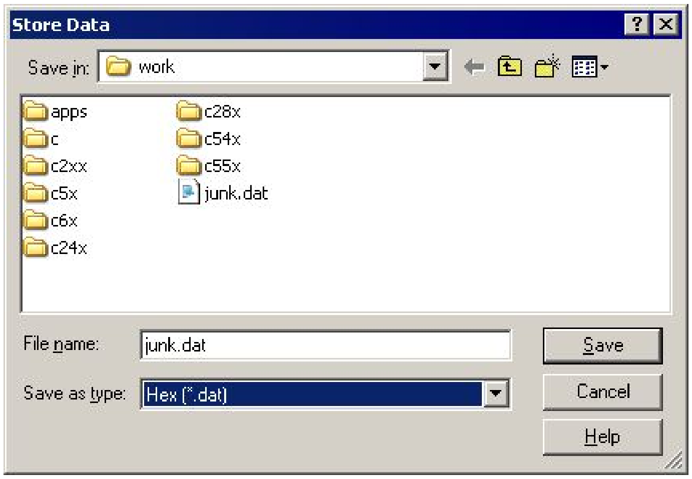
How to copy the flash contents of an unsecure device and reprogram it on another device

Follow this procedure if a simple save of the flash contents and reprogramming does not work. You need to dump the flash contents to a text file, and then create a new CCS project that creates a new .out file from the data. Here's what you'd need to do:

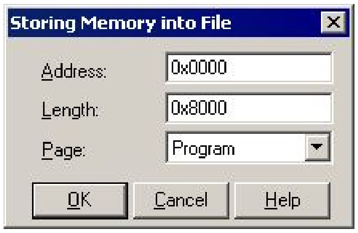
1) In CCS, do File->Data->Save. Name the filename to save to, and choose "Hex" as the Save as type. Click "Save".



File name: junk.dat

Save as type: Hex (*.dat)

You will be prompted for memory to save. Save the entire flash contents. For LF2407A or LF2406A for example, this is 0x0000 to 0x8000. Make sure to choose "Program" for the Page. Click OK.



Address: 0x0000

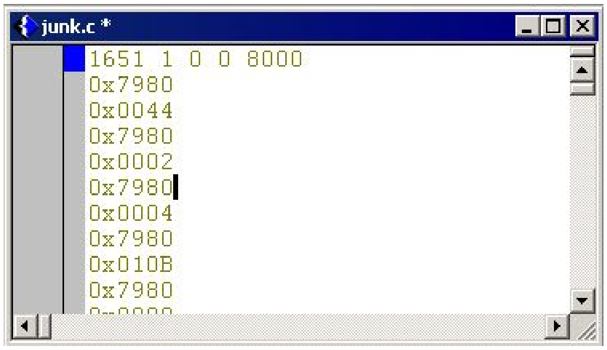
Length: 0x8000

Page: Program

2) Rename the saved file with a .c extension instead of the .dat extension.

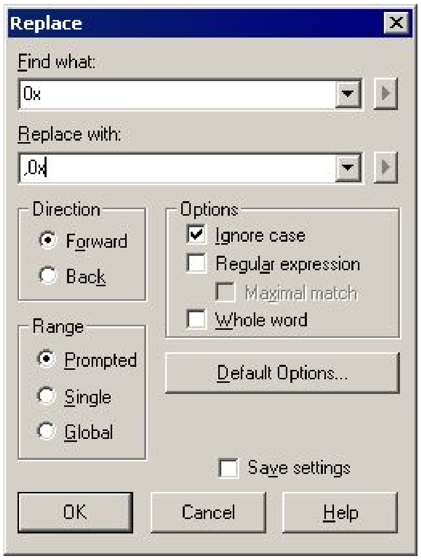
3) Start CCS, and create a new CCS project. Add the .c file to it.

4) Use the CCS editor to edit the .c file. It will look like this:



```
1651 1 0 0 8000
0x7980
0x0044
0x7980
0x0002
0x7980
0x0004
0x7980
0x010B
0x7980
```

You need to turn the data into a constant array in C code. Do this:
a) Delete the entire first line. That is, "1651 1 0 0 8000". This line is not part of the flash contents.
b) Insert a new first line that is this "const int x[32768]={"   (without the quotes of course).
c) Use find/replace in the editor to replace all occurrences of "0x" with ",0x". That's because array values need to be seperated by commas in C.



