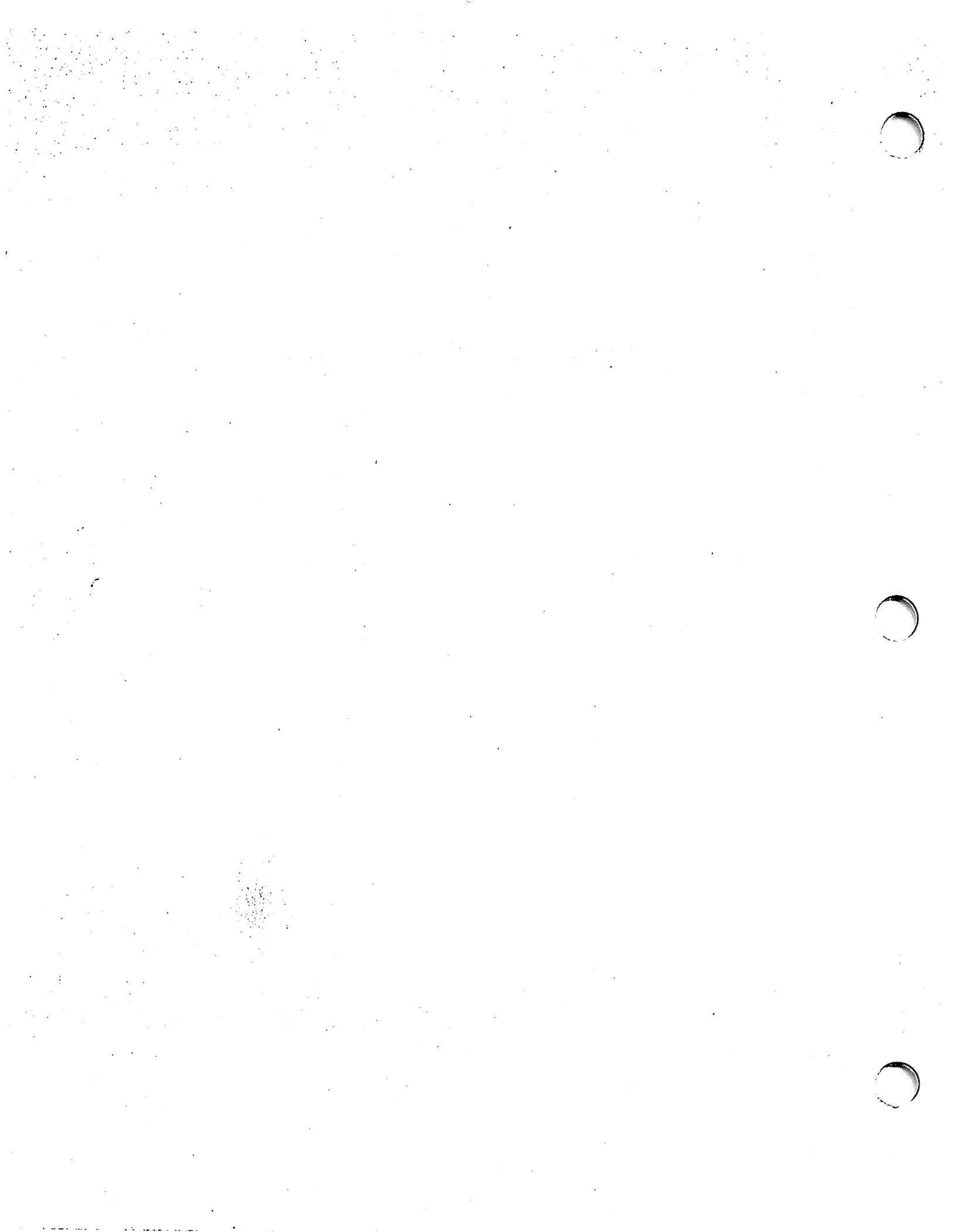


SYSTEM MANAGEMENT - Larry Birenbaum



## SYSTEM

## MANAGEMENT

### Introduction

"System Management" - SM, AM  
organization of accounts, groups, users  
accounting  
capability control  
file security  
Coverage

