



Triangular Form Follows Function at WPRI-TV

Broadcast equipment designed today for the day after tomorrow.

BEFORE YOU BUY A NEW VTR, LOOK AT A REALLY NEW VTR.

RCA's new technology TR-600 proves medium price and small size can add up to unsurpassed performance. Check the specs — check the price — and you'll discover that the newest offers you the most.

It's about half the size of standard quad VTR's. With built-in automatics that

used to cost you extra and the latest technology incorporated in a design that gives you superb picture performance.

For example, computer designed and tested modules give superior reliability; unique straight line threading; LED diagnostic indicators flash warnings before malfunctions get out of hand.

and its new integrated design cuts active electronic devices by 45%.

Check with your RCA representative. He's got the total value story on the one VTR that's really new.



RCA



Page 8

Unique Triangular Broadcast Center for WPRI-TV (Cover Story)

Aesthetics and efficiency combine beautifully in this unusual building design for Poole Communications' Ch. 12, Providence, R. I. station. Space utilization, equipment arrangement and numerous functional features are covered in this article.



Page 16

Automating with RCA's Film Cartridge Projector

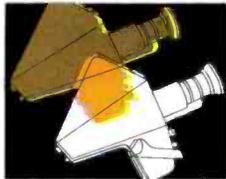
TV-28, Wilkes Barre, teams new TCP-1624 with TCR-100 and an automatic programming system for new efficiency which includes the fully automated station break.



Page 19

Five "Cart" Machines in Three Florida Stations

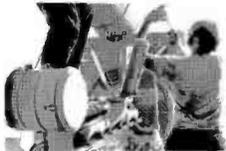
WFLA-TV, Tampa, operates two TCR-100's for playback and production. So does WTOG-TV, St. Petersburg, WBBH-TV, Ft. Myers, in market #161 also finds the "cart" indispensable. These three articles touch on some useful ideas on the utilization of the TCR-100.



Page 29

Two Views of the TKP-45—The One Camera Camera System

Systems expert and camera engineer tell this dual story of the single quality color camera that may be right for everything you ask of it . . . inside, outside, as a studio unit or as a completely independent portable.



Page 35

Painless TV Transmitter Changeover

Details on how WALA-TV, Mobile, Ala., got on-air with new 50 kW parallel transmitting system in minimum time.



Page 43

Australia's First TV Complex Designed for Color

Commercial station CTC-7, Canberra moved to color in a big way, with a superbly designed building and a full complement of cameras, tape and film equipment. How they got there and what they're doing is the subject of this article.



Page 50

Broadcast Studio on Wheels

Mobile Television Services operates a million-dollar video production center—a 40-foot mobile unit that roves the country, rolling to assignments everywhere.

Page 58

Products in the News

Items include: two new audio signal processors; an improved TK-610B Film Camera; new Video Processing and Color Correction Accessory for the TK-28 Telecine Camera; new Audio/Erase Headposts for video tape recorders.

View Finder

New AT&T Corporate Communications Center Equipped With RCA Color TV Studio

American Telephone & Telegraph Company is expanding its use of color television as a corporate communications tool with RCA color TV studio systems capable of broadcast-quality performance.

The installation, including "live" color cameras, TV film systems and audio equipment, is the equal of many TV station studios in program production capacity and flexibility. A complete closed circuit TV distribution switching

and control center also is included in the order.

Richard F. O'Meara, CCTV Production Manager for AT&T said installation of the studio equipment will begin next summer in the company's new facilities in Basking Ridge, N. J., now under construction.

The RCA equipment will be used to produce instructional and informative programs for closed-circuit distribution to the Bell System's 23 operating companies around the nation, Mr. O'Meara said. Programs also will be channeled to more than 80 locations within the Basking Ridge complex and surrounding locations.

"We found from past experience that the television medium is a cost-effective means of improving communications with our employees and enhancing their understanding of their own jobs and of the corporate objectives," Mr. O'Meara said. "The talk-back capability will allow management viewers at distant locations to ask questions and contribute to the conference," he added.

Programming for the AT&T network also will include new product introductions, major announcements, company news, and general information announcements and programs, Mr. O'Meara said.



FIVE GENERATIONS OF RCA CAMERAS line up for inspection at WAVE-TV, Louisville. Since 1948, when Ch. 3 began TV operation, the cameras have been RCA all the way, reports Bernie Holtman, Chief Engineer for WAVE-AM and TV—shown here in the midst of his cameras.

The TK-44B's at WAVE-TV are making great color pictures, Mr. Holtman says, indoors and out. Late last year the cameras were called on to handle the pickup for a high school championship football game in Indianapolis—with field lighting of 5 to 10 footcandles. Results were outstanding, including true reproduction of maroon jerseys even at that low light level.

Mobile, Versatile Color Television System For Veterans Administration Medical Training

Walter Devore checks out color television system now in operation at the Veterans Administration Hospital in Seattle, Wash.

Mr. Devore is a Senior Communications Specialist with the VA's Telecommunications Service.

The color television systems are used by the VA for continuing medical education, producing training tapes as well as live programming. Live telecasts are set up with two-way talk-back audio between the camera location and the audience, permitting interaction, Mr. Devore noted.

This two-camera system, one of several installed at various VA facilities, provides mobility, versatility and ease of operation. Each TK-630 camera has its own mobile operating console which includes the camera control unit (CCU); sync generator; test, and audio facilities. One of the consoles is supplied with a six-input video switcher for production use. The cameras can be used separately at two different locations, or for a two-camera studio system with switching for production versatility. Consoles and camera mountings are on casters for ease of movement.



Forward Communications Corp. Orders Four RCA Transmitters For TV, Radio Stations

Two TV stations and two radio stations in the Forward Communications group, based in Wausau, Wisc. will install new RCA transmitting equipment, valued at approximately \$500,000.

The four-transmitter purchase includes a 25-kilowatt VHF Highband System, Type TT-25FH, for both KCAU-TV, Sioux City, Iowa, and WSAU-TV, Wausau. Input and monitoring systems and associated equipment also will be installed at the two stations.

Forward's radio outlet, KVGB-AM, Great Bend, Kan., will receive a 5-kW transmitter, RCA's BTA-5L1. A 20-kW, BTF-20E1, and antenna also was included in the order for one of the group's FM stations.

Richard D. Dudley, Forward Communications president, said that the transmitter purchase represents an ongoing program to provide the best service to its listeners and viewers.

Canadian Broadcasting Corporation Leases RCA TV Tape, Film Systems For 1976 Olympic Coverage

For its television coverage of the 1976 Montreal summer Olympics, the Canadian Broadcasting Corporation has leased 20 RCA video tape recorders and seven complete telecine systems.

The lease arrangement also includes 24-hour daily maintenance service by RCA specialists for the duration of the Olympic games.

The equipment will be installed in a radio-TV center to be established in Montreal's Radio-Canada Building to receive on-site Olympic event coverage for recording, editing and distribution to various countries around the world.

The seven telecine systems include the TK-28 TV film camera which automatically compensates for technical variations in the film to produce TV color pictures of uniform quality. The lease arrangement also includes the compact new TR-600 video tape recorder.

Plans for the CBC radio-TV center include complete editing facilities so that incoming film and tape coverage can be edited and put on the air immediately, or the edited programs shipped to the various countries for later domestic broadcast.

KWTX Broadcasting And Texoma Broadcasters Order RCA TV Tape And Film Systems

Television equipment valued at more than \$500,000 for RCA video tape cartridge recorders and film originating systems, has been ordered by KWTX-TV, Waco, Texas, and associated stations.

The Waco station, owned by KWTX Broadcasting Co., is installing an RCA TCR-100 "cart" machine and two TK-28 film islands.

KLFY-TV, Lafayette, La., and KXII, Ardmore, Okla./Sherman, Tex., both operated by Texoma Broadcasters, Inc., each will be equipped with a TCR-100.

Pakistan Broadcaster Orders RCA Television Systems To Begin Color Operations

As a first step toward color television service, scheduled to begin later this year, the Pakistan Television Corp., Ltd., has ordered RCA color TV studio equipment valued at more than \$1.5 million.

The order includes studio cameras, telecine systems and switching and monitoring equipment for two complete color studio complexes in Peshawar and Quetta.

Pakistan inaugurated black-and-white TV service in 1964, and currently operates five stations. The new facilities will add the impact of color to the country's many educational and cultural TV programs aimed at raising the living standards of the people.

Six RCA TK-45 color studio cameras are included in the order, along with four complete TK-28 telecine systems. In addition to a master control switcher, each studio will be equipped with a TS-75 video production switching system. Complete monitoring and test equipment also is included in the order.

The Pakistan Television Corp., Ltd., is a government-sponsored corporation which produces and airs technical, vocational, elementary and adult education programs as well as news, cultural and entertainment shows.

RCA Broadcast Seminars Attract Record Attendance; Held In Australia, Brazil For First Time

A record number of 726 TV station engineers and technicians attended 1974 equipment operation and maintenance seminars conducted by RCA Broadcast Systems, including those held in Australia and Brazil for the first time.

The seminars cover set up and maintenance procedures for RCA color cameras, film systems, video cartridge systems and TV tape recorders.

John W. Wentworth, Manager, Broadcast Technical Training, said most of the 17 domestic seminars were held in the equipment demonstration studio and training center at RCA Broadcast Systems' Camden, N.J. headquarters. Others were conducted in San Francisco and Burbank, Calif.

The first technical seminars in Australia and Brazil followed the completion of major installations of RCA color TV program originating equipment there.

The six seminars in Sydney, Australia, attracted approximately 150 attendees and covered the four major areas of studio equipment, Mr. Wentworth said.

More than 100 representatives of Brazilian broadcast stations attended the two seminars in Sao Paulo. These were concerned with training in optimum performance and maintenance of telecine equipment and video tape recorders.

Brazilian broadcasters began color programming in March 1972, and their Australian counterparts began color transmission in March 1975. RCA has made multi-million dollar shipments of broadcast equipment to each country for the color conversions.

Michigan Bell Installing RCA Broadcast Equipment In New TV Studio

—The Michigan Bell Telephone Co., headquartered in Detroit, will install RCA color TV studio systems to produce and tape-record programs for company training and communications. The broadcast quality system includes two TK-44 color cameras, a TK-28 film island and two TR-600's, RCA's newest quadruplex video tape recorder. Video switching will be handled by a TS-75 production switching system.

Fred Edwards, the telephone company's CCTV chief engineer, said the production studio is scheduled to begin operations this summer. The new facility will be used to produce instructional and informative programs aimed at improving communications with employees and enhancing employee job understanding. Mr. Edwards said. "Our training programs will range from driver education courses for vehicle operators to installation procedures for linemen. New product and service introductions, major announcements, company news and general information will be included in our program production service."

In commenting on the use of broadcast-quality systems, in the TV production studio, Mr. Edwards explained that the primary means of distribution of finished programs will be on video cassettes. "Because we will use 'second generation' tapes for playback, we

feel that we need the high quality of the two-inch quadruplex format for our master recordings," he said.

Arkansas Educational TV Network To Expand Operations With New RCA Transmitting System

The Arkansas Educational Television Commission has ordered an RCA TV transmitting system, valued at approximately \$950,000, to extend educational and cultural programming to viewers in the northeast section of the state.

The 60 kW UHF transmitter and Pylon antenna will be installed near Jonesboro, Ark., as a satellite operation to the network's flagship station, KETS-TV, Channel 2, which covers the Little Rock Area. RCA's TTU-60C transmitter and TFU-36J antenna will combine to produce 1.2 million watts of effective radiated power on Channel 19.

Vern Dillaplain, Director of Engineering for the educational network, said the new Jonesboro transmitter will increase coverage to nearly two-thirds of the state's population. Three additional transmitters planned for future installation will extend broadcast to the entire state, he said.

The network will continue to originate programs in the Conway studios and relay them via microwave to the satellite transmitter for broadcast on Channel 19, Mr. Dillaplain noted.

Brazilian TV Station Orders RCA Mobile Broadcast Unit And Studio Equipment

In a major expansion of its broadcast facilities, TV Gazeta, headquartered in Sao Paulo, Brazil, has ordered an RCA-equipped mobile TV broadcast unit and studio video tape equipment valued at more than \$1 million.

The South American station, operated by Fundacao Casper Libero, will use the full-color mobile telecasting unit to increase coverage of sports events, cultural and community affairs and other outstanding activities.

The heart of the mobile van is its complement of six RCA TK-45 live color cameras and a TKP-45 portable camera, Mr. Ulasewicz said. An RCA TR-61 video tape recorder provides program taping capabilities, and the van is also

equipped with a TS-70 Production Video Switcher.

In addition to the mobile unit equipment, Channel 11 is installing an RCA TCR-100 video tape cartridge system in its Sao Paulo studio complex.

The "cart" system will operate in conjunction with another TR-61 reel-to-reel machine to record and reproduce promotional material, news, educational programs and other short taped sequences.

Israel TV Production Company Expands On-Site Capabilities

Israel Motion Picture Studios, Herzliya, will become one of the first TV program producers to use the new TKP-45 portable color camera in combination with the TPR-10 portable quadruplex video tape recorder.

The lightweight duo—the 22-pound, shoulder-mounted TKP-45 camera and the 100-pound TPR-10 transportable recorder—will be used for on-location assignments in conjunction with an RCA-equipped mobile TV unit which the production company has been operating for more than a year.

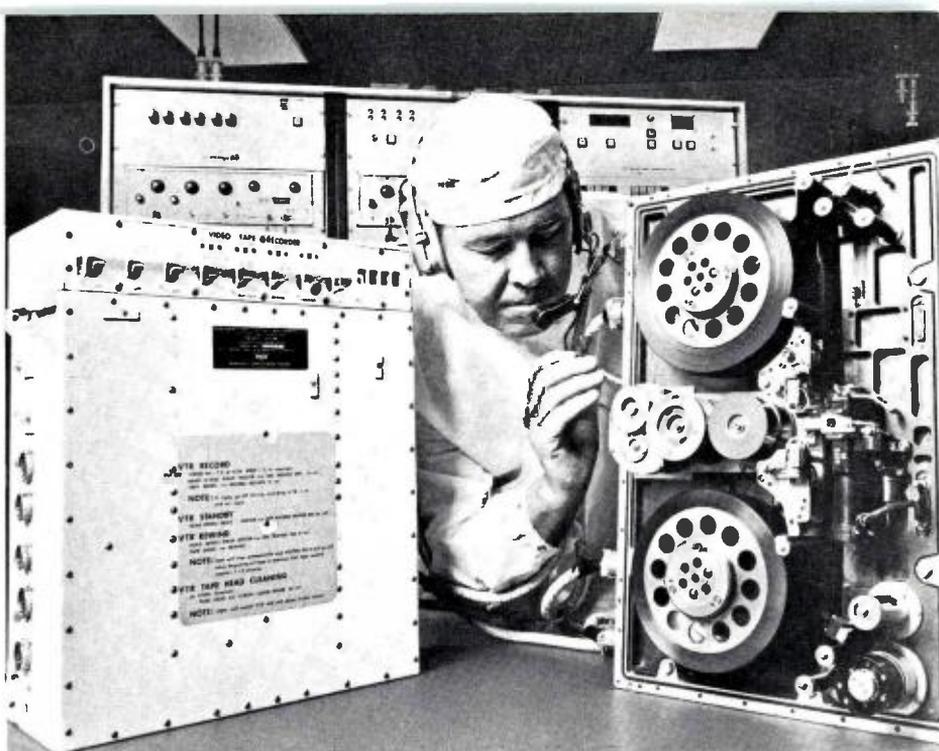
Israel Motion Picture Studios, the nation's largest independent film and video tape production house, uses the mobile van to tape-record news assignments and other feature programs around the country. The material is produced for broadcast within Israel as well as for satellite transmission to broadcasters overseas.

Itzaak Kol, IMPS General Manager, said that addition of the new equipment will enable the production company to provide expanded TV news gathering services in areas where only portable systems are practical. IMPS also plans to tape feature films and commercials for later transfer to film.

RCA time code editing equipment, included in the purchase, will be used at the company's studios to expand the editing capabilities for the existing video tape recorders.

Army Security Agency Training Center To Install RCA Color TV Production Facility

—An RCA color television system is being installed at the Army Security Agency Training Center and School in Ft. Devens, Mass., to provide instructional TV programs for its students and for military units worldwide. The production center for the closed-circuit



SPACE RECORDER—technician Everett Ware makes an optical alignment check on the color video tape recorder system that flew on the Apollo-Soyuz space-docking mission.

RCA Video Recorders Ride On Apollo-Soyuz Space Docking Mission

One of the most important events in the short history of man's venture into space is the cooperative U.S.-U.S.S.R. mission known as the Apollo Soyuz Test Project (ASTP). This joint program marks the first international manned space mission ever.

Dr. James C. Fletcher, NASA Administrator, called the mission "a milestone in international relations and detente."

One of the RCA systems in the ASTP mission is a video tape recorder that recorded for later color playback TV pictures of the Apollo crew during launch and at work during the mission. After the spacecraft dock, the system provided video tape coverage of the

cosmonauts visiting the Apollo spacecraft.

The ASTP VTR processed the field sequential color TV during the Apollo-Soyuz mission and fed this signal to the ATS-6 relay satellite for real time transmission to ground stations.

The system is housed in two discrete packages: a transport unit and an electronics unit. The complete VTR is approximately two cubic feet in size, weighs about 100 pounds and requires 150 watts of power.

The tape transport contains 2,000 feet of special, two-inch wide, video recording tape. The headwheel panel provides the scanning motion for the four video heads and contains a guide assembly which forms the tape around the headwheel.

system will make use of broadcast-type color TV cameras, video tape recorders and other professional studio equipment.

Three TK-630 color cameras, will be used to produce video tape training programs. A TR-61 and a TR-70, equipped with a Tape Editor Programmer, will be used for production and editing of master tapes.

Video switching will be handled by RCA's new TS-75 production switcher.

The installation also includes two RCA telecine systems for distribution of film programs to classrooms.

Jay Serwin, the school's Chief of Television, said that the new color system will be used to produce programs to supplement traditional classroom instruction at the training center. "Additionally, many training programs produced here will be dubbed to video cassettes for use by Army Security Agency units worldwide," he said.

RCA Unveils New Products For New World Markets At Montreux Exposition

In late May, more than 1500 professional and technical representatives of the international TV industry visited the 9th International Television Symposium and Exhibition at Montreux, Switzerland.

RCA's spacious display, which included a substantially expanded line of broadcast equipment, was well attended by

them—some of whom hailed from points as distant as the People's Republic of China, Poland and Zambia.

The equipment presentation was of major significance as it reflected sharply defined growth areas in the world video industry—on-the-spot reporting and production.

Visitors who crowded demonstrations of RCA's two handheld cameras and the new mini-mobile unit were responding to increasing interest in new program formats and concepts.



Crew sets up TK-76 Newsmaker System on Montreux's Avenue du Casino.



Cameraman unobtrusively mingles with sidewalk crowd.

A New Way to Handle the News

One major attraction was the TK-76 Newsmaker System—a total electronic news-gathering system consisting of a 17 lb (7.7 Kg) color camera, separate 12V rechargeable battery packs, a 12V battery-operated cassette VTR weighing just 30 lbs (13.5 Kg), a portable short-range FM microwave transmission system and RCA TACTEC personal portable 2-way radio.

The TK-76 and the recording and playback units were demonstrated live. The consensus was that they offer real competition to 16mm news-film production. Most of the proof lay in the equipment's extreme portability and the end result—the quality of the pictures. Originated in the exhibit studio and outside the Maison des Congress, they looked as good as or better than those possible with a film system. In fact, the pictures subjectively seemed to have a somewhat sharper, more realistic appearance, and were suitably compatible with studio production pictures.

The system's speed and effectiveness were proven in actual performance. To demonstrate how maximum results can be produced with minimal effort, the TK-76 camera and TRP-1000 cassette recorder were deployed to outside locations in Montreux and environs. This was a daily ritual carried out between studio demonstrations.

The mobility the Newsmaker System permits resulted in pickups from the Avenue du Casino along Lake Lemman, the famous medieval castle Chateau Chillon as well as other picture postcard locations in and around Montreux.

A two-man crew brought back full-color, on-the-spot taped coverage. Shown on the studio monitors, it was an indication of the system's ability to provide fast on-air playback.

Major interest also centered on RCA's TKP-45, offspring of the TK-45 studio camera. TV broadcasters examined the portable version closely as it is adaptable to a wide range of applications inside or out. The studio demonstration explained that the TKP camera head, unlike other portable cameras, is the heart of a complete system—which can be geared to specific production needs and thus keep pace with a user's growing requirements.



RCA's new mini-mobile unit: the going thing for fast on-the-spot coverage.

Mini-Mobile Unit Signposts On-The-Spot Coverage

Representatives of the world broadcast community at Montreux also witnessed the first showing anywhere of RCA's new, mini-mobile OB unit. Built and equipped by RCA Jersey Limited on the Isle-of-Jersey, this relatively lightweight vehicle is a new concept based on current needs of the world OB market.

En route to the customer (Channel 80 in Paris), the vehicle in the RCA stand was designed to accommodate two TKP-45 portable cameras in addition to one TR-600 or two TPR-10 quad recorders.

Operating from the mini-mobile unit's CCU, a TKP-45 camera was stationed outside to suggest its value for high-performance location shooting.



With studio-quality equipment forming the heart of the unit, the vehicle meets total on-location requirements—which RCA believes is exactly what the European market wants.

Carefully planned use of space, advanced compact video equipment and supporting electronics combine with a rugged Range Rover chassis to provide everything required for just about any kind of outside coverage or program source—sports, shows, festivals, commercials and instant news.

As such, the mini-mobile unit can feed its own tape recorder, or the station directly with the aid of microwave equipment. Additionally, the vehicle can be integrated with other remote or mobile installations.

Inside, the new RCA OB unit features a fully equipped engineer's position, with a color monitor, audio mixer, a video switcher with special effects generator and talkback facilities.

The mini-mobile unit is designed for comfort and convenience, and easily traverses rugged terrain, to permit the quickest and widest range of outside pickup possible. Overall design and construction is such that the unit can withstand difficult field conditions.

For added operating versatility, the new RCA van is equipped with a motor generator for pickup while in motion. It also has camera vantage points on the reinforced roof over the equipment section, through the roof of the cab and on a specially built rear platform.

