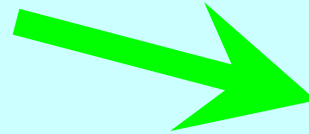
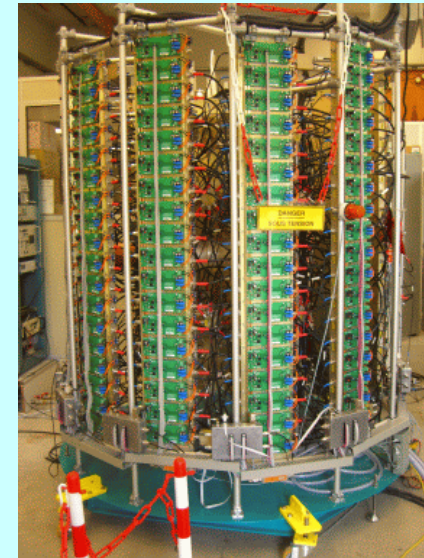
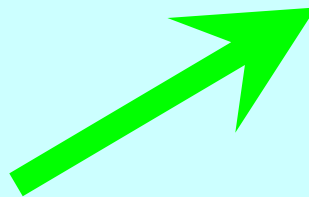


500 MHz Solid state amplifier - development status at PSI

60KW Booster
Amplifier
(500MHz)



20KW Super
Buncher Amplifier
(506MHz)



Solid-State Amplifier

M. Gaspar, M. Pedrozzi

Specifications of Amplifier Modules

60KW Booster Amplifier

Output Power: 60KW

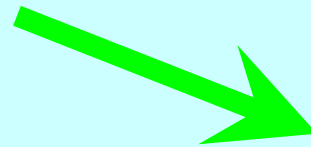
Center Frequency: 499.652MHz

Efficiency: ~ 50%

Price: Cheaper than Klystron Amplifier

Maintenance: Easier, Hot Swap Possible

Construction: In House



Almost the same frequency!!



