# UIFF format

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This briefly documents the format reverse engineered from a single UIFF file. I think the solution will hold up more generally. Feedback is welcome.

The byte order of numbers in the file is all little endian, so bytes are going from LSB to MSB. Indicated lengths in the file are including the length number itself.

Below the analyzed file that I had.

There appear to be 2 types of headers

1. header which is followed by a size field ("UIFF", "LIST", etc). The size is not necessary a multiple of 4. The element after it is not necessarily of the same type, eg the "udih" next element is a LIST. For what I can see, these chained elements always point to another chained element. The contents after the size field come in 2 categories:
   1. Another header
   2. Just a bunch of bytes
2. header followed by data:
   1. another header ("hdrl", "UDI") or
   2. plain data ("vids")

You need to know the header type to properly parse the content.

With headers of type 1, we can skip unknown sub-content as they give size information.

Some headers are used in different ways. Particularly, "strh" header is used both as type 1 and type 2.

I marked type 1 headers in two ways. Some of these markers point to addresses inside an element. Such pointers are marked green. Others point to outside the element: the pointed-at address was already pointed at by some other pointer higher up in the hierarchy. These are marked as blue. I assumed that pointing to an element that is already higher in the hierarchy is the indication that the sub-element has ended.

The java code to read all this has separate classes for each header. New headers and handlers can easily be added.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ADDRESS | content |  |  |  |  | comments |
| 00000000 | "UIFF" | 1846ae04  -> UIFF @4AE4624 | 00000000 | "UDI " | "LIST" |  |
| 00000014 | 00150000  -> LIST @151c | 00000000 | "hdrl" | "udih" | 1C000000  ->LIST  @48 |  |
| 00000028 | 00000000 | 7205B40B | 00000000 | 1EB39B80 | 04000000 |  |
| 0000003C | 2F010000  #imgs | 01000000 | 00000000 | "LIST" | C8140000  -> LIST @151c |  |
| 00000050 | 00000000 | "strh" | "strh" | 3C000000  ->"strf"@a0 | 00000000 |  |
| 00000064 | "2Dus" | "B " | 00000000 | 00000000 | 00000000 |  |
| 00000078 | 2F010000  #imgs | 00000000 | 00000000 | 00000000 | 1EB39B80 |  |
| 0000008C | 04000000 | 7205B40B | 00000000 | 08F40300 | 00000000 |  |
| 000000A0 | "strf" | 70140000  ->LIST @151C | 00000000 | "vids" | 00001000  frame rate |  |
| 000000B4 | 800000AA | 00389B71 | 9031BA6D | BD67CF11 | A0F70020 |  |
| 000000C8 | AFD156E4 | 01000000 | 00000000 | 08F40300 | 6BFEACCC |  |
| 000000DC | 084A454D | 8C240899 | F4B176DD | 00000000 | 28140000 |  |
| 000000F0 | 00000000 | 00000000 | 00000000 | C6020000 | 7F000000 |  |
| 00000104 | 00000000 | 00000000 | C6020000 | FE000000 | 4B000000 |  |
| 00000118 | 00000000 | 0030E003 | 00000000 | 20000000 | C6020000 |  |
| 0000012C | FE000000  height? #palette? | 08000000  depth | FC030000  width | 08F40300  w\*h | 4B000000 |  |
| 00000140 | 00010000  array size? | 00B5FFFF  -19200  element1 | 00000000 | 00000000 | 01000000 | pallette? |
| 00000154 | 40420F00 | 97B5FFFF  -19049  element2 | 00000000 | 00000000 | 01000000 | ramps up with steps of 151 |
| 00000168 | 40420F00 | 2EB6FFFF  -18898  element3 |  |  |  |  |
|  |  | ...table... |  |  |  |  |