Excluding the driving cab and hood, the vehicle features a Carmichael Commando Series body made of strong molded fiberglass with bonded insulation.

Other design features include a regulated voltage control panel, cable storage reels, accessory compartments and wiring ducts.

The OB vehicle shown at Montreux is about 18.7 ft (5.7 m) long, 6 ft (1.8 m) wide and 8 ft (2.4 m) high, and weighs approximately 8000 lbs (3670 Kg) fully equipped.

For demonstration purposes, the mini-mobile unit's TKP-45 served as the outside camera during the whole exhibition. Operating from the van's CCU, the camera was located on the promenade along Lake Lemman outside the convention center.

UNIQUE TRIANGULAR BUILDING

for WPRI-TV
extends production
capability and
projects new image

MOVING from cramped fifth floor quarters in an aging downtown building to a totally new broadcast environment has been a dream come true for the staff of WPRI-TV, Providence, R. I.

Planning for the "dream" move began the day Poole Broadcasting Company purchased Ch. 12 in 1967. It culminated in September 1974 when operations were transferred to a new building in East Providence.

The new broadcast center is unusual in its triangular design; is aesthetically attractive—and yet remarkably functional. The latter was a most important consideration, since Arthur Bone, Vice President and Chief Engineer, was determined that in the technical operating areas efficiency must not be compromised for aesthetic reasons.

With the appointment of an architect in 1972, planning for the new facility became a major, on-going activity for the TV-12 management team. The architect, William Kessler & Associates, Grosse Point, Michigan, had never before designed a broadcast facility. The resulting building design evolved from detailed discussions with Arthur Bone, and Edwin Pfeiffer, Vice President & General Manager at Providence, plus the close involvement of Poole Chairman John B. Poole and President Albert J. Gillen from Corporate headquarters at WJRT-TV, Flint.

Three Interior "Pods"

With complete information on station operating needs, including work flow and traffic patterns—and without the encumbrance of pre-conceived notions—the architect presented a triangular structure as his solution. The building



Impressive front entrance to WPRI-TV carries out the architect's triangular design theme.

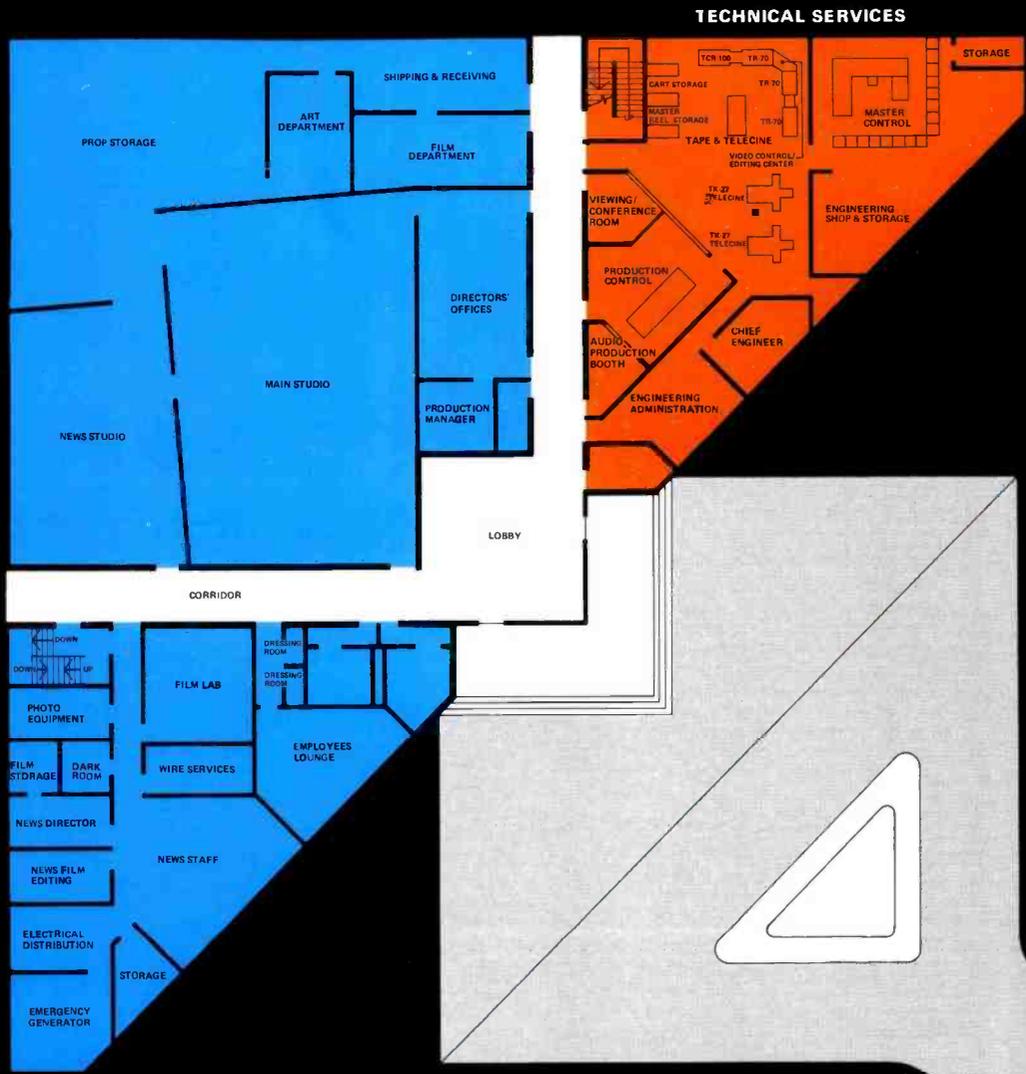
interior is divided into three "pods", which are separated by two-story high corridors. This design achieves some unusual but quite functional facility arrangements, resulting in an extremely effective utilization of available space.

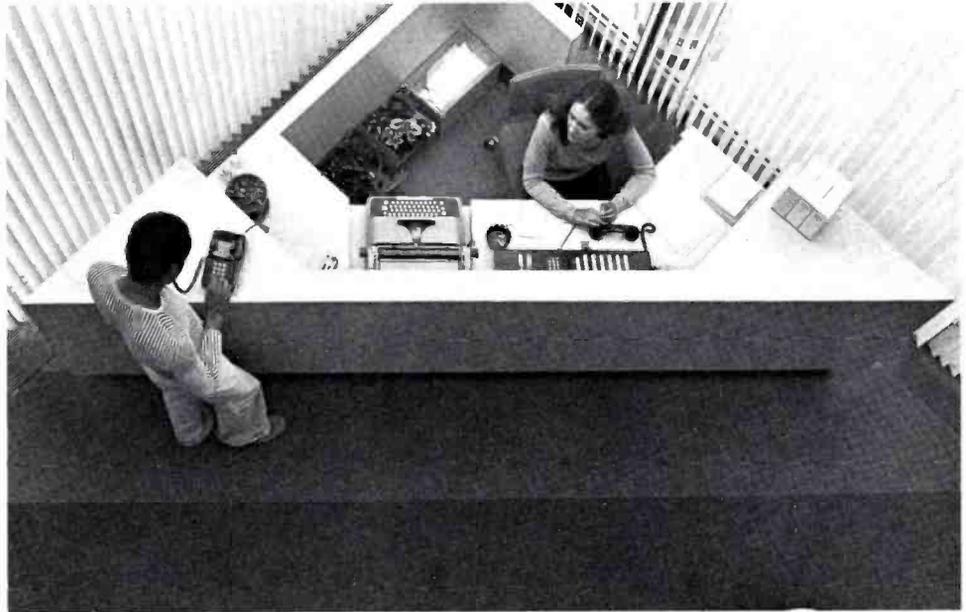
Rising from the main entrance of the building is a brightly-painted triangular tower structure on which the STL microwave mobile radio antennas are mounted. From the spacious lobby/reception area, the TV-12 visitor is easily directed upstairs to the administration/sales office, or down one of the two corridors—one leading to the News Department, the other to the Engineering and Production areas.

Technical Area Accessible, But Traffic-Limited

Engineering areas are accessible from inside or outside of the corridor. The inside access is through the Engineering Offices. From the corridor, Production

Layout of the first floor of TV-12 shows efficient utilization of space. Technical area is compact in size, yet spacious and uncluttered.





Glassed in lobby reception area presents bright and cheerful appearance for visitors.

Pleasant working environment shows in this view of the second floor sales and administrative offices.

Control and the Tape/Telecine spaces are entered through separate doors, which limits unnecessary traffic. Two other doors on this side of the corridor provide entry into a Client Viewing Room and Audio Production Room. This arrangement has worked out very well, Arthur Bone says. The Client Viewing Room is glassed in, but provides direct line of sight to both Production Control and the Tape/Telecine area. The room is equipped with a color TV monitor. Clients can observe the production operation without entering Production Control or disturbing the operating personnel.

Production Control Separated From Studios

Production Control is a generous-sized room, with the usual wall of monitors for displaying available video sources. The work area includes separate positions for Director, TD, and audio operator, with a small seating space at the rear to accommodate several more people. Most frequently, the director also functions as the TD, handling machine control and video switching. The machine control panel, designed by TV-12, is at easy arm reach to the left of the TD position. The production video switcher has 24-inputs, with three mix/effects busses.

Next to the switcher is the character generator keyboard. This system, mostly used for production, is controllable from Master Control as well as from Production Control. The audio console, a 16-input system with four submasters, will accept any combination of high or low level sources. It has switchable equalizers, with foldback and switchable fixed attenuators. The high level is selectable into eight inputs, with cross-fading between any combination.

The physical separation of Production Control from the studios is a break with tradition, but it has not been a problem, according to Mr. Bone. Rather, he says, it has improved the proficiency of the production operation.

The Audio Production Room adjoins Production Control and has a glassed-in view of this room. It is used as a one-man audio production facility, making carts for background music, sound effects or—most frequently—audio tapes for use with news film. All announcements on TV-12 are recorded. In most cases, the announcer cuts a tape on an

RT-22 Recorder in the booth, then takes the reel to Master Control for play on the RT-22 there, where it is cued to roll automatically when called for. Corridor entrance to the announce booth is convenient for the announcers coming from the News Department on the opposite side of the building.

“WRAP-AROUND” Video Tape Center With TCR-100

The Tape/Telecine area can be entered from the corridor; through a door from Production Control, or through the Engineering Administration area. Access is controlled, with easiest access to those directly involved with the Technical Operation.

For the new WPRI-TV facility there was no skimping of space in the Tape/Telecine area. The two TK-27 film islands are positioned to allow ample room for the operator to maneuver in loading and unloading projectors. Both TK-27's are equipped with enhancers, which “make pictures sparkle”, Mr. Bone notes.

The video tape operation is set up in a “wrap-around” arrangement with a TCR-100 and TR-70 along one wall; a Video Control/Editing console in the center, and two more TR-70's along the other wall. One TR-70 is married to the TCR-100, sharing electronics. This machine is normally used for the playback of syndicated tape programs, while the other two TR-70's are designated primarily for production work.

At WPRI-TV, the main function of the “cart” machine is to free the other tape machines for production, and it is performing that role well, averaging some 5,000 plays a month. Currently, all tape commercials, promos and PSA's are on “carts”, but film spots are not at this time. More tape commercials are being received now, Mr. Bone says, with the ratio presently at about 65-35.

TCR-100 With Random Home and EPIS

The TV-12 “Cart” machine is the latest “A” version, with Random Home, and is also equipped with EPIS (Electronic Program Identification System). The EPIS is also remoted to the Master Control and to Production Control. According to Video Tape Operator Norm Ballenger, the Random Home feature is used all the time. It adds more versatility to the TCR-100 by permitting dubs to be made almost up

Conversation “well” in lobby provides an attractive setting for station guests.



to break time. Pressing the "home" button moves the "carts" scheduled for the next break into position, ready to play. An average of 15 to 20 new dubs are made daily, Mr. Bone estimates. Along with handling all of the tape spots aired by TV-12, the TCR-100 is moving gradually into production support. It is being used for program intros and for storing segments of programs taped for later viewing.

Arthur Bone confirms the reliability of the "cart" machine by noting that in the first eight months of operation, there have been only three machine failures—and these were cleared before there was a need to make up a spot reel. After 43,000 cycles, the tip projection on the heads is still almost three miles, he adds.

Shelving is provided in the Tape area for storing all active commercial master reels and all "carts" (1,000 are now on hand). The "cart" is assigned the same number as the master backup reel, so when a master is removed from the active file, the corresponding "cart" label is removed. A new number is assigned when the "cart" is re-dubbed.

Tape Center Is Production Oriented

The Video Tape Control center includes a TEP editor, switching and monitoring facilities in a double console mounting. The input of each tape machine goes to a 12 x 1 routing switcher at the console. A "Tech Preview" auxiliary bus from the Master Control Switcher is also available—ahead of the tape machine inputs—for handling post-production needs. Also available at the console are remote controls for the film systems, which helps expedite post-production editing assignments involving film or slide inserts.

The TV-12 Video Tape Operator loads the tape machines and the TCR-100; dubs tapes and "carts", and works with Production on tape editing requirements. With the "cart" machine handling the breaks, the Tape operation runs smoothly, at an even pace, Arthur Bone remarks, while more is accom-

plished. Program Manager Bob Kinkead comments, "the TCR-100 has made a world of difference in the production area by expanding our commercial capability. It frees two tape machines for production use.

An added feature incorporated in the tape area by Mr. Bone's group is a special clock timing system which is used primarily in conjunction with taping network programs for delayed broadcast. Since the Tape Operator may be involved in dubbing or handling a production job, the clock system provides an advance alert for him to be sure the assigned machine is loaded and ready to roll for taping the network show.

Master Control—Two Walls of Racks

Master Control is located behind the Tape and Telecine Room, isolated from the traffic pattern so the Master Control Operator can function with a minimum of distraction. The TV-12 MC Operator, in addition to on-air switching, also monitors and logs the transmitter remote control readings and shades cameras for live shows. An interesting design feature of the Master Control room is that two of the walls are formed by equipment racks—which face into Master Control and back on the engineering repair shop directly outside Master Control. This arrangement conserves space, concentrates terminal, distribution and control equipment, and more importantly, makes it very accessible for maintenance from the engineering shop.

Rack equipment here includes transmitter remote control; audio tape recorders for on-air and for monitoring; video distribution, sync generators, video switcher electronics; pulse distribution, audio and video patching. The Master Control switcher has pre-set programming capability of up to 17 events.

Also built by WPRI engineering is a separate machine control remote panel which permits the Master Control Operator to manually start the tape and film sources if necessary. The character

generator system remote keyboard is also located at this position.

At the left of the Master Control switcher are the console-mounted Camera Control Units for the two TK-45's. In another console on the right are the CCU's for the two TK-27's.

Engineering Innovations Aid TV-12 Operation

Another TV-12 innovation which has helped the Master Control operation is the use of a digital time clock which is wired to the Master Control switcher. The clock "zeroes" when each event is started so the operator knows the exact elapsed time from the start of the event on-air. When he hits the "Take" or "Roll" button, the clock re-sets to zero. The clock makes following the program log even easier, while minimizing errors.

As noted before, an entry alarm system gives the Master Control Operator a visual indication of any building doors which are opened after normal working hours. A building fire alarm system also has a display panel in Master Control, as well as being directly tied in with the Fire Department.

All of the film and tape equipment remote control outputs terminate in telephone type interconnect blocks in a single panel behind Master Control. This arrangement, Arthur Bone says, provides flexibility in remoting the equipment to various locations, or for re-arranging, should this be needed later.

In the early planning stages for the new facility, Mr. Bone considered installing computer flooring for equipment areas, but instead chose to go with overhead cable ladders.

This proved to be a wise decision, since the cabling is more accessible overhead than in the floor.

Two Centrally Located Studios

The Production Department offices are located directly across the corridor from the technical area. In fact, they separate the technical area from the studio area. As noted previously this



Production control at WPRI-TV is located away from the studio, adjoining the Tape/Telecine area.

Master Control is isolated from traffic flow, and laid out so that camera and machine controls, switching and monitoring facilities are readily available to the MC operator.

The "wrap-around" tape area includes a TCR-100 "married" to a TR-70 VTR; a Video Tape Control/Editing console in the corner, and two additional TR-70's.

The addition of the TCR-100 has enabled the station to dedicate two TR-70 machines for production use.





Studio productions are handled by two new TK-45 cameras.

layout is somewhat unusual, but quite functional, since production is most involved with both the studio and the control areas.

Next to the Production offices and directly across from the Tape/Telecine area is the Film Department. Several screening and editing booths are in this area, as is the storage for spot commercials and films other than News.

Since the bulk of outgoing and incoming shipments involve film and tape, the Film Department handles shipping and receiving functions. A rear door permits bringing material into or from the building without traveling through corridor or disturbing operations.

WPRI-TV's two studios are located off one side of a corridor from the lobby, while the News Department is strategically positioned across the corridor from the News Studio. The studio location, down the corridor from the lobby, gives visitors and talent access to the studios, the lounge area and dressing rooms, without need to pass through the Production or technical operating spaces. In addition, as a security measure, two sliding gates near the entrance reception area seal off the steps to the second floor after hours—when the front doors are locked, and entrance is limited to key people through a News Department door or the rear

doors. The doors are tied to an alarm system which lights and sounds an alert in Master Control, identifying which door is open.

TK-45's "Make Excellent Pictures"

The main studio is 40' x 60', and the second studio (30' x 40') is used primarily for News and has fixed set with blue chroma-key background. For improved acoustics, the wall separating the two studios is set at an angle, and the roof above the studio area is poured concrete for additional sound isolation. A 10' x 14' roll-up door permits bringing cars, boats, props or oversized materials into the studio. Prop storage and a carpenter shop are located behind the studios.

Arthur Bone is delighted with the TK-45 cameras, noting that they make excellent pictures, with consistently good color and require minimum day-to-day attention.

Emergency Power System

In the corner of the building adjoining the News Department is the Electrical Distribution Room and the Emergency Generator. The generator is 75kW unit by Kohler, which operates on utility-supplied natural gas, which eliminates the need for on site storage of fuel. The system is set up to handle all of the key areas in the building:

1. Technical services
2. News Department
3. Wire Services
4. Telephone and 2-way radio equipment.
5. Emergency lighting
6. Computer operation
7. Emergency exhaust fans

The generator starts automatically 3-seconds after a power disruption, and is up to speed in 15 seconds. After commercial power has been restored for 15 minutes, power is transferred to normal distribution, and the generator shuts off. A strip chart recorder shows any power disruptions after hours. The emergency generator automatically starts once a week for a 30-minute exercise period, operating into a load bank.

Air Conditioning and Compressed Air Systems

The air conditioning at WPRI-TV is unusual for a television facility, in that it uses a steam absorption system for air conditioning and humidity control. Oversized air handlers for the studios keep them quiet and cool, while a high efficiency air filtering system keeps the air clean. Also, no smoking is permitted in the studios or the technical equipment areas. This is not merely a health and safety rule, but extends the life of the equipment and reduces maintenance, Mr. Bone explains.

The house compressed air system serves the tape machines, film processor, and is even used for gassing the transmission line. It uses a 7.5 HP compressor with a series of filters and desiccant dryers.

Moving Day—A Sweat, But No Panic

The transition from the old downtown location to the new site was not as traumatic as it might have been, according to Arthur Bone. Advance planning, combined with selected new equipment purchases eased the changeover. A new production switcher, audio console and Master Control switcher were wired into the new location. One of the two TK-27 film islands was moved first. In the tape area, TV-12 had two TR-70's and two TR-22's. The 22's were traded for the TCR-100/TR-70 combination which was installed in the new building. One of the TR-70's was also moved from downtown. Later the other 70 and the second film island were transferred.

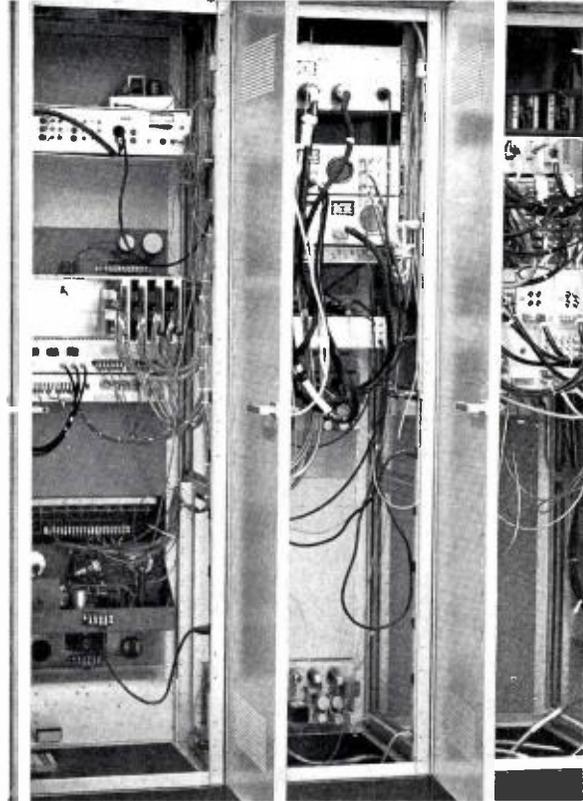
The final switch was made overnight, without any loss of air time and by the end of the day, operations were routine, although Engineering still had long, late hours to spend in completing the installation.

New Building Has Far-Reaching Effects

WPRI-TV's new facility and its overall impact are favorite subjects with General Manager Ed Pfeiffer. "The move to our new building has had a far-reaching effect on TV-12. The pleasant environment has improved morale measurably. And the enlarged, efficient technical facility has opened new avenues of service and revenue. We are able to produce commercials more



Master Control is unusual in that video and audio equipment racks form two of its walls. The racks back on the engineering shop space, for service accessibility.



efficiently, offering a better value to advertisers. Further, the new facility has enabled TV-12 to expand our public service programming and to accommodate more guests for such programs."

TV-12 Commercial Producer Joe Carney is happy about the new broadcast center. "From a commercial production point of view, our new facility is a dream come true. We're producing more commercials now, with less effort. The color from the TK-45 cameras is superb, and the "cart" machine is making it all possible by freeing up two reel VTR's for production. We can now work all day instead of now and then."

The effect of the change is obvious to Bob Kinhead, Program Manager. "One noticeable trend today is toward more commercial and program production," he notes, "particularly public service shows. The new facility has increased the station's ability to produce and air more local programs. It has had a good effect on the spirit and morale of the employees, which is reflected in improved operation. With the new facility, and its expanded technical capability we are able to do more and better production work."

