Abekas

Video Systems, Inc.

A Carlton Company

digital disk recorder **A60**

A60
Operations
Manual

Abekas A60 DIGITAL DISK RECORDER

Operation Manual

Installation Guide

(REV 1.2)

copyright March 1988

Abekas Video Systems, Inc.

101 Galveston Drive

Redwood City

California 94063

(415) 369-5111

Table of Contents

Section 4: OPERATION   4.1

Section 5: REMOTE OPERATION   5.1

Section 7: INDEX   7.1

Section 8: INSTALLATION GUIDE   8.1

Section 1: INTRODUCTION

1.1 Description

The A60 is a real-time component digital recording device, providing real-time playback in forward or reverse, variable playback speeds and random access to recorded material. The A60 conforms to the 4:2:2 component digital standard and provides CCIR 601 input and output ports for interface to other CCIR 601 equipment, making it ideal to use in various graphics environments.

Functionally, the A60 will perform like a playback or a record VTR, configured in one of two capacities; the standard configuration of either 25 seconds for the 525 version or 30 seconds for the 625 version, and the optional configuration of 50 seconds for the 525 version or 60 seconds for the 625 version.

The A60 has two CCIR 601 video input ports, either one may be selected for recording purposes. The Abekas A20 digital video encoder should be used if the input is to be originating from an analog component source, such as an RGB camera or a component VTR.

The A60 has several video output configurations present. The program output is available both in the digital CCIR 601 format, and as an analog signal that is either RGB or Y, R-Y, B-Y. Sync is available as a seperate output and may be added to the G or Y output. The preview output is available in either of the analog formats, and will only differ from the program output by the presence of the timecode and frame position information placed over it.

The A60 may also have digital video transfer and remote machine control acomplished by using either the Ethernet or the SCSI ports. The Ethernet port follows the TCP/IP standard, and supports remote log in, FTP and TELNET. The SCSI port is used typically for off line storage of video using standard 9-track magnetic streamer tape.

1.2 Physical Description

In a 25 (or 30 if 625) second version, the A60 consists of a main electronics chassis with an integral Winchester disk drive assembly, and a control panel. A 50 (or 60 if 625) second version requires an additional disk drive assembly to be mounted near the main electronics chassis.

1.2.1 Control Panel

The compact control panel (4.5"H x 11.75"W x 3.5"D) consists of a 5 digit frame number or timecode display, a trackball, control keys and a numeric keypad. There is also a monochrome analog video output from the control panel to be fed to a black and white monitor for displaying system status and allowing access to the various features of the A60.

The 5 digit display will show the current position of the disks either as a frame number or as a timecode number.

The trackball may be used for browsing through the material on the disks, as well as for system timing operations.

The numeric keypad allows instant access to a frame/field number, as well as providing a means to precisely set system set-up values.

The control keys consist of; disk control keys using normal transport command terminology, segment control keys for defining in and out points of a segment or a loop, and function keys for system set-up, configuration and access to the menu monitor functions.

1.2.2 Main Electronics Chassis

The systems main electronics chassis (12.25"H rackmount) contains the printed circuit boards that control the various aspects of the A60, as well as a Winchester disk drive assembly that will provide 25 seconds (or 30 if 625) of time for the A60 system.

1.2.3 Additional Disk Drive Chassis (optional)

The optional disk drive chassis (7"H rackmount) will provide an additional 25 seconds (or 30 if 625) of time for the A60 system, making a total of 50 seconds (or 60 if 625) possible.

Section 2: SYSTEM SET-UP

2.1 Initial System Connections

Below is a simplified system interconnect drawing of the A60. The component analog program and preview outputs of the system differ only in that the preview monitor will have the current disk position placed on it. These component analog outputs may be configured for either R, G, B or Y, R-Y, B-Y. See section 2.2 on the next page for more information on this.

The control panel will have two connections made to it; the serial communications cable from the main chassis and a BNC cable to a monochrome menu monitor. To make these connections, it will be necessary to remove the rear cover of the control panel.

For more detailed information on system connections, see the INSTALLATION GUIDE found in the back of this manual.
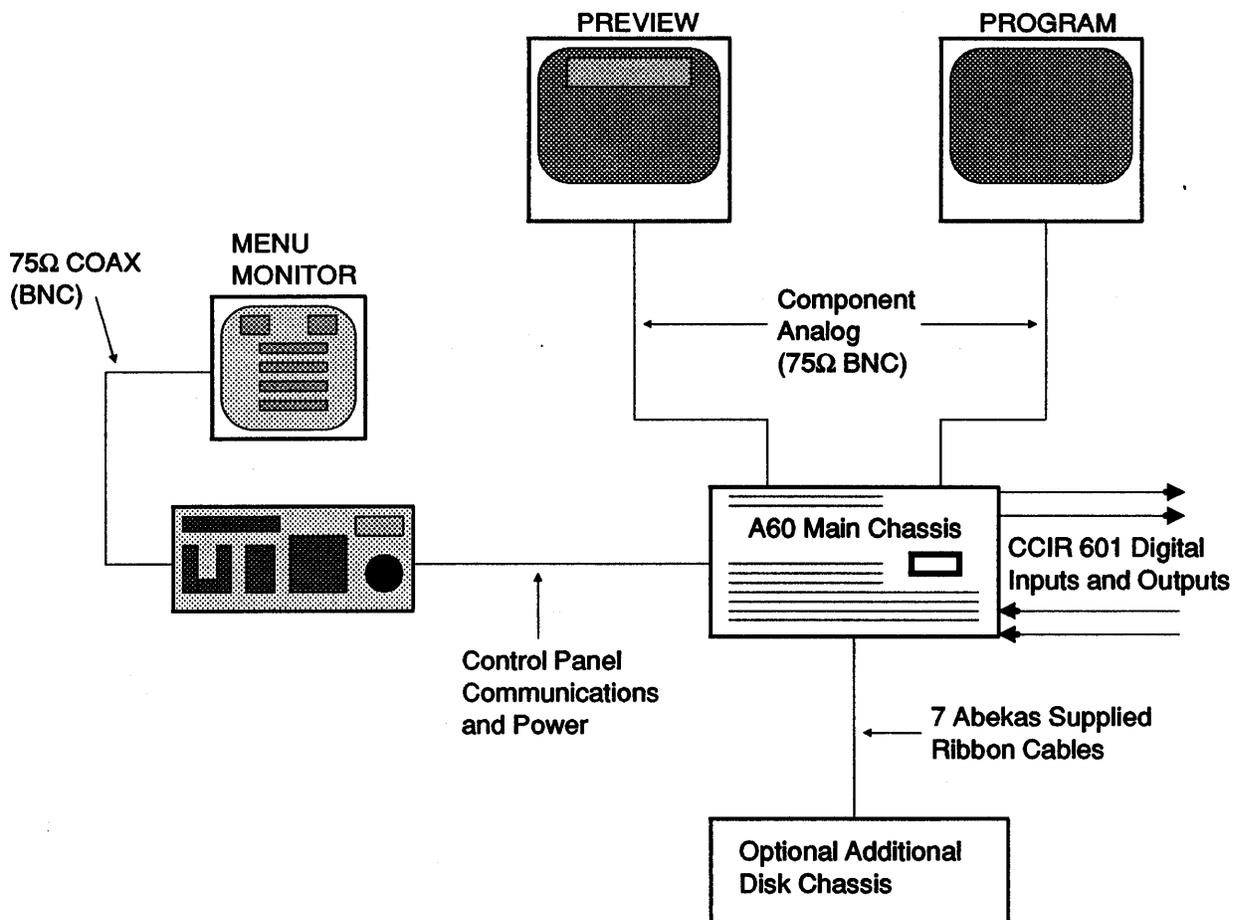
2.2 Configuring the Analog Outputs

The Preview and Program analog outputs may be configured for either R, G, B, or Y, R-Y, B-Y by setting the following jumpers on the A60's Computer board as shown. The unit is shipped as R, G, B with no sync on the G output.

> **NOTE:** To change from the current configuration to a new one, even to just add sync, will require some level adjustments to be made. See section 8 of the INSTALLATION GUIDE for the procedeures to follow.

For R, G, B outputs...

> Remove jumpers W1, W2, W8, W10
> Install jumpers W3, W4, W5, W7, W9

For Y, R-Y, B-Y outputs...

> Remove jumpers W3, W4, W5, W7, W9
> Install jumpers W1, W2, W8, W10

For sync to be placed on the G or Y output, jumper W6 should be installed, in addition W5 should be installed for sync on the Y component. There are two spare jumpers included with the board extractor that may be used if needed. The INSTALLATION GUIDE in the back of this manual should be consulted for more information on connections to the A60.

2.3 Power-Up Procedure

A 25 or 30 second version of the A60 will have one power switch for the whole signal system chassis, located on the front lower right hand side of the unit. The additional disk drive chassis of a 50 or 60 second version will have its own power switch, located on the rear of its chassis. Ensure that both switches are in their off positions before plugging in the power cords.

The signal system chassis requires an outlet with a rating of 8 amps, the additional disk drive chassis requires an outlet of 5 amps. Plug the power cord from each unit into a properly grounded 110V AC outlet.

Locate the computer board in the A60 chassis, board 3, and note the position of the switch on the front edge. This switch must be set to its down position before applying power.

IMPORTANT

Before power is applied, insure that either a reference video signal is connected to the rear of the A60, and the reference select switch on the front left of the I/O board (board 4) is set to the left (external), or that the switch is set to internal (to the right). This will ensure that there will be no problems during the power up process.

POWERING UP THE SYSTEM.

Step 1   Set the computer board switch to the DN position (to the left).

Step 2   Apply power to the optional disk drive chassis (if present).

Step 3   Apply power to the signal system chassis.

Step 4   Set the computer board switch to the UP position (to the right).

The disk drives require approximately 45 seconds to "sequence up", that is, to come to working speed. It is possible to have the menu monitor display the status of the disk drives during this locking up process, by following the steps on the next page.

MONITORING THE DRIVE STATUS

Step 1   Press the **NORM PLAY** key. This should get the *HOME* menu to be displayed on the screen. See page 2.3.

Step 2   Press the **MENU** key until the cursor is sitting on the line *4) Diagnostics*, and press the **ENTER** key. This should bring up the *DIAGNOSTICS* menu, which contains a display at the bottom with disk drive status information.

The names "*drv 0Y*" and "*drv 0C*" refer to the disk drives supplying the first 25 or 30 seconds (depending on whether this A60 is a 525 or a 625 system) of video. The names "*drv 1Y*" and "*drv 1C*" refer to the disk drives supplying the second 25 or 30 seconds of video. Following each of these drive names will be the status of that drive.

UP

Indicates that the drive is running and ready to use.

DOWN

Indicates that the drive is not running (or is not present), or that it is still coming up to speed.

UNLOCKED

Indicates that the drive speed is getting close to full speed, and the locking up process is beginning.

LOCKING

Indicates that the drive is up to speed and is in the final stages of attaining the *UP* status.

The A60 will not try to start both drive 0Y and drive 0C at the same time, due to the amount of initial drive start-up power required.

2.4 Power-Down Procedure

Ideally, the A60 should remain powered up at all times. If it is necessary to power down the system, the following procedure should be followed.

IMPORTANT

The disk drives should not be moved or jarred while powered up. Before undertaking any activity which would cause excessive vibration, such as the installation of equipment in the A60's rack, follow the power down procedure described below.

POWERING DOWN THE SYSTEM.

Step 1   Set the computer board switch to the DN position.

Step 2   Wait approximately 20 seconds, until there is a "clunk" sound from the disk drives.

Step 3   Turn off power at the optional disk drive chassis (if present).

Step 4   Turn off power at the signal system chassis.

2.5 System Timing

Once the system is powered up, the menu moniter should display the *HOME* menu as shown below. If not, press the **NORM PLAY** key to get the correct menu display. Press the **MENU** key until the cursor is sitting on *1) Setup*, and press the **ENTER** key on the numeric keypad. The display should appear similar to the *SETUP* menu.

HOME MENU

```
┌─────────────────────────────────────────────────┐
│  ┌──────────┐                      ┌──────────┐  │
│  │ 0.13.00  │                      │   390    │  │
│  └──────────┘                      └──────────┘  │
│                                                  │
│                  ABEKAS  A60 <525>               │
│                                                  │
│                  1) Setup                        │
│                                                  │
│                  2) Macros                       │
│                                                  │
│                  3) Remote                       │
│                                                  │
│                  4) Diagnostics                  │
│                                                  │
│                  5) GPI Assigns                  │
│                                                  │
│                  6) Record Lockout               │
│                                                  │
│                  7) Miscellaneous                │
│                                                  │
└─────────────────────────────────────────────────┘
```
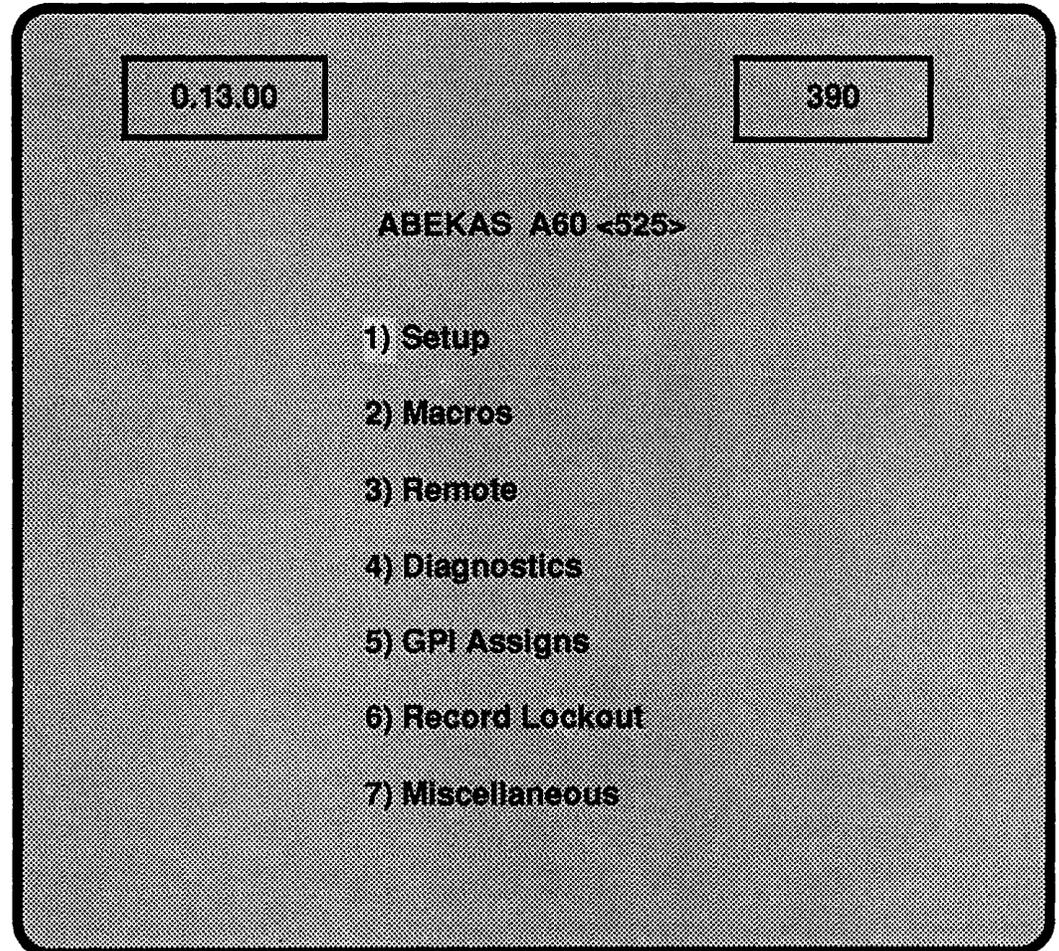
NOTE: USING WITH ENCODERS

The A60 has the ability to provide early output syncs for use with encoders that have a one line video delay, such as the Faroudja NTSC encoder. The selection of early or normal syncs is provided by DIP switch 18K located on the computer board. Section 3 of that DIP switch should be normally set to the **OFF** position for normal output sync timing, and set to the **ON** position to provide syncs that are one line early with respect to reference. The status of this mode may be checked by selecting the Miscellaneous menu, and looking at line 5.

```
┌─────────────────────────────────────────────────────────┐
│  ┌──────────┐                              ┌──────────┐   │
│  │ 0.13.00  │                              │   390    │   │
│  └──────────┘                              └──────────┘   │
│                                                           │
│              1) COARSE HPHASE:  +00 pixels                │
│                                                           │
│              2) FINE HPHASE:  +000 ns                     │
│                                                           │
│              3) INTERP ON/OFF:  OFF                       │
│                                                           │
│              4) FREEZE:  FRAME                            │
│                                                           │
│              5) MACHINE MODE:  FIELD                      │
│                                                           │
│              6) TIME DISPLAY:  FRAMES                     │
│                                                           │
│              7) MARK OFFSET:  00000                       │
│                                                           │
│              8) PVW DISPLAY POSITION                      │
│                                                           │
│              9) INPUT SELECT:  INPUT-1                    │
│                                                           │
└─────────────────────────────────────────────────────────┘
```
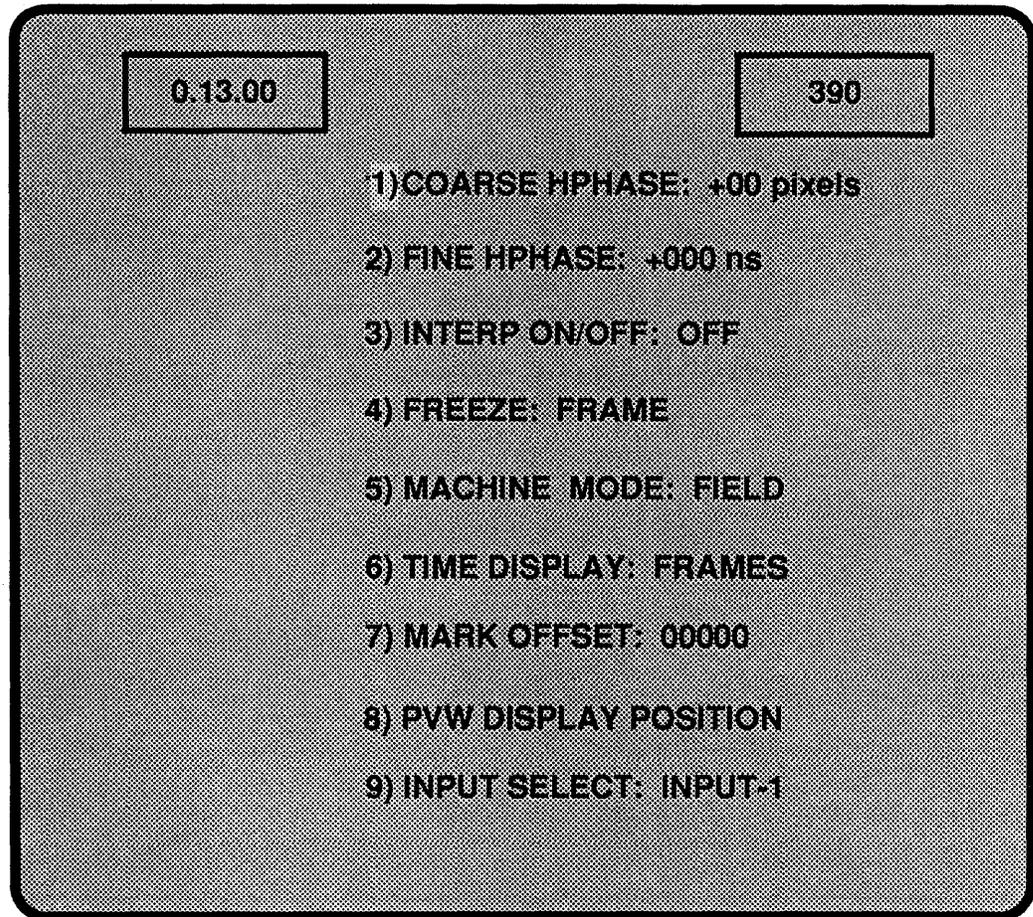
The **MENU** button will allow the cursor to be positioned on one of the nine items currently on display.

SETTING THE A60'S SYSTEM PHASE.

Step 1 Select *1) COARSE HPHASE,* and press **ENTER** at the numeric keypad. The entire line now becomes reverse video, and the output timing may be adjusted with regards to reference in 2 pixel steps (148ns steps), by using either the trackball or the numeric keypad to alter the current value. This adjustment has a range of +/-50 pixels (+/-7.4 μs).

Step 2 Select *2) FINE HPHASE,* as above. This will allow a fine adjustment in 1ns steps, with a range of +/-100ns, once again using the trackball or numeric keypad.

This completes the system timing requirements for the A60. For more information on the *SETUP* menu, see the **FAMILIARIZATION** section.

Section 3: FAMILIARIZATION

3.1 Controls and the Display

The control panel consists of a 5 digit frame number or timecode display, a trackball, control keys and a numeric keypad. The control panel will also feed a menu monitor that will display system status information.

The 5 digit display will show the current position of the disks either as a frame number or as a timecode number.

The trackball may be used for browsing through the material on the disks, as well as for system timing operations.

The numeric keypad allows instant access to a frame/field number, as well as providing a means to precisely key in system set-up values.

The control keys consist of; disk control keys using normal transport command terminology, segment control keys for defining in and out points of a segment or a loop, and function keys for system set-up, configuration and access to the menu monitor functions.

3.2 Description of Keys

3.2.1 FUNCTION KEYS

This is the group of 5 keys along the upper left of the control panel. The fourth key is reserved for future use and is currently blank.

NORM PLAY

Performs two functions; when lit, indicates that the **NORMAL PLAY** mode is active, when not lit, the **SEGMENT PLAY** mode is active. Selecting this key will also display the *HOME* menu on the menu moniter, regardless of what menu is currently being displayed. A segment may be defined only in this mode.

FREEZE

A toggle function that, when lit, will cause the output of the A60 to be frozen, even if the disk is still playing. The freeze will be either a field or a frame, based on the status of line 4 in the *SETUP* menu.

VIDEO IN

A toggle function that, when lit, will allow the selected video input to pass through the electronics and be presented directly at the output of the A60.

MENU

Has two operating levels, both affecting the position of the cursor on the menu monitor. Pressing the MENU key directly will cause the cursor to drop down to the next menu line being displayed. The MENU key may be held down to create a repeating action, causing the cursor to scroll down the screen until the key is released. The cursor will loop back to the top of the display once the bottom is reached. A desired menu line may be specified by selecting that lines number on the numeric keypad and then pressing the MENU button.

