

Television

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While some experimenters and inventors worked with radio waves and sending audio across distances, others were more interested in transmitting live pictures. Experiments in television began in the 1880s, but commercial television broadcasting was not ready to begin business in the United States until the early 1940s. At that time, U.S. involvement in World War II put any further development on hold, because some of the raw materials used to make television sets were deemed essential for the war effort.

Television got off to a slow start again after the war, but the opportunities it offered were seen by many, including veterans returning from the war and AM broadcasters wishing to expand their businesses. The FCC was flooded with requests for licenses and ordered a freeze on accepting applications for stations. Decisions made during the freeze led to the emergence of cable, the UHF TV channels (Ultra High Frequency band of TV channels 14–83 which was another band of TV channels at frequencies higher than the previous channels 2–13 known as VHF, Very High Frequency), color television, channels assigned for educational TV, and the solidification of the networks.

Television shaped U.S. history with its impact on the economy through effective advertising in the 1950s and its presentation of the Vietnam War and social unrest in the 1960s as well as the social awareness of the 1970s. In the 1980s, viewership splintered with the appearance of cable networks such as CNN, MTV, and HBO, creating a less homogeneous television landscape. Although conglomeration may bring back some of that homogeneity, technology exists now that puts individual viewers in charge of what they watch and when.

SEE IT THEN

THE EXPERIMENTAL YEARS

EARLY INNOVATIONS

Early thinking about how to send pictures using electricity was divided into two camps: the mechanical scanning camp and the electronic scanning camp. Mechanical scanning was a method that employed a spinning disc



FIG. 1.1 British family watching a 1930 Baird Televisor, a mechanical scanning TV. *Courtesy MZTV Museum.*

system that used one disc to record the visual image for sending and another one for viewing. Paul Nipkow developed a mechanical scanning system in 1884 in Germany. Other experimenters followed, including John Logie Baird from England. In 1926, Baird developed a workable system to send live television images. The British Broadcasting Corporation (BBC) adopted his system and began broadcasting in 1936.

By today's standards, the John Logie Baird system was primitive, using only 30 horizontal lines of information. Until 2009, analog NTSC (National Television Standards Committee) television used 525 lines; now digital ATSC (Advanced Television Systems Committee) television can use up to 1,080 lines per frame.

Electronic scanning was developed by Westinghouse researcher Vladimir K. Zworykin. In 1923, he developed a working electronic television scanning system that did not require the mechanical spinning disks of previous systems and produced a better picture. His camera tube, the *iconoscope*, was a photosensitive device that converted light into electrical energy. Zworykin is also credited with developing a TV receiver using a similar device called a *kinescope*,¹ which was a cathode ray tube similar to the large glass picture tubes that were used in television sets until the advent of flat screen televisions. When RCA took over the research activities of GE and Westinghouse, Zworykin's boss was David Sarnoff, who was interested in electronic television and building a television network.

In 1922, inventor Philo T. Farnsworth designed a system for electronic television, and in the early 1930s, he accumulated a number of television system patents that made improvements to the system developed by the RCA group. Although RCA almost always bought the companies that held patents in order to acquire their technology, Farnsworth managed to convince RCA to *license*



FIG. 1.2 Vladimir K. Zworykin with the television cathode ray tube he invented. *Courtesy MZTV Museum.*



FIG. 1.3 Philo T. Farnsworth with an early television pickup tube. *Courtesy MZTV Museum.*



FIG. .4 David Sarnoff, president of NBC, makes an introductory speech for live TV at the 1939 World's Fair. *Courtesy MZTV Museum.*

his patents, which gave him control over his inventions and substantial earnings in royalties from RCA (Ritchie, 1994; Schatzkin, 2003; Schwartz, 2000).

In 1930, the leaders in television technology—RCA, GE, and Westinghouse—joined forces to develop electronic television. Zworykin worked with engineers from RCA and GE, and by 1936, an experimental television station—W2XF in New York—began transmitting television pictures. By 1939, a 441-line picture had been developed and the station was transmitting on a regular schedule.

Development of electronic television continued throughout the 1930s, and television made its debut at the New York World's Fair in 1939. Television was introduced to the public by David Sarnoff and the first presidential television address was given by President Franklin D. Roosevelt from the World's Fair. In 1941, the FCC, advised by the National Television System Committee (known as the NTSC, the group that developed the standards for broadcast television), adopted a standard for operation: On July 1, 1941, commercial television broadcasting began by FCC approval. Compared to radio, television required much more space (i.e., bandwidth) on the electromagnetic spectrum. For instance, AM radio requires 10 KHz and FM requires 200 KHz, but television requires 6 MHz, or 30 times as much space as FM and 600 times as much as AM. By 1941, the television picture had improved to 525 horizontal lines, up from the 441-line picture first put forward by RCA.

ZOOM IN

For animation and illustrations about over-the-air television signals, television scanning lines, and streamed video, go to the Focal Press web site for this book at <http://booksite.focalpress.com/companion/medoff>. View a video clip about the origins of television at: www.farnovision.com/media/origins.html.



FIG. .5 A 1939 RCA television. *Courtesy MZTV Museum.*



FIG. .6 This image of Felix the Cat was the result of early electronic scanning experiments. *Courtesy MZTV Museum.*

WORLD WAR II

Commercial television broadcasting was ready to begin business in 1941, but U.S. involvement in World War II essentially halted its development. In early 1942, the federal government noticed that the manufacturing of television stations and receivers used materials and equipment that could be used for the war effort, especially in the production of radar equipment, and so it stopped television broadcasting almost entirely.

As World War II drew to a close, limitations on resources began to change and restrictions were gradually removed. Radio stations were again being built, and materials once deemed scarce were again available to industry. Television, which had been talked about by many but seen by few, was about to get a real test in the marketplace. Yet even after the war ended, it was almost two years before materials were available to resume television station construction and set manufacturing.

OFF TO A SLOW START

The effort to bring television to homes across the country began again after the war. In 1945, there were only



FIG. .7 The experimental NBC Studio where Felix was first televised. Courtesy MZTV Museum.

six television stations on the air, and three years later, on January 1, 1948, there were only sixteen. There were many reasons for the slow growth of television, but perhaps the most important was that building a television station required more technological knowledge than building a radio station. Television added pictures to the sounds, making the construction of a broadcast facility much more complicated. And with additional technological complications came additional expenses. Television required more space, more equipment, and more personnel than radio. Also, investors were concerned that not many people owned television sets. Public support for television did not begin until the end of the 1940s, when the U.S. economy began to boom, television set prices began to decrease and television programming options began to increase, which set the stage for massive growth in the television industry.

By late 1948, there were only 34 stations on the air, but numerous applications were being submitted to the FCC for new licenses. Many of these applications came from AM broadcasters who wanted to start television stations. Interestingly, newspaper companies were encouraged to join in the television industry by the FCC and government. Newspaper companies had experience in mass media, and they could afford to build new television stations. Several newspaper companies built powerful stations that have stayed on the air for many years. For instance, WGN (whose call letters are also an acronym for the World's Greatest Newspaper) in Chicago was built by the Tribune company, then owner of the *Chicago Tribune* and other papers, and WTMJ was built by the owner of the *Milwaukee Journal* and WBAP in Ft. Worth, Texas was built by the Ft. Worth Star Telegram.

Similar to what happened in the early days of the feature film industry, the new television industry offered opportunities for many people. Veterans returning from the war, who had radar experience, often became television engineers. Others moved from camera operation to director to producer in a matter of months. The race was

on to provide a lot of television programs, and the talent pool of people qualified to work in television was still quite small.

