EasyCode® *Macintosh & PC-Windows*

AutoMate Scientific, Inc.

812 Page St
Berkeley, CA 94710
U.S.A.

(800) 998-MATE
-6283

international• (510) 845-6283
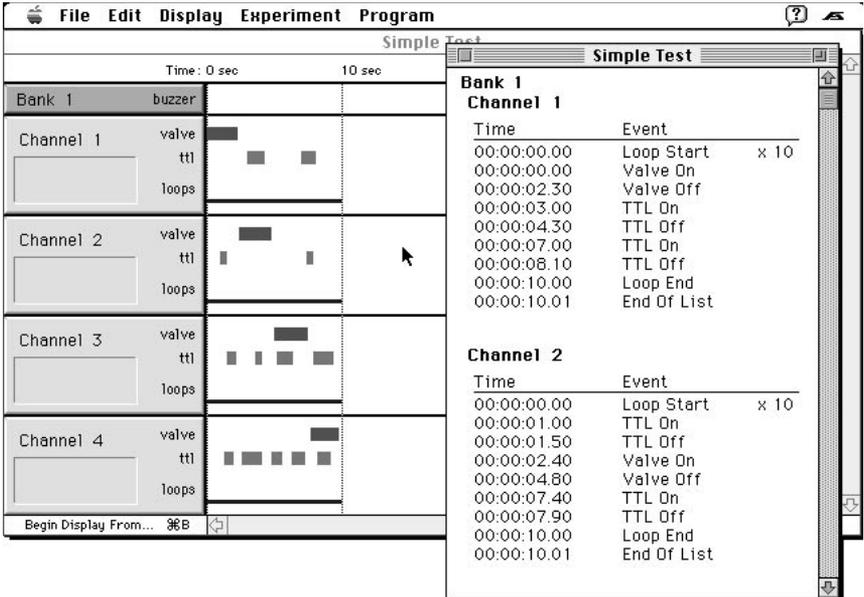fax• (510) 280-3795
e-mail• info@autom8.com
www• http://www.autom8.com

User's Manual

Version 2.0 & 3.0

AutoMate Scientific, Inc.

EasyCode® *2.0 & 3.0*

Macintosh & PC-Windows

User's Manual

For research use only

Josef Kewekordes II, Heath S. Lukatch
Dave Ilstrup, Tim Niemi, James Matley, Dean Diershow

Table of Contents

continued...

Table of Contents (cont'd)

Getting Started

Welcome to EasyCode® – an accessory program for the Valve-Bank™ line of automated valve and pump controllers. EasyCode provides a simple 'click-and-drag' interface for programming on-off sequences using graphic timebars. Researchers can save and load these programs to a hard disk, print out program listings, then download completed programs into the ValveBank's memory in one simple step. Once downloaded, the program remains in the ValveBank's memory, and the ValveBank can then be disconnected from the computer. EasyCode does not currently support direct control of the ValveBank or connected valves from your computer. Programs must be downloaded into the ValveBank, then 'run' using the ValveBank's keypad.

Hardware and software requirements

EasyCode needs the following minimum configuration to run:

Macintosh:
- A Macintosh 512E or later model
- 2 MB under System 7
- System 6.0.5 or later, OS 9 and X (Classic) compatible
- Temporary use of one serial port or USB port
- Serial cable (AutoMate supplied 'null modem' cable)
- USB-to-serial adapter

IBM:
- An IBM-PC or compatible with 2MB RAM
- Microsoft Windows 3.1 to 95 (EasyCode 2.0) Microsoft Windows 98SE, 2000, XP (version 3.0)
- Temporary use of one com port
- Serial cable (AutoMate supplied 'null modem' cable)

Macintosh/Windows basics

If you're new to the Macintosh or Windows, you may want to familiarize yourself with these basic skills. This manual assumes you know how to:

- Open an application
- Move a window, change its size, and close it
- Choose a command from a menu
- Enter information in a dialog box
- Use a scroll bar to scroll through a list or through information in a window
- Select an item in a window by clicking it with the mouse

For details, see your Macintosh or Windows documentation.

Before you install EasyCode

Before you install EasyCode, we recommend that you:

- Check the system requirements on the previous page.
- Make backup copies of your EasyCode product disk, and use the copies for installation or use.
- Take a moment to fill out and mail your registration card. As a registered user, you will receive important product support and update information.

To install EasyCode Macintosh

You can use EasyCode Mac directly from floppy disk (remember to always use a backup disk instead of your original). However, execution, loading and saving ValveBank programs will be faster and more convenient from a hard disk.

To install EasyCode Mac on your hard disk:
1. Create a new folder on your hard disk named EasyCode.
2. Copy the EasyCode floppy disk into this new folder.
OR: Drag the floppy disk icon onto your hard disk.

To install EasyCode PC/Windows

1. Double-click the setup installer on the floppy disk.
2. Follow screen instructions for drive and directory choice.

An extra folder named "Samples" contained on the EasyCode floppy disk is optional and may be deleted if desired. It contains the sample ValveBank programs listed in the ValveBank manual.

Starting and quitting EasyCode

You start and quit EasyCode like any other Mac/Windows application. Double-click the EasyCode icon in the EasyCode folder. Macintosh users can double-click saved ValveBank program files to launch and load them.

To quit, choose Quit {Exit} from the File menu. If you have made changes to a program file and have not saved them, EasyCode asks if you wish to save or discard them.

Serial port set-up

EasyCode must communicate with your ValveBank through a serial {com} port with the provided cable. PC's and Macs are equipped with multiple serial ports located on the back panel of the case – you may use any one. For example, if the printer {com} port is already used by a printer or network cable, insert the serial cable in the modem port {a different com port}. You must tell EasyCode which serial port you are using through the Preferences menu {Serial port sub-menu} option under File. (Also see pg. 20)

Newer Macintosh and PC computers without serial ports require a USB-to-serial adapter - available from AutoMate.
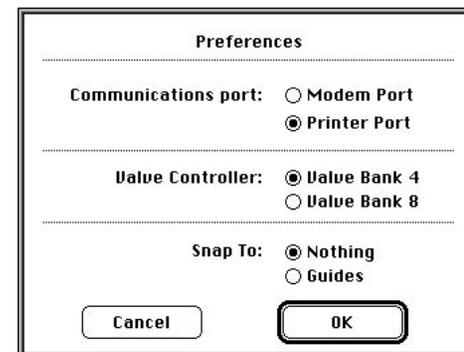
ValveBank 4 and 8

The Preferences {Hardware sub-menu} option allows you to configure EasyCode for use with either the ValveBank4 or 8 controller. This affects the number of channels used and serial transfers.

Choosing active channels

This release of EasyCode supports up to 16 ValveBank channels in a single program. This corresponds to four networked ValveBank4's, two ValveBank8's, or any combination thereof. EasyCode always groups channels in fixed "banks" of four (1-4, 5-8, 9-12, 13-16). A program intended for an eight channel ValveBank8 will be treated as two "banks" of four channels. Since the groups of four channels are fixed, a program using channels 3, 4, 5, and 6 would have to be transmitted as bank 1 (ch. 1-4) and bank 2 (5-8) even though it only uses four channels. Choose Select Channels under the Experiment menu to change the number of channels used in a particular experiment. Check boxes with X's represent active channels.

