



# TEST PLAN WORKSHEET

## PROGRAM DEPUTY APPROVAL

PD Signoff: \_\_\_\_\_ Date: \_\_\_\_\_  
 Ops Reviewer Signoff: \_\_\_\_\_ Date: \_\_\_\_\_  
 Expiration Date (max. 90 days from approval): \_\_\_\_\_  
 Presentation Required?  yes  no

## COMPLETION INFORMATION

Completion Date: \_\_\_\_\_  
 Crew Chief Signoff: \_\_\_\_\_  
 Comments (partial completion, etc.): \_\_\_\_\_



**NOTE:** Information addressing the appropriate content of each of the following sections can be found in Section 2.0 of the Test Plan Instructions.

**Test Plan Title:** Injector FOPT October 2004

**Author(s):** Y. Chao

**Date Submitted:** Oct. 17, 2004

**Revision Number:** 0

### Brief Purpose of Test

Resolving Injector model issue.

### Anticipated Benefits

Important for achieving parity quality beam specs

### Beam Conditions Required

Complete all of the following tables, entering a value or an **X** in the appropriate spaces:

#### Beam Type/Current (enter value)

Beam Type	Beam Current
Beam Off	
Pulsed (std. current = 8 $\mu$ A) <sup>a</sup>	A or B tune beam for FOPT measurement
CW	

a. The standard current for pulsed beam operation is 8  $\mu$ A. If your test requires pulsed beam current >8  $\mu$ A, then specify the required current and provide a brief explanation next to the specified current.

#### Beam Energy (select one)

Beam Off	845 MeV (1-pass)	1.645 GeV (2-pass)	2.445 GeV (3-pass)	3.245 GeV (4-pass)	4.045 GeV (5-pass)	Other (specify)
						60 MeV dump or 1R (preferable)

**Beam Termination Point (select one)**

Hall A	Hall B	Hall C	BSY Dump	NE Stub Dump	45 MeV Dump	Other (specify)
						60 MeV dump or 1R (preferable)

**Type of Test (select one)**

Invasive (disrupts beam delivery)	Non-invasive (does not disrupt beam delivery)
X	

**Time Required**

- a. Setup: 5 minutes
- b. Main test: 2 hours
- c. Backout Procedure: 1 minute

**Preferred Time of Test**

Any time.

**Staff Required to Execute the Test (including contact info)**

OPS. .

**Controlled Access Requirements**

None

**Hardware and/or Software Changes Required**

**NOTE:** If software changes are part of the test plan, include the name of the application, the old revision level, the new revision level, and if applicable, whether or not it is possible to roll back to the old revision level (are there hardware limitations, etc.).

**Special Hazards/Safety Considerations (enter "None" if not applicable)**

**HAZARD** (describe the specific potential hazard[s]; e.g., MPS or PSS interlocks disabled, work near energized equipment, etc.):

**RISK** (characterize the risks involved [e.g., beam damage to beamline components, electrocution of personnel by contact with magnet leads, etc.] and assess the level of risk per the *EH&S Manual, Section 3210, Hazard Identification and Characterization*):

**CONTROLS** (describe what specific measures will be used to mitigate the hazard; if the risk assessment [i.e., risk code] is  $\geq 3$ , list the applicable work control document [SOP, OSP or TOSP]):

**Setup Procedure**

**Section-specific information is summarized in Table 1.**

1. Make sure orbit is good in 100 keV, 5 MeV, 60 MeV & 1L (if beam is present) regions.

2. Refer to [Table 1](#) for test configuration and parameters pertinent to each test.
3. Twiddle save all corrector settings in **OL** region.
4. Twiddle save all OL & OR quad settings and skew quad settings.
5. Perform an Injector magnet AllSave.
6. Set the following skew quads to 0 BDL:

**MQS0L01, MQS0L02, MQS0L03, MQS0L04, MQS0L06**  
**(Not MQS0L05)**

7. Clean up Injector orbit as needed.
8. Open an X-window. Go to the directory  
`/usr/ntfs/public/optics/Gold_daily`

Part of the data acquisition will be done here.

**Acquire GOLD model for the Injector before test:**

**This part is non-invasive**

9. In the X-window just opened, type the following commands:

```
GetTwissTable INJ G
```

```
GetTwissTable GUN G
```

Note: As part of normal running, this script may spit out the following message that can be ignored:

```
CDEV Directory Warning: No service matches "MMSHLBPASS" - "get VAL",  
default to caService
```

However note any other anomaly during this run (Model server errors etc.) in the ELOG.

