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SPHINX Experimenters Information Package

Thomas A. Zarick

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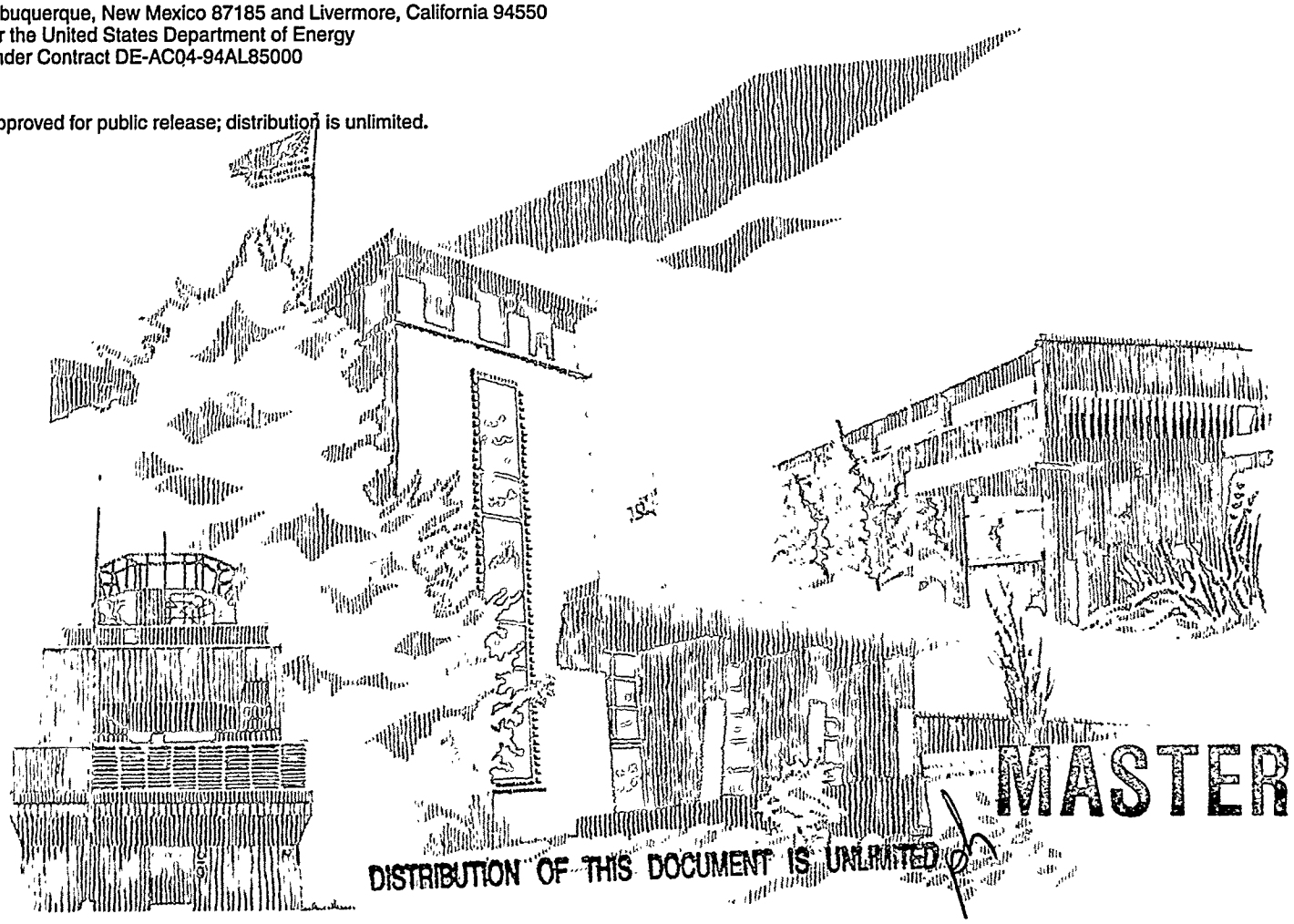

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SPHINX Experimenters Information Package

An Information Package for New and Experienced Users of The
SPHINX Flash X-Ray Facility

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Radiation Effects Experimentation Department
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Albuquerque, NM 87185

Abstract

This information package was prepared for both new and experienced users of the **SPHINX** (**S**hort **P**ulse **H**igh **I**ntensity **N**anosecond **X**-radiator) flash X-Ray facility. It was compiled to help facilitate experiment design and preparation for both the experimenter(s) and the SPHINX operational staff. The major areas covered include: Recording System Capabilities, Recording System Cable Plant, Physical Dimensions of SPHINX and the SPHINX Test Cell, SPHINX Operating Parameters and Modes, Dose Rate Map, Experiment Safety Approval Form, and a Feedback Questionnaire. This package will be updated as the SPHINX facilities and capabilities are enhanced.

SPHINX EXPERIMENT INFORMATION PACKAGE

In keeping with Sandia National Laboratories commitment to quality and providing our customers with the best possible service, we ask that you please provide us some information regarding your upcoming experiment at the SPHINX facility. We realize that very few experimenters have the same requirements and we would like to accommodate any special needs you may have. Additionally this information will aid us in configuring the SPHINX facility for your experiment before your arrival and thus help reduce your setup time. Upon completion, please mail or Fax this information to:

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Sandia National Laboratories
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Albuquerque, NM 87185-1167
(505)845-7939 Fax (505)845-3471

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(505)845-7068 Fax (505)845-7841

If you have questions regarding any of the information requested, please do not hesitate to call.

1. Experiment / Test Information

Title: _____

Program: _____

Security Classification (DOE/DoD): _____

Principal Experimenter: _____

Organization: _____

Address (if non-Sandia): _____

_____

Phone: _____ Fax: _____

Proposed Test Dates: _____ thru _____

*Desired Number of Shots: _____

**Actual Test Dates: _____ thru _____

**Shot Numbers: _____ thru _____

* This number should reflect your proposed shot matrix. ** These items will be completed post test.

2. Physical Description

Please provide a physical description of the item/package you will be testing. This description should include the physical dimensions of both the item and any test specific packaging, **e.g.**, EMI/RFI enclosure, or radiation shielding for associated hardware that must be close to the item under test. **(Due to the fast rise time of the SPHINX pulse it is recommended that an RFI enclosure be used for any support electronics that may be sensitive to Radio Frequency Interference. We have available several EMI/RFI enclosures which you may be able to use. We also have lead bricks and some lead sheet for radiation shielding purposes.)** If possible please include a sketch of the proposed test configuration. We are including a diagram of the SPHINX converter end where your experiment will be placed. This should help you in determining any dimensional restrictions in the package size. **(It should be noted that many dimensional restrictions can be overcome through alternate shielding configurations. However, the alternate shielding configurations must be approved by the Machine Safety Committee, so we ask that you inform us of this possibility ASAP.)**

X axis: _____ Y axis: _____ Z axis: _____

Test Configuration Sketch:

3. Recording System Requirements

3.1 Cable Plant

The Current SPHINX cable plant consists of the following:

3.1.1 High Frequency Screen Room

14 ea. 1 GHz coaxial signal cables[1].
10 ea. 100 MHz coaxial signal cables[1].
6 ea. 1 GHz coaxial signal cables used for machine diagnostics[2].

3.1.2 Low Frequency Screen Room

2 ea. 20 TSP Cable DoD/DNA MP21.
2 ea. 10 TSP Cable DoD/DNA MP23.
2 ea. 10 TSP Dekoron 1824 Type "E" Thermocouple Extension Cables.
4 ea. RG-22 Twinaxial Cables.
9 ea. RF-21 Twinaxial Cables.
9 ea. RG-58 Coaxial Cables.

Please Indicate the cable type, bandwidth, quantity, and connector type, for the signal cables your experiment/test will require.

