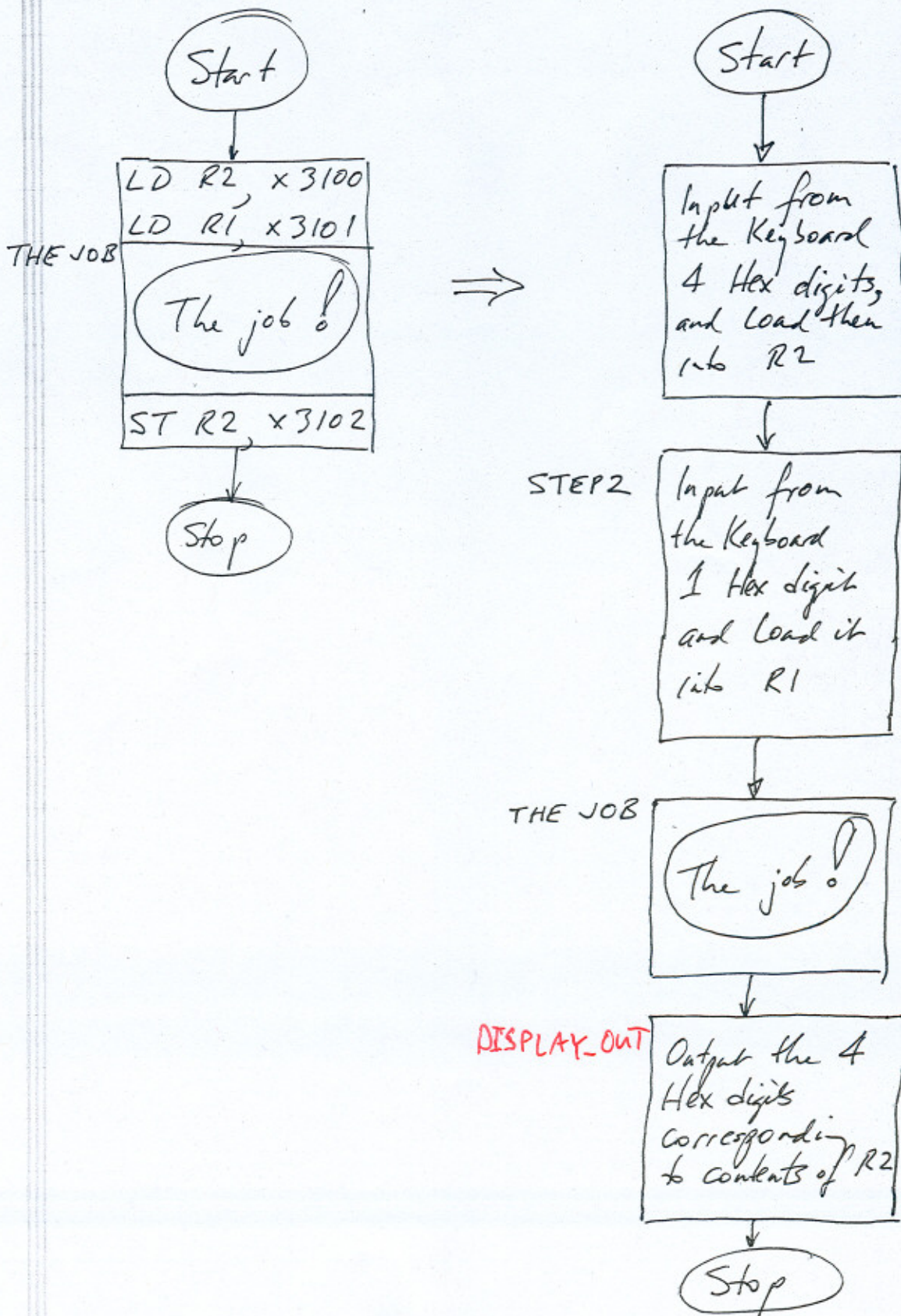


EE 306
Supplemental Note
Adding I/O to PA 1
30 October 2006

SHEET 1 OF 5



EE 306, Supplemental Note
30 October, 2006

SHEET 2

Input from Keyboard
4 Hex digits, and
Load them into R2

```
AND R2, R2, #0
AND R5, R5, #0
ADD R5, R5, #4
```

NEXT_IN BR= STEP2

R2 ← 0
R5 ← 4

```
LD R0, LINEFEED
TRAP R2 x21
LEA R0, INBANNER
TRAP x22
TRAP x20
TRAP x21
```

Decision: R5 = 0?
Yes → STEP2
No → Print CF, Banner

Print CF, Banner
TRAP x20
Echo

```
LD R3, NEGZERO
ADD R3, R3, R0
BRn AF
LD R3, NEGNINE
ADD R3, R3, R0
BRp AF
```

Decision: Dec. digit?
Yes → R3 ← value
No → Decision: A-F?

