

# BROADCAST

NEWS



VOL. No. 96 AUG., 1957



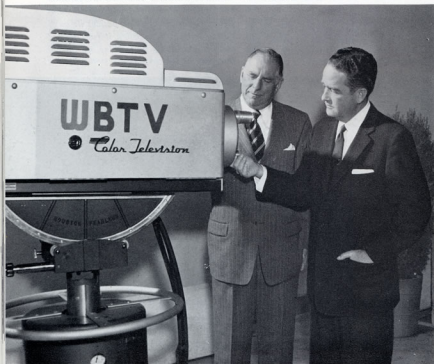


FIG. 1. WBTW's color station ID.

FIG. 3. The WBT-WBTW Building is located on a beautifully landscaped six-acre plot at the top of a sharp elevation in southwest Charlotte, just a few minutes from the center of the business area. This view also shows the 160 ft. microwave tower at the rear of the building.

## WBT-WBTW STUDIOS

FIG. 2. Joseph M. Bryan, President, and Charles H. Crutchfield, Executive Vice-President and General Manager, of Jefferson Standard Broadcasting Company, at WBTW RCA Live Color Camera.



by JOHN P. TAYLOR  
Editor, BROADCAST NEWS

"The Jefferson Standard Broadcasting Company welcomes you to One Jefferson Place. Here, we believe, you will find the last word in broadcasting and telecasting facilities. New and unexplored opportunities in those fields are now available. We intend to take full advantage of these opportunities, so that in turn we will be able to provide more complete service to you and the three-and-a-half million listeners and viewers of our stations."

These were the words which Mr. Joseph M. Bryan, President of Jefferson Standard Broadcasting Company used in April 1955, in welcoming the public and the industry to the new studio-headquarters building of WBT-WBTW Charlotte.

The visitors to WBT-WBTW on that opening day found that Mr. Bryan was not exaggerating. So have thousands of Carolinians and hundreds of the industry's leaders who have accepted Jefferson Standard's invitation to visit and view the beautiful quarters of WBT, the South's oldest commercially-licensed radio station, and WBTW, the Carolinas' first tv station.



People of the Charlotte area have visited WBT-WBTV because of the graciousness of Jefferson Standard's management and staff—and because of the manner in which the station has integrated itself with the pride and purpose of the community. Leaders of the broadcasting and telecasting industry have come for a different, and perhaps even more complimentary, reason. They have visited WBT-WBTV to see at firsthand the building which has been heralded throughout the industry as one of the finest and most efficient radio-iv station facilities built to date. And they have not been disappointed. For here, as Mr. Bryan has pointed out, is a building designed not just for today's realities, but for "new and unexplored opportunities." A building which is not too big for now—but is easily expandable for tomorrow, a facility which aims most of its present programs in monochrome—but which has been completely planned for a near-future switch to all color. A plant which makes engineers drool—but which managers admire for its cost-cutting efficiency.

That the WBT-WBTV Building is a

model facility is not due to accident or even to a touch of luck—rather it is a triumph of long experience, careful planning and painstaking attention to detail. Radio Station WBT is one of the oldest in the country—dating its start back to Station 4XD, which went on the air in 1920. WBT received its commercial license in April 1922—one of the first in the United States, and the first in the South. In 1949, WBTV became the first television station in the Carolinas. In 1954, Jefferson Standard established another television station, WBTW, at Florence, South Carolina.

WBT has always been one of the nation's most distinguished stations—and, in keeping with this tradition, it has a distinguished staff topped by a management team whose experience is surpassed by none. Mr. Bryan has been President of Jefferson Standard Broadcasting Company since WBT was acquired by Jefferson Standard Life Insurance Company in 1945.

Charles H. Crutchfield, Executive Vice-President and General Manager, has been with the station since 1933. He has

been manager since 1945. Thomas E. Howard, who as Vice-President, Engineering, planned and supervised construction of the building, is one of the most experienced engineers in the business. In 1946, Tom supervised the installation of KSD, St. Louis, the first postwar television station (BROADCAST NEWS, Volume No. 45). From KSD he went to WPIX where he planned and supervised the first WPIX installation in the DAILY NEWS Building (BROADCAST NEWS, Volume No. 56) and WPIX's later installation in the Empire State Building.

When WBTV decided to build a new studio plant, General Manager Crutchfield laid down the general requirements then, wisely, gave Tom Howard carte blanche to plan the ideal station to fit those requirements. Working with the station's architects, J. Norman Pease & Company, Inc., he did just that. "Then," Tom says with a mixture of pride and awe, "they built it exactly the way I designed it." The happy result of this management experience plus engineering planning is described in the following pages.



FIG. 4. Another view of the WBT-WBTV Building showing the front and east sides. Built at the top of a slope, it has two floors above ground at the front, and three floors above ground level on the east side, where there is a landscaped patio opening off the cafeteria.



FIG. 5. Lobby of the WBT-WBTV Building features a huge handmade rug depicting all of the company's studio and transmitter buildings.

#### WBT-WBTV Building

WBT-WBTV's modern-style, functionally designed building is located on a beautifully landscaped six-acre plot at the top of a sharp elevation in southwest Charlotte. The site has the advantages of height for microwave facilities, and space for parking areas while at the same time being only twelve minutes by car from the center of the city.

As seen from Morehead Boulevard, on which it faces, the building is an impressive sight. The exterior is of textured brick, except for one half of the front side facing the street, which is blue porcelain enameled steel panels (see picture on cover). All trim, the station call letters, door and window frames, etc., are stainless steel and aluminum. The over-all design is extremely



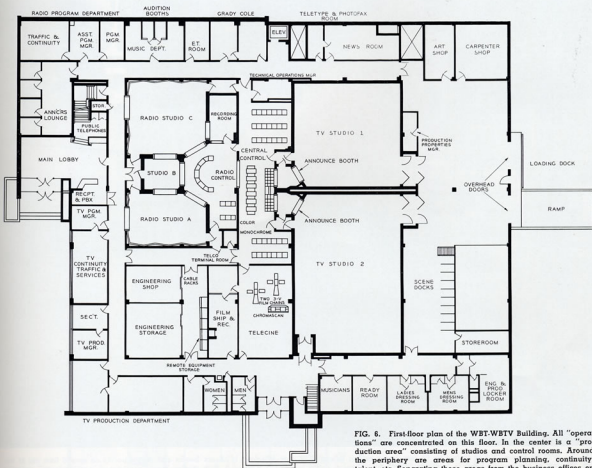


FIG. 6. First-floor plan of the WBT-WBT Building. All "operations" are concentrated on this floor. In the center is a "production area" consisting of studios and control rooms. Around the periphery are areas for program planning, continuity, talent, etc. Separating these areas from the business offices on the second floor helps "traffic" flow.

functional, and yet unusually attractive. It has the distinguished air of quiet but unmistakable success.

The building, which is 181 feet by 141 feet, has two main floors plus a basement level extending under one-third of the building. The first floor is devoted entirely to broadcasting-televasting operations. All administrative functions are located on the second floor.

