

Quench Initiation and Propagation Study

QUIPS

Using a conductor geometry that appropriately models the the features of the Bechtel SMES-ETM cable-in-conduit conductor (and in a similar field and cooling environment):

- determine the energy to initiate a quench
- monitor the progress of the quench
(measure $v(t)$)
- observe the effects of the quench
(measure $p(t,x)$, $T(t,x)$)
- document the results in a form appropriate for comparison with detailed analyses

P.S. – Do it in six months

The Team

Bechtel

- Motivation
(insight, perspective, overall management)

NHMFL

- Concept
- Coordination
- CICC Fabrication
- He II HX Package Design and Fab.
- Facilities, Site Prep. & Final Assembly
- Instrumentation & Test

GDSS/New England Electric Wire

- Cable Fabrication

GA/Star Technologies

- Test Coil Fab.
- Cryostat Design and Fabrication
- Procurement Support

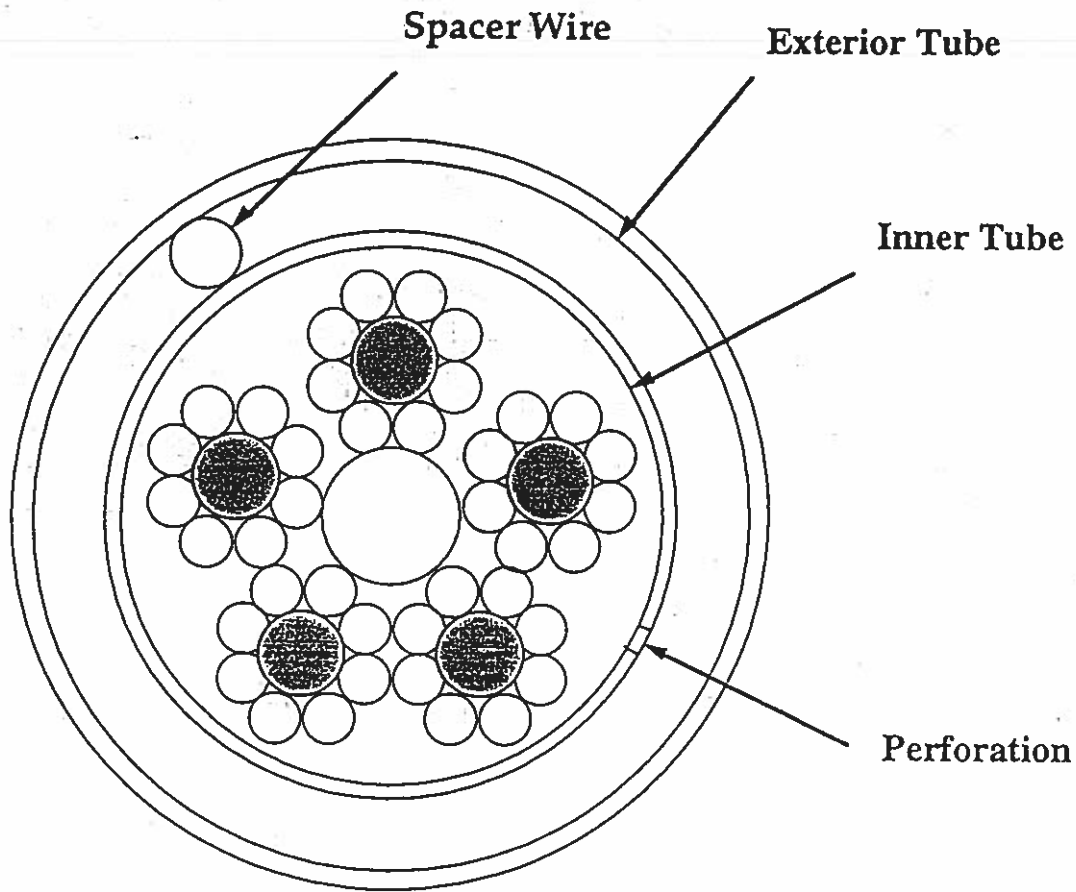
Cryofab

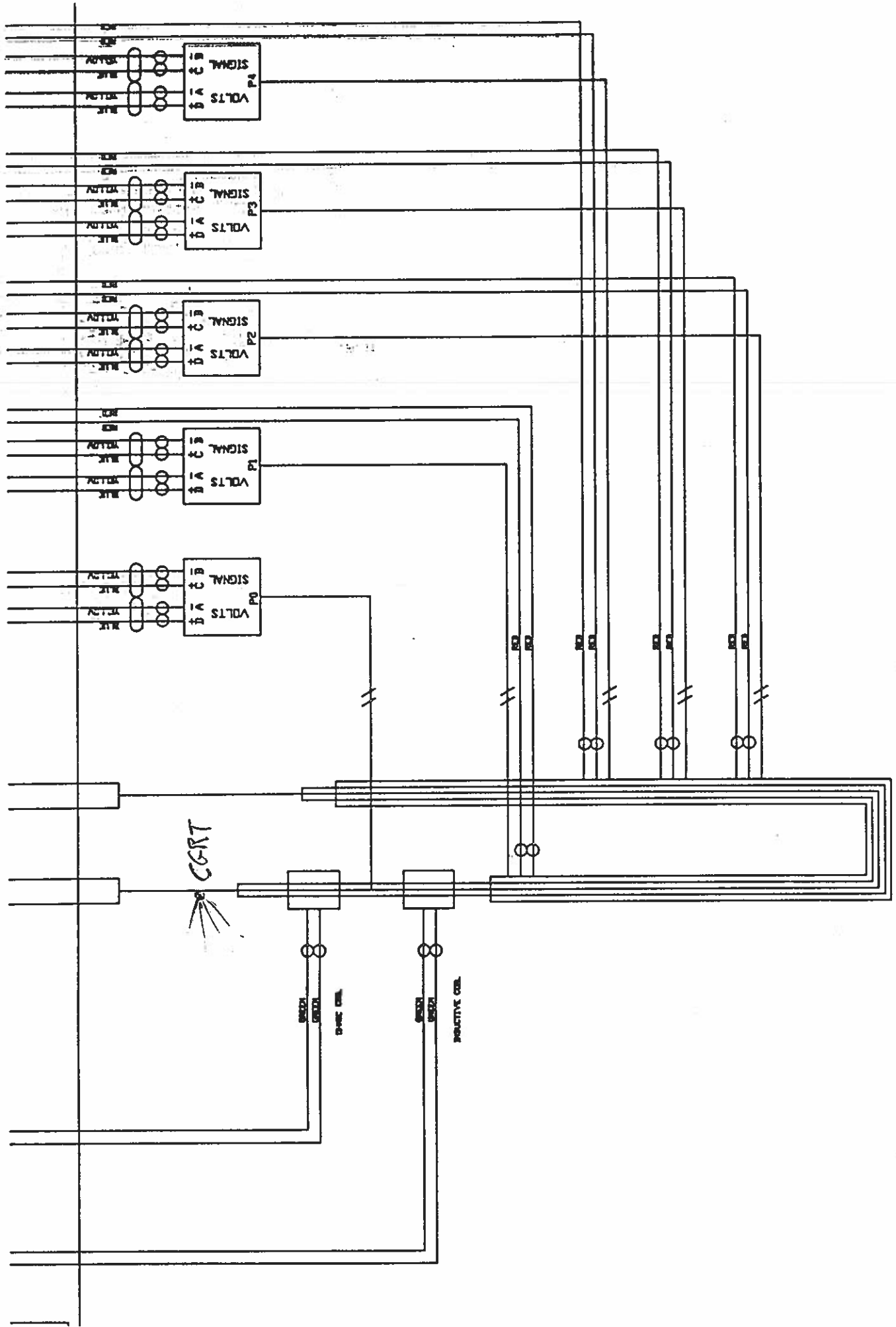