## Test Procedure

---

### This a 3-step test plan:

- Run FOPT and ezlog;
- Get GOLD model;
- Send an email to Chao.

### Perform FOPT run

#### For this part use 8 muA tune beam from A or B laser.

There are 2 FOPT runs. Follow the procedure below for both runs. The only differences between these 2 runs are the corrector file name shown in **Table 1**, and the **BURT files to be downloaded prior to each run**.

#### First FOPT Run: **5MeVkick060804B.cor**

1. Zero POS once. Display Injector relative orbit.
2. Download BURT special file **Inj60MeV\_4464.snap**. Resteer orbit in 60 MeV region to make relative screen flat.
3. Turn all correctors shown under “**Correctors taken off loop**” in Table 1 off loop corresponding to test of interest.
4. Display BPM spikes for regions selected in FOPT (under the “select” tab, see last column of Table 1). BPM pass-overview in relative mode is the ideal display.
5. Zero POS once (for later orbit restoration if needed).
6. Keep all locks specified under “**Locks to be left on**” in Table 1 running for test of interest. Turn all other locks off by hand
7. Run the FOPT **v5** script (**Notice this is not the standard FOPT**):

- a. From Ops HPUX 11 workstation’s shell window:

```
cd ~mccops/hlapps/optics/nfopt/v5.8
source setcdev
./fopt fopt_Chao.cfg
```

(All in /Gold\_daily/foptcmd)

FOPT GUI will appear in a few seconds.

- b. Under **Regime** tab,

Select “Custom with excitation Specified in File”

Enter -1 for “Minimum Current”

Enter 20 for “Number of Samples”

Enter 5 for “Test Samples”

Turn **ON** the “partial data” selector.

Turn **OFF** the “lock” selector. This will prevent FOPT from turning off locks.

Turn **ON** the “auto scale” selector.

- c. Under **Files** tab, enter, or browse to select, the path and file name given under “**FOPT File**” in Table 1 corresponding to test of interest. For example,

**/usr/ntfs/public/optics/fopt3/5MeVkick060804B.cor**

- d. Under **Select** tab, select the data acquisition region as specified under “**Data region selected**” in Table 1..
- e. **Very Important!!!** Make sure the locks specified under “**Locks to be left on**” in Table 1 corresponding to test of interest (see footnote) are still running. All other locks should be off.
- f. **Begin parallel data acquisition:**

Go to the X-window opened in Setup Procedure step 4 where the directory was also specified. Type (case sensitive):

**5MEVPOS**

A time stamp should appear, followed by the message “**msg: all connected**”. Let this process run through step 6 below.

If instead error messages appear such as complaining about not being able to connect to some signals, the signals in questions should be addressed first (They indicate an operational anomaly anyway).

- g. Wait 5 seconds. Press the “**Begin**” button on FOPT GUI.
- h. Monitor the progress of FOPT from the display under the **Progress** tab. Verify that the BPM spikes show orbit changes consistent with the displayed progress.
- i. Allow the run to finish even if it appears to take longer than usual, unless pathological condition arises (for example, correctors set to non-numerical values)
- j. Make sure final data is complete as reported by FOPT progress report. In case of FOPT abort due to current loss or other reasons, and if operational condition permits, repeat steps 1 through 5 until FOPT succeeds in completing the data.
8. After FOPT is complete, wait 5 seconds, then type **<control>C** in the X-window to terminate parallel data acquisition.
9. Make ELOG entry stating test performed and any pertinent information (e.g., suspected machine anomaly during test, BPM failure, etc.).

**Second FOPT Run: gunkick060804C.cor**

10. Zero POS once. Display Injector relative orbit.

11. Download BURT special file **Inj5MeV\_4464.snap**. Resteer orbit in 5 MeV & 60 MeV region to make relative screen flat.
12. Turn all correctors shown under “**Correctors taken off loop**” in Table 1 off loop corresponding to test of interest.
13. Display BPM spikes for regions selected in FOPT (under the “select” tab, see last column of Table 1). BPM pass-overview in relative mode is the ideal display.
14. Zero POS once (for later orbit restoration if needed).
15. Keep all locks specified under “**Locks to be left on**” in Table 1 running for test of interest. Turn all other locks off by hand
16. Run the FOPT **v5** script (**Notice this is not the standard FOPT**):

- a. From Ops HPUX 11 workstation’s shell window:

```
cd ~mccops/hlapps/optics/nfopt/v5.8
source setcdev
./fopt fopt_Chao.cfg
(All in /Gold_daily/foptcmd)
```

FOPT GUI will appear in a few seconds.

