

RHIC, NSRL, and Polarized Proton Operations

- Schedule
- RHIC (gold) and NSRL (Silicon or Carbon) PPM
- Polarized Protons and NSRL PPM
- Mode Switching
- BLIP Operation
- Daily Schedule for Injector Use
- Radiation Safety

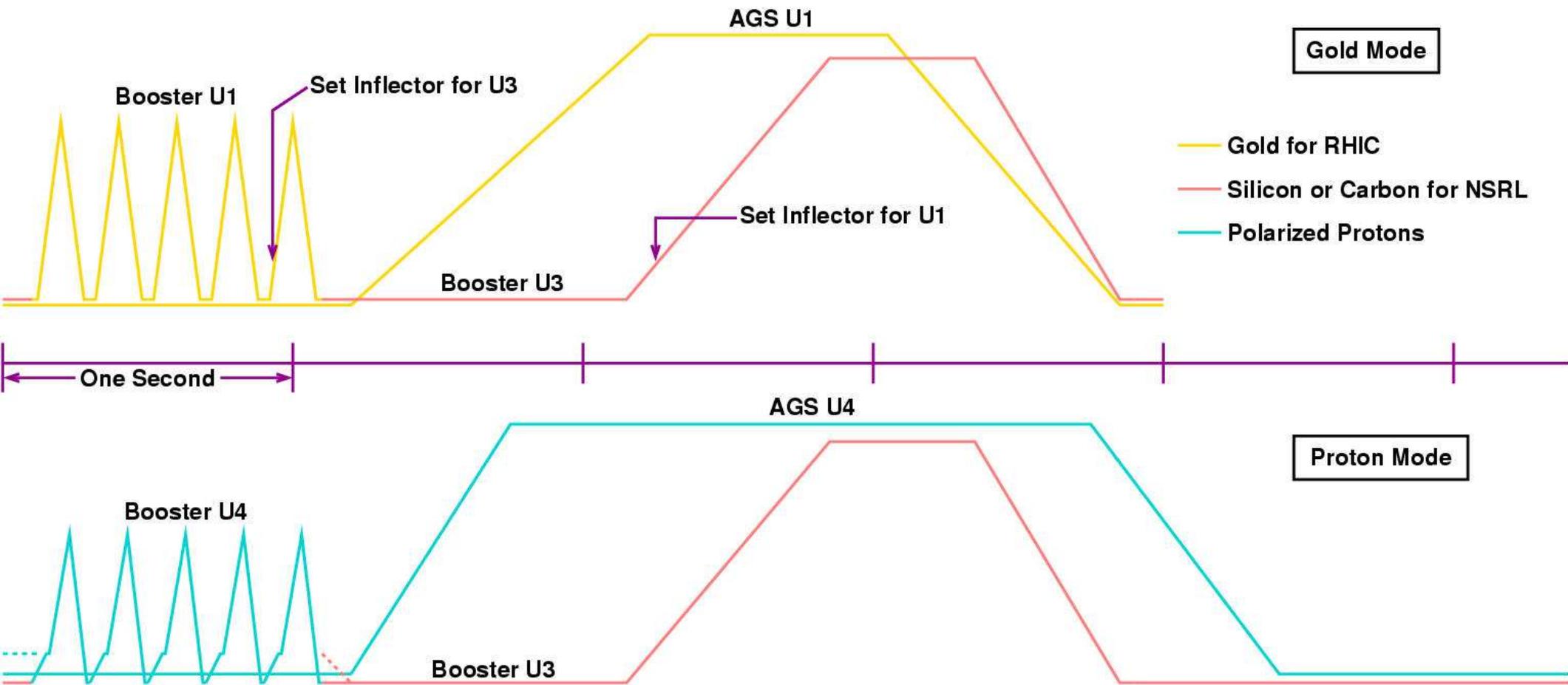
Kin's Schedule

Week no.	Starting Monday	Actually !	Description	
1	1-Dec-2003		5-week RHIC Startup	
2	8-Dec-2003			
3	15-Dec-2003			
4	22-Dec-2003			
5	29-Dec-2003	Dec.31, 2003		
1	5-Jan-2004		14-week RHIC Au-Au run	
2	12-Jan-2004			
3	19-Jan-2004			
4	26-Jan-2004			
5	2-Feb-2004			
6	9-Feb-2004			LINAC turns on
7	16-Feb-2004			
8	23-Feb-2004			
9	1-Mar-2004			
10	8-Mar-2004			Booster/AGS polarized proton run
11	15-Mar-2004			
12	22-Mar-2004			
13	29-Mar-2004			
14	5-Apr-2004			
1	12-Apr-2004		5-week polarized proton run	
2	19-Apr-2004			
3	26-Apr-2004			
4	3-May-2004			
5	10-May-2004			
	17-May-2004			
	24-May-2004			
	31-May-2004			
	7-Jun-2004			
	14-Jun-2004			

