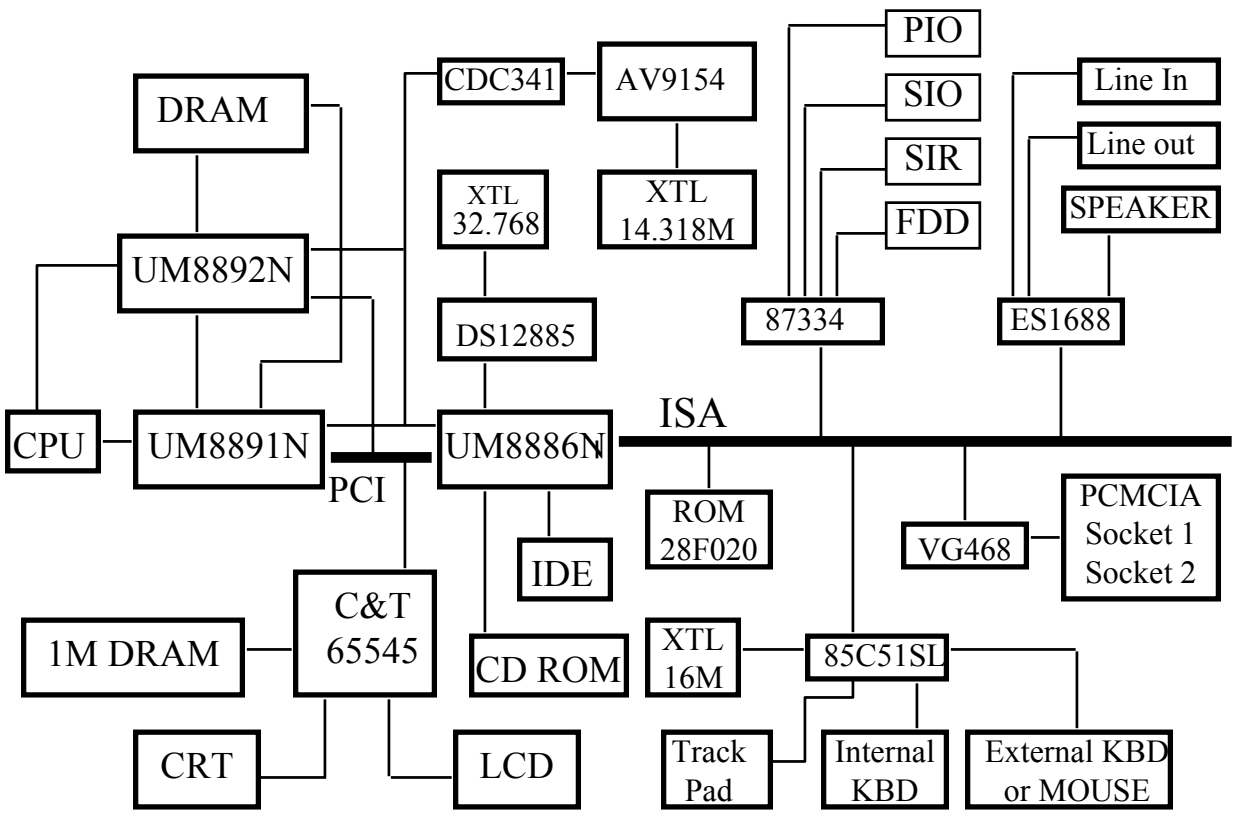
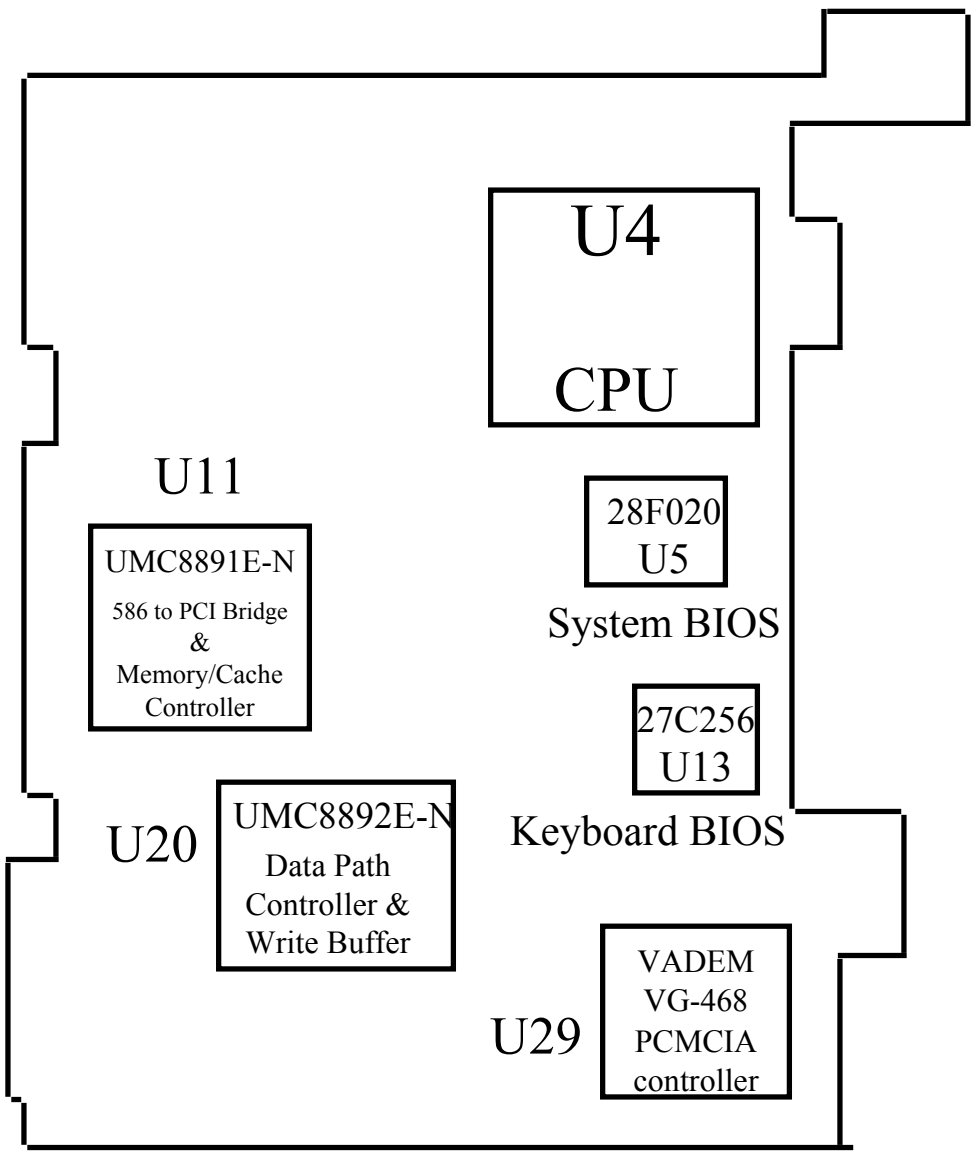
Troubleshooting Guide
For
MiTAC 5024 NoteBook

Edit by J.C.
Maintenance Offering Dep.
JAN. 1996

System Block Diagram

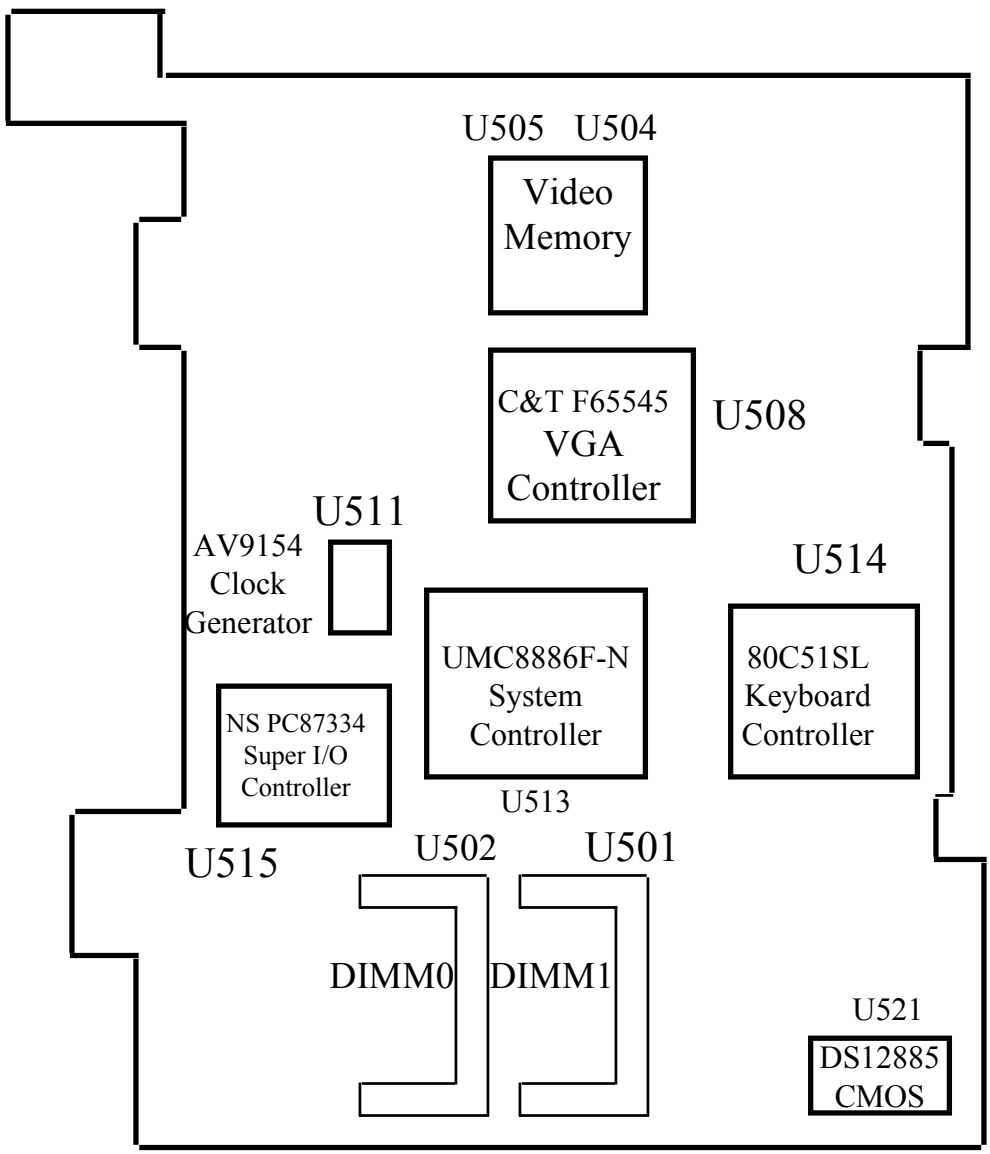


Major Components Of System Board (1)



Front

Major Components Of System Board (2)



Back

CPU

Intel: Pentium

1. P54LM-75,90,100
   2.9V core, 3.3V IO buffer.
2. Support 16 KB L-1 cache
   Separate 8KB code and 8KB data caches.
3. 64 bits data bus and 32 bits address bus.
4. Enhanced floating point capabilities.
5. SPGA 296 pin socket.
6. SMM/SMI for power management.

Cyrix: M1 (TBD)

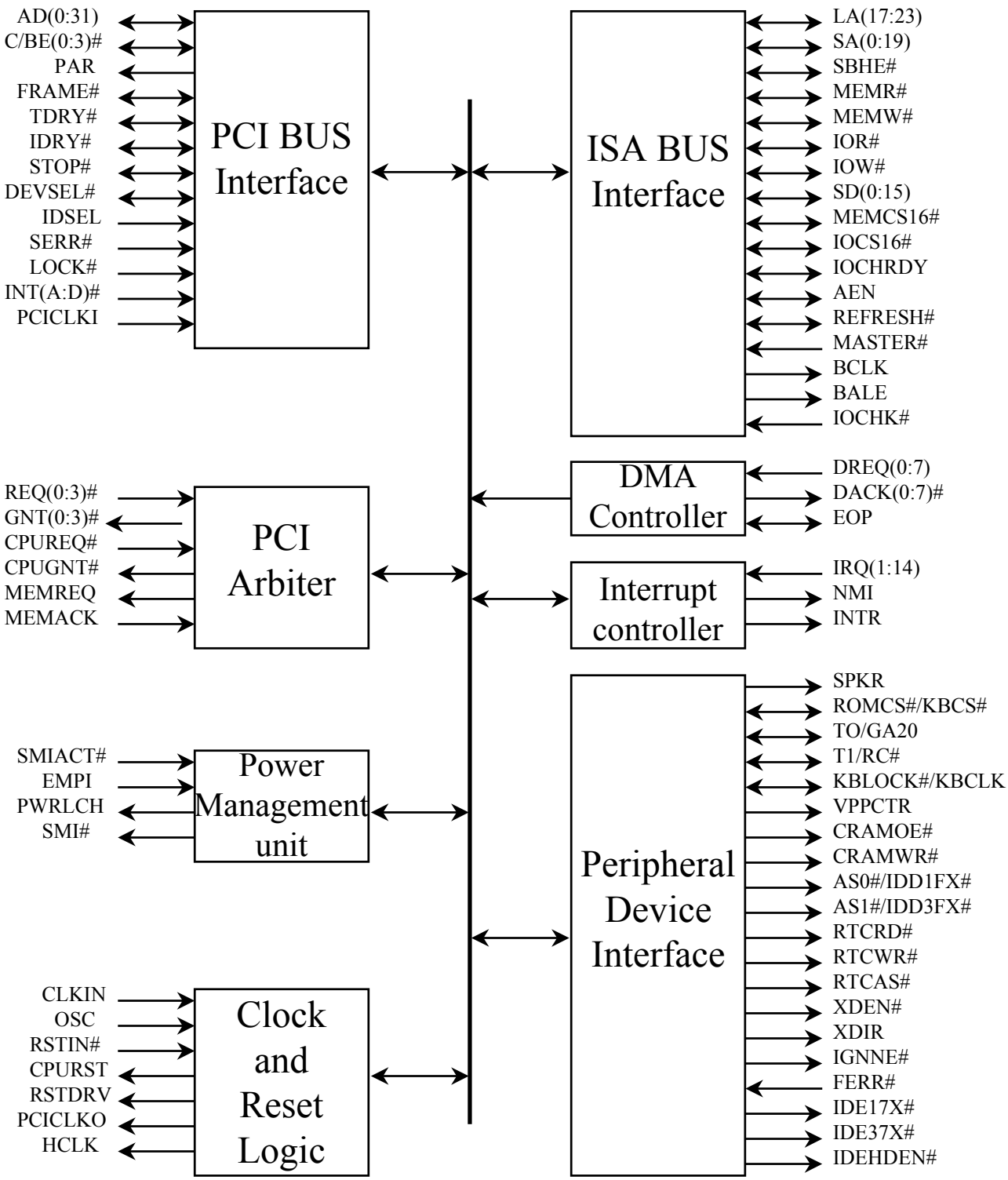
AMD: K5 (TBD)

UM8886F-N

System controller

1.- Support Intel Pentium,Cyrix M1,and AMD K5 with bus up to 66MHZ.
2.- PCI specifications 2.0
3.- PCI to ISA bridge.
4.- SMM/SMI support.
5.- Level-2 write back cache support.
6.- Local IDE for hard disk drive(primary) and CD-ROM drive(secondary).
7.- Memory controller.
8.- IPC:2x8237,2x8259,1x8254.
9.- Power management:On,Doze,Standby,and Suspend mode.
10.- Stop grant,stop clock for 1x clock scaling.
11.- Flash ROM support.

UM8886 Block Diagram



UM8891E-N

- 586 to PCI bridge and memory/cache controller
- 1.- Support the Pentium Processor at 60MHZ,
- 66MHZ,90MHZ and 100MHZ.
- 2.- Support Cyrix M1 CPU.
- 3.- Support AMD K5 CPU.
- 4.- Integrared High Performance Second Level
- Cache Controller.
- 5.- Support 64-bit Page Mode DRAM Controller.
- 6.- Support the Pipeline Address Mode of Pentium
- Processors providing Higher Performance
- 7.- Support Concurrence Between CPU Host Bus
- and PCI Bus Transactions.
- 8.- Support PCI Bus Operation at 30 MHZ and
- 33.3 MHZ, Support PCI burst X-1-2-1-2-1.....
- 9.- Support PCI Memory Read/Write Snoop
- Feature.
- 10.-Support Parity Auto-Detection Function.
- 11.-208PQFP,0.6um CMOS.

