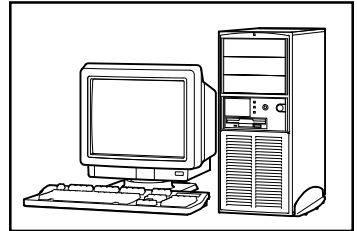


# DECpc 400 MT/MTE Series Service Guide

## System Description 1 of 2

EK-PCT60-SA.A02



### DECpc 400 MT

#### System Board

CPU	Intel 80486
Clock Speed	33 MHz DX, 50 MHz DX2, 66 MHz DX2
ROM BIOS	128 KB

#### Expansion

Slots	6 Standard ISA
CPU	Upgrade via vacancy sockets on daughter card

#### Memory

Up to 64 MB using 4 MB, 16 MB 36-bit SIMMs

### DECpc 400 MTE

#### System Board

CPU	Intel 80486
Clock Speed	33 MHz DX, 66 MHz DX2
ROM BIOS	128 KB FLASH

#### Expansion

Slots	5 Standard EISA 1 EISA or VL-Bus (VESA compliant) 1 Dedicated local bus video
CPU	Upgrade via ZIF socket on main logic board

#### Memory

Up to 128 MB using 4 MB, 16 MB, 64 MB  
36-bit SIMMs

### Power Supply

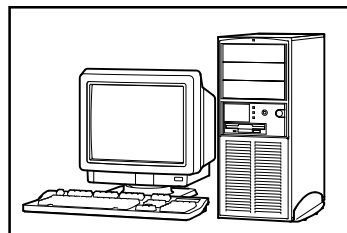
Rated Voltage Range*	Maximum Range	Maximum Input Current	Frequency Range
100 Vac - 120 Vac 220 Vac - 240 Vac	88 Vac - 132 Vac 176 Vac - 264 Vac	8A 4A	47 Hz - 63 Hz 47 Hz - 63 Hz

\* auto-sensing

# DECpc 400 MT/MTE Series Service Guide

## System Description 2 of 2

EK-PCT60-SA.A02



### DECpc 400 MT SIMM Configuration

Bank 0	Bank 1	Bank 2	Bank 3	Total
4 MB				4 MB
4 MB	4 MB			8 MB
4 MB	4 MB	4 MB		12 MB
4 MB	4 MB	4 MB	4 MB	16 MB
4 MB	16 MB			20 MB
4 MB	4 MB	16 MB		24 MB
4 MB	4 MB	16 MB	16 MB	40 MB
16 MB				16 MB
16 MB	16 MB			32 MB
16 MB	16 MB	16 MB		48 MB
16 MB	16 MB	16 MB	16 MB	64 MB

### DECpc 400 MTE SIMM Configuration

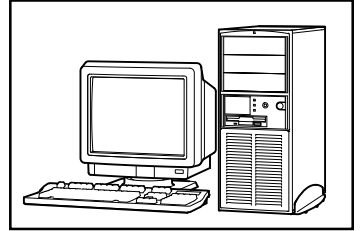
Bank 0	Bank 1	Bank 2	Bank 3	Total
4 MB	4 MB			8 MB
4 MB	4 MB	4 MB		12 MB
4 MB	4 MB	4 MB	4 MB	16 MB
4 MB	16 MB			20 MB
4 MB	4 MB	16 MB		24 MB
4 MB	16 MB	16 MB		36 MB
4 MB	4 MB	16 MB	16 MB	40 MB
16 MB				16 MB
16 MB	16 MB			32 MB
16 MB	16 MB	16 MB		48 MB
16 MB	16 MB	16 MB	16 MB	64 MB
64 MB				64 MB
64 MB	64 MB			128 MB

**Note:** For optimal performance use suggested configurations. When combining SIMMs of different sizes, be sure lower sizes are in lower banks. Failure to follow these guidelines can result in performance degradation.

# DECpc 400 MT/MTE Series Service Guide

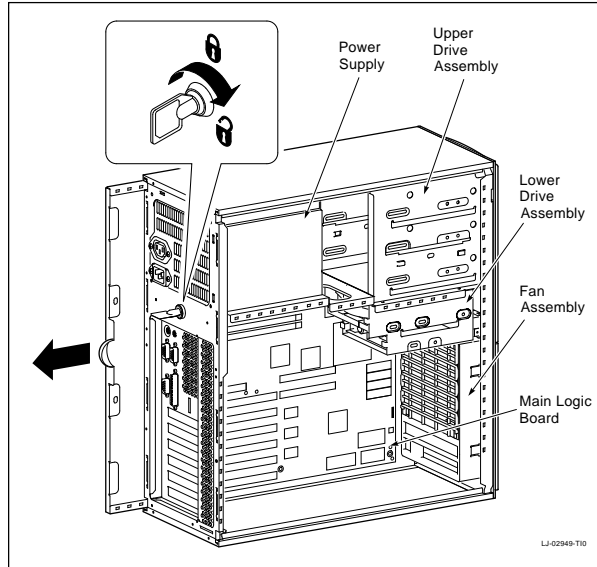
## FRU Removals 1 of 5

EK-PCT60-SA.A02



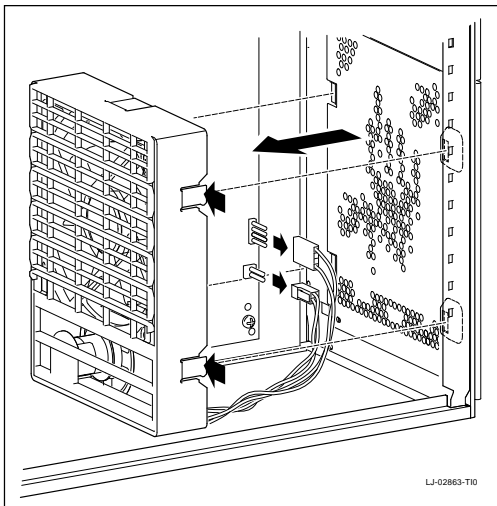
### Removing the Side Panels

- 1 Remove from pedestal
- 2 Turn chassis key clockwise
- 3 Slide side panels to rear



