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SURFACE PREPARATION AND COATINGS
DESIGN/PRODUCTION INTEGRATION
HUMAN RESOURCE INNOVATION
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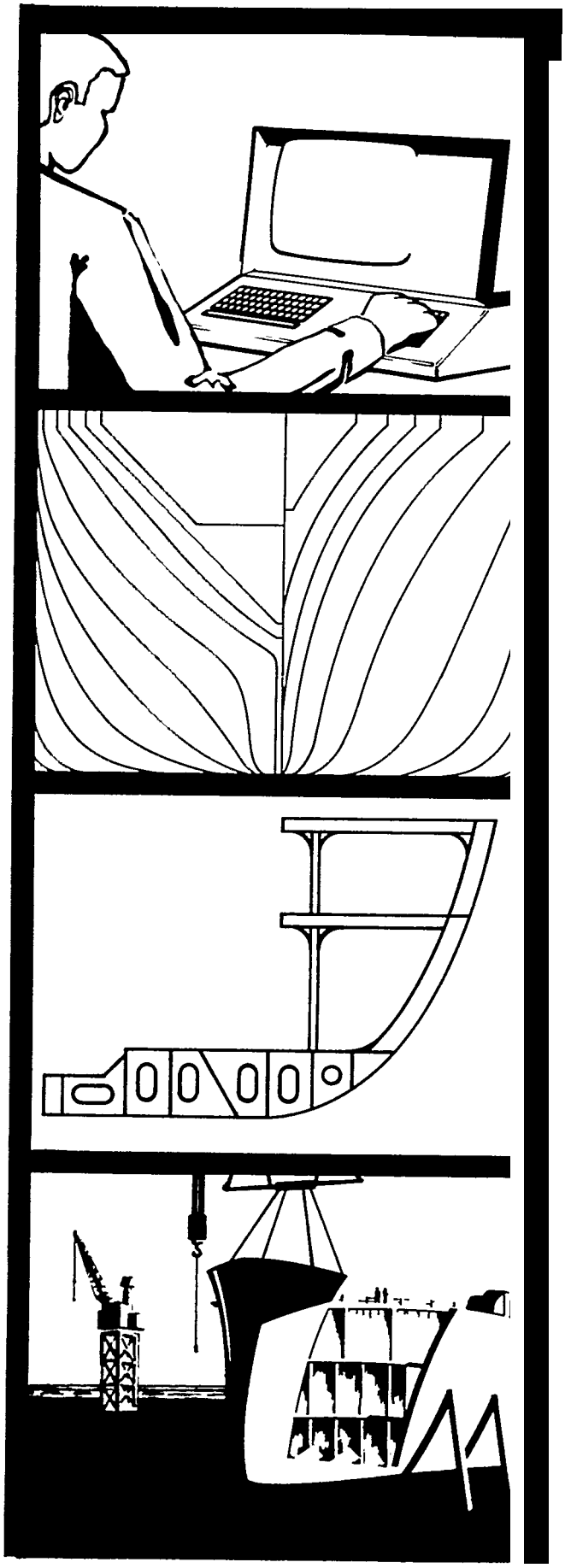

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MAPS-GP (GRAPHIC PIPING) PRESENT AND FUTURE CAPABILITY

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Mr. Kobayashi is a member of the engineering department in the system headquarters and is the group leader of the team developing MAPS-GP. His past experience includes work with a graphic N/C system for steel plate flame cutting and a graphic piping system for a chemical plant.

Mr. Kobayashi is a graduate of Tohoku University, department of science.

MAPS

Ž Qriginaly

Ž Mksui Automated Pipe Shop system

(Mitsui Shipbuilding & Engineering Co., LTD.)

present

Ž Mitsui Advanced production System

(Mitsui Engineering & Shipbuilding Co., LTD)

MAPS-GP ; Graphic Piping system

MAPS-NC ; Graphic Steel plate Cutting system

MAPS-DATA ; MD 7000 work station terminal

MAPS-GRAPH ; YM9000 satellite graphic terminal

MAPS-M ; Modularized plant production

Why MAPS-GP?

