SECTION 1

SYSTEM DESCRIPTION

PRELIMINARY EDITION

The AVL Eagle Computer System shown in Fig. 1-1, is made up of four hardware units:

1. The Central Processing Unit	CPU (EC)
2. The Keyboard	K69
3. The Video Monitor	VM9
4. The Mini-Floppy Disk Drive	FD1

Interconnection cables are used to attach the other units to the Central Processing Unit. Add some projector control equipment (QD's, Show Pro 5B, etc.) via a cable from the Central Processing Unit, and the system is ready to power on. But it doesn't know what it is!

Every general purpose computer needs an Operating System of some type to give it intelligence. Each Eagle PROCALL diskette contains this information. AVL PROCALL (PROgrammable Computerized Audio-visual Language Library), was designed by AVL specifically for multi-image programming and editing. As you shall see, when the system is first powered on, it automatically "goes to the disk" to obtain its intelligence. Once that is loaded, the Eagle tells you "let's begin." The real beauty of this approach is that new A/V features can typically be added to your Eagle system by simply inserting a new version of the diskette. Thus new versions of the Eagle can be generated every few months without having to continually send the system back to the factory for hardware updates.

Each of the units has its specific function to perform, so let's examine them briefly.

(Fig. 1-2 Front and Rear View of CPU)

The Central Processing Unit (CPU) is the heart and the brains of the system. All equipment (devices) in the system are attached to this unit via various input/output (I/O) connectors located on the rear panel. Inside the unit are plug-in printed circuit cards, including a Master CPU card containing a microprocessor, interfaces for the keyboard and printer, and related control circuitry, and two

memory cards that, combined, form the operating system memory, and user memory to store the cues for the show, as well as names and titles in English. The memory in the Eagle CPU is temporary, in that it is there only as long as a-c power is applied to the unit. Permanent memory storage is provided by the Floppy Disk, as we shall see. In addition, other printed circuit cards contain the interface electronics for the VM9 Video Monitor, the FD1 Disk Drive, and mag tape signals. Additional card slots are available in the unit to add (a.) more memory and (b.) interface boards for new peripherals as AVL develops them.

Also included in the CPU are the power supplies for the keyboard, disk drive and the main frame electronics. A switched convenience outlet on the rear panel provides a-c power for the VM9 Monitor. A slide switch is provided to allow selection of 115/220 volts a-c input.

The "OUT 1" and "OUT 2" RCA phono jacks are used to output digital signals to the projector control equipment and to the mag tape tracks. "OUT 1" is for screens 1 through 5, and "OUT 2" is for screens 6 through 10.

The "PLAY" jack reads the digital informations from a mag tape that was encoded from any AVL computer product (5 screens or less). By playing this information in from the show tapes you produced before you got your Eagle, not only will the cues be executed, but they will be stored and displayed so you may edit them, put them on disk memory, or get a hard-copy printout.

The "SYNC IN" and "SYNC OUT" jacks are used in conjunction with the "LINE OUT" and "LINE IN" jacks on your multi-track tape deck. This will allow you to synchronize a point on the soundtrack where you want to start a screen action by pressing the "CUE" button, which also puts out a 1000 cycle sync pulse at the same time. On playback, each pulse will automatically start the screen action exactly where you placed them.

If you need to be away from the Eagle keyboard while you are recording the sync pulses, plug a Kodak Remote Control into the "REM SYNC" jack on the rear of the CPU. Pressing the "FWD" button causes a sync pulse to be output to the tape deck.

To remotely cue the Eagle, either going forward or reversing through the program, use a Kodak Remote Control plugged into the "REM CUE" jack.

Knowing that the power of the Eagle has just been tapped, provisions for future expansion have been made. The two "EXPANSION PANELS" and the 5-pin jacks labeled "EX1", "EX2" and "EX3" are for this purpose.

(Fig. 1-3-Front and rear view of VM9 Monitor)

The VM9 Video Monitor performs several functions: (a) displays what you are putting into the computer from the keyboard, (b) allows the computer to "talk" to you by displaying messages to you, and (c) displays the cues and the lamp status of the program you are working with. A unique feature of the Eagle is that it not only displays the present cue being worked on, but the previous five as well as the following five.

Those of us who have had to relate complex sequences but were limited to stepping through them seeing the next cue only will recall that it was sometimes necessary to write the sequence out to visualize what to do next. The Eagle changes all of that, because now there is visual continuity on the Monitor, automatically.

The VM9 monitor uses a 9 inch CRT, and the whole unit was specifically designed for computer information display use. It was selected to combine the factors of legibility to the user, as well as being compact for portability. Using a 5 x 7 dot matrix to form each character displayed, there are 64 characters per line, and 16 lines. If LED's were used to show LAMP STATUS a minimum of 30 would be required, and any future expansion/format changes would require a hardware update.

During operation a blinking "cursor" indicates where on the display you will next be entering data from the keyboard.

The VM9 Monitor is extremely simple to hook up and use. A coaxial cable supplied with the system connects from the "VIDEO" jack on the CPU to the "VIDEO IN" jack on the rear panel of the monitor. If it is the last monitor in a daisy-chain (all monitors would show the same data) or is the only monitor, the 75 ohm termination switch should be set to the "ON" position.

On the front panel is a POWER ON/OFF switch and two operator controls, CONTRAST and BRIGHTNESS. The Contrast control sets only the intensity of the characters, while the Brightness control sets the intensity level for both the characters and the background. You can adjust these according to the ambient light level you are working in, which could run the gamut from brightly lit rooms to black during a presentation. And your Eagle covers them all.

Behind the front panel are two additional operator controls, "HORIZONTAL HOLD" and "VERTICAL HOLD". These can be adjusted if necessary to give a stable display just as you would do on your home television receiver.

(Fig.1-4 Picture of Keyboard)

The K69 Keyboard is your way to communicate with the computer. With it you will be able to do wondrous things. It consists of a standard typewriter keyboard, combined with special function keys to allow you to control the computer as well as sophisticated editing and monitor control features. For PROCALL all the letters on the display appear in upper case only, whether the SHIFT key is used with them or not. In the areas that you are writing a program's name or the operator's name, the double-marked keys will put out the upper character when used with the SHIFT key. To the right of the regular keyboard is a numeric keypad, if you are more comfortable entering numbers from a calculator. For those of you who type, the standard number keys on the top row operate identically to those on the keypad.

On the bottom row of the keyboard the LEFT and RIGHT arrow keys are used as cursor controls, moving the cursor appropriately on the screen. The SPACE bar moves the cursor on space to the right (as on a standard typewriter) when the cursor is in any area other than the program area of the display. As you will see later on, the computer automatically provides tabs for us in the programming area, and the SPACE bar can act as a tab key.

The next two keys in the bottom row ("↓" and "CUE ") act as the "REVERSE CUE" and the "CUE" buttons on programmers like the Show Pro V.

The "ENTER" key is used to enter information into the computer after you have typed it on the keyboard and observed it on the monitor. If you wish to change something simply move the cursor to where you want to make the change, hit the correct key, and then hit ENTER.

The black keys on the keyboard provide you with a number of control and editing functions that allow you to use a few keys to do many things. And when we get into the actual use of the keys in programming, the logic behind the choice of keys for a given function will surprise you in how quickly you will be using them as though you had known them forever.

The keyboard comes with a permanently attached cable coming from the rear of the case. The other end has a mating connector to the one marked "KEYBOARD" on the CPU.

(Fig. 1-5 Picture of floppy disk drive and diskettes)

The AVL model FD1 Floppy Disk Drive is used to record and playback large blocks of digital data to and from the Central Processing Unit at very high speeds. Utilizing a small flexible diskette about the size of a 45 rpm record, its magnetic surface can store approximately 27,000 cues for five screen, 15 projector shows. For the 10 screen shows, approximately 20,000 cues may be stored.

A LOAD (playback) or a SAVE (record) command causes the diskette to begin spinning. A red LED on the front panel of the drive goes on whenever a LOAD/SAVE operation is being executed. The play/record head inside the disk drive moves rapidly in a straight line from the outer edge of the diskette to the inside and back out, as required. Although magnetically read and recorded, the diskette is divided up into a series of tracks where the data is stored. Unlike the mag tape, the "packing density" of the disk is extremely high, meaning the digital information for each cue takes up very little physical space, hence the term "mass storage".

To give you an idea of the magnitude of difference between mag tape and disk storage, it takes just eight(count 'em, eight!) seconds to load the Eagle memory with any block of 6000 cues out of the 27,000 available. That includes starting the drive up, getting it up to speed, finding the information and transferring it. Compare that with the same situation using mag tape. Let's assume the cues are stacked one right after the other on the tape at a 20 cues per second rate, and the tape is running at 15 ips. To store the cues requires 450 feet of tape, and 5 minutes of playback from one end to the other. You can easily see how time consuming picking out 6000 cues on the first pass would be!

And, as you will see later, the cues can be protected so that one cannot accidentally erase or change cues from the computer, and you can easily move information on the disk from one disk/system to another. Give your show a name, and that's how it is stored. To call up 6000 cues, just ask for the show name! The rest is automatic. And since many shows may be stored on a disk, and you named each of them, those names form a "library". Want to know what shows are on the disk? Ask to see the library. And there on the monitor they all appear. That's the power of the Eagle!

(Fig. 1-6 Picture of Line Printer: Check to see if repro permission required.)

How many times have we wished we had cue sheets, but the time involved has stopped us. Now, thanks to the Eagle it can be done automatically when you have an optional hard copy printer. There are

several manufacturers from which you may buy or lease the printer, such as a DECWRITER from Digital Equipment Corp., or a KSR Model 43 unit from Teletype Corporation. The Eagle has a connector on the rear of the CPU that uses the computer industry standard RS-232-C interface circuitry. All you have to do is plug the printer into the "PRINTER" connector, tell the Eagle to "PRINT", and whatever is in the Eagle memory is printed out, cue line-by-cue line just as it appears on the screen, all automatically. Want a printout of just the names of the shows and the effects on a disk? Simple. Tell the Eagle "PRINT LIBRARY", and there you are. Refer to the Eagle Printer Selection section of this manual for additional printer information.

(Fig.1-7 QD's, Show Pro 5)

Being only a programmer, the Eagle needs some Dissolve Control equipment to translate your show to projector happenings. Your Eagle is presently able to provide control signals to dissolve controls for up to thirty (30) projectors. The digital signals, available at the "OUT 1" and "OUT 2" jacks at the rear of the CPU, are compatible with any of the AVL computer products. In order to take full advantage of all the screen effects available, you can use the AVL QD Playback units , combining economy and portability, or a SHOW PRO VB with MKVII power packs which give you both programming and playback capabilities. Within the limit of The Play Back Unit. see Section 7 page 1 for complete list of compatibility.

SECTION 2

EQUIPMENT SET-UP AND CHECKOUT

In this section you will be shown how to set-up and checkout your Eagle computer system. But first there are a couple of common sense rules that will help you to achieve the highest performance from your system.

The first point is one you have probably heard many times before, but it is just as true now: CHECK THE A-C POWER SOURCE YOU WILL BE USING TO MAKE SURE IT IS WIRED CORRECTLY.

There are two important reasons to observe this rule; (1.) It can prevent you or someone else from being hurt, and (2.) it can prevent the equipment from being damaged or not functioning correctly. So help everyone out, always check the receptacles.

"But how do I do that?", you ask.

By using a small device called an a-c receptacle tester, which has been on the market for the last few years. It plugs into the standard three-wire grounded receptacles. There are three indicators on the unit, and a table printed on it that shows the combination of indicators lit for various fault conditions, as well as correct wiring. There are several manufacturers of this device, they typically cost less than $6, and they may be found at electrical supply stores and some department stores with electrical supplies.

The second point is to read this manual before using the equipment, otherwise you might end up at "When all else fails, read the ---". In most cases it will save you time in getting to the fun of using your Eagle.

UNPACKING THE SYSTEM

The Eagle Computer System is shipped in three cartons. As you unpack each box, save the material, as it has been designed to enable you to ship your unit safely.

The largest carton contains the Central Processing Unit (CPU). The protective foam top is form fit, and goes on easily if you repack your unit. Remove the unit and place it on your work area, desk, etc.

The cube-shaped carton contains the CRT Video Monitor. Lift it out of its carton by the handle at the top, and place it on the top of the CPU. (NOTE: The individual units may be placed anywhere you wish as long as their cables reach, but it is suggested you start out as described.)

The last carton contains (a.) the Keyboard, (b.) the Disk Drive, (c.) a diskette carrying case with three AVL disks enclosed, and (d.) a packet containing the power cord for the CPU, the coaxial cable for the Video Monitor, and the key to turn the Eagle ON and OFF.

CAUTION: Your AVL diskettes use magnetic recording techniques, and they have either pre-recorded PROCALL data or test data on them. As with your magnetic recording tapes, observe the same rules about not getting them too close to magnetized tools, extreme heat, etc. A more thorough list of specific things to watch out for will be discussed when you are told how to load the disk into the drive.

Place the Keyboard in front of the CPU, and place the Disk Drive unit next to the Video Monitor. Figure 2-1 shows a typical setup.

(Fig. 2-1 System + QD's + Printer + Teac)

HOOKING UP THE SYSTEM

Referring to Fig. 2-2, follow the steps below.

(Fig. 2-2, Picture of Rear Panels of System showing interconnection cables.)

1. Place the key supplied into the POWER switch on the CPU and make certain it is in the OFF position. Remove the key.
CAUTION: Whenever plugging or unplugging any of the units to the CPU always make sure the a-c power is OFF to prevent possible damage to one or more units.

2. Connecting the VM9 Video Monitor
A. Connect one end of the coaxial cable supplied to the "VIDEO" jack on the CPU unit. Connect the other end to the VIDEO IN" jack on the monitor.
B. Set the 75 OHM termination slide switch on the VM9 to the "ON" position.
C. Place the POWER switch on the VM9 to the ON position(push it in). D. Place the "BRIGHTNESS" and "CONTRAST" controls to their midway position.

E. Plug the VM9 power cord into the convenience outlet just beneath the fan on the CPU.

3. Connect the end of the K69 Keyboard cable into the "KEYBOARD" jack on the CPU.

4. Connect the end of the FD1 Disk Drive unit into the "DISK DRIVE" jack on the CPU.

5. If you have a compatible printer with the Eagle do the following:
A. Connect the end of its interface cable into the "PRINTER" jack on the CPU.
B. Place the POWER switch on the printer to its OFF position.
C. Plug the printer's power cord into a tested a-c receptacle.
D. Some printers require special cabling. Refer to the Eagle Printer Selection portion of this manual and the manual from the printer manufacturer for further information.

6. On the Eagle CPU set the "115/220" slide switch to the appropriate position.

7. Plug the detachable power cord supplied into the receptacle on the CPU below the fan.

8. After insuring the a-c receptacle on the wall is grounded and wired correctly, plug in the power cord.

9. Using the key supplied turn the POWER switch on the CPU to the ON position. The following should occur:
A. The fan on the CPU should start up.
B. The red LED indicator on the Disk Drive will go ON, indicating the drive is activated, then it will go OFF. Since no disk is installed, it will continue to cycle as described.
C. The Video Monitor should be warmed up by this time, so adjust the controls for a clear display. The top line of the display will say: "DISK DRIVE 1 NOT READY"(older versions will say "DISK DRIVE A NOT READY").

A WORD ABOUT THE FLOPPY DISK

Just before you take the next step there are a few things you should be aware of in regards to handling your diskettes (sometimes simply called disks) to insure you both work well together.
1. Do not bend or fold the disk. The magnetic coating may crack and either lose your data or the PROCALL information.
2. Keep the disk away from magnetic fields. Treat these as you would your audio tapes.
3. Always replace the disk in its protective envelope whenever it is not being used. Slip it in the envelope so the exposed areas are covered (see diagram below).
4. Never write on the plastic jacket with a lead pencil or ball-point

pen. Always use a soft, felt-tip pen. Write only in the label area. There should never be more than two labels (one placed over the top of the other) on a disk at one time. Always remove the top label before putting on a new one.
5. Do not touch or attempt to clean the exposed surfaces of the disk. Abrasions may cause loss of stored data.
6. Do not expose the disk to heat or sunlight.
7. Keep your disks in the storage cases provided. Store the disks in an upright position, to prevent them from warping after a period of time.
8. There is a mechanical SHOW PROTECT notch on every AVL disk that when exposed allows you to change or SAVE programs on the disk. When the small silver/white tab, supplied with disk, is covering the notch you are not able to write on the disk. In either case you can always load (READ) data on the disk into the Eagle Memory. The write protect tab may be remove whenever necessary to write data on the disk(note: do not remove the write protect tab from the Memory Test Diskette, it should only be used to test the Eagle).

(Fig's. of Diskettes)

Open up the Eagle Disk Storage Case and you will see there are three disks supplied with your system. One of the disks has the WRITE PROTECT NOTCH covered with a silver tab, and the label is marked EAGLE MEMORY TEST, whose use will be discussed in the SECTION IX. Take out one of the other disks which is not write protected and use it for the following programming.

(Fig. 2-3 Loading the disk into the Disk Drive)

Remove the disk from its protective envelope, and do the following:
1. Flip up the gate on the disk drive.
2. Hold the disk flat with the arrow pointing towards the gate.
3. Insert the disk into the disk drive until it stops. It should slip in easily. IF IT DOES NOT, DO NOT FORCE IT. Remove it and try again.
4. Push the gate down until it locks.

The next time the red LED indicator comes ON, it will be accessing the PROCALL data, and when completed, the disk drive will shut off.

This time the monitor will display: "PLEASE STANDBY FOR PROCALL LOAD. THANK YOU".

After the Eagle has loaded PROCALL, the top line on the monitor changes to: "HELLO, MY NAME IS EAGLE. WHAT IS YOUR NAME?"

Go ahead and type in your name, then press the ENTER key on the keyboard.

In the wink of an eye the display changes to:

"HI THERE (your name)
NICE TO MEET YOU
THANK YOU FOR LOADING PROCALL VERSION .....
THIS VERSION OF PROCALL ALLOWS ME TO CONTROL 5 OR 10 SCREENS
HOW MANY WOULD YOU LIKE TO USE?

ADJUSTMENT OF THE VIDEO MONITOR

While you have this display on the screen, make the following adjustments.

1. Turn the "CONTRAST" control completely counterclockwise.
2. Adjust the "BRIGHTNESS" control until you just see the background become visible.
3. Adjust the CONTRAST control for clear characters.
4. You will find a balance between the two controls that accomodates the ambient light in the room for a pleasing display.
5. If the display is not stable, do the following:

A. Turn the POWER switch on the monitor to OFF.

B. Using a hex wrench remove the two knobs from the front panel controls.

C. Using a small Phillips Head screwdriver remove the two screws located on the bottom front edge of the monitor and remove the plate.

D. Turn the POWER switch to ON.

E. Using a small flat-bladed screwdrever, adjust the HORIZ.and the VERT. HOLD controls for a stable display as you would for your home TV set.

F. Turn the POWER switch OFF.

G. Replace the plate and the control knobs.

H. Turn the VM9 power ON.

PRELIMINARY EAGLE SYSTEM CHECKOUT

Moving right along, when you typed in your name in answer to the opening(HELLO) sequence you should know that you can type in up to 25 characters (a character is any one of the alpha, numeric or punctuation keys on the keyboard).

Looking back at the display notice the white blinking area next to the question mark ? That is called the "cursor" and it tells you where you are "typing" in data from the keyboard. You will find that the Eagle will tab automatically after an entry, as noted by the position of the cursor on the screen. Now all you have to do is answer the questions. The cursor is at the end of the first question. If you want 5 screens, push the "5" key on either the numeric keypad or on the top row of the keyboard; and for 10 screens you would press the "1" key followed by the "0" key. For now press the "5" key and

then the ENTER key.

