5 ESS OVERVIEW

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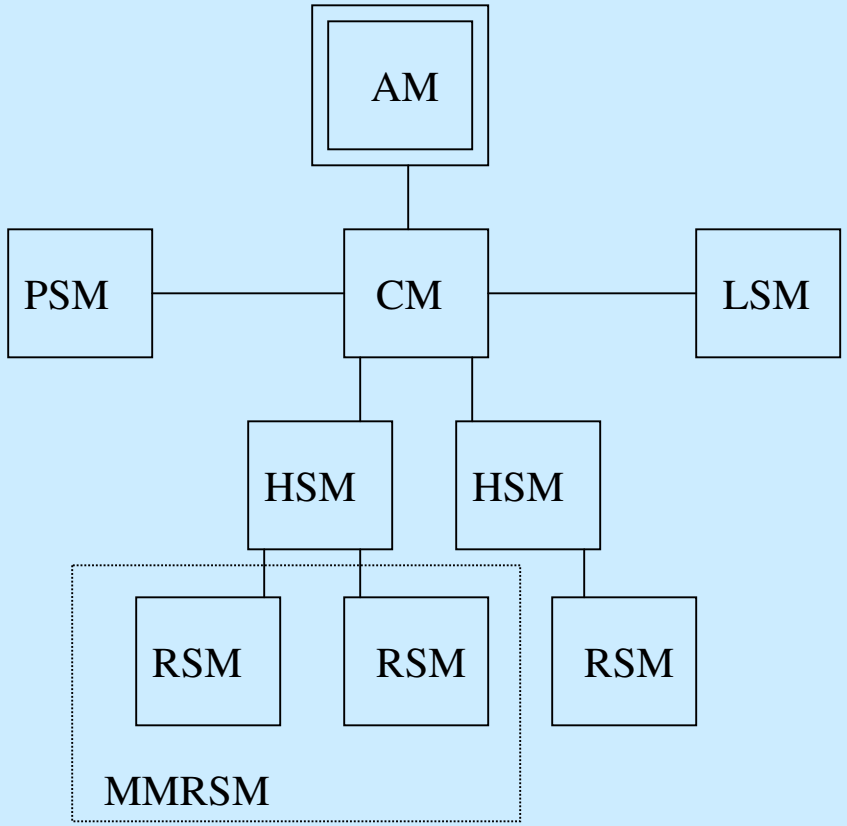
5ESS OVERVIEW

- **BELL Labs, Lucent Technologies of US**
- **Distributed Processor System**
- **Three building blocks SM, CM and AM**
- **CCS#7 and ISDN**
- **1400,000 BHCA**

5ESS OVERVIEW

- **Switch Module (SM)**
- **Interfaces subs. Lines, trunks, service circuits**
- **Functions**
  - **Line & trunk scanning**
  - **Tone and cadence generation**
  - **Digit analysis**
  - **Call routing**
  - **Circuit / Packet switching**
  - **Announcements**
  - **Call progress and supervision**
  - **Routine maintenance and self maintenance**
  - **Supplementary and subs. Facilities**

INTRODUCTION - 5ESS



AM	-Administrative Module
CM	-Communications Module
HSM	-Host Switching Module
LSM	-Local Switching Module
MMRSM	-Multi-Mod Remote Switching Module
PSM	-Position Switching Module
RSM	-Remote Switching Module

5ESS OVERVIEW

- **SM Classic and SM-2000**
- **Max. 192 SMs in 5ESS decided by no. of NCT links towards CM**
- **SM Classic**
  - **Only one NCT link (512 TS) to CM**
  - **5120 Lines or 500 trunks**
  - **10:1 Concentration is used normally**
  - **Only one TSI pack thus aprrox. 3K time slot switching**
- **SM-2000**
  - **Max. 11 NCT links to CM per SM-2000**
  - **65000 Lines or 18000 trunks**
  - **Depends on processor load, Subs./Trunk traffic and service circuit requirements**
  - **Max. 10 TSI packs i.e aprrox. 30 K Time Slots**

