

RADAC - The Next Generation

Concepts Discussed thru 10/22/98 Meeting

Design considerations

Data

Both input and processed data should be archived.

Input buffers containing positional data should have similar or same format before being processed. Convert to earth centered.

A front-end-processor should be used to interface with and format external sources.

The system should be able to monitor quality of input data (prior to processing.)

Automatically generate a positional data file - one for each tracking radar and one for the "best" track.

Automatically generate an ASCII file of raw radar data for all tracking radars from T-0 to LOS. File should have labels and not require a separate README file.

Distribute non-sensitive data via the Internet allowing real-time remote viewing via a web browser.

A standard format (e.g. XML) be used for data output from system

In addition to *positional* data, consider the following types of data for input/processing/output

- Ship surveillance
- Video
- VANDAL TM altitude
- Surveillance plane positions

Use a database system for data published to www.

Compress data files post mission (prior to distribution) FTP server can do in-line decompression for users.

General Design

System should have User Defined Command Routine capability.

Changes to tracking radars need to be able to be made in real time (dynamically - specifically for rendezvous-recovery)

Should we modularize each application as a separate component?

Develop a system that can exist on one computer or be distributed to multiple computers. This allows scalability and mobility. *

System should have the capability to monitor and compare data output from redundant systems in order to calculate a confidence level.

Dedicate a processor to a subset of the system functions. The machine that collects the data could send relevant data to each processor as required.

Add a control byte/word to data to determine if it is to be filtered, used for "best select", etc. Make system data-driven.

Incorporate/replace the PCGDS/PCDQS in both the RCC and Mobile RCC.

Do we know the life expectancy of this system?

What are the timing/latency issues?

Can "best track" be calculated differently? Weighted average? Save best data as separate file.

System should have the capability to calculate multiple "bests" from selected sources (i.e. best of sources 1,5,and7, and best of sources 2,3, 4 and 6). This process should be dynamically controlled.

The functions of several UCDR's (LOOKUCD, Balloon UDC, VANUDC, and slew check) should be maintained.

Logs and system history functions must be maintained, and improved over the existing system.

Calculate and distribute orbital elements.

User Interface

Mission setups can be very cumbersome. Too many files required.
Screen editors would be easier and more versatile. *

Panels should be designed so that one person can control the source of data and displays.

Modularize the control function (separate box).

Use a database to contain dated radar site files.

Maintain same setup names throughout entire system.

Maintain consistent graphics symbols through out system.

Allow user generation of display graphics items such as lines, shapes, etc.

Design Process Considerations

System Requirements

Which functions in the existing system are required in the new system? *

Get requirements from users (RSO, etc.) *

What have been the results of NASA investigations in the area of hardware and software?

Investigate existing systems (COTS, etc.)

White Sands

Naval Air Warfare Center (China Lake) Range Computation and Control System II.

Pax River

Naval Undersea Warfare Center (Newport, RI)

KSC

VAFB

JSC

Build a prototype system.

OS, Language Choice

The most commonly used languages for real time development are Ada, c, c++. *

Object Oriented Framework for Parallel and High Performance Computing (SAIC).

Windows NT not suitable for real-time development.

Team Logistics

Distribute (via www, if possible) diagrams:

Existing RADAC system (*end-to-end specifications*)

Control panels

Inform WFF community of our efforts via e-mail, newsletter, etc.

We must develop training plan and testing plan early in the design process.

New system must be completely documented.

Questions

Will tape processing for data reduction still be required?

How robust should the graphics display system be (layers, etc.)?

Should dynamic modification of system parameters be allowed?

Should system do only Range Safety functions or do data reduction functions? How far along this continuum should it be?

How will acquisition data (look angles) be calculated and how will it be output?