

PROJECT REPORT

GES Technologies Ltd. , a hardware company partnered with GES GROUP, SINGAPORE having fully automated SMT manufacturing plant, is manufacturing DATAMINI brand of PC for domestic and export market.

The first manufacturing unit was set up at Silvassa (30 k.m. from Daman) & subsequently expanded by setting Daman unit at an outlay of Rs.60 million 13000 sqft. of the three storeyed Daman plant encompasses high-end & user-friendly production facility starting from programmable ageing conveyor to SMT line and dedicated VSAT.

GES GROUP founded by Mr. GOH as Goh Electronics Co. in 1975 is now the listed corporation & 2nd largest IT company in Singapore and is having turn over more than \$1 billion per annum.

The group has various representative offices worldwide including Singapore, China, India, Thailand, Vietnam, Indonesia, Malaysia, Australia e.t.c.

GES Technologies Ltd DAMAN , was set up in 1997 to assemble state of the art personal Computer systems and Servers under DATAMINI. brand name . The unit has installed capacity of 50,000 personal computers per annum as per the customer specification . The Servers made are supplied to big corporate companies like CMC , Reliance , ISRO etc. and have been recognized by Intel Corporation for their outstanding performance in Intel Based Server Platforms in the year 2000-2001.

The Daman plant is equipped with the following:

- Three Tier Programmable Conveyor.
- Complete SMT Line.
- Complete MI Line.
- In-Circuit Testor.
- Free Flow Conveyor.
- Pneumatic and Electrical Prod. Tools .
- Lan and Internet Connectivity .
- Genset , Air Compressor and Air Cons.
- Round the clock Security.

It consists of three Departments :

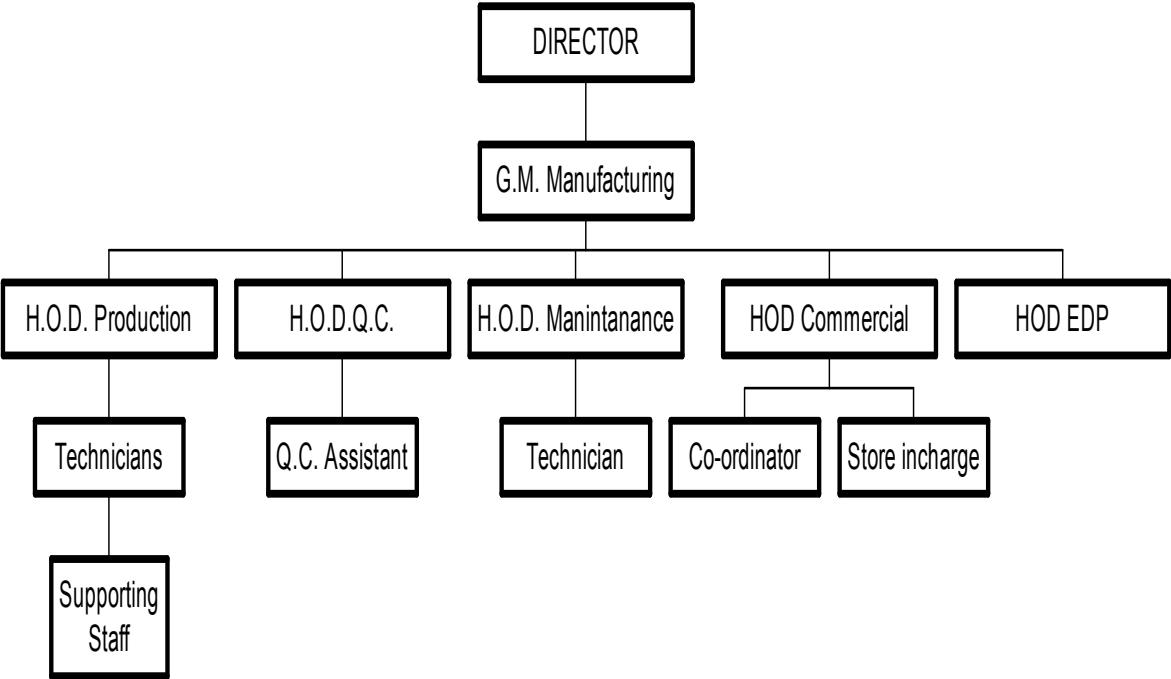
1. System Integration Department (S.I.D).
2. Surface Mount Technology (S.M.T).
3. J.V.C. Department .

