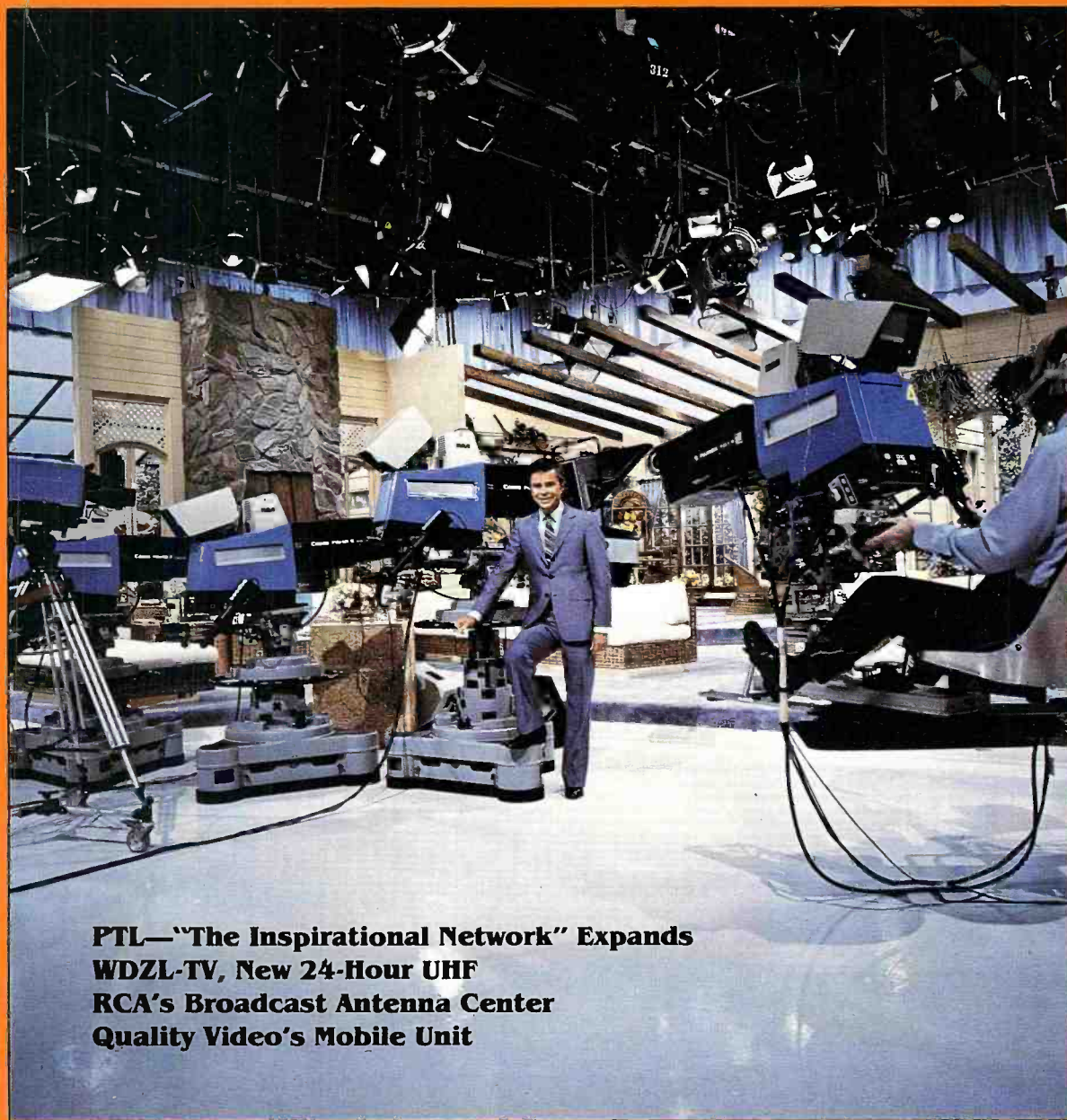


Jamison  
**RCA  
Broadcast  
News** Volume 174

Broadcast and Teleproduction Happenings



**PTL—"The Inspirational Network" Expands  
WDZL-TV, New 24-Hour UHF  
RCA's Broadcast Antenna Center  
Quality Video's Mobile Unit**

# RCA

## On the move . . . for you!



View from United States Avenue

There is a new RCA Broadcast Systems Division, operating from a new headquarters location in Gibbsboro, New Jersey.

Administrative operations—marketing, product management, Tech Alert, customer service and finance—are already in place on site, and a new building is under construction. When completed later this year, TV transmitter engineering and production will move from Meadow Lands, Pennsylvania. Custom Repair, Assembly and Engineering (CRAE Shop) operations will relocate from Pennsauken, N. J.

We're moving toward a full integrated operation—consolidating administration, engineering and manufacturing in one area for added efficiency and customer-responsive service.

RCA Broadcast Systems move to Gibbsboro reaffirms our commitment to remain the industry's leading supplier of quality products, with unequalled support services. We're moving ahead with new products, a new environment, a new organization, and a new spirit.

# RCA

# RCA Broadcast News

March 1984 Vol. No. 174

## CONTENTS



### 4 New WDZL-TV Jumps Into Miami Market

This fast-moving UHF broadcaster found a transmitting site, a studio, and was on-air operating a 24-hour a day schedule—only eight months after the CP was awarded. Getting there took a heroic effort.



### 10 Brazil's New Five-Station TV Network On-Air

Rede Manchete de Televisao launched its five-city network on a grand scale in mid-1983, with state-of-the-art transmitting and studio facilities. The VHF transmitting and antenna systems are covered here.



### 12 RCA Broadcast Antenna Center Revisited

The source for most broadcast television antennas in the U. S. is RCA's facility in Gibbsboro, NJ. Started in 1954, it remains a dedicated antenna engineering resource center, greatly expanded in area and in capability. This report is an update on the facility, personnel and developments.



### 18 More And Better: PTL Expands Its Television Reach

With expanding audiences, larger facilities and ever-growing video requirements, PTL maintains its state-of-art operation, producing more and better programming. Their computer-age teleproduction operation is covered here.



### 25 QVLV Operates A Quality Mobile TV Unit

Quality Video, Las Vegas, covers a lot of turf with its modern 60-foot television production unit. Equipped with six TK-47 automatic cameras, two handhelds, and a complement of video tape, audio, switching and communications facilities, the QVLV mobile unit is a flexible, full scale TV studio on wheels.

### 30 Products In The News

Added to the RCA video product line are the TKS-100, an innovative telecine system which utilizes CCD sensors and micro-processor controls, and the TH-400, a low cost one-inch VTR.

# RCA

### Joseph C. Volpe Heads Broadcast Systems Division

Joseph C. Volpe has been named Division Vice President and General Manager of RCA Broadcast Systems Division, now headquartered in Gibbsboro, N. J.

Before his promotion, Mr. Volpe was Division Vice President, Operations for Broadcast Systems.

He joined RCA in 1958 and served in a series of engineering assignments with the Missile and Surface Radar unit of the RCA Government Systems Division. In 1971 Mr. Volpe became System Project Manager of the AEGIS Program, a combat weapon system developed for U.S. Navy cruisers. Three years later he was appointed Chief Engineer of the Missile and Surface Radar activity and in 1980 he became Director of Product Operations for this group. During 1981 he was advanced to Division Vice President, Broadcast Transmission Systems, with responsibility for product management and engineering for RCA's line of broadcast transmitters, antennas and technical services.

Mr. Volpe succeeds Joseph B. Howe who has been appointed Staff Vice President and Chief Engineer on the staff of RCA Group Vice President, John D. Rittenhouse.



Joseph C. Volpe

### WPAN-TV On-Air With Total RCA System Package

A new independent UHF station, WPAN-TV, in Fort Walton Beach, Florida, is going on-air with a complete RCA system package including transmitter, antenna and studio equipment.

Valued at approximately \$1.75 million, the equipment package includes a TFU-36 JDA antenna, a TTU-55C 55-kilowatt transmitter and a 7-meter satellite receiving station, four TK-710 portable cameras and two TR-800 one-inch video tape recorders, as well as state-of-the-art switching and special effects systems.

Operating with an ERP of three megawatts, Ch. 53 will cover the Northwest Florida region, including Pensacola and Destin with a 'city-grade' signal, according to Elbert Davis, President of Fort Walton Beach Broadcasting Inc., and the station's General Manager.

### High-Power Communications Satellites

RCA Astro-Electronics has been awarded a contract in excess of \$120 million to design and build three high-powered communications satellites.

The three Ku-band satellites, to be produced for RCA American Communications Inc., will provide more efficient, more reliable distribution of TV services to customers in major metropolitan areas.

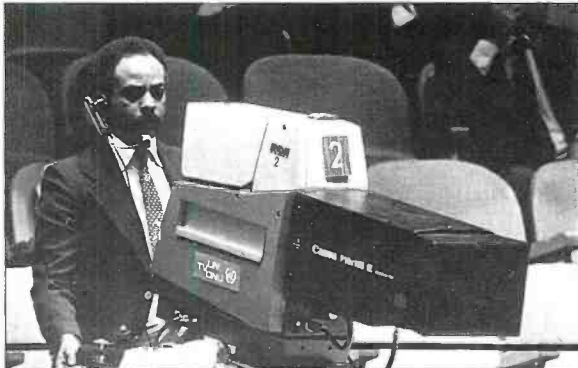
The first of this new generation of communications satellites built by RCA is scheduled for launch in 1985. The Ku-band system's other two in-orbit spacecraft are expected to be in position by 1987.

"These satellites represent a high performance approach to satellite designs through the use of space-proven lightweight, cost-effective component designs based on the highly successful RCA Satcom domestic communications satellite system," said Charles A. Schmidt, Division Vice President and General Manager at RCA Astro-Electronics.

The new satellite's increased signal strength permits use of smaller antennas which can be situated on top of buildings in urban areas. Also, the frequency of the Ku-band transmission is subject to minimal interference from terrestrial radio signals such as microwaves.

Thus, the convenience of Ku-band system makes it a useful tool in the development of services such as teleconferencing and private voice and high-speed data networks linking business centers.

The Ku-band system also offers an attractive option for broadcast television networks by eliminating the need for expensive telephone, microwave or coaxial cable connections to a remote antenna location.



### United Nations Converts RCA TK-47 Cameras For Triax Operation

The United Nations television program production center converted its two RCA TK-47 automatic studio cameras to operate with triax cable. The TK-47s are used in the meeting rooms of the General Assembly and Security Council.

According to Martin Bunnel, Production Manager of the U.N. television operation, the RCA cameras could now be used to broadcast meetings of those two U.N. bodies.



### RCA Equips New Indianapolis UHF Station

WPDS-TV, a new UHF television station in Indianapolis, Indiana, is on-air with approximately \$4.5 million worth of equipment purchased from RCA.

Owned by Anacomp Inc., Ch. 59 broadcasts with an RCA TTU-110C 110-kilowatt transmitter and a TPU-25G pylon antenna.

To produce and edit its daily local news programming, WPDS uses three RCA HAWKEYE camera/recorder combinations and two HR-2 studio VTRs.

Even before its air date, the WPDS studio was in operation, handling teleproduction assignments. The studio is equipped with three TK-47 automatic cameras, four TR-800 one-inch recorders, and a telecine system comprised of a TK-290 automatic telecine camera, two TP-66 16mm film projectors, a TP-7 35mm slide projector and a TP-55 multiplexer. Commercials, station breaks and other short program segments will be played to air with two TCR-100A automatic cartridge machines.

Other equipment purchased from RCA includes computer graphics and electronic graphics systems, a master control and automation system and a routing switcher.

### Emmy Winner



RCA's HAWKEYE camera/recorder combination won the EMMY in the "recording camera" category from The National Academy of Television Arts and Sciences. President John Cannon (left) of the academy presented the EMMY to Dennis J. Woywood, Vice President, RCA Broadcast Systems Division.

"We consider the EMMY to be the most prestigious recognition of technical achievement a company can receive," Mr. Woywood said. "It is an honor for an RCA design team to again be recognized for its contribution to the television industry."



# Starts Fast, Runs Non-Stop

Independent WDZL-TV, Miami's newest station, got off to a remarkably fast start: only eight months after the CP was awarded, TV-39 was on-air and broadcasting a full 24-hour schedule.

Starting with a staff of two in February 1982—General Manager Susan Jaramillo and Station Manager William Lincoln—the entire facility was planned, constructed, installed, staffed, and ready for the October 16, 1982 on-air date. Even more astonishing this nucleus staff was not expanded until July!

By then the transmitter and antenna were ready for installation; a studio site had been located, purchased and set for renovation and installation of equipment. From July until the October 16 air date, the pace was hectic, Bill Lincoln acknowledges. It was a monumental task, involving 7-day work weeks and around-the-clock activity.

For Ms. Jaramillo—who is also a General Partner of 39 Broadcast Limited, the station owners—bringing TV-39 on-air marked another achievement in a success-studded career. (See box text.)

## Antenna Dropped

Three days before the air date, disaster struck. As the RCA TFU-28DAS Pylon Antenna was being hoisted up the tower, it broke loose, plunging more than 600 feet to the ground. Fortunately, there were no injuries, and the transmitter was undamaged. Undeterred by the setback, WDZL management was able to locate a standby antenna which could be installed in time for the October 16 sign-on. However, the station had to go on-air with reduced power, operating at only 316 kW instead of the projected 5,000 kW. Meanwhile a new antenna was fabricated on a rush basis by RCA and was delivered within two months.

## Tower/Transmitter Site Located

Serendipity played a key role in the swift transition of TV-39 from a paper entity to a full scale broadcast operation.

The first order of business, Mr. Lincoln affirms, was to secure a transmitter site and a position on a tower. Simultaneously, an intensive search was begun for a suitable location or facility for studio operations and administrative offices.