☐ Coaxial cabling required.
Bandwidth: 1 GHz: Qty. _____ 100 MHz: Qty._____
Connector Type: _____ _____

☐ Non-Coaxial Cabling Required.
Total Number of Signal Lines Required: _____
Maximum Operating Parameters: Voltage: _____ Current: _____
Connector or Termination Type Required: _____

If you require several different connector or cable termination types, please list them below. (Attach additional sheets as necessary)

Cable Type	Termination	Quantity	Type[3]
☐ 1GHz ☐ 100MHz ☐ Non-Coaxial	_____	_____	☐ Cu ☐ "E"
☐ 1GHz ☐ 100MHz ☐ Non-Coaxial	_____	_____	☐ Cu ☐ "E"
☐ 1GHz ☐ 100MHz ☐ Non-Coaxial	_____	_____	☐ Cu ☐ "E"
☐ 1GHz ☐ 100MHz ☐ Non-Coaxial	_____	_____	☐ Cu ☐ "E"
☐ 1GHz ☐ 100MHz ☐ Non-Coaxial	_____	_____	☐ Cu ☐ "E"

☐ Experiment/Test will require special cable terminations.

Notes: 1) The coaxial signal cables in the test cell are terminated with male SMA connectors. We can adapt to potentially anything commercially available. If you require a specialized connection please contact us with the details, and indicate this above. The SPHINX Cable Plant is fully software compensated to the bandwidth of the recording system instrumentation (Max. 1GHz @ input). See attachment #6 for a more detailed description of the cable plant. 2) The machine diagnostic's cables are terminated with male type N connectors. 3) "Type" refers to non-coaxial cables only.

3.2 Instrumentation

Table of the current instruments supported by the SPHINX Data Acquisition Software[1].

Instrument	Bandwidth	Sample Rate	Channels Available[2]	Comments
Tektronix, SCD1000	1.0 GHz	200 GS/s (max)	5	Ver. Res. 11 bits, 1024 record length.
Tektronix, TDS684A	1.0 GHz	5 GS/s (max)	12	Ver. Res. 8 bits 15K record length.
Tektronix, TDS544A	500 MHz	2 GS/s (max)	8	Ver. Res. 8-15 bits[3], 50K record length.
Tektronix, TDS 420	150 MHz	100 MS/s (max)	4	Ver. Res. 8-15 bits[3], 60K record length.

Please Indicate the digitizer and maximum number of channels your test / experiment will require.

☐ SCD 1000 Number of Channels: _____
☐ TDS684A Number of Channels: _____
☐ TDS 544A Number of Channels: _____
☐ TDS 420 Number of Channels: _____

Please indicate if you have any special triggering requirements, e.g., timing synchronization, delays, etc. Please explain under section 5.

☐ Experiment will have special timing/triggering requirements.

☐ **Experimenter will supply instrumentation and data acquisition software.**

4. Diagnostics

Please indicate the number and type of diagnostics your test / experiment will require. If these diagnostics are to be supplied by SNL give detailed requirements below.

Diagnostic	Quantity[4]	Customer Supplied	SNL Supplied
CaF_2 TLD	_____	☐	☐
Calorimetry	_____	☐	☐
PIN Diode	_____	☐	☐
PCD[5]	_____	☐	☐

Note: 1) For a more detailed explanation of the SPHINX DAS capabilities along with examples and explanations regarding setup please see attachment #5 and the DAS manual. 2) Additional channels may be obtained from other SNL facilities if not being used, however, the SPHINX DAS is limited to controlling approx. 10-15 instruments over the GPIB, if additional channels are required the SATURN DAS may be employed. 3) Vertical Resolution is normally 8 bits, it can be improved for lower frequency signals in Hi-Res mode. 4) The total quantity of Ca F_2 TLDs required for the test may be difficult to determine, since it will depend upon total number of shots, exposure area of experiment, and TLD placement, among other requirements. However, a "guesstimate" would be appreciated. 5) PCD = Photo Conductive Detector. Detectors with a usable range of up to 1E12 are currently available.

5. Additional Requirements

Please use the following section to provide any additional information or details that you feel are essential in preparation for, or conduct of, your test / experiment. (e.g. , Your test specimen must be under vacuum, you require an inert backfill gas, your test involves radioactive materials, your test involves explosives, you require additional instrumentation - signal/function generators, power supplies, - you require a special data recording format, etc.)

ATTACHMENTS

The following is a list of attachments for your reference, and to aid you in completing the Data Package.

Attachment #1: SPHINX Operating Parameters

Attachment #2: SPHINX Dose-Rate Map

Attachment #3: SPHINX "Front End" Dimensions (Cell, Front & Side Views)

Attachment #4: Safety Approval Form **(Please complete and Return This Form)**

Attachment #5: SPHINX DAS Capabilities summary.

Attachment #6 SPHINX Cable Plant

Attachment #7 Sample Header Set-Up Form

Attachment #8 Additional Capabilities (E-Beam Mode)

Attachment #9 SPHINX Post-Test User Questionnaire

Attachment #1
SPHINX OPERATING PARAMETERS

A reusable bremsstrahlung diode (converter) is available for SPHINX. This reusable converter has an anode-cathode gap which has been optimized for a flat radiation pulse using a 350-μm, tantalum converter and a 4.8-mm aluminum debris/beam stop. This mode is primarily used for studying the response of electronics to pulsed high-energy - and -ray environments. The electron beam can also be propagated through a 1-m low pressure-gas drift chamber. This mode is used to study the thermostructural response of materials to pulsed radiation (see attachment 8).

Shot Rate: 12 shots per hour (Max).

Charging Voltage: 45 kV nominal (49 kV maximum).

Converter Design: 356 μm Tantalum, followed by 4.83 mm Aluminum.

Bremsstrahlung Endpoint Energy: ~2.5 MeV (see attachment's 2A & 2B).

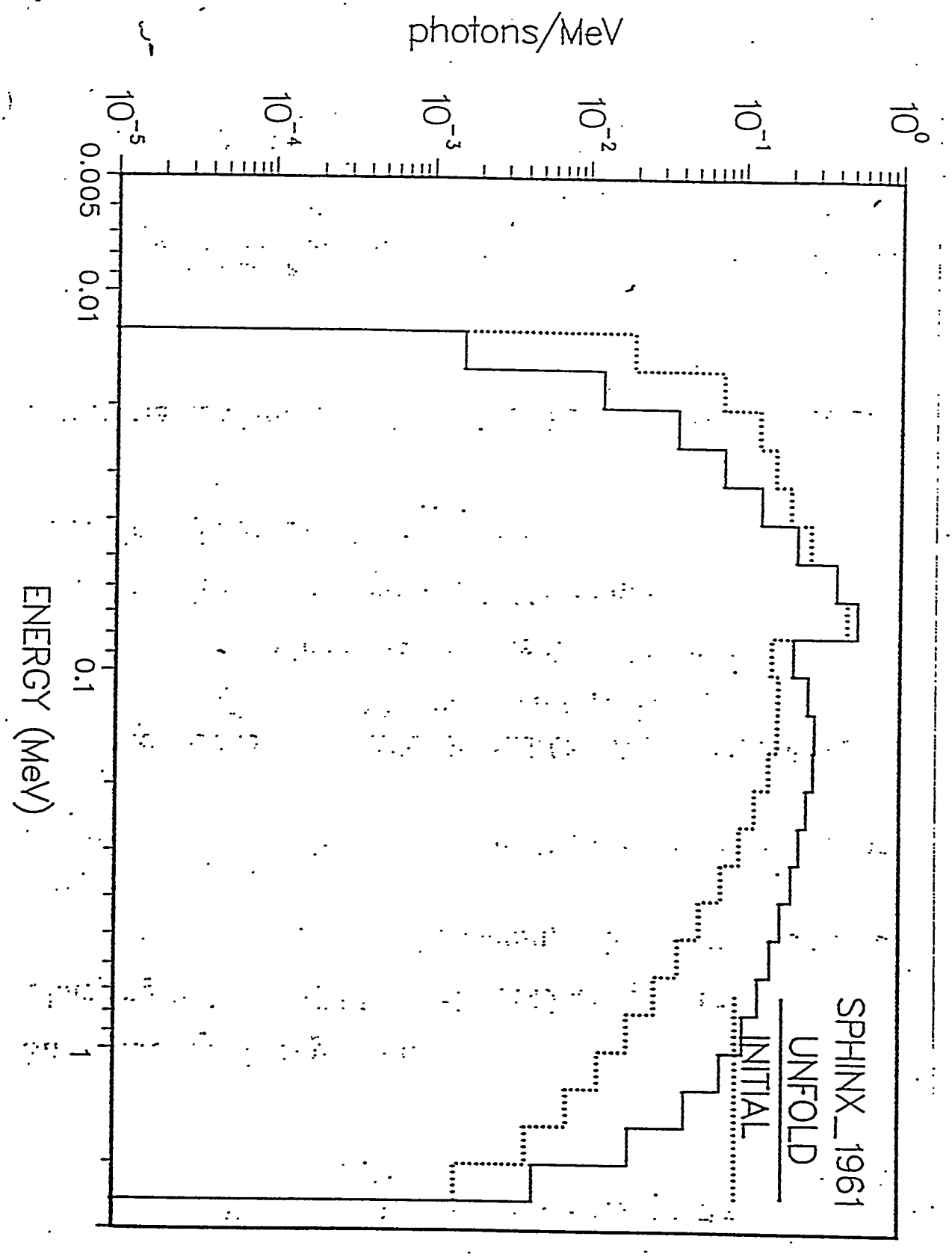
Maximum Dose Rate: 4.0×10^{11} rad(CaF_2)/s on face plate; 1.5×10^{11} rad(CaF_2)/s 1.3 cm from faceplate.

