

BY APPOINTMENT...

An invitation to the Royal Wedding



MATTHEW GLADSTONE, CAMMOTION

▲ High angle of crowds outside Buckingham Palace taken from the Cammotion Vortex mast



▲ Central London was invaded by OB and satellite trucks of all sizes and nationalities

On 29 April, hundreds of television cameramen were involved in an OB of truly massive proportions – the Royal Wedding. Many of those behind camera on the day have sent in photographs and stories for our celebratory GTC Royal Wedding album (see pages 42–47) and here, GTC member Nick Gilbey provides an overview of this impressive operation. In researching the article for Zerb, Nick talked to many of the key people responsible for the success of the TV coverage, including technical producer Christopher Bretnall, lighting director Bernie Davis and Sam Heaphy of ACS, who provided the many remote head cameras in the Abbey.

The official line was that the Royal Wedding between Prince William and Miss Catherine Middleton was a private wedding, not a State occasion. You might therefore think that the television coverage would be a modest affair. How wrong you would have been! In fact, there were over a thousand broadcast cameras covering the event; from the little Panasonic DVC P2 camcorder employed by a Canadian CBC news crew to the top of the range Sony HDC 1500 and Grass Valley/Thomson cameras used for the live pictures. For someone like me who loves television cameras, the atmosphere was intoxicating.

The lure of the State occasion

In 1965, as a schoolboy I lived in central London and I clearly remember travelling the route of the funeral procession of Sir Winston Churchill. TWW (Television Wales and the West) cameras were in Whitehall; Southern Television's scanner was in Trafalgar Square; and Anglia's two-camera OB van was positioned near St Paul's Cathedral. It was like the circus had come to town! Something stirred inside me and I knew from that point on which career beckoned.

Many years later, for this much happier event, the BBC was chosen as host broadcaster. This meant that,

on top of producing its own extensive programming, the BBC would feed pictures to all the other domestic broadcasters as well as to the numerous foreign stations requiring live images. Being host broadcaster entitled the BBC to exclusive access to the high altar end of Westminster Abbey where the service would be conducted; space for cameras in this area was very limited.

All in the planning

The secret of pulling off a huge OB on this scale lies in the planning according to Christopher Bretnall, technical producer for the BBC. Fifteen OB trucks from SIS, NEP Visions, Arena, Bow Tie and Arqiva would be linked by fibre, run under the streets of London. Three SIS trucks were to be stationed at Canada Gate, near Buckingham Palace, and this would form the main hub for the BBC, including the studio from which Huw Edwards would conduct interviews as well as do the commentary.

One truck would be dedicated to the BBC's output, taking camera feeds from the studio as well as from all the other trucks that had been hired in by the BBC. As space was limited near the Palace and along Buckingham Palace Road, only one camera would be allowed in each position. These were

divided between the BBC, Sky and ITN, with the BBC taking a 'tailboard' feed from all the cameras.

The second truck controlled the cameras around Buckingham Palace and down The Mall, which included a couple of Jimmy Jibs, the Cammotion Vortex system soaring up to 30 metres high at the top of the Mall, and a remote camera supplied by Aerial Camera Systems (ACS), on a hoist overlooking the entrance to the Palace. The third truck supplied pictures to the other domestic and international broadcasters who received a mixed feed of the event as well as an ISO from inside the Abbey. The foreign broadcasters just received the mixed live feed.

Yet more trucks

Another SIS OB truck was in place at the Wellington Barracks, while Bow Tie supplied one for Knightsbridge Barracks, and an NEP vehicle was stationed in Hyde Park to cover the crowds partying and watching the big screens. Around the country, an Arqiva truck had travelled to St Andrews, the university town where Kate and William met; a Bow Tie truck was in Buckleberry, the Middletons' home village; and let's not forget the feed from one of the aircraft taking part in the flypast. Then there were two large

vehicles from Arena: one to cover the procession from the bottom of the Mall through to Horse Guards Parade and Whitehall, with the other handling the cameras around Westminster Abbey and a second temporary BBC studio built on top of the Methodist Central Hall. That's a lot of OB trucks all in all!

Inside the Abbey

The BBC relied on one of NEP Visions' trucks to handle the 35 cameras in the Abbey. Of these, 16 came from GTC sponsors ACS, who provided the remote (SMARthead) cameras in the Abbey. Sam Heaphy of ACS picks up the story of the remotes: "The Royal Wedding represented the largest single deployment of the ACS SMARthead system to date. A total of 20 heads and cameras were used, with 16 of these in Westminster Abbey.

