

6/18/75

NOTES ON THE  
USE OF THE NRAO COMPUTER FACILITY

TO: Summer Students

FROM: Ted McKenna

I. INTRODUCTION

A. NRAO Computer Hardware

1. CPU = IBM 360 Model 65
2. Core Storage = 1.25 megabytes
3. I/O Devices
  - a. 6 Mag Tape Drives - 1 7-track; 5-9 track
  - b. 1 2540 Card Reader - Card Punch
  - c. 1 1403 1100 LPM Printer
  - d. 1 Calcomp Drum Plotter - on-line
  - e. 8 Memorex 3670 Disk Drives
  - f. 1 RJE Station in Green Bank
  - g. 12 CRT Terminals

B. Software

1. Release 21.7 of IBM's OS MFT with HASP
  - a. Normal Operation:
    - 2 106K Partitions for Graphics/Batch
    - 4 106K Partitions for Batch
    - 1 258K Partition for large Batch
  - b. Special Runs
2. Compilers
  - a. FORTRAN H & G
  - b. PL/1 Optimizer
  - c. Assembler
  - d. ALGOL (?)
3. Supportive
  - a. Calcomp Software
  - b. IBM's Sort/Merge SM01
  - c. Various Standard Reduction Packages
  - d. TEK Graphics
  - e. OS Utilities
  - f. Pandora

## II. SUBMITTING JOBS TO THE COMPUTER

### A. Batch Input

1. Job Submittal Card - Required
2. JCL Statements (// col 1 & 2)
  - a. JOB (always 1st card - identification & accounting)
  - b. EXEC - execute program or catalogued procedure
  - c. DD - data definition
  - d. /\* - comment
  - e. PROC - procedure (catalogued or in-stream)
  - f. PEND - procedure end
  - g. // - null - not used
  - h. /\* - delimiter - not used except for very special situations
3. Continuation of JCL Statements
  - a. Comma after last operand (before Col 72)
  - b. // Col 1 & 2 with continued operand starting between Col 4 thru 16
4. Examples
  - a. Job submittal
  - b. JOB
  - c. EXEC
  - d. DD

## NRAO JOB SUBMITTAL CARD

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SUBMITTER

JOB NAME _____ *	* _____	TAPE NO.	RING IN	7 TRK.	NO LABEL
JOB CLASS _____ *	CPU TIME _____ MINUTES	_____	( )	( )	( )
SPECIAL OUTPUT: <u>PUNCH</u> <u>CALCOMP</u>		_____	( )	( )	( )
SPECIAL FORMS _____		_____	( )	( )	( )
USER DISK SERIAL NUMBER _____		_____	( )	( )	( )
SPECIAL INSTRUCTIONS ON REVERSE SIDE _____					

REYCO

IBME28758

### NOTES:

1. Job submittal card required for all Batch Processing
2. Minimum info to supply - \*
  - JOB NAME
  - SUBMITTER
  - JOB CLASS
3. Job class info
  - a. Sign in Key punch Room
  - b. Sign above computer I/O shelves
  - c. Handout (job classes)
4. Special utility services provided by operations
  - a. Require job names as indicated on handout  
(utility services - operations)

## NRAO JOB CLASSES

NRAO job classes are primarily based on total CPU time required for the job as printed under JOB TIME in the accounting information listed with printouts. Classes B, C, D, E and F listed below assume that the job will execute entirely in a 106K partition and that they require no more than some combination of 1 seven and 2 nine track tape drives.

Two other classes are available to handle all other jobs. Class L handles frequent need for a 212K partition. Class O takes care of all other odd jobs. Be sure to specify the CPU time and core requirements on the submittal card.

The use of the TIME parameter on the job card is strongly encouraged. Any job without a TIME parameter will be cancelled as soon as the operator notices that it has exceeded the time for its class.

"t" IS EQUAL TO CPU TIME IN MINUTES

B	$t \leq 2$	
C	$2 < t \leq 5$	106K partition
D	$5 < t \leq 10$	any combination of 1 seven
E	$10 < t \leq 20$	and 2 nine track tape
F	$t > 20$	drives
L	Large partition 212K bytes	
O	Odd runs and special setup requirements User disk packs More than 2 nine track drives or 2 seven track drives over 212K bytes of core, please specify partition requirements for all class O runs.	

