

UTILITIES DISC

PRINTSPEED DISCFORM TWEAK

Featuring ...

TWEAK

The Ultimate Graphics
Manipulation Package
for the Amstrad
PCW Series of
Computers



For Users of MicroDesign & ProSCAN*

* and Stop Press, Masterscan, The Desktop Publisher and other PCW software.

This Utilities Disc contains programs to enhance the performance of Micro-Design2 & ProSCAN, as well as other PCW graphics and DTP software. The disc includes special drivers to increase the speed of printing via Centronic and Parallel interfaces, a simple program called Discform for formatting floppy discs, and a powerful graphics manipulation package called Tweak.

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This manual was ENTIRELY designed as A4 pages using MicroDesign, ProSCAN and Tweak on an Amstrad PCW8512. These A4 pages were printed as master artwork on a Hewlett-Packard Deskjet Plus printer, and were then photographically reduced to A5 size for mass reproduction on 100% recycled paper.

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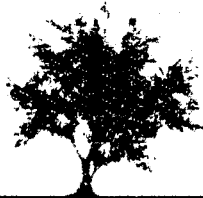
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COPYING & INSTALLATION

Like MicroDesign2 & ProSCAN, this Utilities Disc is copy-protected and comes with its own installation program allowing you to make 'working copies' of the utilities. The disc as a whole can NOT be copied or verified using Diskit or Locoscript, though the printer-drivers and Discform can be copied individually using any standard method.

To run the installation program, switch on your PCW and insert your CP/M+ System Disc. At the A) prompt, insert your Master Utilities Disc and type ...

INSTALL ... then follow the on-screen instructions.

NOTE: The installation program allows for the printer-drivers and/or Tweak to be copied onto a working MicroDesign2 or ProSCAN disc - **DO NOT INSTALL THESE UTILITIES ON YOUR MicroDesign2 / ProSCAN MASTER DISC.**

As with MD2 & ProSCAN, you should not normally use your master disc to run the programs - after making your working copies. It should be put in a safe place away from magnetic fields, dust, humidity, and ill-disciplined household pets.

IMPORTANT NOTE for PCW8256/8512 USERS

Although we recommend that you install the utility programs on a Micro-Design2 or ProSCAN working disc, the graphics program Tweak will not fit on a Start-of-Day MD2/PS disc made on the 8000-series machines. It will fit if you remake the disc as a non-S-o-D disc (using MDMAKE or PSMAKE), but you may prefer to make a separate Start-of-Day Tweak disc using the INSTALL program. Tweak can, however, be copied onto a PCW9512 Start-of-Day disc because of its greater capacity, and the printer-drivers can be attached to any form of working MD2/PS disc on any PCW.

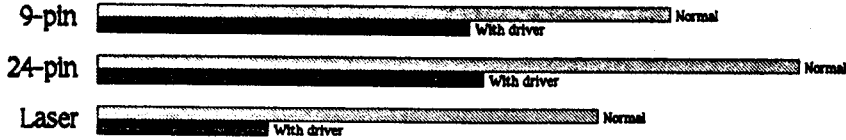
IMPORTANT NOTE FOR PCW9512 USERS

Many PCW9512 users have been supplied with alternative CP/M system discs to support the daisy-wheel's sheet-feeder, or to allow printing on the Parallel port without the daisy-wheel attached. Ideally, you should not use MD2, ProSCAN or Tweak with these replacement CP/Ms as you will encounter problems when you QUIT to CP/M and then run another program. Instead you should use the original CP/M supplied with your PCW (the EMS file on the system disc should be J21CPM3.EMS, not J20 or J29). The printer-drivers on this disc allow you to use the Parallel port without the daisy-wheel connected.

THE PRINTER-DRIVERS

These CP/M drivers, written for us by Cirtech, allow faster data transfer between the PCW and an external printer connected via a Centronics or Parallel interface. The improvement in speed varies with the application, but as a general rule we have found that printing from MicroDesign2 with an external 9-pin dot-matrix takes about 65% of the time it used to, while a 24-pin (or Canon BJ10e) takes just over half. Lasers and Deskjets are improved most of all, taking only about a third of the old time.

Some relative timings for an arbitrary 'average' MD page ...



The drivers also remove the need to keep the PCW9512's daisy-wheel connected when using a printer on the Parallel port.

! A FEW 9-PIN PRINTERS, eg SOME CITIZEN & PANASONIC MODELS, CANNOT PRINT ANY FASTER DESPITE THE ACCELERATED DATA TRANSFER OF THESE DRIVERS. THIS IS A FEATURE OF THE PRINTER DESIGN, AND CANNOT BE OVERCOME.

The drivers are supplied in two forms:

Firstly as the files MDCEN.RSX and MDPAR.RSX (for 8000-series CENTronic and 9000-series PARAllel interfaces respectively), the appropriate one of which may be attached to a working copy of MicroDesign2 or ProSCAN as part of the Utilities Disc INSTALL program. Full on-screen instructions are given, and INSTALL will modify a working copy of MD2/PS so that these faster drivers are always installed when MD2 or PS is run.

Secondly the drivers are also supplied as the programs FASTCEN.COM and FASTPAR.COM, either of which may be run from the A) prompt to install the appropriate driver within the operating system for use with other CP/M software. These .COM files may be copied to any disc you wish using PIP, NSWP or Locoscript.

PLEASE NOTE THAT MANY PCW SOFTWARE PACKAGES USE THE ENTIRE AVAILABLE CP/M PROGRAM SPACE, AND THAT THE DRIVERS CANNOT THEREFORE BE INSTALLED TO WORK WITH THESE PROGRAMS. Appropriate CP/M messages will result from errors connected with this memory limitation, which is not improved by adding extra RAM to your PCW.

When these drivers are used ALL printer output is redirected to the selected port (CEN or PAR). Changing the Printer interface option in MD2/PS (or using DEVICE.COM) will have no effect. To use the 8256/512 integral dot-matrix or the 9512 daisy-wheel after using the drivers, you will have to re-boot your PCW using a normal system disc.

! THESE ARE CP/M .RSX DRIVERS FOR EXTERNAL PRINTERS ONLY. THEY CAN NOT BE USED WITH LOCOSCRIPT, AND DO NOT AFFECT THE PERFORMANCE OF THE PCW 8256/8512 INTEGRAL DOT-MATRIX PRINTER.

PRINTER ERROR and TIME-OUT

... when attached to *MicroDesign2* or *ProSCAN*:

If the printer is off-line or unconnected, or does not respond within a few seconds, press the STOP key to cancel the print. Remember, though, that a 24-pin printer can still be expected to take up to ten seconds or so per print-stripe.

... when installed with other programs using *FASTCEN.COM* or *FASTPAR.COM*:

If the printer is off-line or unconnected, the PCW will 'lock up' until communication can be established with it - the only way out of this is to put the printer on-line or to re-boot the PCW. Do not attempt to print if you have no printer connected!

TECHNICAL INFORMATION

The drivers are .RSX extensions to the CP/M operating system which replace all calls to the CEN or PAR printer-port routines with faster, more direct code.

... when installed with other programs using *FASTCEN.COM* or *FASTPAR.COM*:

The BIOS LIST and LISTST vectors are re-directed, and BDOS calls 5 (OUT to logical device LST) and 112 (LIST to logical device LST) are re-directed.

... when attached to *MicroDesign2* or *ProSCAN*:

Only BDOS functions 5 and 112 are redirected.

Some older PCW hard drive systems used a fair amount of program memory for their own purposes, which may mean that they cannot run *MicroDesign2* or *ProSCAN* with the drivers attached - this will result in an error message. If this is the case, contact your hard-drive manufacturer for an updated CP/M.

A PRONOUNCEMENT

The printer-drivers on this Utilities Disc are short, self-contained pieces of code which reside in an area defined by the CP/M operating system in the PCW. Thus they may be attached to many different programs.

The "drivers" for the different printer types in *MicroDesign2* and *ProSCAN*, however, are huge, inter-dependent pieces of program which cannot simply be lifted from their current environment and transported to another package. Thus the *ProSCAN* driver which produces quadruple-density output on the integral 8000-series dot-matrix cannot be incorporated into *MicroDesign2* as it simply will not fit!

Whilst we are always working on updates and improvements to the *MicroDesign* family, and are happy to provide free disc-replacements when we add the smaller extensions needed for eg the Canon BJ10e printer, we cannot provide the quad-density driver as an add-on for *MicroDesign2*.