A combination of features make the SMARthead particularly suitable for events such as this. From the outset the head was designed to be truly compact and to make use of cameras such as the Sony T kit-equipped cameras and brick-style cameras (Sony HDC-P1). This minimises the physical footprint while retaining full 2/3" HD broadcast quality. The large quantity of remotes required for this event was principally to reduce manned camera



AERIAL CAMERA SYSTEMS FOR THE BBC

positions to a minimum while still offering a wide range of shot selection and placement.

Of the SMARTheads used in the Abbey, twelve were equipped with brick-style Sony HDC-P1s and four with Ikegami HDL-51s. When used with a brick camera, this head requires only a single standard SMPTE cable, which provides all the power, control data, racking data, HD SDI, gen lock and even four audio channels to each camera. The saving in time and effort made by reducing from three cables (as required for most remote heads) to one on 16 positions is considerable and helped a great deal on this event.

The SMARThead fibre system consists of a CCU-style structure packaged in 'fly away' flight-cases that offer engineering versatility in how they are used on site. Few

tailboard to integrate with the truck. The camera remote control panels (RCPs) are placed with the vision engineers and multi-core breakouts using standard audio 8-pairs have been built to reduce cable mess and allow flexibility in distance between the truck and racks."

During the Royal Wedding, ACS used one of its tender vehicles to accommodate all 16 channels of base stations (CCUs) and other engineering components. The vehicle acted as an engineering monitoring point and also as a field shop to maintain all the equipment on site. All the required HD, RCP and other signalling was run to the main Visions OB truck using video and data multi-cores. In addition, Visions supplied a truck normally used for VT and graphics to serve as a 12-position remote operating space, each cameraman having his own return, TX and in some cases auxiliary feeds, as some operators were controlling more than one camera.

A tight time schedule

The Royal Wedding posed some scheduling difficulties for the BBC because of the Easter weekend that preceded it; not surprisingly, the Abbey couldn't close its doors to the public over Easter to allow TV access to rig the building. In the end it worked out well as the BBC provided coverage of the Royal Maundy service scheduled for the Thursday of the previous week. A majority of the wedding cameras were used for this, including 13 of the SMARTheads and the event allowed an essential 'stress test' of the production facilities.

Many of the remote camera positions in the Abbey had been previously used on other events but new locations were also chosen. Some spectacular shots were achieved, including the much talked about dramatic high angle of the sacarium. This had been used before but this was the first time in HD and with shot development. The shot of the Abbey's bells peeling was a complete first and involved significant rigging as well as using one of the audio channels in the SMARThead's fibre system to give the sound boys an ear-deceiving feed of the bells at close quarters.

A new SMARThead accessory incorporating a Canon HJ40 lens was fielded for the first time. Two were used to provide close-ups of the royal and Middleton families in their respective seats in the north and south transepts. These lenses were also used to capture shots of VIPs and other GVs in this area of the Abbey. This accessory allows remote control of the lens's internal stabiliser and, in common with all SMARTheads, provides a real-time lens graphic of the focus ring. The other heads had Canon HJ22 (eight), HJ14 (four) and Fujinon HA13 (two) lenses.

Sam continues: "On site there was a strong sense of teamwork between all the contractors. Naturally, there were quite a lot of changes to the original plans, some due to final approval of camera positions by Buckingham Palace and Clarence House. As would be expected, the security was especially tight at the Abbey and all the heads were swabbed for explosive traces. The Met also photographed every camera and all

associated equipment and prepared a card with the production camera number before it was rigged.

On the day everything worked without a hitch and the ACS gear was de-rigged in about three hours. After eight days on site, long hours, tight security, a few changes here and there, and the occasional dirty fibre to sort out, the entire operation was a success, as was the OB overall."

Also in the Abbey

In addition to the ACS remotes, there were many manually operated cameras in the Abbey. These were Sony 1500s configured either in lightweight mode or in build-up frames to give full facilities.

The cameras were placed in various positions, ranging from the floor of the Abbey to high up in the organ loft where cameras 9, 10 and 12 were situated. Scaffold structures above the Great West Door supported cameras 1 and 2, while cameras 26 and 34 were high up at the east triforium level. The largest scaffold structure housed camera 11 in the north quire aisle; this was needed to bring the camera level with the fanfare trumpeters opposite and to give a view of the other musicians in the organ loft.

Camera mountings used included four Jimmy Jibs, one Hawk and six Osprey pedestals, one static Eclair, four lightweight and four heavyweight tripods, plus numerous scaffold mounts and adaptors as well as special bespoke fittings made for the occasion. Lenses used ranged from 14:1 wide angles through to 40:1 large EFP packages and big 86:1 box



▲ ACS SMARThead in the choir stall

OB trucks can accommodate large numbers of extra CCU channels internally so the system is intended to act as a bolt-on with the racks being placed outside and using the

-type optics.

Three cameras were built into special hides. Camera 32 was a remote panelled into the wall next to the north door and there were two others in hides outside the Great West Door.

