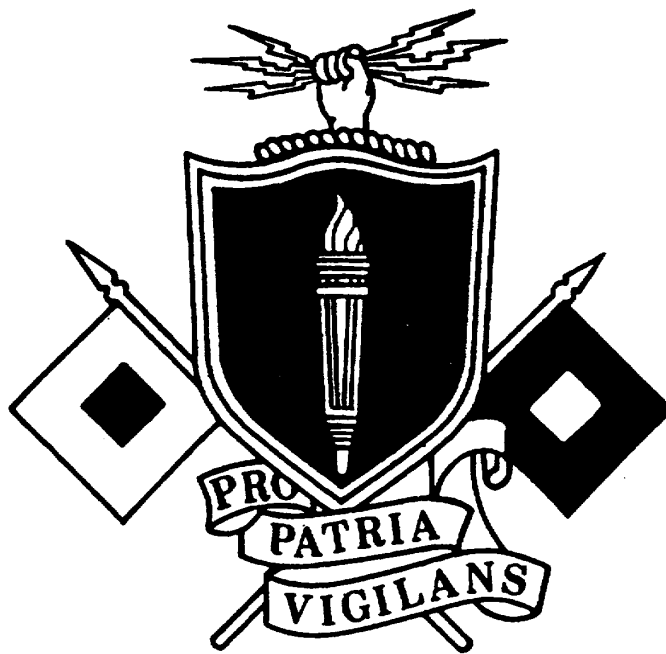


**VIDEO TAPE EDITING AND CHARACTER GENERATOR  
OPERATION**

**(DEVELOPMENT DATE: 30 SEPTEMBER 1988)**



**THE ARMY INSTITUTE FOR PROFESSIONAL DEVELOPMENT**  
**ARMY CORRESPONDENCE COURSE PROGRAM**

**A  
I  
P  
D**

**READINESS /  
PROFESSIONALISM**



**THRU  
GROWTH**

US ARMY AUDIO/TELEVISION SPECIALIST  
MOS 84F SKILL LEVELS 1 AND 2 COURSE

AUTHORSHIP RESPONSIBILITY:

SSG Felix P. Luna  
HQ, 560th Signal Battalion  
Visual Information /Calibration  
Training Development Division  
AUTOVON: 926-2521  
COMMERCIAL: (303) 370-2521

VIDEO TAPE EDITING AND CHARACTER GENERATOR OPERATION

SUBCOURSE NO. SS0551-8  
(Developmental Date: 30 September 1988)

US Army Signal Center and Fort Gordon  
Fort Gordon, Georgia

Four Credit Hours

GENERAL

Video tape recorders play an important role in television production, not only in the recording and playing back of events, but also during post-production editing.

With the advent of video tape recorders, production facilities now have an added advantage over motion pictures - the ability to play back an event immediately after recording. This allows each event to be previewed prior to airing.

This subcourse is intended to teach you the basic principles of video tape editing, the techniques used during editing, and the basic concept of video tape editing operation. It will also introduce you to the basic applications of character generators.

Lesson 1: THEORY OF VIDEO TAPE EDITING

TASK: Identify the principles which best describe video tape editing procedures and select and describe the techniques used during editing.

CONDITIONS: Given material related to video tape editing, illustrations and their functions.

STANDARDS: Demonstrate competency of the task skills and knowledge by correctly responding to 80 percent of the multiple-choice test questions pertaining to video tape editing.

## Lesson 2: PERFORM VIDEO TAPE EDITING USING SINGLE- AND MULTIPLE-SOURCE EDITING SYSTEMS

TASK: Describe the steps related to video tape editing in the assemble mode and insert modes, and identify elements used in a multiple-source editing system.

CONDITIONS: Given material related to video tape editing, illustrations, and diagrams.

STANDARDS: Demonstrate competency of the task skills and knowledge by correctly responding to 80 percent of the multiple-choice test questions pertaining to video tape editing using a single source editing system.

## Lesson 3: THEORY OF CHARACTER GENERATOR OPERATION

TASK: Define and identify the basic functions of a character generator and describe and identify the procedures used to enter information using a character generator.

CONDITIONS: Given material related to a character generator, illustrations, and their functions.

STANDARDS: Demonstrate competency of the task skills and knowledge by correctly responding to 80 percent of the multiple-choice test questions pertaining to the theory of character generator operation.

The following tasks support the lessons presented in this subcourse:

113-577-4209 Operate a Video Tape Cassette Editor  
113-577-4028 Operate a Video Tape Recorder/Reproducer  
113-577-6002 Operate a Character Generator

## TABLE OF CONTENTS

Section	Page
TITLE PAGE.....	i
TABLE OF CONTENTS.....	iii
INTRODUCTION TO VIDEO TAPE EDITING AND CHARACTER GENERATOR OPERATION.....	vi
Lesson 1: THEORY OF VIDEO TAPE EDITING.....	1
Learning Event 1: Identify the Principles Which Best Describe Video Tape Editing Procedures.....	1
Learning Event 2: Select and Describe the Techniques Used During Video Tape Editing.....	12
Practice Exercise.....	17
Lesson 2: PERFORM VIDEO TAPE EDITING USING SINGLE- AND MULTIPLE-SOURCE EDITING SYSTEMS.....	18
Learning Event 1: Perform Video Tape Editing Using the ASSEMBLE Mode (Single-Source Editing System).....	18
Learning Event 2: Perform Video Tape Editing Using the INSERT Mode (Single-Source Editing System).....	20
Learning Event 3: Describe and Identify the Elements Used in a Multiple-source Editing System.....	21
Practice Exercise.....	24
Lesson 3: THEORY OF CHARACTER GENERATOR OPERATION.....	26
Learning Event 1: Define and Identify the Basic Functions of a Character Generator.....	26
Learning Event 2: Describe and Identify the Procedures Used to Enter Information Using a Character Generator.....	28
Practice Exercise.....	34

**\*\*\* IMPORTANT NOTICE \*\*\***

**THE PASSING SCORE FOR ALL ACCP MATERIAL IS NOW 70%.**

**PLEASE DISREGARD ALL REFERENCES TO THE 75% REQUIREMENT.**

Whenever pronouns or other references denoting gender appear in this document, they are written to refer to either male or female unless otherwise indicated.

THIS PAGE INTENTIONALLY LEFT BLANK

## INTRODUCTION TO VIDEO TAPE EDITING AND CHARACTER GENERATOR OPERATION

Video tape editing is one of the most difficult skills you'll learn as a TV Production Specialist, but it is also one of the most rewarding aspects of any TV production. To be proficient in video tape editing, certain requirements must be met before starting the editing process. First, the editor must have a thorough knowledge and understanding of all the key terms and principles used in all aspects of television production; second, the editor must understand the job of the camera operator; and third, the editor must effectively operate the equipment used in video tape editing.

In the television production field, it is important that you become proficient as an editor as well as a camera operator. By becoming skilled in both areas, you can shoot your footage with the eye of an editor and also edit the footage with skill and precision.

Lesson 1 of this subcourse covers key terms, principles, and techniques needed to become an effective video tape editor. Lesson 2 covers the entire editing process and lists the procedures for video tape editing. Although equipment is not required in this subcourse, the information provided to you is essential during video tape editing. We recommend that you familiarize yourself with the actual equipment as soon as possible. Lesson 3 covers the basic uses of character generators.

LESSON 1  
THEORY OF VIDEO TAPE EDITING

TASK

Identify the principles which best describe video tape editing procedures and select and describe the techniques used during editing.

CONDITIONS

Given material related to video tape editing and equipment.

STANDARDS

Demonstrate competency of the task skills and knowledge by responding correctly to 80 percent of the multiple-choice test questions pertaining to the theory of video tape editing.

REFERENCES

None

Learning Event 1:

IDENTIFY THE PRINCIPLES WHICH BEST DESCRIBE VIDEO TAPE EDITING PROCEDURES

1. Goal. The primary goal of video tape editing is to tell the story with clarity and impact. A well-edited program flows in a logical, well-paced manner, maintains audience interest, follows the script, and fulfills the sound and visual requirements of the producer. Timing and tempo are critical factors during video tape editing. The editor must consider timing because the final product must meet exact timing requirements for airing. It is important that the story be told in the minimum amount of time. The editor must also consider tempo because it may change according to the mood established by the program.

2. Splicing editing. One of the earliest methods used to edit video tape was accomplished on the early quad head broadcast recorders. It was done by physically cutting and splicing parts of the video tape together. The editor would find the point to be cut and then paint a special solution directly onto the tape. The editor could then see the actual video tracks by using a special magnifying glass. The editor would then use a cutting instrument to cut the tape; then locate the next edit point and repeat the process until all the necessary cuts were made. Then the pieces were joined together by using a special splicing tape.