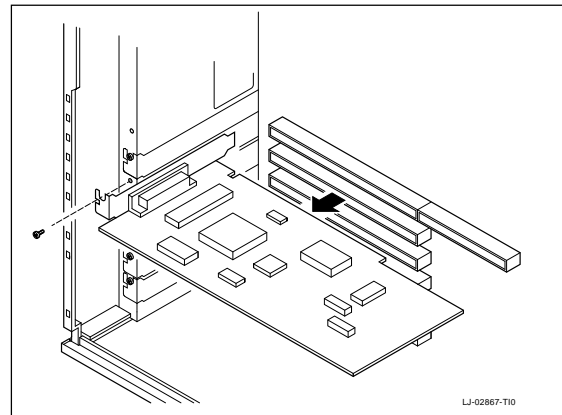
### Removing Fan/Speaker Assembly

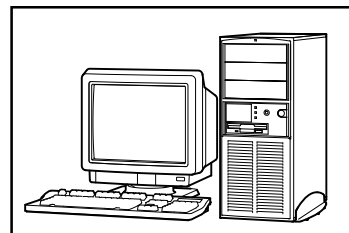
- 1 Remove fan and speaker connections
- 2 Depress tabs
- 3 Pull forward



### Removing Expansion Boards

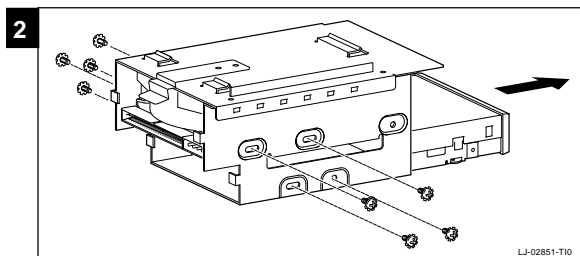
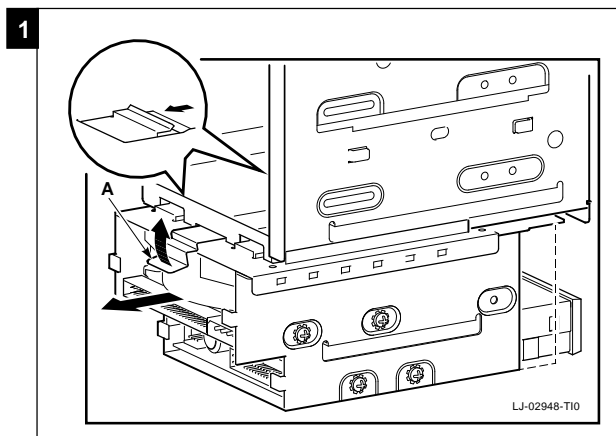
- 1 Remove screw
- 2 Gently pull board forward





### Removing Lower Disk Drives

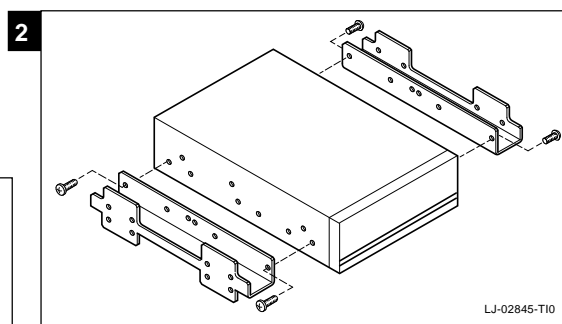
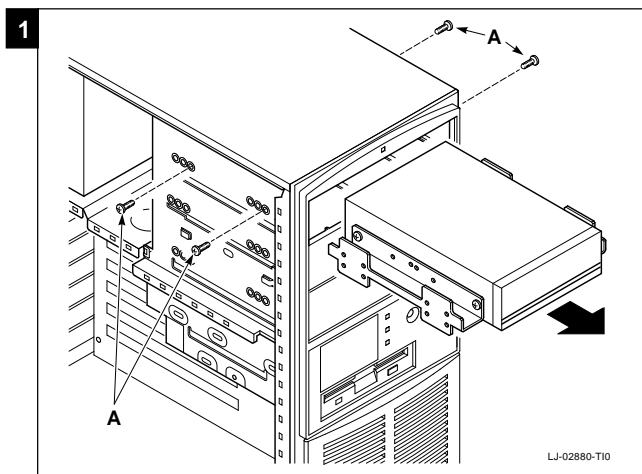
- 1 Remove cables and connections
- 2 Push up retaining clip **1** A
- 3 Slide drive chassis out the back



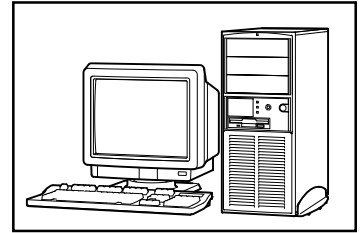
- 4 Remove screws from chassis
- 5 Slide drive out

### Removing Upper Disk Drives

- 1 Remove both side panels
- 2 Remove screws from both sides **1** A
- 3 Slide drive out front