"This Is A People Place"

There is much to be said about the merits of WPRI-TV's move to their

new triangular broadcast center. General Manager Ed Pfeiffer overheard one TV-12 staffer sum up the situation effectively with the statement, "Working here is great because this is a 'people' place."

The combination of a new building; increased and more efficient production capability, and a competent, enthusiastic staff has attracted new advertisers and increased revenue potential, and has made an impact on the community.

For Poole Broadcasting's TV-12 in Providence, that combination spells success for now and for the tomorrows to come. □

WBRE-TV TEAMS CARTRIDGE FILM PROJECTOR WITH CARTRIDGE TAPE RECORDER, ACHIEVES AUTOMATIC STATION BREAK

TV-28 is a station with a tradition for "being there first" with innovations in technical and business operations. The newest addition to this modern Wilkes Barre, Pa. facility is a TCP-1624 Cartridge Film Projector enabling WBRE-TV to achieve a completely automated station break.

Spot Film Reel No Longer Necessary

The TCP-1624 is viewed as a worthwhile investment for TV-28 since it offers an exceptionally efficient way to handle film. The cartridge film system eliminates the need for making up and breaking down a daily spot film reel—and the considerable manpower and film handling this kind of system required.

Work Duplication Eliminated

David Baltimore, President and General Manager, insists on using equipment for its specific design purpose achieving fluid operations by eliminating work duplication, non-productive activity, and by automating repetitive operations where practical. The acquisition of the TCP-1624 supports Mr. Baltimore's basic operating premise.

TCR-100 Is Integral Part Of Automated System

TV-28 was one of the first stations to come on air with the TCR-100. Since 1972 it has been handling much of the tape load for spot announcements and short segments for news programming.

In carrying out Mr. Baltimore's operating philosophy, the station avoids duplication of effort. For example, incoming film spots are not dubbed to TCR-100 carts. And outside tape commercials are seldom dubbed to a TCR-100 cart unless frequent use of the spot is indicated.

Library Of Film Carts Is Increasing

TV-28 installed the TCP-1624 in early April. By mid-month, after a brief "get acquainted" period for station personnel, the station went to full film cartridge operation. The TCP-1624

projector is now averaging 70 to 80 plays a day and their "library" of carts is about 700 with 450 in active use. Eight to ten new spots are "carted" each evening, a relatively simple operation. The spots are first loaded to a cart spool and a Mylar leader attached. The spool is inserted into a cartridge, the film is timed, cued, cleaned, and previewed.

Overall Technical Operation Is Improved With Cart System

The film cart system, says George Andresky, Chief Engineer of the studio

facilities, has definitely helped overall technical operations. Equipment is more efficiently utilized, there is less film handling, and there's a great improvement over days gone by when saturation spot campaigns required the dedication of a projector, or projectors, to single commercials. The TCP-1624, with its 24-cartridge magazine, handles multiple playbacks as routinely as any other.

Don Miller is Production Manager at TV-28. He sees the TCP-1624 as making for better operation on-air. Breaks are smoother, easier. There is no "mice

A TCR-100 tape cartridge recorder operates in conjunction with an automatic programming system and a TCP-1624 film cartridge projector to achieve automatic station breaks.



in a maze" flurry of activity with each break. And spot films, when carted, are easily and smoothly changed right up to "on air". Also, he says, cataloging and following commercials in a cartridge is far simpler since the TCP-1624 cartridge acts as the file and storage container.

Automated Master Control

Master Control is an integral part of the technical area . . . designed in order that the operator could assist in loading film and tape machines after having set up the event sequence in the automatic programming system. The equipment complement also includes three film

islands, two TR-70 recorders (a third TR-70 is devoted exclusively to production) and a TCR-100.

The evening man at TV-28, uses a computer-generated log for the following day (BIAS system) to set up his film and tape sources. The magazine of the TCP-1624 is loaded with 24 carts. Proper video carts are pulled for use in the TCR-100, and slides extracted and set for these projectors.

Automatic On-Air Switching

The benefits of automation are mirrored sharply in TV-28's Master Control operation. The MC operator can set up as many as 40 events in advance.

These are keyed and visually displayed for verification and timing. The system provides for automatic on-air switching from event to event. With the TCP-1624 cartridge film projector pre-loaded with up to 24 cartridges, and with the TCR-100 pre-loaded with up to 22 video tape carts, maintaining continuity is smooth and easy. During local time slots, which are heavy with spots, the advantages in automation are most noticeable. Switching between film and tape carts and other sources is automatic. The MC operator uses his time to program ahead. The fluidity which Mr. Baltimore seeks in his operation is easily seen here.

The TCP-1624 cartridge film projector, with capacity for 24 carts, eliminates the need for a spot film reel. Film carts are played on-cue interchangeably with tape carts.



Easy TCP-1624 Installation

Installation of the TCP-1624 was surprisingly easy, says Mr. Andresky. Interface wiring for the automation system had been completed in advance and actual installation was mostly a matter of floor leveling and optical alignment. The TCP-1624 is installed in an island with a TK-28 film camera mounted inboard on a TP-55 multiplexer.

Picture Enhancement With Auto Color Correction

The TK-28 camera produces excellent pictures with automatic color correcting functions making a distinct difference. The picture enhancement is particularly evident in broadcasting news film, Mr. Andresky reports.

The station's TCR-100 also functions as a production aid, according to Don Miller, to assemble programs and commercials. Material is sometimes taped and stored on video carts for later playback, making it another video source, in effect, a third camera. (WBRE-TV uses two TK-45's.) Selected news segments are also recorded on video carts and integrated into evening programming.

The facilities at WBRE-TV come close to producing the "totally fluid operation" desired by David Baltimore. Since incoming spot material is running about 50-50, film to tape, TV-28's film cartridge installation will be a vital part in the future of this broadcasting operation. □

WBRE-TV designed its own cart storage facility for easy access to both film and video tape carts. Compartmented sections at front of unit contain film carts. They slide away for access to video cart compartments. The wall storage unit is less than 12" deep.

TCP-1624 film carts are compatible with, and may be played on, any standard 16mm projector.

The Master Control operator uses an automatic programming system for advance setup of up to 40 events. Each event may be automatically switched on-air for smooth technical operation.



"TWIN CARTS"

AT WTOG-TV
AVERAGE 300
PLAYS
PER DAY

Just about every TCR-100 user offers the comment "I don't know how we got along without it."

At WTOG-TV, Channel 44, St. Petersburg, Florida, that statement goes double—and then some. This independent Hubbard Broadcasting Company UHF station is equipped with two TCR-100's.

Chief Engineer George Orgera comments, "We have to keep efficiency up and costs down. We've been able to do this with a wide variety of automated equipment."

"Starting with two 'cart' machines turned out to be a stroke of genius," Mr. Orgera happily notes. "We no longer have to worry about reel-to-reel stock and have everything programmed on the two cart machines."

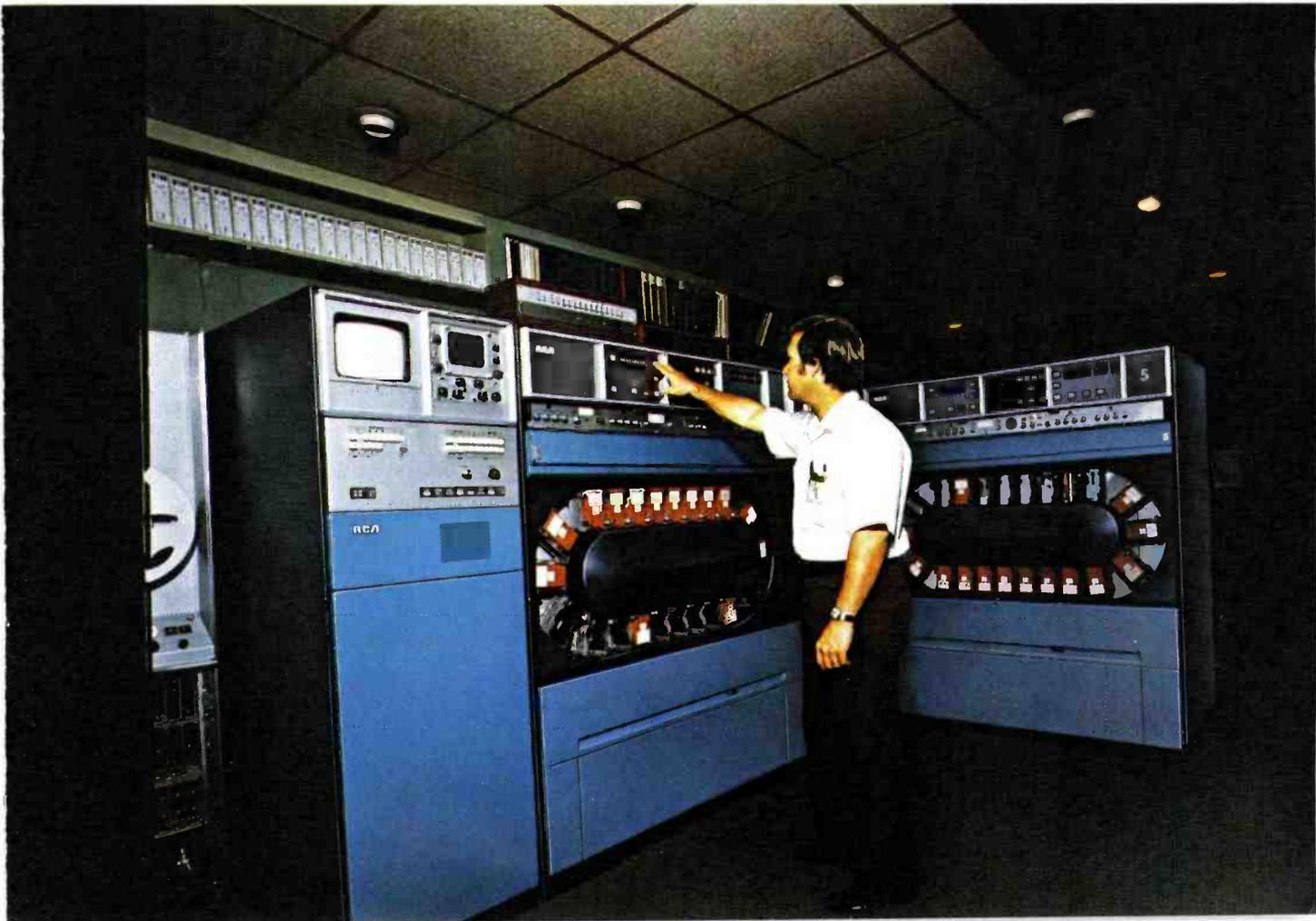
The second cart machine means that up to 44 tape segments can be programmed in advance. It also provides an added production capability and machine back-up. With the dual cart machine operation, WTOG can produce and air a greater variety of promo's, ID's and PSA's.

Automatic Equipment Promotes Efficiency

The WTOG-TV facility is machine-oriented. Its Master Control area is virtually wall-to-wall equipment, with rows of video racks, a unique automated switcher, two film islands and a battery of hard-working tape machines, including two TCR-100's.

The high density of automatic equipment promotes efficiency and effective utilization of manpower. George Orgera is proud of the productivity of his en-

Chief Engineer George Orgera sees that the two TCR-100's at WTOG-TV are fully utilized. All film and tape commercials are dubbed to the "cart".





TV-44's two "carl" machines are averaging over 300 plays per day, and are also used for production.



TCR-100's handle complete break blocks at TV-44, keeping the reel VTR's clear for production and playback of syndicated tape programs.

gineering staff. Although limited in number, they handle an extraordinary volume of assignments.

Mr. Orgera stresses performance, and sets a fast pace for his group. The eleven-man engineering force is specialized, including four strong technical men for maintenance and troubleshooting; four switcher operators, two video tape operators, and a "swing" man. The studio equipment complement at WTOG-TV includes:

- 2 — TK-44 Cameras
- 2 — TK-27 Film Islands
- 2 — TCR-100's
- 2 — TR-50 Video Tape Recorders
- 1 — TR-60 Video Tape Recorder

A recent addition is a compact mobile unit designed and installed by the WTOG-TV engineering crew. Equipped with portable cameras, VTR, video and

audio switching and a built-in generator, this versatile new unit extends TV-44's production capability for handling field assignments.

Staking out the Market

In a market which is covered by three network-affiliated stations, any independent has to scratch for both audiences and advertisers. Counter-programming is the key, and TV-44—the only "U" in the market—uses it well. During the week, network offerings are countered with successful syndicated shows, most of which are on film, and with movies. Religious programs are slated for Saturdays, and cartoons on Sunday.

The station's programming is geared to the 18 to 49 demographic group, and it presently holds an "11" share of market for an average half hour. Furthermore, notes General Manager



Since all film commercials are dubbed to the "cart", there is less strain on the telecine systems.

Jim Dowdle, "With our counter-programming policies, in some time segments we rank number one in the market for all adults."

Because of its alternative programming, Ch. 44 receives excellent penetration of the cable systems throughout much of Florida, providing bonus audiences.

TCR-100's Handle all Breaks

The two TK-27 Telecine systems are utilized for film programming and for production. Daytime tape shows are played on the two TR-50's. The TR-60, with a TEP editing system, works a full schedule. It is used for production during the day and serves as the program playback unit at night.

Both TCR-100's are well utilized—handling all of the commercials and breaks during the entire 18-hour broadcast day for Ch. 44. The average num-

ber of "cart" plays per day is 300, Mr. Orgera estimates. On one record day, 380 carts were broadcast.

There is no set procedure for loading the "carts" for breaks, so the operator on duty determines how he prefers handling them. Most of the time, the machines are loaded for three breaks ahead.

At WTOG-TV, all film and tape commercials received are converted "carts", with an average of ten new spots being dubbed daily. There are 1500 "carts" on hand, and an active file of 1,000 is maintained. Most are one-minute in length, except for about 100 3-minute "carts". Some of these are used by the Ch. 44 News Department for assembly of program segments, including the E-J camera news coverage.

An interesting sidelight of the TV-44 "cart" operation is that no reel tape

High density of automatic equipment at WTOG promotes efficiency and effective utilization of manpower.

masters are retained as back-up. Once material is on the cartridge, the master is either forwarded or re-used.

Production and Creativity

During weekends, Ch. 44 runs smoothly as a two-man operation. This typifies George Orgera's emphasis on efficiency. Labor savings from equipment investments not only increases productivity, he says, but also gives technical personnel more opportunities to be creative. For example, on production assignments, the engineer frequently functions as a director in shooting tape commercials for clients. All production at WTOG is on tape, and typically about 80 per cent is done in the studio. The addition of the new mobile unit may change this ratio, however.

Production is the name of the game at WTOG. At the studio, the production day starts shortly after the 7:30 live morning news show, and lasts until 6:00 pm, with time out for the one-hour variety/news program which is presented live at noon each weekday. Several other half-hour local shows are produced weekly, so the two TK-44's in the studio are kept busy with program and commercial production. In production use, the cameras handle keys, inserts and dub-overs.

An example of the speed and efficiency of the TV-44 production operation is cited by Assistant Chief Engineer Emerson Ray. In doing a series of commercials for a leading regional Department Store, the remote unit was on location at 9:00 am. the shooting

was completed and the tapes were at the station for editing by 2:30 that afternoon. The production and editing of four spot commercials was completed by the end of the normal workday, ready for client viewing.

"Carts" are a Timesaver in Production

The "cart" machines are very much a part of the production team at WTOG. One machine is used for playback, and the other is designated for production. In this application, tape footage from remotes or studio shooting is loaded on the TR-60 VTR, and "rough-cut" footages are selected for editing. These are then recorded on 3-minute "carts". The "carts" are then played for final editing and spot assembly.

Using the "carts" in production work is a real timesaver, Emerson Ray notes. And, he adds, with the editing accessory now available, the editing operation will be even smoother.

A Fast Move-in for the TCR-'s

Installing the two TCR-100's in WTOG's crowded Master Control room was accomplished with precision and speed. The locations for the machines were set; pre-wiring was completed before their arrival and compressors installed. One control room wall had to be torn down to squeeze the machines in. The TCR's were delivered and moved at 7:00 in the morning. By 8:00 am, the construction crew started rebuilding the wall. Astonishingly, the first "cart" from one of the machines was dubbed and aired at 10:00 am the same day!

The "cart" machines at WTOG have improved efficiency and overall quality, Mr. Orgera comments. There is less handling of tape and machines—and the uniform color output from the "carts" give the station a sharper look on-air.

The heavy workload and limited staff does not permit scheduled preventive maintenance on the "cart" machines, other than daily routine cleaning of the capstan headwheels and running the test cart for checking alignment. In nearly two years of operation there have been no headwheel failures.

Ideas and Innovations Encouraged

George Orgera runs like a dynamo—constantly on the move, planning, reviewing and implementing new ways to better the technical performance of TV-44. This drive and enthusiasm is reflected in the station's engineering staff.

"The extensive use of automated equipment," Mr. Orgera says, "has enabled us to make more effective and creative use of our engineering staff. They have been encouraged to initiate changes in our operations to further improve the overall efficiency. This is what I call true 'creative engineering'."

Since the station management is receptive to new ideas and methods, the results have been excellent.

Typical of its willingness to be innovative, WTOG was among the first to move into Electronic Journalism. Their E-J cameras are used by the News Department, primarily for interviews and scheduled events rather than for news breaks.

Based on this experience, Mr. Orgera sees today's low-cost, marginal quality E-J systems as an interim step, and he predicts that once the initial flurry of interest passes, broadcasters will be looking for products that measure up to broadcast performance standards.

TCR-100's Fit Computer Operation

As an independent, WTOG has a

larger-than-normal volume of transactions to handle—more local and national spots, and more individual billings. To keep pace with this overload, Ch. 44 turned to the BIAS computerized information service, and it has been an extremely effective operating tool for the station. "There's no other way we could handle all the volume we deal in," remarks Jim Dowdle. The computer keeps track of avails and even minimizes the effect of breakdowns by permitting quick re-scheduling of make-goods in billable time slots. "Since we are able to account for all spots run, our billings have increased substantially," Mr. Dowdle adds.

The TCR-100's fit easily into the computer operation. From a management viewpoint, Mr. Dowdle reports, the two-cart system has been a great benefit to WTOG because they handle all station breaks automatically, with minimum effort. An additional advantage comes from the versatility of production options the second "cart" machine affords the station's crews. "We're able to program, promote and produce a far greater volume of spots, ID's and public service messages than most stations use—in far less time, and with no increase in manpower."

In performing double-duty service as commercial playback systems and as production aids, WTOG's twin TCR-100's have clearly demonstrated their cost-effectiveness. □



Equipped with portable cameras, VTR, video and audio switching, this compact mobile unit extends TV-44's production capability for covering field assignments.

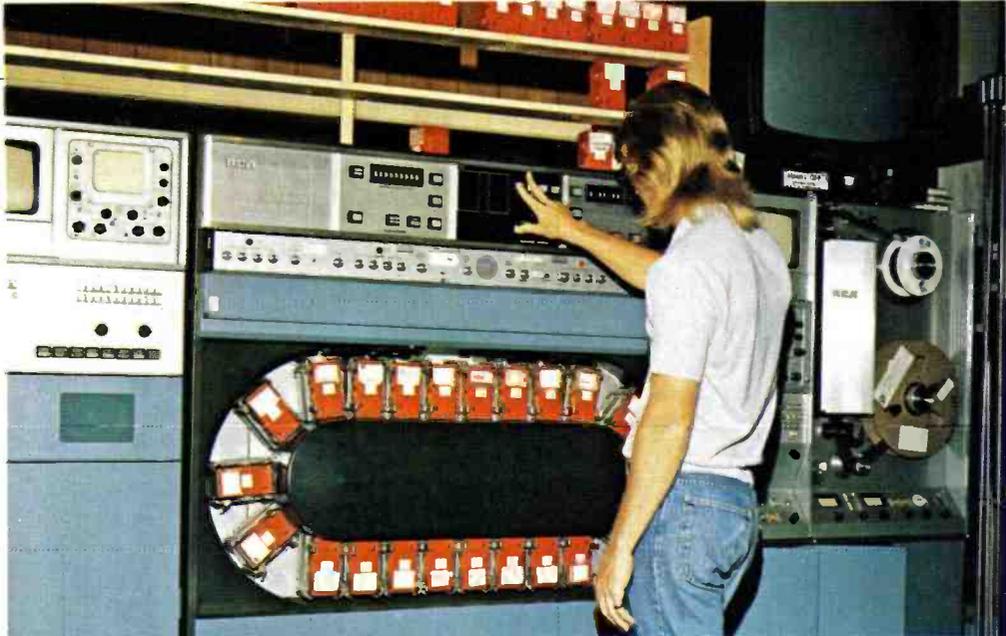


Two TK-44 cameras in the WTOG studio are kept busy with program and commercial production.

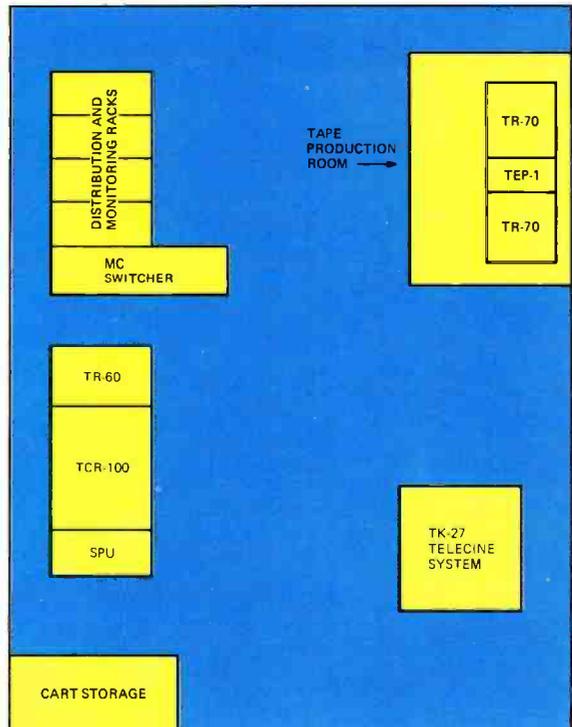
Computerized information service is an effective operating tool.



TCR-100 at TV-20 airs more than 200 "carts" per day. TR-60 is used for syndicated tape playbacks and for recording "carts".