NOTE: After every section of data is typed up on the screen, you must press the "ENTER" key to input that data into the computer.

Note that the digit "5" replaces the cursor, which has now moved to the next question. You have a choice of either 2 or 3, but for now press the "3" key and then the ENTER key. Now the Eagle wants you to name your show (up to 8 characters), so type in what you would like and press ENTER.

The display is automatically replaced by the "NORMAL PROGRAMMING" mode display. It should look like Fig. 2-4.

(Fig. 2-4 Picture or type copy of display)

Note that the information you gave the Eagle has been memorized by the computer, and it has "filled in the blanks". You have been conversing with the Eagle in English, and you will both continue to do so.

HOOKING UP THE DISSOLVE CONTROLS

In order to control the projectors you will need either QD's, PD's, a SHOW PRO III, a SHOW PRO V, or a combination of these units. Using a SHIELDED audio cable with an RCA phono plug on one end, connect it to the "OUT 1" jack on the rear of the CPU, which controls Screens 1 through 5. If using 10 screens, you would also use the "OUT 2" jack for Screens 6 through 10. Connect the other end of the cable to the "PLAY" jack on either the first QD or PD, which requires an RCA phono plug. If using a SHOW PRO III or a SHOW PRO V, the output of the Eagle is connected to the "PLAY" jack which requires a 1/4 inch phone plug.

If using QD's or PD's, finish interconnecting them, and set their "SCREEN SELECT" switches appropriately. For Screens 6 through 10, set the SCREEN SELECT switch for Screen 6 to "1", for Screen 7 to "2", etc. Set their "SEQUENCE" switches to "3" for now.

If you are using a SHOW PRO V as the dissolve control, set the front panel switches as follows:

MEMORY to "TAPE BYPASS"
DISSOLVE to "NORMAL"
SEQUENCE to "THREE"
KEYBOARD to "NORMAL"
MAG TAPE to "PLAY"
PROGRAM TIMING to "STEP"

CHECKING OUT THE SYSTEM WITH PROJECTORS

The assumption here is that you are only using 5 screens and you can control 3 projectors per screen. In the section on programming you will be shown how to use 10 screens. If you only have the capability of 2 projectors per screen, you must go back and request "2" projectors by pressing the RESET button on the front panel of the CPU and answering the question again. In the program below you would ignore the cues concerning the CENTER projectors.

Use the following procedure to check that the Eagle is controlling the projectors. As each cue is executed the STATUS should be the same as the projector lamps. Under "ENTRY" in the Cue Sheet below press the keys in the sequence they are listed: e.g., "AT" means first press the "A" then the "T" keys, followed by the screen data keys, and then the ENTER key.

CUE#	ENTRY	RESULT
1	AT, 1,2,3,4,5,ENTER	Statement = ALT LEFT lamps ON, Screens 1 through 5.
2	AT, 1,2,3,4,5,C,ENTER	Statement = ALT CENTER lamps also ON, Screens 1 through 5.
3	AT 1,2,3,4,5,R,ENTER	Statement = ALT RIGHT lamps also ON, Screens 1 through 5.
4	AT, 1,2,3,4,5,L,C,R,ENTER	Statement = ALT All lamps OFF.

At this point you are ready to start programming a 15-projector show. If you had difficulty, check the cables, then switch settings. After it works turn the power OFF to all units, then read on!

SECTION 3

PROGRAMMING YOUR EAGLE, or LET'S GET ACQUAINTED

In order to maximize the capabilities of the system and minimize the work to produce it, AVL has developed PROCALL (PROgrammable Computerized Audio-visual Language Library). This computer language allows you to do many things, and your first task is to understand what it is all about. With PROCALL you will be able to perform seemingly magical screen effects, easily edit your program and by using Control Commands have the Eagle do your bidding.

The following is a detailed description of PROCALL. Section 8 has an abbreviated version called the PROCALL QUICK REFERENCE GUIDE that you will use to refresh your memory until it becomes second nature.

The first section discusses the various codes that tell the system "what" you want the projectors (or other devices) to do. You will be entering these codes under the "CODE" section on the Video Monitor display, and after you have entered it the Eagle will describe it more clearly under the display heading "STATEMENTS".

CODES

DISSOLVE SPEED CONTROLS

C CUT - Commands an instantaneous lamp change from one projector to the next one in sequence, followed by a tray advance on the projector whose lamp went OFF.

1 D
2 D
3 D
4 D
6 D
8 D
16D
32D

DISSOLVES - Entering one of these codes will cause a cross-fade or blending of the projector lamps over the period of time in seconds(e.g., 3D takes 3 seconds). A tray advance always occurs on the down going projector.

HC HARD CUT - The same result as a CUT, but the down-going projector starts its tray advance just before the lamp status changes between the two projectors. In addition to producing a "harder" visual effect, it provides a method to move slides more quickly on a given screen area.

AT ALTERNATE or ALT - Same as a CUT, except there is no tray advance.

1 A DISSOLVE ALTERNATES - Same as DISSOLVES, except no tray

2 A advance.
3 A
4 A
6 A
8 A
16A
32A

FA FAST ALT - The lamp in a slide projector does not turn ON or OFF instantaneously with the application or removal of power, because the lamp requires fractions of a second to heat up or cool down. This is called the "thermal lag" of the lamp, and is different for turn-on than turn-off. All AVL computerized dissolve controls automatically compensate for this effect for dissolves and alternates. For CUT or ALT there is what AVL calls an "afterburner" to remove any possibility of a "blink" on the screen, and has the additional advantage of allowing the visuals to attain full brilliance when moving at the rate of 10 per second. However, a lamp may NOT be alternated at a rate of 20 times per second wit "ALT" because the afterburner feature will hold the lamp ON. In order to remove the afterburner in this special case, the FAST ALT (FA) is programmed to allow solo flashing and/or flying visuals at 20 times per second. The FA code will also be used in producing an INTENSITY CONTROLLED ALTERNATE described under "ADVANCED PROGRAMMING TECHNIQUES".

FZ DISSOLVE FREEZE - As with the SHOW PRO V version B, the Eagle can issue a Dissolve Freeze command to the dissolve control equipment to stop and hold a dissolve alternate at any rate at any intensity level you want.additionally, this code can be used to continue the lamp dissolving in the same direction at the same rate as before it was frozen. You can also change rates and/or change directons. All this and more covered under ADVANCED PROGRAMMING TECHNIQUES. Again only Disslve Alternate may be used.

PS PRESET - Used to allow notifying specific projectors that they are to respond to the next "action" (dissolve or alternate) cue issued. It allows projectors that normally would have to be accessed 1/10 (or 1/20th) second apart to start the same dissolve rate to start together.

HOME PROGRAMMABLE RETURN TO START OF SHOW - Returns the Eagle memory automatically to CUE#1, places the projector lamps in STANDBY, and returns all trays to their starting positions by the shortest route home. This cue is entered by itself, becomes part of the

program and is stored in memory.

PROJECTOR TRAY COMMAND CODES

PF PROJECTOR FORWARD - Used in conjunction with a screen number and a specific projector if required, this code causes a forward (klunk) tray advance without affecting lamp status.

PR PROJECTOR REVERSE - Same as PF except causes the projector tray to back up one slot without affecting lamp status.

HI-SPEED RUNS

The Eagle can perform cues automatically from memory at a rate of either 10 or 20 cues per second during a hi-speed run. At 10 cps it means that it takes 1/10th second from the time one cue is issued until the next cue is issued. By going to 20 cps, the cue-to-cue time is cut in half. The Eagle may be asked to change speeds, even in the middle of a hi-speed run. The actual commands to start and stop a run (G/S) are placed in the "SCREENS" area of the Monitor and discussed in the SCREENS section of this manual

S10 10 CUES/SECOND - The initial system speed. Used to shift the speed down from 20 CUES/SECOND.

S20 20 CUES/SECOND - Used to increase the number of cues per second from 10/SECOND.

W.05
W.1
W.15
-
-
W9.95
W10

Waits are computer-generated time delays used to allow precise intervals between action cues. They may be entered into the program from .05 second to 10 second delays in .05 second increments. By using additional cue lines any delay you want may be generated.

WX WAIT X - Used in those cases where the precise delay between cues is not known before programming, and must be accomplished "on the fly". Whenever the Eagle sees a WX it starts timing from when the "WX" is seen until you hit the CUE button, signifying that is when you want the next cue to start. The Eagle then automatically replaces that "WX" with the correct WAIT time to the nearest 1/20th of a second, The "WX" feature also allows your Eagle to be used as a stopwatch that can

generate a list of all inter-cue timing for your entire show which you then can either print or simply copy from your Eagle Monitor to assist in preparing a storyboard.

N NO-OP - The "no-operation" or NO-OP cue is a cue that causes no screen action to occur, but is used:

1. To allow a GO/STOP without any screen action
2. To "PAD" a program for later intermixing of other cues to simplify Foreground/Background programming. Thus you can leave every other cue a NOP while programming your Foreground and later go back and substitute Background cues for some of the NOP cues to inter-mix two separate programs
3. A .1 or .05 time delay cue, depending on whether the system is running at 10 or 20 cues per second respectively.

RP REPEAT - If cues are to be repeated several times in a sequence, it is only necessary to write the sequence once into the program. Using this command the Eagle can be instructed to loop (repeat) the sequence from 1 to 255 times on a single cue line. If necessary. up to 10 consecutive (nested) RP commands may be used. A repeat is essentially a 0 CUE TIME GOTO to the nearest preceeding cue which has a "GO" imbedded in it.

RPO REPEAT UNTIL TERMINATED - Using only one cue line, will loop constantly until stopped by hitting the CUE button, a dry-contact closure from REMOTE CUE IN jack, or a 1000 HZ. tone at SYNC IN jack. This is particularly useful in a live show to combine slides with a variable length performance.

SPECIFYING SCREENS AND PROJECTORS THE PROGRAM ACTION IS TO AFFECT

The next section of the PROCALL GUIDE under the heading "SCREENS" is shown to list "1,2,3,4,5,6,7,8,9,0"; and "L", "C","R" (the three individual projectors associated with each of those ten screens). Note that the Eagle recognizes under SCREENS that "0" represents the tenth screen. After the CODE command has been entered into the Eagle, the screens (and projectors, if independently accessing them is desired) are the next information you will need to enter under the "SCREENS" section of the Video Monitor display. You may enter any one or combination of screens, and the same is true of the projectors. Also the commands to start and stop a high speed run are entered in this section, since they can be combined with any screen action command that would also accept screen numbers and projector letters.

G GO - On the cue line where you want the hi-speed run to

begin you will type in a "G" right after specifying the screens and projectors before you press the ENTER key. There are three methods to start the hi-speed run:
1. Hitting the CUE button (key) on the Eagle keyboard;
2. A dry-contact closure, such as a pushbutton switch, to the "REMOTE CUE IN " jack on the rear panel of the CPU;
3. A 1000 HZ. tone to the "SYNC IN" jack on the rear panel of the CPU.

S STOP - On the cue line where you want the hi-speed run to stop you will type in an "S" when the cursor is at the SCREENS column before you press the ENTER key.

EDITING KEYS

By pressing the following keys on the keyboard, either individually or in combination, you will be able to rapidly execute or change screen effects in your show.

In order to utilize the same key to perform different functions, it is necessary to inform the computer as to which meaning the key has. The CONTROL (CTRL) key does this for you when it is pressed and held down while striking another key. For instance, you will recall that if the cursor is at the "CODE" area of the display and you were to press the "A" key followed by the "T" key it was interpreted as an "ALT" command. But, if you were to press the "A" key while holding down the "CTRL" key, the computer knows you want to perform an "ADD-A-CUE" function as described below.

As a matter of notation in this manual, in order to indicate that two keys are to be pressed simultaneously, "/" will be used to seperate the two keys to be pressed. For example the "ADD-A-CUE" function described above will be shown as "CTRL/A".

ENTER Pressing this key causes cues and commands to be entered into the computer. With the exception of the editing keys listed below it will be used every time data is input into the computer.

CUE This key is used to cause a cue in memory to be executed. If the cue contains a "GO" it will start a hi-speed run and the Eagle will continue at the system speed selected until it sees a "STOP". Additionally, each time this key is depressed it causes a quarter second synchronizing 1000 Hz. pulse to be generated from the "SYNC OUT" jack on the CPU. If not part of a hi-speed run, the program will advance one cue each time the CUE button is pressed.

REVERSE CUE - If the cue where this key is depressed is part of a hi-speed run it will return the program to the first previous cue where there is a "GO". The

computer will return all projectors to their correct tray positions at the "GO" cue, as well as insure the lamp status is correct. Because once a hi-speed run is started additional "GO"s are ignored, by placing a "GO" within a hi-speed run where you are trying to change a section of the sequence the "GO" will allow you to easily "tab" back to the trouble spot. If you are currently not in a hi-speed run section of your program(RUN is not lit in upper right of monitor) then the program will go back one cue each time the key is depressed.

Q STEP CUE - Steps forward through the program one cue at a time, regardless of whether or not the cues are part of a hi-speed run. The cue action will be performed by the projectors.

CTRL/Q STEP REVERSE CUE - Backs up one cue at a time, regardless of whether or not the cues are part of a hi-speed run, and the projectors will follow.

CURSOR RIGHT - Used to tab cursor to the right when in the program area of the display(ie., if the cursor is at the CODE column it will jump to the SCREENS column when pressed). Pressing it again will cause the program to advance one cue, and the cursor will be back at the CODE column. When in the CONTROL COMMAND area of the display it moves the cursor right one character position each time it is pressed.

CURSOR LEFT - When in the program area of the display causes the cursor to tab back to the CODE column if the cursor was at the SCREEN column. In the CONTROL COMMAND area of the display it moves the cursor left one character position each time it is pressed.

SPACE BAR In the program area at the CODE column it moves the cursor to the right one character each time it is pressed without changing the character. If pressed at the SCREENS column it will cause the program to advance one cue and will place the cursor at the CODE column. When in the CONTROL COMMAND area it moves the cursor right one character position each time it is pressed without changing the character.

RUBOUT Used to clear an entire cue line, or the entire entry in the CONTROL COMMAND field.

CTRL/A ADD-A-CUE - Enables you to "open up" the program and insert a new cue. Pushes all cues following down one cue number in the Eagle memory.

CTRL/D DELETE CUE - Enables you to remove a cue from the program and automatically will "close up" the following cues in the Eagle memory.

CTRL/R REPEAT CUE - Automatically repeats the cue that was on the working cue line one time for each time it is pressed. Note that this actually opens up memory and inserts the copy of the previous cue without altering any successive cues.

ESC ESCAPE - Used to allow you to stop the program where you want in a hi-speed run. If you are using a printer it will terminate the printer function completely.

CONTROL COMMAND

CTRL/G,ENTER Issues HOME cue, and memory gooes to CUE#1. projecotrs and lamps will follow the program memory to CUE#1. May be used anywhere in the program.

CTRL/G,CUE#, ENTER Memory goes to the cue number specified. Lamps and trays folllow. May be used to go from any cue to any other cue in the program.

ALL THE FOLLOWING INSTRUCTIONS ARE DONE IN THE CONTROL FIELD

CTRL/C,
"GOTO",CUE#,ENTER — Same as CTRL/G, CUE#, ENTER.

CTRL/P, — Returns to the same Cue # in the program you were working on when you went to the Control Command field. Returns you from Control Command Mode to Normal Programming.

"RETURN", ENTER — Same as CTRL/P.

"CAC",ENTER — Clears ALL cues stored in the Eagle memory. Home is issued to connected dissolves.

"I AM ---",
ENTER — Changes Operator's name in Eagle memory to --- (up to 25 characters).

"PROGRAM ---",
ENTER — Changes Program name in Eagle memory to --- (up to 8 characters).

"CUES", ENTER — Displays the total Program Cues available in your system, as well as the number of cues remaining that you may program in the Eagle memory. This data is displayed in the "EAGLE COMMENT" field. This may be done at any time in the program, and has no effect on the program in memory.

THE FOLLOWING ARE COMMANDS FOR MEMORY TRANSFER TO OTHER DEVICES

SAVE ("SV"),ENTER — Memory transfer to disk. Saves program in EAGLE memory with disk file name same as PROGRAM name.

SAVE ("SV")---,
ENTER — Memory transfer to disk. Saves program in EAGLE memory with disk file name of ---(up to 8 characters).

"PRINT",ENTER — Memory transfer to printer. Causes a hard copy print out. No other activity may be performed while in this mode.The Eagle Always starts printing from CUE#1. Printing may be stopped before all the cues printed by pressing the ENTER key, and continued by pressing the ENTER key again. A "PRINTING" message is displayed during the operation.

When the printer is finished, the "PRINTING" message disappears and the cursor remains in the CONTROL COMMAND field.

Printing may be manually terminated at any time by pressing the ESCAPE (ESC) key.

THE FOLLOWING ARE COMMANDS FOR DISK DATA TRANSFER TO OTHER DEVICES, AND DIRECT DISK CONTROL COMMANDS

LOAD ("LD"),ENTER	Loads program with same name as shown after PROGRAM on monitor. ALL PREVIOUS CUES ARE CLEARED.
LOAD ---,ENTER ("LD" ---,ENTER)	Loads program selected from the LIBRARY display named --- from disk to EAGLE memory. ALL PREVIOUS CUES ARE CLEARED.
"INSERT ---",ENTER ("INS---,"ENTER)	Inserts file named --- from disk in between cues in the program already in the EAGLE memory, starting at the working cue line.
APPEND ---,ENTER (AP ---,ENTER)	Adds file named --- from the disk to the end of the program in the EAGLE memory. Normally used to combine show segments.
DELETE ---,ENTER ("DEL ---",ENTER)	Deletes program under file named--- from disk ONLY if program is NOT Write-Protected.
WRITE PROTECT---, ENTER ("WPR---",ENTER	Protects program file named --- from being written over (changed) or deleted from the disk accidentally.
CLEAR WRITE PROTECT---,ENTER ("CWP---",ENTER)	Removes the Write Protect from the program named --- so that it may be changed or deleted from the disk.
RENAME FILE (RNM (old name), (new name), ENTER)	Used to change the file name ONLY when the file is in the Library, and the file name is not NAME PROTECTED. When the file is loaded into the EAGLE memory using the new file name, the PROGRAM name will still be the same as when the program was originally dumped to the disk. Must always be entered with a comma between the old name and the new name.
NAME PROTECT	Used to protect against a file name on the

("NPR---",ENTER) disk being RENAMED (as described above) accidentally.

CLEAR NAME PROTECT ("CNP---",ENTER — Used to remove NAME PROTECT from a file on the disk so that it may be renamed.

PROGRAMMER'S NOTE: If the PROGRAM NAME on the monitor is the same as the name of the file you are operating on, it is not necessary to retype that name in the CONTROL COMMAND field with any of the following CONTROLCOMMANDS:

APPEND ("AP")ENTER)
DELETE ("DEL",ENTER)
WRITE PROTECT ("WPR",ENTER)
CLEAR WRITE PROTECT ("CWP",ENTER)
NAME PROTECT ("NPR",ENTER)
CLEAR NAME PROTECT ("CNP",ENTER)

LIBRARY (LIB".ENTER) — Displays the file names on Video Monitor of all the programs stored on the disk. Use CTRL/P to return tote program

PRINT LIBRARY ("PLB",ENTER) — Causes hard copy print out of all file names of the program stored on the disk. Direct transfer from disk to printer, EAGLE memory is not affected. Operates same as PRINT mode.

Information printed gives FILE NAME, PROGRAM NAME, OPERATOR'S NAME and number of CUES in program.

"PACK",ENTER — Used to "Close up" program files on the disk to allow gaps left by previous DELETES to be used for storage. The EAGLE will automatically PACK the disk if necessary to SAVE a new file, however, since packing can take as much as several minutes then it is usually best to do a PACK periodically (e.g., before taking a coffee break) so it won't slow you down at an inconvenient time.