A floor plan of the first floor of the building is shown in Fig. 6. There are two entrances. The "main" entrance, which is on the street side and opens into the lobby and waiting room, is directly adjacent to the "radio area" of the building. The "west" entrance, which faces toward the parking lot, is adjacent to the "tv area." The division is not emphasized but employees and regular talent automatically

use the most convenient entrance, thereby substantially helping the traffic problem.

The center section of the building is a "production area" in which are located the radio and tv studios, the radio and tv control rooms (back to back), film projection room, engineering shop and parts storage room. Around three sides of this area is a corridor off which (on the exterior side) are office areas for production, news, talent, etc. On the fourth side of the production area (actually the back of the tv studios) is the prop construction and storage area which opens onto the loading dock and ramp (Fig. 6).

Planning a unified production area in this way has several advantages: (1) it simplifies equipment installation problems and makes equipment changes easier, (2) it improves co-ordination in technical opera-

tion and makes it possible to work with minimum-size crews, (3) it helps to keep visitors and nontechnical employees out of operating areas.

The second floor of the building (see Fig. 9) contains all of the business offices including executive, sales, promotion, accounting and engineering areas. Also on the second floor—overlooking the studios—are the two tv studio control booths and the clients' two viewing rooms.

The basement, or "Terrace Floor," contains the photo lab, the air conditioning and locker rooms, maintenance and lounge rooms, garage, and a fine cafeteria-dining room which opens out onto an open terrace-patio (Fig. 50) where station employees enjoy their lunch periods in favorable weather.



FIG. 7. WBTB's Studio TV-2 is 40 feet by 60 feet, has a ceiling height of 27 feet. Windows of clients' booths and control booths on second floor are at top left. Window of announcer's booth is in center, with lighting control board just to the right of it. Both studios have "prestressed, post-tensioned" concrete floors poured as single slabs. Walls and ceiling are covered with two-inch thick, rock-wool blanket. Outlets are provided in the two studios for both monochrome and color cameras.

#### WBTB Studios

WBTB has two studios used exclusively for tv (Figs. 7 and 8). Studio No. 1 is 40 feet by 40 feet; Studio No. 2 is 40 feet by 60 feet. Both are two stories high with ceiling heights of 27 feet. The two studios are very similar in construction and are located symmetrically with respect to the tv central control room—from which it is possible to look through the individual studio announce booths into the two studios (see floor plan, Fig. 6).

In the construction of these studios unusual precautions were taken to insure maximum acoustical insulation. The walls of the studios are "shells" which are completely separate from the rest of the building frame. There are no rigid connections between the two studio walls that abut—or between the studio walls and the walls of surrounding areas such as the control

rooms. Wherever rigid members would ordinarily come in contact, such as all windows and door frames, pads have been inserted. Sound locks, missing in much recent tv construction, are used at all entrances. Microphone, camera and power connections are brought in through flexible connections. As a result, the background noise level in these studios is much lower than in most present-day tv studios.

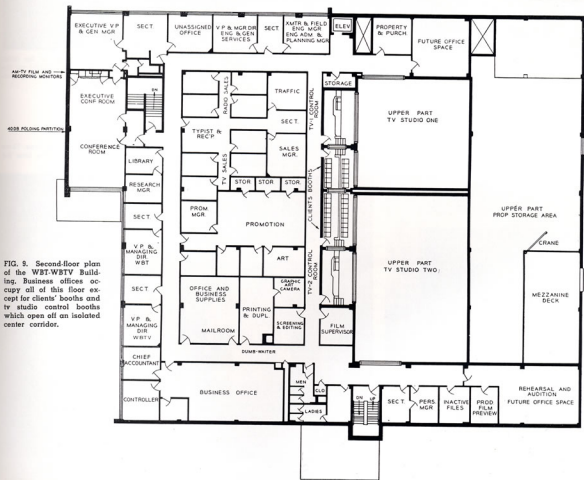
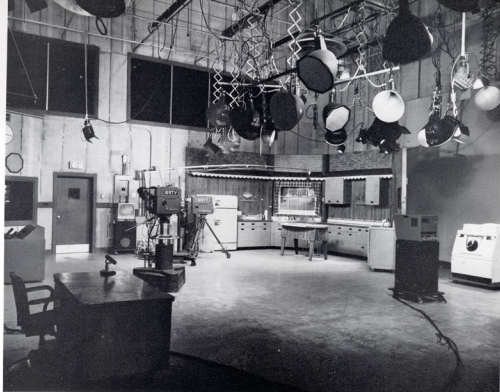
Another very interesting feature of the studio construction is the use of "prestressed post-tensioned" concrete floors. These floors, 1600 and 2400 square feet, respectively, are single slabs, 4 inches thick, and without a single joint. They are poured over a grid of "post-tensioned"  $\frac{3}{8}$ -inch steel cables which are encased in fiber tubes. Three years after pouring there is not a sign of a crack in them. This, together with the fact that they are perfectly level,

greatly facilitates camera action—as well as movement of wheeled props.

Wall and ceiling treatment is the same in both studios and consists of a 2-inch-thick, rock wool blanket covered with "chicken wire" in the standard manner. A 16-foot-high cyc made of unfinished muslin covers two sides of Studio 2. A permanent, and operable, kitchen set is installed in one corner of Studio 1.

Each studio is facilitated for three monochrome and two color cameras. All necessary outlet boxes and cabling together with necessary switching and control equipments have been installed. At the present time the station's live camera complement consists of two TK-10 and two TK-30 Monochrome Cameras and one TK-41 Color Camera. They plan to add color cameras as the local color set count justifies. (See Color Programming, Pg. 55).

FIG. 8. WBTV's Studio TV-1 is 40 feet by 40 feet with same 27-foot ceiling height. Announcer's booth window is at left. A permanent, and operable kitchen set is installed in one corner.



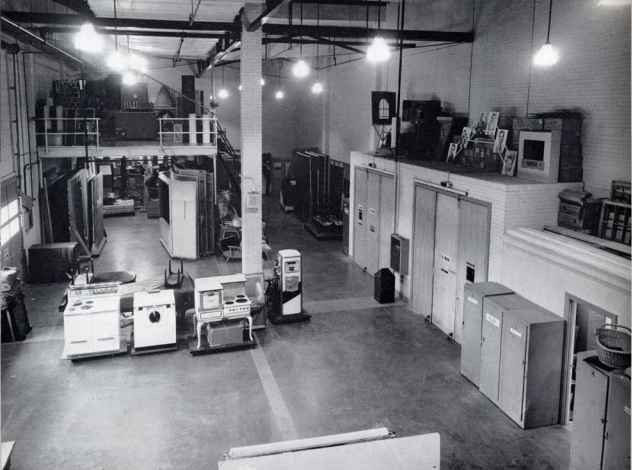


FIG. 10. This large (40-foot by 120-foot) prop construction and storage area is a feature of the WBT-WBTV Building. Large folding doors, at the right, open directly into the two tv studios. Overhead doors, at the left, open onto a loading dock and ramp. This area has the same ceiling height as the studios. Footings, which can be seen in the floor of this area, make it possible to enlarge either or both studios in 20-foot increments by moving non-load bearing studio wall to use part of present prop area.

