



**NAB 1978: A BANNER BROADCAST CONVENTION**

**Announcing the newest in video freedom:  
all you want in a 1" VTR  
backed by total support  
from RCA.**

Now you can have complete freedom from worry about helical-scan VTR support. That's because your investment in the new RCA TH-100 1" VTR is protected by RCA. That protection means 24-hour parts replacement. Emergency service. TechAlert, for help as close as your phone at any time—day or night. Training support. Service manuals. You can be sure that RCA support is there, wherever your RCA equipment operates.

**Quality to start with.**

The new TH-100 is yours in the new SMPTE Type C non-segmented helical format. It's available in three studio configurations—rack, console or tea cart. A small, lightweight, rugged portable—the TH-50—is available for field production. All models deliver the picture and audio quality you need for professional results.

Among the many TH-100 features are two high quality program audio channels for stereo/bilingual use; complete recording/playback of video and vertical blanking interval; one cue/SMPTE time code



**RCA**

**TH-100. Part of the  
new video freedom.**

channel; automatic color framing; five servos for optimum tape handling; two flexible tape timers; plus much, much more.

The TH-100 offers economical first cost, economical head cost, and tape economy, too.

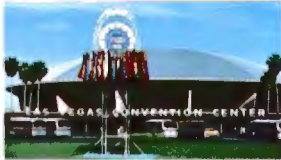
**Simplified edit control.**

One bi-directional search knob gives you forward and reverse editing control, with selectable shuttle speeds up to 60 times normal. You get a color picture to 7 times normal, a recognizable picture at full speed when used with the TBC-100 time base corrector. For more video freedom, you can manually jog frame-by-frame—again, with a color picture.

**Video freedom is everything you need for quality television.**

RCA offers a brilliant array of VTRs, cameras, mobile units, antennas and transmitters. For more facts about any RCA equipment, including the TH-100, just contact your RCA Representative, or write us. RCA Broadcast Systems, Building 2-2, Camden, NJ 08102.

See us at NAB, Booth 601.



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**Technology Dominant at NAB**

"Broadcasting International" was the convention theme, but NAB attendees came looking for advances in technology. This overview covers the RCA exhibit, with emphasis on new technology products.



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**New Product Report—Progress in Technology**

Highlighted in this report are new RCA products introduced at NAB, including the TK-47 automated camera; AE-6000 computer editing system; new helical scan VTR products; TCR-100 automation package.



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**PTL Network Television Ministry**

In 1973 three TV stations aired the new PTL Club. Today, it reaches 20 million worldwide viewers, with over 180 U.S. stations and a new satellite distribution system. Extensive studio and mobile TV production facilities are needed to handle programming needs.



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**"Newscenter 39" Uses Radio-Dispatched ENG for Better Coverage**

Storer Broadcasting's KCST-TV operates a 110 kW transmitting system to cover the San Diego market with a 5 megawatt signal. The TV-39 news operation packs punch, too, with radio-dispatched ENG units and a unique news set.



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**Sundance Productions Growing Bigger in Dallas**

At Sundance Productions the emphasis is on quality, not size. This major Southwest teleproduction facility uses three TKP-45 cameras for film-style on-location and studio production. Post-production includes 24-track audio recording integrated with a computerized video tape editing system.



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**TK-760 Camera: A Design Evolution**

Adapting an ENG camera for other applications is not as easy as it might seem. The TK-760 "three-in-one" Studio/Field/ENG camera evolved from the highly successful TK-76 Portable. This article covers some of the design concepts involved in developing the new camera.



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**TK-76 In Action**

Now more than 1,000 strong, the TK-76 portable camera continues to prove its versatility in handling a diversity of assignments—as evidenced in this assortment of user photo-reports.

# View Finder

## TK-76 #1000 Delivered To WTVW

A major milestone, the delivery of the 1000th TK-76 camera, was marked in May 1978 with the shipment of that designated camera to WTVW, Evansville, Ind.

"The commercial success of this camera, with 1,000 units delivered in just over two years, highlights the remarkable growth of electronic journalism from its small beginnings just a few years ago," remarked J. E. Hill, Division Vice President and General Manager of RCA Broadcast Systems.

The TK-76 camera was specifically designed for rugged electronic news-gathering applications, and was initially demonstrated at the 1975 NAB convention. Deliveries began in April, 1976, with the first camera being shipped to KARD-TV, Wichita, Kan.

"In addition to live action and videotaped news assignments, the TK-76 has found applications in documentary and commercial production and in other programming where mobility and reliability in the field are required," Mr. Hill said.

TK-76 cameras now are in use by TV networks, broadcast stations and teleproduction companies in 32 countries. They operate in either the NTSC, PAL-B, PAL-M, or SECAM television standard.

WTVW is a member of the Fuqua Communications Inc. broadcast group. WTVM, Fuqua's Columbus, Ga. station, currently operates a TK-76 camera for ENG and production applications. The 1,000th unit is part of an additional three-camera order placed by Fuqua.



COMMEMORATING THE 1,000TH—Ed Hill (left), Division Vice President and General Manager, RCA Broadcast Systems, presents to Berry Smith, President and General Manager, WTVW, Evansville, Ind., and Joe Windsor (right), President, Fuqua Communications Inc., a commemorative scale model of RCA's TK-76 ENG television camera in recognition of the 1,000th unit which was scheduled for delivery to WTVW in May. The presentation took place at the National Association of Broadcasters convention in Las Vegas.

## Korean Broadcasting To Expand Facilities With RCA TV Studio Systems Valued At \$4.5 Million

The Korean Broadcasting System has ordered RCA television studio equipment valued at approximately \$4.5 million, in a continuing expansion of its technical facilities.

The major equipment order includes studio and field TV cameras, video tape recorders, film originating systems and associated switching, audio and microwave equipment. The TV

systems will equip seven new television studio facilities to be constructed, one in each of the seven provinces of South Korea.

Fourteen TK-760 studio/field cameras are included in the purchase, as well as seven TK-76 electronic newsgathering cameras. Film handling systems include seven TK-28 complete telecine islands.

Video tape recording in the new KBS studios will be handled by seven TR-600A quadruplex video tape recorders. In addition, the order calls for seven HR-1020 portable videocassette recorders and fourteen HR-1060 editing videocassette recorder/reproducers.

The new studios, scheduled to be in operation by mid-1978, will be used for extensive local program production, and for provincial news and documentary programming.

### **CBC Adds Nineteen TK-76 Cameras**

The Canadian Broadcasting Corp. has placed an order with RCA Broadcast Systems for portable TV cameras to be used in electronic newsgathering and for TV film originating systems, valued at approximately \$1.25 million.

Nineteen TK-76 ENG cameras are included in the major equipment purchase. The cameras will be placed in service throughout the CBC's nationwide newsgathering operations, joining nineteen TK-76 units already in use. Also included in the order are eleven TP-66 16mm film projectors for use in telecine operations at various CBC stations.

### **CKY-TV, Winnipeg, Orders \$1.4 Million In RCA Television Equipment**

CKY-TV, Winnipeg, Manitoba, Canada, has upgraded its technical facilities with RCA color TV studio, transmitting and outside broadcast systems valued at approximately \$1.4 million.

The equipment purchase includes a TT-35FH, 35-kilowatt VHF transmitter, equipped with RCA's OPTO (Optimized Parallel Transmitter Output) switcher which allows the visual and aural outputs of the individual transmitters in the system to be operated in various configurations.

Jim Purvis, CKY-TV's General Manager, said the new RCA transmitter will feed seven existing rebroadcast stations located throughout the province.

The equipment order also calls for an RCA-designed mobile outside broadcast van, equipped with four RCA TK-760 studio/field cameras.

The station's video tape recording and editing will be enhanced with the addition of two TR-600A quadruplex video tape recorders, both equipped with AE-600 time code editing systems.

### **ID's Spots & Promos**

**Richard L. "Rocky" Rocamora** is Manager, Meadow Lands Broadcast Engineering, responsible for engineering design and development of RCA AM/FM/TV broadcast transmitters and audio products. Previously he was Manager, Antenna Engineering.

**Bruno Melchionni** replaces Rocamora as Manager, Antenna Engineering, Gibbsboro, N. J.

**Albert T. Montemuro** has been named Manager, Systems Engineering and Custom, Repair and Engineering Shop (CRAE) for RCA Broadcast Systems. This activity designs custom-built mobile units; designs and assembles custom television studios and systems, and provides an equipment repair and refurbishment facility.

**Gary S. Moskovitz** has been appointed Manager, Electronic Recording Equipment Product Management, a new position.

A recent addition to Studio Product Management is **Tom Jordan** who has product responsibility for Control Equipment, including the TFS-121 Frame Synchronizer.

**Art Nobo** is Manager, Sales, Caribbean and Central America. He is based in Miami.

**Tom E. Newman** has been named Manager, International Sales Development, reporting to A. W. Power, Manager, International Sales.

RCA Limited (Canada) has appointed **John W. Howells** as Manager, Sales with executive responsibility for marketing RCA broadcast equipment in Canada. He is headquartered in Montreal.

**Henry H. Klerx**, formerly Manager, Broadcast Planning has been promoted to Manager, Business Planning for RCA Commercial Communications Systems Division. In his new post, Mr. Klerx is responsible for coordinating product, marketing and related planning activities for the Division's major business units: Broadcast Systems; Mobile Communications Systems; Avionics Systems, and Cablevision Systems.

RCA Photophone Systems, Burbank, has named **Gordon E. Cordell** Manager, Product Management. This Broadcast Systems activity is a major supplier of post-production equipment and systems for motion picture and teleproduction operations.

### **SES, Mt. Gambier, Australia, Installs TCR-100**

SES, Channel 8, the South East Telecasters Ltd. commercial television station serving Mt. Gambier, Australia, is automating its station breaks with an RCA TCR-100 video tape cartridge recorder.

The TCR-100 system for SES includes a Signal Processing Unit which makes the cartridge machine a completely independent facility for on-line service or as an off-line recorder.

### **TVQ, Brisbane, Australia, Upgrades Tape Facilities**

TVQ, Brisbane, Queensland, Australia, is upgrading its television program and commercial production facilities with RCA video tape recording and editing systems.

The Channel O station in Brisbane, operated by Universal Telecasters Queensland Ltd., has ordered two RCA TR-600A quadruplex video tape recorders equipped with the AE-600 automatic editing system.

The built-in AE-600 uses the latest electronics, including microprocessors, programmable memory devices and large-scale integrated circuitry, for sophisticated time code editing of video tapes. The system can control one record TR-600A machine and up to eight playback TR-600s, and provides for either local or remotely controlled editing.

### **Two Caracas TV Stations Upgrade Transmitter Systems**

CARACAS, Venezuela—Two non-commercial Caracas television stations are replacing their existing transmitters with RCA TV transmitting systems valued at approximately \$800,000.

The equipment order, placed with RCA Broadcast Systems by the Ministry of Information and Tourism of Venezuela, includes a 35-kilowatt highband transmitter and a 30-kilowatt lowband unit.

The TT-35FH, 35-kw transmitter will be installed by Channel 8 in Caracas, replacing a 10-kw unit. The new transmitter, which consists of two individual units, will be operated in a parallel configuration.

Channel 5 in Caracas will install a TT-30FL, 30-kilowatt transmitter to replace an existing 10-kw model. The TT-30FL also will be operated in a parallel configuration as a bi-level system which permits operation at the authorized power level of 15-kw in both the combined and alternate modes.

## Color TV Prices Run Counter To Inflation: Drop 43 Per Cent In Past Quarter Century

Color television prices have actually declined 43 per cent over the past quarter of a century in sharp contrast to prices of such products and services as automobiles, health care and housing, according to RCA.

Roy Pollack, Vice President of RCA's Consumer Electronics Division, notes that since 1954 the average retail price of a color TV set has dropped from \$1,000 to \$575, despite tremendous advances in color TV set technology, reliability and safety.

"The cost of living, as everyone knows, has gone up dramatically during the same time span. If color TV prices had kept pace with the Consumer Price Index, the average retail price of a color TV set today would be about \$1,300, or \$725 higher than it now is," Mr. Pollack says.

In that same period, he adds, the average selling price of a new car has gone from \$2,620 in 1954 to \$6,120 in 1977, an increase of 134 per cent; the median price of a new one-family house from \$12,500 to \$48,700, an increase of 290 per cent; and health care spending, on a per capita basis, from \$101 to \$637, an increase of 531 per cent.

Since 1954 television manufacturers have had to contend with sharply higher costs of raw materials and labor, as well as the expense of adding such innovations as solid state circuitry, superior picture tubes, electronic tuning and controls, new fire-retardant materials, and other features. Holding the line on prices in the face of rising costs reflects greater productivity largely resulting from improved production techniques, new materials, new technologies, bigger markets and severe competition.

In addition to being technologically superior to the color TV sets of 10 or 20 years ago, today's receiver consumes about two-thirds less energy than its tube-type counterparts. RCA, for example, has a 13-inch color TV receiver that uses less electricity than a 75-watt light bulb.

"Significantly," Mr. Pollack says, "the many innovations and advances in color television have been brought to the American consumer at lower prices. It is this long-term history of providing the consumer with a better product at lower cost that has accounted for the tremendous growth of television over the past 30 years."

There are approximately 130 million color and black-and-white television sets in American homes, or more than

the number of automobiles, bathtubs, washing machines or refrigerators in use, and not far behind the telephone.

## CKCK-TV, Regina, Orders Tape And Transmitting Equipment

CKCK-TV, Regina, Saskatchewan, Canada, has ordered an RCA 50 kW transmitter and a TCR-100 video tape cartridge system valued at more than \$600,000.

The lowband VHF transmitter on order, RCA's TT-50FL, is scheduled for installation later this year. The unit consists of two 25-kilowatt transmitters combined to deliver a maximum of 50-kw visual power output, while providing full transmitter redundancy. The TCR-100 will be used by Ch. 2 to automate station breaks.

## ERT, Greece, Adds RCA ENG Facility

ERT, the National Hellenic State Broadcasting organization of Greece, has placed in service RCA electronic news-gathering equipment valued at approximately \$450,000.

The equipment, purchased from RCA Jersey Limited, Jersey Channel Island, England, includes five TK-76 portable electronic newsgathering color TV cameras. HR-1020 portable videocassette recorders and HR-1060 editing recorder/reproducers, also included in the order, use the 3/4-inch type A format of videocassettes. The equipment operates on the PAL television standard.

## CFRN-TV, Edmonton, Expands Video Production

CFRN-TV, Edmonton, Alberta, Canada, is expanding its program production capabilities with RCA television studio systems valued at more than \$500,000.

The equipment purchase for the Sunwapta Broadcasting station includes two TR-600A quadruplex video tape recorders, both equipped with RCA's AE-600 time code editing system, and with super highband and pilot tone for extremely high quality master video tape recording.

The Edmonton station also will install a second TCR-100 video tape cartridge recorder to assist in on-air playback of commercials and other short taped segments, and to free existing reel-to-reel video tape machines for production activities.

CFRN-TV is augmenting its current complement of RCA studio cameras with a new TK-46 top-of-the-line camera.

## WITF-TV Reports Power Savings With Mod Anode Pulser

WITF-TV, Hershey, Pa., a non-commercial educational station operated by the South Central Educational Broadcasting Council, has reported significant power savings in the operation of its UHF television transmitter using RCA's Mod Anode Pulser.

The modulating anode pulser reduces the input power requirement of RCA UHF transmitters by increasing the efficiency of the visual power amplifier.

John Bosak, WITF-TV's Chief Engineer, reported that the difference in the power consumption of the station's transmitter with the pulser in operation amounted to a savings of \$1.58 per hour.

"Although that may not seem like a large amount each hour, with our operating schedule the savings amount to more than \$10,000 in one year," Mr. Bosak said.

WITF-TV, which operates on Channel 33, installed the RCA device along with "high efficiency" klystron amplifier tubes in its TTU-60, 60-kilowatt transmitter in the summer of 1977, as part of a major improvement of transmission facilities. The anode pulser can be applied to any RCA UHF transmitter equipped with the company's TTUE-4 or TTUE-44 solid-state exciter and "high-efficiency" klystrons.

In operation, the RCA system applies pulses with an amplitude of approximately -2 kV to the modulating anode of the visual klystron amplifier tube during the sync portion of the visual signal.

This permits the klystron to operate at reduced beam current during the signal's video portion, and then for beam current to be boosted to a higher level during the sync interval. Typically, beam power consumption is reduced by 15 to 20 percent while total transmitter power input falls by 12 to 14 percent, depending on the transmitter type.

## Robert N. Hurst Wins Business Publication Journalism Award

Robert N. Hurst, Administrator, Broadcast Technical Training for RCA Broadcast Systems, has been selected as a winner of a Certificate of Merit in the 1978 Neal Editorial Achievement Awards.

