

PROGRAMMERS PACK

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HTBRI XL/XE

THE PROGRAMMERS PACK (C) SOFTSCAN

Description: The Programmers Pack consists of a compilation of utilities designed to assist the Basic or Assembly Language programmer in the production of games on the Atari XL/XE computers.

The Programmers Pack consists of four main utilities:

GENESIS- a Player (Sprite) designer and animator. Single or multicoloured Players may be designed with up to ten stages of animation.

MELODY MAKER- eliminates the need to work out data values when creating music for your programs. Enter the melody directly using the screen 'keyboard', and save the data values of the musical notes to disc for use in your own programs.

SOFT SHAPER- an Antic 4/5 (Graphics 12/13) character redefinition utility. Design custom multi-coloured character sets for use within your own programs.

VSPC- the VSPC, or Vertically Scrolling Playfield Creator, enables you to design Antic 4 playfields directly onscreen! The program will load in custom character sets created with **SOFT SHAPER** and allow you to experiment with playfield layouts, create title pages, etc. In addition, the utility scrolls the playfield vertically to allow you to design scrolling game playfields.

Loading a Programmers Pack utility:

To load any of the four main utilities, simply insert the correct disc (on the correct side) and switch on your computer. Some of the sub-utilities and routines featured will require Basic, and should be loaded from Basic.

ALL ABOUT GENESIS

Genesis enables you to design animated Players for use within your programs. When Genesis has been loaded, a title screen will appear. Press RETURN to enter Genesis, and you will find a demo file is on display. To stop the animation, press RETURN. To overwrite the data, use the [B] function (described further on). To erase the demo in future, create a blank Genesis file to clear the Player data.

There are a number of demo files included on your Genesis disc. Try loading these files and experimenting with various Size, Colour, Multicolour On & Off, and Resolution settings.

Loading and saving animated sequences:

To load a previously saved animated sequence - for instance one of the demo files. Press RETURN to abort the current function (if applicable). Press the [ESC] key for the option to save or load a file. Press [L] for the load option. Enter the filename - i.e. DOG - press RETURN and the file will load. Finally, press [A] and the file will be animated.

To save a file, press RETURN to abort the current function. Press [ESC] for the load/save option. Press [S] for save. Finally, enter the filename and press RETURN to save the file.

Accessing the disc directory:

To check the contents of a DOS 2.5 disc, press RETURN to abort the current function. Press [Y] to call up the directory. For further information, press the Space-Bar. To leave the directory, press RETURN.

Keying in data directly:

Genesis offers two methods of keying in data. Either in Hexadecimal form, or in Decimal form, depending on the [H] key selection. To enter in hexadecimal, use the [H] key to set the onscreen data to hexadecimal. Press [D], and enter data with the keyboard. The hexadecimal data entry requires a two digit input per byte, i.e. to enter the value \$F, type OF, then RETURN. To enter \$17, type 17, then RETURN.

To enter data in decimal, set the onscreen data to decimal using the [H] key. Press [D], and enter the data with the keyboard. Decimal entry requires a three digit entry per byte, i.e. to enter the value 1, type 001, then RETURN. To enter 26, type 026, then RETURN. To enter 128, type 128, then RETURN. Etc. Etc.

Genesis continued...

Clearing a grid and player area:

Use the [P] key to toggle the cursor into the grid to be cleared. Press [CLEAR] to erase the area.

Selecting player resolution:

Pressing the [R] key will toggle between hi and low resolution players.

Adjusting the colour registers:

Pressing the [Z] and [X] keys will alter the background colour. To alter the player colour, toggle into the correct player grid and press the [Q] or [W] keys.

Drawing an image:

Select the grid using the [P] function, and move the cursor around the grid using your joystick. Pressing the fire-button will switch-on or erase the grid pixels under the cursor.

Images created may be manipulated with the various functions described in the command key section. For instance, pressing [U] will invert an image.

Animation:

The animation function consists of 20 blocks of memory that are used to store player images. The 20 blocks are divided between the two grids, ten per grid. If the cursor is resident in grid 1, then any block save will concern only the contents of grid 1. If the cursor is resident in grid 2, only grid 2 contents will be saved.

The [B] key is used to save images to each block, and will overwrite (erase) any data already contained within that block.

The [N] key is used to retrieve data from a block, and will overwrite any image currently displayed in the relevant grid.

The number keys [1] to [0] are used in conjunction with the [B] and [N] keys to select which block to save to or read from.

Because accidental misuse of the [B] and [N] keys can be rather destructive to your data, an audio prompt will be heard when these keys are pressed. If you do make an accidental selection, press RETURN to abort the function.