20KW Super Bucher Amplifier

Output Power: 20KW

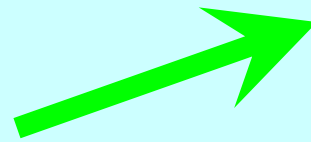
Center Frequency: 506.328MHz

Efficiency: ~ 50%

Price: Cheaper than Commercial Amplifier

Maintenance: Easier, Hot Swap Possible

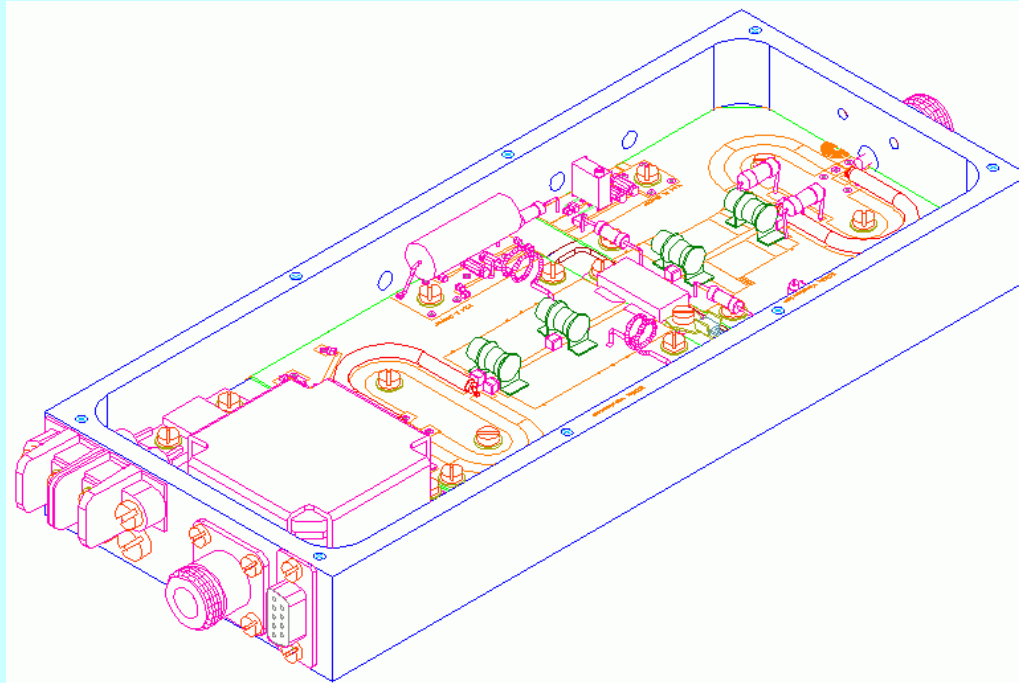
Construction: In House



The same Amplifier Modules
used for both Designs

- Circulator OK
- Matching Structures OK

250W Amplifier



3D-View of 506MHz Amplifier Module

Key Performance Parameters

	Operation	Max
Output Power <i>(with Circulator)</i>	250W	280W
Gain	12dB	10dB
Efficiency	~ 56%	~ 55%

500W Super Buncher Test

Control Computer

506MHz 500W
Amplifier

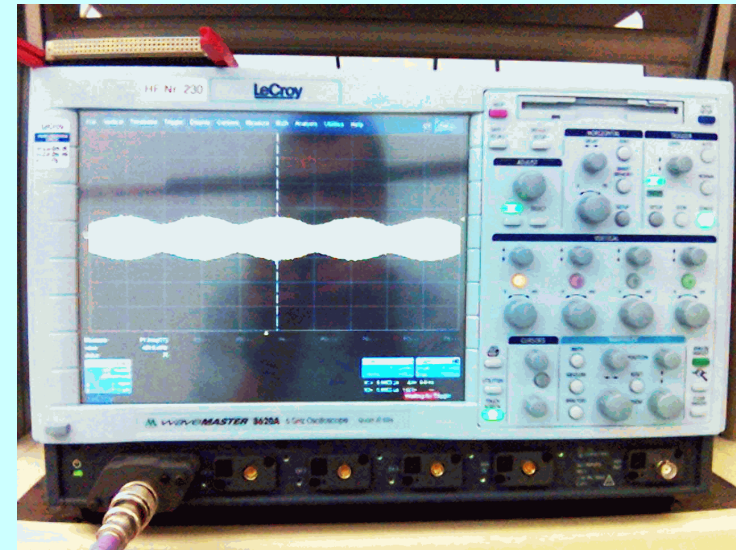
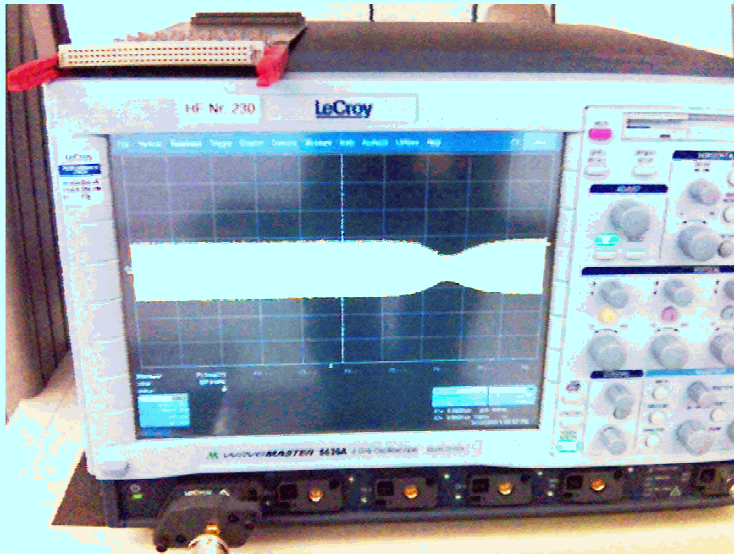
506MHz
Super Buncher

