

Information about the magnets to be used by MINERvA at MTest

Much of this was collected by Julian Felix and Doug Jensen in Winter and Spring 2009.

I've cut and pasted it from their slides and e-mails. Some commentary is from Juilan's original slides, some is from me today.

I think we have technical drawings and exact dimensions, but I don't have them here and don't see them in our electronic document posting area.

--Rik Gran, 17 September 2009

MINERvA magnets are label as NDB021 and NDB022.

Each has this label:

NDB021 (Magnet 1).

Debuncher Trim dipole magnet

5.625-12.5-20

DWG. No. 8020-ME-197392

Ser. No. NDB021

Weight 1700 lb.

Electrical tests (in series)

$L_s = 297$ mH.

$Q = 3.4$. Efficiency. $2\pi\{\text{peak magnetic energy-peack electric energy}\}/\text{energy loss in one oscillation cycle}$

$R = 0.751$ Ohms

NDB022 (Magnet 2).

Debuncher Trim dipole magnet

5.625-12.5-20

DWG. No. 8020-ME-197392

Ser. No. NDB021

Weight 1700 lb.

Electrical tests (in series)

$L_s = 299$ mH.

$Q = 3.4$. Efficiency = $2\pi\{\text{peak magnetic energy-peack electric energy}\}/\text{energy loss in one oscillation cycle}$.

With frequency equal 8.5 Hz, $Q = 3.3575$

$R = 0.746$ Ohms

Number of turns in each coil is 200.

Material the core was made of laminated iron.

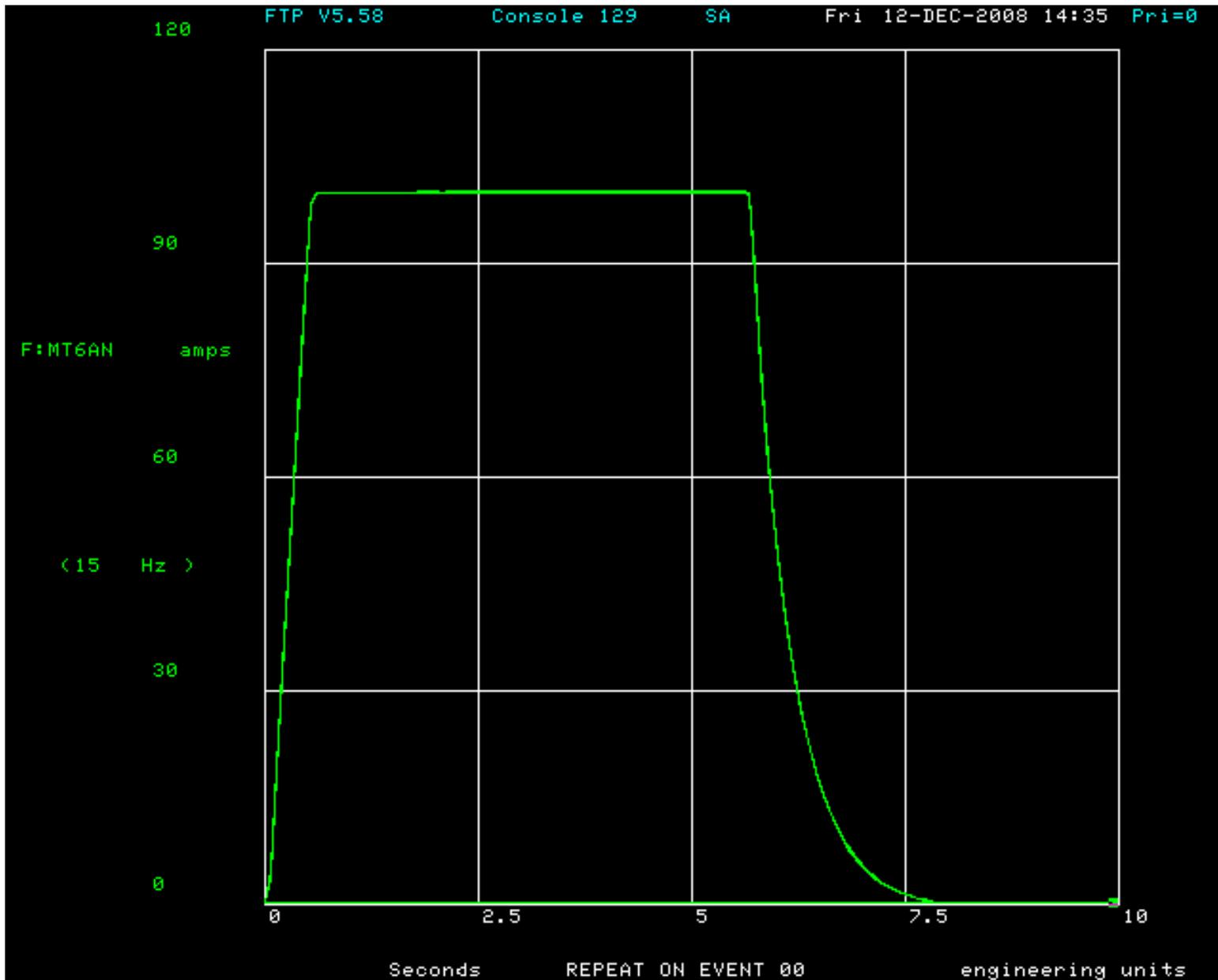
(Relative magnetic permeability is 200 of air.)

