Accelerator Device name tables

1 Linac (domains ALI):*

The linac domains include all devices inside the linac bunker used for guiding the beam to the big beamdump. Only devices to be used when guiding the beam out of the bunker and into the booster belong to the transferline domain ALB. To draw the domain boundary like that is a safety issue, since the linac may run while people are working inside the booster and storage ring tunnel: During linac operation only ALI- devices are used, and ALB- devices must not be touched.

1.1 Linac magnets (ALIMA)

ALIMA-CH, CV-1..4	Correctors between accelerating sections
ALIMA-BY	Switchyard dipole
ALIMA-OG	Gun solenoid
ALIMA-QL-1..3	Triplet between sections quads
ALIMA-QA-1..3	Triplet after linac quads
ALIMA-QE	Single energy measurement leg quad

1.2 Linac diagnostics (ALIDI)

ALIDI-SM-1..4	Screens in linac (fluorescent and/or OTR)
ALIDI-SM-5	OTR screen in front of ALIMA-BY
ALIDI-SM-E	OTR screen in front of beam dump
ALIDI-FCUP	Faraday cup
ALIDI-WCM	Wall current monitor
ALIDI-CTR	Coherent transition radiation
ALIDI-BPM-1,2	Beam position monitors
ALIDI-PUM	Bunch purity measurement

1.3 Linac RF systems (ALIRF)

The linac as a pulsed RF devices has different topology than the ring machines: There are accelerating multicell structures instead of single cavities. And klystron and modulator are not integrated in a transmitter but separate devices. The gun is counted with the RF, although it operates DC only, because it is an accelerating device too.

ALIRF-GUN	Electrostatic gridded gun
ALIRF-SPB	Subharmonic prebuncher (500 MHz)
ALIRF-PBU	Prebuncher (3 GHz)
ALIRF-FBU	Final buncher
ALIRF-AS-1,2	Accelerating sections 1 and 2
ALIRF-KLY	Klystron
ALIRF-FOC1..FOC3	Klystron focusing coils 1 to3
ALIRF-FIL	Klystron filament heating
ALIRF-IPS	Klystron ionisation pump
ALIRF-MOD	Modulator
ALIRF-PFN	Pulse forming network

1.4 Linac vacuum (ALIVA)

ALIVA-PG-1..3	Getter pumps

1.5 Linac alignment (ALIAL): Empty domain

2 Linac to booster transferline (domains ALB)*

The transferline from linac to booster is a rather small domain between the linac switchyard magnet ALIMA-BY and the Booster injection septum ABOMA-YIN.

2.1 Linac to booster transfer line magnets (ALBMA)

For convenience the triplets are called QB and QC since they probably will be used by the operator together with the linac triplet ALIMA-QA-1..3.

ALBMA-BI	Small 10° bend at injection
ALBMA-QB-1..3	Second bunker triplet quads
ALBMA-QC-1..3	Tunnel triplet
ALBMA-QI	Last quad before injection
ALBMA-CH, CV-1..4	Horizontal and vertical correctors

2.2 Linac to booster transfer line diagnostics (ALBDI)

ALBDI-SM-1..4	OTR and/or fluorescent screens
ALBDI-BPM-1,2	Beam position monitors
ALBDI-ICT-1,2	Integrating current transformers
ALBDI-FCT	Fast current transformer
ALBDI-SCH	Horizontal scraper

2.3 Linac to booster transfer RF systems (ALBRF): Empty domain

2.4 Linac to booster transfer line vacuum (ALBVA)

ALBVA-VG-1..3	Gate valves
ALBVA-PG-1..4	Getter pumps

2.5 Linac to booster transfer line alignment (ALBAL): Empty domain

3 Booster synchrotron (domains AB0)*

The booster is divided into 6 sectors with each sector half an arc (60°). Each sector is divided into 9 cells, starting at the middle of the arc: Cells A...G begin and end in the centers of the focussing bends, the half cell H ends at the center of the last defocussing bend, and the cell S is the straight with some quadrupoles. Each of the 54 cells contains one pair of correctors, one BPM and two getterpumps.

