

# Shifter training for MICE runs

March 6, 2015

## Getting good data during a shift is easy but not obvious.

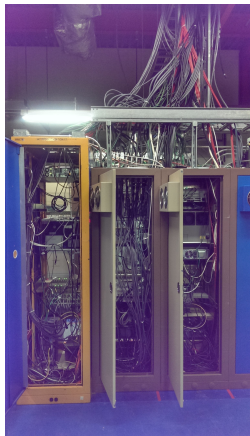


Figure : Keeping track of all this is simpler than you think.

- ▶ How do you know which parts of the DAQ to care about and which you can safely ignore?
- ▶ How will you know if something goes wrong? And what do you do in that event?
- ▶ Between the 6 oscilloscopes and the many computers and monitors, how do you know where to look?

The shifter manual is a great resource.

<http://mice.iit.edu/mta/shift/mice/ShiftManual.txt>

## Checklist for shifters (more detail on following slides)

1. Get your bearings. (Updates from previous shifter and logbook.)
2. Put on hearing protection.
3. Log the start of your shift. This is important!
4. Run “Acnetize” in a browser (once per hour, see next slide)
5. While you're at it, run through the following checklist:
  - ▶ Number of sparks (new sparks? mention these in the logbook!)
  - ▶ RF drive level set correctly?
  - ▶ Tuning ok?
  - ▶ Cavity temperature ok?
  - ▶ Waveform capture on?
  - ▶ ...

# ACNET Monitor Parameter List – a good place to start

<http://mice.iit.edu/cgi-bin/mta/acnetize>

**ACNET Monitor Parameter List**

Reload if status is PENDING

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**RF201**

-- Achtung! lpa17f \* lo = 100, hi = --  
-- lpa17f = -0.21533203125 W [ IPA1 fwd power ] [ 2015-03-06T13:38:43.592-0600 ]  
OK -- lpa17r = 0.0 W [ IPA1 ref power ] [ 2015-03-06T13:38:43.592-0600 ]  
-- Achtung! lpa27f \* lo = 2, hi = --  
-- lpa27f = -0.00130839375 KW [ IPA2 fwd power ] [ 2015-03-06T13:38:43.592-0600 ]  
OK -- lpa27r = -0.001957305908203125 KW [ IPA2 ref power ] [ 2015-03-06T13:38:43.592-0600 ]  
-- Achtung! ldr7f \* lo = 100, hi = --  
-- ldr7f = -0.3733662109375 KW [ Driver fwd power ] [ 2015-03-06T13:38:43.592-0600 ]  
OK -- ldr7r = -0.03814697265625 KW [ Driver ref power ] [ 2015-03-06T13:38:43.592-0600 ]  
-- Achtung! ldr7sv \* lo = 400, hi = --  
-- ldr7sv = 2.44140625 V [ Driver screen voltage ] [ 2015-03-06T13:38:43.592-0600 ]  
-- Achtung! lrf7hv \* lo = 33, hi = 42  
-- lrf7hv = 0.0685009765625 KV [ Modulator HV ] [ 2015-03-06T13:38:43.592-0600 ]  
OK -- lmd7ov = 0.115966796875 KV [ Modulator output voltage ] [ 2015-03-06T13:38:43.592-0600 ]  
OK -- lmd7oi = 0.42724609375 A [ Modulator output current ] [ 2015-03-06T13:38:43.592-0600 ]  
OK -- lrf7psv = 4.953308105466975 VOLT [ 7835 filament voltage ] [ 2015-03-06T13:38:43.592-0600 ]  
OK -- lrf7psi = 6514.58740234375 AMP [ 7835 filament current ] [ 2015-03-06T13:38:43.592-0600 ]  
OK -- lpa7lon = 0.011259359135377126 uAmp [ 7835 filament IP current ] [ 2015-03-06T13:38:43.592-0600 ]

