



BT Tower



Without BT Tower, you wouldn't see your favourite TV programmes or live news pictures of events unfolding around the world – nor would you be able to witness great sporting occasions from the comfort of your home.

The BT Tower is the nerve centre of a vast broadcasting and communications network which brings you all this and more.

It is also a telephone exchange that can connect you with friends, relatives and business associates worldwide. And it enables computers to talk to each other.

From the highest point of the Tower – a breathtaking 189 metres above the streets of London – down to below ground level – we're busy serving the globe 24 hours a day, every day of the year.



A never-ending schedule

BT Tower

BT's forerunner, the General Post Office (GPO), provided the transmission links for the first live outside TV broadcast – the Coronation of King George VI in 1937.

To enable the BBC's cameras to cover this historic occasion, they ran temporary cables between Westminster Abbey, Buckingham Palace, Hyde Park, Broadcasting House and the Corporation's one-and-only transmitter at Alexandra Palace.

And, for many years, that's how all TV programmes came to you – through temporary or permanent cable links and local transmitters.

But as the BBC network grew in size and the ITV companies started broadcasting, it became obvious that it would be impractical to lay cables all over the country.

Apart from the expense involved, it would have meant major disruption from road excavations in town and city centres.

A viable alternative therefore had to be found, and the GPO found it. It's called microwave radio.



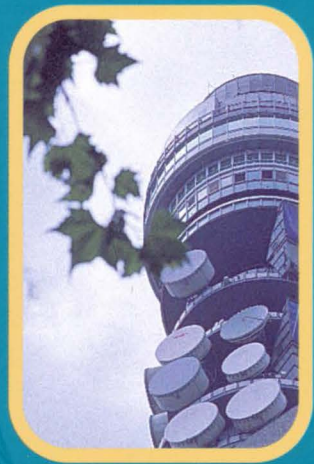
More than 50 years of broadcasting experience under our belts

Microwave radio is not like a radio programme you listen to.

It carries TV programmes, news, live outside broadcasts, phone conversations and computer data on an invisible radio beam – like a laser beam, but one that you can't see.

The large horn and dish-shaped aerials on the Tower – there were 57 of them at the last count – are all microwave aerials.

But microwaves only travel in straight lines, so a large building or hill will block their path.



What is microwave radio and how does it work?

That's why the Tower had to be so tall and why, when we're sending or receiving transmissions beyond our direct line of sight, we need repeater stations along the way.

For example, TV programmes being transmitted from London to Birmingham first go to a repeater station at Harrow Weald, which can be seen on the skyline from the Tower.

From Harrow Weald, there are another three hops (that's how we refer to gaps between repeater stations) before they reach Birmingham.

Many global as well as UK-based broadcasters such as ITV, Channel 4 and BSkyB, choose BT to get their programmes onto your TV screens.

Over the years, the role of BT Tower has become increasingly important for UK and global television transmission. Some traditional analogue technology is still used at the Tower, including microwave radio and satellite transmissions but the digital and optical fibre age has had a substantial impact on the way broadcast signals are carried. In fact, the large microwave dishes at the top of the Tower are largely redundant these days but cannot be removed as BT Tower is a listed building of merit.

BT Tower is equipped with an all-digital centre for global television transmission, using the latest technologies and around-the-clock monitoring systems. In total, there are more than 1,500 video circuits

and 6,000 sound circuits that run through the Tower. BT Broadcast Services also manages more than a million TV switching operations each year – that's an average of around 3,000 per day!

The BT Tower is at the forefront of next-generation digital television and video 'streaming' onto the Internet. The latest computer technologies allow many more TV channels to be squeezed into a much smaller space, allowing such events as the Spice Girls' concert to be transmitted over the Internet.

BT Tower is also home to the world's first digital terrestrial network carrying digital TV to the home via a standard aerial. BT designed, provided and manages this network connecting 29 studios, and more than 80 terrestrial transmitters throughout the UK. For viewers who want the latest in interactive services, Sky's Open TV is also transmitted via BT Tower.

