

**FOS Inverse Sensitivity Reference Files:  
A Quick Reference Guide to the Appropriate  
File for a Particular Date and Instrumental Configuration**

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**Abstract**

In convenient matrix format are complete tabulations of the currently installed FOS Inverse Sensitivity reference files for all combinations of spectral element and aperture. Also provided is a user-friendly summary of all FOS Inverse Sensitivity observations and references to their detailed analyses.

**I. Introduction**

The Faint Object Spectrograph (FOS) has some 324 combinations of detector, grating, aperture, and polarizer that may be calibrated. Of course, not all combinations are commonly used or likely to be used and unique inverse sensitivity (IVS) observations have not been made with all apertures for many configurations.

Currently only one USE\_AFTER (the date on which a specific calibration reference file becomes valid) entry exists for all of these combinations, but there have been multiple deliveries of every combination, so that over 1000 individual reference files have been installed to date in the CDBS at STScI. The task of deciding which reference file to use in the reduction or re-processing of data taken with a particular instrumental configuration is quite formidable.

This report presents in tabular form, *AS OF JUNE 30, 1993*, the currently installed inverse sensitivity reference file names and their USE\_AFTER dates for all supported FOS instrumental configurations.

ASCII text and Postscript versions of the tables and explanatory text in this report will be maintained on STEIS and will be available for anonymous ftp from *stsci.edu*. Both the STEIS tables and explanatory text will be updated periodically.

## II. Description of the Tables

The columns of Tables 1 through 6 correspond to each of the allowed spectral elements for a particular detector/polarizer configuration and the rows of these tables list each of the fifteen calibrated FOS aperture positions. Each cell defined by this matrix structure contains one or more entries of the form *yyyymmdd abcdefghi.r2h,.r2d* where *yyyymmdd* is the USE\_AFTER date and *abcdefghi.r2h* is the name of the inverse sensitivity reference HEADER file and *abcdefghi.r2d* is the name of the inverse sensitivity reference DATA file for this USE\_AFTER date.

For some combinations of aperture and spectral element, several reference file deliveries have been made since launch. This has occurred due to the continuing acquisition and analysis of IVS monitoring observations. The listings presented here contain *only the most recent (the best)* reference file delivery.

Tables 1 and 2 list the non-polarimetric inverse sensitivity reference files for spectral elements used with the FOS/RED detector and Tables 3 and 4 list the non-polarimetric reference files for FOS/BLUE. Tables 5 and 6 provide polarimetric IVS reference files for the BLUE and RED detectors respectively.

## III. Overview of the Data and Important References

FOS inverse sensitivity observations have been made at a variety of epochs as part of different proposals. However, only three are discussed here. The history of earlier epochs will be addressed later in a different Instrument Science Report.

### Cycle 1 Inverse Sensitivity Files:

These files are based on observations of three spectrophotometric standard stars (HZ-44, BD+28D4211, and BD+75D325) made between 1991.4 and 1992.0 in proposals 2823 and 3106. They were used in the Fall 1992 data reprocessing. These files can be identified by the first three characters of the reference file rootname - "c3u".

As reported in CAL/FOS-077, J.D. Neill, *et al.*, April 1992, observations between 1991.0 and 1992.2 show a 10% decrease in sensitivity for the blue detector for all wavelengths, and a 5% sensitivity decrease for the red detector, except in the wavelength range of 1800-2100Å where it is roughly 10% per year decrease. For observations before 1991.0, please refer to this report.

Analysis is currently in progress in determining the inverse sensitivity for epochs later than 1992.2. Preliminary analysis indicates a leveling off in both detectors except for the wavelength range of 1800-2100Å on the red detector. The goal is to create an algorithm that can be applied to the current inverse sensitivity files to produce an IVS appropriate to a specified observation date rather than delivering new files with new USE\_AFTER dates (private communication, R. Bohlin - June 1993).