Mr. Hurst was honored for a series of contributed articles on digital television. He joined RCA in 1951 and has served in various engineering and engineering management positions, including engineering manager for the development of the broadcast industry's first video tape cartridge recorder.

As a Leader, Control Systems Engineering, he directed a group of engineers in the design of the first RCA digital television product, the TFS-121 frame synchronizer. He holds twelve patents in the field of broadcasting.



WINS WRITING AWARD—Robert N. Hurst (center), Administrator, Broadcast Technical Training, for RCA Broadcast Systems, is congratulated upon winning a 1978 Neal Editorial Achievement Award for a series of articles on digital television that appeared in a leading trade magazine. Offering congratulations are (left) J. E. Hill, Division Vice President and General Manager, and John W. Wentworth, Manager, Broadcast Technical Training, Broadcast Systems.

## RCA Receives NASA Contract To Build Space Shuttle TV Camera System

RCA has been awarded a NASA contract of approximately \$10.5 million to supply the high-quality television camera system that will transmit "live" color and black and white TV pictures during the manned orbital Space Shuttle flights.

The closed circuit TV camera system will be installed on the Space Shuttle for earth orbital missions starting in 1979 and will be used on the subsequent flights scheduled for the 1980s.

"The TV system will assist the Shuttle crew in performing the complex tasks of deploying, retrieving and servicing spacecraft in orbit," said Bert Soltoff, Shuttle Television Program Manager, RCA Astro-Electronics, part of the company's Government Systems Division.

The Space Shuttle is a recoverable launch vehicle that can be reused to place multiple payloads into orbit. It is

launched like a rocket, orbits earth as a satellite and returns to the ground as an unpowered aircraft. That portion of the Shuttle which flies in space is called the Orbiter.

RCA, under contract to the NASA Johnson Space Center, will provide up to 50 cameras for approximately 500 Shuttle flights planned over the next decade. Each Space Shuttle Orbiter can carry up to six TV cameras as part of the closed circuit TV system.

The system will consist of several television cameras, a video control unit, pan and tilt mechanisms, and various monitors. The TV cameras will employ a 525-line standard compatible with broadcast television.

Cameras will be installed in the crew compartment, in the cargo bay, and on a remote manipulator arm. Within the cargo bay, camera positions are located at the forward and aft bulkheads and in the keel. These cameras may be controlled remotely by the Shuttle crew or by ground control personnel at NASA's Johnson Space Center.

"The TV system will be especially useful in aiding crew members to retrieve satellites from space and to remove others from the cargo bay of the Shuttle Orbiter," Mr. Soltoff said. "In addition, the cameras can provide visual assistance to the crew in repairing or replacing parts on a satellite attached to the servicing platform mounted in the Orbiter payload bay."

Equipped with multiple focal length "zoom" lenses, the cameras will provide various views to ensure adequate clearance is provided while moving payloads about in the cargo bay, Mr. Soltoff explained.

The TV cameras weigh about 14 pounds and measure 15½ inches long, 5 inches high and 5½ wide. The cameras will have interchangeable lens assemblies for color and black and white pictures.

During the early 70s, RCA-built cameras provided home viewers with spectacular color TV pictures of the Apollo astronauts as they explored the surface of the moon.



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1978

SANDS LAS VEGAS CONVENTION CENTER





# NAB 1978

## Technology, Technology, Technology —TODAY AND TOMORROW

While the theme for the 1978 NAB Convention was "Broadcasting International" the expectations of those attending were centered on technology. Broadcasters came to the Las Vegas exhibits and meetings alerted for advances in technology. And few were disappointed.

Industry suppliers came through with an impressive array of new products

- for automating and simplifying complex technical systems;
- for improving production and post-production techniques;
- for making overall broadcasting operations smoother, more cohesive and manageable.

The large RCA exhibit mirrored the convention emphasis on technology for today and tomorrow.

Highlighting the exhibit was the TK-47, the world's most automated studio camera, a dramatic demonstration of

technological progress. Utilizing new circuitry, new design concepts and micro-processor controls, the TK-47 automatically sets up at the touch of a single button!

In video tape operations, RCA maintained its position as a broad-based supplier. New product introductions included the TH-100 broadcast quality 1-inch tape recorder, with a full complement of ancillary equipment for production and post-production applications.

A new automatic computerized editing system, the AE-6000 was demonstrated with TR-600A quad VTR's. This new innovative system controls up to eight TR-600's and permits continuous automatic assembly.

An early master of advanced technology, Leonardo Da Vinci, lent his artifact-crammed study to serve as the studio setting for demonstrating the expanded line of RCA color cameras:

- TK-76B, an improved version of

the popular choice for ENG and EFP.

- TK-760, the convertible "three-in-one" camera for studio or field use.
- TKP-46, field production camera for film style shoots, with studio quality results.
- TK-46, the acknowledged performance standard among studio cameras.
- TK-47, the fully automatic camera, a quantum advance in camera design.

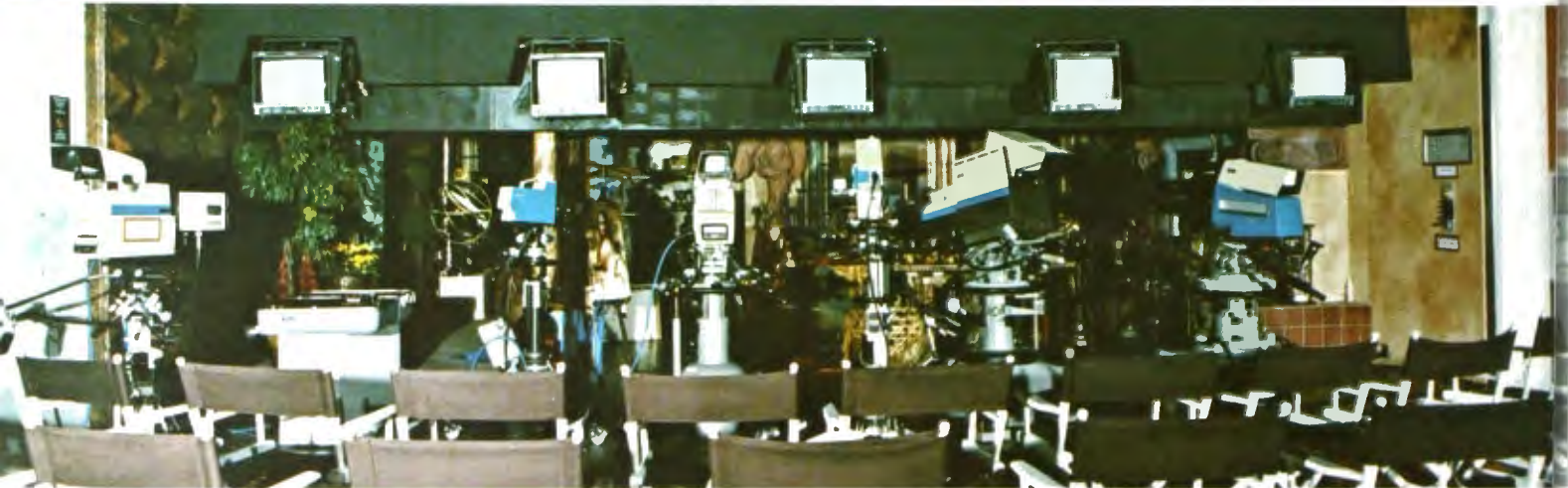
Throughout the 1978 NAB, the prevailing mood of broadcasters was one of readiness to accept and to act on new technology products. The message to broadcast industry suppliers was clear: press forward with innovative, cost-effective and technologically advanced products, or prepare for oblivion.

We've got the message.

**The following pages give an overview of the various product areas in RCA's 1978 NAB exhibit. This largely pictorial report is followed by more detailed information on the major new products introduced: TK-47 camera; AE-6000 Computerized Editing System; TH-100 Tape Recorder, and others.**



A representation of Da Vinci's study provided an unusual setting for the RCA camera show (top)



These three pictures show (1) the cameras on set before "showtime";

## "CAMERAS . . . ACTION"

Action was, indeed, the name of the game in the studio area. Six RCA color cameras were put through their paces, using an unusual set that re-created Leonardo DaVinci's Renaissance period study. The setting was symbolic and appropriate, as advanced technology has ushered in a new era in camera design.

In one part of the set, a TK-76B camera repeated its "rain test" from the last NAB, and demonstrated time-after-time its out-of-the-box operation—with pictures on the monitor a mere ten seconds after turn-on.

Two versions of the new TK-760 studio-convertible camera were demonstrated—the PAL as well as the NTSC. This versatile "3-in-1" camera can deliver superb pictures in the studio or in the field. And, it can be converted in minutes to a TK-76 for ENG use.

The TKP-46 portable production camera roamed the set to show its ability to deliver studio quality pictures from

any angle. Ideally suited for "film style" shoots, it is a one-camera portable system that includes big camera features.

Picture-perfect performances by the TK-46 studio camera left no doubt in the minds of viewers that this camera fully measures up to its rating as the studio camera that all others must be judged by. The TK-46's crisp, clear pictures, captured every nuance, every subtlety of the televised scene.

Climaxing the RCA camera show was the show-stopper—the TK-47. This all-new camera with fully automatic set-up gave dazzling performances, show-after-show, dramatically defining the new era in camera technology.

The TK-47 opened with a horror scene—a badly out-of-register picture—the type you'd get when making a tube change. Under normal conditions, it would take hours of tweaking to get the perfect picture. But not with the automatic TK-47. At the touch of the "AUTO" button, the audience watched

in amazement as a magic transformation occurred. An alphanumeric display on the picture monitor followed the micro-processor-controlled operations and interactions, as the camera quickly brought itself into the optimum operating condition. From "mud" to superb picture in seconds.

"Standing Room Only" audiences prevailed at the camera shows for the duration of the convention.

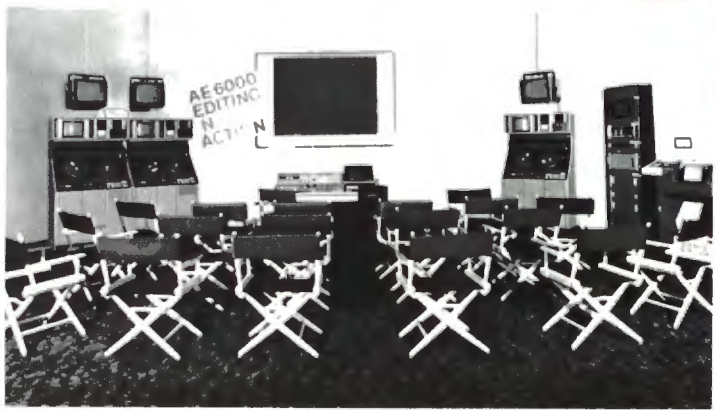


(2) playing to standing room only audiences during the show, and



(3) intense interest following each performance.

AE 6000 computer-controlled time code editing system demonstrated its ability to give the video editor more creative flexibility.



A new helical scan tape product line was introduced, featuring the TH-100 high performance studio recorder.



# ... ROLL TAPE

Most pre-NAB publicity pointed to video tape as a prime interest area. Teleproducers and broadcasters were treated to a veritable banquet of video tape product developments to satisfy the whetted appetites. RCA came prepared to serve.

In the quad tape area, the AE-6000 was introduced. This sophisticated time code editing system can control up to eight TR-600A VTR's, and is designed to give the video editor more creative flexibility while simplifying the editing operation. A structured "show and tell" presentation highlighted key operational advantages of this micro-processor-controlled system. Unique AE-6000 features include continuous automatic assembly; switcher control memory; graphic CRT display format, and push-button "Yes/No" decision-making.

For the expanding market for broadcast quality 1-inch equipment, a complete new helical scan product line was introduced, conforming to the new

SMPTE Type "C" format. The line includes the high performance TH-100 studio recorder; the TH-50 battery-operated portable, and a wide range of support products. For flexibility in post-production editing, the TH-100 features a new tape handling system which provides motion-picture style video tape edit decision capabilities.

The TCR-100 Cartridge Video Tape system was designed to simplify and to automate station breaks. Today there are more than 350 of these machines in use around the world. Now the versatility and cost-effectiveness of the TCR-100 has been extended with the addition of a new Automation Accessory which allows the machine to be totally integrated into a station's technical automation system. The built-in accessory provides for electronic cartridge identification; programmable random play, and automation system interface.

In keeping with the "Broadcast International" theme, a TR-600A with an SE-1 editing system was operated in PAL and SECAM modes.

New Automation Accessory extends the versatility and cost-effectiveness of the TCR-100A.





The RCA TV transmitter line was well represented.

Heavy traffic prevailed in the TV transmitter area.



# TV AND RADIO TRANSMITTING SYSTEMS

The continuing interest in TV transmitters was evidenced by the heavy traffic around the UHF and VHF transmitters in the RCA exhibit. Equally clear was the fact that Circularly Polarized TV Antennas have progressed beyond the novelty stage, with a broader spectrum of broadcasters giving careful attention to new developments in this fast-moving sector of broadcast technology.

The animated discussions confirmed the serious mood of broadcasters facing buying decisions for those long-term investments. To cover the various market segments, RCA displayed three TV transmitters—a TT-50FL, 50 kW VHF Lowband Parallel System; a TT-25FH, a 25 kW VHF Highband, and a TTU-30D, 30 kW UHF. The latter transmitter was equipped with a power-saving Mod Anode Pulsar which has added appeal for energy-conscious UHF broadcasters. Pulsers already in use confirm the cost-effectiveness of this system.

For many broadcasters, CP antennas have become a major investment consideration. RCA's extensive antenna design experience was evident in the range of product offerings exhibited. Highband, lowband, top-mount and side-mount models on display served as excellent conversation pieces for extended information exchanges. Several RCA CP antenna systems are already on-air and more are being readied for delivery.

Highlighting the display of Aural Broadcasting equipment was a dynamic demonstration of a new Digital Overshoot Compensation (DOC) processor, a state-of-the-art solution to the problem of overmodulation in FM broadcasting. The FM stereo processor allows the broadcaster to avoid the characteristic overmodulation due to ringing in stereo low pass filters.

Included in the DOC demonstration was the new BTE-115 Exciter which provides improved stability and signal-to-noise; reduced distortion, lower

crosstalk and greater stereo separation.

A new FM circularly polarized antenna, the BFM, was introduced. This side-mount ring type antenna features wide band width, high power handling capabilities and relative insensitivity to icing.

Also exhibited were representative low and high power FM and AM transmitters, and a complement of audio consoles and studio equipment.

There was a growing interest in circularly polarized antennas for television.



The DOC (Digital Overshoot Compensator) Processor captured the radio spotlight.

### FRAME SYNCHRONIZER AND PRODUCTION WIZARD

A large show attraction in spite of its small size, the TFS-121 Digital Video Frame Synchronizer zipped through its extensive repertoire of production wizardry, including a new “quad freeze” feature. A part of the picture compression option, this feature enables the TFS-121 to display up to four compressed, frozen pictures in any of the four raster quadrants. In addition to its production talents, the TFS-121 switches smoothly between non-synchronous video sources without disrupting sync permitting stations to bring in outside feeds—network; ENG, satellite, and remotes—while inside operations such as taping, dubbing and editing can continue undisturbed.



The TFS-121 fascinated audiences with its visual wizardry.

### INTEGRATED VIDEO/FILM SYSTEM

The FR-35B 35mm Film Projector was a part of an integrated system which demonstrated how sprocketed and non-sprocketed film and video tape equipment can function in a precisely interlocked system. The system included the FR-35 and a PM-86SL magnetic sound reproducer interfaced with an HR-1060 video-cassette recorder. The projector and video tape equipment were controlled through an ASL-600 ServoLock machine control console for remote operation. This equipment configuration illustrates how the best features of video tape and film can be adapted for use in the motion picture and television industries.



RCA Photophone Systems demonstrated an integrated control system for interlock operation of video and film machines.





In the telecine, the TK-28 camera again convincingly demonstrated the features that make it the popular choice around the world.

#### TELECINE: THE TREASURE ISLAND

In the Telecine area, the TK-28 camera gave its customary superb performance, demonstrating the full range of proven built-in features that have made it the worldwide popular choice in telecine systems. (More than 600 in use in 25 countries.)

The TK-28B telecine island was operated in a fully automatic mode, highlighting new technical improvements to the system's automatic film correction system, including black level shading correction and extended gamma range.

The TK-28B was equipped with 1-inch Saticon pickup tubes which offer minimum picture lag and extended operating life. Operating with the TK-28 on the TP-55 Multiplexer was the TCP-1624 Cartridge Film Projector which provides for automatic projection and sequencing of short segments of 16mm film. The system's magazine accommodates up to 24 film cartridges.