Devices are enumerated by sector and cell. The cell character may be omitted if there exists only one device per sector, e.g. sextupole ABOMA-SF-1, however the name ABOMA-SF-1B is preferable since it provides the additional information that the sextupole is located in cell B of the sector. If there exist more than one device per cell, a number is added, e.g. getterpump ABOVA-GP-1A1.

3.1 Booster magnets (ABOMA)

In the circular machine the magnet devices can be of two kinds:

- Magnet families comprising several magnets in series and one power supply. They have current set, read, etc. as channel to be controlled.
- Magnet which are family members and thus act only passive. They may however have channels like waterflow, survey data, geometric data, etc.

The column entitled »Multiplicity« provides this information: Mult. 0 is a magnet which is part of a family and has no dedicated powersupply. Mult. 1 identifies a single manget having its own supply, and Mult. n>1 is actually a family of n magnets fed by one supply

Name	Description	Mult.
ABOMA-B	All booster magnets in series	93
ABOMA-BFC	BF correction circuit	45
ABOMA-BD-1A...6H	Defocussing bends	0
ABOMA-BF-1A...6G	Focussing bends	0
ABOMA-BF-12, 34, 56	Focussing bends on sector boundaries	0
ABOMA-QF	Hor. foc. quadrupole family	12
ABOMA-QD	Vert. foc. quadrupole family	6
ABOMA-QE	Auxiliary quadrupole family	6
ABOMA-QF-1..6	40 cm hor. foc. quadrupoles in cell S	0
ABOMA-QD-1..6	22 cm vert. foc. quadrupoles in cell S	0
ABOMA-QE-1..6	22 cm aux. quadrupoles in cell H	0
ABOMA-SF	Sextupole family for hor. chromaticity	6
ABOMA-SD	Sextupole family for vert. chromaticity	12
ABOMA-SF-1..6	Sextupoles in cell B (6)	0
ABOMA-SD-1D..6D, 1G..6G	Sextupoles in cells D and G (12)	0
ABOMA-CH-1A..6S	Horizontal correctors (54)	1
ABOMA-CV-1A..6S	Vertical correctors (54)	1
ABOMA-YIN	Injection septum	1
ABOMA-KIN	Injection kicker	1
ABOMA-YEX	Extraction septum	1
ABOMA-KEX	Extraction kicker	1

3.2 Booster diagnostics (ABODI)

ABODI-BPM-1A..6S	Beam position monitors (54)
ABODI-SM-1S, 1H, 3S, 5S	OTR screens, (2 after injection kicker, 2 else)
ABODI-TUM	Tune monitor (1)
ABODI-SRM-2,4,6	Synchrotron radiation monitors (3)
ABODI-BLM-?	Beam loss monitors (several)
ABODI-MPCT	Modular parametric beam current monitor (1)

3.3 Booster RF systems (ABORF)

Same like storage ring RF systems (see 5.3), but there is only one station (cavity + amplfier), with the number set to 0.

ABORF-A0	Amplifier as a whole
ABORF-A0-KLY	Klystron
...	etc.

3.4 Booster vacuum (ABOVA)

Cells A...S have each 2 getter pumps, and 1 extra pump is at the cavity:

ABOVA-PG-1A1...6S2	Getter pumps (108)
ABOVA-PC-CAV0	Getter pump at cavity (1)

3.5 Booster alignment (ABOAL): Empty domain

4 Booster to storage ring transferline (domains ABR)*

4.1 Booster to storage ring transfer line magnets (ABRMA)

ABRMA-B-1..3	bending magnets, 8.2° (3)
ABRMA-QB-1	Quadrupole, 22 cm length booster type (1)
ABRMA-QA, QB-2, QC-1..4	Quadrupole, 40 cm length, booster type (6)
ABRMA-CH-1..4	horizontal corrector magnets (4)
ABRMA-CV-1..4	vertical corrector magnets (4)

4.2 Booster to storage ring transfer line diagnosticss (ABRDI)

4.3 Booster to storage ring transfer line RF systems (ABRRF): Empty domain

4.4 Booster to storage ring transfer line vacuum (ABRVA)

4.5 Booster to storage ring transfer line alignment (ABRAL): Empty domain

5 Storage ring (domains ARI)*

The storage ring is divided into 12 sectors. Each sector contains a straight section, followed by a 30° arc (= TBA, triple bend achromat). Sectors begin after and end with the valve between arc and straight (the other valve between straight and arc is inside the sector).