Saving an image:

The following instructions are identical for each grid, and apply to whichever grid the cursor currently resides in.

With the cursor in grid 1, draw an image using your joystick and fire-button. Press [B] then [1]. The image has now been saved to block 1, the first block. To prove this, press the [CLEAR] key to empty the grid, then press [N] then [1] and the image is restored.

You may use these techniques to save up to ten images per grid - [B][1] to [B][0]. For longer animated sequences, you may of course link Genesis sequences within your own programs.

To demonstrate the use of the blocks further, load the demo file D:DOG from the Genesis disc. Next press [CONTROL A]. By pressing the Space-Bar you may single step through the ten stages of animation. This is the single step mode.

Notice that both groups of blocks are animated simultaneously, and because of the way the images have been created, they appear as one larger image. Press [RETURN] to leave the single step mode.

The mirror command:

If you are designing a sequence that uses two players side by side to create a larger character, that is symmetrical, the [K] function can save a lot of time and effort. Simply design one half of the image in one grid and press [K] to copy a mirror image into the other grid.

Genesis continued:

THE GENESIS COMMAND KEYS:

[P] -moves the cursor from grid to grid. Many of the command key functions work on the contents of the grid in which the cursor currently resides.

[S] -increments the player size register

[U] -flips the contents of a grid upside down

[I] -inverses the contents of a grid

[Q] -decrements the player colour

[W] -increments the player colour

[H] -toggles screen information and keyboard input between hexadecimal and decimal

[Z] -decrements the background colour

[X] -increments the background colour

[R] -toggles between single and double line resolution

[D] -key-in date from the keyboard in either HEX or DEC depending on the [H] setting

[C] -copy identically the image from one grid into the other

[K] -copy a mirror image into the other grid

[CLEAR] -clears grid area and player area

[CURSOR KEYS] -scrolls the grid and player data either horizontally or vertically

[Y] -call the disc directory. Press the Space-Bar for further information. or RETURN to re-enter the main program

[ESC] -selects the option to save or load a file from disc. Press [ESC] followed by [L] for load or [S] for save, then type in the filename, i.e. FILENAME.EXT and press RETURN

[B] -save the current image to an animation block - i.e. [B][1]

[N] -retrieve an image from an animation block - i.e. [N][1]

[NUMBER KEYS] -used in conjunction with the [B] and [N] keys to select which animation block to write to or read from

[A] -selects continuous animation mode, press RETURN to stop

[CONTROL A] -selects single step animation mode. Press the Space-Bar to step through the sequence. Press return to stop

[RETURN] -used to abort a process and return to the main program

[M] -multi colour option. Overlaps two players, and , by erasing or writing to different areas of each player, a three colour character can be produced

ALL ABOUT MELODY MAKER

Translating musical notes to data values for use in your Atari programs can be a tedious task. Melody maker will simplify this process by enabling you to enter melodies directly via a screen representation of a piano keyboard. The melody may then be played back through a simple sequencer to provide syncopation. The utility does not provide a variety of tones, only a high and low tone setting, as the purpose of the utility is solely to produce the 'raw data' for inclusion within your own programs.

Using Melody Maker

Enter a melody controlling the hand with your joystick and positioning the finger over the note required. Press the fire-button and the finger will play the note, and the value of the note will be placed in memory. To press the black keys (sharps and flats), move the stick forward which will cause the hand to reach up. Accidental selections may be removed from memory by pressing the [DELETE] key. To clear both the Editing and Sequencer areas of memory, press [SHIFT/CLEAR]. Sustain of the notes may be adjusted using the number keys 1 to 0. Two different tone settings are provided. Press L for low tone and H for high. After entering your melody, check all is well by pressing [RETURN]. All notes so far entered will be played back. Pressing the [START] button will abort the playback process - this also applies to the sequencer playback process. If an error is detected, rectify it by pressing [DELETE] until the offending note is reached and re-enter the passage correctly.

Genesis continued...

Creating multi-coloured players:

Many commercial games use characters that consist of more than one colour. The characters then appear more detailed and realistic.

To implement the multi-colour option is easy - just press [M]. However, using the function does require a little practice to achieve good results. It is suggested that you understand the animation function before tackling the multi-colour player option.

The multi-colour option overlaps two players. The two players are set to separate colours, and where they overlap a third colour is generated.

Assuming you have set up the player colours, return to grid 1 and draw a design. When you are satisfied with it, press [C] to copy it into grid 2. Now, by moving between the two grids and erasing different area of each character, you will see the different colours emerging. Practice is required, but my referring to the multi-colour demos, such as D:WALK it will soon become straightforward.