Mobile Communications Systems and RCA Cablevision Systems shared the Broadcast Systems exhibit.

#### A FAMILY AFFAIR

Joining Broadcast Systems in our exhibit space were two other RCA activities which also are a part of the RCA Commercial Communications Systems Division.

Mobile Communications Systems provides two-way radio equipment for numerous markets, including broadcasting. RCA Cablevision Systems, an established supplier of CATV equipment and systems, is a new addition to this Division. The Company was further represented at the convention with separate exhibits for RCA Americom and RCA Electro-Optics.

The 1978 NAB exhibit once again underscored RCA's continuing role as a diversified total system supplier to the many facets of broadcasting.

# TK-47

## “Quantumatic” Camera

“Simplicity through automation” was a design objective for the new automated TK-47 camera introduced by RCA at the 1978 NAB.

The high level of automation achieved in this totally new camera has resulted in operational simplicity; optional automatic one-button camera set-up; system flexibility, and new benchmarks for stability, reliability and performance.

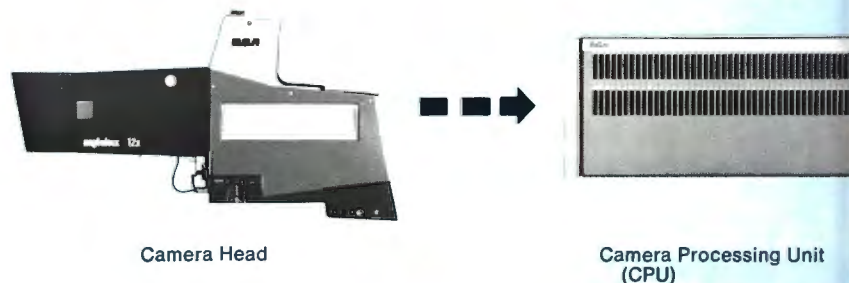
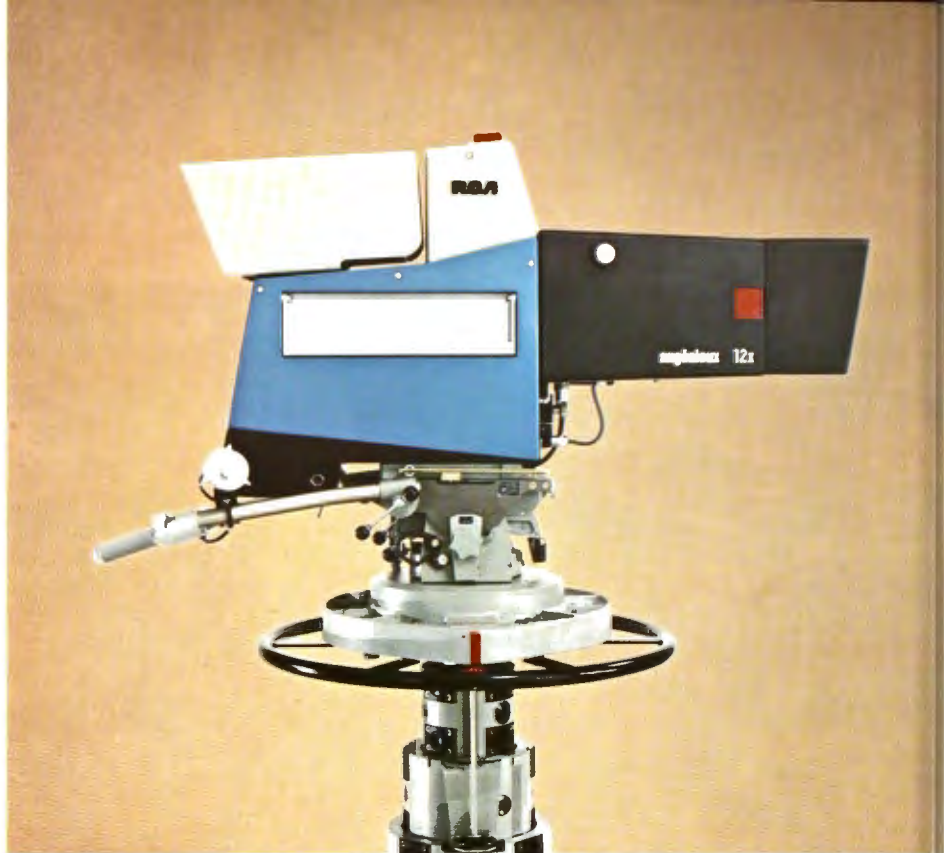
There are no technical controls at the camera head, so the camera operator can concentrate on artistic creativity and picture composition. The normally complicated and time-consuming camera set-up procedure is automated in the TK-47 with Auto-Cam (automatic camera set-up).

### Total Automatic Set-up with Auto-Cam

**AUTO** The Auto-Cam option for the TK-47 camera automatically sets up the camera for optimum performance at the touch of a pushbutton. This microprocessor-controlled system automatically cycles through the complete camera set-up sequence, without operator involvement. The pre-programmed electronic memory interactively monitors, compares and corrects itself with data measured from key points in the picture, automatically adjusting registration, shading, level set, gamma tracking, electronic focus, and beam alignment. This total set-up procedure is normally required only after camera tubes are changed or major repairs are performed.

### Automatic “Preflight” Camera Check

**CHECK** Yet another cost-effective feature is available with the “automatics” option. This is a second level of automated camera set-up which handles the routine, pre-operational camera performance check. This is also accomplished with a single control—the “check” pushbutton.



The “Check” procedure doesn’t mis-adjust the camera the way an operator would to check the operation. It corrects only if necessary, and confirms instantly that the camera is set for optimum performance. Dozens of control functions are checked, using the green channel as reference and making all needed adjustments to the red and blue channels.

The “Check” procedure can be initiated from the Set-Up Control Unit; from the Remote Control Unit, or from the Camera Head.

### SCU—The Technical Control Center

Even with “automatics”, it is recognized that special client requests could require human intervention in adjusting the color picture. In the TK-47, that manual access is provided via the Set-up Control Unit (SCU), a digital device that serves as the technical control center of the camera system. With the SCU, control is complete, and so simple.

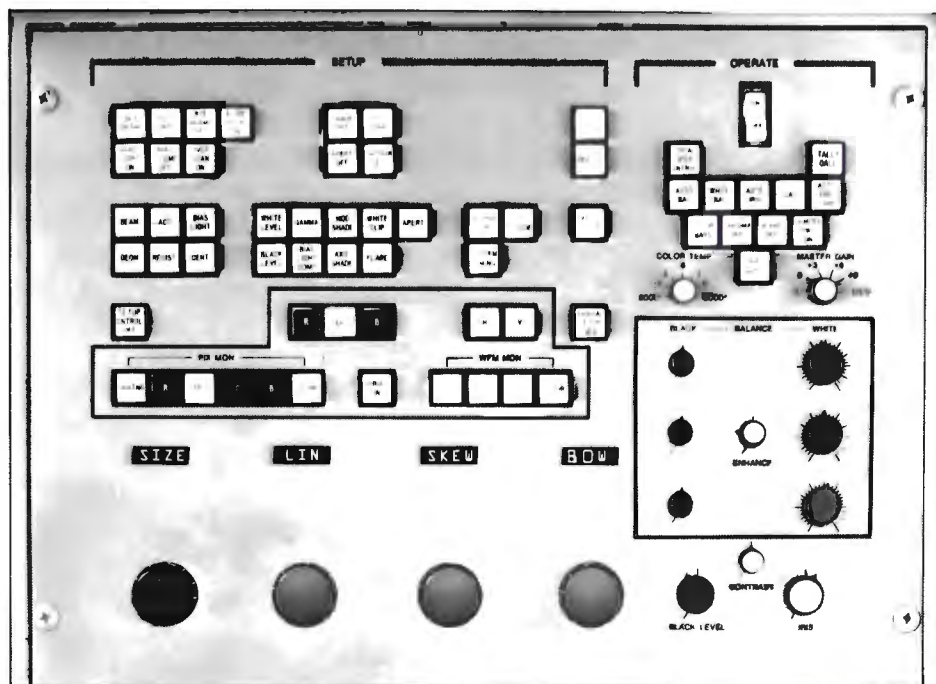
### “Electronic Instruction Book” Set-up

**SET UP SEQ** A single pushbutton control on the Set-Up Control Unit — “Set-Up Sequence” — serves as an Electronic Instruction Book, guiding the operator through a step-by-step computer-programmed sequence of camera set-up operations.

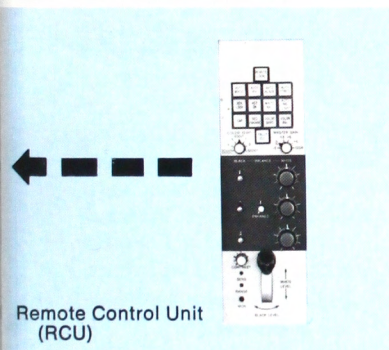
Functions being controlled at each step appear as alphanumeric LED displays in windows above four rotary control knobs at the bottom of the panel.

Adjustments are made through these control knobs which operate with the feel of a potentiometer but which actually generate a digital signal that controls the circuit to which it is delegated. Switching of camera functions, test signals, and even monitor modes is accomplished automatically.

Full control remains with the operator, however, with instant access to any control function available at the touch of a button on the SCU keyboard.



Set-up Control Unit (SCU) is the technical control center for the TK-47 camera. A single SCU can be used to control up to twelve cameras.



Only these three units are required for normal operation of the TK-47 camera system: Camera Head; Camera Processing Unit, and Remote Control Unit.

### Three-Piece Camera System

Normal operation of the TK-47 system requires three separate units: the camera head; the camera processing unit (CPU), and a remote control unit (RCU). For set-up, the Set-up Control Unit (SCU) is activated, but is disconnected from the system once the required adjustments are made.

The camera processing unit (CPU) incorporates circuitry for video signal processing and encoding, including contour enhancement and aperture correction. In function, the camera processing unit is like the camera control unit of conventional cameras, but the controls have been removed so that it becomes a "black box" interface for the camera chain.

The remote control unit (RCU) provides full operational control for the camera. It is a digital device which is connected to the camera processing unit by a simple cable with only twisted

pairs. This arrangement simplifies the delegation of control to many different locations to meet individual requirements.

The camera head accepts the largest, highest optical quality lenses directly, using a simple quick-change mount. The head is rugged, weatherized, and includes a new ultra-stable shock-mount optical system. A large tilting, rotatable viewfinder aids in picture compression.

### State-of-Art Design and Construction

The TK-47 makes extensive use of LSI's, digital memory circuits and many other state-of-art designs for improved performance and reliability. Many potentiometers have been eliminated. A unique shock-mounted optical system assures registration stability even under rough usage. Prism, yokes and tubes are packaged as a single assembly. The 30mm Plumbicon tubes used in the camera are hard-mounted in new precision deflection yokes designed and manufactured by RCA.

### Unlimited Operational Flexibility

Among the advantages of the TK-47 camera design is its operational flexibility. For example, in a multi-camera system, a single SCU can be used to set up any number of cameras. An optional Delegate Switcher Unit (DSU) assigns any of six cameras to the Set-up Control Unit at the touch of a button. Multiple delegate switcher units allow one SCU to handle up to twelve cameras.

### Advanced Assembly and Test Techniques

The advanced technology employed in the development of the TK-47 extends well beyond its design. New production, assembly and computerized test techniques are used to select and pre-test components, assemblies and the completed camera chain prior to shipment.

The "Quantumatic" TK-47 is truly a totally new top-of-the-line camera for studio and field operations. □

# NEW HIGH PERFORMANCE HELICAL VTR'S

TH-100  
Studio Recorder



RCA's new line of high quality, one-inch, helical-scan video tape recorders conform to the Type "C" format recently adapted by the Society of Motion Picture and Television Engineers. Included in the line are the TH-100 compact studio recorder, the TH-50 portable recorder, and a wide range of supporting products.

## Versatile TH-100 Studio Recorder

The TH-100 is a compact, high performance machine that uses the NTSC highband direct FM recording system. The recorder's video and audio reproduction accuracy and movie-style editing control capability make it ideal for studio use. Composed of five, ruggedly-constructed, subsystems — tape transport, electronics package, operating control, meter panel, and power supply — the machine can be easily reconfigured for use in a broadcast vehicle in the field.

## Bi-directional Shuttle Facility

The TH-100 recorder features an editing control system called search control. A single control dial provides bi-directional search capability in two search modes.

In normal shuttle mode, the control dial permits smooth variation of the tape shuttle speed in both forward and reverse. Tape speeds increase from still, step (1/25), one-fourth speed, normal, and, in various increments up to 60-times normal speed. Color lock is maintained up to seven times normal speed when the companion TBC-100 digital time base corrector is used. A recognizable picture is retained even at more than 30-times normal speed. Dynamic tracking used in conjunction with time base correc-

tion provides a fully broadcastable color picture at still-frame, slow motion in forward and reverse, and fast forward up to two times normal speed.

In jog mode, the control dial has the ability to position the tape reels as if by hand. As the operator rotates the control dial, both tape reels follow the rotation precisely. A fully locked picture is retained frame by frame.

## Insert and Assembly Editing

The TH-100 permits both insert and assembly editing of video and audio and is ideally suited to computer cueing and computer-assisted editing. A control track editor for simple editing requirements and a computer-controlled editing system for sophisticated editing needs are available.

Another feature of the TH-100 is its advanced servo system. Five direct coupled servo motors provide individual control of the scanner, the drive capstan, the tension capstan and both tape reels, permitting precision edits and smooth tape handling at all speeds.

Other features include complete monitor switching, color framing, concurrent

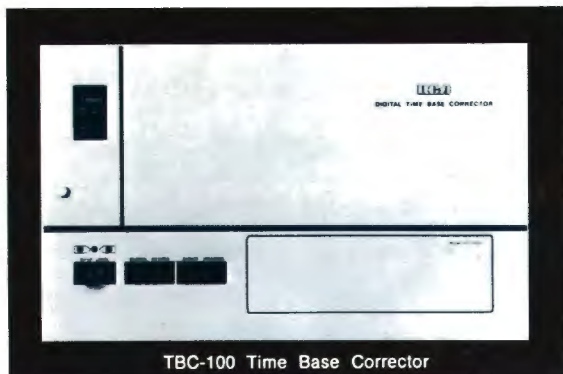
tape timers with "zero memory", quick record current optimization, and protective alarm functions.

## TH-50 Portable Recorder

The TH-50 is a small, lightweight, battery-operated unit specifically designed for electronic field production and newsgathering applications requiring portability. All basic specifications are identical to the TH-100, providing high quality field recording capability with added flexibility for 1" studio editing.

TH-50 Battery-operated Portable Recorder





TBC-100 Time Base Corrector



Remote Control Unit



Time Code Reader/Generator

### Broad Line of Accessories

A wide range of options are available for the TH-100 studio recorder. The dynamic tracking unit produces broadcastable color pictures at still frame, slow motion in forward and reverse, and fast forward up to two times normal speed. The TBC-100 digital time base corrector locks color pictures up to seven times normal speed and monochrome pictures up to greater than 30 times normal speed. The heterodyne color unit, consisting of four modules, produces highly stable color playback up to seven times normal speed without use of the TBC-100. The time code generator, consisting of two plug-in modules, records time code on the cue track and may be displayed on the standard readout to facilitate frame location. The remote control unit permits control of all basic functions and allows automatic in-point editing with manual cutout when two remote units are used with the two TH-100 machines. The vertical interval time code generator/reader, designed for master/slave and mobile applications, features time code readability at slow speed and still-frame and permits utilization of computer assisted editing techniques. Editing options range from a simple, two-machine, previewable track editor to a sophisticated computer-controlled, time code editing system which permits automatic assembly of up to 300 events at once.

### Unique Console Configurations

A unique vertical console which combines a mobile monitor bridge and removable T-cart in a single unit is available for the TH-100. The monitor bridge includes two speakers with independent volume control and provisions for color and waveform monitors and vector scope. The T-cart accommodates the TH-100 and the TBC-100 time base corrector, plus it has another shelf for any additional components required. Removed from the monitor bridge, the T-cart is a complete system capable of being easily maneuvered for varied applications within the studio.

The console features quick disconnect mechanisms which permits conversion in minutes from console, to T-cart, to a package ready for installation in a van.

The versatile TH-100 and its companion products are system-matched to deliver high quality performance in the studio and on-location.



