

NORTH INPUT Tower: location and coding of electrically connected Devices

CODING CONVENTION: The code is divided in 3 fields. The field separator is a dot. The 3th field is used only when more than one device of the same type is hosted on the same suspension stage.

DeviceType . SuspensionStage . DevicePosition (or Function)

M	Motor		1, 2, 3, ...	
MV	Vertical Motor		L	Left
MH	Horizontal Motor		R	Right
MA	Angular Motor		U	Up
TM	TiltMeter		D	Down
C	Coil		F	Front
CV	Vertical Coil		B	Back
CH	Horizontal Coil		UL	Up Left
T	Temperature probe		UR	Up Right
AV	Vert. Accelerometer		DL	Down Left
AH	Hor. Accelerometer		DR	Down Right
LV	Vertical LVDT		LL	Lateral Left
LH	Horizontal LVDT		LR	Lateral Righth
F0	Filter #0 or top-stage		TX	ϑ_x degree of freedom
F1	Filter #1	TZ	ϑ_z degree of freedom	
F2	Filter #2	AH1	Hor. Accelerom. #1	
F3	Filter #3	AH2	Hor. Accelerom. #2	
F4	Filter #4	AH3	Hor. Accelerom. #3	
F7	Filter #7	AV1	Vert. Accelerom. #1	
MA	Marionette	AV2	Vert. Accelerom. #2	
RM	Reference Mass			
TCS	TCS frame			

Change History

<i>Version</i>	<i>Date</i>	<i>Changes/Reasons</i>
v1	2000	initial suspension cabling
v2	2003	added cabling of sensors and actuators on Filter #7
v3r0	4mar08	added TCS cabling
v3r1	28mar08	added panel connector layout on TCS motorized frame (rear view); updated the TCS flange layout; changed TCS motor name
v3r2	22feb10	added 2 temperature sensors close to the RefMass

23 MOTORS

code	Location (see also drawings in the following)	vacuum cable ID	vacuum cable type	notes
MV.F0.U	top-screw on F#0	J1	STP, AWG24	MV.1 (old code)
MV.F0	fishing-rod on F#0	A1	STP, AWG24	MV.2
MV.F1	fishing-rod on F#1	B1	STP, AWG24	MV.3
MV.F2	fishing-rod on F#2	C1	STP, AWG24	MV.4
MV.F3	fishing-rod on F#3	D1	STP, AWG24	MV.5
MV.F4	fishing-rod on F#4	E1	STP, AWG24	MV.6
MV.F7	fishing-rod on F#7	F1	STP, AWG24	MV.7
MH.F0.1	trolley on inner structure	H3	STP, AWG24	MH.1
MH.F0.2	trolley on inner structure	H1	STP, AWG24	MH.2
MH.F0.3	trolley on inner structure	H2	STP, AWG24	MH.3
MH.F7.1	balancing mass on F#7	R1	STP, AWG24	MH.4
MH.F7.2	balancing mass on F#7	R2	STP, AWG24	MH.5
MH.MA	balanc. mass on marion.	T2	STP, AWG24 PYRE-ML 0.7mm	MH.6 with inverted logic
MA.F7.U	F#7 top (for rotation)	R3	STP, AWG24	MA.1
MA.F7.D	F#7 bottom (for rotation)	T1	STP, AWG24	MA.2
M.F0.AH1	Hor. Accelerometer on top-stage	O2	STP, AWG24	
M.F0.AH2	Hor. Accelerometer on top-stage	N2	STP, AWG24	
M.F0.AH3	Hor. Accelerometer on top-stage	M2	STP, AWG24	
M.F0.AV1	Vert. Accelerometer on F#0	K1	STP, AWG24	
M.F0.AV2	Vert. Accelerometer on F#0	L1	STP, AWG24	
M.TCS.UL	Horiz. motor on TCS frame	X1	PYRE-ML 4x1mm + 3x0.6mm	
M.TCS.DL	Horiz. motor on TCS frame	X2	PYRE-ML 4x1mm + 3x0.6mm	
M.TCS.DR	Horiz. motor on TCS frame	X3	PYRE-ML 4x1mm + 3x0.6mm	

total number of conductors/tower needed for motors: $23 \times 7 = 161$ plus $20 \times 2 = 40$ shields (only for phases).

