



## Bugs: dmmerge

### Caveats

#### 1. *Extra GTI blocks in merged event file (16 Apr 2007)*

This caveat has been updated to use the subspace–editing capability added in CIAO 3.4. The previous title was "When two event files that have different ranges of exposure numbers (expno column) are merged, the output file will have two GTI blocks."

When merging ACIS event lists with `dmmerge`, the "data subspace" of the two event lists is combined. Due to a technical subtlety in the way that the EXPNO (ACIS frame exposure number) column is defined, this generates unwanted extra GTI extensions in the output file if the exposure numbers are not equal.

```

unix% dmmerge "acisf01587N002_evt2.fits,acisf07073N001_evt2.fits" NGC3379_merge.fits
unix% dmlist NGC3379_merge.fits blocks
-----
Dataset: NGC3379_merge.fits
-----

```

Block Name	Type	Dimensions
Block 1: PRIMARY	Null	
Block 2: EVENTS	Table	15 cols x 1392531 rows
Block 3: GTI7	Table	2 cols x 1 rows
Block 4: GTI2	Table	2 cols x 3 rows
Block 5: GTI5	Table	2 cols x 1 rows
Block 6: GTI6	Table	2 cols x 2 rows
Block 7: GTI3	Table	2 cols x 2 rows
Block 8: GTI8	Table	2 cols x 2 rows
Block 9: GTI7_CPT7	Table	2 cols x 1 rows
Block 10: GTI2_CPT8	Table	2 cols x 2 rows
Block 11: GTI5_CPT9	Table	2 cols x 1 rows
Block 12: GTI6_CPT10	Table	2 cols x 1 rows
Block 13: GTI3_CPT11	Table	2 cols x 2 rows
Block 14: GTI8_CPT12	Table	2 cols x 1 rows

This occurs because the filters could not be combined into a single, valid range for the chip. It is undesirable for further analysis, as the tools cannot use multiple GTI blocks for a single chip, resulting in incorrect exposure values.

#### Workaround:

The subspace–editing capabilities in CIAO 3.4 simplify the workaround for this issue. It is now possible to delete the EXPNO subspace before merging the files:

## Bugs: dmmerge – CIAO 3.4

```
unix% dmmerge \  
  "acisf01587N002_evt2.fits[subspace -expno],acisf07073N001_evt2.fits[subspace -expno]" \  
  NGC3379_merge_new.fits  
  
unix% dmlist NGC3379_merge_new.fits blocks  
  
-----  
Dataset: NGC3379_merge_new.fits  
-----  
  
      Block Name                Type          Dimensions  
-----  
Block   1: PRIMARY              Null  
Block   2: EVENTS               Table         15 cols x 1392531 rows  
Block   3: GTI7                 Table          2 cols x 2 rows  
Block   4: GTI2                 Table          2 cols x 5 rows  
Block   5: GTI5                 Table          2 cols x 2 rows  
Block   6: GTI6                 Table          2 cols x 3 rows  
Block   7: GTI3                 Table          2 cols x 4 rows  
Block   8: GTI8                 Table          2 cols x 3 rows
```

There are now just six GTI blocks in the output file.

**Merge\_all users:** a "[subspace -expno]" filter was added to the dmmerge command in merge\_all v3.6 as a workaround for this problem. Users no longer need to filter the data before using it as input to merge\_all.

Note that the addition of the subspace filter means that any user who intends to create lightcurves binned on exposure number from the merged output cannot use merge\_all, since that information is eliminated from the subspace. (In general, lightcurves are binned on time.)

### 2. *The tool sums exposure-related keywords (10 Oct 2007)*

Since dmmerge was designed to combine multiple observations, it **sums** exposure-related keywords (e.g. EXPOSURE, LIVTIME, ONTIME).

When combining an array of chips, e.g. to create a background file for a multi-chip observation, these values should not be summed. The ONTIME/LIVETIME/EXPOSURE keywords should match the value of the aim chip, which is the first GTI block by Chandra convention.

Here is an example of a merged file in which the values are the sum of the four individual ONTIMES, EXPOSUREs, and LIVTIMEs (1500000.0\*4=6000000.0):

```
unix% dmlist merged.fits header | egrep '(ONTIM|EXPOS|LIV)'  
0002 LIVTIME0 1500000.0 [s] Real8 Ontime multiplied by DTCOR  
0003 ONTIME0 1500000.0 [s] Real8 Sum of GTIs  
0004 EXPOSUR0 1500000.0 [s] Real8 Total exposure time, with all known corr. a  
0091 ONTIME 6000000.0 [s] Real8 Sum of GTIs  
0092 LIVETIME 6000000.0 [s] Real8 Ontime multiplied by DTCOR  
0093 EXPOSURE 6000000.0 [s] Real8 Total exposure time, with all kn
```

### Workaround:

Use `dmhedit` to correct all three header values, e.g.

```
unix% dmhedit merged.fits filelist="" op=add key=EXPOSURE value=1500000.0 unit=s
```

## Bugs

1. *Corrupt output if text columns of different lengths are merged.*

dmmerge does not check the the length of text columns before merging files. If the columns are different lengths, then the output is corrupted.

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URL:  
<http://cxc.harvard.edu/ciao3.4/bugs/dmmerge.html>  
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Bugs: dmmmerge – CIAO 3.4