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EDITORIAL

This special issue of the ESA IUE Newsletter is devoted to an update of "Techniques of Reduction of IUE Data: Time History of IUESIPS Configurations", namely PART 1 of ESA IUE Newsletter No.14 (Special Issue). Since the majority of the configurations published in that issue require no change to the documentation, this issue contains only those which have been updated or are completely new (no. 72 onwards). ESA IUE Newsletter Nos. 14 and 21 are complementary and the table on p10 of this volume indicates in which of the two a particular configuration is to be found. The chronology of the evolution of the IUE Spectral Image Processing System is extended until the end of 1983 and any further changes will be documented in future issues of the ESA IUE Newsletter.

Appendix A consists of tables extracted from the Bulletin No.2 of the IUE Regional Data Analysis Facilities. These summarise for each observing station and image type which image processing configurations affect the data.

The information in this Newsletter is reproduced from NASA IUE Newsletter No. 25 (Special Issue). Where possible, the NASA Newsletter references listed in the text have been supplemented by the ESA Newsletter references given in Appendix B.

TECHNIQUES OF REDUCTION OF IUE DATA: TIME HISTORY OF IUESIPS CONFIGURATIONS

By

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ABSTRACT

This document presents basic information needed by International Ultraviolet Explorer (IUE) Guest Observers and Archive Users to understand the evolution of the IUE Spectral Image Processing System (IUESIPS) and its products from April 1978 through December 1983. Data on the status of IUESIPS as a function of time are presented in a format intended to facilitate rapid indexing of the changes which have been made to correct deficiencies or errors and to enhance the capabilities of the system. It is expected that the collected information will be of particular utility to users of the IUE Regional Data Analysis Facilities and others wishing to assess the homogeneity of IUE data reduced at various times at either the U.S. or European IUE ground stations. The data contained herein represent an update and extension of the original information published in NASA IUE Newsletter No. 16, February 1982.

ACKNOWLEDGEMENTS

The authors are grateful to Dr. K.J.E. Northover of the European IUE ground station at Villafranca del Castillo, Spain (VILSPA) for reviewing a preliminary version of the original 1982 document and providing a significant amount of data pertaining to the early history of IUESIPS at VILSPA. The authors also thank Dr. F.H. Schiffer, III for many useful discussions and suggestions regarding the format and contents of the original document.

SECTION 1 - INTRODUCTION

1.1 BACKGROUND

The International Ultraviolet Explorer (IUE) satellite has been in operation as a Guest Observer facility since 3 April 1978. The software system used by the IUE Observatory ground stations at GSFC and Villafranca del Castillo, Spain (VILSPA) to perform the standard IUE data reduction operations and generate the standard output products, the IUE Spectral Image Processing System (IUESIPS), has undergone a continual evolution since April 1978 in order to enhance the quality of the data processing and remove various software deficiencies and errors as they were discovered. As a result of the various changes made to IUESIPS, there is necessarily an inhomogeneity between data as it would be processed currently and the same data as it might have been processed at prior times. Documentation such as the International Ultraviolet Explorer Image Processing Information Manual, Version 1.1, CSC/TM-81/6268 (Version 2.0 is currently in preparation), and "Chronology of Modification to IUESIPS Output Products," in NASA IUE Newsletter No. 21, May 1983 provides summary data relating to the existence of the changes made to IUESIPS but does not contain sufficient detail to allow a quantitative assessment of each change, in most cases. The original version of "Time History of IUESIPS Configurations", covering the time period from April 1978 through March 1981, appeared as NASA IUE Newsletter No. 16, February 1982.

1.2 OBJECTIVES

The purpose of this document is to provide a means by which the evolution of IUESIPS since 3 April 1978 can be described in sufficient detail to allow full traceability of the system so that the degree of homogeneity of IUE data reduced at diverse times at either ground station (GSFC or VILSPA) may be adequately assessed. The goal is to provide documentation of each stage in

the life of IUESIPS in a form which is convenient and also comprehensive enough to allow the specification of the exact manner in which data reduced at the various stages differs from data reduced with the current system. Wherever possible, we have striven to facilitate the task of the user who wishes to devise correction procedures to remove reduction inhomogeneities. A collection of specific algorithms/procedures to perform meaningful transformation of early (pre-March 1981) data was presented in NASA IUE Newsletter No. 17, February 1982.

1.3 SCOPE

This document describes all known changes relating to the contents or format of the tape output products (GO and archive tapes) from standard IUESIPS processing through December 1983. Changes which pertain only to the other output products included in GO data packages (CalComp plots, Photowrite hardcopy images, and/or computer printouts) are not treated.

The emphasis in cataloging the changes to IUESIPS herein is on providing an accurate record of the time-history of the evolution of processing conditions, and wherever possible the exact times of implementation of the various changes, at GSFC and VILSPA separately, are given. The types of IUE images affected by each condition catalogued are indicated by camera and dispersion and processing option. Estimates of the actual number of images affected by each condition are made whenever possible. Cross references to available GSFC and VILSPA IUE Observatory software configuration documentation are made when pertinent, and a detailed description of each condition under discussion and its consequences in terms of the character of the data reduced under it, is provided. Finally, as many alternative means of identifying data processed under each configuration (in addition to the date and time of processing included in the headers of all but the very earliest images) as could be determined were included.

The period of time covered by the present document extends from 3 April 1978 to 31 December 1983 for GSFC data. VILSPA entries are less complete.

SECTION 2 - IUESIPS CONFIGURATIONS

2.1 GENERAL DESCRIPTION OF THE DOCUMENTATION

2.1.1 Sources of Data

Changes to the production version of IUESIPS have, with few exceptions, been effected through a configuration control process which provides documentation sufficient to identify the nature and time of implementation of each modification. At GSFC, such documentation comprises Science Operations Center Anomaly Reports (SOCARS), Scheme Modification Reports (SMRs), and Production Processing Modification Reports (PPMRs). SOCARS were used to justify and document the changes that are made to the IUESIPS software per se, i.e., applications programs, utilities, and IUESIPS systems software. SMRs were used to justify and document changes made to the production schemes of IUESIPS--those collections of standardized calls to the various IUESIPS applications programs needed to reduce images and generate specific output products for each image type. As of January 26, 1982, SOCARS and SMRs were combined into a single multi-purpose form, the PPMR. At VILSPA, similar documentation items (Image Processing Software Modification Reports and Scheme Modification Reports) are used to control changes. Although all these forms carry information describing the scope of the changes they document, the detail included is generally insufficient to describe fully the ramifications of each change from a Guest Observer's point of view. Indeed, for this very reason, and also because many of the configuration-control forms describe system-oriented changes which are transparent to the end recipient of the data, this document is being prepared with the user's interest in mind.

The GSFC and VILSPA documentation together were used to generate the short-form IUESIPS chronology appearing in NASA IUE Newsletter No. 21. These combined resources as well as any available more informal notes and records were used to generate the data compiled herein.

In many cases, supplementary and quite detailed explanatory information is contained in articles published in the IUE Newsletter. Notable here are articles in the continuing series "IUE Data reduction" of which 33 have so far been published in the NASA IUE Newsletter. Data from these articles and, more generally, from any relevant contribution in the Newsletter or elsewhere have been assimilated for the present document.

2.1.2 Contents and Use of This Document

As mentioned in Section 1.3 only those IUESIPS changes affecting the contents or format of the tape output products are cataloged in this document. The data are presented here as descriptions of each unique configuration of IUESIPS as defined by start and end dates representing the times at which relevant changes to the system were implemented. Such dates are recorded separately for the IUESIPS production systems at GSFC and at VILSPA. This approach is necessary since the effective times at which modifications were implemented at each ground station are in general different. Although functional equivalence of the two IUESIPS systems has been the overall operational goal, certain modifications at one station are not appropriate to the other; notable in this regard, for example, are most of the changes at GSFC dealing with calibration images, which are not acquired and analyzed as extensively at VILSPA.

The configurations are described herein in two ways: 1) an index of configurations by number and title, and 2) a detailed description of each configuration by number, title, effective dates, etc. The first task of a user wishing to relate data reduced in the past to present-day data is to identify all past configurations

appropriate to the old data, since the existence of a configuration with an end date at some point in the past indicates a difference between the system as it was prior to the end date and as it is now. From the index of configurations in Section 2.2, the user can ascertain, by title, which configurations are relevant to his data. The user can then refer to Section 2.3 for the detailed writeup of each configuration, including the exact start and end dates (when known), data types affected, relevant documentation, means of recognizing affected data (other than processing date), and the ramifications of each configuration.

2.2 INDEX OF CATALOGUED CONFIGURATIONS

In this section each past configuration is listed by sequential number and title (Table 2-1). Note that the configuration number is not necessarily an integer. Because a preliminary version of this document had been circulated at the IUE ground stations in May 1981 and some cross-referencing of configurations by number had occurred, it was decided to retain the original configuration numbers as they appeared in the preliminary version. This means that several additional configurations subsequently identified as falling by date between original configurations are assigned decimal numbers, such as 14.1, and inserted in the proper sequence. With this system of numbering, the configurations are generally in chronological order by the GSFC end date. Note that VILSPA does not necessarily implement changes in the same order as GSFC, and therefore the configurations are not always in chronological order according to VILSPA end dates.

Table 2-1. INDEX TO CATALOGED CONFIGURATIONS

Number	Title	ESA NL Volume	p.
1.	Corrupted data at the ends of smoothed background spectra (and hence net spectra).	14	
2.	Restricted low dispersion SWP wavelength coverage (λ1000-1900Å).	14	
3.	Erroneous negative fluxes in extracted spectra due to incorrect integer scaling of Fmax.	14	
4.	Non-optimal center and radius values for circle in which geometric correction is performed.	14	
5.	Suppression of redundant wavelengths in high dispersion processing.	14	
6.	Unrestricted RIPPLE correction at ends of orders in high dispersion.	14	
7.	Reversed naming convention for dispersion constants as written in IUESIPS history label.	14	
8.	No processing dates written in IUESIPS history labels.	14	
9.	One-pixel error in OSCRIBE (dispersion-constant overlay program).	14	
10.	Nearest-neighbor line-finding algorithm in WAVECAL.	14	
11.	Use of ITF's composed of single exposures.	14	
12.	Accomplish registration of spectral orders with dispersion-constant overlays by shifting the images (rather than the dispersion constants).	14	
13.	Extraction of low dispersion spectra using the programs SPIN, ROTATEH, and COMPARE.	14	
14.	Epsilon-field values in smoothed backgrounds shifted to incorrect wavelengths.	14	
14.1	Dispersion constant and reseau calibration used for VILSPA reductions (1).	14	
14.2	Error in long wavelength high dispersion wavelengths.	14	
15.	Reseau flagging in low dispersion merged spectra does not distinguish between reseau mark in gross spectrum and reseau mark in background spectrum.	14	
16.	Geometric correction of high dispersion images accomplished using reseaux measured on high dispersion WAVECAL images.	14	

Table 2-1 continued

Number	Title	ESA NL Volume	p
17.	Use of non-optimal RIPPLE parameters for LWR.	14	
18.	Extract low dispersion spectra (EXTLOW) with HT=9 and DISTANCE=8.0 (Will not properly extract spectra of aperture-filling objects).	14	
19.	Image sequence number sometimes zeroed out in scale factor record of merged spectral file.	14	
20.	Determine LWR low dispersion wavelength calibrations from preliminary version of line library.	14	
21.	Use of incorrect offsets from small to large aperture in LWR.	14	
21.1	Error in SWP low dispersion wavelength scale.	14	
22.	Perform all registrations of spectral orders with dispersion-constant overlays manually.	14	
23.	Camera number transmitted as true number plus 10 or 20 in scale factor record of merged spectral file.	21,19	
24.	Determine SWP low dispersion wavelength calibrations from preliminary version of line library.	14	
25.	Extract low dispersion large-aperture point-source spectra with DISTANCE=8.0.	14	
26.	Improper truncation of area of image photometrically corrected.	14	
27.	Automatic registration of spectral orders done using only 6 sampling areas in DSPCON.	14	
28.	Omit vacuum-to-air correction for LWR low-dispersion single-aperture reduction.	14	
29.	Photometrically correct entire 768 x 768 image (SWP high dispersion).	14	
30.	Photometrically correct entire 768 x 768 image (low dispersion).	14	
31.	No information on values of OMEGA, HBACK, or DISTANCE in IUESIPS history labels.	14	
32.	No information on values of automatic registration shifts recorded in IUESIPS history labels.	14	

Table 2-1 continued

Number	Title	ESA NL Volume	p.
33.	Process order 65 in SWP high dispersion.	14	
34.	Photometrically correct entire 768 x 768 image (LWR high dispersion).	14	
34.1	Dispersion constant and reseau calibration used for VILSPA reduction (2).	14	
34.2	Dispersion constant and reseau calibration used for VILSPA reduction (3).	21,	20
35.	Use incorrect version of ETOEM.	14	
36.	High dispersion partial processing on S/360 (VICAR).	14.	
37.	Use original IUESIPS File Management System.	14	
38.	No information on values of manual registration shifts recorded in IUESIPS history label.	14	
39.	No output products generated for images designated "Do Not Process".	14	
40.	Improperly convert certain spectral files with negative fluxes to GO-tape integer format.	14	
41.	All high dispersion extractions due with HT=5.	14	
42.	Write redundant raw-image tape files for wavelength calibration images.	14	
43.	No short header file written at beginning of GO tape.	14	
44.	Use of SWP ITF with incorrect 20% exposure level.	14	
45.	Use of non-optimal pixel offsets from small to large aperture.	14	
46.	Use of pixel offsets from small to large aperture which do not correspond to physical center of large aperture.	21,	21
47.	Write geometrically-correct-image tape file for wavelength calibration images.	14	
48.	Use biweekly dispersion-constant calibrations in low dispersion.	14	
49.	Determine high dispersion wavelength calibrations from unrefined line libraries (version I libraries).	14	
50.	Do not provide absolutely calibrated net spectrum in low dispersion.	14	

Table 2-1 continued

Number	Title	ESA NL Volume	p.
51.	Truncation of ITF at upper limit.	14	
52.	Incorrect units for DISTANCE parameter in EXTLOW.	14	
53.	Use original Astron. Astrophys. absolute calibration.	14	
54.	Determine high dispersion wavelength calibrations from partially refined line libraries (version II libraries).	14	
55.	Use biweekly reseau calibrations.	21, 22	
56.	Use biweekly dispersion constant calibrations in high dispersion.	14	
57.	Use preliminary mean dispersion constants for low dispersion.	14	
58.	Inaccurate automatic registration programs.	14	
59.	Determine high dispersion wavelength calibrations from further refinements to line libraries (version III libraries).	14	
59.1	Incorrectly transmit 5-digit image sequence numbers to scale-factor record of extracted spectral files.	14	
60.	Processing of low dispersion spectra using the programs GEOM, FICOR, and EXTLOW.	14	
61.	Non-perpendicular manual shifts (REGISTER).	14	
62.	Label lacks scheme name and auto/manual message.	21, 23	
63.	Incorrect manual shift for SWP images (REG).	14	
64.	VBBLK without label processing.	14	
65.	Incorrect entries in label by SPECLO (negative declination and zero shift).	21, 24	
66.	Inaccurate automatic registration (LWR-LOW, SWP-HIGH and all Trailed).	21, 25	
67.	Calibration files without temperature corrections (low dispersion).	21, 26	

(continued)

(continued)

2.3 DETAILED CONFIGURATION DATA

In this section the fully-detailed discussion of each cataloged IUESIPS configuration is found. To facilitate the use of this section as a reference tool, a standard format for the data presentation has been adopted. Each configuration begins on a new page and has the title and sequence number at the top of the page. The entries under "Data Affected" are used to specify the types of data pertinent to the configuration described. The "Camera" and "Dispersion" entries are self-evident. "Processing" means the specific type of file affected by the configuration - for example, a change in the photometric correction affects both the photometrically corrected image itself and the spectra extracted from it, whereas a change in wavelength scales affects only the extracted spectra. The file mnemonic conventions defined in CSC/TM-81/6268, in "IUE Data Reduction XVIII, Implementation of New Low Dispersion Software: Summary of Output Format Changes" in NASA IUE Newsletter No. 12, and in "IUE Data Reduction XXIV, Implementation of New High Dispersion Software: Summary of Output Format Changes" in NASA IUE Newsletter No. 18 are used often here (GPI, ESSR, ESHI, etc.). The terminology "merged spectra" refers to the file of merged gross, background and various net spectra (ESHI, ESLO, MEHI, or MELO), whereas in low dispersion the terminology "extracted spectra" would include both the line-by-line (ESSR or LBLS) and merged spectra.

The start and end dates (GMT) for each configuration are given, separately for GSFC and VILSPA, with the greatest precision possible. (An entry of N/A means that the configuration is not applicable at that particular ground station). Where an exact time of day is available, it is given in GMT hours and minutes (hh:mm). In certain cases where exact times of changes were not recorded originally, a limit on the time of the change is set by the existence of a program or scheme listing evidencing the change (and which bears a time of day). In such cases the time of the listing becomes an "upper limit" to the time of the change and is preceded by the symbol "<".

When the start or end date is left totally blank, no information is currently available on the change date (certain VILSPA dates only). VILSPA dates which are uncertain but supported by strong indirect evidence are enclosed within exclamation marks, e.g., !14 June 1978!

The entry "Media" reflects the output product media affected by the configuration. The entry "Estimated Fraction of Processed Images Affected" is an estimated proportion of images actually affected by the configuration out of the images potentially affected (i.e., the estimated fraction of affected data out of total data of the type specified above). The "Estimated Number of Images Affected" is an estimate of all affected data (GSFC and VILSPA). Both of the above estimates are rough and should not be relied upon for detailed statistics.

Under "Pertinent Documentation" are included cross references to all relevant documentation, including GSFC SOCAR, SMR, and PPMR numbers, IUE Newsletter articles, and other sources.

The "Description" section contains the discussion of the nature of each configuration, with equations, tables, and figures included where applicable. The attempt was made to provide sufficient detail without excessive length. Those descriptions or parts thereof provided by Dr. K.J.E. Northover of VILSPA are enclosed within brackets "< >".

Under "Means of Identifying Affected Data" we have provided, where possible, means of recognizing data affected by each configuration which are either alternative to or complement the date of processing. Where it was not possible to specify any such alternative identification methods, this section was omitted.

The set of detailed descriptions follows, according to the format outlined above.

NO. 23

TITLE: Camera number transmitted as true number plus 10 or 20 in scale factor record of merged spectral file.

DATA AFFECTED:

CAMERA: All DISPERSION: Both PROCESSING: Extracted spectra

MEDIA: Tape

DATES: BEGIN ≥ 2 Sept. 1978 END 20 Sept. 1978 (GSFC)

BEGIN ≥ 06 Nov. 1978 END 01 Feb. 1979 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: > 20

PERTINENT DOCUMENTATION: GSFC SOCAR 151, CSC/TM-79/6301, OCC SIR 5355

DESCRIPTION: The program ETOEM accessed bytes 49 and 50 of record 1 of the IUESIPS label (see CSC/TM-79 6301) to obtain the camera number for the scale factor record of the merged spectral file. Until 2 September 1978, the OCC software which wrote record 1 of the label used the value 0 for the station flag in byte 49 for both NASA and ESA images, so that the camera number read by ETOEM was effectively correct. When the correct station flag values (1=NASA, 2=ESA) were put into the label beginning on 2 September 1978 with OCC software system 7 (see OCC SIR 5355), however, the 1 or 2 in byte 49 was included by ETOEM as part of the camera number passed to the merged spectral file.

