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RHIC Ring Element Nomenclature System

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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 either/	or*	Outer Sextants either/	or*
	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:

	Abbreviation
Dipole	D
Dipole Vertical	DV
Dipole Horizontal	DH

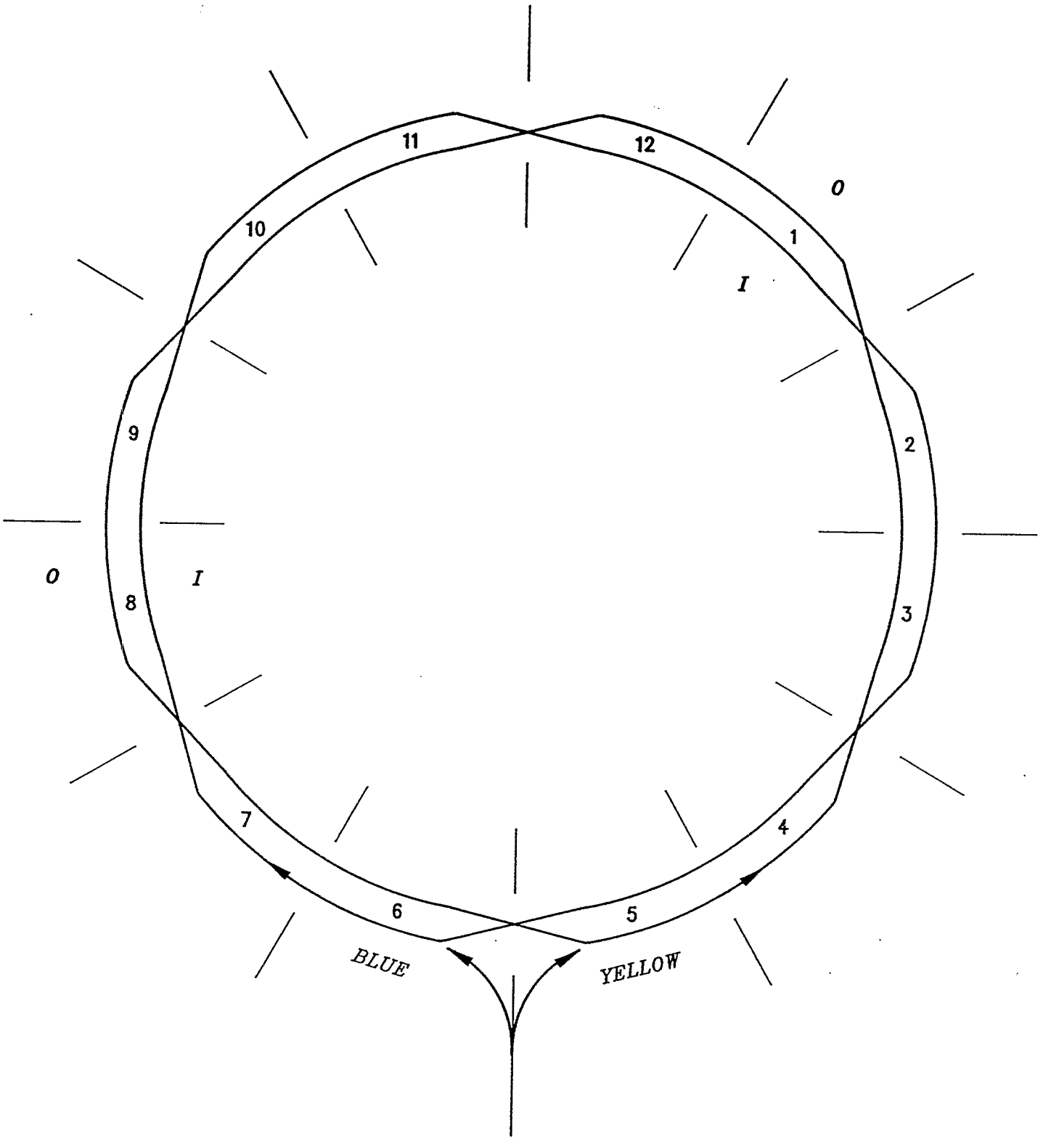
The letter D in the first position is therefore reserved to identify a dipole class of magnets. The second letter always identifies the kind of dipole or it's action on the beam. The 3rd qualifier, if needed, provides further qualifications such as machine element association or more operational information.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

	Abbreviation
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:

	Abbreviation
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

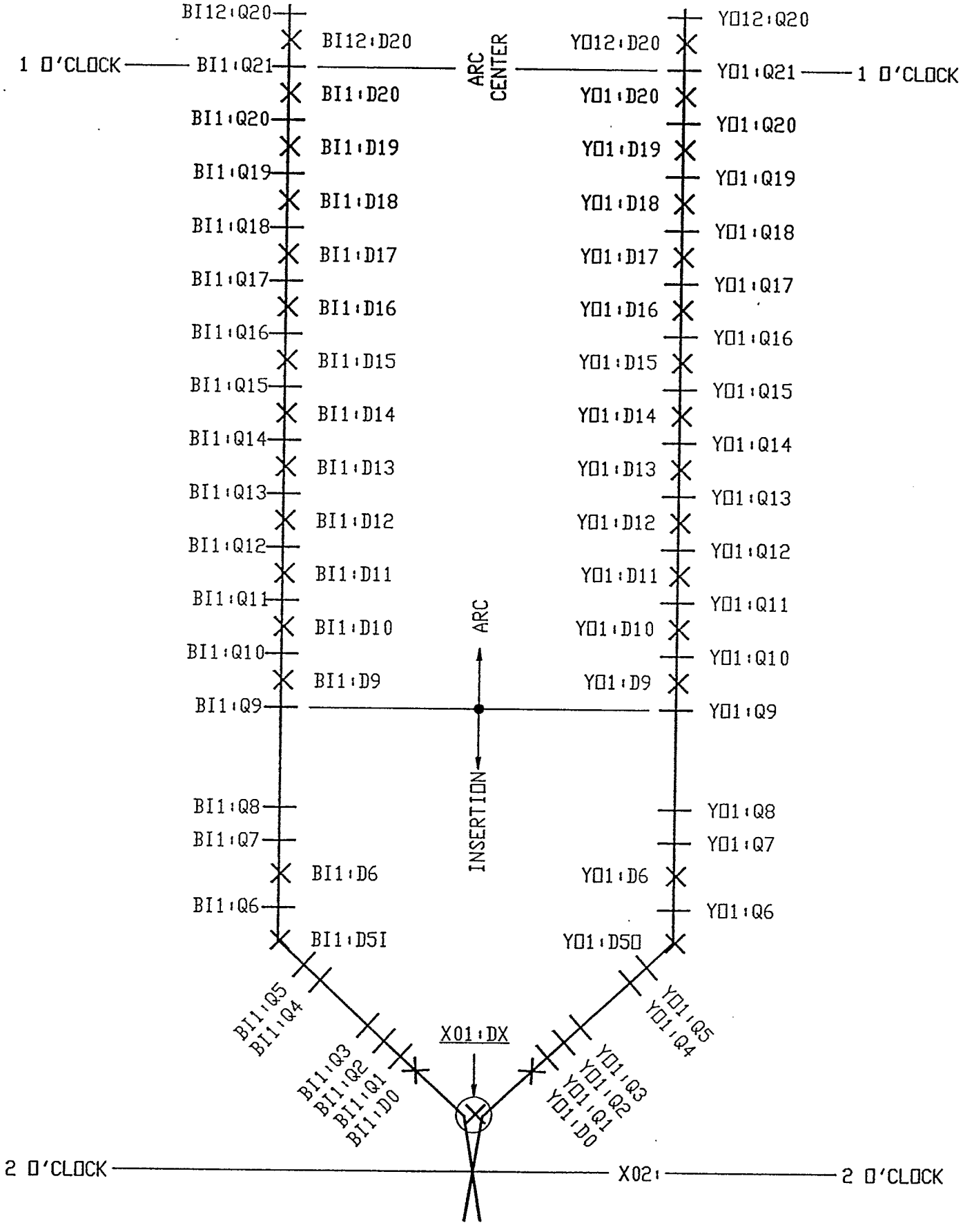

BI12:Q20
BI12:D20
1 O'CLOCK
BI1:Q21
ARC CENTER
YO12:D20
YO12:Q20
YO1:Q21
1 O'CLOCK
BI1:D20
YO1:D20
BI1:Q20
YO1:Q20
BI1:D19
YO1:D19
BI1:Q19
YO1:Q19
BI1:D18
YO1:D18
BI1:Q18
YO1:Q18
BI1:D17
YO1:D17
BI1:Q17
YO1:Q17
BI1:D16
YO1:D16
BI1:Q16
YO1:Q16
BI1:D15
YO1:D15
BI1:Q15
YO1:Q15
BI1:D14
YO1:D14
BI1:Q14
YO1:Q14
BI1:D13
YO1:D13
BI1:Q13
YO1:Q13
BI1:D12
YO1:D12
BI1:Q12
YO1:Q12
BI1:D11
YO1:D11
BI1:Q11
YO1:Q11
ARC
BI1:D10
YO1:D10
BI1:Q10
YO1:Q10
BI1:D9
YO1:D9
BI1:Q9
YO1:Q9
INSERTION
BI1:Q8
YO1:Q8
BI1:Q7
YO1:Q7
BI1:D6
YO1:D6
BI1:Q6
YO1:Q6
BI1:D5I
YO1:D5O
BI1:Q5
BI1:Q4
YO1:Q5
YO1:Q4
X01:DX
BI1:Q3
BI1:Q2
BI1:Q1
BI1:D0
YO1:Q3
YO1:Q2
YO1:Q1
YO1:D0
2 O'CLOCK
X02:
2 O'CLOCK

Figure 2