                  Workshop on Hard Copy Line Graphics

    At CMU we have recently interfaced a Xerox Graphic Printer (ex-LDX)
    to the PDP-10 using a PDP-11 as in intelligent controller for the
    printer. Specially designed interface and data structures permit the
    PDP-11 to generate each scan line as needed without having to resort
    to the brute force generation of the bit image for the whole page.

    The attached pages were produced using this system with the help of a
    document generation program and a character set design program. This
    is something personal.

    In response to several requests, we are conducting a one day workshop
    on the XCRIBL system. The workshop will be held in 3124 Science Hall
    at Carnegie-Mellon University on April 12. An agenda for the
    workshop is attached. If you are interested in coming or sending
    someone to this workshop, please contact Dr. D. R. Reddy (412-621-
    6200 ext. 149), Mr. Mack Hicks (412-687-5846) or Miss M. Kostkas
    (412-626-2600 ext. 141), for further information or local
    arrangements. Local reservations may be made at the Webster Hall
    Hotel (412-621-7700) or the Civic Center Motor Hotel (412-683-6700)
    which are within walking distance of Carnegie-Mellon University.

CARNEGIE-MELLON UNIVERSITY

WORKSHOP ON HARD COPY LINE GRAPHICS

April 12

Morning
Document Generating Languages and Systems

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9:00-9:30     Raj Reddy           Overview of the XCRIBL system
9:30-10:20    Joe Newcomer        Languages for Document Generation
10:20-10:30   Coffee Break
10:30-12:00   Examples of Document Generation
                                  Letter Producing Systems
                                  Technical Report Production
                                  A Graphics and Gray Scale Image System
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Afternoon
Systems Support

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12:00-1:45    Lunch               Character Sets (Generation and
1:45-2:45     Lee Erman            Modification)
2:45-3:00     Coffee Break
3:00-4:00     George Robertson    The PDP-11 Support System
4:00-5:00     Bill Broadly and    The PDP-11 XGP Interface (Hardware)
              Jack Wright
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Evening
Session for the "Hackers"

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7:30-10:30    Discussion session of as yet unsolved issues and
              possible hardware-software solutions.
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                              XCRIBL SYSTEM
                     COMPUTER SCIENCE DEPARTMENT
                     CARNEGIE-MELLON UNIVERSITY

What you are now reading is a computer printout produced by the
XCRIBL system. Computers printers do not have typefaces like this
one nor can they change typefaces. Conventional computer printers
cannot print character sets where the center to center distances are
not all the same. The machine that printed this document is a
facsimile copying machine built by Xerox a number of years ago. The
computer science department of Carnegie-Mellon University has
designed and constructed the interface to connect it to a
minicomputer (PDP-11) which in turn is linked to a large computer,
the PDP-10. The equipment has been working since January.

The Xerox Graphic Printer (XGP) works in a similar fashion to the
Xerox office copiers. Instead of reflecting light off a printed page
as in a copier the XGP uses a cathode ray tube similar to old
television tubes as a source of light. The image is drawn as a
series of dots on the CRT with a resolution of 12 dots per inch. The
line of dots is reflected onto a selenium drum which
electrostatically attracts a fine black powder to the exposed
selenium areas. The powder is transfered to a moving sheet of paper.
Finally a fuser melts the powder onto the paper.

To be able to print any character the pattern of dots which will be
printed as that character must be entered into the computer along
with an indicator of what the pattern represents. To facilitate this
a program has been written to design character sets. This program
draws a grid on a display terminal. Each box in the grid represents
one dot in the final Xerox output. The dots may be set or unset and
the character redrawn on the display as frequently as one might
desire. Because of the ease with which this may be done it becomes
an enjoyable task to design a character set and then be able to
change any part of any character.

The XGP is also capable of drawing lines and gray scale images. The
AI group is using the XGP to print pictures of faces and speech
spectrograms. The range of possible uses is boundless.

        [This RFC was put into machine readable form for entry]
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