Amplifier
Monitoring

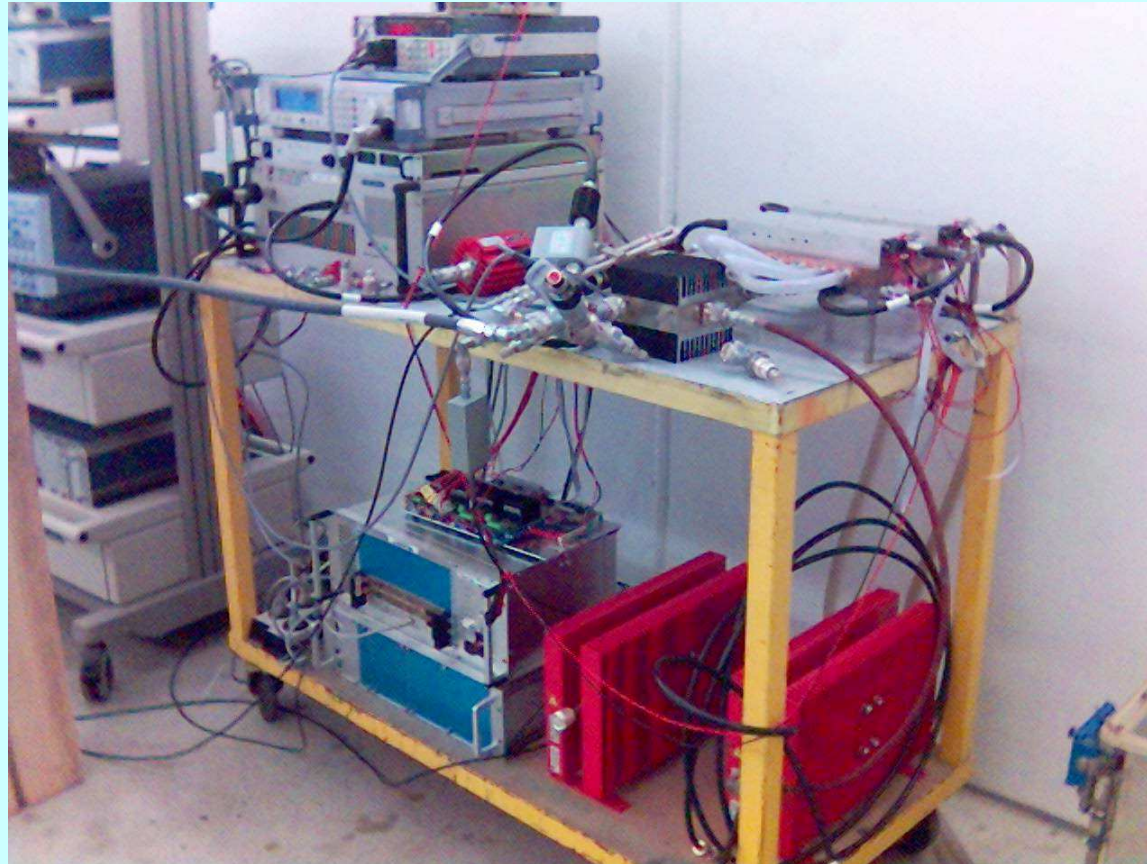
Cavity
Tuning



Super Buncher Multipacting

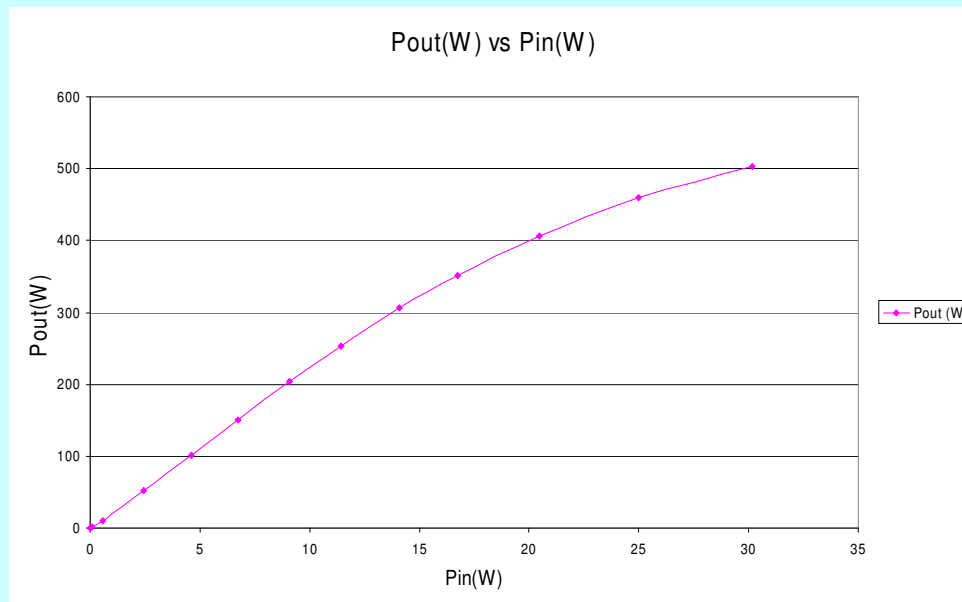