The program ETOEM was modified on the end date above to access only byte 50 for the camera number. Therefore, all images acquired on or after 2 Sept. 1978 and processed prior to 20 Sept. 1978 will have incorrect camera numbers in the merged spectrum scale factor record. Because processing did not always follow the strict chronological order of image acquisition, a unique processing start date for the incorrect camera numbers is difficult to determine; the start date shown above is therefore indicated as ≥ 2 Sept. 1978.

MEANS OF IDENTIFYING AFFECTED DATA:

- Incorrect camera number in merged-spectrum scale factor record
- Acquisition date ≥ 2 Sept. 1978, processing date < 20 Sept. 1978. (GSFC)

NO. 34.2

TITLE: Dispersion constant and reseau calibrations used for VILSPA reductions (3)

DATA AFFECTED:

CAMERA: SWP DISPERSION: Low PROCESSING: Extracted spectra

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN N/A END N/A (GSFC)

BEGIN 07 Sept. 1978 END 17:00 01 Feb. 1979 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 300

PERTINENT DOCUMENTATION: VILSPA internal memo JB/bm 6 Sept. 78
VILSPA TN/2003-00/AS/780614 (Release 10 file)

DESCRIPTION: <The dispersion constant calibration file for SWP low dispersion data was based on image SWP 2244 acquired on 08 August 1978. This corrected the error described in the VILSPA configuration ending 07 September 1978. (No. 21.1) >

NO. 46

TITLE: Use pixel offsets from small to large aperture which do not correspond to physical center of large aperture

DATA AFFECTED:

CAMERA: All DISPERSION: Both PROCESSING: Extracted spectra (large aperture)

MEDIA: Tape, CalComp

DATES: BEGIN 03 April 1978 END 06 Aug. 1979
20 Sept. 1979 (LWR low) 29 Oct. 1979 (LWR low)(GSFC)
BEGIN 17 April 1978 END 16:00 10 Mar. 1981 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 4200

PERTINENT DOCUMENTATION: GSFC SMR 86; "IUE Data Reduction V. Wavelength Assignments for Large Aperture Spectra; NASA IUE Newsletter No. 6, Sept. 1979; GSFC SMR 106.

DESCRIPTION: As described in the Newsletter documentation above, prior to 1 August 1979 at GSFC, telescope operations procedures did not place point sources at the physical center of the large aperture during the acquisition process. When an operations change was made on that date to place objects at the physical center, a corresponding change was made to the ΔL and ΔS pixel offsets used by IUESIPS in establishing large-aperture wavelength scales so that all spectra acquired as of 1 August 1979 would be reduced using the correct offsets. This change was implemented in IUESIPS on 6 August 1979 at GSFC. The new offsets used are (in pixels):

SWP			LWR		
ΔL	ΔS	R	ΔL	ΔS	R
-19.7	-17.4	26.3	+19.4	-18.6	26.9

$$R = \left[(\Delta L)^2 + (\Delta S)^2\right]^{\frac{1}{2}}$$

These values may be compared to previous offsets as documented in the changes of 08 July 1979.

Due to a clerical error, the old offsets were inadvertantly reintroduced (for LWR low dispersion only) during the short period 20 September - 29 October 1979.

No. 55

TITLE: Use biweekly reseau calibrations.

DATA AFFECTED:

CAMERA: LWR & SWP DISPERSION: Both PROCESSING: All but raw image

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 03 Apr. 1978 END 10:00 18 July 1980 (GSFC)
BEGIN N/A END N/A (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 11000

PERTINENT DOCUMENTATION: GSFC SMR 107, 103, 104; "IUE Data Reduction XVII., NASA IUE Newsletter No. 11, Oct. 1980.

DESCRIPTION: Prior to the end date shown the reseau positions used to correct the geometry of the IUE images were determined from new WAVECAL + TFLOOD calibration images taken approximately every two weeks. After the above end date a set of mean reseau positions were implemented based on 16 LWR 60% or 77% UVITF images exposed between day 73 of 1978 and day 204 of 1979 and 20 SWP 60% or 77% UVITF images exposed between day 85 of 1978 and day 334 of 1979. As noted in the above Newsletter article the chief advantage of mean files over the usual biweekly calibrations is that short term fluctuations are averaged out yielding calibrations more appropriate to the "typical" IUE image. UVITF images were used instead of WAVECAL + TFLOOD images since the former provide a flatter and less contaminated area for the FNDRES (reseaux finding) program to search.

Several impovements were made in the details of the FNDRES program in order to get the highest possible accuracy. An improved template for the large reseau in row 11, column 11 was used and three more reseaux in SWP and two more in LWR near the tube edges were added so as to reduce the amount of extrapolation needed to achieve the full 13-by-13 grid of reseaux used in the geometric correction process (see SMR 103 & 104).* Furthermore, the average positions found on the UVITF images with the improved FNDRES were calculated without the row-and-column smoothing procedure usually applied to reseaux measured on a single image. This smoothing was found to introduce errors.

* These changes to FNDRES were implemented 22 April 1980 and hence also pertain to the biweekly reseau calibrations generated between 22 April and 18 July 1980. On 31 May 1980, "naked" TFLOOD images (no platinum spectrum superposed) were first used for reseau positions accompanying WAVECALS.

NO. 62

TITLE: Label lacks scheme name and AUTO/MANUAL message

DATA AFFECTED:

CAMERA: All DISPERSION: Both PROCESSING: Extracted spectra

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 03 Apr. 1978 END 00:11, 04 Nov. 1980 (GSFC) (GSFC)

BEGIN 17 Apr. 1978 END 16:42 30 Jan. 1981 (high)
16:00 10 Mar. 1981 (low) (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 19000

PERTINENT DOCUMENTATION: GSFC SMR 116, SOCAR's 216, 223, 224.

DESCRIPTION: During this period the image labels did not contain the name of the processing procedure ("Scheme") used or a notation indicating the type of registration shift applied (manual, automatic, or none). The registration shift information was not contained in the scale factor record ("record Ø") of the extracted files. After the end date the scheme name and shift information were added to the label and a flag was placed in word 62 of record Ø to indicate the type of shift used (Ø=no shift, 1=auto shift, 2=manual shift).

At VILSPA, these changes were implemented in two phases. On 30 Jan. 1981 the AUTO/MANUAL message was added to high dispersion labels; on 10 March 1981, the same was done for low dispersion and the scheme name was added for both dispersions.

No. 65

TITLE: Incorrect entries in label by SPECLO (Declination and Zero Shift).

DATA AFFECTED:

CAMERA: All DISPERSION: Low PROCESSING: All but raw image

MEDIA: Tape, CalComp

DATES: BEGIN 00:11 04 Nov. 1980 END 20:00 16 Jan. 1981 (GSFC)
BEGIN 16:00 10 Mar. 1981 END 17 June 1981 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 50%
(only negative DEC and unshifted cases)
ESTIMATED NUMBER OF IMAGES AFFECTED: 300

PERTINENT DOCUMENTATION: GSFC SOCARS 231, 232; SMR 116

DESCRIPTION: During this period the declination of an object listed in the processing label on the line starting "TARGET COORD. (1950):" had the correct magnitude but the wrong sign for objects south of the Equator. In addition the line of the label giving the line and sample shift did not list the shifts as 0.0 when a shift was not used, but instead looked like the following:
"LINE SHIFT=YY.YYY SAMPLE SHIFT=XX.XXX"
After the end date these two errors were corrected.

No. 66

TITLE: Inaccurate automatic registration (LWR-LOW, SWP-HIGH and all Trailed).

DATA AFFECTED:

CAMERA: LWR & SWP DISPERSION: Both PROCESSING: Extracted spectra

MEDIA: Tape, CalComp, Photowrite

DATES:	BEGIN	11:30	18 Aug. 1980	END	14:00	19 Jan. 1981	GSFC
	BEGIN	22:00	30 Dec. 1980	END		17 June 1981	VILSPA

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 50% (automatic only)

ESTIMATED NUMBER OF IMAGES AFFECTED: 500

PERTINENT DOCUMENTATION: GSFC SOCAR 233

DESCRIPTION: During this period, LWR low dispersion, SWP high dispersion, and all trailed images were mis-registered by about 0.4 pixels. Since this is less than 10 percent of the length of the shortest slit used, the photometric error caused should be very small (in most cases the entire spectrum was still in the slit). The error in the dispersion direction would, in general, be less than this total error.

No. 67

TITLE: Calibration Files without temperature corrections (low dispersion).

DATA AFFECTED:

CAMERA: LWR & SWP DISPERSION: LOW PROCESSING; All But Raw Image

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 03 Apr. 1978 END 05:00 03 Mar. 1981 (GSFC)

BEGIN 17 Apr. 1978 END 11 Mar. 1982 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 12000

PERTINENT DOCUMENTATION GSFC SMR 118, and SOCAR's 238, 241, 240, 242; "IUE Data Reduction XXI", NASA IUE Newsletter No. 15.

DESCRIPTION: The IUESIPS processing software uses a set of displacements (determined from the reseaux on the tube faceplate) for each camera to correct each data image for geometric distortion, and a set of dispersion constants for each camera and dispersion mode (high, low) to determine the location of the spectrum for extraction and wavelength assignment. Primarily because of variations in spacecraft temperature at the time of observation the geometry of the image and the location of the spectral format on the camera faceplate change from image to image. Before the end date, no explicit thermal correction was applied to the calibration files.

During this period several changes were made to the processing software in an effort to use the best set of reseaux and dispersion constants for each image (see GSFC changes for: 22 May '78, 09 Jun. '78, 01 Jul. '78, 11 Aug. '78, 10 Sept. '78, 13 Nov. '79, 18 Apr. '80, 22 Apr. '80, 31 May '80, 18 Jul. '80, 18 Aug. '80, 29 Aug. '80, 04 Nov. '80 -- underlined dates are the most significant).

As of the end date for this change the displacement set used and the dispersion constants used were a function of the temperature at the time of the observation and the time of observation (the temperature used is referred to as the THDA and is usually available in the binary part of the image header). Before this change if an image were taken at a temperature which differed significantly from the temperature of the calibration files used, the wavelength assigned to a point on the spectrum would be incorrect. As an example, if the temperature of the image and the calibration file differed by 9° C for an SWP low dispersion image a wavelength error of over 2 A would result.

Those images processed during the period when bi-weekly calibrations were used are likely to show larger errors than images processed after the mean calibrations were implemented (the effective temperatures for the mean

calibrations were approximately 8° C for SWP and 13° C for LWR). The average (one standard deviation) wavelength error caused by using the mean calibrations (specifically the mean dispersion constants implemented on the end date of this change) instead of the temperature corrected calibrations is 0.16 Å for LWR-Low and 0.30 Å for SWP-Low (this corresponds to 0.06 pixels in LWR and 0.18 pixels in SWP along the spectrum).

Some of the bi-weekly calibrations were taken at temperatures very different from both the mean temperatures and the temperatures of the images processed using them; therefore, it would be possible to greatly improve the accuracy of the wavelengths of images taken during the bi-weekly calibration era.

The photometric quality of data processed before and after the end date differed very little. The data after the end date may be marginally less noisy (~5%), due to the use of the temperature corrected reseaux for the SWP camera. The reseaux motion is greatest for the SWP camera (it is at most ~0.9 pixels from the mean). For LWR the motion is so small (about 0.2 pixels from the mean) that the mean values were still used after the end date.*

In those cases where the date of observation or the temperature cannot be obtained from the label (all images prior to March 1979 lack the temperature and the date of observation) they will be entered manually (a comment in the processsing label will say "MANUAL OVERIDE") or mean calibrations will be used (a message in the label will note this). The mean dispersion constants to be used in such cases were implemented on the end date of this change. These new dispersion constants are slightly better than the July, 1980 set. The processing label for all images taken after the end date will contain the lines:

```
THDA FOR RESEAU MOTION =
THDA FOR SPECTRUM MOTION =
THERMAL SHIFTS:  LINE =      SAMPLE =
```

Any further shifting necessary to register the image, either manual or automatic, is recorded in the label under the name REGISTRATION SHIFTS: LINE = SAMPLE =

MEANS OF IDENTIFYING AFFECTED DATA:

- The messages to specify the temperatures used will not appear in the label.

* The mean reseau sets for both SWP and LWR were updated on the end date shown; details are given in configuration No. 73.

No. 68

TITLE: Use of preliminary parameters to specify the region to be processed by the program PHOTOM.

DATA AFFECTED:

CAMERA: All DISPERSION: LOW PROCESSING: All but raw image

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 00:11 04 Nov. 1980 END 05:00 03 Mar. 1981 (GSFC)
BEGIN 16:00 10 Mar. 1981 END 17 June 1981 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 1000

PERTINENT DOCUMENTATION: GSFC SOCAR 247

DESCRIPTION: During this period, the 160-pixel-wide band of the raw image which is photometrically corrected was slightly larger in the dispersion direction by roughly 2 and 15 pixels for SWP and LWR respectively. It was also displaced by several pixels (29 for SWP and 10 for LWR). The affect of this on the extracted data is to slightly change the endpoints of the spectrum (the shortest and longest wavelengths). Immediately after the end dates (3-5 March) the new smaller corrected area caused an error which is described in the GSFC change for 5 March 1981.

No. 69

TITLE: Use positional information to determine the bounds of the area of the to be extracted (SPECLO).

DATA AFFECTED:

CAMERA: ALL DISPERSION: Low PROCESSING: Extracted Spectra

MEDIA: Tape, CalComp

DATES:	BEGIN	00:11	04 Nov. 1980	END	05:00	05 Mar. 1981	GSFC
	BEGIN	16:00	10 Mar. 1981	END		07 June 1981	VILSPA

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 1000

PERTINENT DOCUMENTATION: GSFC SOCAR 245

DESCRIPTION: During this period the program SPECLO extracted that part of the spectrum lying between two nominal (coded into the program) endpoint wavelenths as long as the center of the extraction slits for these wavelengths fell within a designated area of the image. If the sample and line position of the endpoint wavelengths slit center fell outside these bounds SPECLO substituted for that endpoint a new wavelength having a slit center just inside the area. Between 05:00 GMT, 3 Mar. 1981 and 05:00 GMT, 5 Mar. 1981 the area of the image which was photometrically corrected did not coincide with the area designated by SPECLO for extraction. Therefore, during this two-day period pixels outside the photometrically corrected area could be included in the gross flux extracted.

After the end date for this change SPECLO was modified so that it no longer used positional information to determine the starting and ending wavelengths of the spectrum to be extracted. Starting at one of two nominal endpoints supplied in the program and continuing to the other, the new version of SPECLO extracts the flux in slits spaced along the spectrum at an interval of 0.707 pixels. If any of the pixels in an extraction slit are flagged as raw data pixels (the area of raw data outside the photometrically corrected area is coded by the program PHOTOM to flag it as raw data - see GSFC changes for 4 Nov 1980) the flux from that slit and its corresponding wavelength are excluded from the extracted spectrum. The result of this is that SPECLO extracts all the data lying between the two nominal wavelengths and completely (in the sense that every pixel is checked) inside of the photometrically corrected area.

No. 70

TITLE: Unused lines of header label not blank-filled by POSTLO.

DATA AFFECTED:

CAMERA: All DISPERSION: Low PROCESSING: All but raw image

MEDIA: Tape, CalComp, Printout

DATES: BEGIN 00:11 04 Nov. 1980 END 14:30 6 Mar. 1981 GSFC
BEGIN 16:00 10 Mar. 1981 END 5 May 1981 VILSPA

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 1000

PERTINENT DOCUMENTATION: GSFC SOCAR 246

DESCRIPTION: During this period the program POSTLO did not fill unused lines of the header label or unused portions of lines with blanks (these parts of the label contained core garbage). Therefore, if the label is printed as an EBCDIC string some lines will contain arbitary characters. After the end date these lines were blank filled (i.e., the EBCDIC character, blank, was placed in each byte).

No. 72

TITLE: Use June 1979 - June 1980 mean dispersion constants in high dispersion.

DATA AFFECTED:

CAMERA: LWR & SWP DISPERSION: High PROCESSING: Extracted spectra

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 10:00 18 July 1980 END 18:00 30 April 1981 (GSFC)
BEGIN 10 Mar. 1981 END (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 1800

PERTINENT DOCUMENTATION: GSFC SMR 120, SMR 107, "IUE Data Redution XVII" NASA IUE Newsletter No. 11, Oct. 1980; Configurations No. 56 and 67.

DESCRIPTION: The dispersion constants used during this time period represent an average of dispersion solutions obtained between June 1979 and June 1980. (See "IUE Data Reduction XVII" and Configuration No. 56). These constants were replaced on the end dates above with a new mean set of dispersion constants based on 41 SWP and 41 LWR calibration images obtained between March 1979 and January 1981. (Note that the improved mean dispersion constants for low dispersion mentioned in Configuration No. 67 refer to this same March 1979 - January 1981 time base), It was felt that the larger data base including more recent calibration images represented a more appropriate set for determining mean dispersion constants. The new constants are given below and should appear as shown in the header label of the extracted spectral file (aside from the $A_1 + B_1$ terms, which are subject to adjustment for thermal and registration shifts).

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	SWP		LWR	
A_1	.981209330662201	D+3	-.509452651319565	D+4
A_2	-.177605064866280	D 0	.149251059715936	D 0
A_3	.129246425785837	D-5	-.556662198103489	D-6
A_4	.313148250186739	D-1	.218482361188139	D-2
A_5	-.465498655398958	D 0	.275161223903935	D 0
A_6	-.226814749601652	D-6	0	
A_7	-.143951757345994	D-7	.117217168885699	D-6
B_1	-.656637324319187	D+4	.154668450687027	D+5
B_2	-.127092427525431	D 0	-.277985820942175	D 0
B_3	.125533624294198	D-5	.908925575350436	D-6
B_4	0		.845592613048529	D-1
B_5	.407922452808576	D 0	.223410718083750	D 0
B_6	.172022377820959	D-7	-.766471494922043	D-7
B_7	-.237700930453820	D-6	.176976584255456	D-7

MEANS OF IDENTIFYING AFFECTED DATA:

- Values of the dispersion constants (given in image label) which differ from the above mean constants (aside from the A_1 and B_1 terms).

No. 73

TITLE: Calibration files without temperature corrections (high dispersion).

DATA AFFECTED:

CAMERA: LWR & SWP DISPERSION: High PROCESSING: All but raw image

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 03 April 1978 END 03:00 19 May 1981 (GSFC)
BEGIN 17 April 1978 END 11 Mar. 1982 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 9000

PERTINENT DOCUMENTATION: GSFC SMR 122; "IUE Data Reduction XXI," NASA IUE Newsletter No. 15, September 1981; Configurations No. 55, 56, and 67.

