



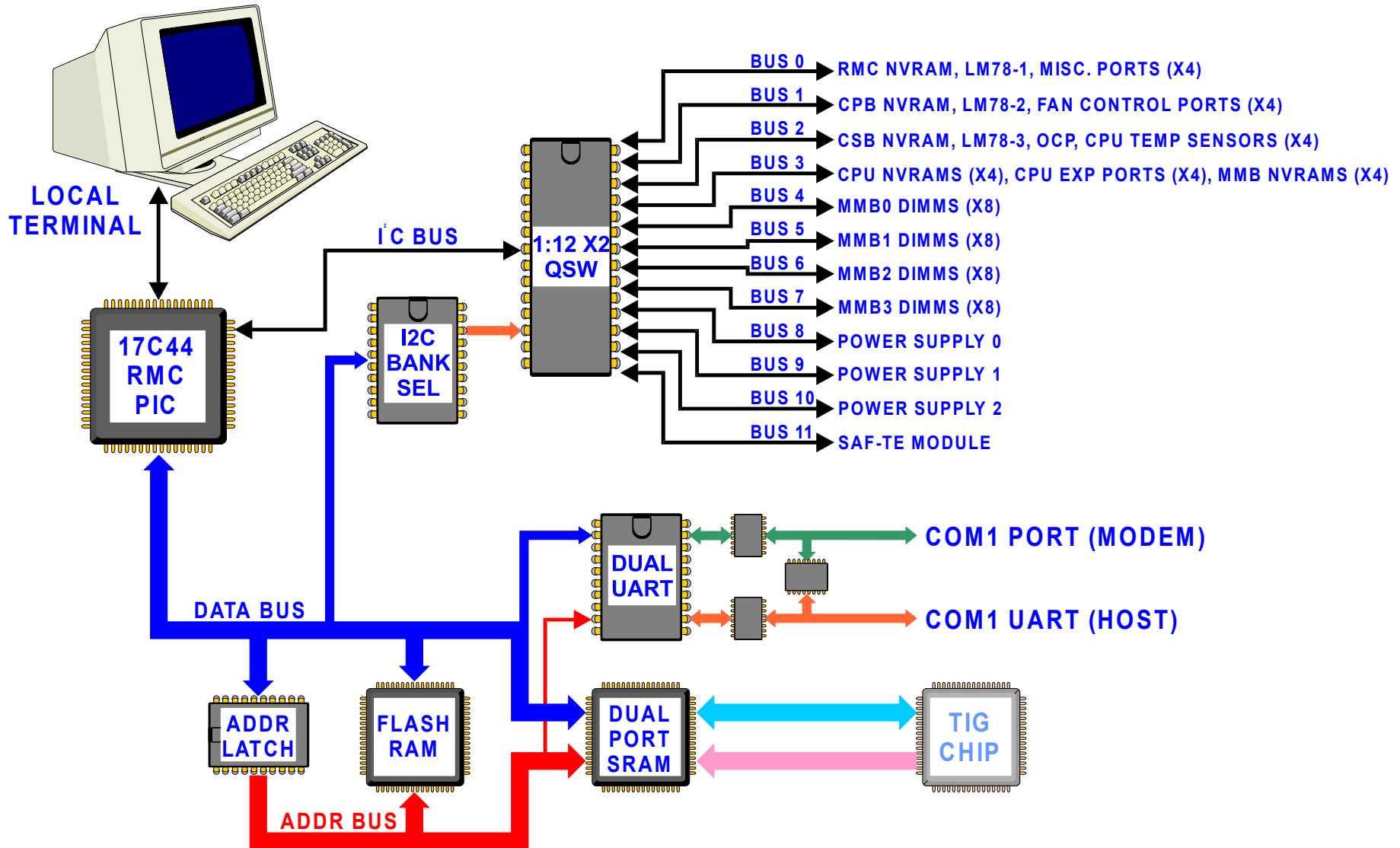
Remote Management Corner ("RMC")

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Alpha Volume Server Engineering