- Dewar Fabrication

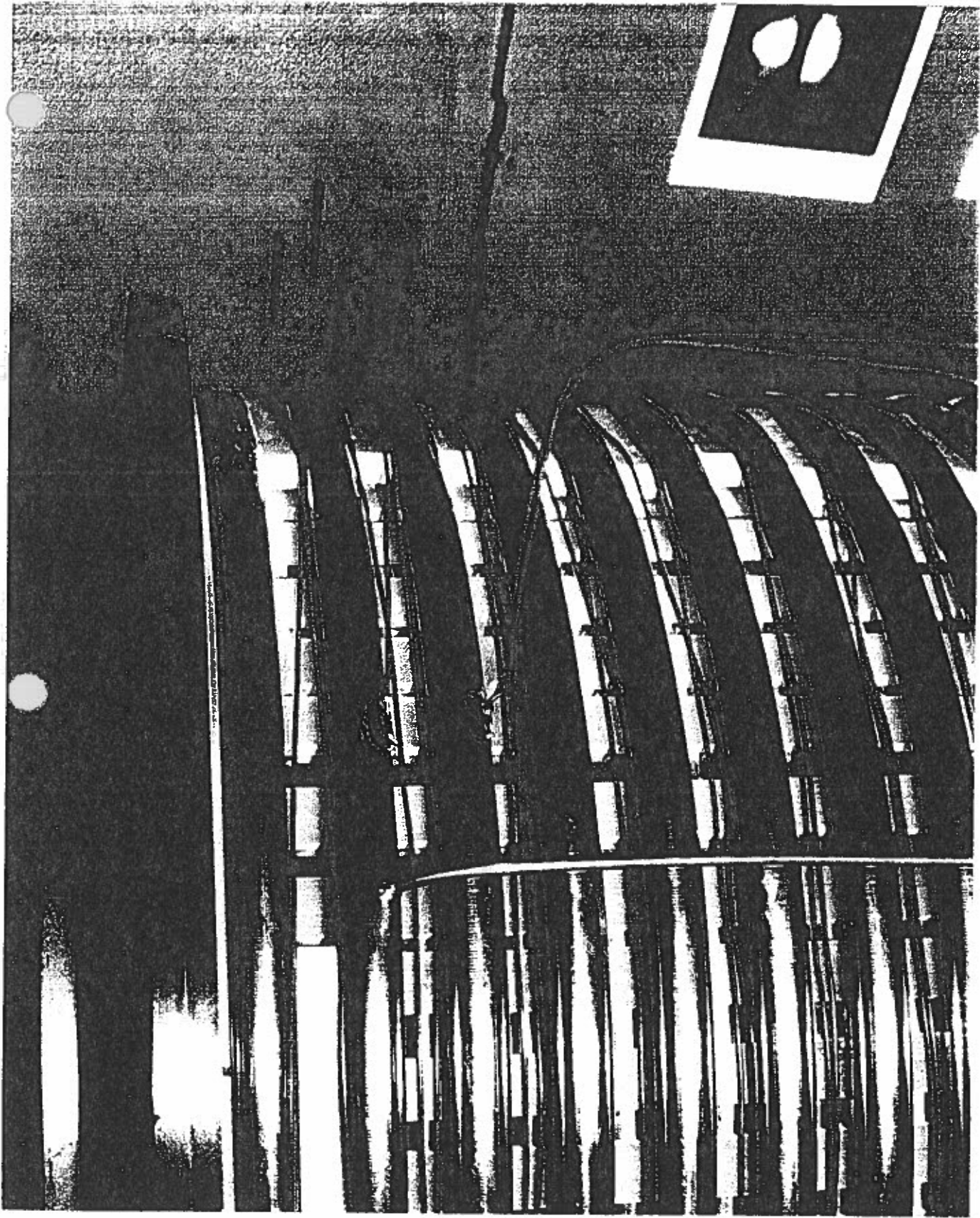
American Magnetics

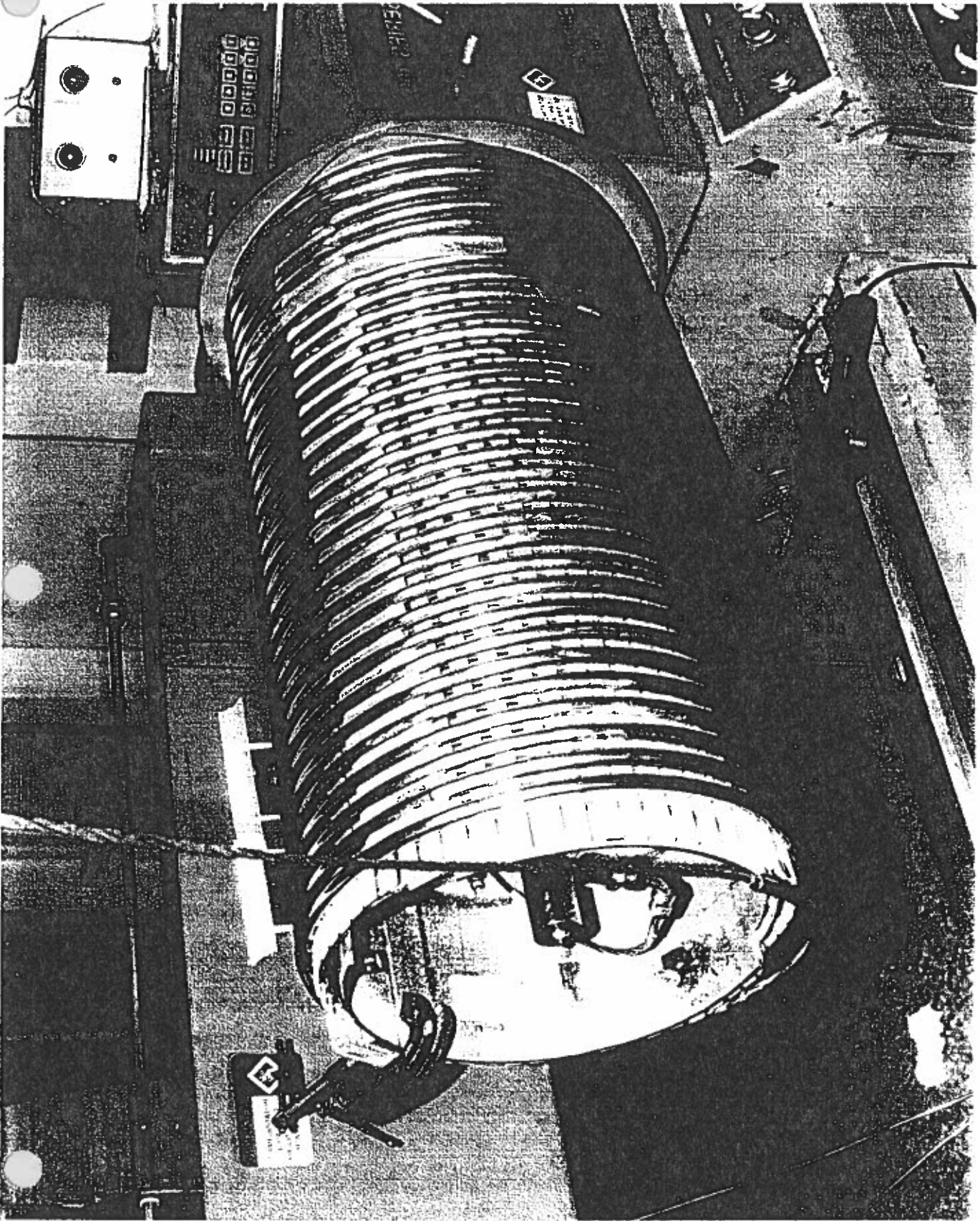
- 10-kA VCL Fabrication

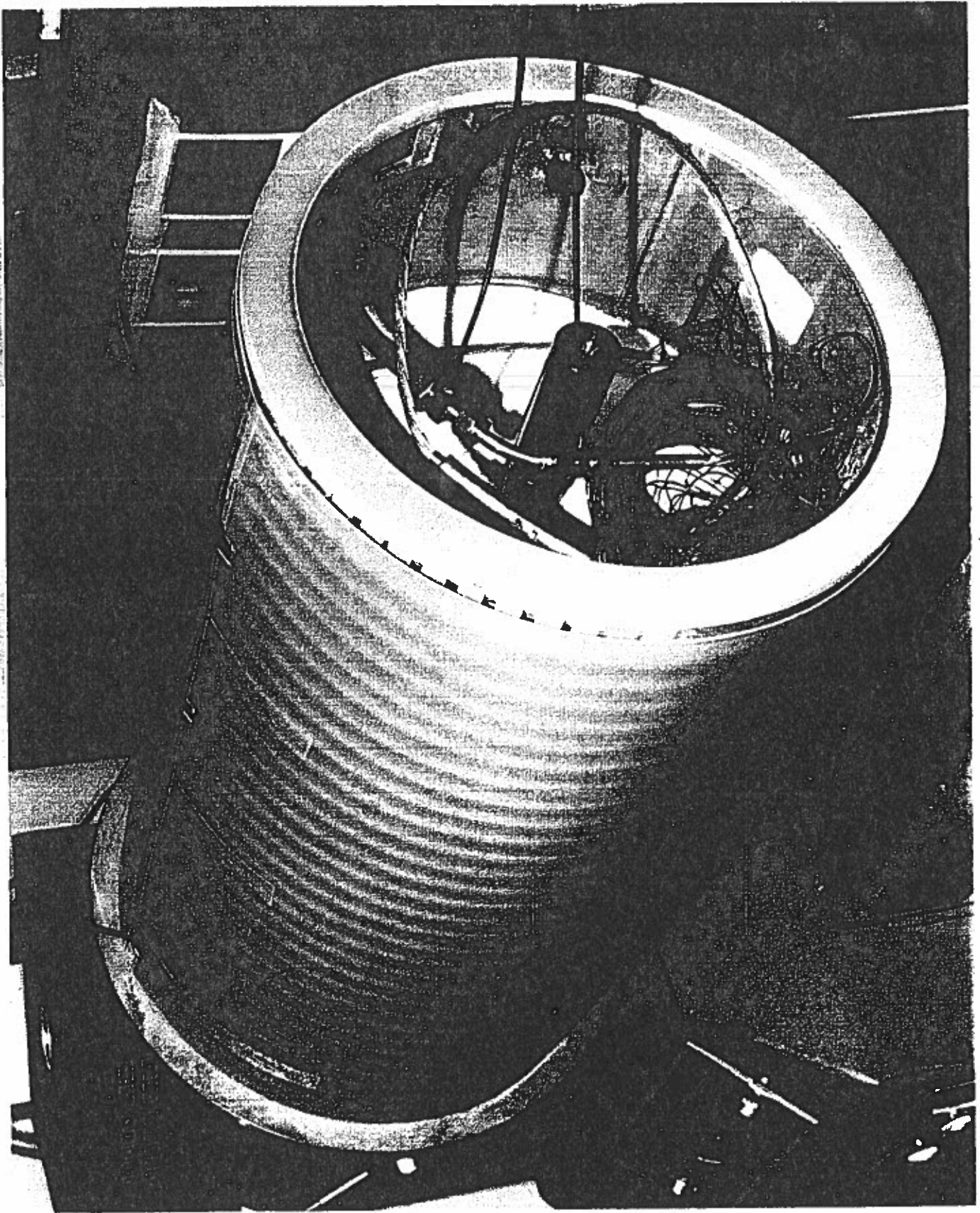
Schematic Cross-Section of the QUIPS Model Conductor