2 TILTMETERS

code	Location (see also drawings in the following)	vacuum cable ID	vacuum cable type	notes
TM.F7.TX	F#7 upper part	F4	STP, AWG24	
TM.F7.TZ	F#7 upper part	F4	STP, AWG24	

total number of conductors for tiltmeters: $2 \times 2 = 4$, plus $2 \times 1 = 2$ shields.

15 COILS

code	Location (see also drawings in the following)	vacuum cable ID	vacuum cable type	notes
CH.F0.1 CH.F0.2 CH.F0.3	Safety frame ring	G2 G4 G6	STP, AWG24 (double)	CH.1 CH.2 CH.3
CV.F0.1 CV.F0.2	crossbar on F#0 crossbar on F#0 (fish.rod side)	J3 J2	STP, AWG24	CV.1 CV.2
C.F7.F C.F7.B C.F7.R C.F7.L	F#7 legs	S3 S2 S4 S1	STP, AWG24 (double)	
C.RM.L C.RM.R C.RM.D C.RM.U C.RM.LL C.RM.LR	reference mass	V3 V1 V5 V6 V2 V4	STP, AWG24, PYRE-ML 0.5mm	2 interconnessioni con coppie Lemo 0B.302 in prossimita' delle coils ed 1 interconnessione sulla marionetta <i>LL e LR no more used since MS upgrade (feb 2010)</i>

total number of conductors for coils: $15 \times 2 = 24$, plus 15 shields.

14 THERMAL PROBES (6 couples of AD590 and 2 single PT100)

code	location	vacuum cable ID	vacuum cable type	notes
T.F0.1 T.F0.2	antispring back on F#0	A2	STP, AWG24	TP.1
T.F1.1 T.F1.2	antispring back on F#1	B2	STP, AWG24	TP.2
T.F2.1 T.F2.2	antispring back on F#2	C2	STP, AWG24	TP.3
T.F3.1 T.F3.2	antispring back on F#3	D2	STP, AWG24	TP.4
T.F4.1 T.F4.2	antispring back on F#4	E2	STP, AWG24	TP.5
T.F7.1 T.F7.2	antispring back on F#7	F2	STP, AWG24	TP.6
T.RM.1	RefMass tubular safety frame, N-side cradle	U1	PYRE-ML 4x1mm	PT100 sensor (LakeShore PT-102)
T.RM.2	RefMass tubular safety frame, N-E side leg	U2	PYRE-ML 4x1mm	PT100 sensor (LakeShore PT-102)

total number of conductors for thermal probes: $8 \times 4 = \underline{32}$, plus $6 \times 2 + 2 \times 1 = \underline{14}$ shields.

5 ACCELEROMETERS

code	Location (see also drawings in the following)	vacuum cable ID	vacuum cable type	notes
AH.F0.1	top-ring	O2	STP, AWG24	AH.1
AH.F0.2	top-ring	N2	STP, AWG24	AH.2
AH.F0.3	top-ring	M2	STP, AWG24	AH.3
AV.F0.1	crossbar F#0	K1	STP, AWG24	AV.1
AV.F0.2	crossbar F#0 (fish.rod side)	L1	STP, AWG24	AV.2

total number of conductors for accelerometers: $5 \times 13 = 65$, plus $5 \times 5 = 25$ shields (motors included).