We checked the above characteristics and found good agreement.

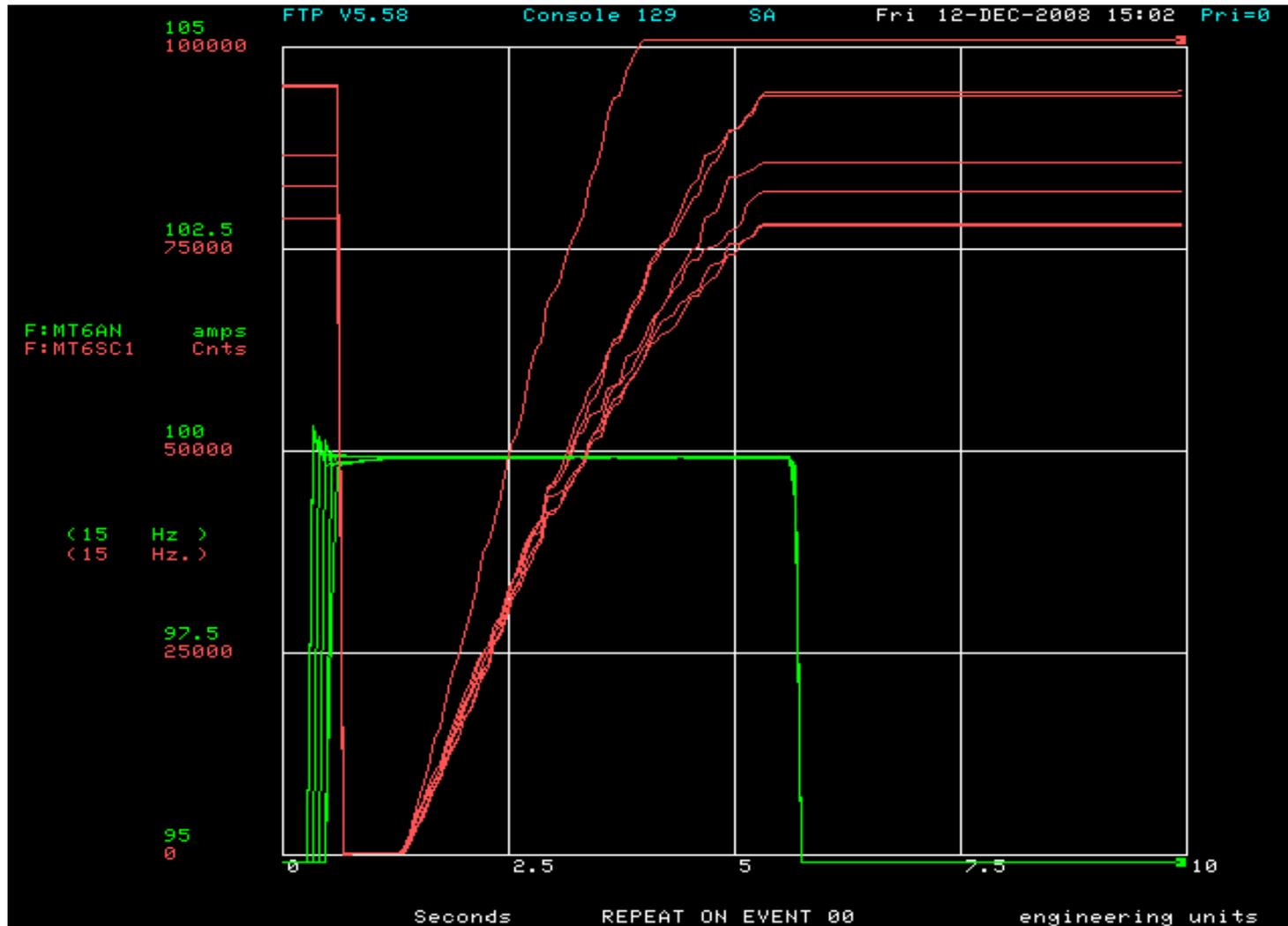
Also we checked the geometrical dimensions. They agree with the reported in draws.







