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## Investigation of A-line Transport Losses

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Date 10/27/77 Time 1800-2000 Experimenters J.W. GlennSubject Investigation of A Line Transport LossesOBSERVATIONS AND CONCLUSION

- 1) Swept beam vertically with CPO33 and AP109. Though not at an optimum for A line, the loss at AD5-6 and the A transmission are near minimum and maximum for the typical settings of CPO33 and AP109 (Figs. 1,2).
- 2) Increased A line intensity from a typical ~ 9% (of CE010) to ~ 15%. After a quick optimization of beam to B&C the best delivery [  $(A+B+C)/C10$  ] was 68% (vs. 77% for 9% on A). Thus it appears 1.7 protons are required to deliver 1 proton to A target.
- 3) The beam was swept at the entrance to AD1 with CD014. The delivery to B&C was ignored. The transmission increased by ~ 30% while the losses on AD1 dropped ~ 30%. The losses on AD5-6 went up by a factor of ~ 3 (Fig. 3).
- 4) Beam was steered with combinations of AD1T, AD1-8 and AD242. Increasing AD1T to its limit helped slightly but increased the losses at AD5-6 (Figs. 4,5,6).

Conclusion: A major part of the loss of beam directed toward A target occurs due to horizontal losses in AD1 and possibly AD2-8.

Recommendations:

- 1) Vertical positioning should be cleaned up though this is not critical.
- 2) The optics of CQ1, 2 & 3 should be checked for the possibility of decreasing the focusing of CQ3. This quad could bend the beam into AD1's septum.
- 3) More loss monitors are needed in the A line with a flag box at the end of AD8. The C057 SWIC should be operational to check the 1.7:1 ratio.
- 4) The possibility of running AD019 at higher current should be examined.

Note: The spot was generally centered on the A target but small motions at the A SEC could affect these results.

Note of Figures: A300F  $\equiv$  A SEC/CE010 SEC

AD19  $\equiv$  AD19 loss monitor/CE010 SEC

AQ47S  $\equiv$  AD5-6 loss monitor/CE010 SEC

AD1  $\equiv$  AD1 loss monitor/CE010 SEC

Fig 1

A: LOSSES AND EFF'S  
9-HOU-77 18:25 19.3

YD: A380F, 0 = 0, 100 =  
YB: AD19, 0 = 0, 100 =  
YC: A047S, 0 = 0, 100 =  
YD: AD1, 0 = 0, 100 =  
10000  
10000  
10000  
10000  
10000