NEP Visions provided all the manned cameras involved in the Abbey. The TV director for BBC Events was Claire Popplewell and the camera supervisor was Neil MacLintock who was responsible for selecting all the other freelance camera operators.

Historical context

With 26 years of OB experience behind him, Christopher Bretnall has covered many similar large events. So, how have things changed? "The reliability of equipment is getting better so we can confidently do things on a bigger scale." But this hasn't led to complacency, as there were many layers of redundancy and resilience built into the system Christopher designed to ensure no breaks in transmission. Asked how things went on the big day, he summed it up: "As you can imagine there were a myriad problems to solve on the day, logistically and with crews, equipment and due to events changing, but I don't think any of it was reflected on the screens."

In 1981, Prince William's parents married in St Paul's Cathedral. At the time this was the biggest colour OB the BBC had undertaken. The Corporation had managed to muster 17 scanners with a little help from TVR and Trillion. There were 18 cameras covering the service inside St Paul's, as well as exterior shots. Supporting the BBC's central control room, which was equipped with 42 B&W monitors, were two BBC Type 5 scanners, each with eight cameras plus another two-camera unit. In total, the BBC used over 60 cameras.

The BBC lighting director responsible for lighting St Paul's, Bryan Wilkes, took advantage of the then new compact source iodide lamps because of their high light output per kilowatt. He had to use 275 x 1kW units and other lighting units, weighing 17 tons in total, to bring the light up to an acceptable level for the Philips LDK 5 cameras.

Lighting the Abbey

The BBC's lighting director for William and Kate's wedding ceremony was Bernie Davis. Asked about the choice of Westminster Abbey over St Paul's from a lighting perspective, he explained: "St Paul's is easier to light than Westminster Abbey. The Abbey sets some challenges around where we can put lights; St Paul's is a more open space and much more straightforward to light. The biggest problem in the Abbey is that the area around the choir and the high altar, the triforium – the natural place to put lights – is quite high and tight for space. You can only get a small amount of lighting in one of the windows of the triforium. Also, it is a very steep angle for getting faces looking good. So, we have another position at a lower level. There are tie-bars in the arches below the triforium where we rig scaffolding to put lights on."

Bernie chose to use 350 PAR cans, most with ¼ blue gels. "It surprises people that I use PAR cans, but if you look at discharge lamps and big Fresnels, they are big lumps of kit with very big barn doors, while PAR cans appear as nice little rows of circles of light. I know you don't get the shaping, but if you've got relatively narrow beams, you can point them where you want. If you have six PAR cans to cover an area, you can spread them in the way you want. You can choose the most suitable bulb (narrow,

medium or wide beam). As the bulb, reflector and lens are all combined, every time a bulb goes it means a new reflector and lens – so the lamp is always working at its optimum. Another advantage is ease of rigging – I can carry four upstairs at a time comfortably, whereas a 5kW Fresnel would be as much as I would want to lift, let alone carry upstairs. So the PAR cans are easier to mount, they look tidier when they are up, and they plug up very neatly into dimmers."

Bernie uses a Compulite Vector Violet desk. "I like to have control over the lighting sources and, although you can get dimmer shutters for discharge sources, they are an added complication and expense. What I like about tungsten light is that it gives very good colour rendition; it is very nice for faces. Discharge lighting is OK, but it's never as flattering and friendly as tungsten."

In 1981, Bryan Wilkes used 0.6ND CTO gel on the windows of St Paul's but Bernie says "I am not sure I would be allowed to gel up the windows these days – even at St Paul's – because it looks ugly from the outside. What I like to consider when I am lighting something of this nature is that it is somebody's event, somebody's wedding, and whatever I do has to be good for them. It isn't a TV studio, so I will compromise the look to a certain extent in order to



▲ The Abbey camera crew

make it good for them.

I have experimented and learnt a lot from working at both St Paul's and Westminster Abbey and I now know how to get the lighting comfortable but also good for the cameras. If you look at the wide shot inside the Abbey, the top of the picture is quite blue in comparison with the bottom; I like that. If you look at the RAF fanfare, there is a nice cool backlight – that's daylight. You have to think where the shots will be and work with the situation. I think it looks good to mix colour temperature in a controlled way. Bryan Wilkes did a fantastic job, especially considering they were using tube cameras. I was lucky my lighting career in TV started just when chip cameras came in – it's so much easier to make good pictures as they handle



▲ Lighting director Bernie Davis with assistant Nigel Catmur (on the left)

See it live from his point of view...



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▲ A specially constructed 'media village' at Canada Gate housed the many news journalists from all over the world

contrast so much better; you just couldn't pan across a window with daylight outside with tube cameras as it would smear everywhere. Now, even if it burns out a bit, it's still acceptable.

