

## 2. Reference Information

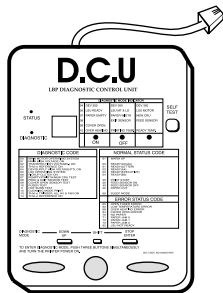
This chapter describes the reference information for applying this training manual, and it is consisted of the tool list, the abbreviation table, the outline of model, and so on.

### 2.1 Tool for Troubleshooting

The following tools are recommended for safe and smooth troubleshooting described in this service manual.

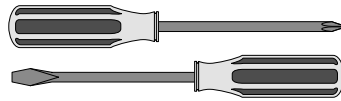
#### 1 DCU(Diagnostic Control Unit)

Standard : Test equipment to diagnose the Laser printer supplied by Samsung Electronics.



#### 4 Driver

Standard : "-" type, "+" type (M3 long, M3 short, M2 long, M2 short).



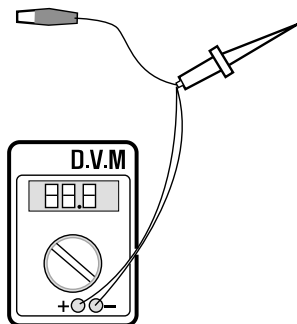
#### 5 Tweezers

Standard : For general home use, small type.



#### 2 DVM(Digital Volt Meter)

Standard : Indicates more than 3 digits.



#### 6 Cotton Swab

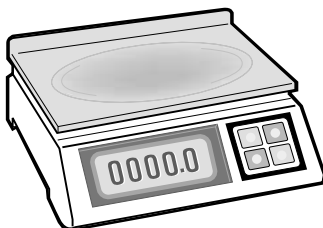
Standard : For general home use, for medical service



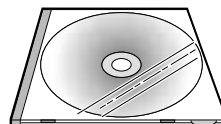
#### 7 Cleaning Equipments a IPA(Isopropyl Alcohol)dry cloth or a soft stuff neutral detergent

#### 3 Electronic Scale

Standard : Equipment to check the weight of consumables(toner cartridge) supplied by Samsung Electronics. (The gram unit can be measured.)



#### 8 Software(Driver) installation CD ROM



## 2.2 Acronyms and Abbreviations

The table in the below explains abbreviations used in this service manual.

The contents of this service manual are declared with abbreviations in many parts. Please refer to the table.

AC	Alternating Current	IEEE	Institute of Electrical and Electronics Engineers, Inc
ASIC	Application Specific Integrated Circuit	IPA	Isopropyl Alcohol
ASSY	assembly	IPM	Images Per Minute
BIOS	Basic Input Output System	LAN	local area network
CMOS Semiconductor	Complementary Metal Oxide Semiconductor	lb	pound(s)
CN	connector	LBP	Laser Beam Printer
CON	connector	LCD	Liquid Crystal Display
CPU	Central Processing Unit	LED	Light Emitting Diode
dB	decibel	LSU	Laser Scanning Unit
dbA	decibelampere	MB	megabyte
dBm	decibel milliwatt	MHz	megahertz
DC	direct current	NVRAM	nonvolatile random access memory
DCU	Diagnostic Control Unit	OPC	Organic Photo Conductor
DPI	Dot Per Inch	PBA	Printed Board Assembly
DRAM	Dynamic Random Access Memory	PCL	Printer Command Language , Printer Control Language
DVM	Digital Voltmeter	PDL	Page Discription Language
ECP	Enhanced Capability Port	PPM	Page Per Minute
EEPROM	Electrically Erasable Programmable Read Only Memory	PTL	Pre-Transfer Lamp
EMI	Electro Magnetic Interference	Q-PID	Quick Printer Initiating Device
EP	electrophotographic	Q ty	quantity
EPP	Enhanced Parallel Port	RAM	Random Access Memory
F/W	firmware	ROM	Read Only Memory
GDI	graphics device interface	SCF	Second Cassette Feeder
GND	ground	SMPS	Switching Mode Power Supply
HBP	Host Based Printing	SPGP	Samsung Printer Graphic Processor
HDD	Hard Disk Drive	SPL	Samsung Printer Language
HV	high voltage	Spool	Simultaneous Peripheral Operation Online
HVPS	High Voltage Power Supply	SW	switch
I/F	interface	sync	synchronous or synchronization
I/O	Input and Output	USB	Universal Serial Bus
IC	integrated circuit		
IDE	Intelligent Drive electronics or Imbedded Drive Electronics		

## 2.3 The Sample Pattern for the Test

The sample pattern shown in below is the standard pattern used in a factory.

The contents of the life span and the printing speed are measured with the pattern shown in below.