Abekas A60 Control Panel
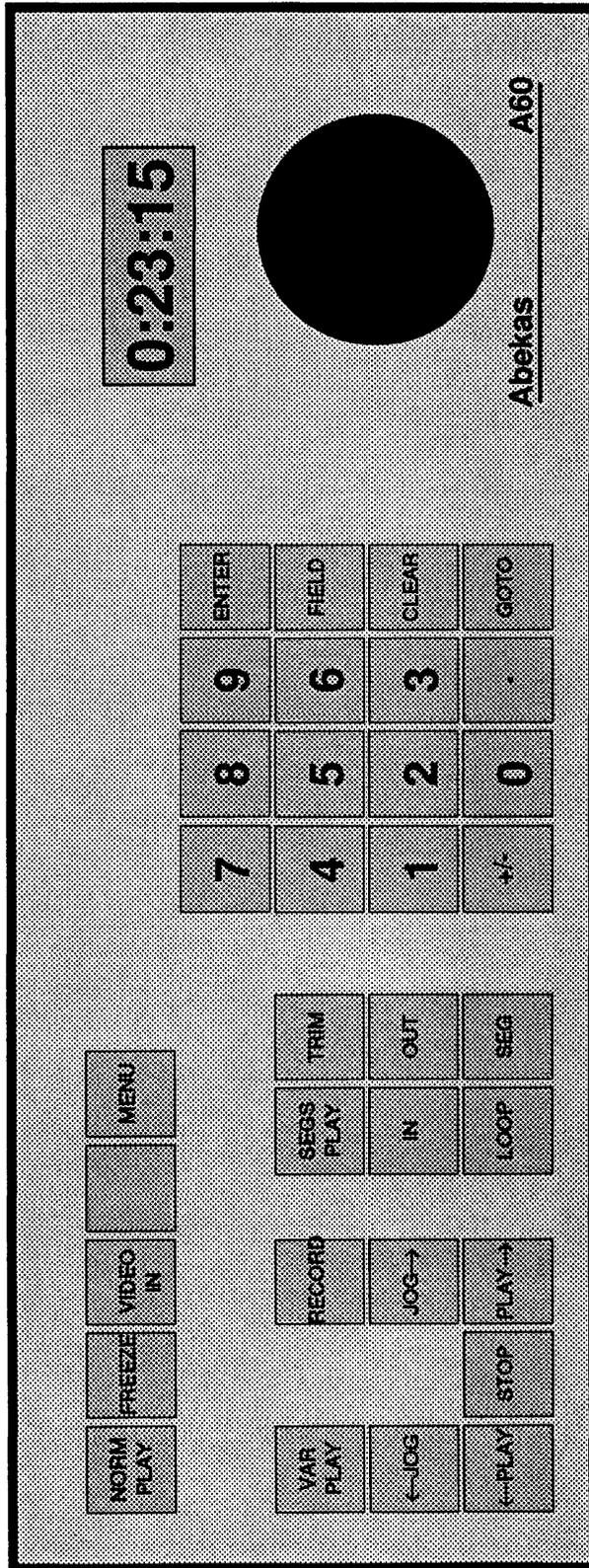
Abekas A60 Control Panel

3.2.2 TRANSPORT KEYS

This is the group of seven keys located at the lower left of the control panel.

VAR PLAY

Will play the disks at either a speed selected on the keypad or at the last speed used. A value of 0.500 would result in a speed that is half the play speed, a value of -5.000 indicating a speed of 5 times play speed in the reverse direction. The speed value will be displayed at the top of the menu monitor, once this mode is selected.

RECORD

Will "arm" the system for a recording to take place. Pressing the **PLAY→** key actually starts the system recording. The length of the recording should be specified with the numeric keypad before the **RECORD** button is pressed. The record length that was last used will be used if none is specified.

←JOG and JOG→

Will provide a field or a frame step function through the recorded material, based on the setting of menu line 5 in the *SETUP* section.

←PLAY and PLAY→

Will playback a recording in either the forward or the reverse direction, normally at play speed. An alternate speed may be selected at the numeric keypad prior to pressing one of these keys. These keys will also initiate the playback of a segment or a loop.

STOP

Is used to halt the playback or record process, as well as to regain local control of the system when under external computer control.

3.2.3 SEGMENT AND LOOP KEYS

This is the group of six keys located to the right of the transport control keys.

SEGS PLAY

Will bring up the *SEGMENTS* menu on the menu monitor, which will then allow the editing of the segments present.

TRIM

Can be used in all modes to trim a number that had previously been entered. When using this function, the sign key (+/- key), must be pressed to select the polarity of the trim value. Should the sign key not be pressed, the value will be treated as an absolute and not a trim.

IN and OUT

Used to specify boundries for segments and loops.

LOOP

May be used to get the system to either playback a portion of the disk repeatedly as specified by the IN and OUT keys, or to establish a loop in a series of segments. In both cases, pressing either the **VAR PLAY** or a **PLAY** key will start the **LOOP** playback.

SEG

Used while in the **NORM PLAY** mode. It should be pressed after in and out points have been established, if those points are to define a segment.

3.2.4 NUMERIC KEYPAD

This is the group of sixteen keys in the center of the control panel. A number that is selected here will appear on the menu monitor in a temporary register area located on the lower left of the screen.

ENTER

Will allow the modification of a menu line in several different ways. Should the menu cursor be sitting on a non-numeric choice (e.g. an on/off function), pressing ENTER will cause the alternate choice to be made. Should the menu line be a numeric type, a number may be selected at the numeric keypad and entered by pressing ENTER. Pressing ENTER with no number specified by the numeric keypad will enable the current value to be altered by using the trackball.

FIELD

Is used to specify which field of a frame is to be used for a particular function (to GOTO, an IN value, etc.). The timecode display will indicate that field one is current by displaying a period between the groups of minutes, seconds, and frames. Field two will be indicated by a colon between the groups. This is true wherever the timecode mode is displayed, on the control panel display, the menu monitor display and the preview monitor display.

The frame display at the control panel (if chosen on line 6 of the *SETUP* menu), will show the number only for field one, and a period in the lower right hand corner for field two. The frame display on the menu monitor will display a "+" after the number if it is field two, and the frame display for the preview monitor will not indicate field one or two.

CLEAR

Will clear the temporary register on the menu monitor.

GOTO

Should be pressed after a time number (either timecode or frames, based on the display selected) has been keyed in, and will cause the disk to position itself to that point. It can also be used to go to a segment number, while in the SEG PLAY mode.

+/-

Is used to enter a negitive value, pressed once will give a "+" sign in the temporary register, pressed twice will give a "-" sign. This is useful both when entering a new value (other than time), or when trimming an existing value or time.

. (decimal point)

Is used for certain setup parameters and speed values. This must not to be used for the entry of timecode numbers (they are automatically grouped).

3.3 Menu Monitor

While the menu monitor is not absolutely required for normal system operation, it is necessary for most of the special functions (setup, segments, macros etc.).

Regardless of the menu being displayed, there are a few things that will be constant. A box in the upper left hand corner will show the current disk position in timecode, and a box in the upper right corner will show the position in frames (a "+" indicating field two of the current frame). The space between these boxes will display various system messages while operating the A60, such as the variable play speed value or record length. The lower left of the monitor will always show a number as it is being selected on the numeric keypad, and will be referred to as the "temporary register".

3.3.1 THE HOME MENU

Time Display　　　　**System Messages**　　　　**Frame Position**

```
         ┌──────────┐                          ┌──────────┐
         │  0.13.00 │       01.000             │   390    │
         └──────────┘                          └──────────┘


                     ABEKAS  A60  <525>


                     1) Setup

                     2) Macros

                     3) Remote

                     4) Diagnostics

                     5) GPI Assigns

                     6) Record Lockout

                     7) Miscellaneous

        -1.500
```

Temporary Register
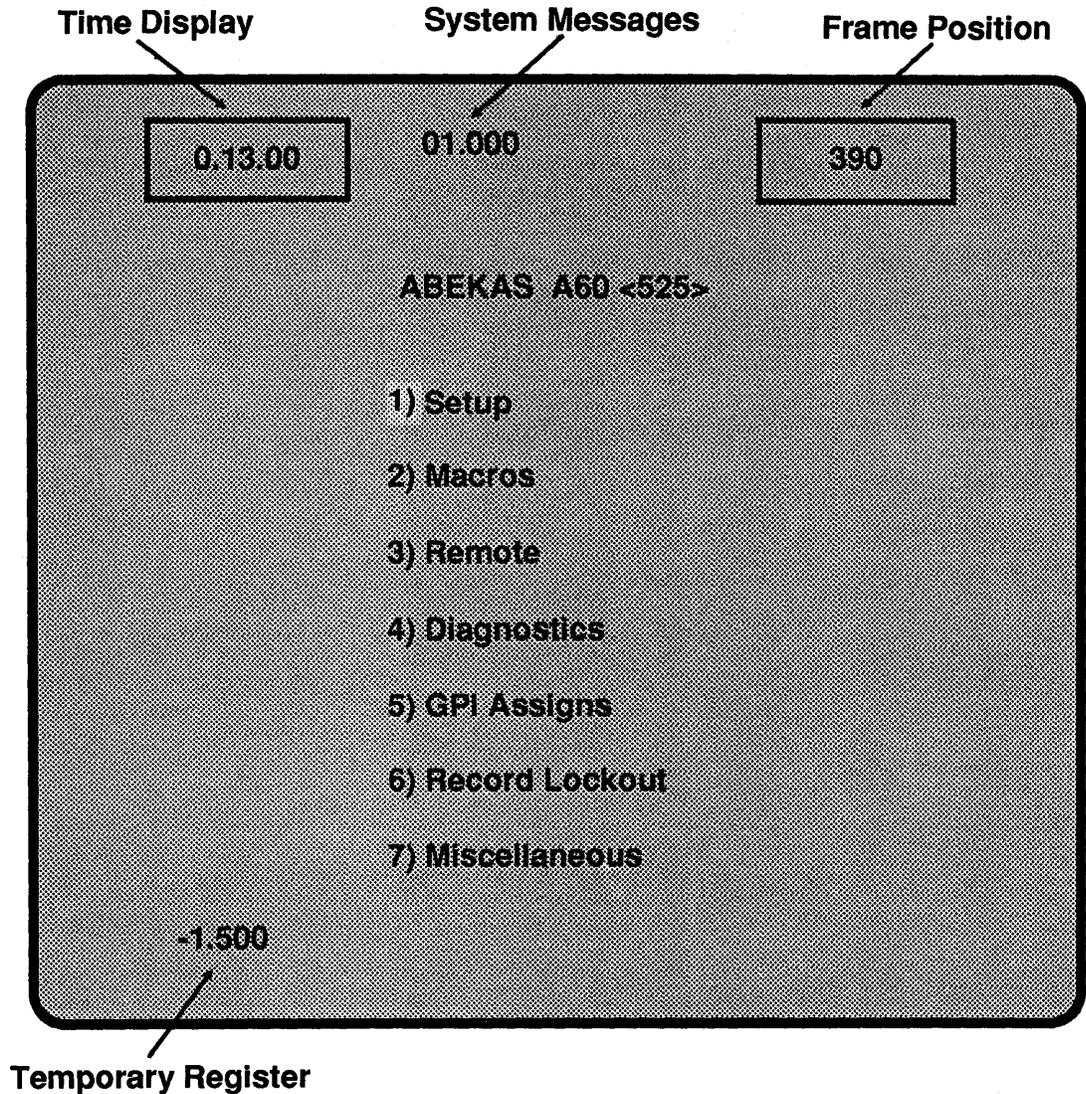
The **NORM PLAY** key will bring up the *HOME* menu. It is from this menu that one of the branch menus may be selected in order to access a particular function.

The **MENU** key will directly affect the position of the cursor as it appears on any given menu. Simply pressing **MENU** will cause the cursor to drop to the next line present, once at the bottom it will loop back to the top line. Selecting the number of a menu line with the numeric keypad and then pressing the **MENU** key will cause the cursor to jump directly to that menu line. Selecting a two digit number before pressing the **MENU** key can cause a jump to a menu line that is not part of the menu being displayed. The first digit specifies the *HOME* menu line number, the last digit specifies the actual desired menu line.

EXAMPLE: Menu line selection.

Step 1 Select the numbers 1 and 6 on the numeric keypad, and press the **MENU** key. This should bring up the Setup menu (line 1 of the *HOME* menu), and position the cursor on line *6) TIME DISPLAY*. The **ENTER** key may now be pressed to change the setting of this mode.

Step 2 Note the status of menu line *4)FREEZE*. Select the number 4 on the numeric keypad, and press the **MENU** key. The cursor will jump to menu line *4)FREEZE*, and will also change its current status.

As a general rule, numerically selecting a menu line of a menu not currently being displayed (using a two digit number) will change the menu display to that menu, park the cursor on that line, but not change that lines status. Numerically selecting a menu line of the menu that is currently being displayed will change the status of that line (when applicable), as well as parking the cursor on it.

Once the correct menu line has been selected, a value may be pressed at the numeric keypad and entered, by pressing the **ENTER** key, or, if the line is a non-numeric type, an alternate choice made by simply pressing the **ENTER** key. If the line has a numeric type value and no value is selected at the numeric keypad, pressing **ENTER** will cause that line to become reverse video, and allow the trackball to alter the current value.

3.3.2 HOME MENU LINES

1) Setup

This menu contains system timing parameters and various system operating variables.

2) Macros

This menu will deal with the creating and modifying of macros. A macro is a command that can be taught to perform a string of functions, thus simplifying a repetitive task.

3) Remote

This menu will allow the configuration of the remote port, and access to the tape off-line streaming functions.

4) Diagnostics

This menu will show the software revision level of the system, allow the selection of a digitally generated test pattern, and show the status of the "early syncs" mode.

5) GPI Assigns

This menu will allow the configuration of both the input GPIs and the output GPIs. An input GPI (General Purpose Interface) may be used to allow an external device to start a particular function (run fwd etc.), or the running of a macro. An output GPI can be sent to an external device to trigger it.

6) Record Lockout

This menu will allow the definition of sections of the disk to be locked out, prohibiting recording in these areas.

7) Miscellaneous

This menu deals with VITC (Vertical Interval Time Code) line selection, and Ethernet attributes.

3.3.3 SETUP MENU

```
┌─────────────────────────────────────────────────┐
│  ┌──────────┐                    ┌──────────┐    │
│  │ 0.13.00  │                    │   390    │    │
│  └──────────┘                    └──────────┘    │
│                                                  │
│              1) COARSE HPHASE: +00 pixels        │
│                                                  │
│              2) FINE HPHASE: +000 ns             │
│                                                  │
│              3) INTERP ON/OFF: OFF               │
│                                                  │
│              4) FREEZE: FRAME                    │
│                                                  │
│              5) MACHINE MODE: FIELD              │
│                                                  │
│              6) TIME DISPLAY: FRAMES             │
│                                                  │
│              7) MARK OFFSET: 00000               │
│                                                  │
│              8) PVW DISPLAY POSITION             │
│                                                  │
│              9) INPUT SELECT: INPUT-1            │
│                                                  │
└─────────────────────────────────────────────────┘
```
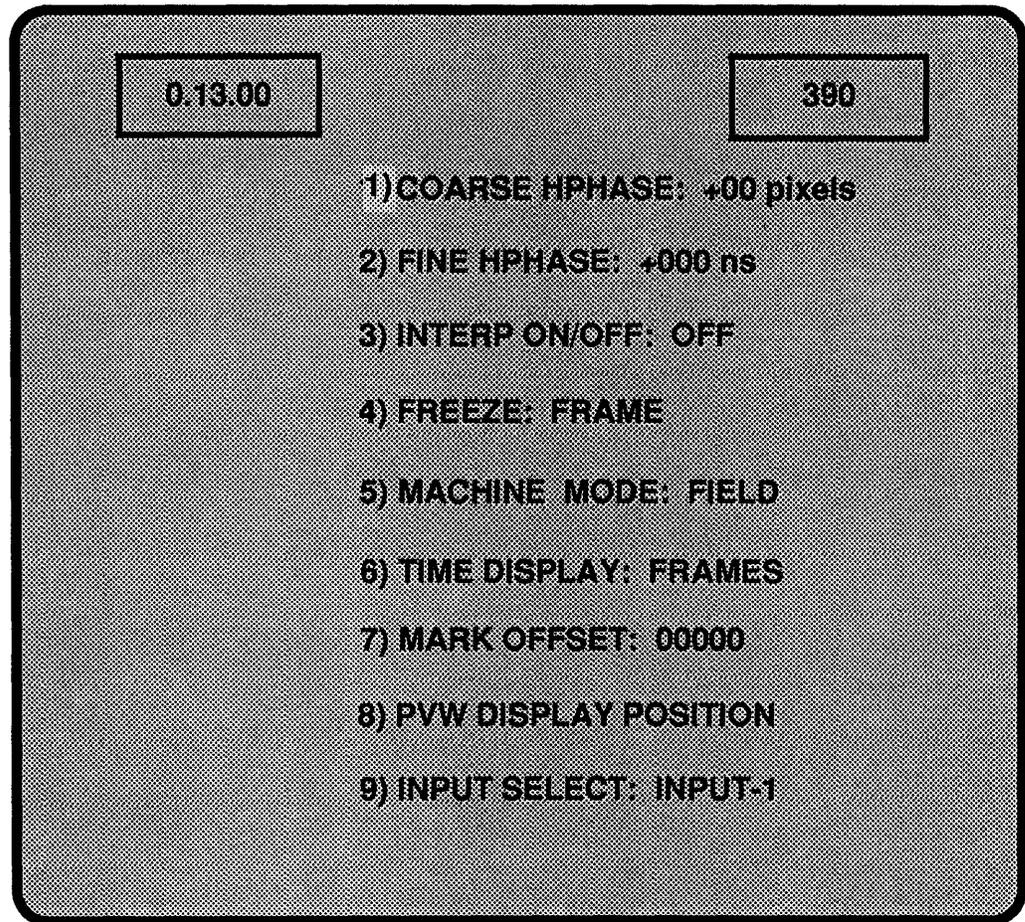
3.3.4 SETUP MENU LINES

1) COARSE HPHASE

Allows the adjustment of the A60's output with regard to reference. The range is +/-50 pixels (+/-7.4 µs), and will adjust in 2 pixel steps.

2) FINE HPHASE

Allows a fine adjustment of the A60's output, with a range of +/-100ns.

3) INTERP ON/OFF

Determines how the A60 will create a second field when necessary, for example, when in a freeze field mode.

OFF

Will create the second field by simply repeating the previous field.

ON

Will create the second field by averaging two adjacent lines, giving a smoother appearance to any diagonal lines in the video.

4) FREEZE

Once the **FREEZE** key is pressed, this will determine whether the output will be a *FRAME, FIELD 1* or *FIELD 2*.

5) MACHINE MODE

This will determine what the system will output when viewing the recorded material in the **STOP** mode.

FIELD

The A60 will only send one field, creating the second field based on the setting of the *IN-TERP ON/OFF* line. The **JOG** keys and the trackball will position the disk one field at a time.

FRAME

The output will be the entire current frame (time displayed plus the next field). The **JOG** keys and the trackball will position the disk one field at a time.

AUTO FRAME

The output will be the entire frame as above, however the **JOG** keys and the trackball will position the disk one frame at a time, retaining the two field relationship established when this function was selected. The two field relationship will determine whether the frame of video being output will consist of an odd and even field from the same frame, or the even field of a frame and the odd field of the next frame. The two field relationship may be changed by pressing the +/- key, the **FIELD** key, then the **GOTO** key (this will position the disk ahead by one field, changing the two field relationship). This function may be useful for animation applications.

6) TIME DISPLAY

This will determine whether the 5 digit control panel display will show the current disk position as a *TIMECODE* value, or as a *FRAMES* value. This will also determine how time numbers will be entered for various functions.

7) MARK OFFSET

This function allows "frame zero" to be redefined anywhere on the disk. The *TIME DIS-PLAY* function above must be set to the *FRAMES* mode. If not, there will be an error message displayed on the bottom of the screen, should an attempt be made to use this function.

The timecode display on the menu and preview monitors will not be affected by this redefining of frame zero, and will display the actual disk time.

The frames display on the control panel will continuously flash should the disk be positioned before this new "frame zero" point. The menu and preview monitors will indicate this condition by placing a minus sign in front of the frames value.

8) PVW DISPLAY POSITION

The A60's preview monitor output will have the disk time placed over it, this function will allow the positioning of that time.

9) INPUT SELECT

There are two video inputs into the A60, this will allow the selection of the one which is to be used by the system.

