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7 Feb, 2003

Predicted Efficiencies for 40 MeV d

I. ~~Beam~~ Injection Emittance

for $W = 0.01$ GeV $\quad cp = 0.138$ GeV/n

$\beta = 0.1445 \quad \beta\gamma = 0.146$

Given Booster

$$A = 90\ \pi \text{ mm-mrad}$$

then

$$\epsilon_N^{99\%} = 13\ \pi \text{ mm-mrad.}$$

II. 40 MeV d emittance

$cp = 0.1978$ GeV/n

$\beta = 0.2023 \quad \beta\gamma = 0.2065$

then $\epsilon^{99\%} = 63\ \pi$ mm-mrad

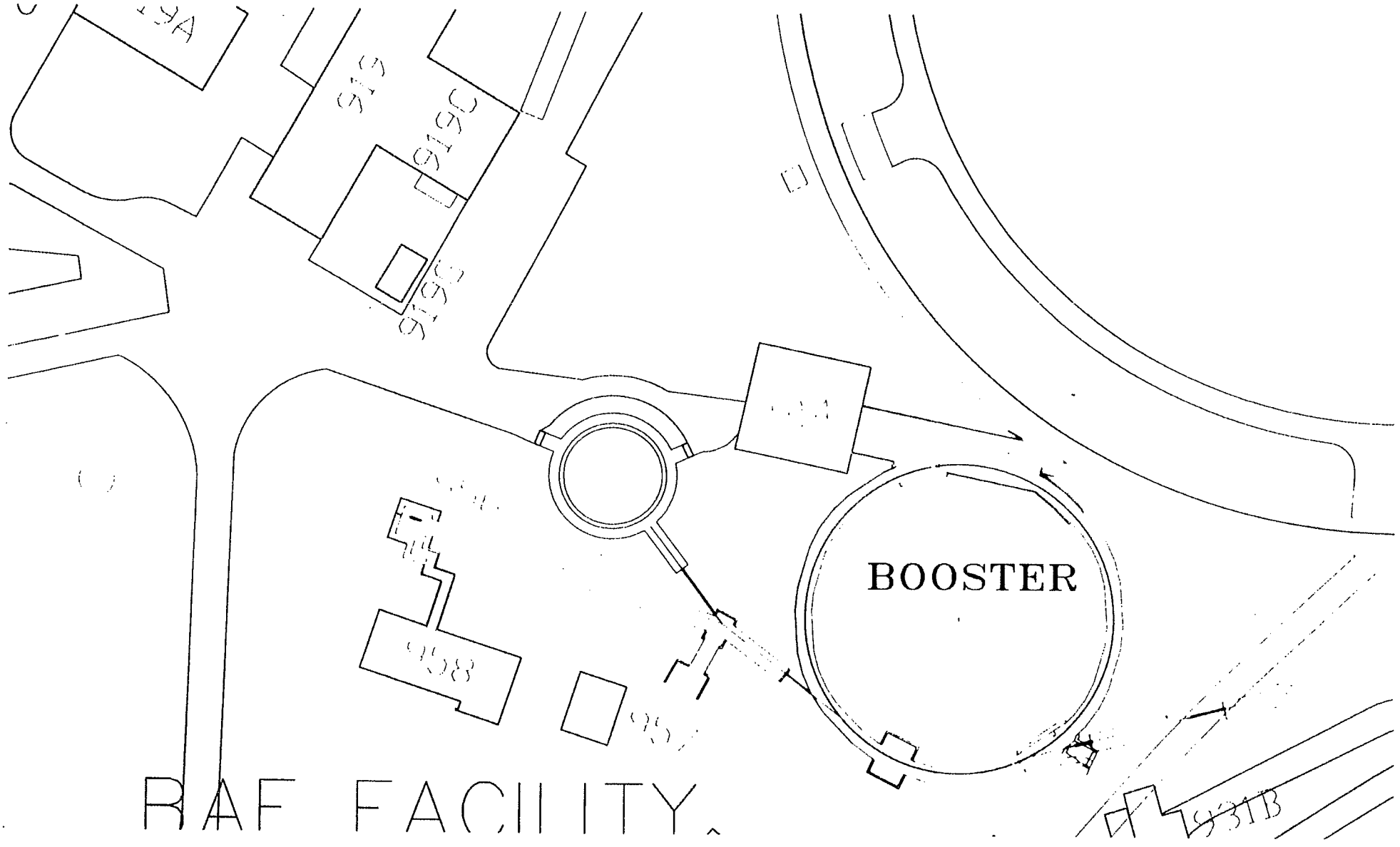
III. Fraction Transmitted = F

$$\epsilon^{99\%} = 9.21\ \pi\ \sigma^2/\beta$$

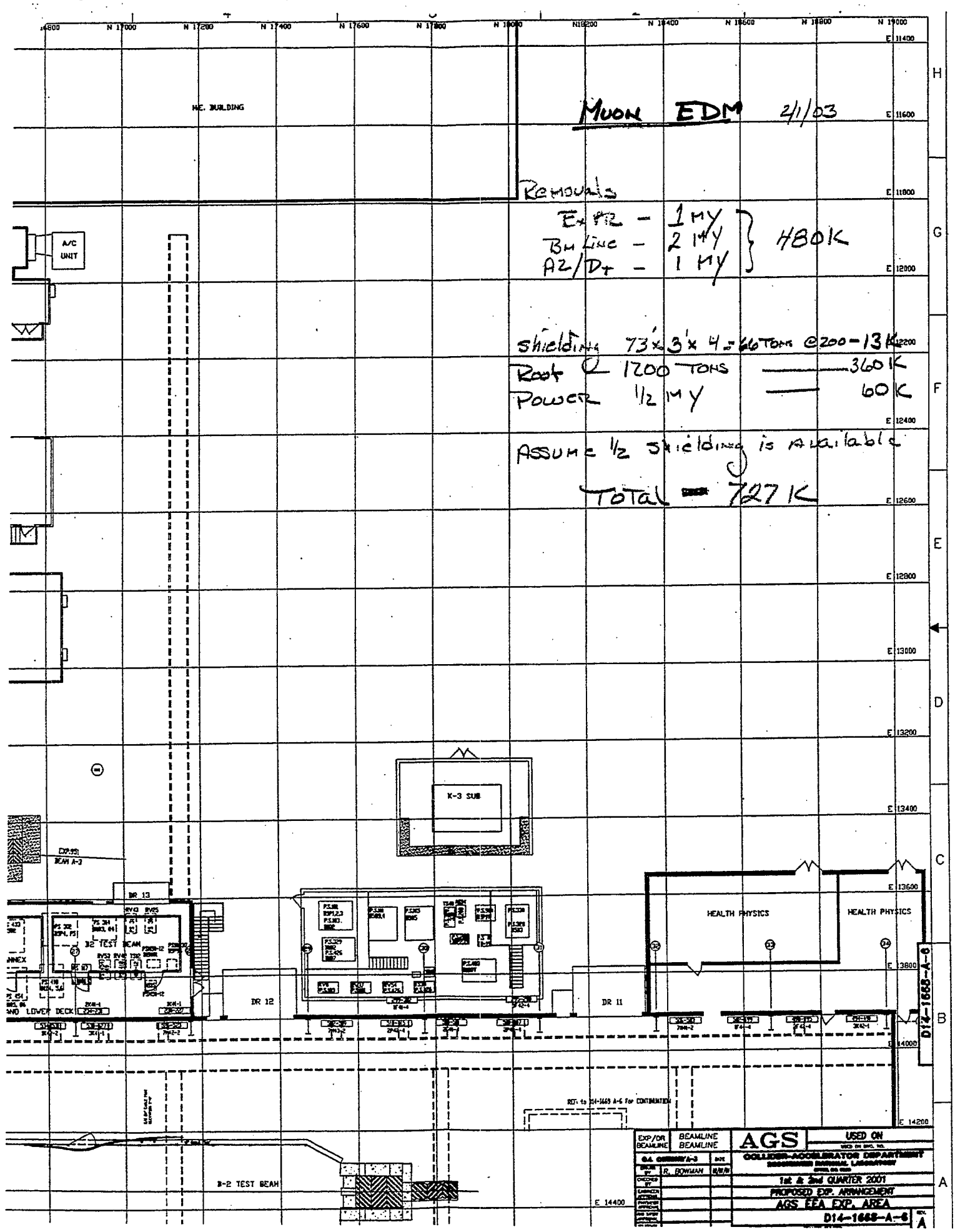
$$A = (\text{aperture}/2)^2/\beta$$

$$\therefore\ F = 1 - e^{-4.61 \cdot A/\epsilon^{99\%}}$$

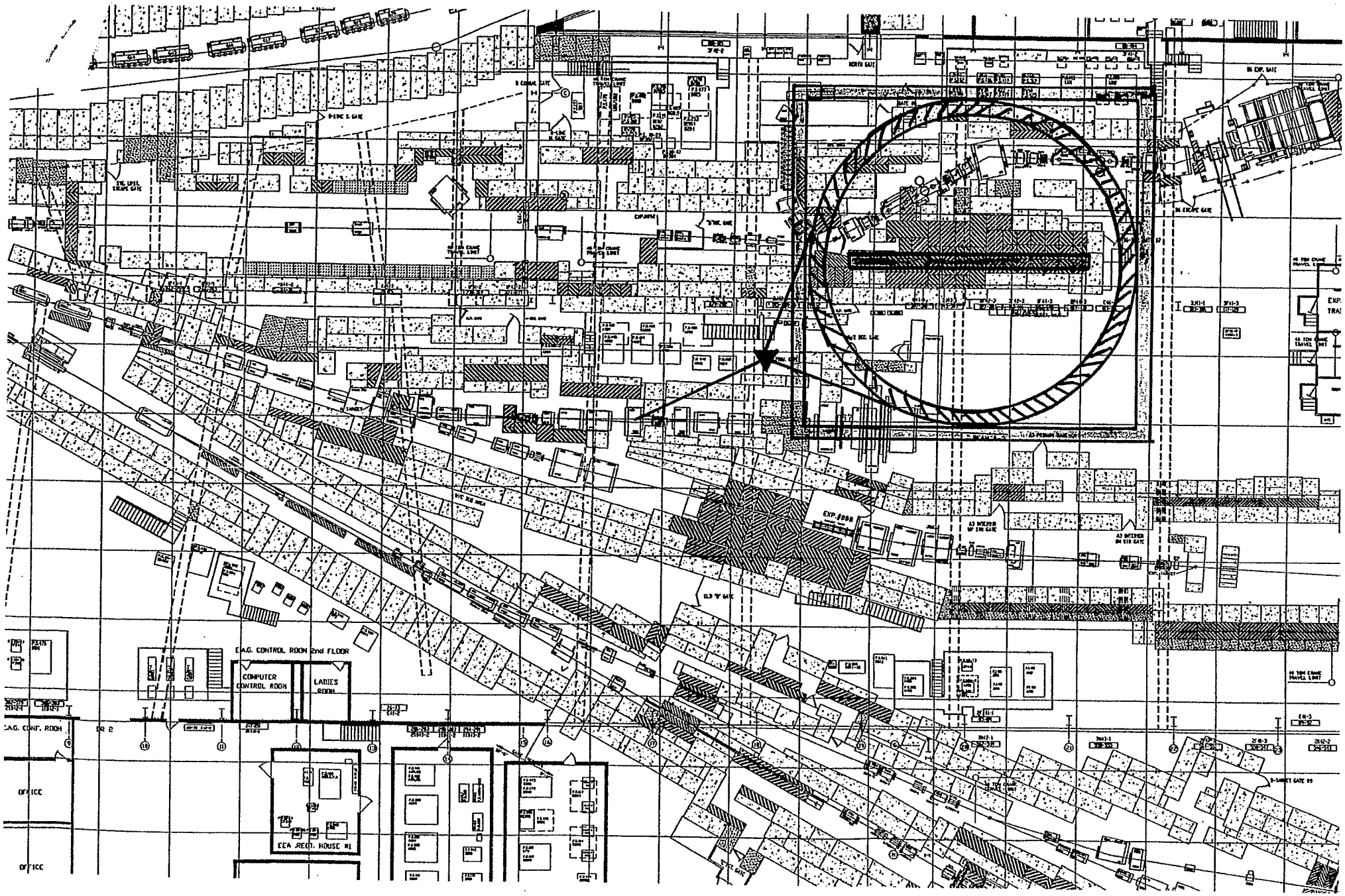
Device	Vert. Aper.	Horiz. Aper.	$\beta_{H,max}$	$\beta_{V,max}$	A limiting	F
Booster D6	25.4	55.8	12	10	16.1	69 %
Booster F6	27	71	12	10	18.2	74 %
AGS L20	50	75	20	20	31	90 %
AGS F10	26	60	20	20	8.45	46 %
SWAP AD23	16	51	25	20	12.8	61
AD4	18	58	25	20	16.7	71
AD5	17.5	58	32	22	13.9	64
AD6	17.5	58	40	25	12.25	59
AD7	17.5	58	50	28	10.9	55
AD8	17.5	58	70	34	9.0	48
AD9	17.8	58	80	40	7.9	44