With TCR-100 handling breaks, two TR-70's with tape editing programmer are dedicated to production.



Master Control layout at WBBH-TV, Fort Myers, Fla.

TCR-100 does a big job for **SMALL STATIONS**

DAVE McKELVEY, Chief Engineer of WBBH-TV, CH. 20 Ft. Myers, Florida, chuckles when he hears how the TCR-100 "cart" machine is helping major market broadcasters to achieve new efficiency and economy in their tape operations.

"Of course, the 'cart' is a valuable asset for the top market stations," he says, "but looking at it from our position—the TCR is even more essential. We're in Market #164, ADI, and need all the help we can get.

"With the 'cart' machine handling breaks automatically and a TR-60 for on-air playback of syndicated tapes, master control can be a one-man operation here—and not a back-breaking one at that."

An NBC network affiliate, WBBH-TV is a smooth-running, well-equipped UHF facility. The large investment in equipment provides the labor-savings and efficiency needed for a small staff operation, Mr. McKelvey notes.

Video Tape Used Extensively

Tape and film equipment complement in the Master Control room includes:

- TCR-100 Video Cartridge Recorder
- TR-60 Video Tape Recorder
- 2—TR-70 Video Tape Recorders
- TEP-1 Editing System
- TK-27 Telecine System

The combination of TCR-100 with separate Signal Processor (SPU) and TR-60 in line alongside, provides extended flexibility and utilization of tape equipment. The TR-60 is used for playback of syndicated tapes, and as the master recorder for making "cart" dubs. The two TR-70's are dedicated to production. These and the TEP-1 editor are located in a glassed-in area of the control room—an arrangement which provides "clean-room" isolation

for the production crew, while centralizing the equipment for convenient maintenance. The TK-27 film system is also extensively used in production as well as for programming.

Tape and Film Spots Dubbed to "Cart"

At Ch. 20, all film and tape commercials are dubbed to "cart" (unless otherwise specified by the client). More than 200 "carts" are aired each day, according to Mr. McKelvey, including commercials, ID's, PSA's, bumpers, openings and closings.

Dubs are most often made during daytime network programming. Indicative of the heavy commitment to the "cart" for automatic handling of station breaks is the fact that 1,000 cartridges are inventoried, with 700 being maintained in the active file.

The TCR-100 is usually loaded for a break ahead, which permits making dubs during slack, network periods. At 7:00 PM, two back-to-back syndicated tape shows are scheduled, and for this time slot the machine is loaded to its 22—"cart" capacity.

Among the advantages of the TCR-100 cited by Mr. McKelvey are:

- Elimination of spot reels
- Tighter switching
- Cleaner on-air picture
- More professional presentation.

News Clips Transferred to "Cart"

WBBH operates a 20-hour broadcast day with a technical staff of only seven. The day starts early at Ch. 20, with a local news program preceding the network "Today" show. "Gulf Coast Today" includes news, interviews and local interest material, and the "cart" machine is used for assembling this program. The morning crew starts at 4:00 AM and selects some tape and film news clips from the previous day for the first local news presentation.

These are dubbed to "carts" for air presentation, a production technique that is quick and convenient, Mr. McKelvey says,—and the "carts" make for smooth playback of the pre-recorded items.

Weather is an important element in local news programming at WBBH-TV, and the station is equipped with a weather radar system. The TCR-100 is used in conjunction with the weather radar display.

A colored background with a map of the area covered by the radar picture is pre-recorded on a "cart". The live, monochrome weather radar picture is supered on this "cart", making a colorful, easy-to-comprehend on-air weather map presentation.

The TCR-100 was installed at WBBH in November 1973 and has given excellent service. In this area, Dave McKelvey has an added experience edge, since he was responsible for installing a number of "cart" machines as an engineer for RCA Service Company. He is a believer in preventive maintenance and sees that this is performed on a scheduled basis.

Emphasis on Local Advertising

As any small market broadcaster can confirm, local advertising is a crucial factor in the color of the "P & L" statement. At Ch. 20, there is a heavy local emphasis in commercials. Production capability helps bring in new advertisers—and with the TCR-100 and TR-60 handling all of the air requirements for tape, the two TR-70's are free for full-time production use.

Can stations operating in the smaller, "100 plus" markets, justify the investment in "cart" machines? At WBBH-TV—after more than a year and a half of "cart" operating experience, this question is turned around to read "How could we operate without it?" □

A Pair of "Cart" Machines Gives WFLA-TV A Double Edge — In Playback And in Production

WHEN Ch. 8, WFLA-TV, Tampa, took delivery of two TCR-100's late in 1973, the back-up protection of the second "cart" machine was an important factor in the decision to buy the pair.

As Patrick McLaughlin, Chief Engineer for WFLA puts it, "Prime time for a major market network station is sold out well ahead. So, if a spot is missed, it is very difficult to fit back into the schedule. Make-goods are both costly and troublesome."

The reliability of the RCA "cart" machines proved so good that the "spare parts" system has not been needed for that purpose. But it is definitely not sitting idle.

Production is a ten-hour operation at Ch. 8, with production involving commercials, documentaries, public service and religious programs, station promos, ID's and three daily news programs at 1, 6 and 11 PM.

Production "Cart" Machine Keeps Busy

The TCR-100 performs a useful role in this busy production environment. For example, WFLA subscribes to the NBC Network Program Service, receiving a daily video feed which is recorded on a reel VTR. The tape is screened by the News Department, and selected topics from the service—such as education, medicine, business—are recorded on "carts" to be stored and assembled as special feature presentations during different evening news shows.

Frank Stringer, Operations Manager for WFLA expected to make extensive production use of the TCR-100, and he has not been disappointed. Frequently, the "cart" machine is used as a video source for making inserts and effects. Used, in this manner, the TCR functions as another camera, or—with

the machine's A and B transports—as two live cameras on standby. Thus a two-camera shooting becomes a four-camera production. Assembly of commercials and programs is speeded up, since standard segments—unique logos, designs, scenery or other repeat material—can be recorded on "carts" and used as submasters for easy insertion during the editing operation. The Ch. 8 production TCR is equipped with the editing accessory, which has extended versatility and usefulness of the machine, Mr. Stringer says.

Multiple Dubs from "Cart" Master

As an example of how the "cart" machine can expedite production, Mr. McLaughlin noted that WFLA uses their production TCR as a "master" for making multiple dubs of spot commercials. The dubs are made to a reel-type VTR, then cut and assembled into separate tape reels for distribution.

In one such production run, 900 dubs were made from the "cart" machine to the reel VTR, involving five different commercials for a major regional retailer. The "cart" machine is ideally suited to this application, Mr. McLaughlin notes, because it can be set for uniform phase and saturation during recording, while the built-in CAVEC and DOC produce excellent and consistent color in the playback mode.

Multiple Dubs with Tag Inserts

A similar production situation which the TCR-100 handles with ease is cited by Mr. Stringer. In this case, a self-contained record-offer commercial produced by the station is dubbed for general distribution on tape reels, again using the "cart" as the master. But in addition to the multiple dubs, "tags" for the various area locations involved are inserted in the copies, with minimum effort.

The precision editing and exact cueing possible with the TCR-100 simplifies the production of "doughnut" type commercials—those with standard openings and closings with a "hole" in the middle for a special audio message or client jingle. The audio and related slide or flip-card visuals are recorded on a "cart" for insertion in the "hole".

Playback TCR in Master Control

At WFLA, Master Control is divided into two separate areas. One area includes the production switcher; camera shading controls; two reel-to-reel VTR's, and the "cart" machine, which is used as a production facility. Dubbing "carts" for the playback system is just a part-time assignment for this TCR-100, which is equipped with the editing accessory.

The other Master Control area includes the on-air switcher; the playback TCR-100; a quad reel-to-reel VTR; a TK-28 Telecine system; a TK-27 Telecine system, and active "cart" video tape, and film storage space.

Using the program log, the Master Control operator picks the day's requirements for "carts" from file and places them on a rolling carriage which is used for loading the TCR-100. At Ch. 8, the playback machine is loaded for several breaks ahead. This machine is equipped with EPIS (Electronic Program Identification System), which is a valuable aid for the Master Control operator since it gives him a visual, alphanumeric display of the cartridges threaded up and cued-in the tape transports. The top display identifies the tape being played on-air, while the lower display shows the next scheduled event. With EPIS there is no doubt about the next upcoming event, and if a change is required, it can be made immediately, before the tape is aired.



One of the two TCR-100's at WFLA-TV is located near the on-air switcher for handling "cart" playbacks.

Simple identification and storage system for "carts" at WFLA reduces paperwork required for processing commercials.

TCR-100 is loaded for several breaks ahead, using special "cart" carriage to move the selected cartridges from the file to the machine.

Second TCR-100 is used for dubbing "carts" and as a production aid.



One Less VTR—No More Tape Dub Reels

The station maintains 1500 active "carts", including commercials, promos, ID's, PSA's, and program intros and trailers. Some of the "carts" are designated for News Department use.

Dubbing is done by the night crew on the production TCR-100, with an average of 15 to 20 new dubs being made

each day, according to Mr. McLaughlin.

Before going to the "cart" operation, Mr. McLaughlin says, a dub tape reel was made up each night. The TCR-100 not only eliminated this, but also permitted the station to trade off one of their older reel quad recorders.

"Cart" Cuts Internal Workload

The "cart" operation has cut down on the internal workload, Mr. Stringer adds. Incoming video tape commercials no longer need to be checked separately, since this is routinely done when transferring the tape to a "cart". An uncomplicated identification and storage system reduces the paperwork required for processing commercials. Each "cart" at WFLA is given a Traffic Operations Department log number, and a sequential serial number is assigned to the master tape reel from which the dub was made. The engineer making the transfer assigns the number. The "cart" label designed by WFLA carries all the information needed for locating the master, so additional paperwork is eliminated.

The transition to the cartridge operation was made between Christmas and New Year in 1973, with tape commercials and PSA's being dubbed to the "cart". Some PSA's were aired during this time. The switch to "cart" was made on January 2, 1974, and since then the TCR-100's have been carrying a heavy break load and hefty production schedule.

In the first year of operation, film spots were seldom transferred to "cart", but this situation also is changing, Mr. McLaughlin says. He envisions the time in the not-so-distant future, when all commercials will be aired on the "cart", reducing the running of a multi-commercial break segment to a single push-button operation.

The station has experimented with exchanging "carts" with other TCR-equipped local stations. This did not prove practical, Mr. McLaughlin said, primarily because it is too easy to make a "cart" dub.

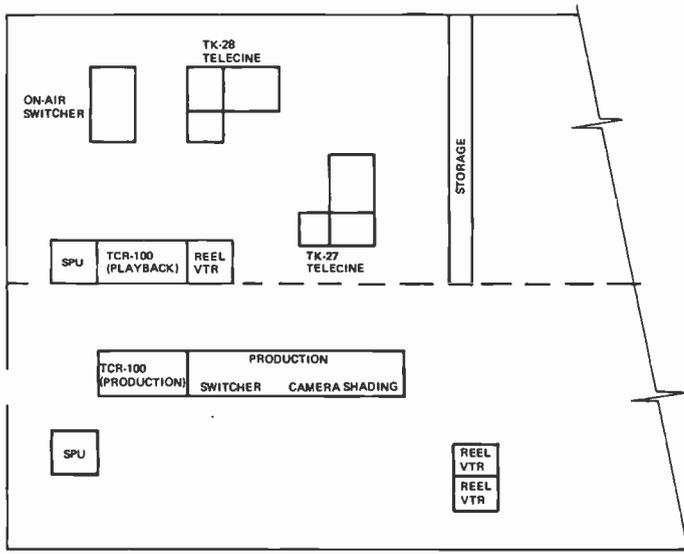
TCR-100's—A Cost-Effective Investment

Prior to selecting any automatic video cartridge system, the technical staff of WFLA visited a number of stations in the Southeast which had operating experience with these systems. The overall performance record of the TCR-100 among users was good, Mr. McLaughlin notes, and the systems had been easily integrated into station operations.

The performance and reliability record of the TCR-100's at WFLA-TV has measured up to expectations. Further, the utilization of both "cart" machines for playback and for production functions have made them a cost effective investment. □



Production TCR-100, equipped with editing accessory, is used for program assembly, for dubbing tape segments of news programs and even as a "master" for making multiple tape dubs.



WFLA-TV Master Control Layout.

TWO VIEWS

OF THE NEW WAY TO THINK COLOR CAMERAS

A Universal Camera System for Universal Application

BY JOHN C. ADISON, *Camera Product Management*
RCA Broadcast Systems

IT IS APPARENT that RCA's TKP-45 color camera system clearly sees both the business and technical sides of broadcasting and teleproduction operations. This new universal color camera system focuses squarely on the many specialty cameras now needed—and faces them down.

Full Broadcast Quality System

The premise which motivated the TKP-45 rules out the idle camera, produces a one camera camera system where a single, quality camera is able to operate in many modes to be extremely cost effective.

The TKP-45 camera may be used in, or go to, most any place to handle an assignment . . . in the studio or on location, inside or outside. It may be used with ease on a tripod or pedestal or on a cameraman's shoulder. The TKP-45 accommodates direct mount lightweight lenses or large lenses with typical ratios to 34:1. In any of its operating environments, the TKP-45 produces pictures of full broadcast quality with excellent color characteristics. To do this, the TKP-45 must be physically rugged and electronically stable under extreme conditions.

TKP-45 is "top-of-the-line" equipment. In no way should it be compared to "portable" cameras proliferating in the marketplace which compromise picture quality to achieve a reduction in camera size and weight.

Easy Handling as a Portable Unit is Only Part of the TKP-45 Capability

Size and weight reduction have been industry goals since the first camera was lifted to a pedestal. The TKP-45 camera system reduces weight of the

continued on page 30

Covering the Operational Gamut with a Single Electronic Camera

BY J. J. CLARKE, *Leader, Camera Engineering*
RCA Broadcast Systems

THE TKP-45 color camera system is unusually versatile. It is a system which may be used inside or outside, in full studio production as well as in portable or hand-held configurations. To achieve a broadcast quality camera in all of these operational modes required many innovations in optical, electrical, and mechanical design areas.

Image Sensor

The design of all electronic cameras evolves around the image sensor and, in this regard, the pre-eminence of lead oxide as a light sensor has simplified selection of a pickup device to determination of the size of the tube. Size and weight is directly related to the size of the pick-up device, so it is essential that performance integrity be maintained with the smallest unit. While important parameters in the one-inch tube, such as resolution, have been improved, the sensitivity of the photoconductor has remained the same. Practical limitations in the speed of zoom lenses for the smaller one-inch format and the inability to operate

one-inch tubes with as high signal currents as the 30mm version results in an inherent loss of about 5 dB in signal-to-noise, relative to cameras with the larger tube. This assumes that both cameras have front end preamplifiers with the same noise factor. Current state-of-the-art video amplifiers have a signal-to-noise ratio of approximately 48 dB, relative to a 300 nA input signal, and a bandwidth of 4.2 MHz. To overcome this 5 dB disadvantage, the TKP-45 uses video amplifiers of advanced design which have signal-to-noise ratios of 53 dB relative to 300 nA. This achievement was one of the many crucial to developing a high performance camera based on one-inch tubes.

continued on page 32



Zoom optics



System accommodates typical ratios through 34:1

Long zoom lens adapter



May be used with large variety of pedestals and tripods

TKP-45
A one camera camera system

Full broadcast quality

Zoom optics



Direct mount zoom lens

Cam head



Tripod



Pedestal

Mounts



Body brace



Fluid head

Fixed optics



Telephoto

Wide angle

Fish eye



Fixed lens adapter



Hydroped

J. C. ADISON, continued

camera head to approximately 17 pounds. The 3" standard kinescope viewfinder adds less than 2.5 pounds. And a typical direct mount zoom lens with servo iris adds less than 5 pounds for a unit that a cameraman can easily handle on his shoulder.

There's no backpack with the TKP-45 and special lightweight, small diameter (less than 1/2") cabling is standard . . . both considerations making it easier for the cameraman to get the picture he wants.

Unique Camera Control Units and Special Cabling Adapter

Standard AC powered camera control units are easily transported, along with

other TKP-45 system components, in a small van. When used with this control unit, the TKP-45 can use cable runs up to 1500'.

A newly designed "Minipack" camera control unit can support TKP-45 camera operation in the field. It weighs just 35 pounds, yet lets the camera operate, using all of its features, for extended periods independent of external power sources. (See article highlight on "Minipack.")

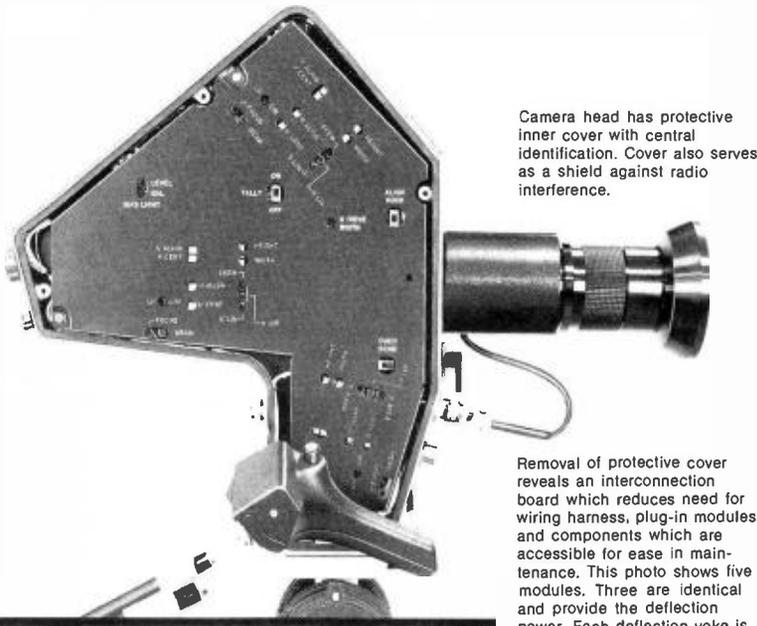
With the "Minipack" camera control, up to 300' of cable may be used for the camera. No camera adjustments are necessary when shorter cables are used.

The TKP-45 system includes a *Triax Cable Converter* so that with AC-powered camera controls in use, economical triax cable may be run up to 5,000'.

If the TKP-45 camera system sounds more and more like a cost-effective camera, it is. And we've yet to show you the "whites of our automatic eyes."

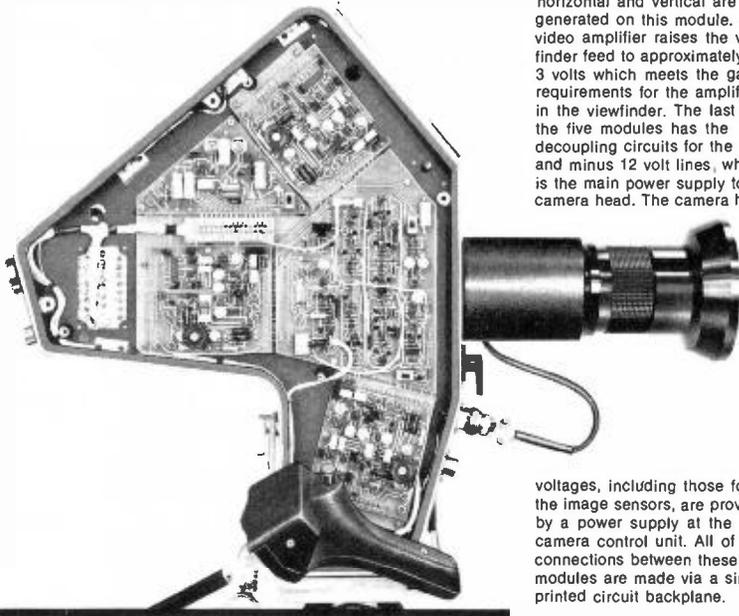
Automatic Features for Hands-Off Operation

The one camera camera system, TKP-45, inherits its quality, automatic character from TK-44 and TK-45 camera designs. Both of these studio units have earned superior reputations, are used throughout the world, and have set the



Camera head has protective inner cover with central identification. Cover also serves as a shield against radio interference.

Removal of protective cover reveals an interconnection board which reduces need for wiring harness, plug-in modules and components which are accessible for ease in maintenance. This photo shows five modules. Three are identical and provide the deflection power. Each deflection yoke is driven by separate horizontal and vertical deflection amplifiers. Feedback techniques similar to those used in larger cameras assure stable operation. All first order adjustments for the deflection system are done at the camera head. Only Vernier centering is taken back to the camera control unit. A fourth module derives the timing and drive pulses from sync, which comes to the camera on the viewfinder feed. The basic sawtooth signals for horizontal and vertical are also generated on this module. A video amplifier raises the viewfinder feed to approximately 3 volts which meets the gain requirements for the amplifier in the viewfinder. The last of the five modules has the decoupling circuits for the plus and minus 12 volt lines, which is the main power supply to the camera head. The camera head



voltages, including those for the image sensors, are provided by a power supply at the camera control unit. All of the connections between these modules are made via a single printed circuit backplane.

Optical Design

Physical size and cost of a lens for a given speed, focal length and field of view is related to the back focal distance. Most high quality television cameras use a color-splitting prism between the lens and camera tubes which effectively lengthens the back focal distance and, hence, the size of the lens. The TKP-45 innovates with a prism designed to use a high index glass, and which results in an equivalent air back focal distance of only 35mm. This approach means the camera can use modified high quality 16mm type lenses, with all the attendant advantages in size, weight and cost. The short back focal distance also accommodates very wide angle lenses, another advantage in a portable camera. For example, there is the 12-120mm f2 lens with servo iris and zoom which weighs less than 5 pounds. The variable rate zoom control is built into the support handle of the camera simplifying operation when it is hand-carried.