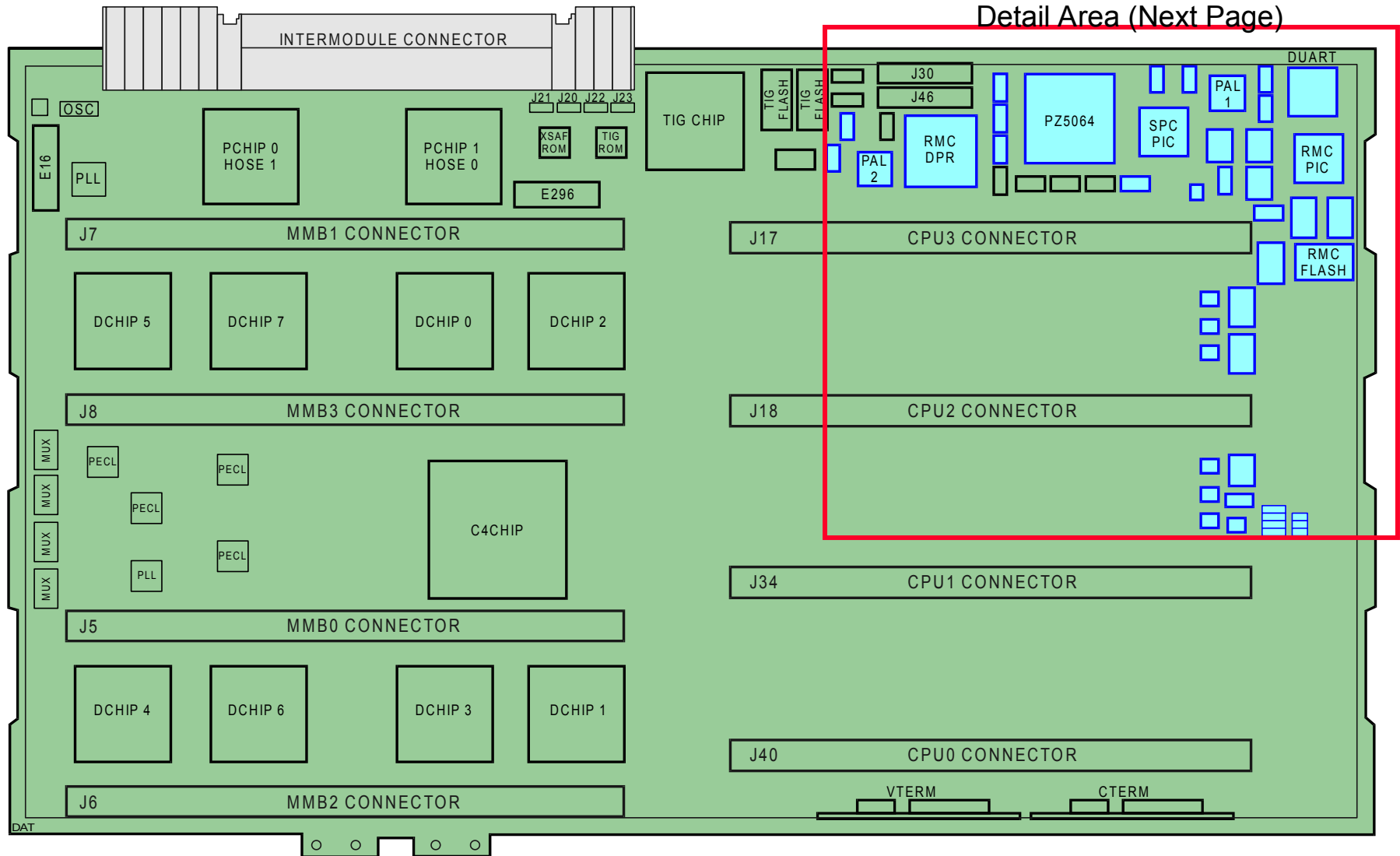
- **Monitors System Environment and “Wellness”**
 - Voltages and Fan Speeds Monitored Via LM78’s on CPB Module
 - Temperatures Monitored by LM75’s on CPU Modules, LM78’s on CPB Module, and Sensors within Power Supplies
- **Controls All System Cooling Fans**
 - Fan Speed and On/Off Control Via I2C to Regulators on CPB Module
- **Multi-Mode Support for System Console**
 - Remote Terminal Via Modem and Local Terminal Via Serial Line
- **Operator Control Panel Interface**
 - Responds to OCP Controls and Manages LCD Display
- **Manages Extensive Network of FRU I2C EEPROMs**
 - Loads FRU Configuration Data into Dual Port RAM on Power-Up
 - Writes FRU Error Footprints from DPR into EEPROMs on Command
- **Supports Power Supply “Hot Swap”**

- **Microchip 17C44 RISC Microcontroller, 24MHZ**
 - 8KB OTP ROM, 454B RAM
- **External Resources**
 - 128KB Flash RAM For External Code Store
 - 16KB Dual Ported SRAM
 - 16552D Dual UART, 16550 Compatible
- **Support Components**
 - External Address Latches for DUART, Flash RAM, and DPR Address
 - (2) 22V10 PALs
 - Chip Select Decoder for DUART, Flash RAM, DPR
 - “Watchdog” Timer
 - External Interrupt Controller
 - (2) 74ACT373 for “I2C Bus Select” Latches
 - I2C 8-Bit Port Expanders
 - I2C EEPROM