Pulse Width: Continuously variable from 3.5 ns to 10 ns.

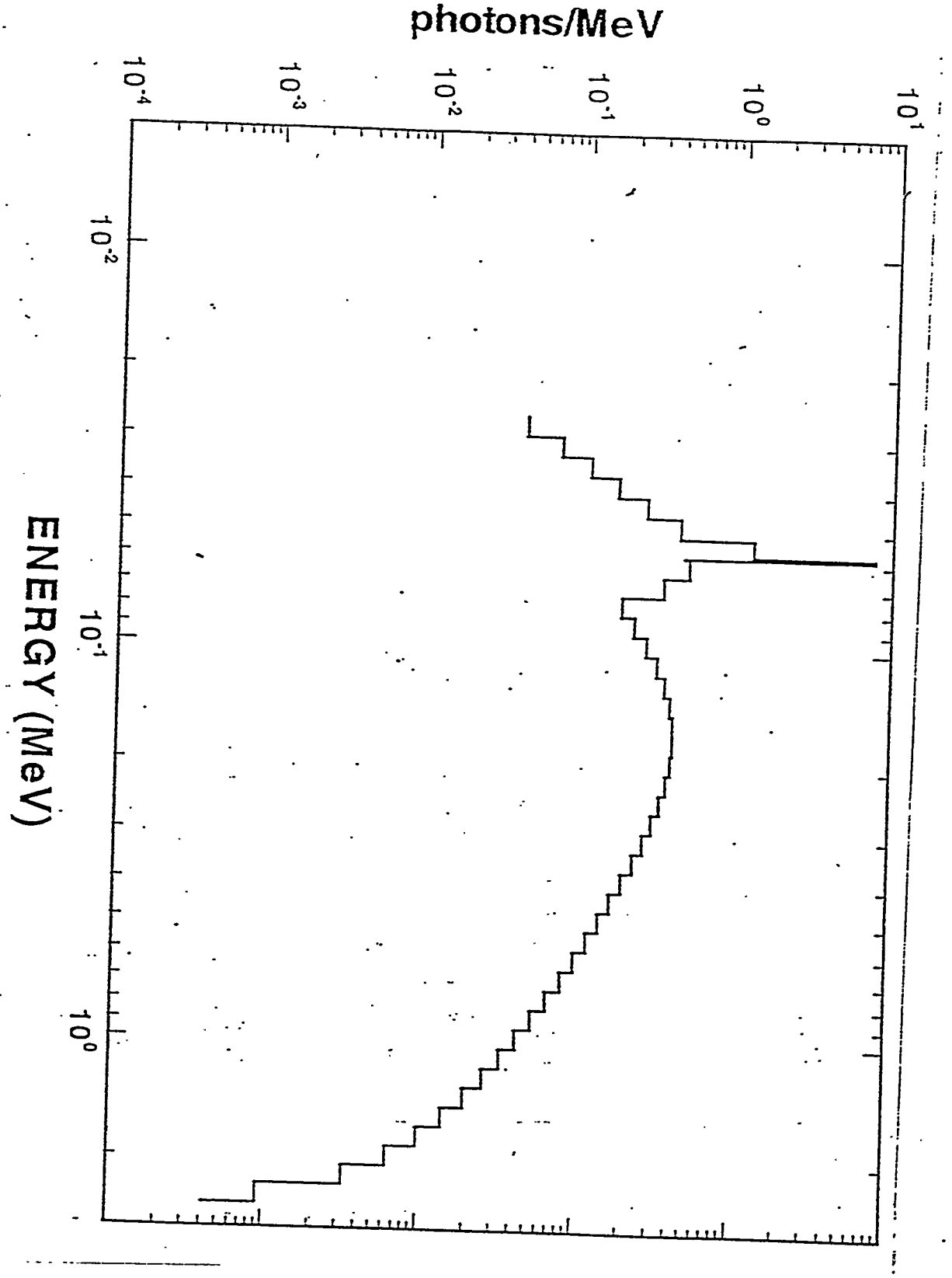
Rise Time: 2 ns (independent of pulse width).

Radiation Field: (See attached Dose-Rate map, Attachment #2C)

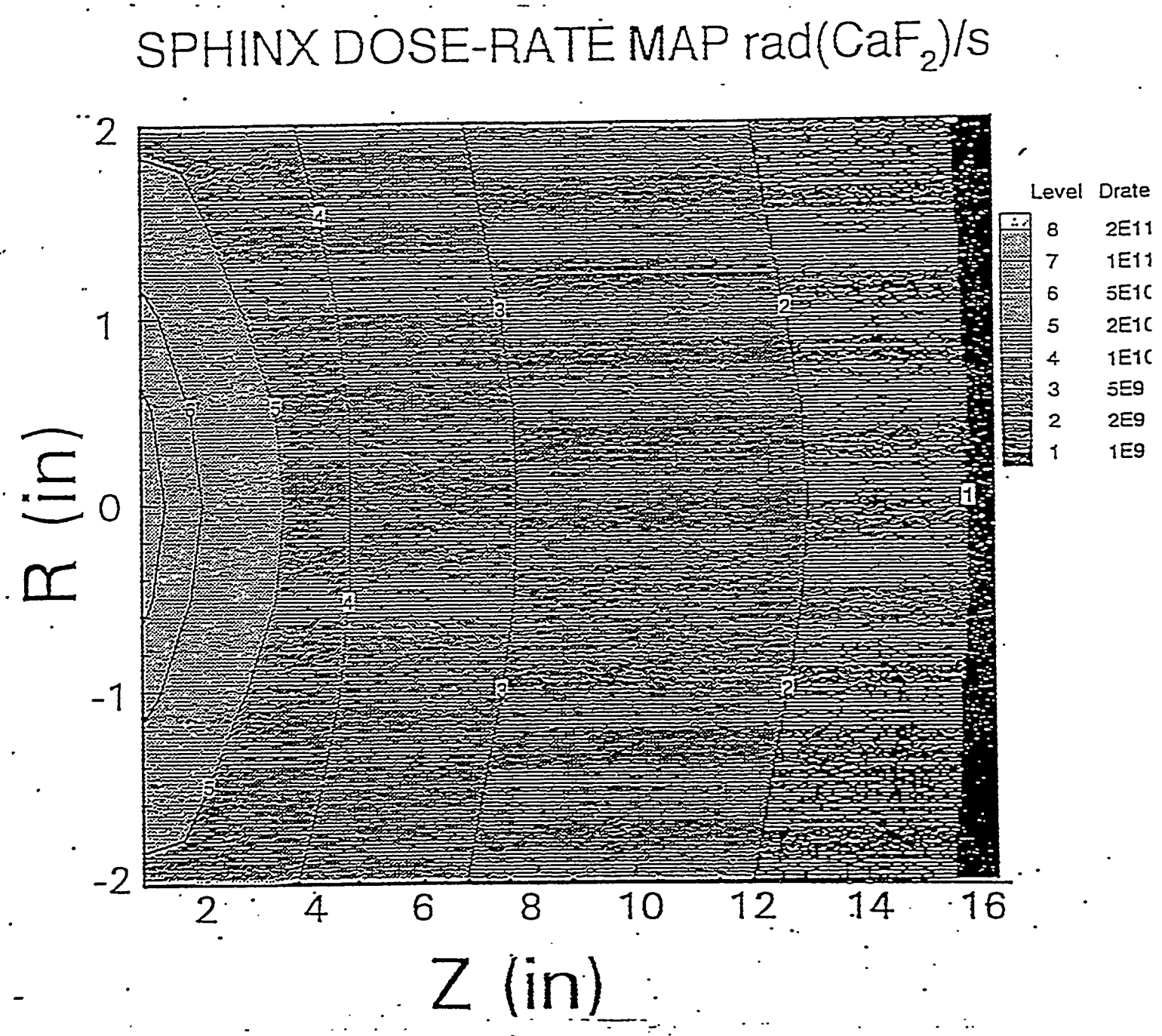
Attachment #2A
Differential Absorption Spectrometer Unfolded Photon Spectrum