UTILITY SERVICES  
 PROVIDED BY COMPUTER OPERATOR

## PROGRAM NAME

- |   |                                      |
|---|--------------------------------------|
| 1. Reproduce card decks _____   | "REPRO"                              |
| 2. List card decks _____  | "LIST"                               |
| 3. Reproduce and list decks _____   | "DUPLIST"                            |
| 4. Translate punched cards from 026 to 029 _____  | "TRANSLAT"                           |
| 5. Label tapes with standard NRAO Label.<br>Writes first 2 records of header label<br>on tape.              | "LAB 1600"<br>"LAB 800"<br>"LAB7TRK" |
| 6. Index of tape records, length and block<br>size.   | "TAPINDX"                            |
| 7. Copy data from one form to another, i.e.,<br>tape to tape, tape to card<br>tape to printer, card to tape | "DEBE"                               |
| 8. Delete uncataloged disk data sets. _____   | "SCRATCH"                            |
| 9. List cataloged disk data sets. _____   | "SUPERLST"                           |
| 10. Reproduce card decks and punch sequence<br>numbers in CC 76-80.   | "SEQUENCE"                           |
| 11. Print address labels from user supplied<br>cards.   | "ADDRESS"                            |









EXEC  
(continued)

Of the various parameters which can be coded on the EXEC statement, only the following may be useful at NRAO:

1. ,TIME=(MIN,SECS)/(,SECS)/MIN - applies CPU time limit to the specific step in which it is used - great for breaking infinite loops or uncovering unusual problems.
2. ,PARM=PARAMETERS - some programs have specific data of a control type which can be passed to them via PARM=. You must consult each program to determine what, if any, PARMS can be used and their coding SYNTAX.
3. ,COND=CONDPARM - primary use is for complicated, multiple step jobs whose execution depends upon the result of a prior job step execution. Consult the JCL reference text for details.

## DD STATEMENT

Of the various JCL statements, this one is the most complicated due to its many parameters and uses.

The primary DD parameters which you will use at NRAO are as follows:

<u>PARAMETERS</u>	<u>USE</u>	<u>COMMENT</u>
//	Coded in Col. 1 & 2	<u>Required</u>
DDNAME	1-8 alphanumeric characters starting in Col. 3	<u>Optional</u>
DD	Must be preceded and followed with at least 1 blank	Required
*	Identifies input data with no JCL	
DATA	Identifies input data containing JCL	
DUMMY	Bypasses I/O	
DCB=	Data control block	
DISP=	Describes the status of the dataset	
DSN=	Data set name - fully qualified	
LABEL	Used for tape processing only	
SPACE	Disk storage space to be allocated for new datasets	
UNIT	Specifies the device or device type on which a dataset resides	

1. Special DDNAMES

- a. JOBLIB - identifies private library for use for JOB
- b. STEPLIB - identifies private library for use for STEP
- c. SYSUDUMP - defines a dataset on which a DUMP can be written if job abnormally terminates
- d. SYSIN - defines input dataset

DD STATEMENT  
(continued)

## 2. Special DD Operands

- a. 'SYSOUT=' - Identifies output dataset

<u>OPERAND</u>	<u>EXPLANATION</u>
SYSOUT=A	Directs output to the Printer
SYSOUT=B	Directs output to the Cardpunch
SYSOUT=O	Directs output to the Calcomp Plotter
SYSOUT=T	Directs output to a special forms Queue for upper/lower case printout

DD STATEMENT  
(continued)

Prior to discussing specific details associated with the DD statement, the following background info is useful to understand its peculiarities and application at NRAO.

I. DATASETS

A. Type of Organization	Nemonic ID	Device
1. Partitioned	PO	Disk
2. Direct Access	DA	Disk
3. Sequential	PS	Tape/Disk
4. Indexed Sequential		Disk

B. Status

1. Temporary - not cataloged - scratched at EOJ
  - a. User defined
  - b. System defined
2. Non-Temporary - newly created or previously existed
  - a. User defined
  - b. Cataloged - (?)

C. SYSCTLG

1. General
  - a. Resides on SYSRES (Ann)
  - b. Contains DSN and Pointer to VTOC
  - c. DSN may exist in name only
  - d. All DSN not necessarily cataloged

II. MAG TAPE DEVICE USAGE

No.	Trks	BPI	Unit=(Generic Name(s))
1	7	200/556/800	TAPE7/SYSSQ7
5	9	800/1600	TAPE/SYSSQ

III. DISK USAGE

A. Space

1. Physical

- a. 13030 Bytes/Track (Maximum-Unblocked)  
19 Tracks/Cylinder  
404 Cylinders/Pack

## 2. NRAO use:

Serial No.	Use	Status	Units (generic name)
Ann	System Volume	Private	--/SYSDA
Becky	Storage	Resident	DISK/SYSDA
Carol	Storage	Resident	DISK/SYSDA
Donna	Storage	Resident	DISK/SYSDA
Elaine	System Use	Demountable	--
Faithl	Hasp Spooler	Resident	--
Hope	Storage	Resident	DISK/SYSDA

## II. Use of the DD parameters - brief treatment

### A. Special DD cards

```
//SYSIN      DD *  
//SYSIN      DD DATA  
//SYSPRINT   DD SYSOUT=A  
//SYSPUNCH   DD SYSOUT=B  
//SYSUDUMP   DD SYSOUT=A
```

### B. DISP=(x,y,z)

#### 1. X Values

- a. NEW - for creating a new dataset - automatic default provides exclusive control of the dataset.
- b. OLD - for existing datasets - provides exclusive control.
- c. SHR - existing dataset which can be shared (required for accessing Pandora Data Sets)
- d. MOD - for extending existing datasets - device positioned after last data record.