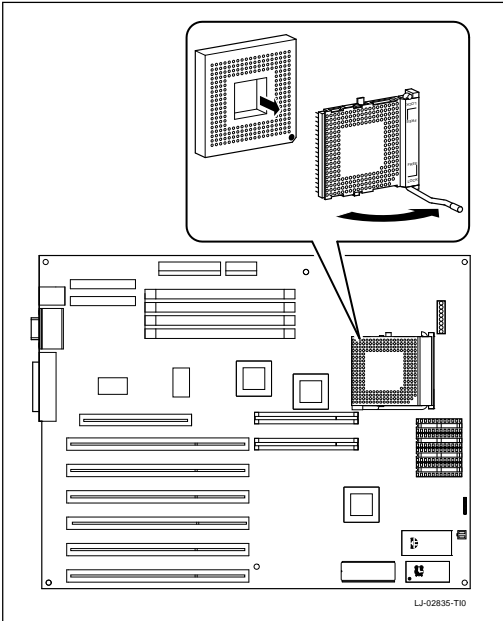


- 4 Remove side brackets



### CPU Chip Removal (DECpc 400 MTE only)

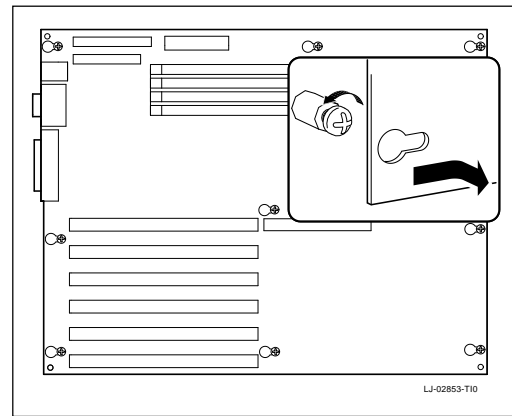
- 1 Move lever towards the right
- 2 Remove chip



**Note:** When re-installing, align pin one (identified by notch and dot) for correct orientation.

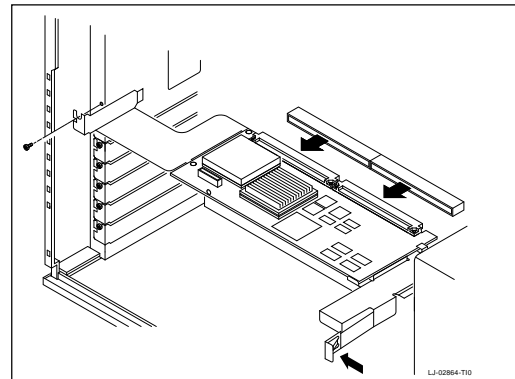
### Main Logic Board Removal

- 1 Remove all connectors
- 2 Remove all expansion boards
- 3 Remove fan assembly
- 4 Remove lower drives
- 5 Loosen screws and slide off standoffs



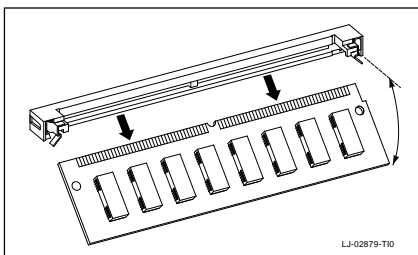
### CPU Module Removal (DECpc 400 MT only)

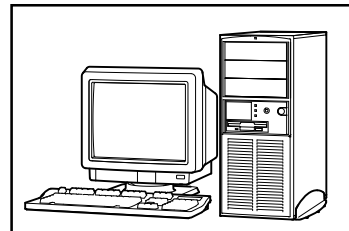
- 1 Remove screw
- 2 Unclip from fan assembly
- 3 Gently lift up on module and pull forward



### SIMM Removal

- 1 Press retaining clips out
- 2 Push SIMM down and pull out

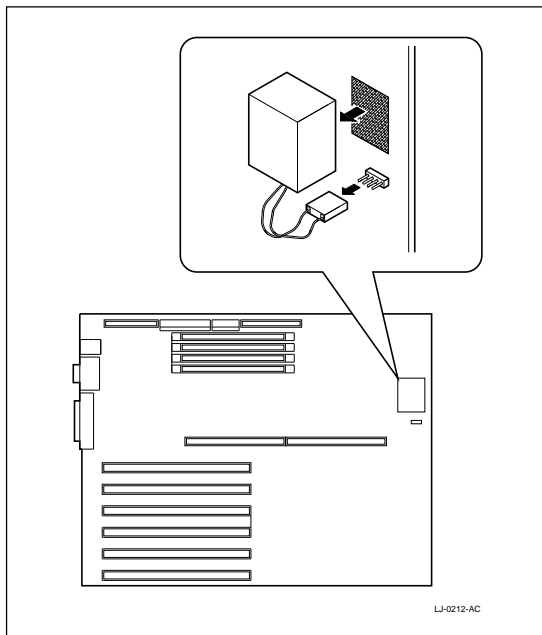




### Battery Removal

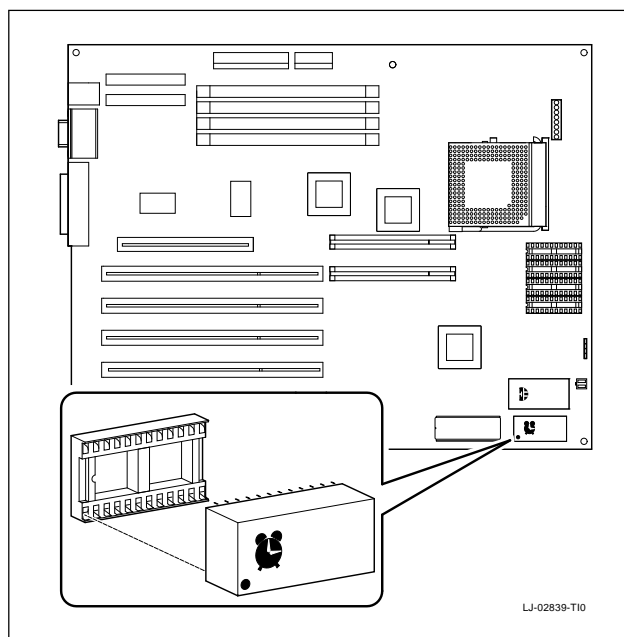
#### Battery (DECpc 400 MT only)