A tower and transmitter site were available from the Dade County Board of Education which had closed its UHF station. As an additional bit of good fortune, the transmitter structure was also available and adapted to accommodate the 110 kW TTU-110C Transmitter. Although transmission line was already installed on the tower, it was decided to go with new line. The TFU-28DAS Pylon Antenna and TTU-110C Transmitter were specified when filing for the CP through consulting engineer Julius Cohen.

## A Hollywood Studio

The present studio location in Hollywood, some ten miles north of Miami, was formerly occupied by a commercial television production house and was ideally suited for TV-39 since it had ample power, air conditioning, a studio, and a layout that could readily adapt to the new station's needs.

In addition, Bill Lincoln notes, it saved the cash outlay that major construction or renovation would require. And, equally important, the facility fit into the short lead time for getting the station on-air.

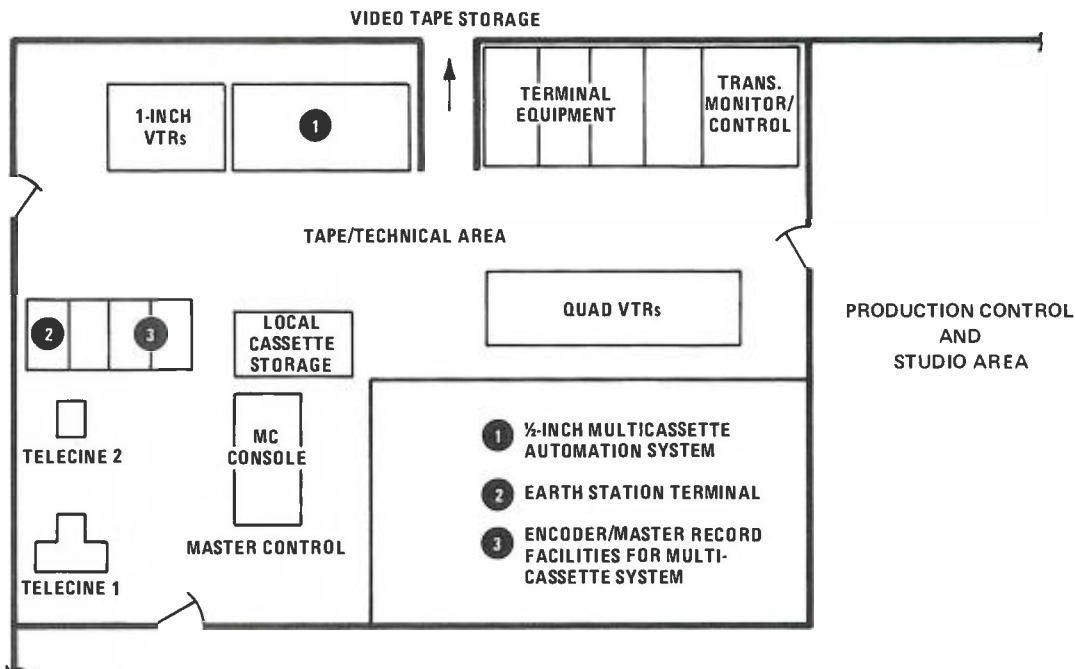
## Building And Staffing

Ms. Jaramillo and Mr. Lincoln moved into the new building in July. During the next four months, prior to the October 16 air date they completed renovating and refurbishing the studio/administration facility; hiring a staff; renovating a transmitter building and installing the transmitter, line and antenna; and purchasing, laying out and installing complete studio facilities.

Staffing was done in stages, beginning with a small cadre of managers. In August, the technical staff was built-up to get the station on-air; then sales and administrative people were added. By the mid-October air date, the station was fully staffed, with fifty employees.

Among those hired to install technical facilities was Doug Holland, now Chief Engineer for WDZL. Mr. Holland's 10-year career in broadcasting has been in radio and automation—a background which has been especially valuable in developing computer-based systems for TV-39's technical operations.

# 24 hours



## Susan Jaramillo

Susan Jaramillo represents a real life fulfillment of the "American Dream", overcoming hardship and adversity to achieve stunning success. Born in Ecuador, Ms. Jaramillo was five years old when her family emigrated to the U.S., settling in Chicago. The early years were difficult since her father, a physician, had to repeat his medical training to be licensed for practice here.

Ms. Jaramillo graduated from high school at age 16, started her first business venture at 17 and earned an MBA from the University of Chicago in 1977. She began her broadcasting career at WBBM-TV, the CBS 0 & 0 station in Chicago, where Bill Lincoln, Director of Planning and Administra-

tion recruited her to work in his department.

After a three-year stint at WBBM, she joined 20th Century Fox in Syndication Sales, and moved from there to American Cinema, an independent movie producer and distributor.

On learning of the availability of a TV channel in Miami, Ms. Jaramillo swung into action to make a reality of her dream of owning and managing a television station.

Awarded the CP for Channel 39 in February 1982, Ms. Jaramillo immediately turned to the task of getting the station on-air. Her first move was to persuade Bill Lincoln to leave WBBM to become station Manager for WDZL-TV.

## William Lincoln

Bill Lincoln started in broadcasting with CBS in New York City in 1972, after earning his MBA degree. There he was involved in long range planning, primarily projects relating to Owned and

Operated stations. Subsequently, he transferred to WBBM-TV, Chicago, as Director of Planning and Administration, remaining there until February 1982 when he became Station Manager for the new WDZL-TV.

## Technical Operations

The Technical/Production staff of twenty includes seventeen operators and production personnel and three technicians and is responsible for maintenance, production and air operations.

The station operates on a 24-hour schedule, with two people handling the on-air operations per shift—a Master Control Operator and a Tape Room Operator. The MC operator handles on-air switching and loads film.

## Equipment Complement

The equipment complement at TV-39 reflects its extended broadcast and production schedule. Tape and Master Control includes a TK-29 Telecine System; three quad VTRs; nine HR-2 HAWKEYE ½-inch Studio VTRs (used in a station-designed multi-cassette commercial playback system); two TR-800 one-inch VTRs, and a ¾-inch videocassette unit.

Production Control houses three more TR-800s and a Grass Valley GV-300 with E-Mem and two effects banks. The Studio camera complement includes two TK-761s; a TK-76 portable with large viewfinder and CCU.

## Multi-Cassette Playback System

The young TV-39 technical staff demonstrated its facility for innovativeness by designing a multi-cassette commercial playback system that went on-line July 18, 1983, barely three months after the system was conceptualized.

The microprocessor-controlled system includes an Encoder/Keyboard unit; a Master Record HR-2 ChromaTrak ½-inch studio VTR; eight Playback HR-2 machines and two Time Base Correctors (one for system use; one for backup). A single National Semiconductor computer handles all system functions, including cueing, sequencing and logging.

The system was designed and constructed by Andy Sackheim and Terry Tucker of the TV-39 Technical Staff, who refer to it as the "Auto-Cart". It has provided an efficient and cost-effective means of handling commercial breaks.

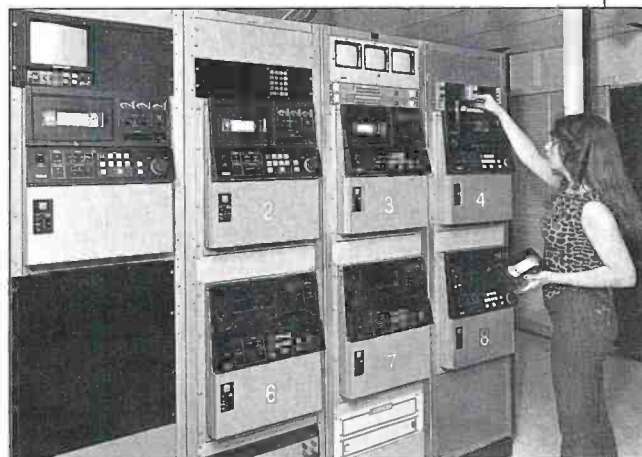
As an independent, the majority of spots aired by TV-39 are locally originated. The system handles playback of 400 to 500 events daily, and has performed virtually flawlessly, Mr. Holland remarks. The station now has about 1400 to 1600 VHS cassettes dedicated to the multi-cassette playback system. All "break" segments—commercials, promos, PSA's, program opens, closes and bumpers—are dubbed to the cassette for on-air playback.

## Improved Efficiency

The system hardware and software are designed for simplicity, accuracy and ease of operation. Along with these operational features, it also provides a smooth on-air presentation of commercials with clean transitions.



Tape center at TV-39 with "Auto-Cart" system at right and operator at the Encoder/Keyboard unit.

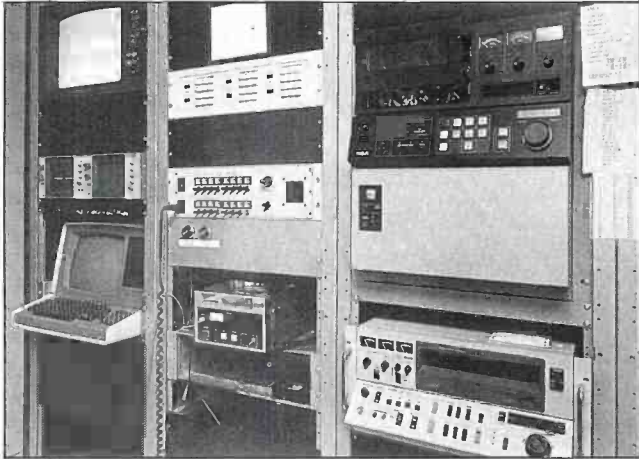


Loading cassettes for commercial breaks is easily handled.

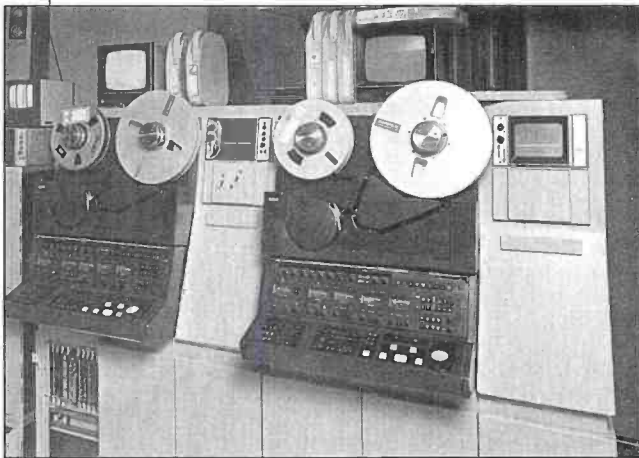


½-inch ChromaTrak Multi-cassette system at WDZL handles 400-500 events daily.





**Control center for the Multi-cassette playback system includes an Encoder/Keyboard Unit and a Master Record HR-2 ChromaTrak 1/2-inch studio VTR.**



**Two TR-800 one-inch VTR's in the technical area are used for program playback.**



**Hard copy printout used with Multi-cassette playback system provides positive identification of each commercial, its duration and time of airing.**

Before the new system became operational, the tape room was tense and hectic, with commercials rolling on the TR-800 VTR's; on the quad machines and on occasion, even on the film chain.

Evening production time was hampered when a spot reel was dubbed. At this time, all five TR-800's were installed in the tape room and used for program playback, dubbing and production. With the "Auto-Cart" cassette system covering station breaks, three TR-800's were moved to production control where they are dedicated to production use.

The result is better utilization of these machines and of their production-related capabilities.

### **System Operation**

A Jefferson Data business computer is used for generating log data and the normal Traffic-Sales-Accounting functions. The on-air operations are handled by a Master Control operator and a Tape Operator.

The Tape Operator refers to a "cart load sheet" for handling the break events. The Tape Operator loads and unloads cassettes and is responsible for tape machines used for program playback. The MC operator loads the film chain and handles on-air switching.

In operation, the Tape Operator uses a keypad to program the number of events in the upcoming break. This is displayed on a monitor at the bank of HR-2's and also at Master Control.

The display shows the machine, identifies the commercial in plain text, and shows the "next event" via cursor arrows.

Following the log, the operator loads the VTR's for the break ahead. As the break approaches, the MC operator hits the "Take" key, and the cassette playback system automatically handles the break. After each cassette is played, the system switches to the next event, and the cassette automatically rewinds. On completing the last event in a break sequence, the cassette system automatically pre-rolls and switches to the next pre-set program source on the MC console.

### **Hard Copy Printout**

As each commercial is being aired, the hard-copy printout is generated at Master Control, identifying the commercial and the precise duration and time of airing to confirm the program log and provide necessary verification for billing.

### **System Redundancy**

The playback machines in the system are loaded sequentially, starting with any machine. If an assigned machine malfunctions, or is not loaded with tape, the system automatically cycles to the next event.

"It's a pretty secure system and has been thoroughly debugged," Mr. Holland remarks. "As far as we know, we have never accidentally played a wrong tape on-air. The operator can see the data written on the cassette itself, as well as on the display monitor for direct comparison."

"Since the day the new cassette playback system went on-line, we haven't used the dub reel, and have not had a failure. In fact, one of the features of this system is that it has eight VTRs for playback, which provides more than ample redundancy."

The function of dubbing to cassette is the responsibility of the Tape Operator or of Production, depending on the volume of dubs. With the encoder and dedicated HR-2 Record/Playback VTR, dubbing can be done at any time without affecting system operation.

A "media management" function in the system keeps the track of the number of passes for each cassette. According to Mr. Sackheim, there has been no significant degradation of tapes, even on some used during testing which have made 500 to 600 passes. The system also includes diagnostics to pinpoint problem sources.

### **Tape and Telecine**

The five TR-800 one-inch VTRs at WDZL have been busy, Mr. Holland confirms. For the first nine months the station was on-air, the TR-800s handled commercial breaks, program playback and production around the clock. With the new multi-cassette system installed for station breaks, three of the TR-800s have been moved to Production Control as dedicated production machines.