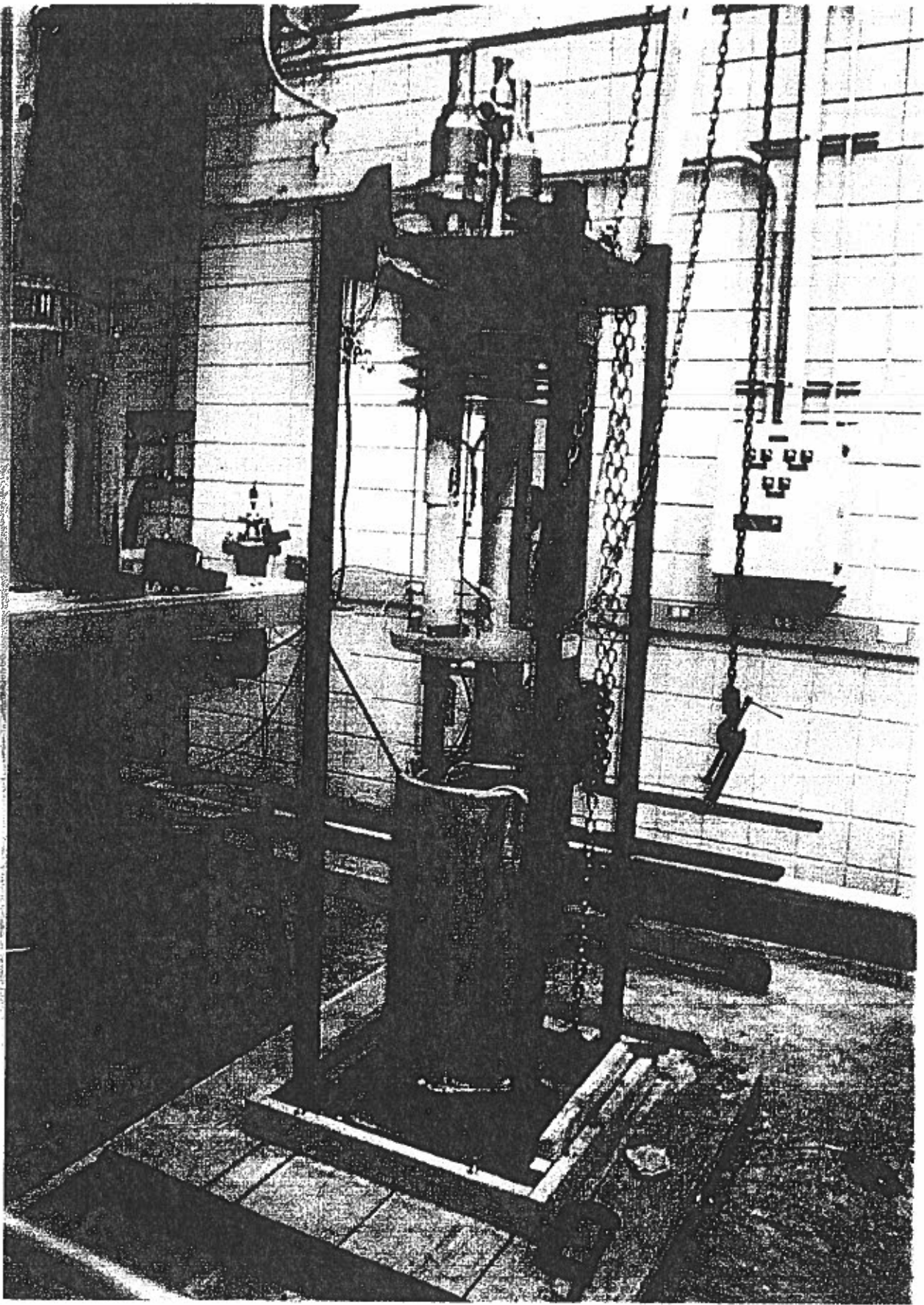


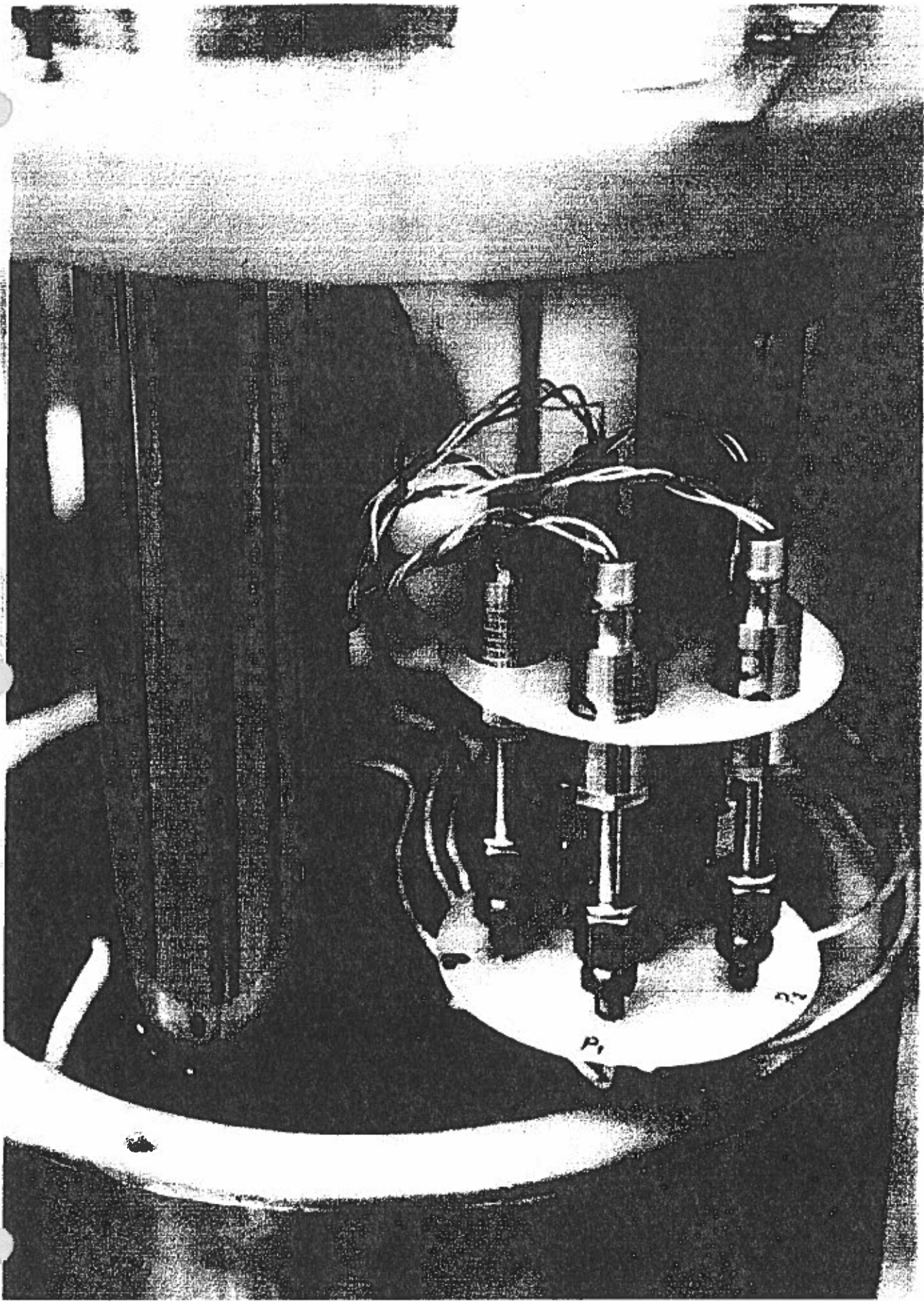












The Schedule

Conceived the basic experiment – February 18

Organized team for design and fabrication of apparatus – March

Tubing received from Gibson Tube – April 6

Cable received from NEEW – April 13

CICC shipped to GA – May 17

Dewar received from Cryofab – July 9

VCLs received from American Magnetics – July 12

Coil/Cryostat received from GA – July 16

Site preparation completed – August 2

HX package complete – August 20

Seal-weld cryostat – August 27

Power system checked out – August 30

Preliminary low-current tests and calibrations – September 3

~~Quench and propagation tests – September 6-10~~

- Transfer and cooldown to < 2 K completed
- Test coil repeatedly charged to 8 kA without quench
- Data acquisition system failed to operate
- Test halted

~~Data evaluation and retest – September 13-17~~

- Test postponed until delivery of isolation amplifiers

~~Report – September 30~~

- Test October 4 - 8
- Report October 18