THE FOLLOWING ARE COMMANDS TO THE MAG TAPE CONTROL SECTION.

CONTROL COMMAND	DEFINITION
"MTB", ENTER	MAG TAPE BYPASS. Identical to Show Pro V MEMORY Switch to "TAPE BYPASS". Allows sections of the

program to run directly from the audio tape through the EAGLE which updates the STATUS, but does not affect the memory, and the program as displayed on the monitor does not change. Allows for "mixed" (canned and live) presentations. When active, shown on the MODE area of the display.

"MTN", ENTER — MAG TAPE NORMAL. Identical to SHOW PRO V MEMORY switch to "NORMAL". Cues coming in from the tape will go into memory. MUST BE USED TO GET OUT OF "MAG TAPE BYPASS" (MTB) MODE.

"MIF", ENTER — MAG TAPE INPUT (PLAY) OFF. Indentical to SHOW PRO V MEMORY switch to "DISCONNECT". Although memory and status are not active, the regenerated cues are still sent out to the dissolves through the OUT 1 jack. Shown on display as "PLAY OFF" on MODE line.

"MIN", ENTER — MAG TAPE INPUT (PLAY) ON. This turns ON the tape input if it was previously turned OFF with MIF command.

"MOF", ENTER — MAG TAPE OUTPUT OFF. Shuts off the signals to the OUT 1, OUT 2 jacks. Identical to SHOW PRO V "DISSOLVE DISCONNECT". May be used when wanting to move through the program without affecting projectors. Shown on display on the MODE line as "RECORD OFF". NOTE: USE WITH CARE SINCE EAGLE AND PROJECTORS WILL GET OUT OF SYNC WHILE IN THIS MODE(however, you can recover by either doing a MON at the same cue # as you did a MOF, or by doing a CNTRL/G,ENTER which will HOME both the EAGLE and the projectors).

"MON", ENTER — MAG TAPE OUTPUT ON. This turns ON the OUT 1, OUT 2 jacks if they were turned OFF with the MOF command.

SET LEVELS, ENTER ("STL", ENTER) — Causes continuous burst of 1000 Hz. Test Tone to be output to the "SYNC OUT" jack on the CPU, and a digital Test signal to be outputted from the "OUT 1" and "OUT 2" jacks on the CPU. These test levels are used to set the levels on the tape decks prior to recording, and also to record test signals at the "head" of the mag tape to aid in setting playback levels for the show.

To terminate the signals, press ESCAPE, then CTRL/P to return to the program.

KEYBOARD REVIEW

The keyboard was described fully under "SYSTEM DESCRIPTION" in an

earlier section of the manual, and if there is any question, it is recommended that you review that section. The important thing to remember is that the Eagle System is very forgiving, and if you are a hunt-and-peck typist, worry not! With a little practice the keys will come naturally.

For those of you familiar with the SHOW PRO V, the "1" through "5" screen buttons and the "L", "C", "R" buttons were push ON-push OFF, that is, the first time you pressed one of them it would latch on (button lit up) and the next time you pressed it, it would unlatch (button light went off). The same is true with the Eagle in that when you press the key it wll appear on the display, and if you want to get rid of it, press the key again and it's gone. This feature can save you significant program editing time.

DISPLAY ON THE VIDEO MONITOR

In order to better understand how to use the display you need to examine the various areas, and how you and the computer will be using them. In order to do that, please do the following.

1. Turn the Eagle System power ON.
2. Load the PROCALL Disk into the Disk Drive if necessary.
3. When you see the opening message "HELLO, MY NAME IS EAGLE. WHAT IS YOUR NAME?" you can type your name or move on by simply pressing the ENTER bar.
4. The next question the Eagle poses is format. Skip through it by pressing the ENTER key 3 times. The Eagle assumes when you do this that you want 10 screens and 3 projectors per screen.
5. The display should now appear as shown below.

(picture or type of display)

TOP LINE - Contains the names of the operator and the program(note the default values if you skipped over the HELLO sequence by using just the ENTER key).

SECOND LINE - "MODE:NORMAL PROGRAMMING" indicates that you will be doing programming as defined by the PROCALL GUIDE. The other MODES ("MAG TAPE BYPASS", "RECORD OFF", and "PLAY OFF"), are displayed, when appropriate, on this line.

THIRD LINE - This is the CONTROL COMMAND field as discussed in the PROCALL GUIDE.

FOURTH LINE - This is presently a blank line, but this is the "EAGLE COMMENT" area, where it can give us special messages. See "EAGLE COMMENT LISTING".

FIFTH LINE - Headings for the various columns of the programming area.

CUE # - As on other AVL programmers the cue is previewed before it is executed. Unique to the Eagle, however, is that you will be able to also see the 5 previous cues as well as the 5 following cues to the working cue line. As cues are executed they will move up on the display, their associated Cue # following them.

CODE - These are for the various Codes as described in the PROCALL GUIDE that will tell "what" the screen action will be.

STATEMENT - A more complete statement by the computer to the abreviation you entered into the "CODE" area. Gives you positive feedback that the computer knows what you want.

SCREENS - In this area you will specify "where" you want the screen action you called for to occur. You can select any combination of screens and projectors that are in your format.

RUN - Used to indicate that a hi-speed run is in progress.

A "GO" starts the run, while a "STOP" ends the run. During the time a hi-speed run is in progress, the word "RUN" on the display appears as reverse video (black characters against a white background.)

During the time the computer is running at 20 Cues per Second, "20CPS" will be displayed in this area. If the computer is running at 10 Cues per Second, this area will be blank.

STATUS - Whenever a projector lamp is lit it is shown in the STATUS area in reverse video. Note that there are 30 projectors represented on this display. If you specify a different format the Eagle will automatically give you the correct STATUS display.

The logic in the Eagle is the same with regard to projector sequencing as the SHOW PRO V, in that it sequences LEFT, then CENTER, then RIGHT, then back

to LEFT, etc.(in 2 projector format it would be LEFT, RIGHT,LEFT,RIGHT,etc.).

INVALID ENTRIES

If you ever try to enter invalid information into the Eagle (data the computer cannot understand) it will put a "?" next to the incorrect character until you change it. Try the following. The cursor should now be under the "CODE" column at CUE # 1. A quick review of the PROCALL GUIDE will show that "FA" is a valid entry, but not so with "FX". Type in "FX". What happened? The cursor is still blinking over the "X" and a "?" next to it. Now press the ENTER key. The Eagle says "nothing doing until you give me a valid unput". OK, press the "A" key, which immediately replaces the "?" and there you are, "FAST ALT", the Eagle has accepted your entry. As you can see the Eagle really wants to help you.

LIBRARY DISPLAY

After you have stored programs on the Disk, you will undoubtedly like to know what programs are available. With your Eagle you may request a "LIBRARY" display. This will temporarily replace the cues in the program area, and the cues you had before you requested the library display will return when you return to programming.

PROGRAMMING EXERCISE

Now that you have read all about the system it is time to practice a simple program. First, clear the EAGLE entirely by pressing the "RESET" button on the CPU. The display is cleared, the disk drive loads in PROCALL and the opening message appears on the display.

PROGRAMMERS NOTE: You can always take advantage of the latest features of PROCALL, even though the disk you want to work with is an earlier version. Once PROCALL is loaded (when the display says "HELLO, MY NAME IS EAGLE.---") it remains in the EAGLE regardless of how many times you change disks or what versions they are until you either (a.) press the RESET button on the CPU, or (b.) a-c power is removed from the EAGLE. To take advantage of this fact, take your latest version diskette, load PROCALL, remove the disk. Any disk after that is only used as a storage medium.

Type in your name and ENTER. The format display comes on, and for this exercise you need 5 screens, and 3 projectors per screen area.

How did you do? If you got stuck, you should press "5", then ENTER, then "3", ENTER. Finally type in "EXER-1" for the program

name, then ENTER. The display is replaced with the NORMAL PROGRAMMING mode display, and 15 projectors will be shown in the STATUS area.

FINDING OUT HOW MANY CUES ARE AVAILABLE IN THE EAGLE MEMORY (CUES)

Before you start programming, perhaps you would like to know how many cues are available to you in the EAGLE memory. You also, after programming your show for a while, might like to quickly know how many cues at that point in time you have available. Do the following:

1. CTRL/C - Cursor to CONTROL COMMAND field.
2. Type in "CUES", ENTER - EAGLE COMMENT: CUES AVAILABLE ---.
   CUES REMAINING ---.
3. CTRL/P - Cursor returns to working cue line.

The "CUES AVAILABLE" may vary depending on what version of PROCALL you have loaded. The "CUES REMAINING" is the result of subtracting the cues you have used in the EAGLE memory from the "CUES AVAILABLE".

PROGRAMMERS NOTE: The "CUES" command may be called for at any time the program is stopped and the computer is idle (not outputting to a device such as the disk or printer or receiving input from a disk or mag tape). EAGLE memory is not affected.

STEP PROGRAM

A STEP PROGRAM is one where each cue is executed manually by you. If there are 100 cues in your program, then you would have to hit the CUE button 100 times to do the program.

PROGRAMMERS NOTE: There are, in fact, three ways to execute the cue:
1. Hitting the CUE key on the EAGLE keyboard.
2. A dry-contact closure, such as a push button switch, to the REMOTE CUE IN jack on the CPU.
3. A 1000 Hz. tone to the SYNC in jack on the CPU.

You will undoubtedly find many places to use this STEP programming, e.g.,during live speeches if you only want one slide change at a time.

NOW TRY ENTERING THE FOLLOWING PROGRAM:

CUE #	ENTRY	RESULT
1	CT	"CUT" appears under STATEMENT column on display, and cursor jumps to SCREENS column

	12345,ENTER	LEFT projector lamps all ON, and STATUS display agrees. CUE #1 has moved up on the display, CUE #2 is on the working cue line. Cursor at CODE column of CUE #2.
2	1D 1,ENTER	1 SEC. DISSOLVE CENTER ON, LEFT OFF, SCREEN 1 PROJECTOR 1L ADVANCES
3	2D 2,ENTER	2 SEC. DISSOLVE "C" ON, "L" OFF, SCREEN 2 PROJECTOR 2L ADVANCES
4	3D 3,ENTER	3 SEC. DISSOLVE "C" ON, "L" OFF, SCREEN 3 PROJECTOR 3L ADVANCES
5	4D 4,ENTER	4 SEC. DISSOLVE "C" ON, "L" OFF, SCREEN 4 PROJECTOR 4L ADVANCES
6	6D 5,ENTER	6 SEC. DISSOLVE "C" ON, "L" OFF, SCREEN 5 PROJECTOR 5L ADVANCES
7	8A 135,ENTER	8 SEC. ALT "R" ON, "C" OFF, SCREENS 1,3,5
8	16A 24,ENTER	16 SEC. ALT "R" ON, "C" OFF, SCREENS 2,4
9	32A 12345,ENTER	32 SEC. ALT "L" ON, "R" OFF, ALL SCREENS

With the projectors connected to the Eagle, tray advances will occur when dissolves were called for, and no tray advances when the ALTS were used. Now, step back to CUE #1 by using the " " (REVERSE CUE) key. Remember, in NORMAL or STEP programming as you have just done you will back up the program one cue each time this key is pressed. Note that the lamps and trays follow the cues. Wait until all the projectors are back and ready.

Reading your mind, yes, there is an easier way to get to CUE #1, but in this exercise do it so you understand one of the options available to you.

Now move forward through the cues using the CUE button on your EAGLE keyboard. Note the EAGLE takes care of any hasty moves and will not let the projector lamps or trays get out of sync.

The "L","C", and "R" keys may be used in any combination along with any dissolve or alternate speed to command any group of projectors to go ON or OFF independently of the normal "LCR" sequence. To leave the LEFT lamps ON, bring up the other projectors, and then go to black, do the following:

CUE	ENTRY	RESULT
10	AT, 12345,C,ENTER	ALT LEFT and CENTER ON, all Screens.
11	1A, 12345,R,ENTER	1 SEC ALT All 15 projectors ON.
12	16A, 12345,LCR,	16 SEC ALT All projectors go to black in 16 seconds.

In addition you can use the "L","C","R" keys to independantly control the advancing and reversing of slide trays without affecting the lamp status. Use the "PF" code for projector forward, "PR" for projector reverse and the appropriate screen and "L", "C" and "R" to specify which particular projector/projectors.

CUE	ENTRY	RESULT
13	PF 12345,L,ENTER	All LEFT projectors advance one slide.
14	PF 12345,C,ENTER	All CENTER projectors advance one slide.
15	PF 12345,R,ENTER	All RIGHT projectors advance one slide.
16	PR 12345,L,C,R,ENTER	All projectors reverse one slide.

One more way that you can use the "L" and "R" keys is to select AUXILLIARY channels on the playback unit you are using as a dissolve control, e.g., there are two AUX channels in each QD3. When programming, enter "AX" under the CODE column of the cue, then the Screen number of the dissolve control, and finally either "L" or "R" activates the momentary dry-contact closure when the CUE key is pressed.

PROGRAMMER'S NOTE: If you have connected "klunk" projectors or latching devices to the AUX channels they must be reset manually when backing up through program cues.

CUE	ENTRY	RESULT
17	AX	

12345L,ENTER	All 5 left AUX outputs give a momentary dry-contact closure.
AX 12345R,ENTER	All 5 right AUX outputs give a momentary dry-contact closure.

HI-SPEED PROGRAMMING

In order to produce sophisticated screen effects repeatedly at rapid speeds one could not do it if they had to press the CUE button each time the action was to occur, as in the STEP mode of programming. The Eagle allows you to do hi-speed programming, freeing you from this limitation. You will simply start the sequence off, and the computer will do the rest, at 10 or 20 cues per second, automatically.

For those of you who are using automatic computer sequences for the first time, a word about the speed at which your Eagle can automatically execute cues. At 10 CUES per Second, the Eagle can go from one cue to the next every tenth of a second. At 20 CUES per Second, the speed is twice as fast, 1/20th second cue-to-cue time.

The first cue in a hi-speed run is executed as soon as the CUE button is hit. Therefore, at 10 cues per second if you were to give an ALT cue independantly to each projector one right after the other it would take 1.4 seconds to send the cue to projector #15. At 20 cues per second it would take .7 seconds.

The command which tells the EAGLE the sequence is a hi-sped run is the "GO" which is inserted in the cue during programming while the cursor is at the SCREENS column of the cue. Once started by hitting the CUE button, the EAGLE will automatically execute the cues at the rate selected (10 or 20 cues per second) until it sees a STOP command, which you will place in the last cue in the sequence while the cursor is at the SCREENS column of that cue.

> PROGRAMMERS NOTE: You will still be programming in STEP mode. Even though you place a GO command at the first cue in the sequence, you hit the ENTER key, rather than the CUE key,which places the cue in memory and steps to the next cue line and waits.

During the time a dissolve is in progress, you have to wait until it is completed before going back and giving another cue to the same projector bank in the normal LCR sequencing. To do this automatically within a hi-speed run, the EAGLE recognizes a WAIT command, a cue by itself. These computer-generated time delays last from .05 to 10 seconds in .05 increments. If the delay requires more than 10 seconds, more WAIT cues may be added consecutively into the program (nested). Thus for 16 seconds the first WAIT cue would be 10 seconds and on the next cue line would be a WAIT cue of 6 seconds.

In regard to timing, it is important to note that when disolve commands are given to a projector, time must be allowed for the dissolve to occur AND the projector cycle time on the down-going machine to insure the tray has advanced and the gate has dropped before sending a new command to that projector. When insufficient

time is allowed, there will be a momentary blank on the screen when it was supposed to be ON, known as "flap", which is very disconcerting. The projector cycle time for the Kodak Ektagraphic slide projector is typically 1.15 seconds while the European SAV projector has about a 1.7 second cycle time.

Using 3 or more projectors on a given screen area allows you to move the screen action faster because additional visuals may be seen during the cycle time of the first projector. Remember, with all projectors ready, any two moves may be made 1/10th or 1/20th of a second apart, but you must wait the prescribed time for repetitive commands if the commands require a tray advance or time to finish dissolving. The following table lists the waiting times that must be added between any two cues to the same screen when projectors have a tray advance. This will insure smooth visual transition without projector flap. These times are for the domestic Ektagraphic.

DISSOLVE COMMAND	TIME TO ADD (IN SECONDS) 2 PROJECTORS	3 PROJECTORS
HARD CUT	0.7	0.5
CUT	1.6	0.7
1 SEC	2	1
2 SEC	3	1.5
3 SEC	4	2.5
4 SEC	5	3.5
6 SEC	7	5.5
8 SEC	9	7.5
16 SEC	17	15.5
32 SEC	33	31.5

TABLE 3-1. TIMES TO ALLOW BETWEEN DISSOLVE COMMANDS TO THE SAME SCREEN.

Since ALTERNATE commands do not involve tray advances there is no additional time to add. They can be cued as rapidly as 1/10th second (ALT) or 1/20th second (FAST ALT).

OK. Why don't you put this new knowledge to work with another exercise program. But first you need to get the EAGLE system back to CUE #1 and erase all cues from the memory, as well as get the projector trays back to their home position.

USING THE CLEAR ALL CUES COMMAND

To accomplish all this, use the Clear All Cues (or "CAC") command in the CONTROL COMMAND field. When this command is executed it does the following:

1. Issues a "HOME" command to all connected dissolve controls, which turns lamps to STANDBY and moves the trays.
2. Erases all cues from the memory, and sets the cursor on CUE #1, now on the working cue line.

If you need help, here is what to do:

1. CTRL/C (places the cursor in the CONTROL COMMAND field).
2. Type in "CAC" and press the ENTER key.
3. CTRL/P to move cursor back to programming area.
4. Wait to start until the projectors have stopped moving.

In this exercise you will be programming the first 20 seconds of the opening sequence of the show. The first move is a five screen panoramic shot, and listening to the audio track it seems a six second fade up will work fine. At the end of the fade up, the five divisions in the company are to appear one-at-a-time, so a slide for each division will be used, and starting on Screen 1 they will appear .3 seconds apart. After the last slide is up, all screens hold for 10 seconds, then all change to another panorama showing the company logo on the center screen and the other screens are a colored background, which you have determined looks good as a 2 second dissolve.

Since we start with all projectors OFF, remember the first projectors lit in the normal LCR sequence are the LEFT projectors, and that's where you placed the first slides. The division name slides will be in the CENTER trays, and the company logo panorama will be in the RIGHT trays.

PROGRAMMING USING COMPUTER GENERATED TIME DELAYS (WAIT CODES)

Using your PROCALL GUIDE, on CUE #1 you enter a "6D", and then Screens 1 through 5. When you hit the ENTER key, all the "L" under SCREEN STATUS column will be ON. On CUE #2, you have to wait for the fade up to finish so use the "WAIT" code. The "W" or WAIT codes are the computer-generated time delays from .05 to 10 seconds in .05 second increments. Under the CODE column put a "W" followed by a "6" for six seconds and ENTER. Under "STATEMENT" the EAGLE should say "WAIT 6.0 SEC".

CUE #3 starts the division name moves, each new screen coming up .3 seconds apart. Type in "1D" for the one second dissolve, then "1" for Screen 1. Entering that shows that the LEFT projector on SCREEN 1 dissolves OFF and the CENTER projector dissolves ON in one second. Now we have to enter the .3 second WAIT time on CUE #4. Before you do that too quickly, you must consider the infamous CUE-TO-CUE time.

Remember, the EAGLE is operating at 10 cues per second, and

therefore to go from CUE #3 to CUE #4 takes .1 seconds. You subtract this time from your total time between screen actions (.3 seconds) and therefore you will enter a "W.2" on CUE #4. The EAGLE, while waiting the required delay time will automatically go to the next cue, and therefore as soon as the WAIT time is finished it will immediately execute the next cue. So the rule is: "Between an action cue and a wait cue, subtract the cue-to-cue time. Between the WAIT cue and the next cue there is zero cue-to-cue time".

