MEMORIES

CAPACITY OF MEMORY

- ✓ Memories are identified by
  =no. of words * word size
- ✓ no. of words = power of 2

2^M =no. of words or address locations

N =word size

FIFO

- ✓ Formed by the arrangement of shift registers.
- ✓ First data bit written into memory is first to be read out.
- ✓ Can be used in case where two systems of different data rates must communicate.

LIFO

- ✓ Last in first out
- ✓ Last data to be stored is first to be retrieved.
- ✓ Found in applications involving microprocessors (stack) and other computing systems.

TYPES OF PLDs - - - -Continued

4. **GAL (Generic Array Logic)**
   - ✓ **Innovation of PAL** and has same logical properties as PAL but can be **erased and reprogrammed**
   - ✓ Very useful in prototyping stage of design where any bugs can be corrected by reprogramming.
   - ✓ Consists of **reprogrammable AND array and a fixed OR array with programmable output configurations** (these are two difference between PAL and GAL)
   - ✓ Uses **E^2CMOS (Electrically Erasable CMOS) technology** instead of Bipolar technology and fusible links

LOGICAL FAMILIES

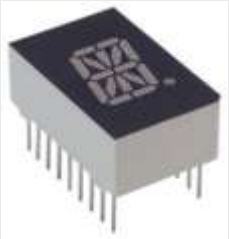
TRANSISTOR TRANSISTOR LOGIC (TTL)

- ✓ Based on BJT technology
- ✓ **Appropriate in SSI and MSI circuits**
- ✓ Good noise performance
- ✓ Power dissipation high
- ✓ Large Propagation delay
- ✓ less packing density, so large fabrication area required
- ✓ Not sensitive to ESD(Electrostatic Discharge)
- ✓ Fan out/in 10/6
- ✓ used in many **applications such as computers, industrial controls, test equipment and instrumentation, consumer electronics, synthesizers**

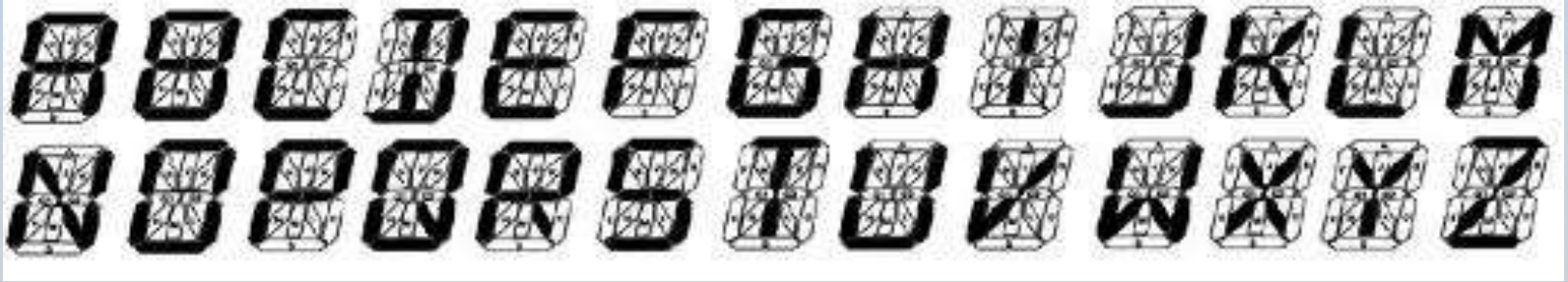
INTEGRATED INJECTION LOGIC(I^2L)

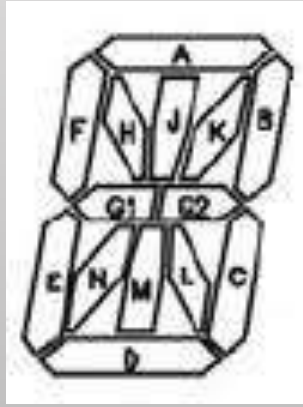
- ✓ Merged Transistor Logic
- ✓ Based on BJT technology
- ✓ **Used in LSI circuits**
- ✓ High packing density
- ✓ Less power dissipation as no use of resistors
- ✓ Propagation delay large
- ✓ Low logical swing
- ✓ Lower noise immunity
- ✓ Not sensitive to ESD

FOURTEEN SEGMENT DISPLAY



- ✓ Referred to as a starburst display or a "Union Jack" display
- ✓ Display based on 14 segments that can be turned on or off to produce letters and numerals
- ✓ Having an additional four diagonal and two vertical segments with the middle horizontal segment broken in half.





DIGITAL CLOCK