There is (contrary to some of our correspondents' apparent beliefs) a limit to what even Creative Technology can squeeze into a program retrospectively!



DISCFORM

This simple CP/M command-line program can format floppy discs in Drive A: or B: on any PCW, and can be used in CP/M batch (.SUB) files.

DISCFORM is not copy-protected and can be transferred to any working or other disc using any standard method. For example, to copy it onto a working MD2 disc ...

- 1) Boot up your PCW using a CP/M+ system disc.
- 2) At the A) prompt, type `PIP RETURN`
- 3) At the # prompt, insert your master Utilities Disc and type `M:=DISCFORM.COM RETURN`
- 4) At the next # prompt, insert the working MD2 disc on which you want to put the program, and type `A:=M:DISCFORM.COM RETURN`
- 5) A final press of `RETURN` will return you to CP/M.

DISCFORM is used by typing, at the CP/M A) prompt:

`DISCFORM A RETURN` to format a disc in drive A:

`DISCFORM B RETURN` to format a disc in drive B:

! The drive-letter given refers to floppy drives only - Cirtech Diamond hard-drive users can give A: or C: to format their first floppy drive, and B: or D: for their second one. Discform will NOT format your hard disc!

There are two optional parameters which may be typed as part of the command:

- If a Q is included in the command-line, the error-checking is reduced, and the formatting process is speeded up considerably. (Q='QUICK')
- If a K is included, the normal 'Insert Disc to Format then Any Key' stage is omitted, allowing DISCFORM to be used within a batch file without waiting for a key-press each time. Be very careful when using this option, as you may accidentally re-format the disc with DISCFORM itself on! (K='KEYMISS')

eg `DISCFORM B Q RETURN` ... format disc in B: with reduced error-checking

`DISCFORM A Q K RETURN` ... format disc in A: with reduced error-check and no wait-for-key

! PLEASE NOTE THAT DISCS FORMATTED WITH DISCFORM CANNOT BE USED AS START-OF-DAY DISCS ... YOU WILL STILL NEED TO USE LOCOSCRIPIT OR DISKIT TO FORMAT A DISC FOR S-O-D USE.

TWEAK

TWEAK is a program for manipulating bit-image files created using MicroDesign2, ProSCAN, Stop Press, The Desktop Publisher, Masterscan, etc. It works by loading an 'ORIGINAL' file, then one of the TWEAK operations is selected and a new 'DESTINATION' file is created - the resulting 'tweaked' image is always saved to disc as part of the operation itself. The program can load and create images as .MDA, .CUT or .GRF files, and can convert between these formats.

RUNNING THE PROGRAM

The INSTALL program allows you two main options for using TWEAK on floppy disc ...



Firstly you can add the program to a working copy of MicroDesign2 or ProSCAN, provided that there is sufficient space on the disc. If you do this, you can then QUIT to CP/M from MicroDesign2 or ProSCAN, then at the A) prompt, with the disc in the drive, type ...

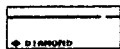
TWEAK **[RETURN]**

(PCW9512 users - read the Important Note on page 3 regarding CP/M versions)



Secondly you can make a separate Start-of-Day TWEAK disc - if you use INSTALL to copy the program onto a non MD2/PS disc, you will be given the option of making it into a Start-of-Day disc, and will be asked to insert your CP/M system disc for the relevant S-o-D files to be copied. You can then simply turn on the PCW and insert the disc, or press SHIFT-EXTRA-EXIT to reset the machine with the disc in the drive if it is already switched on.

Hard drive users are also catered for ...



Hard drive users may add TWEAK to their system wherever it will be most useful - INSTALL allows you to copy it to any drive, User 0-9. As with MD2/PS a 'key-disc' is needed in a floppy drive for the program to run, but any MD2 or ProSCAN or TWEAK disc will do for this.

IMPORTANT NOTE - MEMORY AND DRIVE M:

TWEAK will normally use up to 512k of memory if it can find it, obliterating any files stored in the M: drive. However, the program WILL take advantage of any extra RAM you may have added to your machine if needed for a very large image (more than a full MD page area). Tweak can therefore be used with Flipper, provided that 512k RAM is allocated, but may overrun its partition if a large image is created.

NOTE: If you wish to run any program other than MicroDesign2 or ProSCAN after using TWEAK, we strongly recommend that you re-boot your PCW, especially if you intend to use the M: drive.

LOADING & SAVING IMAGE FILES

Before using TWEAK, you will need to have saved on disc any material you wish to manipulate, and you will need some free space on a formatted disc for the tweaked versions of your designs. As with all of the MicroDesign & ProSCAN family, once the program is running you can remove the program disc from the drive, so you do not have to have the files or the free space on the same disc as TWEAK itself.

FILENAMES AND SEARCH-STRINGS

All the graphic operations in TWEAK require that there be an ORIGINAL file loaded into memory, and when you first run the program, you will find that it automatically launches the Load operation, asking you to:

Enter ORIGINAL Area Name ---- ■ or Search String (eg *.MDA) for Directory

Filenames for both loading and saving can have an .MDA, .CUT or .GRF suffix, and may include a drive letter. The file format is selected by giving the appropriate suffix. The file suffix and/or drive letter can be omitted, in which case the program will assume the same type and/or drive as was last used. Thus the following are all valid filenames for loading or saving:

MYPIC.MDA YOURPIC.CUT B:HERPIC.GRF A:HISPIC OURPIC

A Search String is a filename with ? and/or * included, and is entered in order to view a Directory of available files when loading or saving. Here the file suffix must be given if you wish to see eg all the .MDA files on a particular disc.

e.g. A:*.MDA _____ Show all .MDA files on A:
 *.GRF _____ Show all .GRF files on last accessed drive
 B:MYPIC???.CUT _____ Show all files on B: named MYPICanything.CUT

The maximum number of files that can be listed is 100.

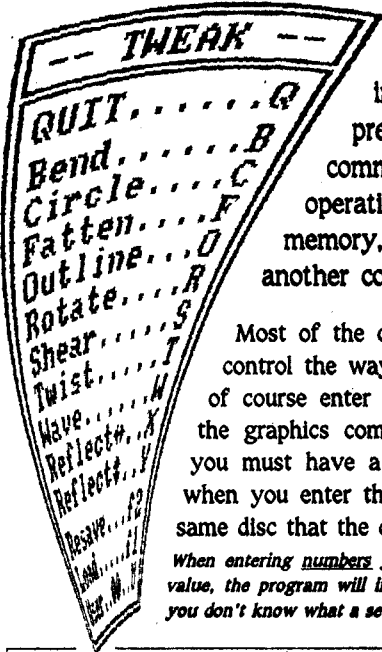
Since all the graphic operations in TWEAK create a DESTINATION file on disc, you do not need to save your work as you proceed. However, the RESAVE operation is included so that you may copy a file to a different disc, save it with a different suffix to perform a format conversion, or CROP the image, removing the spare white space around your design which will result from many of the TWEAK operations.

Resave...f2

The USER facility allows access to files in different user areas (groups) - press U repeatedly to make the User Number count up from 0 to 15 and round again.

User..00..U

THE GRAPHICS OPERATIONS



TWEAK has ten graphics manipulation commands, each of which performs a different image transformation, and is selected by pressing the listed key. Only one of these commands may be used at a time, but after each operation the result is always left in the PCW's memory, so that it may immediately be manipulated by another command in order to combine effects.

Most of the operations require that you input a few 'parameters' to control the way that they operate, and for every command you must of course enter a filename for the DESTINATION tweaked image. All the graphics commands work by creating a tweaked file ON DISC, so you must have a disc with enough free space in the appropriate drive when you enter the destination filename. (This does not have to be the same disc that the original image was loaded from)

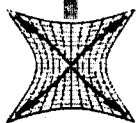
When entering numbers you will find that if you simply press RETURN without typing in a value, the program will insert a sensible default value for the parameter in question. So ... if you don't know what a setting does, just press RETURN!

... OF TIME ...



The different commands take varying times to execute - the Circle operation is by far the slowest (the mathematics involved are working the PCW very hard indeed) and can take anything up to 200 times as long to process an image as Y-Reflect, for example. As well as displaying their output as they go along, all operations give you an idea of their progress from the Line x of y report.

... AND SPACE ...



The different effects also create differing sizes of tweaked image. In some cases the result is the same size as the original, whereas in others it will be smaller or larger. The width and height of the current file are given on screen, so you will be able to tell from this whether it will fit on the MD2 page (a 256k Upright A4 page is 960 wide by 1088 tall, for example, and a 256k Sideways A4 is 1152 by 952).