PROGRAMMERS NOTE: The minimum delay between two action cues with a "W.05" between them is .15 seconds at 10 cues per second, and .1 seconds at 20 cues per second.

If you require an exact 16 second delay between two cues, the first WAIT cue is "W10" and the next cue line would be "W5.9" at 10 cues per second, or "W5.95" at 20 cues per second.

Shown below is the CUE SHEET for this program. After entering the data in the CODE column, the cursor automatically jumps to the SCREENS area , enter screen numbers and projector letters, and hit the ENTER key.

PROGRAM NAME: EXER-1 OPERATOR: YOUR NAME

CUE#	CODE	STATEMENT	SCREENS	RUN
1	6D	6 SEC DIS	12345	
2	W6	WAIT 6.0 SEC		
3	1D	1 SEC DIS	1	
4	W.2	WAIT 0.2 SEC		
5	1D	1 SEC DIS	2	
6	W.2	WAIT 0.2 SEC		
7	1D	1 SEC DIS	3	
8	W.2	WAIT 0.2 SEC		
9	1D	1 SEC DIS	4	
10	W.2	WAIT 0.2 SEC		
11	1D	1 SEC DIS	5	
12	W10	WAIT 10.0 SEC		
13	2D	2 SEC DIS	12345	

To review your program, use CTRL/G, ENTER, which takes you back to CUE #1. Wait for the projectors to get home. Now step through the program with the CUE button, as you are still in STEP mode.

CHANGING A STEP PROGRAM TO A HI-SPEED RUN

Assuming the program is correct, you want to now make this sequence a hi-speed run. Since it is a short program, step back up using the REVERSE CUE ("↑") key. Each time you hit it the program backs up one cue line, and the projectors follow. Note that you may

hit the key rapidly, and the projectors still follow.

Now that you are back to CUE #1, you need to define the boundaries of the hi-speed run. The cue line it is to start on needs a "GO" command, and the last cue executed needs a "STOP" command.

Hit the ENTER key (or you could have hit the SPACE BAR twice) and you are at the SCREENS column. Hit the "G" key, and a "GO" appears under the RUN column. Hit the ENTER key to put the GO in memory.

PROGRAMMER'S NOTES:

1. When used in the SCREENS area, the "G" and "S" keys are latching, as are all the other keys that can be used in this area, i.e., the first time they are pressed they go ON, the second time OFF, etc.
2. If a "GO" is already ON, it may be changed to a "STOP" by hitting the "S" key without first having to get the "GO" off. The same automatic feature holds true for changing a "STOP" to a "GO".

To place a STOP at CUE #13, use "CTRL/G,13,ENTER". Again move the cursor to the SCREENS column, depress the "S" key and "STOP" will appear under the RUN column. Depress the ENTER key and we are ready to view our hi-speed sequence.

Use the REVERSE CUE key (↑) and note that pressing it once now causes the program to jump back to the last "GO" which, in your case, is CUE #1. Wait for all the projectors to get back to their starting positions. Now press the CUE button and watch! Note that during this hi-speed run, the "RUN" on the display has turned into black letters on a white background. This tells you the EAGLE is in a hi-speed run, and at the STOP the "RUN" returns to white letters.

DUMP-TO-DISK

Since the next section of the show is not ready to program (the slides are still not back from the lab!) you will want to save what you have just finished. The disk is your permanent storage, so do the following:

1. CTRL/C,ENTER - Cursor jumps to COMMAND field.
2. Type in "SV" (or "SAVE"), ENTER - Red LED on disk drive goes ON. When the program has been written on the disk, the EAGLE COMMENT : OPERATION COMPLETE appears.

PROGRAMMER'S NOTE: If you make a mistake typing data into the CONTROL COMMAND field, there are three ways to correct it:

1. The EAGLE recognizes an illegal entry (?) and waits for you to hit the correct key.
2. If you made a valid entry of a character, but it is not the one you wanted, use the CURSOR BACK SPACE key ( ) to get to the character, then type in the correct one.

3. Hit the RUBOUT key to erase the whole line and you can enter all the data again.

LIBRARY DISPLAY

In order to verify the program is stored on the disk, you may want to call up the LIBRARY display. This display shows all the FILE names of the programs saved on the disk.

PROGRAMMER'S NOTE - All programs stored on the disk are done so under the FILE name. However, the FILE name does not have to be the same as the PROGRAM NAME. However, only the FILE names shown on the LIBRARY display may be recalled from the disk to the EAGLE memory.

As entered above, your PROGRAM NAME will be the same as the FILE name "EXER-1". To call up the LIBRARY display do the following:

1. Type in "LIB" (or "LIBRARY"), ENTER - Disk drive activates, and the LIBRARY display appears in the PROGRAM area of the display. "EXER-1" is shown.

PROGRAMMER'S NOTE: The LIBRARY display has no effect on the program in memory. It may be called up anytime the EAGLE is not busy (executing a program, receiving data input, or outputting to a printer). To return to the PROGRAM display, use a CTRL/P command to return to the same place in the program as you were when you went to the CONTROL COMMAND field, or use a GOTO command if you want to return to a different place in the program.

LOADING A PROGRAM FROM DISK-TO-MEMORY

To load a program into the EAGLE memory from the disk you will use the LOAD command in the CONTROL COMMAND field.

PROGRAMMER'S NOTE: Anytime the LOAD command is used to load a program into the memory, the memory is automatically ERASED by the system just before it loads the program just called in.

Because the program you are going to load in from the disk is the same as the one in memory, you would never see a change in the display. Clear the memory by using the "CAC",ENTER command. The display now shows no cues. Do the following:

1. Type in: "LD" (or "LOAD") EXER-1" - Disk drive activates, cues show on display, and EAGLE COMMENT: OPERATION COMPLETE.

PROGRAMMER'S NOTE: Whenever the PROGRAM NAME shown on the display is the same as the FILE name to be loaded, as above, it is only necessary to type in "LD",ENTER.

CHANGING THE PROGRAM NAME

Since this is the opening sequence of the XYZ Co. show, you decide to rename the program XYZ-1. Since you are still in the CONTROL COMMAND field do the following:

1. Type in "PROGRAM XYZ-1",ENTER - PROGRAM NAME changes.

Dump this XYZ-1 program to disk by using the SAVE ("SV",ENTER) command. Call up the LIBRARY display, and both file names appear.

PROTECTING THE PROGRAM ON DISK FROM ACCIDENTALLY BEING ERASED (WRITE PROTECT)

In order to use a disk for program storage over and over again, the EAGLE has a way to erase programs, under your control, that you no longer need. However, you don't want this to happen accidentally so the system allows you to write protect a program as follows. In the CONTROL COMMAND FIELD type in "WRITE PROTECT (or WPR) XYZ-1" and press the ENTER key. The disk drive activates, and when the task is finished, the EAGLE COMMENT: OPERATION COMPLETE comes on.

ERASING A PROGRAM (FILE) FROM THE DISK

From the above you should be able to erase "EXER-1" from the disk, however you should NOT be able to erase "XYZ-1". First try to delete the program "XYZ-1".

In the CONTROL COMMAND FIELD type in "DEL (or" DELETE") XYZ-1" and depress the ENTER key. The disk drive activates, and then the display will show the EAGLE COMMENT: "FILE IS WRITE PROTECTED", indicating it cannot delete this program from the disk.

Now type in "DEL EXER-1", and depress the ENTER key. The disk drive activates, then the system displays "OPERATION COMPLETE".

Call up the LIBRARY display and you will note only "XYZ-1" is shown. "EXER-1" has been erased.

In order to do the next exercise, you need to save the program on disk again. Rename the program "XYZ-1A", then put it on the disk and write protect it. If you have difficulty, here are the steps to use. All are done in the CONTROL COMMAND FIELD.

1. "PROGRAM XYZ-1A", ENTER.
2. "SV(or SAVE) ",ENTER (LIBRARY display shows "XYZ-1" and "XYZ-1A".)

3. "WPR(or WRITE PROTECT) XYZ-1A",ENTER.

REMOVING THE WRITE PROTECT FROM A PROGRAM SO IT MAY BE DELETED FROM THE DISK. (CLEAR WRITE PROTECT).

Suppose you want to erase the file named "XYZ-1A" from the disk. You must first clear the WRITE PROTECT from that file, then you can delete the file. You still have the LIBRARY display on the monitor so you can watch what is happening. Perform the following steps in the CONTROL COMMAND FIELD:

1. "CWP(or CLEAR WRITE PROTECT) XYZ-1A",ENTER.
2. "DEL(or DELETE) XYZ-1A",ENTER.

The LIBRARY display will show the FILE has been deleted automatically.

PROGRAM EXERCISE #2

The next sequence you can program has all the slides, but the sound track you have doesn't have the voice mix since the producer is still trying to get client approval. With some minor changes you can do this sequence. But first you have to remove the trays from the first sequence and delete the cues presently in the EAGLE memory.

One command does it all, remember? The Clear All Cues or "CAC" command. Put on your new trays and away you go.

Although you have cleared all cues, the PROGRAM name is still the same. Since this is the third section of the XYZ show, change the name to "XYZ-3". Type in "PROGRAM XYZ-3",ENTER.

From the storyboard you are going to start at screen 1 moving slides as quickly as possible using cuts and as the Screen 1 LEFT comes on again, then Screen 3 starts and after another L,C,R sequence Screen 5 starts up. Then all three screens will repeat the sequence four times.

To get back to the programming area use CTRL/P. Now enter the program as follows:

CUE	CODE	STATEMENT	SCREENS	RUN
1	CT		1	GO
2	W.7			
3	CT		1	
4	W.7			
5	CT		1	
6	W.7			
7	CT		1 3	
8	W.7			
9	CT		1 3	
10	W.7			
11	CT		1 3	
12	W.7			
13	CT		1 3 5	GO

```
14      W.7
15      CT              1 3 5
16      W.7
17      CT              1 3 5
18      W.7
19      RP4
20      N                       STOP
```

USING THE REPEAT FEATURE

The EAGLE system allows you to repeat moves within a hi-speed run with the "RP" cue. This cue, once the EAGLE sees it has zero cue-to-cue time, and will loop back to the last "GO" in the sequence. You may repeat from once to 255 times on one cue line, and if more than 255 times is required you may use another "RP" cue line. Remember, however, with "RP" cues nested together in this fashion, you multiply the "RP" cue lines to get the total lines the sequence loops, and on any sequence (in our example the sequence has Screens 1,3 an 5 doing the same thing five times) the REPEAT number is one less than the total (in your case RP=4) because the first time is the actual cues you wrote.

If you have a sequence that is to loop a total of 300 times, the first RP cue line would be 149. The very next cue would also be an RP cue, as follows:

CUES TO BE REPEATED
RP 149 (totals 150)
RP 1 (repeat the repeat, or 150 + 150 = 300)

Returning to your sequence, you need to add the .7 Wait time for projector cycling and then repeat the sequence 4 times. Put a "GO" at CUE #13, and CUE #19 is "RP4". You will stop the sequence at the end of the looping, and you use the "NO-OP" command (a do-nothing code) along with a "STOP" under the RUN column at CUE # 20.

PROGRAMMING NOTE: The fastest way to get from one section of the program to another when there is a repeat sequence between them,is to use the GOTO command. The EAGLE will automatically take you there and bring the projectors with it. In the above case,to go from CUE # 1 to CUE # 20, use CTRL/G (GOTO) 20.

EDITING A HI-SPEED RUN

Your producer just walked in and, reviewing this section, wants you to change it. Now how many times have you changed the program and, when all is said and done, it is decided to use the original! So tell the producer you will be ready for him in a minute, and SAVE what you just did on your disk!

PROGRAMMERS NOTE: Since the PROGRAM NAME is the same as what you are saving you don't need to type in the Program Name with "SV" or "WPR".

Do the following:

1. Call up the LIBRARY display (CTRL/C, "LIB",ENTER).
2. Type in "SV". Wait until you see "OPERATION COMPLETE"

before proceeding.
3. Type in "WPR". When "OPERATION COMPLETE", use CTRL/P to get back to the program.

What he wants is the first cues faster, then as the second screen joins in the visuals move slower, and finally as the three screens rotate together, slower yet. So you want to use HARD CUT on the first, cues next and finally ONE SECOND dissolves.

Remembering the REVERSE CUE ( ) key acts as a tab back to "GO" cue lines (as does the SHOW PRO V in PLAY in a hi-speed run), the EAGLE keyboard uses the "Q" key to step forward and "CTRL/Q" to step backwards one cue at-a-time. GOTO CUE #1 (CTRL/G,ENTER). Type over the "CT" with "HC", and depress the ENTER key. From your chart of cycle times you see you can go every .5 seconds between projectors. Change CUE #2 to "W.5", ENTER. Do the same for CUES #5-6. CUES #7-11 remain the same, but once you start doing 1 SECOND dissolves the cycle time dictates one second between cues to the same screen.

Change CUES #13,15 and 17 to "1D", and change CUES #14, 16 and 18 to 1 SECOND delays by first hitting the RUBOUT key ("W.7" disappears) and then enter "W1".

You try it and the producer loves it, except he wants the client to review both sequences at the walk-through. The disk to the rescue! However, look at the PROGRAM name. You have already stored "XYZ-3" on the disk, so use CTRL/C and type in "PROGRAM XYZ-3A",ENTER. Now SAVE on the disk, WRITE PROTECT the file and continue on.

The next thing the storyboard calls for is a five-screen panorama showing the XYZ Co. plant, and it looks like an 8 SECOND dissolve will do nicely. Enter that at CUE #21, and all LEFT lamps will be ON ("8D,12345",ENTER).

SUPER IMPOSITION

The next sequence to program is to bring up the five division managers pictures over the panorama (one per screen) as their names are called in the narration on the sound track. The slides are in the gate of the CENTER projector for each screen. In order to superimpose the two images you must "break out" from the normal projector sequencing by using either a PRESET cue or by simply using independant accessing.

Up to now, you have been using the L/C/R projector sequencing, and if you called for a screen alone under the SCREENS column, the projector ON goes OFF while the next projector in the sequence does the opposite (in your case the LEFT would go OFF while the CENTER would come ON). However, you want to leave the LEFT ON and bring the CENTER projectors ON over them. You can do this by using independant commands to the center projectors.

USING THE WAIT X (WX) FEATURE

Remembering that, since you still don't have the narration on the sound track, you have no idea what the time delay should be between the cues to bring up the slides of the managers. A quick phone call

to the studio and you hear "they're just finishing the tape up. No more than a half an hour." Where have you heard that one before! Since you have to "get on with it", you use the WAIT X feature of the EAGLE.

Each picture will go ON with a CUT, and instead of using an arbitrary WAIT time enter a "WX" code in its place. Then when you get the audio mix, you start the high speed run and the EAGLE will sit on the "WX" cue (up to 10 seconds) until you hear the man's name and press the CUE button. The EAGLE will automatically insert the correct WAIT TIME to the nearest 1/20th of a second, execute the next action cue and be waiting on the "WX" cue.

The program from CUE #21 on looks like this:

CUE	CODE	STATEMENT	SCREENS		RUN
21	8D		12345		
22	CT		1	C	GO
23	WX				
24	CT		2	C	
25	WX				
26	CT		3	C	
27	WX				
28	CT		4	C	
29	WX				
30	CT		5	C	STOP

PROGRAMMER'S NOTE:

1. At this point you should save the program with the WX cues on the disk so that if you want to try the WAIT TIMES differently, particulary when you are practicing, you can easily re-load the program back in with the "WX" cues ready to try again. (For this exercise use the file name "XYZ-WX".)
2. There are three methods to change the "WX" cues into WAIT TIMES as described above:
   1. CUE button.
   2. REMOTE CUE jack (CPU rear panel).
   3. AUDIO SYNC IN (CPU rear panel).

In walks the messenger from the audio studio with your tape. You practice it a couple of times, get the feel, then press the CUE button at CUE #22 when you hear "Mr. Brown", press it again for "Mr. Green", and again for "Mr. Black", etc. And there you have it.

It is always a good idea to occassionally dump your work to the disk so you may retain a permanent copy. Since this last section you just finished includes the "XYZ-3A" program, save it under "XYZ-3B".

INDEPENDENT PROJECTOR CONTROL

The next section of the show deals with speeches by each manager. The storyboard calls for cross fading from the super up on the screen

now to a colored background on all screens with the company logo on Screen 3. The appropriate slides are in the gates of the RIGHT projectors. You decide a SIX SECOND dissolve is just right.

You want the LEFT and CENTER projectors to fade OFF at the same time the RIGHT projectors are fading ON. Since all 15 projectors are doing the same action you only need one cue. As you only want to do the one cue, no "GO" cue is used.

CUE #	CODE	STATEMENT	SCREENS	RUN
31	6D		12345 L C R	

PROGRAMMER'S NOTE: The "L", "C" and "R" are latching just as the Screen number keys when in the SCREEN column. Press them once they are ON, press them again they are OFF.

After the speeches there is a coffee break, and the slides announcing the break are in the gates of the LEFT projectors. After the people have left you want to take all screens to black. Both cues are probably manual (you are going to do them from the keyboard) so again you don't need a "GO" command. The coffee break slides cross-fade ON in two seconds (CUE #32:2D,12345).

There are two ways to get to black on the last cue, and it may depend on whether or not you need to do a tray change:

1. If there is no tray change required use an independent projector control command to the LEFT projectors with a CUT to insure a tray advance.

CUE #	CODE	STATEMENT	SCREENS	RUN
32	2D		12345	
33	CT		12345 L	

2. If you want to do a tray change use the "HOME" code.

CUE #	CODE	STATEMENT	SCREENS	RUN
32	2D		12345	
33	HOME			

You should dump to disk after changing to a later revision file name.

1. Call LIBRARY display, the last version of this section was "XYZ-3B".
2. "PROGRAM XYZ-3C".
3. SAVE ("SV")
4. WRITE PROTECT ("WCall LIBRARY display, the last version of this section was "XYZ-3B".
2. "PROGRAM XYZ-3C".
3. SAVE ("SV")
4. WRITE PROTECT ("WPR").

USING THE HOME CUE

Used mainly in automated exhibits to turn the projector lamps to STANDBY, home the trays and return the program to the head of the show, you have just been shown another time it could be used.

There are two modes in which the "HOME" cue works:

1. Used in the STEP mode. If the cue is NOT part of a hi-speed run, when executed by the CUE button (or REMOTE CUE IN or SYNC IN) it causes the EAGLE to issue the HOME to the attached dissolves, and the EAGLE memory simply goes to CUE #1 and waits for the next time the system is CUED.
2. Used as part of a HI-SPEED run. Whenever included as part of a hi-speed run the EAGLE upon sensing HOME issues the command to the dissolves as in the STEP MODE, but it will continue from CUE #1 executing the program until it sees a STOP.

In order to STOP at the first cue in the show, always make CUE #1 a NO-OP code with a STOP. Cue #2 is waiting, which is the first cue of the show.

Another important point to remember is that the EAGLE can load shows from the disk one right after the other, and they ma all have HOME cues in them. The EAGLE will never execute th programs after it sees the first HOME cue, which by definition is always "GOTO CUE #1".

PROGRAMMERS NOTE: In a program consisting of several shows, delete (use SKIP-A-CUE) all "HOME" cues except the last one and save the new total show. All that's necessary to find the HOME cues is to do a CTRL/G,"9999", ENTER which will always to take you to the first HOME cue encountered, after deleting that HOME the next time you do a GOTO 9999 the EAGLE will stop at the next HOME,etc.