Select the channels to use for this experiment.

Bank 1
⊠ Channel 1
⊠ Channel 2
⊠ Channel 3
⊠ Channel 4

Bank 3
☐ Channel 9
☐ Channel 10
☐ Channel 11
☐ Channel 12

OK

Bank 2
☐ Channel 5
☐ Channel 6
☐ Channel 7
☐ Channel 8

Bank 4
☐ Channel 13
☐ Channel 14
☐ Channel 15
☐ Channel 16

Cancel

Speed tip: Screen redraws will be faster with fewer channels. Turn off any unused channels for quicker response.

If you program in a bank of channels then turn those channels off, any programming in the disabled channels will NOT be lost – it simply is not displayed. Return to the Select Channels option to view the hidden data.

Macintosh and PC-Windows Differences

While every effort has been made to keep the Mac and Windows versions of EasyCode identical, several differences exist. Some relate to nuances or conventions of the respective operating systems ('Quit' is called 'Exit' in Windows), while others are actual programming changes. Sample screens throughout this manual are taken from the Macintosh version, but should be functionally identical to Windows.

User's guide notation

References to menu choices and dialog boxes throughout this instruction manual are generally universal to both versions of EasyCode. However, subtle wording differences are noted with {brackets} for the Windows specific notation. For example, a reference to serial {com} ports means they are called com ports on the PC and serial ports on the Macintosh. Macintosh keyboard shortcuts usually use the command key (⌘-S for Save), while Windows uses the Ctrl key (Ctrl-S).
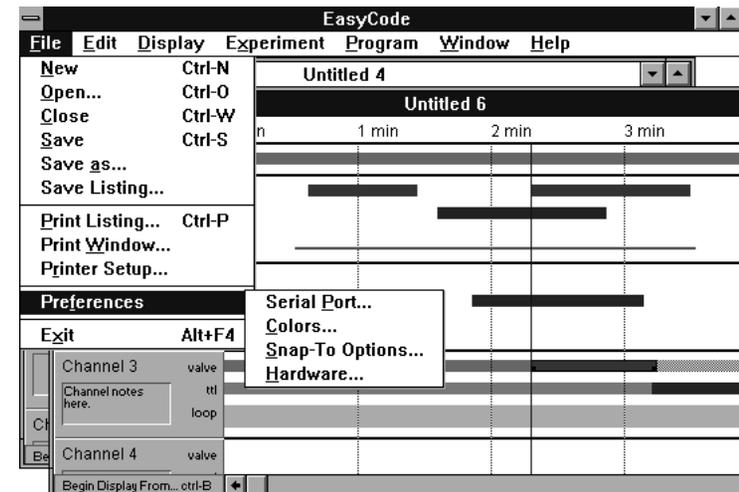
EasyCode PC window with Preferences sub-menus

Preferences

The Preferences option under the File menu (sample screen previous page) differs between the Macintosh and PC. The Macintosh Preferences dialog box shown on page 6 includes serial port, ValveBank4/8, and guides options. These three options appear as sub-menus on the PC. The actual settings are functionally identical between the two platforms.

Note: Most EasyCode settings apply only to the current document (select channels, display interval), or individual timebars, but changes made to Preferences settings apply to <u>all</u> documents opened on that copy of EasyCode. Preferences settings are stored with EasyCode, and will be preserved next time you run the program.

Macintosh auto-scroll timebar editing

The Macintosh version offers automatic screen scrolling as you create, edit, or move timebars off the left or right edges of the screen.

Using EasyCode

At this point you need to begin associating the channels you see in EasyCode with the channels on your ValveBank(s). For a ValveBank4, channels 1 through 4 represent valves and *TTL's
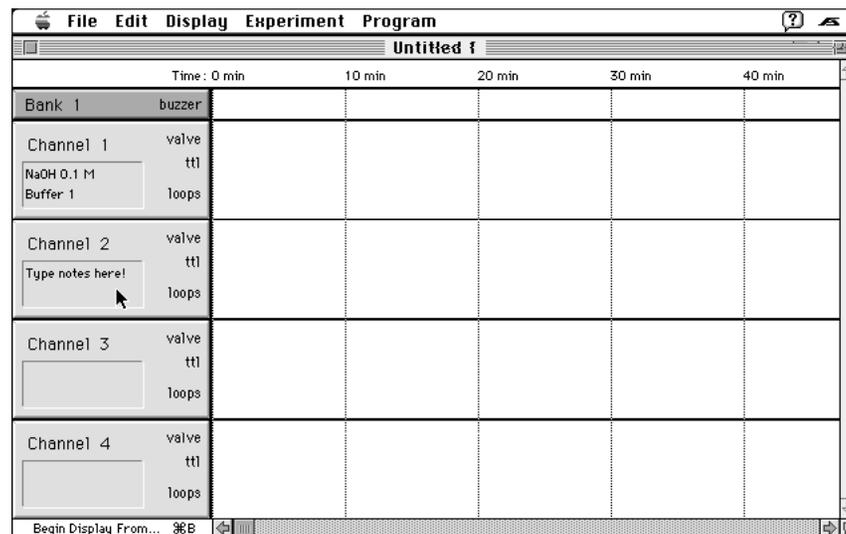
1 through 4. Taken another step, you should associate channel one with the solution to flow through valve one or accessory controlled by TTL one. The small notes box below each channel number allow you to keep track of what each channel is controlling.

Experiment notes

By selecting the Notes option under the Experiment menu, you can enter a message up to 255 characters long pertaining to the particular experiment you are working on. This window is stored when you save a program to disk, and is independent of any notes typed into individual channels.

---

* TTL stands for Transistor-Transistor-Logic, a +5/0 volt standard for representing on and off – used by the ValveBank to control and monitor external devices. See the Technical Notes chapter of the ValveBank manual for more information and uses.

Customizing your display

In general, you will adapt the EasyCode window to the Valve-Bank system you use most often. For speed reasons it is most efficient to turn off all of the channels and rows that are not in use. The Show option under the Display menu allows further control of what is displayed in the EasyCode window. For users who do not need TTL's, loops, buzzers, or valves, the Show sub-menu under Display allows these rows to be selectively turned off and on. As with Select Channels, programming in a row that is subsequently turned off is not lost. It will re-appear when those rows are later displayed, and when the program is Listed to the screen (see p. 19).
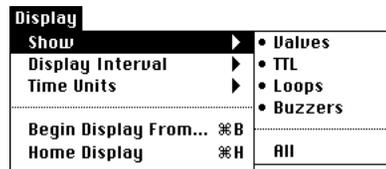
Zooming in and out of your program

The Display Interval sub-menu under Display allows you to adjust the length of time drawn horizontally across the screen. If you are using very short valve or TTL commands, you will need to select a shorter time interval for the timebars to be accessible. Likewise, if you a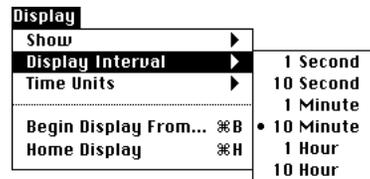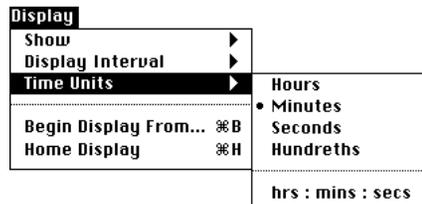re creating a very long program and want to see a greater length of time displayed, choose a higher interval. The selected interval corresponds to the width of the grey guides on screen (see next page).