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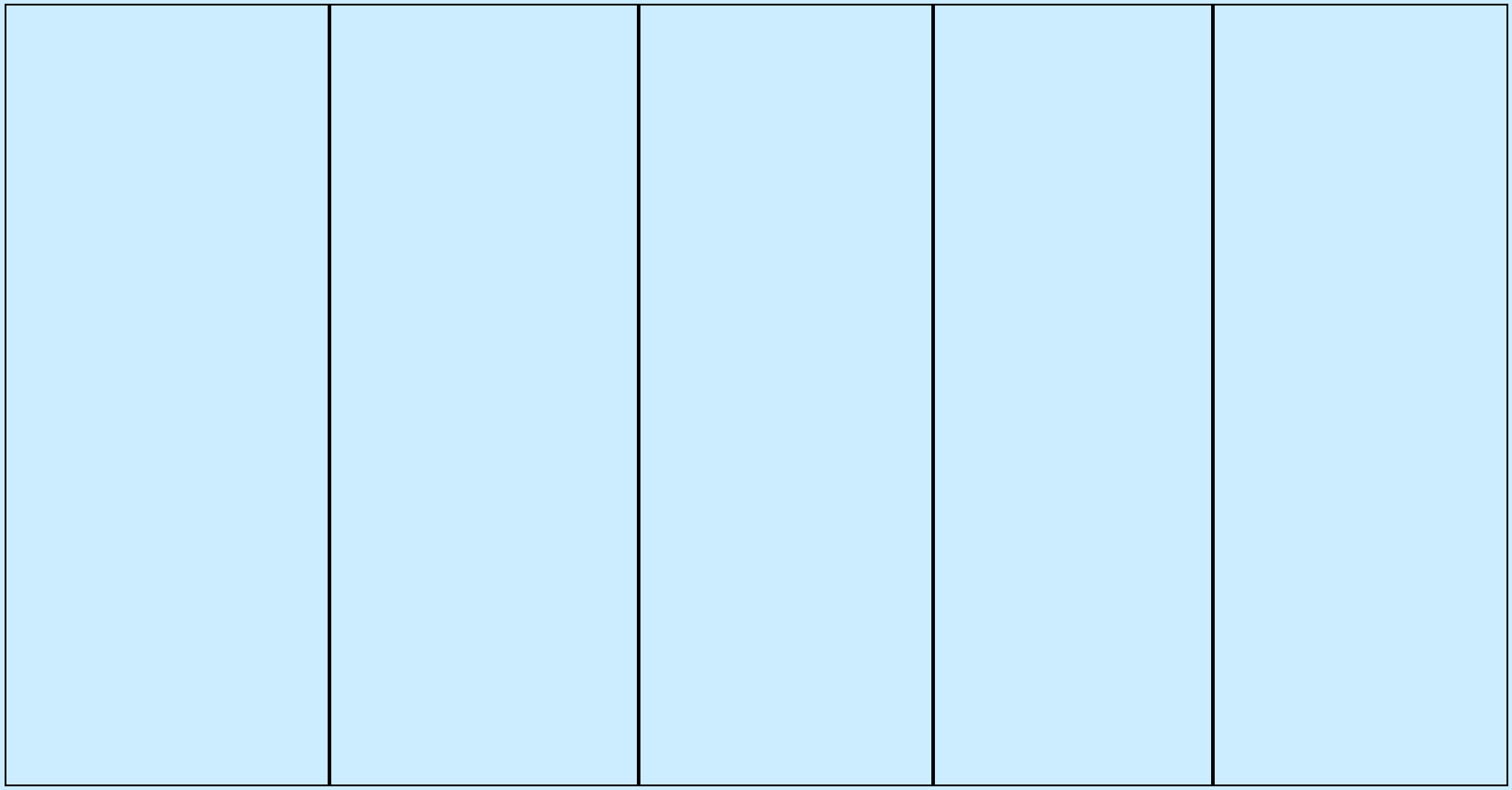