CHAINING SHOWS TOGETHER (APPEND)

For the XYZ Company presentation you have now completed two segments, and your producer wants to see them together (and you want to know how many cues you have left in the EAGLE memory). To chain them together do the following:

1. Call up the LIBRARY display ("XYZ-1 and "XYZ-3C" are the ones you want.)
2. Load "XYZ-1". (LIBRARY display is replaced by program.)
3. Call up the LIBRARY display again.
4. Type in "AP XYZ-3C". This will cause the XYZ-3C section to be appended to the end of the XYZ-1 section.

To verify they are chained together GOTO CUE #14 (XYZ-1 had 13 cues). CUE #14 is the Hard CUT command to Screen 1.

Save this program under "XYZ-1/3" (first and third segments).

STOPPING A HI-SPEED RUN (ESCAPE)

You decide to review the first part of the show again and right in the middle the producer wants your immediate attention. You don't mind stopping, but you would like to continue from where you stopped. So you:

Depress the ESCAPE key.

It will complete whatever cue was active at that moment, and the program and projectors will wait for you to restart them from the CUE button (or REMOTE CUE IN or SYNC IN).

PROGRAMMER'S NOTE: Hitting the ESCAPE key also terminates the timer during a WAIT cue. Again, the program must be restarted by hitting the CUE button. During programming this feature will save time if you want to "get around " WAIT times during review.

The reason he stopped you is that he has the storyboard, script, slides and the audio tape for the second segment (will wonders never cease!)

A look at the storyboard shows that you are going to have fun with this one. So, clear all cues.

By clever masking, each of the twelve new models XYZ is introducing at this meeting is done in such a manner that the first slide on Screen 1 covers the upper part of the screen, the same for Screen 2,3,4 and 5. The second slide on Screen 5 is in the center of the screen, while the third slide on Screen 5 is on the bottom part of the screen. The next slides for Screens 1,2,3 and 4 are also in the bottom. The third slide for Screen 1 is in the middle. Refer to the figure below.

SCREENS

(L)	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5
(C)	MODEL 12				MODEL 6
(R)	MODEL 11	MODEL 10	MODEL 9	MODEL 8	MODEL 7

LAYOUT OF SLIDES FOR "PINWHEEL" EFFECT

What the producer wants is a pinwheel effect starting with the slide for MODEL 1 on Screen 1. As Screen 2 comes ON, Screen 1 goes

OFF, etc., and travels around the screens in a clockwise manner. It is decided the effect will look great with each slide being on the screen for .1 seconds. The pinwheel will rotate around "several" times.

USING ALTERNATES

Since the same slides are to be used over and over again, you will use the ALTERNATE code (AT) which means projector lamps will go ON and OFF but no tray advance.

Enter the following program:

CUE #	CODE	STATEMENT	SCREENS		RUN
1	AT		1		GO
2	AT		12	L	
3	AT		23	L	
4	AT		34	L	
5	AT		45	L	
6	AT		5		
7	AT		5		
8	AT		45	R	
9	AT		34	R	
10	AT		23	R	
11	AT		12	R	
12	AT		1	CR	
13	AT		1	LC	

Use the REV CUE ( ) key to get back to the beginning, then hit the CUE button.

USING THE REPEAT 0 FUNCTION

Since you don't know how many times this sequence is to be repeated use the REPEAT 0 cue. This cue allows you to repeat a sequence until you hit the CUE button.

Just before you put in the "RP0" cue, look at your SCREENS STATUS display. You ended up with the Screen 1 LEFT projector ON. You really want to repeat from CUE #2 to have the correct effect so do the following entries:

CUE #	
2	Add a "GO"
14	RP0,ENTER. Program jumps immediately to CUE #3.
3	GOTO 15
15	NO-OP/STOP

Return to CUE #1 and press the CUE button. After several times around press the CUE button again. Note that the EAGLE completes the last repeat, and then stops.

Realizing that this is a neat effect that you may want to use another time, save it on your disk. Name this program "PINWHEEL".

After the operation is complete use the CTRL/P command to return you to your program.

Suppose you decided the pinwheel would look great going around 5 times at one rate, then the next 5 times around going twice that rate, and the final 5 times around back at the original rate.

To easily accomplish this you need to chain three "PINWHEEL" programs together. You already have it once in the EAGLE memory.

1. Use CTRL/C. Since the PROGRAM NAME is the same as the one we want, you can APPEND without having to type in the name.
2. Type in "AP",ENTER.
3. When the operation is complete, type in "AP",ENTER.

USING THE ADD-A-CUE (CTRL/A) AND SKIP-A-CUE (CTRL/D) EDITING FEATURES

The EAGLE allows you to "open up" the memory on the working cue line so you may insert a complete cue easily. Called "ADD-A-CUE", it is accomplished with "CTRL/A".

You also have the capability to take out a working cue line and the EAGLE will automatically "close up" the memory. Called DELETE-A-CUE, it is accomplished with a "CTRL/D".

Do the following:

1. GOTO CUE #14 and change "RP0" to RP4".
2. GOTO CUE #15. Since we want to continue the pinwheel without stopping, delete this cue using CTRL/D. Note that the cue that was at #16 is now at #15.

Note that CUE #15 is also not wanted in this sequence. (If you can't see why, press the "Q" key twice. Now that you understand, press "CTRL/Q" twice and carry on.)

3. Use CTRL/D again.
4. Use the "Q" key to step the program to CUE #27. Change "RP0" to "RP4".
5. GOTO CUE #28.
6. Use SKIP-A-CUE (CTRL/D) twice.
7. Use the "Q" key to step the program to CUE #40. Change "RP0" to "RP4".

USING 20 CUES PER SECOND

Up to this point the EAGLE has operated at 10 cues per second. The EAGLE may also operate at 20 cues per second, and you may programmably go up to 20 and back down to 10 cues per second.

The fact that you can go twice as fast fits in with our pinwheel sequence. You want to go up to 20 cues per second at the start of the pinwheel cycle right after the first RP cue in the sequence.

1. GOTO CUE #1. Step through the program until you can

see the cue number following the RP cue. GOTO CUE #15.
2. You want to ADD-A-CUE at this point, so use CTRL/A.
3. Use the code "S20",ENTER. This is where the program will pick up speed.
4. Step through the program until you see the cue number right after the next "RP4" cue. GOTO CUE #29.
5. ADD-A-CUE at this point.
6. Use the code "S10",ENTER, and the EAGLE will down shift to 10 cues per second at this cue.

Now GOTO CUE #1, press the CUE button, and there you have it. You show the producer, who commends you as a programming genius, and calls it a wrap.

Save this portion on the disk under the name"XYZ-2"

INSERTING A FILE BETWEEN CUES IN A PROGRAM ALREADY LOADED IN THE EAGLE MEMORY (INSERT)

All the program files for the XYZ show on day 1 before the coffee breaks are finished, except to make it one load from the disk we would have to insert the "XYZ-2" file between the first and third segments on "XYZ-1/3". Here is how to quickly do this.

1. LOAD "XYZ-1/3".
2. GOTO CUE #14 (first cue in the third segment).
3. CTRL/C. Type in "INS XYZ-2",ENTER.

The EAGLE automatically "pushes down" the memory starting at the working cue line and places the inserted show in the memory.

Whenever you chain programs you must be sure the status at the end of the last show is OK for the beginning of the next show. You see CUE #14 ends up with all RIGHT projectors ON, and CUE #15 wants to come up from black. A check with your producer says that you can hold those slides on the screen for 10 seconds, and they can fade to black in 4 seconds.

Here is how to quickly make this change.
1. GOTO CUE #13. Remove the "STOP", then ENTER.
2. At CUE #14 use CTRL/A, Enter "W10".
3. At CUE #15 use CTRL/A, Enter "4D,12345R,STOP".

Between the end of the second segment (CUE #58) and the beginning of the third section which wants to start from black, you have two problems:

a. Screen 1 LEFT projector is still ON.
b. None of the twelve projectors used in the pinwheel sequence has done a tray advance.

USING THE PROJECTOR FORWARD (PF) FEATURE

The PROJECTOR FORWARD feature causes the tray of the affected projectors to "klunk" forward. The condition of the lamp is not affected.

Here is how you correct the program.

1. GOTO CUE #58 and hit the RUBOUT key. Enter "AT,IL" to take the projector to black.
2. Use ADD-A-CUE at CUE #59. Since only the CENTER projectors on Screens 1 and 5 were involved, enter "PF,1 5 C".
3. At CUE #60 use ADD-A-CUE. Tell the LEFT and RIGHT projectors on all five screens to advance their slide trays by entering "PF,12345LR,S". The STOP is used to end this sequence.

Now you will want to save this completed program under a file name such as "XYZ-123".

NAME PROTECTING YOUR FILE

In order to protect against someone accidentally renaming your file, (which means you wouldn't see it on the library anymore, even though the program is actually there and safe) the EAGLE gives you the ability to NAME PROTECT your file. You would probably do this immediately after having WRITE PROTECTED your program.

In the CONTROL COMMAND FIELD, type in "NPR",ENTER.

> Note: If the PROGRAM NAME on the monitor is the same as the file you are NAME PROTECTING, the "NPR" by itself is all that is needed. If, however, the names are different you must enter "NPR (file name)".

CLEAR NAME PROTECT (CNP)

Used to remove the NAME PROTECT so a file name may be changed. In the CONTROL COMMAND FIELD type in "CNP (file name)",ENTER. The same program notes as for NAME PROTECT apply.

RENAMING YOUR FILE ON THE DISK (RNM)

While you have the LIBRARY display up, the producer walks over and says "Why don't you call that program you just did "XYZ1-BC" for me. I can remember XYZ Company, Day 1, before coffee break, and if you aren't here tomorrow I can have the other fellow run it for me."

Being too tired to argue, you agree. First you must CLEAR NAME PROTECT from the file, then RENAME it and finally NAME PROTECT the file again. It is quickly done.

1. Call up the LIBRARY display.
2. In the CONTROL COMMAND FIELD type in "CNP XYZ-123",ENTER.

3. Type in "RNM XYZ-123, XYZ1-BC", ENTER. Note the name on the LIBRARY display has changed.
4. Type in "NPR XYZ1-BC",ENTER.

PROGRAMMER'S NOTES:

1. To observe the effect of the RNM command it is necessary to have the LIBRARY displayed(LIB).
2. Always enter as follows:
   "RNM (OLD FILE NAME), (NEW FILE NAME)",ENTER.

(The comma is used to seperate the old from the new)

3. Whenever you load a renamed file, the PROGRAM NAME will be the same as originally saved. (Whenever "XYZ1-BC" is loaded, the PROGRAM NAME will remain "XYZ-123"). If you wish to insure both are the same then change the PROGRAM name and SAVE rather than just doing a RNM.

A QUICK WAY TO FIND OUT HOW MANY CUES YOU HAVE USED IN THE EAGLE MEMORY

Using the CUES command in the COMMAND CONTROL FIELD tells you how many cues are left in the memory, and you could subtract this from the CUES AVAILABLE to get the answer. A faster way is to use the GOTO command to a cue number you believe to be higher than what you have used(e.g., always use 9999).

1. GOTO CUE #9999, ENTER

The EAGLE tries to go to that cue, but stops automatically after the last cue used in the memory.

DISK-TO-DISK TRANSFER

The PINWHEEL program you have stored on your disk can be used to start an EFFECTS LIBRARY disk, one that could be useful in several shows. To transfer a file from one disk to another, do the following:

1. LOAD "PINWHEEL".
2. After the disk drive stops operating lift up the gate and remove the program disk.
3. Place a fresh disk in the disk drive.
4. Call the LIBRARY display.
5. Save "PINWHEEL", use WRITE PROTECT and NAME PROTECT.
6. Remove the disk and store in a safe place.

MASTER DISK FILES

Since it has been demonstrated to you how quickly and easily you can do disk-to-disk transfers you should now see a great advantage to keeping a backup disk, in case the one you were originally working on gets damaged or misplaced. Just as you should dump your EAGLE memory to disk anytime you have to leave the EAGLE, transfer any files you feel you need to your MASTER disk, which (a.) always is stored in a safe place and (b.) never leaves the house. This transfer can be done at the end of the work day, and someday it will save you a great deal of aggravation.

REMOVING PROGRAM FILES FROM A DISK (DELETE)

Once you are ready to delete some files, as during the day you have saved some interum programming that is no longer viable, the EAGLE allows you a fast way to do it, as you will see in the next part of the exercise.

First, call up the LIBRARY display. Note that of the 11 program files listed you decide you only really want to save five of them: "XYZ-1", "XYZ-2", "XYZ-3C", "XYZ1-BC" and "PINWHEEL". To delete the files, one at a time:

1. CLEAR NAME PROTECT, then CLEAR WRITE PROTECT from the file.
2. Type in "DEL (FILE name)", ENTER. When completed, the LIBRARY display shows the file deleted, since the name is gone.

CLOSING UP FILES STORED ON DISK TO REDUCE DUMP-TO-DISK TIME (PACK)

The SAVE operation which takes the program in the EAGLE memory and writes it on the disk must first search the disk to locate a contiguous storage area long enough to put the program in. After there are several programs stored, and files have been deleted several times, there are typically several gaps left on the disk. If necessary the Eagle will automatically "pack" these gaps back down, but this could take several minutes and might catch you at a very inconvenient time. To insure that this does not happen you can simply force the EAGLE to pack periodically when it would be convenient for you(e.g., during a coffee break).

In order to do the "PACK" operation, do the following:

1. CTRL/C, ENTER - (if you were not already in the CONTROL Command field).
2. Type in "PACK", ENTER - Disk drive activates, EAGLE COMMENT:
   "PLEASE WAIT, DISK PACKING IN PROCESS".
   When finished, the comment: "OPERATION COMPLETE".

Note that if you attempt to do a SAVE and, even after the EAGLE packs the disk, there still is not room to save your entire program then the EAGLE will report that the disk is full and refuse to save it for you(since to save the new program the EAGLE would have to write over an old one). To obtain enough space for the new program you can either delete one or more of the old programs or simply insert a different diskette with more space left.

REPEATING ONE CUE LINE (CTRL/R)

While the RP code allows a simple way to repeat cue sequences, there are times when you will only want to repeat one cue one or more times. Each time the CTRL/R keys are depressed, the cue line above will be repeated.

USE OF THE "REPEAT" KEY ON THE KEYBORAD

The REPEAT key is used in conjunction with other key (s) to save having to constantly keep hitting the keys. It "hits the keys" for you at an approximate 10 cues per second rate while you hold down the other keys.

1. CTRL/R/REPEAT - Used to repeat one cue line over and over.
2. Q/REPEAT - Allows you to scan the cues as they scroll up. Projectors follow normally (see MOF).
3. CTRL/Q/REPEAT - Allows you to see the cues as they reverse

through the program. Projectors would normally follow (see MOF).
4. CTRL/D/REPEAT - Used to delete cues from the EAGLE memory. As you will not see any cue numbers change you must watch that you do not delete cues you want in the program.

USING THE "WX" FEATURE AS A STOP WATCH

There are many places that you can use a stop watch, to measure the length of a music passage, length of a film clip, etc. But timing the beats of a fast piece of music? Well, not so good.

However, using the "WX" feature of the EAGLE you will be able to tell the time between EACH beat of the music as you perceive it.

What you are going to do is create another special program that you will be using over and over again. You can name this file "STOPWTCH" (no, that is not a typo, only 8 characters in a PROGRAM NAME, remember). Go ahead and clear all cues. Then do the following:

1. Type in "PROGRAM STOPWTCH", ENTER: TO PROGRAM NAME.
2. CTRL/P, ENTER: return cursor to Cue #1.
3. "N,G", ENTER: NO-OP, GO, CUE #1.
4. WX: WAIT X, CUE #2.
5. CTRL/R/REPEAT - "WX" cue repeated, (put in about 100).
6. "N,S", ENTER - (NO-OP, STOP, CUE #101).
7. CTRL/C: Cursor to COMMAND CONTROL FIELD.
8. Type in "SV", ENTER: Dump-to-disk.
9. Type in "WPR", ENTER: Write Protect File.
10. Type in "NPR", ENTER: Name Protect File.
11. CTRL/P, ENTER: Return to program.

Now, to use this "STOPWTCH" program, imagine a piece of music (or get the real thing if you want) and get set to go. Poise your finger over the CUE button, and as you hear the beat hit the CUE button. Do this as long as you want (up to 99 cues), then return to CUE #1. Use the "Q" key to step throuh the cues and each cue displayed represents the time between the beats of the music.

Besides the obvious use of doing this while programming, consider that you can actually review music before you ever see a slide, get the timing of the beats, then SAVE this information on the disk for use at a later time. Note that while you are striking the CUE key you are also generating SYNC pulses which you could be simultaneously recording for your SYNC track.

STOPPING LAMPS AT AN INTERMEDIATE LEVEL (FREEZE)

Under normal conditions the dissolve controls are commanded to change from one state (OFF or ON) to the other at a rate dictated by the program. Because computer-generated dissolves are actually created by many small incremental steps it is possible to stop the "stepping" at virtually anyplace in the "dissolve curve", regardless

of whether the projector lamp is going up or down. The EAGLE command for this is the FREEZE (FZ).

Once the FREEZE to a lamp is activated, the lamp is held at that intensity level until such time as it is told to do something. There are four ways the lamp can be affected:

1. Resume in the same direction and the same rate as it was going when told to FREEZE.
2. Resume in the same direction but at a different rate.
3. Begin going in the opposite direction at the same rate.
4. Begin going in the opposite direction at a different rate.

FIG. 3 - FREEZE DISSOLVE PROGRAM PLOT
(INTENSITY VS. TIME)

Referring to the figure above, your next exercise will cover the four possible conditions. Although only the SCREEN 1 LEFT projector is involved, any number of projectors could be doing the same or different FREEZE moves.

If any program is still in memory, first clear all cues. Then enter the following program:

CUE #	ENTRY	RESULT
1.	"16A,1L,"G", ENTER	Start 16 second fade UP. Starting at A.
2.	"W4", ENTER	WAIT 4 seconds.
3.	"FZ, 1L", ENTER	Lamp frozen B.
4.	"W3", ENTER	Hold intensity for 3 seconds.
5.	"FZ, 1L",ENTER	Removes freeze, lamp continues UP at SAME RATE, at C.
6.	"W4", ENTER	Wait 4 seconds.
7.	"FZ,1L", ENTER	Lamp frozen at D.

8.	"W3", ENTER	Hold intensity for 3 seconds.
9.	"2A", ENTER	Removes freeze, lamp continues UP at a NEW RATE (2 secs.) from point E.
10.	"W1", ENTER	Wait 1 Second.
11.	"FZ,1L", ENTER	Lamp frozen at F.
12.	"W4", ENTER	Hold intensity for 4 seconds.
13.	"2A,1L", ENTER	Remove freeze, lamp goes DOWN at the SAME 2 second rate from G.
14.	"W1", ENTER	Wait 1 second.
15.	"FZ,1L", ENTER	Lamp frozen at H.
16.	"W3", ENTER	Wait 3 seconds.
17.	"4A,1L", ENTER	Remove freeze, lamp goes UP at NEW RATE of 4 seconds from I to J.

The next thing to do is to watch the effect on the screen.

There are several rules to observe when using freezes, and once mastered will enable you to create some exotic effects.

1. Must use a dissolve ALT (8A,4A ect.) only when planning to do a freeze dissolve on that projector. If a projector is to have an advance program a projector forward at the complection of the sequence.

2. To freeze a projector or projectors at a point in their curve you must use "FZ" in the code column and specify the projectors by screen number and its L,C, or R designation.

3. To unfreeze a projector and allow it to continue to complete its dissolve at the rate it was programmed, simply program another freeze dissolve for that projector.

4. To change the rate of a dissolve and continue in the same direction, after any projector is frozen. Issue a dissolve ALT <u>without any screen or projector designated</u>, will remove the freeze from all projectors frozen at that time, and they will continue in the same direction, But at the new rate entered in.