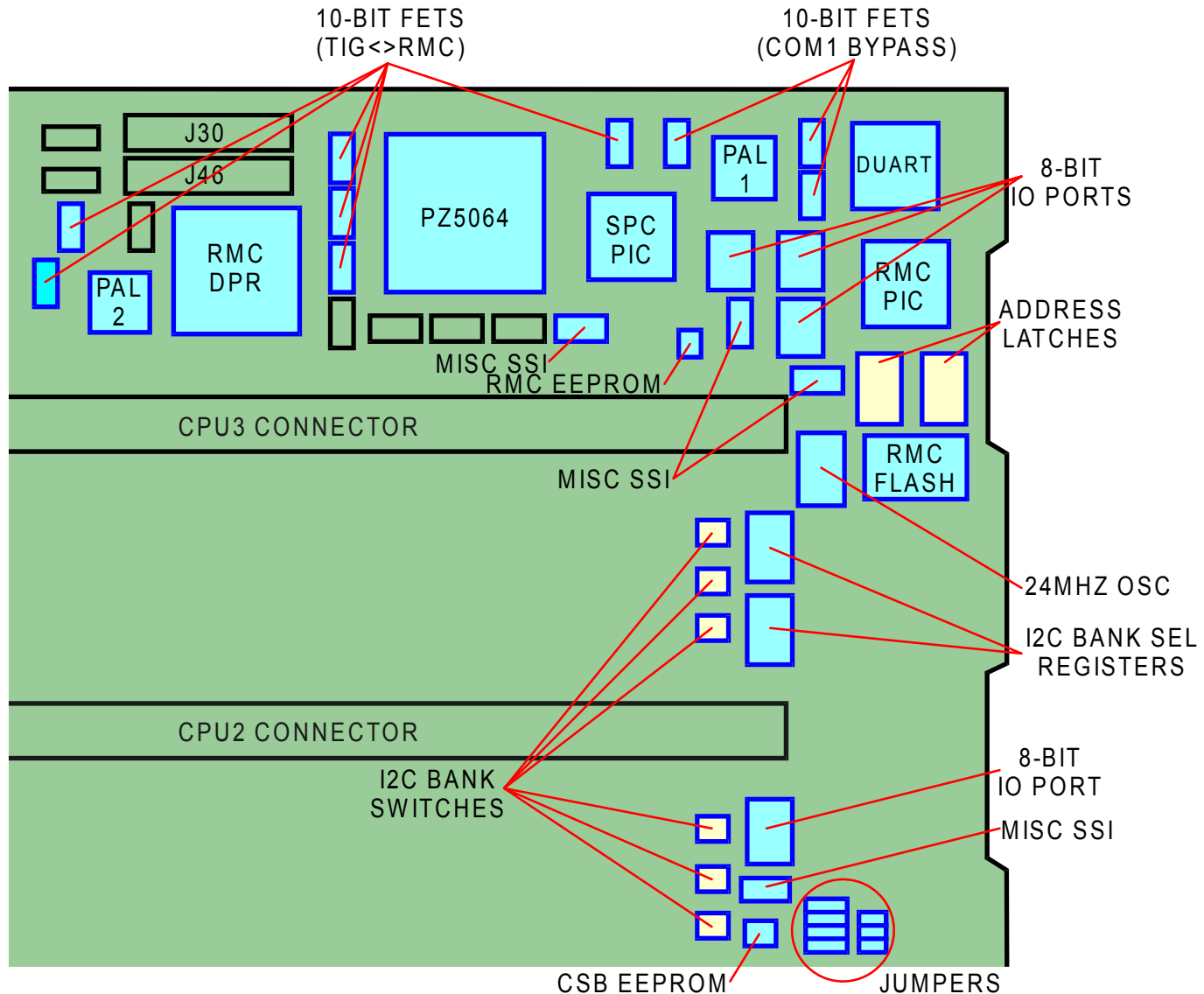
RMC Block Diagram



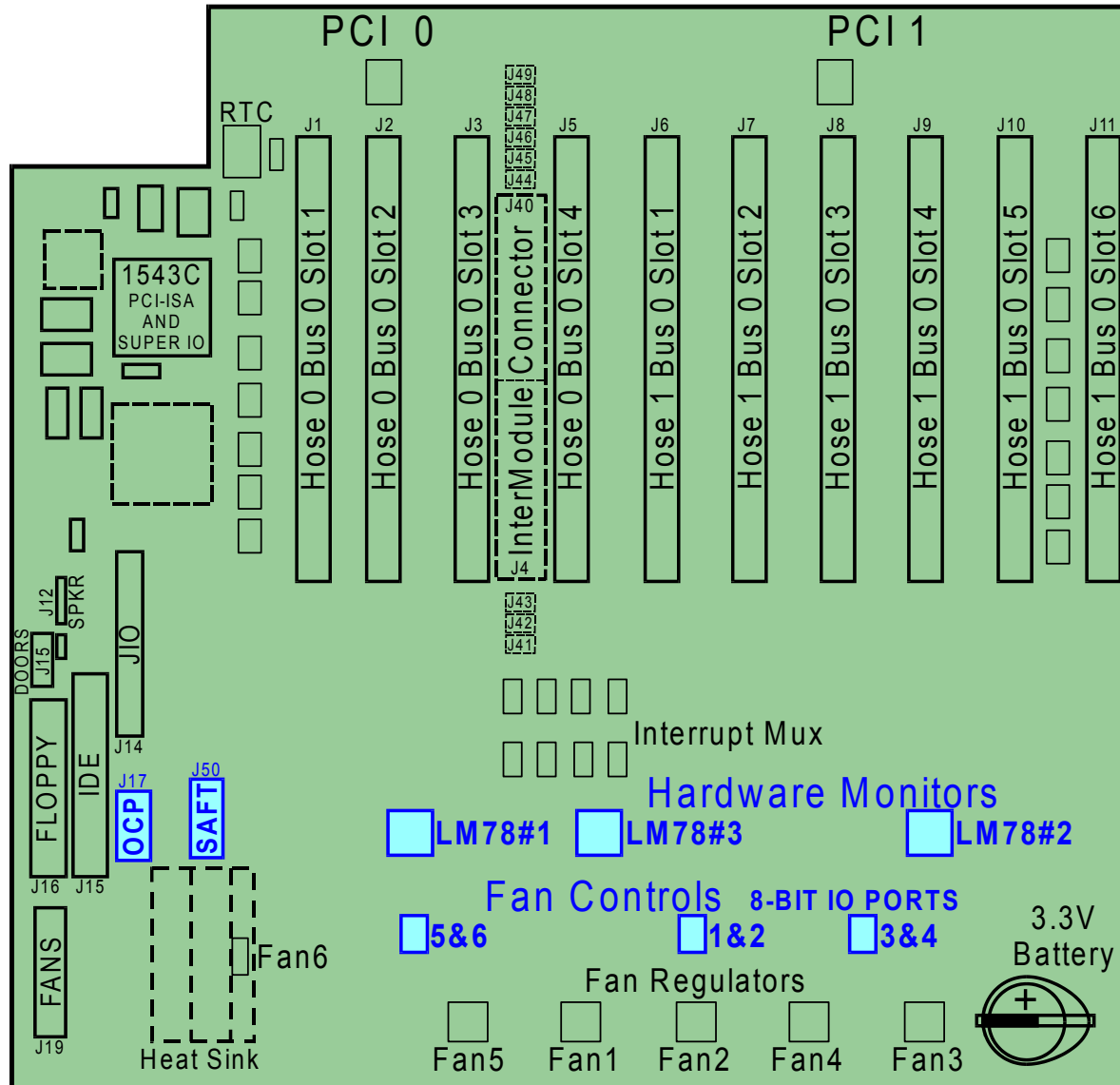
RMC Component Locations: CSB



RMC Component Locations: CSB

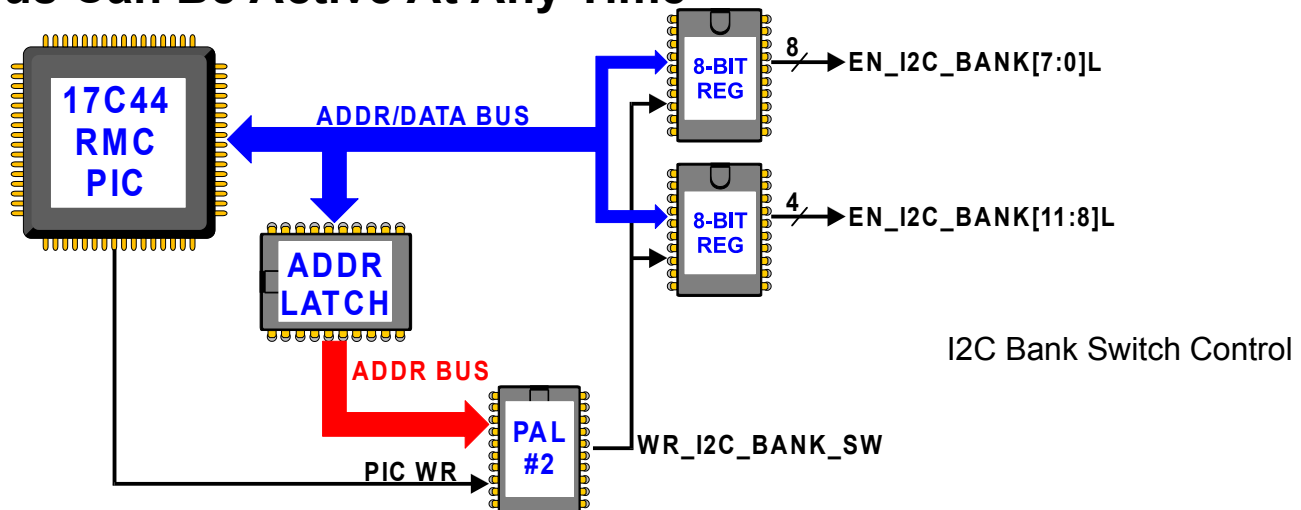


RMC Component Locations: CPB

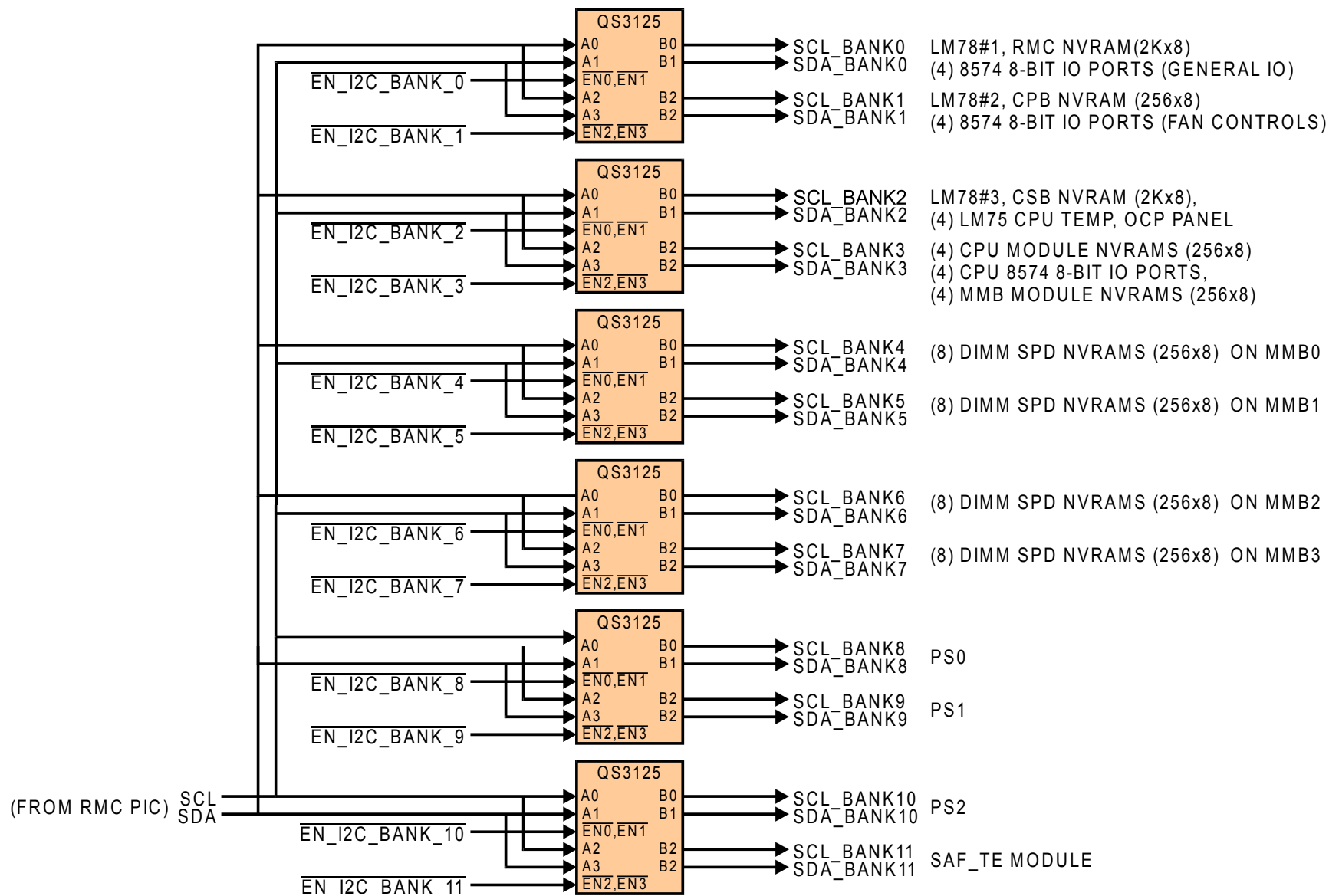


- **8-Bit IO Port Expanders on CSB, CPB, and CPU Modules**
- **LM75 Temperature Sensors on CPU Modules**
- **LM78 Hardware Monitors on CPB Module**
 - Temperature, Voltage, Fan Speeds
- **EEPROMs on CSB, CPU, CPB, MMB, DIMMs, and Power Supplies**
 - FRU Configuration Data
 - FRU Error Logs
 - Storage for RMC Environmental Strings
- **OCP Display Controls**
- **Power Supplies (Multichannel I2C A-D Converters)**
 - Line Voltage
 - Internal Temperature
 - Fan Speed
 - Output Current
- **Connection to SAF-TE Module Used with SCSI Backplanes (Optional)**

- **RMC PIC I2C Bus Routed to (12) Subordinate Buses**
 - CMOS FETs Form Bi-directional Bus Switch
 - Expands Address Space
 - Reduces Effective Capacitance Seen by Transmitting Nodes
 - Enables Voltage Domain Partitioning (AUX5 vs non-AUX5 Logic)
- **Branch Selection Controlled by RMC PIC Processor**
 - PIC Writes Control Word into 12-Bit Memory Mapped Register
 - Low Output Enables Desired Path Through Bus Switch
 - Only 1 Bus Can Be Active At Any Time