#### 2. Y Values

- a. DELETE - release the space for the dataset - remove VTOC entry - for 'EXISTING' datasets.
- b. KEEP - dataset to remain on volume after the end of this job (default value)
- c. PASS - Passed to subsequent job steps
- d. CATLG -

#### 3. Z Values for Abnormal Termination of Step

- a. DELETE/KEEP/CATLG/UNCATLG/

## COMMAND FORMATS

COMMAND FORM	NOTES
ADD <MEMBER_NAME>	
BYE	
CHANGE <LINE_NUMBER>	
CLEAR	
DELETE <LINE_NUMBER>, <LINE_NUMBER>	SECOND L.N. MAY BE OMITTED
ENTER <MEMBER_NAME>	IF MEMB. OMITTED, WRKSPACE IS ASSUMED.
GET <MEMBER_NAME>, <USER_I.D.>	USER I.D., IF OMITTED, => YOU
INSERT <LINE_NUMBER>, <FRACTION>	LN.FR MUST NOT EXIST IN WS
LIST <LINE#>, <#LINES>, <MEMB.>, <USER>	IF USER OMITTED, "MYSELF".
	IF MEMB OMITTED, W.S.
	IF #LINES OMITTED, A "PAGE"
	IF LINE# OMITTED, TAKE NEXT
	IF #LINES="*", SCROLL.
	IF LINE#="*", ASSUME LINE 1
LISTPDS <USER_I.D.>	USER I.D. MAY BE OMITTED
REPLACE <MEMBER_NAME>	MEMBER MAY BE THUS CREATED
SAVE	SAVE W.S. INTO "GET" FILE
SCRATCH <MEMBER>, <MEMBER>, ...	UP TO 7 MEMBERS
SEQUENCE	ALWAYS SEQ NON-PANDORA MEMB
SETTABS <COL#>, ..., <COL#>	SET TAB POSITIONS (UP TO 7)
SUBMIT <MEMBER>, <MEMBER>, ...	UP TO 7 MEMBERS
	IF MEMBER="*", TAKE W.S.

101-Kenna

NATIONAL RADIO ASTRONOMY OBSERVATORY  
Charlottesville, Virginia

April 17, 1975

MEMORANDUM

TO: All Pandora Users

FROM: Ted McKenna

SUBJECT: Pandora Utilities

In order to reduce duplication, eliminate (?) JCL errors, and improve the Computer Division services, a new dataset has been added to Pandora for your use.

When you are logged onto your dataset, the Pandora PDS list can be obtained by entering:

LISTPDS PANDORA

To obtain the syntax rules for use of the utilities, enter:

L 1,22,UTILITY,PANDORA

I am still adding items and debugging. Your suggestions, comments, criticism (and even praise) will be accepted.



McKenna

NATIONAL RADIO ASTRONOMY OBSERVATORY  
Charlottesville, Virginia

June 10, 1975

MEMORANDUM

TO: NRAO Pandora Users  
FROM: Ted McKenna *TM*  
SUBJECT: Maintenance of, and loading card images to, Pandora Datasets

1. Maintenance of Pandora Datasets

The number of Pandora users has increased to the point where compression of fragmented (more than 1 extent) datasets requires a significant amount of CPU time. This activity can be greatly reduced if each Pandora user compresses his/her own dataset when the amount of free space is only a couple of tracks. After a 'SAVE' or 'REPLACE', the following message appears on the Pandora terminals:

PDS HAS 'P' EXTENTS. TOTAL SPACE 'Q' CYL 'RR' TRK. FREE SPACE 'X' CYL 'YY' TRK.

When X = 0 and YY = 02/01 clear the workspace and

GET COMPRESS,PANDORA  
L

Caution: If P > 1, this procedure is not recommended

2. Loading Card Images to Pandora Datasets

On 6-9-75, several terrible crashes of Pandora resulted when a user accessed various members of his Pandora Dataset. Investigation of the crashes indicated that three of the members did not get properly loaded. I urge you to refer to the JCL depicted in the Pandora member which can be listed:

L 1,\*,CRDTPDS,PANDORA