(⌘-< and >) { , and . (comma and period) on the PC} will zoom in or out one interval respectively, as will the small and large 'mountain' icons on the Mac (see next page).

You may also wish to adjust the units in which time is displayed on screen. Time units correspond to the values printed above the top of the window. Hrs:min:sec may be the most flexible.

Display Units are used here

Valve and TTL timebars at Display Interval 1 minute
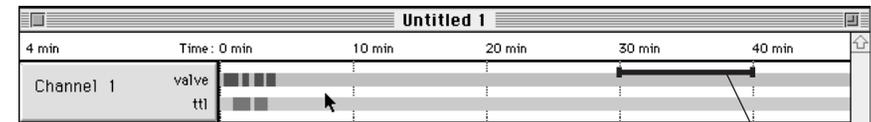
The same valve and TTL commands at Display Interval 10 minutes with buzzers and loops turned off

Display Interval corresponds to this period of time

Several additional commands facilitate quick jumps to specific times in your program. 'Begin Display From' brings-up a dialog box in which you may type a new starting display time. The screen will update with this new time at the left margin. This command is available from the Display menu or by clicking the rectangle in the lower left corner of the programming window or by typing its keyboard short-cut (⌘-B).
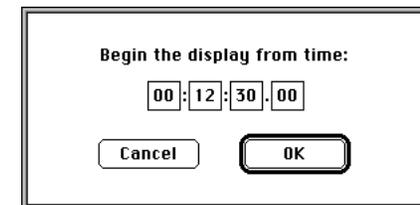
The large and small 'mountain' icons (Mac only) zoom the display interval in and out respectively.

The Home Display command under the Display menu immediately jumps the display back to time zero (short-cut: ⌘-H).

Programming in EasyCode

Programming sequences for ValveBank valves, TTL's, buzzers and loops is accomplished by dragging timebars in specific rows of the desired channels in the programming window. These timebars represent when an activity will occur (i.e. when a valve will be open or buzzer will be on). The sequential examples below will step you through creating and editing timebars.

1. Click in a channel to make it active – its rows become shaded.

2. Click and drag (left to right only) inside a valve, TTL, buzzer or loop shaded row to create a timebar. Use the time indicator in the upper left corner and the grey vertical interval guides as references.

3. Drag the small corner squares to resize timebars.

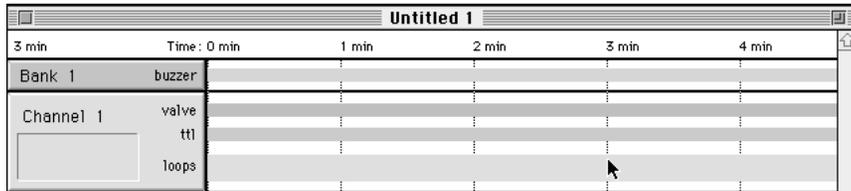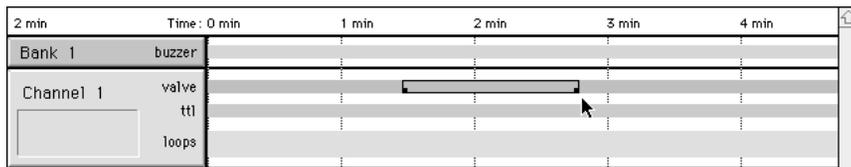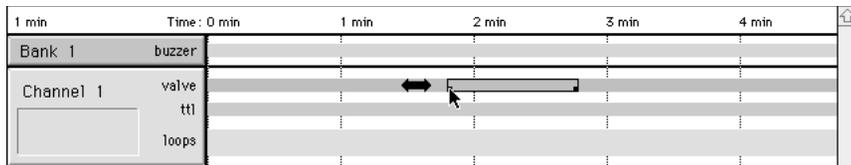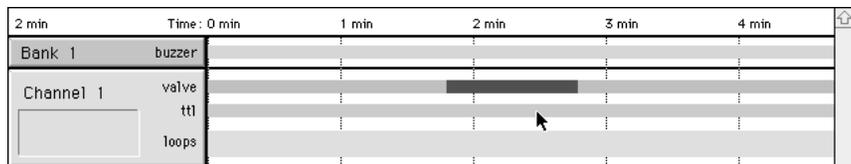*4. Click once on a timebar to select it, click between rows {upper time indicator bar on PC} to de-select. When a timebar is selected, the Tab key selects the next timebar (to the right), and Shift-Tab selects the next timebar left.*
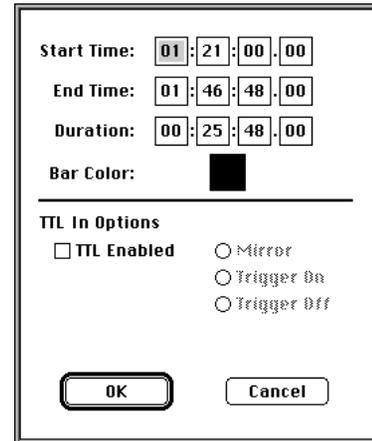
5. Double-click a timebar or choose Get Info under Edit menu to access the info dialog box for a selected timebar.
Type new time values.
Tab key advances to the next entry box. TTL In Options are explained in the TTL chapter.
Color and Duration only appear on the Mac version of EasyCode. Duration is immediately updated whenever the start or end times are modified. See Custom timebar colors (p. 31) for more color info.

☞ *Double-clicking a very small timebar may be difficult. Shorten the Display Interval (zoom in) or click once and choose Get Info. Alternately, choose the next timebar to the left or right, and use Tab or Shift-Tab to select the small timebar, or use the marquee (next page).*

6. Drag inside a timebar to move it. Delete key deletes selection.
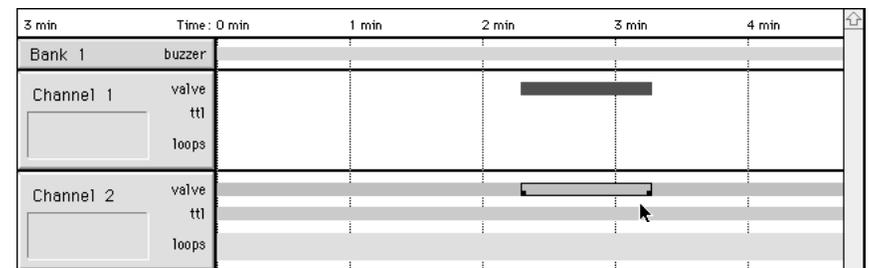
*7. Cut, copy, and paste under the Edit menu will duplicate or move timebars between channels or programs. **Note:** You cannot paste a timebar overlapping an existing one – EasyCode will beep. Move one.*

Undo under the Edit menu (⌘-Z) / {Ctrl-Z} reverses the last change made.

