



Broadcast News

Volume No. 149, May 1973



W B S • A T V O • W B R E • W B T V • K T B S • W D A Y

W D C A • W E A T • W F M Y • W G N • W I S N

W K Y C • W M A L • W N C T • W S B • K O B • W T A E

W T V C • W T V N • W U T V • K I R O • N B C • T V 8 M E X

**TCR-100
DELIVERIES
TOP 100
MARK**

• W G R • W E C T • C H A N • W R A L • W R L • W E W S
K A T U • K T R K • K B T V • K N O E • C F T O • W M A Q
• K C A U • W R T V • W D B J • W M C • W X Y Z • A B C

Introducing the TK-45 camera.

It sees things the way the TK-44 does. But automatically.



Until now, the TV color camera that couldn't be beat was the RCA TK-44.

You could depend on it for true, sharp pictures time after time.

Now there's the new TK-45. It combines what you liked so much about the TK-44 with big new advantages.

Advantages like automatic black and white levels. Automatic iris. Automatic centering.

So you get consistent picture quality, consistent scene-to-scene colorimetry with less need for technical manipulation. Camera set-up and operation are simpler and easier.

And since the new features are located in the control unit, cable clutter is kept down.

There's more. Much more. But it adds up to this. No other camera can do more to make your productions look better — automatically.

Just ask your RCA representative. Or write for full details. RCA Broadcast Systems, Bldg. 2-5, Camden, N.J. 08102.

The RCA logo, consisting of the letters 'RCA' in a bold, stylized, sans-serif font.

The New TK-45. It sees things your way. Automatically.

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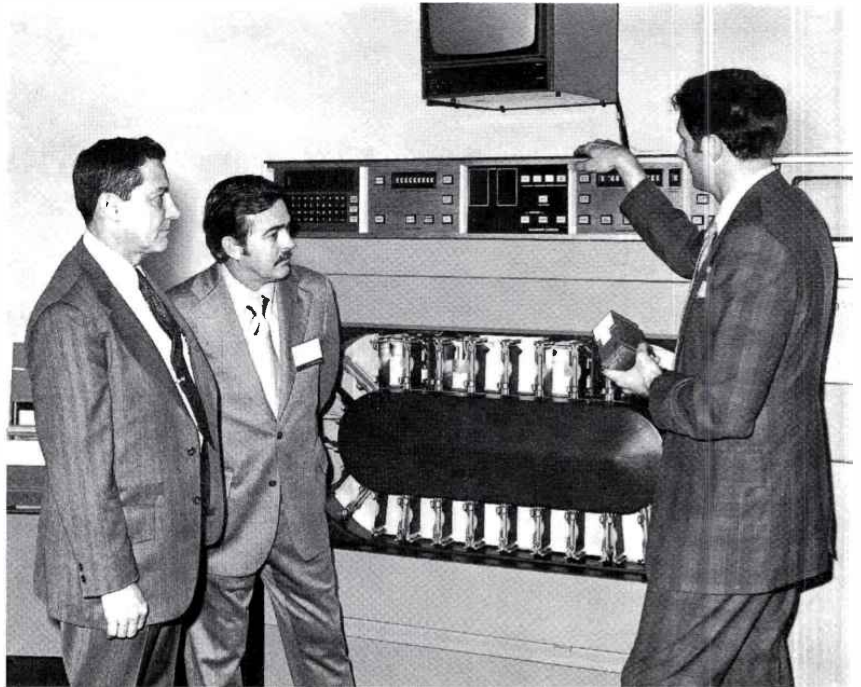
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OUR COVER—A look at some of the more than 100 TCR-100s now installed in television stations throughout the world serves as an introduction to this special Cartridge Tape issue of BROADCAST NEWS.



Cartridge Tape Milestone - TCR-100 Deliveries Hit Century Mark

At the NAB Convention, J. Ed Newman, Chief Engineer, WDBJ-TV, Roanoke, Va., and L. A. Dyson, Jr., Assistant Chief Engineer, discuss fine points of the TCR-100 with Barry Lloyd, RCA Tape Product Specialist. WDBJ-TV will be the recipient of the 100th TCR-100 delivered by RCA. The "cart machine" will relieve three TR-22's which are now being used for production of programs and commercials, Mr. Newman notes. It will also relieve pressure on tape room personnel and eliminate the need for making up a daily spot reel.



Six TK-44B Cameras Included in Upgrading Plan at Walter Reed Army Medical Center

One of the pioneers in medical television, Walter Reed Army Medical Center in Washington, D. C., is embarked on a major program to expand and upgrade its television training capabilities.

Six TK-44B color cameras have been installed recently for improving the extensive medical and dental training facilities operated by the Medical Center.

The Center has been using color television for diagnostic purposes and for instruction of interns, nurses and post graduates in medical and dental fields since 1956. The new cameras provide for

expanded coverage of diagnostic and surgical procedures as well as of administrative subjects.

The TK-44B's capability of operating effectively at low light levels was an important consideration in the purchase. Three of the new cameras are installed in the Medical Center's broadcast studio on a permanent basis, according to William Schettler, chief of the professional CCTV group at the Medical Center. The three other cameras are installed in consoles for use as remote TV units in operating rooms, diagnostic and conference rooms for presenting special programs.

For operating room television, a special mirror arrangement has been installed with the RCA cameras. Mounted on an electronically-controlled boom with remote pan and tilt capabilities, only the mirror extends over the operating table. The mirror arrangement can be used with any of the standard cameras, allowing broadcast from any operating room.

The broadcast-quality studio is equipped with most of the facilities of a hospital operating room. Dental operations, local anesthesia operations, lectures and demonstrations are televised and recorded on video tape. Six quadruplex VTR's with full edit and special effects handle the Center's recording requirements. Along with the medical and dental training tapes, the TV activity also produces and distributes a number of other programs, including such diverse subject matter as management methods, drug abuse prevention and race relations.

First Telecast of Pan African Games Uses New RCA Mobile Unit

One of the key elements in the elaborate broadcast plan for the Second All-Africa Games was a new RCA color OB van. Custom-fabricated for the Nigerian Broadcasting Corporation (NBC-TV Channel 10), the mobile unit provided on-the-spot coverage of Africa's 12-day Games. They were held in January 1973 in the new national sports complex in Lagos, Nigeria.

It was a historic broadcast event, marking the first telecast of Africa's grand event in sports, as well as Africa's first participation in overseas satellite colorcasts.

Providing the desired broadcast coverage required a joint effort. So NBC-TV and four other Nigerian Broadcasters formed a central body called the Broadcasting Organization of Nigeria, under whose auspices all of the Games' events were transmitted daily.

Purchased through Mandilas Ltd., the RCA distributor in Nigeria, NBC's new van was the only color mobile unit used for the Games. Its excellent performance in providing brilliant color pictures certainly enhanced all the drama and spectacle of the events which were telecast live and on video tape.

Approximately 25 ft. long, the color studio on wheels includes all the TV facilities needed to produce a complete color program in the field. The van is fully equipped with a video switcher, audio console, microwave equipment, an intercom system, a TR-60 high-band tape recorder and four TK-44B color cameras.

At the stadium location, two cameras televised the arrival of the Head of State at the opening and closing ceremonies. The TK-44's provided remarkably good, high-

Nigerian Broadcasting Corporation's remote broadcast of the Pan-African Games was the first assignment for their new RCA mobile unit. The TV studio system is installed in a diesel-powered Mercedes chassis, and includes a small trailer containing a power generator for the TV lights, air conditioning and other requirements.



resolution pictures. The TK-44's also covered many of the Games' indoor contests such as basketball and wrestling. And in doing so, they dealt successfully with the restricted lighting conditions of the sports hall.

The van's TR-60 tape machine was also utilized to telecast/record many of the outdoor events. For studio use, RCA also furnished NBC-TV with three additional TR-60's and a TFR-1 16-mm television film recorder.

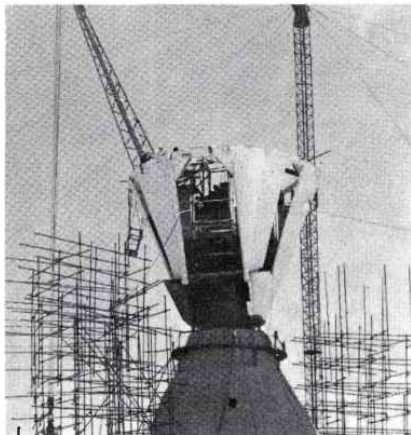
The Games' operations center for master control and dubbing was within the stadium complex. A dual-channel, single antenna microwave link relayed final program output from the stadium to NBC's studios on Victoria Island, about two miles from the center of Lagos. The Station then transmitted its feeds to NCOM House (Nigeria External Telecommunications Ltd.) which in turn relayed the material to ground stations for satellite transmission.

RCA equipment is no stranger to the people at NBC-TV in Lagos. Back in 1962, when Nigerian television was authorized, RCA provided equipment and services to implement the proposed system. And now, with its operations complemented by a second RCA OB van, NBC is better equipped than ever to bring a variety of outside and remote events to its growing TV audience.



The boxing event was just one of many fast-action indoor and outdoor sports events the van's TK-44's televised.

India Education Satellite



India's first earth station for satellite communications built at Arvi, 120 miles east of Bombay, 20 months ago, involved Indian technical participation and the assistance of RCA Limited of Canada. The second RCA earth station, to be located at Dehra Dun, about 100 miles north of New Delhi, will be operational by the middle of next year.

Television in India is extremely limited, with an astounding total of 550,000 villages beyond the reach of any television signal.

This critical situation lends added importance to an educational television plan employing the cooperative efforts of the Canadian, U. S. and Indian governments and equipment and technology from RCA Ltd., Canada.

The experiment will be the first to provide direct broadcasting of television programs from a satellite into small village receivers without the benefit of relay stations on the ground.

The plan involves establishing an orbiting satellite, an earth station and a large number of receiving stations for picking up television signals relayed from the satellite. The spacecraft is the ATS-F communications satellite to be launched by the U. S. in mid-1974, which will be placed in orbit over the Indian Ocean for a one-year period. RCA Ltd. will provide equipment, training and technological support for operating the system's earth station facilities. The Canadian International Development Agency is contributing financial assistance.

Several hundred Indian villages will be equipped with special receiving stations designed to pick up signals relayed directly from the orbiting satellite. Each receiving station will cost \$500, and will consist of a "dish" antenna (8-10 feet in diameter) along with necessary electronics for converting and amplifying the signal to regular TV receivers located in the community centers. This arrangement eliminates the need for costly microwave relay towers placed at 30-mile intervals.

The Indian government will be responsible for television programming, primarily in the education field.

The RCA earth station, to be located at Dehra Dun, about 100 miles north of New Delhi, will be operational by the middle of next year. After the initial operational period, the station may be directed toward revenue-producing applications in normal satellite communications work.

Beyond its immediate benefits, this system has further significance in serving as a pilot test of procedures and programs which could vastly accelerate the advance of national communications systems in the world.

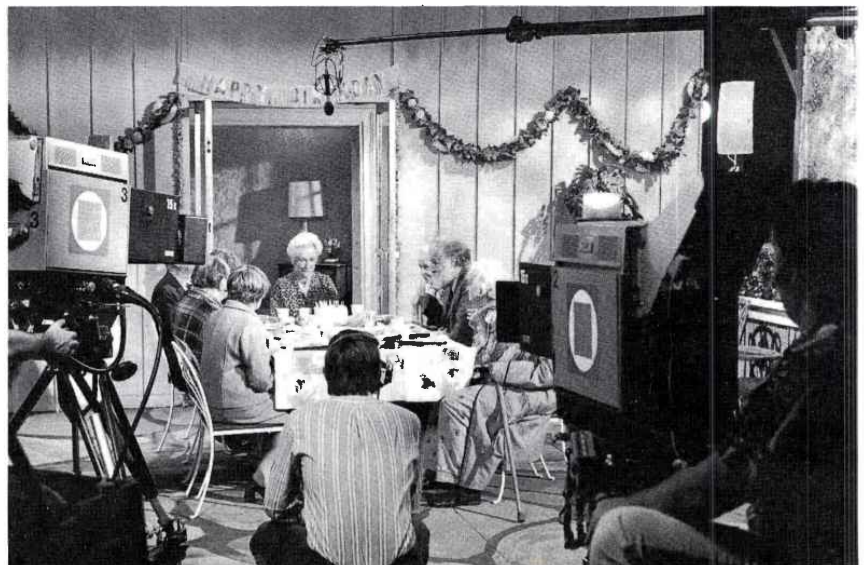
Pacific Video Equips Van for Film Production with RCA Camera & Tape Systems

Pacific Video Industries, a new Los Angeles-based company has equipped a 40-foot mobile van with complete studio facilities, including RCA color TV cameras, VTR's and related control equipment for use in electronic production of feature films. In addition to film production, the van will be used for on-location taping of sports events, commercials and other TV programs.

Two of Pacific Video Industries' three TK-44 color cameras on set at Key West Studios, Hollywood, during taping of "This is the Life," a Family Films syndicated production. Cameras are part of Pacific Video's mobile van equipment complement.

Feature films first recorded on video tape can be viewed and edited immediately and re-shot if required, while the performers are still on the set. This immediacy of playback provides a significant saving in time over the normal film-making procedure. For distribution and exhibition, the edited tape production is transferred to film.

The Pacific Video van carries three RCA TK-44B color cameras and two TR-70C highband tape recorders. The mobile TV facility also includes a 16-track mastering quad mix-down audio system and a complete electronic editing system.



JerseyVision TV Van Ready to Roll

Gov. William T. Cahill receives symbolic key to New Jersey Public Broadcasting's new mobile color TV van from Andrew F. Inglis of RCA. The new van will serve as a roving source for news, sports, public affairs and cultural events—televised live or taped for re-broadcast. Its equipment complement includes three TK-44 color cameras and a TR-60 tape recorder, as well as audio and video switching and control systems. Representing the NJPBA at the ceremonies were Executive Director, Dr. Lawrence T. Frymire (second from left); Commissioner Calvin Louderback (second from right) and Commissioner Buckey Hatchett (right). Mr. Inglis is Division Vice President and General Manager of RCA Communications Systems Division, Camden.



Christian Broadcasting Network Orders \$1,000,000 in RCA Broadcast Equipment for New Boston Station

When WXNE-TV, Ch. 25, Boston, commences broadcasting later this year, it will be operating from a fully equipped facility, with a complete complement of RCA studio and transmitting equipment, representing an investment of more than \$1 million.

This new Christian Broadcasting Network station will be powered by a TTU-110B, 110 kW UHF transmitter, incorporating RCA's new totally solid state TTUE-4A Exciter system. The antenna system is a TFU-25G pylon, omni-directional.

Studio equipment includes two TR-70C highband color tape recorders, and a new TK-28 color film system which automatically corrects color balance and other technical variations in film.

The Christian Broadcasting Network, a non-profit religious corporation based in Portsmouth, Va., is no newcomer in broad-

casting. It has operated WYAH-TV, Ch. 27, Portsmouth, since 1961, and WHAE-TV, Ch. 46, Atlanta, since June 1971, and also operates six FM stations.