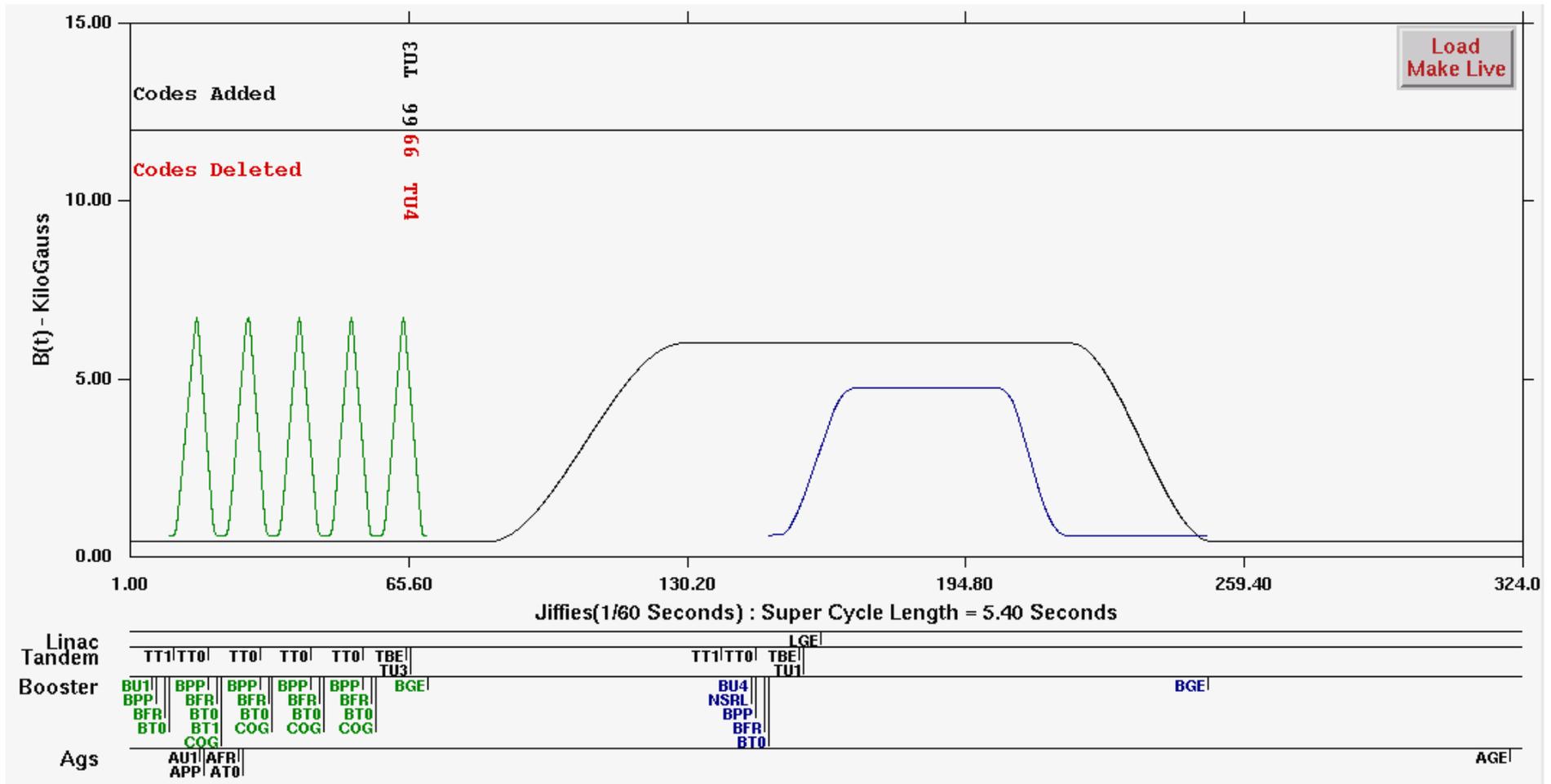
NSRL

BLIP

Supercycles for RHIC, NSRL, and PP Operation. NSRL ions at gold rigidity.