THE BIG FREEZE

The post-World War II audience demand for television sets and programming was the catalyst for the increased number of new applications for television licenses. The FCC became overwhelmed by the number of new station applicants and though it had a set procedure for allocating radio stations to markets, the FCC simply was not prepared to deal with licensing television stations. And so in 1948, the FCC essentially threw up its hands and yelled, "Freeze!"

The FCC froze all new applications until it could devise a new plan. Specifically, it wanted to provide local television service to as many markets as possible, give maximum television coverage nationwide, and prevent interference among station signals. However, the FCC needed time to prepare the specifics of the plan, such as how to allocate frequencies and achieve the agency's goals of preventing signal interference. The plan took almost four years to develop, and it wasn't until April 1952 that the FCC lifted the freeze and began to accept new applications for stations.

THE BIRTH OF CABLE

Because the freeze came at a time when many stations had been planned but not yet licensed, many cities didn't get television stations until after 1952. People in many markets were simply left out of the television boom. Not surprisingly, the lack of a television signal led to the birth of community antenna television (CATV), the precursor to modern-day cable television.

In communities that did not have local stations, enterprising individuals found a way to provide television. (These were often appliance store owners, who wanted to

TELEVISION! Air waves that bring you voices of musical stars, the sweet melody of the trumpet, the cascading surge of the symphony, now bring you electronic pictures of excellent quality to go with the music! Television

FARNSWORTH TELEVISION



In those cities where television programming is broadcast, a limited number of Farnsworth table model television sets will soon be available. Like the Farnsworth portable radio, table model, and photograph-radio, the new television receiver combines model grace with the quality you expect from the best of television. The inventor, Philo T. Farnsworth, developed the first practical system of electronic television, and it is the company which bears his name that today offers for your entertainment and pleasure the fruits of electronic research. Prices: Farnsworth radios and photograph-sets: **\$25 to \$250**

A reproduction photograph from "Song of Norway," "Knutten cannot dance" based on the film and music of the Norwegian composer, Edvard Grieg



Capelhart and Farnsworth television will bring the greatest stage shows to your home—in speaking, colored black-and-white color picture

is no longer in rehearsal. It is here, now, in many cities for your delight and enjoyment. In your own home, on the Capelhart and the Farnsworth, television will reproduce in clear, sparkling black and white the musical comedy, the opera, the play, the ballet, the news of the hour, as it happens.

CAPEHART TELEVISION



In the field of musical reproduction, one photograph-radio stands supreme, and that is the Capelhart. Only by comparison with the human voice, or with the original musical instrument, can its clarity and purity of tone be appreciated. This standard of excellence will be inherent, also, in the new Capelhart television receivers for the home. Just as Capelhart now brings you the finest instruments for musical reproduction, so will Capelhart bring you the latest instruments for your visual enjoyment. Photograph-radio prices: The Panatomic by Capelhart, **\$300 to \$700**. The Capelhart, **\$925 to \$1500**

© 1938 F.T.F.C.

FARNSWORTH TELEVISION & RADIO CORPORATION, FORT WAYNE 1, INDIANA

FIG. . A, . B, & . C Advertisements for early television sets.

sell television sets, and telephone line engineers.) They built systems that included a large, sensitive antenna that brought in television signals from distant stations. The antenna was usually placed on the top of a nearby hill or a location just outside town that could receive television

signals. The system ran an antenna cable to a central location in town from where a wire that carried the television signals was connected to each individual home that was willing to pay a fee for the television reception. (See Chapter 4.)

GET MORE OUT OF LIFE WITH TELEVISION

GET MORE OUT OF LIFE WITH TELEVISION

Features Hi-Fi stereo system with hi-fi gram, radio, automatic phonograph—Cabinet designed by Helmut Rosengren.

Get the most out of television with a DuMont Teleset

Only direct comparison can show how far DuMont outshines all other sets. Compare the size, brilliance and clarity of the image. Compare the quality of sound. Compare the ease and accuracy of tuning. Compare styling and workmanship of the cabinets. See and hear the new DuMont Telesets at authorized DuMont Dealers. See; Hear; and Compare.

DU MONT *Fast with the finest in Television*

DU MONT'S NEW YORK TELEVISION STATION **WABD** is broadcasting all the home games of the **NEW YORK YANKEES**

WABD STAGES AND PLAYS, FRIDAY, NEW JERSEY

RILEY B. DE RIGHE, SANFORD, INC. • GENERAL TELEVISION SALES OFFICES AND STATION WABD, 510 MADISON AVE., NEW YORK 17, NEW YORK. • WABD STAGES AND PLAYS, FRIDAY, NEW JERSEY

FIG. .A, .B, & .C (Continued).

Kingsize pictures are 2 1/2 times bigger—126 square inches!

There's MORE to see today in television and RCA Victor shows it to you better!

You follow every play—pictures are locked in tune with sending stations!

Television sound is static-free FM through the famous "Golden Throat" tone system!

Big console-size speaker!

Tuning is simpler, easier than ever!

RCA Victor 8T270
 Kingsize pictures—126 square inches big. But that's not all! There are Eye Witness pictures—brilliant, clear, steady, crystal locked in tune by RCA Victor's Eye Witness Picture System. Powerful circuits adjust automatically to television signals of varying strength. New Multi-Channel Automatic Station Selector, improved controls, make tuning simpler, easier than ever. Mahogany or walnut finish. Blued slightly higher. A.C. **\$495.00!**
Includes picture tube, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life.

HERE IS 16-INCH RCA VICTOR

RCA Victor 8TK29
 New Eye Witness television tube model has A-M-FM radio and handy switching stand... all for the low price. Picture, 32 square inches big, are locked in tune by RCA Victor's Eye Witness Picture System. Tuning is simple with the new Multi-Channel Automatic Station Selector. Television sound and powerful A-M-FM radio reception are heard through the famous "Golden Throat" tone system. A.C. **\$375.00!**
Includes picture tube, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life.

EYE WITNESS TELEVISION

RCA Victor 8TK27
 New Eye Witness television tube model has A-M-FM radio and handy switching stand... all for the low price. Picture, 32 square inches big, are locked in tune by RCA Victor's Eye Witness Picture System. Tuning is simple with the new Multi-Channel Automatic Station Selector. Television sound and powerful A-M-FM radio reception are heard through the famous "Golden Throat" tone system. A.C. **\$375.00!**
Includes picture tube, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life, 1000 hours life.

SEE YOUR RCA VICTOR TELEVISION DEALER FOR A DEMONSTRATION AND FREE BROCHURE

RCA VICTOR

MEMBER OF RAYCO CORPORATION OF AMERICA

WORLD LEADER IN RADIO... FIRST IN TELEVISION

FIG. .A, .B,& .C (Continued).

VHF AND UHF

The freeze on licensing new television stations ended when the FCC issued *The Sixth Report and Order*; its master plan for the allotment of stations to channels and markets. Included was the opening of the ultra-high-frequency band, or UHF, which allotted channels 14 through 83 to television stations across the United States. The UHF band seemed like a great idea, except for the fact that none of the television sets manufactured up to that time could receive those channels without using a converter. Before the freeze all stations were licensed to the very-high-frequency band, or VHF channels which were originally channels 2 through 13.

Stations that were licensed to the UHF band didn't have large audiences because existing sets couldn't receive the signal. Also, the nature of the ultra high frequency of the channels above 13 made both transmission and reception more difficult. UHF signals do not travel as far as VHF signals; therefore, a UHF station requires quite a bit more power than a VHF station just to reach the same geographical area. Sets without UHF tuners required set-top converter boxes, but they were not as easy to operate as VHF tuners, which clicked into place on each channel. As a result, the set-top boxes required more adjusting. Also, in order to receive UHF signals, a different style of television antenna was required. Combination antennas were sold that received both VHF and UHF signals, and sometimes, each antenna had to be aimed in a different direction to receive the various signals available in the market.

