

15-410

“Don't make me stop the car...”

#define
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Outline

What's wrong with this picture?

Example 1

```
int scanbuf[64];
```

```
int getchar(void)
```

```
{
```

```
    ...
```

```
    if (++bufindex == 64)
```

```
        bufindex = 0;
```

```
    ...
```

```
}
```

Example 1 – Change Requirement

From: Dave Eckhardt

Subject: keyboard buffer size

Keyboard buffers must handle somebody placing a cat on the keyboard (the 101-key keyboard) .

Option 1

```
int scanbuf[256];

int getchar(void)
{
    ...
    if (++bufindex == 64)
        bufindex = 0;
    ...
}
```

Option 2

```
int scanbuf[64];
```

```
int getchar(void)
```

```
{
```

```
    ...
```

```
    if (++bufindex == 256)
```

```
        bufindex = 0;
```

```
    ...
```

```
}
```

Option 3 – *Try This At Home!!!*

```
#define KSB_SIZE 256
int scanbuf[KSB_SIZE];

int getchar(void)
{
    ...
    if (++bufindex == KSB_SIZE)
        bufindex = 0;
    ...
}
```

Example 2

```
int scanbuf[64];
```

```
int getchar(void)
```

```
{
```

```
    ...
```

```
    if (bufindex == 63)
```

```
        bufindex = 0;
```

```
    ...
```

```
}
```


Example 2 – Truly Pernicious

How to fix *half* of the problem

```
% grep 64 *.c
```

Wrong *two* ways

- Won't find 63
- Will find random unrelated 64's

Example 3

```
#define CENTER_X 40  
#define CENTER_Y 12
```

...

```
set_cursor_pos (CENTER_Y,  
                CENTER_X) ;
```

...

Example 3 – Change Requirement

From: Dave Eckhardt

Subject: new screen size

We have updated the VGA hardware initialization sequence. The new screen size will be:

```
#define CONSOLE_WIDTH 120
```

```
#define CONSOLE_HEIGHT 30
```

Example 4

...

```
p->regsave[-18] |= 0x402;
```

...

Don't make me stop the car.....