Description: In Configuration No. 67 the details relating to the switchover from mean to temperature-corrected calibration files for low dispersion processing were described. Similar considerations apply to the case of high dispersion documented here, with the addition of several numerical quantities pertinent specifically to high dispersion. Accordingly, the discussion from Configuration No. 67 is repeated herein where appropriate. The IUESIPS processing software uses a set of displacements (determined from the reseaux on the tube faceplate) for each camera to compensate for the effects of geometric distortion, and a set of dispersion constants for each camera and dispersion mode (high, low) to determine the location of the spectrum for extraction and wavelength assignment. Primarily because of variations in spacecraft temperature at the time of observation, the geometry of the image and the location of the spectral format on the camera faceplate change from image to image. Before the end date, no explicit thermal correction was applied to the calibration files.

As of the end date for this change the displacement set used and the dispersion constants used are a function of the temperature at the time of the observation and the time of observation (the temperature used is referred to as the THDA and is usually available in the binary part of the image header). Before this change if an image were taken at a temperature which differed significantly from the temperature of the calibration files used, the wavelength assigned to a point on the spectrum would be incorrect. As an example, if the temperature of the image and the calibration file differed by 3°C for an LWR high dispersion image, a wavelength error corresponding to ~14 km/sec would result. The average 1 σ scatter in the wavelength scale for images processed with the mean calibration files implemented on 30 April 1981 at GSFC corresponds to a velocity scatter of 8.4 km/sec in LWR and

4.5 km/sec in SWP; in the earlier era when biweekly calibrations were used (prior to 18 July 1980 at GSFC; see Configuration No. 56), the typical scatter would be considerably larger. However, after the temperature and time corrections implemented on the end dates of this configuration, the average 1 σ scatter is reduced to 2.7 km/sec for LWR and 2.0 km/sec for SWP. The photometric quality of data processed before and after the end date differed very little. After the end date, SWP data may be marginally less noisy (~5%), due to the use of the temperature-corrected reseaux for the SWP camera. The reseau motion is greatest for the SWP camera (it is at most ~0.9 pixels from the mean). For LWR, the motion is so small (about 0.2 pixels from the mean) that mean reseau positions were still used after the end date. Note, however, that for both cameras the baseline mean reseau set used as of the end date of this configuration represents a redefinition of the baseline from that implemented on 18 July 1980 (see Configuration No. 55). In this new baseline set, the same time period is spanned (day 73 of 1978 to day 204 of 1979 for LWR and day 85 of 1978 to day 334 of 1979 for SWP), but with several images having been dropped for lack of reliable temperature data, leaving a total of 15 LWR flat fields and 18 SWP flat fields in the baseline. (These new mean reseau sets were also implemented for low dispersion processing at the time temperature-corrected calibrations were implemented in low dispersion - 3 March 1981 at GSFC, Configuration No. 67).

In those cases where the date of observation or the temperature cannot be obtained from the label (all images prior to March 1979 lack reliable temperature and date of observation) they will be entered manually (a comment in the processing label will say "MANUAL OVERIDE") or the mean calibrations will be used (a message in the label will note this). The processing label for all images processed after the end date will contain the lines:

```
MEAN RESEAU    (followed by information identifying the baseline
                data set*)
MEAN DC        (followed by information identifying the baseline
                data set*)
THDA for RESEAU MOTION =
THDA for SPECTRUM MOTION =
THERMAL SHIFTS:  LINE =     SAMPLE =
```

Any further shifting necessary to register the image, either manual or automatic, is recorded in the label under the name
REGISTRATION SHIFTS: LINE = SAMPLE =

MEANS OF IDENTIFYING AFFECTED DATA:

- The messages to specify the temperatures used will not appear in the label.

* Detailed in "IUE Data Reduction XXI".

No. 74

TITLE: Use only two pass running average for background smoothing in high dispersion.

DATA AFFECTED:

CAMERA: All DISPERSION: High PROCESSING: Extracted Spectra

MEDIA: Tape, CalComp

DATES: BEGIN 03 April 1978 END 14:00 11 June 1981 (GSFC)
BEGIN 17 April 1978 END 22:00 30 Dec. 1980 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 8000

PERTINENT DOCUMENTATION: VILSPA SMR R12D-1, GSFC SOCAR 263, GSFC SMR 124; "IUE Data Reduction X. Planned Changes to the Background Smoothing Algorithm," NASA IUE Newsletter No. 7, November 1979.

DESCRIPTION: Prior to the end dates given the extracted background was smoothed by two passes of a 15-point running-average filter. After the end date a 31-point median filter (program ESMOOTH) followed by the two-pass 15-point running average filter (program SMOOTH) was used. This is more effective at removing spikes (bright spots) and reseaux from the background than the previous filter. (See "IUE Data Reduction X" referenced above).

No. 75

TITLE: Error in specifying the region to which the photometric correction is applied.

DATA AFFECTED:

CAMERA: LWR, SWP DISPERSION: Low PROCESSING: All but raw image

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 13:47 10 July 1981 END 19:35 24 July 1981 (GSFC)
BEGIN END (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 150

PERTINENT DOCUMENTATION: GSFC SOCARS 247, 274, Configurations No. 68, and 80.

DESCRIPTION: The new version of the photometric-correction program PHOTOM which was implemented at GSFC 10 July 1981 to improve the ITF extrapolation in low dispersion (see Configuration No. 79) inadvertently contained an outdated set of center and radius parameters. These parameters describe the region of the raw image file which is to be photometrically corrected and those inadvertently installed are the "preliminary" values referred to in Configuration No. 68. Only low dispersion images were affected, and the only effect on the extracted spectrum file would be a slight change in the value of the maximum extracted wavelength. (See Configuration No. 68).

No. 76

TITLE: Potential loss of lines in raw image.

DATA AFFECTED:

CAMERA: All DISPERSION: Both PROCESSING: All

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 03 April 1978? END < 14 Aug. 1981 (GSFC)
BEGIN END (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: << 1%

ESTIMATED NUMBER OF IMAGES AFFECTED: << 240

PERTINENT DOCUMENTATION GSFC SOCARS 197, 281

DESCRIPTION: The backup utility program ULTPIN, used to transfer raw images from tape to disk in those instances in which the primary tape-to-disk program VTAPEIN failed, was found to be potentially defective and was removed from use in mid-1981 at GSFC. ULTPIN was intended simply to attempt a greater number of retrys in reading image records, so that recoverable tape errors would not prevent accessing tape files. It was discovered, however, that when an irrecoverable read error was encountered, ULTPIN completely dropped (i.e., skipped over without any place-keeping) the affected lines(s) from the image and proceeded to read the remainder of the image without posting any messages or warnings. Such a problem obviously affects the usefulness of the scientific data by changing, in the line direction, the positions of the remaining lines of the image. At its worst, when several lines of the image were so dropped, this problem resulted in visible distortion, particularly after the geometric correction. When only single lines were dropped, however, the effect was essentially impossible to detect visually or by the other normal quality-control checking mechanisms.

There is uncertainty as to the exact time period over which ULTPIN may have been used, although an outside limit for its last use at GSFC is the end date above, which represents the initiation date for SOCAR 281 to correct the line-dropping problem. Subsequent versions of this program zero-filled bad records and posted warning messages.

The number of images estimated to have been affected by missing lines is very small, for two reasons. First, ULTPIN was generally used only as a third resort if the image file could not be transferred to the SIPS working disk area from the Shared Disk by IMAGEIN or from tape by VTAPEIN; the exact statistics of such occurrences are unavailable. Second, the use of ULTPIN does not necessarily imply loss of image lines; recoverable read errors could well be handled by ULTPIN without loss of data. Statistics as to the fraction of the time ULTPIN worked successfully are unavailable. The best estimate is

that far less than one percent of all images were affected by the data loss problem. Furthermore, it is expected that the majority of such instances would have occurred near the beginning of the time period involved, since a greater fraction of raw images were accessed from tape (rather than the Shared Disk) in 1978 and 1979, due to backlogs.

MEANS OF IDENTIFYING AFFECTED DATA:

- Distorted images (e.g., divergence of wavelength overlay from spectra order below certain point in image). It is likely that only those images for which 2 or more lines were dropped would be distorted badly enough to be obvious visually.

No. 77

TITLE: Non-optimal automatic registration of closely-spaced orders in high dispersion spectra.

DATA AFFECTED:

CAMERA: All DISPERSION: High PROCESSING: Extracted Spectra

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 02:00 10 Sept. 1978 END 13:50 28 Aug. 1981 (GSFC)
BEGIN 17:00 01 Feb. 1979 END 11 Mar. 1982 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 40%

ESTIMATED NUMBER OF IMAGES AFFECTED: 3500

PERTINENT DOCUMENTATION: GSFC SOCAR 277, "IUE Data Reduction XXVI: Automatic Registration of the Extraction Slit with the Spectral Format," NASA IUE Newsletter No. 18, March 1982.

DESCRIPTION: Historically, the automatic registration shift applied in production processing was based on an average of 12 shifts calculated in various central spectral orders. It was discovered, however, that due to differential geometrical effects one registration shift does not necessarily apply equally well to all spectral orders, so that registering the central orders would in general result in a non-optimal registration for the closely-spaced orders. Since precise registration is crucial to the background extraction at the closely spaced orders, the registration routines DSPCON and DCSHIFT were modified as of the end date to determine a registration shift based on 12 search areas all in order 108. If an acceptable shift cannot be determined, the process is repeated for order 100, order 86 (82 for LWR) and finally (if necessary) order 77, as described in the IUE Data Reduction memo referenced above. The new registration technique results in lower extracted background flux levels for the closely-spaced orders.

No. 78

TITLE: Use preliminary ITF for LWP.

DATA AFFECTED:

CAMERA: LWP DISPERSION: Both PROCESSING: All but raw image

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 17 Aug. 1981 END 3 Nov. 1981 (GSFC)
BEGIN END (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 100

PERTINENT DOCUMENTATION: GSFC SMR 129

DESCRIPTION: Prior to the end dates indicated, the Intensity Transfer Function (ITF) in use for LWP processing, designated ITF0, used an effective exposure time of 20.22 seconds for the second level. By 3-Agency agreement, this effective exposure time was changed to 23.00 seconds on the end dates above, with the resulting ITF designated ITF1. The effect of using the preliminary ITF was to have assigned an FN approximately 12 percent too low to pixels at the second exposure level (FN = 1213 instead of FN = 1380), with corresponding reductions in FN for pixels interpolated between the first and second or the second and third levels.

MEANS OF IDENTIFYING DATA:

- Exposure time 2022 (instead of 2300) listed in the table of ITF exposure times included in the IUESIPS history label of photometrically corrected files.

No. 79

TITLE: Preliminary ITF extrapolation method used in photometric correction.

DATA AFFECTED:

CAMERA: ALL DISPERSION: Both PROCESSING: All but raw image

MEDIA: Tape, CalComp, Photowrite

DATES:	BEGIN	16:55	8 Jan. 1980	END	13:47	10 Jul. 1981	(low)	(GSFC)
					14:18	10 Nov. 1981	(high)	
	BEGIN	16:00	1 Feb. 1980	END		?	(low)	(VILSPA)
						11 Mar. 1982	(high)	

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 11000

PERTINENT DOCUMENTATION: GSFC SOCAR 257; "IUE Data Reduction XIII. Modification of Photometric Correction to Extrapolate the Intensity Transfer Function", NASA IUE Newsletter No. 8, February 1980; "IUE Data Reduction XVIII. Implementation of New Low Dispersion Software: Summary of Output Format Changes," NASA IUE Newsletter No. 12, January 1981; "IUE Data Reduction XXIII. Further Modifications to the Extrapolation of the Intensity Transfer Function," NASA IUE Newsletter No. 15, September 1981; "IUE Data Reduction XXIV. Implementation of New High Dispersion Software: Summary of Output Format Changes," NASA IUE Newsletter No. 18, March 1982.

DESCRIPTION: Under the ITF extrapolation procedures introduced on the start dates shown above (see "IUE Data Reduction XIII"), the maximum valid ITF DN level used for interpolation or to establish extrapolation was DN =254. In addition, the method of extrapolation involved an exact linear fit to the last two valid points of the ITF. On the end dates indicated, the maximum valid ITF DN level was redefined to be DN=250, and the method of extrapolation was modified to use a linear least-squares fit to the last 3 valid ITF points. (see "IUE Data Reduction XXIII"). These changes result primarily in a reduction in the occasional phenomenon of excessively large extrapolation.

Note that these changes were made only to the "new software" photometric correction routine PHOTOM, and hence the ITF extrapolation done in the high dispersion case unchanged until the new high dispersion software was implemented.

MEANS OF IDENTIFYING AFFECTED DATA:

- For low dispersion, the processing date must be used, since the version of PHOTOM employing the preliminary method of extrapolation was in production use until the end date shown.
- For high dispersion, the use of the "old software" photometric correction program (FICOR6) is, in addition to the processing date, an indication that the preliminary extrapolation method was used.

No. 80

TITLE: No flagging of LWR microphonic pings.

DATA AFFECTED:

CAMERA: LWR DISPERSION: Both PROCESSING: All†

MEDIA: Tape, CalComp

DATES:	BEGIN	3 April 1978	END	14:28 28 Sept. 1981 (low) 10 Nov. 1981 (high)	(GSFC)
	BEGIN	17 April 1978	END	11 Mar. 1982	(VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 11000

PERTINENT DOCUMENTATION: GSFC SOCAR 276, GSFC SMR 127, SOCAR 267

DESCRIPTION: Prior to the end dates indicated, standard production processing included no flagging of LWR data affected by microphonic noise. On those dates, the program MICRO was implemented in LWR processing schemes to screen raw images for microphonic pings (detected on the basis of image lines with peak-to-peak amplitudes $\geq$ 10 DN outside of the target ring). If microphonics noise of this nature is detected, the lines affected are flagged by an EBCDIC message in the image header label with the format:

PING! MICROPHONICS, AFFECTED LINES: nnn TO mmm

This message is subsequently decoded by the spectral extraction schemes such that flux points with contributions from the affected image lines are flagged by the epsilon value -220. The associated CalComp plots have such points plotted with the special symbol"*".

MEANS OF IDENTIFYING AFFECTED DATA:

- No reference to the program MICRO in IUESIPS history label.

† See also Configuration Number 81.

No. 81

TITLE: Microphonics flagging in the header label of the raw image file.

DATA AFFECTED:

CAMERA: LWR DISPERSION: Low PROCESSING: Raw Image

MEDIA: Tape, Photowrite

DATES: BEGIN 14:28 28 Sept. 1981 END 14:18 10 Nov. 1981 (GSFC)
BEGIN END (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 200

PERTINENT DOCUMENTATION: GSFC SMR 130

DESCRIPTION: When the application program MICRO was implemented to flag microphonic noise in LWR images (see Configuration No. 80) the processing schemes were modified to write the flagged raw image file to the GO tape rather than the unprocessed raw image file. Although the only difference between the 2 files was that the flagged image file had 2 extra lines added to the image label describing the location of the microphonic noise, it was decided that the raw image file would best be left as a totally unprocessed data file, thereby minimizing the risk of inadvertant damage due to undetected errors in applications programs. Note that the microphonics flagging is still contained in the labels of the other GO tape files and on the CalComp plot.

MEANS OF IDENTIFYING AFFECTED DATA:

- Records pertaining to MICRO will be found in history portion of image label.

No. 82

TITLE: Processing of high dispersion spectra using the programs GEOM, FICOR and DATEXTH (or DATEXTH2).

DATA AFFECTED:

CAMERA: All DISPERSION: High PROCESSING: All but raw image

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 03 April 1978 END 14:18 10 Nov. 1981 (LWR & SWP)
20:30 7 Jan. 1982 (LWP) (GSFC)

BEGIN 17 April 1978 END 11 Mar. 1982 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 10000

PERTINENT DOCUMENTATION: "IUE Data Reduction XVIII," NASA IUE Newsletter No. 12, January 1981; "IUE Data Reduction XXIV & XXV", NASA IUE Newsletter 18, March 1982; GSFC SMR 131, GSFC SOCAR 291 (LWP), IUE Image Processing Information Manual, Version 1.0 CSM/TM-79/6301 1979, or Version 1.1 CSC/TM-81/6268, 1981.

DESCRIPTION: A detailed description of the processing procedures used during the indicated period can be found in Version 1.0 (or 1.1) of the Information Manual referred to above, and the 3 Newsletter articles listed can be consulted for the processing details in effect as of the end date for this period.

The output products produced during this period and those produced immediately after the end date differed in the manner shown by the following table:

During Period	After End Date
Photometrically and geometrically corrected image provided. For the photometrically and geometrically corrected image the halfword pixel values are coded in a simple manner such that the relative flux (FN) equals the scaled value given unless the scaled value is 32767, in which case the pixel is saturated or extrapolated to the halfword limit (32767 is the largest FN possible).	Photometrically corrected image provided. The coding of the halfword pixels of the photometrically corrected image is designed to accommodate an extensive flagging system for exceptional pixels. The following conditions are flagged: (a) $-32767 \leq$ Scaled value ≤ -2049; Saturation (DN=255) or excessive extrapolation of ITF.

During Period	After End Date
	(b) $-2048 \leq$ Scaled Value <0; Extrapolation of upper end of ITF up to FN=65536 (c) $0 \leq$ Scaled Value ≤ 255; No photometric correction, raw DN (d) $256 \leq$ Scaled Value < 32767; Normal interpolation of ITF up to FN=61534 or extrapolation to negative FN down to FN=-3488. For case (d) the relation between FN and the Scaled Value is FN=2x (Scaled Value - 2000). For cases (a) - (c), see "IUE Data Reduction XVIII"
Gross spectra extracted using slit length of $5\sqrt{2}$ pixels for point-source reduction mode and $7\sqrt{2}$ pixels for extended-source reduction mode.	Gross spectra extracted using a slit length which depends on order number for point-source reduction mode and which is constant (10 pixels) for extended source reduction mode. (See "IUE Data Reduction XXV")
The extracted spectrum file has a data record length of 1204 bytes (up to 602 points per order). The scale factor record (record zero) does not contain target or engineering data.	Extracted spectrum file has a data record length of 2048 bytes, accommodating a total of 1022 points per order. The scale factor record contains such things as RA & DEC of target, camera temperatures, and time of observation.
Spectral data are extracted at an interval of 1.4 pixels from the resampled (smoothed) photometrically and geometrically corrected image.	Spectral data are extracted at an interval of 0.7 pixels from the photometrically corrected image. The resulting spectral resolution is better than with the older method.
The background spectrum is extracted at positions determined by an algorithm which only approximates the midpoint between orders and in fact samples too close to the spectral order by an amount ~.07 times the true order separation.	The background spectrum is extracted closer to the true midpoint between orders.
The background spectrum is extracted without regard to the presence of reseaux, microphonic noise in LWR, and saturated pixels.	The background spectrum is extended excluding such points.