"So far we have been editing with the built-in edit facility on the TR-800, which is quite accurate. We are also developing our own computerized editing system, using a Model 16 Radio Shack computer. This is being done by two of our technical staff members, Andy Sackheim and Terry Tucker, who also designed the hardware and software for the multiple cassette playback systems."

As might be expected, the TK-29 Telecine system is used extensively, both for program play and for production. Doug Holland notes that sixty percent of the TV-39 program material is on film. The film programs are transferred to 1-inch tape during the first on-air showing, and subsequent repeats are tape playbacks.

At present, Production use of the TK-29 system is limited to the 9:30 A.M. to 11 A.M. period daily when the 700 Club is broadcast live, followed by the PTL Club which was recorded the previous evening via satellite.

### **Studio/Production Control**

The TV-39 studio, 60' by 40' with an 18' ceiling and a hard cyc of 50' x 23', is one of the largest north of Miami, and provides the station with an excellent production capability. Two TK-761 cameras with prompters are used for studio pro-

ductions, augmented by a TK-76 with large viewfinder and CCU for video control.

Production Control adjoins the studio, with a window giving the director both eye and voice contact with the floor crew and talent. The PC console includes a Grass Valley GV-300A switcher with E-Mem; a 3M Graphics Model D-8800; a Quantel DPE-5000; portable 8-channel audio mixer and a GV routing switcher for switching any video or film source into any of the three dedicated TR-800 one-inch which are located in the production control room. The console also includes the usual monitoring and intercom facilities and CCU's for the three studio cameras.

"We would like production to be a profit center for WDZL," Mr. Lincoln says. "We're set up for it with technical capabilities, and also possess one of the finest studio facilities in the area."

The production staff works two 8-hour shifts, with five people per shift to handle cameras, videotaping, editing, dubbing, audio, and field operations. The hefty production schedule includes numerous in-house promos; program assembly, and extensive dubbing as well as client commercials.

The second production shift ends at 11 P.M., when the crew sets up for the all-night movie program "Live From Hollywood", which features popular personality Dave Dixon to introduce, critique and comment on the films.

This midnight to 6 A.M. movie segment concludes WDZL's 24-hour daily programming. During this "graveyard" shift, a Tape Operator and a Master Control Operator (in addition to Dave Dixon) handle all air and production operations. Camera positions are preset and changed occasionally by the Tape Room and MC operators.

### **HAWKEYE Recording Camera**

An HCR-1 HAWKEYE Recording Camera is used for location shoots for commercials and program content. One of the early uses for the system is in producing the "Entertainment 39" show. Featuring talent George Capewell, this production includes coverage of noteworthy happenings and on-location interviews with local celebrities, visiting performers and personalities.

The HAWKEYE tapes are dubbed to 1-inch for editing as inserts for the "Entertainment 39" program which is taped on Tuesday and aired Saturday.

"The HAWKEYE quality is excellent— $\frac{3}{4}$ -inch can't compete with it," says Mr. Holland. "The ChromaTrak format is cost effective and high quality. That's why I expect the industry to latch on to it."

### **Transmission System**

WDZL's TTU-110C Transmitter is operated at 104 kW output, combined with the TFU-28DAS Directional Pylon Antenna to deliver a maximum 5,000 kW ERP. The TFU-28's skull shaped pattern



**Production Control adjoins the studio, with a window giving the director both eye and voice contact with floor crew and talent.**

provides strong, efficient signal coverage of the market.

The transmitter is fully remote controlled and is equipped with the new TTUE-44 Exciter and the high efficiency aural and visual couplers. The TTUE-44 incorporates a SAW filter for vestigial sideband filtering, and achieves final frequency by low level up-conversion of the modulated IF signals with a single heterodyne local oscillator.

WDZL-TV was the first station to install the high efficiency Aural and Visual Couplers, and they have performed well. "The aural and visual couplers have added tremendously to the efficiency of the transmitters," Doug Holland notes. "We're getting about 53% conversion efficiency out of the visual power amplifier, which is excellent."

#### **Freon-Filled Line**

An unusual feature of the transmission system is the amount of power—104 kW—handled by 6½-inch transmission line, according to Mr. Holland. Some 700 feet of line is used from the waveguide combiner to the antenna. The line is filled with Freon at two atmospheres, with the transmission line and transmitter protected against damage from leakage by a two-step process which monitors pressure in the line and cuts back transmitter output if the line develops a leak. Normal pressure is 28 psi. If pressure drops two pounds, transmitter output power is cut by a half.

"We have had no leaks at all—not a pound of Freon has been used up," states Mr. Holland.

"Before loading the Freon in the transmission line, we actually evacuated it down to a one micron vacuum. When the Freon was put in the line, it looked like a refrigeration system, with ice completely covering some 35 feet of ¾-inch fill tubing. It took an hour and a half to fill the line, and we

used 95 pounds of Freon to fill it.

"We went to the 6½-inch line primarily because the line already on the tower was that size, and larger line would have required building a new tower. And, of course, the smaller line costs less."

#### **Program Flexibility And Innovation**

As the second independent in the Miami market, TV-39 provides an additional alternative viewing option, Mr. Lincoln comments. "We are youth oriented, with appeal to younger adults as well as children. As a new station, we can take more risks and be more innovative in our programming than established outlets. For example, our line-up of films and syndicated shows is being augmented with increased sports programming, including major league baseball, basketball, and University of Florida football."

#### **Phased Growth Pattern**

Bill Lincoln sees the development of TV-39 as a three-stage evolution. First, the building and start-up phase, followed by a transition period of growing and adapting to establish a position in the market. And finally, the "greening", maturing phase where the station is a competitive force in the market, with a solid viewer base.

#### **Progressive Ratings Improvement**

With the building and start-up phase completed, what progress has been made?

"There has been a progressive improvement in every sweep since November 1982," Mr. Lincoln affirms. "The reach is increasing on a linear basis from one rating period to the next, with strong appeal to the key young demographic group." Young WDZL-TV has its course charted and is moving in the right direction—up.

# TV MANCHETE STAN

With the slogan "Television for the Year 2000", Rede Manchete de Televisão (Manchete Television Network) launched a new five-city television network in Brazil, providing television coverage of the most populous areas of that country. The "network" operates from state-of-the-art studio and transmitting facilities in Rio de Janeiro, São Paulo, Belo Horizonte, Recife, and Fortaleza.

On June 5, 1983, the first three stations went on-air simultaneously at 7 P.M. All five are now on-air.

All of the stations are VHF, both highband and lowband, and two are broadcasting with circularly polarized antennas. The transmitting systems and antennas were supplied by RCA Broadcast Systems.

## Communications Empire

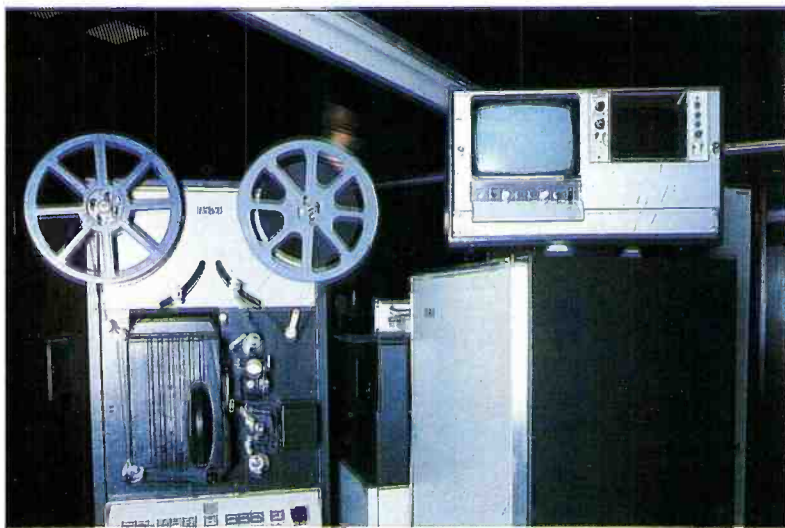
The new network is the latest expansion of a communications empire headed by Adolpho Bloch, who emigrated to Brazil from Russia with his family in 1922. The highly successful Bloch printing operation launched Manchete magazine in 1952, followed by other magazines, books and encyclopedias, resulting in what today is the largest printing complex in Latin America. In 1979, the Manchete enterprise inaugurated a network of six FM and AM radio stations, and in 1981 it secured the license for five television stations.

## São Paulo . . . the best picture for Brazil's biggest market

TV Manchete's presence in São Paulo is highly visible, starting with the impressive 151-meter self-supporting tower (408 ft.) topped by a 22 meter (60 ft.) TCL-12A9 circularly polarized antenna. The tower and antenna are at the top of Sumaré



Channel 9's tower at São Paulo rises above its glass-arched transmitter/administration building.



TK-29 telecine systems are employed at various TV Manchete locations.

# DS TALL IN BRAZIL



Base of TV Manchete tower at Sumaré Hill provides a panoramic view of Rio de Janeiro and its magnificent harbor.



Controls for TTG-30/30L parallel transmitters are console-mounted.

Hill, overlooking the entire city.

At the base of the antenna is Channel 9's technical plant, housed in a modern four-story building which is designed with Master Control operations on the first floor and an air conditioning system on the second floor to maintain the temperature throughout the building at a comfortable 23° C. The top floor houses the transmitting plant, while the ground floor has the

power plant and safety facilities.

The transmitters at Channel 9 are state-of-the-art RCA TTG-30/30H, 60 kW parallel systems.

### Reaching High and Wide in Rio

Rising to a height of 182.8 meters (493 ft.) from the top of Sumaré Hill in Rio de Janeiro, TV Manchete's Channel 6 antenna/tower combination is the tallest privately owned such structure in Brazil.

The circularly polarized RCA TDM-7A6 antenna, in combination with the station's TTG-30/30L 60 kW lowband parallel transmitter, delivers a TV picture of high technical quality up to a radius of 300 km (180 miles) according to Rede Manchete.

The other three new Rede Manchete transmitting systems utilize single-ended RCA "G-Line" VHF television transmitters and Superturnstile antennas:

Belo Horizonte, Channel 4, is equipped with a TTG-16L, 16 kW transmitter and a Type TF-3EM antenna.

In Recife, Channel 6 operates with a TTG-30L, 30 kW transmitter and a Type TF-4B antenna.

Fortaleza, Channel 2, is equipped with a TTG-16L transmitter and a Type TF-2CL antenna.

### Today's Best Equipped Network

In a full color illustrated brochure highlighting their new television network, Rede Manchete notes, "When we began thinking about setting up Rede Manchete de Televisão our great concern was to purchase the best and most sophisticated equipment. We wanted the latest generation available in the market. In implementing this equipment purchasing philosophy, we have achieved an ideal level of quality which places us in the position of being the best equipped television network of our times, according to statements by many technicians of the largest Brazilian and North American television networks. Fifty million dollars were invested in this gigantic undertaking.

"As a result of innumerable tests, the selection was made of RCA transmitters and circular-polarization antennas, since they represented the last word in radiation systems."

## RCA's Broadcast Antenna Engineering Center:

# A TRADITION GETS BETTER

Antenna Engineering management team at RCA's Broadcast Antenna Engineering facility in Gibbsboro, New Jersey. (Left to Right) Bruno Melchionni; Dr. Oded Ben-Dov.; Don Hymas; Nick Nikolayuk.



RCA's Broadcast Antenna site spreads over 135 acres of ideally contoured ground for efficient antenna handling and testing.

From a modest, isolated antenna test site established in 1954, RCA's broadcast antenna engineering and production center at Gibbsboro, New Jersey, has expanded into the present 135 acre dedicated complex.

Located in a cleared, sandy area surrounded by woods, the facility is deceptively unimposing. The buildings are plain and functional; almost austere. The antenna turntables, trestles and outlying structures are unpainted and weathered.

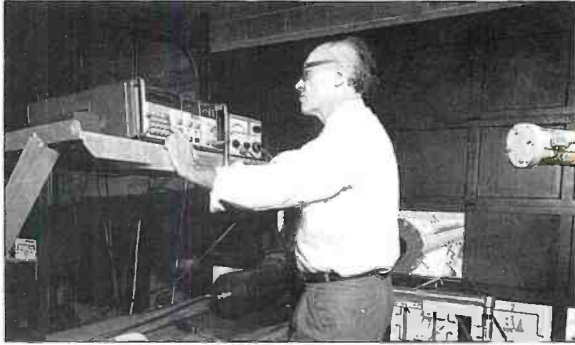
The bland initial impression is quickly changed by a tour of the complex. It encompasses more than 20,000 square feet of engineering labs, machine shops, offices and antenna assembly buildings—together with outlying test structures, including three turntables and two model ranges.

### Complete Product Line

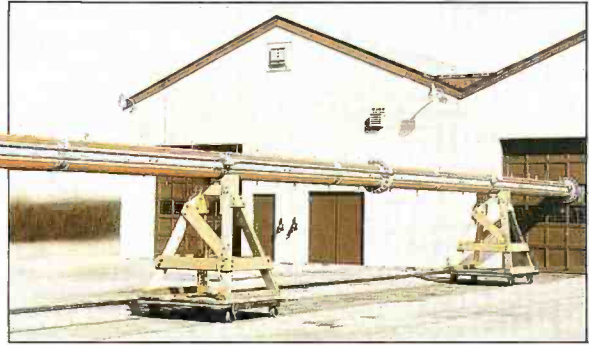
A complete range of high power VHF and UHF antennas, both horizontally and circularly polarized types are currently designed, assembled and tested at the Gibbsboro site. More than 500 UHF Pylon Antennas, 600 VHF Superturnstiles and 100 Traveling Wave Antennas have been produced there. In addition, RCA Antenna Engineering is responsible for the design of transmission system products such as filterplexers, harmonic filters, special waveguide components and related equipment. A recent such development is the "Magic Tee" switchless switching system for parallel UHF transmitters.

