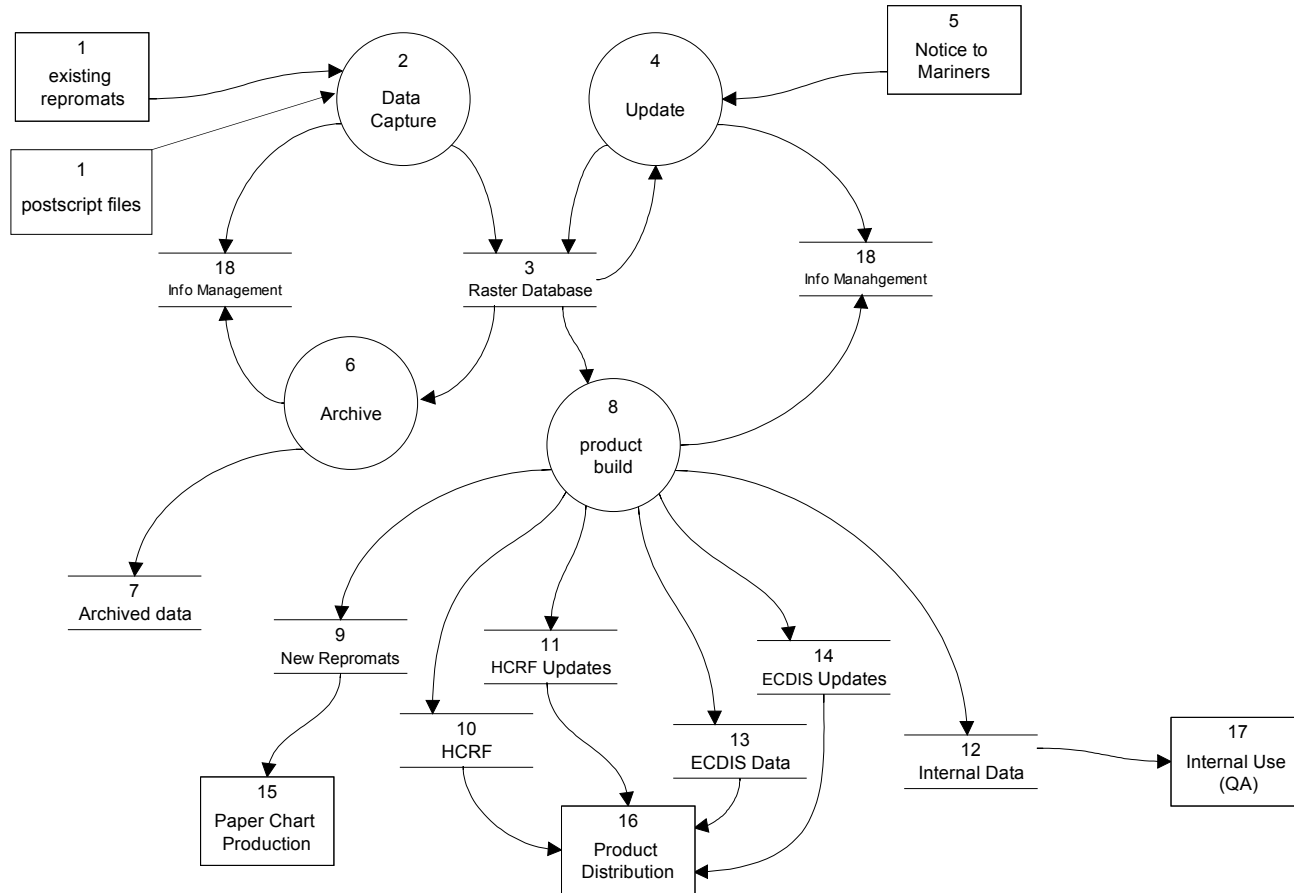
- HSA has undertaken the complete software development of all the systems required to capture the data, maintain it and produce product
- HSA is responsible for all the processing involved in capturing and maintaining the data on behalf of the Hydrographic Service
- Full QA of all the processes involved in raster production is carried out by HSA staff
 - HSA is certified to ISO 9001
 - Final QA is done by staff from the Hydrographic Service
- Once the data has been approved, HSA provides the Hydrographic Service with final digital data