Animating multi-coloured images:

As you will now realise, it requires both grids to create one multicoloured player. As you create each image, save them to the animation blocks using the [B] key, i.e. for the first image, press [B] then [1], then move to the other grid and press [B] then [1] again, and both images are saved. You may then alter the grid images for the second stage of animation and then save these, this time pressing [B] followed by [2] (both grids of course). Continue to use this method up to [B] [0] which is the tenth and final image.

When finished, press [A] to animate your sequence. Make sure the [M] option is ON!

If you are still dissatisfied with one or more of your images, they can be retrieved for editing using the [N] command, i.e. [N][1] to [N][0]. *Using a Genesis file in a Basic program:*

To place a file created with Genesis within data statements for use in your own programs, switch on your computer with a standard DOS 2.5 disc in drive 1. When the 'ready' prompt appears, place the Genesis disc into the drive and type RUN "D:CDATA.DEC" and press RETURN. The program CDATA.DEC will then load and run. When asked for a filename, enter the name of the file to be converted, i.e. D:FILENAME.EXT. Insert the disc containing the file to be converted and type in the line number you require the data statements to begin at, i.e. 1000. Press RETURN and the program will begin its task. When completed, the data statements will scroll up the screen and you will be offered the option to save them to disc. To save to disc, insert a DOS 2.5 disc and type in a filename, i.e. D:FILENAME.EXT and press RETURN. The data statements will be LISTED to disc.

Hexadecimal data statements may be created instead of decimal, for use in Assembler programs for instance, using the same procedure but using RUN "D:CDATA.HEX" instead.

To load your data statement files into your own programs use the ENTER "D:FILENAME.EXT" format.

Using Genesis files in Assembler:

After converting the Genesis binary file into hexadecimal data statements using CDATA.HEX, ENTER the newly created data file into your assembler and use your assembler's REPLACE command to replace all occurrences of the word DATA with the correct assembler directive.

Data files - further details:

Data files created with the CDATA routines are constructed in the following way:

Each line consists of 23 values which comprise 1 player image. The first 10 data lines contain ten images created in the left hand grid - the first data line being the first image, the second line the second image, etc. The eleventh line contains 23 zeroes and has simply been included as a delimiter and can be ignored. This line contains NO player data and can be eliminated if preferred.

Lines 12 to 21 contain the player data for the images created in the right hand grid. The data is in the same format as lines 1 to 10.

Melody Maker continued...

When satisfied that all notes entered are correct, enter the sequencer mode by pressing S. Pressing the fire-button starts the sequencer and a metronome pulse will be heard. This pulse runs at a speed governed by the sustain setting. Each pulse represents a pause in the finished melody, so press the fire-button when you wish to position a note, or allow a pulse (or pulses) through where you desire a pause.

When completed, the whole tune may be played back by pressing T. If dissatisfied, you may return to either the sequencer or editing stages to try again.

Both the editing and sequencer areas of memory hold a maximum of 254 notes. However it should be noted that each *pause* introduced at the sequencer stage is also equal to one note, so if 254 notes have been entered at the editing stage, not all of the tune can be fitted into the sequencer stage if pauses are required.

If completely satisfied with your melody, press [ESC] for the option to save or load a file to/from disc. Press S for save and enter a filename of up to 8 upper-case characters (no extender .EXT), and press [RETURN]. The file will be saved to disc (DOS 2.5).

A previously saved file may be reloaded if required by pressing [ESC] followed by L for load. Enter the filename and press [RETURN]. The file will be loaded from disc.

Converting a Melody Maker binary file:

To convert a binary file created with Melody Maker into values contained within data statements, for inclusion in your own programs:

From Basic with DOS 2.5 installed, type LOAD "D:CDATA.MUS". Insert the disc containing the file to be converted and type RUN. The conversion program will require you to enter:

- (a) the filename of your Melody Maker file.
- (b) the final sequencer count (if you've forgotten it, enter 254).
- (c) an initial line number (must be over 100).

The screen will turn black until the data statements have been created, after which you will receive the option to enter a filename and LIST the data to disc.

Sound to light:

Also included on your Melody Maker disc is a program that will play binary files created with Melody Maker (note that files that have been converted to data statements using CDATA.MUS are unsuitable), and in addition will display a graphics sequence that is triggered by the melody (the images are multitasked Players making use of the XL/XE interrupts).

This program has been included only for your amusement. As well as playing Melody Maker binary files, the routine will also accept other binary files. When a filename is requested try entering DUP.SYS, or LSHOW.BIN, the effect can sometimes be quite weird.