3. Electronic editing. Today, electronic editing is the newest method and offers great flexibility to the editors. It also eliminates most of the problems associated with mechanical editing such as, adding cement to the tape, or cutting and splicing the tape at the right angles. Electronic editing systems allow the interfacing of the actual editing equipment with other electronic equipment in the production facility (fig 1-1). Programmable or computer-assisted editing systems are much more complex, but enable the editor to accomplish a wide variety of edits in one single take. Electronic editing is accomplished by transferring live or prerecorded material electronically from one source to another. Both splicing and electronic editing methods are reliable; however, some advantages and disadvantages to the editors are listed below:

	ADVANTAGE	DISADVANTAGE
Splicing	Best quality	Nonreusable tapes Slower editing Less precise
Electronic	Reusable tapes Faster editing More precise	Signal loss

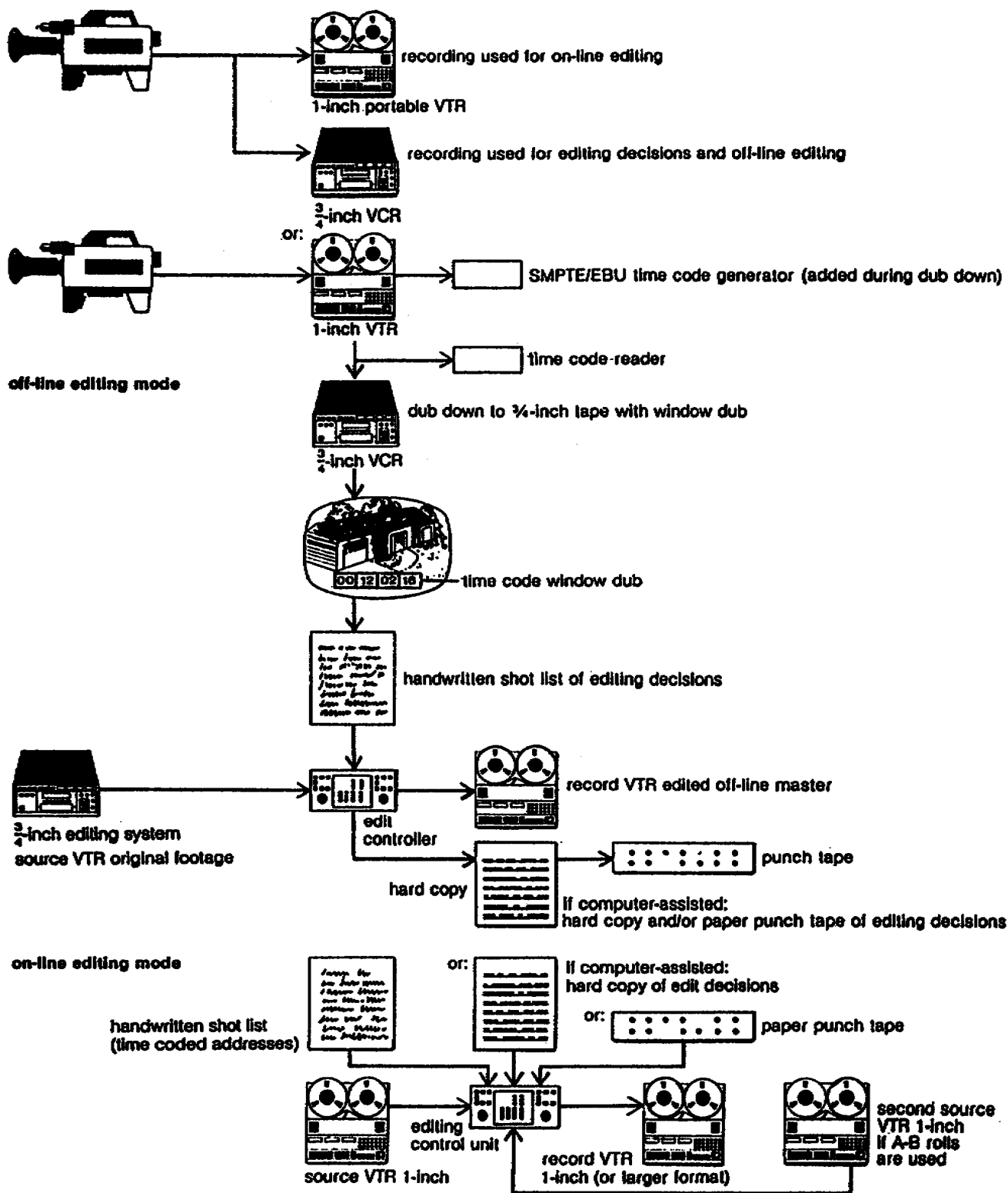


Figure 1-1. Equipment interfacing

4. Editing. Editing is the final stage of Electronic News Gathering/Electronic Field Production (ENG/EFP). When the final scene is on tape, you can assess your work, Smooth out the rough areas, and play up the good points.

5. Definition. Video tape editing is defined as the technique of assembling, rearranging, inserting and deleting audio and video material. Of the different methods available for electronic editing, assemble and insert are the most widely used.

6. ASSEMBLE Mode. The ASSEMBLE mode, also referred to as assemble editing, allows you to edit audio and video in order, or in uninterrupted sequences. In other words, it is the successive addition of audio and video material from the beginning to the end of the program. When in the assemble mode, the slave (or second VTR) records a new control track each time an edit is made (fig 1-2). In this edited sequence, you record scene one with its respective control track, then stop. At the end of this first scene, record the beginning of the second scene, plus the new control track, then the third, and the fourth, and so on until the program is completed. Also, notice the use of the basic shot sequences; long, medium, close-up, and then the re-establish shot.

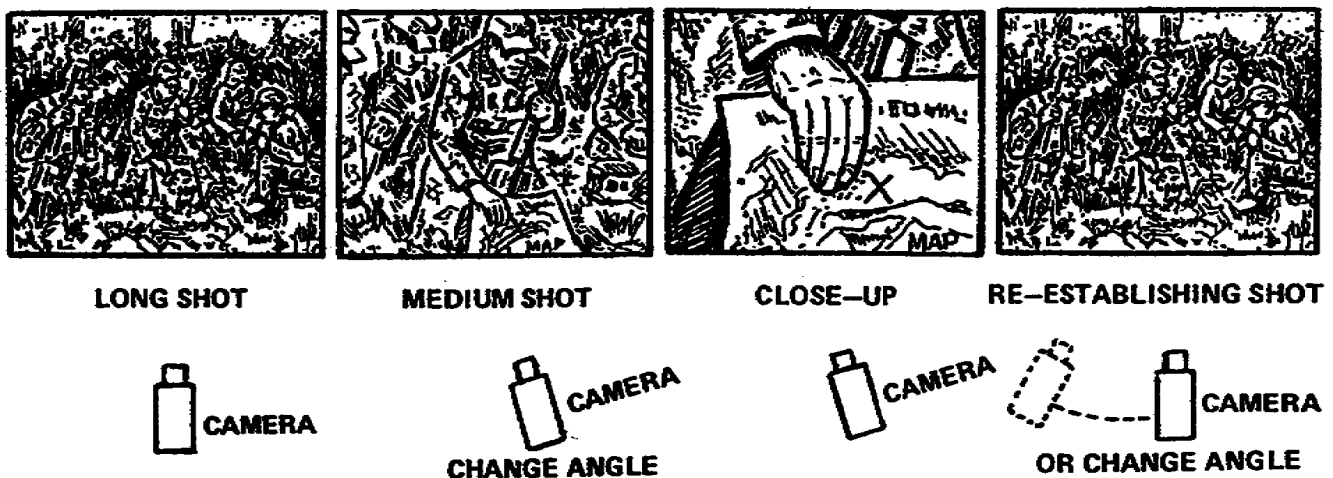


Figure 1-2. Assemble editing sequence

a. A problem encountered in the assemble mode is sync roll or a momentary tear of the picture at the end of each edit. This occurs because each tape or tapes dubbed onto the master also transfers its own control track. Unfortunately, the control track does not always achieve continuity with the track dubbed on the previous edit.

(1) One way to correct the sync roll is to allow the tape to run about 5 seconds beyond your edit out point. Then lay the next edit in point about 1/2 second after the previous edit out point.

(2) For example, the edit out point is 57 seconds. Roll the tape to 62 seconds. Enter the new edit in point at 57.05 seconds.

b. The ASSEMBLE mode is the easiest method but it has disadvantages. They are:

(1) The control track must match evenly at each new edit point, otherwise a glitch may be seen in your finished product.

(2) It is not possible to correct a bad edit in the middle of two scenes using the assemble mode.

7. INSERT mode. The INSERT mode, also referred to as insert editing, consists of inserting new material (audio 1 or 2, video, or both) into a particular section or sections of a prerecorded video tape.

a. One technical difference between INSERT and ASSEMBLE mode is that when editing in the INSERT mode, no new control track is recorded on the slave tape. However, this control track must be laid down (recorded) prior to the editing process. If a 10-minute production is to be edited in the INSERT mode, at least 10 minutes of a signal with burst (see control track for definition of burst), must be recorded on the slave tape. Then, as each new edit is made, often out of sequence, the previously recorded control track is kept intact.

b. Look at Figures 1-3 and 1-4. In the edited sequence of Figure 1-3, you decide to replace scene 3 with a close-up (CU) of the face. Notice that in Figure 1-4, the CU now occupies the same location of the previous scene without disrupting the control track. In order to insert or replace a scene, the new scene must be the same length as the one to be replaced.

c. Figure 1-3 is the same sequence of shots we saw in Figure 1-2 in the assemble mode, but using the INSERT mode you can replace any shot (fig 1-4).

(1) For example, you could insert a close-up of the leader's head and shoulders IF he had important dialogue.

(2) Or, you could insert a larger close-up of the map and hand (if the cameraman gave you several choices). Remember, the new scene must be exactly the same length as the one to be replaced.

NOTE: Each time a scene is replaced with another, the new scene will erase a few frames from the scenes closer to its edit in and out points.

