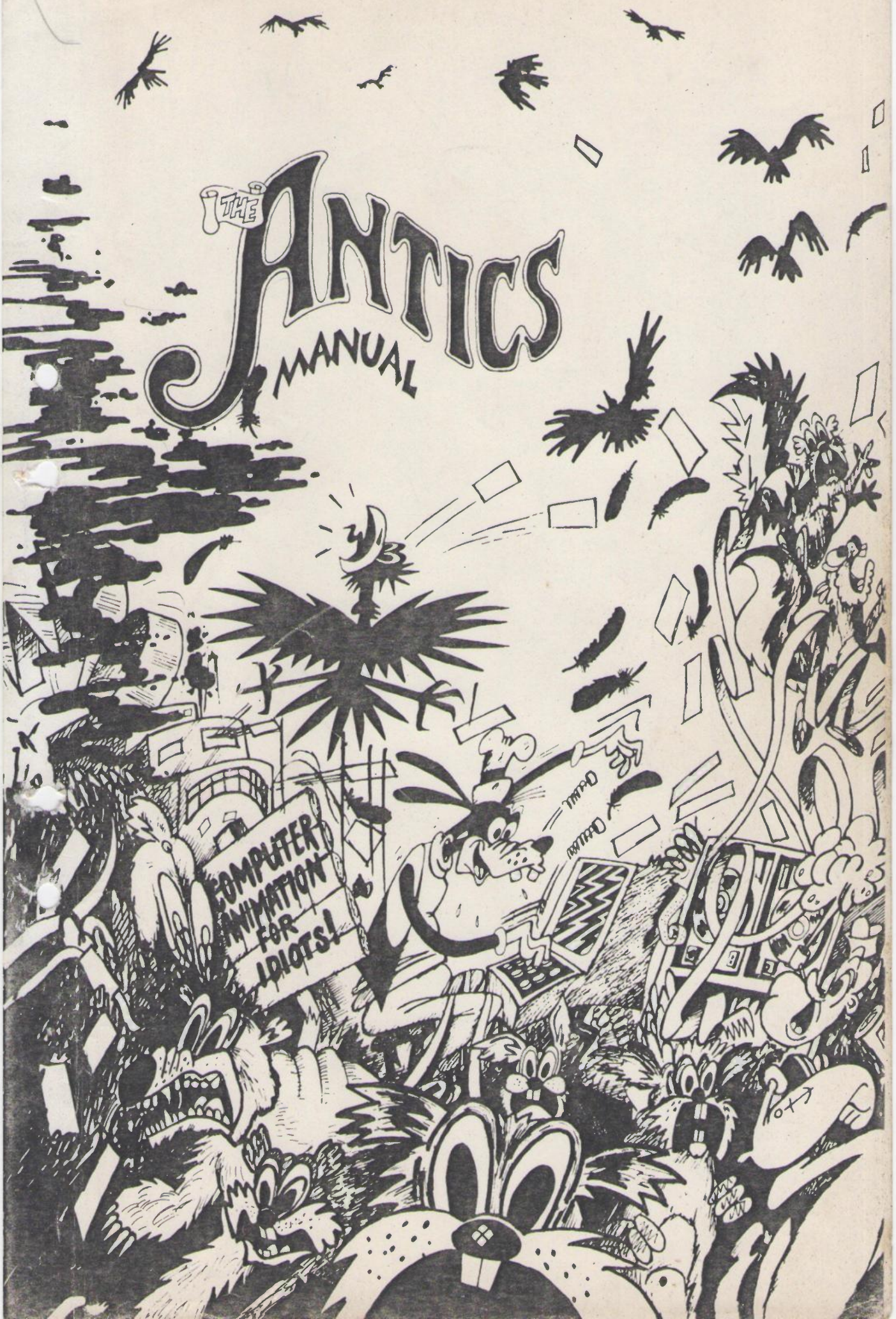


THE ANTIICS MANUAL

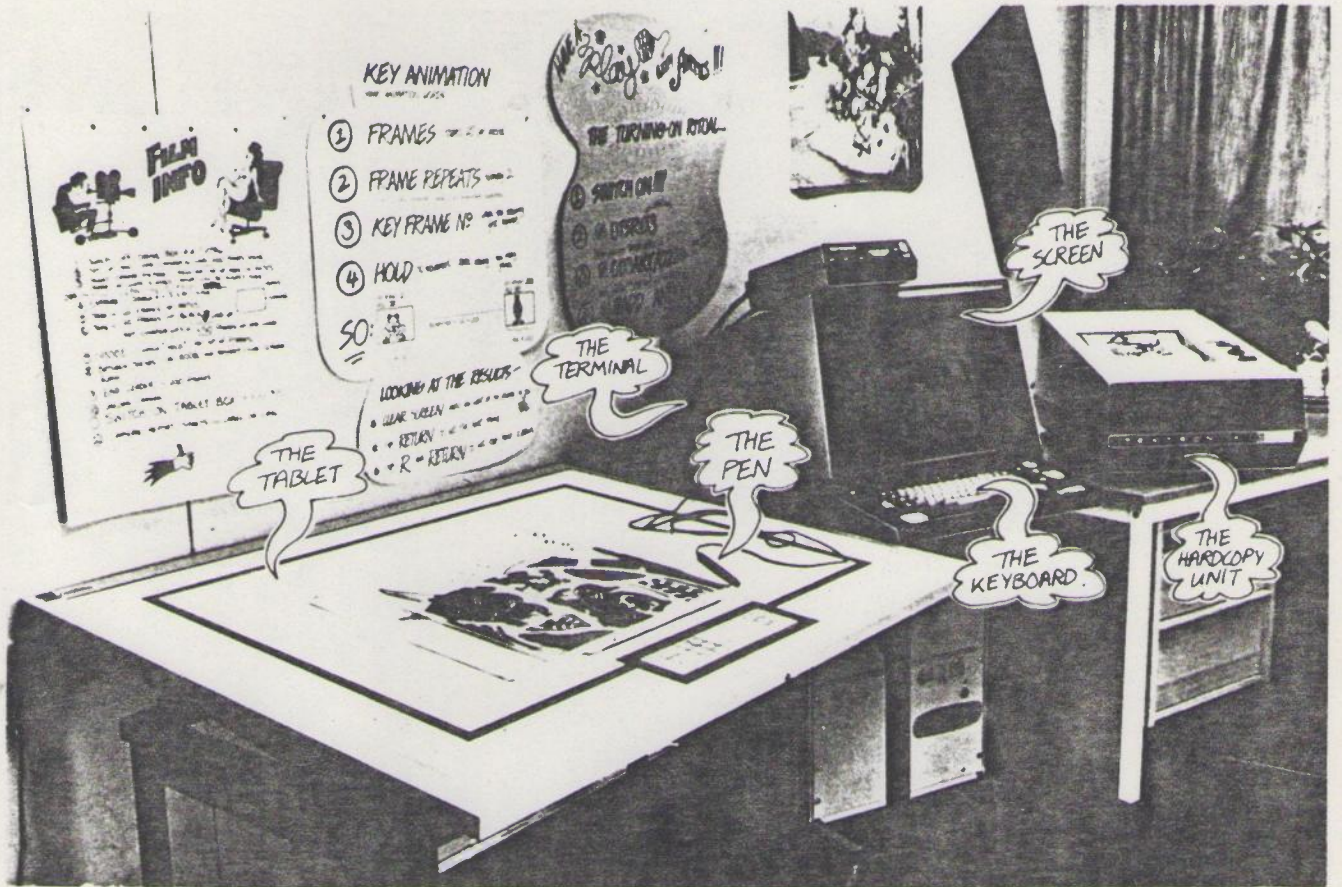


ANTICS

COMPUTER
ANIMATION
SYSTEM

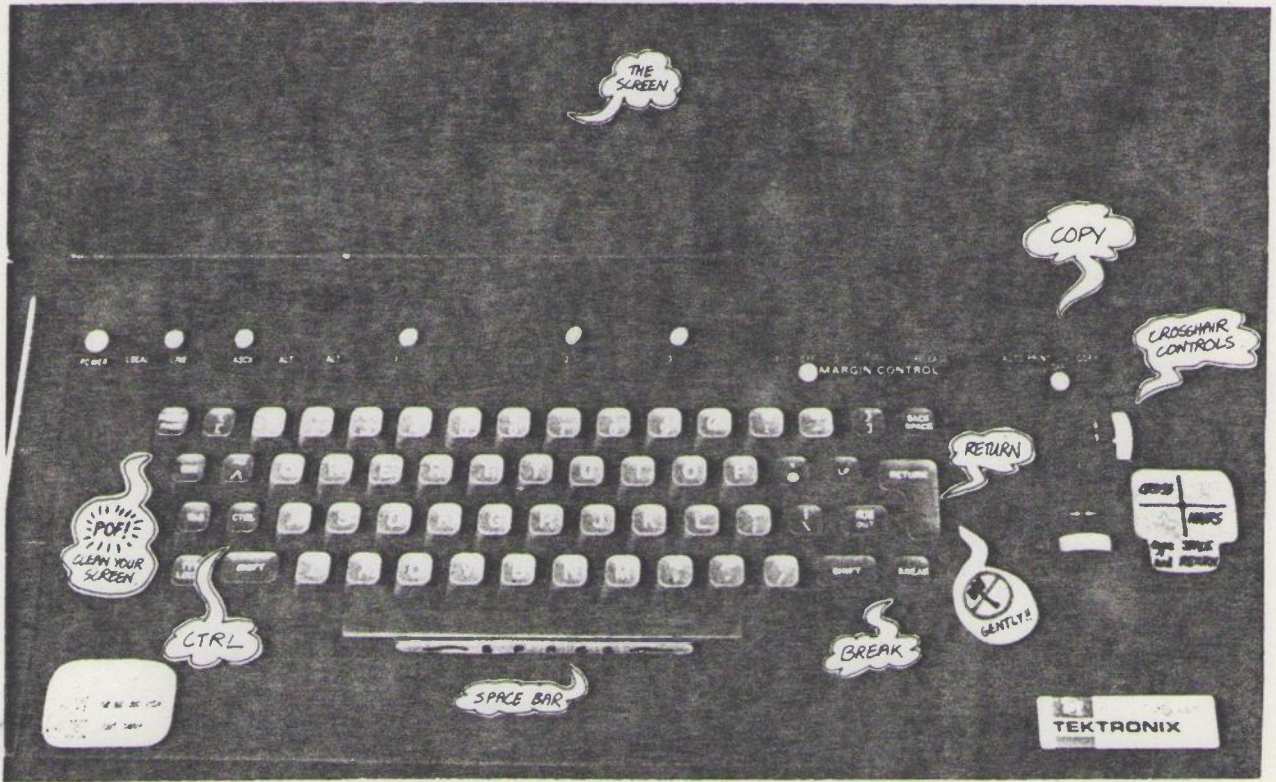


INTRODUCING THE GEAR —



- ★ DRAWINGS ARE DONE BY USING THE PEN ON THE TABLET
- ★ THE DRAWINGS APPEAR ON THE TERMINAL'S SCREEN, AND SO DO THE ANIMATION RESULTS.
- ★ OUT OF ALL THE MYRIAD POSSIBILITIES THAT ANTICS CAN DO, THE MACHINE DISCOVERS WHAT YOU WANT BY ASKING YOU SIMPLE YES/NO QUESTIONS — LIKE A GAME OF 20 QUESTIONS.
- ★ THESE QUESTIONS APPEAR ON THE SCREEN.....YOU TYPE ANSWERS ON THE TYPEWRITER KEYBOARD.....NO NEED TO BE A TYPING WIZARD.....ONE FINGER IS ENUFF — PRINIST ALL THE ANSWERS ARE A SINGLE LETTER OR A NUMBER..
- ★ THE HARDCOPY UNIT WILL GIVE YOU A GOOD QUALITY PAPER COPY OF ANY PICTURE OR WRITING ON THE SCREEN.

THE KEYBOARD.



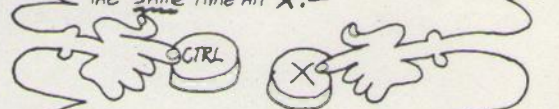
- ★ LIKE SOME ELECTRIC TYPEWRITERS, THE KEYS ON THE TERMINAL WILL REPEAT IF YOU HOLD THEM DOWN FOR LONGER THAN HALF-A-SECOND. HIT THE KEYS WITH A QUICK, FIRM, TAP.... BUT GENTLY!!
- ★ ANTI-C TYPING IS USUALLY A SINGLE LETTER OR A NUMBER, OR A SHORT NAME — TYPE THE INFO THEN HIT THE RETURN KEY — THAT SENDS THE MESSAGE.....NOTHING HAPPENS UNTIL YOU DO THAT. SO REMEMBER —

EVERYTIME, FINISH BY HITTING RETURN!!...

- ★ **"CLEAN YOUR SCREEN"** — THE SCREEN MAY GET TOO CLUTTERED WITH DRAWINGS AND WORDS — AT ANY TIME YOU CAN PUSH THIS BUTTON TO CLEAR THE SCREEN.
- ★ **"BREAK"** — THIS KEY WILL INTERRUPT ANYTHING COMING OVER ON THE SCREEN. USE RETURN TO START OFF AGAIN.
- ★ **"COPY"** — PRESS THIS BUTTON TO GET A HARDCOPY PRINT OF WHATEVERS ON THE SCREEN.
- ★ **CROSSHAIRS** — ARE USED TO PINPOINT TO THE MACHING THINGS TO TURN, RUB OUT, ALTER, CHANGE POSITION ETC. TO USE — HIT SPACE.... THEN RETURN.

TYPING FOOBS

IF YOU MAKE A TYPOGRAPHICAL ERROR YOU CAN RUB OUT WHAT YOU'VE TYPED BY HOLDING DOWN THE **CTRL** BUTTON WITH ONE FINGER, AND AT THE SAME TIME HIT **X**:-



YOU CAN ALSO RUB OUT THE LAST LETTER BY HOLDING DOWN **CTRL** AND HITTING **Z**....DO IT TWICE TO RUB OUT THE LAST TWO LETTERS... UNFORTUNATELY YOU DON'T SEE THE RUBOUT, THE LETTERS STAY ON THE SCREEN, THEY'RE JUST NOT INCLUDED IN THE MESSAGE.

USING ANTICS.

TO GET ANTICS WORKING, BEGIN WITH,

THE TURNING ON RITUAL

- ① SWITCH ON **VITAL**
- ② TYPE UTSR03 THAT'S ZERO.
AND WHEN YOU GET "ENTER USERID ETC..."
- ③ TYPE ANTICS / DON'T FERGIT THIS

ON THE SCREEN YOU NOW GET —

41 FOLKS
ANTICS IS AWAKE AND READY FOR ACTION
FIRST A BIT OF HOUSEKEEPING

— WHICH PROGRAM?
— DRAW
— CAPTION
— ANIMATE
— PAINT
— VIEW
— ODDS 'N' SODS
— TYPE D, C, A, P, V, OR O...

Antics

FROM NOW ON EVERYTHING IS QUESTION-AND-ANSWER. THE FIRST QUESTION ASKS —

- WHICH PROGRAM?..
 - DRAW
 - CAPTION
 - ANIMATE
 - PAINT
 - VIEW
 - ODDS 'N' SODS
- TYPE D, C, A, P, V, OR O...

DRAW — IS USED TO MAKE NEW DRAWINGS OR ALTER OLD ONES — ALSO FOR GIVING ANIMATION INSTRUCTIONS.

CAPTION — IS USED FOR COMPOSING LETTERING FROM TEXT TYPED ON THE KEYBOARD

ANIMATE — CARRIES OUT THE ANIMATION

PAINT — MAKES THE FINAL FULL COLOUR VERSION

VIEW — IS USED TO LOOK AT RESULTS

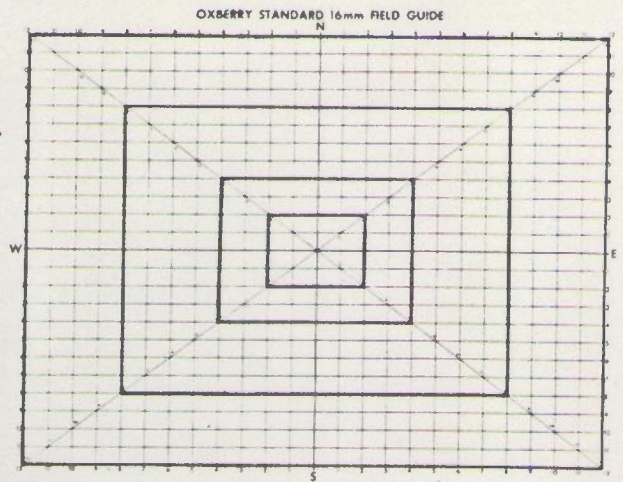
ODDS 'N' SODS — DOES MISCELLANEOUS LITTLE THINGS.

SO IF YOU WANT TO DRAW SOMETHING, USE THE DRAW PROGRAM —
— TYPE D (AND RETURN).

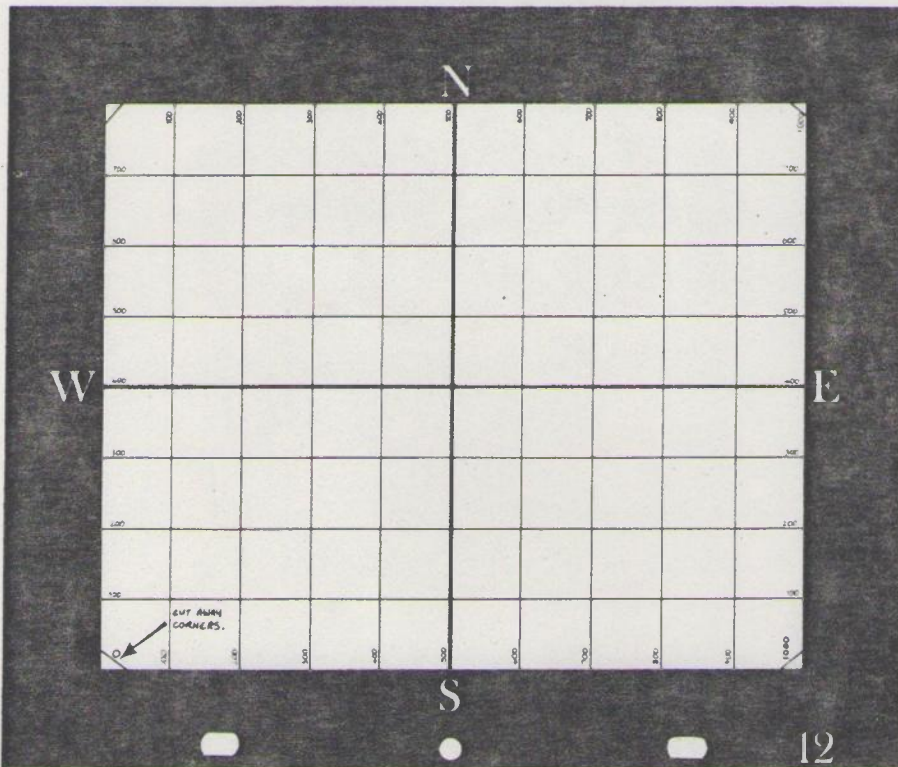
★ WHEN YOU'VE FINISHED USING A PROGRAM, THE MACHINE ASKS "ANY MORE ANTICS?... Y OR N". TYPE Y FOR YES IF YOU WANT TO DO MORE — TYPE N FOR NO TO FINISH THE SESSION. THE MACHINE CAN THEN BE SWITCHED OFF.

THE ANTICS FIELDCHART.

A CONVENTIONAL FIELDCHART LOOKS A BIT LIKE THIS
 MEASUREMENTS ARE MADE FROM THE CENTRE OF THE
 CHART OUTWARDS — IN 4 DIRECTIONS N,S,E,W.
 SIZES REFER TO THE THE WIDTH OF THE PICTURE AREA
 IN INCHES. THE ANTICS FIELDCHART IS SIMILAR, BUT WITH
 ONE BIG DIFFERENCE.



OXBERRY FIELD CHART.



ANTICS FRAME AREA.

RATIO 4:5 (FOR TV).

WIDTH - 1000
 HEIGHT - 800.

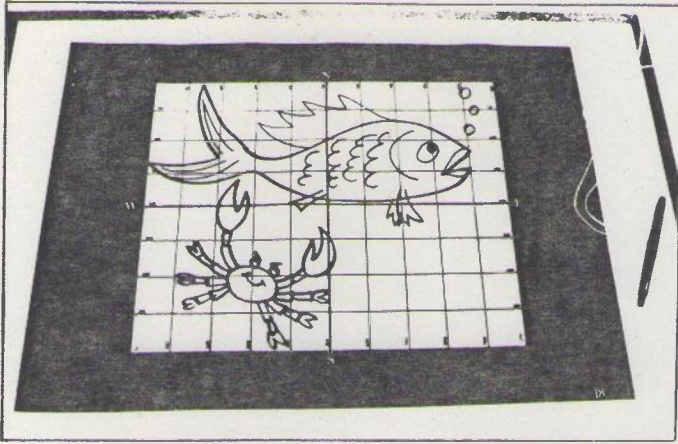
THE BIG DIFFERENCE IS THIS —

★ THE PICTURE SIZE IS ALWAYS THE SAME!! IT'S THE DRAWINGS THAT CHANGE SIZE.

YOU DON'T NEED DIFFERENT FIELD SIZES — USING ZOOM YOU CAN BLOW UP OR REDUCE A DRAWING TO ANY SIZE YOU LIKE — AND YOU CAN DO THIS INDEPENDENTLY WITH ANY NUMBER OF DIFFERENT DRAWINGS ON THE SCREEN TOGETHER, SOMETHING IMPOSSIBLE WITH AN ANIMATION CAMERA ZOOM. SO IN ANTICS EVERYTHING RELATES TO ONE SINGLE FRAME AREA — THE SCREEN.....

THE OTHER DIFFERENCE IS THIS — WE MEASURE IN ONLY TWO DIRECTIONS, NOT 4 — EITHER E/W OR N/S, SO, TO AVOID MINUS NUMBERS WE DON'T MEASURE FROM THE CENTRE WE MEASURE FROM LEFT, TO RIGHT (E/W) AND FROM BOTTOM TO TOP (N/S). THE MEASURE IS 1000 ACROSS THE FULL WIDTH OF THE SCREEN — 800 FOR THE HEIGHT — LEFT SIDE OF THE SCREEN IS ZERO E/W — CENTRE IS 500 E/W — RIGHT SIDE IS 1000 E/W. BOTTOM OF SCREEN IS ZERO N/S — CENTRE IS 400 N/S — TOP IS 800 N/S. THESE UNITS HAVE NO ABSOLUTE SIZE — THEY'RE NOT MILLIMETRES, NOT INCHES — THEY'RE PURELY RELATIVE TO THE DRAWING ON THE SCREEN, WHATEVER SIZE THAT MAY BE — A TINY HARDCOPY PRINT, OR A BIG ORIGINAL DRAWING, OR BLOWN UP ON A CINEMA SCREEN — IT STILL MEASURES 1000 WOE/SITS ACROSS. WHY 1000? — IT'S THE SMALLEST ROUND NUMBER THAT IS BOTH EASY TO WORK WITH, YET GIVES PLENTY OF ACCURACY — IF YOU'RE FAMILIAR WITH CONVENTIONAL FIELD-CHARTS IT RELATES VERY EASILY TO A 10" FIELD DIVIDED INTO HUNDRETHS OF AN INCH — PROBABLY THE MOST COMMONLY USED SIZE.

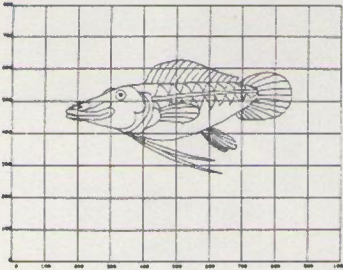
USING THE FIELDCHART.



COMBINED FIELD CHART AND FRAME MASK.

THE BLACK SURROUND MAKES IT EASY TO DECIDE HOW TO PLACE YOUR DRAWING ON THE SCREEN — THE CORNERS OF THE CHART ARE CUTAWAY SO YOU CAN MARK THE CORNERS ON THE DRAWING. THE FIELD CHARTS ARE AVAILABLE IN A WIDE RANGE OF SIZES TO SUIT DIFFERENT SIZES OF DRAWINGS.

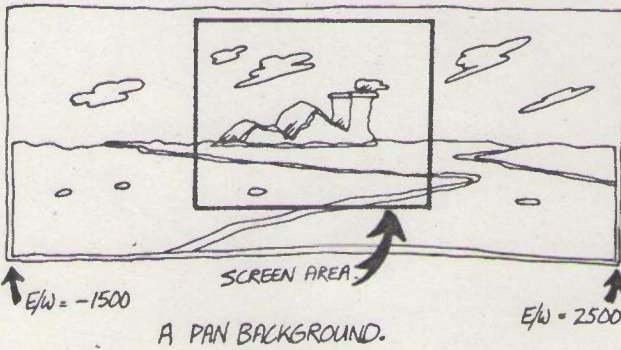
POSITIONS AND SIZES ARE OFTEN NEEDED FOR ANIMATION FX — FOR INSTANCE, THE START AND END POSITION OF A PAN — OR THE CENTRE OF A SPIN OR ZOOM. THESE MEASUREMENTS CAN BE MADE DIRECT FROM THE DRAWING WITH THE FIELD CHART.



YOU CAN GET THE SIZE AND POSITION OF A DRAWING BY USING —
— "GIVE SIZES AND POSITIONS" —

YOU CAN USE THE TABLET INSTRUCTION "DRAW FIELDCHART" TO GET A FIELDCHART DRAWN ON THE SCREEN....

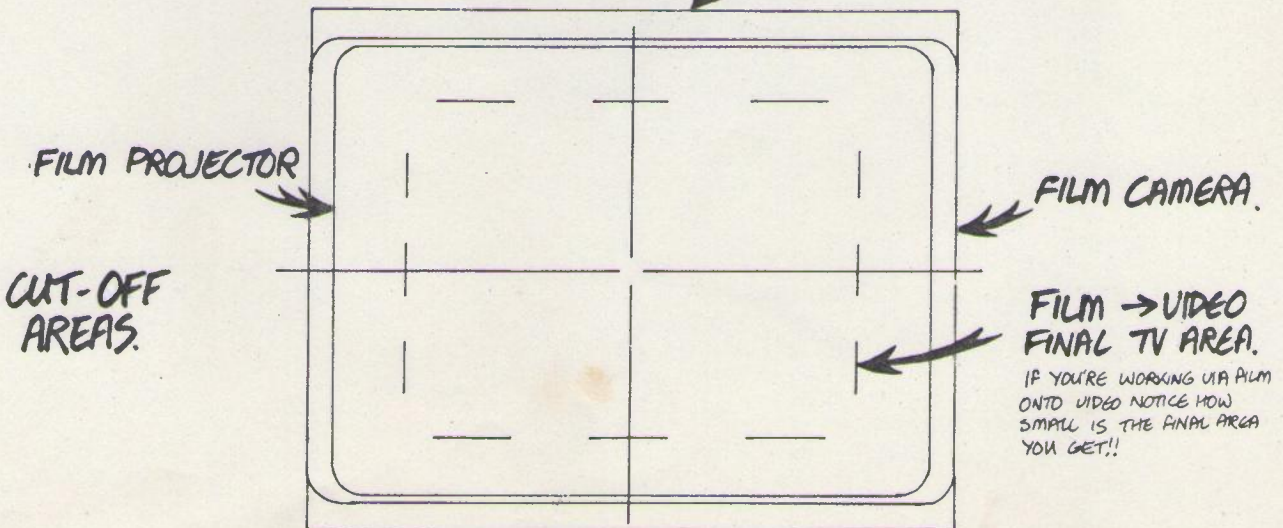
YOU CAN ALSO GET THE MEASUREMENTS OF ANY POINT BY USING —
— "GIVE POINT NUMBERS"



DRAWINGS CAN EXTEND BEYOND THE SCREEN AREA AS FAR AS YOU LIKE IN ANY DIRECTION.

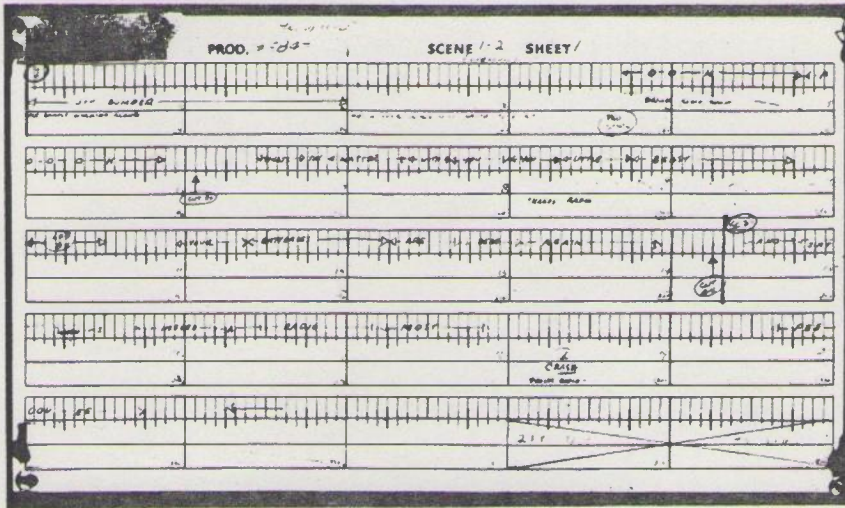
- * TO THE RIGHT OF THE SCREEN, E/W NUMBERS CARRY ON GOING UP.
- * TO THE LEFT, E/W NUMBERS ARE MINUS.
- * ABOVE THE TOP, N/S NUMBERS CARRY ON UP.
- * BELOW THE SCREEN, N/S NUMBERS ARE MINUS.

ANTICS TV AREA.



ANIMATION CHARTS.

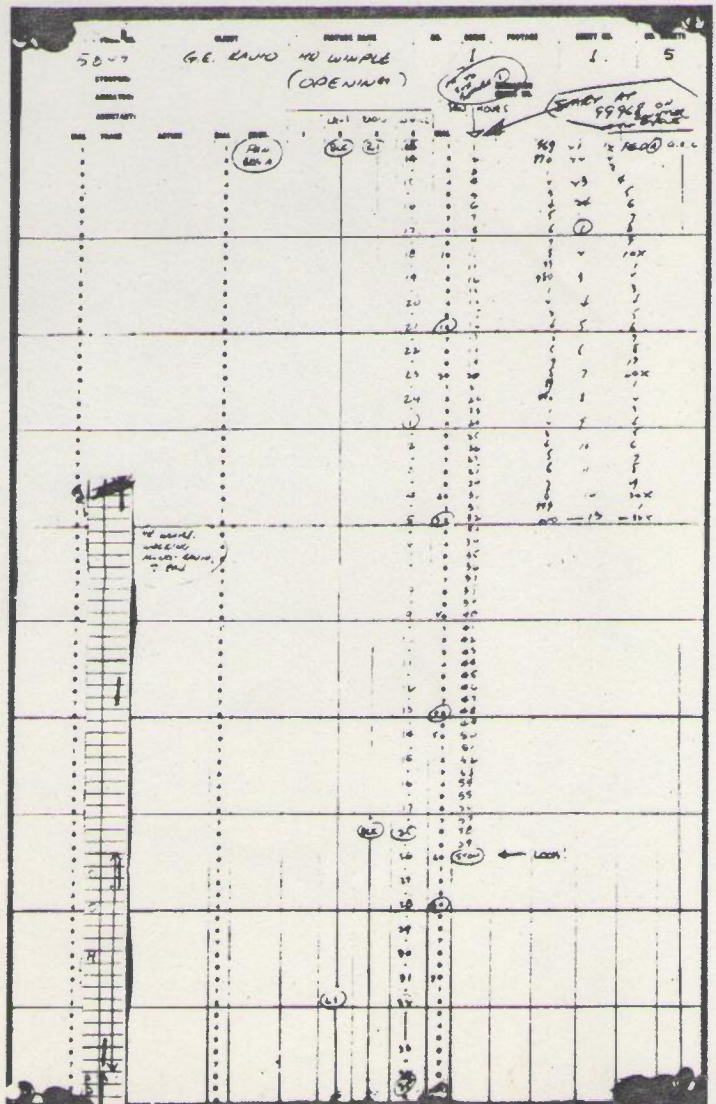
CONVENTIONAL CEL ANIMATION USUALLY STARTS WITH A "BAR CHART," WHICH GIVES AN OVERALL DIAGRAM OF THE FILM, SECOND BY SECOND. TIMINGS ARE INDICATED EXACTLY, BUT THE ACTION IS DESCRIBED VERY SIMPLY — "HE WALKS ALONG.....STOPS.....JUMPS IN THE AIR....." ETC.



BAR CHART.

WHEN ALL THE CELS HAVE BEEN DONE, EVERYTHING IS WRITTEN ON A DOPE-SHEET—THESE ARE THE INSTRUCTIONS TO THE ANIMATION CAMERAMAN. ALL THE CELS ARE NUMBERED, AND THE DOPE SHEET SHOWS WHICH CELS ARE NEEDED FOR EVERY FRAME OF FILM, THE ORDER OF THE CEL LEVELS, AND THE POSITIONS FOR ANY PAN, TILT, SPIN OR ZOOM MOVEMENTS.

IN ANTIQUES, IT'S A WHOLE LOT SIMPLER—YOU NEED ONLY ONE CHART—WE CALL IT JUST THE "ANIMATION CHART"—AND THIS IS SOMETHING IN BETWEEN A BAR CHART AND A DOPE SHEET. WHAT'S MORE, ONCE YOU BECOME FAMILIAR WITH THE FX YOU CAN PROBABLY MANAGE WITHOUT A CHART AT ALL... TO BEGIN WITH THOUGH, YOU SHOULD ALWAYS MAKE SOME SORT OF CHART ON SOME SCRAP OF PAPER..... THIS IS HOW TO DO IT.....



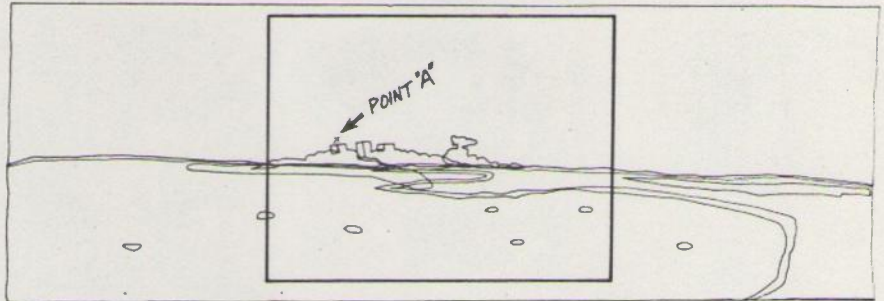
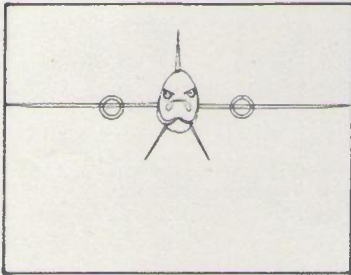
DOPE SHEET.

THE ANTICS ANIMATION CHART.

THE ANIMATION PROGRAM WORKS LIKE THIS —

- * YOU START WITH SOME DRAWINGS ON THE TABLET.....
- * FOR EACH DRAWING YOU DECIDE WHAT FX YOU WANT IT TO DO, AND WHEN.....
- * YOU CAN ALSO HAVE EFFECTS HAPPENING ON INDIVIDUAL CELLS OF A DRAWING.....
- * AND..... (GET THIS!)..... IF YOU HAVE NO FX ON A DRAWING IT DOESN'T APPEAR.....

FOR INSTANCE, IF YOU HAVE A DRAWING DOING A PAN ACROSS THE SCREEN FROM FRAME 51 TO FRAME 150, THEN FROM FRAMES 1 TO 50 IT SIMPLY WON'T APPEAR ON THE SCREEN. SO, YOU CAN HAVE LOTS OF BITS AND PIECES OF DRAWINGS IN YOUR FILE, AND YOU JUST PUT THEM WHERE YOU WANT THEM WHEN YOU WANT THEM. — IF YOU GIVE THEM NOTHING TO DO, THEY DO NOTHING!!.....

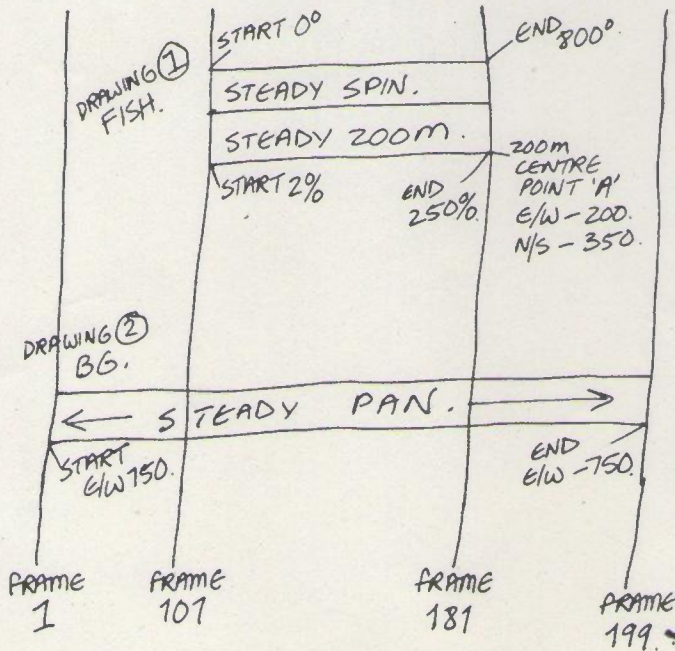


FOR EXAMPLE..... WE HAVE DRAWING 1 — THE ULTIMATE FLYING FISH.

AND DRAWING 2..... THE BACKGROUND..... THE MESA IN THE DESERT.

THE IDEA IS THAT WE PAN ACROSS THE DESERT (FRAMES 1 — 200)..... HALF-WAY ACROSS THE FISH COMES ZOOMING AND SPINNING OUT FROM THE MESA (POINT A) RIGHT PAST THE "CAMERA".....

..... A CHART OF THIS WOULD LOOK LIKE THIS.....



NOTICE..... ALL THE FRAMES ARE ODD NUMBERS!! THATS BECAUSE.....

- * WE START AT FRAME 1.
- * WE DOUBLE-FRAME. (FRAME REPEATS = 2).

SO

- * ALL EVEN FRAMES ARE REPEATS OF THE ODD ONES BEFORE..... RIGHT?
- * ONLY THE ODD FRAMES ARE NEW.
- * SO FORGET THE EVEN NUMBERS, JUST USE THE ODD ONES — AT LEAST TO BEGIN WITH.....

THIS CHART HAS ALL THE INFO NECESSARY FOR THE SEQUENCE..... ALL WE DO NOW IS TYPE IT INTO THE MACHINE, AND THAT GOES LIKE THIS.....

GETTING THE INFO INTO THE MACHINE.

LIKE THE DRAW PROGRAM, THIS IS DONE WITH QUESTION AND ANSWER. WHEN YOU'VE FINISHED THE DRAWINGS, YOU GET A CONVERSATION THAT GOES LIKE THIS.....

INFO FOR SPIN.

INFO FOR STEADY MOVEMENT.

INFO FOR ZOOM.

INFO FOR STEADY MOVEMENT.

INFO FOR PAN.

INFO FOR STEADY MOVEMENT.

DRAWING 1 - FISH - ANY FX ?

YES

TYPE FX NAME ?

SPIN

START FRAME, END FRAME ?

101 181.

MOVEMENT CONTROL ?

STEADY.

START FRAME, END FRAME ?

101 181

FRAME 101 - WHAT ANGLE ?

0

FRAME 181 - WHAT ANGLE ?