The straights at both sides of an arc are different, thus a subdivision of each sector is naturally given by attaching the letter of the straight to the sector number. For example `01L` would describe the half of arc `01` on the long straight side. If there are many identical devices within a half arc, e.g. getterpumps, they are just numbered, starting at the arc center, i.e. at the large center bending magnet. For example the getterpumps in `01L` would be named `ARIVA-PG-01Ln, n=1,2,...`

From the beam dynamics point of view a straight and the adjacent half arcs rather would form a sector, since matching to the straights involves magnets from the arcs upstream and downstream. However since the beam dynamics takes place on a »software level« anyway, the sector division as described above was imposed as the most natural from the hardware assembly (vacuum, girders, diagnostics, etc.). Now, for example, a pair of quads for matching to the short straight in sector `02` would be `ARIMA-QSG-01` and `ARIMA-QSG-02`. In this case a name like `ARIMA-QSG-S02` could be a useful alias for adressing the pair as a whole. (Note that further specification of the half sector is not required, since there is only one `QSG` in sector `01`, the corresponding quad on the other side is `QLG`, because a long straight follows there).

5.1 Storage ring magnets (ARIMA)

- The quadrupoles have individual power supplies, however for the ideal lattice (period 3) they may be adressed as families, e.g. all quadrupoles matching to the six short straights may be set simultaneously. Therfore the information of adjacent straight is part of the family name.
- The bending magnets and sextupoles are cabled in line. The members with names as given below can not be adressed individually. Thus the member names serve as etiquettes only. Other than the quadrupoles the type of adjacent straight has nothing to do with their functionality, therefore this information is only needed for unique naming and put into the member name.
- 72 correctors are additional coils inside the sextupoles `SD, SE` and `S*B.` All the correctors are numbered by sector, side of sector and name of the correlated sextupole.
- For convenience of referencing, also the straight sections have names, although they are only free spaces.
- The insertion devices are part of the storage ring as well as part of the experiment, since moving the gap affects both. In practice the experiment's operator will steer the gap, but the storage ring operator will see a beta-beat and should at least know where it comes from. Control procedures for automatic matching to the ID during gap changes by adjusting the adjacent quadrupoles thus would operate in two domains.
- Following the ESRF naming convention [3] the girders are also treated as magnets, since moving them affects the magnet position and thus the beam. There mover motors would be the active parts to be controlled.
- For explanation of the »Mult.« column see comment in section 3.1

Name	Description	Mult.
ARIMA-B	Bending magnets	36
ARIMA-BX-01...12	TBA center bend, 14°, used for beamlines	0
ARIMA-BE-12L, 01L, 04L, 05L, 08L, 09L	TBA end bend, 8°, at long straight side	0
ARIMA-BE-02M, 03M, 06M, 07M, 10M, 11M	TBA end bend, 8°, at medium straight side	0
ARIMA-BE-01S...12S	TBA end bend, 8°, at short straight side	0
ARIMA-QLA...QLH-12,01,04,05,08,09	Quads for matching to long straights	1
ARIMA-QMA...QMG-02,03,06,07,10,11	Quads for matching to medium straights	1
ARIMA-QSA...QSG-01...12	Quads for matching to short straights	1
ARIMA-SF	Chromatic sextupole family SF	24
ARIMA-SD	Chromatic sextupole family SD	12
ARIMA-SE	Chromatic sextupole family SE	12
ARIMA-SLA	Geometric sextupole family SLA	6
ARIMA-SLB	Geometric sextupole family SLB	6
ARIMA-SMA	Geometric sextupole family SMA	6
ARIMA-SMB	Geometric sextupole family SMB	6
ARIMA-SSA	Geometric sextupole family SSA	12
ARIMA-SSB	Geometric sextupole family SSB	12
ARIMA-SF-12L, 01L, 04L, 05L, 08L, 09L, 02M, 03M, 06M,	Chromatic sextupoles of family SF	0