Replace

Find what: 0x

Replace with: ,0x

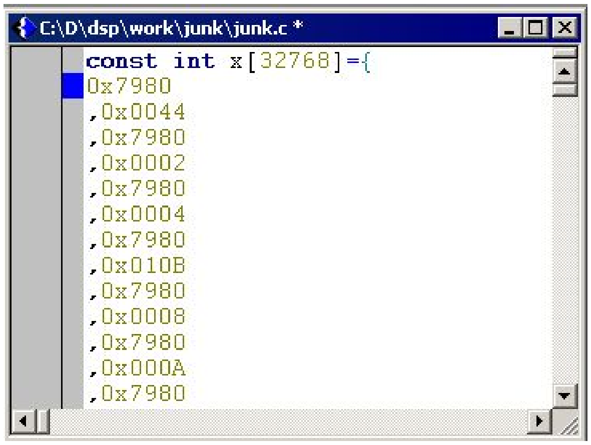
Direction: ● Forward ○ Back

Range: ● Prompted ○ Single ○ Global

Options: ☑ Ignore case □ Regular expression □ Maximal match □ Whole word

□ Save settings

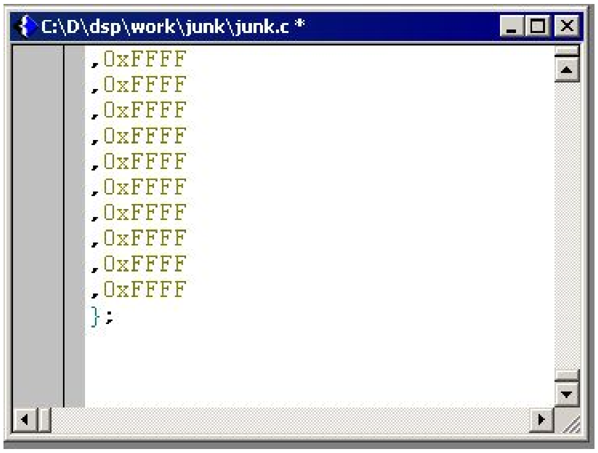
d) Delete the comma in front of the very first value:



C:\D\dsp\work\junk\junk.c *

```
const int x[32768]={
0x7980
,0x0044
,0x7980
,0x0002
,0x7980
,0x0004
,0x7980
,0x010B
,0x7980
,0x0008
,0x7980
,0x000A
,0x7980
```

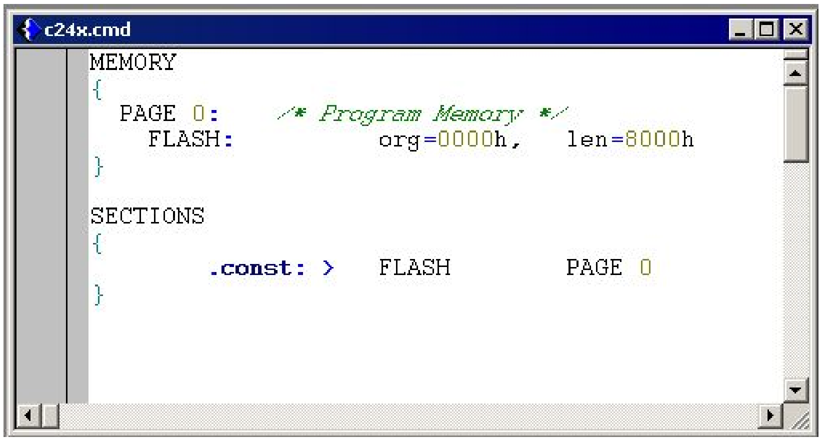
e) Make sure you terminate the array properly with a closing brace and semi-colon. Also insert a carriage return at the end since CCS wants source files to end with a carriage return (it will complain otherwise).



```
,0xFFFF
,0xFFFF
,0xFFFF
,0xFFFF
,0xFFFF
,0xFFFF
,0xFFFF
,0xFFFF
,0xFFFF
,0xFFFF
};
```

f) Save and close the .c file.

5) Create a new linker .cmd file that defines the flash memory in your device, and links the .const section there. Like this:

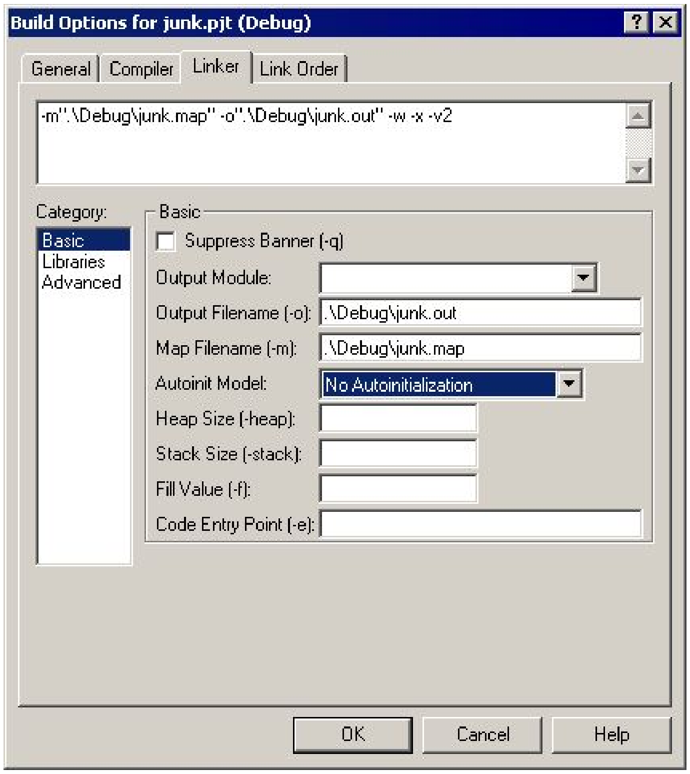


```
MEMORY
{
  PAGE 0:     /* Program Memory */
    FLASH:           org=0000h,    len=8000h
}

SECTIONS
{
        .const: >    FLASH         PAGE 0
}
```

Add the .cmd to your project.