Group selecting

EasyCode now supports selecting, moving, copying and pasting multiple timebars. In order to change several timebars at once, they must first be selected. Selecting a group of timebars can be accomplished in several ways:

• Holding the Shift key down while clicking on timebars alternately selects and de-selects them - adding or removing them from the current group selection.

• Dragging a rectangle (marquee) around timebars selects all timebars touched or enclosed by the marquee (see below).

• Clicking in a row (valve, ttl, etc.) selects all timebars in that row - even if off screen. Clicking in a channel header (grey box on the left side of each channel except for the channel notes box) {or between rows on the PC} selects all timebars in that channel.

• Holding Shift down while clicking on a row or header allows an entire row to be added or removed from the current selection.

Click here to select all timebars in a channel
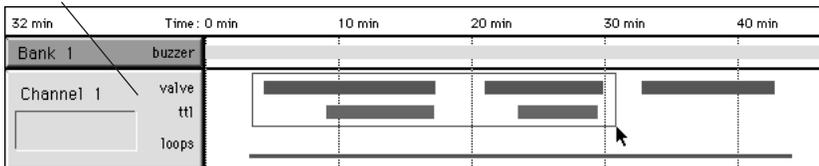
1. Drag a marquee to select several timebars, or hold the Shift key to add or remove timebars from the current selection.

Click in a shaded row to select all timebars in that row
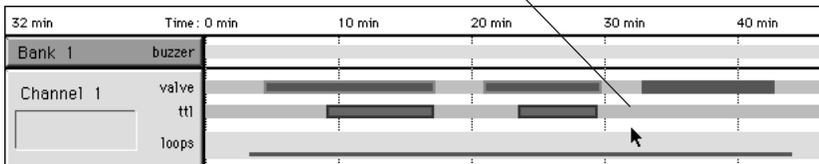
2. Timebars in a group selection appear with a heavy border {hollow corner boxes on the PC}.
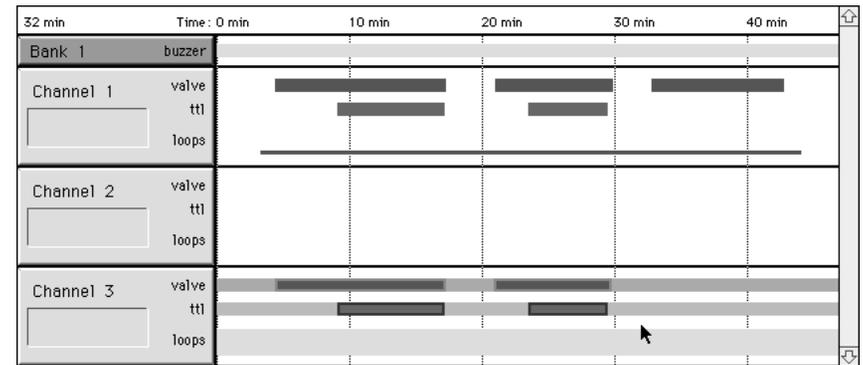
3. Cut, copy and paste work for group selections as well as delete and move. Click once in a channel to highlight it as a paste destination.

Guides

Vertical guides (grey lines) automatically appear below each 'Display Interval.' Additionally, user defined guides (blue lines) can be created to facilitate lining-up events at the same time across channels. Guides must be activated under the Guides {Snap-to}
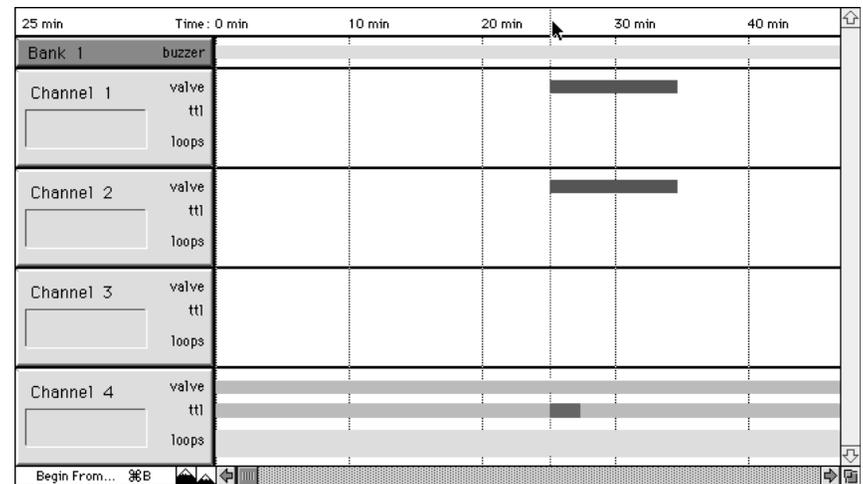
Preferences dialog under the File menu. They are created on the Mac by clicking or dragging in the white bar where the time units are displayed. On the Windows version, they are created by dragging left to right from the channel headers, then a dialog box

Guides continued...

appears for entering an exact time or removing the guide. Once created, user guides can be moved by dragging them, and deleted by dragging them back off the left edge of the screen.

Guides are useful visually for lining-up timebars, but their real strength is when 'Snap-to-guides' is turned on in the Preferences dialog. Thereafter, timebars 'snap' to the nearest user or interval guide when being created, resized, or moved.

Programming tips

Open and Save program files under the File menu as with any Mac or Windows application – even open several programs at once.

☞ You are limited to 32 timebars per channel (64 events max).
☞ Save (⌘-S) frequently!

Group tips

->> PC Only: You cannot drag a timebar that overlaps the edge of the screen or lies off-screen. Be careful selecting entire rows or channels. The Mac version will automatically scroll left or right as you drag off the screen.

->> Any time a 'Multi-channel' loop is included in a group selection, all of its linked 'partners' and inner nested loops are automatically included.

->> Get Info does not apply to a group. However, you may Get Info on an individual timebar without disturbing the group selection by clicking on it, (the timebar appears with an individual selection outline) then choosing Get Info.

Graphic printing

Choose Print from the file menu to print a graphic view of your program. Select how much of your program to print with the print screen dialog box. Enter by time duration on the Macintosh and number of pages on the PC.
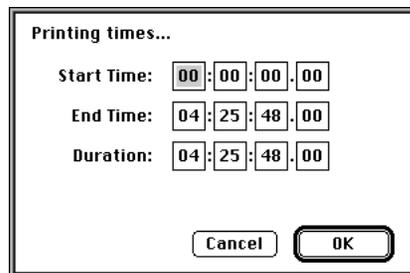
18

Listing your program

You can see your entire program as it will look in the ValveBank by choosing List Program (⌘-L) under the Program menu (shown on next page). A List window appears – complete with program and channel notes.

Remember, if a channel has been programmed and then turned off using Display Channels, that programming is not erased and will appear in the List window.

Scroll up and down to review the listing, choose Print from the File menu for a hard copy of the ValveBank program, or choose 'Save as text file...' from the File menu to store a formatted ASCII listing of your program to disk. This text file can then be read with any word processor. EasyCode cannot read text file programs.

