

RHIC Ring Element Nomenclature System

H. Hahn

October 1990

Collider Accelerator Department
Brookhaven National Laboratory

U.S. Department of Energy
USDOE Office of Science (SC)

Notice: This technical note has been authored by employees of Brookhaven Science Associates, LLC under Contract No. DE-AC02-76CH00016 with the U.S. Department of Energy. The publisher by accepting the technical note for publication acknowledges that the United States Government retains a non-exclusive, paid-up, irrevocable, world-wide license to publish or reproduce the published form of this technical note, or allow others to do so, for United States Government purposes.

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

AD/RHIC/RD-24

RHIC PROJECT
Brookhaven National Laboratory

RHIC Ring Element Nomenclature System

H. Hahn, C. Rufer and J. Sondericker

October 1990

RHIC RING ELEMENT NOMENCLATURE SYSTEM

H. Hahn
C. Rufer
J. Sondericker

Introduction

A technical note (RHIC-AP-14) was published by Hahn, in March 1985, that presented a nomenclature system which identified RHIC main magnets and their position in the ring structure.

A revised nomenclature system is described in this technical note which supersedes the earlier version. This present designation completes the 1985 note and has been enlarged to take into account practical considerations - like machine installation and operation. Since RHIC will become part of an ever increasing string of machines, to be operated from a central control facility, the new nomenclature system is compatible with the requirements of the Control Group, data base design described by Booster Tech. Note No. 166 of May 24, 1990, by E. H. Auerbach.

Details of the new nomenclature system have been reviewed and accepted by the RHIC Layout Task Force and the scientific and professional staff of the Accelerator Development Department.

The convention upon which the new nomenclature system is based consists of the use of two fields separated by a dash. The first set of symbols specifies graphical location in the ring (zip code) and the second to the right of the dash describes the tag name of the machine element, element properties etc.

RHIC Ring Geographical Structure

1. The two rings are identified as YELLOW (Y) and BLUE (B). Particles in the Y-ring travel in the counter clockwise direction, and clockwise in the B ring. For practical reasons the sextants are also identified as INNER (I) and OUTER (O).

2. Each ring is divided into 12 half-sextants. Each half-sextant is fully defined by
- the clock position 01 to 12
 - the inner/outer position
 - the blue/yellow label

For instance, the one o'clock position starts at the center of the arc at one o'clock and ends just before the cross-over point at the two o'clock position. The two o'clock position starts with the cross-over point at two and ends just before the center of the arc at the three o'clock position etc. as illustrated in Fig. 1. The position of an accelerator element is therefore given by the following set of geographical identifiers:

Inner Sextants <u>either/ or*</u>		Outer Sextants <u>either/ or*</u>	
	BI01 I1	YO01 O1	
	YI02 I2	BO02 O2	
	YI03 I3	BO03 O3	
	BI04 I4	YO04 O4	
(dump)	BI05 I5	YO05 O5 (injection)	
(dump)	YI06 I6	BO06 O6 (injection)	
	YI07 I7	BO07 O7	
	BI08 I8	YO08 O8	
	BI09 I9	YO09 O9	
	YI10 I10	BO10 O10	
	YI11 I11	BO11 O11	
	BI12 I12	YO12 O12	

* On drawings and schematics and where there is no loss of clarity, the shortened geographical identifiers may be used.

A dash (-) separates the geographical identifier from the element description. Thus a typical address would look like this: BO11-XXXX where the four X's indicate the machine element name or qualifier.

Numbering of Dipole and Quadrupole Magnets and Quadrupole Assemblies

1. The quadrupoles of a half sextant are numbered consecutively Q1 to Q21 always starting from the crossing and going either in clockwise or counterclockwise direction. Q21 therefore always resides at the center of the arc. This is best illustrated by Fig. 2. Where required (e.g., in the data base) the numbering goes from 01 to 21.

2. The dipoles of a half sextant are numbered according to the quadrupole position, e.g. the dipole number follows the quadrupole number. The dipole common to both beams near the crossing point is called DX. Fig. 2 explains the scheme.

3. Correctors and sextupoles which form permanent sub-assemblies with quadrupoles, are called Q+C and Q+C+S assemblies and carry the same number as their associated quad.