- 1 Remove CPU module
- 2 Remove battery connector
- 3 Gently twist battery from Velcro strip

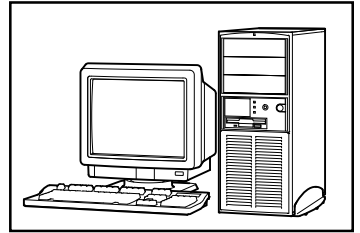


#### System Battery/Real Time Clock (DECpc 400 MTE only)

- 1 Pry battery/real time clock from main logic board



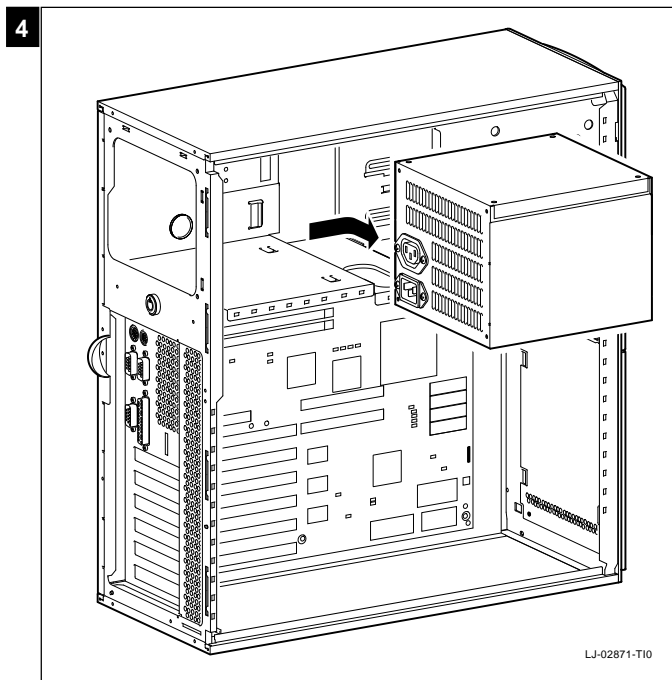
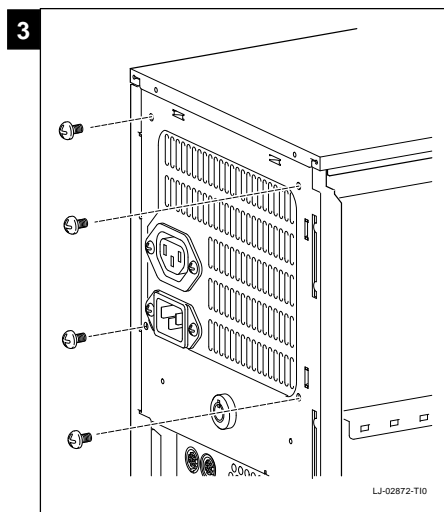
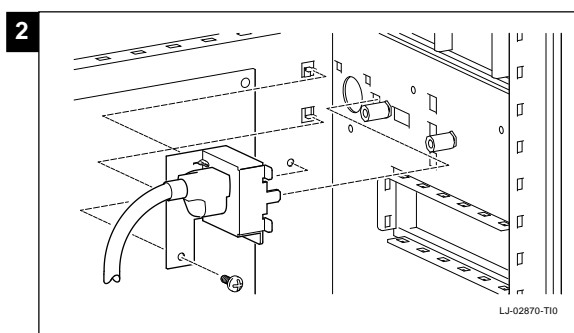
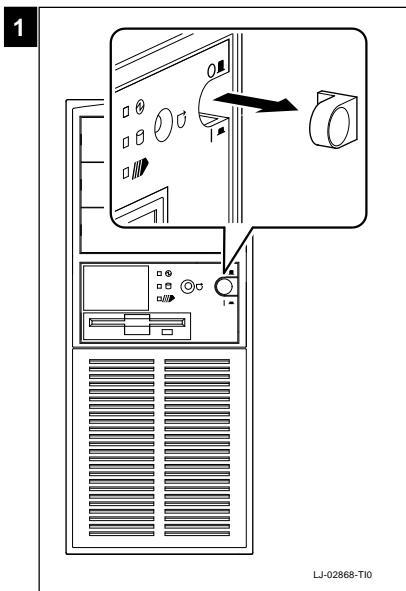
**Note:** Use proper removal tool.



### Power Supply Removal

- 1 Remove CPU or video module
- 2 Remove connections
- 3 Remove lower and upper drives
- 4 Remove on/off switch **1**

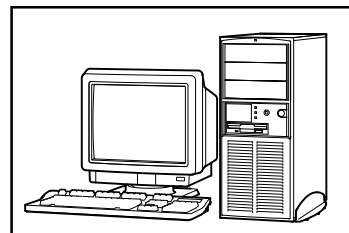
- 5 Remove screw from power plug **2**
- 6 Pull out power plug
- 7 Remove four screws from the rear **3**
- 8 Slide power supply forward and out **4**