### Special "Unity" Inverse Sensitivity Files for Particular Apertures:

For both detectors in the A-2 (0.5-PAIR), A-3 (0.25-PAIR), A-4 (0.1-PAIR), C-1 (1.0-PAIR), C-3 (2.0-BAR), and C-4 (0.7x2.0-BAR) apertures, "unity" IVS reference files have been delivered for *all* spectral elements. These files were delivered in March, 1993 and replaced the pre-launch files which were off by up to a factor of 2 (private communication, R. Bohlin - April 1993). These files can be identified by the first three characters of the reference rootname - "d3u".

"Unity" IVS reference files have been delivered for the FOS/BLUE single apertures {A-1 (4.3), B-1 (0.5), B-2 (0.3), B-3 (1.0), C-2 (0.25x2.0)} for gratings H57 and L65. These files were delivered in April, 1993 and can be identified by the first three characters of the reference rootname - "d4u".

For the FOS/BLUE B-1 (0.5) polarimetry configurations (polar\_id = B, H13, H19, H27 gratings) and the FOS/RED polarimetry configurations, "unity" IVS reference files were also delivered. These files were delivered in April, 1993 and can be identified by the first three characters of the reference rootname - "d4s".

### Polarimetry Inverse Sensitivity Files:

Polarimetric observations of BD+28D4211 were made in SV proposal 3235 for the three supported FOS/BLUE polarimetric spectral elements in apertures A-1 (4.3) and B-3 (1.0). These files were delivered in January, 1992. See CAL/FOS-078, R.G. Allen and P.S. Smith, March, 1992 for more details.

FOS/RED polarimetric IVS files will be delivered in Fall, 1993 based on Cycle 3 observations. Only the A-1 (4.3) aperture for the H19-Polarizer B, H27-Polarizer B, and H40-Polarizer A will be supported.

## **IV. Availability of this Information and Updates**

Periodically updated ASCII text and Postscript versions of the explanatory text and the Tables herein will be maintained in the /instrument\_news/fos/ sub-directory on STEIS and will be available for anonymous ftp from *stsci.edu*. The files will be named "ivs\_tables\_mmmmyy.ps" and "ivs\_tables\_mmmmyy.asc", where the extension "ps" indicates the Postscript version, the extension "asc" denotes the ASCII version, and "mmmmyy" is the posting date in month and year. For example, the first files delivered are "ivs\_tables\_jun93.ps" and "ivs\_tables\_jun93.asc". Current inverse sensitivity information is also available from the STScI Research Support Branch Analysis Hot Line (telephone: (410) 338-1082 or email: *analysis@stsci.edu*). Copies of this report may be obtained by contacting the SIB secretary at STScI (telephone: (410) 338-4955).

## References

Allen,R.G. and Smith,P.S., 1992, Instrument Science Report CAL/FOS-078.

Neill,J.D., Bohlin,R.C., and Hartig,G.,1992, Instrument Science Report CAL/FOS-077.

## Notes for TABLE interpretation

*yyyymmdd* : USE\_AFTER date (4-digit year A.D., 2-digit month, 2-digit day)

*abcdefghi.r2h,.r2d* : rootname of inverse sensitivity reference files and extensions for header and data files.

The letter "l" in rootnames in the tables is italicized ("*l*") to make it more legible.