- High... Low Economic Development
  - Alter company's need
    - Reduce Input Cost
      - Shorten the EXEC. Time
    - Change Organization
  - Enhance production design
  - Ž Distributed System Request

Long Range Plan of MAPS-GP

Step	Range	Object	Technology	Need
I	1970-75	Ž Numerical Information System Ž Automated Pipe Shop	.Large scale Computer Ž Part coding & Batch job	ŽMass Production system Ž Improved Shipbuilding Ž Large scale investment of equipment
II	1976–78	Ž Separation the routine and judgement work .Elimination Part coding .Reduce the TAT'	Ž Interactive Computer Graphics Ž Distributed S y s t e m s	Ž Reduce ship acquisition time Ž Design power up Ž Cut the equipment
III	1979-80	Multi purpose system Cut off the drawing work High speed data input	Ž High accurate digitizer Load sharing System Large scale file	Concentrate design office Wide range application Separate production design
IV	1981–	.Automated piping design Ž Perfect unmanned pipe shop	Ž Computer Network Ž Advanced CAD/CAM Ž Full Automated pipe shop)	Engineering power up . Concentrate production management

. The Object of II step MAPS=GP

- Low Cost

  .**Simultaneous operation with GNC system ..... effective use**

  Ž Cost down . . . . . 30% **of design cost**

  Ž Shorten the **design time**

  Ž **Improve: the design accuracy**

- **.Step by Step Approach**

  .**Eliminate part coding**

  .**Move the most load from center to work station**

  .**Shorten** T. **A.** T .

- **Ž Output Production Management Data**

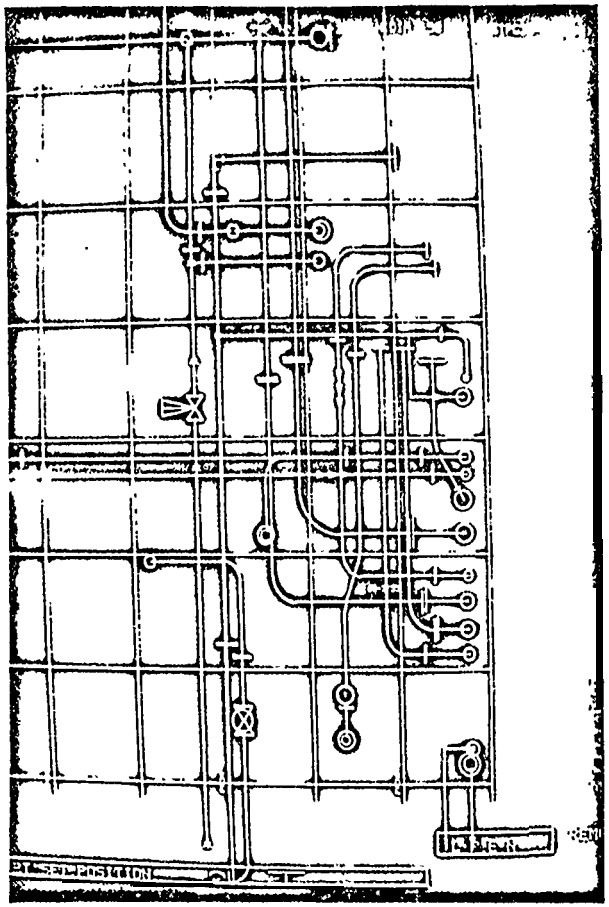
  .**Reduce the Pipe shop idle time**

System's Characteristics

- Interactive Graphics
- Tutorial Operation
- Function Key
- Easy Programming
- instant Correcting Errors

