SPECTRON DSM TEST PATCHES

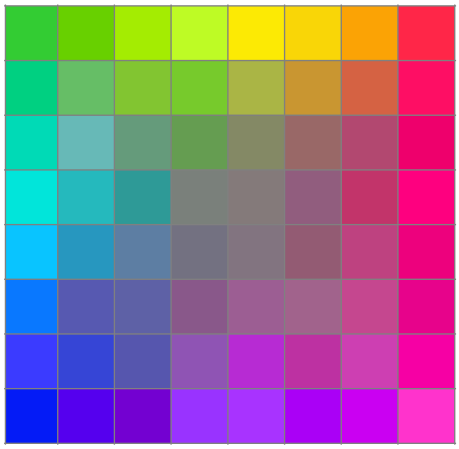
COUNTER COLOUR COMBINATIONS

Patch to DSM	X1	→	Luminance 0
	X2	→	Luminance 1
	X3	→	Luminance 2
	X4	→	Luminance 3
	END	→	INVERT X1

A purple grey-scale should appear on the screen. There should be 16 different levels, the darkest levels may be lost in black. Removing any one of the patch pins should change the pattern.

Patch to DSM	X2	→	Colour 1 (0)	
	X3	→	Colour 1 (1)	
	X4	→	Colour 1 (2)	
	Y2	→	Colour 2 (0)	OUT A
	Y3	→	Colour 2 (1)	
	Y4	→	Colour 2 (2)	
	END	→	Luminance 0	

Complex colour squares should appear on the screen, each being divided into the 8 x 8 continuous sequence of colours as shown below:



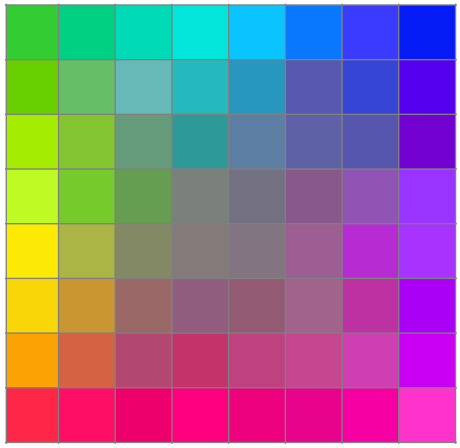
The central area is neutral with all output controls central.
Advancing the C1 control should make the red area move across the square from right to left. Advancing the C2 control should make the blue area move up the square from bottom.

Patch on ACM	Control slider A	→	Video Input R
	Control slider B	→	Video input B

Put video output sliders to the neutral position.
Advancing Slider A should move red area left
Advancing Slider B should move blue area up

Patch to DSM	X0	→	Colour Swap

The order of colours in the left 2/3 of the picture should be reversed, so the 8 x 8 colour sequence on the left of the picture now reads:



Try the previous two patches using Output channel B instead of Output channel A.

COUNTER OUTPUTS & INVERT LOGIC

Patch on DSM	X0	→	Y0 (invert)	
	X1	→	Y1 (invert)	
	X2	→	Y2 (invert)	
	X3	→	Y3 (invert)	
	X4	→	Y4 (invert)	OUT A
	X5	→	Y5 (invert)	
	X6	→	Y6 (invert)	
	X7	→	Y7 (invert)	
	X8	→	Y8 (invert)	

Now check that each Y counter output is a checkerboard each half the size of the previous one. By patching each Y output in turn to Output channel A, luminance 0 → Y0 should give largest checker, Y8 the smallest. This will only be visible on the RGB monitor.

Patch on DSM	Y0	→	X0 (invert)	
	Y1	→	X1 (invert)	
	Y2	→	X2 (invert)	
	Y3	→	X3 (invert)	
	Y4	→	X4 (invert)	OUT A
	Y5	→	X5 (invert)	
	Y6	→	X6 (invert)	
	Y7	→	X7 (invert)	
	Y8	→	X8 (invert)	

Now check that the X counter outputs give the same sequence of checkerboards as the Y counter outputs did in previous patch.