During Period	After End Date
The data quality measure values (epsilons) are calculated using a formula that includes a term proportional to the distance of a pixel from the tube center.	There are only a finite number of possible values of epsilon (data quality measure) which signal special conditions. (If more than one of the conditions occurs, the value for the worst case is given).
No heliocentric velocity correction applied to wavelength assignments.	Wavelengths are reduced to a heliocentric frame of reference on the basis of the target coordinates and the time of observation.
Vacuum-to-air wavelength correction applied for $\lambda \geq$ 2000 Å in the LWR and LWP cameras only.	Vacuum-to-air wavelength correction applied for $\lambda \geq$ 2000 Å in <u>all</u> cameras.
Net ripple-corrected fluxes are provided to the end points of each spectral order.	Net ripple-corrected fluxes are set to zero when $\lvert\lambda-\lambda_c\rvert > 2.6\ K/\pi m^2$ where K = ripple constant m = order number λ_c = blaze wavelength in Å ($=K/m$) λ = wavelength in Å (before corrections described above) Furthermore, a 7-point "optimal" filter is used to condition the noise inherent in raw IUE images as discussed in "IUE Data Reduction XXV."
The header label associated with the data files gives the names of the reduction programs in use (FICOR, GEOM, DATEXTH2).	The header label associated with the data files gives the names of the new reduction programs (PHOTOM, SPECHI, POSTHI) and in addition gives the time of the midpoint of the observation, the target coordinates, and a statement noting that either an automatic or a manual shift was used.

Data quality during this period was different from that after end end date as follows:

(1) The spectral resolution was not as good.

(2) Because of the broader extraction slit and geometric smoothing used, there was less noise apparent in the spectra.

(3) Reseaux and noise spikes are smoothed into the background spectrum, and when the background is then subtracted from the gross to produce the net, erroneous broad dips or rises are produced.

(4) The calculated net flux at the closely-spaced high orders was less due to the generally higher background flux level.

MEANS OF IDENTIFYING AFFECTED DATA:

- Program names GEOM, FICOR, DATEXTH2 in history label
- 1204-byte record lengths for extracted-spectrum files.

No. 83

Title: Round-off error in dispersion constants listed in record 0 of extracted spectral files.

DATA AFFECTED:

CAMERA: All DISPERSION: LOW PROCESSING: Extracted Spectra

MEDIA: Tape

DATES: BEGIN 18:10 03 Nov. 1980 (LWR, SWP) END 19:30 16 Nov. 1981 (GSFC)
17 Aug. 1981 (LWP)

BEGIN 16:00 10 Mar. 1981 11 Mar. 1982 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 4500

PERTINENT DOCUMENTATION: GSFC SOCAR 287

DESCRIPTION: Record 0 (the scale-factor record) of the extracted spectral file contains the first 12 significant digits of each dispersion constant and its exponent m when the value is expressed in the form: $0.nnnn....x\ 10^{\pm m}$. The twelfth digit was to be rounded off by adding 0.5×10^{-12} to the dispersion constant after dividing by the appropriate power of ten. During the period defined above, however, the program SPECLO was adding 0.5×10^{-12} before division by the power of ten. The result was that dispersion constants greater than or equal to 1.0 in absolute value would be rounded-off in a digit less significant than the twelfth and that dispersion constants less than 0.1 in absolute value would be rounded-off in a digit more significant than the twelfth. Dispersion constants with absolute value greater than or equal to 0.1 but less than 1.0 would not be affected. Since in low dispersion the dispersion constants are all greater than 0.1 in absolute value, the round-off error, when it occurred at all, was of the first type.

No. 84

TITLE: Camera and image sequence number of raw image (used for locating reseaux) not contained in first line of reseau-position data set.

DATA AFFECTED:

CAMERA: All DISPERSION: N/A PROCESSING: Reseau-position data-set

MEDIA: Tape

DATES: BEGIN 03 April 1978 END 15:10 23 Nov. 1981 (GSFC)
BEGIN N/A END N/A (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 400

PERTINENT DOCUMENTATION: GSFC SOCAR 248

DESCRIPTION: The reseau-position data set which contains the found reseau positions from a flood lamp image is written to the Guest Observer tape for special processing requests and to a "PHCAL" Guest Observer tape for the standard wavelength calibration processing. In both cases, prior to the end date the reseau file header label contained no identification in line 1 relating to the floodlamp camera and image number. Accordingly, a change was made to the reseau-finding program FNDRES so that bytes 41-72 of line 1 of the input floodlamp image label are copied into the same location of the output reseau file label. These bytes contain the camera, image number, station ID flag, etc., which are normally passed on to output files by IUESIPS processing so that reseau sets, like other derived files, can now be identified with the image from which they were derived.

MEANS OF IDENTIFYING AFFECTED DATA:

- Bytes 41-72 of reseau-file label are blank

No. 85

TITLE: Possible slight automatic registration errors.

DATA AFFECTED:

CAMERA: All DISPERSION: Low (old & new SW) PROCESSING: Extracted spectra
High (old SW)

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 02:00 10 Sept. 1978 END 16:20 24 Nov. 1981 (new low SW)
19:40 24 Nov. 1981 (old SW) (GSFC)

BEGIN 17:00 01 Feb. 1979 END (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 70%

ESTIMATED NUMBER OF IMAGES AFFECTED: 20,000

PERTINENT DOCUMENTATION: GSFC SOCARS 283,292,293,294,"IUE Data Reduction XXVI: Automatic Registration of the Extraction Slit with the Spectral Format", NASA IUE Newsletter No. 18, March 1982; Minutes of the Meeting of the IUE Users' Committee, March 1982, CSC/TM-82/6103.

DESCRIPTION: A number of changes to the automatic registration software, discussed below, were made during the period between 3 Nov. 1981 and 24 Nov. 1981. Note that no end date applies to the new high dispersion software, since the changes to the program DCSHIFT affecting high dispersion were already in place when the new high dispersion reduction software was implemented (see Configuration No. 82). Although all changes described herein were in place at GSFC by 24 Nov. 1981, certain of the changes were implemented earlier. Consequently, the effective time/date (at GSFC) for each change affecting the new low dispersion software is noted by each paragraph below. For the old software both in low and high dispersion, the effective implementation date of all changes is 19:40 24 Nov. 1981.

(continued on next page)

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Trailed Spectra:

14:15 13 Nov. 1981 - The algorithm for calculating the automatic registration shift for low dispersion trailed images requires determining the point at which the square of the difference between the normalized template and image rowsums is a minimum. The software employed previously, however, because of a coding error, searched for the minimum of the difference times 2 rather than the difference squared. Although the magnitude of the resulting error cannot be calculated for the general case, tests made with pseudo-images showed the errors in the applied shifts to be less than 1 pixel.

14:15 13 Nov. 1981 - The previous software did not, in measuring shifts, discriminate against areas of LWR images affected by microphonic noise. The modified software uses the information provided by the microphonics detection program MICRO to ignore shifts determined in the regions containing microphonic noise. Errors in final shifts induced by microphonic contamination are expected to be quite small, since only a small number of search areas would be affected.

14:15 13 Nov. 1981 - The previous software did not discriminate against shifts measured at the very edge of a search area where proper interpolation of the fractional-pixel shift was not possible; the modified software does discriminate against such cases. It is doubtful, however, that any errors were induced by this effect since shifts as large as 6 pixels were allowed within the search area for trailed spectra.

16:20 24 Nov. 1981 - The previous software excluded search areas in which the maximum rowsum (see the referenced Newsletter report) divided by the minimum rowsum (i.e., background) was less than 1.5; here, a rowsum equals the total DN value of 3 diagonal pixels. In the modified software, the signal-to-noise test requires that the average DN of the 5 central rowsums minus the average DN of the 5 edge rowsums (i.e., background) be greater than 30 DN. The effect of the previous software was to exclude search areas containing high background levels, whereas such areas are now felt to be measureable.

16:20 24 Nov. 1981 - Under the previous software, if less than 4 of the 12 search areas were acceptable, manual registration would be required; under the modified software, at least 6 of the 12 search areas must be acceptable for automatic registration.

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16:20 24 Nov. 1981 - The previous software excluded search areas if any rowsum was equal to 765 DN (3 x 255 DN). Since the template used for trailed images is primarily sensitive to the edges of the spectral order rather than a central peak as for point source images, this constraint was removed in the modified software. The previous software excluded certain search areas unnecessarily, which resulted in more images requiring the less accurate manual registration procedure.

Point Source Spectra

18:10 3 Nov. 1981 - The previous software could not determine shifts greater than 2.8 pixels in the direction perpendicular to the dispersion. The modified software employs a larger search area to allow shifts up to 3.5 pixels.

18:10 3 Nov. 1981 - As mentioned above for trailed spectra, the previous software did not discriminate against areas of LWR images affected by microphonic noise.

18:10 3 Nov. 1981 - The previous software allowed 2 of the 12 shifts to be measured at the very edge of a search area where proper interpolation was not possible; the modified software allows none.

18:10 3 Nov. 1981 - Under the previous software, shifts for at least 4 of the 12 search areas were required to be acceptable for automatic registration to occur; under the modified software, this number is increased to 6 of 12 search areas.

No. 86

TITLE: Redundant "L" in column 72 of label of certain processed data files sent to NSSDC.

DATA AFFECTED:

CAMERA: All DISPERSION: Both PROCESSING: All but raw image (NSSDC tapes only)

MEDIA Tape

DATES: BEGIN 10 Dec. 1979 END 13:21 29 April 1982 (GSFC)
BEGIN N/A END N/A (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 11000

PERTINENT DOCUMENTATION: GSFC PPMR 306; CSC/TM-79/6301 or CSC/TM-81/6268.

DESCRIPTION: This problem affected only those tapes sent to the National Space Science Data Center (NSSDC). Regular Guest Observer tapes were not affected. The EBCDIC character "L" in column 72 of a header label record is used to signal the end of header label information. (See CSC TM's referenced above). Prior to the end date, the applications program VBBLK, which writes data files in blocked format for use at the NSSDC, incorrectly wrote an "L" into column 72 of the last 2 lines (logical records) of the header label for any file which did not contain an integer multiple of 5 lines in the label.

MEANS OF IDENTIFYING AFFECTED DATA:

- "L" in last 2 logical records of label.

No. 87

TITLE: Incompletely extract data from last spectral order of high dispersion spectra.

DATA AFFECTED:

CAMERA: All DISPERSION: High PROCESSING: Extracted Spectra

MEDIA: Tape, CalComp

DATES: BEGIN 14:18 10 Nov. 1981 (LWR,SWP) END 16:45 05 May 1982 (GSFC)
20:30 07 Jan. 1982 (LWP)

BEGIN 11 Mar. 1982 END 07 Jul. 1982 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 1000

PERTINENT DOCUMENTATION: GSFC SOCAR 300

DESCRIPTION: During the time period indicated, the applications program POSTHI did not read the last data record from the output files of an intermediate program step (SORTHI). Since the last data record was generally only partially filled, this meant that between 1 and 60 data points were being excluded from the last order contained in the MEHI file and displayed on the CalComp plot. (In some cases the last order did not appear at all on the CalComp; however, at least part of the data from the last order was always included in the MEHI file). In the test run conducted using corrected software for an SWP image, only 4 points were added to order 66 in the MEHI file. Note that because of the 63-point smoothing applied to the extracted background flux before the NET and ABNET fluxes are calculated, the added data points will change the last 31 NET and ABNET flux values in the last extracted spectral order.

No. 88

TITLE: Error in the observation date calculation used in the high dispersion heliocentric velocity correction (and written to the header label for both dispersion modes).

DATA AFFECTED:

CAMERA: All DISPERSION: Both PROCESSING: Extracted Spectra

MEDIA: Tape, CalComp

DATES: BEGIN 00:11 04 Nov. 1980 (low) END 13:47 6 May 1982 (Low)
14:18 10 Nov. 1981 (high) 16:45 5 May 1982 (High) (GSFC)

BEGIN 16:00 10 Mar. 1981 (Low) END 7 Jul. 1982 (VILSPA)
11 Mar. 1982 (High)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 2%

ESTIMATED NUMBER OF IMAGES AFFECTED: 150

PERTINENT DOCUMENTATION: GSFC PPMR 313, 314, CSC/TM-79/6301 or CSC/TM-81/6268

DESCRIPTION: The midpoint of observation is calculated by locating the time of the end of exposure in the event status portion of the image header label (lines 10-32; see CSC TM's referenced above) and subtracting half of the exposure (duration) time specified in line 2 of the header label. Although this technique will only be as accurate as the extracted label information mentioned above, it was found that the programs POSTHI and SPECLO were not reading the event status entry given in line 10 of the header label. If the time of end of exposure happened to be specified in this particular entry (out of the total of 45 entries) the above programs would write an anomalous observation date into the processing history portion of the header label and POSTHI would apply an incorrect velocity correction to the ABNET wavelength assignments.

MEANS OF IDENTIFYING AFFECTED DATA:

- Inspection of observation time recorded in processing history portion of label.
- Inspection of event-status entries in label to determine whether the end-of-exposure command for the image in question is in line 10 of label. The software identifies end-of-exposure commands by an initial 12-byte EBCDIC character string of the form.

"hhmmss FIN n"

where hh = hours
mm = minutes
ss = seconds
n = camera number.

The most recent (i.e., latest time) entry of this form above the double blank lines in the event status section, for which the camera number agrees with the camera number specified in line 1 of the label, is the one selected by the software to represent the end of exposure.

No. 89

TITLE: Error in handling negative declination values in high dispersion processing.

DATA AFFECTED

CAMERA: All DISPERSION: High PROCESSING: Extracted spectra

MEDIA: Tape

DATES: BEGIN 14:18 10 Nov. 1981 END 14:40 5 Aug. 1982 (GSFC)
BEGIN 11 Mar. 1982 END 19 Oct. 1982 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 50%

ESTIMATED NUMBER OF IMAGES AFFECTED: 750

PERTINENT DOCUMENTATION: GSFC PPMR 318; "IUE Data Reduction XXVIII," NASA IUE Newsletter No. 20, January 1983.

DESCRIPTION: Two errors existed in the way in which negative declination values were handled by the program POSTHI, which performs post-extraction processing of high-dispersion spectra.

1. The declination value used in the heliocentric velocity correction procedure was calculated by adding the minutes and seconds of declination (as positive quantities) to the degrees of declination regardless of whether the degrees term was positive or negative. This resulted in errors of up to 2 degrees in the declination value, which in turn resulted in small errors in the net velocity correction because of the erroneous line-of-sight.

2. The sign for negative declinations did not appear in the portion of the processing-history label where the target coordinates actually used are specified (the label line beginning "TARGET COORD, (1950):").

On the end date shown above, these problems were corrected. These changes were also announced in the Newsletter article referenced above.

MEANS OF IDENTIFYING AFFECTED DATA:

- Negative declination value stored in line 37 of header label (as written by operations software), but negative sign missing in processing history label line referred to above.

No. 90

TITLE: Error in scaling net ripple-corrected fluxes in high dispersion.

DATA AFFECTED:

CAMERA: All DISPERSION: High PROCESSING: Extracted spectra

MEDIA: Tape

DATES: BEGIN 14:18 10 Nov. 1981 END 14:40 05 Aug. 1982 (GSFC)
BEGIN 11 Mar. 1982 END 16 Jul. 1982 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 1500

PERTINENT DOCUMENTATION: VILSPA Software Modification Report R14A-1, GSFC PPMR 324, "IUE Data Reduction XXVIII," NASA IUE Newsletter No. 20, January 1983.

DESCRIPTION An error existed in the scaling of the ripple-corrected net spectral fluxes generated by the program POSTHI. The conversion of floating-point ripple-corrected net flux values to scaled-integer fluxes for inclusion in the MEHI tape file was incorrectly done on the basis of the maximum and minimum floating-point values for the uncorrected net flux. This caused any ripple-corrected net flux value exceeding the maximum uncorreced net flux to be interpreted on tape as a negative value.

This problem was corrected on the end dates shown above and was also discussed in the Newsletter article referenced.

MEANS OF IDENTIFYING AFFECTED DATA

- Incongruously negative flux values in the net ripple-corrected spectrum on the GO tape.

No. 91

TITLE: Perform photometric correction in low dispersion (under new software) without spatial truncation due to partial-read boundaries.

DATA AFFECTED

CAMERA: All DISPERSION: Low PROCESSING: PI only

MEDIA: Tape, Photowrite

DATES: BEGIN 00:11 04 Nov. 1980 END 19:45 27 Aug. 1982 (GSFC)
17 Aug. 1981 (LWP)

BEGIN 16:00 10 Mar. 1981 END 19 Oct. 1982 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 7500

PERTINENT DOCUMENTATION GSFC PPMR 321; "IUE Data Reduction XXIX", NASA IUE Newsletter No. 20, January 1983.

DESCRIPTION: Since the start up of the new reduction software on the start dates shown above, the photometric correction for low dispersion images has been done only within a swath surrounding the spectral order. The possibility that "partial-read" images (images for which only a rectangular portion of the vidicon target, encompassing the low-dispersion spectrum, is read out) may become a user option prompted the development of a means of handling the photometric correction in low dispersion so as to facilitate partial-read image processing.

Therefore, the program PHOTOM was changed on the end dates shown so that for all low dispersion images (whether partial-read images or not), pixels outside of the partial-read image boundaries are left unchanged (raw DN). This insures that when partial-read images are processed, the zero-DN pixels added on to fill a full frame (768x768) 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. With this change, all low dispersion images will have the corners of the photometrically corrected region truncated wherever the partial-read boundaries impinge upon the PHOTOM swath. This truncation, discussed further in the Newsletter article referenced above, does not affect the extracted spectral data.

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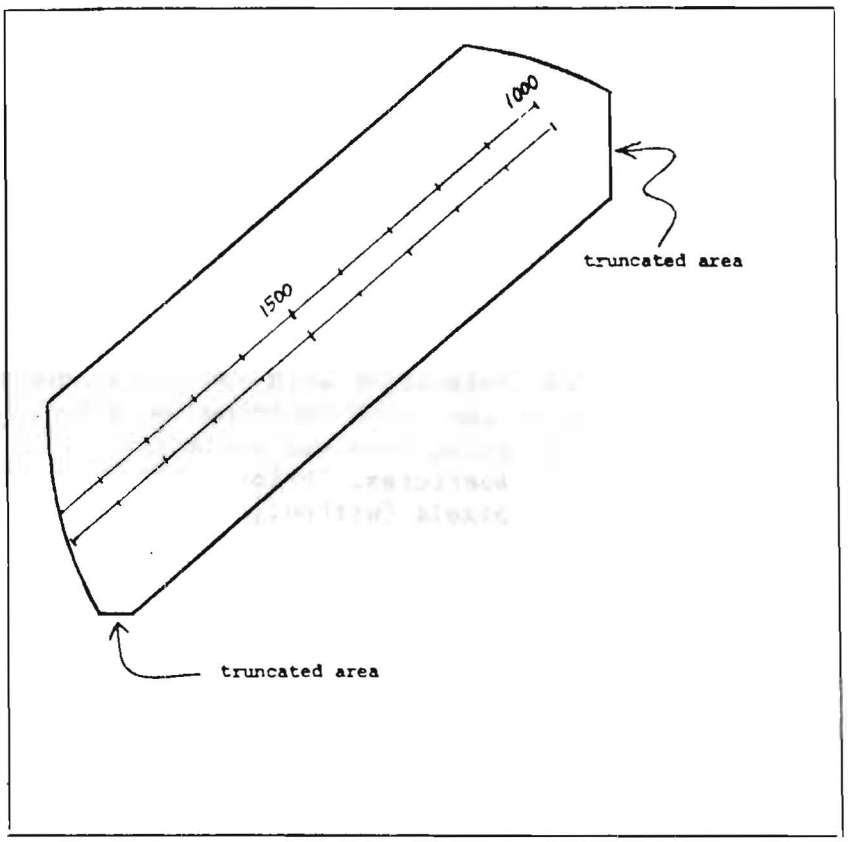
MEANS OF IDENTIFYING AFFECTED DATA:

- Truncation of certain edges of the PHOTOM swath (as illustrated below schematically for the SWP case).