07M, 10M, 11M, 01S...12S		
ARIMA-SD-12L, 01L, 04L, 05L, 08L, 09L, 02M, 03M, 06M, 07M, 10M, 11M, 01S...12S	Chromatic sextupoles of family SD	0
ARIMA-SE-12L, 01L, 04L, 05L, 08L, 09L, 02M, 03M, 06M, 07M, 10M, 11M, 01S...12S	Chromatic sextupoles of family SE	0
ARIMA-SLA, SLB-12, 01, 04, 05, 08, 09	Long straight geometric sextupoles	0
ARIMA-SMA, SMB-02, 03, 06, 07, 10, 11	Long straight geometric sextupoles	0
ARIMA-SSA, SSB-01...12	Long straight geometric sextupoles	0
ARIMA-CH- 01LB, 01LE, 01LD, 01SD, 01SE, 01SB, 02SB, 02SE, ...12LE, 12LB	Horizontal correctors, 6 per sector	1
ARIMA-CV- 01LB, 01LE, 01LD, 01SD, 01SE, 01SB, 02SB, 02SE, ...12LE, 12LB	Vertical correctors, 6 per sector	1
ARIMA-ID-04 (= X04S-IDMA-UN)	Undulator in short straight S04	1
ARIMA-ID-06 (= X06S-IDMA-WI)	Wiggler in short straight S06	1
ARIMA-ID-07 (= X07M-IDMA-UN)	Undulator in medium straight M07	1
ARIMA-ID-09 (= X09L-IDMA-WE)	Elliptical wiggler in long straight L09	1
ARIMA-YIN	Injection septum	1
ARIMA-KIN-1..4	Injection kickers	1

5.2 Storage ring diagnostics (ARIDI)

BPMs correspond to the correctors, with the ***E, ***D, ***B BPMs attached close to the sextupoles SE,SD and S*B (where the correctors sit inside as additional coils).

ARIDI-BPM- 01LB, 01LE, 01LD, 01SD, 01SE, 01SB, 02SB, 02SE,.....12LE, 12LB	Beam position monitors (72)
ARIDI-FBPM-01LB...	Fast beam position monitors (72)
ARIDI-PCT	Parametric current transformer (1)
ARIDI-SM-01A, 01B, 05, 09	OTR screens (4)
ARIDI-SCH-12A, 12B	Horizontal scrapers (2)
ARIDI-SCV-12	Vertical scraper (1)
ARIDI-TUM	Tune monitor (+)
ARIDI-SRM	Synchrotron radiation monitor (1 beamline)
ARIDI-BLM-?	Beam loss monitors (several)

5.3 Storage ring RF systems (ARIRF)

There are four cavities, two of them located in straight S02, two in straight S08. Every cavity has its own amplifier. Since there are only four cavities, everybody will know them and it seems not necessary to make the straight name part of the cavity name. Therefore they are just numbered 1..4:

ARIRF-An, n=1..4	Amplifier as a whole
ARIRF-An-KLY	Klystron
ARIRF-An-FIL	Klystron filament heating
ARIRF-An-FOC1,FOC2	Klystron focusing coils 1 and 2

