

# MODERN TV SYSTEM OF U.S. ARMY SIGNAL SCHOOL TRAINS EXPERT "SOLDIER COMMUNICATORS"

Broadcast TV Equipment, Improved Teaching Methods  
and Professional Showmanship at the  
Hands of Experienced Talent, Provide Around-the-Clock  
Program Lessons for Thousands of Students

A meteoric rise in utilization of the U.S. Army Signal Center and School Television facility at Fort Monmouth, New Jersey, in the past year made it one of the largest and most active of Army television systems. During the twelve months of 1966, WFM-TV, the school's closed-circuit TV station, was in operation 15,832 hours and produced 1,064 programs. More than 10,000 students received training through television.

## Mass Education by TV

Again this year an expanding role for WFM-TV is planned, with some 19,000 students consisting of enlisted men and

commissioned officers of the U.S. and allied countries expected to receive training through TV. Programs produced will again number a thousand or more. Signal School classrooms will be provided with 24 hour service, five days a week.

"The motivation behind our extensive use of ETV at Fort Monmouth," said Major Frank Peterson, Chief, TV Division, "is our goal to produce the best trained 'soldier/communicator' in the world. Thanks largely to educational television we are meeting this goal. Much of the credit for the outstanding job being done by Signal Corps trainee replacements arriving in posts and units

throughout the world is due to the improved training techniques made possible through ETV.

"Our TV staff approaches the problem of maintaining individual appeal—while producing large numbers of TV programs in support of three shifts of classes—with the idea that educational TV need not be dull or uninteresting. To be completely informative, it has to be dynamic and visually exciting. Showmanship, we reason, is conducive to good learning."

## Large-Scale ETV Station

The USASCS facility is equipped and

FIG. 1. Studio scene during a course in basic electronics which employs two-instructor teams to increase class attention-holding power.

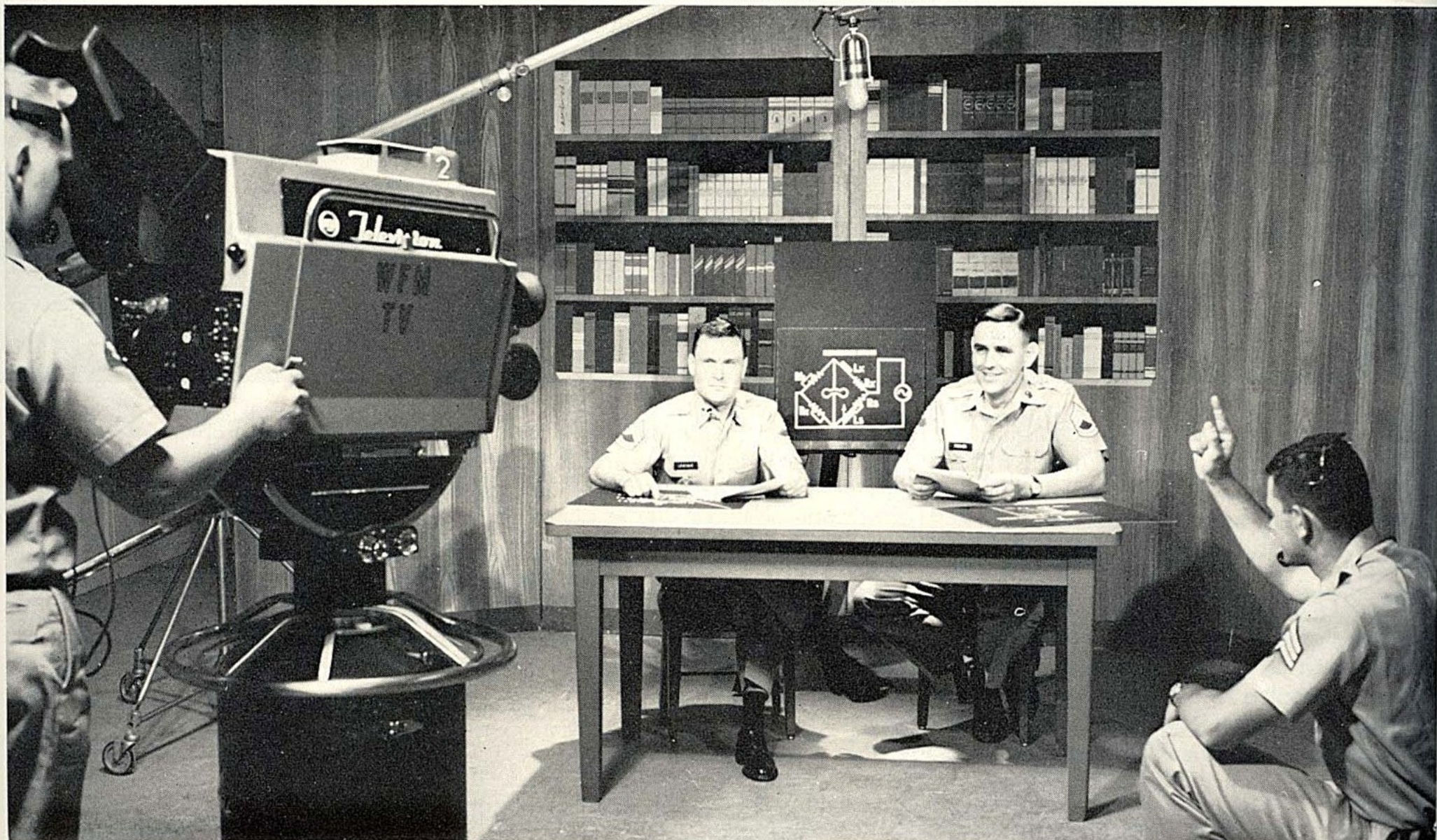






FIG. 2. Mobile van with cameras, TV tape and microwave link makes remote pickups for instruction and troop entertainment.

FIG. 3. Brigadier General Thomas Matthew Rienzi, Commanding General, U. S. Army Signal Center and School, welcomes visitor Ed Tracy, Division Vice President, RCA Broadcast Sales Department.

staffed to function much like a large television station. By Army regulations, however, its output is restricted to closed circuit, on-the-Post transmission and to the exchange of TV tapes and film with the many other military installations using similar facilities for instruction.

The TV system supports the Army Signal School's conventional classroom and self-tutoring instruction and is manned by the Television Division, Office of Academic Operations. The staff comprises four officers, 16 civilians and 46 enlisted military personnel, many with backgrounds in engineering, dramatic arts, motion picture photography and broadcast programming and production.

WFM-TV presently uses 21 RF channels for closed-circuit transmissions. Broadcasts are made from two professionally equipped studios to 500 classrooms and conference rooms, three theaters with large screen television projectors, and to 35 receivers in Patterson Army Hospital. Virtually the entire post can be reached by TV at any one time for briefings or special programs, or in the event of mass mobilization.

TV equipment consists of standard image orthicon studio cameras, television tape re-





corders, TV film recorders and multiple film chains. A new mobile TV studio allows visual pickup from any distant classroom and transmission by cable or microwave to WFM-TV headquarters for taping and distribution.

### Creativity in TV Teaching

"Television holds the promise of becoming an indispensable tool in education," according to Murray V. Tesser, Deputy Chief of the TV Division. "Actually the problem of education in an increasingly complex environment is one that affects us all. We must constantly search out new methods of dealing with abstractions—new ways of demonstrating and of clarifying scientific principles—new ways of 'bringing the student to the point of discovery,' which is in the end the purpose of education. Television is meeting this challenge through use of what we call 'multi-visual stimuli.'

"We discovered that television, for example, could demonstrate the invisible properties of electricity through use of an optical technique employing polarized light. Magnetic graphics, or 'slap-ons' as we call them, replace the writing on the chalk board which took time and meant loss of the students' attention. We found that one instructor tended to lose effectiveness over a fifty-minute period. The solution was use of two-instructor teams in a 'Huntley-Brinkley' format. Of course, television is always right in there with its unique ability to give the entire class a front-row seat in practical demonstrations. If the equipment is small, the camera magnifies it. If it is 'one of a kind,' television proves mass communication benefit by showing it to hundreds of students at once."

### Variety of Subjects

Subjects taught at USASCS cover a wide field of study, from equipment maintenance and fundamentals of electricity for enlisted students, for example, to "Career Courses" in Administrative Leadership, or "Specialist Courses" in Automatic Data Processing Systems, Satellite Communications, and Audio-Visual Photography and Production, Radar and Radio.

In the first four weeks (or about half of the Basic Electronics Course) about 50 percent of the material is devoted to televised lessons.

### College-Level Course

A course which has very high recognition among colleges and universities is the "Calculus Review" presented by USASCS, although no college credits are given. This 36-hour math refresher is designed for scientists

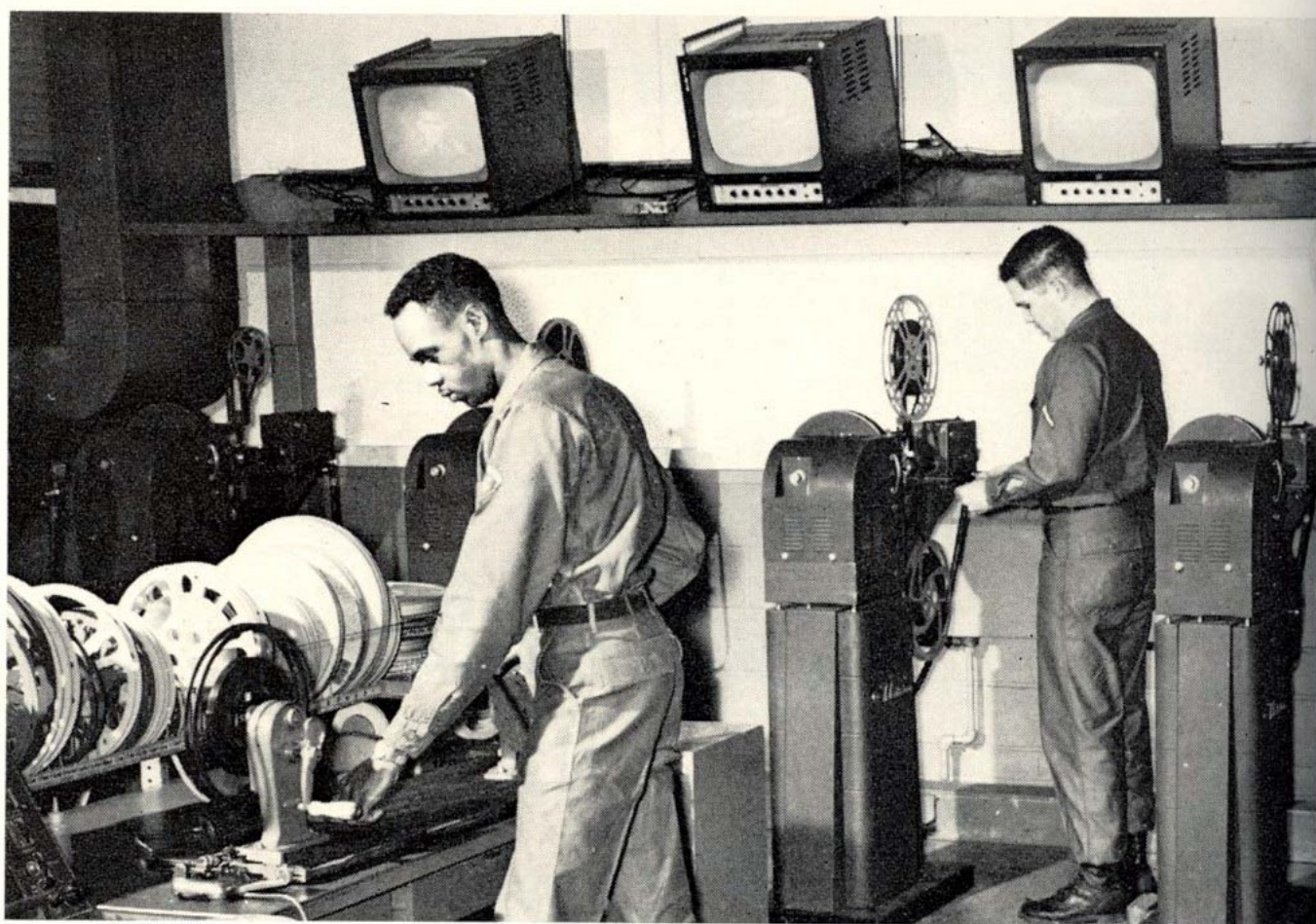


FIG. 4. Nine TV film chains are used to distribute training films to classrooms.

and engineers who wish to "bone up" in certain areas either for undergraduate study or special assignments. According to Dr. Ransohoff, Electronic Command Education Officer of USAECOM, this course has succeeded in ironing out the "bell curve." It is anticipated in the future that other similar programs will be produced.