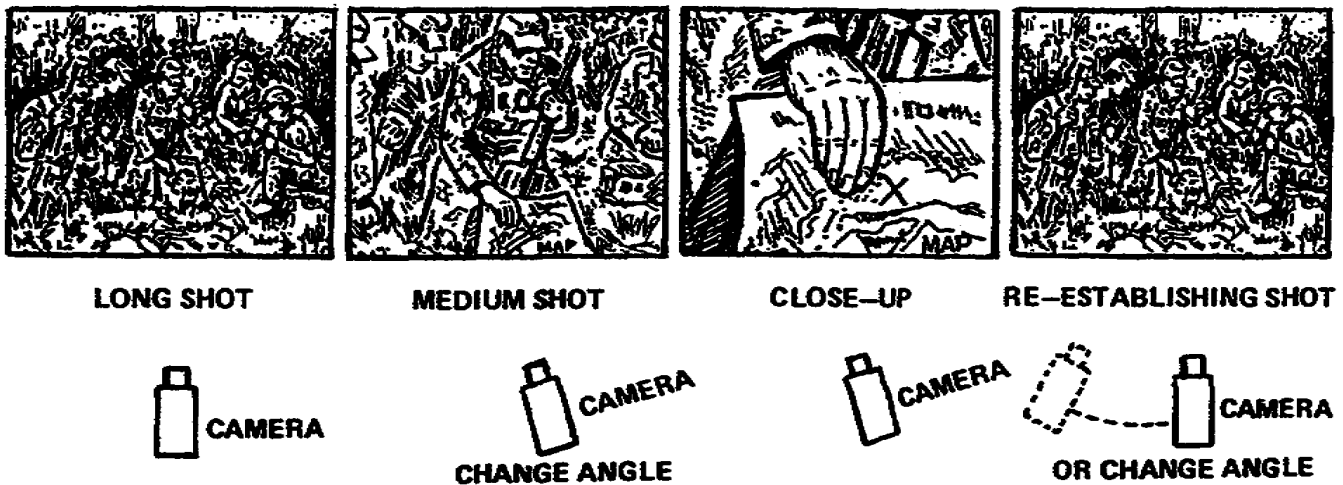


Figure 1-3. INSERT mode

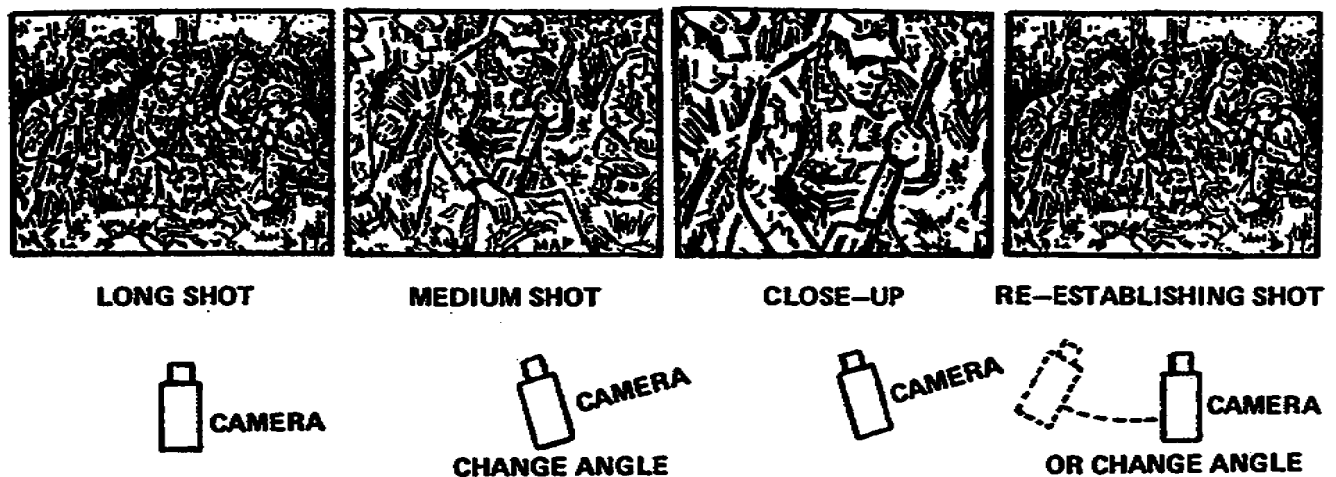


Figure 1-4. INSERT mode

8. Hot and segment edits. When you edit video tape, several sources for assembling or inserting into the final production are used. The sources may be from a live camera, telecine, live microphones, audio tapes, and other video tapes.

a. A hot edit (first generation tape) comes from a live source, i.e., camera or microphone (fig 1-5). It provides you with the highest quality signal your system has to offer.

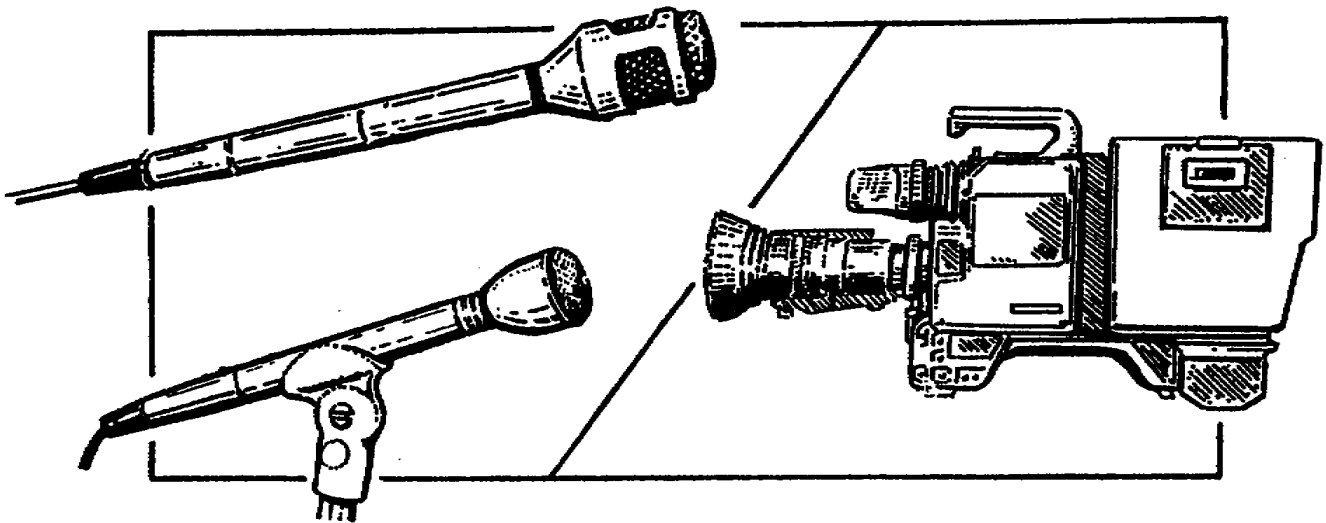


Figure 1-5. Microphones and camera

b. A segment or cold edit (second or subsequent generation tape) comes from prerecorded sources such as video tape or audio tape (fig 1-6). It is important to differentiate between the two types of tapes, hot or segment (cold), because tape generations and signal losses are factors.

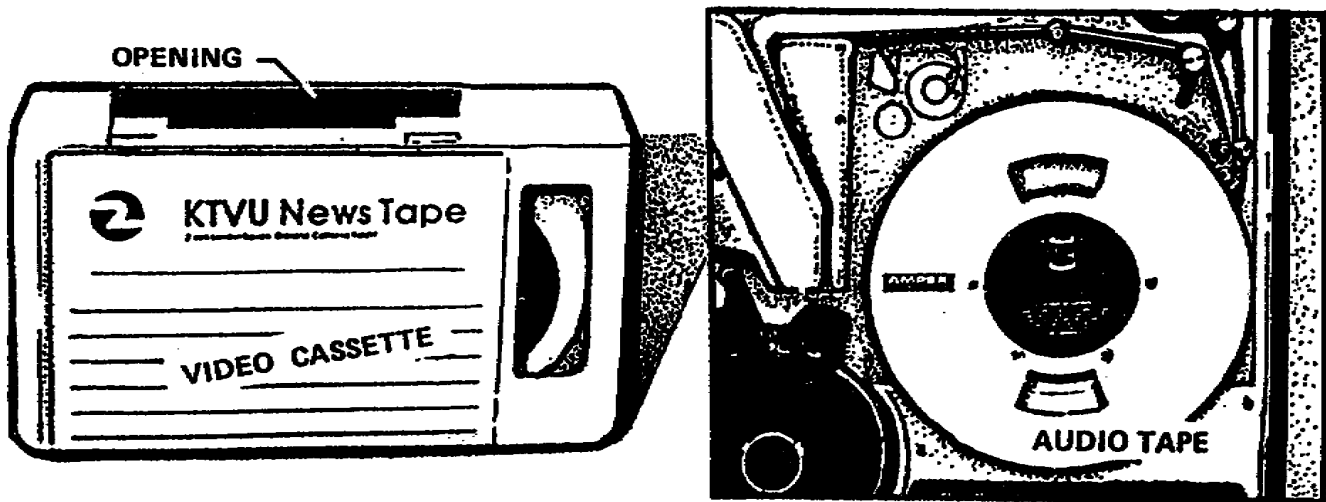


Figure 1-6. Video and audio tape

(1) When a signal from another video tape is used, the recorded segments become second or subsequent generations. Cold edits are almost always of lower quality due to the paths the video signal takes.

(2) Should you use a second generation tape to edit onto another tape, then the new tape becomes a third generation tape with considerably less signal quality than the second generation tape.

