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BEVATRON VACUUM MEASURED PUMP DOWNS

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Engineering & Technical Services Division

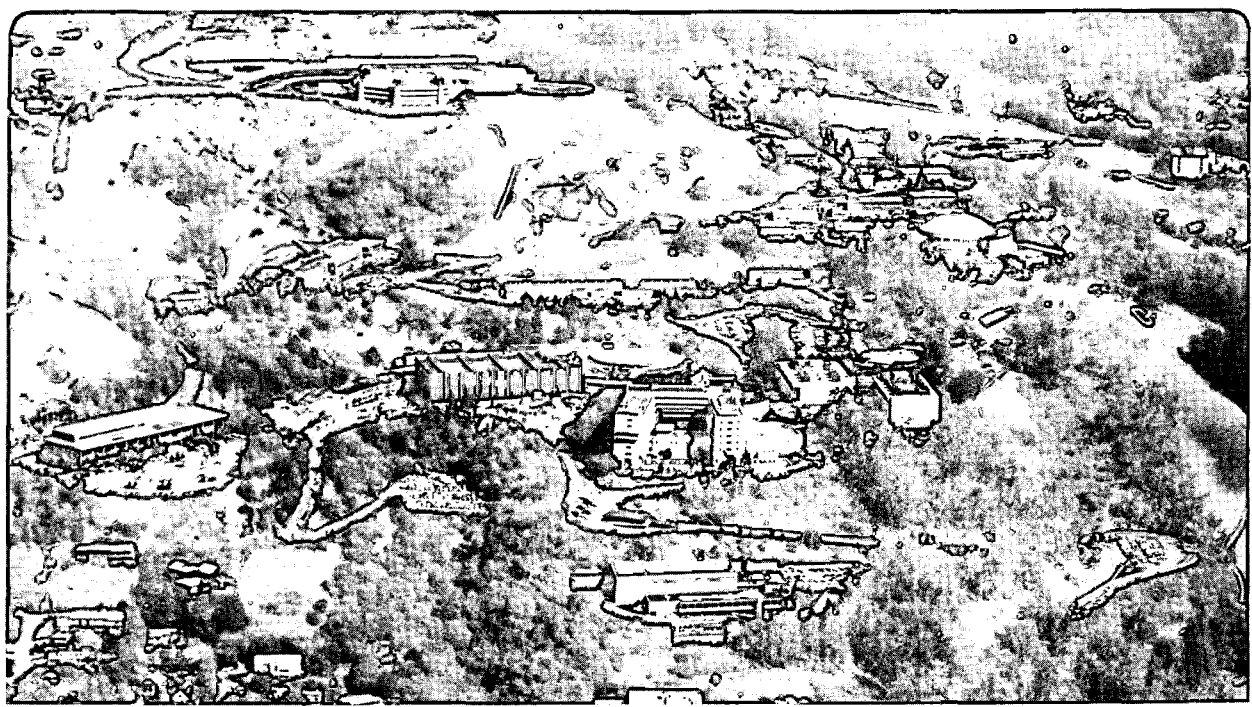
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ENGINEERING NOTE

BW2007

M4549

7 Pages

AUTHOR

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LOCATION

DATE

Rod Byrns

MECHANICAL ENGINEERING

BERK.