Hundreds of digital TV channels pass through BT Tower, many to other countries including CNBC Europe (UK, France, Germany), Media Overseas (Caribbean and Pacific), and Multichoice (South Africa). The Tower Broadcast team monitors all of these services, 24 hours a day, 365 days a year.



TV broadcasters rely on BT



BT Tower has direct connection to both cross-channel and transatlantic optical fibre. In addition to satellite links via the BT Earth Stations, fibre increases capacity to the rest of the world while avoiding the delay associated with satellite transmission. BT's network interconnects the key media centres of London, Los Angeles, Washington DC, New York and Paris, providing fast, simple and cost-effective transfer of media content between them via high-speed computer networks.

Outside broadcast transmissions from the world's top sporting and news events pass through the Tower. During busy periods, such as the football season, BT Tower can deal with the equivalent of 36 simultaneous outside broadcasts. These news and sport transmissions from all over the world are often beamed into the UK using one of BT's fleet

of 44 satellite trucks that contain all the equipment needed to receive camera inputs and transmit them via satellite. Live events include; arts: the Edinburgh Festival; Premier League football: the World and European Cups; sports: the Olympics and news: international government elections and summits.

The newest additions to BT Tower are digital content management services and interactive TV. These services are for both broadcasters, and, in time, home TV users too. BT digitises any media content, whether TV or film footage, and stores it on servers at the Tower which can be downloaded, watched or used as required. With an estimated 46 million hours of footage available to store, the possibilities are almost endless.





The Tower has become well known as a radio and TV broadcasting studio in its own right. It has been used as a radio station for Gloria Hunniford's Radio 2 programme as well as the BT-sponsored *Voices for Hospices* broadcast of Handel's Messiah.

As a TV studio, it has also played host to *Christmas Morning with Noel*, *Challenge Anneka* and plays an ongoing and integral part in the following appeals:

GMTV's Get Up & Give

2001 saw the 8th Anniversary of the *Get Up & Give Appeal* which aims not only to raise money for five lesser-known UK charities each year but also to raise their profile. The 2000 Appeal was broadcast live from the Millennium Dome which saw record numbers of calls and the final total pledged exceeded £500,000.

For the BT Tower team, the GMTV event is the largest in terms of television broadcast and involves some 200 volunteer telephonists, 30 administration staff and 30 crew.

Comic Relief

Since its first event in 1988, this bi-annual event which exists to tackle poverty and social injustice in Africa has raised a total of £174m. The appeal receives enormous media coverage both during the build up to the events and on the day of the actual appeal. This is due to the high profile of the media and entertainment personalities who support the aims of *Comic Relief* and become involved in the appeal. For the BT Tower team, this has often been the largest event in terms of volunteer recruitment and the longest in terms of live telephone action, with, historically some 400 telephone lines manned over a combined period of 15 hours.

Children in Need

This is a yearly event which is organised by the BBC to raise money for disadvantaged children in the UK. The appeal takes place every November with a seven-hour live television broadcast covering all of the local BBC TV and Radio regions. Since its first event held in 1980, the *Children in Need* appeal has raised more than £235m.

BT Tower is typically one of the 48 phone-in sites, accommodating 150 volunteer telephonists and approximately 50 administration staff. Additionally, the Tower becomes the site of live TV Broadcasts for BBC South East and is the control centre for the other 47 sites.



All in a good cause



Since 1998, the BT Tower has organised and managed many appeals for the Disaster Emergency Committee – the Sudan crisis, flood victims in Bangladesh and Mozambique and the population of Kosovo. On one night alone in February 2001, £2.5m was raised for the Earthquake Disaster Appeal.

Royalty and famous names who have signed the visitor's book include Her Majesty the Queen, Margaret Thatcher, Esther Rantzen, Bob Hoskins and Michelle Collins to name but a few.