800

TYPE FX NAME -

ZOOM

START FRAME, END FRAME ?

101 181

MOVEMENT CONTROL ?

STEADY

START FRAME, END FRAME ?

101 181

FRAME 101 - WHAT SIZE (PERCENT) ?

2

FRAME 181 - WHAT SIZE (PERCENT) ?

250

VANISHING POINT - POSITION E/W ?

200

VANISHING POINT - POSITION N/S ?

350

TO FINISH HIT RETURN.....

NOTICE THAT THE FRAME NUMBERS FOR STEADY NEEDN'T BE THE SAME AS THE FX FRAMES. - USUALLY THEY'RE DIFFERENT - FOR INSTANCE, IF YOU WANT A HOLD BEFORE STARTING THE MOVEMENT - THE STEADY CONTROL COULD START ON FRAME 111 - THEN YOU'D GET A HOLD ON THE START POSITION FROM FRAME 101 - 110 - GOT IT!!

101 181
10° SPIN. 360°
STEADY 181.
MOVEMENT

DRAWING 2 - BACKGROUND - ANY FX ?

YES

TYPE FX NAME

PAN

START FRAME, END FRAME ?

1 199

MOVEMENT CONTROL ?

STEADY.

START FRAME, END FRAME ?

1 199

FRAME 1.....WHAT POSITION E/W ?

750

FRAME 199.....WHAT POSITION E/W ?

-750.

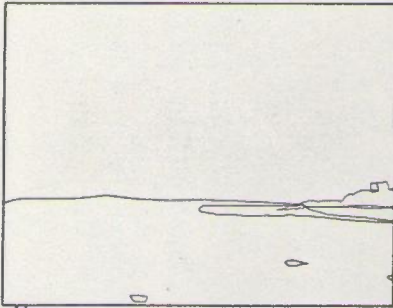
TO FINISH HIT RETURN .

GOOD NEWS FOR ONE-FINGER TYPISTS!!

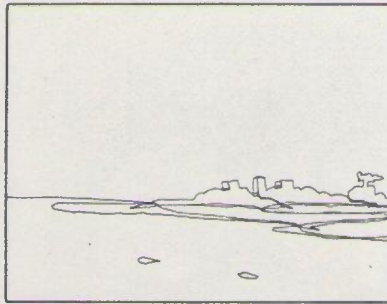
AKCHERLY YOU DON'T HAVE TO TYPE THE WHOLE FX NAME - THE FIRST THREE LETTERS ARE ENUFF!!.....

TYPING THAT LOT MIGHT TAKE AS LONG AS 3 WHOLE MINUTES.....!! THEN IT'S "ANY MORE PANICS" - YES, A FOR ANIMATE" - AND NOW WE GET A PLAYBACK OF THE COMPLETED LINE-TEST ANIMATION.

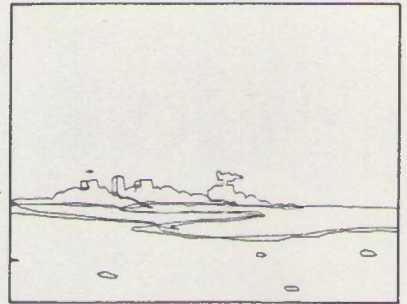
THE COMPLETED LINE TEST.



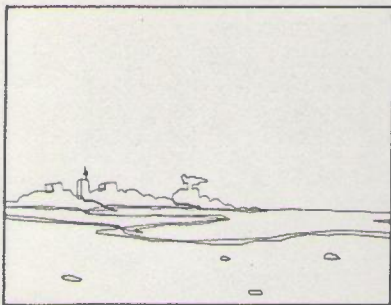
FRAME 1
HOLD 2



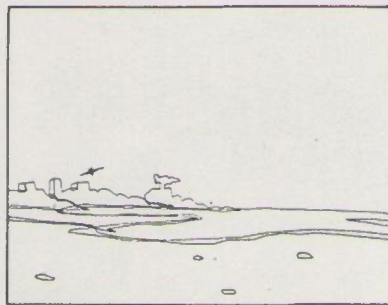
FRAME 5
HOLD 2



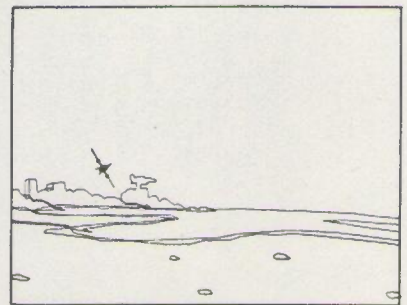
FRAME 10
HOLD 2



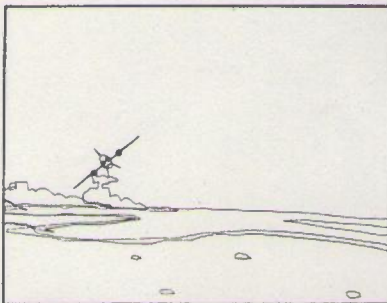
FRAME 11
HOLD 2



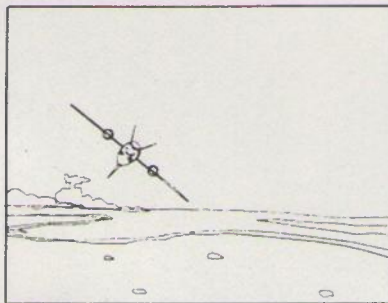
FRAME 12
HOLD 2



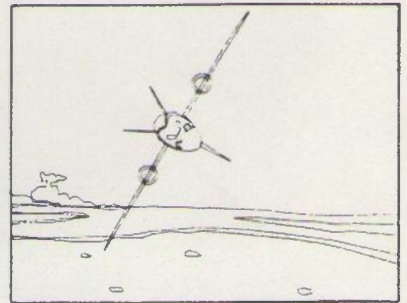
FRAME 13
HOLD 2



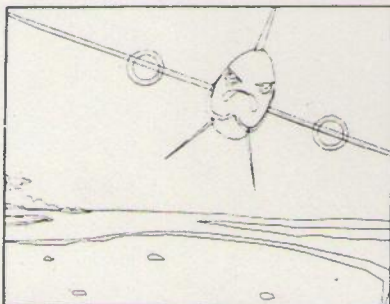
FRAME 14
HOLD 2



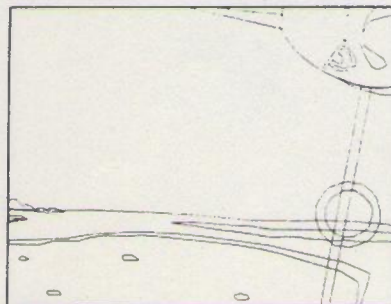
FRAME 15
HOLD 2



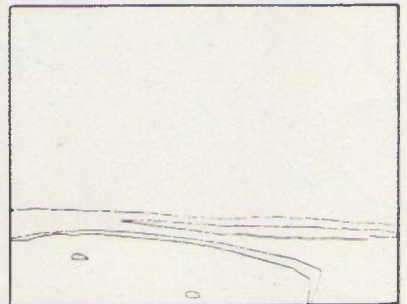
FRAME 16
HOLD 2



FRAME 17
HOLD 2



FRAME 18
HOLD 2



FRAME 20
HOLD 2

IF THAT'S OK YOU CAN GO STRAIGHT ON AND FILM IT, OR PLOT IT, OR PAINT IT OR WHATEVER.....AND THAT'S IT!!

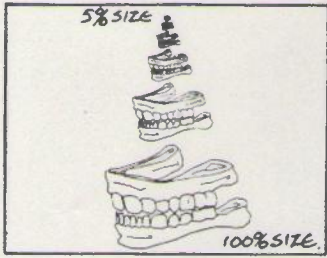
★ LINE TEST DRAWINGS ARE ALWAYS TRANSPARENT!! THE OPAQUE HIDING ONLY WORKS IN THE PAINT PROGRAM, AFTER THE LINE TEST IS DONE!!!...

MOVEMENT CONTROLS.

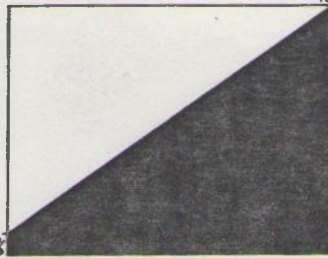
THIS IS THE MOST FUNDAMENTAL CONCEPT IN ANIMICS — GET YOUR HEAD ROUND THIS ONE AND YOU'VE GOT THE WHOLE THING SUSSSED — AFTER THAT ALL IT TAKES IS PRACTICE AND YOU'LL MASTER IT IN NO TIME.....



THE DIFFERENCE BETWEEN EFFECTS AND CONTROLS: —
EFFECT = WHAT KIND OF MOVEMENT
MOVEMENT CONTROL = HOW THE MOVEMENT GOES.



EFFECT-ZOOM.



MOVEMENT-STEADY

★ ANIMATION EFFECTS RELATE TO THE DRAWING STORED IN THE MACHINE.

FOR INSTANCE, SUPPOSE THIS IS THE DRAWING JUST AS YOU DID IT STORED IN THE MACHINE. →



IT WON'T APPEAR ON THE SCREEN UNLESS YOU GIVE IT SOME EFFECT TO DO.

A STATIC ZOOM 50% SIZE WILL GIVE YOU THIS... →



JUST THIS STATIC POSITION AND NOTHING ELSE — NO MOVEMENT!!!...

OR... A STATIC PAN, SHIFTED DISTANCE 300 E/W, WILL GIVE YOU THIS... →



JUST THIS STATIC POSITION AND NOTHING ELSE — NO MOVEMENT!!!.....

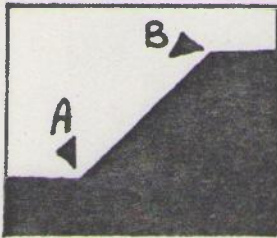
MOSTLY, THE EFFECTS USED BY THEMSELVES ONLY PRODUCE A STATIC POSITION.....
 ★ TO GET MOVEMENT — YOU MUST USE A CONTROL!!!.....

3 BASIC MOVEMENT CONTROLS.

PAN USED ON ITS OWN WILL SHIFT THE DRAWING — BUT ONLY TO A STATIC POSITION.
TILT USED ON ITS OWN WILL SHIFT THE DRAWING — BUT ONLY TO A STATIC POSITION.
ZOOM USED ON ITS OWN WILL SHIFT THE DRAWING — BUT ONLY TO A STATIC POSITION.
SPIN USED ON ITS OWN WILL SHIFT THE DRAWING — BUT ONLY TO A STATIC POSITION.

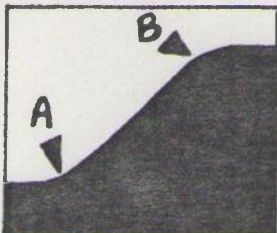
SOMETIMES YOU MAY WANT THINGS IN A STATIC POSITION, SO FX ON THEIR OWN CAN BE USEFUL.....
BUT THE USUAL IDEA IN ANIMATION IS THAT DRAWINGS MOVE!!.....

THERE ARE TEN MOVEMENT CONTROLS, AND ANY OF THEM CAN BE USED TO CONTROL THE MOVEMENT
OF ANY OF THE FX. (JUST ABOUT).
START BY GETTING FAMILIAR WITH JUST THESE THREE SIMPLEST CONTROLS.....



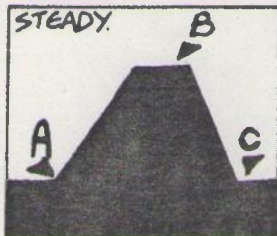
STEADY.

A STEADY MOVEMENT GOES DIRECTLY FROM A TO B AT A COMPLETELY EVEN STEADY PACE — IT CAN BE USED TO CONTROL POSITION, SIZE, ANGLE OF SPIN, CHANGE IN BETWEENING, AND JUST ABOUT ANYTHING ELSE.....



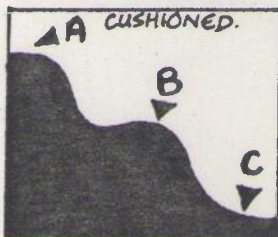
SMOOTH.

A SMOOTH MOVEMENT ALSO GOES FROM A TO B BUT "CUSHIONED" — I.E. IT STARTS GENTLY, ACCELERATES UP TO HALF WAY, THEN SLOWS DOWN, AND FINALLY COMES GENTLY TO REST...



DOUBLE.

A DOUBLE MOVEMENT GOES IN TWO STAGES — FIRST FROM A TO B, THEN FROM B TO C. POSITION C CAN BE THE SAME AS A IF YOU WANT, SO DOUBLE IS THEN GOING FROM A TO B AND BACK TO A. THE MOVEMENTS IN DOUBLE CAN BE EITHER STEADY OR CUSHIONED.



THE COMBINATION OF 6 EFFECTS — HOLD, PAN, TILT, ZOOM, SPIN, CHANGE.

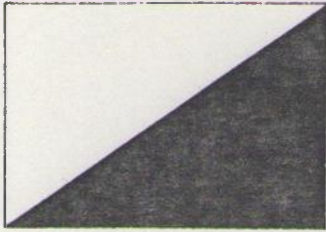
TOGETHER WITH 3 CONTROLS — STEADY, SMOOTH, DOUBLE.

WILL NOT BE ENOUGH TO MAKE "SNOW WHITE AND THE SEVEN TROLLS", BUT WITH A LITTLE IMAGINATION IT WILL TAKE YOU QUITE A LONG WAY, AND PROVIDE YOU WITH HOURS OF INSANE AMUSEMENT. ONCE YOU'VE MASTERED THEM, YOUR BRAIN WILL BE READY FOR THE FINAL BLAST — ALL THE REST OF THE FX AND CONTROLS!!...

STEADY AND SMOOTH - FULL DETAILS.

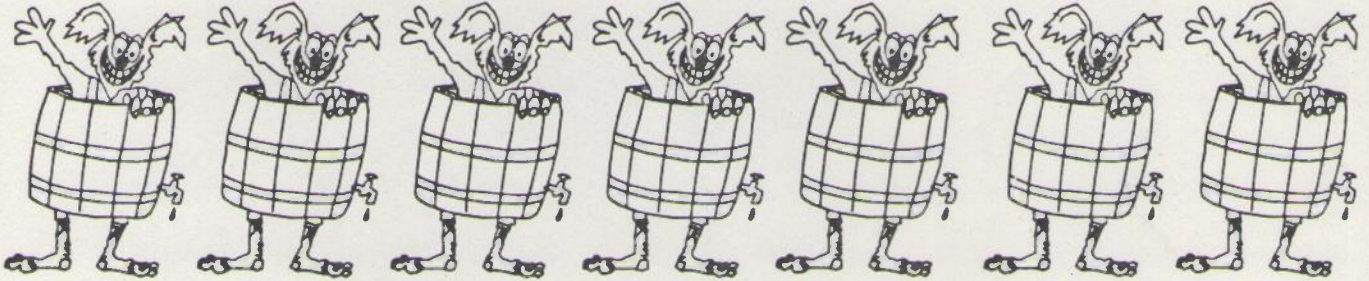
STEADY AND SMOOTH BOTH MAKE A MOVEMENT THAT GOES FROM ONE POSITION AT ONE FRAME TO ANOTHER POSITION AT ANOTHER FRAME - STEADY MAKES THE MOVEMENT GO AT AN EVEN STEADY PACE ALL THE WAY THROUGH, SMOOTH MAKES A CUSHIONED MOVEMENT

THAT STARTS GENTLY, ACCELERATES UP TO HALF WAY, SLOWS DOWN AGAIN, AND COMES TO REST GENTLY - THESE MOVEMENTS CAN BE USED GRAPHICALLY LIKE THIS -

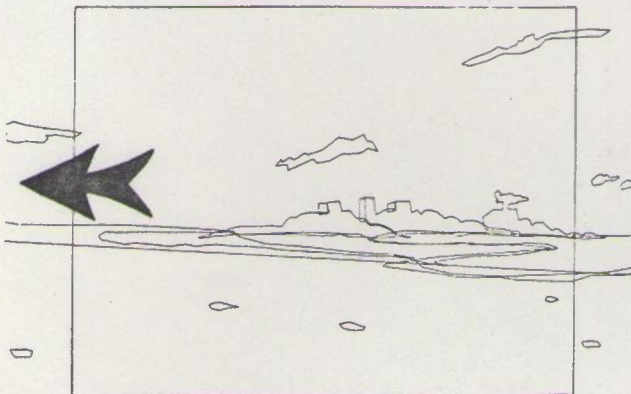


STEADY.

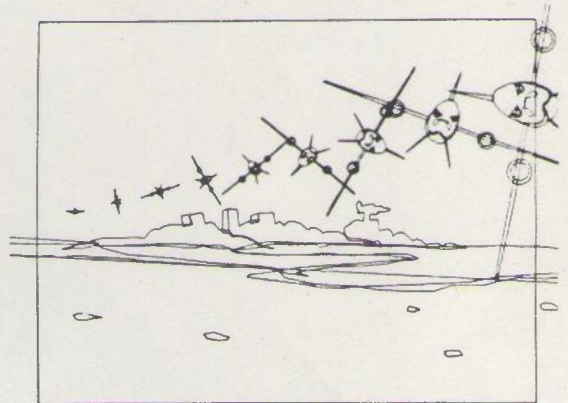
FROM ONE POSITION TO ANOTHER - THE PACE IS COMPLETELY UNIFORM ALL THE WAY THROUGH SO IT STARTS AND ENDS WITH A VERY SUDDEN JERK -
- STEADY IS MOSTLY USED FOR MOVEMENTS THAT START AND END OFF SCREEN
- LIKE A PAN THAT GOES CONTINUOUSLY ACROSS THE SCREEN - SO YOU WON'T SEE THE BUMP WHEN IT STARTS AND STOPS.



STEADY PAN - START AND END ARE OFF THE SCREEN.



- OR A CONTINUOUS PAN THAT GOES STEADILY ALL THE WAY THROUGH A SCENE.

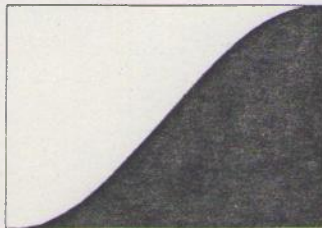


- A STEADY PAN AND A STEADY ZOOM - STARTING AS AN INVISIBLE DOT, ENDING OFF THE SCREEN.

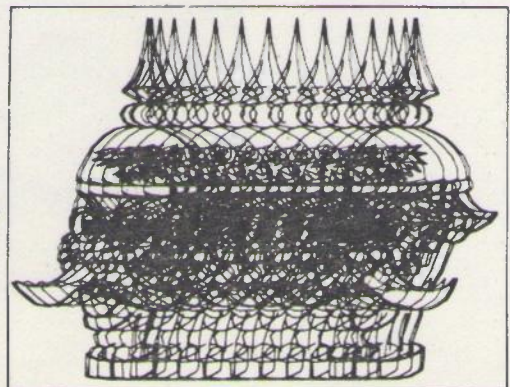
SMOOTH.

WHEN THE STARTING AND/OR ENDING OF THE MOVEMENT IS ON THE SCREEN - I.E. IF THE START AND END POSITION IS HELD FOR ANY LENGTH OF TIME, IT'S USUALLY BETTER TO USE SMOOTH. THE SMOOTH MOVEMENT IN ANIMICS IS KNOWN TECHNICALLY AS A **SINE-WAVE**

MOVEMENT - IT IS THE BASIC FORM OF ALL NATURAL WAVE MOVEMENTS - EVERY KIND OF WAVE, VIBRATION OR OSCILLATION IN NATURE FOLLOWS THIS FORM OF MOVEMENT. THE SINE-WAVE MOVEMENT HAS A PARTICULAR PLEASING FEEL; IN ANIMICS WHENEVER YOU ASK FOR A SMOOTH MOVEMENT THIS IS WHAT YOU WILL GET. FOR OTHER TYPES OF CUSHIONED MOVEMENT, SEE THE DETAILS ON **TAPER** AND **WANDER**.



A SMOOTH PAN - NOTICE HOW THE DRAWINGS ARE SPACED - CLOSE TOGETHER AT START AND END (SLOW MOVEMENT) - SPACING WIDEST IN THE MIDDLE (FASTEST MOVEMENT).



INFO FOR STEADY AND SMOOTH.

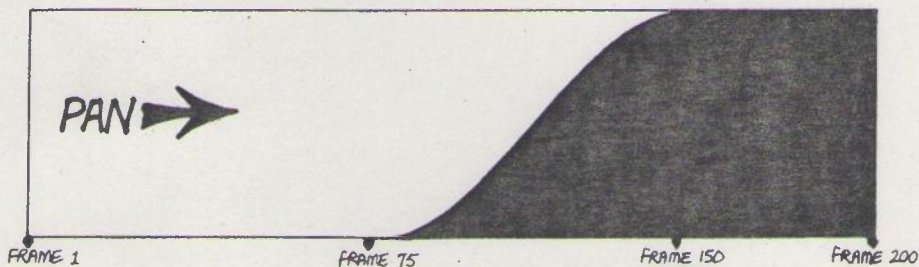
HERE'S THE QUESTIONS THE MACHINE ASKS FOR A STEADY OR SMOOTH MOVEMENT—

① START FRAME, END FRAME?...

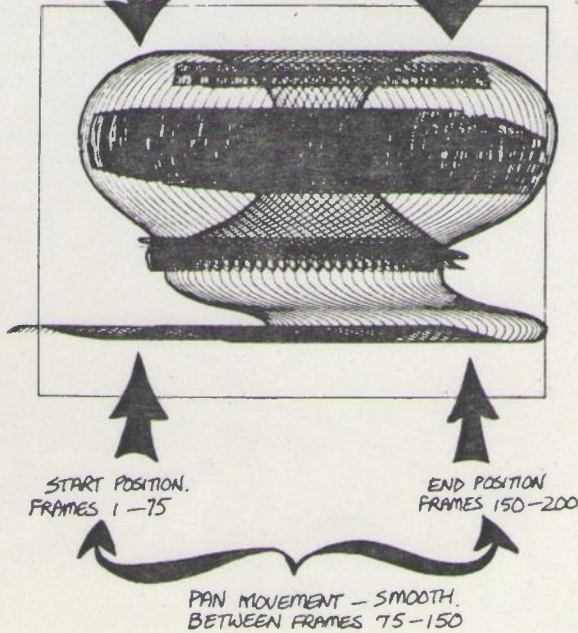
TYPE TWO NUMBERS, AS FOR FX, BUT THERE'S ONE BIG DIFFERENCE—

GENERAL RULE FOR ALL MOVEMENT CONTROLS

- ★ DRAWINGS AND CELS USE EFFECTS — EFFECTS USE MOVEMENT CONTROLS!
- ★ DIFFERENT DRAWING OR CEL FX CAN USE THE SAME CONTROL!
- ★ START AND END FRAME OF A CONTROL CAN BE QUITE DIFFERENT FROM THE EFFECT USING IT!
- ★ BEFORE THE START FRAME — YOU GET THE START POSITION!
- ★ AFTER THE END FRAME — YOU GET THE END POSITION!



RESULT



THAT IS FOR
START AND END
FRAME!!!.....
THE OTHER INFO
ANTICS ASK FOR
IN STEADY OR
SMOOTH.

② START FRAME.....WHAT POSITION?...

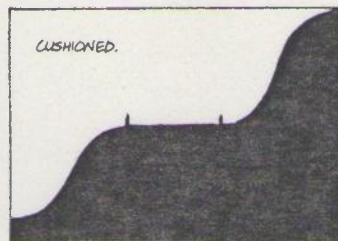
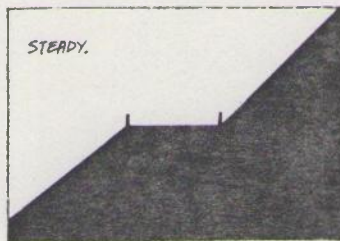
A MOVEMENT CONTROL CAN BE APPLIED TO PRACTICALLY ANY EFFECT..... PAN POSITION, ZOOM SIZE, SPIN ANGLE, FADE COLOUR, FOLLOW POINT NUMBER..... THE QUESTION YOU GET WILL ALWAYS ASK THE APPROPRIATE QUESTION — "WHAT ANGLE (DEGREES)?"... "WHAT SIZE (PERCENT)?"..... WHATEVER INFO IT IS, IT WILL TELL YOU WHAT IT WANTS TO KNOW.....

③ END FRAME..... WHAT POSITION (N/S)?...

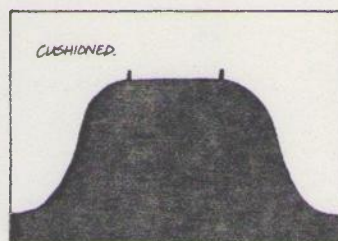
OR WHATEVER IT IS.....TYPE THE NUMBER, AND THAT'S IT FOR STEADY AND SMOOTH.....

DOUBLE.

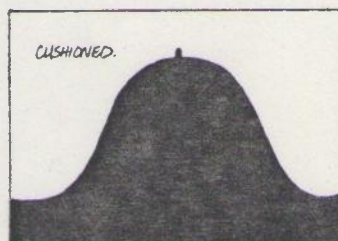
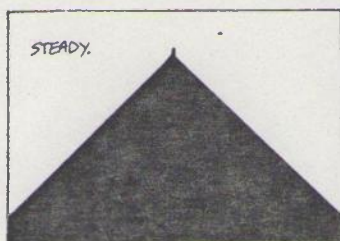
DOUBLE IS THE 2-STAGE VERSION OF STEADY AND SMOOTH — I'VE ALREADY GIVEN DETAILS OF THE CHANGE WITH MOVEMENT CONTROL..... SO HERE'S JUST A FEW EXAMPLES OF DIFFERENT VARIETIES OF A DOUBLE MOVEMENT —



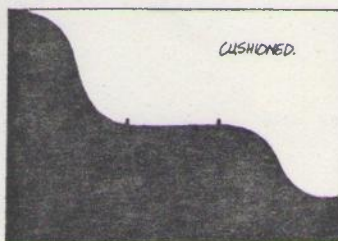
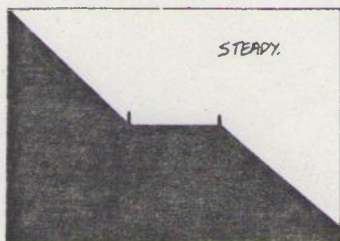
A, B, C.
GOING UP.



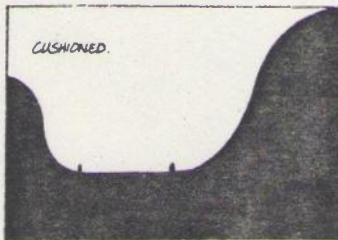
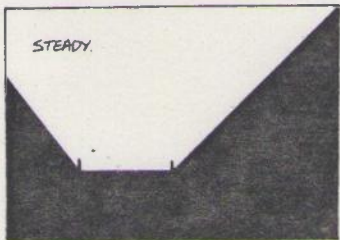
A TO B AND
BACK TO A.



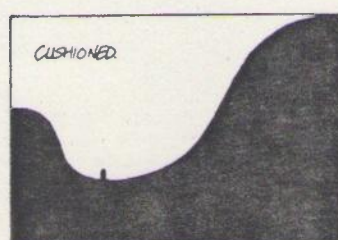
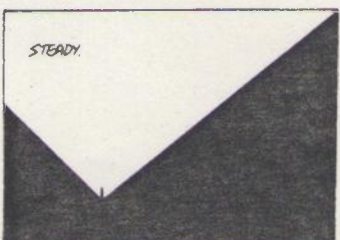
MIDDLE HOLD
A SINGLE FRAME.



A, B, C.
GOING DOWN.



A - DOWN TO B -
UP TO C.

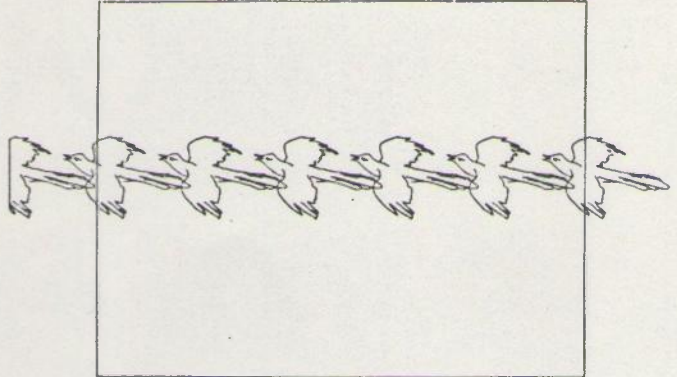
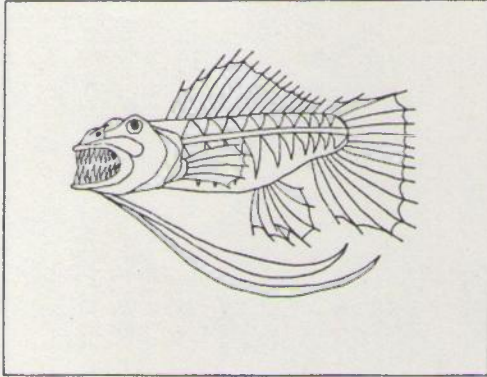


MIDDLE HOLD
A SINGLE FRAME.

GRAPHICS ANIMATION - BASIC FX.

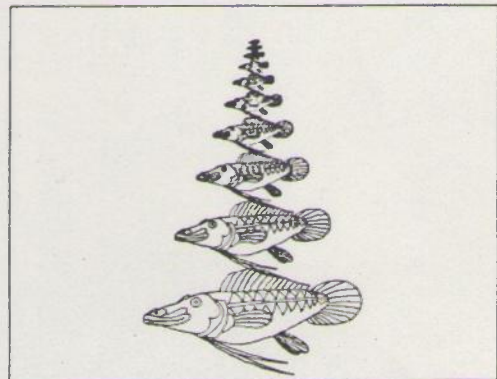
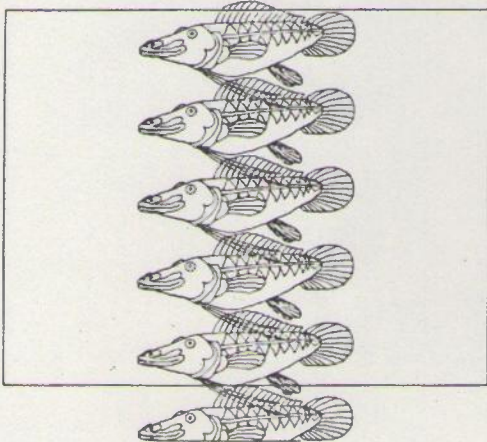
THESE EFFECTS (APART FROM CHANGE) ARE EXACTLY THE SAME AS ORDINARY CAMERA MOVEMENTS, BUT WITH ONE BIG PLUS - YOU CAN HAVE MANY DIFFERENT CELLS AND DRAWINGS DOING DIFFERENT MOVEMENTS ALL ON THE SCREEN TOGETHER. THESE ARE THE VOWELS OF THE

ALPHABET OF FX - WHATEVER YOU'RE DOING YOU NEARLY ALWAYS NEED A BIT OF HOLD, PAN OR ZOOM. GET TO KNOW THESE FX FIRST - ONCE YOU'VE MASTERED THEM THE REST IS EASY.....



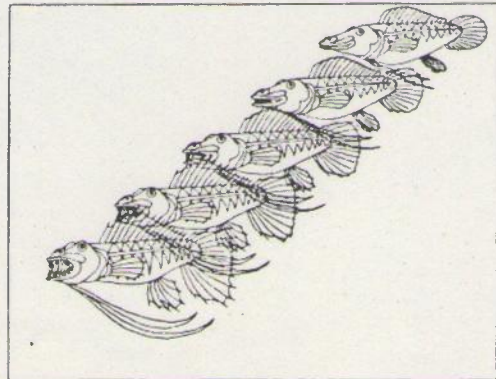
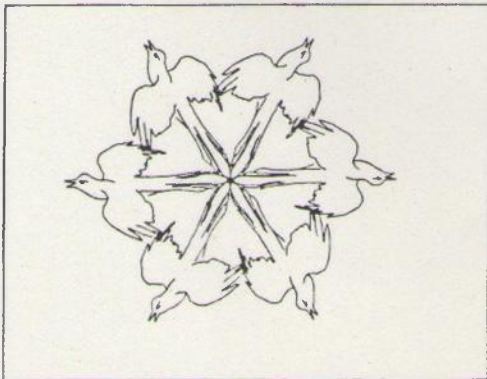
HOLD. MAKES A DRAWING APPEAR ON THE SCREEN WITHOUT ANY MOVEMENT.

PAN. SHIFTS A DRAWING SIDWAYS ACROSS THE SCREEN (E/W DIRECTION). CONTROLLED BY MEASURING THE DISTANCE YOU WANT IT TO SHIFT.



TILT. LIKE PAN, BUT VERTICAL (N/S DIRECTION).

ZOOM. CHANGES THE SIZE OF A DRAWING - CONTROLLED BY PERCENTAGE SIZE RELATIVE TO YOUR ORIGINAL DRAWING - CAN BE ENLARGED OR REDUCED.

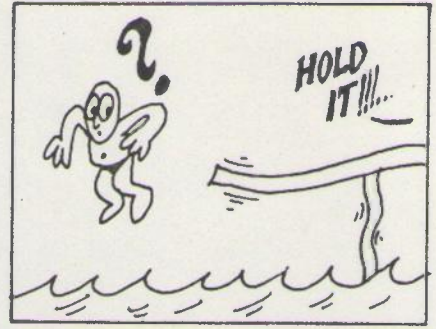


SPIN. TURNS A DRAWING AROUND - CONTROLLED BY ANGLE, MEASURED IN DEGREES.

CHANGE INBETWEENS FROM ONE DRAWING TO ANOTHER - EXACTLY THE SAME AS THE TRANSFORMATIONS IN KEY ANIMATION.

HOLD — FULL DETAILS.

HOLD IS MOSTLY USED WHEN YOU WANT A DRAWING TO SIMPLY APPEAR ON THE SCREEN WITHOUT ANY MOVEMENT — LIKE F'INSTANCE, A STATIC BACKGROUND. THERE'S ALSO A FEW OTHER USES, AS YOU'LL SEE.....



WHEN YOU ASK FOR A HOLD THESE ARE THE QUESTIONS THAT COME UP.....

① START FRAME AND END FRAME?

ALL FX AND CONTROLS BEGIN WITH THIS ONE. YOU'RE SUPPOSED TO TYPE BOTH NUMBERS ONE AFTER THE OTHER ON THE SAME LINE (SPACE IN BETWEEN OF COURSE) — BUT IF YOU ONLY TYPE THE START FRAME THE MACHINE WILL ASK FOR THE END FRAME. IF YOU WANT AN EFFECT APPLIED JUST TO ONE SINGLE FRAME, PUT START FRAME AND END FRAME THE SAME.

THE NORMAL DRAW RULE FOR FX.

- ★ THE EFFECT IS APPLIED EVERY FRAME FROM START FRAME TO END FRAME INCLUSIVE.
- ★ HOW IT'S APPLIED IS UP TO YOU..... EVEN IF NOTHING'S HAPPENING (LIKE A SPIN OF NOTHING DEGREES) THE IDIOT MACHINE STILL RELIGIOUSLY DOES IT.....
- ★ AS LONG AS THERE'S AT LEAST ONE EFFECT BEING APPLIED ON A PARTICULAR FRAME THE DRAWING WILL APPEAR..... ON FRAMES WHERE NO EFFECT IS BEING APPLIED, THE DRAWING DOES NOT APPEAR.
- ★ NO DRAWING FX = NO DRAWING.
- ★ DRAWING FX BUT NO CEL FX = WHOLE DRAWING APPEARS.
- ★ DRAWING FX AND CEL FX = ONLY CELS WITH FX HAPPENING WILL APPEAR.

THAT'S THE NORMAL RULE — THE IDEA OF IT IS THIS..... FOR SIMPLE ANIMATION, YOU CAN JUST USE DRAWING FX — NO CEL FX — AND YOU GET THE WHOLE DRAWING..... FOR MORE SOPHISTICATED STUFF WITH BITS CHANGING INTO OTHER BITS AND VARIOUS THINGS GOING ON, YOU CAN STICK ALL THE DIFFERENT BITS AND PIECES INTO A SINGLE DRAWING AND JUST ANIMATE THE BITS YOU WANT, WHEN YOU WANT THEM.

② NORMAL FRAME REPEATS/EXTRA.

YOU CAN CHANGE THE FRAME REPEATS ON PARTICULAR FRAMES BY TYPING A NUMBER HERE — F'INSTANCE, IF YOU WANT A HOLD OF 100 FRAMES ON FRAME 75, PUT IN A HOLD STARTING FRAME 75 EXTRA REPEATS 100, INSTEAD OF THE NORMAL REPEATS (2, SAY), YOU'LL GET 100 (98 EXTRA), YOU CAN PUT THIS IN ON ANY DRAWING OR CEL, THE RESULT IS THE SAME. FRAME 75 REPEAT 100 WILL DO FROM 76 TO 174 — ANIMATION STARTS AGAIN FROM 175.

③ NORMAL DRAW/DRAW ALL CELS/DRAW NOTHING.

NORMAL DRAW MEANS THAT THE NORMAL DRAWING RULE FOR FX APPLIES. DRAW ALL CELS MEANS THAT ALL CELS WILL APPEAR WHETHER THEY'VE GOT ANY FX OR NOT. DRAW NOTHING MEANS THAT THE DRAWING OR CEL WON'T APPEAR, EVEN IF IT HAS GOT OTHER FX GOING. THAT SOUNDS A BIT DAFT, BUT THE TIME YOU'D USE IT WOULD BE A SITUATION LIKE THIS —

SUPPOSE YOU'VE GOT DRAWING 1 DOING A CHANGE TO DRAWING 2.... DRAWING ONE DOES THE STUFF, SO YOU DON'T NEED DRAWING 2 ON THE SCREEN AS WELL. BUT IF YOU WANT DRAWING 2 TO BE ANIMATING WHILE THE CHANGE IS HAPPENING, THEN YOU'LL HAVE TO "BANISH" IT WITH A NO — DRAW HOLD....., OK? IF NOT NEVER MIND! TO BEGIN WITH YOU CAN JUST STICK WITH NORMAL DRAW!!....

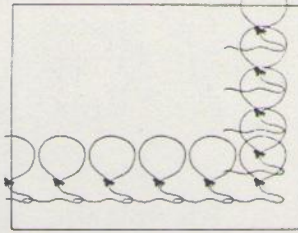
NORMAL DRAW
RULES O.K

PAN AND TILT - FULL DETAILS.

PAN IS USED TO SHIFT A DRAWING SIDELWAYS ACROSS THE SCREEN (E/W DIRECTION) - TILT IS USED TO SHIFT POSITION VERTICALLY (N/S DIRECTION). WHEN YOU ASK FOR PAN OR TILT, YOU GET THESE QUESTIONS.....

① START FRAME/END FRAME.

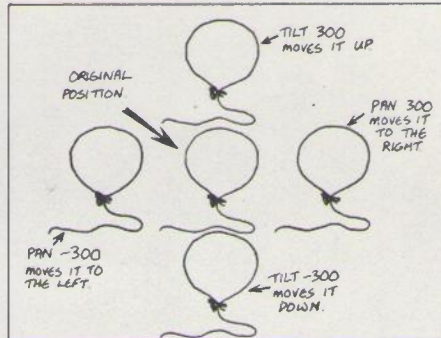
SAME AS ALWAYS.... (SEE 'HOLD' DETAILS).



② WHAT POSITION...?

