

RECA

Broadcast News

Volume No. 151, November 1973



The Automatic Color Camera

Comes the Evolution!

- 1969** RCA introduces the TK-44A, a new generation of color cameras.
- 1970** New features added. New colorplexer, miniature cable and equalizer. Improved camera cable and joystick control panel.
- 1971** The TK-44B. With more new features. Bias Light to reduce lag and RGB coring to minimize noise at low light levels. Scene Contrast Compression to bring out details in high-contrast scenes.
- 1972** First automation designs demonstrated at NAB.



RECORDING

IN THE VIEWFINDER

Major Purchase by Scripps-Howard Broadcasting Includes Eleven TK-44's: Three "Cart" Machines

In a major upgrading of facilities, Scripps-Howard Broadcasting Company has added eleven TK-44B color cameras, three TCR-100 "Cart" machines and other TV equipment for four of its stations.

WEWS-TV, Cleveland and WCPO-TV, Cin-

with a separate Signal Processing Unit, which makes the cartridge machine a completely independent facility either on line or as an off-line recorder.

WEWS-TV also will install an RCA TK-28 color film system.

This combination provides for recording cartridges from reels, reels from cartridges, or reels and cartridges from the line, simultaneously. The TCR-100 can playback on-air while recording on the TR-60, and vice versa.

ABC to Test RCA-Developed Circularly Polarized TV Antenna

The American Broadcasting Company will test a new concept for improving TV reception through use of an RCA developed circularly-polarized broadcasting antenna.

The experiments will be conducted at WLS-TV, an ABC-TV owned station in Chicago, beginning late this year. The antenna will be installed on a 86-foot cylinder atop the new 110-story Sears Building in that city.

The tests are expected to determine whether the new technique provides significantly better reception by TV sets with single pole or "rabbit ears" receiving antennas as well as by receivers in heavily-built-up and problem reception areas.

To provide a standard reference for test-

ing the new concept, RCA also will furnish ABC-TV with an antenna radiating the horizontally-polarized type signal now used in TV broadcasting.

A single transmitter will feed broadcast signals to both antennas, on an alternating basis, to assure that each antenna receives the identical radiating power. Signals transmitted from each antenna will be monitored throughout the Chicago area to determine the relative signal strength of reception in various locations and by different types of receivers.

VHF Transmitters And Antennas for Global Television, Canada

RCA is supplying broadcast transmitting systems for the first phase of Canada's new television network. Global Television is establishing a grid of TV transmitter facilities strategically located for overlapping coverage of most major Southern Ontario urban centers, as well as broadcast service to less dense areas. The transmitters and Global's new studio complex in Toronto will be inter-connected by a two-way microwave system, and the

stations in the network will all carry the same programming. Initially the network will provide program service to more than seven million people in the coverage area.

A 25 kW transmitter and a Superturnstile antenna are being installed at Paris, Ont., while a 15 kW transmitter and butterfly type antenna will be provided for Bancroft. Ottawa will be equipped with a 3 kW system and a custom-built dipole panel antenna. RCA's UHF pylon type antennas will be used at Uxbridge, Sarnia and Cottam.

Al A. Bruner, Global's President and Chief Executive Officer, said special provisions are being made to overcome interference from other stations in fringe areas. Atomic clock standards will be installed in the VHF transmitters to implement a technique known as "very precise frequency

offset". This technique reduces interference by as much as five times by weaving the unwanted signal into the desired one, he said.

Transmitters in the system will be automated and remotely controlled, obviating the need for an operating staff at each site. Roving crews will maintain the grid.

The transmission system is scheduled for testing by the end of November with January 1, 1974 planned as the on-air date.

Mr. Bruner stated that Global Television plans further expansion of its facilities in the future. "The natural extension of this new program service in different time zones can be accomplished using satellite and microwave facilities, inter-connecting regional transmitters in other provinces," he said.

Versatile Mobile Color TV Van Equipped for Dual Standard Operation

Israel Motion Picture Studios, based in Tel Aviv, is now operating an RCA-equipped color TV mobile unit capable of operation at NTSC or PAL standards. This flexibility enables the TV production company to provide improved service to its television news and feature program clients around the world.

The three-camera, 30-foot van is used to tape-record news assignments in either the NTSC standard used in the U.S., Canada and Japan, or in the PAL standard

adopted by countries in Europe and elsewhere.

Switchover from one standard to another requires minor adjustments to the TV equipment and is accomplished in only about 15 minutes. The mobile van then is ready to video-tape programs at the new standard and to arrange for their satellite transmission to broadcasters overseas.

The air-conditioned mobile unit employs three TK-44 color cameras, a TR-70C video tape recorder, TS-51 video switching, and audio. The air conditioning system, powerful enough to overcome Israel's desert heat, is augmented by a dehumidification system for seacoast operations. A 45-kva generator provides power for these systems and for the TV equipment.

Equipped by RCA Broadcast Systems in

Camden, the van arrived in Israel just three days before the beginning of that nation's 25th birthday celebration. The equipment was in operating condition in only six hours after arrival, and coverage of the anniversary events represented its first assignment.

Last year RCA supplied the Israeli production house with a complete color telecine system which made possible the transmission of TV program material from motion picture film and slides. The van includes the first color tape recording equipment to operate in Israel.

While the mobile unit covers news assignments that will be viewed in other countries, Israel itself has not yet authorized color broadcasting within its borders. The PAL standard has been selected for use when color broadcasting begins.

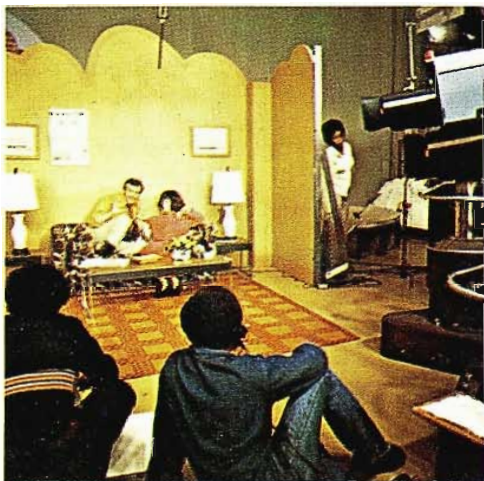
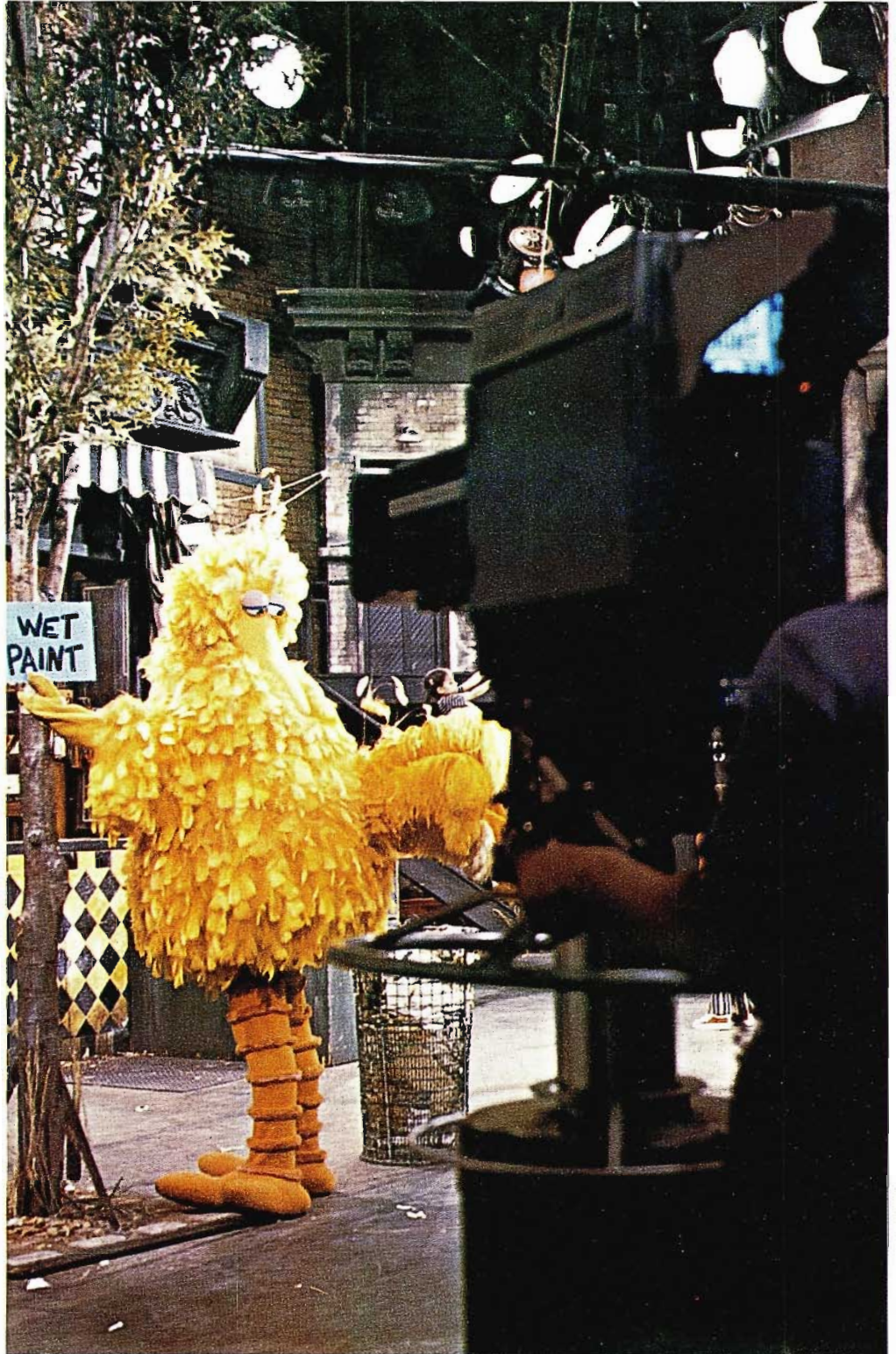
Colorful "Sesame Street" Swings with the TK-44 at Teletape Corporation Studios

The popular antics of Big Bird and his "Sesame Street" friends are picked up by TK-44 color cameras at Teletape Corporation studio. "The Electric Company" (lower left) features different sets, cast and content, but the same TK-44 cameras are used.

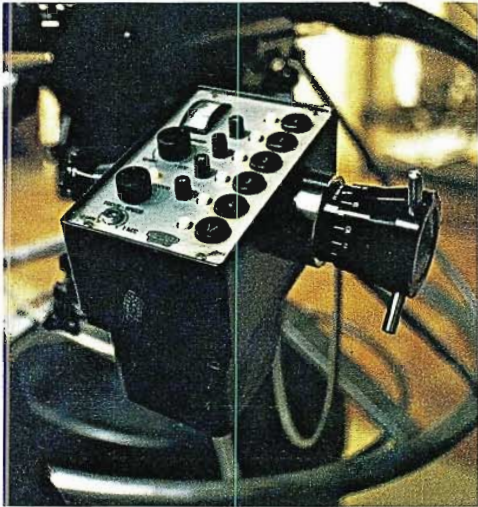
Vaudeville may be dead. But a spacious, converted vaudeville theatre just off Broadway at 81st Street in New York City now echoes the vibrant beats of a new generation of accomplished and aspiring performers.

Here, at the Teletape Corporation studio, yellow-plumed "Big Bird" and his renowned "Sesame Street" crew cavort before television cameras as their performances are taped for world-wide distribution.

"Sesame Street" and its companion production, "The Electric Company" are both produced by Childrens Television Workshop at the Teletape facilities. These two shows, distinctly different in their approaches, content, settings and production techniques, presently take up the full capacity of the 81st Street studio.



"Shot box" is used with TK-44 cameras for handling pre-set zoom functions.



at the 7-to-10 year old level. First aired in the 1971-72 season, this show uses a repertory cast and a faster-paced sequence of events. Extensive use is made of TV production techniques such as Chromakey to achieve desired effects, and many of the shots are pre-programmed, which makes the "shot-box" a valuable adjunct to the TK-44 cameras.

Aside from the sheer size of the "Sesame Street" set, the studio at 81st Street is an interesting arrangement. Around the periphery of the set are such facilities as the lighting board, sound effects, and an ample assortment of spare props. Even a part of the overhead is used for storing Big Bird's friend Snuffle-Upagus, a large, lovable woolly mammoth.

Flat sets used for "Sesame Street" backgrounds provide a test for cameras to produce crisp color picture detail.

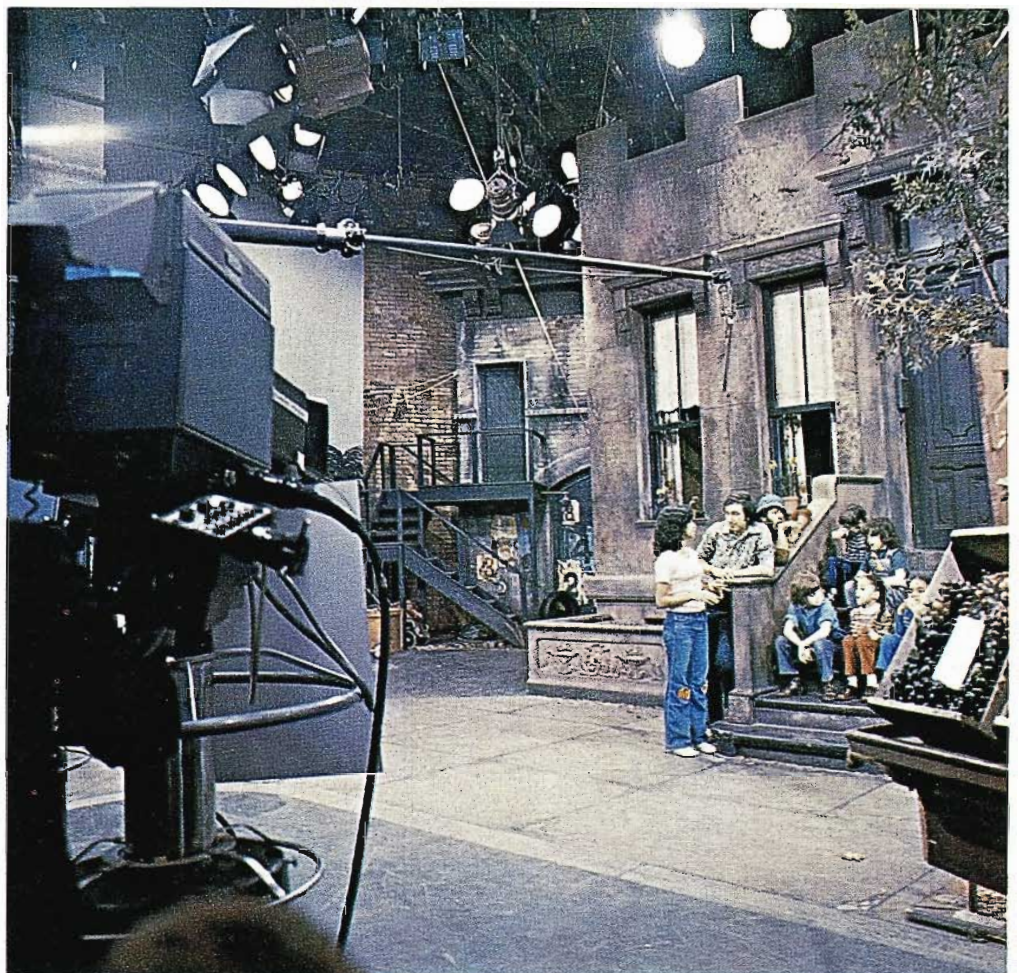
Three TK-44B cameras are used for televising "Sesame Street", and four are employed for "The Electric Company". The cameras are equipped with Schneider 11:1 zoom lenses, with an attached "shot box" for pre-set zoom operations.

Observing a segment of a "Sesame Street" show being produced can be a mind-boggling experience. The set is mammoth and realistic to extremes—from the old brownstone row house with the weathered steps to the surrounding street scene and shops—right down to the authentic cracks in the sidewalk.

Attention to detail is a must with this production, and nothing less than the best is tolerated. The finished product must not only be technically and artistically polished, but also must be educationally sound, since the object is to reach as well as entertain millions of young viewers. A panel including psychologists and educators screen each segment for suitability.

Populating the set is a cast of youthful street residents, along with "Big Bird" and his fellow characters. Add the floor crew, production personnel and assorted guests and the result—surprisingly—is not chaos, but a whole series of sparkling performances.

"The Electric Company" is directed toward improving the reading skills of youngsters



Video operating position at Teletape's 81st Street studio includes control units for their four TK-44 cameras.

One level above the studio floor is the production control room. It is generous-sized, with a long table that accommodates six people, including the video switcher operator. The table faces a wall of monitors which display the output of all live cameras. The "take" camera shot is viewed on both color and monochrome receivers.

To the left of the control room is Audio control. On the other side is the Video operating position, including controls for all four TK-44 cameras. Joystick camera controls are located in the center video control position, for the convenience of the video operator in shading cameras.

Adjoining video control is a compact Engineering office/work area. In a separate room just below Engineering is a single film system equipped with both film and slide projectors. The other major equipment complement is on the main studio level and includes six VTR's, two of which are used primarily for recording and the others for editing.

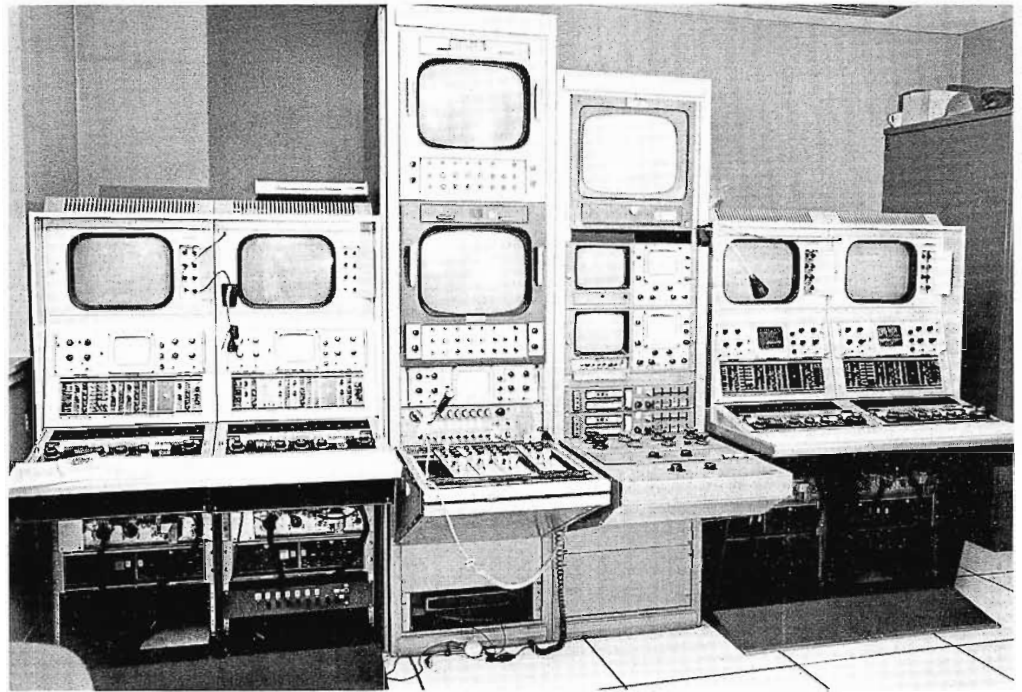
A technical staff of 17 operates the 81st Street studio, under the direction of Engineering Supervisor Walter Rauffer. As might be expected of a production facility, the pace is often hectic. Equipment downtime can be disastrous, with the large cast and tight shooting schedule. Maintenance and new equipment additions must be carefully planned to fit into studio changeover periods. When a "Sesame Street" series is completed, the sets are dismantled and removed to storage, while "The Electric Company" sets are moved in. During this interim period, major renovations and overhaul must be accomplished. Indicative of the close scheduling required, a complete new video switching system was installed within a 72-hour extended weekend period in June.

