KUMA

Amstrad CPC464

ARTWORK graphics package from
Kuma Computers Limited

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This program runs on the
AMSTRAD CPC 464

ARTWORK allows you to draw pictures using your AMSTRAD CPC 464 computer and monitor. It includes sophisticated circle, ellipse, line and box drawing; the full use of all available screen modes and colours; fast colour fill and complete screen scroll in all directions, plus the ability to load and save completed pictures to tape and disc.

To assist you when using the program there are help screens available on all the facilities which may be called up without loss of the current picture.

ARTWORK OPERATING INSTRUCTIONS

To load the program hold down the (CTRL) key and press the smaller (ENTER) key. It will take approximately 5 minutes for the program to load, and will start up in the default drawing mode (MODE 0). You can now commence drawing in this mode, select a new mode or load in a previously saved picture – see later instructions for details.

The cassette containing this program also has a demonstration picture called "DEMO" on it which you may like to try, after loading the program the tape will be positioned correctly for it.

FACILITIES AVAILABLE

Cursor Movement

You can move the cursor in any direction by using the four cursor keys, if desired two keys can be pressed simultaneously to effect diagonal movement. There are two points to note here – first that the cursor speeds up as long as the cursor keys are pressed and second that nothing is actually drawn by just the cursor keys, this prevents accidentally overdrawing your pictures.

Simple Drawing

Hold down either ›SHIFT‹ key and use the cursor keys as above, now when the cursor moves a line is drawn. Note that the colour drawn is the same as the border around the picture – this is always the case.

Line Drawing

Sometimes you may wish to draw a straight line between two points. To do this position the cursor at one end of the line, hold down the ›CTRL‹ key and use cursor keys to move the other end of the line to the desired position. This achieves a kind of "rubber band" effect. You can see where the line will be drawn and can position it without altering the picture. If after all you decide you don't wish to draw the line press ›SPACE‹ (while still holding down the ›CTRL‹ key) and the

line will be undrawn and the cursor returned to its starting position. To draw the line simply release the ›CTRL‹ key.

Colour Selection

This routine is entered by pressing ›COPY‹ while on the drawing screen and when selected a row of boxes appears at the top of the screen. The number of boxes shown is the number of colours available in the mode being used and the cursor moves from its position on the drawing screen to the box containing the current drawing colour.

To select a new drawing colour move the cursor with the left and right cursor keys until it is in the box with the colour you require.

While the boxes are at the top you may also change the colour within each box (and consequently where used already in the drawing) by pressing the cursor up and down keys. Initially the box at the left end will be the paper colour, changing this will affect the whole screen. There are 27 colours available but you can only use 16 at once in mode 0; 4 at once in mode 1; and 2 in mode 2.

You can now get back to drawing again by pressing the ›COPY‹ key, note that the border changes to your newly selected colour.

Note:–try to avoid setting all the colours the same (particulary in mode 2) as there will be no other colour left to display the cursor in, making it very difficult to see what is happening.

Colour Fill

To fill an enclosed shape with the current drawing colour move the cursor to the desired position and press ›F‹. As it is very easy to spoil your picture by the fill "leaking" a prompt appears at the bottom of the screen allowing you to "unfill" if required, if you wish to unfill press ›U‹ as suggested otherwise continue with any other key and the prompt will disapper.

Circles

As you may expect circle drawing is selected by pressing ›C‹, which brings up a circle of dots showing where a circle will be drawn. The size of the circle is initially about five centimetres or the same size as the last circle if you have drawn one before. You can now position the circle anywhere on the screen by using the cursor keys, increase the circle size by holding down ›SHIFT‹ and pressing the cursor up key, and decrease the size by holding down ›SHIFT‹ and pressing down cursor down.

To draw the circle in its final position press the enter ›ENTER‹ key or if you wish to abandon the circle press ›SPACE‹ instead.