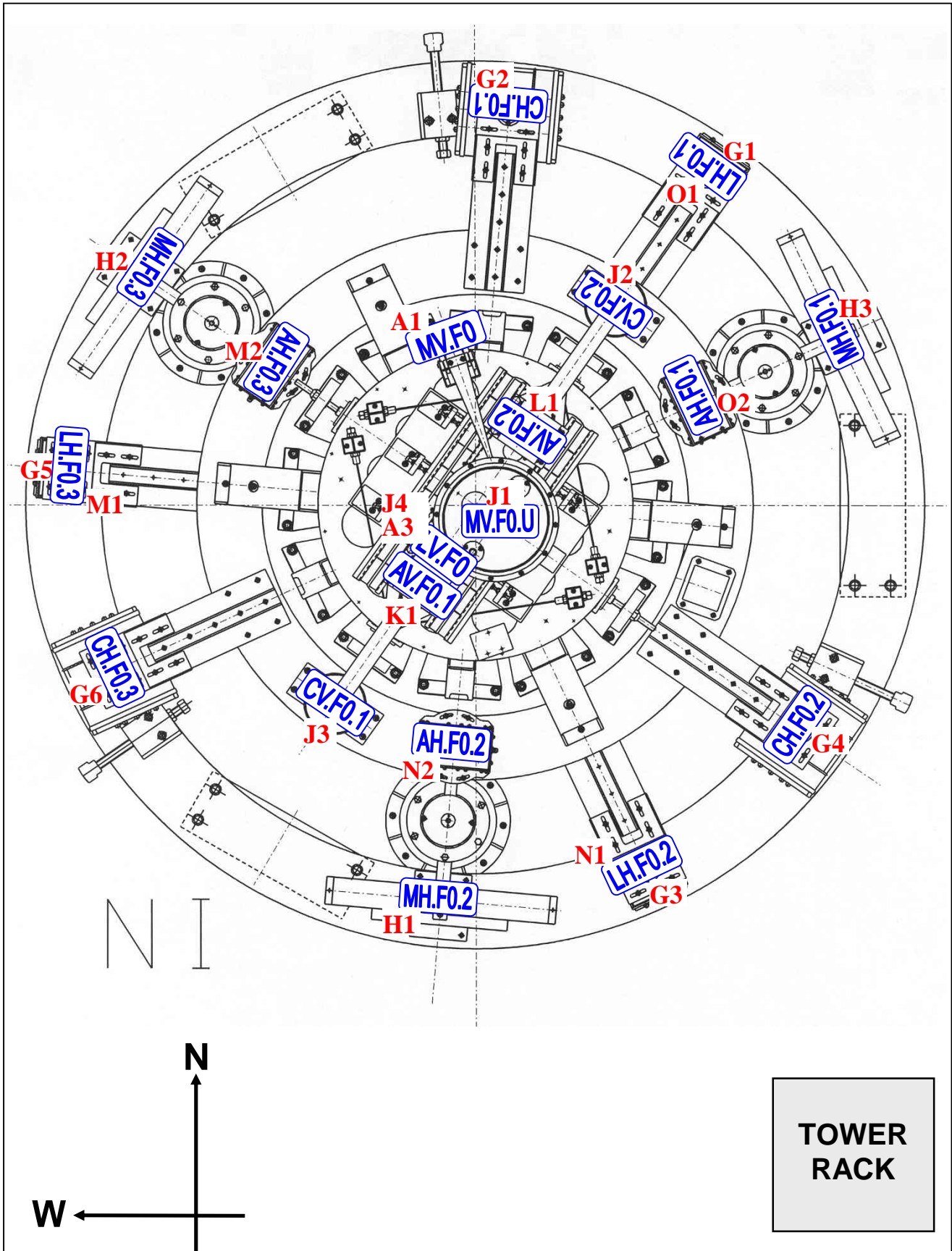
12 LVDTs

code	Location (see also drawings in the following)	vacuum cable ID	vacuum cable type	notes
LH.F0.1	Primary on top-ring	O1	STP, AWG24	LH.1
	Secondary on inner structure	G1	STP, AWG24	
LH.F0.2	Primary on top-ring	N1	STP, AWG24	LH.2
	Secondary on inner structure	G3	STP, AWG24	
LH.F0.3	Primary on top-ring	M1	STP, AWG24	LH.3
	Secondary on inner structure	G5	STP, AWG24	
LV.F0	primary on F#0 crossbar	J4	STP, AWG24	LV.1
	secondary on F#0 body	A3	STP, AWG24	
LV.F1	F#1	B3	STP, AWG24	LV.2
LV.F2	F#2	C3	STP, AWG24	LV.3
LV.F3	F#3	D3	STP, AWG24	LV.4
LV.F4	F#4	E3	STP, AWG24	LV.5
LV.F7	F#7	F3	STP, AWG24	LV.6
LH.F7.1	Primary on F#0 body	T3a	STP, AWG24	
	Secondary on bottom ring	W1	STP, AWG24	
LH.F7.2	Primary on F#0 body	T3b	STP, AWG24	
	Secondary on bottom ring	W2	STP, AWG24	
LH.F7.3	Primary on F#0 body	T3c	STP, AWG24	
	Secondary on bottom ring	W3	STP, AWG24	

total number of conductors for LVDTs: $12 \times 4 = 48$, plus $12 \times 2 = 24$ shields.