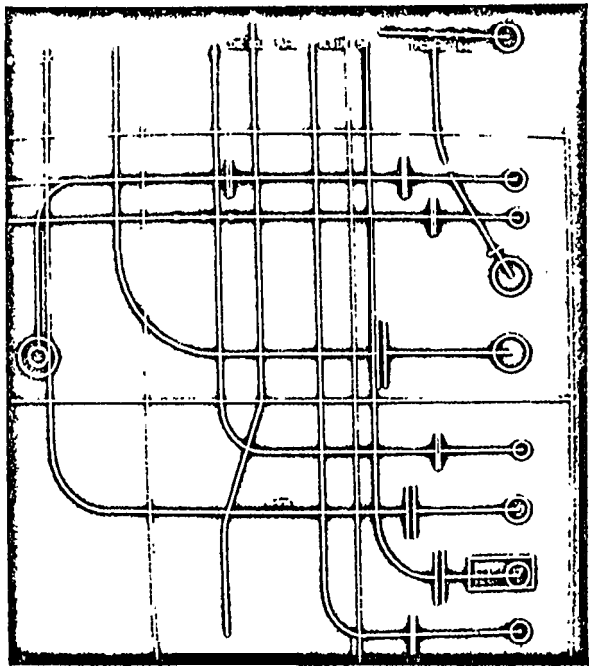
Operation Functions

- Pipe Line Generation
  - (Piping Root, Node Point, Branch)
  - Setting parts
    - .Valve, Reducer, Flange, Elbow , ...
- Pipe piece Data Generation
  - NC Cutting & Fitting control Data
  - NC Bender Data
  - pipe piece Drawing . . . . Dimension, comment
- Scale
- View change
- Display Hull Line
- Change

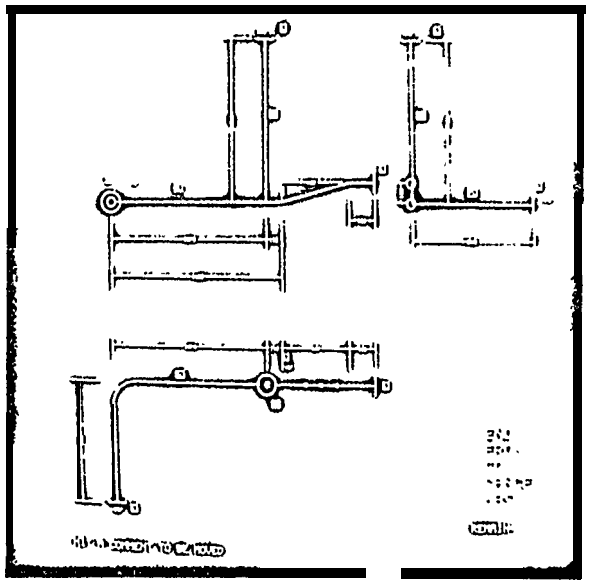


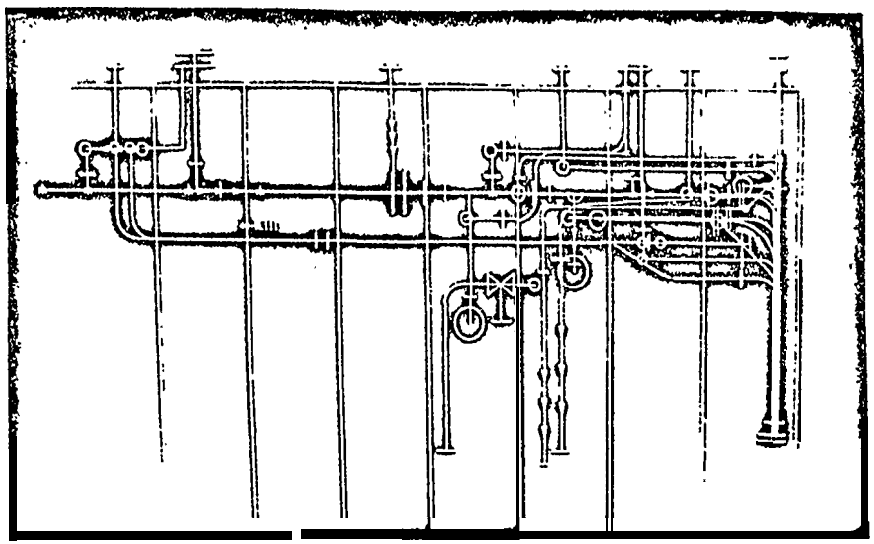
plan

scale up



pipe piece





view change

YM-9000 GRAPHIC DISPLAY

Remote (Full, Half duplex), or Local

- **Refresh type CRT display**
- **17 or 21 inch Screen**
- **2048 X 2048 dot matrix**
- **16 intensities**
- **Blinking, Scroll, Rotate**
- **Light pen, Tablet**
- **Random scan**
- **Analogue stroke**
- **using 2 μ processors**

MAPS - GP Software

- Application Sofware
  - Geometric functions
  - File data management
  - Interactive graphic package (I. G. P.)
  - standard data file maintenance
  - Generate production management data
- Support Software
  - G O S (Graphic Oprating System)
  - Multi programming (4 job)
  - Virtual memory management
  - Fortran executable

