

**Technical Evaluation Report
 “ND2 Attenuation of the COS Bright Object Aperture”**

Date:	30 June 2000
Document Number:	COS-11-0019
Revision:	Initial Release
Contract No.:	NAS5-98043
CDRL No.:	N/A

Prepared By: _____
 J. Morse, COS Project Scientist, CU/CASA _____

Reviewed By: _____
 J. Green, COS Principal Investigator, CU/CASA _____ Date _____

Reviewed By: _____
 E. Wilkinson, COS Instrument Scientist, CU/CASA _____ Date _____

Approved By: _____
 J. Andrews, COS Experiment Manager, CU/CASA _____ Date _____

**Web-Released
 Document**



Center for Astrophysics & Space Astronomy
 University of Colorado
 Campus Box 593
 Boulder, Colorado 80309

REVISIONS

Letter	ECO No.	Description	Check	Approved	Date
-		Initial Release			
Original Release		Date	THE UNIVERSITY OF COLORADO At Boulder The Center for Astrophysics and Space Astronomy Technical Evaluation Report “Sub-Arrays for COS Time-Tag Science Observations”		
Name					
Drawn: J. Morse	6/30/00				
Reviewed:					
Approved:					
	Date	Size	Code Indent No.	Document No.	Rev
		A		COS-11-0019	-
		Scale: N/A			

Table of Contents

1. Introduction 1
2. BOA Attenuation Specification 1

1. INTRODUCTION

We review the COS Bright Object Aperture (BOA) attenuation specification. A factor of 100 neutral density attenuation (ND2) will provide adequate extension of the COS flux dynamic range for observing bright sensitivity or reddening calibration stars and for backing up some STIS UV spectroscopic capability.

2. BOA ATTENUATION SPECIFICATION

The brightest flux density COS should observe through its Primary Science Aperture (PSA) over the 1150-1800Å (FUV) wavelength region is $\sim 10^{-12}$ ergs/cm²/sec/Å for the R=20,000 modes and $\sim 10^{-13}$ ergs/cm²/sec/Å with G140L. These provide an average count rate of ~ 10 counts/sec per spectral resolution element (see Ball SER COS-SYS-022 by D. Ebbets, April 2000) and a global count rate of $\sim 25,000$ counts/sec per FUV detector segment. (Brighter fluxes could be safely observed, up to 40,000 counts/sec per segment, but the MCPs would suffer rapid gain depletion after only a few such observations. NUV observations can access flux densities ~ 10 times brighter.)

We have sought the advice of COS Science Team member, Dr. Claus Leitherer (STScI), and Dr. Geoff Clayton (LSU) on the flux range of suitable standard stars for use as FUV sensitivity and reddening calibrators. The HST-STIS/COS Faint Standard Extension Program and the UV extinction projects conducted so far include stars (mostly white dwarfs) with flux densities in the range 7×10^{-12} ergs/cm²/sec/Å to 2×10^{-11} ergs/cm²/sec/Å. Thus, in order to have access to a suitable number of standard stars with reasonable count rates using the G140L grating, we require an attenuation factor of ~ 100 for the Bright Object Aperture (BOA). This attenuation also provides, as a back-up capability, significant overlap in accessible fluxes between the COS G130M/G160M modes and the STIS E140M mode. Hence, we baseline a factor of 100 attenuation (ND2) for the neutral density filter to be used with the BOA.