10-11-72

PROGRAM - PROJECT - JOB

BEVATRON VACUUM PUMPING SYSTEM

CRYOGENIC PUMPING

TITLE

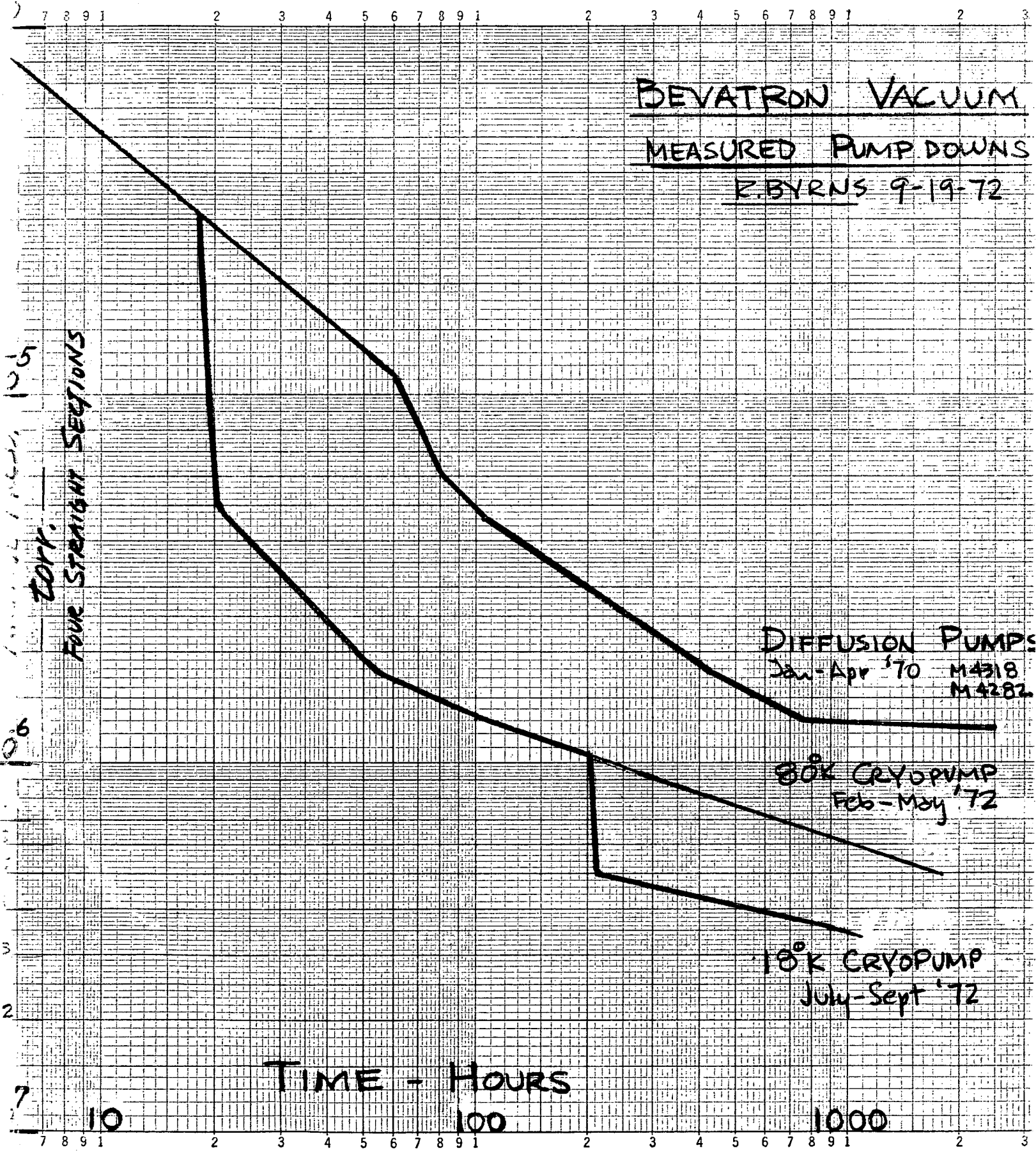
PRESSURE HISTORY

BEVATRON VACUUM

MEASURED PUMP DOWNS

R. BYRNS 9-19-72

-4



PRESSURE VS. POSITION BEVATRON VACUUM SYSTEM

————— MEASURED
----- ESTIMATED

PRESSURE - TORR.

10^{-6}

10^{-7}

9
8
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10

DIFFUSION PUMPS ONLY
3 MONTHS PUMPING.

80°K & 18°K CRYOPUMPS
~ 1 MONTH OF PUMPING

(From
M 4282
p. 14.
3-3-70)

(SEPT 72)