... AND ERRORS



The maths involved in some of the graphics commands is extremely complex, and accumulated rounding errors may result, particularly near the edges of an image. Saving a little space around a design can protect it from this edge effect to some extent.

There now follows a description of each of the commands in turn, with details of the various parameters and their meanings, and then we will see how several of the operations may be combined in sequence to produce virtually limitless graphic effects.

BEND

This operation wraps your original image onto the surface of a cylinder with variable amounts of 'bend' and 'end-rounding'.

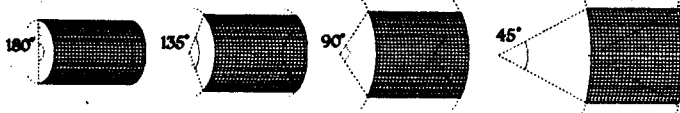
PARAMETERS

Vert/Horizontal

The axis of the cylinder can be chosen to run across the page (HORIZONTAL) or down it (VERTICAL). As with many of the commands, the effect of a cylinder at an angle 'in between' can be achieved by combining Rotate and Bend - more about this later.

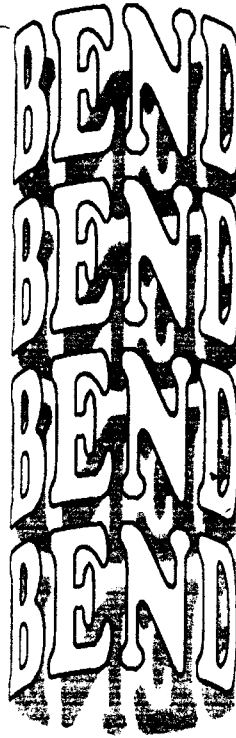
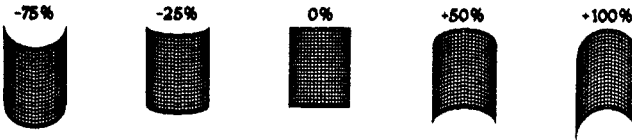
Degrees of Bend

The amount of bend is measured in degrees, where the maximum (180°) represents the image being wrapped onto the entire front face of a cylinder, and lower values mean progressively gentler bending. *These examples show a Horizontal Bend of ...*



End Rounding

This parameter controls the curvature of the ends of your Bent design, creating a variable 'viewing-angle' effect. A negative value for this parameter makes the ends curve in the opposite direction. *These examples show a Vertical Bend of 180° with rounding of ...*



BEND may be used particularly effectively to create an 'arch' effect like the Utilities Disc title on the front cover of this manual:

If an area this shape ... **HAPPY VALLEY ESTATE**

is bent onto a VERTICAL cylinder (160°) with 30% end-rounding ...



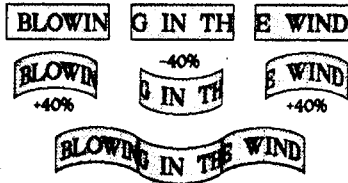
Spectacular 3-D 'rippled banner' effects may also be created by breaking an image into more than one section, each of which is then bent separately - alternate sections should have positive/negative end-rounding:

This design is saved to disc as separate areas ...

... which are then bent (Vertical, 140°)* with alternating positive/negative end-rounding (+40%)*

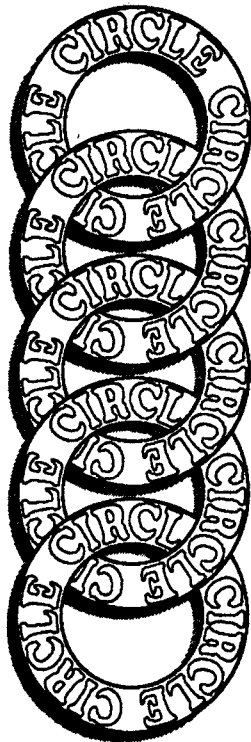
... and are then stuck back together

* = adjustable setting - reduce both values to lessen the 'warp'.



CIRCLE

This operation curves your original image into a circular arc. The number of degrees around which it is curved, and whether it curves 'up' or 'down' are controllable.



PARAMETERS

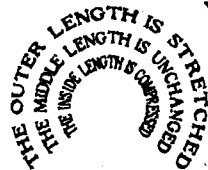
Angle This controls the degrees of arc covered by the curved design. A positive number gives a curve over the top of a circle, and a negative one gives a curve around the bottom.



Correction Because of the problem of the PCW's non-square pixels, the image must be created with the destination page format in mind if it is to be exactly circular, so you may choose Upright or Sideways page correction. Users of ProSCAN's HIGH-Q printing on 24-pin/Laser/Inkjet printers should select None.

N.B. Circle performs a large number of complex calculations for each pixel and can therefore take a very long time to process a large area.* If you are not absolutely sure how much curve to use, you should create a much smaller version of your image to experiment with before using the Circle command on your full-sized design. This applies equally to the other more complex commands such as Bend, Twist and Wave.

* The longest we have ever run took 5 hours to Circle an area 1104 by 952.



You will notice that the Circled image is EXPANDED around the outside of the curve and COMPRESSED around the inside. The centre remains exactly the same length, though it is now along a circular arc. This effect will lead to some distortion in lettering and graphics if the image is tall compared to its length, but this can be avoided with lettering by using Rotate instead (more later).

For taller images, there is a limit to the degrees of Circle you can apply before your design starts to fold in on itself ...



45°



135°

Note how a 'vanishing point' is developing here

... but this shouldn't stop you using this effect, which can be most interesting:

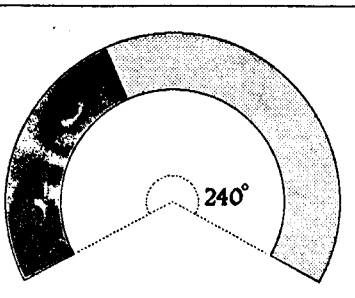


180° Circle



Although CIRCLE only operates around the top or bottom of a circle, you can wrap an image onto an 'off-centre' arc by including some white space in your saved image:

The inclusion of the blank space pushes the image itself across onto an off-centre part of the circle.



The CIRCLE operation can be used on sections of an image to create a wavy design somewhat like that described for BEND. As in that case, the sections of the design are Circled with alternately positive/negative angles :

The separate sections:



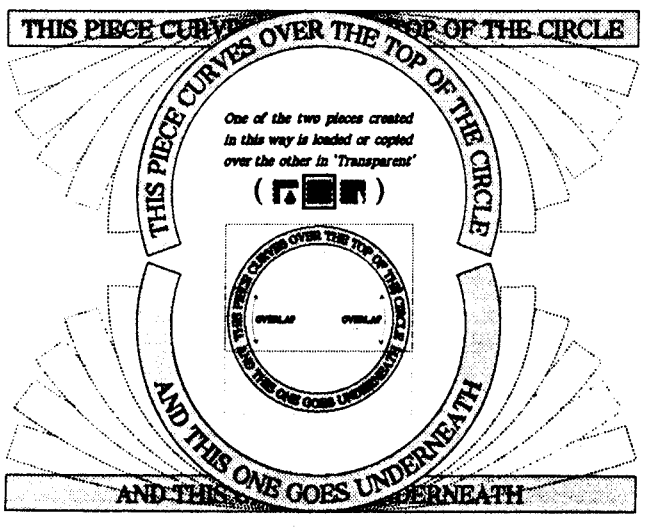
These are each Circled by alternately plus/minus 140 degrees. As with the banner ripple in BEND, the number of degrees can be altered to taste.



If you are creating a ring of lettering where some must curve over the top of the circle and some under the bottom, then to ensure that the two pieces fit together exactly make both original images the same size and use the same angle for both:

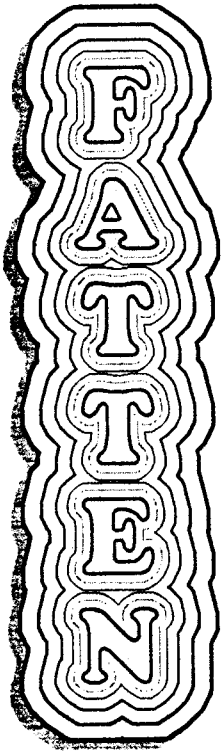
The top section of the lettering is 1.5 times longer than the bottom section, so the top must be Circled through 1.5 times as many degrees as the bottom. This means 220° for the top and 140° for the bottom, adding up to a full circle of 360 degrees.