In 1962, Congress passed the All-Channel Receiver Act, amending the Communications Act of 1934. The 1962 act authorized the FCC to mandate that all television sets manufactured in 1964 and beyond must be able to easily tune both VHF and UHF stations. Despite this legislation, the inequality between stations on the two bands remained. Until cable television became widespread and provided good-quality signals for all stations on the system, VHF signals dominated. In fact, a common saying about stations in the first decades of television broadcasting was that getting a VHF license was like getting a "license to print money." Although it was never quite that easy, VHF stations with network affiliations dominated the market and commanded the majority of television advertising dollars.

COLOR TELEVISION

In the 1950s, the public was just beginning to get used to the idea of black-and-white television, but the networks were experimenting with systems to bring full color to television broadcasting. In fact, one of the issues dealt with during the freeze was the changeover from black-and-white television broadcasting to color. The FCC was concerned about color because it was looking carefully into the allotments of spectrum space for television, and at that time, color television appeared to require more channel space than black-and-white television.

Two competing systems emerged that both fit into the existing 6 MHz of channel space allotted for each



FIG. 1 The first color television was made by RCA in 1954 and sold for around \$1,000—or about \$6,000 in today's money. *Courtesy MZTV.*

television station. The CBS system used a mechanical color wheel that transmitted a color signal. This system was not compatible with existing black-and-white sets at the time; plus, it was somewhat difficult to maintain and also produced "noise" that distorted both the electronic picture and sound. RCA promoted a competing system that accomplished color television broadcasting electronically, rather than mechanically. After much wrangling and debate, the FCC supported the CBS color system in October 1950.

The public was not quite ready to buy color sets, had CBS or its manufacturing partners even produced them in the months following the FCC's decision. Very few programs had been prepared for color broadcasting, and very few audience members could afford color television sets. As the United States turned its attention to the Korean War in 1951, the issue of color television faded in importance.

At the end of 1953, with impetus from the courts, the FCC reversed itself and selected the electronic color system developed by RCA. This reversal came about in part because CBS lacked the conviction to continue its push for color and the NTSC accepted the RCA version. No doubt David Sarnoff, head of RCA, who also campaigned for acceptance of his company's system, had an impact on the FCC decision. The RCA system was improved from the original and was still used by broadcasters in the United States until the digital switchover in June 2009.

Although other better-performing systems have been adopted worldwide, the NTSC (RCA) system remained intact until the United States replaced it with digital television. The 525-line color broadcasting system was criticized repeatedly over the years, not only for its lower resolution as compared to other systems but also because engineers often found it unreliable. Some engineers jokingly referred to the NTSC acronym as meaning "Never Twice the Same Color."

ZOOM IN

Go to the companion web site for this text, <http://booksite.focalpress.com/companion/medoff>, for information and animation of black-and-white versus color and analog versus digital signals.

Despite adoption of the RCA color system, there was no huge demand either to manufacture color sets or to broadcast color programs. Because almost all television cameras were capable of producing only black-and-white images, very few programs were made for broadcasting in color. Also, people had already bought black-and-white sets, which were very expensive at the time. In sum, the situation was similar to the recent switch from analog to digital television broadcasting. Digital TV set purchases began slowly from the late 1990s until just before the digital switchover, because they were expensive and the audience didn't see the need for an expensive new set.

DOMINATION OF THE NETWORKS

As had been the case in radio during the 1930s and 1940s—radio's Golden Age—the networks dominated television from its inception. Interestingly enough, the financial power that the networks had accumulated from radio was used to bankroll the new medium of television. Television stations with network affiliations did well, while independent stations often struggled for audiences, programming, and money.

The freeze helped solidify the networks. During the four freeze years, existing stations scrambled to affiliate with the two powerful networks, CBS and NBC. Thus, two years after the freeze ended, CBS and NBC had more than three-quarters of all stations that were affiliates. ABC, which was formed after NBC divested its Blue radio network in 1943, was always a distant third in number of stations and audience size. ABC was so financially strapped that in 1951 it merged with United Paramount Theaters to receive a cash infusion and stay in business. A fourth network, the Du Mont network (a TV set manufacturing company), had many affiliates in medium and smaller-sized markets, but it experienced problems similar to ABC with audience size and ceased operation in 1955.

RELATIONSHIPS WITH AFFILIATES

Beginning in the early days of radio, the networks exerted quite a bit of control over the affiliates. The reason behind this was simple: The networks provided the high-quality entertainment that made the local stations both popular and sophisticated. Big-name stars from Hollywood and New York could be heard on local stations in small towns across the country. Without the big-name stars and high-quality programs, a local station was nothing special—often a so-called Mom and Pop operation owned by a group of small businesspeople. The networks' ability to bring stars and desirable programs to the affiliates continued into the television era.

Television programming has always been expensive to produce. In the early days, the networks, using the money they had banked during the Golden Age of radio, produced enough programming to allow local stations to provide some news, public affairs, children's programs, and sports. Drama, situation-comedy, and even variety shows were too expensive for most local stations, however.

Independent stations were forced to either produce shows on their own or seek programming material from *independent producers* or *syndicators*. In the early 1950s, not much quality programming was available from these sources, which made affiliation with a television network very attractive, both financially and operationally. It was easier to get programs from the network than to produce them at the station or to get them from other sources. More important, network programs were usually of higher quality than locally produced or independently produced programs.

These harsh facts of life in the television industry meant that network affiliation was highly valued. The networks had their pick of stations in a given market and were in a very strong bargaining position with their affiliates. In other words, the networks could often dictate financial terms and the availability of airtime to the local stations. The top three stations in a market affiliated with CBS, NBC, and ABC. In most cases, the independent stations were newcomers to a market or broadcast on a less desirable UHF channel, and in television markets that had three stations or less there were no independent stations.

The networks also had quite a bit of freedom from regulation. Although local stations were regulated directly by the FCC, the networks were regulated only through the stations they owned. Very little legislation and regulation hampered the networks directly, because the networks weren't using publicly owned airwaves—the affiliate stations were.

The affiliations between local stations and networks were renewable every year. However, from the post-World War II years until recently, an affiliation with a network usually lasted for many years. Often, the relationship between a network and an affiliate began in the very early days of the station's existence and remained unchanged. The affiliate relationship has several components. The local station provides its airtime (known as *clearance*) and its audiences to the network, and the network provides a dependable schedule of high-quality shows to the local affiliate for most of the broadcast day. In addition, the affiliate is paid for its airtime. This practice, known as *station compensation*, is based on the size and the demographic makeup of the audience delivered by the station to the network, its advertisers, and the competition for the station's affiliation.

In the early days of television, NBC and CBS both had money, strong VHF affiliates, and an inventory of radio programs that were set to make the transition from radio to television. Besides the shows themselves, the networks also enjoyed the relationship between the shows and their advertisers. The shows that made the change from radio to television often brought their sponsors along. And for an established show with a loyal following, this created an instant audience of loyal television viewers.

If there was a problem with network programming in the early days of television, it was that television was really radio with pictures. Many of the same programs, with the same stars, switched from radio to television. Although this transition was comfortable for the audience, it didn't encourage much experimentation or the development of new program types and styles. Despite this, the years after World War II were the Golden Age of television, when audiences and advertisers flocked to the tube.

THE GOLDEN AGE

In the 1950s, television was severely restricted by technological factors. Cameras were large and heavy, and strong lighting (which generated quite a bit of heat as well as light) was required to get a good video image. Portable video cameras did not exist and neither did videotape (until after 1956). Although about one-quarter of the prime-time programs were recorded on film, most shows had to be produced live.