Also, the cameras are so much more sensitive. Bryan Wilkes was lighting to a level of 1700 lux. I didn't actually measure the level but I know the emission I get out of the PARs, and I guess from the exposure, I was probably lighting to about 500 to 600 lux. The cameras were working at about f4, which is comfortable, giving a certain amount of focal separation without being a struggle for the cameramen. Also, as we had to work with daylight, if I lit too low the daylight would take over."

Bernie did use some other kinds of lights: there were a few profiles for picking up pulpits and reading positions; four small Fresnels to light the organ loft; two 575 MSR lamps for the bells; and five LED PAR cans uplighting the arches behind the high altar. LED lights were chosen as they don't give off heat and they were to be positioned in a very ancient part of the Abbey. He decided to keep the existing chandelier lights on at a low

level. He also used four of the existing profiles. "I watched to see if they were a problem but they weren't. The only thing that was slightly odd was that the ones on the Tomb of the Unknown Warrior were very hard focus. This looked good by eye, but on camera if anybody passed nearby, you could see a hard line of light, which I didn't like. So we put a Hamburg Frost in the profiles lighting the Tomb to keep the light focused but with a softer edge."

Other broadcasters

While the BBC was the host broadcaster, ITN also provided coverage for ITV and Sky. Apart from using the BBC feed from the cameras around the high altar in Westminster Abbey, ITN covered the event with OB trucks supplied by Telegenic at the Abbey and CTV trucks along Whitehall, Horse Guards Parade, around Buckingham Palace and The Mall, as well as Wellington Barracks and in Hyde Park. ITN did upstage the BBC in one area: at Wellington Barracks looking across to Buckingham Palace and St James Park, ITN had a hoist from EPL Skylifts, which took a camera and cameraman up to 100 metres,

twice the height of any the BBC used.

Many of the US and European networks took studios next to the BBC, ITV and Sky, housed in a temporary three-storey building erected next to Canada Gate. Either side of the Mall were 22 single-storey tented camera positions, where freelance cameramen were employed to film a succession of short pieces to camera from presenters and journalists from all over the world. Every 15 to 20 minutes a broadcaster from, say, Poland or Brazil would turn up for their pre-booked time and present a piece to camera; then it was on to the next one. Some reporters had an array of different microphone identifiers that they would quickly put on the mic before starting a report for a different station.

Around 750 million people watched Charles and Diana's wedding. Thirty years later the BBC, with a predicted two billion people tuning in around the world, again produced a near faultless live production. Sadly, there were no BBC television OB trucks, but most of the key roles, on the facilities side, were undertaken by ex-BBC staff.

Just like the wedding itself, the TV coverage of the event seemed to hit just the right tone, blending a sense of continuity with similar events in the past (for fun we have included some stories from cameramen on the Coronation elsewhere in this magazine) and retaining all the pageantry and regalia, while at



MATTHEW GLADSTONE, CAMMOTION

▲ The GTC award-winning Cammotion Vortex, at the top of the Mall, achieved spectacular high angles of the Palace including the 'balcony moment'

the same time introducing hints of modernity that stopped this 21st century wedding feeling like a staid rerun of former royal events. Touches like Kate and William driving away in a balloon-bedecked Aston Martin and the row of massive trees transported into the Abbey for the occasion were mirrored by innovations introduced by those planning the TV coverage; such as the use of well-hidden SMARTheads to achieve wonderful 'never-seen-before' shots, while the lighting director pulled off a clever blend of beautiful and yet unobtrusive, naturalistic lighting. As one American producer was heard to say "Boy, you guys really know how to put on a wedding!"

Fact File

Christopher Bretnall

After 19 years at BBC OBs, Christopher set up Creative Broadcast Solutions to deliver broadcast productions to a wide range of international clients. This has included such diverse projects as *Live 8*, *Live from Abbey Road*, *Miss World*, *London Fashion Week*, and the *Rolling Stones* in Twickenham.

Bernie Davis

Bernie Davis started lighting TV programmes in 1987 after working as a vision engineer with BBC OBs. He has worked on a wide range of productions including *Carols from Kings* and *The Proms*. He has won three RTS and four Bafta Cymru awards as well as many more nominations.

Nick Gilbey

Nick Gilbey is a freelance lighting cameraman and director based in the South West working on factual programmes. Nick has worked in broadcast television for three decades, starting at the BBC in 1981.

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Sam Heaphy

Sam Heaphy is Technical Director of ACS and project managed the SMARThead provision for the Royal Wedding. ACS is a specialist camera company with a range of facilities available for rental including HD Cineflex stabilised mounts, railcams, wirecams and aerial filming services. See more about ACS at: www.acsmedia.com