3.3.5 MACROS MENU

```
┌─────────────────────────────────────────────┐
│  ┌──────────┐                  ┌──────────┐  │
│  │ 0.13.00  │                  │   390    │  │
│  └──────────┘                  └──────────┘  │
│                                               │
│           #01 Step 01  ===end of macro===     │
│                                               │
│                  1) LIST                       │
│                                               │
│                  2) CREATE                     │
│                                               │
│                  3) STEP                       │
│                                               │
│                  4) EXECUTE                    │
│                                               │
│                  5) END                        │
│                                               │
│                  6) DELETE STEP                │
│                                               │
│                  7) INSERT STEP                │
│                                               │
│                  8) EDIT MACRO                 │
└─────────────────────────────────────────────┘
```
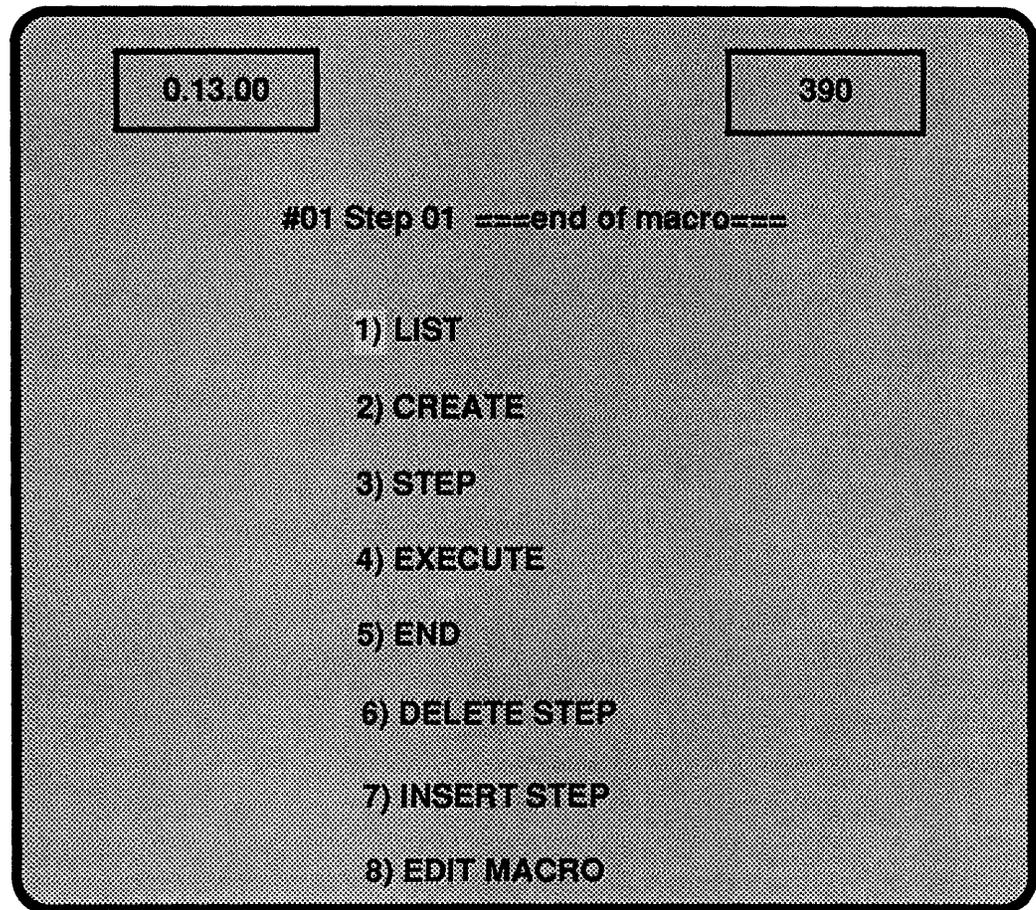
3.3.6 MACROS MENU LINES

The top line shows the number of the current macro, 1 through 12, the step, 1 through 50, and the function of that step. See the OPERATION section 4.5 for operational procedures for createing and using macros.

1) LIST

This will allow the examination of each step in a macro, without actually executing them. The trackball should be used to scroll through the steps.

2) CREATE

Selecting this will start the macro learning process.

3) STEP

This will allow the step by step executing of a macro, with the exception of any record instructions.

4) EXECUTE

This will run the macro at full speed, performing all instructions as they occur.

5) END

This should be selected to halt the macro learning process while in the *CREATE* mode.

6) DELETE STEP

This will allow a step to be removed from an existing macro. The *EDIT MACRO* mode, line 8, must be selected before this mode will work.

7) INSERT STEP

This will allow a step to be added to an existing macro. The *EDIT MACRO* mode does not need to be enabled first.

8) EDIT MACRO

This must be selected before line *6) DELETE STEP* will function.

3.3.7 REMOTE MENU

```
┌─────────────────────────────────────────────────────┐
│  ┌────────────┐                      ┌────────────┐   │
│  │  0.13.00   │                      │    390     │   │
│  └────────────┘                      └────────────┘   │
│                                                       │
│              1) REMOTE BAUD RATE: 9600 baud           │
│                                                       │
│              2) REMOTE PROTOCOL: PORT OFF             │
│                                                       │
│              3) EDIT FIELD: F2                        │
│                                                       │
│              4) TIMECODE TRIGGER: ??.??.??            │
│                                                       │
│              5) TAPE BACKUP LENGTH: 00000             │
│                                                       │
│              6) DISK RESTORE LENGTH: 00000            │
│                                                       │
└─────────────────────────────────────────────────────┘
```
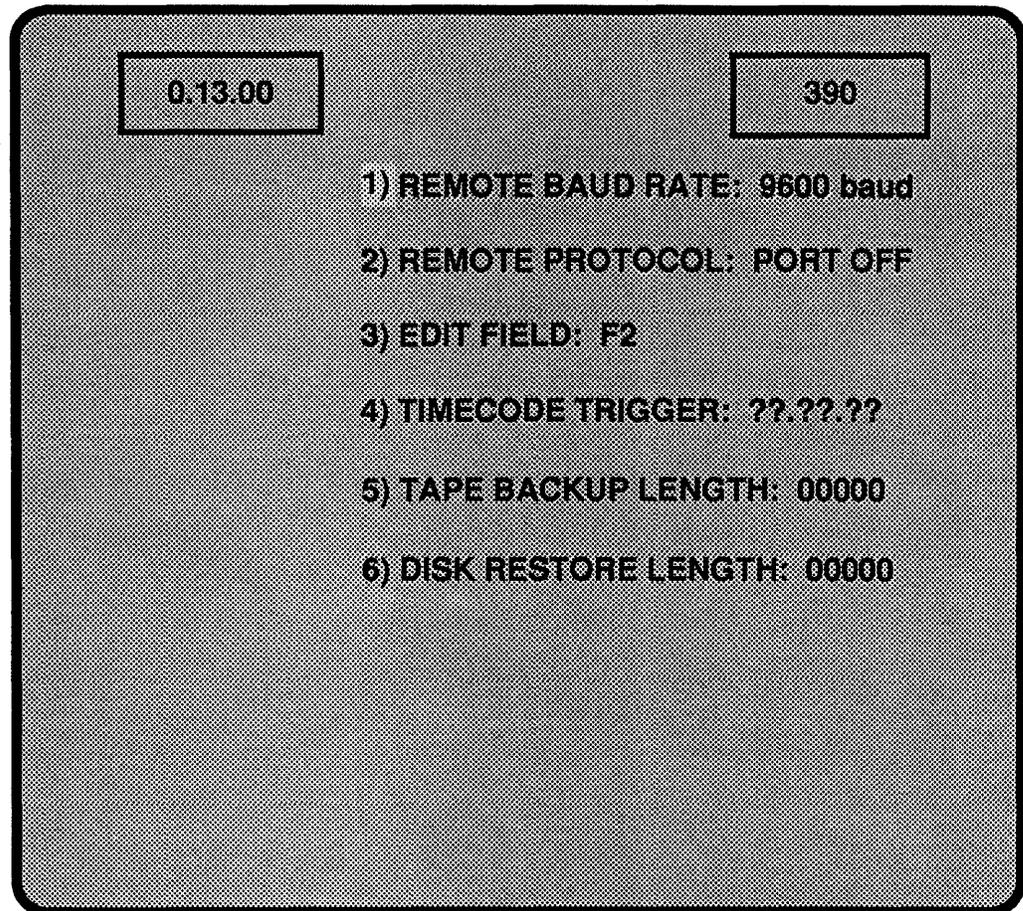
3.3.8 REMOTE MENU LINES

1) REMOTE BAUD RATE

Allows the selection of either **9600** or **38400** BAUD as the remote communications speed.

2) REMOTE PROTOCOL

PORT OFF

The remote port is inactive.

CMX I2 (CMX I-squared)

The remote port is configured to communicate with a CMX editor.

A53D

The remote port is configured to communicate with the Abekas A53D digital effects system.

SMPTE

The remote port is configured to communicate with a device supporting the SMPTE style protocol, such as the Ampex ACE or the GVG editing systems.

SONY

The remote port is configured to communicate with the Sony 900 or 9000 editing systems.

3) EDIT FIELD

This will set the A60's record field dominance, that is, which field of the frame that the recording will start on, when connected to an editing system. An editing system will typically specify a frame number as the point that the A60 should use for a particular function. The setting here will determine whether field 1 (*F1*) or field 2 (*F2*) of that frame is the precise point to be used. For example, a recording at 5 seconds will occur at either "5.00" for field one, or "5:00" for field two.

4) TIMECODE TRIGGER

A timecode time may be specified, such that when it and the timecode coming in through the timecode port in the back of the unit match, the A60 will perform the PLAY→ function.

If the system is armed for a recording (the RECORD key flashing), this function will cause the system to go into the record mode.

5) TAPE BACKUP LENGTH

This is used to determine how much of the disk should be sent to the 9-track streamer tape for back up. The maximum time with 3600' of tape is 10 seconds, with 2400' of tape 7 seconds may be expected. The density at the tape machine should be set to 6250 BPI (Bytes Per Inch).

6) DISK RESTORE LENGTH

This is used to determine how much of the streamer tape input is to be put to the disk.

3.3.9 DIAGNOSTICS MENU

```
┌─────────────────────────────────────────────────────┐
│  ┌──────────┐                          ┌──────────┐   │
│  │ 0.13.00  │                          │   390    │   │
│  └──────────┘                          └──────────┘   │
│                                                        │
│          KBD    HLC    LLC    RMT    GRP               │
│          00.00  00.10  00.10  00.10  00.10             │
│                                                        │
│                                                        │
│              1) Select Pattern:  Digital Test          │
│                                                        │
│              2) Write pattern                          │
│                                                        │
│                                                        │
│                                                        │
│          drv 0Y:  up              drv 0C:  up          │
│                                                        │
│          drv 1Y:  down            drv 1C:  down        │
│                                                        │
└─────────────────────────────────────────────────────┘
```
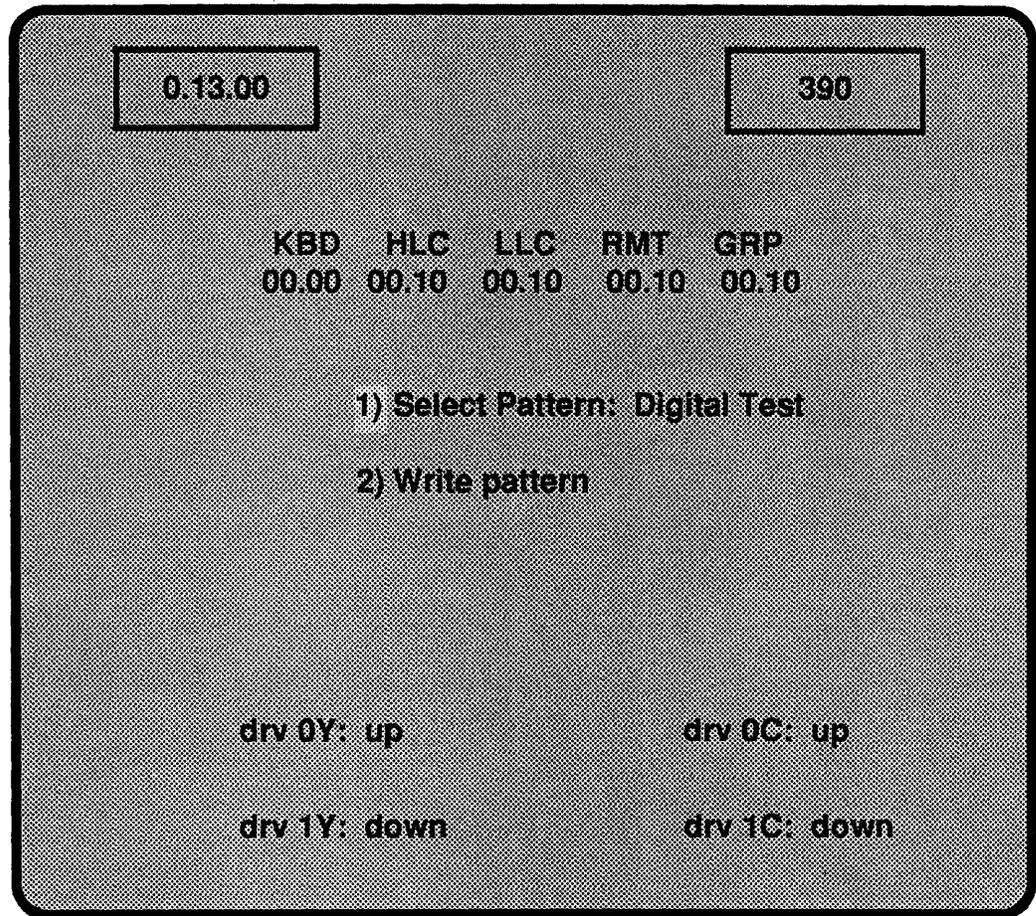
3.3.10 DIAGNOSTICS MENU LINES

The top of the monitor will show the level of software installed in the various locations of the A60.

1) Select Pattern

These are various digitally generated video test signals that are useful for system alignment and troubleshooting. The pattern selected will not appear until the next line, *WRITE PATTERN*, is selected and entered.

Digital Test

100% Combo

95% Combo

75% Combo

100% Bars

95% Bars

75% Bars

Linear Ramp

Modulated Ramp

Ten Step

*Crosshatch*

2T Pulse

Pluge

Multiburst

Bowtie

2) Write Pattern

This will write the above selected pattern into the framestore, and automatically enable the **FREEZE** mode. Pressing the **FREEZE** key will cause the video to revert to off disk.

The bottom of the monitor will show the status of the disk drives, *0Y* and *0C* refering to the drives supplying the first 25 or 30 seconds of video, *1Y* and *1C* refering to the optional drive chassis supplying the additional 25 or 30 seconds. "*UP*" indicates that the drive is running, "*DOWN*" indicates that it is not running , is not up to full speed, or is not present, "*UN-LOCKED*" indicates that the drive is close to full speed, and "*LOCKING*" indicates that the drive is in the final stages of attaining the "*UP*" status.

3.3.11 GPI MENU

```
┌─────────────────────────────────────────────────┐
│  ┌──────────┐                      ┌──────────┐  │
│  │ 0.13.00  │                      │   390    │  │
│  └──────────┘                      └──────────┘  │
│                                                   │
│           1) GPI 1 INPUT:  STOP                   │
│                                                   │
│           2) GPI 2 INPUT:  RUN REV                │
│                                                   │
│           3) GPI 3 INPUT:  RUN FWD                │
│                                                   │
│           4) GPI 4 INPUT:  RECORD                 │
│                                                   │
│           5) GPI 1 OUTPUT              (X)        │
│                                                   │
│           6) GPI 2 OUTPUT                         │
│                                                   │
│           7) GPI 3 OUTPUT                         │
│                                                   │
│           8) GPI 4 OUTPUT                         │
│                                                   │
└─────────────────────────────────────────────────┘
```
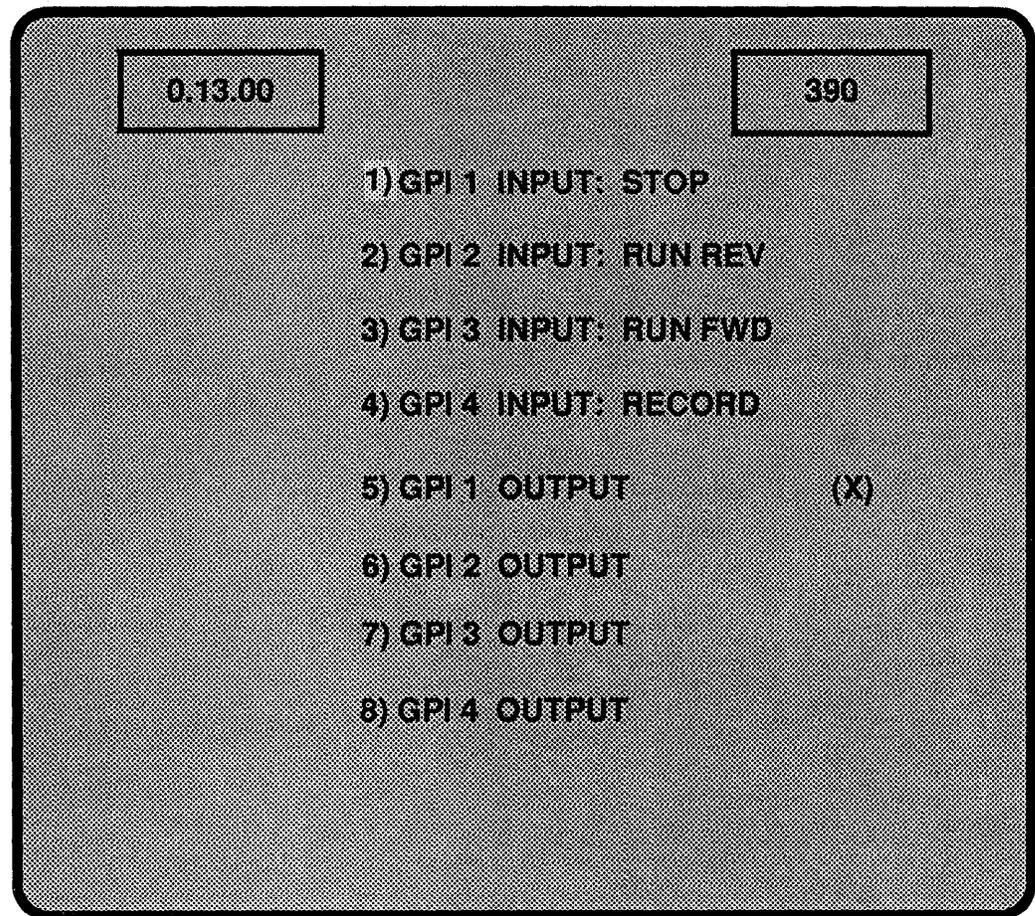
3.3.12 GPI MENU LINES

The first four menu lines are inputs to the system, and are assigned the default functions of **STOP, RUN REV, RUN FWD**, and **RECORD**. These may be assigned by the operator to trigger the running of a particular macro.

The second four menu lines are outputs, and are to be used with the macros to provide a switch closure to an external device. An "X" will flash next to one of these as a pulse is sent out.

See the REMOTE OPERATION section for more information on the usage of GPIs.

3.3.13 RECORD LOCKOUT MENU

```
┌─────────────────────────────────────────────┐
│  ┌──────────┐                    ┌──────────┐ │
│  │ 0.13.00  │                    │   390    │ │
│  └──────────┘                    └──────────┘ │
│                                               │
│          NO LOCKED SEGMENTS DEFINED           │
│                                               │
│                                               │
│            1) INSERT SEGMENT                  │
│                                               │
│            2) DELETE SEGMENT                  │
│                                               │
│            3) LIST SEGMENTS                   │
│                                               │
└─────────────────────────────────────────────┘
```
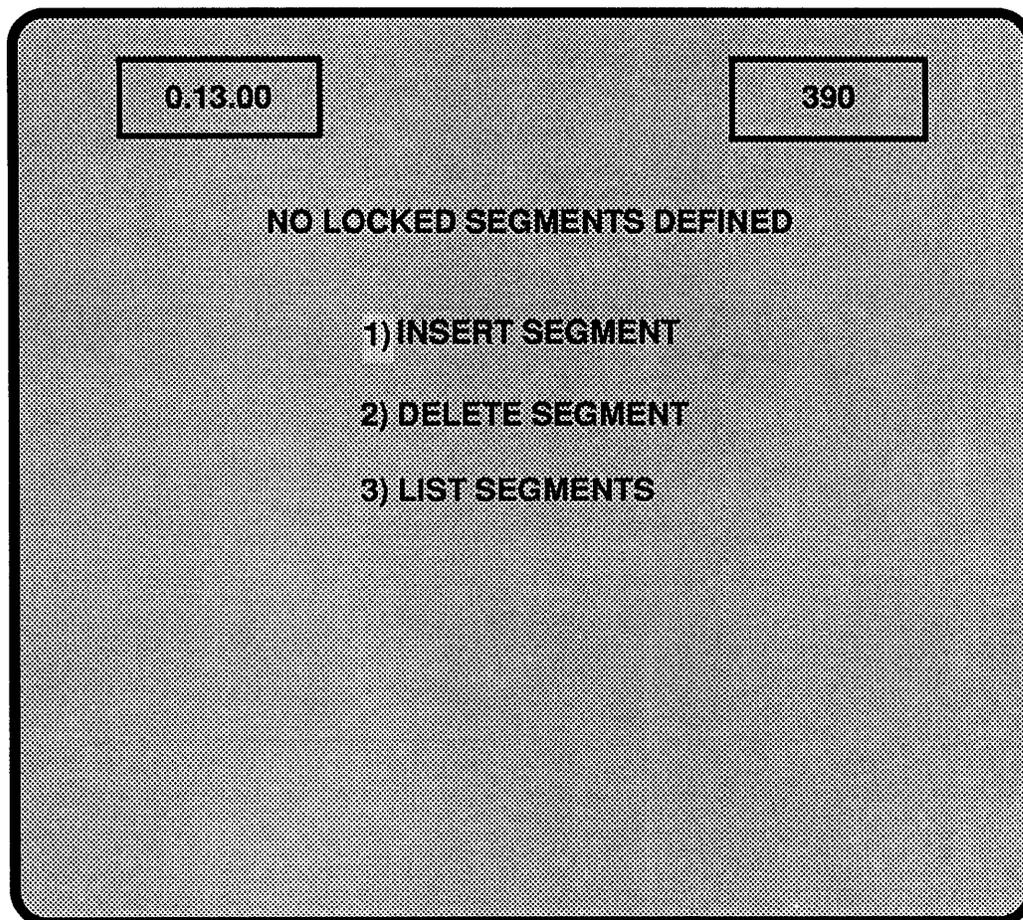
3.3.14 RECORD LOCKOUT MENU LINES

The top of the display will indicate any record lockout segments that exist (maximum of two lines will show), or will state that none have been defined. Refer to the OPERATION section 4.3 for operational procedures in using this funtion.

1) INSERT SEGMENT

Used with the **IN** and **OUT** keys to create a lockout segment.

2) DELETE SEGMENT

Will delete the top lockout segment that is showing. In addition, a range of time as specified by the **IN** and **OUT** points may have the lockout function removed.

3) LIST SEGMENTS

Will allow the listing of all of the record lockout segments, two at a time, at the top of the screen. The trackball should be used to scroll through them.