SLOW COUNTER OUTPUTS

Patch on DSM	X2	→	INVERT A
	X3	→	INVERT A
	X4	→	INVERT A
	X5	→	INVERT A
	X6	→	INVERT A
	X7	→	INVERT A
	6 Hz	→	X7 (invert)
SLOW	3 Hz	→	X6 (invert)

COUNTER OUTPUTS	1.5 Hz →	X5 (invert)
	0.8 Hz →	X4 (invert)
	0.4 Hz →	X3 (invert)
	0.2 Hz →	X2 (invert)
	INVERT A	Luminance 0, 1 CH A

Two or three lines should be seen moving horizontally in a series of small steps left to right.

DELAY

Patch in addition to previous patch:

INVERT A	→	Delay
Delay	→	Luminance 0, 1 Output B

A second set of moving lines approximately 1 cm to the right of those in the previous patch should appear.

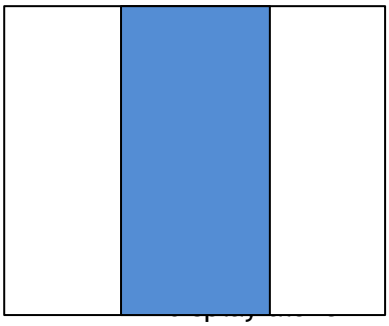
FLIP FLOP

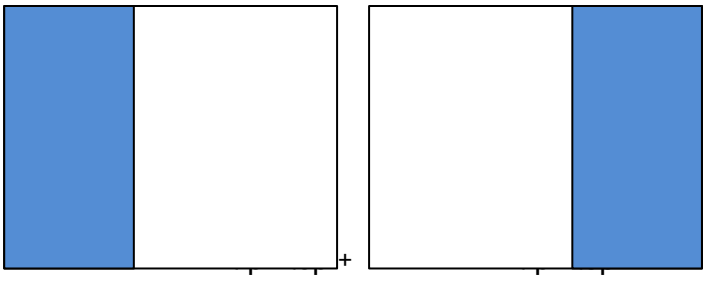
Patch to DSM X1 → Flip Flop+
FF+ → Luminance 0, 1 Output A

The first Flip Flop + output should change state (to active – white) on the left hand side of the screen.

Patch to DSM X2 → Flip Flop-
FF- → Luminance 0, 1 output A

The Flip Flop – output should change state on the right hand side of the screen. Patch X1 to Output A Luminance 0 for comparison:





INVERTERS

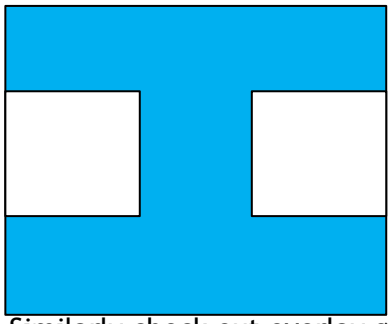
Patch to DSM X1 → INVERT A
INVERT A → Output A luminance 0,1

A light band (the inverse of X1) should appear. Similarly check out Inverters B, C and D.

OVERLAY GATES

Patch to DSM X1 → Overlay 1 SIG
Overlay 1 → Output A Luminance 0, 1

An X1 stripe should appear on the screen. Now patch Y1 → Overlay 1 DIS. The screen should appear thus:



Similarly check out overlay gates 2, 3 and 4.

To check the functioning of all the Overlay Gates, setup the following patch that should display a resolution chart:

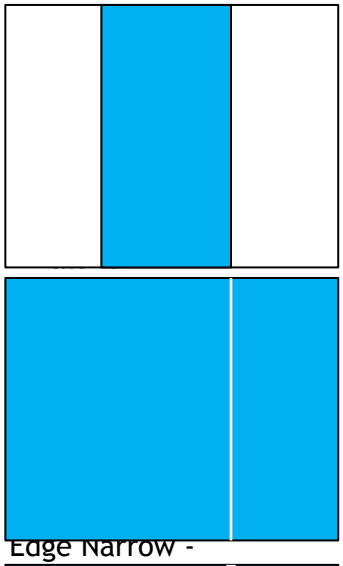
Patch to DSM:

X5	→	Overlay 4 SIG
X6	→	Overlay 3 SIG
X7	→	Overlay 2 SIG
X8	→	Overlay 1 SIG
Y1	→	Overlay 2 DIS, Overlay 3 DIS, INVERT A
Y2	→	Overlay 1 DIS, Overlay 3 DIS, INVERT B
INVERT A	→	Overlay 1 DIS, Overlay 4 DIS
INVERT B	→	Overlay 2 DIS, Overlay 4 DIS
Overlay 1	→	Output A Luminance 0
Overlay 2	→	Output A Luminance 0
Overlay 3	→	Output A Luminance 0
Overlay 4	→	Output A Luminance 0
END	→	Output A Colour 1 (0), Colour 2 (0)

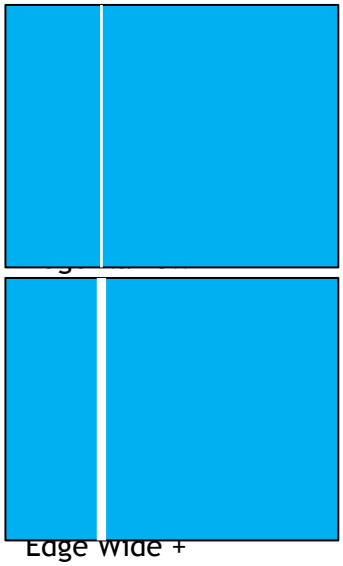
EDGE GENERATOR

Patch to DSM X1 → Edge

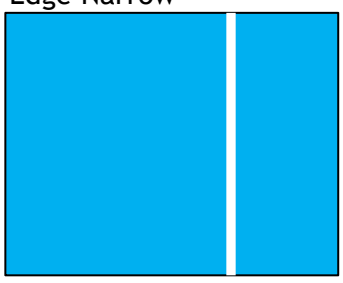
Now patch each edge output to Output A Luminance 0 in turn. The following pictures should be obtained:



Edge Narrow -



Edge Wide +



Edge Wide –

Narrow wide = 0.5 cms
Wide width = 1 cm

VIDEO INPUT COMPARATOR

Set the video comparator control slider to 7 and patch the following colourisation patch on the DSM:

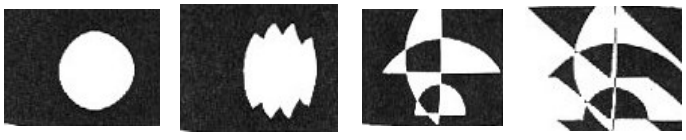
VIDEO INPUT		LUMINANCE				COLOUR 1			COLOUR 2		
		0	1	2	3	0	1	2	0	1	2
	0	■							■	■	■
	1	■	■						■	■	
	2	■	■				■		■	■	
	3	■	■			■	■		■	■	■
	4	■				■					
	5		■			■					
	6		■								

There should appear two sets of six rainbow colours on a purple background, moving the comparator level spacing control should alter the spacing of the rainbow. At about 2 the stripes should be compressed together and frizz out. On the ACM patch control Slider A to Comparator, check that Control slider A also affects Comparator Level Spacing. Connect a video camera to Spectron and check that all 7 levels can be activated with a suitable subject.

SHAPE GENERATORS

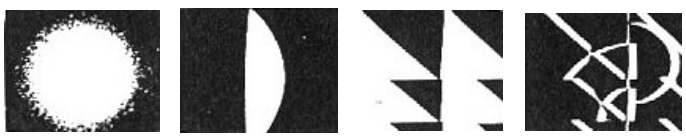
The following procedure can be repeated for Shape Generators 1 & 2. With both clock sliders at 0, check that each advance button clocks up indicated count by 1 and that count indication counts 0 -15 in binary. Advance the clock rate Slider A to 4. The shape selection A should clock up about once a second. Similarly check Slider B.