Mechanical Design

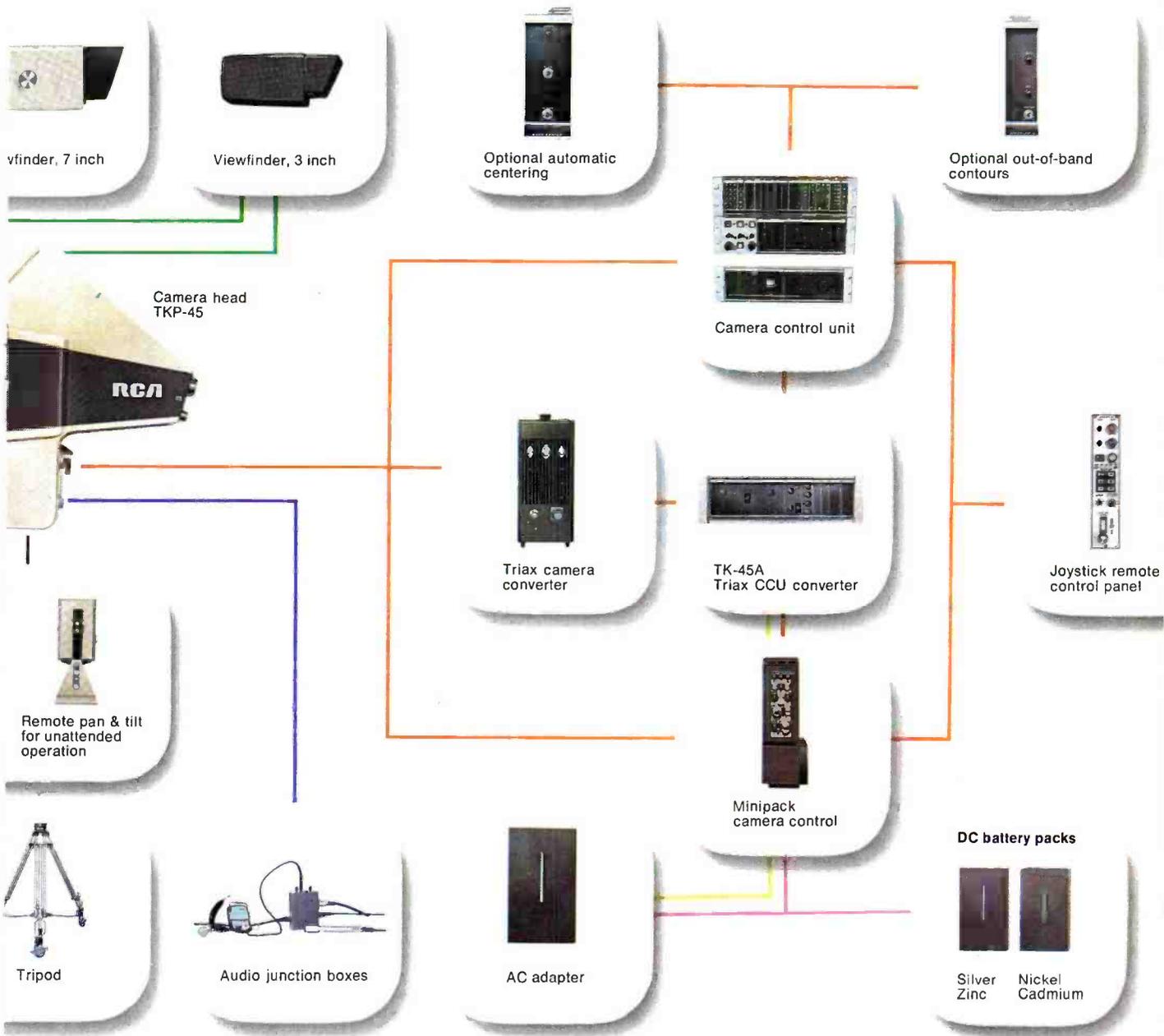
Present day solid state devices make it possible to design the electronics for a television camera to exceed, by several times, the overall camera stability specifications. The remaining problem then is to achieve mechanical stability. Those mechanical parts of the camera most critical to picture stability are lens, prism, deflection yokes and pick-up tubes. TKP-45 design ties these components together to form an integrated rigid structure. Individual components have been machined to tolerances which allow the lens, prism and deflection yokes to be assembled together without the need for collimation. This integrated optical assembly is then shock-mounted to the camera frame, which is a rugged lightweight casting. Innovative mechanical design proves that picture stability can be maintained through such difficult conditions as transportation by air and truck, mobile set-ups and portable operation.

The configuration of the camera was primarily determined by the optical design and, here again, the short back focal distance has resulted in a minimum package utilizing prism optics.

Electronic Innovations

The elimination of a back-pack was accomplished by simplifying the system, utilizing efficient components and creating innovative circuits.

For example, approximately 36 percent of the camera head power would normally be used to drive the deflection



standards of quality and performance for the industry.

“Hands-off” video control is prominent in TKP-45 operation. The camera automatically detects and corrects black balance at the touch of a button. White balance, too, is maintained automatically, corrected for color temperature variations, both indoors and out, by simply framing on a white reference in the scene and touching a button.

Other “big camera” features abound in TKP-45 including *automatic iris* to automatically adjust video level for fluctuations in light levels, *scene contrast compression* for pulling details out of

dark areas, *contour enhancement* for producing sharp, clear pictures free of noise.

Wide Choice in Zoom and Fixed Optics

The TKP-45, with large lens adapter, can accommodate large zoom lenses. With a cam head, popular pedestal and tripod mounts are easily used. When an assignment calls for lightweight lenses, they are direct mounted. And fixed focus lenses may be used with an adapter so that telephoto, wide angle, fisheye and other special effects can be achieved.

TKP-45 is a Make Sense System

There has never before been a television camera so universal in application

as the new TKP-45. It's a one camera camera system that makes operational sense, engineering sense, and financial sense. You can use as much, or as little, of the TKP-45 system as fits your immediate needs. And you can expand your system later to keep abreast of expanding needs or changing opportunities. Always you are assured of uncompromised picture quality, a color camera that is more than equal to any assignment.

TKP-45. A universal color camera system that clearly makes sense in a studio, on location, inside or outside. A reason perhaps, for its rapidly expanding demand. □

TKP-45 Gets the camera where the action is!



No backpack required for cameraman

Extended portable operation

Run up to 1500' of lightweight cable to standard Camera Control Unit, or



connect in Triax adapter to give cameraman up to 75' of cable and 5000' of Triax cable to CCU.

Portable operation

Use up to 300' of lightweight cable and connect into Minipack Camera Control Unit



with self-contained DC power source. Move camera at will.

Junction Box for Audio and two way Intercom is belt-worn by cameraman.

"Joystick" Remote Control Panel May Be Connected into Either Mode of Operation.



VTR, Microwave Relay or Telephone Line



"Minipack" Portable Camera Control Severs the Umbilical to AC Power

"Minipack" camera control unit is a lightweight portable addition to the TKP-45 color camera system which gives the camera complete independence from external power sources. (Or provides an additional method for using AC power.) Rechargeable batteries, either nickel cadmium or silver zinc, are self-contained in the "Minipack" and may be replaced in seconds to operate the camera in the field for extended periods. AC power may be provided to the "Minipack" camera control with a plug-in AC adapter which is simply substituted for a battery pack.

All of the capability inherent in the standard TKP-45 camera control unit is available when a "Minipack" is used. There is no compromise with performance. Horizontal and vertical contour enhancement with coring and combing is built-in. This is a top-quality enhancer using 2-line delay. No compromise has been made in the interest of size and weight reduction.

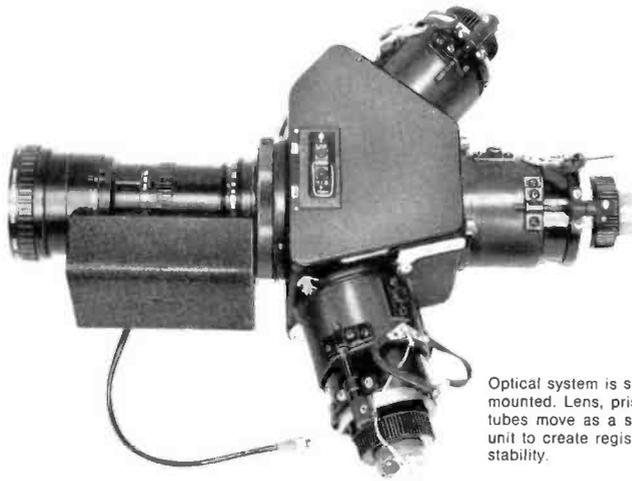
Automatic White Balance and Automatic Black Balance simplify camera set-up, eliminate the need for subjective evaluation on the part of the camera operator. These "automatics" are included in "Minipack" design. Automatic Iris Control holds video at the proper level under large variations in light level. Manual iris

control or remote servo drive can be employed when operating conditions dictate. Video levels may be monitored in the viewfinder using an inversion technique which causes peaks to go negative.

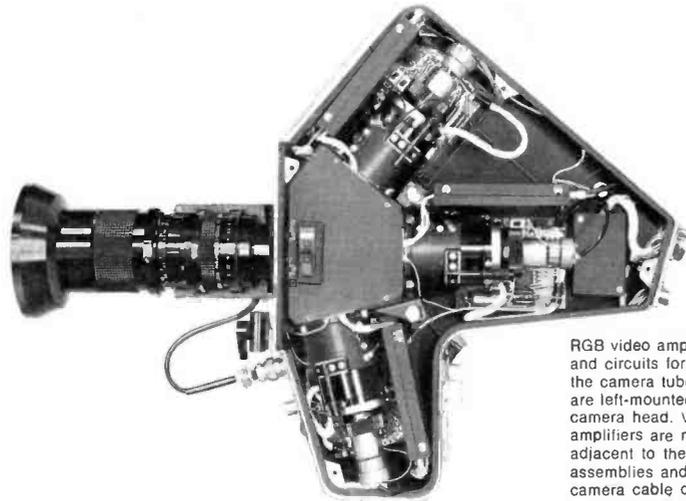
Another valuable feature, Scene Contrast Compression, is incorporated in "Minipack." Detail normally hidden in shadow areas is brought out by this unique RCA feature wherein the colors in the stretched area do not desaturate. Accurate color rendition and color balance are assured regardless of the amount of stretch employed.

A source sync generator is an integral part of the "Minipack." This can be operated in either the Crystal or Genlock mode. A digital circuit is included in the horizontal phase lock loop which permits advance or retard of the camera timing pulses relative to the input reference video by up to approximately 16 μ s, with a resolution of 70ns.

The "Minipack" CCU is a self-contained unit with all of the important features found in the best full-size studio equipments. "Minipack" is top performance in a small package which opens up new possibilities in all areas of broadcast and teleproduction operations.



Optical system is shock mounted. Lens, prism and tubes move as a single unit to create registration stability.



RGB video amplifiers and circuits for supplying the camera tube voltages are left-mounted in the camera head. Video amplifiers are mounted adjacent to the yoke assemblies and drive the camera cable directly at a level of 0.7 volts.

system. In the new TKP-45 camera, the deflection power has been reduced to 12 percent by utilizing a novel horizontal deflection drive circuit.

The total power dissipated in the camera head and viewfinder is slightly over 40 watts. This relatively low power allows the camera to operate 1500 feet from the CCU via a cable which is less than one-half inch in diameter. The video signals can be equalized for the cable loss up to a maximum of 1500 feet. It is also possible to operate at 2000 feet if some loss in video is accepted.

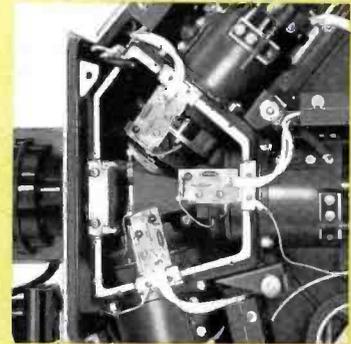
Viewfinder

The viewfinder has a 3" kinescope which is capable of resolving 400 TV lines, with a picture brightness of 200 ft. Lamberts. With a suitable hood, this is quite adequate for outdoor use. The viewfinder housing is compact and the total package, including the mount, weighs slightly over 2.5 pounds. It can be mounted on either side of the camera

and can be adjusted to virtually any position.

In addition to the brightness and contrast controls, there is a four-position switch mounted on the front viewfinder panel. The switch positions are as follows: normal operation, high peaker on, video level indicator, battery level indicator. The first two positions are self-explanatory. The third position is used when the cameraman is controlling the iris as, for example, in a one-man operation set-up. Special circuitry in the viewfinder makes peak white go towards black when it exceeds peak white level. The fourth position of the switch is used to assess the charge condition of the batteries when the camera is operated with a portable CCU. If the battery voltage falls below a preset threshold, an LED indicator mounted underneath the kinescope will light up. An "On Air" tally light is also mounted on the front panel.

The camera supplies to the viewfinder video at approximately 3 volts peak-to-



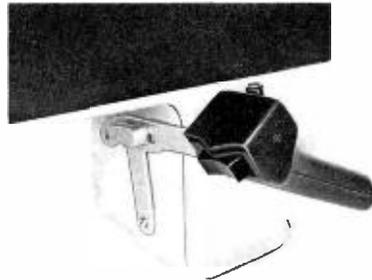
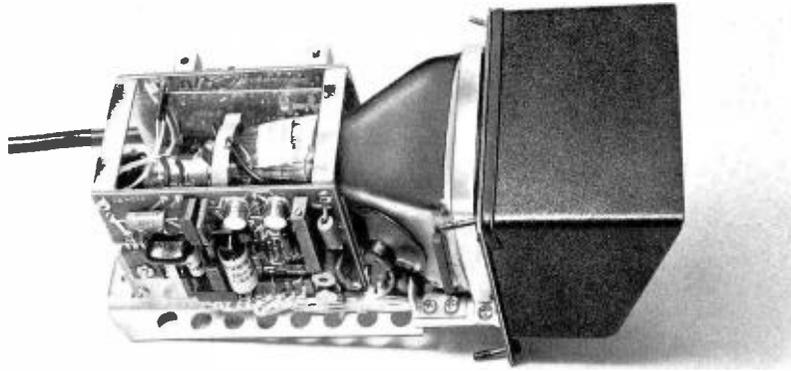
Mounting of the input amplifiers inside the prism mount casting improves signal-to-noise performance and serves to protect the input circuit from radio interference.



Size comparison between a 30 mm PbO and the one-inch lead oxide type tube used in TKP-45. Advanced video amplifiers in the TKP-45 camera bring signal-to-noise performance of the smaller tube to be equal with the larger tube design.



Camera prism can accommodate lenses as fast as f1.5 and it incorporates an integral bias light system.



A 3" kinescope viewfinder is standard. Illustration, cover removed, shows installation of PC boards. (A 7" model is optional and is used with large lens adapter.)

Variable rate zoom control is built into camera support handle simplifying lens operation when TKP-45 is used in portable hand-carried mode.

Audio junction box connects audio pickup and 2-way intercom and is belt-worn by cameraman. Junction boxes may be used in series for multiple audio pickup.

Standard 3" viewfinder has battery condition and tally indicators, focus and brightness controls and a four-position switch with positions for normal operation, high peaker on, video level indicator, battery level indicator. It may be mounted on either side of camera head and is easily and quickly adjusted to most any position.

peak, horizontal drive, and a vertical sawtooth.

The anode, screen and focus voltages are generated within the viewfinder. All other voltages are supplied by the camera.

The viewfinder chassis contains three printed circuit boards. Two of these boards are readily removed from the chassis by utilizing disconnects. The third board, which contains the high voltage components, is mounted underneath the kinescope.

A 7" viewfinder is optional for studio-type camera applications.

Audio

The TKP-45 design approach separates the audio system from the camera and houses the interphone amplifier, telephone jacks and controls in a separate package. In addition to the interphone facilities, there is also provision to plug in a microphone via an XLR type connector. An interconnection cable is used between the audio box and the camera. It is also possible to loop through a second audio box which could be used by an announcer or a floor manager. The audio box has a metal clip which can be used to attach it to a cameraman's belt. □

WALA-TV
Plans Carefully
For

PAINLESS TRANSMITTER CHANGEOVER

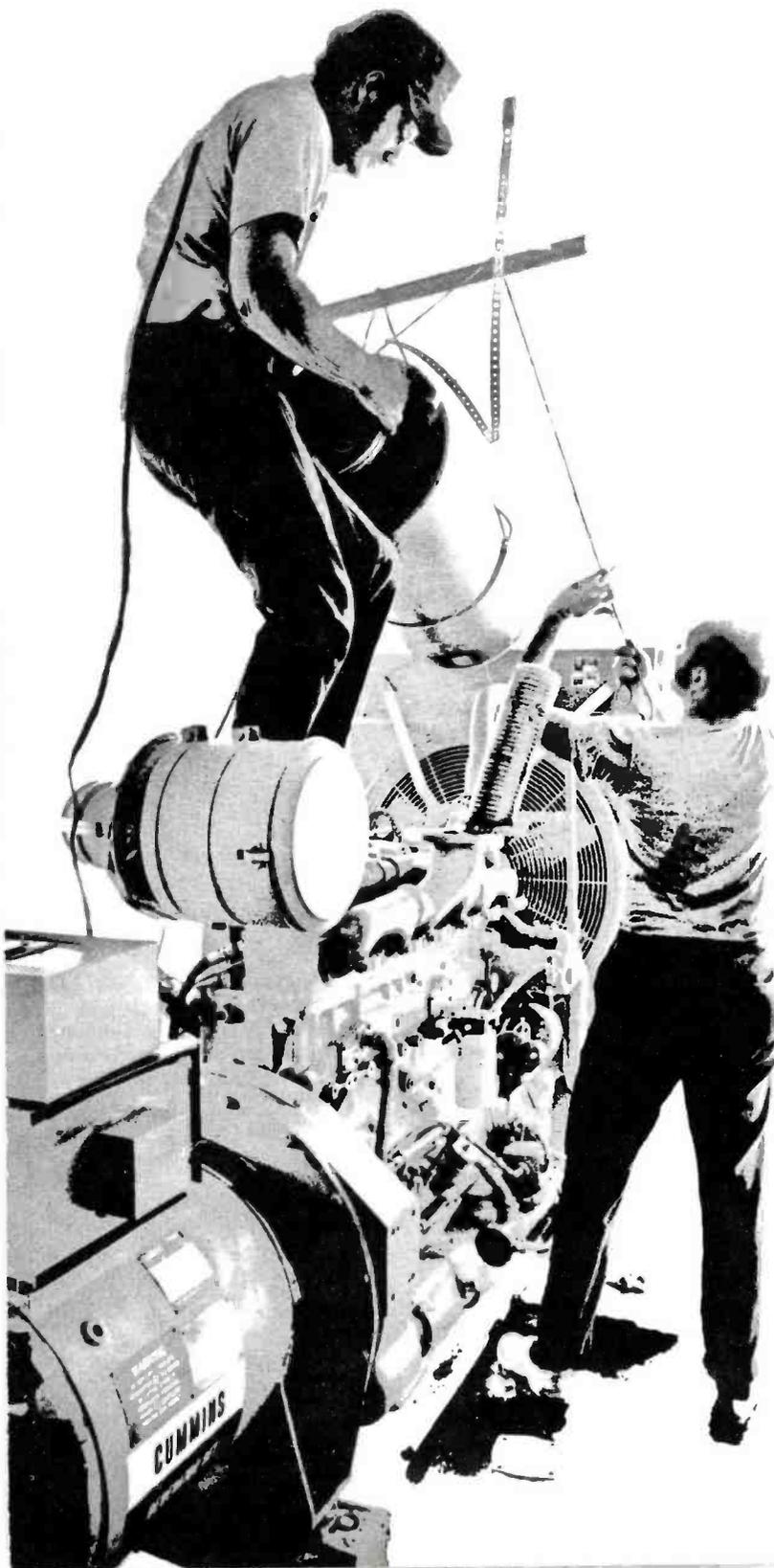
CAUGHT in the "freeze" of 1948, WALA-TV, Mobile, Alabama, did not get on-air until January, 1953. Its first transmitter was the durable TT-50AH, 50 kW highband system. The TT-50AH and WALA-TV's present Chief Engineer, Grady Jackson, started at Ch. 10 just about the same time and lived happily together for more than twenty years.

Over the years, the performance and reliability of this transmitter were excellent, Mr. Jackson says, and lost air time was not a factor in replacing it. In fact, the old transmitter had lost only three and a half hours in the three-year period before it was replaced. However, maintenance costs were mounting, and a major problem could have been serious, since there was no back-up transmitter.

TT-50FH System Purchased

Planning for a new transmitting system began in October, 1973, with management approval to purchase coming in December. The order was placed with RCA for a TT-50FH, 50 kW parallel transmitter system with OPTO-Switcher, filterplexer and new transmission line. The purchase was justified on the basis of projected savings in maintenance and in labor, and from reduced power requirements resulting from the solid state design of the transmitter. It is expected that the new transmitter will pay for itself in ten years.

Although competitive offerings were considered, the instrumental factor in favor of RCA, according to Mr. Jack-



son, was its long-term parts and back-up support. The validity of this consideration was tested and confirmed when—just before the 22-year old transmitter was replaced—a needed replacement part was ordered and delivered overnight. (WALA-TV's confidence in the RCA emergency parts service is evidenced by the fact that all of the spare parts for the TT-50AH were contained in two small overhead kitchen cabinets in the transmitter building).

An NBC affiliate owned by the Universal Communications Corporation, WALA-TV operates in the 65th market, including Pensacola, Florida and Pascagoula, Mississippi, as well as Mobile. The station's broadcast day now extends to 20 hours.

Four-Stage Installation Plan

The established "game plan" was to install the new transmitter in July, 1974, in ample time for the fall programming season. Logistics for making the changeover were carefully programmed by Grady Jackson and his staff, with nothing being left to chance.

The 25 kW "A" side of the new transmitter was to be installed first; then the old TT-50AH would be moved out and the area cleared. The 25 kW "B" side of the new TT-50FH transmitter would then be installed in a permanent position where the old transmitter sat. This side would be wired and put on-air. Then, the "A" side (which was temporarily set up in a small area which once housed an FM transmitter) was to be disconnected and moved into final position next to its mate, with the interconnections being made while the "B" side continued as the on-air transmitter.

Everything went according to plan. The entire operation, from delivery of the transmitter to completion of proof-of-performance tests on the entire system, took only 35 days. Grady Jackson's log (Page 39) traces the progress during installation.

Unloading and Setting Up

The switch to the new transmitting system was made without fanfare or notice—and deliberately so. As Mr. Jackson says, "We knew that if anyone in our primary area noticed a problem on

continued on page 40



Logistics played a key role in the smooth TV transmitter changeover at WALA-TV, as shown in this sequence of pictures.