### Office and Lab Building

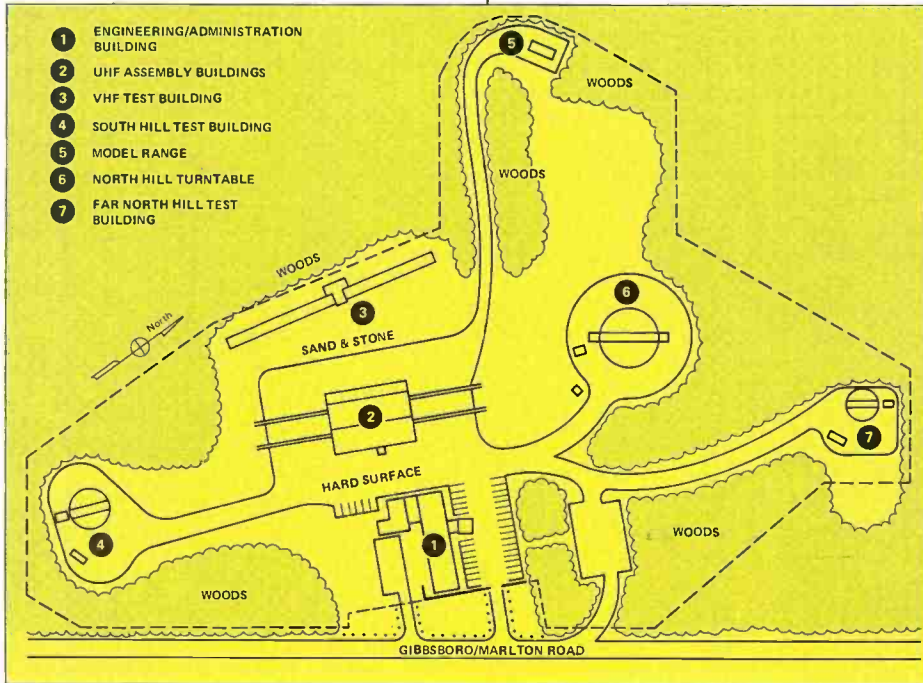
The largest structure, in terms of floor area



**Comprehensive antenna test facilities are incorporated, including automated test equipment; network analyzers and computers.**



**Outdoor assembly area provides expanded capability for meeting delivery schedules.**



under cover, is the office and lab building. The building was specially designed for the facility and uses laminated-wood girders instead of the usual steel. The reason for this is that large masses of metal might have an effect on the antennas under test. So that the various tests performed on the antennas are as accurate as possible, structural steel was ruled out for all of the buildings at the antenna facility. Another area in this building serves as the laboratory and drafting department.

Also located here is the storage area for test equipment and various materials and, the "short-order" machine shop where all of the special components used in the building of antennas and other products are turned out. This shop is equipped with the usual metal-working machines, lathes, cutoff saw, milling machine, drill press, etc. Thus,

the facility is a self-contained installation, including purchasing and other support services.

### **Antenna Assembly Building**

Constructed of concrete-block walls with a wood truss roof, the Antenna Assembly building includes a rail track imbedded in its concrete floor. This track aids in the movement of assembled antennas, mounted on wheeled "horses" to outdoor locations for transport to the testing turntables. Large overhead doors at either end of the building provide excellent access.

### **Outdoor Assembly Area**

Antenna manufacturing is a seasonal business to the extent that most customers specify delivery during mild weather, and frequently prior to the

TCL circularly polarized VHF antenna on test trestle (left); UHF Pylon under test (right).



Each test range includes its own control building equipped with latest measurement equipment (below).

start of the new TV season in September. As a result, with indoor production area strained at this time, the RCA antenna facility utilizes an adjoining outdoor assembly area when needed to maintain delivery schedules. A rail track laid the entire length of the area allows easy movement of even the largest antenna assemblies on wheeled horses.

The facility is continually improved to meet customer requirements and to maintain its state-of-the-art design, production and test capabilities. There has been an extensive enhancement of on-site resources, including automated test equipment, network analyzers and computers.

### Ideally Contoured Site

The RCA Antenna Center occupies 135 acres of ideally contoured ground, and is laid out to provide optimum conditions for efficient antenna handling and testing.

The surface of the ground between the transmitting antenna and the receiving antenna is covered with foliage which diffuses and absorbs that portion of the transmitted electrical energy which could otherwise be reflected into the antenna under test.

The test range is re-calibrated periodically to make sure that it provides a clean signal, without reflections. The terrain is checked and trees in the range paths are trimmed to maintain the established contour, and transmitting antenna locations have been changed several times over the years to improve signal purity.

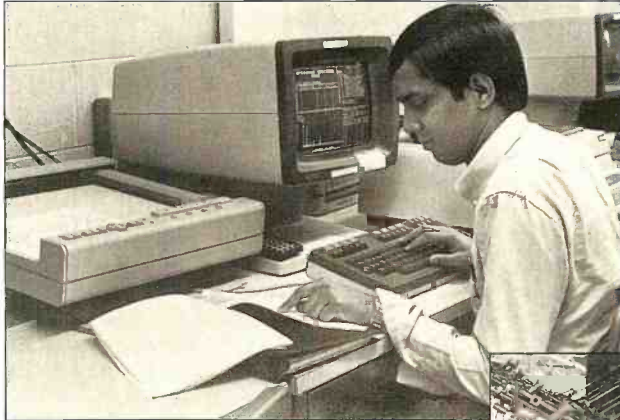


### Two Antenna Ranges

The Center is built around two antenna ranges, one 18,000 feet and the other 10,000 feet in length. Supplementing the ranges are four antenna positioners, each tailored for special requirements, and each with its own control building equipped with latest measurement equipment.

- 1) **North Hill** is the site of the largest positioner. This facility resembles a 130-foot long barge located diametrically on a 90-foot circular rail track. Positioner capability was extended to handle antennas as long as 150 feet and weighing up to 45 tons. Antennas for all TV frequencies can be supported horizontally up to 25 feet above the barge which has an automatic spit turning system. Also at North Hill is a pedestal type positioner which is used for azimuthal pattern measurements and impedance testing of low band VHF antennas.
- 2) **South Hill** is the oldest facility at the Center.





**Engineer Bhaskar Durvasula developing a program with a computer.**

**Wiremen at work on antenna inside one of the two assembly buildings (right).**



**When weather permits, outdoor assembly area is utilized.**



## Measurement Techniques

Under normal operating conditions, high power signals are pumped into the antenna through the transmission line, and the signal is radiated by means of electro-magnetic radiation.

In making pattern measurements, the exact opposite process is followed. A low level signal is radiated at a specific frequency and the antenna is tested as a receiving antenna, in accordance with the reciprocity principle.

Vertical patterns are recorded with the antenna lying horizontally on a rotating positioner. Azimuthal patterns are recorded on the vertical pattern positioner by rotating the antenna on its longitudinal axis, spit fashion. Azimuthal patterns can also be recorded with the antenna mounted vertically on a positioner. Where size or complexity make it impractical to mount an antenna system on standard test facilities, scale models are fabricated and tested in free space. Gain is determined by mechanical integration of the recorded patterns.

Upon delivery and erection of an antenna at the customer's site, field-service engineers conduct antenna system performance tests. Since all antennas have been adjusted at the factory for proper input impedance, field tests should be minimal.

## Experienced Staff

The on-site staff at Gibbsboro averages seventy employees, about equally divided between

The positioner at this site is used primarily for UHF Pylons and high band VHF (Traveling Wave) antennas up to 120 feet long and weighing 15 tons. Panel antennas are also tested on the South Hill.

- 3) The **Far North** facility was added in 1967 to accommodate increased UHF business. The basic equipment is a pedestal-type positioner. A support trestle is normally used to measure horizontally Pylon and panel antennas up to 80 feet long and weighing 10 tons. The main pedestal positioner also serves for impedance and azimuthal pattern testing of vertically mounted massive antennas such as those used for the World Trade Center project.
- 4) The **Model Range** is actually four separate ranges, with three turntables for scale model antenna and system measurements.

technical/administrative and production.

The Center is currently headed by Bruno Melchionni, who has been with RCA in engineering and management positions for forty years. Engineering staff management represents an equally extensive experience resource in television antenna design:

**Nick Nikolayuk**—Unit Manager,  
UHF Antenna Engineering

**Don Hymas**—Unit Manager,  
Antenna Engineering

**Dr. Oded Ben-Dov**—Unit Manager,  
Antenna Design and Development

Nikolayuk, with 30 years in RCA Antenna Engineering is responsible for UHF antenna design and development.

Dr. Ben-Dov, who has been with RCA for 16 years, specializes in VHF antenna design, with special emphasis on the new circularly polarized types.

Don Hymas' RCA career spans 29 years, just about all of it with antenna engineering. Hymas is the resident expert on transmission products such as waveguide combiners, diplexers, harmonic filters. He is responsible for the design of the new "Magic Tee" UHF switching system.

## Team Approach

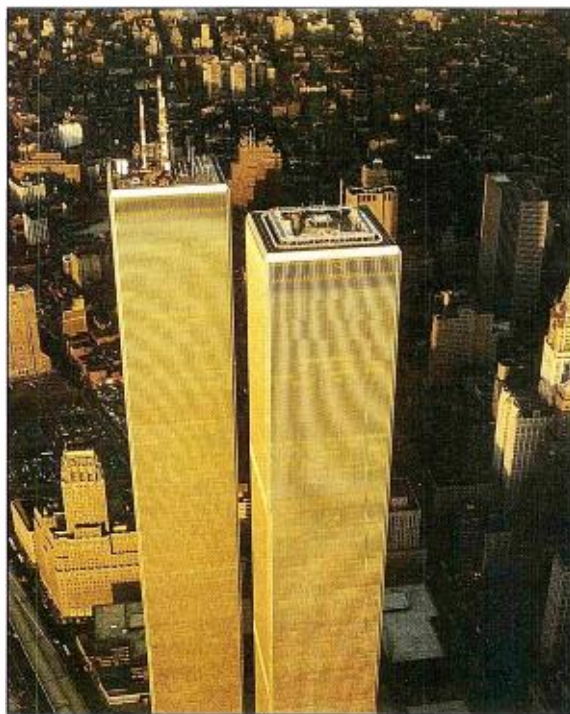
The Antenna Center, Mr. Melchionni notes, is a closely knit organization which operates on the "team" concept for efficient utilization of design and assembly personnel. Each antenna order is assigned to a designated group which is responsible for taking it through engineering, fabrication, assembly, testing, shipping, and on occasion, even installation at the customer site. The team approach, he adds, has been effective in maintaining continuity of quality and performance which distinguish RCA antennas.

"There's something like a pride of ownership with our people. Everything from design to final test is done here, so they see an antenna from start to finish—and that means a lot," says Melchionni. "Our people feel like there's a part of them in an antenna they've worked on, and because of that they want it to work right."

The acceptance of RCA antenna products is such that 60% of VHF stations and 70% of UHF stations in the U. S. are equipped with RCA antennas, nearly all designed and manufactured at the Gibbsboro Center.

RCA's antenna engineering operation has been in the vanguard of new developments, sometimes to the point of anticipating market needs. In the early 1970's, Dr. Ben-Dov developed the circularly polarized antenna which adds signals in the vertical dimension to the horizontal signals of the traditional antenna.

This development typifies why RCA has been the leader in the U. S. antenna market, Dr. Ben-Dov says. "The culture here at Gibbsboro is to maintain



The two largest multiple antenna system installations in the U. S.—World Trade Center in New York City, and Mt. Sutro—were designed by RCA's Antenna Engineering group.

leadership by being responsive to user needs. We don't look at the competition and say 'We can do that too'. We make sure they are always running behind us."

## An Early Computer User

RCA Antenna Engineering was one of the first technical operations to make heavy use of computer technology as a design tool. Since 1956, computers have been used in the design and development of RCA antennas. As a result, the Gibbsboro facility provides a comprehensive data bank on all facets of antenna design—for standard as well as special applications. Computed and measured patterns for hundreds of individual antennas as well as multiple antenna systems have been carefully documented. Computer techniques are used to handle the mass of sophisticated calculations involved in conceptualizing and developing new antenna designs. Predictable patterns and performance parameters can be determined even before scale models are made.

With the computer program, a calculated 360° radiation pattern can be completed in less than a minute. Previously this task took months of laborious effort to accomplish. Once the basic program is developed, the correlation data between theory and measured tests can be fed into the computer and it can adjust for the variables and accurately predict pattern measurements.



**Mt. Sutro Tower Antenna Array covers San Francisco Bay Area.**

## Variations and Product Innovations

Bruno Melchionni confirms the value of the computer program in antenna design. "The UHF antenna is by large a custom-built product, since there are so many combinations and variations. Of the 540 high power UHF antennas built here, less than five percent are exact duplicates. All others are unique—different power, gain, pattern, or channel."

Stemming from this history of design variations is an on-going stream of product innovations and design improvements. Nikolayuk remarks that in the past 29 years there have been 24 major developments in UHF antenna design alone from RCA. In addition, the close personal contact with consultants and broadcasters has permitted the Antenna Center to develop pace-setting designs to meet changing market requirements.

## Multiple Antenna Systems

The recognized strengths of the RCA Antenna Engineering group were called on starting in the 1950's to meet the requirements of multiple station systems. It was necessary to develop new antennas as well as to modify existing designs so they could be stacked side-by-side, one above the other, or both. Auxiliary equipment was also introduced to permit stations to share antennas and antenna apertures.

The pioneer multiple antenna array was installed atop the Empire State Building, followed by

a number of candelabras consisting of two or more TV antennas horizontally stacked on the same platform at the top of the tower.

In the 1970's, more sophisticated RCA-designed multiple antenna systems were installed on the John Hancock Center Building in Chicago and on the Mt. Sutro Tower near San Francisco serving the Bay Area.

Both the 6-station John Hancock system and the 11-station (7 TV, 4 FM) Mt. Sutro system combine horizontally and vertically stacked antennas.

