

Design and development of satellite dish

- Mechanisms designed to ensure accuracy and reliability
- Strength and endurance of all mechanisms rig tested
- FEA used to maximise strength and minimise deflections with tight weight constraints
- Innovative anti-vibration transit locks
- Waterproof sub-assemblies
- 690° rotation requiring cable management and limit switch protection
- CE approvals documentation
- Supply chain management
- 6 months from briefing to production solution

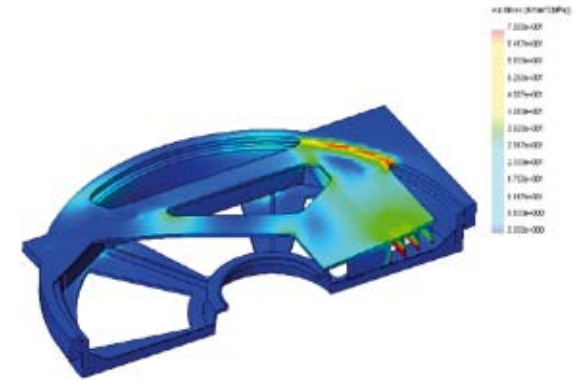




1



2



3

The SISLink uPod is the first automatic satellite uplink system in its class. It is able to find and track satellites without the need for an operator, then send or receive up to two television signals simultaneously.

The uPod was the winner of the prestigious Cable and Satellite International Magazine, Product of the Year award in the category “Best satellite contribution/distribution/transmission solution” at the 2005 IBC show. Within 6 months of the product launch, there were over 20 uPods in use with ITV, and SISLink are receiving further orders and enquiries far in excess of their original projections.

DCA assumed responsibility for the mechanical design of the uPod after SISLink had produced an early functional prototype, accelerating the project from first briefing to a full production solution within 6 months.

The uPod contains four separate mechanisms used to deploy the dish and train it on satellites approximately 36,000km above the earth’s surface. This requires an accuracy of $\pm 0.3^\circ$ to be maintained on each axis of movement in wind speeds of up to

40mph, which meant that both the backlash in the mechanisms and the deflection of the entire structure had to be minimised. Alongside this, there were strict weight restrictions on the device to allow for vehicle roof mounting.

DCA designed mechanisms that achieved, and in some cases improved on, the tight specification. Rigs were constructed for the two major axes to test them for accuracy, strength and endurance before integration into the final design. The main turntable used lightweight aluminium castings whose strength to weight ratio was optimised using finite element analysis.

The uPod has to withstand the vibrational conditions associated with roof mounting to a road vehicle travelling at speeds of up to 100mph. To achieve this, all the principal mechanisms were fitted with automatic locks that prevented wear during transit. The uPod was specified to withstand harsh environmental conditions, including an operational temperature range from -20°C to $+55^\circ\text{C}$ as well as snow loading. To avoid a requirement for the outer covers to provide a watertight seal, each sub-system and electrical component was sealed individually.

The main rotational axis achieved a range of movement of 690° , which required innovative solutions for cable management and limit switch protection.

As well as developing a robust and innovative mechanical design, DCA supported SISLink during the entire development process. This included creating and managing specification documents, handling the supply base for 15 sets of the 130 bespoke parts that made up each device and checking parts received for accuracy. We also worked with approvals specialists to provide all documentation required to achieve CE marking for the uPod.

“The solutions DCA provided were creative and practical and throughout the entire development process they committed themselves to helping us achieve our goals, providing a very friendly and professional service”

David Meynall, General Manager

1. Outside broadcast unit
2. Mechanical development
3. FEA stress analysis model