The TK-44 cameras were installed at the Teletape studio this Spring.

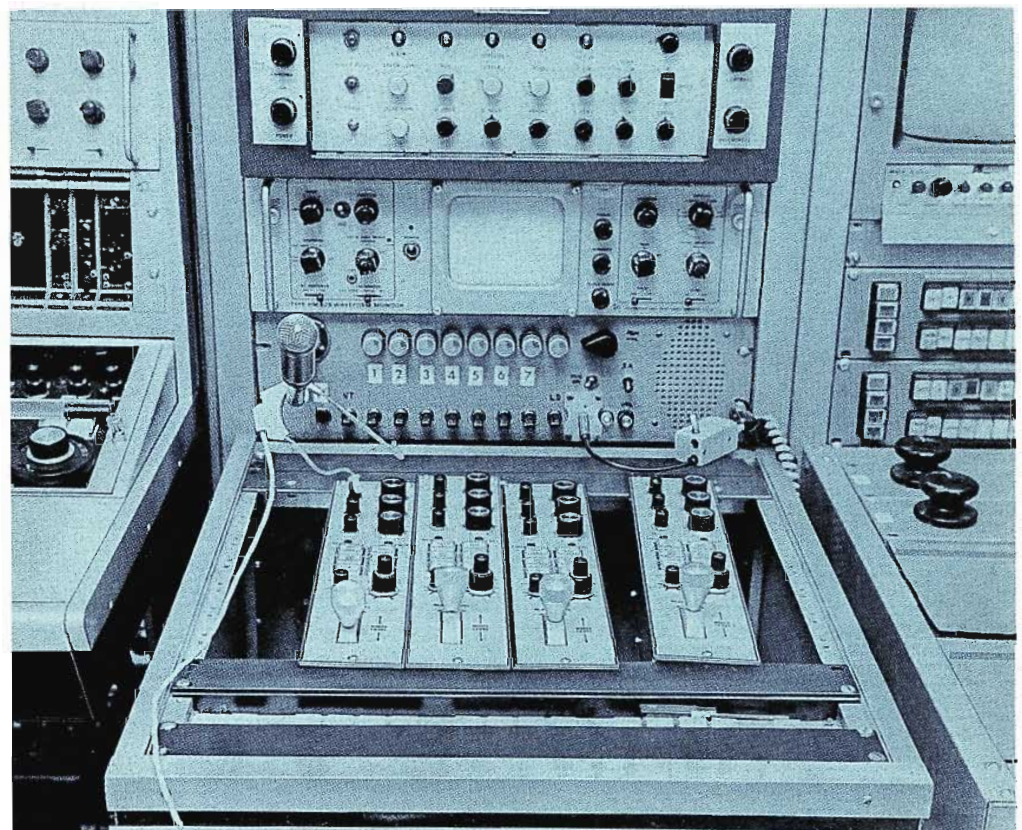
Veteran cameraman Arnold Giordano likes the TK-44's because they're "more compact, mobile and easier to work with".

Video Operator Bob Squitieri notes that "TK-44 pictures are 100% better. The cameras are stable and easy to set up".

Ralph Mensch, Technical Director, observes, "They're a pleasure to work with. Excellent for Chromakey—Bang! Bang! Bang!—and you're done. There's no waiting for set-ups, which saves time and



Center video position provides joystick controls for convenience in shading cameras.



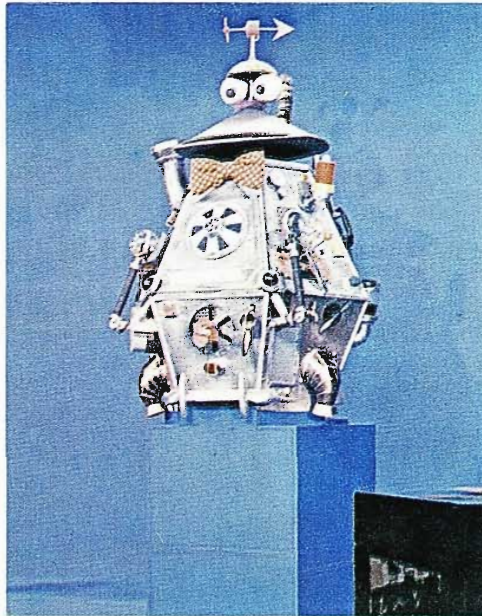
Chromakey is a production technique used extensively by both "Sesame Street" and "The Electric Company".

money. Camera operation is also enhanced by the shot box".

Jon Stone, Executive Producer of "Sesame Street", is also quick to articulate his reaction to the new cameras. "The color is great. The camera handles contrasts very well, from Big Bird's yellow to skin tones, without blooming".

And he adds, "To give 'Sesame Street' scenes a lively appearance, the sets must be brightly lighted, and the cameras must be able to adjust, or the set will have a hazy, mushy appearance. The TK-44 pictures have snap, excellent detail".

In evaluating color cameras, one of the features that made the TK-44 particularly suitable to the Teletape operation was Scene Contrast Compression, which stretches blacks so that shadow details can be seen, while maintaining perfect color balance.



An excellent feature for field pickups, such as ball games, Scene Contrast Compression is useful in producing "Sesame Street" for two situations:

1. The bright yellows of Big Bird's features tend to cause blooming and wash out the skin tones of performers' faces when next to him. This condition is most critical with darker skin tones.
2. In some "Sesame Street" scenes, the action starts in shadow areas—an actor is coming from the garage at the back of the set, or going into a store. This dark, shadowy area tended to blur, as the camera failed to pick up detail.

Both of these problem conditions are overcome at the touch of the Scene Contrast Compression button on the TK-44.

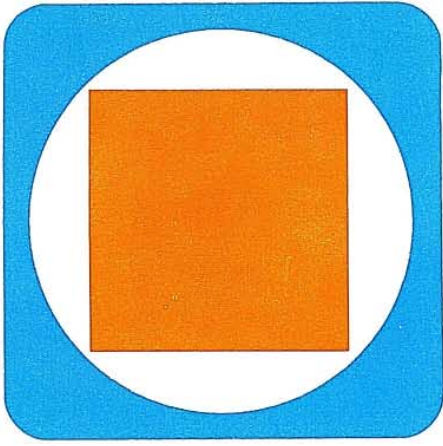
The TK-44 has been the established favorite of broadcasters. The superb performance of this camera at Teletape Corporation's New York studio underscores the reasons why it is rapidly achieving the same acceptance with independent TV production centers.



From a standing start in 1960, Teletape Corporation has grown into a major operation, involved in a total spectrum of media—video tape, video cassettes, motion pictures, slide films, animation, live productions, business communications, training programs, etc.

In New York, in addition to the 81st Street facility, the Company's administrative offices and a complete post-production center are located at West 44th Street. Two fully equipped TV mobile units for handling remotes and on-location assignments are included in the field operation located in New Jersey.

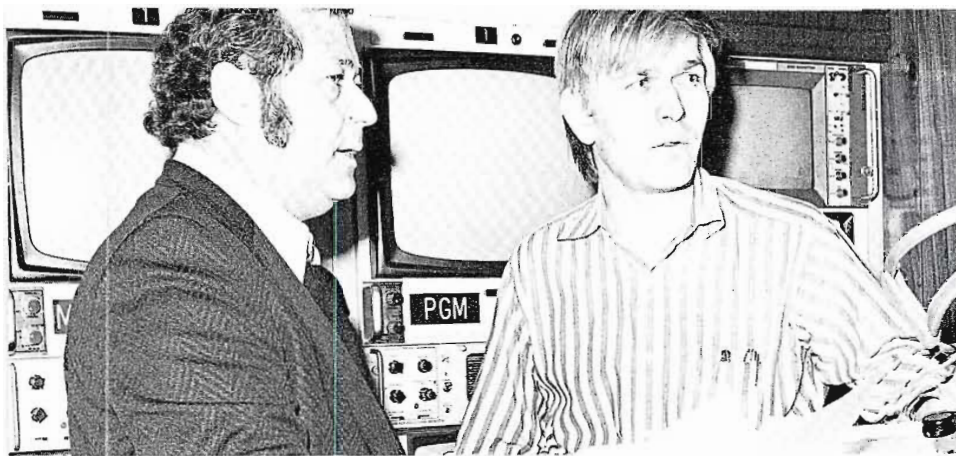
Teletape Corporation's credo is simple: excellent work. Although the presentation here highlights "Sesame Street" and "The Electric Company", the two most widely seen of their productions, Teletape's credits are far-ranging, including: "Barbra Streisand Specials"; "Merv Griffin Show" in N. Y.; "David Frost Show"; "Jose Feliciano Special"; "Easy Living—Joyce Brothers"; "Fifth Dimension Special"; "Flipside"; "Tijuano Brass Special".



Pacific Video Industries Fully-Equipped TV Van Rolls To Where the Action Is

"Fisheye" view shows two TR-70C Tape Recorders positioned in Pacific Video Industries mobile van.





Jack Meyer, President of PVI and Randy Blim, Vice President and Director of Engineering in control room of van (upper left). TK-44 cameras follow action at L.A. Kings hockey game, one of many sports assignments covered by PVI.



Technician checks out TR-70 module.

Suddenly video is a hot item in the heartland of the movie industry. Movies are being made especially for television. Features are being shot using TV cameras and video tape, with the final product undergoing a tape-to-film transfer process for the normal 35 and 16 mm film distribution. Movie camera techniques are being adapted for television, and TV "wrinkles" are finding use in the film medium.

The obvious advantage that the electronic medium of television offers in making feature "films" is that video tape permits viewing and editing action immediately, so that reshooting can be done while the performers are still on the set.

In this dynamic industry environment, a prime opportunity exists for those with both film and television skills. One such organization is Pacific Video Industries, based in Los Angeles. Founded in 1972, PVI is hardly a household name yet. But, in the span of a few months, it has achieved a solid reputation in the industry—and an impressive string of major credits.

Success stems from the combination of people and capability. In the case of PVI, the capability is a mobile van which is fully equipped with complete TV studio facilities, including color cameras, quad VTR's with editing, double re-entry video switching and control, and an audio system with 16-track mastering.

Jack Meyer, President of PVI, has been active in film and TV for many years, serving as a cameraman in both fields. His involvement in mobile video facilities dates to 1959, when he designed and equipped one of the first mobile units which included video tape recorders. For ten years prior to founding PVI, he was West Coast Operations Director for ABC-TV.

With this career experience, it was a "natural" for Jack Meyer to see the need for a mobile video production and post-production facility to serve both the film and television media in California.

The yardstick for performance, Mr. Meyer was well aware, had to be quality—in people and equipment. Along with assembling an unusually competent staff, Mr. Meyer opted for investing in premium studio equipment for his van.

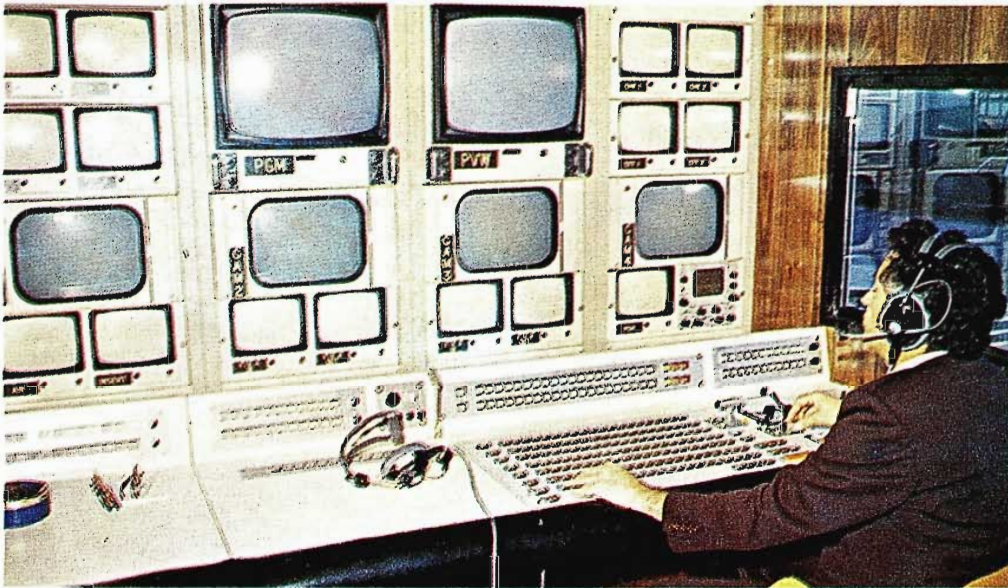
Three RCA TK-44B color cameras travel with the PVI van. Stability and ease of set-up were important factors in the selection of the TK-44's, as well as their ability to produce noise-free, true-to-life color. The excellent picture resolution of the cameras results in crisper tape-to-film transfers according to Mr. Meyer. The camera's Chromacomp feature permits accurate color matching of critical products or scenes—a distinct asset in coping with the diversified situations encountered in teleproduction work.

Further, since their application would vary from outdoor night shooting with minimum lighting to indoor settings with total light control, the camera's ability to perform well under all conditions was a "must", Mr. Meyer emphasized. In handling sporting events, he noted, the Scene Contrast Compression feature provides yet another element of control for the cameraman—permitting the camera to pick out detail from dim areas indoors or out.

Each of the TK-44's is equipped with Angenieux 15:1 zoom lenses (f 2.0) with 1.5x, 2x and 2.5x built-in extenders for extending the normal 18mm to 270mm zoom range. The cameras use miniature cable (TV-81N), with 2100 feet of the cable reel-loaded in the van.

The two TR-70C tape recorders aboard the mobile unit are equipped with DOC (Drop-out Compensator) and CAVEC (Chroma Amplitude and Velocity Error Corrector)—accessories which facilitate teleproduction assignments.

The DOC inserts properly phased chroma automatically, while the CAVEC provides line-by-line correction of both chroma and velocity. This control automatically eliminates "banding" caused by improper playback equalization or velocity errors. In addition, special output filters in the TR-70's provide extended bandwidth playbacks, resulting in higher quality masters.



Particularly useful for teleproduction work, PVI's Chief Engineer Randy Blim says, is the TR-70C's integrated circuit servo system which locks the picture for playback in less than two seconds. The stability and operating ease of the recorders enhance their value in mobile applications. Furthermore, asserts Mr. Blim, in handling assignments where the finished video tape will be transferred to film, superior quality masters are essential.

Since the VTR's are integrated with Time Code Editing Systems, the PVI mobile van has full capability for highest quality post-production editing functions as well as for recording. The TCE's utilize a digital time code to permit frame-by-frame electronic editing. Having these systems in the van with the TR-70's provides PVI with the advantage of making edits quickly, on-site where corrections or re-takes can be made at once, if necessary. This flexibility can result in substantial savings in time and talent costs for clients— as well as expediting production.

An unusual feature of the Control Room is its generous size for a mobile unit, with comfortable seating provided for six people. For comfort and viewing, it is also equipped with outside windows which are polarized and tinted for minimum glare and may be covered if desired.

The Control Room includes a wall of 21 monitors—two color and 19 monochrome, with fully patchable video and tally. Quadraphonic monitoring for audio can be controlled from the Director's console.

The custom video switcher in the PVI van is a double re-entry type, with full special effects including double color insert keyers, positioner with modulator, quad split, etc. There is a Downstream Keyer on the Program Bus, with colorizer and borderline generator with four selectable inputs. The switcher also includes PREVIEW-to-PROGRAM cut bar and dissolve features; a background generator and two ISO input switchers for VTR input selection.

Also customized is the audio console which handles 26 inputs and 16 bus outputs, plus quad, stereo and mono outputs. Input attenuation on the microphone inputs



Control room of PVI van includes a wall of viewing monitors, and room enough for six people.

TK-44 camera is ready to go while set is being prepared for taping a commercial.

is variable from -50 dB to -15 dB. Full monitoring is provided for 16-track mastering, quad, stereo or mono mixdown.

Housing this electronic equipment complex is the PVI trailer which is 40-feet long and only 8-foot wide and weighs over 41,000 pounds loaded. It is equipped with 100-feet of power cable and can handle 240/120 volts, single phase at 200 amps; 240 Delta, three-phase at 100 amps per leg, or 208-Y three-phase at 100 amps per leg. Power hookup is by a pigtail which terminates in bare ends. Power requirements for the system are 180 amps.

The van's air conditioning system is designed to maintain a temperature of 75° inside with an ambient temperature of 110°. The system provides eight tons of forced air, thermostatically and humidity-controlled, and heated if required.



PVI's 40-foot deluxe Mobile Unit houses a complete television facility.

Pacific Video Industries Credits

Pacific Video Industries' investment in a mobile facility to provide quality video production service is showing positive results.

Since its van was activated early in 1973, PVI has kept it rolling on a variety of assignments from networks, major studios, independent and commercial television producers. Among their current credits:

1973 "Emmy" Awards

Premiere of "Lost Horizon"—for Merv Griffin Show

"Roast" of Howard Cosell

"This is the Life"—dramatic series for Family Films

Commercials for AC Spark Plugs, Capitol Records, Pepsi-Cola, Zenith Corporation and others

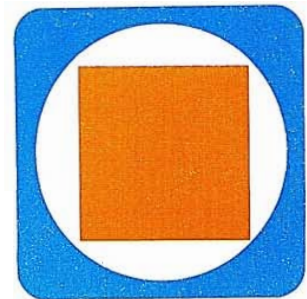
Sports coverage—L. A. Kings hockey, boxing matches, basketball

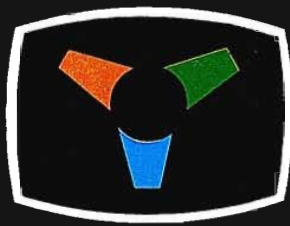
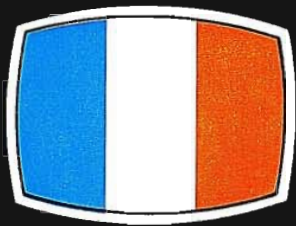
"Sigmund and the Sea Monsters", TV series

Frank Sinatra Special, "Old Blue Eyes Is Back"

Universal Studios, series for ABC's "Wide World of Entertainment"

Pacific Video Industries may not be a household name yet—but many of their clients are.



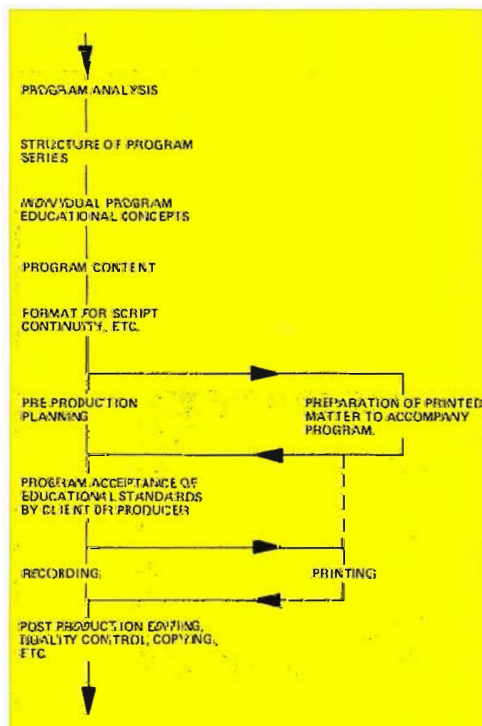


Broadcast Quality Equipment: A Winning Combination for Datacommunications, Paris

In the field of corporate or vocational education, television has long been established as a powerful instructional medium. Datacommunications, the first private TV production center in Paris, has opened new frontiers in this area.

