



# DECUS

## PROGRAM LIBRARY

DECUS NO.	8-383B
TITLE	CORE DISPLAY PROGRAM
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SOURCE LANGUAGE	

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[Illegible]	[Illegible]	[Illegible]	[Illegible]	[Illegible]
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# CORE DISPLAY PROGRAM

DECUS Program Library Write-up

DECUS NO. 8-383B

## 1. INTRODUCTION

This program allows the user to display, change, dump and punch the contents of any core location by commands initiated from the 338 display light pen and push buttons. The program occupies locations 5000-7340 of memory field one. The program does not set the push down pointer or the interrupt system and hence field 0 is absolutely free for use by other programs. It is possible to run this program concurrently with another which uses the interrupt system. (This second program should not use the display unless in special modified cases.)

## 2. OPERATION

The starting address of the program is 16000. Depending on the setting of the push buttons the display will show a picture similar to that in Figure 1. The teletype and high speed punch flags will also be set by a TLS and PLS respectively. The column on the left hand side shows a four digit address with its 4 digit content. The field setting can be 0 or 1. The letter functions are:

L - Punch Leader/Trailer on high speed punch

D - Set to Dump on teletype

P - Set to binary on high speed punch

The push buttons have the meanings shown in Figure 2. P.B 0-5 and 11 set the starting address while P. B. 6 sets the field of the address. The number of addresses displayed is dependent on P. B.s 9 and 10. For setting:

00 means 128<sub>10</sub> (i.e. 1 page) addresses and contents are displayed. This also shows the letters D and P.

01 means 64<sub>10</sub> (i.e. 1/2 page) addresses and contents are displayed at twice the previous size with intensity set to 7.

10 means 32<sub>10</sub> (i.e. 1/4 page) addresses and contents are displayed at twice the previous size with intensity set to 6.

11 means as above but intensity is set to 7.

### 2.1 Core Content Changing

Pointing the light pen to any digit in an address or its content will result in an arrow pointing to the line chosen and the address chosen is shown as four digits in the middle of the screen.

The teletype will give CR, LF, then a one or space and the four digits of the address. The one or space correspond to field 1 or  $\emptyset$  respectively. The punch will similarly give a field setting and an address.

The contents of the address can now be changed by the digits  $\emptyset$ -7 displayed at the bottom of the screen. Pointing the light pen to any digit will set the digit in the most significant end of the 4 digit octal number in the middle of the screen. Also the row of four digits from which it was chosen will change position up or down to avoid multiple hits. The teletype will give two spaces and the digit chosen. The next three digits can then be chosen, and the teletype will type each chosen digit.

When four digits are set and (four digits must be chosen) the new value is deposited and punched, and the arrow is moved to point to the next address to set, type, and punch new contents. If an error is made at any time when setting the content, the address can be set again and the process restarted.

## 2.2 L, D and P Operation

Pointing the light pen to L will result in punching 2 frames of runout (to compensate for checksum frames which are not computed) followed by  $64_{10}$  frames of Leader/Trailer code.

To initiate a dump on the teletype or a binary punch, P. B. 9 and  $1\emptyset$  should be set to  $\emptyset\emptyset$  and the light pen pointed to D or P or both. The manual interrupt button should be pressed and the first address is chosen. The manual interrupt button should be pressed again and the last address is chosen. The program will proceed to perform the required functions.

It should be noted that P does not give L/T before and after the punched binary block. The dumping format is an address followed by 4 words of content per line.

## 2.3 AC $\emptyset$ and 1

If AC switch registers  $\emptyset$  and 1 are down, the teletype and punch are inhibited from operation and the flags are not set on starting the program. When the teletype or punch are busy any light pen hit is ignored. Hence, if teletype or punch are switched off while AC $\emptyset$  and 1 are up, the light pen will have no effect after its first operation.

## 3. FRAME RATE

Core location  $166\emptyset\emptyset$  is incremented once every time a display frame is completed. Hence it is possible to obtain real time frame rate for the display.

## 4. CONNECTION TO OTHER PROGRAMS

It is possible to connect this program with another which does not use the display. If this other program uses the interrupt system then after putting ION a jump to the beginning of the core display program should be made. After an interrupt, the service routine should jump to location  $16\emptyset12$  which is the start of the wait loop of the core display program.

If the second program does not use ION then starting from location 16152 (to 16177) the instructions to jump from core display wait loop to the other program's wait loop should be inserted, and a jump to 16012 should be made as above from the wait loop of the second program.