However, we save the lower section with enough blank space either side to make it the same length as the upper, and Circle both pieces by the same 220°. We then simply overlap the two resulting circular sections to give the final design.



FATTEN

This command is used to thicken or 'thin' your designs. When thickening, each pixel of the original is expanded into a blob, thereby darkening the image, whereas when thinning the black areas are shrunk to lighten the image.



PARAMETERS

Thickness If the thickness given is POSITIVE, the image is Fattened by the quoted amount. If the thickness given is NEGATIVE, it is thinned by the same amount.

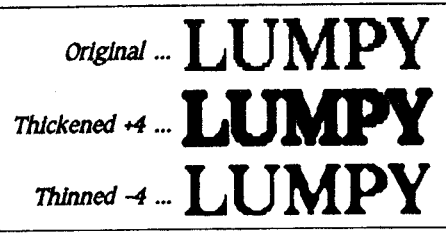
MINUS 1 NORMAL PLUS 2
 MINUS 3 PLUS 5

The effect on one pixel of thickening by values 1 to 5 is shown here:



If you want to expand the white areas of a design, use a negative thickness. Positive values conversely shrink the white.

If an image is thick-ened and then thin-ened again, the result is a rounding of edges and corners. This may help to improve jagged shapes such as are produced when lettering is expanded by rescaling.



One of the obvious uses of Fatten is to darken or lighten an image, especially a photo. Using the technique described above to thicken-and-thin will also help to remove unwanted ragged detail from photographic scans.

Using Fatten does not have quite the same effect as altering the brightness control when using ProSCAN but can still be useful in producing your finished image.

LIGHTENED (-2)

ORIGINAL

DARKENED (+2)

OUTLINE

This operation traces a 'key-line' of variable thickness around a design, following the edges of either the black or the white areas.

PARAMETERS

Outline Thickness

If you give a POSITIVE value, an outline of the requested thickness is created around the OUTSIDE of the black areas (eg letters). A NEGATIVE value will create an outline around the INSIDE of the black (ie the outside of the white).

MINUS 1 PLUS 2
 MINUS 3 NORMAL PLUS 5

When creating a keyline around the outside of lettering (when using positive thicknesses), you should be careful that the outlines of the letters do not crash into each other:

This lettering was created with its 'normal' spacing *Extra spacing was used here to allow for the fattening of the letters*

TOO CLOSE **BETTER**

To create a key-line which stands AWAY from a design, Fatten the image first and then Outline the fattened version:

Original ... Fattened +4 ... Outlined +2 ... Add Original ...
LINE **LINE** **LINE** **LINE**

Repeatedly Outlining an image is interesting, though the result can easily become confusingly complex if you overdo it:



Another rather fun effect is achieved when a photographic image is Outlined:

This is our original grey-scale image (a video-digitised Herbert):



This 'Top-of-the-Pops' effect is the result of a direct Outline of +2:



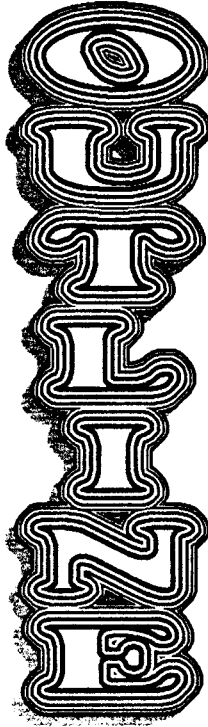
If, however, the grey shades are blurred out to black using Fatten first ...



... then the Outline will produce an 'emptier' result as shown here:

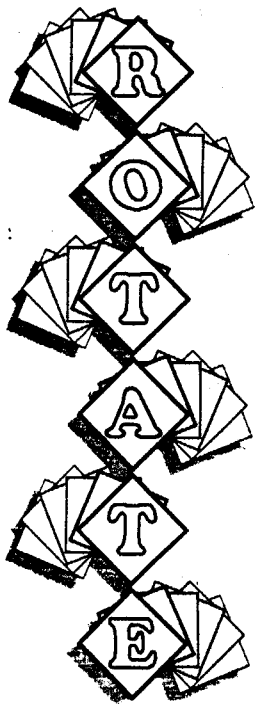


If recombined with the original, we get a photo image with a traced outline:



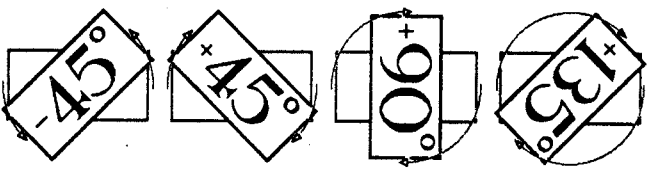
ROTATE

This operation turns the original image about its centre through any number of degrees clockwise or anti-clockwise.



PARAMETERS

Angle If you give a POSITIVE angle, the image will be rotated clockwise. A NEGATIVE angle results in anti-clockwise rotation. The angle does not have to be a whole number - you can enter eg 22.5 or -37.2 if required. Rotating through angles close to plus/minus ninety degrees may produce a slight loss of image quality as whole- and half-pixels have to be exchanged.



Please note that the angle is exactly correct only when the result is printed using ProSCAN's High-Q setting, but the error in other cases is small.

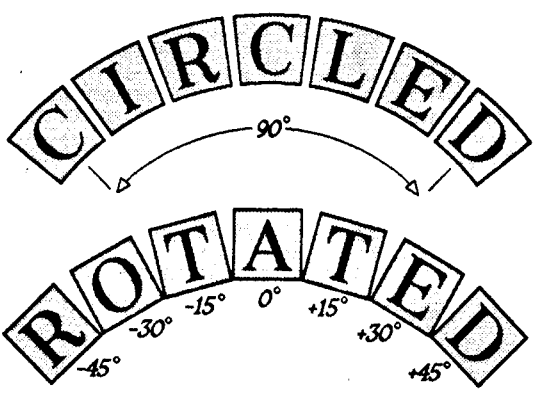
Normal/Superfine Performing a Rotate to the best possible accuracy is reasonably slow, so Normal has been included to give you a faster, slightly rougher result when you do not need the very highest quality. Select Superfine if you are prepared to wait for perfection!

One thing to note about Rotate is that the resulting image is always larger than the original (except at -90, 90 or 180 degrees). And because both the original and destination images are always rectangular, a considerable amount of apparently unnecessary white space can be generated ... *Resize* will remove this if necessary.

Rotate can be used to create lettering around any form of curve, and has the advantage that it does not distort the shape of the letters themselves:

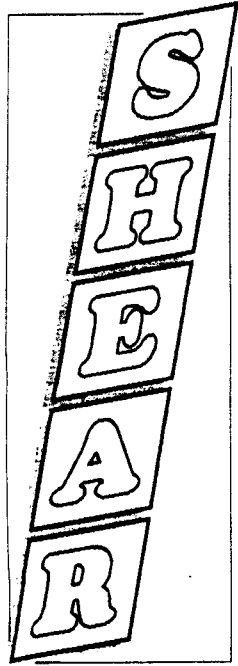
The top design was Circled through 90 (plus a few degrees as one complete image, and the lettering & the shapes of the squares are distorted as a result.

The lower design, however, has been constructed by rotating each of the letters individually through a different angle, and then re-positioning them on a circular arc. Any sort of curve could be used, but the angle of each letter must be appropriate to its position along the arc. You must be careful that the letters don't overlap along the inside, as this method does NOT compress & expand the inner/outer edges.



SHEAR

Shear slides the contents of your image left/right or up/down to produce a slanted or tapered effect.



PARAMETERS

Sides or Top/Bot

This parameter selects the 'axis' along which the Shear operates, and which two opposite edges of your image become slanted as a result.

Parallel / Taper

This parameter chooses between the two types of Shear. With Parallel the two affected edges move in the same direction, but with Taper they are sloped towards each other:

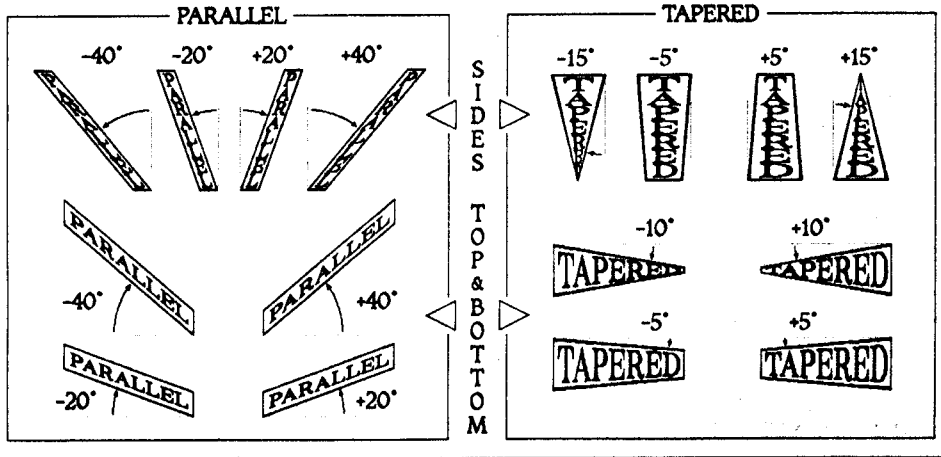


For Parallel Shears, the resulting rectangular area is always bigger than the original. However, the actual image content is not rescaled or distorted, merely re-positioned.