FYI: Kinescopes

The method used to preserve live television shows and show them in different time zones was referred to as *kinescope recording*. Developed by Du Mont, NBC, and Kodak, this was a primitive method of storing visual images by aiming a film camera at a television monitor showing the program to be recorded. Kinescopes (as they have been referred to over the years) were not good quality and required time for developing and shipping to stations. After videotape became available in 1956, kinescopes ceased to be a viable medium for storing video programs. Now they are considered rare and are collector's items.

For more information, go to www.museum.tv and find the Encyclopedia of Television under the Publications tab, click on Browse Now, then use the index to click on K, then click on Kinescopes.

GOING LIVE

Most programs at that time were produced in a studio. For instance, news shows were primarily a newscaster reading the news, with an occasional piece of film accompanying the story. Talk shows, game shows, and music and variety shows were also relatively easy to produce in a TV studio. The look of television then was simple and straightforward. There were no fancy special effects.

Even so, live shows often had an edge to them. Viewers became accustomed to the ever-present possibility that things could go wrong. Actors forgot their lines, doors would not open, lights would not work, and a host of other things that could go wrong sometimes did. Videotape was not invented until 1956, and even then, it was very expensive, prohibiting all but the largest stations and networks from using it.

THEATRICAL INFLUENCES

From 1948 to 1957, the networks began looking for ways to persuade people to buy their first television sets.

Most programming came from New York City, the location of the networks' headquarters and television studios. Programming was thus influenced by Broadway.

Some of the programming during this period was created by people who worked in the theater and had an interest in the new television medium. Original television plays were aired on programs (called *anthologies*) that showed different plays each week, often written by big-name theatrical writers and sometimes performed by big-name actors. Programs like *Kraft Theater*, *Playhouse 90*, and *Studio One* featured live, high-quality dramas that attracted educated viewers who were likely to buy expensive TV sets.

Interest in this first-rate work was high at first, but it diminished after the composition of the audience changed from mostly affluent, educated people to an audience that included almost everybody, educated and affluent or not. Also, audience taste began to favor programs that were shot on location and had more action and adventure than plays shot in a studio. In addition, advertisers didn't care for some of the serious dramatic topics shown on the anthologies.

BLACKLISTING AND BROADCASTING

After World War II, the U.S. government and the public in general became very aware of the growing power and nuclear capabilities of the Soviet Union. In addition, Americans feared that communism was spreading in many parts of the world.

The general attitude toward communism was not just that it was different from the American system but that it was a political ideology that would be used to take over the world. Politicians seized on these fears and used them for political gain. In the early 1950s, a small group of former Federal Bureau of Investigation (FBI) agents published a newsletter called *Counterattack*. Its purpose was to encourage Americans to identify and even shun people who demonstrated sympathy or ideological agreement with communism. Another publication, *Red Channels: The Report of Communist Influence in Radio and Television*, described the communist influence in broadcasting and named 151 people in the industry who supposedly had communist ties. The names of these people were put on a blacklist, and they were essentially no longer permitted to work in broadcasting or related industries. *Red Channels* was published just as North Korea, a communist country, invaded South Korea. The United States got involved in the conflict, and hence the nation's role in stopping communism began, as American troops were sent to fight in a foreign land.

The Korean War, which lasted until 1953, reinforced many Americans' feelings that communism had to be stopped, and the idea that communism had infiltrated broadcasting triggered activities to stop it. Although no individual's association with communist activities was ever proven, the mere listing of a person's name in *Red Channels* prevented him or her from continuing a career in broadcasting. The networks and advertising agencies even employed individuals to check the backgrounds of people working in the industry. If a person's name

New **PHILCO** Predicta

... world's first swivel screen television!

In one bold stroke of scientific research, Philco brings exciting new freedom to television design! A new "S-F" (Semi-Flat) picture tube which measures less from front to back than any other and a new Predicta chassis which puts more power in less space, bring a new approach to television use and enjoyment.

Philco Predicta table TV (above), the new look of television! The picture, completely enclosed in its own case, "floats" and swivels above its 8" high cabinet. Finished all around, it can be placed anywhere. Gleaming brass trim and beautiful woods. Gives a brilliant, picture window view of TV land.

Take your choice of the latest, most exciting styles and features in television today! All these handsome models contain Philco's exclusive new "S-F" picture tube and Predicta chassis. At your dealer's store.

LOOK AHEAD... and you'll choose **PHILCO.**

FIG. . O Advertisement for the 1958 Philco Predicta.

showed up in any list of communist sympathizers, he or she could not be hired to work for the network, the advertising agency, or any project or program produced by either. New employees were expected to take a loyalty oath before working. People who were suspected of

communist activities were expected to confess and name their communist associates.

The most prominent of the politicians who used Americans' fear of communism to strengthen his own political power was a U.S. senator from Wisconsin: Joseph

McCarthy. He used televised congressional hearings about communism in the U.S. Army to further his notoriety. Eventually, McCarthy's tactics caught up with him. He was challenged by Edward R. Murrow on a personal interview show called *See It Now* that aired on March 9, 1954. In the show, excerpts of speeches given by McCarthy were replayed to uncover his inconsistencies. In the end, McCarthy was shown to be a bully who ignored fact and used innuendo to level accusations at his adversaries and innocent people who worked in the media.

ZOOM IN

Learn more about blacklisting by going to www.museum.tv and find the Encyclopedia of Television under the Publications tab. Click on the Browse Now link, then use the index to select B, then click on blacklisting.

The *Red Scare*, as it was known, created a very bad atmosphere for broadcasting and its employees. The cloud of blacklisting continued until 1962, when radio comedian John Henry Faulk, who had been blacklisted in 1956, won a multimillion-dollar lawsuit against AWARE, a group that had named him as a communist sympathizer. The effect of the lawsuit was that the blacklisting practices went from upfront and public to secretive and private. The *blacklist* became a *graylist*, which was used in broadcasting to identify people who might have subversive ideas, especially those who embraced communism. The practice of graylisting lasted into the 1960s.

UPHEAVAL AND EDUCATION

THE "VAST WASTELAND"

In 1961, recently appointed FCC Chairman Newton Minow stated at the National Association of Broadcasters convention that television programming was a "vast wasteland." Critics have latched onto that remark as accurately depicting the quality of the programming offered by most television stations.

Although few would argue that television has traditionally offered many hours of intellectually light programs, it has and still does serve a function beyond pure entertainment. For example, television allowed Americans to witness history during the tumultuous decade of the 1960s. This journalistic function both solidified the importance of television in American society and gave it real credibility as a provider of valuable information.

THE TUMULTUOUS 1960s

Some of the many events covered by television during the 1960s included the presidential debates between candidates John F. Kennedy and Richard M. Nixon; the 1962 Cuban missile crisis; the 1963 assassination of President John F. Kennedy and the subsequent killing of his accused assassin, Lee Harvey Oswald; the 1968 assassinations of Martin Luther King, Jr., and Robert Kennedy;

and man's first walk on the moon in 1969. In addition, continuing coverage of the escalating war in Vietnam, domestic unrest regarding racial issues, and violent demonstrations during the 1968 Democratic convention in Chicago allowed the public to view historical events in an up close and personal way never before possible.

Viewers were deeply affected by the events and issues presented on television—for example, realistic footage of rioting in the streets and the horrors of war. In addition, the proliferation of violent action shows on television led many to wonder whether the media were somehow encouraging people to behave in violent ways.