3.3.15 MISCELLANEOUS MENU

```
 0.13.00                                    390


             1) VITC line 1        18

             2) VITC line 2        19

             3) TCP/IP  DEBUG  00

             4) IP ADDRESS   000.000.000.000

             5) SYNC ADVANCE OFF
```
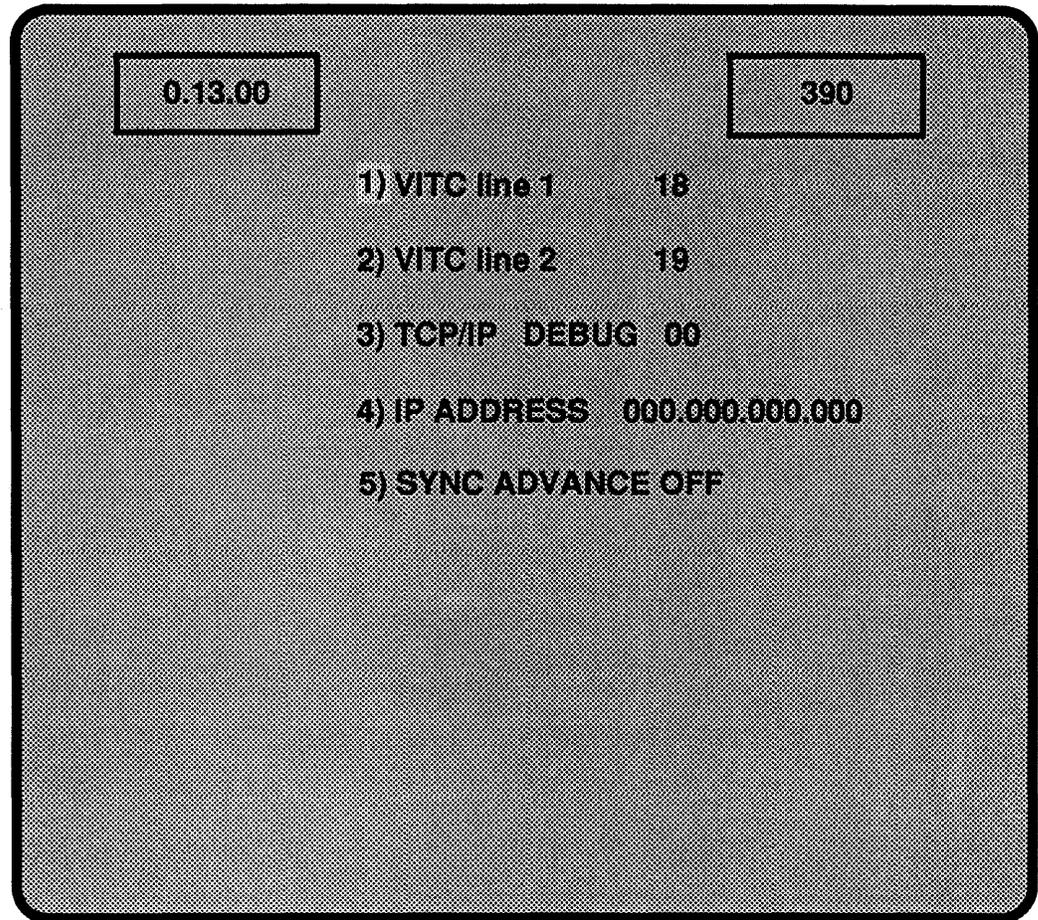
3.3.16 MISC MENU LINES

1) VITC line 1

Allows the choice of a line (12 through 20) in the vertical interval to be recorded and played back with the video. A typical use would be to retain the first line of VITC (Vertical Interval Time Code) from a tape source.

2) VITC line 2

The same as above, but for VITC line 2. Typically line 2 is placed 2 lines from the first line (e.g. line 1 on line 15, line 2 on line 17).

3) TCP/IP DEBUG

This allows the entering of an Ethernet TCP/IP (Transmission Control Protocol/ Internet Protocol) maintenance routine. These routines work in conjunction with an external device that connects to the computer board

4) IP ADDRESS

This allows the Internet Protocol address to be specified for this particular A60, and must be specified for communications to occur on the Ethernet network.

The number must be entered in two sections, the left six numbers first, followed by the next six numbers. For example, to enter the number "192.9.200.5", the number 192.009 must first be selected at the numeric keypad, (note the leading zeros and the decimal point, they must be included). Pressing the ENTER key will now enter this as the first six digits. The number 200.005 may now be selected and entered to complete the process.

The section titled REMOTE OPERATION will have more information on the Ethernet system. Also see the A60 ETHERNET MANUAL for more detailed information.

5) SYNC ADVANCE OFF

This will indicate the status of the A60's computer board switch 18K section 3, which determines whether the A60's output will be in time with the reference (set to OFF), or one line early (set to ON). The advanced sync is required when using an encoder that will add a delay of one line during the processing of the video. This menu line is strictly to display the status of this mode, and can not be used to change it.

3.3.17 SEGMENTS PLAY MENU

```
┌─────────────────────────────────────────────┐
│  ┌───────────┐                 ┌───────────┐ │
│  │  0.13.00  │                 │    390    │ │
│  └───────────┘                 └───────────┘ │
│                                               │
│              NO SEGMENTS DEFINED              │
│                                               │
│               1) INSERT SEGMENT               │
│                                               │
│               2) DELETE SEGMENT               │
│                                               │
│               3) COPY SEGMENTS                │
│                                               │
│               4) SEGMENT SPEED                │
│                                               │
│               5) SEGMENT PAUSE                │
│                                               │
│              00 SEGMENTS DEFINED              │
│                                               │
└─────────────────────────────────────────────┘
```
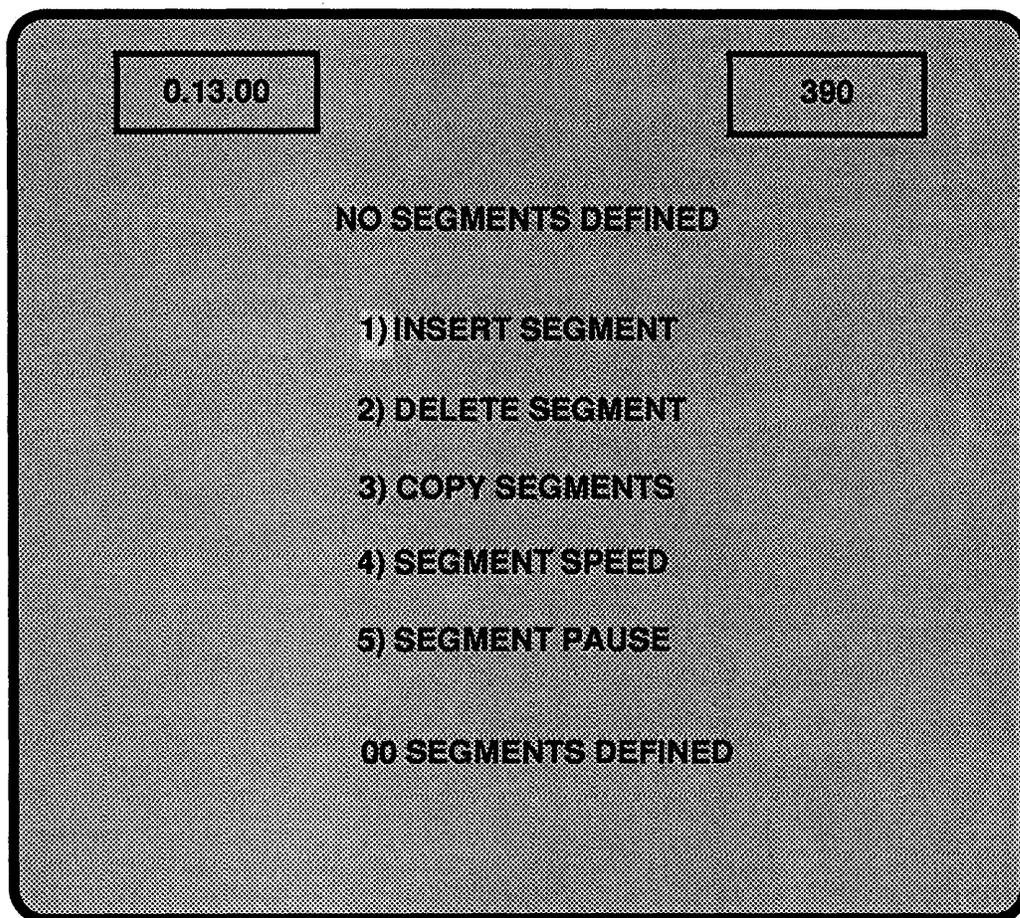
3.3.18 Segs Play Menu Lines

This menu is attained by selecting the **SEGS PLAY** key. See the OPERATION section 4.4 for procedures in using this function.

The top portion of the screen is a window that will show two segments. The trackball may be used to scroll through all of the segments present.

1) INSERT SEGMENT

To be used with *COPY* or *DELETE SEGMENT* functions to instruct the system where to place a segment that has been copied or deleted. This is not for creating new segments.

2) DELETE SEGMENT

This will delete the highlighted segment. A deleted segment is held in memory temporarily, and may be recalled by selecting *INSERT SEGMENT*.

3) COPY SEGMENT

This will make a copy of the highlighted segment, or of a segment specified by the numeric keypad. This copied segment will not appear until *INSERT SEGMENT* has been selected to place the copied segment.

4) SEGMENT SPEED

This will allow the speed of a particular segment to be specified, using the numeric keypad.

5) SEGMENT PAUSE

This will specify that a pause in the running of a list of segments should occur at the end of this segment. The segments playback may be restarted by selecting the proper transport function key.

The bottom of the menu monitor will note the total number of segments that have been defined.

3.4 The Timecode and Frame Numbers

3.4.1 The Control Panel Display

The control panel 5 digit display can show the disk position in either a timecode (minutes, seconds, frames) style or in frames. To change the display to the alternate style, follow the steps below.

CONTROL PANEL DISPLAY SELECTION.

Step 1 Press the NORM PLAY key, if necessary, to bring up the *HOME* menu.

Step 2 Press the MENU key, if necessary, to position the cursor on *1) Setup* and press ENTER, or select the number 1 on the keypad, and press MENU.

Step 3 Press the MENU key as required to position the cursor on *6) TIME DIS-PLAY*.

Step 4 Press the ENTER key to toggle to the alternate display style.

The display will indicate whether the current field is field one or field two of the current frame in one of two ways. Should the display be in the timecode mode, field one will be indicated by a single dot separating the groups of digits, field two will have two dots. Should the display be in the frame mode, field one will have no dot, field two will have one dot in the lower right corner.

3.4.2 The Menu Monitor Display

At all times, the menu monitor will show the current disk time in both timecode and frames. The timecode number will indicate the current field as is done on the control panel display, the frame number will indicate field two by placing a "+" after it.

3.4.3 The Preview Monitor Display

The preview monitor output of the A60 will display the current disk time in both styles, the timecode mode indicating fields as above, the frames display does not indicate which field is present. The time display may be positioned on the preview monitor by following the steps below.

POSITIONING THE PREVIEW MONITOR TIME DISPLAY.

Step 1 Press the numbers 1 and 8 on the keypad, followed by the MENU key. This will select the *SETUP* menu, and will position the cursor on line 8 *PVW DISPLAY POSITION*.

Step 2 Press the ENTER key to cause the time display to be repositioned. Each press will cause the time display to move down, once at the bottom it will jump back to the top of the preview monitor screen. The ENTER key may be held down to cause a repeat function, releasing the key once the display is correctly positioned.

Section 4: OPERATION

4.1 Playback Functions

The playback functions rely on a basic knowledge of the A60 controls and menu monitor usage. Section 3 "FAMILIARIZATION" should be consulted if necessary.

The INSTALLATION GUIDE in the back of this manual should be consulted if there are any questions as to how the A60 should be connected into your system.

Ensure the **NORM PLAY** key is lit for the following functions.

4.1.1 OUTPUT MONITORING

There are two video outputs from the system, a program output and a preview output. The program output is the main output, and should be dealt with as such. The preview output is essentially the same, with the addition of the disk position numbers (timecode and frames) being superimposed over it (see section 3.4 for information on positioning these numbers on the screen).

4.1.2 FIELD OR FRAME OUTPUT

When the A60 is stopped, either a frame or a field may be displayed on the output. To choose the desired output, proceed as follows.

SETTING THE MACHINE MODE.

Step 1   Select the *Setup* line of the *HOME* menu, and press **ENTER**.

Step 2   Select line 5, *MACHINE MODE*, and press **ENTER** to select the desired mode.

FIELD

When in the field mode, only the current field will be the output to the monitor. This is useful when the video to be played back has a significant amount of motion, which may yield unacceptable amounts of interfield flicker should either of the frame modes be used.

FRAME

When in this mode, the current field plus the next sequential field will be displayed. Using **JOG** or the trackball will cause the disk to be scanned at one field increments.

AUTO FRAME

This mode is useful when frame animation has been recorded onto the A60, as it will continue to keep the fields aligned as they were when *AUTO FRAME* was selected, even when using the **JOG** mode or the trackball to scan the disk. In other words, the field type displayed (field one or two), will always be displayed, and the **JOG** and trackball will actually move the disk a frame at a time. The two field alignment may be changed by pressing the +/- key, the **FIELD** key, then the **GOTO** key (this will position the disk ahead by one field). The following drawing may help to visualize this.

AUTOFRAME MODE EXAMPLES

FRAME		FRAME		FRAME		FRAME	
Fld 1	Fld 2	Fld 1	Fld 2	Fld 1	Fld 2	Fld 1	Fld 2

Output Frame   Output Frame   Output Frame   Output Frame

Timecode will
show field one:
1.00
1.01
1.02
etc.

FRAME		FRAME		FRAME		FRAME	
Fld 1	Fld 2	Fld 1	Fld 2	Fld 1	Fld 2	Fld 1	Fld 2

Output Frame   Output Frame   Output Frame

Timecode will
show field two:
1:00
1:01
1:02
etc.
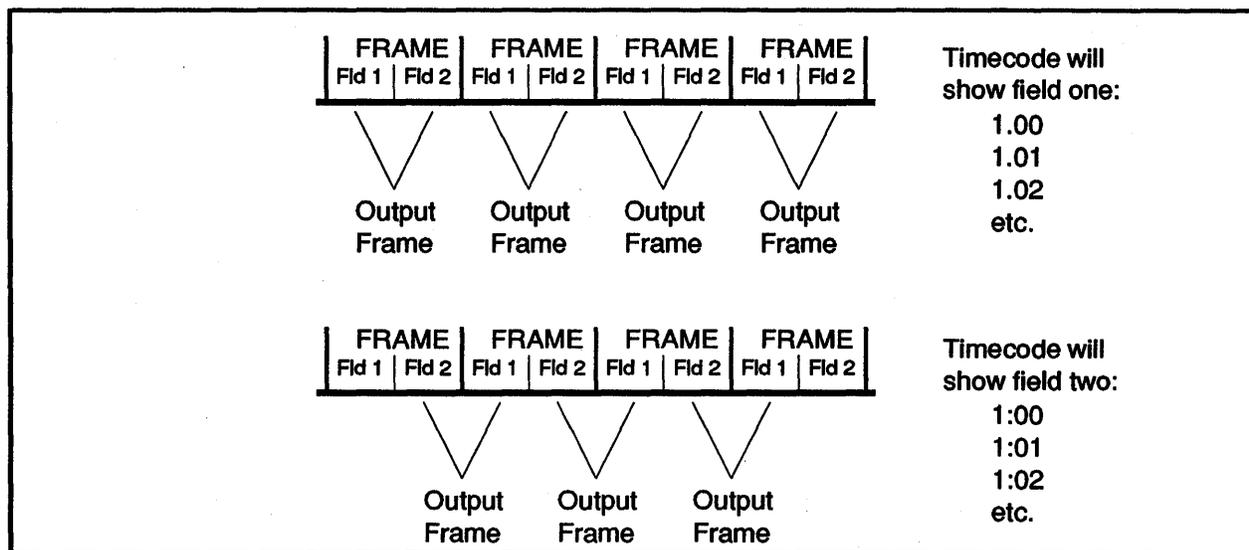
4.1.3 INTERPOLATOR MODES

The Interpolator function setting will affect the output of the A60 at all times, except at the normal play speed (one times forward). Its affect will generally be most noticable when in still motion with field mode selected, or in the freeze mode with field selected, or when playing at a speed close to one times forward. To change its setting, proceed as follows.

CHANGING THE INTERPOLATOR MODE.

Step 1 Select the *Setup* line of the *HOME* menu, and press **ENTER**.

Step 2 Move the cursor to line 3, *INTERP ON/OFF*, and press **ENTER** to select the desired mode.

ON

Whenever it is necessary for the A60 to create a field to be sent to the monitor, such as in the freeze mode with field selected, or when playing at any speed other than +/-1 times play, the A60 will create the next field using an averaging method that could make the output subjectively better looking, with smoother diagonal transitions. There may be a noticable reduction in the sharpness of the fine detail while this is on.

OFF

The A60 will simply take the current field and make it the next field as well, whenever it encounters the above situations.

4.1.4 PLAY MODES

The forward and reverse **PLAY** keys provide real-time playback of recorded video.

Pressing the **PLAY→** key, while in the **NORMAL PLAY** mode, will playback video at a normal real-time rate from the current position of the disk forward. The menu monitor will show "01.000", and the A60 will continue to play until the end of the time available on the disk(s) arrives, at which point it will go into the **STOP** mode.

Pressing the ←PLAY key will perform as above, except going in the opposite direction. The menu monitor will display "-01.000".

Pressing the STOP key will cause any playback to halt.

The PLAY speed may be altered from its normal value, by selecting the desired speed at the numeric keypad before pressing one of the PLAY keys. The acceptable range is +/- 30 times play speed, with 0.001 (1.8 frames per minute 525, 1.5 frames per minute in 625) being the slowest speed available.

EXAMPLE: To playback at a speed of 1.5 times normal.

Step 1   Type in 1.5 at the numeric keypad.

Step 2   Press the PLAY→ key.

The menu monitor will display "01.500" during playback. Pressing the ←PLAY key in step 2 would have caused the playback to go in the reverse direction, and the menu monitor to display "-01.500".

Once playing back at the selected speed has concluded, either by reaching the end of the disk or pressing the STOP key, the play speed will revert to the normal speed of +/- 1.000, the next time that the PLAY mode is selected.

4.1.5 THE VAR PLAY KEY

The VAR PLAY key has the same speed limits as the PLAY keys, with the following differences in their application. The direction of the speed must be specified at the keypad with the +/- key. The VAR PLAY key will remember the last speed used, with the exception of when either end of the disk is reached, at which time the preset speed will change to 0.000.

The VAR PLAY speed may be altered with the trackball while the A60 is playing back in the VAR PLAY mode.

4.1.6 THE JOG KEYS

The forward or reverse jog keys will provide a field or frame step function through the recorded video. The *MACHINE MODE* setting (*Setup* menu, line 5) will determine whether the increment will be a field at a time (*FIELD* or *FRAME* selected), or a frame at a time (*AUTO FRAME* selected).

4.1.7 THE GOTO KEY

The GOTO key is used to instantly access the video at a specific timecode or frame number. The number used must be of the same type as the control panel is displaying (timecode or frames), and should be selected at the numeric keypad. Pressing GOTO once the number is selected will cause the disk to move, instantaneously, to the selected position.

4.1.8 THE LOOP KEY

The loop function provides a continuous playback loop of a given section of video on the disk. The video to be played back in the loop is specified by using the IN and OUT keys, or by simply typing the loop duration.

EXAMPLE: Creating a playback loop using the IN and OUT keys.

Step 1 Using the trackball or the numeric keypad, position the disk to the desired start point of the loop.

Step 2 Press the **IN** key.

Step 3 Position the disk at the desired end point of the loop.

Step 4 Press the **OUT** key.

Step 5 Press the **LOOP** key.

The A60 will now run this loop if either of the **PLAY** keys are pressed, or if the **VAR PLAY** mode is selected. The **STOP** key should be pressed to stop the loop. The loop function is active as long as the **LOOP** button is lit.

EXAMPLE: Creating a playback loop with a specified duration.

Step 1 Position the disk at the starting point by using either the **GOTO** key or the trackball.

Step 2 Type the duration of the loop on the numeric keypad.

Step 3 Press the **LOOP** key.

The A60 will now run the loop as in the previous example.

Once a loop has been defined, and while the **LOOP** key is lit, the A60 in all playback modes will remain within the boundries of the loop. This includes when using the trackball.

4.1.9 TRIMMING LOOPS

A loop may be trimmed in one of three ways. A new **IN** or **OUT** point can be entered directly, or the **TRIM** key may be used as below.

EXAMPLE: Trimming a loop with the TRIM key and the numeric keypad.

Step 1 Define a loop using either of the previous examples.

Step 2 Select the **TRIM** key (it will start flashing), and on the numeric keypad press the +/- key to determine the trim direction.

Step 3 Using the numeric keypad, type in the amount of the trim, and select the **IN** or **OUT** point to be trimmed.

> **Keep in mind, that when using the trim function, the +/- key must be selected, or instead of a trim, an entry of an absolute value will take place.**

EXAMPLE: Trimming a loop with the TRIM key and the trackball.

Step 1 Define a loop.

Step 2 Press the **TRIM** key. This will cause it to start flashing, and now the trackball can be used to position the disk to points outside the loop boundries.

Step 3 Position the disk to a point after the loop out point, and press the **OUT** key.

These same steps may be used to change the **IN** point, by using the **IN** key in place of the **OUT** key.

The last field of a loop will define the end of the loop, but will not actually be played as part of the loop.

4.2 Recording Functions

4.2.1 VIDEO INPUT SELECTION

There are two CCIR 601 video inputs provided in the back of the A60. To select the input desired, follow the steps below.

SELECTING THE VIDEO INPUT.

Step 1   Select the *Setup* line of the *HOME* menu, and press **ENTER**.

Step 2   Select line 9, *INPUT SELECT*, and by pressing **ENTER**, select the desired video input.

4.2.2 SIMPLE RECORDING

The VIDEO IN key is a toggle function, presing it will cause it to change its status as will be indicated by its light. When the light is on, the A60 will allow the incoming video to be viewed prior to recording. In order to see the disk video, the **VIDEO IN** key must not be lit.

A recording length must be specified, unless the previously used recording length is satisfactory. To specify a recording length, select a value at the numeric keypad before pressing the **RECORD** key.

EXAMPLE: To RECORD for 10 seconds.

Step 1   Position the A60 to the point where the recording is to begin.

Step 2   Select a value of 10 seconds at the numeric keypad. (Remember, the control panel display determines whether time or frames can be entered).

Step 3   Press the **RECORD** key. This will arm the A60 for recording, but not actually start the process.

Step 4   Press the **PLAY→** key. This will start the A60 recording. The record length should be displayed on the menu monitor during the recording process.

After recording, the A60 will be correctly positioned for the next recording, making it easy to assemble a video sequence on to the disk.

4.2.3 FIELD AND FRAME RECORD LENGTHS

To record a single field, simply press the **FIELD** key as the record length. This will be displayed on the menu monitor as " :00" (timecode) for the record length (seen once the **RECORD** key is pressed). This display may be interpreted as zero frames (" .00") plus one field. A colon in the record length always indicates that an extra field will be recorded.

To record a single frame, simply type "1" on the keypad, the menu monitor display will show " .01" for the record length.

To record 3 fields, type "1" on the keypad followed by the **FIELD** key. The menu monitor will display " :01" for the record length.