Under the direction of Jacques Zekkar, Chairman of the Board, the progressive company has taken a resourceful approach to the use of up-to-the-minute RCA broadcast hardware for producing educational programs for adults.

In business since 1971, it has developed an impressive specialized service. Included are: creating and producing the client's program (see diagram); and even providing 1-inch tape playback systems. To insure high technical quality and meet full international standards, Zekkar opted for broadcast equipment to produce videotape masters to professional color standards.



Data's basic "script" for a complete video tape production.

Zekkar says, "In Europe, the educational market has changed. It began with audio-visual aids, and has now advanced to systems very much like those in the computer business. In educational TV, it's necessary to present a lot of information in a short amount of time. So the effectiveness of the presentation relies heavily on final quality."

He went on to explain that adult educational needs in France really began to increase several years ago. The government initiated the establishment of comprehensive training requirements on a national level. What's more, further impetus was added just last year when French corporations—obliged by law—began allocating a percentage of their total salary budget for the education of, or the dissemination of corporate information to, their employees.

To realize the full potential of the videotape instruction market, Datacommunications went full color. The rationale was the proven effectiveness of color for instructional purposes, especially for industries where color is critical. Also, monochrome was predisposed to obsolescence too near in the future.

The facilities are designed to simplify and expedite the entire production process. At each client's disposal is a team of technicians, program directors, educational and training specialists, writers, art directors and graphic and scenic artists; plus a complete range of color TV studio systems to put an entire program together.

The center also has several unique technical operating features. The studios are designed to meet dual standard requirements: SECAM for French, Italian and Spanish markets; PAL for English, German and Scandinavian markets. Depending on requirements, a master can be generated or edited in either standard—directly or through a PAL to SECAM transcoder.

Underscoring the sophistication of the operations is the studio control room which works on a non-coded color signal, the RGB signal. The switcher device and some cameras are also modified for use on the same signal.

Camera Studio Setup

Two studios, one over 1600 ft² (A) and the other 860 ft² (B), accommodate most of the program production work. Studio A is equipped with four TK-44's functioning in the PAL configuration. Studio B uses two TK-44's which RCA supplied with accessory modules permitting generation of an RGB (non-coded) signal. Routed through an RGB switcher, the non-coded signal allows simultaneous PAL and SECAM coding.

Mike Roach, Datacommunications' Technical Manager, says that good color pictures begin with a camera that excels in colorimetry, sensitivity and stability. Such performance is vital as the camera originates the information that goes onto the videotape.

"The TK-44's," according to Mr. Roach, "help speed up and simplify production. They are easy to set up and very stable in operation."

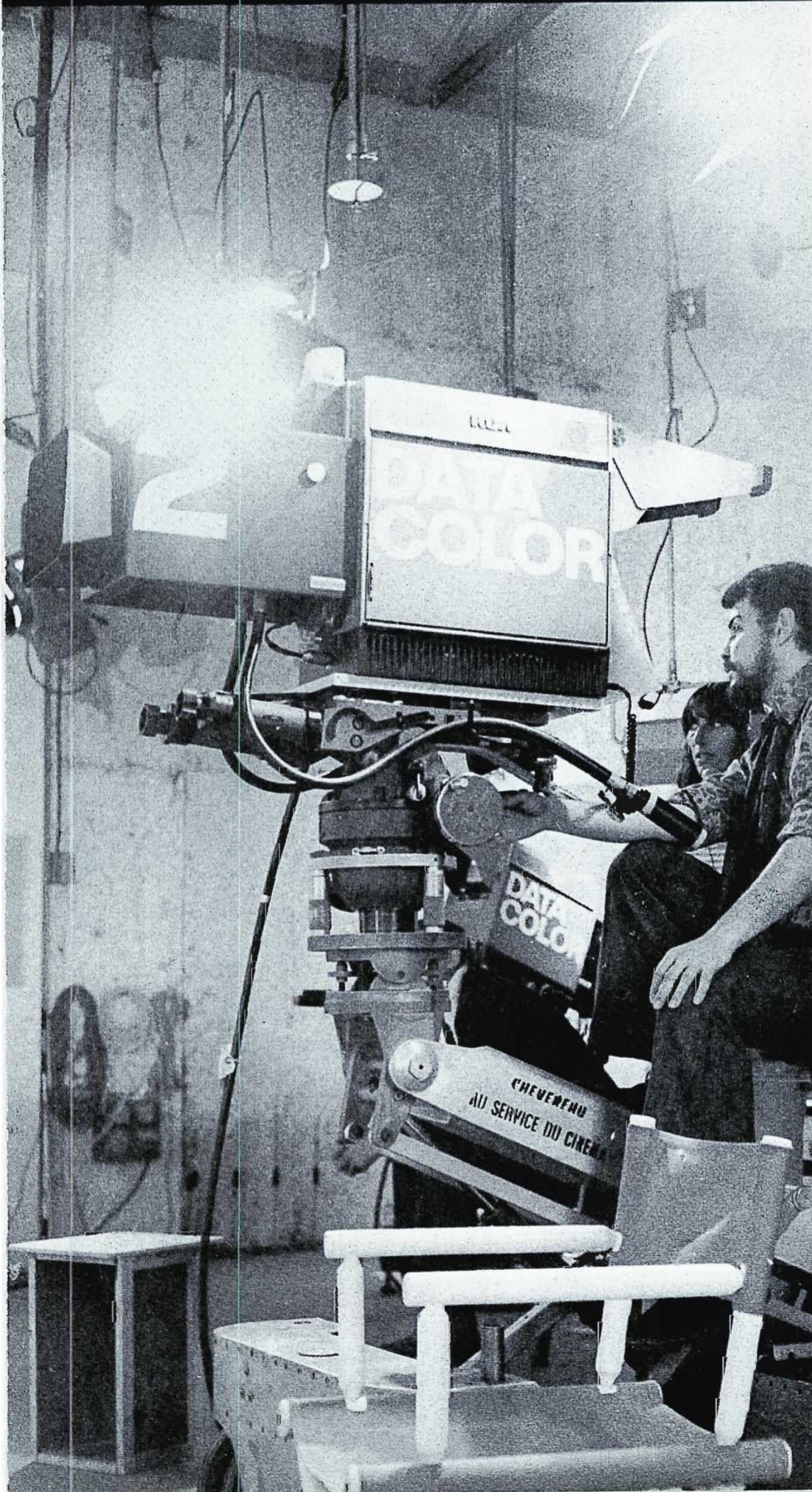
"Because of the nature of our work, the shooting schedule is an on-and-off operation. Ordinarily, this would pose a serious problem for camera stability. But with the 44's cast aluminum optical bedplate, we have no optical alignment problems."

He also mentioned the cameras' Scene Contrast Compression feature. "It's almost essential in our work. If we're confronted with shooting a high contrast scene—say 8 to 1 or even 30 to 1—this camera capability quickly and easily allows a reduction of the contrast range. What's more, if the contrast range is narrow, the cameras let us compensate by increasing the density of the scene."

For program segments that can't be covered in the studios, Scene Contrast Compression extends the TK-44's usefulness to remote work. When a job requires on-location shooting, where lighting is not always ideal—say at a construction site—the TK-44's let Datacommunications maintain the consistent high quality on which its reputation was established.

Telecine Area

In the complex's film section is a TK-28 film chain system, including a TP-66 film



Two camera studios, one of which is shown during production of an educational program, also generate broadcast, news, and TV commercial material.

projector, a slide projector and a TP-55 multiplexer. The TK-28 also contributes to consistent color quality traceable to its automatic color balancing features. This camera not only permits the addition of film or slides into the studio productions but also actually corrects flaws or errors in the film at the film-to-tape transfer point.

The TK-28 is also modified with an RGB module so that its output can be both PAL and SECAM simultaneously. This arrangement makes the telecine function available for work in both studios, thus saving a lot of complex switching.

In the PAL configuration, the TK-28 is used in conjunction with Studio A (PAL) for special effects and mixing with other sources.

Record and Playback Capabilities

RCA quadruplex TR-60's are the company's tape standard. There are many reasons in addition to the quality level it imparts to the end product. One is greater flexibility than film. "With tape," Zekkar adds, "you can see what you've shot almost immediately—you have instantaneous 'rushes'."

"The instructional content of our programs needs fast response. It has to be accurate, polished and current. With tape, we can generate, duplicate and update material very quickly. This kind of flexibility removes the obsolescence that expensive film prints are prone to. Furthermore, since the work requires editing and re-recording, quadruplex quality becomes all the more necessary."

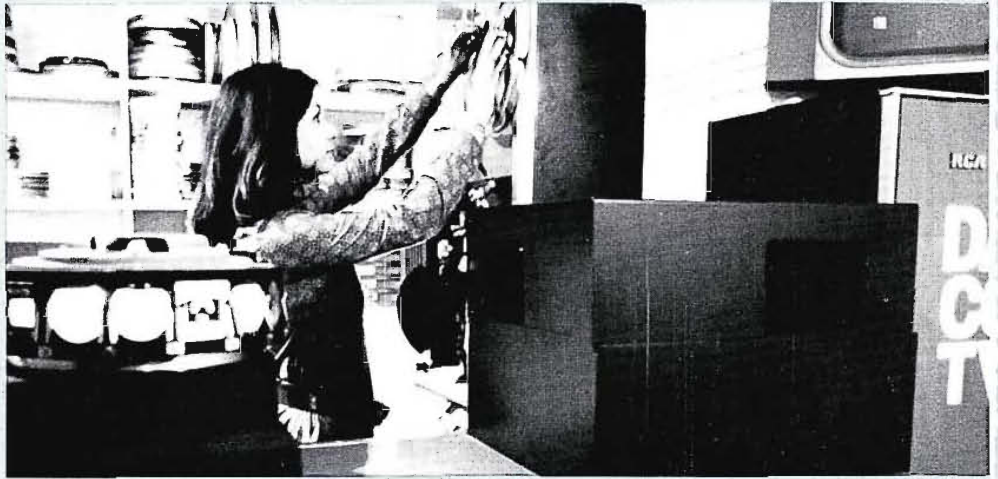
The VTR rooms are also used to post-dub productions in as many as five major European languages and copy them in either color standard.

The production center has two such areas containing a total of five machines. There are three fully PAL/SECAM TR-60's plus two for SECAM playback and PAL/SECAM record.

"Where space is critical," Zekkar comments, "the TR-60's big advantage is its combination of quality and compactness."



A VTR operator monitors a TR-60 producing the high-quality master tapes necessary for final assembly work.



For film inserts, the TK-28 camera in the telecine island automatically corrects color errors directly at the film-to-tape transfer point.



Rendezvous point for all camera, tape and telecine sources is the RCA TS-51 switcher. This video production tool creates visual effects.



With the aid of RCA's Time Code Editor, VTR Supervisor Jacqueline Jeannert uncomplicates the video tape editing procedure. Identifying each frame of information in hours, minutes, seconds and frames, the TCE lends speed, accuracy and flexibility to the whole process.

Of the two, however, quality is more important as it is a major factor in the editing process.

"In the beginning, editing was done manually, just by hitting the record button and then re-recording. As the work became involved, the next progression for accuracy was a Tape Editing Programmer. But it controlled only one recorder and we needed control of more. So a natural acquisition was RCA's Time Code Editor (TCE). Right now, our TCE controls the two PAL/SECAM recorders. Eventually the TCE will be used with three VTR's and a four-track audio machine."

Once the master tape containing the raw recorded material is obtained, the TCE becomes an indispensable tool, not only sequencing segments but also adding certain effects that can't be achieved with a switcher alone. Special graphics, for example, can be shot and then inserted; or, invisible edits can be made to animate graphics.

According to Jacqueline Jeannert, VTR Supervisor, "The flexibility, speed and accuracy of our videotape editing is made possible by the use of the TCE, which is available for the first time in a private company on the Continent.

"The VTR's are equipped with single-frame edit electronics and synchronized four-track audio. With the TCE capabilities and those of the TR-60's, we have the ability to do complex post synchronized audio assembly and full animation."

Production Manager Patricia Guary likes the scheduling flexibility the TCE technique allows. "The TCE is part of the solution to any scheduling problems. For example, one day we can concentrate on location shots; the next day, complex graphics. Or we can do live studio work as the schedule permits. The TCE lets us put each segment in its proper sequence at some other time."

The production people use the Time Code to make their editing decisions. Here, briefly, is how they do it. Either simultaneously or after recording a one-inch helical dub, a copy is made with the time code converted to a character display and inserted in the picture. Hours, minutes, seconds and frames are displayed. As a result, the producer—using a helical machine with slow motion and stop motion capabilities—can log exactly where edits are to be made.

Back in VTR, the editor takes the prepared list of times and programs the TCE to edit

the master tapes. With the TCE locating the start and stop points and cueing the two machines in advance, each segment can be previewed or edited. Both tapes start and synchronize, and at the edit point the record machine switches to the edit mode.

At the end of the insert, the record machine switches to play mode at which point both machines can be stopped. Editing is accurate to the frame, which much of the technical program content requires to insure accuracy, especially when editing involves music or speech tracks.

Controlling the Interface

As in most production processes, the control rooms are the nerve center. Data's Studio A in PAL utilizes a 16-input RCA TS-51 production switcher to which all live camera, telecine and tape signals are routed. This switcher is also employed to produce color backgrounds, computer sub-titles and special effects with a Telestrator light pen. One input is reserved for signals from Studio B to allow even more production capability.

Including two sets of special effects and two chroma/external keys in cascade, the TS-51 allows wide operational flexibility.

Efficiency is enhanced with use of a dial access to expedite distribution. It can switch video and audio from any source to all areas without causing interference.

Utilizing the results from such sophisticated equipment, the production people can deliver an end product on a par with that from film houses.

Although Datacommunications' physical installation is highly sophisticated, it's basically designed to facilitate production. This is a real plus, especially since a client's training personnel are apt to become involved in the creation of a program. Which is a new role for customers as the educational TV business is a young one in France.

Seeing the marketing opportunity involved here is what led Datacommunications to expand its facilities with a full complement of RCA equipment. However, the company soon recognized that providing software programming was also essential to success of the new venture.

Mainly at the request of clients, Datacommunications responded. It created a software programming department with two primary activities: field service such as

organizing clients' training departments; and production of general education programs made available on a subscription basis.

To provide further convenience to the overall concept, Datacommunications also developed a leasing arrangement for playback systems. On the 1-inch helical scan format, they are based on the modular concept and thus provide great flexibility in accommodating companies and institutions of all sizes.

Commercial work is also part of Data's activities, meeting production requirements for European advertising agencies and broadcasters. And with an eye to the foreseeable future, the company hopes to make its services available on a worldwide basis by installing microwave facilities tied into a satellite network.

A New Video Service Comes to Paris

Paris' Gare de L'est district is close to the hub of the French movie and TV industries—and the home of VCI.



Paralleling developments in the States, the video market in Europe is also getting itself together. A prime example is a recent merger. Three separate TV-oriented companies in Paris have joined forces and emerged as Video Cassette Industrie (VCI). It offers a combination of far-ranging television services, including a post-production function in which broadcast equipment is playing a major role.

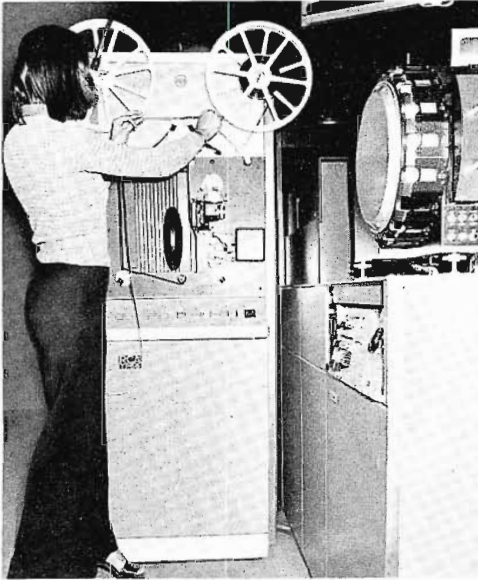
There are three divisions: VCI Technical Service is responsible for the maintenance and compatibility of any video network and the adjustments necessary to its operation. VCI Engineering Service provides the technical and commercial engineering for the establishment, development and operation of any video system. And VCI Video Laboratory is the postproduction arm, offering specialized services which indicate the new directions tape is taking in an expanding video market.

The parent company, VCI, was created by Albert Knobler, President, and Guy Job, General Manager, originally users of the list of services the newly organized firm offers. They feel the merger reflects a natural progression toward filling emerging needs in the entertainment and visual communications industries.

What's more, an objective observer might add that the move seems to foretell how the satellite segment of the broadcast industry should develop in France and elsewhere in Europe.

Significant is the fact that the lion's share of VCI's investment money is earmarked for the acquisition of technical facilities for the postproduction division.

Before the merger, this part of the company was already outfitted with RCA highband TR-60's and a Tape Editing Programmer. Desiring to increase the quality of its services, VCI recently added an RCA TK-28 film chain, which was on show at the Montreux technical exhibition earlier this year. Besides enabling film and video to be combined economically, it makes color reproduction corrections—automatically—right at the film-to-tape transfer point.



VCI's newly acquired film chain. The TK-28 camera, providing automatic correction of color film errors, helps maintain a consistently high quality end product.

The VTR's and editing equipment are also vital to providing additional high quality services. They include: revisional treatment and duplication of quad tapes, conversion and recording to multi-standard requirements and cassetting.

The TR-60's are equipped with PAL/SECAM/NTSC switchable standards. So, in conjunction with standards conversion equipment, they give video tape a new dimension as an important release medium.

Meeting all color transmission standards, the Laboratory can thus make it possible for program contractors to market tape instead of film in countries with different line standards.

Their work in this area also includes dubbing in foreign languages. Here again, the TR-60's demonstrate their special capabilities for postproduction work. "We take the raw tape footage," explains VTR operator Jean Paul Fouche, "make an edited 'master' with original sound track left untouched and play it back. Then, we insert a new audio track from a sync tape." Mr. Fouche cites the advantage of the operator-oriented control panels of the TR-60's as a further aid to insuring efficient operations. Record and playback controls are grouped and separated to eliminate any possibility of error in doing such work.

Helping increase the Video Laboratory's volume of postproduction work is the RCA Tape Editing Programmer (or TEP) which is used to its fullest capability. Extending the usefulness of the VTR's, the TEP helps keep the Video Laboratory's services competitive with film production. By allowing the insertion of additional material, such as special graphics or animation for a certain effect, this editing device gives them a speed and control advantage.

The TEP is hooked into the second TR-60. Dubbing from one to the other, the operator reassembles shots from a master reel and records them on the second machine.

Future Markets

VCI is also thinking about additional post-production facilities to suit coming needs. To become even more competitive with commercial film houses, more sophisticated video production tools are deemed essential. Thought is being given to acquiring a production switcher to provide special visual effects advertisers would desire.