FIG. 11. Carpenter shop, art shop, and painting booth, together with prop manager's office, are located in one end of the prop area.



FIG. 12. The doors from the prop area into the studios are ten feet high by ten feet wide. There are two sets of doors to each studio with a "sound lock" between. This keeps noise from the prop area from getting into the studios during programs.





FIG. 13. One of the overhead doors from the prop area opens onto a loading dock which enables props to be rolled from a truck floor to the studio floor without lifting. The other door leads to a ramp which allows cars to be driven directly onto the floor of the studios.

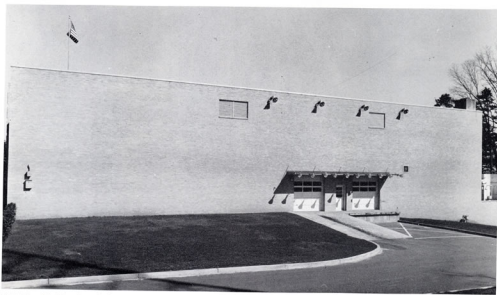


FIG. 14. Exterior view of the rear of the WBTV-WBTV Building showing the ramp and dock leading into the prop area. Floodlights installed at the top of the building and on the canopy, together with power outlets (left center) make it convenient to use the paved area or the large parking lot as an "outdoor studio."

#### WBTV Prop Area

A feature of the WBTV layout is a large (40-foot by 120-foot) area, directly off of the tv studios, which is used for construction of sets, and for storage of sets and props. The area includes an art shop, a carpenter shop, a paint spray booth, scene docks, a mezzanine storage deck and a locked storeroom area. Between this area and the two studios are sound locks—another example of the unusual precautions taken to keep extraneous sounds out of the studios. Folding doors which open to provide an entrance ten feet wide and ten feet high are provided on both sides of the sound locks (Fig. 12).

Directly opposite the doors to the studios are two large garage-type overhead doors which open onto the outside loading dock and ramp. The dock, which faces one door, provides for rolling props directly from a truck floor to the floor of the storage area without lifting. The ramp which leads to other door (Fig. 13), makes it possible to drive a car up the ramp, through the storage area and directly into either studio.

The entire storage area has the same 27-foot ceiling height as the studios. In addition footings have been provided in the floor of this area so that the depth of either

or both studios can readily be expanded by either 20 feet or 40 feet by moving the nonload-bearing rear walls of the studios. Space to make up for the storage area lost by the move could be gained by adding a low wing on this side of the building. This provision is typical of the careful planning for the future which is incorporated in this building.

Just beyond the loading dock and ramp is a large paved area (Fig. 14) which is used frequently as an "outdoor studio." Floodlights mounted in two levels on the building make it possible to use this area at night as well as in the daytime.



FIG. 15. WBTV's main control room. Master audio and video switching facilities are concentrated in the low console at the right (just in front of the windows which look into the announcers' booths and the studios). Camera control operations are performed at the console, at the left, which contains controls and monitors for all live cameras, film cameras, and Chromascan units. Equipment racks are located at the two ends of the control room. The floor plan of this control room is shown in Fig. 16, on the opposite page.

## TV Control Rooms

The "production" area (Fig. 16) of the WBT-WBTV Studios occupies the entire center area of the first floor and is more or less isolated by a corridor from the auxiliary areas located around the outer rim of the floor (Fig. 6, Pg. 37). In the center of the production area is a "technical core" consisting of the a-m control room, the tv control room, the announce booths, and the recording room.

Surrounding this technical core are the tv studios, the a-m studios, the film room and the engineering shop. These are the areas to which the engineers need quick access—and this plan provides for it. Other

doors to the studios provide entrance for talent and non-technical personnel, so that they do not need to enter the technical area at any time. The whole arrangement is one which provides maximum convenience for engineering work with minimum likelihood of distraction.

The tv and a-m control rooms are back to back and there is a large window between them.

The tv control room straddles the dividing wall between the two tv studios (Fig. 16). The windows in this room look into the two tv announce booths and through them into the studios. This arrangement

is particularly suited to the method of operation used by WBTV.

The master switching console is located in front of the windows looking into the booths (right side, Fig. 15). The audio section of this console is an RCA BC-2B Console. It is used for master audio switching and announce booth control. The video section of the console includes a WBTV-built switching panel, a TM-5B Monitor and three TM-5A Monitors. These are, respectively, transmitter line, preview No. 1, preview No. 2, and monochrome system line. There is a TM-10 Color Monitor on the cabinet at right for monitoring the color system line.



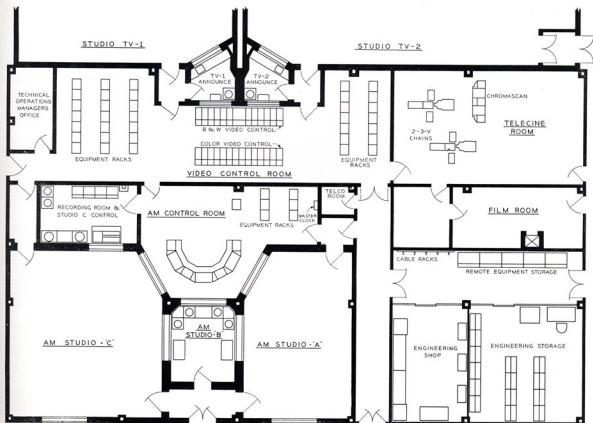


FIG. 16. Floor plan of the "technical core" of the WBT-WBTV Building. Arrangement of various areas was carefully planned to provide maximum operating convenience. There is a window between the video control room and the a-m room which is not indicated in this drawing.

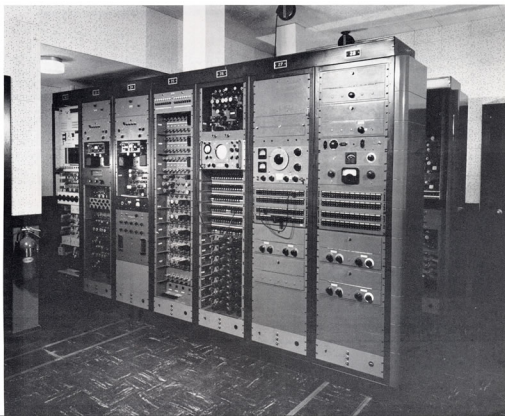


FIG. 17. These racks, at the right side of the video control room contain micro-wave equipment, test equipment and audio equipment.



FIG. 18. WBTV's video control console as seen through the window from the a-m control room (see floor plan, Fig. 6). Camera control for four monochrome studio cameras, one color studio camera, two 3-V color film cameras and two color Chromascan units are incorporated in this console. Monitors are provided for both monochrome and color operation. Location of the various units in this console is shown in Fig. 19. Video operators at this position make all necessary camera adjustments. Camera switching is done by the director in the studio control booth.

#### Video Operating Console

In a line behind the switching position is the "video operating" console containing all of the camera controls. All told there are nine camera chains, including: two TK-30 Monochrome Cameras used in TV-1, two TK-10 Monochrome Cameras used in TV-2, one TK-41 Live Color Camera, two TK-26 Color Film Cameras and

two "Chromascan" Color Opaque Cameras. WBTV engineers have assembled the various control and monitor units which go with these nine cameras into a neat and conveniently arranged console. The identification of the various units is shown in Fig. 19.