UM8892E-N

Data path controller and write buffers

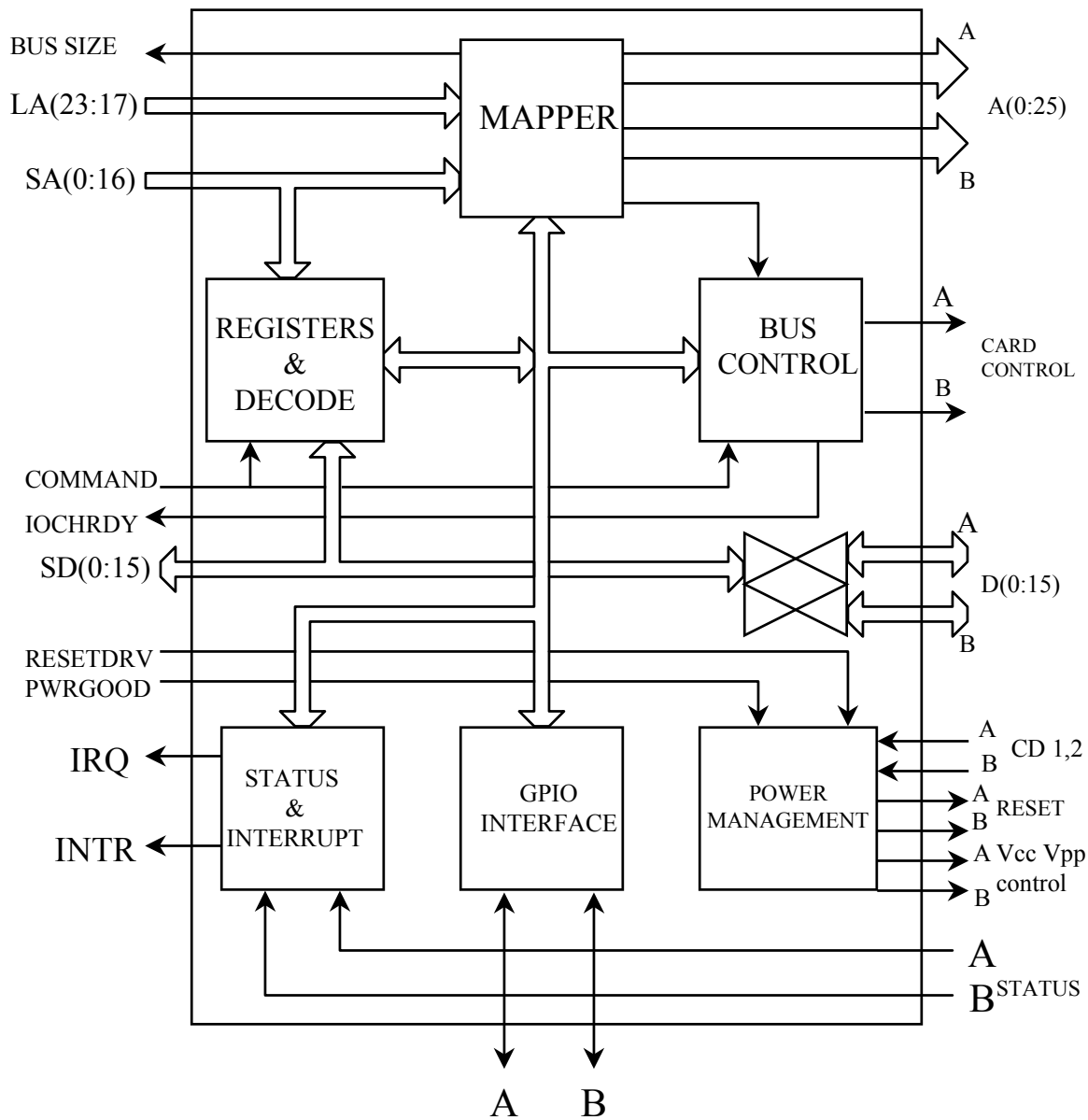
1.- Support 64-bit CPU Data,64-bit DRAM Data, and 32-bit PCI Data controller.
2.- Support 4-Level 64-bit CPU to DRAM Post-write Buffers.
3.- Support 4-Level 64-bit CPU to PCI Post-write buffers.
4.- Support 1-Level 64-bit PCI to CPU or DRAM Post-write buffers.
5.- Provides DRAM tp PCI Read Prefetch Feature.
6.- Byte Parity Support for Main Memory Bus
7.- Support 32-bit PCI Data Bus Parity bit and 64-bit DRAM Parity Error Flag.
8.- Host-to-Memory and Host-to-PCI Write Posting Buffers Permit Near Zero Wait State Write Performance.
9.- Operates Synchronously with 66.6/60 MHZ CPU and 33.3/30 MHZ PCI Clock.
10.- Support Parity Auto Detection Function.
11.- 208PQFP 0.6um CMOS.

VADEM VG-468

PCMCIA interface controller.

1.- Compliant with PCMCIA 2.01/JEIDA 4.1 specifications along with ExCA extension.
2.- Card socket interface consists of 60 signals and 8 power connection.
3.- Two PC card socket, support two type II or one type III application.
4.- Digital audio sound indication for card insertion/removing.
5.- Support PCMCIA-ATA hard disk, semiconductor disk,memory,flash, SRAM and I/O cards.
6.- Support maooable memory windows and I/O windows for each socket.

VG-468 Block Diagram



C&T F65545

VGA Controller

1.- High performance flat panel/CRT VGA controller,RAMDAC chipset.
2.- 32-bit PCI-bus interface with 1 MB video RAM
3.- Support panel resolution 800x600,1024x768 and 1280x1024.
4.- Support CRT monitor resolution up to 1024x768/256 colors
5.- Advanced power management feature for power saving mode.
6.- Support TFT,DSTN,Mono LCD panel.
7.- Automatic CRT sensing.

80C51SL

Keyboard controller

1.- Decoding matrix-switch type keyboard input.
2.- Support one internal keyboard and one internal trackball.
3.- Support one PS/2 port for external keyboard or external mouse.
4.- Provide in-system battery function management including BATT charging control with protection,and icon display.

NS PC87334

Super I/O controller

1.- 2.88MB super I/O floppy disk controller.
Support 3-Mode.
Changable with CD-ROM module.

2.- Support EPP and ECP parallel ports.

3.- 1 SIR for Infrared application.(COM2)
Support IrDA version 1.0.

4.- High speed NS16C550 compatible serial port.

5.- 100-pin PQFP device.

Hardware configuration

	IO address	IRQx	DRQx
COM1	3F8-F	4	-
SIR(COM2)	278-F	3	-
PIO	378-37F	7	-
FDD	3F0-F	6	2

- IDE interface was disabled.

DIMM

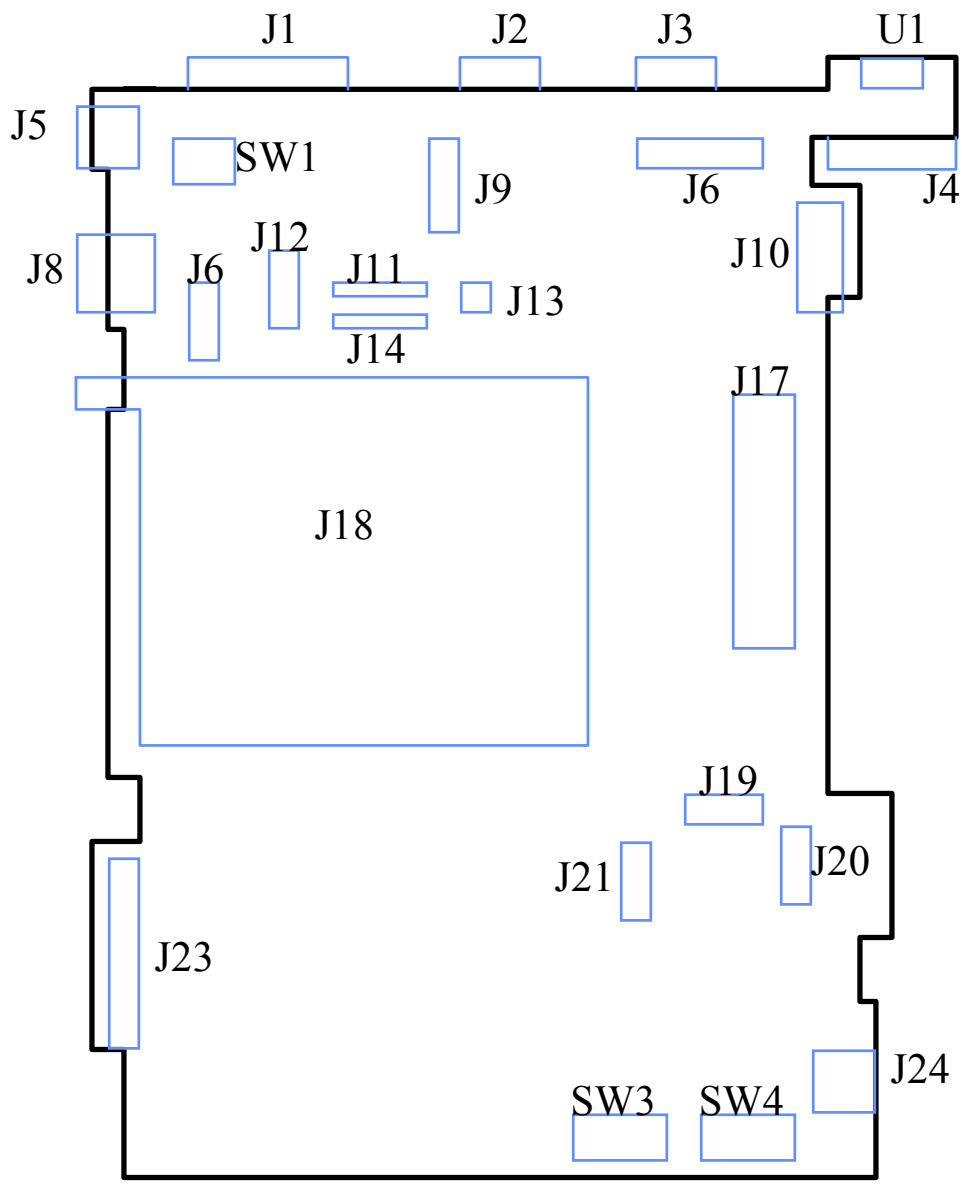
Four banks architecture in two DIMM socket supporting 4MB standard DRAM , and expandable up to 32MB.

J502 DIMM0	J502 DIMM1	Total Size
1M x 4	-----	4MB
1M x 16 (4M)	-----	4MB
1M x 4	1M x 4	8MB
1M x 16 (4M)	1M x 16 (4M)	8MB
1M x 16 (8M)	-----	8MB
2M x 8	-----	8MB
1M x 16 (8M)	1M x 16 (8M)	16MB
2M x 8	2M x 8	16MB
4M x 4	-----	16MB
4M x 4	4M x 4	32MB

Notes:

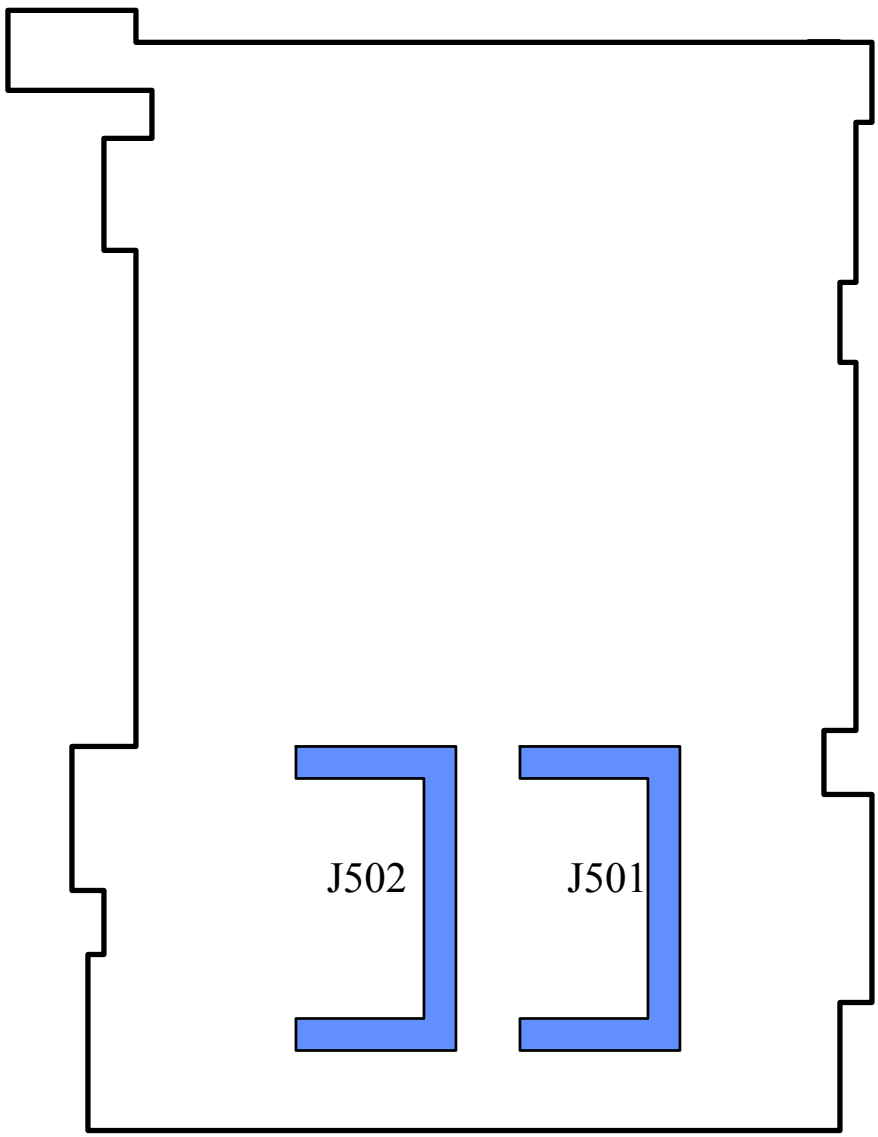
1. When only one DIMM is installed, be sure to install it on DIMM 0.
2. When two DIMM are installed, be sure to use the ***same type*** and size of DIMM from the same manufacturer.