Disaster Emergency Committee (DEC)

BT has an agreement with the Disasters Emergency Committee to provide support and funding to respond to requests for telephone appeals in as little as 48 hours. The DEC is a consortium of UK relief agencies, which in the event of a major disaster becomes the nominated representative for all its registered charities, leading initiatives to get aid into disaster areas and arranging fundraising appeals at very short notice.

The Tower – bordered by Maple Street, Cleveland Street, Cleveland Mews and Howland Street – is located in a part of central London that was once known as Fitzrovia.

During the 18th and 19th centuries, Fitzrovia was best known for its residents – mostly artists and writers, together with a sprinkling of aristocrats.

Compulsory acquisition of the Tower site for the GPO began with the passing of the Post Office (Sites) Act in 1936.

But the legal process involved in buying out over 40 freeholders had still not been completed when the Second World War started in 1939, which brought a temporary halt to the proceedings.

Originally, the location was to have been shared for telephone and postal use. However, post-war planning pointed to a tremendous upsurge in demand for telephone lines, so it was finally decided not to include postal buildings as well.

Work on the Tower itself began on 4 April 1961. A somewhat fearful blessing from the Royal Fine Arts Commission at the time deplored 'the effect of the proposed Tower will have on buildings of more intrinsic merit, such as St Paul's Cathedral, when viewed from Hampstead Heath'.



The historical perspective

LANDDROST
FINEST BLEND OF
SOUTH AFRICAN
SHERRY

World's
Largest
Evening
Sale
PRICE 4d.

The Evening News

and STAR
LONDON TUESDAY MAY 10 1966

100% BRILLYNOL
SHIRTS THROLORED BY
Bonsoir
AT MAKERS

TOWER
SPECIAL

Welcome!

Equipment will provide
150,000 simultaneous tele-
phone conversations and 40
television channels.

☆
The restaurant revolves
three times an hour.

There are 13,000 tons of
concrete, steel and glass in
the tower: 50,000 square
feet of glass.

☆
Height - 620 feet to aerial
tip: 580 to top of tower.

Building time . . . five
years, cost . . . £21 million.
It is country's tallest build-
ing.

☆
The three public observa-
tion galleries open May 19.

THE TOP O' THE TOWER



A panoramic view from the Tower, showing many of London's landmarks with the Centre Point building in St. Giles-circus dominating the picture's centre.

Living it up in London's new glamour spot

OPENING day is not until next week, but already it ranks with the Houses of Parliament Bridge and St. Paul's as one of

the tower, soaring 620 feet above Trafalgar Square, has captured the imagination of Londoners as the Age of Technology's own addition to the traditional skyline.

Next week visitors will see the tower as it has never been before - spread out like an open book, and surprisingly well-lit. The tower's TV and radio masts and the challenge of the tower's conversations will be heard from all over the city.

Traditionalists have changed their tune since the early 1960s. The Tower, which cost £2.5 million to construct and was opened for operations on 8 October 1965, is now listed as a building of merit.

In August 2000, the Tower's hospitality floors underwent a comprehensive refurbishment. As well as new heating, ventilation and lighting, ceiling-to-floor windows were installed into the famous revolving floor which now give even more spectacular and uninterrupted views across the London skyline.

New lifts were also installed into the Tower. A lot of time and effort was put into their design to ensure that they are not only aesthetically pleasing for our customers, but that they also retain operational functionality.

A unique architectural challenge

The Tower was designed by the Ministry of Public Building and Works.

At first, it was going to be a simple stalk – just 111 metres high.

But our engineers kept wanting to add on more equipment, so it grew and grew to its present height of 189 metres – equivalent to a line of 25 double-decker buses parked end-to-end.