Equipment racks are located in rows of seven at each end of the control room. In

all there are 35 racks—some of them reserved for future expansion. There are many other minor features—such as LC-1A Speakers on the walls, small powerstat controlled spots which can be directed on controls (and away from monitors), reel-type trouble lights over racks, etc.—which make the WBTV control room an engineer's dream.

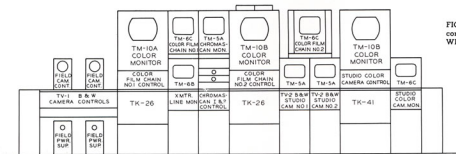


FIG. 19. Arrangement of the camera control and monitoring units in the WBTV video console shown in Fig. 18.

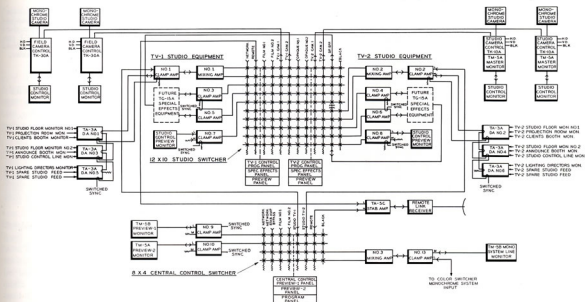


FIG. 20. Simplified block diagram of the monochrome video system in use at WBTV.

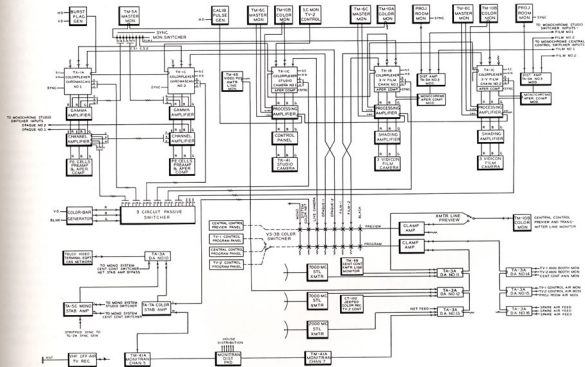


FIG. 21. Simplified block diagram of the color video system in use at WBTV.



FIG. 22. TV studio control booths and clients' booths are arranged in a line on second floor (see Fig. 9, Pg. 38). Director sits at near position, does his own switching. This view is from TV-1 control room and looks through three double-glazed windows into TV-2 control room 74 feet away.

#### TV Control Booths

The tv studio control booths at WBTV are located on the second floor—so that they look down into the studios (Fig. 9). This arrangement has the advantage that sets can be arranged on all four sides of the studio without blocking the view from the control booth (Fig. 23). This is particularly important where shows using a multiplicity of sets are produced in a single studio—or where local shows must be done back-to-back from the same studio.

The two studio control booths are identical in arrangement and equipment. Each has a long console (designed by WBTV engineers) at which there are positions for an audio engineer, the director, and an assistant director (Fig. 22). The audio position has an RCA BC-2B Audio Control Console, an RCA BCM-11A Microphone Mixer Console, two RCA BQ-70-B Transcription Turntables, a line patching panel and a convenient cabinet for holding transcriptions to be used during the day's programming. Two RCA de luxe-type LC-1A Speakers are mounted overhead. The director's position has convenient switching panels set flush with the top of the console—so that the director's view of the studio is not obstructed in any way. Using the push-buttons at his finger tips the director can select the camera picture he wishes to transmit, switch or fade from studio cameras to film room or net as required. He has a microphone directly in front of him which he uses to give directions to his production crew on the floor of the studio.

The position at which the director and audio man sit is on a floor level approximately 3 feet above the bottom of the window into the studio. Thus the table top where the switches are located is about 5½ feet above the bottom of the window. This allows the director to look sharply downward into the studio (Fig. 23). Viewing is further facilitated by the use of special filter glass in the windows which look into the studios. This glass, used here for the first time anywhere, admits only 25 per cent of the light intensity—but causes no material change in color rendition. This effectively prevents the high-intensity lamps in the studio from blinding the observers in the control booths. How-



FIG. 23. Because of his elevated position, director has this very good, commanding view of studio floor.

FIG. 24. View of a control booth from clients' booth. Audio position includes RCA BC-2B Audio Console and RCA BCM-11A Mixer Console, and two RCA BQ-70B Transcription Turntables.

ever, it does not change the color of sets or costumes as does ordinary tinted or darkened glass. This is, of course, very important on color shows as it enables the director to correctly judge color values.

Observation of the various camera pictures—and upcoming net or remote programs—is provided by monitors in the wall above the studio window (Fig. 24). Here again the relatively low-set window is of great advantage in that it allows the monitors to be at almost eye level (instead of high up as in some installations of this type). At the present time six monochrome monitors are mounted in position. Normally these are "On Air," "Preview," "Studio Line," and Cameras No. 1, No. 2 and No. 3. The space for mounting the monitors has been made large enough so that eventually up to eight color monitors can replace the monochrome units. WBTB plans to add these as their color programming increases.

Lighting in the control booths, as in the main control room, is provided by overhead adjustable, low-intensity powerstat-controlled spotlights. These can be positioned to throw light on controls and script while keeping direct light off the monitors.

#### Clients' Booths

Graciousness and hospitality are long suits at WBTB and nowhere is this more evident than in the accommodations they have provided for sponsors and client agencies. The "clients' booths" at WBTB are distinctly more than the poorly located cubbyholes provided in less well-thought-out installations. They are good-sized (12 feet by 20 feet), they are located in prime space adjacent to the tv control booths, and they are entered directly from the center corridor of the business area (second floor) of the building. These clients' booths have the same two-level floor construction as the control booths, so that clients sitting here have the same good view of the studio floor as the director. Also, the studio windows have similar light-reducing filter glass so that the floor operation can be viewed in comfort. De luxe, theatre-type chairs are permanently mounted in two rows, one at each level. Every seat has a good view and there is room for people to move in and out without climbing over those nearer the door.

FIG. 25. Clients' booths have de luxe theatre-type chairs arranged on two levels.



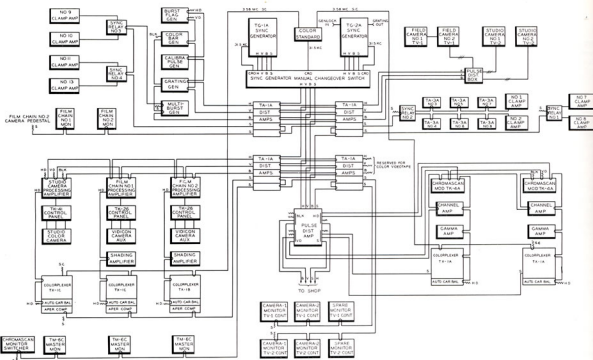
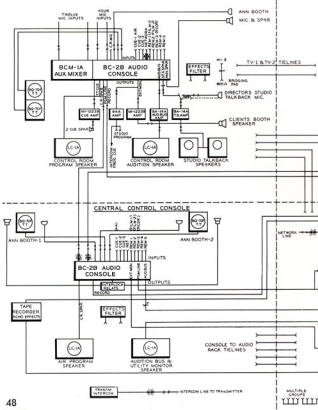


FIG. 26. Simplified block diagram of the pulse distribution system in use at WBTV.