The most recent and largest TV and FM multiple antenna array, also designed by RCA is the twin-tower structure on the World Trade Center in New York City. This mammoth installation is comprised of 10 television stations and 4 FM stations.

Of the 30 TV antennas involved in the John Hancock, Mt. Sutro and World Trade Center Systems, all but one were supplied by RCA.

## Trends

In VHF broadcasting, Melchionni notes, the most significant trend has been to circularly polarized transmission. RCA Antenna Engineering was involved in developing the first CP antenna for WLS, Chicago, and today we have a complete line of CP antennas for both VHF and UHF applications.

The trend in UHF is to concentrate on the principal market area—30 miles and in—and to shape the pattern of the antenna to direct the most effective signal into that prime audience area. High power, directional antennas are required to meet this need.

Another area of need today is for high performance, low cost UHF antennas. Here again RCA was able to respond. Using data banks of performance parameters and pattern measurements on file for the popular TFU-30J Pylon antenna, we were able to develop the new low cost TFU-33JN antenna now available. Since we are able to predict antenna performance without extensive range tests, the 33JN antenna retains the quality design, construction and performance characteristics of custom pylons, but at considerably less cost. However, each 33JN is fully assembled and tested on a turntable to check patterns, null fill and impedance—which verifies that the completed antenna measures up to predicted performance standards.

## Keeping Pace

This example highlights the strength of the dedicated RCA Antenna Engineering Center. RCA engineers at Gibbsboro are keeping abreast of technological developments and market trends by:

- Initiating state-of-the-art solutions to system problems.
- Maintaining a sophisticated test range to verify concepts.
- Continuing to provide antenna equipment with a performance and acceptance record that is unmatched anywhere in the industry.

# PTL

## “THE INSPIRATIONAL NETWORK” ADDS NEW TV CAPABILITIES



Best known for Jim Bakker's PTL (Praise The Lord) television programs, the three interrelated television divisions of Heritage Village Church and Missionary Fellowship, Inc., have added to their production and post-production facilities more than \$3 million worth of new TV equipment purchased from RCA. The Carolina-based missionary group's sizeable television divisions include: the PTL Satellite Network, "The Inspirational Network", who uplink



Four TK-47B Automatic Color Cameras are used for producing the daily "Jim Bakker Show".

PTL's own, and other Christian-client programming (to RCA Satcom IIIR-transponder T-2), Park Road Productions, the group's teleproduction/post-production house, and the PTL Studios, from which originate an estimated 280 hours of live programming a year.

#### Live Television Lives On

While live network entertainment television is relatively rare today, at PTL Studios in South Carolina, the excitement, interest and immediacy of live entertainment programming is a daily occurrence. Monday through Friday, at 11:00 a.m. Eastern Time Zone, PTL broadcasts the "Jim Bakker Show", an hour hosted by Minister Bakker and his wife, Tammy. Far from a simple Sunday-morning sermon, Bakker's show has talk-show guests, a live orchestra, a chorus, telethon-style phone operators, and a studio audience of about 1,000 each day. Technical needs to produce this one program are considerable. But additionally, PTL produces a TV seminar live each day from 3 to 4 p.m. ETZ, and Camp Meeting USA, evenings from 8 to 9 p.m. Live remotes and holiday specials are frequently scheduled, as well.

PTL's Studios now have four new TK-47B automatic triax cameras, three TK-86 cameras equipped for triax, two TK-710

portable cameras and six TH-200 1-inch VTRs, each with a TBC, as their portion of the new equipment acquisition.

#### PTL's Camera Complement

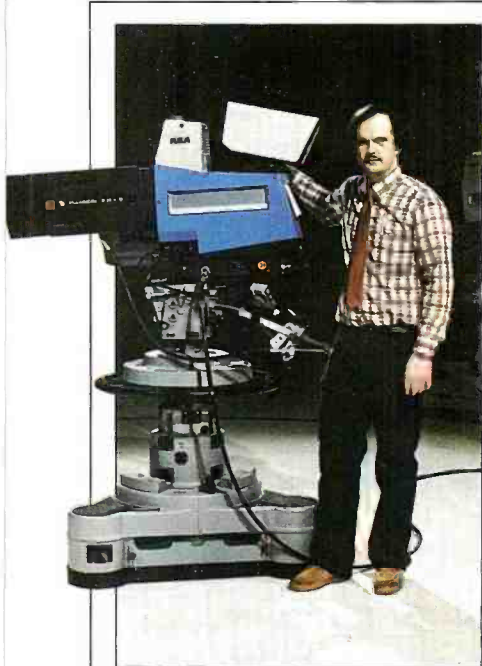
Wayne Coleman is Chief of PTL Engineering. He's involved with the day-to-day origination studio operations. According to Coleman, PTL has had experience with previously purchased RCA TK-44, TK-45 and TK-46 cameras. This led them to evaluate, then choose the new computer-controlled TK-47 when facilities were upgraded. According to Chief Engineer Coleman, "They're now our main-line camera for our bread-and-butter,

primary production, 'The Jim Bakker Show'." While it's still a bit unusual to see triax in a studio situation rather than on an O.B. van, the TK-47BT is designed for triax, and PTL specified this capability for several good reasons. Coleman says, "We anticipated long cable runs. Also, you can do patch panels with triax. With all the activity that goes on, on the floor, we've been known to chop up cables. With TV-81 we'd have to send out for repair. Being able to repair triax in-house saves us a lot of time and money. Also, it's all interchangeable cable so that we can substitute different runs."

PTL is enthusiastic about



Production Control at PTL: no room for amateurs.



**Chief Engineer Wayne Coleman.**

their TK-47s. Says Coleman, "We're very happy with them. We've done shows where the lighting is not the best. The improvement of the TK-47 over the '46 is just night and day."

PTL Maintenance Engineer Bill Baker points out, "Our camera-people like the viewfinder and the way you can move around to get your shot. A '47 can handle a contrast ratio higher than a '46 can, especially if the lighting is poor."

Coleman responds, "You can change your sensitivity on a '47 without adding any appreciable noise. It's a noise-free picture when you look into dark picture areas. Comet tail suppression takes care of the hot spots you sometimes get, and of course, older camera designs didn't have that." While the PTL engineers appreciate their new TK-47s' better response, they also find color consistency among shots from their array of RCA cameras easy to achieve. "They all match well," says Coleman.

PTL purchased their array of

new RCA cameras with different tasks in mind for each. As noted, the four new top-of-the-line TK-47s are for their high-profile, live studio-to-satellite telecasts. Of the three quality portable TK-86 cameras, two are similarly dedicated to the live programs, while one is to be used in their large TV truck. The two inexpensive TK-710s are, PTL feels, cheap insurance. As Maintenance Engineer, Bill Baker, says, "They can make good outdoor pictures. And if your EFP crew drops one into a lake, you haven't risked as much. For indoor EFP, our crew takes an '86, of course."

Chief Engineer Coleman continues, "We use the four studio TK-47 cameras and a hand-held TK-86 for the Bakker Show. The hand-held addition gives us quicker reactions, and more flexibility, especially artistically."

With many new names in television camera manufacturers to choose from, PTL chose cameras exclusively from RCA for good reasons, according to Coleman. "RCA's technical support is better. If you're in Hawaii, say, and something gets broken, the part's on the airplane the next morning. If you call Tech Alert anytime, they'll talk you through the problem. And RCA technical seminars are very good. We've all (in engineering) been to at least one," he says, and adds that they intend to send more personnel to RCA schools in the future.



**Bill Baker, Maintenance Engineer, at Set-Up Terminal for TK-47B Camera System.**

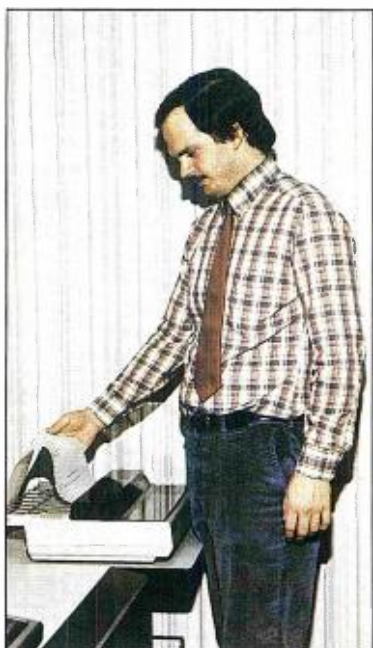


**In a room adjoining Production Control, a battery of TH-200 one-inch VTRs record camera action.**

## PTL Tape Operations

"PTL's policy has always been to have the highest technical quality," says Wayne Coleman. He reports that tapes played to air within the live programs from PTL are virtually all 1-inch Type C today, via TH-200s. "We shoot nothing on 3/4-inch ourselves. If we have to play back an outside tape at the last minute—we can't get the footage any other way—then we'll occasionally play a 3/4-inch tape to air. I'd much rather have quad than 3/4-inch and we ourselves shoot nothing but 1-inch now." As we'll see later, PTL's technical standards are held high at its sister satellite and post-production TV operations as well.

The Jim Bakker Show and PTL's other live shows are sent uplink in real time, but PTL also tapes the programs. Wisely, PTL Engineering provides for correcting problems that happened within the live show when released in its taped version. "During the live show we've had bulbs in the lighting grid explode, for example," says Coleman. "Or, maybe there was a missed cue, or the director punched to the wrong camera." Coleman emphasizes that the program tape



**Wayne Coleman checks computer printout of an equipment maintenance program developed by PTL's engineering staff.**

is valuable to PTL as more than a record—"A lot of stations still don't have TVROs, so we have a number of our markets tape-syndicated."

As a result of these problems and needs, taping PTL's live programs always includes an iso-VTR running simultaneously with the program master that's being layed down on tape. Then in post-production, an audio-matched, and SMPTE-coded relief shot is easily found, if needed.

#### **Computer-Age Facility**

While teleproducers "computer-edit" and commercial TV broadcasters commonly use computers to track clients' spots, at PTL, engineering is benefiting from bits and bytes. Using a Radio Shack® Model II TRS-80 computer, equipped with disc drive and printer peripherals, Chief Engineer Coleman has written programs for equipment and cable inventories, and maintenance. Coleman says, "If we pull out, say, a sync generator for service, when the unit comes back from the bench, I go to the computer. I call up 'List Cables



**Jim Jupin is Division Manager of PTL's Park Road Productions, which includes studio and post-production operations.**

By Equipment'. The computer's CRT will show me all the input and output cables that connect to the serviced unit, tell me what each cable connects to and what it does. I hit 'P' on the keyboard and get a printout and hook up the equipment. With the amount of equipment here, it really saves a lot of time and money in troubleshooting."

The computerized system also shows PTL technicians cable runs available, service intervals, and records of maintenance done to equipment. Inventory can be accomplished at the stroke of a key, as well. Coleman concludes, "I think our computer program has a lot of potential."

#### **Post-Production at Park Road**

Located in Charlotte, North Carolina, PTL's sister teleproduction/post-production facilities, Park Road Productions, originally were the home of the PTL studios. The handsome colonial church-style buildings now house the PTL Satellite Network, with both uplink and TVRO dishes outdoors, and Park Road Productions. Over a year ago, PTL studios moved to new spa-

acious quarters in nearby South Carolina and, subsequently, Park Road became a production house for both PTL and its clients.

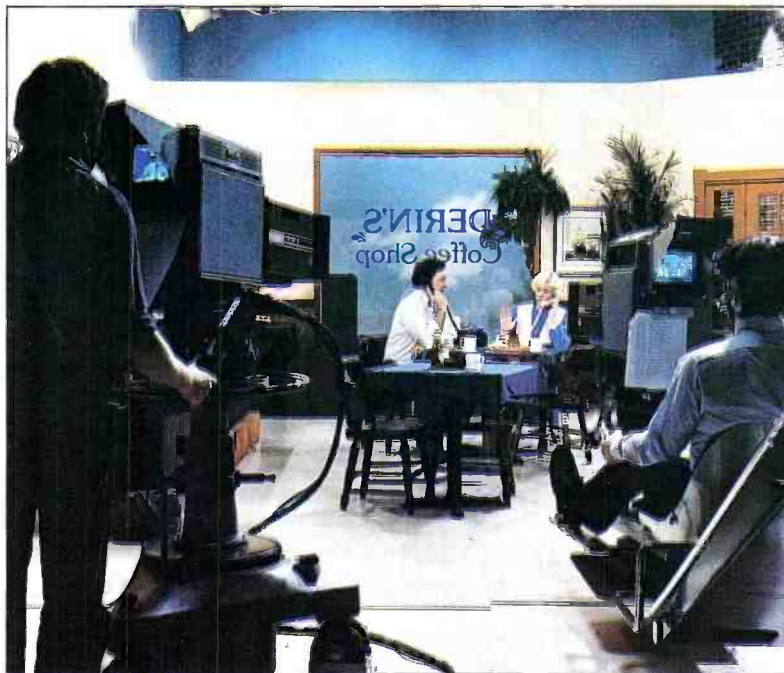
The move to build Park Road into the well-equipped company it is today came as an economic decision. PTL produces foreign programming for twenty-five countries that is either produced or post-produced at Park Road. Programs are produced in French, Italian and Spanish at Park Road with national hosts. The studio in South Carolina is then free to continue the programs that must be produced daily. Jim Jupin, Division Manager of Park Road, also explains that, "We used to do special editing in New York or on the West Coast. We'd fly out with our tapes. It got to be very expensive. So, we decided to create facilities here." Even producing foreign productions and special editing does not fully utilize Park Road's state-of-the-art equipment so it was structured from the beginning to sell off the unused time. But Park Road won't sell time to just anyone. The

## TV REACH EXPANDS

facilities are used exclusively for inspirational projects. "We've been approached for sports and things, and said 'No,'" avows Jupin. "We're able to serve ministries by offering them a top-notch product, an environment that they feel very comfortable in, and a price that's good for them. It's our mission," he says.

