

Use of the Transputer Event Line from Helios

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Whenever the transputer's event input is asserted, Helios responds by executing each of the handlers which have been added into the kernel's list. This technical note describes the Helios routines, `SetEvent()` and `RemEvent()`, which are used to add or remove the handler, and the event structure which is used to define the handler. An example C program is included to show how a simple handler is used.

1 The Event structure

The event structure is used to define the event handler. It is defined as:

```
struct Event
{
    struct Node Node;
    word Priority;
    void (*Handler)();
    word *Data;
    word Reserved;
};
```

The instance of `struct Node` is used to link this event handler into a list of handlers which is maintained by the kernel. The position of the handler within this list is determined by the `Priority` field; small numbers represent high priority handlers and large numbers represent lower priority ones. The `handler` field is used to store a pointer to the handler's code, and the `data` field contains a pointer to its data area; this data pointer is passed as an argument to the handler routine whenever it is called.

2 SetEvent()

This routine should be used to install an event handler within the kernel's list of handlers. The syntax of this routine is:

```
word SetEvent( Event *handler )          /* returns an error code */
```

When called, this routine uses the `priority` field in the `Event` structure to determine the handler's position in the list. The handler will always be inserted before other handlers that have a higher value in their `priority` field.

3 RemEvent()

This routine removes the specified event-handler from the kernel's handler list. The syntax of this routine is:

```
word RemEvent( Event *handler )           /* returns an error code */
```

4 An Example Program

```
/* Program to demonstrate the action of SetEvent and           *
 * RemEvent, plus the calling convention of the event routine. */

#include <syslib.h>
#include <event.h>
#include <sem.h>

/* these two templates should be in event.h, but aren't. */
word SetEvent(Event *event):
word RemEvent(Event *event);

void do_something(word *data, Event *event);

Event event = {           /* setup Event structure */
    NULL, NULL,
    0,
    do_something,
    NULL,
    NULL
}

Semaphore evsem;           /* event to process signal */

int main()
{
    InitSemaphore(&evsem, 0);
    SetEvent(&event);
    Wait(&evsem);
    RemEvent(&event);
    return 0;
}

/* Event handler routine */
void do_something(word *data, Event *event)
{
    Signal(&evsem);
}

```