

Please click the [page numbers](#) after the following companies to see information on their equipment:

Advanced Techniques US, Inc.

[p.1-10](#)

- SPOT 20/20

Affiliated Manufacturers, Inc. (AMI)

[p.1-10](#)

- MSP-1826 PC
- XP-508

Automated Production Systems, Inc.

[p.1-10](#)

- SPR-25
- SPR-40
- SPR-45

Cookson Electronics Equipment

[p.1-10](#)

- AccuFlex
- AP Excel
- SPM
- UltraFlex
- UltraFlex BBP
- UP2000 HiE

EKRA America, Inc.

[p.11-20](#)

- E5
- E5 XL
- E5 36
- E5 HSP
- Dual Con
- Titan

Elite Circuit Equipment

[p.11-20](#)

- E-6920
- E-5920
- E-4500

Europlacer

[p.11-20](#)

- Model SP-200

Fuji America Corp.

[p.11-20](#)

- GP-551E

Milara Inc.

[p.21-30](#)

- TouchPrint TP2929

Minami

[p.21-30](#)

- MK-878sv L
- MK-878sv M
- MK-880sv LL

Panasonic Factory Automation

[p.21-30](#)

- SPF

Reprint Services

[p.21-30](#)

- Compact 29
- R 29

Surface Mount Techniques

[p.31-40](#)

- 2424 LPT
- 3032 LPT
- 3038 LPT
- 3046 LPT
- 3060 LPT
- 2444 AV
- Opti-Print 2220 PTV
- Opti-Print SL2220
- Opti-Print 2444BAM
- Opti-Print 2430 BAM
- Opti-Print 2020
- Opti-Print 483P3
- Opti-Print 1616PD/256P3

Transition Automation

[p.31-40](#)

- PrinTEK I Model 4000 (Manual)
- PrinTEK I Model 4000 (Semi-automatic)
- PrinTEK II

[Click here for contact information](#)

Circuits Assembly — Screen Printer Survey

Company	Model	[GENERAL]					[BOARD HANDLING -		
		Length (in.)	Width (in.)	Height (in.)	Automation	Transport height from floor (in.)	Maximum size (in.)	Minimum size (in.)	Maximum thickness (in.)
Advanced Techniques US, Inc.	SPOT 20/20	29	24	10	Semi-automatic	36	20 x 20	1 x 1	1
Affiliated Manufacturers, Inc. (AMI)	MSP-1826 PC	61	66	61	Fully automatic	33 to 38	21 x 21	1 x 1	1
Affiliated Manufacturers, Inc. (AMI)	XP-508	57	38	58	Semi-automatic	33 to 38	16 x 18	Unlimited	0.5
Automated Production Systems, Inc.	SPR-25	33	28	14	Manual	Benchtop, 45 in. with stand	18 x 20	1 x 1	0.625
Automated Production Systems, Inc.	SPR-40	33	28.5	14	Semi-automatic	47 on benchtop	16 x 18	N/A	0.625
Automated Production Systems, Inc.	SPR-45	35	30	16	Fully automatic	47 on benchtop	16 x 18	1 x 1	0.625
Cookson Electronics Equipment	AccuFlex	57	52	62	Fully automatic	34 to 38	23 x 20	3 x 2	0.02
Cookson Electronics Equipment	AP Excel	70.4	47.5	58	Fully automatic	33.9-41	20 x 16	2 x 2	0.5
Cookson Electronics Equipment	SPM	56	72	52	Semi-automatic	N/A	20.5 x 18.5	3 x 2	
Cookson Electronics Equipment	UltraFlex	63	63	60	Fully automatic	30-40	22 x 20	2 x 1.5	0.5
Cookson Electronics Equipment	UltraFlex BBP	89	64	63	Fully automatic	30-40	24 x 36	4 x 6	1
Cookson Electronics Equipment	UP2000 HiE	36.2	46	64.4	Fully automatic	Adjustable 34.5-41	20 x 16	2 x 2	0.5

Circuits Assembly — Screen Printer Survey

- BOARD HANDLING -							
Company	Model	Minimum thickness (in.)	Maximum board weight (lbs)	Maximum warpage (in.)	Underside component clearance (in.)	Board held by	Board support
Advanced Techniques US, Inc.	SPOT 20/20	N/A	N/A	.31	.5	Edge clamp, vacuum	Magnetic pins, Tooling pins, vacuum plate
Affiliated Manufacturers, Inc. (AMI)	MSP-1826 PC	0.01	2	0.31	0.75	Edge clamp, vacuum	Magnetic pins, tooling pins, vacuum plate
Affiliated Manufacturers, Inc. (AMI)	XP-508	0.001	2	0.31	0.5	Edge clamp, vacuum	Magnetic pins, tooling pins, vacuum plate
Automated Production Systems, Inc.	SPR-25	Unlimited	Unlimited	±3°	0.375	Edge clamp, vacuum	Vacuum plate
Automated Production Systems, Inc.	SPR-40	N/A	N/A	±3°	0.375 (with nesting kit)	Edge clamp, vacuum	Magnetic pins, vacuum plate
Automated Production Systems, Inc.	SPR-45	N/A	N/A	±3°	0.375 (with nesting kit)	Edge clamp, vacuum, other	Magnetic pins, tooling pins, vacuum plate
Cookson Electronics Equipment	AccuFlex	0.03	10	Per SMEMA Spec.	0.59	Edge clamp, vacuum	Magnetic pins , tooling pins, vacuum plate
Cookson Electronics Equipment	AP Excel	0.02	5	1% diagonal (.010"/1")	0.5	Edge clamp (optional), vacuum	Magnetic pins , tooling pins(optional), vacuum plate
Cookson Electronics Equipment	SPM					Edge clamp, vacuum	Magnetic pins, tooling pins, vacuum plate
Cookson Electronics Equipment	UltraFlex	0.015	7	1% diagonal (.010"/1")	1	Edge clamp, vacuum	Magnetic pins ,vacuum plate
Cookson Electronics Equipment	UltraFlex BBP	0.062	70	1% diagonal (.010"/1")	1	Edge clamp, vacuum	Magnetic pins ,vacuum plate
Cookson Electronics Equipment	UP2000 HiE	0.015			0.5 (1 in. optional)	Vacuum (edge clamp optional)	Magnetic pins, (vacuum plate optional)

Circuits Assembly — Screen Printer Survey

Company	Model	- BOARD HANDLING]				[PRINT PARAMETERS -			
		Auto pin support placement available	Conveyor	Board Movement	Machine interface transport speed (in./sec.)	Motorized width control	Dual-lane board handling	Print area	Maximum print stroke (in.)
Advanced Techniques US, Inc.	SPOT 20/20	No	N/A		N/A	No	No	20 x 20	20
Affiliated Manufacturers, Inc. (AMI)	MSP-1826 PC	No	Optional	R to L, L to R	1 to 30	No	pro	21 x 21	21
Affiliated Manufacturers, Inc. (AMI)	XP-508	No	N/A		N/A	N/A	N/A	16 x 18	20
Automated Production Systems, Inc.	SPR-25	Yes	N/A	N/A	N/A	No	No	16 x 18	18
Automated Production Systems, Inc.	SPR-40	No	N/A	N/A	N/A	No	No	16 x 18	18
Automated Production Systems, Inc.	SPR-45	No	N/A	N/A	Manual	No	No	16 x 18	18
Cookson Electronics Equipment	AccuFlex	Yes	Standard	R to L, L to R	N/A	Yes	No	22 x 19.6	20
Cookson Electronics Equipment	AP Excel	No	Standard	R to L, L to R	.3 to 60" adjustable	Yes	No	18 x 16	16
Cookson Electronics Equipment	SPM	No	N/A		N/A	N/A	N/A	20 x 18	19
Cookson Electronics Equipment	UltraFlex	Yes	Standard	R to L, L to R	1 to 40	Yes	No	21.76 x 19.76 max; 1.76 x 1.76 min	30.5
Cookson Electronics Equipment	UltraFlex BBP	No	Standard	R to L, L to R	1 to 40	Yes	No	23.5 x 35.5	38
Cookson Electronics Equipment	UP2000 HiE	No	Standard	R to L, L to R	.3 to 60	Yes	No	18 x 16	18

Circuits Assembly — Screen Printer Survey

Company	Model	- PRINT PARAMETERS -				Print modes	Print speed (in./sec.)	Print pressure (lbs)
		Method of registration	Optical alignment	Alignment accuracy (microns)	Alignment repeatability (microns)			
Advanced Techniques US, Inc.	SPOT 20/20	Manual	No	-25	<25		.1-20	N/A
Affiliated Manufacturers, Inc. (AMI)	MSP-1826 PC	Two-camera vision	Yes	±25.4	±12.7	print/print, print/flood, flood/print, on contact, alternate pin, 1 or 2 deposits	0.1 to 20	2 to 50
Affiliated Manufacturers, Inc. (AMI)	XP-508	Two-camera vision, manual	Yes	Operator dependable	Operator dependable	print/print, print/flood, flood/print, on contact, alternate pin, 1 or 2 deposits	0.1 to 10	up to 50
Automated Production Systems, Inc.	SPR-25	Manual	No	±25	<25		Manually guided	Manual with squeegee guide
Automated Production Systems, Inc.	SPR-40	Manual	No	±25	<25	1 or 2 deposits	Manually guided	
Automated Production Systems, Inc.	SPR-45	Manual	No	±25	<25	print/print, flood/print, on contact, 1 or 2 deposits	0 - 20	
Cookson Electronics Equipment	AccuFlex	Vision	Yes		±25 at 6 sigma (2.0 Cp)	print/print, print/flood, flood/print, on contact, 1 or 2 deposits	.200-7.78	0-44
Cookson Electronics Equipment	AP Excel	Vision	Yes	±25	±25	print/print, print/flood, flood/print, on contact, 1 or 2 deposits	.25 to 12	0-60
Cookson Electronics Equipment	SPM	Two-camera vision	Yes	1		print/print, print/flood, flood/print, on contact, 1 or 2 deposits	.4-12	50
Cookson Electronics Equipment	UltraFlex	Vision	Yes	±.001" at 6 sigma (2.0 Cp)	±.001" at 6 sigma (2.0 Cp)	print/print, print/flood, flood/print, on contact, 1 or 2 deposits	.25 to 8	1.5
Cookson Electronics Equipment	UltraFlex BBP	Vision	Yes	±.001" at 6 sigma (2.0 Cp)	±.001" at 6 sigma (2.0 Cp)	print/print, print/flood, flood/print, on contact, 1 or 2 deposits	.050 to .100	1 to 50
Cookson Electronics Equipment	UP2000 HiE	Vision	Yes		±25 at 6 sigma (2.0 Cp)	print/print, print/flood, flood/print, on contact, 1 or 2 deposits	0.20 - 12	50