Out of the three Departments the S.I.D is ISO 9002 certified ,so this makes all the models of DATAMINI PC's ISO-9002 certified.

The Management Responsibility of GES Tech. Ltd. Is distributed according to the following flowchart.

GES Technologies Ltd. DAMAN

Organization Chart



SYSTEM INTEGRATION DEPARTMENT

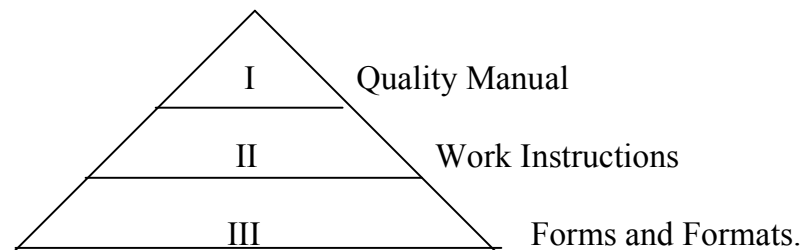
In the S.I.D assembling of Personal Computers and Servers is done . The Personal Computers are divided in two models .

1. Datamini Festiva Series :The series contains two models.
 - Festiva MO/EO.
 - Festiva MV/EV.
2. Datamini Cesky Series: This series also contains two models.
 - Cesky SO/EO.
 - Cesky SV/EV.

The S.I.D. is divided in Six Sections. They are :

1. Store.
2. Pre Soak Conveyor.
3. Ageing Conveyor.
4. Post Soak Conveyor -I.
5. Post Soak Conveyor –II.
6. Packaging ,Final Q.C. and Dispatch.

It follows an Apex Structure .It has three levels in the documents.
The Quality system consists of three parts in regard with ISO-9002-1994.



1. **QUALITY MANUAL** : Which covers company's Quality Policy objectives and organizational structure & procedure of all depts.
2. **WORK INSTRUCTION** :- Which covers specific jobs / operation . The work instructions are in the form of Drawing/ Sketches Do's or Don't format.
3. **FORMS AND FORMAT** :- To demonstrate compliance of product and system to specification.

Study Of System Integration Department

I. Study Of Different Components:

a. MotherBoard (Intel / PC Partner)

- 810 chipset .
- 810E chipset.
- 815 chipset.
- Pentium IV (D850GB).
- Pentium XEON (SBI-II).

b. Processors

- Intel Celeron (700 / 667 / 633 / 600 MHz).
- Intel Pentium III(667 / 800 MHz).
- Intel Pentium IV(1.3 GHz).
- Intel Pentium Xeon (1 GHz & above).

c. RAM (Motorola)

- 64 MB SDRAM
- 128 MB SDRAM .
- 256 MB SDRAM .
- 64 RAMBUS (For PentiumIV).

d. Hard Disk (Quantum & Seagate)

- 20.4GB (IDE)
- SCSI(Small Computer System Interface)

e. CD-ROM

- 52X (X=Transfer Speed=150KBps)

f. Floppy Disk Drive(Sony & Samsung)

- 1.44MB

g. Local Area Network(LAN Cards)

- 10Mbps
- 10/100Mbps

h. Sound Chipset

- Integrated AC-97.

i. Switching Mode Power Supply (SMPS)

- AT (A.C. :- Input :115/230V ,50-60 Hz, 5/3 Amp ;Output : 235 Watts).

- ATX (A.C.:-Input : 115/220V, 50-60 Hz , 5/2.5 Amp;Output :235Watts).

g. Keyboard (Datamini)

- Normal(104 Keys).
- Internet KeyBoard(108 Keys).
- Internet KeyBoard(For T.V.).
- Multimedia Keyboard(121 Keys).

h. Mouse (Datamini)

- Two Button.
- Three Button .
- Scroll Mouse.

i. Speakers (Datamini)

- 180 Watts.
- 340 Watts.

j. Tape Drive

- 4/8 GB.

k. AGP/VGA (Accelerated Graphics Port)

- 2X .