RAF FACILITY

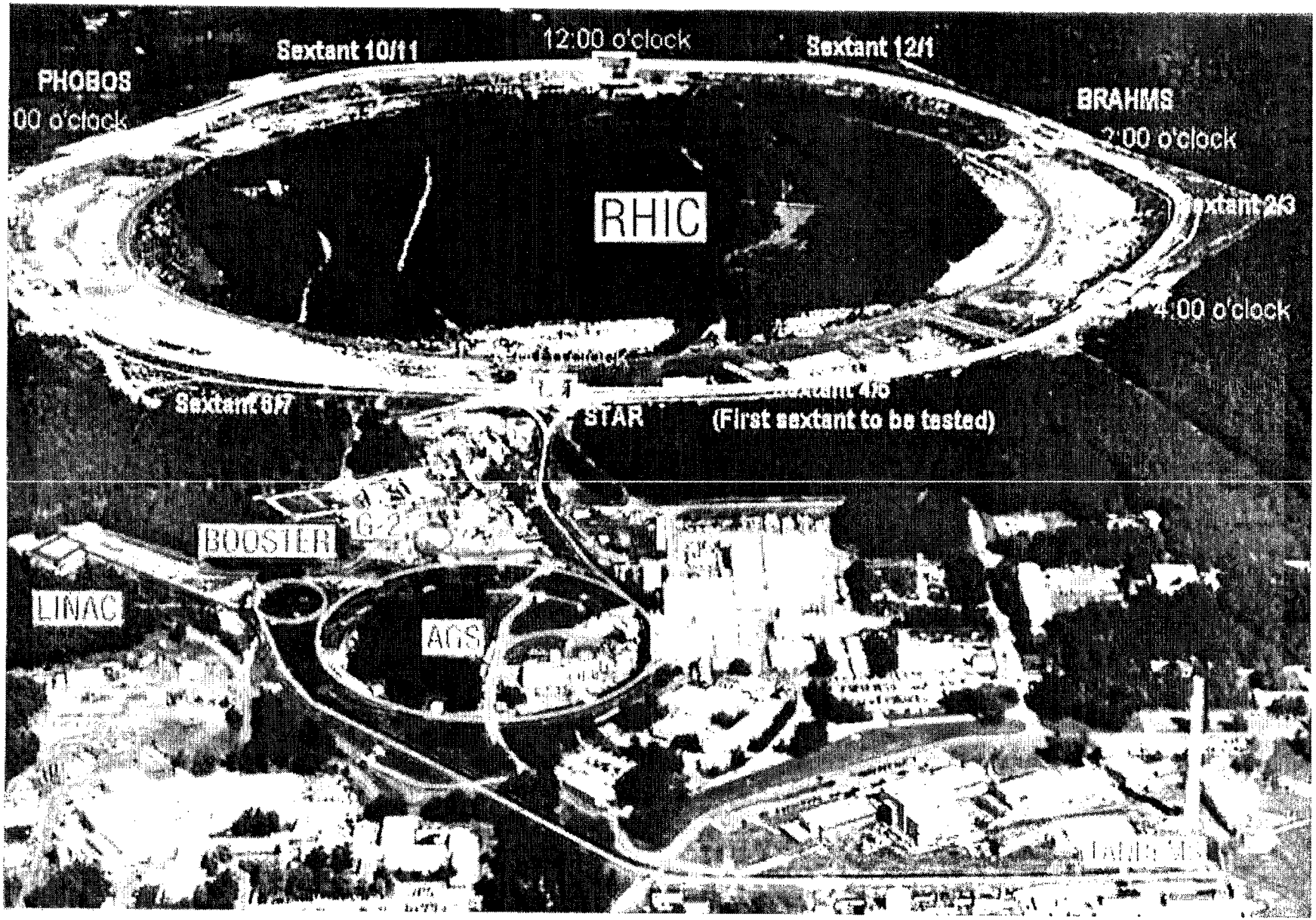


MUON EDM 2/1/03
Removals
Ex PR - 1 MY
Bm Line - 2 MY
A2/Dt - 1 MY
480K
shielding 73'x3'x4 = 66 Tons @200 - 13K
Roof @ 1200 Tons — 360K
Power 1/2 MY — 60K
Assume 1/2 shielding is Available
Total = 727K
H.E. BUILDING
A/C UNIT
K-3 SUB
HEALTH PHYSICS
HEALTH PHYSICS
DR 13
DR 12
DR 11
B-2 TEST BEAM
EXP/DR BEAMLINE
BEAMLINE BEAMLINE
AGS
USED ON
COLLIDER-ACCELERATOR DEPARTMENT
1st & 2nd QUARTER 2001
PROPOSED EXP. ARRANGEMENT
AGS EEA EXP. AREA
D14-1668-A-6
A