Tapered Shears produce an overall area the same size as the original, with the image content progressively reduced in size along the taper.

Shear Angle

This parameter controls the severity and direction of the Shear effect, and is measured in degrees as it represents the angle of the sloped edges produced by the operation. Positive and negative angles produce different directions of slant:

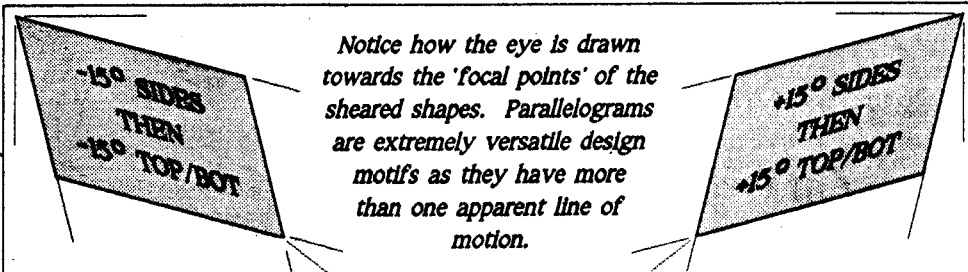


Chevrons and other directional shapes can be created by splitting a design into sections which are then independently sheared through different angles:



This picture was saved as separate left and right halves which were then Parallel Sheared (Top/Bot) by -15 and +15 degrees respectively.

The shapes created by Parallel Shearing to slant both the Sides AND the Top/Bottom are called parallelograms, and carry a strong sense of 'movement':



One of the more obvious uses of the Tapered Shear is to create a sense of three-dimensional perspective. This effect can be given more genuine depth if the taper is combined with a Bend operation:

If the original image (1) is directly Sheared (Top/Bot Tapered), the result is (2), which is a reasonable effect but lacks true depth.

If instead the design is first wrapped onto 140° of Vertical Bend with 0% End-Rounding, the result is shown in (3), which when Sheared as above produces (4) ... a much more convincing 3-dimensional effect, the 'depth' of which can be altered by adjusting the number of degrees of Bend.

N.B. To achieve the Bend shown here, the original area must be saved with a blank space of equal width to its right. This positions the design on the left-hand half of the cylinder only.

①

THREE-DEE PERSPECTIVE

②

THREE-DEE PERSPECTIVE ✗

③

④

THREE-DEE PERSPECTIVE ✓

TWIST

Twist is the most original, the most powerful, and the most complex of the graphics operations. It twists your original image like a ribbon which can run across or up/down the page, and gives you control over the position of the image on the ribbon, the amount of twist, and the special 'Skew' effect.

PARAMETERS

Vert/Horizontal

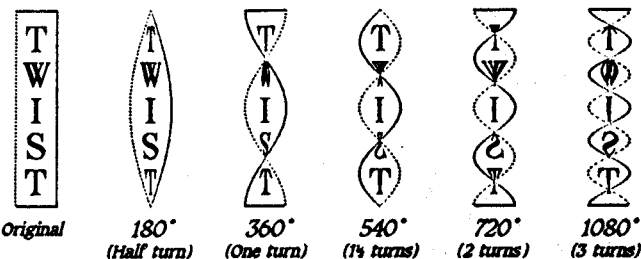
This parameter selects whether the 'ribbon' to which the twist is applied runs across or up/down the page. Because a Horizontal ribbon runs across the page, the pixels in the image are moved up and down to create the Twist effect. By the same token, the image pixels are moved left and right on a Vertical ribbon.

Using a Vertical Twist on a long area, or a Horizontal Twist on a tall one, produces a drastically warped result!



Degrees of Twist

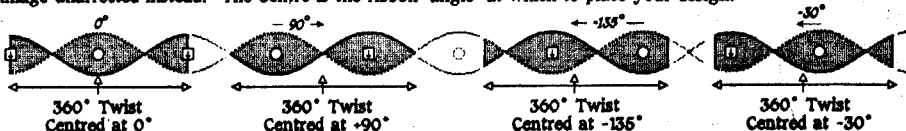
This selects the severity of the twist applied to your image. It is measured in degrees because it represents the total amount of rotation applied to the ends of your design, where one complete twist is 360 degrees:



The examples here show Vertical Twists of differing degrees. The number given is the TOTAL twist between the two ends, not between one end to the centre.

Centre

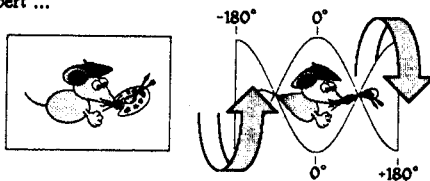
In the examples above, half of the total twist has been applied to each end, leaving the midpoint of the image completely unaffected. This represents a Centre of 0 degrees, the default value. Altering this value moves the 'stationary' point so as to keep e.g. one end of your image unaffected instead. The Centre is the ribbon 'angle' at which to place your design:



All these examples have a 360° twist /e one complete turn from end to end. The white circles show the totally unaffected points (0°, 360°, -360°, etc), the white squares show the points at which the image is unaffected but flipped over (180°, -180°, etc). Note how the whole image is inverted between 90° & 270°, -270° & -90°, etc.

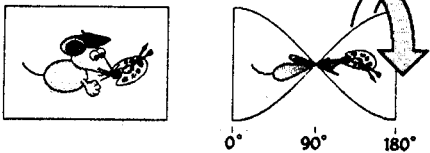
Now this detailed description of ribbons is all very well, but what does Twist actually do to your images? Basically, it turns your rectangular original design into the shape of the piece of ribbon you have selected. So let's see what some example Twists do to our old friend Herbert ...

- ① Our first example shows a simple 360-degree Twist Centred at 0, so Herbert's mid-point doesn't move at all, and each end turns through a half-twist.

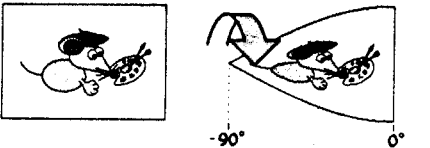


This is a lot of Twist for a short image like this, so let's see what happens if we use rather less ...

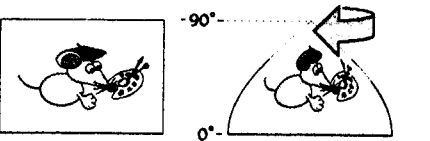
- ② ... say 180 degrees, Centred at +90 so the left hand end remains stationary, and the right-hand end is turned right over by the half-turn of Twist.



- ③ ... or only 90 degrees, centred at minus 45, so that the right hand end is at zero degrees, and therefore stationary, and the left hand end is turned through ninety degrees (a quarter-circle):



- ④ ... or the same thing (90 degrees of Twist centred at -45), but on a Vertical ribbon. Here the bottom edge stays stationary at zero degrees, while the top edge performs the quarter-turn:



So, having examined the Degrees of Twist and Centre parameters, now let us now take a look at the ...

Skew

This parameter allows you to make the twist 'lop-sided', moving the two twisted edges relative to each other. The examples here demonstrate the effect of this Skew, which is measured in degrees like the Twist and Centre. The number of degrees you enter is the amount of relative 'slip' applied to the sides of the ribbon, with positive Skew moving them one way and negative Skew the other.

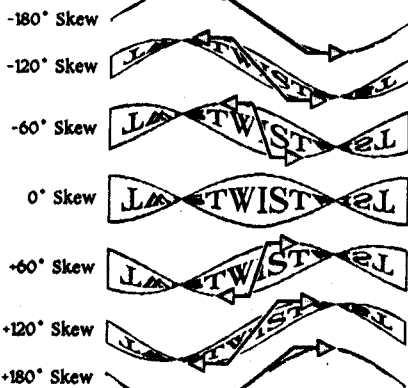
All these examples show a 180° Horizontal Twist, Centred at 0°, with differing degrees of Skew ...