### Training Films Viewed on TV

Most of the Signal School's training films, whether produced by the TV Division or obtained from other sources, are viewed in classrooms via TV. The TV receiver is easy to operate and permits the students to view live programs as well. Furthermore, students are in lighted classrooms where they can take notes, so the TV receiver presentation of films is ideal. The TV system has also proved convenient in enabling instructors and supervisors to preview new training films as soon as they are received.

### News, Orientations, Education by TV

News programs, character guidance presentations, orientations of new students and visitors, educational developments and command addresses are seen by students, staff and faculty via TV. Newscasts, professionally done by trained students, are telecast throughout the day. Character guidance presentations are made regularly by the Post chaplains. Medical and health messages are often presented in a light vein by student productions.

Taped addresses by high ranking local

and visiting military personnel are frequently prepared for viewing throughout the Post and for distribution to other educational TV centers. Often, slide, chart and background projection material is integrated into one taped program for scientific briefings, thus saving valuable time and personnel.

The trend at the Signal School has been toward more extensive use of TV during off-duty hours. Plans call for equipping troop housing areas for presenting courses in mathematics, physics, the languages; and special military activities.

### TV Repair and Maintenance

The Audio-Visual Division of the Department of Specialist Training conducts a 25-week course for TV repair and maintenance technicians. The course, which offers training to Army, Air Force, and Navy is for all ranks and all grades. It proceeds from the simplest vidicon TV system through receiver repair, I.O. cameras, film chains, and microwave relay systems to an RCA color camera system, color receivers, TV tape and new solid state equipment.

Students must qualify in the maintenance and repair of typical equipment used in Armed Forces TV facilities. At the end of each phase of instruction, both written and performance troubleshooting tests are given for evaluating the progress of each student. Graduates of the course are sent to various military television sites and centers through-



## How Closed-Circuit Television Is Used

- Supplementary Instruction
- Complete Instruction
- Programmed Instruction
- Orientations
- Information
- Staff and Faculty Hour
- Briefings
- Instructor Training
- Training Films
- Film Previews
- General Education

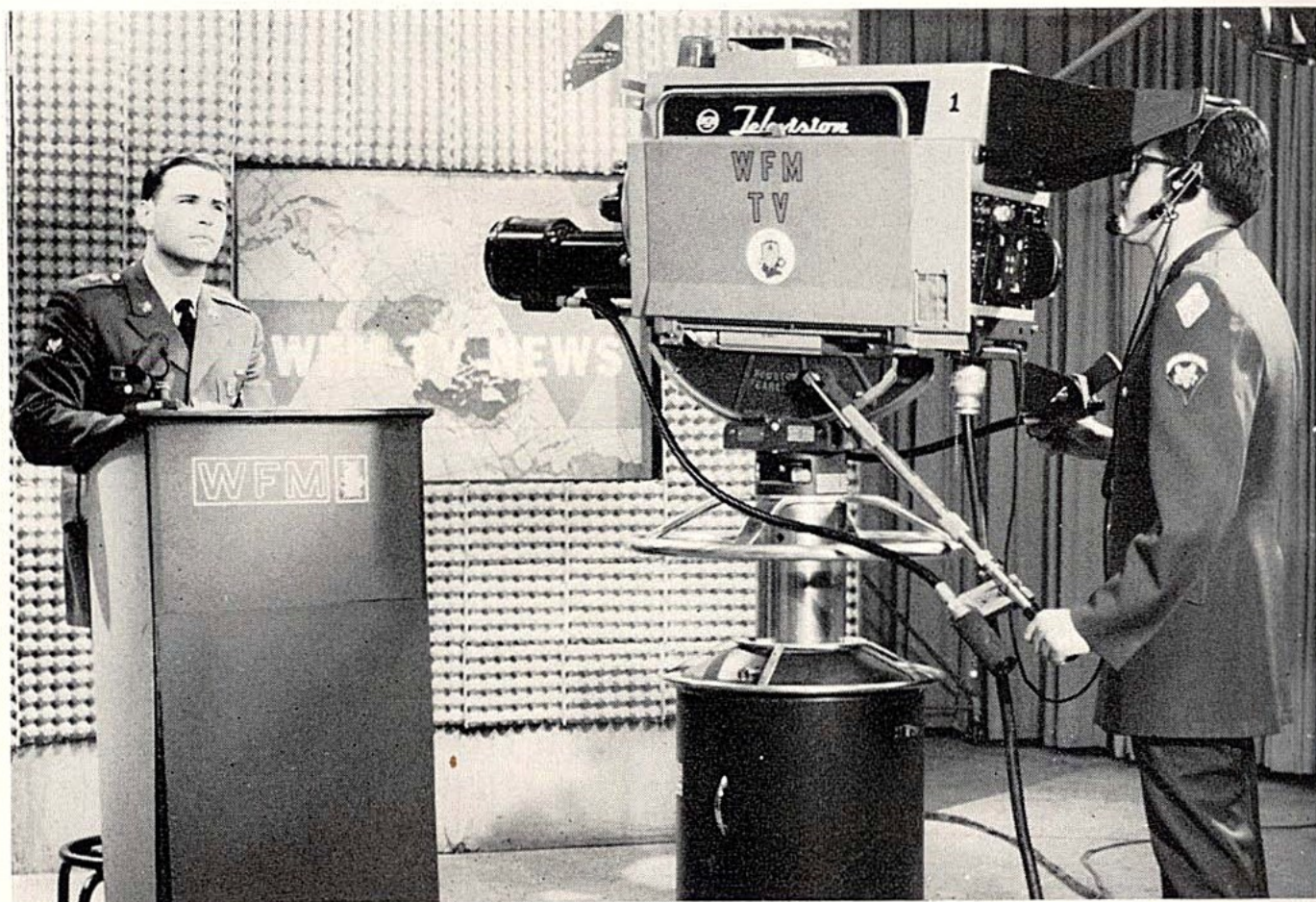


FIG. 6. Daily newscasts are a regular part of the School's closed-circuit broadcast curriculum.

FIG. 5. Use of two cameras to produce the split screen effect shown on the monitor at the right and seen by the students in classrooms is one of the "multi-visual stimuli" teaching techniques employed.

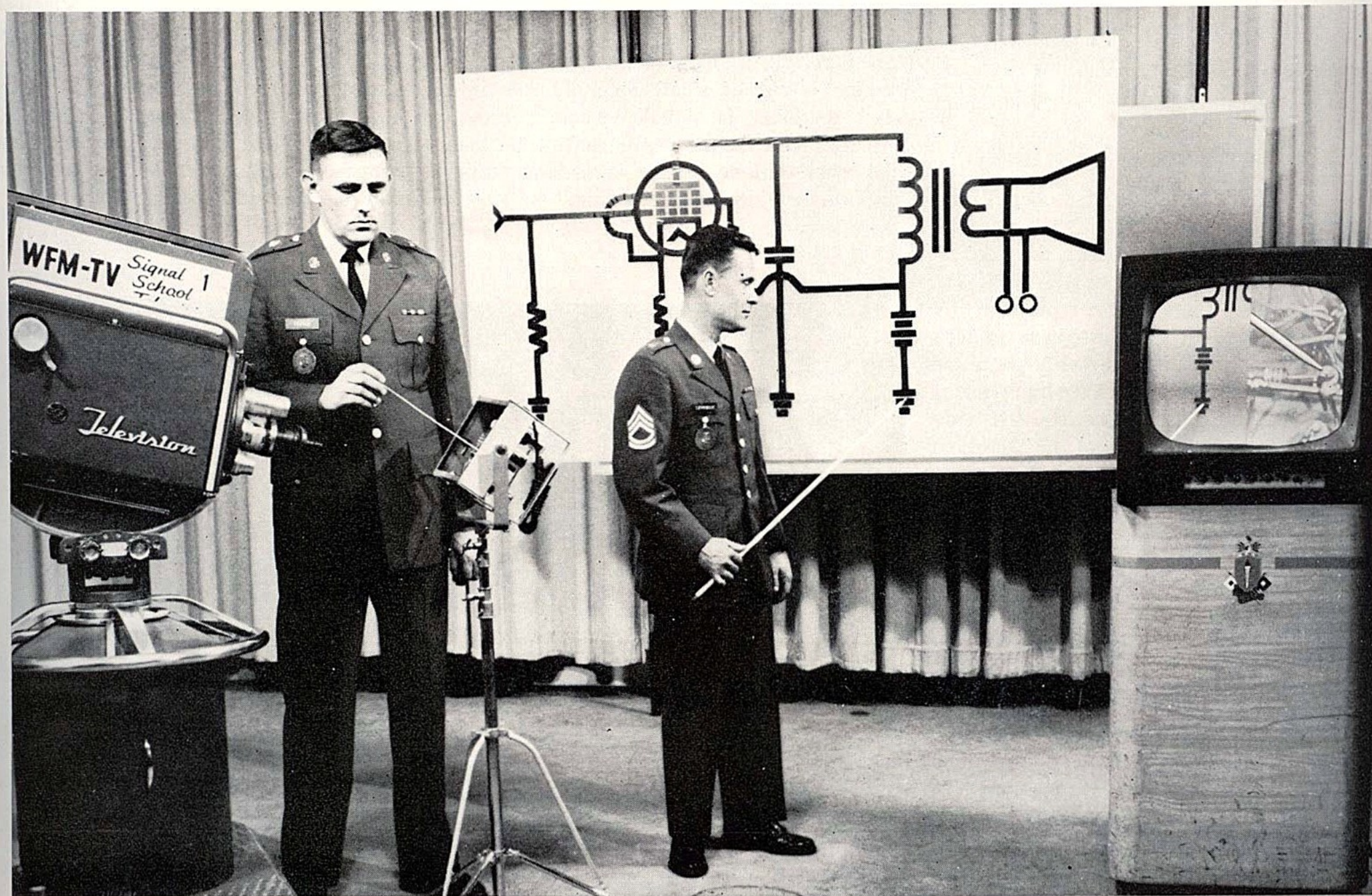






FIG. 7. In TV repair course, Greg Lentzakis (left) Chief Instructor, assists student in the proper use of test equipment.

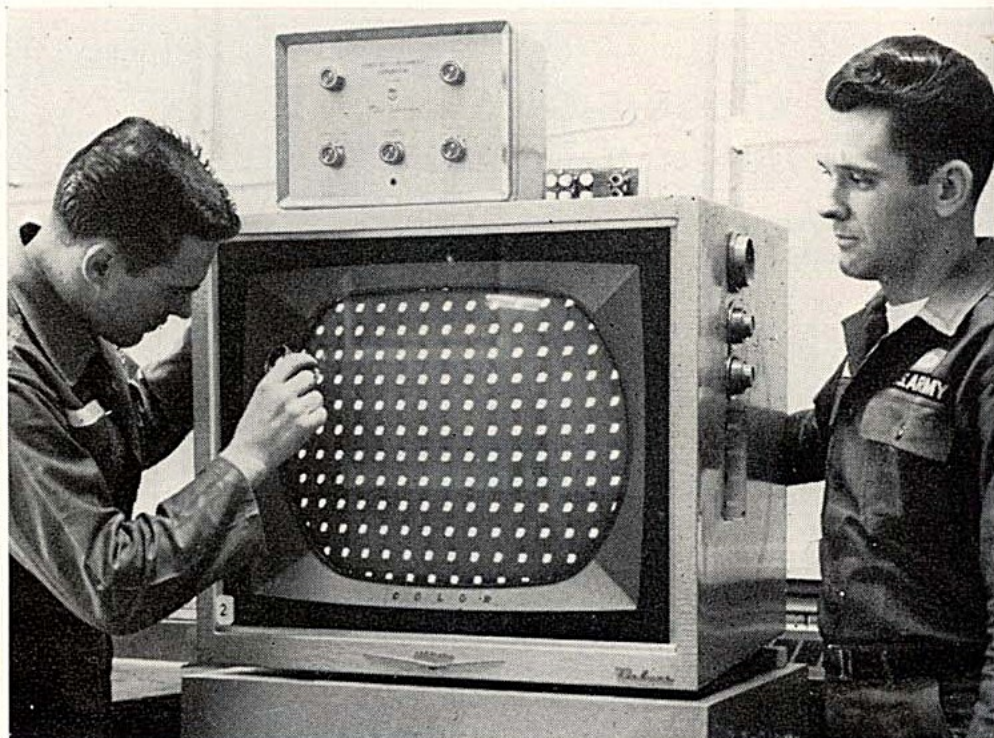


FIG. 8. Students learn to test color equipment.

out the world, such as: Armed Forces Radio and Television Service; U.S. Continental Army Command production and playback centers; aboard aircraft carriers for associated training and combat missions; and at military weather television networks, medical centers, missile centers, for White House assignments; and in research and development centers.