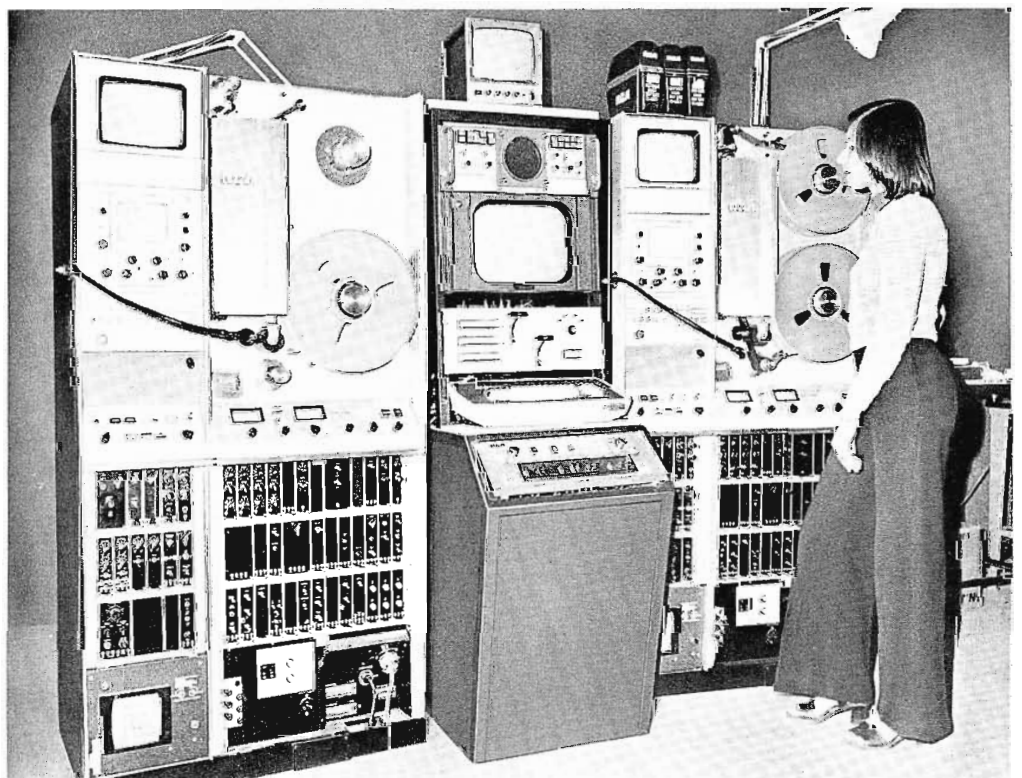
Management is also looking at distribution of tapes for uses other than TV broad-

casting as an expandable business in the educational, medical and private entertainment fields. At one time, film or tape-to-film transfers would have been the release medium. However, videocassette players are becoming very popular in this segment of the visual communications markets. And, with highband recording techniques allowing the creation of many generations from a single master, video tape becomes a distributional reality.

In response to current requirements in this area, VCI Video Laboratory also offers transfer and duplicating service for 2 in. tape reduced to 1/2 in. and 3/4 in. cassettes.

It is already providing this service for a large network of videocassette units in physicians' offices, and is making moves to do the same thing with entertainment cassettes for a major hotel chain.

The postproduction area of television's expanding intra-industry is growing rapidly. As demonstrated by VCI, a major factor for its success is that developments in broadcast hardware are also keeping pace with postproduction techniques.



TR-60's, shown with Tape Editing Programmer, meet multi-standard requirements.

CFTO-TV "On-Location" in Greece Televising Miss Universe Pageant Is Not All Fun and Games

The Outside Broadcast crew of CFTO-TV, Toronto, thrives on tough assignments. Producing the Miss Universe Pageant for television during the heat of summer in Greece again tested the mettle and ingenuity of the crew.

Bob Rose, Engineering Liaison Supervisor for the OB staff writes:

"The primary job was to televise the Miss Universe Pageant which was staged in the ancient Herod Atticus Ampitheatre at the foot of the Acropolis overlooking Athens. We used six TK-44 cameras and two tape machines.

"Temperatures in the theatre ran as high as 120° during the day. Working conditions with the heat, dust and language problems were extremely difficult. For a control room we built a plywood house and air conditioned it. Power came from 50 kW generators driven from England.

"The secondary shooting site for the Pageant was on board a 16,000 ton cruise ship from which we shot pictures of the girls in swim suits against Greek Island backgrounds. This was all accomplished in one day, using two TK-44 cameras and one tape machine."

A second assignment for the CFTO OB unit in Greece was for ABC's Wide World of Sports, covering the World Championship High Diving competition at the Olympic pool in Athens. Camera-positioning proved to be interesting, particularly since some of the dives were from a 100-foot platform. Bob Rose tells why:

"One camera was suspended from a crane in a specially built cage approximately 180-foot above the ground, shooting down on top of the divers on their 100-foot platform. For full coverage, we used five cameras, including a hand-held version which we have constructed from a regular TK-44."

The accompanying pictures, taken by members of the CFTO OB crew, show some of the "behind-the-scenes" activity on-location in Greece. While it wasn't all fun-and-games for the hard-pressed staff, their clients were pleased with the results.



Preparing for televising the Miss Universe Pageant, production staff surveys setting at Herod Atticus Ampitheatre.

The cameraman's lot was not an easy one, working in sundrenched 120° daytime temperatures in the Ampitheatre. Cameras and operators held up well under the difficult conditions.

Two TK-44 cameras and a tape machine boarded a luxury cruise ship to televise Miss Universe contestants in swim suits. The cameras and one of the fair ladies are shown during a lull period.



A "house"—complete with air conditioning—was constructed in the Ampitheatre for the Control Room gear.



CFTO camera lines up on 10-meter board at World High Diving Championships in Athens.



This platform for mounting TK-44 camera looks innocuous enough on terra firma. During the Diving Championships, it was suspended from a crane, 180 feet above ground, shooting down on the 100-foot diving platform. The parasol provided a small creature comfort for the cameraman on his precarious perch. Red trucks in background are power generators.

The automated VHF transmitter.



The real thing...not just a remote possibility.

The entire "F" line of RCA transmitters is now automated.

So they need far less operator attention.

Every tube not absolutely essential was designed out. That means fewer tubes model-for-model than any other VHF transmitter.

We took out as many tuned circuits as possible. For instance, our totally solid-state IPA has no controls to drift or adjust.

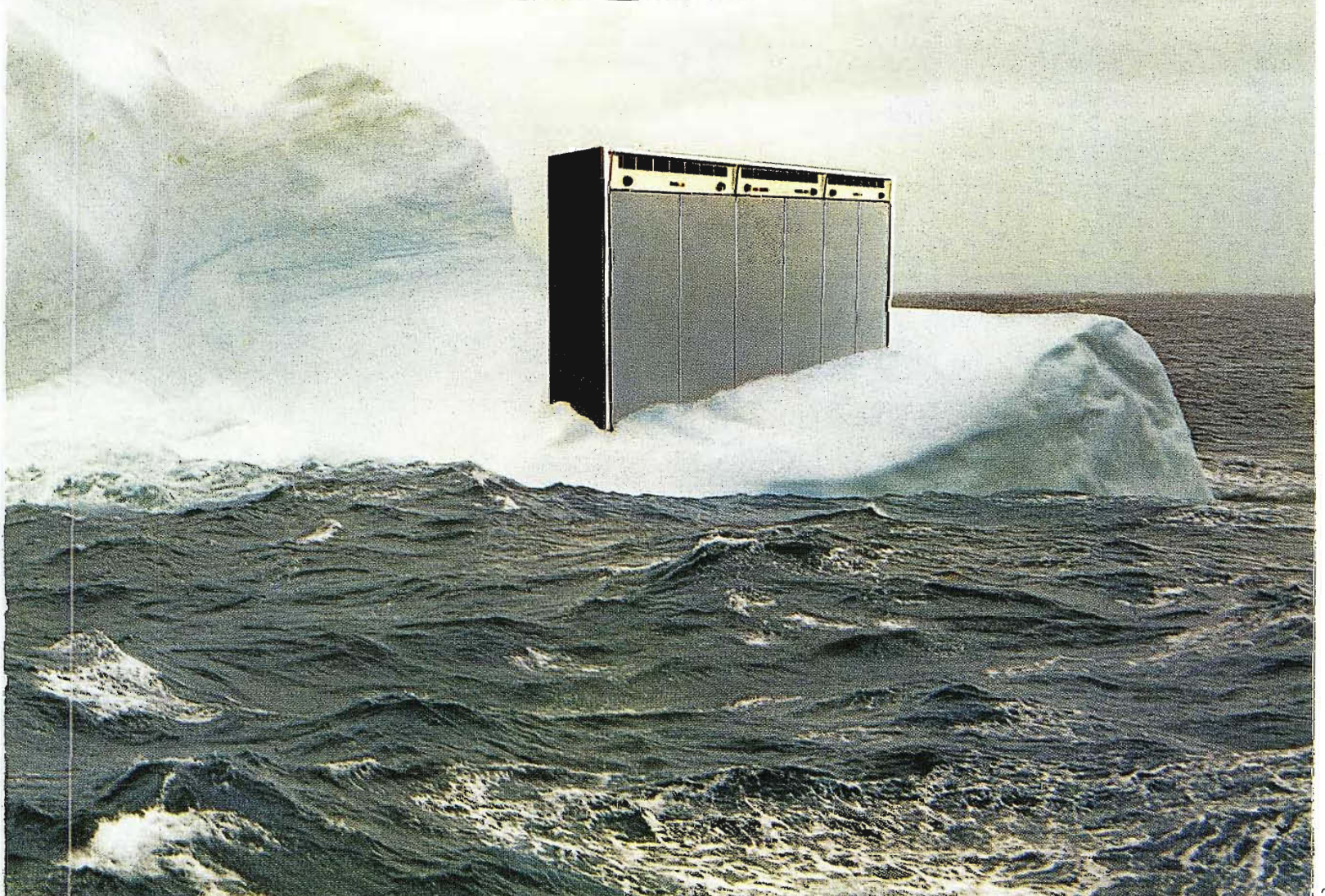
We deleted all the blowers except one. And that cools the whole transmitter.

Then we added automatic control of output power and sync level so you don't have to readjust power.

We topped it off by building in the functions you need for complete remote control.

Result: transmitters that require less attention. Wherever they're stationed.

For further details, write RCA Broadcast Systems, Bldg. 2-5, Camden, N.J. 08102. Or see your RCA representative.



New Alternate-Main Transmitting Plant At WAGA-TV Features Twin Parallel Transmitters

WAGA-TV, Ch. 5, Atlanta treats TV transmitters as long-term investments. This Storer Broadcasting Company station went on-air in 1949 with an RCA TT-5 transmitter. In 1952, power was increased by the addition of a TT-25AL transmitter, with the TT-5 serving as the driver. With continuing up-dates and effective maintenance programs, this durable workhorse was still providing yeoman service in 1972 when it was replaced by two TT-30FL 30 kW transmitters operating as an Alternate-Main system. This arrangement makes lost air time a virtual impossibility. The transmitters operate at 19.4 kW output, in conjunction with a six-bay Superturnstile antenna to provide the authorized 100 kW ERP.

The Alternate-Main method of transmitter operation is becoming more popular with TV broadcasters, particularly with the trend toward extended programming—with 24-hour operation already in effect at a few stations.

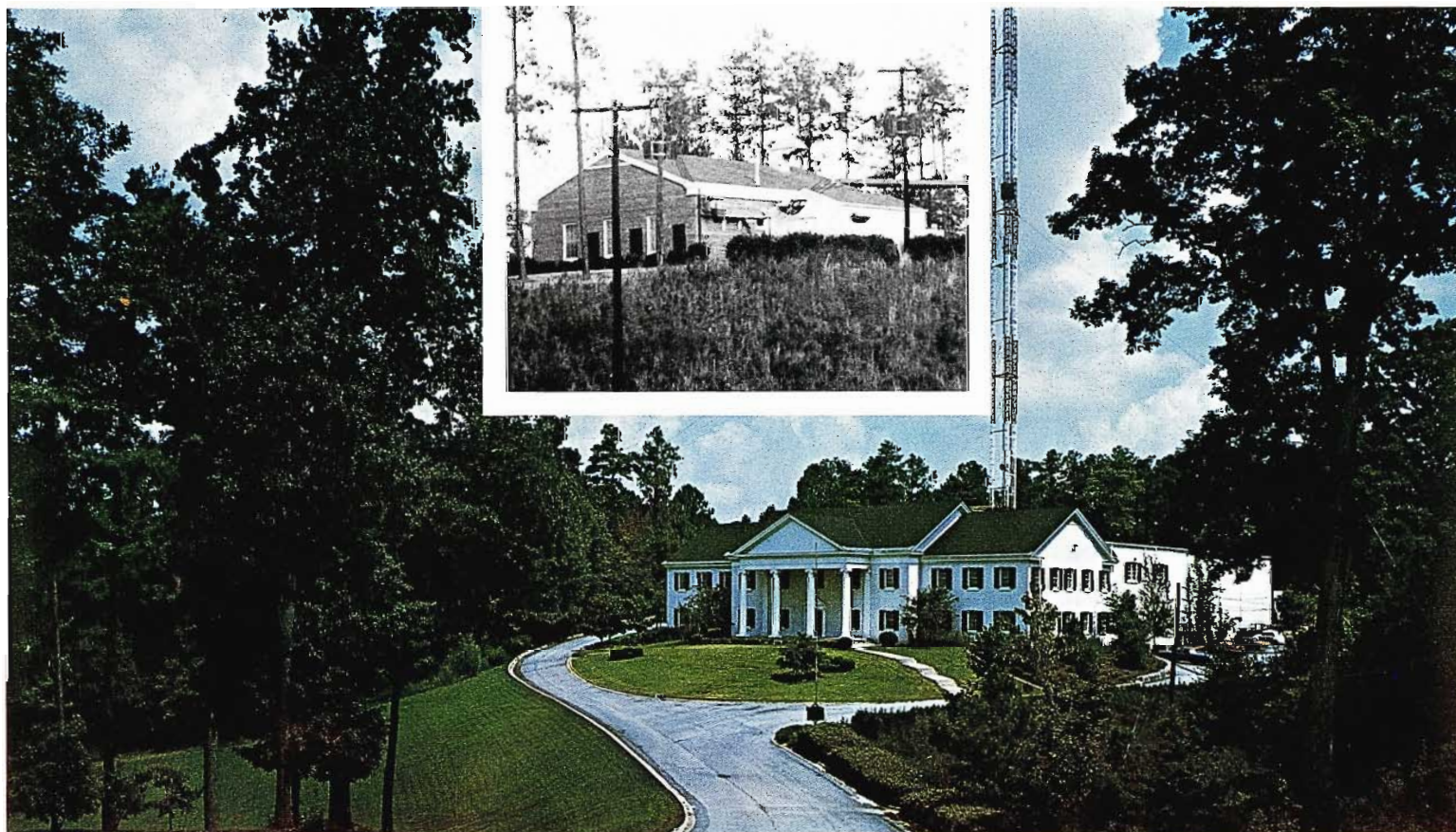
At present, WAGA goes on-air at 5:20 AM, and programming continues until the 2:00 AM sign-off. At times, even this has been extended with after-midnight "double-features". The transmitters are operating between 21 and 22 hours a day. This, of course, is no problem for the Alternate-Main transmitter operation, and even 24-hour a day schedule would be accommodated without strain.

Since the transmitters went on-air September 12, 1972, they have measured up to the high performance standards expected by WAGA's Chief Engineer, Hugo Bondy.

There has been absolutely no lost air time. The color signal is vastly improved. The transmitters provide excellent stability. Tuning is simplified—accomplished in a matter of minutes instead of being a full evening's work. And, maintenance is a routinely scheduled procedure.

The wait for a new transmitting plant was a long one, but Hugo Bondy is glad that the buying decision was deferred until the new generation solid state transmitter

In 1955, an omnidirectional TF-6BM, six-section Superturnstile antenna was installed on a new 1017 foot tower which was erected on a then-remote hilltop in the Druid Hills section of suburban Atlanta. At the same time, the TT-25AL transmitter was moved to the new location (inset picture). By 1966, this commanding but bleak 28 acre site was transformed into the magnificent 53,000 square foot facility which now serves as WAGA-TV's studio, operations and administration center.



designs such as the TT-30FL were developed and field-proven.

Planning the installation was a coordinated effort, involving both the WAGA engineering group and the corporate engineering staff. Clem Castle, Director of Engineering for Storer had a major role in developing the RF "plumbing" layout for the new system.

Because the installation of the new transmitters had been carefully planned, it came off smoothly, and with few surprises. Once the system was placed in operation and settled down, problems turned out to be minimal. The dual parallel transmitters provide maximum protection against lost

air time. If both "A" and "B" sides of one transmitter went out, a switchover to the alternate is completed in a matter of seconds. Even in the remote contingency that one side of the remaining transmitter also failed, operation could still continue at reduced power.

And WAGA takes extra steps to keep their signal on the air. For example, during last winter's severe ice storm which cut off power to most of the area, WAGA was the only Atlanta station able to maintain its broadcasting schedule. The emergency power was supplied by a pair of powerful diesel generators installed for such contingencies. These produce 550 kilowatts

on the line in four seconds in the event of power failure.

In addition, this Alternate-Main system permits handling maintenance on a routine basis. Spare parts stocking is simplified, since each 30kW transmitter uses only five tubes of three types. In fact the spare parts inventory ordered with the transmitters is still intact, since both transmitters are still operating with their original tubes. (As of August 22, 1973, the final power tube on the main transmitter had recorded 7335 filament hours.) In performing system checks, the operating transmitter serves as a model for obtaining duplicate meter readings and measurements.



Old and new transmitter control consoles. Light above transmitter (right photo) indicates that it is On-Air.





The two new 30 kW TT-30FL transmitters occupy less floor space than the TT-25 and TT-5 which they replaced. This "bonus" space in the photo above is being refurbished and will be occupied by the video tape operation which is scheduled to move from typically cramped quarters next to Master Control.

Easier tuning is a feature of the TT-30FL which Senior Transmitter Supervisor John Bassett finds appealing. Tuning can be accomplished in 10 minutes or less, as contrasted with previous transmitters utilizing tube amplifiers and many more tuned stages.

System performance, Mr. Bassett notes, shows a substantial improvement. Stability is excellent, and the differential phase for the overall system, including video switching stays between 1° and 1.1 or 1.2°.

