

---

Subject: Re: 10 bit packed as 8 bit unpacking  
Posted by [Craig Markwardt](#) on Tue, 19 Jun 2001 15:11:16 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

dmarshall@ivory.trentu.ca writes:

- > I would like to get the raw information from a 1280 by 960 image that has
- > 10 bit resolution. I can get at a dumped version that comes out in 8 bit
- > chunks.
- >
- > Could I read the image into a bytarr and "simply" reformat it as 10 bit?

This question comes up now and then. I think the answer, "simply," is sort of. You will probably use the ISHFT function to shift bits into place. However, IDL does not have a 10-bit data type, so you will have to load it into a 16-bit INT or UINT.

However, I do have a suggestion that might help: remember that every group of five bytes contains four data values. Thus, for speed, you can reformat the original array into quintuples of bytes, and then read out the interleaved array values with appropriate choices if ISHFT and bitwise AND.

```
n = 1280L & m = 960L
rawimg = bytarr(n*m*5/4)      ;; 10-bit is 20% more than 8-bit
readdatafromdisk, rawimg     ;; Read data however you do it

rawimg = reform(rawimg, 5, n*m/4)  ;; Reform into quintuples
outimg = intarr(4, n*m/4)        ;; Make new output image of quadruples
ii = lindgen(n*m/4)            ;; Indices for interleaved access

;; Interleave the bytes together
outimg(0,ii) = ishft(rawimg(0,jj) AND 'ff'x,2) + ishft(rawimg(1,jj) AND 'c0'x,-6)
outimg(1,ii) = ishft(rawimg(1,jj) AND '3f'x,4) + ishft(rawimg(2,jj) AND 'f0'x,-4)
outimg(2,ii) = ishft(rawimg(2,jj) AND '0f'x,6) + ishft(rawimg(3,jj) AND 'fc'x,-2)
outimg(3,ii) = ishft(rawimg(3,jj) AND '03'x,8) + ishft(rawimg(4,jj) AND 'ff'x, 0)

outimg = reform(outimg, n, m)     ;; Convert back to an NxM array
```

This will require some tweaking, but it is probably the best way to go. Check it out at least. The final result will be a 16-bit 2-d array suitable for manipulation in IDL.

Craig

--

-----  
Craig B. Markwardt, Ph.D.      EMAIL: [craigmnet@cow.physics.wisc.edu](mailto:craigmnet@cow.physics.wisc.edu)

---

Subject: Re: 10 bit packed as 8 bit unpacking  
Posted by [dmarshall](#) on Wed, 20 Jun 2001 13:37:14 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

This worked beautifully "right out of the box".  
Thanks,

Dave.

In article <onpuc07be3.fsf@cow.physics.wisc.edu>, Craig Markwardt  
<craigmnet@cow.physics.wisc.edu> writes:

```
>
> dmarshall@ivory.trentu.ca writes:
>
>> I would like to get the raw information from a 1280 by 960 image that has
>> 10 bit resolution. I can get at a dumped version that comes out in 8 bit
>> chunks.
>>
>> Could I read the image into a bytarr and "simply" reformat it as 10 bit?
>
> This question comes up now and then. I think the answer, "simply," is
> sort of. You will probably use the ISHFT function to shift bits into
> place. However, IDL does not have a 10-bit data type, so you will
> have to load it into a 16-bit INT or UINT.
>
> However, I do have a suggestion that might help: remember that every
> group of five bytes contains four data values. Thus, for speed, you
> can reformat the original array into quintuples of bytes, and then
> read out the interleaved array values with appropriate choices if
> ISHFT and bitwise AND.
>
> n = 1280L & m = 960L
> rawimg = bytarr(n*m*5/4)      ;; 10-bit is 20% more than 8-bit
> readdatafromdisk, rawimg     ;; Read data however you do it
>
> rawimg = reform(rawimg, 5, n*m/4)  ;; Reform into quintuples
> outimg = intarr(4, n*m/4)        ;; Make new output image of quadruples
> ii = linden(n*m/4)             ;; Indices for interleaved access
>
> ;; Interleave the bytes together
> outimg(0,ii) = ishft(rawimg(0,jj) AND 'ff'x,2) + ishft(rawimg(1,jj) AND 'c0'x,-6)
> outimg(1,ii) = ishft(rawimg(1,jj) AND '3f'x,4) + ishft(rawimg(2,jj) AND 'f0'x,-4)
> outimg(2,ii) = ishft(rawimg(2,jj) AND '0f'x,6) + ishft(rawimg(3,jj) AND 'fc'x,-2)
> outimg(3,ii) = ishft(rawimg(3,jj) AND '03'x,8) + ishft(rawimg(4,jj) AND 'ff'x, 0)
```

>  
> outimg = reform(outimg, n, m) ;; Convert back to an NxM array  
>  
> This will require some tweaking, but it is probably the best way to  
> go. Check it out at least. The final result will be a 16-bit 2-d  
> array suitable for manipulation in IDL.  
>  
> Craig  
>  
> --  
> -----  
> Craig B. Markwardt, Ph.D. EMAIL: craigmnet@cow.physics.wisc.edu  
> Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response  
> -----

---