4.2.4 CALCULATE RECORD LENGTH MODE

To perform insert recordings more easily, a calculate mode is provided on the A60.

The calculate mode allows the **IN** and **OUT** points of a recording to be set using the **IN** and **OUT** keys. The A60 will park at the in point once the **RECORD** key is selected, and will calculate the record length based on the difference of the two points.

EXAMPLE: To use the calculate mode.

Step 1   Select an in point either with the keypad, or use the trackball to position at the desired point, and press the **IN** key.

Step 2   Select an out point as above, using the **OUT** key.

Step 3   Press the **RECORD** key. The record length should now appear on the menu monitor, and the disk will position itself at the **IN** point.

Step 4   Press the **PLAY**→ key to perform the recording.

4.3 RECORD LOCKOUT Mode

4.3.1 RECORD LOCKOUT SEGMENTS

The record lockout function allows segments of video to be locked out from accidental recordings. A recording may be started on a section of video that is not locked out, and continue over a section that is locked out. The LED on the **RECORD** key will only be illuminated when actual recording is taking place, turning it off for the locked out portion of the disk. Multiple segments may be locked out.

RECORD LOCKOUT MENU

```
  0.13.00                                  390


         RCRD LOCK  0.02.00  →  0.03.00
                     END OF LIST


              1) INSERT SEGMENT

              2) DELETE SEGMENT

              3) LIST SEGMENTS
```
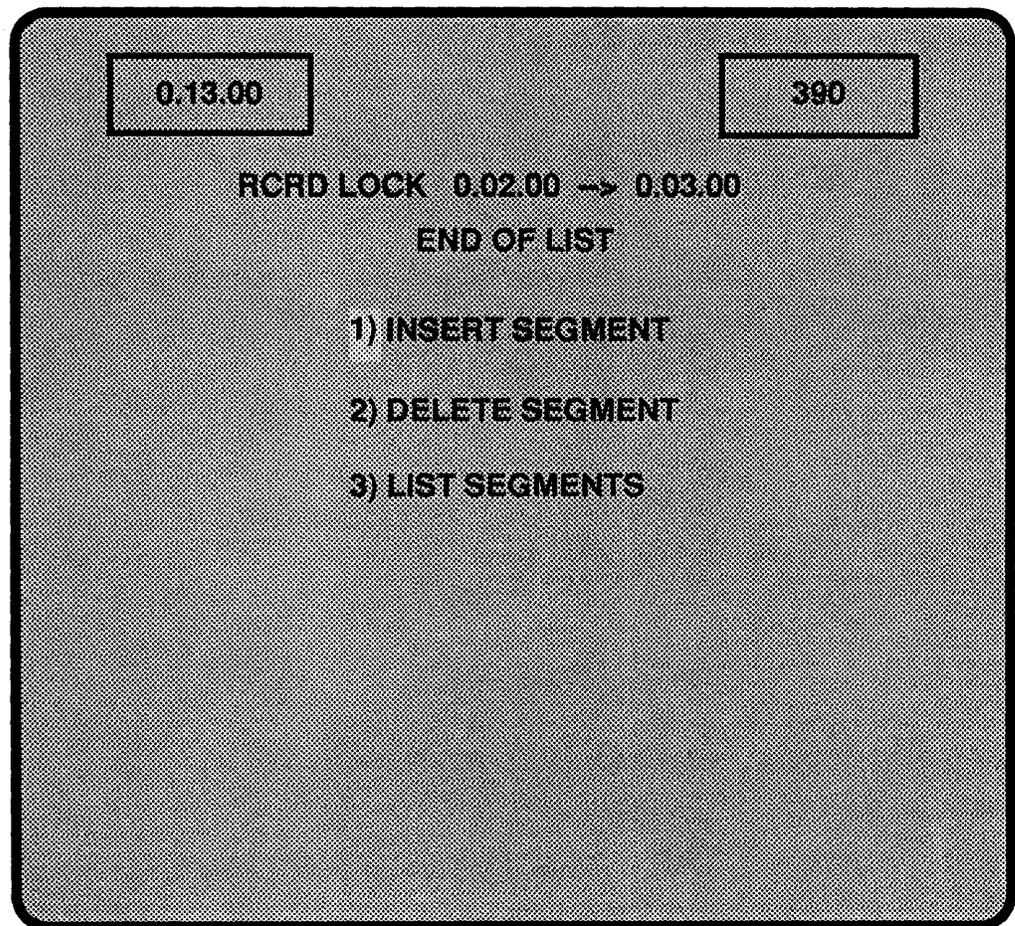
4.3.2 CREATING A LOCKOUT SEGMENT

EXAMPLE: Creating a record lockout segment.

Step 1   Press the number 6 on the keypad, and then the MENU key. This will call up the record lockout menu, which initially should say "NO LOCK-ED SEGMENTS DEFINED". If not, put the cursor over *2) DELETE SEGMENT*, and press the ENTER key until it is indicated that no more segments exist.

Step 2   Place the cursor on *1) INSERT SEGMENT*.

Step 3   Locate a starting point using either the trackball or the GOTO key, and press the IN key.

Step 4   Locate an ending point as above, pressing the OUT key.

Step 5   Define this as a record lockout segment by now pressing the ENTER key (the cursor should still be sitting on *1) INSERT SEGMENT*).

Step 5   Further segments may be defined in this manner, if needed.

Step 6   The record lockout segments may now be listed by placing the cursor on *3) LIST SEGMENTS*, and pressing ENTER. The trackball may be used to scroll through the segments.

4.3.3 DELETING A LOCKOUT SEGMENT

The *DELETE SEGMENT* function will delete the top record lockout segment that is displayed.

A range of time may have the *RECORD LOCKOUT* function removed, by specifying an IN point and an OUT point before selecting the *DELETE SEGMENT* mode.

EXAMPLE: To turn the LOCKOUT function off for the entire disk.

Step 1   Type "0" then press the IN key.

Step 2   Type "2500", then press the OUT key. If frames are currently being displayed on the control panel, then the number "750" should be selected as the OUT point. Should the system have the optional additional disk drive, then "5000" for timecode or "1500" for frames should be entered. For a 625 A60, the number keyed in for a 30 second version will be "3000" for timecode display, or "750" for frames. The 60 second version should have the number "6000" for timecode and "1500" for frames display selected as the OUT point.

> **NOTE: The out point of a lockout segment is inclusive, unlike the out point of a regular segment.**

4.4 SEGMENT PLAY Mode

4.4.1 SEGMENT LIMITS

The segment play mode allows the creation of a random playback list of segments, each with its own in and out point, and with its own unique speed, if desired.

A maximum of 99 segments may be programmed at one time, however there are a few other limitations.

A single disk system (the 25 or 30 second version of the A60), will generally need to freeze the output video while the disk drive is seeking from the end of one segment to the start of the next. The maximum amount of time for this is 2 frames, the actual amount will depend on how far it must seek.

A two disk system (the 50 or 60 second versions), within certain limits, will not have this problem. A maximum of 24 segment starts per disk (48 total) will perform seamless transitions between segments. The disk from which a segment will start is determined by the IN point timecode. "00.00.00" to "00:24:29" would be disk one in a 525 system, anything above this would be disk two. The 625 limits would be from "00.00.00" to "00:29:29" for disk one. Any segments above the limit of 24 on a drive will have the possibility of a freeze taking place, as in the single disk system.

4.4.2 DEFINING SEGMENTS

The **NORM PLAY** mode must be active in order to define a segment. A segment is defined by selecting an **IN** and an **OUT** point, and then pressing the **SEG** key.

EXAMPLE: Defining a segment.

Step 1   Ensure the **NORM PLAY** mode is active.

Step 2   Using the trackball or **GOTO** key, select the desired start point of the segment.

Step 3   Press the **IN** key to define this as the start point.

Step 4   Now position the disk for the end point.

Step 5   Press the **OUT** key to define this as the out point of the segment.

Step 6   Press the **SEG** key. The bottom of the menu monitor will flash that a segment has now been defined, as well as the number of that segment.

Step 7   Repeat until there are several segments defined.

4.4.3 THE SEGMENTS PLAY MENU

Selecting the **SEGS PLAY** key will bring up the *SEGMENTS PLAY* menu. The top of the display will show a maximum of 2 segments, using the trackball will scroll through the other segments. The bottom of the screen will show the total number of segments present.

To now play the list of segments, select either of the **PLAY** keys, the **VAR PLAY** function, or use the trackball to scan through the segments. Playback will commence from the point that the A60 is parked at.

4.4.4 THE GOTO KEY AND SEGMENTS

The **GOTO** key may be used to move the disk to the start of a specific segment, by first selecting that segments number with the numeric keypad, and then pressing the **GOTO** key.

4.4.5 LOOPING SEGMENTS

The **LOOP** key may be used to get the system to continually playback a series of segments.

EXAMPLE: Creating a segment loop.

Step 1   Type in the segment number to start from.

Step 2   Press the **IN** key.

Step 3   Type in the segment number that is to be the last of the loop.

Step 4   Press the **OUT** key.

Step 5   Press the **LOOP** key.

When the segments are started playing, using either of the **PLAY** keys or the **VAR PLAY** key, they will continuously loop until the **STOP** key is pressed.

4.4.6 USING THE SEGMENTS PLAY MENU

The menu lines allow changes to the segment list to take place, however, new segments may not be created (with the exception of the *COPY SEGMENT* line).

The following menu lines will affect the top segment (shown highlighted), that is being displayed.

1) INSERT SEGMENT

This menu line will allow a previously deleted segment to be re-inserted at a different location in the segment list. The segment will be placed before the highlighted segment.

2) DELETE SEGMENT

This menu line will be used to delete or move a segment. A segment that is deleted will be retained in memory, and may be placed elsewhere in the list by scrolling to the desired location (using the trackball), and selecting the *INSERT SEGMENT* line.

3) COPY SEGMENT

This will make a copy of a segment, which may be placed elsewhere in the segment list by using the trackball or the **GOTO** function and the *INSERT SEGMENT* menu line.

4) SEGMENT SPEED

The speed of a segment is by default the normal play speed, the reverse direction will be assumed if the **IN** point of the segment occurs after the **OUT** point. Using this menu line, the actual speed may be altered for a particular segment, by selecting the new speed on the

keypad and pressing **ENTER** (assuming the cursor is sitting on the *SEGMENT SPEED* line).

5) SEGMENT PAUSE

A pause may be placed at the end of a segment by using this menu line. Once the system has paused, it may be re-started by pressing any of the keys normally used to start a segment play operation. In addition, the **JOG→** key may be pressed to cue the A60 to the start of the next segment, without actually running it.

SEGMENTS PLAY MENU

```
┌─────────────┐                    ┌─────────────┐
│   0:13.00   │                    │     390     │
└─────────────┘                    └─────────────┘

       02  IN 0:23 09   OUT 0:24:29   SPD:  01.000

           END


               1) INSERT SEGMENT

               2) DELETE SEGMENT

               3) COPY SEGMENTS

               4) SEGMENT SPEED

               5) SEGMENT PAUSE


               02 SEGMENTS DEFINED
```
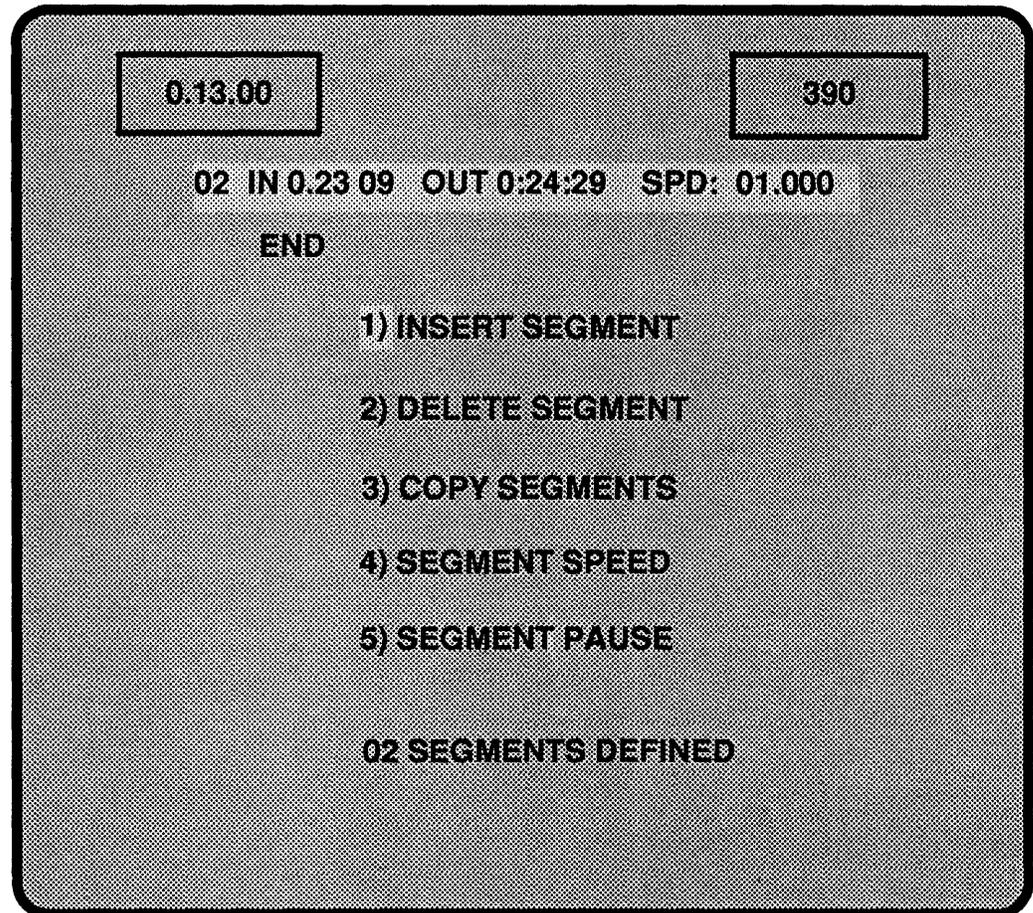
4.4.7 SEGMENT EXAMPLES

For the following examples, please create a list of 5 or more segments.

4.4.8 DELETING AND MOVING SEGMENTS

EXAMPLE: Deleting a segment.

Step 1 Position the disk, using either the trackball or the GOTO key, to the segment to be deleted.

Step 2 Position the cursor over *2) DELETE SEGMENT*, and press the ENTER key.

This will have deleted the highlighted segment. The A60 will hold this segment in memory, until it is recalled using the *INSERT SEGMENT* menu line, or another segment is deleted.

EXAMPLE: Moving a segment.

Step 1 Delete a segment as in the above example.

Step 2 Position the segment list to another location. The next step will take the segment that was deleted and place it before this highlighted segment.

Step 3 Move the cursor to *1) INSERT SEGMENT*, and press the ENTER key.

The deleted segment will now appear inserted with the number of what was the highlighted segment, and all following segments have their numbers increased by one.

A group of segments may be deleted, however, only the last segment of the group will be retained in memory. An exception is if all segments are deleted, at which point no segments are retained in memory.

EXAMPLE: Deleting a group of segments.

Step 1 Select the number of the first segment in the group to be deleted with the numeric keypad, and press IN.

Step 2 Select the number of the last segment in the group, and press OUT.

Step 3 Position the menu cursor over *2) DELETE SEGMENT*, and press ENTER.

4.4.9 COPYING SEGMENTS

Segments may be copied one at a time (a group copy function is not possible).

EXAMPLE: To copy a segment.

Step 1 Position the segment list so that the desired segment to be copied is high-lighted.

Step 2 Position the menu cursor over *3) COPY SEGMENTS*, and press the ENTER key.

Step 3 Re-position the segment list to the point where the copied segment should be placed. The copied segment will be placed in front of this highlighted segment, and will assume its number. The segments following will have their numbers increased by one.

Step 4 Place the menu cursor over *1) INSERT SEGMENT*, and press ENTER.

4.4.10 SEGMENT SPEED

The speed of a segment is assumed to be the normal one times play speed. Should an **IN** point be placed after an **OUT** point, a speed of -01.000 will be assumed. The speed of a segment may be altered using the *SEGMENT SPEED* function.

EXAMPLE: Modifying a segments speed.

Step 1 Position the segment list to the segment whose speed needs to be changed.

Step 2 Select the new speed for the segment at the numeric keypad.

Step 3 Position the menu cursor over *4) SEGMENT SPEED*, and press ENTER.

Should a negative speed be selected, the **IN** and **OUT** points of the segment will be reversed.

Should the segment list be played back at a speed other than one times play, the segments with non-normal speeds will have their speeds altered proportionately.

4.4.11 SEGMENT PAUSE

A pause may be placed at the end of a segment by using this function. The pause will occur at the end of the segments playing, whether it is played in the forward or reverse direction.

EXAMPLE: Installing a pause.

Step 1 Position the segment list to the segment to have a pause placed after it.

Step 2 Position the menu cursor over *5) SEGMENT PAUSE*, and press ENTER.

A "P" will now be placed in that segments line. When playing the segments list, the A60 will **STOP** after the segment with the pause is encountered, and may be restarted using any of the normal transport keys.

4.4.12 TRIMMING A SEGMENT

While in the *SEGMENTS PLAY* mode, the **IN** and **OUT** points for a segment may be trimmed.

EXAMPLE: Trimming a segment.

Step 1   Position the segment to be changed to the highlighted area of the menu monitor.

Step 2   Press the **TRIM** key. A number may be selected at the keypad, along with the +/- key to indicate the polarity of the trim. In addition, the trackball may be used to position the disk to a point outside of this segments normal boundaries, or to position it to a new point inside of them.

Step 3   Depending on the boundary to be changed, press the **IN** or **OUT** key to enter the current position or trim value as the new one.


Keep in mind, that when using the trim function, the +/- key must be selected, or instead of a trim, an entry of an absolute value will take place.

4.5 MACROS

The A60 contains twelve macros (1-12) that are designed to speed the process of repetitive operations. A group of instructions, up to 50, can be recorded into a macro, then treated as a single function. In addition, several macros may be linked to each other to create a more versatile operation.

To see the *MACROS* menu, press **NORM PLAY**, place the cursor on *2) Macros* and press **ENTER**.

MACROS MENU

```
┌─────────────────────────────────────────────────────┐
│  ┌───────────────┐              ┌───────────────┐    │
│  │   0.13.00     │              │     390       │    │
│  └───────────────┘              └───────────────┘    │
│                                                       │
│          #01 Step 01  ===end of macro===              │
│                                                       │
│                   1) LIST                             │
│                                                       │
│                   2) CREATE                           │
│                                                       │
│                   3) STEP                             │
│                                                       │
│                   4) EXECUTE                          │
│                                                       │
│                   5) END                              │
│                                                       │
│                   6) DELETE STEP                      │
│                                                       │
│                   7) INSERT STEP                      │
│                                                       │
│                   8) EDIT MACRO                       │
└─────────────────────────────────────────────────────┘
```
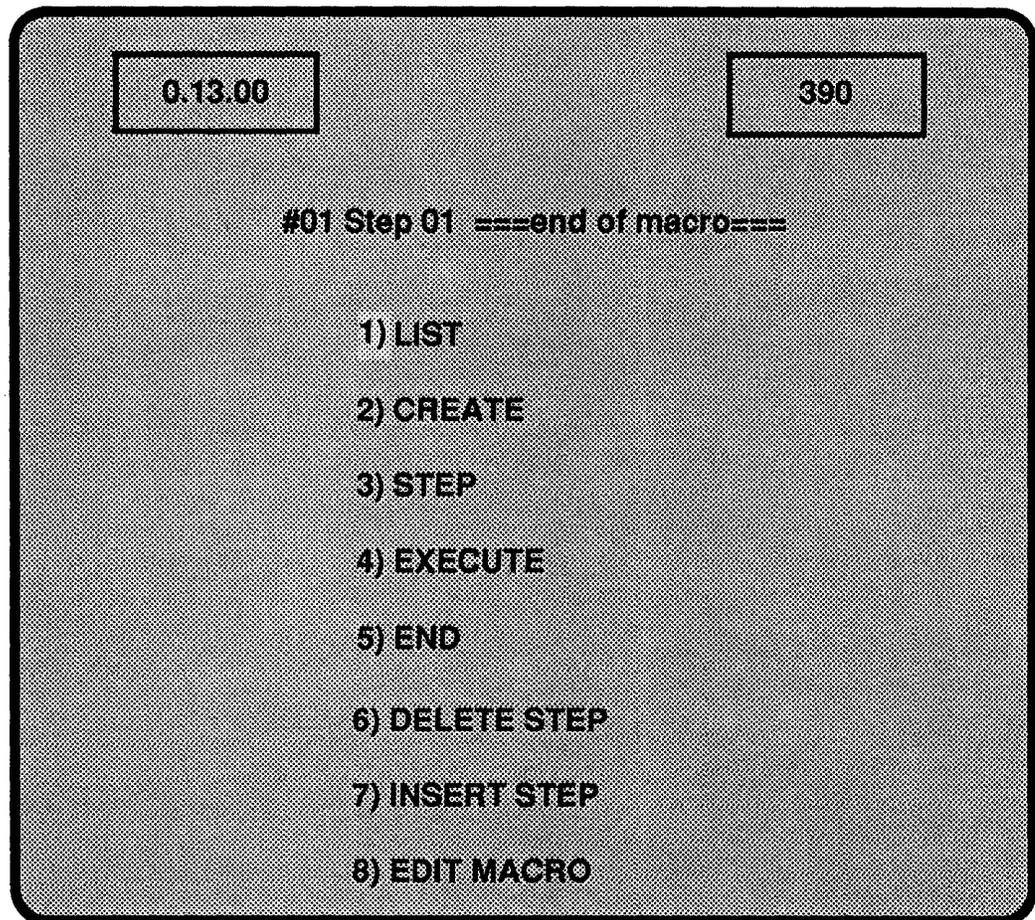
The top line shows the number of the current macro, the number of the current step of the macro, and the function of that step.

4.5.1 MACROS MENU LINES

The number of the macro that these menu lines are to affect should be specified before entering any of these modes. *LIST* and *STEP* will use the current macro that is being displayed, however, once the end of that macro is reached, it's number will need to be re-selected to pass through it again.

1) LIST

This will allow the examination of each step of a specified macro, or the current one, by enabling the trackball to scroll through them. The steps within the macro will not be performed.

2) CREATE

This should be selected to start the macro learning process for the specified macro. A prompt at the bottom of the screen will appear should no macro number be specified. All functions performed from this point on will be recorded as part of this macro.