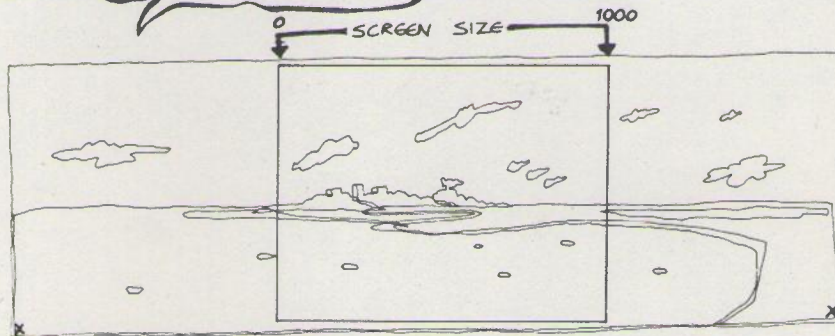
- STATIC..... TYPE A NUMBER.
- MOVING.... TYPE A NUMBER.

IF YOU TYPE A NUMBER HERE, YOU JUST GET A STATIC POSITION. THE NUMBER YOU TYPE DETERMINES HOW FAR THE DRAWING IS SHIFTED..... SO IF YOU TYPE ZERO, THERE'S NO SHIFT..... YOU GET THE SAME AS IF YOU'D JUST DONE A HOLD. IF YOU TYPE AN ORDINARY (POSITIVE) NUMBER, PAN WILL SHIFT THE DRAWING TO THE RIGHT, TILT WILL SHIFT IT UPWARDS. IF YOU TYPE A MINUS NUMBER (NEGATIVE NUMBER) PAN SHIFTS IT TO THE LEFT, TILT SHIFTS IT DOWN.



TO GET A MOVEMENT, YOU MUST HIT RETURN TO USE A MOVEMENT CONTROL - INSTEAD OF TYPING A STATIC POSITION, YOU NOW TYPE THE NAME OF THE CONTROL EFFECT YOU WANT - WHAT HAPPENS THEN DEPENDS UPON WHICH CONTROL YOU ASKED FOR..... EACH CONTROL ASKS FOR THE INFO IT NEEDS - TURN TO THE APPROPRIATE PAGE TO FIND OUT THE DETAILS.

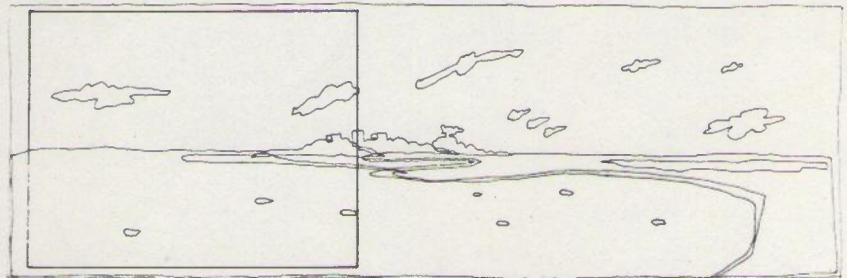
EXAMPLE..... - HERES A PAN BACKGROUND IN ITS ORIGINAL DRAWN POSITION. FIRST MEASURE ITS SIZE.



THIS END IS AT -750

THIS END IS AT 1750

START OF PAN....
WITH IT SHIFTED 750 [TO THE RIGHT]



END OF PAN....
WITH IT SHIFTED -750 [TO THE LEFT]

SO A STEADY PAN WOULD BE A STEADY MOVEMENT STARTING POSITION 750
END POSITION -750
THATS IT !!!

ZOOM - FULL DETAILS.

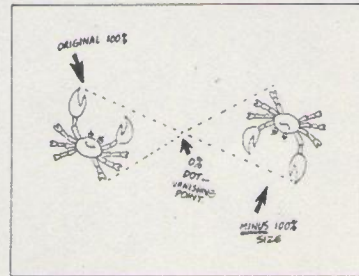
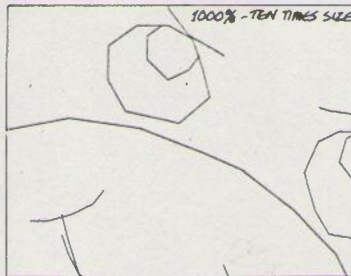
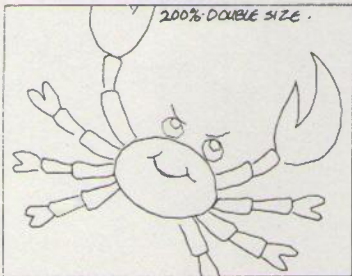
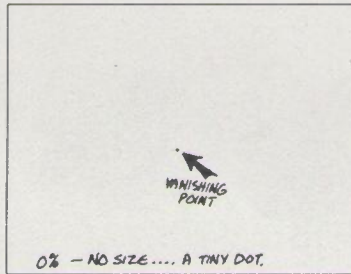
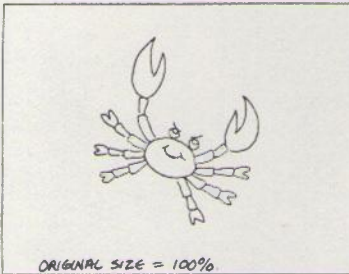
ZOOM IS USED TO VARY THE SIZE OF A DRAWING OR CEL - HERE'S THE QUESTIONS YOU GET....

① START FRAME, END FRAME.

SAME AS ALWAYS.....SEE 'HOLD' DETAILS.

② SIZE?.....STATIC/MOVING.

TYPE A NUMBER OR USE A MOVEMENT CONTROL. SIZE IS GIVEN AS A PERCENTAGE OF THE ORIGINAL SIZE.....

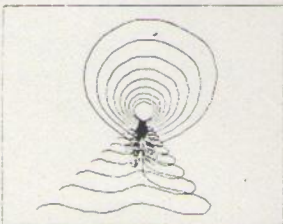


③ VANISHING POINT?...STATIC/MOVING.

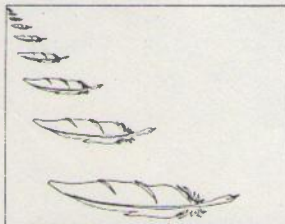
THE VANISHING POINT OF THE ZOOM IS THE POINT THE PICTURE ZOOMS IN AND OUT OF. WHEN THE ZOOM SIZE IS 100% YOU GET THE ORIGINAL DRAWING AT ITS ORIGINAL SIZE AND IN ITS ORIGINAL POSITION. WHEN ITS 0% SIZE ITS DOWN TO A TINY DOT, AND THIS WILL BE POSITIONED AT THE VANISHING POINT. OTHER SIZES FOLLOW THE SAME LINE.....

THE VANISHING POINT CAN BE STATIC OR MOVING.....FOR A STATIC ONE GIVE THE POSITION E/W AND THE POSITION N/S.....FOR A MOVING ONE, YOU CAN USE A CONTROL FOR EITHER N/S OR E/W.....OR FOR BOTH.

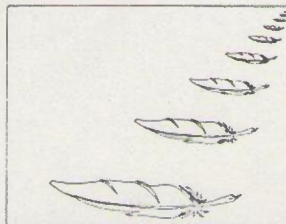
HERE'S A WEIRD ONE..... THE SIZE CAN BE A MINUS NUMBER!!! WHAT HAPPENS IS, IF YOU GO BELOW ZERO SIZE, THE PICTURE STARTS GROWING AGAIN ~ UPSIDE DOWN.



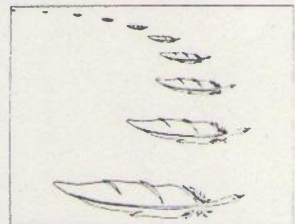
STATIC VANISHING POINT IN THE CENTRE OF THE SCREEN E/W-500 N/S-400



STATIC VANISHING POINT TOP LEFT CORNER E/W-0 N/S-800

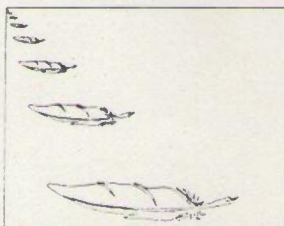


STATIC VANISHING POINT TOP RIGHT CORNER E/W-1000 N/S-800

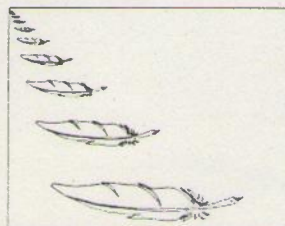


VANISHING POINT MOVING ALONG TOP OF SCREEN E/W-STEADY MOVEMENT FROM 0 TO 1000 N/S-800.

A HANDY TIP.....



ZOOM 0% TO 100%



ZOOM 2% TO 100%

SAME NUMBER OF FEATHERS.....DIFFERENT SPACING!!

NOTICE HOW THE ZOOM FRAMES ARE SPACED - THE PROPORTIONS (OR RATIO) BETWEEN ONE DRAWING AND THE NEXT ARE EVEN. TECHNICALLY THIS IS CALLED A LOGARITHMIC ZOOM. MD HOWEVER IF YOU START FROM ZERO SIZE, IT WILL BE RATHER MANY FRAMES BEFORE THE DRAWING GETS BIG..... STARTING FROM 1% OR 2% MAKES A BIG DIFFERENCE!..

SPIN - FULL DETAILS.

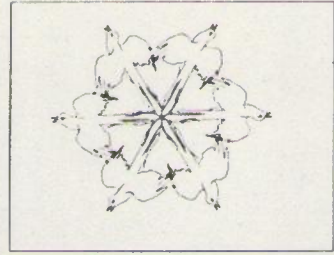
SPIN IS USED TO TURN A DRAWING ROUND - OR SIMPLY TO CHANGE ITS ANGLE ON THE SCREEN. HERE'S THE QUESTIONS.....

① START FRAME, END FRAME?

SAME PROCEDURE AS BEFORE.....

② ANGLE? STATIC/MOVING.

TYPE A NUMBER OR USE A MOVEMENT CONTROL. ANGLES ARE MEASURED IN DEGREES..... 360° IS A FULL TURN, SO 360° IS THE SAME AS 0°.....



0° SPIN = ORIGINAL DRAWING

90° = QUARTER TURN

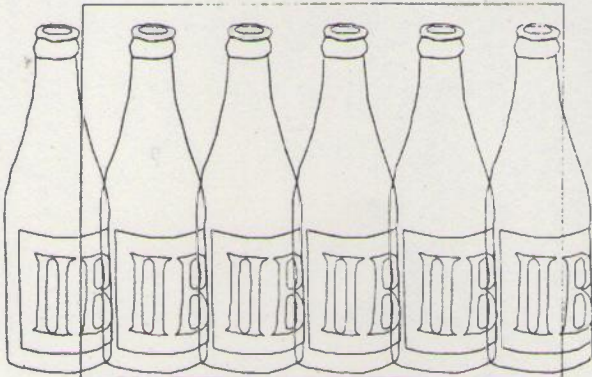
180° = HALF TURN

270° = 3/4 TURN

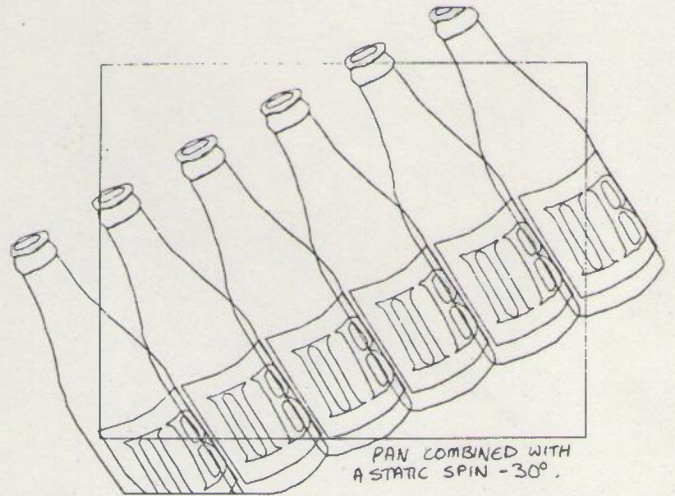
360° FULL TURN.

IF YOU TYPE A SINGLE STATIC NUMBER, THE TURN IS MADE ANTI-CLOCKWISE, TO TURN IT THE OTHER WAY YOU CAN EITHER TYPE A MINUS NUMBER, OR SUBTRACT THE ANGLE FROM 360°.....
 FOR INSTANCE, TYPING -20° WILL SHIFT IT 20° CLOCKWISE, AND SO WILL IT BE IF YOU TYPE 340°. STATIC SPINS ARE PARTICULARLY USEFUL IN COMBINATION WITH OTHER EFFECTS..... LIKE PAN OR TILT. THESE EFFECTS ONLY WORK EITHER HORIZONTALLY OR VERTICALLY..... SO IF YOU WANT SOMETHING PANNING ACROSS THE SCREEN AT AN ANGLE, YOU FIRST GIVE IT A HORIZONTAL PAN, AND THEN COMBINE IT WITH A STATIC SPIN.....

WHEN YOU USE A MOVING SPIN THIS IS THE RULE...
 *IF THE ANGLE GOES UP THE SPIN IS ANTI-CLOCKWISE.
 *IF THE ANGLE GOES DOWN THE SPIN IS CLOCKWISE.



PAN.

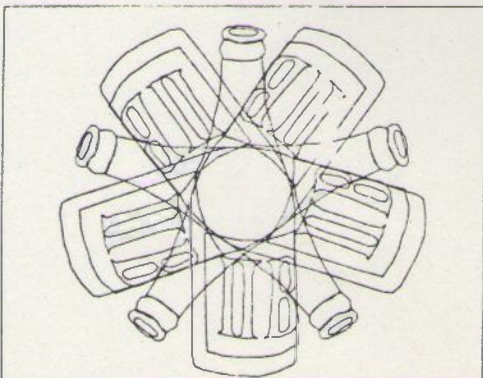


PAN COMBINED WITH A STATIC SPIN - 30°.

③ CENTRE POINT?... STATIC/MOVING.

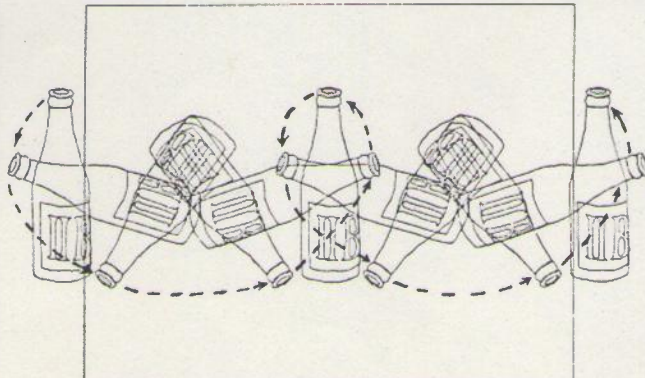
THE CENTRE POINT IS THE POINT THE SPIN SPINS AROUND..... LIKE THE VANISHING POINT OF A ZOOM, IT CAN BE STATIC OR MOVING..... TYPE THE POSITION (X AND Y) FOR A STATIC CENTRE POINT, OR USE A CONTROL FOR EITHER OR BOTH WHEN YOU WANT A MOVING CENTRE POINT.....

EXAMPLES.....



STEADY SPIN 0° TO 360° = 1 TURN ANTI-CLOCKWISE

STEADY SPIN 360° TO 0° = 1 TURN CLOCKWISE.



STEADY SPIN 0 TO 720 (2 TURNS ANTI-CLOCKWISE) COMBINED WITH PAN.

*SEE "COMBINING EFFECTS" FOR NOTES ON HOW TO COMBINE EFFECTS TOGETHER.



DEGREES	TURNS
90	1/4
180	1/2
270	3/4
360	1
540	1 1/2
720	2
900	2 1/2
1080	3
1260	3 1/2
1440	4
1620	4 1/2
1800	5
1980	5 1/2
2160	6
2340	6 1/2
2520	7
2700	7 1/2
2880	8
3060	8 1/2
3240	9
3420	9 1/2
3600	10
7200	20
10,800	30

CHANGE - FROM ONE DRAWING TO ANOTHER.

CHANGE DOES KEY INBETWEENING, SAME AS YOU GET WITH THE KEY-ANIMATION PROGRAM - EXCEPT CHANGE IS MUCH MORE FLEXIBLE..... IT CAN BE USED IN LOTS OF DIFFERENT WAYS. THE MOST BASIC USE IS A STRAIGHT CHANGE FROM ONE DRAWING TO ANOTHER.

HERE'S THE DETAILS FOR THAT.....

① START FRAME, END FRAME?

SAME AS EVER.....

② CHANGE TO..... WHICH DRAWING?

TYPE THE DRAWING NUMBER!!!.....
ALTERNATIVELY TO MAKE A WHOLE SEQUENCE OF CHANGES BETWEEN LOTS OF DRAWINGS, USE THE CONTROL 'PHASES' FOR DETAILS SEE PAGE 'CHANGE - WITH PHASES'

③ MOVEMENT - STEADY OR CUSHIONED?

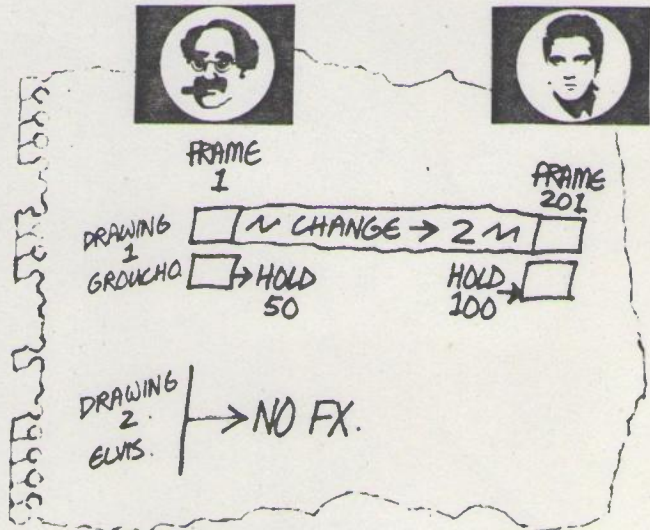
AS USUAL, STEADY MEANS A MOVEMENT THAT GOES AT A COMPLETELY STEADY PACE ALL THE WAY THROUGH - CUSHIONED MEANS IT STARTS AND ENDS GENTLY. IF YOU ASK FOR EITHER OF THESE, WHAT YOU GET IS THIS -

START FRAME = ORIGINAL DRAWING

END FRAME = OTHER DRAWING

..... ANIMATION ON ALL FRAMES INBETWEEN.

ALTERNATIVELY YOU CAN USE A MOVEMENT CONTROL TO MAKE THE CHANGE GO BACK AND FORTH IN ANY WAY YOU LIKE - DETAILS NEXT PAGE.....



ANIMATION CHART-

FOR A CHANGE FROM DRAWING ① TO DRAWING ② OVER 200 FRAMES..... TO GET A HOLD AT START AND END, TWO HOLD FX HAVE BEEN MARKED - 50 REPEATS ON THE FIRST FRAME, 100 ON THE LAST.....
DRAWING ② NEEDS NO FX.

NOTES.....

★ ONE BIG DIFFERENCE BETWEEN THE KEY PROGRAM AND THE GRAPHICS - IN THE KEY PROGRAM, THE KEY DRAWINGS CAN HAVE DIFFERENT NUMBERS OF CELLS - IN THE GRAPHICS KEY DRAWINGS MUST HAVE THE SAME NUMBER OF CELLS OTHERWISE IT'LL COME OUT A MESS !!!..... CELLS CAN HAVE DIFFERENT NUMBERS OF LINES AND POINTS OK - IT'S JUST THE NUMBER OF CELLS MUST BE THE SAME WHEN YOU DO A CHANGE FROM ONE DRAWING TO ANOTHER..... SO REMEMBER. TO PUT DUMMY CELLS IN IF YOU NEED THEM.....

★ NOTICE IN THE EXAMPLE - DRAWING 2 HAS NO FX; IT NEVER APPEARS!!! CHANGE WORKS ON DRAWING 1 - IT CHANGES THE POINTS AND COLOURS IN DRAWING 1 UNTIL THEY'RE EXACTLY THE SAME AS DRAWING 2, YET IT'S STILL DRAWING 1

CHANGE WITH MOVEMENT CONTROL

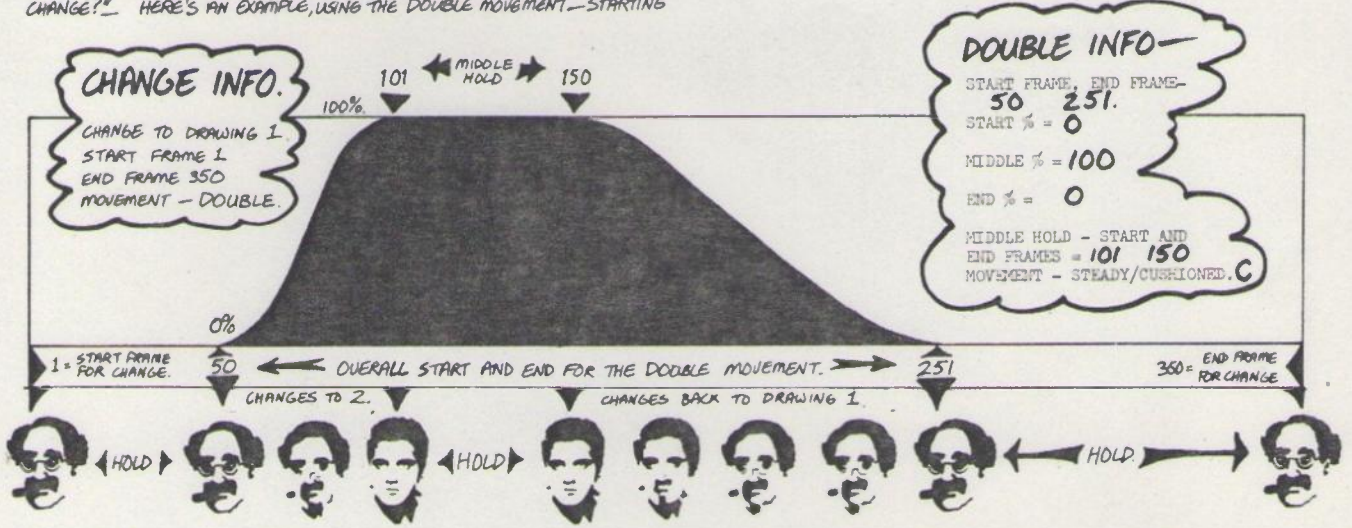
CHANGE IS ONE OF THE FEW FX THAT PRODUCES A MOVEMENT WITHOUT A MOVEMENT CONTROL — A STRAIGHT CHANGE FROM ONE DRAWING TO ANOTHER THEN SIMPLY BEGINS WITH THE ORIGINAL DRAWING ON THE START FRAME, AND ENDS UP AS THE OTHER DRAWING ON THE END FRAME. ALTERNATIVELY, YOU CAN CONTROL THE WAY THE INBETWEENING GOES BY USING ONE OF THE MOVEMENT

CONTROLS — THE CHANGE CAN GO BACK AND FORTH ANY WAY YOU LIKE BETWEEN THE START AND END FRAMES. THE INFO THE MACHINE ASKS FOR IS THE SAME AS ON THE PREVIOUS PAGE EXCEPT INSTEAD OF CHOOSING STEADY OR CUSHIONED ON THE THIRD QUESTION YOU GET —

③ MOVEMENT — HIT RETURN TO USE A CONTROL.

TYPE THE NAME OF THE MOVEMENT YOU WANT, AND YOU THEN GET THE QUESTIONS APPROPRIATE TO IT. THE INBETWEENING IS CONTROLLED BY PERCENT — 0% = ORIGINAL PICTURE — 100% = FULL CHANGE TO THE OTHER PICTURE — 50% = HALFWAY CHANGE ETC, ETC; THE MACHINE WILL ASK FOR A PERCENTAGE CHANGE? — HERE'S AN EXAMPLE, USING THE DOUBLE MOVEMENT — STARTING

WITH A HOLD ON DRAWING 1 FOR 50 FRAMES (0% CHANGE), CHANGING TO DRAWING 2 AT FRAME 101, AND HOLDING THAT FOR 50 FRAMES (100% CHANGE), THEN BACK TO THE ORIGINAL AT FRAME 251 AND HOLDING THAT FOR 100 FRAMES. THAT'S A DOUBLE MOVEMENT THAT GOES CUSHIONED LIKE THIS —



DOUBLE INFO
 START FRAME, END FRAME — 50 251.
 START % = 0
 MIDDLE % = 100
 END % = 0
 MIDDLE HOLD — START AND END FRAMES = 101 150
 MOVEMENT — STEADY/CUSHIONED. C

* NOTE — START AND END FRAME OF THE DOUBLE MOVEMENT IS DIFFERENT FROM START AND END FOR THE CHANGE EFFECT — ALL THE CONTROLS WORK THIS WAY — A CONTROL GIVES ITS STARTING POSITION IF YOU USE IT BEFORE ITS START FRAME

— IF YOU USE IT AFTER ITS END FRAME YOU ALWAYS GET THE END POSITION. THAT MEANS YOU CAN GET START AND END HOLDS ON AN EFFECT WITHOUT USING THE HOLD EFFECT AS WELL.

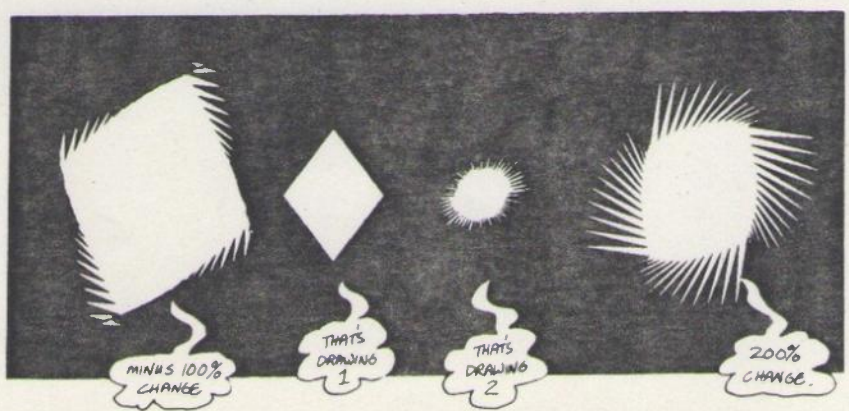
* A SINGLE CHANGE WITH DOUBLE IS DOING THE SAME AS 3 HOLDS AND 2 STRAIGHT CHANGES.

* HERE'S A WERDIE!!!!...

LIKE THE ZOOM SIZE THAT CAN GO MINUS, THE CHANGE PERCENT CAN GO OVER 100, OR LESS THAN ZERO, IN FACT IF YOU HAVE A DRAWING WHICH IS JUST A SINGLE DOT, A CHANGE TO ANOTHER DRAWING WILL BE EXACTLY THE SAME AS A ZOOM! WHAT HAPPENS IS THAT EACH POINT OF THE DRAWING MOVES TO THE CORRESPONDING POINT IN THE OTHER DRAWING — IF THE CHANGE CARRIES ON OVER 100% THE POINTS SIMPLY KEEP ON GOING!! — IF THE CHANGE % GOES MINUS THE POINTS MOVE OFF IN THE OPPOSITE DIRECTION — THE RESULT MAY BE ANYTHING — PROBABLY A COMPLETE MESS, BUT TRY IT AND SEE!! — IT COULD BE USEFUL FOR SOMETHING*?!.....



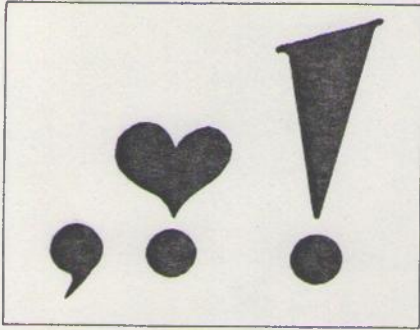
WITH MOST ORDINARY DRAWINGS YOU'LL PROBABLY GET A RIGHT FUNNY MESS — WITH SIMPLE SHAPES THOUGH YOU CAN GET SOME NICE SURPRISES!...



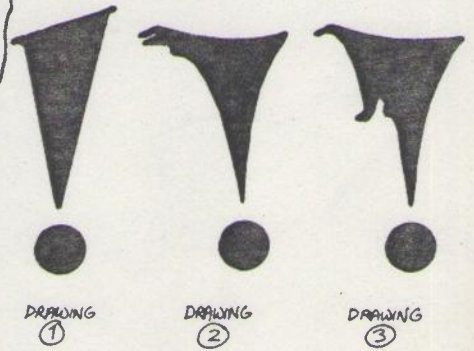
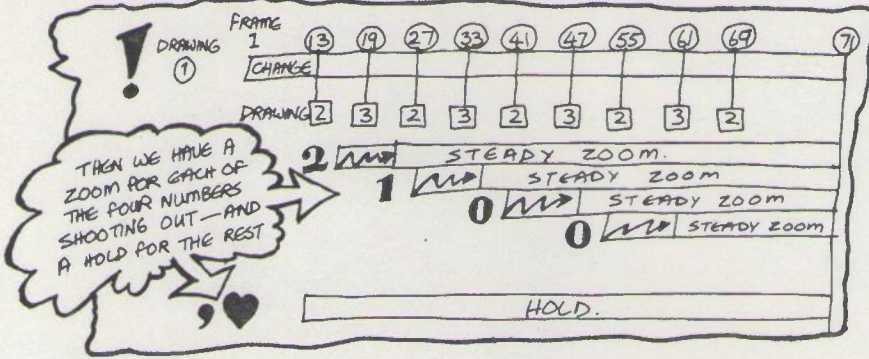
CHANGE WITH PHASES.

SO FAR I HAVE DESCRIBED A STRAIGHT CHANGE FROM ONE DRAWING TO ONE OTHER — BOTH WITH AND WITHOUT MOVEMENT CONTROL FOR THE INBETWEENING. IF YOU HAVE A WHOLE SERIES OF KEY DRAWINGS IN

SEQUENCE YOU COULD DO IT BY DESCRIBING EACH CHANGE SEPARATELY — BUT THERE'S A MUCH QUICKER WAY — USING "PHASES" TO GIVE A LIST OF KEY FRAME NUMBERS.



FOR INSTANCE HERE'S A SCENE WHERE THE CHARACTER ON THE RIGHT IS BARKING OUT THE NUMBERS 21 00 ONE BY ONE..... THAT'S 3 KEY DRAWINGS FOR THIS MOVEMENT, AND THE CHART GOES LIKE THIS



TO MAKE THE CHANGES GO LIKE THAT, ANSWER THE QUESTIONS LIKE THIS —

① START FRAME, END FRAME?

SAME AS EVER —

② CHANGE TO... WHICH DRAWING? — OR HIT RETURN TO USE PHASES.

HIT THE RETURN KEY AND YOU GET THIS —

③ TYPE FRAME NUMBER... — OR HIT RETURN TO FINISH...

TYPE THE FIRST KEY — FRAME NUMBER.

④ CHANGE TO... WHICH DRAWING?

TYPE THE DRAWING NUMBER.

THESE TWO QUESTIONS KEEP REPEATING — TYPE IN THE WHOLE LIST OF FRAME NUMBERS AND CORRESPONDING DRAWINGS — WHEN YOU'VE FINISHED THE LIST, HIT RETURN INSTEAD OF GIVING A NEW FRAME NUMBER. FINALLY, HOW DOES THE MOVEMENT GO ON THE CHANGES —

⑤ MOVEMENT.

1 - STEADY

2 - CUSHIONED

3 - JUMP CUT

4 - SELECT EXTREMES

— 1, 2, 3 OR 4?

THIS GIVES NO ANIMATION — JUST STATIC HOLDS ON EACH DRAWING, WITH A CUT TO THE NEXT DRAWING AT THE NEXT KEY-FRAME

FOR WHEN YOU WANT A MIXTURE OF SOME CHANGES CUSHIONED, SOME NOT. SEE NEXT PAGE —

HERE'S THE LIST —

FRAME 1	DRAWING 1
FRAME 13	DRAWING 2
FRAME 19	DRAWING 3
FRAME 27	DRAWING 2
FRAME 33	DRAWING 3
FRAME 41	DRAWING 2
FRAME 47	DRAWING 3
FRAME 55	DRAWING 2
FRAME 61	DRAWING 3
FRAME 69	DRAWING 2
FRAME 71	DRAWING 1

NOTES.


★ EVEN QUICKER — USE CYCLE FOR THE REPEATING SECTION — SEE PAGE CYCLE FULL DETAILS.

★ IF YOU HAVE THE SAME DRAWING ON TWO CONSECUTIVE KEY-FRAMES — YOU JUST GET A HOLD ON THAT DRAWING.

EG. FRAME 101 DRAWING 3
FRAME 150 DRAWING 3
GIVES A HOLD ON DRAWING 3, FRAMES 101 TO 150.




CHANGE WITH PHASES - AND - EXTREMES.

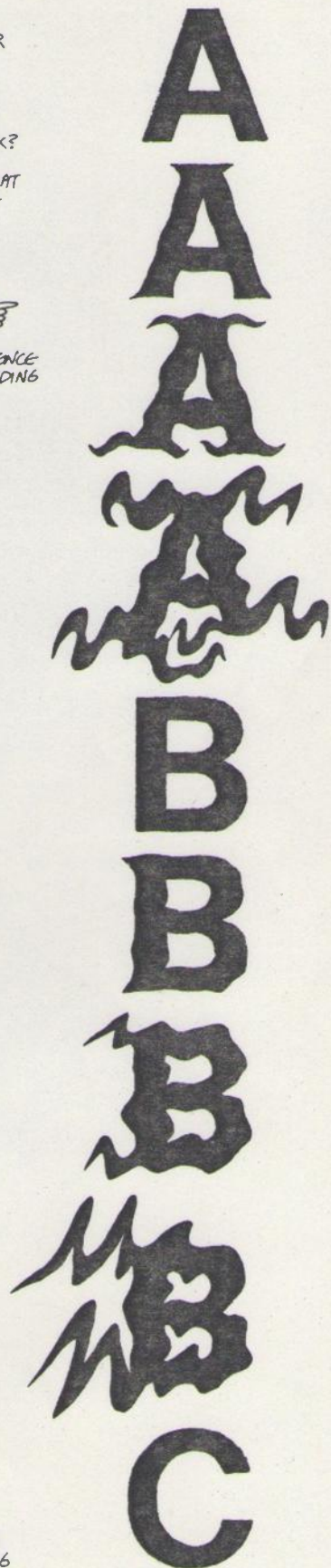
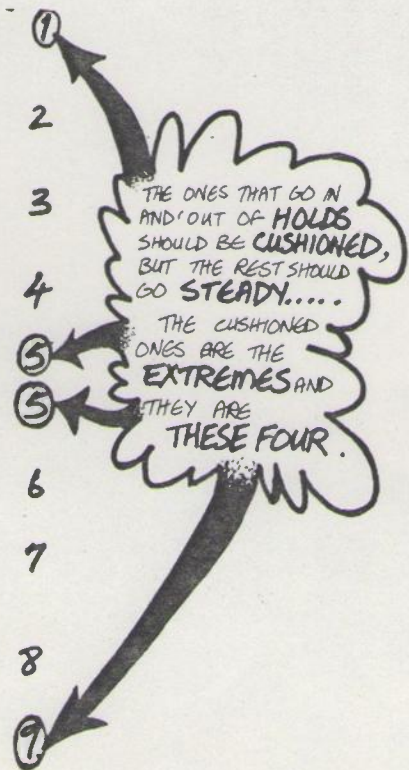
"EXTREMES" IS AN ANIMATION TERM - IN ANIMATION YOU CAN HAVE KEY-DRAWINGS OR KEY-POSITIONS - YOU CAN ALSO HAVE EXTREME POSITIONS AND DRAWINGS - AN EXTREME IS SIMPLY THE START AND END POSITION OF A SERIES OF KEYS, OR ANY PARTICULARLY IMPORTANT OR CRITICAL POSITION - USUALLY A POSE THAT HAS A HOLD - SO - AN EXTREME IS ALWAYS A KEY - BUT A KEY ISN'T NECESSARILY AN EXTREME, BECAUSE YOU COULD HAVE SEVERAL KEYS BETWEEN TWO EXTREMES OK? IT'S NOT SPLITTING HAIRS, BECAUSE IT MAKES A DIFFERENCE TO HOW THE ANIMATION SHOULD GO - IF IT'S AN EXTREME IT WILL NEED TO BE CUSHIONED IN AND OUT OF THAT POSITION - IF IT'S AN ORDINARY KEY, THE ANIMATION SHOULD GO STEADY STRAIGHT THROUGH IT.

EXAMPLE - FOUR LETTER A's, FOUR LETTER B's, AND A C 

START WITH A HOLD ON THE FIRST A - CHANGE STEADILY THROUGH THE SEQUENCE OF A'S, ENDING ON THE FIRST B WITH A HOLD - STEADILY THROUGH THE B'S ENDING WITH C AND A HOLD - USING CHANGE WITH PHASES.

THE FRAME NUMBERS CAN GO LIKE THIS: -

	FRAME	DRAWING
START HOLD. A →	37	①
A	57	2
A	77	3
	97	4
HOLD ON B {	117	⑤
	167	⑤
B	187	6
	207	7
	227	8
HOLD ON C →	247.	⑨



THESE FOUR ARE THE EXTREMES - FRAMES 37, 117, 167, 247.....
 SO WHEN YOU DO CHANGE WITH PHASES, AND ALSO SELECT EXTREMES.....
 YOU GET THE LIST OF PHASES, PLUS THE QUESTION -

EXTREME...? TYPE FRAME NO..... OR HIT RETURN.

ANY KEY FRAME NUMBER YOU TYPE WILL NOW BE AN EXTREME, SO YOU WILL GET A CUSHIONED MOVEMENT IN AND OUT OF IT. THE ONES YOU DON'T TYPE WILL REMAIN ORDINARY KEYS, AND THE ANIMATION WILL GO STEADY. THE QUESTION REPEATS ITSELF, SO YOU CAN TYPE AS MANY EXTREMES AS YOU WANT - YOU FINISH BY HITTING THE RETURN KEY WITHOUT TYPING A FRAME NUMBER.

CHANGE AS A CEL EFFECT.

WHEN YOU USE CHANGE TO ANIMATE AN INDIVIDUAL CEL, IT WORKS EXACTLY THE SAME AS CHANGE USED TO ANIMATE A WHOLE DRAWING, EXCEPT FOR A COUPLA POINTS.... INSTEAD OF ASKING YOU "CHANGE TO WHICH DRAWING" ANIUS ASKS —

CHANGE TO WHICH CEL (R-E-L-A-T-I-V-E)?

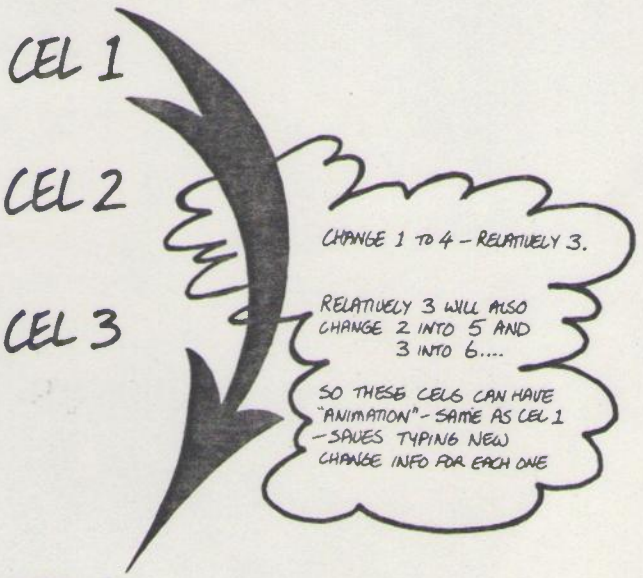
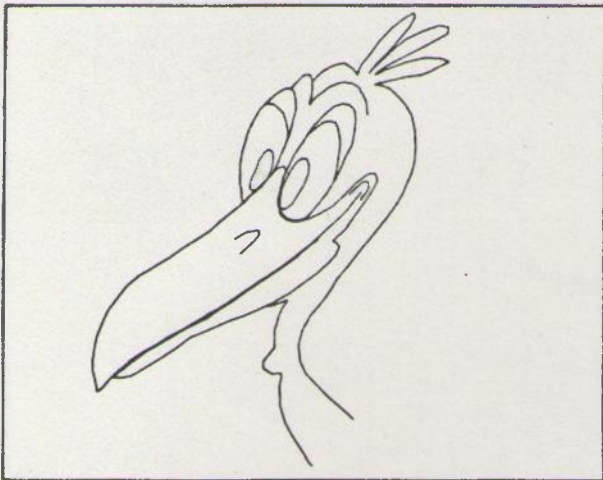
★ IT'S NOT THE ACTUAL CEL NUMBER....