#### Instructor Training by TV

"Oh some power the gift to gie us to see ourselves as others see us. It would from many a blunder free us."

This plea, by Scottish poet, Robert Burns, has indeed been answered with an Instructor Training Course sponsored by the Instructional Methods Division of USASCS, Dr. Joseph Frank, Chief. Here, replays of TV tapings made of the instructor-trainee's classroom teaching have in reality permitted him to see himself as others see him. During class, a remotely controlled PK-301 vidicon camera scans the front of the classroom through a porthole in the rear wall. Camera movements are limited to pan and tilt with no special effects, and the camera operator is required to concentrate on the instructor-trainee, not on the material being taught. At the conclusion of the lesson, the tape is replayed in a conference room and critiqued by the IMD instructor as well as by the instructor-trainee and classmates.

While the instructor-trainees know they are being televised and taped, few are consciously aware of the process. There is little evidence of the stage fright or overacting that is common to staged productions. The Instructor Training Program, which prob-

ably represents the first use of the immediate playback feature of tape for instruction, has been in use at the Signal School since 1960 and has been unusually effective in the training and evaluation of instructors.

Mr. S. J. Ripandelli, Assistant Chief of the Instructional Methods Division, attributes the success of the program to the realistic circumstances under which the video tape is recorded. "First of all," he said, "the camera is out of sight. Secondly, the instructor-trainee is actually teaching class. Finally, there is the reinforcement of the classroom critique by the immediate playback of the video tape recording."

Instructional Methods Division has two classrooms which are used for training instructors in TV presentation techniques. These classrooms are equipped with vidicon TV cameras and are served by a centrally located control room.

The television camera is used by IMD in its briefings and presentations for scientists and senior administrators. It is also used to assist fully trained instructors who wish to concentrate on self-improvement. Dry run tapings are scheduled so that the experienced instructor can see himself. The television camera records the action without becoming an intruder in the classroom.

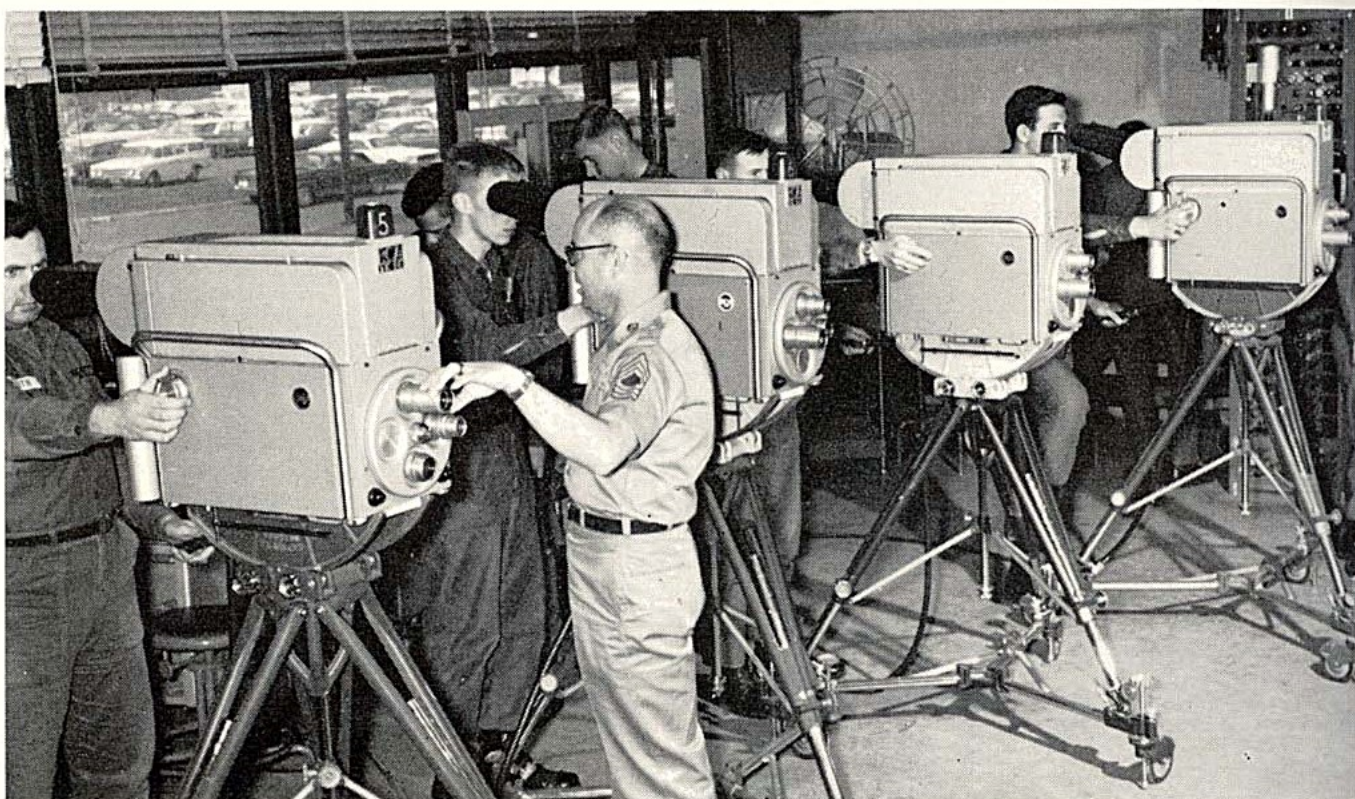


FIG. 9. Class in TV camera operation and maintenance.



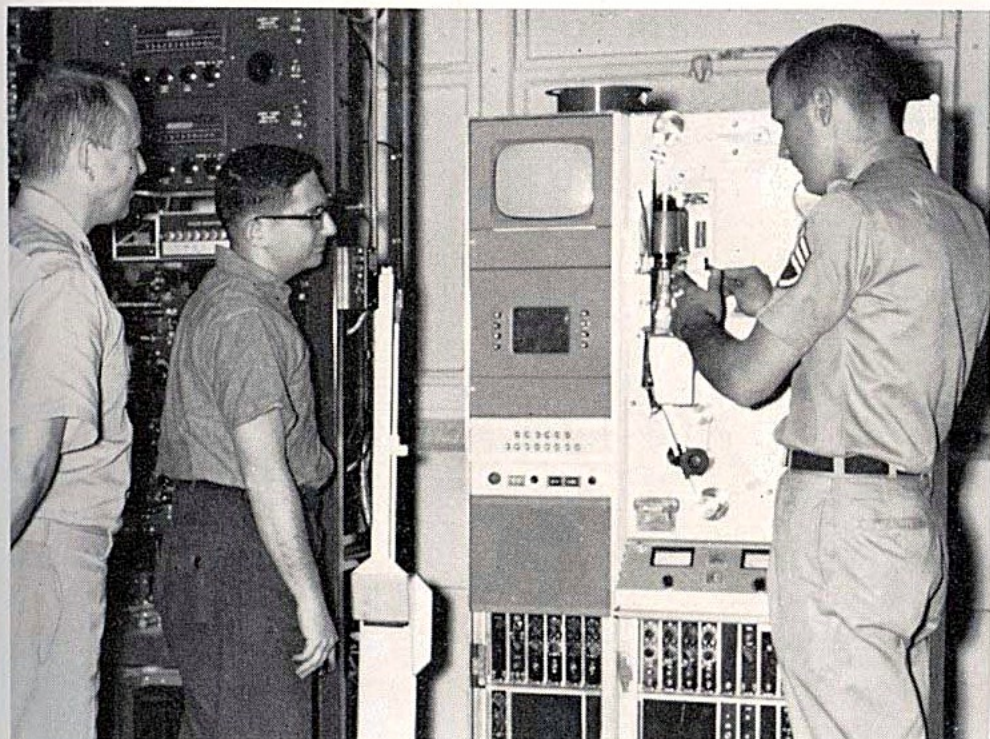


FIG. 10. The TV repair course is a tri-service operation, with students from the Army, Navy and Air Force.

Instructor training courses run 8 hours per day, 5 days per week—for a total of 10 days or 80 hours. IMD has designed instructor courses in "TV Script Writing" and courses covering the "Philosophy of Educational Television."

#### WFM-TV Services and Staff

The WFM-TV closed-circuit TV system provides educational television facilities and services to meet instructional needs of the various academic divisions and other official organizations of the Signal School and Fort Monmouth.

WFM-TV is manned by the Television Division, Office of Academic Operations, which also provides production "know how" to assist academic personnel in planning, staging and presenting their lessons through the video medium.

The Division encompasses administration, engineering and production branches and is staffed by a nucleus of civilian TV specialists and a majority of military personnel, many with previous experience in commercial television. Others are trained in the Signal School technical courses or on-the-job in the TV Division. Considering its size and complexity, WFM-TV operates with a minimum staff.

The Chief, TV Division is in charge of all divisional personnel and activities. He reviews all new programs for matters of policy, and assigns personnel and facility resources necessary for each program.

The Program Director is Chief of Programming. He works with agencies and other divisions in planning their programs, and in obtaining special training aids or other re-

FIG. 12. J. J. Flanagan, Instructor, displays TV microwave equipment, part of TV operation, repair and maintenance course.



FIG. 13. Placement of "see yourself" PK-301 remotely controlled vidicon camera used for training instructors in improved teaching.