Storer corporate engineering in Miami asks for monthly Polaroid shots of the

performance of both transmitters. These are compared with a master set made in November, 1972. Pictures required include:

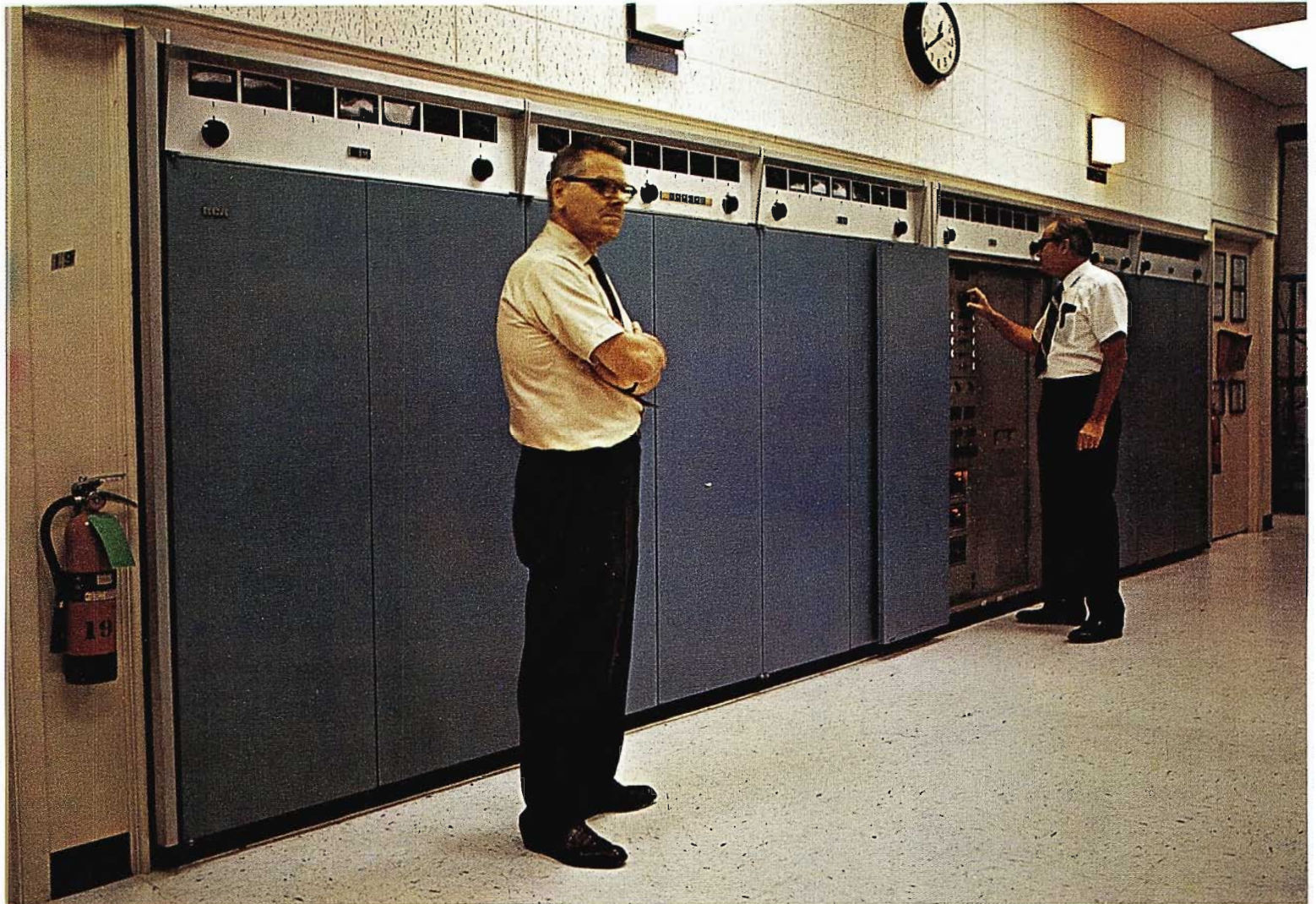
- Video response
- Window
- 2T Pulse
- Differential Gain and Phase
- RS Demod.—Stairstep and multi-burst

For identification purposes, WAGA has designated one transmitter (the left one when viewed from the transmitter console) as the "MAIN", with the second being

designated "ALTERNATE". The large white light above each transmitter leaves no doubt as to which is "on-air". The filaments and control voltages on the standby transmitter are always on, so it is ready for instant operation if needed.

Hugo Bondy encourages his engineering staff to be creative in devising systems and products to meet WAGA's specific needs. Indicative of this application of talent is the fact that the station's Studio "A" audio board as well as all video distribution amplifiers, video switcher, relay decks, video cross bar switchers, audio switchers

and The New



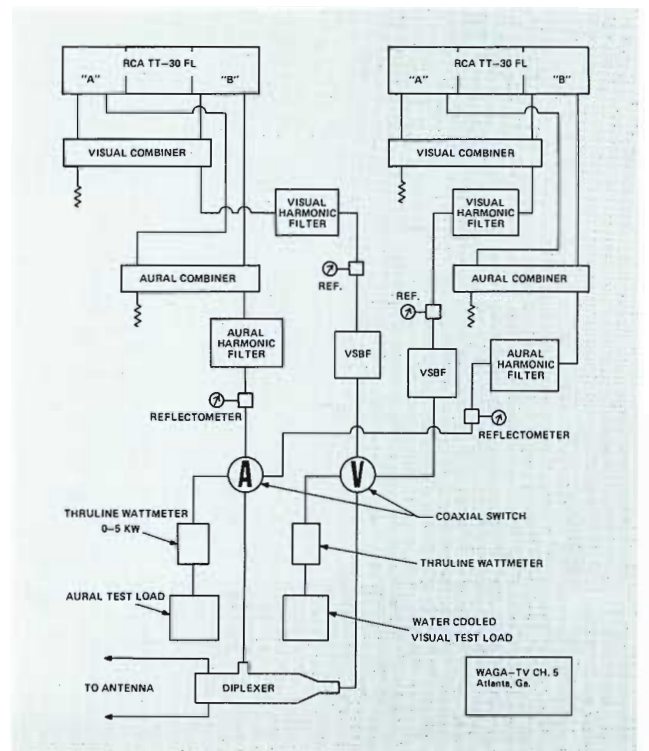
Chief Engineer Hugo Bondy (left) started with Storer Broadcasting in Miami in 1946 for a brief 6-month stint. In 1951 he re-joined the Storer corporate engineering group in Detroit. His association with WAGA-TV began shortly thereafter when he was assigned to work on the station's then-new studio building on West Peachtree Street. After construction was completed, Hugo stayed on at TV-5 and has been there since 1952.

and distribution decks and other equipment have been designed and built by WAGA-TV engineers.

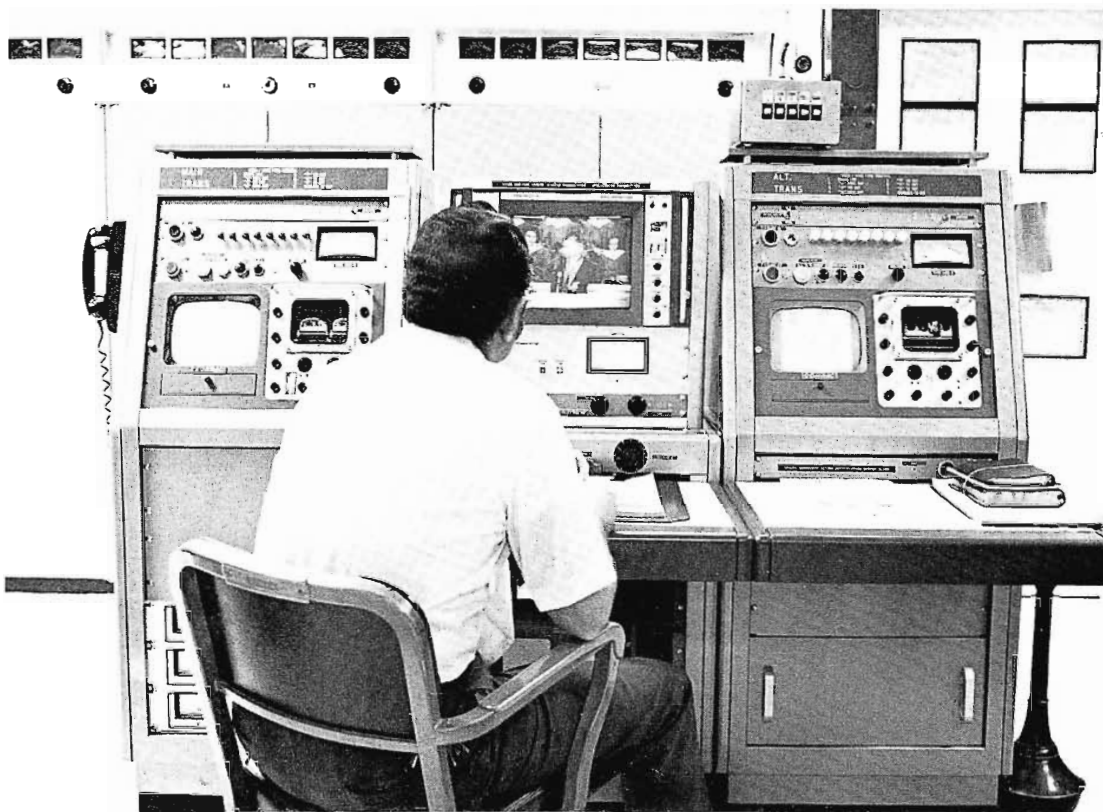
Not surprisingly, therefore, the Ch. 5 engineers added a few wrinkles to the transmitting plant installation. The custom console provides complete control of major transmitter functions for both transmitters. From the console, the transmitter engineer can monitor the output of the on-air transmitter and can effect the complete changeover manually.

For emergency situations, such as the loss of one or both sides of the on-air trans-

Block diagram—RF output, switching and combining system at WAGA-TV.



Complete control of On-Air and Off-Air transmitters is provided at the WAGA-TV console.



mitter, the system is set up for automatic changeover.

Each side of the console is dedicated to one transmitter. The pushbuttons on the top panels permit making the switch from one transmitter to the other smoothly, and with full protection through a special interlock system also developed by WAGA engineering.

This relay-logic system protects the transmitter and the dummy load by making sure the dummy load water is circulating and that power settings are correct before the switch can be accomplished.

The system also functions during switchover so that a 5-second delay occurs before the changeover from one transmitter to the other is made. This built-in time delay assures complete cycling for the aural and video coaxial switchers to be certain that voltage is not applied too soon.

The system is tied in with the internal interlock system incorporated in the TT-30FL transmitters. The readout on the front cabinet of the transmitter also gives visual indication when the dummy load water circulation is OK for system operation.

The off-air transmitter is always connected to dummy load, and always has power on the filaments as well as control voltages.

Separate sideband filters are used for each of the transmitters. In making the transmitter switchover from the console position, audio and video are fed simultaneously to both transmitters. The "swap" of Alternate-Main transmitters is made weekly, usually at Sunday morning sign-on.

The transmitters will go on automatic logging as soon as the print-out equipment is delivered and checked out.

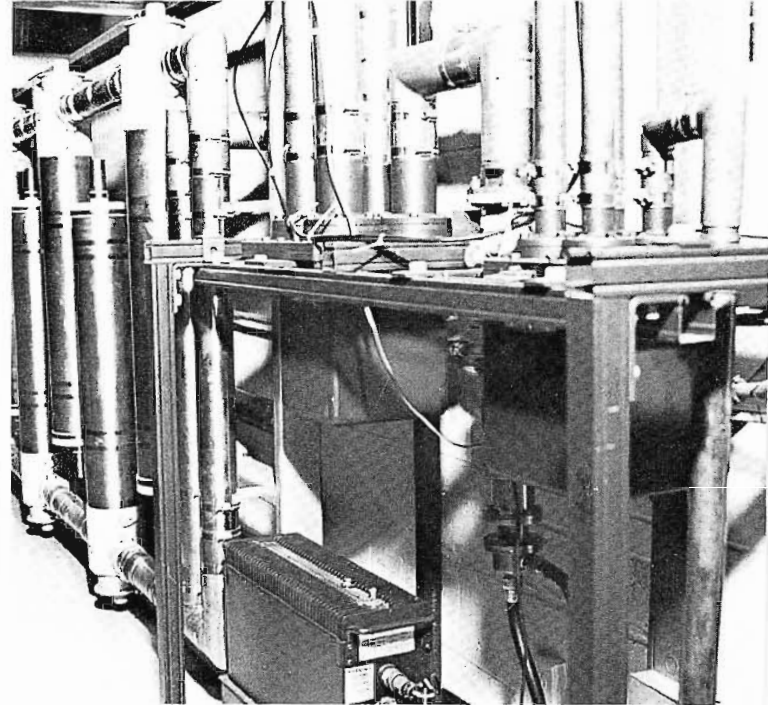
In going to the dual parallel transmitting system with Alternate-Main operation, WAGA-TV has made another long-term investment. The correctness of this approach is evidenced in the flexibility of operation; in the complete protection against outages, and in significantly improved system performance.

And, as a result of the success of the WAGA-TV installation, Storer Broadcasting Company is now installing a similar twin TT-30FL transmitting system at WJBK-TV, Ch. 2, Detroit.

Close-up of left console control panel showing controls for monitoring output and for accomplishing transmitter changeover.



Filterplexer, coax switching system and dummy load.



Operation of the WAGA-TV Transmitter Changeover Panel

If the MAIN transmitter has been on the air and for one reason or another you wish to place the ALTERNATE on the air and thereby place the MAIN on the Dummy load and immediately run tests, follow this procedure:

1. You have started up the ALTERNATE transmitter and it has gone through its normal starting cycle.
2. Operate the MAIN TX PA PLATE OFF pushbutton on the console (or on the transmitter).
3. Operate the MAIN TRANSMITTER TO DUMMY/ALTERNATE TRANSMITTER TO ANTENNA pushbutton on the MAIN transmitter console control panel . . . or PB-2 on the transfer panel. This will connect the output circuit of the MAIN transmitter to the dummy load and the output circuitry of the ALTERNATE transmitter to the transmission line.
4. Operate the ALTERNATE transmitter PLATE ON pushbutton on the console . . . or the transmitter. This should place the ALTERNATE TRANSMITTER ON THE AIR.
5. After the timing cycle has been completed (three minutes) operate the MAIN transmitter PLATE ON pushbutton on the console (or on the transmitter).

Reverse the above procedure if you wish to place the MAIN transmitter ON THE AIR and the ALTERNATE transmitter on the dummy load as follows:

1. You have started up the MAIN transmitter and it has gone through its normal starting cycle.
2. Operate the ALTERNATE PA PLATE OFF pushbutton on the console (or on the transmitter).
3. Operate ALTERNATE TRANSMITTER TO DUMMY/MAIN TRANSMITTER TO ANTENNA pushbutton on the ALTERNATE transmitter console control panel . . . or PB-1 on the transfer panel. This will connect the output of the ALTERNATE transmitter to dummy and the MAIN transmitter to the transmission line.
4. Operate the MAIN transmitter PLATE ON pushbutton on the console . . . or the transmitter. This will place the MAIN TRANSMITTER ON THE AIR.
5. After the three minute timing cycle has been completed . . . operate the ALTERNATE transmitter PLATE ON pushbutton on the console . . . or on the transmitter.

WEDH, Hartford, Packs New Power To The People

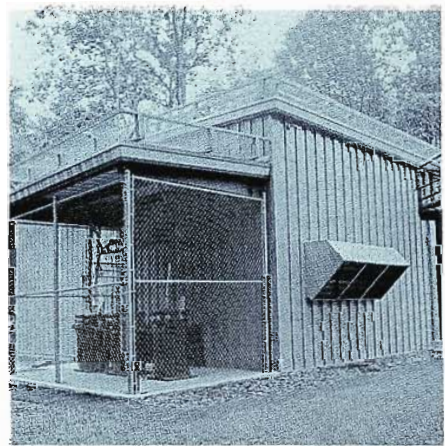
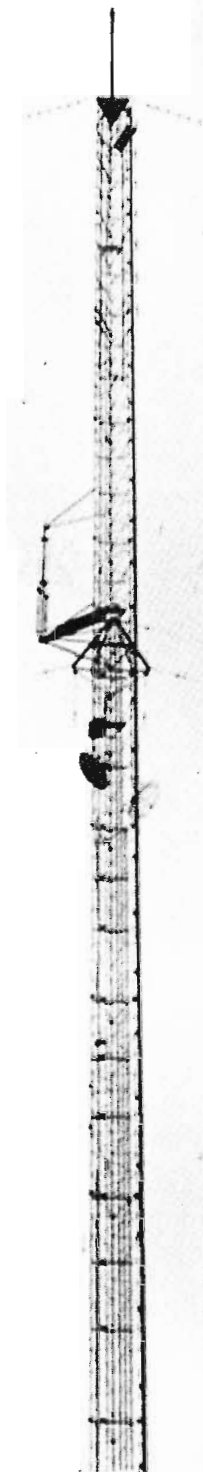
Connecticut Public Television

CPTV is now a 5-station public television network, including:

- Ch. 24—Hartford
- Ch. 71—New Haven
- Ch. 49—Bridgeport
- Ch. 53—Norwich
- Ch. 61—Waterbury

Flagship station WEDH, Ch. 24 began operating on October 1, 1962. Approval for the latest network station, Ch. 61, Waterbury, was received in October 1973, with an anticipated air date of February 1, 1974.

CPTV studios, production facilities and staff are located in a separate Broadcasting Center located near the campus of Trinity College, Hartford.



New pylon antenna for Ch. 24 soars high in the Connecticut sky, delivering a clear, clean signal to the Hartford area. Inset is the metal pre-fab building which houses new 60 kW UHF Transmitter.

For Connecticut Public Television, the past five years have been replete with accomplishments for providing better service to its statewide audience.

When the CPTV flagship station, WEDH—Ch: 24, Hartford—cranked up its new 60 kW transmitter and antenna system earlier this year, it marked yet another milestone in this continuing parade of improvements in facilities and programming.

The new TTU-60 BX is the first installation of a 60 kW UHF transmitter with built-in standby capability to meet current FCC requirements for once-a-week inspection. This is also the first 60 kW transmitter which is solid state through the IPA stages. The aural and visual klystrons are the only tubes employed in the system. The transmitter is a replacement for the 12 kW plant installed in 1962 when Ch. 24 went on-air.

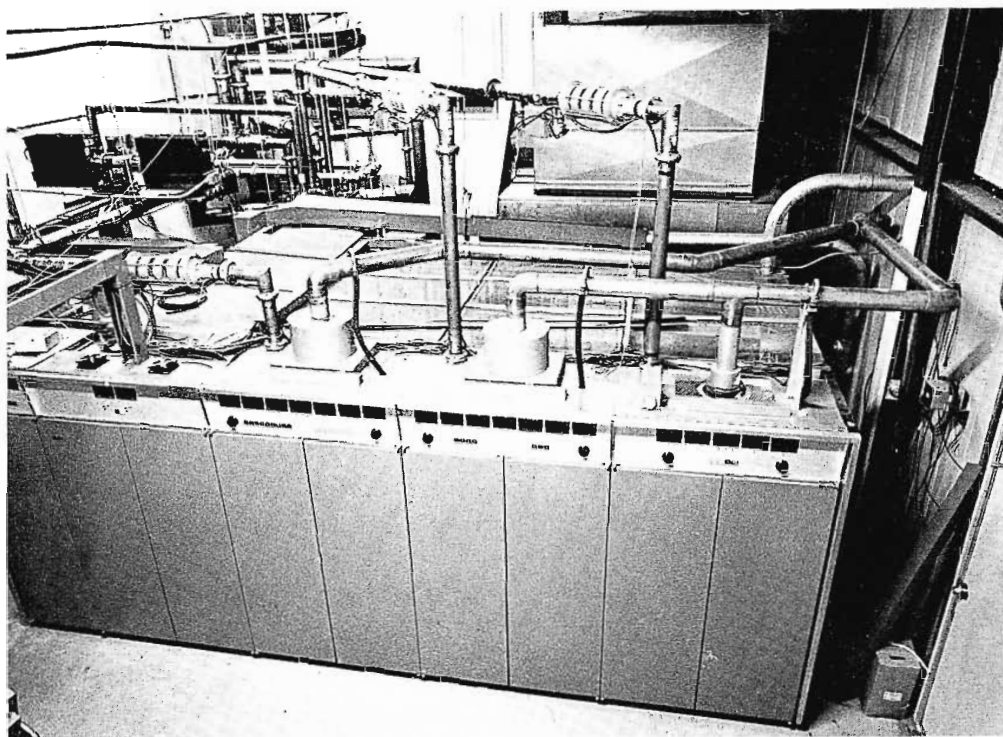
"Phenomenal improvement in signal clarity"

The original antenna was also replaced by a new UHF Pylon, Type TFU-20J. This omni-directional antenna, designed to fill in null areas solved a coverage problem and resulted in a "phenomenal improvement in signal clarity", according to Jack Kean, Vice President, Engineering for Connecticut Public Broadcasting.