3) STEP

This will allow the step by step executing of the specified macro, or the current one, with the exception of any **RECORD** instructions.

4) EXECUTE

This will cause the selected macro to begin running at full speed, performing each instruction in turn.

5) END

This should be selected to halt the macro *CREATE* process.

6) DELETE STEP

This should be used to remove the step being displayed at the top of the monitor from the current macro. The menu line *8) EDIT MACRO* must be selected before this mode can be activated.

7) INSERT STEP

This should be used to add a step to the current macro. The new step will be placed in front of the step being displayed. The menu line *8) EDIT MACRO* does not have to be enabled for this function to work.

8) EDIT MACRO

This should be selected to enable menu line *6) DELETE STEP*.

4.5.2 CREATING A MACRO

When *CREATE* is selected along with a macro number, the top of the menu monitor will say "<<<ready to record>>>". From this point until the end of the learning process, the words "MACRO LEARN" will appear in the lower right corner on all menus.

The easiest way to teach the A60 a macro is to simply perform the task once while in the learning process. Should the task include a record command, that function will not actually be performed, but will be remembered as part of the macro. Almost all functions within the A60 are available to be part of a macro.

It is possible to create a macro that runs in continuous loop fashion. Instead of selecting *END* as the last step of a macro that is being created, select *EXECUTE*, the number of this macro, and press **ENTER**. By substituting the number of a different macro after the *EXECUTE* command, it is possible to have one macro call up another and run it.

4.5.3 FRAME RECORD MACRO EXAMPLE

The following is an example of a macro that could be used to record a frame from a graphics system, and send a GPI pulse to that system to let it know that the frame has been recorded. For this example, GPI 1 OUTPUT will be used, however any of the four could be used, depending on the GPI out connections.

EXAMPLE: Frame record Macro.

Step 1 Press the number 22 and the **MENU** key. This will select the line *2)Macros* from the *HOME* menu, and position the cursor on line *2)CREATE.*

Step 2 Select the number of the macro to be created (1-12) and press **ENTER**. The words "MACRO LEARN" should appear in the lower right corner of the screen.

Step 3 Select the number 1 at the numeric keypad and press the **RECORD** key. This will set up a record length of one frame, and arm the system for recording.

Step 4 Press the **PLAY→** key. This will put a step into this macro that will cause the recording to take place (no recording will take place during the learning process).

Step 5 Press the number 55 on the keypad and press **MENU**. This will select the *GPI Assigns* menu, and place the cursor on *GPI 1 OUTPUT.*

Step 6 Press **ENTER**. This will send a strobe pulse to the graphics device indicating that the recording has taken place. This is also assuming that there is a GPI line tied to the graphics device that may be used this way.

Step 7 Press the number 25 on the keypad and press the **MENU** key. This will select the *Macros* menu, and position the cursor on line *5)END.* line.

Step 8 Press **ENTER**. This stops the learning process for this macro.

4.5.4 RUNNING A MACRO

There are two ways to get a macro to run, using the *EXECUTE* function and by assigning the macro to one of the *GPI INPUT* lines, which may then be triggered by an external device.

To use the *EXECUTE* function, simply place the cursor on it, select the number of the macro to run, and press **ENTER**.

To use the *GPI INPUT* function, first go to the *GPI Assigns* menu from the *HOME* menu. Position the cursor on the one of the four *GPI INPUT* lines that is connected to the external device, and press **ENTER**. The trackball may now be used to change the line from it's default function to any of the 12 macros. A strobe pulse on that line will now trigger the running of the assigned macro.

See the APPLICATIONS section for more macro examples.

GPI ASSIGNS MENU

See the REMOTE OPERATION section for more information on the usage of GPIs.

```
┌─────────────┐                    ┌─────────────┐
│  0.13.00    │                    │    390      │
└─────────────┘                    └─────────────┘

              1) GPI 1 INPUT: STOP

              2) GPI 2 INPUT: RUN REV

              3) GPI 3 INPUT: RUN FWD

              4) GPI 4 INPUT: RECORD

              5) GPI 1 OUTPUT

              6) GPI 2 OUTPUT

              7) GPI 3 OUTPUT

              8) GPI 4 OUTPUT
```
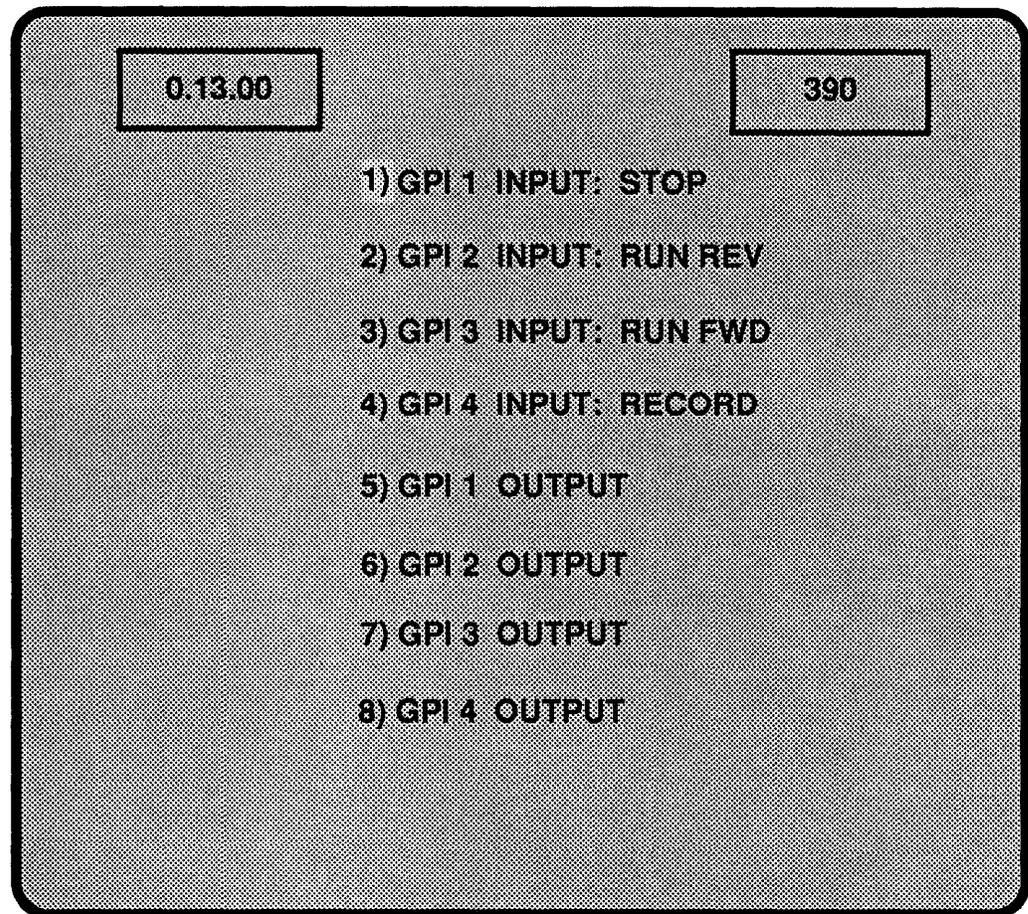
Section 5: REMOTE OPERATION

There are five methods of remote controlling the A60; through the serial remote port, through the Ethernet port, through direct RS232 control, by using the *TIMECODE TRIGGER* function of the *REMOTE* menu, or by using the GPI (General Purpose Interface) switch closure provisions.

The SCSI port on the back of the A60 also has the provisions for remote control of the system, however the port is normally used to transfer video either to or from a standard 9-track magnetic tape device. For more information on this interface, see the **A60/A64 DIGITAL VIDEO INTERFACE MANUAL.**

5.1 REMOTE MENU SELECTIONS

To see the *REMOTE* menu, from the *HOME* menu, position the cursor on *3)Remote*, and press **ENTER.**

REMOTE MENU

```
┌─────────────┐                    ┌─────────────┐
│   0.13.00   │                    │     390     │
└─────────────┘                    └─────────────┘

            1) REMOTE BAUD RATE:  9600 baud

            2) REMOTE PROTOCOL:  PORT OFF

            3) EDIT FIELD:  F2

            4) TIMECODE TRIGGER:  ??.??.??

            5) TAPE BACKUP LENGTH:  00000

            6) DISK RESTORE LENGTH:  00000
```
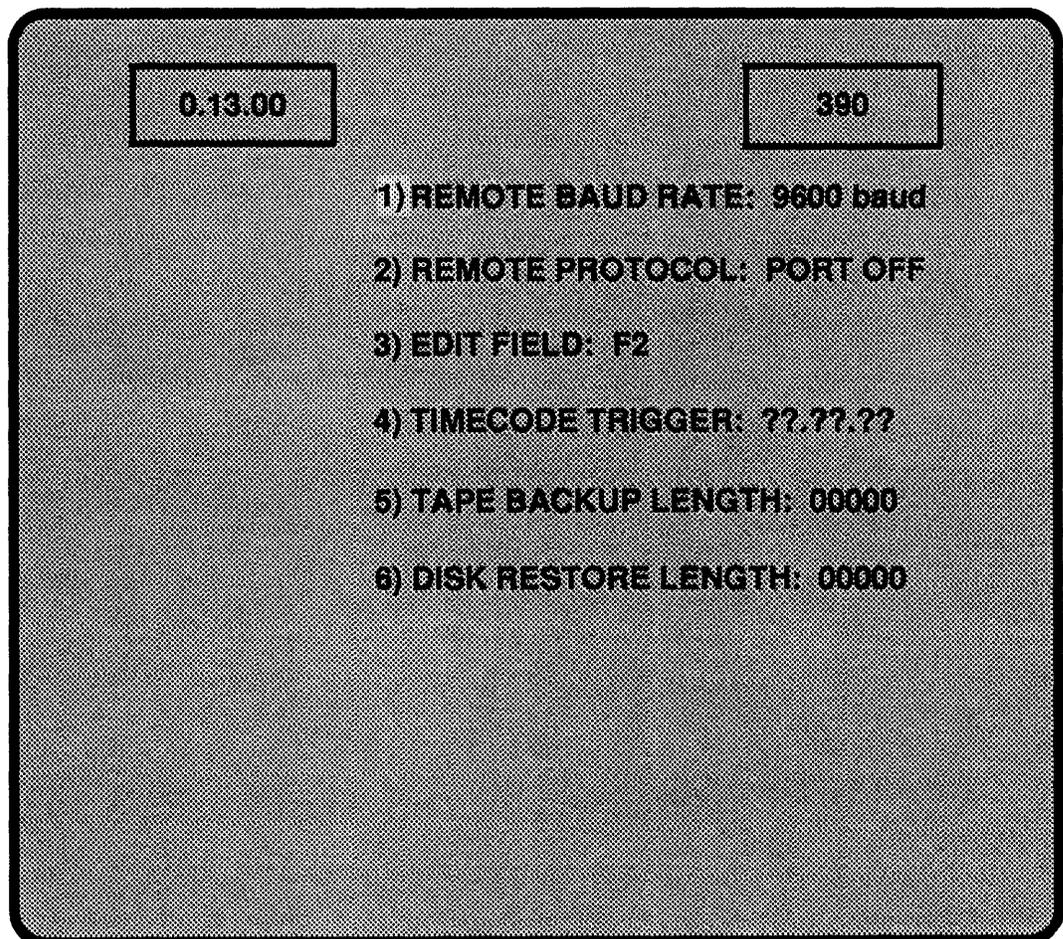
1) REMOTE BAUD RATE

This will allow the selection of either 9600 or 38400 as the baud rate for remote communications utilizing the SMPTE port.

9600

This should be used with certain models of the CMX editor series.

38400

This should be used whenever the remote port is configured for certain CMX editing systems, the Abekas A53D digital special effects system, SMPTE based devices, or the SONY 900 and 9000 editors.

2) REMOTE PROTOCOL

This assigns the remote port to a specific communications protocol.

PORT OFF

This will disable the remote port completely, and should be selected if no devices are connected to the port.

CMX I2 (CMX I-squared)

This will enable communications with a CMX editor. The baud rate above should be set to match the type required by the CMX model to be used.

A53D

This will configure the remote port to communicate with an Abekas A53D digital special effects device. The A60 will cue up and run the current effect on the A53D, which would make creating a precisely timed move easier. The communication cable between the A60 and the A53D would need to be specially wired due to both devices being "slaves" for serial communications. See the wiring diagram in the INSTALLATION GUIDE. The baud rate should be set to *38400*.

SMPTE

This will configure the remote port for usage with those editing systems utilizing the SMPTE standard for communications. The baud rate should be set to *38400*.

SONY

This will enable the Sony 900 or 9000 editors to control the A60. The baud rate should be set to *38400*.

3) EDIT FIELD

This will specify the field to which the A60 should begin recording on when an editor specifies a given frame number, since typically an editor will not specify a field. The choices are F1 (field one) and F2 (field two).

EDIT FIELD SETTINGS

```
        1:00        1:01        1:02        1:03
      | FRAME  |  FRAME  |  FRAME  |  FRAME  |
      |        |         |         |         |
      |Fld 1|Fld 2|Fld 1|Fld 2|Fld 1|Fld 2|Fld 1|Fld 2|
```

```
F1        OLD             |       NEW
                          1.02

F2            OLD             |     NEW
                             1:02
```
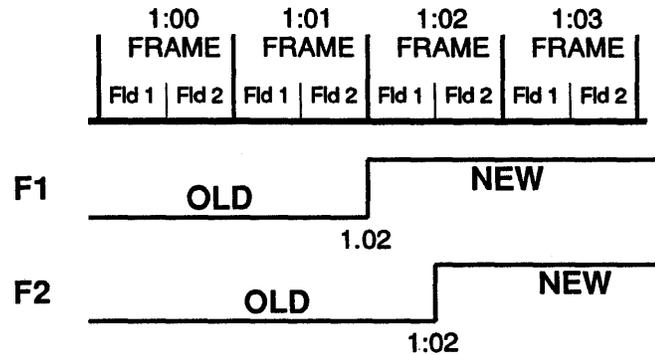
4) TIMECODE TRIGGER

This allows a timecode number to be specified, such that when it and the timecode coming in through the rear of the A60 match, the A60 will perform the **PLAY** → function. If the **RECORD** key is pressed before the match occurrs, a recording will be made. See the **REMOTE OPERATION** section 5.5 for more information on this mode.

5) TAPE BACKUP LENGTH

This is a function to be used with a standard 9-track magnetic streamer tape device to provide a tape backup of the video on the disk. This menu line allows the specifying of the amount of disk time to be sent to the tape device. The maximum amount of time is 10 seconds with 3600' of tape, a 2400' tape will give about 7 seconds. A density of 6250 BPI (Bytes Per Inch) should be specified.

6) DISK RESTORE LENGTH

This function should be used to specify how much of the streamer tape should be sent to the A60.

5.2 SERIAL REMOTE CONTROL

The A60 may be directly connected to a variety of editors, and will appear as either a source or a record machine.

The Remote menu lines specifying the baud rate, protocol, and edit field should be configured correctly. See section 5.1 for information regarding these menu lines.

The A60 will not actually preroll as a VTR would, it will send the appropriate numbers to the editing system to make it think that a preroll has taken place. This means that the first 5 seconds of the disk do not have to be sacrificed for this purpose. However, the earliest time that may be specified is 00:02 (with *FIELD 1* as the *EDIT FIELD*, the first field would be 00.02).

The **INSTALLATION GUIDE** at the back of this manual should be consulted for information on cable connections and requirements.

5.3 ETHERNET

The A60 supports both the remote control and the transfer of video provisions of the Ethernet system.

The A60 will appear to be a host computer that files (video) may be transferred to or from. Installation requires simply connecting the A60's ETHERNET port to a transeiver which provides the interface to the Ethernet Coax.

The video to be transfered may be either in the R, G, B or Y, R-Y, B-Y formats, and may be either a field or a frame.

Remote control and video transfer may be accomplished using TELNET, FTP, and the UNIX 'r' commands ('rcp', 'rlogin', and 'rsh').

The A60 needs to be assigned an IP address in order for communications to begin. The *Miscellaneous* menu contains the menu lines for setting this address. Press the numbers 7,and 4 to place the cursor on the correct menu line.

MISCELLANEOUS MENU

```
  0.13.00                              390

            1) VITC line 1        18

            2) VITC line 2        19

            3) TCP/IP  DEBUG  00

            4) IP ADDRESS   000.000.000.000
```

3) TCP/IP DEBUG

This allows the entering of an Ethernet TCP/IP (Transmission Control Protocol/Internet Protocol) maintenance routine. These routines work in conjunction with a device that connects to the A60's computer board.

4) IP ADDRESS

This allows the Internet Protocol address to be specified for this particular A60, and must be specified for communications to occur on the Ethernet network.

The numbers must be entered in 2 sections, the left six numbers first, followed by the next six numbers. For example, to enter the number "192.9.200.5", the number 192.009 must be first selected at the numeric keypad, (note the leading zeros and the decimal point, they must be included). Pressing the ENTER key will now enter this as the first six digits. The number 200.005 may now be selected and entered to complete the process.

The A60 should be treated as just another node on the Ethernet network. For more information, consult the A60 ETHERNET Manual.
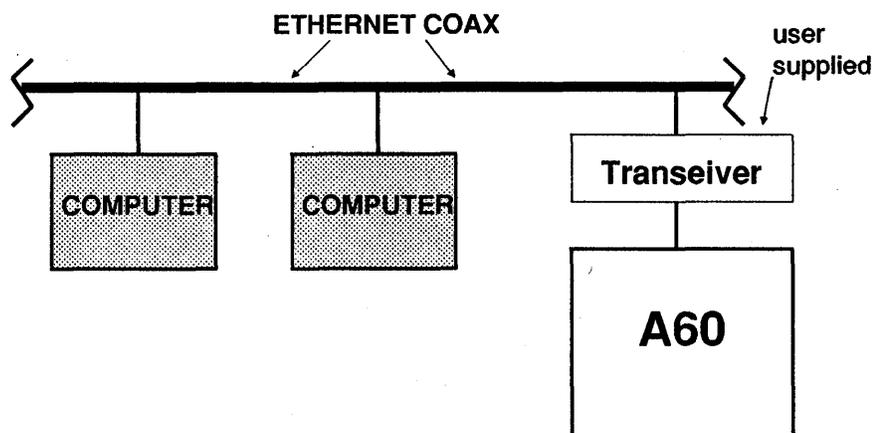
5.4 COMPUTER 232 CONTROL

The A60 may be controlled directly from an external computer by using the RS232 port on the back of the system. For pin connections, see the **INSTALLATION GUIDE**, for protocol information see the **A60 EXTERNAL PROTOCOL MANUAL**.

5.5 THE TIMECODE TRIGGER MODE

The A60 rear panel has a three pin audio connection labeled **TIMECODE**. The purpose is to allow a simple easily installed interface to an external device, that could either start the A60 in a **PLAY** mode or a **RECORD** mode.

Menu line 4, *TIMECODE TRIGGER*, of the Remote menu will allow a timecode time to be specified. The A60 will monitor the timecode coming in the rear of the unit, and should it detect a coincidence with the entered timecode, will "press" the **PLAY** → key. This will start the A60 in the **PLAY** mode. If the **RECORD** key is enabled prior to this coincidence, a recording will take place. Any other mode that may be started with a press of the **PLAY** → key, such as playing at a non-standard speed, playing a segment list, or a loop function, may be started with this mode, providing the A60 is set-up such that pressing the **PLAY** → key is all that is needed to get the function going.

5.6 GPI CONTROL

The A60 has four GPI inputs that may be used to either perform a transport function or to run an assigned macro. There are also four GPI outputs that may be used to trigger an outside device, such as a graphics device sending video to the A60. To see the GPI menu, select line *5) GPI Assigns* from the *HOME* menu .

GPI ASSIGNS MENU

```
┌─────────────┐                    ┌─────────────┐
│  0.13.00    │                    │    390      │
└─────────────┘                    └─────────────┘

              1) GPI 1 INPUT: STOP

              2) GPI 2 INPUT: RUN REV

              3) GPI 3 INPUT: RUN FWD

              4) GPI 4 INPUT: RECORD

              5) GPI 1 OUTPUT              (X)

              6) GPI 2 OUTPUT

              7) GPI 3 OUTPUT

              8) GPI 4 OUTPUT
```
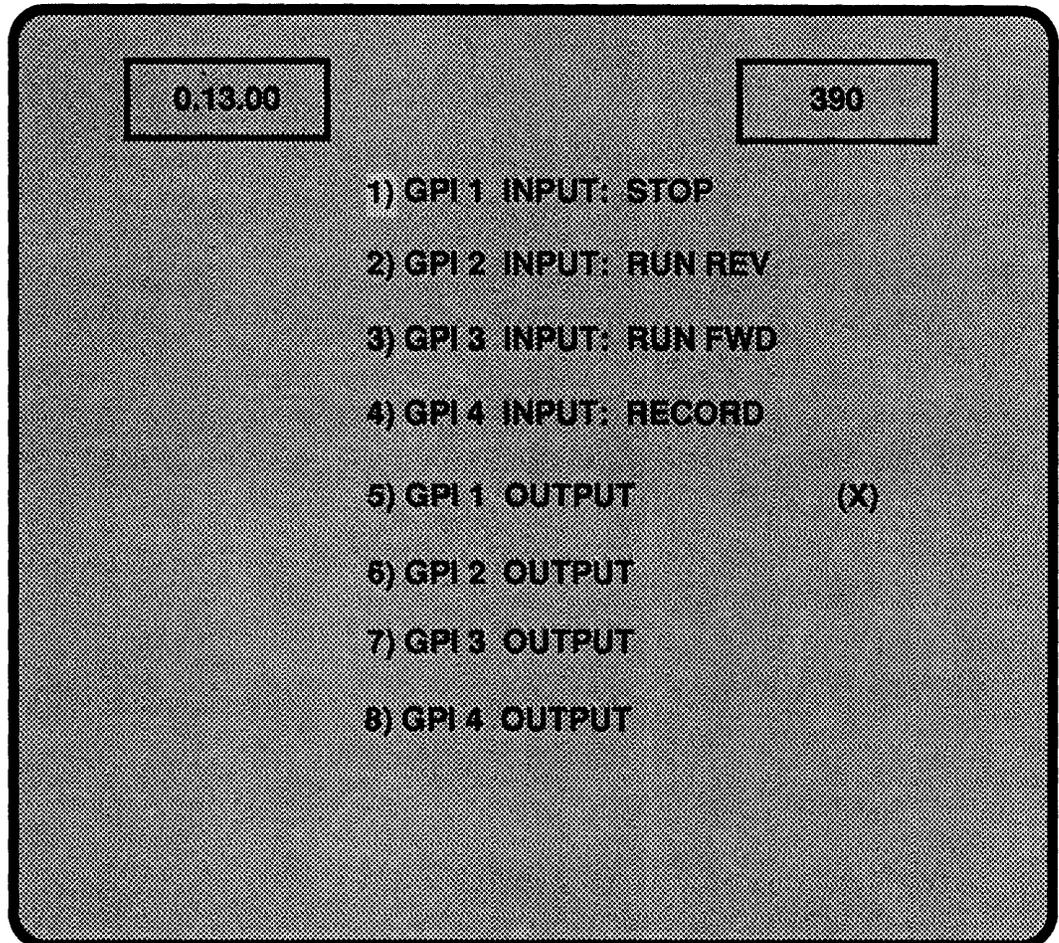
The menu shows the eight GPI's of the A60, the four input GPI's followed by the four output GPI's.