Ellipses

To select ellipse drawing press ›E‹. As in the circle routine a series of dots appear which show where the ellipse will be drawn. The complete ellipse can be moved around the screen using the cursor keys but the size adjustment is more complicated. To alter the shape of the ellipse in one axis (initially vertical) hold down ›SHIFT‹ and press cursor up/down keys as required, to alter the shape in the other axis (initially horizontal) hold down ›SHIFT‹ and press the cursor left/right keys. The complete ellipse can also be rotated, hold down ›CTRL‹ and press right cursor key for clockwise rotation, ›CTRL‹ and left cursor key for anticlockwise.

To draw the ellipse in its final position press the ›ENTER‹ key or if you wish to abandon the ellipse press ›SPACE‹ instead.

Clear Screen

If you do want to clear the screen press the ›CLR‹ key and reply ›Y‹ to confirm the prompt. Enter ›N‹ instead if clear was selected by mistake.

Boxes

The box routine will allow you to draw filled boxes of any shape or size onto the screen. It can also be used as a way of clearing a partial area of the screen to any colour and is selected by pressing ›B‹.

When selected a box shape appears which delimits the area to be filled (including the lines drawn otherwise you couldn't reach the edge of the screen). Move the box around the screen with the cursor keys and change the size with ›SHIFT‹ and cursor keys. When expanding the box it increases to the right and top as appropriate until the screen edge is reached, whereupon the opposite side expands until the whole screen is filled.

To fill the box with current drawing colour press the ›ENTER‹ key, to abandon the box press ›SPACE‹.

Wire-frame boxes (outline only) should be drawn using the line-drawing method, see above.

Text

Press the ›T‹ key will allow you to place text anywhere on the screen. The text will initially be placed at the cursor position but it is possible to move the text around the screen while it is being entered. Note that the colour of the text at this stage may not appear to be correct. This will be rectified later.

While you are typing in the text you may use the cursor keys to position the text as required and the ›DEL‹ key may be used to correct any mistakes. When complete and

correctly positioned pressing the ›ENTER‹ key will complete the routine and colour the text correctly in the current drawing colour.

Scroll

At any time while you are creating your picture it may be re-centralised by holding down ›S‹ and pressing the cursor keys to scroll in the relevant direction.

Options Menu

This can be called up by pressing ›ESC‹ when in drawing mode, a list of options are now displayed from which you can select your desired function. Note that if you were not in drawing mode i.e. in the middle of a circle or box routine etc., pressing ›ESC‹ will not present the Options Menu but will present you with a help screen on the particular function that you were in.

1. Help

From the Options Menu selecting Help will present you with the Help Menu from which you can select help on any of the facilities available.

These individual help screens can also be displayed by pressing ›ESC‹ while actually using any of the facilities, e.g. while drawing an ellipse if the ›ESC‹ key is pressed the ellipse help screen is displayed. This avoids

having to go through two menu levels to obtain help on a particular function.

2. Load

Use this option to load a previously saved picture, when requested enter the picture name or just press ›ENTER‹ to load the next picture on the cassette. You don't need to worry about which mode the picture was saved in as the correct mode is entered and you can then see the picture loading.

If there are any tape errors while loading, the relevant message will appear at the bottom of the screen, you can either try rewinding the tape in which case some of your picture may be lost on the message line or you could press ›ESC‹ and attempt reloading from the beginning.

Note:

When loading a picture from cassette it is important to have the cassette positioned correctly at the start of the first file (see "Files" for more information). Use the Catalogue option to position the tape. If an incorrect file type is loaded the load routine will be terminated and you will need to reposition the tape and restart the load routine.

During the load routine the ›ESC‹ key can be used to abandon the operation.

3. Save

Use this option to save your picture, it is obviously wise to save occassionally in case you accidentally spoil or lose the picture in some way. The save routine asks you for a name for the picture (maximum 12 characters) but you can just press ›ENTER‹ if required at this point. The picture is saved on the same screen so you can see how it is progressing.

Notes:

When saving a picture to cassette it is important to have the cassettte positioned correctly to avoid overwriting another file, use the Catalogue option to position the tape.

During the save routine the ›ESC‹ key can be used to abandon the operation.

4. Cassette Save Speed

The cassette tape speed can be set either FAST or SLOW for saving pictures, use FAST for speed or SLOW for security as required. When loading a picture the correct speed is automatically selected. The default speed is FAST when the program is first run.