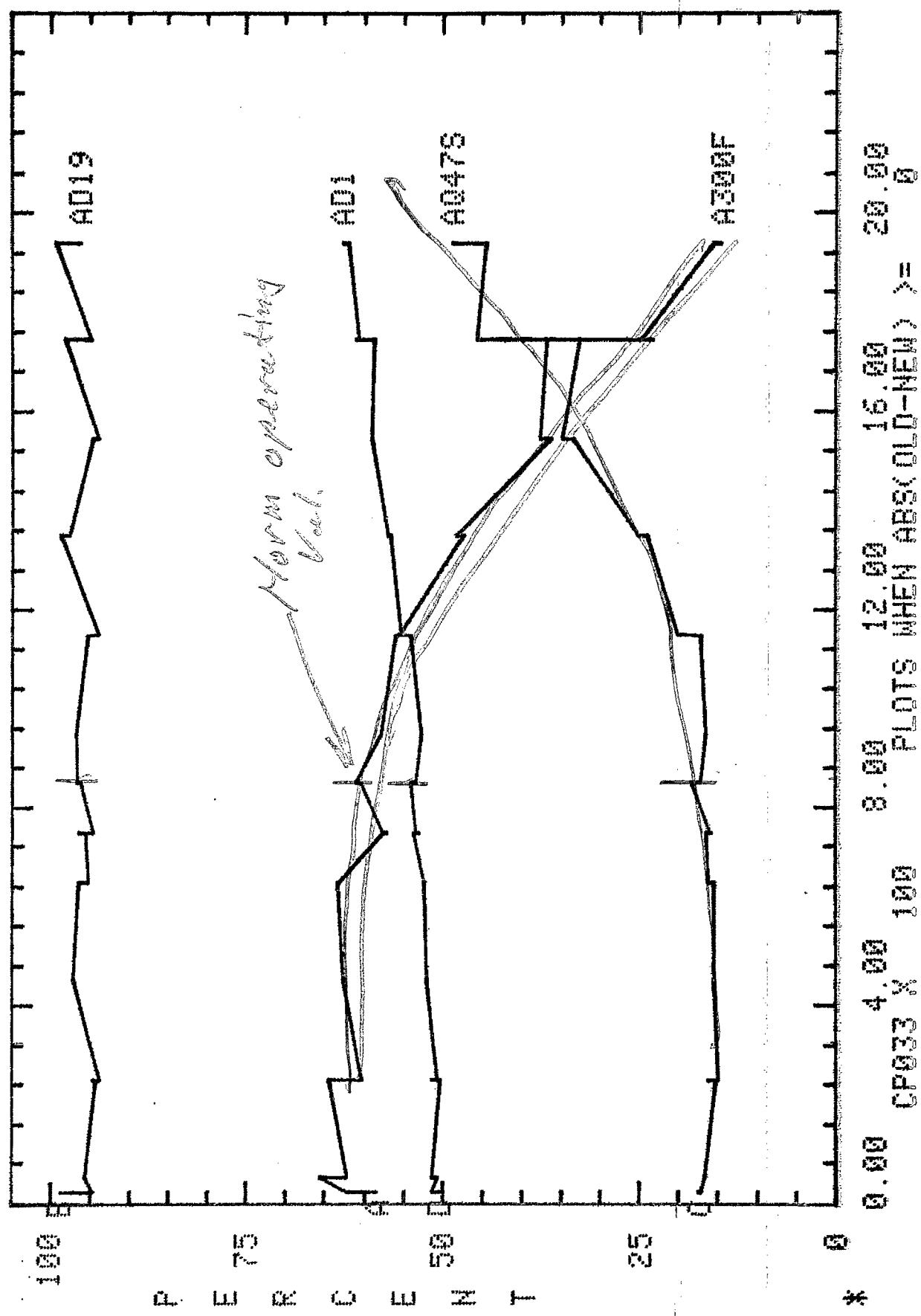


Fig 2

▲ LOSSES AND EFF'S  
9-NOV-77 18:41 21.4  
 $y_A = 0.300F, 0 = 0, 100 = 2000$   
 $y_B = 0.019, 0 = 0, 100 = 1000$   
 $y_C = 0.0475, 0 = 0, 100 = 1000$   
 $y_D = 0.01, 0 = 0, 100 = 300$