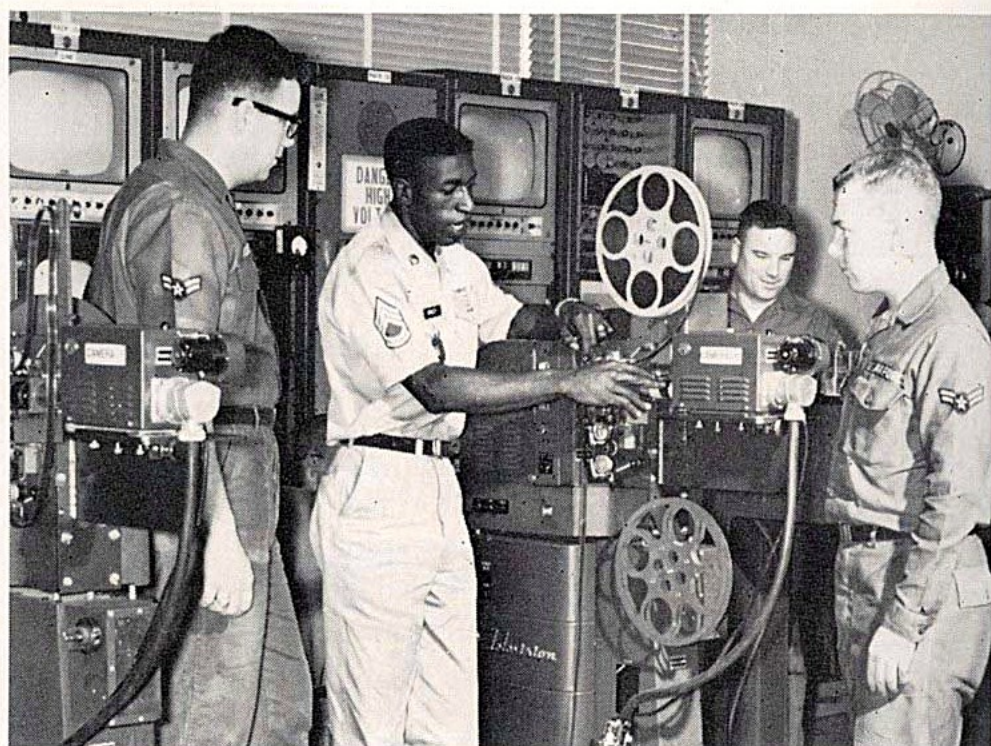
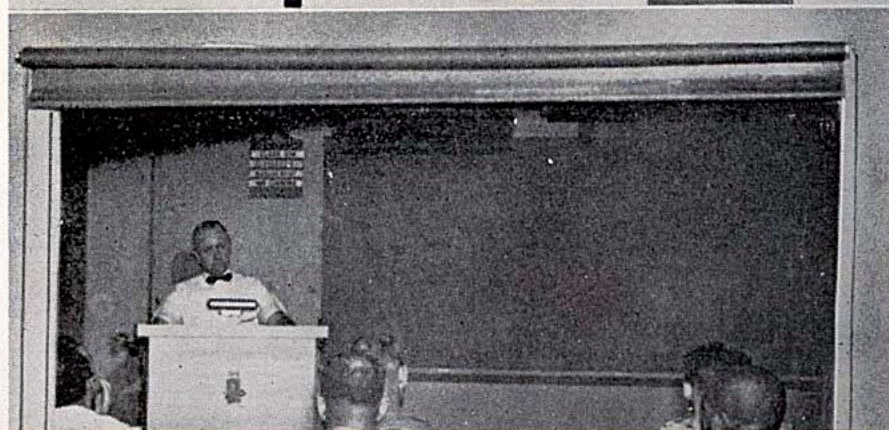
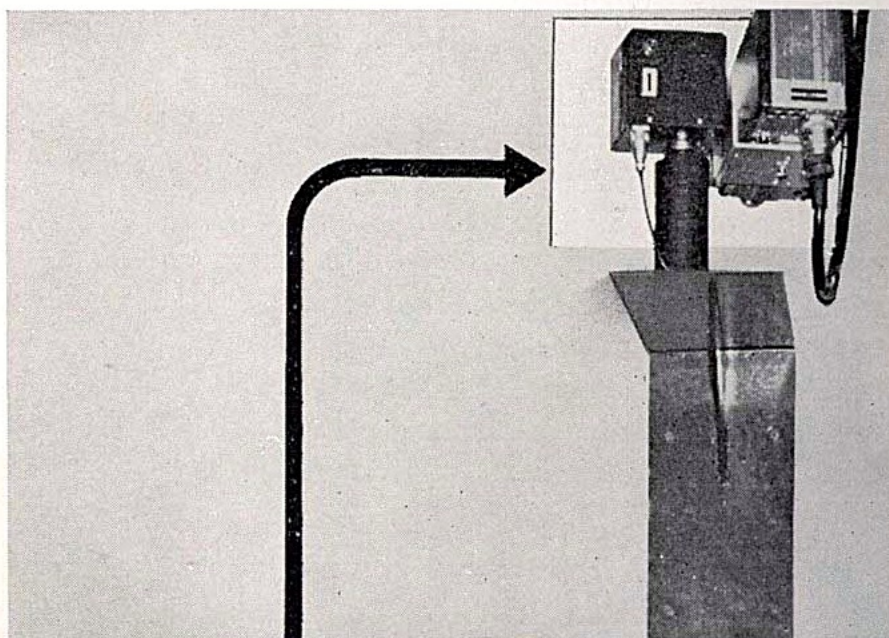


FIG. 11. Students work with TK-21 and TK-22 film cameras.



sources for their programs. He also supervises the scheduling of studio facilities and programs for viewing in the School or elsewhere on Post.

The Broadcast Supervisor assists the Program Director in scheduling programs for transmission to classrooms.

### Engineering Branch

Under the direction of the Chief Engineer, the Engineering Branch of the TV Division, staffs 37 persons and is responsible for the design, installation, operation and maintenance of the entire closed-circuit TV system, and for the procurement and training of technical directors, cameramen, film projectionists, video control operators, and other technical operating personnel.

Obtaining technical personnel is a problem and the turnover is high; the average stay at the TV center is only 15 months. Many students get their First-Class telephone tickets before they leave.

Duties and responsibilities of Engineering Branch personnel are as follows:

The Chief Engineer is Chief of the Engineering Branch. He assigns and supervises all technical personnel associated with the operation and maintenance of WFM-TV equipment facilities. Distribution and receiving equipment is maintained by the Post Signal Officer.

The Technical Director, working closely with the Producer-Director, operates the video switching and fading facilities in the studio control room. He sets up visual effects and switches scenes on cues from the director. He also supervises technical quality of pictures in control room by video camera control operation.

The Video Engineer controls the quality of the pictures transmitted by all TV equipment, aligns cameras, and assists in lighting prior to the program.

The Video Tape Engineer works closely with the TD to insure the highest quality tape recordings and to control technical quality of tapes in accordance with industry standards and USCONARC (U.S. Continental Army Command) regulations. He also controls and maintains the USASCS tape library, issuing tape dubs to other schools when so directed.

The Kinescope Film Recorder and Processor Technician controls the quality of all locally produced kine recordings and film processing. He works closely with the TD and lighting director to insure maximum quality of recordings.

The Audio Engineer controls the quality of all sound on the program, sets up microphones, maintains correct volume levels, op-

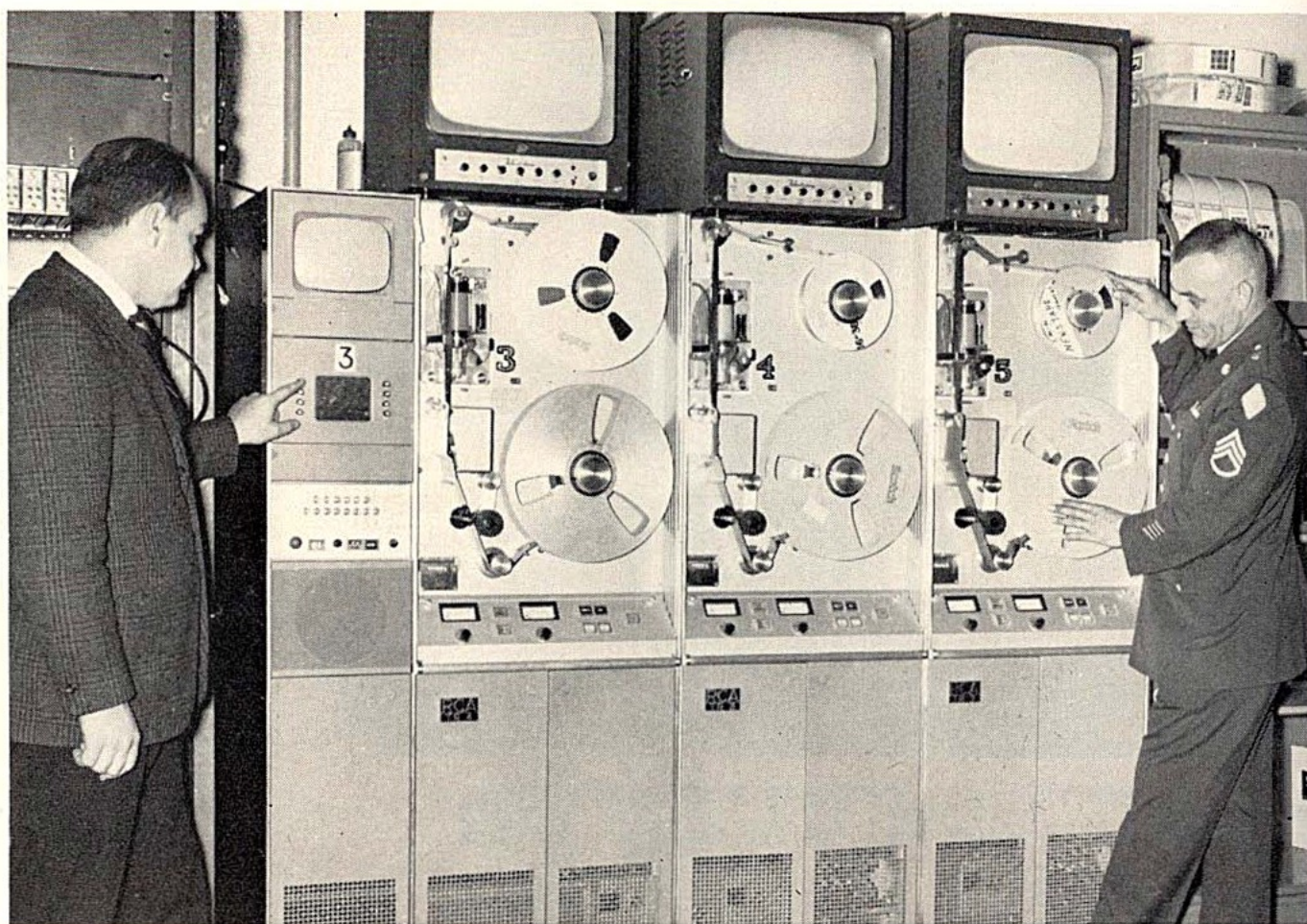


FIG. 14. TR-4 tape recorder and two TR-3 playback machines being checked out in the video tape room.

erates turntables, the audio console, tape machines and film sound controls.

The Production Branch, led by a Production Officer, staffs 23 people and trains program directors, script writers, studio floor-men, narrators, artists, illustrators and others necessary to the production of TV programs. The duties and responsibilities are as follows:

### Traffic Branch

The Traffic Branch, headed by a television coordinator and two assistants, is the master file and index center for all WFM-TV closed-circuit programs. The system, in ad-

dition to maintaining a central file of all programs produced and broadcast, also makes it possible for the Branch to issue a "TV Guide" each week listing programs scheduled to be broadcast on WFM-TV by channel, subject, title and running time. Advanced requests by the various departments and branches served by WFM-TV for specific programs can be filled in as little as three minutes.

### Production Branch

The Production Officer is Chief of the Production Branch. He assigns and super-

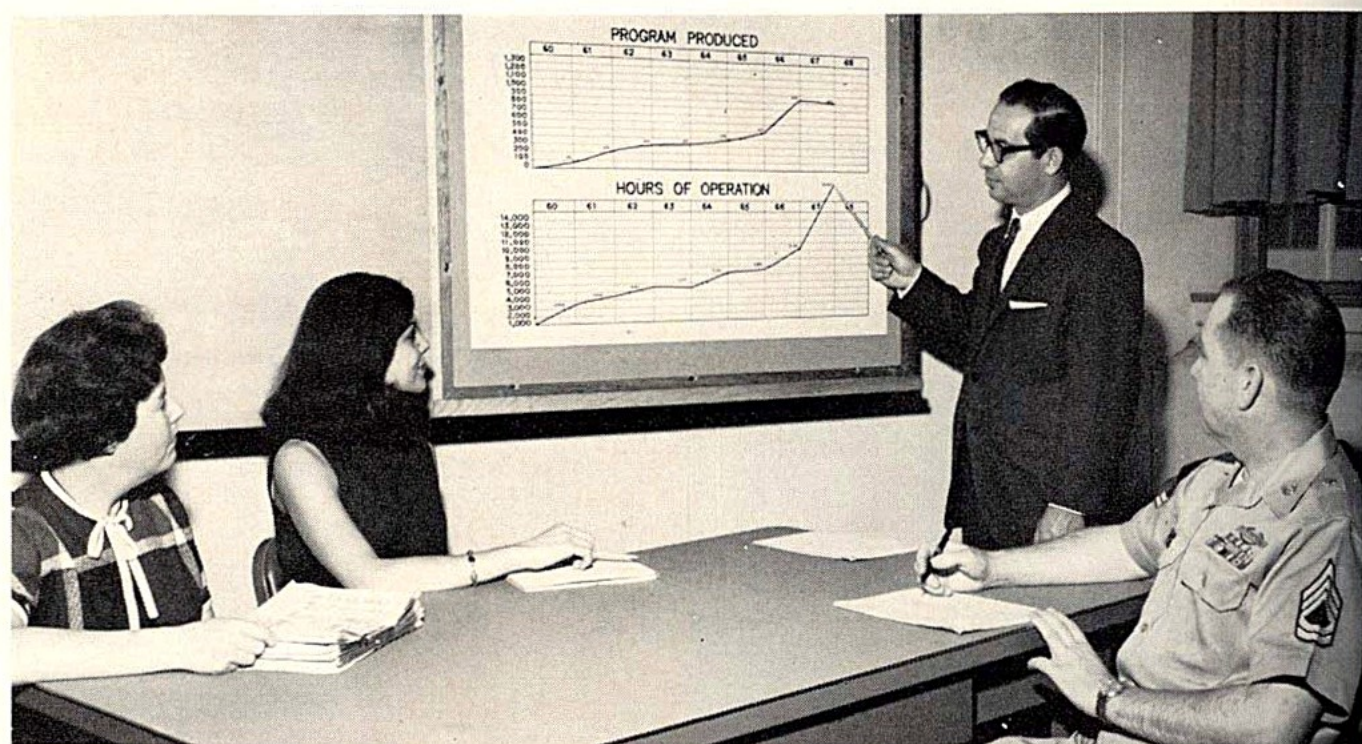


FIG. 15. Murray V. Tesser, Deputy Chief, TV Division, discusses production volume with Mrs. Michael Celli, TV Coordinator, Mrs. David Jones, Secretary, and Sgt. First Class Rost.