Editing in the List window

Individual commands can be edited from the List window by double-clicking them. A standard Get Info dialog box will appear from the timebar associated with the command. Once changes have been made, click OK and the List window will be updated.

19

Communicating with the ValveBank

In the ValveBank programming language all of the timebars become a start and end command pair (see your ValveBank manual for a full description of the commands available). After selecting a timebar, its starting and ending times are accessible using Get Info (⌘-I or double-click) under the Edit menu.

Sending programs

1. Check your cable connections to both computer and Valve-Bank – see Serial port set-up (p. 7).
2. Make sure the ValveBank is plugged in and turned on.
3. Scroll to Serial Mode on the ValveBank and select "Receive."
4. Enter a program number in which to save the incoming code
5. Press Enter until the ValveBank screen reads "Ready to receive."

On the Macintosh or PC:
1. Choose Send... under the Program menu. This will create a List window of the Valve-Bank code about to be transferred (described on the previous page) and perform a consistency check for errors. A program with errors cannot be sent – see the Consistency section (p. 26) to help identify the problem.
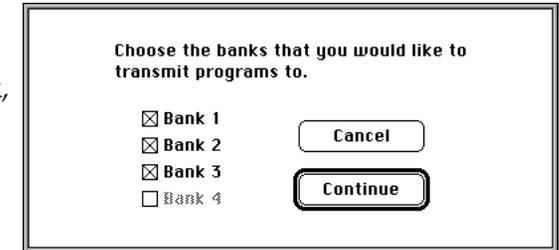2. See the next page for multi-ValveBank programs, otherwise click Send to begin the transfer. A progress box will show four channels of programming being transferred to the designated ValveBank memory slot. The ValveBank performs an internal verification and should display "Successful Receive" upon completion.
3. ValveBank8's will prompt you to send a second bank of programming. Press Cancel at this point to save one bank.

If EasyCode has difficulty and retrys sending, see pg. 22.

Multiple ValveBank transfers

If you have more than four channels active under Select Channels, EasyCode will prompt you with a check box for which 'banks' of programming you wish to transfer. Each bank represents four channels of programming and is transmitted individually – see Choosing active channels (p. 8).

ValveBank4's accept one bank and ValveBank8's can receive one or two banks (a 4 or 8 channel program). If you are using several ValveBanks as a network, you must transfer banks of programming to each one. When EasyCode has completed sending the first four channels, disconnect the serial cable from the first ValveBank, connect it to the second, and click send. The order in which to send to several ValveBanks will be determined by the solutions and valves represented by the channels in EasyCode – keep track! Repeat this process for each ValveBank (one or two banks to any ValveBank8's).

Choose the banks that you would like to transmit programs to.

☒ Bank 1
☒ Bank 2   Cancel
☒ Bank 3
☐ Bank 4   Continue

Receiving programs

Programs can also be received from ValveBanks for editing on your computer. This might be necessary if you have made changes or done fine tuning to ValveBank programs using the keypad on the controller and now wish to maintain the revised code in EasyCode.

1. Choose Receive... under the Program menu in EasyCode so that it indicates "Ready to receive."
2. Choose Serial Mode on the ValveBank and select Send.
3. Choose the source program number, and press Enter to begin the transfer. After transmitting, EasyCode performs a verification of the data and the ValveBank should display "Successful Send." A new program window will be created in EasyCode.

Troubleshooting serial transfers

Both the sender and receiver of ValveBank serial data transfers perform a data verification step. If a discrepancy is found, you will hear a beep, and the sending device will attempt several retrys. Occasionally, your computer and the ValveBank will get out of sync with one another during sends and retrys – especially if the serial cable is disconnected during a transfer. Often a serial *Receive* by EasyCode will re-synchronize both devices. If several sends to the ValveBank are beeping as unsuccessful:

1. Cancel the transfer on both ends (click Cancel or type ⌘-period on the Mac and press Cancel on the ValveBank).
2. Send any program from the ValveBank (even a blank one) and receive it in EasyCode.

If successful, you should then be able to send correctly from EasyCode to the ValveBank. The window of the dummy program received by EasyCode may be closed without saving it. If this Receive also fails, however, check the cable connections. Are you sending to several ValveBanks? Is the serial port being used selected under Preferences in the File menu? Finally, try turning the ValveBank off and re-starting the EasyCode application on the Mac or re-starting Windows and EasyCode on a PC. If all else fails, contact AutoMate Scientific for technical support at the phone number on the back of this manual.

Serial cable

EasyCode transmits to ValveBanks using a standard 'null' modem cable with the following simple wiring:

```
2  \    /  2
    \  /
     \/
     /\
    /  \
3  /    \  3

5  ----------  5  (ground)
```
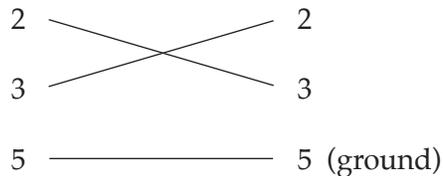
Loops

Loops are used to simplify repetition of sequences in a single channel, or in several channels as a multi-channel loop. They are created, modified, copied and transmitted much like other timebars. The following examples should help clarify loops:

1. Draw a loop to enclose other timebars to be repeated.
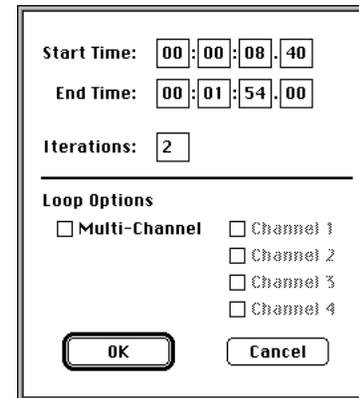
2. Creating a loop immediately brings up its info box so you can enter the number of iterations to repeat the loop. This can always be changed later.

☞ *Limit of 99 iterations*

☞ *Limit of 16 loops per channel*

3. A heavy black rectangle appears below and right of the new loop. This represents the time that the loop is repeating (the loop's second iteration in this example). During this time, the channel is occupied repeating the loop and its contents. Do not create timebars in this repetition area.
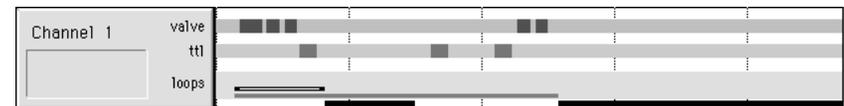
4. The loop row is extra wide to allow for 'nesting' loops up to four deep (on top and inside one another). Inner loops and their repetition areas must all lie within their containing outer loops.

