Programming Tips

Simulated Pan and Zoom on the 4114

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The 4112 and 4113 have local Pan and Zoom facilities. However, the 4114 requires that any Pan and Zoom operation (windowing) be controlled from the host. This can be done in several ways. The host can perform the transformation and then transmit the picture to the terminal, or the host can create a segment on the terminal with the Pivot Point at the proper location, and then a local terminal transform can be applied. In either case, the whole picture must be retransmitted by the host.

An alternative method takes advantage of the 4100 terminal's local capabilities. The general steps are:

1. Assign each segment as it is created to one or more segment classes.

2. Create a match class from those classes containing segments on which zoom and pan will be performed.

3. Create a new segment (with a pivot point at the proper location) by copying the current match class into the new segment.

4. Apply image transformations as required.

For example:

1 < Set-Segment-Class: − 2, (0), (1) >

2 (Create as many segments with varying pivot points as desired)

3 (Determine XMIN, XMAX, YMIN, YMAX, for desired Window)

4 < Set-Current-Matching-Class: (1), (0) >

5 < Set-Pivot Point:
   XMIN + (XMAX − XMIN)/2,
   YMIN + (YMAX − YMIN)/2 >

6 < Begin-Segment: 500 >

7 < Include-Copy-Of-Segment: − 3 >

8 < End-Segment >

9 < Set-Segment-Image-Transform:
   500, 4096/(XMAX − XMIN),
      3172/(YMAX − YMIN),
      0, (2048, 1586) >

Line 1. Assigns all future segments to Segment Class 1.

Line 2. Creates as many segments in memory as desired. These segments may have their pivot points positioned at any valid location.

Line 3. The desired window can be determined by prior knowledge or by use of the GIN operation to define lower left and upper right points.

Line 4. Makes the current matching class consist of all segments which belong to Segment Class 1.

Line 5. Sets the pivot point to the center of the new window.

Line 6. Begins a new Segment. In this case, Segment #500 is assigned.

Line 7. Copies the current matching class into Segment #500. In this case it consists of all segments.

Line 8. Ends Segment #500.

Line 9. Applies the segment image transform to Segment #500. The X and Y scale factors are chosen so that the new window will just fill the screen and the center of the new window is translated to the physical center of the screen.

The Include-Copy-Of-Segment command preserves any Pick ID's assigned within the original segment. Thus, if Pick ID numbers are not duplicated in the original segments created, the segment built using the segment class (step 7) will contain unique Pick ID's. This allows elements within the zoomed picture to be identified using standard Pick techniques.

4050 Extended Memory Backup/Restore

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This short routine will save the contents of the Extended Memory File Manager on tape or restore the contents from tape to memory. It is assumed this routine will reside on file 1 marked for 768 bytes, with file 2 containing the memory contents. For 256K memory (Option 27), use a 300K tape and mark the second file for 300000 bytes; for 512K memory (Option 28), use the new 600K tape and mark the second file for 600000 bytes.

```
100 PRINT "LEXTENDED MEMORY BACKUP PROGRAM"
110 PRINT "JSAVE OR RESTORE? ";
120 DIM R$(4),A$(300)
130 INPUT R$
140 CALL "DSTAT",4,A$
150 REM S$ IS SIZE OF EXTENDED MEMORY
160 S$=SEG(A$,94,6)
170 S=VAL(S$)
180 FIND 2
190 PRINT "BLOCK:[[[[HHHH]]]]";
200 IF R$="REST" THEN 300
210 FOR I=0 TO S/256-1
220    CALL "NUMHEX",I*256,I$
230    I$=SEG(I$,1,4)
240    PRINT "HHHH";I$;
250    CALL "MREAD",I*256,A$
260    WRITE @33:A$
270 NEXT I
280 PRINT "  EXTENDED MEMORY SAVED."
290 END
300 ON EOF (0) THEN 390
310 I=0
320 CALL "NUMHEX",I*256,I$
330 I$=SEG(I$,1,4)
340 PRINT "HHHH";I$;
350 READ @33:A$
360 CALL "MWRITE",I$,A$
370 I=I+1
380 GO TO 320
390 PRINT "  RESTORED."
```