

**ROCHESTER INSTITUTE OF TECHNOLOGY
MICROELECTRONIC ENGINEERING**

MESA Process Definition

Dr. Lynn Fuller

Webpage: <http://people.rit.edu/lffeee>

Microelectronic Engineering

Rochester Institute of Technology

82 Lomb Memorial Drive

Rochester, NY 14623-5604

Tel (585) 475-2035

Fax (585) 475-5041

Email: Lynn.Fuller@rit.edu

Department Webpage: <http://www.microe.rit.edu>

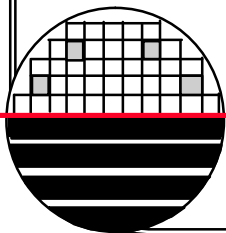
OUTLINE

Introduction

MESA Process Definition

Approach

Example



MES CIM SYSTEMS



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***MESA - MANUFACTURING EXECUTION SYSTEM
APPLICATION***

MESA is an integrated relational database system for discrete part manufacturing (a computerized record-keeping system)

A relational database system is a database in which the data is perceived by the user as tables (and nothing but tables)

Operations include:

Adding new tables to the database

Inserting new data into existing tables

Retrieving data from existing tables

Updating data in existing tables

Deleting data from existing tables

Removing existing tables from the database

Quarrying database tables for specific information

MESA PROCESS DEFINITION

PROCESS CLASS
(MOS, BiPolar, MEMs)

PROCESS

(PMOS ver 1.0, CMOS ver PW-3)

STEPS

(STEP1 STEP2 STEP3STEP78)

SPECIFICATIONS

DOCUMENTS

DOCUMENT TYPE
(TEXT, GRAPHICAL)

DOCUMENT
CLE01.FFT
SHIPLEY.IMG
SCRIBE.IMG

INSTRUCTION GROUP NAMES

OPERATION CLASSES

OPERATION	
CL01	ET01
CV01	ET07
CV02	ET08
CV03	IM01
DE01	OX06
DI01	PH03
DI02	SI01
ET01	TE01

PARAMETER GROUP NAMES

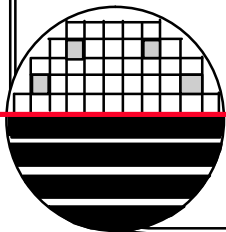
PARAMETER TYPE
(ALPHA, NUMERICAL)

PARAMETER
(XOX)
(XJ)
TEMP
TIME
POWER



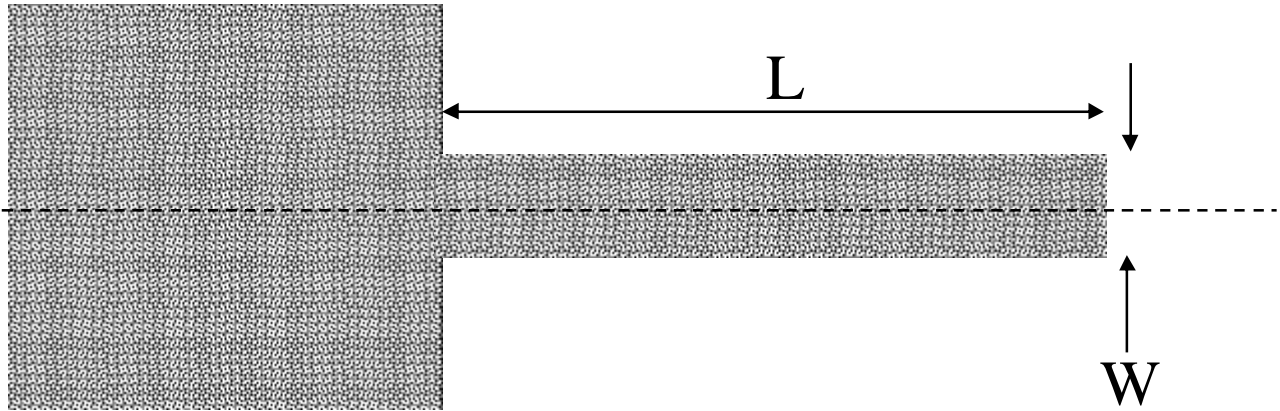
APPROACH

- Sketch out the process flow
- Define any new operations not already in MESA
- Define instructions for each step
- Define parameters for each step
- Define specifications for each step
- Create documents
- Define the process