### Organization of accounts, groups, users

Evolution of structure  
Attributes of structure

2 trees

dual purposes of accounts, groups  
hierarchical

Benefits of structure

partition of files

define relationship between users and groups/files  
"parental limitations" - control hierarchy (SM, AM)

Additional attributes of structure

logon control

groups - logon & home  
accounting

### Capability

Components

Purpose

Use

(Maxpri and local attributes)

## File Security

"Security is a matrix"

Concept

Implementation

access / accessors

Hierarchical protection

Defaults

Other forms

RELEASE

lockword

## Comments on organizational structuring

Basic structure?

Distribution in structure

Interpretation of groups

Applications of groups

## Some examples

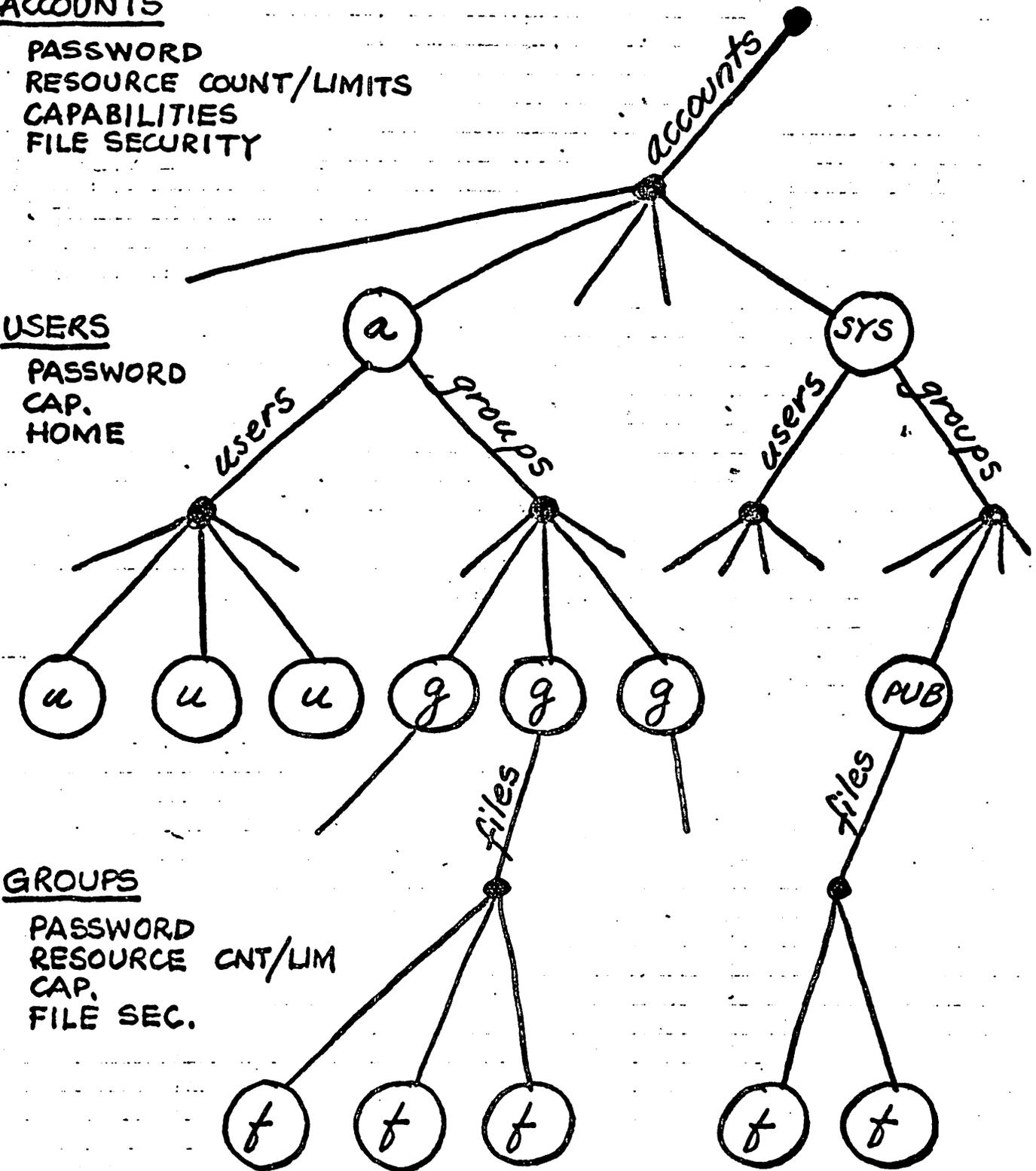
# BASIC STRUCTURE

## ACCOUNTS

PASSWORD  
RESOURCE COUNT/LIMITS  
CAPABILITIES  