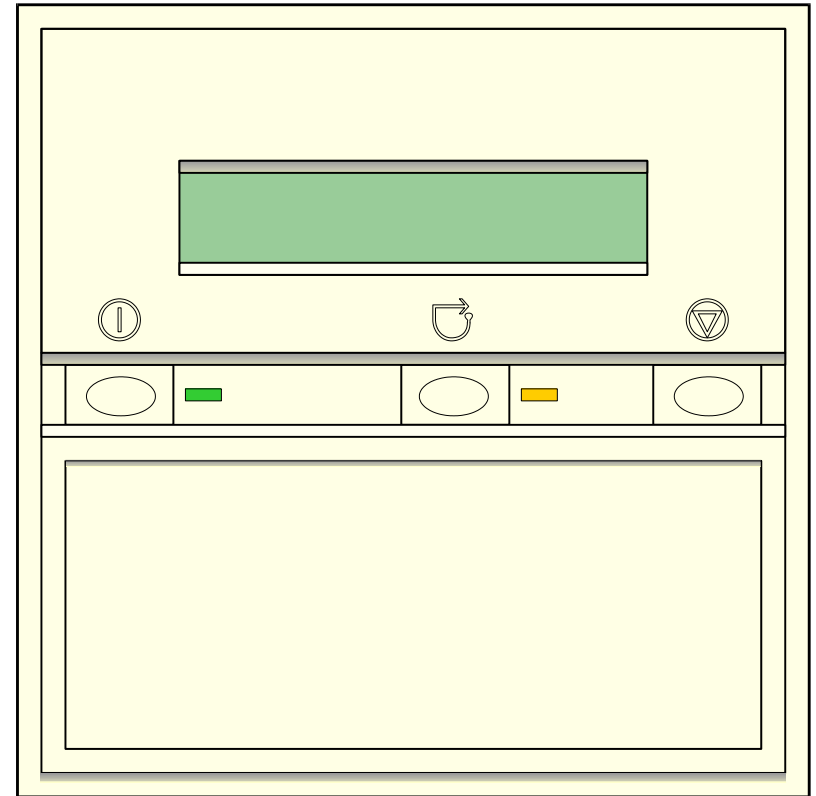


I2C Bank Switches



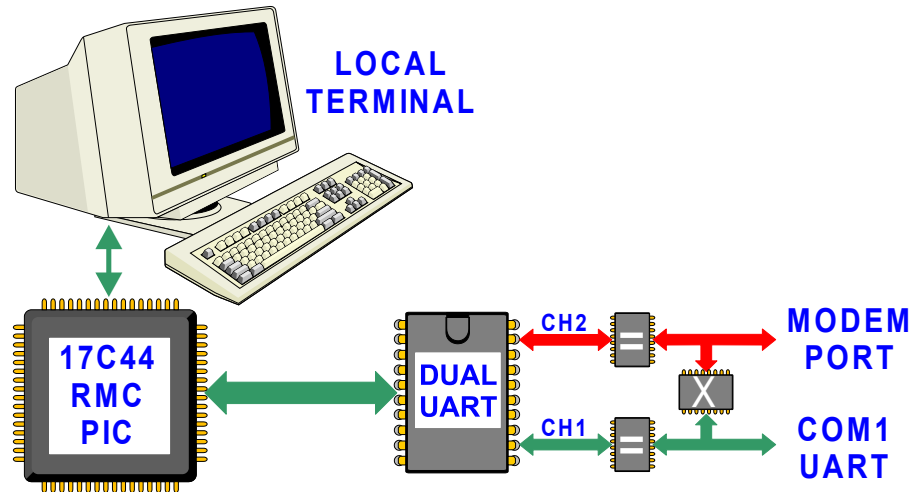
OCP Features:

- 16 character LCD display
 - Driven by RMC PIC via I2C (Bus 2)
- Backlit display
- Power On/Off button - Locking
- Power LED - Green
- System Reset button - Momentary
- HALT Button - Locking
- HALT LED - Amber
- Powered by AUX5



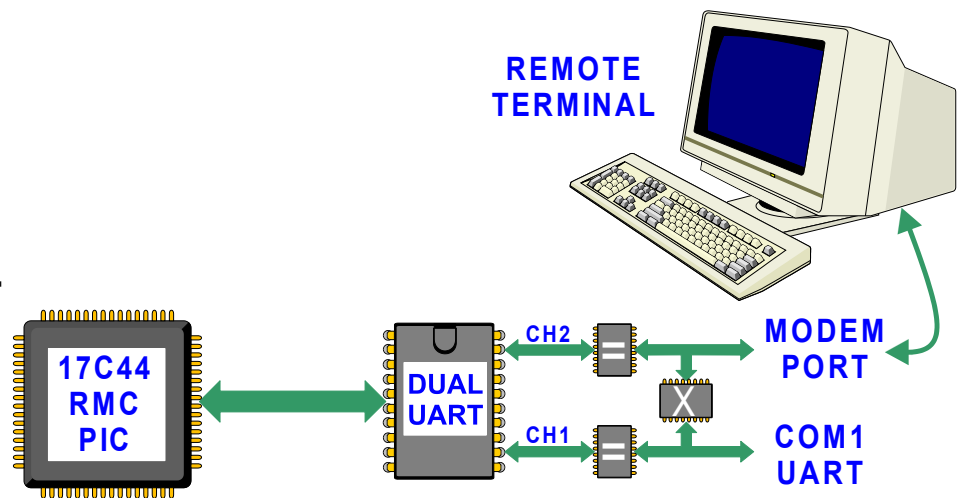
- **Local Serial Console Via MMJ Connector**