The input GPI's each have a default function assigned to them. A macro (1-12) may be assigned to an input GPI line by selecting that line (positioning the cursor on it), pressing ENTER (the line becomes reverse video), and specifying the macro number to be assigned by using the trackball to scroll to the desired one. A pulse coming in through that line from an external device will now trigger the running of that macro.

The output GPI's are provided to be used, typically in conjunction with a macro, to supply a pulse to an external device. Some uses might be to let an outside device know that a recording process has completed, or that a segment has finished playing back.

See the **INSTALLATION GUIDE** for information on connecting the GPI's to an external device.

Section 7: INDEX

Section 8: INSTALLATION GUIDE

8.1 Physical Mounting

Both the signal system chassis and the optional additional disk drive chassis are supplied with rack slides for installation into a standard 19" equipment rack. The signal system chassis, with it's internal disk drives, will require 12.25" of rack space, the optional additional disk drive will require 7" of rack space. The additional disk drive should be mounted on top of the main chassis to allow more efficient cable routing.

NOTE: Exercise caution when lifting these chassis, as they are approximately 100lb. each.

8.2 System Interconnects

8.2.1 Signal System to Disk Drive Connections

A 25 or 30 second version of the A60 has all of the system to disk drive connections done internally.

A 50 or 60 second version of the A60 will have an external disk drive chassis that will need to be cabled using Abekas supplied cables. To ensure proper connection to the appropriate chassis, each connector on the 7-50 pin ribbon cables is keyed. Use only Abekas supplied ribbon cables for the interconnects between the chassis.

8.2.2 RIBBON CABLE CONNECTION TABLE

Signal Chassis	Disk Chassis
Disk control	Disk control
Write data: Y	Y Write data
Write data: C	C Write data
Read data A: Y	Y Read data A
Read data A: C	C Read data A
Read data B: Y	Y Read data B
Read data B: C	C Read data B

Ensure that all ribbon connectors are firmly seated at all locations.

DISK CONTROL   WRITE DATA   READ DATA A   READ DATA B

Y   Y   Y

C   C   C

TIMECODE   RS232   SCSI   R-Y/R PGM OUT B-Y/B OUT Y/G PGM OUT
TRIGGER IN

KEYBOARD   SYNCS OUT SYNCS OUT

DIGITAL VIDEO IN #1   DIGITAL VIDEO IN #2

SMPTE   AUX   R-Y/R PVW OUT B-Y/B OUT Y/G PVW OUT

DIGITAL VIDEO OUT #1   DIGITAL VIDEO OUT #2

ETHERNET   REF
                                                                                        LOOP
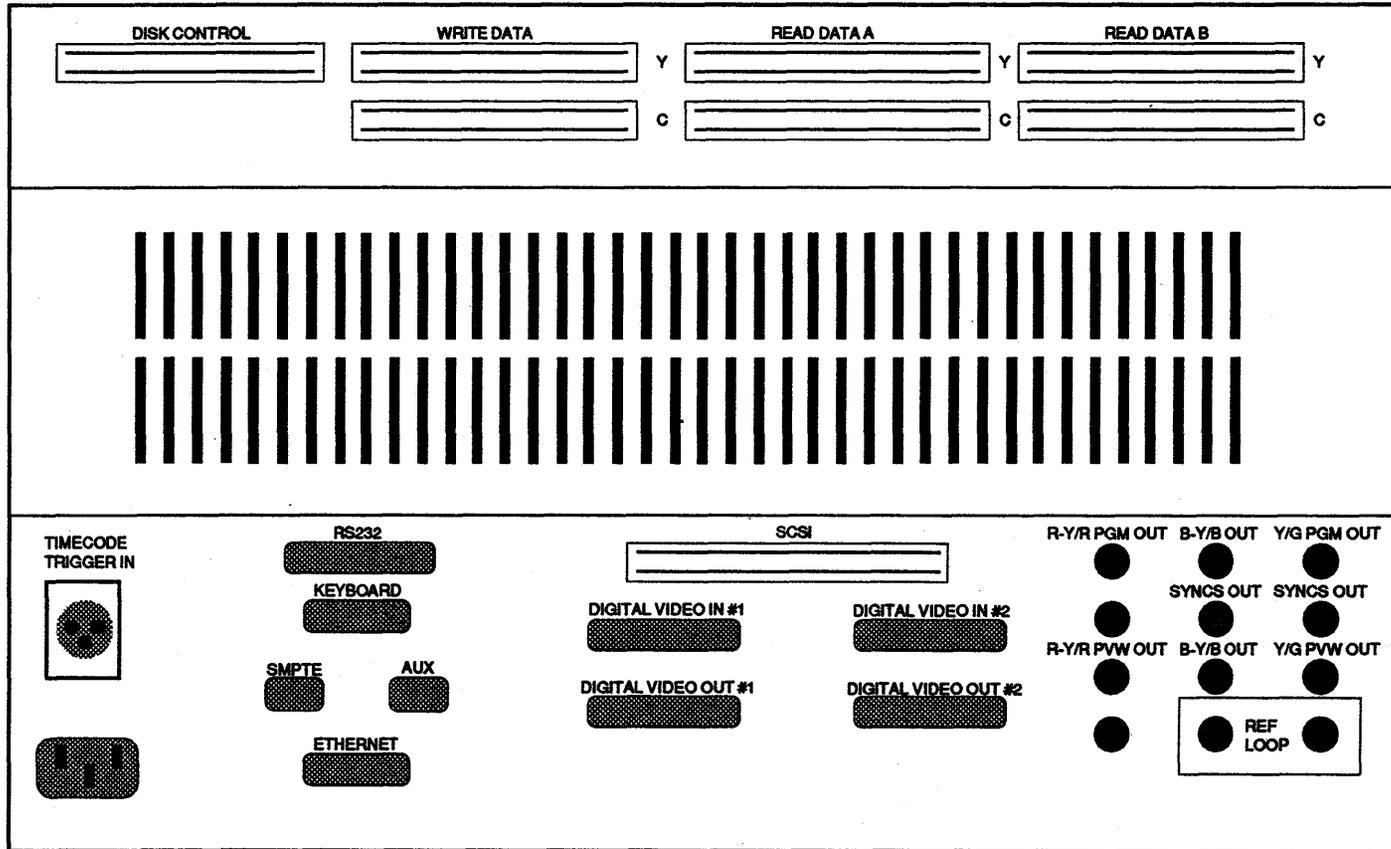
A60 REAR CONNECTIONS

8.2.3 Control Panel to Signal System Connection

The A60 control panel communicates with the signal system by means of an RS422 link, modified with the addition of carrying the control panel power. The control panel cable will have a 15 pin connector on one end, this should be connected to the signal system socket labeled **KEYBOARD**. The other end of the cable has a 9 pin connector and will connect directly to the control panel. The back cover of the control panel will have to be removed to gain access to the 9 pin socket. There is a grommet provided for routing the control cable through, once the back is replaced on the control panel.

> **NOTE:** The cable length between the control panel and the signal system chassis must be less than 200 feet, in order for the +24 volts sent from the signal system to be able to power the control panel. Should a distance greater than this be necessary, up to 2000 feet, a user supplied external power supply at the control panel will need to be utilized. A +12 volt supply at 2 amps will be sufficient. See section 8.4.2 for pin-out information should a custom cable be necessary.

8.2.4 Control Panel to Menu Monitor Connection

The BNC connector present on the left side of the control panel should be connected to a monochrome monitor, with a user supplied 75 ohm cable, for the display of operator menus. The video out of the control panel should be terminated with 75 ohms. It may be necessary to slightly alter the scanning height of the monitor to get the entire menu to display.

> **NOTE:** To access the BNC connector on some control panels, it is necessary to remove the back as was done for the above communications cable. The connector is located along the lower edge of the control panel. There is a second grommet provided for the routing of the coax cable out of the back of the control panel.

8.3 Video Connections

8.3.1 Reference

A 2 volt p-p analog composite sync signal should be connected to the left BNC connector on the back of the signal system chassis labeled **REF LOOP**. The right BNC may be used as a loop through, however when not used as such it should be terminated in 75 ohms.

8.3.2 Video Inputs

There are two digital CCIR 601 video inputs supplied with the A60. For use with an analog component signal, the Abekas A20 may be used. The video input to be used is selected at the control panel by selecting the *SETUP* menu from the *HOME* menu, and selecting on line 9 the input desired. For more information, see the A60 OPERATIONS manual.

8.3.3 Video Outputs

There are two digital CCIR 601 video outputs supplied with the A60, as well as a component analog program output and a component analog preview output. The preview output will differ from the program output only by the addition of a super-imposed timecode and frame display. The analog outputs are configured as RGB without sync, and may be configured as either RGB or Y/R-Y/B-Y, by setting the following plug-in jumpers located near the front of the A60's I/O BOARD.

> **NOTE:** If the configuration is changed from its current setup, some level adjustments will have to be made. See section 8.8 of this INSTALLATION GUIDE for the procedures required.

For RGB operation;

> Install jumpers W3, W4, W5, W7, and W9
> Remove jumpers W1, W2, W8, and W10

For Y/R-Y/B-Y operation;

> Install jumpers W1, W2, W8, and W10
> Remove jumpers W3, W4, W5, W7, and W9

8.3.4 Analog Sync Outputs

There are two BNC outputs on the back of the A60 labeled **SYNCS OUT**, both of which contain composite analog sync at 2V p-p. It is also possible to have sync added to the G or Y analog component outputs by installing a jumper at W6, and at W5 if for the Y component, on the A60's I/O BOARD.

8.3.5 Early Output Syncs

The A60 has the ability to provide early output syncs for use with encoders that have a one line video delay, such as the Faroudja NTSC encoder.

The selection of early or normal syncs is provided by DIP switch 18K located on the A60's COMPUTER BOARD. Section 3 of that switch should be normally set to the OFF position for normal output sync timing, and set to ON to provide syncs that are one line early with regard to reference.

8.4 Detailed Pin-Out Information

8.4.1 Keyboard Interconnections

The following is a pin listing of the cable used to interconnect the A60 control panel with the signal system chassis. These interconnections are identical to other Abekas equipment, including the A42, A52, A53D, A62, and A64. It should be noted that separate wires are used for chassis ground, signal ground, and the phantom power return. These grounds are at differing potentials and should not be interconnected at any point. The cable used is 22 gauge, 9 parallel conductors, unshielded. The Belden equivalent part number is 9423. The connectors used are a 15 pin D male for the signal system end, and a 9 pin D male for the control panel end.

The RS422 communications may have a cable length of up to 2000 feet, however, if power is also being sent along the cable, there is a length limit of 200 feet. If longer than 200 feet is necessary, the control panel will need to be powered locally with a user supplied power supply. A +12 volt at 2 amp supply will be sufficient.

8.4.2 KEYBOARD CABLE PIN LISTING

Main Chassis 15 pin conn.		Control Panel 9 pin conn.
1	. . . . +24V Power Supply	1
2	. . . . Receive Data ← (+)	2
3	. . . . Transmit Data → (+)	3
4	. . . . Circuit Ground	4
5	. . . . Not Used	-
6	. . . . Reserved	6
7	. . . . Transmit Data → (-)	7
8	. . . . Receive Data ← (-)	8
9	. . . . 24V Power Supply Return	9
10	. . . . Not Used	-
11	. . . . Not Used	-
12	. . . . Chassis Ground	5
13	. . . . Not Used	-
14	. . . . Not Used	-
15	. . . . Not Used	-

8.4.3 The SMPTE and AUX RS422 Connections

There are two 9 pin connectors on the rear of the A60, labeled SMPTE and AUX. Currently the AUX connector is not used. The SMPTE connector should be used when the A60 is connected to an editing system or the Abekas A53D. The baud rate of the communications may set to either 9600 or 38400. For detailed editor connection information, see section 5 REMOTE OPERATIONS.

8.4.4 SMPTE CONNECTOR PIN-OUT

PIN	FUNCTION
1	. . . . Chassis Ground
2	. . . . Transmit Data (-)
3	. . . . Receive Data (+)
4	. . . . Signal Ground
5	. . . . Not Used
6	. . . . Signal Ground
7	. . . . Transmit Data (+)
8	. . . . Receive Data (-)
9	. . . . Chassis Ground

NOTE: This port is designed to handle RS422 communications, and does not provide the voltage levels required for some RS232 applications. A user supplied translator box may be necessary in those instances.

8.4.5 The RS232 Connections

The RS232 connector is a 25 pin D female, and contains a serial communications port for remote control of the A60, as well as the GPI inputs and outputs.

8.4.6 RS232 PIN LISTING

PIN	FUNCTION	SIGNAL
1	Frame Ground	Frame Ground
2	Transmit Data	Transmit Data
3	Receive Data	Receive Data
4	Ready to Send	$\overline{RTS}$
5	Clear to Send	$\overline{CTS}$
6	not used	
7	Circuit Ground	0V
8	not used	
9	not used	
10	GPI- Input STOP	CCR0-
11	GPI+ Input STOP	CCR0+
12	GPI- Input RUN FORWARD	CCR1-
13	GPI+ Input RUN FORWARD	CCR1+
14	GPI- Input RUN REVERSE	CCR2-
15	GPI+ Input RUN REVERSE	CCR2+
16	GPI- Input RECORD	CCR3-
17	GPI+ Input RECORD	CCR3+
18	GPI- Output GPI 1	CCT0-
19	GPI+ Output GPI 1	CCT0+
20	GPI- Output GPI 2	CCT1-
21	GPI+ Output GPI 2	CCT1+
22	GPI- Output GPI 3	CCT2-
23	GPI+ Output GPI 3	CCT2+
24	GPI- Output GPI 4	CCT3-
25	GPI+ Output GPI 4	CCT3+

8.5 Editor Interfacing

The A60 can be interfaced to editors such as the CMX, Grass Valley, Ampex ACE, Paltex and Calloway. The A60 will emulate a VTR, and may be used as either a source or a record transport.

8.5.1 CMX Editors/RS232

The serial communication ports on older CMX editors have XLR connectors. These communication ports use RS232/9600 baud to talk to the I2 protocol of the A60. **A translator box will be required to alter the signal levels of the CMX signal to RS422 standards.** At the A60's *REMOTE* menu, set the *REMOTE BAUD RATE* to *9600*, and set the *REMOTE PROTOCOL* to *CMX I2*. The A60 should now be controllable by the editor.

8.5.2 CMX Editors/RS422

The communication ports on the newer CMX editors have 9 pin D connectors. These communication ports use RS422 to talk to the *I2* protocol of the A60. The connections should be made as follows.

```
CMX serial                              A60
9-pin D                                 SMPTE
                                        9-pin D

pin 1 . . . . . . . . .Chassis Ground . . . . . . . . pin 1
pin 2 . . . . . . . . .Transmit Data ←—(−) . . . . pin 2
pin 3 . . . . . . . . .Receive Data →(+) . . . . . pin 3
pin 4 . . . . . . . . .Signal Ground . . . . . . . . pin 4
pin 5 . . . . . . . . .not used . . . . . . . . . . . . . pin 5
pin 6 . . . . . . . . .Signal Ground . . . . . . . . pin 6
pin 7 . . . . . . . . .Transmit Data ←—(+) . . . . pin 7
pin 8 . . . . . . . . .Receive Data →(−) . . . . . pin 8
pin 9 . . . . . . . . .Chassis Ground . . . . . . . . pin 9
```

At the A60's *REMOTE* menu, set the *REMOTE BAUD RATE* to either *38400* or *9600*, and set the *REMOTE PROTOCOL* to *CMX I2*. The A60 should now be controllable by the editor.

> **NOTE:** If pin 9 in the cable between the CMX and the A60 is connected, the CMX will run at a 38400 baud rate, if not connected, a baud rate of 9600 will be enabled. Ensure that the proper baud rate is selected in the A60's REMOTE menu.

8.5.3 SMPTE Editors/RS422

The serial communications ports on SMPTE editors have 9 pin D connectors. These editor ports use RS422 to talk to the A60. The connections should be made as follows.

```
NOTE: Some editors, such as the Grass Valley and the Paltex, require a
special interface to be supplied by them. Check with the editor
manufacturer.
```

EDITOR serial 9-pin D		A60 SMPTE 9-pin D
pin 1	Chassis Ground	pin 1
pin 2	Transmit Data ←(–)	pin 2
pin 3	Receive Data →(+)	pin 3
pin 4	Signal Ground	pin 4
pin 5	not used	pin 5
pin 6	Signal Ground	pin 6
pin 7	Transmit Data ←(+)	pin 7
pin 8	Receive Data →(–)	pin 8
pin 9	Chassis Ground	pin 9

At the A60's *REMOTE* menu, set the *REMOTE BAUD RATE* to *38400*, and set the *REMOTE PROTOCOL* to *SMPTE*. The A60 should now be controllable by the editor.

8.6 A53D Interfacing

The A60 can interface directly to the A53D by using the SMPTE port on the back of the A60 and the RS422 port on the back of the A53D.

Since both devices are considered "slaves", a special communications cable must be made for this purpose.

A60 SMPTE 9-pin D		A53D RS422 9-pin D
pin 1 . . . . .Chassis Ground . . . . pin 1
pin 2 . . . . .Transmit Data →(−) . . . . pin 8
pin 3 . . . . .Receive Data ←(+) . . . . . pin 7
pin 4 . . . . .Signal Ground . . . . pin 4
pin 5 . . . . .not used . . . . pin 5
pin 6 . . . . .Signal Ground . . . . pin 6
pin 7 . . . . .Transmit Data →(+) . . . . pin 3
pin 8 . . . . .Receive Data ←(−) . . . . . pin 2
pin 9 . . . . .Chassis Ground . . . . pin 9

Note that the cable is not a "pin for pin" type as seen in other cases.

8.7 GPI Connections

The A60 supports 8 independent GPI (General Purpose Interface) lines. Four are inputs that may be used to trigger a function in the A60 from an external device, the four others are outputs that may be used to trigger an external device from the A60. The RS232 connector on the rear of the A60 is used to make the connections. For the pin out information of the RS232 connector, see page 8.7 of this INSTALLATION GUIDE. For operational information, see the REMOTE OPERATION section of the A60 OPERATIONS MANUAL.

8.7.1 GPI INPUTS

There are two methods for connecting to the A60 GPI inputs, a "dry" method that requires only a switch to be placed across two pins, and a method that requires an external voltage to operate.

Switch 24D on the A60's Computer board will select which of the two methods is active for a particular GPI Input line.
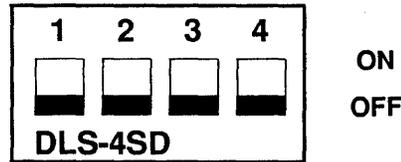

8.7.1.1 The "Dry" Method

The "dry" method will require the switch section for that GPI line to be set to the "ON" position (towards it's number), and an external switch to be connected from that GPI's CCR- pin to ground (pin 7 of the RS232 connector).
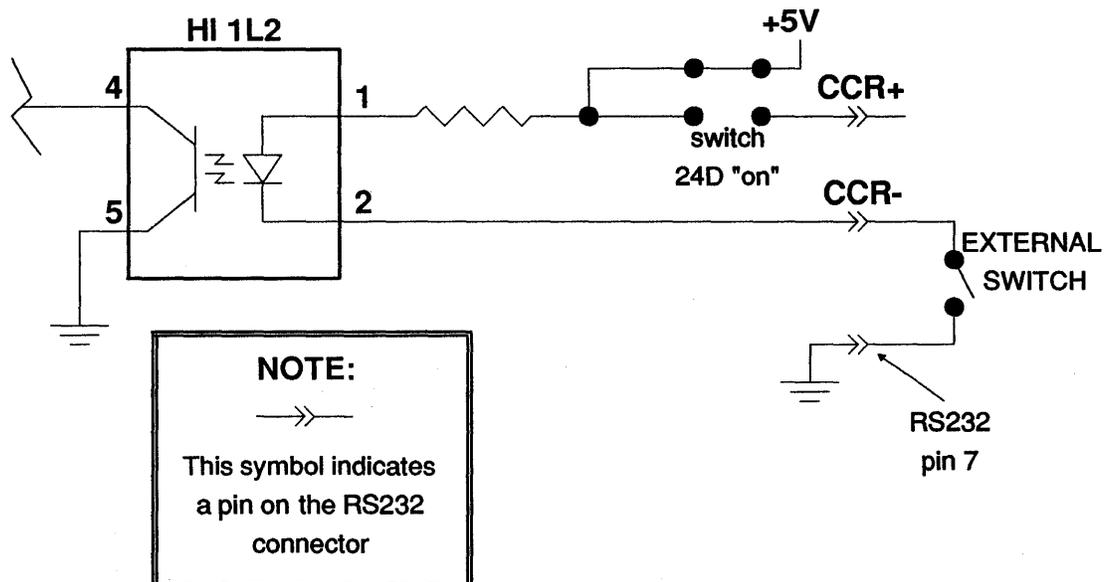
8.7.1.2 The External Voltage Method

The external voltage method will require the switch section for that GPI line to be set to the "OFF" position (away from it's number). The specifications for the external voltage are shown below. An important point to remember when connecting the voltage, is that the polarity should be such that it will forward bias the LED.
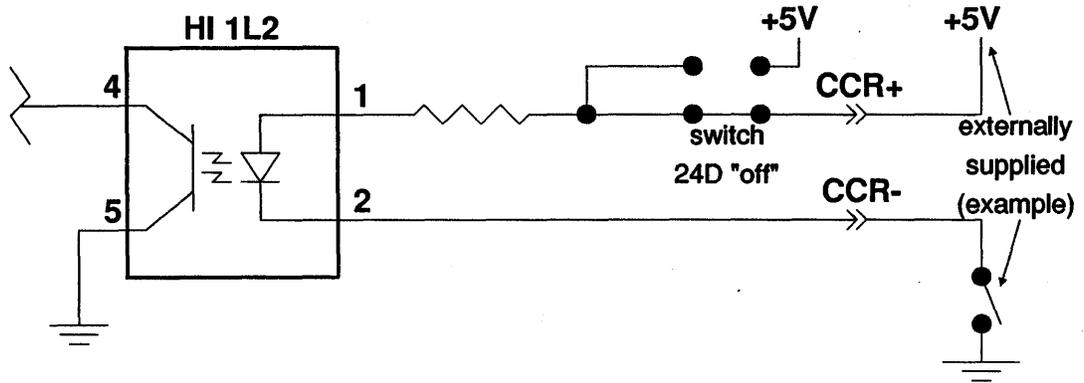
INPUT CONTACT CLOSURE SPECIFICATIONS

Isolation: . . . . .Greater than 2KV

Minimum turn-on: .4.8V/10 mA (worst case)

Maximum input voltage: 20V


NOTE:

—»—

This symbol indicates
a pin on the RS232
connector

8.7.2 GPI OUTPUTS

The A60 GPI outputs will require an externally supplied pull-up voltage and signal buffer (as shown in the example). The contact closure will not supply sufficient current for most relay usages, a relay driver should be used in those circumstances.
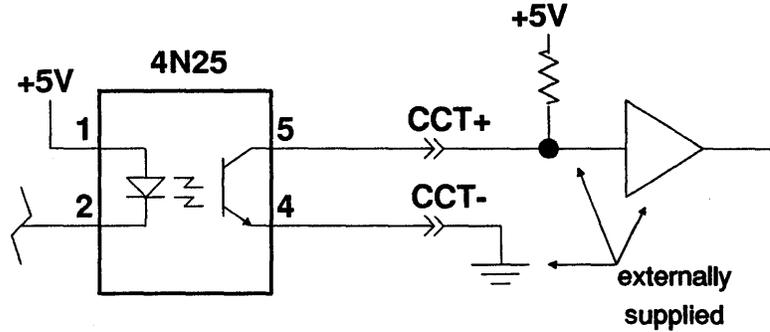
OUTPUT CONTACT CLOSURE SPECIFICATIONS

Isolation: . . . . Greater than 2.5 KV

Safe output voltage: . . . . -5V to +30V (CCT+ to CCT-)

Output current: . . . . .80 mA typical

NOTE:

——»——
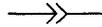
This symbol indicates
a pin on the RS232
connector

8.8 ANALOG OUTPUT CONFIGURATION

8.8.1 INTRODUCTION

The A60 has the provisions for component analog video out of the unit. There is a program output and a preview output, the preview being identical to the program with the exception of having the disk position, in both timecode and frames, placed over it.