FOS INVERSE SENSITIVITY REFERENCE FILES

Table 1: RED H19,H27,H40,H57 REFERENCE FILES

Aperture	H19	H27	H40	H57
A-1 (4.3)	19900101 c3u1339hy.r2h.,r2d	19900101 c3u1339y.r2h.,r2d	19900101 c3u1340ay.r2h.,r2d	19900101 c3u1340y.r2h.,r2d
A-2 (0.5 pair) UPPER	19900101 d3u1351sy.r2h.,r2d	19900101 d3u1351sy.r2h.,r2d	19900101 d3u1351sy.r2h.,r2d	19900101 d3u1351sy.r2h.,r2d
A-2 (0.5 pair) LOWER	19900101 d3u1351ry.r2h.,r2d	19900101 d3u1351ry.r2h.,r2d	19900101 d3u1351ry.r2h.,r2d	19900101 d3u1351ry.r2h.,r2d
A-3 (0.25 pair) UPPER	19900101 d3u13520y.r2h.,r2d	19900101 d3u13520y.r2h.,r2d	19900101 d3u13520y.r2h.,r2d	19900101 d3u13520y.r2h.,r2d
A-3(0.25 pair) LOWER	19900101 d3u1351ty.r2h.,r2d	19900101 d3u1351ty.r2h.,r2d	19900101 d3u1351ty.r2h.,r2d	19900101 d3u1351ty.r2h.,r2d
A-4 (0.1 pair) UPPER	19900101 d3u13522y.r2h.,r2d	19900101 d3u13522y.r2h.,r2d	19900101 d3u13522y.r2h.,r2d	19900101 d3u13522y.r2h.,r2d
A-4 (0.1 pair) LOWER	19900101 d3u13521y.r2h.,r2d	19900101 d3u13521y.r2h.,r2d	19900101 d3u13521y.r2h.,r2d	19900101 d3u13521y.r2h.,r2d
B-1 (0.5)	19900101 c3u1339fy.r2h.,r2d	19900101 c3u1340ly.r2h.,r2d	19900101 c3u1340dy.r2h.,r2d	19900101 c3u1340ty.r2h.,r2d
B-2 (0.3)	19900101 c3u1339oy.r2h.,r2d	19900101 c3u13403y.r2h.,r2d	19900101 c3u1340gy.r2h.,r2d	19900101 c3u13412y.r2h.,r2d
B-3 (1.0)	19900101 c3u1339qy.r2h.,r2d	19900101 c3u13405y.r2h.,r2d	19900101 c3u1340ky.r2h.,r2d	19900101 c3u13414y.r2h.,r2d
C-1 (1.0 pair) UPPER	19900101 d3u13524y.r2h.,r2d	19900101 d3u13524y.r2h.,r2d	19900101 d3u13524y.r2h.,r2d	19900101 d3u13524y.r2h.,r2d
C-1 (1.0 pair) LOWER	19900101 d3u13523y.r2h.,r2d	19900101 d3u13523y.r2h.,r2d	19900101 d3u13523y.r2h.,r2d	19900101 d3u13523y.r2h.,r2d
C-2 (0.25x2.0 slit)	19900101 c3u1339sy.r2h.,r2d	19900101 c3u13408y.r2h.,r2d	19900101 c3u1340ny.r2h.,r2d	19900101 c3u13415y.r2h.,r2d
C-3 (2.0-BAR)	19900101 d3u13525y.r2h.,r2d	19900101 d3u13525y.r2h.,r2d	19900101 d3u13525y.r2h.,r2d	19900101 d3u13525y.r2h.,r2d
C-4 (0.7x2.0-BAR)	19900101 d3u13526y.r2h.,r2d	19900101 d3u13526y.r2h.,r2d	19900101 d3u13526y.r2h.,r2d	19900101 d3u13526y.r2h.,r2d