LPTO SMC1 LTP2 LTP3 LTP4

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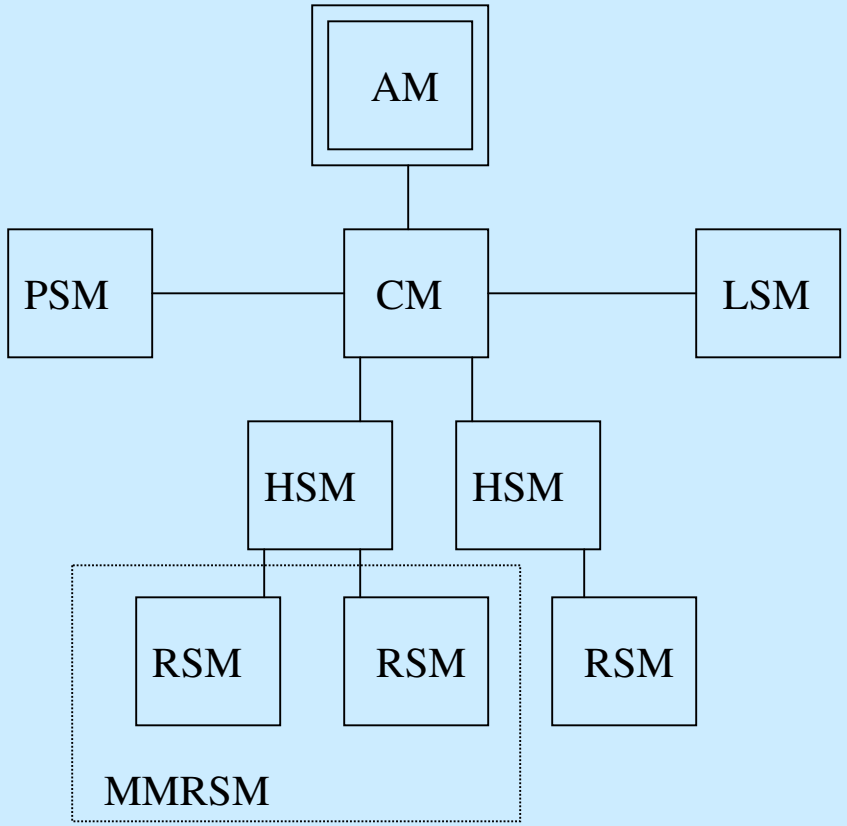

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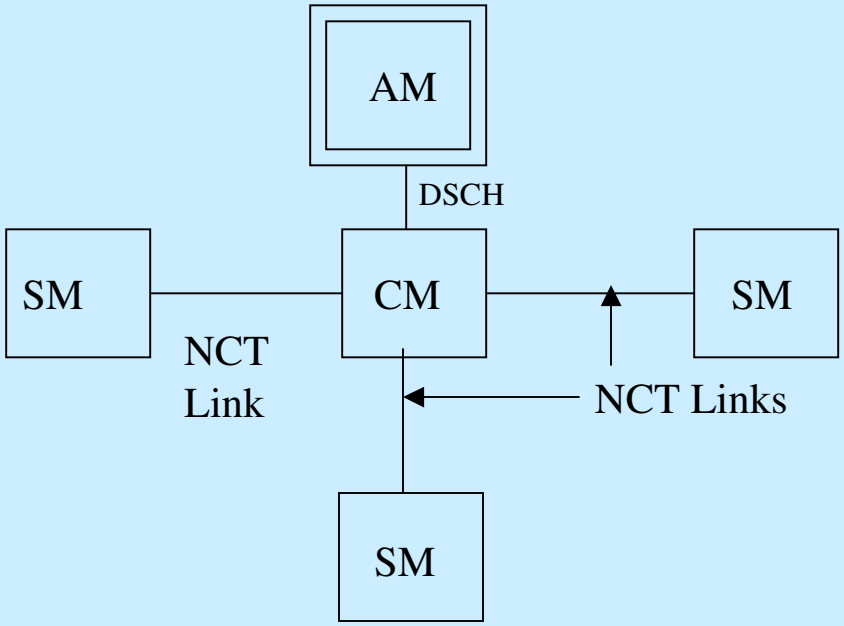

AM	-Administrative Module
CM	-Communications Module
SM	-Switching Module
DSCH	-Dual Serial Channel
NCT	-Network Control and Timing

