



**London Marathon  
April 23<sup>rd</sup> 2006**

Low cloud and rain at this year's London Marathon may have restricted the operation of the helicopter cameras, but at 26,000ft the Skylink relay aircraft was able to deliver robust live pictures from the four BBC motorbike cameras throughout the race.

**Friday 21st April**

At 10:30am the Skylink relay aircraft arrived at Biggin Hill airport after a 2.5 hour ferry flight from Zurich. All of the airport bookings, landing arrangements, and air traffic control agreements are handled by the Skylink team.

With all of the links being relayed by just one aircraft, the aircraft team is small: three Skylink crew (2 pilots and 1 on-board engineer) and 1 BBC engineer.

The aircraft arrives with 6 of the 9 passenger seats already removed, and the phased array beamforming electronics already installed. With a large cargo door, plenty of DC power and room to walk around the PC-12 provides the ideal working space for installing and testing the video links. Protected from the weather, the crew are able to work quickly and the entire 4 link relay system is fully installed in 4 hours.



*Room to move inside the PC-12*



**Key features of the Skylink relay aircraft (a Pilatus PC-12)**

- 1 Additional generator supplying up to 300A at +28V DC
- 2 Low profile, high gain phased array antenna for receiving the uplinks: one below the cockpit, one between the wings. Each antenna can receive up to 4 independent uplinks.
- 3 12 UHF + VHF antennas accessible from an internal patch panel and suitable for relaying voice comms and telemetry.
- 4 Two larger radomes for housing a range of downlink transmitter antennas including a 2-axis GPS steered 11dBi antenna for long ranges.

After the equipment is installed all 4 links are tested on the ground, and within 1 hour everything is working perfectly and the crew lock up the plane and check into the hotel.

**Saturday 22<sup>nd</sup> April**

After a quick check that everything is as it was left the previous evening, the aircraft team await a call from the Program Manager to confirm the time of the test flight.

Because the airborne relay set-up is in one place, on one aircraft and requires only a small team, the installation is controlled and well managed. Features that save both time and money.

It is mid-afternoon when the team receive notification that the ground receive site and the camera motorbikes are ready for the test. All 4 links work perfectly and the flight test lasts just 20 minutes. Within 30 minutes of the 'test complete' call, the aircraft has landed and the crew are heading off back to the hotel.

**Sunday 23<sup>rd</sup> April**

The early broadcast time requires the aircraft to take off at 8:15am. This is outside of the normal operating hours of Biggin Hill, but obtaining this permission is all part of the Skylink service.

The Skylink system delivers all of the pictures, all of the time.

There is no downtime for refuelling and no compromise in coverage in bad weather. It is this unique capability that enables the BBC to deliver its interactive service, allowing the viewer at home to choose which race he or she wishes to follow.

Capturing multiple live feeds is increasingly important as this adds to the viewers experience both at home and, with the advent of mobile TV, to the spectators at the event.



*All of the pictures, all of the time*

After what was described as a 'flawless' operation, the PC-12 was de-rigged within an hour and returned to Zurich in time to cover the Tour de Romandie starting on Monday 24<sup>th</sup> April.

**Skylink**

Skylink is a collaboration between QinetiQ (a UK technology specialist) and Lions Air (a Swiss aircraft operator). For more information see below.