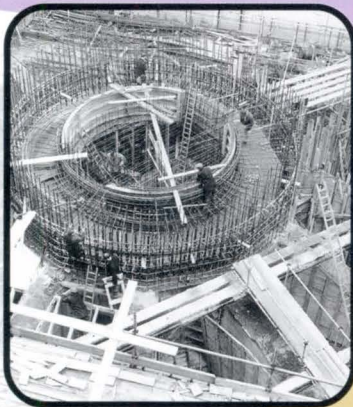
At one time, the GPO flirted with the idea of having a square tower. However, to combine consistency of form with maximum visual slenderness – and to

offer the minimum wind resistance – we eventually opted for a circular design.

Being circular, of course, also meant that it would be easier to align the aerials in any direction we wanted.

Months of calculations and wind tunnel tests at the National Physical Laboratory followed, until everyone was satisfied that the design was safe and sound.

A bore site survey of the Tower site had revealed a tricky problem. There was hard chalk suitable for supporting foundations beneath the



It just grew and grew

blue London clay, but it was 53 metres down.

To have sunk metal piles and plates that deep in the conventional manner would have been a lengthy and difficult operation.

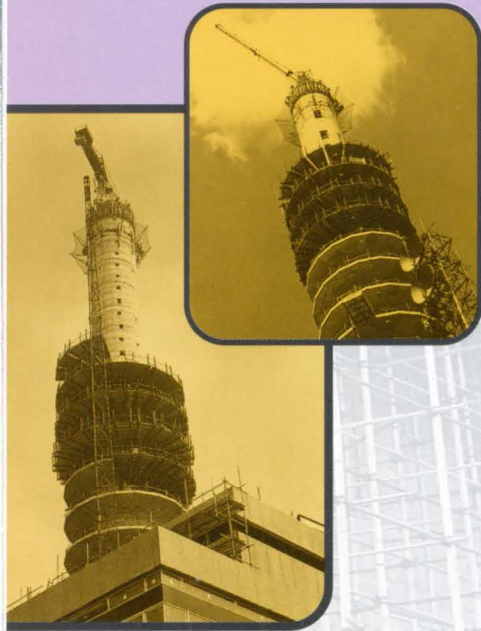
We therefore decided to look for an alternative way of supporting the massive 13,000 tonne structure.

An Italian firm called ICOS came to the rescue. What they did was to lay a concrete raft on the clay, some eight metres below ground level.

This raft measures around 27 metres square, is one metre thick and reinforced with six layers of steel cables. On it sits a seven metre tall reinforced concrete pyramid with a flat top.

The raft and the pyramid together provide the foundations and, on top of them, a hollow reinforced concrete shaft runs from near enough ground level, right up through the centre of the Tower.

This is the backbone of the whole structure which, together with a collar connecting it to the adjacent four-storey building, gives the Tower its stability.



