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# PXIE RFQ Power Source & Schedule

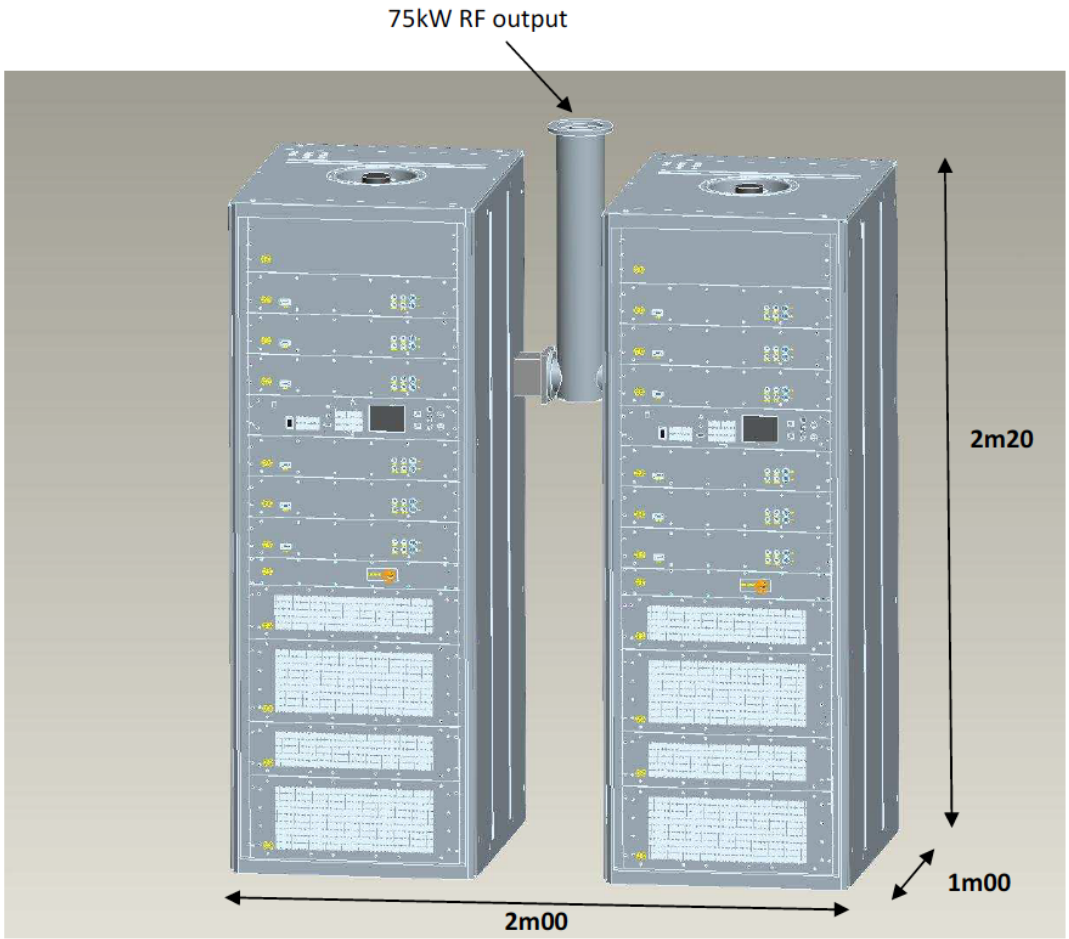
*Ralph J. Pasquinelli*

**10/23/2012**

# Fermilab PXIE RFQ Power Source & Schedule

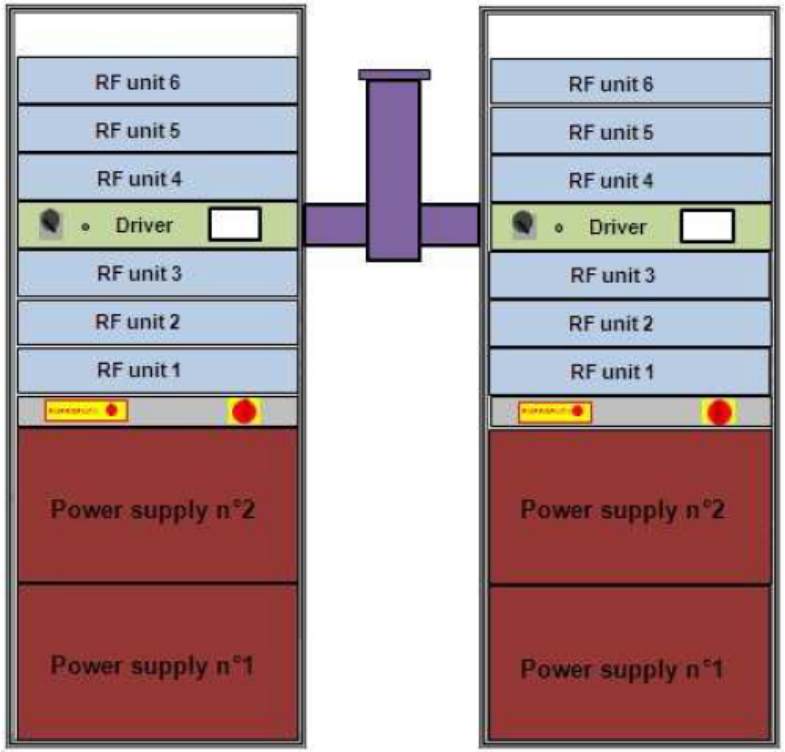
Bruker BioSpin

*Two 75 kW*
*162.5 MHz*
*Solid-state Amps*

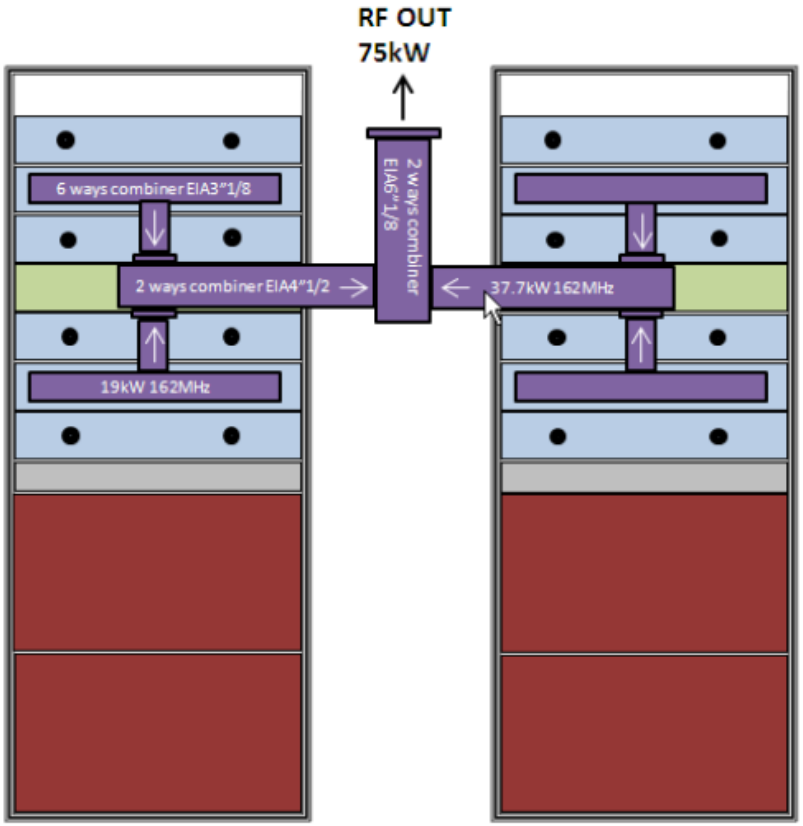



*R. J. Pasquinelli*

# Fermilab PXIE RFQ Power Source & Schedule




Front View




Rear View

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*RFQ Amp Specs*

| Item | required | BRUKER |
|---|---|---|
| Number of units required | two | OK |
| Center frequency | 162.5 MHz | OK |
