TITLE: A Catalog of FOC Calibration Images

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We have constructed a catalog of FOC calibration images on the FOC VAX 11/785. This report will serve to describe briefly the content and format of the catalog. The catalog was constructed by writing a program to scan FOC data tapes and extract header data from each of the images. The average pixel value was also calculated for each image. The headers were concatenated along with the average count values and stored in a text file on disk. This text file was used as input to a CDBS/FOC program that creates a MIDAS format table file that has a column for each header keyword. In turn, this table file is used by a specially written MIDAS program to generate a new table file with somewhat different formats for output, different column names, and different keyword values to make the header information more consistent. At this time, we have scanned all FOC SDS format images in our possession (currently a total of 42 tapes and 1864 images). We have also scanned the only PDA SDS format tape in (the long exposure images). SDS PDA images have many temperatures and voltages in the header which can be added to the catalog. We can also add to the catalog image headers that are stored on disk as part of SDAS image files allowing us to add image header data that was originally not in a SDS format. It should be possible to add the catalog to the IDM using CDBS utilities.

Now that information about these exposures is stored in a MIDAS table, all the MIDAS utilities for manipulating tables are available. In particular, one can relatively easily search for images that satisfy certain selection criteria by using the MIDAS SELECT command (now available in SDAS also). For example, one can list all images in 512 by 1024 zoomed format for PFM2 easily. Keep in mind, however, that several of the image headers contain errors so a search may miss images or include inappropriate images because of these errors. These errors, when noticed, may be corrected in the headers and rebuilding the table. Tracking of such changes is possible by editing the headers and using the VAX DIFF utility. Attached is a list of all FOC calibration tapes that are in SDS format with comments describing them. The ones not marked as being in our possession are not included in the catalog. Also attached is a list of the column names for the intermediate and final

DISTRIBUTION:

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form tables and allowed values for each. We hope that this catalog will prove valuable in locating images for production of calibration files, and for intercomparison of images.
LIST OF ALL SDS FORMAT FOC EXPOSURE TAPES

* after tape number means we have here

<table>
<thead>
<tr>
<th>tape</th>
<th>comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>MATRA exposures - ambient</td>
</tr>
<tr>
<td>5</td>
<td>tape is incomplete, awaiting complete version</td>
</tr>
<tr>
<td>11</td>
<td>ESTEC exposures - vacuum</td>
</tr>
<tr>
<td>28</td>
<td>STDS exposures - see Francesco</td>
</tr>
<tr>
<td>29</td>
<td>STDS exposures - see Francesco</td>
</tr>
<tr>
<td>30</td>
<td>tests of data interface after the replacement of the SDS</td>
</tr>
<tr>
<td>31</td>
<td>IST exposures to verify equipment integration, exp 1-9 badly saturated, tape is incomplete, awaiting complete version</td>
</tr>
<tr>
<td>32</td>
<td>Kohler tube exposures</td>
</tr>
<tr>
<td>33</td>
<td>scattered light tests - source misaligned, exposures useless</td>
</tr>
<tr>
<td>34</td>
<td>Beginning of 1984 Goddard TV tests - REM, FAL, ALV ambient</td>
</tr>
<tr>
<td>35</td>
<td>SAL, REM, FLU, LED, REL - vacuum</td>
</tr>
<tr>
<td>36</td>
<td>REL, LED, FLU - vacuum</td>
</tr>
<tr>
<td>37</td>
<td>REM, LED, ABS, SAL - vacuum</td>
</tr>
<tr>
<td>38</td>
<td>SAL, DRK, FLU, REL - vacuum</td>
</tr>
<tr>
<td>39</td>
<td>REL, ABS, DRK, EXP, SAL, FLU, SPC - vacuum</td>
</tr>
<tr>
<td>40</td>
<td>SPC, SCA, FLU, ITF, REL - vacuum</td>
</tr>
<tr>
<td>41</td>
<td>REL, SAL, TS, FLU, ABS, ITF - vacuum</td>
</tr>
<tr>
<td>42</td>
<td>REL, MAP, FLU, DRK, ABS - vacuum</td>
</tr>
<tr>
<td>43</td>
<td>DRK, STA, SAL, ITF, ABS - vacuum, ambient</td>
</tr>
<tr>
<td>44</td>
<td>FAL, TST - ambient</td>
</tr>
<tr>
<td>45</td>
<td>OBC dumps, no useful calibration data</td>
</tr>
<tr>
<td>46</td>
<td>PFM2,3 tests, no useful calibration data</td>
</tr>
<tr>
<td>47</td>
<td>same as 46, no useful calibration data</td>
</tr>
<tr>
<td>48</td>
<td>same plus investigation of different focus coil and filter networks, no useful calibration data</td>
</tr>
</tbody>
</table>
- focus coil investigation, coron. finger adjust, no useful data
- no useful calibration data
- calibration preparations, no useful calibration data
- Start of 2nd calibration run - AIT, ALV, DRK, VIT, FLU, ITF, ambient, vacuum
- LED, ITF, ABS, SAL, MIT, POL, REL - vacuum
- REL, ITF, VIT, ABS, LED, FLU, COR - vacuum
- REL, LED, FLU, POL, ABS, HAL - vacuum
- FLU, ABS, POL, ITF, LED, VIT, IFL, DRK, SAL, FLV - vacuum
- IFL, LED, ABS - vacuum
- ABS, LED, DRK, FLU, SPC, IFL, VIT - vacuum
- IFL, LED, FLU, REL, VIT, POL, OBJ - vacuum
- End of Goddard TV, REL, LED, TRM, IFL, VIT, AIT - vacuum, ambient
- Post rework verification, OBC dumps, internal exposures.
- Kohler tube exposures of PFM2, 3
- Lockheed exposures begin - R&I, IST exposures
- Chris Blades exposures
- Chris Blades exposures (red leak, ITF, stab, long)
- PFM4 exposures
- PFM4 exposures
- copy of SATS exposures