★ IT'S HOW MANY CELS BETWEEN THIS ONE AND THAT....

F'RINSTANCE — A CHANGE FROM CEL 1 TO CEL 4....
RELATIVELY THATS THREE CELS ON....

— NO CHANGE AT ALL — RELATIVELY THATS ZERO....

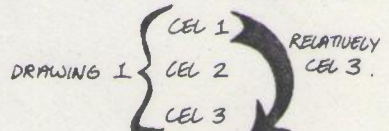
— CHANGE CEL 2 INTO CEL 1 — RELATIVELY THATS MINUS 1....



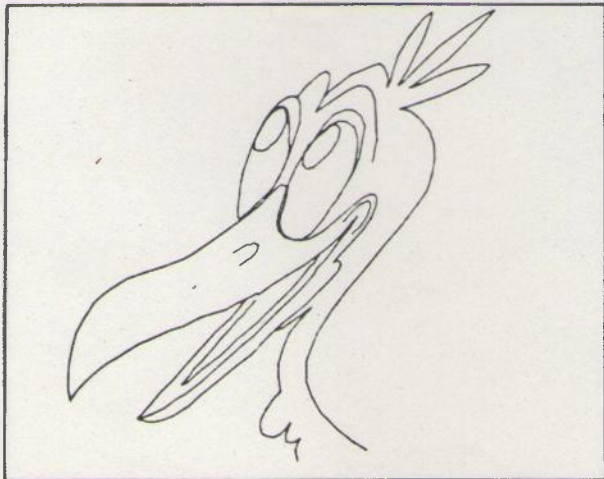
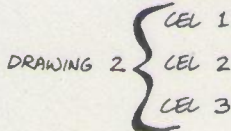
CEL 4

★ RELATIVE CELS ALSO WORK FROM DRAWING TO DRAWING...F'RINSTANCE

CEL 5



CEL 6



★ ONE OTHER THING WITH CHANGE AS A CEL EFFECT — THE QUESTION —

NORMAL CHANGE...OR 3D SPECIAL?

3D SPECIAL IS FOR 3-D PICTURE MAKING WITH PLAN AND ELEVATION DRAWINGS — DESCRIBED IN THE PAGES ON 3-D ANIMATION — NORMALLY ITS NORMAL!!...



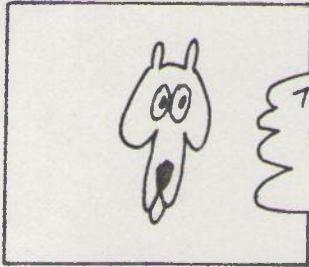
COMBINING EFFECTS

THE WAY THIS WORKS IS LIKE THIS —

- ★ EFFECTS ARE DONE ONE BY ONE, IN THE ORDER YOU WROTE 'EM.
- ★ THE FIRST EFFECT (FOR ANY DRAWING OR CEL) WORKS ON THE ORIGINAL DRAWING STORED.
- ★ THE NEXT EFFECTS WORK ON THE RESULT OF THE PREVIOUS ANIMATION EFFECT.
- ★ CEL FX-IF ANY-ARE ALL DONE FIRST.
- ★ FX FOR THE WHOLE DRAWING ARE DONE LAST.

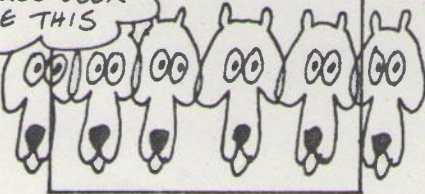
THIS MEANS THE ORDER YOU WRITE FX MAKES A BIG DIFFERENCE

EXAMPLE



THIS IS THE ORIGINAL DRAWING

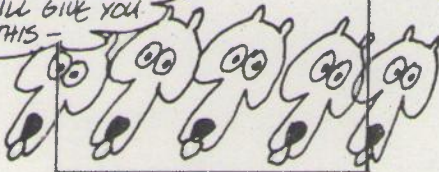
A STEADY PAN ON ITS OWN WOULD LOOK LIKE THIS



A STATIC PAN OF -30° ON ITS OWN WOULD LOOK LIKE THIS



SPIN FIRST PAN SECOND WILL GIVE YOU THIS —



BECAUSE THE PAN IS APPLIED TO THE RESULT OF THE SPIN —

PAN FIRST SPIN SECOND WILL GIVE YOU THIS —



BECAUSE THE SPIN IS APPLIED TO THE RESULT OF THE PAN —

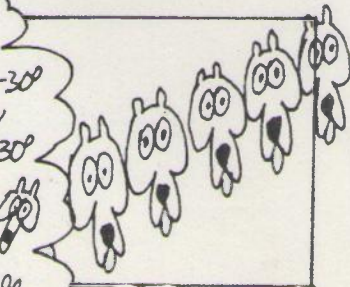
— AND IF YOU HAD —

- ① SPIN STATIC -30°
- ② PAN STEADY
- ③ SPIN STATIC 30°

THE FIRST SPIN TURNS IT SO —

THE PAN DOES SO

THE LAST SPIN DOES SO

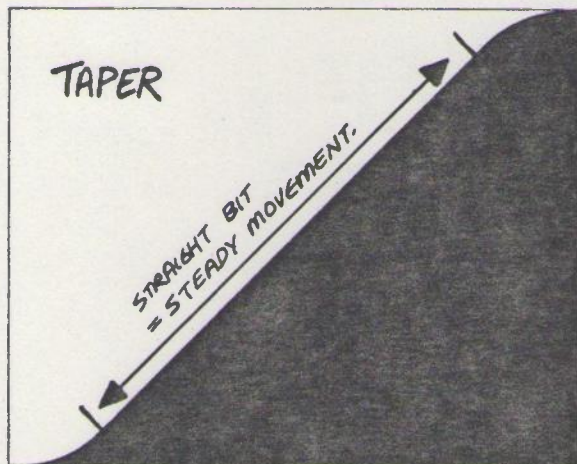


★ THIS COMPLETES ALL THE INFO ABOUT USING THE FX HOLD, PAN, TILT, SPIN, ZOOM AND CHANGE, PLUS THE MOVEMENTS STEADY, SMOOTH AND DOUBLE.

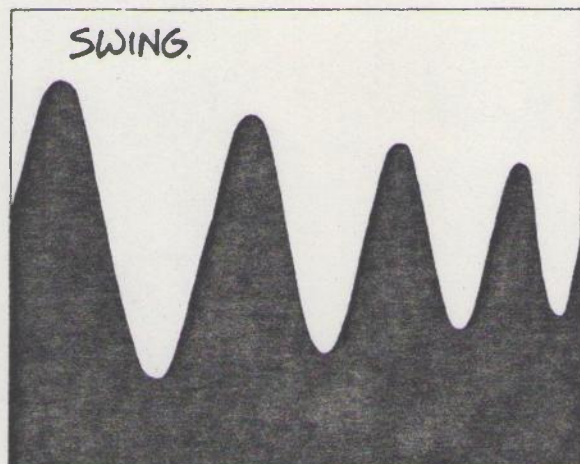
★ IF YOU'RE A BEGINNER — DON'T BE TOO AMBITIOUS!! — GET FAMILIAR WITH HANDLING THESE FIRST — ONCE YOU'VE GOT THEM TAPED, YOU'RE READY TO GO ON TO THE REST.

MOVEMENT CONTROLS - THE REST.

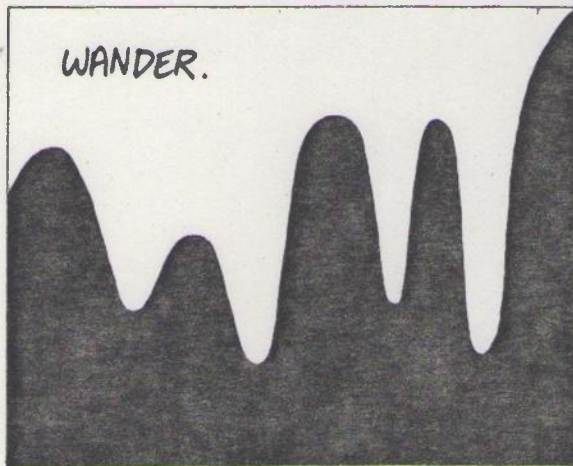
THERE'S TEN ALTOGETHER - I'VE ALREADY DESCRIBED 3 - STEADY, SMOOTH AND DOUBLE. - HERE'S THE OTHER SEVEN - LIKE THE OTHERS THEY CAN BE APPLIED TO ALMOST ANYTHING - PAN POSITION, ZOOM SIZE, SPIN ANGLE, CHANGE IN BETWEENING..... ETC, ETC.



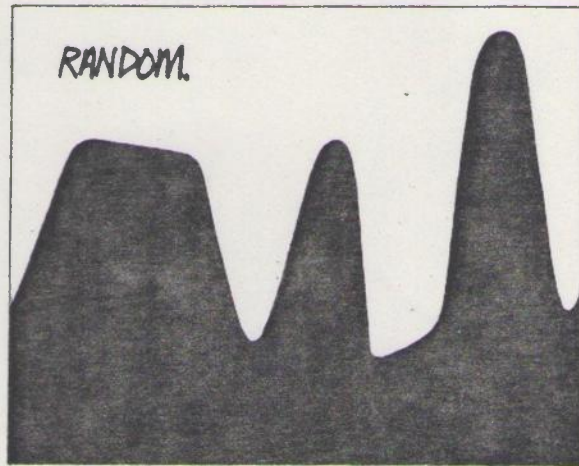
THIS IS LIKE SMOOTH - IT GOES FROM ONE POSITION TO ONE OTHER AND IT'S CUSHIONED - BUT IN SMOOTH YOU GET A SPEED UP/SLOW DOWN MOVEMENT ALL THE WAY THROUGH - IN TAPER, THE CUSHIONING HAPPENS JUST AT START AND END - IN THE MIDDLE THE MOVEMENT GOES STEADY.



SWING DOES NATURAL WAVE MOVEMENTS (SINE WAVES) OF ANY SHAPE - CAN BE USED FOR ALL WAVES OSCILLATIONS, VIBRATIONS OR WHAT HAVE YOU.



WANDER USES A HAND-DRAWN LINE TO CONTROL MOVEMENT - IT CAN GO ANY WAY YOU LIKE.



RANDOM MAKES MOVEMENTS BETWEEN SPECIFIED LIMITS, AT A SPECIFIED RATE.

TAG.

THIS TAGS THE MOVEMENT TO A POINT ON THE SCREEN - FOR INSTANCE ZOOM SIZE CAN BE "TAGGED" TO THE HEIGHT OF THE DRAWING ON THE SCREEN - OR TO THE POSITION OF SOME OTHER DRAWING - OR THE ANGLE...
... OR ... ETC... ETC..

SCALE.

THIS SCALES THE VALUE OF SOME OTHER MOVEMENT CONTROL - FOR INSTANCE, IF ONE THING IS DOING A WANDER ABOUT, ANOTHER DRAWING CAN BE MADE TO WANDER EXACTLY TWICE AS MUCH BY SIMPLY DOING "SCALE ON THE WANDER... TIMES 2"

PHASES.

HAS ALREADY BEEN DESCRIBED FOR CONTROLLING CHANGE IN BETWEENING BY A LIST OF KEY FRAMES AND POSITIONS. PHASES CAN ALSO BE USED TO CONTROL ANYTHING ELSE.



TAPER-FULL DETAILS

LIKE SMOOTH THIS DOES A CUSHIONED MOVEMENT FROM ONE POSITION TO ANOTHER. THE DIFFERENCE IS THIS - IN SMOOTH, THE SPEEDING-UP GOES ALL THROUGH THE FIRST HALF OF THE MOVEMENT, AND THE WHOLE OF THE SECOND HALF OF THE MOVEMENT IS SLOWING DOWN. IN TAPER, THE

CUSHIONING HAPPENS ONLY IN A FEW FRAMES (YOU SPECIFY HOW MANY) AND YOU CAN HAVE THE CUSHIONING EITHER AT BOTH ENDS OF THE MOVEMENT, OR JUST ONE END. BETWEEN THE CUSHION FRAMES, THE MOVEMENT GOES STEADY. HERE'S THE INFO ANIMICS ASKS FOR -

① START FRAME, END FRAME

SAME AS FOR ANY CONTROL SEE STEADY/SMOOTH FULL DETAILS...

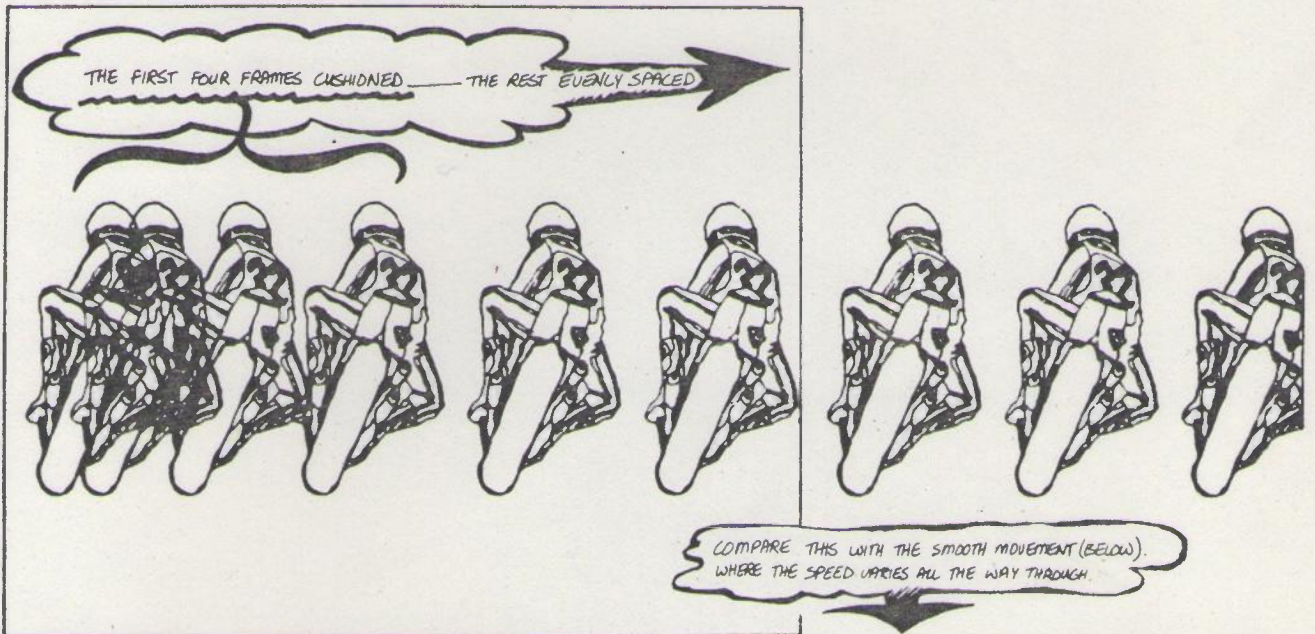
② START POSITION } SAME AS USUAL. ③ END POSITION }

④ CUSHIONS - ?

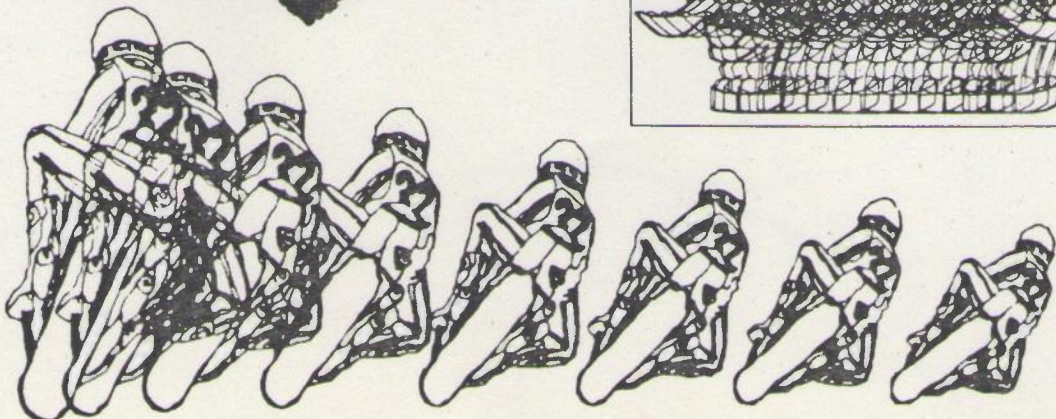
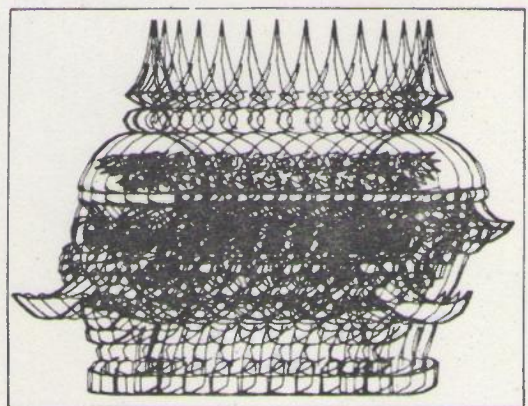
- START ONLY
- END ONLY
- BOTH.

⑤ HOW MANY CUSHION FRAMES?

FR INSTANCE - SUPPOSE YOU HAVE A PAN - IT STARTS ON THE SCREEN, AT FRAME 50 - BUT THE END IS OFF THE SCREEN, FRAME 200. IT'S A SLOW PAN, AND YOU WANT THE MOVEMENT STEADY, BUT BECAUSE IT STARTS ON THE SCREEN, IT WOULD BE BAD TO USE STEADY - IT STARTS WITH A JERK - SO YOU'D USE TAPER - IT WOULD BE CUSHIONED AT THE START ONLY LIKE THIS -



FOR THE FINISHED MOTORCYCLE SEQUENCE BELOW WE ADDED A FEW MORE FX TO MAKE THE MOVEMENT EVEN MORE INTERESTING
THESE WERE - ZOOM - STEADY - 120% - 60%.
PAN - STEADY - 0° - 30°.



WANDER.

IS SIMILAR TO **PATH**, EXCEPT IT'S A **MOVEMENT CONTROL**, NOT AN **EFFECT**.

★ **PATH** IS AN **EFFECT** — USED WITH A DRAWING OR CEL TO MAKE IT MOVE ALONG A DRAWN PATH.

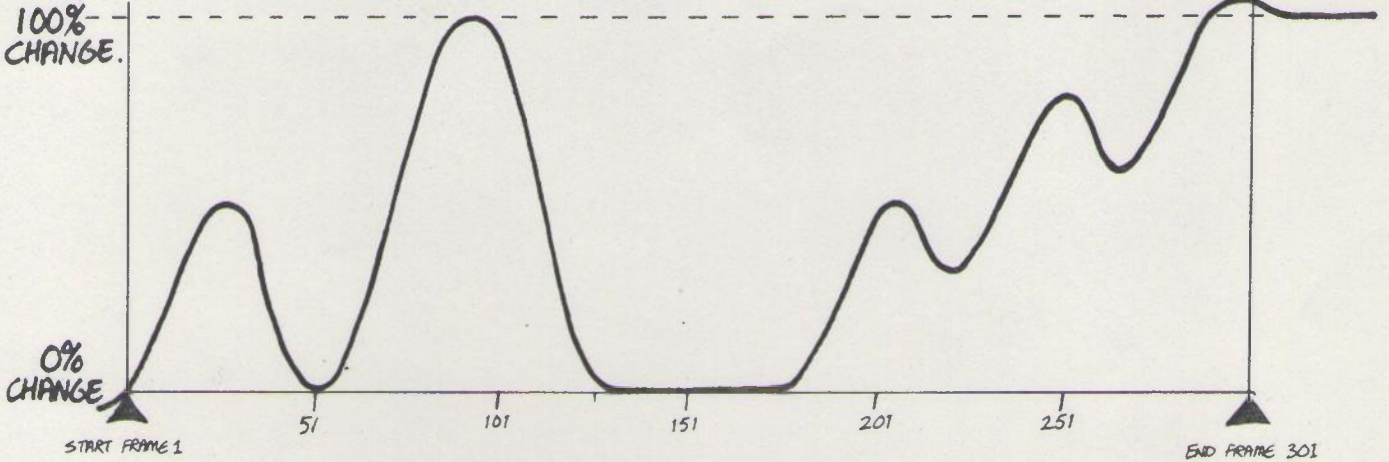
★ **WANDER** IS A **MOVEMENT CONTROL** — USED BY AN **EFFECT** TO CONTROL SOME ASPECT OF THE MOVEMENT — SIZE, ANGLE, POSITION, INBETWEENING ETC.

THE LINE YOU DRAW IN **WANDER** IS A CHART OR TIME-GRAPH OF THE WAY THE MOVEMENT IS TO GO.....

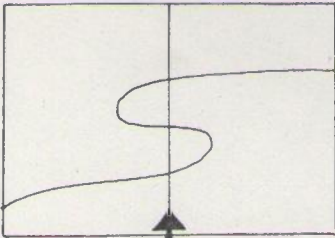
① START FRAME, END FRAME?

START FRAME CORRESPONDS TO THE LEFT SIDE OF THE DRAWING AREA, END FRAME CORRESPONDS TO THE RIGHT SIDE.... FRAMES INBETWEEN GO STEADILY ACROSS, LEFT TO RIGHT.

WANDER FOR A CHANGE.



② DRAW THE LINE — IT CAN GO OUTSIDE THE AREA — BUT IT CAN'T DOUBLE BACK ON ITSELF LIKE THIS —



FRAME 99.

THIS LINE HAS 3 POSITIONS ON FRAME 99!!! WANDER LINES SHOULD BE A SINGLE UNBROKEN LINE GOING STEADILY FROM LEFT TO RIGHT, NEVER DOUBLING BACK — IT'S THE UP AND DOWN MOVEMENT THAT IS USED TO ANIMATE — LEFT TO RIGHT IS SIMPLY THE FRAME COUNT.

③ TWO POINTS NEEDED TO GET THE SCALE —

LEFT TO RIGHT SCALE IS FIXED BY START FRAME, END FRAME — THE UP-DOWN SCALE NEEDS TO BE FIXED SIMILARLY — IN THE EXAMPLE, THE LINE IS GOING TO BE USED TO CONTROL A CHANGE — THE BOTTOM OF THE SCREEN IS FIXED AS 0% CHANGE, AND THE DOTTED LINE IS 100% CHANGE — BETWEEN IS INBETWEEN!! THE LINE STARTS AT THE BOTTOM — GOES HALFWAY UP, THEN BACK AGAIN, THEN SHOOTS RIGHT UP TO 100% AND RIGHT BACK DOWN AGAIN — RESTING BETWEEN FRAMES 130 AND 170, THEN CLIMBING UP IN 3 STAGES — AT THE END, NOTICE HOW IT GOES OVER 100% AND THEN FALLS BACK ONTO IT — IN ANIMATION THIS IS CALLED **OVERSHOOT** AND IS VERY IMPORTANT FOR GIVING A MOVEMENT CHARACTER. **ANTICIPATION** IS THE SAME IDEA AT THE START OF THE MOVEMENT — GO BACKWARDS FOR A FEW FRAMES BEFORE MOVING FORWARDS.



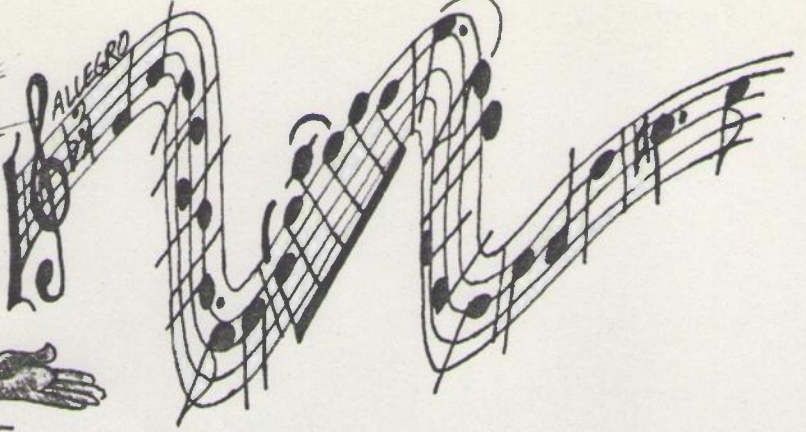
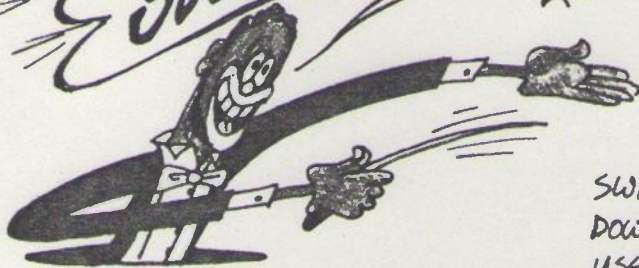
ANTICIPATION



OVERSHOOT

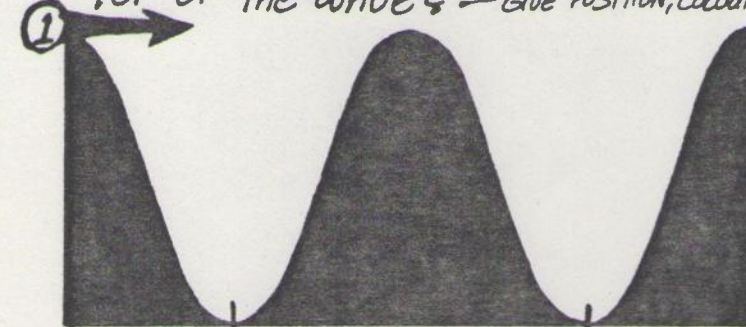
SWING.

IT DON'T MEAN A THING
IF YOU AIN'T GOT DAT
SWING!!



SWING IS A MOVEMENT CONTROL THAT GOES UP AND DOWN IN A WAVE (A SINE-WAVE TO BE EXACT) USE IT FOR CONTROLLING POSITION, SIZE, COLOUR ETC....

① TOP OF THE WAVE? — GIVE POSITION, COLOUR, ANGLE ETC....



③ START POSITION? — GIVE ANGLE.



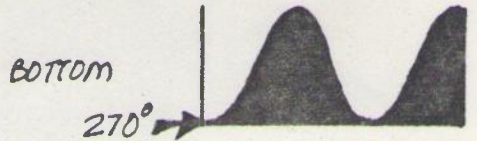
② BOTTOM OF THE WAVE? POSITION ANGLE ETC....



FRAMES PER SWING.



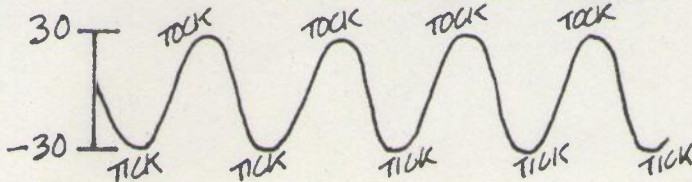
④ SPEED — HOW MANY FRAMES PER SWING?....



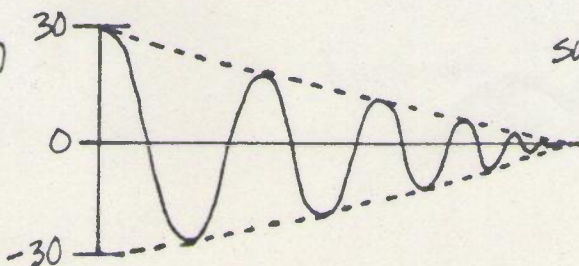
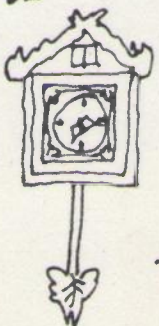
★ THE TOP AND BOTTOM POSITIONS CAN BE STATIC, OR MOVING — F' RIN STANCE —



PENDULUM — EFFECT SPIN — WITH SWING GOING FROM -30 TO 30 DEGREES.



1 WAVE PER SECOND (24 FRAMES).




★ SWING — TOP GOES STEADY FROM 30 TO 0.

★ BOTTOM FROM -30 TO 0.


THE PENDULUM SWINGS LESS AND LESS AND FINALLY STOPS.....

RANDOM.

A MOVEMENT CONTROL THAT MAKES RANDOM MOVEMENTS — FOR POSITION ANGLE, PERCENT, COLOUR ETC, ETC.....

①  MAXIMUM POSITION/ANGLE/CHANGE.

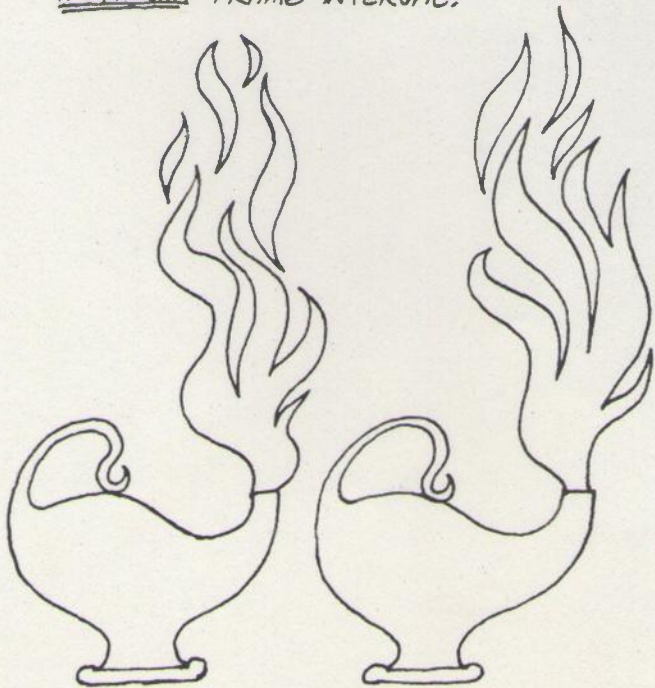
②  MINIMUM POSITION/ANGLE/CHANGE/ETC.

 FRAMES INTERVAL BETWEEN NEW RANDOM POSITIONS:-

THAT SETS THE LIMITS TO THE RANDOM POSITIONS.

③ FRAMES INTERVAL — YOU CAN HAVE —

- ★ A NEW POSITION EVERY FRAME — GIVING A RAPIDLY FLASHING RANDOM MOVEMENT.
- ★ A REGULAR FRAME INTERVAL — TYPE A NUMBER — MOVEMENT GOES REGULARLY FROM ONE RANDOM POSITION TO ANOTHER — THE GOING CAN BE STEADY OR CUSHIONED.
- ★ A RANDOM FRAME INTERVAL — GOES STEADY OR CUSHIONED, FROM ONE RANDOM POSITION TO ANOTHER, AND AT RANDOM INTERVALS — TYPE A NUMBER FOR THE MAXIMUM FRAME INTERVAL.



EXAMPLE —

A CRUDE FLAMES EFFECT CAN BE DONE JUST BY CHANGING RAPIDLY BACK AND FORTH BETWEEN TWO DRAWINGS.

BUT:

- ★ THE CHANGE PERCENT CAN BE RANDOM.
- ★ ADD ON A RANDOM WOBBLE.
- ★ AND PERHAPS A FREAK.

= AND YOU'LL GET A VERY LIVELY FLAMES EFFECT!

TAG.

IS THE MOVEMENT CONTROL EQUIVALENT OF THE EFFECT FOLLOW — ANY ASPECT OF A MOVEMENT CAN BE CONTROLLED BY SOMETHING ALREADY HAPPENING ON THE SCREEN. THE POSITION OF A POINT, OR THE ANGLE OR THE DISTANCE BETWEEN TWO POINTS.....

AFTER START FRAME, END FRAME GIVE.

① TAG TO WHAT?

- ① E/W POSITION
- ② N/S POSITION
- ③ ANGLE BETWEEN 2 POINTS
- ④ DISTANCE BETWEEN 2 POINTS.

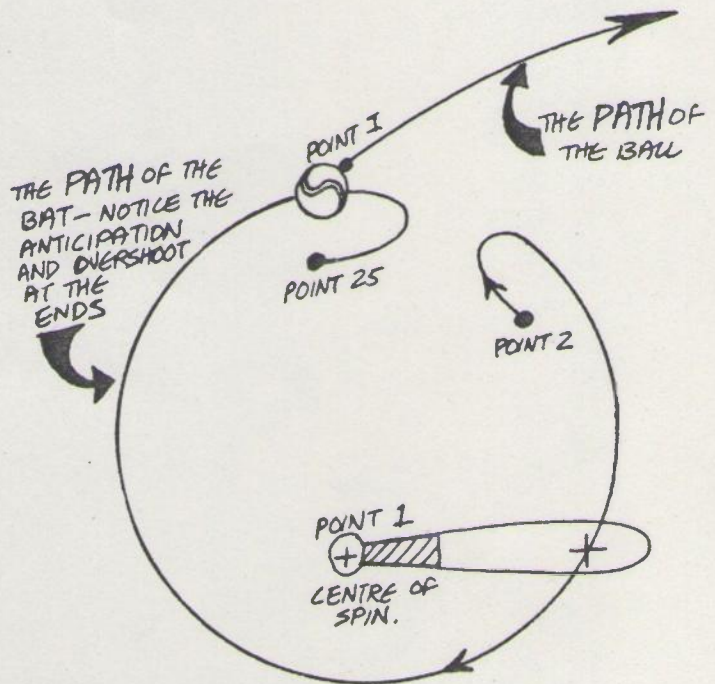
② WHAT POINT? GIVE —

CEL NUMBER
LINE NUMBER
POINT NUMBER.

★ POINT NUMBER CAN ALSO BE A MOVEMENT CONTROL, SO THE POINT CAN MOVE ALONG THE LINE.

★ YOU DON'T GIVE THE DRAWING NUMBER — IT ASSUMES THE TAGGED POINT IS IN THE DRAWING BEING ANIMATED — IF IT ISN'T YOU CAN FOOL THE MACHINE — STARTING WITH THE CURRENT DRAWINGS FIRST CEL AS NO 1, COUNT FORWARDS OR BACKWARDS TO THE CEL YOU WANT.

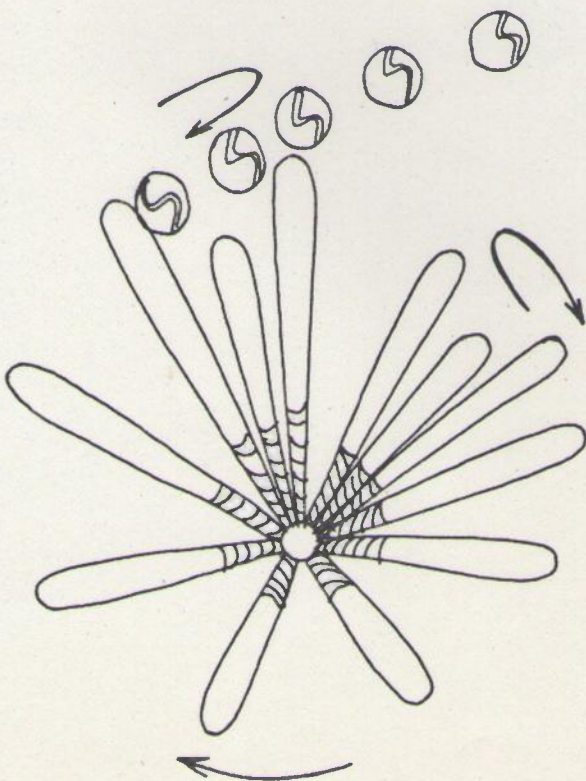
③ IF YOU ASK FOR ANGLE OR DISTANCE BETWEEN TWO POINTS, ANTICS WILL ASK "WHAT POINT? CEL, LINE POINT" AGAIN.



THE BAT IS DRAWN HORIZONTALLY ORIGINALLY —

SPIN WILL MAKE THE BAT SPIN ROUND — THE ANGLE OF SPIN IS FIXED BY TWO POINTS — POINT 1 (THE CENTRE OF SPIN) AND THE SECOND POINT WHICH MOVES STEADILY FROM POINT 2 TO POINT 25.

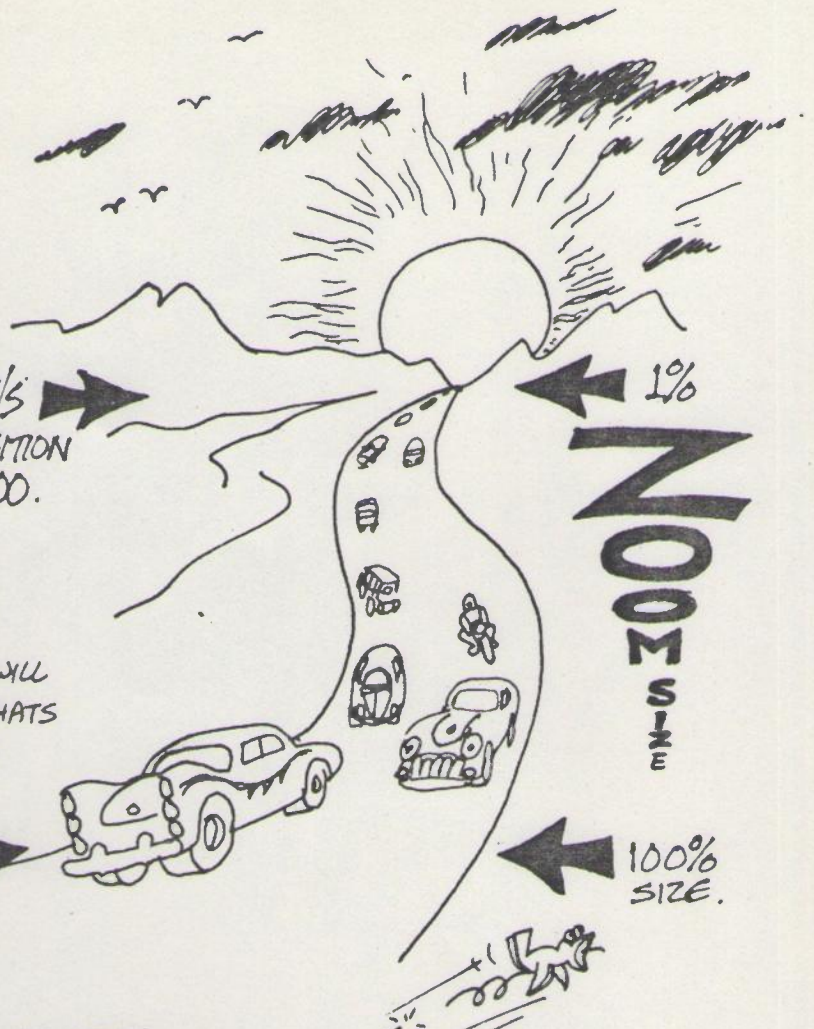
THIS LINE IS IN THE ORIGINAL DRAWING, IN A SEPARATE CEL — IT DOESN'T APPEAR ON THE SCREEN BECAUSE IT HAS NO ANIMATION OF ITS OWN.



RESULT — THE SWING OF THE BAT NOW FOLLOWS YOUR HAND-DRAWN LINE — SO THE QUALITY OF THE MOVEMENT WILL DEPEND ON HOW SKILLFULLY THIS IS DRAWN. THE LENGTH CAN BE TAGGED TO THE SAME TWO POINTS BY USING SQUASH —

SCALE.