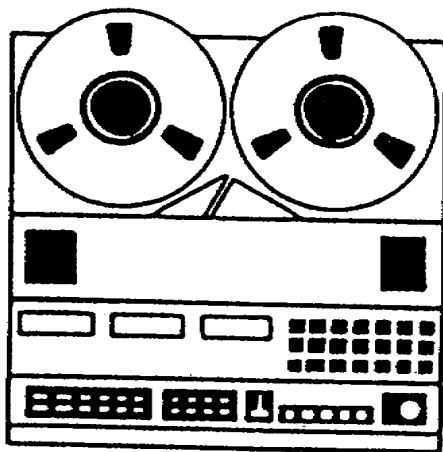
9. Minimizing signal loss. There is no way to prevent signal loss or degradation when transferring from one tape to another. However, there are some ways to minimize signal loss.

a. Use a first generation tape (hot edit) whenever possible.

b. Use a time base corrector (TBC).

c. Use a high density tape; using old or worn-out tape adds noise to the video signal.

d. When editing or dubbing, always try to edit down. That is, edit or dub from 2-inch tape to 1-inch tape to 3/4-inch tape to 1/2-inch tape (fig 1-7).



**1 INCH VTR**



**3/4 INCH VCR**

Figure 1-7. 1-inch VTR and 3/4-inch VCR

10. Control track. Basically, a control track (referred to as electronic sprocket holes), is an electronic signal laid on the outer edge of the video tape. The control track consists of 30 electronic sync pulses recorded each second. The most critical element of the control track is the requirement that all of the pulses be recorded at the same distance or time apart. When the tape is played back, the play-back VTR reads these pulses and uses them to control the speed of the rotating video heads; therefore controlling the relationship between the head speed and tape speed. Without a good control track, it is not possible to edit in the INSERT mode and it is almost impossible to get a stable picture.

a. Since the control track is recorded along the outer edge of the video tape, it is important that the outer edge of the tape remains free from damage by tearing, wrinkling, or creasing. Should the control track become damaged, you must replace the

damaged portion through re-recording or editing to another tape. Control track can be any composite signal (i.e., black burst, color bars, or color background, etc.) recorded from the beginning to the end (or at least longer than the program to be edited). Refer to Figure 1-8.

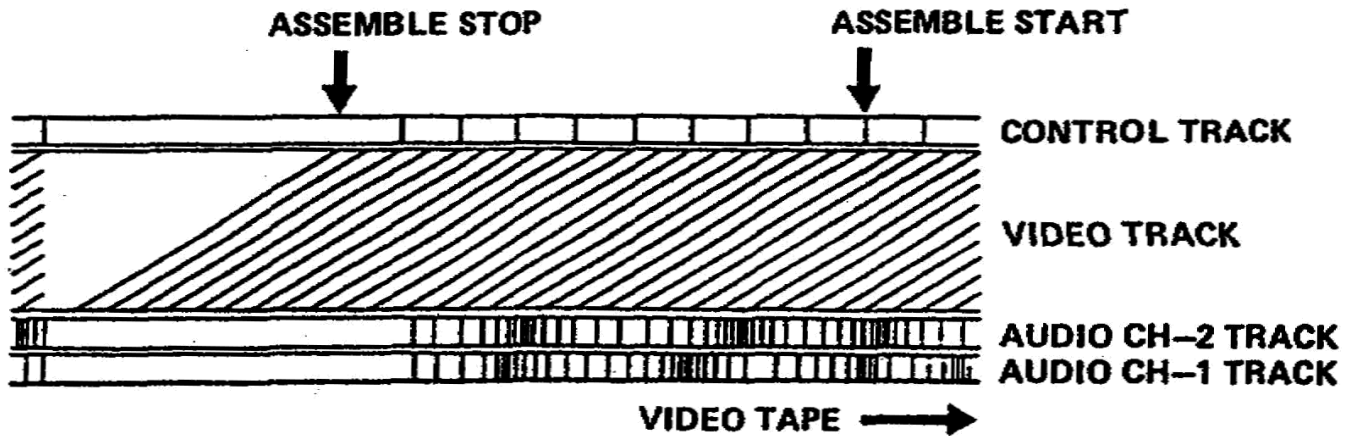


Figure 1-8. Control track

b. A good way to check if the outer edge of the tape is damaged is to use a video tape evaluator. The video tape evaluator will identify damaged portions of the tape by displaying a readout of any track that is unusable.

11. Preroll. In order for a VTR to record or play back a control track, all moving parts (drum, tape, etc.) must come up to speed and lock up. During editing, preroll backs both tapes approximately five seconds from the tapes' edit-in points. Without this preroll time, the VTRs will not achieve a stable lock up of the control track at the beginning. This, in turn, will produce an unstable picture when played back or edited. It is for this reason you should always record at least five seconds or more of control track before playing back or editing.

12. Continuity. Do you remember watching some of the early movies where the actors seemed to jump from one part of the screen to another without explanation? Some of those jumps were caused by a lack of pictorial continuity. As a camera operator/editor your primary goal is to present the story in such a manner that each scene conveys part of the main idea to the viewer. All related scenes should flow one into another so there will be no gap in continuity. All unrelated scenes must be joined together into the story with smooth transitions. Therefore, continuity is defined as the smooth flow of actions from one scene to another.



a. In order to achieve good pictorial continuity, the camera operator and the editor must use the basic shot sequence. Unless otherwise called by the story, the basic shot sequence - long shot (LS), medium shot (MS), and close-up (CU) should be used. In many instances, the basic shot sequence can be expanded to include the extreme long shot (ELS) and the extreme close-up (ECU).

b. As a video tape editor, you cannot go to work until the camera operator finishes. In order to achieve good pictorial continuity, it is imperative that the camera operator/editor follow certain requirements which will make the editing job easier and more efficient.

(1) Figure 1-9 shows a long shot. As the name implies, the LS is taken at some distance from the subject. It is usually the first shot of the sequence and it establishes the locality of the area and lets the audience know exactly where the action is taking place.



Figure 1-9. Long shot

(2) The medium shot introduces the action and the audience becomes more aware of who, or what, the center of interest is. The medium shot is taken at a distance closer than that of the long shot either by moving the camera closer to the subject or by zooming in (fig 1-10).



Figure 1-10. Medium shot

(3) The close-up is the most important shot of the sequence since it shows detail of the action thereby holding the audience's attention. The CU is taken at a distance much closer than that of the medium shot (fig 1-11).



**Rudolf Hess at the  
Nuremberg trials in  
1945.**

Figure 1-11. Close-up

(4) The following dialogue could accompany Figures 1-9, 1-10, and 1-11:

"An imposing, security-tight fortress, (fig 1-9) somewhere in Europe, (cut to fig 1-10), where American and

Soviet troops change guard vigil every 20 days, because (cut to fig 1-11) Rudolf Hess is their prisoner. One man. One prison. The only prisoner for over 45 years in Berlin's Spandau Prison" (cut back to fig 1-9).

13. Style. Just as there are editing styles for directing or writing, there are also styles of editing. Some editors edit in a precise, mechanical style, while others may have a natural feeling for when the edit should occur. To be an effective editor, you must be able to select and use the style of editing that best enhances the production and its contents. Whatever style you use, you must not interrupt the story, clash with the music, or the feel of the scene. If your editing style disturbs the audience, or leaves a question unanswered in the mind of the viewer, then the edits were wrong. You must always remember that although video tape editing differs entirely from motion picture editing, the purpose remains the same - to maintain good pictorial continuity.

#### Learning Event 2:

#### SELECT AND DESCRIBE THE TECHNIQUES USED DURING VIDEO TAPE EDITING

1. The following tips will help you become a good editor:

a. Use pans only to follow the action or to cover large vistas. All other situations are better covered by a series of locked-down shots, each showing part of the overall picture.

b. Don't edit from a still shot into a moving pan, tilt, or zoom; or vice versa. This may cause the viewer to feel a physical jar at the edit point.

c. Use cut-ins and cut-aways to cover major jumps in action, or to change screen direction (fig 1-12).

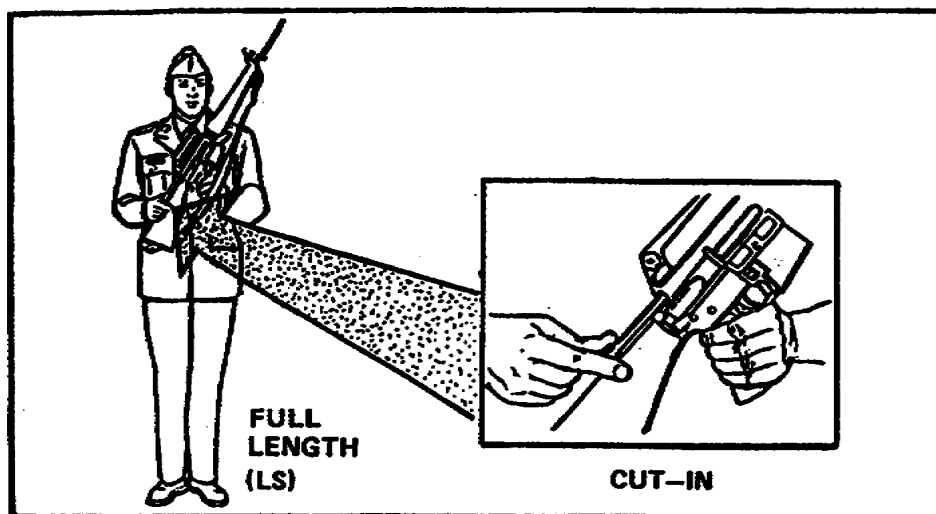


Figure 1-12. Camera shots

d. Use re-establishing shots to help the audience remember the sequence of events. For example, Figure 1-13 shows a re-establishing shot to complete the sequence.