FIG. 27. Simplified block diagram of the tv audio system in use at WBTV.

#### TV-1 STUDIO CONTROL ROOM



#### TV-2 STUDIO CONTROL ROOM

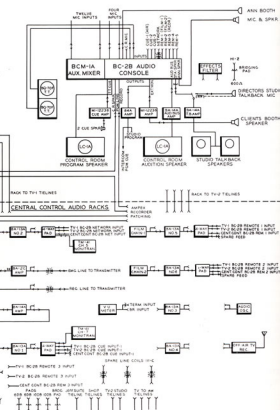




FIG. 28. All lights in WBTV's studios are suspended on pantographs from an overhead pipe grid, thereby keeping floor clear for camera movements.

### Lighting

Both of WBTV's television studios are equipped with lighting control facilities designed to combine maximum flexibility with relative simplicity and convenience of operation. In accordance with the most up-to-date concepts the lighting control position is directly on the studio floor. This is a great convenience during setup in that the lighting director can go back and forth from the floor to the lighting position at will.

The light control position in Studio TV-2 (which is the larger of the two) includes a Kliegl Rotolector Cross-Connecting Board with one hundred and twenty 20-ampere, 24-point rotolectors (Fig. 29) and a dimmer console which has 12 dim and 12 no-dim 50 amp circuits fed from two main switches with 1200 amperes total capacity. The lighting director has a monitor in front of him so that he can check his lighting during operation.

The smaller Studio TV-1 has a similar lighting control position except that the dimmer console has six dim and six no-dim circuits and one main switch.

All lights in both studios are suspended from overhead on pantographs—an arrangement which allows easy adjustment of height and direction and keeps the studio floor free for camera movement. This is particularly important when airing a show using five or six sets arranged around the room with the cameras in the center. It is a necessity when using a single color camera for the whole show!

The pantograph fixtures are hung by clamps on a pipe grid of the standard type (Fig. 28). Lights are about evenly divided between scoops and Fresnel spots with the former used mostly for base light and the latter for back and mood lighting. Lights are connected to Kliegl Type 619G/10 Connector Strips mounted on the grid at convenient locations.

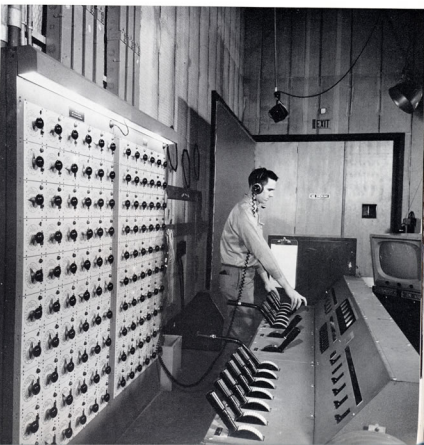
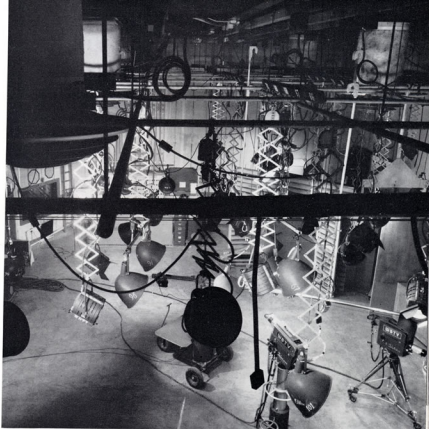


FIG. 29. Lighting in Studio TV-2 is controlled by this Kliegl Rotolector Board, containing 120 rotolectors and a Kliegl Dimmer Console having 12 dim and 12 no-dim 50-amp circuits fed from two 200-amp main switches.

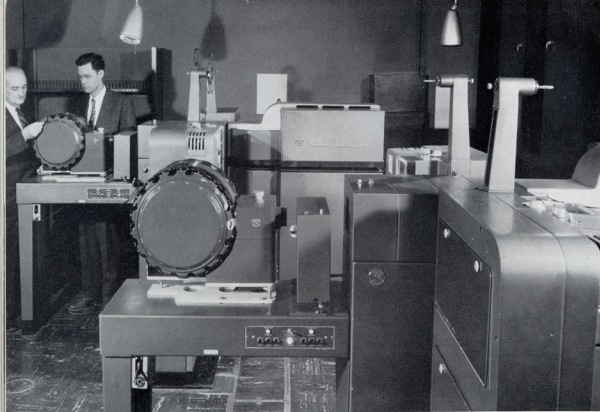


FIG. 30. WBTB's film room contains two RCA 3-V Color Film Cameras, four TP-6C Film Projectors, two TP-7A Slide Projectors and two Chromascan units. Space has been reserved in this room for future installation of color video tape equipment.

FIG. 31. Another view of WBTB's film room showing film handling and monitoring equipment.



#### WBTB Film Room

An outstanding feature of the WBTB plant is its film room—probably the most modern-equipped in the country. Entirely “colorized,” it includes two complete film equipment groupings each consisting of a TK-26 3-V Color Film Camera, two de luxe-type TP-6BC Film Projectors and one of the brand-new TP-7A Slide Projectors. In addition there are two Chromascan units (see next page) for projecting color opaques and small package items. With this setup WBTB is equipped to transmit color films, slides, opaques or “live” product shots. It can put on its color commercials in whichever manner seems best fitted to the product and message. Moreover, the completely dual setup allows great flexibility in continuity since it is not necessary to follow fixed sequencing patterns.

The film room also contains complete audio and video monitoring facilities, intercom, rewind equipment, and film storage racks. With all this equipment only about half the space in the 20-foot-by-40-foot room is presently used. The rest is “reserved for color video tape equipment.” If WBTB follows its tradition of being the “first with the newest,” it may not be too long before this space is filled.



FIG. 35. Hank Warren (right), photo lab supervisor, and assistant in the mixing room which is a part of WBTV's efficiently arranged photo-lab facilities.

#### Film Production Facilities

Any station which undertakes to do a strong local programming job must have extensive and efficient facilities for producing its own news films. WBTV is rightfully proud of its ability to shoot and develop film on an extremely fast schedule. Unusually fast-moving mobile camera crews plus fast-developing equipment make it possible.

WBTV can put three camera crews in the field simultaneously; when necessary, they can be at separate locations ready to film events in a fast-breaking news story. Using radio-equipped cars they can talk to each other to co-ordinate their efforts and—equally important—can advise the sta-

tion when they will be back with a hot story. This allows the program director to plan his news programs to incorporate the hot films, to write continuity for them, and to warn the photo lab that a rush job is on the way.

In addition to the cars, WBTV maintains its own Cessna twin-engined plane at the nearby Charlotte airport. Film crews, transported by this plane, can shoot film anywhere in the Carolinas and have it back to Charlotte and on the air in two or three hours.