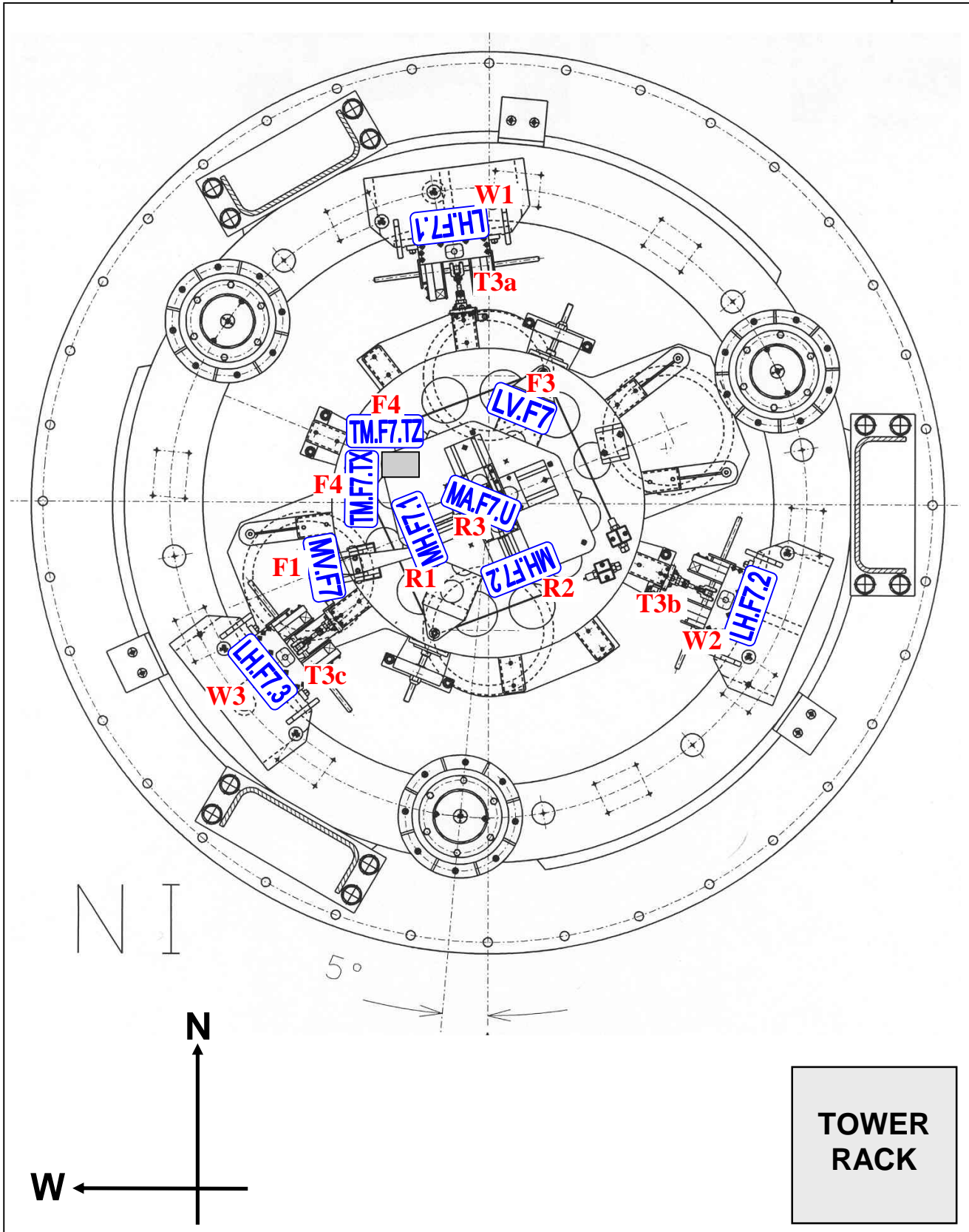
F#0 / TOP-STAGE devices

top view



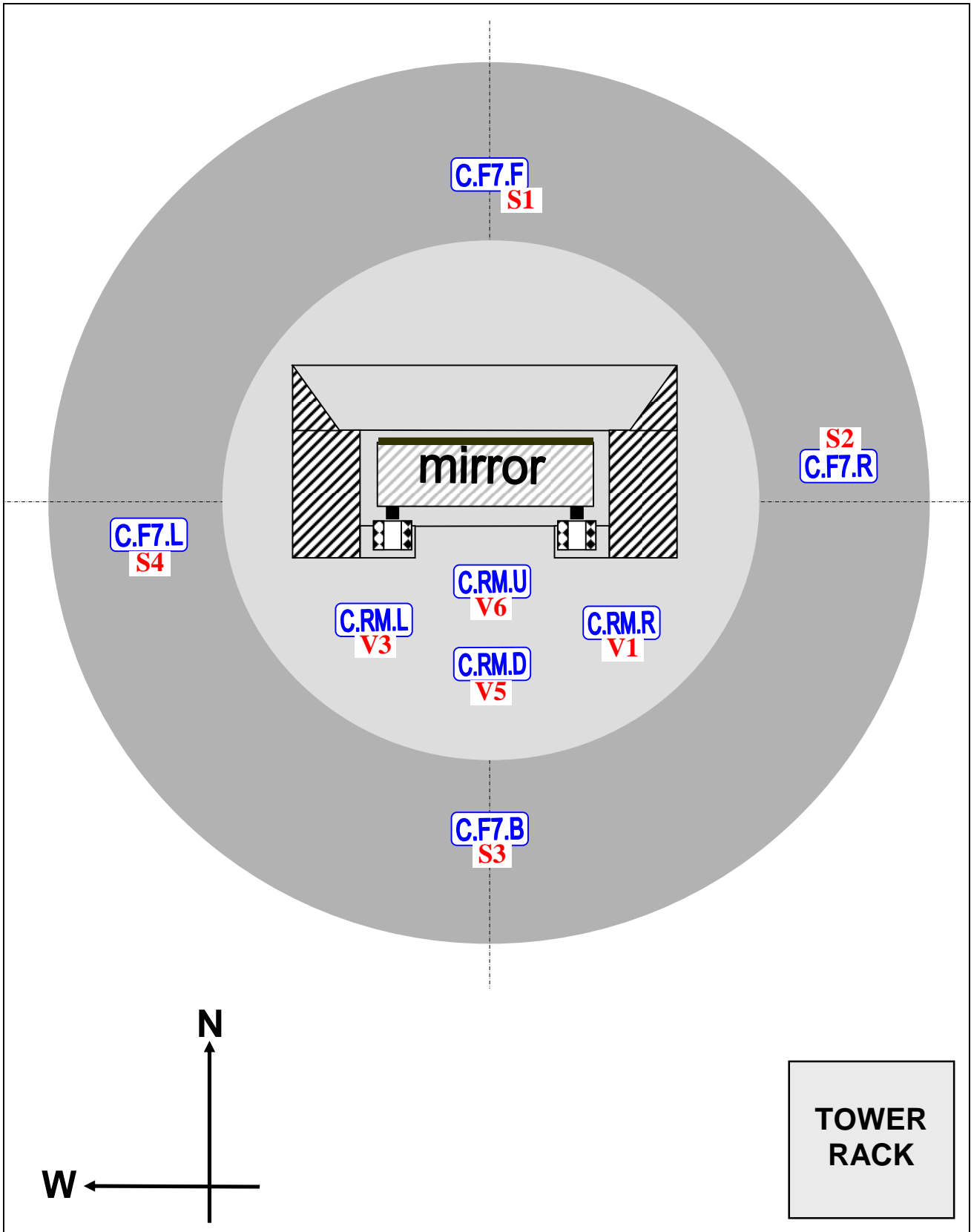
FILTER #7 (upper part) devices