The U.S. government responded to the violence on television and in real life in 1968 by creating a research commission, the Commission on the Causes and Effects of Violence. In 1969, the Senate asked the U.S. Surgeon General to investigate the relationship between television and violent behavior. The results, published in early 1972, stated that violence on television can lead some individuals to violent behavior. Although the findings fell short of pointing to television as the *cause* of increased violence in society, it fueled the efforts of citizen's action groups like the Action for Children's Television (ACT), which sought to focus congressional attention on the content of television and its effect on children.

EDUCATIONAL TELEVISION GOES PUBLIC

During the television freeze that followed World War II, the FCC was lobbied both by commercial broadcasters and the Joint Committee on Educational Television (JCET) regarding noncommercial television stations. The commercial broadcasters tried to prevent the FCC from reserving television channels for noncommercial television stations, while the JCET lobbied for noncommercial television use. As part of the Sixth Report and Order, which ended the station licensing freeze, the FCC increased the number of channels reserved for noncommercial stations from 10 percent to 35 percent of the available station allocations (242 channels—80 VHF and 162 UHF) for noncommercial use. Since then, the FCC has increased the number of channels dedicated for noncommercial stations to a total of 600.

In 1959, noncommercial television producers formed the National Educational Television (NET) network to operate as a cooperative, sharing venture among stations by sending prerecorded programs by mail. After one station aired a program, it sent it to the next station, and so on. This inexpensive and low-tech network, which became known as a *bicycle network*, didn't allow stations in different locations to air the same program at the same time.

In 1967, the Carnegie Commission on Educational Television (CET)—a group composed of leaders in politics, business corporations, the arts, and education—published a report about noncommercial television that recommended that the government establish a corporation for public television. Until that point, noncommercial television had been strongly associated with educational television. The CET wanted to change the direction of noncommercial television so as to provide a broader cultural view.

The eventual result of the report and discussion that followed was the Public Broadcasting Act of 1967. The term “broadcasting” was used instead of “television” because Congress decided to include radio as well as television in the legislation. The act provided that a corporation would be set up, with the board of directors appointed by the president of the United States, and that financial support would come from Congress. Having a corporation oversee public television was intended to provide some distance between the government and the non-commercial network.

The corporation that was formed in 1968, the Corporation for Public Broadcasting (CPB), was meant to support both the producers who created programs and the stations that aired them. However, CPB was not allowed to own or operate any stations. Rather, the Public Broadcasting Service (PBS), the television network arm of CPB, would operate the network that connected the participating stations. This arrangement provided for CPB to fund producers of programs and PBS and the public stations to select the programs they wish to air, thereby insulating program presenters from government pressure to air government financed programs. PBS went on the air in 1969 and began distributing programming to member stations five nights a week, including a children’s daytime show called *Sesame Street*.

PBS, like CPB, is a private, nonprofit corporation whose members are public television stations. Its mission has been direct involvement in program acquisition, distribution, and promotion for its stations. Although PBS doesn’t produce programs, it does support programs produced by PBS stations and helps acquire programs from independent producers around the world. PBS has also been involved in developing engineering and technology and in marketing video products (e.g., videotapes of programs) to the public. In addition, PBS administered the PBS Adult Learning Service, which provided televised educational courses for credit to up to 450,000 students each year. This service was discontinued in 2005.

PBS is unlike the commercial networks, because it doesn’t sell advertising time. Instead, PBS gets its funding from a variety of national, regional, and local sources. Audience members provide almost 25 percent of the funding through direct donations. State governments provide about 18 percent, and CPB (along with federal grants and contracts) adds about 16 percent. Businesses add another 16 percent, state universities and colleges add over 6 percent, and foundations provide an additional 5 percent. Because PBS does not get 100 percent of its funding from ratings-conscious advertisers like the commercial networks do, the programming philosophy of PBS is more oriented to providing programs of cultural and educational interest. When the Carnegie Commission first recommended establishing the new, noncommercial network (PBS), the commercial TV networks supported the concept because it would provide programming to that segment of the audience that was critical of the entertainment concept presented by the commercial networks. The audience that who had opposed the move from “serious” cultural and information

programming of the “live” era of TV would now have an alternative to the entertainment program content of the commercial networks. The commercial stations and networks could now concentrate on entertainment that collected a less sophisticated audience that was more attractive to advertisers. Also these entities would be under less pressure from the FCC to program to the public interest if the public broadcasters were fulfilling this role, thereby avoiding the Newton Minow concern that American TV was becoming a “vast wasteland.”

Because the president appoints the leaders of CPB, it sometimes gets caught up in politics. When Richard Nixon was president, he vetoed a funding bill for CPB because he didn’t like the fact that it allowed PBS to air information programs that showed his administration in an unfavorable light. Nixon’s action resulted in the forced resignation of some CPB officials, who were replaced by people who favored Nixon’s view of the role of CPB and PBS. Although this event was unusual in the history of CPB, it shows that public television is influenced by the presidential administration in power.

INCREASED CHOICE AND COMPETITION IN THE 1970s

The television broadcast industry was affected by huge changes that began in the 1970s. Videocassette recorders (VCRs) began to be used in industry and in homes. Audiences learned to have more control over television through time shifting, or recording a program and viewing it later.²

Satellite distribution of television programming was used by new services like Home Box Office (HBO) with great success. In fact, HBO ushered in a new era—that of the distribution of programming via satellite—which led to the growth of the cable industry and the concept of audiences receiving television programming from sources other than broadcast stations and networks and paying for the programming via subscription. (See more about HBO in Chapter 4.) National cable channels began to appear that resembled broadcast networks but did not require licensing by the FCC. The big-three networks were beginning to see some real competition for audience time, but their audience sizes and revenues continued to climb.

GOVERNMENT REGULATION

The FCC enacted some new rules in the 1970s that encouraged competition in the television business. The first was the *prime-time access rule* (PTAR), which prevented network affiliates in the top 50 markets from programming more than three hours of network shows in prime time (i.e., 7:00 p.m. to 11:00 p.m. Eastern and Pacific; 6:00 p.m. to 10:00 p.m. Central and Mountain). The FCC’s goal was to encourage more local programming at television stations and to allow independent producers one hour of prime time for syndication distribution of their programs outside of the network hold on this lucrative audience. However, most of the stations affected by the rule resorted to finding inexpensive programming, rather than producing their own. The result was more game shows and other syndicated fare.

Another FCC rule prevented the networks from acquiring financial interest and control or syndication rights over independently produced programs that aired on the networks. Known as *fin/syn* (*Financial Interest and Syndication Rule*), it allowed both independent producers and syndicators to reap bigger financial rewards from successful television programs.

A third rule, the *duopoly rule*, prohibited a company that owned a television station or AM or FM radio station in a market from acquiring another station in that market. In other words, the owners of a TV station could not buy another TV station in the same market. The FCC obviously feared that multiple-station ownership in a given market could lead to a broadcast monopoly.

A fourth rule was an attempt put forward by the National Association of Broadcasters (NAB) to reduce the amount of sex and violence on television that would be seen by children. Known as the family hour, it attempted to restrict sex and violence on television before 9:00 p.m. (8:00 p.m. Central). The rule was strongly opposed by the television industry because it restricted creativity and the right of free speech. In other words, it didn't like the NAB's attempt to dictate program content. Others were opposed to the idea because they suspected that the NAB was bowing to pressure from the FCC. The rule was never accepted by the FCC, but the "jawboning" (informal discussion) impact of these dialogues still had an impact on TV programming in the 1970s.

These four restrictions on television remained in place for some time, but all ultimately were abolished. The FCC's willingness to deregulate, which began in the late 1970s, overcame its need to restrict broadcast television—at least in the areas just mentioned.