Circuits Assembly — Screen Printer Survey

Company	Model	- PRINT PARAMETERS -			Snap off speed (in./sec.)	Snap-off program-mable?	Cycle time (sec.)	Is this a pump/ pressured head design machine	Stencil frame size (in.)	Fixed frame or adjustable
		Adjustment?	Snap off (print gap) (in.)							
Advanced Techniques US, Inc.	SPOT 20/20	Pneumatic	N/A	N/A	No	N/A	No	24 x 24	Adjustable	
Affiliated Manufacturers, Inc. (AMI)	MSP-1826 PC		1.25	0.1 to 0.8	Yes	Single lane	Yes	29 x 29	Fixed	
Affiliated Manufacturers, Inc. (AMI)	XP-508		0.75	0.1 to 1.1	Yes	6	No	20	Fixed	
Automated Production Systems, Inc.	SPR-25	Manual	N/A	N/A	No		No	23 x 23	Fixed frame or adjustable	
Automated Production Systems, Inc.	SPR-40	Pneumatic	N/A	N/A	No	Single lane: 20; Dual lane 25		23 x 23	Adjustable	
Automated Production Systems, Inc.	SPR-45	Pneumatic	0 - 0.06	Adjustable	No	Single lane: 20; Dual lane 25	No	23 x 23	Adjustable	
Cookson Electronics Equipment	AccuFlex	Electric	0-.197	.010-.39	Yes	Single lane: <11	Yes	29 x 29	Fixed frame, adjustable available	
Cookson Electronics Equipment	AP Excel	Pneumatic	-.05 to .10; - .02 to .10	Programmable	Yes	Single lane: <6	Yes	29 x 29	Adjustable	
Cookson Electronics Equipment	SPM	Electric	0-.38		Yes	Single lane: 6.5 (excluding print stroke)	No	29 x 29	Fixed	
Cookson Electronics Equipment	UltraFlex	Pneumatic	-.05 to .1	Programmable	Yes	Single lane: 8.8	Yes	29 x 29	Fixed	
Cookson Electronics Equipment	UltraFlex BBP	Pneumatic	-.05 to .1	Programmable	Yes	Single lane: 45	No	29 x 29 to 29 x 50	Fixed	
Cookson Electronics Equipment	UP2000 HiE	Electric	-0.02 to +.1		Yes	Single lane: <11 (excluding print stroke)	Yes	29 x 29	Fixed , adjustable optional	

Circuits Assembly — Screen Printer Survey

- PRINT PARAMETERS -								
Company	Model	Stencil frame adaptor plates	Stencil alignment range (x,y)(in.)	Radial stencil alignment range (degree)	PCB stencil separation speed (in./sec.)	Stencil wiper	Stencil cleaning	Squeegees
Advanced Techniques US, Inc.	SPOT 20/20	Yes	N/A	N/A	N/A	No	N/A	Metal, polyurethane
Affiliated Manufacturers, Inc. (AMI)	MSP-1826 PC	Yes	1, 1	8° (total)	0.1 to 0.8	Dry, Programmable: no	Optional	Metal, polyurethane
Affiliated Manufacturers, Inc. (AMI)	XP-508	Yes	1, 1	8°	0.1 to 1.1	N/A	N/A	Metal, polyurethane
Automated Production Systems, Inc.	SPR-25	Yes	±0.5	±5°	Manual	No	No	Metal, polyurethane, other
Automated Production Systems, Inc.	SPR-40	Yes	±0.5	±5°	Manual	No	N/A	Metal, polyurethane, other
Automated Production Systems, Inc.	SPR-45	Yes	±0.5	±5°	Adjustable 0 - 10	No	N/A	Metal, polyurethane, other
Cookson Electronics Equipment	AccuFlex	Yes	x: ±10mm y: ±10mm	±3	.2-.39	Optional	Dry, wet, vacuum; programmable: yes	Metal, polyurethane, other
Cookson Electronics Equipment	AP Excel	Yes	-.5 total, y=8	-3	Adjustable	Optional	Dry, wet, vacuum; programmable: yes	Metal, polyurethane, Rheopump
Cookson Electronics Equipment	SPM	Yes	±0.5	±5°		Optional	Dry, wet;	Metal, polyurethane
Cookson Electronics Equipment	UltraFlex		.3 x .3	±3	Adjustable	Optional	Dry, wet, vacuum; programmable: yes	Metal, polyurethane, Rheopump
Cookson Electronics Equipment	UltraFlex BBP		.3 x .3	±3	Adjustable	Optional	Dry, wet, vacuum; programmable: yes	Metal, polyurethane,
Cookson Electronics Equipment	UP2000 HiE	Yes				Optional	Dry, wet, vacuum; programmable: yes	Metal, polyurethane,

Circuits Assembly — Screen Printer Survey

Company	Model	- PRINT PARAMETERS]					[VISION SYSTEM -	
		Squeegee programmable down cycle	Squeegee pressure (lbs)	Where measured	Horizontal or central pivot?	Typical number of cycles to sharpening/ replacement	Type	Field of vision (in.)
Advanced Techniques US, Inc.	SPOT 20/20	No	0-80	Pressure gauge	Central	N/A	N/A	N/A
Affiliated Manufacturers, Inc. (AMI)	MSP-1826 PC	Yes	2 to 50	At squeegee	Both	Dependent		0.25 x 0.25
Affiliated Manufacturers, Inc. (AMI)	XP-508	No	50	At squeegee	Both	Dependent	Manual, fixed camera	0.25 x 0.25
Automated Production Systems, Inc.	SPR-25	No	Manual squeegee guide		Central	N/A	N/A	N/A
Automated Production Systems, Inc.	SPR-40	No	0 - 100	At squeegee actuator	Central	N/A	N/A	N/A
Automated Production Systems, Inc.	SPR-45	Yes	0 - 100	At squeegee actuator	Central	N/A	N/A	N/A
Cookson Electronics Equipment	AccuFlex	Yes	0-44	At squeegee	Central	N/A	On the move, look up, look down	10mm x 10mm
Cookson Electronics Equipment	AP Excel	Yes	1 to 60	at blade mount	Balanced Control Printhead	N/A	Look up, look down	.380 horiz, .296 vertical
Cookson Electronics Equipment	SPM	Yes	50		Central	N/A	Fixed, look down	9.5mm x 9.5mm
Cookson Electronics Equipment	UltraFlex	Yes	1 to 50	at squeegee	Balanced Control Printhead	N/A	Look up, look down	.4 x .3
Cookson Electronics Equipment	UltraFlex BBP	Yes	1 to 50	at squeegee	Balanced Control Printhead	N/A	On the move, Look up, look down	.4 x .3
Cookson Electronics Equipment	UP2000 HiE	Yes	60	At squeegee	Central standard w/ Horizontal Option	N/A	On the move, look up, look down	9.6mm x 7.5 mm

Circuits Assembly — Screen Printer Survey

- VISION SYSTEM -								
Company	Model	Magnification	Viewing capability (in.)	Gray scale resolution (shades of gray/pixel)	Image storage capacity (pixels)	Accuracy (in.)	Repeatability (in.)	Fiducial type/size
Advanced Techniques US, Inc.	SPOT 20/20	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Affiliated Manufacturers, Inc. (AMI)	MSP-1826 PC	2x	21 x 21	256	512 x 480	0.0005	0.00005	User defined
Affiliated Manufacturers, Inc. (AMI)	XP-508	2x	20 x 20	256	512 x 480	N/A	N/A	Unlimited shape, size <0.15 in
Automated Production Systems, Inc.	SPR-25	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Automated Production Systems, Inc.	SPR-40	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Automated Production Systems, Inc.	SPR-45	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cookson Electronics Equipment	AccuFlex			256			±.25 microns @ 6-sigma, Cp ≥2.0	Per SMEMA Spec
Cookson Electronics Equipment	AP Excel	30x	17.5 x 16	256	640 x 480 x 8 bit	±.001 " @ 6-sigma, Cp ≥2.0	±.001 " @ 6-sigma, Cp ≥2.0	All types
Cookson Electronics Equipment	SPM		Full Board Size	256				Per SMEMA Spec
Cookson Electronics Equipment	UltraFlex	30x	24 x 22	1/4 pixel	.1 x .1 "	±.001 " @ 6-sigma, Cp ≥2.0	±.001 " @ 6-sigma, Cp ≥2.0	.03 x .1
Cookson Electronics Equipment	UltraFlex BBP	30x	36 x 24	1/4 pixel	.1 x .1 "	±.001 " @ 6-sigma, Cp ≥2.0	±.001 " @ 6-sigma, Cp ≥2.0	All types
Cookson Electronics Equipment	UP2000 HiE		Full Board Size	256			±25 microns @ 6-sigma, Cp ≥2.0	All types