No. 92

TITLE: Perform photometric correction in low dispersion (under new software) in a non-optimally centered swath.

DATA AFFECTED:

CAMERA: ALL DISPERSION: Low PROCESSING: PI only

MEDIA: Tape, Photowrite

DATES: BEGIN 00:11 04 Nov. 1980 END 19:45 27 Aug. 1982 (GSFC)
17 Aug. 1981 (LWP)

BEGIN 16:00 10 Mar. 1981 END 19 Oct. 1982 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 7500

PERTINENT DOCUMENTATION: GSFC PPMR 322

DESCRIPTION: On the end dates shown, coincident with the change described by Configuration No. 91, the centering of the swath defining the primary constraint on the photometrically corrected area was optimized to lie more precisely between the large and small apertures. Prior to that time the swath had been miscentered by up to several pixels (without, however, affecting the extracted spectral data).

No. 93

TITLE: Utilize old echelle ripple correction in high dispersion.

DATA AFFECTED:

CAMERA: All DISPERSION: High PROCESSING: Extracted Spectra

MEDIA: Tape, CalComp

DATES: BEGIN 03 Apr. 1978 END 19:45 27 Aug. 1982 (GSFC)
BEGIN 17 Apr. 1978 END 19 Oct. 1982 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 12000

PERTINENT DOCUMENTATION: GSFC PPMR 308; "IUE Data Reduction XXVIII," NASA IUE Newsletter No. 20, January 1983; "IUE Camera Sensitivities and the Echelle Ripple Correction," NASA IUE Newsletter No. 19, July 1982;" Configurations No. 6 and 17.

DESCRIPTION: Prior to the end dates listed, the echelle blaze ("ripple") correction was done according to the formula

$$F_{corr}(\lambda) = \frac{F(\lambda)}{R(\lambda)}$$

where $F_{corr}(\lambda)$ is the corrected flux, $F(\lambda)$ the uncorrected flux, and

$$R(\lambda) \equiv \frac{\sin^2 x}{x^2}(1+ax^2)$$

$$x = \frac{\pi m^2 (\lambda-\lambda_c)}{K}$$

$$\lambda_c = \frac{K}{m}$$

$$m = \text{order number},$$

and a and K are appropriately chosen constants (see Configurations No. 6 and 17).

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As a result of the analysis done by T. Ake (Newsletter No. 19, alone), an improved ripple correction, of the form

$$\text{sinc}^2 m\pi\alpha\,(1-K/m/\lambda),$$

where K is allowed to be a second-order function of m, was adopted for production use on the end dates shown. K and α values used are listed below.

SWP, SWR	LWR, LWP
$K = 138827.0 - 27.43m + 0.1659m^2$	$K = 230012.0+17.25m - 0.0599m^2$
$\alpha = 0.856$	$\alpha = 0.896$

The constants were directly determined for SWP and LWR only and are also adopted for the SWR and LWP cases, respectively, until separate determinations can be made.

MEANS OF IDENTIFYING AFFECTED DATA:

- Old-form correction constants (K not a function of m) in processing - history label.

No. 94

TITLE: Use of non-optimal pixel offsets from small to large aperture in LWP.

DATA AFFECTED:

CAMERA: LWP DISPERSION: Both PROCESSING: Extracted Spectra

MEDIA: Tape, CalComp

DATES: BEGIN 17 Aug. 81 END 17:20 21 Sept. 1982 (GSFC)
BEGIN 10 Mar. 82 END 19 Oct. 1982 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 50% (large-aperture only)

ESTIMATED NUMBER OF IMAGES AFFECTED: 200

PERTINENT DOCUMENTATION GSFC PPMR 326; "IUE Data Reduction XXXI," NASA IUE Newsletter No. 20, January 1983.

DESCRIPTION: Prior to the end dates specified, the small-to-large aperture offsets used to transplant the fundamental LWP small-aperture dispersion relations to the large aperture were mirror-reflections of the values used for the LWR camera. Although the spectral scale as seen by the two long-wavelength cameras is essentially the same, the orientation of the camera scan lines relative to the spectral orders is slightly different, which means that a mirror reflection of the LWR values is not optimal for LWP. The old and new offset values are tabulated below, in pixels.

	ΔL	ΔS	R
Old	+19.4	+18.6	26.9
New	+18.1	+19.9	26.9

$$R = [(\Delta L)^2 + (\Delta S)^2]^{1/2}$$

Assuming the new offsets correctly indicate the location of objects placed in the large aperture, the use of the old offsets introduced a wavelength error of -4.8 A in low dispersion and a velocity error of -1.0 km s^{-1} in high dispersion, for large aperture spectra.

No. 95

TITLE Use of March 1979 - January 1981 mean dispersion constants for LWR and SWP.

DATA AFFECTED:

CAMERA: LWR & SWP DISPERSION: Both PROCESSING: Extracted Spectra

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 18:00 30 April 1981 (high) END 17:20 21 September 1982 (GSFC)
05:00 03 March 1981 (low)

BEGIN END (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 8,500

PERTINENT DOCUMENTATION: GSFC PPMRs 301, 302, 305, 309, 311, 319, 320,325, 326, 327; "IUE Data Reduction XXX" NASA IUE Newsletter No. 20, Jan. 1983; Minutes of the IUE Users Committee Meeting Sept. 27-28 1982, CSC/TM/6211. Configurations No. 67 and 72; "IUE Data Reduction XXXII" NASA IUE Newsletter No. 21, May 1983.

DESCRIPTION: The dispersion constants used during this time period represent an average of dispersion solutions obtained between March 1979 and January 1981. (See "IUE Data Reduction XXX" and Configurations number 72 and 67). These constants were replaced on the end dates above with a new mean set of dispersion constants based on 45 SWP high dispersion images, 44 SWP low dispersion images, 47 LWR high dispersion images and 46 LWR low dispersion images obtained between January 1980 and August 1982. It was felt that the larger data base including more recent calibration images represented a more appropriate set for determining mean dispersion constants and correlation coefficients. The new dispersion relations, including updated temperature and time corrections, also incorporate several improvements made to the procedures for calculating dispersion constants which are summarized below:

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Date of Implementation	PPMR	Description
2/1/82	301	Temperature and time corrections were applied to the preliminary dispersion relation that are input to the program WAVECAL. These preliminary dispersion constants define the starting search locations used to identify the platinum emission lines.
2/5/82	302	The improved starting search locations described above allowed the use of smaller search areas (i.e., from 11 x 11 pixels to 7 x 7 pixels). The smaller search areas improved the cross-correlations used to identify line locations.
4/19/82	309-311	An LWR reseau which was commonly misidentified was removed from the file of "searched-for" reseaux. This modification has the effect of improving the geometric correction procedure which is applied to the wavelength calibration images.
7/26/82	319	The program FNDRES was modified to center more closely the cross-correlation matrix on the input reseau positions and to delete the central reseau area from the calculation of the mean background level. These changes improve the reseau-finding procedure.
7/26/82	320	The input parameters to the reseau-finding program FNDRES were modified to reduce the search area from 12 x 12 pixels to 7 x 7 pixels. As was the case in WAVECAL with finding the Pt-Ne emission lines, the smaller search area in FNDRES should improve the cross-correlations used to identify reseau positions and thereby improve the geometric correction procedure.
8/27/82	325	The search area described above was further reduced to 6 x 6 pixels (from 7 x 7 pixels) after an analysis of FNDRES showed that specifying an even number of pixels improved the centering of the correlation matrix on the input reseau positions.

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The new dispersion constants are given below and should appear as shown in the header label of the extracted spectral files (aside from the A and B terms, which are subject to adjustment for thermal and registration shifts). The correlation coefficients shown for the temperature and time corrections are defined such that the mean time and temperature correspond to a correction of zero and are applied to the dispersion constants by adding a value W such that

$$W = W_1 + W_2T + W_3t$$

where

T = head amplifier temperature (THDA, in C°) and
t = number of days since January 1, 1978.

Updated Coefficients Defining the Dispersion Relations
for the Small Aperture (High Dispersion)

Dispersion Constants

	LWR HIGH	SWP HIGH
A_1	-4.877917909118001E-03	6.218892050975904E 02
A_2	1.472791022260271E-01	-1.723188694946298E-01
A_3	-5.522146305212622E-07	1.273046286227277E-06
A_4	7.449215787825510E-03	2.768587190334483E-02
A_5	2.767349997273978E-01	-4.654400112925802E-01
A_6	2.920103076528571E-09	-1.991352524783476E-07
A_7	1.110510384889110E-07	-1.311560455819058E-08
B_1	1.540903104020054E 04	-7.263344544922493E 03
B_2	-2.774574415612283E-01	-1.167948613338929E-01
B_3	9.077724306570848E-07	1.217348513144755E-06
B_4	5.925811878052170E-02	-8.673599101745499E-04
B_5	2.260993410233010E-01	3.988096737403947E-01
B_6	-8.019420360642425E-09	2.123655462298873E-08
B_7	4.017085561525235E-09	-1.725994284098098E-07

Correlation Coefficients

$W_1(S)$	5.279257774353027E 00	-2.243103027343750E 00
$W_2(S)$	-2.944609522819519E-01	2.709355205297470E-02
$W_3(S)$	-1.101587899029255E-03	1.696390565484762E-03
$W_1(L)$	-8.647566795349121E 00	-2.585970878601074E 00
$W_2(L)$	5.825527310371399E-01	2.170356512069702E-01
$W_3(L)$	6.621174979954958E-04	5.693519487977028E-04

Updated Coefficients Defining the Dispersion Relations
for the Small Aperture (Low Dispersion)

Dispersion Constants

	LWR LOW	SWP LOW
A_1	-2.990875719313456E 02	9.831253793383688E 02
A_2	3.022277020991960E-01	-4.664930974754992E-01
B_1	-2.644043768193267E 02	-2.633819950912196E 02
B_2	2.255967850073182E-01	3.762518274366946E-01

Correlation Coefficients

$W_1(S)$	5.347592353820801E 00	-2.239044189453125E 00
$W_2(S)$	-2.516177892684937E-01	1.984719652682543D-03
$W_3(S)$	-1.652141334488988E-03	1.870391191914678E-03
$W_1(L)$	-8.600588798522949E 00	-1.632983207702637E 00
$W_2(L)$	5.316009521484375E-01	1.545836925506592E-01
$W_3(L)$	1.222184859216213E-03	2.332759177079424E-04

MEANS OF IDENTIFYING AFFECTED DATA:

- The values for, and descriptions of, the dispersion constants, as given in the image label) will differ from those for the above mean constants (the A_1 and B_1 terms will normally vary from image to image).

No. 96

TITLE: Use of LWP dispersion constant files derived from single calibration images obtained on GMT day 168, 1981.

DATA AFFECTED:

CAMERA: LWP DISPERSION: Both PROCESSING: Extracted spectra

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 17 August 1981 END 17:20 21 Sept. 1982 (GSFC)
BEGIN END (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 300

PERTINENT DOCUMENTATION: GSFC PPMRs 326, 327; "IUE Data Reduction XXX" NASA IUE Newsletter No. 20, Jan. 1983 (note errata in NASA IUE Newsletter No. 21, May 1983); "IUE Data Reduction XXXI" NASA IUE Newsletter No. 20, Jan. 1983; Configuration No. 95.

The LWP dispersion constants used during the above time period represent dispersion solutions obtained from single high and low dispersion calibration images (LWP 1220 low, LWP 1221 high). These constants were replaced on the end dates shown above with a new mean set of dispersion constants based on 14 LWP high and low dispersion images obtained between 17 June 1980 and 17 August 1982. The new dispersion relations (listed below in Table 1) incorporate several improvements to the procedures for calculating dispersion constants which are described in Configuration No. 95. Note that temperature and time corrections, which are implemented for the LWR and SWP cameras, have not been implemented for the LWP camera.

Table 1

Updated Coefficients Defining the Dispersion Relations
for the Small Aperture

	LWP High	LWP Low
A_1	7092.434	1045.484
B_1	-102.733	-272.238
A_2	18332.296E-5	-286.471E-3
B_2	-13694.831E-5	246.469E-3
A_3	6804.252E-10	
B_3	5902.048E-10	
A_4	1675.931E-2	
B_4	0.	
A_5	374.701E-3	
B_5	330.485E-3	
A_6	-721.526E-7	
B_6	180.210E-10	
A_7	-284.761E-8	
B_7	-36.529E-8	

No. 97

TITLE No optimal filtering for noise conditioning in LWP high dispersion processing.

DATA AFFECTED:

CAMERA: LWP DISPERSION: High PROCESSING: Extracted spectra

MEDIA: Tape, CalComp

DATES: BEGIN 14:18 10 Nov. 1981 END 13:30 11 Oct. 1982 (GSFC)
BEGIN 11 Mar. 1982 END 19 Oct. 1982 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 100

PERTINENT DOCUMENTATION: GSFC PPMR 328; "IUE Data Reduction XXV," NASA IUE Newsletter No. 18, March 1982; "IUE Data Reduction XXVIII", NASA IUE Newsletter No. 20, January 1983.

DESCRIPTION: The "optimal" noise-conditioning filter applied to the net ripple-corrected spectrum under the new reduction software was originally defined to be a unity filter in the case of the LWP camera. On the end dates shown, filter elements determined by F.H. Schiffer specifically for LWP spectra were put into LWP production use. These filter elements now condition the noise in the same way as is done for the LWR and SWP cameras. The old and new LWP filter weights used are listed below.

Element No.	Old	New
1	0	0.0017
2	0	0.0076
3	0	0.1027
4	1	0.7760
5	0	0.1027
6	0	0.0076
7	0	0.0017

No. 98

TITLE: No flagging of "bright spots".

DATA AFFECTED:

CAMERA: All DISPERSION: Both PROCESSING: Extracted spectra

MEDIA: Tape, CalComp

DATES: BEGIN 03 Apr. 1978 END 17:04 19 Nov. 1982 (GSFC)
BEGIN 17 Apr. 1978 END 19 Oct. 1982 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 30000

PERTINENT DOCUMENTATION: GSFC SOCARs 269, 270, 284; GSFC PPMRs 304, 329

DESCRIPTION: Prior to the end dates listed, standard production processing included no flagging of data affected by "bright-spot" artifacts in IUE images, i.e., discrete bright blemishes due either to permanent "hot pixels" or random radiation events. On the dates indicated, the program BSPOT was implemented to screen the raw images for bright-spot blemishes by searching for pixels with outlying DN values (i.e., pixels with values more than 90 DN above the typical local value) according to a specialized mean/median filtering routine. Pixels so located are catalogued in a file which is decoded by the extraction programs such that flux points with contributions from the affected pixels are flagged by the epsilon value - 300. The associated CalComp plots have such points plotted with the special symbol "◊".

No. 99

TITLE: Microphonics detection software run in "dummy" mode for SWP and LWP cameras.

DATA AFFECTED:

CAMERA: LWP, SWP DISPERSION: Both PROCESSING: Raw image

MEDIA: Tape, Photowrite

DATES: BEGIN 28 Sep. 1981 (low) END 6:03 31 Jan. 1983 (GSFC)
10 Nov. 1981 (high)

BEGIN N/A END N/A (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 4500

PERTINENT DOCUMENTATION: GSFC PPMR 332

DESCRIPTION: When the applications program MICRO was implemented to flag microphonic noise in LWR images (see Configuration No. 80), the SWP & LWP processing schemes at GSFC also included an execution of MICRO, even though MICRO was hardcoded to skip over the detection loop in the case of SWP or LWP. Thus, although the overall scheme structure was simplified by treating all cameras alike at the scheme level, execution time was wasted by MICRO's operation of reading the raw image file and then exiting in the case of SWP or LWP.

On the end date shown, the SWP and LWP schemes were modified to delete the call to MICRO. The only difference noticeable to the user is the lack of the MICRO execution tag in the image processing history label. Its presence under the old scheme configuration was potentially misleading since in fact no screening for microphonics was done for those cameras.

MEANS OF IDENTIFYING AFFECTED DATA:

- MICRO execution tag in history portion of image label.

No. 100

TITLE: Possible error in extracting correct head amplifier temperature from image header label.

DATA AFFECTED:

CAMERA: LWR & SWP DISPERSION: Both PROCESSING: SWP: all but raw image
LWR: extracted spectra

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN Low: 03 Mar. 1981 END 16:00 24 Feb. 1983 (GSFC)
High: 19 May 1981

BEGIN END 31 May 1983 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: < 1 %

ESTIMATED NUMBER OF IMAGES AFFECTED: < 100

PERTINENT DOCUMENTATION: GSFC PPMR 333; "IUE Data Reduction XXI," NASA IUE Newsletter No. 15, Sep 1981.

DESCRIPTION: When the GMT date (i.e., day number) changed between the time an image was exposed and the time it was read, the applications program TCCAL would not obtain the correct head amplifier temperture (THDA) from the header label. As a result, the program would use mean dispersion constants rather than applying a temperature and time correction. For SWP, mean displacement files would be used rather than temperature corrected displacement files. On the end dates indicated, changes to TCCAL were implemented which allow the change in day number to be detected and handled properly.

MEANS OF IDENTIFYING AFFECTED DATA: If the read time in line 10 of post-1981 image header labels is close to 0 hours and the history portion of the header label shows mean dispersion constants and reseau positions were used, the above error was probably encountered.

No. 101

TITLE: Non-perpendicular manual registration shift.

DATA AFFECTED:

CAMERA: All DISPERSION: Both PROCESSING: Extracted Spectra

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 17:20 21 Sept. 1982 END 16:00 24 Feb. 1983 (GSFC)
BEGIN END 31 May 1983 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 50%

ESTIMATED NUMBER OF IMAGES AFFECTED: 1100

PERTINENT DOCUMENTATION: GSFC PPMR 334

DESCRIPTION: The manual registration program, REG, contains values representing the approximate angles between the spectral orders and the direction in which the read beam moves. These angles are calculated using the mean dispersion constants (i.e., slope = $(dL/d\lambda)/(dS/d\lambda)$ and were not updated when the new dispersion constants were implemented on September 21, 1982. The old and new values are given below. In general, the differences are so small that little difference would be seen in the extracted spectral data.

Camera	Dispersion	Old angle(°)	Updated angle(°)
LWP	high	39.6	39.8
	low	310.69	310.7
LWR	high	324.25	324.1
	low	53.26	53.3
SWP	high	37.86	38.0
	low	308.88	308.9

No. 102

TITLE: Use of June 1980 - August 1982 mean LWP dispersion constants without a correction for temperature.

