3 GHz and *30* GHz Conditioning Programs

by Dubrovskiy Alexey

“If there is just one possible action a program should take it.”

12-Sep-06

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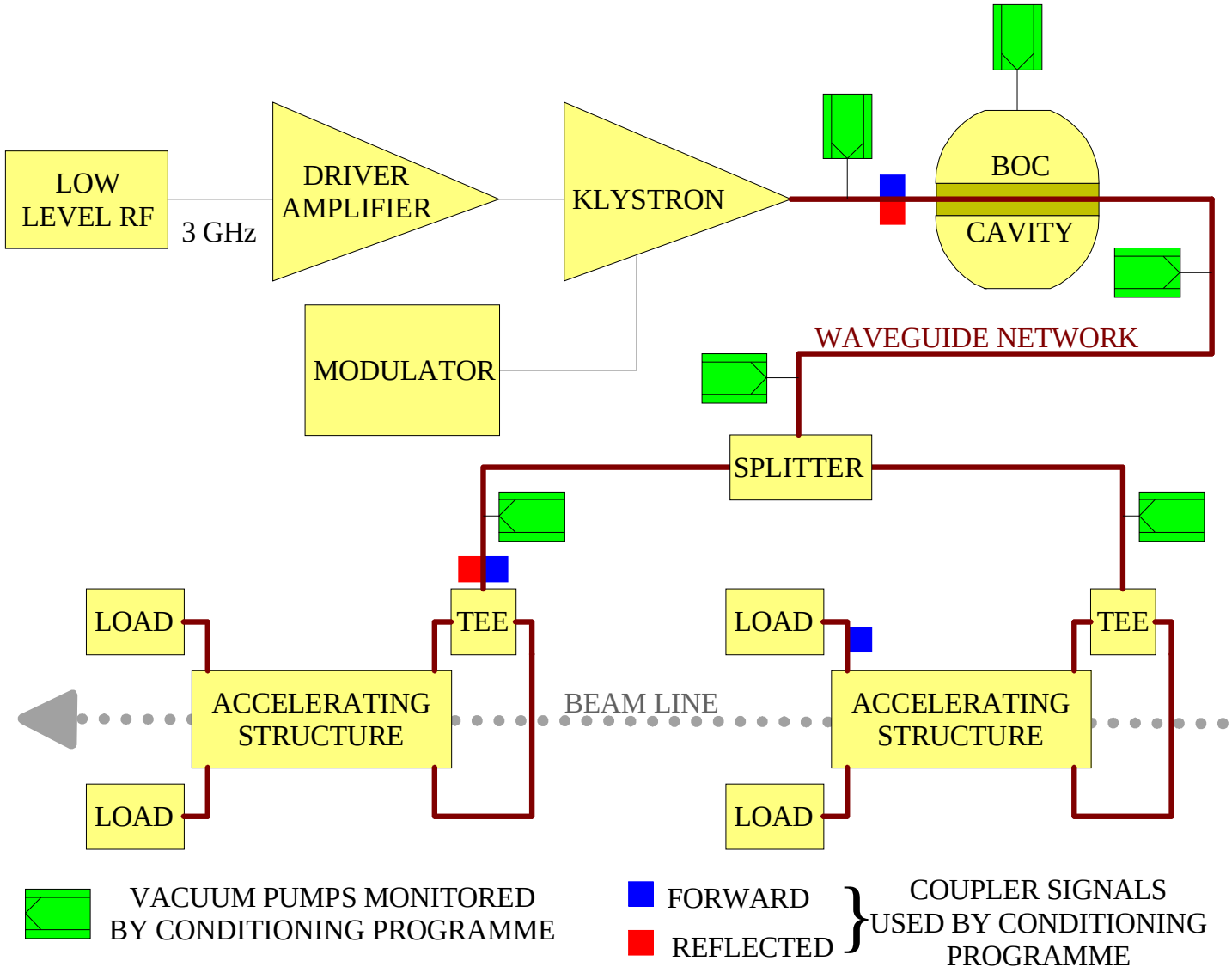
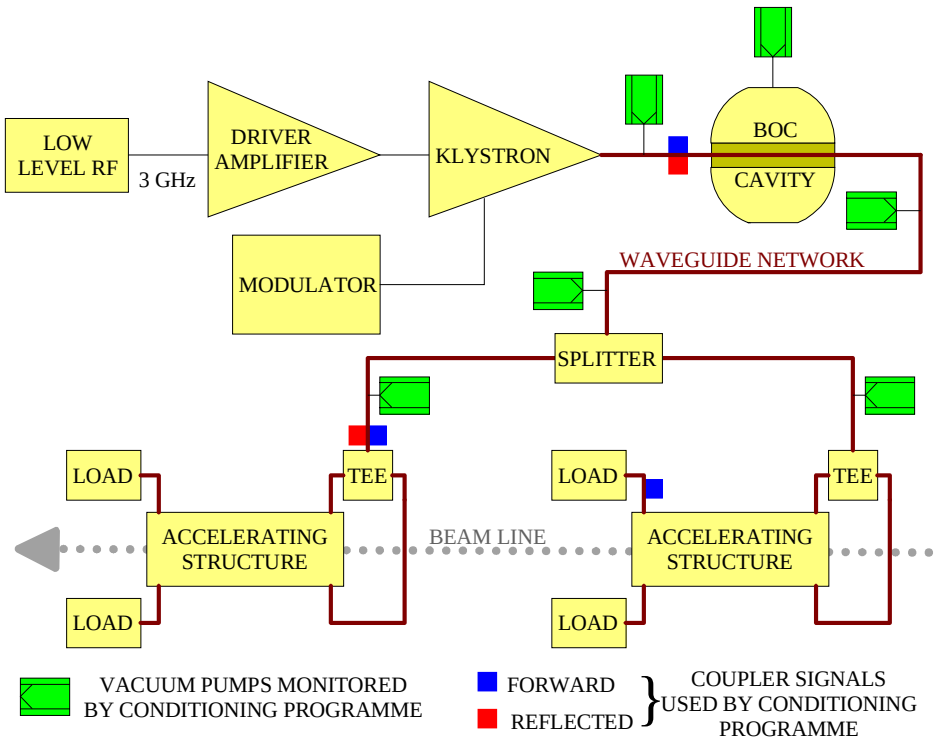
- Overview of the 3 GHz Conditioning
- Overview of the 30 GHz Conditioning
- The principle schema of the programs
- The 3 GHz Conditioning Application
- The 30 GHz Conditioning Application
- Logging
- The End

Overview of the 3 GHz Conditioning



Overview of the 3 GHz Conditioning



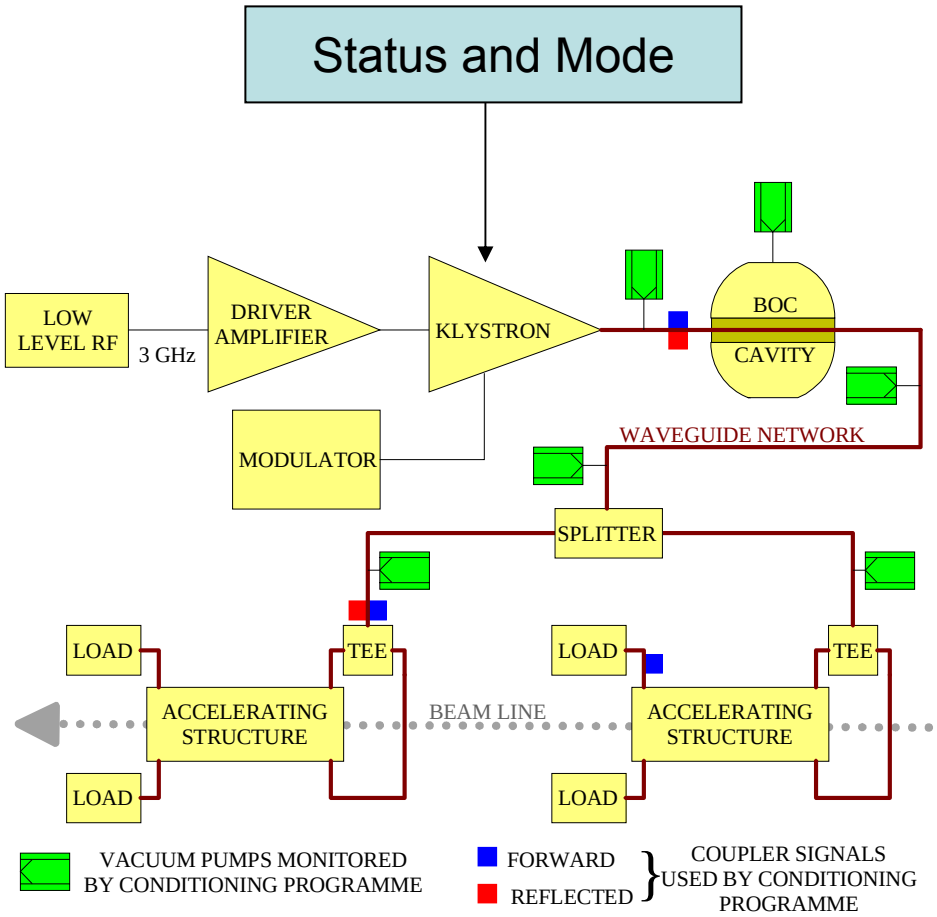
Checks:

- Klystron
- Anomalous forward power
- Reflected power
- Vacuum levels
- Timing inhibit interlock
- Vacuum pumps

Control:

- PFN
- Driver Amplifier

Overview of the 3 GHz Conditioning



Checks:

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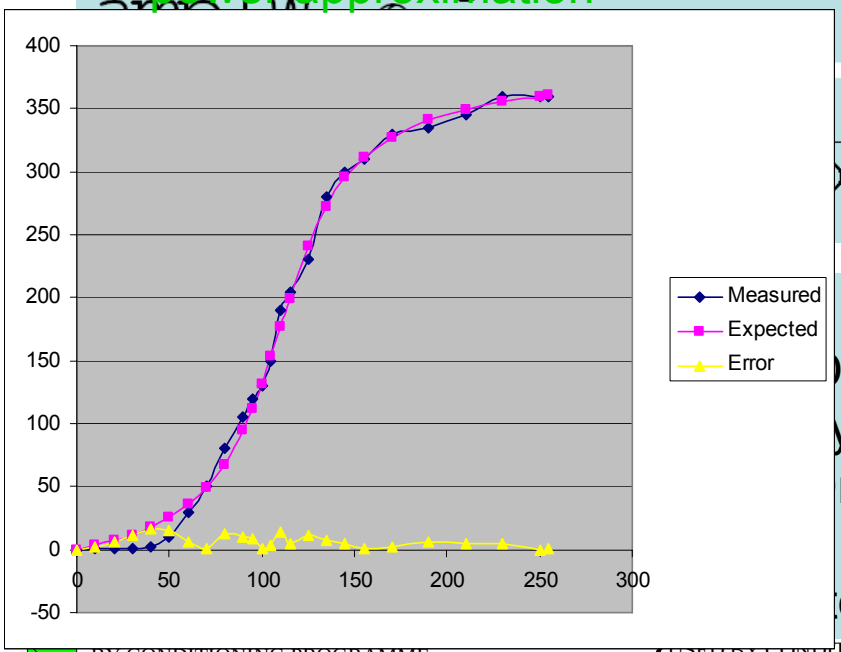
Overview of the 3 GHz Conditioning

Checking peaks of transmitted power

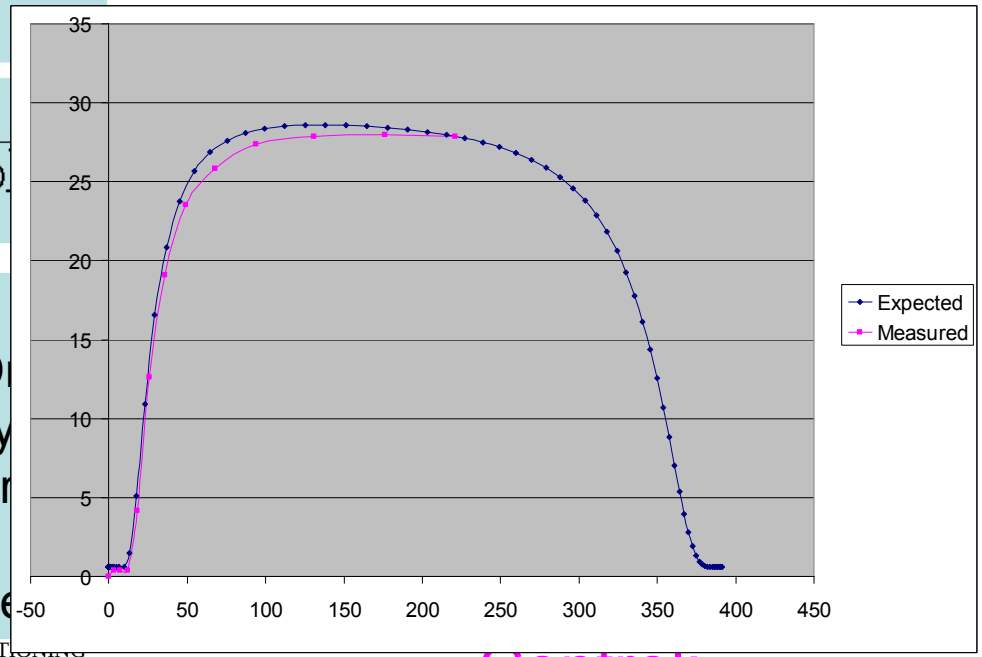
Drv. Ampl. Value

Klystron Transmitted Power

Driver amplifier power approximation



Klystron transmitted power approximation



BY CONDITIONING PROGRAMME

REFLECTED

USED BY CONDITIONING PROGRAMME

Checks:

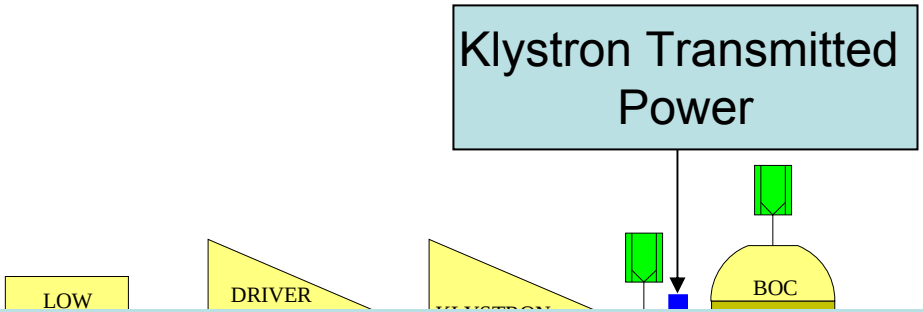
- Klystron

Control:

- PFN
- Driver Amplifier

Overview of the 3 GHz Conditioning

Checking peaks of transmitted power



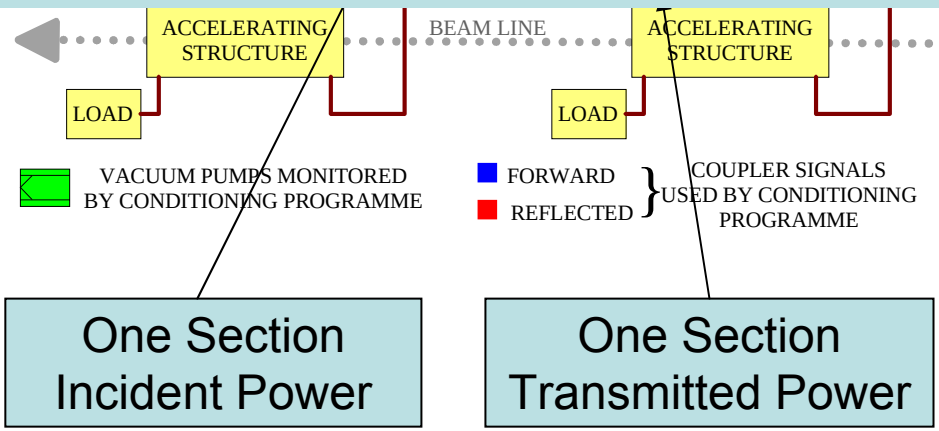
Checks:

- Klystron
- *Anomalous forward power*

One Section Incident Power ≈ Klystron Transmitted Power / 2 * Cavity Coefficient

One Section Transmitted Power ≈ One Section Incident Power

Cavity Coefficient = 1 (if the conditioning without cavity)
Cavity Coefficient ≈ 1,8 (with cavity)



- Vacuum pumps

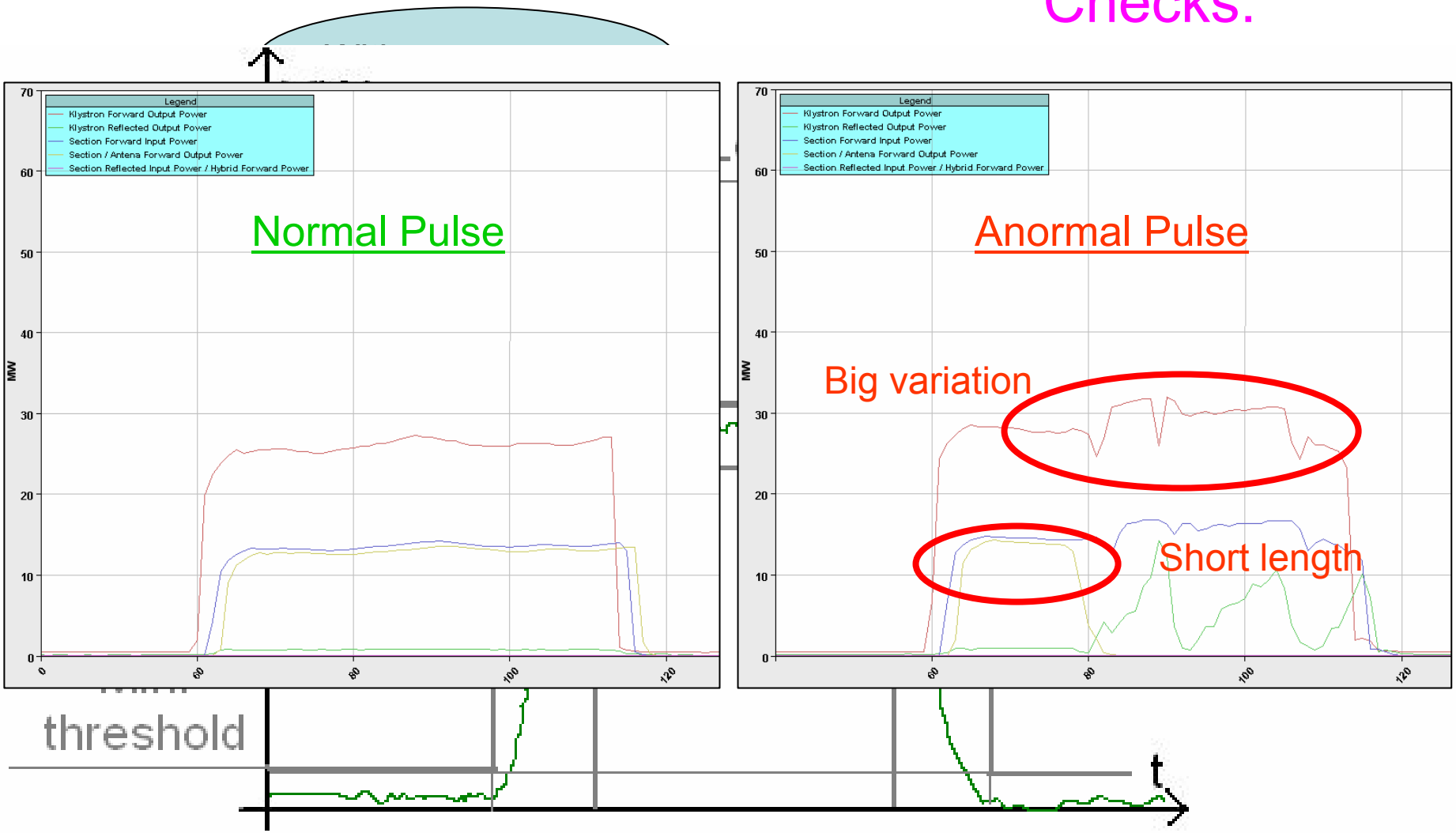
Control:

- PFN
- Driver Amplifier

Overview of the 3 GHz Conditioning

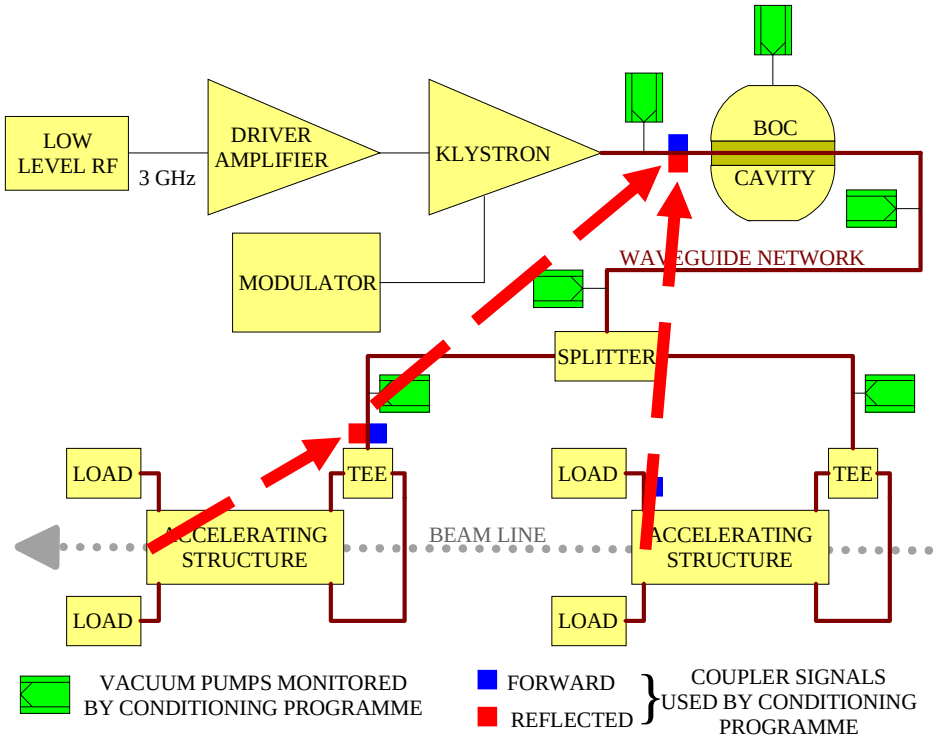
Checks of transmitted power shapes

Checks:



Overview of the 3 GHz Conditioning

Checking peaks of reflected power



Reflected power ranges:

- *Normal*
- *Waiting*
- *Reduce the klystron incident power*

Checks:

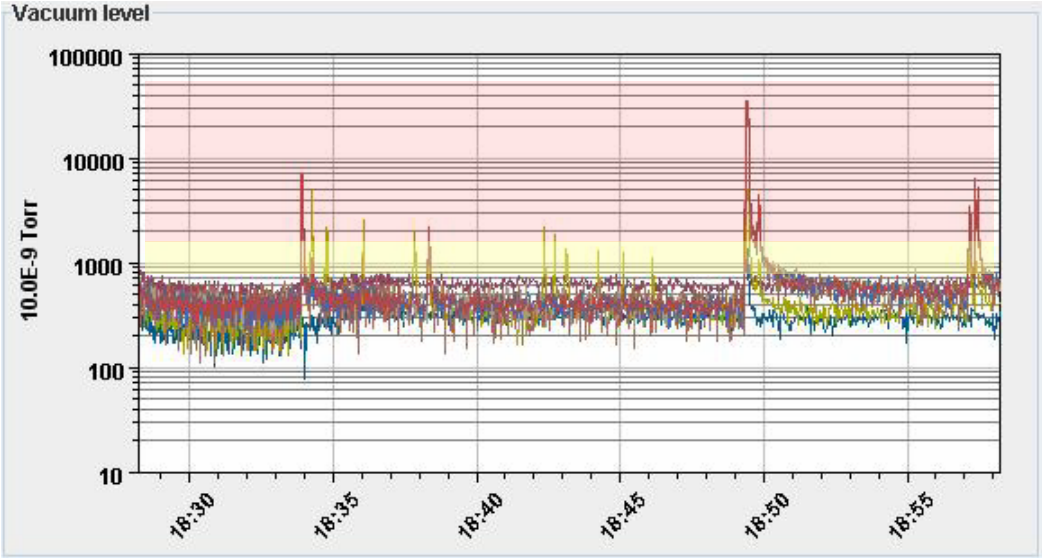
- Klystron
- Anomalous forward power
- *Reflected power*
- Vacuum levels
- Timing inhibit interlock
- Vacuum pumps

Control:

- PFN
- Driver Amplifier

Overview of the 3 GHz Conditioning

Up to 8 vacuum channels



Vacuum level ranges:

- *Normal*
- *Waiting*
- *Reduce the klystron incident power*

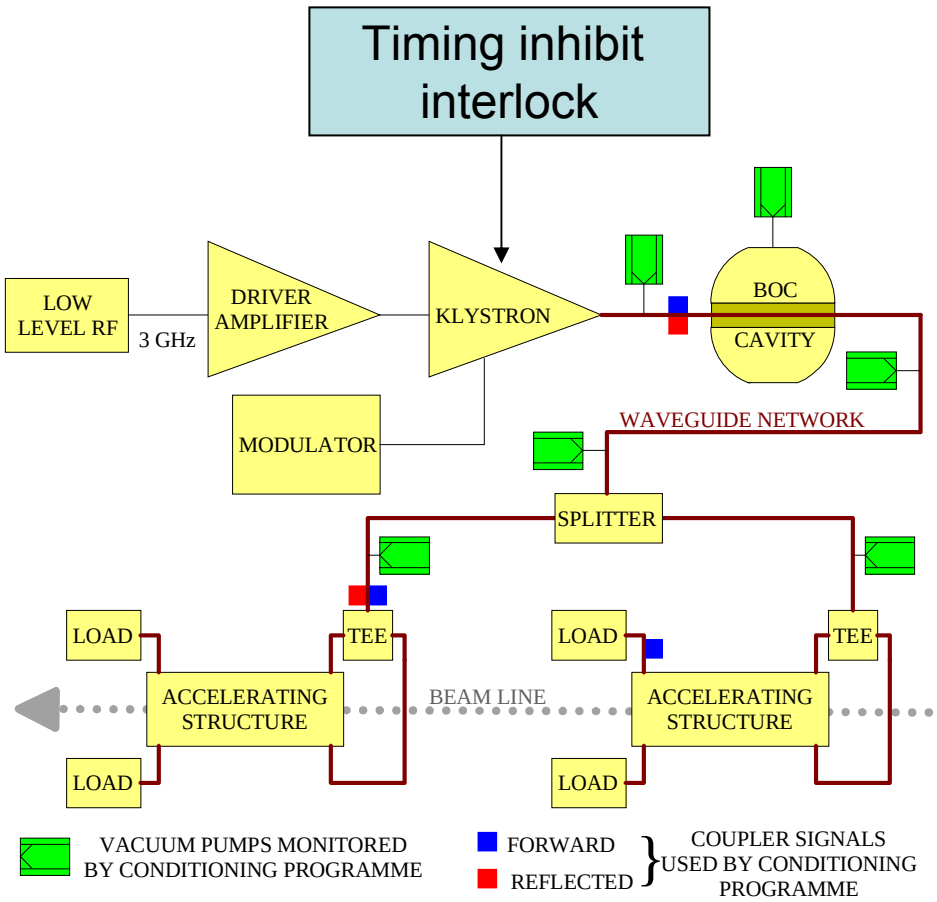
Checks:

- Klystron
- Anomalous forward power
- Reflected power
- *Vacuum levels*
- Timing inhibit interlock
- Vacuum pumps

Control:

- PFN
- Driver Amplifier

Overview of the 3 GHz Conditioning



Checks:

- Klystron
- Anomalous forward power
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- *Timing inhibit interlock*
- Vacuum pumps

Control:

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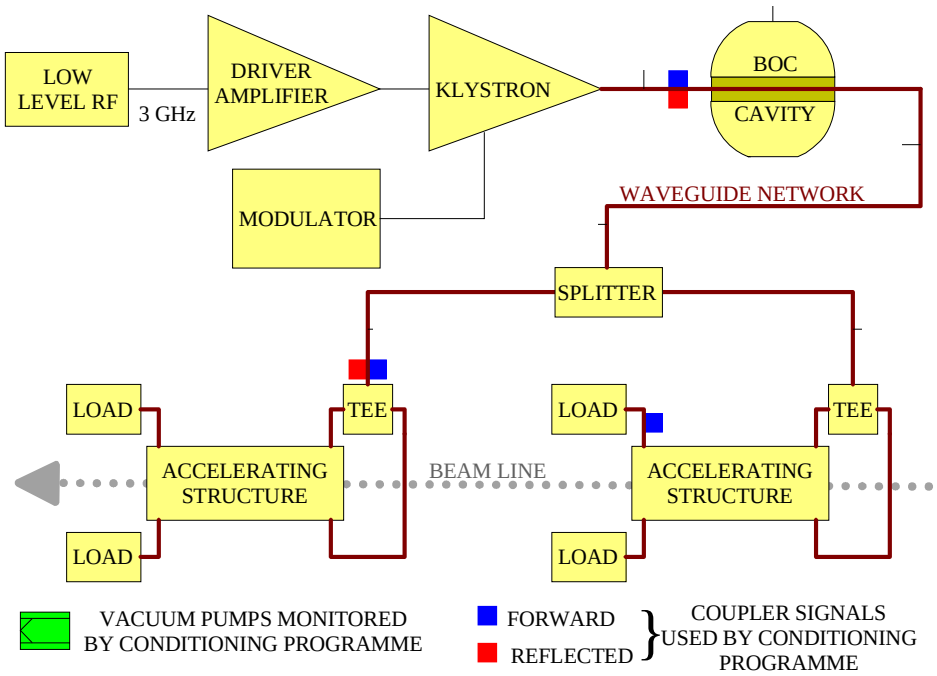
Overview of the 3 GHz Conditioning



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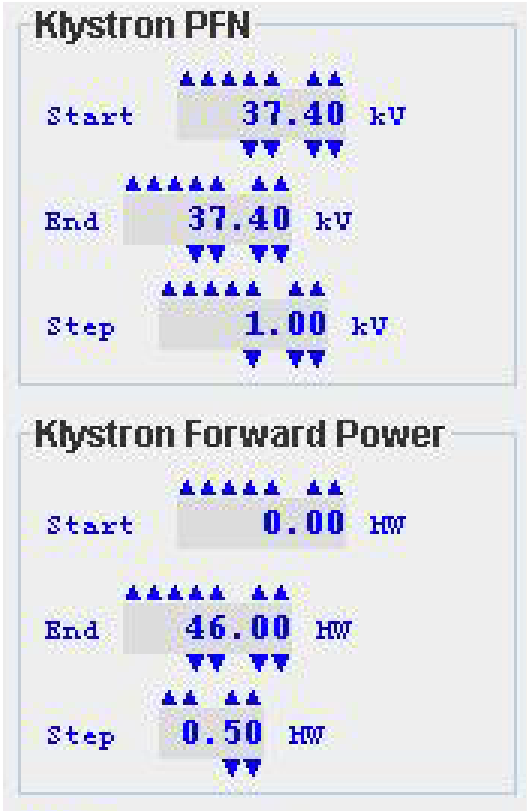


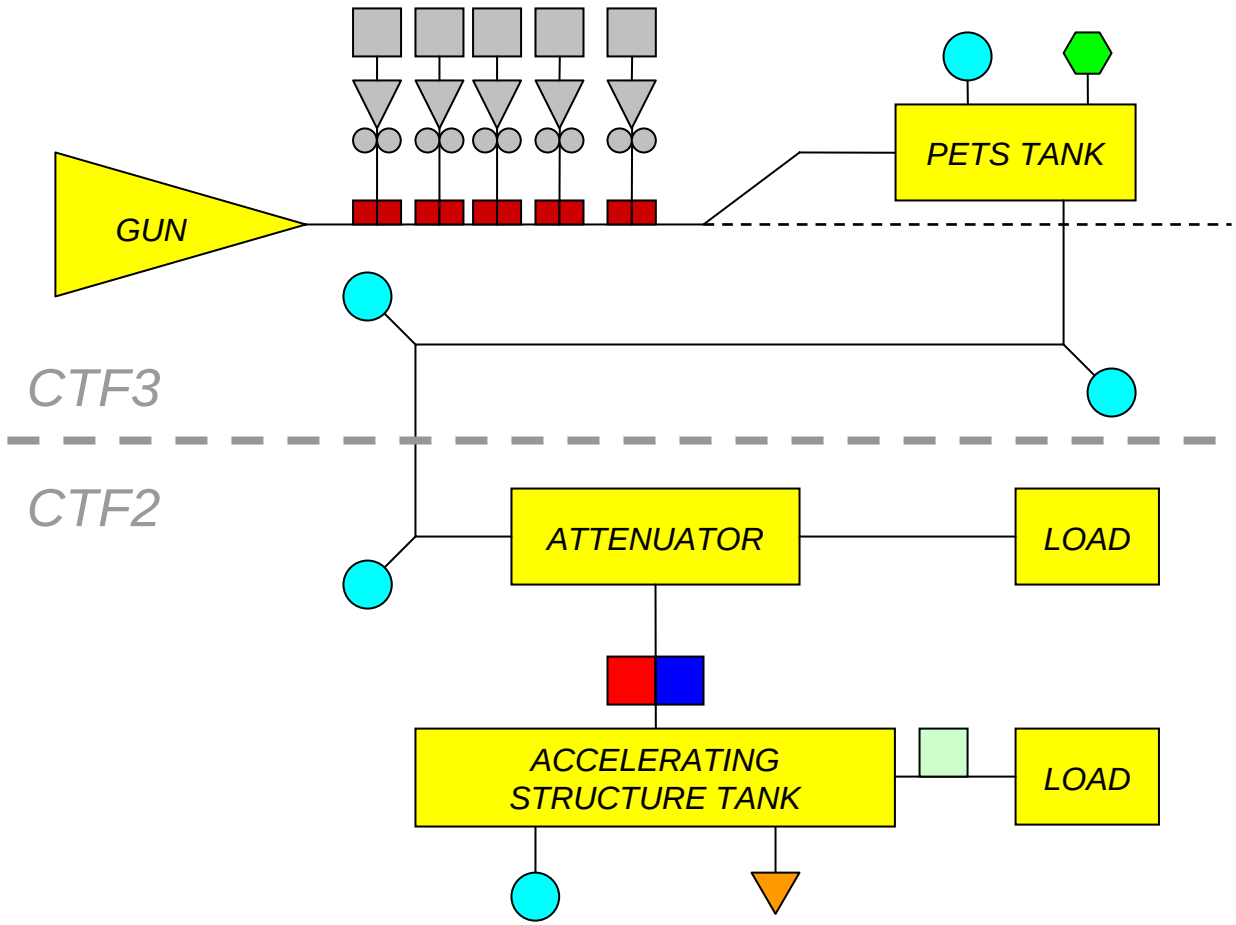
Checks:

- Klystron
- Anomalous forward power
- Reflected power
- Vacuum levels
- Timing inhibit interlock
- Vacuum pumps

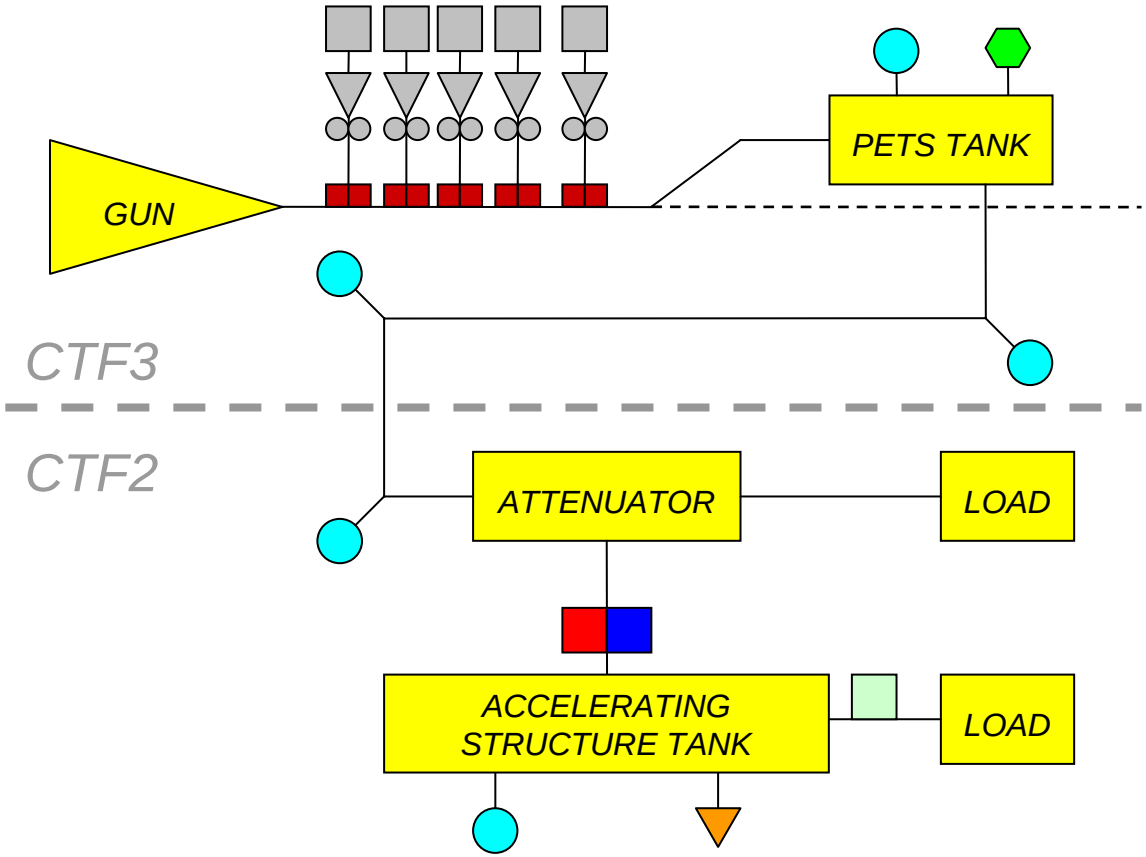
Control:

- *PFN*
- *Driver Amplifier*

Overview of the 30 GHz Conditioning



Overview of the 30 GHz Conditioning



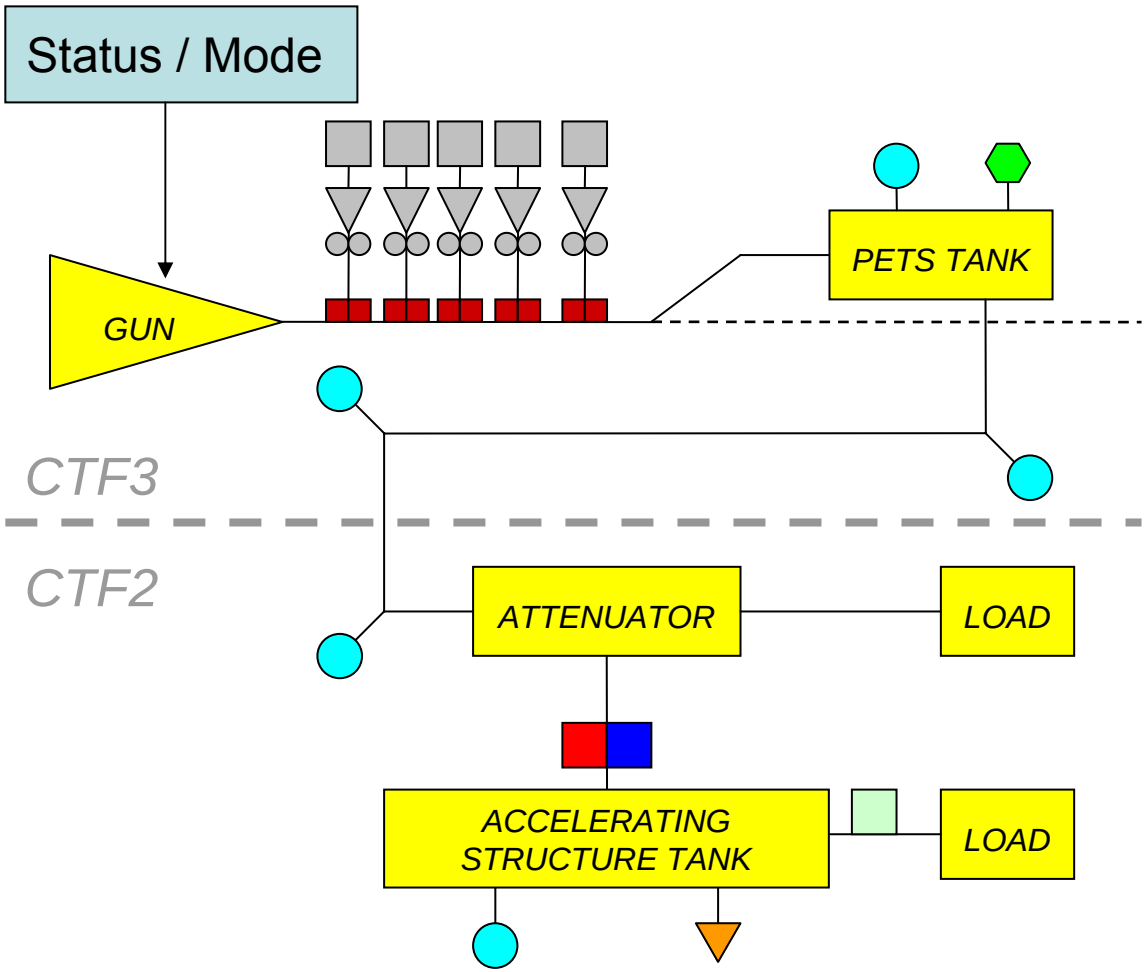
Checks:

- Gun
- Missing energy
- Reflected energy
- FC signal
- Vacuums
- Gun inhibiter

Control:

- Gun
- Attenuator
- Pulse length

Overview of the 30 GHz Conditioning



Checks:

- *Gun*
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- Gun
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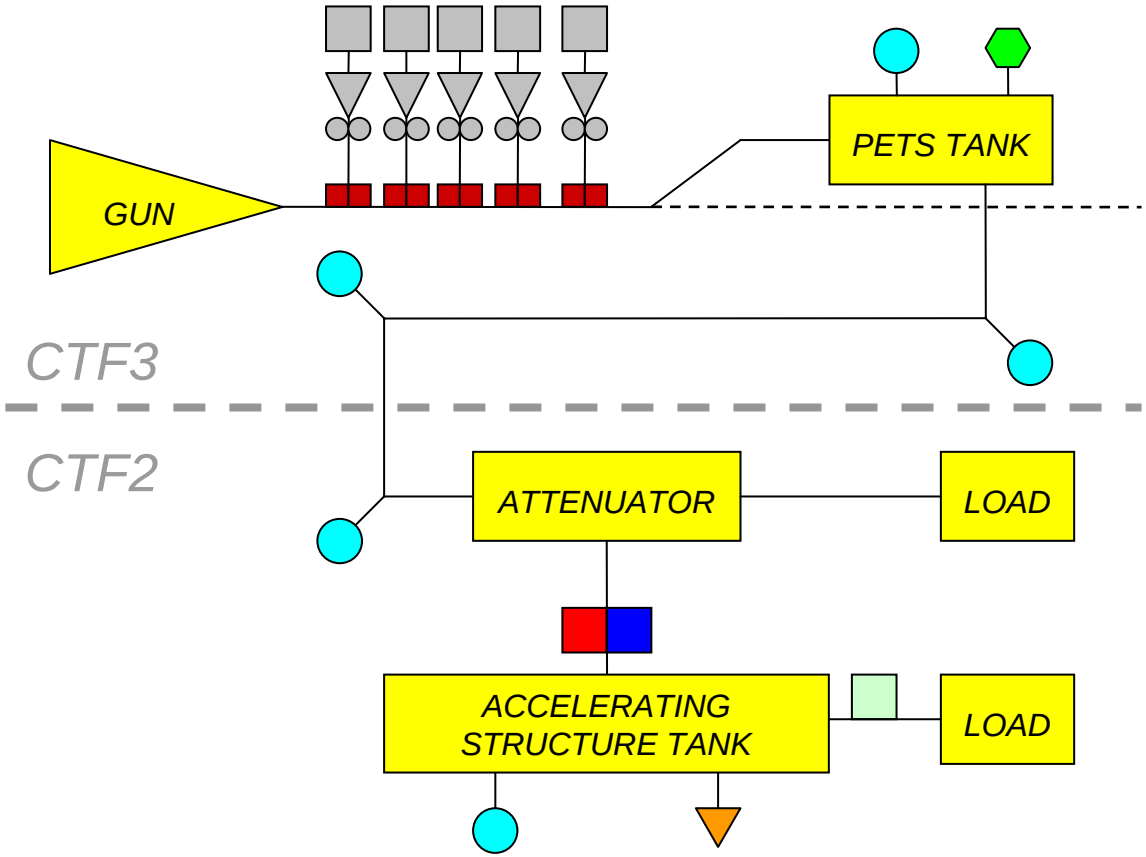
Overview of the 30 GHz Conditioning



Vacuum gauge
FC
BPM
Reflected power
Incident power
Transmitted power

Checks:

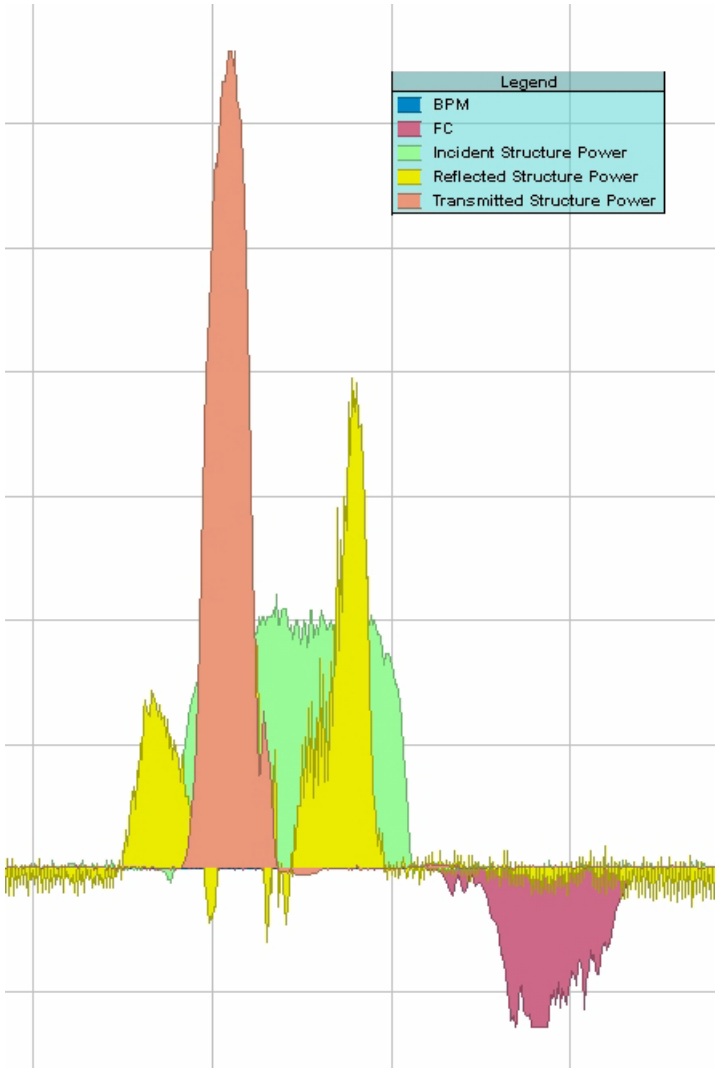
- Gun
- *Missing energy*
- *Reflected energy*
- *FC signal*
- Vacuums
- Gun inhibiter