Actual Gold and Carbon PPM Supercycle



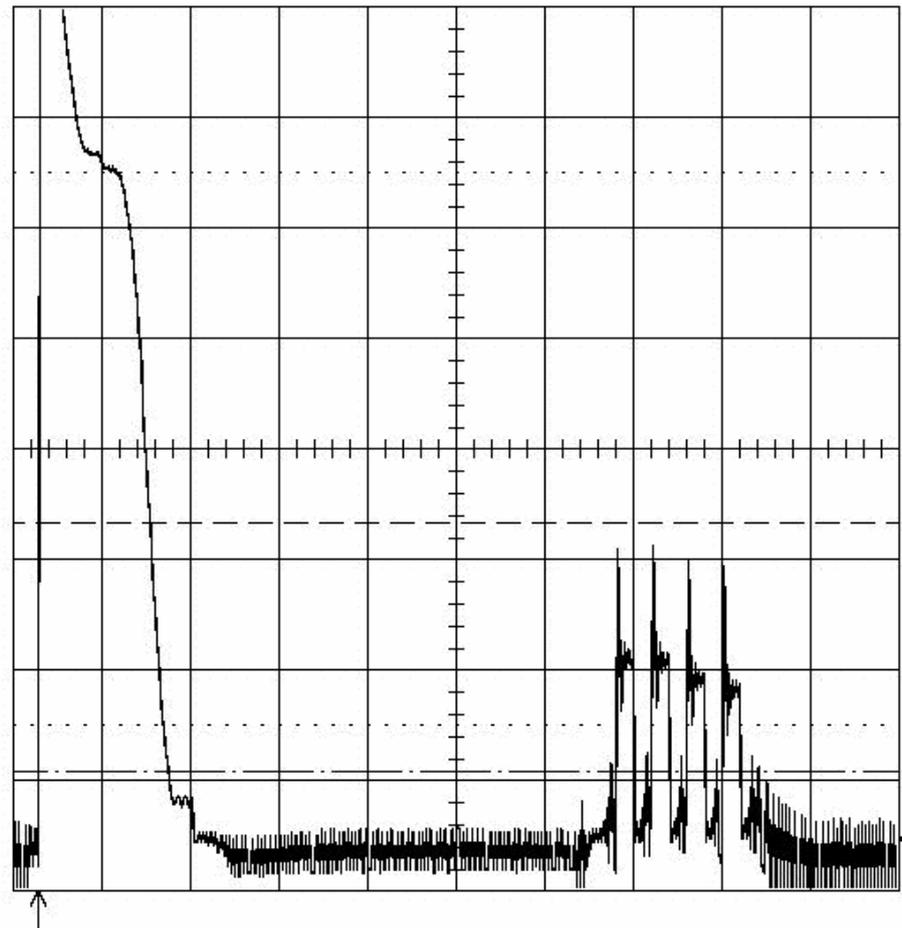
Actual Gold and Carbon PPM

20-Nov-03
17:38:03

REMOTE ENABLE

GO TO
LOCAL

1
.5 s
1.00 V
2.25 V



.5 s
1 1 V 50Ω
2 .5 V DC
3 1 V DC
4 50 mV 50Ω

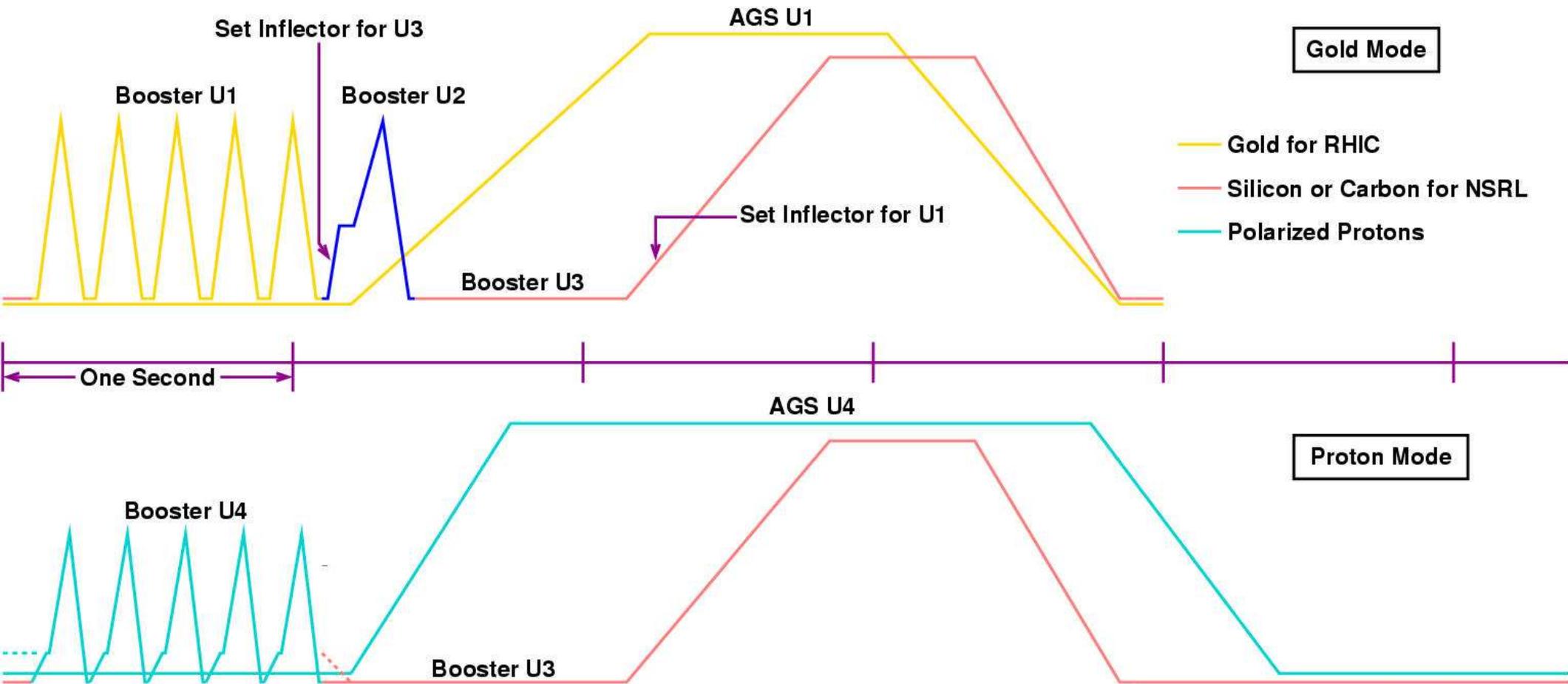


Ext10 DC 100 V 1MΩ

50 kS/s

STOPPED

Addition of Booster Merge Cycle

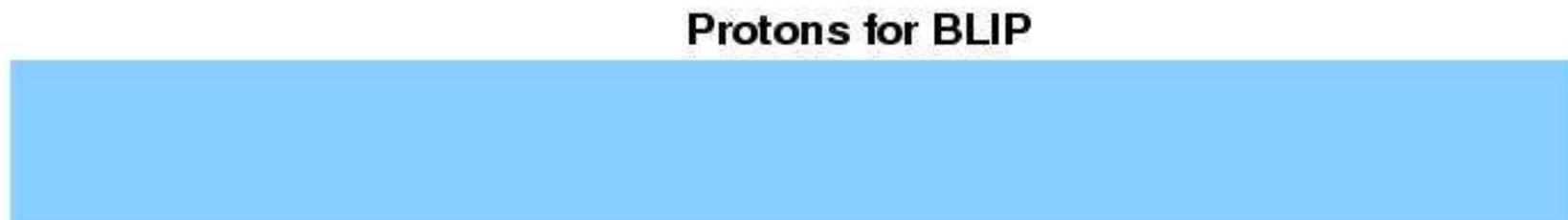
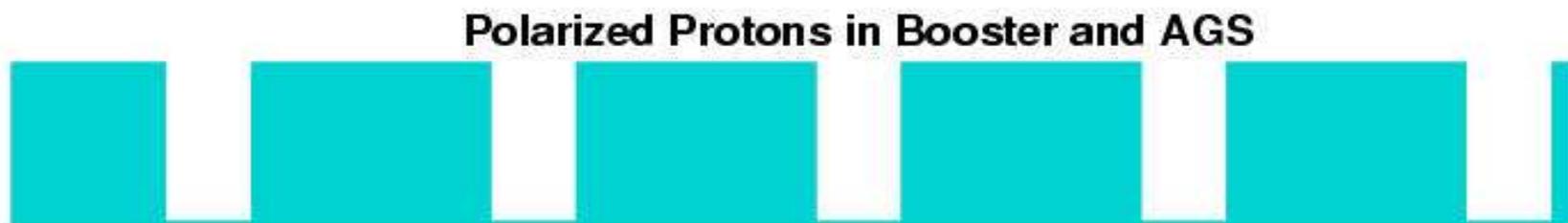
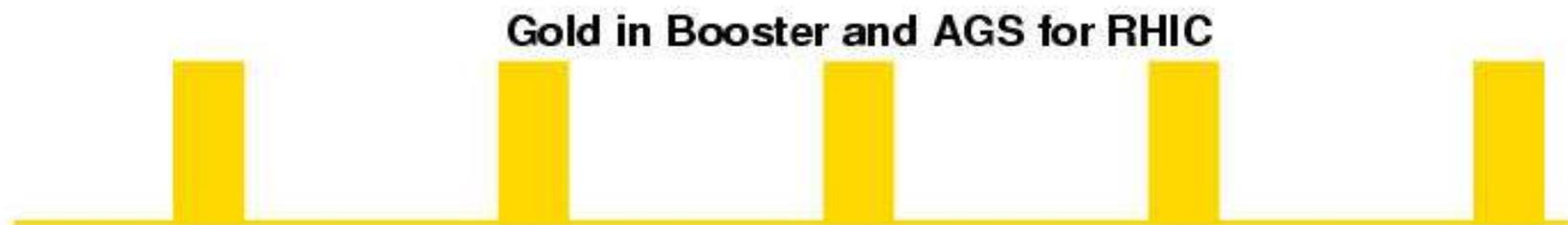


Assignment of Users

- BU1: Gold for RHIC
- BU2: Gold Merge for RHIC
- BU3: Silicon, Carbon, Iron, Titanium for NSRL
- BU4: Polarized Protons
- AU1: Gold for RHIC
- AU4: Polarized Protons for RHIC

24 Hour Operation. NSRL Ions at Gold Rigidity.

00:00 08:00 16:00 24:00



Issues and Notes (a)

- When going between gold and proton modes with NSRL ions at gold rigidity, will injection field for NSRL ions require adjustment?
- How can we cope with D6 septum going ON and OFF?
- NSRL must be tuned up with H-minus injection foil inserted. So Booster U3 needs an orbit bump around the foil.
- In the gold to proton mode switch, the TTB beam stops should remain open so that NSRL is not interrupted. Gold beam should be disabled at Tandem (CNI polarimeter can be damaged by gold beam).
- Do we need inflector event on supercycle if there is just one inflector user?
- Which Booster RF cavities will be used for proton acceleration?