HERE'S LOTS OF WHEELS TAKING OFF INTO THE SUNSET — DIFFERENT CELLS, ALL MOVING ALONG THE SAME PATH, BUT DIFFERENTLY. THE SIZE IS ALSO ZOOMING — INSTEAD OF GIVING EACH ONE A DIFFERENT ZOOM, THEY CAN ALL HAVE THE SAME ONE — PEGGED AUTOMATICALLY TO THE POSITION ON THE SCREEN, SO THAT IT'S FULL SIZE AT THE BOTTOM, AND TINY ON THE HORIZON.



★ THE MOVEMENT CONTROL TAG WILL GIVE YOU THE N/S POSITION. — THATS 0 AT THE BOTTOM, 600 ON THE HORIZON.

★ NOW USE SCALE TO CONVERT THAT TO THE ZOOM SIZE YOU WANT.

① SCALE ANOTHER MOVEMENT CONTROL.... CONVERSION NUMBERS.....

② POSITION TYPE NUMBER.... 600 CONVERTS TO..... 1

③ POSITION..... 0 CONVERTS TO..... 100.



★ CAN BE USED FOR TAKING ANGLE FROM POSITION, COLOUR FROM INBETWEENING, ANYTHING FROM ANYTHING.

★ OR SIMPLY LIKE ONE CLOCK HAND GOING 12 TIMES FASTER THAN ANOTHER...

★ SCALING BY ARITHMETIC.

INSTEAD OF SCALING BY CONVERSION POINTS, YOU CAN ALSO SCALE BY ARITHMETIC — F'INSTANCE — "THIS ANGLE 12 TIMES THAT ANGLE"..... "THIS POSITION 120 MORE THAN THAT ONE".....

① ADD / SUBTRACT SOMETHING

— PUT A NUMBER — NORMAL NUMBER FOR ADD — MINUS FOR SUBTRACT

② SCALE PERCENT....

GRAPHICS FX - THE REST.

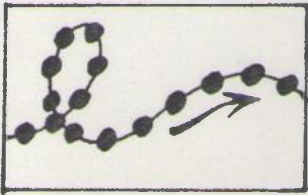
SO FAR I'VE DESCRIBED 6 BASIC FX IN THE GRAPHICS ANIMATION - HOLD, PAN, TILT, ZOOM, SPIN AND CHANGE - HERE'S THE REMAINING 18 -



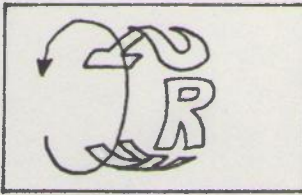
FADE. DOES FADE-OUTS AND FADE-INS - OR COMBINED FOR MIXES - FADE ALSO CAN MAKE COLOURS CHANGE IN ANY OTHER WAY YOU LIKE.



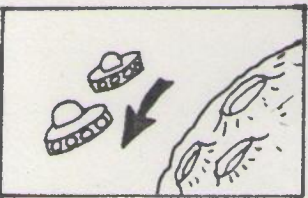
TUMBLE PUTS THE DRAWING ON A CYLINDER.



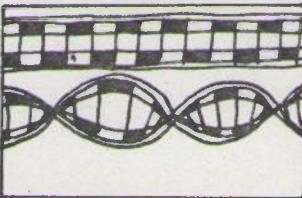
PATH, USES A HAND DRAWN LINE AS A PATH OF MOVEMENT FOR A DRAWING.



TURN IS LIKE TUMBLE BUT VERTICAL INSTEAD OF HORIZONTAL.



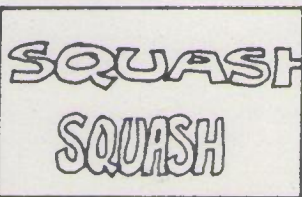
FOLLOW. FIXES A DRAWING TO FOLLOW SOME POINT ON ANOTHER DRAWING.



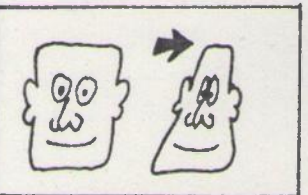
TWIST TWISTS THE DRAWING INTO A SPIRAL.



FLIP. DOES A PERSPECTIVE TURN SIMILAR TO A CONVENTIONAL ANIMATION "FLIPOVER"



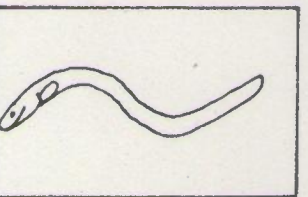
SQUASH DOES A SQUASH OR STRETCH ON A DRAWING.



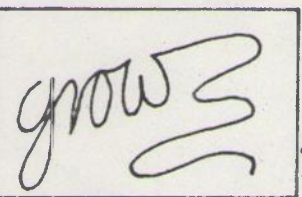
PINCH. DISTORTS SHAPE BY PINCHING AT ONE END - IT ALSO PUSHES IT OVER A BIT IF YOU LIKE.



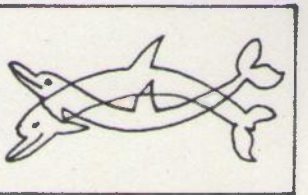
SUPER IS USED TO SUPERIMPOSE ONE SCENE ONTO ANOTHER.



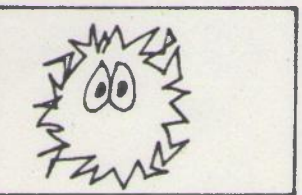
WAVE, MAKES A WAVY MOTION FLOW THROUGH THE DRAWING



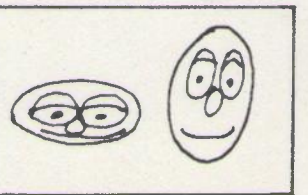
LIMITS. IS USED TO MAKE ANIMATION HARDEN TO JUST A PART OF A SINGLE LINE OR CEL - INCLUDING A "SCRAPE-BACK" EFFECT WHERE A DRAWING GROWS.



BENDY MAKES THE DRAWING MOVE LIKE A VIBRATING STRING.



FREAK. DISTORTS THE OUTLINE IN A RANDOM WAY TO A CERTAIN DEGREE - CAN BE GENTLE OR SPIKEY..



WOBBLE MAKES THE DRAWING SQUASH AND STRETCH.



MASK. CHOPS OFF PART OF A DRAWING OR CEL, WITHOUT AFFECTING ANY OF THE OTHER DRAWINGS OR CELS.

LEVELS. IS USED TO PLAY WITH THE CEL LEVEL ORDER - FOR INSTANCE WHEN DRAWINGS MOVE AROUND EACH OTHER.

CYCLE. IS USED TO MAKE A SECTION OF ANIMATION REPEAT - CAN BE COMBINED WITH NON-CYCLED FX OR MOVEMENTS SO THAT REPEAT CYCLES ARENT NECESSARILY IDENTICAL...

FADE.

★ FADE USED FOR A WHOLE DRAWING IS EXACTLY LIKE AN OPTICAL FADE — GIVE START FRAME, END FRAME, AND SAY EITHER FADE OUT OR FADE IN.

★ WHEN THE DRAWING FADES, THE COLOURS GO TO BLACK, AND THE DRAWING ALSO GOES GRADUALLY TO "LUMINOUS" — SO AS IT FADES THE BACKGROUND AUTOMATICALLY SHOWS THROUGH.

★ A FADE-OUT ON ONE DRAWING, PLUS A FADE-IN ON ANOTHER IS CALLED A "MIX" FROM ONE DRAWING TO ANOTHER.

FADE-ON CELS.

★ FADE USED AS A CEL EFFECT IS USED TO PLAY AROUND WITH THE CEL'S COLOUR (AS A NUMBER) — WHEN FADE IS OPERATING, THE COLOUR IS GIVEN BY A MOVEMENT CONTROL F'INSTANCE —

★ STEADY OR SMOOTH FROM 0 TO 888 TAKES THE COLOUR FROM BLACK TO WHITE

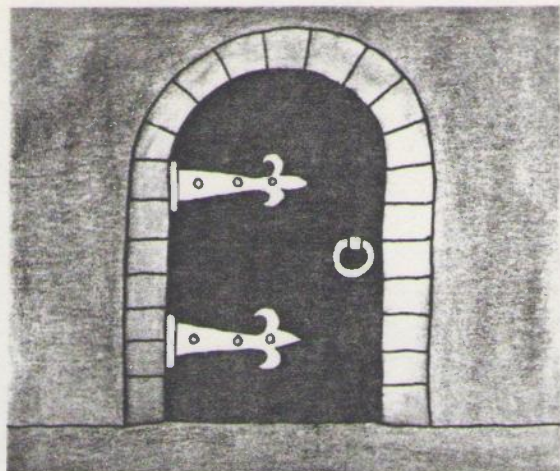
★ DOUBLE GOES FROM ONE COLOUR TO ANOTHER AND THEN A THIRD.

★ SWING MAKES THE COLOUR FLUCTUATE REGULARLY.

★ RANDOM MAKES RANDOM COLOUR CHANGES.

★ PHASES FOR A WHOLE SEQUENCE OF PLANNED COLOUR CHANGES.

NOTE — TAG, TAPER AND WANDGR CANNOT BE USED WITH FADE..



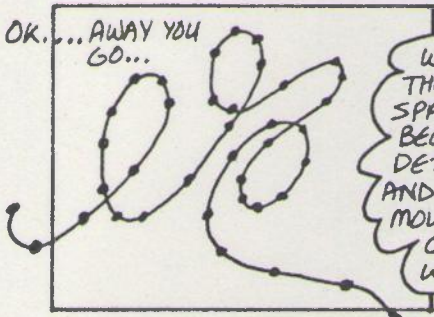
PATH.

THIS IS THE ONE THAT MAKES THE PICTURE MOVE ALONG A HAND-DRAWN PATH LINE. IT'S A PARTICULARLY GOOD ONE, BECAUSE IT INTRODUCES HAND-DRAWN QUALITIES INTO THE ANIMATION MOVEMENTS —

① AFTER "START FRAME, END FRAME", ANTICS ASKS YOU TO DRAW THE PATH, LIKE AN ORDINARY DRAWING —

② THEN IT ASKS "WHAT POINT ON THE DRAWING FOLLOWS THE PATH?... GIVE POSITION E/W AND N/S.

OK... AWAY YOU GO...

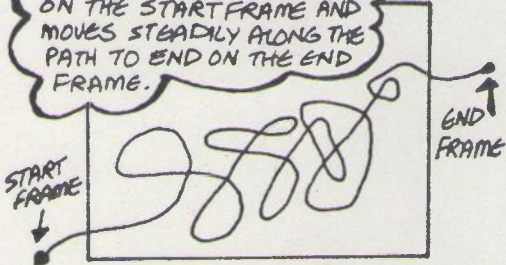


IT SHOWS YOU WHERE YOU'VE PUT THE POINTS — THE SPACING IS IMPORTANT, BECAUSE THAT'S WHAT DETERMINES THE SPEED AND FLOW OF THE MOVEMENT —
CLOSELY SPACED = SLOW.
WIDELY SPACED = FAST.



③ NORMAL PATH OR CRAZY?

NORMAL PATH MEANS IT STARTS AT THE BEGINNING ON THE START FRAME AND MOVES STEADILY ALONG THE PATH TO END ON THE END FRAME.

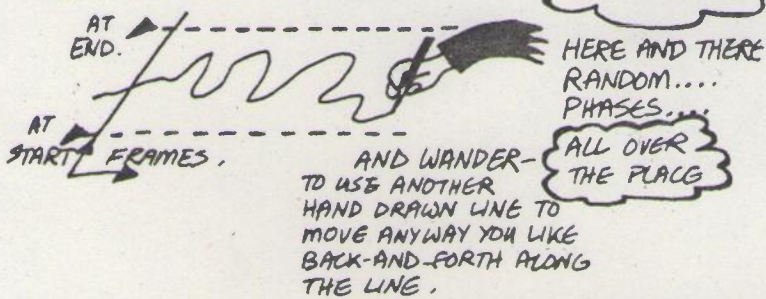


CRAZY PATH IS NOT CRAZY PAVING, BUT USING ONE OF THE MOVEMENT CONTROLS TO MOVE THE DRAWING TO AND FRO ALONG THE PATH.



HERE AND THERE RANDOM... PHASES... ALL OVER THE PLACE

AND WANDER — TO USE ANOTHER HAND DRAWN LINE TO MOVE ANYWAY YOU LIKE BACK-AND-FORTH ALONG THE LINE.



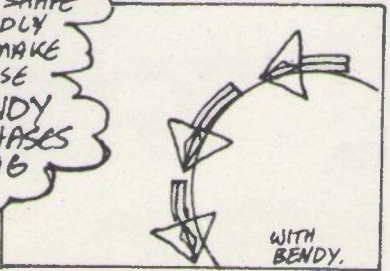
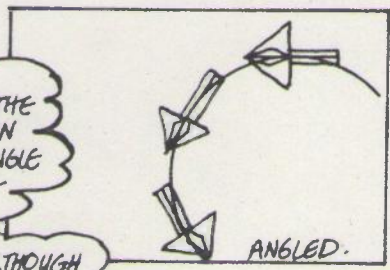
④ FINALLY — MOVE STRAIGHT OR ANGLED?

STRAIGHT MEANS THE DRAWING STAYS UPRIGHT LIKE THE CHAIRS ON A FERRIS WHEEL.



ANGLED MEANS THE DRAWING WILL TURN TO FOLLOW THE ANGLE OF THE PATHLINE —

★ NOTE — THAT ALTHOUGH IT WILL TURN ITS SHAPE WILL REMAIN RIGIDLY THE SAME — TO MAKE IT FLOW BETTER USE THE EFFECT BENDY WITH PERHAPS PHASES SCALE OR TAB



★ NOTE — INSTEAD OF DRAWING A NEW PATH, YOU CAN ALSO USE A LINE OUT OF AN ACTUAL DRAWING AS A PATH — THAT MEANS THE PATH ITSELF CAN ACTUALLY BE ANIMATING... THE MACHINE ASKS FOR "DRAWING NUMBER, CEL NUMBER, LINE NUMBER"...

FOLLOW.

IS USED TO MAKE SOMETHING FOLLOW A POINT ON ANOTHER DRAWING —
HERES THE INFO YOU NEED FOR IT.

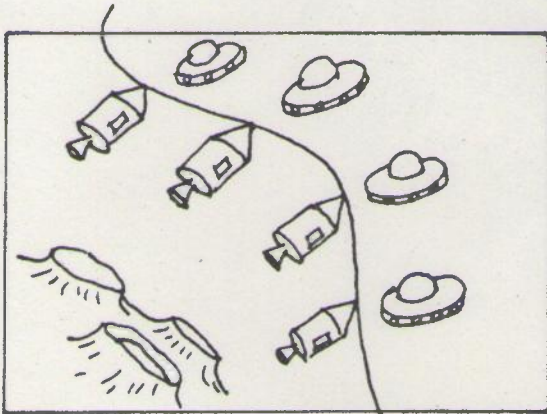
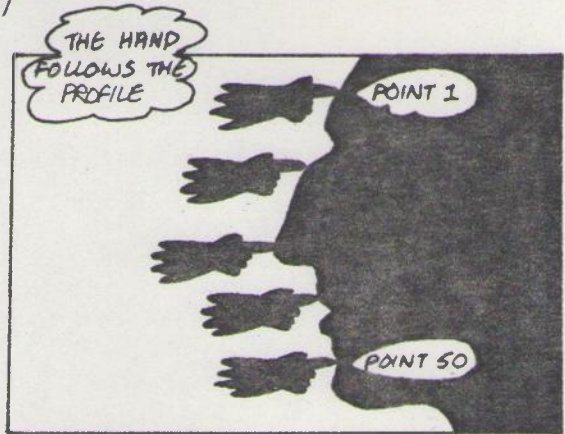
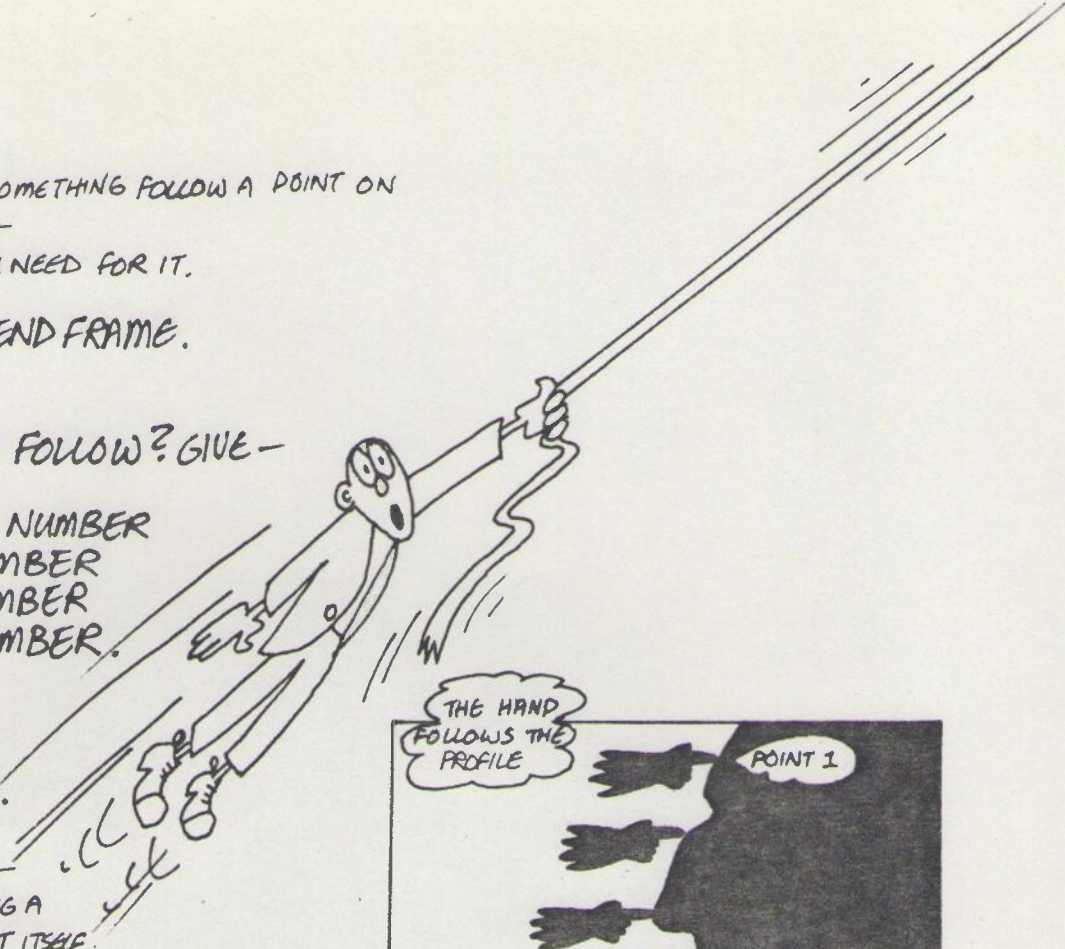
① START FRAME, END FRAME.
AS USUAL —

② WHAT POINT TO FOLLOW? GIVE —

DRAWING NUMBER
CEL NUMBER
LINE NUMBER
POINT NUMBER.

★ NOTE — THE POINT NUMBER CAN BE A MOVEMENT CONTROL. YOU CAN VARY THE NUMBER IN ANY WAY — INSTEAD OF FOLLOWING A FIXED POINT, THAT POINT ITSELF

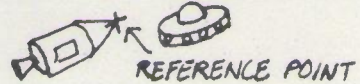
CAN BE MOVING ALONG THE LINE — F' RINSTANCE, IF THE LINE HAS 150 POINTS, YOU CAN DO A STEADY MOVEMENT 1 TO 150 FOR THE POINT NUMBER, AND THE DRAWING WILL MOVE ALONG THE LINE JUST LIKE A PATH. OTHER CONTROLS CAN MAKE IT GO BACK AND FORTH ALONG THE LINE ANY WAY YOU LIKE (WANDER F' RINSTANCE).



③ REFERENCE POINT —

WHAT POINT OF THE ORIGINAL DRAWING IS TO STICK TO THE POINT BEING FOLLOWED? TYPE IN THE MEASUREMENTS HERE — E/W, N/S —

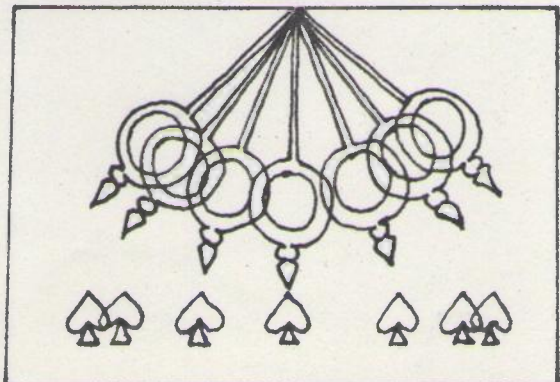
★ NOTE THAT THIS POINT DOESN'T ACTUALLY HAVE TO BE ON THE DRAWING — IT CAN BE OFF TO ONE SIDE, SO THE DRAWING WILL FOLLOW AT A DISTANCE — LIKE THE FLYING SAUCER IN THE DRAWING —



④ NORMAL FOLLOW?

NORMALLY YES — THE ALTERNATIVES ARE E/W OR N/S ONLY — IN WHICH CASE, THE DRAWING FOLLOWS ONLY THE HORIZONTAL POSITION, OR ONLY THE VERTICAL POSITION, INSTEAD OF BOTH AT ONCE AS IN THE NORMAL FOLLOW.

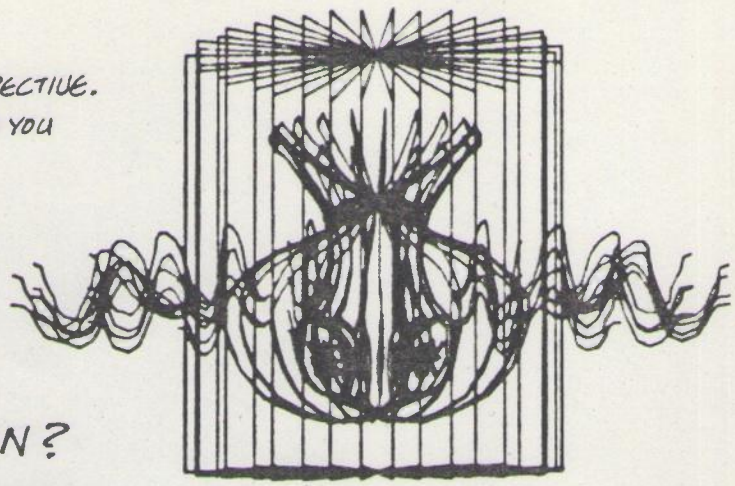
AS THE PENDULUM SWINGS THE ARROW FOLLOWS E/W ONLY



FLIP

TAKES A FLAT DRAWING AND FLIPS IT IN PERSPECTIVE.
 — AFTER START FRAME, END FRAME THE INFO YOU NEED IS AS FOLLOWS —

- ② AXIS TO FLIP AROUND — VERTICAL OR HORIZONTAL.
- ③ AXIS — POSITION?
- ④ AXIS FOR PERSPECTIVE — POSITION?
- ⑤ HOW DOES THE FLIP FLIP — ANGLE ^{MOVING} STATIC
- ⑥ HOW MUCH PERSPECTIVE SQUASH? — %

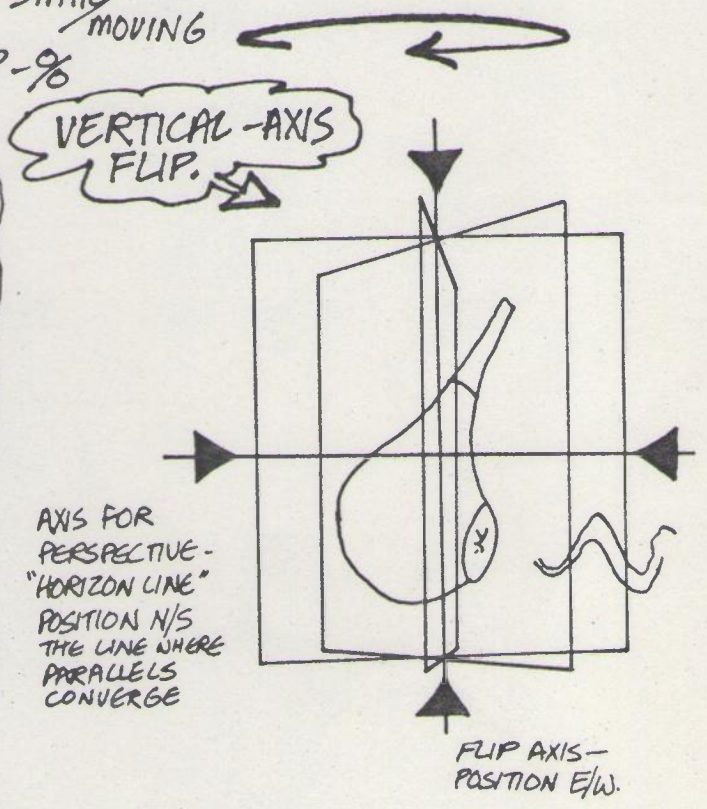


★ FLIP AXIS CAN BE ANYWHERE — IN THE MIDDLE — AT ONE END — OFF TO THE SIDE.

★ THE PERSPECTIVE AXIS CAN BE ANYWHERE
SOME EXAMPLES —

AT THE BOTTOM

AT THE TOP



★ FLIP IS CONTROLLED BY ANGLE — JUST LIKE SPIN.

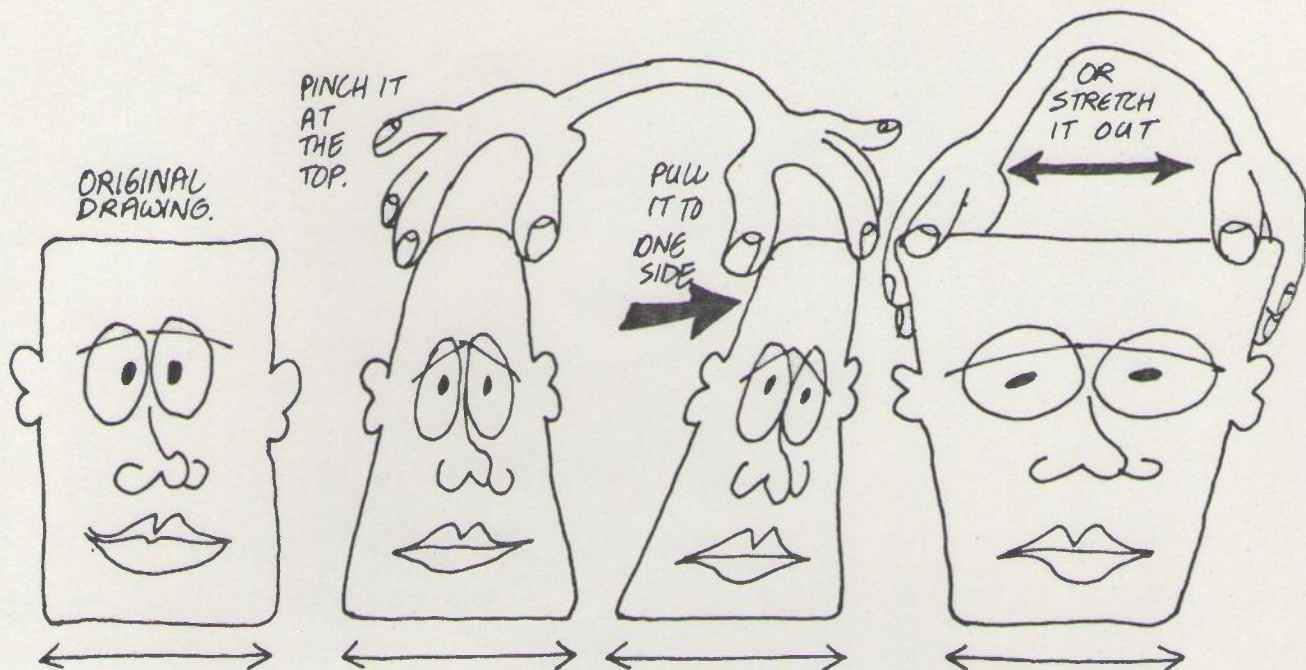


★ PERSPECTIVE SQUASH — 0% = NO SQUASH, 100% = FULLY SQUASHED.
 HERE'S A 45° FLIPPED DRAWING WITH DIFFERENT DEGREES OF SQUASH.



PINCH.

THIS PINCHES AND STRETCHES THE DRAWING LIKE A PIECE OF RUBBER—



★ NOTICE — ALONG THE BOTTOM IT'S ALWAYS THE SAME.

AFTER START FRAME, END FRAME, HERE'S THE INFO YOU NEED.—

① PINCH WHICH WAY? VERTICAL OR HORIZONTAL.
THE PINCH SHOWN IN THE EXAMPLE IS HORIZONTAL.

② "NO PINCH" MARGIN?
ALONG THIS LINE THERE IS NO PINCH OR STRETCH — GIVE POSITION.

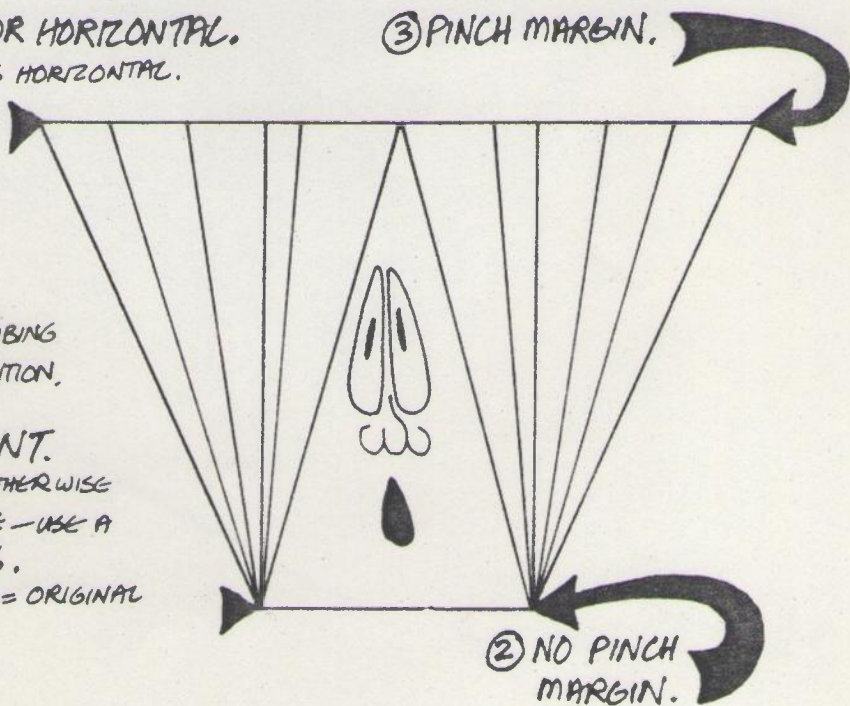
③ PINCH MARGIN?
ANY OTHER LINE CONVENIENT FOR DESCRIBING HOW MUCH PINCH YOU WANT — GIVE POSITION.

④ HOW MUCH PINCH? — PERCENT.
STATIC SHAPE — TYPE A NUMBER.... OTHERWISE TO MAKE A CHANGING PINCHED SHAPE — USE A MOVEMENT CONTROL FOR THE PINCH %.
ZERO% = PINCHED TO NOTHING 100% = ORIGINAL DRAWING WITH NO PINCH.

⑤ SIDEWAYS PULL?

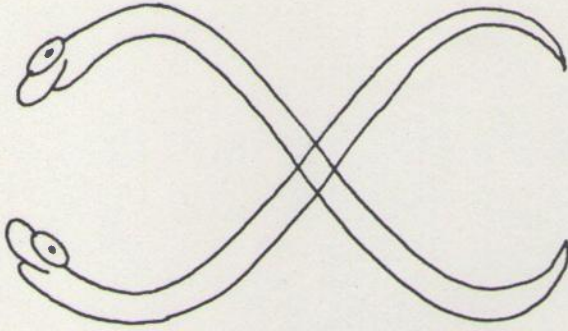
LIKE ON THE THIRD PICTURE ON THE TOP. JUST SAY WHAT DISTANCE YOU WANT IT PULLED ASIDE, IN ANTICS MEASURE — STATIC NUMBER FOR A FIXED SHAPE, A MOVEMENT CONTROL IF IT IS TO MOVE. EXACTLY LIKE A PAN, ORDINARY PLUS-NUMBERS MOVE IT TO THE RIGHT, MINUS NUMBERS MOVE IT TO THE LEFT.

③ PINCH MARGIN.



WAVE

THIS MAKES A WAVE TRAVEL THROUGH THE DRAWING—



AFTER START AND END FRAME, HERE'S THE INFO NECESSARY—

① TRAVELLING WAVE - VERTICAL OR HORIZONTAL?

THE EXAMPLES ARE HORIZONTAL.

② WAVELENGTH?

THE SIZE OF ONE COMPLETE UP-AND-DOWN OF THE WAVE - IN ANTICS MEASURE.

③ WIDTH OF WAVE.

BIG WAVE - SMALL WAVE - THE AMOUNT OF UP-AND-DOWN MOVEMENT IN ANTICS MEASURE. THE WAVE WIDTH CAN BE A STATIC NUMBER OR A MOVEMENT CONTROL

④ WAVE IT ALL ABOUT—

CONTROLLED BY ANGLE, A STATIC POSITION, OR A MOVEMENT CONTROL. ONE ANGLE TURN (360°) MAKES THE WAVE MOVE ONE WAVELENGTH THROUGH THE DRAWING.

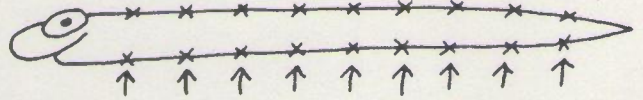
⑤ WHERE DOES WAVE START FROM?

SET A MARGIN ACROSS THE DRAWING - THE WAVE ANGLE IS APPLIED HERE.

⑥ WAVE NORMAL OR FIXED?

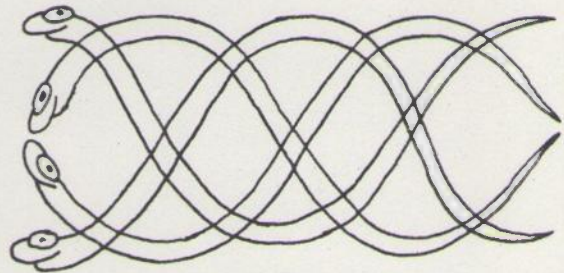
FIXED MEANS THAT ALONG THE WAVE MARGIN THERE'LL BE NO MOVEMENT - THAT POINT WILL BE FIXED - LIKE THE POINT OF AN ANIMALS TAIL WHERE IT'S FIXED TO THE BODY.

★ ORIGINAL DRAWING IS FLAT—

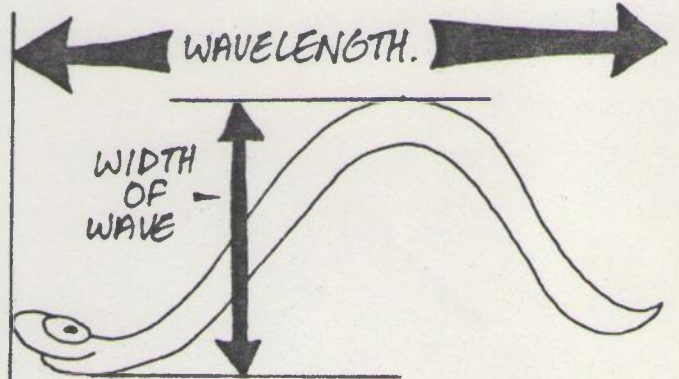


MAKE SURE THERE'S POINTS ALONG THE STRAIGHT LINES - OTHERWISE THERE'S NOTHING TO BEND.

★



WITH ALL THE DRAWING SUPERIMPOSED - NOTICE THAT ALL PARTS OF THE DRAWING ARE WAVING - THE WAVE SHAPE IS TRAVELLING THROUGH THE DRAWING.



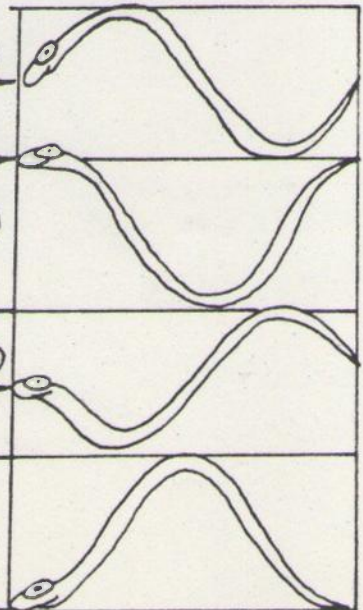
WAVE MARGIN.

MIDDLE GOING UP
0° AND 360°

TOP
90°

MIDDLE GOING DOWN
180°

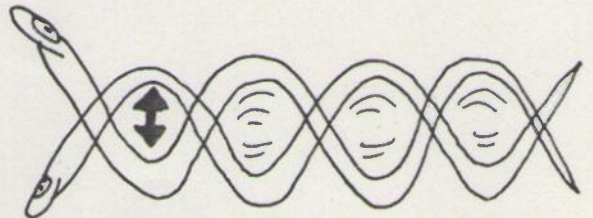
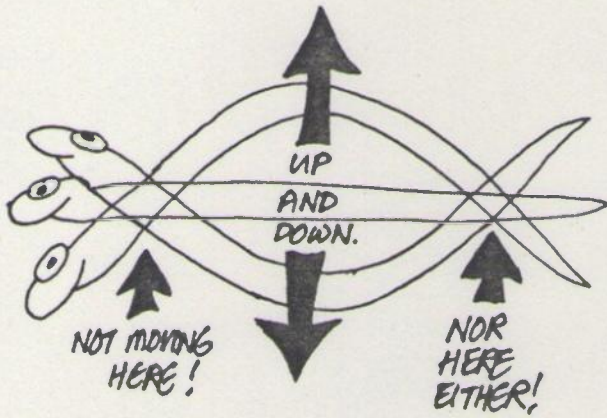
BOTTOM
270°



BENDY.

THIS IS VERY LIKE WAVE — EXCEPT IT'S A SIDE-TO-SIDE WAVE, NOT A TRAVELLING ONE — IT'S THE KIND OF WAVE THAT HAS STATIC POINTS, LIKE A GUITAR STRING VIBRATING — AND LIKE THE HARMONICS ON A STRING THERE CAN BE ANY NUMBER OF "LOOPS"

fw



AND IF YOU USE ONLY A PART OF A SINGLE WAVE IT'S GOOD FOR BENDY THINGS —
— LIKE BENDING IN THE WIND

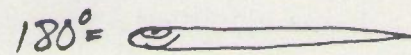
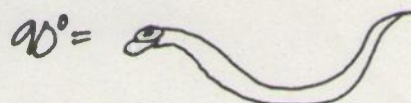
HERE'S THE INFO—

- ① BENDY, SIDE-TO-SIDE WAVE — VERTICAL OR HORIZONTAL?

THE EXAMPLE ABOVE IS HORIZONTAL.