R3 ← value

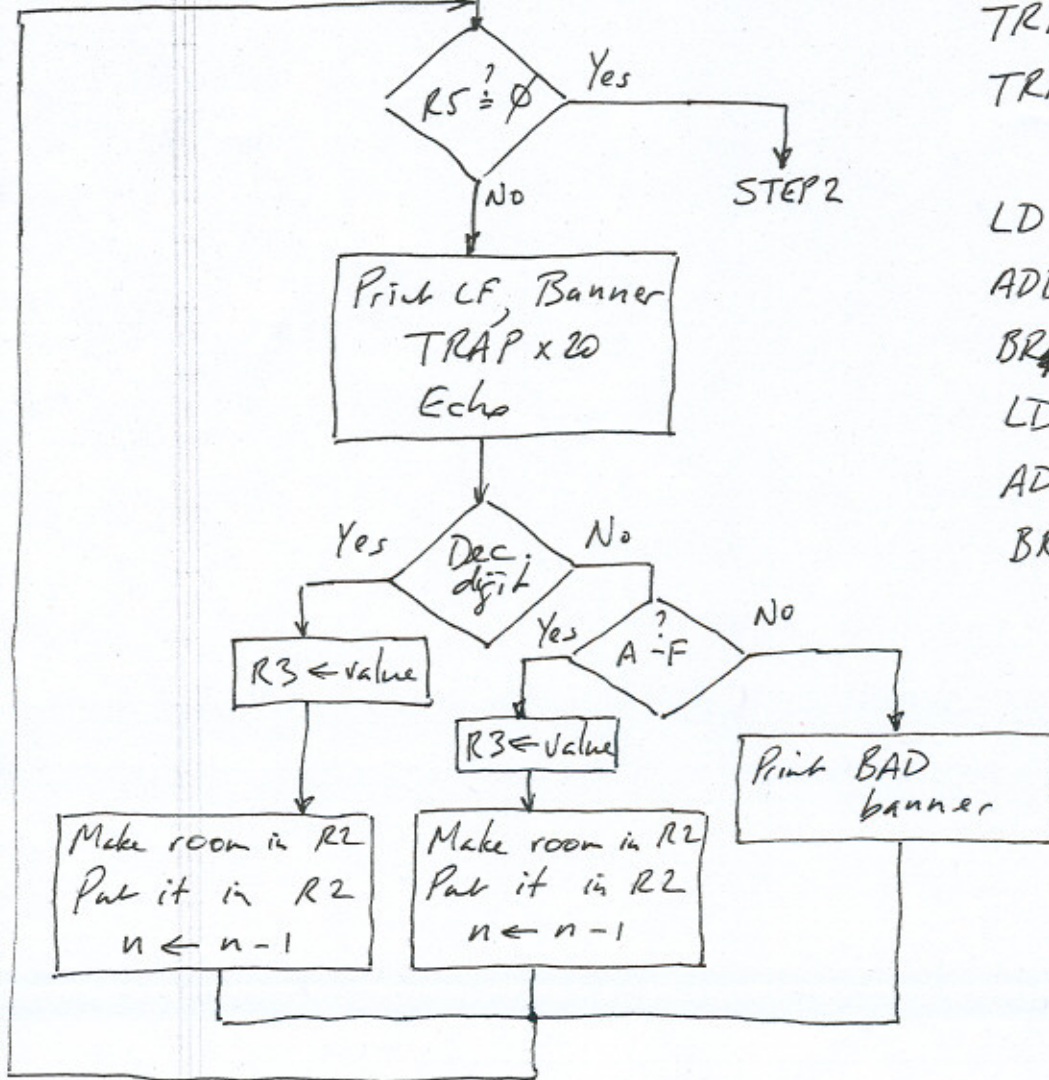
R3 ← value

Print BAD banner

```
ADD R2, R2, R2
ADD R2, R2, R2
ADD R2, R2, R2
ADD R2, R2, R2
AND R0, R0, xF
ADD R2, R2, R0
ADD R5, R5, #-1
BR NEXT_IN
```

