

**HowToCode7**

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## Chapter 1

# HowToCode7

### 1.1 HowToCode: Interrupts

Legal Interrupt Handling for Amiga Demos

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OS Legal interrupts are so easy to add and have such a very tiny overhead that it is a real pity that so many people ignore them...

Hardware interrupts are set with `AddIntServer` and removed with `RemIntServer` .

The best way to show how to use interrupts on the Amiga is with an example (thanks Bjorn!). I've pessimised it slightly (to make it a little more readable) and fixed one bug!

```
INTB_VERTB equ 5           ; for vblank interrupt
INTB_COPER equ 4           ; for copper interrupt

CALL: MACRO
    jsr    _LVO\1(a6)
ENDM

SystemOff:
    move.l  GfxBase, a6
    sub.l   a1, a1
    CALL    LoadView          ;Get default view
    CALL    WaitTOF
    CALL    WaitTOF
    CALL    OwnBlitter         ;Claim ownership of blitter
    move.l  $4.w, a6
    CALL    Forbid             ;Forbid multitasking
    moveq.l #INTB_VERTB, d0     ; INTB_COPER for copper interrupt
    lea     VBlankServer(pc), a1
    CALL    AddIntServer       ;Add my interrupt to system list
    rts

SystemOn:
    move.l  $4.w, a6
```

```

moveq.l  #INTB_VERTB,d0      ;Change for copper interrupt.
lea      VBlankServer(pc),a1
CALL     RemIntServer        ;Remove my interrupt
CALL     Permit              ;Permit multitasking
move.l   GfxBase,a6
CALL     DisownBlitter       ;Give blitter back
move.l   MyView,a1
CALL     LoadView            ;Load original view
rts

```

IntLevel3:

```

movem.l  d2-d7/a2-a4,-(sp)    ; all other registers can be trashed
...
movem.l  (sp)+,d2-d7/a2-a4

```

```

; If you set your interrupt to priority 10 or higher then
; a0 must point at $dff000 on exit.

```

```

moveq    #0,d0                ; must set Z flag on exit!
rts                                             ;Not rte!!!

```

VBlankServer:

```

dc.l  0,0                      ;ln_Succ,ln_Pred
dc.b  2,0                      ;ln_Type,ln_Pri
dc.l  IntName                   ;ln_Name
dc.l  0,IntLevel3              ;is_Data,is_Code

```

```

IntName:dc.b "Dexion & SAE IntLevel3",0      ; :-)
        EVEN

```

```

;-----

```

where MyView is filled in immediately after graphics.library  
have been opened:

```

..
move.l  GfxBase,a1
move.l  gb_ActiView(a1),MyView
...

```

## 1.2 exec.library/AddIntServer()

NAME

AddIntServer -- add an interrupt server to a system server chain

SYNOPSIS

```

AddIntServer(intNum, interrupt)
    -168      D0-0:4      A1

```

```

void AddIntServer(ULONG, struct Interrupt *);

```

FUNCTION

This function adds a new interrupt server to a given server chain.  
The node is located on the chain in a priority dependent position.  
If this is the first server on a particular chain, interrupts will

be enabled for that chain.

Each link in the chain will be called in priority order until the chain ends or one of the servers returns with the 68000's Z condition code clear (indicating non-zero). Servers on the chain should return with the Z flag clear if the interrupt was specifically for that server, and no one else. VERTB servers should always return Z set. (Take care with High Level Language servers, the language may not have a mechanism for reliably setting the Z flag on exit).

Servers are called with the following register conventions:

```
D0 - scratch
D1 - scratch

A0 - scratch
A1 - server is_Data pointer (scratch)

A5 - jump vector register (scratch)
A6 - scratch

all other registers must be preserved
```

#### INPUTS

intNum - the Paula interrupt bit number (0 through 14). Processor level seven interrupts (NMI) are encoded as intNum 15. The PORTS, COPER, VERTB, EXTER and NMI interrupts are set up as server chains.

interrupt - pointer to an Interrupt structure.

By convention, the LN\_NAME of the interrupt structure must point a descriptive string so that other users may identify who currently has control of the interrupt.

#### WARNING

Some compilers or assemblers may optimize code in unexpected ways, affecting the conditions codes returned from the function. Watch out for a "MOVEM" instruction (which does not affect the condition codes) turning into "MOVE" (which does).

#### BUGS

The graphics library's VBLANK server, and some user code, currently assume that address register A0 will contain a pointer to the custom chips. If you add a server at a priority of 10 or greater, you must compensate for this by providing the expected value (\$DFF000).

## 1.3 exec.library/RemIntServer()

#### NAME

RemIntServer -- remove an interrupt server from a server chain

#### SYNOPSIS

```
RemIntServer(intNum, interrupt)
    -174      D0      A1
```

```
void RemIntServer(ULONG, struct Interrupt *);
```

#### FUNCTION

This function removes an interrupt server node from the given server chain.

If this server was the last one on this chain, interrupts for this chain are disabled.

#### INPUTS

intNum - the Paula interrupt bit (0..14)

interrupt - pointer to an interrupt server node

#### BUGS

Before V36 Kickstart, the feature that disables the interrupt would not function. For most server chains this does not cause a problem.