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 other 64's**

Example 3

```
#define CENTER_X 49
#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.....