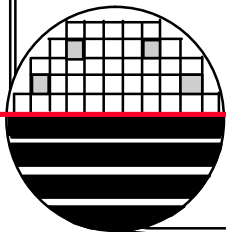
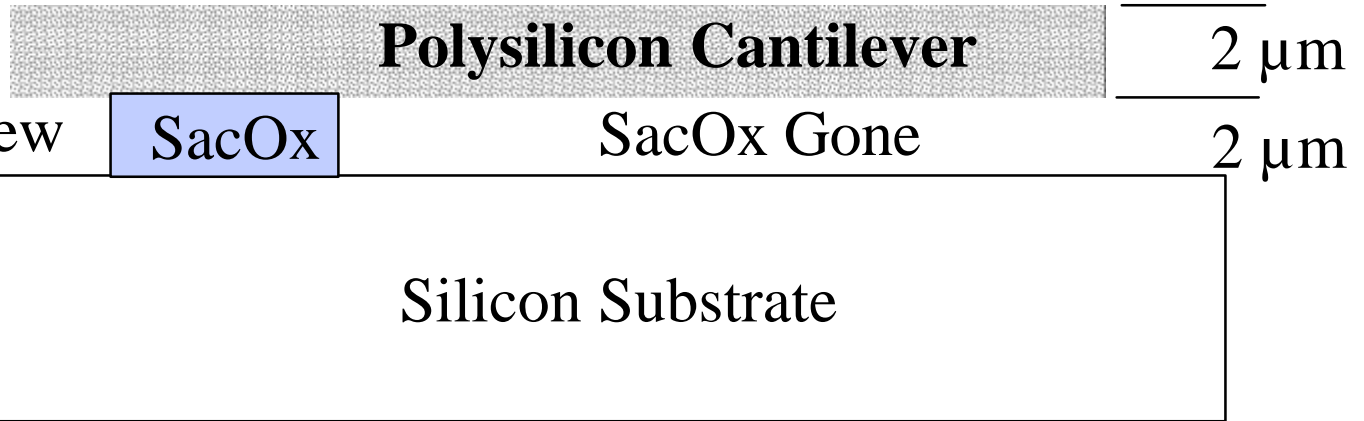


EXAMPLE CANTILEVER STRUCTURE

Top View

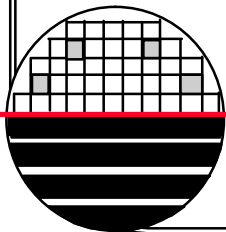


Cross Section View



SKETCH OUT THE PROCESS FLOW

ID wafer
RCA Clean
Grow Sacrificial Oxide
Deposit Polysilicon
Dope Polysilicon
Thick Photoresist Pattern
Etch Polysilicon
Strip Photoresist
Etch Sacrificial Oxide
Test



NEW OPERATIONS

NEW

Thick Photoresist Operation
CMP Operation
Rapid Thermal Operation
Spin-on Glass
Shallow Trench Etch
Etc.

EXISTING

RCA Clean
Wet Oxide Growth
LPCVD Poly
Etc.

DEFINE NEW OPERATIONS

12/16/02
16:58:50

MESA
Operation File Maintenance

OPMSMNT S05201
QPADEV0005 RIT
Page 1 of 8

Type information. Then Enter, or use Roll keys to page.

Action _ 1=Create, 2=Change, 3=Replace, 4=Delete

Plant : RIT

Operation _____

Copy from (Create or replace only):

Plant : RIT

Operation _____

F3=Exit F4=Prompt F5=Refresh F12=Cancel F20=Set Defaults

MA a A 06/031

Connected to remote server/host 129.21.172.163 using port 23

DEFINE INSTRUCTIONS FOR EACH STEP

Instructions include detailed information for each step.

