

This information was prepared by Free TV Australia, the industry body representing Australia's commercial free-to-air broadcasters.

how a tv station works



The background of the page is a complex, abstract design. On the left side, there are large, overlapping, curved bands of light blue and white, creating a sense of motion and depth. On the right side, there are several thin, parallel lines radiating from the top right towards the bottom left, interspersed with a grid of small, semi-transparent blue squares of varying sizes and opacities, creating a digital or network-like aesthetic.

Television – The Universal Medium

Television is the world's most powerful form of communication. Every day it reaches out to millions of people to entertain and inform them with images and sounds from the world around them.

In Australia, 99 per cent of homes have at least one television set, and almost every Australian watches television some time during the week.

Communications satellites and microwave and fibre optic circuits mean that television can now reach Australians in even the most remote areas.

The process of getting a live news report, your favourite sit-com, a football game or the latest movie onto a TV set in your living room is a complex one, involving sophisticated equipment and highly skilled people — as this brochure will explain.

What is a Television Picture?

Television pictures are generated electronically and are transmitted to our homes by radio waves (analogue television) or digital signals (digital television).

The colour television camera begins the process of creating a picture on your television screen. The camera lens focuses the image onto television pick-up devices which convert light energy (the picture) into electrical signals, the television signal. The television camera has three pick-up devices — one for each of the primary colours — red, blue and green.

Television pictures are like movie pictures, in that although our eyes see a continual moving image, we are really seeing thousands of sequential still images. The TV system in Australia uses 25 still frames each second to create the illusion of the moving picture we see on the screen.

Unlike movie pictures, which are whole screen images, television pictures are made up of horizontal lines. Each line is transmitted one at a time in a process called scanning. In Australia each picture is on your screen for 1/25th of a second and is made up of 625 lines for analog and Standard Definition digital, or even more lines for High Definition digital.

So, to get the moving picture you see on television, the colour television camera has to scan 625 or more lines in every image, 25 times every second.

The television signal is sent from the camera either to a video recorder or to the transmitter. (Because stations carry many networked programs, a signal originating in Sydney may pass via satellite, microwave or fibre optic circuits to transmitters all over the country.) The transmitter sends out radio waves or a digital signal to be picked up by your television antenna. The TV set then converts the signal back to the original red, green and blue colour signals (and of course the associated sound). The red, green and blue signals are combined onto the colour picture tube which forms the full colour image that you view.

Getting a Program to Air

The picture you see on your screen can come from several sources. Some programs are transmitted live from a studio or outside broadcast van. Others are pre-recorded on videotape.

News – A Window to the World

Most Australians rely on television for news about the world, Australia and the local community. Every station runs a news bulletin in the main evening viewing period. Smaller stations often produce only local news, and take a full news bulletin on relay from a city station.

The Newsroom is where the news is written and compiled for the station's bulletins. Under the control of the Director of News, Journalists and Camera Crews cover stories throughout the day.

In bigger stations, the day-to-day management of news staff is the responsibility of the Chief of Staff or the News Producer. She/he may also assign news crews to particular stories, monitor the progress of stories throughout the day and work with the Director of News to decide on the order in which stories will go to air.

News happens 24 hours a day, so news reporting goes on round the clock.

News from overseas arrives via satellite. Networks subscribe to worldwide TV news gathering services and also maintain their own news staff in some of the world's major centres. News from other cities in Australia arrives via satellite or by microwave or fibre optic circuits. Local news is shot using very portable hand-held digital video cameras and recorders. The tapes are then transported back to the station for editing and transmission. In the bigger cities, stations use vehicles equipped with microwave radio links to get the story back to the station with the least possible delay — often going live to air. One of these vehicles will probably be a helicopter, giving both fast transport and a very good platform for the microwave radio link.

The TV Station

The Studio

The studios and studio facility areas are an important part of any television station. It is where programs (and sometimes commercials) are recorded.

Each studio has at least three cameras recording the studio action from different angles, so that the Program Director can switch or fade between shots as the creative aspects of the program demand.

On the studio floor the person in charge is the Floor Manager, who is responsible for ensuring that the Camera Operators, the Audio People who operate the microphones, and the Lighting and Stage Crew all follow the Program Director's instructions.

The Floor Manager is the link between the Director and every other person in the studio. He/she is always in touch with the Director by means of headphones with inbuilt microphone, and provides the signals or 'cues' for actors and presenters.

Studio facilities include the make-up and wardrobe area, where performers are prepared for their on-air appearance. There is also a graphic arts department where station and program logos and material such as weather maps and sporting results are produced by graphic artists using specialised software.

Studio Control Room

The program is put together in the Studio Control Room, which is usually alongside the studio with windows looking into it.

In the Studio Control Room the pictures from the different cameras are mixed and interchanged according to the director's instructions, and material from other sources such as videotape or outside broadcasts is also inserted.

The Studio Director works from the Studio Control Room, where he/she can look directly into the studio and also view on special monitors the pictures coming from each camera and from outside sources.