Control:

- Gun
- Attenuator
- Pulse length

Overview of the 30 GHz Conditioning

Powers and Signals



Checks:

- Gun
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- Vacuums
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Control:

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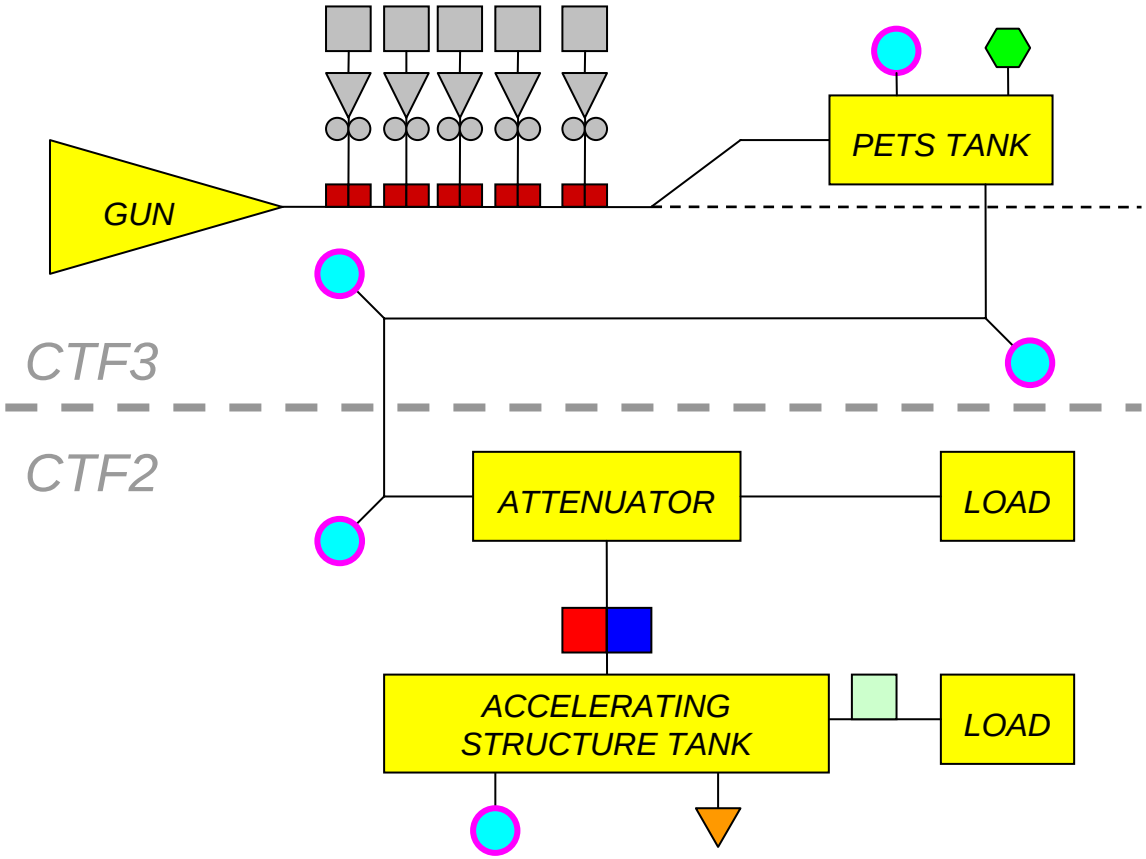
Overview of the 30 GHz Conditioning



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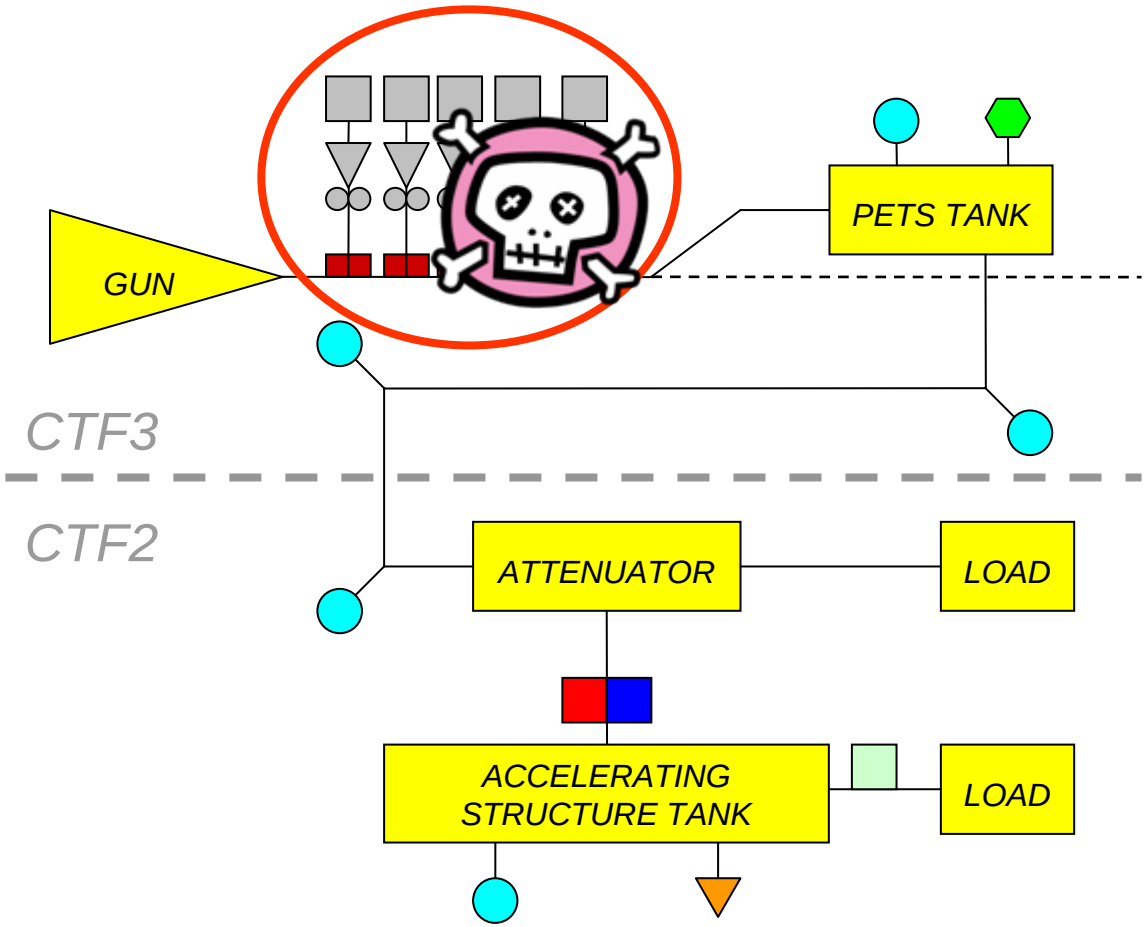
Overview of the 30 GHz Conditioning



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- Gun
- Missing energy
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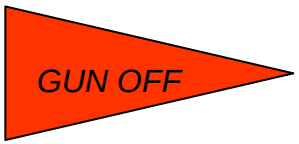
- *Gun inhibiter*

Control:

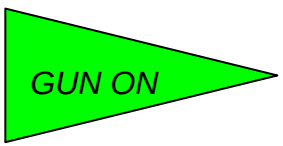
- Gun
- Attenuator
- Pulse length

Overview of the 30 GHz Conditioning



The Gun should be switched off, when:

1. Missing energy
2. Reflected energy
3. FC



The Gun should be switched on, when:

1. Vacuum levels are OK
2. Status of the gun inhibiter is OK
3. If there was a breakdown, after changing pulse length and attenuator position

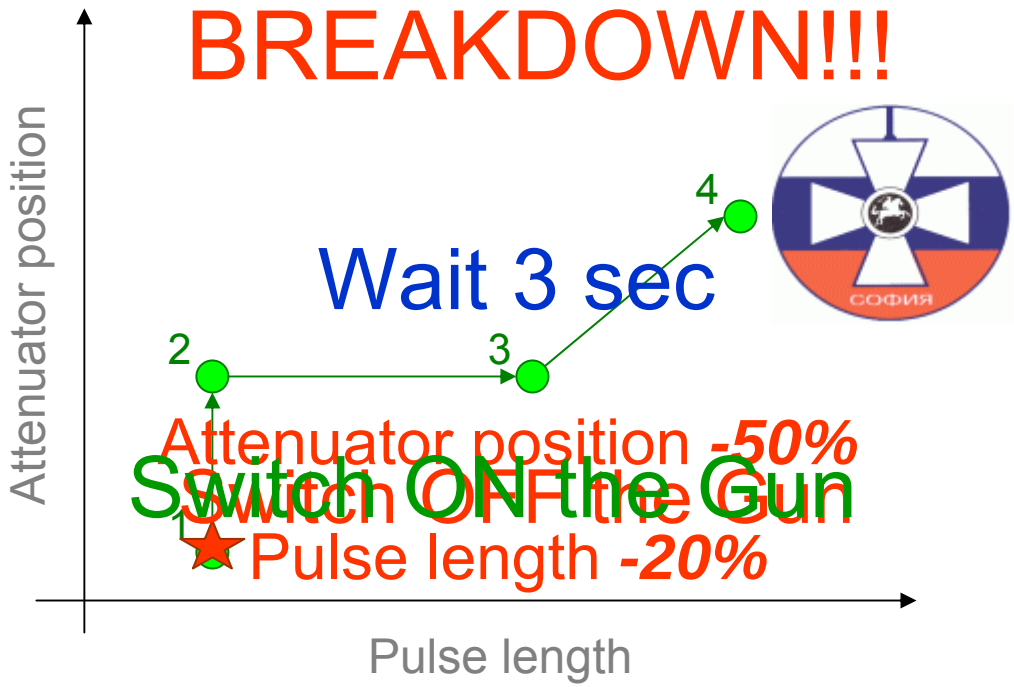
Checks:

- Gun
- Missing energy
- Reflected energy
- FC signal
- Vacuums
- Gun inhibiter

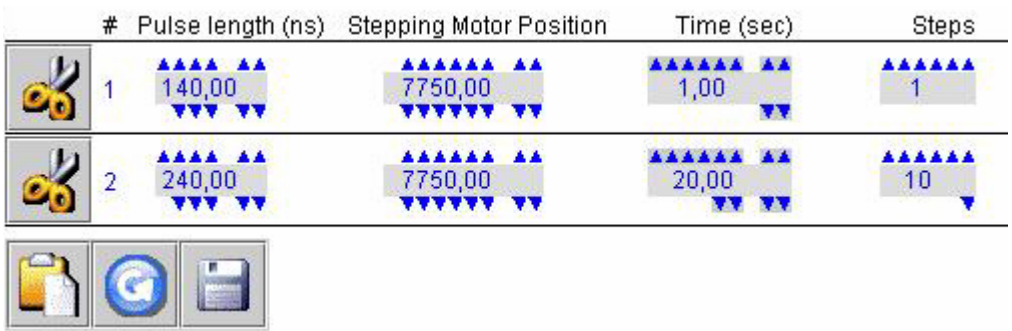
Control:

- *Gun*
- Attenuator
- Pulse length

Overview of the 30 GHz Conditioning



GUI



Checks:

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- Reflected energy
- FC signal
- Vacuums
- Gun inhibiter

Control:

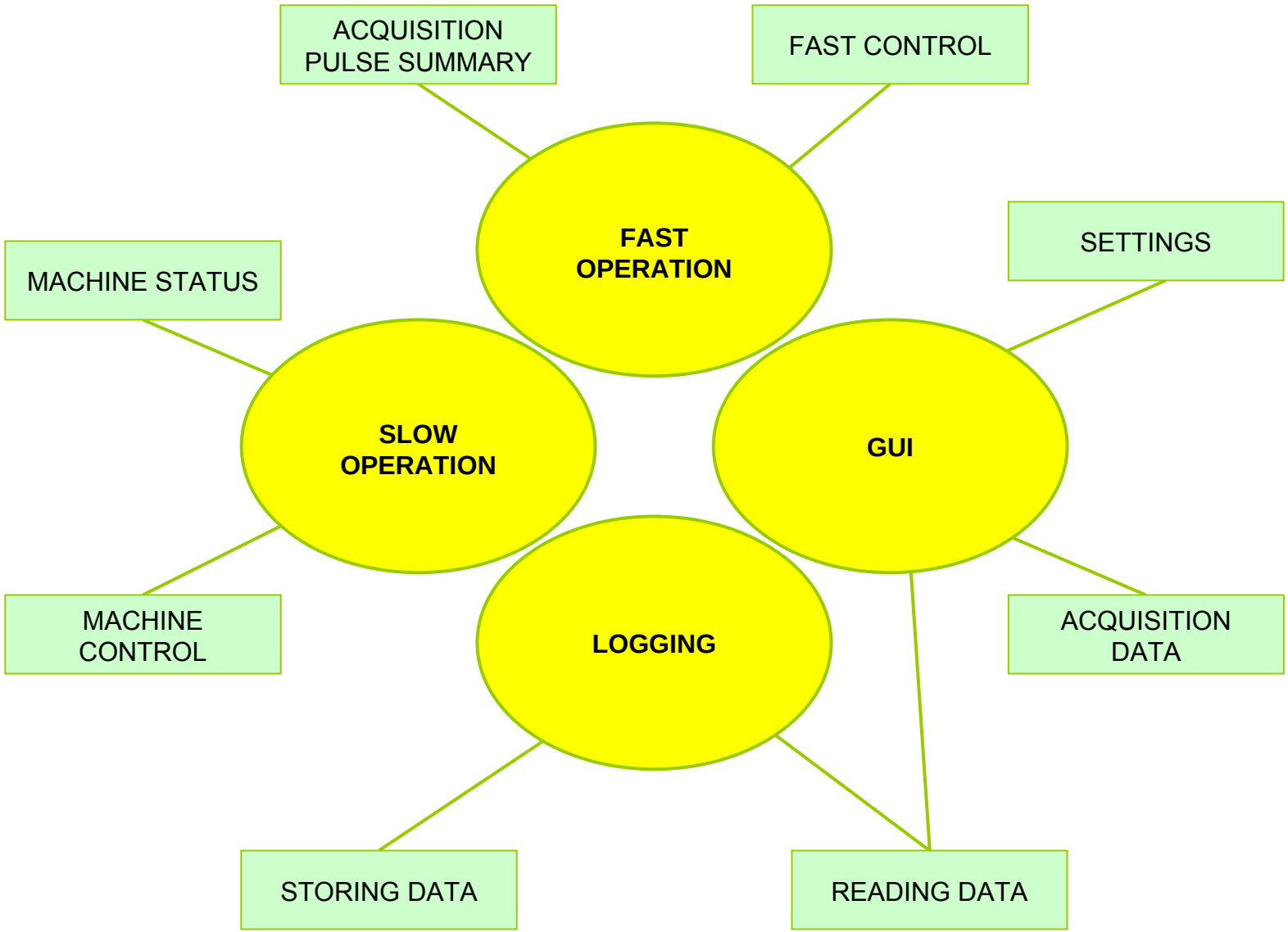
- Gun
- *Attenuator*
- *Pulse length*

Overview of the 30 GHz Conditioning

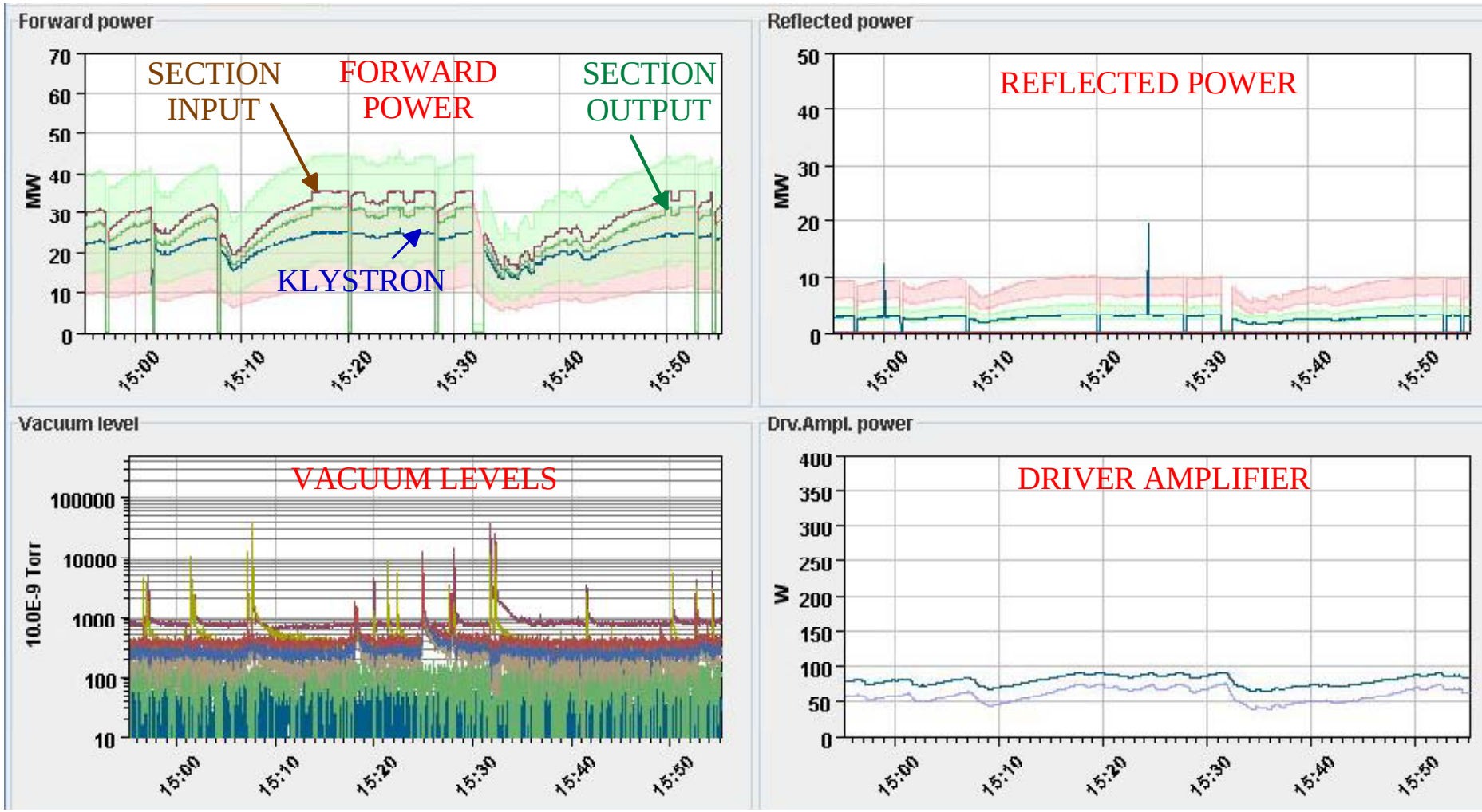
Interlock settings

Enable / Name	Number events	Pulse length	Stepping Motor	Wait	Threshold	Incid. Power Threshold
☑ FC	1	50,00 %	100,00 %	0,00 sec	-0,10	
☐ Missing energy	1	100,00 %	100,00 %	0,00 sec	25,00 %	0,10
☐ Reflected energy	1	100,00 %	100,00 %	0,00 sec	25,00 %	0,10
☑ Vacuum AST		100,00 %	100,00 %	10,00 sec	100,00	
☑ Vacuum PT		100,00 %		10,00 sec	100,00	
☑ Vacuum FB		100,00 %		10,00 sec	100,00	
☑ Vacuum SB		100,00 %		10,00 sec	100,00	
☑ Vacuum TB		100,00 %		10,00 sec	100,00	
☑ Gun stopped		50,00 %	100,00 %	5,00 sec		