These outputs may be configured in either an R,G,B format or a Y,R-Y,B-Y format. Sync may be added to the G or Y component if desired. Sync is also available separately through two BNC connectors at the rear of the A60.

The A60 is shipped configured for R,G,B with no sync on the G component. To change this configuration, some jumper changes and level adjustments will be necessary. Locate the desired configuration and perform the steps listed.

> **NOTE:** Any adjustments made should affect both the program and preview outputs identically. Should there be any problem with the preview outputs not matching the program outputs, see the Technical Manual for information on preview adjustments.

> **NOTE:** The oscilloscope used should have the 20Mgz filter turned on. In addition, it may be necessary to externally trigger it from a horizontal signal.

8.8.2 Y,R-Y,B-Y WITH SYNC ON Y

JUMPER SETTINGS

W1 . . . . IN

W2 . . . . IN

W3 . . . . OUT

W4 . . . . OUT

W5 . . . . IN

W6 . . . . IN

W7 . . . . OUT

W8 . . . . IN

W9 . . . . OUT

W10 . . . . IN

Step 1   Power down the unit and place the A60's INPUT/OUTPUT board on an extender, then power up the unit.

NOTE: Boards should never be removed or inserted with the power on.

Step 2   Select the A60 generated 100% COLOR BARS signal as follows;

A) At the numeric keypad press the keys **4, 1,** then the **MENU** key. (This selects the *Diagnostics* menu from the *Home* menu, and positions the cursor on *1) Select Pattern*).

B) Press the **ENTER** key until *100% COLOR BARS* is displayed.

C) Press the **MENU** key once to move the cursor down to *2) Write Pattern*, and press the **ENTER** key. This will write the 100% COLOR BARS signal to the frame store, and will output it as the video signal.

Step 3   Connect the ocsilloscope to I.C. 7A pin 7, and adjust R89 for 0.7 volts p-p.

Step 4   Connect the ocsilloscope to I.C. 14A pin 7, and adjust R113 for 0.75 volts p-p.

Step 5   Connect the ocsilloscope to I.C. 20A pin 7, and adjust R91 for 0.79 volts p-p.

Step 6   Connect the ocsilloscope to the junction of R45 and R93, and adjust R93 for a sync amplitude of 0.6 volts p-p.

Step 7   NOTE: For steps 7 to 13, use a BNC to BNC cable to connect the BNC labeled **Y/G PGM OUT**, on the rear of the A60, to a 75 ohm terminated oscilloscope.

Adjust R33 for 0.0 volts at blanking.

Step 8   Adjust R34 for a sync amplitude of 0.3 volts p-p.

Step 9   Adjust R35 for a video amplitude of 0.7 volts p-p.

Step 10 Due to the above adjustments interaction, repeat steps 7 through 9 until all three adjustments are correct.

Step 11 Write the A60 generated Multiburst signal into the framestore as follows:

A) The *Diagnostics* menu should still be displayed. If not, press the keys **1, 4,** and **MENU**. Position the cursor on *1) Select Pattern*, and press the **ENTER** key until the pattern is *Multiburst*.

B) Press the **MENU** key once to get the cursor to move down to *2) Write Pattern*, and press the **ENTER** key. Multiburst should now be written into the framestore.

Step 12 Adjust C7 for the flattest possible frequency response.

Step 13 Write the A60 generated 100% Color Bars signal into the framestore, following the procedure of step 11.

Step 14 NOTE: For steps 14 to 16, use a BNC to BNC cable to connect the BNC labeled **B-Y/B PGM OUT**, on the rear of the A60, to a 75 ohm terminated oscilloscope.

Adjust R55 for 0.0 volts at blanking.

Step 15 Adjust R56 for 0.7 volts p-p.

Step 16 Due to the above adjustments interaction, repeat steps 14 and 15 until both adjustments are correct.

Step 17 NOTE: For steps 17 to 19, use a BNC to BNC cable to connect the BNC labeled **R-Y/R PGM OUT**, on the rear of the A60, to a 75 ohm terminated oscilloscope.

Adjust R10 for 0.0 volts at blanking.

Step 18 Adjust R11 for 0.7 volts p-p.

Step 19 Due to the above adjustments interaction, repeat steps 17 and 18 until both adjustments are correct.

8.8.3 Y,R-Y,B-Y WITH NO SYNC

JUMPER SETTINGS

W1 . . . . IN

W2 . . . . IN

W3 . . . . OUT

W4 . . . . OUT

W5 . . . . OUT

W6 . . . . OUT

W7 . . . . OUT

W8 . . . . IN

W9 . . . . OUT

W10 . . . . IN

Step 1 Power down the unit and place the A60's INPUT/OUTPUT board on an extender, then power up the unit.

NOTE: Boards should never be removed or inserted with the power on.

Step 2 Select the A60 generated 100% COLOR BARS signal as follows;

A) At the numeric keypad press the keys **4, 1,** then the **MENU** key. (This selects the *Diagnostics* menu from the *Home* menu, and positions the cursor on *1) Select Pattern*).

B) Press the **ENTER** key until *100% COLOR BARS* is displayed.

C) Press the **MENU** key once to move the cursor down to *2) Write Pattern*, and press the **ENTER** key. This will write the 100% COLOR BARS signal to the frame store, and will output it as the video signal.

Step 3 Connect the ocsilloscope to I.C. 7A pin 7, and adjust R89 for 0.7 volts p-p.

Step 4 Connect the ocsilloscope to I.C. 14A pin 7, and adjust R113 for 0.75 volts p-p.

Step 5 Connect the ocsilloscope to I.C. 20A pin 7, and adjust R91 for 0.79 volts p-p.

Step 6 Connect the ocsilloscope to the junction of R45 and R93, and adjust R93 for a sync amplitude of 0.6 volts p-p.

Step 7 NOTE: For steps 7 to 12, use a BNC to BNC cable to connect the BNC labeled **Y/G PGM OUT**, on the rear of the A60, to a 75 ohm terminated oscilloscope.

Adjust R33 for 0.0 volts at blanking.

Step 8 Adjust R34 for a video amplitude of 0.7 volts p-p.

Step 9 Due to the above adjustments interaction, repeat steps 7 through 8 until both adjustments are correct.

Step 10 Write the A60 generated Multiburst signal into the framestore as follows:

A) The *Diagnostics* menu should still be displayed. If not, press the keys **1, 4,** and **MENU**. Position the cursor on *1) Select Pattern*, and press the **ENTER** key until the pattern is *Multiburst*.

B) Press the **MENU** key once to get the cursor to move down to *2) Write Pattern*, and press the **ENTER** key. Multiburst should now be written into the framestore.

Step 11 Adjust C7 for the flattest possible frequency response.

Step 12 Write the A60 generated 100% Color Bars signal into the framestore, following the procedure of step 10.

Step 13 NOTE: For steps 13 to 15 use a BNC to BNC cable to connect the BNC labeled **B-Y/B PGM OUT**, on the rear of the A60, to a 75 ohm terminated oscilloscope.

Adjust R55 for 0.0 volts at blanking.

Step 14 Adjust R56 for 0.7 volts p-p.

Step 15 Due to the above adjustments interaction, repeat steps 13 and 14 until both adjustments are correct.

Step 16 NOTE: For steps 16 to 18, use a BNC to BNC cable to connect the BNC labeled **R-Y/R PGM OUT**, on the rear of the A60, to a 75 ohm terminated oscilloscope.

Adjust R10 for 0.0 volts at blanking.

Step 17 Adjust R11 for 0.7 volts p-p.

Step 18 Due to the above adjustments interaction, repeat steps 16 and 17 until both adjustments are correct.

8.8.4 R,G,B WITH SYNC ON GREEN

JUMPER SETTINGS

        W1 . . . . OUT

        W2 . . . . OUT

        W3 . . . . IN

        W4 . . . . IN

        W5 . . . . IN

        W6 . . . . IN

        W7 . . . . IN

        W8 . . . . OUT

        W9 . . . . IN

        W10 . . . . OUT

Step 1 Power down the unit and place the A60's INPUT/OUTPUT board on an extender, then power up the unit.

NOTE: Boards should never be removed or inserted with the power on.

Step 2 Select the A60 generated 100% COLOR BARS signal as follows;

A) At the numeric keypad press the keys **4, 1,** then the **MENU** key. (This selects the *Diagnostics* menu from the *Home* menu, and positions the cursor on *1) Select Pattern*).

B) Press the **ENTER** key until *100% COLOR BARS* is displayed.

C) Press the **MENU** key once to move the cursor down to *2) Write Pattern*, and press the **ENTER** key. This will write the 100% COLOR BARS signal to the frame store, and will output it as the video signal.

Step 3 Connect the ocsilloscope to I.C. 7A pin 7, and adjust R89 for 0.7 volts p-p.

Step 4 Connect the ocsilloscope to I.C. 14A pin 7, and adjust R113 for 0.75 volts p-p.

Step 5 Connect the ocsilloscope to I.C. 20A pin 7, and adjust R91 for 0.79 volts p-p.

Step 6 NOTE: For steps 6 to 13, use a BNC to BNC cable to connect the BNC labeled **Y/G PGM OUT**, on the rear of the A60, to a 75 ohm terminated oscilloscope.

Adjust R33 for 0.0 volts at blanking.

Step 7 Adjust R35 for a waveform without tilt on the peaks. See figure 1.

Figure 1
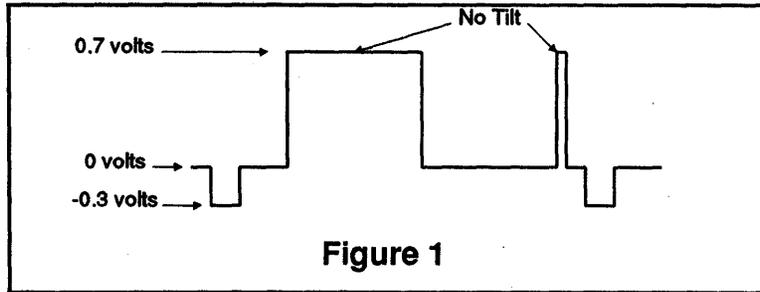
Step 8 Adjust R34 for a video amplitude of 0.7 volts p-p.

Step 9 Adjust R93 for a sync amplitude of 0.3 volts p-p.

Step 10 Due to the above adjustments interaction, repeat steps 6 through 9 until all four adjustments are correct.

Step 11 Write the A60 generated Multiburst signal into the framestore as follows:

A) The *Diagnostics* menu should still be displayed. If not, press the keys 1, 4, and **MENU**. Position the cursor on *1) Select Pattern*, and press the **ENTER** key until the pattern is *Multiburst*.

B) Press the **MENU** key once to get the cursor to move down to *2) Write Pattern*, and press the **ENTER** key. Multiburst should now be written into the framestore.

Step 12 Adjust C7 for the flattest possible frequency response.

Step 13 Write the A60 generated 100% Color Bars signal into the framestore, following the procedure of step 11.

Step 14 NOTE: For steps 14 to 20, use a BNC to BNC cable to connect the BNC labeled **B-Y/B PGM OUT**, on the rear of the A60, to a 75 ohm terminated oscilloscope.

Adjust R55 for 0.0 volts at blanking.

Step 15 Re-adjust R91 for a waveform without tilt on the peaks. See figure 2.

Figure 2
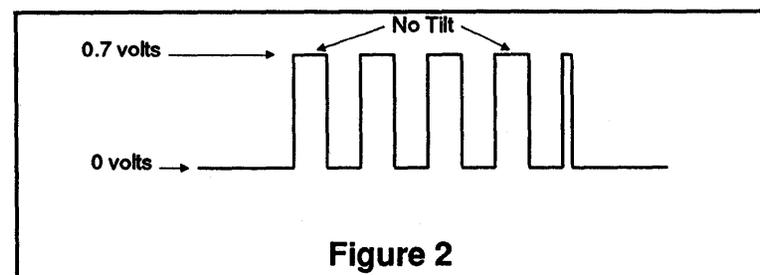
Step 16 Adjust R56 for 0.7 volts p-p.

Step 17 Due to the above adjustments interaction, repeat steps 14 through 16 until all of the adjustments are correct.

Step 18 Select Multiburst as the video into the framestore, by following the procedure of step 11.

Step 19 Adjust C9 for the flattest possible frequency response.

Step 20 Select 100% Color Bars as the video into the framestore, by following the procedure of step 11.

Step 21 NOTE: For steps 21 to 26, use a BNC to BNC cable to connect the BNC labeled **R-Y/R PGM OUT**, on the rear of the A60, to a 75 ohm terminated oscilloscope.

Adjust R10 for 0.0 volts at blanking.

Step 22 Re-adjust R113 for a waveform without tilt on the peaks. See figure 3.

Figure 3
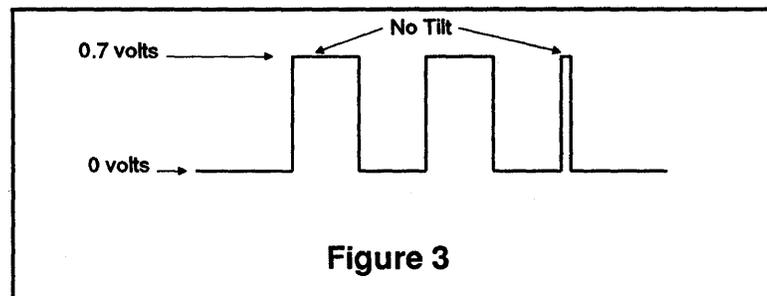
Step 23 Adjust R11 for 0.7 volts p-p.

Step 24 Due to the above adjustments interaction, repeat steps 21 through 23 until all of the adjustments are correct.

Step 25 Select Multiburst as the video into the framestore by following the procedure of step 11.

Step 26 Adjust C5 for the flattest possible frequency response.

8.8.5 R,G,B WITH NO SYNC

JUMPER SETTINGS

W1 . . . . OUT

W2 . . . . OUT

W3 . . . . IN

W4 . . . . IN

W5 . . . . IN

W6 . . . . OUT

W7 . . . . IN

W8 . . . . OUT

W9 . . . . IN

W10 . . . . OUT

Step 1 Power down the unit and place the A60's INPUT/OUTPUT board on an extender, then power up the unit.

NOTE: Boards should never be removed or inserted with the power on.

Step 2 Select the A60 generated 100% COLOR BARS signal as follows;

A) At the numeric keypad press the keys **4, 1**, then the **MENU** key. (This selects the *Diagnostics* menu from the *Home* menu, and positions the cursor on *1) Select Pattern*).

B) Press the **ENTER** key until *100% COLOR BARS* is displayed.

C) Press the **MENU** key once to move the cursor down to *2) Write Pattern*, and press the **ENTER** key. This will write the 100% COLOR BARS signal to the frame store, and will output it as the video signal.

Step 3 Connect the ocsilloscope to I.C. 7A pin 7, and adjust R89 for 0.7 volts p-p.

Step 4 Connect the ocsilloscope to I.C. 14A pin 7, and adjust R113 for 0.75 volts p-p.

Step 5 Connect the ocsilloscope to I.C. 20A pin 7, and adjust R91 for 0.79 volts p-p.

Step 6 NOTE: For steps 6 to 12, use a BNC to BNC cable to connect the BNC labeled **Y/G PGM OUT**, on the rear of the A60, to a 75 ohm terminated oscilloscope.

Adjust R33 for 0.0 volts at blanking.

Step 7   Adjust R35 for a waveform without tilt on the peaks. See figure 1.

Figure 1
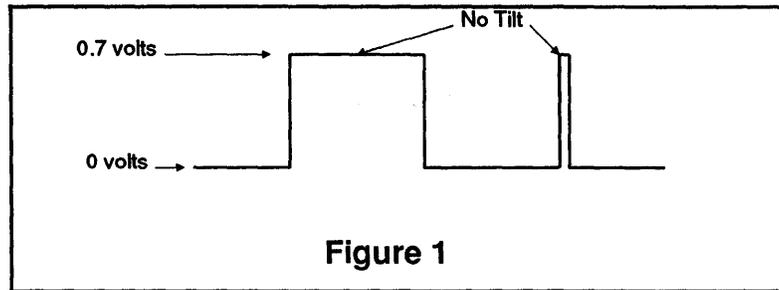
Step 8   Adjust R34 for a video amplitude of 0.7 volts p-p.

Step 9   Due to the above adjustments interaction, repeat steps 6 through 8 until all three adjustments are correct.

Step 10   Write the A60 generated Multiburst signal into the framestore as follows:

A) The *Diagnostics* menu should still be displayed. If not, press the keys 1, 4, and **MENU**. Position the cursor on *1) Select Pattern*, and press the **ENTER** key until the pattern is *Multiburst*.

B) Press the **MENU** key once to get the cursor to move down to *2) Write Pattern*, and press the **ENTER** key. Multiburst should now be written into the framestore.

Step 11   Adjust C7 for the flattest possible frequency response.

Step 12   Write the A60 generated 100% Color Bars signal into the framestore, following the procedure of step 10.

Step 13   NOTE: For steps 10 to 13, use a BNC to BNC cable to connect the BNC labeled **B-Y/B PGM OUT**, on the rear of the A60, to a 75 ohm terminated oscilloscope.

Adjust R55 for 0.0 volts at blanking.

Step 14   Re-adjust R91 for a waveform without tilt on the peaks. See figure 2.
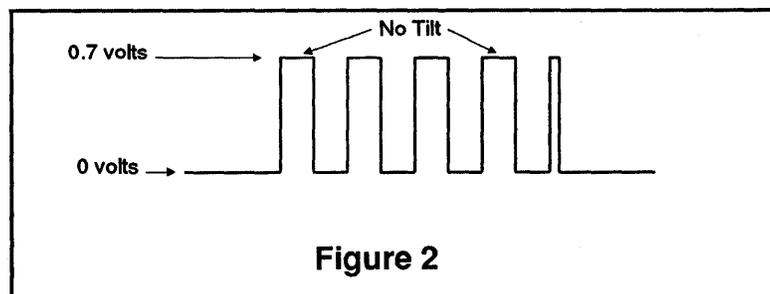
Figure 2

Step 15 Adjust R56 for 0.7 volts p-p.

Step 16 Due to the above adjustments interaction, repeat steps 13 through 15 until all of the adjustments are correct.

Step 17 Select Multiburst as the video into the framestore, by following the procedure of step 10.

Step 18 Adjust C9 for the flattest possible frequency response.

Step 19 Select 100% Color Bars as the video into the framestore, by following the procedure of step 10.

Step 20 NOTE: For steps 20 to 26, use a BNC to BNC cable to connect the BNC labeled **R-Y/R PGM OUT**, on the rear of the A60, to a 75 ohm terminated oscilloscope.

Adjust R10 for 0.0 volts at blanking.

Step 21 Re-adjust R113 for a waveform without tilt on the peaks. See figure 3.

Figure 3
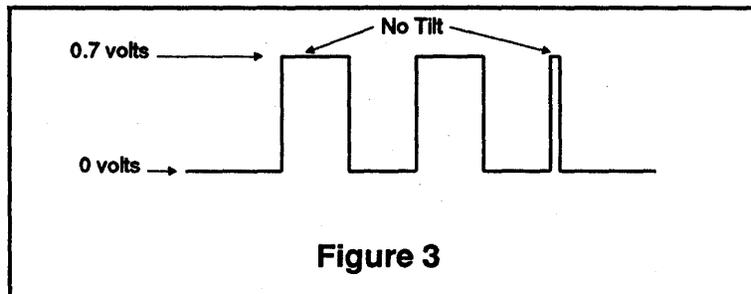
Step 22 Adjust R11 for 0.7 volts p-p.

Step 23 Due to the above adjustments interaction, repeat steps 20 through 22 until all of the adjustments are correct.

Step 24 Select Multiburst as the video into the framestore by following the procedure of step 10.

Step 26 Adjust C5 for the flattest possible frequency response.

Abekas