Assembling Of Personal Computer

Firstly the production department is informed by H.O. as to which DBAN has to be taken into the manufacturing schedule. As per the DBAN request slip is issued by the H.O.D of production to the stores. The store issues the material inline with the requirement. Then the assembling of PC's is carried out as follows:-

General requirement :

When handling or working near static sensitive PCBA's / HDAs / Drives always wear an ESD wrist strap worn directly contacting the skin (not over the gloves) and attached to an ESD mat or properly grounded work bench.

At the beginning of each shift , the operator is instructed to test the condition of the ESD wrist strap.

Cabinet preformation :

Ensure that the power supply unit , is installed on the cabinet with all supporting screws.

Check that the voltage setting switch is set to 230VAC if this setting switch is available.

Mother board assembly :

Place plastic spacers in the oval apertures. If the motherboard chasis does not have pre-fixed metal spacers , place and thread the metal spacers into the circular apertures.

Align the key board connector end of the motherboard with the rear end of the chasis identified by several rectangular slots.

Ensure that all spacers placed have their corresponding apertures on the motherboard .If less , remove extra spacers or if more , provide additional spacers.

Fit the motherboard using screws\ plastic locks. Do jumper \switch settings as per motherboard layout \ manual and configuration.

Cpu installation :

Take cpu as per configuration , if cpu is without fan\heatsink ,fit fan \ heatsink with cpu with locks.

Install cpu supporting kit (Retention Mechanism) on the cpu slot on the motherboard with metal screws \ plastic locks.

Fit the cpu in to the cpu slot on the motherboard and lock the cpu. Connect cpu cooling fan connector with the cpu fan connector on the motherboard. (cpu cooling fan is not require for the BIG heatsink).

Memory module installation :

Insert memory module on the memory slot of the motherboard firmly , as per configuration. Ensure that the memory module is properly installed.

Floppy Disk Drive assembly :

Take Floppy disk drive as per configuration , check it for any damages. Fit the Floppy disk drive with four screws on its location in the cabinet. Ensure that the front of the floppy disk drive is align with the front of the cabinet.

Hard Disk Drive assembly:

Take Hard disk drive from HDD copying station as per configuration & check it for any damages. Fit the Hard disk drive with four screws on its location in the cabinet. Ensure that the hard disk drive is properly fixed.

Cd-Rom Drive assembly :

Take Cd-Rom drive as per configuration , check it for any damages. Fit the Cd-Rom drive with four screws on its location in the cabinet .Ensure that the front of the Cd-Rom drive is align with the front of the cabinet.

Front panel connector assembly :

Connect the front pannel connectors onto the motherboard as indicated on the mother- board \ manual . Tidy up the cables with cable ties.

Data cable connection :

Connect the data cables for Floppy disk drive , Hard disk drive and Cd-Rom drive onto the motherboard \ controller card. Tidy up the cables.

Power supply unit connection with drives \ board :

Connect the power supply cables of the power supply unit on to the motherboard connectors , Floppy disk drive p/s connector , Hard disk drive p/s connector , Cd-Rom drive p/s connector.

Connect audio signal connector between cd-rom audio connector and cd audio in connector on sound card \ motherboard (with on board sound) for system with cd-rom drive and sound. Tidy up the cables with cable ties.

Ports fitment (for mother boards with out external port connector) :

Fit the port brackets on cabinet with screws and connect data cables on the motherboard. Tidy up the cables with cable ties.

Procedure for installing VGA \ AGP (display card) card as per configuration :

Mount the Vga \ Agp card on to the slot on the motherboard. The slot to be used will be advised by the Engineer on a case to case basis. Secure the Vga \ Agp card with screw.

Procedure for installing Sound card as per configuration :

Mount the sound card on the slot on the motherboard. The slot to be used will be advised by the Engineer on a case to case basis. Secure the sound card with screw.