WEST Q III NORTH Q IV EAST Q I SOUTH Q II WEST

CIRCUMFERENCE
OF BEVATRON VACUUM ENVELOPE

← 75 FT → 22 FT ←

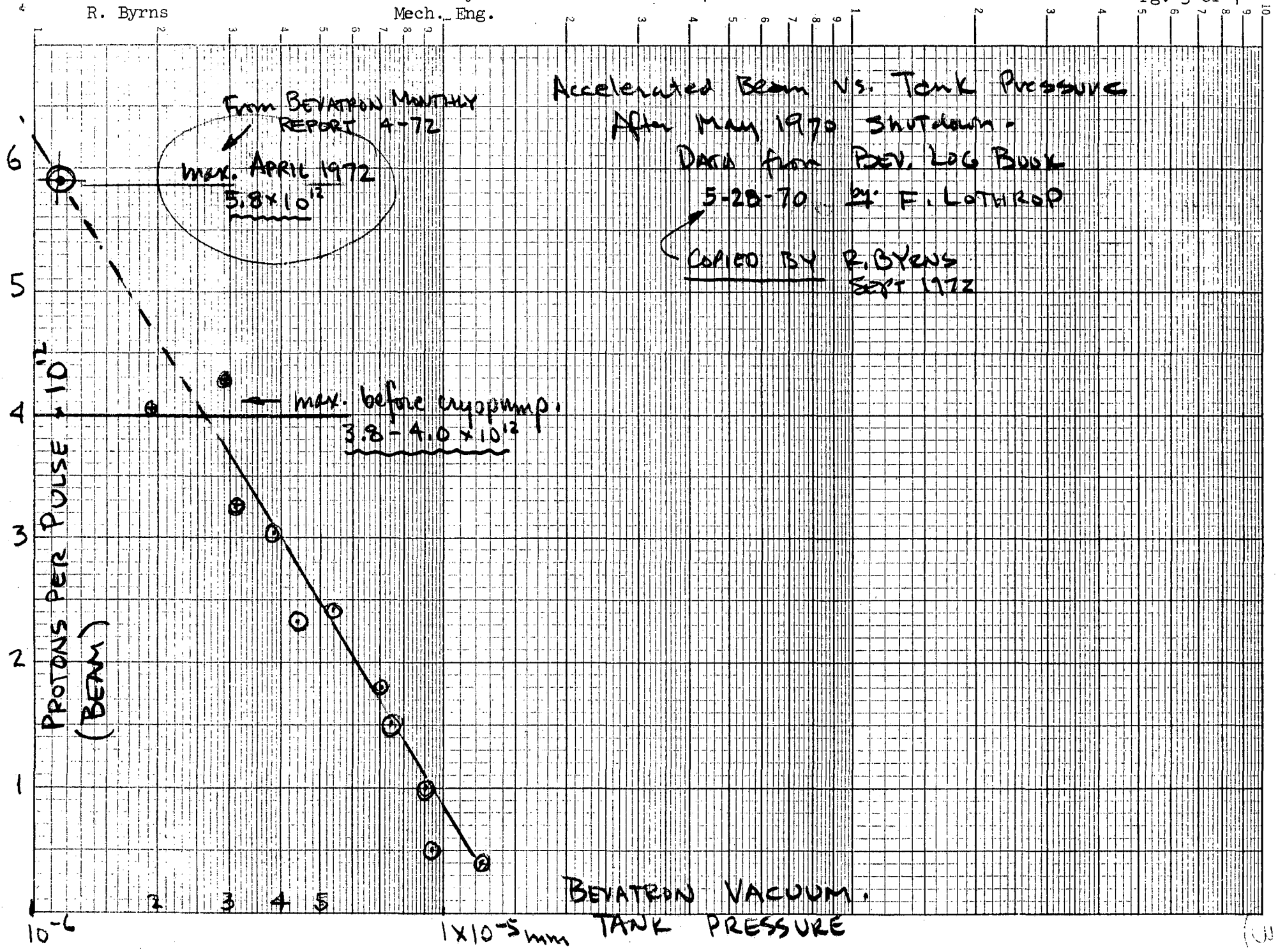
RB. Sept 19, 72

SEMI-LOGARITHMIC
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KEUFFEL & ESSER CO.
MADE IN U.S.A.
3 CYCLES X 180 DIVISIONS

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Berkeley
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Mechanical Engineering

BERK.

6 AUG. 72

PROGRAM - PROJECT - JOB

BEV. VAC. SYSTEM - CRYO PUMP

PRESSURE HISTORY

TITLE

(P in 10^{-6} mm.)