Table 2: RED H78,L15,L65,PRI REFERENCE FILES

Aperture	H78	L15	L65	PRISM
A-1 (4.3)	19900101 c3u13417y.r2h.,r2d	19900101 c3u1341gy.r2h.,r2d	19900101 c3u1341ry.r2h.,r2d	19900101 c3u13426y.r2h.,r2d
A-2 (0.5 pair) UPPER	19900101 d3u1351sy.r2h.,r2d	19900101 d3u1351sy.r2h.,r2d	19900101 d3u1351sy.r2h.,r2d	19900101 d3u1351sy.r2h.,r2d
A-2 (0.5 pair) LOWER	19900101 d3u1351ry.r2h.,r2d	19900101 d3u1351ry.r2h.,r2d	19900101 d3u1351ry.r2h.,r2d	19900101 d3u1351ry.r2h.,r2d
A-3 (0.25 pair) UPPER	19900101 d3u13520y.r2h.,r2d	19900101 d3u13520y.r2h.,r2d	19900101 d3u13520y.r2h.,r2d	19900101 d3u13520y.r2h.,r2d
A-3(0.25 pair) LOWER	19900101 d3u1351ty.r2h.,r2d	19900101 d3u1351ty.r2h.,r2d	19900101 d3u1351ty.r2h.,r2d	19900101 d3u1351ty.r2h.,r2d
A-4 (0.1 pair) UPPER	19900101 d3u13522y.r2h.,r2d	19900101 d3u13522y.r2h.,r2d	19900101 d3u13522y.r2h.,r2d	19900101 d3u13522y.r2h.,r2d
A-4 (0.1 pair) LOWER	19900101 d3u13521y.r2h.,r2d	19900101 d3u13521y.r2h.,r2d	19900101 d3u13521y.r2h.,r2d	19900101 d3u13521y.r2h.,r2d
B-1 (0.5)	19900101 c3u13418y.r2h.,r2d	19900101 c3u1341iy.r2h.,r2d	19900101 c3u1341ty.r2h.,r2d	19900101 c3u13428y.r2h.,r2d
B-2 (0.3)	19900101 c3u1341ay.r2h.,r2d	19900101 c3u1341y.r2h.,r2d	19900101 c3u13421y.r2h.,r2d	19900101 c3u13429y.r2h.,r2d
B-3 (1.0)	19900101 c3u1341cy.r2h.,r2d	19900101 c3u1341ny.r2h.,r2d	19900101 c3u13423y.r2h.,r2d	19900101 c3u1342by.r2h.,r2d
C-1 (1.0 pair) UPPER	19900101 d3u13524y.r2h.,r2d	19900101 d3u13524y.r2h.,r2d	19900101 d3u13524y.r2h.,r2d	19900101 d3u13524y.r2h.,r2d
C-1 (1.0 pair) LOWER	19900101 d3u13523y.r2h.,r2d	19900101 d3u13523y.r2h.,r2d	19900101 d3u13523y.r2h.,r2d	19900101 d3u13523y.r2h.,r2d
C-2 (0.25x2.0 slit)	19900101 c3u1341ey.r2h.,r2d	19900101 c3u1341py.r2h.,r2d	19900101 c3u13425y.r2h.,r2d	19900101 c3u1342dy.r2h.,r2d
C-3 (2.0-BAR)	19900101 d3u13525y.r2h.,r2d	19900101 d3u13525y.r2h.,r2d	19900101 d3u13525y.r2h.,r2d	19900101 d3u13525y.r2h.,r2d
C-4 (0.7x2.0-BAR)	19900101 d3u13526y.r2h.,r2d	19900101 d3u13526y.r2h.,r2d	19900101 d3u13526y.r2h.,r2d	19900101 d3u13526y.r2h.,r2d