The antenna provides heavy signal strength in the first 10 miles—from 100,000 to 500,000 microvolts, and the signal power is doubled for many areas beyond the 10-mile zone. This coverage pattern permits excellent signal reception to all of Hartford, including the densely populated disadvantaged areas—without need for rooftop antenna installations. Even when the side-mounted temporary antenna was in use while the TFU-20J was being mounted on the existing tower, the improvement in signal strength was significant, with many viewers calling in to comment on the better quality pictures being received.

Transmitter remote control operation

Since the remote transmitter operation eliminates the daily routine of sending a man to the transmitter site to make checks and perform minimum calibration functions, Ch. 24 is able to make more productive use of this available time. At the Ch. 24 studio, for example, the BTR-30A transmitter remote controls are located in Master Control, near the VTR area. With the new once-a-week inspection routine, one man can handle transmitter main-



Overhead view of WEDH's TTU-60BX Transmitter—first 60 kW UHF transmitter with built-in standby power capability to meet FCC requirements for remote operation with once-a-week inspection.

Jack Kean, Vice President of Engineering for Connecticut Public Television. In background is Administration Building and central production facility for statewide television network.



Rolling Camera Control Consoles designed by WEDH provide extra flexibility. Three TK-44 cameras and rolling CCU's are used with the CPTV mobile unit, and three more in the studio.



tenance on a part-time basis, and also assist with some studio/control room maintenance functions.

Jack Kean indicated that he had been considering the possibilities of remote transmitter operation for several years. A complete standby transmitter system would have been an ideal solution, but not with the budget limitations of a non-commercial station. The TTU-60BX with standby power option provides much the same capability at a considerably lower cost. It is a single-ended 60 kW transmitter with spare exciter and a switching arrangement with the aural and visual klystrons which permits meeting the 20% standby power requirement of the FCC for once-weekly inspection.

The changeover can be effected in a matter of 3 seconds and can, of course, be remotely switched from the studio.

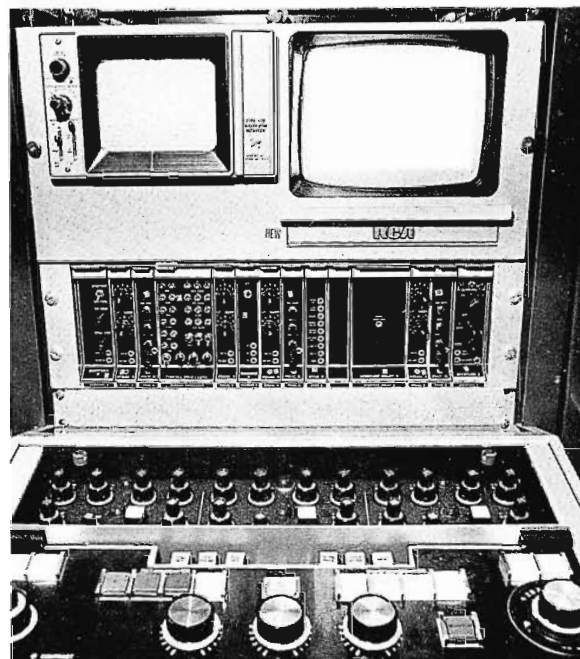
If one visual klystron went out, the switch-over would cut output to $\frac{1}{4}$ power, with half the power of the remaining visual going through the diplexer to the antenna and the other half to the reject load. Should the aural klystron fail, the #2 visual is manually switched into aural service. The #1 visual then puts out $\frac{1}{4}$ power through the diplexer, and the station remains on air. Vacuum relays are used to disconnect beam voltage from the failed klystron.

A long way in five years

From a marginal monochrome operation in an old classroom building on the Trinity College campus, just five years ago, CPTV has come a long way. Particularly so since Connecticut Educational Television Corporation (its legal designation) was the first privately owned statewide PTV network in operation in the U. S. While partial funding is obtained from the Legislature on a year-to-year basis, CPTV is not a State agency.

In 1968, the CPTV studio was housed in a room which had been used for lectures, with a slanted floor built on 10-inch wooden beams. The film island mounted on the beams picked up vibrations which were transmitted as picture jitter. The system at this time also included three monochrome cameras. There was no color, and except for off-air pickup, no network programming.

This was the technical facility when Jack Kean became Chief Engineer of Connecticut Public Television in 1968.



Close-up of Camera Control Unit for WEDH. Consoles feature quick disconnect/connect facilities so all six color cameras can be used in studio or on remotes.

It was, in his words, "a challenge and an opportunity to upgrade a statewide PTV network to modern day standards." Under his guidance and with the active support of CPTV President Paul K. Taff, rapid progress is being made toward completing the network while improving both the technical facilities and the programming quality.

When Paul K. Taff became President and General Manager of Connecticut Educational Television Corporation in 1970 his career experience provided ideal training for the responsibilities of the job. His previous assignments covered management, operations and program development.

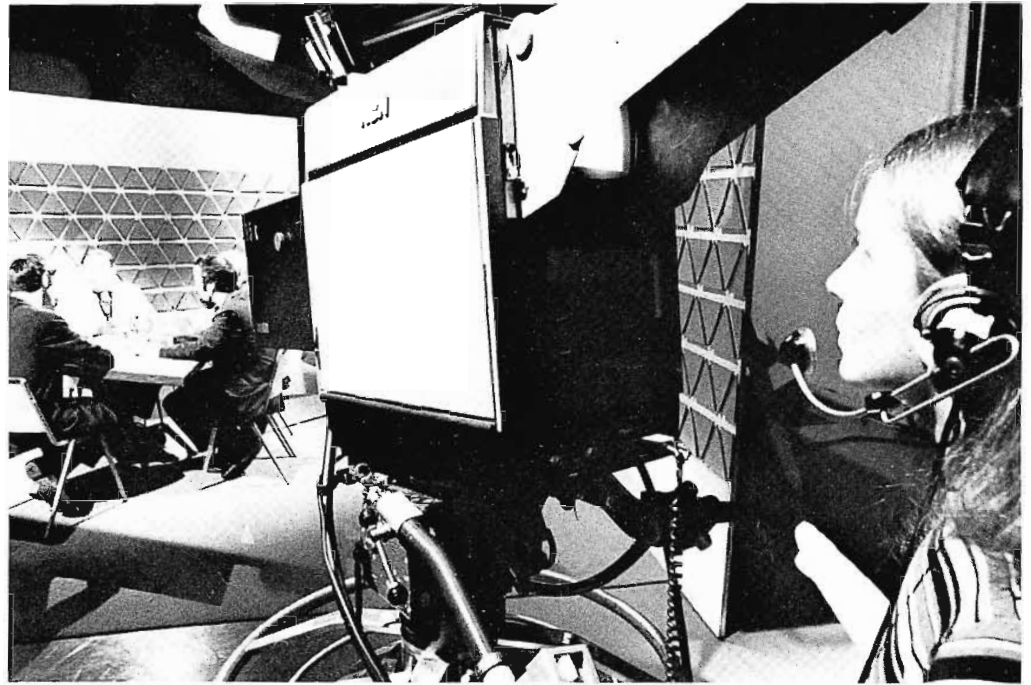
Prior to coming to CPTV, Mr. Taff was associated with National Educational Television as Director of Children's Programs. As an executive producer at N.E.T., Mr. Taff directed the creation and production of a number of widely acclaimed programs, including "Misterogers Neighborhood". He was involved in the original planning sessions which resulted in "Sesame Street", and is presently on the national Board of Advisors to the Children's Television Workshop. Before joining N.E.T. in 1960, Mr. Taff managed Milwaukee's non-commercial station WMVS-TV.

New cameras and video tape recorders

Along with the new transmitting plant, CPTV added this year two TR-70C Tape Recorders and six TK-44 Cameras. Three of the cameras are for studio use, and three assigned to the CPTV mobile unit. For added versatility, the Ch. 24 engineering staff designed special rolling consoles for the camera control units. This arrangement permits utilizing all cameras for studio or remote assignments. While three cameras are permanently delegated to the mobile unit, these can be easily removed, along with the CCU's to augment the three TK-44's in the Ch. 24 studio. Or two of the studio cameras and their rolling control units can be moved into the van, which carries a full complement of audio and video switching equipment, giving it a five-camera capability. The van roams the state (and even beyond on occasion) on assignments—special programs, sporting events, local coverage.

The TK-44B cameras have proved excellent in meeting this need, Mr. Kean affirms. Their color fidelity was expected, he notes, but "the stability of the cameras was beyond our expectations".

CPTV camerawoman focuses on FOURTH ESTATE panel, a weekly series featuring Connecticut editors and journalists who discuss top stories.



Increased emphasis on post-production facilities resulted in the addition of two TR-70C Tape Recorders at CPTV production center.



TK-44's shine in low light use

The easy set-up, plus the fact that the cameras provide better than acceptable color pictures under adverse lighting conditions (frequently necessitating the use of available light) make them superb for handling remotes. Again, according to Mr. Kean, the Scene Contrast Compression feature helps in bringing out detail in extremely low light level areas, such as crowds at indoor events.

Frequent use is made of the TK-44's for televising meetings of the State Legislature—most of which must be done under "available light" conditions which test the color capability of the cameras. Legislative sessions account for some 120 hours of CPTV programming per year.

The rolling camera control consoles designed by CPTV provide the flexibility needed to fully utilize the equipment. The CCU's are set up for instant mobility—fast disconnect and quick hook-up on site. To accomplish this, there are only five connections at the rear of the console: Power Cable; Camera Cable; Pulse Decoder (composite video out); Color-Black; and Tally and Intercom.

Environment control aids equipment performance

The Ch. 24 Master Control is cool, compact and reflects CPTV's updating efforts. The equipment in the room is a blend of old and new, carefully integrated for efficient operation. It includes: three new color live cameras; three monochrome cameras; three aging color film chains; five quad tape machines, as well as switching and terminal equipment.

The control room is air-conditioned and humidity-controlled, with large volume, slow-moving air throughout. A precipitator filters air, absorbs smoke and provides a better working environment for personnel and equipment. This controlled environment, coupled with a program of periodic maintenance, helps to extend the life of aging equipment as well as enhancing the performance of newer equipment.

The two TR-70C Tape Recorders were acquired because of the increased emphasis on post-production work, involving a need for several generations of quality tape. There is much less "straight-through" production now, Mr. Kean comments, with more video tape editing being done to achieve the desired result.

Mobile unit produces Coast Guard Band Concert

In developing a special July 4th program, for example, CPTV crews went to New London with the mobile unit to record and video tape the Coast Guard Band performing a Sousa concert. First, an audio recording was made of the band's performance "on the beach". The band then assembled on the deck of the Coast Guard training ship "Eagle", a 3-masted barque. The audio tape was played and the band "mimed" the action while TK-44 cameras televised the shipboard performance. Later one camera and CCU went to sea with the ship, along with a VTR, recording "wild" footage of the "Eagle" under full sail. This footage, along with other tape and film clips, was edited at the CPTV studio, providing exciting, appropriate visual accompaniment for the stirring Coast Guard Band music previously audio-recorded. The result was a moving, memorable program—one where the post-production artistry provided the creative impact. This program received national prime time distribution via PBS.

Programming: quality counts

Vigorous, energetic Anders (Andy) Yocom, Vice President, Programming, defines the role of CPTV as "A commitment to cultural programming—music, art, folklore, sports. Developing programming is a matter of matching the unfilled needs with what is available and what we can do well".

Instructional, cultural and public affairs programs dominate the CPTV schedule. Not only must programs produced by public television facilities such as CPTV be entertaining and enriching, Mr. Yocom observes, but they must match commercial offerings in quality of production. This means, he adds, spending extra time in production and using the best available equipment.

Representative of the programming public broadcasting can do well, according to Mr. Yocom, is a current CPTV production, "When Witches Hovered Near". This dramatization of 18th century legends about witchcraft was given national distribution by PBS during the Halloween season. The production included "on-location" and studio shooting, plus integrating considerable video tape and film footage—all of which was assembled in the WEDH studio.

A regular weekly show that fits into CPTV's function of filling a programming void is aptly named "Free-for-All". As the name implies, it's a wide-open opportunity for individuals or groups to "do their thing" on TV. The show covers the full spectrum of subject matter and performances—ranging from the serious to the zany, and all stops in between. (Of course would-be participants are advised and must agree to abide by basic broadcast regulations for decency, fairness, solicitations, etc.).

Lean, highly-motivated staff

Perhaps typical of public television organizations, WEDH is staffed with eager, involved young people. Possibly less typical is the fact that women handle many of the management and creative functions. They produce, direct, write, and also perform the "hands-on" jobs—handling cameras, master control switching, lighting. On remotes, they unflinchingly take on the tougher tasks such as pulling camera cable.

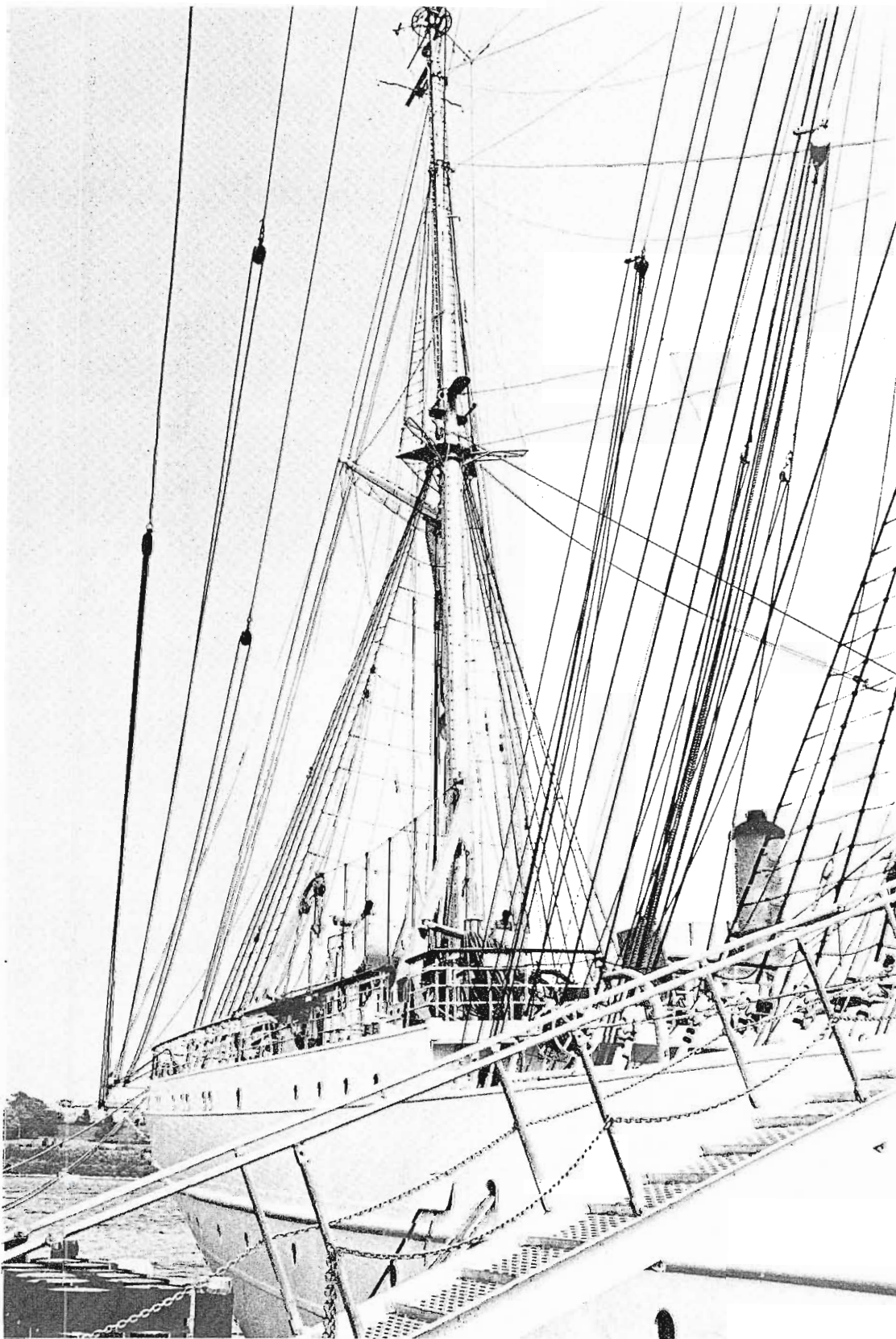
The broadcast day for CPTV begins at 8:00 A.M., with pre-school and in-school programming including, naturally "Sesame Street" and "The Electric Company". Programming continues until the midnight sign-off, with evening offerings from Public Broadcasting Service, Eastern Educational Network, and CPTV-originated productions.

Operating this schedule involves a surprisingly small organization. The total staff at CPTV—technical, creative/production and administrative numbers about 50. Augmenting this slim group are some twenty non-paid volunteers.

Looking forward

The challenge of building an ETV network for Connecticut is being met. Technical facilities and programming quality are being upgraded regularly. Sometime in the future, Mr. Kean would like to provide the capability for programming at other network locations, starting with New Haven and Bridgeport. Increased local interest programming, he feels, would have the desirable effect of stimulating community involvement and attracting more viewers. The technical manpower and equipment support would be provided by CPTV's Hartford headquarters staff.

In maintaining its growth program to offer better television service throughout the state, CPTV carefully plans equipment



purchases as long-term investments. John Kean firmly believes that non-commercial, non-profit public television facilities must be fully as quality-oriented as commercial broadcasters, since their product is available to the same audience and will be rated accordingly. However, the recognition of the value of quality equipment must necessarily be tempered with the realities of tight capital budgets. Purchasing must be done on a selective, "best available" basis, spreading equipment acquisitions over a longer period. In this instance, Jack Kean says, the end *does* justify the means, since he wants to end with an operation that is top quality in all respects.

A nationally televised (Public Broadcasting Service) program produced by CPTV had the Coast Guard Band on the deck of the training barque EAGLE performing stirring selections from John Philip Sousa.

New VTR Teleproduction Facility

TR-61: A Compact Quadruplex Video Tape Recorder With Fast Lockup And Headwheel Braking

by W. G. Trippel and
R. J. Marian

When we first conceived the TR-61, we knew the performance record of its predecessor would be a hard act to follow. The TR-60A already had much of our deluxe TR-70C production hardware, and its small size had proved ideal to users with compact mobile units and limited studio floor space. We were well aware of that fact and so were our customers, and we were not about to spoil a good thing. Our goal was to retain TR-60A compactness and flexibility, as well as price, while incorporating as many more of the advanced operational features of our big machine as physically possible.

The integrity of this concept was preserved partly by utilizing the same cabinetry and making only minor modifications in the placement of subassemblies.

