T	1 .		1.	Ι.	1	1		1		1
	airplane		boats	lena	mandril	peppers	tiffany	zelda	max	min
	+	510x510				510x510		510x510		
	polarfft1	polarfft1	polarfft1	polarfft1	polarfft1	polarfft1	polarfft1	polarfft1		
1	44.6					44.6			44.	
brightness -20%	11.6	4.9	8.4	6.6	7.5	11.6	4.4	8.4	11.6	
brightness -15%	5.8	3.5	7.5	4.9	6.2	9.3	4.4	8	9.3	
brightness -10%	4	0.8	4	3.5	4	8.4	4.9	4	8.4	
brightness -5%	3.1	0		1.3	0.4	4.9	4.4	1.7	4.9	_
brightness 5%	0	0		2.2	0	0.8	3.5	1.7	3.5	
brightness 10%	2.2	3.5	0.8	4	0	0.8	8	2.2	10.5	
brightness 15%	4	8.4	4	5.3	4.9	2.6	10.2	2.6	10.2	
brightness 20%	3.5	11.1	8	7.1	7.5	5.8	14.2	7.1	14.2	<u> </u>
		-								
tt 200/	0	1.7	0.8	0	0.4	0.0	4.4	0	4	
contrast -20%	0			0		0.8	4.4 4.4	0	4.4	
contrast -15%	0			0		0.8	4.4	0.4	4.2	1
contrast -10%		-								1
contrast -5% contrast 5%	2.2	0.8		0 2.6	0.4	0.8 3.1	3.1 3.1	0.4 1.7	3.1	
		0.8							7.5	1
contrast 15%	3.5 5.8	4		6.2	2.6 5.8	7.5	5.8 7.5	4.4 7.1	8.4	
contrast 15%	14.7	8.9		6.2 7.5	5.8 8.9	8.4 11.1	7.5 9.8	9.3	14.7	
contrast 20%	14./	8.9	8.4	7.5	8.9	11.1	9.8	9.3	14.	
	1	<u> </u>								
gamma 0.75	4	4.9	4.4	3.1	2.6	6.6	4	6.6	6.6	j
gamma 0.8	3.5	3.5	3.5	2.2	1.7	5.8	2.2	5.3	5.8	
gamma 0.85	3.5	2.6		0.8	0.8	3.5	2.6	3.5	3.5	
gamma 0.9	2.2	2.2	3.1	0.0	0.0	1.7	0	1.3	3.1	1
gamma 1.05	0.8	0		0	0.8	0.8	0	1.3	2.2	_
gamma 1.1	0.4	1.3	2.2	0.8	1.7	1.3	0.8	1.3	2.2	
gamma 1.15	1.3	1.3	3.1	0.8	0.8	1.3	2.6	1.3	3.1	
gamma 1.2	2.2	1.7	2.2	0.0		1.7	1.7	1.3	2.2	
gamma 1.25	0.8	1.3	3.1	0.8	2.2	1.7	1.7	2.6	3.1	1
g										
blur 0.5	2.6	2.2	0.8	3.1	2.2	0.4	0.8	1.7	3.1	
blur 1	3.5	2.6		4.9	4.9	1.7	4.9	4	4.9	
blur 2	3.5	4	5.3	7.5	4.4	2.2	5.8	5.8	7.5	5
blur 3	2.6	8		5.8	8	4	6.6	6.6	8	_
compress 5	3.5	11.6	4.9	4.9	4.4	4.9	4.9	10.7	11.6	5
compress 10	0.8	8		1.7	3.1	4	3.1	8	8	3
compress 25	0.8	1.3		1.3	2.2	2.6	0	3.1	3.1	
compress 50	0	2.2	0.8	2.6	0	0.8	0	0.8	2.6	5
compress 75	0.8	1		2.2	0	0.8			2.6	
compress 100	0	0	0	0.4	0	0	0.4	0	0.4	
color noise 0.5	1.3	2.6	0	0.8	2.2	1.7	1.3	0.4	2.6	5
color noise 1	1.7	4.9		1.7	2.6	4		1.7	4.9	
color noise 1.5	0.8	1		1.7	3.5	4.9	4	5.3	5.8	
color noise 2	3.5	1		4.9	4.4	6.6		10.7	10.7	7
color noise 2.5	2.6			6.6		7.5		12.5	12.5	
color noise 3	4.9	9.8		8.9	6.2	8.4		12.5	12.5	5
gray noise 0.5	0.4	2.2		0		0.8		0.4	2.2	
gray noise 1	1.7	3.5		0		4.9	3.1	6.2	6.2	1
gray noise 1.5	1.3	5.3	6.6	1.3	4.4	4.4		9.8	9.8	
gray noise 2	2.6			6.2	5.3	6.6		12.5	12.5	
gray noise 2.5	4.4	13.8	11.6	9.8	8.4	8.4	10.7	14.7	14.7	'
gray noise 3	5.8	17.4	16	10.2	10.2	10.2	9.8	15.1	17.4	L .
