Summary of Visit to
Rising Star Mobile India Pvt. Ltd. A Foxconn manufacturing facility on 12th August 2021.

1. Objective: To explore opportunities for machine tool industries.

2. Participants*:

- Mr. Jagannath-Bharat Fritz Werner Ltd.,
- Mr. B Raghu-Ace Manufacturing Systems Ltd.,
- Mr. AK Menon – Strategi Automation Solutions Pvt Ltd
- Mr. A Sasmal- Shibaura Machine India Pvt Ltd, and
- Mr. PJ Mohanram and Mr. S Satish Kumar from IMTMA

3. Introduction:

Visit to RSMIPL is meant for exploring and generating opportunities for machine tool industries to build capital goods (machinery) for the electronic industry. Foxconn manufacturing facility is involved in contract mass manufacturing of mobiles and large investments are planned by Foxconn as a result of evolving alternate supply chain needs.

Visited two plants of RSMIPL, **L6-L10 manufacturing facility**, an electronic PCB assembly and testing facility (L6) and final assembly facility (L10). Second plant is **L5 manufacturing facility** which carries out final assembly of feature phones, largely manually. They have a plant in Sri City, Andhra Pradesh as well.

3.1.1 Summary of the visit :

RSMIPL L6-L10 facility: Assembly and testing zones are involved in the manufacturing of MI and other smart phones. There are 30 identical assembly lines which are flexible and configurable for manufacturing variety of phones, changeover can happen under 2 hours. RSMIPL is operating currently in three shifts with 8000 workers, mostly female, work in 3 shifts. They also provide dormitory facility for 2000 female workers. They manufacture 3 mobile phones per second. Currently contract manufacturing for MI, Xaomi, Vu LCD TV and OLA(EV) is in progress.

Eight layer, SMD component mountable PCBs are received from China, inspected, laser marked, stored and transferred to assembly line as a 'Kitty'. There is a Kitting area and usage of components, progress of production in each production line is monitored continuously by kitting operators. RSMIPL gets 200 Kits for assembly per batch. Each PCB is a stack of 4 units and SMD components are populated on either side in two passes. They maintain an inventory of 6-8 days. Laser marked, numbered PCBs are fed to GKG gluing machine which is the first assembly process. Components are fed to the machine for assembly through a role carrying SMD components.

Assembly zone (Annexure – generic Layout) consists of 30 identical lines and each line has,

(1) GKG make solder paste printer or stencilling (dual PCB) which laminates the PCBs
(2) PCB is inspected, in-process, by camera based visual inspection machine by HOLLY make machine. In-process, visual inspection takes place after every assembly operation.
(3) SMD component mounting / assembly happens in the next stage by vacuum based pick and place machine from FUJI-NXT3 capable of placing 48000 SMD components in an hour
(4) The PCBs are subjected to rework stage and metal parts are mounted in this stage
(5) SMD mounted PCBs are soldered using SONIC make - Auto soldering station
(6) Finally, repair and final visual inspection follows before populating SMDs on the other side
(7) AGVs take back the SMD mounted PCBs for the second pass for assembly of SMD components on the other side of the PCB
(8) Once components are mounted on both sides GENITEC- GAM320AT routing machine is used for cutting and separating stack of four into individual PCBs.

Testing zone, housed in another floor consists of dedicated functionality testing station/units. Each PCB needs to be inspected for its functioning by checking functionality of components assembled on it. This takes many numbers of stations with fixturing required to hold the PCB in place along with engaging testing probes in the stations. One operator handles 10 single testing stations. Each testing station checks one or more functionality of the assembled PCB. Loading and unloading operations are entirely manual in this section. Testing zone has 30 lines and in each line SMD mounted PCBs undergo dummy functional testing – powered Go/NoGo testing. 100% of PCBs are inspected, tested and qualified.

Final Assembly zone: has several lines, largely manual assembly and final testing is carried out.