Key to exposure types

ABS - absolute DE exposure
AIT - ambient ITF
ALV - alignment verification
COR - coronagraphic fingers
DRK - dark count exposure
FAL - final alignment
FLU - rough check on count rate (flux check)
HAL - HRA alignment
ITF - intensity transfer function
LED - LED exposure
MAP - source uniformity measurements
MIT - monitoring of ITF changes?
OBJ - objective prism
POL - polarization
REL - relative DE exposure
REM - remanence test (for target burn-in)
SAL - spectral alignment
SCA - scattered light test
SPC - spectral calibration
SPT - special performance test
STA - geometric stability?
TRM - trim coil
TS - troubleshoot
TST - remanence test
VIT - vacuum ITF
KEY TO COLUMN NAMES AND ALLOWED VALUES

:TAPE  The tape number.

:RUN  The run number. The first two digits are the tape number and
the last two digits are the file number on that tape.

:C  The configuration.
 F = FOC level exposure
 P = PDA level exposure

:U  The detector unit number
 1 = PFM1
 2 = PFM2
 3 = PFM3
 4 = PFM4

:TY  Exposure type. The first three characters of the name given
to the exposure. Pre- and post-Goddard TV images tend not to
have a three letter code at the beginning of the name. See
tape list for meaning of these codes

:IDENT  The rest of the exposure name.

:MSK  Mask used for exposure.
 NO = none
 FF = flat field
 LI = spectral line source
 CX = complex, i.e. not a flat field
 Note that this column has many spectral line source exposures
 labeled as flat fields.

:MODE  Optical Mode. The following permitted values are self-explanatory.
 F48
 F96
 F288
 SPEC

:VF  Video format. This field is formed from three characters "ABC"
where
 A:  blank = normal (unzoomed) mode
     Z = zoomed mode
 B: number of pixels per line given as follows
    1 = 512
    2 = 256
    3 = 128
    4 = 64
 C: number of lines per frame
    0 = 1024
    1 = 512
    2 = 256
    3 = 128
    4 = 64
 For example, Z10 refers to a zoomed 512 by 1024 image and
22 refers to a 256 by 256 image.

:SX  Offset of starting x position (0 to 1024).

:SY  Offset of starting y position (0 to 1024).
:LAMP  Light source used.
      NONE  = guess
      LED   = light emitting diode
      OBC   = ?
      QI    = quartz iodine
      QIP   = polarized quartz iodine
      H2    = hydrogen
      Hg    = mercury
      Hcz   = mercury, cadmium, zinc tube
      KT    = Kohler tube
      N2    = nitrogen
      STOS  = ask Francesco
      ?     = unknown

:LED   LED identification. Blank or NO if not used.

:INT   LED intensity setting (0 to 255)

:LAMB  Wavelength in angstroms.

:LTLV  Light level. Uncertain meaning.

:EXP   Exposure time in seconds.

:MEANCT Mean counts per pixel. Calculated from data, not assumed.

:MEANCR Mean count rate per pixel (counts/sec). Also calculated from data.

:F1, F2, F3, F4

:P     Pressure.
      A  = ambient
      V  = vacuum

:LOC   Location.
      GSFC = Goddard
      LMSC = Lockheed
      MATR = Matra
      ESTC = ESTEC

:D     Day of exposure

:MO    Month

:Y     Year

:H     Hour

:M     Minute

:S     I hope you've got the idea by now.

:S1, S2, S3

:S1, S2, S3

:C1, C2 Comment fields

:C3    Our comments
Below is a listing of the column names and meaning of the intermediate table. Except for :CAMMODE, references to other columns are to columns described above.

:TAPE   Tape name.
:FILE   File number on tape
:DETECTOR e.g. FOC
:MODEL  which PDA unit

NOTE !!!! not the same as :U in the final table. Here
1 = PFM1
2 = PFM2
3 = PFM3
4 = PFM2 (after it was fixed)
5 = PFM4 (just to confuse you)

:RUN    same as :RUN
:PLACE  corresponds to :P but inconsistent in values for the same place
:IDENT  same as :TY and :IDENT combined
:LAMP   corresponds to :LAMP but very inconsistent in descriptors used.
:MASK   corresponds to :MSK but inconsistent in descriptors used.
:LIGHTLEV  same as :LTLV
:WAVELEN wavelength in nanometers
:TEMP   temperature
:PRESSURE corresponds to :P but some inconsistencies
:SPIX   same as :SX
:SLINE  same as :SY
:HOUR   same as :H
:MIN    same as :M
:SEC    same as :S
:DAY    same as :D
:MONTH  same as :MO
:CALCT  meaning uncertain
:RFM    refocus mechanism position
:CGMODE coronagraphic mode (IN or OUT)
:EXPTIME same as :EXP
:ACCESS meaning uncertain
:FNO    optical chain (F48 or F96). Not the same as :MODE
:NPIX   number of pixels in a line
:NLINE  number of lines in a frame
:ZOOM   zoom on or off.
:SMMODE spectral mirror mode (IN or OUT)
:OPTELT1 same as :F1
:OPTELT2 :F2
:OPTELT3 :F3
:OPTELT4 :F4
:CAMMODE apparently redundant with :CGMODE
:CAL    meaning uncertain
:LEDID  same as :LED
:LEDINT same as :INT
:SDSST1  same as :S1
:SDSST2  same as :S2
:SDSST3  same as :S3
:DNFORMT pixel storage size (8 or 16 bit)
:TRIM   trim coil adjustment mode
:C1,C2  comment fields
:MEAN   same as :MEANCT