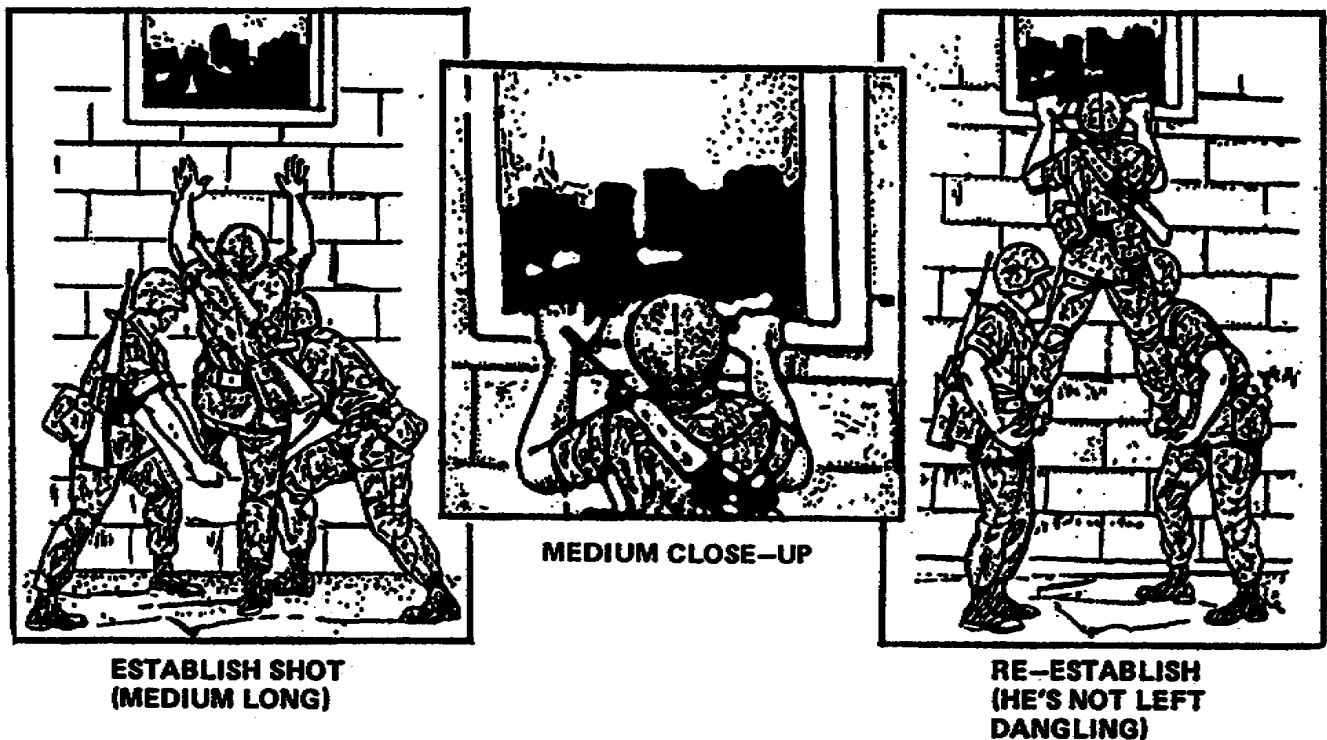


Figure 1-13. Shot sequences

e. Use CUs to help the audience see details of the scene as in Figure 1-14.

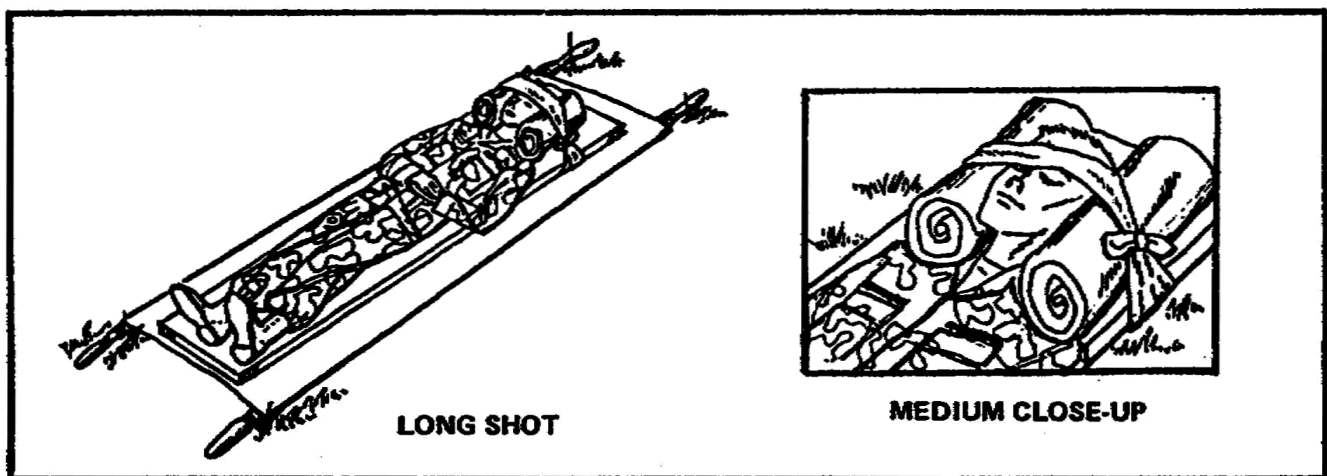


Figure 1-14. Long shot and medium close-up

f. Don't cut from a long shot to an extreme close-up (fig 1-15). This confuses the viewers. It is better to use the basic shot sequence (fig 1-14).

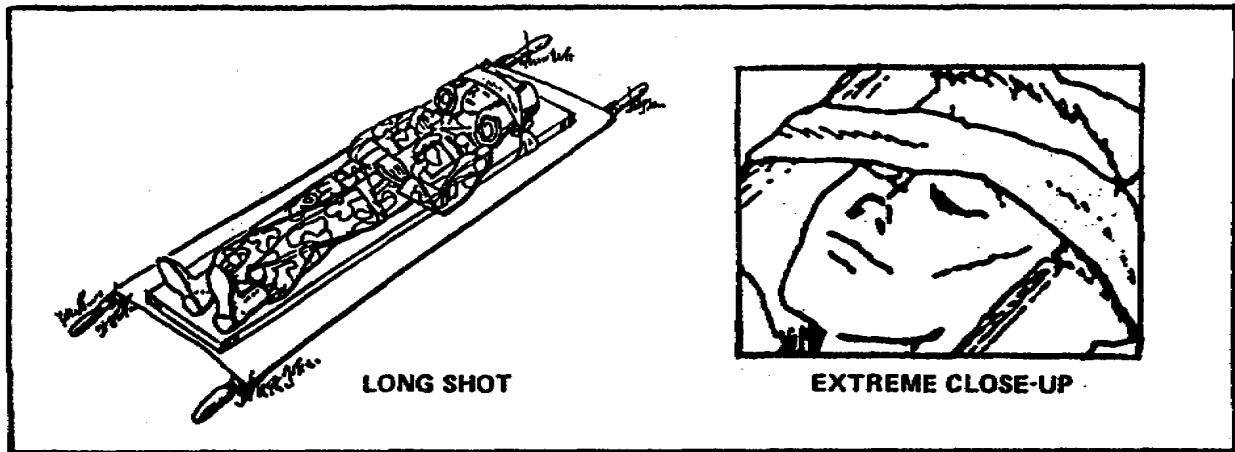


Figure 1-15. Long shot to extreme close-up

g. Use establishing shots to help the audience know where the action is taking place (fig 1-16).



Figure 1-16. Establishing shot

h. Make sure that the shots used for cut-ins and cut-aways (second unit pickups) are shot with the same quality film and equipment as the overall scenes.

i. Always pay attention to screen directions. Don't change screen direction without explanation. If you cannot match screen direction, use a head-on or going-away shot as a transition shot. If no such shot is available, the entire scene must be re-shot with proper screen direction. If your original screen direction is "A", your next shot cannot be "B" because the reverse will jar the audience (fig 1-17).

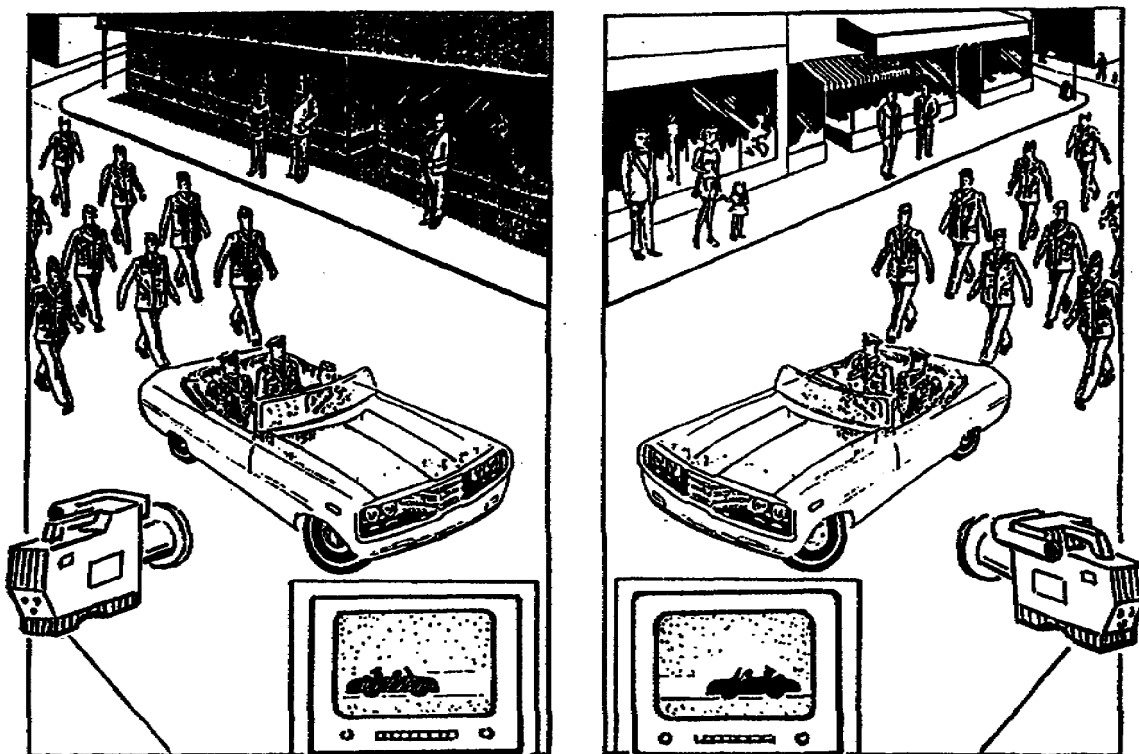


Figure 1-17. Reversed screen direction

j. When matching video edits to audio edits, video edits should normally occur at pauses in sentences or at the end of sentences and paragraphs.

k. When matching audio edits to video edits, sentences must end just prior to video changes.

l. Shoot at least 10 seconds of heads and tails before and after any action. Remember, equipment for video tape editing requires at least 5 seconds of good control track for editing.

m. Look for signs, symbols, and logos for establishing shots.