For program production Park Road offers its clients a huge 9,000 sq. ft. studio, with full lighting grid, microphone array, two 32 channel audio boards, three RCA TK-44s with Cannon 18:1 servo zooms and shot boxes, and a TKP-45 portable. Need more cameras? Park Road can roll its 45-foot mobile truck into a pre-cabled bay and hook up four more TK-46s. While PTL's own studios in South Carolina are much larger, Park Road is a comfortable 54,000 sq. ft. in facilities and includes dressing rooms, guest quarters and a Olympic-sized indoor swimming pool for relaxation.

The tape equipment complement at Park Road is equally impressive. As part of the mis-



TK-46 cameras on-set at Park Road Productions studios.

sion's system package, Park Road has added new tape, editing, and character-generation gear to their considerable exist-

ing equipment.

Their new, large editing suite now houses three RCA TR-800 1-inch VTRs with a quad for



Sophisticated Epic I Editing Suite at Park Road Productions provides state-of-the-art post-production capability.

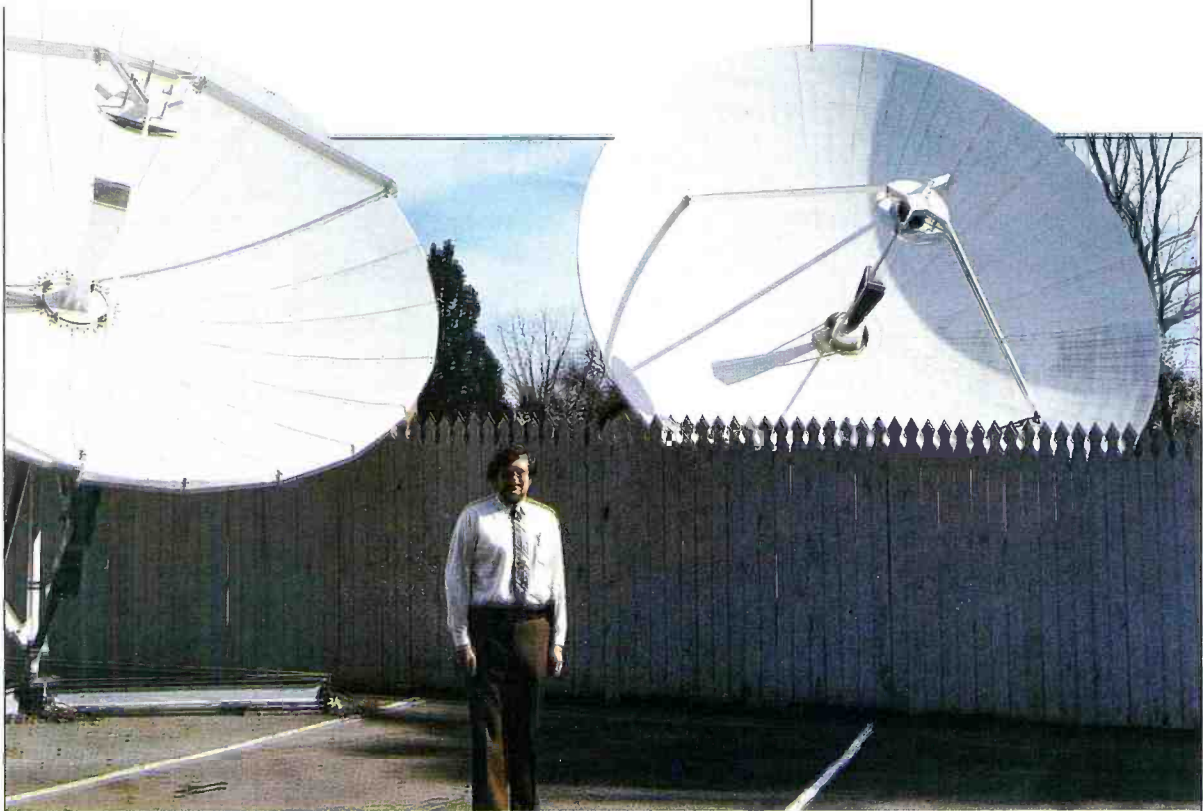




Three TR-800s share space outside the EPIC I Editing Suite with extensive video and audio distribution and terminal facilities.

backup. VTR control is through an EPIC computer editor and the console offers Grass Valley switching and a Chyron character generator.

According to Jim Jupin, "The EPIC interfaces to the TR-800s works very well. We were the prototype for this system and have had it on line since Fall, 1982. We do a lot of matchframe edits. When you go back and find a match, it has to be just right. With this system, our edits are *absolutely transparent*. You cannot find a video edit, visually, after it's done. You can go back over and do a piece of material where you edit on top of it, over and over, and you can't find where the edit was done. That's audio and video. You can't even find it on a 'scope! You can't see it in a normal display of two fields."



Allen McCarty, Chief Engineer, Satellite Operations.

Prior to using the big editing suite, Park Road strongly suggests that clients first go into one of its two smaller suites, equipped with CMX Edge and ¾-inch frontloaders. "We tell them, 'go into offline ¾ first, make your decision list, punch a tape and we'll auto-assemble in 1-inch while you have some coffee,'" says Jupin. "It's much more cost-effective, at a ratio of about six-to-one. In the CMX room we can do a five and a half-inch floppy disc, a printout and a punchtape. Our CMX system does everything and we can directly load the results into the EPIC," he concludes.

### The PTL Satellite Network—Downstairs At The Uplink

Located beneath Park Road Productions floors a well-equipped control area handles uplink of PTL's own shows, and tapes, as well as playback of programs from other ministries over the PTL Satellite Network.

The satellite operations' chief engineer is Allen McCarty. Running the system 24 hours a day, 365 days a year, McCarty finds that extra care in equipment

and software cleanliness pays off in long life and reliability.

Smoking isn't permitted *in the building*. We have our own closed air system with controlled temperature, humidity and dust filtering. We clean tapes and clean tape heads before and after every play." As one example of the pay-off for this care, while some stations get 250-500 hours of life on quad heads, McCarty boasts an enviable average of 2000 to 3000 hours for his quads' heads. Says the chief, "It doesn't take long to add up in dollars."

To assure continuity in case of technical mishap, PTL Satellite uses both usual and unusual safeguards. For example, while the live Jim Bakker Show is being aired, Satellite Control is rolling a tape of a previous show.

If the live feed between the North Carolina uplink and the South Carolina studios is lost, Satellite Control switches to tape. The taped show is carefully selected in an effort to match the live show's guests, subject matter, and even the host's clothing that day. In one case, according to Chief Engineer McCarty, feed

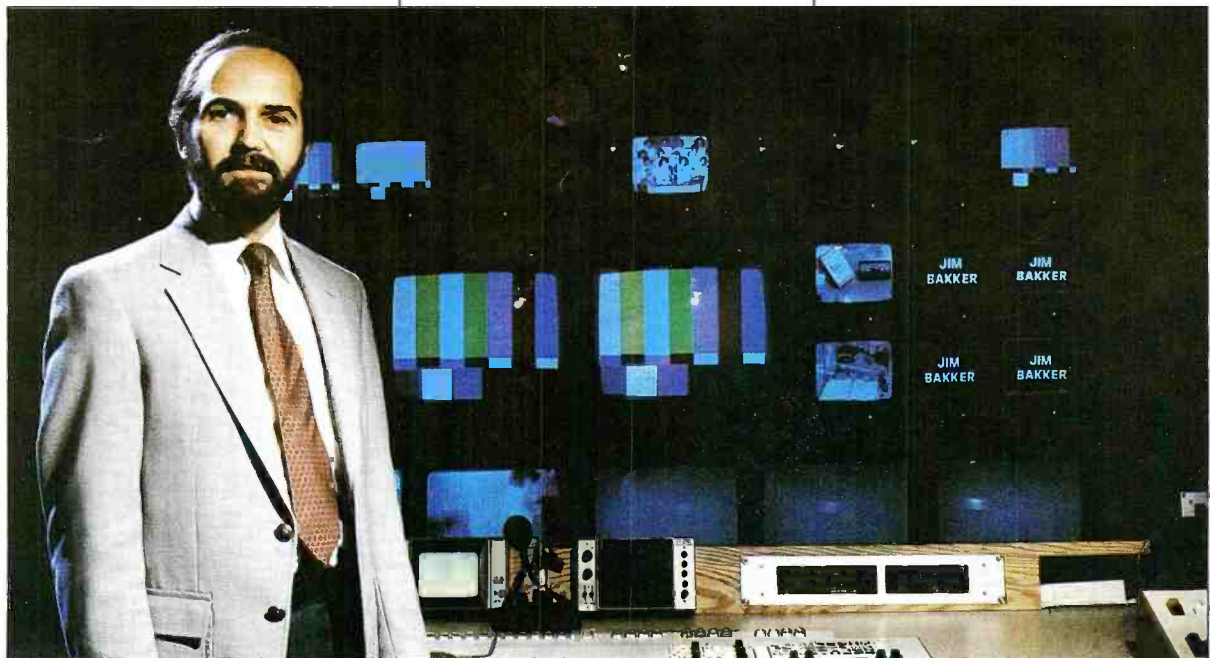
was lost precisely at a music seg's finish, and the match was virtually undetectable, except for the requisite "This program was prerecorded" super at the end of the program.

McCarty says that problems are rare, but in the event of lost feed, the show is re-fed later and stations that tape the feed are notified of all the re-feed times available.

### PTL Envisions Continued Growth

PTL's Executive Vice President of Broadcasting Dale Hill expresses his faith in both the network's future, and in RCA. Says Hill, "I've been involved with RCA equipment for about 17 years. Equipment choice is a team effort here, and we've always felt that RCA better understood Christian broadcasters. We respect RCA because they understand our goals."

Having seen PTL grow from a small, single-station broadcast in North Carolina, to a network with millions of faithful viewers, Hill says, "The growth of PTL has been at least phenomenal and I envision the growth to continue this way."



**Dale Hill, Executive Vice President, in familiar surroundings—Production Control at PTL's new Heritage USA Production Center.**

# Las Vegas High Roller- Quality Video On The Road

## Quality Isn't Just Luck!

Headquartered in Las Vegas, Nevada, Quality Video is a new name in the mobile television production business. Today "QVLV" is gaining a fine reputation and covering a lot of territory fast, especially in sports coverage.

The company, founded in 1982, currently has four corporate officers: Ernest R. Mueller, president; Frank L. Anderson, vice president of engineering; James Duty, vice president transportation; and Lorraine Mueller, secretary and treasurer. Bruce Stevens is the operations manager. Far from boardroom executives, all four men are actively involved in the day-to-day excitement and hard work of running a big tv truck.

The single 60-foot (with tractor) truck is, at this point, Quality Video's only television production vehicle, but it contains as much state-of-the-art hardware as a half-dozen smaller mobile units.

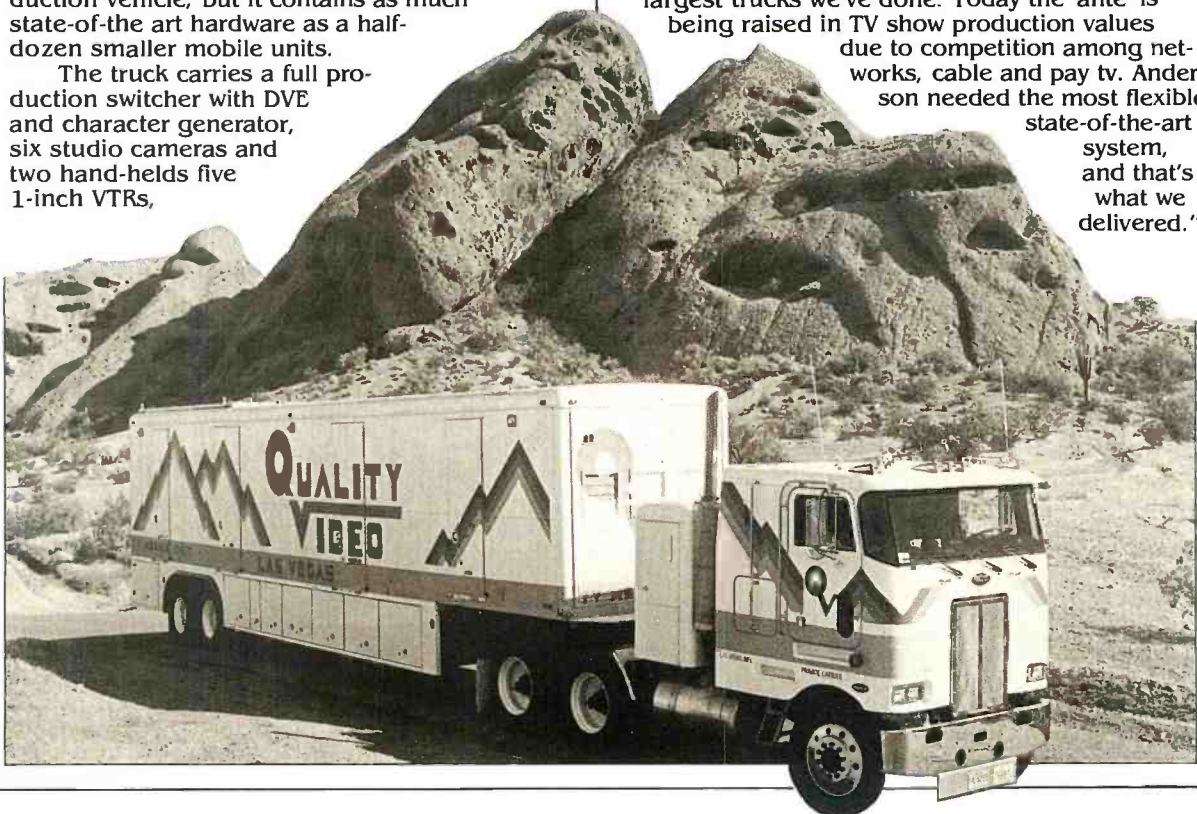
The truck carries a full production switcher with DVE and character generator, six studio cameras and two hand-helds five 1-inch VTRs,

an audio equipment complement that would serve a recording company well, 15 TV monitors and thousands of feet of cable.