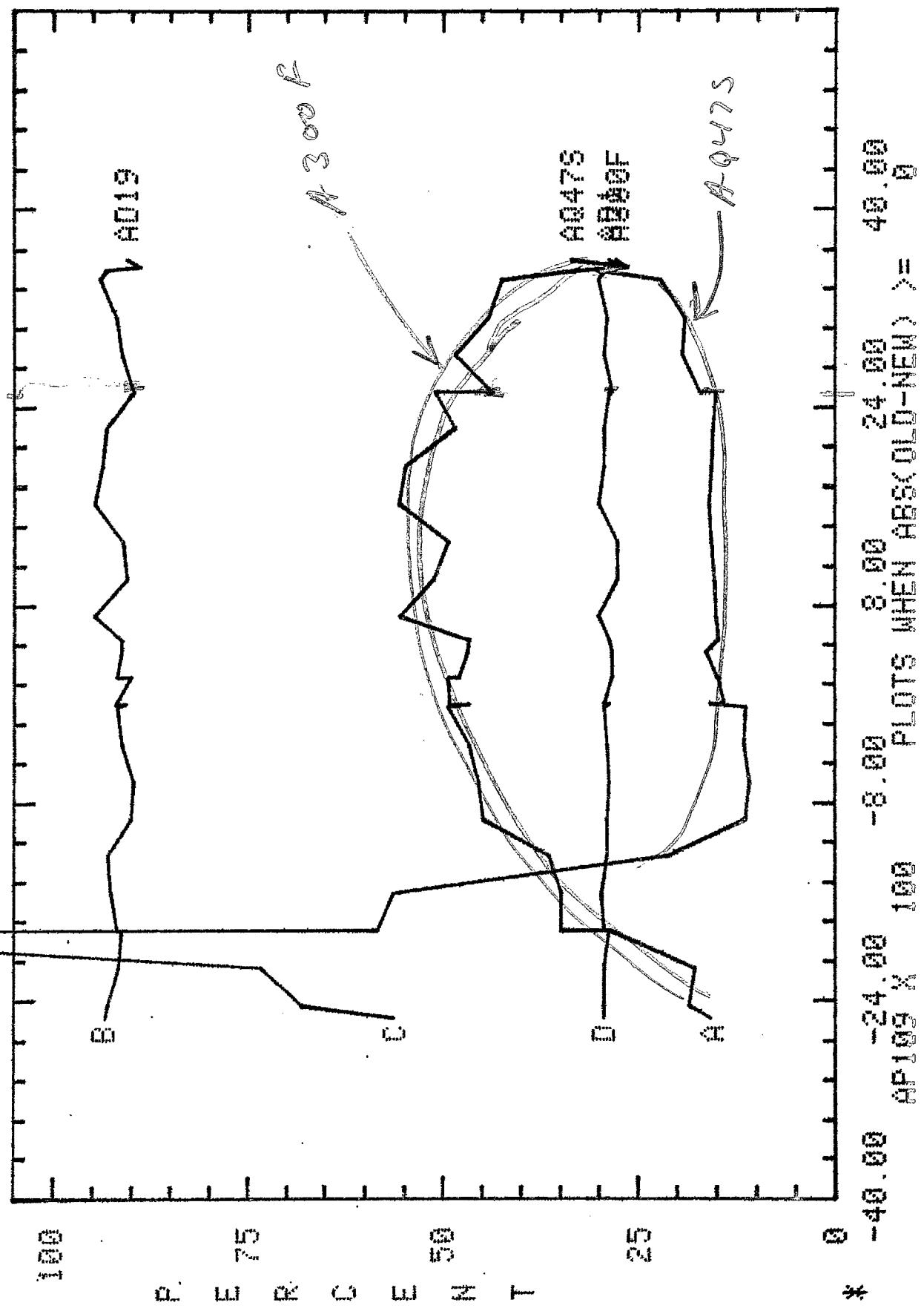


Fig. 3

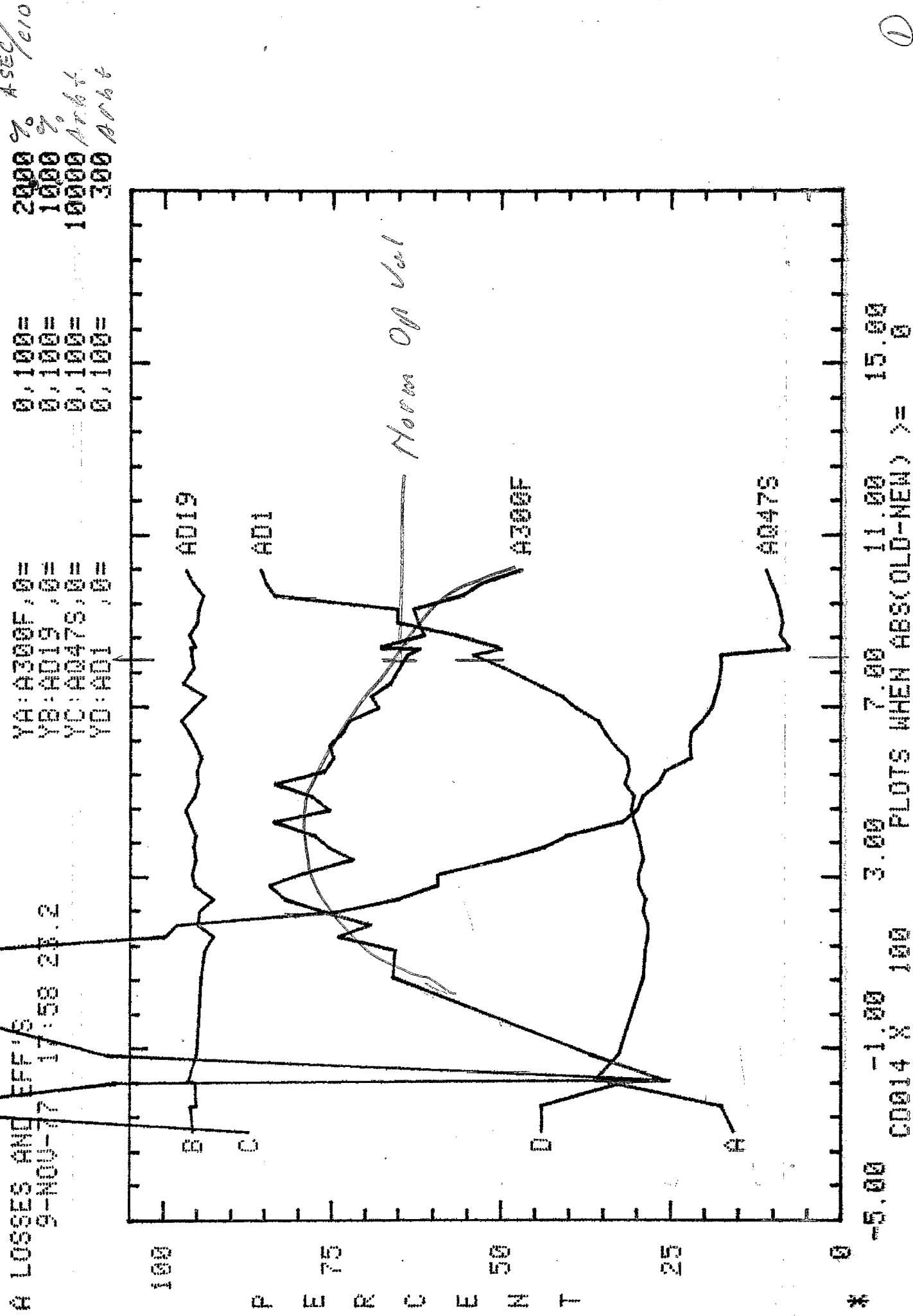


Fig 4

LOSSES AND EFF'S  
9-HOU-77 18:35 51.8

Y<sub>A</sub>:A380F, G= 0.100= 2000  
Y<sub>B</sub>:AD19, G= 0.100= 1000  
Y<sub>C</sub>:A047S, G= 0.100= 10000  
Y<sub>D</sub>:AD1, G= 0.100= 300