☞ *You must delete nested loops in reverse order or EasyCode beeps.*
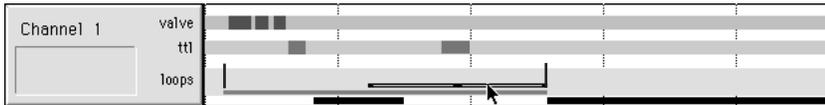
5. When moving a loop timebar, its outline becomes as long as its total repetition length. Also, you are automatically constrained inside any outer loops (the loop in the example above cannot move any farther right).
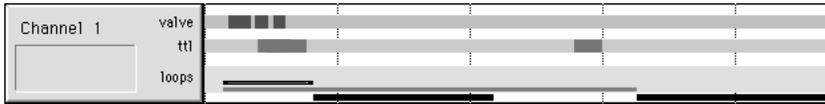
6. Creating or changing the number of iterations or the start/end times for a loop alters its repetition area and <u>automatically lengthens or shortens any outer loops</u>. Any timebars beyond the loop will also be moved left or right to prevent overlaps. Example: The number of iterations has been increased from two to three for the inner loop. Now its iteration rectangle is twice as long and the outer loop has increased as well.

Multi-channel loops

Draw a loop in any channel and click Multi-channel in its info box to make it a multi-channel loop. Identical loops will appear in all channels you check in the info box. Multi-channel loops are special structures that facilitate repeating of sequences across several channels. Once created, they are linked to one another so that altering one will change all of its partners.
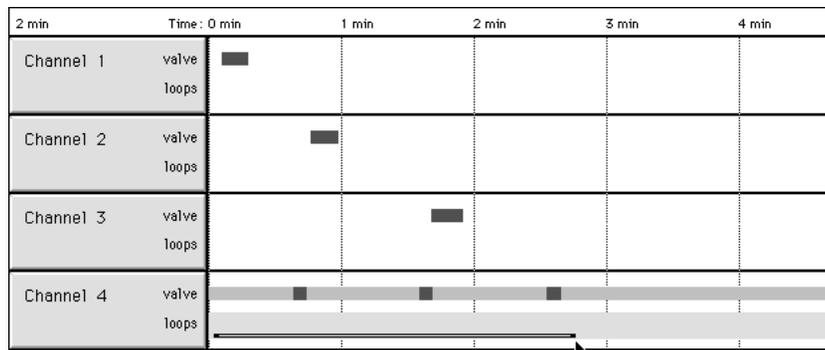
Create an ordinary loop or select an existing one.

Click Multi-channel.
Select the channels you wish the multi-channel loop to appear in. The channel it was originally drawn in is automatically included and grayed-out.
Individual loops can also be 'disconnected' later from the multi-channel link by un-clicking them.
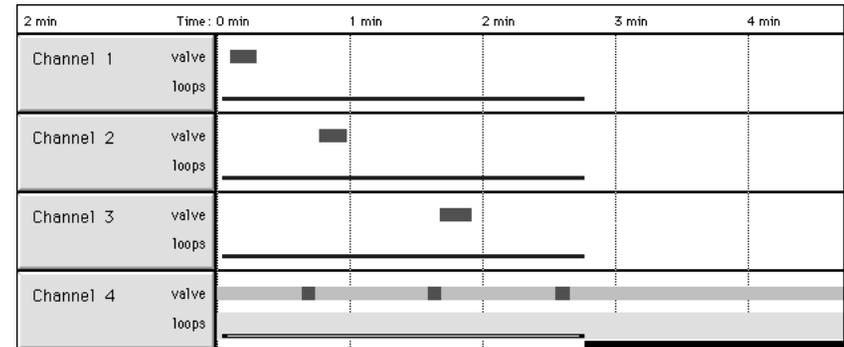

Multi-channel loops appear in blue on color systems.
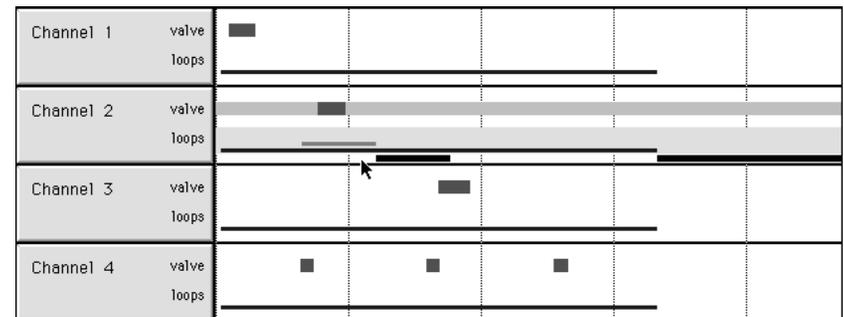
*Here a nested (inner) loop was added inside a channel with a multi-channel loop. This **automatically** lengthens the containing loop in channel 2 to compensate for the new repetition time (see example 6 on previous page), which, in turn, lengthens all of the other linked multi-channel loops.*

All of this may seem excessive simply to keep 'multi-channel' loops tied together, but if either the starting or ending time of one channel's loop was individually changed, its channel would quickly lose sync with the others it was meant to coordinate with. EasyCode handles all of the hard work for you.

Multi-channel loops may be nested, but may only be the outer-most loop. Any channel may contain a total of up to 16 loops with any combination of nesting (up to four deep) or multi-channel loops.

The ValveBank has no multi-channel loop command. Easy-Code automatically generates LOOP START and LOOP END commands in each participating channel at exactly the same times.

Consistency (error-checking)

The Consistency sub-menu under Program allows you to check selected timebars or entire programs for illegal structures: illegal timebars in loop repetition areas (see example), too many events (> 32 timebars), or too many loops in a channel (> 16). You may also turn active warnings on and off.

Illegal timebar

You cannot place a timebar during a repetition area (shown by the black rectangle when a loop is repeating) or you will generate the following error:
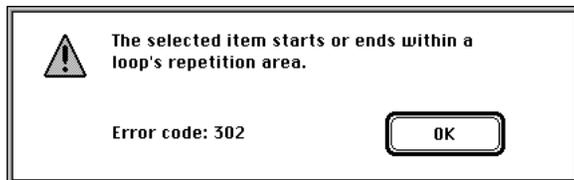
Move or delete the offending timebar to eliminate the error. Below: The same error while the loop is selected. You could move the loop or change its iterations.
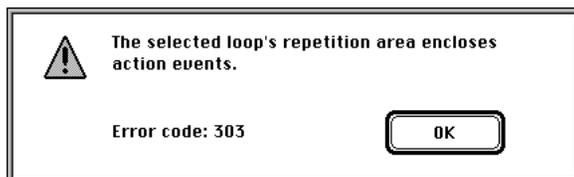
TTL Input options

Three TTL Input options are available to instruct the Valve-Bank to react to external signals through its TTL Input port. See the TTL Input Commands sub-chapter in your ValveBank manual for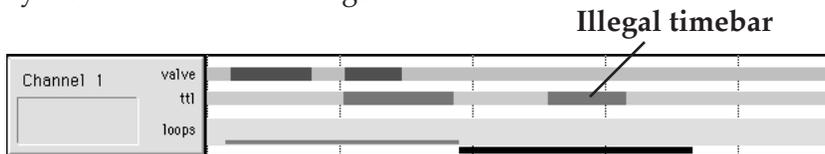 a full description of the commands that these TTL options translate into. Access the special options through the usual Get Info box for any valve timebar - not TTL's:
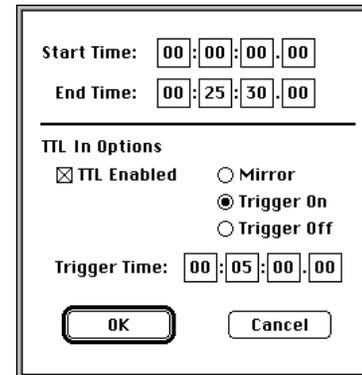
Selecting TTL Enabled un-greys three TTL In options. Enter a Trigger Time (length) for either TRIGGER ON or OFF.
☛ *Trigger time must be less or equal to the total length of the timebar.*

Sample timebars of each TTL In option (l to r: mirror, trigger on, trigger off) White inner lines in second two timebars represent their 'Trigger Time.'