- b. Under **Regime** tab,

Select “Custom with excitation Specified in File”

Enter -1 for “Minimum Current”

Enter 20 for “Number of Samples”

Enter 5 for “Test Samples”

Turn **ON** the “partial data” selector.

Turn **OFF** the “lock” selector. This will prevent FOPT from turning off locks.

Turn **ON** the “auto scale” selector.

- c. Under **Files** tab, enter, or browse to select, the path and file name given under “**FOPT File**” in Table 1 corresponding to test of interest. For example,

```
/usr/ntfs/public/optics/fopt3/gunkick060804C.cor
```

- d. Under **Select** tab, select the data acquisition region as specified under “**Data region selected**” in Table 1..

- e. **Very Important!!!** Make sure the locks specified under “**Locks to be left on**” in Table 1 corresponding to test of interest (see footnote) are still running. All other locks should be off.

- f. **Begin parallel data acquisition:**

Go to the X-window opened in Setup Procedure step 4 where the directory was also speci-

fied. Type (case sensitive):

```
100KEVPOS060804
```

A time stamp should appear, followed by the message “**msg: all connected**”. Let this process run through step 6 below.

If instead error messages appear such as complaining about not being able to connect to some signals, the signals in questions should be addressed first (They indicate an operational anomaly anyway).

- g. Wait 5 seconds. Press the “**Begin**” button on FOPT GUI.
  - h. Monitor the progress of FOPT from the display under the **Progress** tab. Verify that the BPM spikes show orbit changes consistent with the displayed progress.
  - i. Allow the run to finish even if it appears to take longer than usual, unless pathological condition arises (for example, correctors set to non-numerical values)
  - j. Make sure final data is complete as reported by FOPT progress report. In case of FOPT abort due to current loss or other reasons, and if operational condition permits, repeat steps 1 through 5 until FOPT succeeds in completing the data.
17. After FOPT is complete, wait 5 seconds, then type **<control>C** in the X-window to terminate parallel data acquisition.
18. Make ELOG entry stating test performed and any pertinent information (e.g., suspected machine anomaly during test, BPM failure, etc.).
19. Go to twiddle save panel saved in Setup steps 3 & 4. Make sure all correctors, quads, and skew quads are restored to original settings. If not, manually restore.
20. Repeat steps 1-8 for the second FOPT corrector file in Table 1.
21. Restore locks to running configuration.

### **Acquire GOLD model for the Injector after test:**

**This part is non-invasive**

22. Execute the following:
- a. Bring up an x-term on an ops computer.
  - b. Go to the /usr/ntfs/public/optics/Gold\_daily/ directory:  

```
cd /usr/ntfs/public/optics/Gold_daily
```
  - c. Type the following commands:  

```
GetTwissTable INJ G  
GetTwissTable GUN G
```

Note: As part of normal running, this script may spit out the following message that can be ignored:

CDEV Directory Warning: No service matches "MMSHLBPASS" - "get VAL",  
default to caService

**23.** However note any other anomaly during this run (Model server errors etc.) in the ELOG.

## Send Chao an email

24. Send Chao an email (chao@jlab.org) indicating completion of FOPT, multiharp, and GOLD model acquisition , noting any anomaly encountered.

**Table 1: v5 FOPT files used & Correctors to be cycled before FOPT for each matching region**

Check Here When Done	Test	FOPT File in <a href="#">/usr/ntfs/public/optics/fopt3</a>	Correctors taken <b>OFF</b> loop	Locks to be left <b>ON</b> <b>(Very Important)</b>	Data region selected
	0L kick A	5MeVkick060804 <b>B</b> .cor	None	None	100 keV 5MeV 60 MeV +NL
	0I kick C	gunkick060804 <b>C</b> .cor	None	None	100 keV 5MeV

## Backout Procedure

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1. Go to twiddle save panel saved in Setup steps 3 & 4. Make sure all correctors, quads, and skew quads are restored to original settings. If not, manually restore.
2. Put correctors back on loop (except lock correctors) if applicable
3. Restor standard locks
4. **Resteer orbit in 5 MeV & 60 MeV regions to regain good orbit if needed.**

## Test Results

---

Result & automatically logged data will be analyzed off-line.