System Board Connector Definitions (1)



Front

System Board Connector Definitions (2)

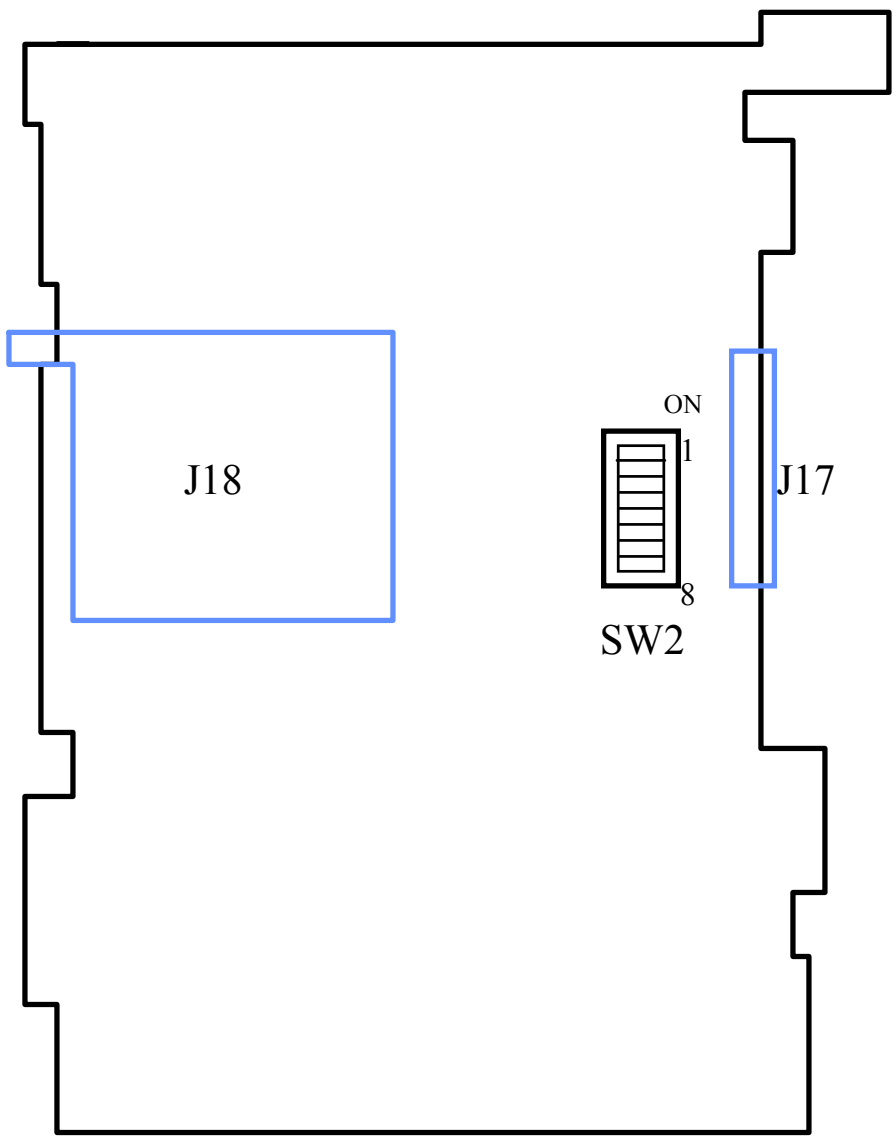


Back

System Board Connector Definitions (3)

Connector	Definition
J1	Parallel port (PIO)
J2	CRT video connector
J3	Serial port (SIO 1)
J4	Audio board connector
J5	PS/2 Keyboard/Mouse connector
J6	Icon LCD module connector
J8	Power jack
J9,J12	LCD module connector
J10	Secondary battery connector
J11,14	Internal keyboard connector
J13	Cover switch (suspend)
J16	Backlight connector
J17	Floppy disk drive and CD-ROM drive connector
J18	PCMCIA IC card connector
J19	Trackpad connector
J20	Primary battery translation connector
J21	Button board connector
J23	Hard disk connector
J24	Speaker connector
U1	SIR port
SW1	Power button
SW3,SW4	Mouse button
J501,J502	Memory module connector

System Board Switch Definitions (1)



System Board Switch Definitions (2)

SW2	Definition	Setting
1,2,3	Reeserved	OFF (by default)
4,5	CPU bus clock (input)	Pin 4 Pin 5 20MHZ OFF ON 50MHZ ON ON 60MHZ OFF OFF 66MHZ ON OFF
6,7	Reserved	OFF (by default)
8	CMOS data	ON: Clear CMOS data OFF: Normal state

Note:

CPU bus clock X 1.5 = CPU Type

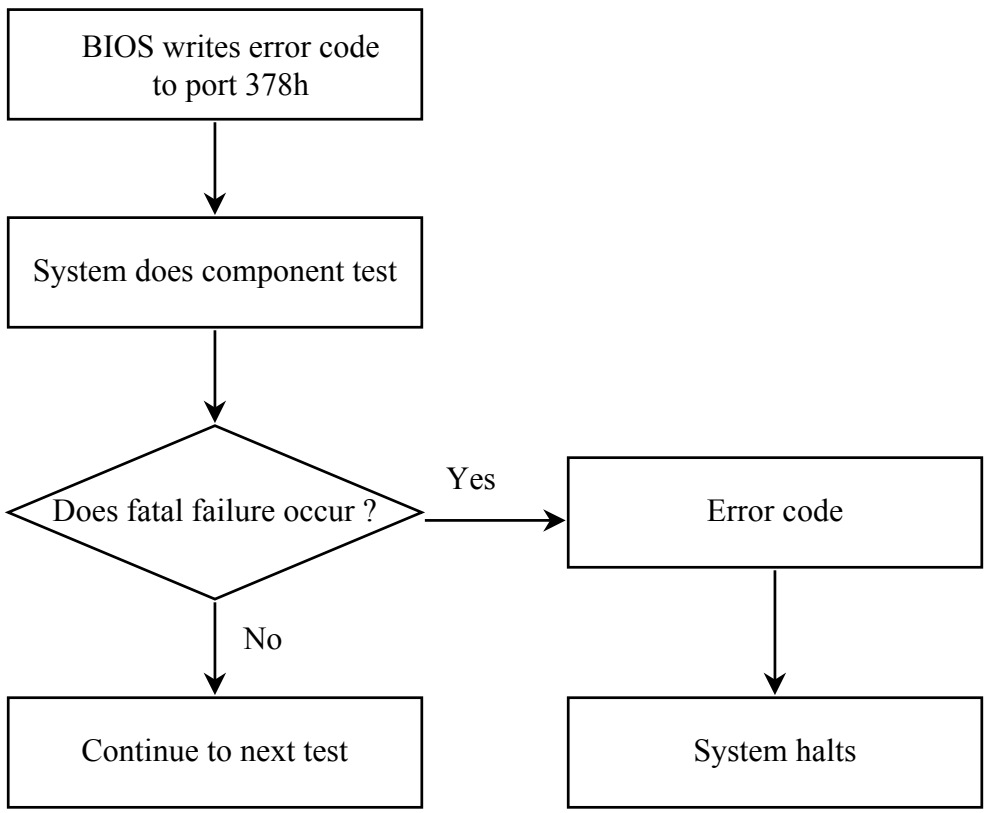
Example:

If CPU is Pentium-90

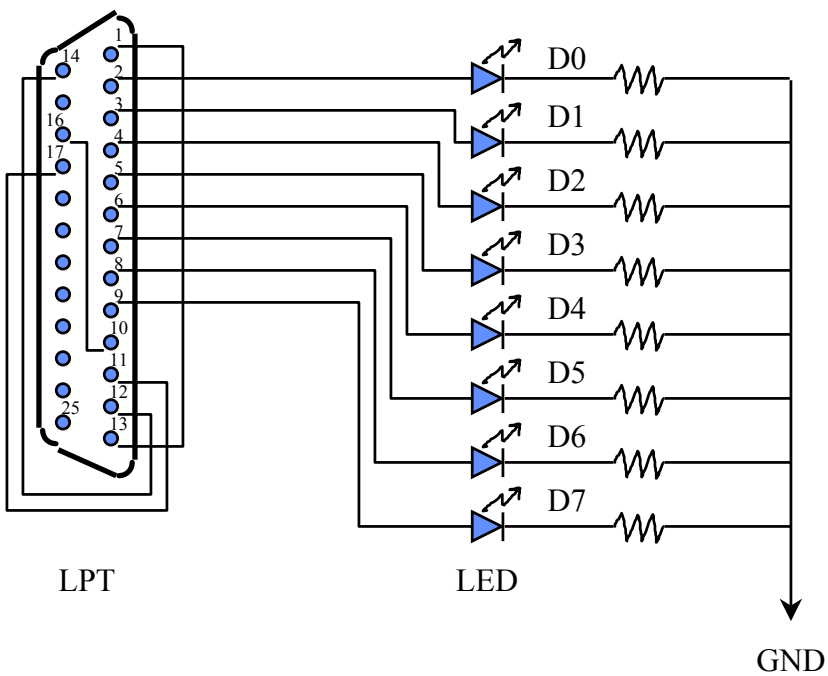
then CPU bus clock is 90/1.5 = 60 (MHZ)

So SW2 pin 4,pin5 select OFF .

PIO Debug Board (1)



PIO Debug Board (2)



Pin 1: STROBE ⟷ Pin 13: SLCT
Pin10: ACK# ⟷ Pin 16: INIT#
Pin11: BUSY ⟷ Pin 17: SELIN#
Pin12: PTERR ⟷ Pin 14: AUTOFD#
Pin 2~Pin 9 : PD0~PD7

Error Code For PIO Debug Board (1)

Code	Beeps	Description
02		Verify Real Mode
04		Get CPU type
06		Initialize system hardware
08		Initialize chipset registers with initial POST values
09		Set in POST flag
0A		Initialize CPU registers
0C		Initialize cache to initial POST values
0E		Initialize I/O
0F		Initialize the local bus IDE
10		Initialize Power Management
11		Load alternate registers with initial POST values
12		Jump to UserPatch0
14		Initialize keyboard controller
16	2-2-3	BIOS ROM checksum
18		8254 timer initialization
1A		8237 DMA controller initilazation
1C		Reset Programmable Interrupt Controller
20	3-1-1	Test DRAM refresh
22	3-1-3	Test 8742 keyboard controller
24		Set ES segment register to 4 GB
28		Autosize DRAM
2A		Clear 512K base RAM
2C	3-4-1	Test 512 K base addres lines
2E	3-4-3	Test 512K base memory
32		Test CPU bus-clock frequency
34		Test CMOS RAM
35		Initialize alternate chipset registers
37		Reinitialize the chipset (MB only)
38		Shadow system BIOS ROM

Error Code For PIO Debug Board (2)

Code	Beeps	Description
39		Reinitialize the cache (MB only)
3A		Autosize cache
3C		Configure advanced chipset registers
3D		Load Alternate registers with CMOS values
40		Set Initial CPU speed
42		Initialize interrupt vectors
44		Initialize BIOS interrupts
46	2-1-2-3	Check ROM copyright notice
47		Initialize manager for PCI Option ROMs
48		Check video configuration against CMOS
49		Initialize PCI bus and devices
4A		Initialize all video adapters in system
4C		Shadow video BIOS ROM
4E		Display copyright notice
50		Display CPU type and speed
51		Initialize EISA board
52		Test keyboard
54		Set key click if enabled
56		Enabled keyboard
58	2-2-3-1	Test for unexpected interrups
5A		Display prompt "Press F2 to enter SETUP"
5C		Test RAM between 512 and 640KB
60		Test extended memory
62		Test extended memory address lines
64		Jump to UserPatch 1
66		Configure advanced cache registers
68		Enable external and CPU caches
6A		Display external cache size
6C		Display shadow message

Error Code For PIO Debug Board (3)

Code	Beeps	Description
6E		Display non-disposable segmeents
70		Display error messages
72		Check for configuration errors
74		Test real-time clock
76		Check for keyboard errors
7C		Set up hardware interrupt vectors
7E		Test coprocessor if present
80		Disable onboard I/O ports
82		Detect and install external RS232 ports
84		Detect and install external parallel ports
86		Re-initialize onboard I/O ports
88		Initialize BIOS Data Area
8A		Initialize extended BIOS Data Area
8C		Initialize floppy controller
90		Initialize hard-disk controller
91		Initialize local-bus hard-disk controller
92		Jump to UserPatch 2
93		Build MPTABLE for muli-processor boards
94		Disable A20 address line
96		Clear huge ES segment register
98		Search for option ROMs
9A		Shadow option ROMs
9C		Set up Power Management
9E		Enable hardware interrupts
A0		Set time of day
A2		Check key lock
A4		Initialize typematic rate
A8		Erase F2 prompt
AA		Scan for F2 stroke

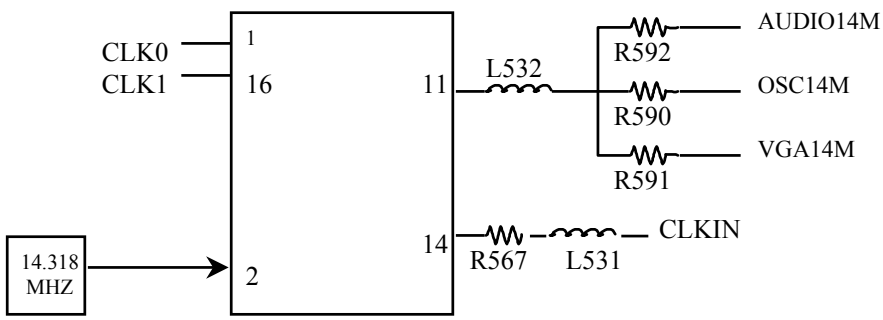
Error Code For PIO Debug Board (4)

Code	Beeps	Description
AC		Enter SETUP
AE		Clear in-POST flag
B0		Check for error
B2		POST done-prepare to boot operating system
B4		One beep
B6		Check Password(optional)
B8		Clear global descriptor table
BC		Clear parity checkers
BE		Clear screen(optional)
BF		Check virus and backup reminders
C0		Try to boot with INT 19
D0		Interrupt handler error
D2		Unknown interrup error
D4		Pending interrup error
D6		Initialize option ROM error
D8		Shutdown error
DA		Extended Block Move
DC		Shutdown 10 error

Error Code For PIO Debug Board (5)

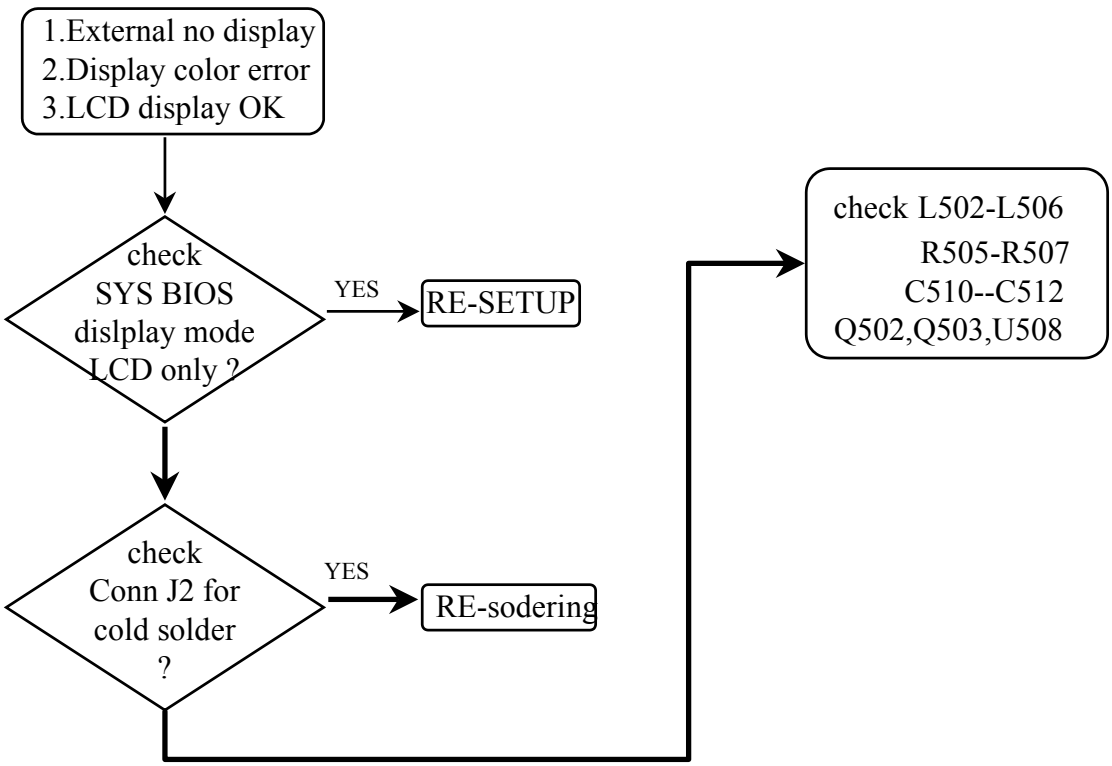
Code	Beeps	Description
		The following are for boot block in Flash ROM
E2		Initialize the chipset
E3		Initialize refresh counter
E4		Check for Forced Flash
E5		Check HW status of ROM
E6		BIOS ROM is OK
E7		Do complete RAM test
E8		Do OEM initialization
E9		Initialize interrupt controller
EA		Read in the bootstrap code
EB		Initialize all vectors
EC		Boot the Flash program
ED		Initialize the boot device
EE		Boot code was read OK