M. G. Robertson, President and General Manager, describes the network as an evangelical broadcast service, with its primarily Christian programming aimed at the entire family. Special emphasis is placed on children's programs, and more than three hours are devoted to such shows each weekday. The new Boston station will follow the same basic programming format.

To handle its extensive programming requirements, Christian Broadcasting operates a full-time production center in Portsmouth, producing most of its own programs for WYAH-TV, as well as for affiliates. TV and radio programs and spots are distributed to more than 200 stations.



Visitor's to this year's NAB Convention will recognize this character from his frequent appearances in the RCA studio camera presentations. The theme of the exhibit was "Year of the Automatics". Among the featured automatic systems were: Cartridge Tape; Cartridge Film; Live Camera; Telecine Camera; Transmitters; Command and Control. For a pictorial tour of the RCA display, please turn this page — automatically.



TCR-100

RCA Packs 'em in At NAB

Broadcasters Throng to RCA's "Automatics" Exhibit at NAB

The "Year of the Automatics" was more than a theme at RCA's NAB exhibit this year. It was a reality, exemplified in a range of innovative products which form a solid foundation for future operational patterns in broadcasting.

The listing on the opposite page identifies the automatic systems displayed and demonstrated at the show. But even more significant—it clearly indicates that the systems of tomorrow are already here.

The response to the "Automatics" at NAB left no doubt that broadcasters shared this view that "the future is now."



the year of the

automatic

Systems of Compatible Automatics

Automatic Cartridge Tape

Automatic Cartridge Film

Automatic Live Camera

Automatic Telecine Camera

Automatic Transmitters

Automatic Command & Control

tape

THE AUTOMATIC TCR-100 AND "MURPHY'S LAW"

In the "TCR-100 Theatre", the cart machine and a stellar supporting cast gave dozens of convincing performances, playing before packed audiences. The plot revolved around the extreme reliability and operational simplicity of the main character.



Flawlessly performing TCR-100 foils and frustrates the sinister "Murphy" and his assistant.

While the cart machine was the center of attraction, the TR-70C and TR-60 had their "share of audience".





Nothing went right for "Murphy" at the show. Here he registers stunned disbelief at the prospect of having his well-established law repealed by the TCR-100.

TCR-100 and Selectavision demonstrations were attention-getters.



"Hands-on" TCR-100 provided prospective buyers an opportunity to put the "cart machine" through its paces.

TPR-10 portable quadruplex tape recorder drew much interest since it fits broadcaster needs for mobile recording capability.



studio

INTRODUCING THE AUTOMATIC TK-45 COLOR CAMERA

The RCA studio camera show featured three sterling performers, aided by two attractive animate assistants and a lovable electromechanical marvel.



The new TK-45A demonstrating four new fully automatic features for faster set-up and better pictures.

Command and Control systems demonstrated a remarkably versatile video switcher.

The Portable Pack camera, an economical means of achieving TK-44 quality in portable applications.



Belying its modest price, the TK-630 produced sparkling pictures and showed an excellent performance capability.



Crowds hover around the star of the show, patiently waiting while he honors requests for autographs.

telecine

TV TRANSMITTERS, RADIO|AUDIO . . . MORE AUTOMATICS

Telecine systems included the automatic TK-28 and moderate priced TK-610B.



The innovative TK-28 drew heavy traffic to witness its automatic features.



New Television Cartridge Film System, an engineering model. Companion to the TCR-100, the TCP-1624 will do for film spots what the "cart" does for tape. It handles up to 24 cartridge film segments in a single carousel loading.



Two new UHF transmitters, 30 kW TTU-30C and 60 kW TTU-60C, are solid state through the IPA.

New TT-25FL lowband transmitter incorporates a number of "hands-off" automatic functions.



Radio display demonstrated an "Automatic Radio Transmitter" and introduced a new 5 kW FM Transmitter, new signal processing systems, also a new automation system, a BC-50 custom console, and a full range of cartridge tape equipment.

Cost Effective Study by KPRC Validates Purchase of TCR-100

When Paul Huhndorff, Vice President, Operations for KPRC-TV, Houston, recommended that the station purchase two TCR-100 "cart machines," his management was interested but not overly encouraging.

And for good reason. Early in 1972, KPRC had completed a move to a totally new broadcasting facility which is magnificent—architecturally, aesthetically and functionally. With this major investment, new equipment purchases were not given highest priority.

Study reveals potential savings

However, innovation and constant up-grading of technical facilities have characterized the KPRC operation over the years. So Mr. Huhndorff was confident that if he could prove the cost effectiveness of the TCR-100, his management would approve its purchase. Mr. Huhndorff's study confirmed the sizable savings potential possible with the TCR-100. KPRC management concurred, and one "cart machine" was ordered immediately and combined with one of the six TR-70's in the Tape Room. The second TCR-100 has now been delivered.

Soon after installation, the TCR-100 was working a busy schedule, handling some 125 playbacks per day. In addition, new spots are recorded each evening to build the "cart" library. Ultimately, 2,000-2500 "carts" will be maintained as a current file.

The box details how Ed Schafer of KPRC calculated the cost effectiveness of the TCR-100 for their operation.

KPRC STUDY ON COST EFFECTIVENESS OF TCR-100

	TCR-100 Savings
1. HEAD COST	
Average head life: 500 hours. Cost per head for rebuilding: \$990. Heads used in 1971: 13 @ \$990. Average number of spots per day—100. (Most spots run about 30 sec. on average.) Head contact for a 30 sec. spot is about 32 sec. with "cart" compared to 120 sec. on a reel machine—a 75% reduction in head contact. A saving in head cost of	\$ 9,652
2. LABOR	
"Cart machine" requires 6 sec. of labor per play for 30 sec. spot vs. 120 sec. for reel-to-reel. Assuming 100 spots per day: Reel machines require 3½ man hours daily. "Cart" requires 1 man hour daily—365 per year. Labor savings with "cart"—913 hours per year or	\$ 9,130
3. ELIMINATION OF SPOT REEL	
Without the "cart machine," a spot reel must be made up daily, requiring 3 man hours per day. Labor savings with "cart"—1095 hours per year or	\$10,950
Head cost for making up daily spot reel (two VTR's @ \$2/hr.)—a saving per year of	\$ 4,000
TOTAL PROJECTED YEARLY SAVINGS WITH TCR-100	\$33,732

Also, in using a "cart machine" for spot playoffs, more production capabilities can be obtained from both manpower and equipment at little additional cost.



KPRC Tape Room

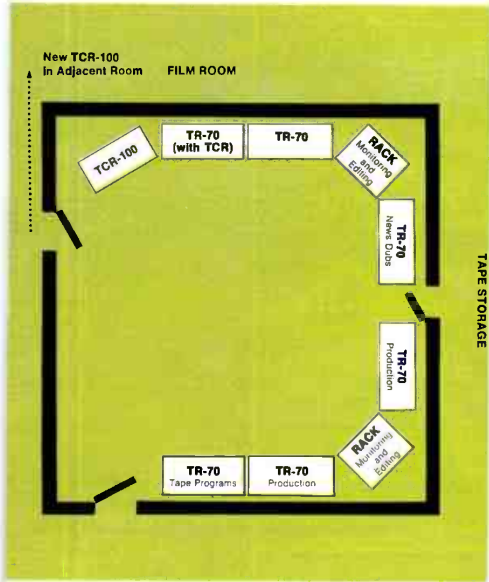
Video Tape Room at KPRC includes six TR-70's.

Video tape operator uses log to set up event sequence on TCR-100.

Tape storage area at KPRC is rapidly filling up. Library of 2,000 to 2500 current "carts" will be maintained.

Busy taping schedule keeps TR-70's rolling, handling a full load of programming and commercial production.

John Hebert, Video Tape Operator (left) and Paul Huhndorff, Vice President, Operations, check out KPRC-TV's TCR-100.



Remote operation from four control rooms

At KPRC, the TCR-100 is connected to a delegate system which permits it to be remote controlled from any of four control rooms as well as being operated from the Tape Room. This is especially important for news programming, since these often emanate from more than one studio.

KPRC subscribes to several services, including NBC, Newsweek, and others. These provide video tapes on a variety of subjects for use as "fillers" or daily news items. The incoming tapes are previewed, cataloged and marked either for use on the day received, or put on "hold" for later use. The selected segments are then called for by the News Room, which frequently ties up several VTR's for a single newscast. Since news takes precedence at KPRC, the production department is wiped out during this time. The TCR-100 has already alleviated much of this aggravation, and Mr. Huhndorff foresees even more advantages when the second TCR-100 is installed.

Second "cart machine" in Film Room

Interestingly, the second TCR-100 is being installed in the KPRC Film Room, where it will be used primarily as a playback machine. Mr. Huhndorff offered several reasons for this location:

- More space is available in the Film Room.
- With increasing use of tape commercials, the "cart" permits better utilization of Film Room personnel.
- From long practice, the Film Room is better trained in scheduling and handling of commercials and the related functions of cataloging, filing, record-keeping.

With one TCR dedicated to handling the commercial blocks, Mr. Huhndorff will enjoy much more operating flexibility. One

"cart machine" can handle all the dubbing requirements on a normal daytime basis. Network news stories can be recorded one at a time with "in" and "out" cues on the cartridge. The special subscription video tapes can also be recorded as individual segments on "carts," labelled and filed for later use. This will permit using the TCR-100 for handling news segments and facilitate the assembling of daily news items and updating them for later broadcasts.

Hyper-active Tape Room

An inspection tour of the KPRC Tape Room quickly reveals the reasons for the station's added investment in cartridge machines. The TR-70's are used for production, program assembly, recording and playback—constantly. The machines are never turned off, and are in operation virtually around the clock. Two of the machines are used for handling remotes. When required for this purpose, they are rolled onto the mobile units. This full utilization of equipment is a part of Mr. Huhndorff's philosophy of flexibility.

This flexibility is needed, since the production schedule at KPRC is filling up to the point where Mr. Huhndorff has the daily log of events posted on a "crawl" which is scanned by a monochrome camera and distributed over the house monitoring system to a number of locations.

There is a daily production schedule of commercials as well as house shows, and promos which involve cameras and tape equipment during the day. In addition, production is scheduled from 7 to 9 each evening. At that time, the cameras must break away for the 10 P.M. news.

TR-70's—"Real workhorses"

Chester Weidner, a Video Tape Operator at KPRC calls the TR-70's "real workhorses" that give little trouble and just keep on

playing. He points out that the machines don't get the preventive routine maintenance that they should, because "they're just too busy on line."

In between bustling from one TR-70 to another, loading, cueing, rolling, unloading tapes, responding to intercom instructions, Mr. Weidner provides this brief run-down on daily utilization of the tape equipment:

one or two machines used for house previewing of programs, commercials, and checking results of previous day's production.

one machine reserved for daily tape shows, including Mike Douglas, Merv Griffin and others.

one or two machines used for assembling news clips for 5 PM live news show.

And before the TCR-100 was installed, one tape machine was tied up full time with the spot reel.

The RCA tape equipment at KPRC has been performing well. Mr. Huhndorff likes its stability, reliability and headwheel life. He points out that at KPRC they do not try to get 1000 hours out of the headwheels because in production work, even slightly worn heads can effect quality. Hence, they would rather get less headwheel life than risk compromising quality in any way.

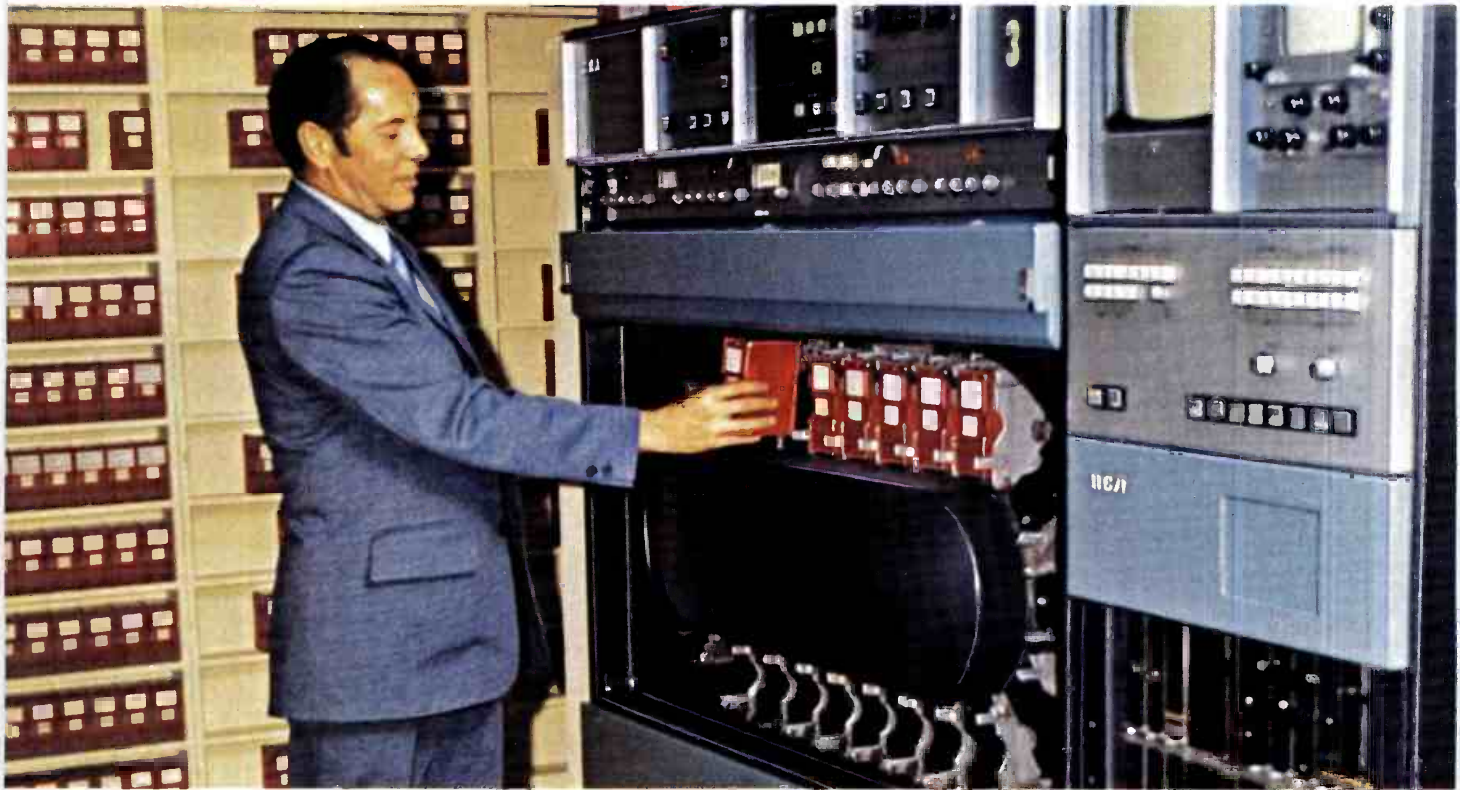
High volume production and dubbing schedule

In addition to normal production use, the TR-70's at KPRC are called on to handle quantity tape dubbing of some client commercials. Since more companies are moving their headquarters to Houston, an increase in this workload is anticipated in the future.