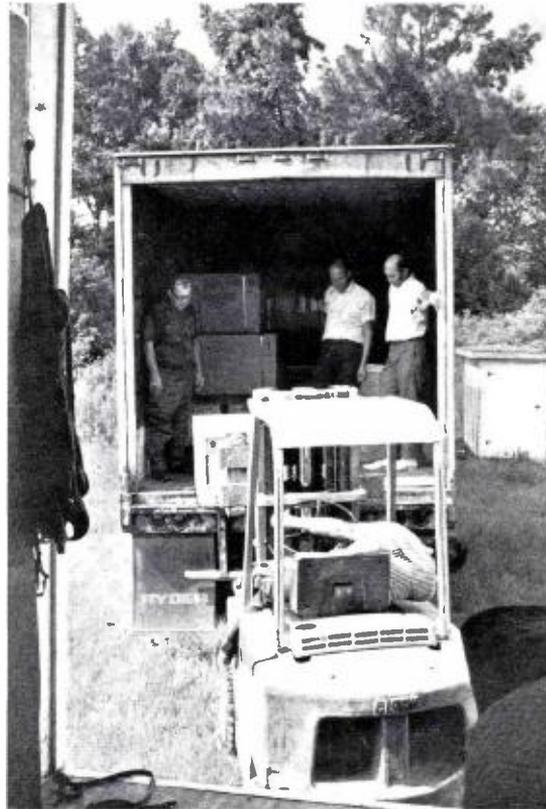
One side of the 50 kW transmitter was off-loaded from the RCA trailer first and set in place in the transmitter building.





Transmitter side "A" was set-up in a temporary location and readied for operation.

The second 25 kW transmitter side was unloaded and moved into another rented trailer on site for storage until needed. (Above and right.) Chief Engineer Grady Jackson, above left, and the WALA-TV Technical Staff worked long hours to expedite the transmitter changeover.

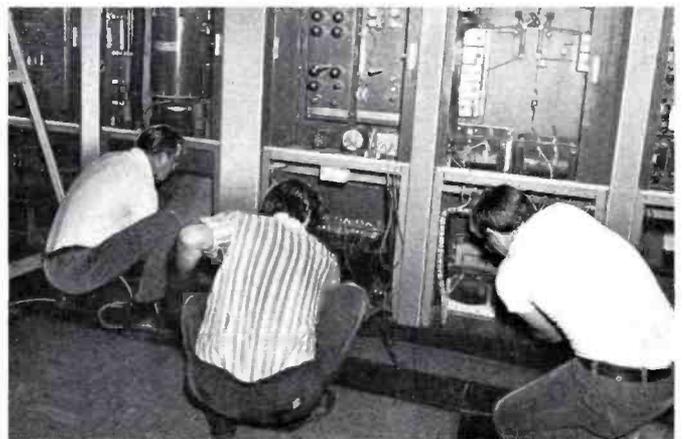
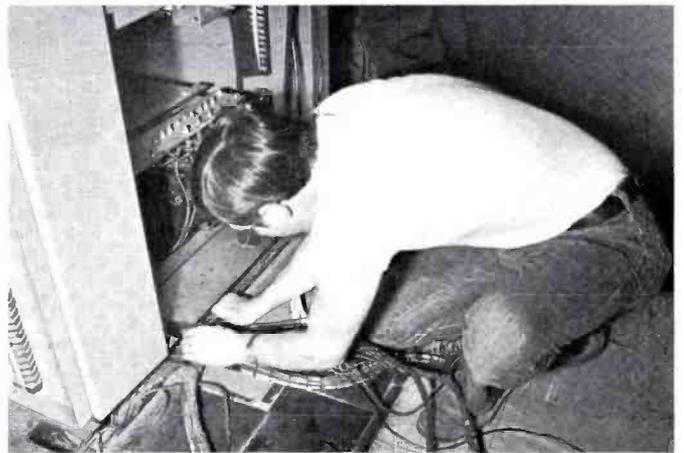




WALA-TV Transmitter Supervisor Ken Brlster and RCA engineer Jerry Servitas check out "A" transmitter before putting it on-air.



The veteran TT-50AH transmitter was disconnected and readied for removal.



Wiring connections on the TT-50AH were cut with care, since the system was sold to another broadcaster.

WALA-TV Transmitter Installation Log (informal)

GRADY JACKSON, CE

DAY	DATE	
FRIDAY	AUG. 2	Transmitter arrived.
FRIDAY	AUG. 2	Transmitter unloaded. Transmitter "A" into spare room. Transmitter and associated parts into storage van. (40' van with side and rear doors).
SATURDAY	AUG. 3	Left the transmitter and power supply on shipping pads and started wiring "A" Transmitter for temporary service.
MONDAY	AUG. 5	RCA Engineer Jerry Servitas arrived for installation supervision.
TUESDAY	AUG. 6	Turned on A.C. power for control checkout.
WEDNESDAY	AUG. 7	Put high voltage on and checked power. Called F.C.C. to get temporary permit to air transmitter.
THURSDAY	AUG. 8	Installed temporary ducts for heat.
MONDAY	AUG. 12	Removed "OLD" transmitter.
TUESDAY	AUG. 13	Cleaned up area and started bringing in transmitter "B".
WEDNESDAY	AUG. 14	Started wiring transmitter "B" in its permanent location.
THURSDAY	AUG. 15	Set OPTO Switcher in place.
FRIDAY	AUG. 16	Wiring transmitter "B"; its power supply cabinet, and the OPTO switcher in their permanent location.
MONDAY	AUG. 19	Power turned on transmitter "B".
TUESDAY	AUG. 20	RF checkout with OPTO switcher and transmitter "B".
WEDNESDAY	AUG. 21	On air with 25kW transmitter "B".
FRIDAY	AUG. 23	WALA-TV crew (5 men) installed a new 100 kW Cummins Diesel Generator with automatic switching for AUX power.
MONDAY	AUG. 26	Shut down transmitter "A" and moved it in the other room with transmitter "B".
TUESDAY	AUG. 27	Started rewiring transmitter "A" in its permanent location.
THURSDAY	AUG. 29	Started tying in transmitter "A" into OPTO switcher.
FRIDAY	AUG. 30	Wiring in transmitter "A" to transmitter "B" for marriage.
SATURDAY	AUG. 31	Switch over to midnight work to complete the marriage of the two transmitters.
SUNDAY	SEPT. 1	Continued wiring of the two transmitters. Our work time is now reduced to 4½ hours per night two men.
MONDAY	SEPT. 2	Continued testing and checking.
TUESDAY	SEPT. 3	Power checks with both transmitters together.
WEDNESDAY	SEPT. 4	Automatic, checkouts.
THURSDAY	SEPT. 5	On air with full power.
SATURDAY	SEPT. 7	Proof of performance checkout.

their TV set, they would immediately blame WALA-TV. As it turned out, there was no reason for this concern.”

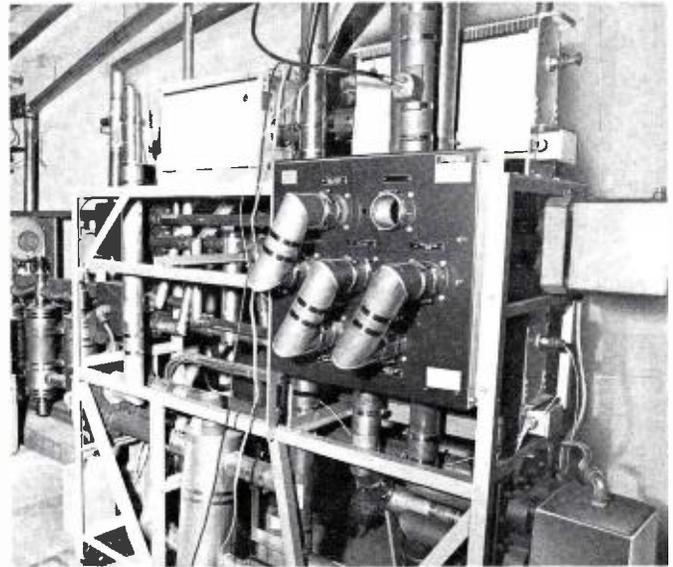
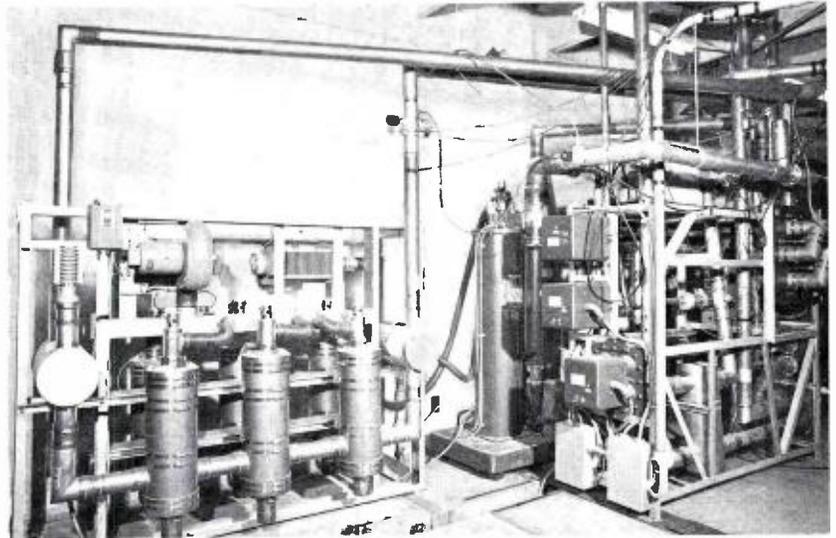
Grady Jackson’s meticulous planning even included instructions for loading equipment on the RCA van at the Meadow Lands, Pennsylvania transmitter plant. It was set up so that the first items off-loaded were one complete 25 kW transmitter side, including power supply. This was unloaded first and located, temporarily, in the area which once housed an FM transmitter. Wiring of this system began immediately, although the equipment was left on the shipping skids, since this was only an interim location.

The second transmitter side and ancillary equipment were unloaded and transferred to a rented trailer for temporary storage near the transmitter building.

“A” Transmitter On-Air

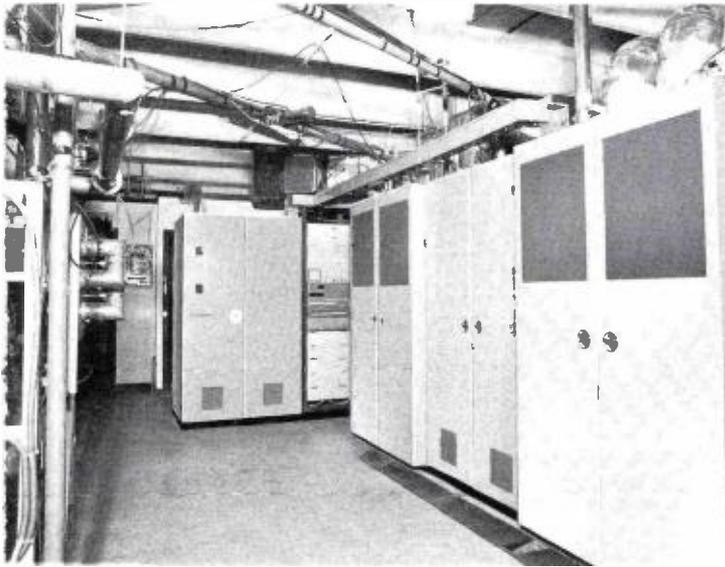
Once the equipment was unloaded, the RCA Service engineer was notified. Even before he arrived on the scene, the eager WALA-TV engineers had wired up the “A” transmitter to its RF power cabinet. This was accomplished during the weekend. By that Friday, the new transmitter had been checked out and was ready to put on-air. After receiving FCC approval, the “Go” decision was made quickly, and the TT-50AH was shut down, while the “A” side of the new TT-50FH took over air duty.

Ch. 10’s management and technical staff waited for a reaction from viewers regarding the change in signal. None came. Grady Jackson called several area cable system operators and service shops to inquire about the signal strength and quality. The response was welcome, but unexpected. As Mr. Jackson puts it, “On the day when President Nixon made his public statement of resignation, I called our cable connection 160 miles away to check on the quality of WALA-TV’s new transmission. At that time, we were running one half of the transmitter, or the first 25, at 20 kilowatts. The cable operator commented that all stations were using the same feed, providing the same program material, but WALA-TV had the best picture quality.”

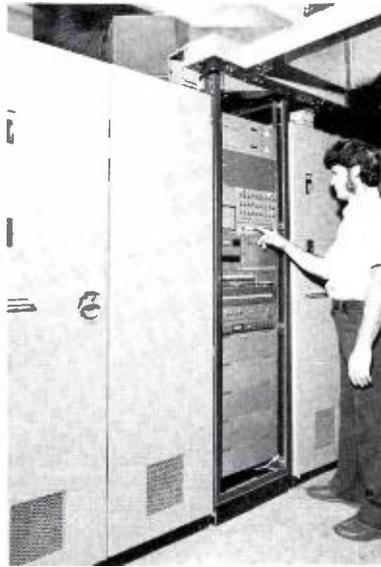


A new filterplexer (top) was installed with the TT-50FH, along with an OPTO-Switcher (bottom) which provides for easier and more versatile switching. The switching system is factory optimized for best VSWR.

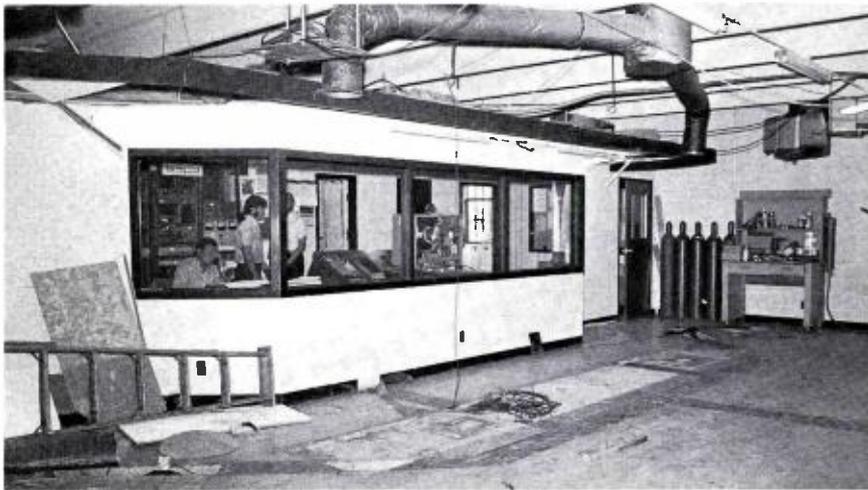
Front line cabinets for the TT-50FH system are checked by Ken Brister. The entire installation and changeover to the new transmitting system was accomplished in only 35 days.



Ample room is provided behind cabinets for maintenance accessibility. Filterplexer and OPTO-Switcher are at left.



Remote control and monitoring rack is flanked by the two Power Supply cabinets. At WALA-TV, these are positioned at right angles to the front line cabinets.



Transmitter area is cleaned out and readied for the TT-50 FH system, which requires far less floor space.

Veteran TT-50AH Dismantled

With the assurance that the "A" transmitter side was delivering a strong signal and had completed the weekend of service without a hitch, the next "Go" move was to dismantle the old faithful TT-50AH and deliver it to a new owner. (The old transmitter was purchased by Frank Spain, President of WTWV, Tupelo, Mississippi. This station also operates a "milestone" RCA antenna—Traveling Wave #101. WTWV came with a tractor-trailer and the sections of the 50AH were moved from the transmitter building right into the trailer).

For Transmitter Supervisor, Ken Brister, and for Grady Jackson, cutting the first wires on the 50AH was a wrenching experience—leaving the familiar old unit which they knew inside and out. They had lived with its idiosyncrasies and could diagnose potential problems almost automatically.

"B" Side Installed and Activated

Switching to the new was not a comfortable feeling, but at least there was comfort in knowing that the first side of the new TT-50FH went on-air with relative ease. The same day the TT-50AH was removed, the space it occupied was cleared and readied for the new transmitter. The "B" transmitter and power supply, as well as the "Opto-Switcher", sideband filter and transmis-

sion line, were installed and connected. After three days, the installation was completed and checked out.

Completing the Installation

The on-air "A" transmitter, in its temporary location, was shut down, and the "B" side was switched on. Still no problems. At this time, the "A" transmitter was moved into position, alongside the "B" side which was on-air. Interconnections were made, marrying the two sides into a parallel 50 kW system. In less than a week, wiring and proof-of-performance checks had been completed, operating at 34.5 kilowatts—full power. Only 35 days had elapsed from the on-site delivery of the TT-50FH until it was a complete, on-air system.

Previous Transmitter Moving Experience

The smooth transmitter changeover was helped by the fact Mr. Jackson had already moved the TT-50AH to two different locations, and could apply that experience. The first move was in 1954, following the collapse of a steel tower/antenna structure behind the Ch. 10 studio building in Mobile. The transmitter and antenna were relocated at a new site in nearby Baldwin County. The shift to the present location was made in 1963 and it, too, tested Mr. Jackson's planning talent. When the 1200-foot tower was erected, and the

antenna and transmission line was connected, the TT-50AH was moved—a distance of five miles. By careful scheduling and completely pre-wiring the new transmitter location, the shift was made with minimal disruption and lost air time. Sign off at the old site was midnight, and sign-on at the present location came at noon the same day.

Supportive Management Shares Credit

Grady Jackson readily acknowledges that much of the credit for the smooth TT-50FH transmitter installation should go to the WALA-TV management. Ray McGuire, Vice President and General Manager, never hesitated to support the "Go" decisions requested by Engineering during the installation procedure. The approval for putting the new "A" transmitter side on-air after a brief test period was especially crucial, enabling the installation to proceed on schedule.

Clear, Sharp Signal

With the installation complete and in operation for more than six months, Mr. Jackson summarizes his experience with the TT-50FH system as follows: "This new RCA transmitter has to be the cleanest piece of equipment that we have ever received. The installation went smoothly and we are getting superb picture quality. Our signal is sharp and clear, and we anticipate many years of excellent service from the new transmitter". □

CTC-7 CANBERRA



Australia's First New TV Complex Designed as an All-Color Facility

mARCH 1, 1975 marked the official introduction of color TV broadcasts "Down Under". In preparation for the switchover, CTC-7, Canberra's commercial station, built an ultra-modern, multi-million dollar complex designed for color from the ground up.

Beyond the expense, eight years of planning and two years of construction, the new complex seems to have even greater significance. One could say that it's not only a landmark in broadcast-integrated design for Australia's color broadcast industry, but also an indication of its growth pattern.

Form Follows Three Functions

Overall development of the plan was based on technical and architectural compatibility, thanks to the foresight and indefatigable efforts of General Manager G. K. Barlin. "The new facilities," he says, "are a great success,

which proves the worth of all the hard work and the hardware."

Covering nearly half a million square feet, the complex successfully integrates management, administration and production activities. Administration and general offices are clustered around a landscaped courtyard. Adjacent to this block of the building are specially designed production areas. They are outfitted with a full equipment complement including five TK-45 cameras, a TK-28 film chain, a TCR-100 video tape cartridge machine, and three TR-70C's. They're future-compatible systems that meet current program and production requirements, and protect against obsolescence. As a result, CTC management feels they are obtaining the most value from equipment investment costs.

Among the largest TV facilities at a local level, the complex is a striking contrast to the station's somewhat modest



Selection of the site for CTC's new complex, a ten-acre tract near Canberra's residential suburbs, was an important aspect of researching and planning a pleasant and efficient place to work.

beginnings. When Australia's Postmaster-General introduced Canberra to television with the first local telecast in 1962, CTC had the dubious distinction of being the country's smallest commercial station.

Reflects City's Growth

Starting with an audience of 60,000 on that auspicious day, CTC now serves a market area numbering 240,000. Paralleling the city's growth, the station has shaken loose from its moorings and emerged as a major entry in color TV for the National Capital. But besides Canberra and environs, CTC also relays to Cooma (70 miles south) and Goulburn (60 miles northeast), and serves as a source of political news for major stations in other metropolitan cities.

Originally, the TV station operated from a relatively small studio on the summit of Black Mountain, next to the transmitter and antenna, just three miles from the city center.

"Even back in 1962," Mr. Barlin recalls, "RCA equipment was our choice

because of its reliability and no-nonsense operation. In those days, we were a one-video-tape-machine operation. We had an RCA TRT-1B, making us Australia's first provincial station to use the magnetic medium."

However, increasing commercial production and network requirements between Canberra and the State capitals made further demands that exceeded what the facilities could handle. From then on it became increasingly apparent that greatly expanded facilities would be needed. The country's inevitable conversion to color added further impetus to the desire for a new plant.

Adopting International Ideas

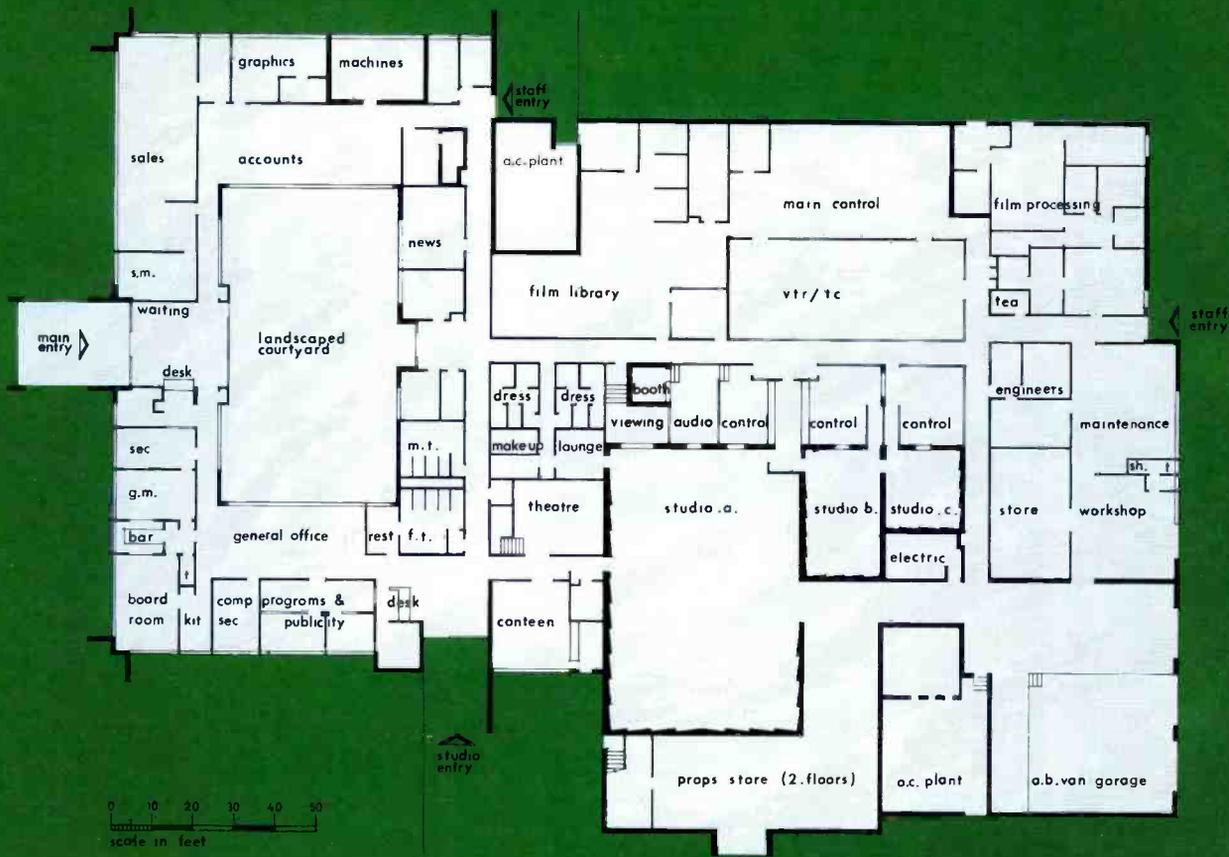
So, Barlin began casting around for ideas for a new home. An article in a 1968 issue of *Broadcast News* described *Broadcast House*—at that time the new headquarters for WSJS stations in Winston-Salem, North Carolina. It proved inspirational, just the type of dream operation that would fill all of CTC's requirements.