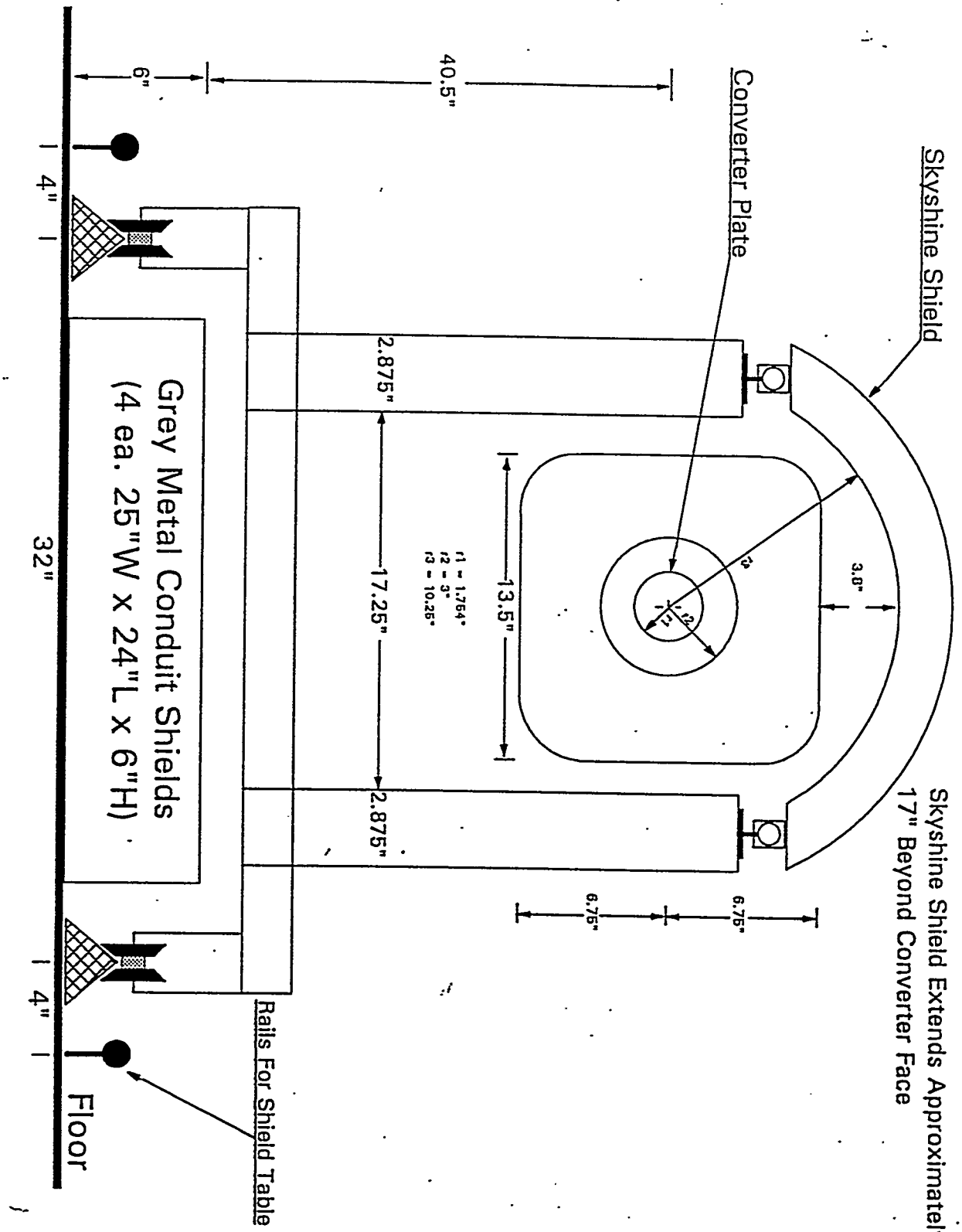
Attachment #2B
SPHINX Calculated Differential Photon Spectrum