Procedure for installing Ethernet \ Lan card as per configuration :

Mount the Ethernet \ Lan card on the slot on the motherboard. The slot to be used will be advised by the Engineer on a case to case basis. Secure the Ethernet \ Lan card with screw.

Device Driver checking and installation :

Make all connection & switch ON the pc-system. Do CMOS-SETUP as per sample given and pc-system configuration. Enter current date & time. Save CMOS-SETUP & exit the setup. After display comes switch OFF the pc-system.

WINDOWS 95/ WINDOWS 98 O S LOADING\DRIVER CONFIRMANCE:

Make all connection & switch ON the pc-system .Allow pc-system to boot from the Hard Disk Drive .Check for start up sound for Multi-Media pc-system .Check for all drivers (as per pc-system configuration) loaded in the pc-system . If any driver is missing then load appropriate driver. Check for all device resource setting .

Check 1024 x 768 bit with High color resolution .Play audio -CD for Multi-Media pc-system .Check lan connectivity for pc-system with lan card only. Check MODEM detection for pc-system with fax/modem card only. Shut down the pc-system & remove all connection. Send pc-system for BURN IN. After Burn-In the two tests are performed.

TEST-I**Pre mechanical inspection :**

Check front cover for any damages and check alignment of the drives with front cover. Check front pannel switch action.(PSU switch , Reset switch). Check all drive's fitment , cable fitment , motherboard fitment , add on card fitment and harnessing of the cables. Check CPU and Memory module fitment.

Make all connection and switch on the pc-system. Check power supply unit fan and CPU cooling fan is working or not. Check Reset switch by pressing it.

After Test-I the packing of the PC is done , described in the following process.

PROCEDURE FOR PACKING PC-SYSTEM :

Take pc-system on Pallete , collect Packing acc. from it , remove History Card & configuration sticker from packing acc & keep it at appropriate place.

Clean the pc-system with Cleaning Cloth , apply Colin/Min cream if necessary . Check sticker pasted on the front of the pc-system (check sticker type , physical location).If not ok then correct it.

Put pc-system in the polybag & fold the polybag with pcking Tape (1 ").

Take appropriate Carton Box , (make it with 3" packing Tape if it is not ready) & put appropriate Thermocol Buffer inside the Carton Box. Put pc-system in to the Carton Box & keep Thermocol Top on it. Take key board as per configuration (read from configuration sticker) & clean it .Paste pc-system serial no. sticker on it.Pack it in the poly. Bag & keep it in the Carton Box. Take Mouse as per configuration (read from configuration sticker) & clean it .Keep it in the Carton Box. Take QC ok Mains cord & clean it . Put it in the Carton Box. Take packing acc. ,Put it with Mouse PAD & repack it . Put this packing acc. In the Carton Box.

Take warranty Card & fill / paste pc-system serial no. in it .Take File Folder & put warranty Card in it. Put file folder in the Carton Box. Close the Carton Box (fold) & paste packing Tape (3") on it. Paste pc-system serial no sticker , Intel in side sticker & pc-system configuration sticker on Carton Box. Take Multi Media Speaker as per configuration , clean it & paste pc-system serial no. Sticker on it .Repack it in the carton box & paste pc-system serial no. sticker on carton.

Take Monitor as per configuration & check it for QC ok sticker & serial no. sticker .If pc-sytem serial no. is not present & QC ok sticker is present then un pack monitor & clean it. Paste pc-system serial no. sticker on it &keep it in the poly. Bag & repack it in the carton box. Paste pc-system serial no. sticker on the carton box. Apply poly Stratch Film on all packed Carton Box & stepple it with the help of stepple machine. Keep the packed Carton Box at the appropriate place.

After Audit & Inspection transfer the packed pc-system as per configuration to the FINISHED GOODS STORE as per format number.

S.M.T Department

SMT, It stands for Surface mount technology. The SMD (Surface mount devices) components are placed /mounted on the surface of the PCB with very high accuracy. Now days this technology is widely adopted in electronic PCB assembly. The PCB's manufactured with this technology are compact, more reliable & less expensive. SMT involves different types of processes like

- Paste printing
- Glue dispensing
- Component placing
- IR- reflow
- Visual inspection
- Tape masking
- Touch-up
- PCB Rework

As the component size is very small & process involves lot of precise work , the following activities are done with the help of machine.