For Example

```
Session A - [24 x 80]
File Edit Transfer Appearance Communication Assist Window Help
FileScan Copy Paste Send Recv Display Color Map Record Stop Play Quit Clipboard Support Index

12/16/02          MESA          IGMSMNT          S06801
17:00:27          Instruction Group Maintenance  QPADEV0005     RIT

Type information. Then Enter.

Action . . . . . 1          1=Create, 2=Change, 3=Replace, 4=Delete
Plant . . . . . : RIT
Instruction group name . . . MEMS RCA_CLEAN
Revision level . . . . . 1.0

Copy from (Create or replace only)
Plant . . . . . : RIT
Instruction group name . . .
Revision level . . . . .

F3=Exit  F4=Prompt  F5=Refresh  F12=Cancel

MA a A 09/038
Connected to remote server/host [29.21.172.163 using port 23]
Start [New Title - CD Pla... C:\POWER.PPT PROCESS.PPT Session A - [24 ... 3:59 PM
```

Roches
Microel

CREATE DOCUMENTS

Documents are text or graphical files stored on a network drive. The J:/ drive resides on a PC in building 17. The J:/mesadoc directory is normally used for these documents.

MEM's Laboratory

HEIGHT MEASUREMENT USING MECHANICAL STYLUS PROFILOMETER

Readout

Film Thickness

Stylus

Film

1,000 Å < Max < 1,000,000 Å

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Example document showing how to measure thickness

MEM's Laboratory

TEST

Probe and apply voltage. It's a good idea to provide current limiting 1000 ohm resistor.

Silicon Substrate

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Example document showing how to electrically activate the cantilever

REGISTER DOCUMENTS IN MESA

```
Session A - [24 x 80]
File Edit Transfer Appearance Communication Assist Window Help
[Icons] Copy Paste Send Recv Display Color Map Record Stop Play Quit Clipboard Support Index

12/16/02          MESA
17:09:03          Document Master Maintenance  DMMSMNT  S08701
                                     QPADEV0005 RIT

Type information. Then Enter, or use Roll keys to page.

Action . . . . . 1=Create, 2=Change, 4=Delete
Document ID . . . . .
Revision . . . . .
```

```
Session A - [24 x 80]
File Edit Transfer Appearance Communication Assist Window Help
[Icons] Copy Paste Send Recv Display Color Map Record Stop Play Quit Clipboard Support Index
Copy selected text to clipboard

12/16/02          MESA
17:11:15          Document Master Maintenance  DMMSMNT  S08702
                                     QPADEV0005 RIT

Document ID . . . . . : RCACLEAN

Type information. Then Enter, or use Roll keys to page.

Description . . . . . RCA Clean
Folder . . . . . J:/MESADOC

Document name . . . . . RCACLEAN.PPS
Help label . . . . .
Access code . . . . . POWERPNT
Status . . . . . 1 1=Active, 2=Inactive
Creator . . . . . LFFEEE
Password . . . . .

F3=Exit F4=Prompt F5=Refresh F10=Show password F12=Cancel
```

DEFINE PARAMETERS FOR EACH STEP

FROM: QDCPMNU

```
12/16/02          MESA          QDCPMNU          S90031
17:17:27          Parameter Definition Menu  QPHDEV0005     RIT

Select one of the following.

1. Parameter ID maintenance          (PIMSMNT)
2. Parameter group maintenance       (PGMSMNT)
3. Parameter ID master inquiry       (PIMSINQ)
4. Parameter group master inquiry    (PGMSINQ)
5. Parameter group detail inquiry    (PGDTINQ)
6. Parameter ID master listing       (PIMSRPT)
7. Parameter group master listing    (PGMSRPT)
8. Resource transaction parameter maintenance (RTRPMNT)
9. Resource transaction parameter listing (RTRPRPT)

Bottom

Selection or command
===> _____
F3=Exit   F4=Prompt   F5=Refresh   F9=Retrieve   F10=Dataset   F12=Cancel

MA a A 22/007
Connected to remote server/host 129.21.172.163 using port 23
```

DEFINE SPECIFICATION FOR EACH STEP

12/16/02
17:16:26

MESA
Specification ID Maintenance

SFMSMNT S07001
QPHDEV0005 RIT
Page 1 of 4

Type information. Then Enter, or use Roll keys to page.