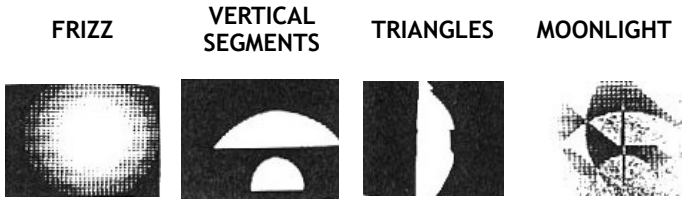
Graphical Representations of the 16 shape primitives:



CIRCLE GEAR CRISS-CROSS CUT OUT

RING GEAR + CIRCLE CRISS-CROSS INVERTED AMAZON





FRIZZ VERTICAL SEGMENTS TRIANGLES MOONLIGHT

LANTERN HORIZONTAL SEGMENTS PALM LEAVES LANTERN + CUTOUT

Patch on the DSM Shape 1A to Output A Luminance 0, Colour 1 (0), Colour 2 (0). By using the Advance button, the shapes should appear in the order shown above.

The number of ramps per line can be varied by patching a control slider into the Horizontal Zoom input **Z→** on the ACM. The number of ramps per frame can be varied by patching a control slider into the vertical zoom input **Z↓** on the ACM.

Patch on the ACM control slider A to each of the voltage control parameters in turn. Note that only the Vertical position and Horizontal position affect all shapes. Other parameters only affect some shapes.

CONTROL PARAMETERS

↔ ↕ → ↓ ● ●● ▦ ✹

BINARY

A	B	C	D	E	F	G	H	
☑	☑			☑				0 0 0 0 0
☑	☑			☑				0 0 0 1 1
☑	☑					☑		0 0 1 0 2
☑	☑				☑			0 0 1 1 3
☑	☑			☑				0 1 0 0 4
☑	☑			☑		☑		0 1 0 1 5
☑	☑		☑					0 1 1 0 6
☑	☑	☑						0 1 1 1 7
☑	☑	☑	☑					1 0 0 0 8
☑	☑	☑	☑					1 0 0 1 9
☑	☑	☑	☑					1 0 1 0 10
☑	☑	☑	☑					1 0 1 1 11
☑	☑	☑	☑					1 1 0 0 12
☑	☑	☑	☑					1 1 0 1 13
☑	☑	☑	☑					1 1 1 0 14
☑	☑	☑	☑		☑			1 1 1 1 15

0 0000 CIRCLE A = *horizontal position*

1 0001 RING B = *vertical position*

2 0010 FRIZZ C = *horizontal zoom*

3 0011 LANTERN D = *vertical zoom*

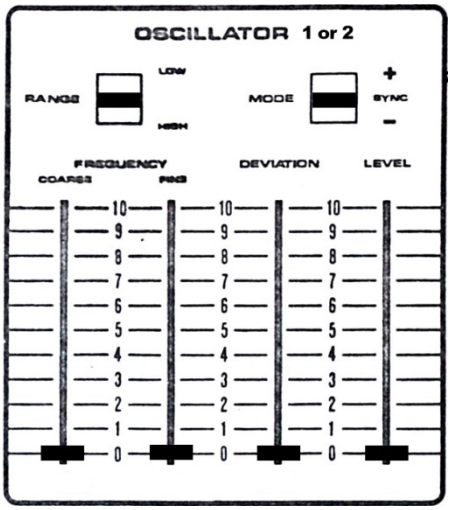
4 0100 GEAR E = *circle size*
5 0101 CIRCLE + GEAR F = *gear size*
6 0110 VERTICAL SEGMENTS G = *lantern size*
7 0111 HORIZONTAL SEGMENTS H = *frizz size*
8 1000 CRISS CROSS
9 1001 CRISS CROSS INVERTED
10 1010 TRIANGLES
11 1011 PALM LEAVES
12 1100 CUT OUT
13 1101 AMAZON
14 1100 MOONLIGHT
15 1111 LANTERN BEHIND CUT OUT

CONTROL SLIDERS

Patch each control slider in turn on the ACM to a control input, eg: the horizontal position of Shape Generator A. Check that the functioning of the sliders operate for each input connected. The four control sliders produce voltages which remain constant at the level set on the slider. There are many uses for the control sliders, and these may be used to affect manual control over a variety of parameters.