2. In theory, you should be able to have complete control of the program, a detailed script, and ideal shooting conditions. In this case, you shoot your sequences with such precision that virtually no cutting or editing is necessary. As you know, this is called cutting or editing on the camera.

3. Perfect cutting in the camera is not usually possible. Even in the major production studios where shooting conditions are well controlled, there is still a considerable amount of waste.

4. Mechanical or electrical errors, gawking subjects, scenes with poor camera angles, missed lines, or lighting problems must

be edited out. In the final edit, look at your material the way the audience will see it. Cut out poor footage, rearrange scenes for better continuity, and generally polish your work.

5. Editing is a cosmetic treatment for your productions. Like any cosmetic, it can't transform poor original material into a great production. But with good material, editing can perform a remarkable polishing job.

6. Editing in the assemble mode is relatively simple. Just run a video tape through a player and cut any unwanted material based on your visual impressions. As your productions become more complicated, editing requires more detailed written planning.

Lesson 1  
PRACTICE EXERCISE

1. Which signal does the VTR use to control the speed of the rotating video heads?
  - a. Preroll
  - b. Preview
  - c. Control track
  - d. Black sync
2. Which of the following best describes the successive addition of audio and video material from the beginning to the end of a program?
  - a. Assemble editing
  - b. Continuous editing
  - c. Video tape editing
  - d. Insert editing
3. How many pulses per second does a control track consist of?
  - a. 15
  - b. 30
  - c. 45
  - d. 60
4. Which of the following definitions describes a pan shot?
  - a. It is used to follow the action
  - b. It is used to re-establish location
  - c. It is used for cut-ins or cut-aways
  - d. It is used for zoom shots
5. What is the most important aspect to remember when shooting cut-in or cut-away shots?
  - a. Ensure you are shooting close-ups
  - b. Ensure you are shooting with the same quality film and camera as used for overall scenes
  - c. Ensure you are helping the audience to remember where they are in the story
  - d. Ensure the correct perspective viewpoint is used
6. How many seconds of heads and tails shooting should you run before and after any action?
  - a. 40 seconds
  - b. 30 seconds
  - c. 20 seconds
  - d. 10 seconds



LESSON 2  
PERFORM VIDEO TAPE EDITING USING SINGLE- AND MULTIPLE-  
SOURCE EDITING SYSTEMS

TASK

Describe the steps related to video tape editing in the single-source editing systems, (ASSEMBLE and INSERT modes), and identify elements used in a multiple-source editing system.

CONDITIONS

Given material, including illustrations and diagrams, related to video tape editing.

STANDARDS

Demonstrate competency of the task skills and knowledge by responding correctly to 80 percent of the multiple-choice test questions pertaining to video tape editing using single- and multiple-source editing systems.

REFERENCES

None

Learning Event 1:

PERFORM VIDEO TAPE EDITING USING THE ASSEMBLE MODE (SINGLE-SOURCE EDITING SYSTEM)

1. Before starting the editing process, consult the operator's manual regarding the operational controls on the VCRs and editing control unit (ECU). If you have any difficulties with the materials, refer to your unit's SOP or your NCOIC for guidelines. Keep in mind that the editing procedures you are about to follow were written as generic as possible to avoid confusion with other brand name equipment. Therefore, you will be graded according to the information presented in this subcourse.

2. Follow these steps before editing:

- a. Prepare and organize your work area, equipment, and materials.
- b. Conduct a preoperational check on all equipment to be used. Refer to your unit's SOP.

c. Gather all the original tapes. Fast forward and rewind the tapes to set tape tension.

d. Remove the red button from all the tapes except the slave tape to prevent accidental erasure of the slave tape.

e. Make a shot sheet for all the tapes. Include information such as:

(1) Video quality (good, bad, fair)

(2) Audio quality (good, bad, fair)

(3) Type of shot (LS, MCU, CU, etc.)

(4) Annotate the length of each scene

(5) Location of each scene on the tape

(6) Ensure each shot is related to the script

NOTE: Mark all the tapes, tape cases, and shot sheets clearly. This will speed up the editing process.

f. Read and become familiar with the script to ensure that each scene has been recorded. Often, inexperienced editors start editing without knowing the content of the script or even the tape. If the production requires extensive editing, the editor may spend most of the time searching for footage which may not even be on the tape.

3. To edit in the ASSEMBLE mode, follow the steps listed below:

a. Perform steps listed previously in paragraphs 2a through f.

b. Load VCRs with appropriate tapes.

c. Record color bars with tone and title slate. Refer to your unit's SOP. If no SOP exists, follow d through l below.

d. Record 1 minute of color bars with a 1 kHz tone, then record 10 seconds of black.

e. Select ASSEMBLE mode on the ECU.

f. Locate the desired edit in point on the player and the recorder using the PLAY or SEARCH dial knob. Engage the STILL mode after locating the starting points.

g. Press the IN and ENTRY buttons simultaneously on the player and recorder side of the ECU. Both entry-in indicators should be lit without flashing.

h. Locate the desired edit out points on the player and the recorder using PLAY or SEARCH dial knob. Engage the STILL mode after locating the starting points.

i. Press the OUT and ENTRY button simultaneously on the player and recorder side of the ECU. Both entry-out indicators should be lit without flashing.

NOTE: Observe both IN and OUT indicators to ensure that correct start and end points have been selected. Only one out point will be accepted by the ECU.

j. Press the PREVIEW button and observe the monitors for the rehearsal edit. If not satisfied with the edit, repeat steps a through i above.

k. Press the IN or OUT button simultaneously with the plus (+) or minus (-) sign buttons to adjust the start or ending points forward (+) or backward (-).

l. Repeat step i above until satisfied, then, press the auto edit button.

m. Always leave at least 5 seconds of control track before the start of each edit in point. When the edit is completed, both VCRs will stop automatically.

#### Learning Event 2:

PERFORM VIDEO TAPE EDITING USING THE INSERT MODE (SINGLE-SOURCE EDITING SYSTEM)

1. To edit in the INSERT mode, follow the steps below:

a. Perform the steps in Learning Event 1, paragraphs 3a through f, to prepare for editing.

b. Lay down a control track for the entire length of the production (30 min, 1 hr, etc).

c. Check to ensure that the control track does not contain any breakups. If there are breakups, then re-record the control track.

d. Record in the INSERT mode color bars with tone (refer to your unit's SOP. If no SOP exists, follow paragraph 2a through f below).

2. Select audio, video or both on the edit mode selector switch.

a. Locate the desired edit in point on the player and the recorder using the PLAY or SEARCH dial knob. Engage the STILL mode after locating the starting points.

b. Press the IN and ENTRY button simultaneously on the player and recorder side of the ECU. Both entry-in indicators should be lit without flashing.

c. Locate the desired edit out points on the player and the recorder using either the PLAY or SEARCH dial knobs. Engage the STILL mode after locating the starting points.

d. Press the OUT and ENTRY button simultaneously on the player and recorder side of the ECU. Both entry-out indicators should be lit without flashing.

NOTE: Observe both in and out indicators to ensure that correct start and end points have been selected. Only one out point will be accepted by the ECU.

e. Press the preview button and observe the monitors for the rehearsal edit. If not satisfied with the edit, repeat 2a through e, or press the IN or OUT button simultaneously with the plus (+) or minus (-) sign buttons to adjust the start or ending points forward (+) or backwards (-).

f. Repeat step e above until satisfied, then, press the AUTO EDIT button.

NOTE: Remember to have at least 5 seconds of control track before the start of each edit in point. When the edit is completed, both VCRs will stop automatically. Record 1 minute of color bars with a 1 kHz tone, then record 10 seconds of black.

### Learning Event 3:

#### DESCRIBE AND IDENTIFY THE ELEMENTS USED IN A MULTIPLE-SOURCE EDITING SYSTEM

1. You should be aware of the ON-LINE and OFF-LINE editing modes.

a. ON-LINE produces the final master copy that is used on-the-air.

b. OFF-LINE produces the preliminary tape, or workprint copy, which is not used on the air.

2. You should also be aware of the two types of address code systems, the pulse count system, and the Society of Motion Picture Television Engineers/European Broadcasting Union (SMPTE/EBU) time code system.

a. The pulse count system counts the control track pulses and translates these into elapsed time and frame numbers (fig 2-1).