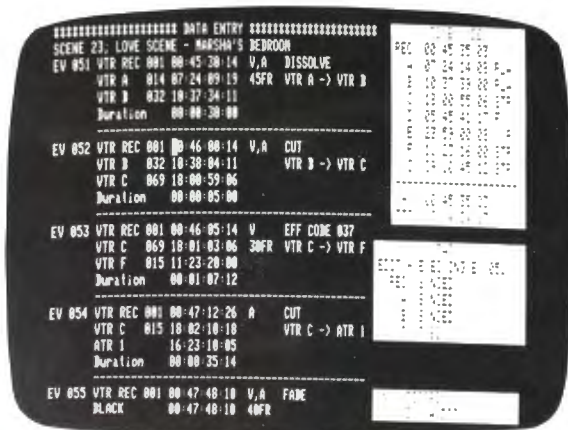
Console and T-cart mounting configurations



AE-6000 controls up to eight TR-600A VTR's with AE-600 editing systems.

# AE-6000

## A NEW AUTOMATIC COMPUTERIZED EDITING SYSTEM



Edit Decision List Format



Graphic Format

The AE-6000 is a sophisticated time code editing system for RCA's TR-600A video tape recorders and AE-600 time code editing systems.

It is designed to give the video editor and director more creative flexibility, while simplifying the editing operation.

Microprocessor control permits complete automation of machine controls so that editing speed is increased, artistic options expanded, and editing time reduced.

The AE-6000 includes a highly sophisticated switcher control system, state-of-the-art microprocessor electronics, operator-oriented control panel, innovative CRT display, and mini-floppy dual disk unit, all designed for standard 19" mounting.

Up to eight RCA TR-600A video tape recorders may be controlled with the system. One TR-600A can be used for recording and seven for playback; or for two edited masters, two units can be recording machines and six playback units.

### Unique Continuous Automatic Assembly

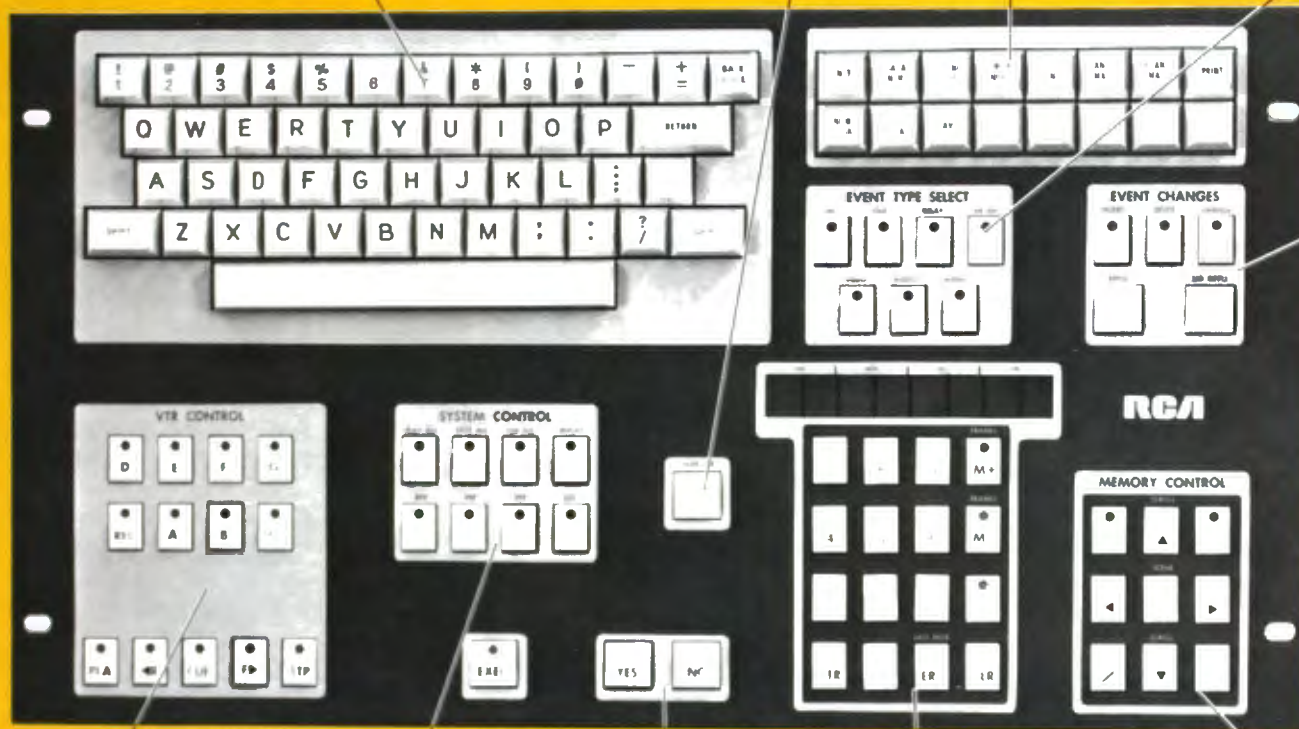
A unique feature of the system, called continuous automatic assembly, permits an editor to make, store, alter, preview and execute edit decisions for an entire program of events at once. As edit decisions are made, they are stored on the mini-floppy disk. The disk records all required information, including reel numbers, event identification, video and audio cue and edit points, machine identification, switcher set-up, special effects, and even plain language notes. Should changes be required, the stored information may be easily altered. If the change affects the timing of subsequent events, the necessary correction can be automatically "rippled" through those events. The whole sequence of events or any part of it may be previewed at any time. Once final edit decisions have been entered, the entire program is automatically assembled. The disk may then be stored for re-editing in the future.

Alpha Numeric keyboard—  
For entering scene titles  
and notes.

Store Direct—Permits  
selection of event times  
"on-the-fly".

Display mode select—Permits  
selection of various CRT  
display modes and initiation  
of special system operations

Event type select—Utilized  
in decision-making process  
to enter the selected action.



Event Changes—Used to  
insert, delete, or change  
events and to determine  
whether or not to modify  
subsequent event times  
based on these changes.

VTR Control—Provides stand-  
ard machine control for all  
TR-600A VTR's in the system.

System Control—Provides  
system action selection when  
used in conjunction with  
the execute button.

Yes/No Keys—Used in the  
yes/no decision-making  
process.

Numeric keyboard with LED  
display—For entering and  
modifying system times.

Memory control—Provides  
direct access to any memory  
location when used in  
conjunction with the  
numeric keyboard.

### Switcher Control System

The system's sophisticated switcher control system, another unique feature, gives the editor unlimited freedom to create complex and unusual special effects. It provides total control over every aspect of switcher operation. An editor can program and select a special effect, and then rehearse it until the desired creative result is attained. All switcher control data required to create the effect is stored on the same mini-floppy disk with all other edit decisions and is recalled automatically as required for previewing and executing the event.

### Sophisticated, Yet Simple

The AE-6000 control panel has been designed for easy operator interface to facilitate data entry speed and accuracy. The panel is divided into functional sections. Unlike other sophisticated editing systems which utilize a standard typewriter keyboard with multiple function keys, the AE-6000 keys control only one function, in most cases, and

are clearly labeled for immediate identification.

### "Yes/No" Decision-Making

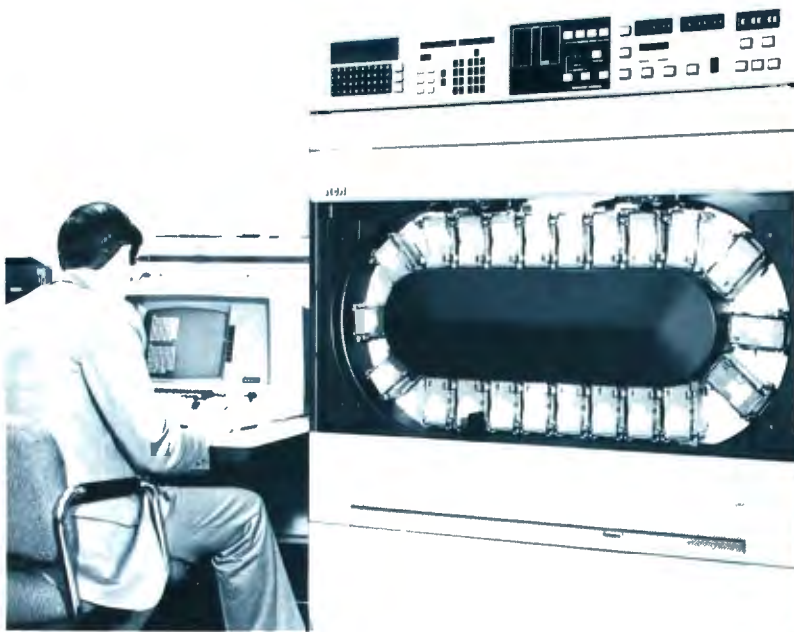
Unique to the AE-6000 is its yes/no decision making. This feature improves the accuracy and reduces the complexity of data entry and system operation. Complex courses of action have been pre-programmed within the system, eliminating the need to enter them through the keyboard each time required. After initial data has been entered, the system shifts to the query mode. In this mode, the system questions the editor to determine what course of action it should take. The editor responds quickly and easily by depressing the yes or no key. When data is omitted or erroneous information is entered, the editor is notified via the CRT display so that the fault can be corrected immediately.

### CRT Displays and Options

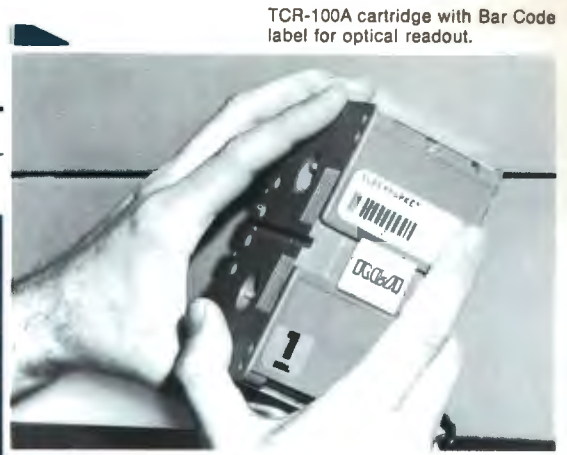
The unique CRT display has been designed to simplify operation. It offers

two easy to read display formats. One is an edit decision list in the more traditional format. The other is an innovative graphic format which relates the progress of a sequence of events in easily identifiable symbols. The display and format layouts are designed to reduce operator fatigue and improve readability. Data of precedence is presented in crisp, well illuminated characters, while other data appears at half intensity to reduce eye fatigue. Warning messages flash to draw the attention of the editor. Other messages appear in the reverse video section of the screen.

A synchronizer option to the AE-6000 permits additional playback control of two audio or video tape machines. A hard copy printer is also available for quick reference to the edit history.



TCR-100A with Automation Accessory can be fully integrated into a computer-controlled technical automation system.



TCR-100A cartridge with Bar Code label for optical readout.

## A NEW AUTOMATION ACCESSORY FOR TCR-100

With its introduction in 1969, the TCR-100 Video Tape Cartridge Recorder revolutionized stationbreaks, permitting multiple commercials, ID's, PSA's and other short segment material to be aired automatically. The TCR-100 alone was an automation system. And it still is.

Now a new level of operational versatility has been achieved with the development of a new Automation Accessory which allows the TCR-100A to be totally integrated into a TV station's technical automation system.

The built-in automation accessory provides for electronic cartridge identification, automation system interface, and

programmable random play of any cartridges loaded into the TCR-100.

### Cartridge Identification System

Fast, accurate machine identification of up to 22 cartridges in the TCR-100 magazine is accomplished without threading or cueing the cartridges. Individual cartridges are identified with external bar code labels which are scanned as the magazine carries the cartridges past a sensing device.

Scanning and identification of all 22 carts is accomplished in only 11 seconds. The resulting information is combined with the proper bin location, and stored in the system's memory. The data then is supplied to the station's

technical automation system as a table of contents, as required.

The identification system handles up to 16 alphanumeric characters of any library coding information desired.

### Sending Device for "Intrusion Protection"

While the magazine's contents are fully accessible, the system includes a sensing device for "intrusion protection". The device, activated by a light beam interruption, flashes a warning when cartridges are changed and the operator fails to enter the new information in the system's memory.

### Random Play Capability

The automation accessory also contains a microprocessor control system to provide completely random play of the TCR-100 magazine contents. Programming can be accomplished from a local play control panel on the TCR-100, or remotely through the technical automation equipment.

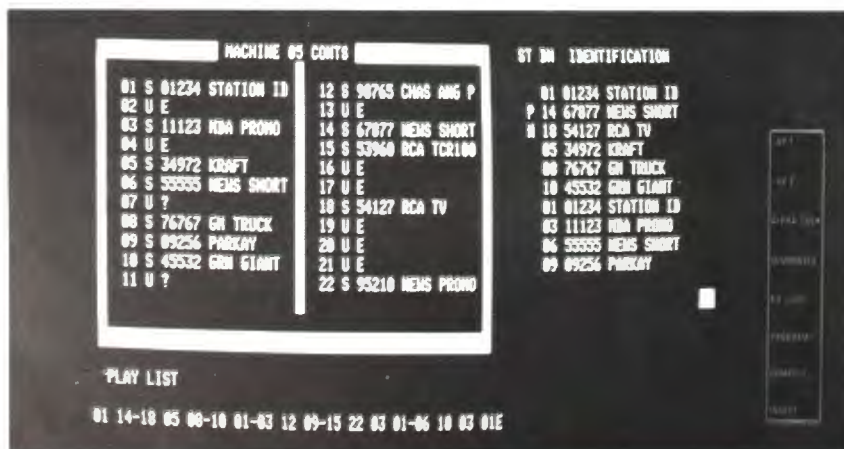
For last-minute program changes, a sequence change capability allows an event to be deleted, or up to seven new events inserted, simply and quickly, without complete reprogramming.

During programming periods when manual control is desired, a simple method of sequential operation is available with the TCR-100 automation accessory.

### Automation Devices Built-in

All automation input-output devices are built into the TCR-100 when the machine is equipped with the accessory. Data transmission modes and rates are internally selectable to match the user's existing external technical automation system.

The unique features and operational convenience of the basic TCR-100 are maintained. The addition of the new Automation Accessory makes the "cart" machine an even more cost effective system.



Sample display of TCR-100A status.





Visual Effects: The dual freeze feature enables the TFS-121 to display up to four compressed frozen pictures in any of the four raster quadrants (upper left). The freeze quadrant also can be placed in any of the four quadrants (upper right). A hall of mirrors effect is achieved by keying the output of the synchronizer back on itself (lower left and right).

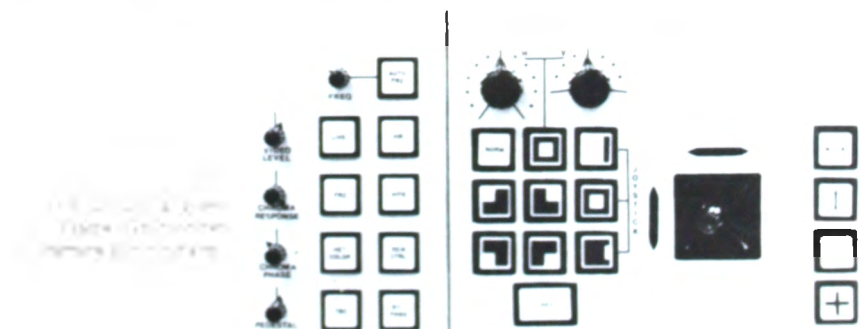
## NEW VISUAL EFFECTS CAPABILITIES FOR TFS-121

Picture freeze and picture compression accessories now offered with the TFS-121 Digital Frame Synchronizer enhance its versatility as a production aid.

The picture freeze accessory, which allows the picture output of the synchronizer to be retained "frozen" on the screen, includes an "auto-freeze" mode. By pushing a button and adjusting a knob, the operator can cause the picture to pulse automatically. The pulsing rate is adjustable from about one freeze per second to three per second.

The resulting effect, which produces "real-time slow-motion", can be adjusted to equal the beat of background music. With the TFS-121, the output video from the synchronizer does not have to return to live action to capture a new frozen picture.

The picture compressor option, which allows the operator to reduce a full-size picture to one-fourth its original size, now includes "Quad Freeze."



This feature enables the TFS-121 to display up to four compressed, frozen pictures in any of the four raster quadrants. Additionally, with up to three compressed, frozen pictures displayed, another compressed picture can be moving in the auto-freeze mode. The fourth quadrant also can be a composite of the other three quadrants.

With the picture compressor, the picture can be moved to any one of five fixed positions or placed in any position, using a joystick control. Picture

movement by joystick can be anywhere within the raster, or even completely off the screen in any direction and back onto the screen from the same or any other direction. A full-size picture also may be positioned, removed and replaced using the joystick.

A hall of mirror effect is achieved by keying the output of the synchronizer back on itself, forming multiple images at the output. These images may be either full size or diminishing size.



PTL's mobile production unit is a fully equipped, seasoned traveller. Main studio and Production Center for PTL are in the building behind the van.