5ESS OVERVIEW

- **SM Types**
- **LSM - only in the main and serving subs./trunks connected to it**
- **HSM - connection to RSM E1s and local interfaces**
- **RSM - standalone feature, max. 242 Kms from host**
- **MMRSM cluster RSMs with standalone feature**
- **RLG and for less capacity connections**
- **PSM for OSPS operations**

5ESS OVERVIEW

- **SM- Components**
- **SMC Switching Module Controller 1**
- **Controls all activitieswithin SM**
- **95% of call processing**
- **CORE 30 ,40 or 60 Processor used**
- **LTP Line and Trunk Pheripheral Unit 0,2,3&4**
- **Interface units can be analog , digital line/trunk interfaces, packet data interface**
- **Service Ubits**
- **Test equipment, conference circuits, line test equipments**
- **LDSU, GDSU for tone generation and reception**

5ESS OVERVIEW

- **IN SM-2000 LTPs accomodate AIU(Access Interface Unit) for subscriber line / trunk interface**
- **Service units are same as SM Classic**
- **Processor used is CORE60**

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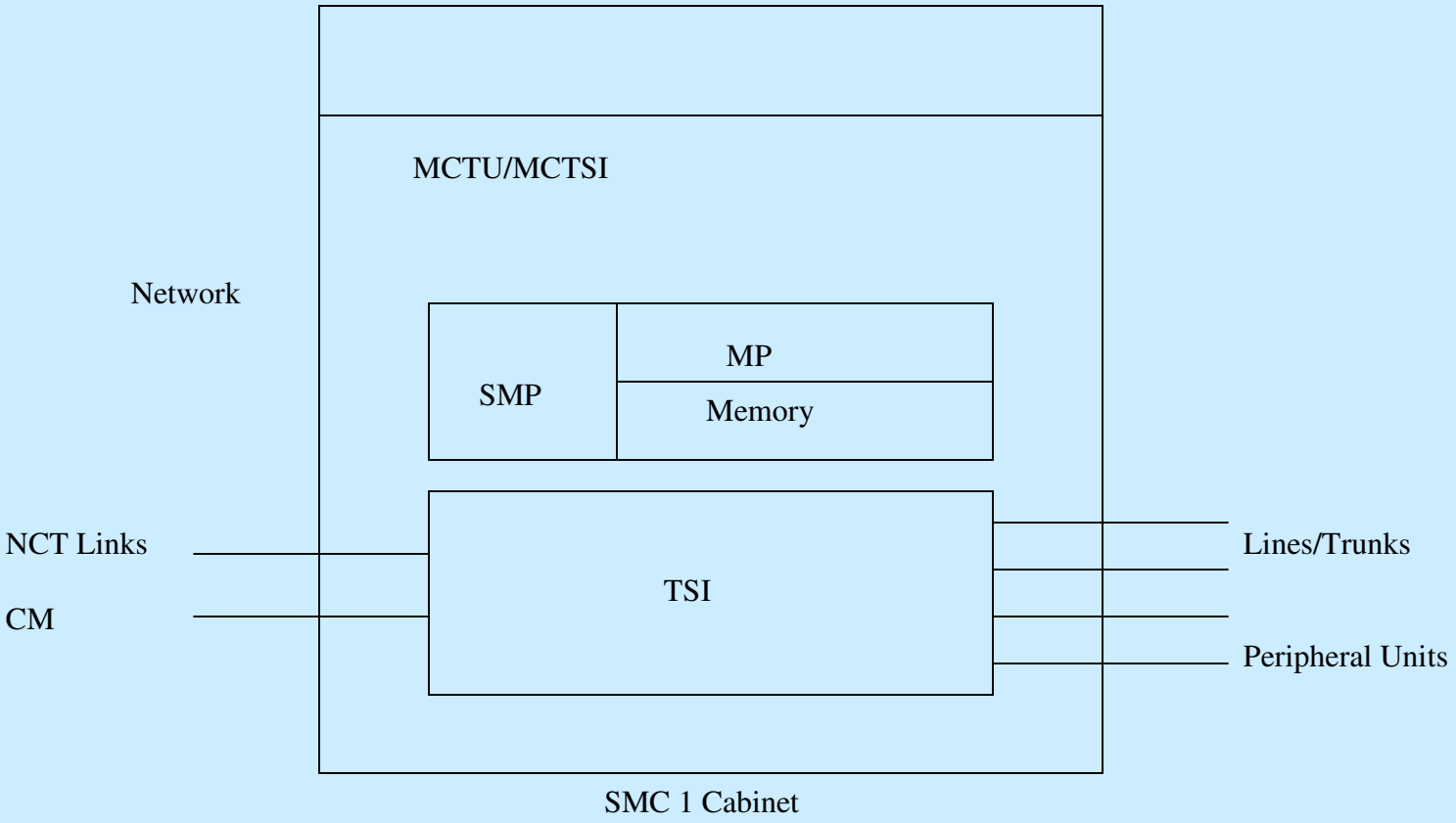