| 000014F0 | 40420F00 | D1490000 | 00000000 | 00000000 | 01000000 |  |
| 00001504 | 40420F00 | 684A0000 | 00000000 | 00000000 | 01000000 |  |
| 00001518 | 40420F00 | "LIST" | FC30AE04  offset to | 00000000  UIFF @0x4AE4624 | "strd" | 151C-144=13D8  13D8/(4\*5)=254 |
| 0000152C | "00ft" | 70140000  ->"00bb" @29a8 | 00000000 | "vids" | 00001000 |  |
| 00001540 | 800000AA | 00389B71 | 9031BA6D | BD67CF11 | A0F70020 |  |
| 00001554 | AFD156E4 | 01000000 | 00000000 | 08F40300 | 6BFEACCC |  |
| 00001568 | 084A454D | 8C240899 | F4B176DD | 00000000 | 28140000 |  |
| 0000157C | 00000000 | 00000000 | 00000000 | C6020000 | 7F000000 |  |
| 00001590 | 00000000 | 00000000 | C6020000 | FE000000 | 4B000000 |  |
| 000015A4 | 00000000 | 0030E003 | 00000000 | 20000000 | C6020000 |  |
| 000015B8 | FE000000  height? #palette? | 08000000  depth | FC030000  width | 08F40300  w\*h | 4B000000 |  |
| 000015CC | 00010000  array size? | 00B5FFFF  -19200  element1 | 00000000 | 00000000 | 01000000 | same pallette again? |
| 000015E0 | 40420F00 | 97B5FFF-19049  element2 | 00000000 | 00000000 | 01000000 |  |
| .... |  | ...table... |  |  |  |  |
| 0002990 | 40420F00 | 684A0000 | 00000000 | 00000000 | 01000000 |  |
| 00029A4 | 40420F00 | "00bb" | 38F40300  -> "00bb" @0x41DE8 | 00000000 | 30000000 | img header? |
| 00029B8 | 00000000 | 19010000  flags? | 08F40300  w \* h | 1EB39B80 =2157687582  time \* 0.1us | 04000000 |  |
| 00029CC | E076A580 | 04000000 | 00000000 | 00000000 | 00000000 |  |
| 00029E0 | 08F40300  w\*h | 5D78767B  imgstart | 7B695050 | 6760466D | 93A6A89C | img data |
| ........ |  | w\*h =0x3F408 bytes |  |  |  |  |
| 0041DE8 | 3F4E3F2F  imgend | "00bb" | 38F40300  ->"00bb" @0x81230 | 00000000 | 30000000 | 41DE8-29A4=3F444 |
| 0041DFC | 00000000 | 11010000  flags? | 08F40300  w \* h | E176A580 =2158327521  time \* 0.1us | 04000000 | dt=639939 |
| 0041E10 | 093BAF80 | 04000000 | 00000000 | 00000000 | 00000000 |  |
| 0041E38 | 08F40300  w\*h | 5C7D8188 | 836D6B79 | 816C5A73 | 607C867A |  |
| ....... |  | w\*h bytes |  |  |  |  |
| 008122C | 403E383F  imgend | "00bb" | 38F40300  ->"00bb" | 00000000 | 30000000 | 008122C - 0041DE8=3F444 |
| 0081240 | 00000000 | 11010000 | 08F40300  w\*h | 0A3BAF80 =2158967562  time \* 0.1us | 04000000 | dt=640041 |
| 0081254 | 809BB980 | 04000000 | 00000000 | 00000000 | 00000000 |  |
| 0081268 | 08F40300  w\*h |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 4AA51E0 | 29394148 | "00bb" | 38F40300  -> "UIFF" @0x4AE4624 | 00000000 | 30000000 | start of last block |
| 4AA51F0 | 00000000 | 11000000 | 08F40300  w\*h | 8FB84F8C=  2354034831  time \* 0.1us | 04000000 | T-T0=19..6s |
| 4aa5204 | 90B84F8C | 04000000 | 00000000 | 00000000 | 00000000 |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ....... |  | w\*h bytes |  |  |  |  |
| 4AE4620 | 131B3C34  last img end | "UIFF" | ECE70300  -> UIFF @4B22E1C | 00000000 | 02000000 |  |
| 4AE4634 | 02000000 | DCE70300 | 00000000 | 00010000 | 00FFFFFF |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 4B22E0C | 00000000 | 00001010 | 00000000 | 0000000B | "UIFF" |  |
| 4B22E20 | 472E0100  -> UIFF  @4B35C6F  (!!!) | 00000000 | 04000000 | 04000000 | 372E0100 |  |
| 4B22E34 |  |  |  |  |  |  |
| 4B22E48 | 000C0200 | 0000 ?E | choW | ave, | Ver |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 4B35C64 | 00000006 | 72000000 | 01310B U | IFFw | D2000000  -> @?? |  |
| 4B35C78 | 00000001 | 00000001 | 00000067 |  |  |  |