FIG. 16. Major Frank J. Peterson, Chief, TV division, explains use of TK-60 I.O. camera to German and Canadian liaison officers assigned to the U.S. Army Signal Center and School.

FIG. 17. School film equipment includes multiplexed TP-66 projectors and TK-22 camera.

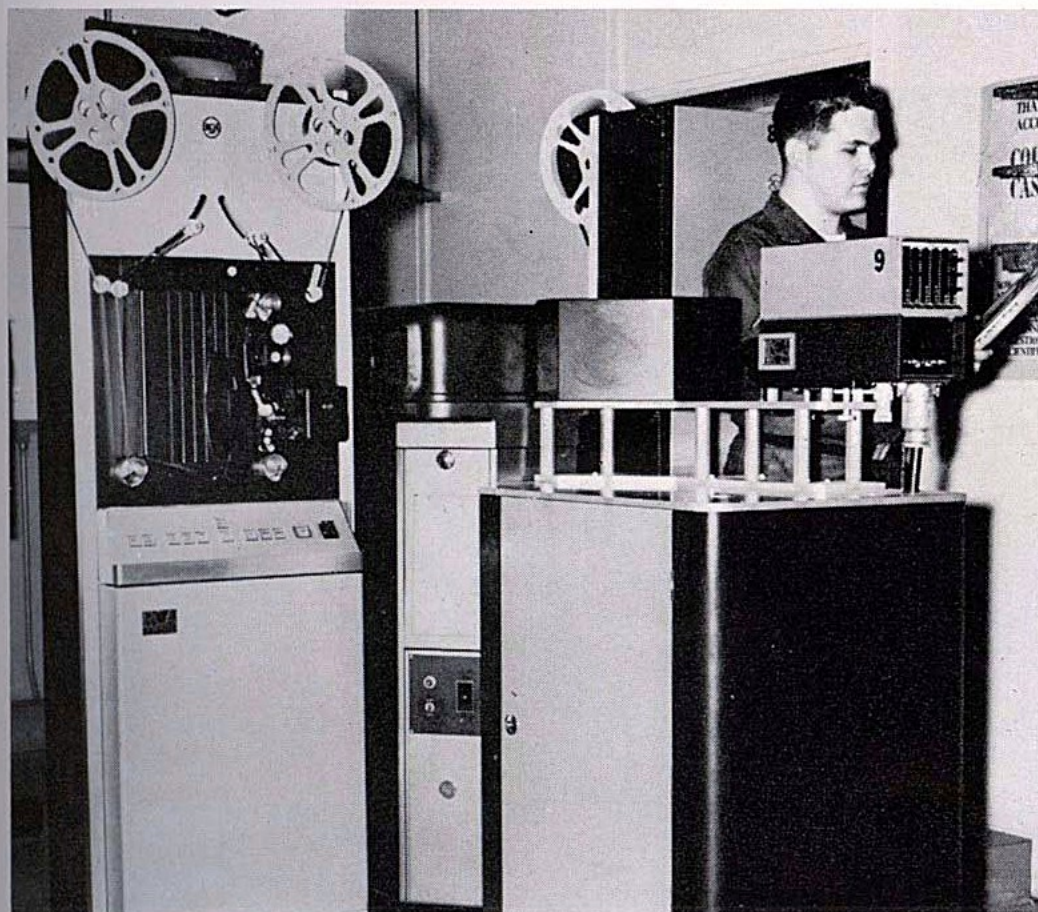
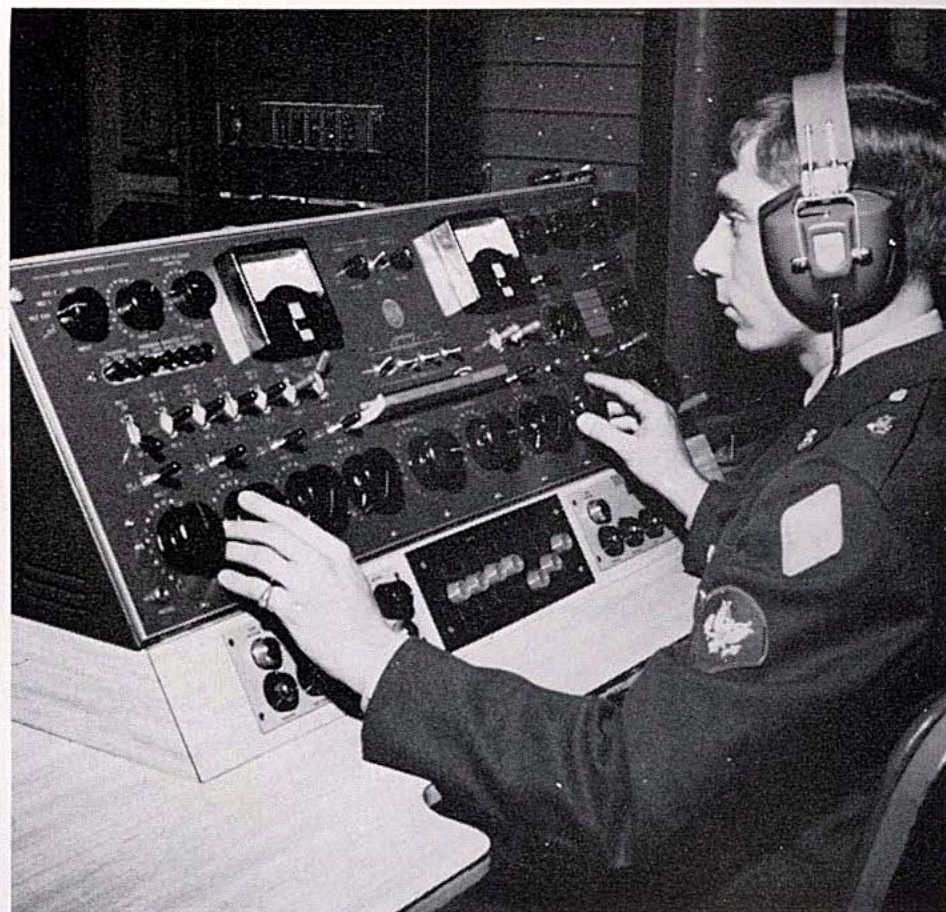


FIG. 18. Audio engineer in control room rides gain during program rehearsal.





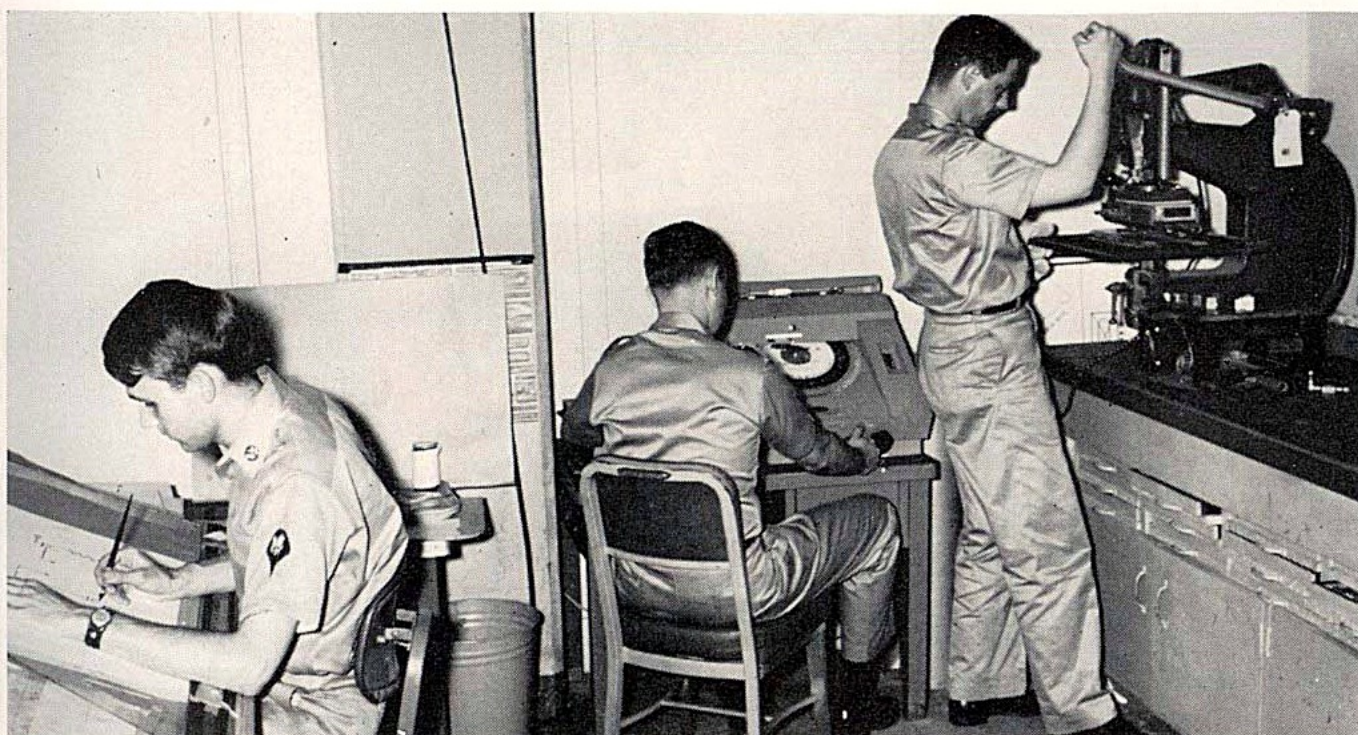


FIG. 19. The TV Division maintains a complete graphic arts department to prepare teaching aids.



FIG. 20. Artists check visual aids for transmission.

vises all production personnel and facilities. He assigns studio equipment, props and other devices that the program requires, and reviews all production details of the program.

The Producer-Director advises in planning and preparing scripts, visual aids and materials. He stages the program, conducts rehearsals and advises on techniques of good production. He is in charge of the program and all TV personnel assigned to it.

The Floor Manager is the director's assistant in charge of the studio. He is responsible for having all scenery, props and equipment in place. He gives cues for movement during the program.

The Cameramen maneuver cameras into position for good picture composition; they focus, change lenses, and take cues from the director.

### TV "Professionalism"

"One of the secrets to effective teaching at the Signal School is that we find ways of adding to the interest and enjoyment of the program," said Mr. Tesser. "Through showmanship, we try for student 'involvement.' A tight shot of a musician's hand fingering the strings of an electric guitar as it sings out a popular song, demonstrates what happens to the signal when it is fed through different classes of amplifiers. Our staff strives for professional quality in pictures and programming—comparable to broadcast station productions. We are equipped with I.O. studio cameras and other TV equipment capable of the best pictures, so that the quality of capabilities of our programming is not limited. We learned that for a production to have its maximum effect, it had to look good and



FIG. 21. Members of the production department discuss a new program sequence.



sound good. Born and raised in the TV era, our students were satisfied with nothing less." Mr. Tesser has an extensive background experience in educational and commercial broadcasting.

### WFM-TV Facilities

Studio, control and programming facilities of WFM-TV are located on one floor in a wing of Myer Hall, which also houses headquarters and administration offices.

There are two studios, each with a control room, a film-projection room, tape and kinescope recording room, master control, art and production departments, film-viewing area, and storage areas for scenery and props.

TV material originating in WFM-TV can be transmitted simultaneously to a total of 600 TV receivers located in remote classroom areas and to three large-screen TV projectors in theaters and auditoriums throughout the Post.

### 21-Channel System

Transmission to receivers and large-screen projectors is over a 21-channel RF distribution system utilizing approximately 18 miles of coaxial cable, one of the largest such closed-circuit systems in use by any ETV facility. Seven channels feed Myer Hall and school brigade dayrooms. Twelve channels feed the Department of Command Communications and radar classrooms. Two channels feed IMD.

At the sending end, program video and audio information from the TV switching system in master control modulates RF transmitters which feed a 72-ohm, double-shielded coaxial cable with approximately



FIG. 22. Program director cues beginning of news broadcast.



FIG. 23. Video engineers at control console observe pictures on camera controls and overhead monitors, perform switching.



FIG 24. Members of WFM-TV production department confer before program goes "on-air." Production team includes writers, educators, artists, cameramen, floormen, and technical director.