E.A.G. CONTROL ROOM 2nd FLOOR
COMPUTER CONTROL ROOM
LADIES ROOM
E.A.G. CONF. ROOM
DR 2
OFFICE
OFFICE
EEA RECT. HOUSE #1

RHIC
ATR

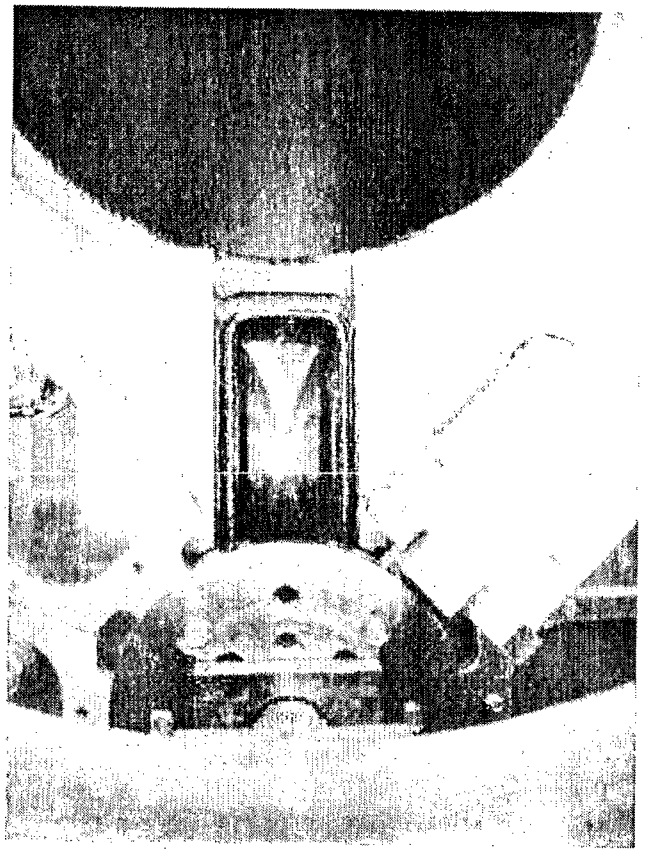
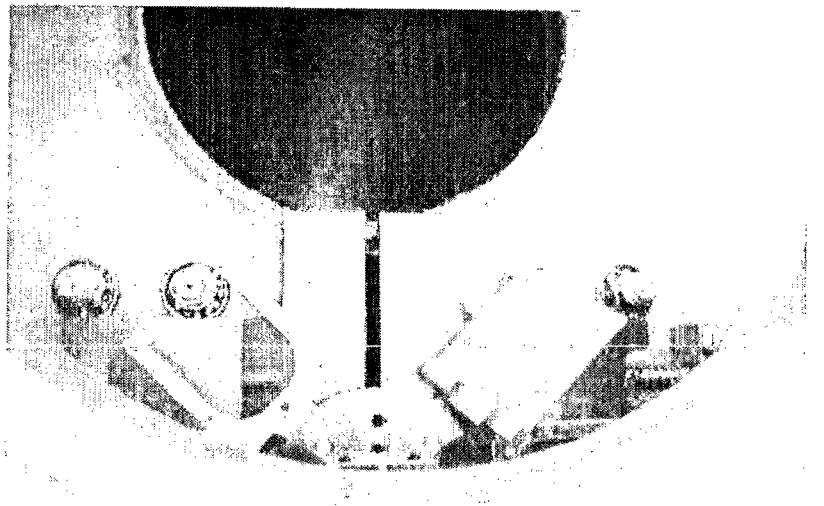

Sextant 10/11
12:00 o'clock
Sextant 12/1
PHOBOS
00 o'clock
BRAHMS
2:00 o'clock
RHIC
4:00 o'clock
Sextant 6/7
STAR
(First sextant to be tested)
BOOSTER
LINAC
AGS

Booster Operation

RF harmonic	f_{RF}(inj) MHz	f_{RF}(Ext.) MHz
2	0.416	0.60
4	0.832	1.20
8	1.664	2.4
12	2.496	3.6

freq. = 208 kHz → 300 kHz

higher h = more bunches, but shorter

15 nsec → 100 nsec

Booster cycle time ?