Make room in R2
Put it in R2
n ← n - 1

Make room in R2
Put it in R2
n ← n - 1



EE 306, Supplemental Note
30 October 2006

SHEET 3

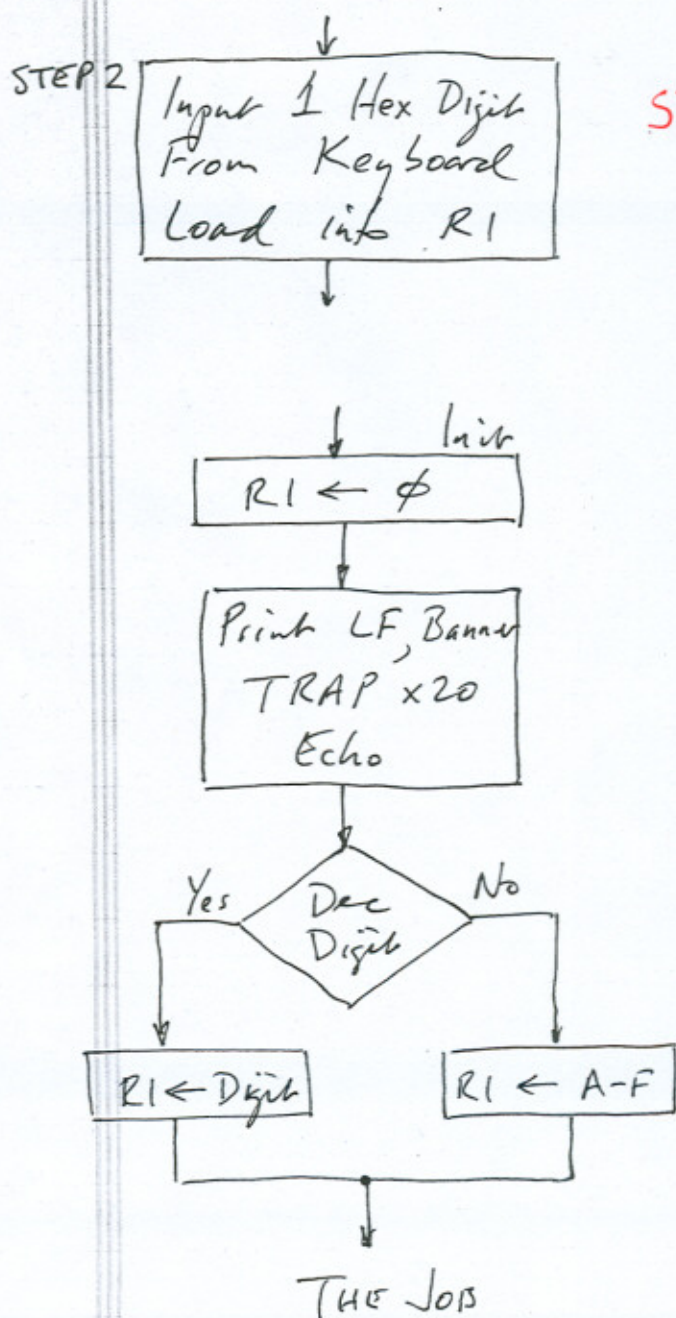
```
AF  LD R3, NEG_A
    ADD R3, R3, R0
    BRn BAD
    LD R3, NEG_F
    ADD R3, R3, R0
    BRp BAD
    ADD R2, R2, R2
    ADD R2, R2, R2
    ADD R2, R2, R2
    ADD R2, R2, R2
    LD R3, NEG_SS
    ADD R0, R0, R3
    ADD R2, R2, R0
    ADD R5, R5, #-1
    BR NEXT_IN
```

```
BAD  LD      LINEFEED
LEA R0, BAD NOT_HEX
    TRAP x21 21
    LEA R0, NOT_HEX
    TRAP x22
    BR NEXT_IN
```

```
INBANNER .STRINGZ "INPUT A HEX CHARACT DIGIT"
NOT_HEX .STRINGZ "THAT WAS NOT A HEX DIGIT"
LINEFEED .FILL x0A
NEGZERO .FILL xFFD0
NEGNINE .FILL xFFC7
```

```

NEG_A    .FILL xFFBF
NEG_F    .FILL xFFBA
NEG_SS   .FILL xFFC9
    
```