500W Amplifier - Test Prototype

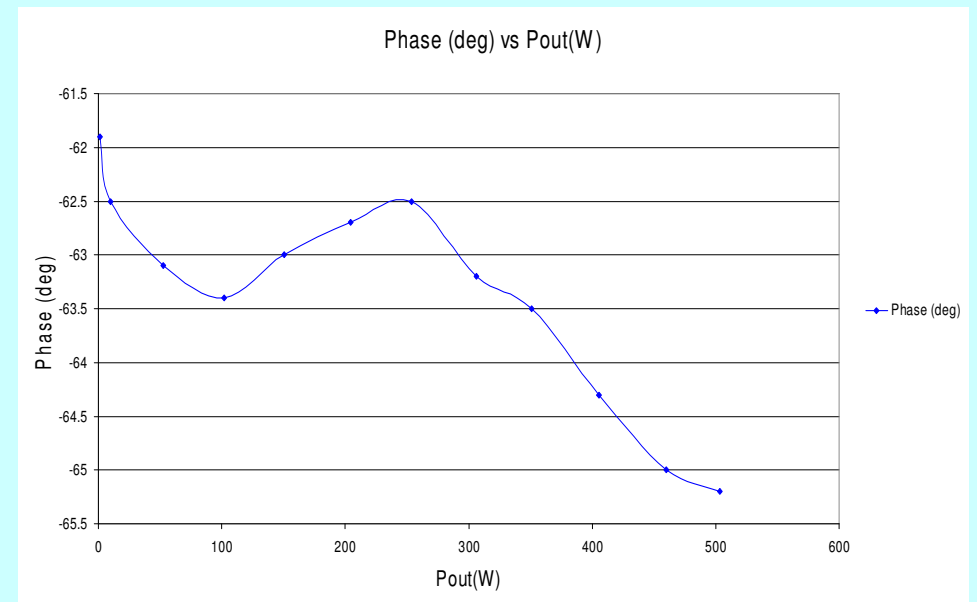


500W Amplifier - Measurement Results