FILE SECURITY

## USERS

PASSWORD  
CAP.  
HOME



## GROUPS

PASSWORD  
RESOURCE CNT/LIM  
CAP.  
FILE SEC.

WHAT IT DOES

CAPABILITIES

WHY HAVE IT

SM	SYSTEM MGR.	}	PROTECT SYSTEM CONTROL
AM	ACCT. MGR.		
OP	SYSTEM SUP.	}	TYPE FOR SECURITY
AL	ACCT. LIB.		
GL	GROUP LIB.	}	CHARGABLE
IA	INTERACTIVE		
BA	BATCH	}	CONTROL SYSTEM LOAD
ND	DEVICES		
SF	SAVE FILES	}	PROTECT DEADLOCK
PH	PROCESS		
DS	DATA SEGS.	}	PROTECT SYSTEM
MR	MULT. RINS		
PM	PRIV. MODE		

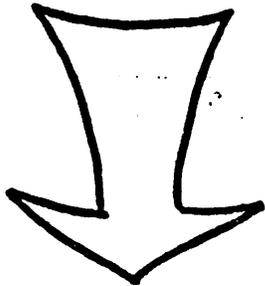
RESTRICT COMMAND ACCESS

RESTRICT INTRINSIC ACCESS

# PROGRAM CAPABILITIES

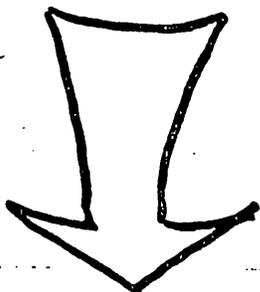
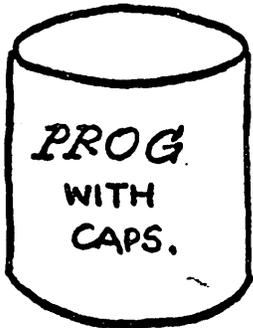
AM, MR, DS, PH

## THE PROTECTION MECHANISM



PREPARE  
WITH  
CAPS.

USER MUST HAVE CAPS.



RUN

PROGRAM FILE'S GROUP  
MUST HAVE CAPS.



# FILE SECURITY

## MATRIX

WHO  
(ACCESSOR)

PROGRAMMER

MANAGER

SECRETARY

WHAT  
(ACCESS)