STEP 2 AND R1, R1, #ϕ

```

LD Rϕ, LINEFCD
TRAP x21
LEA Rϕ, ROTATION
TRAP x22
TRAP x20
TRAP x21
    
```

```

LD R3, NEGNINE
ADD R3, R3, Rϕ
BRp AF_ROT
    
```

```

AND Rϕ, Rϕ, xF
ADD R1, R1, Rϕ
BR THEJOB
    
```

```

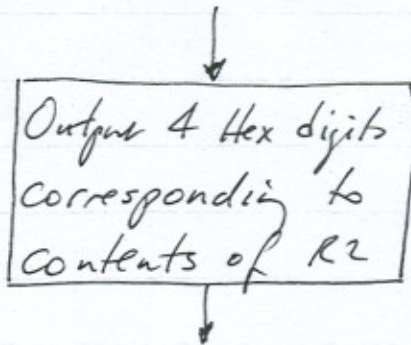
AF_ROT LD R3, NEG_SS
ADD Rϕ, Rϕ, R3
ADD R1, R1, Rϕ
BR THEJOB
    
```

ROTATION .STRANGE "INPUT HEX DIGIT (ROT)

EE 306 Supplemental Note
30 October 2006

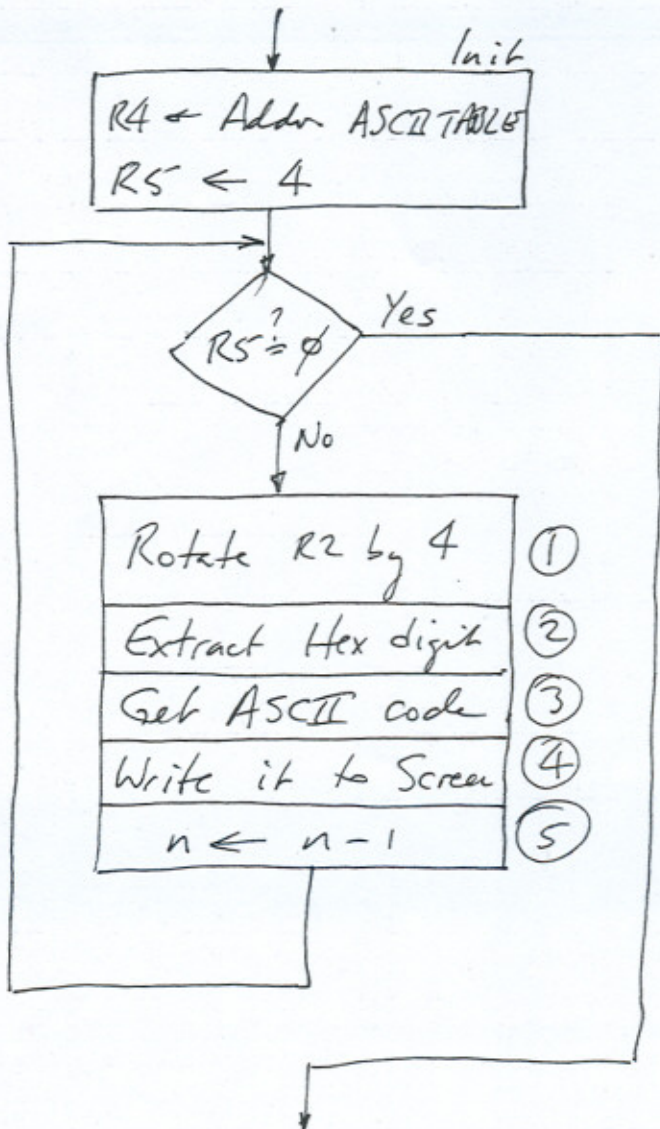
SHEET 5

DISPLAY_OUT LD R0, LINEFEED
TRAP x21



LEA R4, ASCII_TABLE
AND R5, R5, #0
ADD R5, R5, #4

AGAIN BRz DONE



① { AND R1, R1, #0
ADD R1, R1, #4
The job!

② AND R3, R2, ~~XF~~

③ { ADD R3, R3, R4
LDR R0, R3, #0

④ TRAP x21

⑤ { ADD R5, R5, #-1
BR AGAIN

DONE TRAP x25

ASCII_TABLE .FILL x30
.FILL x31
.FILL x32
:
.FILL x46