Loading the sound to light routine:

From Basic with DOS 2.5 installed, type LOAD "D:PLAY.MM" and press [RETURN]. Run the program, but leave the Melody Maker disc in place, as the program requires a binary file, LSHOW.BIN. When requested, enter your Melody Maker filename (or one of the demo files on the disc) and press [RETURN]. When the file has loaded, press [RETURN] to start the display. To load another file, press RESET and re-run PLAY.MM, following the same procedure as above.

Playing your converted data files:

PLAYIT.BAS is a simple Basic routine that will play data files that have been converted with CDATA.MUS. From Basic, LOAD "D:PLAYIT.BAS" and ENTER "D:FILENAME (one of your data files)". Type RUN and the melody will be played.

The demo files:

ROCKER - a simple rock'n'roll pattern. MELODIC - a straightforward melody. ELECTRO - an improvised pattern.

ALL ABOUT SOFT SHAPER

Soft Shaper is an Antic 4/5 (Graphics 12/13) character redefinition utility that will enable you to redefine the existing character set into multicoloured graphical images for use in your programs.

Using Soft Shaper:

Use the Left, Right and Down cursor keys to control the blue cursor. The cursor should be moved behind the character you wish to alter, and the [RETURN] key pressed. The character will then be displayed in the editing grid. Use your joystick to control the grid cursor, pressing the fire-button to write or erase pixels. The current pixel colour is selected by pressing the Space-Bar, and modifying the colour using the SELECT & START buttons. Colour register values are displayed in the menu area.

It should be noted that it is the character under which the blue cursor is residing, and not the contents of the editing grid, that determine which character is being altered.

THE COMMAND KEYS:

[M] -mirror image of the original character
[T] -move the character to another location (i.e. duplicate the character). The relevant character should be displayed in the editing grid, and the blue cursor positioned behind the character to receive the image - then press T
[R] -restores the character in the blue cursor position to its standard character set image
[I] -inverse (strictly speaking, not true inverse, but shifts the colour/pixel positions of a character)
[CLEAR] -erase the character in the blue cursor position
[Q] -scroll character right, with wraparound
[W] -scroll character left, with wraparound
[SELECT/START] -alter the current pixel colour - value is displayed
[1/2] -alter the background colour
[D] -access the disc directory
[RETURN] -display the character at the blue cursor position, in the editing grid
[L] -load a file from a DOS 2.5 disc. The filename should be upper-case and of a maximum 6 characters, no extender (.EXT)
[S] -save to a DOS 2.5 disc, filename as [L]

Routines included on your Soft Shaper disc:

CDATA.DEC -load from Basic. This routine will convert a binary file created with Soft Shaper, to data statements suitable for inclusion within your Basic programs [LOAD "D:CDATA.DEC"]
CDATA.HEX -load from Basic. Similar to CDATA.DEC, but the data statements are in hexadecimal. Assembler programmers can REPLACE all incidence of the word 'DATA' with the correct assembler directive
MOVESET.BAS -installs and displays your new character set

A rough and ready guide to Antic 4/5 (Graphics 12/13):

Antic modes 4 and 5 are multicolour character graphics modes. They may be utilised on the XL/XE computers with a Graphics 12 or a Graphics 13 command. The older 400/800 computers cannot access these modes directly, and would require the programmer to modify Antic's display list.

Antic mode 4 displays characters of four colours including the background colour. These characters are the same size as Graphics 0 characters. Antic mode 5 characters are the same width but are twice the height.

However Antic mode 4 and 5 characters are only four pixels wide (instead of the eight pixels used by Graphics 0 characters). Each pixel may be one of three colours, or if blank, assumes the background colour.

Each mode 4 or 5 character is made up of eight bytes, but each pixel requires two bits per byte to determine its colour. This explains the four pixel resolution. As each pixel requires two bits, there can only be four pixels per byte!

Soft Shaper continued...

The setting of the two-bit pairs is as follows:

00 = no bits set. The pixel will assume the background colour (can be set by poking register 712)
01 = least significant byte set (LSB). The pixel gets its colour from register 708
10 = most significant byte set (MSB). The pixel gets its colour from register 709
11 = both bits set. The pixel colour is derived from the setting of register 710

To demonstrate further - if a byte contained the value 01000010 binary, bits 7 and 6 would represent one pixel that would take its colour from register 708. Bits 4 and 5 would represent a pixel that was not 'switched on', therefore assuming the background colour, as would bits 3 and 2. Bits 1 and 0 would represent one pixel that would get its colour from register 709.