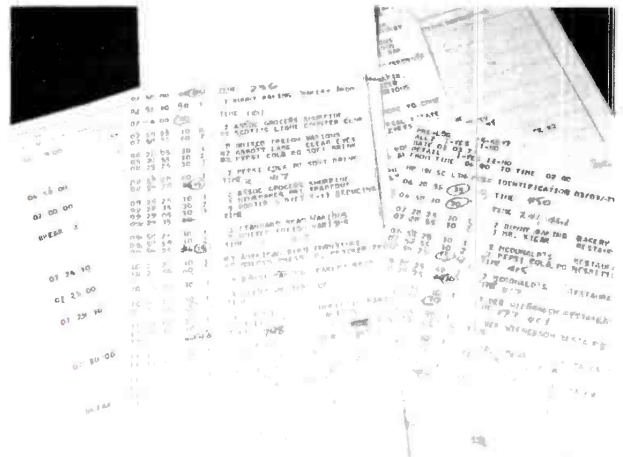
Aside from cost-effective operational economies, the TCR-100's can permit expanding the profitable commercial production business by making additional VTR's available for this purpose.

CART and Computer: A Compatible Combination for KOB-TV

Chief Engineer F. A. Bibeau demonstrates how easy it is to load the TCR-100.



Television Sales/Service Co-ordinator Dorothy Smith operates one of the computer terminals.



Daily log print-out gives Engineering early notice of cartridge dubs required, so these can be made before production crew arrives.

Efficiency-oriented KOB-TV, Albuquerque, utilizes a time-share computer system to streamline operations and to take full advantage of market opportunities. Two terminals at the station provide instant updated information on avails. When a salesman sells an order, it is punched up on the computer and the information on the particular commercial sold, its scheduling, as well as billing data, etc., is made available to all station activities involved in processing the order.

The "cart" fits in

The TCR-100 fits nicely into this operating pattern because it is easily programmed to handle up to 22 commercials at one loading. At the same time, it affords the flexibility to accommodate last-minute changes so that PSA's or station promos can be replaced with income-producing commercials.

In setting up the initial selection of spots to be dubbed to "carts," the computer simplified the task by supplying a print-out of commercials in current use.

Daily computer print-out

The computer system provides a daily print-out which identifies and schedules the event sequence. From this print-out, the TCR-100 is set up to handle programming for the day. Engineering can quickly determine if any new spots need to be dubbed to the "cart" for the day. These are made between 6 A.M. and 10 A.M. when the Production crew arrives. This careful scheduling minimizes equipment conflicts.

All film and tape spots, including "where-to-buy" tag-ons are dubbed to the "cart." So are station ID's, promos and PSA's. This permits the entire station break block to be assigned to the TCR-100.

KOB maintains an active file of 1,000 carts, which are screened every two or three weeks to keep current. Most of the carts are 20-second spots.

Mr. F. A. Bibeau, Chief Engineer, says the TCR-100 is the equivalent of three tape recorders. This is particularly important for KOB since it operates on Mountain Time, with a one-hour network delay which ties up recording facilities. It was especially hectic during the evening shift when the Tape Room had to handle recording a segment of the "Tonight" show while at the same time putting on the 10 P.M. news program with its usual heavy spot commercial load. Following the news, the first part of the "Tonight" show was played back while the rest was being recorded.

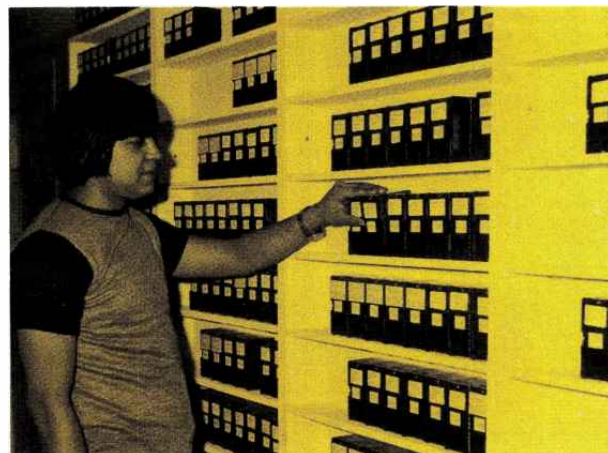
Tape Room Trauma

The two TR-70's and two TR-60's and film systems were all used to handle the load—and the Tape Room was a constant panic. It got so bad that engineers hated being assigned to the tape operation.

Before the TCR-100 moved in, a production crew had to be brought in for 1½ to 2 hours after sign-off each night to set up spots and programming for the next day. In the Film Room, an operator had to spend 3 to 4 hours daily making up a "porcupine" reel of spot commercials—spliced and



Studio Supervisor Sam Tikkanen dubs "cart".



Martin Vargas at the storage racks, selects "carts" for loading the TCR-100.

cued in the proper sequence. In addition, the "porcupine" had to be disassembled and the spot films returned to their individual reels.

Impact of the "cart"

Since the TCR-100 went "on stream" at KOB, it has had a noticeable impact on station operating procedures. Production and commercial dubbing is now a normal daytime function. Overtime operation is the exception rather than the daily routine.

Additional benefits have also been garnered. The Film Room pace has slackened, leaving more time for handling jobs that were previously deferred—like cataloging, filing and routine record-keeping. The TK-27 film islands can be used for production as well as programming without the troublesome schedule tangles that once prevailed.

The Tape Room is operating with far less strain on its personnel and on its TR-70's and TR-60's. Relieved of some of the operational burden, Engineering now has more time available for machine maintenance.

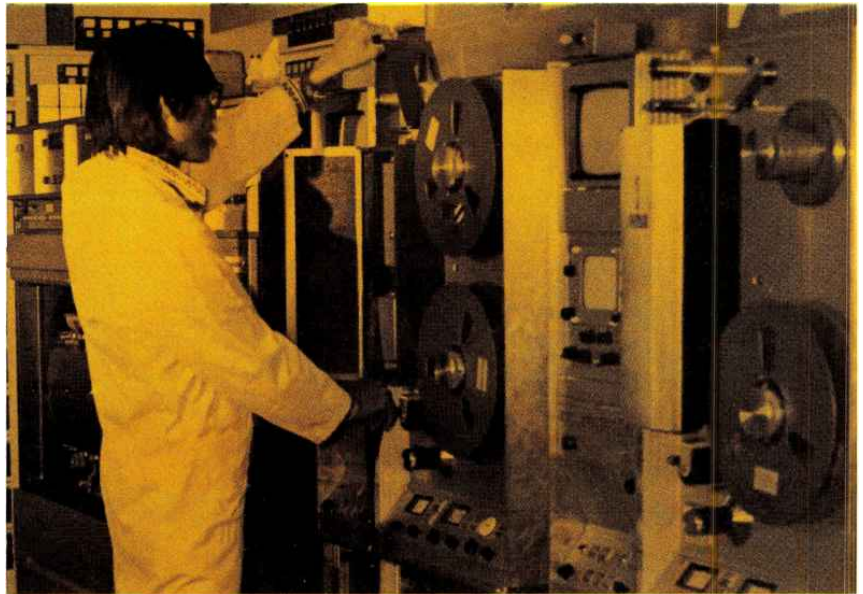
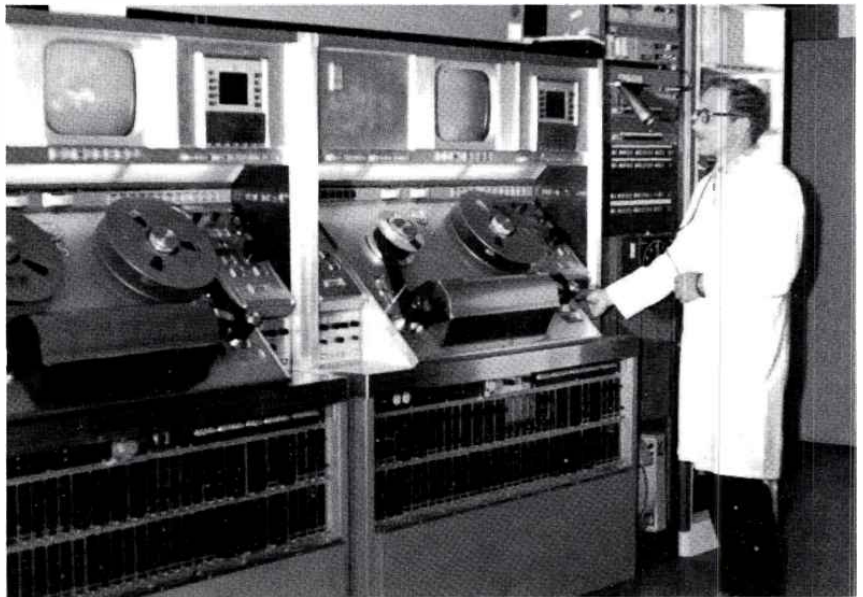
The Traffic Department is finding that the "cart" simplifies their scheduling, logging and verification functions. The overall operation has been running so smoothly that KOB management is considering extending their sign-off by adding a late movie—with commercials handled by the "cart," naturally.

For KOB, the computer system and the TCR-100 cartridge system are proving to be a compatible, highly efficient combination.

KOB received their TCR-100 with SPU in December, and moved it into position, ready for installation which was scheduled for early January.

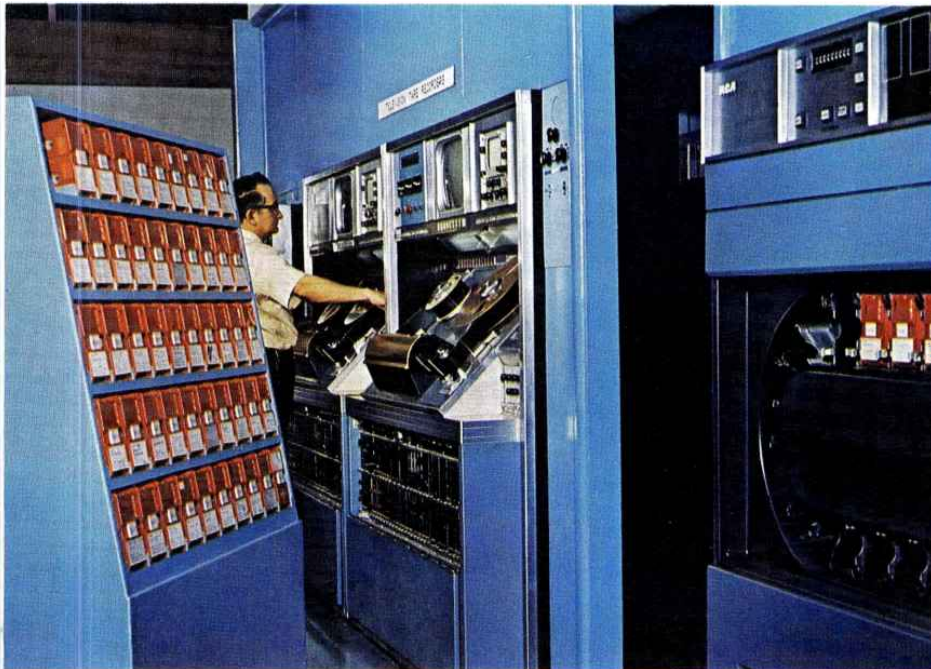
Instead of waiting for the RCA installer, Mr. Bibeau turned his engineering crew loose on the machine. They connected the system, reviewed the operating manual, fired it up and started dubbing tapes.

By the time the RCA service man arrived right after New Year's Day 1973, KOB already had two week's operating experience and a stockpile of over 400 recorded cartridges.



With the TCR-100, the TR-70's and TR-60's still have an ample work-load, but there is far less strain on both men and machines. More time is available for production and maintenance. In the photos above, Technician Ron Schuetze adjusts a TR-70, while Trainee Leroy Nelsor threads tape on the TR-60. He is in a Career Vocational Apprenticeship Program in which KOB participates.

With the TCR-100, Dubbing Sessions Are Only a Memory At KHQ-TV



Special rolling cart (left) designed by KHQ is used for bringing "carts" from storage racks to the TCR-100. In background are trusty TR-70's now more available for production usage.

KHQ-TV, Spokane, Washington, spent a lot of time dubbing short segments of video tape material onto one tape in order to play them on the air. The two TR-70's and one TR-60 were going day and night. Studio production had to be shut down at times, in order to get through a station break, while clients, talent, and the production crew had to wait. Film chains were tied up for commercial breaks. Two men were kept busy loading tape and film plus on air switching.

Enter the TCR-100

Then the TCR-100 came.

In a few days the need for short segment dubbing of video tapes to play on the air just didn't exist anymore. It became obvious that with such a slick working device as the "cart machine" available, it would be a real waste not to use its capabilities through which to funnel all short segment material going on the air.

"Takes the panic out of breaks"

The cart machine does a beautiful job of taking these short segments and putting them together into a smooth-flowing sequence that takes the panic out of breaks.



So the dubbing game soon was only a memory and a whole new game was started. This one is known as "Feeding the Cart Machine". It consists of making a real effort to make all breaks "all cart" breaks plus any other uses for the cart we can think up.

The following are put on the "cart" at KHQ:

- All film commercials
- All tape commercials
- Slide sequences with audio
- Promos and Public Service Announcements
- Standard program format open and close
- Pre-recorded open and close cover shots on fixed camera news shows
- Some news segments
- Translator identification with audio promo
- "Tags" on other carts

Consistently smoother breaks

Feeding the TCR-100 takes a good bit of work each day because of ever-changing commercial schedules, promos, etc., but it's well worth the effort. Pressure has been relieved on both men and machines. "All cart breaks" are consistently smoother and pressure on the operator is certainly less. Most times of the day the on-air operation is handled by one man. The Reel-to-Reel VTR's and the film chains are free for production or for "Feeding the Cart Machine".

Since the TCR-100 arrived over a year ago, more than 70,000 "carts" have been put through. Over 200 a day are now being scheduled. The original headwheels are still in use with approximately 400 hours on each.

The present 750 cart library is combed at least once a week to put back into use those carts with outdated material on them.

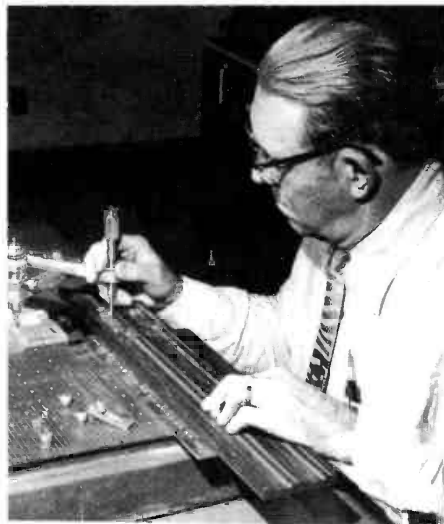
Dubs are routine daytime operations

Since cartridges are being recorded by the machine throughout the broadcast day, it is common practice to load the belt only for the upcoming break, always starting the sequence with #1, #2, #3, etc. Recording then is done in any of the empty positions. When the machine is needed for playback, a push on the home button, puts the pre-programmed carts into the machine in a few seconds.