Mr. Barlin then contacted the late Harold Essex, WSJS President and followed up with a trip there in 1969 as part of a world tour to study contemporary ideas in TV facilities.

CTC adopted WSJS's basic design factors which—simply stated—reflected a concern for functionalism, aesthetics and being a good neighbor since the Carolina station is also close to a residential area. In planning the new facilities, the Canberra engineering design group maintained close contact with WSJS staffers.

The chief design goals developed were to achieve greater efficiency and flexibility of operation, allowing the station to accomplish more production of commercials and programming and, at the same time, reduce overall operating costs.

Since one of the factors related to operating efficiency is morale of the employees, it was decided early on that the new plant should be not only cheerful and attractive, but also part of a



Covering nearly half-a-million square feet, the building floor plan integrates management, administrative, engineering and production activities. It even includes a parking garage for CTC's color OB unit.

natural environment conducive to a feeling of well-being.

Accordingly, the first decision was to move to an appropriate site—a ten-acre tract in the bushland at the base of Mount Majura. It is close to a major highway and residential suburbs, away from commercial and industrial areas and just five miles from the center of the city.

Research and Construction

Architecturally, the plant is a tour de force. The courtyard, which is the core for the executive, administrative and sales offices, provides more than an attractive view for many of them. It is sometimes used as a convenient location for interviews by CTC's News Team.

The technical and production studios adjacent to the block of offices were also planned with attention to detail. The station engineers determined that maximum visual communication was essential to efficient operations, and

decided on the use of continuous glass panels to flank the broad passageway which divides the operations center from the studio control rooms. This means of communicating is complemented by an intercom system with 20 inputs and talk-back facilities.

A heavy production schedule was also predominant in the planning factors. The Australian Broadcasting Control Board, a regulatory commission overseeing commercial TV, requires that up to 50 percent of the programming material for all commercial stations must be Australian produced. To meet this dictum, plus the requirements of the growing commercial business and telecasts from Parliament House, design of the studios had to provide the ultimate in efficiency and effectiveness.

Complete Control from Three Levels

The building plan features a main studio ("A"), 50 x 70 feet, which utilizes two of the TK-45's, under quartz-halogen luminaires. This studio's vision control is outfitted with a

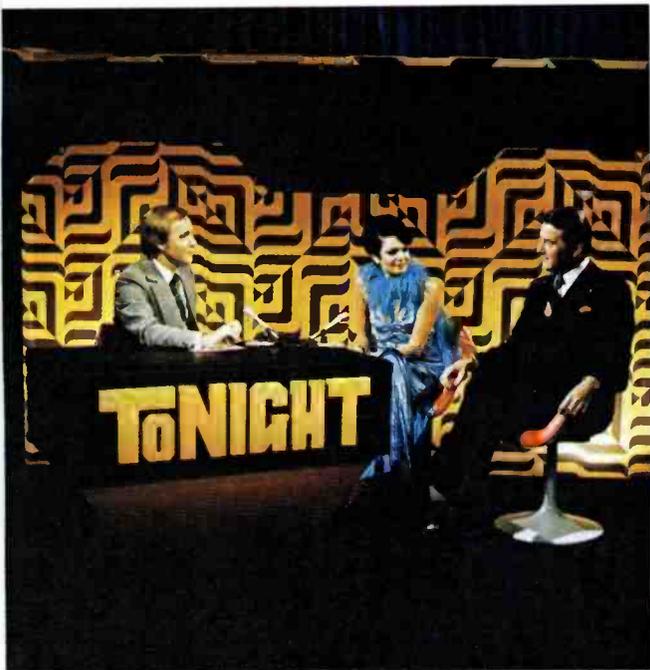
20-input production switcher featuring pattern and mix effects. Incoming vision sources and outgoing circuits are monitored continuously in monochrome. Color monitors are used for program and preview outputs.

A 25-input audio console occupies its own booth. Ten inputs have variable equalizers while all have echo and fold-back capabilities.

Studio A is viewed from three separate levels—vision control at the floor level, audio control on a slightly raised level, and the Client Viewing Lounge—slightly higher again—with additional windows overlooking the Studio A control rooms.

The smaller studio ("B"), which is 20 x 32 feet, still has to be equipped as production needs expand. Right now, it has basic lighting and is used mainly for smaller productions, utilizing Studio A's cameras and control facilities, or cameras from the station's OB van.

Studios A and B are used to originate programming and produce some 50



The Australian Broadcasting Control Board requires up to 50% of station programming to be Australian produced. To that end, CTC productions include: (top left and right) a monthly variety show called Tonight and, reflecting the station's community roots, an inter-schools student debating contest shown weekly. Inner courtyard serves as setting for film and tape productions.



CTC's approach to development of its special facility was based on technical and architectural compatibility.

commercials each week for local and national clients. These studios are also used to generate news programming from the Federal capital which is fed to major stations in Sydney, Melbourne, Brisbane and Adelaide. National TV networks ask for studio time on short notice, and they get it.

The station's on-air program coordination is carried out in still another studio ("C"). Just 20 x 20 feet, the studio is manned by one person and generates local news broadcasts, updates, public service spots and even commercials and interviews. All of this is handled with one of the TK-45A cameras.

A continuity switcher with 20 inputs is coupled with a 16-event automation package and an audio console feeding 6 inputs.

The view of the studio is unobstructed from the console which incorporates a married switcher and remote controls for the telecine chains, video-tape machines and caption scanners.

Recordings and On-Air Presentations

The tape area handles a heavy schedule. Three TR-70C video tape machines are busy all day long, recording commercials, playing back programs and dubbing. Another functional asset that grows more valuable each day is the TCR-100 cartridge videotape machine. It handles all of the station's short segments.

They consist of commercials, as well as public service announcements, station promos and ID's.

Color commercials made at CTC are planned by the advertising personnel. Others are supplied to the station. But all are immediately dubbed to cartridges for presentation—visually correct and ready for airing.

CTC's library of 1500 cartridge tapes are aired at a playback rate of 6000 per month. As a result, the three TR-70's are freed up for increased studio recording time.

Film is handled on two TP-66 film projectors feeding a TK-28 color telecine chain with 35mm slide facilities provided by a TP-7 projector.

Other film facilities, plus two monochrome caption scanners, are also called on for production and on-air continuity work.

The spacious area for tape and telecine operations features computer-type flooring, which is still another indication of the quality put into the building's overall design.

One Person In Command

CTC's master-control room looks through the telecine area to studio control rooms for maximum visual contact. The main panel gives effective separation for equipment in its two spheres of production and on-air operations. Like the station's on-air program coordination, this function is handled by only one person.

Assignment equipment for machine control and sync-pulse distribution also originate in Master Control.

Design of the equipment racks, incidentally, includes two sections. Video processing, sound information and synchronizing are kept separate from vision controls, distribution amplifiers, camera control units and switching.

Covering Outside Events

Initial doubts about the value of an outside broadcast unit were quickly dispelled more than five years ago when the first monochrome vehicle was purchased. Mobile broadcasts, covered by a new color van, are an integral part of the station's production operations. For example, it's used to pick up Prime Minister Whitlam's regular press briefings which emanate from Parliament House and are fed into a national distribution link. Other outside or remote events of national or regional interest the mobile unit picks up include district football and agricultural shows (Canberra is surrounded by a rich grazing area).

The color van is fitted with two RCA TK-45 cameras, a 10-input switcher with 30 pattern effects and audio control with a 6-input console.

Programming Reflects Australian Life

Daily newscasts originate in the studio to link up with national news from the "7" Network through ATN in Sydney.

A monthly variety program, TONIGHT, was launched earlier this year. A "first" in Canberra for a production of this calibre, the program encourages and promotes the city's showbiz industry. TONIGHT was CTC's first major production to go to air live and in color from the new studios.

A new series of women's programs followed successful pilot essays, and "THIS AFTERNOON" is now a weekly magazine show for Canberra's afternoon audience.

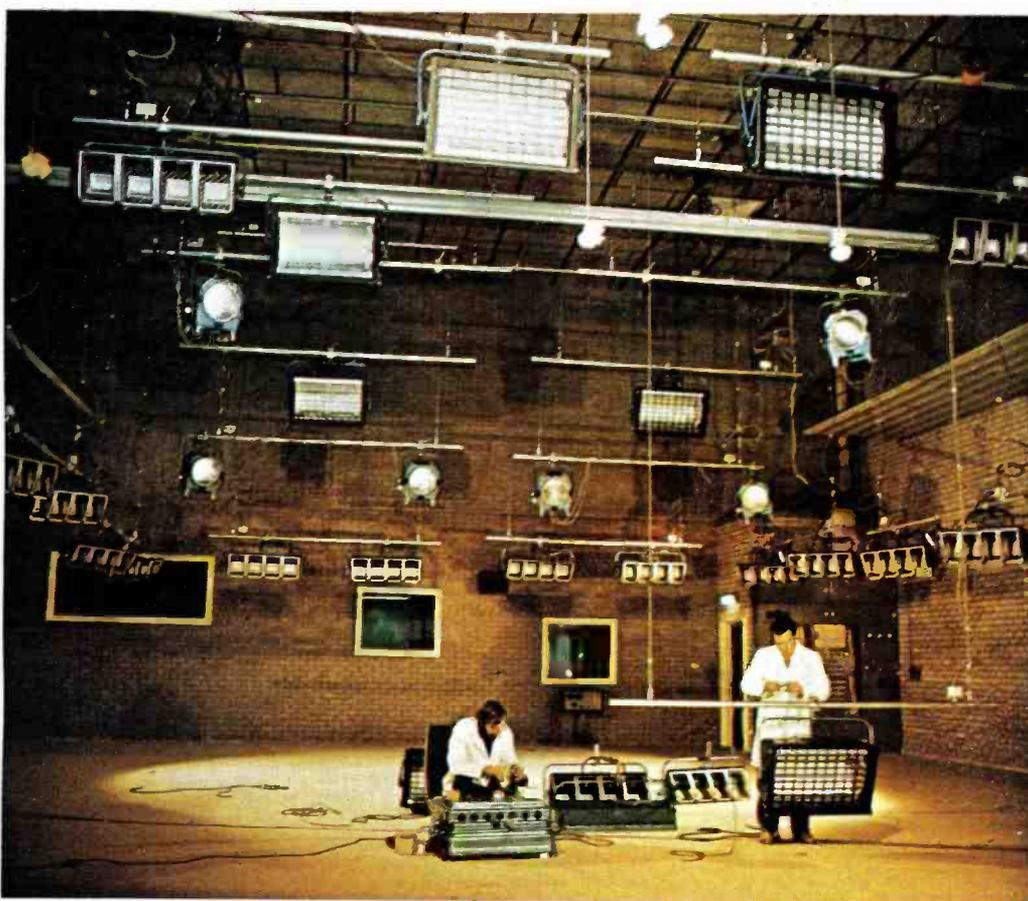
David Jones, one of the city's major retailers, produces a weekly 30-minute program in color after eleven years in monochrome. It features new fashions and furniture and introduces special visitors to Canberra.

CTC also puts strong emphasis on community affairs. Typical is a CTC-produced weekly student debating contest. Sixteen local high schools take part, and are encouraged to do so by Canberra's Schools Authority. 1975 marks this program's second year.

Color Film Processing, Too

Four networks produce daily news and current affairs reports on color film. CTC processes their film output through a subsidiary division, Canlab, which is the capital's only fast film-processing service.

An Australian designed and built processor provides ME-4 and ECO-3 capability at speeds up to 35 fpm, with metered replenishment. Monochrome processing is also available (60 fpm), and Canlab's own photographers provide stills in black and white and color as well as 16mm commercials. Editing and printing services are also provided for clients.



(Top left) The TCR-100 airs cartridge-tape commercials and other short segments at the playback rate of 6000 per month.

(center) Five TK-45 cameras are used in various studio and OB van combinations to fill production needs.

(right) CTC's mobile TV van covers events of regional and national interest.

(bottom left) Focal point of the new complex is Studio A, a full-sized facility utilizing quartz halogen lamps.



Three TR-70C's are an important part of the station's video-tape capability.

Looking Ahead

What of CTC's future? "It's as great as Canberra will be," Mr. Barlin states. As the heart of the nation, and an important commercial and administrative center, the city is poised for growth. And, as the audience grows, there should be a rising need for programs to serve the community. Barlin says that the station will serve those needs, by using the varied talents of its competent staff, and the tools of new television technology as they are introduced.

Canberra can be extremely proud of the new CTC-7. □



Broadcasters Country-Wide Attend RCA Seminar at CTC

CTC is Australia's first station to create new color studios for the big event. So it seemed appropriate that it should also be the venue for the country's first RCA Engineering Seminar last year. It was organized by Messrs. Ray Walsh, Manager, CES Sales, and Al Crego, Manager of Field Technical Services, RCA Limited Sydney and demonstrated the following RCA color equipment: TK-45A color camera; TK-28 telecine equipment; TR-60/TR-61/TR-70C reel-to-reel video tape machines; and the TCR-100 cartridge video tape machine.

Twenty-two stations from around Australia—including Perth, Townsville, Hobart and two of the newest stations, ITQ Mount Isa and NTD Darwin—were represented. Staff from the production houses of Video-Tape Corporation (Sydney and Melbourne) and Video-Tape Centre (Melbourne) also attended and members of the Australian Broadcasting Control Board were present as observers.

All equipment was operational during the Seminar with lectures held in "hands-off" and "hands-on" sessions. Specialist lecturers, from RCA Broadcast Systems in Camden, New Jersey, were joined by Australia's Graeme Otter and Jan Nianko from the new Engineering Services Department set up as part of RCA's Sydney operation.

The response to the Seminar was so enthusiastic that it was extended from six to eight weeks, repeating instructions and demonstrations for the TK-28 telecine equipment and the TK-45 automatic color camera.

The MTS mobile unit is divided into four separate operating compartments.



Mobile Television Services' 40-foot mobile unit is a fully equipped video production center.



Rain or shine, outdoors or inside, the pictures sparkle for Mobile Television Services.



MOBILE TELEVISION SERVICES

Broadcast Studio on Wheels

Operating a mobile unit which houses more than a million dollars worth of broadcast television equipment requires massive doses of intestinal fortitude, luck, ingenuity, ulcer repellents, talent, endurance—and the ability to survive an impossible travel schedule.

Howard Zuckerman, Executive Vice President of Chicago-based Mobile Television Services, not only handles the nerve-racking job, but actually thrives on it. Mr. Zuckerman travels so much that he seems to be on the move even when seated behind a desk—which is infrequently.

Mobile Television Services started operations in mid-1974 with the conviction that there was a definite need for a versatile, fully equipped mobile unit that could function as a self-contained broadcast center. The conviction was supported by the extensive experience of Mr. Zuckerman and by TVS's contract to produce the "Game of the Week" for the fledgling World Football League.

A Maximum Use TV Facility

The MTS van was designed for maximum usage, as a complete program facility. The equipment complement equals that of many commercial broadcast stations. Included are:

- 5 — TK-45A Color Cameras, with Joystick controls
- 1 — TKP-45 Portable Color Camera
- 2 — TR-61 Video Tape Recorders
- 2 — Slo-Mo VTR's

BCS-100 Custom Audio System
TS-70 Production Video Switcher
Character Generator System

Before it was modified for use as a television mobile unit, the MTS trailer was destined to be a furniture van. The van itself is 40-feet long, with an overall height of 13-feet, and is equipped with air suspension springs.

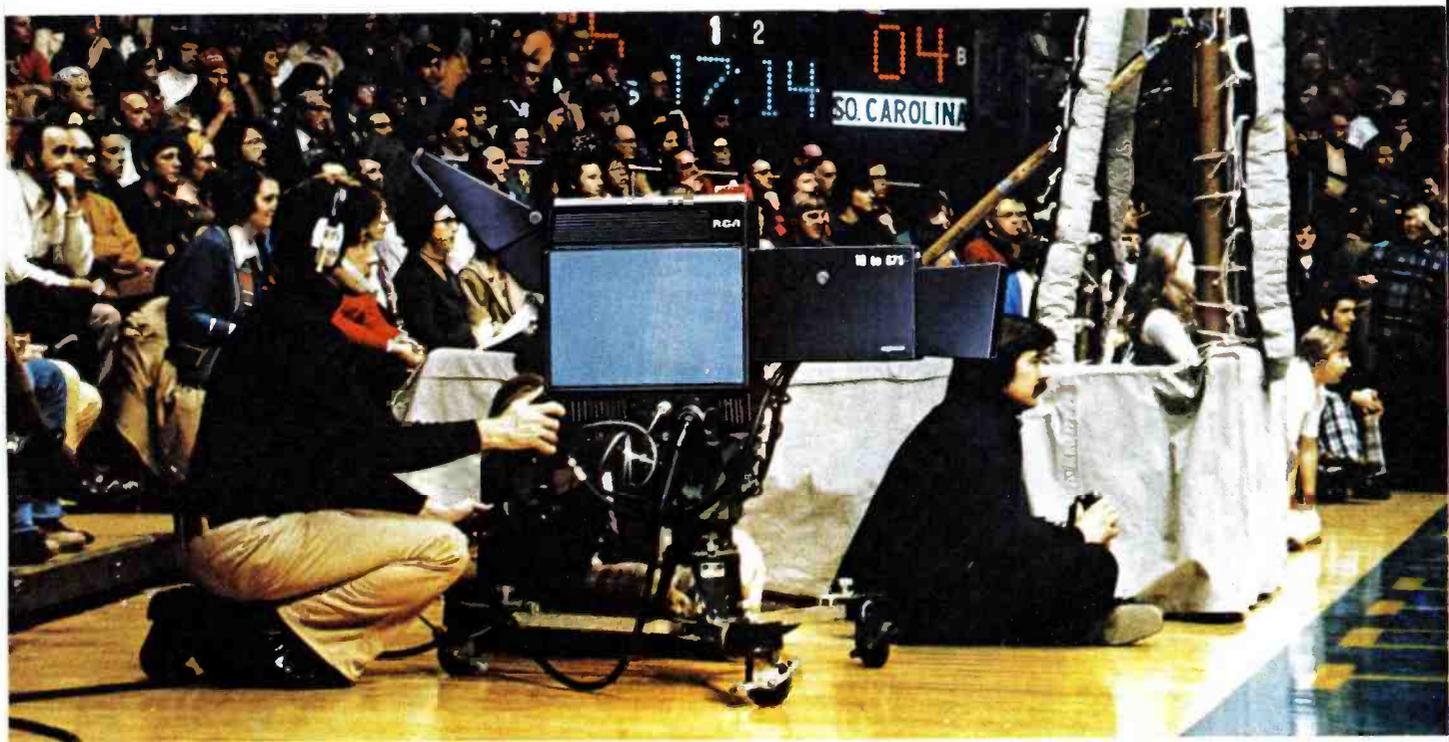
Gene Crowe, the youthful Chief Engineer for MTS, and his exuberant technical staff planned the interior layout and handled the complete equipment installation. While some of the rack wiring was accomplished in advance, the assembly and interior wiring and hookup were completed in only twenty-one working days—a remarkable achievement, considering the scope and complexity of the system.