SOCIAL AWARENESS PROGRAMMING

The 1970s also saw a new type of situation-comedy program, or *sitcom*, that included a social consciousness. Shows like *All in the Family*, *Maude*, and *The Jeffersons* encouraged the audience to think about social issues such as the Vietnam War, abortion, and racism by examining them within a humorous context. The critical and financial success of these shows kept these issues in front of the public and encouraged other producers to include socially relevant topics in entertainment television programs. In addition, audiences and social pressure groups took action to persuade electronic media to stop stereotyping minorities and to include more of these individuals in the media workforce, management, and ownership structure.

TECHNOLOGICAL CHANGES

In the 1970s, cities all over the country were being wired for cable television. Satellite-to-home television also was a reality, although it was most popular in sparsely populated areas, where cable wasn't available and homeowners had the space and money for a large receiving dish. Yet despite these developments, the major networks did very little to change what they presented to the audience. Network schedules revealed little innovation. Program formats that had been successful for many years in both

radio and then television remained in place during the 1970s. After all, broadcast television provided free entertainment to anyone who could afford a television set.

Unlike the early days of television—when television sets were expensive and purchased only by upscale, educated people—television sets became very affordable in the 1970s. Low-priced television sets were a result of manufacturers enjoying the economy of scale: the more sets that were produced, the cheaper it was to manufacture each set. Another factor was that foreign companies, especially those from Japan (Sony, Panasonic, and Toshiba), were producing low-cost, high-quality color television sets and selling them in the United States.

Regardless, the size of the audience grew, and despite losing its strong share dominance of the audience, the audience for the television networks grew. As a result, network advertising revenues grew as well.

THE NETWORKS LOSE GROUND IN THE 1980s

The networks maintained a powerful position in their dealings with affiliates from the early days of television up to the 1980s. The three major networks enjoyed 90 percent of the viewing audience at the beginning of the 1980s, but during later years, the viewing audience had a shift in behavior. Instead of relying on the broadcast networks for their television-viewing fare, the audience began to spend more and more time with *cable* channels. National cable channels like CNN, MTV, and ESPN and pay channels like HBO and Showtime gained larger shares of the audience, as most of the country's big cities became wired for cable television. The introduction of the Fox network gave viewers yet another broadcast choice. Rentals of VCR videos further eroded the network-viewing audience.

As viewers' options proliferated, they spent less and less time with the big-three broadcast networks. During the 1980s, the networks combined share of the primetime audience shrank by about one-third, going from almost 90 percent to 60 percent.

DEREGULATION REVISITED

The broadcast deregulation trend that began in the late 1970s continued throughout the 1980s. Some have even said that the *deregulation* of the 1970s became the *unregulation* of the 1980s during the Reagan Republican years. There were less public service programs, no limit on the number of commercials per hour, a much easier license renewal process, no trafficking restrictions (previously, an owner had to hold a broadcast station at least three years before it could be sold), and less recordkeeping. In 1982, a federal court struck down the NAB Code, a set of programming and advertising guidelines for radio and television, on antitrust grounds. In 1984, the FCC upped ownership limits from the *rule of sevens* (which allowed owning only seven stations in any service, AM, FM, or TV) to twelve stations in either radio service and up to 25 percent of the total television households nationwide. In 1992, the limits were raised again, allowing up to 40 radio stations per owner and some relaxation of the duopoly rules.

ELECTRONIC NEWS GATHERING

Another technological development of the 1980s was the miniaturization of the components needed to produce broadcast-quality video. As portable video cameras became common at networks and television stations across the United States, news gathering and reporting changed.

In earlier days, news was shot on film and then developed and edited, preventing stories from being ready for the 6:00 p.m. newscast. Anchors would report a breaking story and then give the “Film at eleven” promise. Beginning in the late 1970s and becoming widespread in the 1980s, battery-powered portable video cameras, easy video-editing procedures, and lower-priced editing systems made the production of a news story shot in the field easily available for earlier broadcasts. On a late-breaking story, the anchor could then say, “We will have that video for you later in this program.”

Gathering news video in the field became known as ENG, for electronic news gathering, which noted the difference between shooting film for news and shooting video. With ENG, broadcast news changed in several ways—namely, video was cheaper and easier to produce. The Cable News Network (CNN) started operation and competed directly with the broadcast networks for the news audience because news stories could be easily and quickly produced. In addition, satellite news gathering (SNG) was initiated, which allowed a news crew in a satellite news truck with uplink capability to shoot video from just about anywhere and transmit it to the station via satellite.

THE NETWORKS REGROUP

Broadcasting revenues, which had for decades been on the rise, started to level off toward the end of the 1980s. One of the results of this decline in revenues was a change in ownership at the network level. In 1985, GE bought RCA, the parent company of NBC, and Capital Cities Communications, a broadcast group, bought ABC. And in 1986, for the first time since the demise of the Du Mont network in 1955, television had a fourth commercial network, the Fox television network. Fox was started by Rupert Murdoch, who owned News Corporation, and it was named after the film studio Twentieth Century Fox, also owned by Murdoch’s company. The network slowly built a prime-time schedule, despite losing large sums of money in the early years. In 1988, Fox lost \$80 million. It took another five years until Fox began scheduling prime-time programming seven nights per week.

Because broadcast network revenues were declining and despite the competition from cable, satellite, and even a new network (Fox), many executives of the big-three networks decided that their strategies were working fine and didn’t require overhauling. New ideas clashed with old, and the direction of the television industry became a source of tension. Generally, the big-three networks managed to change very little with the times, leading some industry critics to refer to them as the “three blind mice” (Auletta, 1991).

MORE NETWORK CHALLENGES

The 1990s brought many changes to television. During this decade, the *Internet* became a household word and promised to bring dramatic changes to the media landscape. Moreover, new networks appeared, cable channels proliferated, and direct broadcast satellite became economically viable.

CNN

The 1991 Gulf War gave TV news operations the opportunity to use satellite technology to deliver quality news reporting from half a world away. The big winner with audiences was CNN, with its 24-hours-per-day coverage. The broadcast networks could not afford this extensive coverage because they could not preempt their advertiser-supported entertainment programs (i.e., show their own news programs instead). Also, the networks didn’t have the infrastructure of news bureaus and reporters in the field. CNN did have that structure, and as a result, it became an important source for breaking international news. CNN’s reputation as a premier source for news was solidified.

ANGRY AFFILIATES

As a result of having smaller audiences, the networks had less power over the advertising market and their own affiliates. Angered over having less advertising slots available in prime time, the affiliates continued to preempt network programs and instead aired programs they produced or obtained. Some stations believed that the network compensation they were receiving for their airtime was not enough. Other stations didn’t want to sign long-term agreements with the networks, preferring to keep the network affiliation option flexible.

NEW NETWORKS

By the time Fox finally had filled its prime-time schedule, two other groups had also started new networks. The WB Television Network (owned by Warner Brothers, a film studio) and the United Paramount Network, or UPN (owned by the United Paramount film studio) began their prime-time television programming in 1995. These networks took on affiliates that had formerly been independent stations and were usually smaller stations with smaller audiences.

Neither of these two networks had a noticeable influence on the big-three networks’ viewership. The WB and UPN programmed fewer hours per week and had significantly smaller audiences than ABC, CBS, and NBC. Yet despite the weak performance of the two new entries, a third new network was started by television group owner Bud Paxson in 1998. PAX attempted to counterprogram to its competition by offering family-friendly programming and avoiding shows heavy in violence. Although the network still exists (known as ION Television since 2007), it is available through affiliated broadcast stations and through cable and satellite network distribution.