CW $f = 506\text{MHz}$
Modules #1 & #2 Combined

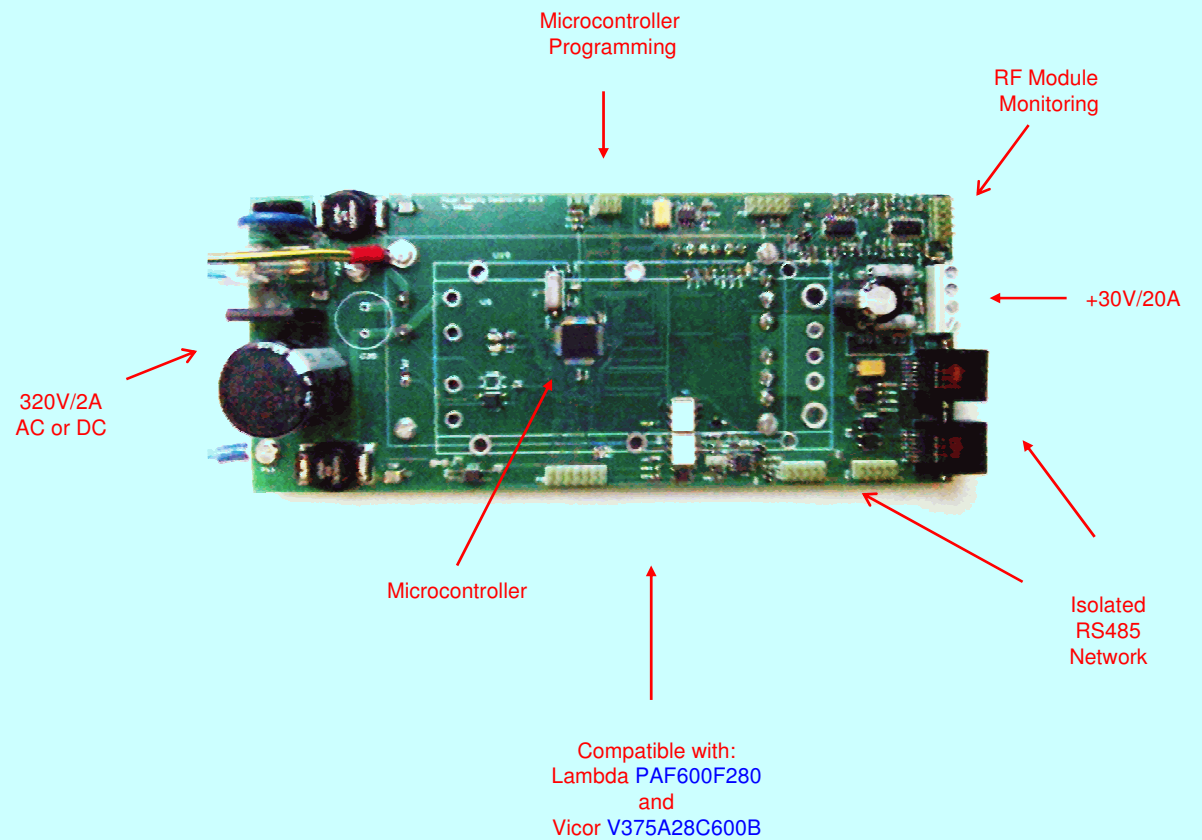
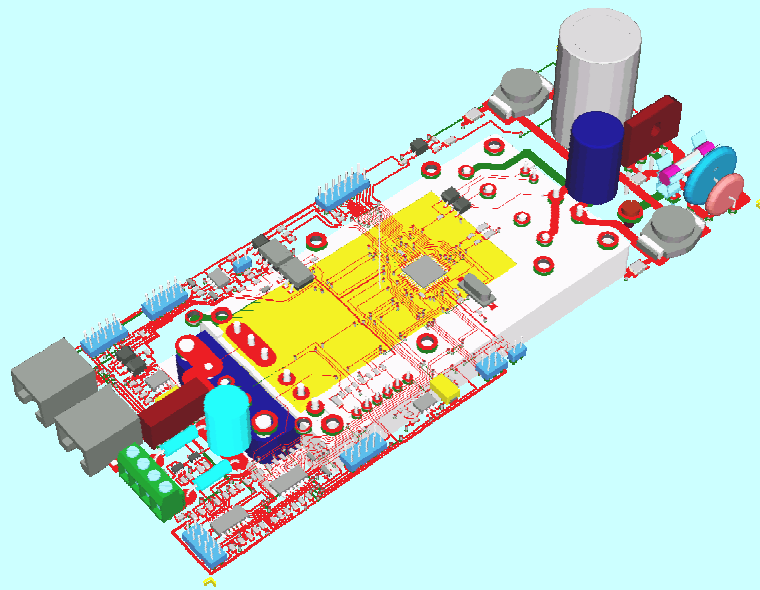


