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-- KeyStreams.Mesa Edited by Johnsson on September 22, 1977 8:23 AM
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DIRECTORY
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```
Keyboard: FROM "keyboard",
KeyDefs: FROM "keydefs",
Mopcodes: FROM "mopcodes",
StreamDefs: FROM "streamdefs",
SystemDefs: FROM "systemdefs",
InlineDefs: FROM "inlinedefs",
ControlDefs: FROM "controldefs",
ProcessDefs: FROM "processdefs";
```

```
DEFINITIONS FROM ProcessDefs, InlineDefs, KeyDefs, StreamDefs;
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```
KeyStreams: PROGRAM IMPORTS Keyboard, ProcessDefs, StreamDefs, SystemDefs
EXPORTS KeyDefs, StreamDefs SHARES ProcessDefs, StreamDefs =
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BEGIN
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-- The Stream part:
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KS: PUBLIC Keyboard StreamObject ← StreamObject [
ClearInputBuffer, Keyboard.ReadChar, PutBackChar,
WriteChar, Keyboard.InputBufferEmpty, DestroyKey,
Keyboard[0,0,,]];
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```
GetDefaultKey: PUBLIC PROCEDURE RETURNS [KeyboardHandle] =
BEGIN
RETURN[@KS];
END;
```

```
GetCurrentKey: PUBLIC PROCEDURE RETURNS [KeyboardHandle] =
BEGIN
RETURN[Keyboard.ks];
END;
```

```
CreateKeyStream: PUBLIC PROCEDURE RETURNS [KeyboardHandle] =
BEGIN OPEN SystemDefs;
s: KeyboardHandle ←
SystemDefs.AllocateHeapNode[SIZE[Keyboard StreamObject]];
s ← KS;
s.buffer ← LOOPHOLE[BASE[s.bstring],STRING];
s.in ← s.out ← 0;
RETURN[s];
END;
```

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ControlDELtyped: PUBLIC PROCEDURE RETURNS [BOOLEAN] =
BEGIN RETURN[Keyboard.CDT] END;
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ResetControlDEL: PUBLIC PROCEDURE =
BEGIN Keyboard.CDT ← FALSE END;
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```
OpenKeyStream: PUBLIC PROCEDURE [stream:StreamHandle] =
BEGIN
WITH s:stream SELECT FROM
Keyboard => Keyboard.ks ← @s;
ENDCASE => SIGNAL StreamError[stream,StreamType];
RETURN;
END;
```

```
ClearInputBuffer: PROCEDURE [stream:StreamHandle] =
BEGIN
WITH s:stream SELECT FROM
Keyboard => s.in ← s.out ← 0;
ENDCASE => SIGNAL StreamError[stream,StreamType];
RETURN;
END;
```

```
SetIdleProc: PUBLIC PROCEDURE [p: PROCEDURE] =
BEGIN Keyboard.IdleProc ← p END;
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ResetIdleProc: PUBLIC PROCEDURE =
BEGIN Keyboard.IdleProc ← LOOPHOLE[0] END;
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PutBackChar: PROCEDURE [stream:StreamHandle, char:UNSPECIFIED] =
BEGIN newout: CARDINAL;
```

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WITH s:stream SELECT FROM
  Keyboard =>
  BEGIN
    newout ← s.out;
    newout ←
      IF newout = 0
        THEN KeyBufChars-1
        ELSE newout-1;
    IF newout # s.in THEN
      BEGIN
        s.out ← newout;
        s.buffer[s.out] ← char;
      END;
    END;
  ENDCASE => SIGNAL StreamError[stream,StreamType];
RETURN;
END;

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WriteChar: PROCEDURE [stream:StreamHandle, char:UNSPECIFIED] =
  BEGIN
    SIGNAL StreamError[stream,StreamAccess];
  RETURN
  END;

```

```

CloseKeyStream: PUBLIC PROCEDURE [stream:StreamHandle] =
  BEGIN
    WITH s:stream SELECT FROM
      Keyboard => Keyboard.ks ← @KS;
    ENDCASE => SIGNAL StreamError[stream,StreamType];
  RETURN;
  END;

```

```

DestroyKey: PROCEDURE [stream:StreamHandle] =
  BEGIN OPEN SystemDefs;
  WITH s:stream SELECT FROM
    Keyboard => FreeHeapNode[0s];
  ENDCASE => SIGNAL StreamError[stream,StreamType];
  RETURN;
  END;

```

```

CursorTrack: PUBLIC PROCEDURE [b: BOOLEAN] =
  BEGIN
    Keyboard.cursorTracking ← b;
  RETURN
  END;

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```

KeyTable: ARRAY [0..80] OF KeyItem ← [
  -- MEMORY[177033B]   Index [0..15]
  KeyItem[FALSE, 0, 0], -- UNUSED
  KeyItem[FALSE, 0, 0], -- UNUSED
  KeyItem[FALSE, 0, 0], -- UNUSED
  KeyItem[FALSE, 0, 0], -- UNUSED
  KeyItem[FALSE, 0, 0], -- UNUSED
  KeyItem[FALSE, 0, 0], -- UNUSED
  KeyItem[FALSE, 0, 0], -- UNUSED
  KeyItem[FALSE, 0, 0], -- UNUSED
  KeyItem[FALSE, 0, 0], -- KeyItemset1
  KeyItem[FALSE, 0, 0], -- KeyItemset2
  KeyItem[FALSE, 0, 0], -- KeyItemset3
  KeyItem[FALSE, 0, 0], -- KeyItemset4
  KeyItem[FALSE, 0, 0], -- KeyItemset5
  KeyItem[FALSE, 0, 0], -- Red
  KeyItem[FALSE, 0, 0], -- Blue
  KeyItem[FALSE, 0, 0], -- Yellow
  -- MEMORY[177034B]   Index [16..31]
  KeyItem[FALSE, 45B, 65B], -- %,5
  KeyItem[FALSE, 44B, 64B], -- $,4
  KeyItem[FALSE, 176B, 66B], -- ~,6
  KeyItem[TRUE, 105B, 145B], -- E
  KeyItem[FALSE, 46B, 67B], -- &,7
  KeyItem[TRUE, 104B, 144B], -- D
  KeyItem[TRUE, 125B, 165B], -- U
  KeyItem[TRUE, 126B, 166B], -- V
  KeyItem[FALSE, 51B, 60B], -- ),0