Circuits Assembly — Screen Printer Survey

- VISION SYSTEM]								
Company	Model	SMEMA fiducial standard compatible?	Typical fiducial processing speed	Fiducial teach	Align calibration	Automatic stencil inspection	Board inspection	Post print inspection available
Advanced Techniques US, Inc.	SPOT 20/20	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Affiliated Manufacturers, Inc. (AMI)	MSP-1826 PC	Yes	10 ms	Yes	Fully automatic	No	No	No
Affiliated Manufacturers, Inc. (AMI)	XP-508	Yes	N/A	Yes	N/A	No	No	No
Automated Production Systems, Inc.	SPR-25	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Automated Production Systems, Inc.	SPR-40	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Automated Production Systems, Inc.	SPR-45	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cookson Electronics Equipment	AccuFlex	Yes		Yes	Fully automatic	No	Yes	2-D
Cookson Electronics Equipment	AP Excel	Yes		Yes	Fully automatic	No	Yes	2-D
Cookson Electronics Equipment	SPM	Yes		Yes	Fully automatic, Semi-automatic, manual	No	No	No
Cookson Electronics Equipment	UltraFlex	Yes	Practically zero	Yes	Fully automatic	No	Yes	2-D, 3-D
Cookson Electronics Equipment	UltraFlex BBP	Yes	Practically zero	Yes	Fully automatic	No	Yes	2-D, 3-D
Cookson Electronics Equipment	UP2000 HiE	Yes		Yes	Fully automatic	No	Yes	2-D

Circuits Assembly — Screen Printer Survey

Company	Model	[PROGRAMMING]							
		Up and down line protocol	PLC used	User Interface/ Operating system	On-board recipe storage	Number of programs stored	Emergency stop at each end of machine	Printer network-able	SPC data extrac-tion
Advanced Techniques US, Inc.	SPOT 20/20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Affiliated Manufacturers, Inc. (AMI)	MSP-1826 PC	SMEMA		Light pen/ Windows 98	Yes	2,000+	Yes	Yes	Yes
Affiliated Manufacturers, Inc. (AMI)	XP-508	SMEMA	KOYO	Touch pad/ LCD- PLC	Yes	50	Yes	N/A	No
Automated Production Systems, Inc.	SPR-25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Automated Production Systems, Inc.	SPR-40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Automated Production Systems, Inc.	SPR-45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Cookson Electronics Equipment	AccuFlex	SMEMA	No	Windows 2000	Yes	Unlimited	Yes	Yes	Yes
Cookson Electronics Equipment	AP Excel	SMEMA		Windows NT	Yes	Unlimited	Yes	Yes	Yes
Cookson Electronics Equipment	SPM	N/A	N/A	Windows	Yes	Unlimited	Yes		No
Cookson Electronics Equipment	UltraFlex	SMEMA, SECS, GEM		DOS	Yes	1000	Yes	No	Yes
Cookson Electronics Equipment	UltraFlex BBP	SMEMA, SECS, GEM		DOS	Yes	1000	Yes	No	Yes
Cookson Electronics Equipment	UP2000 HiE	SMEMA	P6	Windows 2000	Yes	Unlimited	Yes	Yes	Yes

Circuits Assembly — Screen Printer Survey

Company	Model	[GENERAL]					[BOARD HANDLING -		
		Length (in.)	Width (in.)	Height (in.)	Automation	Transport height from floor (in.)	Maximum size (in.)	Minimum size (in.)	Maximum thickness (in.)
EKRA America, Inc.	E5	59	50.4	59	Fully Automatic	Variable/SMEMA	21.6 x 21.6	3.1 x 1.10	0.24
EKRA America, Inc.	E5 XL	59	50.4	59	Fully Automatic	Variable/SMEMA	24 x 30	3.1 x 1.10	0.24
EKRA America, Inc.	E5 36	78.7	64.9	62.2	Fully Automatic	Variable/SMEMA	24 x 36	2 x 1	0.31 top clamps - 0.59 side clamp
EKRA America, Inc.	E5 HSP	47.2	46.3	55.1	Fully Automatic	Variable/SMEMA	12.9 x 9.8	3.1 x 1.9	0.24
EKRA America, Inc.	Dual Con	59	76.8	57	Fully Automatic	Variable/SMEMA	12.9 x 8.5	2.1 x 3.1	0.24
EKRA America, Inc.	Titan	129.5	81.3	77.9	Fully Automatic	Variable/SMEMA	60 x 36	6 x 6	0.45
Elite Circuit Equipment	E-6920	38	38	16	Semi-automatic	N/A	20 x 30	N/A	0.75
Elite Circuit Equipment	E-5920	38	38	16	Semi-automatic	N/A	20 x 30	None	0.75
Elite Circuit Equipment	E-4500	33	36	11	Manual	N/A	20 x 30	None	0.75
Europlacer	Model SP-200	33.46	43.31	45.08	Semi-automatic	N/A	15.7 x 17.7	2 x 2	Unlimited
Fuji America Corp.	GP-551E	69	70.27	61	Fully automatic	35,5 to 37.5	18 x 20	2 x 3	0.1574

Circuits Assembly — Screen Printer Survey

Company	Model	- BOARD HANDLING -				Board held by	Board support
		Minimum thickness (in.)	Maximum board weight (lbs)	Maximum warpage (in.)	Underside component clearance (in.)		
EKRA America, Inc.	E5	0.02	10	1% (Diagonal)	0.01 Edge / 0.7 Verticle	Edge and Top Clamping (vacuum optional)	Magnetic pins, tooling pins, vacuum plate, other
EKRA America, Inc.	E5 XL	0.02	24	1% (Diagonal)	0.01 Edge / 0.7 Verticle	Edge and Top Clamping (vacuum optional)	Magnetic pins, tooling pins, vacuum plate, other
EKRA America, Inc.	E5 36	0.02	55	1% (Diagonal)	0.9 Verticle	Edge and Top Clamping (vacuum optional)	Magnetic pins, tooling pins, vacuum plate, other
EKRA America, Inc.	E5 HSP	0.015	10	1% (Diagonal)	0.01 Edge / 0.7 Verticle	Edge and Top Clamping (vacuum optional)	Magnetic pins, tooling pins, vacuum plate, other
EKRA America, Inc.	Dual Con	0.02	10	1% (Diagonal)	0.01 Edge / 0.7 Verticle	Edge and Top Clamping (vacuum optional)	Magnetic pins, tooling pins, vacuum plate, other
EKRA America, Inc.	Titan	0.062	52	1% (Diagonal)	0.9 Verticle	Edge and Top Clamping (vacuum optional)	Magnetic pins, tooling pins, vacuum plate, other
Elite Circuit Equipment	E-6920	None	N/A	N/A	0.5	Vacuum, other	Tooling pins, Vacuum plate, Other
Elite Circuit Equipment	E-5920	0.001	N/A	N/A	0.5	Vacuum, other	Tooling pins, Vacuum plate, Other
Elite Circuit Equipment	E-4500	0.001	N/A	N/A	0.5	Vacuum, other	Tooling pins, Vacuum plate, Other
Europlacer	Model SP-200	0.2	Unlimited	Vacuum to Remove (0.19)	1.19 Standard	Edge clamp, vacuum, tooling pins	Magnetic pins, tooling pins, vacuum plate
Fuji America Corp.	GP-551E	0.0196	2.2	0.04	1	Edge clamp, vacuum	Tooling pins, vacuum plate

Circuits Assembly — Screen Printer Survey

Company	Model	- BOARD HANDLING]				[PRINT PARAMETERS -			
		Auto pin support placement available	Conveyor	Board Movement	Machine interface transport speed (in./sec.)	Motorized width control	Dual-lane board handling	Print area	Maximum print stroke (in.)
EKRA America, Inc.	E5	Optional Auto Guidance System	Standard	R to L, L to R	Up to 15.7	Yes	No	21.6 x 21.6	26
EKRA America, Inc.	E5 XL	Optional Auto Guidance System	Standard	R to L, L to R	Up to 15.7	Yes	No	24 x 30	28
EKRA America, Inc.	E5 36	Optional Auto Guidance System	Standard	R to L, L to R	Up to 15.7	Yes	No	24 x 36	28
EKRA America, Inc.	E5 HSP	Optional Auto Pin Guidance System	Standard 3 Conveyers	R to L, L to R	up to 15.7	Yes	No	12.9 x 9.8	13
EKRA America, Inc.	Dual Con	Optional Auto Pin Guidance System	Standard	R to L, L to R	Up to 15.8	Yes	Yes	12.9 x 8.5	14
EKRA America, Inc.	Titan	Optional Auto Guidance System	Standard	R to L, L to R	Up to 25	Yes	No	60 x 36	42
Elite Circuit Equipment	E-6920	No	No	R to L, L to R		N/A	N/A	18 x 18	19
Elite Circuit Equipment	E-5920	No	No	N/A	N/A	N/A	N/A	18 x 18	19
Elite Circuit Equipment	E-4500	No	No	N/A	N/A	N/A	N/A	18 x 18	19-20
Europlacer	Model SP-200	No	N/A			No	No	15.7 x 17.7	18
Fuji America Corp.	GP-551E	No	Standard	L to R	12	No	No	18 x 20	22

Circuits Assembly — Screen Printer Survey

Company	Model	- PRINT PARAMETERS -				Print modes	Print speed (in./sec.)	Print pressure (lbs)
		Method of registration	Optical alignment	Alignment accuracy (microns)	Alignment repeatability (microns)			
EKRA America, Inc.	E5	2 Camera Vision	Yes	±25	±7.5		0.2 - 7.8	0 - 54
EKRA America, Inc.	E5 XL	2 Camera Vision	Yes	±25	±12.5		0.2 - 7.8	0 - 54
EKRA America, Inc.	E5 36	2 Camera Vision	Yes	±25	±12.5		0.35 - 7.8	0 - 90
EKRA America, Inc.	E5 HSP	2 Camera Vision	Yes	±25	±12.5		0 - 15.7	0 - 54
EKRA America, Inc.	Dual Con	2 Camera Vision	Yes	±25	±12.5		0 - 19.6	0 - 54
EKRA America, Inc.	Titan	2 Camera Vision	Yes	±25	±12.5		0 - 20.3	0 - 112
Elite Circuit Equipment	E-6920	Manual, other	Yes	N/A	12.5	print/print, print/flood, flood/print, on contact, 1 or 2 deposits	0-16	20-40
Elite Circuit Equipment	E-5920	Manual, other	Yes	N/A	12.5	print/print, print/flood, flood/print, on contact, 1 or 2 deposits	0-16	20-40
Elite Circuit Equipment	E-4500	Manual, other	Yes	N/A	12.5		N/A	
Europlacer	Model SP-200	Two-camera vision, Manual	No	±25	±25 microns	print/print, print/flood, flood/print, on contact	0.25 to 7.9	0 to 55
Fuji America Corp.	GP-551E	Vision	Yes	0.02 mm	0.012 mm	print/print, flood/print, on contact	0.1 to 11	