SMC 1 Cabinet

CM	-Communications Module
MCTU/MCTSI	-Module Controller and TSI Unit/Module Controller and Time Slot Interchange
MP	-Microprocessor
NCT	-Network Control and Timing
SMC	-Switching Module Controll
SMP	-Switching Module Processor
TSI	-Time Slot Interchange

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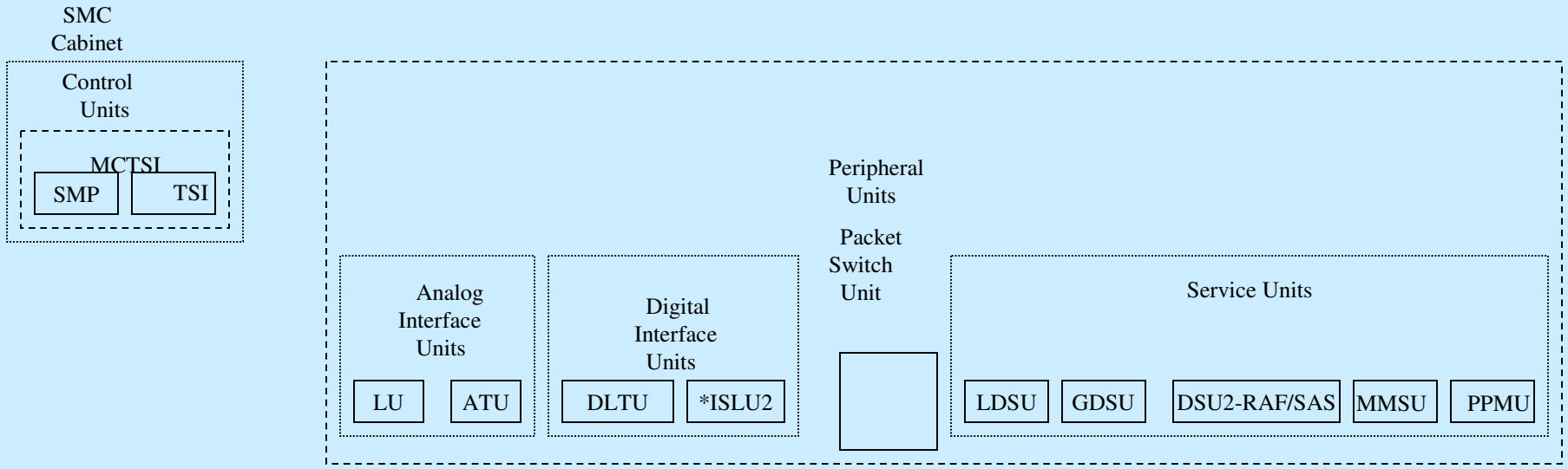

ATU	-Analog Trunk Unit
DLTU	-Digital Line Trunk Unit
DSU2-RAF/SAS	-Digital Service Unit Model 2-Recorded Announcement Function/Service Announcement System
GDSU	-Global Digital Service Unit
ISLU2	-Integrated Services Line Unit Model 2
LDSU	-Local Digital Service Unit
LTP	-Logical Test Port
LU	-Line Unit
MCTSI	-ModuleController and Time Slot Interchange
MMSU	-Multi-Mod Service Unit
PPMU	-PeriodicPulse Metering Unit
SMC	-Switching Module
SMP	-Switching Module Processor
TSI	-Time Slot Interchange

