

XEROX

PALO ALTO RESEARCH CENTER

Learning Research Group

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To: Text Display Interest
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Subject: DOTEXT - A Handy Piece of Microcode
Filed on: <INGALLS>DOTEXT.Bravo

This memo describes a microcode primitive which we are implementing to assist in the display of formatted text. The purpose is to make you aware of its availability and, by describing its function, to elicit proposals for improvement before the clay dries.

Introduction

Most non-trivial display of text on an alto involves a lot of code and computation devoted to various checks and setups. DOTEXT is designed to work with BITBLT and STRIKE fonts to reduce this complexity and eliminate the computational overhead. Specifically, the inner loop for text display becomes:

for printing:

```
DOTEXT  
JMP EXCEPTIONS  
BITBLT  
JMP .-3
```

for measuring:

```
DOTEXT  
JMP EXCEPTIONS  
JMP .-2
```

DOTEXT takes about 1/10 the time of BITBLT and does the following:

- Sets condition if end of string
- Picks up next character in string, increments pointer
- Checks for ascii out of range of font
(if so, sets up illegal char)
- Sets condition for space, tab, CR, or zero width char
- Sets up destx, destwid, sourcex for BITBLT
- Sets condition if destx beyond limit
- Sets condition if end of run
- Decrements run count
- Skip-returns unless conditions have been set

DOTEXT uses less than 100 words of microcode, and uses the same registers as BITBLT.

Calling conventions

AC2 points to a BITBLT table which has been set up as much as possible (rasters, y, height, fontglyphs, etc).

AC3 points to a 6-word table on an evenword boundary, containing the following fields:

- string - core address of ascii string
- xtable - core address of font x-table
- char - string index of char to be set up
- last - if char>last, then condition will be set

stopx - if updated destx+width>stopx,
then condition will be set
runcnt - if runcnt<=0, then condition will be set

Returning conventions

AC2 and AC3 are preserved.

AC0 is set to ascii string[char]

AC1 = sum of conditions:

1 = space, tab, CR, zero width

2 = stopx exceeded by this char

4 = runcnt exhausted

8 = this char is beyond last - this one condition
prevents any stores (table updates) or other
setting of conditions

If AC1=0, DOTEXT skips, else it returns immediately.