Circuits Assembly — Screen Printer Survey

Company	Model	- PRINT PARAMETERS -			Snap off speed (in./sec.)	Snap-off program-mable?	Cycle time (sec.)	Is this a pump/ pressured head design machine	Stencil frame size (in.)	Fixed frame or adjustable
		Adjustment?	Snap off (print gap) (in.)							
EKRA America, Inc.	E5		0 - 0.39	0.004 - 0.04	Yes	10		12.6 x 12.6 to 33.5 x 39.4		
EKRA America, Inc.	E5 XL		0 - 0.39	0.004 - 0.04	Yes	10		12.6 x 12.6 to 34.6 x 39.4		
EKRA America, Inc.	E5 36		0 - 0.39	0.008 - 0.04	Yes	10		20 x 20 to 50 x 45		
EKRA America, Inc.	E5 HSP		0 - 0.39	0.004 - 0.04	Yes	6.5		29 x 29		
EKRA America, Inc.	Dual Con		0 - 0.39	0.004 - 0.04	Yes	6.5		29 x 29		
EKRA America, Inc.	Titan		0.004 - 0.04		Yes	30		20 x 20 to 84 x 64		
Elite Circuit Equipment	E-6920	Pneumatic	0.75	N/A	No	N/A	Yes	12 x 12 to 20 x 20	Adjustable	
Elite Circuit Equipment	E-5920	Manual, pneumatic	0.75	N/A	No	N/A	N/A	12 x 12 to 20 x 20	Adjustable	
Elite Circuit Equipment	E-4500		0.75	N/A	No	N/A	N/A	8 x 10 to 20 x 20	Adjustable	
Europlacer	Model SP-200	Pneumatic	1	0.39	Yes	N/A	No	23 x 23 OD	Fixed	
Fuji America Corp.	GP-551E	Electric, pneumatic	Contact -1	Programmable	Yes	Single lane: 11	Yes	36 x 28	Adjustable	

Circuits Assembly — Screen Printer Survey

- PRINT PARAMETERS -								
Company	Model	Stencil frame adaptor plates	Stencil alignment range (x,y)(in.)	Radial stencil alignment range (degree)	PCB stencil separation speed (in./sec.)	Stencil wiper	Stencil cleaning	Squeegees
EKRA America, Inc.	E5	No	±0.31	±2	0.004 - 0.04	Standard	Dry, wet, vacuum; Programmable: Yes	Metal, polyurethane
EKRA America, Inc.	E5 XL	No	±0.31	±2	0.004 - 0.04	Standard	Dry, wet, vacuum; Programmable: Yes	Metal, polyurethane
EKRA America, Inc.	E5 36	NO	±0.19	±2	0.008 - 0.04	Standard	Dry, wet, vacuum; Programmable: Yes	Metal, polyurethane
EKRA America, Inc.	E5 HSP	No	±0.16	±2	0.004 - 0.04	Standard	Dry, wet, vacuum; Programmable: Yes	Metal, polyurethane
EKRA America, Inc.	Dual Con	No	±0.16	±2	0.004 - 0.04	Standard	Dry, wet, vacuum; Programmable: Yes	Metal, polyurethane
EKRA America, Inc.	Titan	No	±0.16	±2	0.004 - 0.04	Standard	Dry, wet, vacuum; Programmable: Yes	Metal or Poly
Elite Circuit Equipment	E-6920	Yes	±0.10	10		No		Metal or Poly
Elite Circuit Equipment	E-5920	Yes	±1.0	10		No		Metal, polyurethane
Elite Circuit Equipment	E-4500	Yes	±1.0	10		No		Metal, polyurethane
Europlacer	Model SP-200	Yes	0.19	N/A	0.39	Optional	Dry, wet, Programmable: Yes	Metal, polyurethane
Fuji America Corp.	GP-551E	Yes	0.58	1.14°	Programmable	Standard, top and bottom	Dry, wet, vacuum, other; Programmable: Yes	Metal, polyurethane, other

Circuits Assembly — Screen Printer Survey

Company	Model	- PRINT PARAMETERS]					[VISION SYSTEM -	
		Squeegee programmable down cycle	Squeegee pressure (lbs)	Where measured	Horizontal or central pivot?	Typical number of cycles to sharpening/ replacement	Type	Field of vision (in.)
EKRA America, Inc.	E5	Yes	0 - 54	Closed Loop - Print Head	Central		On the move, look up, look down	0.39 - 0.31
EKRA America, Inc.	E5 XL	Yes	0 - 54	Closed Loop - Print Head	Central		On the move, look up, look down	0.39 - 0.31
EKRA America, Inc.	E5 36	Yes	0 - 90	Closed Loop - Print Head	Central		On the move, look up, look down	0.39 - 0.30
EKRA America, Inc.	E5 HSP	Yes	0 - 54	Closed Loop - Print Head	Central		On the move, look up, look down	0.39 - 0.31
EKRA America, Inc.	Dual Con	Yes	0 - 54	Closed Loop - Print Head	Central		On the move, look up, look down	0.39 - 0.31
EKRA America, Inc.	Titan	Yes	0 - 112	Closed Loop - Print Head	Central		On the move, Look up and Look down	0.39 - 0.31
Elite Circuit Equipment	E-6920	No	0-60 psi	Squeegee panel	Horizontal		On the move, look down	Variable
Elite Circuit Equipment	E-5920	No			Horizontal		On the move, look down	Variable
Elite Circuit Equipment	E-4500				Horizontal		On the move, look down	Variable
Europlacer	Model SP-200	No	0 to 44		Central	Varies	Look down	2 x 2
Fuji America Corp.	GP-551E	Yes	44	at print head	Central	Depends on pressure and stroke	On the move, look up, look down	0.5 x 0.5

Circuits Assembly — Screen Printer Survey

- VISION SYSTEM -								
Company	Model	Magnification	Viewing capability (in.)	Gray scale resolution (shades of gray/pixel)	Image storage capacity (pixels)	Accuracy (in.)	Repeatability (in.)	Fiducial type/size
EKRA America, Inc.	E5					0.001	0.0003	Variable / 0.3 x 0.3
EKRA America, Inc.	E5 XL					0.001	0.0003	Variable / 0.3 x 0.3
EKRA America, Inc.	E5 36					0.001	0.0003	Variable / 0.3 x 0.3
EKRA America, Inc.	E5 HSP					0.001	0.0003	Variable / 0.3 x 0.3
EKRA America, Inc.	Dual Con					0.001	0.0003	Variable / 0.3 x 0.3
EKRA America, Inc.	Titan					0.001	0.0003	Variable / 0.3 x 0.3
Elite Circuit Equipment	E-6920	Variable	Variable	N/A	None	N/A	N/A	N/A
Elite Circuit Equipment	E-5920	Variable	Variable	N/A	None	N/A	N/A	N/A
Elite Circuit Equipment	E-4500	Variable	Variable	N/A	None	N/A	N/A	N/A
Europlacer	Model SP-200	1 to 1.4	2 x 2	N/A	N/A	N/A	N/A	Customer define
Fuji America Corp.	GP-551E	1:1	0.24 x 0.25	256	N/A	N/A	N/A	8 types, 0.5 mm to 4 mm

Circuits Assembly — Screen Printer Survey

- VISION SYSTEM]								
Company	Model	SMEMA fiducial standard compatible?	Typical fiducial processing speed	Fiducial teach	Align calibration	Automatic stencil inspection	Board inspection	Post print inspection available
EKRA America, Inc.	E5	Yes		Yes	Fully Automatic	Optional	Optional	Optional
EKRA America, Inc.	E5 XL	Yes		Yes	Fully Automatic	Optional	Optional	Optional
EKRA America, Inc.	E5 36	Yes		Yes	Fully Automatic	Optional	Optional	Optional
EKRA America, Inc.	E5 HSP	Yes		Yes	Fully Automatic	Optional	Optional	Optional
EKRA America, Inc.	Dual Con	Yes		Yes	Fully Automatic	Optional	Optional	Optional
EKRA America, Inc.	Titan	Yes		Yes	Fully Automatic	Optional	Optional	Optional
Elite Circuit Equipment	E-6920	N/A	N/A	N/A	N/A	No	No	No
Elite Circuit Equipment	E-5920	N/A	N/A	N/A	N/A	No	No	No
Elite Circuit Equipment	E-4500	N/A	N/A	N/A	N/A	No	No	No
Europlacer	Model SP-200	No	N/A	Yes	Manual	No	No	No
Fuji America Corp.	GP-551E	Yes	0.5 sec.	Yes	Fully automatic	Yes	Yes	No

Circuits Assembly — Screen Printer Survey

Company	Model	[PROGRAMMING]							
		Up and down line protocol	PLC used	User Interface/ Operating system	On-board recipe storage	Number of programs stored	Emergency stop at each end of machine	Printer network-able	SPC data extrac-tion
EKRA America, Inc.	E5	SMEMA		Windows	Yes	1000	No	Yes	Yes
EKRA America, Inc.	E5 XL	SMEMA		Windows	Yes	1000	No	Yes	Yes
EKRA America, Inc.	E5 36	SMEMA		Windows	Yes	1000	No	Yes	Yes
EKRA America, Inc.	E5 HSP	SMEMA		Windows	Yes	1000	No	Yes	Yes
EKRA America, Inc.	Dual Con	SMEMA		Windows	Yes	1000	No	Yes	Yes
EKRA America, Inc.	Titan	SMEMA		Windows	Yes	1000	No	Yes	Yes
Elite Circuit Equipment	E-6920	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Elite Circuit Equipment	E-5920	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Elite Circuit Equipment	E-4500	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Europlacer	Model SP-200		Omron	PLC Control	Yes	400	Yes	No	No
Fuji America Corp.	GP-551E	SMEMA, SECS, GEM	Servo control, Yamatake/ Honeywell MX (250)	Windows NT (proprietary)	Yes	10	No	Yes	Yes