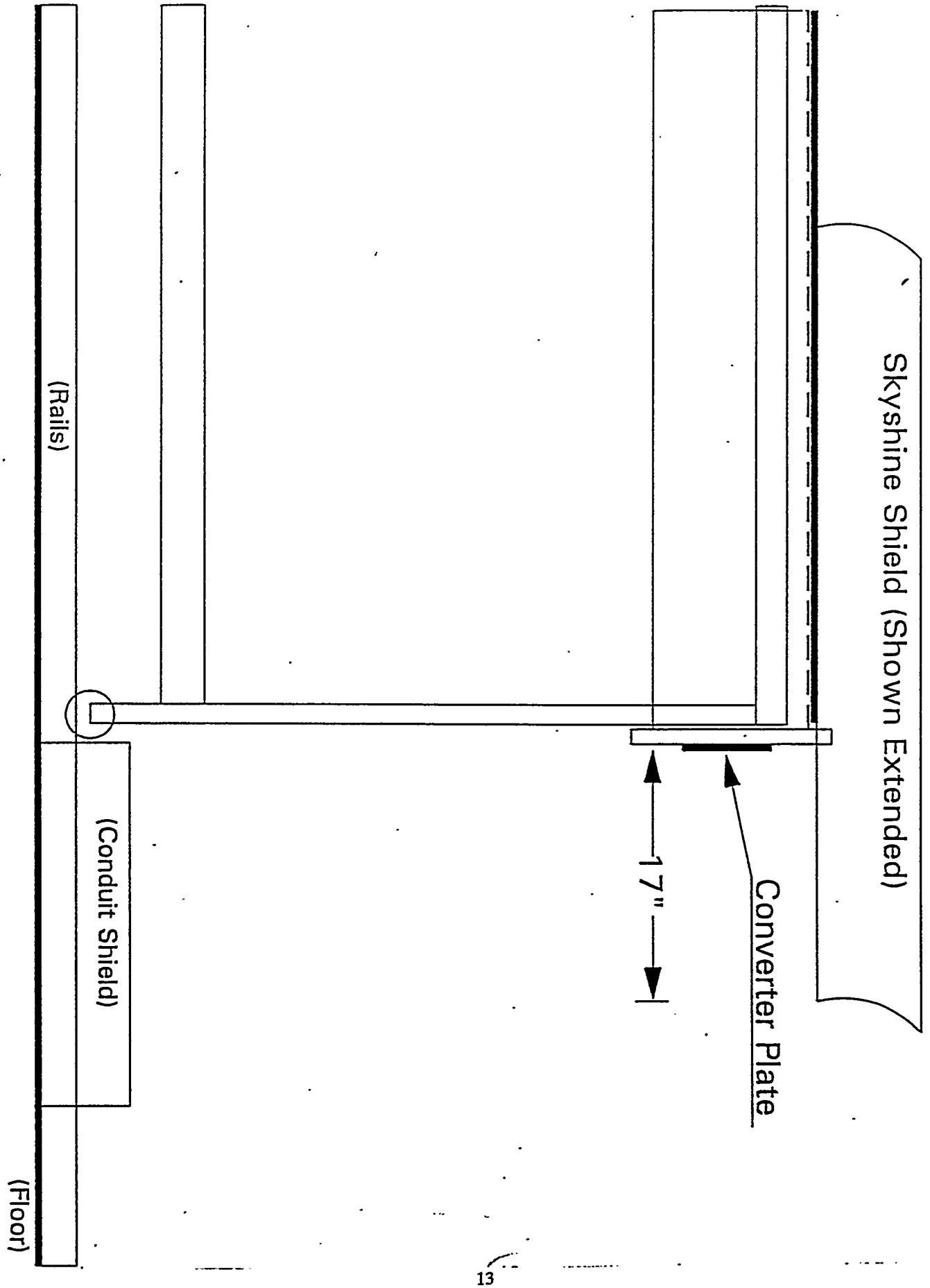


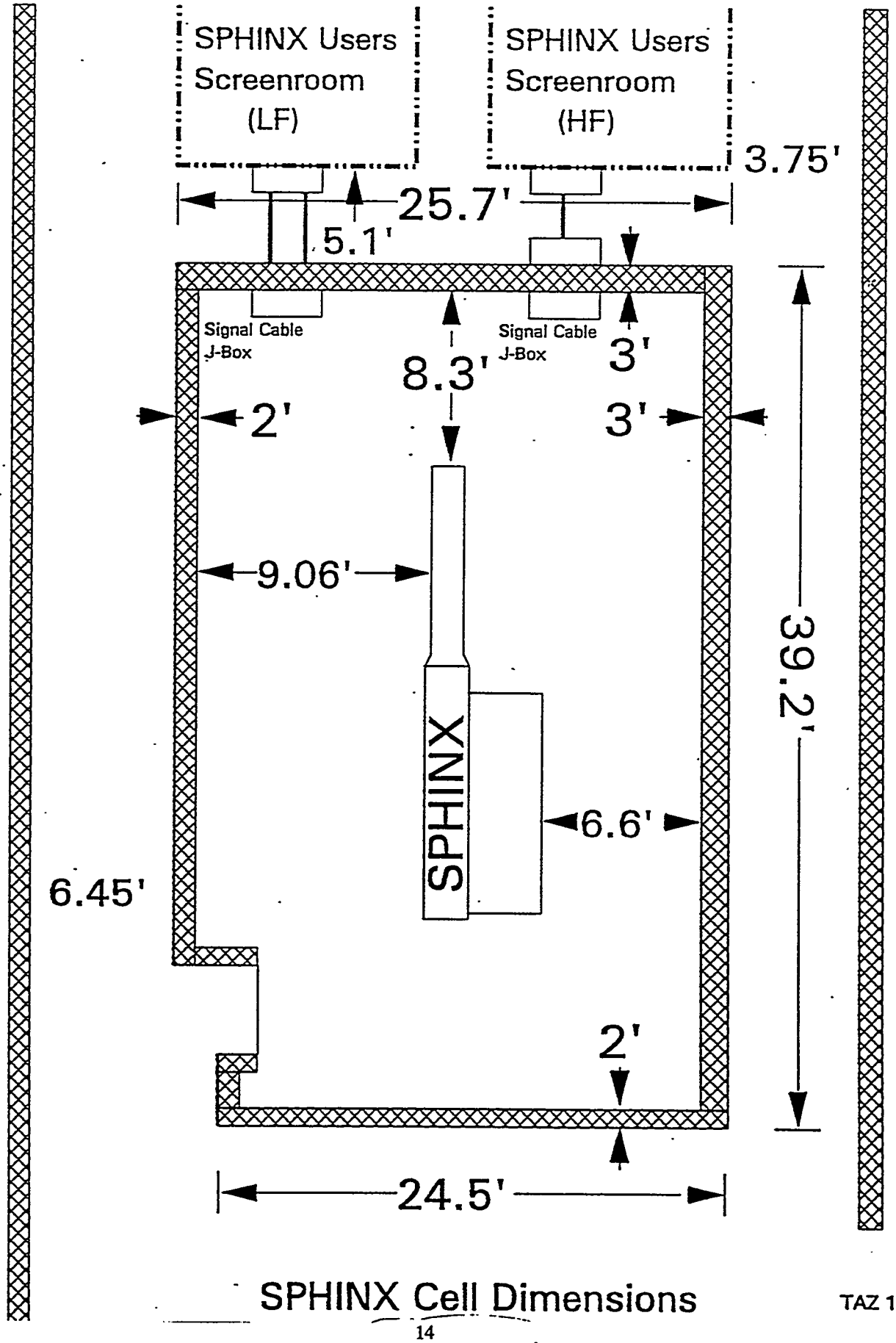
Attachment #2C
SPHINX Dose-Rate Map



Attachment #3
SPHINX "Front End" Dimensions




SPHINX "Front End" (Side View)
Skyshine Shield (Shown Extended)
Converter Plate
17"
(Rails)
(Conduit Shield)
(Floor)



SPHINX Cell Dimensions

TAZ 10/95

Attachment #4
Safety Approval Form

SAFETY APPROVAL FORM

For Experiments to be Conducted at 1200/9300 Facilities

I. Facility _____ Facility Organization _____

A. Scheduled Test Dates: __/__/__ thru __/__/__

B. Actual Test Dates and Shot Numbers:

_____ thru _____ Shot Numbers _____ thru _____

II. User Identification

A. Sandia

1. Name:_____
2. Organization:_____
3. Telephone:_____ Fax:_____

B. Non-Sandia

1. Name:_____
2. Company:_____
3. Address:_____

_____

4. Telephone:_____ Fax:_____

III. Experiment/Test Identification

A. Title:_____

B. Program:_____

C. Security Classification(DOE/DoD):_____

IV. Environmental, Safety, or Health Hazards

Describe hazards such as radioactive materials, explosives, toxic materials, energy storage devices, etc. List hazardous materials or gases which may be generated or released into the environment. Attach sufficient detail to permit a meaningful safety review.

_____

_____

_____

_____

_____

_____

V. Administrative Approvals

Attachment #5
SPHINX DAS Capabilities Summary

SPHINX DAS Capabilities[1]

1) Can control Tektronix; SCD1000, TDS684A, TDS544A, TDS420, and 7912 digitizers.
2) Can perform cable compensation, integration, Time of Flight (TOF)compensation and de-droop functions.
3) Stores data to a file using only the "Y" data values, instead of "XY" data pairs to save memory.
4) Plots data to the monitor screen and hardcopy device (if desired) 4 plots at a time. The plots provide YMax, YMin, Trise, Tfall, and FWHM pulse width with autoscaling for ease of readability.
5) Reads a "Header File" for instrument set-up information.
6) Provides for re-arming the DAS recording instrumentation in case of a pre-trigger, without having to manually reset the units.
7) Allows for editing of test "Title" to annotate changes in test set-up whether editing instrument settings or not.
8) Automatically increments the shot number to provide for quick turn-around between shots when no header changes are required.
9) Updated to GUI (Graphical User Interface)format in 1995.