5ESS OVERVIEW

- **LTP**
- **Analog Interface unit (LU, ATU) - LU for anaog subscriber with / without home metering - 32/24 subs per pack**
- **ISLU2 both digital / analog subs - 20 BRA subs per pack**
- **Digital Interface Units (DLTU, ISLU2)**
- **DLTU Digital Line and Trunk Unit**
- **E1 2 Mbps connectivity for digital trunks /RSM Umblicals to HSM**
- **Packet Switch Unit (PSU)**
- **Service Units (LDSU, GDSU, MMSU)**
- **PPMU, DSU2-RAF/SAS**
- **AIU Access Interface Unit is new version for accomodating analog / digital subs. Both in HSM / RSM**
- **3 Shelves per side and 6 per cabinet back to back**

5ESS OVERVIEW

- **PSU Packet Switch Unit**
- **CCS7 signalling data**
- **ISDN subs. D Chl. data**
- **Packet switched data**
- **V5.2 interface connectivity to switch**
- **Service Units - LDSU , GDSU**
- **LDSU Local Digital Service Units**
- **Generate digital tones**
- **Decode digital tones**
- **Implemented in circuit packs or full units**
- **TS in the input of TSI is allotted as per requirements**

5ESS OVERVIEW

- **GDSU Global Digital Service Unit**
- **Min. One GDSU**
- **Conference capabilities**
- **Transmission testing**
- **TS in the input of TSI is allotted as per requirements**
- **MMSU Modular Metallic Service unit**
- **Metallic test access**
- **Subs. Line testing**
- **Scan and distribution of external alarms**

5ESS OVERVIEW

- **DSU2 - RAF/SAS Digital Service Unit2 - Recorded Announcement Fuction/Service Announcement Systems**
- **Provides announcement**
- **SAS is latest and has 128 Mbps memory**

5ESS OVERVIEW

- **SM input is subs. or trunks or E1s from RSMs**
- **SM output towards TSI is max. 24 PIDBs (768 TS)**
- **TSI output towards CM is NCTs (Network Control & Timing Links)**
- **NCT is 512 TS and NCT2 is 1024 TS per link**
- **Max. 11 NCT2 links per SM2000**

5ESS OVERVIEW

- **CM (Communication Module)**
- **CM2 is latest version and CM@QLPS used in case of SM2000**
- **Functions**
  - **Inter SM communications**
  - **Call switching , Message switching**
  - **Network & timing**
  - **Fast pump action (uses all 32 TS in NCT)**