"ID" system keeps track of carts

For ease of identification, KHQ engraves a 3-digit number on the upper right corner of each cartridge. This number is visible even when the cartridge is in the "play" mode. It permits positive identification of all "carts" loaded in the machine at all times. In addition, the cartridges are stored in bins which have the same identifying number. Even though the message on the "cart" changes, the number stays the same. The numbers are engraved vertically on the upper right corner of the cartridge.

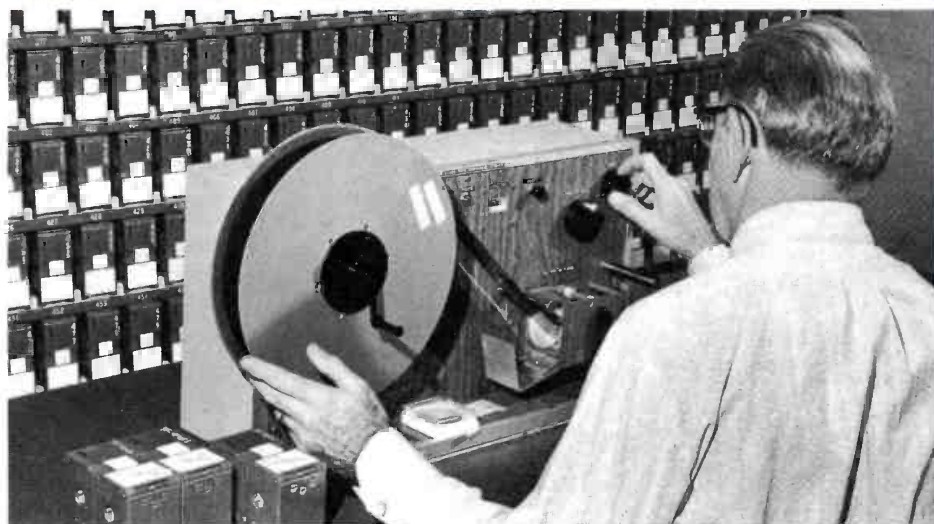
Engraving machine marks each "cart" with identifying 3-digit number.



"Carts" are stored in number sequence for quick retrieval. Number remains the same, even when new commercials are dubbed on "cart".

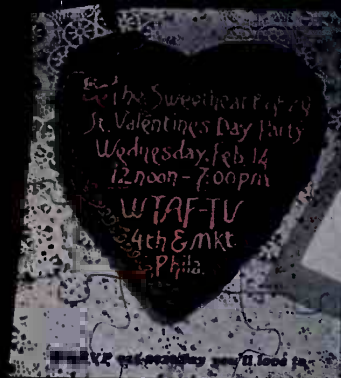


An advantage of large size engraved number is easy identification of all "carts" in machine. Number is clearly visible even when cartridge is in the "play" mode.



A "cart" tape-loading device is another innovation by KHQ.

KHQ-TV usually loads its "cart machine" for one break ahead, with dubbing scheduled between breaks.



Invitations consisting of an easy-to-assemble Valentine jig saw puzzle were sent to Delaware Valley and New York advertising agency personnel, TV buyers, clients, entertainment personalities and public figures.

WTAF-TV, Taft Broadcasting Company, wanted to showcase their new studios in the center of historic old Philadelphia. Their new location at 4th and Market Streets is right next door to Ben Franklin's Colonial residence. And Independence Hall is just around the corner.

To mark the occasion, they organized the TV-29 Grand Opening Party—a carefully planned "fun" event. Valentine's Day was an ideal time, and also fit into the festive, happy theme of the promotion.

The party was a huge success—a well-attended, happy affair that brought home the serious message: that TV-29 is a key part of the new Philadelphia TV story, and that the station is amply endowed with a talented staff and modern programming and production facilities.

A featured performer at the party was the TCR-100, a recent addition to the WTAF Tape and Telecine Room which has already established itself as a favorite with the technical crew and with station management.

Genial Ben Franklin welcomes TV-29 guests to his old neighborhood.

WTAF-TV Had a Party... and Their CART Played on





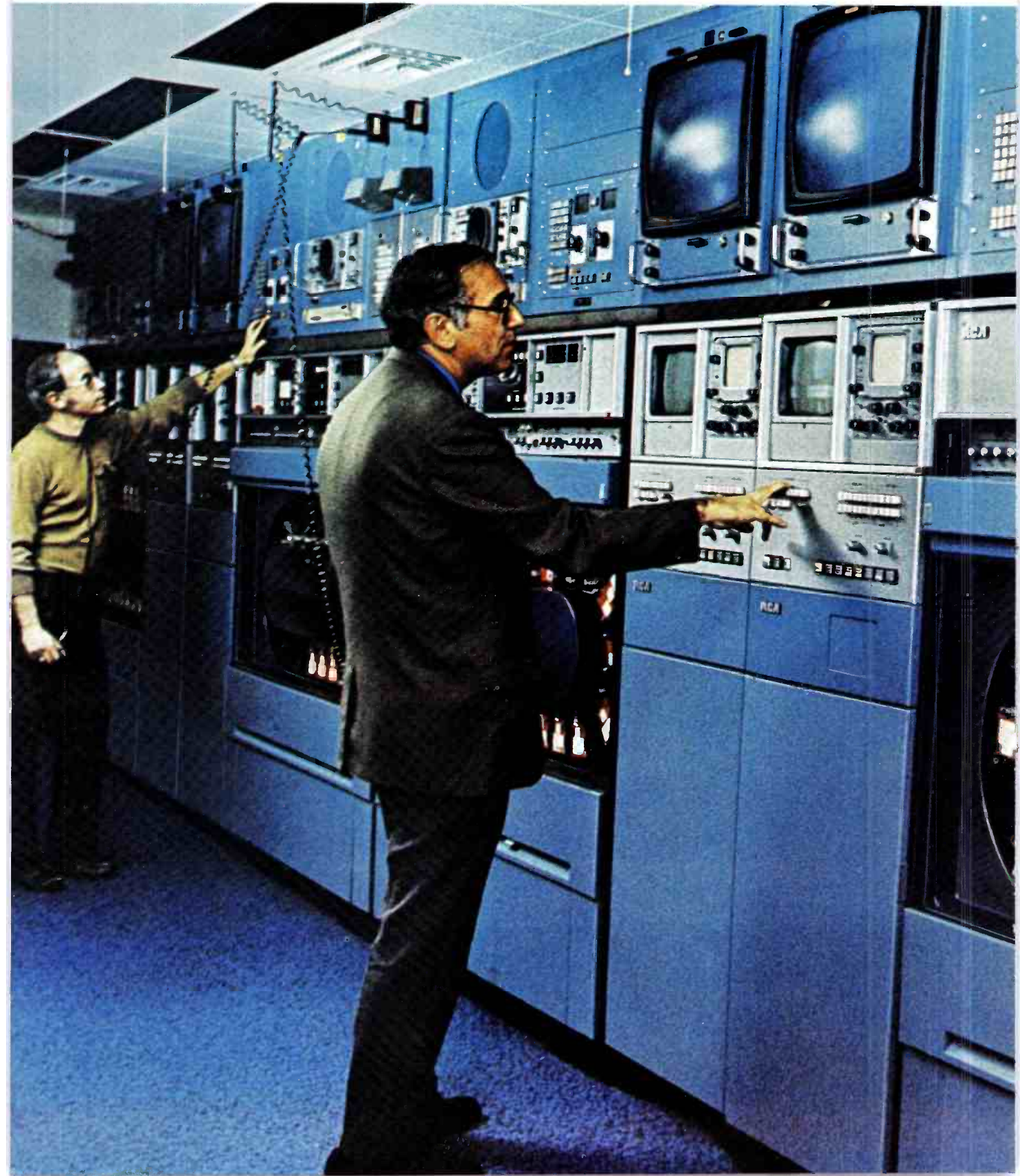
Engineering Supervisor Wil Moore had a busy time explaining how the TCR-100 works and why it helps make the technical crew's job easier. The TV-29 TCR-100 shares electronics with a TR-60, which further simplifies programming of syndicated video tape shows. These can be cued for automatic switching from program to the sequence of "cart" commercials and back to the program again.

Master Control was one of the focal points of the studio tour.

A friendly Frankenstein lives it up and finds the TV-29 party "just what the doctor ordered."

Congenial Valentine hostesses spread cheer and escort visitors on tours of the TV-29 studio. The studios were decorated to enhance the party atmosphere. *Studio One* served as the source for a seemingly unending array of appetite and thirst assuagers, while *Studio Two* provided a lively orchestra and a dance floor.

NBC's New York 'CART' Quartet





Film commercials are something of a rarity around NBC-TV's network operational headquarters in New York these days, and the Ch. 4 flagship station, WNBC-TV. Even rarer is a film spot "on the air." The reason can be found in an area on the fifth floor of 30 Rockefeller Center, the nerve center for NBC's Video Recording Operations.

What the visitor sees there is the sight of four TCR-100's in a row, plus support equipment and storage facilities for a daily-growing number of "carts". These now represent virtually all commercials and promotion segments, plus short-length program lead-ins and other format elements, seen in network feeds from New York or on the local o&o station.

Heavy traffic in tape

"Right now, about half of all incoming commercials arriving from agencies or distribution services are already on high-band quadruplex reel-to-reel tape," estimates Robert S. Daniels, Director of Video Recording Operations.

"This, of course, includes commercials originally produced on film but transferred to reel tape, as well as commercials produced directly on tape in the first place. The volume, over-all, is tremendous, something like 30 to 35 commercials coming in each day."

Tape and film spots dubbed to "cart"

Just about all of these new tape commercials as well as spot film commercials are dubbed to "carts". However, by no means is this the extent of "transfer operations" for incoming commercials scheduled for network or local NBC exposure in New York. The now-familiar red "cart" housings are, more and more, the final destination for new commercials, whether reel tape or film, as well as reel commercials already in-house from existing campaigns.

Storing, handling, and scheduling these "carts" has called for several innovations on the part of those concerned with Video Recording Operations for NBC in New York.

Tape commercials roll on four TCR-100's at Video Recording Operations, NBC, New York. One unit primarily feeds WNBC-TV. Two more provide "cart" spots for daytime network shows, with one unit running as standby. The fourth unit is sequenced with prime-time material, joined by WNBC-TV system in standby role.



Three of the four "cart" machines on duty at NBC, New York. 96% of NBC network and WNBC local tape commercials are played on these machines. The TCR-100's are handling more than 400 plays per day.

Headed for all-cart operation

"Clearly, we are heading for an 'all-cart' operation here," says Daniels. "Right now, we have storage space for some 4200 'carts'. This may eventually grow to 6000, but we hope to keep it at a level below that as we 'retire' commercials, unless notified otherwise, 90 days after the last play date."

Backup for network feeds

When network commercials originate from telecine chains, it is standard operating procedure to run two identical films simultaneously—one on the air, and the other as a switchable standby if needed. The practice is still followed with "cart" feeds to the network, notably the commercials seen in daytime shows between 10:30 a.m. and 4:30 p.m. This is one of the reasons for the presence of a full quartet of TCR-100s in one location. Switches from the on-air machine to the standby machine rarely happen—but it's ready if needed.

Over 100,000 "cart" operations

The four TCR-100s get plenty of use, and they hold up extremely well, by all indications. They are seldom down for repairs despite the sizable operating load.

Between the time they were installed beginning April, 1972 until March 14, 1973 they have had a total of 128,799 operations, including initial tests. Since that time, additional operations have been accumulating at the rate of approximately 400 per day.

The "carts" are definitely taking over at NBC from airplays of reel tape commercials. (Reel commercials, of course, still arrive daily—NBC-TV now has some 5000 on hand—but they serve mostly as the master source for dubbing to "carts".)

Few reel tape spots aired

In a three-day, mid-week period at the height of the 1972-73 season, this was the pattern:

NETWORK—217 "carts", 31 reel tape spots.

LOCAL—312 "carts", 5 reel tape spots.

At BROADCAST NEWS press time, 96% of NBC network and WNBC local tape commercials are played on the "cart machines".

Merely storing and handling such a flow of cartridge spots is an extensive operation in itself.

Unique storage system

The storage problem was tackled by means of sliding shelving, four rows deep, in which "carts" are stored not far from the TCR-100s on which they'll be played. A number system, in fact, correlates to the reel originals, which are stored elsewhere in an identical sequence.

The sliding shelving (available commercially but not used hitherto for the purpose



"Carts" are shelved in sliding storage racks in the VTR Room, and are identified by letter and number for ease in filing and retrieval. Space is provided for some 4200 "carts" at present.

Charles Savaia, Manager, Video Recording Operations, selects a "cart" from the special storage system devised by NBC. Carts are shelved in 4-deep rows, which conserves space while providing ready access to the filed carts.

VTR Operator Lloyd Campbell lines up a sequence of "carts" for the #1 TCR-100 at NBC.

to which it was put by NBC's Sherman Atwood, who supervised the installation) is considered a "good interim step" in solving the storage problem. In the planning stage is a form of "retrieval system" that could be computerized, delivering wanted "carts" with a minimum of hunting back and forth in the four-layer system.

Cataloging the "carts" and readying them for insertion in the TCR-100 systems is aided considerably by a roll-around carrier that holds around 100 "carts" in slots. This carrier, made in NBC's shop, gave rise to an additional safety device to improve routing. Wooden blocks, painted bright yellow and sized similarly to "cart" housings, are used as "reference dummies" when a commercial will be played several times in a day. A slip-on tag on each yellow block identifies the slot where the original "cart" is stored.

Expanded "cart" usage planned

Transferring films or reel tapes to "carts" has become a routine operation. NBC video recording specialists in New York are already anticipating the day when a great deal of program elements—introductions and titles, billboards, standardized lead-ins, end credits, etc.—are all transferred to cartridges.

Also projected is the further use of "carts" to handle segments of newscasts, feature news such as drama or movie reviews, highlights of sports events for later newscasts, and the like. Some of this is already happening for WNBC-TV, where editorials, sign-on, Sermonettes, program promos, etc. are already on "cart".

But commercials will likely remain the focal point of the activity surrounding NBC's "New York Cart Quartet" for quite a while.

"The time may come, and perhaps it's not too far off, when agencies and others

will furnish all, or nearly all, commercials to us in a 'compatible to cart' form," Daniels ventures. *

"Meanwhile, clients and agencies have come to appreciate the saving that results from having to furnish only a single high-band tape copy—from which we make our 'cart' copies— instead of the former practice of sending in two reel tape copies or multiple copies of commercials on 35mm film."

Future programming potential

Programs, network or local, may take new directions because of the "carts", suggests Charles Savaia, Manager of Video Recording Operations at NBC. "I can visualize putting nearly all the segments of a major circus on 'carts', and then building a show with them in any sequence you like, using more 'carts' for intrqs and commercials."

Can a Small Station, KCEN-TV Operating in Market #110 Find Happiness in the TCR-100?

You bet your "cart" they can! Ask Rush Evans, Vice President and General Manager of KCEN-TV, Temple-Waco-Texas.