# TEST PLAN WORKSHEET

## PROGRAM DEPUTY APPROVAL

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 Presentation Required?  yes  no

## COMPLETION INFORMATION

Completion Date: \_\_\_\_\_  
 Crew Chief Signoff: \_\_\_\_\_  
 Comments (partial completion, etc.): \_\_\_\_\_



**NOTE:** Information addressing the appropriate content of each of the following sections can be found in Section 2.0 of the Test Plan Instructions.

**Test Plan Title:** Injector FOPT October 2004

**Author(s):** Y. Chao

**Date Submitted:** Oct. 17, 2004

**Revision Number:** 0

### Brief Purpose of Test

Resolving Injector model issue.

### Anticipated Benefits

Important for achieving parity quality beam specs

### Beam Conditions Required

Complete all of the following tables, entering a value or an **X** in the appropriate spaces:

#### Beam Type/Current (enter value)

Beam Type	Beam Current
Beam Off	
Pulsed (std. current = 8 $\mu$ A) <sup>a</sup>	A or B tune beam for FOPT measurement
CW	

a. The standard current for pulsed beam operation is 8  $\mu$ A. If your test requires pulsed beam current >8  $\mu$ A, then specify the required current and provide a brief explanation next to the specified current.

#### Beam Energy (select one)

Beam Off	845 MeV (1-pass)	1.645 GeV (2-pass)	2.445 GeV (3-pass)	3.245 GeV (4-pass)	4.045 GeV (5-pass)	Other (specify)
						60 MeV dump or 1R (preferable)

**Beam Termination Point (select one)**

Hall A	Hall B	Hall C	BSY Dump	NE Stub Dump	45 MeV Dump	Other (specify)
						60 MeV dump or 1R (preferable)

**Type of Test (select one)**

Invasive (disrupts beam delivery)	Non-invasive (does not disrupt beam delivery)
X	

**Time Required**

- a. Setup: 5 minutes
- b. Main test: 2 hours
- c. Backout Procedure: 1 minute

**Preferred Time of Test**

Any time.

**Staff Required to Execute the Test (including contact info)**

OPS. .

**Controlled Access Requirements**

None

**Hardware and/or Software Changes Required**

**NOTE:** If software changes are part of the test plan, include the name of the application, the old revision level, the new revision level, and if applicable, whether or not it is possible to roll back to the old revision level (are there hardware limitations, etc.).

**Special Hazards/Safety Considerations (enter "None" if not applicable)**

**HAZARD** (describe the specific potential hazard[s]; e.g., MPS or PSS interlocks disabled, work near energized equipment, etc.):

**RISK** (characterize the risks involved [e.g., beam damage to beamline components, electrocution of personnel by contact with magnet leads, etc.] and assess the level of risk per the *EH&S Manual, Section 3210, Hazard Identification and Characterization*):

**CONTROLS** (describe what specific measures will be used to mitigate the hazard; if the risk assessment [i.e., risk code] is  $\geq 3$ , list the applicable work control document [SOP, OSP or TOSP]):

**Setup Procedure**

**Section-specific information is summarized in Table 1.**

1. Make sure orbit is good in 100 keV, 5 MeV, 60 MeV & 1L (if beam is present) regions.

2. Refer to [Table 1](#) for test configuration and parameters pertinent to each test.
3. Twiddle save all corrector settings in **OL** region.
4. Twiddle save all OL & OR quad settings and skew quad settings.
5. Perform an Injector magnet AllSave.
6. Set the following skew quads to 0 BDL:

**MQS0L01, MQS0L02, MQS0L03, MQS0L04, MQS0L06**  
**(Not MQS0L05)**

7. Clean up Injector orbit as needed.
8. Open an X-window. Go to the directory  
`/usr/ntfs/public/optics/Gold_daily`

Part of the data acquisition will be done here.

**Acquire GOLD model for the Injector before test:**

**This part is non-invasive**

9. In the X-window just opened, type the following commands:

```
GetTwissTable INJ G
```

```
GetTwissTable GUN G
```

Note: As part of normal running, this script may spit out the following message that can be ignored:

```
CDEV Directory Warning: No service matches "MMSHLBPASS" - "get VAL",  
default to caService
```

However note any other anomaly during this run (Model server errors etc.) in the ELOG.