Circuits Assembly — Screen Printer Survey

Company	Model	[GENERAL]					[BOARD HANDLING -		
		Length (in.)	Width (in.)	Height (in.)	Automation	Transport height from floor (in.)	Maximum size (in.)	Minimum size (in.)	Maximum thickness (in.)
Milara Inc.	TouchPrint TP2929	63	53.5	56	Fully automatic	SMEMA (adjustable)	20 x 24	2 x 2	.1
Minami	MK-878sv L	55	41	70	Fully automatic	35.5±1	18 x 14	2 x 2	0.4
Minami	MK-878sv M	47	34	59	Semi-automatic	35.5±1	13 x 10	2 x 2	0.4
Minami	MK-880sv LL	56	52	72	Fully automatic	35.5±1	20 x 18	4 x 4	0.4
Panasonic Factory Automation	SPF	72	68	59	Fully automatic	35.4	18 x 20	2 x 2	0.16
Reprint Services	Compact 29	35.9	40.86	46.96	Manual	37.5	31.4 x 20.27	2 x 1	0.4
Reprint Services	R 29	65.15	51.45	54.48	Semi-automatic	34 to 38	31.4 x 22	2 x 1	0.4

Circuits Assembly — Screen Printer Survey

- BOARD HANDLING -							
Company	Model	Minimum thickness (in.)	Maximum board weight (lbs)	Maximum warpage (in.)	Underside component clearance (in.)	Board held by	Board support
Milara Inc.	TouchPrint TP2929	.015	70	.1	.75	Edge clamp, vacuum optional, servo torque	Magnetic pins, tooling pins
Minami	MK-878sv L	0	2.5	0.2	0.7	Edge clamp	Tooling pins, vacuum plate
Minami	MK-878sv M	0	2.5	0.2	0.7	Edge clamp	Tooling pins, vacuum plate
Minami	MK-880sv LL	0	2.5	0.2	0.7	Edge clamp, vacuum	Tooling pins, vacuum plate
Panasonic Factory Automation	SPF	0.02	6.6	0.05	1.18	Edge clamp, vacuum, pin	Tooling pins, vacuum plate
Reprint Services	Compact 29	0.007	11		0.8	Edge clamp, vacuum	Magnetic pins, tooling pins, Bespoke Tooling on request
Reprint Services	R 29	0.007	11		0.8	Edge clamp, vacuum, snuggers optional	Magnetic pins, tooling pins, Bespoke Tooling on request

Circuits Assembly — Screen Printer Survey

Company	Model	- BOARD HANDLING]				[PRINT PARAMETERS -			
		Auto pin support placement available	Conveyor	Board Movement	Machine interface transport speed (in./sec.)	Motorized width control	Dual-lane board handling	Print area	Maximum print stroke (in.)
Milara Inc.	TouchPrint TP2929	Yes	Standard	R to L, L to R	1 to 60 in/sec.	Yes	No	20 x 24	28
Minami	MK-878sv L	No	Standard	R to L, L to R	7.5	Yes	No	18 x 14	20
Minami	MK-878sv M	No	Standard	R to L, L to R	7.5	Yes	No	13 x 10	15
Minami	MK-880sv LL	No	Standard	R to L, L to R	7.5	Yes	No	20 x 18	22
Panasonic Factory Automation	SPF	Optional	Standard	R to L, L to R	19.4 to 35.3	Yes	No	20 x 17.8	23.6
Reprint Services	Compact 29	No	No		N/A	No	No	18.5 x 20.3 to 23.6 x 20.3	23.22
Reprint Services	R 29	No	Shuttle Table	L to R	N/A	No	No	20.3 x 18.5	23.22

Circuits Assembly — Screen Printer Survey

- PRINT PARAMETERS -								
Company	Model	Method of registration	Optical alignment	Alignment accuracy (microns)	Alignment repeatability (microns)	Print modes	Print speed (in./sec.)	Print pressure (lbs)
Milara Inc.	TouchPrint TP2929	Vision	Yes	8	4	print/print, print/flood, flood/print, on contact	.1 to 10	.1 to 65
Minami	MK-878sv L	Vision	Yes	±15	±15	print/print, print/flood, flood/print, on contact, 1 deposit	0.2 to 4.0	N/A
Minami	MK-878sv M	Vision	Yes	±15	±15	print/print, print/flood, flood/print, on contact, 1 deposit	0.2 to 4.0	0.5 to 1
Minami	MK-880sv LL	Vision	Yes	±15	±15	print/print, print/flood, flood/print, on contact, 1 deposit	0.2 to 4.0	0.2 to 4
Panasonic Factory Automation	SPF	Vision	Yes	25	8	print/print, print/flood, flood/print, on contact	0.04 to 11.8	0 to 57.2
Reprint Services	Compact 29	Manual		+/-4 microns	+/-10 microns	print/print, print/flood, flood/print, 1 or 2 deposits	.002 - 7.87	0-44
Reprint Services	R 29	Two-camera vision, manual		+/-4 microns	+/-10 microns	print/print, print/flood, flood/print, on contact, 1 or 2 deposits	.002 - 7.87	0-44

Circuits Assembly — Screen Printer Survey

Company	Model	- PRINT PARAMETERS -			Snap off speed (in./sec.)	Snap-off program-mable?	Cycle time (sec.)	Is this a pump/ pressured head design machine	Stencil frame size (in.)	Fixed frame or adjustable
		Adjustment?	Snap off (print gap) (in.)							
Milara Inc.	TouchPrint TP2929	Electric, pneumatic	.2	.0001 to 5 IPS	Yes	Single: less than 4 secs	No, but upgradable	29 x 29	Fixed, Adjustable	
Minami	MK-878sv L	Electric	4	0.4	Yes	Single lane: 25	Yes	29 x 29	Fixed	
Minami	MK-878sv M	Electric	4	0.4	Yes	Single lane: 25	Yes	25.5 x 21.5	Fixed	
Minami	MK-880sv LL	Electric	4	0.4	Yes	Single lane: 25	Yes	29 x 29	Fixed	
Panasonic Factory Automation	SPF	Pneumatic	0.04 to 0.12	0 to 0.4	Yes	Single lane: 7	No	29 x 29	Adjustable	
Reprint Services	Compact 29	Programable	0-.78		Yes	Single lane: 12	No	29 x 29		
Reprint Services	R 29	Programable	0-.78	Programmable	Yes	Single lane: 10	No	29 x 29		

Circuits Assembly — Screen Printer Survey

- PRINT PARAMETERS -								
Company	Model	Stencil frame adaptor plates	Stencil alignment range (x,y)(in.)	Radial stencil alignment range (degree)	PCB stencil separation speed (in./sec.)	Stencil wiper	Stencil cleaning	Squeegees
Milara Inc.	TouchPrint TP2929	Yes	.4 x .4	±3	.0001 to 5	Optional	Other; programmable	Metal, polurethane, other: new
Minami	MK-878sv L	Yes	0.4, 3.5	±1.5	0.4	Standard	Dry, wet, vacuum, air; Programmable: Yes	Metal, polyurethane, other: "SUS"
Minami	MK-878sv M	Yes	0.4, 3.5	±1.5	0.4	Standard	Dry, wet, vacuum, air; Programmable: Yes	Metal, polyurethane, other: "SUS"
Minami	MK-880sv LL	Yes	0.4, 3.5	±1.5	0.4	Standard	Dry, wet, vacuum, air; Programmable: Yes	Metal, polyurethane, other: "SUS"
Panasonic Factory Automation	SPF	Yes	0.75, 10	-15° to +15°	0 to 1	Standard	Dry, wet, vacuum, air; Programmable: Yes	Metal, polyurethane, other
Reprint Services	Compact 29	Yes	±010	4	Programmable	No	N/A	Metal, poyurethane
Reprint Services	R 29	Yes	±010	4	Programmable	Optional	Dry, wet, vacuum; programmable: yes	Metal, poyurethane

Circuits Assembly — Screen Printer Survey

Company	Model	- PRINT PARAMETERS]					[VISION SYSTEM -	
		Squeegee programmable down cycle	Squeegee pressure (lbs)	Where measured	Horizontal or central pivot?	Typical number of cycles to sharpening/ replacement	Type	Field of vision (in.)
Milara Inc.	TouchPrint TP2929	Yes	.1 to 70	Proportional air controlled or new servo	Central	Application Specific	On the move, look down	.4 x .4
Minami	MK-878sv L	Yes	0.5 to 1.0	Across squeegee length	Central	150000	On the move, look up, look down	0.3 x 0.25
Minami	MK-878sv M	Yes	0.5 to 1.0	Across squeegee length	Central	150000	On the move, look up, look down	0.3 x 0.25
Minami	MK-880sv LL	Yes	0.5 to 1.0	Across squeegee length	Central	150000	On the move, look up, look down	0.3 x 0.25
Panasonic Factory Automation	SPF	Yes	0 to 43	At squeegee head	Central		On the move, look down	0.16
Reprint Services	Compact 29	Yes	0-44		Central		N/A	N/A
Reprint Services	R 29	Yes	0-44		Central		Fixed, look down	Adjustable

