STANFORD TIME-SHARING PROJECT
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RITUAL TO ODIN TIME SHARING SYSTEM

by G. Feldman & H. Gilman

Abstract: A preliminary description of the Stanford Preliminary Time-Sharing System called "ODIN" is contained herein.

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INTRODUCTION:

The ODIN time sharing system is operational on an experimental basis. It is useable but somewhat unforgiving, therefore, you use it at your own risk. Shortly, the last bugs will be cleared up and a permanent version will be located on the drum. In the beginning there will be three users; one console typewriter and two teletypes.

The following set of programming restrictions are necessary for running programs on ODIN.

1. Do not use program flag one for anything but type-in.

2. Do not use any sense switches. (The use of Expensive Typewriter will be explained below).

3. Do not attempt to enter extend mode or sequence break mode.

4. When talking to ODIN from a teletype, treat it as a typewriter, since all input goes through an input translator.

To call the system type ˙ carriage return (i.e. center dot carriage return) from the typewriter or # carriage return from a teletype. (To enter a # or ˙ respectively into text type the character twice for each time you want it entered.)

System commands are of the following form:

<system command>:=<letter> , <parameter list> <carriage return>|

<letter> <carriage return>

<parameter list>:=<parameter> | <parameter list> , <parameter>

<parameter>:=any 1-6 character string or an octal number in the case of the transfer instruction with the exception of cliches which will be discussed below.

(For all descriptions of system commands the terminating carriage return will be omitted).

If you make an error in any system command you can have the system ignore it by typing backspace on the typewriter or rubout on a teletype before the terminating carriage return (or end parenthesis in the case of cliche naming). note "∂" stands for carriage return

The system commands are:

a — Continue the program that was running in user core from where it left off.

c,α, (list of system commands)
This causes a cliche list of system commands to be entered under the name α in the cliche table. Each command in the list should be terminated by "∂"and the final command should be terminated by ")" rather than "∂".
Restriction: Do not include naming a cliche within the list of system commands.

d,α,β... — This causes the cliches named α,β, etc. to be deleted from the cliche table. d ∂ causes all the cliches to be deleted.

e,α — causes the cliche named α to be executed.

f — causes the current punch file to be closed. As the system now stands this operation is absolutely essential for use of the current file. It must be performed after a "move" command or after punching into a file that will be read or before naming a new file after punching in an old file.

g — causes the current location of the punch and read pointers to be printed out.

i,α — causes the reader pointer to be attached to the file named α.

k,α,β... — causes files α,β, etc. to be killed. k ∂ causes all files to be killed and the punch pointer to be re-attached at the beginning of ones file allocation.

l,* — causes the control program * to be loaded from drum and become a system program. *'s may be one of the following three parameters.

et (i.e. Expensive Typewriter)
ddt(i.e. ddt 6000)
macro(i.e. macro assembler)

m,α,β — causes the contents of file α to be transferred to file β. Note: It must be terminated by the close file operator. α may be the reserved word "rdr" standing for the real reader or β may be the reserved word "pch" standing for the real punch. However, α and β cannot form the configuration m, rdr, pch.

n,α — causes a file to be created named α whose associated punch pointer is the current location of the punch pointer.

o,α — causes the punch pointer to be attached to the file named α.

p — causes the file table and the associated punch pointers to be printed out.

q — causes the cliche table to be printed out.

r — causes the contents of the current reader file to be read in as if the computer were operating in read-in-mode.

t, <octal number> — causes the system to transfer to user core at location number.

w — causes the system to wait for a response before continuing. This is useful for allowing commands which deal with a real tape reader to be imbedded within cliches.

z — is a sign off operation indicating that one is finished for the day.

A sample dialogue with ODIN. It is desired to assemble a small program using Expensive Typewriter and Macro and to read it in with ddt for debugging purposes. In the dialogue commands or input, typed by the user,will be underlined. Carriage return will be indicated by ∂.

To call the system type

. (center dot) ∂

ODIN ∂

to name a file

n, eng ∂

∂

p ∂

```
name        drum address
eng         300000
```

i, eng ∂

o, eng ∂

g ∂

```
the punch pointer is -      eng      300000

the reader pointer is -     eng      300000
```

l, et ∂

Note: You are now talking to expensive typewriter. It is to be used exactly as before with one exception. Do not use sense switch 1 to return from text mode to control mode, instead when you wish to go into control mode call the system by typing ° ∂ and then transfer to the start of et by typing t,440 ∂. As usual, do not forget to end any text with a ∂ before going into control mode. You are now talking to et and you type this program:

```
Title
100/
beg,        dzm x
            dzm y
str,        lac x
            lio y
            dpy 300
            dpy 300
            lac x
            add (10000
            dac x
            lac y
            sub (20000
            dac y
            jmp str
variables
constants
start beg
```

To enter control mode type

° ∂

t, 440

At this point the punch pointer is at "eng" so type

p ∂

s ∂ (as usual)

Then call the system

· ∂

and close the file

f ∂. THIS IS IMPERATIVE if you wish to read the file in type t,100 since the reader pointer is already attached.