**Table 3: BLUE H13,H19,H27,H40 REFERENCE FILES**

Aperture	H13	H19	H27	H40
A-1 (4.3)	19900101 c3u1342ey.r2h.,r2d	19900101 c3u1342ly.r2h.,r2d	19900101 c3u13430y.r2h.,r2d	19900101 c3u13439y.r2h.,r2d
A-2 (0.5 pair) UPPER	19900101 d3u13528y.r2h.,r2d	19900101 d3u13528y.r2h.,r2d	19900101 d3u13528y.r2h.,r2d	19900101 d3u13528y.r2h.,r2d
A-2 (0.5 pair) LOWER	19900101 d3u13527y.r2h.,r2d	19900101 d3u13527y.r2h.,r2d	19900101 d3u13527y.r2h.,r2d	19900101 d3u13527y.r2h.,r2d
A-3 (0.25 pair) UPPER	19900101 d3u1352ay.r2h.,r2d	19900101 d3u1352ay.r2h.,r2d	19900101 d3u1352ay.r2h.,r2d	19900101 d3u1352ay.r2h.,r2d
A-3(0.25 pair) LOWER	19900101 d3u13529y.r2h.,r2d	19900101 d3u13529y.r2h.,r2d	19900101 d3u13529y.r2h.,r2d	19900101 d3u13529y.r2h.,r2d
A-4 (0.1 pair) UPPER	19900101 d3u1352cy.r2h.,r2d	19900101 d3u1352cy.r2h.,r2d	19900101 d3u1352cy.r2h.,r2d	19900101 d3u1352cy.r2h.,r2d
A-4 (0.1 pair) LOWER	19900101 d3u1352by.r2h.,r2d	19900101 d3u1352by.r2h.,r2d	19900101 d3u1352by.r2h.,r2d	19900101 d3u1352by.r2h.,r2d
B-1 (0.5)	19900101 c3u1342gy.r2h.,r2d	19900101 c3u1342ny.r2h.,r2d	19900101 c3u13432y.r2h.,r2d	19900101 c3u1343by.r2h.,r2d
B-2 (0.3)	19900101 c3u1342hy.r2h.,r2d	19900101 c3u1342py.r2h.,r2d	19900101 c3u13434y.r2h.,r2d	19900101 c3u1343dy.r2h.,r2d
B-3 (1.0)	19900101 c3u1342iy.r2h.,r2d	19900101 c3u1342qy.r2h.,r2d	19900101 c3u13436y.r2h.,r2d	19900101 c3u1343gy.r2h.,r2d
C-1 (1.0 pair) UPPER	19900101 d3u1352ey.r2h.,r2d	19900101 d3u1352ey.r2h.,r2d	19900101 d3u1352ey.r2h.,r2d	19900101 d3u1352ey.r2h.,r2d
C-1 (1.0 pair) LOWER	19900101 d3u1352dy.r2h.,r2d	19900101 d3u1352dy.r2h.,r2d	19900101 d3u1352dy.r2h.,r2d	19900101 d3u1352dy.r2h.,r2d
C-2 (0.25x2.0 slit)	19900101 c3u1342ky.r2h.,r2d	19900101 c3u1342sy.r2h.,r2d	19900101 c3u13437y.r2h.,r2d	19900101 c3u1343iy.r2h.,r2d
C-3 (2.0-BAR)	19900101 d3u1352fy.r2h.,r2d	19900101 d3u1352fy.r2h.,r2d	19900101 d3u1352fy.r2h.,r2d	19900101 d3u1352fy.r2h.,r2d
C-4 (0.7x2.0-BAR)	19900101 d3u1352hy.r2h.,r2d	19900101 d3u1352hy.r2h.,r2d	19900101 d3u1352hy.r2h.,r2d	19900101 d3u1352hy.r2h.,r2d

Table 4: BLUE H57,L15,L65,PRI REFERENCE FILES

Aperture	H57	L15	L65	PRISM
A-1 (4.3)	19900101 d4u1054iy.r2h.,r2d	19900101 c3u1343ky.r2h.,r2d	19900101 d4u1054py.r2h.,r2d	19900101 c3u13441yr2h.,r2d
A-2 (0.5 pair) UPPER	19900101 d3u13528y.r2h.,r2d	19900101 d3u13528y.r2h.,r2d	19900101 d3u13528y.r2h.,r2d	19900101 d3u13528y.r2h.,r2d
A-2 (0.5 pair) LOWER	19900101 d3u13527y.r2h.,r2d	19900101 d3u13527y.r2h.,r2d	19900101 d3u13527y.r2h.,r2d	19900101 d3u13527y.r2h.,r2d
A-3 (0.25 pair) UPPER	19900101 d3u1352ay.r2h.,r2d	19900101 d3u1352ay.r2h.,r2d	19900101 d3u1352ay.r2h.,r2d	19900101 d3u1352ay.r2h.,r2d
A-3(0.25 pair) LOWER	19900101 d3u13529y.r2h.,r2d	19900101 d3u13529y.r2h.,r2d	19900101 d3u13529y.r2h.,r2d	19900101 d3u13529y.r2h.,r2d
A-4 (0.1 pair) UPPER	19900101 d3u1352cy.r2h.,r2d	19900101 d3u1352cy.r2h.,r2d	19900101 d3u1352cy.r2h.,r2d	19900101 d3u1352cy.r2h.,r2d
A-4 (0.1 pair) LOWER	19900101 d3u1352by.r2h.,r2d	19900101 d3u1352by.r2h.,r2d	19900101 d3u1352by.r2h.,r2d	19900101 d3u1352by.r2h.,r2d
B-1 (0.5)	19900101 d4u1054jy.r2h.,r2d	19900101 c3u1343ny.r2h.,r2d	19900101 d4u1054fy.r2h.,r2d	19900101 c3u13443yr2h.,r2d
B-2 (0.3)	19900101 d4u1054ly.r2h.,r2d	19900101 c3u1343gy.r2h.,r2d	19900101 d4u1054sy.r2h.,r2d	19900101 c3u13444yr2h.,r2d
B-3 (1.0)	19900101 d4u1054my.r2h.,r2d	19900101 c3u1343ry.r2h.,r2d	19900101 d4u1054ry.r2h.,r2d	19900101 c3u13446yr2h.,r2d
C-1 (1.0 pair) UPPER	19900101 d3u1352ey.r2h.,r2d	19900101 d3u1352ey.r2h.,r2d	19900101 d3u1352ey.r2h.,r2d	19900101 d3u1352ey.r2h.,r2d
C-1 (1.0 pair) LOWER	19900101 d3u1352dy.r2h.,r2d	19900101 d3u1352dy.r2h.,r2d	19900101 d3u1352dy.r2h.,r2d	19900101 d3u1352dy.r2h.,r2d
C-2 (0.25x2.0 slit)	19900101 d4u1054oy.r2h.,r2d	19900101 c3u1343ty.r2h.,r2d	19900101 d4u10551y.r2h.,r2d	19900101 c3u13448yr2h.,r2d
C-3 (2.0-BAR)	19900101 d3u1352fy.r2h.,r2d	19900101 d3u1352fy.r2h.,r2d	19900101 d3u1352fy.r2h.,r2d	19900101 d3u1352fy.r2h.,r2d
C-4 (0.7x2.0-BAR)	19900101 d3u1352hy.r2h.,r2d	19900101 d3u1352hy.r2h.,r2d	19900101 d3u1352hy.r2h.,r2d	19900101 d3u1352hy.r2h.,r2d