A Structured System of Element Description

Machine elements are called by their generic names with qualifiers added. Abbreviations to be chosen should be suggestive to initiated persons, as short as possible and be unique. For instance, dipoles may be of the following kinds:

	<u>Abbreviation</u>
Dipole	D
Dipole Vertical	DV
Dipole Horizontal	DH

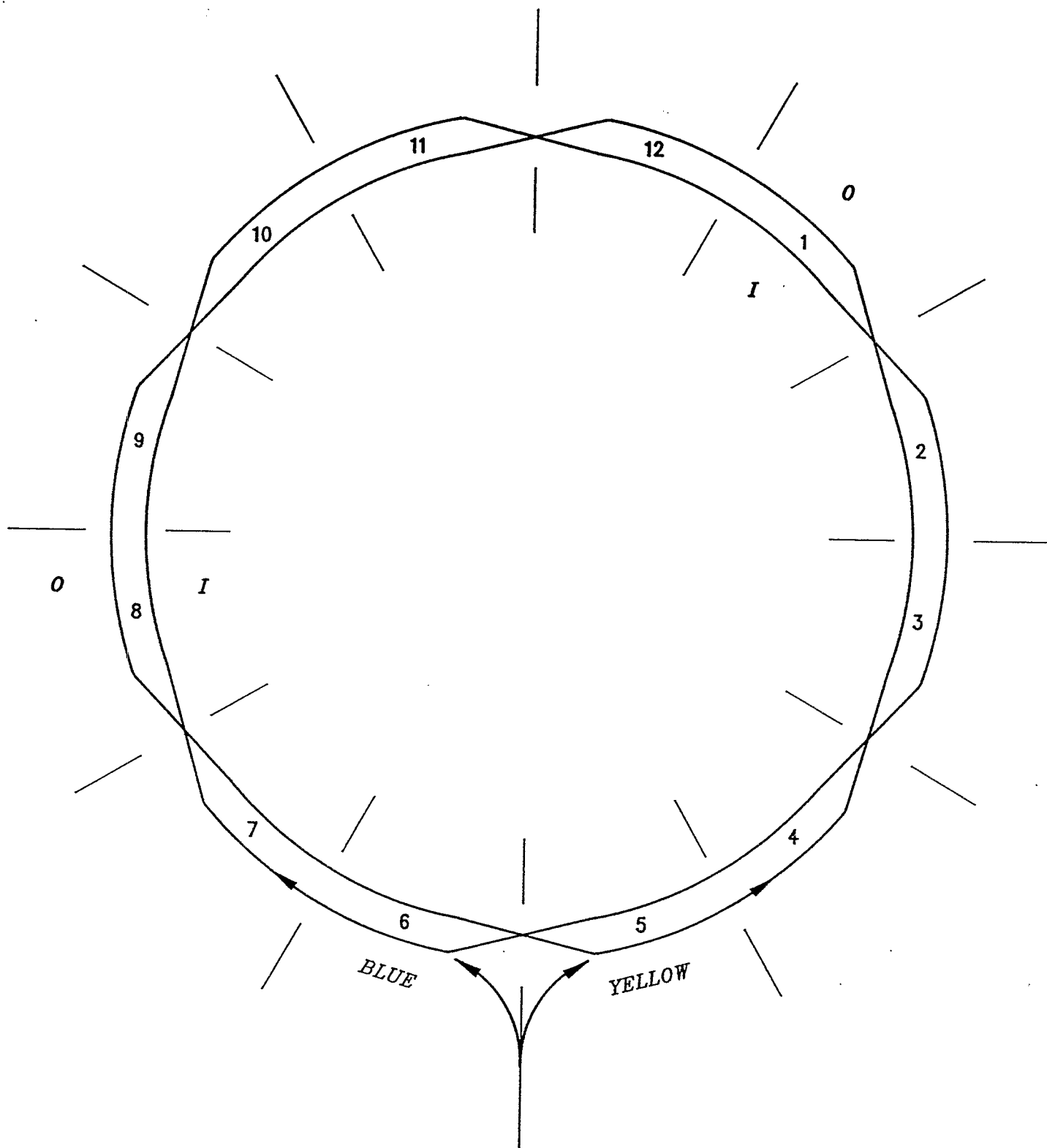
The letter D in the first position is therefore reserved to identify a dipole class of magnets. The second letter always identifies the kind of dipole or it's action on the beam. The 3rd qualifier, if needed, provides further qualifications such as machine element association or more operational information. Examples are:

	<u>Abbreviation</u>
Dipole Kicker Injection	DKI
Dipole Kicker Ejection	DKE
Dipole Septum Injection	DSI
Dipole Septum Ejection	DSE
and so on...	

Another frequently occurring class of magnets are quadrupoles. Applying the above scheme one has:

	<u>Abbreviation</u>
Quadrupole	Q
Quadrupole Focussing	QF
Quadrupole Defocussing	QD
Quadrupole Skewed	QS
and so on...	