top view



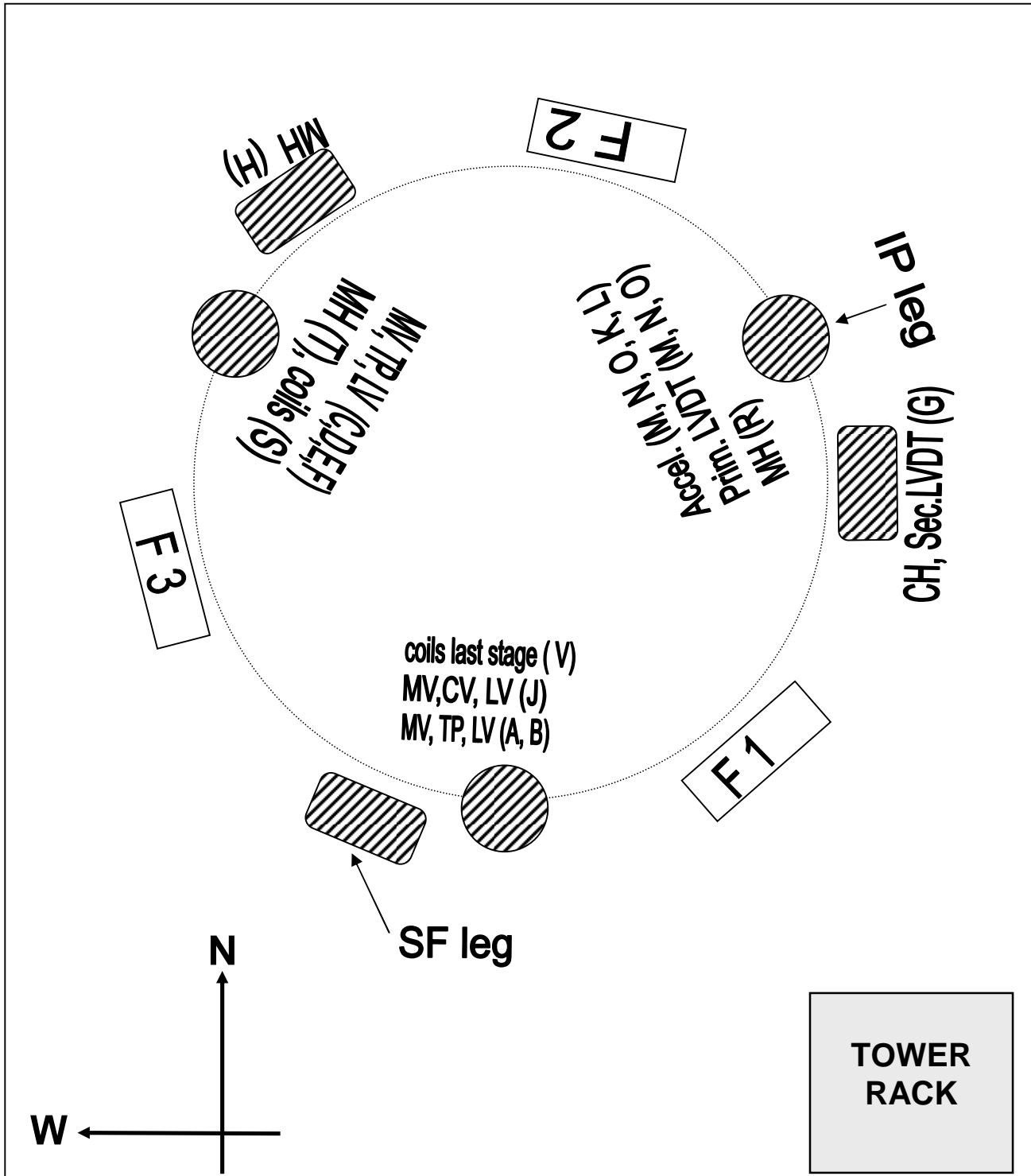
location of F#7 and Ref-Mass coils

top view



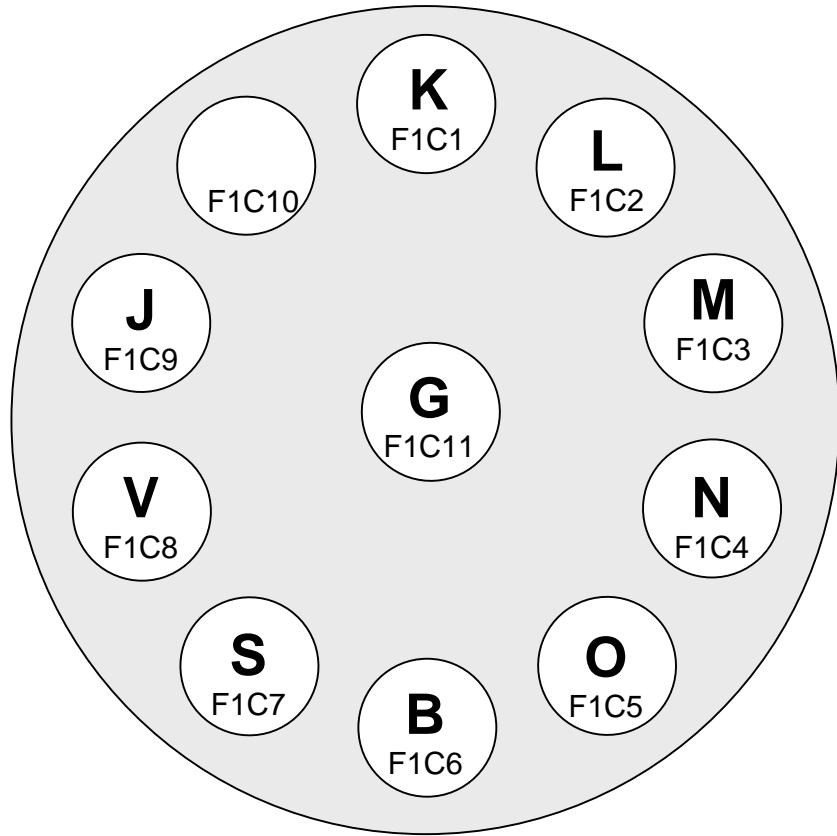
Cable arrangement along inverted pendulum (IP) legs and safety structure (SF) legs

(the position of the flanges of the Technical Ring is also shown)