Responsible for the truck's creation at RCA, C. D. "Bud" Phillips is administrator of mobile van activities. Phillips points out that RCA has been involved in building TV mobile systems for over 30 years. He has been associated with mobile unit design and fabrication for 17 years and is responsible for over 100 RCA-equipped and designed TV units now in use in 31 countries and 19 U.S. states.

According to Phillips, his team of 15 RCA engineers and technicians put in an estimated 2600 man-hours on the QVLV vehicle. Says Phillips, "Frank Anderson knew what he wanted. We knew how to put it together. It's one of the largest trucks we've done. Today the 'ante' is being raised in TV show production values

due to competition among networks, cable and pay tv. Anderson needed the most flexible state-of-the-art system, and that's what we delivered."



## TV MOBILE UNIT

### Quality Cameras

Among the state-of-the-art equipment that QVLV brings to an assignment are six RCA TK-47BT automatic computer triax cameras with "long glass" which include four Fujinon 30:1 lenses and two Fujinon 17:1 lenses. QVLV's experiences with the performance of these new cameras has been very good.

Chief Engineer Frank Anderson says, "The cameras are outstanding. The pictures they make are second to none. We've worked with a lot of clients who have told us that 'This is the absolute best television camera there is.'"

### Quality Editing

According to Quality Video, it has become commonplace to do a lot of videotape editing on-site now. Sports producers bring tape reels to the truck and build opens, packages, half-time features and post-game wrap shows during the sports event. It's high-pressure, exacting work and often involves using tapes from "unknown" machines. Producers have, says QVLV, sometimes recorded a game off-air, and edited an opening from it for the game to be telecast immediately after the first game's conclusion.

The production room in the truck features a Grass Valley 300-3A with five isolated banks as well as a Chyron IV graphics generator and ADDA ESP-150 still store.

While SMPTE Time Code is standard for QVLV tapes, relatively unused features of the Quality Video vehicle's tape equipment, so far, are vertical interval time code and user bits. Anderson predicts, "People will take advantage of VITC when they learn more about it."

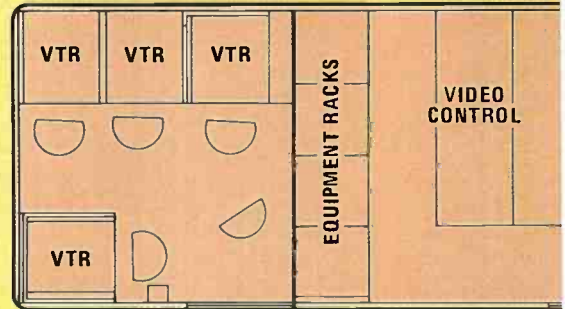
### Quality Communications

Quality Video's intercommunications systems were given special attention in Anderson's design. The systems include 6-channel RTS master stations, a 12-channel RTS IFB system, a Cetec-Vega RF PL system, a 9-line key telephone system, and a 4-channel 2-way radio system with a base station and four remotes.

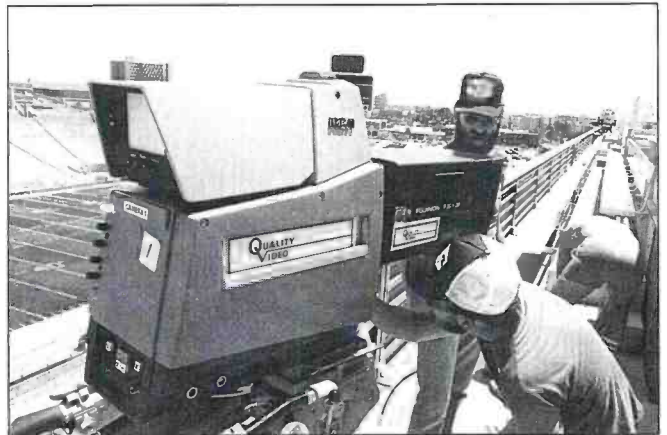
Anderson points out that Quality Video's truck was created to be a "pool-feed" vehicle when called upon to do so. He says "You get into split feeds where, say, five cameras are in use on the United States feed and Mexico is taking a feed from those five and adding two more. The cameramen on the Mexican cameras want to hear the U.S. program and their director. We have a lot of master stations on the RTS system. We can send different program audio to each camera if necessary. All selection is made right on the thumbwheel."

### Quality Audio

The audio facilities that QVLV brings to an assignment include a Yamaha PM2000-32 audio board with 32 inputs, a Tapco 16x2 patchable to



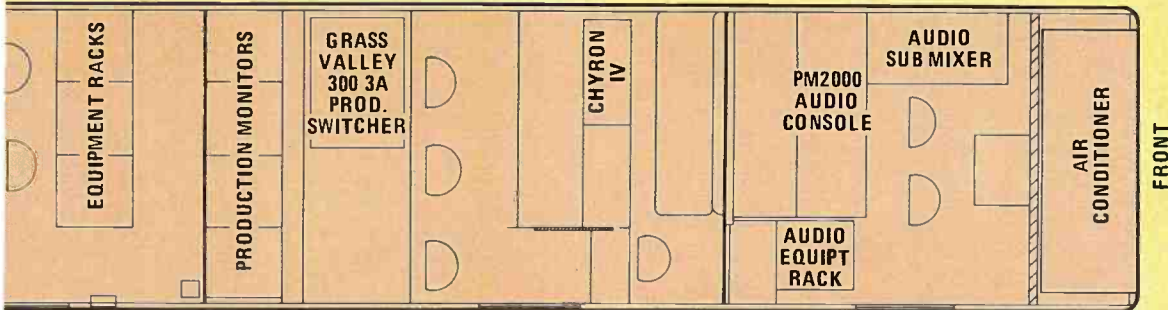
QVLV's extensive on-board equipment complement



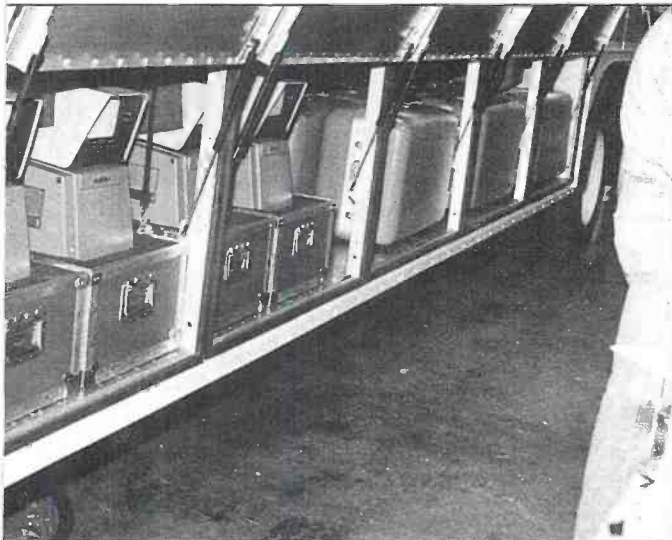
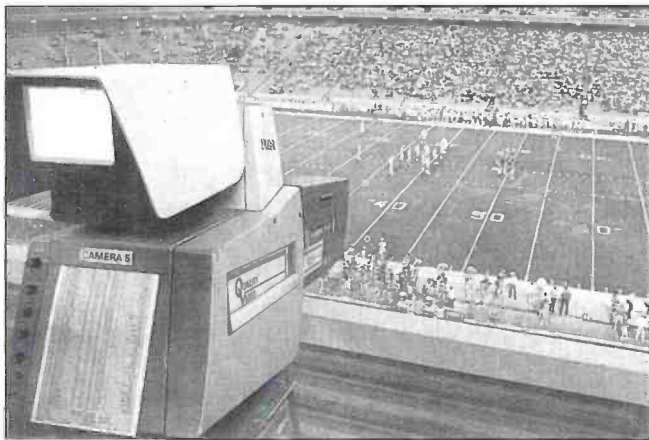
Quick set-up is essential for QVLV operations. Automatic computer set-up and checks for TK-47 cameras provide optimum performance in minimum time.



TK-47s and their ancillary equipment complement ride in comfort



provides sophisticated TV production facilities to handle even the most demanding on-location shoots.



and safety in compartment below operating floor.

two busses, Lexicon 93 digital audio effects, a DBX 160X compressor-limiter and a full array of microphones.

On this sports assignment, ESPN-USFL, two parabolic microphones were placed on the field, with reaction mics on the cameras, and a pressure zone microphone on the stadium wall for ambience. Eighteen inputs on the board were utilized.

**Quality Vehicle**

The QVLV truck is valued at \$3.5 million. The RCA-equipped vehicle is based on a Gerstenslager custom trailer and is hauled by a Peterbilt tractor with a supercharged 400 horsepower Caterpillar diesel engine. According to James Duty, the truck's 400 horsepower engine is not excessive. "People don't realize how far apart cities are out here. Underpowered trucks break down and just don't last long," he says. Airbag suspension assures that when the big truck arrives, its contents are in good shape. And beyond reliability and the equipment array, Quality's truck shows up in immaculate condition, inside and out.

**Quality Sports—Covering The USFL**

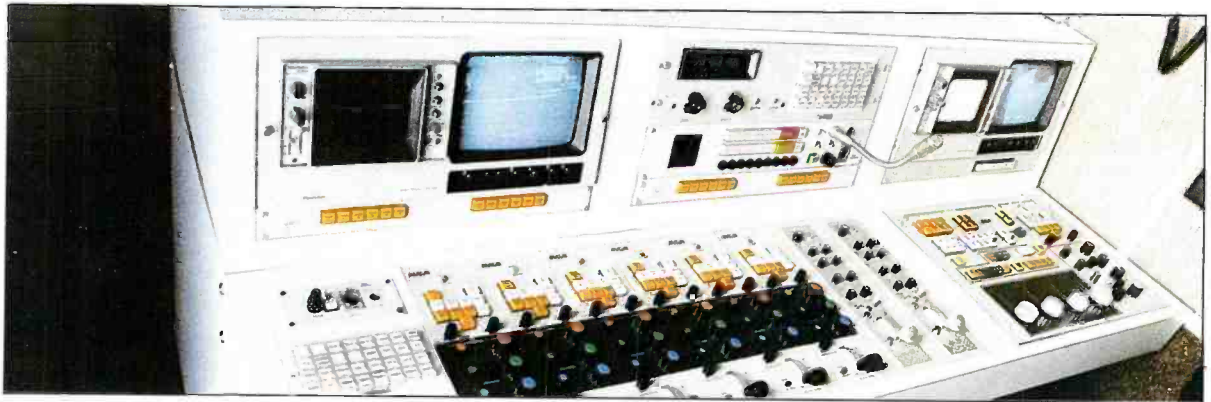
On location at Sun Devil Stadium in Phoenix, Arizona, the big Quality truck sets up quickly to cover the U.S. Football League's Arizona Wranglers vs. Michigan Panthers game for cable network client, ESPN. It's hot. But even the air-conditioning is special in the QVLV vehicle.

"I don't think there's a TV truck that's come to this part of the country in the summer—network or independent—that hasn't had air-conditioning problems," says QVLV's Anderson. A summer-Southwest-USA remote often means that, "the truck may sit in 120° heat all afternoon before power to run the air-conditioning is hooked up,"

## TV MOBILE UNIT



On-location in Arizona sun, QLVV truck is the control center for coverage of USFL football game.



Video control for TK-47 automatic cameras is a compact facility with console for set-up terminal and RCUs for individual cameras.



Comprehensive audio facilities are housed in a separate compartment.



Production control in the QVLV truck features a Grass Valley 300-3A video switcher with five isolated banks and a Chyron IV graphics system.

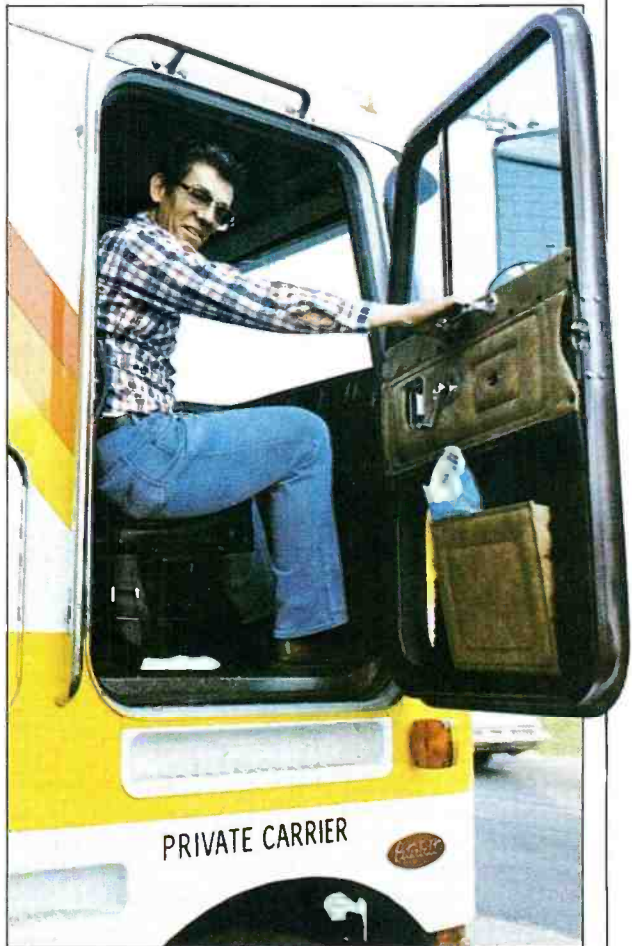
he says. Quality Video's system is specially flow-controlled to equalize cooling air output through the large vehicle.