Circuits Assembly — Screen Printer Survey

- VISION SYSTEM -								
Company	Model	Magnification	Viewing capability (in.)	Gray scale resolution (shades of gray/pixel)	Image storage capacity (pixels)	Accuracy (in.)	Repeatability (in.)	Fiducial type/size
Milara Inc.	TouchPrint TP2929	40X	20 x 22	65535	652 x 454 x 16 bit	.0005	.00025	Infinitely variable
Minami	MK-878sv L		0.3 x 0.25	256	257,025/ image			Unique mark capture/ 0.02 to 0.08
Minami	MK-878sv M		0.3 x 0.25	256	257,025/ image			Unique mark capture/ 0.02 to 0.08
Minami	MK-880sv LL		0.3 x 0.25	256	257,025/ image			Unique mark capture/ 0.02 to 0.08
Panasonic Factory Automation	SPF	30x	0.0003/pixel	256	460 x 512	0.0003	0.0003	All up to 0.090 in. sq.
Reprint Services	Compact 29	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Reprint Services	R 29		21.6 x 21.6	Yes				Boundary/Whole Image/ Cross Hairs/ Ellipse, Circles

Circuits Assembly — Screen Printer Survey

- VISION SYSTEM]								
Company	Model	SMEMA fiducial standard compatible?	Typical fiducial processing speed	Fiducial teach	Align calibration	Automatic stencil inspection	Board inspection	Post print inspection available
Milara Inc.	TouchPrint TP2929	Yes	30 microseconds	Yes	Fully automatic	Not required	Yes	Yes, 2-D
Minami	MK-878sv L	N/A	0.5 sec.	Yes	Fully automatic	No	No	2-D
Minami	MK-878sv M	N/A	0.5 sec.	Yes	Fully automatic	No	No	2-D
Minami	MK-880sv LL	N/A	0.5 sec.	Yes	Fully automatic	No	No	2-D
Panasonic Factory Automation	SPF	Yes	75 ms	Yes	Fully automatic	Yes	No	2-D
Reprint Services	Compact 29	No	N/A	No	N/A	No	No	No
Reprint Services	R 29			Yes	Semi-automatic, manual	No	No	No

Circuits Assembly — Screen Printer Survey

[PROGRAMMING]									
Company	Model	Up and down line protocol	PLC used	User Interface/ Operating system	On-board recipe storage	Number of programs stored	Emergency stop at each end of machine	Printer networkable	SPC data extraction
Milara Inc.	TouchPrint TP2929	SMEMA,	n/a	Windows 2000 Pro	Yes	Unlimited	Yes	Yes	Yes
Minami	MK-878sv L	SMEMA		DOS 6.20	Yes	500	Yes	No	No
Minami	MK-878sv M	SMEMA		DOS 6.20	Yes	500	Yes	No	No
Minami	MK-880sv LL	SMEMA		DOS 6.20	N/A		Yes	No	No
Panasonic Factory Automation	SPF	SMEMA	Panasonic	MDOS	Yes	50	Yes	Yes	Yes
Reprint Services	Compact 29	N/A	N/A	Windows 98/ Reprint Bespoke GUI	Yes		No	Yes	Yes
Reprint Services	R 29	N/A	N/A	Windows 98/ Reprint Bespoke GUI	Yes		No	Yes	Yes

Circuits Assembly — Screen Printer Survey

Company	Model	[GENERAL]					[BOARD HANDLING -		
		Length (in.)	Width (in.)	Height (in.)	Automation	Transport height from floor (in.)	Maximum size (in.)	Minimum size (in.)	Maximum thickness (in.)
Surface Mount Techniques	2424 LPT	68	65	55	Fully automatic	37 to 39	25 x 26	2 x 2	0.5
Surface Mount Techniques	3032 LPT	68	65	55	Fully automatic	37 to 39	30.5 x 32.5	2 x 2	0.5
Surface Mount Techniques	3038 LPT	68	65	55	Fully automatic	37 to 39	30 x 38	6 x 6	1
Surface Mount Techniques	3046 LPT	74	65	55	Fully automatic	37 to 39	30 x 46	6 x 6	1
Surface Mount Techniques	3060 LPT	90	65	55	Fully automatic	37 to 39	30 x 60	6 x 6	1
Surface Mount Techniques	2444 AV	134	40	60	Semi-automatic	N/A	24 x 48	6 x 6	1
Surface Mount Techniques	Opti-Print 2220 PTV	90	48	64	Fully automatic	33 to 38	18 x 20	3 x 4	0.125
Surface Mount Techniques	Opti-Print SL2220	48	65	64	Semi-automatic	N/A	22 x 24	2 x 2	0.625
Surface Mount Techniques	Opti-Print 2444BAM	48	65	64	Semi-automatic	N/A	24 x 48	2 x 2	0.625
Surface Mount Techniques	Opti-Print 2430 BAM	36	45	50	Semi-automatic	N/A	24 x 32	2 x 2	0.625
Surface Mount Techniques	Opti-Print 2020	36	36	54	Semi-automatic	N/A	21 x 24	2 x 2	0.625
Surface Mount Techniques	Opti-Print 483P3	36	36	50	Semi-automatic	N/A	21 x 24	2 x 2	0.625
Surface Mount Techniques	Opti-Print 1616PD/256P3	30/34	32/32	18.5/49	Semi-automatic	N/A	18 x 18	2 x 2	0.625
Transition Automation	PrinTEK I Model 4000 (Manual)	39	54	6	Manual	38	22 x 24	N/A	0.5625
Transition Automation	PrinTEK I Model 4000 (Semi automatic)	54	80	14	Semi-automatic	38	26 x 41	N/A	0.75
Transition Automation	PrinTEK II	38	59	55	Semi-automatic	38	18 x 18.5	N/A	0.75

Circuits Assembly — Screen Printer Survey

Company	Model	- BOARD HANDLING -				Board held by	Board support
		Minimum thickness (in.)	Maximum board weight (lbs)	Maximum warpage (in.)	Underside component clearance (in.)		
Surface Mount Techniques	2424 LPT	0.048	<45	0.05	0.075	Edge clamp, vacuum	Magnetic pins, vacuum plate
Surface Mount Techniques	3032 LPT	0.048	<45	0.05	0.75	Edge clamp, vacuum	Magnetic pins, vacuum plate
Surface Mount Techniques	3038 LPT	0.062	<45	0.05	0.75	Edge clamp, vacuum	Magnetic pins, vacuum plate
Surface Mount Techniques	3046 LPT	0.062	<45	0.05	0.75	Edge clamp, vacuum	Magnetic pins, vacuum plate
Surface Mount Techniques	3060 LPT	0.062	<45	0.05	0.75	Edge clamp, vacuum	Magnetic pins, vacuum plate
Surface Mount Techniques	2444 AV	0.02	100	0.05	0.505	Vacuum, tooling pins	Magnetic pins, vacuum plate
Surface Mount Techniques	Opti-Print 2220 PTV	0.045	15	0.04	1.25	Edge clamp, vacuum	Magnetic pins, vacuum plate
Surface Mount Techniques	Opti-Print SL2220	0.005	75	0.05	0.505	Tooling pins/Vacuum	Magnetic pins, vacuum plate
Surface Mount Techniques	Opti-Print 2444BAM	0.005	75	0.05	0.505	Tooling pins/Vacuum	Magnetic pins, vacuum plate
Surface Mount Techniques	Opti-Print 2430 BAM	0.005	75	0.05	0.505	Tooling pins/Vacuum	Magnetic pins, vacuum plate
Surface Mount Techniques	Opti-Print 2020	0.005	75	0.05	0.505	Tooling pins/Vacuum	Magnetic pins, vacuum plate
Surface Mount Techniques	Opti-Print 483P3	0.005	75	0.05	0.505	Tooling pins/Vacuum	Magnetic pins, vacuum plate
Surface Mount Techniques	Opti-Print 1616PD/256P3	0.005	75	0.05	0.505	Tooling pins/Vacuum	Magnetic pins, vacuum plate
Transition Automation	PrinTEK I Model 4000 (Manual)	N/A	10	0.5	0.9	Pins	Magnetic pins, tooling pins, vacuum plate
Transition Automation	PrinTEK I Model 4000 (Semi automatic)	N/A	10	0.5	0.9	Vacuum, tooling pins	Magnetic pins, tooling pins, vacuum plate
Transition Automation	PrinTEK II	N/A	10	0.5	0.9	Vacuum, pins	Magnetic pins, tooling pins, vacuum plate

Circuits Assembly — Screen Printer Survey

Company	Model	- BOARD HANDLING]				[PRINT PARAMETERS -			
		Auto pin support placement available	Conveyor	Board Movement	Machine interface transport speed (in./sec.)	Motorized width control	Dual-lane board handling	Print area	Maximum print stroke (in.)
Surface Mount Techniques	2424 LPT	Optional	Standard	R to L or L to R	10	Yes	No	24 x 24	26
Surface Mount Techniques	3032 LPT	Optional	Standard	R to L or L to R	10	Yes	No	30 x 32	34
Surface Mount Techniques	3038 LPT	Optional	Standard	R to L or L to R	10	Yes	No	30 x 38	40
Surface Mount Techniques	3046 LPT	Optional	Standard	R to L or L to R	10	Yes	No	30 x 46	48
Surface Mount Techniques	3060 LPT	Optional	Standard	R to L or L to R	10	Yes	No	30 x 60	
Surface Mount Techniques	2444 AV	No	N/A		N/A	No	No	24 x 44	48
Surface Mount Techniques	Opti-Print 2220 PTV	No	Standard	R to L	3	Yes	No	18 x 20	20
Surface Mount Techniques	Opti-Print SL2220	No	N/A	N/A	N/A	N/A	N/A	21 x 23	23
Surface Mount Techniques	Opti-Print 2444BAM	No	N/A	N/A	N/A	N/A	N/A	24 x 44	44
Surface Mount Techniques	Opti-Print 2430 BAM	No	N/A	N/A	N/A	N/A	N/A	24 x 30	30
Surface Mount Techniques	Opti-Print 2020	No	N/A	N/A	N/A	N/A	N/A	21 x 23	23
Surface Mount Techniques	Opti-Print 483P3	No	N/A	N/A	N/A	N/A	N/A	21 x 23	23
Surface Mount Techniques	Opti-Print 1616PD/256P3	No	N/A	N/A	N/A	N/A	N/A	16 x 16	16 in.
Transition Automation	PrinTEK I Model 4000 (Manual)	No	N/A		N/A	No	No	22 x 24	24
Transition Automation	PrinTEK I Model 4000 (Semi automatic)	No	N/A	L to R	N/A	No	No	24 x 36	36
Transition Automation	PrinTEK II	No	N/A	L to R	N/A	No	No	16 x 18	16