He'll tell you that happiness is airing all the commercials you can schedule—and still having equipment and personnel to spare to take care of programming and commercial production.

To compete successfully in the *second* 100 market areas, you've got to have the flexibility and capacity to schedule all the business you can handle. And at the same time, you have to be very selective about equipment purchases.

TCR-100 . . . "the perfect answer"

"When you're operating in the 110th market," Mr. Evans notes, "the TCR-100 is the perfect answer."

Rush Evans supports this strong statement by comparing the KCEN operation on New Year's Day 1973 and New Year's Day 1972 "BC" (Before Cart).

The excitement of a New Year's Day at a TV station was missing on the first day of 1973, and the new tranquility was welcomed by all at KCEN, Temple-Waco, Texas—by management and operating personnel alike.

The contrast with New Year's Day 1972 was striking. Then, as now, the all-day



schedule of bowl games and special programming generated a complete sell-out of time. Getting the advertising dollars into the till was a "whole 'nother story."

Jan. 1, 1972—Hectic, heavy traffic day

On New Year's Day 1972 KCEN had to rely on two RCA TR-22HB's and one RCA TK-27 Film Chain. Rush K. Evans, Vice President and General Manager, says, "You'll never know what a nerve-racking, ulcer-producing exercise it was to try to handle that busy traffic. The only way we could make it all happen as scheduled was to record a sequence from one TR-22 to the other during the running of the major program, then get set for

playback, first checking the color bars and previewing—and as soon as playback was completed, start repeating the process, all the while staying on the alert to activate the film system as required.

Jan. 1, 1973—TCR-100 handles the load

By New Year's Day 1973, the TCR-100 Video Cartridge Recorder had been on the job about four weeks. The TCR-100 Cart machine was kept fully loaded and fully programmed. The right material went on the air at the right time with a minimum of button pushing.

When you can get through *that* kind of a saturation traffic situation with the TCR-100,

the normal operating routine becomes just that—routine.

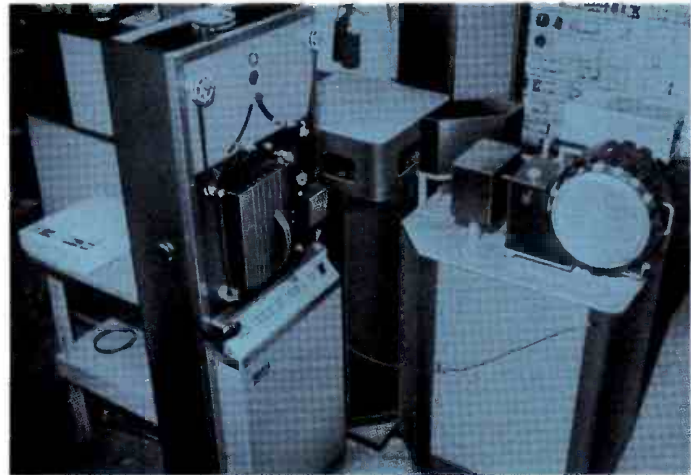
Happiness is a good investment

A small market station can't afford to keep buying new equipment. But what do you do when the character of the business is changing . . . when more and more spots are arriving on tape . . . when local commercial business is burgeoning, and when new opportunities for production outside broadcasting keep cropping up?

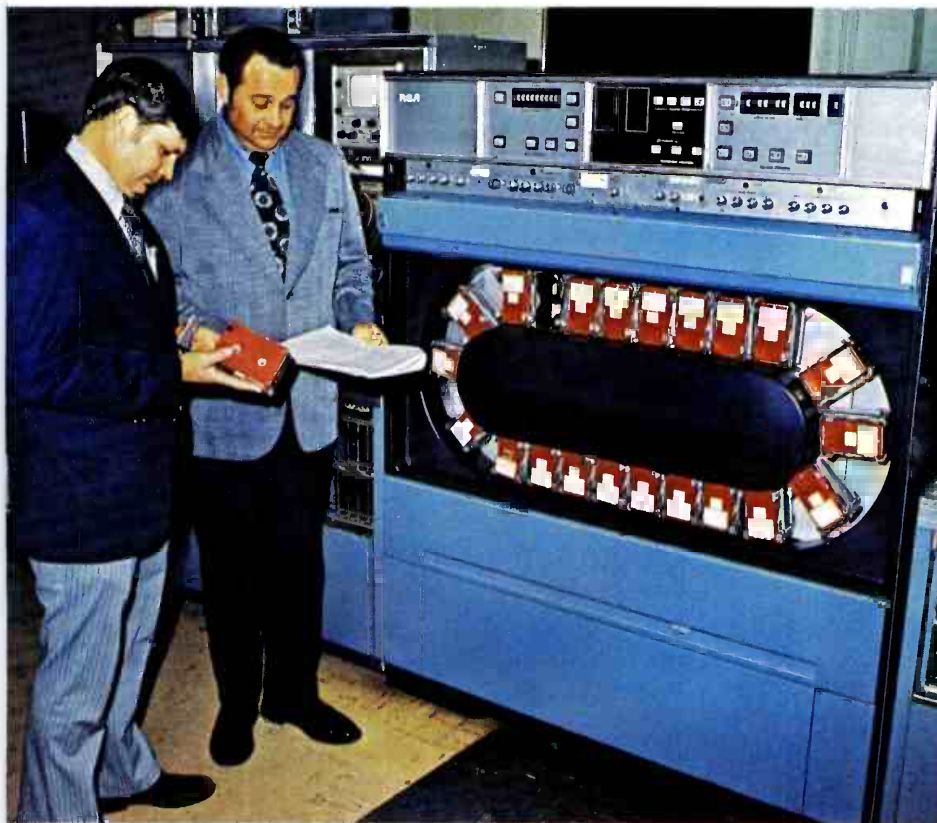
You can face up to buying new reel-to-reel equipment. Or do as KCEN did and acquire a TCR-100.

Who says you can't buy happiness?

With the TCR-100 handling the break traffic, KCEN is able to get more effective utilization of its studio, tape and film equipment. The "cart machine" provides extra flexibility and capacity to take advantage of more production and commercial opportunities.



The CART Moves Into Programming Applications at KARD-TV



Glenn Bell, Chief Engineer, KARD-TV (left) and Rod Herring, Vice President and Director of Engineering for Kansas State Network, stand by the KARD TCR-100.



TCR-100 is used by KARD-TV to help assemble program content for the *Elmer Childress Show*, a daily gospel music program.

One of the most recent broadcasters applying the video cartridge concept to regular programming is KARD-TV, the Kansas State Network's flagship station in Wichita.

Like a growing number of stations, KARD went "Cart" for all the usual reasons—smoother, more professional-looking commercial station breaks, relief from the hassle of short-segment sequencing that reel-to-reel machines impose, and improved service for the advertiser.

"Cart" aids program assembly

But the people operating the facilities were also quick to recognize the advantages of their new TCR-100 for regular programming.

Already, it is doing double duty for the Elmer Childress Show, a daily gospel music program now in its 16th year at KARD. The machine helps assemble part of the show's content which consists of live production, tapes and film. It easily

accommodates open and close sequences, plus pre-taped musical numbers placed here and there.

A natural for short segment "repeats"

Bill Sikes, the station's Vice President and Assistant General Manager, told BROADCAST NEWS: "We're contemplating still further use of the "Cart" for the openings and closings, as well as repeat material, for several other shows.

"One is the Jim Monroe Show, a weekly half-hour of performing and cultural talents from all local minority groups. Another is our daily space-oriented show featuring Major Astro. For this one, the TCR is handling special space effects for openings and closings.

"We have a nationally-syndicated feature, Revival Fires, for which the machine should also be a natural. It's a weekly half-hour religious program.

"As it's running in 150 markets, the best production quality we can provide is essential. We know the TCR-100 will handle

all the repeat material involved, with consistent quality for each program." In the near future, the TV station intends to phase "Cart" operations into still another quality-demanding spot, Friday Night at the Movies. The TCR will automatically sequence opening, closing and break bumper material.

More production from reel machines

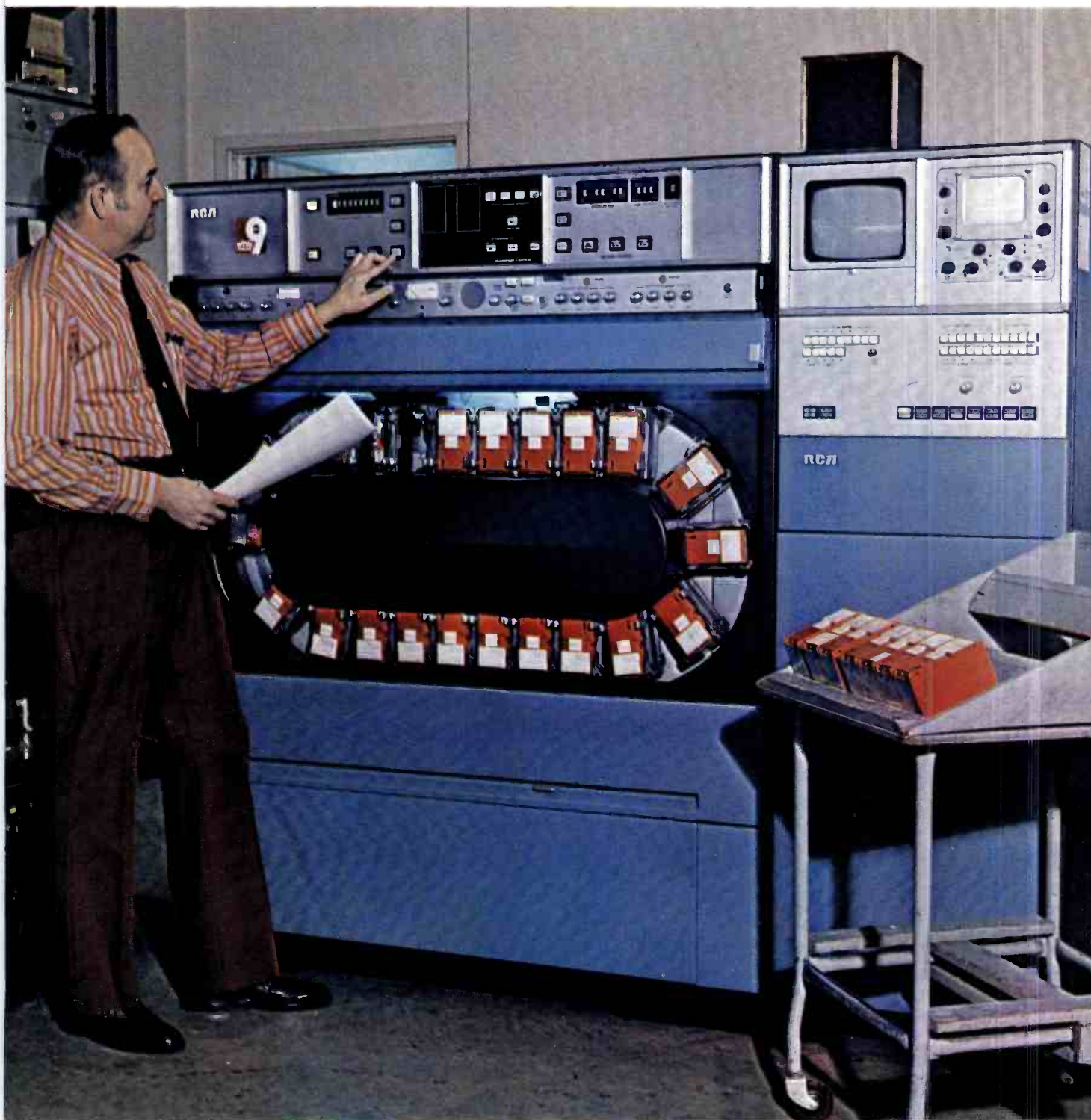
Besides allowing side programming benefits, the TCR-100 also has substantially increased tape capability; it has released two TR-70's and two TR-4's for other work. This is a boon to the station's production department since it is active in program and production on local, regional and national bases.

Last year, the Kansas Association of Broadcasters honored Kansas State Network with the KAB Advertising Award for spot television. With KARD-TV taking the lead again with innovative equipment to complement program and production capability, 1973 could be another award-winning year.



The "cart machine" is ideally suited for handling short repeat segments, such as show openings and closings. At KARD, the *Jim Monroe Show* and *Major Astro* are two programs where the TCR-100 is used in this way.

Production of "Dealer Tag" Spot Commercials is Routine for WTVC



Charles Stephenson, Chief Engineer of WTVC, sets up the TCR-100.

The TCR-100 at WTVC, Chattanooga saves time and worry in airing commercials, increases station efficiency and cuts down significantly on "make-goods."

But that's only a part of the story. Charles Stephenson, Chief Engineer at WTVC, credits his "cart machine" with a number of other benefits—

1. Smoother operating procedure
2. Reel-to-reel machines available for production
3. Easier assembly and playback of spot commercials

"Dealer tags" challenge station break efficiency

The advantages of the TCR-100 come into sharp focus in a "before and after" comparison of the handling of spot film or tape commercials with a local dealer tag. On a reel-to-reel dub, the slide had to be supered on, and audio added. For film spots, the projector had to be threaded, the correct slide positioned on another

film island and the right audio cartridge pulled out and be ready to play.

The copy department had to verify that the copy was on hand and OK. The technical director had to coordinate the film projector, the slide, the audio tag. Getting it all together properly during the course of a normally hectic station break was a challenge. And the challenge was even greater when the dealer tag had to be changed frequently.

Now a routine "cart" operation

With the coming of the "cart" machine, the local dealer ID has become a routine operation at WTVC. The blank "cart" is loaded, film rolled and the spot recorded on the "cart," then the slide tag is supered at the end, along with the appropriate audio.

Recording a spot on the cart takes only two or three minutes, Mr. Stephenson notes. And, once the commercial is on the cart, the old 3-machine panic is reduced to an automatic, programmed event.

When several different dealer ID's are needed for the same commercial, changing the ID is easily handled on the cart by making A-to-B dubs and adding the new dealer tag. Dubbing at WTVC is usually done during the day while network programming is scheduled. A standard cart is used for the setup to assure proper colorimetry.

Dubbing from "cart" to reel machines

In making dubs, WTVC generally records directly on the "cart," eliminating the need for going through the reel recorder first. In some cases, the cart is used as a master for making reel-to-reel dubs for use by other stations. This is done by setting up the "cart" with 10 seconds of black video following the color bar. Then at the end of the recorded spot, a switch is made to a second master "cart," also set up with 10 seconds of black. This procedure makes it convenient for spacing the dubs on the reel machine used for making multiple copies.



Putting together a spot involving dealer tags has been greatly simplified with the TCR-100. In the picture sequence above, the "cart" machine is set up for recording; the spot film commercial and the dealer copy slide have been loaded on the film island. The film spot is dubbed to the cart, then the dealer ID slide, along with appropriate audio. Recording a spot takes only 2 or 3 minutes at WTVC.

Uncomplicated studio-produced commercials are recorded "live" directly on the TCR-100 "cart".