## Test Procedure

---

### This a 3-step test plan:

- Run FOPT and ezlog;
- Get GOLD model;
- Send an email to Chao.

### Perform FOPT run

#### For this part use 8 muA tune beam from A or B laser.

There are 2 FOPT runs. Follow the procedure below for both runs. The only differences between these 2 runs are the corrector file name shown in **Table 1**, and the **BURT files to be downloaded prior to each run**.

#### First FOPT Run: **5MeVkick060804B.cor**

1. Zero POS once. Display Injector relative orbit.
2. Download BURT special file **Inj60MeV\_4464.snap**. Resteer orbit in 60 MeV region to make relative screen flat.
3. Turn all correctors shown under “**Correctors taken off loop**” in Table 1 off loop corresponding to test of interest.
4. Display BPM spikes for regions selected in FOPT (under the “select” tab, see last column of Table 1). BPM pass-overview in relative mode is the ideal display.
5. Zero POS once (for later orbit restoration if needed).
6. Keep all locks specified under “**Locks to be left on**” in Table 1 running for test of interest. Turn all other locks off by hand
7. Run the FOPT **v5** script (**Notice this is not the standard FOPT**):

- a. From Ops HPUX 11 workstation’s shell window:

```
cd ~mccops/hlapps/optics/nfopt/v5.8
source setcdev
./fopt fopt_Chao.cfg
```

(All in /Gold\_daily/foptcmd)

FOPT GUI will appear in a few seconds.

- b. Under **Regime** tab,

Select “Custom with excitation Specified in File”

Enter -1 for “Minimum Current”

Enter 20 for “Number of Samples”

Enter 5 for “Test Samples”

Turn **ON** the “partial data” selector.

Turn **OFF** the “lock” selector. This will prevent FOPT from turning off locks.

Turn **ON** the “auto scale” selector.

- c. Under **Files** tab, enter, or browse to select, the path and file name given under “**FOPT File**” in Table 1 corresponding to test of interest. For example,

**/usr/ntfs/public/optics/fopt3/5MeVkick060804B.cor**

- d. Under **Select** tab, select the data acquisition region as specified under “**Data region selected**” in Table 1..
- e. **Very Important!!!** Make sure the locks specified under “**Locks to be left on**” in Table 1 corresponding to test of interest (see footnote) are still running. All other locks should be off.
- f. **Begin parallel data acquisition:**

Go to the X-window opened in Setup Procedure step 4 where the directory was also specified. Type (case sensitive):

**5MEVPOS**

A time stamp should appear, followed by the message “**msg: all connected**”. Let this process run through step 6 below.

If instead error messages appear such as complaining about not being able to connect to some signals, the signals in questions should be addressed first (They indicate an operational anomaly anyway).

- g. Wait 5 seconds. Press the “**Begin**” button on FOPT GUI.
- h. Monitor the progress of FOPT from the display under the **Progress** tab. Verify that the BPM spikes show orbit changes consistent with the displayed progress.
- i. Allow the run to finish even if it appears to take longer than usual, unless pathological condition arises (for example, correctors set to non-numerical values)
- j. Make sure final data is complete as reported by FOPT progress report. In case of FOPT abort due to current loss or other reasons, and if operational condition permits, repeat steps 1 through 5 until FOPT succeeds in completing the data.
8. After FOPT is complete, wait 5 seconds, then type **<control>C** in the X-window to terminate parallel data acquisition.
9. Make ELOG entry stating test performed and any pertinent information (e.g., suspected machine anomaly during test, BPM failure, etc.).

**Second FOPT Run: gunkick060804C.cor**

10. Zero POS once. Display Injector relative orbit.

11. Download BURT special file [Inj5MeV\\_4464.snap](#). Resteer orbit in 5 MeV & 60 MeV region to make relative screen flat.
12. Turn all correctors shown under “**Correctors taken off loop**” in Table 1 off loop corresponding to test of interest.
13. Display BPM spikes for regions selected in FOPT (under the “select” tab, see last column of Table 1). BPM pass-overview in relative mode is the ideal display.
14. Zero POS once (for later orbit restoration if needed).
15. Keep all locks specified under “**Locks to be left on**” in Table 1 running for test of interest. Turn all other locks off by hand
16. Run the FOPT **v5** script (**Notice this is not the standard FOPT**):