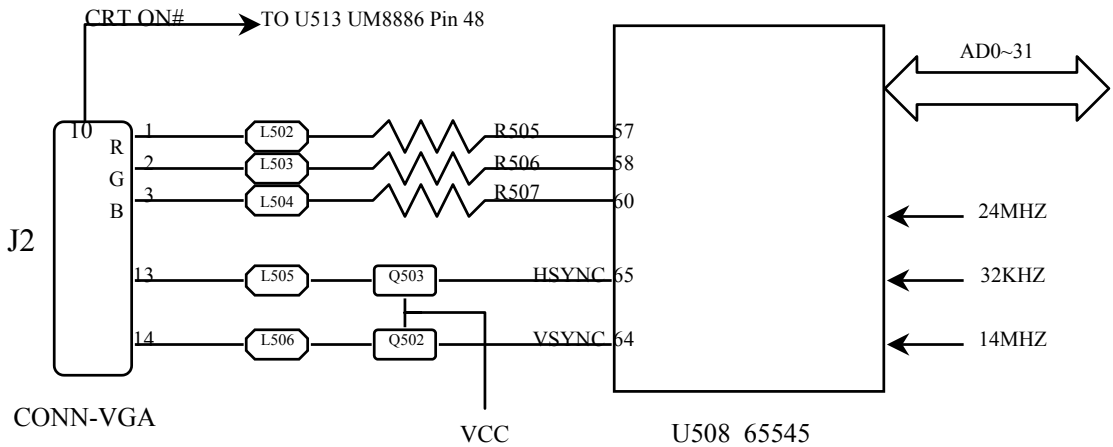
System Frequency Generator



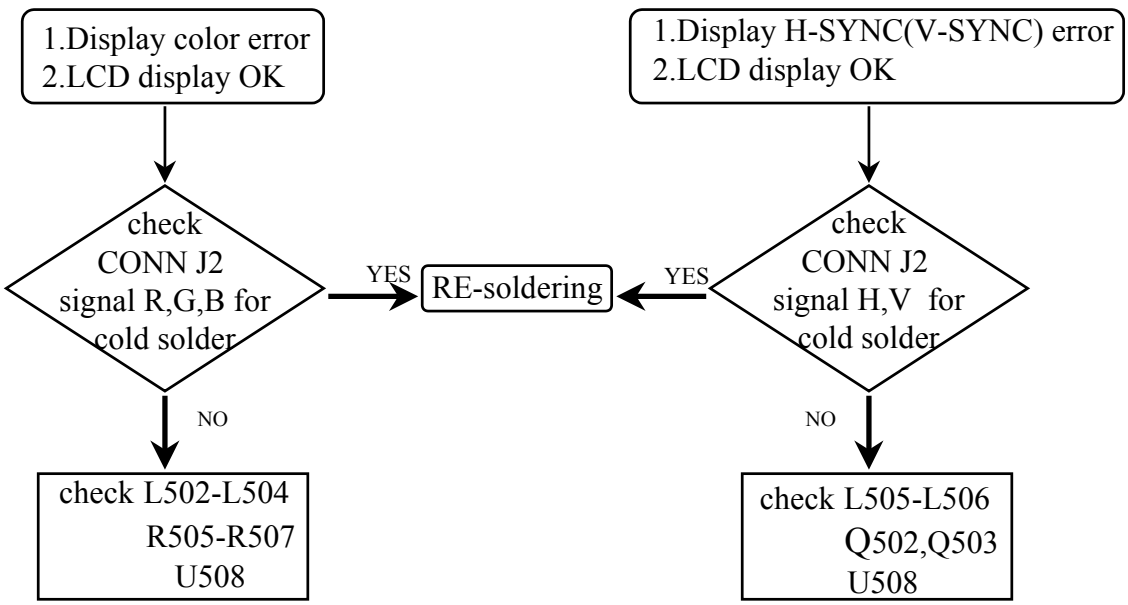
U511
AV9154

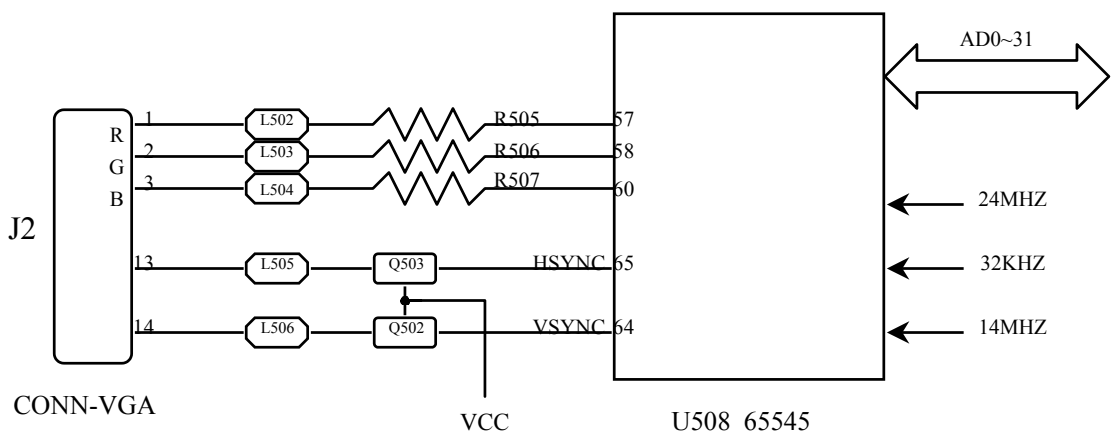
External VGA No Display



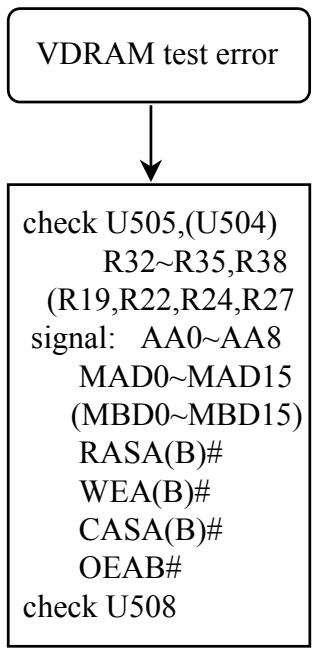


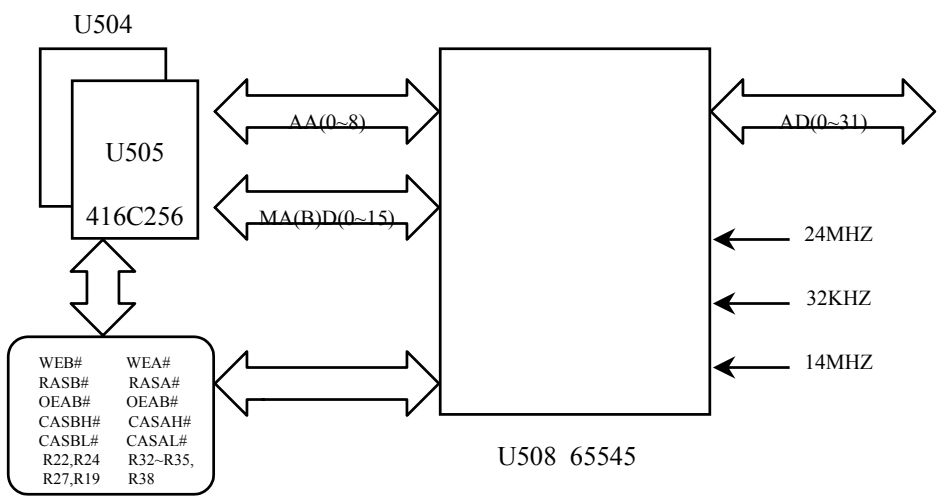
External Display Error



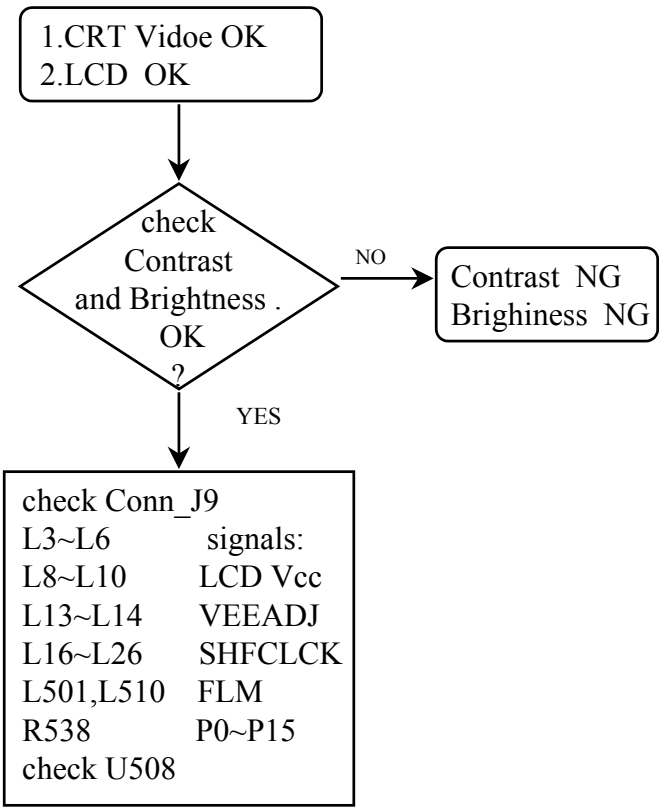


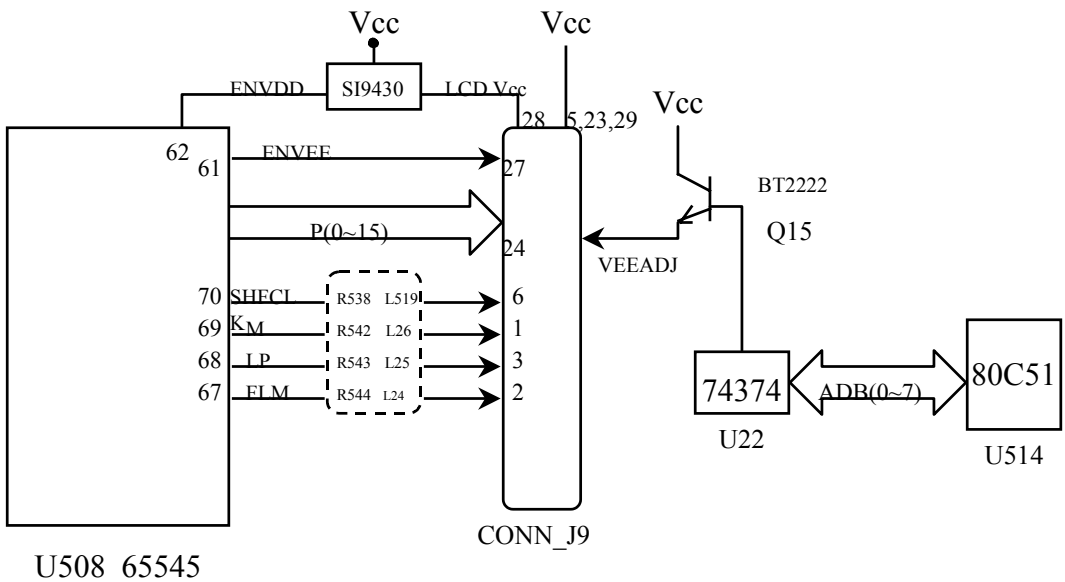
Display VDRAM Test Error





LCD No Display



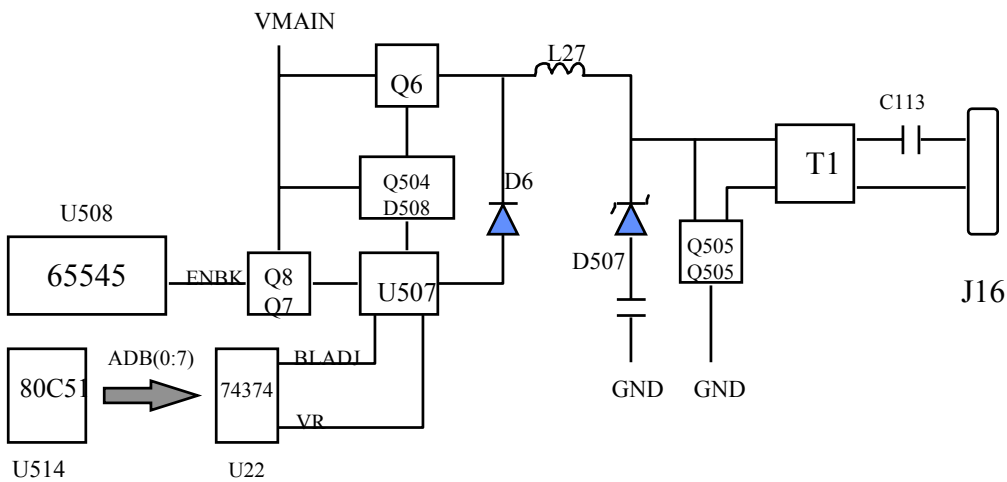


LCD Brightness N.G.

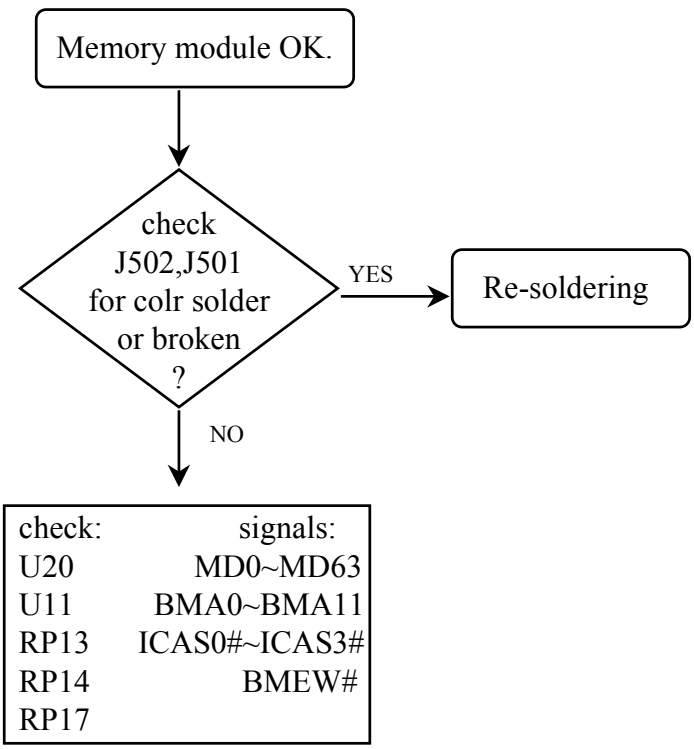
Brightness light OK
KBD function key
"F9","F10","Fn" OK

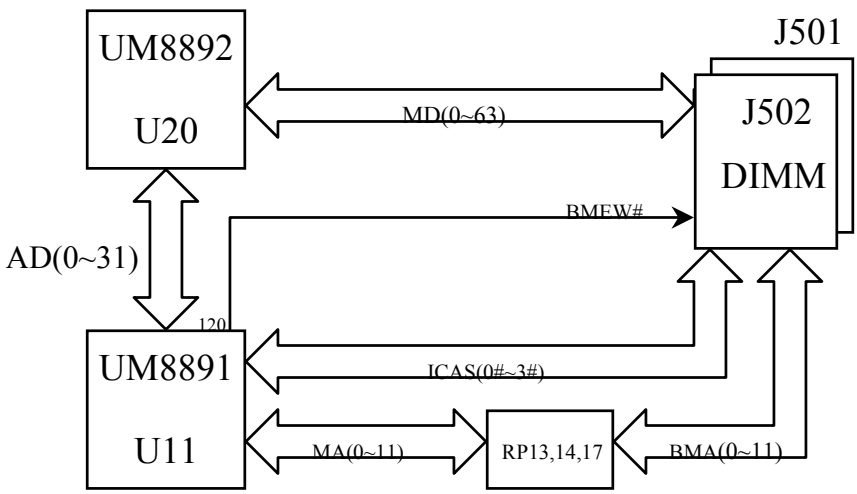
↓

check parts:	signals:
C113,T1,C86, Q505,Q506, L27,D507,D6, Q6,Q504,Q7, Q8,D508, U507,U22, U514,U508	VMAIN, ENBK, BLADJ, VR