| Bandwidth | ≥ +/- 1MHz at -1dB | OK |
| Saturated output power | 75kW CW | OK |
| 1dB compression output | 60kW CW | OK |
| Gain | 69dB for full saturated output power | OK |
| Input drive power | Saturated power to be achieved with no more than 10dBm | OK |
| Duty cycle | CW | OK |
| Output Harmonics | ≤ -30dBc | OK |
| Output spurious | ≤ - 50dBc | OK |
| Amplitude to Phase conversion | <10° from saturation to -3dB | OK |
| Noise figure | 15dB max | OK |
| Input/Output impedance | 50 Ohms | OK |
| VSWR | Input ≤ 1.5 Output ≤ 2.0 | OK |
| Connectors | Input : N female<br>Output : 6''1/8 EIA flange | OK |

| | | |
|---|---|---|
| Cooling | Water cooled with low conductivity water. Maximum inlet pressure 125psi. Vendor shall supply flow rates, pressure drops, and temperature differential input to output | OK |
| AC to RF power output efficiency | 40% min at 1dB compression | OK |
| AC power | 480VAC three phases 60Hz | OK |
| Remote control | Industry standard remote control should be proposed. Provide an input for external enable permit signal. Reaction time 100us. | OK |
| Foot print | Submit estimated required floor space and height | OK |
| Operation ambient | 10-40°C | OK |
| Humidity | 0-95% non condensing | OK |

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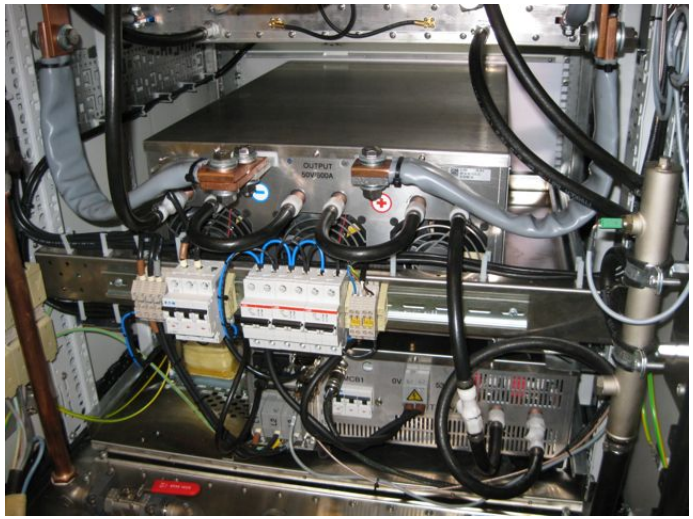