To improve accessibility of controls, we stripped all covers from the face of the machine except those over the headwheel and power panel. This also gave us greater ease of handling during transport. All the FM and video electronics of the TR-60A, including head resonance compensation and full video processing were transferred directly to the TR-61. These are innovative, high-performance—hard-to-improve-upon circuits. We also borrowed the rear side erase heads, long life Alfecon II head material, the built in tape monitor sensor, guide servo, extensive picture and waveform monitor switching facilities, and the convenient panel layout. Then, as we had done in the TR-60A, we pre-wired the TR-61 to accommodate our complement of teleproduction accessories such as the electronic splicer, tape-edit-programmer (TEP), dropout compensator (DOC), chroma amplitude and velocity error corrector (CAVEC), and record current optimizer (RCO).

We could have stopped right there. But instead, we went all out and fitted our new TR-61 with a digital servo system identical to that used in the TR-70C reel-to-reel and TCR-100 video cart machines. This last stroke proved to be the pièce-de-resistance in pyramiding the TR-61 performance qualities to their present high level.

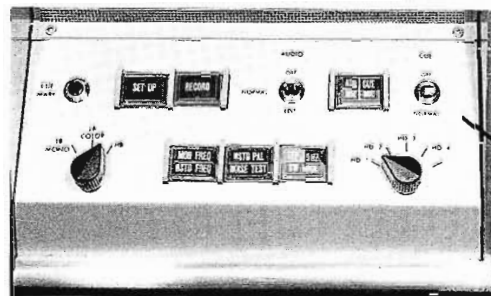
Digital Servo System

Big machine owners will recognize this unit. It is the integrated-circuit servo system which controls headwheel and capstan motors in the deluxe TR-70C. As the major addition to the TR-61, it opens a wide avenue of capabilities. First of all, the power and stability of the servo is such that the DC capstan motor used with it provides the exceptional lockup time of one second from standby mode, or two seconds from stop (PAL systems lock up in 1.5 and 2.5 seconds respectively).

Two other advantages offered by the digital servo are automatic braking of the headwheel motor and automatic peaking of FM response. The latter is brought about by use of the automatic control track phasing accessory (ACTP), a memory device that keeps the heads centered on the video tracks during playback.

The phenomenal stability of the servo is such that, without adjustment, you can change headwheels, switch between different kinds of tape, or different size reels, or operate the machine under changing environments. Many of the adjustments that were necessary on earlier machines are eliminated entirely. Positive and negative drive in the servo gives the machine fast recovery from disturbances such as poor edits or non-synchronous switches. Tight control over the position of the vertical interval during recording

Record controls are grouped for efficiency and easier operation.



improves the quality of your splices whether they are mechanical or electronic. The TR-61 has the capability of recording 15 Hz edit pulses to permit correct color field editing of NTSC signals.

Switchable Standards

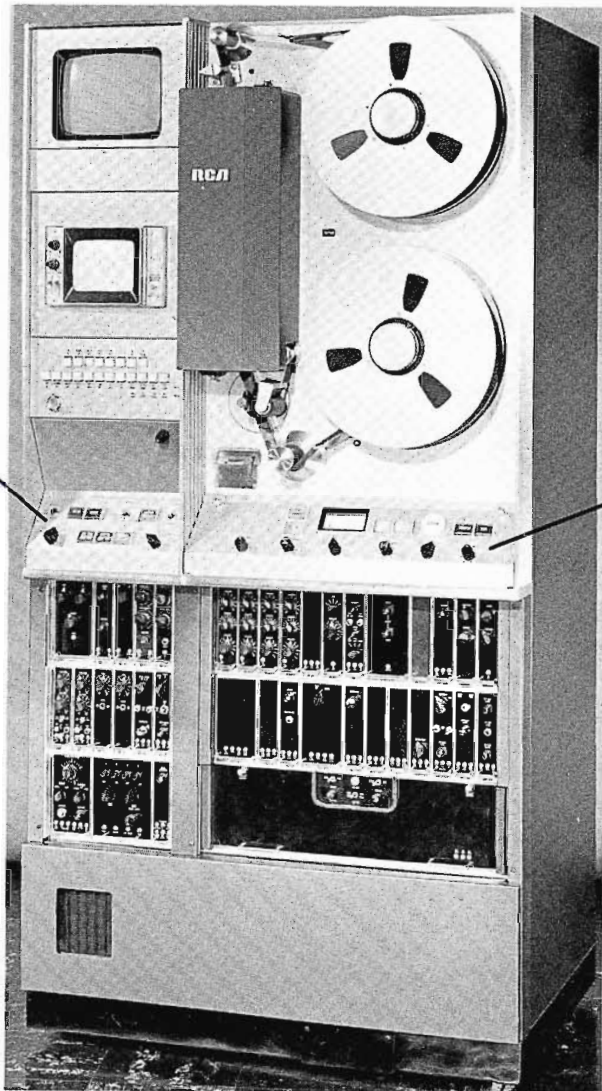
The TR-61 is available as either an NTSC or PAL machine. The latter is switchable between the two TV standards. Both machines operate on either 525/60 or 625/50, also at the flick of a switch, and automatically adjust themselves for proper FM deviation, video low pass characteristics, and other factors related to the standard selected.

"Unity/Variable" Recording

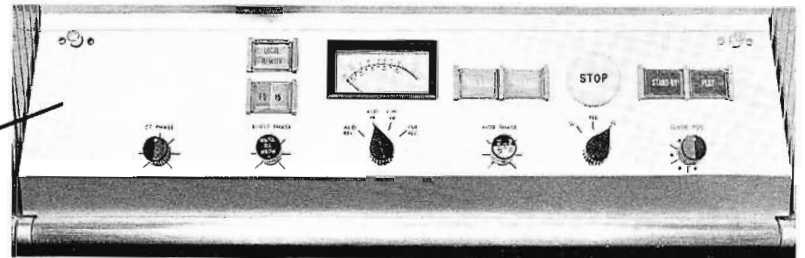
As an extra convenience in recording, the TR-61 video input includes what is known as unity/variable selection. In the unity position, the incoming signal passes to the recording circuits untouched, while in the variable position, both the gain and high-frequency compensation may be adjusted manually before the signal is recorded. These two controls can be used to offset most signal deficiencies that may have been introduced elsewhere in the television system.

Modulation of the crystal controlled FM carrier is accomplished in a heterodyne modulator with AFC. The system includes a crystal controlled white level indicator for use during modulator deviation setup. The modulated carrier is equalized and amplified to the proper level before it arrives at the video heads.

TR-61 Color Video Tape Recorder, with recording section at left, transport section, right, and electronic modules below.



A "pulse count" demodulator in the playback channel is followed by a "Zorbalas" type low pass filter, resulting in the exceptionally low K-factor rating (one percent), minimum luminance/chrominance delay, and excellent moiré performance (-43 dB).



Playback controls are directly beneath tape deck for added convenience.

Head Resonance Compensation

A high input impedance preamplifier in the playback signal path contributes to the excellent signal-to-noise ratio (46 dB) and differential gain (less than 4 percent) of the TR-61. Two anti-resonance (resistance and reactance) controls are provided to compensate for the resonance effects otherwise introduced by connecting heads to these high impedance inputs. The two controls allow the operator to accurately match the response of the individual heads to eliminate banding. The adjustments are easily made using the test tape supplied with the TR-61. However, these adjustments can be handled automatically by the chroma amplitude and velocity error corrector (CAVEC) accessory.

Full Video Processing

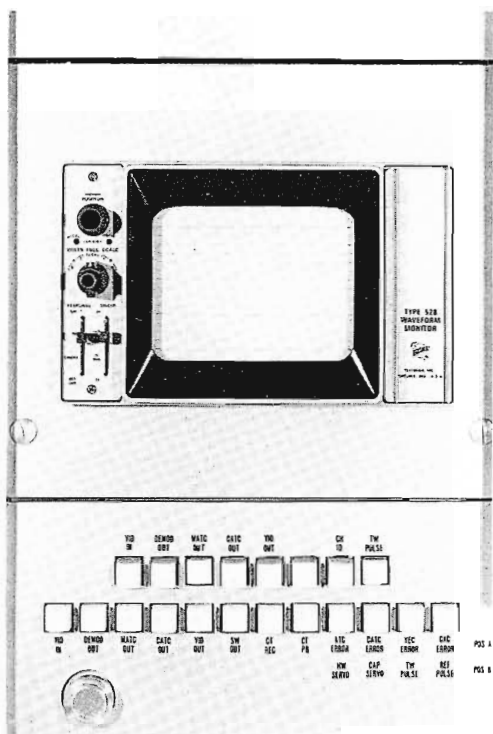
Another important big machine feature of the TR-61 is the built in video processor which completely regenerates sync. It has individual controls for sync pedestal, video level and chroma level, and three video outputs, each of which is switchable between composite and non-composite video. A separate video output is used internally for system monitoring.

Time Base Accuracy

Built in automatic timing correction (ATC) eliminates the effects of residual servo jitter and minute differences in headwheel geometry. The TR-61 provides control of horizontal phase, burst phase and system phase so that the machine output can be made completely synchronous with other video sources.

Controls: Error Elimination

Control panels are operator-oriented for best efficiency and to eliminate human error. Record controls are grouped on a small panel in the monitoring section, away from the play functions which are on a larger panel in the transport section. A big plus of the play control panel, in addition to the normal mode controls, is complete availability of servo mode selection, horizontal phasing, burst phase and manual guide position control.



Extensive monitoring facilities feature pushbutton switching.

Complete Monitoring

Comprehensive monitoring facilities, featuring integral picture and waveform monitors, are incorporated in the TR-61. The picture monitor is a professional 9-inch unit with pulse cross display and interconnections via pushbuttons to the input, output and intermediate signal sections of the system. The waveform monitor is a completely solid state Tektronix Model 528, also connected through pushbuttons to test points throughout the system. A microphone for voice cueing, optimizing video heads, or for other uses, can be switched into the main audio channel for emergency announcements.

In "Combination" with TCR-100

The TR-61 will readily accept a modification to share electronics with the TCR-100 Video Tape Cartridge Recorder. With the TR-61 as "master" and the Cart as "slave", users get a combination that can do more than the two machines can do alone. Properly cued program material can go on the TR-61, commercials on the Cart—ready for easy on-air playback. From then on, everything happens automatically, since automatic cueing and switching are possible between the machines without adding switching equipment.

In delayed broadcast, production, or news segment dubbing—from network, from the studio, from film, from reel-to-reel to Cart or vice versa—the "combo" is flexible.

Time Code Editing

Production facilities of the TR-61 may be further extended in a system designed to provide the very best in quality of edits, and also to improve "human engineering" in tape production by automating several of the routine tasks. Known as the Time Code Editor (TCE), the accessory uses digital techniques to make possible frame-by-frame editing via pushbutton. TCE systems are the ideal answer to volume editing requirements. They are packaged from building blocks, and therefore may be expanded as production needs grow.

TR-61 System Flexibility

The TR-61 Color Video Tape Recorder is designed as a teleproduction center that is compact enough for mobile units and for stations with limited floor space. In addition to the normal video and audio inputs and outputs, only sync and subcarrier need be supplied for full color operation. This greatly simplifies, (1) integration into the studio complex, (2) delegation to the various sources within the station and, where desired, (3) easy transfer to a small compact van for mobile applications.

Enough big machine capabilities are incorporated in the TR-61 to make it an independent facility, and state-of-the-art circuitry produces the best color pictures seen in a machine of its size.

An Extra Dimension of Service

Broadcasters can Call on RCA Replacement Parts for Round-The-Clock Support



Modern Parts and Accessories distribution center at Deptford, N. J. Giant 26-acre building is located within easy reach of rail, truck and air transportation facilities. Philadelphia's International Airport is only 15-minutes away.

It's Christmas at WHWH-AM, Princeton, New Jersey. But for Chief Engineer Dudley Bullock, it's not a festive occasion. The modulation transformer in the high level plate modulated transmitter is burned out, and the station is off-air. (The transmitter is a 5 kW Type BTA-5T, installed in 1963). Dudley Bullock knows that the station will remain off-air until a replacement transformer is installed.

Can RCA Parts and Accessories respond—measure up to its claim of "round-the-clock" replacement parts service—even on Christmas Day?

He dials the Emergency Parts number at P & A, Deptford, N. J. An emergency service man answers his call. To Mr. Bullock's delight, the transformer is in stock—and in a little more than two hours, the part is at the station ready for installation.

Of course, not every broadcaster is an hour's drive from the Parts and Accessories warehouse. Their course of action in an emergency situation is to call the emergency number, order the needed part and request fastest delivery. And, because of P & A's unique system of processing orders, the wait isn't long.

Typical Emergency Situation

Suppose, for example, a TV station in San Francisco suddenly goes off-air. An IPA component has failed, and the only place to get a replacement is RCA Parts and Accessories, nearly 3,000 miles away.

This is a typical emergency situation for P & A. The first step for the San Francisco Chief Engineer is to telephone the P & A Emergency Service number—Area Code 609-848-5900. Expert help is at hand, since Emergency Service men at P & A are trained to give difficult assignments fast and personal attention.

Once the emergency service man has the stock number of the part or parts involved,

he turns to the computer to advise availability and warehouse location of the part.

(Having the right stock number saves considerable time, since more than 40,000 broadcast stock numbers are inventoried and must be checked).

The emergency service man follows the order personally, including taking a bicycle ride to its location. And he must ride. The P & A warehouse occupies 26 acres of ground, and walking would take too much time.

Part is Hand-carried

When the emergency service man gets the part, he hand-carries it through packing and personally weighs it for shipment. He also arranges to ship on the first available flight from nearby Philadelphia International Airport, just 15 minutes away. Within a few hours after the order is received, the part is on its way.

At the request of the customer, the same emergency service man who first took the order, pulled the part from its warehouse shelf, and arranged for its shipment, calls the broadcaster and gives him complete delivery information, including expected arrival time at the destination.

The key to the operation is a computer system. Whenever an order is submitted to P & A—whether it's a routine stocking order or an emergency—the computer first determines the availability of the parts required. If a part is not in the warehouse, and the order for it was placed on an emergency basis, the RCA production facility involved, or the vendor is called and the part is shipped immediately from either location. On one rare occasion, neither the P & A warehouse or the vendor had a vitally needed broadcast part. An emergency service man had the part dismantled from new but unsold equipment, and shipped to the broadcaster to meet his emergency need.

Stocking Key Parts

While emergency service is essential, it is also more costly in terms of aggravation as well as money and manpower. Broadcasters have always recognized the merits of maintaining a limited stock of key parts. To assist in such programs, Parts and Accessories—in conjunction with Broadcast Systems Product Management—has developed recommended spare parts packages for various products. While it's not practical to maintain a full stock of parts, a limited inventory of the most basic items can help stations minimize emergency downtime.

Speed and Efficiency

RCA Parts and Accessories' ability to back up its Broadcast equipment with speed and efficiency is the result of many things. The size of its inventory. Its proximity to mass transportation. The layout of its warehouse. And most important, the experience and attitude of its people.

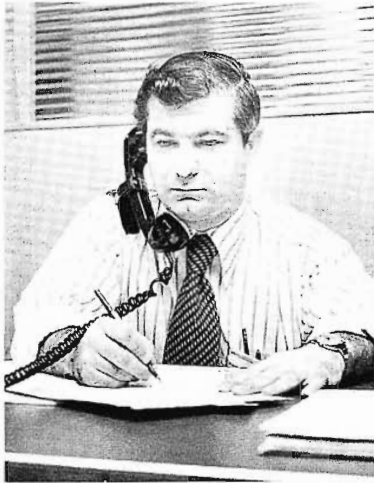
P & A is a complete, modern distribution center employing nearly 500 people. It is one of the largest commercial electronic parts depots in the world. So large is its warehouse that seven football fields could be placed inside end-to-end with room to spare. The 26-acre building is situated on a 132-acre tract of land in Deptford, N.J., in the metropolitan Philadelphia area.

40,000 Broadcast Parts

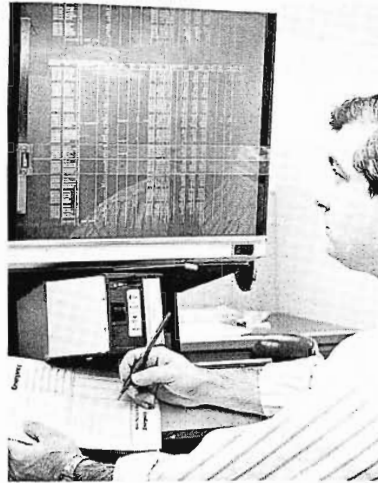
Over 40,000 different parts—nearly 2,300,000 individual items—used in the Broadcast industry are stocked at Deptford. This extensive stock protects virtually all RCA commercial equipment in use today.

RCA supplies replacement parts for Broadcast equipment for at least 10 years. However, some of the parts in stock back up equipment over 25 years old. It's important to remember that RCA exact replacement Broadcast parts are engineered to the same performance specifications first built into your original equipment.

RCA Emergency Service Man receives rush order for Broadcast part. Emergency service is available at P&A 24 hours a day.



Emergency Service Man checks computer printout to determine part's availability and warehouse location.



He rides to the part's location. All emergency orders are hand processed in this way by specially trained personnel.



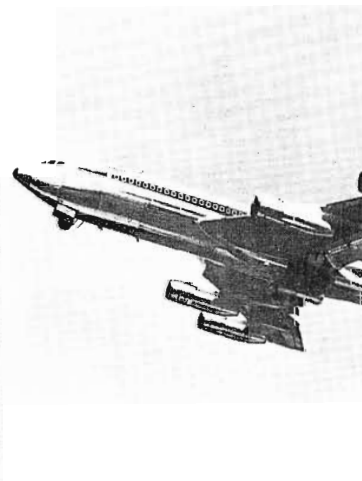
Part is taken from shelf. If part is not in stock the plant is called and the part is shipped from there.



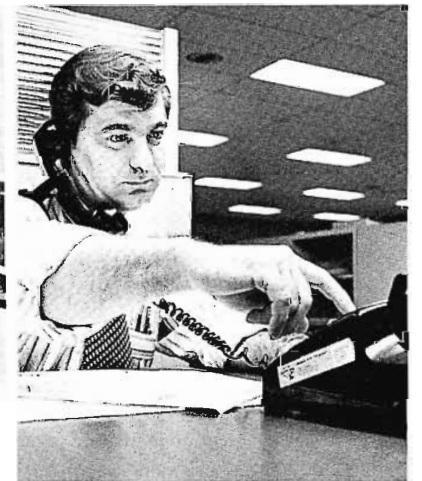
Part is packed and weighed for shipment.



Immediate transportation is arranged. Emergency shipments are normally taken to Philadelphia International Airport, a 15-minute drive.



Part is shipped on first available flight.



RCA Emergency Service Man telephones the flight number, time of arrival and other pertinent data to the station which ordered the part.

Safeguarding Quality

Every department at RCA Parts and Accessories has a vital role in safeguarding replacement parts quality. A quality control section surveys parts coming in, parts in stock and parts going out to be sure they will give the same high quality performance originally engineered into RCA equipment.

The cataloging department keeps ordering information accurate. All parts used in commercial products produced by RCA are carefully reviewed with marketing and engineering staffs of RCA product divisions and last minute changes in equipment are recorded so that catalog listings are current.

Parts identification service is available for customers who have difficulty identifying parts or need parts that have not been cataloged.

The Computer Keeps Control

A highly sophisticated computer system

maintains rigid control over Broadcast parts inventory. The computer reviews inventory levels to be maintained and recommends quantities for inventories. Forecasts of requirements are computed each week. The computer also supplies vital information on prices, sales histories, warehouse locations, shipping information, purchasing histories, follow-up reports and literally hundreds of other reports necessary for the running of such a complex business.