Recording "live" on cart

Another indication of the confidence WTVC has in the TCR-100 is their use of it for direct recording of studio commercials. Mr. Stephenson notes that this is the quickest, and simplest way of handling basic product commercials, especially those involving only one product, a flip card or a short introduction to a slide commercial. Frequently local advertisers will have a spokesman, usually a company official doing the commercials to add a personal touch—and time is a factor. The "cart" expedites production, especially for basic commercials, because if a mistake is made in recording, the TCR-100 re-winds and is cued up in a matter of seconds, ready for the re-take. The TCR-100 is also used by WTVC for production of local commercials involving a series of slides. These are easy to put on the "cart," and once there, assure perfect repeat plays.

Sometimes WTVC uses the "cart machine" for recording news segments for later playback.

Less errors, make-goods, frazzled nerves

The "cart," Mr. Stephenson states, is ideally suited for the complicated, multi-machine spots, because it practically eliminates the chance for error. As a result, station breaks are smoother; there are less "make-goods" and fewer frazzled nerves in Master Control.

At WTVC, the "cart" has also effected savings in the copy and film departments through easier, quicker verification and logging of spots run.

Like many other users, WTVC is constantly finding new uses for the versatile TCR-100. "We're sure glad we've got it," Mr. Stephenson concludes.



In a switch of roles, WTVC makes use of the TCR-100 as a "master" for making multiple dubs to the TR-70.

Keeping on Top "Down Under" with The TCR-100



The people at ATV Channel 0, Melbourne, Australia, wasted no time in getting their TCR-100 "on-air". They started making dubs and scheduling cart plays immediately. And now it's leading a busy, productive commercial life, handling a volume of some 250 events per day.

ATV-0's "cart machine" is also helping to boost the station's ratings. Station management attributes this all-important benefit to being able to increase the number of aired station promos. They explained that the TCR-100 enables them to insert more spot announcements of upcoming programs between commercials than previously possible with reel-to-reel machines.

To all these benefits, the TCR-100 adds still more. It has released five reel-to-reel machines, plus the manpower involved for more profitable use.

Chief Engineer Graeme Davey particularly likes the simplicity of operation and

consistent quality of the material aired on the "cart machine". Since the TCR-100 was installed, ATV-0 has received many compliments on its superior quality presentation compared to competitive stations.

Smooth, automatic switching and consistent, reliable performance are prime advantages of the machine.

Mr. Davey notes: "The TCR-100 hasn't skipped a beat. By allowing us to exploit all of our commercial air time, it is really proving its worth. There have been no make-goods. Agencies are keeping their schedules with us because we can keep the clients happy."

ATV-0's TCR-100 is a PAL machine which time shares the signal-handling electronics of a TR-60 to pre-roll and switch; to go from cart to reel; and to cue the start of the TCR. This convenient "marriage" means that running a video tape program has been vastly simplified—in fact, automated.

The station's operating hours are from 0700 hours to midnight Monday through Saturday, 0900 hours to midnight on Sunday. When queried about the programming format "down under," Mr. Davey explained that nine minutes in every clock hour are reserved for advertising messages. Each sequence at ATV-0 consists of six to eight cartridges which fill about 40% of break time. Tape segments vary from 10 seconds to 30 seconds. The station has 6 carts in use.

The cartridge dubs are made at closing. When dubbing from reel-to-reel to cart, Mr. Davey says that they gain another important benefit—consistency of volume. There are no irritating highs and lows in volume when the material is aired. Which helps ATV-0 make a video presentation that sounds good too.



The TCR-100 At London Weekend TV: A Jolly Good Show

KENNETH ULLYETT, fellow of the Royal Society of Arts, Member of the Royal Television Society, executive editor, **Craft Publications Trust**, editor of **International Broadcast Engineer**. A pioneer "ham", starting in 1922 when he also wrote his first radio press article. First broadcast from PCJJ, Holland, in 1928, and on BBC 405-line television in 1938. Today an independent and international radio columnist. Author of the A. & C. Black book **Radio & TV** in the series explaining how components are designed and made.

Bustling London swings with weekend TV programming provided through London Weekend Television, Ltd.



His Royal Highness The Duke of Kent officially opened Kent House, the remarkably advanced production center of London Weekend Television (LWT) last June. Shortly after this landmark event, LWT again evidenced its progressive posture by marking up another significant "first". In July the station took delivery of a color video cartridge recorder—the first RCA TCR-100 in Europe. By mid-August it was On Air, immediately reducing reel-to-reel machine time in the British independent's operations.

But that in itself is not too noteworthy, as it is an expected benefit in most broadcasters' applications. What makes London Weekend's decision to go video cart even more significant is what the name implies. The programming schedule is limited to two and one-half days—from 7:00 pm Friday to sign-off Sunday night.

Can weekend-only programming justify purchase of TCR-100?

What then, one is certain to ask, is the justification for making a capital investment for use only on weekends? Initially, LWT management wondered too. But they soon discovered that, modified to the British way of TV life, the TCR-100 could substantially expand its production potential.

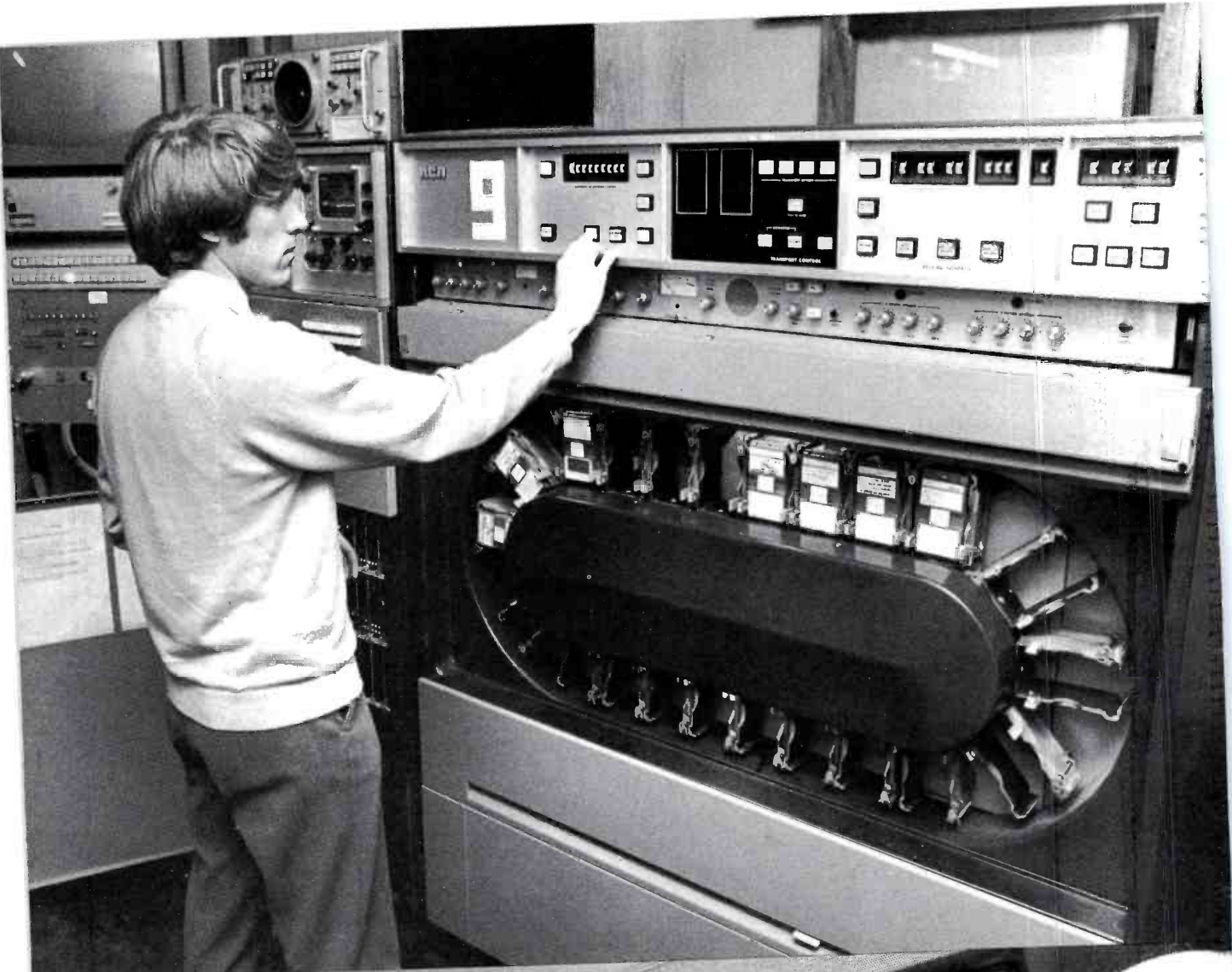
LWT first learned of video carts in 1969 when equipment of this type by RCA was coming off the drawing-board and undergoing field trials prior to being offered to broadcasters. From the start, London Weekend management and others of Britain's Royal Television Society were directly interested.

At a weekend course of the Society's Production Techniques, a former LWT executive disclosed that: "It was clear

during a recent personal visit to a North American station evaluating a cartridge recorder, that significant savings can be made in the expenditure of videotape . . . The equipment permits a more flexible operation, without the necessity of having to tie up a number of other expensive machines which could be more profitably employed on long-duration or replay work.

Trend toward short segment programming

In discussing program applications, he said: "Yes, the signs are that there will tend to be increasing use of short recorded program sequences. With existing arrangements, this would tie up more and more men and machines, and hence result in higher operating costs. Semi-automatic handling of these sequences would seem to be one way of combating these rising costs . . ."





The TCR-100 fits into LWT programming and production format because of its ability to handle short segment program sequences. Continuous record capability of the LWT "cart machine" permits recording numerous program segments in individual cartridges for later editing and assembly. The result is faster, smoother and less costly production.

Behind the scenes, London Weekend was doing more than reading reports of distant field trials. Sidney Blumsom, Head of Planning, said: "In February (1972) we discussed the outlines of a cassette (cartridge) project. Roger Appleton, Chief Engineer, went to the United States in advance of the NAB Convention for a general appraisal of systems. There were discussions in the United States and in Great Britain on the production potentials of cassettes. It must be understood that already we are largely an RCA station. At our Wembley studios we had six TR-70B's plus one TR-70C, which were moved here to South Bank. Certain of the units in the 'C' and the TCR-100 are interchangeable . . . an obvious advantage if you run into trouble."

Continuous record capability

During the appraisal period the production potentiality was obvious; LWT realised that they could justify the use of a TCR-100 if its studio applications could be extended. Therefore, they asked RCA to make certain modifications, the most important being the addition of a Continuous Record feature.

Although London Weekend's new South Bank Television Center utilizes seven RCA reel-to-reel-video tape recorders, Continuous Record is part of the special applications they have in mind.

An immediate one will be LWT's coverage of World of Sport, the Saturday marathon show networked across the nation.

Ideally suited for sporting event highlights

When covering such events, LWT likes to show the highlights, with some of them in slow motion. Normally, this would commandeer as many as five reel-to-reel recorders, and involve cueing and feverish rewinding to get the right segments.

All this will change for the better with the TCR-100. With its Continuous Record

feature, all the operator will have to do is select the desired cartridges for half-time analysis and link up with a slow-motion presentation.

For general production too, London Weekend expects smoother operations, especially for the "Laugh-In" type of show format, the gag-a-minute production with dubbed-in audience reaction. Using the TCR-100, the producer can continuously record, choose the appropriate cartridges to make a show, and then cue up his outlets. This will eliminate expensive time spent on cutting and editing with reel-to-reel VTR's.

Time-and-cost-saving potential

Commenting on savings, London Weekend's Production Controller, Peter Cazaly said: "Time-saving is perhaps still a guesstimate, but if you are freeing two reel-to-reel operators this could mean a savings of \$18,000 annually in manpower alone. As program hours go up the manpower position becomes ever more important."

Conjecture aside, LWT is already using, on a regular basis, the TCR-100 for drama inserts and roll-back-and-mix.

Extending its use even further, Cazaly cited another involvement for the TCR-100. When transmitting a live sporting event such as a Football Cup Final, there is always need during half-time for visual reference, discussions and analysis to be made about highlights of the preceding play. Up until now this would have been achieved by using two reel-to-reel machines with fast re-winds to find the specific highlight. Now we are able to continuously record the event on the TCR-100, marking as we go cassettes on which are the recorded highlights. At the required time we select the appropriate cassettes and place them in the required replay order for the half-time analysis period.

This is yet another reason why here at LWT we have requested the Continuous-Record facility.

TCR-100 remote operation

Head of VTR, Alan Clarke added, "We are firm believers in cost-saving by Remoting. At present we have the TCR-100 remoted to the Operational Controllers and also to the Presentation area. In the future we are even planning remote control to the studios, so that a skilled VTR operator does not have to stay at the cartridge machine just to push buttons."

At London Weekend, obviously, the philosophy and concept behind the use of the TCR-100 differ from those in the United States. But to really appreciate the special importance of this video cartridge machine's application, it's time to examine the total British TV scene in which London Weekend operates.

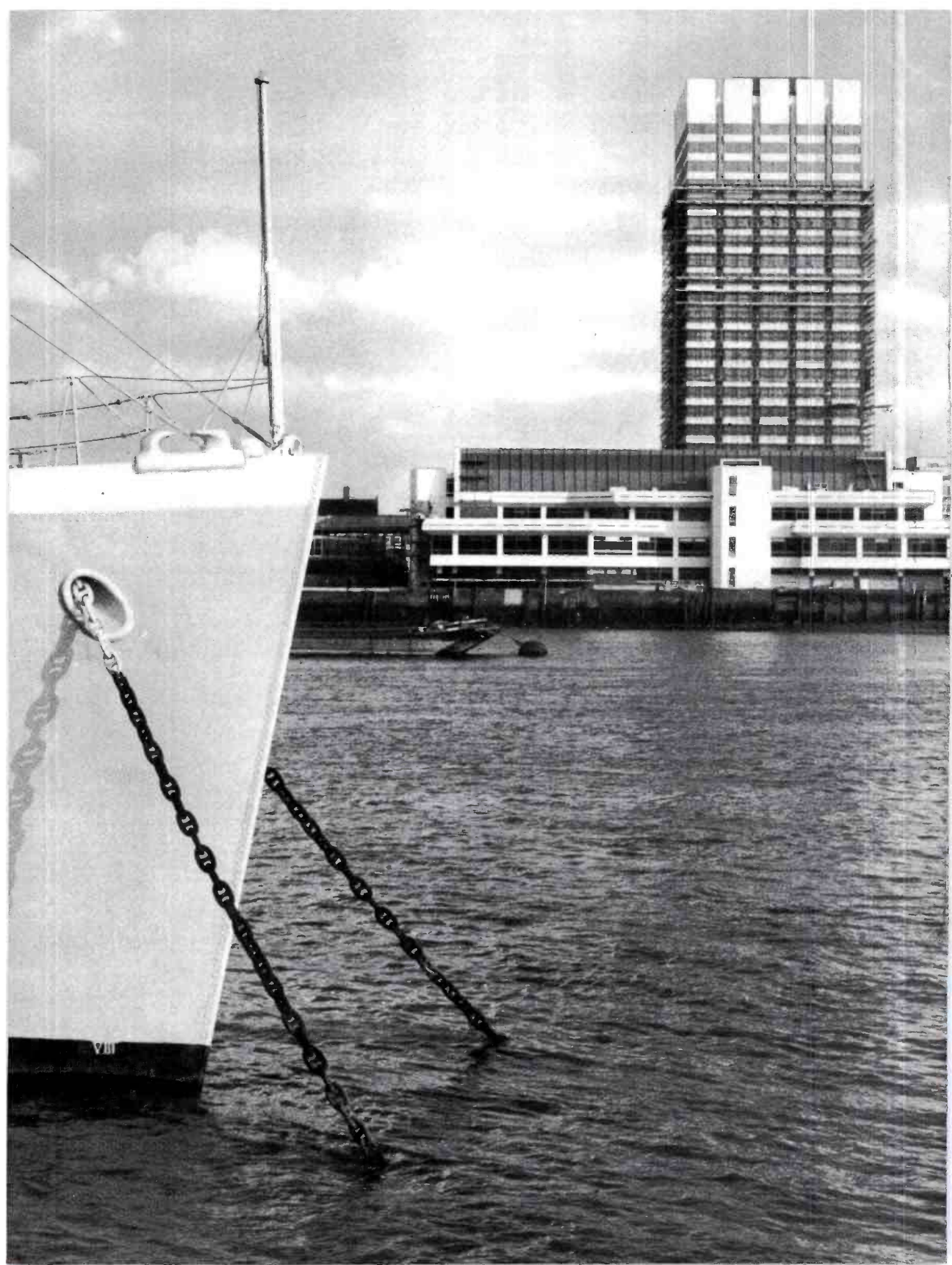
British TV: A dual system

Television in Britain is a dual system, a successful co-existence of two entirely separate and distinct broadcasting organizations. There is the venerable British Broadcasting Corporation (the BBC) established in the 1920's by Royal Charter, which is not quite an Act of Parliament. But it is responsible to Parliament through the Minister of Posts and Telecommunications through which it obtains revenues from the viewing public.