Circuits Assembly — Screen Printer Survey

Company	Model	- PRINT PARAMETERS -				Print modes	Print speed (in./sec.)	Print pressure (lbs)
		Method of registration	Optical alignment	Alignment accuracy (microns)	Alignment repeatability (microns)			
Surface Mount Techniques	2424 LPT	Two-camera vision	Yes	6.25	6.25	print/print, print/flood, flood/print, on contact, 1 or 2 deposits	0 to 14	0 to 90
Surface Mount Techniques	3032 LPT	Two-camera vision	Yes	6.25	6.25	print/print, print/flood, flood/print, on contact, 1 or 2 deposits	0 to 14	0 to 90
Surface Mount Techniques	3038 LPT	Two-camera vision	Yes	6.25	6.25	print/print, print/flood, flood/print, on contact, 1 or 2 deposits	0 to 14	0 to 90
Surface Mount Techniques	3046 LPT	Two-camera vision	Yes	6.25	6.25	print/print, print/flood, flood/print, on contact, 1 or 2 deposits	0 to 14	0 to 90
Surface Mount Techniques	3060 LPT	Two-camera vision	Yes	6.25	6.25	print/print, print/flood, flood/print, on contact, 1 or 2 deposits	0 to 14	0 to 90
Surface Mount Techniques	2444 AV	Vision, two-camera vision	Yes	6.25	6.25	print/print, print/flood, flood/print, on contact, 1 or 2 deposits	0 to 14	0 to 100
Surface Mount Techniques	Opti-Print 2220 PTV	Vision, two-camera vision	Yes	6.25	6.25	print/print, print/flood, on contact, 1 or 2 deposits	0 to 14	0 to 100
Surface Mount Techniques	Opti-Print SL2220	Vision, two-camera vision, manual,	Yes	6.25	6.25	print/print, print/flood, flood/print, on contact, 1 or 2 deposits	0 to 14	0 to 100
Surface Mount Techniques	Opti-Print 2444BAM	Two-camera vision, manual	No	6.25	6.25	print/print, print/flood, on contact, 1 or 2 deposits	0 to 14	0 to 100
Surface Mount Techniques	Opti-Print 2430 BAM	Two-camera vision, manual	No	6.25	6.25	print/print, print/flood, on contact, 1 or 2 deposits	0 to 14	0 to 100
Surface Mount Techniques	Opti-Print 2020	Two-camera vision, manual	No	6.25	6.25	print/print, print/flood, on contact, 1 or 2 deposits	0 to 14	0 to 100
Surface Mount Techniques	Opti-Print 483P3	Manual	No	6.25	6.25	print/print, print/flood, on contact, 1 or 2 deposits	0 to 14	0 to 100
Surface Mount Techniques	Opti-Print 1616PD/256P3	Manual	No	6.25	6.25	print/print, on contact, 1 or 2 deposits	0 to 14	0 to 100
Transition Automation	PrinTEK I Model 4000 (Manual)	Two-camera vision, Manual	Yes	±20	±20	print/print, print/floods on contact	Manual	
Transition Automation	PrinTEK I Model 4000 (Semi automatic)	Two-camera vision, Manual	Yes	±20	±20	print/print, on contact	0 to 8	0 to 80
Transition Automation	PrinTEK II	Two-camera vision, manual	Yes	±20	±20	print/print, on contact	0 to 8	0 to 80

Circuits Assembly — Screen Printer Survey

Company	Model	- PRINT PARAMETERS -							
		Adjustment?	Snap off (print gap) (in.)	Snap off speed (in./sec.)	Snap-off program-mable?	Cycle time (sec.)	Is this a pump/ pressured head design machine	Stencil frame size (in.)	Fixed frame or adjustable
Surface Mount Techniques	2424 LPT	Electric	0.5	0.04 to 0.4	Yes	<20	Yes	30 x 36	Adjustable
Surface Mount Techniques	3032 LPT	Electric	0.5	0.04 to 0.4	Yes	<20	Yes	30 x 46	Adjustable
Surface Mount Techniques	3038 LPT	Electric	0.5	0.04 to 0.4	Yes	<20	Yes	30 x 52	Adjustable
Surface Mount Techniques	3046 LPT	Electric	0.5	0.04 to 0.4	Yes	<20	Yes	36 x 60	Adjustable
Surface Mount Techniques	3060 LPT	Electric	0.5	0.04 to 0.4	Yes	<20	Yes	36 x 72	Adjustable
Surface Mount Techniques	2444 AV		0.6	0.4	Yes	<60		30.5 x 52	
Surface Mount Techniques	Opti-Print 2220 PTV		0.5	0.4	Yes	Single lane: <20		24 x 24	
Surface Mount Techniques	Opti-Print SL2220		0.6	0.4	Yes	Single lane: <25		29 x 30	
Surface Mount Techniques	Opti-Print 2444BAM		1	0.4	No	Single lane: <45		29 x 52	
Surface Mount Techniques	Opti-Print 2430 BAM		1	0.4	No	Single lane: <35		29 x 38	
Surface Mount Techniques	Opti-Print 2020		1	0.4	No	Single lane: <25		29 x 36	
Surface Mount Techniques	Opti-Print 483P3		1	0.4	No	Single lane: <25		29 x 36	
Surface Mount Techniques	Opti-Print 1616PD/256P3		1	0.4	No	Single lane: <30		12 x 12 to 20 x 20	
Transition Automation	PrinTEK I Model 4000 (Manual)	Manual	0 to 0.05	Manual	No		No	29 x 29	Adjustable
Transition Automation	PrinTEK I Model 4000 (Semi automatic)	Manual	0 to 0.05	0 to 1	No	Single lane: 15	No	29 x 29 up to 35 x 46	Fixed
Transition Automation	PrinTEK II		0 to 0.5	0 to 1	No	Single lane: 15	No	20 x 20	Fixed

Circuits Assembly — Screen Printer Survey

Company	Model	- PRINT PARAMETERS -						
		Stencil frame adaptor plates	Stencil alignment range (x,y)(in.)	Radial stencil alignment range (degree)	PCB stencil separation speed (in./sec.)	Stencil wiper	Stencil cleaning	Squeegees
Surface Mount Techniques	2424 LPT	Yes	1, 1	±10°	0.04 to 0.4	Standard	Dry, wet, vacuum; Programmable: Yes	Metal, polyurethane
Surface Mount Techniques	3032 LPT	Yes	1, 1	10°	0.04 to 0.4	Standard	Dry, wet, vacuum; Programmable: Yes	Metal, polyurethane
Surface Mount Techniques	3038 LPT	Yes	1, 1	10°	0.04 to 0.4	Standard	Dry, wet, vacuum; Programmable: Yes	Metal, polyurethane
Surface Mount Techniques	3046 LPT	Yes	1, 1	10°	0.04 to 0.4	Standard	Dry, wet, vacuum; Programmable: Yes	Metal, polyurethane
Surface Mount Techniques	3060 LPT	Yes	1, 1	10°	0.04 to 0.4	Standard	Dry, wet, vacuum; Programmable: Yes	Metal, polyurethane
Surface Mount Techniques	2444 AV	No	±0.35	±7°	0.4	Optional	Dry, vacuum, Programmable: yes	Metal, polyurethane
Surface Mount Techniques	Opti-Print 2220 PTV	Yes	± 0.5	±7°	0.4	Optional	Dry, vacuum, Programmable: yes	Metal, polyurethane
Surface Mount Techniques	Opti-Print SL2220	No	±0.25	±7°	0.4	Optional	Dry, vacuum, Programmable: yes	Metal, polyurethane
Surface Mount Techniques	Opti-Print 2444BAM	No	±0.5	±7°	0.4	N/A	Manual, Programmable: No	Metal, polyurethane
Surface Mount Techniques	Opti-Print 2430 BAM	No	± 0.5	±7°	0.4	N/A	Manual, Programmable: No	Metal, polyurethane
Surface Mount Techniques	Opti-Print 2020	No	± 0.25	±7°	0.4	N/A	Manual, Programmable: No	Metal, polyurethane
Surface Mount Techniques	Opti-Print 483P3	No	± 0.25	±7°	0.4	N/A	Manual, Programmable: No	Metal, polyurethane
Surface Mount Techniques	Opti-Print 1616PD/256P3	No	± 0.25	± 7°	0.4	N/A	Manual	Metal, polyurethane
Transition Automation	PrinTEK I Model 4000 (Manual)	Yes	0.75, 0.25	4.5°	Manual	No	N/A	Permallex metal
Transition Automation	PrinTEK I Model 4000 (Semi automatic)	Yes	0.75, 0.25	4.5°	0 to 1	N/A		Permallex metal
Transition Automation	PrinTEK II	Yes	0.75x, 0.25y	4.5°	0 to 1	No	N/A	Permallex Metal