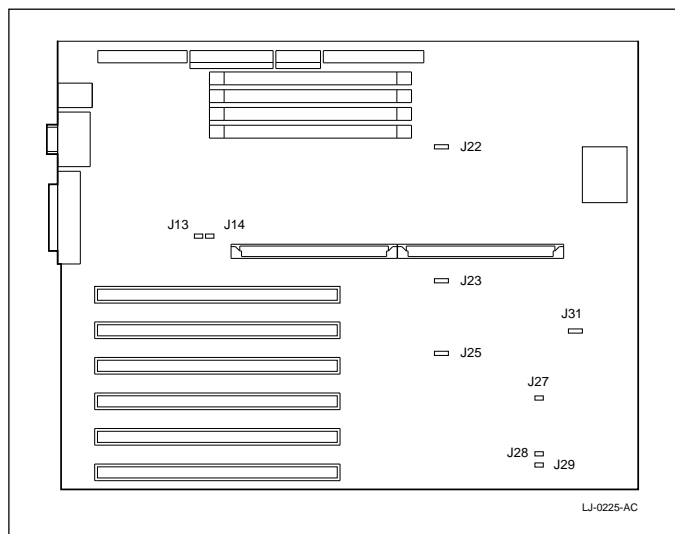
# DECpc 400 MT/MTE Series Service Guide

## Switches/Jumpers 1 of 4

EK-PCT60-SA.A02



### MT Main Logic Board



### Main Logic Board Jumper Settings

Feature	Description	Settings
On-board VGA	Disable IRQ9 Enable IRQ9	J13, pin 1 and 2 open (1) J13, pin 1 and 2 jumpered
On-board VGA	Enable Disable	J14, pin 1 and 2 jumpered (1) J14, pin 1 and 2 open
CMOS Memory	Normal operation Clear CMOS memory	J31, pin 1 and 2 jumpered (1) J31, pin 2 and 3 jumpered
Enable/Disable RESET switch	Enable RESET switch Disable RESET switch	J27, pin 1 and 2 jumpered (1) J27, pin 2 and 3 jumpered
Parallel port	Printer Bidirectional	J25, pin 1 and 2 jumpered (1) J25, pin 2 and 3 jumpered
Video display type	Color monitor Monochrome monitor	J29, pin 1 and 2 jumpered J29, pin 1 and 2 open
VRAM	512 KB VRAM 1 MB VRAM	J22, pin 1 and 2 jumpered (1) J22, pin 2 and 3 jumpered
Reserved	Factory use only	J28
VGA I/O	Local Local and ISA	J23, pin 1 and 2 jumpered (1) J23, pin 2 and 3 jumpered

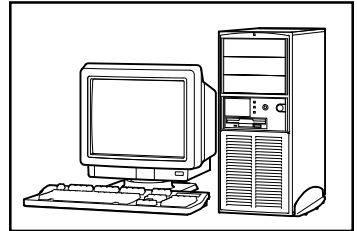
(1)--- Factory-default setting



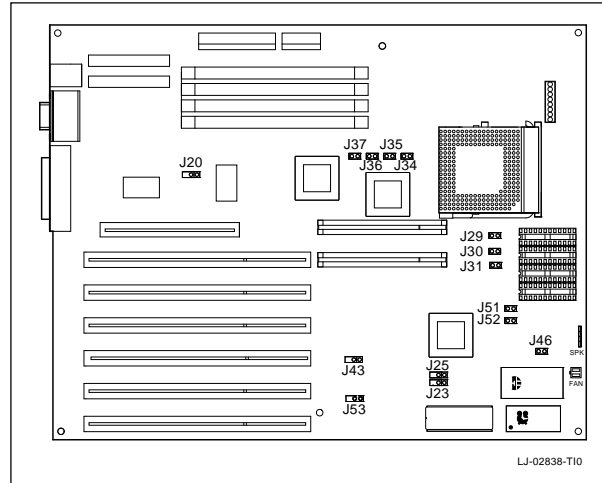
# DECpc 400 MT/MTE Series Service Guide

## Switches/Jumpers 2 of 4

EK-PCT60-SA.A02



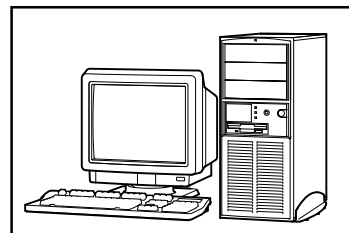
### MTE Main Logic Board



### Main Logic Board Jumper Settings

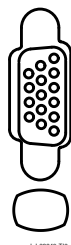
Feature	Description	Settings
Flash BIOS Upgrade	Enable Disable	J43, jumpered (1) J43, open
CPU Select	P24T 486 DX or DX2	J52, pin 1 and 2 jumpered J52, pin 2 and 3 jumpered
RESET switch	Enable Disable	J46, jumpered (1) J46, open
Parallel port type	Printer Bi-directional	J20, pin 1 and 2 jumpered (1) J20, pin 2 and 3 jumpered
Factory Test/ Remove password	Normal Operation Factory test/clear password	J23, open/parked (1) J23, jumpered
Display type	Color Mono	J25, jumpered J25, open (1)
CPU Clock input	50 MHz 40 MHz 33 MHz 25 MHz	J34, 35, 36, 37 open J36 on, 34, 35, 37 off J35 off, 34, 36, 37 on J36 off, 34, 35, 37 on
Cache size select	128 KB 256 KB	J29, J30, J31, pin 1 and 2 jumpered (1) J29, J30, J31, pin 2 and 3 jumpered
VL-Bus Write Wait State	Zero Wait Write One Wait Write	J51, pin 1 and 2 jumpered (1) J51, pin 2 and 3 jumpered
BIOS Recovery	Normal Operation Recovery mode	J53, open (1) J53, jumpered

(1)--- Factory-default setting



### Analog Video Connector

The analog video connector consists of industry-standard, 15-pin, D-type video connector.



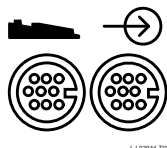
LJ-0296-T10

### Analog Video Connector

Pin	Signal
1	Red video
2	Green video
3	Blue video
4	No connection
5	Digital ground
6	Red return (ground)
7	Green return (ground)
8	Blue return (ground)
9	Composite sync
10	Digital ground
11	No connection
12	No connection
13	Horizontal sync
14	Vertical sync
15	No connection

### Keyboard and Mouse Connectors

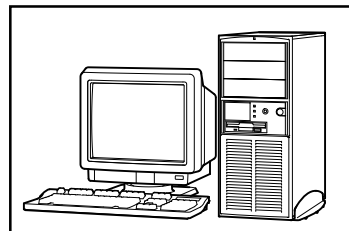
The keyboard and mouse connectors consist of two 6-pin, mini-DIN connectors.