5. Select Screen Mode

The AMSTRAD CPC 464 supports 3 screen modes, all of which are available in ARTWORK, they are:–

Mode 0 – Low resolution, 16 colours available
Mode 1 – Medium resolution, 4 colours
Mode 2 – High resolution, only 2 colours

Select the mode required and when you return to drawing the new mode will be in force. Note that when you change mode the current picture will be lost.

6. Catalogue

To determine what files are already saved on cassette select catalogue. Press ›ESC‹ when you have finished looking.

Border Colour

As previously stated the border colour is the same colour as the current drawing colour. However this may be changed to give a better overall effect to a finished picture, especially in a two colour mode where it is possible to use a third colour for the border. To change the border colour hold down the ›CTRL‹ key and press ›B‹. The cursor will then be removed and the border colour can be changed using the up and down cursor keys.

To return to drawing (and return the border to the drawing colour), press any other key.

Note that the border colour is not saved and loaded on cassette, but can be selected again after loading.

Files

When a picture is saved to cassette you will notice that two files are actually created. The first file will be the name you gave plus a suffix of .AWV.
The second file will be the same except the suffix will be .AWS.

e.g. If you gave the name "SCREEN" or "screen" the two files will be called SCREEN .AWV and SCREEN .AWS.

The first file SCREEN .AWV is a short file which contains information such as mode, colours etc, and SCREEN .AWS is the actual picture file. When reloading a picture from cassette it is important that the tape is positioned just in front of the first file, in this case SCREEN .AWV else the load will not function correctly.

If a picture is saved without a filename by just pressing ›ENTER‹ when a filename is requested, then this picture will be saved as .AWV and .AWS.

If you intend to use the picture (or part of the picture) within your own programs (see below) you only need the second file (.AWS suffix and the first file can be discarded as it serves no purpose outside this program.

Pictures within your own programs

The file with a suffix of .AWS can be loaded directly into the screen area by simply loading the file from cassette. Before you attempt to load a picture, first make sure that you are in the correct mode, i.e. the same mode used when the picture was saved.

To load picture:

When in Basic enter : LOAD "SCREEN .AWS" or LOAD""
Make sure the tape is positioned correctly and then press PLAY. The picture will now load directly onto the screen. The memory address of this is &C000.

You may now notice that some of the colours within your picture have reverted back to the default colours. Your Basic program (or machine code program) that you use to show these images will have to contain the relevant ink commands to switch the overall colour pallette to the desired colours.

Due to the way that the screen memory is organised on the AMSTRAD CPC 464 it is not possible to easily load or save part of a picture. On the next page you will find a method that may be used to extract a number of lines from a full screen image and save this part only, for use within your own programs.

Here is an example Basic program:

```
 10 MODE 0                          '(or whatever mode the picture uses)
 20 OPENOUT "DUMMY"
 30 MEMORY HIMEM-1                  'lines 20-40 fix the cassette buffer
 40 CLOSEOUT
 50 LOAD "SCREEN.AWS"               '(the name of the picture file)
 60 startline=40                    'startline=0 to 199 see below
 70 endline=64                      'endline=0 to 199 see below
 80 length=(endline+1-startline)*80
 90 MEMORY HIMEM-length             'reserve save area
100 savearea=HIMEM+1                'allocates save area address
110 '
120 '
130 addr=&C000+(startline MOD 9)*&800+(startline\8)*80
140 FOR lne=startline TO endline
150 FOR byte=0 to 79
160 POKE savearea+byte, PEEK (addr+byte)
170 NEXT byte
180 savearea=savearea+80
190 addr=addr+&800
200 IF addr>&FFFF THEN addr=addr-&3FB0
210 NEXT lne
220 SAVE "IMAGE",b,HIMEM+1, length
```

Startline can be any number between 0 and 199. This is the number of lines down, from the top of the screen, wheer the image starts. Remember to start counting from zero.
Endline can be any number between 0 and 199. This is the number of lines down, from the top of the screen, where the image ends. Again remember to start counting from zero.