FOR EXAMPLE, no lamp on screen 1 thru 4, screen 5 left is on,

program an 8 ALT on screen # 1 and 5L, with a GO, so left pojector on screen #1 is dissolving up, while screen 5L is dissolving down.Program a wait 3 second ENTER, then program a freeze (FZ) on screen 1 and 5L ENTER, Then NO OP STOP ENTER, REV Q and CUE, Now screen 1 and 5 left projector are frozen. The next command is to allow them to continue in the same direction as before but at a faster rate. So program a 1 SEC ALT (1A) ENTER. Screen 1L comes up to full brightness while scren 5L is completely down.

5. To change direction of a dissolve while not allowing it to go to full brightness, after any projector is frozen program a dissolve ALT with screen number and projector designation.

FOR EXAMPLE, 1 left is still on from before, program a 8 ALT on screen 1L with a "GO" ENTER, WAIT 2 ENTER, FZ 1L ENTER, NO OP STOP ENTER. Now program a 16 A on 1L projector dissolves up.

TO CAUSE ONLY ONE OF SEVERAL FROZEN PROJECTORS TO RESPOND

1. To FREEZE a projector, enter "FZ" and the SCREEN and the PROJECTOR designation of the one to respond.

If several projectors are in the process of fading up or down at the same time, to FREEZE projector 1L at some point enter "FZ,1L".

2. If several projectors are frozen along with the one you want to resume fading in the SAME DIRECTION at the SAME RATE as before it was frozen, enter "FZ" and the SCREEN and PROJECTOR designation of the one to respond.

> PROGRAMMER'S NOTE: In this instance the same commands are used to both FREEZE and UNFREEZE the projector(as in a latching mode).

Assuming projector 1L in the example above was fading UP at 4 second rate prior to being frozen, entering "FZ,1L" will cause it to resume in the same direction at the same rate.

3. If several projectors are frozen and you want only one of them to resume fading in the SAME DIRECTION but at a NEW RATE you will need to use 3 CUES:

1. "32A, SCREEN, PROJECTOR", ENTER.
2. "FZ, SCREEN, PROJECTOR", ENTER.
3. "NEW RATE, SCREEN, PROJECTOR", ENTER.

What occurs is the projector to respond is first told to go in the OPPOSITE DIRECTION at a 32 second rate. Then .1 or .05 seconds later, depending on the speed the EAGLE is running, its lamp is frozen again (the intensity, for all practical purposes, has not changed). A .1 (or .05) second later the lamp is AGAIN told to go in the OPPOSITE DIRECTION (now the same direction as it was originally going) at the

NEW RATE.

From the first example, projector 1L was going UP at a 4 second rate before being frozen. The following cues will cause the lamp to continue in the SAME DIRECTION (up) but at a NEW RATE:

1. "32A, 1L", ENTER.
2. "FZ, 1L", ENTER.
3. "8A, 1L", ENTER.

PROGRAMMER'S NOTE: If the cue-to-cue time is so critical that the .2 seconds at 10 cues per second (or .1 seconds at 20 cues per second) that are required to set up this move will affect your program, the first two cues may be done at any time convenient after the projector lamp is frozen, typically during a WAIT time. Remember to reduce the WAIT TIME by the total cue-to-cue time of the two cues, or program in 20 cues per second.

4. If several projectors are frozen and you want only one to resume fading in the OPPOSITE DIRECTION and at the SAME RATE as when it was frozen then use the new alternate rate desired and the appropriate SCREEN and PROJECTOR designation.

Following our example, projector 1L was going UP at an 8 second RATE before it was frozen at some point. To cause it to go DOWN at an 8 second RATE, enter "8A,1L" .

5. If several projectors are frozen and you want only one to resume fading in the OPPOSITE DIRECTION but at a NEW RATE, enter the NEW RATE as well as the SCREEN and PROJECTOR designation.

Back to our example, projector 1L was going down at an 8 second rate before being frozen. To cause it to go UP at a 2 second rate, enter "2A,1L".

INTENSITY CONTROLLED ALTERNATE (USING FAST ALT)

Since the introduction of the AVL SHOW PRO V Version B, the MARQUEE EFFECT, as the Intensity Controlled Alternate has become known, has been used extensively by programmers.

The effect is that of a lamp starting from either its full ON or OFF condition, going the opposite direction at the rate you select, and alternating rapidly between its starting intensity and the position the intensity has reached on the dissolve curve as a function of time.

The diagram below graphically shows this effect on a lamp, the starting intensity being OFF (glow level).

SEE CHART ON PAGE 5-63 OF HANDWRITTEN MANUAL.

Many times three projectors focused on a common screen area are used, the slides in one projector having a bar, for instance, of one color, the next projector in the sequence having on its slide a bar in a different position of a second color, and the slide in the third projector having a bar of a third color in a different place than the other two.

To program this effect on the EAGLE, enter the following (all lamps OFF):

CUE #	CODE	SCREENS	EFFECT
1	8D	1,LCR,GO	All lamps start up, Screen 1
2	FA	1,LCR	All lamps shut off before they become visible.
3	FA	1,L	LEFT lamp ON
4	FA	1,LC,GO	LEFT OFF, CENTER ON
5	FA	1,CR	CENTER OFF, RIGHT ON
6	FA	1,LR	RIGHT OFF, LEFT ON
7	RP0		
8	N	STOP	

You recall that the REPEAT 0 programmed on cue #7 will cause the program to repeat the sequence between it and the previous GO until the next time you hit the CUE button. After you determine how many times you want to repeat the sequence, change CUE #7 to the appropriate RP command.

Now that you have programmed the Marque effect going up, let's program the same effect going down. It is best to stop the Marque for a moment and then program the Marque going down. In the event that you

wish to program without the stop, the following program may be used:

PROGRAM NAME: DEMO 1 OPERATOR:

CUE#	CODE	STATEMENT	SCREENS	RUN
1	S20	SPEED=20 CPS		GO
2	8D	8 SEC DIS	1 3 5	LCR
3	FA	FAST ALT	1 3 5	LCR
4	FA	FAST ALT	1 3 5	GO
5	FA	FAST ALT	1 3 5	
6	RP62	REPEAT 62 TIMES		
7	AT	ALT	1 3 5	GO
8	AT	ALT	1 3 5	
9	RP10	REPEAT 10 TIMES		
10	AT	ALT	1 3 5	GO
11	W.05	WAIT 0.05 SEC		
12	RP10	REPEAT 10 TIMES		
13	8A	8 SEC ALT	1 3 5	R
14	FA	FAST ALT	1 3 5	L R
15	8A	8 SEC ALT	1 3 5	L
16	FA	FAST ALT	1 3 5	LCR
17	8A	8 SEC ALT	1 3 5	C
18	FA	FAST ALT	1 3 5	LC
19	FA	FAST ALT	1 3 5	GO
20	FA	FAST ALT	1 3 5	
21	RP68	REPEAT 68 TIMES		
22	FA	FAST ALT	1 3 5	C

By the way, to calculate the number of times to repeat the sequence, multiply the cue to cue time, which is either 20 cps or 10 cps, By the time of the dissolve and subtract the cues needed to set up and divide by the cues to complete the first sequence of the repaet. Two things should be brought up at this time. When dissolving from or to black the time to complete the fade is shorter than the dissolve rate. To find the exact time of the fade use a stop watch, or use the Eagle as a stop watch. First program the 8 ALT on sccreen #1 from black with a go ENTER, the WAIT X ENTER REV Q. Now cue the Eagle and watch the ready lite on the QD and be ready to cue the Eagle again when the ready lite comes on. Now you have the exact time displayed on WAIT X which is 6.4 seconds. Let's apply it to the example below:

```
    20      CUES PER SECOND
x   6.4     SECONDS ON AN 8 SECOND ALT FROM BLACK
  128.0     CUES NEEDED FOR TIME OF THE DISSOLVE
-   4       CUES NEEDED FOR SET UP
  124       CUES NEEDED FOR THE REPEAT
    2       DIVIDE THE NUMBER OF CUES USED IN THE REPEAT
   62       ACTUAL NUMBER OF REPEATS NEEDED
```

PROGRAMMING FOR 2 PROJECTORS PER SCREEN AREA

The rules you have been shown so far all directly relate to the 2 projectors per screen sequencing as well as 3 projectors, with two exceptions:

1. The normal sequencing will be L-R-L, (as opposed to L-C-R-L in the 3-projector format).

2. The time required between an action cue to the same dissolve control that previously had an action cue sent to it must be longer for 2 projectors, as indicated in TABLE 3-1.

SETTING UP THE SYSTEM FOR TWO PROJECTORS PER SCREEN AREA

If you are presently setup for 5-Screens, 3 projectors per screen then you must re-initialize the system. To do this, press the "RESET" button on the front panel of the CPU. The screen on the monitor will blink, ask you to wait for the PROCALL load, then the "HELLO" message comes on.

Enter your name or just hit the "ENTER" key. Enter the number of Screens desired. On the question about "2 or 3 projectors" enter a "2". Name the show, hit the ENTER key and the PROGRAM display appears, except in the STATUS area note that only "L" and "R" appear.

Make sure the "SEQUENCE" switch on the playback units are set to "2". Now enter the following:

CUE#	ENTRY	RESULT
1	"AT,12345,G",ENTER	All LEFT lamps ON.
2	"RP0",ENTER	Press the REVERSE CUE key, then press the CUE button. Note that the "L" and "R" alternate ON and OFF every 0.1 seconds until you hit the CUE button to stop it.

Note that if you are using 3 projector dissolves but "NORMALLY" only sequencing between 2 of them you can still access the center projector independantly. This can be useful if you are using one of the projectors (center) primarily for backdrops and using the other 2 projectors for higher speed action superimposed on the background. Although C (center) is not shown on the status display, if you ask for the center projector (e.g. AT 1,2,3,4,5,C) then the status "light" in the center position will come on.

USING A "KLUNK" PROJECTOR ALONG WITH 2 PROJECTORS PER SCREEN AREA USING THE AUXILIARY (AX)

You may have useable shows where you only had the capability of two projectors in dissolve, such as the AVL MARK IV units, and for a third projector used one that had its lamp always ON, used blanks in the trays to "black out" its light, and controlled it by directly accessing the "FORWARD" pins at the jack on the projector.

You may do the same thing by programming an "AX" command with just the SCREEN number when using QD2's or PD2's, as there is only one auxilliary output on these units. However, if using a QD3 there are two outputs available, "AUX L" and "AUX R". When using a QD3 with one or two "klunk" projectors, in addition to entering the SCREEN number, also enter the independant "L" or "R" you wish to access. The appropriate AUX jack is where you will put your 5-pin control cable, the other end goes to the projector. Each time the EAGLE outputs an "AX" command, it will cause a momentary dry-contact closure which will advance or "klunk" the slide tray one slot forward on the specified screen.

PROGRAMMER'S NOTE: Since the "AX" command only provides a momentary closure, there is no memory of the status of the device the auxiliary channel is controlling. During rehearsal, if you are backing up into the program you must MANUALLY move the trays back to the correct position on klunk pojectors.

PROGRAMMING FOR 10 SCREENS

Now you know all there is in the world to know about programming a 5-Screen show. Right? The next logical step is to work on a 10-Screen program, for which the EAGLE eagerly awaits your bidding.

Actually, a straight 10-Screen format with 3 projectors per screen area is not much more difficult than programming 5 screens. All the rules, commands and techniques you have learned up to this point apply 100%.

SELECTING A 10-SCREEN FORMAT

In order to call up the FORMAT display, you must re-initialize the system by pressing the "RESET" push button on the front panel of the CPU unit. There is a blink on the screen, you await PROCALL to load. Then the "HELLO" message appears. Type in your name and ENTER, which automatically brings up the number of screens question.

This time enter "10" for number of Screens and enter 3 projectors per screen. Type in "10SCRN" for the program name. Then hit the ENTER key, and the PROGRAM display comes up.

Look at the STATUS area of the display and note that in adition to the 5-screen format you have been working with up to this point, an identical group appears below it, making a total of 30 projectors. These represent Screens 6 through 10.

PROGRAMMER'S NOTE: If 2 projectors per screen area had been selected instead, as with the first group in the STATUS display area

there are no CENTER projectors shown in the second group. In this configuration there is a maximum of 20 projectors (although you can still access the center projectors if you have 3 projector dissolves).

SETTING UP THE EQUIPMENT FOR 10 SCREENS

Presently you have the fist 5 screens (1-5) connected to the "OUT 1" jack on the rear panel of the CPU. The "OUT 2" jack is used in like manner for Screens 6 through 10. Connect the QD3 for Screen 6 to this output, and daisy-chain the rest of the QD's as you did for the ones for Screens 1-5.

When using a Show Pro V for the playback unit the SCREEN SELECTION is automatic. However with the QD or PD units you must set the SCREEN SELECT switches to the appropriate number.

Set the SCREEN SELECT switch on SCREEN 6 QD to "1", SCREEN 7 QD switch to "2", and so on.

PROGRAMMER'S NOTE: The EAGLE internally converts the data stream at the "OUT 2" jack so that when it sees "SCREEN 6" it automatically ships the commands to that screen via the "OUT 2" jack with a SCREEN 1 address. Similar conversions occur for screens 7 through 10.

PROGRAMMING EXERCISE FOR 10 SCREENS

To get used to this format try this simple program.

CUE #	ENTRY	RESULT
1	"AT,1,6"ENTER	LEFT lamps ON, SCRNS 1 and 6.
2	"AT,2,7"ENTER	LEFT lamps ON, SCRNS 2 and 7.
3	"AT,3,8"ENTER	LEFT lamps ON, SCRNS 3 and 8.
4	"AT,4,9"ENTER	LEFT lamps ON, SCRNS 4 and 9.
5	"AT,5,0"ENTER	LEFT lamps ON, SCRNS 5 and 10.

PROGRAMMERS NOTE: For entries for SCREEN "10", use the "0" only from either the numerics row on the main keyboard or the numeric keypad.

Now all LEFT lamps are ON. Continue as follows:

CUE #	ENTRY	RESULT
6	"AT 1,2,3,4,5,6,7,8,9,0",ENTER	All LEFT lamps OFF, all CENTER lamps ON.
7	"AT,1-0",ENTER	CENTER lamps OFF, RIGHT lamps ON.
8	"AT,1-0",ENTER	RIGHT lamps OFF, LEFT lamps ON.
9	"AT,1-0,C,R",ENTER	ALL lamps ON.
10	"AT,1-0,L,C,R",ENTER	ALL lamps OFF.

The preceeding 10 cue exercise demonstrates that Screens 6 through 10 respond in the same manner as Screens 1 through 5.

The next set of cues is more of a show on the STATUS display area of the CRT than on the projection screen, but does demonstrate a "WALKING" pattern of visuals you might experiment with sometime.

CUE #	ENTRY
11	"AT,1",ENTER
12	"AT,1,2",ENTER
13	"AT,1,2,3",ENTER
14	"AT,1,2,3,4",ENTER
15	"AT,1,2,3,4,5",ENTER
16	"AT,1,2,3,4,5,6",ENTER
17	"AT,1,2,3,4,5,6,7",ENTER
18	"AT,1,2,3,4,5,6,7,8",ENTER
19	"AT,1,2,3,4,5,6,7,8,9",ENTER
20	"AT,1,2,3,4,5,6,7,8,9,0,GO",ENTER
21	RP0
22	CTRL/G,"11",ENTER (GOTO CUE # 11)
11	ENTER (cursor to SCREENS column),"G", ENTER

Now, hit the CUE button. At 10 cues per second you first see the lamps come on, then sequence "L-C-R-L", each screen offset from the screens on either side. When all 10 screens are involved, the sequence will repeat until you hit the CUE button.

Save this on disk if you want to. If you wish you can also NAME PROTECT and WRITE PROTECT the program.

ADVANCED PROGRAMMING : CONTRA-ROTATING PINWHEELS

Now that you have shown your producer how clever you are at programming for 10 Screens, he has this brilliant flash about using the "PINWHEEL" program you did in the section on 5 screens, except, naturally its "slightly" different.

He wants 6 projectors per screen area, and standard 5-Screen format as before. Now he wants two slides to come up at the same time, some to appear in the upper part of Screen 1 and rotate clockwise, while the other slide appears in the bottom of Screen 1 and rotates counter-clockwise.

Now, while all of this is going on, he wants some dissolves to take place from time to time on Screens 2, 3 and 4. How do you like it so far?

Actually, the problem really needs to be broken down into two sections. First, get the pinwheel effect working and store it on disk. Enter the following program, named "R/L PNWL".

PROGRAM NAME: R/L PNWL OPERATOR: YOUR NAME

CUE#	CODE	STATEMENT	SCREENS	RUN
1	S20	SPEED=20 CPS		GO
2	4A	4 SEC ALT	1 L	
3	4A	4 SEC ALT	6 R	
4	W4	WAIT 4.0 SEC		
5	FA	FAST ALT	12 L	GO
6	FA	FAST ALT	67 R	
7	FA	FAST ALT	23 L	
8	FA	FAST ALT	78 R	
9	FA	FAST ALT	34 L	
10	FA	FAST ALT	89 R	
11	FA	FAST ALT	45 L	
12	FA	FAST ALT	90 R	
13	FA	FAST ALT	5	
14	FA	FAST ALT	0 CR	
15	FA	FAST ALT	5	
16	FA	FAST ALT	0 LC	
17	FA	FAST ALT	45 R	
18	FA	FAST ALT	90 L	
19	FA	FAST ALT	34 R	
20	FA	FAST ALT	89 L	
21	FA	FAST ALT	23 R	
22	FA	FAST ALT	78 L	
23	FA	FAST ALT	12 R	
24	FA	FAST ALT	67 L	
25	FA	FAST ALT	1 CR	
26	FA	FAST ALT	6	
27	FA	FAST ALT	1 LC	
28	FA	FAST ALT	6	
29	RPO	REPEAT 0 TIMES		

Now REV CUE ( ) twice, hit the CUE key, and enjoy the show. The program will slowly bring up two projectors (1L and 6R) and then begin rotating the lamps in opposite directions on each bank. It will continue the rotation until you strike the cue key again. Finish up the sequence by striking the cue key and then save the program as "PNWL".

INTERLEAVING MOVES WITH A REPETITIVE SCREEN SEQUENCE

The producer, estatic over the results so far now wants the sequence to go 5 times, then on the next time around start a 2 SECOND fade up on Screen 3, when it is finished, a 2 SECOND dissolve on Screens 2,3 and 4. All the while the pinwheel effect is to continue.

The rotating sequence consists of 24 "real" cues (REPEATS take "0" cue time) and is running at 20 cues per second. Thus the sequence takes 1.2 seconds per pass. To accomplish what the producer is requesting you can:

1. Change cue 29 to a RP4.
2. ENTER a "2D 3C" cue at cue #30.
3. Do a CNTRL/C and then "AP PNWL" to append another pinwheel sequence.
4. CNTRL/G 9999 to get to the last cue.
5. REV CUE (CNTRL/Q) and change the RP0 to RP1 to get two passes which will allow 2.4 seconds for the 2 sec dissolve to come up.
6. Enter "2D 234 8C" as the next cue.
7. CNTRL/C and then "AP PNWL" to append another pinwheel sequence.
8. CNTRL/G 9999 to get to the new last cue.
9. REV CUE (CNTRL/Q) and change the RP0 to an RP2 to allow 3 passes (3.6 seconds) of foreground looping while the 2 second background dissolves are going on. Note that this timing would allow for the projector advances on projector 3C and thus you could begin another dissolve/rotation sequence if you so desire.

Now do a CNTRL/G ENTER to get back to CUE #1 and bring all the projectors HOME. Hit the cue button, sit back and enjoy the show. Naturally, the producer thinks its perfect just the way it is. So save it on the disk under a new file name (e.g. DPNWL for dissolve with pinwheel). Later this show segment can be easily combined with other segments to produce the complete show.