- RX/TX into RMC PIC Processor
- In-Band Flow Control Only (XON/XOFF)
- Characters Pass Through RMC PIC, Through DUART Channel 1, Then To System COM1 UART at ACER PCI-ISA Bridge

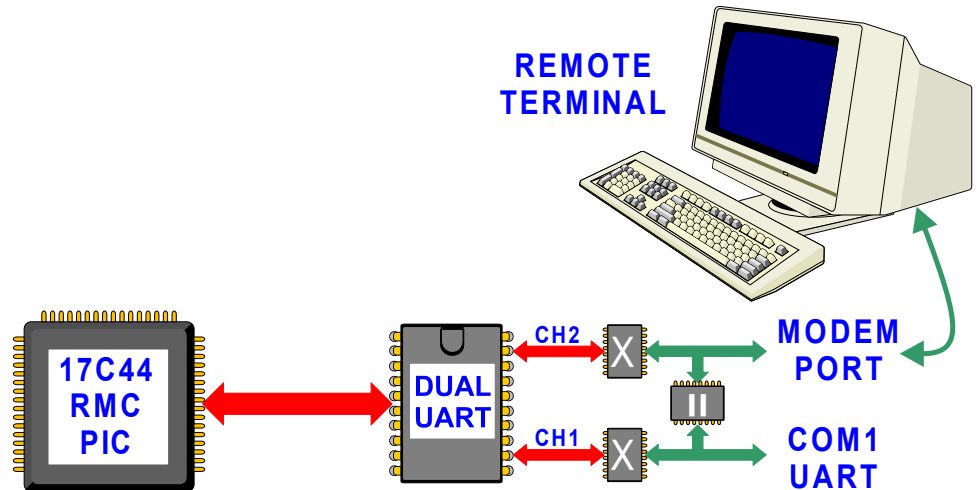


- **Remote Serial Console Via 9-Pin Dshell**

- Full Modem Controls Provided
- Can Be Used As Alternate Local Console
- Characters Pass Through DUART Channel 2, To RMC PIC, Back To DUART Channel 1, Then To System COM1 UART at ACER PCI-ISA Bridge



- **Remote Serial Console Via 9-Pin Dshell Using “Bypass Mode”**
 - Full Modem Controls Provided
 - Can Be Used As Alternate Local Console
 - Bypasses RMC PIC
 - Characters Pass Directly From Modem Port to System COM1 UART at ACER PCI-ISA Bridge
 - Can Be Forced By Removing CSB Jumper J21
 - RMC CONSOLE NOT AVAILABLE!
 - Can Be Disabled By Installing CSB Jumper J21 1-2
 - Can Allow RMC to Toggle Bypass Mode On/Off By Installing CSB Jumper J21 2-3



RMC Console Commands

Command Help

```
RMC>help  
  
clear {alert, port}  
deposit  
disable {alert, remote}  
dump  
enable {alert, remote}  
env  
halt {in, out}  
hangup  
help or ?  
power {on, off}  
quit  
reset  
send alert  
set {alert, dial, escape, init, password, user}  
status  
  
RMC>|
```

RMC Console Commands

STATUS Command

```
RMC>stat

      AlphaServer Clipper Status
On-Chip Firmware Revision: T0.3
Flash Firmware Revision: X0.7
Server Power: ON
System Halt: Deasserted
RMC Power Control: ON
Escape Sequence: ^[[RMC
Remote Access: Disabled
Modem Password: not set
Alert Enable: Disabled
Alert Pending: NO
Init String:
Dial String:
Alert String:
Modem and COM1 baud: 9600
Last Alert:
User String:

RMC>|
```

ENV Command

```
RMC>env

      System Hardware Monitor

Temperature (warnings at 46.0°C, power-off at 52.0°C)
  CPU0: OFF   CPU1: OFF   CPU2: OFF   CPU3: OFF
  Zone0: 26.0°C   Zone1: 26.0°C   Zone2: 26.0°C
Fans RPM
  Fan1: OFF   Fan2: OFF   Fan3: OFF
  Fan4: OFF   Fan5: OFF   Fan6: OFF
Power Supplies(OK, FAIL, OFF, '----' means not present)
  PS0 : ----   PS1 : OFF   PS2 : OFF   VTERM: OFF
  CPU0: OFF   CPU1: OFF   CPU2: OFF   CPU3: OFF
CPU CORE voltage
  CPU0: +0.0V   CPU1: +0.0V   CPU2: +0.0V   CPU3: +0.0V
CPU IO voltage
  CPU0: +0.0V   CPU1: +0.0V   CPU2: +0.0V   CPU3: +0.0V
Bulk voltage
  +3.3V Bulk: +0.0V   +5V Bulk: +0.1V   +12V Bulk: +0.0V
  Vterm: +0.0V   -12V Bulk: -0.1V
RMC>
```