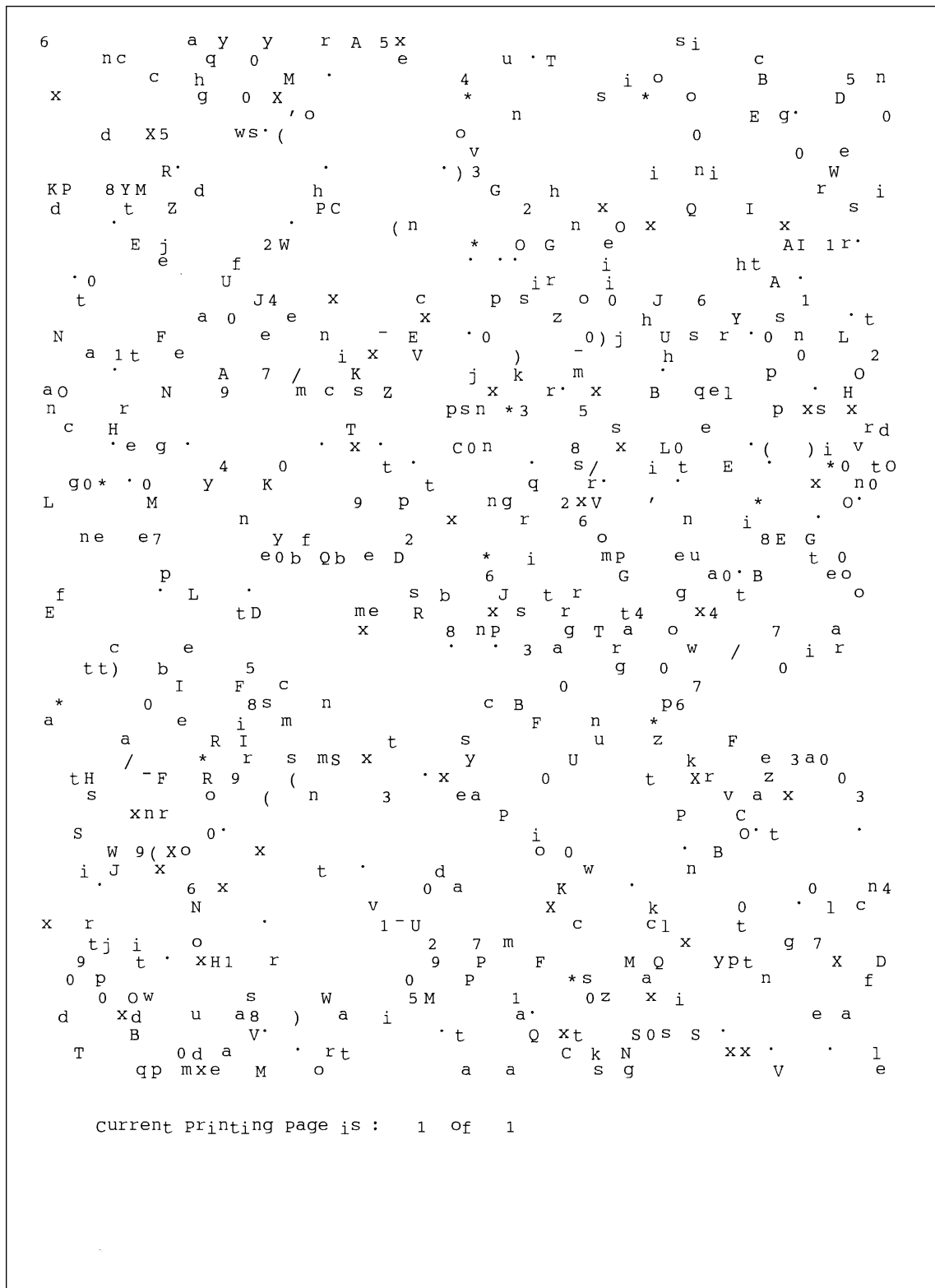
(The picture in the manual is 70% size of the actual A4 size.)