DATE - TIME	EAST	WEST	NORTH	SOUTH	QUAD I	QUAD II		
28 FEB 11 ⁰⁰	15.5	1.6	5.6	3.8	12.0	3.5	AFTER ~10 DAYS FEB. SHV LN CRYO PUMP (UP TO AIR)	
29 Feb 09 ⁰⁰	2.1	1.4	2.3	1.5	2.9	3.1		
1 MAR 08 ⁰⁰	8.0	2.2	8.0	2.0	6.0	4.8	LHe in QUAD II & III - 11 ⁰⁰	
13 ³⁰	1.9	1.2	1.9	1.1	3.0	2.5		
6 MAR							WARM-UP LN	
8 MAR 16 ¹⁵	1.9	0.7	1.5	0.9				
13 MAR 08 ³⁰	1.5	0.62	1.0	0.78	2.1	1.5	LHe in QII - 9 ³⁰ LHe in QIII - 10 ¹⁵	
16 ⁰⁰	1.15	0.56	0.82	0.68	1.3	1.9		
13 APRIL	1.0	0.32	0.72	0.60			AFTER ~3 MOS. OF LN-ONLY - 5, 2 UP TO AIRS.	
24 APRIL 08 ⁰⁰	1.50	0.35	0.45	0.65	1.6	0.80	NOTE: P(air) $\leq 0.5 \times 10^{-6}$ WITH ONLY LN.	
22 MAY 10 ⁴⁵	0.66	0.30	0.37	0.50	1.1	0.66		
19 JUNE THRU 1 JULY - SHUT DOWN FOR QII MAGNET INSTALL.								
5 JULY	PRESS ~ 1×10^{-5} mm							
6 JULY	" ~ 2×10^{-6}							
10 JULY	PRESS WAS ~ $1.8 - 3.5 \times 10^{-6}$							WARM-UP LN
11 JULY	2.20	1.80	1.4	1.6				
14 JULY 10 ³⁰	2.6	2.2	1.6	1.6	3.5	3.3		
17 JULY 08 ⁰⁰	2.0	1.2	1.3	1.0	2.2	1.7	WELDING ON EAST, T.T. DIFF. PUMP. BOTTOM (N.G.)	
20 JULY 10 ⁰⁰	1.3	0.8	0.65	0.9	2.0	1.3	DUXSEAL ADDED TO WEST PROBE #3 & FOREVAC LINE	
21 JULY 11 ³⁰	1.5	0.75	0.65	0.85				
24 JULY							WARM-UP LN	
25 " 12 ⁰⁷	1.4	1.0	0.70	0.90				
26 " 11 ³⁰	1.4	0.8	0.70	0.90				
27 JULY 16 ³⁰	2.2	1.0	0.90	1.0			E. HOYER SET POWER ON QII MAGNET @ 10 ⁰⁰ AM IN START PULSES.	
28 JULY 12 ⁰⁰	1.4	0.9	0.90	0.75				

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BERK

6 AUG - 72

PROGRAM - PROJECT - JOB

BEV. VAC. SYSTEM. - CRYOPUMP

Cryogenic Pumping

TITLE

Pressure History

$P \times 10^{-6}$ mm

DATE	Time	EAST	WEST	NORTH	SOUTH	QUAD I	QUAD II	
1 AUG	0800	1.6	0.85	0.60	0.90			LN ONLY!
2 AUG	0800	1.9	0.70	0.50	0.90			EAST HE REFER START. 094 CLOSE BYPASS @ 1315
	1200	1.5	0.82	0.50	0.80			
	1300	1.0	0.50	0.32	0.45			
	1430	0.85	0.65	0.32	0.45			
	1630	0.85	0.60	0.32	0.45			
3 AUG	0800	1.0	0.70	0.35	0.50			EAST HE REFER CONTINUE WEST " " START 0940 WITH LN.
	1230	0.72	0.51	0.35	0.40	0.80	0.55	BEV. MAGNET OFF ~ 1000
	1355	0.72	0.52	0.26	0.40	0.85	0.55	CLOSE HE REF. BYPASS @ 1300 EAST MOUSE REPAIR
	1430	0.72	0.52	*0.26	0.40	0.80	0.55	*CLOSED NORTH D.P. HEAD GATES, Press → 1.0×10^{-6}
	1720	0.80	0.47	0.28	0.40			BEV. MAGNET ON ~ 1500
4 AUG	0920	0.80	0.44	0.27	0.43			RICHTER SEZ CAN CLOSE EAST HEAD GATES - PRESSURE HOLDS ALL OTHERS - NO HOLD!
	1600	0.80	0.46	0.28	0.42			
4 AUG	SWING	0.80	0.46	0.38	0.42			
5 AUG	OWL	1.0	0.35	0.28	0.35			NOTE: PRESS. AFTER LN + HE + MI LEAKS
	DAY	1.0	0.68	0.40	0.56			
5 AUG	0600							PRESSURE BURSTS EAST MI OFF START WARM-UP TRACK!
6 AUG	0600	UP TO AIR →						TO FIX MI SEALS & ROLLERS
"	1800	ON VAC. PUMPS						
7 AUG	0300	~ $3-5 \times 10^{-6}$ AFTER				went ON LN @		$P \approx 3 \times 10^{-5}$ mm
8 AUG	1420	2.2	1.85	1.40	1.60	3.50	2.60	$\frac{7}{4}$ 1.75
9 AUG	1320	2.0	1.45	1.20	1.60			
10 ✓	1608	1.65	1.25	1.08	1.35			
11 ✓	1505	1.60	1.30	1.02	1.20			