In addition, the display file of core display has in 17200 - 17202 the following SK2 10; 0; 0 i.e. skip on P. B. 8 (the spare P. B.) . Hence in 17201 and 17202, JUMP; ADDRESS instruction can be added to connect some other display file. (This other display file should jump back to 17203 as no PJMP is allowed.)

ADDRESS=CONTENTS

FIELD 1

" = "

" = "

" = "

0000

0 1 2 3

4 5 6 7

LDP

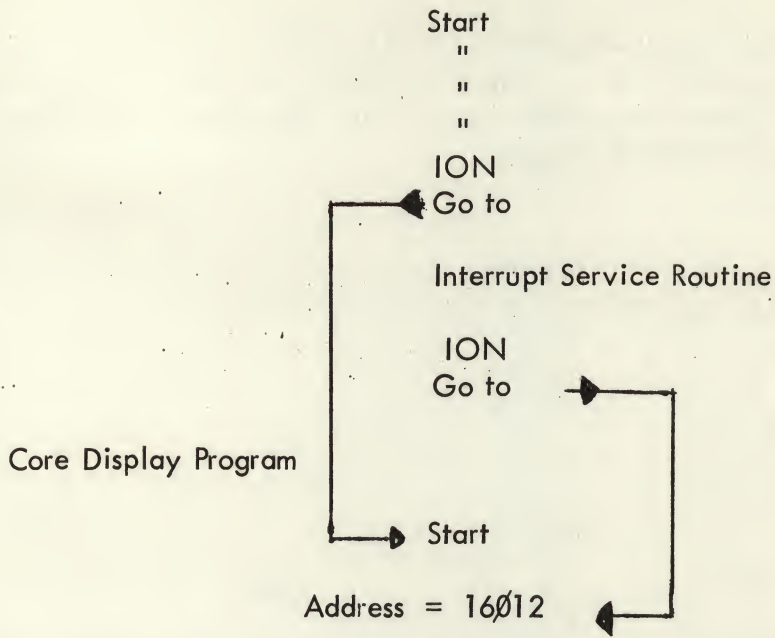
FIGURE 1

4000	2000	1000	400	200	100
Field 0 or 1	TO BE LEFT ALONE	SPARE	Size 200 Size 40 Octal	OCTAL size 100 <sub>8</sub> Int 7	40

FIGURE 2

First case: Program with interrupt ON

Second Program



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Second case: Program with interrupt OFF

Second Program

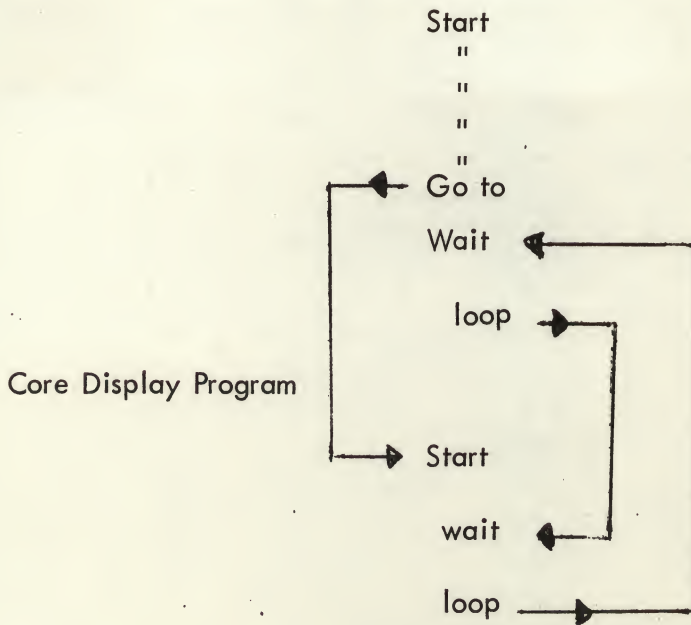


FIGURE 3

## APPENDIX 1

The core display program has been extended to include a core transfer facility. Hence it is possible to transfer a block with start address A and end address B to another part of memory with start address C. This transfer is from one field to another or within each field.

To operate this under program control the following steps should be taken:

- (1) Put push buttons 9 and 10 OFF
- (2) "Hit" letter T with light pen
- (3) Press manual interrupt, choose first address -A-
- (4) Press manual interrupt, choose second address -B-
- (5) Press manual interrupt, choose final address -C-

If an error is made in choosing A or B the transfer can be re-initiated by hitting T again. (It should be noted that once a D, P or T hit is made, the settings of P. B. 9 and 10 could be both ON to make selection of any address easier.)