Issues and Notes (b)

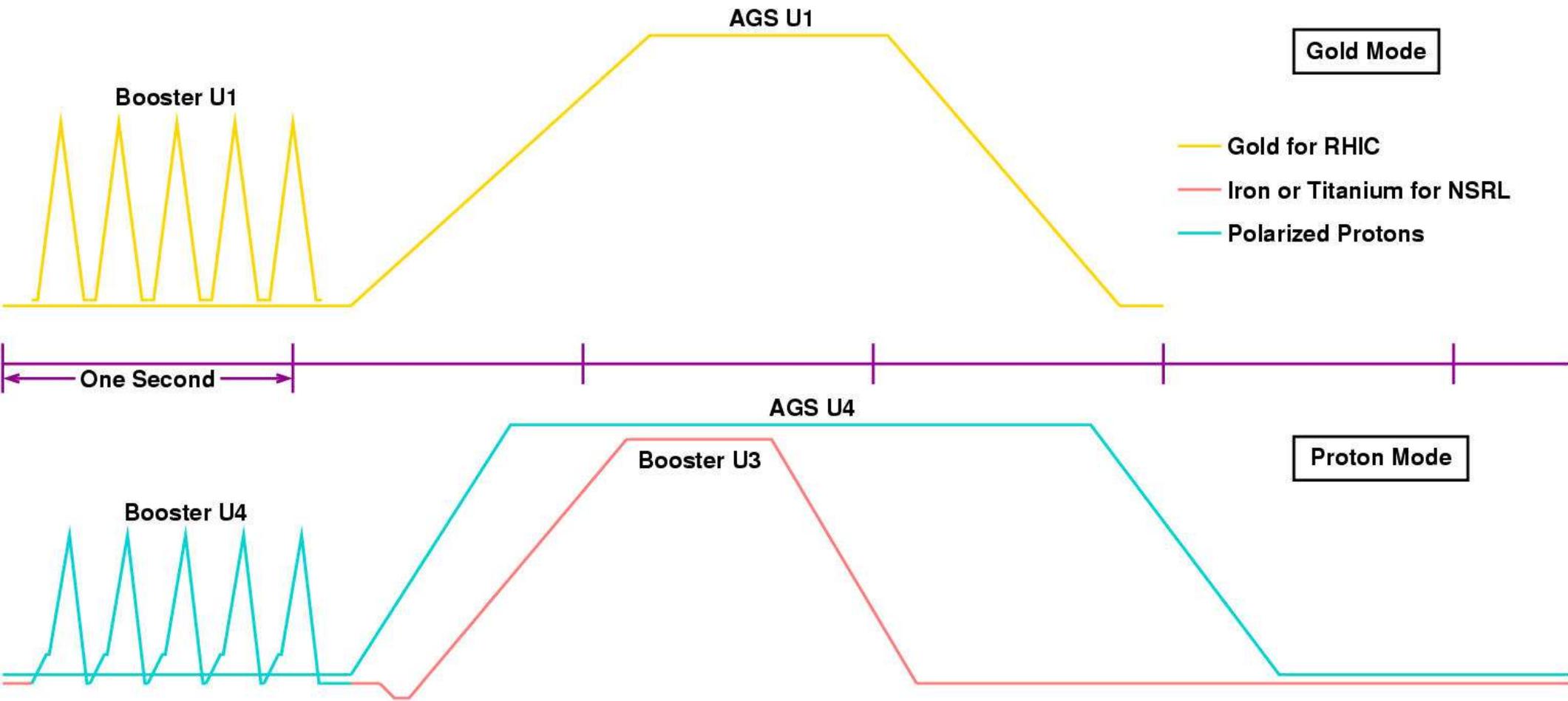
- While RHIC is in STORE mode, the 8 and 20 degree bends in ATR line need to be OFF so that BLIP can run with LTB beamstops open.
- While filling RHIC with gold, the LTB beamstops need to be closed so that BLIP can continue to run. (PP cannot run in this mode anyway.)