OSCILLATORS

LOW RANGE



Active controls include: coarse frequency, fine frequency, level. Frequency range is 0.2 Hz to 25 Hz. Because of the tracking filter arrangement for obtaining the sine wave output, the output will only stabilize several seconds after the movement of any of the controls.

HIGH RANGE

All controls will function for the high range selection. Frequency range is 25 Hz to Hz to 45 kilo Hz. With the mode switch to SYNC, the deviation control will be inactive, and the output frequency should bear an integer ratio relationship to the line drive frequency. With the mode switch to + or – the deviation controls enables one to add or subtract a small frequency deviation. This is most useful on the highest frequency range – the coarse frequency slider at the top of its range. Try modulating the circle size at this high frequency range. The Deviation should be smooth in both directions.

RANDOM VOLTAGE GENERATOR

The two Random Voltage outputs on the ACM are produced by a digital pseudo random generator. With the control switch at continuous, the repeat length is 4096 events. With the control switch set to repeat, the sequence is the last 16 events. It may be necessary to flick the switch back and forth to start operation after the machine has been switched on. The outputs have 16 possible levels, one output being correlated but different from the other. Controlling the horizontal zoom or thee vertical zoom of the triangles shape for example, is a simple way to determine if the outputs are functioning. The slew control varies the changes from smooth steplike.

AUDIO SPECTRUM SPLITTER

Available on the ACM are the outputs derived from the audio inputs: signal direct, bass envelope, treble envelope. The split control affects the frequency at which the treble output takes over from the bass. This frequency may be varied from about 500 Hz to 5 KHz. Using a signal generator into the audio input, it is important to check these outputs are functioning correctly. The level control affects all three outputs.

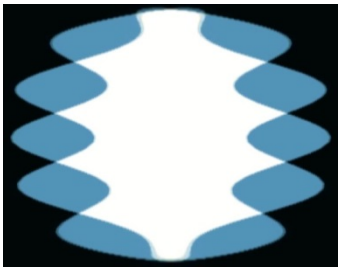
ACM FEEDS

Patch on DSM Circle Shape 1A → Output A, Luminance 0, Colour 2 (0), to ACM Fast.
Ground → Output A, Luminance 2.
Patch on ACM from DSM (high) → video input Y

The addition of the ACM pin should cause the circle to take on shading, giving it the appearance of a sphere.

Patch on DSM Shape 1A (circle) → Output A, Luminance 0, Colour 1 (0), Colour 2 (0)
Y5 → To ACM slow
Patch on ACM Slider A → (circle) Shape Generator 1

From DSM slow → (circle) Shape Generator 1



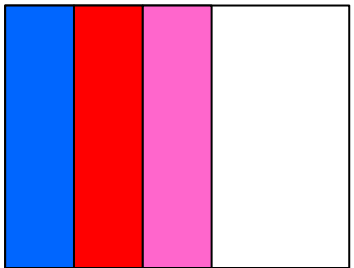
Advance the Slider until the shape is well visible. The signal from the DSM should modulate the circle width i.e:

EXTERNAL CONTROL INPUT

A signal generator may be used for this purpose, connecting to the Control Voltage Input, and will appear on the bottom row of the ACM.

EXTERNAL DIGITAL INPUTS

Feed any suitable digital signal source into the External 1 input. This signal will appear on the Spare 1 row on the DSM. Similarly, the External 2 will feed to Spare 2.



MONITOR CONNECTIONS

Patch on DSM Ground → Luminance 0
X1 → Colour 1 (0), Colour 1 (1), Colour 1 (2)
X2 → Colour 1 (0), Colour 1 (1), Colour 2 (2)
Use shorting pins (white)

Appearance on screen:

These waveforms can be used for calibrations purposes and as demonstrations of colour purity of the Spectron.