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KeyItem[TRUE, 113B, 163B], -- K
KeyItem[FALSE, 30B, 55B], --
**, -
KeyItem[TRUE, 120B, 160B], -- P
KeyItem[FALSE, 77B, 57B], -- ?, /
KeyItem[FALSE, 174B, 134B], -- ], \
KeyItem[FALSE, 12B, 12B], -- LF
KeyItem[FALSE, 10B, 10B], -- BS
-- MEMORY[177035B] Index [32..47]
KeyItem[FALSE, 43B, 63B], -- #, 3
KeyItem[FALSE, 100B, 62B], -- @, 2
KeyItem[TRUE, 127B, 167B], -- W
KeyItem[TRUE, 121B, 161B], -- Q
KeyItem[TRUE, 123B, 163B], -- S
KeyItem[TRUE, 101B, 141B], -- A
KeyItem[FALSE, 50B, 71B], -- (, 9
KeyItem[TRUE, 111B, 151B], -- I
KeyItem[TRUE, 130B, 170B], -- X
KeyItem[TRUE, 117B, 157B], -- O
KeyItem[TRUE, 114B, 154B], -- L
KeyItem[FALSE, 74B, 54B], -- <, ,
KeyItem[FALSE, 42B, 47B], -- ", '
KeyItem[FALSE, 175B, 135B], -- }, ]
KeyItem[FALSE, 0B, 0B], -- SPARE2
KeyItem[FALSE, 0B, 0B], -- SPARE1
-- MEMORY[177036B] Index [48..63]
KeyItem[FALSE, 41B, 61B], -- !, 1
KeyItem[FALSE, 33B, 33B], -- ESCAPE
KeyItem[FALSE, 11B, 11B], -- TAB
KeyItem[TRUE, 106B, 146B], -- F
KeyItem[FALSE, 0B, 0B], -- CONTROL
KeyItem[TRUE, 103B, 143B], -- C
KeyItem[TRUE, 112B, 152B], -- J
KeyItem[TRUE, 102B, 142B], -- B
KeyItem[TRUE, 132B, 172B], -- Z
KeyItem[FALSE, 0B, 0B], -- SHIFT
KeyItem[FALSE, 76B, 56B], -- >, .
KeyItem[FALSE, 72B, 73B], -- :;
KeyItem[FALSE, 15B, 15B], -- CR
KeyItem[FALSE, 136B, 137B], -- ↑, ←
KeyItem[FALSE, 177B, 177B], -- DEL
KeyItem[FALSE, 0B, 0B], -- NOT USED (FL3)
-- MEMORY[177037B] Index [64..79]
KeyItem[TRUE, 122B, 162B], -- R
KeyItem[TRUE, 124B, 164B], -- T
KeyItem[TRUE, 107B, 147B], -- G
KeyItem[TRUE, 131B, 171B], -- Y
KeyItem[TRUE, 110B, 150B], -- H
KeyItem[FALSE, 52B, 70B], -- *, 8
KeyItem[TRUE, 116B, 156B], -- N
KeyItem[TRUE, 115B, 155B], -- M
KeyItem[FALSE, 0B, 0B], -- LOCK
KeyItem[FALSE, 40B, 40B], -- SPACE
KeyItem[FALSE, 173B, 133B], -- {, [
KeyItem[FALSE, 53B, 75B], -- +, =
KeyItem[FALSE, 0B, 0B], -- SHIFT
KeyItem[FALSE, 0B, 0B], -- SPARE3
KeyItem[FALSE, 0B, 0B], -- NOT USED (FL4)
KeyItem[FALSE, 0B, 0B]; -- NOT USED (FR5)

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ChangeKey: PUBLIC PROCEDURE [key: KeyName, action: KeyItem] RETURNS [oldAction: KeyItem] =
BEGIN
  oldAction ← KeyTable[LOOPHOLE[key,CARDINAL]];
  KeyTable[LOOPHOLE[key,CARDINAL]] ← action;
RETURN
END;

```

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-- The Process (and initialization) part

-- Process constants for keyboard
KeyboardBit: WORD = 4;
Process: PUBLIC ProcessHandle;
KeyboardPriority: ProcessPriority = 2;
DisplayInterruptWord: POINTER TO WORD = LOOPHOLE[421B];

```

```
START Keyboard;
ResetIdleProc[];
ResetControlDEL[];
CursorTrack[TRUE];
Keyboard.KeyTable ← @KeyTable;
Keyboard.ks ← @KS;
KS.buffer ← LOOPHOLE[BASE[KS.bstring],STRING];
KS.bstring[0] ← KS.bstring[1] ← KeyBufChars;
Process ← ProcessDefs.CreateProcessFromProcedure[
    Keyboard.ProcessKeyboard,KeyboardPriority];
ActivateProcess[Process];
DisplayInterruptWord↑ ← BITOR[DisplayInterruptWord↑,KeyboardBit];

END.
```