NOTES ON EAGLE COMMENTS

INCOMPATIBLE FORMATS

When you select either "5" or "10" Screens on the format display, and then you try to bring in from the disk a program with the format you did not select, it WILL NOT LOAD, and the EAGLE COMMENT is: "SCREEN FORMAT IS NOT COMPATIBLE". To load the file you should RESET the EAGLE and enter the appropriate response to the number of screens question.

APPENDING CUES THAT EXCEED EAGLE MEMORY

If you try to APPEND a file from the disk, and the total number of cues it contains is in excess of the CUES REMAINING, the excess cues are not retained, and the EAGLE COMMENT is : "END OF CUE SPACE. CUES DISCARDED". You can use the digital recording technique described in Section 4 to link the two files together or order another Memory board for your system.

INSERTING A FILE THAT WOULD EXCEED CUE CAPACITY

If you try to INSERT a file from disk somewhere in the program

you have in the EAGLE memory, and the total number of cues in that file exceed the CUES REMAINING, the EAGLE will not change the original program and will not insert the file, therefore none of your cues are lost. EAGLE COMMENT is : "NOT ENOUGH CUE SPACE IS AVAILABLE". You can either combine files using the digital recording technique or order an additional EAGLE Memory module.

TRYING TO SAVE A PROGRAM LARGER THAN REMAINING DISK STORAGE

If you attempt to SAVE a program which contains more cues than the disk has as contiguous space, the disk will automatically do a PACK. After packing one of the following will occur.

1. If sufficient storage is now available, the program is automatically stored and the EAGLE COMMENT is : "OPERATION COMPLETE".
2. If there is still not enough storage available, none of the program cues are stored, and the EAGLE COMMENT is : "NOT ENOUGH DISK SPACE IS AVAILABLE".

In order to save the program, remove the full disk and replace with another, and reissue the SAVE command.

TRYING TO NEST MORE THAN 10 "REPEAT" CUES

The EAGLE will not let you do more than ten "RP " cue lines that are nested (i.e., all referencing the same "GO"). Note that a single cue, e.g. ALT 1,2,3,4,5, GO, running at 10 cues per second, would take one second to be repeated 9 times. If on the next cue you repeated the repeat 9 times the total sequence would take 10 seconds. If you kept adding "RP9" cues until you have 10 in a row, plan on a long coffee break, it will take more than 30 YEARS to finish the sequence. EAGLE COMMENT is: "MORE THAN 10 NESTED REPEAT LEVELS".

TRYING TO "RENAME" A FILE WITH A FILE NAME ALREADY ON THE DISK

If you attempt to RENAME a file to a File Name that already exists on the diskette, nothing is changed. EAGLE COMMENT is "FILE NAME ALREADY EXISTS". You will have to choose a different name for your new file or first rename the old file to some other name.

EXCEEDING THE NUMBER OF FILE NAMES THAT MAY BE STORED ON A DISK

Each disk you use has a "File Name Directory" associated with it.

The maximum number of "File Names" may not exceed 144 in a File Directory. If you try to SAVE a program that exceeds this limit, the program will stay the same in the EAGLE memory, but nothing will be saved on the disk, regardless of whether there is storage room on the disk or not. EAGLE COMMENT is : "DISK DIRECTORY FULL". You must either delete one of your old files from the disk or else replace the diskette.

SYSTEM STATUS WHILE JUMPING AROUND IN THE PROGRAM

When you use the "GOTO" command to get to a different location in the program you are doing, it takes the system some time to move the projector trays from the Cue line you left to the Cue line specified in the "GOTO" command. No other entry from the keyboard will be accepted until the EAGLE has finished the task of outputting data to the dissolve controls so the trays and lamps are correct. EAGLE COMMENT is: "STANDBY TO OUTPUT NECESSARY CUES".

TRYING TO SAVE A "PROGRAM" WHEN THERE ARE NO CUES

If you attempt to do a SAVE when there are no cues in the EAGLE memory (i.e. do a CLEAR ALL CUES, then SAVE), the EAGLE COMMENT is : "NO CUES TO SAVE".

CHANGING THE NAME OF THE PERSON PROGRAMMING

If you are working on a program that has another person's name already on it and you want to change it to yours, go to CONTROL COMMAND field and type in "I AM (up to 25 characters)", then ENTER.

IN CASE OF DIFFICULTY

If you experience trouble of some kind while programming the visual portion of the show, as covered in this section, do the following :

1. Check to see if there is an EAGLE COMMENT. Many of these comments have been discussed in this section, and these and more are covered in an "EAGLE COMMENTS LISTING" found in the "IN CASE OF TROUBLE" Section. If there is a comment on the display that you do not understand, it is advisable to do nothing more with the system until you read the appropriate description in this manual.

2. Check to see if you are in a special mode, such as "RECORD OFF", etc.

3. Check that all units of the system are properly connected and any switches are correctly set.

SECTION 4

MARRYING THE PROGRAM TO THE SOUNDTRACK

Now that you have finished programming and have the show in the EAGLE memory, you need to match it up to the often neglected half of A-V, the audio soundtrack.

Up to this point, to synchronize the program to the soundtrack, YOU have been hitting the CUE button at the appropriate time. However, for consistent presentations everytime, you need to make the audio tape "hit the CUE button" for you.

METHODS AVAILABLE TO SYNCHRONIZE THE PROGRAM TO THE SOUND TRACK

Using another track on the audio tape other than the audio channel(s), with the EAGLE you may encode (record) as well as decode (playback) synchronizing data in one of two forms :

1. 1000 Hertz Tone - This is a 1/4 second long synchronizing pulse. It is output from the EAGLE every time either the cue or the REM CUE button is pushed. When decoded from the tape it will activate the program in the EAGLE memory the same way as when you hit the CUE button.

2. Digital Data - Used in those cases where you do not wish to use memory for playback. It allows the show to be played "directly" from tape either without the use of a programmer (e.g. QD3's) or with a programmer in MT Bypass (e.g. SPV). Since this technique does not require memory during playback, show segments can be combined which together can be of any length. Thus this technique can be used in situations where you have very large programs (e.g. over 10,000 cues).

This digital track is encoded using the memory stored in the EAGLE, outputting cues at the same time the programmer is causing some function to occur on any combination of the dissolve controls connected to the EAGLE. This data is recorded on the tape in real time. The data is SPVB compatible thus a REPEAT or "RP " cue is not encoded. If the cues to be performed are repeated 3 times the digital data encoded will appear 4 times on the tape, the first time plus the 3 repeats.

EQUIPMENT SETUP TO RECORD 1000 Hz. SYNC PULSES

Using one of the non-audio tracks on your show tape connect that track's "LINE IN" jack to the "SYNC OUT" jack on the back panel of the CPU, using a shielded audio cable with an RCA phono plug on the EAGLE end and your tape decks mating connector on the other end. In a

similar manner, connect another audio cable between the tape deck track's "LINE LEVEL OUT" and the "SYNC IN" jack on the CPU.

SETTING THE SYNC LEVEL (STL)

After loading in your show from the disk to the EAGLE memory, go to the CONTROL COMMAND field, type in "STL",ENTER.

The EAGLE COMMENT is : "ADJUST RECORDING LEVELS". Use the tape deck's INPUT LEVEL control, and increase the level until the VU meter reads approximately "+1".

NOTE : The needle will appear to waver, as the test tone consists of continuous 1/4 second bursts.

RECORDING A TEST TONE

In order to make certain you have the proper level when playing back, record the SET LEVEL tone on a 15-30 second section of tape, probably the same length of tape you have recorded the audio tracks level set test tones. This test secton can be placed at the head end of the show tape separated by a length of leader.

To terminate the SET LEVEL mode, hit the "ESC" (ESCAPE) key.

Play the test tone back into the EAGLE. Note that the correctly received tone shows "SYN" on the MODE line of the display.

RECORDING THE SYNC PULSE TO THE PROGRAM

Perhaps you have noticed that every time you hit the CUE button or activated the REMOTE CUE IN jack, "SYN" appears momentarily on the MODE line of the display. This indicates the tone is sent out via the "SYNC OUT" jack.

In order to have the sync pulse cause the action to occur at the same moment as you hear the tape, you must use a tape deck that allows you to hear the soundtrack through the RECORD HEAD while you are recording the sync tone.

Now, return to CUE # 1, and, starting the tape deck, hit the CUE button each time you want to start a move. In a hi-speed run you only need to press the CUE button to start the sequence, the computer-generated waits will take care of the timing inside the run.

PROGRAMMER'S NOTE: Since the EAGLE has a crystal-controlled clock, the computer generated waits are extremely accurate. It is therefore recommended not to have a hi-speed run go for more than 30 seconds before using another SYNC pulse to insure that if the tape deck is for some reason running off-speed, the visuals will not get out of sync.

PLAYING A SHOW FROM SYNC PULSES

Use the following checklist :

1. Use a shielded audio cable (typically RCA phono plug to phono plug) between the appropriate "LINE OUT" jack on the tape deck and the "SYNC IN" jack on the rear panel of the CPU.

2. Using the test tone on the tape, set the output level of the tape deck to a nominal "0 VU" reading (+/-2 VU). Note "SYN" on the MODE line of the display.

3. Insure all trays are at their HOME position, and the program loaded from the disk is at CUE # 1.

4. Start the show tape.

EDITING A SYNC PULSE ON THE SHOW TAPE

After reviewing the show, you may have to make one of two types of changes :

1. Pulse Too Early : Use ADD-A-CUE, and insert a WAIT time to correct the timing.

> PROGRAMMER'S NOTE : Insure that the new program is SAVED on the disk.

2. Pulse Too Late : re-record the sync pulse earlier.

> PROGRAMMER'S NOTE : If a sync pulse is left on the tape when one is placed ahead of it, it is not necessary to erase it if the pulse occurs during a hi-speed run. This is because the EAGLE ignores "extra" sync pulses during a high speed run.

DIGITAL MAG TAPE SIGNALS

The EAGLE has the following capabilities in this mode :

1. Encode digital data for up to 10-Screen, 30 projector shows.

2. Decode digital signals into the EAGLE and output a regenerated signal to produce another original quality tape one tract at a time.

3. Decode a digital signal from mag tape, store in the EAGLE memory, allowing a show programmed on any of the other AVL digital programmers

to be stored on disk. Note this is only possible with one track shows (e.g. 15 projectors or less).

EQUIPMENT SET-UP (5-SCREENS)

Assuming you have the SYNC track "hitting" the CUE button for you, to record the digital data on the fourth track do the following :

1. Connect a shielded audio cable between the tape recorder LINE LEVEL IN on the fourth track and the "OUT 1" jack on the rear panel of the CPU.

PROGRAMMER'S NOTE : As the "OUT 1" jack also feeds the signals to the playback dissolve controls, you must use a "Y" connector to feed both paths.

2. Connect a shielded audio cable between the tape deck "LINE LEVEL OUT" on the fourth track and the "PLAY" jack on the rear panel of the CPU.

PROGRAMMER'S NOTE : Due to the fact that the REGENERATOR can pick up very low level signals through the PLAY jack and sends them back out at full strength through the OUT 1 jack, there can be enough bleed-through on certain tape decks that incorrect data may be received. It is therefore suggested that the tape deck be disconnected from the PLAY jack while recording.
Due to this situation the next version of the disk will shut off the regenerator when using the "MIF" command.

RECORDING A DIGITAL TEST SIGNAL (STL)

In the same fashion as before, the "STL" command is used to record a test level. Do the following :

1. In the CONTROL COMMAND field, type in "STL", ENTER.

2. Adjust the LINE LEVEL IN control on the tape deck until the VU meter reads "+1".

3. On the test leader section discussed before record the digital test signal.

4. To terminate the test tone, hit the "ESC" (ESCAPE) key.

5. Play the signal back through the "PLAY" jack on the EAGLE. Set the playback level on the tape deck for "0VU". Note that the word

"AMP" appears on the MODE line of the display, letting you know the EAGLE has approved the first test of the signal, correct amplitude level.

RECORDING THE SHOW

Once again you must make certain the SYNC track signal is read by the RECORD HEAD so the signals will be on the same place on the tape.

PROGRAMMER'S NOTE : Remember, remove the input to the PLAY jack at this time.

Now, start the tape, and every sync pulse will produce the digital code exactly as the memory dictates.

PLAYBACK OF THE SHOW PRO WITH DIGITAL SIGNALS (EAGLE 5-SCREEN, SHOW PRO V etc.)

Although this is a continuation of the previous section, it applies directly for playing shows that were produced on SHOW PRO V and other AVL programmers.

Now that the show is in sync with the soundtrack with all the cues carried on the digital track, do the following :

1. Make sure the projectors are at their HOME positions.

2. Since the program has been saved on disk, Clear All Cues. The program comming back in off the mag tape has its cues in real time, WAIT times have been split into SPVB compatible waits and there are no "REPEAT" cues (instead the cue is repetitively on the tape at the correct positions).

3. Insure the "LINE LEVEL OUT" of the track of the tape deck that the digital signals were recorded on is cojnnected with a shielded audio cable to the "PLAY" jack on the rear panel of the EAGLE CPU.

4. If you want to disconnect the dissolve controls while checking the incoming signals, go to the CONTROL COMMAND field and type in "MOF". The MODE line displays "RECORD OFF" (no output).

5. Start the tape. Again, the "AMP" is displayed whenever the digital signal is seen and passes that test. In addition, there are mag tape quality messages that are displayed for each cue, in the same fashion as the red, yellow and green LED's on other AVL units :

"MT GOOD" : Perfect signal set. Cue executed.

"MT POOR" : Less than perfect, however at least one pass is acceptable, and the cue is executed.
"MT BAD" (CUE #) : Signal is of such poor quality (CRC unacceptable) that the cue is NOT executed. The bad cue number is also displayed.

PROGRAMMER'S NOTE : If the "MT BAD" cue cannot be corrected by increasing the LINE LEVEL out control, that cue must be re-recorded on the mag tape.

6. Rewind the tape to the head of the show. Go to the CONTROL COMMAND field and type in "MON",ENTER. The "RECORD OFF" display will be gone, and the "OUT 1" jack again will send cues to the dissolve controls.

MAKING EACH TAPE DUPE A DIGITAL TRACK "MASTER" WITH THE REGENERATOR

Many times you will have the show "master" tape recorded at the highest speed your system allows for best fidelity. Record the digital track on the master tape.

Now, using two tape decks, connect the audio tracks between the appropriate channels on the decks, and connect the master digital track output to the "PLAY" jack on the rear of the EAGLE CPU. then connect the "OUT 1" jack to the LINE IN jack on the track assigned on the dupe recorder. all channels on the playback deck should be used in the normal mode (all signals read through the playback head).

Start both decks. The signal sent to the EAGLE is regenerated immediately and is placed on the dupe tape as an original digital signal.

RECORDING A 10-SCREEN SHOW

Although the EAGLE can only accept a 5-Screen show into the "PLAY" jack, you can record a 10-Screen show digital signals using the "OUT 1" and "OUT 2" jacks on the rear of the CPU, and two tracks on the show mag tape.

Use the same procedures as discussed under "RECORDING A SHOW" for the 5-Screen show, record the show.

PLAYING BACK A 10-SCREEN SHOW

The outputs of the tape deck for the digital tracks should be connected as follows :

1. Using a shielded audio cable, connect the track for Screens 1-5 to the "PLAY" jack on the AVL playback dissolve controls. On QD's and PD's, set the appropriate SCREEN SELECT switches.

2. Using another shielded cable connect the track for Screens 6-10 to the "PLAY" jack on the AVL playback dissolve controls. On QD's and PD's, set the SCREEN SELECT switch for screen 6 to "1", screen 7 to "2", etc.

3. The operation is now identical to the playback for a 5-Screen show.

USING THE "MAG TAPE INPUT OFF" CONTROL COMMANDS (MIF,MIN)

In the 5-Screen format with mag tape digital signal coming into the "PLAY" jack, in order NOT to affect the EAGLE memory or status, go to the CONTROL COMMAND field and type in "MIF",ENTER. The display on the MODE line will show "PLAY OFF". Presently, although the memory is disconnected, the REGENERATOR is still active. it is necessary to also use the "MOF" command to shut that OFF.

To reconnect the memory and status to the "PLAY" jack, use the "MIN" command. To reconnect the outputs, use the "MON" command.

SHOWING MIXED PRESENTATIONS (MTB,MTN)

There are many instances where you will want a mixture of pre-recorded material ("canned" sections) and "line" sections from memory, activated by a CUE button. As with the SHOW PRO V, the EAGLE allows this, : known as the MAG TAPE BYPASS command.

1. Load the EAGLE memory with the cues that will be executed during the "Live" part of the presentation from the disk.

2. In the CONTROL COMMAND field type in "MTB",ENTER. The display on the MODE line shows : "---------". Return to CUE # 1.

3. The digital track on the tape deck is connected with a shielded audio cable to the "PLAY" jack.

4. In use, when the show is run through the tape deck, the lamp and tray status of the projectors is maintained by the EAGLE, however the memory is not affected, and stays at the same cue number.

At the end of a "canned" section, turn OFF the tape deck. A "live" section is run by the speaker with a switch connected to the REMOTE CUE IN jack, or by you following a cued script with the CUE button.

5. The above switching back and forth may take place as you wish. At the end of a presentation, use the "GOTO 0" cue to home all projectors and the memory.

6. To get out of the Mag Tape Bypass mode, in the CONTROL COMMND field type in "MTN",ENTER. ("MTN" stands for Mag Tape Normal).

SECTION 5

IN CASE OF TROUBLE

There are those times when you may experience difficulty in either programming or running the show. Here are some things to check.

1. Operator Error - The most common source of problems. Either the equipment has not been interconnected properly, a switch is not set to the proper position, or a procedure not followed properly. Take your time to insure all the above have been checked out.

2. A-C Power Problems - A poor safety ground can cause problems. Use your tester to verify correct connections.
Even newly wired outlets should be checked since many times the power is not wired correctly.

Another source of problems can be caused by ground loops between equipments, exhilisted by malfunctions on the screen and a hum in the sound system. The safety ground is theoretically a virtual zero impedance to all powered devices at the power distribution system, however there are instances where this is not the case, even though there is a safety ground wire at the outlet. If the sound system is some distance from the program equipment, perhaps it is on a different part of the house power distribution system, and the impedance is not low enough, so the ground-loop is established.

Occassionally, a piece of equipment may be causing the problem due to a-c leakage in the equipment to chassis ground. To find it, remove each piece one at a time until the unit is discovered. This is particularly true of projectors, so try them first.

3. Problems in the EAGLE system - If the problem appears to be internal to the EAGLE system try the following:

A. Mag Tape Problems. The EAGLE allows you to self-test its Mag Tape record/play circuit. To test OUT1, connect it directly back into the EAGLE PLAY jack. Type in any cue for bank 1. The EAGLE will send it out OUT1 see it coming in the PLAY jack and regenerate it (send it out the OUT1 jack again). Thus this loop should continue until you disconnect the OUT1 to PLAY patch cord. If the OUT1 or PLAY circuit are not working correctly, you should see MT POOR or MT BAD displayed on the CRT, or the system should simply refuse to regenerate.

To test OUT2, you can loop the patch cord between OUT2 and the PLAY jack. However, since the EAGLE only excepts BANK1 cues in this jack, it will only regenerate "NOP" cues (S10 or S20 depending on what speed you were running when you connected the loop back). Thus no matter what CUE you ENTER into the EAGLE the following looped cues will be either S10 or S20 (with "GO's" also if the cue contained a

GO).

If one or both of the above tests fail, you most likely have either a bad patch cord or one of the two mag tape modules (MT SLAVE or MT I/O) are defective.

B. Memory Problems. The EAGLE comes with a MEM TEST diskette which tests the main memory modules (up to 3) and also the memory in the SLAVE CPU and the Video Control Module. Simply insert the MEM TEST disk and push the RESET button. The EAGLE will boot in the TEST program and begin executing it automatically. The display should indicate how much memory you have (32K or 48K) and keep a running pass count. Note that the display is also being tested so that you should see a full display of assorted characters every few seconds.