- ② WAVELENGTH
- ③ WIDTH OF WAVE
- ④ WAVE IT ALL ABOUT
- ⑤ WAVE START FROM

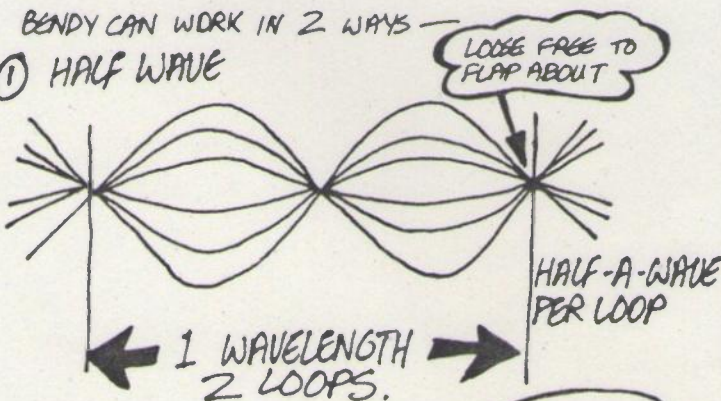
ALL 'EXACTLY LIKE WAVE



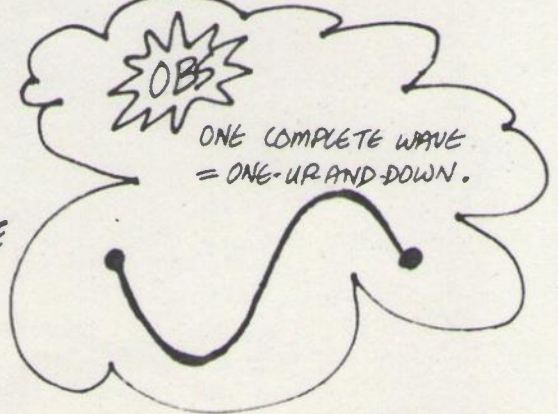
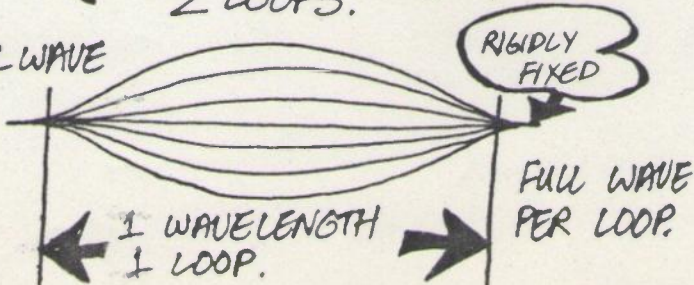
- ⑥ HALF WAVE OR FULL WAVE?

BENDY CAN WORK IN 2 WAYS —

- ① HALF WAVE

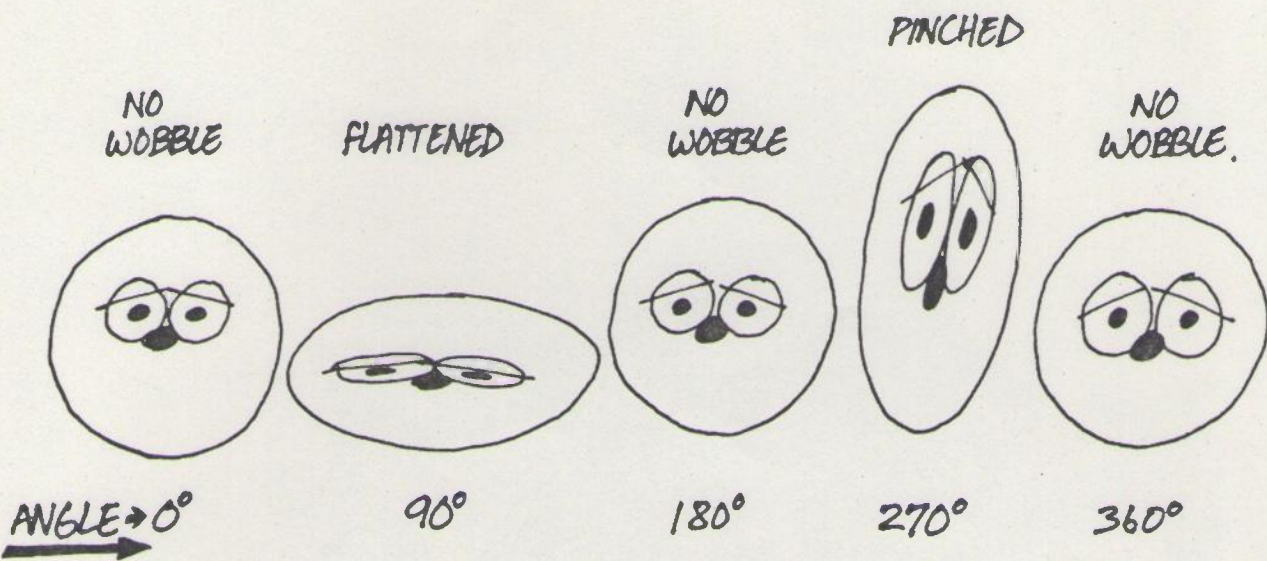


- ② FULL WAVE



WOBBLE.

WOBBLE DOES A SQUASH-STRETCH-SQUASH EFFECT, MAKING THE DRAWING WOBBLE LIKE A BAG OF JELLY - IT'S A CYCLIC MOVEMENT CONTROLLED BY ANGLE -



★ NOTICE THAT WHEN FLATTENED ITS ALSO STRETCHED OUT SIDEWAYS - ITS A SIMULTANEOUS SQUASH AND STRETCH - AND HERES THE INFO FOR IT -

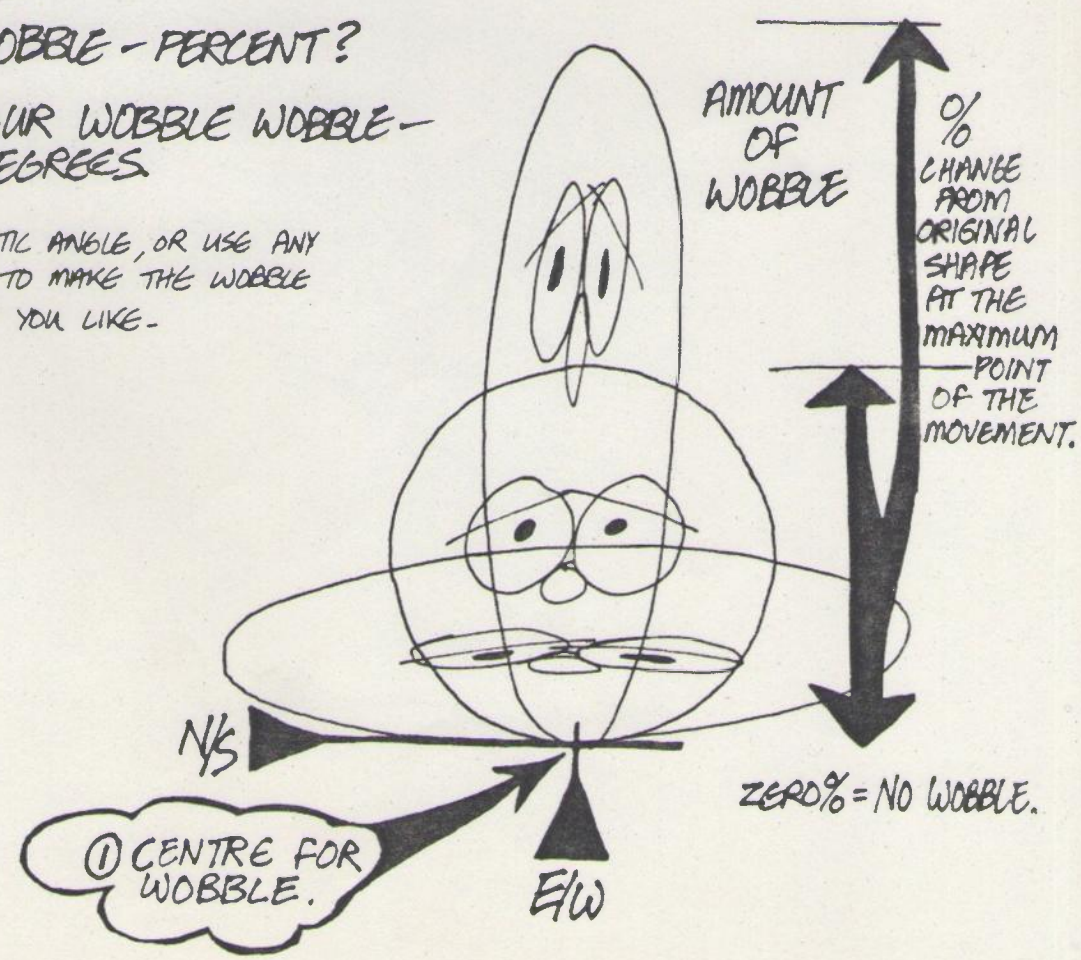
① CENTRE OF WOBBLE?

- THE ONLY POINT THAT DOESN'T MOVE.
GIVE POSITION E/W, N/S.

② AMOUNT OF WOBBLE - PERCENT?

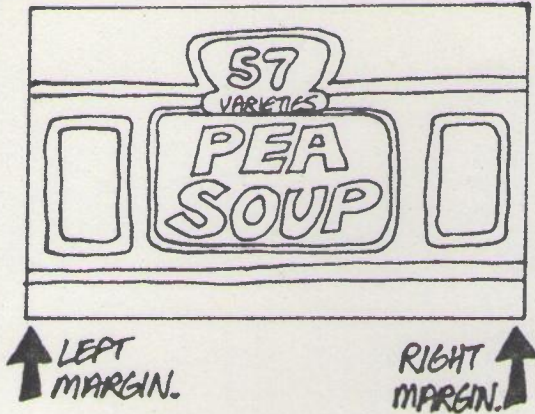
③ HOW DOES YOUR WOBBLE WOBBLE - ANGLE IN DEGREES.

GIVE EITHER A STATIC ANGLE, OR USE ANY MOVEMENT CONTROL TO MAKE THE WOBBLE ANGLE GO ANY WAY YOU LIKE.



TUMBLE AND TURN.

TAKE AN ORIGINAL DRAWING — STICK IT ON A CYLINDER —

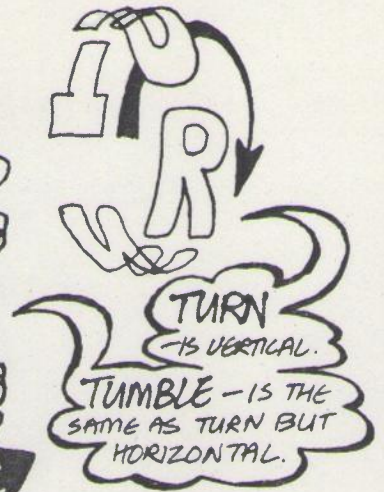


LEFT MARGIN.

RIGHT MARGIN.



AND SET THE WHOLE THING TURNING AROUND



TURN

— IS VERTICAL.

TUMBLE — IS THE SAME AS TURN BUT HORIZONTAL.

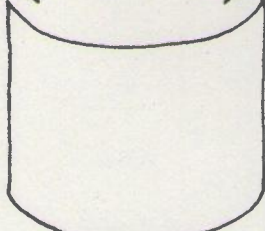
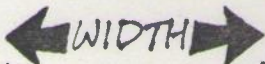
① PUT MARGINS ON DRAWING —

IT IS THIS SECTION THAT WILL BE WRAPPED, LIKE A LABEL ON A CAN. ANYTHING OUTSIDE THE MARGIN STAYS EXACTLY WHERE IT IS.

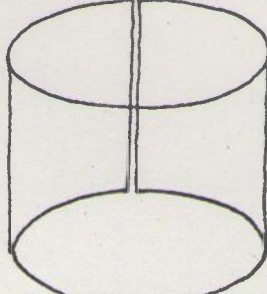
★ NOTE — YOU'RE ACTUALLY PUTTING THE MARGINS ON THE SCREEN, NOT ONTO THE DRAWING ITSELF. — THE DRAWING CAN BE MOVING ALREADY BEFORE IT TAKES A TUMBLE — AND WHATEVER IS BETWEEN THE MARGINS YOU PUT ON THE SCREEN — THAT'S WHAT'S ON YOUR CAN LABEL.

② WIDTH OF CYLINDER? —

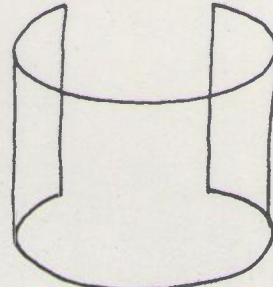
THE WIDTH ON THE SCREEN IN SCREEN MEASUREMENTS — THE CYLINDER WILL BE CENTERED BETWEEN YOUR TWO MARGINS —



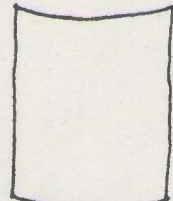
180° WRAP (HALF ROUND)



360° WRAP (ALL THE WAY ROUND)



270° WRAP



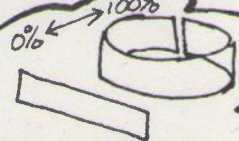
90° WRAP

③ WRAP AROUND THE CYLINDER.

HOW MUCH OF THE CAN DOES THE LABEL COVER? ALL OF IT — HALF OF IT? GIVE AN ANGLE MEASURE.

ANIMATION

THERE'S 2 INDEPENDENT MOVEMENTS.



④ TIP UP?

HOW MUCH THE FRONT OF THE CAN IS TIPPED UP OR DOWN —



NO TIP-UP



25 TIP-UP



50 TIP-UP



200 TIP-UP.

IN SCREEN MEASURE — HOW FAR TO TIP IT FROM STRAIGHT-ON POSITION PLUS TIPS IT UP (RIGHT IN TURN) MINUS TIPS IT DOWN (LEFT IN TURN).

⑤ MOVEMENT FROM FLAT DRAWING ONTO CYLINDER —

— DONE BY %, LIKE CHANGE — 0% = FLAT DRAWING 100% = ON CYLINDER — USE STATIC NUMBER OR A MOVEMENT CONTROL.

⑥ TURN ANGLE —

TO MAKE THE CYLINDER TURN ROUND — JUST LIKE A SPIN — ANY MOVEMENT CONTROL OR A STATIC NUMBER —



0° AND 360°



90°



180°



270°

TWIST.

① VERTICAL OR HORIZONTAL? MARGIN.

THE EXAMPLES ON THIS PAGE ARE VERTICAL.

② SET 2 MARGINS ON THE SCREEN, AND THE TWIST'S AXIS.

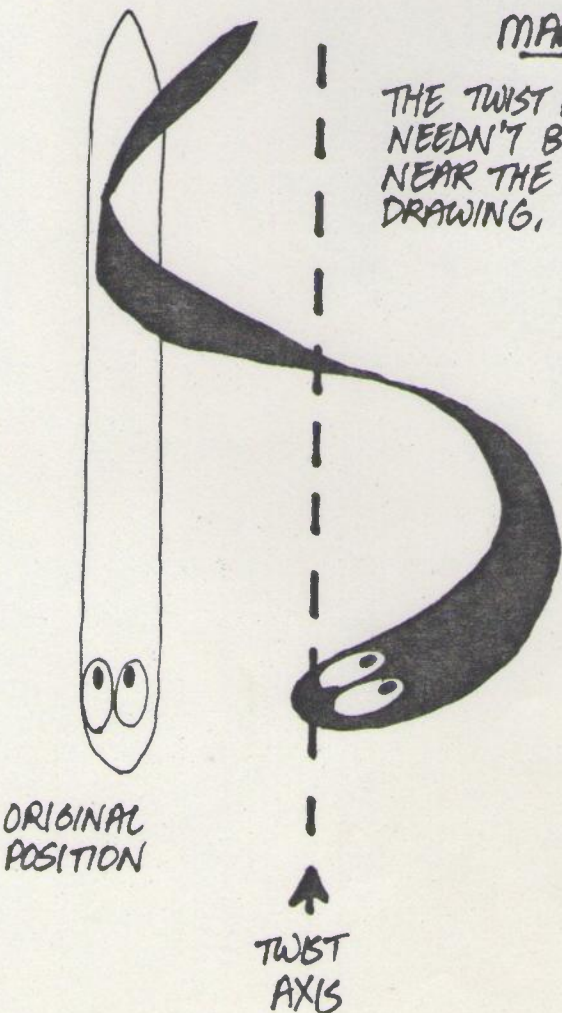
③ TWIST 1ST MARGIN —
TWIST 2ND MARGIN —

THE MARGINS ARE THE HANDLES FOR TWISTING THE IMAGE. THEY ARE QUITE INDEPENDENT — BOTH CAN BE EITHER STATIONARY OR MOVING — THEY'RE CONTROLLED BY ANGLE, JUST LIKE SPIN. TYPE A STATIC ANGLE, OR USE A MOVEMENT CONTROL —

0° = FLAT (AS ORIGINAL)

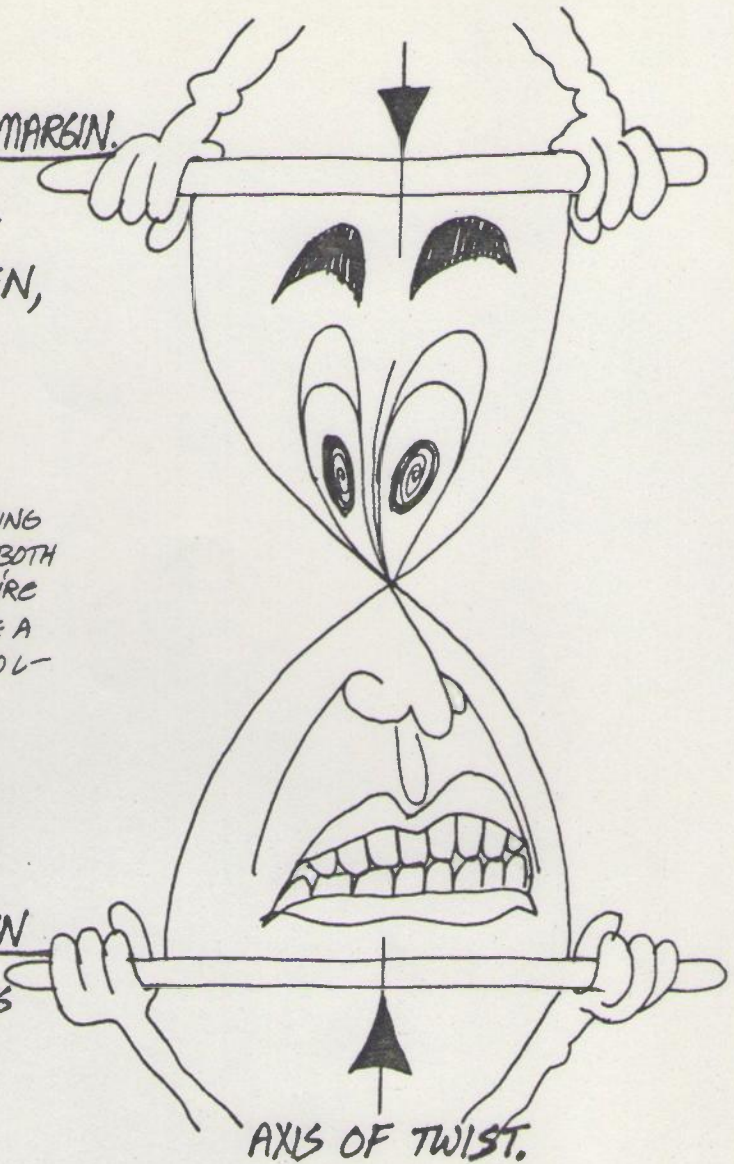
180° = UPSIDE DOWN

$90^\circ, 270^\circ$ = EDGE ON.



MARGIN

THE TWIST AXIS NEEDN'T BE NEAR THE DRAWING.



★ THE PICTURE CAN EVEN EXTEND BEYOND THE MARGINS — AND THE TWIST STILL HAS EFFECT — THE TWIST GOES INDEFINITELY, BOTH WAYS OUT.

★ THE DRAWING CAN BE MOVED BEFORE APPLYING THE TWIST — WHATEVER IS ON THE SCREEN GETS TWISTED INTO SHAPE!

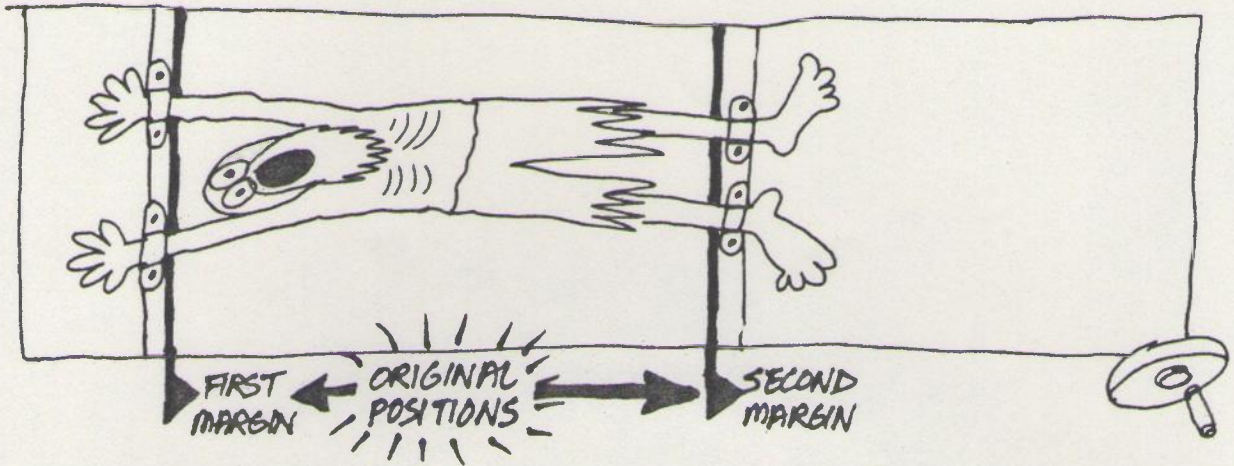
★ THE MARGINS THEMSELVES CAN BE EITHER STATIC OR MOVING.

SQUASH.

① HORIZONTAL OR VERTICAL?...

THE EXAMPLES ON THIS PAGE ARE HORIZONTAL.

② SET 2 MARGINS ON THE SCREEN —



③ FIRST MARGIN — MOVEMENT?...

STATIC, OR USE A MOVEMENT CONTROL — IN THE EXAMPLE, TO START WITH THE ORIGINAL POSITION AND THEN PULL HIM 200 TO THE LEFT, USE A STEADY MOVEMENT FROM 0 TO -200.

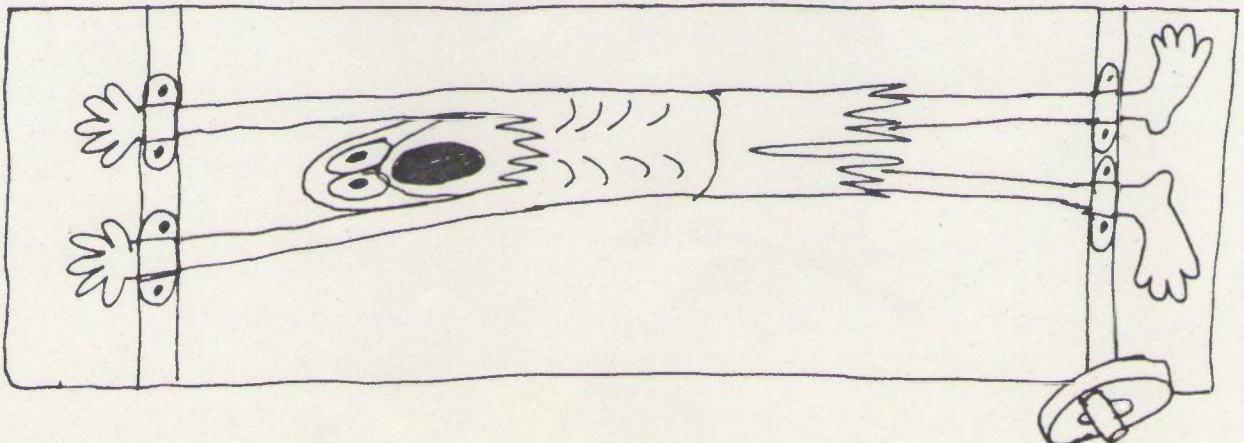
SECOND MARGIN — MOVEMENT?

STATIC, OR USE A MOVEMENT CONTROL — JUST LIKE ON THE FIRST MARGIN, BUT YOU ALSO GET A CHOICE OF WHAT TO MOVE. —

- DISTANCE FROM ORIGINAL POSITION
- OR — DISTANCE FROM THE FIRST MARGIN

HOW IT WORKS.

- ★ WHATEVER IS ON THE TWO ORIGINAL MARGINS WILL FOLLOW WHEREVER THEY GO.
- ★ WHATEVER IS BETWEEN THE MARGINS WILL SQUASH AND STRETCH BETWEEN THEM ANY WAY THEY GO.
- ★ WHATEVERS OUTSIDE THE MARGINS JUST FOLLOWS THE MARGIN ROUND.



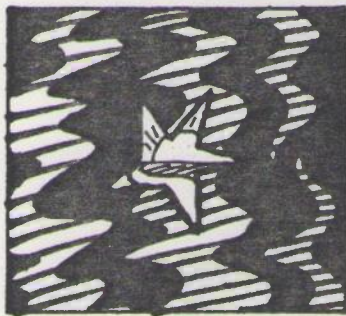
SUPER.

★ IS USED FOR "MATTE" EFFECTS — SUPERIMPOSITIONS — ANY FORM OF "WIPE" FROM ONE SCENE TO ANOTHER.

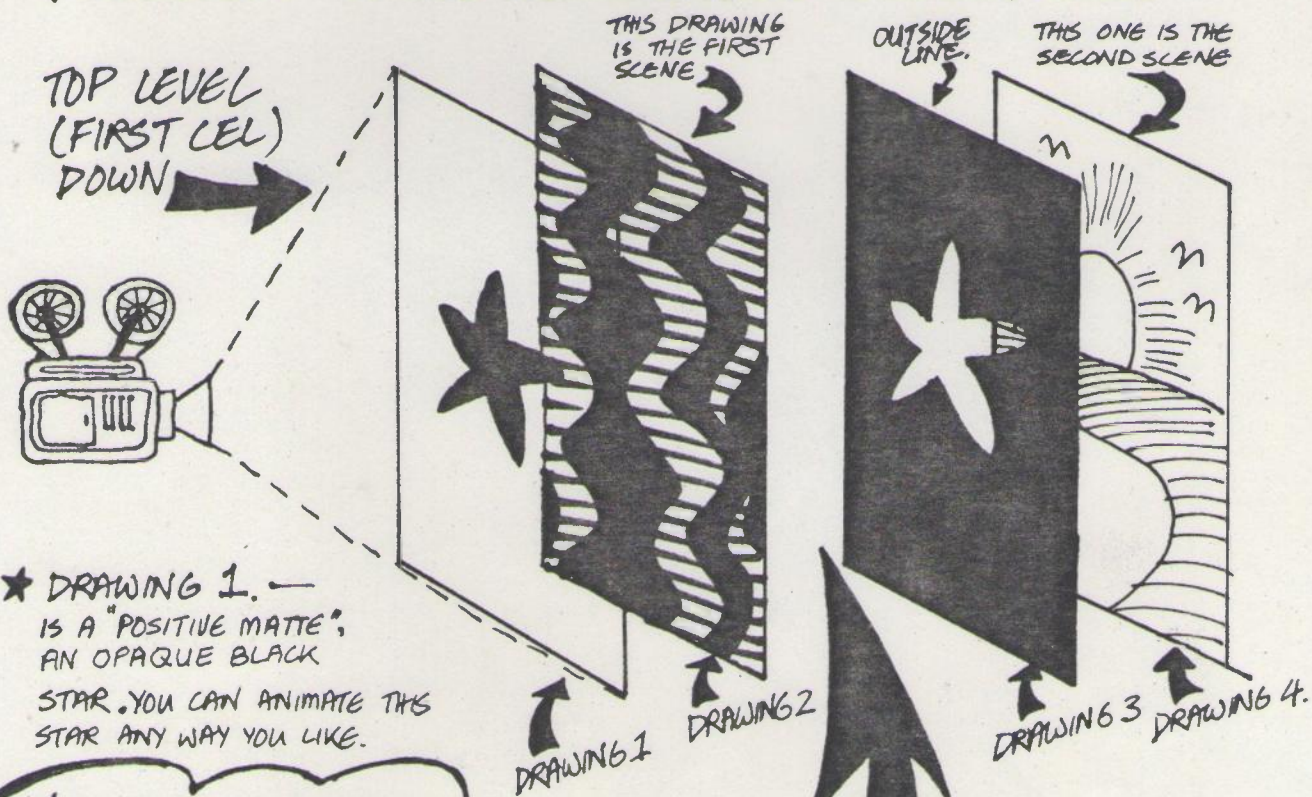
★ IT NEEDS NO INFO OTHER THAN START AND END FRAME.

★ IT IS ALWAYS USED AS A DRAWING EFFECT.

★ THE ONLY THING IS — MAKE SURE YOU PUT SUPER WITH THE RIGHT DRAWING.



F'RINGSTANCE — A "WIPE" FROM ONE SCENE TO ANOTHER.....



★ DRAWING 1. — IS A "POSITIVE MATTE", AN OPAQUE BLACK STAR. YOU CAN ANIMATE THIS STAR ANY WAY YOU LIKE.

★ UNFORTUNATELY THE FIRST MATTE BLOCKS OUT THE SECOND SCENE AS WELL — SO INSERT SUPER ON DRAWING 2.

— THIS SPLITS THE PAINTING PROCESS INTO TWO PARTS, SO THAT TWO SCENES ARE CORRECTLY SUPERIMPOSED.

SUPER
HERE!
= END OF
DRAWING 2

★ DRAWING 3 — AN OPAQUE BLACK CEL — WITH A HOLE IN IT, AN IDENTICAL COPY OF THE BLACK STAR FROM DRAWING 1 BUT WITH AN EXTRA LINE IN IT — THE OUTSIDE LINE.

LIMITS

NORMALLY, FX WORK EITHER WITH CELLS OR WITH WHOLE DRAWINGS — TO GET ANIMATION ON JUST A PART OF A CEL OR PART OF A LINE — ANYTHING DOWN TO A SINGLE POINT, FIRST PUT IN LIMITS...

① LIMITS — ON OR OFF?

PUTTING LIMITS ON MEANS ANY FX FOLLOWING WILL BE APPLIED ONLY TO THE PART OF THE CEL YOU WANT. LIMITS OFF PUTS IT BACK TO NORMAL SO THAT ANY FURTHER FX WILL AGAIN BE APPLIED TO THE WHOLE CEL. YOU CAN THEN PUT LIMITS ON AGAIN IF YOU WANT TO DO SOMETHING ELSE TO ANOTHER PART OF THE CEL.

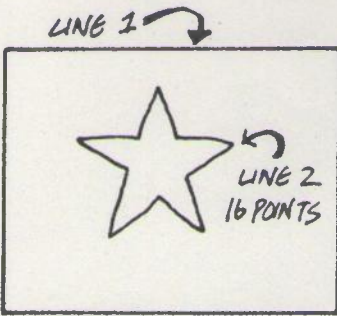
② FIRST POINT — LINE NUMBER, POINT NUMBER.

③ LAST POINT — LINE NUMBER, POINT NUMBER.

ANIMATION WILL NOW BE APPLIED ONLY TO THESE POINTS AND WHATEVERS BETWEEN THEM.

★ TO ANIMATE A SINGLE POINT — FIRST AND LAST POINTS THE SAME.

EXAMPLE —



1 CEL.
2 LINES.

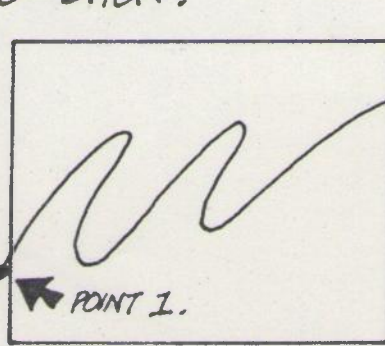


OPAQUE VERSION
— PAINTED BLACK.
THE HOLE IS ACTUALLY
A HOLE!
— CELLS UNDERNEATH WILL
SHOW THROUGH.

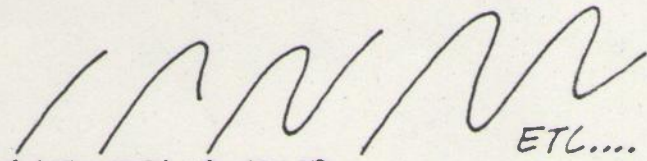
PUT LIMITS LINE 2 pt 1 — ANIMATION WILL NOW WORK
ONLY ON THE STAR SHAPE
NOT ON THE OUTSIDE BORDER.
TO LINE 2 pt 16

④ NORMAL LIMITS — OR SCRAPE-BACK?

NORMAL LIMITS WORKS LIKE THE ABOVE EXAMPLE — THE PARTS OUTSIDE THE LIMITS ARE NOT AFFECTED. WITH SCRAPE-BACK, THE PARTS OUTSIDE THE LIMITS WILL DISAPPEAR COMPLETELY. THIS IS PARTICULARLY USEFUL WITH A "MOVING LIMIT"... WHEN YOU GIVE THE POINT NUMBERS FOR THE LIMITS, INSTEAD OF JUST A SINGLE CONSTANT NUMBER, YOU CAN USE A MOVEMENT CONTROL, SO THE LIMITS CAN RUN UP AND DOWN THE LINES OF THE CEL IN ANY WAY YOU WANT. WITH SCRAPE-BACK, ONLY THE SECTION BETWEEN THE LIMITS WILL APPEAR, SO LINES CAN BE MADE TO GROW, SHRINK, DRAW THEMSELVES AND RUB THEMSELVES OUT AS YOU LIKE —



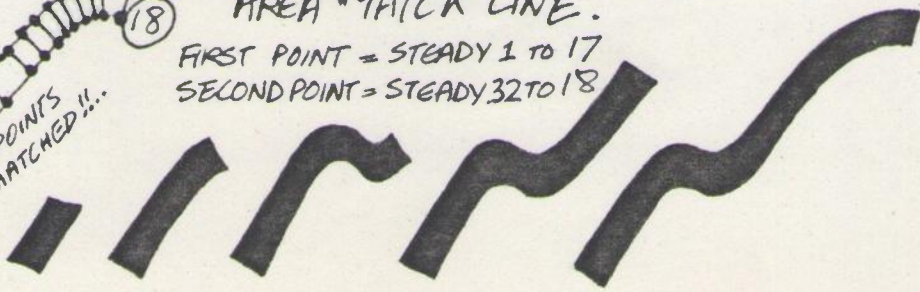
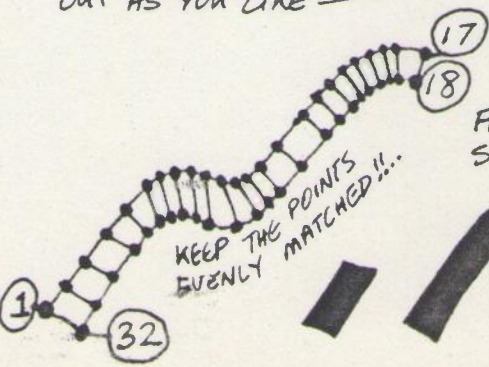
POINT 3/4.
FIRST POINT = 1
SECOND POINT = STEADY
FROM
1 TO 3/4.
GIVES A "SCRAPE-BACK"
EFFECT OF THE LINE
DRAWING ITSELF.



ETC....

SAME EFFECT WITH A SOLID AREA "THICK LINE."

FIRST POINT = STEADY 1 TO 17
SECOND POINT = STEADY 32 TO 18

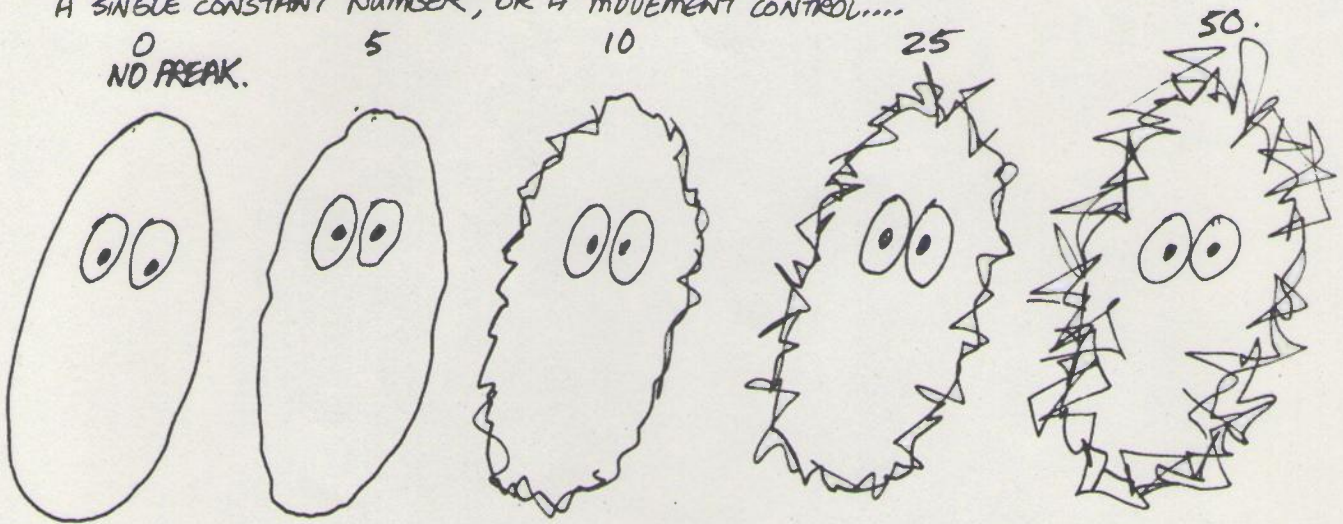


FREAK.

THIS MAKES THE LINES OF THE DRAWING GO WOBBLY OR SPIKEY— IT WORKS BY TAKING THE POINTS IN THE DRAWING AND PUSHING THEM ABOUT IN A RANDOM WAY, BUT IT'S NOT COMPLETELY RANDOM.....

① AMOUNT OF FREAK? SCREEN MEASURE.

A SINGLE CONSTANT NUMBER, OR A MOVEMENT CONTROL.....

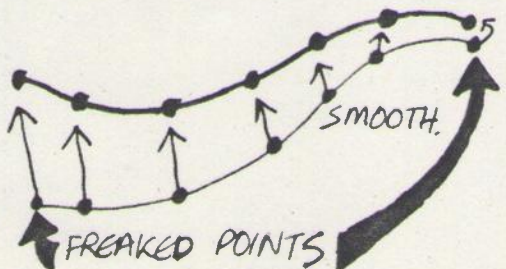
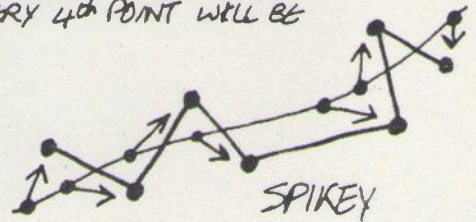
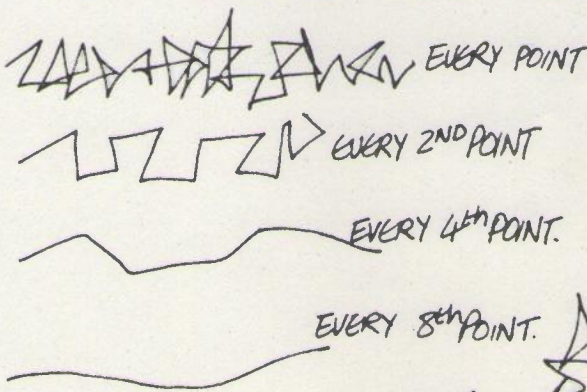


② HOW OFTEN?... FRAMES INTERVAL.

FOR A FLASHING EFFECT, THE FREAK IS DIFFERENT ON EVERY FRAME — THAT'S A "FRAMES INTERVAL" OF 1. FOR A SLOWER EFFECT, YOU CAN HAVE ONE FREAK GRADUALLY CHANGING INTO ANOTHER FREAK, THEN TO ANOTHER, AND SO-ON AT INTERVALS — FOR INSTANCE, TYPE 12 AND THE FREAK WILL CHANGE SMOOTHLY FROM ONE FREAK SHAPE TO ANOTHER — AT THE RATE OF TWO CHANGES PER SECOND.