## PTL Network — A Growing Television Ministry . . .



This lovely garden and gazebo typify the attractive, gracious surroundings at PTL's headquarters near Charlotte, N. C.

**H**ERITAGE VILLAGE is more an attitude than a place. The attitude is sharing and the place is the headquarters of PTL Television Network.

The twenty-five acre tract is set in the gentle green rolling hills of the Caroline Piedmont, south of Charlotte. There are six hundred PTL-ers—PEOPLE THAT LOVE—on the staff (with a thousand expected by August); all united by the common bond of Christian evangelism and a television ministry that reaches out to the world.

There is a PTL look and a PTL voice, too. The look is Virginia colonial and the voice that of ordained minister and PTL Club host Jim Bakker. His temperate voice and compassionate manner have a meaningful influence on the daily lives of 20 million viewers.

"We care," Rev. Bakker says. And because he does, others do.

## PTL Club Reaches Out

But the PTL success story, if threaded with "caring", is bound together by many small miracles starting in 1974 when the stripling PTL operation took over the long-vacant Thompson manor house and twenty-five acres of surrounding land. PTL'ers restored the mansion, designed after the Carter's Grove plantation home outside colonial Williamsburg; manicured the land and built a broadcast facility that houses one of the largest single indoor studios of its kind in the world. It's a studio with a steeple. And a steeple with six foot microwave relay dish that beams a daily two hour program to Charlotte's Channel 36 five mornings a week.

The two-hour show combines talk, entertainment, inspirational messages, and spiritual counselling from a busy battery of 60 constantly jangling aquamarine telephones.

Aired live from eleven o'clock to one o'clock, the PTL Club Show is covered like the dew covers Dixie with four RCA TK-46s. One camera is boom-mounted to cover the entertainment and spiritual counselling activities. The other three TK-46s operate in ballet-like sequences between the anchor chair with Jim Bakker and guests, and three very lively entertainment sets.

## 20 Million Viewers

Jim Bakker's PTL Club Program is star studded with special visiting guests like Pat Boone; Walt Disney star Dean Jones; Art Linkletter, Dale Evans, Car-

rie ten Boom; ministers Rex Humbard, and Oral Roberts; astronaut Jim Irwin; musician Johnny Mann, to name a few.

From 1973 with a three-station visibility, the PTL Club Program has skyrocketed to a major syndication effort. Two inch quad masters are sent to NET, Ann Arbor, Michigan, where they are distributed to 180 domestic broadcast stations, over 3,000 cable systems and eleven countries. Not to mention an assortment of hospitals, prisons and institutions. Attesting to its wide appeal and popularity, the PTL Show is viewed daily by an estimated 20 million people.

"Club Alabare", produced in Spanish with Elmer Bueno as host, uses the same format as Jim Bakker's PTL Club Show. It is syndicated to a major Spanish speaking population centers like Los Angeles, the largest in the U. S., and to 15 Central and South American countries.

Thousands of viewers write and call daily. Specially trained telephone counsellors on duty around-the-clock, are constantly advised of new developments in the ministry to insure that every caller receives the fullest benefit of his call, whatever the need. The most modern equipment available and PTL's top-notch mailing staff, move a literal mountain (nearly 20,000 pieces daily) of mail items quickly and efficiently every day. This means when a viewer reaches out to PTL, he can be sure PTL will respond.



"Club Alabare" with host Elmer Bueno is the Spanish-language version of the PTL Club, using the same format.



Telephone counsellors are available to handle calls coming in to PTL. Phones are manned around the clock.



Four TK-46 cameras are used to cover the PTL Club production. The L-shaped studio has about 9,000 square feet of floor space and includes a 208 seat theatre.

Jim Bakker (left), PTL host, conducts the popular two-hour daily PTL Club which combines talk, entertainment, inspirational messages and counselling. Co-host is Henry Harrison.

### Prove the Need First

Television Senior V.P. Roger Flessing is dedicated to the TV medium and a true believer in the message his facility carries. Originally from Sacramento, California, he studied at Bethany Bible College and University of California—Santa Cruz. Veep Flessing and his staff: Alex Valderama, V.P. Production; Dave Carver, V.P. Syndication; and Chief Engineer Jerry Forman are responsible for innovative technical approaches that bring the popular PTL Club Show to such a vast audience of regulars.

Roger Flessing believes in pushing production equipment to its limits and in some cases, "a little beyond". He illustrates this belief with anecdotes.

"An example would be about a week after I got here. We were shooting the construction of the studio. I wanted some aerial shots but I didn't want to spend money on a helicopter, but I wanted some in-tight stuff. So we took a TK-44 on its tripod, strapped it inside a basket attached to the boom of a construction rig and took off. The basket wasn't the right kind for television cameras. It swung wildly, and I'm in the basket with the TK-44. Everybody thinks, 'this guy's going to kill himself and he's going to break all of our equipment. We've got to get him a hand-held camera.' After I proved the need we got our first TKP-45.

"Another time we were on location in Florida, shooting a family of uncooperative ducks—dashing all around the place with our cameras and gear. Our crew and the ducks were running all over, and I almost dumped the camera and cables in the lake. And they said, 'This guy is going to kill himself and break our equipment. We've got to get him a TK-76 portable camera.' That's sort of been the practice—we prove the need first, then get the equipment.



Camera complement at PTL includes the TK-76 as well as TK-46, TKP-45 and TK-44 cameras.

### Editing—Without Time Code

We've used everything. Our editing was 'punch and crunch', and we went right up to the point where we did nineteen edits in twenty-one seconds. In this particular sequence, we had a canoe tipping over, and we just kept doing it over and over, the hard way—punching, jogging, doing the edits manually, just as tight as we possibly could. That performance proved that we needed time code editing, so we got our AE-600 system from RCA. We said it all along, but had to prove it first."

Flessing is partial to the four TK-46 studio cameras, and so is engineering chief Jerry Forman, who adds, "We've had no downtime at all on the TK-46. In fact, no downtime on any of our cameras."

### Fully Equipped Mobile Van

One of the major innovations at PTL is a forty-five foot van with a Peterbilt tractor which is equipped with three TK-44s, a TKP-45 and three TR-600A tape machines with AE-600 editing systems. When backed into a special bay and patched into the studio, camera and tape power are doubled. This has been done for special telethons, including simulcast to 12 stations. By using the van as a modular studio, PTL covers the action with 9 cameras, four from the truck and five from the studio.

The array of VTR's available provides unusual production flexibility for PTL. The studio has four TR-60's and four TR-70 tape machines, and these are supplemented by the mobile unit's complement of two TR-600's (with AE-600 time code editing systems) and three helical scan recorders.

With the camera and tape facility, several productions can be handled at the same time. For special productions, each camera can have a dedicated tape machine. Or program production and editing can be performed simultaneously without cramping either operation.

Inside PTL's 45-foot van is a complete studio. Two TR-600A tape machines with AE-600 editing systems; three TK-44's and a TK-76 are part of the flexible mobile unit.



Post-production tape editing suite. With expanded production requirements, four TR-600A VTR's with AE-600 editing systems have been added.



Video control position in the PTL mobile van.





Spacious PTL studio can handle major scale productions, aided by in-house set design and construction facilities.



Grammy winner Gary Paxton shares his views with Rev. Bakker.



Art Linkletter is among the distinguished PTL Club guest roster.



A popular PTL Club talent is Tammy Bakker.

**Studio Production: Never Dull**

Studio production presents a real challenge. The PTL Show alone involves ten hours of program content each week, plus a massive production support effort to put the show together. And there is other programming and production to test the mettle of the 20-person production crew.

Production consumes ten hours of prep time per day. Modular, contemporarily designed sets permit daily changeovers.

Little editing is done on the studio PTL Club Show. "We try to capture the

flow," says Alex Valderama, V.P. Production. "We want to capture the realism of life as it happens."

The show has a framework but PTL staffers are never quite sure that it will be followed. Host Jim Bakker is spontaneous. He might want to get into the audience for an interview. Or talk to one of the entertainers. Or, there might be a guest hog caller in the audience who is singled out for special coverage. Despite the extensive on air time, PTL productions are top quality. "We have to have top quality equipment to do the job." Mr. Valderama says, "We

have a lot of faith around here, too," he adds. "Our programs reflect the needs of people."

Field production is also on the increase. The Jesus '77 Concert played to a hundred thousand people on six acres of Eastern Pennsylvania's Pocono Mountains. The PTL-sponsored event was aired live and the production crew set up a week in advance. Recently fourteen programs were produced in one week, demanding six hours a day of production prep.

### Syndication—A Major Effort

Dave Carver heads PTL's syndication operation—a vast, mushrooming enterprise. He is responsible for program distribution to U. S. and foreign television stations, and to an extensive cable network. Duplication and distribution of the daily two-hour PTL Club Show is handled by the NET organization.

The syndication activity includes radio, also. Up to six hours are taped nightly and the PTL *Night-Watch* program anchored by Henry Harrison is syndicated now to ten AM and FM stations.

Domestically, PTL is represented in some capacity in almost every market. Globally, Canada, South America, Africa, Asia and the Middle East are now, or will shortly be, within reach of PTL's television ministry. The concept however is to let PTL Club develop freely, incorporating the cultural background of the country airing the show. And PTL's Charlotte headquarters will provide technology, craft, skill and talent to help others in other lands to help themselves.

### Message Beamed By Satellite

PTL looks on its RCA equipment as building blocks leading to bigger, better productions capable of reaching out to larger and larger audiences.

A new venture to expand the PTL television ministry started this Spring, when a round-the-clock lease on an RCA Americom satellite became operational. (See opposite page.)

### "A Versatile Engineering Staff, with Flexible Equipment"

Engineering Chief Jerry Forman is a stickler for quality. Maintaining equipment to produce a consistently high quality product under diverse and constantly changing conditions is a formidable task.

Studio equipment must be tweaked and ready to produce the PTL Club show on a sustaining 40-hour per month basis, plus occasional telethons, ID's and sponsor messages. For on-location assignments, the PTL van covers Christian concerts like "Jesus 77" and the "Greatest Churches In The Land", a series and Christian conventions. When Rev. Bakker was presented a special award at a gospel music festival in Nashville, the PTL van covered the entire service.

"These demands require a versatile engineering staff with flexible equipment,"

Chief Forman points out, "And we are blessed with both."

### Production Expanded . . . Again

PTL has expanded its production operation once again with a new RCA equipment package. Added capacity is needed to produce program material for 'round-the-clock satellite transmission. Equipment for the video tape activity includes four new TR-600A tape machines, with AE-600 editing systems. Also included is a TK-28 film system, a Grass Valley video switcher and ancillary equipment.

Film-to-tape transfers are routine, and require the quality that the TK-28 can deliver. Film from visiting missionaries is transferred to quad tape for airing during the interview segment of the PTL Club Show.

### Global Outreach

Things always look up at PTL, even beyond the RCA Americom satellite station. And straight up seems to be where PTL is growing. In the near

future, children's programs and soap operas will be added to the programming schedule. Facility-wise, a new studio "B" will be added in Charlotte and serviced by a modular van/studio setup. Totally new studio facilities are now planned for WJAN, the Network's newly acquired television station in Canton, Ohio. Abroad, a new studio complex is planned in Korea with the possibility that a Manila facility will follow. In South America, Brazil and Argentina are potential studio sites.

Presently, the PTL Club show is carried somewhere in the world during each hour of each broadcast day. And with 24 hour a day programming beamed out by RCA Americom satellite, the PTL outreach becomes truly global.

PTL is a very different kind of teleproduction facility. It bustles with construction activity and youthful exuberances. But there's more there than meets the eye—dedication and a sense of mission. □



Video Control position.



Fisheye view of Master Control in the PTL studio.



Jim Bakker presides at dedication ceremonies for PTL's satellite television service.

## PTL TELEVISION NETWORK STARTS 24-HOUR SATELLITE DISTRIBUTION VIA RCA AMERICOM TRANSPONDER

Nationwide distribution of PTL Television Network programming began on April 3, 1978 with the dedication of a full-time satellite transponder provided by RCA American Communications, Inc.

Dedication ceremonies for the satellite television service and PTL's own earth station were held outside the network's studio in Charlotte.

"The RCA Americom satellite connects us directly and economically with millions of cable TV viewers," said Jim Bakker. "This broader access to the viewing public has encouraged us to expand our Christian theme programming schedule to 24 hours a day starting right now."

Andrew F. Inglis, President of RCA Americom, said "It's gratifying to know that our satellite technology is helping PTL's ministry to reach out to more people."

The inaugural satellite special was highlighted by live transmission from South Korea; Brazil; England,

and Guatemala. In addition to its 24-hour transponder, the network leased television time on two more satellite transponders to carry these inaugural overseas greetings from the San Francisco and New York international gateways to Charlotte.

The \$5.7 million agreement between PTL and RCA Americom covers 24-hour satellite television services for six years.

The network's transmit and receive earth station has a 10-meter diameter parabolic antenna.

Programming produced at PTL's studios in Charlotte will be transmitted to RCA Americom's satellite. The high capacity, three axis stabilized spacecraft will amplify and distribute the television signal to all authorized receiving earth stations.

Cable television systems that own earth stations, or those that are fed by satellite stations, can receive PTL programming free of charge in addition to all other programming they carry.

# KCST-TV

## Backs its New News Punch With Five Megawatts of Power



KCST-TV steps up its news operation with flexible new ENG units; a radio dispatch system and an unusual news set. A sparkling new transmitting plant delivers a clear, powerful signal at the maximum authorized ERP of five megawatts.



RCA two-way radio systems are used in the TV-39 mobile units for news and for technical operations.



Two-way radio at Newscenter 39 anchor desk can be used for direct on-air communication with reporters on location.

**T**HE past two years have seen a host of changes at KCST-TV, San Diego. TV-39 has been and is on the move. The station changed ownership, and is now a part of the Storer Broadcasting group. It increased its power to the maximum authorized five megawatts, with a new antenna, tower and transmitter. It changed network affiliation from ABC to NBC. And it stepped up the news gathering and airing operation with a new radio dispatch system, two new ENG mobile units and a unique news set that puts the news room right in the center.

### "Newscenter 39"

Appropriately, the KCST-TV local news is identified as "NEWSCENTER 39". This concept, developed by Bill Peterson, News Director, puts the entire news operation on camera, adding more realism, immediacy, and identity to the news function. "NEWSCENTER 39" has been on-air since June 1977, and has been a successful format.

Six news units are now in operation—two ENG vans with TK-76 cameras, and four film units. The ENG vans have been in operation for sixteen months, and have worked out so well that TV-39 is planning for a 100 percent ENG operation.



The addition of the two ENG vans and a radio dispatch system has made the production of local news faster and easier—as well as providing a new degree of flexibility for getting the news on-air.

Designing the ENG/radio system at TV-39 was a joint effort, with News Director Peterson setting the general and functional requirements for the system, and Chief Engineer Bill Yordy and his staff handling the technical details of specifying, installing and maintaining the system.

The two ENG vans are equipped with TK-76 cameras; BVU-100 videocassette tape machines; RCA mobile radios, and Nurad microwave systems. These units are used for both scheduled and breaking news, with a separate three-man crew assigned to each van (reporter; cameraman, and driver/grip). One of the vans is also equipped with a Van Ladder which permits raising the microwave dish and maneuvering it for best line-of-sight transmission.

### Total Communications

The RCA radio system provides total communications between field and studio for coordinated news gathering operations. Each of the news crew vehicles and the News Director's car is equipped with an RCA two-way mobile radio for direct contact with the news center. The mobile radios are used for dispatching the crews, for providing instructions to reporters on how to handle a particular story, and for

receiving status reports on field assignments.

In addition, the radios are often used to provide additional details on a story while the crew is on the way back to the studio. These timely reports can then be integrated into a two-minute "tease" that TV-39 uses immediately preceding the evening news segment.

For communications on-site, each news crew is equipped with RCA TACTEC hand-held radios. These portable units, which operate on a different frequency than the mobile radios, are used for technical operations, including orienting the microwave dish and for cueing reporters and camera operators.

Two repeater systems in the two-channel radio network extend the effective range of the communications system to thirty miles, depending on the terrain.

### Flexibility for Handling News

Tom Mitchell, Assistant News Director, is the prime user of the ENG system, with his office in the news room serving as the radio dispatch point, and also as an editing suite for incoming stories.

The two ENG vans, Mitchell says, gives the news operation excellent flexibility. The vans permit putting on a live picture, or, if the action is in an area where direct transmission is not feasible, the story can be taped on-site, and the van moved to a location where it can be transmitted to the studio for re-taping or on-air use. Or, if time permits, the crew returns to the studio with the tape for editing.