The Processes

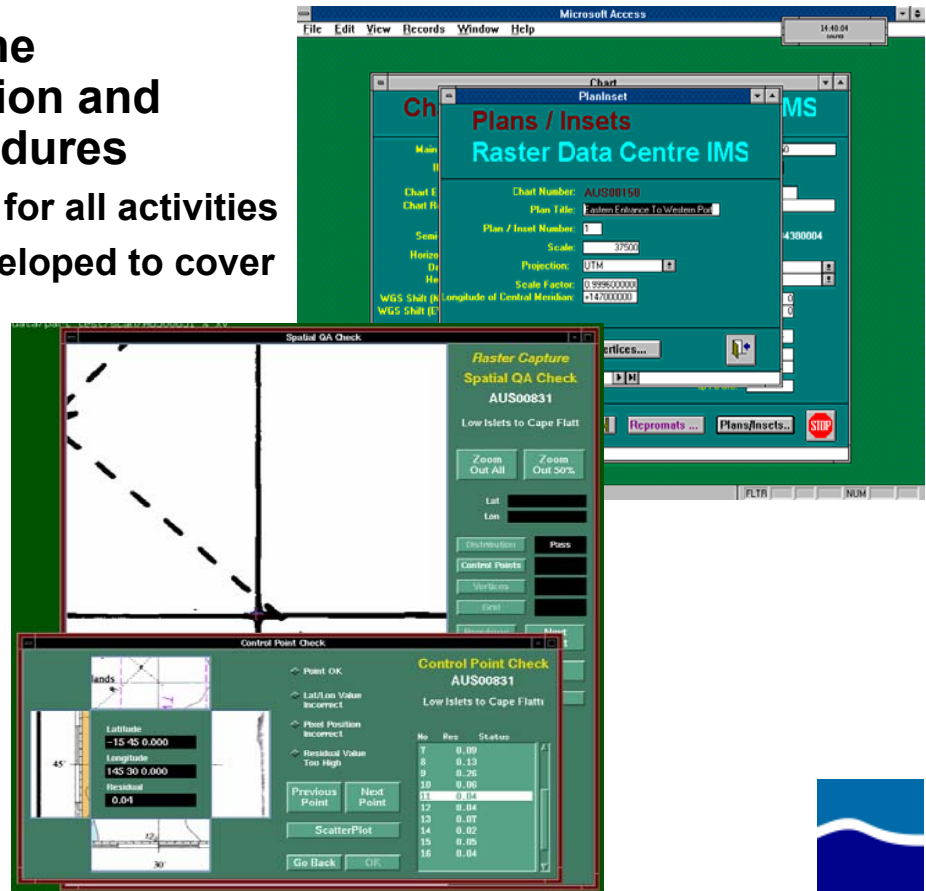
- **There are 4 key processes involved in the production of raster charts**
 - **Capture of the chart repromats**
 - **Archive of the digital charts – backup and disaster recovery capability**
 - **Compilation, update and maintenance of the charts**
 - **Generation of products**
- **Central to all processes are the databases where all data are stored**

Raster Data Centre - Overview



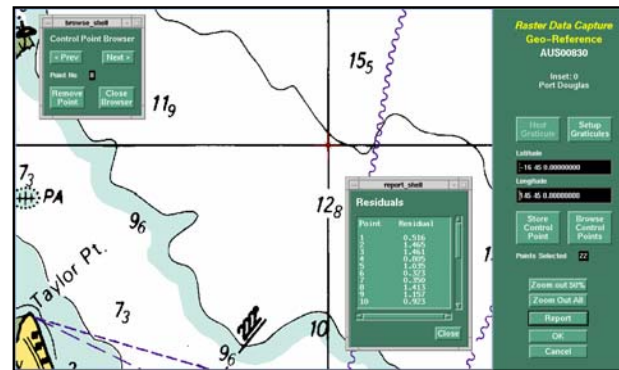
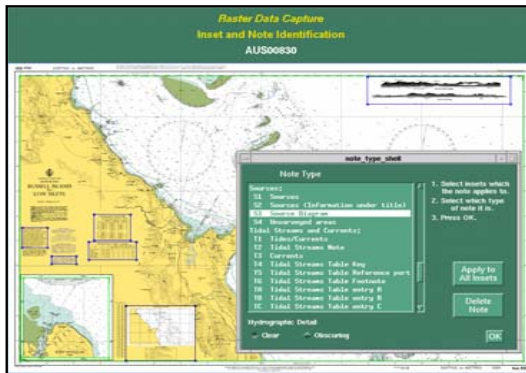
Information and Quality Management