Figure 2-1. Time display of pulse count system

b. The SMPTE/EBU time code is more accurate because it is recorded on a special videotape track that is displayed directly over the videotape image on the screen (figs 2-2 and 2-3).

(1) SMPTE/EBU Time Code Reader. The SMPTE time code identifies each television frame by hour, minute, second, and frame number. After 29 frames, the seconds are advanced by 1 digit (there are 30 frames to a second). The time code is an electronic signal recorded on the address code track or the cue track.

(2) SMPTE/EBU Lock Screen Display. The time code can be keyed directly over the image of the videotape for off-line editing. This way, each frame displays its time-code address.

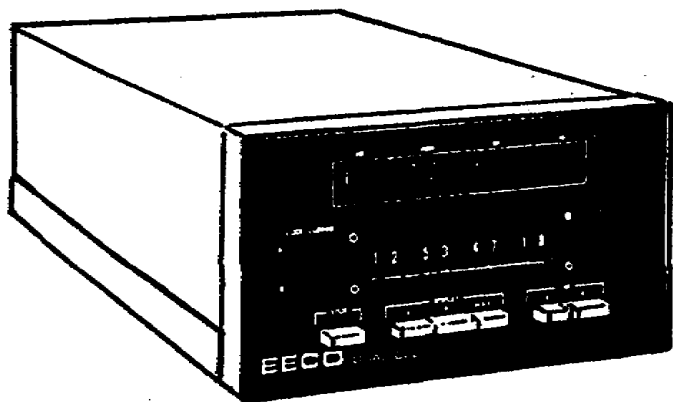


Figure 2-2. SMPTE/EBU Time Code Reader

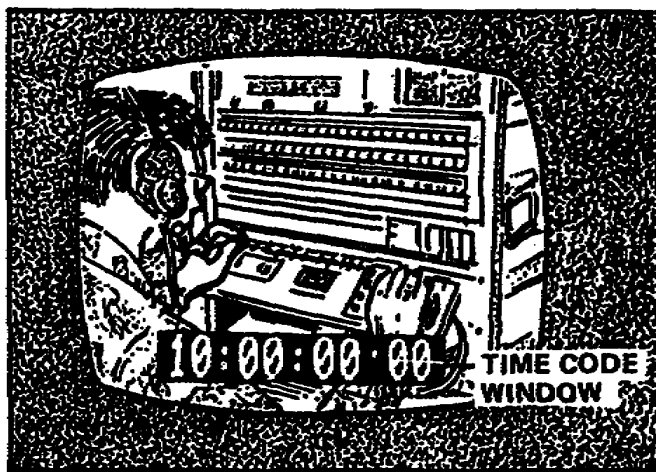


Figure 2-3. SMPTE/EBU Time Code Screen Display

Lesson 2  
PRACTICE EXERCISES

1. How do you set tape tension before starting to edit?
  - a. Adjust the rollers
  - b. Request a technician to help
  - c. Fast forward and rewind all tapes
  - d. Play all tapes through the machine, twice, at normal speed.
2. What must you check on a tape to ensure it cannot be accidentally erased?
  - a. The red button is in place
  - b. The red button has been removed
  - c. The expiration date of film quality label
  - d. The tape format (VHS, BETAMAX)
3. What should you do after recording one minute of color bars, when editing in the ASSEMBLE mode?
  - a. Record the slate information for 15 seconds
  - b. Record test video for 30 seconds
  - c. Record test audio for 30 seconds
  - d. Record 10 seconds of black
4. You are now using the insert edit mode. What must you do before editing?
  - a. Record one minute of color bars
  - b. Lay down a control track for the entire length of the production
  - c. Record a 1 kHz tone
  - d. Check the audio and video quality
5. What is the same whether you are editing in the ASSEMBLE or INSERT modes?
  - a. You must lay down a full control track
  - b. You must remove the red button from all tapes
  - c. You must have 30 seconds of black before each edit in point
  - d. Only one out point will be accepted by the ECU
6. Which type of editing mode produces the final master copy to be aired?
  - a. Off-line
  - b. Preroll
  - c. On-line
  - d. A-B-C roll

7. What system displays data directly over the image on a TV monitor?
- a. The pulse count system
  - b. The SMPTE/EBU system
  - c. The HV-CL-MTA system
  - d. The VEGA system

LESSON 3  
THEORY OF CHARACTER GENERATOR OPERATION

TASK

Define and identify the basic functions of a character generator and describe and identify the procedures used to enter information using a character generator.

CONDITIONS

Given material with illustrations describing functions and operation of a character generator.

STANDARDS

Demonstrate competency of the task skills and knowledge by responding correctly to 80 percent of the multiple-choice test questions pertaining to character generator operation.

REFERENCES

None

Learning Event 1:

DEFINE AND IDENTIFY THE BASIC FUNCTIONS OF A CHARACTER GENERATOR

1. The purpose of this lesson is to provide you with quality information to get you started in the operation of a character generator (CG). It is not the intent of this lesson to teach you step-by-step procedures regarding the operation of any specific character generator. You should consult the owner's manual whenever you are using a particular character generator.

2. A character generator is a computer-like device that works much in the same manner as a typewriter except that it produces alphanumeric characters and graphics electronically on a television monitor rather than on paper. This information can then be stored and recalled at any given time. Most television facilities use a character generator to increase the creativity and flexibility of the production.

3. The many uses of a CG include tilting, graphic imaging, closed captions, etc. Character generators are suitable for any type of production including closed-circuit TV, broadcast and non-broadcast TV, and live or prerecorded material. Some CGs are equipped with one or two disk drives used for storage; two output channels, one for preview and the other for program, and a built-in monitor.

a. All character generators operate in the same way. Typically, no artistic talent or creativity is needed to compose



perfect titles or logos. CGs are much more versatile than typewriters due to their ability to create letters and manipulate them anywhere on the screen. You can also preview each written page before recording or airing.

b. You can type each line using the keyboard exactly as it will appear on the screen. Then, you can correct any mistakes or add and delete any information as needed. As you type each character, the cursor, usually a blinking square or dash, indicates the current location of each character and the next available character spaces.

c. In Figure 3-1, the operator uses the keyboard to enter the information line by line. The information is temporarily saved in the CG's internal memory until it is saved on a floppy disk or other storage device.

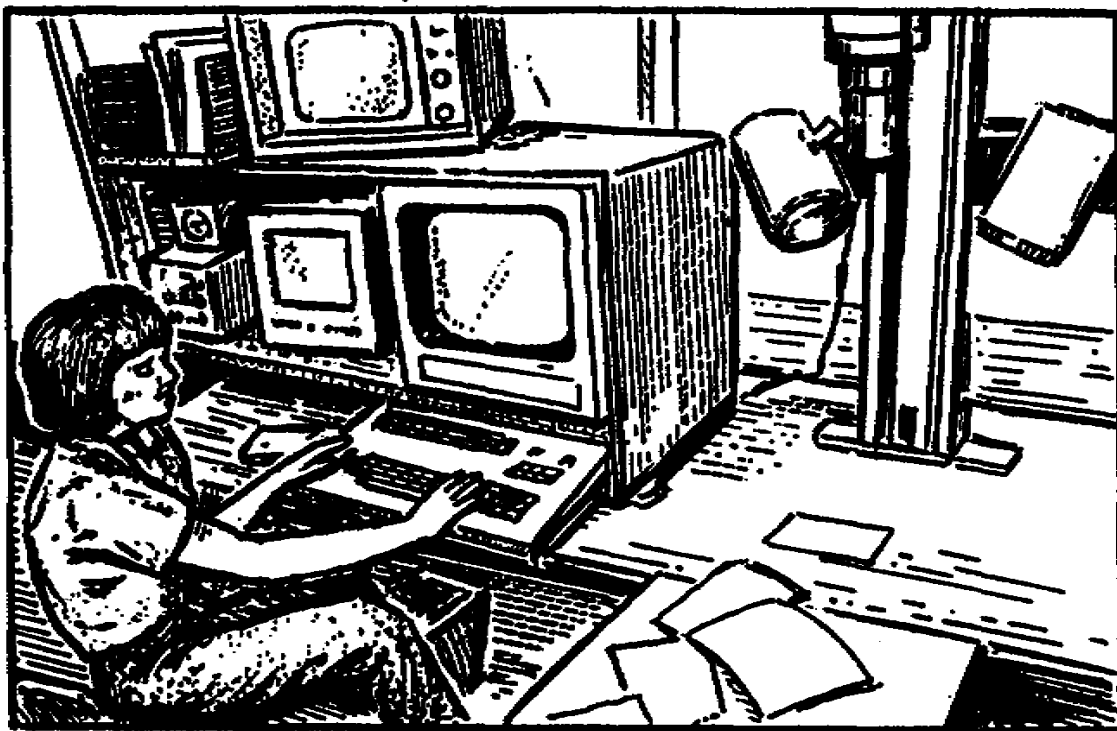


Figure 3-1. Character generator

4. A typical example of the many uses of a character generator are the credits shown at the end of a program or the weather report on TV. Another example is the statistics shown as the batter comes up to bat. This information is usually keyed over the output of a live camera.

a. The greatest value of a character generator is not the ability to create and edit various letter sizes and font styles, but the ability to store and recall any given message either randomly or sequentially whenever needed.

b. Some standard editing features include absolute centering, which accurately positions the information in the center of the screen; character, row, and page delete; row-by-row or page colorizing; left and right margin justification; variable speed roll or crawl, flash mode; character edge; graphics capability; etc.

c. More advanced CGs allow you to create custom characters such as logos. Logos are best described as the letter/picture graphics seen on a station's ID. Custom characters are created by preparing a high contrast black and white artwork of the logo. This artwork is then photographed with a small black and white camera which is connected to the character generator. Once the information is recorded, it is converted into electronic pulses by the CG. It can then be recalled using the functions available in the CG. You can change the size of the logo, add letters, colorize it, and place it anywhere on the screen.