There is also an independent or commercial organization made up of member companies including London Weekend. All told there are 15 program companies operating through various regional transmitting stations controlled by the Independent Broadcasting Authority (IBA). Two contracting companies serve the lucrative London region, one for weekdays and one for weekends. Hence, London Weekend Television.

To pay for their programs, each IBA member is allowed to sell up to six minutes of spots (no sponsorship) in the hour to advertisers. They are averaged over the day's programs with a normal maximum of seven minutes in any one clock-hour. Thus in an average hour, Britain's IBA viewers get 54 minutes of program(s) with six minutes of ads and three ad breaks.

His Royal Highness The Duke of Kent inspects LWT's facilities during official dedication of the station's new Kent House production center in London.



View from the Thames shows London Weekend Television's magnificent production facility rising from the South Bank.



TCR-100 eases commercial "break" stress

The pattern of commercials is different in the UK compared to that in the U. S. But LWT too is rapidly appreciating the avoidance of make-goods and lost business video cart presentation makes possible.

Take, for example, a typical commercial break at peak-viewing time. There may be seven commercials. What's more, while the program and some of the commercials are networked in an intricate inter-British-region pattern, a news flash could come in.

With reel-to-reel, or with the filmed commercial on a planned telecine program, panic usually reigns. But with the TCR-100, London Weekend, can eliminate the chaos simply by pushing a button, and inserting the news flash cartridge for another time slot.

Stringent IBA Code

Continuing dependability of operating equipment is essential in the UK, due in large part to the IBA Code of Practice. Under the 1964 Television Act, the Authority is responsible for maintaining a high general standard in all respects, particularly in content and quality. The Technical Code follows from this, so that program and ad material shall be On Air unmarred by technical imperfections.

About twice a year, but with spot checks at any time, the IBA engineers come to all member stations to check the audio and video performance. In the US the FCC has overall control, but the code is not as specific as the IBA's. Of course, the BBC has its own technical code of standards. But with their own system of networking through Post Office links and lines, their problems are possibly fewer than those of the Independents with an intricate network and local commercials.

When the BBC first saw the Code applying to the Authority, their engineers gasped. The Authority laid down a path from the PO switchboard to presentation control, back to the switchboard, and so on. A maze. And at every point the audio had to be within limits, and the color accurately aligned.

"In practice it works out very well, and the introduction of cassettes has raised no problems here," notes Sidney Blumsom. "We welcome the IBA Code, because not only is this part of the terms of our license, but we ourselves MUST maintain high

standard to hold viewers on every part of the network."

Rigid standards for equipment selection and operation

Explained VTR engineer Malcolm Farrow: "At the outset we consider manufacturers' specifications. Where there are parameters listed by, say RCA and the IBA, we take the tightest! This applies to audio and video. Mechanics are a separate consideration.

Of course most of the TCR-100 data are well-known already . . . total playback phase jitter 6 nanoseconds peak-to-peak, audio signal performance ± 2 dB from 50 Hz to 15 kHz, and that sort of thing."

VTR Supervisor Alan Clarke continued: "To be blunt, our operation of the cassette system has been simplified. Time and money are saved by LWT's own test routine. For instance, we have a vector-scope for every VTR machine. These scopes run continuously from about 9:00 a.m. to close-down. We use mobile racks of equipment and have a three-man team of engineers doing nothing but 'Code of Practice' tests. The adjacent vectorscope on each VTR of course helps us immediately to assess if any faults are developing, then we promptly wheel in the test equipment. What tools are used? Well, pulse-and-bar generators, staircase

generators, chrominance/luminance delay measuring sets, and of course the video noise measuring set devised by the IBA themselves and made to their specs. Apart from Code of Practice tests, each VTR machine is fully checked through every two working weeks . . .".

TCR-100: Another step forward for LWT

In commenting on the future potential of the TCR-100, Production Manager Roger Philcox states, "We are building up an initial library of 500 cassettes. As for future production uses, well it all depends upon how reliable and flexible the system proves to be. Frankly we are still exploring the uses of 'carts,' and there are plenty more beyond the immediate horizon."

And, apropos reliability, Sidney Blumsom further remarks, "Down-time since the TCR-100 went On Air at LWT has so far been nil. A good element seems to be the essential ruggedness of the cart system itself."

This European premier installation of the TCR-100 is another step forward in London Weekend's plans to meet the demands of British TV in the Seventies.

Still another is a recently placed order by LWT for delivery of a second "cart machine."

LWT's superbly planned production center numbers seven TR-70 VTR's among its impressive equipment array.



Murphy's Law and The TCR-100

by Barry Lloyd,
Tape Product Analyst

Murphy's Law: If something can go wrong, it will go wrong.



NAB Convention finds Murphy and assistant investigating TCR-100 as possible threat to Murphy's Law.

At the recent NAB Convention, the RCA "Tape Theater" presentation featured a simulated journey through the master control rooms of the nation to discover whether Murphy's Law was still in effect . . . whether control room mistakes were still being made simply because they are there . . . and if the advent of the "cart" machine was endangering the Murphy premise.

In hopes of resolving Murphy's plight, the following depicts a normal day in the life of the average TCR-100. The TCR-100 is designed to eliminate most of what can go wrong in preparing and bringing short program and commercial segments to air. Its design philosophy is one of automatic operation. The record, dubbing and play operations are all programmed and actuated by a minimum number of operator moves. This, in the belief that the fewer the moves, the fewer the chances of mistakes—the more the operations, the more the chances for mistakes.

But, let's return to our average day.

Before the station manager arrives in the morning, the TCR-100 operator plays the color reference tape cartridge provided with the TCR-100. In this manner, he makes the few adjustments that may have been necessary. It is more likely that he merely confirms that no one had rotated any knobs the night before. After assurance that the playback electronics are properly aligned via the reference cartridge, the operator checks the record functions. From this point on, the TCR-100 pre-programmed functions make everyone's life easier. This includes the production crew, the librarian and traffic department, the operator, and even the accounting department.

Recording with the TCR-100

A little later in the morning, the production crew uses a corner of the news studio and the TCR-100 to make a promo, while the large studio and the reel-to-reel machines are doing agency production work. The TCR-100 has exclusive automatic features which make the record procedure simple. Of the two transports in the TCR-100, the operator uses the "B" transport for recording in the standardly equipped TCR-100 and pushes the Record Cue Up button on the Record Control Panel. The TCR-100 then takes over and automatically loads, threads and

record-cues the tape through the system's preprogrammed logic. The operator does with one push button what might otherwise require separate initiation of each of these tape manipulations. A second operator action is to dial the duration of the recording into the "Message End Time" register (thumbwheels that can be set for any time up to three minutes; set in single frame increments). A third and final action is to push the Record button. Again, the TCR-100 performs a pre-programmed procedure which includes the following items (after pushing only the record button):

1. The TCR-100 rolls the tape.
2. The start cue tone is automatically recorded in the cue channel.
3. An actor's cue (relay closure) is provided by the TCR-100 one second before the active message and remains for the recording duration.
4. Audio and video are recorded.
5. The end of message cue tone is automatically laid down and, if desired, is made audible at a point ten seconds before the finish of the recording.
6. The tape records for two seconds beyond the time dialed into the message duration and then automatically rewinds.
7. The tape is then play cued for previewings.

All these things upon one simple request!

Another exclusive feature of the TCR-100 is the provision of a command button on the Record Control Panel, labeled Record Recue. If there had been any reason to reinitiate the recording, one push of the Record Recue button would rewind the tape and record cue it again.

The TCR-100 operator has made a recording by simply pushing the Record button. If the operator would like to preview the recording, he can push the Preview button on the Play Control Panel. This exclusive TCR-100 feature will play the cartridge *showing none of the preroll nor the two seconds of recorded overrun*. By means of this preprogrammed operation, the operator can audition the recording the same as though it were playing in the middle of a series of cartridges. There is no need to program a phony station break and actually play the new recording



Operating day begins with a quick checkout of performance via this reference cart.

between two other carts to check the cues—one push of the Preview button does the job.

What happens after the tape is previewed? It is automatically rewound and play recued.

If either the start cue, end cue, or both need to be shifted, the fact that all recordings are timed from a fixed benchmark (the reflective start-of-tape marker) provides the operator with the facility to dial the cue shift into cue registers on the Record Control Panel. In this manner a station can be meticulous and provide 15 frames of black on the beginning and end of each message, if desired. The audio and video are left untouched while the start and end cues are moved by one push button each. The Start Cue Shift and Auto Cue Shift buttons are preprogrammed to make the proper cue positioning relative to the thumbwheel registers. Again, as upon completion of any record function, the TCR-100 automatically rewinds and play cues for subsequent preview. If the operator is satisfied with the position of the cues, he pushes the Reject button and the cartridge is unloaded and placed in its proper position in the fully accessible magazine.

Dubbing with the TCR-100

One other feature of the Record Control Panel is the adjustable external source preroll thumbwheel. The time (0 to 14 seconds) set on this thumbwheel provides a relay closure timed prior to the active message recording. When recording dubs from reel-to-reel machines or film projectors, this register allows a preroll that matches the station preroll practice for that particular program source. The standard TCR-100 records only on the "B" transport. With the TCR-100 option of equipping the "A" transport for recording, two cartridges can be dubbed simultaneously.

Preprogrammed system functions make recording on the TCR-100 much simpler. This fact is epitomized in the TCR-100 procedure for making a cartridge dub from the "A" (playing) transport into the "B" (recording) transport.

The TCR-100 operator prepares for an "A" to "B" dub of a cartridge by pushing the "A-B Dub" button and the Home button on the Transport Control Panel and placing the source material in bin number 1 and the tape cartridges to be recorded in bins 2 through 22 as needed. The operator then pushes the Record Cue Up button. The exclusive "A-B Dub" feature of the TCR-100 automatically loads, threads and cues the source tape in transport "A". The cartridge in bin 2 is loaded, threaded, and cued into transport "B". When the "Record Ready" status light comes on, the operator pushes the Record button. The cartridge material is played on the "A" deck and recorded into the "B" deck. The "A" deck automatically rewinds and record cues. The "B" deck unloads the dub.

Two carts were loaded, cued and one was duplicated via only four push buttons—an RCA TCR-100 exclusive feature. A copy of a 30 second spot can be made in 1 to 2 minutes. To make a second copy of the source cart, the operator (1) pushes the (magazine) Advance button and (2) pushes Record Cue Up to record cue the next cartridge and then

(3) pushes Record. For a 30 second spot, this subsequent dub takes less than 60 seconds.

In the dub process audio, video, cue, and EPIS information (if equipped with an Electronic Program Identification System) are all transferred directly from the "A" deck into the "B" deck. On the front of the SP-100, Signal Processing Unit, is a push button for selecting the option of dubbing of audio and video material directly from the "A" (playing) deck into the "B" (recording) deck or the option of playing the "A" deck and feeding its audio and/or video signals to the output of the Signal Processing Unit. This output signal can then be fed through a switcher for keying or inserts and then fed back into the TCR-100 "B" (recording) transport.

The exclusive features of the TCR-100 make recording and duplicating of cartridges a simple procedure of pushing only 3 or 4 buttons. There are no magazine bin selections to add confusion, no threading, no cueing or shuttling. Rewind after recording is always done automatically. These preprogrammed features are in keeping with the overall automatic concept of cartridge operation.

The RCA Cartridge

To the librarian and/or machine loader the red cartridge is convenient to store because there is no carton or "optional" cartridge cover to keep track of; no cartridge orientation to be concerned with during storage. In fact, the RCA cartridge has its own integral doors to protect the tape from the grubby hands that toss and catch cart tapes. These same doors protect the cartridge against dust accumulation during on-the-shelf storage. The RCA cart's label is easy to read when stored; the cart is always stored upright with the entire tape pack supported within the cart spool flanges.

Programming with the TCR-100

When loading cartridges into the TCR-100, the operator places them on the open magazine in the order the log indicates

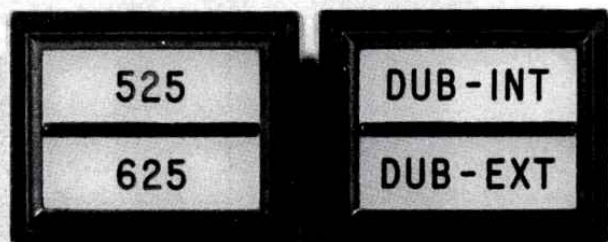
that they are to be played. The TCR-100 operator then, according to the program log, dials into the Automatic Sequencer Register (ASR) the number of cartridges to play during each station break—up to nine breaks in advance. The operator loads, threads and cues the first two tapes by pushing the Play Cue Up button. The TCR-100 is ready to be turned over to the master control. It probably won't need reloading for another 6 or 7 station breaks. THAT'S SIMPLIFIED MACHINE PROGRAMMING!

The TCR-100 system design has been carried out so that the play preroll time can be set in the TCR-100 in 1 second increments from 2 to 10 seconds. There is no need for external delay relays and special operator techniques to generate the proper play preroll. Although the remote play command is adjustable from 2 to 10 seconds, the local (machine push button) play command is always used with a standard 2 second preroll.

