**Timing Proposal for NML/ASTA**

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* 2 Rep Rate Generators exist, each with 16 events
* Line lock between them is not guaranteed
* Event generation priority is in descending order (e.g. $AF is highest, $A0 is lowest)
* 4 variable rate events exist: $AC, $AB, $C0, $C1

|  |  |  |
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| **Event** | **Source** | **Description** |
| $A1 | K6 RF | Cryomodule RF Present, Klystron 6 |
| $A9 | RRG1 | "0.1 Hz"; synchronized to AC line and RF Master Oscillator, |
|  |  | triggered by Rep-Rate Generator 1 |
| $AA | RRG1 | "1 Hz"; synchronized to AC line and RF Master Oscillator, |
|  |  | triggered by Rep-Rate Generator 1 |
| $AB | RRG1 | Rate N"; synchronized to AC line and RF Master Oscillator, |
|  |  | triggered by Rep-Rate Generator 1; Cryomodule Commissioning |
|  |  | Selectable rate: 0.2, 0.5, 1, 2, 2.5, 5, or 10Hz; |
| $AC | RRG1 | Rate M"; synchronized to AC line and RF Master Oscillator, |
|  |  | triggered by Rep-Rate Generator 1; RF Gun Commissioning |
|  |  | Selectable rate: 0.2, 0.5, 1, 2, 2.5, 5, or 10Hz; |
| $AD | RRG1 | "2.5 Hz"; synchronized to AC line and RF Master Oscillator, |
|  |  | triggered by Rep-Rate Generator 1 |
| $AE | RRG1 | "5 Hz"; synchronized to AC line and RF Master Oscillator, |
|  |  | triggered by Rep-Rate Generator 1 |
| $AF | RRG1 | "10 Hz"; synchronized to AC line and RF Master Oscillator, |
|  |  | triggered by Rep-Rate Generator 1 |
|  |  |  |
| $C0 | RRG2 | Rate M"; synchronized to AC line and RF Master Oscillator, |
|  |  | triggered by Rep-Rate Generator 2; RF Gun Commissioning |
|  |  | Selectable rate: 0.2, 0.5, 1, 2, 2.5, 5, or 10Hz; |
| $C1 | RRG2 | Rate N"; synchronized to AC line and RF Master Oscillator, |
|  |  | triggered by Rep-Rate Generator 2; Cryomodule Commissioning |
|  |  | Selectable rate: 0.2, 0.5, 1, 2, 2.5, 5, or 10Hz; |
| $C2 | Timer | Conditioning Event, referenced to event $C0 |
| $C3 | Timer | Conditioning Event, referenced to event $C1 |

*$A0, $A2 - $A8, $C4 - $CF are undefined at this time.*

1. Use **$An** events for **beam operation**
2. Use **$Cn** events for **commissioning/other asynchronous operation**
3. Assume **5ms** canonical delay between **arming events** and **actual beam**
4. Default **Laser** rate is **5 Hz**
5. **RF** systems will run at **variable** rates as programmatic needs dictate, typically 1, 2.5, or 5 Hz
6. **$AE** is the **master** timer for the **Laser** (with appropriate delay) and **drives all timing**
7. **$AC** serves as the **operational systems trigger** for RF systems: Gun, CC1 &2, CMn’s and diagnostics. Its **variable** rate is determined by **operational demands**.
8. **$A8** = $AC + 5ms is the **‘beam’** and RF pulse **trigger**