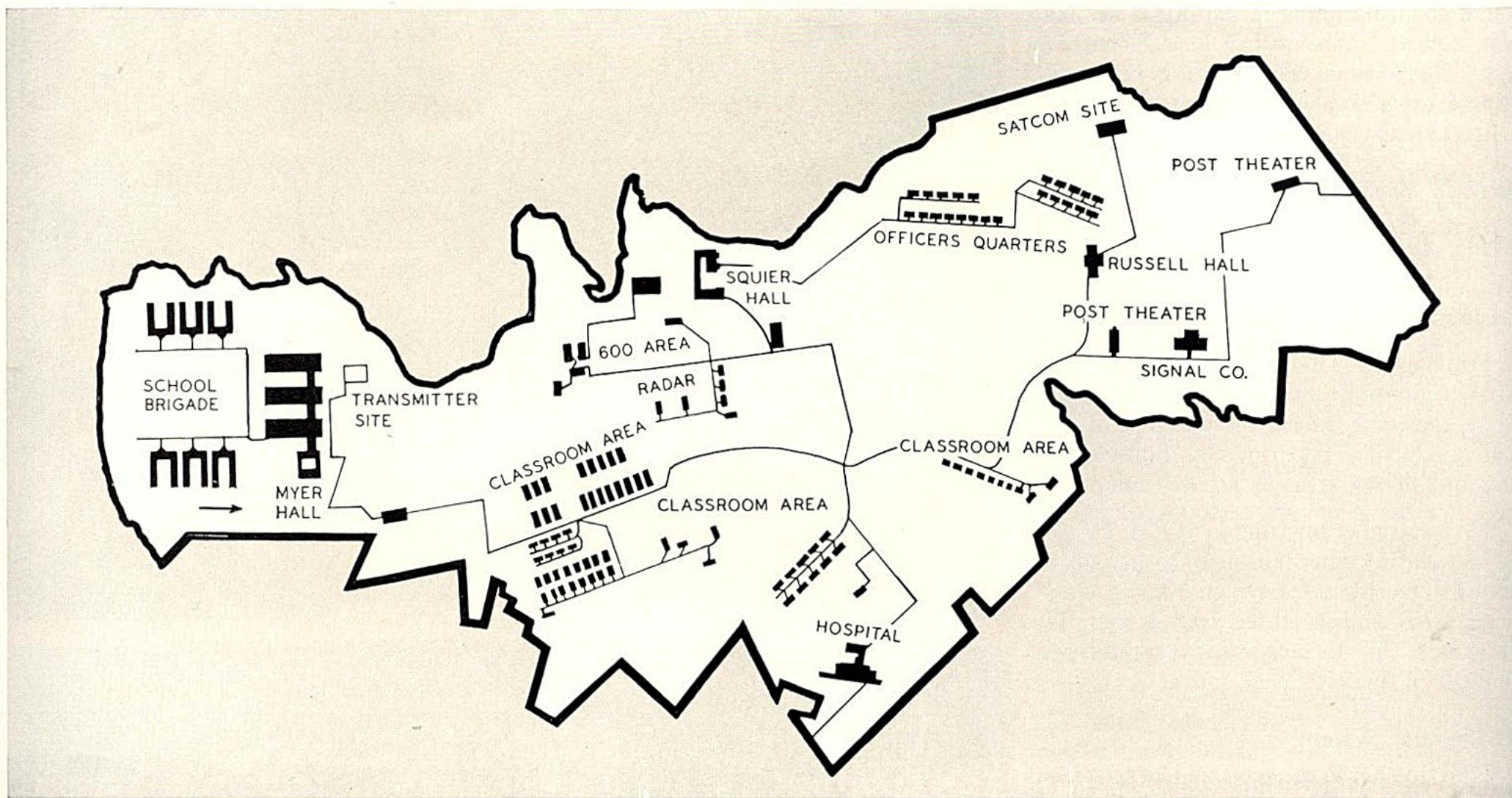


FIG. 25. Closed circuit TV system at Fort Monmouth. Myer Hall is site of WFM-TV, headquarters and administration offices.

one-volt of RF on each TV channel. At the receivers, the cable is wired to the RF front ends (modified for 72-ohm input), permitting selection of the desired RF channel for viewing. Broad-band, distributed type amplifiers are inserted at intervals in the distribution cables to maintain signal strength.

One additional RF channel is provided as a "house monitor" channel and is wired to selected administrative offices. Also available is a microwave system linking the Signal Corps Research and Development Laboratory, three miles away.

#### Broadcast TV Equipment

Major TV units of WFM-TV comprise nine live camera chains, nine 16mm TV film projectors, a slide projector, five TV tape machines, kinescope recorder and film processor, monoscope camera, step generator and off-air TV receiver. These facilities provide several video program sources in every TV medium.

#### TV Mobile Unit

A mobile TV unit equipped with two TK-31 field cameras, a video tape recorder, TV microwave link and associated equipment provides TV production and taping support for schools at Fort Dix, New Jersey and Fort Hamilton, New York. Tapes and kine recordings are supplied by USASCS.

Mobile pickups for classroom instruction and student entertainment programs are relayed back to TV headquarters by the microwave link.

#### Studios and Control Rooms

The main studio, Studio A, is 22 by 50 feet equipped with three TK-11B studio cameras, rear screen projection equipment, and extensive lighting facilities. It is used for live pickup of presentations by Post personnel and instructors. Flip charts, animations or other devices may be used in whole or in part for informational and instructional programs.

Prompter units for the cameras aid personnel in making their presentations from prepared scripts. Rear screen equipments project transparencies, film strips, opaques and similar materials on a 9 by 12 foot screen for camera pickup and integration into the program. This equipment also permits optical animations and wipes. "Limbo" (separation) shots are made on a black section of the acoustic curtains in the studio.

The Studio A control room contains the camera controls, a TS-11A video switcher and special effects generator, TV monitors, a BC-6 audio console, turntables, and two audio tape recorders. The switcher permits instantaneous selection of camera, fading or

dissolving between pictures and superimpositions.

Studio B is 22 by 40 feet and also has a separate control room looking into the studio. This studio contains two TK-60 4½-inch image orthicon camera as well as lighting and audio facilities. It is used primarily for newscasts and special programs when Studio A is in use. The control room contains camera controls, a TS-11A switcher, turntables, a BC-6 audio console and audio and video patch facilities.

#### Instructor Training Classrooms

The two instructor training classrooms, where student instructors' TV teaching techniques are observed while they teach their classes, are located at opposite ends of a control room which looks into both classrooms.

Microphones mounted to pick up the instructor's voice and special lighting are the only equipment facilities in the instructor training classroom. The control room contains two PK-301 vidicon cameras, each equipped for remote pan and tilt, two rack-mounted TV master monitors and two audio tape recorders. Duplication of control room equipment permits both classrooms to operate simultaneously. Video output of these classrooms is fed to TV Tape Recording studio (via Master Control).



## Equipment Employed in Ft. Monmouth CC-TV System

### STUDIO A AND CONTROL ROOM

3—TK-11 Studio I.O. Camera Chains  
 1—Taylor-Hobson Studio Varatol II  
 3—Teleprompter Systems  
 2—21-inch Video Monitors  
 1—Telepro 6000 Rear Screen Projector  
 Eastern and Century Lighting  
 Century Dimmer Consoles  
 Sound-Proof Audio Booth  
 1—TS-11A Video Switcher  
 4—WP-15B Power Supplies  
 4—TM-6C Master Monitors  
 5—TM-7AC Preview and Line Monitors  
 1—BC-6C Audio Consolette  
 2—Audio Turntables  
 2—Audio Recorders  
 1—Multiplexer Remote Control Panel  
 1—Special Effects Generator  
 1—PK-301 Vidicon Camera

### FILM PROJECTION ROOM

1—TK-22 Vidicon Film Camera  
 8—TK-21C Vidicon Film Cameras  
 2—TP-6DC 16mm TV Projectors  
 1—TP-7A Slide Projector  
 1—TP-15 Universal Multiplexer  
 5—TP-16F 16mm TV Projectors  
 5—TM-7BC Film Line Projectors  
 9—TM-6C Master Monitors  
 1—Multiplexer Remote Control Panel  
 4—WP-15B Power Supplies  
 4—WP-16B Power Supplies  
 2—TP-66 16mm Projectors

### MASTER CONTROL ROOM

1—Video/Audio 20/20 Input/Output Switcher  
 1—Master Monitor  
 16—24" TV R.F. Line Monitors  
 1—Off-Air Demodulator  
 1—FM Tuner  
 1—TM-8 Video Monitor  
 1—Audio Tape Recorder  
 2—B15A VU Meter Panel  
 19—Modulators/RF Transmitters  
 2—Sync Generators  
 16—TA-24 D.A.  
 1—TK-1C Monoscope Camera  
 1—WP-15 Power Supply  
 1—PK-301 Vidicon TV Camera  
 1—TK-202 Vidicon TV Camera  
 10—Solid State Power Supplies  
 1—Generator Test Package—  
 10 Step, Multi-burst, etc.

### VIDEO TAPE RECORDING STUDIO

2—TRT-1A TV Tape Recorders  
 with Pix Lock  
 2—TR-3 Playback Units  
 1—TR-4 TV Tape Recorder with  
 Electronic Editor  
 1—16mm Kinescope Recorder  
 1—Viscomat 16mm Film Processor  
 5—TM-7C Video Monitors

### TV-56A TV MOBILE UNIT

2—TK-31 I.O. Field Cameras  
 2—TK-31 Field Camera Control Units  
 1—TS-30D Switcher  
 1—TG-12A Sync Generator  
 1—Complete Microwave Link  
 1—TR-5 Video Tape Recorder  
 2—TM-9 Video Monitors  
 1—TM-6 Master Monitor  
 3—TY31A Power Supplies  
 1—WP-15B Power Supply

### STUDIO B AND CONTROL ROOM

2—TK-60 4½-inch I.O. Camera Chains  
 2—TK-60 Studio Control Units  
 1—Taylor-Hobson Studio Varatol V  
 1—TS-11A Video Switcher  
 1—Multiplexer Remote Control Panel  
 1—BC-6C Audio Consolette  
 3—WP-16B Power Supply  
 Eastern and Century Lighting  
 Century Dimmer Console

### CLASSROOM & AUDITORIUM RECEIVERS

5—PT-100 Theatre-Size TV Projectors  
 650—21 and 24-inch Classroom TV Receivers (Modified for 72 Ohm Input)

### INSTRUCTOR TRAINING STUDIO

2—PK-301 Vidicon TV Cameras  
 (with Remote Pan & Tilt)  
 1—TG-21A Studio Sync Generator  
 2—TM-35 Master Monitors  
 2—BN-6B Transistor Portable Remote  
 2—Audio Tape Recorders

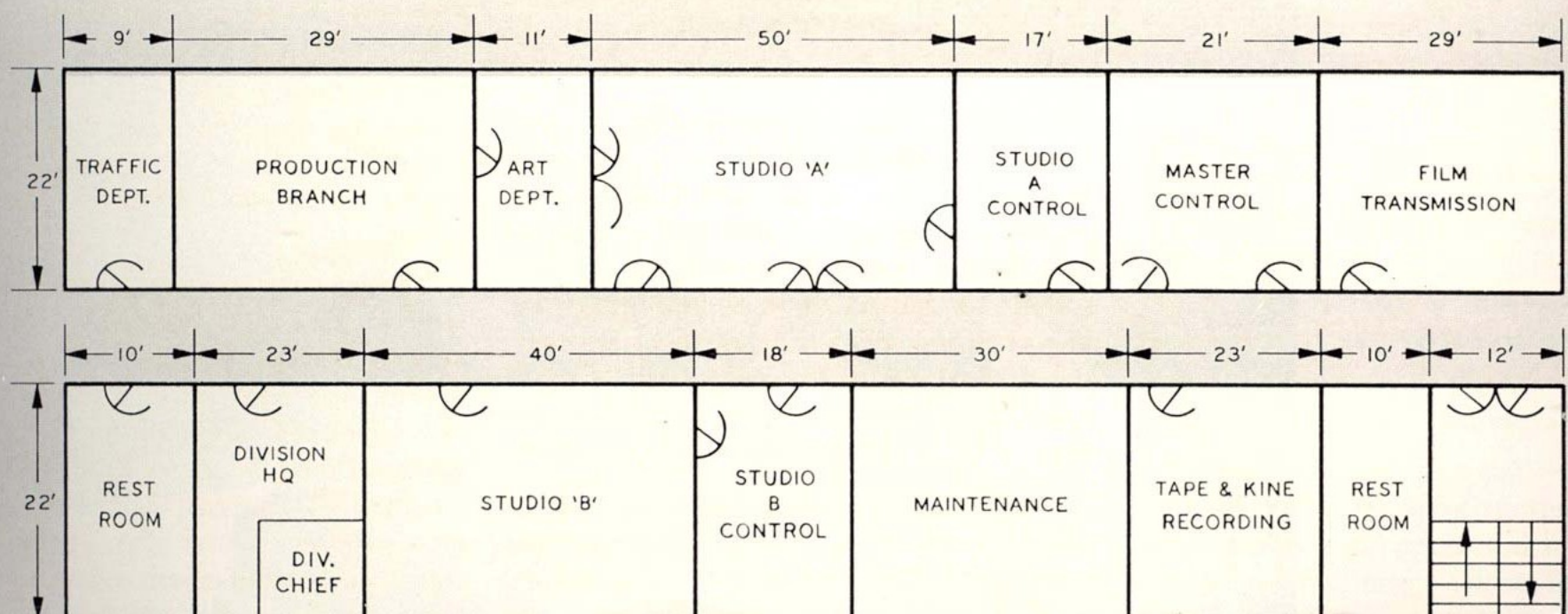
### TV INSTRUCTION CLASSROOMS

8—TK-14 Field Type Cameras  
 2—TS-30 Field Switchers  
 8—TG-12 Field Sync Generators  
 2—TM-6C Master Monitor  
 1—TVM-1A Microwave System  
 2—BC-3C Audio Consolettes  
 2—TK-22 Vidicon Cameras  
 2—TK-21 Vidicon Cameras  
 1—TR-2 (Colorized) Video Tape Recorder  
 1—TR-4 Video Tape Recorder