Anderson notes that in sports assignments like the Phoenix job, speed and changes are the norm. He says, "This job started out as five hard cameras and one handheld. Then it changed to four and two. Producers will completely change their sightlines and camera positions. You have to be flexible.

#### Growing Demands Project A Profitable Future

To date, Quality Video's customers have been 65-70% sports-related TV productions. Anderson mentions that the future was very much a part of his truck design for today. Says QVLV's chief engineer, "Right now sports is the big thing. A few years ago, everything in Las Vegas was music shows. Who knows what it will be in three or four years?" And so, the truck was designed to accommodate the widest possible range of assignments. "Most clients don't use 100% of our capabilities, but it's better to have too much than not enough," says Anderson. Mueller sums up the present situation by stating, "The networks have accepted us very well, as have cable television and independent producers. Wherever a producer or network needs our truck, that's where we'll be—West Coast or anywhere. The growing demands of broadcast and of cable tv help us to project a very profitable future."

On-the-road executive: QVLV President Ernest Mueller.



## NEW SOLID STATE TELECINE SYSTEM

TKS-100 designates a new state-of-the-art telecine system designed specifically for broadcast applications.

Comprising the system are an electronics control unit and film transports. The electronics unit controls up to three multiplexed film transports, thus providing for economical and efficient telecine functions.

The innovative TKS-100 is the first completely new telecine designed to utilize latest digital and scanning technologies. The system incorporates four CCD sensors and microprocessor controls for reliable, cost-effective performance. Three of the sensors are used for the R, G and B channels. The fourth CCD is employed to detect the infra-red signal, functioning as an effective dirt and scratch detector.

The output of this sensor controls a signal processing subsystem which conceals the defects caused by dirt and blemishes on the film. The result is similar to the dropout compensator used with video tape recorders.

The TKS-100 provides excellent picture quality and handles a wide range of film stocks. It is designed for NTSC, PAL and SECAM operation, and accommodates wide screen as well as normal film formats.

Automatic features include auto black, auto white and auto color correction.

Latest distributed multi-microprocessor control techniques permit the TKS-100 electronic control unit to handle up to three independently controlled film transports. Each

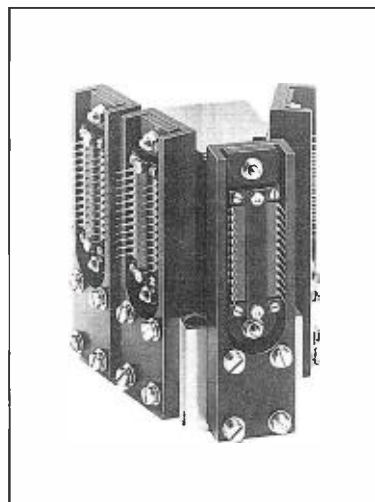
transport provides switchable 16mm and 35mm film modes, and utilizes a digital servo system with dual microprocessors.

This highly sophisticated system provides for pre-programmed, synchronized switch-over from one film transport to another, or locking two transports for A/B roll use in post production.

Microprocessor control and digital servos permit continuously variable speed operation, instant stop and start, and pre-selected "in-and-out" cueing. A keypad on the electronics unit is used for entering desired operations. Comprehensive monitoring facilities are also located in the electronics unit.



TKS-100 Telecine System



Solid State TKS-100 uses CCD sensors and microprocessor controls.



## Low Cost One-Inch Type C VTR Added

The new TH-400 Type C one-inch VTR is a microprocessor-based system which provides broadcast quality performance with excellent versatility and reliability.

A modestly priced video production system, the TH-400 can be configured as a tabletop recorder, rackmounted or placed into a console for use in the field or studio.

The studio console configuration features a dual-channel switcher that permits economical time sharing of monitors for picture, waveform and audio.

The recorder's scan-tracking system provides continuously variable play from still frame playback to 1½ times playspeed, with no picture breakup.

The TH-400 also has an extensive built-in fault detection system. Optional diagnostic probe systems allow the user to trace faults to component level quickly and simply.

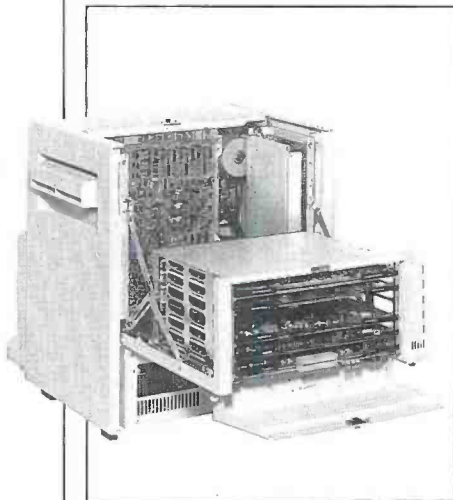
The recorder's control panel has a number of convenient and advanced features such as individual audio and video channel meters, automatic or manual adjustment of equalization and manual override for operator control of the color framing circuitry. A "power down" memory system holds information for control panel setup and tape timer for up to four days.

Computerized frame accurate editing is standard on the TH-400. Preview capabilities permit edit rehearsal and edit

trimming is possible through the control panel keypad or manual jogging. A full capability editor incorporates an automatic review mode as well as an automatic out-transfer mode which automatically sets the entrance point for the next scene edit.

Interface options for serial and parallel remote control adapt the TH-400 to a variety of control devices such as editing systems, remote control panels and station automation systems.

A single module adds a generator for time code. The optional time base corrector provides full signal correction including dropout replacement and velocity error correction.



Rear of TH-400, showing packaging and accessibility of electronics.



TH-400 VTR in table-top configuration.

# RCA Leads the Way with New Camera Technology

# CCD

It's so good, it can practically see in the dark.  
But that's only the beginning. There's no lag,  
no burn-in. Just crisp, sharp, clear images.  
You never saw a camera so good!

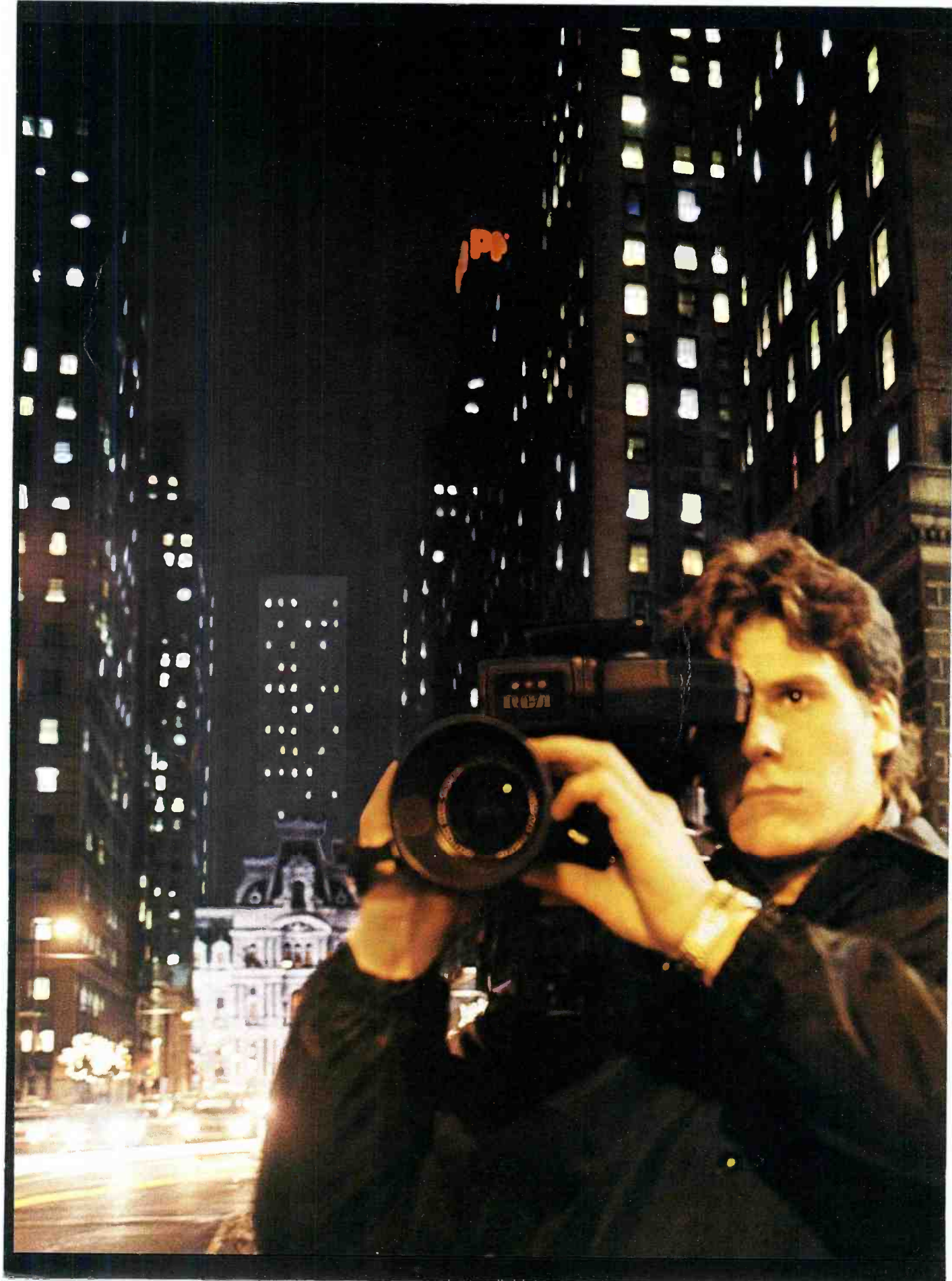
But we don't want to keep you in the dark.  
We want you to see the new RCA CCD  
camera in action at our NAB exhibit.

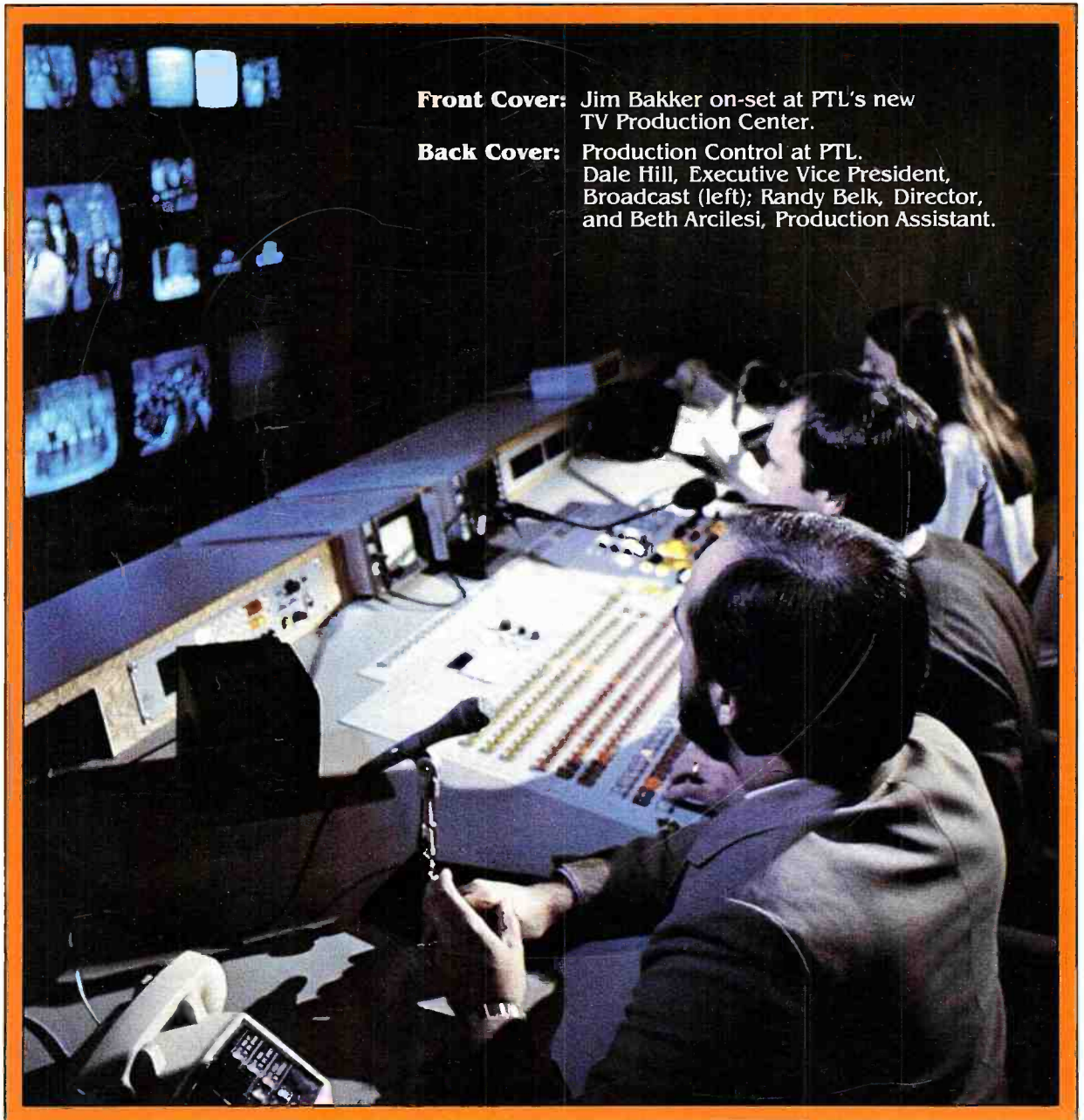
You won't believe your eyes.

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RCA Broadcast Systems, P.O. Box 900,  
Gibbsboro, NJ 08026.

# RCA





**Front Cover:** Jim Bakker on-set at PTL's new TV Production Center.

**Back Cover:** Production Control at PTL. Dale Hill, Executive Vice President, Broadcast (left); Randy Belk, Director, and Beth Arcilesi, Production Assistant.