- Key to all processes is the management of information and Quality Assurance procedures
 - Audit trails are maintained for all activities
 - Procedures have been developed to cover all production activities
 - QA systems have been put in place to automate data checking
 - Software has been designed to enforce all processing is done according to the procedures

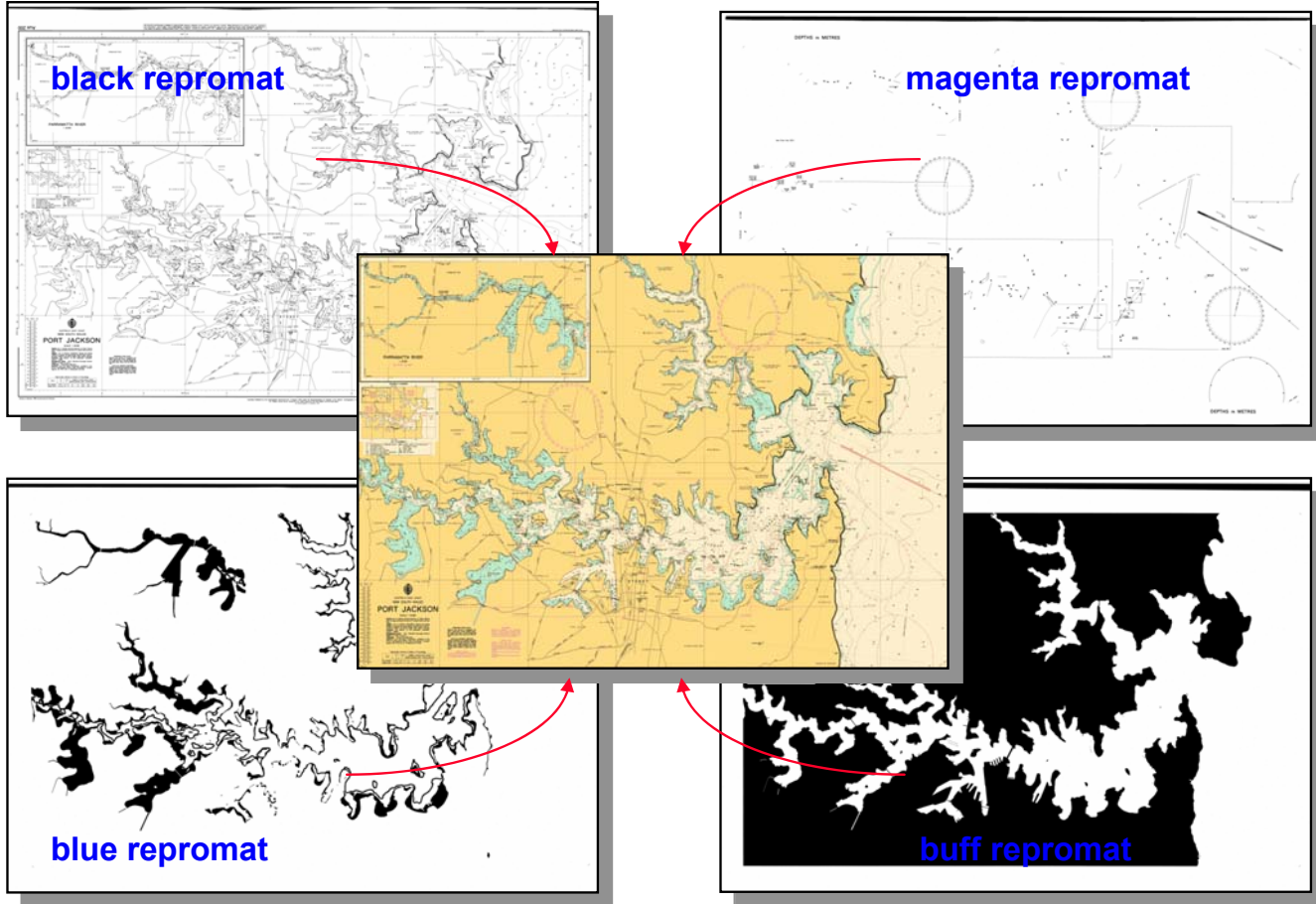


Data Capture

- The photographic colour separated images (film reprints) are individually scanned
 - This is done at very high resolution 1600 dots per inch
- Digital postscript files can be imported from vector chart production systems
- Image files are aligned so that the separate colour images match up
- All insets and notes are identified and spatially referenced
- Identified control points are used to geo-reference the charts
- The chart is then put through a through QA phase before being added to the chart database
- The final chart alignment and accuracy is often better than the original reprints



Combined Repromats



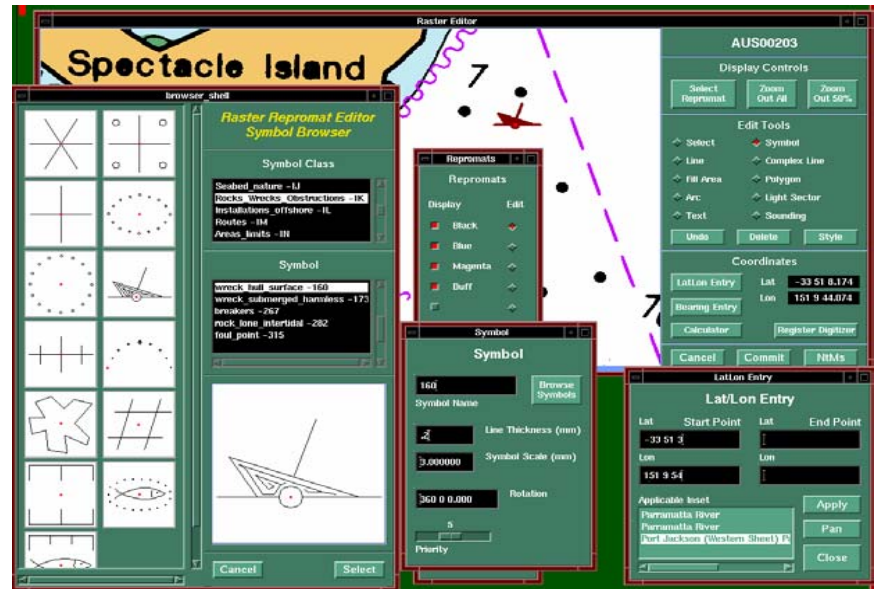
The Raster Database

- **The reprints are stored at high resolution**
 - 1600 dpi
- **Substantial attribute information is also maintained with the images**
 - Chart Titles
 - Inset information
 - Geo-referencing data
 - Update application and QA time-stamping
- **The Information Management System also maintains audit information**



Update

- Update and chart corrections are done digitally according to the Notices to Mariners and other Serial Reprinting