### COLOR TV INSTRUCTION STUDIO & CONTROL ROOM

1—TK-41 Color TV Camera  
 2—TM-21B Color TV Monitors  
 1—TK-41 Camera Control Console  
 1—Audio Consolette  
 8—21-inch Color Receivers

FIG. 26. Floor plan, WFM-TV television facilities.





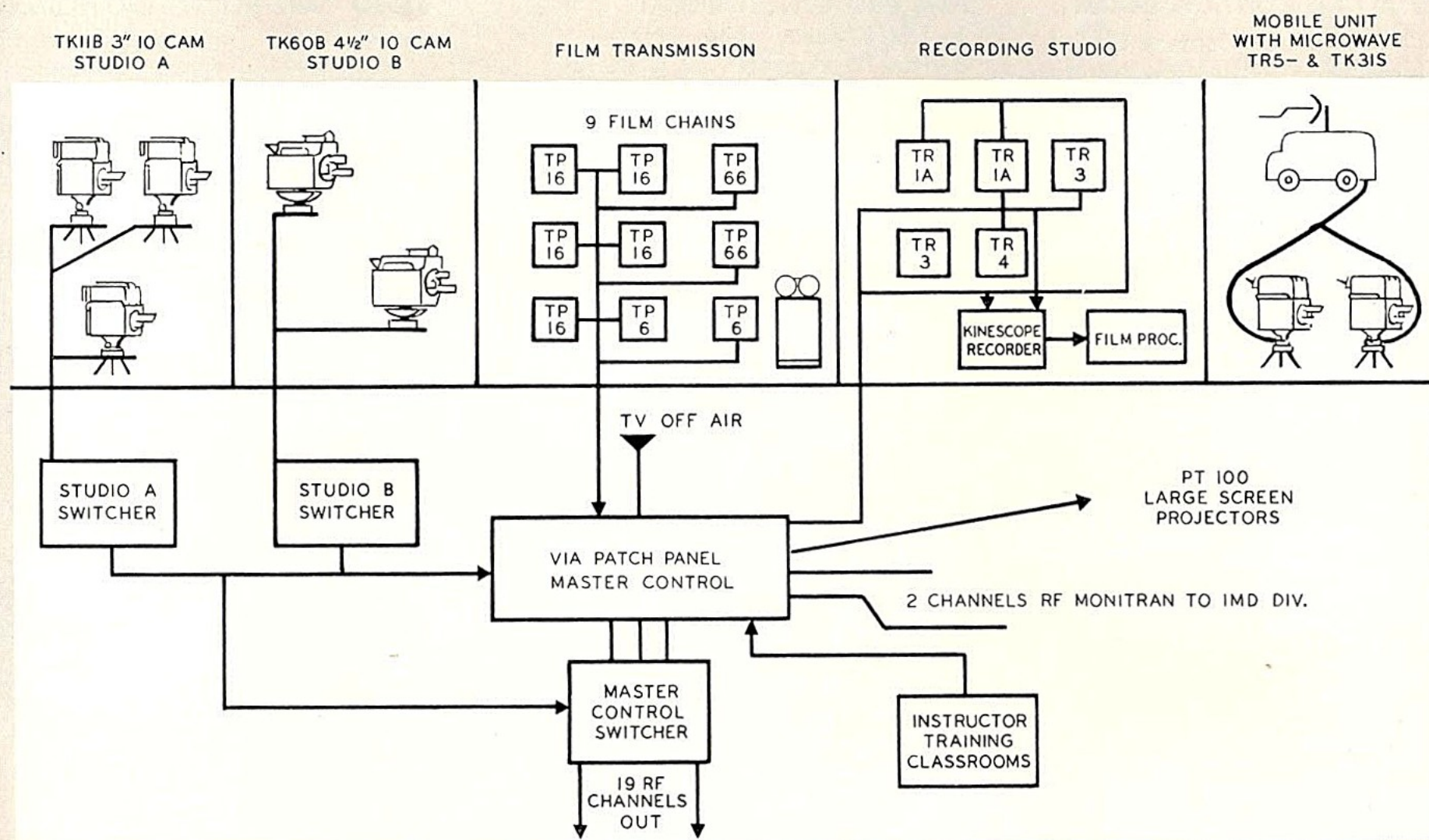


FIG. 27. Block diagram of WFM-TV technical facilities.

FIG. 28. TK-60 camera controls, film remote control and master monitors in Studio B control room.





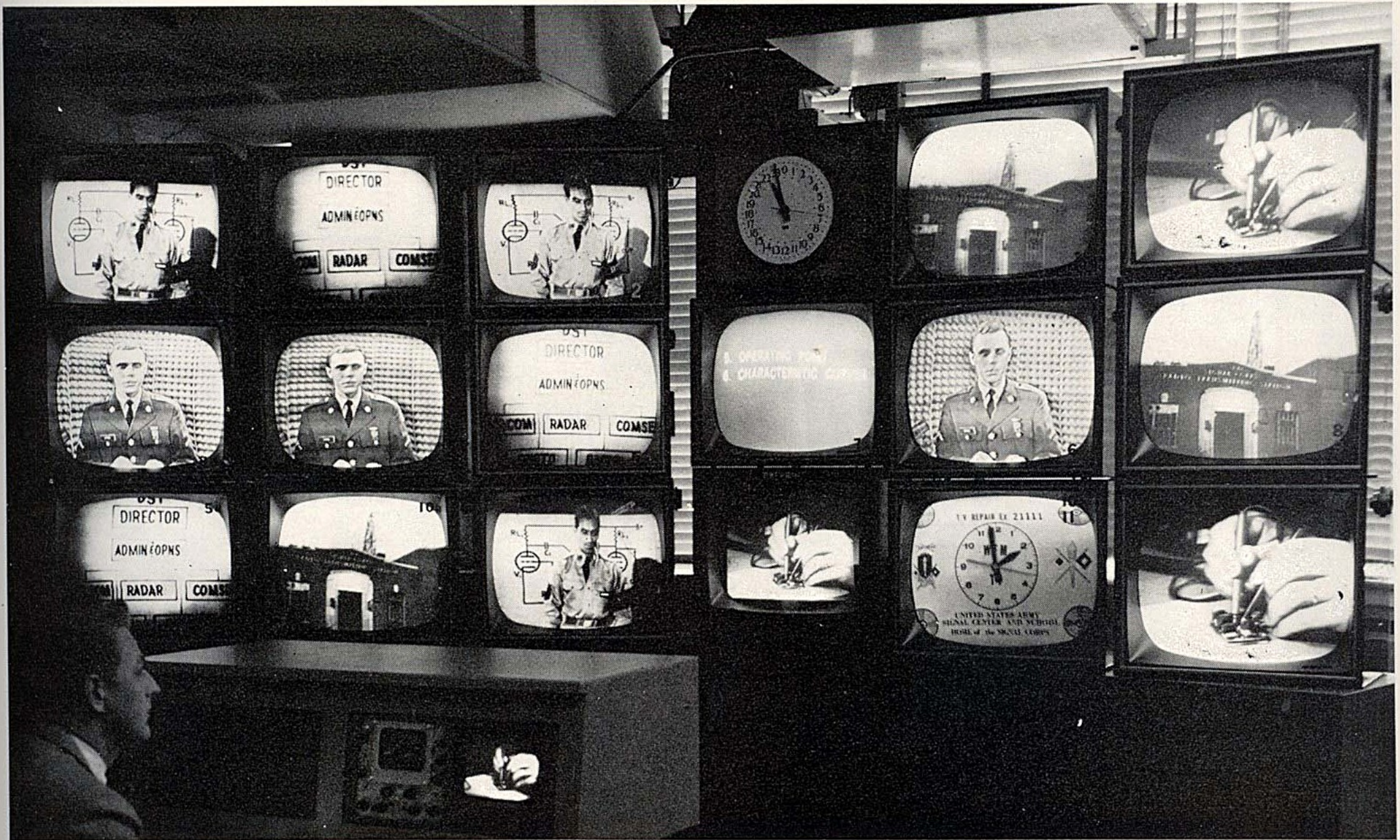


FIG. 29. Master control for the multi-channel WFM-TV closed circuit system.

### TV Tape Film Processing

The taping studio contains two TRT-1A TV tape recorders, two TR-3 TV tape players, one TR-4 TV tape recorder with electronic editing, a 16mm kinescope recorder and 16mm Viscomat film processor. One of the TR-3 players is soon to be modified to TR-4 status by adding the record accessory. The studio tapes training programs, troop entertainment shows, remote pickups from the TV mobile unit and honor guard ceremonies, as well as occasional presentations by outstanding visiting instructors. Useful life on one of the RCA tape heads has exceeded 1,000 hours.

Most of the TV material produced by WFM-TV is recorded on TV tape, either for storage or immediate playback. Film recording and processing is used when extra copies are needed either for exchange with other Post facilities or for playback on TV projection equipment. Tape and film recordings

are usually made simultaneously to provide first generation copies.

### Master Control

Master control facilities are located in a room 21 by 22 feet and consist of 16, 24-inch TV receivers used as RF line monitors, an off-air pickup TV receiver, TK-1C Monoscope camera for test pattern I.D., a step (gray scale) generator, a video switcher, modulator/transmitters to produce the RF channels, an audio tape recorder, and a microwave link. A PK-301 vidicon camera distributes a continuous "clock signal" over the system which is used as a time check between program control and instructor. Another continuously available signal for use in emergencies is a "standby sign" produced by a TK-202 vidicon camera.

Master control is the center of all program selection and switching to desired dis-

tribution channels. Guided by a "master schedule," the operator selects from incoming video programs, and routes them at designated times to the proper RF channels or to the recording studio. Switching is accomplished by a 20 x 20 custombuilt solid state relay system which provides simultaneous switching of video and audio.

USASCS video system now utilizes the complete RCA TA-24 pulse distribution system as well as a modular test package that provides multi-burst window,  $\sin^2$  pulse and gray scale for system evaluation.

### Color TV Instruction Studio

The Signal School maintains a professionally equipped and operating color TV studio and control room which is used exclusively for training students in the operation and maintenance of color TV receivers and studio equipment.