LJ-0294-T10

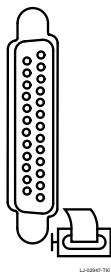
### Keyboard and Mouse Connector Pins

Pin	Signal
1	Data
2	Reserved
3	Ground
4	+5 Vdc (fused)
5	Clock
6	No connection



### Parallel Printer Connector

The parallel printer connector provides an interface to a printer or other parallel devices. An asterisk (\*) after a signal name indicates an active low signal. For example, STB-R\*.

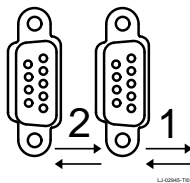


### Parallel Printer Pinout

DB25 Pin	Signal	Function
1	STB-R*	Strobe
2	PRTD0	Printer data bit 0
3	PRTD1	Printer data bit 1
4	PRTD2	Printer data bit 2
5	PRTD3	Printer data bit 3
6	PRTD4	Printer data bit 4
7	PRTD5	Printer data bit 5
8	PRTD6	Printer data bit 6
9	PRTD7	Printer data bit 7
10	ACK*	Acknowledge
11	BUSY	Busy
12	PE	Paper end
13	SLCT	Select
14	AUTOFDXT*	Autofeed
15	ERR*	Error
16	INIT*	Initialize printer
17	SLCTIN*	Select
18 to 25	GND	Ground

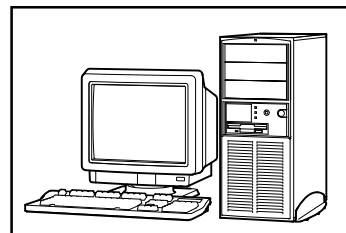
### Serial Port Connectors

The serial port connectors consist of two 9-pin D-submini connectors. The two connectors are not interchangeable. The baud rates supported by the computer's serial ports are 300, 1200, 2400, 4800, 9600, 19 200, 38 400.



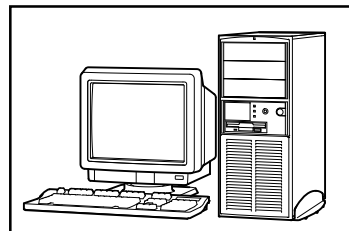
### 9-Pin Serial Port Pinouts

DB9 Pin	Signal	Function
1	DCD	Data carrier detect
2	RXD	Receive data
3	TXD	Transmit data
4	DTR	Data terminal ready
5	GND	Ground
6	DSR	Data set ready
7	RTS	Request to send
8	CTS	Clear to send
9	RI	Ring indicator



### POST Error Messages

POST Code	Error Number	Message	Solution
240 200 190	0007 0001 0009	No timer tick Shutdown failure Timer 2 failure	
180	0010	Keyboard	<ul style="list-style-type: none"><li>• Check connections</li><li>• Check controller</li><li>• Replace keyboard</li></ul>
170	0041	Mouse failure	<ul style="list-style-type: none"><li>• Check for IRQ conflict</li><li>• Replace mouse</li></ul>
150 050	0017 0019	Time-of-day clock	<ul style="list-style-type: none"><li>• Run setup</li><li>• Replace clock</li></ul>
100	0018	Invalid configuration	<ul style="list-style-type: none"><li>• Run setup</li></ul>
090	0011	Diskette drive failure	<ul style="list-style-type: none"><li>• Run setup</li><li>• Check connections</li><li>• Replace drive</li></ul>
080	0015	Hard disk failure	<ul style="list-style-type: none"><li>• Run setup</li><li>• Check connections</li><li>• Replace drive</li></ul>
060	0021	xxxxoh Optional ROM Bad Checksum = xx	<ul style="list-style-type: none"><li>• Correct address conflict</li><li>• Replace ROM chip</li></ul>
010		Enable cache	



### Beep Codes

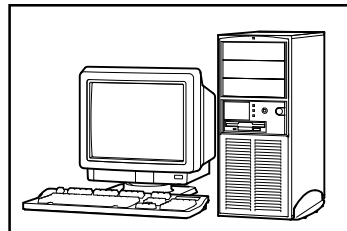
#### Beep Codes for Fatal Errors

Beep Code	Error Message	Port 80H
1-1-3	CMOS Write/Read test or failure	02h
1-1-4	ROM Checksum test or failure	03h
1-2-1	Interval Timer test or failure	04h
1-2-2	DMS Initialization or failure	05h
1-2-3	DMA Page Register Write/Read test or failure	06h
1-3-1	RAM Refresh verification or failure	08h
1-3-3	1st 64 KB RAM Chip or data line failure	0Ah
1-3-4	1st 64 KB RAM Odd/even logic failure	0Bh
1-4-1	1st 64 KB RAM Address line failure	0Ch
1-4-2	1st 64 KB RAM Parity test or failure	0Dh
2-1-1	Bit 0 1st 64 KB RAM failure	10h
2-1-2	Bit 1 1st 64 KB RAM failure	11h
2-1-3	Bit 2 1st 64 KB RAM failure	12h
2-1-4	Bit 3 1st 64 KB RAM failure	13h
2-2-1	Bit 4 1st 64KB RAM failure	14h
2-2-2	Bit 5 1st 64 KB RAM failure	15h
2-2-3	Bit 6 1st 64 KB RAM failure	16h
2-2-4	Bit 7 1st 64 KB RAM failure	17h
2-3-1	Bit 8 1st 64 KB RAM failure	18h
2-3-2	Bit 9 1st 64 KB RAM failure	19h
2-3-3	Bit A 1st 64 KB RAM failure	1Ah
2-3-4	Bit B 1st 64 KB RAM failure	1Bh
2-4-1	Bit C 1st 64 KB RAM failure	1Ch
2-4-2	Bit D 1st 64 KB RAM failure	1Dh
2-4-3	Bit E 1st 64 KB RAM failure	1Eh
2-4-4	Bit F 1st 64 KB RAM failure	1Fh