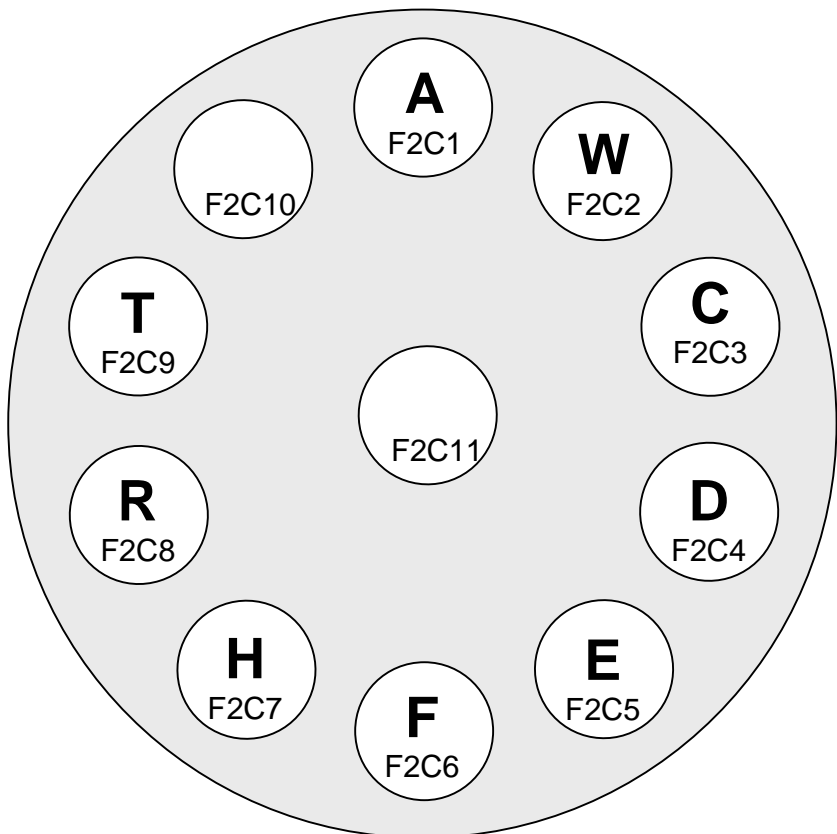


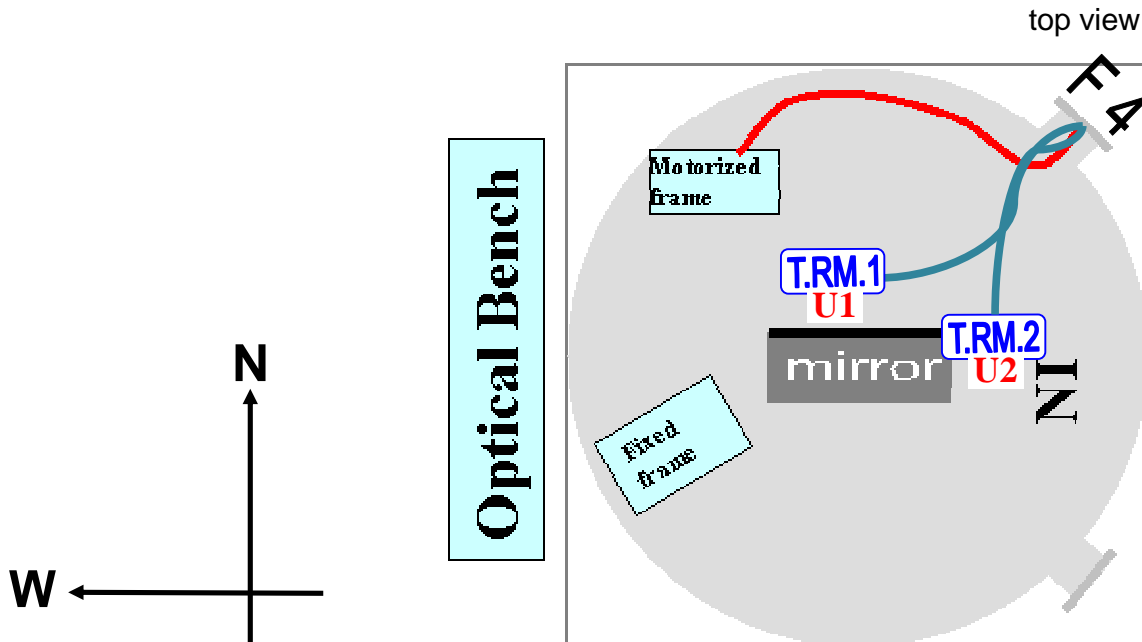
Feed-through location on flanges of the Technical Ring

Flange F1
(air side view)



Flange F2
(air side view)



Cable layout and used flange for TCS and for RefMass thermal probes

The used flange is the lower one on the tower base (here named F4)
(accessible by entering into the oven)

Percorso cavo TCS:

Il cavo (disegnato in **rosso**) inizia dalla flangia indicata, scende a livello di pavimento, dove continua sino ad arrivare alla base del supporto, ove sale fino alla piastra motorizzata

Lunghezza cavo TCS in vuoto :