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Oct. 11, 1972

PROGRAM - PROJECT - JOB

BEVATRON VACUUM PUMPING SYSTEM

VACUUM PRESS. (10^{-6} TORR)

TITLE	DATE	Time	EAST	WEST	NORTH	SOUTH	QUAD I	QUAD II	
	8-14		LN	WARMUP	-	OF	CRYO	PANELS	
	8-15	16 ³⁰	1.8	1.1	1.1	1.2			
	8-16	08 ⁰⁰	1.7	1.0	1.1	1.3			START HE REFRIG ON BEV VAC.
		16 ³⁰	0.9	0.6	0.45	0.50			← HE REFRIG FULLY OPEN TO BEV 430
	8-18	16 ³⁰	1.0	0.45	.45	.47			BOTH REFRIG ON BEV
	8-21	16 ³⁰	1.1	0.55	0.48	0.55			
	8-24	16 ³⁰	0.8	0.4	0.45	0.45			
	8-25	12 ⁰⁰	0.6	0.4	0.46	0.44	0.83	0.50	BEV SHUT DOWN
	8-28	-	0.70	0.40	0.50	0.40	0.80	0.50	↓ FOR HEAVY ION SOURCE Δ
	8-30	16 ¹⁵	0.50	.45	.35	0.40			PRESSURE UP IN AM. → 2×10^{-6} - GOLD MAGNET
	8/31	16 ⁰⁰	0.60	0.40	0.35	0.40			
	9-1	~0900	0.60	0.50	0.35	0.50			} HEAVY-ION RUN
	9-5	~ "	0.60	0.50	0.40	0.70			
	"	12 ³⁰	0.50	0.55	0.70	0.85			
	9-7	12 ⁰⁰	0.60	0.50	0.95	0.35			SOUTH GOT UP TO 1.0 CREW SEZ A BAD D.P. NOW ONLY 2 PUMPS ON SOUTH
FRI.	9-8	~0900	0.50	0.40	0.30	0.35			← READ @ MAGNET OFF
		~12 ⁰⁰	0.60	0.60	0.30	0.60			(DIFF. PUMPS E-4, W-3, N-2, S-2)
MON.	9-11	OWL	0.50	0.43	0.30	0.37			All meters recalib MONDAY MAINTENANCE
		~11 ⁰⁰	1.10	0.50	0.50	1.30	1.8	0.8	EAST HE REFRIG OFF BEV ~0900 MAGNET OFF TIL 1600
TUES.	9-12	10 ⁰⁰	0.90	0.45	0.40	0.85			EAST PRESSURE GOT UP TO 3.0 EAST HE REFRIG STILL OFF.
WED.	9-13	11 ⁰⁰	0.80	0.45	0.35	0.80			" " " "
	9-14	09 ⁰⁰	0.80	0.50	0.35	0.70			EAST REFR ON BEV ~1630 INCREASED BEAM (HILL) FACTOR 4
FRI.	9-15	12 ⁰⁰	0.50	0.42	0.22	0.30			WORKING ON MOUSE MAGNET ON
MON.	9-18	13 ³⁰	0.50	0.46	0.22	0.37			BEV ON HEAVY IONS DIFF PUMPS - E-4, W3, N2, S2
WED.	9-20	0000	0.50	0.45	0.20	0.30			$P_{AV} \approx 0.36$
		1600	0.50	1.70*	0.22	0.42			* 2-TRAVEL TARGET INTO WEST AIR LOCK ~15 ³⁰

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9-21-72

PROGRAM - PROJECT - JOB

BEVATRON VACUUM PUMPING SYSTEM

CRYOGENIC PUMPING

TITLE

PRESSURE HISTORY

DATE	TIME	EAST	WEST	NORTH	SOUTH	QUAD I	QUAD II		
9-21	1600	0.50	0.31	0.22	0.32			$P_{avg} = 0.34$	HEAVY ION - NEON MEDICAL - EYE FLASH
9-22	1500	0.50	0.34	0.26	0.30			$P_{avg} = 0.35$	He tune " " "
9-25	0930	0.80	0.30	0.26	0.38	0.85	0.36		SOME weekend problems with WEST REFER
	1000	START	WARM-UP						FOR UP TO AIR -
									MAINTENANCE & GRIND MOUSE RAILS
									THEN - BACK TO PROTONS FOR PHYSICS
									1 OCT 72

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