Current profile of the Ramp, zoomed out to show full scale.
Several measurements are superimposed.



Current profile, but vertical axis is zoomed to show flattop detail.

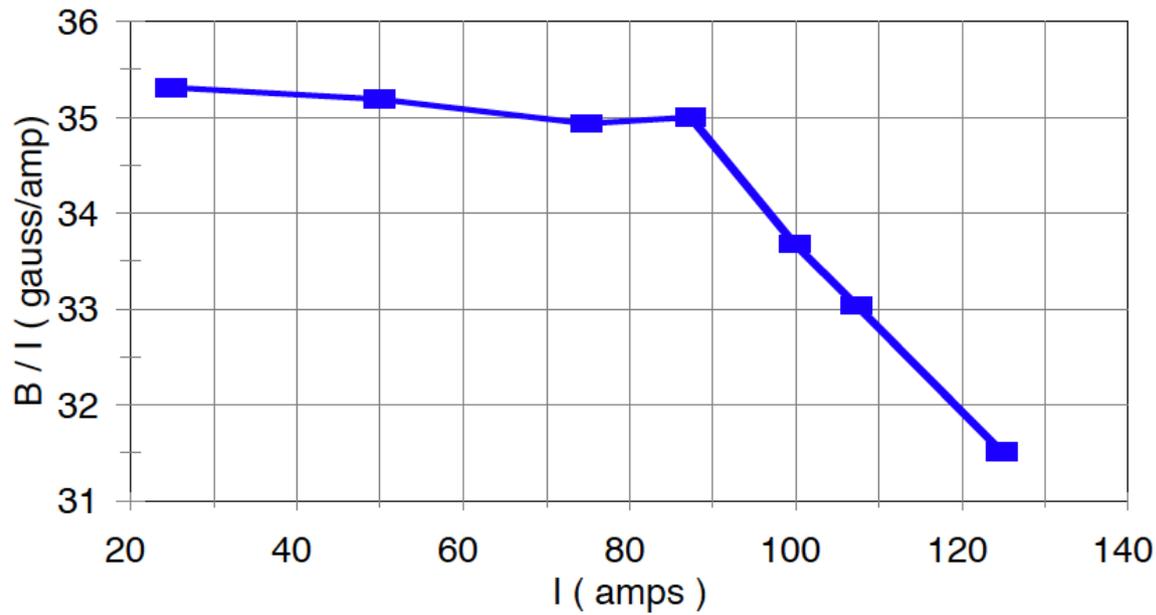
The overshoot and recovery is $<0.5\%$.

Superposed in Red is a scaler showing the arrival of the beam.

The magnet ramp is well matched to the timing and duration of the beam.

The beam duty cycle is 4 seconds on, ~60 seconds off.

NDB022 Excitation



Excitation measurements

Taken by
Doug Jensen
and
Julius Lentz

in May 2009

NDB021 Excitation