Beep Code	Error Message	Port 80H
3-1-1	Slave DMA register test or failure	20h
3-1-2	Master DMA register test or failure	21h
3-1-3	Master interrupt mask register test or failure	22h
3-1-4	Slave interrupt mask register test or failure	23h
3-2-4	Keyboard/mouse controller test or failure	27h
4-2-1	Timer tick interrupt test or failure	34h
4-2-2	Shutdown test or failure	35h
4-2-3	Gate A20 failure	36h
4-2-4	Unexpected interrupt in protected mode	37h
4-3-1	RAM test or failure (above 0FFFFh)	38h
4-3-3	Interval timer 2 test or failure	3Ah
4-3-4	Time of day clock test or failure	3Bh
4-4-1	Serial port test or failure	3Ch
4-4-2	Parallel port test or failure	3Dh
4-4-3	Math coprocessor test or failure	3Fh

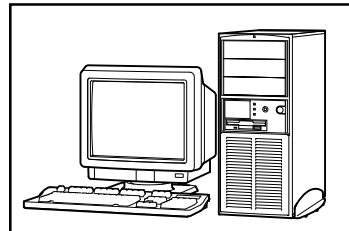
#### Beep Codes for Nonfatal Errors

Beep Code	Error Message	Port 80H
3-3-4	Screen memory test or failure	2Bh
3-4-1	Screen initialization or failure	2Ch
3-4-2	Screen retrace test or failure	2Dh



### MT/MTE I/O Address Map

Range (hexadecimal)	Function
000-00F	DMA Controller one
020-021	Interrupt controller one
040-043	Interval timer
060-06F	Keyboard controller
070-07F	Real-time clock (RTC), NMI
080-08F	DMA Page register
0A0-0A1	Interrupt controller 2
0C0-0CF	DMA Controller 2
0F0	Clear math coprocessor busy
0F1	Reset math coprocessor
0F8-0FF	Math coprocessor
1F0-1F7	IDE Controller
2F8-2FF	COM2
378-37F	LPT
3B0-3DF	VGA Registers
3F0-3F7	Diskette controller
3F6-3F7	IDE Controller (alt status, device address)
3F8-3FF	COM1
46E8	VGA Enable register

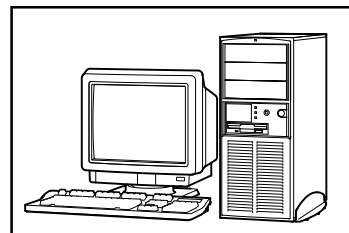


### Address Map (MT only)

Range (hexadecimal)	Function
42E8	VGA Enhanced mode register
4AE8	
82E8	
86E8	
8AE8	
8EE8	
92E8	
96E8	
9AE8	
9EE8	
A2E8	
A6E8	
AAE8	
AEE8	
B6E8	
BAE8	
BEE8	
E2E8	
022	Index register (82C206, 82C496, 82C497)
023	Data register (82C206)
024	Data register (82C496, 82C497)

### Address Map (MTE only)

Range (hexadecimal)	Function
C00	EISA Configuration PAGE register
800-8FF	EISA Configuration DATA register
C18	Index register (Sis 85c411V)
C1C	Data register (Sis 85c411V)
C80-C83	System board ID
CA0	Index register (Sis 85c406)
CA1	Data register (Sis 85c406)



### Memory Map MT

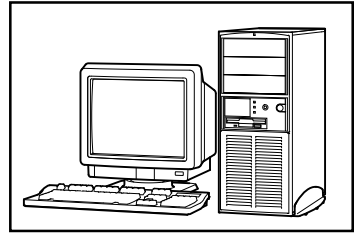
Address Range	Function	Size
0h to 9FFFFh	Base memory	640 KB
A0000h to BFFFFh	Video RAM	128 KB
C0000h to C7FFFh	VGA BIOS	32 KB
C8000h to DFFFFh	BIOS Extension ROM (AT bus usage)	96 KB
E0000h to EFFFFh	Reserved	64 KB
F0000h to FFFFFh	Computer BIOS	64 KB
100000h to 3FFFFFFh	Extended memory	63 MB

### Memory Map MTE

Address Range	Function	Size
0h to 9FFFFh	Base memory	640 KB
A0000h to BFFFFh	Display buffer	128 KB
C0000h to C7FFFh	VGA BIOS	32 KB
C8000h to DFFFFh	BIOS Extension ROM (AT bus usage)	96 KB
E0000h to EFFFFh	Reserved	64 KB
F0000h to FFFFFh	Computer BIOS	64 KB
100000h to 7FFFFFFh	Extended memory	127 MB

**Note:** After the system completes POST, the E0000h address range is available for EMS page frame.





### QAPLus Advanced Diagnostics

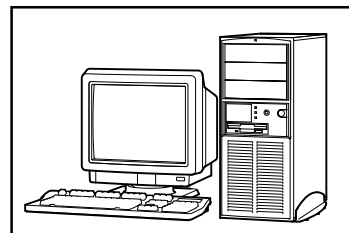
#### To:

- Receive System Information select the SysInfo menu on the Main Menu.
- Locate bad chips and run mouse and keyboard tests select Interact menu on the Main Menu.
- Edit CMOS select the Setup menu on the Menu.
- Run tests on components select Testing menu on the Main Menu.