DATA AFFECTED:

CAMERA: LWP DISPERSION: Both PROCESSING: Extracted spectra

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 17:20 21 Sept. 1982 END 16:12 12 April 1983 (GSFC)
BEGIN END 11 Oct. 1983 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 150

PERTINENT DOCUMENTATION: GSFC PPMRs 336, 335, 327; "IUE Data Reduction XXX" NASA IUE Newsletter No. 20 January 1983; Configuration No. 95, "IUE Data Reduction XXXII", NASA IUE Newsletter No. 21, May 1983.

DESCRIPTION: The June 1980 - August 1982 mean LWP dispersion constants were replaced on the end dates shown above with a new mean set of dispersion constants based on 28 high and low dispersion images obtained between June 1980 and March 1983. The expanded data base not only represented a more appropriate set for determining mean dispersion constants but also allowed the implementation of a correction for thermal shifts in location of the LWP spectral format.

The new constants and correlation coefficients are given below and should appear as shown in the header label of the extracted spectral files (aside from the $A_1 + B_1$ terms, which are subject to adjustment for thermal and registration shifts). The correction for temperature is applied by adding a value W where

$$W = W_1 + W_2T + W_3t$$

T = head amplifier temperature (THDA, in C°) and
t = number of days since January 1, 1978.

The correlation coefficients W above are defined such that the mean temperature corresponds to a correction of zero. Note that for the LWP camera the W_3 coefficients are set to zero, signifying that no correction for time is applied for this camera.

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MEANS OF IDENTIFYING AFFECTED DATA:

- Values of, and descriptions for, the dispersion constants (given in image label) which differ from those for mean constants (aside from the A_1 and B_1 terms). The message "MEAN DC USED" also appears in the label when no temperature correction is applied.

Updated Coefficients Defining the LWP Dispersion Relations
for the Small Aperture (High Dispersion)

DISPERSION CONSTANTS

A1	6.519567430691839E 03
A2	-1.778483034226251E-01
A3	6.674819991848808E-07
A4	1.598582672397747E 01
A5	3.553799013108267E-01
A6	-6.882926804695988E-05
A7	-2.764837136203847E-06
B1	1.204170348210633E 03
B2	-1.481415791069993E-01
B3	6.141328065489587E-07
B4	3.920442560853582E-03
B5	3.214292514202579E-01
B6	4.968180685794447E-08
B7	-3.245305013106521E-07

CORRELATION COEFFICIENTS

W1(S)	-9.397546052932739E-01
W2(S)	1.034402847290039E-01
W3(S)	0.
W1(L)	-4.678806304931641E-00
W2(L)	5.145044326782227E-01
W3(L)	0.

Updated Coefficients Defining the LWP Dispersion Relations
for the Small Aperture (Low Dispersion)

DISPERSION CONSTANTS

A1	1.045978073509556E 03
A2	-2.866200015671855E-01
A3	0.
A4	0.
A5	0.
A6	0.
A7	0.
B1	-2.722438935715519E 02
B2	2.465021881612769E-01
B3	0.
B4	0.
B5	0.
B6	0.
B7	0.

CORRELATION COEFFICIENTS

W1(S)	-7.499701976776123E-01
W2(S)	8.839589357376099E-02
W3(S)	0.
W1(L)	-3.398871421813965E 00
W2(L)	4.001707434654236E-01
W3(L)	0.

No. 103

TITLE: Possible corruption of binary temperature data contained in image header label.

DATA AFFECTED:

CAMERA: All DISPERSION Both PROCESSING: All

MEDIA: Tape, CalComp

DATES: BEGIN 03 Apr. 1978 END 09 May 1983 (GSFC)
BEGIN END (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: << 1 %

ESTIMATED NUMBER OF IMAGES AFFECTED: << 350

PERTINENT DOCUMENTATION: GSFC PPMR 347.1 "IUE Data Reduction XIX", NASA IUE Newsletter No. 12, January 1981; NASA IUE Newsletter No. 17. February 1982; Configurations No. 67, 73, 102.

DESCRIPTION: The IUESIPS label modification utility program ULFLBM, used when an image label is corrupted and/or incomplete as archived by the OCC system, was found to delete unprintable characters from the label. This means that if the utility was used for modifying (or even displaying) label lines 40-100, the binary data (e.g. THDA data) contained therein was probably corrupted.

Images with binary label data corrupted in this way would be processed without any corrections applied for temperature or time (i.e., corrections would be defaulted to mean values).

NOTE: Images obtained before March 1979 were not considered to have reliable temperature data stored in the header label in any case, due to characteristics of the OCC software system (see "IUE Data Reduction XIX", NASA IUE Newsletter No. 12, January 1981).

MEANS OF IDENTIFYING AFFECTED DATA:

- In those cases where temperature corrections would otherwise have been made (see Configurations number 67, 73 and 102), the existence of the condition reported here would be flagged by an indication in the processing history portion of the label that "MEAN DC" had been used.

- Alternatively, the binary portion of the label can be directly inspected for corruption. For example, the data in label lines 86-100 as described on page A-30 of NASA IUE Newsletter No. 17 would be corrupted.

No. 104

TITLE Automatic registration without avoidance of multiple regions containing microphonic noise.

DATA AFFECTED:

CAMERA: LWR DISPERSION: Both PROCESSING: Extracted Spectra

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 24 Nov. 1981 END 15:00 19 May 1983 (GSFC)
BEGIN END (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: <<< 1 %

ESTIMATED NUMBER OF IMAGES AFFECTED: $\lesssim$ 5

PERTINENT DOCUMENTATION: GSFC PPMR 340; NASA IUE Newsletter No. 18, March 1982; Configuration No. 85.

DESCRIPTION: As described in the Newsletter article mentioned above (see also Configuration number 85) the automatic registration program DCSHIFT was modified on November 24, 1981 to exclude from the registration shift calculation any spectral regions flagged as containing microphonic noise. It was assumed, however, that the microphonic noise for a particular image would only occur in one region, and therefore DCSHIFT was programmed to process only a single entry from the microphonics-flagging routine MICRO (specifically, the first entry written to the header label by MICRO). Since microphonics are now known occasionally to occur in more than one region (in a particular image) changes were made to DCSHIFT on the end date shown above allowing it to avoid up to 10 separate microphonics regions.

The effect of this error was to cause slightly less accurate registration shifts than would otherwise be used, although the self consistency checks built into the shift calculation would have eliminated large errors.

MEANS OF IDENTIFYING AFFECTED DATA: LWR images processed with automatic registration between the end dates shown and containing more than one label entry flagging microphonic noise, may be affected. The microphonic noise would have to occur in one of the spectral regions used by DCSHIFT for the registration calculation (see IUE Newsletter article).

No. 105

TITLE: Automatic registration without avoidance of any region containing microphonic noise.

DATA AFFECTED:

CAMERA: LWR DISPERSION: Both PROCESSING: Extracted Spectra

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 3:50 31 Jan. 1983 END 15:00 19 May 1983 (GSFC)
BEGIN END (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: < 10%

ESTIMATED NUMBER OF IMAGES AFFECTED: < 60

PERTINENT DOCUMENTATION: GSFC PPMRs 332, 342; Configuration number 104.

DESCRIPTION: Independent of the changes in capability described in Configuration number 104, a modification to the IUESIPS scheme-generator software inadvertantly prevented DCSHIFT from obtaining microphonics flags output by the program MICRO. This means that LWR images processed between 31 Jan. 1983 and 19 May 1983 using the automatic registration procedure did not have regions containing microphonic noise excluded from the registration shift calculation.

The effect of this error was to cause slightly less accurate registration shifts then would otherwise be used, although the self-consistency checks built into the shift calculation would have eliminated large errors. The error was corrected on the end date shown above.

MEANS OF IDENTIFYING AFFECTED DATA:

- LWR images processed with automatic registration during the affected time period and containing a label entry flagging microphonic noise may be affected. The microphonic noise would have to occur in one of the spectral regions used by DCSHIFT for the registration calculation (see reference in Configuration number 104).

No. 106

TITLE Low dispersion background smoothing filter width of 30 data points.

DATA AFFECTED

CAMERA: All DISPERSION: Low PROCESSING: Extracted Spectra

MEDIA: CalComp, Tape

DATES: BEGIN 00:11 04 Nov. 1980 END 14:30 22 July 1983 (GSFC)
BEGIN 16:00 10 Mar. 1981 END 11 Oct. 1983 (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 5,000

PERTINENT DOCUMENTATION: GSFC PPMR 347; Configuration number 60.

DESCRIPTION: The low dispersion extraction routine POSTLO implemented on the start dates shown uses a double-pass mean filter for smoothing the low dispersion extracted background flux after a median filter is applied. (See Configuration number 60). The default filter width was documented as being 31 data points, although the program was actually coded to use 30 points. Changing the width to 31 on the end date shown resulted in a slight change to the net and the absolutely-calibrated net spectral fluxes stored in the MELO data file.

MEANS OF IDENTIFYING AFFECTED IMAGES:

- All low dispersion images processed during the time period shown will be affected.

No. 107

TITLE: Error in handling extracted LWR spectral data from images flagged as containing more than one region of microphonic noise.

DATA AFFECTED;

CAMERA: LWR DISPERSION: Both PROCESSING: Extracted Spectra

MEDIA: Tape, CalComp, Photowrite

DATES:	BEGIN	14:28	28 Sept.	1981	(low)	END	12:35	21 July	1983	(low)
			10 Nov.	1981	(high)		19:46	25 July	1983	(high) (GSFC)
	BEGIN					END		27 Apr.	1984	(low)
								27 Apr.	1984	(high) (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: << 1%

ESTIMATED NUMBER OF IMAGES AFFECTED: < 5

PERTINENT DOCUMENTATION: GSFC PPMR's 339, 338

DESCRIPTION: The data extraction routines SPECLO and SPECHI were coded to handle only a single occurrence of microphonic noise in LWR spectral images. If the microphonics flagging program, MICRO, flagged more than one region as containing microphonic noise, the programs SPECLO and SPECHI would properly flag as contaminated (i.e., set the epsilon value equal to -220) only those spectral data extracted from the last region. Since the background flux calculation excludes data points flagged as containing microphonic noise, a slight error in the derived net and absolutely-calibrated net fluxes would occur as well.

MEANS OF IDENTIFYING AFFECTED IMAGES:

- LWR images with more than one region of microphonic noise identified in the header label and processed during the affected time period.

No. 108

TITLE: Incorrect observation date calculation when the GMT day number changes between the end of exposure and the time of read.

DATA AFFECTED

CAMERA: All DISPERSION: Both PROCESSING: Extracted Spectra

MEDIA: Tape, CalComp

DATES:

BEGIN	SWP, & LWR:	00:11	04 Nov. 1980 (low) 10 Nov. 1981 (high)	END 14:15 12 July 1983 (low) 15:45 27 July 1983 (high)	(GSFC)
	LWP:		17 Aug. 1981 (low) 07 Jan. 1982 (high)		
BEGIN				END 27 Apr. 1984 (low) 27 Apr. 1984 (high)	(VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: << 5%

ESTIMATED NUMBER OF IMAGES AFFECTED: << 500

PERTINENT DOCUMENTATION GSFC PPMRs 344,345; Configuration number 100.

DESCRIPTION: When the GMT day number changes between the time an image exposure ends and the time it is read (as recorded in the image header label), the extraction routines POSTHI and SPECLO introduced an error of 24 hours in the observation date calculation. In low dispersion this error appeared in the header label and in the scale-factor record ("record 0") of the extracted spectral file where the midpoint of observation is recorded. Additionally, in high dispersion, an error would occur in the heliocentric velocity correction which is applied to the extracted spectral data on the basis of the calculated observation date.

MEANS OF IDENTIFYING AFFECTED IMAGES:

- If the read time in line 10 of the image header label is close to, but greater than, 0 hours and the GMT date in line 10 is the same as the observation date listed in the history portion of the header label, then the error may have occurred. The only way to be certain is to check the time entries in the event status portion of the header label and see if the end of exposure entry and the time of read entry differ numerically by ~24 hours.

No. 109

TITLE: No absolute calibration of LWP low dispersion fluxes.

DATA AFFECTED:

CAMERA: LWP DISPERSION: Low PROCESSING: Extracted Spectra

MEDIA: Tape, CalComp

DATES:	BEGIN	3 Apr. 1978	END	17:40 19 Oct. 1983	(GSFC)
	BEGIN		END	11 Oct. 1983	(VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 600

PERTINENT DOCUMENTATION: GSFC PPMR 352, ESA IUE Newsletter No. 17; NASA IUE Newsletter No. 23, Dec. 1983, p. 20.

DESCRIPTION: Prior to the end date shown above, no absolute calibration had been applied to LWP low dispersion net spectra. As of the end date, the LWP ABNET fluxes are calculated from the net fluxes using the absolute calibration for LWP presented in the Newsletter articles referenced.

No. 110

TITLE: No method for identifying modified image header label parameters.

DATA AFFECTED:

CAMERA: All DISPERSION: Both PROCESSING: All

MEDIA: Tape, CalComp, Photowrite

DATES: BEGIN 03 April 1978 END 18:35 19 Oct. 1983 (GSFC)
BEGIN END (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: < 1%

ESTIMATED NUMBER OF IMAGES AFFECTED: < 350

PERTINENT DOCUMENTATION: GSFC PPMR 350.

DESCRIPTION: Prior to the end dates shown, there existed no means of identifying situations in which certain image header label parameters needed by IUESIPS had been modified. The scheme LABINMOD, implemented on the end date, is an interim solution to the requirement for a means of replacing certain header label entries which are used by IUESIPS in those cases where those entries are in error or missing. Erroneous values are preserved as an audit record.

LABINMOD first creates an appendage to the header label which indicates which parameters have been modified and their original values. After those values are recorded, the parameter entries in the label are corrected in place.

Only certain label entries can be replaced by LABINMOD. They are: camera, image number, program identification, read time, right ascension, declination, and exposure time.

It is planned that LABINMOD will be replaced in the future by a scheme which will leave the bad label parameters as is and store the corrected values in an appendage patterned after the VILSPA data bank appendage.

No. 111

TITLE: Inaccurate message "MEAN DC USED" in label of temperature-corrected LWP images.

DATA AFFECTED:

CAMERA: LWP DISPERSION: Low PROCESSING: Extracted spectra

MEDIA: Tape, Photowrite

DATES: BEGIN 16:11 12 Apr. 1983 END 18:15 9 Nov. 1983 (GSFC)
BEGIN END (VILSPA)

ESTIMATED FRACTION OF PROCESSED IMAGES AFFECTED: 100%

ESTIMATED NUMBER OF IMAGES AFFECTED: 400

PERTINENT DOCUMENTATION: GSFC PPMR 351.

DESCRIPTION: Prior to this time period, no head amplifier temperature (THDA) correction was applied to the mean dispersion constants in the case of LWP images (See Configuration No. 102). During this period THDA corrections were made to LWP spectra, but their header labels incorrectly indicate that the mean dispersion constants (uncorrected) were used.

MEANS OF IDENTIFYING AFFECTED DATA:

- Affected images are in the range LWP 1844 - 2245.

SECTION 3 - LIMITATIONS AND WARNINGS

Every attempt has been made to provide correct and complete information in this document. The degree to which such efforts have succeeded is not uniform, depending on a number of circumstances, most of which relate to the state of the available records used as sources. The limitations imposed by such shortcomings are discussed below.

3.1 UNAVAILABLE DATA

A certain fraction of the relevant data for this documentation effort is not presently available. Most often, such data pertain to the configuration start and end dates. In some cases, the exact hour of implementation was not recorded and so only the GMT date is provided. In other cases, even the day of implementation is not presently known. In such instances, the date fields are left blank.

3.2 UNCERTAIN DATA

Some of the data required for the complete description of each configuration are uncertain. Such situations can arise when the available documentation sources are sketchy or imprecise or when the configuration is by nature too complicated for simple exposition in the format adopted here (an example would be the complete description of "special calibrations"--reseau-position and/or wavelength calibrations taken by the original Guest Observer for application to his own data).

In cases where dates are uncertain, exclamation marks are used to set them off. In cases where other specific information is uncertain, a "TBD" ("To Be Determined") entry is made. Some such entries might be resolved by further research with considerable additional effort; others may not be resolved at all. In general, the unresolved issues which are left because of conflicting or unclear data are of minor significance. Those areas in which there is known particular uncertainty include:

1) Background-smoothing program SMOOTH during the first two months of operation. There is ambiguity as to which program versions incorporating which changes were used in production during this time period. (See Configuration number 1).

2) Special calibrations (particularly prior to March 1981). The details of what effect special calibrations have on data are difficult to quantify because of the varying purposes for which the calibrations were obtained and the varying circumstances under which they were applied. For example, some high dispersion special calibrations were executed using reseaux found on high dispersion Pt-Ne images, even after July 1978 (see Configuration number 15) in order to satisfy the needs of the particular Guest Observer. It is also difficult to tell which images were reduced under special calibrations without an image-by-image check of processing logs, since prior to March 1981 no information identifying the calibration files used was put into the labels of images.

3) LWR ripple correction parameters in use at VILSPA prior to 14 June 1978. There is ambiguity as to the values of the K and A parameters used in production from 17 April 1978 to 14 June 1978. (See Configuration number 17).

Appendix A

Sorted Configuration Entries of IUE Regional Data Analysis Facilities (RDAF) (RW Thompson)

The following tables, obtained from RDAF allow users to determine which IUESIPS configuration entries are relevant to their own data, afterwhich they should refer to the detailed descriptions published in this volume on N° 14 of the ESA IUE Newsletter.