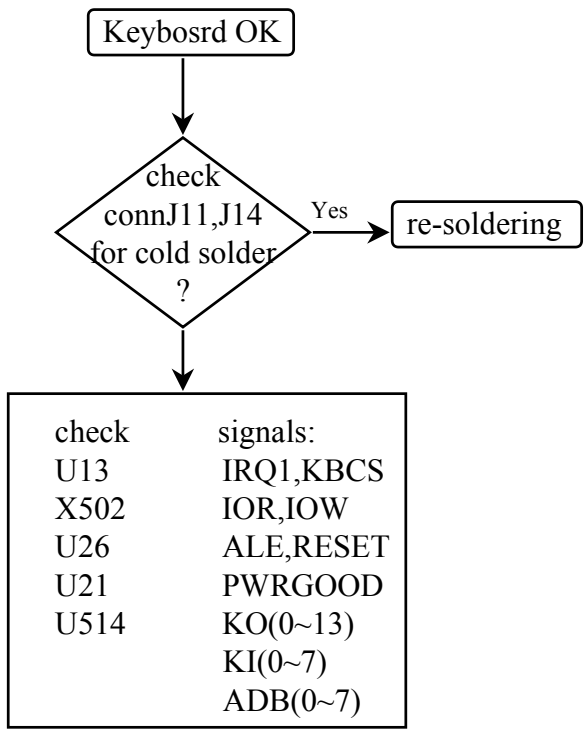


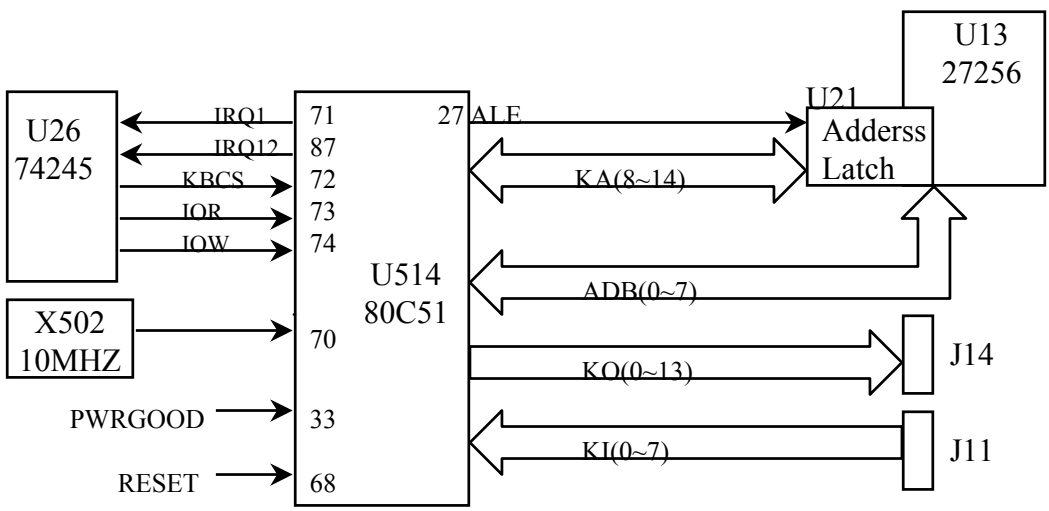
System Memory Test Error



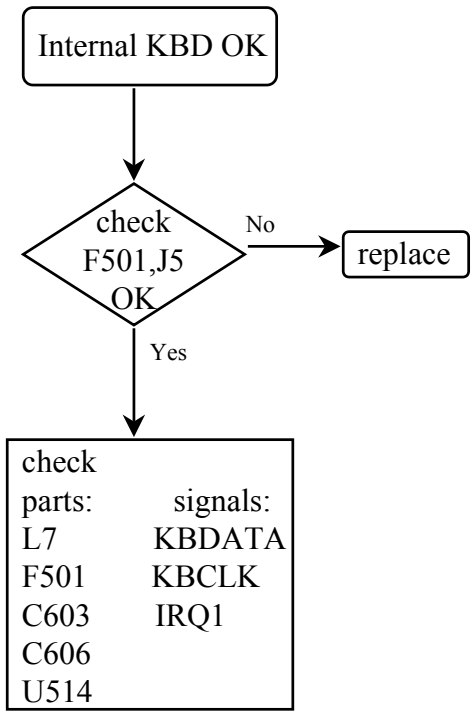


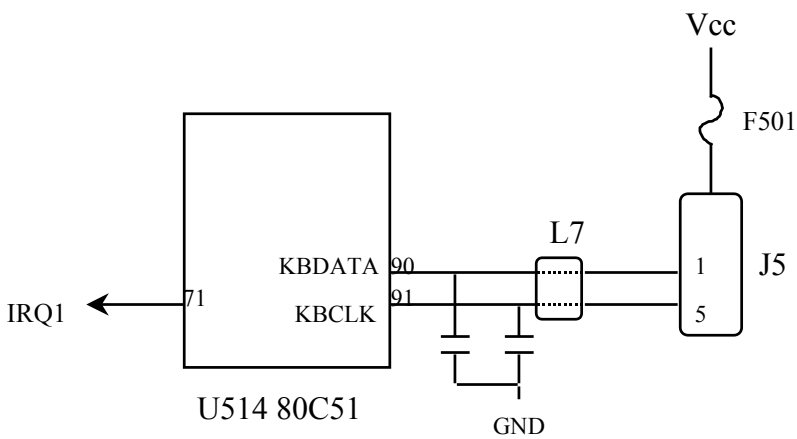
Keyboard Test Failure



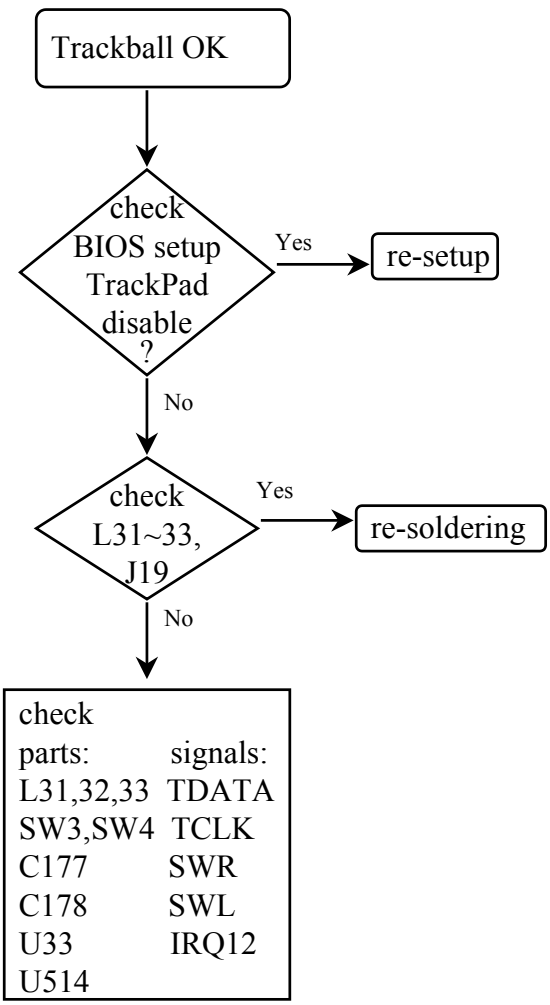


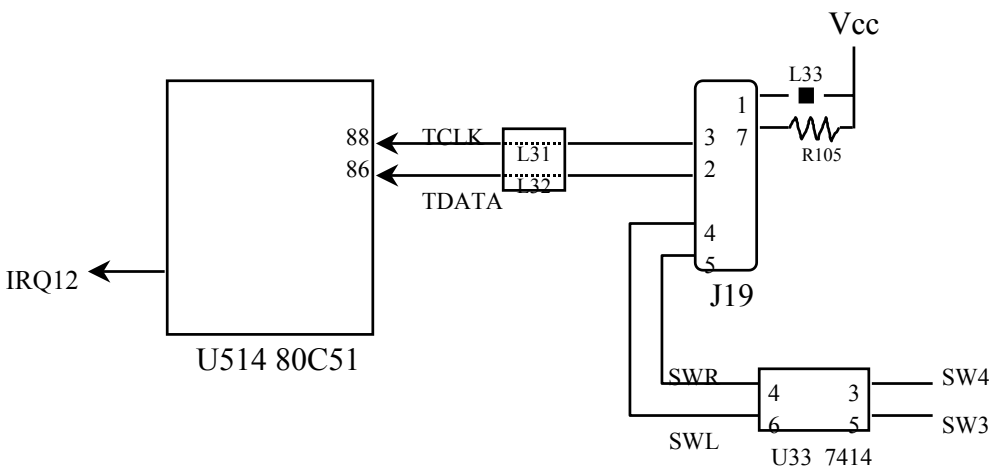
External KBD Failure



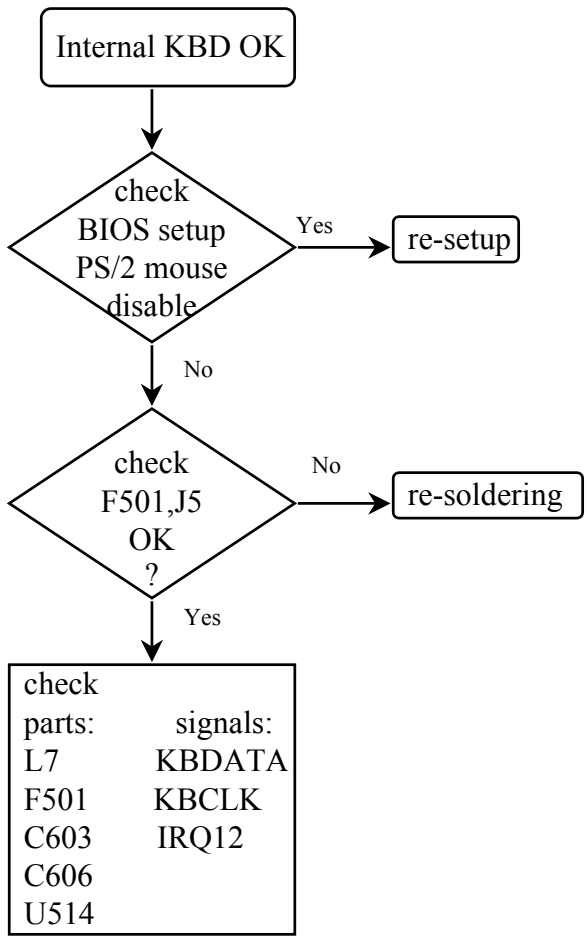


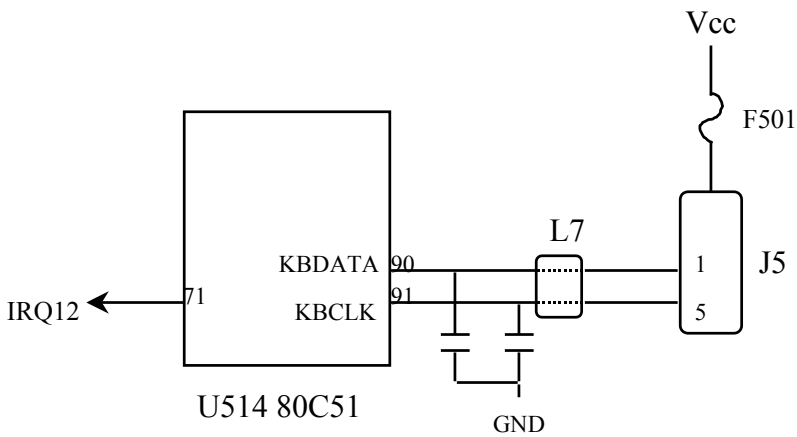
TrackPad Failure



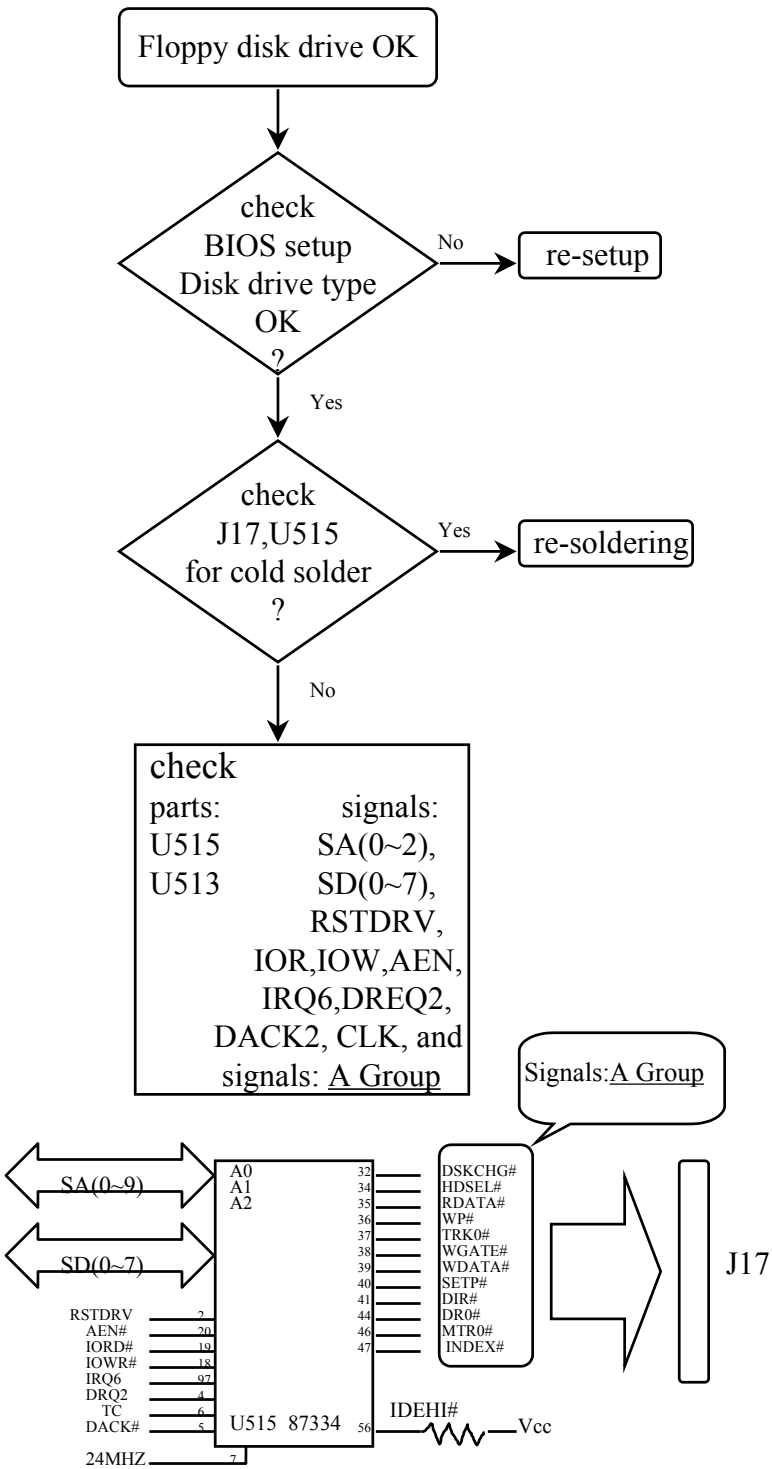


PS/2 Mouse Failure

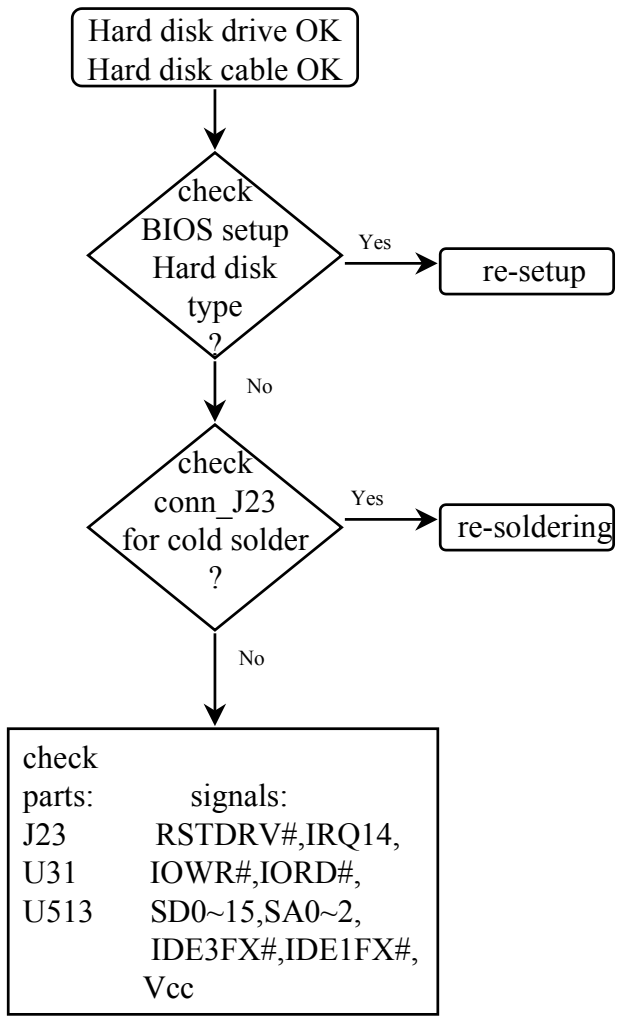


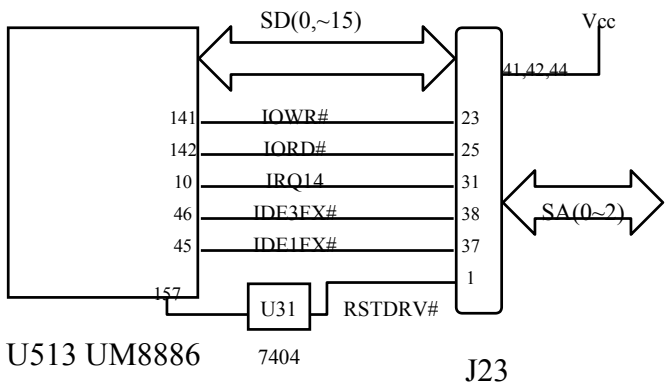


Diskette Drive Failure

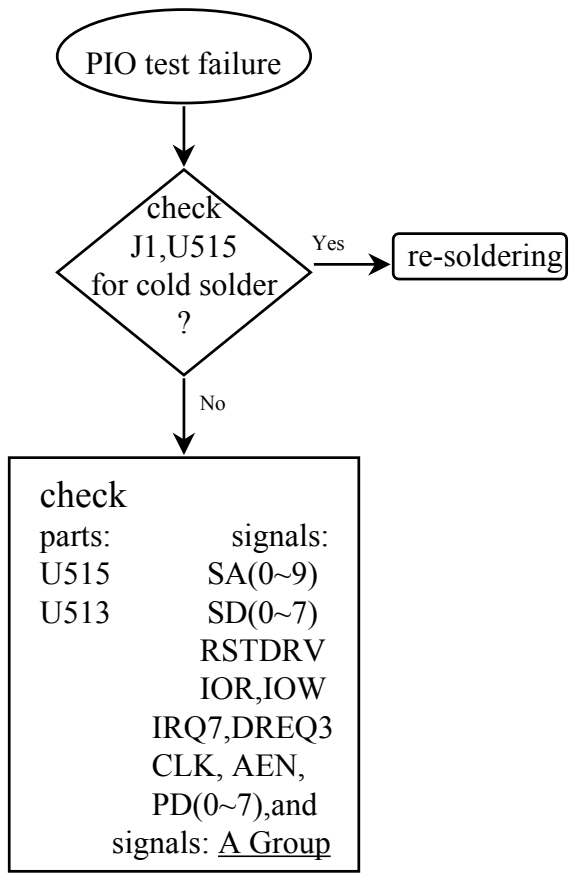


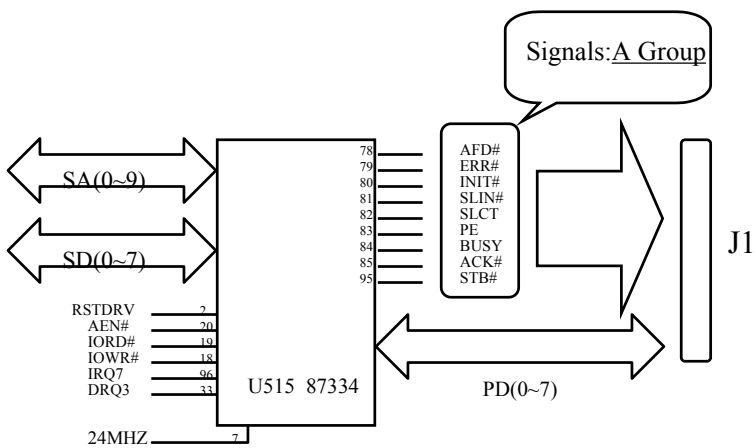
Hard Disk Drive Failure



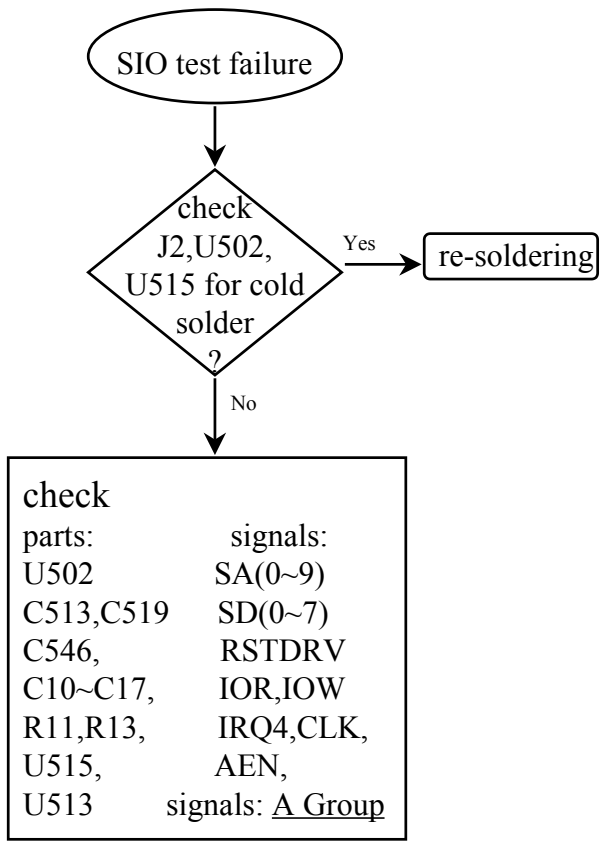


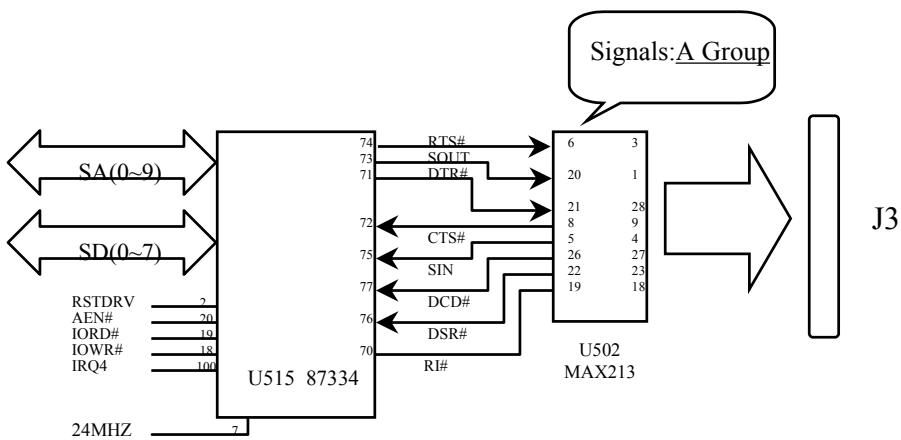
Parallel Ports Failure



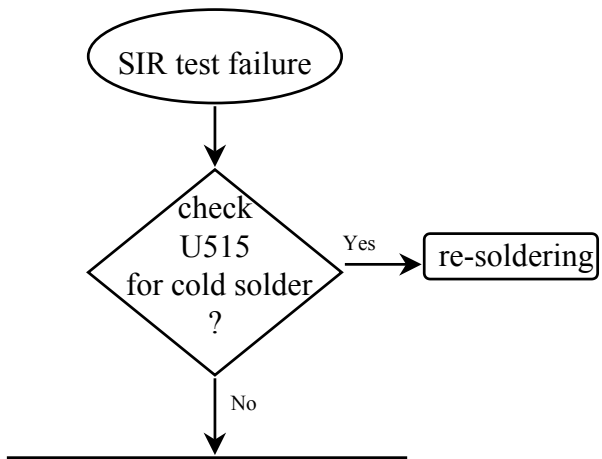