	_	<u> </u>	_		_	_				1
resize 25%	0.8	1		4	4.9	0.4	5.3	3.1	5.3	
resize 50%	2.2	2.6		4		0.8	2.2	2.6	4	1
resize 75%	1.3	0.4	0.8	0	0.4	0	0.4	0.4	1.3	3
								,		
resize 150% resize 200%	2.2 2.2	0.8		2.2 2.2	0.4 0.4	0		1.7 2.6	2.2	

		1					_1			T
resize 400%	0.8	0.8	0.8	2.2	0.4	0	0	1.7	2.2	
										-
rotation -90	0	0	0	0	0	0	0	0	0	
rotation -45	27.2	41.5	37.9	33	29.9	31.2	29.9	35.2		
rotation -30	27.2	40.6	38.3	34.3	30.3	29.4	29	35.2		
rotation -15	26.3	32.5	35.2	37.5	25.4	30.3	29	32.5		
rotation -5	21.4	22.7	29.4	22.3	19.1	23.6	25.8	20.9		
rotation 5	21.8	22.3	28.1	20.9	19.1	23.6	25.8	20.5		
rotation 15	26.7	31.2	33.9	37.5	24.5	29.4	29.9	32.5		
rotation 30	26.3	41	37.9	34.3	30.3	29.9	29	34.3		
rotation 45	27.2	41.5 0	37.9 0	33	29.9 0	31.2	29.9 0	35.2 0	0	-
rotation 90	0	U	U	0	U	0	U	U	0	
										-
	0	4.0	0.4	0.0	2.1	1 7	12.0		12.0	-
rotcrop 1	0.8	4.9 4.9	0.4	0.8	3.1	1.7	12.9 12.9	6.6	12.9	1
rotcrop 2			1.3 2.2	0.4		2.2		6.6	12.9	1
rotcrop 5	1.7	4.9			0.4	2.2	12.9	6.2	12.9	
rotcrop 7	1.3	4.9	0.4	0.8	1.7	0.8	12.5	5.3	12.5	1
rotcrop 10	0	4.9	0.8	0	2.2	3.1	12.5	6.6	12.5	
rotcrop 15	0.4	4.9 4.9	2.2 0.8	2.6	2.6	1.3	12.5	5.3	12.5	
rotcrop 20						2.6	12.5	4 E 0	12.5	
rotcrop 30	0	4.9	1.7	0	1.7	4.9	12.5	5.8	12.5	
rotcrop 45	0	4.9	0.8	0	1.7	1.3	12.5	1.7	12.5	
rotcrop 90	0	0	0	0	0	0	0	0	0	
										-
a.	24.5	22.4	27.2	24.5	22.7	20.0	26.7	24.2		
flop	24.5	33.4	27.2	24.5	22.7	30.8	26.7	31.2		
flip	24.5	33.4	27.2	24.5	22.7	30.8	26.7	31.2		
transpose	24.5	33.4	27.2	24.5	22.7	30.8	26.7	31.2		
transverse	24.5	33.4	27.2	24.5	22.7	30.8	26.7	31.2		
	20.4	22.4	27.0	24.6	27.6	25.0	22.7	20.0		
translate north (black)	29.4	33.4	37.9	31.6	27.6	35.2	22.7	29.9		
traslate west (black)	26.3	26.7	29.9	35.2	24.1	30.8	25.4	31.2		
translate northwest (black)	22.3 29.4	29	25 37.9	27.2	22.7 27.6	30.8 35.2	18.7 22.7	26.3 29.9		
translate north vs west (black)	29.4	33.4	37.9	31.6	27.0	33.2	22.7	29.9		
										
translate north (white)	26.3	33	29	33.4	21.4	36.6	23.2	36.6		
traslate west (white)	27.6	40.6	31.6	37.9	25.4	38.3	20.9	32.1		
translate northwest (white)	20	28.5	28.5	29.4	22.7	29.4	20.3	25.8		
translate north vs west (white)	26.3	33	28.3	33.4	21.4	36.6	23.2	36.6		