III Step MAPS-GP

- Improve the IIstep MAPS-GP

ž Complete it as a tool of production design

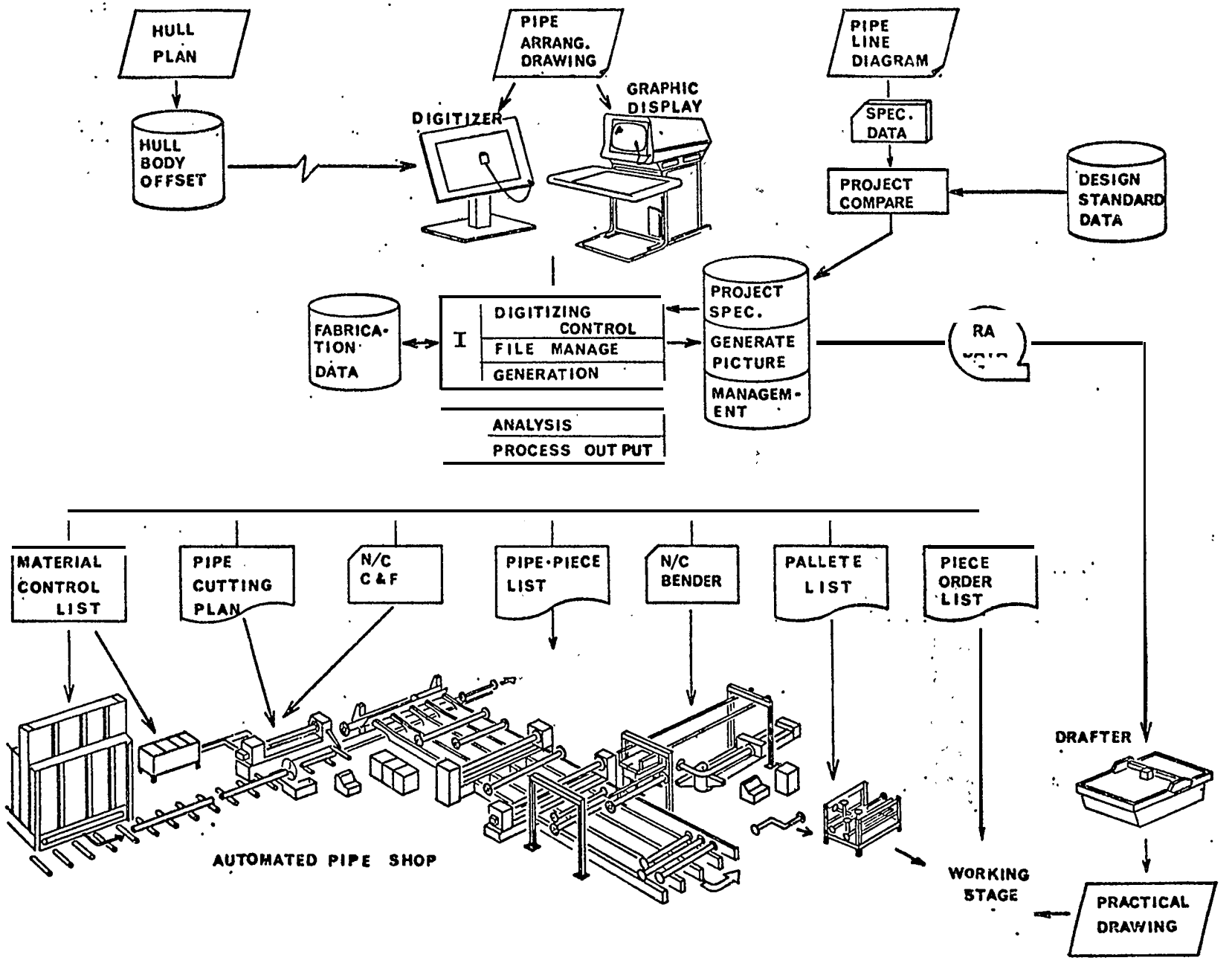
- promote the high contact with pipe shop"

ž Link with host machine (2400 ~ 48000 bpS)