Interestingly, while the computer controls thousands of individual statistics it is programmed to issue reports only on those items requiring action. In the future the computer will perform many new functions. Perhaps some day a Broadcaster will place his order directly with RCA's computer. But the human touch will always be at P & A because there may be another Christmas day when a station goes off-air, and a computer could never ride a bicycle through P & A's warehouse to pick up the needed part.

**For RCA
exact replacement
Broadcast parts
write, telegraph, telephone**

Mail to:

RCA Parts and Accessories
2000 Clements Bridge Road
Deptford, New Jersey 08096

Telegraph:

TWX: 510-686-8982
Cable Address: "RadioParts"
Telex: 84-5128, RCA Parts

Telephone:

For routine orders or inquiries
609-963-8000
Ext. PT 274
Monday thru Friday, 8 a.m. to
4:45 p.m. Eastern Time

For emergency orders only

609-848-5900 (24 hours a day)

NOTE: Emergency orders must be placed via telephone or TWX, and you must request "emergency service". Orders received by mail will not be processed on an emergency basis.

123 practical reasons for owning the RCA Cart Machine.

1. The TCR-100 can make your station breaks totally automatic.
2. Savings of up to \$33,000 a year in head-wheel, tape and manpower costs have been reported.
3. The TCR-100 records and plays commercials.
4. It records and plays psas.
5. It duplicates cartridges.
6. It records and plays promos.
7. It records and plays news segments.
8. It can be used as a production machine.
9. It can record simple commercials directly from studio.
10. It records and plays openings and closings.
11. Use it to assemble programs.
12. You can dub film spots onto cartridges.
13. How do you make a movie review more useful? Dub it to cartridge.
14. With the Cart, when you need a news "filler", you've got it.
15. The Cart Machine makes it easy to "localize" national commercials.
16. Directly record weather reports for later use.
17. It records and plays station editorials.
18. Use it to integrate live, film and slide material with audio for spots or programs.
19. Use it to make multiple dubs to reel machines.
20. Dealer tags. Make them once and dub onto carts where needed.
21. Some stations use it to dub tapes in quantity for clients.
22. Alfecon II headwheels last as much as 3 times longer than previous materials.
23. TCR-100 design is based on a study of actual station program logs.
24. Cartridges are easy to handle and store.
25. Ready access allows cart changes up to within 30 sec. of air time.
26. Carts available preloaded or reloadable.
27. Tapes recorded on highband VTRs can be loaded into carts and played on the TCR-100.
28. Consistent cart quality makes your station look better on the air.
29. All cartridges in the magazine are always visible.
30. Carts are factory loaded and cue coded.
31. Preloaded carts come in 1- and 3-min. lengths.
32. Tape in the cart is always in a rewind state, ready for replay.
33. Change carts in 3 sec.
34. Some carts have been played over 3,000 times.
35. Consistent color quality from cart to cart.
36. Cartridge doors protect tape while cart is out of machine.
37. Cart shelf area is only 2½ by 3½ in.
38. Carts are labeled so they can be identified in storage as well as in the machine.
39. Carts are keyed to prevent incorrect insertion.
40. Six carts can be stored in the same space required by two 6-in. tape reels.
41. Cartridges are respoolable.
42. The tape in preloaded carts is the best available.
43. The TCR-100 is designed for simplicity, not complexity.
44. Power consumption is low.
45. One to 21 dubs in one load.
46. Can do the work of 3 or more reel-to-reel machines at the break.
47. It eliminates the need for spot reels.
48. It programs 1 to 9 sequences with 1 to 8 events in each.
49. It's easily interfaced with a computer.
50. Operating controls are divided into 3 convenient functional groups.
51. To correct a premature start, just press the "Play Recue" button.
52. The TCR-100 has automatic A-to-B dub.
53. The Cart Machine follows the program log. No need for a bin log or sequence log.
54. Cue tones are audible.
55. "Last Event" warning on remote-control panel tells operator when final cart is playing.
56. Can be teamed up with our newly announced TCP-1624 Cartridge Film Projector.
57. The entire break is pretimed via cues, so cuts are clean and consistent.
58. To record, there are only 7 steps. Competition requires more.
59. Setup is easy with RCA Color Reference Cart.
60. Once reference is set, all tapes are recorded and played to the same standard.
61. Automatic threading, cueing, rewinding.
62. It can time-share the electronics of reel-to-reel TR-60s and TR-70Cs.
63. Traffic departments like it because it simplifies scheduling as well as logging and verification.
64. Machine can preview cart sequence to make sure they're in correct order.
65. Preview the entire cart sequence at the touch of a button.
66. After preview, one button recues the break.
67. It interfaces with and cues other VTRs and film equipment.
68. The TCR-100 switches video automatically.
69. To dub a cart, push only 4 buttons. No shuffling or cueing.
70. Makes possible all-tape station break.
71. Tape is protected from crimping and tearing.
72. You get dependable tape handling. No vacuum used.
73. There's no need for repeated color-bar checks throughout the broadcast day.
74. You use less tape because color-bar leaders, clapboards are unnecessary.
75. To program, just place carts in magazine, dial the number onto sequence register.
76. Smooth cartridge operation minimizes dead air time.
77. Tapes stay untouched by human hands.
78. With the Cart Machine, stations are able to get into more local production.
79. Machine setup takes only 10 to 15 minutes at start of broadcast day.
80. One man can control the entire station break.
81. It's easy to substitute a paying spot for a nonpaying one at the last minute.
82. Drastically cut headwheel cleaning time. Do it once at the beginning of the day.
83. If you receive just one film spot to run on a heavy schedule, the Cart solves the problem.
84. The Cart simplifies adding several different dealer tags to the same commercial.
85. Headwheels are interchangeable with those of TR-60s, TR-61s and TR-70Cs.
86. When time-shared with a TR-60, TR-61 or TR-70C, the reel-to-reel machine has separate video output for loading and cueing.
87. Cart dubs can be edited during dubbing.
88. The TCR-100 can be slaved to RCA TR-60s or TR-70Cs you already own.
89. An automatic actor's tally operates during recording.
90. It's the lowest-priced 2" quad cartridge VTR.
91. It frees up reel machines for production.
92. Its Signal Processing Unit contains picture and waveform monitors, monitor switching systems.
93. External Source Preroll Control for dubbing and recording.
94. There's a more relaxed atmosphere in the tape room at station-break time.
95. The TCR-100 includes its own processing amplifier.
96. There are only 35 control panel buttons compared to a competitor's 60.
97. Lighted status displays on TCR-100 indicate function being performed.
98. Optional remote-control panel also has status lamps for operator assistance.
99. Reference tape is supplied with machine.
100. Time sharing with TR-60, TR-61 or TR-70C provides cue-actuated preroll and audio-follow with TCR-100.
101. Rear-side video erase protects tape.
102. Available in 525/60 or 625/50 standards.
103. Rear-side handling during threading and playing prevents scratching.
104. Requires less floor space than the competition.
105. The signal processor includes a color dropout compensator (CDOC).
106. And a chroma amplitude and velocity error corrector (CAVEC).
107. Record-lockout control prevents loss of recorded material.
108. Only 2 tape contacts—one video, one audio head—means less tape wear.
109. All controls are at eye level.
110. Stations tell us that the TCR-100 frees manpower for other duties.
111. Make-goods are drastically reduced.
112. Optional remote-control panel fits into only 7 inches of rack or console space.
113. Optional Electronic Programming Identification System (EPIS) displays an identification of the cart being played.
114. There's a splicer-editor option for quickly adding last-minute information to carts.
115. Editor performs both video-only and audio-only edits.
116. Record Current Optimizer is standard.
117. Control track phase can be optimized automatically with an accessory.
118. Recording on both decks is available optionally. Most stations don't need it.
119. More than 4 million commercial plays to date.
120. It's the most experienced machine of its kind.
121. One of the best things about it is figuring out what to do with the money you save.
122. The service backup available is second to none.
123. And according to one user, "It makes such nice noises."

123 reassuring reasons for owning the RCA Cart Machine.

1. One TCR-100 delivered to WBAY-TV, Green Bay, Wisc.
2. One TCR-100 delivered to WUTV, Buffalo, N. Y.
3. One TCR-100 delivered to KSLA-TV, Shreveport, La.
4. One TCR-100 delivered to WWL-TV, New Orleans, La.
5. One TCR-100 delivered to WBAL-TV, Baltimore, Md.
6. One TCR-100 delivered to WJAR-TV, Providence, R. I.
7. One TCR-100 delivered to WBRE-TV, Wilkes-Barre, Pa.
8. One TCR-100 delivered to WAFB-TV, Baton Rouge, La.
9. Five TCR-100s delivered to NBC Network, N. Y. C.
10. One TCR-100 delivered to WDCA-TV, Washington, D. C.
11. One TCR-100 delivered to KIRO-TV, Seattle, Wash.
12. One TCR-100 delivered to WSAV-TV, Savannah, Ga.
13. One TCR-100 delivered to KNTV, San Jose, Cal.
14. One TCR-100 delivered to KPLR-TV, St. Louis, Mo.
15. One TCR-100 delivered to KHQ-TV, Spokane, Wash.
16. One TCR-100 delivered to KTSM-TV, El Paso, Tex.
17. One TCR-100 delivered to WAPA-TV, San Juan, P. R.
18. One TCR-100 delivered to WISN-TV, Milwaukee, Wisc.
19. One TCR-100 delivered to WFMY-TV, Greensboro, N. C.
20. One TCR-100 delivered to WTVC, Chattanooga, Tenn.
21. One TCR-100 delivered to WSB-TV, Atlanta, Ga.
22. One TCR-100 delivered to WTAF-TV, Philadelphia, Pa.
23. One TCR-100 delivered to WTAE-TV, Pittsburgh, Pa.
24. One TCR-100 delivered to WPTV, W. Palm Beach, Fla.
25. One TCR-100 delivered to WGR-TV, Buffalo, N. Y.
26. Two TCR-100s delivered to WBNS-TV, Columbus, Ohio
27. Two TCR-100s delivered to WECT-TV, Wilmington, N. C.
28. One TCR-100 delivered to WKBW-TV, Buffalo, N. Y.
29. One TCR-100 delivered to WGN-TV, Chicago, Ill.
30. One TCR-100 delivered to CHAN-TV, Vancouver, B. C., Can.
31. One TCR-100 delivered to WDAY-TV, Fargo, N. D.
32. Three TCR-100s delivered to NBC Network, Burbank, Cal.
33. One TCR-100 delivered to WRAL-TV, Raleigh, N. C.
34. One TCR-100 delivered to WNCT-TV, Greenville, N. C.
35. One TCR-100 delivered to WKRC-TV, Cincinnati, Ohio
36. One TCR-100 delivered to WTVN, Columbus, Ohio
37. One TCR-100 delivered to WBRC-TV, Birmingham, Ala.
38. One TCR-100 delivered to WDAF-TV, Kansas City, Mo.
39. One TCR-100 delivered to KVRL-TV, Houston, Tex.
40. Two TCR-100s delivered to WRC-TV, Washington, D. C.
41. One TCR-100 delivered to KSD-TV, St. Louis, Mo.
42. Two TCR-100s delivered to WKYC-TV, Cleveland, Ohio
43. One TCR-100 delivered to KWTU, Oklahoma City, Okla.
44. Two TCR-100s delivered to KPRC-TV, Houston, Tex.
45. One TCR-100 delivered to KTBS-TV, Shreveport, La.
46. One TCR-100 delivered to KARD-TV, Wichita, Kan.
47. One TCR-100 delivered to WMAL-TV, Washington, D. C.
48. Two TCR-100s delivered to KSTP-TV, St. Paul, Minn.
49. One TCR-100 delivered to WEAT-TV, W. Palm Beach, Fla.
50. One TCR-100 delivered to KPTV, Portland, Ore.
51. One TCR-100 delivered to WKRG-TV, Mobile, Ala.
52. One TCR-100 delivered to WSPA-TV, Spartanburg, S. C.
53. One TCR-100 delivered to KWGN-TV, Denver, Colo.
54. One TCR-100 delivered to KCEN-TV, Temple, Tex.
55. Two TCR-100s delivered to KRON-TV, San Francisco, Cal.
56. One TCR-100 delivered to WSOC-TV, Charlotte, N. C.
57. Two TCR-100s delivered to KOB-TV, Albuquerque, N. M.
58. One TCR-100 delivered to WBTV, Charlotte, N. C.
59. One TCR-100 delivered to KOMO-TV, Seattle, Wash.
60. One TCR-100 delivered to KATU-TV, Portland, Ore.
61. Two TCR-100s delivered to WBAP-TV, Fort Worth, Tex.
62. One TCR-100 delivered to KTRK-TV, Houston, Tex.
63. One TCR-100 delivered to KBTU, Denver, Colo.
64. One TCR-100 delivered to KOCO-TV, Oklahoma City, Okla.
65. One TCR-100 delivered to WUAB-TV, Cleveland, Ohio
66. One TCR-100 delivered to KTVW, Tacoma, Wash.
67. One TCR-100 delivered to WTOP-TV, Washington, D. C.
68. One TCR-100 delivered to KNOE-TV, Monroe, La.
69. One TCR-100 delivered to WTNH-TV, New Haven, Conn.
70. One TCR-100 delivered to CFTO-TV, Toronto, Ontario, Can.
71. One TCR-100 delivered to KFSN-TV, Fresno, Cal.
72. One TCR-100 delivered to WATE-TV, Knoxville, Tenn.
73. One TCR-100 delivered to KMGH-TV, Denver, Colo.
74. Two TCR-100s delivered to WMAQ-TV, Chicago, Ill.
75. One TCR-100 delivered to KOVR-TV, Stockton, Cal.
76. One TCR-100 delivered to KYTV, Springfield, Mo.
77. One TCR-100 delivered to CFRN-TV, Edmonton, Alberta, Can.
78. One TCR-100 delivered to WVUE-TV, New Orleans, La.
79. One TCR-100 delivered to WTVD, Durham, N. C.
80. One TCR-100 delivered to KCAU-TV, Sioux City, Iowa
81. One TCR-100 delivered to WRTV, Indianapolis, Ind.
82. One TCR-100 delivered to WTMJ-TV, Milwaukee, Wisc.
83. One TCR-100 delivered to WDBJ-TV, Roanoke, Va.
84. One TCR-100 delivered to WMC-TV, Memphis, Tenn.
85. One TCR-100 delivered to WCPO-TV, Cincinnati, Ohio
86. One TCR-100 delivered to WXYZ-TV, Detroit, Mich.
87. Two TCR-100s delivered to WABC-TV, N. Y. C.
88. One TCR-100 delivered to WEWS-TV, Cleveland, Ohio
89. One TCR-100 delivered to WBOC-TV, Salisbury, Md.
90. One TCR-100 delivered to KVUE-TV, Austin, Tex.
91. One TCR-100 delivered to KRIS-TV, Corpus Christi, Tex.
92. One TCR-100 delivered to WLS-TV, Chicago, Ill.
93. One TCR-100 delivered to WJAC-TV, Johnstown, Pa.
94. One TCR-100 delivered to KOAA-TV, Pueblo, Colo.
95. One TCR-100 delivered to KTEN-TV, Ada, Okla.
96. One TCR-100 delivered to WTEV-TV, New Bedford, Mass.
97. One TCR-100 delivered to WZZM-TV, Grand Rapids, Mich.
98. One TCR-100 delivered to WJRT-TV, Flint, Mich.
99. One TCR-100 delivered to WMAR-TV, Baltimore, Md.
100. Two TCR-100s delivered to WTOG-TV, St. Petersburg, Fla.
101. One TCR-100 delivered to KATC-TV, Lafayette, La.
102. One TCR-100 delivered to WTLV-TV, Jacksonville, Fla.
103. One TCR-100 delivered to WYAH-TV, Portsmouth, Va.
104. One TCR-100 delivered to WMTV, Madison, Wisc.
105. One TCR-100 delivered to WAVY-TV, Portsmouth, Va.
106. One TCR-100 delivered to WAPI-TV, Birmingham, Ala.
107. One TCR-100 delivered to WFMJ-TV, Youngstown, Ohio
108. One TCR-100 delivered to WCSH-TV, Portland, Me.
109. One TCR-100 delivered to ATV-O, Melbourne, Australia
110. One TCR-100 delivered to TV-Q, Brisbane, Australia
111. One TCR-100 delivered to BTW, Bunbury, Australia
112. One TCR-100 delivered to YTV, Yorkshire, England
113. One TCR-100 delivered to LWT, London, England
114. One TCR-100 delivered to Venevision, Caracas, Venezuela
115. One TCR-100 delivered to TIMSA, Mexico City, Mexico
116. Two TCR-100s delivered to WKAQ-TV, San Juan, P. R.
117. One TCR-100 delivered to WCYB-TV, Bristol, Va.
118. One TCR-100 delivered to Global Communications, Toronto, Can.
119. One TCR-100 delivered to WSBT-TV, South Bend, Ind.
120. One TCR-100 delivered to KOTA-TV, Rapid City, S. D.
121. One TCR-100 delivered to KELO-TV, Sioux Falls, S. D.
122. One TCR-100 delivered to WBBH-TV, Ft. Myers, Fla.
123. One TCR-100 delivered to WPVI-TV, Philadelphia, Pa.

For further information, see your RCA representative. Or write RCA Broadcast Systems, Bldg. 2-5, Camden, N.J. 08102.

Our cure for the blues works automatically.

Blue haze where blue haze shouldn't be is just one problem in color film reproduction.

There are others, too. And altogether, they're enough to depress any broadcaster. After all, you put a lot of money into film packages.

What happens is that stations get their film from a lot of different sources, and what they get varies in a lot of different ways. Some is old, some is new, some is made especially for television. And the bulk of it is 16 mm reduction print. Therefore maintaining uniform picture quality is often difficult and sometimes impossible.

But now, finally, there's a color film camera that corrects for these variations—automatically.

It's the new RCA TK-28 and it can actually improve the reproduction of the films you receive. You get more quality from your film investment, present more striking spots for your clients, and build a faithful audience for your feature films.

Exclusive new automatic color circuits in the TK-28 maintain

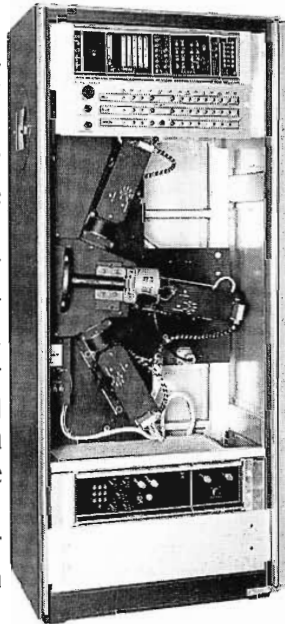
color balance and correct for printing errors and color temperature variations from projector to projector.

Pre-selectable Chromacomp gives a boost to low saturation color films, compensates for scene-to-scene variations and corrects dye transfer errors.

Black and white levels? The TK-28 maintains them automatically and compensates for variations in film density and contrast range.

And a three-tube design (vidicon or lead oxide) helps assure a performance approaching that previously associated only with live cameras such as the TK-44B.

So if erratic color film quality is getting you down, ask your RCA representative for the cheery and profitable facts about the TK-28. Or write for new brochure. RCA Broadcast Systems, Building 2-5, Camden, New Jersey 08102.



RCA

New TK-28 color film camera.