Circuits Assembly — Screen Printer Survey

Company	Model	- PRINT PARAMETERS]					[VISION SYSTEM -	
		Squeegee programmable down cycle	Squeegee pressure (lbs)	Where measured	Horizontal or central pivot?	Typical number of cycles to sharpening/ replacement	Type	Field of vision (in.)
Surface Mount Techniques	2424 LPT	Yes	0 to 90	At stencil	Central	5,000	On the move, look down	0.2
Surface Mount Techniques	3032 LPT	Yes	0 to 90	At stencil	Central	5,000	On the move, look down	0.2
Surface Mount Techniques	3038 LPT	Yes	0 to 90	At stencil	Central	5,000	On the move, look down	0.2
Surface Mount Techniques	3046 LPT	Yes	0 to 90	At stencil	Central	5,000	On the move, look down	0.2
Surface Mount Techniques	3060 LPT	Yes	0 to 90	At stencil	Central	5,000	On the move, look down	0.2
Surface Mount Techniques	2444 AV	Yes	0 to 100	At stencil	Central		Fixed, look down	0.31 x 0.25
Surface Mount Techniques	Opti-Print 2220 PTV	Yes	0 to 100	At stencil	Central		Fixed, look down	0.31 x 0.25
Surface Mount Techniques	Opti-Print SL2220	Yes	0 to 100	At stencil	Central		Fixed, look down	0.31 x 0.25
Surface Mount Techniques	Opti-Print 2444BAM	No	0 to 100	At stencil	Central		Look down	0.25 to 1
Surface Mount Techniques	Opti-Print 2430 BAM	No	0 to 100	At stencil	Central		Look down	0.25 x 1
Surface Mount Techniques	Opti-Print 2020	No	0 to 100	At stencil	Central		Look down	0.25 to 1
Surface Mount Techniques	Opti-Print 483P3	No	0 to 100	At stencil	Central		N/A	N/A
Surface Mount Techniques	Opti-Print 1616PD/256P3	No	0 to 100	At stencil	Central		N/A	N/A
Transition Automation	PrinTEK I Model 4000 (Manual)	No	Manual	N/A	Manual		Look down	2.125
Transition Automation	PrinTEK I Model 4000 (Semi automatic)	No	0 to 80	Pressure gauge on regulator	Horizontal		Look down	2.125
Transition Automation	PrinTEK II	No	0 to 80	Regulator	Horizontal		Look down	1

Circuits Assembly — Screen Printer Survey

- VISION SYSTEM -								
Company	Model	Magnification	Viewing capability (in.)	Gray scale resolution (shades of gray/pixel)	Image storage capacity (pixels)	Accuracy (in.)	Repeatability (in.)	Fiducial type/size
Surface Mount Techniques	2424 LPT	20x	4 x 4	256 (8 bits)	>250,000	0.0005	0.0005	SMEMA compatible
Surface Mount Techniques	3032 LPT	20x	4 x 4	256 (8 bits)	>250,000	0.0005	0.0005	SMEMA compatible
Surface Mount Techniques	3038 LPT	20x	4 x 4	256 (8 bits)	>250,000	0.0005	0.0005	SMEMA compatible
Surface Mount Techniques	3046 LPT	20x	4 x 4	256 (8 bits)	>250,000	0.0005	0.0005	SMEMA compatible
Surface Mount Techniques	3060 LPT	20x	4 x 4	256 (8 bits)	>250,000	0.0005	0.0005	SMEMA compatible
Surface Mount Techniques	2444 AV	12x	24 x 44	256 (8 bits)	320 x 234	0.0008	0.00025	SMEMA compatible
Surface Mount Techniques	Opti-Print 2220 PTV	12x	18 x 20	256 (8 bits)	320 x 234	0.0008	0.00025	SMEMA compatible
Surface Mount Techniques	Opti-Print SL2220	12x	20 x 22	256 (8 bits)	320 x 234	0.0008	0.00025	SMEMA compatible
Surface Mount Techniques	Opti-Print 2444BAM	10x to 20x	23 x 43	N/A	N/A	N/A	N/A	N/A
Surface Mount Techniques	Opti-Print 2430 BAM	10 x to 20x	23 x 29	N/A	N/A	N/A	N/A	N/A
Surface Mount Techniques	Opti-Print 2020	10x to 20x	20 x 22	N/A	N/A	N/A	N/A	N/A
Surface Mount Techniques	Opti-Print 483P3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Surface Mount Techniques	Opti-Print 1616PD/256P3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Transition Automation	PrinTEK I Model 4000 (Manual)	16x	0.38	N/A	N/A	±20 microns	±20 microns	N/A
Transition Automation	PrinTEK I Model 4000 (Semi automatic)	16x	500 sq. in.	0.005	N/A	±20 microns	±20 microns	No restrictions
Transition Automation	PrinTEK II	16x	297.5 sq. in.	0.005	N/A	±20 microns	±20 microns	No restrictions

Circuits Assembly — Screen Printer Survey

- VISION SYSTEM]								
Company	Model	SMEMA fiducial standard compatible?	Typical fiducial processing speed	Fiducial teach	Align calibration	Automatic stencil inspection	Board inspection	Post print inspection available
Surface Mount Techniques	2424 LPT	Yes	200 ms	Yes	Fully automatic	No	No	Yes, 3-D
Surface Mount Techniques	3032 LPT	Yes	200 ms	Yes	Fully automatic	No	No	Yes, 3-D
Surface Mount Techniques	3038 LPT	Yes	200 ms	Yes	Fully automatic	No	No	Yes, 3-D
Surface Mount Techniques	3046 LPT	Yes	200 ms	Yes	Fully automatic	No	No	Yes, 3-D
Surface Mount Techniques	3060 LPT	Yes	200 ms	Yes	Fully automatic	No	No	Yes, 3-D
Surface Mount Techniques	2444 AV	Yes	0.5 sec.	Yes	Semi-automatic	No	No	No
Surface Mount Techniques	Opti-Print 2220 PTV	Yes	0.5 sec	Yes	Fully automatic	No	No	No
Surface Mount Techniques	Opti-Print SL2220	Yes	0.5 sec	Yes	Semi-automatic	No	No	No
Surface Mount Techniques	Opti-Print 2444BAM	N/A	N/A	N/A	N/A	N/A	N/A	No
Surface Mount Techniques	Opti-Print 2430 BAM	N/A	N/A	N/A	N/A	N/A	N/A	No
Surface Mount Techniques	Opti-Print 2020	N/A	N/A	N/A	N/A	N/A	N/A	No
Surface Mount Techniques	Opti-Print 483P3	N/A	N/A	N/A	N/A	N/A	N/A	No
Surface Mount Techniques	Opti-Print 1616PD/256P3	N/A	N/A	N/A	N/A	N/A	N/A	No
Transition Automation	PrinTEK I Model 4000 (Manual)	N/A	N/A	No	Manual	No	No	No
Transition Automation	PrinTEK I Model 4000 (Semi automatic)	No	N/A	N/A	Manual	No	No	N/A
Transition Automation	PrinTEK II	No	N/A	No	Manual	No	No	No

Circuits Assembly — Screen Printer Survey

[PROGRAMMING]									
Company	Model	Up and down line protocol	PLC used	User Interface/ Operating system	On-board recipe storage	Number of programs stored	Emergency stop at each end of machine	Printer network-able	SPC data extrac-tion
Surface Mount Techniques	2424 LPT	SMEMA, SECS, GEM	Yes	Windows 2000	Yes	10,000+	Yes	Yes	No
Surface Mount Techniques	3032 LPT	SMEMA, SECS, GEM	Yes	Windows 2000	Yes	10,000+	Yes	Yes	No
Surface Mount Techniques	3038 LPT	SMEMA, SECS, GEM	Yes	Windows 2000	Yes	10,000+	Yes	Yes	No
Surface Mount Techniques	3046 LPT	SMEMA, SECS, GEM	Yes	Windows 2000	Yes	10,000+	Yes	Yes	No
Surface Mount Techniques	3060 LPT	SMEMA, SECS, GEM	Yes	Windows 2000	Yes	10,000+	Yes	Yes	No
Surface Mount Techniques	2444 AV	SMEMA, SECS		Windows NT	Yes	10,000	Yes	No	
Surface Mount Techniques	Opti-Print 2220 PTV	SMEMA		Windows	Yes	2000	Yes	No	
Surface Mount Techniques	Opti-Print SL2220	SMEMA		Windows NT	Yes	10000	Yes	No	
Surface Mount Techniques	Opti-Print 2444BAM	N/A		N/A	N/A	N/A	Yes	N/A	
Surface Mount Techniques	Opti-Print 2430 BAM	N/A		N/A	N/A	N/A	Yes	N/A	
Surface Mount Techniques	Opti-Print 2020	N/A		N/A	No	N/A	N/A	N/A	
Surface Mount Techniques	Opti-Print 483P3	N/A		N/A	N/A	N/A	No	N/A	
Surface Mount Techniques	Opti-Print 1616PD/256P3	N/A		N/A	N/A	N/A	N/A	N/A	
Transition Automation	PrinTEK I Model 4000 (Manual)	N/A					N/A		
Transition Automation	PrinTEK I Model 4000 (Semi automatic)	N/A	N/A	N/A	No	N/A	No	No	
Transition Automation	PrinTEK II	N/A		N/A	Yes	60	Yes	No	No

Screen Printer Equipment Survey

Contact information for the companies who participated in this year's survey:

Advanced Techniques US, Inc.

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Feasterville, PA 19053
(215) 364-5588

Affiliated Manufacturers, Inc. (AMI)

3087 U.S. Highway 22
P.O. Box 5049
North Branch, NJ 08876
(908) 722-7100 ext. 243

Automated Production Systems, Inc.

280 PineRoad
Huntigndon Valley, PA 19006
(215) 938-1000

Cookson Electronics Equipment

16 Forge Park
Franklin, MA 02038
(508) 520-6999

DEK Printing Machines Ltd.

Granby Industrial Estate
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United Kingdom
+44 (0) 1305 760760

EKRA America, Inc.

34 St. Martin Drive, Unit 799-3
Marlborough, MA 01752
(508) 486-9566

Elite Circuit Equipment

12261 Industry St.
Garden Grove, CA 92841
(714) 895-1911

Europlacer

95 Parker Street
Newburyport, MA 01950
(978) 499-2233

Fuji America Corp.

171 Corporate Woods Parkway
Vernon Hills, IL 60061
(847) 821-2405

Milara Inc.

71 West Street
Medfield, MA 02052
(508) 359-2786

Minami

2730 Monterey St., Suite 107
Torrance, CA 90503
(310) 328-4913

Panasonic Factory Automation

9377 W. Grand Ave.
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Surface Mount Techniques

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(949) 768-0178

Transition Automation

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