translate north vs west (write)	20.3	33	23	33.4	21.4	30.0	23.2	30.0		
watermark 20%	15.6	25.8	18.7	13.8	14.2	13.8	16	16.9		
watermark 40%	25	32.5	29	20	21.4	22.3	24.5	25.8		
watermark 60%	31.2	31.6	32.5	25	24.1	28.1	25.8	30.3		—
watermark 80%	33.4	33.9	32.3	26.7	27.2	26.3	28.5	31.6		
watermark 80% watermark 100%	33.4	34.3	32.1	27.6	27.2	26.3	30.3	31.6		—
watermark 100/0	33	54.5	33	27.0	۷.۱۷	20.7	50.5	33		—
shear 1	2.6	6.2	4.9	6.6	2.6	9.3	10.7	7.5	10.7	
shear 2	9.8	11.1	8.4	13.3	4.9	16	14.7	15.6	16.7	1
shear 3	21.8	14.7	15.1	14.7	8.9	18.3	21.4	20.5	10	
shear 4	26.3	16.9	20	17.8	12.9	20.5	29.9	26.7		
shear 5	30.8	22.7	22.3	23.6	17.8	20.5	33.4	32.5		
shear 10	27.6	36.1	23.6	33	21.4	29.4	35.4	33.4		—
Silicui 10	27.0	50.1	23.0	33	41.4	43.4	ر.رر	JJ.4		
										
arc 1	3.1	5.3	4.4	5.8	3.5	7.1	10.7	4.9	10.7	
arc 2	5.8	7.1	5.8	8.4	3.3	7.1	11.6	5.8	11.6	1
arc 3	8.9	9.3	8.4	13.3	4.4	11.6	10.7	12.5	13.3	
arc 4	11.6	9.5	13.3	18.3	5.8	14.2	10.7	14.7	18.3	1
arc 5	13.3	13.3	16.5	20.5	7.5	17.4	15.1	17.8		
arc 10	21.8	25	25.4	31.6	22.3	25	27.6	22.7		
u10 10	21.0	23	23.4	51.0	22.3	23	27.0	22.1		
					+					
barrel 0.1	3.1	10.7	8	6.6	4.9	4.4	11.1	12.9	12.9	
barrel 0.2	6.2	15.1	11.1	10.2	7.5	11.1	12.9	17.8		
	10.7	20.5	13.3		11.1		15.6	22.7	17.0	
barrel 0.3	10.7	20.5	15.5	13.8	11.1	16.9	15.0	ZZ./		1

barrel 0.4	9.8	24.5	15.1	20.9	10.2	21.4	15.6	26.7		
pincushion -0.1	27.6	24.1	30.8	27.6	23.2	25.8	26.7	24.5		
pincusion -0.2	27.6	25.4	33.4	29.4	25.4	25.4	26.3	23.2		
pincusion -0.3	28.5	26.7	33	28.5	26.3	28.1	25.8	28.1		
pincusion -0.4	28.5	30.8	34.3	32.1	29.9	30.8	26.7	28.5		
airplane	0	37.5	36.6	35.7	28.1	36.6	26.3	34.8		
barbara	37.5	0	36.6	33	32.5	39.2	36.1	36.6		
boats	36.6	36.6	0	33	34.3	40.1	29	40.1		
lena	35.7	33	33	0	29.9	37.5	29	35.7		
mandril	28.1	32.5	34.3	29.9	0	34.3	29.4	31.6		
peppers	36.6	39.2	40.1	37.5	34.3	0	35.2	33.9		
tiffany2	26.3	36.1	29	29	29.4	35.2	0	32.5		29
zelda	34.8	36.6	40.1	35.7	31.6	33.9	32.5	0		
Threshold Range									18.3	29
•									10.5	
Separability (max-min)										10.7
Insensitive: all rotation-crop	and 90 incr ro	otation, sh	ear up to	4, arc up to	o 5, barrel	up to 0.2				
Sensitive: all watermark, flip-	-flop-trans an	d pincushi	on							