The photo lab—under the direction of Hank Warren—is unusually well arranged and equipped. The over-all setup includes four rooms. One is a central office. The

others are the dark room, the mixing room and the film processing room.

Since WBTV uses an average of 1000 feet of film a day, the film processing equipment is of considerable interest. This equipment is a Model 16HT Filmatic which Mr. Warren has modified somewhat to adapt it to WBTV's particular needs. He has also worked out a technique which saves considerable time on rush jobs. One part of this is to keep a leader (about 275 feet long) in the machine at all times. This saves threading time. When a hot film comes in, he puts it on a reel, staples it to the already-in-place leader and he is ready to go. Every time he runs a piece of film through, he puts a leader on the

FIG. 36. Dark room in WBTV's photo lab which is equipped to produce glossy prints for promotion as well as films for programming.



FIG. 37. WBTV uses this Filmatic to get pictures on the air minutes after the undeveloped film is brought in by the station's camera crews.



FIG. 38. WBTV can put three camera crews in action simultaneously. Using radio-equipped cars and the station's own Cessna twin-engine plane they can shoot film anywhere within several hundred miles of the station and have the pictures on the air within two or three hours.



end of it so that he will have one in place for the next film.

The developers in the machine take about 20 minutes to warm up to the 90-degree temperature at which film is usually run (speed is 50 feet per minute at this temperature). In the case of very hot stories, the camera crews call in from their location to say when they will be in. This allows Warren to have his machine warmed up and ready to go. In this way WBTV has, on occasion, had film on the air within 8 minutes after it arrived at the photo lab.

The ability of WBTV to shoot film anywhere in its area and have it on the air within hours is one of the factors which has given the station an unusual identity with the interests of the community.



FIG. 39. The engineering team at WBTV—124 years of communications experience. From the left, M. J. Minor, Transmitter Field Engineering Manager; Thomas E. Howard, Vice-President and Managing Director, Engineering and General Services; Frank Bateman, Technical Operations Manager; and T. G. Callahan, Engineering Administration and Planning Manager.



FIG. 40. The WBTV Studios, which were designed "from the ground up" for color, presently have live color equipment in Studio TV-2 in addition to complete film, slide and opaque color camera equipment. Using this equipment in flexible fashion, they have been producing several local color shows a week since May of 1956.

### Color Operation

WBTV people like to describe their studio building as "the first built from the ground up for color operation." The claim seems merited. Some stations have "made provisions for color" in their original planning. Other stations have adapted monochrome studios for color. Some have renovated their whole plants for "all-color." But WBTV has gone farthest. In their original planning and building they have (a) designed the whole building for all-color programming, (b) provided all the cabling, switching and control circuits for all-color, (c) installed initially color equipment for all types of color telecasting (films, slides, opaques, lives) and (d) provided space for the several additional live color studio camera chains which are the only extra items they will need for 100 per cent color programming.

It is also noteworthy that they have not installed any strictly monochrome film cameras (see below) and that they have provided in their film room a large space which is marked "reserved for color video tape equipment."

### Color Situation

WBTV's management is enthusiastic about color television and they have long been of the opinion that *all* television will be in color in the not too distant future. They are ready for this transition. Up until the present time they have proceeded at a deliberate and moderate pace and without fanfare. They have taken the stand that they will not actively promote color and ask their viewers to buy color receivers until the public can be assured that they will be able to receive a reasonable number of their favorite network shows in color and on a regular and continuing basis.

Despite this lack of promotion many of the WBTV viewers have seen WBTV's color programs and based on what they saw they are purchasing color receivers. The latest set count shows 934 color receivers in the WBTV service area.

### Color Equipment

The WBTV studios, as previously noted, are not only completely air conditioned, lighted and wired for color, they are also equipped right now for all types of color operation.

Each of the two tv studios has two color-camera outlets installed and wired to central control. One complete RCA TK-41 live color camera chain is in operation. This can be used in either studio or, by use of extra camera cable length, in the "outside studio" area.

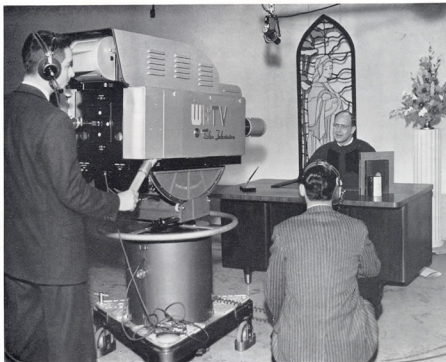
WBTV has two RCA TK-26 3-V Color Film Camera Chains. One of these is presently used for monochrome and hence is operated with a single vidicon. It can be quickly changed for color, when required.

With each of these film cameras is a pair of RCA TP-6BC de luxe-type Film Projectors and one of the brand-new RCA TP-7A Dual-Drum Projectors. The latter adds greatly to the flexibility and efficiency of the system—as well as the quality of projection. WBTV was the first to have them.

WBTV also has another unusual feature in color equipment—a pair of color opaque scanners. Called "Chromascan" by the station engineers who developed them (see story, Pg. 51), they enable WBTV to transmit color prints or other opaques directly and also to pick up "live" various merchandise packages.



FIG. 41. WBTB's first live color program, produced in December 1955, featured Dr. George Heston, Pastor of the Myers Park Baptist Church.



#### Color History

WBTB's color history is similar to that of other stations who are pioneering in this new field of visual communications. In order to provide servicemen in the area with a means of checking color receiver installations, the station started transmitting color bar "patterns" in May 1954. Color slide and film programs were aired beginning in August of 1954, and the first color network programs were transmitted in August 1954. At this time the pace of color started picking up and the station began telecasting live color programs in December 1955. In May 1956, regular telecasting of two locally originated color shows a week was started, and has continued to the present date.

#### Present Color Programming

At the present time WBTB is producing a half-hour live color show called "Spectrum" on a regular twice-a-week basis. Spectrum is a simplified variety-type show with four to six participating local sponsors. It is produced in Studio TV-2 using WBTB's live color camera. Chromascan artwork is used for some commercials (others are done live) and for breaks to cover periods when the camera is panning from one set to another.

FIG. 42. WBTB's live color programs are produced on small color sets, arranged around the periphery of the studio, with the center floor area reserved for camera movement (see Fig. 43, Pg. 57).





WBTV producers and engineers have been developing the Spectrum show for some time and it is astounding how much variety they are getting into it with their one-camera setup. On a typical day's show, for example, they used, by actual count, no less than seven sets. These sets were arranged in a circle around the color camera located in the center of the studio floor (Fig. 43).

Three of the sets were fairly large—on the order of 25 feet wide. One of these (set No. 1), which is used regularly as the opening and closing theme, consists of a black velvet drape in front of which is placed an open framework on which are mounted small panels in various colors. The announcer stands in front of this set in opening and closing the show. The second large set consisted of three neutral colored flats (see diagram, Fig. 43) on which a color gel projected a light blue cast. Flowers on a stand completed this simple set against which a parade of girls modeled large-brimmed summer hats. For

a simple set it was surprisingly effective. The third large set was considerably more complicated. It simulated the outside of a small railroad station—complete with hedge and street lamp. The background for this was a city sky line at night. The latter was provided by rear-screen projection using a cutout pattern to cast the shadowy outline of buildings. This, of course, was plain black and white—but, for a night scene, it seemed realistic.