ARIRF-An-IPS1,IPS2	Klystron ionisation pumps
ARIRF-An-HVDK	High voltage deck
ARIRF-An-HVPS	High voltage power supply
ARIRF-An-MOD	Modulator
ARIRF-An-PS	Klystron power supply
ARIRF-An-PLC	Logical control of the whole amplifier
ARIRF-An-FC	Fast controller
ARIRF-An-AMLP	Amplitude loop
ARIRF-An-PHLP	Phase loop
ARIRF-An-RFSW	Drive chain RF switch
ARIRF-An-D50W	Drive chain 50 W amplifier
ARIRF-CAVn, n=1..4	Cavity
ARIRF-CAVn-TULP	Cavity tuning loop
ARIRF-CAVn-HOMFS	Higher order modes frequency shifter
ARIRF-CAVn-CLRK	Cavity cooling rack
ARIRF-WGn, n=1..4	Waveguide
ARIRF-WGn-CI	Circulator
ARIRF-WGn-CO1,CO2	Couplers
ARIRF-WGn-LD	Load

5.4 Storage ring vacuum (ARIVA)

Vacuum system prefers a simple numbering of devices along the ring and is less interested in the machine symmetry. As a compromise with convenience, the sector number became now part of the family name:

ARIVA-AS01..AS12-01..13	Synchrotron radiation absorbers (156)
ARIVA-ASID01..ASID12	Absorber in straight sections (12)
ARIVA-PG01..PG12-01..16	Getterpumps (192)
ARIVA-VG01..VG12-1,2	Gate valves (24)
ARIVA-MP01..MP12-1..6	Penning measurement (72)
ARIVA-MI01..MI12-1..6	Ionisation measurement, (72)
ARIVA-MT01..MP12-1..4	Thermovac measurement, (48)
ARIVA-MQ01..MQ12-1..4	Quad. mass. spec. measurement, (48)

5.5 Storage ring alignment (ARIAL)

The AL-domains contain only devices explicitly used for the alignment task, like sensors, movers, etc. This restricts naming to the ARIAL domain since only the ring has active alignment systems.

Concerning naming different domains have different points of view. Beam dynamics emphasizes the ring symmetry, whereas vacuum prefers a simple numbering of devices along the ring. Compromising for the alignment naming we follow the ESRF naming, which is SR/A-devi/CnnGkk (in ESRF naming convention!) with dev the device (e.g. HLS), i its number in beam direction, in cell Cnn on girder Gkk. For SLS the cell corresponds to the sector. The HLS-sensors thus will be named **ARIAL-HLSi-nnGk with** i=1..4 the numbering within the girder, nn the sector number and k the girder number, counting in beam direction. This implies a clear girder numbering: 01G1, 01G2, 01G3, 01G4,

`02G1....12G4.` The same scheme is applied to the horizontal position system and the girder mover motors. Also the girders themselves are listed here although they are completely passive.

The BPM position measurement sensor names do not follow this scheme but will have the same names like the BPMs they are attached, see section 5.2.

`ARIAL-HLS1..4-01G1..12G4`	Hydrostatic levelling sensors (192)
`ARIAL-HPS1..2-01G1..12G4`	Horizontal positioning sensors (96)
`ARIAL-POMSH-01LB, 01LE, 01LD, 01SD, 01SE, 01SB, 02SB, 02SE, ..., 12LD, 12LE, 12LB`	Horizontal BPM position measurement (72)
`ARIAL-POMSV-01LB, 01LE, 01LD, 01SD, 01SE, 01SB, 02SB, 02SE, ..., 12LD, 12LE, 12LB`	Vertical BPM position measurement (72)
`ARIAL-GM1..5-01G1..12G4`	Girder mover motors (240)
`ARIAL-GME1..5-01G1..12G4`	Girder mover motor encoders (240)
`ARIAL-GIRL-nnG2, -nnG3`	Long girders for the TBA cells (24)
`ARIAL-GIRL-01G1, 04G4, 05G1, 08G4, 09G1, 12G4`	Long giders at long straights (6)
`ARIAL-GIRS-01G4, 02G1, 03G4, 04G1, 05G4, 06G1, 07G4, 08G1, 09G4, 10G1, 11G4, 12G1`	Short girders at short straights (12)
`ARIAL-GIRS-02G4, 03G1, 06G4, 07G1, 10G4, 11G1`	Short girders at mediume straights (6)

6 Control room (domains `CO*`):

6.4 Control room RF systems (`CORF`)

`ACORF-TIM`	Timing (RF master oscillator and accessories)

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