System Power = Off

RMC Console Commands

ENV Command

```
RMC>env

      System Hardware Monitor

Temperature (warnings at 46.0°C, power-off at 52.0°C)
  CPU0: 21.0°C   CPU1: 22.0°C   CPU2: 22.0°C   CPU3: 23.0°C
  Zone0: 25.0°C   Zone1: 25.0°C   Zone2: 24.0°C
Fans RPM
  Fan1: 3409   Fan2: 3425   Fan3: 3341
  Fan4: 3308   Fan5: 3329   Fan6: 3096
Power Supplies(OK, FAIL, OFF, '----' means not present)
  PS0 : ----   PS1 : OK     PS2 : OK     VTERM: OK
  CPU0: OK     CPU1: OK     CPU2: OK     CPU3: OK
CPU CORE voltage
  CPU0: +2.2V   CPU1: +2.2V   CPU2: +2.2V   CPU3: +2.2V
CPU IO voltage
  CPU0: +1.5V   CPU1: +1.5V   CPU2: +1.5V   CPU3: +1.5V
Bulk voltage
  +3.3V Bulk: +3.3V   +5V Bulk: +5.0V   +12V Bulk: +11.9V
  Vterm: +1.9V   -12V Bulk: -12.4V
RMC>
```

System Power = On
No Faults

ENV Command

```
RMC>env

      System Hardware Monitor

Temperature (warnings at 46.0°C, power-off at 52.0°C)
  CPU0: 21.0°C   CPU1: 22.0°C   CPU2: 22.0°C   CPU3: 23.0°C
  Zone0: 25.0°C   Zone1: 25.0°C   Zone2: 24.0°C
Fans RPM
  Fan1: 3409   Fan2: 3425   Fan3: 3341
  Fan4: 3308   Fan5: 3329   Fan6: 3096
Power Supplies(OK, FAIL, OFF, '----' means not present)
  PS0 : ----   PS1 : OK     PS2 : FAIL   VTERM: OK
  CPU0: OK     CPU1: OK     CPU2: OK     CPU3: OK
CPU CORE voltage
  CPU0: +2.2V   CPU1: +2.2V   CPU2: +2.2V   CPU3: +2.2V
CPU IO voltage
  CPU0: +1.5V   CPU1: +1.5V   CPU2: +1.5V   CPU3: +1.5V
Bulk voltage
  +3.3V Bulk: +3.3V   +5V Bulk: +5.0V   +12V Bulk: +11.9V
  Vterm: +1.9V   -12V Bulk: -12.4V
RMC>
```

System Power = On
PS2 Fault

RMC Console Commands

DUMP Command

```
RMC>du
addr> 0
count> 100
0000:01 80 01 01 01 01 01 01 DD 01 FF C2 01 00 00 00
0010:14 25 08 05 11 46 00 00 00 00 00 00 00 00 0C 00
0020:01 01 01 01 01 01 01 01 DD 01 FF C2 01 00 00 00
0030:14 25 14 05 11 46 00 00 00 00 00 00 00 00 0C 00
0040:01 02 01 01 01 01 01 01 DD 01 FF C2 01 00 00 00
0050:14 25 21 05 11 46 00 00 00 00 00 00 00 00 0C 00
0060:01 03 01 01 01 01 01 01 DD 01 FF C2 01 00 00 00
0070:14 25 27 05 11 46 00 00 00 00 00 00 00 00 0C 00
0080:50 02 51 00 02 00 03 00 00 00 00 01 00 00 00 00
0090:FE 00 06 15 16 16 16 19 19 18 63 FF 65 66 FF 6C
00A0:00 00 00 00 00 00 00 00 00 00 00 FC FC FC FC 00
00B0:00 00 00 00 00 00 00 00 00 00 BA 00 00 00 00 00
00C0:00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00D0:00 00 00 00 00 00 00 00 00 00 03 82 00 00 00 00
00E0:00 00 00 00 1C 1C 1C 1C 1C 1C 1C 1C 1C 1C F6 43 40
00F0:00 7A 3A 26 2F 1B 00 00 00 0F 00 00 00 76 03 76
0100:80
RMC>
```

Dump 256 Bytes of Dual Port
Ram From Address 0

RMC Console Commands

DEPosit Command

```
RMC>du
addr> 2900
count> 10
2900:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
RMC>
RMC>dep
addr> 2906
count> 0
data> AA
RMC>
RMC>du
addr> 2900
count> 10
2900:FF FF FF FF FF FF AA FF FF FF FF FF FF FF FF
RMC>
```

Write “AA” to Dual Port Ram
Address 2906

RMC Console Commands

Command Help

```
RMC>help  
  
clear {alert, port}  
deposit  
disable {alert, remote}  
dump  
enable {alert, remote}  
env  
halt {in, out}  
hangup  
help or ?  
power {on, off}  
quit  
reset  
send alert  
set {alert, dial, escape, init, password, user}  
status  
  
RMC>|
```