- Paste printing
- Glue dispensing
- Component placing
- Reflow process
- PCB rework.

SMT section can be viewed as having **SMT line, Manual Insertion Line and Completion Line.**

Description of th SMT Line :

SMT line is having **Six** stages:

STAGE 1:TPM-30:-It is a **SANYO** make semi automatic paste printer capable of making two strokes per minute.

STAGE2:TDM-60:- It's is a **SANYO** make **EPOXY** dispenser equipped with four heads which is capable of dispensing 20,000 dots per hour at a minimum pitch of 0.01mm It can take care pcbs from 50*50mm to 330*250mm.

STAGE3:TCM-60:- It's is a **SANYO** make **CHIP-SHOOTER** equipped with eighteen heads having three nozzles each head. It can Mount 15000 chips per hour by picking component from 100 spools at a minimum pitch of 0.01mm.It can mount resistor, laminated capacitor ,mini-mould transistor, mini flat IC's and many more types of chip. It can take care of 50*50mm to 330*250mm pcbs.

STAGE4:TCM51:-It's a **SANYO** make **IC PLACER** which can pick the ICs from tray, stick as well as from tape spools.

STAGE5:YM84V:-It's a **YAMAHA** make **CHIP MOUNTER** which has three heads and and three cameras. It can pick and place twenty different kinds of ICs from tray itself. It can pick the ICs from stick feeder as well as from tape feeder. As equipped with camera it optically aligns the pcbs before mounting the component. The camera facilitates it for mounting the ultra fine chips like BGA and QFP. The other lower order component like resistor, capacitor, transistor, etc are also taken care by this mounter. Its feeder capacity of 84 spools.

STAGE6:TFM80IL:-It's **SANYO** make **REFLOW OVEN** provided with **UV** curing.

Description of the Manual Insertion Line:

In **MANUAL INSERTION LINE** , there is twenty stage moving conveyor where in each stage 12 to 16 leaded components can be manually inserted. At the end of this line there is a **WAVE SOLDER** machine which produces literally zero defect boards.

In **COMPLETION LINE** which starts with **ULTRA-SONIC CLEANER**, There is forty feet long belt conveyor having provision of seven stage on each side of conveyor where all types of touch-up,lead cutting cleaning and any final assembly is done by well qualified and trained operators. This line ends with **IN-CIRCUIT TESTER** and final **TESTING-JIGS**.

TEST JIGS :

The SMT Department also has jigs made for different models of the production. The jigs studied are as follows.

Switch Testing Jigs : This jig is capable of testing 8 port switch , 12 port switch and 24 port switch . This jig has the software which checks all the connections of the switch and shows the result .

Profiler :

Its Multicore make software driven profiler having model name **SOLDAPRO** model no. **TPS040**. This is used to set the profile of the **REFLOW** oven with three different Thermocouples.

IC TESTER :

The department also has HP make in-circuit tester having model no. ICT-3065 which is capable of testing the board in cold condition.

Consumables:

In SMT floor NO_CLEAN solder paste from COOKSON having model name GUIDELINE and model no. RMA390D14 is used . Solder paste is kept and Monitored under controlled condition . Solder wire as well as Solder bars are also from COOKSON. The Solder wire is made up of Pb-37% and Sn-63% or Sn-62% ,Pb-36%,Ag-2%.

Detailed Specification of Machines:**Instruments For Audio Protection :**

1. WOW & Flutter Meter .
2. C.R.O. (Cathode Ray Oscilloscope).
3. Constant Voltage Power Supply Unit.
4. Multimeter.
5. Millivolt meter.
6. AM-FM Signal Generator (Under Procurement).