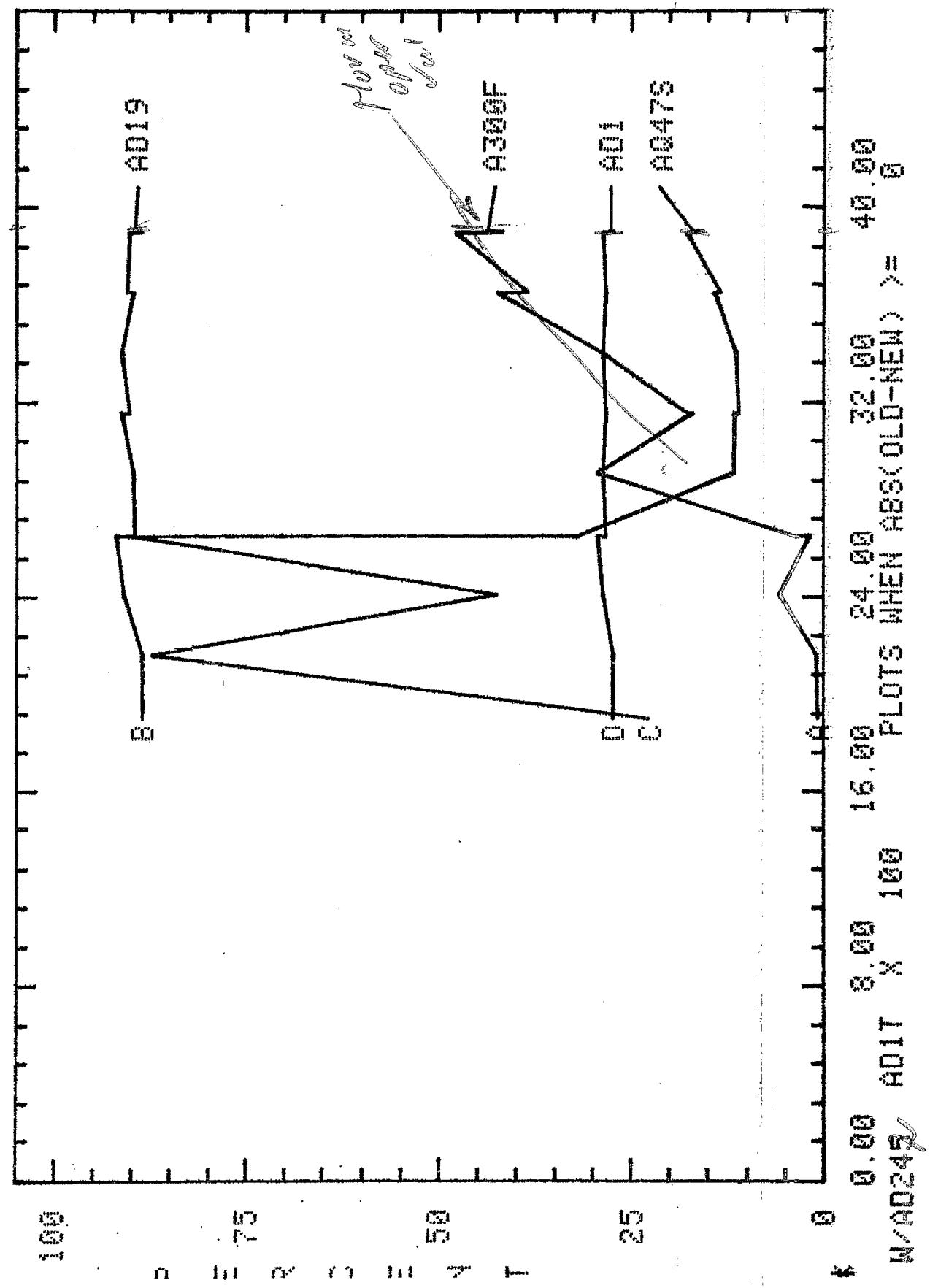
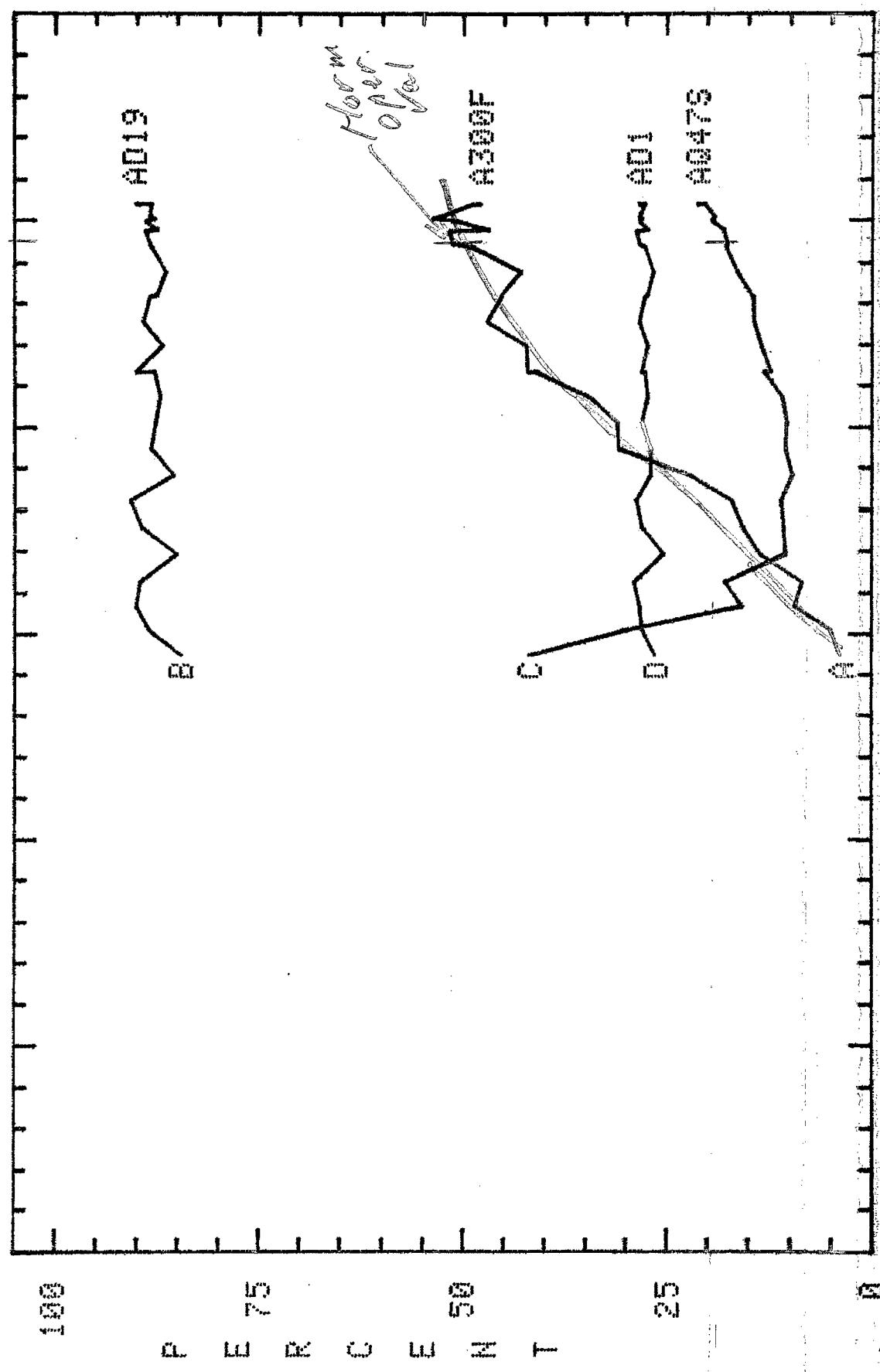


Fig 5

A LOGSES AND ERF'S  
2-MOU-77 18:28 56.5

YA: A300F, 0 = 0, 100 = 2000  
YB: A019, 0 = 0, 100 = 1000  
YC: A0478, 0 = 0, 100 = 1000  
YD: A01, 0 = 0, 100 = 300



\* W/A01-80 ADT % 8.60 16.00 24.00 32.00 PLOTS WHEN ABSC(OLD-NEW) >= 40.00

(3)

Fig 6

Δ LOGSES AND EFFICIENCIES

$y_0 = H3000F, \theta =$   
 $y_0 = H01476, \theta =$   
 $y_0 = H0159, \theta =$   
 $y_0 = H019, \theta =$   
 $y_0 = H0476, \theta =$   
 $y_0 = H0600, \theta =$   
 $y_0 = H073, \theta =$   
 $y_0 = H0900, \theta =$   
 $y_0 = H0900F, \theta =$