- Updates are then available for
 - Paper chart reproduction
 - Support for digital products including:
 - Seafarer RNC
 - GeoTIFF, TIFF
- Updates are maintained so that it is always possible to go back to earlier versions



Products

- **The Raster Data Centre supports a number of products**
 - **Digitally generated Repromats for the reprint of paper charts, and now full Print On Demand.**
 - **Defence requirements**
 - DIGEST - ASRP
 - **Navigation/Civil formats**
 - Seafarer (HCRF)
 - Supports automatic digital Notices to Mariners
 - GeoTIFF
 - TIFF
 - **Special Applications**
 - Print On Demand
 - ECDIS sea trials
 - Great Barrier Reef Reporting System
 - **High resolution images for internal use with HS RAN**
 - QA for vector GIS data
 - Base information (e.g. NavMarks)
 - Backdrop for heads up conversion and raster to vector conversion.



Conclusion

- HSA has developed a world leading technology combined with best cartographic practices to maintain the Hydrographic Services navigational charts.
- The process has accelerated the introduction of digital chart data
- Decreased the costs of maintenance and storage
- Improved the quality of the paper chart stock
- Facilitated Print On Demand (POD) capability
- Provided a reliable method of archiving, backup and disaster recovery
- Introduced to defence and civil users critically needed digital products for use in navigational and tactical applications