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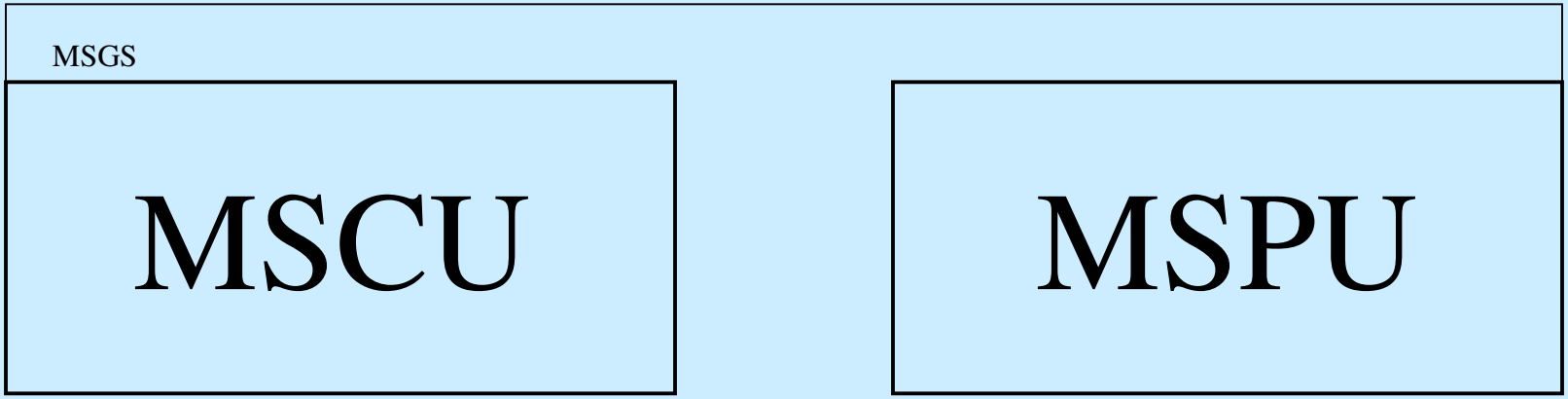
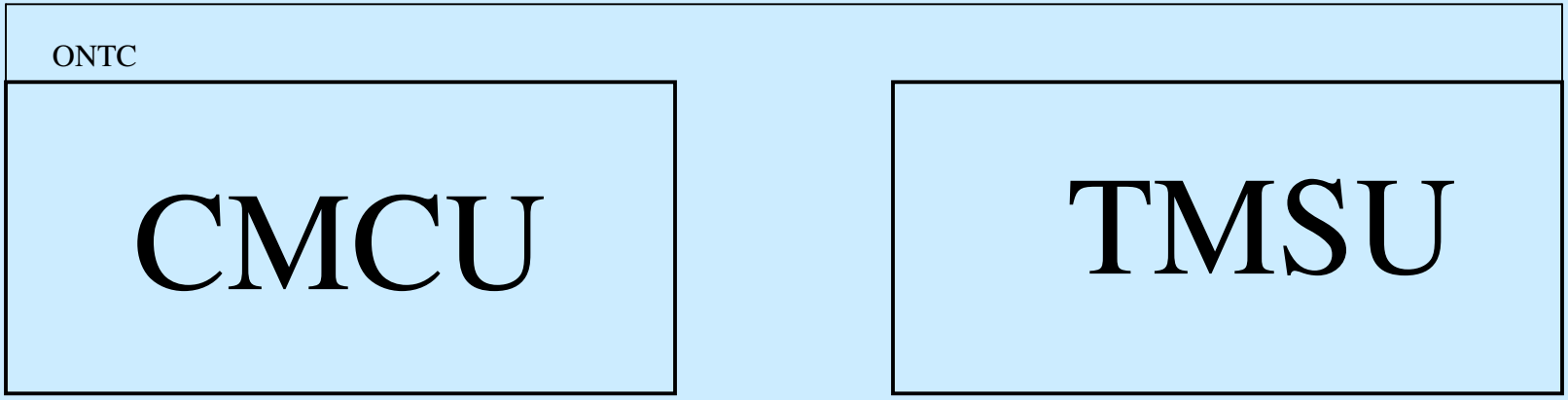


Message Switch Controll Unit

Message Switch Peripheral Unit



Communication Module Control Unit

Time Multiplexed Switch Unit

MSGS - Message Switch
ONTC - Office Network and Timing Comples

5ESS OVERVIEW

- **CM Components**
- **MSGS _ Message Switch**
  - **MSCU - Message switch Control Unit**
  - **Control over MSPU**
  - **Control information interchange between AM and SM**
- **MSPU Message Switch Peripheral Unit**
  - **Processes control messages and switches them to AM or SMs**
  - **Acts as a mail box for messages**
  - **Each SM has assigned location in SMPU**

5ESS OVERVIEW

- **AM (Administrative Module)**
  - **Controls CM and communication with all SMs through CM**
  - **Self maintenance and maintenance of CM**
  - **Only one AM**
- **Functions**
  - **call routing for inter module and intramodule calls**
  - **administrative data processing / billing data**
  - **traffic measurement repoorts / system performance reports**
  - **memory management & system maintenance**
  - **maintaining of file records of changes**
  - **man-machine interface and system monitoring**
  - **allocating trunks for call processing**