Opportunity for members: *opportunity for supplying*

- Pick and Place machine for assembly of SMD components
- Visual inspection machines for PCB inspection
- Router for cutting and separating PCBs; Alternate process may also be explored

- Solder paste printer
- Testing line can be automated, requires deeper study
- Fixtures are required at various stages of PCB assembly and testing

RSMIPL L5 facility: Nomenclature L5 indicates mechanical assembly located 3-4 Kms away from the RSMIPL L6-L10 facility. This unit is catering to Nokia, MI, VIVO, Ather and Honeywell requirements. This unit accepts large orders for contract manufacturing of mobiles, Electric Vehicle electronics assembly, and other similar type of manufacturing.

This unit is involved in the manufacture of plastic mobile cases- top and bottom and intermediate cases using IMM, twin mold units for feature phones. Final Assembly of feature phones happens largely manually in this shop. This unit has 80 lines, 2640 workers and has the capacity to manufacture 15 million pieces. General Toolroom of the unit is populated with,

- Injection moulding machines-Fanuc 100T injection moulding machine
- TOYO 150T/180T machines, Chin Fong presses-110T (China/Taiwan)
- SEYI presses-160T/200T (Taiwan) for stamping of metal parts
- Makino VMCs, Model V33
- Wire cut EDM machines
- Fanuc Roboshot for painting
- Assembly area uses SCARA robot for work handling.

Opportunity for members: opportunity for supplying

- Injection molding machines of 110-160T capacity
- Presses of 100T-200T
- VMCs
- Tool and die molds
- SCARA Robot for PCB handling and testing
- Fixtures

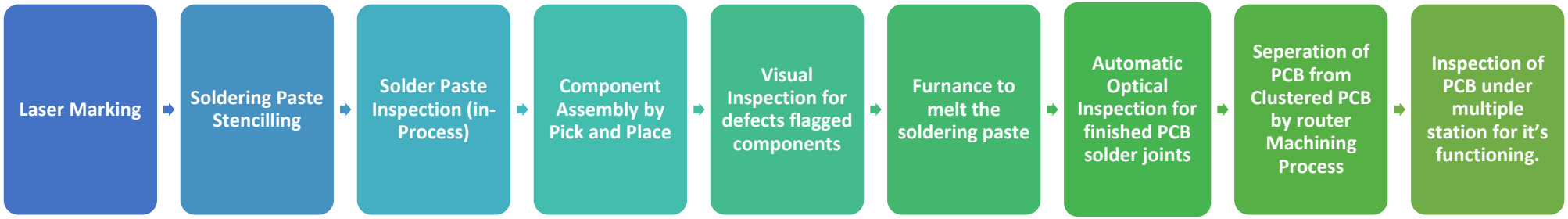
L5 unit is under expansion- first expansion has already been planned. Officials of this unit agreed to share future expansion plans with IMTMA and its members in advance.

3.1.2 Opportunity for Machine Tool membership :

	RSMIPL L5 facility	
1	*Injection Moulding Machines*	110-160T
2	*Presses*	100T-200T
3	*VMCs*	Tool room class
4	*EDM machines*	Tool room class
5	*SCARA Robot*	Machine supply and programming
6	*Jigs and Fixtures*	Component variety is large
7	*Die and Mold*	Component variety is large
8	*Shifting to Robotic assembly*	Automation needs
	RSMIPL L6-L10 facility	
1	*Pick and Place machine for SMD component placing*	High speed, 48,000 SMD component placing / hour, Complex, Required in large numbers;
2	*Router / Routing machine*	Alternate solution may be worked out
3	*Visual inspection machines*	Required in large numbers
4	Linking Conveyers	Required in large numbers
5	Automation in Testing zone	Productivity enhancement