Default testing is No Pause on Errors/Single Pass/No Peripherals/No Error Logging/Test All Components. To change default, select settings under the Testing menu *before* running tests.

### QAPLUS Error Messages

Component	Messages	Solution
CPU	"Arithmetic Function Failed" "General Functions Failed" "Exception Interrupt in Protected Mode" "Refresh Failure" "Logic Functions Failed"	<ul style="list-style-type: none"><li>• Reseat CPU</li><li>• Replace CPU</li></ul>
Hard disk	"Butterfly Cylinder Access Test Failed" "Cylinder 0 Errors" "Random Cylinder Access Test Failed" "Linear Cylinder Access Test Failed"	<ul style="list-style-type: none"><li>• Low-level format hard disk</li><li>• Replace disk</li></ul>
Hard drive/controller	"Controller Diagnostic Test Failed" "Questionable Controller Card" "Hard Drives Failed"	<ul style="list-style-type: none"><li>• Run Setup</li><li>• Check connections</li><li>• Reseat controller</li><li>• Replace controller</li><li>• Replace disk</li></ul>
Floppy diskette	"Media Mismatch" "Drive not ready" "Unformatted media" "Write protected media"	<ul style="list-style-type: none"><li>• Use known good diskette</li><li>• Check size and density of diskette</li><li>• Close drive door</li><li>• Remove write protection</li><li>• Format diskette</li></ul>



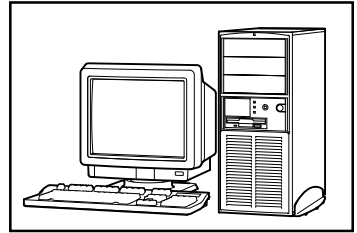
### QAPLUS Error Messages *continued*

Component	Messages	Solution
Floppy Drive	"Floppy Drives Failed"	<ul style="list-style-type: none"><li>• Check connections</li><li>• Replace drive</li></ul>
Battery/Clock	"Clock Stopped" "Invalid Date" "RTC Interrupt Failed"	<ul style="list-style-type: none"><li>• Run Setup</li><li>• Replace battery/clock</li></ul>
CMOS	"CMOS Clock Test Failed"	<ul style="list-style-type: none"><li>• Change time from Setup menu in QAPLUS</li></ul>
Serial port	"COM port failed" "Serial Chip Error" "Serial Compare Error" "Serial Timeout Error"	<ul style="list-style-type: none"><li>• Check COM device</li><li>• Check jumpers</li><li>• Check connections</li><li>• Reseat serial adapter board</li><li>• Replace COM device</li><li>• Replace adapter board</li></ul>
Video adapter board/Module	"Video Adapters Failed" "Error in Video Buffer"	<ul style="list-style-type: none"><li>• Check connections</li><li>• Reseat video board</li><li>• Replace video board</li></ul>

# DECpc 400 MT/MTE Series Service Guide

Logistics and Support 1 of 1

EK-PCT60-SA.A02



## Part Numbers

74-46491-01	Bracket, CPU card (MT only)	54-22669-01	VGA card, S3 928 chipset, 1 MB VRAM, W S/W (MTE only)
74-46492-01	Bracket, VGA card (MTE only)	00-PC7XL-AA	U.S. Keyboard
30-32969-02	3.5" 1.44 MB Floppy disk driver	22-00908-03	QAPLUS Diagnostic software
12-37977-02	Key, master	70-30797-01	Fan/Speaker assembly
54-22036-01	CPU Module, 486 DX/33 MHZ (MT only)	54-22088-01	Switch board
54-22036-01	CPU Module, 486 DX2/66 MHZ (MT only)	21-33453-02	486 DX/33 MHZ CPU chip
54-22036-02	CPU Module, 486 DX2/50 MHZ (MT only)	21-39004-02	486 DX2/66 MHZ CPU chip
17-03461-02	IDE cable assembly, 40 pin, flat (MT only)	00-ME524-DE	4 MB SIMM (1X36), tin 70 NS
17-03461-03	IDE cable assembly, 40 pin, flat (MTE only)	00-ME544-DE	16 MB SIMM (4X36), tin 70 NS
17-03460-03	Floppy cable assembly, 34 pin, flat	00-PC74M-BA	128 KB Cache Memory Upgrade; Four 20 NS SRAM DIPs
54-22080-01	DECpc 400 MT main board	00-PC74M-CA	512 KB Video Memory Upgrade; Four 80 NS VRAM ZIPs (MT S3-924 only)
PC7XS-CA	PS/2 3-Button mouse	00-PCT7M-CA	1 MB Video Memory Upgrade; Eight 60 NS DRAM DIPs (MTE S3-805 VGA card and MT S3-805 only)
54-22092-04	DECpc 400 MTE main board	00-PCT7M-CB	1 MB Video Memory Upgrade Module; 80 NS VRAM (MTE S3-928 VGA card only)
70-30805-01	Pedestal assembly	00-PCT7M-CC	3 MB Video Memory Upgrade Module; 80 NS VRAM (MTE S3-928 VGA card only)
70-30683-01	Panel assembly, side	12-38597-01	Battery pack, 4.5 volt (MT only)
00-H7889-AA	Power supply	21-39151-01	Real-Time clock W/VRAM (MTE only)
74-46472-01	Bezel, front		
54-22092-01	VGA card, S3 805 chipset, 1 MB DRAM, W S/W (MTE only)		

## Related Documentation

*DECpc 400 MT*  
User Information  
EK-PCT60-UA

*QA Plus*  
User's Guide

*DECpc 400 MTE*  
User Information  
EK-PCT70-UA

*DECpc MTE Series*  
*Vid-805 Local Bus VGA Module*  
User Guide  
EK-T7HEA-IA