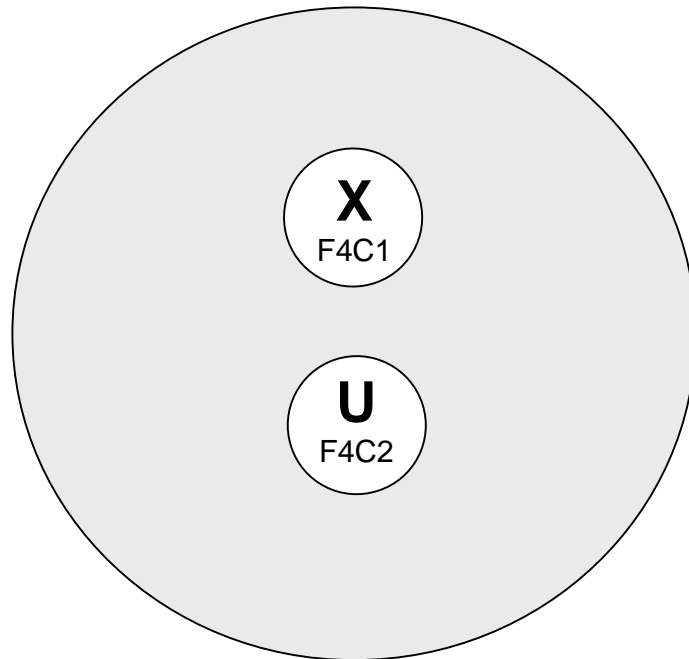
Tratto orizzontale nel codolo:	0.4 m
Tratto verticale codolo-pavimento:	0.4 m
Tratto oriz. pavimento:	2 m
Tratto verticale supporto e piastra:	1 m
Extra lunghezza per essere sicuri:	0.7 m
Totale:	4.5 m

Percorso cavo PT100:

Il cavo (disegnato in **verde**) inizia dalla flangia indicata, scende a livello di pavimento, dove continua sino ad arrivare alla gamba lato North-East della safety structure, ove sale e poi si dirama fino ai 2 sensori.

Feed-through location on the flange of the tower base

Flange **F4**
(air side view)



Rear view of the TCS motorized frame