6) In CCS, go to Project->Build_Options, and choose Linker tab. Change the autoinit mode to "No Autoinitialization". This keeps the _cint00 routine from the rts library from getting linked in.



Build Options for junk.pjt (Debug)

```
-m".\Debug\junk.map" -o".\Debug\junk.out" -w -x -v2
```

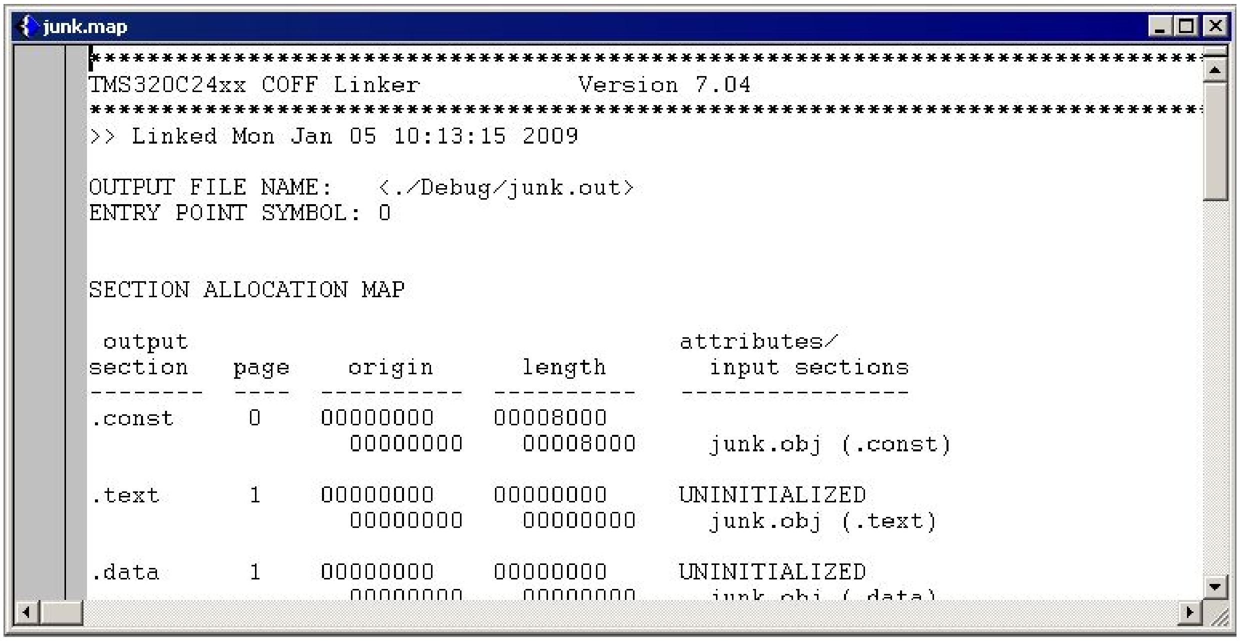
Category: Basic, Libraries, Advanced

Basic

- ☐ Suppress Banner (-q)
- Output Module:
- Output Filename (-o): .\Debug\junk.out
- Map Filename (-m): .\Debug\junk.map
- Autoinit Model: No Autoinitialization
- Heap Size (-heap):
- Stack Size (-stack):
- Fill Value (-f):
- Code Entry Point (-e):

7) Build the project. It should build without error. You may get a warning about -pd and -ps options being ignored. That is OK. That is a bug in CCS, and can be ignored.

8) You can inspect the .map file to see that the build worked correctly. You should see the flash completely populated with the .const section:



junk.map

```
******************************************************************************
TMS320C24xx COFF Linker          Version 7.04
******************************************************************************
>> Linked Mon Jan 05 10:13:15 2009

OUTPUT FILE NAME:   <./Debug/junk.out>
ENTRY POINT SYMBOL: 0


SECTION ALLOCATION MAP

 output                                       attributes/
section   page    origin      length          input sections
--------  ----  ----------  ----------      ----------------
.const     0    00000000    00008000
                  00000000    00008000        junk.obj (.const)

.text      1    00000000    00000000      UNINITIALIZED
                  00000000    00000000        junk.obj (.text)

.data      1    00000000    00000000      UNINITIALIZED
                  00000000    00000000        junk.obj (.data)
```

9) You can now use the flash utility to program the .out file you just created