The above list is not inclusive but showed as a guide for the creation of additional symbols and logic abbreviations for all machine associated data base variables. Since the control system data base is the one area where all tag names are gathered together, system managers should be sure that their element descriptions are unique, suggestive of use or purpose, and should check with E. H. Auerbach of the RHIC Controls Group to be sure that no conflicts or other problems arise when added to the control systems data base.



TAG NAME DATA FIELDS
 XXX : YYY

X = GEOGRAPHICAL FIELD
 Y = ELEMENT NAME

Figure 1

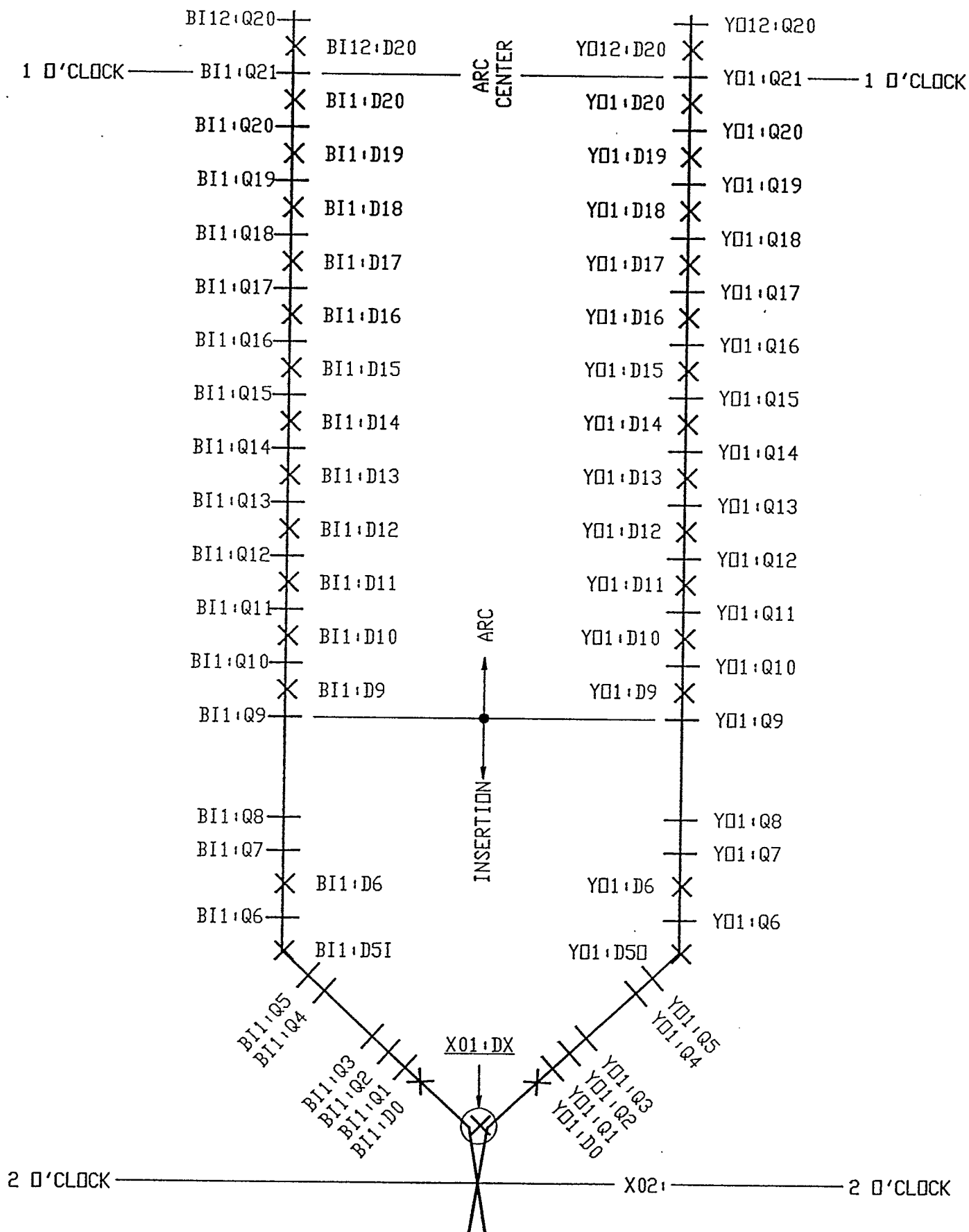


Figure 2