At TV-39 the reporting team usually does its own editing, except for breaking news. The 2-way radio system is also available as a back-up for the audio with the ENG units for direct, on-air transmission.

As an indication of the versatility and immediacy added by the TK-76's, Mr. Mitchell says that on occasion he has aired two separate live TK-76 remote pickups within 10 seconds.

Another application of the two ENG vans, he adds, is in tying them together for doing two-camera productions with direct on-air switching.

### "Best Mini-Cam In Town"

Bill Peterson is obviously proud of the TV-39 ENG operation. He says, "We feel we have the best mini-cam operation in town, and our guys work hard to keep it that way. We can be on-air within three minutes of arriving on a scene—and that includes setting up, orienting the microwave and transmitting picture. Our radio network gives us complete control over our crews in the field, and often gives us the jump on the other stations in handling newsbreaks".

### Reliable Performance From TK-76's

The two TK-76 cameras have been in use for nearly a year and a half, and have had little downtime, according to Mr. Mitchell. During that period, he estimates a total downtime of only three days. He attributes this to the ruggedness of the cameras themselves and also to the scheduled maintenance program

One ENG van is equipped with a Van Ladder to raise the microwave dish for best line-of-sight transmission.



The interior of an ENG van accommodates a microphone and all related audio equipment. The TK-76 camera is mounted in a padded nest ready for quick use.



Radio dispatch system in Assistant News Director's office provides continuous contact with six field units.



In addition to the VEETAC mobile units in the vehicles, TV-39 uses RCA TACTEC hand-held portable radios for use outside of the mobile units. When not in use, these are stored in the charging unit shown.



Two large screen units on the TV-39 news set are used to chroma-key news segments, while the "anchor" can be on live with the reporter via two-way radio.

whereby Engineering checks out each camera every two weeks.

The TK-76 suits Bill Yordy just fine. "Our techs like it," he says, "because it just plays and makes great pictures. And, with our technical staff of eight, reliability is critical."

The reliability of the TK-76 camera; its performance in producing consistently excellent pictures, and the flexibility afforded by the radio system are key factors in TV-39's planned expansion of the ENG operation.

#### News Room Is News Set

The "NEWSCENTER 39" evening news segment starts at 5:58 P.M., with a two-minute lead-in highlighting major local stories, and usually concludes by identifying the major news item from NBC Evening News which follows immediately. Local news occupies the 6:30-7 P.M. slot, with late news at 11 P.M.

As previously noted, the KCST news set is the newsroom itself. At the front of the room is the customary desk for the anchor team. Off to one side is a small working office for the meteorologist and the weather set. Flanking the news desk are two screens which look like rear screen projection systems. These are used to chroma key in news segments as they are integrated into the program. The pictures are compressed by a frame store unit and displayed on the screen, with the news anchor leading in to the segment by talking with the reporter handling the chroma-keyed segment. Then the news segment goes full screen. This treatment enhances the visual effect of the news and serves as an effective production aid in assembling the news program.

"When a viewer looks in on the actual news room, sees a report come in and be aired immediately, it can be very dramatic and effective," Mr. Peterson reports.

#### New Antenna, Tower, Transmitter

While news operations provide the glamorous, it's the lonely transmission system on the hilltop that makes the difference in picture clarity on the viewer's home television screen. KCST-TV management was well aware of this important fact. Along with its ENG upgrading, TV-39 added a magnificent new transmission system, including a new tower topped by a TFU-25 Custom Pylon Antenna, and a new 110 kW parallel transmitter. The antenna/transmitter site atop 2600 ft. Mt. San

Miguel is 13 air miles and a long 25 driving miles from the studio which is located in an industrial park in the Kearny Mesa section of San Diego.

The antenna, a TFU-25 Custom Pylon with a skull pattern combines with the 110 kW transmitter to deliver the maximum authorized five megawatts ERP. It has extended the station's coverage area and "puts the signal where we want it," Bill Yordy says. "It provides null fill for the close-in areas, and broad beam width for the city."

#### Compartmented Transmitter Layout

The transmitter facility is spacious, sparkling clean and well laid out. It was designed and equipped to accommodate virtually any contingency to keep TV-39 on-air. The transmitter building is compartmentalized into four separate areas:

- The front-line cabinets of the two TTU-55, 55 kW transmitters and the related test, monitoring and combining racks.
- The rear transmitter cabinets, plus the ceiling-mounted system components filterplexers, switches, combiner and output.
- Heat exchanger area.
- Emergency generator room, equipped with 1000 kVa diesel generator.

#### Parallel Transmitter System

The transmitting plant is unusual for



Control and monitoring racks. Center unit is parallel control cabinet for total system aural and visual output, and for automatic exciter switching. Other racks mount audio and video input monitoring and remote control equipment. System layout was designed by Transmitter Supervisor Bill Stevens.

a UHF system in that it uses two TTU-55, 55 kW transmitters combined as a parallel system. The system mirrors Transmitter Supervisor Bill Stevens' emphasis on redundancy for maintaining on-air operation.

Two filterplexers are used in the system, and the combining is done after sideband shaping and audio processing. There is provision for automatic switching from any operating mode. The normal mode is for both transmitters to operate into the combiner; however, if either side is disabled or shut down for maintenance, one side provides power while the other operates into the dummy load. Motorized coaxial switching is employed, with 6-inch line up to the combiner and 8-inch line to the antenna.

The two 55 kW transmitters are positioned side-by-side, separated by monitoring and test racks. A special RF monitoring panel with three Bird coaxial switches permits making a quick check of all RF points when sweeping the transmitter. The output of the coax switches is fed to the demodulator or to the sideband analyzer.

The transmitters are equipped with solid state TTUE-4 exciters and high efficiency klystrons. For further economy in power usage, the station has two RCA Mode Anode Pulsers on order. These systems reduce power consumption through a direct increase

in the operating efficiency of the visual klystron amplifier. With anticipated power savings, Mr. Yordy is projecting a two and a half year payout for the Pulsers.

#### Redundant Systems for Extra Protection

Two separate air conditioning systems are used for the front line cabinets and the rear area. In addition, positive pressure is maintained, and the air is periodically cleaned.

In the rear area, should the air conditioning fail, a large sliding door can be opened to let outside air in for cooling. The heat exchanger area obviously is not air conditioned, but it is equipped with a two-stage ventilating system to keep air circulating.

For protection against outages, two separate power lines are used. And, in the event that power is cut off or drops below 90 percent of normal, the diesel emergency generator automatically cuts on, delivering 1000 kVa of power within six seconds. The 1100 horsepower unit operates at 1800 RPM.

#### Coming on Strong

With its versatile ENG operation and powerful five megawatt transmitting system, KCST-TV is coming on strong—changing . . . growing . . . moving . . . keeping pace with the vibrant San Diego market. □

The entire TV-39 transmitting plant is maintained in impeccable condition, as this view of the rear cabinet area shows.



A portion of the ceiling mounted equipment, including waveguide transmitter combining system and one of the two filterplexers used in the system.

Chief Engineer Bill Yordy checks operation of KCST's twin 55 kW transmitters

# SUNDANCE PRODUCTIONS EARNS ITS SPURS IN DALLAS

**S**UNDANCE PRODUCTIONS, a spritely, spirited teleproduction operation in Dallas has swiftly become a major Southwest audio and video production center.

Like a latter-day Will Rogers, Sundance sauntered onto the teleproduction scene, talking slow, working hard, and doing creative audio and video tricks that made clients happy. Sundance's President, Rush Beesley is a gangly, easy-going, hard-driving Oklahoman. A casual, friendly person, he seems totally relaxed in a tension-charged business—yet responds quickly and decisively.

When Rush Beesley opened his shop

in 1971, operating from his garage, he brought with him a headful of bright ideas and a well-rounded background of audio and video production expertise. Job skills honed at a major Dallas advertising agency included writing, producing and directing a host of film and tape commercials. His musical talent led him into the independent production arena, starting with an audio production facility.

#### Video Expansion In 1975

In 1975, the video operation was launched with the purchase of an RCA TKP-45 camera; a TR-600 quad VTR and a truck for a mobile unit. Post-production facilities followed, includ-

ing two-inch helical machines for mastering, with Datatron computerized editing and a ¾-inch videocassette editing suite.

Later, for film-to-tape transfer work, a TK-28 color film island was installed, equipped with a 16mm film projector and an FR-35, 35mm film projector. The system also includes a PM-86SL Magnetic Sound Reproducer for separate sound capability.

#### TV Production—Film Style

Rush Beesley's background as Director of Radio and Television Production for Tracey Locke Advertising helped shape the philosophy for his fledgling teleproduction company. It convinced him that "quality counts"—a truism that is reflected in the Sundance approach to production assignments. The agency experience also convinced Rush that the film approach in video was best for him—providing portability, mobility and "A" roll capability. At Sundance, the emphasis is on location work, utilizing the TKP-45, shooting film style.

The swing to tape in commercials is accelerating rapidly according to Beesley, hastened by TV cameras such as the TKP-45 which operate at low light levels and shoot film style. More than 90 percent of television commercials are now produced on tape, he says.

The TKP-45 met Sundance requirements because it was designed for high quality field production use, and adapts to a wide range of lenses—long, close-up, wide angle.

With the fixed lens adaptor, the scan of the camera must be inverted—which made for an unusual early experience with Sundance's first TKP-45. When the camera was delivered, it was needed immediately for an assignment—before the scan change could be made. The result was an interesting "shoot", with the camera operated in an upside down position so that the image would be right. (Photo at right.)

High flyer! Sundance Productions demonstrates the newest hydro-manipulated, hyper-extended TKP-45 camera system mount—a fearless cameraman.



## DALLAS

### Three TKP-45's

Three TKP-45 cameras are now used by Sundance, and Beesley says "They're great—just won't quit". While single camera shoots are most common, Sundance also has done multi-camera productions, with dedicated VTR's for each camera; with a single recorder for director-selected "takes", and with an Iso-Switch arrangement.

The TKP-45 cameras are re-painted an off-white, with the distinctive Sundance logos on the side. Each is a System II type, with the Minipack camera control unit. The CCU and

ancillary monitoring and control equipment is mounted in a short, rolling rack, ready for instant use in the studio or on location. Three Italian motorcycle type batteries are used in the mobile units for powering the equipment on location shoots. A Jones plug is used to split off 12, 24 and 36 volts for the individual requirements of the various pieces of equipment.

Most frequently, especially on location, the TKP-45 is operated on the shoulder. It has been an excellent airborne performer, the veteran of many helicopter shoots.



Warm front. When you walk in, you know you're at Sundance. The cozy western atmosphere puts visitors at ease.

What it is . . . is pragmatism. When you have to get a fixed long lens shot of a flaming sunset, and you haven't got time to invert the scan and re-register the camera—the answer is simple: invert the camera. The TKP-45 is "hanging tight" under the tripod, and the picture was great.

View from the top. Sometimes the top of Sundance's production truck provides an ideal perch for the TKP-45 and its tripod mount.



### Two Mobile Trucks

The company operates two mobile production units which they designed and constructed. The mobile units are equipped with TKP-45 cameras; BCN-20 portable 1-inch VTR's and audio and video support facilities. SMPTE time code can be provided in the field, or can be added later when off-line cassette copies are being made for in-house editing. The trucks are completely self-powered, and setups and strikes are extremely quick and easy. "We've done as many as 30 set-ups in one day of mobile production," Mr. Beesley notes. "And," he adds, "today's video equipment affords a tremendous degree of versatility which translates into speed, efficiency and economy".

### Compact, Well-Utilized Facility

The Sundance production facility comprises 11,000 square feet of space which is well utilized. Overall, the layout is compact, tight and efficient. The decor is Old West, but the equipment is up-to-date audio and video.

The main on-line editing area includes the usual bank of color and video monitors; a Datatron computer editing system; audio and video switchers;

character generator; two monochrome titling cameras and joystick remote control for the TK-28 film camera. The custom designed video switcher is interfaced with and completely controlled by the computer editing system.

In the adjoining tape room are the TR-600; a "Merlin" converted quad VTR and two 2-inch helical scan VTR's which are used for mastering. Quad dubs are made for distribution.

The off-line editing suite uses two 2850A cassette VTR's; an EA-3 video editor, and a quarter-track stereo reel-to-reel audio system.

The film equipment is housed in a separate, typically crowded space. The TK-28B film camera automatically corrects color balance and video levels from scene-to-scene, and is equipped with Saticon tubes for their low lag capabilities. The FR-35B 35mm Projector and Athena 4000 16mm Projector are servo-locked with an RCA PM-86SL mag interlock system. In many cases now, Beesley says, material shot on film is transferred to tape for editing and mastering. Even negative film can be handled by the system and transferred.

### Versatile Production Studio

Although the Sundance camera studio is comparatively small, it is ideally suited to the sweep table and closeups for food and small product displays. These are mostly used for inserts into the material shot on location. The 30' x 33' stage has a 22' ceiling with an adjustable lighting grid. Wrapped around three walls of the stage is a 60 percent gray cyc which extends nearly to the roof, providing for an almost infinite variety of angles. A black felt curtain is used for "limbo" effects.

The room is acoustically treated, permitting its use for recording instrumentals for film or video post-scoring.

The sweep table, designed by Sundance, is totally adjustable, and allows for long trucks or dolly moves as well as providing for infinite colors, textures and light tent applications.

### Extensive, Integrated Audio Complement

Even as the video tape operation grew, the audio facility at Sundance kept pace. Its expanded equipment complement includes a 24-track recording system; a 16-track system and a full



Telling stories. A classic pose for a Texas-style interview—all part of Sundance-produced feature on Luckenback, Texas.



Decisions, decisions. Senior Production Director Alton Cagle commands the Master Editing Console.

complement of audio control boards and related recording equipment.

Proudly displayed in the lobby area are several "gold" awards for singles and albums recorded at Sundance. The 24-track audio recording system is interfaced with the video tape time code editing system, an arrangement which Rush Beesley feels is ideal for "sweetening" audio. This system, too, is a part of the Sundance philosophy of total integration of audio and video capability.

#### **Creative, Innovative Staff**

The Sundance staff is a mixture of young talents, mostly free spirits with advertising, television and radio backgrounds.

The technical personal are adept at maintaining equipment at optimum performance levels—but are also extremely creative and innovative in adapting electronic equipment to accommodate the range of unusual requirements that are typical to teleproduction.

Innovation is characteristic of the operation, and Sundance often welcomes the opportunity to be the first

to try a new product. It was first to use the small, lightweight Angenieux 15:1 lens. And it is now testing Visticon pickup tubes in one of the TKP-45 cameras for RCA's Electro-Optical Division.

Surprisingly—or perhaps not so—many of Sundance's clients are not regional or Dallas-based organizations. The list includes such prestigious names as Phillips Petroleum; IBM; Haggar, and Tandy Company (Radio Shack and Color Tile).

**Fun And Hard Work—A Happy Mix**  
Sundance Productions is a serious, successful business, but it operates like the hustle, bustle and impossible deadlines are fun. And that, Rush Beesley says, is the key to success—work hard to get the job done, but make it a happy challenge and not a grind.

That philosophy is paying off for both Sundance and its clients. □



Looking up . . . looking down. Insert stage at Sundance has a 22 foot ceiling with a movable grid for lighting. TKP-45 cameras are used for both studio and location production.



Lights . . . camera . . . charge! Dallas Cowboy Harvey Martin with Sundance Lighting Director Ian Wagner and TKP-45 camera, ready for a location shoot.