LIST OF TABLES

CONFIGURATION ENTRIES BELOW SELECTED FOR:
GODDARD
ALL CAMERA(S)
BOTH DISPERSION(S) BOTH APERTURE(S)
LABEL AND RECORD 0 MODIFICATIONS ONLY

CONFIG	DESCRIPTION OF CONFIGURATION
07	VICAR label lists dispersion constants incorrectly
08	VICAR label does not list processing date
19	Header record may record image sequence no. as 0
23	Header record may list the camera number incorrectly (e.g 13, 23)
31	VICAR label doesn't list extraction OMEGA(90),HBACK(5), DISTANCE(?)
32	VICAR label doesn't list information on automatic registration
36	Some Images processed on the IBM 360 (VICAR label truncated)
38	VICAR label does not list values of manual registration shifts
59.1	Image sequence number in header record missing left-most digit
62	VICAR label missing AUTO/MANUAL message and scheme name
62	VICAR label missing AUTO/MANUAL message and scheme name
65	VICAR label lists DEC of target and SHIFT parameter incorrectly
70	Unused region of VICAR label not filled with blanks
83	Round-off error in header record dispersion constants
86	Redundant end-of-label flag in NSSDC data file labels
88	Possible error in observation date (listed in VICAR label & header)
108	Possible error in calculated observing date (listed in label & header)
108	Possible error in calculated observing date (listed in label & header)
110	No method for identifying modified VICAR label parameters
111	Inaccurate message 'MEAN DC USED' in label of corrected LWP images

CONFIGURATION ENTRIES BELOW SELECTED FOR:
GODDARD
LWP CAMERA(S)
LOW DISPERSION(S) SMALL APERTURE(S)
CONFIGURATIONS AFFECTING DATA PORTION OF FILES ONLY

CONFIG	DESCRIPTION OF CONFIGURATION
01	Background spectrum smoothed improperly at ends of orders
03	Extracted spectra contain erroneous negative fluxes
04	Region of image processed included target ring
09	Extraction slit not centered on order (1-pixel error in OBSCRIBE)
10	Dispersion constants derived by WAVECAL slightly inaccurate
12	Whole image shifted to register orders
13	Spectrum extracted by preliminary programs (SPIN,ROTATEH, COMPARE)
14	Some error flags for reseaux and sat. pixels displaced by 14 data-pts
15	Data quality flag does not distinguish gross & bkgnd reseaux
22	Registration of spectral orders done manually
26	Wavelength coverage restricted by preliminary version of FICOR5
27	Automatic registration (DSPCON) used only 6 (vs. 12) sampling areas
40	Improper scaling for neg. flux values (where abs(fmin)>abs(fmax))
48	Biweekly dispersion constants used to assign wavelengths
50	Low-dispersion spectrum not given absolute calibration
52	DISTANCE parameter for EXTLOW procedure specified incorrectly ***
60	Image processing used outdated procedures GEOM,FICOR, and EXTLOW **
61	Non-perpendicular manual registration shifts used
69	Un-photometrically corrected pixels possibly extracted
76	Potential loss of lines in raw image
78	Preliminary ITF used for LWP
79	Preliminary ITF extrapolation used in photometric correction
85	Possible slight automatic registration errors
96	Dispersion constants based on single image from jun 17 1981
98	No flagging of bright spots
102	Use of jun-80 - aug-82 dispersion constants without temperature corr.
103	Possible corruption of temperature data in VICAR label
109	No absolute calibration used for low dispersion LWP ABNET flux

CONFIGURATION ENTRIES BELOW SELECTED FOR:
GODDARD
LWP CAMERA(S)
LOW DISPERSION(S) LARGE APERTURE(S)
CONFIGURATIONS AFFECTING DATA PORTION OF FILES ONLY

CONFIG	DESCRIPTION OF CONFIGURATION
01	Background spectrum smoothed improperly at ends of orders
03	Extracted spectra contain erroneous negative fluxes
04	Region of image processed included target ring
09	Extraction slit not centered on order (1-pixel error in OBSCRIBE)
10	Dispersion constants derived by WAVECAL slightly inaccurate
12	Whole image shifted to register orders
13	Spectrum extracted by preliminary programs (SPIN,ROTATEH, COMPARE)
14	Some error flags for reseaux and sat. pixels displaced by 14 data-pts
15	Data quality flag does not distinguish gross & bkgnd reseaux
18	All spectra extracted with HT=9, DISTANCE=8.0
22	Registration of spectral orders done manually
25	Point source (HT=9) spectra extracted with DISTANCE=8 (too small)
26	Wavelength coverage restricted by preliminary version of FICOR5
27	Automatic registration (DSPCON) used only 6 (vs. 12) sampling areas
40	Improper scaling for neg. flux values (where abs(fmin)>abs(fmax))
48	Biweekly dispersion constants used to assign wavelengths
50	Low-dispersion spectrum not given absolute calibration
52	DISTANCE parameter for EXTLOW procedure specified incorrectly ***
60	Image processing used outdated procedures GEOM,FICOR, and EXTLOW **
61	Non-perpendicular manual registration shifts used
69	Un-photometrically corrected pixels possibly extracted
76	Potential loss of lines in raw image
78	Preliminary ITF used for LWP
79	Preliminary ITF extrapolation used in photometric correction
85	Possible slight automatic registration errors
94	Non-optimal offsets used from small to large aperture
96	Dispersion constants based on single image from jun 17 1981
98	No flagging of bright spots
102	Use of jun-80 - aug-82 dispersion constants without temperature corr.
103	Possible corruption of temperature data in VICAR label
109	No absolute calibration used for low dispersion LWP ABNET flux

CONFIGURATION ENTRIES BELOW SELECTED FOR:
GODDARD
LWP CAMERA(S)
HIGH DISPERSION(S) SMALL APERTURE(S)
CONFIGURATIONS AFFECTING DATA PORTION OF FILES ONLY

CONFIG	DESCRIPTION OF CONFIGURATION
01	Background spectrum smoothed improperly at ends of orders
03	Extracted spectra contain erroneous negative fluxes
04	Region of image processed included target ring
05	Wavelength regions where orders overlap were deleted
06	Echelle ripple correction applied to whole order
09	Extraction slit not centered on order (1-pixel error in OBSCRIBE)
10	Dispersion constants derived by WAVECAL slightly inaccurate
12	Whole image shifted to register orders
14	Some error flags for reseaux and sat. pixels displaced by 14 data-pts
22	Registration of spectral orders done manually
26	Wavelength coverage restricted by preliminary version of FICOR5
27	Automatic registration (DSPCON) used only 6 (vs. 12) sampling areas
40	Improper scaling for neg. flux values (where abs(fmin)>abs(fmax))
61	Non-perpendicular manual registration shifts used
74	Background smoothed using only 2 pass 15-pt. running-average filter
76	Potential loss of lines in raw image
77	Non-optimal automatic registration of closely-spaced orders
78	Preliminary ITF used for LWP
79	Preliminary ITF extrapolation used in photometric correction
82	Image processing used outdated procedures GEOM, FICOR and DATEXTH **
85	Possible slight automatic registration errors
87	Data missing from last extracted spectral order
88	Possible error in observation date (used in helio. velocity corr.)
89	Error in handling negative declination values
90	Error in scaling net ripple-corrected fluxes
93	Old echelle ripple correction used to calculate ABNET flux
96	Dispersion constants based on single image from jun 17 1981
97	Noise conditioning filter not used for LWP (high dispersion)
98	No flagging of bright spots
102	Use of jun-80 - aug-82 dispersion constants without temperature corr.
103	Possible corruption of temperature data in VICAR label
108	Possible error in calculated observing date (listed in label & header)

CONFIGURATION ENTRIES BELOW SELECTED FOR:
GODDARD
LWP CAMERA(S)
HIGH DISPERSION(S) LARGE APERTURE(S)
CONFIGURATIONS AFFECTING DATA PORTION OF FILES ONLY

CONFIG	DESCRIPTION OF CONFIGURATION
01	Background spectrum smoothed improperly at ends of orders
03	Extracted spectra contain erroneous negative fluxes
04	Region of image processed included target ring
05	Wavelength regions where orders overlap were deleted
06	Echelle ripple correction applied to whole order
09	Extraction slit not centered on order (1-pixel error in OBSCRIBE)
10	Dispersion constants derived by WAVECAL slightly inaccurate
12	Whole image shifted to register orders
14	Some error flags for reseaux and sat. pixels displaced by 14 data-pts
22	Registration of spectral orders done manually
26	Wavelength coverage restricted by preliminary version of FICOR5
27	Automatic registration (DSPCON) used only 6 (vs. 12) sampling areas
40	Improper scaling for neg. flux values (where abs(fmin)>abs(fmax))
41	All spectra extracted with HT=5 (no extended-source processing)
61	Non-perpendicular manual registration shifts used
74	Background smoothed using only 2 pass 15-pt. running-average filter
76	Potential loss of lines in raw image
77	Non-optimal automatic registration of closely-spaced orders
78	Preliminary ITF used for LWP
79	Preliminary ITF extrapolation used in photometric correction
82	Image processing used outdated procedures GEOM, FICOR and DATEXTH **
85	Possible slight automatic registration errors
87	Data missing from last extracted spectral order
88	Possible error in observation date (used in helio. velocity corr.)
89	Error in handling negative declination values
90	Error in scaling net ripple-corrected fluxes
93	Old echelle ripple correction used to calculate ABNET flux
94	Non-optimal offsets used from small to large aperture
96	Dispersion constants based on single image from jun 17 1981
97	Noise conditioning filter not used for LWP (high dispersion)
98	No flagging of bright spots
102	Use of jun-80 - aug-82 dispersion constants without temperature corr.
103	Possible corruption of temperature data in VICAR label
108	Possible error in calculated observing date (listed in label & header)

CONFIGURATION ENTRIES BELOW SELECTED FOR:
GODDARD
LWR CAMERA(S)
LOW DISPERSION(S) SMALL APERTURE(S)
CONFIGURATIONS AFFECTING DATA PORTION OF FILES ONLY

CONFIG	DESCRIPTION OF CONFIGURATION
01	Background spectrum smoothed improperly at ends of orders
03	Extracted spectra contain erroneous negative fluxes
04	Region of image processed included target ring
09	Extraction slit not centered on order (1-pixel error in OBSCRIBE)
10	Dispersion constants derived by WAVECAL slightly inaccurate
11	ITF based on single image at each exposure level
12	Whole image shifted to register orders
13	Spectrum extracted by preliminary programs (SPIN,ROTATEH, COMPARE)
14	Some error flags for reseaux and sat. pixels displaced by 14 data-pts
15	Data quality flag does not distinguish gross & bkgnd reseaux
22	Registration of spectral orders done manually
26	Wavelength coverage restricted by preliminary version of FICOR5
27	Automatic registration (DSPCON) used only 6 (vs. 12) sampling areas
28	Vacuum-to-air correction not applied to single-aperture spectra
40	Improper scaling for neg. flux values (where abs(fmin)>abs(fmax))
48	Biweekly dispersion constants used to assign wavelengths
50	Low-dispersion spectrum not given absolute calibration
51	ITF truncated at upper limit
52	DISTANCE parameter for EXTLOW procedure specified incorrectly ***
55	Biweekly reseau grid used for geometric corrections
57	Preliminary mean dispersion constants used to assign wavelengths
58	Inaccurate automatic registration used
60	Image processing used outdated procedures GEOM,FICOR, and EXTLOW **
61	Non-perpendicular manual registration shifts used
67	Temperature dependence of calibration files not taken into account
68	Photometrically-corrected region slightly off-center
69	Un-photometrically corrected pixels possibly extracted
75	Error in specifying region to be photometrically-corrected
76	Potential loss of lines in raw image
79	Preliminary ITF extrapolation used in photometric correction
80	No flagging of LWR microphonic pings
83	Round-off error in header record dispersion constants
85	Possible slight automatic registration errors
95	Use of mar-79 - jan-81 mean dispersion constants
98	No flagging of bright spots
100	Possible default to mean temperature for correcting calib. files
103	Possible corruption of temperature data in VICAR label
107	Error handling images with > 1 region of microphonic noise

CONFIGURATION ENTRIES BELOW SELECTED FOR:
GODDARD
LWR CAMERA(S)
LOW DISPERSION(S) LARGE APERTURE(S)
CONFIGURATIONS AFFECTING DATA PORTION OF FILES ONLY

CONFIG	DESCRIPTION OF CONFIGURATION
01	Background spectrum smoothed improperly at ends of orders
03	Extracted spectra contain erroneous negative fluxes
04	Region of image processed included target ring
09	Extraction slit not centered on order (1-pixel error in OBSCRIBE)
10	Dispersion constants derived by WAVECAL slightly inaccurate
11	ITF based on single image at each exposure level
12	Whole image shifted to register orders
13	Spectrum extracted by preliminary programs (SPIN,ROTATEH, COMPARE)
14	Some error flags for reseaux and sat. pixels displaced by 14 data-pts
15	Data quality flag does not distinguish gross & bkgnd reseaux
18	All spectra extracted with HT=9, DISTANCE=8.0
21	Incorrect offsets from small to large aperture
22	Registration of spectral orders done manually
25	Point source (HT=9) spectra extracted with DISTANCE=8 (too small)
26	Wavelength coverage restricted by preliminary version of FICOR5
27	Automatic registration (DSPCON) used only 6 (vs. 12) sampling areas
28	Vacuum-to-air correction not applied to single-aperture spectra
40	Improper scaling for neg. flux values (where abs(fmin)>abs(fmax))
45	Non-optimal offsets from small to large aperture (lambda error)
48	Biweekly dispersion constants used to assign wavelengths
50	Low-dispersion spectrum not given absolute calibration
51	ITF truncated at upper limit
52	DISTANCE parameter for EXTLOW procedure specified incorrectly ***
55	Biweekly reseau grid used for geometric corrections
57	Preliminary mean dispersion constants used to assign wavelengths
58	Inaccurate automatic registration used
60	Image processing used outdated procedures GEOM,FICOR, and EXTLOW **
61	Non-perpendicular manual registration shifts used
67	Temperature dependence of calibration files not taken into account
68	Photometrically-corrected region slightly off-center
69	Un-photometrically corrected pixels possibly extracted
75	Error in specifying region to be photometrically-corrected
76	Potential loss of lines in raw image
79	Preliminary ITF extrapolation used in photometric correction
80	No flagging of LWR microphonic pings
83	Round-off error in header record dispersion constants
85	Possible slight automatic registration errors
95	Use of mar-79 - jan-81 mean dispersion constants
98	No flagging of bright spots
100	Possible default to mean temperature for correcting calib. files
103	Possible corruption of temperature data in VICAR label
107	Error handling images with > 1 region of microphonic noise

CONFIGURATION ENTRIES BELOW SELECTED FOR:
GODDARD
LWR CAMERA(S)
HIGH DISPERSION(S) SMALL APERTURE(S)
CONFIGURATIONS AFFECTING DATA PORTION OF FILES ONLY

CONFIG	DESCRIPTION OF CONFIGURATION
01	Background spectrum smoothed improperly at ends of orders
03	Extracted spectra contain erroneous negative fluxes
04	Region of image processed included target ring
05	Wavelength regions where orders overlap were deleted
06	Echelle ripple correction applied to whole order
09	Extraction slit not centered on order (1-pixel error in OBSCRIBE)
10	Dispersion constants derived by WAVECAL slightly inaccurate
11	ITF based on single image at each exposure level
12	Whole image shifted to register orders
14	Some error flags for reseaux and sat. pixels displaced by 14 data-pts
16	Geometric correction based on erroneous reseau grid
17	Echelle ripple correction used non-optimal parameters
22	Registration of spectral orders done manually
26	Wavelength coverage restricted by preliminary version of FICOR5
27	Automatic registration (DSPCON) used only 6 (vs. 12) sampling areas
40	Improper scaling for neg. flux values (where abs(fmin)>abs(fmax))
51	ITF truncated at upper limit
55	Biweekly reseau grid used for geometric corrections
56	Biweekly dispersion constants used to assign wavelengths
58	Inaccurate automatic registration used
61	Non-perpendicular manual registration shifts used
72	Use jun-79 - jun-80 mean dispersion constants
73	Temperature correction of calibration files not applied
74	Background smoothed using only 2 pass 15-pt. running-average filter
76	Potential loss of lines in raw image
77	Non-optimal automatic registration of closely-spaced orders
79	Preliminary ITF extrapolation used in photometric correction
80	No flagging of LWR microphonic pings
82	Image processing used outdated procedures GEOM, FICOR and DATEXTH **
85	Possible slight automatic registration errors
87	Data missing from last extracted spectral order
88	Possible error in observation date (used in helio. velocity corr.)
89	Error in handling negative declination values
90	Error in scaling net ripple-corrected fluxes
93	Old echelle ripple correction used to calculate ABNET flux
95	Use of mar-79 - jan-81 mean dispersion constants
98	No flagging of bright spots
100	Possible default to mean temperature for correcting calib. files
103	Possible corruption of temperature data in VICAR label
107	Error handling images with > 1 region of microphonic noise
108	Possible error in calculated observing date (used in helio. vel. corr.)

CONFIGURATION ENTRIES BELOW SELECTED FOR:
GODDARD
LWR CAMERA(S)
HIGH DISPERSION(S) LARGE APERTURE(S)
CONFIGURATIONS AFFECTING DATA PORTION OF FILES ONLY

CONFIG	DESCRIPTION OF CONFIGURATION
01	Background spectrum smoothed improperly at ends of orders
03	Extracted spectra contain erroneous negative fluxes
04	Region of image processed included target ring
05	Wavelength regions where orders overlap were deleted
06	Echelle ripple correction applied to whole order
09	Extraction slit not centered on order (1-pixel error in OBSCRIBE)
10	Dispersion constants derived by WAVECAL slightly inaccurate
11	ITF based on single image at each exposure level
12	Whole image shifted to register orders
14	Some error flags for reseaux and sat. pixels displaced by 14 data-pts
16	Geometric correction based on erroneous reseau grid
17	Echelle ripple correction used non-optimal parameters
21	Incorrect offsets from small to large aperture (-50 km/s error) **
22	Registration of spectral orders done manually
26	Wavelength coverage restricted by preliminary version of FICOR5
27	Automatic registration (DSPCON) used only 6 (vs. 12) sampling areas
40	Improper scaling for neg. flux values (where abs(fmin)>abs(fmax))
41	All spectra extracted with HT=5 (no extended-source processing)
45	Non-optimal offsets from small to large aperture (lambda error)
51	ITF truncated at upper limit
55	Biweekly reseau grid used for geometric corrections
56	Biweekly dispersion constants used to assign wavelengths
58	Inaccurate automatic registration used
61	Non-perpendicular manual registration shifts used
72	Use jun-79 - jun-80 mean dispersion constants
73	Temperature correction of calibration files not applied
74	Background smoothed using only 2 pass 15-pt. running-average filter
76	Potential loss of lines in raw image
77	Non-optimal automatic registration of closely-spaced orders
79	Preliminary ITF extrapolation used in photometric correction
80	No flagging of LWR microphonic pings
82	Image processing used outdated procedures GEOM, FICOR and DATEXTH **
85	Possible slight automatic registration errors
87	Data missing from last extracted spectral order
88	Possible error in observation date (used in helio. velocity corr.)
89	Error in handling negative declination values
90	Error in scaling net ripple-corrected fluxes
93	Old echelle ripple correction used to calculate ABNET flux
95	Use of mar-79 - jan-81 mean dispersion constants
98	No flagging of bright spots
100	Possible default to mean temperature for correcting calib. files
103	Possible corruption of temperature data in VICAR label
107	Error handling images with > 1 region of microphonic noise
108	Possible error in calculated observing date (used in helio. vel. corr.)