In between these larger sets were placed four small sets. These were: Set No. 2, an artist's easel; Set No. 3, a piano; Set No. 5, a refrigerator (sponsor's product); Set No. 6, a kitchen table (for bread commercial). A neutral cyc which runs around two walls of the studio provided background for most of these. Others used available flats of simple types. As a rule only one of the sets used (in this case Set No. 7) is made up especially for this show.

Part of the reason this relatively simple WBTV show is so effective is due to the use of the Chromascan units. A colored

opaque, the "Spectrum Title Chart" is used alternately with live shots in order to give the cameraman time to swing his camera from one set to the next. Colored "opaques" are also used for some commercials. This use of the Chromascan is similar to the way some stations are using color slides. WBTV personnel feel that opaques are easier to make—more convenient to use. Without some such arrangement it is difficult to do a multiple-set show with a single camera.

#### Color Production Crew

WBTV produces its color shows with the same size crew as used for local live programs in monochrome. The production crew consists of the producer, a floor manager, one cameraman, one boom man, one lighting man, and a utility man (who handles props). The technical crew consists of a technical crew chief at the video switching position in central control, a video operator at the camera controls, a projectionist and an audio engineer in the tv studio control booth.

At WBTV the producer does his own switching; he also directs the setting up of props, and lighting of sets, previous to going on the air. It is the station's intent that eventually all of its producers as well as other personnel will have the requisite experience to handle color shows. However, to date some specialization has been necessary. Production on most color shows has been handled by Norman Prevatte and the experience he has gained is quite evident in watching the Spectrum Show. Despite the difficulties of operating with one camera, he manages by careful planning and timing to produce a surprisingly variegated show with the smoothness of a network production.

#### Warmup Schedule

Warmup time for color should be carefully planned so that valuable tube life is used to the best advantage. WBTV, like most stations presently using color, does this by combining warmup time with scene check-out and "on-camera" rehearsal time. A typical schedule is as follows:

9:00 A.M.—11:30 A.M.

Camera warmup and initial setup

11:30 A.M.—12:30 P.M.

Studio lighting setup using camera to check

12:30 P.M.—1:00 P.M.

Engineering setup

1:00 P.M.—1:50 P.M.

Rehearsal on camera

1:50 P.M.—2:00 P.M.

Final camera check

2:00 P.M.—2:30 P.M.

Air time

**Table I**  
**WBTV COLOR SPECTRUM PROGRAM**  
**SIMPLIFIED CONTINUITY**

Scene Transmitted	Picked Up By	From
Spectrum Title Chart	Chromascan No. 1	Artwork
Girl Announcer	Live Camera	Set 1
Spectrum Title Chart	Chromascan No. 1	Artwork
Man Announcer	Live Camera	Set 1
Spectrum Title Chart	Chromascan No. 1	Artwork
Male Singer	Live Camera	Set 3
Spectrum Title Chart	Chromascan No. 1	Artwork
Refrigerator Commercial	Live Camera	Set 5
Commercial	Chromascan No. 2	Artwork
Spectrum Title Chart	Chromascan No. 1	Artwork
Girls Modeling Hats	Live Camera	Set 4
Spectrum Title Chart	Chromascan No. 1	Artwork
Girl Singer	Live Camera	Set 4
Spectrum Title Chart	Chromascan No. 1	Artwork
Bread Commercial	Live Camera	Set 6
Spectrum Title Chart	Chromascan No. 1	Artwork
Cartoon Artist at Easel	Live Camera	Set 2
Spectrum Title Chart	Chromascan No. 1	Artwork
Musical Skit	Live Camera	Set 7
Commercial	Chromascan No. 2	Artwork
Girl Announcer	Live Camera	Set 6
Spectrum Title Chart	Chromascan No. 1	Artwork

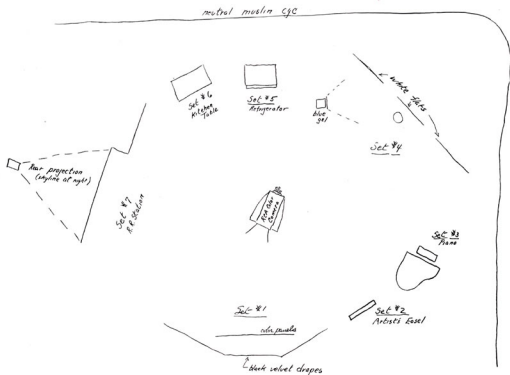


FIG. 43. Floor-plan arrangement used by WBTV in producing the "Spectrum" program described in the text (see continuity Table II). Three fairly large sets and four small ones are arranged in a circle about the live color camera which can easily pan from one to another. During transitions color slides or opaques are used.

In practice these time intervals are flexible and in most periods several things go on at once. Usually the floor man gets his plan around 10:00 A.M.—starts bringing in sets around 11:00 A.M. Preliminary on-camera checks are made during this period. Around 11:30 announcers and singers start arriving and informal rehearsing and checking of costumes, make-up, etc., on-camera begin. As in most local programs of this type, only the commercials are rehearsed completely. Talent is usually checked only for placement, lighting and sound pickup. Since all these things are done during the so-called "warm-up" period, the camera time cannot be counted as wasted. Most of it would be necessary even though the cameras did not need a warm-up period.



FIG. 44. A well-equipped engineering shop is conveniently located within the "technical core" of the building (see Fig. 16, Pg. 43). Next to this is an engineering storage room. Remote equipment is stored in cabinets in passageway just outside this room.



FIG. 45. Master control room of WBT looks into the three radio studios through conveniently placed windows. Master console includes a separate control panel for each studio plus terminal and switching facilities. Studio B (center) is a d.j. studio, equipped with four RCA Type 70-D Turntables and one announcer's control box.

FIG. 46. Not only are the technical operations of WBT-WBTV centered in one area but, for convenience, the whole area is made visible by conveniently placed windows. In this view, from Studio C, can be seen the recording room (left); the radio control room, and beyond it the tv control room (center); and Studios B and A (right).



## WBT Radio Studios

Although the tv studios in the WBT-WBTV Building occupy the largest space, the radio operation has not been neglected. In fact the space given to radio, and the care with which the facilities have been planned, is fresh evidence of the resurgence of radio broadcasting.

The studios and control facilities of WBT have been arranged to provide maximum convenience and efficiency for the type of radio operation which has come to the fore in the past few years. This means emphasis on d.j. and news-type programs, centralized operating control and maximum provision for recording.

WBT has three radio studios which are grouped around a central control room (see Fig. 16, Pg. 43). Studio C, the largest, is 26 feet by 28 feet; Studio A is 18 feet by 28 feet. Studio B, a strictly news and d.j. studio, is 11 feet by 14 feet. All three studios have isolated floors and floating walls and ceilings, affording a high degree of sound isolation. Sound locks are provided at all doors. Entrance to all studios is directly from the corridor so that talent or announcers need not enter the technical area.