If the operator, or computer, has initiated the play command prematurely a push of the Play Recue button will immediately recue the tape for play. This RCA TCR-100 exclusive feature has obvious advantages in preventing make goods, etc., occurring as a result of trigger-fingeritis.

Of equal importance is another exclusive preprogrammed feature of the TCR-100. As previously described, the Preview button serves the unique cue audit function during production, but it also has an important function to perform in the on-air mode as well.

To preview the entire station break on the TCR-100, an operator takes advantage of the unique preprogrammed Preview command. Pushing the Preview button will play the number of carts programmed in the sequence register for the break and then leave all of these cartridges in their proper position in the completely accessible magazine. The TCR-100 remembers the first cartridge of that station break and how many cartridges were played. The operator changes the station



Provision for selecting internal or external dubbing modes is provided on the Signal Processing Unit. In the external mode an output signal can be fed through a switcher for keying and inserting and then fed back into the "B" (recording) transport.

break carts and/or pushes the Play Cue Up button to reprogram the break. The operator has then previewed the entire station break (up to 8 cartridges) and is ready to go again having pushed only two buttons, Preview (to set the break) and Play Cue Up (to reset the break).

Similarly, a client's carts can be auditioned on the TCR-100 without disrupting the sequence register or the magazine load by "previewing" the station break, exchanging the on-air carts for client's carts and then pushing Preview for the client. After this preview, the program material is again placed in the magazine and play cued up. The TCR-100 has maintained the sequenced start point and events in memory for the operator. The TCR-100's ability to perform a preview without proceeding to the next break programmed is an exclusive feature.

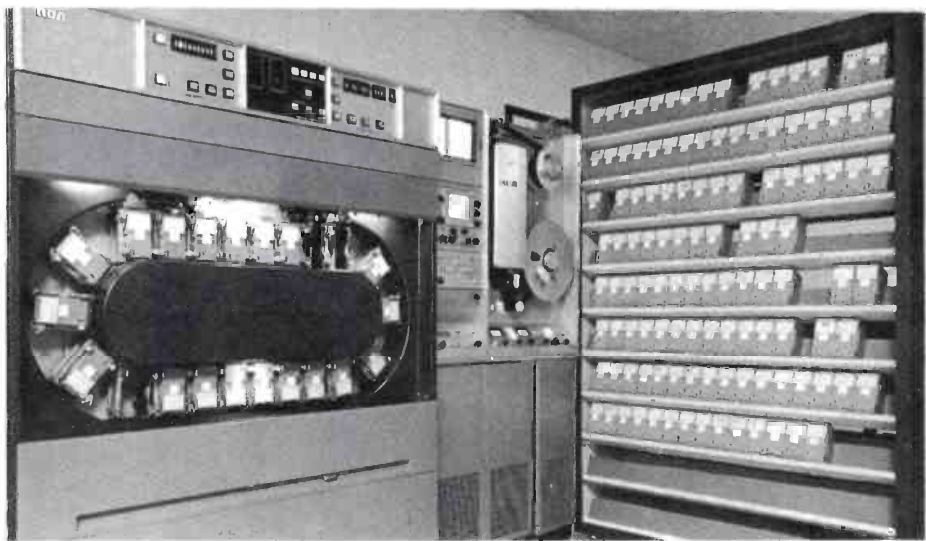
Not to be neglected is the other end of the station break—the last cartridge of a sequence. If the automatic sequence register has been programmed for five cartridges, the fifth, or last cartridge is identified as the last one to the operator. This is done by both of two ways. The local (machine) panel and the remote control panel will indicate "last event" in the status display while the last cartridge is playing. In addition, a relay is activated ten seconds before the end of this last cartridge and remains activated for eight seconds. With these exclusive features of the TCR-100, the operator is prewarned and then warned again.

More Conveniences

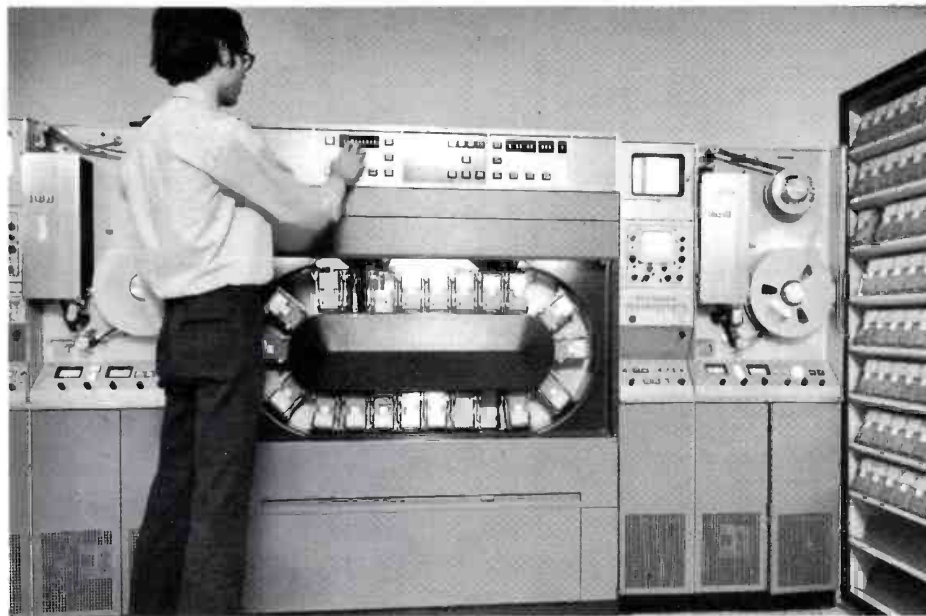
Speaking of operator conveniences, the indication of the number of cartridges that will play in a sequence is remotable. Remote indication of the bin number that is cued or playing is also provided. Interface for both conveniences is provided on the rear of the TCR-100.

The TCR-100 can be "slaved" to a TR-60 or TR-70 reel-to-reel recorder. In this setup, the "master" TR-60 or TR-70 will time share its playback electronics with the TCR-100. The system can be recording network delay on the reel-to-reel machine while playing back on the TCR-100 and vice versa. The TCR-100 may be using the shared color playback electronics for on-air use but it is possible to simultaneously cue the reel-to-reel machine in monochrome through an auxiliary demodulator. An auxiliary demodulator is provided in the TCR-100 machine as well.

TCR-100 "slaved" to TR-70 incorporates same time-sharing advantages as with TR-60.



A typical library with over 100 active carts ready to load and play.



A popular and economical option is the TCR-100 "slaved" to the TR-60 reel-to-reel recorder. The "master" TR-60 time-shares its electronics with the TCR-100. The TR-60 can record while the TCR-100 is playing back and vice versa.



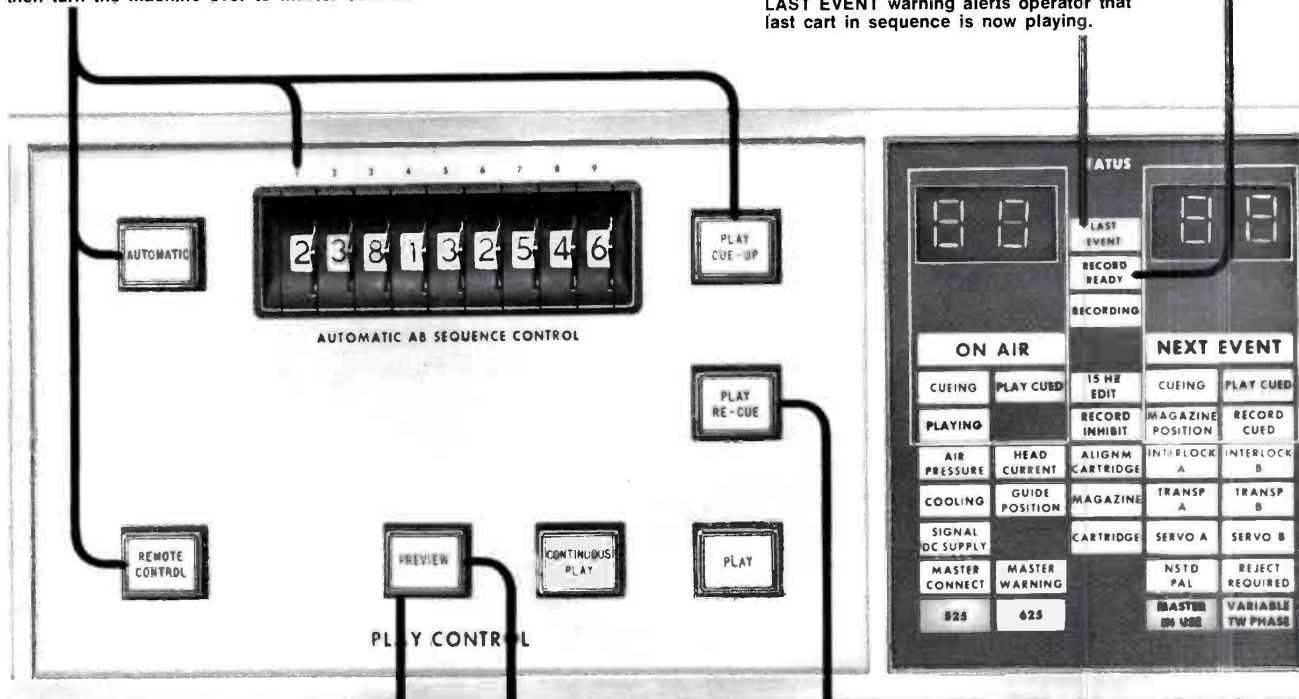
How About That, Mr. Murphy?

You've seen the kind of operations that make the TCR-100's average day. It has played about 150 carts, recorded another dozen, dubbed some saturation schedules from the film library, made some station promos . . . with fewer operator moves than any other device. It provided uniform picture quality and reliable air operation. It's made the tv station a happier place to work.

To program a break: (1) dial AUTOMATIC AB SEQUENCE CONTROL (2) push PLAY CUE-UP (3) push AUTOMATIC (4) push REMOTE and then turn the machine over to master control.

RECORD READY indicator signals operator that TCR-100 is ready for recording.

LAST EVENT warning alerts operator that last cart in sequence is now playing.



PREVIEW on the Play Control Panel plays a cart showing none of the preroll or recorded overruns. It shows the segment just as it will appear on-air.

PREVIEW also permits playing the carts in a given break and returning them automatically to their proper position in the completely accessible magazine.

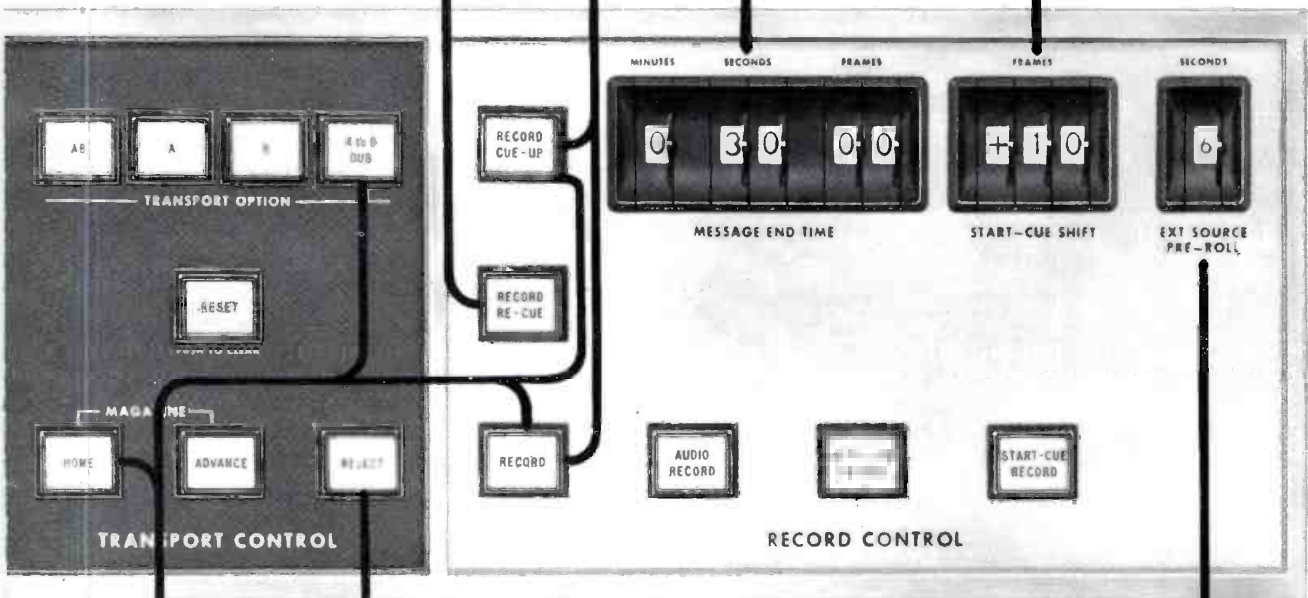
PLAY RECUE can rescue the break should the operator start the machine prematurely.



Three step record procedure: (1) push RECORD CUE UP (2) dial MESSAGE END TIME (3) push RECORD button. The TCR-100 does the rest.

One push of this RECORD RECUE button rewinds the tape and cues it again.

A CUE SHIFT feature permits dialing in plus or minus 29 frames (one second).



REJECT after preview unloads the cart and places it in the proper position in the magazine.

EXT SOURCE PRE-ROLL thumbwheel provides preroll (up to 14 seconds) of other station program sources.

Four step dub procedure: (1) push A to B DUB (2) push HOME (3) push RECORD CUE-UP, (4) push RECORD.

Our cure for the blues works automatically.

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

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

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

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

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

Exclusive new automatic color circuits in the TK-28 maintain

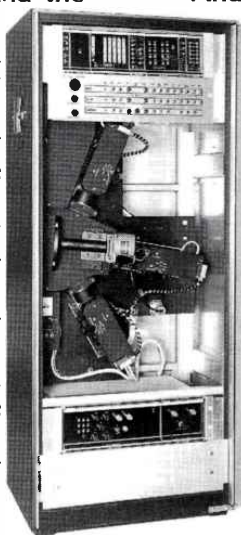
color balance and correct for printing errors and color temperature variations from projector to projector.

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

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

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

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



RCA

New TK-28 color film camera.



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WSAV
WPTV
WKRC
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WUAB
KTVW
WTOP
WTNH
KMGH
WVUE
WTVB
WCPO
WBOC
WTMJ

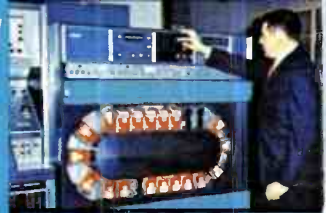
KARD • KCEN • KHQ • WTA • WSPA • KNTV



KPRC • KPTV • KSD • KSLA • WDAF • KTSM



KVRL • KWGN • WAFB • WBAL • WBAP • WBAY



WWL • WJAR • KPLR • VENEVISION • WAPA
LWT-UK • KWTW • KSTP • KRON • WSOC •
KFSN • WATE • TV-Q • KOVR • KYTV • CFRN