



What is broadcast engineering?

Broadcast engineering covers all the engineering roles that ensure the broadcast systems for television, radio and new media programmes can be enjoyed by billions of people all over the world. This involves many different fields of engineering, from research and development to software engineering, hardware installation, satellite systems, audio visual systems and general maintenance.

What is the broadcast engineering workflow?

It takes a variety of different engineers with a wide range of skills to create the programme 'chain' that carries video and audio signals to our living rooms.

Broadcast engineering projects and facilities can vary in size, from a major production facility such as the BBC studios in Salford to a temporary studio for a sporting event like the 2022 Commonwealth Games from Birmingham. They can also include a wide variety of content, for example a location broadcast for *I'm a Celebrity...Get Me Out of Here*, a reporter position in Kyiv Ukraine or a concert from Glastonbury.

All broadcast engineering projects begin with equipment designed by research and development (R&D) engineers and a detailed plan. A different team of engineers will then install and build the project and a further team will maintain and support the technology, make sure it works efficiently and repair hardware or update software

Once the studio, post-production house or outside broadcast truck is built and has a maintenance team, the next engineers in the chain are the operations team – the broadcast, communications and satellite engineers who run the equipment. Finally, the distribution and playout engineers work in the control room to make sure that finished programmes are 'played out' to a pre-arranged schedule. Playout may be over satellite, terrestrial transmitter network, cable or streamed via the internet.

Where does broadcast engineering happen?

Broadcast engineers may work in research centres, commercial factories, production centres, transmitter sites or satellite farms. They work on a range of jobs, from outside broadcasts and front-line news reporting to live sporting events and broadcasts on location such as *Love Island*. This can involve travel across the UK or around the world, depending on where programmes are being made.

Other engineers work mostly at a fixed location and there are roles available across the UK. It's now also possible to set up remote production facilities. This is a relatively new development that is becoming more mainstream. It enables staff to work in a central facility, while being connected to a remote location over high-speed data links. In this way, for example, a camera operator working in London might be able to control several cameras hundreds, or even thousands, of miles away - as Sky Sports have done.

Different types of engineers will work in a variety of settings. For example, broadcast engineers who work in research and development (R&D) will have their own specialist workshops, fitted out to enable them to test, modify and adapt whatever equipment they are working on; design engineers may have access to a workshop, but will normally have an office desk, and installation teams will divide their time between a fixed base and working on site. The work on site may be for a few days or for many months and could be in remote parts of the UK or overseas. If you do this sort of job, you will need to be comfortable with being away from home for extended periods of time.

Maintenance engineers are usually based in a workshop, with test equipment and test benches, so that they can mend and maintain all the equipment in the facility that they support. An exception to this are the teams that work on outside broadcast vehicles; they are often asked to travel with the trucks so that they can be available at a moment's notice to fix faults. Operational engineers are based where

the programme that they are working on is being made. If it's a studio production, they will work in the studio gallery. If it's an outside broadcast then they will work in an OB truck, or in a temporary location equipped with portable kit. Distribution and playout engineers will invariably work from a control centre, and engineers who work on high power transmitters will usually be based at one main site, with responsibility for covering a larger area where there are several smaller transmitters. Transmitters are sited in remote geographical locations, which means travel between them can be a lengthy process using small roads and 4x4 transport.

Who do broadcast engineers work for?

As you might expect, the BBC, ITV and other broadcasters and streamers such as Sky and BT Sport, employ broadcast engineers. However, many other companies employ broadcast engineers too, including large telecoms companies, studios, post-production houses and even football clubs and large event venues.

Why choose a career in broadcast engineering?

It's a great place to work for anyone with engineering and IT skills. Broadcasting provides a mix of high-end technology, operational skill and a dash of pure showbiz that is hard to imagine being replicated in any other sector of employment. As an engineer, you won't ever have to step out in front of a camera or a live microphone, but you will be providing the support services for all those people who do.

There is a wide variety of different roles, but they all require a mix of technical skill and creativity, and the ability to work in a team. Making broadcast programmes and running broadcast projects mean that you will regularly be in contact with people who have creative roles, such as designers, artists and architects.

Many of the jobs suit people who like working with technology, or who enjoy making, developing and building new hardware and systems.

More than 80% of people in the UK now use

an online streaming service. The workflow that brings those pictures to our screens is complex, so some engineering roles will appeal to those who enjoy solving technical problems.

Employment Prospects

There is a shortage of engineers in the broadcast space and the industry is growing, so you should be able to find work. Streaming video on demand has transformed the way we consume television, and the streaming market has grown rapidly in recent years. This has led to an increased demand for the engineering skills required to broadcast screen content.

Many companies offer permanent roles or longer fixed-term contracts, although some engineers work as freelancers and move from project to project. Some roles require extensive travel or involve shift work, and these may not be suitable for everyone.

Technology across the broadcast sector is constantly changing, so you will get the chance to continue to learn and develop. As you progress, there will be the opportunity to move into a more senior role, perhaps leading a team or being responsible for a studio or an entire facility.