ESD Precaution :

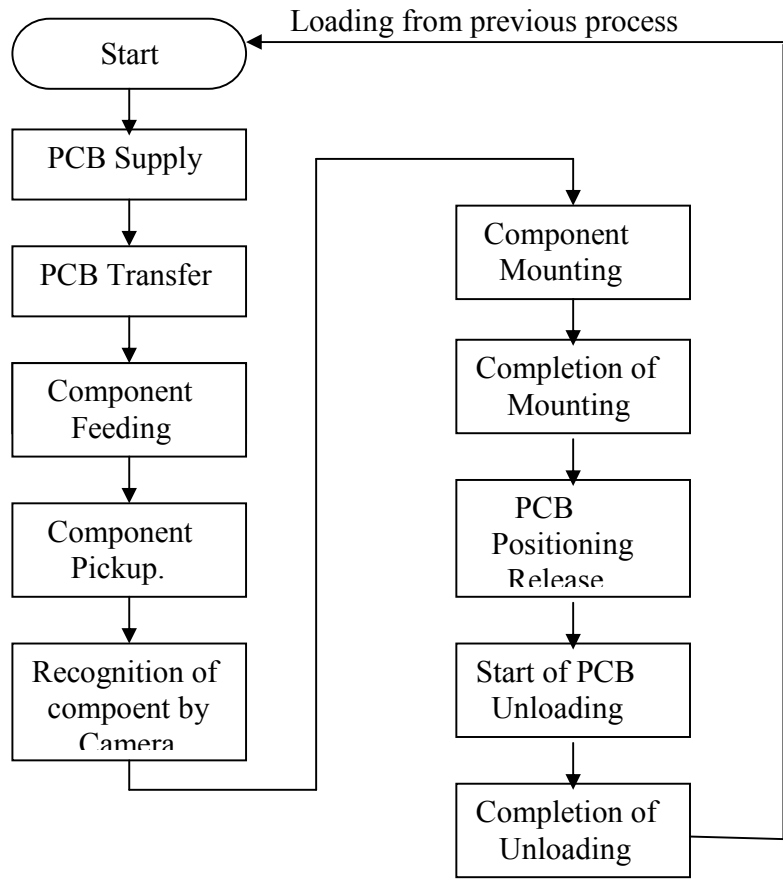
ESD mats are used at all the workstations and all the handlers are provided with EDS slippers and ESD wrist bands . Wrist bands are regularly checked with wristband tester and ESD mats are tested with surface Resistivity Meter.

Environment:

Full SMT floor temperature and humidity is maintained by 24 tons ductible airconditioner.

Working Procedure:

The working can be easily understood by the below drawn flowchart.



J.V.C DEPARTMENT

The J.V.C Department was started in JAN-2001. In Collaboration with the VICTORY COMPANY OF JAPAN or J.V.C. The Department is basically assembling the Semi Knocked Down products into complete assembly set making world class Hi-Fi Music Systems, Car Stereo's and Portable under the brand name J.V.C.

J.V.C cannot supply the fully assembled music systems in India because of the taxes applicable and the services. So J.V.C found suitable place for assembly and servicing. And collaborated with Ges Tech Ltd based on their excellent performance in computer assembly.

The various models of music systems and car stereo's which are assembled in Ges Technologies Ltd. Daman are as follows:

- **Car Stereo's :**

- a: **Stereo's:**

- 1: K.S- FX-150.
- 2: K.S-FX-240.
- 3: KS-FX-450.
- 4: KS-FX-350.
- 5: KS-FX-12.

- b: **Cd Changer's:**

- 1: CHX-11.
- 2: KDS-600.
- 3: PK-12.(Combination of CHX-11 and KS-FX-12).

- **Hi-Fi Music Systems:**

- a: **Audio CD Systems:**

MX-J-100V .

- b: **Audio Video CD Systems :**

MX-J-170V.

- C: **Audio Video CD Systems with Power Rolling Pannel:**

- 1: MX-J-570V.
- 2: MX-J-770V.
- 3: MX-J-777V.

Conclusion

This training at GES Technologies Ltd. was a new experience for me. After This Training I not only gained knowledge but added many positive qualities to our Personalities and also got a practical approach towards life.

I would like to thank the college staff, who cooperated with us and allowed us to train at this prestigious company.

I would also like to thank and express our gratitude, for the guidance and support which we received from the employees at GES Technologies Ltd. During the course of training they not only trained me, but showed the professional and systematic way of doing things. Their cooperation and suggestions were invaluable