**Table 5: BLUE H13,H19,H27 POLARIZER REFERENCE FILES**

Aperture	H13-POL B	H19-POL B	H27-POL B
A-1 (4.3) PASS 1	19900101 cle11040y.r2h.,r2d	19900101 cle11049y.r2h.,r2d	19900101 cle1104hy.r2h.,r2d
A-1 (4.3) PASS 2	19900101 cle11044y.r2h.,r2d	19900101 cle1104by.r2h.,r2d	19900101 cle1104ky.r2h.,r2d
B-1 (0.5) PASS 1	19900101 d4s10346y.r2h.,r2d	19900101 d4s10348y.r2h.,r2d	19900101 d4s1034ay.r2h.,r2d
B-1 (0.5) PASS 2	19900101 d4s10347y.r2h.,r2d	19900101 d4s10349y.r2h.,r2d	19900101 d4s1034by.r2h.,r2d
B-3 (1.0) PASS 1	19900101 cle11046y.r2h.,r2d	19900101 cle1104dy.r2h.,r2d	19900101 cle1104my.r2h.,r2d
B-3 (1.0) PASS 2	19900101 cle11047y.r2h.,r2d	19900101 cle1104gy.r2h.,r2d	19900101 cle1104oy.r2h.,r2d

**Table 6: RED H19,H27,H40 POLARIZER REFERENCE FILES (ALL UNITY)**

Aperture	H19-POL B	H27-POL B	H40-POL A
A-1 (4.3) PASS 1	19900101 d4s1033by.r2h.,r2d	19900101 d4s1033oy.r2h.,r2d	19900101 d4s10340y.r2h.,r2d
A-1 (4.3) PASS 2	19900101 d4s1033jy.r2h.,r2d	19900101 d4s1033py.r2h.,r2d	19900101 d4s10341y.r2h.,r2d
B-1 (0.5) PASS 1	19900101 d4s1033ky.r2h.,r2d	19900101 d4s1033qy.r2h.,r2d	19900101 d4s10342y.r2h.,r2d
B-1 (0.5) PASS 2	19900101 d4s1033ly.r2h.,r2d	19900101 d4s1033ry.r2h.,r2d	19900101 d4s10343y.r2h.,r2d
B-3 (1.0) PASS 1	19900101 d4s1033my.r2h.,r2d	19900101 d4s1033sy.r2h.,r2d	19900101 d4s10344y.r2h.,r2d
B-3 (1.0) PASS 2	19900101 d4s1033ny.r2h.,r2d	19900101 d4s1033ty.r2h.,r2d	19900101 d4s10345y.r2h.,r2d