- a. From Ops HPUX 11 workstation’s shell window:

```
cd ~mccops/hlapps/optics/nfopt/v5.8
source setcdev
./fopt fopt_Chao.cfg
(All in /Gold_daily/foptcmd)
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FOPT GUI will appear in a few seconds.

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Select “Custom with excitation Specified in File”

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Enter 20 for “Number of Samples”

Enter 5 for “Test Samples”

Turn **ON** the “partial data” selector.

Turn **OFF** the “lock” selector. This will prevent FOPT from turning off locks.

Turn **ON** the “auto scale” selector.

- c. Under **Files** tab, enter, or browse to select, the path and file name given under “**FOPT File**” in Table 1 corresponding to test of interest. For example,

```
/usr/ntfs/public/optics/fopt3/gunkick060804C.cor
```

- d. Under **Select** tab, select the data acquisition region as specified under “**Data region selected**” in Table 1..

- e. **Very Important!!!** Make sure the locks specified under “**Locks to be left on**” in Table 1 corresponding to test of interest (see footnote) are still running. All other locks should be off.

- f. **Begin parallel data acquisition:**

Go to the X-window opened in Setup Procedure step 4 where the directory was also speci-

fied. Type (case sensitive):

```
100KEVPOS060804
```

A time stamp should appear, followed by the message “**msg: all connected**”. Let this process run through step 6 below.

If instead error messages appear such as complaining about not being able to connect to some signals, the signals in questions should be addressed first (They indicate an operational anomaly anyway).

- g. Wait 5 seconds. Press the “**Begin**” button on FOPT GUI.
  - h. Monitor the progress of FOPT from the display under the **Progress** tab. Verify that the BPM spikes show orbit changes consistent with the displayed progress.
  - i. Allow the run to finish even if it appears to take longer than usual, unless pathological condition arises (for example, correctors set to non-numerical values)
  - j. Make sure final data is complete as reported by FOPT progress report. In case of FOPT abort due to current loss or other reasons, and if operational condition permits, repeat steps 1 through 5 until FOPT succeeds in completing the data.
17. After FOPT is complete, wait 5 seconds, then type **<control>C** in the X-window to terminate parallel data acquisition.
  18. Make ELOG entry stating test performed and any pertinent information (e.g., suspected machine anomaly during test, BPM failure, etc.).
  19. Go to twiddle save panel saved in Setup steps 3 & 4. Make sure all correctors, quads, and skew quads are restored to original settings. If not, manually restore.
  20. Repeat steps 1-8 for the second FOPT corrector file in Table 1.
  21. Restore locks to running configuration.

### **Acquire GOLD model for the Injector after test:**

**This part is non-invasive**

22. Execute the following:
  - a. Bring up an x-term on an ops computer.
  - b. Go to the /usr/ntfs/public/optics/Gold\_daily/ directory:

```
cd /usr/ntfs/public/optics/Gold_daily
```
  - c. Type the following commands:

```
GetTwissTable INJ G
GetTwissTable GUN G
```

Note: As part of normal running, this script may spit out the following message that can be ignored:

CDEV Directory Warning: No service matches "MMSHLBPASS" - "get VAL",  
default to caService

**23.** However note any other anomaly during this run (Model server errors etc.) in the ELOG.

## Send Chao an email

24. Send Chao an email (chao@jlab.org) indicating completion of FOPT, multiharp, and GOLD model acquisition , noting any anomaly encountered.

**Table 1: v5 FOPT files used & Correctors to be cycled before FOPT for each matching region**

Check Here When Done	Test	FOPT File in <i>/usr/ntfs/public/optics/fopt3</i>	Correctors taken <b>OFF</b> loop	Locks to be left <b>ON</b> <b>(Very Important)</b>	Data region selected
	0L kick A	5MeVkick060804 <b>B</b> .cor	None	None	100 keV 5MeV 60 MeV +NL
	0I kick C	gunkick060804 <b>C</b> .cor	None	None	100 keV 5MeV

## Backout Procedure

---

1. Go to twiddle save panel saved in Setup steps 3 & 4. Make sure all correctors, quads, and skew quads are restored to original settings. If not, manually restore.
2. Put correctors back on loop (except lock correctors) if applicable
3. Restor standard locks
4. **Resteer orbit in 5 MeV & 60 MeV regions to regain good orbit if needed.**

## Test Results

---

Result & automatically logged data will be analyzed off-line.