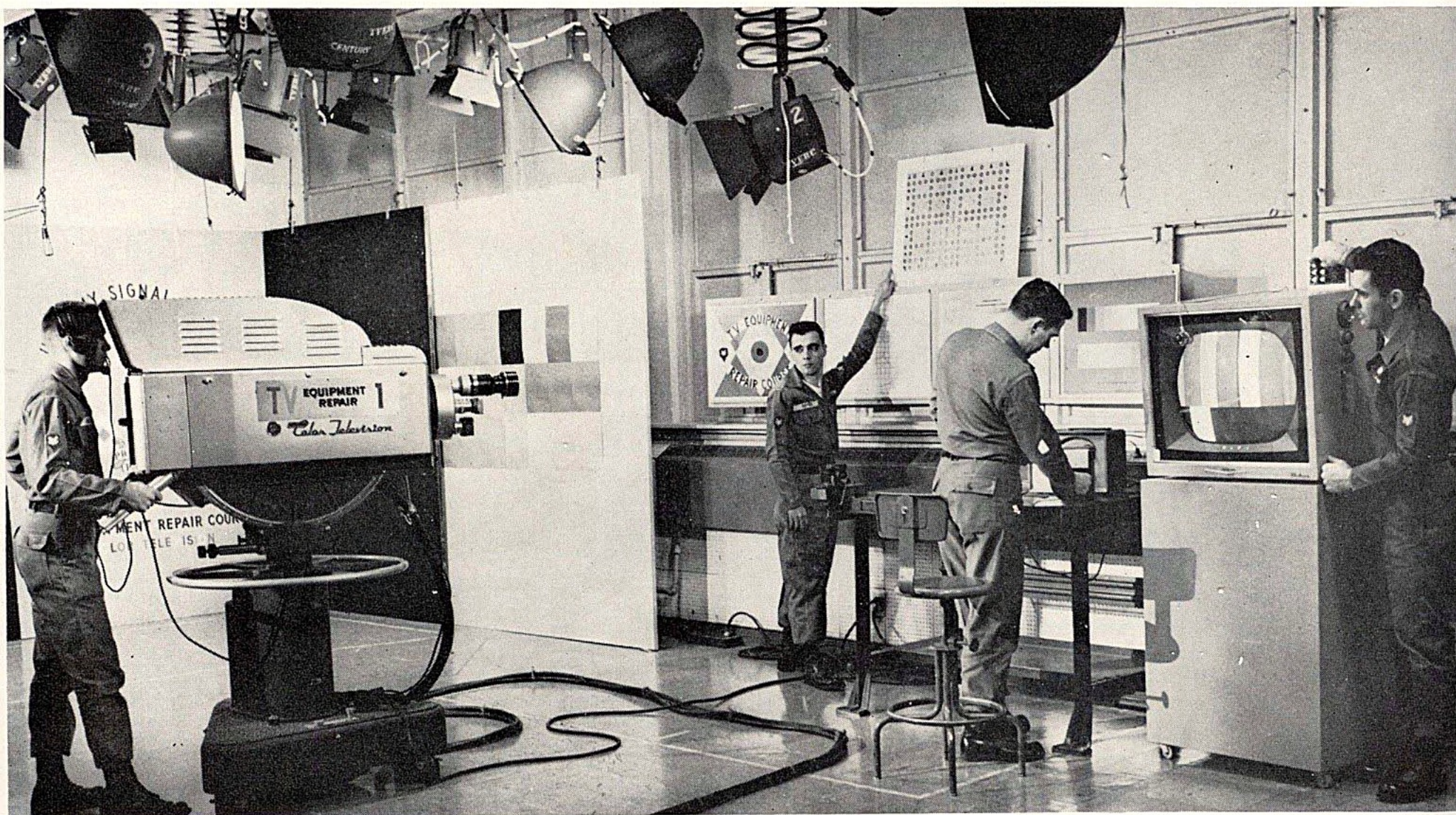


FIG. 30. View into operating color studio used to train students in operation, repair and maintenance of color TV equipment.

Equipment for this purpose consists of a TK-41 color TV camera, two TM-21B color TV monitors, TK-41 camera control console, eight 21-inch color TV receivers, audio console and audio turntable.

Students, many of whom have been trained by the facility for operation and maintenance of military color TV systems throughout the country, are taught the fundamentals of color TV theory, set-up and adjustment of color TV camera systems, studio lighting for color productions, and equipment repair and maintenance.

#### Selecting TV Program Participants

Sponsoring organizations are expected to provide technical advisers and/or television instructors (participants) for all TV programs which the organization wishes to present. In instructional programs, the technical adviser assists in the planning and preparation of program content; the same individual or another in the organization presents the program on TV. Programs to be used in several courses or for several divisions require joint planning by technical advisers from each of the academic areas.

Certain factors are considered in selecting participants: How well he knows his subject; classroom teaching experience; TV

personality requirements such as reasonably good speaking voice, warmth, good grammar and good diction; and whether he will have time to participate in the planning and preparation. TV techniques can be learned by most experienced classroom instructors in relatively short time.

#### How WFM-TV Produces an ETV Program

When the academic division has completed general plans for its TV program and has selected technical advisers and instructors, or participants to work with TV Division personnel, detailed preparation of the ETV program begins.

1. The sponsoring division prepares, with the help of a TV staff writer, a written script so that the TV director and crew members can follow the presentation. For instructional programs, the script is normally a good outline, with instructions regarding demonstrations, use of visuals, planned movement and important cue lines.
2. The script is then discussed with the producer-director to be sure all the information he requires is included.
3. The script is then "blocked," or marked by the TV director for cameras, lenses, cues, etc.

4. Necessary graphics and visual materials are then prepared by a TV Division illustrator. Complex materials are prepared by the Training Aids Division.
5. Program is rehearsed and taped. The program is then scheduled for transmission and documented in a weekly TV program schedule which gives the MOS (Military Occupational Specialty), the time at which the subject matter will be shown, and the channel on which it can be seen.

#### Advantages of TV in Instruction

TV provides the following technical advantages not readily available in normal classrooms:

Gives close-up magnification of small objects so that each student has a "front-row" seat.

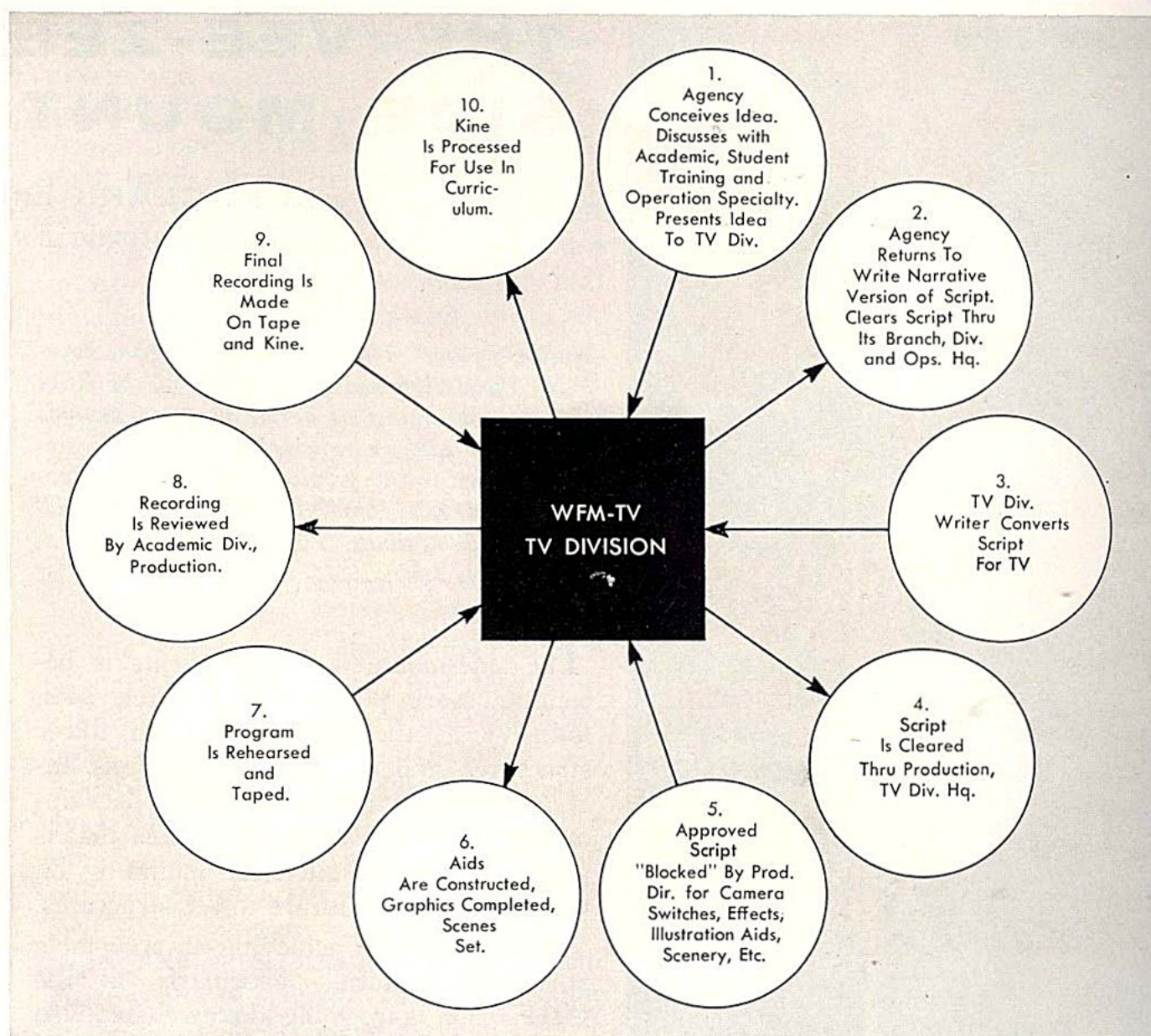
Changes perspective instantly from wide angle to close-up.

Allows comparison of two or more illustrations at the same time.

Eliminates distraction; directs student's attention to essential detail.



**FIG. 31.** Steps in the evolution of a typical WFM-TV program.



Allows use of actual pieces of small equipment for illustration rather than large and costly "mock-ups."

Brings "live" or recorded views of equipment and demonstrations from remote locations into lighted classrooms.

Allows integration of films, slides, graphics, special training aids into TV presentations.

Saves time and effect of moving personnel to theatres to view films, or to remote locations for demonstrations. Saves time of setting up film projection equipment.

TV provides enrichment of training.

Increases use of visual and training aids.

Provides a common grounding of all students in certain fundamental subject areas.

Gives classroom instructors an opportunity to observe presentation techniques of other instructors, and to observe students while they are watching a TV presentation.

Allows the instructor more time to teach applications of complex subject matter initially presented by TV.

#### Future Plans

A major step in the future expansion of WFM-TV is a study on conversion to color. Certain types of military instruction, particularly electronics circuitry with its color coding, lend themselves to color. Additional equipment, monochrome or color will be solid state wherever possible.

Plans call for additional tape facilities for the mobile unit, additional cameras and for complete air conditioning of Studio B and control room. Studio A is presently air conditioned.

By the end of fiscal 1968, WFM-TV expects to produce more than one thousand programs and help train more than 19,000 students.

#### HISTORY OF TV AT USASCS

- 1951** U.S. Army Signal School acquired a field-type, image-orthicon TV camera for experimental training by TV. TV classroom instruction in radio-electronics was begun on 27 September.
- 1952** The School acquired a second TV camera, and added TV courses in radio, radar, photography, wire and fundamentals.
- 1953** The School instituted a program of expansion to include new facilities in Myer Hall, a three-channel closed-circuit distribution system, two new image-orthicon cameras, two 16mm film projection systems and a 16mm kinescope film recorder.
- 1956** Educational Television Division was established to produce instructional and informational TV programs.
- 1958** TV system further expanded with addition of three image-orthicon cameras, four 16mm vidicon film projection chains, new audio system, directors' consoles, studio accessories and 7-channel RF distribution system.
- 1959** Dedication on 6 February of Signal School Closed-Circuit Television System, WFM-TV. Staff and functions of TV Division increased.
- 1960** Addition of two TV tape recorders, and air conditioning of a studio and control room.
- 1961** Addition of two 16mm vidicon film projection chains and multiplexer system with two professional film projectors.
- 1963** Addition of two complete studio TK-60 camera chains and two 353-C audio tape recorders.
- 1964** The system acquired an Audimax II, a TK-21C film chain, a transistor interphone system, a Varatol V zoom lens with close-up adapter. There was also a permanent installation of camera cable throughout the Myer Hall complex, including the auditorium for remote pick-up.
- 1965** Addition of 150 more receivers, special effects generators and switcher, test package, MP-3 Polaroid copymaker and a TK-22 vidicon camera.
- 1966** Acquisition of two solid-state sync generators, and switching system, 12 additional channels to the existing closed-circuit TV system, two TR-3 video tape players, and one TR-4 Tape Recorder with electronic splicing accessory, 16mm Kodak film processor, two TP-66 film projectors and one TK-22 Vidicon camera.
- 1967** Acquisition of a mobile television unit with three RCA camera chains.