Serial Ports Failure

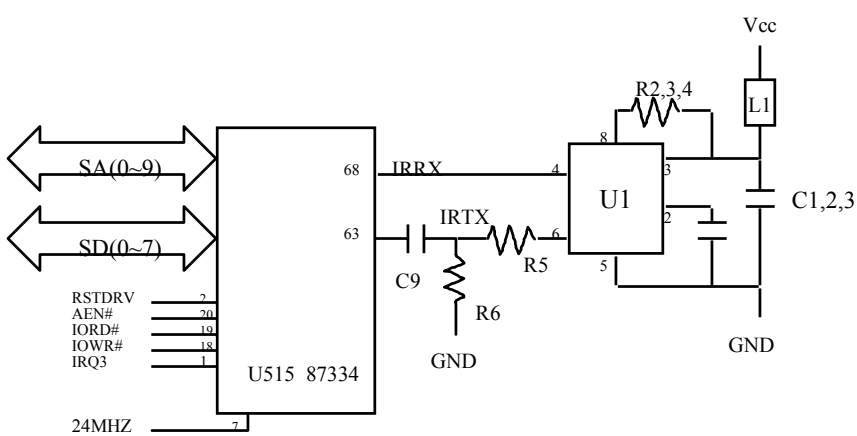




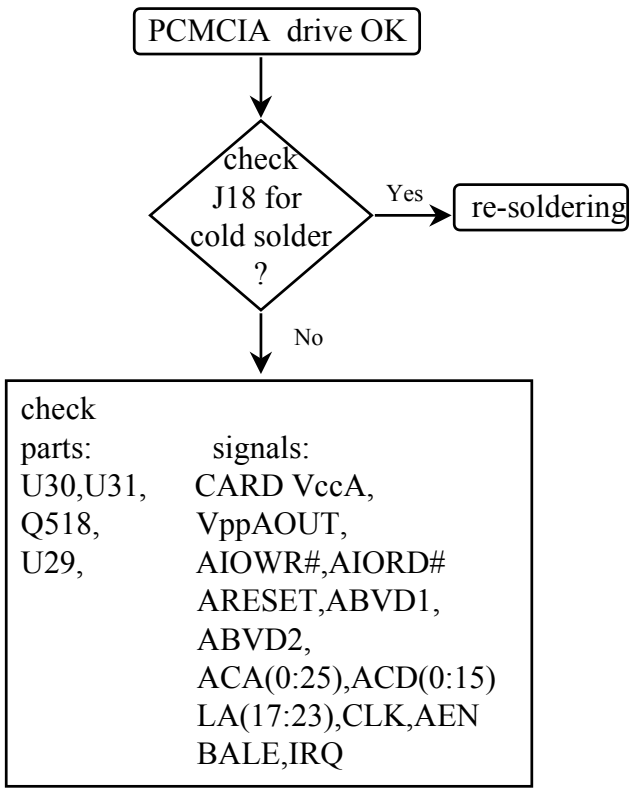
Serial Infrared Failure

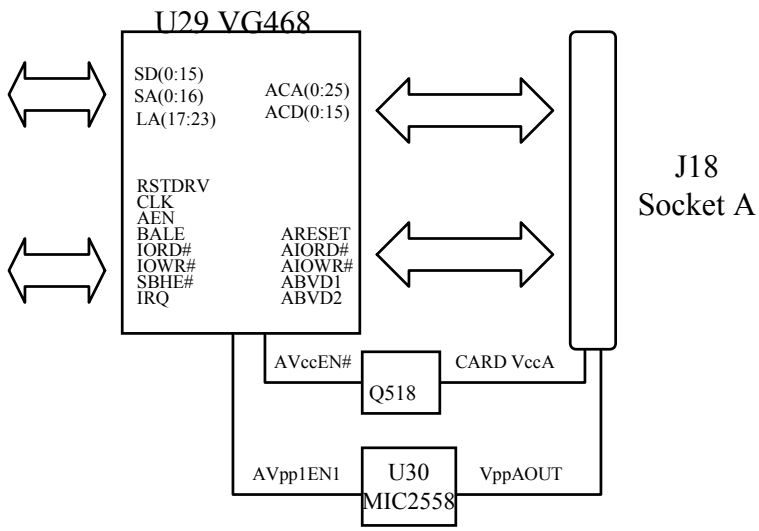


Signals:A Group

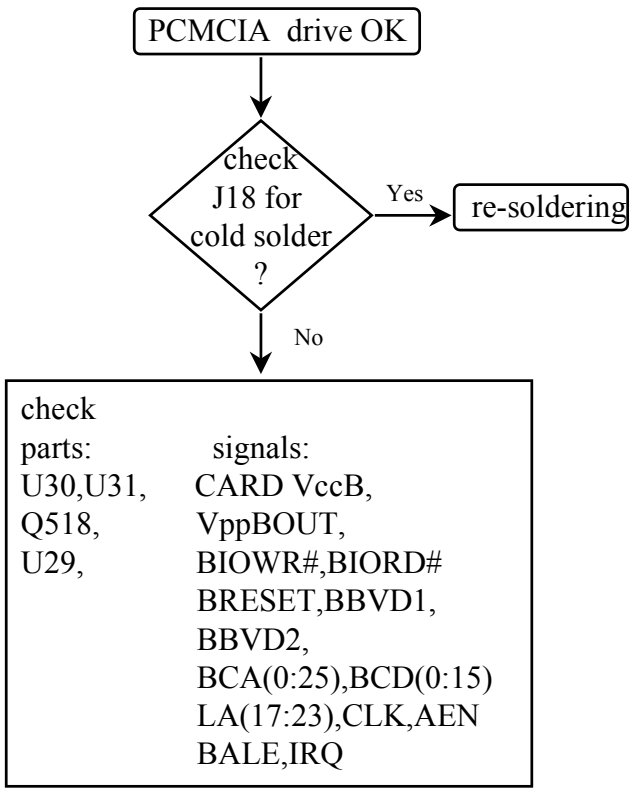


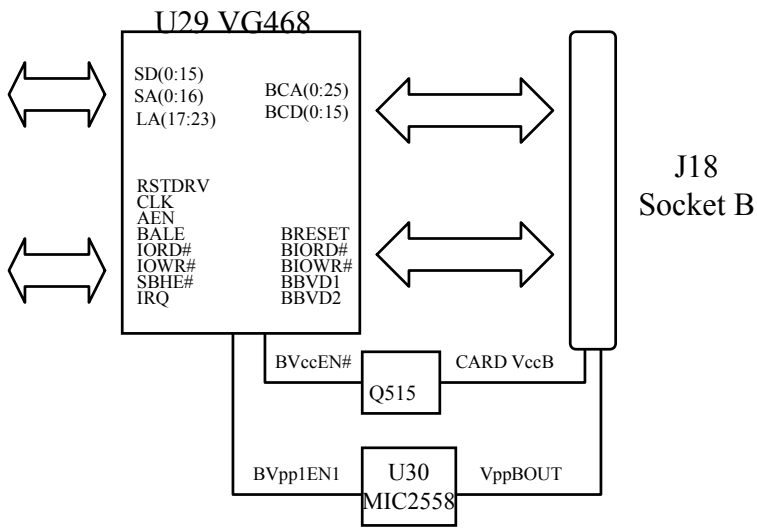
PCMCIA Socket A Test Failure





PCMCIA Socket B Test Failure

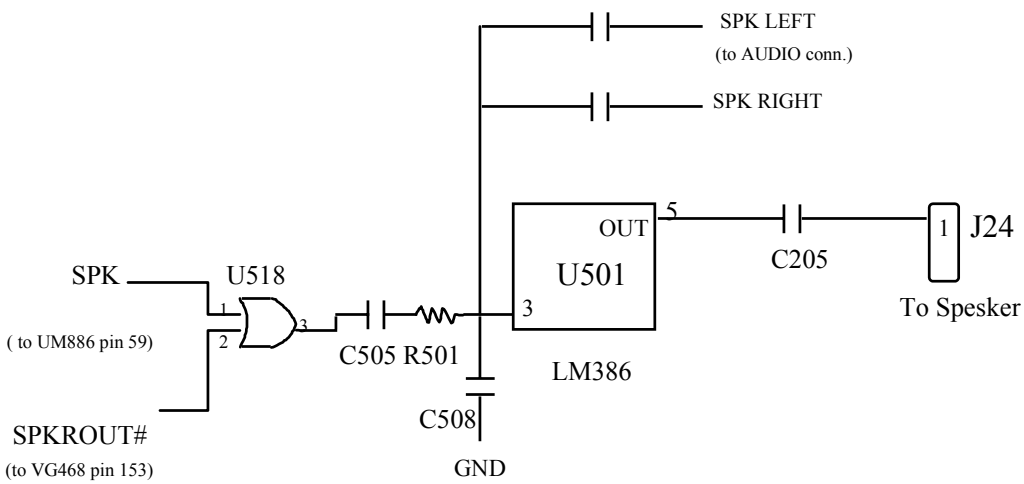




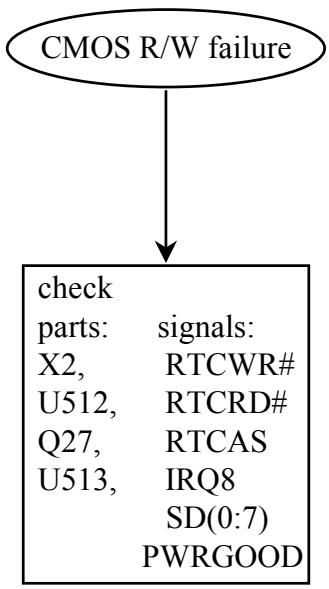
No Sound

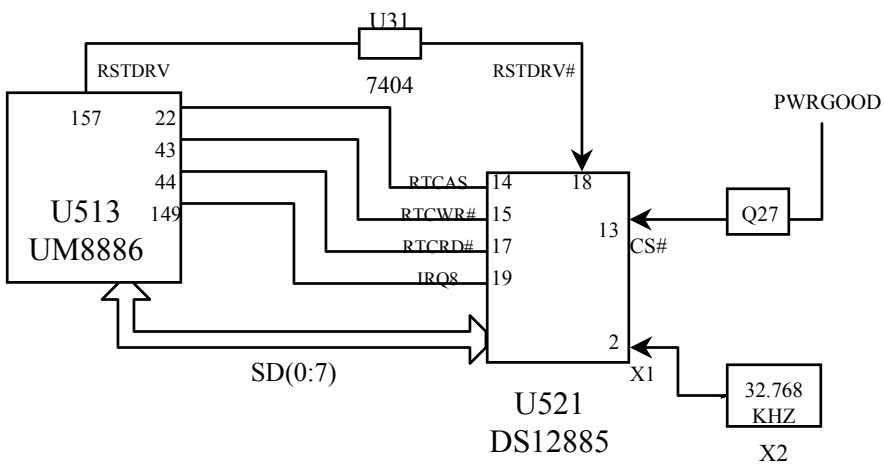
Speaker OK

check parts:	signals:
C205	SPK
U501	SPK OFF
R501	SPKROUT
C505	
U518	
U513	

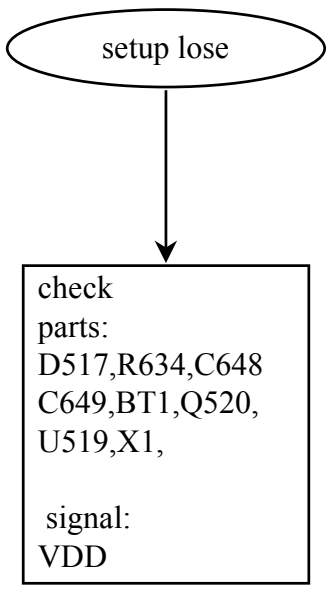


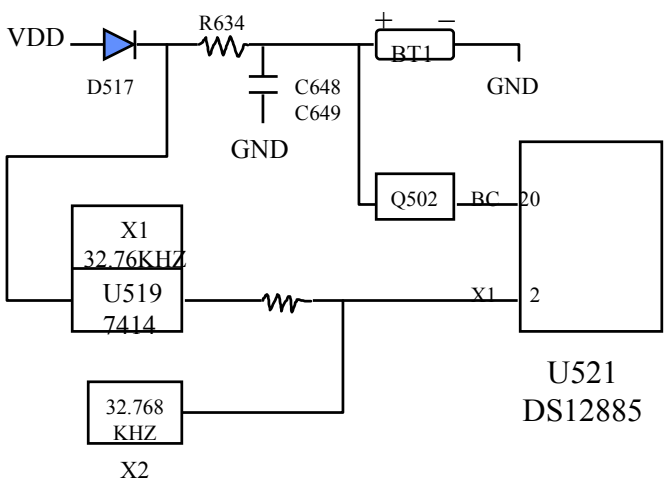
CMOS Read/Write Failure



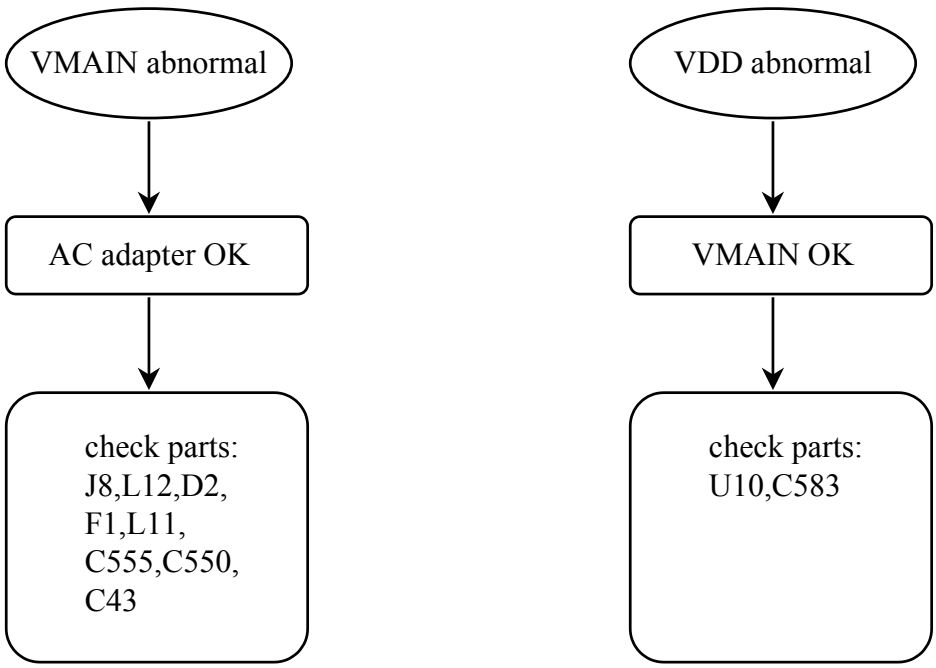


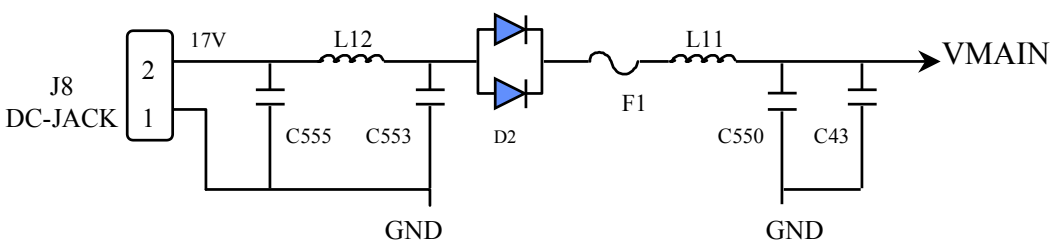
Lose CMOS Setup

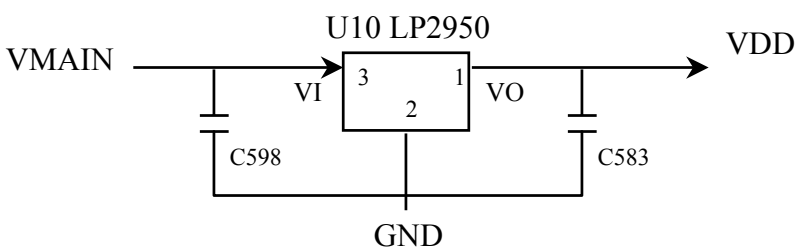




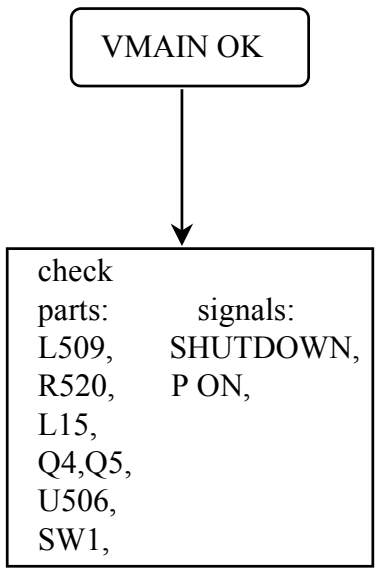