Example of Header File For SPHINX DAS

						VERTICAL				HORIZONTAL			TRIGGER						Cables
DIGITIZER	HUN#	NAME	GF	ATTEN	LABEL	CH	VSPAN	VOFF	VCOUP	TSPAN (us)	HPOS	RECL	SRC	LEV	POL	TCOUP	SIGPROC	HILOZ	TOF(ns)
TDS684A	1	490	1	9.995	V	1	8.0	0.10	DC	0.100	0.1	500	EXT	0.20	POS	AC	INT	LO	C52.922
TDS684A	1	527	1	9.986	V	2	8.0	0.10	DC	0.100	0.1	500	EXT	0.20	POS	AC	INT	LO	C52.918
TDS684A	3	VV	67.2	19.986	kV	1	4.0	0.70	DC	0.100	0.1	500	CH1	-0.5	NEG	AC	DD1E-7	LO	C72.472
TDS684A	3	IV	6.12	1.0	kA	2	8.0	0.75	DC	0.100	0.1	500	CH1	-0.5	NEG	AC	DD4.58e-7	LO	C71.568
TDS684A	3	VL	55.5	19.818	kV	3	8.0	0.75	DC	0.100	0.1	500	CH1	-0.5	NEG	AC	DD1e-7	LO	C72.336
TDS684A	3	IL	5.88	1.989	kA	4	8.0	0.75	DC	0.100	0.1	500	CH1	-0.5	NEG	AC	DD4.38e-7	LO	C71.692
SCD1000	7	VO2	73.0	19.958	kV	A	5.0	0.80	DC	0.050	0	500	INT	-0.5	NEG	DC	NONE	NONE	NONE
SCD1000	8	VP2	335	2.0	kV	A	10.0	0.75	DC	0.200	0	1024	INT	-0.5	NEG	DC	NONE	NONE	NONE
*SCD1000[2]	9	NOISE	1	1	V	A	0.5	0.50	DC	0.100	0	1024	EXT	0.20	POS	DC	NONE	NONE	NONE

Under the "NAME" column the following are machine diagnostics[3]:

VV: is the voltage measured at the Vacuum interface.
IV: is the current measured at the Vacuum interface.
VL: is the voltage measured at the diode or "load".
IL: is the current measured at the diode or "load".
VO2: is the voltage at the sharpening switches.
VP2: is the voltage measured at the interface of the oil section (marx generators) and the sharpening switches.

Note: 1) For more detailed information on operation of the DAS and its' capabilities see the DAS manual. 2) An asterisk preceding the digitizer name tells the software to ignore this line.
3) Additional current diagnostics (Rogowski's) are used in the E-Beam mode.

SPHINX DAS Header Explanation:

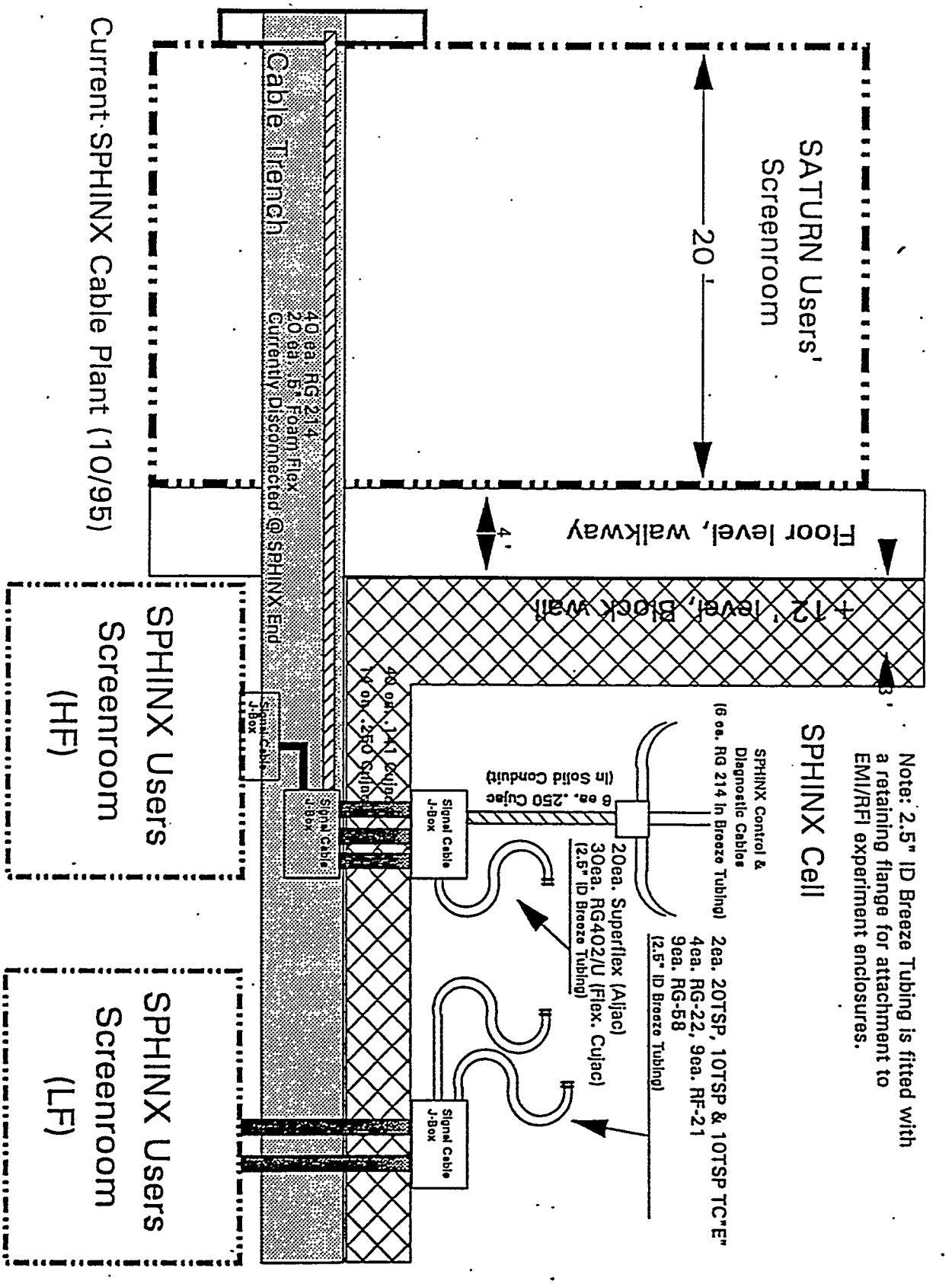
1) "DIGITIZER" is the recording device that will be utilized for data collection. Currently the SPHINX DAS software can control Tektronix SCD1000's, TDS 684's, TDS544A's, TDS420's and 7912's.
2) "HUN" is the Hardware Unit Number (GPIB address) of the recording device.
3) "NAME" is the test signal or device name being recorded.
4) "GF" is the Gauge Factor or signal scaling factor.
5) "ATTEN" is any attenuation or amplification added into the recording system.
6) "LABEL" is the recording system unit of measure for the signal type (ex. Volts(V), Amps(A).).
7) "CH" is the digitizer channel selected ("A" for SCD1000's, or 1 thru 4 for the TDS series).
8) "VSPAN" is the vertical window in volts. (.1 to 10 for SCD1000's in a 1,2,5 format, from .008 to 8.0 for the TDS series (these units use a 1,2,5 format but only display 8 vertical divisions) , the 7912's are manually set and checked by the program).
9) "VOFF" is the vertical offset from 0 to 1 (min to max) with .5 being center screen. (The 7912's must be set manually and the program will check for proper offset.)
10) "VCOUP" is the vertical coupling (AC or DC).
11) "TSPAN(us)" is the Horizontal window in microseconds (time/div. * 10 div.).
12) "HPOS" is the horizontal position from 0 to 1 (Pre-trigger or baseline data for the TDS series (0-10=0-100%), trigger delay in % of window setting for the SCD1000's (0-50=0-500%), automatic for 7912's except when "MAG" is turned on - then it must be set manually).
13) "RECL" is the record length, or number of data points (500 to 30,000[1] for the TDS series, 256, 512, or 1024 for SCD1000's, and 512 for 7912's).
14) "SRC" is the trigger source (CH1 thru 4 or EXT for the TDS series, INT or EXT for the SCD's & 7912's).
15) "LEV" is the trigger level.
16) "POL" is the trigger polarity (POS or NEG).
17) "TCOUP" is the trigger coupling (AC or DC).
18) "SIGPROC" are signal processing algorithms available for use. Select: DD for De-droop, INT for integration, or NONE.
19) "HILOZ" selects the input impedance for the TDS series (HI = 1 Megohm, LO = 50 ohms, NONE used for other units).
20) "CABLES TOF (ns)" Allows for compensation due to differences in electrical length of signal cabling (signal time alignment/referencing) C (Time of Flight (TOF) compensation without defidu), F (TOF compensation with defidu), or NONE (no operation performed).

Note: 1) The Tektronix TDS series have the following maximum record lengths; 684 - 15k points, 544 - 50k points(30k in HIRes mode), 420 - 60k points (30k in HIRes mode).

