

*TMS320 DSP
DESIGNER'S NOTEBOOK*

Designing Macros for the TMS320C5x

APPLICATION BRIEF: SPRA255

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Designing Macros for the TMS320C5x

Abstract

The TMS320 Assembler includes a powerful macro capability. It provides an effective way to generate a macro function that appears to be a normal instruction, including support of all the normal addressing modes. An example illustrating a lower-limit macro is used to demonstrate the capability. The lower-limit macro has the characteristics typical of many of the native 'C5x instructions.



Design Problem

What are the tricks to creating a macro that supports all the normal addressing modes for its parameter fields?

How can I be sure that I'm using the correct instruction (CRGT/CRLT) when I want to apply a lower/upper limit to a variable?

Solution

The TMS320 Assembler includes a powerful macro capability. It provides an effective way to generate a macro function that appears to be a normal instruction, including support of all the normal addressing modes. An example illustrating a lower-limit macro is used to demonstrate the capability. The lower-limit macro has the characteristics typical of many of the native 'C5x instructions.

Example 1. Code Listing, llimit.asm

```
llimit                .macro limit,shift,nextar
                        .nolist
;=====
;/                                FILE INFORMATION                                //
;/                                //
;/ (C) Copyright 1993 Texas Instruments. All rights reserved. //
;/   Use of copyright notice is precautionary and does imply //
;/   publication.                                           //
;/                                //
;=====
;/ File                : llimit.asm
;/
;/ Comments :       Perform a lower limit test. The result will be
;/                  in both the accumulator and the accumulator
;/                  buffer on exit.
;/                  The accumulator buffer must contain the value to
;/                  be tested upon entry. A total of three
;/                  parameters may be passed to llimit. These
;/                  parameters must satisfy the syntax for the
;/                  lacc/lac1 instructions. The limit parameter may
;/                  be an immediate value or an address in data
;/                  memory containing the value. If the limit
;/                  parameter is provided as a direct address or as
;/                  an indirect address, the data page pointer or the
;/                  ARP, respectively, must be properly set on entry.
;/                  In any case, the limit will be loaded into the
;/                  accumulator and accumulator buffer compared.
;/                  The greater of the two values, either the original
;/                  or the lower limit, will be loaded into both the
;/                  accumulator and the accumulator buffer.
;/
```




```
.elseif ($symcmp(tmp1,"#")==0)
.list
lacc      :limit::shft:
.nolist
.else
.list
.emsg      "ERROR - invalid macro parameter to llimit."
.mexit
.endif
.list
crgt
.endm
```