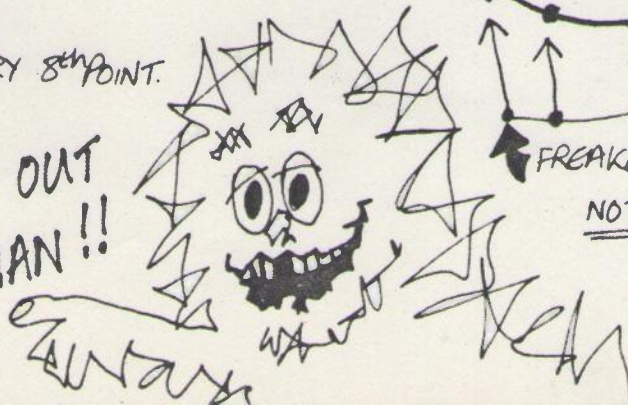
③ SPIKEY FREAK — OR SMOOTH?

FREAK WORKS BY PUSHING ALL THE DRAWING POINTS IN RANDOM DIRECTIONS — WHEN EVERY POINT IS BEING FREAKED, THE EFFECT IS VERY SPIKEY — FOR A SMOOTH FREAK, TYPE A NUMBER — IF YOU TYPE 4, THEN ONLY EVERY 4th POINT WILL BE FREAKED — THE POINTS IN BETWEEN WILL FOLLOW SMOOTHLY.



NOTE THE IN BETWEEN
= FREAKED POINTS!

FREAK OUT
MAN!!



MASK.

ALL OPAQUE CELS COVER WHATEVER'S ON THE CELS UNDERNEATH SO A BLACK CEL LIKE THIS COVERS EVERYTHING



SOMETIMES YOU MIGHT WANT TO MASK SOMETHING OFF, BUT WITHOUT ALSO MASKING OFF ANYTHING IN THE BACKGROUND - THIS IS WHAT MASK DOES - MASK APPLIES ONLY TO THE DRAWING OR CEL YOU PUT IT ON.

F' R INSTANCE

- ★ THE ROW OF PIGGIES ARE DOING A PAN INTO THE SOSSIJ MACHINE.
- ★ THE WHEEL IS SPANNING
- ★ AND THE SAUSAGES ARE FOLLOWING A PATH.

THE MACHINE IS DRAWING I SO IT COVERS THE PIGGIES AND SAUSAGES

DON'T FORGET TO MASK THE SAUSAGES AS WELL



BUT !!

UNLESS YOU MASK THEM OFF AT THIS LINE

THE PIGS WILL REAPPEAR HERE

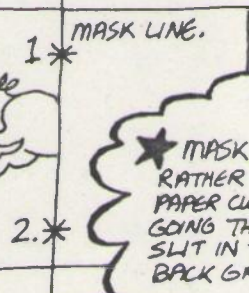
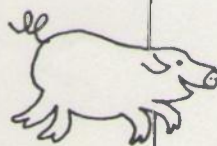
WITH MASK YOU PUT A LINE ACROSS THE SCREEN AND ANYTHING IN THE CEL OR DRAWING THAT GOES OVER THE LINE GETS CHOPPED OFF !!

- ★ THE MASK LINE CAN BE ANYWHERE - YOU GIVE -

① FIRST POINT E/W, N/S.

② SECOND POINT E/W, N/S.

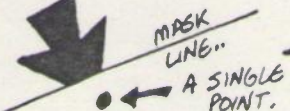
THIS TELLS THE MACHINE WHERE THE MASK GOES - THE MASK LINE CAN ALSO MOVE, COS YOU CAN USE A MOVEMENT CONTROL INSTEAD OF A SINGLE CONSTANT NUMBER FOR THE E/W, N/S POSITIONS.



★ MASK IS RATHER LIKE PAPER CUT-OUTS GOING THROUGH A SLIT IN THE BACK GROUND.

③ WHICH SIDE OF THE LINE GETS MASKED OFF ?

GIVE A THIRD POINT ON THE SIDE YOU WANT MASKED OFF - THE POINT CAN BE ANYWHERE YOU LIKE, ALL THAT MATTERS IS WHICH SIDE OF THE MASK LINE IT'S ON - THAT'S THE SIDE THAT WILL BE CHOPPED OFF.



NOTE - IF THERE'S ONLY ONE POINT BEING CHOPPED OFF, IT SOMETIMES MAY GET STRANGELY BENT - IF YOU HAVE THIS TROUBLE - JUST INSERT AN EXTRA POINT.

LEVELS.

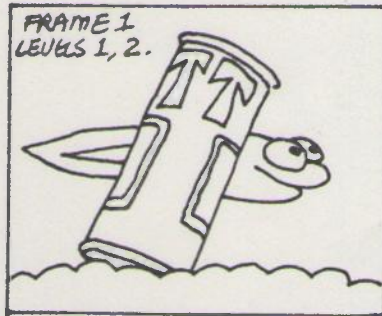
NORMALLY, PAINTING IS DONE STARTING WITH THE FIRST CEL OF DRAWING 1 AS THE TOP LEVEL, AND WORKING DOWNWARDS — YOU CAN CHANGE THIS RULE BY USING LEVELS — IN EITHER OF TWO WAYS — MANUAL OR AUTOMATIC.

MANUAL.

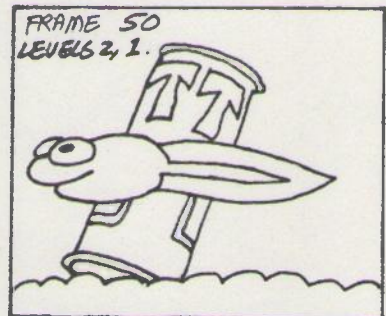
THIS WORKS IN PHASES —

- ① FRAME NUMBER?....
- ② LEVELS?....

TYPE THE CEL NUMBERS IN THE ORDER YOU WANT THEM, TOP LEVEL DOWNWARDS. THE LEVELS WILL STAY IN THIS ORDER UNTIL CHANGED AT ANOTHER FRAME.



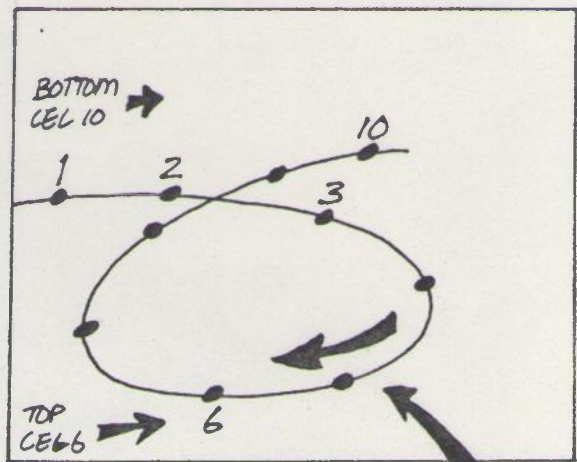
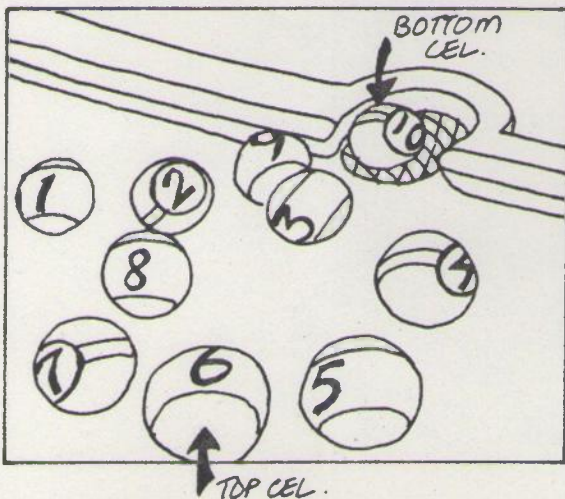
BEHIND



IN FRONT.

AUTOMATIC.

THIS WORKS BY USING A "SKELETON CEL".



SKELETON CEL HAS JUST A SINGLE POINT FOR EACH OF THE OTHER CELS.

★ IN THIS EXAMPLE THE POINTS OF THE SKELETON CEL ARE MOVING ALONG THE LINE — USING PATH — BUT ANY FX CAN BE USED OF COURSE.

★ THE OTHER CELS ARE ALL DOING A FOLLOW ON THEIR RESPECTIVE SKELETON POINTS.

★ LEVELS FOR THE WHOLE DRAWING — CHOOSE "SKELETON CEL" — AND SAY —

- ① WHICH CEL IS SKELETON?..
- ② GO BY HEIGHT OR WIDTH?..

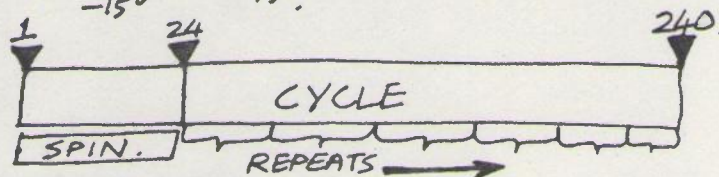
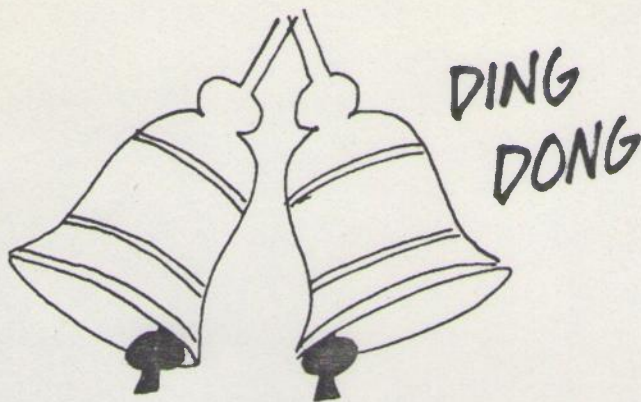
IN THIS EXAMPLE IT'S THE HEIGHT — 6 IS AT THE BOTTOM OF SCREEN, WILL BE TOP CEL — 10 IS HIGHEST WILL BE BOTTOM LEVEL.

IF YOU CHOOSE WIDTH, TOP LEVEL IS AT THE RIGHT, AND THE BOTTOM LEVEL AT THE LEFT.

CYCLE.

IS USED TO REPEAT A SECTION OF ANIMATION —

FOR INSTANCE — ONE CYCLE OF THE BELL RINGING IS A SPIN GOING FROM 30° TO -30° AND BACK AGAIN (DOUBLE MOVEMENT) — THE CLAPPER IS ALSO DOING A SPIN, BUT ONLY 150° EITHER WAY. ONE CYCLE IS 24 FRAMES. — TO MAKE IT REPEAT FOR 240 FRAMES, USE CYCLE LIKE THIS —



① CYCLE ON.

② START FRAME = 1

③ END FRAME = 240

④ END FRAME OF SECTION TO BE CYCLED = 24.

★ CYCLE APPLIES ONLY TO THE FX FOLLOWING IT — YOU PUT "CYCLE ON" BEFORE THE ANIMATION TO BE CYCLED. FX THAT COME BEFORE CYCLE ARE DONE NORMALLY, SO YOU CAN COMBINE CYCLED FX WITH NON-CYCLED ONES.

★ YOU CAN ALSO PUT "CYCLE OFF" — THIS CANCELS THE CYCLE — SO ANY FOLLOWING FX ARE DONE NORMALLY.

★ MOVEMENT CONTROLS USED IN A CYCLE — NORMALLY MOVEMENT CONTROLS ARE CYCLED AS WELL AS FX — BUT IF THE END FRAME OF THE CONTROL IS AFTER THE END FRAME OF THE CYCLE, IT WON'T BE CYCLED.

⑤ CYCLE — NORMAL — SKELETON FADE IN/FADE OUT.

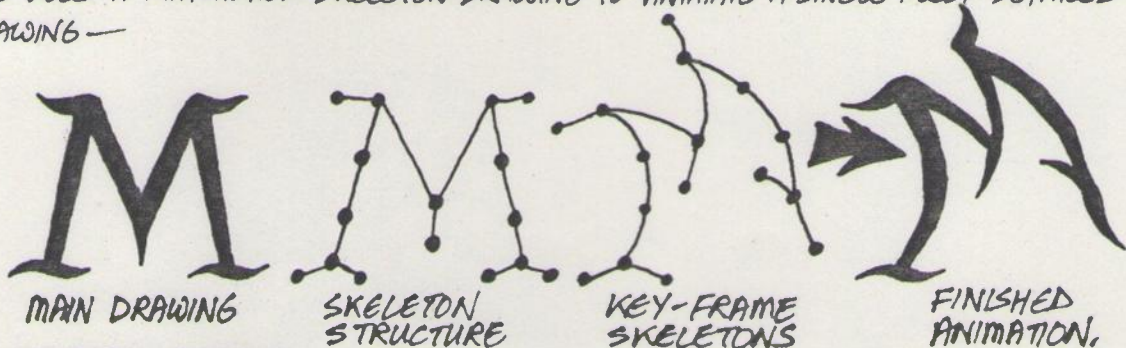
THERE IS A FACILITY IN CYCLE SPECIALLY FOR USE WITH SKELETON ANIMATION, SEE SKELETON DETAILS.

CARTOON ANIMATION PROGRAM—

THIS IS EXACTLY THE SAME AS THE GRAPHICS PROGRAM, PLUS IT'S ALSO GOT 3 EXTRA EFFECTS IN IT — SKELLY, MIRROR AND SPACE.

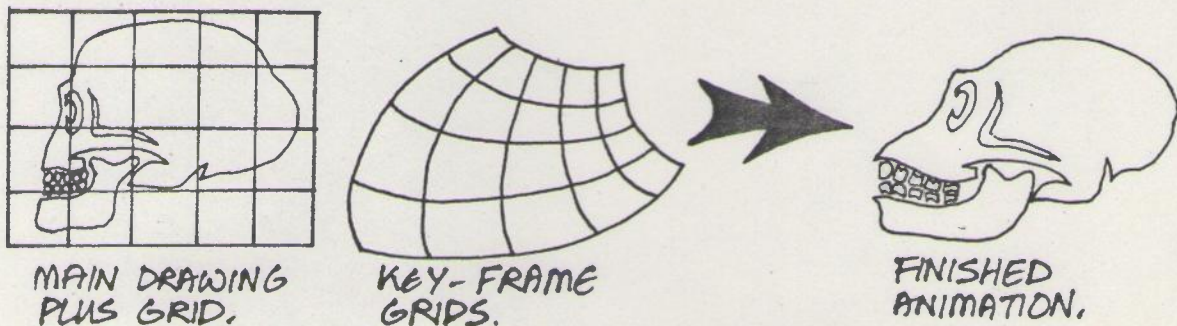
★ SKELLY.

THIS USES A MATCHSTICK SKELETON DRAWING TO ANIMATE A SINGLE FULLY-DETAILED DRAWING —



★ SKELETON GRIDS.

SIMILAR TO SKELETONS, EXCEPT USING AN OVERALL GRID INSTEAD OF A STRUCTURAL SKELETON.... SKELETONS AND GRIDS CAN BE COMBINED — I.E YOU CAN HAVE A STRUCTURE THAT IS PART SKELETON AND PART GRID.

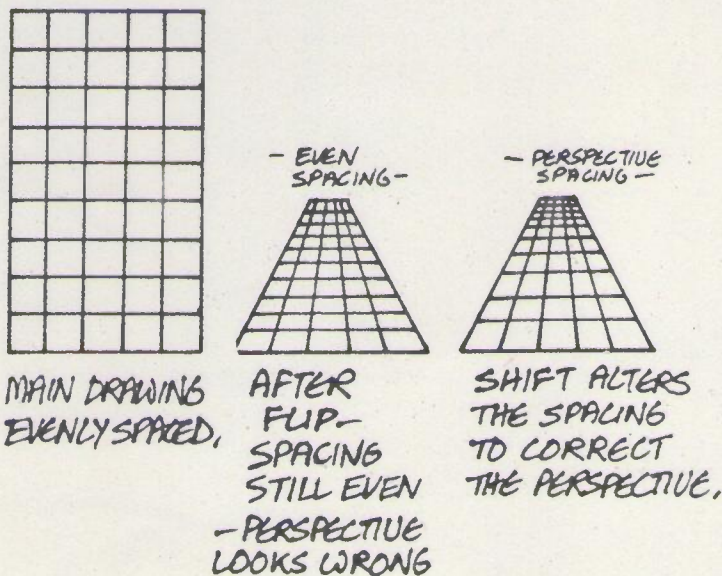


★ MIRROR.



MAKES A MIRROR IMAGE REFLECTION OF A CEL — REFLECTED AT A LINE ACROSS THE SCREEN — THIS LINE IS INVISIBLE, AND CAN MOVE IN ANY WAY. MIRROR CAN BE REPEATED TO MAKE A KALIEDOSCOPIC EFFECT.

★ SPACE. — ALTERS THE SPACING ACROSS A DRAWING, BETWEEN 2 MARGINS, TO SIMULATE PERSPECTIVE SPACING ~



MAIN DRAWING EVENLY SPACED.

AFTER FLIP-SPACING STILL EVEN — PERSPECTIVE LOOKS WRONG

SHIFT ALTERS THE SPACING TO CORRECT THE PERSPECTIVE.

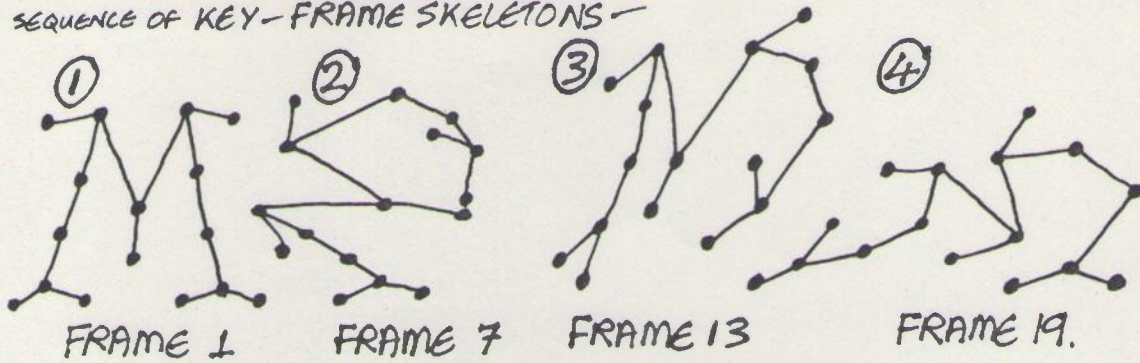
★ NOTE — THESE FX WORK ONLY IN THE CARTOON PRG, IF YOU TRY TO USE EM WITH GRAPHICS THE PROGRAM WILL

CRASH

AAAAARRRGGH!!!
* @ !! * @ * * *

SKELETON ANIMATION.

THE MAIN DRAWING IS ANIMATED BY DRAWING A SEQUENCE OF KEY-FRAME SKELETONS —



USE THE EFFECT SKELLY — THE INFO GOES LIKE THIS —

① START FRAME, END FRAME — AS USUAL.

② DRAW NEW SKELETONS.... HIT RETURN.

DRAW EACH SKELETON, IN THE USUAL WAY, POINT BY POINT, — THEY MUST BE IN THE SAME ORDER AS THE ORIGINAL SKELETON. AS A REMINDER, YOU GET THE ORIGINAL DRAWN UP IN THE TOP RIGHT CORNER OF THE SCREEN WITH THE POINTS NUMBERED. THE MACHINE WILL CONNECT THE POINTS IN THE SAME WAY AS THE ORIGINAL, SO YOU JUST DO THE POINTS — NO "END OF LINE" BUSINESS NEEDED. THE TABLET FACILITIES YOU CAN USE ARE RUB OUT LAST POINT, GEOMETRIC AND REDRAW. — IF YOU MESS UP A SKELETON, REDRAW THE WHOLE THING — IT ONLY TAKES A FEW SECONDS.

★ NOTE —

IT'S NOT NECESSARY TO BE SUPER-ACCURATE DRAWING SKELETONS — THE DRAWING WILL SQUASH AND STRETCH TO FOLLOW ANY VARIATION IN LENGTH OF LIMBS!!!...

③ YOU'VE GOT IF SKELLIES — WHAT FRAME — WHAT SKEL?...

THIS IS THE OLD PHASES ROUTINE — MAKE A LIST OF KEY-FRAME NUMBERS AND RESPECTIVE SKELETONS — YOU CAN USE THE SAME SKELETON AS OFTEN AS YOU LIKE, OR NOT AT ALL. THE PROGRAM WILL HOLD UP TO 64 SKELETONS.

★ NOTE ~

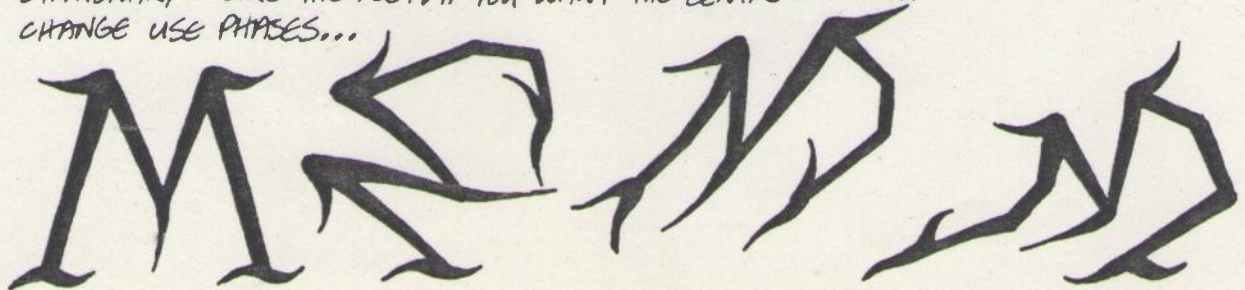
DON'T HAVE ANY LIMB TURNING MORE THAN 180° ROUND BETWEEN TWO KEY POSITIONS — THE MACHINE ALWAYS TAKES THEM THE SHORTEST WAY ROUND TO THE NEW POSITION...

④ MOVEMENT —

STEADY, CUSHIONED, JUMP CUT OR WITH EXTREMES — AS IN PHASES.

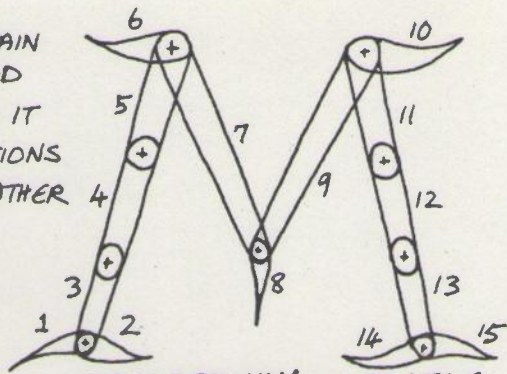
⑤ WHICH POINT IS CENTRE OF ACTION...?

SKELETONS ARE INBETWEENED DIFFERENTLY FROM CHANGE INBETWEENING — THE LIMBS ROTATE AROUND EACH OTHER AND THIS IS WHAT GIVES SKELETON ANIMATION ITS SMOOTH FLOW. ALL EXCEPT FOR ONE POINT, THE POINT FROM WHICH THE ACTION STARTS — THIS POINT IS CALLED THE CENTRE OF ACTION — TYPE WHICH POINT. IT WOULD NORMALLY EITHER BE IN THE MIDDLE OF THE SKELETON, OR ELSE AT ANY POINT THAT'S STATIONARY — LIKE THE FOOT. IF YOU WANT THE CENTRE OF ACTION TO CHANGE USE PHASES...



PREPARING A SKELETON DRAWING.

THE ESSENTIAL THING WITH SKELETON IS TO DO THE MAIN DRAWING PROPERLY — ALL THE ANIMATION IS PRODUCED FROM THIS ONE DRAWING, SO TAKE YOUR TIME, DO IT CAREFULLY. THE DRAWING MUST BE DONE IN SECTIONS — ONE PART FOR EACH LIMB OF THE SKELETON — RATHER LIKE A HINGED CARDBOARD PUPPET....



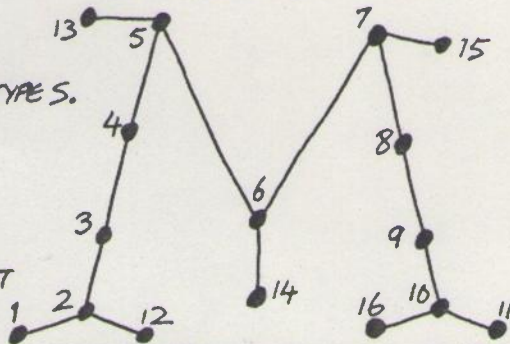
MAIN DRAWING — 15 CELLS.
ONE FOR EACH LIMB —

- ① FIRST DO YOUR MAIN DRAWING IN THE NORMAL WAY, BUT WITH EACH LIMB MADE UP OF ONE OR MORE SEPARATE CELLS. YOU CAN ALSO HAVE INVISIBLE LIMBS — IE LIMBS WITHOUT ANY CELLS HANGING ON THEM.

- ② SKELETON/GRID? Y OR N... ANSWER YES.
SKELETON, GRID OR BOTH? TYPE S, G OR B... TYPE S.
TABLET OR CROSSHAIRS?... TYPE T OR C.

- ③ DRAW THE SKELETON, POINT BY POINT...

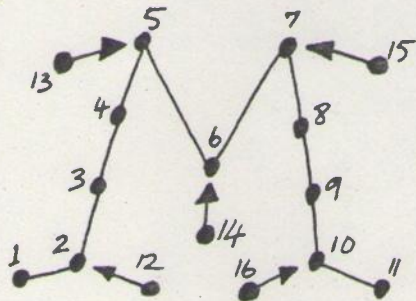
- USE "END OF LINE" TO END A CHAIN OF POINTS.
- START EACH NEW CHAIN FROM AN EXISTING POINT
- FINISH WITH "END OF DRAWING".



SKELETON DRAWING — 16 POINTS.

FRINSTANCE

- ★ THE FIRST ELEVEN POINTS ARE ALL IN A CHAIN...



- ★ POINT 12 ATTACHES TO POINT 2, SO AFTER POINT 11 DO "END OF LINE" — THE MACHINE ASKS "START FROM WHAT POINT" — TYPE 2, AND CARRY ON — NEXT POINT WILL BE JOINED WITH POINT 2.

- ★ NOTE — APART FROM END OF LINE AND END OF DRAWING THE ONLY TABLET INSTRUCTIONS YOU CAN USE ARE RUB OUT LAST POINT

GEOMETRIC DRAWING
USE CROSSHAIRS

AND REDRAW ALL/SOMETHING

TOUCHING ANY OTHER ONE WILL
JUST GIVE YOU A REDRAW.

- ④ WHICH CELLS FIT WHICH LIMBS — ?

FOR EACH CEL, TYPE 2 POINT NUMBERS — FRINSTANCE, CEL 1 FITS ON POINTS 1 AND 2, SO TYPE: 1 2 (WITH A SPACE IN BETWEEN OF COURSE, OR ELSE THE MACHINE THINKS YOU MEAN TWELVE). WHEN ASKING FOR THIS INFO, THE MACHINE DRAWS UP ALL THE CELS, NUMBERED, AND IT ALSO DRAWS UP THE SKELETON WITH POINTS NUMBERED, SO IT'S QUITE EASY TO SEE WHAT GOES WHERE. IF YOU PUT THE SAME POINT TWICE — LIKE " 2 2" — THE CEL WILL FOLLOW THAT POINT STRAIGHT, WITHOUT TURNING OR CHANGING SHAPE.

- ⑤ IF YOU'RE USING A SHADOW EDGE IN YOUR PAINTING — YOU CAN MAKE CELS MERGE TOGETHER WITHOUT A VISIBLE JOIN — SEE MERGING CELS. THIS IS ONLY NEEDED WHEN USING A SHADOW EDGE — NORMALLY CELS ALWAYS MERGE INVISIBLY ANYWAY.

GRIDS.

THE SKELETON EFFECT ALSO INCLUDES THE USE OF SKELETON GRIDS—IT'S THE ULTIMATE IN DISTORTION EFFECTS SINCE YOU CAN MAKE ANY KIND OF DISTORTION YOU LIKE—THE INBETWEENING IS DONE IN THE SAME WAY AS SKELETON, SO YOU HAVE THE SAME POSSIBILITY TO PRODUCE GOOD QUALITY ANIMATION MOVEMENTS.

★ PREPARING THE DRAWING.

THE DRAWING ITSELF NEEDS NO SPECIAL PREPARATION—WHEN THE DRAWING IS COMPLETE, YOU DRAW THE GRID—POINT BY POINT, JUST LIKE SKELETON, THIS MUST BE DONE SYSTEMATICALLY—

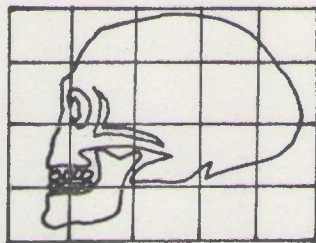
—ROW BY ROW, ALWAYS GOING THE SAME DIRECTION ALONG THE ROWS.

BEFORE YOU START THE MACHINE ASKS—HOW MANY ROWS?..

HOW MANY COLUMNS?..



MAIN DRAWING



MAIN DRAWING + GRID.

5 ROWS AND 6 COLUMNS.

★ ANIMATION.

SAME AS WITH SKELETONS—USE THE EFFECT SKELLY TO DRAW A SEQUENCE OF KEY-FRAME GRIDS. AGAIN, THE MACHINE ASSUMES THEY ALL CORRESPOND POINT-FOR-POINT WITH THE ORIGINAL GRID—JUST DRAW THE POINTS.

★ RECTANGULAR GRIDS—Y OR N?

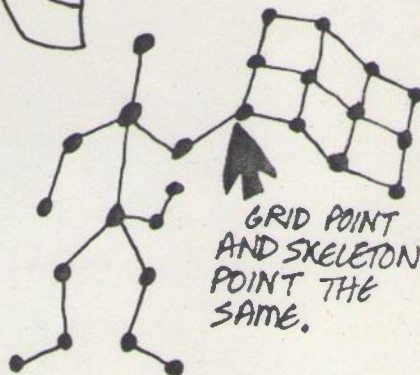
IF YOU WANT AN ACCURATELY DRAWN RECTANGULAR GRID, WITH POINTS EVENLY SPACED, ANSWER YES—AND JUST GIVE TWO OPPOSITE CORNER POINTS—THE MACHINE FILLS IN THE REST.

★ COMBINED SKELETON AND GRID

CHOOSE "BOTH"—WHEN THE SKELETON HAS BEEN DRAWN, CARRY ON TO DRAW THE GRID.

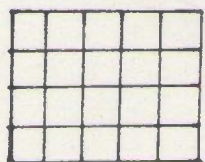
—THIS MUST HAVE AT LEAST ONE POINT THE SAME AS ONE OF THE SKELETON POINTS—

—WHEN YOU'VE FINISHED, THE MACHINE WILL ASK WHICH GRID POINT IS TO BE LINKED TO WHICH SKELETON POINT. IF YOU WISH, YOU CAN HAVE FURTHER POINTS LINKED IN THE SAME WAY. WHEN ANIMATING, JUST DRAW ALL THE POINTS IN THE SAME ORDER AS USUAL. WHEN GIVING THE INFO FOR "WHICH CELLS FIT WHICH LIMBS"—JUST HIT RETURN FOR THE CELLS THAT GO IN THE GRID, AND GIVE NUMBERS FOR THE CELLS THAT FIT THE SKELETON.



★ ORDINARY CELS AS SKELETONS OR GRIDS.

YOU CAN USE A CEL IN THE DRAWING AS THE SKELETON OR GRID FOR ANIMATING—THIS MEANS YOU CAN APPLY ANY OF THE ORDINARY CEL FX TO IT. F'R INSTANCE—



CEL 1



CEL 2



CEL 3.

THE COMPUTER PREDICTS—
RESULT → THE SHAPE OF MAN TO COME!!!

CEL 1 AND CEL 2 ARE TWO GRIDS—
—CEL 3 IS THE SKULL DRAWING (THESE DRAWINGS ARE BASED ON THE DRAWINGS BY THE BIOLOGIST DARCY THOMPSON IN HIS BOOK "ORIGIN AND GROWTH OF FORMS"). USING SKELLY, INSTEAD OF DRAWING NEW GRIDS, USE THE INSTRUCTION USE A CEL IN THE DRAWING—AND TYPE 1. WE THEN GIVE CEL 1 A CHANGE TO CEL 2—AND CARRY IT ON TO 160% CHANGE—THE RESULT—THE COMPUTER'S PREDICTION OF MAN TO COME—ALL BRAIN AND NO FACE!!!...

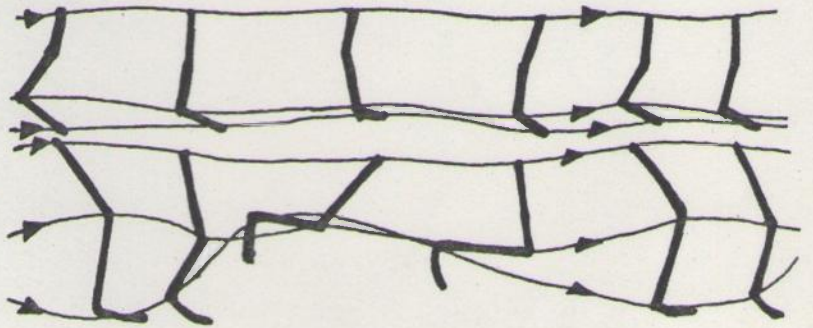
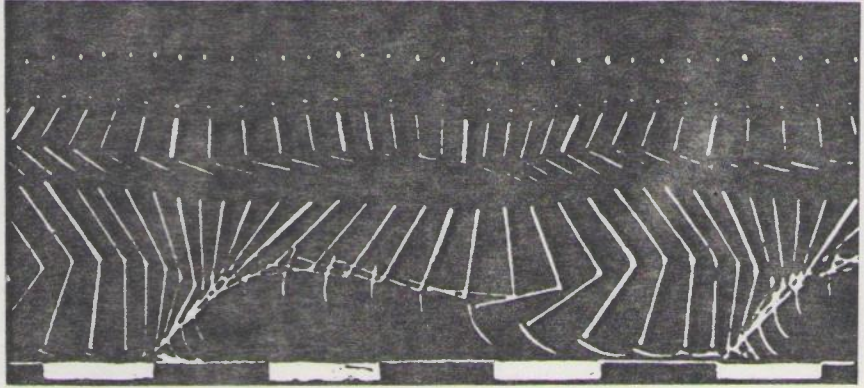
USING SKELLY + GRID.

IT TAKES ONLY A FEW SECONDS TO DRAW A SKELETON, SO YOU CAN HAVE AS MANY AS YOU WANT.... A GOOD AVERAGE IS 3 OR 4 PER SECOND - MORE FOR QUICK ACTIONS. THIS MEANS THE QUALITY OF THE ANIMATION CAN BE AS GOOD AS THE BEST HAND ANIMATION - IT'S LIMITED ONLY BY YOUR SKILL. A POINT OFTEN OVERLOOKED - YOU CAN'T MAKE GOOD ANIMATED FILMS UNLESS YOU'RE A GOOD ANIMATOR - IT MAKES NO DIFFERENCE WHAT EQUIPMENT YOU USE, NO MACHINE CAN MAKE UP FOR LACK OF CREATIVE SKILL!!.. ANTICS IS THE IDEAL ANIMATION TEACHING MACHINE - THE IMMEDIATE PLAYBACK OF RESULTS MAKES IT THE QUICKEST AND EASIEST WAY FOR ANYONE TO LEARN THE ART OF ANIMATION.....

★ NATURAL FLOW OF MOVEMENT.

NATURALISTIC MOVEMENT IS NOT THE ONLY WAY OF ANIMATING - BUT IF YOU CAN MASTER THIS, YOU HAVE MASTERED THE MOST FUNDAMENTAL SKILL OF ANIMATION AND WHATEVER YOU DO AFTER THAT IS UP TO YOU!...

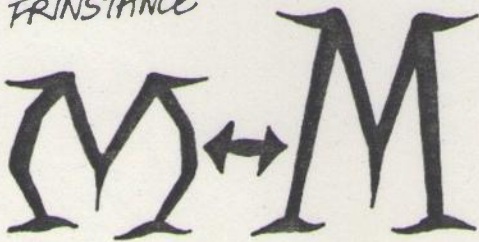
THIS PIC IS A MULTIPLE EXPOSURE PHOTO OF A MAN RUNNING, WEARING BLACK CLOTHING AND WHITE STRIPES (MADE BY ETIENNE-JULES MAREY IN 1882). NOTICE THE SMOOTH LINES OF FLOW THROUGH THE MOVEMENT - THESE MAKE UP A KIND OF MOVEMENT ENVELOPE - WHEN YOU DRAW A SERIES OF KEY SKELETONS, THIS IS WHAT YOU ARE CREATING.



★ DON'T FORGET - YOU CAN ALSO USE CHANGE SIMULTANEOUSLY WITH SKELLY - THE WHOLE DRAWING (OR ANY OF THE CELLS) CAN BE DOING A CHANGE - FOR INSTANCE, FRONT VIEW TO SIDE VIEW, AS WELL AS DOING SKELETON ANIMATION - BUT PUT THE CHANGE BEFORE THE SKELLY..

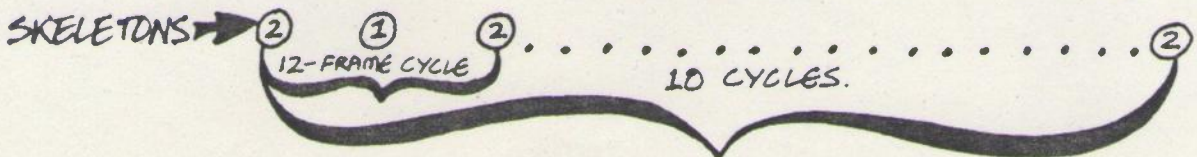
★ THERE'S ALSO - A SPECIAL FACILITY IN CYCLE FOR USE WITH SKELETONS.

FOR INSTANCE



SUPPOSE HE'S BOUNCING UP AND DOWN 1, 2, 1, 2, 1, 2 ETC... - YOU CAN USE CYCLE FOR THIS - BUT SUPPOSE YOU WANT THE BOUNCES TO GET SMALLER TILL HE JUST ENDS UP ON POSITION 2 AFTER 10 CYCLES.... USE CYCLE, AND CHOOSE THE FACILITY "SKELETON-FADE OUT" - THAT MAKES THE CYCLED MOVEMENT GET GRADUALLY SMALLER AND SMALLER. "SKELETON-FADE IN" DOES THE REVERSE.

FRAMES → 1 3 5 7 9 11 13 121



CYCLE START FRAME = 2 END FRAME = 121
END OF CYCLED BIT = 13 SKELETON FADE OUT.

THE ILLUSTRATIONS ON THIS PAGE ARE FROM PRESTON BUAIRS BOOK "ANIMATION" PUBLISHED BY WALTER T. FOSTER, 430 WEST SIXTH STREET, TUSTIN, CALIFORNIA 92680 — THIS BOOK IS THE ANIMATORS BIBLE — ESSENTIAL READING FOR ANYONE WANTING TO LEARN THE ART OF ANIMATION — YOU WILL FIND IT IN MOST GOOD ART SHOPS.