Output Power (W) x Input Power (W)

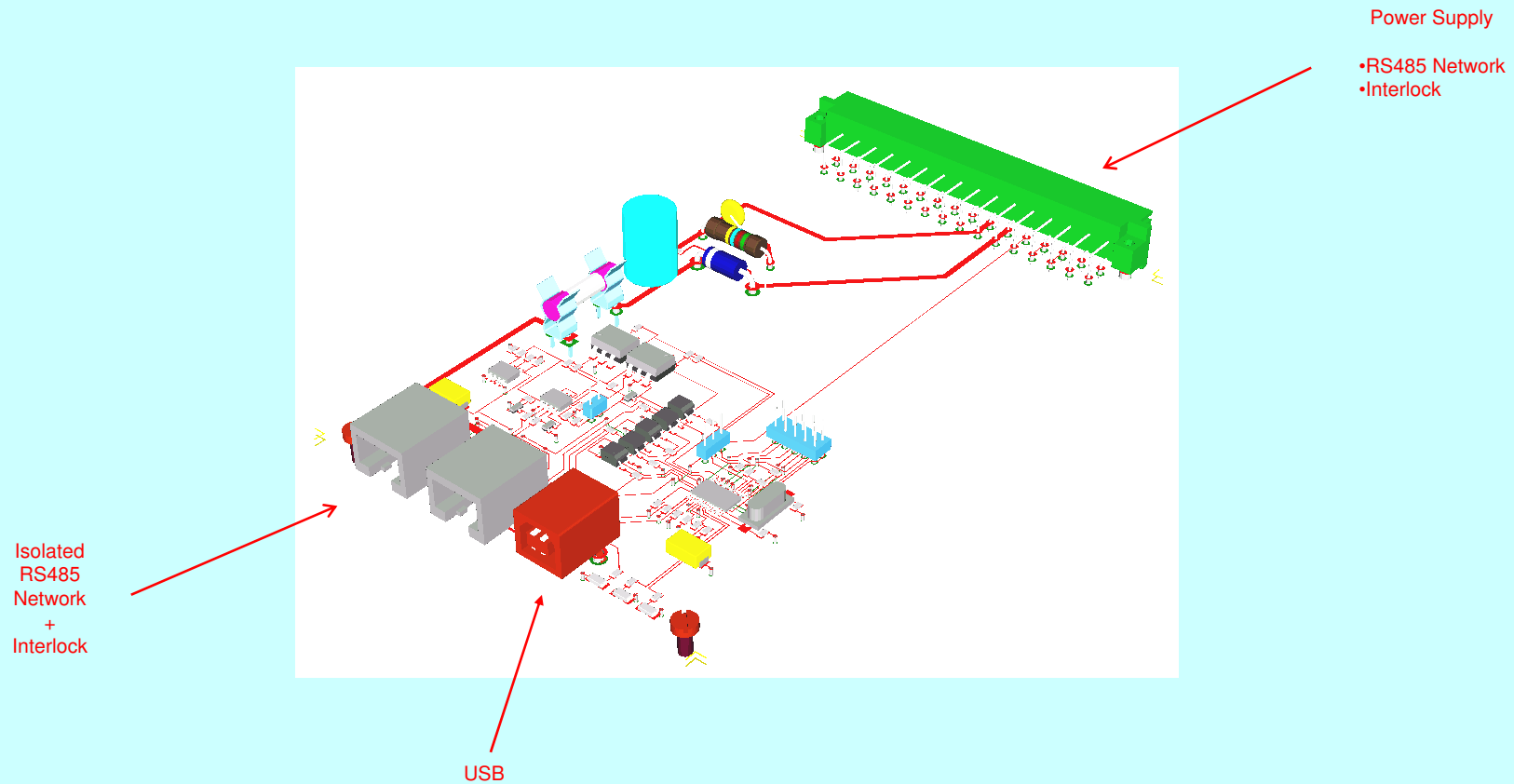


Output RF Phase (deg) x Output Power (W)

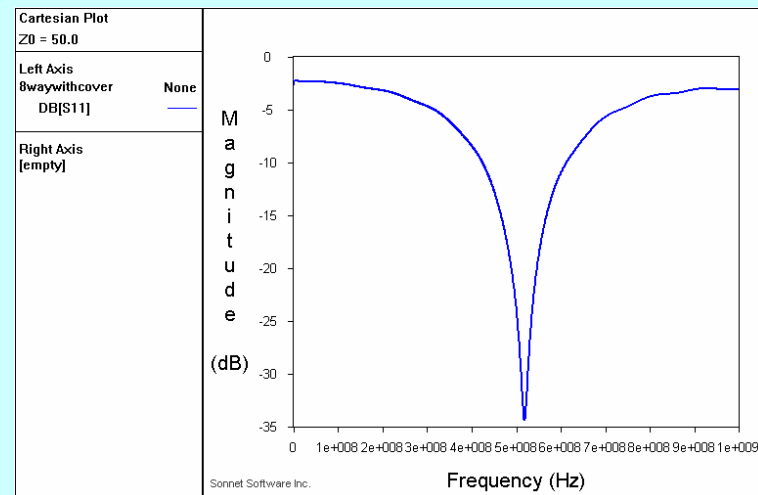
