Interoffice

AIPS MEMO NO. 4

National Radio Astronomy Observatory

Charlottesville, Virginia

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To: Ron Ekers

From: Walter Jaffe

Subject:

These are the results of a series of timing tests of the mapping program on our VAX.

Conditions:

working space of 0.5 Mbyte
otherwise empty machine
2-disks: 1 for system only
1 for data & scratch only
Input data set ∿ 40,000 visibilities
already loaded & sorted on disk
Fortran language FFT subroutine

I plot the times for 2 phases of the program.

A) Weighting & gridding, where time is probably proportional to # of visibilities and apparently only weakly on size of map.

B) FFT & scaling, time is independent of # of visibilities.

Notes:

A) I tried timings with both 0.25 & 0.5 Mbytes working spaces, with very little difference.

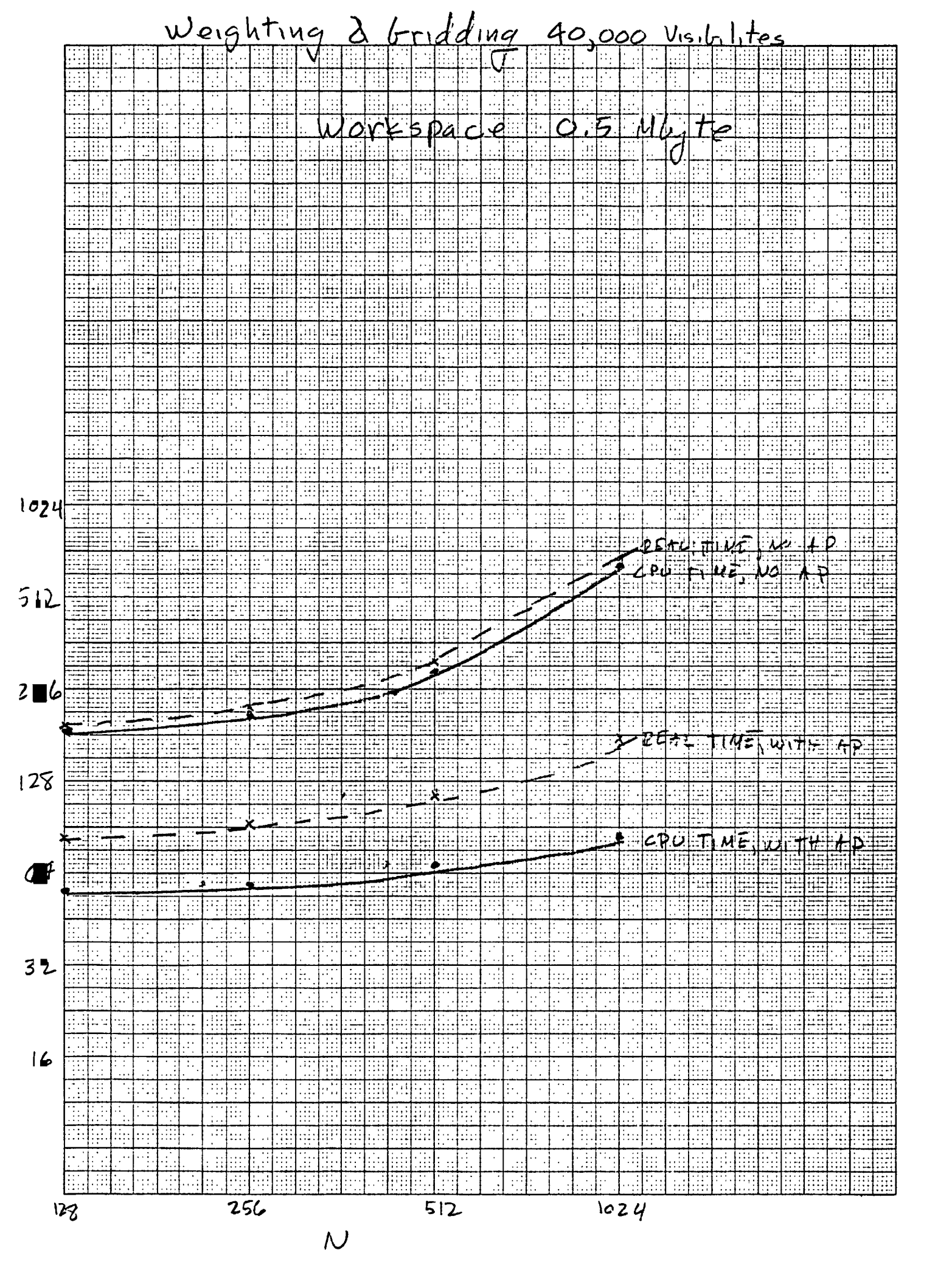
B) For not AP versions cpu/real ∿ 98% in an otherwise empty machine. For AP versions cpu/real ∿ 50%.

C) For the FFT & scaling, the times in the AP version are more or less proportional to N (= number of lines in map) rather than N^2 (= number of points in map). This indicates that speed is limited by I/O initialization time e.g., head seek time & command send time for the AP, rather than calculation or I/O transfer time.

For the non-AP versions, time is more or less proportional to N^2. This means AP version is relatively more efficient for large maps.

D) For CLEAN, AP/non-AP behavior is probably similar to FFT part of mapping.
For SELFCAL, AP probably is relatively more efficient than for mapping because of heavy computing load.

cc: Fomalont
Greisen
Cotton
Schwab
Burns


Weighting & Gridding 40,000 Visibilities
Workspace 0.5 Mbyte
1024
512
256
128
64
32
16
REAL TIME, NO AP
CPU TIME, NO AP
REAL TIME, WITH AP
CPU TIME, WITH AP
128
256
512
1024
N

FFT + Scaling + Fixing; Workspace = 0.5 Mbyte