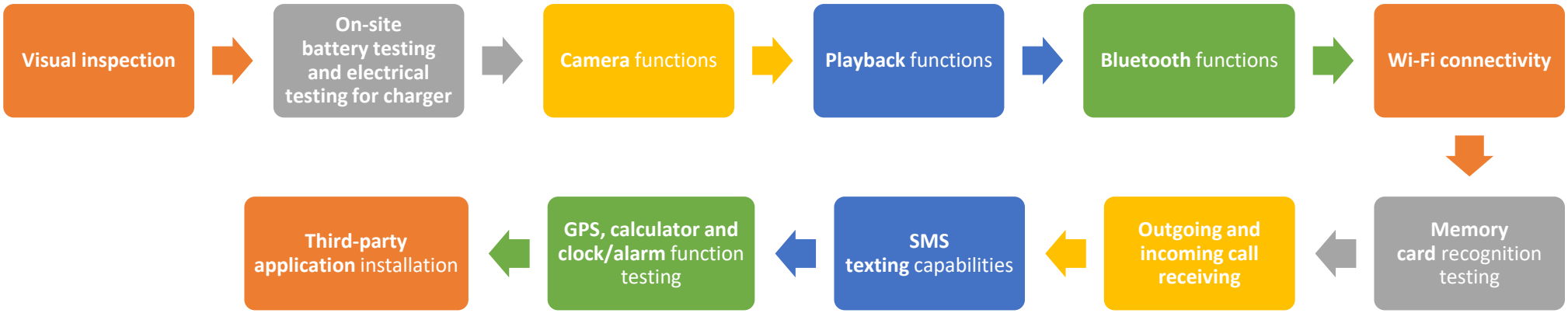
3.1.3 Annexure:

A. PCB Assembly Zone – Generic and indicative* Layout



B. PCB Inspection Station

- Each PCB needs to be inspected for its functioning by checking functionally of components assembled on it.
- This takes many numbers of stations with fixturing required to hold the PCB in place along with engaging testing probes in the stations



Website : www.foxconn.com

Information about Machines used in Foxconn facility for PCB Assembly

1. Fuji-NXT3 Pick & Place Machine

https://www.fuji.co.jp/en/items/rs_list/nxt3

NXT III Specifications

Machine			M3 III / M3 IIIS	M6 III
Feeder slot quantity			20	45
Panel size (L x W)	Single conveyor		48 x 48 to 305 x 610 mm	48 x 48 to 610 x 610 mm
	Double conveyor	Single conveyance	48 x 48 to 305 x 510 mm	48 x 48 to 610 x 510 mm
		Dual conveyance	48 x 48 to 305 x 280 mm	48 x 48 to 610 x 280 mm
Heads			H24S, H24A, DX *1, V12, H12HS(Q), H08M(Q) *1, H08(Q), H04SF, H04, H02F, H01, OF *1, G04F(Q), GL	
Throughput	H24S / H24A	Standard mode	35,000 cph	
		Productivity priority mode	42,000 cph (43,000 cph)	
	H08M	Standard mode	13,000 cph	
		Productivity priority mode	14,000 cph	
	H02F	Standard mode	6,700 cph	
		Productivity priority mode	7,400 cph	
Placing accuracy	H24S / H24A	Standard mode	±0.025 mm Cpk ≥ 1.00	
		Heightened accuracy mode *2	±0.015 mm Cpk ≥ 1.00	
	H08M		±0.040 mm Cpk ≥ 1.00	
	H02F		±0.025 mm Cpk ≥ 1.00	
Part supply units			Tape feeders, stick feeders, tray units, others	
Power source			3-phase 200 to 230 V ± 10 % (50/60 Hz)	
Air			0.5 MPa (ANR)	

2. GKG G-TITAN | SMT PRINTER

http://www.gkgasia.com/

FACILITIES REQUIREMENT	
Power Supply	AC220V ± 10% 50/60Hz
Power Consumption	3kW
Air Supply	4 ~ 6Kgf/cm²
Air Consumption	5L/min
Dimension (excluding signal tower)	1,240 mm (L) x 1,560 mm (W) x 1,490 mm (H)
Machine Weight	1,200kg

BOARD HANDLING	
Max. Size (L x W)	510 mm x 510 mm
Min. Size (L x W)	50 mm x 50 mm
Thickness	0.4~6 mm
PCB Thickness Adjustment	Automatic
PCB Max. Weight	5 kg
PCB Edge Clearance	3 mm
PCB Bottom Clearance	23 mm
PCB Warpage	Max. 1% diagonally
Clamping Method	Auto retractable top clamp, motor controlled side clamp
Support Method	Magnetic support pins, bars, blocks, vacuum suction