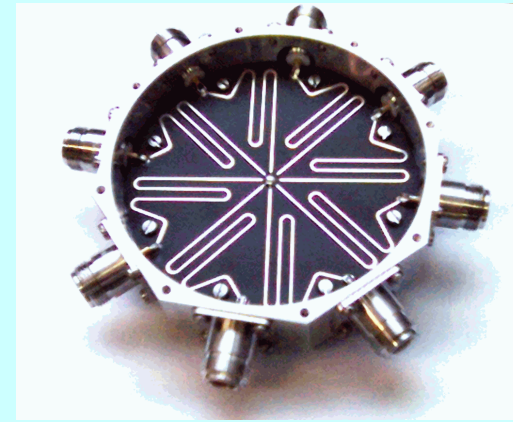
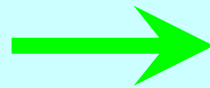
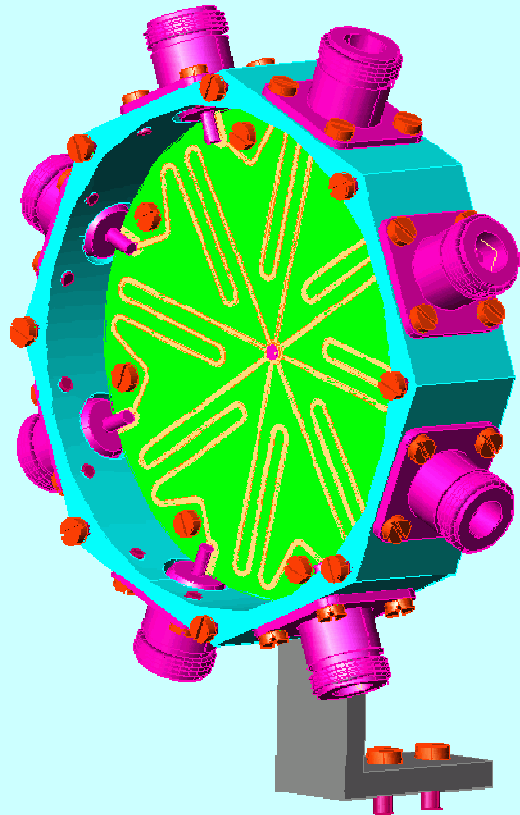
Power Supply Controller



