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Case Study
NASA Wallops Flight Facility

The Challenge

The NASA Wallops Flight Facility, located on Virginia's Eastern Shore, was established in 1945 by the National Advisory Committee for Aeronautics as a centre for aeronautic research.

It is one of the world's oldest launch sites. Wallops Island is now NASA's principal facility for management and implementation of suborbital research programs.

We were tasked, via our US representative Brandywine Communications, with developing a range timing system for the facility.

The specific requirement was to provide a resilient countdown system so that countdown time and other data could be distributed to the required users and to various remote outstations.

The Solution

As with all safety critical applications, we recommended the use of a dual redundant system, which provides a continuous output if a fault develops.

This system, together with our M170 Countdown/Up Generators provided the basis of the solution.

A dual redundant master clock system, using two of our GPS-synchronised M211 Modular Timing Systems together with a changeover unit, was installed at the central site.

Countdown/up time data is distributed from the countdown generators via the dual redundant system to remote outstations.

The systems at each remote outstation are also dual redundant for extra reliability, and receive data from the central master clock system over fibre optic links. Countdown time is displayed on our M355 11-Digit Countdown Displays.

As well as countdown data the system generates and distributes various timecode and frequency signals for use throughout the entire range.

An SNMP-based Network Management System is provided at the central site, which monitors the whole system and provides the facility for generating event logs and other statistics.

The Result

NASA Wallops Flight Facility now has a fully synchronised, highly reliable master clock system, generating precision countdown/up time data plus timecode and frequency signals throughout the entire facility.

In addition, it has the capability to remotely monitor and control all aspects of the system.

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Product Solutions

Configuration for NASA Wallops Flight Facility

Dual Redundant System

- Two or more M211 Modular Time & Frequency Systems are linked by a Changeover Unit
- If a failure occurs in the primary timing system, the Changeover Unit switches to the secondary or standby timing system, automatically ensuring uninterrupted operation
- Manual operation is possible for maintenance purposes

M211 Modular Time & Frequency System

- Ideal where synchronisation of many different output interfaces is required
- 9-slot module output capacity
- Choice of clock synchronisation options
- Choice of master clock accuracy
- Large range of output options
- 3 U high standard 19” rack mount
- 5 button front panel keyboard for equipment configuration and control
- Alphanumeric display of time, date and status
- Equipment configuration stored in non-volatile memory

M170 Countdown/ Countup Clock Generator

- Maintains a count of time in hours through to tenths of a second
- Start time preset by front panel switches at switch-on, or operator entry
- Hold resolution 0.1 second
- Synchronised to an external time and frequency source
- High accuracy internal oscillator options available
- Remotelv controllable

M170 Countdown/Up Generator

M355 11-Digit LED Countdown/Up Display

M355 11-Digit Display

- Reads and displays time-of-day
- Alternatively it displays countdown or countup from a PSEUDO IRIG timecode input.
- Single-sided display
- Seven segment high-intensity LED digits
- Rack-mountable
- Automatic recognition of time code format
- Particularly suitable for range-timing display
- Choice of input options: Serial (via RS232 or RS422 interface); Timecode (IRIG CS525z); Modulated carrier timecode (IRIG-B, PSEUDO IRIG-B, NASA36, AFNOR S 87500, 2137, XR3)

Network Management System

- Centralised or remote monitoring and control of TFS Timing System and component parts
- User-friendly graphical interface allows monitoring in overview or detail mode
- Visual representation of instrument front
- Fault log reporting on errors occurring in the Timing System
- Monitoring Status e.g. Alarms, Software and Hardware Faults Errors, Serial number details
- Flexible options: different platforms, customisation or delivered on a pre-configured PC.
- SMS text alerts when alarms are triggered

M211 Dual Redundant Time & Frequency System

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