180° Horizontal Twist
Centre 0°, 50° of Skew



90° Vertical Twist
Centre 210°, -60° of Skew



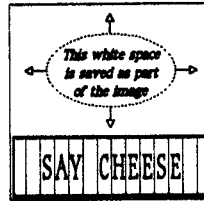
Skew is in fact the relative PHASE of the two sides of the ribbon.

So far we have seen what happens if we perform a single Twist on a strictly rectangular image. Some of the most interesting effects can be achieved, however, when you combine two or more twist operations, and the shapes become less and less square:

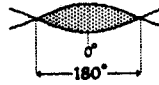
As an example, let us see how two Twists, one Horizontal and one Vertical, are used to create this truly cheesy grin:



This is the design we start with, which is supplied on your Master Utilities Disc as SAYCHEES.MDA. You will notice that there is a lot of white space saved as part of the image - this blank space is important, as it forces the actual picture content to stay below the halfway line in the Twist we are about to perform ...



... which is a simple Horizontal Twist through 180 degrees, Centred at 0 degrees. We have already seen the overall shape this will produce ...



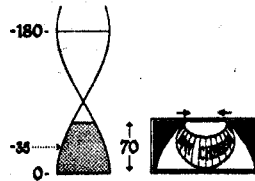
... but the fact that our image content is all below the midline of the saved area means that it also stays below the midline of the twisted version ...



... which we RESAVE using the CROP facility to remove the white space now that it has done its job.



Now that we have pulled the corners of the mouth UP with a Horizontal Twist, let us pull the corners IN sideways towards the centre with a Vertical Twist ...

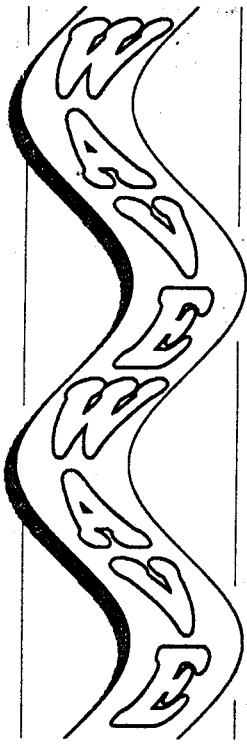


As we want the bottom edge to stay unaffected, it must be at the zero degree point, and we want to twist the tops inwards by about seventy degrees. The figures to enter are therefore 70 degrees of Twist, Centred at -35.

Although initially the calculation of all these values for the parameters may seem a little complex to some, don't worry. You will acquire a feel for these numbers as you use the program - there is no substitute for experience, except perhaps a degree in Mathematics! Certainly those users who have encountered sinusoidal waveforms before will find Twist relatively simple to understand ... for the rest, a little practice will make up for years of educational neglect!



WAVE



This operation is related to Twist, and can in fact duplicate some of the latter's effects exactly, but is easier to control. It imposes either a variable 'ripple' effect on your image, with opposite edges moving in parallel, or a variable 'bulge-and-waist' effect where the edges move in opposite directions.

PARAMETERS

Vert/Horizontal Predictably, this parameter selects whether the wave runs across or up/down the page. The Wave 'logo' (see left) is Vertical ... this is its horizontal equivalent.

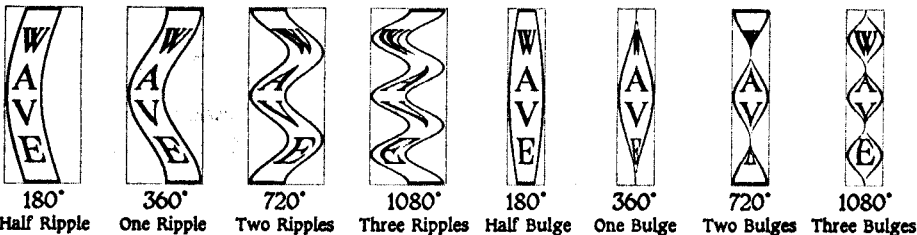


Ripple/Bulge There are two types of Wave that can be used on your images - with a Ripple wave the two affected sides move in parallel, whereas with a Bulge wave the sides move in opposition:



Degrees of Wave Very like the Degrees parameter in the Twist operation, this controls the 'length' of the Wave ie the number of ripples or bulges along or up/down your image. 360 degrees represents one complete Ripple or Bulge - look how the two correspond above, and how similar is their shape to that of the Twisted ribbon.

These examples show differing degrees of Wave, both Ripple and Bulge types:



You will observe that Ripple produces a rectangular image larger than the original, though the content itself is not expanded, merely slid around. Bulge, however, produces a rectangular image the same size as the original, much of the content of which is shrunk by being pushed inwards.

Centre As with the Twist operation, this parameter allows you to slide your image along the overall wave shape to the position you require. All the examples immediately above show a Centre of 0 degrees, whereas the following show different Centres:

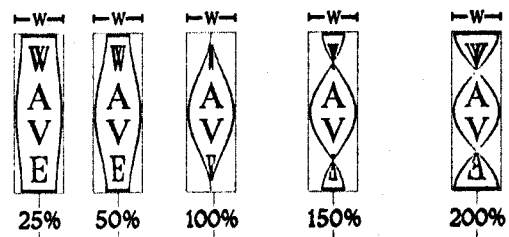


Notice the stationary points (X) which remain 'unaffected' as they are at the zero-degree positions.

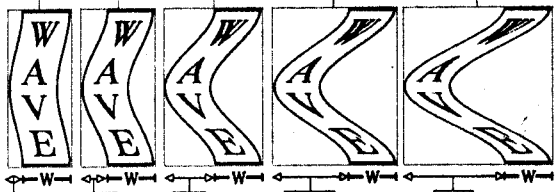
Percent Effect

This parameter allows you to control the severity of the Wave command. All the examples shown so far use a 100% Effect, meaning that the maximum movement in the case of Ripple, or the maximum amount of 'squeeze' in the case of Bulge, are the same as the width/height of the original image. The following examples demonstrate the effect of varying the Percent:

Bulge: The effect of the Percent parameter is fairly obvious up to 100%. At 25%, for instance, the 'squeeze' at the waist (the 180-degree point) is 25% of the image width, so the result is 75% of the original width. At 50%, the squeeze is HALF the width, so the result is half. At 100%, the image is squeezed by 100% to ZERO width at the waist. Once the Percent goes over 100%, however, the image is squeezed right through itself, and at 200% (max) the opposite edges have swapped sides, producing EXACTLY the same effect as a Twist with zero Skew.



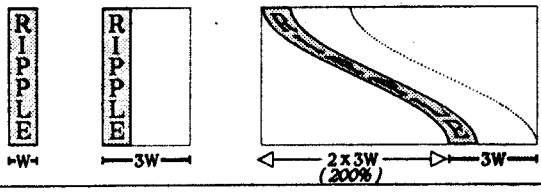
Ripple: The effect of the Percent parameter is very simple. The given percentage of the original width is the size of the side-to-side movement (up/down on Horizontal Wave), so when we enter 100% we are adding a wobble the same width as the image and the overall width (height) doubles. With 200% we add a wobble twice the original width so the overall width triples, a 25% figure adds a quarter to the width, etc etc.



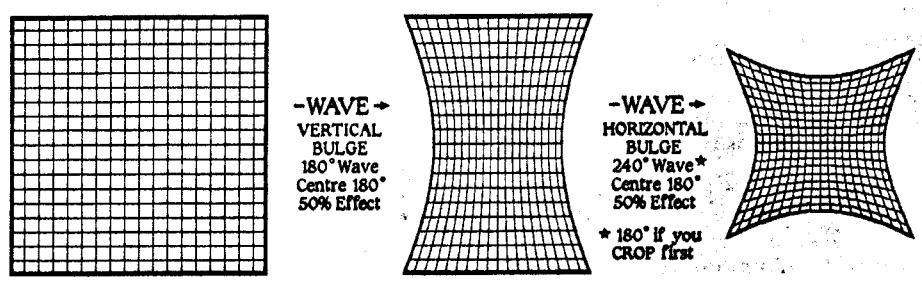
All examples show 360-degree wave. W - Original Width

The effect of a Ripple Wave can be increased beyond the apparent limit of 200% by saving extra width (or height) with the original image:

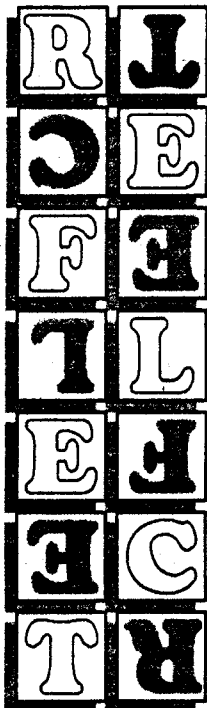
By saving the extra space along with the original, we treble the width from which the amount of ripple movement is calculated. Thus a 200% Ripple produces a side-to-side wobble SIX times the width of the original design.