#### Learning Event 2:

DESCRIBE AND IDENTIFY THE PROCEDURES USED TO ENTER INFORMATION USING A CHARACTER GENERATOR

1. This lesson should be used as a learning tool but it is not intended to supercede the owner's manual of your character generator or the Standing Operating Procedures (SOP) already established by your unit.

2. Before operating a character generator, you should become thoroughly familiar with the basic layout of your keyboard. Let's look at a basic keyboard (fig 3-2) and its functions.

NOTE: Do not use this lesson on the job. Rather, use the owner's manual for your character generator.

a. Cursor keys. The cursor control keys left (←), right (→), up (↑) and down (↓) are used to move the cursor rapidly anywhere on the screen.

b. HOME key. This key is used to move the cursor to row one, column one of the current page.

c. RETURN key. The return key will move the cursor one row down and to the left margin from its current location.

d. Space bar. This key moves the cursor to the right, one space at a time, from its current location.

e. DELETE key. There are various ways to erase characters from the screen. You can replace them by simply typing over them; use the space bar and delete one character at a time; or use the erase/delete key to erase rows or pages at a time.

f. SHIFT key. The SHIFT key allows you to enter text in either lower case or upper case. This key, when used simultaneously with the CENTER key or the FONT SELECT key, provides you with an additional function of the system. Please refer to the owner's manual for additional information regarding this subject.

g. END OF MESSAGE. The END OF MESSAGE key is used to indicate the end of a composed page. In some CGs, this key is used to control whether a roll or crawl should loop through continuously, or stop at the end of the sequence.

h. TAB key. This key will allow you to set columnar tabs on each composed page. The tabs can be stored with each page and be recalled later.

(1) To set tabs, follow these steps:

- (a) Place cursor at desired location.
- (b) Depress TAB/SET.
- (c) Repeat steps (1) and (2) until satisfied.

(2) To clear the tabs, follow these steps:

- (a) Place cursor at desired location.
- (b) Depress TAB/CLEAR.
- (c) Repeat steps (1) and (2) until satisfied.

i. ABSOLUTE CENTER KEY. Press the ABSOLUTE CENTER key to center text on the screen.

(1) To center text row-by-row, follow the steps below:

- (a) Place the cursor anywhere on the desired row.
- (b) Depress the CENTER key. Text will be centered automatically.
- (c) Repeat steps (1) and (2) until satisfied.

(2) To center text by page:

- (a) Place cursor at row 1, column 1.
- (b) Depress the PAGE SELECT (PRIOR/NEXT) key.
- (c) Depress the CENTER key, then,

(3) To return text to original position:

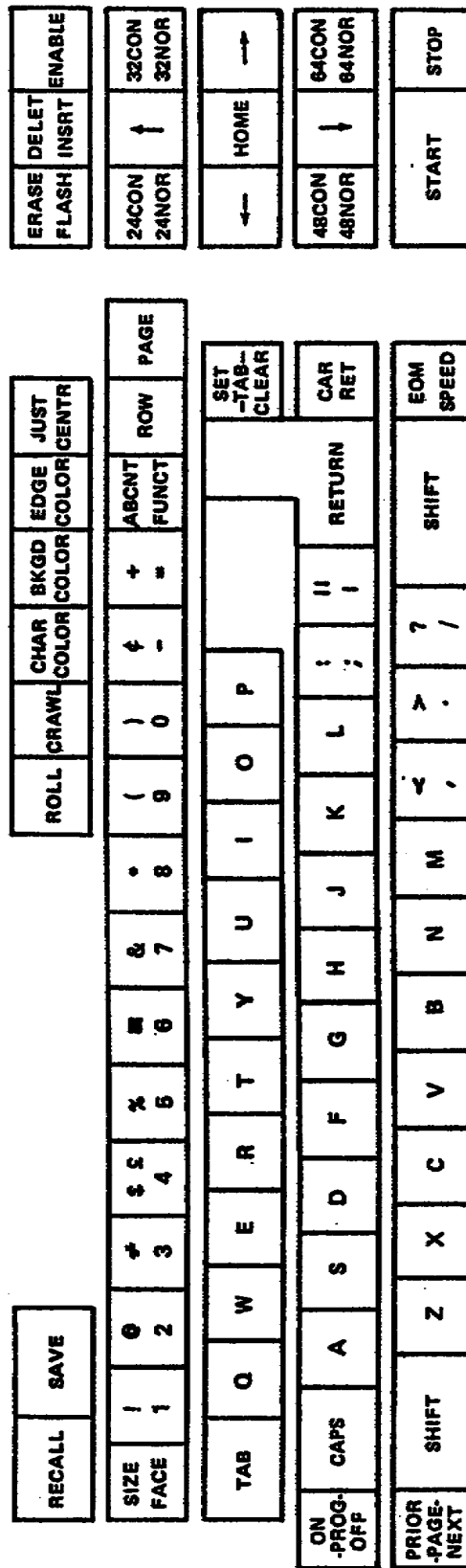


Figure 3-2. Typical keyboard layout

- (a) Place cursor at row 1, column 1.
- (b) Depress the PAGE SELECT (PRIOR/NEXT) key.
- (c) Depress the SHIFT/CENTER key.

j. BACKGROUND COLOR key. Character generators have the capability to change the background color. Others have a color palette which allows you to change the hue, brightness, and saturation of each color, providing you with more than 500 color selections.

(1) To change the background color at the cursor position, simply depress the BACKGROUND COLOR key, then depress the desired color.

(2) To change the background color of an entire page, follow the steps below:

- (a) Place cursor at row 1, column 1.
- (b) Depress the PAGE SELECT key.
- (c) Depress BACKGROUND COLOR key.
- (d) Depress desired color.

k. CHARACTER COLOR key. When this key is used, you can change the character color in each individual row.

(1) To change character color by row:

- (a) Place cursor at desired location.
- (b) Depress the CHARACTER COLOR key.

(2) To change character color by page,

- (a) Place cursor at row 1, column 1.
- (b) Depress the PAGE SELECT (PRIOR/NEXT) key.
- (c) Depress the CHARACTER COLOR key.

NOTE: You cannot change the color of each individual character in a row.

l. FLASH key. When this key is depressed, the characters to the right of the cursor will flash automatically at a normal interval. To flash a character, word, or line in a row:

- (1) Place cursor at desired location.
- (2) Depress the FLASH key.

NOTE: If flash is desired on only one word or part of a row, depress the FLASH key where it is to start, then move cursor to where flash should stop and depress flash again.

3. Some character generators have ALL the character font styles in permanent memory. Others have to be loaded from a disk drive or other storage devices. These character styles can be changed to different sizes including small, medium, and large.

a. To change the font style:

- (1) Select font style from disk drive, if applicable.
- (2) Select font style from internal memory, if applicable.

b. To enter information in a CG, follow the steps below:

- (1) Conduct a pre-operational check IAW the owner's manual.
- (2) Select font style.
- (3) Select background and character color, if applicable.
- (4) Place cursor at desired starting position.
- (5) Type information in accordance with the script.
- (6) Store message in storage device, if applicable.

c. To roll text:

- (1) Conduct steps 1 through 6 above.
- (2) Select page(s) to be rolled.
- (3) Depress the ROLL key. Text should roll from bottom to top.

d. To crawl text:

- (1) Conduct steps 1 through 6 above.
- (2) Select page(s) to be crawled.
- (3) Depress the CRAWL key. Text should crawl from right to left.

NOTE: To end either the roll or crawl, depress the STOP key.

Lesson 3  
PRACTICE EXERCISE

1. What is the letter/picture graphic seen on a station ID called?
  - a. Artwork
  - b. Roll
  - c. Crawl
  - d. Logo
2. What are three standard editing features of most character generators, in addition to graphics capability, character edge, variable speed roll or crawl?
  - a. Absolute centering, flash mode, row-by-row colorizing
  - b. Fast forward, reverse, pause modes
  - c. Individual letter coloring in a word, zig/zag, crimping
  - d. All of the above
3. What controls a blinking square or dash on the screen?
  - a. A modem
  - b. A disk
  - c. A cursor
  - d. A character generator
4. What is the first step when setting tabs?
  - a. Depress TAB/SET
  - b. Depress the PAGE key
  - c. Place cursor at desired location
  - d. Depress TAB/CLEAR
5. In order to have a roll loop through, which key must be used to insert data in the text?
  - a. ROLL key
  - b. END OF MESSAGE key
  - c. Page roll key
  - d. Start roll key

THIS PAGE INTENTIONALLY LEFT BLANK



# ANSWERS TO PRACTICE EXERCISES

Test Question Number	Correct Response	(Learning Event	<u>Reference</u> Paragraph	Page)
Lesson 1				
1	c	1	10	8
2	a	1	6	4
3	b	1	10	8
4	a	2	1a	12
5	b	2	1h	14
6	d	2	1l	15
Lesson 2				
1	c	1	2c	19
2	a	1	1d	20
3	d	1	3d	19
4	b	2	1b	20
5	d	2	1b	20
6	c	3	1a	21
7	b	3	2	21
Lesson 3				
1	d	1	3c	27
2	a	1	3b	27
3	c	1	3a	26
4	c	2	2h	29
5	b	2	2g	29