VMAIN VDD Abnormal

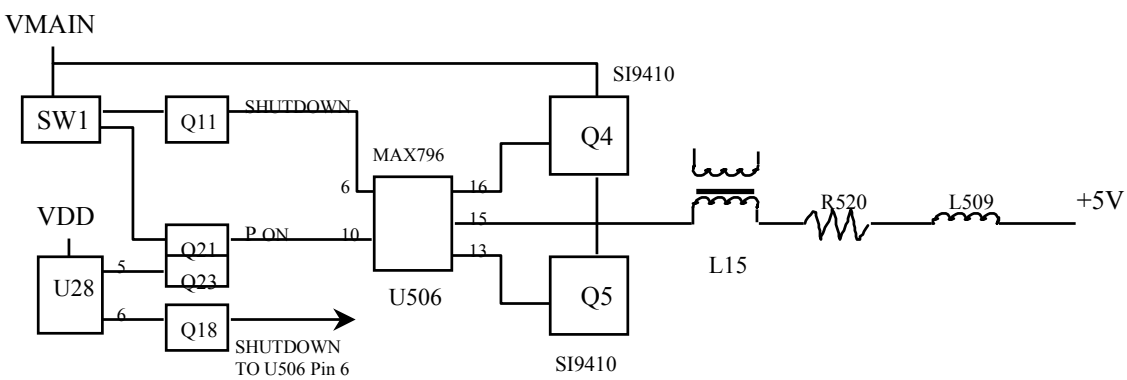




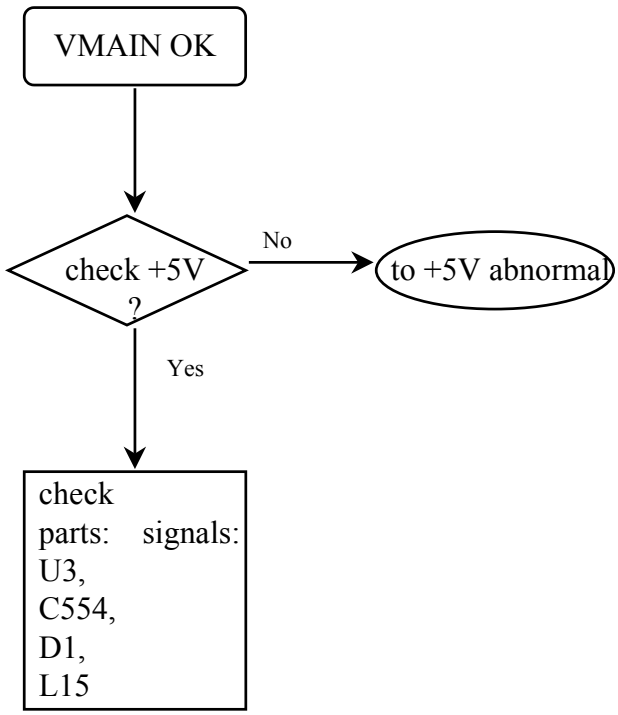


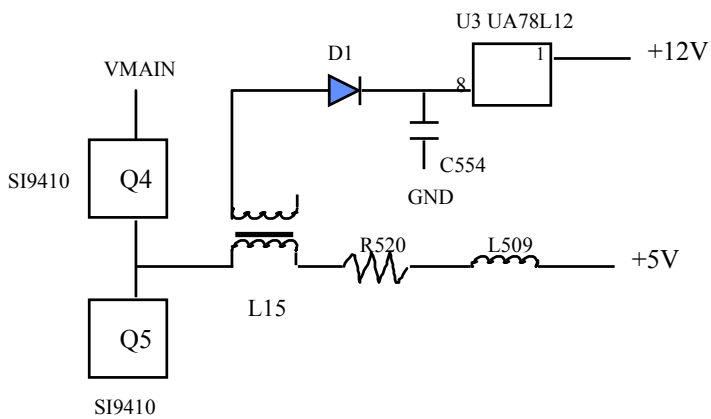
+5V Abnormal


VMAIN OK
check
parts:
L509,
R520,
L15,
Q4,Q5,
U506,
SW1,
signals:
SHUTDOWN,
P ON,

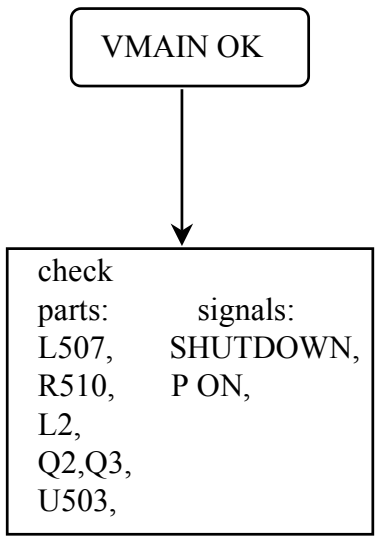

VMAIN
SI9410
SW1
Q11
SHUTDOWN
Q4
MAX796
6
16
VDD
Q21
P ON
10
15
R520
L509
+5V
5
Q23
13
U28
U506
L15
Q5
6
Q18
SHUTDOWN
TO U506 Pin 6
SI9410

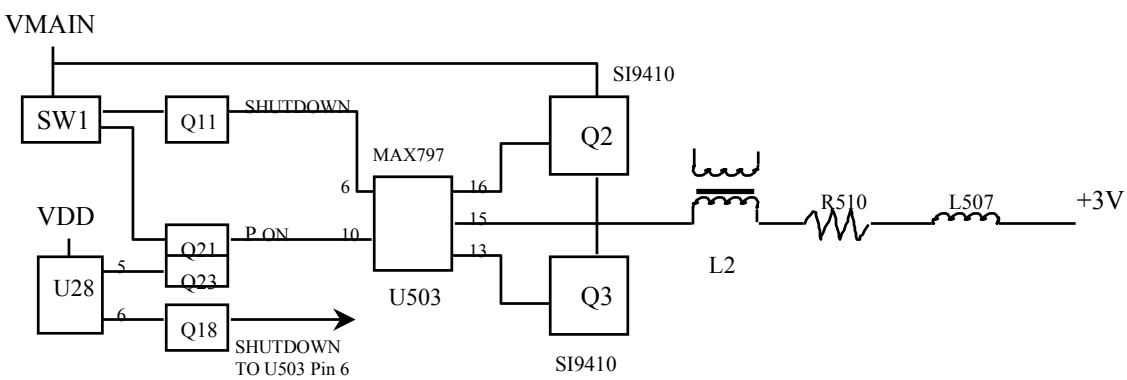
+12V Abnormal



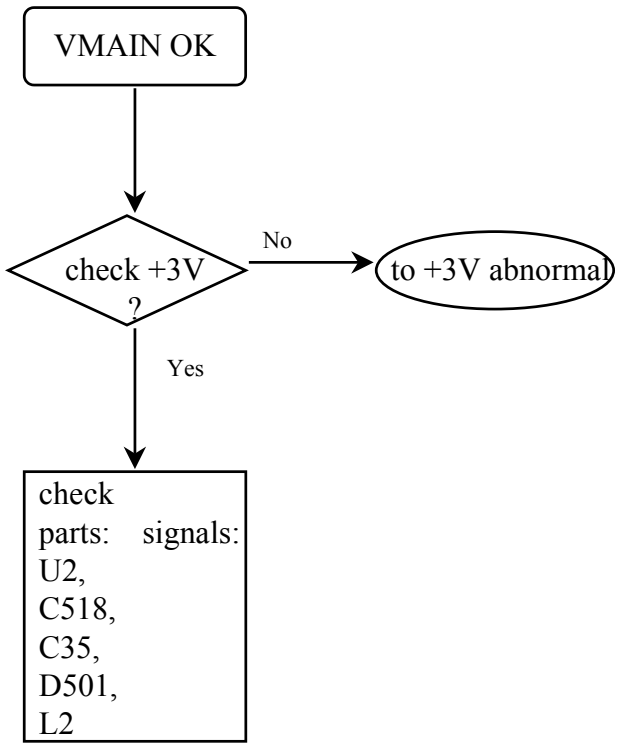


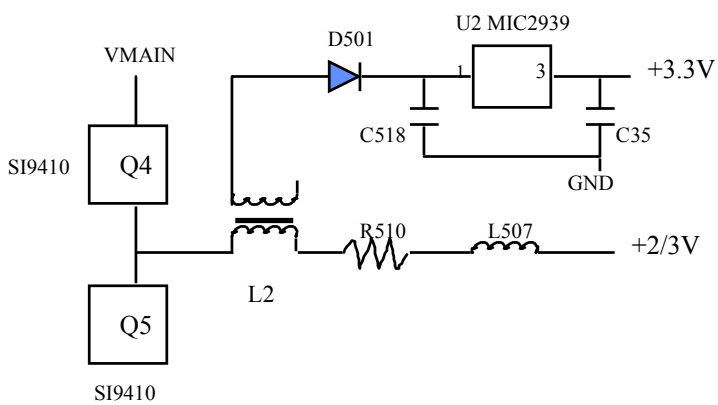
+3V Abnormal


VMAIN OK
check
parts:
L507,
R510,
L2,
Q2,Q3,
U503,
signals:
SHUTDOWN,
P ON,

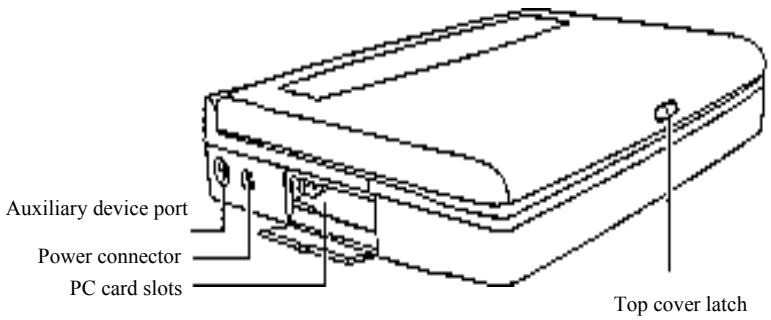

VMAIN
SI9410
SW1
Q11
SHUTDOWN
Q2
MAX797
6
16
VDD
P ON
10
15
R510
L507
+3V
Q21
13
5
U28
Q23
U503
Q3
L2
6
Q18
SHUTDOWN
TO U503 Pin 6
SI9410