Using two Bulge Wave operations, one Horizontal and the other Vertical, both Centred at 180° so they operate as 'waists', and both of about 40..60% effect, produces a 'stretched-corners' effect when applied to a rectangular area:



REFLECT



There are two Reflect operations listed in the Tweak menu. The Reflect ↔ operation (selected by X) flips the image contents horizontally so that left & right change over. Conversely, the Reflect ↓ operation (selected by Y) flips the contents vertically so that top & bottom are reversed.



If both Reflect operations are used on the same image, the same effect is achieved as a 180 degree Rotate (which would in fact be quicker than the two Reflects).



As with many other operations, the 'axis' of the reflection can be changed to a non-Vertical or -Horizontal mirror by using Rotate before & after the Reflect (*more later*).

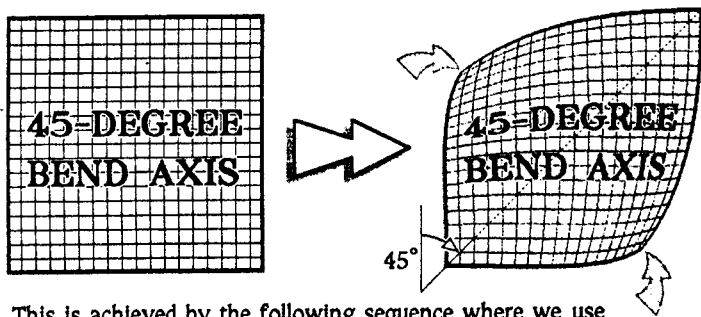
This concludes our examination of each of the TWEAK graphics operations in turn. By now you should have a pretty good idea of the basic effect that each of the commands in isolation will have on your images, but by executing a planned sequence of Tweak operations you can achieve truly spectacular effects which will add several new dimensions to your designs ... so let us now take a look at how to combine the various transformations

ADVANCED TECHNIQUES

■ USING ROTATE TO ALTER THE AXIS OF AN OPERATION ■

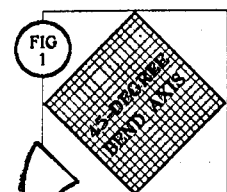
The Bend, Shear, Twist, Wave and Reflect commands each have two different 'axes' of operation, selected using the Horizontal vs Vertical parameter (Sides vs Top/Bot in the case of Shear, X vs Y in the case of Reflect).

This gives us a basic choice of two directions for each of these effects, but the angle at which they operate across your image can be moved *away* from the purely horizontal or vertical by Rotating your design before & after the command you wish to use.



As a simple example, suppose we wish to Bend the image shown here onto a cylinder whose axis runs diagonally from bottom left of the image to top right ...

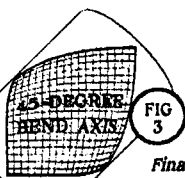
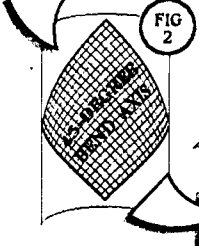
This is achieved by the following sequence where we use a PRE-rotate of -45 degrees, perform the Bend, and then use a POST-rotate of +45 degrees:



Firstly, Rotate the image by MINUS the required axis angle (FIG 1). The axis we want is 45 degrees clockwise from the Vertical, which is plus 45 degrees, so we choose minus 45 as the angle for our pre-Rotate.

Secondly, we perform the Bend itself. We originally thought of our diagonal axis as being rotated forty-five degrees clockwise from the Vertical, so it is a Vertical Bend we must perform. The parameters used here are 180 degrees of wrap with 30% end-rounding (FIG 2).

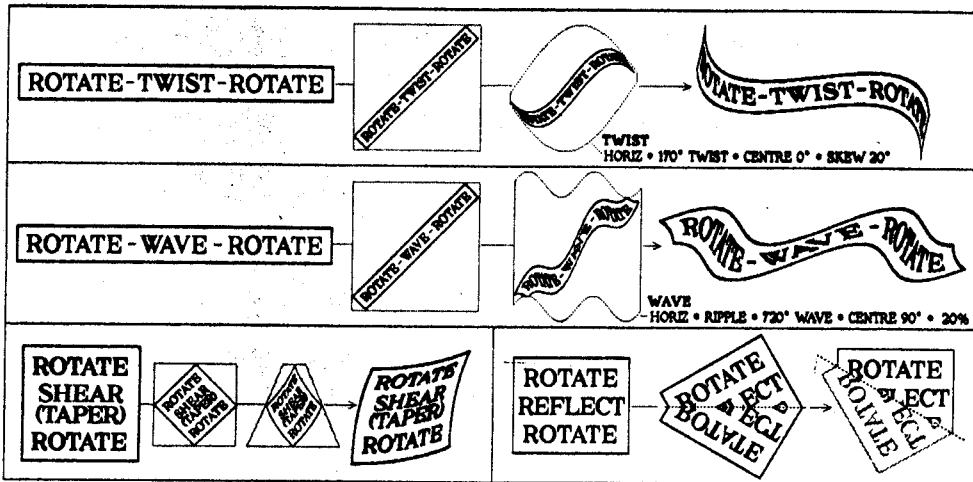
- If we had thought of our axis as being 45 degrees ANTI-clockwise from the HORIZONTAL (which is the same thing), we would have performed a PLUS 45 degree Rotate above, and would now be using a Horizontal Bend.



Finally we Rotate the bent design back to its intended angle, using the opposite of the original pre-Rotate i.e. we now use a PLUS 45 degrees Rotate to restore the orientation (FIG 3).

You will find that each of the Rotate operations causes an increase in the size of the overall rectangular area, so by the time you get to FIG 3 there is a fair amount of redundant white space around the design. This can be removed if necessary using Resave-with-Crop.

The same technique applies equally to other operations. A few examples can serve only to whet the appetite ... the full possibilities of these combined Tweak commands could not be covered in one-thousand-and-one pages of this manual!

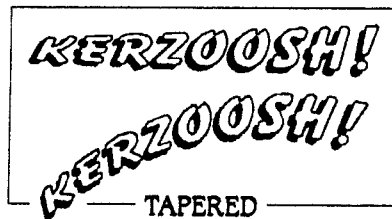


Some distortion is inevitably going to creep in as a result of using two Rotate operations like this ... there is simply no way of avoiding this, but you can help to minimise the 'noise' in the end result by:

- (1) Use an enlarged version of your design, and then reduce it in size again after the transformation is complete. This may cost you time, but will definitely reduce the percentage error in the eventual image.
- (2) Use Superfine Rotates ... again this costs time, but definitely produces a better result.
- (3) Fatten your image first by thickness 1 or 2, and then UN-Fatten it once the rest of the sequence is complete (i.e. Fatten again with matching negative thickness). This will lose you a little detail, but will remove most of the 'fuzzy' effect which can be generated by a series of Rotates.

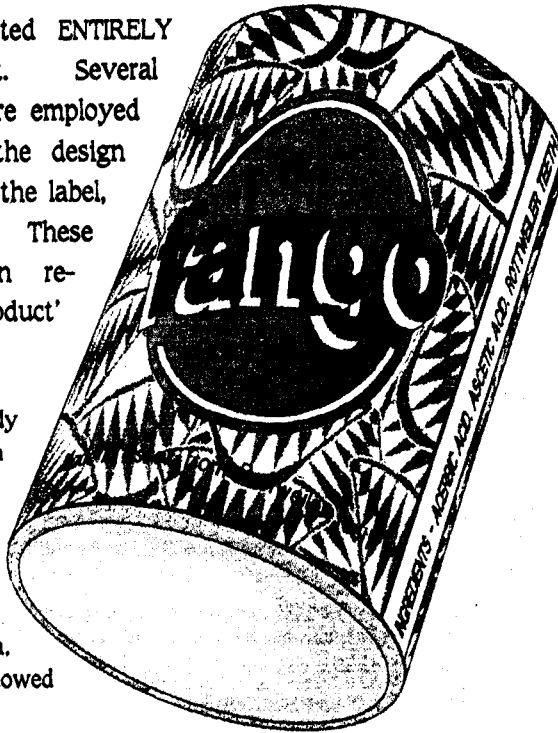
■ USING TAPERED SHEAR TO CREATE 'DIRECTION' ■

Many of the effects lack a sense of motion & direction when used in isolation. This can leave some designs, especially lettering, looking rather flat. Applying a Tapered Shear to your image before e.g. Circling will help to give the final result more 'kerzoosh' ...