To calculate the number of lines it is useful to know that a standard character square on the Amstrad computer is 8 lines high. However most characters only occupy the top seven lines of each square, the eighth line being reserved for descenders on such letters as y,p,g etc. Placing characters on the screen, within the ARTWORK program, may therefore assist in calculating the number of lines required.

The above Basic program will allocate its own workspace to be used as a temporary store area before the image is saved on cassette. This store area will vary in size depending on the number of lines to be saved and will be placed just under HIMEM. HIMEM is then moved down to preserve this area.

Please note in line 130 the character \, this means DIV in Amstrad Basic. Do not confuse it with / which means divide.

Here is an example Basic program to load back your part picture:

```
 10 MODE 0                              '(or whatever mode the picture uses)
 20 OPENOUT "DUMMY"
 30 MEMORY HIMEM-1                      'lines 20-40 fix the cassette buffer
 40 CLOSEOUT
 50 '
 60 startline=90                        'startline=0 to 199 see below
 70 endline=114                         'endline=0 to 199 see below
 80 length=(endline+1-startline)*80
 90 MEMORY HIMEM-length                 'reserve save area
100 savearea=HIMEM+1                    'allocates save area address
105 LOAD "IMAGE", HIMEM+1
110 '
120 '
130 addr=&C000+(startline MOD 8)*&800+(startline\8)*80
140 FOR line=startline TO endline
150 FOR byte=0 to 79
160 POKE addr+byte, PEEK (savearea+byte)
170 NEXT byte
180 savearea=savearea+80
190 addr=addr+&800
200 IF addr>&FFFF THEN addr=addr-&3FB0
210 NEXT line
220 '
```

Notes:– this is the same as the previous Basic program apart from lines 50, 105, 160 and 220.

The startline and endline values may be different to move the image up and down as required but the difference between the two should be the same.

As these Basic programs are rather slow, for the assembler language programmer the following routines maybe used:–

SAVE

```
        LD      HL,#C280        ; screen address of start line
        LD      DE,#4000        ; address of image work area
        LD      B,41            ; number of lines required
SALOOP:
        PUSH    BC
        LD      BC,80
        LDIR
        LD      BC,#7BO
        ADD     HL,BC
        JR      NC,SNEXT
        LD      BC,-#3FBO
        ADD     HL,BC
SNEXT:
        POP     BC
        DJNZ    SALOOP
        RET
```

LOAD

```
        LD      HL,#C000        ; screen address of start line
        LD      DE,#4000        ; address of image work area
        LD      B,41            ; number of lines required
LOLOOP:
        PUSH    BC
        LD      BC,80
        EX      DE,HL
        LDIR
        EX      DE,HL
        LD      BC,#7BO
        ADD     HL,BC
        JR      NC,LNEXT
        LD      BC,-#3FBO
        ADD     HL,BC
LNEXT:
        POP     BC
        DJNZ    LOLOOP
        RET
```

The more experienced user will be able to merge this assembler load routine with his/her own code and part-image to build up a complete picture as has been done with the ARTWORK title screen.

Disc users

Artwork has been written to be fully compatible with AMSTRAD disc drives and interface and when discs are fitted the user will be able to enjoy the faster load and save times of pictures that discs provide.

When using discs the file names are the same as on cassette except that they can only be 8 characters long.

If required you may also prefix the file name with either A: or B: to allow you to specify an alternative disc drive if you are lucky enough to have more than one. This prefix is in addition to your maximum 8 characters.

e.g. you could enter PICTURE 1 or B:PICTURE 1

Unlike the cassette user the disc user must specify a file name for loading and saving, if no name is entered you are prompted to re-enter one.

Care should be taken when saving pictures as any previously saved picture with the same name will be overwritten. The Catalogue routine may be used prior to saving to check the files already on disc.

Any disc error messages such as "not found", "disc missing" etc. will be reported and action required will be indicated.

When you have disc drive and interface fitted (and switched on!) then you will notice an extra entry on the Options Menu to allow the selection between TAPE and DISC. The use of this option is self-explanatory. THIS OPTION WILL NOT APPEAR UNLESS A DISC DRIVE IS FITTED.

When in DISC mode the Catalogue option will produce a full disc catalogue of drive A in the 80 column mode to show all possible files at once.