Existing Mode Switching Sequences

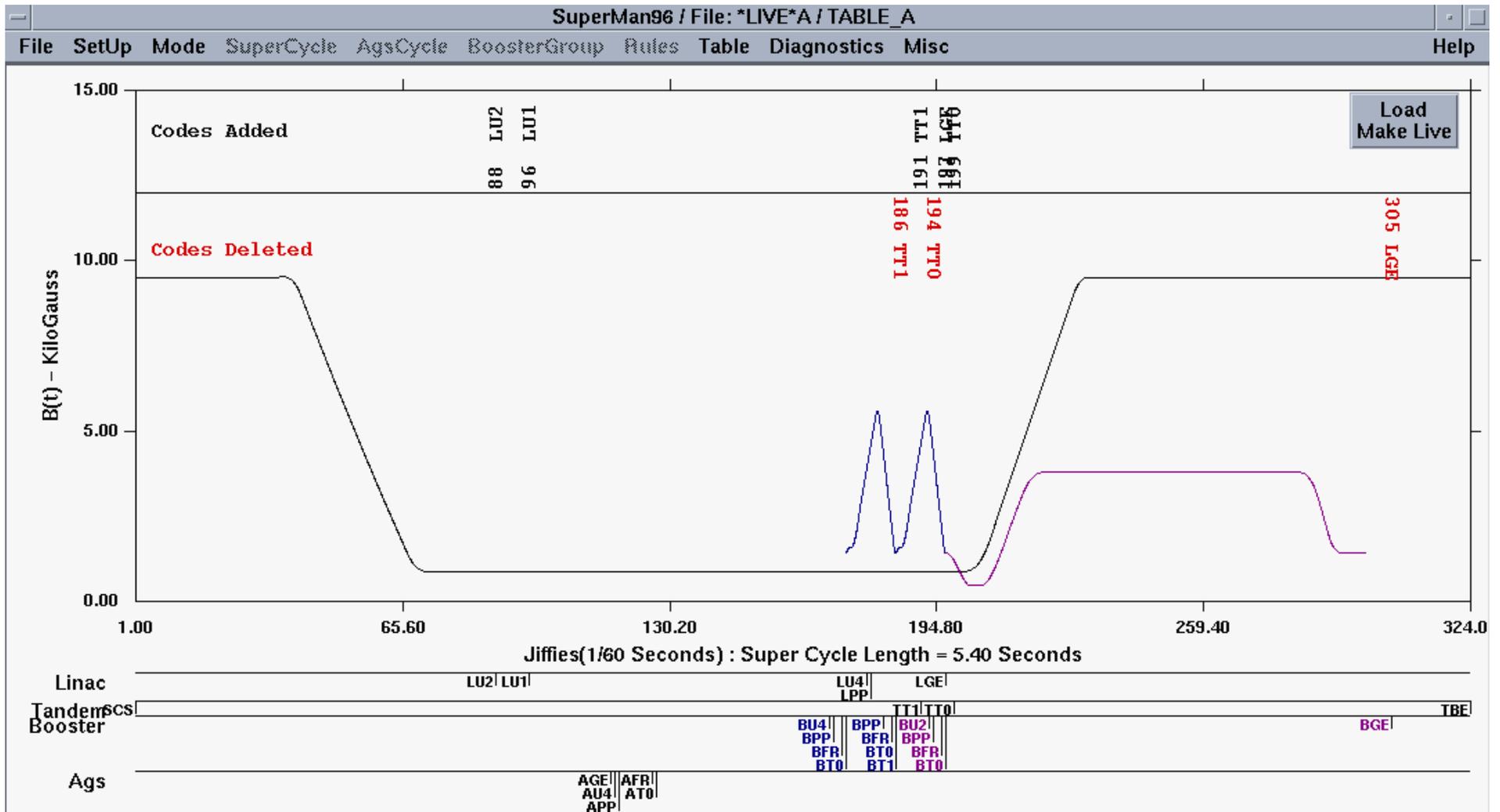
Tool for Automated Procedure Execution (T)		
File	Mode	View Lists Procedures Help
▼	RHIC-Gold to Proton	- ?
▶	Verify State	- ?
	Save State	P ?
	Save State	P ?
▶	Save Archives	- ?
	TTB Beam Stop Status	C ?
▼	A5 Injection Kicker	- ?
	Set Pre-Delay to OFF	P ?
	Wait for Pre-Delay OFF	P ?
	Set A5 Kicker to STA	P ?
	Wait for A5 Kicker STA	P ?
	Set A5 Mode to NOR	P ?
	Wait for A5 Mode NOR	P ?
	Set A5 Kicker to ON	P ?
	Set Pre-Delay to ON	P ?
▶	Set ARC8 Magnet	- ?
▶	Set ARC20 Magnet	- ?
▶	Set ATR Magnets	- ?
▶	Set Foil Positions	- ?
▶	Set XFMR Gains	- ?
▶	Set BTA Bending Magnets	- ?
▶	Set BTA Trim Dipoles	- ?
▶	Set BTA Quadrupoles	- ?
	Enable VHF Cavity	P ?
▶	Set VHF Cavity Delay	- ?
▶	Verify Foil Positions	- ?
	Switch Supercycle Table	P ?
▶	Set State	- ?

