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## The RHIC Data Base

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**Brookhaven National Laboratory**

**U.S. Department of Energy**

USDOE Office of Science (SC)

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High Energy Facilities

RHIC-12

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RHIC Technical Note No. 12

The RHIC Data Base

S. Y. Lee

October 23, 1985

## I. RHIC Data Base

H. Hahn, T. Ludlam and I have set up a data base for the Relativistic Heavy Ion Collider. The data base, set up in June 1985, is located at:

BNLDAG"RHIC RHIC":DUA1:[RHIC]

It will provide the following capabilities:

1. It will allow communication among RHIC project contributors.
2. Essential programs in the design and operation of the RHIC will be located inside the data base. Anyone interested in the RHIC can access these files and work.
3. Essential programs, such as SYNCH, MAD, HARMON, etc., can be grouped together. This would help increase the calculational power.
4. National access of the data base through VAXNET, BITNET, or ARPANET will be possible. This will promote cooperation among colleagues in other national laboratories.

At present, the data base is set up with several subdirectories:

|       |   |
|-------|---|
| AGS   | AGS lattice and beam properties needed for RHIC operation                       |
| AP    | Accelerator Physics programs open to all users in the laboratory through VAXNET |
| BOOST | AGS Booster   |
| CRYO  | Cryogenic data needed for RHIC operation  |
| MAG   | Magnet specification and information needed for the operation                   |
| MAIN  | RHIC Collider   |
| PARA  | Parameter list of the collider.   |
| PHYS  | Physics requirements for the collider   |
| VACU  | Vacuum specification and data around the collider                               |

## II. How to Use the RHICDB

Members of the RHIC Task Force who are interested in the RHICDB should be registered in the Data Base in order to log into the system. Once you log in to the system, consult the VAX operating system manuals<sup>1-3)</sup>.

| <u>To communicate with</u> | <u>Use</u>                                     |
|----------------------------|--|
| CDC7600                    | Consult with the CYBERVAX manual <sup>4)</sup> |
| CDC6600                    | CYBERVAX or CDCLINK.                           |

The CDCLINK resides in DAGVAX. If you type \$CDC <CR>, you can find a list of commands for file transfer and job submission.

The organization of the data base will be as following:

1. A set of globally defined symbols [in login. com] such as root, AGS, AP, BOOST... etc., enable the user to move around the directories easily.
2. Each subdirectory should have a file called "subdirectory.INF", so that users can find the proper file to work.
3. The author should put his name inside the program so that other people can refer to it. The authors are encouraged to create a file, e.g., your program INF to inform other people about the result of your calculation.
4. When you have worked on the data base, you should leave a few sentences of message in the file ZRHIC.NEW.

## III. Present Status

Since the data base was just set up recently, it remains incomplete. Many of the subdirectories are empty. Lattices for AGS, BOOSTER and RHIC are now in the DB. Some programs such as MAD version 4.03 and the stand alone HARMON are in the [RHIC.AP] (see Appendix). Programs used in the calculation of the crossing geometry of RHIC and in the study of microwave instability across the transition energy are also in the DB.

Everyone is welcome to contribute his work and results to the data base. Hopefully, the data base will be useful to everyone. Current listed users are:

|               |             |
|---------------|-------------|
| J. Claus      | (claus)     |
| E. D. Courant | (edc)       |
| F. G. Dell    | (dell)      |
| H. Hahn       | (hahn)      |
| R. Gupta      | (gupta)     |
| S. Y. Lee     | (syl)       |
| T. Ludlam     | (ludlam)    |
| S. Tepikian   | (tepinkian) |
| P. Thompson   | (pat)       |

#### References

- |  |             |
|--|-------------|
| 1. VAX/VMS Command Language User's Guide | AA-D023C-TE |
| 2. EDT Editorial Manual                  | AA-J726A-TC |
| 3. VAX-II FORTRAN User's Guide           | AA-D035C-TE |
| VAX-II FORTRAN Language Reference Manual | AA-D034C-TE |
| 4. CYBERVAX User's Guide                 |             |

APPENDIX

BROOKHAVEN NATIONAL LABORATORY

MEMORANDUM

DATE: September 20, 1985

TO: Accelerator Physics Group, HEF, NSLS

FROM: S.Y. Lee and R. Gupta

SUBJECT: Programs for Accelerator Design Studies

Besides the well known SYNCH, programs commonly used in the accelerator design studies are:

- (a) MAD version 4.03 (which also contain HARMON) author C. Islin
- (b) HARMON stand alone version, author M. Donald

These programs were transferred to us on August 7, 1985 from M. Donald (SLAC). Executable files of two programs are put on DAGVAX. The executable files reside on

DAGVAX::DUAL:[RHIC.AP]

Anyone who is interested in using these two programs is welcome to use them. Please do note the following minor modifications.

[1] MAD403 -> MAD403S.EXE

(A) REF: "MAD PROGRAM REF. MANUAL" F.C. Islin CERN-LEP-TH/85-15

(B) STATUS

- a. The arithmetic expression is expanded to include TAN ( ), ATAN ( ), ACOS ( ) in Section 3.3.
- b. The dimension has been increased to 1800 elements in MAD403L.EXE.
- c. Input data file must be written in capital letters.
- d. How to use it:
  - \$ ASSIGN your input file FOR005
  - \$ RUN DUAL:[RHIC.AP]MAD403S.EXE.

(C) Future Improvements

We intend to modify the program so that it can execute subroutines such as SYNCH. If you have any problems or suggestions, please contact S.Y. Lee at Extension 3702 or R. Gupta at Extension 4805. If you need the source code, contact us also.

----->

[2] HARMON [You can also execute HARMON in MAD]

(A) REF: A User's Guide to the HARMON Program,  
M. Donald and D. Schofield (LEP Note 420)

Note: The input format of this REF is slightly out  
of date. The Tape 5 input format remains  
correct. The output (TAPE9) remains the same.

(B) STATUS:

(a) A small program has been written to translate the TAPE5 (output) of  
SYNCH CYC command into TAPE 3 of HARMON and CATALOG that TAPE 3 in  
CYBER 6600. CDCLINK should be used to transfer that file to DAGVAX  
in order to execute HARMON with SYNCH output.

(b) How to use it -

(i) If you have FOR003.DAT file from the MAD calculation  
you could simply do  
\$ ASSIGN (your HARMON command file) FOR005  
\$ RUN DUAL:[RHIC.AP]HARMON.EXE

(ii) If you have TAPE5 file from your SYNCH calculation in CDC7600  
then

(a) Submit a job to CDC7600 with

```
ATTACH,MN,SYNHAR,ID=ADSGN
ATTACH,TAPE5,your Synch output file,ID = Your id.
REQUEST,TAPE3,*PF
FILE,TAPE3,RT=Z,BT=C,FL=80.
MN.
CATALOG,TAPE3,(Your HARMON file),ID = Your id ,ST=MFA.
```

\*EOR

DATA: NSUP, MSYM (format (I8, L8))  
TITLE TO BE WRITTEN INTO TAPE3

NOTE: NSUP = number of superperiod  
MSYM = logical information (T or F) on the  
symmetric (T) or non-symmetric (F) design.

(b) Use CDCLINK to read (your HARMON input file) from MFA.  
Then follow the instruction of (i).



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```
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ATTACH,TAPE5,your Synch output file,ID = Your id.
REQUEST,TAPE3,*PF
FILE,TAPE3,RT=Z,BT=C,FL=80.
MN.
CATALOG,TAPE3,(Your HARMON file),ID = Your id ,ST=MFA.
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\*EOR

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NOTE: NSUP = number of superperiod  
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