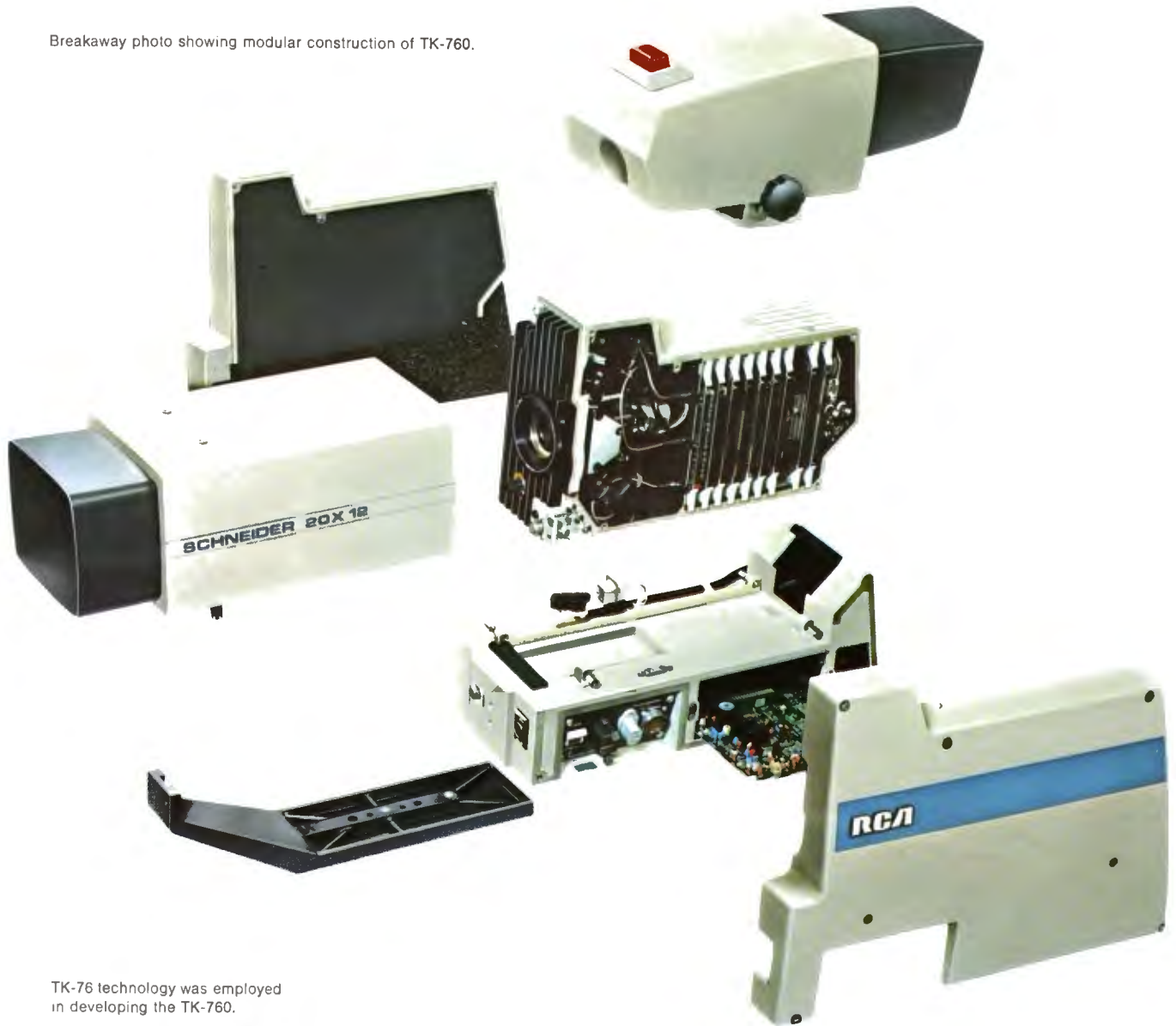
# TK-760 Camera A Design Evolution

L. J. Bazin  
Camera Design Group



Lucas J. Bazin, RCA Broadcast Systems design engineer checks out TK-760 "three-in-one" camera.

Breakaway photo showing modular construction of TK-760.



TK-76 technology was employed in developing the TK-760.



**A**DVANCES in the performance of portable color cameras have produced a revolution in the design concepts of cameras intended for studio and field productions. It is now accepted that the performance of some small color cameras in areas such as stability, resolution and sensitivity has achieved

broadcast production quality. RCA's TK-76 Portable is an excellent example. It is, therefore, natural to apply some of the portable camera concepts to the design of small, lightweight and easy to operate studio and field production cameras.



A prime example is the TK-760 "three-in-one" combination Field/Studio/ENG camera which evolved from the TK-76 camera design.

There are complications and problems in adapting a hand-held camera to one intended for use in studio and field productions.

Some of the design concepts involved in developing the TK-760 camera are covered in this article. These include:

- System Interface
- Remote Control System
- Automatic Cable Timing
- Automatic Cable Equalization
- Chroma Key Facilities

### TK-76 Led The Way

The camera field has changed radically in the past few years, pushed forward by new technology, new design concepts, and new circuitry as well as advanced automatic assembly and test techniques.

In 1975, RCA introduced the "News-maker", a single package, hand-held camera. It utilized three 2/3 inch pickup tubes and was intended primarily for use as a TV news camera. By eliminating the back-pack, it gave the cameraman greater mobility, and far less weight to carry. This camera became the highly successful TK-76. To date, more than 1,000 of these portable cameras have been delivered.

As originally intended, the specifications on hand-held camera performance were not as stringent as those for a full size production camera, especially since the video tape recorders used for ENG applications were (in most cases) not capable of high performance. It soon became obvious that the resolution and sensitivity of the 2/3 inch pickup tube were better than expected, and so was the performance of the camera. With these results, it was not surprising that the news gathering camera would also be used in production applications. Its weight, physical size and simplicity gave mobility to the cameraman that was not obtainable with full size production cameras.

### Reliability; Stability; Mobility, Fast Set-Up

The single package concept allows the production crew to minimize setup time while achieving reliability and mobility that was not obtainable with other camera systems. Many factors contribute to the reliability and stability of these cameras. System simplicity,

in most cases, increases the mean time between failures because of the smaller number of components and system interconnections. Circuit designs utilizing new technological developments such as large scale integrated circuits have improved camera performance.

For example, the TK-76 uses an integrated circuit sync generator that produces synchronizing signals for any of the world-wide TV Broadcast standards simply by connecting the appropriate pins together.

Better components and large amounts of feedback have also contributed to the high stability and reliability achieved in these cameras. Finally, the TK-76 camera was designed to take rough handling and adverse weather conditions which further improved its performance especially in outdoor situations.

### Needed: A Production/ENG Camera

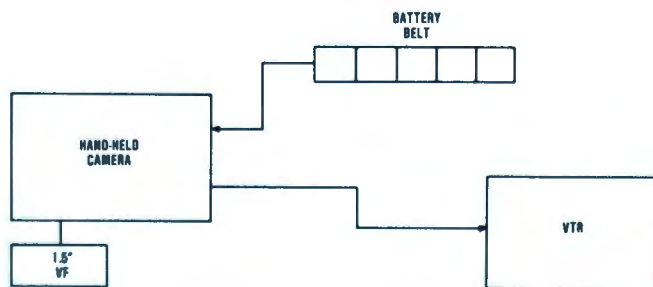
All of these factors have contributed to making the TK-76 useful for production applications as well as for ENG. And, the increased use of the camera for production stimulated demand for a camera which retains the excellent performance and reliability features of the TK-76, while adding the

controls and system interconnections needed for production work and multi-camera installations.

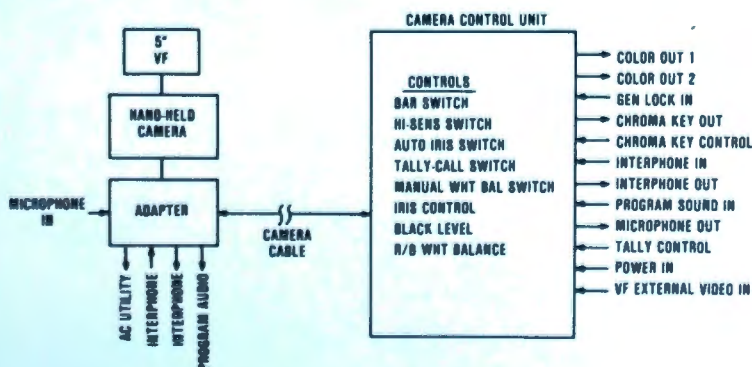
System interface is the significant factor in adapting the hand-held camera for production use.

As shown in the block diagram of the TK-76 ENG system, a minimum of controls are needed, and the camera usually connects directly to a portable VTR.

Performance requirements for production call for a much higher level of operational sophistication, as detailed in the TK-760 Production Camera System diagram. For example, in production situations, "genlock" is frequently used and the camera must operate with varying cable lengths preferably without timing and equalization adjustments. Intercom and audio facilities are required and remote control circuits are necessary. Chroma key facilities must also be provided at the camera if RGB keying is desired. ENG-type cameras typically send a composite color signal down the cable and RGB signals are not available at the system interface.



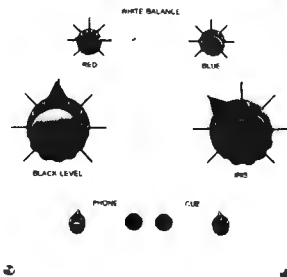
TK-76 ELECTRONIC JOURNALISM SYSTEM



TK-760 PRODUCTION CAMERA SYSTEM



Compact CCU for TK-760 provides automatic timing and automatic cable equalization as well as technical camera controls.



**Enter The TK-760**

In developing the TK-760 camera, consideration was given to retaining the camera portion of the system in its original hand-held form, so it can still be used in a portable mode for added flexibility.

One way of adding the production facilities to the hand-held camera is to mount the camera on an adapter base that contains the interface circuits. As shown in the exploded view (page 38), the TK-76 portion of the TK-760 camera is mounted on a base that contains the power supply and audio and intercom facilities. Viewfinder switching, monitoring circuits and an RGB chroma keyer are also included in this base. A five-inch viewfinder has been mounted on the camera in place of the 1.5 inch viewfinder. A small diameter camera cable connects the base to a remote camera control unit that contains the camera controls, automatic timing and automatic coaxial cable equalizer circuits.

Basic controls on the CCU are: Color Bars, Hi-Sensitivity, Auto Iris, Tally Call and Manual White Balance Switches. Iris, Black Level, Red and Blue White Balance controls are also provided. The camera control unit also serves as a junction box to the various system interconnections.

Another example of the versatility of the TK-76/TK-760 design is the capability of operating the camera in its hand-held form, with a small viewfinder and a special belt-worn adaptor unit which provides power, audio and intercom facilities. This unit replaces the cameraman's battery belt and interfaces with the camera cable.



Belt-worn adaptor unit provides power, audio and intercom facilities for TK-760 camera when used in field applications, connecting to the remote CCU.

The same system CCU is used, providing automatic timing and automatic equalization for up to 1,000 feet of lightweight cable.

### Automatic Timing System

The camera produces a composite color signal that is either synchronized to its internal crystal or "genlocked" to a reference signal fed to the camera through the cable. Since the camera cable length is variable, this reference signal could produce timing problems at the switcher. A solution to this problem is obtained by feeding a combined sync and burst signal to the camera that automatically adjusts its timing as cable length is varied.

As shown in the Automatic Timing System Diagram, an advanced "black burst" signal is generated at the camera control unit. The camera can still operate as a self-contained unit since its crystal and genlock circuits have not been disturbed.

Two phase locked loops are used to obtain independent horizontal and sub-carrier phasing. For horizontal timing, horizontal sync from the camera is compared with the horizontal sync of the system genlock signal. The error signal from this comparison is then fed to a voltage controlled oscillator that generates a clock frequency for the LSI sync generator. Vertical lock is obtained by deriving a vertical pulse from the system genlock signal and resetting the sync generator during the vertical interval. A similar technique is used to obtain subcarrier phase and frequency lock.

Subcarrier signals in the burst intervals of the camera and system genlock signals are compared and the error is used to control an oscillator. The oscillator in this circuit, however, is a voltage controlled crystal type which prevents "lock-out" conditions. A burst signal is formed by gating the crystal oscillator output with a burst flag signal derived from the sync generator. This is added to the sync output of the generator to form the "black burst" signal which is used for "genlocking" the camera. This system will hold subcarrier phase to  $\pm 5$  degrees over a temperature range of  $-20^{\circ}\text{C}$  to  $+55^{\circ}\text{C}$  and a cable variation of 1000 feet. Horizontal timing is held to  $\pm 20$  nanoseconds over the same ranges.

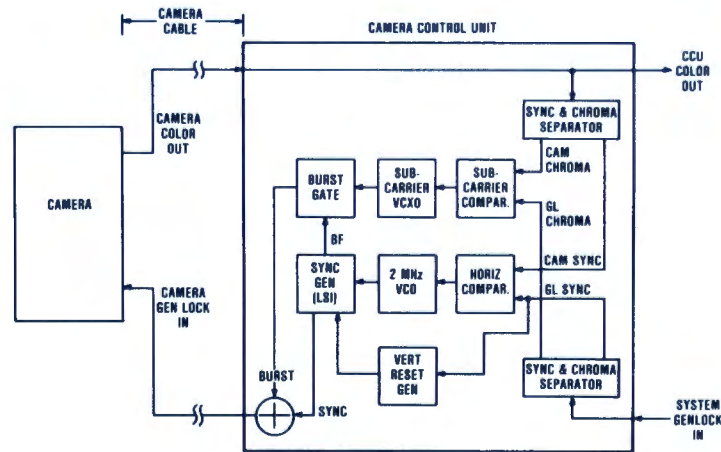
### Automatic Cable Equalization

Another problem that occurs with

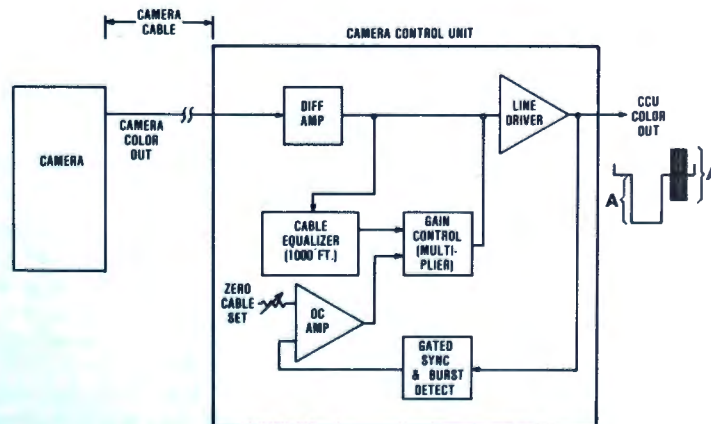
varying cable lengths is variable cable attenuation. As in the timing system, it is desirable to compensate for this error automatically to simplify setup and avoid the possibility of using incorrect cable equalization.

The solution is depicted in the Automatic Cable Equalizer diagram. Two paths are shown for the video signal after the differential input amplifier. One path is essentially straight through to the system outputs via a line driver amplifier. The second path feeds an amplifier that has a frequency response that complements the longest cable length attenuation characteristic. The

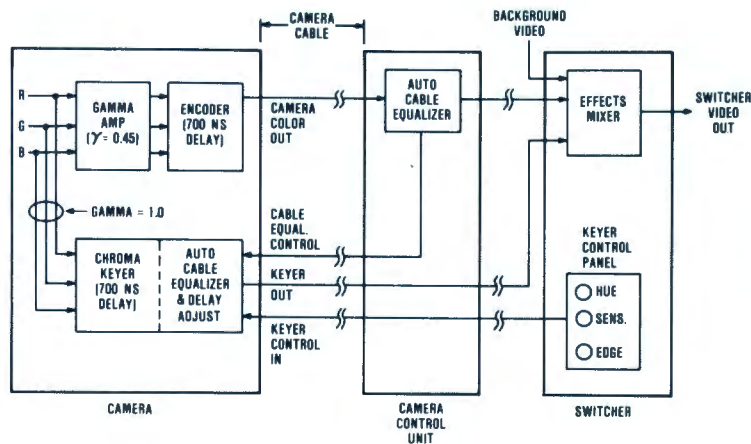
output of this amplifier is also fed to the line driver amplifier through a gain controlling multiplier. Gain control is obtained by applying a control voltage to the "Y" input of the multiplier. The control voltage is derived from a gated detector which samples the burst to sync ratio at the CCU color output. Since the peak-to-peak burst amplitude must equal the sync amplitude as it was established at the camera head, any deviation in this ratio can be attributed to cable attenuation. When an error is detected, the multiplier gain is modified so that a compensating equalization signal is added to the main signal at the output amplifier.



AUTOMATIC CABLE TIMING SYSTEM



AUTOMATIC CABLE EQUALIZER



CHROMA KEY SYSTEM



### Chroma Key Facility

Another system demand occurs when chroma key special effects are required. Since RGB signal outputs are not available at the CCU, it was recognized that Chroma Keying could be accomplished by the use of an in-line chroma keyer which decodes the composite color output signal into its RGB components. However, there are limitations in this keying method which make it unattractive. One disadvantage is that the RGB signals have been gamma corrected and the noise at black level is 4-5 times that of the linear RGB signals at the camera. Color separation and noise free keying is more difficult and inverse gamma correction has to be applied to improve the performance.

Another problem with the "in-line keyer" is caused by the delay of the decoding and color separation circuits which requires that a substantial delay be added to the main signal for correct timing at the switcher. Finally, the filters used in the decoder circuits produce bandwidth limited keying signals.

The TK-760 employs an alternative concept for chroma keying that avoids these limitations. This is achieved by locating the keyer in the camera head. Referring to the diagram of the Chroma Key System, a single coaxial lead in the camera cable is used to feed the

keying signal to the switcher. Linear RGB signals are obtained directly from the camera color channels which simplifies the separation circuits and reduces the noise at black level. Since the camera encoder inserts a delay of about 700 nanoseconds (300 nanoseconds in PAL), in the color output signal, the color output signal, the color separation circuits can utilize all of this delay without having to add delay to the main signal. Remote control of the keyer is obtained via control leads in the camera cable. Keyer delay is usually set so that the main signal and keyer signals are time coincident at the switcher.