Two Spanish language networks Univision and Telemundo have been supplying programs to stations for many years, but since they broadcast in Spanish only, their mass appeal

is limited. Univision is the largest network and began in 1968 as the Spanish International Network. It became Univision in 1986 and in 1988 began producing for a “national audience,” although in Spanish only. Telemundo the second largest Spanish language network began in 1954 at a station in Puerto Rico. It was purchased by NBC in 2002 and continues to supply Spanish language programming.

In some cases, local stations changed network affiliations. Ownership changes among stations in groups triggered some big switches in network affiliations in the early 1990s. As a result of a television group changing hands, some stations in the group switched affiliations from CBS to Fox. (See Chapter 9.)

SATELLITE TELEVISION

In the mid-1990s, direct broadcast satellites (DBS) brought another television delivery system to consumers. Using a small dish, rather than the large one used since the 1970s, consumers could enjoy many high-quality channels for about the same price as cable. Two companies now compete for subscribers nationally: the DISH Network and DirecTV. (See Chapter 4 for more about satellite delivery.)

NEW REGULATIONS

Broadcasting changed significantly with the passage of the Telecommunications Act of 1996: The policy on owning television stations went from a 25 percent limit on the size of the national audience that one television group could reach to a 35 percent limit of the national audience. After the act was passed, large television groups became even larger by buying more stations. In June 2003, the FCC raised the television ownership cap from 35 percent to 45 percent, but this rule change was blocked by a court in Philadelphia. In November 2003, a compromise was reached that allowed television groups to increase their national audience reach to 39 percent.

SEE IT NOW

DIGITAL TELEVISION



FIG. - Coupon for digital TV converter box.

The conversion to digital TV in broadcasting was completed on June 12, 2009. Digital television, or DTV, allows transmission of television programs in a wide-screen, high-resolution format known as high-definition television (HDTV). It also allows transmission in standard definition (SDTV), similar to an analog television picture, but with better color reproduction and less interference. The old analog picture has 525 lines of resolution, but the HDTV picture can have up to 1,080 lines, or more than twice as much picture information. In addition, the HDTV picture has a wider *aspect ratio* (the relationship between screen width and height), yielding a 16:9 picture (16 units wide, 9 units high) that more closely resembles a widescreen movie picture and more closely reproduces how our eyes see than the 4:3 picture of analog television. This new broadcast standard, adopted by the Advanced Television Systems Committee is known as ATSC A/53 or simply ATSC.

In making the move from analog to digital, the FCC also forced all television stations to make large investments in new digital equipment. This switch to digital has not offered immediate financial rewards, as stations don't have a way to generate any more income with a digital picture than they did with analog-only broadcasting. One advantage to the new digital system, however, is that stations have enough room in the 6 MHz channel to send out more than one program at a time. For example a local station might have its main programming on its first channel, that is, a network feed, such as NBC. A second channel may carry weather and news, and a third may carry programming in other languages, for example, Spanish.

Before the switch to digital, audiences were slow to embrace the new digital broadcast technology. A digital set costs many times more than an analog set, and the digital broadcast signal requires some type of broadcast-receiving antenna. Because more than three-quarters of the audience uses either cable or satellite to receive television programs, knowledge of and interest in these antennas were low, but it increased when both cable and satellite delivery systems added HDTV signals to the subscriber's options. Analog set owners are still able to receive programming, as the cable and satellite companies convert the digital signals to analog for older sets. Analog set owners that are not subscribers to either cable or satellite systems require a converter box to convert digital signals into analog signals.

With the digital signal, television stations now have the capability of transmitting multiple programs in SDTV or, in some cases, two HDTV programs. Audio quality for both HDTV and SDTV are similar to the quality of a CD and include up to five channels of sound, an improvement over analog transmission. Digital data services can also be transmitted via digital transmission, allowing stations to send news, program schedules, and product information to the audience at the same time as the television program.

TV STATIONS

Stations are now using the web to connect with viewers through the use of online video, social networking, and

other features that are not shown via broadcast. Stations are providing blogs about local news issues, up-to-the-minute traffic and weather coverage, community chat rooms, in-depth coverage of stories, and—most importantly for station revenues—advertising space. News personalities offer email contact with the audience as well as a presence on Facebook and Twitter. Some stations are now posting information and content from the audience emails directly into local news shows.

Young people who are interested in working at television stations need to face the reality that jobs now have different requirements than in the past. Stations are less inclined to hire a person who can only shoot or only edit. Reporters who had good on-air delivery are often passed over while those who can shoot, edit, write, and deliver the “stand up” in front of the camera get close attention. Job applicants who have traditional audio/video skills plus web site skills and experience are more desired by stations that need to keep pace with the competition and rapidly changing technology.

NETWORKS

Because of poor ratings, the WB and UPN merged and in association with CBS became the CW network in 2006. The CW got its name from the parent companies, CBS and Warner Bros. Other stations not part of the CW became a network called MyNetworkTV in 2006. After three years of low ratings, MyNetworkTV changed its status from a network to a syndication programming service and is owned by the Fox network.

FYI: Analog versus Digital

Duplicating an analog signal was like pouring water from one jar to another. After you finish pouring, the new jar will be almost full and a few drops will be left in the old jar. When you duplicate in analog, the entire signal is not duplicated. Some gets lost in transit. Duplicating a digital signal is like pouring marbles from one jar to another. In this case, the new jar will be full of marbles and the other jar will be completely empty. Digital transfer allows the entire sampled signal to be duplicated, and the copies are identical to the original. Although some say that the process of digital sampling misses some of the original (like the content represented by the spaces between the marbles), the process is very accurate.

INDUSTRY STRUCTURE

Since the Telecommunications Act of 1996 was signed into law, the electronic media landscape has changed noticeably. Fewer and fewer owners are controlling more and more broadcast stations. Ownership rules are being relaxed, allowing media companies to buy more properties in a category (i.e., radio stations or television stations) and to cross traditional lines. For example, some companies now own a television station and a daily newspaper in the same market. The issues related to cross-ownership have not been settled, however.

ZOOM IN .4

The Advanced Television Systems Committee (ATSC) is an international nonprofit organization that helps to develop voluntary standards for digital television. More information about this group is available at www.atsc.org, and more information about digital television is available at www.dtv.gov.

For animations about digital television transmission, resolution, pixels, and aspect ratio, go to the Focal Press web site for this book at <http://booksite.focalpress.com/companion/medoff/>.

It is difficult to predict how changes in ownership will ultimately change television. The FCC rules on ownership are still evolving but have a strong predisposition toward relaxation of rules and deregulation, which means that fewer companies will program more stations. Consolidation in radio has led to more formulaic and less local programming. This same trend is developing for television, as well.

SEE IT LATER

TECHNOLOGICAL CHALLENGES

Now that the digital changeover has taken place, television sets will be much more similar to computers than they have been in the past. Computers with CD drives, DVD drives, and high-quality speaker systems will soon serve as centers for home entertainment, as they are able to play any digitally recorded medium and receive any online radio or audio service. The missing link has been the ability to receive network, cable, and satellite television on a computer monitor without special hardware or extreme effort. Digital broadcasting (and digital cable and satellite delivery) will blur the lines of distinction between using television sets for entertainment only and using television monitors for computer work.

This blurring of distinction has encouraged some of the big names in the computer industry—Apple, Microsoft, Dell, and Gateway—to get into selling equipment to the audience for both computing and entertainment needs. Not only does this change the competitive environment in home entertainment, but it also changes how audiences will use their computers and where they will place them in their homes.

TV-on-DVD also has become a factor in television viewing. The sales of television programs on DVD generated \$1.5 billion in 2003. Many viewers are willing to buy a whole season of a TV series on DVD to avoid annoying commercials, to get a better-quality picture, and to set their own viewing times. This trend has slowed somewhat with a slow economy since 2007. In addition, download sites—both legal and illegal—make buying the physical DVD less necessary. The trend toward netbooks (small laptops capable of Internet connectivity) as replacements for laptops and desktop computers is significant, in that

the netbooks do not have internal DVD drives. The lack of the internal drives encourages viewers to seek entertainment that is stored or transported in other forms, such as flash memory or “jump” drives.