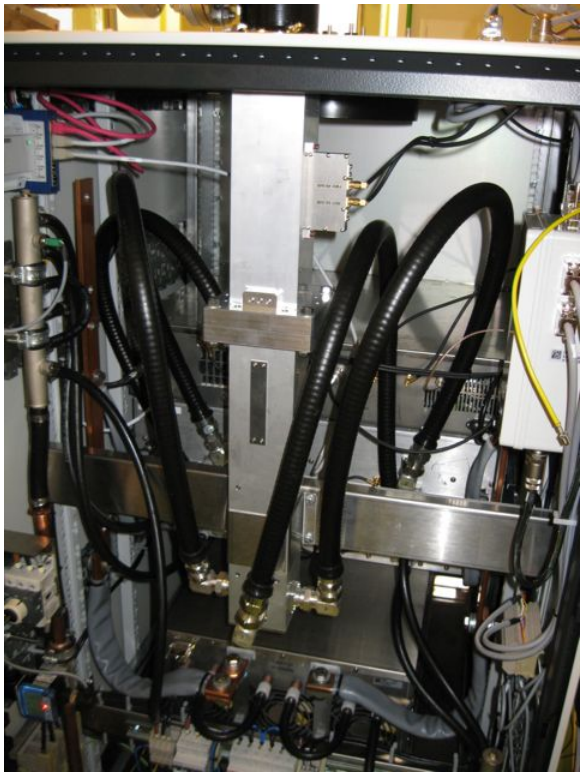

*Bruker 10 kW*
*325 MHz amp*

*R. J. Pasquinelli*

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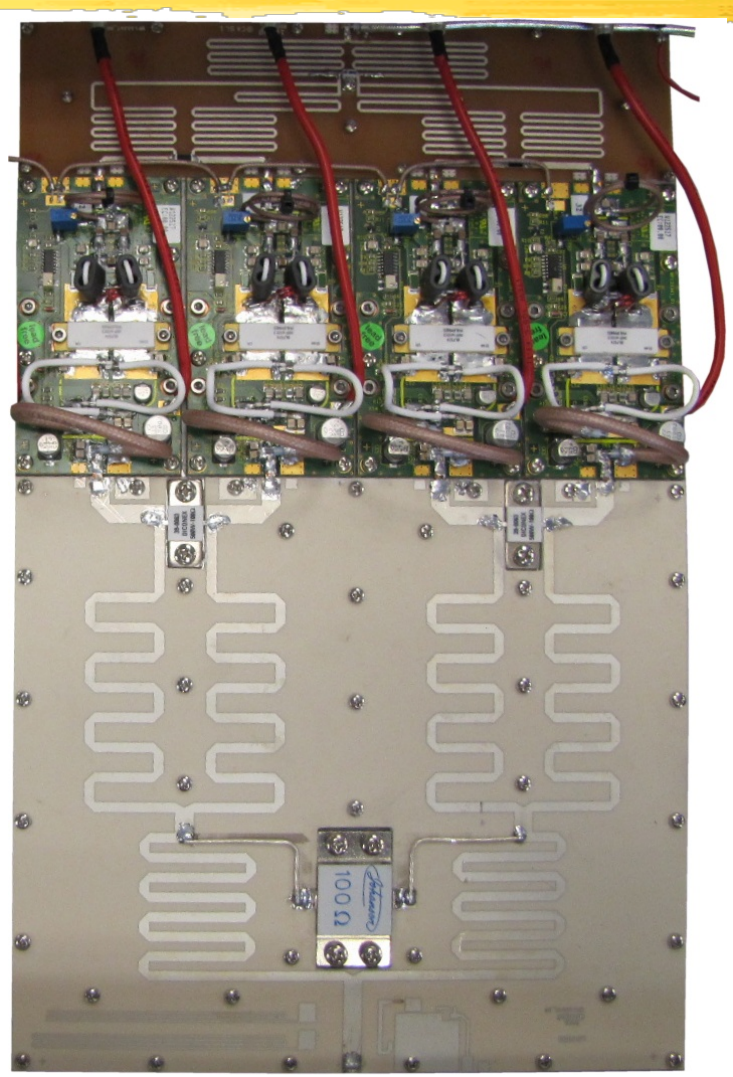
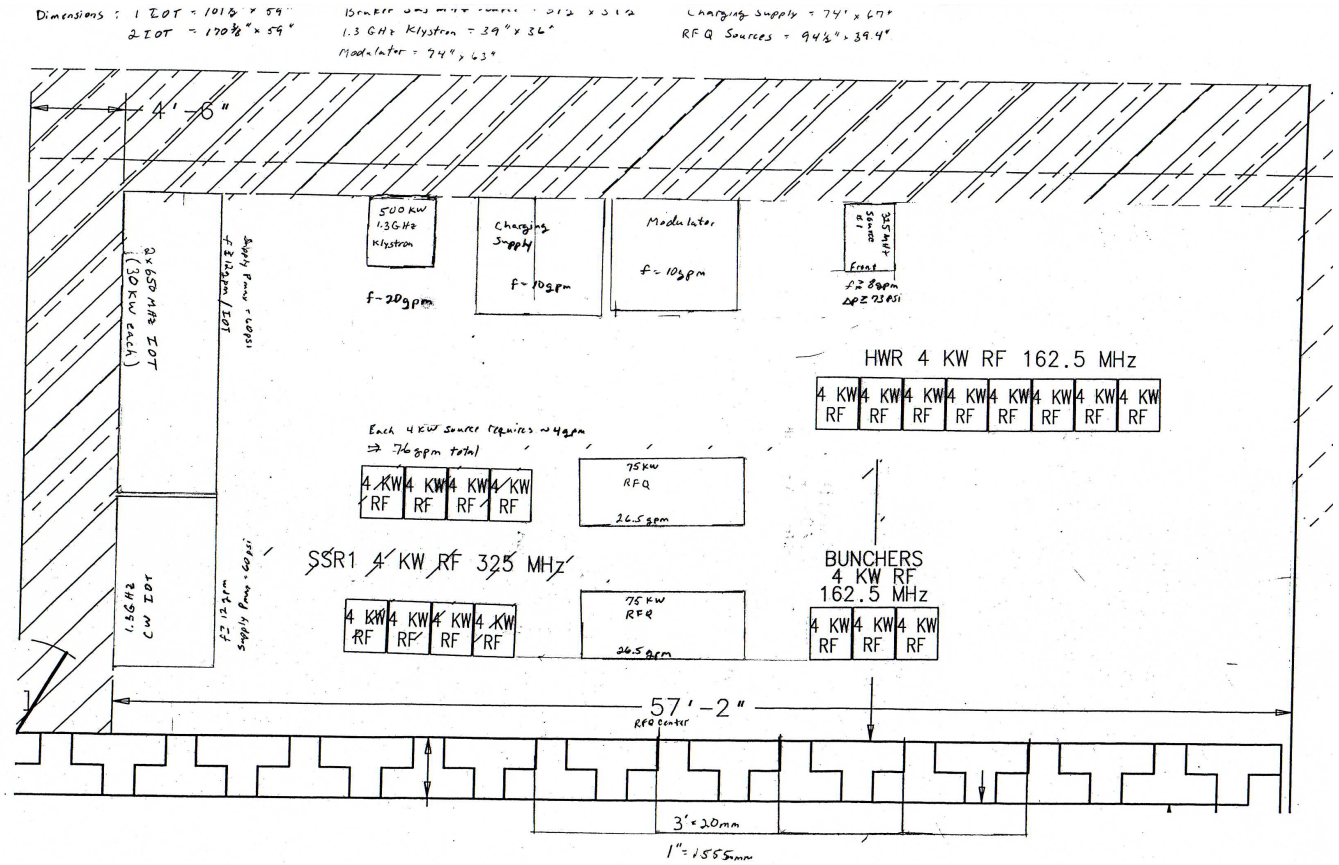


*Typical 2 kW module*

*R. J. Pasquinelli*

# Fermilab PXIE RFQ Power Source & Schedule

## PXIE RF Gallery at CMTF

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# PXIE RFQ Power Source & Schedule

## Schedule Milestones

- *Two 75 kW amplifiers ordered September 2012*
- *Building of cave at CMTF Spring 2013???*
- *Water and power infrastructure at CMTF complete June 2013*
- *Delivery of amplifiers scheduled for June 2013*
- *Installation and initial commissioning at CMTF September 2013*
- *Coupler high power testing can begin September 2013*
- *Delivery of RFQ October 2014???*
- *Beam out of RFQ December 2014???*