### 2.3.1 A4 5% Pattern

```
i o 0 e / A K 06 cs hh r m E ei **.0 Y S r a i
r a) ( . y b S lM* s g .3 A A4 r n
t Leyi RS . s d u Xo 0 lg P t f l
N l ot f ' t psF ott o 2 ux-s o i t Anvp N 0 tQ
tl ti uso w i ag l u p o . n X0t li at
Ley OH m n N: lc T c hrry x i t
ia* X 0 t utst- N*Qir ep n b pepa We t
eo t s IT i 'e dn o S b* te * G * srX isn
. auo s t s e l A cko o 9 0 gs
ne 3 o n l* r a/n i op r r i * ee
s O aeocS p * * Ke'0 sn*s z e0 cr o 0 ma go
FpT sonm da t s l xopr a r p . o o ' - u
ac-n * / sac Y t e (ty* mlaI p b t2 (l
i edu ar -0 l Dpr e Dse ag c e sa6g p p'
*/mn0ov p se* l w a o r * gm o p p r P00
n t*n su n h*xv ri tp' o rg co ine s vo -0 1 T
y 01 m ' (l0 M ' u/ r ne o pe
s ob d t nu e n e lA apro iotre
s o e d o u' I si esc o i X ee
pe e t i md opc e Letyo aoi t nn l tm e B
x i xlo ) c aicn fern i)x i p n* n oi e u in D W
X y X r eo 001 dE bs PB teo * Ro H g u*K
d s Fxr rCF a bh s p g s ler roJ n e pp
a p tr ps(s oadrr la s p z uis n oa
. m d t E *F i* opn E h i rudc r s o
a petya b d e v" d t e p) . ro . h n s t
n p t e v t ho *f0X*a o ic o em i a c4 FA0
i2q n/ s8 i ) BZ p cd~ pso o 30a Or Y *h
dr -e tu9 t F iet3 rhP * e m0 dt x De
wTpp xix n m( wd lAacc a -0 z)l i i n e
5 e * sn o Pd .Xl o ic sa y X pk
i- po0 p h yb olo) C e ( w sco"o o ynn !Xnj
i va3 Ac H a C Xt0rp ow . ersico s 10 a
Plplae a tid ep/tF t )s pn F 't g(eD e
so ss w 10h yxt OS p) Dn0-
*dynM o u i i Tp nly ne' l c x s(seo o.c
i 08 BW ouch ue k EX t2 i sonn * op
is1 n g ir r Q o X gr ny* tu 0 mxsar uj*
a o/* p 8 ur f o t a ip P no e
es pn .i* i .t) .t W 5A * iyn t I o stn rtx
n t e s ev s n x ( Xen e0 Xw td l' -
Ui c i7 e )SPX m uros3*is s .n n M o l L-g
at *sUrN2 7e u l X o o tH-res c p eo W
5* oe s- a o( Q F0P nN * em'r*ud e t MM c iox5
iog s- a os on d b so'6p s 6At eo . n s
Hist 0 J t R 6 ei T rJ iil ' i o ank'
p r e r0 F Bui opMM e0M 0 00 1Ee u e B u
q t i o xB iO *hn t r i a ses " t X t t s n
m) g p d G F I soy Ors fE*0 o Ie hd e n
p gnO t H r s nZE e iea p * t - p/4e l
t E oo w a g e s6 n0c xpc -w n
d X X er s t o t idt *o s 0 p e t ll/R e
XX i g i e fg s p C . m x h te C g os ta e
Pa(o0 n/t00' ozdI dno x p O W ae or R t icF
(1 xa B co o s )r s 8Y*x toe ie t o ah
r B o rlr d t l Ei et0Da h n s7
c - s oo1o t ga 'r FM *d i*s o x o pe *
```

current printing page is : 1 of 1

## 2.3.2 A4 2% Pattern



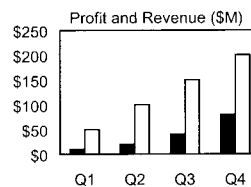
### 2.3.3 A4 IDC Pattern

#### INTEROFFICE MEMORANDUM

**TO:** Cathy Scott  
**FROM:** Lane Wolters  
**SUBJECT:** The Typical Printed Page  
**DATE:** 07/14/09

What does the typical laser printer document look like? Well, across the diverse business community it would be impossible to capture all aspects of printing style within a single page document. However, if attention is focused on the majority of printing volume, text and simple business graphics would stand out as the most prevalent output from laser printers. This

sample memo represents a reasonable example of the typical business document. This memo covers approximately 5% of a letter or A4-sized piece of paper. This number (5%) has historically been called the "average" page coverage by laser printer manufacturers. It may seem to the naked eye that there is much more than 5%, but in fact, alphanumeric characters rely on a large portion of white space for their composition.



Mileage Chart

City	London	Los Angeles	New York	Tokyo
London	--	5456	3453	5975
Los Angeles	5456	--	2468	5451
New York	3453	2468	--	6736
Tokyo	5975	5451	6736	--

There are many factors that can influence the actual page coverage of a document as well as the page-yield of a toner cartridge. Testing parameters such as font size and style, internal printer settings, print environment, paper stock, sample size, job length and criteria for determining "end of life", can all influence how long a toner cartridge will last. The best competitive analysis of printer page yield should occur under similar conditions using industry standards for the variables listed above.

# *Memo*

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