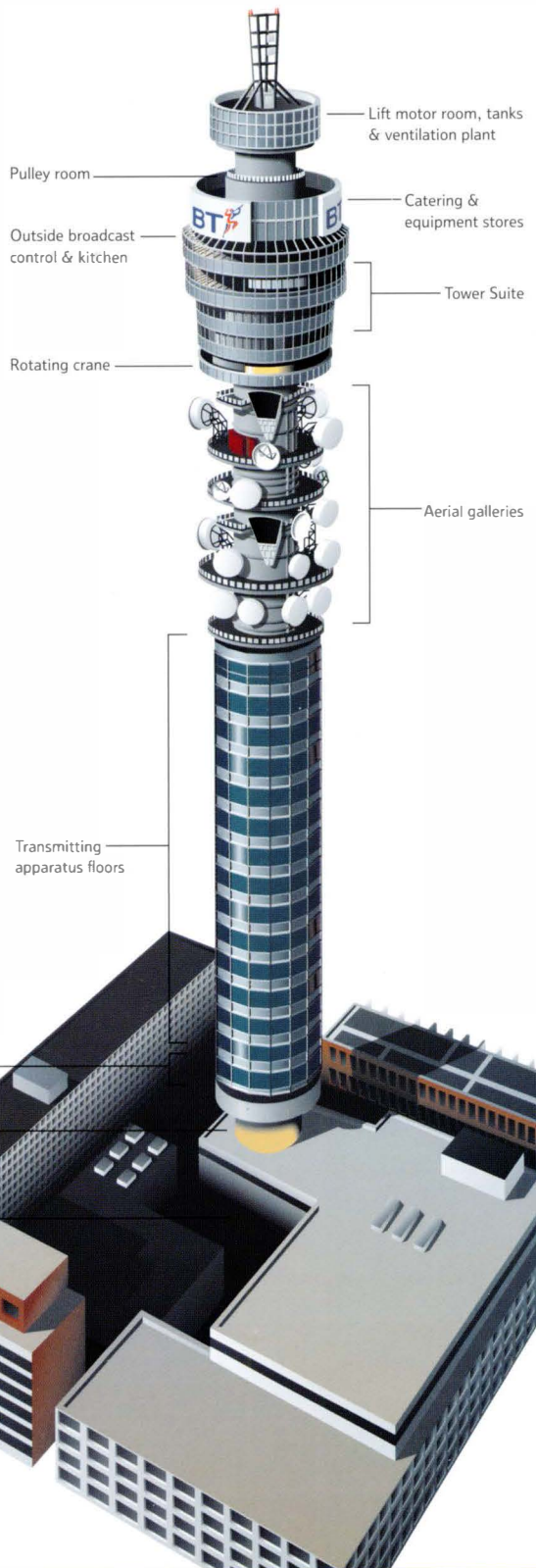
At the top of the tower you find the lift motors and water tanks. And crowning it all is the lattice aerial.

Above the aerials are six floors containing the restaurant and hospitality suite, kitchens and technical apparatus.

Next come the horn-and-dish-shaped microwave radio aerials, which are housed in an open section between 110 metres and 145 metres.

These floors are glazed in a special glass that let's the light in, but keeps the heat from the sun's rays out. This gives the building its greenish colour.

The first 16 floors of the Tower contain radio equipment, ventilation and refrigeration plant and power units.



A quick guided tour





Customer-focused events

The ground floor of the Tower houses the refurbished BT Tower Showcase. This exciting and high-tech environment gives BT a chance to host customer-focused events, conferences, meetings, workshops and presentations in a purpose-built, BT-branded environment.



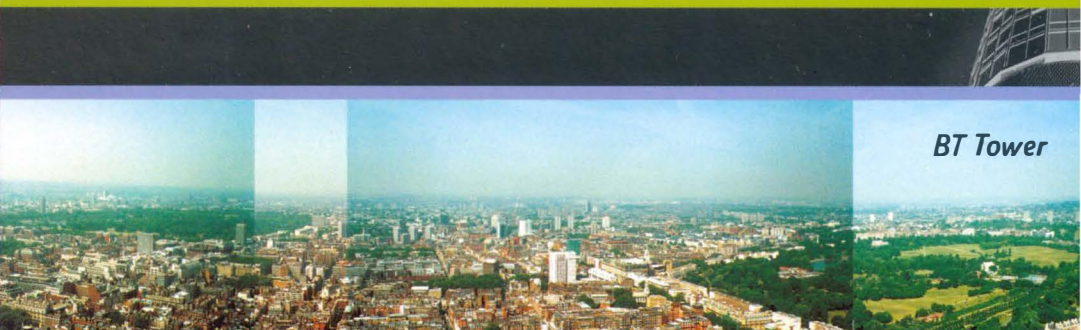
What happens if there is a power cut?

Like most buildings in the capital, we get the power to run our equipment from the London Electricity Board.

All essential plant is backed up by uninterruptible power supplies – alternators, permanently charged up by the mains, that cut in the instant power is lost.

If necessary, these alternators would keep us going for at least an hour. That said, they would never be needed for anywhere near that length of time.

