

IUE DATA REDUCTION

XXIX. Processing of Partial-Read Images

I. Introduction

"Partial-read" images are images for which only a portion of the vidicon target is readout. The resulting image contains the entire low dispersion spectral format and represents a subset of the standard 768x768-pixel array. Since the IUE low dispersion spectral format does not encompass a full image, the savings in time associated with reading out makes the partial-read capability a potentially valuable technique in situations where rapid-fire low dispersion spectra must be obtained.

Currently, a testing program is being carried out by the operations and calibration groups of the Three Agencies to evaluate the use of partial-read images, to investigate what, if any, photometric consequences arise from the use of partial-reads and to establish guidelines for future use of partial reads by Guest Observers. Current plans include the use of standard definitions for the boundaries of the partial-read areas, which are rectangular or square arrays determined separately for each camera according to the location of the low dispersion spectral format.

In anticipation of the eventual use of partial-read images, the IUESIPS programs INSERT and PHOTOM have been modified as discussed below to deal with standard partial-read (PREAD) images in an efficient way. The PREAD parameters being evaluated for operational use (Table 1) were checked to insure that all portions of the data extracted in the line-by-line file will be contained within the portion of the image read by the PREAD procedures. This check was made for the LWP, LWR, and SWP cameras by measurement of 200 μ Photowrites on which a double-aperture wavelength overlay was superposed. The truncation, in certain cases, of the corners of the photometrically corrected swath was in itself not regarded as a problem as long as extracted data were not affected.

II. INSERT

INSERT imbeds the partial image at the proper position within a full 768x768 array of zero DN so that subsequent processing may be done by IUESIPS. The default parameters in INSERT were changed to correspond to the PREAD parameters in Table 1. With these standard values as defaults, parameters need not be entered manually for routine processing.

III. PHOTOM

The program PHOTOM was changed so that for all low dispersion images, in addition to the constraint which results in the photometric correction being applied only within a swath around the spectral order, pixels outside of the PREAD boundaries are left uncorrected (raw DN). This insures that for partial-read images, the zero-DN pixels added on to fill a full frame will be left as zeroes, rather than being extrapolated meaninglessly to negative FN levels if they happen to fall within the low-dispersion PHOTOM swath. By imposing this additional constraint on all low dispersion images (whether partial-read or not), it is not necessary to treat the partial-read images in any special way after the INSERT step. With this change, all low dispersion images will have the corners of the photometrically corrected region truncated wherever the PREAD boundaries impinge upon the standard PHOTOM swath. This truncation, as discussed in Section I, does not affect the extracted data and is illustrated schematically in Figure 1.

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Table 1 - Standard PREAD Parameters

Camera	Starting Line	No. of Lines	Starting Sample	No. Samples
LWP	99	528	31	576
LWR	73	528	123	624
SWP	36	528	33	528
SWR	135	480	175	576

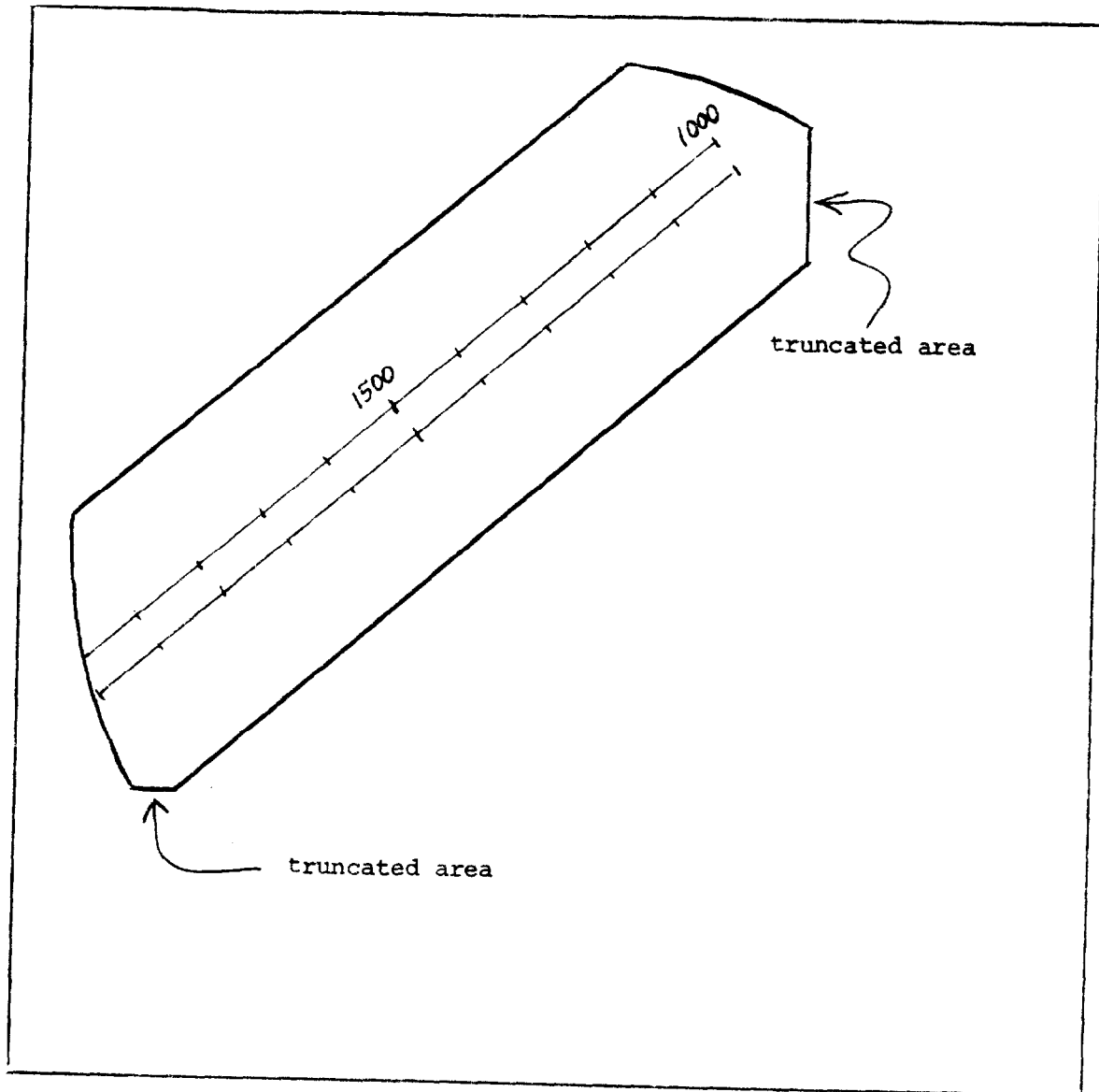


Figure 1 - Schematic representation of the truncation to the photometrically corrected swath in low dispersion (SWP in this example) induced by changes for partial-read processing.