The WBT radio control room is built so that an operator sitting at the master control position can see into all three studios (Fig. 45). The radio master console was designed by WBT engineers and custom-built by another manufacturer. It is U-shaped and has a separate control panel for each studio. An operator sitting at any of these three control positions faces directly into the studio with which that panel is associated.

Recording of programs, both for auditioning and for delayed playback, is an increasingly important aspect of radio station operation. WBT engineers planned their recording facilities with this in mind and the resulting installation is a model of convenience and flexibility, providing for almost any conceivable requirement.

The recording room is located directly off of the master control room (Fig. 47) and adjacent to Studio C, which it looks into through a conveniently placed window (Fig. 16, Pg. 43). In the recording room is an audio control panel (similar to those in the master console), which can be used to control operations in Studio C. This makes it possible to produce a program in Studio C and record it completely independent of master control. Recording equipment includes two RCA Type Disc Recorders and four console-type tape recorders. Each recorder has its own monitor for playback.

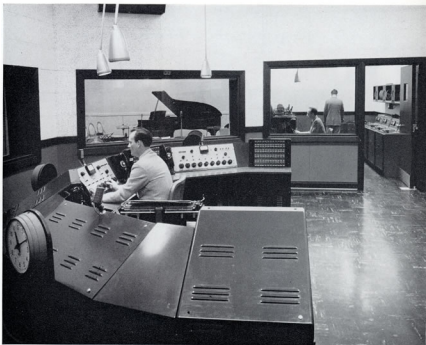


FIG. 47. Another view of WBT radio control room, showing direct access to recording room (top right). Recording equipment can be operated independently or by push-button control from master.

FIG. 48. Interior of the WBT recording room. Control console, at left, faces into Studio C and may be used to control a program originating in this studio independent of master control.

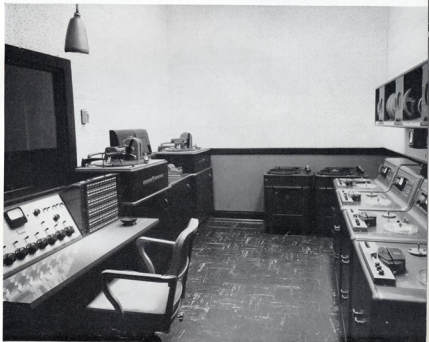




FIG. 49. The "Jefferson Suite" conference room in the WBT-WBTV Building can be used for meetings or for auditioning of air or film programs in color or monochrome.



FIG. 50. In nice weather employees enjoy this beautiful dining terrace, which opens off the indoor cafeteria-dining area seen through the glass panels at rear.

#### WBT-WBTV Office Areas

This article has been primarily concerned with the technical facilities of the WBT-WBTV Building, because these are the features which most interest the engineering-minded readers of BROADCAST NEWS. It is worth noting, however, that the business areas of the building have been planned with equal care, both overall and in detail.

While functionalization has been the key consideration, and this is evident in the use of movable partitions in most office areas, the factors of appearance and comfort have not been overlooked. Furnishings and decoration in the building are, for the most part, traditional in styling, enhanced by the soft colors and contemporary textures of fabrics and wall coverings—offering the kind of settings in which harassed executives can relax and conduct their business affairs surrounded by an atmosphere of tranquility.

One unusual area is the magnificent conference room which is aptly called the "Jefferson Suite." The carefully planned conference room actually serves as two rooms. Covering an area of 800 square feet, the room can be divided by means of a special folding partition which rests unobtrusively in a mahogany column when not in use. A conference table is set up at one end of the room, while furnishings in the other half are arranged in a conversational grouping for the use of clients. A built-in cabinet covers the entire east wall and houses black and white and color television sets, radio, 16 mm film projector, tape recorder and phonograph, all of which can be operated by a master control panel. Another section provides storage space and conceals a small refrigerator. Grass cloth with an olive green cast is used on the walls which are paneled to dado height in mahogany finish to match the conference table.

Other areas of the business section of the building have been treated with equal care, if somewhat less lavishly. The whole building is air conditioned—with the overall system being divided into seven essentially separate systems each with individual controls. Employee comfort has been considered and areas for relaxation and dining are provided. The cafeteria-dining room, with its adjoining outdoor terrace is an eye-catcher (see Fig. 50).

FIG. 51. WBTV's transmitter is located on top of Spencer Mountain, sixteen miles from downtown Charlotte.



#### WBT-WBTV Transmitters

The WBT transmitter (50 kw-1110 kc) is located seven miles southwest of Charlotte. (For the story on the radio transmitter installation see *BROADCAST NEWS*, Vol. No. 71, Sept.-Oct., 1952.)

WBTV's transmitter is located on Spencer Mountain—a chocolate-drop-shaped peak which rises above a gently rolling countryside—approximately sixteen miles west of Charlotte. A 450-foot tower surmounted by a six-section RCA Superturbo Antenna provides a total elevation of 1090 feet above average surrounding terrain.

The Spencer Mountain site was actually purchased by Jefferson Standard in 1947, as a site for an FM transmitter—but with hopes that it would, as it actually did, become a TV site as well.

When the FCC granted the CP for WBTV, an RCA Type TT-5A Transmitter was moved into the strikingly modernistic building on the mountain, the TV antenna installed, and the station was ready to go on the air. In June, 1953, a new RCA 25 kw amplifier was installed and the station increased its effective radiated power to 100 kw—the maximum permitted by the Federal Communications Commission.

FIG. 52. WBTV's transmitter building on Spencer Mountain.





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**COLOR EVERY NIGHT.** See color every single night in the week! More shows than ever before with something for everyone—dramas, comedies, Spectaculars, children's shows, local telecasts. And to every show, "Living Color" adds a *beauty* and a *naturalness* you must see to believe.

**DEPENDABLE PERFORMANCE** you can rely on. Big Color practical color. And to RCA Victor owners, Factory Service is available most areas at new low cost . . . as little as \$39.95. VHF *Stanwyck* in light oak grained finish. (21CT783) \$550. (UHF model shown is slightly high



**LIKE 2 SETS IN 1.** Because Big Color is *Compatible Color*, you see all color shows in beautiful "Living Color" . . . all regular programs in crisp, clear black-and-white. With Big Color you see *everything*. (Shown) *Aldrich* in mahogany grained finish. (21CS781) \$495.



**EASY TO TUNE.** Even a child can tune RCA Victor Big Color TV, quick, accurate, easy—tunes in seconds. You simply turn two knobs and before your eyes the *screen blossoms out in all the colors of life!* And once set it, RCA Victor Big Color *stays* just the way you like it.



**EASY TO OWN.** (Shown) *Asbury Deluxe* in walnut. (21CD791) \$750.

**No other television gives you the enjoyment—the satisfaction—the 2-sets-in-1 value of Big Color TV!**

For as little as \$495 you and your family can get everything you want most in a TV set. You see regular programs in sharp, fine black-and-white—color shows in "Living Color." You get easy "Color-Quick" tuning, and famous RCA Victor performance with day-in, day-out dependability.

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