Attachment #6
SPHINX Cable Plant

Cable Type	Quantity	Length	Location	Comments
SuperFlex (0.141) (Lead-Tin Aljac)	20 ea. (14 signal, 6 spare)	Approx. 12'	SPHINX Cell (In Breeze)	Signal Cables Terminated SMA-M
RG 402/U (0.141) (Flexible Cujac)	30 ea. (10 signal, 20 spare)	Approx. 12'	SPHINX Cell (In Breeze)	Signal Cables Terminated SMA-M
RG 214	6 ea.	Approx. 10'	SPHINX Cell (In Breeze)	SPHINX Control & Diagnostic Cables Terminated in "N" -M
.250 Cujac	6 ea.	Approx. 15'	SPHINX Cell (In Conduit)	SPHINX Control & Diagnostic Cables
.141 Cujac	40 ea.	Approx. 5'	Signal Cable J-Box, (Jumper thru Test Cell Wall)	Signal Cable J-Box Jumpers
.250 Cujac	14 ea.	Approx. 5'	Signal Cable J-Box (Jumper thru Test Cell Wall)	Signal Cable J-Box Jumpers
.375" Foam Flex	30 ea.	Approx. 10'	Outside Test Cell to HF Screen Room	Signal Cables from Outer J-box to HF Screen Room(SR) Bulkhead
20 TSP Cable MP21	2 ea.	Approx. 30'	SPHINX Cell (In Conduit)	Signal Cables to LF SR Bulkhead
20 TSP Cable MP21	2 ea.	Approx. 13'	SPHINX Cell (In NEMA)	Signal Cables to LF NEMA in Test Cell
10 TSP Cable MP23	2 ea.	Approx. 30'	SPHINX Cell (In Conduit)	Signal Cables to LF SR Bulkhead
10 TSP Cable MP23	2 ea.	Approx. 13'	SPHINX Cell (In NEMA)	Signal Cables to LF NEMA in Test Cell
10 TSP Type "E" Dekoron 1824	2 ea.	Approx. 30'	SPHINX Cell (In Conduit)	Signal Cables to LF SR Bulkhead
10 TSP Type "E" Dekoron 1824	2 ea.	Approx. 13'	SPHINX Cell (In NEMA)	Signal Cables to LF NEMA in Test Cell
RG-22 Twinax.	4 ea.	Approx. 30'	SPHINX Cell (In Conduit)	Signal Cables to LF SR Bulkhead
RF-21 Twinax.	9 ea.	Approx. 30'	SPHINX Cell (In Conduit)	Signal Cables to LF SR Bulkhead
RG-58 Coax.	9 ea.	Approx. 30'	SPHINX Cell (In Conduit)	Signal Cables to LF SR Bulkhead
RG 214	40 ea.	Approx. 50'	4" Conduit in Cable Trench	Signal Cables from J-Box to SATURN Screen Room
.5" Foam Flex	20 ea.	Approx. 50'	4" Conduit in Cable Trench	Signal Cables from J-Box to SATURN Screen Room

SPHINX Cable Plant Diagram



ATTACHMENT #7
Sample Header Set-Up Form

SPHINX SHOT # _____

						VERTICAL				HORIZONTAL			TRIGGER						CABLES
DIGITIZER	HUN//	NAME	GF	ATTEN	LABEL	CH	VSPAN	VOFF	VCOUP	TSPAN (us)	HPOS	RECL	SRC	LEV	POL	TCOUP	SIGPROC	HILOZ	TOF(ns)

NOTE: It is only necessary that you complete the following columns: Digitizer, Name, Gage Factor (If other than 1), Attenuation, Label, Vertical Span, Vertical Offset, Vertical Coupling, Time Span, Horizontal Position (If Other Than 0), Record Length (If other than maximum), Signal Processing (If any is desired). If you are utilizing these forms as a "Shot Log", you may wish to generate one form per shot, however if your test does not involve numerous changes in the configuration and the header, than you may only wish to generate a new form when header changes are necessary.

Attachment #8
Additional Capabilities
SPHINX E-Beam Mode

Shot Rate: 12 shots per hour (Max - assuming no break in vacuum).

Charging Voltage: 45 kV nominal (49 kV maximum).

Design: 5-cm graphite cathode injecting through a 1-mil Titanium window (virtual anode) into a low pressure gas cell.

Electron Energy: ~1.4 MeV standard, can be raised to 3 MeV(see attachment 8A).

Maximum Dose: **Unfiltered:** 10 calories/gram (Al), up to 7 calories/cm^2 fluence (See attachment #8B). (40 kA beam current).

Filtered [1]: 12 and 27.2 calories/gram (Al), 3.0 and 6.8 calories/cm^2 fluence (all values given are post filter).

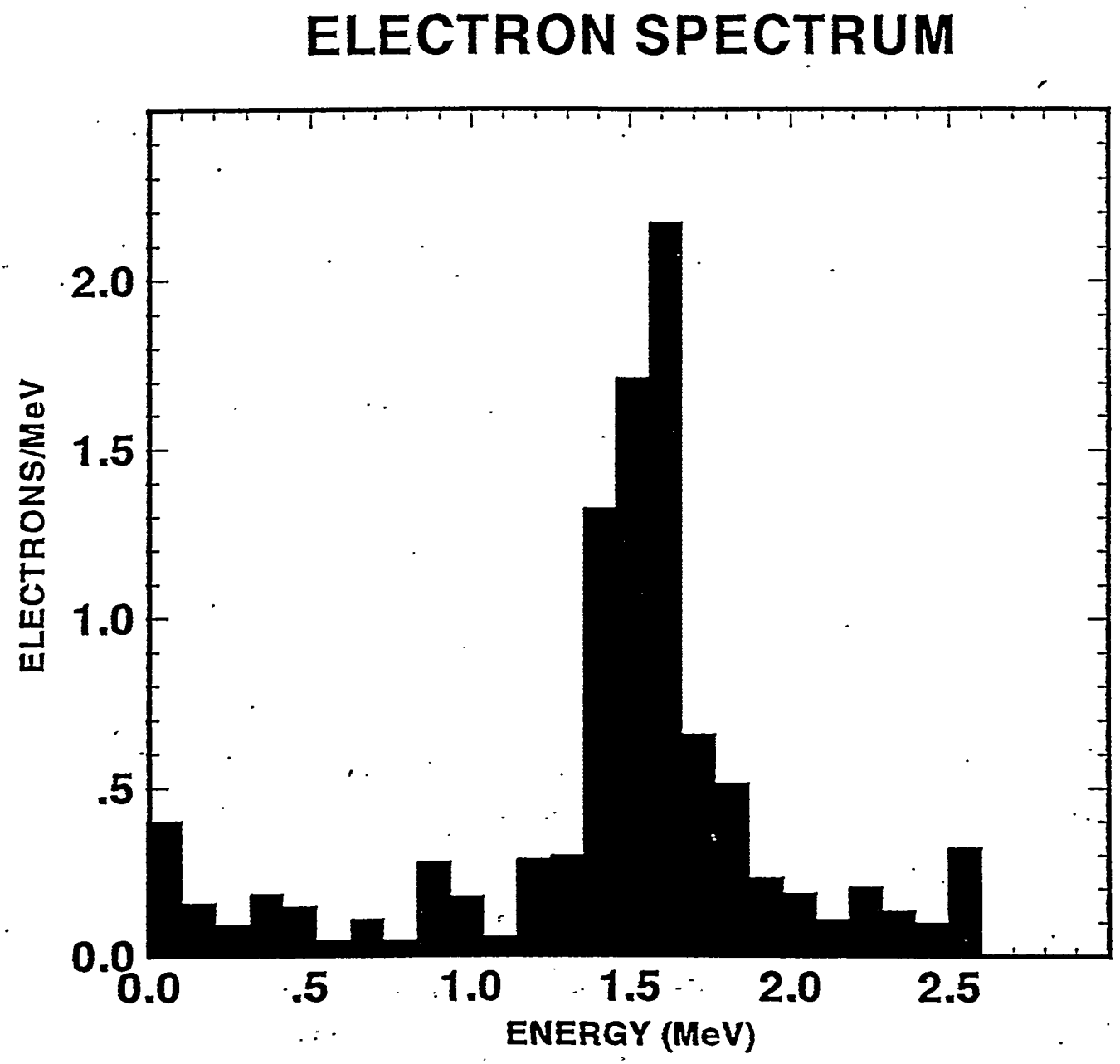
Pulse Width: 14 ns.