Action 1 1=Create, 2=Change, 3=Replace, 4=Delete
Plant RIT
Specification ID MEMS-CL01
Revision level _____

Copy from (Create or Replace only):
Plant RIT
Specification ID _____
Revision level _____

F3=Exit F4=Prompt F5=Refresh F12=Cancel

MA a A 06/033

Connected to remote server/host 129.21.172.163 using port 23

Start | New Title - CD Pla... | C:\POWERPNT | PROCESS.PPT | Session A - [24 ... | 4:13 PM

DEFINE THE PROCESS

FROM: PCMSMNT

```
12/16/02          MESA          PCMSMNT  S05401
17:23:31        Process File Maintenance QPHDEV0005  RIT

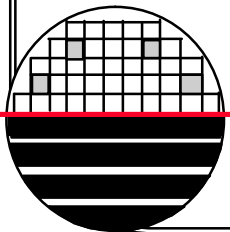
Type information.  Then Enter.

Action . . . . . 1=Create, 2=Change, 3=Replace, 4=Delete
Plant . . . . . RIT
Process . . . . .
Revision . . . . .

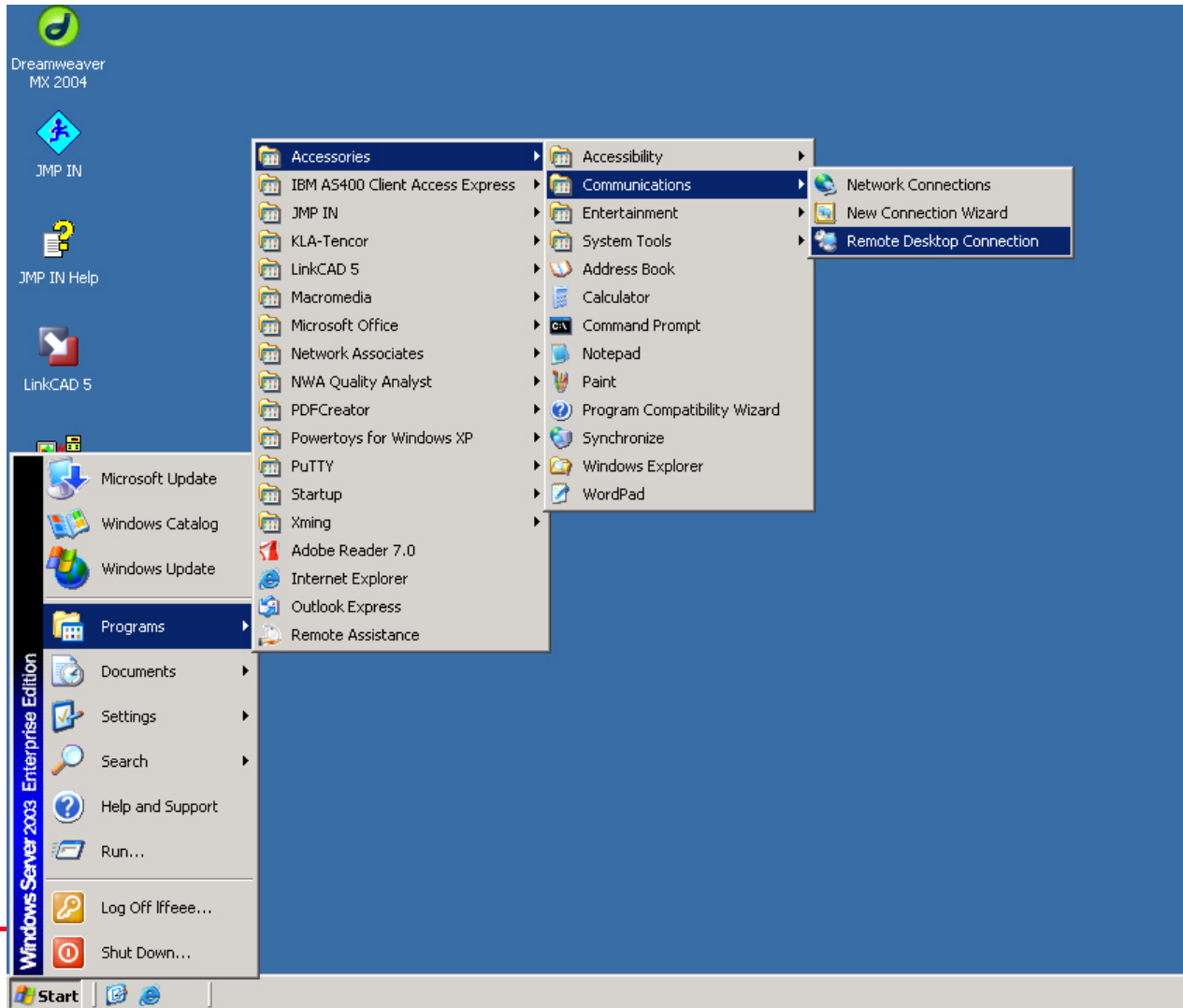
Copy-from (Create or Replace only)

Plant . . . . . RIT
Process . . . . .
Revision . . . . .

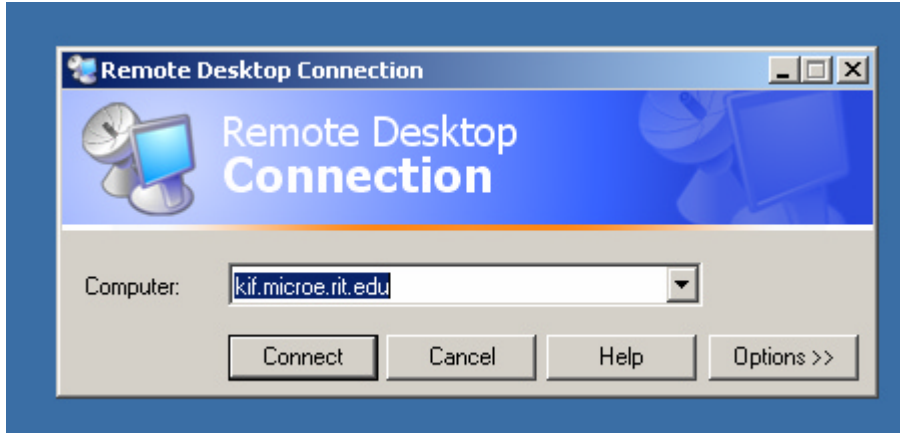
F3=Exit  F4=Prompt  F5=Refresh  F12=Cancel  F20=Sequence options
```