Mirror   The valve will 'mirror' its channel's TTL input during the timebar: While the TTL input is High, the valve will be Open, TTL Low = Closed. Open/closed logic can be inverted on the ValveBank.

Trigger On   Instructs the ValveBank to begin watching the TTL input associated with its channel. When that TTL input goes High, that channel's valve will open (like a Mirror above), but only for the amount of time specified by the Trigger Time. If the TTL input is already High when the TRIGGER ON command is processed, the valve is opened immediately and

Trigger On (cont'd)   timed according to the Trigger Time as usual. TRIGGER ON only triggers once. Use loops to repeat trigger (see below). A VALVE OFF command is included at the timebar's end time to discontinue the pending TRIGGER ON command or override any Trigger Time remaining.

| Time : 0 min | 10 min | 20 min | 30 min | 40 min |

Channel 1   valve
            loops
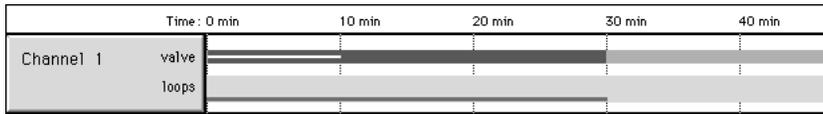
Use a loop to trigger repeatedly. This example will open valve one for up to 10 minutes out of every 30 minute period as many times as the loop repeats.

Trigger Off   EasyCode translates the Trigger Off timebar into a VALVE ON command at its start time then a TRIGGER OFF command at the end time minus the Trigger Time entered. The TRIGGER OFF instructs the ValveBank to watch its TTL input (like a TRIGGER ON), but, when the TTL input goes High, the ValveBank *CLOSES* that channel's valve. Finally, the TRIGGER OFF timebar is discontinued with a VALVE OFF, just like a TRIGGER ON, to make sure the valve closes at its end time.

See the Timing Diagram on the next page and the *Computer Interfacing* chapter of the ValveBank manual for more TTL input information.

☛ Remember ValveBank8's only have TTL Inputs for their first *four* channels. EasyCode lets you use them in *any* channel not knowing which banks may be transmitted later as channels 1-4.

The TTL Inputs can be used for computer (or other timer) interfacing – allowing a computer to operate valves using the ValveBank as a driver; to respond to sensor inputs (pressure, temperature, flow or level sensors, bubble detectors); to deliver timed feedings; or otherwise react to TTL-generating devices.

Timing diagrams (Sample TTL input is bottom graph)

TTL RESPOND 00:00:05.00
TTL IGNORE   00:00:16.00

On

Off

TRIGGER ON   00:00:05.00
TRIG LENGTH   00:00:

On

Off

VALVE ON   00:00:00.00
TRIGGER OFF 00:00.05.00

On

Off

TRIGGER ON   00:00:04.00   (disables TRIGGER ON or
TRIG LENGTH   00:00: OFF)
02.00
VALVE OFF   00:00:05.00

On

Off

Valve output

Sample TTL INPUT:

High

Low

t=0   5 sec.   10 sec.   15 sec.
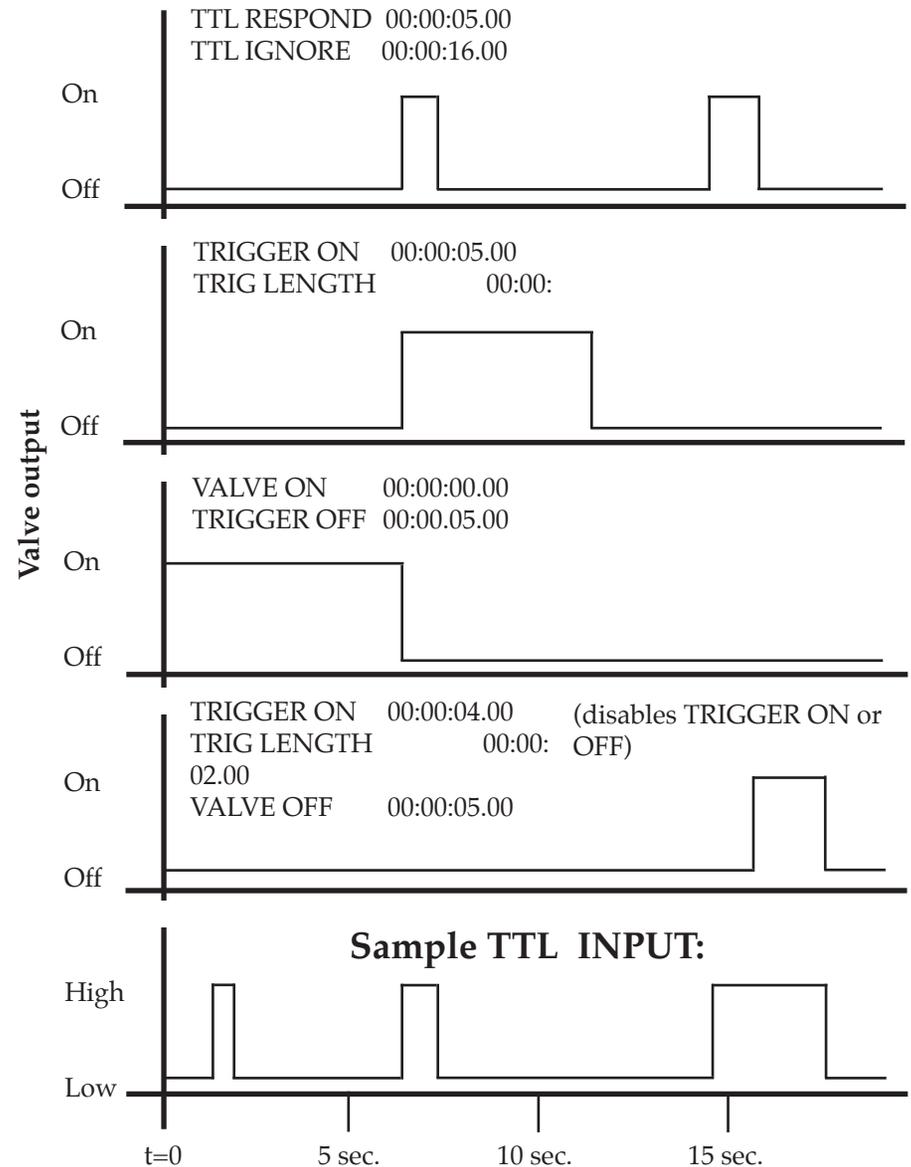
Advanced Features & Tips

Speed screen display

- Eliminate unused channels (Select Channels under the Program menu).
- Turn off unused rows (use Show under the Display menu).
- Try the Black & White (not color or greys) setting in the Monitors control panel.