That's because we've also got five powerful diesel generators, designed to take over from the alternators after a maximum of 35 seconds. These engines could keep essential services going for up to 20 days.



BT Tower

See London in 22 minutes

The hospitality suite (located where the restaurant used to be) is the widest part of the Tower – with a total diameter of almost 20 metres. And yes, it still revolves!

The revolving part is just over three metres wide, runs on nylon-tyred wheels on circular rails, completes a full circle every 22 minutes and weighs 30 tonnes.

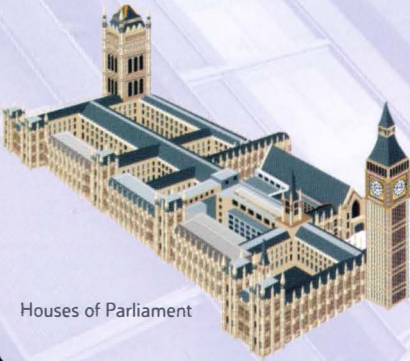
The precision of the rotating mechanism is such that there is a clearance of less than one third of a centimetre between the moving and stationary section.



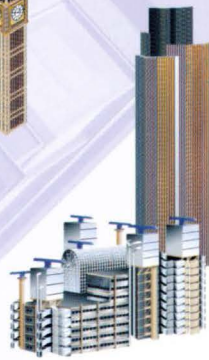
The London Eye



Buckingham Palace



Houses of Parliament



The City



Canary Wharf

The short and the tall of it

Did you know that every tall building contracts in cold weather and expands in warm weather? The Tower is no exception to this rule. In the winter, it can be as much as 23 centimetres shorter than it is in the summer.

Designed to sway in the wind

Another characteristic of tall buildings is that they sway from side to side in the wind.

The Tower is designed to sway much less than most high-rise structures – up to 20 centimetres from the vertical, to be precise – so as not to affect the accuracy of the microwave radio transmissions.

An uplifting experience

The two new lifts in the Tower are among the fastest in Europe. They travel at an incredible seven and a half metres a second and take just over 20 seconds to whizz you to the top. During the first year, the Tower was open to the public – from

19 May 1966, to 19 May 1967 – the original lifts travelled 70,000 kilometres between them, carrying nearly one million visitors; 105,000 of whom dined in the revolving restaurant 158 metres above London.

The fare for everyone, whether you were eating or not, was 4 shillings (20p) and half price for children.

Food for thought

A special edition of the *Evening News* during the week the revolving restaurant opened made no mention of the quality of the food, but reported:

‘Drinks are about double street level prices and the cheapest meal, the businessman’s lunch (with menu in French), costs 30 shillings, plus 2s 6d for coffee. Dinner costs around £5 a head’.



St Paul's Cathedral



Tower Bridge



The total number of visitors to the Tower up until 31 October 1971 was a staggering 4,632,822 – making it one of London's most popular Tourist attractions.

At 4.30 in the morning on that fateful day, a bomb exploded on the 31st floor. It had been cleverly hidden in a false ceiling in the men's lavatory.

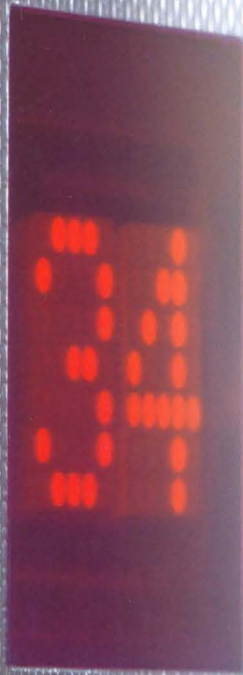
No-one ever claimed responsibility for placing the device and, thankfully no-one was injured. But the restoration work took nearly two years to complete.

We decided to close the Tower to the public after this incident, although the restaurant did re-open again some months later, before closing its doors for business in 1980, when the owner's lease expired.

Today, you can only visit the Tower by special invitation.



Why we are closed to the public





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