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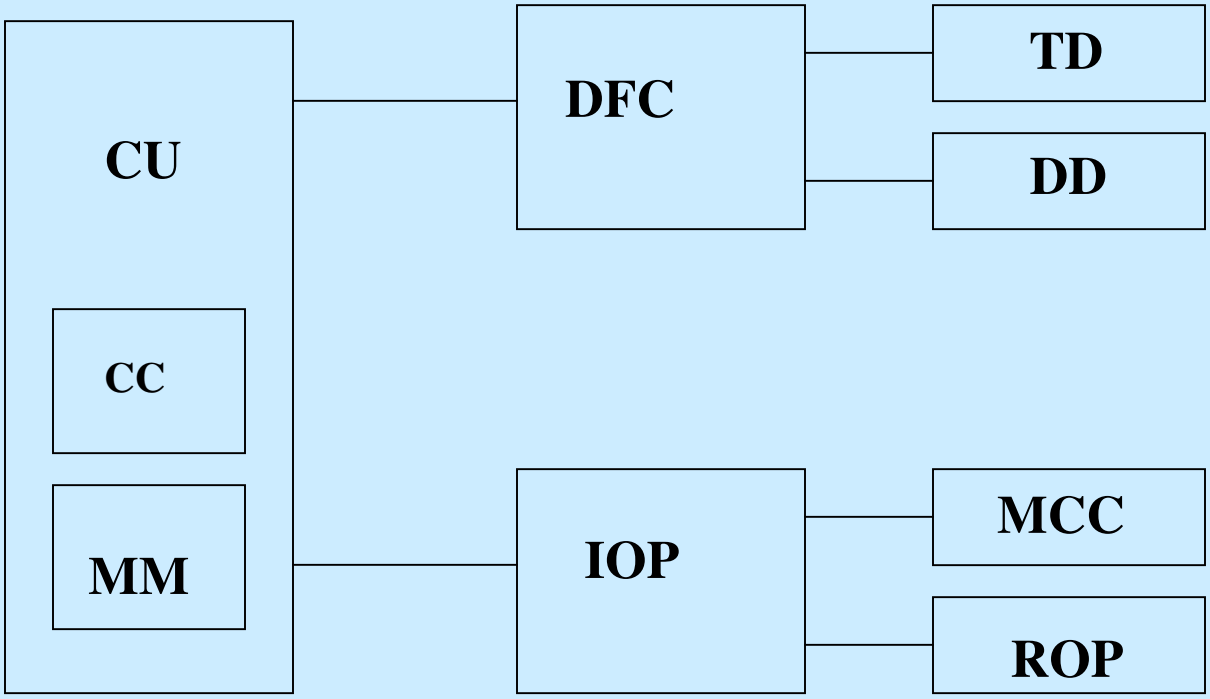

CC	-Central Control
CU	-Control Unit
DFC	-Disk File Controller
DD	-Disk Drive
IOP	-Input/Output Processor
MCC	-Master Control Center
MM	-Main Memory
ROP	-Receive Only Printer
TD	-Tape Drive

5ESS OVERVIEW

- **Units of AM - CU , DFC and IOP**
- **CU Control Unit - consists of CC and MM**
- **CC-**
  - **executes programs**
  - **executes program requests**
  - **process administrative data**
  - **monitors system operation**
  - **updates duplicated CU**
  - **manages the data transfer**
- **MM - stores the program instructions and data**

5ESS OVERVIEW

- **Disk File Controller (DFC)**
  - **interfaces with SCSI peripheral devices like MHD andMagtapes**
  - **stores copies of software used in 5ESS inn MHD and used for restoration of MM**
  - **stores hardware configuration data (ECD/ODD)**
  - **stores billing data**
- **Tape Drive -**
  - **conventional nine track tape or Digital Audio Tape**
  - **data transfer from tape to disk and vice versa**
  - **billing data backup**

5ESS OVERVIEW

- **Input/Output Processor**
  - **peripheral interfaces like MCC/ROP**
- **MCC - Master Control Centre**
  - **man-machine interface for maintenance and operation**
  - **visual displays of system status and alarm information**
  - **tool to control, test and reconfigure the system**
  - **tool to manually recover the system**
  - **access to the exchange data**
- **ROP- Receive Only Printer**
- **TLWS/STLWS - max. 32 terminals for one side of CU and works on 9600 bauds per sec.**