The Studio Director is able to communicate with studio crew members by way of headphones, and instructs the audio and camera operators on where to move their microphones and cameras to get the shots that are needed.

Also working in the studio control room is the Technical Director, the Camera Control Operator, who has technical control of the cameras, and the Lighting Director, who co-operates with the camera control operator to ensure that each scene is correctly lit. The Lighting Director has a control panel which allows him/her to switch and fade the studio lights.

The Audio Director works from a mixing desk in the audio room, mixing sound signals from different sources and switching from one source to another. The microphones used in a studio can be a tiny unit clipped to an announcer's tie or pocket, desk-mounted units or very long boom-mounted units which can be moved all over the studio.

Just as the Audio Director mixes and switches sound sources, the Vision Switcher, who also works in the studio control room, follows the Director's commands to mix and switch all the picture sources which make up a program.

The Vision Switcher is also responsible for creating most of the special effects seen in television productions. Most of these effects are produced electronically by the vision switching unit or an associated digital special effects system.

The Sound Control Room is part of the Studio Control Complex. This room contains a mixing desk, which mixes sound signals from different sources to ensure that the sounds signal transmitted to your TV set is correctly balanced and audible.

The OB Van

Many television programs, especially sports and concerts, are transmitted live or pre-recorded from venues away from the station's own studios. These programs are made possible by the use of Outside Broadcast (or OB) Vans which are really studio control rooms on wheels. The picture and sound signal from the OB van can be transmitted back to the TV station by a microwave radio link, by satellite or by fibre optic circuit.

Master Control/Network Control

Thanks to the facilities provided by modern telecommunications, television stations are now much more closely interconnected with each other and the world. The Master Control Room is where incoming and outgoing signals are monitored, switched and when necessary adjusted to produce the best quality picture and sound.

The People Behind the Scenes

Sitting at home watching your favourite TV show you may think that only actors and presenters are needed to make a television program.

In fact, the task takes many highly skilled people.

Of course, there are the actors, presenters, newsreaders and reporters, but before they appear in front of the camera they are fitted with the right costumes or everyday clothes by staff in the Wardrobe Department and they are made-up by Make-up Artists.

Writers and Researchers are the people who are responsible for what presenters and actors actually say on screen. For many information-based shows, researchers unearth facts and figures for producers, presenters or writers. For TV drama and comedy, writers are the starting point of the whole production when they produce a script in which the stories and characters are mapped out.

Every television station has a Director of Programming. Their most important task is to place programs in time slots where they will appeal to as many people as possible. So, he/she must be very skilled at anticipating viewer tastes and trends. The Director of Programming also oversees on-air promotions for the station itself and ensures weekly television program details are widely available.

In the Production Department, the Production Manager supervises the station's own local live programs and works closely with the Producers and Directors who are in charge of the station-produced programs.

The centre of a TV station's daily operations is the video post-production department. Typically this is divided into an 'on-air' area and a number of rooms called edit suites. The on-air area contains machines for replay to air of program material, commercials and program promotions. Most programs are pre-recorded in bits and pieces, either in a studio or on location. These programs are finally put together in an edit suite.

The Presentation or On-Air Control Room is a special room used to assemble (produce) the on-air program using inputs from Studios, Videotapes, Outside Broadcasts and Satellite feeds. This control room also inserts the advertisements/commercials and program promotions into the final on-air presentation.

The Tape Librarian has the job of filing and storing all the program tapes and commercial tapes from advertisers, which are made and collected by the station. Each day the Librarian receives a transmission schedule and for this he/she selects the material needed for the day in question.

In every commercial television station a very important group is the Sales Team. Free-to-air commercial television stations generate their income from selling commercial airtime to advertisers. Sales Representatives prepare proposals to attract advertisers, and so must have a good understanding of both the advertiser's product, marketing and merchandising plans and also the station's programs and audience profiles, and its production facilities.

Satellite TV

The development of satellites which can receive and transmit television signals has added to the variety of programs we see on television.

Australia is able to receive direct telecasts from most parts of the world via many international satellites located above the Pacific Ocean and Indian Ocean. Programs and news reports can be beamed live from overseas television stations to the Australian networks, and sporting enthusiasts are able to watch major sporting events, such as Wimbledon tennis or World Cup soccer live, while the games are being played.

Because terrestrial television signals are sent from the station's transmitter to your television set, the signals may be blocked by geographical features such as a mountain range. They also have a limited reception distance because they can't follow the curves of the earth's surface. Until the advent of satellite, this meant that people in the more remote parts of Australia had no access to television programs.

These days there are a number of satellites in orbit which serve our vast continent.

These satellites allow special commercial and non-commercial services to transmit programs to people in remote parts of the country. People in these regions receive the satellite signal on a special 'dish' shaped aerial. This is pointed at the satellite which is in orbit near the equator, some 36,000kms above the Pacific Ocean.