Digital video recorders (DVRs), such as TiVos, may have an enormous impact on television advertising, because they allow viewers to skip commercials from the playback of TV shows. These devices are easily available through cable and satellite providers. DVRs are computer-type hard drives located inside of cable and satellite receivers that allow users to transfer programs to other media, such as DVDs or flash memory drives.

Some cable channels and the networks are considering DVD and videogame use when attempting to reach young audiences. Moreover, they are considering putting prime-time shows on later at night or perhaps repeating them at a later time to reach those that use other entertainment options during prime time. In addition to integrating some shows with the Internet, the networks are considering connections between TV shows and cell phones. For example, Fox TV's *American Idol* encourages voters to send text messages to vote for their favorites.

The broadcast network audience share will continue to decrease in the years to come, because the audience will have more choices. The networks may find that their profitability depends increasingly on being able to deliver programs that other services cannot provide or that they, the networks, can best provide. For example, the networks can deliver live programs, like news and sports, and can operate profitably by offering reality shows that do not require large payments to stars, writers, and independent producers. The networks will continue to be challenged by technological changes and other delivery systems. As a result, they will continue to vertically integrate by buying program-producing and program-syndication companies, which allows them to gain control over programming sources and outlets. They will also utilize new programming services on other delivery systems (e.g., cable, satellite, and the Internet) and even new technologies to keep their audience share large enough to attract advertisers.

Although it does not now pose a threat to large television producers, the ability of individuals to create television programs looms on the horizon. Digital tools for the production of high-quality television, once the exclusive domain of “big media,” are now becoming available to ordinary people. Personal technology of this type may change the future production of television programs.

Local broadcast stations are now producing video content not only for their broadcast newscasts, but also for streaming from their web sites. A video package produced for a nighttime newscast is often archived as is or edited to a different length and repurposed for later use on the web site. Stations owned by broadcast groups often share content in this way.

TV stations compete not only with traditional media and other TV stations in their market, but also with a service like YouTube that shows content created by the audience. Although not known as a news source, YouTube

(purchased by Google in 2006 for \$1.65 billion) had close to 100 million viewers per month in 2010. Each of the networks has its own web site that will stream video, and NBC, ABC, and Fox created Hulu.com to attract viewers to clips and full episodes of their shows. It is not yet clear if online viewing will cause local TV stations serious problems in the near future. The challenge to traditional television is to provide compelling content that audiences will watch and advertisers will support.

As a final note about the future of television, new devices and innovations will continue to surface and perhaps create big changes in viewing behavior. As netbooks become more moderately priced, more viewing will occur through these devices. Mobile TV, viewing television using cell phones, has previously been limited because of delivery systems, bandwidth, and the size of the screen. When larger screen cell phones (e.g., iPhones and similar phones) are more readily available, TV industry efforts to reach people anytime and anywhere will increase dramatically. Some believe that the next big thing for TV is 3D (three-dimensional TV). Although numerous obstacles like the need to wear special glasses to get the 3D effect still exist, numerous players in the TV industry are conducting research to make 3D viewing a possibility for television.

SUMMARY

Early experimenters in television tried two methods to obtain pictures: a mechanical scanning system and an electronic scanning system. The electronic system was eventually adopted as the standard. Although many inventors were involved in the development of electronic television, two of the most important were Vladimir K. Zworykin and Philo T. Farnsworth.

The FCC authorized commercial television broadcasting in 1941, but the industry didn't grow until after World War II, when the materials needed for television equipment manufacturing became available. After the war, television grew so rapidly that the FCC could not keep up with license applications or technical issues. In 1948, the FCC put a freeze on all television license applications that lasted until 1952. During the freeze, the FCC considered the allocation of spectrum space to stations, designed the UHF band and dealt with the issues of VHF and UHF stations in the same markets, color television, and educational channels.

Stations with network affiliations did well because of network programming. Independent stations had to resort to older programs from syndication as well as sports and locally produced programs, especially children's programs and cooking shows.

At first, television was a live medium. In the 1950s, many high-quality, dramatic programs were written for live theater-type performances in order to attract educated audience members who could afford the cost of a television set. Program production changed when videotape became available and programs were no longer produced live in the studio. The television audience changed when the price of a TV set dropped and programs were adapted to appeal to a less educated audience. The early days of television had some challenges, including creation of a

blacklist of people working in the industry who supposedly had communist sympathies.

The importance of television became more evident in the 1960s when events such as the assassinations of John F. Kennedy, Martin Luther King, Jr., and Robert Kennedy were covered extensively by the networks. That decade also saw a growth in local news coverage and national news coverage of the Vietnam War, violence in the streets, racial tension, and the first man on the moon. In 1967, Congress approved the Public Broadcasting Act, signaling the birth of a network dedicated to noncommercial broadcasting.

In the 1970s, cable television attracted audiences with its premium channels (like HBO) and excellent reception. VCRs gave the audience the ability to rent movies and record programs off the air. In the 1980s, these alternate delivery systems became stronger, with more programming available. The number of channels grew considerably with the addition of cable networks like CNN, MTV, and ESPN. Broadcast deregulation was a guiding principle for the FCC, and many rules were modified, or removed entirely. Television technology improved, and electronic news gathering using portable video equipment became common in stations across the country. During this decade, a new commercial network, Fox, began operating. Overall, the audience size grew, but the networks' share of the audience declined because viewers had more choices.

The 1990s began with extensive coverage of the Gulf War, giving television an opportunity to show live video from the other side of the world. A new technology, direct broadcast satellite, began service to audiences, providing many high-quality channels and direct competition to local cable companies. The passage of the Telecommunications Act of 1996 changed many of the rules regarding ownership of electronic media stations and allowed television group owners to acquire as many stations as they wanted, up to a cap of 39 percent of the national audience. This relaxation of ownership rules resulted in fewer groups owning more stations

and thus consolidating the television station business. In the 1990s, three new television networks emerged: the WB, UPN, and PAX and have since evolved into the CW (UPN and WB) and ION. In the last half of the 1990s, the Internet became popular and signaled huge changes in audience media behavior. People began to spend more time online and less time in front of their television sets.

At the beginning of the new century, consolidation of station ownership began to raise issues about diversity and localism. The role of the networks continues to change from one of a delivery system for independently produced programs to one that delivers network-owned and -produced programs. The convergence of computers and television will continue drawing corporations like Apple, Microsoft, Dell, and Gateway into the television business. Digital broadcasting replaced analog broadcasting in 2009 and ushered in a new era of high-quality video and sound and different delivery methods, including multiple signals and web delivery of content to the audience. Television stations are now using new media to provide additional viewing opportunities and social media to connect with the audience.

Technology continues to present different viewing opportunities to the audience that will force the networks and multichannel TV program services (cable companies, satellite companies, and telecommunication companies) to continually adjust their delivery and revenue models to stay financially viable in the competition for viewers and advertisers.

NOTES

1. The term "kinescope," first used as the name of Zworykin's picture tube, was also used later as the term for the films that recorded live television shows before videotape came into use. This was accomplished by pointing a film camera at a TV monitor while the shows were broadcast live.
2. VCRs were popular but still expensive in the late 1970s. Because of their high price, significant saturation (i.e., 50 percent of all households) was not reached until 1988. VCR prices dropped in the 1990s, and by the end of that decade, saturation had reached 85 percent (*Home Video Index*, 2004).

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