

## LArSoft - Bug #11572

### Crash in uncompress for kHuffman

02/02/2016 12:08 PM - David Adams

|                        |                   |                        |            |
|------------------------|-------------------|------------------------|------------|
| <b>Status:</b>         | Rejected          | <b>Start date:</b>     | 02/02/2016 |
| <b>Priority:</b>       | Normal            | <b>Due date:</b>       |            |
| <b>Assignee:</b>       | Gianluca Petrillo | <b>% Done:</b>         | 0%         |
| <b>Category:</b>       |                   | <b>Estimated time:</b> | 0.00 hour  |
| <b>Target version:</b> |                   | <b>Spent time:</b>     | 0.50 hour  |
| <b>Occurs In:</b>      |                   | <b>Co-Assignees:</b>   |            |
| <b>Experiment:</b>     | -                 |                        |            |

#### Description

I get a crash in

```
void UncompressHuffman(const std::vector<short>& adc,  
std::vector<short> &uncompressed)
```

from lardata/RawData/raw.cxx. I believe it is because I have passed an empty vector in my call to

```
void Uncompress(const std::vector<short>& adc,  
std::vector<short> &uncompressed,  
int &pedestal,  
raw::Compress_t compress)
```

with compress = raw::kHuffman.

and UncompressHuffman tries to fill uncompress without allocating space:

```
uncompressed[0] = adc[0];
```

I believe UncompressHuffman (or Uncompress) should first ensure the vector is of appropriate size.

#### History

##### #1 - 02/04/2016 05:39 PM - Jonathan Insler

David Adams wrote:

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int &pedestal,  
raw::Compress_t compress)
```

with compress = raw::kHuffman.

and UncompressHuffman tries to fill uncompress without allocating space:

```
uncompressed0 = adc0;
```

I believe UncompressHuffman (or Uncompress) should first ensure the vector is of appropriate size.

This problem predates my involvement with raw.cxx. It looks like the original UncompressHuffman function doesn't resize std::vector<short> uncompressed, so it must be delivered to raw.cxx as the proper size.

##### #2 - 03/04/2016 10:57 AM - Gianluca Petrillo

- Status changed from New to Rejected

The function `raw::Uncompress()` expects the buffer to be fully allocated. Good old C style (or not so good).  
Of course, that is documented nowhere.

I will not change this behaviour, since the `uncompress` function does not necessarily know the size of the uncompressed data before inflating is completed. Progressively expanding the buffer can be inefficient.  
On the other end, the caller one, if the buffer comes from a `raw::RawDigit` the sample size is known and the caller can resize the buffer to the expected final size.

### **#3 - 03/04/2016 11:39 AM - Gianluca Petrillo**

I have pushed (develop branch in `lardata`) inline documentation to `Uncompress()` and `Compress()` functions, that are the functions that `LArSoft` originally supported.

I don't know enough of the current custom to personally support the others.

I believe the whole uncompression system (and maybe the compression too?) should be revisited, formalized and updated.  
There are already some utility classes in the event display that handle (in an attempted "smart" way) uncompressed data, and we may consider to promote them, or to write something better.