WORKED EXAMPLE - THE FANGO CAN

This spectacular design was created ENTIRELY using MicroDesign2 and Tweak. Several sequences of Tweak commands were employed to create the separate parts of the design from simple blocks created in MD2 (the label, the background of fangs, etc). These Tweaked components were then re-assembled into the finished 'product' using MicroDesign2 once again.



You have probably worked out already that this design is going to involve a cylindrical Bend operation to create the overall can shape. However, before we get to that stage, we will want to create the label and the background as simple flat designs. The first component to examine, then, is the label with its angled, drop-shadowed 'fango' ...

THE FANGO LABEL & LETTERING

The first component is the oval label, the construction of which involves creating the word fango (with its outlined drop-shadow) at an angle of 13 degrees to the horizontal.

This requires two Tweak operations: one Rotate, and one Outline:



Firstly the word 'fango' is constructed in MicroDesign2 (using the headline typeface Grdian44 from XFD1, rescaled slightly to narrow it), and is saved on disc as FANGO.MDA (1). Note that the letters are spaced so that we can see the 'drop-shadow' between them later.

This whole word is then Rotated by -13 degrees in Tweak to create FANGO-R.MDA (2). Use a Superfine rotate if you can be bothered to wait - the quality is better, but it does require a little more patience!

The rotated version is then Outlined with Thickness-2 to make FANGO-RO.MDA (3), and we now have the two pieces to make the drop-shadowed word ...

(You can use whatever names you like, but this convention of adding the initial letters of the Tweak operations performed is helpful).

Re-starting MicroDesign, we now combine the outlined and solid versions with a Block Copy in Transparent mode (4).

We then copy the combined result over a design of three concentric ellipses, which has had two holes knocked out of it already to receive the logo (5).

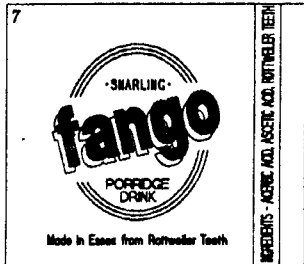
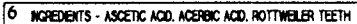
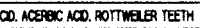
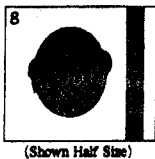
The 'SNARLING' and 'PORRIDGE DRINK' lettering are added with Write, using one of the Helvetic fonts, to complete the oval label. You will note that we have NOT yet shaded it - we will do this much later, to avoid Tweaking the shading pattern itself.

We now add the remainder of the lettering, which first involves creating the INGREDIENTS list running up the right-hand side of the can...

The list is Typeset and saved as INGRED.MDA (6), then Tweak is used to Rotate it by -90 degrees, producing INGRED-R.MDA.

MicroDesign is then used once again to combine the oval label, the newly-created INGRED-R.MDA, and the final lettering reading 'Made in Essex from Rottweiler Teeth' (another Typeset). This final assembly is surrounded by a box and saved on disc as LABEL.MDA (7).

Before finishing with this section, we also create a 'mask' for the oval so that we can punch a hole in the background. This mask (8) is created by redrawing the outer ellipse in solid black, then Painting or Flooding any last remaining holes, and using Block Erase & Invert to create a black rectangle over the ingredients list.



THE BACKGROUND OF FANGS

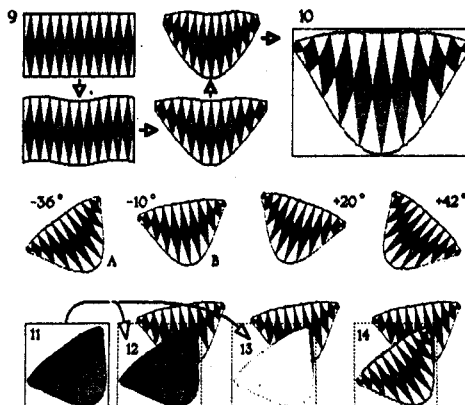
The rectangular image which will eventually be Bent to make the main background of the can is constructed by overlaying umpteen versions of a basic pair of fangs, using a few different rotations to give variety.

The basic set of fangs itself (10) is created from the original rectangular design shown here (9) using a process almost identical to that described for the 'Say Cheese' logo on page 20 - the only differences being that a slight Wave (Horiz.) was used before the two Twists, and the Twists themselves are 'milder' in effect.

A few Rotated versions of the basic FANGS.MDA were then created using Tweak, being saved as FANGS-10.MDA, FANGS+20.MDA, etc.

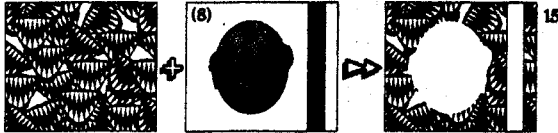
MicroDesign2 was then used to overlay these various rotations on each other time and time again, using the normal 'cut-a-hole' technique with solid masks as shown in the sequence here (right).

This overlaying process is repeated with one after another of the rotated sets of fangs until an area the size of the label above has been filled. Then we must 'punch a hole' in this overall background to allow for the label later ...



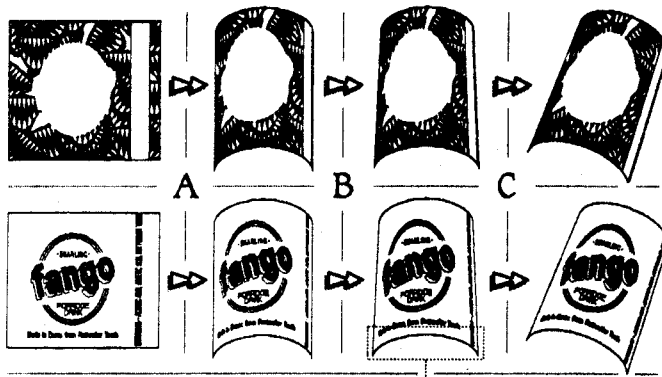
Firstly a solid black version of A is made (11). This is then copied over B twice ... once in Transparent mode (12), and once in XOR mode (13), thus creating the white hole. The original A is then copied into this hole (in Transparent mode) to create the overlapped pair (14).

The mask technique is repeated to make the holes in the block of fangs (15). We now have both can elements, the label and the background, which must be saved as equal-sized areas so that Tweak affects them identically.



Both label and background are now passed through exactly the same sequence in Tweak:

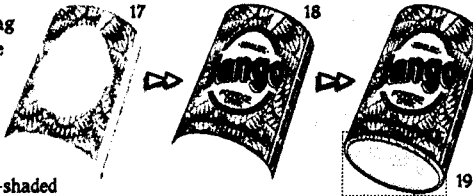
- A) BEND (VERTICAL)
180 DEGREES
50% END-ROUND
- B) SHEAR (SLANT SIDES)
TAPER
3° SHEAR ANGLE
- C) ROTATE
22° ANGLE
SUPERFINE (up to you!)



We next create the bottom of the can from the bottom of the Bent-&-Tapered label and its Y-reflection (16). We add a bit of depth by drawing another Ellipse within it, centred very slightly below the outer one, then Rotate in Tweak by the same 22 degrees as in stage C above.



The canned background is shaded (17), either by Flooding with the pattern you want, or by Inverting the whole design, performing a patterned Rectangle over it in Transparent mode, then re-inverting. (Remember to perform the Rectangle with the inverse of the pattern you eventually want to see).



Next the Tweaked label is loaded over the newly-shaded background in Transparent mode (18). (Since the two same-sized originals have been passed through exactly the same set of Tweak commands, these two designs will line up over each other exactly when re-loaded into MD2). The bottom of the can is also added (19), leaving us only some shading to perform ...

After some tidying-up in the Design section (esp Zoom) to make solid any broken outlines etc., the body of the oval label can be Flooded with your chosen grey-shade. Remember to save a copy of the design before you do this, as Flooded areas are difficult to un-Flood later. A little patterned Painting has also been used to provide shading in the bottom of the can, and the bottom rim has been darkened too with another Flood.