C. Disk related problems. The disk operating software has many checks and associated error messages. These are shown in the COMMENT FIELD in the PROCALL or as the only display if attempting to boot the diskette.

COMMENT	CAUSE OF FAILURE
DISK DRIVE NOT READY	A. Defective diskette. B. Defective disk drive. C. Defective disk control module. D. Disk drive not connected. E. No disk inserted into disk drive.
DISK READ ERROR	A. Diskette not inserted properly. Remove and carefully re-insert. B. Defective diskette. Replace it. C. Defective disk drive. D. Defective disk control module.
DISK SEEK ERROR	Same as DISK READ ERROR
READ ERROR ON DIRECTORY	Same as DISK READ ERROR
PACKING ERROR OCCURRED	Same as DISK READ ERROR
DISK WRITE ERROR	Same as DISK READ ERROR
DISK VERIFY ERROR	Same as DISK READ ERROR
INVALID WRITE REQUEST	PROCALL is most likely to do something which could be dangerous to its health. Either re-boot the system immediately or remove the diskette immediately and attempt a MT dump.

D. Note that new versions are always capable of running programs created on LATER VERSIONS. HOWEVER EARLIER VERSIONS TYPICALLY CANNOT RUN PROGRAMS CREATED ON LATER VERSIONS. This is because the earlier version probably did not even know what some of the newer cues mean. You can correct this problem by simply booting in your newest version and then inserting your old diskette back in the disk drive. Now you may load and run any of the programs stored on it.

SECTION 6

OPTIONAL PERIPHERALS

Optional peripherals are devices which are compatible with the EAGLE system but which AVL does not manufacture or sell. Although they are by no means necessary for A/V production, they can enhance your production capabilities. There are currently two peripherals that can be attached to your EAGLE. One is a different or additional CRT display. The EAGLE outputs a standard composite video signal (EIA RS-170) that can be directly connected to most closed circuit video monitors. This allows you to use a larger (e.g. 12",15" or even a large ADVENT with the special computer terminal option) monitor or to have more than one simultaneous display. You might find a larger or multiple display particularly useful for teaching system operation and/or monitoring the show remotely while the show is running. The other optional peripheral is a printer.

PRINTER OPTION

In programming there are innumerable times when you would love to have a hard copy printout of your show (cue sheets) but it is simply too time consuming. With the EAGLE and a printer of your choice, you are able to automatically get your hard copy printout.

For the purposes of discussion of the CONTROL COMMANDS used for all printers, the Teletype modes KSR-43 unit will be described.

1. Connect the interface cable between the "PRINTER" jack on the rear panel of the EAGLE CPU and the "INPUT" connector on the printer.

2. Turn ON the printer (the switch is on the rear of the unit). Load the paper into the printer following the instructions supplied with the printer.

3. To correctly setup the control options, set the switches as follows:

   PARITY OFF (DOWN)
   DUPLEX FULL (DOWN)
   30 CPS (UP)

4. Load a program from the disk into the memory.

5. To the left side of the printer, depress the "DATA" key so you may receive data from the EAGLE. This de-activates the printer keyboard.

6. In the CONTROL COMMAND field, type "PRINT",ENTER.

Note that the printer activates. The first line contains the PROGRAM NAME and the OPERATOR, followed by the cues.

The EAGLE COMMENT is : "PRINTING. HIT 'ENTER' TO STOP".

To temporarily stop the printing, hit the "ENTER" key. The EAGLE COMMENT is : "HIT 'ESC' TO TERMINATE, 'ENTER' TO CONTINUE".

To continue from where you left off, hit "ENTER". The EAGLE COMMENT is again the "PRINTING" message.

Termination by hitting the "ESC" key means the printer stops, the printer "buffer" memory is cleared, and the program is at CUE # 1.

To start printing from CUE # 1 again, use the "PRINT" Control Command.

After all cues are printed, the "PRINTING" message is replaced by "OPERATION COMPLETE".

7. To use the "LINE FEED" key on the printer you must depress the "LOCAL" key. Remember, anytime you want to receive data from the EAGLE, the "DATA" key must be depressed.

Below is a sample printout :

PROGRAM NAME: PINWHEEL OPERATOR: YOUR NAME

CUE#	CODE	STATEMENT	SCREENS		RUN
1	AT	ALT	1		GO
2	AT	ALT	12	L	GO
3	AT	ALT	23	L	
4	AT	ALT	34	L	
5	AT	ALT	45	L	
6	AT	ALT	5		
7	AT	ALT	5		
8	AT	ALT	45	R	
9	AT	ALT	34	R	
10	AT	ALT	23	R	
11	AT	ALT	12	R	
12	AT	ALT	1	CR	
13	AT	ALT	1	LC	
14	RPO	REPEAT 0 TIMES			
15	N	NO OPERATION			STOP

PRINTING FILE NAMES ON A DISK (PLB)

If you wish to have a hard-copy printout of the files contained on a disk, do the following :

1. Call up the LIBRARY display.

2. In the CONTROL COMMAND FIELD, type "PLB",ENTER.

3. The same EAGLE COMMENTS and operations as described above apply.

Below is a sample of the hard copy printout of a disk. Note that both the FILE NAME and the PROGRAM NAME are displayed since they can be different (see the last entry). The total number of cues in each file are also shown.

FILE NAME	PROGRAM	OPERATOR'S NAME	CUES
PINWHEEL	PINWHEEL	YOUR NAME	15
STOPWTCH	STOPWTCH	YOUR NAME	102
TIME-1	TIME-1	YOUR NAME	102
FRZ MAN	FRZ MAN	YOUR NAME	9
MARKEE	MARKEE	YOUR NAME	8
XYZ-1	XYZ-1	YOUR NAME	13
XYZ-2	XYZ-2	YOUR NAME	43
XYZ-3C1	XYZ-3C1	YOUR NAME	34
XYZ1-BC	XYZ-123	YOUR NAME	94

EAGLE PRINTER SELECTION

The Eagle system provides a 25 pin female connector to interface to a printer. This plug is compatable with the Electronic Industries Association(EIA) standard RS-232-C. The print speed is software selectable to any standard rate up to 9,600 BAUD(approximately 873 characters per second). Thus the Eagle can be connected to almost any standard computer printer.

There are an extremely large selection of serial RS-232-C printers available. The most significant variables are cost, print speed, and print quality. Costs vary from about $600 to about $3,500, however, the printers available for less than $1,000 are typically of the hobbyist variety and their reliability, print quality(and types of paper they accept), and availability of service are generally not acceptable. This document includes a list of 6 professional quality printers that are some of the better known units available. All of

the printers on the list except the converted IBM Selectric and the Diablo have been used by AVL and found satisfactory.

A good approach to obtaining a printer is to first lease one for a month or so to determine whether it really meets your own particular needs. This will typically cost you approximately 10% of the total purchase price. Some AVL dealers are beginning to lease/sell printers and we recommend you try your dealer first since he can then help with the installation and servicing of the entire Eagle system. If your dealer does not provide this service and you wish to lease a printer before buying it, we suggest you try Leasemetrics or one of the similar nationwide leasing companies. We have included a list of Leasametric Inventory Centers for your convenience.

Typical Printer Options

Keyboard

Many printers offer a keyboard either as an option or it comes with the standard printer. The printer output on the Eagle does not accept input from a keyboard, thus the keyboard is not actually usable with the eagle. The keyboard could justify the extra cost, however, if you plan to use the printer as a stand-alone, off-line device(ie., an office typewriter when the Eagle is busy doing A/V work).

Print Quality

If you plan to sometimes use the Eagle as a true word processing system(ie., to generate letters, advertising, etc.) you will probably require a printer with high quality print. Note that this typically limits you to <60 characters per second and also costs more money. If you plan to use the printer pimarily for in-house listings such as PROCALL, inventory, accounting, etc. listings then you can save money while increasing print speed by selecting a medium print quality unit. We feel that the low print quality units which typically cost a little less but require special paper are simply not acceptable for either applcation and thus have not bothered documenting them.

Print Speed

BAUD rates(essentially bits/sec with 11 bits required per character) typically vary from 110 BAUD to 2400. The Eagle is capable of BAUD rates of 100,110,150 and all even multiples of 100 from 200 to 9600 BAUD. Since the average Eagle cue length is about 30 characters and the average sentence in a letter is about 60 characters it is rather painful to run at only 15 to 30 characters per second for many applications. A 6000 cue Eagle show could take 2 hours to print out, and a large inventory listing could take even longer. Thus if you plan to generate letters and do large listings you should consider

purchasing both a high print quality, lower speed printer(which could be used off-line as an office typewriter) and a medium print quality, high speed printer for your A/V and inventory/accounting applications.

Feed Mechanisms

Friction Feed. Necessary if you are going to be doing printing on ordinary stationary. Thus if you select a printer primarily for word processing/front office use(e.g., IBM Selectric, Diablo, or Qume) you'll probably want to choose this option.

Tractor Feed. Typically comes standard with higher speed printers(e.g. TI 810) and many lower speed computer terminal type printers(e.g., Decwriter). Allows you to use any of several widths of computer line printer paper. Thus you can use fan-fold paper, with edge sprocket holes, which is definitely preferable for any long listings such as PROCALL and accounting.

Pin-Feed. Comparable to tractor feed except the sprockets are fixed to the platen and thus are not adjustable. Sometimes requires special paper(e.g. KSR 43) since its sprocket holes can be different spacing than the tractor feed models.

Note that you cannot have any of the above feed mechanisms on the same printer simultaneously. Thus you must choose which one you prefer at purchase time, which typically requires a comprimise since in most cases it would be nice to have both tractor feed and friction feed available.

Interface Specifications

Serial ASCII RS-232-C
8 Data Bits
No Parity
2 Stop Bits(compatible with 1,1.5, or 2 Stop Bits)
All standard speeds(Baud rates) up to 9600 Baud

Special Notes

1. Although the Eagle only requires a two wire cable(pins 3 and 7), some printers require special signals. We have provided this special information for two of these printers(KSR 43 and TI 810) for your reference, your printer manual/dealer should supply documentation/information on any other special signals your particular printer might require.

2. PRINTER BUSY. High speed printers(e.g., TI 810) generally require interfacing a printer busy signal to them. This signal is sent from

the printer to the Eagle to tell the Eagle that its buffer is full so that the Eagle will stop sending data until the printer is ready to recieve it again. The Eagle expects this signal to be brought in on pin 5 of its printer connector. Either polarity(high true or low true) is acceptable since the Eagle is software selectable for either. See Figure P-1 for further cabling information.

3. MODEM Control. Some printers expect to be connected to a MODEM(device to allow transmission over the phone lines). These printers(e.g., TI 810 and KSR 43) require special MODEM control signals. The Eagle provides an RTS(Request to Send) signal on pin 4 of its printer connector(see Figure P-4 for entire listing of RS-232 signals) which can be used to drive up to 2 of a printers MODEM control recievers. The Eagle simply brings the RTS signal true(positive) when it is powered up and holds it true as long as power is applied. A printer typically puts out at least one driving signal which can simply be looped back to drive up to two of its own recievers. See Figures P-1 thru P-4 and your printer manual for further MODEM control cabling information.

Some Common Printers

Printer	Speed (characters/sec)	Approximate cost
Medium quality print(suitable for PROCALL or inventory listings)		
TI 810	150	$1900
DECWRITER II	30	$1600-2000
KSR 43	30	$1000-1200
High quality print(most suitable for printing letters, manuals,etc.)		
Qume Sprint 5 KSR	45-55	$3000-3500
Diablo 1620	45	$2600-3300
conversion to IBM selectric	14.5	$550-1000
IBM selectric/ with conversion	14.5	$1400-2000

Manufacturers of the above printers:

TI 810

Texas Instruments, Inc.
Digital Systems Division
P.O. Box 1444
Houston, Texas 77001

713-491-5115

Decwriter II

Digital Equipment Corporation
Maynard, Massachusetts 01754

617-897-5111

KSR 43

Teletype Corp.
5555 Touhy Ave.
Skokie, Illinois 60076

312-982-2000

Qume

Qume Corporation
2323 Industrial Parkway West
Hayward, California 94545

415-783-6100

Diablo

Diablo System Inc.
545 Oakmead Parkway
Sunnyvale, California 94086

408-733-2300

One of the corporations selling both IBM Selectric RS232 conversions and new IBM Selectrics with RS232 conversions already installed:

Escon Products, Inc.
171 Mayhew Way
Suite 204
Pleasant Hill, California 94523

415-935-4590

All of the above corporations except Escon will probably have local sales/service offices in your general area and you should be able to obtain that information by calling the above numbers. Lead times for delivery directly from the manufacturer are sometimes fairly long(as

much as 6 months), thus you might prefer to obtain a printer from a stocking distributor instead. A good source of printer distributors is a computer trade magazine or newsweekly such as:

Computerworld
797 Washington Street
Newton, Massachusetts 02160

617-965-5800

Here are some companies who carry a wide range of printers:

American Terminal Leasing
P.O. Box 68
Kenmore Sta.
Boston,Massachusetts 02215
617-261-1100

ComData
8115 Monticello
Skokie, Illinois 60076
312-677-3900
New York-212-267-3696
Los Angeles-213-614-0550

MQI Computer Products
2315 Otis St.
Santa Ana, Ca. 92704
714-751-2005

Synchro-Sound Enterprises, Inc.
193-25 Jamaica Ave.
Jamaica, N.Y. 11423
212-468-7067

Transnet Corporation
2005 Route 22
Union, N.J. 07083
201-688-7800

Westwood Associates, Inc.
25 Rt. 22 East
Springfield, N.J. 07081
201-376-4242
Philadelphia Area 609-829-7280
Pittsburgh Area 412-566-1525

Wilson's Data Communications, Inc.
8989 Westheimer, Suite 103
Houston, Texas 77063
713-977-2778

The above list was compiled from advertisements as an aid to Eagle users---it is in no way an AVL recommended list since we have not done buisness with any of the distributors on the list. We suggest you begin your printer search with your AVL dealer and use the above only if your AVL dealer neither distributes printers himself nor can recommend a printer distributor in your area.

CABLE REQUIREMENTS FOR PRINTER WITH PRINTER BUSY(e.g. TI 810)

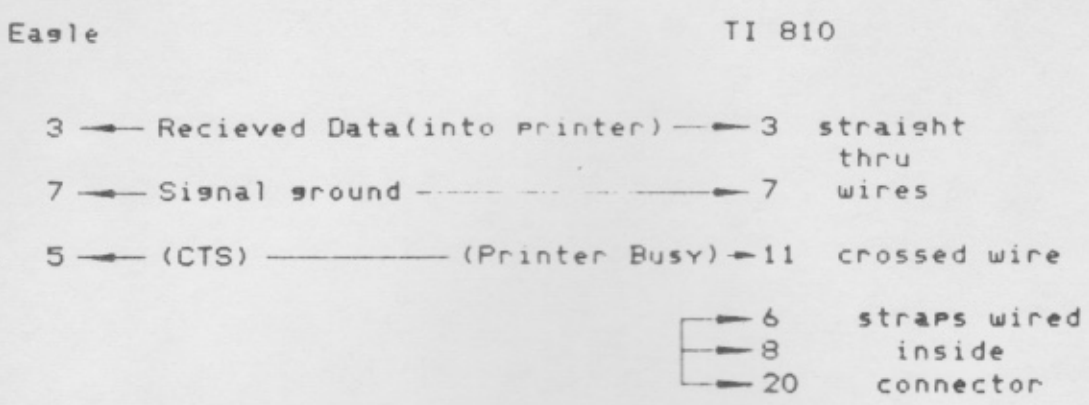

FIGURE P-1

CABLE REQUIREMENTS WITH MODEM CONTROL WITHOUT PRINTER BUSY(e.g. KSR 43)

Requires all of the above except the 5 to 11 wire(CTS to Printer Busy)

Also requires:

FIGURE P-2

RS-232-C/EAGLE PRINTER CONNECTOR PIN DESIGNATIONS
AS SEEN FROM EXTERNAL REAR OF EAGLE COMPUTER BOX

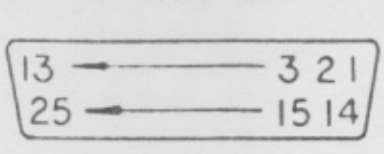

FIGURE P-3

NOTE: None of the printers on the list execept TI 810 and KSR 43 require any signals except Recieved Data and Signal Ground thus they do not need any changes to their cables to work with the Eagle.

A.V.L. DIGITAL SYSTEMS CUE CHART

	C EAGLE	C QD3	C QD2	C SPVB	B PD3	B PD2	B SPV	A SPIII
HARD CUT	X	X	X	X	X	X	X	
CUT	X	X	X	X	X	X	X	X
1 SEC DIS	X	X	X	X	X	X	X	
2 SEC DIS	X	X	X	X	X	X	X	X
3 SEC DIS	X	X	X	X				
4 SEC DIS	X	X	X	X	X	X	X	X
6 SEC DIS	X	X	X	X				
8 SEC DIS	X	X	X	X	X	X	X	X
16 SEC DIS	X	X	X	X	X	X	X	
32 SEC DIS	X	X	X	X	X	X	X	
FAST ALT	X	X	X	X				
ALT	X	X	X	X	X	X	X	X
1 SEC ALT	X	X	X	X	X	X	X	
2 SEC ALT	X	X	X	X	X	X	X	
3 SEC ALT	X	X	X	X				
4 SEC ALT	X	X	X	X	X	X	X	
6 SEC ALT	X	X	X	X				
8 SEC ALT	X	X	X	X	X	X	X	
16 SEC ALT	X	X	X	X	X	X	X	
32 SEC ALT	X	X	X	X	X	X	X	
PROJ. FWD.	X	X	X	X	X	X	X	X
PROJ. REV.	X	X	X	X	X	X	X	X
FREEZE	X	X	X	X				
FREEZE RELEASE	X	X	X	X				
WAIT X	X							
REPEAT (RP)	X							
SPEED CHANGE 10 CPS.	X	X	X	X				
SPEED CHANGE 20 CPS.	X	X	X	X				
PRESET	X	X	X	X	X	X	X	
GO OR START	X	X	X	X	X	X	X	X
STOP	X	X	X	X	X	X	X	X
GO OR START WITH CUE	X	X	X	X	X	X	X	
STOP WITH CUE	X	X	X	X	X	X	X	
STANDBY								X
WAIT 0.05	X	X	X	X	X	X		
WAIT 0.1	X	X	X	X	X	X	X	X
WAIT 0.3	X	X	X	X	X	X	X	
WAIT 0.5	X	X	X	X	X	X	X	X
WAIT 0.6	X	X	X	X	X	X	X	X
WAIT 0.7	X	X	X	X	X	X	X	
WAIT 1.0	X	X	X	X	X	X	X	X

A.V.L. DIGITAL SYSTEMS CUE CHART CONTINUED.

	C EAGLE	C QD3	C QD2	C SPVB	B PD3	B PD2	B SPV	A SPIII
WAIT 1.5	X	X	X	X	X	X	X	X
WAIT 1.6	X	X	X	X	X	X	X	X
WAIT 2.0	X	X	X	X	X	X	X	
WAIT 3.0	X	X	X	X	X	X	X	
AUX 0								X
AUX L								X
AUX R	X	X		X	X		X	
SCREEN 1	X	X	X	X	X	X	X	X
2	X	X	X	X	X	X	X	X
3	X	X	X	X	X	X	X	X
4	X	X	X	X	X	X	X	
5	X	X	X	X	X	X	X	
LEFT PROJ. ADDRESS	X	X	X	X	X	X	X	X
CENTER PROJ. ADDRESS	X	X		X	X		X	
RIGHT PROJ. ADDRESS	X	X	X	X	X	X	X	X