Routes in

There is no set route into any of the roles in broadcast engineering. Everyone who works in the industry will have a different story to tell and some people will have moved over from other industries. Here are some ways you could try:

The apprenticeship route

An apprenticeship is a job combined with training, so it's a great way to earn as you learn. Some of the major broadcasters offer apprenticeships. Go to [screenskills.com/job-profiles/unscribed-tv](https://www.screenskills.com/job-profiles/unscribed-tv) to find out more about the relevant apprenticeships for each role. There is a Broadcast Technical Operator apprenticeship standard.

The university route

It's not essential to go to university to get into broadcast engineering, but if you want to study for a degree there are specialist degree courses. There are also more general

engineering courses that are relevant, for example software engineering, electrical engineering and telecoms engineering.

The entry-level job route

Getting an entry-level job is a great way to get to know the industry, build contacts and make your way up to your chosen role. Look for roles such as technical operator, maintenance assistant or technician in a TV studio or other TV setting. Research the companies you'd like to work for. Check out their websites for job vacancies. Write and ask if they have any entry-level roles.

Networking

Networking is an important part of getting jobs in broadcast engineering. Increase your connections by going to industry events. [screenskills.com/training-and-opportunities](https://www.screenskills.com/training-and-opportunities) is a good place to start. Do some skills training and get to know people there.

Pay

Pay is usually an annual salary, paid monthly, unless you are working freelance, in which case you are usually paid by the day.

Hours of work

Working in broadcast engineering sometimes involves irregular hours, depending on the job role. You can expect early mornings, late finishes and shift work in some roles. Other roles have more regular hours.



Inclusivity
The television industry is committed to building an inclusive and culturally diverse workforce, welcoming talent regardless of age, disability, ethnic or socioeconomic background, gender, religion or sexual orientation.

What next?

Details of the routes into each job role can be found at [screenskills.com/job-profiles/unscribed-tv](https://www.screenskills.com/job-profiles/unscribed-tv). There's information about freelancing, networking and building a portfolio at [screenskills.com/your-career/](https://www.screenskills.com/your-career/)

Looking for further advice?

If you're interested in a career in broadcast engineering, check out these websites to find out more:

ScreenSkills for information on careers and courses: [screenskills.com/careers-in-TV](https://www.screenskills.com/careers-in-TV)

BBC jobs and apprenticeships: [bbc.co.uk/careers](https://www.bbc.co.uk/careers)

Royal Television Society; bursaries, jobs and training schemes in the TV industry: [rts.org.uk/education-training](https://www.rts.org.uk/education-training)

The Institution of Engineering and Technology; membership organisation with careers information in engineering: [theiet.org/career](https://www.theiet.org/career)

Studios and stage space; list of UK studios compiled by the BFI: [britishfilmcommission.org.uk/plan-your-production/studios](https://www.britishfilmcommission.org.uk/plan-your-production/studios)

Bectu; the media and entertainment union: [bectu.org.uk](https://www.bectu.org.uk)

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Research and development

Research and development (R&D) engineer
Develops broadcast technology using cutting-edge techniques and facilities. R&D engineers turn ideas for technology into reality by experimenting with new kit, testing it in labs and then trialling it in a production.

Planning

Project director
Leads projects, such as building a news studio for the BBC or broadcasting a huge sports event like the Olympics. Project directors are responsible for managing budgets, making the most important decisions and getting the work done on time.

Systems architect
Designs the computer systems that link different areas together, such as the production office, edit suite and studios. Systems architects choose the best technology for the job, including hardware, like network switches and servers, and software, such as apps and operating systems. They often work with the R&D engineers. Once installed, the system is maintained by the network systems engineer.

Broadcast technical consultant
Advises broadcast companies on the most efficient use of equipment, space and budget for the projects at hand. Broadcast technical consultants might help a TV company plan a studio in a sports venue where matches are filmed, or design a new fleet of vans used for outside broadcasts.

Software engineer
Develops and tests computer software used in broadcasting. Software engineers might make sure that a production house's edit suites can access only the footage they have permission to use. Or they might create a system to make sure every piece of music used in a film is logged automatically so that composers are paid quickly.

Trainee software engineer – entry level
Helps develop software used in broadcasting, such as making the sound effects, lighting and LED screens sync on a show like *Strictly Come Dancing*. Trainee software engineers mainly write simple code and get rid of bugs.

Installation

Design engineer
Leads on building broadcast systems to a technical plan. Design engineers are responsible for working out exactly how many cables are needed, how many edit suites to install or how best to maintain the equipment. The results of their work could be a communications system for a TV studio or a temporary playout centre at the Olympics.

Senior technical project manager
Is responsible for delivering multiple projects, often to different deadlines. The senior technical project manager needs to understand how to get different teams of people to work together to a fixed timeline and a fixed budget to build anything from a new piece of equipment to a complete broadcast centre. They work to the project director.

Technical project manager
Works across different teams to deliver technical projects, such as equipping a van that broadcasts live from a location. Technical project managers get different teams of engineers to work together and ensure projects are finished on time and within budget.