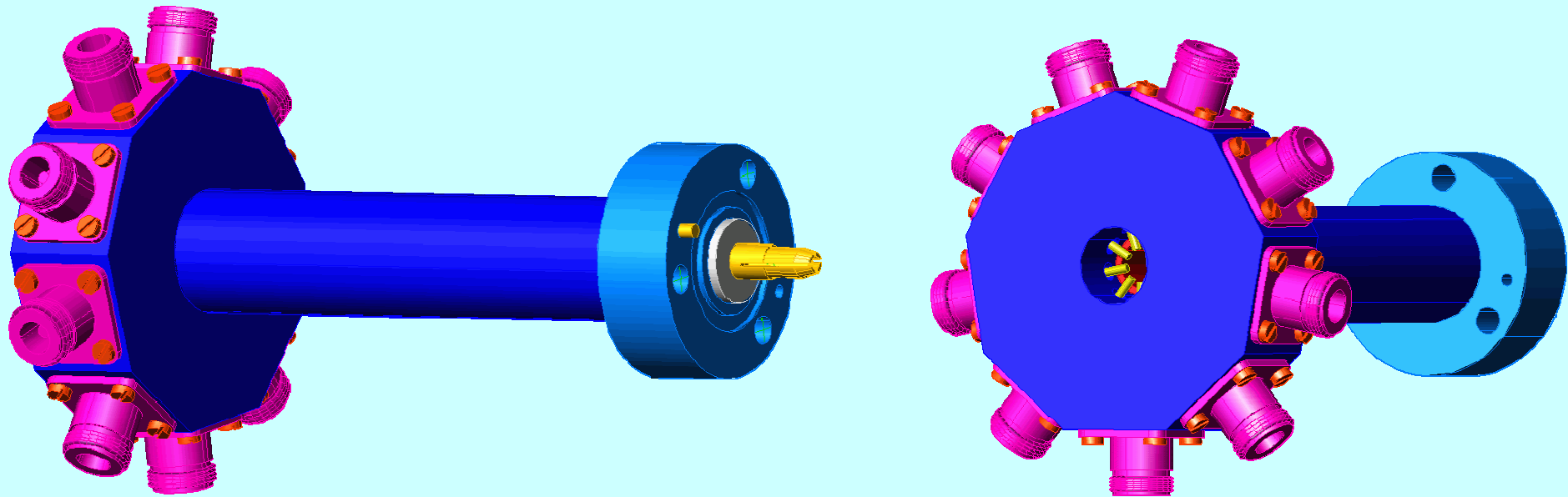
PC Master Controller



8 Way Splitter - 506MHz



9 Way Combiner - 506MHz



Components Available

Power Supply: 3 Different Models Commercially Available (Industry)

Power Splitter: 2 8-Way, 1 4-Way and 1 2-Way Prototypes working (PSI Design)

250W Amplifier Module: 2 Finished Amplifier Modules working (PSI Design)

Cooling Bar: Use Soleil Design (Keep Compatibility) (Industry)

Circulator + Load: Commercially Available (Industry) (Already Tested)

Components Under Development @ PSI

Control System: Local (Amplifier Module) and Main Controller

Power Splitter: 1 4-Way and 1 9-Way Low Loss High Isolation

250W Amplifier Module: New design using 2 new transistors

Power Combiner: 8-Way 9-Way and 4-Way Coax

Power Coupler: 2KW and 32 KW Types

500W Amplifier - Test-setup