### Design Objective Achieved

The system concepts described here for RCA's new TK-760 Studio/Field/ENG camera are essential to adapting small, hand-held cameras for production applications. There is more to the design problem than is at first apparent.

Evolving from the lightweight, hand-held TK-76, the TK-760 adds full production versatility while retaining the proven design features and a lightweight, compact configuration. The weight of this camera is 38.5 pounds (17.3 kg), less lens, and the power requirement of the entire camera system including the CCU is less than 130 watts.

Many lenses are currently available and long focal lengths of over 1000mm are being designed for the camera. These lenses are equivalent in viewing angle to lenses of twice the focal length on larger cameras because of the smaller image size. The TK-760 can also operate in a "stand-alone" configuration without a camera cable and camera control unit. A color signal can be taken directly from the camera head and fed into a small tape recorder as in the ENG system.

**The TK-760 camera has been an interesting design challenge. Happily, the resulting product justifies the effort expended in its development.** □

# TK-760 SUMMARY

## FEATURES . . . PERFORMANCE . . . BENEFITS

Feature	User Benefit
1. Pick Tubes: 2/3 in. Saticons.	Smaller camera size and weight with broadcast performance.
2. Prism Optics.	Greater sensitivity. Easy to clean; match colorimetry.
3. Bias Light.	Minimizes lag at low light levels.
4. Shock-mounted Optical System.	Unsurpassed registration stability.
5. Tilting Viewfinder.	Cameraman convenience for high or low angles.
6. Video Level Indicator in VF.	Permits one-man operation.
7. Max. cable length, 1,000 ft.; Cable diameter, 1/2 in.	Small lightweight cable. Easy to carry.
8. Built-in Image Enhancer with Comb Filter and Coring.	State-of-art Enhancer. No external connections required.
9. Built-in Encoder.	Stable, state-of-art design. No external connections or additional space required.
10. Built-in Sync Gen. with Genlock.	No external Sync. Gen. required. Simplifies system interconnections.
11. Built-in Chroma Keyer (Optional).	Simplified interconnection. No separate unit required. RGB Chroma Key even with inexpensive switchers.
12. Automatic White Balance.	Optimum performance at push of button.
13. Automatic Flare Correction.	Maintains flat black level.
14. Automatic Cable Timing.	Perfect timing without adjustment.
15. Automatic Cable Equalization.	Perfect equalization without adjustment.
16. Automatic Iris Control.	Operable without video operator.
17. Output Line Equalizer.	No external equalizer required.
18. Low power consumption: 130 W.	Multi-camera system operable from wall outlet.
19. Program Microphone Feed.	Simplifies field setup. No separate Mic line needed.
20. Sync Input Signal: Black Burst or Video.	Simplifies system interconnections; eliminates need for many DA's.
21. Camera Head Operable without CCU.	Greater flexibility and mobility.
22. PC Backplane instead of wiring Harnesses.	Simplifies maintenance; increases reliability.
23. Adaptable for Hand-held Use.	Permits maximum equipment utilization. Minimizes investment.
24. Fast Lens Change.	Saves time; permits use of specialized lenses.
25. Weather-resistant Construction.	Operates reliably under inclement weather conditions.
26. Fast Warm-up: 10 sec.	Saves time and money.
27. Typical Scene Illumination: 125 fc.	Fewer lighting fixtures; less power. Excellent pictures outdoors in poor light.
28. S/N: 51 dB.	Substantially better picture quality.
29. Simple to Operate.	Performance not limited by operator skill.
30. Centralized Set-up Controls.	Reduces set-up time; simplifies maintenance.



# TK-76

*IN ACTION*

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## FISHER SCIENTIFIC: THE COMPANY ON CAMERA

Fisher Scientific Company christened its new TK-76 camera with an amazing endurance test, combining studio and location shoots for the company's biannual sales meeting.

Involving production at nearly 100 locations, the sales meeting shows were historically done on film. However, the TK's flexibility, ease of handling and speed allowed Fisher to take advantage of the economies of video.



A major portion of the show was comprised of a series of parodies on famous TV commercials. Here videotographer John Goodin rides atop a station wagon to capture the Clydesdales for Fisher's version of Budweiser's "Here Comes the King".



A two-day shoot involving five dancers, choreographer, and a crew of seven produced a 3-minute musical extravaganza to open the meeting on an upbeat note.

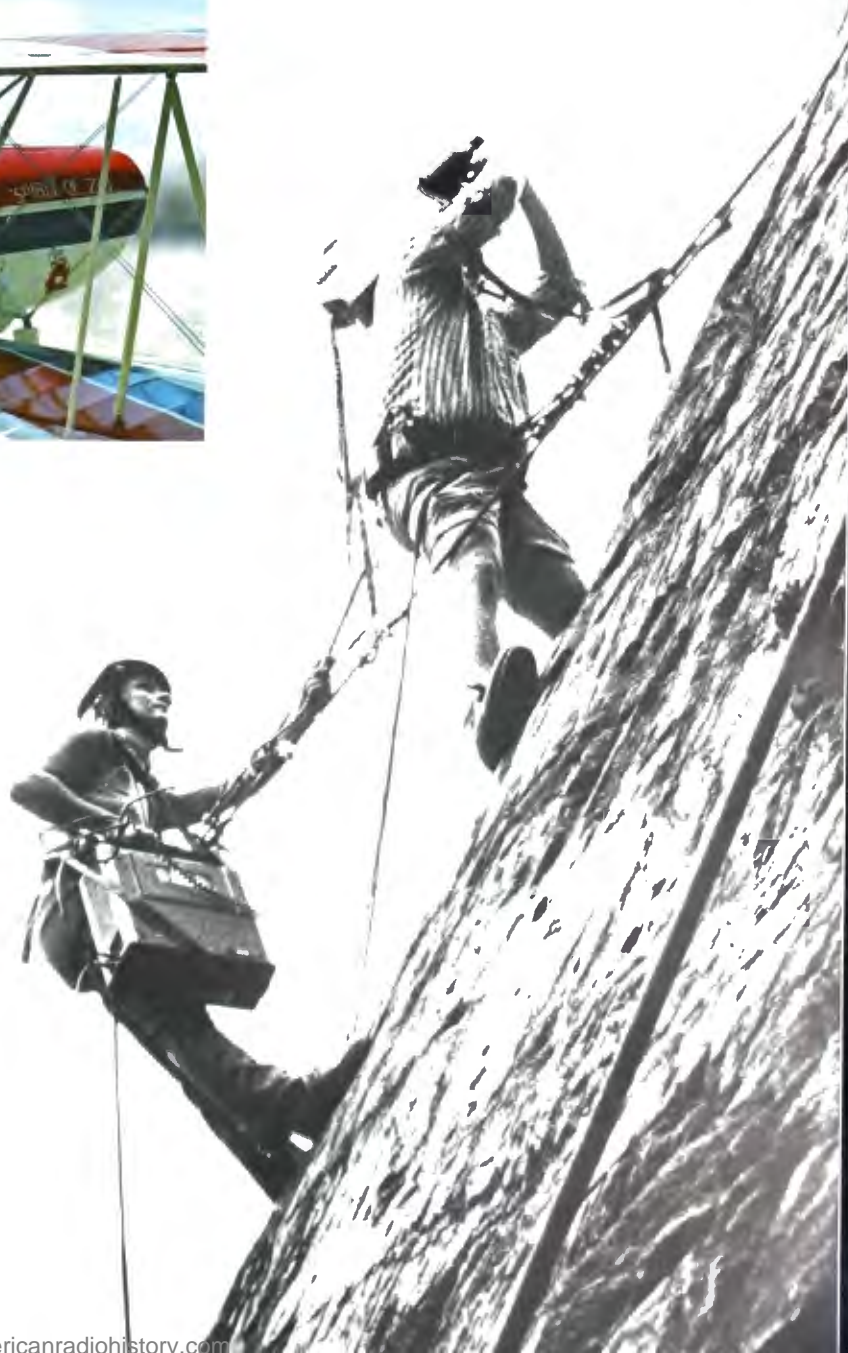


### TK-76 MEETS WATERLOO (and loves it).

Carnaby Square, a Waterloo, Iowa teleproduction company is making excellent use of its TK-76 camera. Notes Production Engineer David Wood: "Most of our work is commercial production, and most of it is on-location. We like the TK-76 for the rugged way it is built and for its dependability. When the job calls for an out of the way location or the need to move around easily, the TK-76 is the one we take."

One interesting assignment for the TK-76 was producing a commercial designed to give the public an idea of the sense of freedom one gets from flying. All but one scene was shot from a second plane at an altitude of 8,000 feet, above the haze level. Cameraman Rick Stone was strapped in to the camera ship with the door removed, and the TK-76 secured with a rope.

Tight closeups of take-off were shot from the front cockpit of the plane. Scenes were recorded on 3/4-inch cassettes; A/B rolls were edited on cassette and mixed on quads.



### ONWARD AND UPWARD

Šandar Films, a teleproduction company based in Williamsport, Pennsylvania, believes their TK-76 camera is designed for rugged use, as the accompanying photo shows. Steve Smith of Šandar describes the assignment:

"We were shooting a commercial for a local camping/mountaineering store, and the spot required that we descend down a rock face to get a shot of some people scaling the cliff. I am the cameraman and my wife, Martha, is the video recordist.

"We've had the camera since the end of 1976, and have subjected it to a variety of rigors. It has performed well in every imaginable climatic condition—from -15°F to the Johnstown Flood. We do quite a bit of network news, mostly for CBS. We also shoot many commercials I must say I am impressed with the quality of our TK-76. It has performed flawlessly, and is incredibly reliable. The pictures it puts out—covering a flood or an important commercial—are consistently excellent."



### TK-76 CAMERAS "ADD NEW DIMENSION TO NEWS" AT WSAZ-TV

WSAZ-TV operates studios in Huntington and Charleston, W. VA., connected by a 3-hop microwave system. Since October, 1976, two TK-76 cameras have been covering the news—and a lot more.

Chief Engineer John Clay reports:

"With the purchase of our TK-76 cameras we added a new dimension. During the 1976 general elections, we originated live from the headquarters of the two candidates for governor and fed the NBC Network on a shared basis with a single TK-76. This was our first air usage.

"Since then, we have enhanced our news coverage with the TK-76's, and have put them to other uses. We have used the two cameras to cover parades; as a floor camera on basketball remotes; as an extra camera in our studios.

"In conjunction with the opening of the spectacular New River Gorge Bridge, TV-3 News produced a half-hour documentary on the bridge, in addition to covering the opening ceremonies on regular newscasts.

"With such great success, the TK-76 cameras can't be everywhere, so we have ordered two TK-760 cameras for the Charleston studio and for remote usage, which will ease the scheduling load on the TK-76's."



### TK-76 CAMERAS IN ACTION . . . —MAY WE INCLUDE YOURS? . . .

*With 1,000 TK-76 cameras at work around the world, testimonials for camera performance are readily available. More difficult to come by are exciting—or even interesting—pictures showing the TK-76 in use. (It seems that pictures of a camera taking pictures are seldom taken.)*

*If you would like to have your camera covered in our "TK-76 In Action" series in BROADCAST NEWS, please send us photos, slides, or transparencies—either black and white or color—of your camera in action. Along with the dramatic illustration, give us some commentary on how the camera is being used, including unique or interesting applications, or possibly an unusual event or situation involving the camera. Send to:*

*Editor, BROADCAST NEWS  
RCA Broadcast Systems  
Building 2-2A  
Camden, N. J. 08102*

*We would like to hear from you.*



### WWLP-TV, SPRINGFIELD, MASS.

Four TK-76 cameras have been effectively utilized by WWLP-TV, Springfield, Mass., for the past two years, handling both news and EFP assignments. Production Manager Tom Lamarche likes the performance, reliability and color quality of the camera as well as their versatility.

TV-22 uses the TK-76's for regular news; for multiple-camera coverage of special events—and even in the studio when needed to augment the studio cameras.

A cameraman-reporter team with a TK-76 and 3/4-inch cassette VTR is the customary operation, while a microwave-equipped van is utilized for remotes or live pick-ups. Increasingly, the TV-22 cameras are in demand for Electronic Field Production, handling on-location commercial production. This technique, Mr. Lamarche affirms, is popular with local advertisers.

Earlier this year, when the President visited New Hampshire, WWLP's TK-76's were there—as shown in the accompanying illustration.



# Last year, 42 U.S. broadcasters made the biggest decisions of their careers. And the smartest. They chose RCA TV transmitters.

Purchasing a TV transmitter is probably one of the biggest single equipment decisions you'll ever make!

We know it. You know it.

But the real measure of any transmitter investment isn't how much you spend. It's what you get for your dollar.

In a word, it's value. Value that translates into performance. Long-term, reliable, trouble-free performance.

## **It's what's inside a transmitter that counts.**

And in some cases, what's left out is just as important.

Inside RCA transmitters, for example, you'll find fewer tubes, fewer blowers, fewer linear amplifiers.

But you'll find more solid state circuitry, and more features that increase reliability and decrease the need for adjustments.

In part, these features explain why year after year, more U.S. broadcasters choose RCA TV transmitters than any other.

## **And it's who's behind a transmitter that counts.**

A transmitter is a long-term investment.

And the longer the term, the better.

With RCA Tech Alert support, you get technical information and assistance any time around the clock.

RCA's staff of field experts service RCA transmitters world-wide. And there is real comfort in the knowledge that parts will be available from RCA whenever, wherever, you need them.

Which is one more reason why, today, there are more RCA TV transmitters out there performing than any other brand.

## **Cost-effectiveness was never clearer.**

Consider your initial investment, repair and service costs, and length of operating service. Then decide on RCA.

RCA TV transmitters and RCA service have been providing reliable performance—and long-term cost-effectiveness—for many years.

Find out for yourself what RCA quality can mean to you. Contact your RCA Representative or write directly to us. RCA Broadcast Systems, Front & Cooper Streets, Bldg. 2-2, Camden, NJ 08102.

**We sell more TV transmitters in the U.S. than anybody else. With more in operation than anybody else. Now, you know some of the reasons why.**



# **RCA**

# You can get top studio quality with this portable production camera- and that's video freedom.

Video freedom is our TKP-46.

Now, our portable production camera is even better. We've improved the stability in the TKP-45, even added the TK-46 studio-control room CCU for greater production flexibility. That's why it's now our TKP-46. It has a huge assortment of mounts, controls, lenses and accessories that complement its basic quality, automatic features and sensitivity. It's a multi-camera system in one unit.

## **For flexibility to pay off on location, your camera has to have studio quality deep down under.**

The TKP-46 has that quality, with big camera features in a production-designed portable camera.

Among them are standouts like shock-mounted optics for stability even in rough-and-tumble situations. High performance input amps with full level video outputs. Lots of automatics: white balance, black balance, iris control, pulse advance and voltage regulation. There's a scene contrast compression. Built-in contour enhancer with coring and comb filter. And more. No wonder it's a teleproduction favorite.

## **You start with a quality camera, and you end up with a quality multi-camera system.**

Have we got a system for you!

The TKP-46 and its accessories let you build exactly the electronic field production camera you need.

Let's start with portability. There's no backpack with the TKP-46 so it can go almost anywhere with ease. Since the TKP-46 is a system, not just a camera, there are two CCUs available. For studio or OB van work we use the studio-control room TK-46 CCU, which will work with up to 1500 ft. of mini-weight camera cable. For portable power, you can plug into our compact AC or battery operated Minipack CCU which has a built in sync generator with color genlock.

The system concept goes on: two tiltable, interchangeable viewfinders, 3" and 7". A host of tripods, shoulder mounts and studio bases. Three zoom lenses. And a Minimax adaptor that accepts full-size lenses, to turn your TKP-46 into a studio camera.

## **The new video freedom is the TKP-46, our other quality cameras, and a huge array of broadcast equipment.**

Considering an ENG camera? Looking into a mobile van? Thinking about a new transmitter? Investigating a VTR? Turn to RCA, and get the new video freedom in every item you need for superior broadcasting. See your RCA Representative, or write us. RCA Broadcast Systems, Building 2-2, Camden, NJ 08102.

The RCA logo is displayed in a bold, red, sans-serif font. The letters are thick and blocky, with a slight shadow effect behind them, giving it a three-dimensional appearance. The 'R' and 'C' are particularly prominent.



*Foldaway handle for easy portability.*



*Minipack control unit.*



*Studio camera conversion using Minimax adaptor*



**TKP-46. Part of the new video freedom.**