3. GAM 320AT In-Line Automatic PCB Separator

http://www.genitec.com.tw/gam-320AT-e.htm

ITEMS	Gam320AT	GAM330AT
Valid cutting size	350*300mm	
Loading Method	Track Delivery	
Unloading Method	Track Delivery or Partition Delivery	
Transfer Method	Vacuum Nozzle Adsorption	
Movement Direction	Left to Right/Right to Left	
Cutting function	Tweening to Straight line , Circle, and Arc	
Process table	Dual tables	
Repeat precision	±0.01mm	
Cutting precision	<=±0.1mm	
Max. moving speed	XY 800mm/s、 Z 350mm/s	
Max. moving stroke	X:810 Y:370 Z:90mm	
Main shaft rotational speed	MAX.60,000rpm (Adjustable)	
Cutting speed	1~100mm/s (Adjustable)	
Operating system	Windows 10	
Program teaching mode	Intuitive teaching by CCD color image input	
Program backup	USB data transfer	
Control method	Precision multi-axis control system	
XYZ axis driving mode	AC Servo Motor	
Size of milling tool	ø0.8~3.0mm	
Voltage/Power requirement	AC220V 50/60HZ 4KW Single-phase	
Machine dimensions	1580(W)*1200(D)*1740(H)mm	1760(W)*1260(D)*1740(H)mm
Machine weight	800kg	800kg
Dust collector	TS200L	TS300L

3.1.4 : IMTMA delegation for the visit.

Indian Machine Tool Manufacturers' Association

P.J. Mohanram
Sr. Advisor

10th Mile, Tumkur Road
Madavara Post, Bangalore - 562 123
Karnataka, India
T : +91-80-66246600
F : +91-80-66246658
M : +91-98863 31677
E : mohanram@imtma.in
W : www.imtma.in

A K Menon
Director

Mobile: +91-99805 63850
Tel: 080-41206806, 41163136 / 7
arun@strategiautomation.com

Strategi Automation Solutions Pvt. Ltd.
An Iso 9001 : 2015 Company
Plot No.: 25/ B, Doddanakundi Industrial Estate,
Off Whitefield Road, Behind Graphite India, Bengaluru – 560 048.
www.strategiautomation.com

m2nxt
Off Tumkur Road,
Bengaluru - 560022, India.
+9180 39821100/28395745

JAGANNATH V
BUSINESS HEAD
+91 9513604044
jagannathv@m2nxt.com

www.m2nxt.com ..... A BFW SUBSIDIARY

Raghu .B
GM - Design & Development

AMS In Pursuit of Excellence Since 1994

QMS ISO 9001 : 2015, EMS ISO 14001 : 2015, OHSMS ISO 45001 : 2018,
SA 8000 : 2014, ISMS ISO 27001 : 2013

ACE MANUFACTURING SYSTEMS LTD.
467 to 469, 4th Phase, 12th Cross,
Peenya Industrial Area, Bengaluru - 560058. INDIA
E-mail : raghub@amslindia.co.in

Tel : +91-80-2836 0508 to 0512
+91-80-4182 8100
Dir : +91-80-4182 8140
Fax : +91- 4182 8102
Cell : +91 98801 89836

Website : www.amsl.in

Ace Micromatic Group Company

Indian Machine Tool Manufacturers' Association

Satish Kumar S
Senior Advisor

10th Mile, Tumkur Road
Madavara Post, Bangalore - 562 123
Karnataka, India
T : +91-80-66246600
D : +91-80-66246825
F : +91-80-66246658 / 61
M : +91-9449842677
E : satishk@imtma.in
W : www.imtma.in

Shibaura Machine

Amarendra Nath Sasmal
Head - Sales & Marketing

SHIBAURA MACHINE INDIA PRIVATE LIMITED
(Formerly TOSHIBA MACHINE (CHENNAI) PRIVATE LIMITED)
No.65 (P.O.Box No.5), Chennai-Bangalore Highway, Chembarambakkam,
Poonamallee Taluk, Thiruvallur District, Chennai - 600 123. Tamil Nadu, India

Tel : +91-44-2681 2000
Dir : +91-44-2681 2043
Fax : +91-44-2681 0303
Mob : +91-73977 35505
E-mail : an.sasmal@shibauramachine.co.in
URL : www.shibaura-machine.co.jp/india