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**MICEcavity**

OK -- e201vac = 1.5997073233840936E-7 Torr [ Cavity top vacuum IG ] [ 2015-03-06T13:38:43.592-0600 ]  
-- Achtung! e2c2cpr \* lo = 1E-8, hi = 1E-6 --  
-- e2c2cpr = 1.8910778234202286E-6 Torr [ Cavity top vacuum CCG ] [ 2015-03-06T13:38:43.311-0600 ]  
OK -- e2c2cpr = 3.9665730404052165E-8 Torr [ Cavity bot vacuum IG ] [ 2015-03-06T13:38:43.311-0600 ]  
OK -- e2c2cpr = 4.5383081150982038E-7 Torr [ Cavity bot vacuum PRG ] [ 2015-03-06T13:38:43.311-0600 ]  
OK -- e2c2cpr = 7.768189830909693E-8 Torr [ Vessel vacuum IG ] [ 2015-03-06T13:38:43.591-0600 ]  
OK -- e2c2cpr = 7.955013416726528E-7 Torr [ Vessel vacuum CCG ] [ 2015-03-06T13:38:43.311-0600 ]  
OK -- e2c2cpr = 1.043287970391611 Torr [ Left coupler vacuum IG ] [ 2015-03-06T13:38:43.311-0600 ]  
OK -- e2c2cpr = 9.325571779287164E-8 Torr [ Right coupler vacuum IG ] [ 2015-03-06T13:38:43.311-0600 ]  
-- Achtung! e2c2cpr \* lo = 1E-7, hi = 1E-6 --  
-- e2c2cpr = 2.160212257967689E-6 Torr [ Left coupler vacuum CCG ] [ 2015-03-06T13:38:43.311-0600 ]  
OK -- e2c2cpr = 6.7971851752903E-7 Torr [ Right coupler vacuum CCG ] [ 2015-03-06T13:38:43.311-0600 ]  
OK -- e2c2cpr = 2.8378631781360038E-8 Torr [ Getter manifold vacuum IG ] [ 2015-03-06T13:38:43.311-0600 ]  
-- Achtung! e2c2wmg \* lo = 1E-8, hi = 1E-7 --  
-- e2c2wmg = 8.986600436322874E-9 Torr [ Wall manifold vacuum IG ] [ 2015-03-06T13:38:43.311-0600 ]  
OK -- e2c2wmg = 57.2451916236543 PSIG [ Chiller output supply pressure ] [ 2015-03-06T13:38:44.409-0600 ]  
OK -- e2c2wmg = 11.431363821029663 PSIG [ Chiller input return pressure ] [ 2015-03-06T13:38:44.409-0600 ]

Figure : Lines in yellow are the ones you should pay attention to.

# Checklist: Getting set up

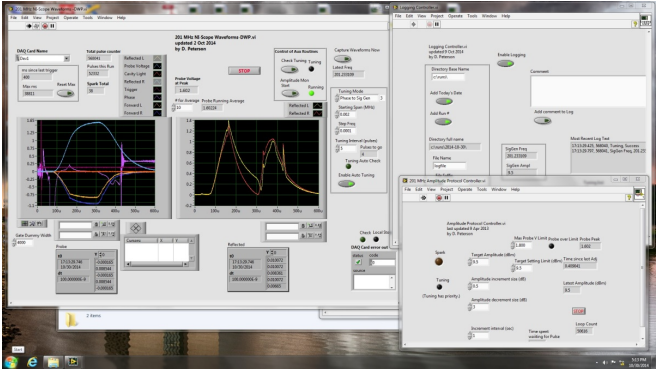


Figure : Shown on monitor labeled MTARFLV2. Look under keyboard for login to unlock screensaver.



# Checklist: RF drive level set correctly?

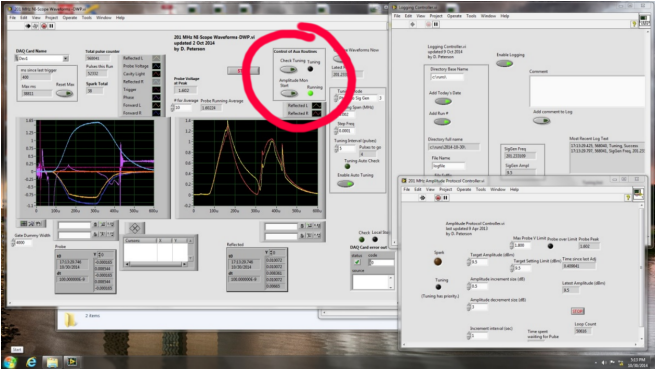
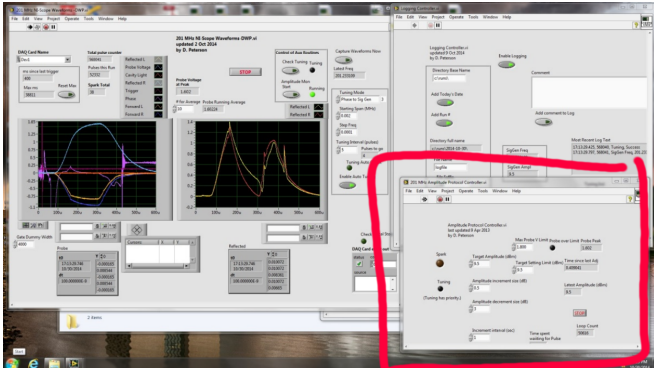


Figure : First, is amplitude monitoring turned on?



# Checklist: RF drive level set correctly? (cont'd.)

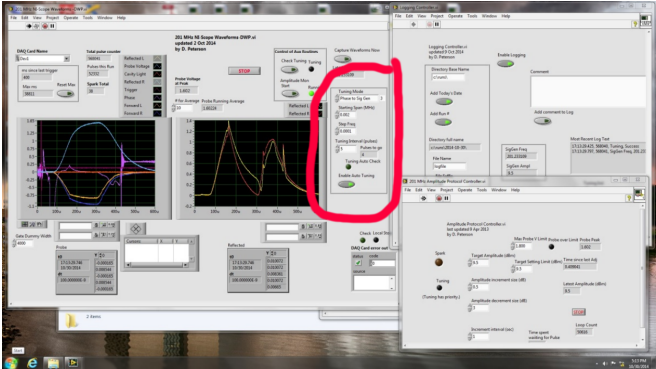


# Checklist: RF drive level set correctly? (cont'd.)

The screenshot displays the 'Amplitude Protocol Controller.vi' interface. At the top, the title bar reads '201 MHz Amplitude Protocol Controller.vi'. Below it is a menu bar with 'File', 'Edit', 'View', 'Project', 'Operate', 'Tools', 'Window', and 'Help'. A toolbar contains a play button, a stop button, and a help icon. The main panel features the following elements:

- Header:** 'Amplitude Protocol Controller.vi', 'last updated 9 Apr 2013', 'by D. Peterson'.
- Buttons:** 'Spark' (brown circle), 'Tuning' (black circle), and a red 'STOP' button.
- Parameters (all with up/down arrows):**
  - Max Probe V Limit: 1.800
  - Probe over Limit: 1.602
  - Target Amplitude (dBm): 9.5
  - Target Setting Limit (dBm): 9.5
  - Amplitude increment size (dB): 0.5
  - Amplitude decrement size (dB): 3
  - Increment interval (sec): 1
- Status/Readouts:**
  - Time since last Adj: 0.409041
  - Latest Amplitude (dBm): 9.5
  - Time spent waiting for Pulse: (blank)
  - Loop Count: 50616
- Text:** '(Tuning has priority.)' is located below the Tuning button.

# Checklist: Cavity tuning ok?



## Other items on checklist

- ▶ Cavity temperature? Check the “Acnetize” site.  
<http://mice.iit.edu/cgi-bin/mta/acnetize>
- ▶ Waveform capture on? (This is important! We want to capture waveforms.) Check the LabView page to see that it's running.
- ▶ Other parameters in the shift manual are easily checked in the same way.

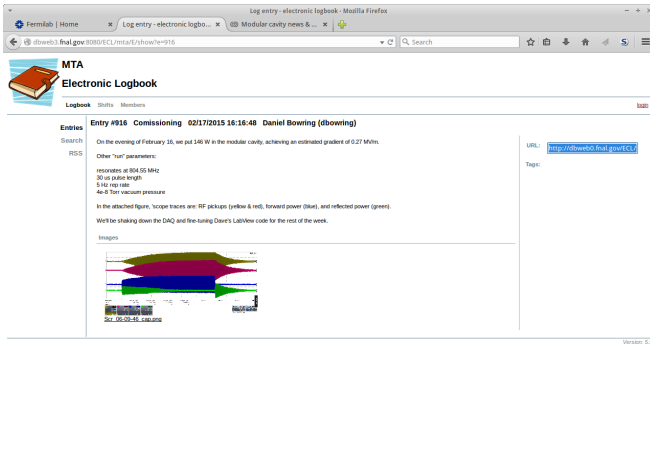
## What if there are problems?

- ▶ If there are LabView problems during the day, call Dave (x3873).
- ▶ If there are RF problems during the day, call Al (x4843) or Yagmur (312-420-5519)

# Your shift, in a nutshell

1. Orient yourself
2. Check parameters as described above
3. Relax, but keep one eye on the “Acnetize” script
4. At the end of your shift, take some time to write a logbook entry even if nothing happened.
5. Give the next shifter a detailed run-down so they know what to look for.

# Logbook entries are easy!



The screenshot shows a web browser window with the URL `dbweb3.fnal.gov:8080/ECL/mta/E/show?e=916`. The page title is "MTA Electronic Logbook". The main content area displays an entry titled "Entry #916 Commissioning 02/17/2015 16:16:48 Daniel Bowring (dbowring)". The entry text describes an event on the evening of February 16, where a power of 140 W was put in the modular cavity, achieving an estimated gradient of 0.27 M/Vm. It lists parameters such as a resonance at 804.55 MHz, a 30 ns pulse length, a 5 kHz rep rate, and a 4e-8 Torr vacuum pressure. The text also mentions RF pickups (yellow & red), forward power (blue), and reflected power (green) in an attached figure. A note at the bottom of the entry states: "We'll be shaking down the DAQ and fine-tuning Dave's LabView code for the rest of the week." The figure shows a plot with multiple colored traces (yellow, red, blue, green) over time, with a legend below it. The legend includes "RF pickups", "forward power", and "reflected power". The browser's address bar and search bar are visible at the top.

MTA  
Electronic Logbook

Logbook Shifts Members

Entries

Entry #916 Commissioning 02/17/2015 16:16:48 Daniel Bowring (dbowring)

Search

RSS

On the evening of February 16, we put 140 W in the modular cavity, achieving an estimated gradient of 0.27 M/Vm.

Other "run" parameters:

- resonates at 804.55 MHz
- 30 ns pulse length
- 5 kHz rep rate
- 4e-8 Torr vacuum pressure

In the attached figure, 'scope traces are: RF pickups (yellow & red), forward power (blue), and reflected power (green).

We'll be shaking down the DAQ and fine-tuning Dave's LabView code for the rest of the week.

Images

URL: <http://dbweb3.fnal.gov/ECL/>

Tags:

Version: 0.5

Figure : This brings us to Michael's part of the training.