Tool for Automated Procedure Execution (T)		
File	Mode	View Lists Procedures Help
▼	Proton to RHIC-Gold	- ?
	PrintJeff/Clyde	P ?
▶	Verify State	- ?
	Save State	C ?
	Save State	C ?
▶	Save Archives	- ?
	LTB Beam Stops Status	C ?
▼	A5 Injection Kicker	- ?
	Set Pre-Delay to OFF	P ?
	Wait for Pre-Delay OFF	P ?
	Set A5 Kicker to STA	P ?
	Wait for A5 Kicker STA	P ?
	Set A5 Mode to ION	P ?
	Wait for A5 Mode ION	P ?
	Set A5 Kicker to ON	P ?
	Set Pre-Delay to ON	P ?
▶	Set Foil Positions	- ?
▶	Set XFMR Gains	- ?
▶	Set BTA Bending Magnets	- ?
▶	Set BTA Trim Dipoles	- ?
▶	Set BTA Quadrupoles	- ?
	Disable VHF Cavity	P ?
▶	Set VHF Cavity Delay	- ?
▶	Set ATR Magnets	- ?
▶	Set ARC8 Magnet	- ?
▶	Set ARC20 Magnet	- ?
▶	Verify Foils' Positions	- ?
	Switch Supercycle Table	P ?
▶	Set State	- ?
	Save SEB	P ?
	Transport to Idle	P ?

Supercycles for RHIC, NSRL, and PP Operation. NSRL ions NOT at gold rigidity.



Actual Supercycle used for PP and NSRL PPM



Polarized Protons in RHIC (gold run finished)

00:00

08:00

16:00

24:00

Iron in Booster for NSRL



Inject Polarized Protons into RHIC



Polarized Protons in Booster and AGS



Protons for BLIP



Notes

- While filling RHIC with polarized protons, the high-intensity source must be disabled. BLIP is OFF during this time.
- This will not be necessary once Woody's current transformers are installed and operational in AGS.

Radiation Safety

- Check-Off Lists
 - Booster for Proton Operation
 - NSRL
 - AGS for Proton Operation
 - ATR for PP Operation
 - Beamline for RSVP R&D
- Booster and AGS must be posted for high-intensity operation
- High-intensity source to ATR cross interlock needs to be operational (ATR check-off list item?)
- Polarized proton intensity interlock operational and MCR procedure in place (ATR check-off list item?)