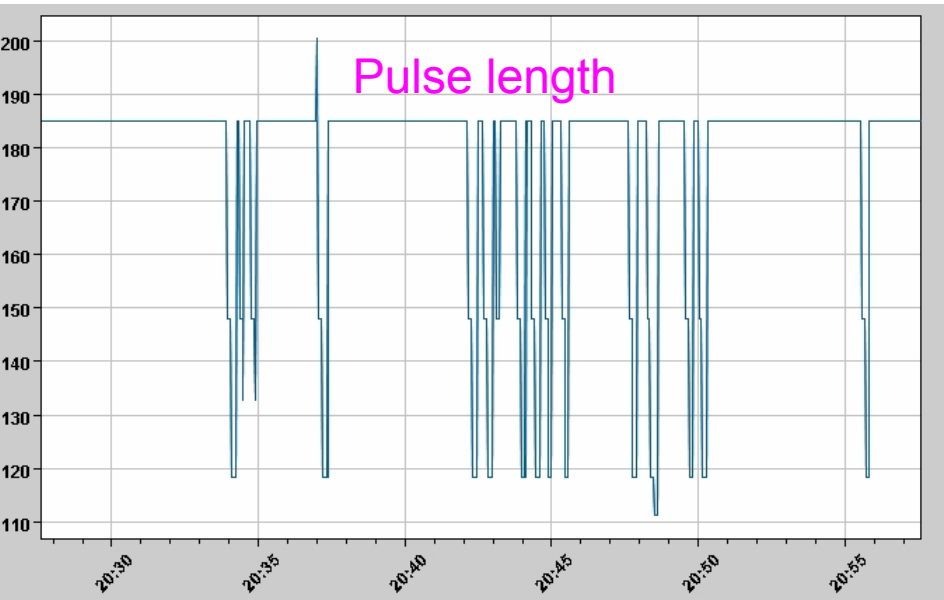
The principle schema of the programs

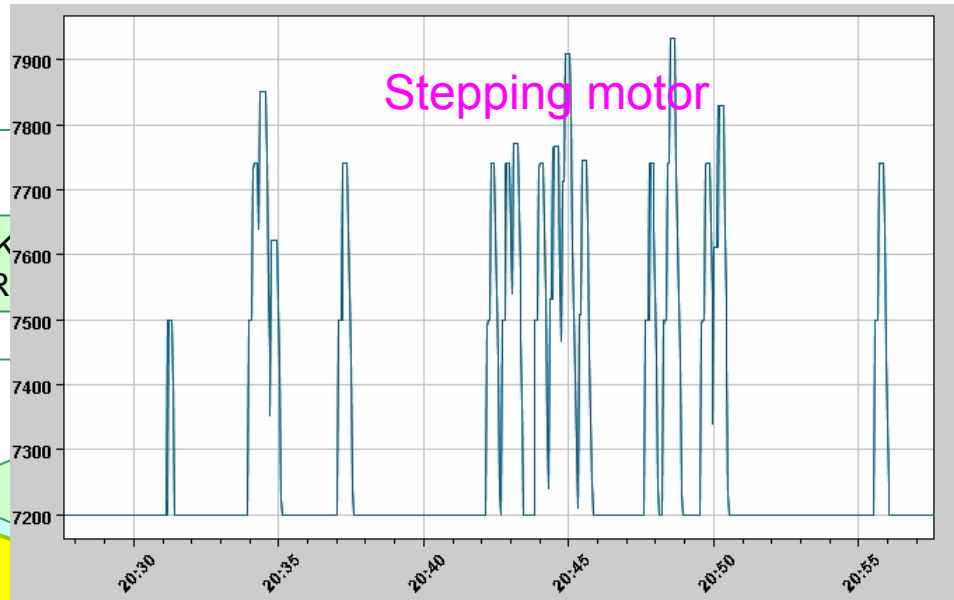


The 3 GHz Conditioning Application



The 30 GHz Conditioning Application





SLOW OPERATION

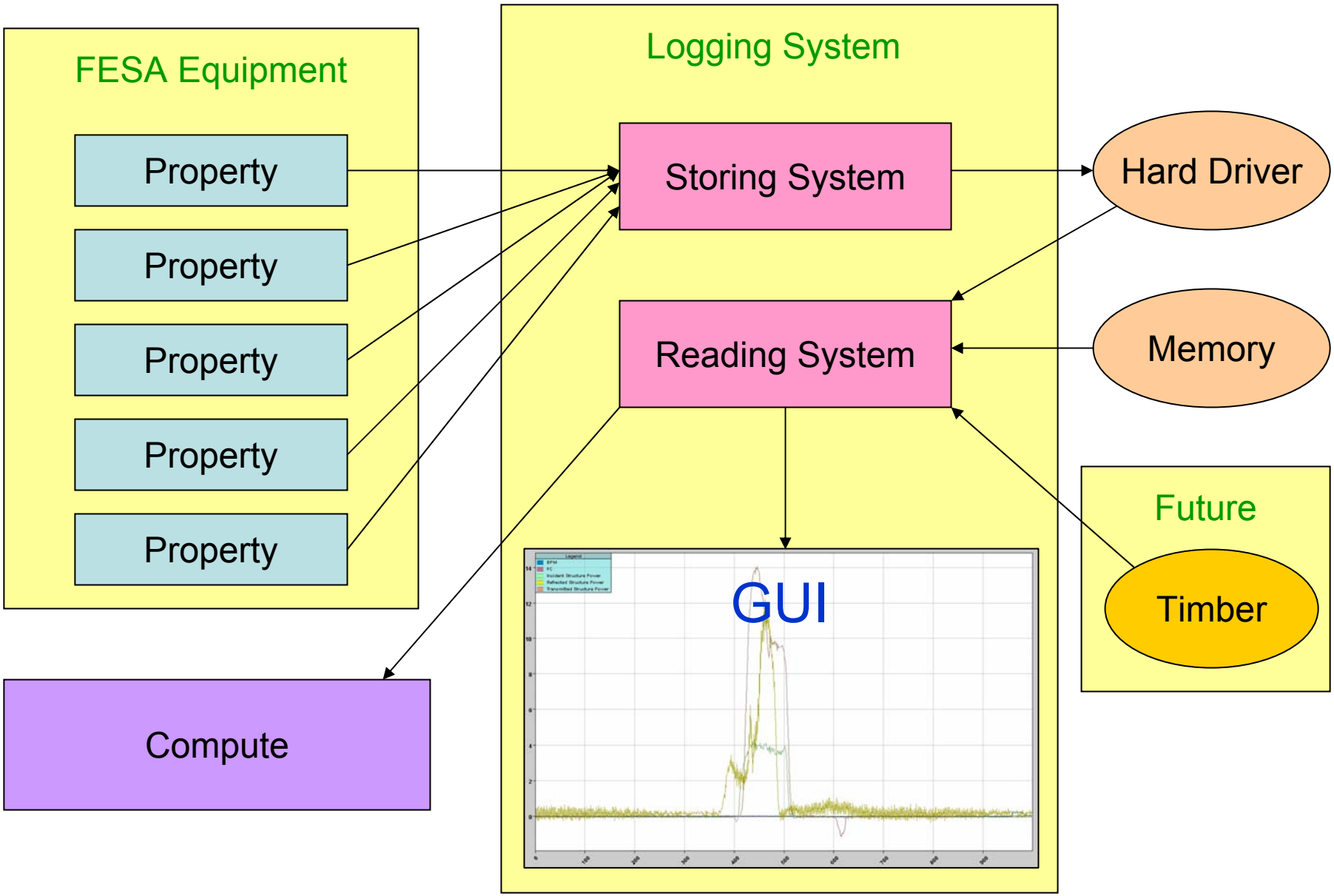
GUN OFF

RES
GUN-INH

C. STEPPING MOTOR

JAVA

Logging


FESA Equipment
Property
Property
Property
Property
Property
Logging System
Storing System
Reading System
GUI
Hard Driver
Memory
Future
Timber
Compute

Logging for *3* GHz Conditioning

Logging data for an action:

- Driver amplifier value
- Power shapes, peaks and statuses
- Vacuum levels
- Pulse length
- Conditioning status

Logging for ***30*** GHz Conditioning

Logging data:

- All settings
- Powers and signals shapes and vacuum levels, if there is an event
- Interlocks
- Pulse summery
- Conditioning acquisition

The End

XXX

Thank you for your attention

XXX