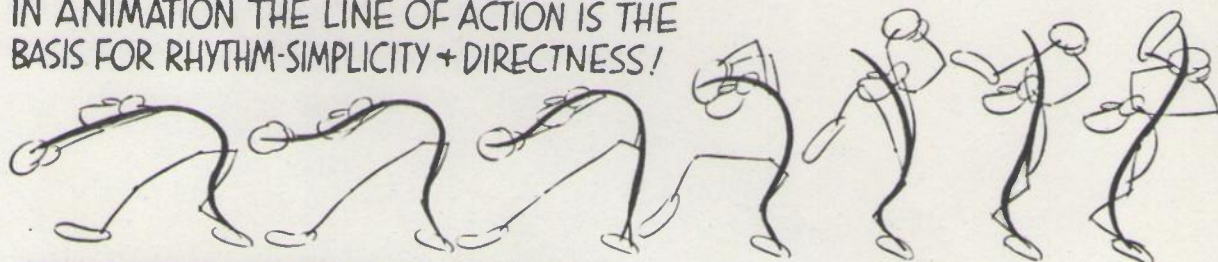
LINE OF ACTION

AN IMAGINARY LINE EXTENDING THRU THE MAIN ACTION OF THE FIGURE IS THE "LINE OF ACTION" -- PLAN YOUR FIGURE AND IT'S DETAILS TO ACCENTUATE THIS LINE -- BY SO DOING YOU STRENGTHEN THE DRAMATIC EFFECT -- THE FIRST THING TO DRAW WHEN CONSTRUCTING A FIGURE IS THE LINE OF ACTION -- THEN BUILD OVER THAT.



WRONG! LINES OF ACTION UNFIT --- RIGHT! LINES OF ACTION FIT AND ARE ACCENTUATED

IN ANIMATION THE LINE OF ACTION IS THE BASIS FOR RHYTHM-SIMPLICITY + DIRECTNESS!

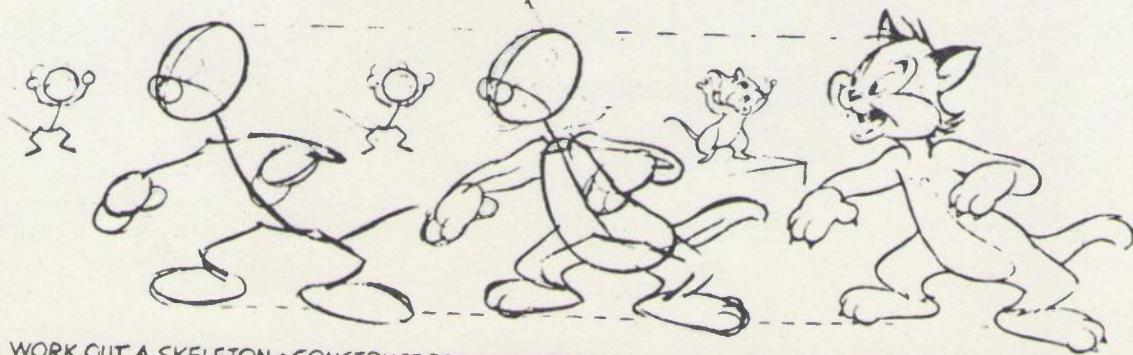


START YOUR ANIMATION FIRST WITH A LINE OF ACTION-THEN A SKELETON+DETAILS



THE SKELETON FOUNDATION

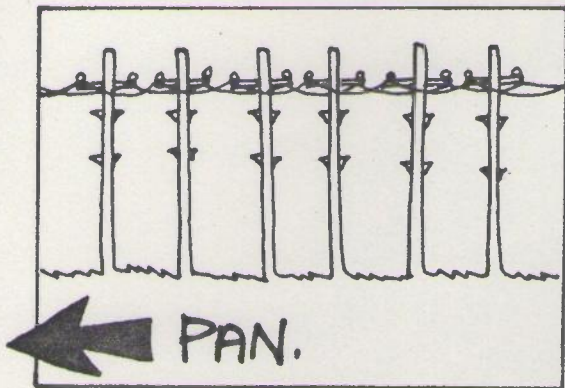
BUILD THE CARTOON UP FROM A ROUGH SKELETON -- DON'T EXPECT TO GET THE RIGHT SKELETON THE FIRST TRY ALWAYS -- NO ONE CAN DO THAT -- EXPERIMENT-DISCARD-MAKE SEVERAL THEN PICK THE BEST ONE -- BE SURE TO WORK LOOSE IN CONSTRUCTING THE CHARACTER.



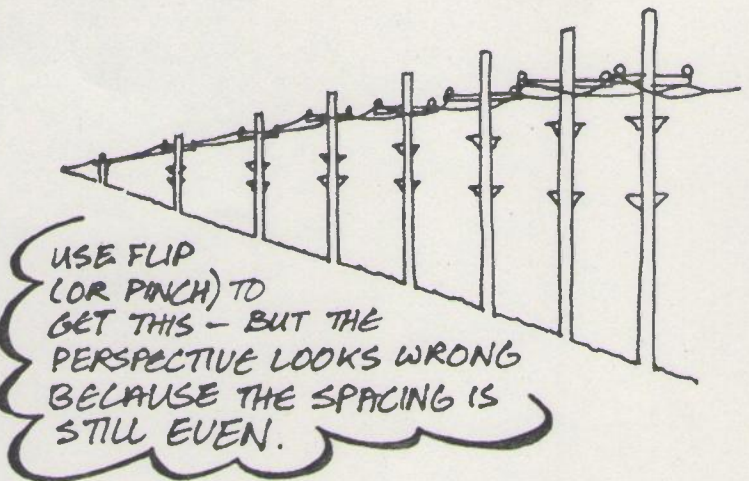
WORK OUT A SKELETON-CONSTRUCT BODY MASSES AROUND IT-THEN BUILD DETAILS OVER THIS

SPACE.

THIS IS USED WHEN YOU WANT AN EFFECT LIKE MOVING OVER A LANDSCAPE IN PERSPECTIVE - OR ALONG A WALL - OR UNDER A CEILING - ETC.... START WITH A SIMPLE FLAT VIEW AS THE BASIC DRAWING.



FLAT VIEW - CAN BE MOVED WITH PAN



SO ADD SPACE TO END UP WITH THIS

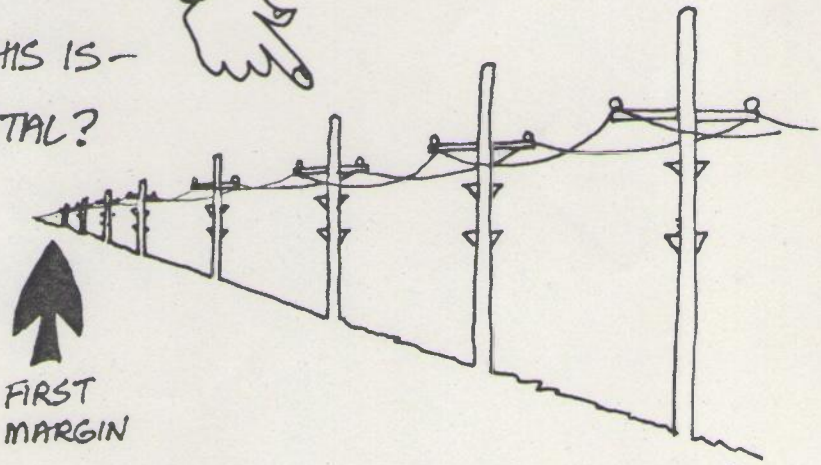
THE INFO YOU NEED FOR THIS IS -

① VERTICAL OR HORIZONTAL?

THE EXAMPLE IS HORIZONTAL.

② SET TWO MARGINS.

THE RESPACING HAPPENS BETWEEN THE MARGINS - ANYTHING OUTSIDE IS LEFT ALONE.



③ HOW MUCH RESPACING - PERCENT?..

- ZERO = NO DIFFERENCE
- 50% = ABOUT AVERAGE
- 90% = VERY EXTREME.

★ NOTE - ORDINARY (POSITIVE) NUMBERS SHIFT THE SPACING TOWARDS THE TOP, OR TO THE RIGHT - NEGATIVE (MINUS) NUMBERS SHIFT IT DOWN OR LEFT.

MIRROR.

THE INFO FOR MIRROR IS ALMOST EXACTLY THE SAME AS FOR MASK. — MARK THE LINE OF THE MIRROR WITH TWO POINTS — GIVE POSITIONS E/W AND N/S FOR EACH — AND ALSO A THIRD POINT TO MARK WHICH SIDE OF THE LINE IS TO BE CHOPPED OFF, BEHIND THE MIRROR.

THEN THERE'S ONE EXTRA THING —

MIRROR — WHICH CEL/DRAWING....?

MIRROR WORKS BY MAKING THIS CEL OR DRAWING A MIRROR IMAGE OF ANOTHER CEL OR DRAWING. THAT MEANS THAT THIS CEL-OR-DRAWING NEED ONLY BE A DUMMY — AND 2 POINTS IN A SINGLE LINE IS ENUFF —

SO — IF YOU'RE USING MIRROR AS A DRAWING EFFECT — GIVE THE DRAWING NUMBER TO BE MIRRORED — IF IT'S A CEL EFFECT, GIVE THE CEL NUMBER R-E-L-A-T-I-V-E.

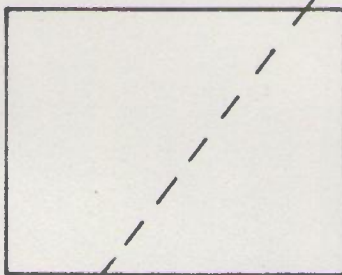
MIRROR WORKS IN THESE STEPS —

- ① FIRST IT MASKS OFF THE DRAWING OR CEL TO BE MIRRORED.
- ② THEN IT DOES A 100% CHANGE TO MAKE THIS ONE SAME AS THAT ONE
- ③ THEN IT REFLECTS IT IN THE MIRROR.

HERE'S SOME EXAMPLES —



DRAWING 1 AND DRAWING 2



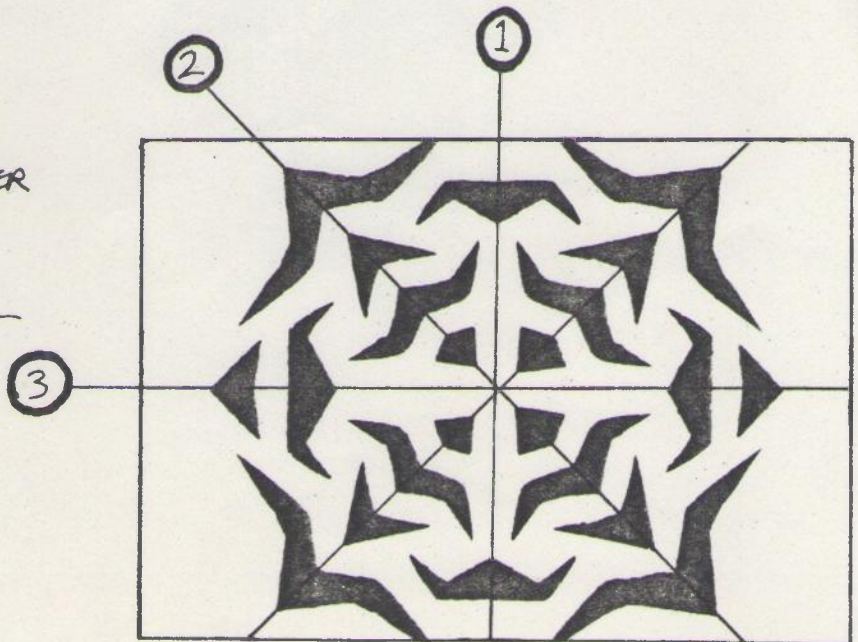
MIRROR EFFECT. DRAWING 2 TO MIRROR DRAWING 1 AT THIS LINE.



THAT'S DRAWING 2 — IT'S A REFLECTION OF DRAWING 1

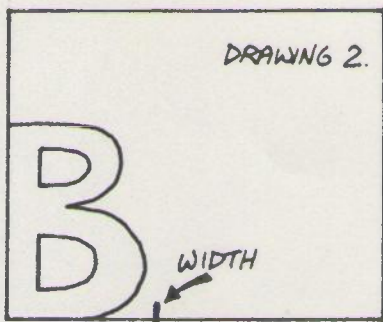
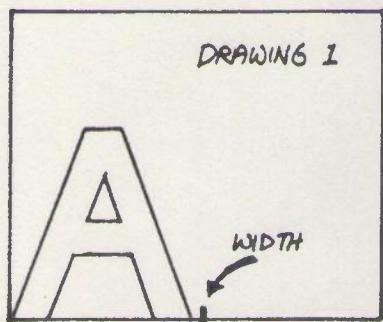
★ YOU CAN ADD ON FURTHER MIRRORS TO MAKE A KALEIDOSCOPE....

HERE'S 3 MIRRORS. —



DRAWING TYPEFACES FOR CAPTIONS.

USE THE DRAW PROGRAM IN THE NORMAL WAY, AS IF FOR KEY ANIMATION, WITH EACH LETTER AS A SINGLE COMPLETE DRAWING. EACH LETTER SHOULD BE DRAWN SITTING ON THE BOTTOM LEFT CORNER OF THE DRAWING AREA, THIS.



★ MAKE THEM BIG!!!

★ MARK A POINT FOR THE SETTING WIDTH - I.E THE NEXT LETTER WILL BE SET ON THIS POINT - MEASURE IT WITH FIELDCHART OR "GIVE POINT NUMBERS".

① START THE DRAW PROGRAM.

- TITLE = NAME OF THE TYPEFACE.
- 1 DRAWING PER KEYFRAME.
- FRAME REPEATS 1.

② LINE SPACING.

THE HEIGHT OF THE TYPE BODY - I.E THE MINIMUM HEIGHT TO CONTAIN ASCENDERS AND DESCENDERS WITH A FRACTIONAL GAP TOP AND BOTTOM.

③ EACH LETTER IS A COMPLETE DRAWING OF 1 AREA CEL.

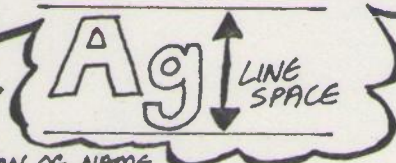
- ★ FRAME NUMBER = DRAWING NUMBER.
- ★ DRAWING TITLE = THE LETTER - MUST BE FIRST COLUMN OF NAME.
- ★ HOLD = 0 EXCEPT FOR THE FIRST LETTER WHERE YOU PUT THE HOLD = LINE SPACE MEASURE.
- ★ CEL COLOUR ON EACH DRAWING, PUT THE LETTER WIDTH.

EXAMPLE - DRAWING 1 - A
 CEL 1 - AREA
 DRAWING 2 - B
 CEL 1 - AREA.

FRAME 1 HOLD 530
 COLOUR 388
 FRAME 2 HOLD 0
 COLOUR 415

LINE SPACING - ZERO ON ALL OTHER LETTERS.

LETTER WIDTH



④ STANDARD FOUNT - LETTERS MUST BE IN THIS ORDER.

1 TO 26 = A TO Z CAPITALS.
 27 TO 52 = A TO Z LOWERCASE.
 53 TO 61 = NUMERALS 1 TO 9.

76 = !
 77 = (OPEN BRACKET.
 78 =) CLOSE BRACKET.
 79 = * ASTERISK.
 80 = SPACE. - JUST PUT 2 ZERO POINTS FOR THE DRAWING, BUT GIVE WIDTH FOR THE COLOUR AS USUAL.

62 = ZERO
 63 = ● (FULL STOP)
 64 = , (COMMA)
 65 = " (TEKTRONIX DOUBLE QUOTE - BUT DRAWING A SINGLE OPEN QUOTE.)
 66 = ' (TEKTRONIX SINGLE QUOTE - BUT DRAWING A SINGLE CLOSE QUOTE.)
 67 = ; (SEMI COLON).
 68 = : (COLON).
 69 = - (HYPHEN).
 70 = / (OBUQUE DASH).
 71 = & (AMPERSAND).
 72 = % (PERCENT).
 73 = + (PLUS).
 74 = # (TEKTRONIX HASH MARK - DRAWING £ POUND SIGN).

⑤ SPECIAL CHARACTERS.

LETTERS 81 TO 86 ARE THE SPECIAL CHARACTERS -

CAPS. {
 Å = 81 = ^ A *
 Ä = 82 = ^ A "
 Ö = 83 = ^ O "
 LOWER CASE. {
 å = 84 = ^ A *
 ä = 85 = ^ A "
 ö = 86 = ^ O "

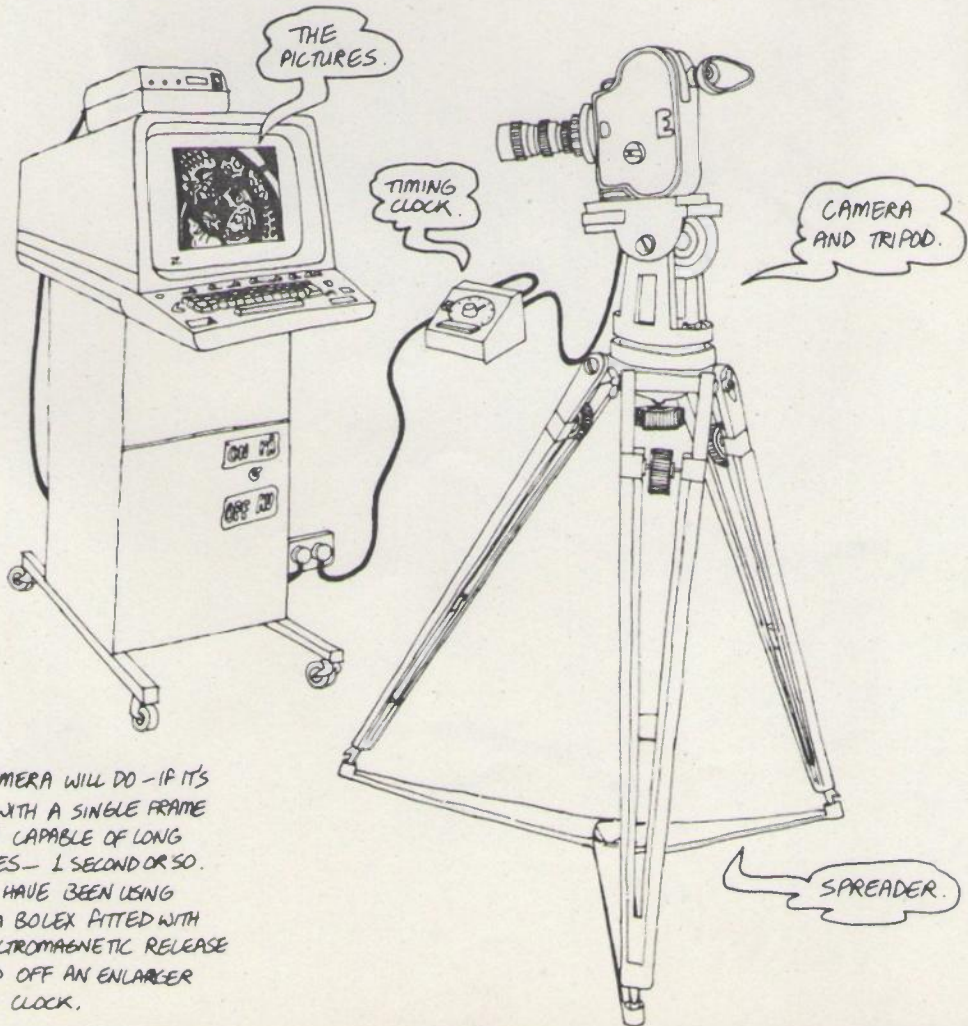
DRAWING TITLES WRITTEN IN TEKTRONIX THUS.

★ NOTE - THAT FIRST COLUMN OF DRAWING TITLE MUST BE BLANK FOR THESE SPECIAL CHARACTERS

75 = ?

FILMING FROM THE TEKTRONIX.

24



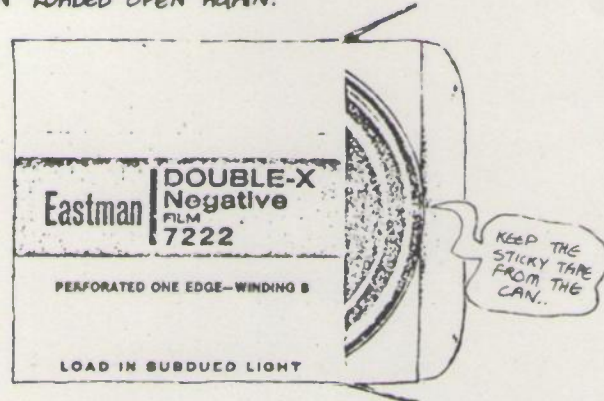
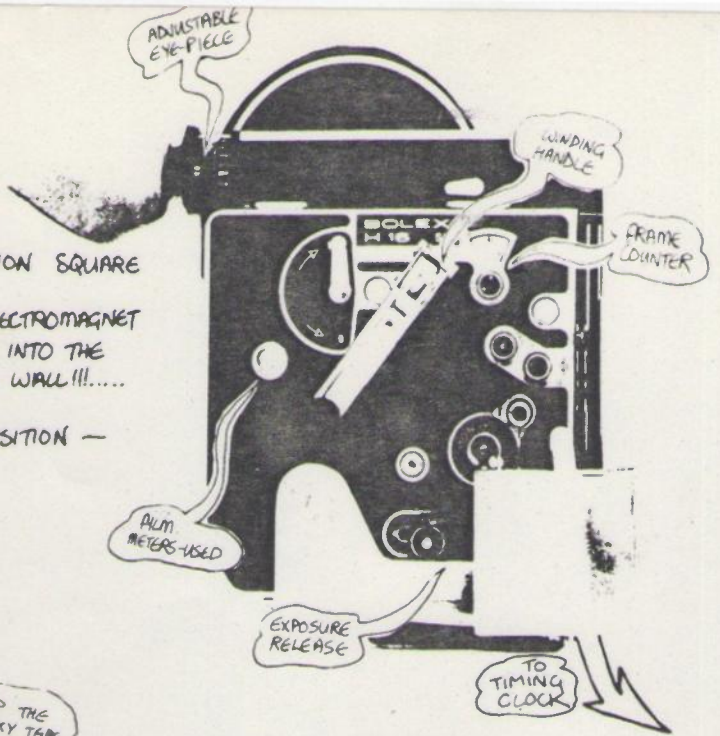
THE BASIC SET-UP.

ANY CAMERA WILL DO - IF IT'S FITTED WITH A SINGLE FRAME RELEASE CAPABLE OF LONG EXPOSURES - 1 SECOND OR SO.

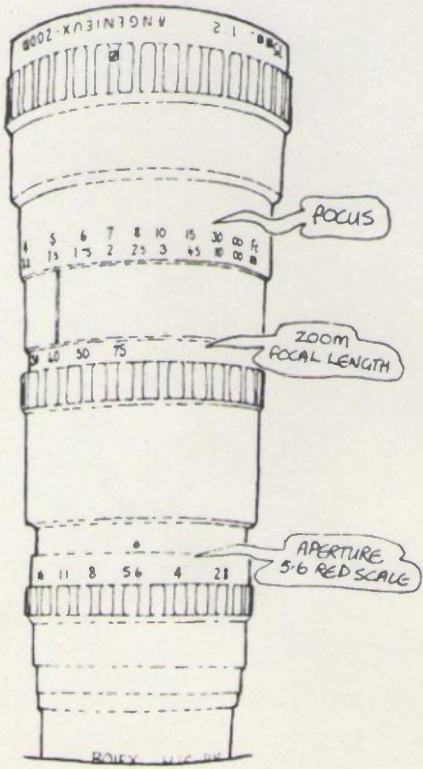
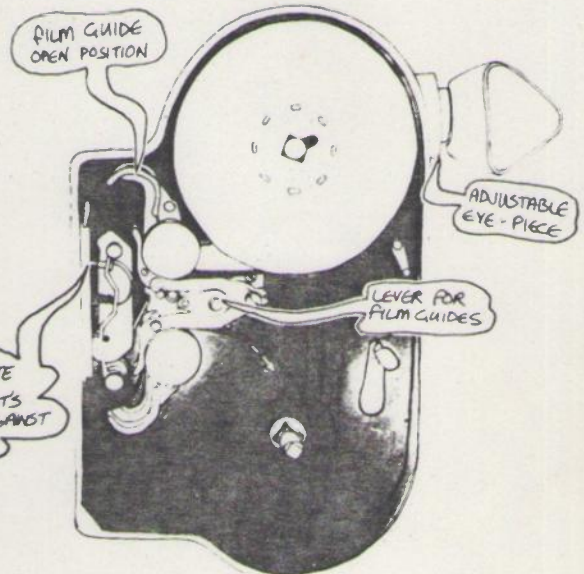
WE HAVE BEEN USING A 16MM BOLEX FITTED WITH AN ELECTROMAGNETIC RELEASE WORKED OFF AN ENLARGER TIMING CLOCK.

SETTING-UP

- ① SET-UP TRIPOD SPREADER AND CAMERA.— POSITION SQUARE ONTO SCREEN.
- ② WE ARE USING A BOLEX 16MM CAMERA WITH AN ELECTROMAGNET EXPOSURE RELEASE FOR THE EXPOSURES - THIS PLUGS INTO THE TIMING CLOCK - THE TIMING CLOCK PLUGS INTO THE WALL!!!!.....
- ③ FILM.— WE NORMALLY USE DOUBLE-X. LOAD THE FILM WITH FILMGUIDES IN THE CLOSED POSITION — WHEN LOADED OPEN AGAIN.



- ④ EXPOSURE ON TIMING CLOCK IS 1 SECOND (N.B. USE THE "SEC" SCALE ON THE CLOCK, NOT X10.)
- ⑤ SET FOCUS WITH APERTURE FULLY OPEN (2.8) NB.— YOU MAY NEED TO ADJUST THE EYEPIECE FOR YOUR EYE.
- ⑥ SET ZOOM FOCAL LENGTH TO GET THE PICTURE RIGHT SIZE
- ⑦ SET APERTURE TO 5.6 ON THE RED SCALE.
- ⑧ BLACK OUT THE ROOM IF IT'S DAYLIGHT.
- ⑨ CLEAN THE TEKTRONIX SCREEN!!! *O!!..



LINE-UP FOR FILM
 SIDES OF FRAME JUST VISIBLE, TOP AND BOTTOM OUT OF FRAME.

LINE-UP FOR VIDEO-SCANNING.
 TOP AND BOTTOM VISIBLE.



SHOOTING.

BEFORE YOU START:- SWITCH TO "SCREEN FILMING" - OTHERWISE

YOUR PICTURES WILL WANDER ABOUT ALL OVER THE PLACE.

- ① TAKE ABOUT A DOZEN FRAMES OF THE ANTICS TITLE (OUR EQUIVALENT OF THE SLATE BOARD).
- ② NOW A DOZEN FRAMES BLANK (STICK YOUR HAND OVER THE LENS).
- ③ WIND-UP THE CAMERA!! THE BOLEX DOES JUST OVER 600 FRAMES ON ONE WIND - YOU MUST WATCH THE FRAME COUNTER, REWIND EVERY 600 FRAMES - IF IT RUNS OUT OF WIND YOU GET NO WARNING - ONLY DUD FRAMES!!!
- ④ YOU ALSO GET NO WARNING IF YOU RUN OUT OF FILM. ONE ROLL OF FILM IS 30 METRES - 100 FEET - 4000 FRAMES. THE FILM COUNTER ON THE BOLEX TELLS YOU THE NUMBER OF METRES USED SINCE YOU CLOSED THE CAMERA LID. IT GOES BACK TO ZERO WHEN YOU OPEN THE CAMERA LID. - SO DON'T OPEN WITHOUT FIRST CHECKING HOW MUCH FILM YOU'VE GOT LEFT!!!
- ⑤ READY TO GO!! GET THE FILM ROLLING ON THE SCREEN - WATCH FRAME NUMBERS TO TELL NUMBER OF REPEATS. - ON LONG HOLDS, HIT THE SPACE BAR EVERY 20th FRAME - OTHERWISE THE PICTURE WILL SUDDENLY SWITCH ITSELF OFF, PROBABLY IN THE MIDDLE OF A FRAME. - AND DON'T FORGET YOUR CAMERA WINDS!!!
- ⑥ IF YOU MAKE A BOOB. - STICK IN A FEW FRAMES BLANK SO YOU CAN FIND THE PLACE LATER. - MAKE A NOTE OF WHAT WENT WRONG - YOU CAN STICK A BIT OF PAPER SUCH AS "CUT BACK LAST 12 FRAMES" ON THE SCREEN AND SHOOT IT.
- ⑦ AT END - 200 FRAMES BLANK.
- ⑧ UNLOAD FILM - IF THERE'S ENOUGH FILM LEFT FOR ANOTHER SHOOT, STICK A LABEL ON THE CAMERA TO TELL WHAT'S LEFT, "DX 12 METRES" OR WHATEVER.
- ⑨ STICK EXPOSED FILM IN CAN, TAPE IT UP, FILL OUT A LABEL, STICK IT ON THE CAN, FILL OUT THE PICTURE NEG REPORTS, STICK THAT ON THE CAN, THEN STICK THE WHOLE LOT IN THE PROCESSING LABS.

WHEN YOU FINISH:- SWITCH TO "SCREEN NORMAL" - OTHERWISE

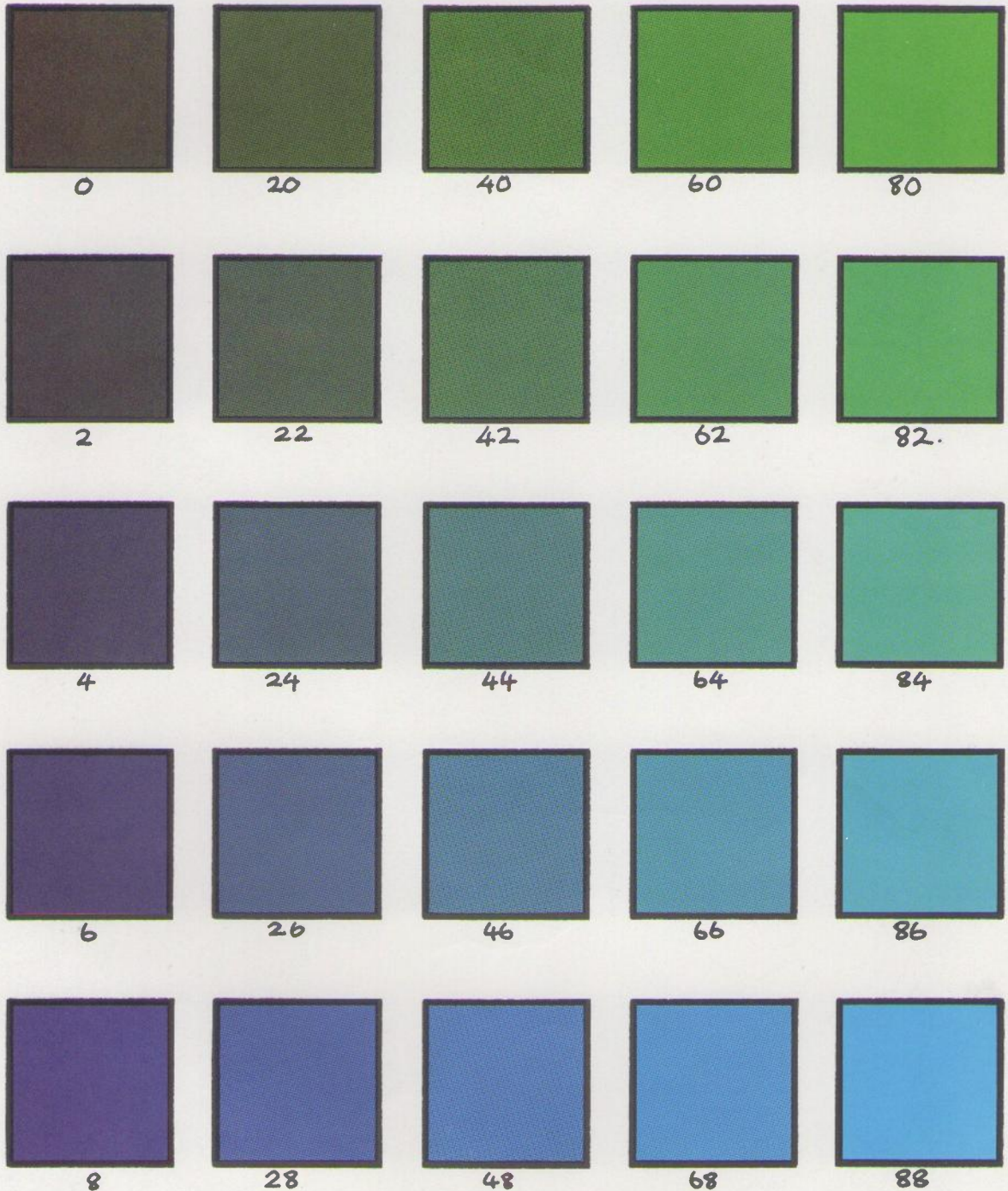
THE SCREEN WILL BE BURNT OUT IN NO TIME.

THEN PUT EVERYTHING AWAY, AND GO HOME TO BED.....



COLOUR SAMPLE - SHEET 1

EACH COLOUR SAMPLE IS LABELLED WITH A REFERENCE NUMBER - WHEN YOU DO A DRAWING WITH THE DRAWING TABLET, THE MACHINE WILL ASK YOU WHAT COLOURS YOU WANT TO USE - BE READY TO GIVE IT THE COLOURS YOU WANT!



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COLOUR SAMPLE - SHEET 2

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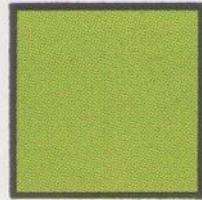
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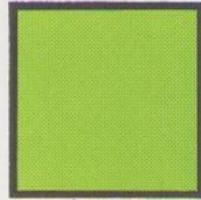
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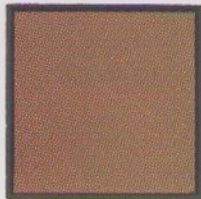
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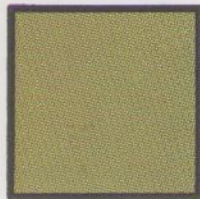
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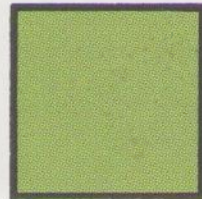
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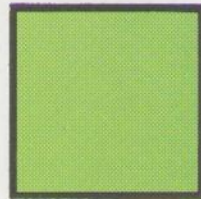
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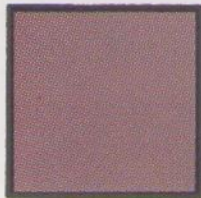
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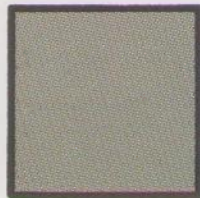
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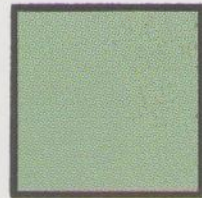
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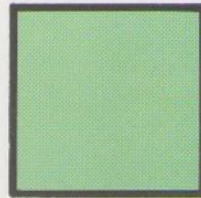
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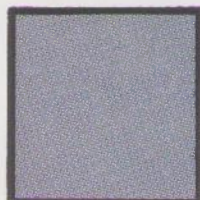
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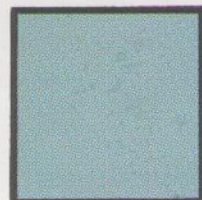
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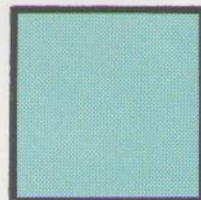
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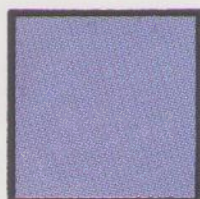
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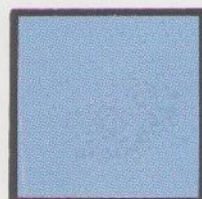
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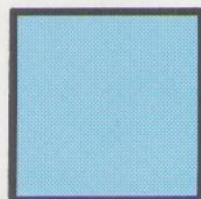
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268



288

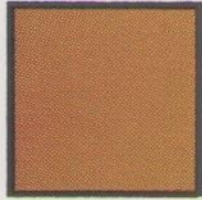
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400



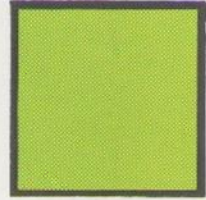
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440



460



480



402



422



442



462



482



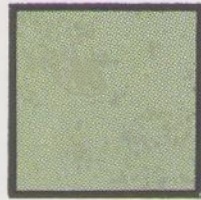
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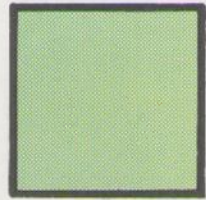
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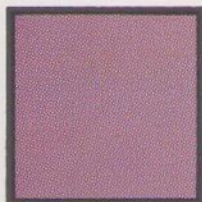
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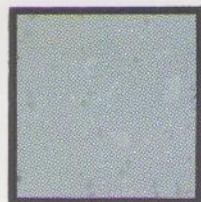
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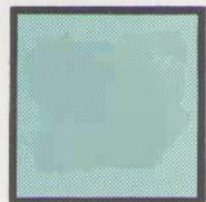
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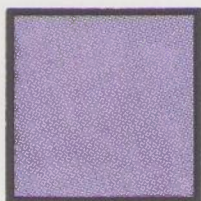
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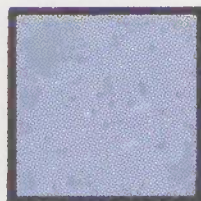
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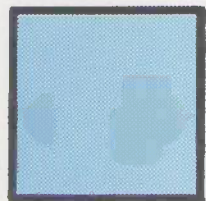
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488

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Creating a file for use with the ANTICS program "SCAN":

SCAN will take frame images consisting of outlines and submit them to the Antics scanning + hiding?? + eliding + colouring process.

To use SCAN, you will need to have your own 9-track bcd-tape; the tape librarian will allocate tapes for you, but to use SCAN you must know the number of your tape. This is done from a MOP terminal by issuing the command GET name (*MT,PR TRACK9) and waiting for the response (name is your chosen file-name for the tape).

SCAN does not do any animation; it will read only the frames actually present in your file; however, it is possible to scan only 'selected' frames from your file if you wish, as explained later.

All that is now required is that your animation program is designed to produce a filestore file of the correct format; which is -

FIRST LINE TITLE OF FILM in first 40 cols SCENE description cols 41-71 You may use any letter of the alphabet, any digit; but the only punctuation allowed is *, - Do not have more than 26 without an intervening space.

SECOND LINE (15 format numbers)

```
NFT no of last frame in file
NFST no of first frame to be scanned
NFEND no of last frame to be scanned
NFSKIP no of frames skip frame interval
NREP no of repesta for each frame
MAXD maximum density to be used in scanning
ISHAD size of shadow edge
```

Notes:

Each frame of the animation in your file must be numbered, and the frames must be arranged in ascending order. However, there may be gaps. NFST is the number of the frame (which must be present) that you wish the scanning to start with - This need not necessarily be the first frame of the file. NFEND is the last frame you wish to have scanned. It is not essential that there should actually be a frame of this number present - if the program encounters a frame whose number is higher than NFEND, the program will finish. If you wish to scan every frame, put NFSKIP = 1. If you wish to scan only every 3rd frame, put NFSKIP = 3 - etc. Put NREP=2. MAXD is the maximum number from 1 to 9. ISHAD is normally 0, 1, 2 or 3. It can be much greater, but the effect soon becomes unusual.

Examples

```
300 1 300 1 2 1 0
```

Total 300 frames, begin at no 1, do the lot; repeat 2, max density = 1, shadow = 0

```
300 120 200 7 2 1 0
```

Total 300 frames, start scanning at no 120, doing every 7th frame; stop when past frame 200

After these two preliminary lines of data, the actual frame information now follows