Multiple documents

EasyCode allows you to have any number of program files open at once. Open files are listed under the Experiment menu where you can easily switch between them. Cut, copy and paste across documents to combine programs or pieces of programs. Use the Windows menu on the PC to Tile, Cascade, Arrange, or Close All open document windows.

Mac - PC file sharing

EasyCode on both platforms read each other's files. Transfer EasyCode files by high-density disk or network.

Typing in a program

You cannot type ValveBank commands (as shown in the List window) directly into EasyCode from the keyboard. However, if you wish to type a program from a print-out or notes with precise times, simply click-and-drag timebars anywhere in rows as you need commands (valve, TTL, loops, etc.) and immediately select Get Info to call its info box (p. 15). Here you can type any start and end times – even if it will completely reposition the timebar. Hence, you simply drag-create timebars anywhere quickly, then type in new, valid times and repeat through your listing for each pair of on/off commands and all channels.

Custom timebar colors

Macintosh: Colors of individual timebars can be changed in their Get Info box. Click on the color box to display the standard Apple color picker. Start by sliding the right scroll bar to its top.
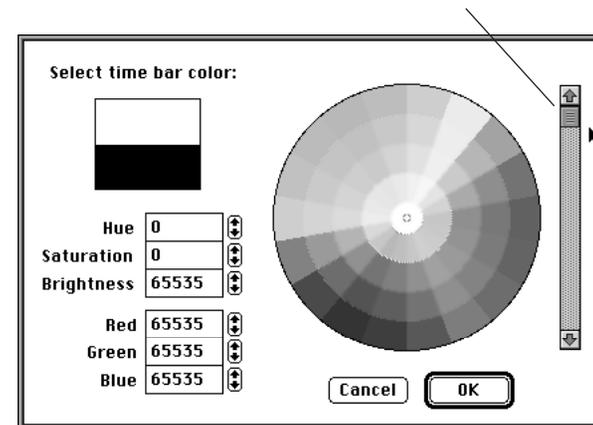
Then choose a color by clicking inside the wheel, or typing numbers directly into the small boxes on the left. Click OK to finish color selection and return to the dialog box. All EasyCode color boxes default to black which displays in the standard timebar color for the corresponding row. Setting a timebar back to black returns it to the internal default color.

Graphic screen snapshots

In addition to printing the graphic timebar window (p.18), you can also capture a disk image of the current screen. Arrange the entire screen exactly as you want (scroll and position windows and increase the Display Interval under the Display menu to fit more across the screen).

Macintosh: Press ⌘-shift-3 on your Macintosh keyboard. After a brief pause, a new PICT file named "Picture 1" will be created on your system hard disk. Subsequent 'snap shots' are numbered "Picture 2..." sequentially. These PICT image files are of the whole screen, menu bar, background, arrow cursor, open dialog boxes and all. They may be large files, especially on big color monitor systems – try a sample. These PICT files may be opened by most graphic software; imported into many word processors, page layout, and slide presentation programs; or even translated into a PC-compatible format with the appropriate software. If subsequent print-outs are 'muddy' because of difficulty printing greys, switch the Monitors control panel to Black & White (not greys) before taking the snap shots. This creates smaller files on your hard disk too.

Windows users: Press the PrintScreen key, and a screen snapshot will be created in the Windows clipboard. It can be displayed, modified, printed and saved using *PC Paintbrush* that comes with most PC systems. If subsequent print-outs are 'muddy' because of difficulty printing greys, switch the Monitors control panel to Black & White (not greys) before taking the snap shots. This creates smaller files on your hard disk too. Alternately, adjust the palette in *PC Paintbrush.*

Sample files

Be sure and check the folder of sample files included on your EasyCode disk (remember to use a back-up copy or from hard disk). All of the samples found in the back of the ValveBank manual are included as well as several newer examples. These programs are intended as templates. You will almost certainly need to modify them for your own configuration (solutions and accessory channels), calibration (flow rates and fill times), and specific timing requirements. Remember to do a Save As... (which will allow you to save with a new name and to a different drive) instead of a Save (which would overwrite the sample file) if you make changes and want to keep the original sample files.

Special thanks to Susan Abrahamson and the Grussem lab at U.C. Berkeley for the Silver Stain protocol and program.

Please calibrate the sample templates to your system and test before using them.

Send in your warranty card and we will keep you updated on new releases of EasyCode and additional sample templates.

Keyboard shortcuts

Many EasyCode features can be accessed by keyboard. Hold command (⌘) or Ctrl down while pressing the following keys:

N	New program	X	Cut
O	Open file	C	Copy
S	Save file	V	Paste
W	Close window	I	Get Info
Q	Quit EasyCode	Z	Undo
P	Print window		

< {,}	Zoom out	Error checking:	
> {.}	Zoom in	J	Selection
B	Begin from	K	Program
H	Home (zero)		
L	List program		

Tab	Select next timebar right
Shift-tab	Select previous timebar left

Dialog boxes:

Tab	Jump to next entry box
Return or Enter	OK
Esc	Cancel

Warranty

AutoMate Scientific, Inc. warrants its products against defects of workmanship and/or material for **ONE YEAR** from the date of sale. Any product that fails to perform as specified may be returned, freight pre-paid to the factory (with a written explanation of the problem) for examination and repair or replacement. If it is defective, AutoMate Scientific will repair or replace (at our option) the product without charge and return it to you.

If the examination indicates that non-compatible fluid, destructive environment, accidental damage, modification or abusive practices have occurred, all labor, materials and freight costs shall be at the expense of the customer. Due to the nature of research laboratory applications, AutoMate Scientific, Inc. will **NOT** accept the return of any products which have been used with **HAZARDOUS MATERIALS** or in a harmful environment.

This warranty is in lieu of all other warranties, whether oral or written, express or implied. In no event shall AutoMate Scientific, Inc. or its licensor/licensees be liable for contingent, special, direct, indirect or consequential damages for the breach of any express or implied warranty or resulting from the use, failure or malfunction of any product, including damage to property and, to the fullest extent permitted by law, damages for personal injury, even if AutoMate Scientific, Inc. has been advised of the possibility of such damages or if this warranty is found to fail its essential purpose. If you choose to use this program, you agree that AutoMate Scientific, Inc's liability is limited to the reimbursement of the cost of the product or program licensed to you. All other warranties, including, but not limited to warranties for fitness or merchantability for a particular purpose are expressly excluded. No verbal changes to this policy will be authorized. **DISCLAIMER:** AutoMate does **not** warrant that the program is free from all bugs, errors, and omissions – only that it operates substantially as described in this User's Manual.

AutoMate Scientific, Inc. manufacturers and sells goods in accordance with U.S. federal, state and local laws, but assumes no responsibility or liability for laws, regulations, duties, or taxes imposed by any foreign country. All terms and conditions hereof shall be governed by the laws of the State of California. Some states do not allow the exclusion or limitation of implied warranties or liability for incidental or consequential damages, so the above limitations or exclusions may not apply to you.