+3.3V Abnormal

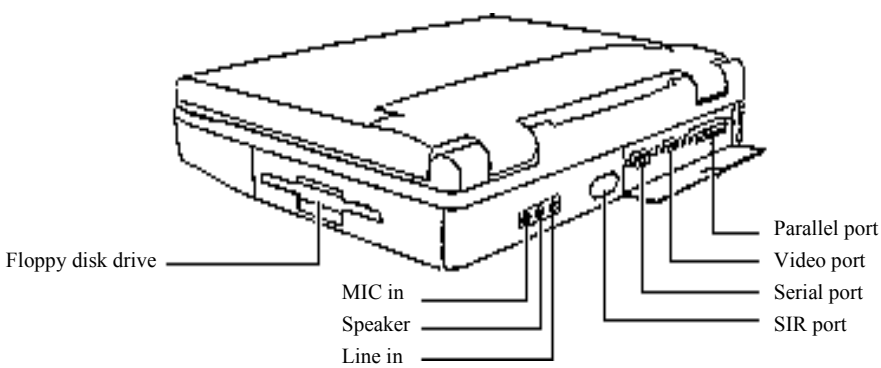




System View and Disassembly



Notebook Front and Left-Side Views



Notebook Read and Right-Side Views

Keyboard

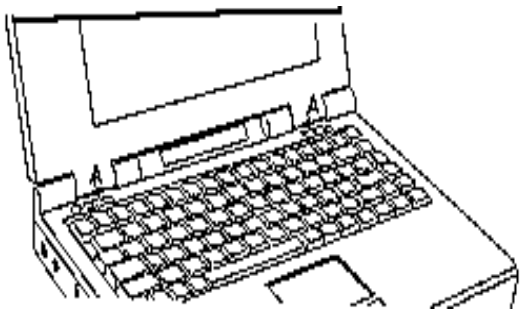


Figure A

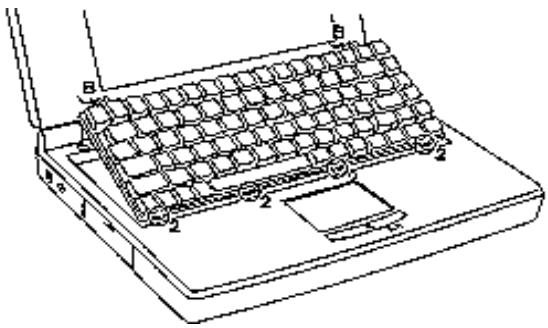


Figure B

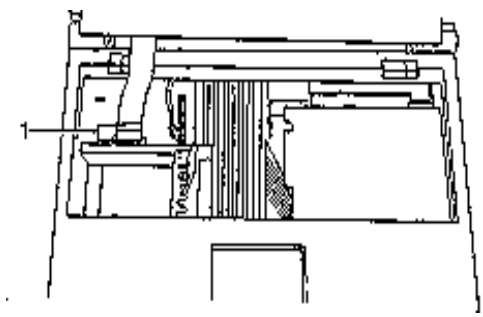


Figure C

Disassembly

1. Open the top cover(LCD cover)
2. Slide the two keyboard latches inward (Arrow "A").
3. Pry up the metal tabs(Arrow "B")and lift the keyboard.
4. Unplug the keyboard cable.

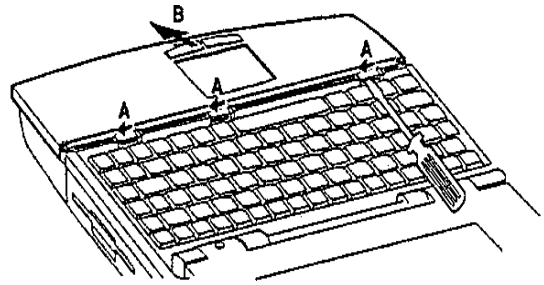
Reassembly

1. Reconnect the keyboard cable (Figure C #1).
2. Insert the four lower hooks(Figure B #2) to the chassis at an angle and then laydown the keyboard.
3. Slide the two keyboard latches outward to lock the keyboard in position.

Hard Disk Drive

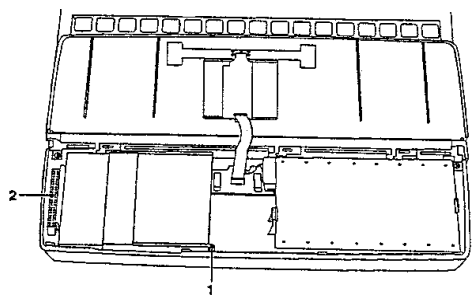
Disassembly

1. Open the top cover(LCD cover).
2. Using a pointed tool,slide the three safety catches toward the right of the notebook,if you are facing the front of the notebook. Then slide the cover plate downward until it is free and carefully put the plate aside without pulling the cable between the trackpad and system board.
3. Remove the screw securig the hard disk to the chassis.
4. Unplug the hard disk cable and lift the hard disk drive free.



Reassembly

1. Fit the hard disk back into place and connect the hard disk cable.
2. Secure the hard disk to the chassis with one screw.
3. To replace the cover plate,first insert the front hooks to the chassis at an angle and then lay down the lower end,making sure the lower hooks fit into place. Finally slide the three safety catches back to the locked poaition.



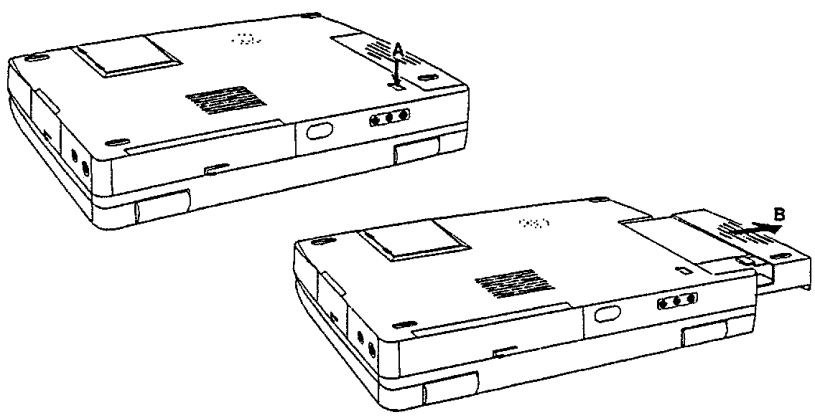
Floppy Disk Drive

Disassembly

1. The floppy disk drive comes in an easy-to-replace package. To remove the package,simply push in the safety catch and slide it out of its compartment.

Reassembly

1. Slide the floppy disk drive package into the compartment until the safety catch clicks into place.



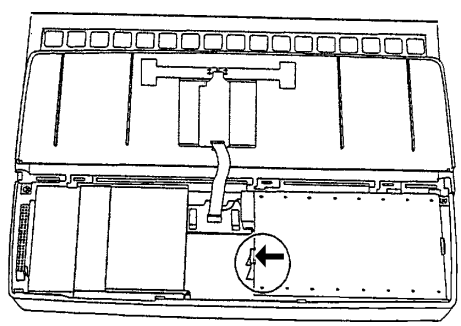
Battery Pack

Disassembly

1. Open the top cover(LCD)
2. Remove the lower cover plate.
3. Release the battery pack by prying the retaining clip and lift the battery pack out of its compartment.

Reassembly

1. Align the battery pack with its compartment and fit it into place.
   Make sure the retaining clips secure the battery pack.
2. Replace the lower cover plate.



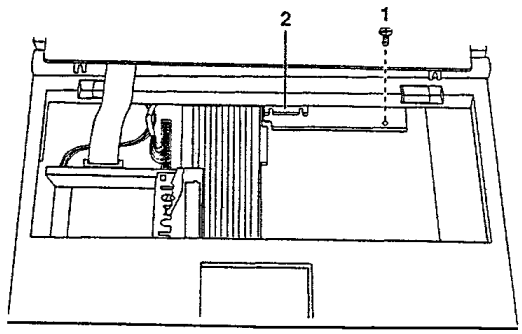
Audio Board

Disassembly

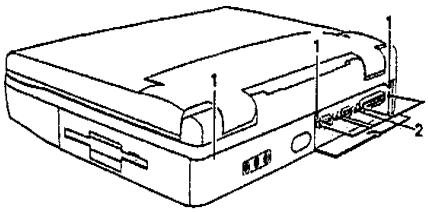
1. Temporarily remove the floppy disk drive/CD-ROM drive/secondary battery pack package.
2. Open the top cover(LCD cover).
3. Lift up the keyboard without unplugging the keyboard cable.
4. Remove the screw securing the audio board to the chassis.
5. Unplug the connector from the system board.

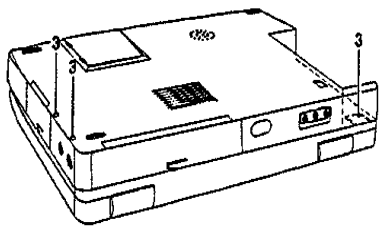
Reassembly

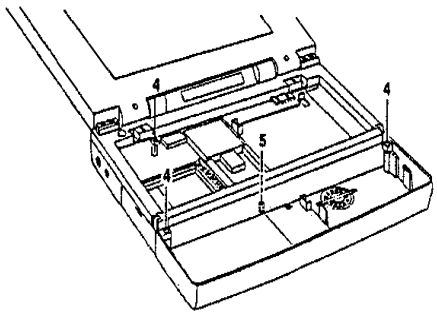
1. Align and plug the connector to the system board and secure with one screw.
2. Replace the keyboard.
3. Replace the floppy disk drive/CD-ROM drive/secondary battery pack package.

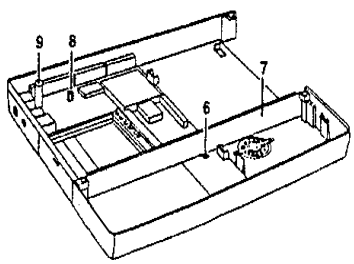


System Board









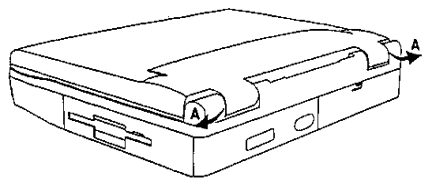
Disassembly

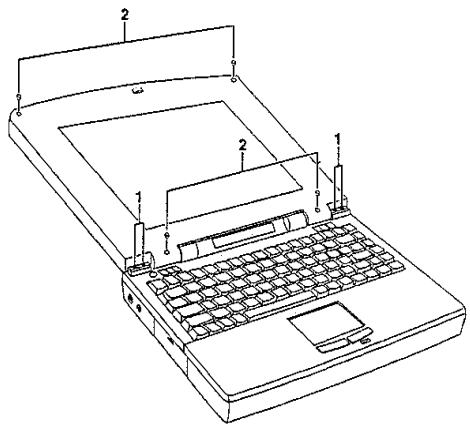
1. Remove the floppy /CD-ROM drive/secondary battery pack package.
2. Remove the keyboard.
3. Remove the lower cover plate.Unplug the trackpad cable.
4. Remove the hard disk drive and battery pack.
5. Remove the heat sink
6. Unplug all the connectors from the system board.
7. Remove three screws and six hexnut screws from the rear panel.
8. Remove three screws and one standoff securing the top cover to the chassis.
9. Separate the top cover from the chassis.
10. Remove the audio board.
11. Remove the screw securing the bracket to the system board and remove the bracket.
12. Remove one standoff and the power button cap.
13. Lift the system board free.

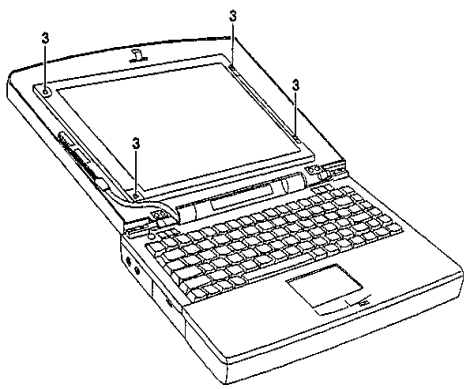
Reassembly

1. Align and fit the system board back into place.
2. Replace the power button cap and one standoff.
3. Replace the bracket and the screw.
4. Replace the audio board .
5. Aling the top cover with the chassis and replace the the three screws and one standoff.
6. Replace the three botton screws.
7. Replace the three rear panel screws and six hexnut
. screws.
8. Reconnect all the connectors to the system board.
9. replace the heat sink.
10. Replace the battery pack and hard disk drive.
11. Reconnect the trackpad cable.Replace the lower cover plate.
12. Replace the keyboard.
13. Replace the floppy disk drive/CD-ROM drive/ secondary pack package.

LCD







Disassembly

1. Remove the hinge covers by inserting a flat screwdriver to force them out.
2. Open the LCD/cover.
3. Remove the four screws under the hinge covers.
4. Remove the four cushions and the four screws inside.
5. Separate the LCD panel from the LCD houing.
6. Unplug all connectors from the LCD.
7. Remove the four screws securing the LCD to the LCD housing and lift the LCD free.

Reassembly

1. Align the LCD with the LCD housing and secure with four screws.
2. Reconnect all the connectors.
3. Align and fix the LCD panel back into the LCD housing.
4. Replace the eight screws and four cushions.
5. Close the LCD/cover.
6. Replace the two hinge covers.

DIMM

1. Carefully place the notebook with its bottom facing up.
2. To remove the access cover, press its latch and lift the cover
3. To install the DIMM, align the DIMM's notched end with the socket's corresponding end and firmly insert the DIMM into the socket at an angle(Arrow A).Then push down (Arrow B) until the retaining clips lock the DIMM into position.

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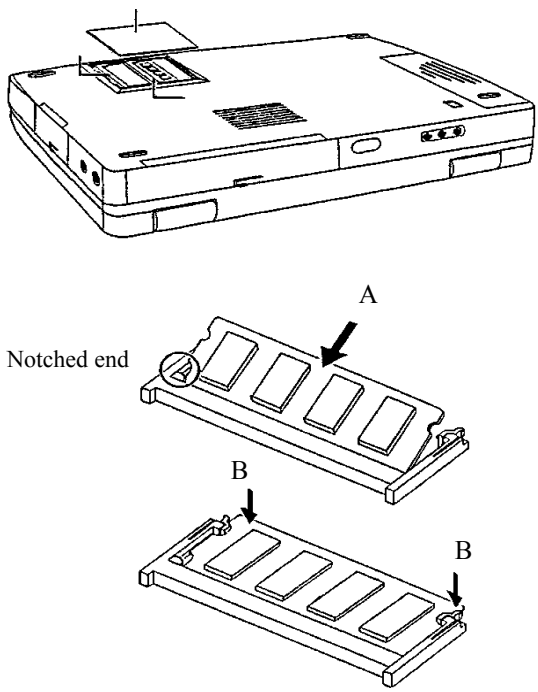

CPU

1. Open the top cover(LCD cover)
2. Lift up the keyboard without unplugging the keyboard cable.
3. Remove the heat sink by removing one screw.
4. Remove the CPU by pulling it straight up.
5. Aligning the beveled corner, install the new CPU by ibserting its pins into the corresponding holes on the socket

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