Trainee technical project manager – entry level
Assists the technical project manager by helping to coordinate all the technical requirements of a broadcast project. They may be given responsibility for a small part of a project, including its budget, and might work from the office or on broadcast sites.

Wireperson
Runs and wires cables and connectors to a detailed schedule. Wirepeople have to make a neat job of handling thousands of metres of

video, audio and data cable. They are good at soldering and installing equipment, whether that's in an Olympic media village or a single video edit suite.

Maintenance

Network systems engineer
Is responsible for maintaining the complex computer networks that broadcasting and production depend on. Network systems engineers analyse the computing power needed by a project for the network to operate correctly. They can then plan how to assemble the most functional and secure system that fits the project.

Broadcast maintenance engineer
Makes sure that all the technology is functioning correctly. Broadcast maintenance engineers check hardware systems for wear and tear and carry out routine maintenance to make sure everything is working correctly, and that software is up to date and properly installed.

IT support engineer
Sets up and looks after all the technology needed to broadcast a programme. IT support engineers might get a request to install a new office printer, immediately followed by an urgent call from the news studio asking for help to fix an audio app before they go on air in 20 minutes' time.

Trainee network systems engineer – entry level
Assists the network systems engineer in making sure the network systems – the computer connections between all the technical equipment used in broadcasting – are running smoothly.

Trainee broadcast engineer – entry level
Helps ensure equipment in a studio is in tip-top condition. One minute trainee broadcast engineers are making sure the cables on the set of *Strictly Come Dancing* are properly taped down; the next they are installing updates to an app.

Trainee IT support engineer – entry level
Assists the IT support engineers in helping production staff with their IT behind the scenes and supporting the people working in the studios with the technology they need to get a programme on air.

Operations

Technical manager
Has overall responsibility for all the technical equipment - lights, cameras and sound. Technical managers are the most senior technicians in a TV studio. They are the point of contact for the many suppliers who bring in specialist kit like rock'n'roll lighting or huge LED screens. Technical managers manage the crew and are responsible for health and safety. On an outside broadcast, where there are often more factors to consider (like the weather), they are known as engineering managers.

Vision guarantee
Ensures all aspects of the 'vision chain' work from end to end – from the cameras in a studio or on location to the monitors in the gallery. Vision guarantees make sure all the cameras are ready for the start of rehearsals and that the enormous number of monitors are perfectly set up so the director, producer and lighting director can rely on the accuracy of the pictures.

Location engineer
Sets up the studios and technology needed to broadcast TV programmes from all over the world and makes sure live programmes stay on air. This could be at an international conference for climate change, the tennis at Wimbledon or a war zone like Ukraine. Location engineers drive and operate vans with satellite dishes on the roof that send footage back to the studio at home. They also know how to manage links over the internet. They usually work for news, but their skills are also required for other productions at remote locations such as *I'm a Celebrity or Springwatch*.

OB engineer
Knows how to identify problems and find solutions with outside broadcasts (OBs). OB engineers are flexible and quick-thinking team members who work across many departments on a production, setting up equipment and fixing issues that arise during broadcasting. They are skilled in everything from camera set-ups and sound systems to rigging broadcast equipment and the large vehicles that form the hub of many OBs.

Operations / Distribution and Playout

Satcomms engineer
Ensures the signal from a satellite dish on location, reaches the communications satellite orbiting in space, which is then beamed back to a large satellite on a 'dish farm' in the UK. Whether based on location or in a dish farm, satcomms engineers make sure the technology works.

Radio frequency (RF) engineer
Is responsible for the equipment that uses the high frequency signals that carry pictures and sound to your home. Some RF engineers look after high power transmitters in large, fixed installations. Others work in the studio or on location, taking care of the kit needed to receive pictures from drones or mobile cameras.

Distribution and Playout

Control room engineer (MCR and Playout)
Makes sure programmes reach our homes on TV, computers or phones.

Control room engineers check the quality of all the signals, whether that be with satellites (like Sky TV), terrestrial transmitter networks (like Freeview) or the internet. They work in the master control room (MCR), also known as the playout centre, to ensure the programme 'plays out' to the broadcast schedule.

Trainee control room engineer (MCR and Playout) – entry level
Assists the control room engineer in the master control room (MCR). Together they control playout operations and live video feeds coming in from around the UK and the world, 24 hours a day, seven days a week.

Audio Visual (AV)

Audio visual (AV) engineer
Looks after the technology that creates audio and visual content, such as the sound system and screens at an industry awards ceremony, music festival or political conference. AV engineers are involved in the whole journey of making an AV system, from coming up with a design that fits the budget and technical requirements to building, testing and operating the installation on site.

Trainee AV engineer – entry level
Helps qualified AV engineers install and look after audio-visual systems. This might involve installing a huge screen at a prestigious awards ceremony or an immersive art exhibition like the touring Van Gogh Exhibit. Trainee AV engineers do tasks ranging from configuring software, to soldering wires and installing AV equipment in technical cabinets on site.

Careers in Broadcast Engineering