START UP REMOTE DESKTOP



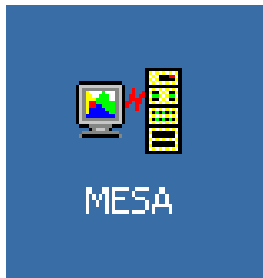
LOG ON TO KIF SERVER, START UP MESA



Type in kif.microe.rit.edu
Click Connect

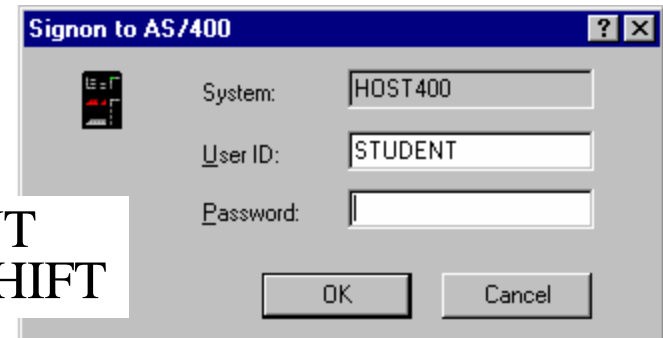
Then: Enter DCE Username and Password
(all registered students should have this)

Then: Click on MESA Icon



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Sign onto AS400:



STUDENT
NIGHTSHIFT

AS/400 SIGN ON

Session A - [24 x 80]

File Edit Transfer Appearance Communication Assist Window Help

PrintScreen Copy Paste Send Recv Display Color Map Record Stop Play Quit Clipbrd Support Index

Sign On

System : HOST400
Subsystem : QINTER
Display : QPADEV0005

User
Password
Program/procedure
Menu
Current library

STUDENT NIGHTSHIFT

(C) COPYRIGHT IBM CORP. 1980, 1999.

MA a 06/053

Connected to remote server/host Host400 using port 23

PLANT AND USER SIGN ON

Session A - [24 x 80]

File Edit Transfer Appearance Communication Assist Window Help

PrtScrn Copy Paste Send Recv Display Color Map Record Stop Play Quit Clipbrd Support Index

12/16/02
10:47:34

MESA
User Signon

MESADB S99901
QPADEV0005 RIT

www.camstar.com

Version . . . : 2.00
A/C level . . : 0011

Type information. Then Enter.