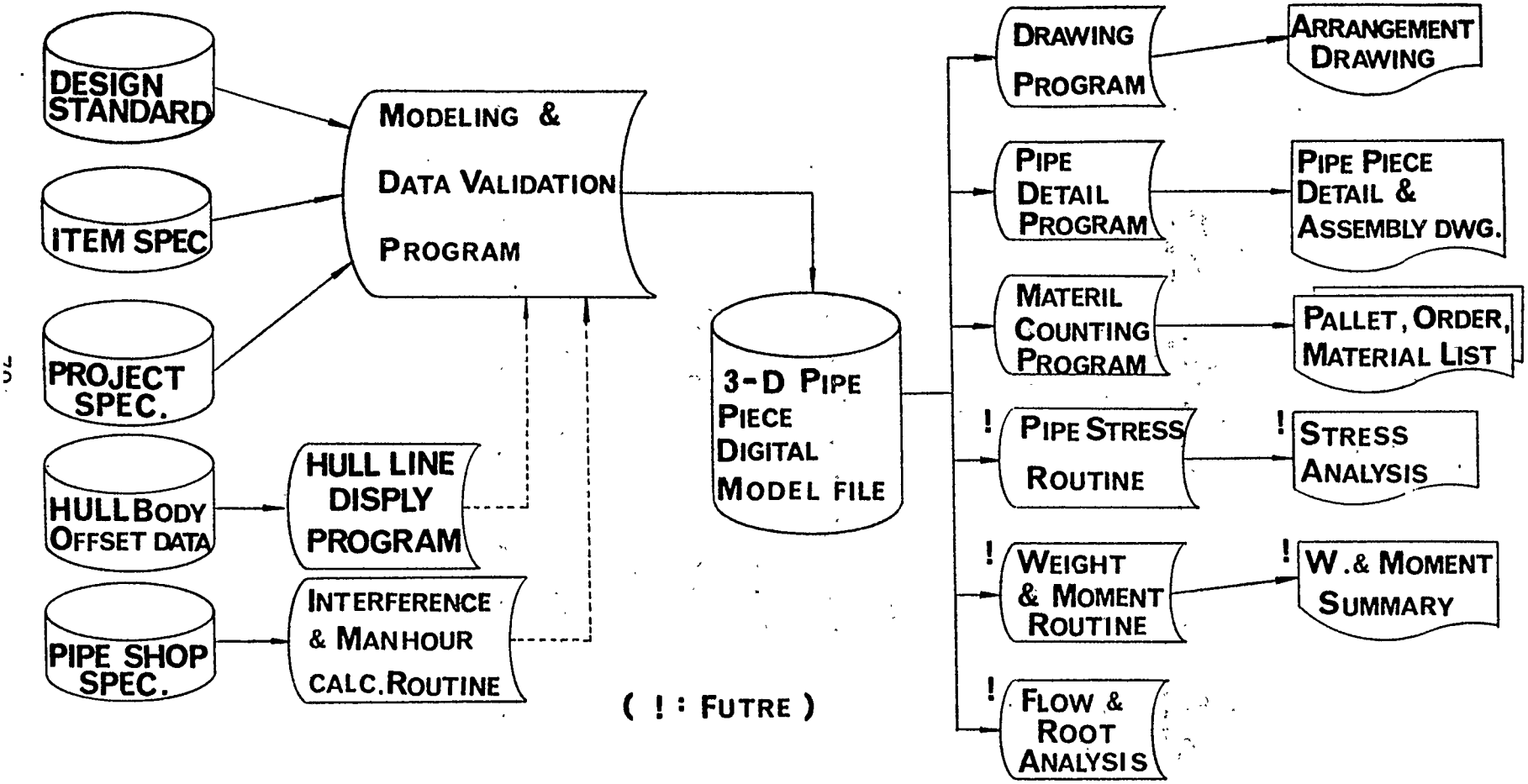
  - Load Sharing System
  - Work Station Type

- Yard plan Drawing

System Diagram



OVERVIEW of FILES & SOFTWARE



MAPS-GP & OBJECTIVES:

- Total production cost down
  - Low cost automation
  - Enhanced Management control
- Maximize Man power & System resource
- Full Modularized System
  - Flexible system
  - Coordinate CAD/CAM System
  - Interface Engineering/Manufacturing
  - General purpose System
- Prmote GP system use by wide segment of industry