For example, to define a letter 'A' using Soft Shaper, in one colour with the 00 pixels assuming the background colour, of course. We would require the following:

```
00 00 00 00
00 00 00 00
00 01 00 00
01 00 01 00
01 00 01 00
01 01 01 00
01 00 01 00
01 00 01 00
```

The newly defined letter 'A' would get its colour from register 708.

To use the same example, but include another colour to obtain a 3D effect, which is a common use of the Antic 4 and 5 modes:

```
00 00 00 00
00 10 00 00
10 01 10 00
01 00 01 00
01 00 01 00
01 01 01 00
01 00 01 00
01 00 01 00
```

This would achieve a shaded effect by utilising register 719 (10). Naturally, the different colours need to be chosen carefully to give the required effect, and the third colour register might also have been utilised if required.

ALL ABOUT THE VERTICALLY SCROLLING PLAYFIELD CREATOR

Creating game playfields, title screens, diagrams, or any form of complex graphical representation onscreen, can be a tedious and time consuming task. The VSPC utility will eliminate much of the tedium of playfield design.

By loading a redefined character set into the VSPC editor, Antic 4 (Graphics 12) playfields may be designed directly onto the screen, offering you endless experimentation.

In addition, the utility will fine scroll up to 5 screenlengths vertically, enabling scrolling games to be designed. For a greater scroll area, you may of course link your playfields within your own programs.

All colour registers may be altered during the design process, and all values are helpfully displayed.

Using the VSPC:

When loaded, the program will initially display a menu screen. You will need to load in a redefined character set to do any useful work. To load in a redefined character set created with Soft Shaper, press C, and enter the filename which may be of up to 6 upper-case characters. Press [RETURN] and the custom set will be loaded.

Vertically Scrolling Playfield Creator continued...

The VSPC also offers the option to save and load playfields. This of course allows you to create your designs at leisure and re-edit them at a later time if you require. Type S, enter the filename and press [RETURN] to save a playfield. Playfields should be saved to a DOS 2.5 disc.

DOS may be called directly from the VSPC by pressing D. To re-enter the VSPC from DOS, use the DOS M function, and type 5000 [RETURN].

Assuming that you have loaded in your custom character set, press E to enter the editor. Place the characters of your choice onscreen by pressing the relevant keyboard character. you may toggle between Graphics, Upper-case, and Lower-case, by pressing the [INVERSE VIDEO] key. This will save you using Control and Shift combination keypresses. You may also toggle between your custom character set and the standard set using the SELECT button. To place characters at any point on the screen, use your joystick to move the parallel flashing bars to the position at which you require a character, and then press the relevant keyboard character to produce the image. You may scroll the screen area using the OPTION & START buttons. A tone will be heard when either the top or bottom limit of scroll has been reached. The Page Indication will change as each page is reached, helping you determine the start position of each screen.

The colour register values are displayed at the bottom of the screen. These values may be altered by selecting Left/Right movement on your joystick. When the relevant colour is highlighted, hold the fire-button down and select Left or Right joystick positions to decrement or increment the register value.

To return to the VSPC menu:

To return to the VSPC menu, simply press [ESC].

Clearing the playfield area:

To erase all screen data from the playfield area, press [SHIFT/CLEAR]. It is advisable to save the playfield to disc first [S], as once erased, the playfield data is totally lost.

The finished playfield:

When you are entirely satisfied with your playfield, and wish to save it for use within your own program, enter DOS by pressing D, and save your playfield data using the DOS binary save function [K]. The format is:

FILENAME.EXT, 6000, 7000 [RETURN]

The playfield has now been saved as a DOS binary file.

If you should wish to load a playfield that has been saved using the DOS [K] function, back into the VSPC editor, use the DOS [L] function: FILENAME.EXT [RETURN]

A demonstration:

Include on your VSPC disc is a custom character set that has been created using Soft Shaper, load this into the VSPC editor by pressing C, typing SET and pressing [RETURN].

To accompany this character set we have included a demo playfield which may be loaded by pressing L, typing SCREEN and pressing [RETURN].

Now enter the editor, E. This playfield should enable you to gain some insight into using the utility.

Ultimately, it is up to the programmer to make use of the playfield data created with the VSPC. As described above, the playfield finishes up as a binary file, saved using the DOS [K] function. As well as creating game playfields, the utility is particularly useful for designing title screens. To use a file from assembler, BLOAD the file into memory, then write a routine to display, and if required animate, the Antic 4 VSPC playfield.

If locations 6000H to 7000H are inconvenient, use your assembler MOVE command to place the playfield data in a more convenient area of memory.

VSPC playfields may also be used within Basic programs, however the programmer would need to adapt the playfield binary file to his own needs.

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