Rise Time: 2 ns.

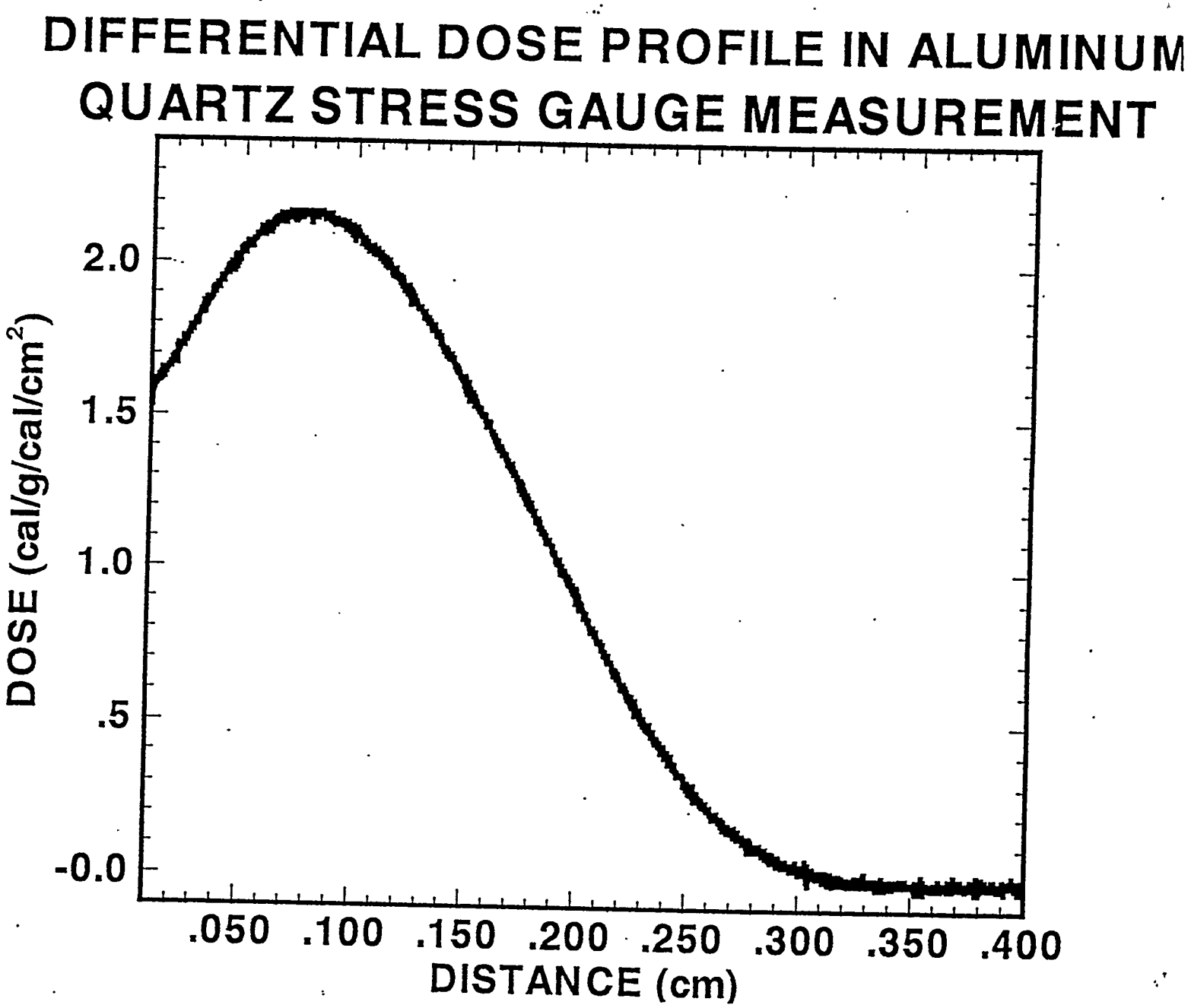
Uniformity: +/- 10% over 1" diameter circle.

[1] Filtering may be used in the E-Beam mode to simulate an x-ray dose profile. These figures were obtained using a 826μ Al filter.

Attachment #8A
SPHINX Electron Spectrum



Attachment #8B
SPHINX E-Beam Dose Profile



Attachment #9
SPHINX Post Test Questionnaire

SPHINX POST-TEST

In our continuing efforts to meet the needs of, and provide the best possible service to our customers, we would appreciate your feedback on your recent utilization of our facilities, and interaction(s) with our personnel.

SPHINX is a relatively new facility and we are in the process of defining items such as DAS capabilities, minimum customer support requirements, cable plant requirements, etc. Therefore, your inputs - comments, compliments, suggested areas for improvement - are important in helping us achieve our goal of making SPHINX a "user friendly" facility that meets or exceeds our customers expectations. (Please feel free to add additional sheets as necessary.)

Please Fax or mail the completed survey to one of the individuals listed below:

Thomas A. Zarick
Dept. 9351
Sandia National Laboratories
PO Box 5800
Albuquerque, NM 87185-1167
(505)845-7939 Fax (505)845-3471

David E. Beutler
Dept. 9341
Sandia National Laboratories
PO Box 5800
Albuquerque, NM 87185-1179
(505)845-7068 Fax (505)845-7841

Thank you for your cooperation !

1. What is your overall impression of the support you received for your SPHINX experiments?

   Poor Marginal Acceptable Very Good Excellent Not Applicable

   Comments:

2. How well did SPHINX satisfy your experimental requirements?

   Poor Marginal Acceptable Very Good Excellent Not Applicable

   Comments:

3. How would you rate the interaction and support before your arrival?

   Poor Marginal Acceptable Very Good Excellent Not Applicable

   Comments:

4. How would you rate the interaction and support on arrival and during the experimental setup?

   Poor Marginal Acceptable Very Good Excellent Not Applicable

   Comments:

5. How would you rate the interaction and support you received during the experiment(s)?

   Poor Marginal Acceptable Very Good Excellent Not Applicable

   Comments:

6. What is your overall impression of the performance of SPHINX during your experiment?

Poor Marginal Acceptable Very Good Excellent Not Applicable

Comments:

7. How would you rate the performance of the SPHINX Data Acquisition System and the DAS support you received?

Poor Marginal Acceptable Very Good Excellent Not Applicable

Comments:

8. How would you rate the performance of the SATURN Data Acquisition System and the DAS support you received?

Poor Marginal Acceptable Very Good Excellent Not Applicable

Comments:

9. How would you rate the interaction and support you received during experiment shutdown and your departure?

Poor Marginal Acceptable Very Good Excellent Not Applicable

Comments:

10. How would you rate the interaction and support you received after departing SPHINX?

Poor Marginal Acceptable Very Good Excellent Not Applicable

Comments:

11. How would you rate your interaction with the Badge Office and security guards before, during, and after your SPHINX runs?

Poor Marginal Acceptable Very Good Excellent Not Applicable

Comments:

12. How would you rate Sandia's handling of your shipping and receiving needs?

Poor Marginal Acceptable Very Good Excellent Not Applicable

Comments:

13. How would you rate the process for transferring funds to Sandia in order to perform your experiment?

Poor Marginal Acceptable Very Good Excellent Not Applicable

Comments:

14. How would you rate the scheduling of time on SPHINX?

Poor Marginal Acceptable Very Good Excellent Not Applicable

Comments:

15. How well could SPHINX satisfy your future needs?

Poor Marginal Acceptable Very Good Excellent Not Applicable

Comments:

16. How would you compare SPHINX with other test facilities that you have used?

Poor Marginal Acceptable Very Good Excellent Not Applicable

Comments:

17. What funding process was utilized to pay for your machine time?

18. What capabilities, not presently available, would be useful to you?

19. What other comments would you like to provide to support our quality improvement efforts?

Optional:

Name: _____

Org.: _____

Phone: _____

Experiment Name: _____

Date of test(s): From: _____ **To:** _____

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