Four Operating Compartments

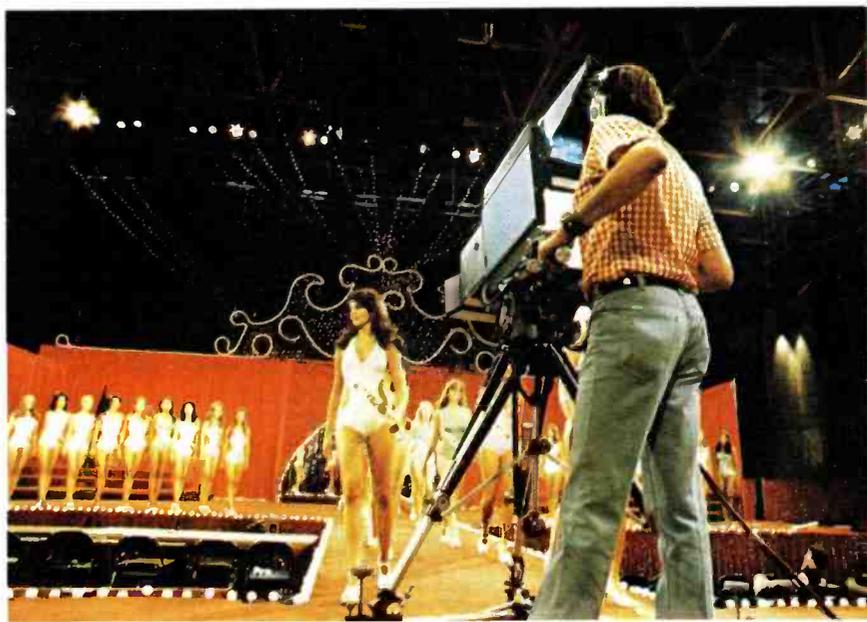
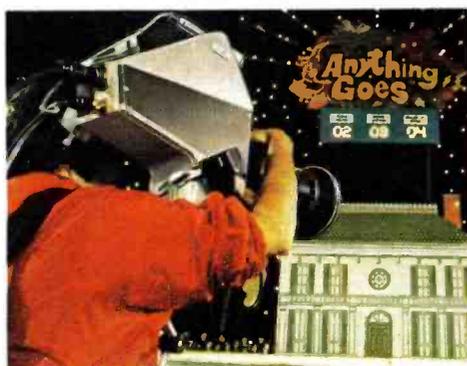
The MTS mobile unit is divided into four separate operating compartments. The forward area is the production control center, with wall-to-wall monitors displaying the outputs of all available video sources. It is arranged to provide ample space for both operating personnel and clients. In front of the monitors and extending for almost the entire width of the trailer is a working area, including the video switcher and intercom facility—with ample space for the Director, Associate Director and Technical Director. The production switcher, usually manned by the TD, is a TS-70, System 160 with dual Chroma Key and Preview Pre-set. In the MTS system, a Downstream Keyer is used for inserting graphics. A 20 x 10 routing switcher permits punching up the output of the video switcher before going to the Downstream Keyer, plus all other sources, including the output of the Keyer into any recorder.

BC-100 Custom Audio Console

Directly behind the Production Control Area is the glass-enclosed Audio Compartment which is equipped with a BC-



With its five TK-45 cameras and a portable TKP-45, Mobile Television Services can easily handle a diversity of assignments—from sports events to pageants, to specials and spectaculars.



Coverage of the World Football League Game of the Week as well as a number of post-season Bowl games kept the MTS unit criss-crossing the country. Twenty games were handled in four months, with other production assignments interspersed.



100A four-channel, 20 input custom audio system with full equalization on each input; switchable line or mike level on each input, and echo send and fold-back on each mixer. From his operating position at the console, the Audio man has an unobstructed view of the monitor display and has visual contact with the Director, TD and the entire production control area.

The third compartment in the van is the tape area, which includes two TR-61 VTR's; monitoring facilities; routing switcher and a Tape Editing Programmer for on-the-scene editing capability. Another feature added by MTS to their van is an oversize access door by the tape area which permits removing the tape recorders for use outside the mobile unit, or for service.

Joystick Controls for 6 Cameras

Compartment #4 is the video technical quality control area and is lined with equipment racks. Housed in this compartment are camera controls for six color cameras, monitoring and video distribution equipment, video jack panels, etc. A compact console is provided for the video operator, with joystick controls for the six color cameras. Voltage regulator and amp meters let the video operator know the power conditions at all times so he can make adjustments.

Mr. Zuckerman pointed out that the van is divided into zones for air conditioning and heating, so personnel in each area can suit their individual comfort level. This feature is especially useful for outdoor events where some areas of the van might be warm while others are frigid.

8-Channel Intercom System

Among the sophisticated electronic systems aboard the MTS van is an 8-channel custom intercom with eight individual "talk" paths and the capability of holding eight separate conversations from a single location. The system provides total flexibility for communication between the various locations in the mobile unit itself as well as with announcers, cameramen, talent and others involved in productions. The audio quality of this system, according to Gene Crowe, is good enough for on-air broadcast use. The system includes "Master" stations and "User" boxes. Any "Master" station can select circuits to talk on or listen to. The "User" box is more limited, with thumbwheels for the selection of communications circuits.

In addition to the extensive internal intercom capability, the MTS van is equipped with an external phone system which can handle 10 outside phone lines, plus a 10-line "inside" service.

Storage Space . . . and Easy Access

In adapting the van for mobile tele-



Cameras, tripods, headwheels and related equipment ride in the space between the wheels, ready for quick set-up.



Mounted at the rear of the trailer, behind the video compartment is the power control equipment, including the power input panel; transformers and voltage regulators.

vision production use, MTS floored in the "well" area between the axles, providing generous space underneath for the storage of cameras, lenses, tripods, cables, headwheel cases and spare parts—in easily accessible compartments. Locating cable troughs under the flooring permitted orderly wiring, with complete isolation of audio and video cabling. This arrangement also simplifies expansion and re-arrangement, a feature which MTS found immediately useful, since a number of system alterations and additions had to be made "on the fly" after the unit became operational.

Another van modification which permits complete utilization of space was the addition of side access doors toward

the rear of the trailer where the video rack equipment was located. With this arrangement, video racks could be mounted flush against the side wall. Opening the side door gives full access to the rear of the racks and wiring.

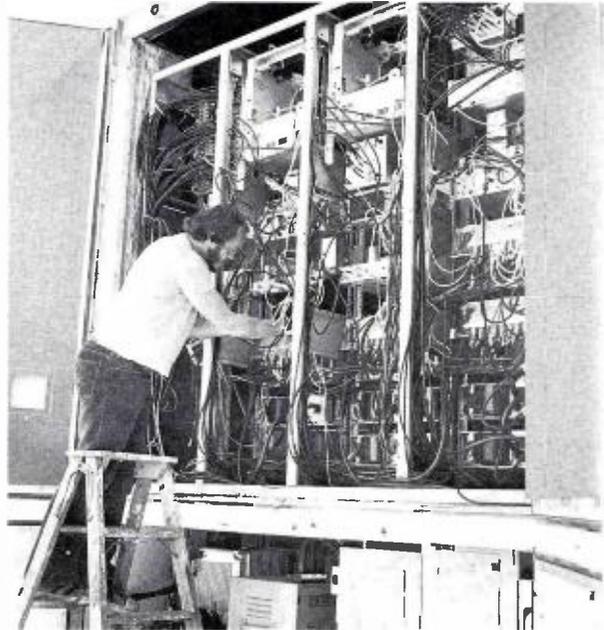
Total "On Board" Programming on Remotes

In televising the football games, the entire program is controlled from the MTS van—live coverage; commercials; instant replays, and even graphics. One of the TR-61 VTR's is loaded with a "spot" reel of tape commercials. The second TR-61 is used to "take" some of the game action and instant replay material.

For covering remote assignments, the



Hundreds of feet of cabling must be carried aboard the van to support a variety of production requirements.



Side access doors can be opened from the outside, permitting full utilization of inside floor space, while providing complete access to video rack equipment.

MTS staff is augmented by a roster of proven free lance talent, particularly cameramen. Maintenance, however, is the responsibility of the full time technical group.

Setting up for Football

Logistics for live coverage of the WFL "Game of the Week" football games is particularly critical, since the games were frequently on opposite Coasts from one week to the next. And, even during this period, additional production assignments were sandwiched in. Usually, the MTS van is scheduled to arrive at the stadium Tuesday afternoon. Set-up is complete by Thursday afternoon for the evening broadcast.

If necessary, the set-up can be com-

pleted in 8 to 10 hours, but normally a day is allotted for setting up and checking out the system.

All six color cameras are used:

Three TK-45's are in the stands—one at the announcers booth and one at each of the 30-yard lines.

One TK-45 is located in the end zone.

One TK-45 is mounted on a flat-bed truck or motorized golf cart for roving along the side lines.

A hand-held camera is also used at field level for close-ups, interviews and sideline action shots.

A parabolic microphone is employed at the sidelines to pick up the game sounds.

After the game is over, packing up for the next move is done in a fast two hours.

20,000 Miles in Four Months

During the last four months of 1974, the MTS van criss-crossed the country, handling some 20 different football games, including the WFL series as well as several post-season Bowl games (Blue-Gray; Tangerine; Peach; All-America). In between, other production assignments were squeezed in, such as the Miss World Pageant in Binghamton, N.Y., and some "Wide World of Entertainment" segments for ABC. Indicative of its frenetic pace, in the first four months of operation, the Mobile Television Services van logged nearly 20,000 over-the-road miles.



Production Control includes full display of video sources, video switcher with quad split capability; intercom. Space is provided for Technical Director, Director, and Producer/Assistant Director.

Another sports series produced for TVS is college basketball. The MTS unit travelled each weekend to another site to handle the nationally televised game.

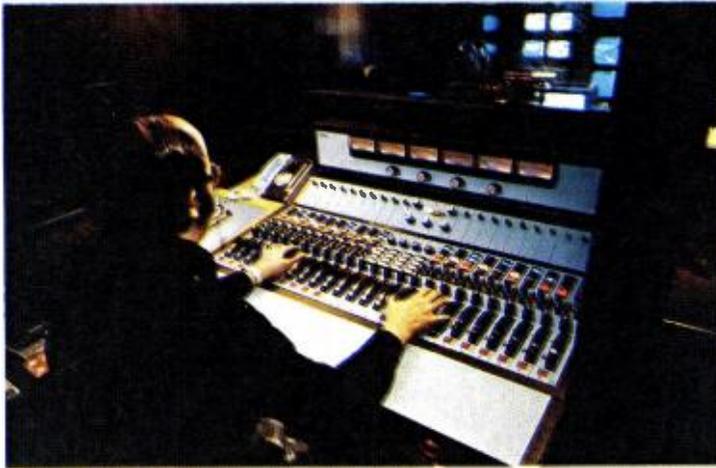
During May of this year, the mobile van logged over 10,000 miles, starting with a baseball pick-up for the Canadian Broadcasting Company from Philadelphia. Next was the production of the Junior Miss Pageant in Mobile, Ala. From there, the van rolled on to Banning, Calif. for the start of a five-show series entitled "Anything Goes", for Bob Banner Productions. It is scheduled to run on ABC during the summer. Other shows in the Banner Productions series handled by MTS originated in Florida, Connecticut and Ohio.

Moving Successes . . . Bright Bookings

The people at MTS are young and enthusiastic. They work hard and enjoy it. They're involved in an "on-the-move" business where the action is, and that's the way they like it.

Howard Zuckerman's approach to assignments is refreshingly simple: "You're only as good as your last job," he says. "Therefore every assignment must be done right, without skimping or corner-cutting that might degrade the quality of the production and reflect badly on the professionalism of Mobile Television Services."

With this philosophy, plus a team of young "pros", and a fully equipped video production center on wheels, Mobile Television Services is rolling—with a solid string of moving successes, and bright bookings ahead. □

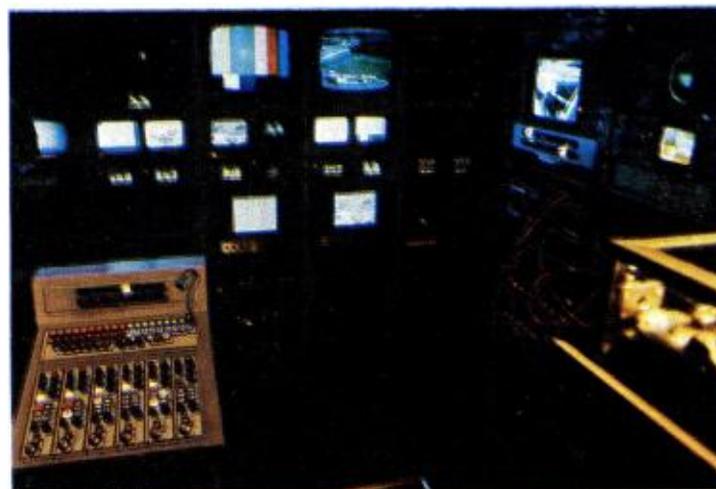


Audio Control is a glassed-in booth, with full view of video monitoring display. Custom audio console is a 20-input, 4-channel BC-100. Operating the audio console is MTS Executive Vice President, Howard Zuckerman.

The dynamic Mr. Zuckerman, an under-40 seasoned veteran of over 20 years in broadcasting and teleproduction, began his career in Columbia, S.C. at WIS as an AM Master Control Engineer. He put UHF station WCOS-TV on-air in Columbia, then moved to WLOS-TV, Asheville, N.C. as Production Manager. After a stint at WLWA-TV, Atlanta; a brief tour in the Air Force, and additional broadcast experience, he shifted to Indianapolis as Program Director for WTTV. In 1968, with several other investors, he founded National Teleproductions Company, starting operations by packaging and producing the Miss Indiana Pageant. This successful teleproduction debut was followed by the Johnny Cash Show, and a string of commercials and sports events.

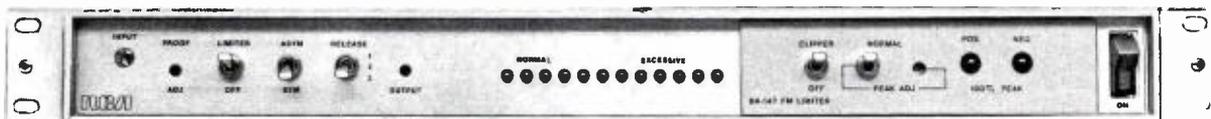


The Video Tape center in the MTS van is located behind the Audio Control and is equipped with two TR-61 VTR's plus tape editing facilities.



Video Control equipment is housed in the rear compartment. This master engineering center contains all electronic support facilities: joy stick controls for all six color cameras plus video patching, control and monitoring equipment.

New Signal Processing Systems



BA-147 Limiter/Clipper Amplifier

Designed for use with FM radio and the aural channel of TV transmitters, the new BA-147 Limiter/Clipper Amplifier allows high peak modulation levels for maximum broadcast coverage. It limits FM signals to 100 per-cent modulation all along the FCC pre-emphasis curve, faithfully preserving the highs, while preventing overmodulation.

The system features inaudible limiting action, through the use of an insulated gate, field effect transistor (IG-FET) that operates as a voltage-controlled amplifier in the program line. As long as the audio level on the program line

is below the threshold of overmodulation, the clipper takes no action.

A series of twelve light emitting diodes (LED) is used to indicate levels of limiting and recovery. The LED responds faster and is more accurate than the mechanical meter movement.

Both symmetrical and asymmetrical limiting modes are available in the BA-147. In the symmetrical mode, both positive and negative peaks are limited equally; in the asymmetrical mode, positive peaks are allowed to attain a 125 per-cent level, while maintaining a 100 per-cent limit on negative peaks.

In addition to the peak limiting action, the BA-147 provides selective clipping action, according to the pre-emphasis curve used in the transmitter system and the desired operational fidelity.

The BA-147 is a "Thin Line" design, requiring but 1¾-inches of rack height in the standard 19-inch width. (Catalog AU.6410A.)

A unique signal processing system, the BA-145 AGC Amplifier makes gain control decisions automatically to provide the maximum average modulation over extreme variations of program levels.



BA-145 AGC Amplifier

Unlike conventional AGC amplifiers, the BA-145 incorporates logic circuitry to make gain change decisions under logical, preset conditions rather than continuously riding gain. This makes the action virtually inaudible and eliminates the undesirable side effects—swish-up, thump, gain pumping—of conventional automatic gain controlling amplifiers.

The gain control device for the BA-145 is an insulated gate field effect transistor (IG-FET) which provides wide range and smooth response with no

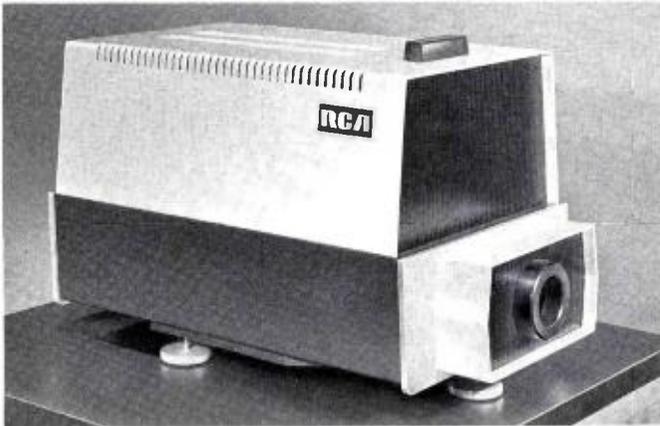
thumping. All logic and audio circuits in the system are solid state.

The BA-145 provides for up to 24 dB of gain compression and a maximum of 16 dB of expansion. This, coupled with a selectable program modulated release time, gives complete control of the widest input dynamic range of any type programming format, from rock to classical.

The gain meter on the BA-145 has a two-color scale showing the amount of compression or expansion. An exclusive feature of this unit is a set of three LED's which provides positive

indication of gain expansion (green); compression (red), or hold (yellow). The meter is color-coded to match the appropriate LED. Since the relative amount of compression or expansion is displayed, there is no ambiguity in determining the operational status at any time.

All controls and metering for the BA-145 are mounted on the front panel. Both monaural and stereo models are available. The compact unit occupies a minimum of rack space—only 1¾ inches of height, 19-inches wide. (Catalog AU.6400).



Improved Version of TK-610 Film Camera

As a result of a recently completed product improvement program, the medium priced TK-610B three-vidicon color film camera has been substantially upgraded in performance and reliability. Among the improvements incorporated in the TK-610B cameras now being shipped are:

- **Matched yokes**, providing these specifications for Registration and Geometry:

Registration

Zone 1 (defined as a circle equal to 0.8 picture height) 0.1%

Zone 2 (defined as a circle equal to 1.0 picture width) 0.2%

Zone 3 (outside Zone 2) 0.3%

Geometry

No point shall deviate more than 2.0% from its true position.

- **New yoke assembly** provides for precise rotation and focus, and the ability to lock the yoke and tube in place to maintain registration stability.
- **Electrical skew circuits** for enhanced performance and convenience of adjustment.
- **Electrical revisions** in circuitry for improved sweep and video performance.

The new precise registration and mechanical stability features added to the TK-610B are part of a continuing improvement program which has already produced a new encoder/enhancer and a new optical system for the camera. The improved TK-610B is a rugged performer, capable of producing quality pictures at modest cost.

Dramatic Improvement In Color Reproduction From New TK-28 Accessory

With the new Video Processing and Color Correction Accessory, the TK-28 Telecine Camera achieves an extended range of color film correction which is strikingly noticeable.

Two modules comprise the new accessory (MI-557873-A1) which can be installed in existing TK-28 cameras as well as new systems. These replace the processor module in the camera and provide all video processing, flare correction, shading correction and master gamma selection for the TK-28 system.

The accessory incorporates circuitry to automatically detect and correct differential gamma (mid-tone) errors. These circuits, operating in conjunction with the other automatic systems in the TK-28, perform a line-by-line analysis of the signal and vary the individual channel gammas to achieve

mid-tone balance. The dynamic correction range is adjustable, as is the overall master gamma range of the camera.

Special circuitry in the MI-557873-A1 accessory provides for inversion and gamma compensation of negative video signals, which permits the TK-28 camera to process video from negative film without the need for external devices.

The new accessory complements the automatic functions already included in the TK-28 camera to form a complete automatic control system called ASCET (Automatic System for Correction of Errors in Telecine).

New Audio/Erase Headposts And Shields For VTR's At Lower Prices

As a part of the design program for the TR-600, several new Audio/Erase headposts and shields were developed for use with other RCA tape machines. The new design supercedes heads previously used, and provides the same performance. As a result of manufacturing and assembly economies, the new heads are 45 per-cent lower in price than previous models.

For optimum results in making replacements, new head shields should be utilized with the record/play and simul-play headposts. The new heads and shield kits can be installed as replacements in these RCA tape machines: TR-600; TR-70; TCR-100; TR-60; TR-61; TR-4; TR-22; TR-50.

These replacement units are available from RCA Parts and Accessories, Deptford, N. J.

RCA announces of the film



A special Mylar leader is spliced onto each film segment. Film is inserted into a cartridge—no further film handling.



Each cartridge can contain from ten seconds to two minutes of film, with complete cartridge flexibility.



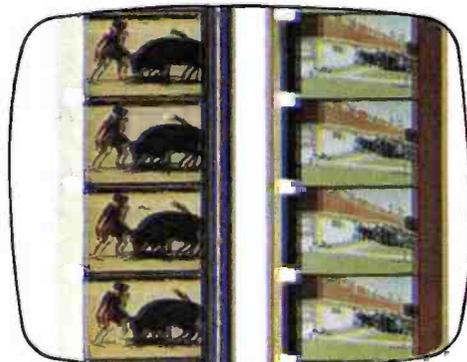
A cartridge is drawn into the machine on cue, shown by one of the two projectors, then rewound, all automatically.



As the first reel rewinds and is replaced in the magazine, the second projector runs film from the next cartridge.



The TCP-1624 will play one cartridge and stop, or will play cartridges continuously until it receives an order to stop.



The TCP-1624 switches automatically from optical to magnetic soundtrack, then returns to optical mode.

the end clip slip-up.

Now you can put miscues, make-goods, and imperfect film color all behind you. Do away with time-consuming, costly film clip cataloguing, storage, retrieval, dubbing, splicing, threading, cueing, playing, unsplicing—and the chances for error that go with them. The RCA TCP-1624 Cartridge Film Projector is here. In full production now.

A survey of TV station logs shows that 89% of film segments run from 10 to 120 seconds—the film lengths the TCP-1624 is made to handle. Its magazine holds 24 16mm. film cartridges, each of which can be cued, played and rewound with push-button or computer control, with full intermix; even last-minute changes can be made. Once film clips are cartridge-loaded, no further film handling is needed. You play the film spot on film, without dubbing. Spot reel makeup and breakdown are eliminated; each break can be programmed in any order.

The TCP-1624 is part of a new, problem-solving telecine system from RCA.

The TCP-1624 Cartridge Projector features two identical, self-threading projection systems with automatic cue, zero pre-roll, automatic switching between optical and magnetic sound tracks, and automatic film rewind. It can operate in "automatic sequential" or "single event" modes.

The RCA TCP-1624 can do for film what cartridge systems do for tape. In fact, the TCP-1624 is fully compatible with a cartridge system, to give you automatic station breaks using both film and tape.

In addition, the system offers consistent color quality in real time, automatically, with optional

ASCET (Automatic System for Correcting Errors in Telecine). ASCET is available as part of a TK-28 film island. With this new automatic color correction option, you can put a high-quality picture on the air with less than high-quality film.

Whether or not you saw the RCA TCP-1624 at NAB, contact us now. Your RCA Representative will gladly demonstrate the end of the film clip slip-up.



RCA TCP-1624
Cartridge Film Projector.
You've seen it at NAB.
You can buy it now.

RCA Broadcast
Systems