Plant RIT RIT
User ID ——— ENGINEER
Password WAFER

(C) Copyright 1986,1998 Camstar Systems, Inc.
All Rights Reserved.

F3=Exit F12=Cancel

M@a 11/029

Connected to remote server/host Host400 using port 23

MAIN MENU

```
Session A - [24 x 80]
File Edit Transfer Appearance Communication Assist Window Help
Print Copy Paste Send Recv Display Color Map Record Stop Play Quit Clipboard Support Index

12/16/02          MESA          R.I.T u-E  $90000
16:38:05        Main Menu    QPADEV0005  RIT

Select one of the following.

  1. WIP tracking menu          (WIPSMNU)
  2. Files/tables menu         (FTBLMNU)
  3. Quality data collection menu (QDCLMNU)
  4. Planning/scheduling menu  (PSCHMNU)
  9. Resource management menu  (RESCMNU)
 10. Material control menu     (MCTLMNU)
 11. Quality analysis menu     (QUALMNU)
 12. Cost accounting menu     (COSTMNU)
 18. System functions menu     (SYFMNU)
 19. Custom menu              (CUSTOMNU)
 20. Query processing menu     (WRKQRY)
 90. Signoff
 91. Transaction Menu 1

Selection or command
==> FMNTMNU
F3=Exit  F4=Prompt  F5=Refresh  F9=Retrieve  F10=Dataset  F12=Cancel

MR a 22/014
Connected to remote server (host 129.21.172.163 using port 23)
New Title - CD Ma... C:\POWERPNT PROCESS.PPT Session A - [24 ... 3:35 PM
```

File Maintenance Menu
FMNTMNU

MASTER FILES TABLE MAINTENANCE

```
Session A - [24 x 80]
File Edit Transfer Appearance Communication Assist Window Help
PtScrn Copy Paste Send Recv Display Color Map Record Stop Play Quit Clipbrd Support Index

12/16/02
16:49:27

MESA
Master Files/Table Maintenance
FMNTMNU 90021
QPADEV0005 RIT

Select one of the following.

1. Product master maintenance (PDMSMNT)
2. Operation master maintenance (OPMSMNT)
3. Process master maintenance (PCMSMNT)
4. Work center master maintenance (WCMSMNT)
5. Table definition master maintenance (TDEFMNT)
6. Table data master maintenance (TDATMNT)
7. Specification ID master maintenance (SFMSMNT)
9. WIP message master maintenance (WMSGMNT)
10. Instruction group master maintenance (IGMSMNT)
11. Override spec ID master maintenance (OSMSMNT)
12. Process override master maintenance (POMSMT)
13. Document master maintenance (DMMSMNT)
14. Product group master maintenance (PDGPMNT)
15. Note master maintenance (NTMSMNT)

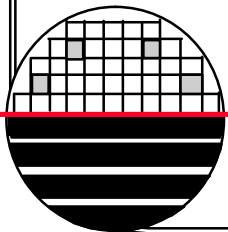
Bottom

Selection or command
==>
F3=Exit F4=Prompt F5=Refresh F9=Retrieve F10=Dataset F12=Cancel

MA a 22/007
Connected to remote server/host 129.21.172.163 using port 23
Start New Title - CD Pla... C:\POWERPNT PROCESS.PPT Session A - [24 ... 3:50 PM
```

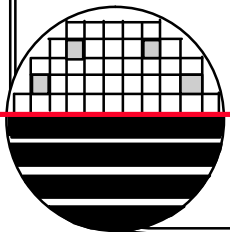
SUMMARY

Process definition is at the core of basic work-in-progress tracking software. MESA needs a process definition in order to do transactions such as MOVE, MOVE-IN, START, SHIP, Etc.



REFERENCES

1. IBM AS/400 Manual.
2. MESA Manual.



HOMEWORK – MESA PROCESS DEFINITION

Create your own process in MESA. (Three steps is enough) Use your name or your initials in naming the various new operations, process, specifications, parameter groups, etc.

1. RCA Clean, Grow Oxide ...