Type

k ∂

r ∂

w ∂

title

. (The text has returned)

start beg

Return to the system

· ∂

You wish to assemble so you need a copy of the macro symbol punch. Put a tape copy in the real reader, turn it on.

Type

n, macsym ∂

m, rdr, macsym ∂

f ∂ (This is imperative).

To assemble you will need a binary output file

Type

n, bin ∂. You can assemble by means of a cliche

Type

c, macwow, (i, eng ∂

o, bin ∂

1, macro ∂

α ∂

a) (Note ")" terminates the last system command)

and

c, symwow, (i, macsym ∂

r ∂

f)

Type

q ∂

```
name        text
macwow      i, eng
            o, bin
            l, macro
            a
            i, eng
            a
            a
            )
symwow      i, macsym
            r
            f
            )
```

Note: First macro symbol package requires sense switches so until that is fixed check that you will not affect another user.

Type

e, macwow

∂

∂

∂

title - pass 1

∂

title - pass 2

∂

∂

e, symwow

∂

some sort of title - remember the symbol punch waits for a title.

∂

to read in the program with ddt type

i, bin ∂

l, ddt ∂

Z ∂

K ∂

Y ∂

T ∂

You are now in business.

Note: From time to time an error message will be typed out. A list of their meanings will be posted by the PDP-1 until the user's manual is written.

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ADDENDUM TO MEMO NO. 21
(Ritual to Odin Time Sharing System)

NOTICE TO USERS OF ODIN

There have been a few changes to the system control language. The idea has been to make the language as easy to use and remember as possible.

1. To have the name table typed out type n carriage return instead of p carriage return.

2. To have the cliche table typed out type c carriage return instead of q carriage return.

3. To have the reader pointer typed out type i carriage return.

4. To have the punch pointer typed out type o carriage return.

5. To continue a user program type t carriage return instead of a carriage return.

6. It is no longer necessary to type f carriage return to close files. This is now done automatically by the system. f is now a special operator which tells the system how to handle flag one logic. It will not be normally used; if you want information about it ask either Gary Feldman or Harold Gilman.

7. To rename a file use the letter b. For example to rename filel to be file2 type b, filel, file2 carriage return.

G. Feldman

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ADDENDUM #2 to MEMO NO. 21
(Ritual to Odin Time Sharing System)

The following is a list and explanation of the transliterations between the teletype and typewriter characters under the ODIN Time Sharing System.

A - Z and 0 - 9 are translated directly.
The special characters are as follows:

Teletype	Concise(Typewriter)
! (Exclamation Point)	| (Vertical Bar)
"	"
#	~
$	⊃
%	∨
&	∧
'	'
>	>
<	<
+	+
=	=
-	-
;	·, (Center Dot Comma)
:	·. (Center Dot Period)
*	x (Times sign)
,	,
.	.
?	?
/	/
←	→
↑	↑
@	— (Over Strike)
TAB	TAB
CARRIAGE RETURN	CARRIAGE RETURN

LINE FEED	NULL
(	(
)	)
[(Shift K)	[
] (Shift M)	]
ALT MODE	UPPER CASE SHIFT (ALPHABETIC ONLY)
RUBOUT	BACKSPACE

All other teletype characters (e.g. 'BELL', 'EOT', Etc.) are translated NULL and are invisible to the 'TYI' instruction.

There are, at present, no equivalent characters to _ (underscore) and · (center dot), however since both colon and semi-colon emit the center dot first, it is possible to get it, in text by typing Colon Rubout or Semicolon Rubout, and as a ddt action character by typing either character.

'Alt Mode' acts as upper case shift for alphabetic characters only: All upper case special characters are handled automatically. It is necessary to type 'Alt Mode' before each upper case alphabetic character desired, because a downshift is automatically inserted before the second alphabetic after an 'Alt Mode'. For example, to insert 'TITLE' from a teletype, one would type 'Alt Mode' 't' 'Alt Mode' 'i' 'Alt Mode' 't' 'Alt Mode' 'l' 'Alt Mode' 'e'.

Upper case type out materializes as the character preceded by backward slash, hence the example word would be typed out as \T\I\T\L\E on the teletype.

The 'Shift' key on the teletype changes a key from the lower character to the upper, as printed on the key. The 'control' key causes the generation on those control functions indicated in writing on the top half of the key. The only 'control' character used by ODIN is 'tab' which translates to typewriter 'tab' and materializes as a number of spaces. All others are ignored.

It is important not to confuse the use of the 'Shift' key and 'Alt Mode'. 'Shift' changes a key from one teletype character to another, whereas 'Alt Mode' causes the character to be in typewriter upper case. (e.g., 'Shift' n is the character '^', while 'Alt Mode' n is N.)

Harold Gilman