LOOK AT IT

DELETE IT

ADD TO IT

Y	Y	N	
N	Y	N	
Y	N	Y	

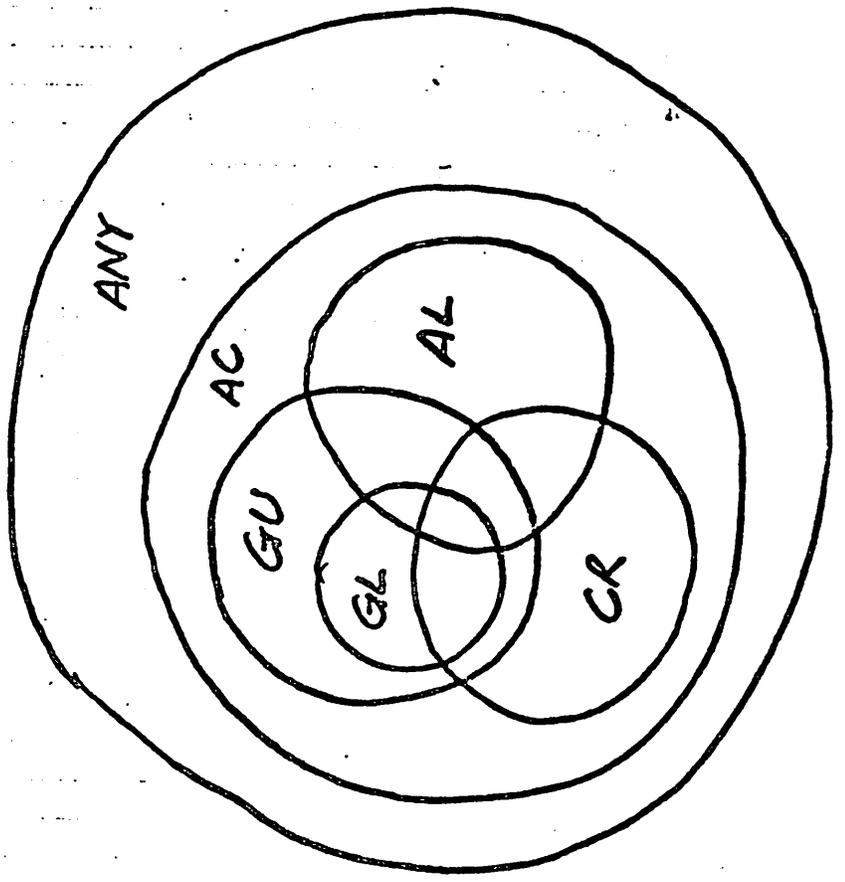
FOR A GIVEN  
FILE ACCESS

ACCESS

- R READ
- A APPEND
- W WRITE
- L LOCK
- X EXECUTE
- S SAVE

ACCESSOR

- ANY ANY USER
- AC ACCT MEMBER
- AL AC ^ AL CAP
- GU HOME ^ LOGON
- GL HOME ^ GL
- CR CREATOR



SOME EXAMPLES

CRITERIA

SOLUTION

GROUP FOR "NEWS" FILE

GROUP SEC- R:ANY A:GU W:S:GL

READ- EVERYONE  
ADD TO FILE- REPORTER  
CREATE/DELETE FILES- EDITOR

REPORTER- HOME = GROUP  
EDITOR- HOME = GROUP; and GL

---

GROUP FOR PROPRIETARY PROGRAMS

GROUP SEC- X:ANY W:S:GU R:GL

RUN- SELECTED PEOPLE  
DELETE/CREATE FILES- LIBRARIAN  
MODIFY PROGRAMS- SYS. PROGRAMMER

[LOCKWORD ON FILES]  
LIBRARIAN- HOME = GROUP  
PROGRAMMER- HOME = GROUP; and GL

---

GROUP FOR DATA COLLECTION

GROUP SEC- A:ANY R:GU S:AL W:GL

ADD TO FILES- SALESMEN  
READ- DISTRICT MANAGERS  
DELETE & MODIFY- SALES MANAGER  
CREATE FILES- SYS. PROGRAMMER  
(special format)

---

DISTRICT MGR- HOME = GROUP  
SALES MGR- HOME = GROUP; and GL  
PROGRAMMER- AL

---

SIMPLE ACCOUNT

UNLIMITED ACCESS TO ALL USERS  
N MALICIOUS USERS

give everyone AM

(MORE EXAMPLES)

GROUP FOR TIME ACCT'G ONLY; NO FILES

- give PASSWORD to authorized users.
- GROUP SEC - R:GU

GROUP FOR FILES ONLY; NO TIME ACCT'G

- give PASSWORD to no one!
- GROUP SEC - as required.

ACCT. WITH NO FILES; SAVE ACCESS DISALLOWED - don't give account SF

USER WITH TWO PRIVATE GROUPS

- HOME = GROUP1
- logon with GROUP2 (PASSWORD)
- (default group security)

"SECURITY IS A MATRIX"

JAIL