CONFIGURATION ENTRIES BELOW SELECTED FOR:
GODDARD
SWP CAMERA(S)
LOW DISPERSION(S) SMALL APERTURE(S)
CONFIGURATIONS AFFECTING DATA PORTION OF FILES ONLY

CONFIG	DESCRIPTION OF CONFIGURATION
01	Background spectrum smoothed improperly at ends of orders
02	Extracted SWP spectrum limited to 1000-1900 angstroms
03	Extracted spectra contain erroneous negative fluxes
04	Region of image processed included target ring
09	Extraction slit not centered on order (1-pixel error in OBSCRIBE)
10	Dispersion constants derived by WAVECAL slightly inaccurate
11	ITF based on single image at each exposure level
12	Whole image shifted to register orders
13	Spectrum extracted by preliminary programs (SPIN,ROTATEH, COMPARE)
14	Some error flags for reseaux and sat. pixels displaced by 14 data-pts
15	Data quality flag does not distinguish gross & bkgnd reseaux
22	Registration of spectral orders done manually
24	Preliminary line library used for WAVECAL
26	Wavelength coverage restricted by preliminary version of FICOR5
27	Automatic registration (DSPCON) used only 6 (vs. 12) sampling areas
40	Improper scaling for neg. flux values (where abs(fmin)>abs(fmax))
44	20% exposure level of ITF was incorrect ***** use SWPFIX
48	Biweekly dispersion constants used to assign wavelengths
50	Low-dispersion spectrum not given absolute calibration
51	ITF truncated at upper limit
52	DISTANCE parameter for EXTLOW procedure specified incorrectly ***
55	Biweekly reseau grid used for geometric corrections
57	Preliminary mean dispersion constants used to assign wavelengths
58	Inaccurate automatic registration used
60	Image processing used outdated procedures GEOM,FICOR, and EXTLOW **
61	Non-perpendicular manual registration shifts used
63	Non-perpendicular manual registration shifts used
67	Temperature dependence of calibration files not taken into account
68	Photometrically-corrected region slightly off-center
69	Un-photometrically corrected pixels possibly extracted
75	Error in specifying region to be photometrically-corrected
76	Potential loss of lines in raw image
79	Preliminary ITF extrapolation used in photometric correction
83	Round-off error in header record dispersion constants
85	Possible slight automatic registration errors
95	Use of mar-79 - jan-81 mean dispersion constants
98	No flagging of bright spots
100	Possible default to mean temperature for correcting calib. files
103	Possible corruption of temperature data in VICAR label

CONFIGURATION ENTRIES BELOW SELECTED FOR:
GODDARD
SWP CAMERA(S)
LOW DISPERSION(S) LARGE APERTURE(S)
CONFIGURATIONS AFFECTING DATA PORTION OF FILES ONLY

CONFIG	DESCRIPTION OF CONFIGURATION
01	Background spectrum smoothed improperly at ends of orders
02	Extracted SWP spectrum limited to 1000-1900 angstroms
03	Extracted spectra contain erroneous negative fluxes
04	Region of image processed included target ring
09	Extraction slit not centered on order (1-pixel error in OBSCRIBE)
10	Dispersion constants derived by WAVECAL slightly inaccurate
11	ITF based on single image at each exposure level
12	Whole image shifted to register orders
13	Spectrum extracted by preliminary programs (SPIN,ROTATEH, COMPARE)
14	Some error flags for reseaux and sat. pixels displaced by 14 data-pts
15	Data quality flag does not distinguish gross & bkgnd reseaux
18	All spectra extracted with HT=9, DISTANCE=8.0
22	Registration of spectral orders done manually
24	Preliminary line library used for WAVECAL
25	Point source (HT=9) spectra extracted with DISTANCE=8 (too small)
26	Wavelength coverage restricted by preliminary version of FICOR5
27	Automatic registration (DSPCON) used only 6 (vs. 12) sampling areas
40	Improper scaling for neg. flux values (where abs(fmin)>abs(fmax))
44	20% exposure level of ITF was incorrect **** use SWPFIX
45	Non-optimal offsets from small to large aperture (lambda error)
48	Biweekly dispersion constants used to assign wavelengths
50	Low-dispersion spectrum not given absolute calibration
51	ITF truncated at upper limit
52	DISTANCE parameter for EXTLOW procedure specified incorrectly ***
55	Biweekly reseau grid used for geometric corrections
57	Preliminary mean dispersion constants used to assign wavelengths
58	Inaccurate automatic registration used
60	Image processing used outdated procedures GEOM,FICOR, and EXTLOW **
61	Non-perpendicular manual registration shifts used
63	Non-perpendicular manual registration shifts used
67	Temperature dependence of calibration files not taken into account
68	Photometrically-corrected region slightly off-center
69	Un-photometrically corrected pixels possibly extracted
75	Error in specifying region to be photometrically-corrected
76	Potential loss of lines in raw image
79	Preliminary ITF extrapolation used in photometric correction
83	Round-off error in header record dispersion constants
85	Possible slight automatic registration errors
95	Use of mar-79 - jan-81 mean dispersion constants
98	No flagging of bright spots
100	Possible default to mean temperature for correcting calib. files

CONFIGURATION ENTRIES BELOW SELECTED FOR:
GODDARD
SWP CAMERA(S)
HIGH DISPERSION(S) SMALL APERTURE(S)
CONFIGURATIONS AFFECTING DATA PORTION OF FILES ONLY

CONFIG	DESCRIPTION OF CONFIGURATION
01	Background spectrum smoothed improperly at ends of orders
03	Extracted spectra contain erroneous negative fluxes
04	Region of image processed included target ring
05	Wavelength regions where orders overlap were deleted
06	Echelle ripple correction applied to whole order
09	Extraction slit not centered on order (1-pixel error in OBSCRIBE)
10	Dispersion constants derived by WAVECAL slightly inaccurate
11	ITF based on single image at each exposure level
12	Whole image shifted to register orders
14	Some error flags for reseaux and sat. pixels displaced by 14 data-pts
16	Geometric correction based on erroneous reseau grid
22	Registration of spectral orders done manually
26	Wavelength coverage restricted by preliminary version of FICOR5
27	Automatic registration (DSPCON) used only 6 (vs. 12) sampling areas
33	Spectrum contains order 65 (at very edge of tube)
40	Improper scaling for neg. flux values (where abs(fmin)>abs(fmax))
44	20% exposure level of ITF was incorrect ***** use SWPFIX
51	ITF truncated at upper limit
55	Biweekly reseau grid used for geometric corrections
56	Biweekly dispersion constants used to assign wavelengths
58	Inaccurate automatic registration used
61	Non-perpendicular manual registration shifts used
63	Non-perpendicular manual registration shifts used
72	Use jun-79 - jun-80 mean dispersion constants
73	Temperature correction of calibration files not applied
74	Background smoothed using only 2 pass 15-pt. running-average filter
76	Potential loss of lines in raw image
77	Non-optimal automatic registration of closely-spaced orders
79	Preliminary ITF extrapolation used in photometric correction
82	Image processing used outdated procedures GEOM, FICOR and DATEXTH **
85	Possible slight automatic registration errors
87	Data missing from last extracted spectral order
88	Possible error in observation date (used in helio. velocity corr.)
89	Error in handling negative declination values
90	Error in scaling net ripple-corrected fluxes
93	Old echelle ripple correction used to calculate ABNET flux
95	Use of mar-79 - jan-81 mean dispersion constants
98	No flagging of bright spots
100	Possible default to mean temperature for correcting calib. files
103	Possible corruption of temperature data in VICAR label
108	Possible error in calculated observing date (used in helio. vel. corr.)

CONFIGURATION ENTRIES BELOW SELECTED FOR:
GODDARD
SWP CAMERA(S)
HIGH DISPERSION(S) LARGE APERTURE(S)
CONFIGURATIONS AFFECTING DATA PORTION OF FILES ONLY

CONFIG	DESCRIPTION OF CONFIGURATION
01	Background spectrum smoothed improperly at ends of orders
03	Extracted spectra contain erroneous negative fluxes
04	Region of image processed included target ring
05	Wavelength regions where orders overlap were deleted
06	Echelle ripple correction applied to whole order
09	Extraction slit not centered on order (1-pixel error in OBSCRIBE)
10	Dispersion constants derived by WAVECAL slightly inaccurate
11	ITF based on single image at each exposure level
12	Whole image shifted to register orders
14	Some error flags for reseaux and sat. pixels displaced by 14 data-pts
16	Geometric correction based on erroneous reseau grid
22	Registration of spectral orders done manually
26	Wavelength coverage restricted by preliminary version of FICOR5
27	Automatic registration (DSPCON) used only 6 (vs. 12) sampling areas
33	Spectrum contains order 65 (at very edge of tube)
40	Improper scaling for neg. flux values (where abs(fmin)>abs(fmax))
41	All spectra extracted with HT=5 (no extended-source processing)
44	20% exposure level of ITF was incorrect ***** use SWPFIX
45	Non-optimal offsets from small to large aperture (lambda error)
51	ITF truncated at upper limit
55	Biweekly reseau grid used for geometric corrections
56	Biweekly dispersion constants used to assign wavelengths
58	Inaccurate automatic registration used
61	Non-perpendicular manual registration shifts used
63	Non-perpendicular manual registration shifts used
72	Use jun-79 - jun-80 mean dispersion constants
73	Temperature correction of calibration files not applied
74	Background smoothed using only 2 pass 15-pt. running-average filter
76	Potential loss of lines in raw image
77	Non-optimal automatic registration of closely-spaced orders
79	Preliminary ITF extrapolation used in photometric correction
82	Image processing used outdated procedures GEOM, FICOR and DATEXTH **
85	Possible slight automatic registration errors
87	Data missing from last extracted spectral order
88	Possible error in observation date (used in helio. velocity corr.)
89	Error in handling negative declination values
90	Error in scaling net ripple-corrected fluxes
93	Old echelle ripple correction used to calculate ABNET flux
95	Use of mar-79 - jan-81 mean dispersion constants
98	No flagging of bright spots
100	Possible default to mean temperature for correcting calib. files
103	Possible corruption of temperature data in VICAR label
108	Possible error in calculated observing date (used in helio. vel. corr.)

CONFIGURATION ENTRIES BELOW SELECTED FOR:
VILSPA
ALL CAMERA(S)
BOTH DISPERSION(S) BOTH APERTURE(S)
LABEL AND RECORD 0 MODIFICATIONS ONLY

CONFIG	DESCRIPTION OF CONFIGURATION
07	VICAR label lists dispersion constants incorrectly
08	VICAR label does not list processing date
19	Header record may record image sequence no. as 0
23	Header record may list the camera number incorrectly (e.g 13, 23)
31	VICAR label doesn't list extraction OMEGA(90),HBACK(5), DISTANCE(?)
38	VICAR label does not list values of manual registration shifts
59.1	Image sequence number in header record missing left-most digit
62	VICAR label missing AUTO/MANUAL message and scheme name
62	VICAR label missing AUTO/MANUAL message and scheme name
65	VICAR label lists DEC of target and SHIFT parameter incorrectly
70	Unused region of VICAR label not filled with blanks
83	Round-off error in header record dispersion constants
88	Possible error in observation date (listed in VICAR label & header)

CONFIGURATION ENTRIES BELOW SELECTED FOR:
VILSPA
LWP CAMERA(S)
BOTH DISPERSION(S) BOTH APERTURE(S)
CONFIGURATIONS AFFECTING DATA PORTION OF FILES ONLY

CONFIG	DESCRIPTION OF CONFIGURATION
01	Background spectrum smoothed improperly at ends of orders
03	Extracted spectra contain erroneous negative fluxes
04	Region of image processed included target ring
05	Wavelength regions where orders overlap were deleted
06	Echelle ripple correction applied to whole order
09	Extraction slit not centered on order (1-pixel error in OBSCRIBE)
10	Dispersion constants derived by WAVECAL slightly inaccurate
12	Whole image shifted to register orders
13	Spectrum extracted by preliminary programs (SPIN,ROTATEH, COMPARE)
14	Some error flags for reseaux and sat. pixels displaced by 14 data-pts
14.1	March 1978 reseau grid and disp. constants applied
15	Data quality flag does not distinguish gross & bkgnd reseaux
22	Registration of spectral orders done manually
25	Point source (HT=9) spectra extracted with DISTANCE=8 (too small)
34.1	Geometric/wavelength processing used GSFC 23-May-78 calib. files
40	Improper scaling for neg. flux values (where abs(fmin)>abs(fmax))
41	All spectra extracted with HT=5 (no extended-source processing)
50	Low-dispersion spectrum not given absolute calibration
52	DISTANCE parameter for EXTLOW procedure specified incorrectly ***
60	Image processing used outdated procedures GEOM,FICOR, and EXTLOW **
61	Non-perpendicular manual registration shifts used
69	Un-photometrically corrected pixels possibly extracted
74	Background smoothed using only 2 pass 15-pt. running-average filter
77	Non-optimal automatic registration of closely-spaced orders
79	Preliminary ITF extrapolation used in photometric correction
79	Preliminary ITF extrapolation used in photometric correction
82	Image processing used outdated procedures GEOM, FICOR and DATEXTH **
85	Possible slight automatic registration errors
87	Data missing from last extracted spectral order
88	Possible error in observation date (used in helio. velocity corr.)
89	Error in handling negative declination values
90	Error in scaling net ripple-corrected fluxes
93	Old echelle ripple correction used to calculate ABNET flux
94	Non-optimal offsets used from small to large aperture
97	Noise conditioning filter not used for LWP (high dispersion)
98	No flagging of bright spots

CONFIGURATION ENTRIES BELOW SELECTED FOR:
VILSPA
LWR CAMERA(S)
BOTH DISPERSION(S) BOTH APERTURE(S)
CONFIGURATIONS AFFECTING DATA PORTION OF FILES ONLY

CONFIG	DESCRIPTION OF CONFIGURATION
01	Background spectrum smoothed improperly at ends of orders
03	Extracted spectra contain erroneous negative fluxes
04	Region of image processed included target ring
05	Wavelength regions where orders overlap were deleted
06	Echelle ripple correction applied to whole order
09	Extraction slit not centered on order (1-pixel error in OBSCRIBE)
10	Dispersion constants derived by WAVECAL slightly inaccurate
11	ITF based on single image at each exposure level
12	Whole image shifted to register orders
13	Spectrum extracted by preliminary programs (SPIN,ROTATEH, COMPARE)
14	Some error flags for reseaux and sat. pixels displaced by 14 data-pts
14.1	March 1978 reseau grid and disp. constants applied
14.2	Assigned wavelengths approximately 0.7 Angstroms too short
15	Data quality flag does not distinguish gross & bkgnd reseaux
16	Geometric correction based on erroneous reseau grid
17	Echelle ripple correction used non-optimal parameters
21	Incorrect offsets from small to large aperture
21	Incorrect offsets from small to large aperture (-50 km/s error) **
22	Registration of spectral orders done manually
25	Point source (HT=9) spectra extracted with DISTANCE=8 (too small)
34.1	Geometric/wavelength processing used GSFC 23-May-78 calib. files
40	Improper scaling for neg. flux values (where abs(fmin)>abs(fmax))
41	All spectra extracted with HT=5 (no extended-source processing)
45	Non-optimal offsets from small to large aperture (lambda error)
50	Low-dispersion spectrum not given absolute calibration
51	ITF truncated at upper limit
52	DISTANCE parameter for EXTLOW procedure specified incorrectly ***
53	Absolute calibration based on Bohlin et al. (Astr. Ap., 1980)
58	Inaccurate automatic registration used
60	Image processing used outdated procedures GEOM,FICOR, and EXTLOW **
61	Non-perpendicular manual registration shifts used
67	Temperature dependence of calibration files not taken into account
68	Photometrically-corrected region slightly off-center
69	Un-photometrically corrected pixels possibly extracted
71	Geometric/wavelength calibration used GSFC 13-Nov-78 calib. files
72	Use jun-79 - jun-80 mean dispersion constants
73	Temperature correction of calibration files not applied
74	Background smoothed using only 2 pass 15-pt. running-average filter
77	Non-optimal automatic registration of closely-spaced orders
79	Preliminary ITF extrapolation used in photometric correction
79	Preliminary ITF extrapolation used in photometric correction

80 No flagging of LWR microphonic pings
80 No flagging of LWR microphonic pings
82 Image processing used outdated procedures GEOM, FICOR and DATEXTH **
83 Round-off error in header record dispersion constants
85 Possible slight automatic registration errors
87 Data missing from last extracted spectral order
88 Possible error in observation date (used in helio. velocity corr.)
89 Error in handling negative declination values
90 Error in scaling net ripple-corrected fluxes
93 Old echelle ripple correction used to calculate ABNET flux
98 No flagging of bright spots

CONFIGURATION ENTRIES BELOW SELECTED FOR:
VILSPA
SWP CAMERA(S)
BOTH DISPERSION(S) BOTH APERTURE(S)
CONFIGURATIONS AFFECTING DATA PORTION OF FILES ONLY

CONFIG	DESCRIPTION OF CONFIGURATION
01	Background spectrum smoothed improperly at ends of orders
03	Extracted spectra contain erroneous negative fluxes
04	Region of image processed included target ring
05	Wavelength regions where orders overlap were deleted
06	Echelle ripple correction applied to whole order
09	Extraction slit not centered on order (1-pixel error in OBSCRIBE)
10	Dispersion constants derived by WAVECAL slightly inaccurate
11	ITF based on single image at each exposure level
12	Whole image shifted to register orders
13	Spectrum extracted by preliminary programs (SPIN,ROTATEH, COMPARE)
14	Some error flags for reseaux and sat. pixels displaced by 14 data-pts
14.1	March 1978 reseau grid and disp. constants applied
15	Data quality flag does not distinguish gross & bkgnd reseaux
16	Geometric correction based on erroneous reseau grid
21.1	Wavelength Scale is in error- correction: wave=-20 +1.0158*wave
22	Registration of spectral orders done manually
24	Preliminary line library used for WAVECAL
25	Point source (HT=9) spectra extracted with DISTANCE=8 (too small)
33	Spectrum contains order 65 (at very edge of tube)
34.1	Geometric/wavelength processing used GSFC 23-May-78 calib. files
34.2	Geometric/wavelength processing used GSFC 08-Aug-78 calib files
40	Improper scaling for neg. flux values (where abs(fmin)>abs(fmax))
41	All spectra extracted with HT=5 (no extended-source processing)
44	20% exposure level of ITF was incorrect **** use SWPFIX
45	Non-optimal offsets from small to large aperture (lambda error)
50	Low-dispersion spectrum not given absolute calibration
51	ITF truncated at upper limit
52	DISTANCE parameter for EXTLOW procedure specified incorrectly ***
53	Absolute calibration based on Bohlin et al. (Astr. Ap., 1980)
58	Inaccurate automatic registration used
60	Image processing used outdated procedures GEOM,FICOR, and EXTLOW **
61	Non-perpendicular manual registration shifts used
67	Temperature dependence of calibration files not taken into account
68	Photometrically-corrected region slightly off-center
69	Un-photometrically corrected pixels possibly extracted
71	Geometric/wavelength calibration used GSFC 13-Nov-78 calib. files
72	Use jun-79 - jun-80 mean dispersion constants
73	Temperature correction of calibration files not applied
74	Background smoothed using only 2 pass 15-pt. running-average filter
77	Non-optimal automatic registration of closely-spaced orders
79	Preliminary ITF extrapolation used in photometric correction

79	Preliminary ITF extrapolation used in photometric correction
82	Image processing used outdated procedures GEOM, FICOR and DATEXTH **
83	Round-off error in header record dispersion constants
85	Possible slight automatic registration errors
87	Data missing from last extracted spectral order
88	Possible error in observation date (used in helio. velocity corr.)
89	Error in handling negative declination values
90	Error in scaling net ripple-corrected fluxes
93	Old echelle ripple correction used to calculate ABNET flux
98	No flagging of bright spots

APPENDIX B

NASA/ESA NEWSLETTER CONVERSION LIST

(for references in ESA IUE Newsletter
Special Issues Nos. 14 and 21)

NASA NL			Title	ESA NL
5,-	Jul	79	IUE Data Reduction III	-
6,180	Sep	79	IUE Data Rediction V	-
7,9	Nov	79	IUE Data Reduction X	-
7,17	Nov	79	IUE Data Reduction XI	-
7,27	Nov	79	Notification of an Error in the Photometric Correction of SWP Images (Holm)	-
7,45	Nov	79	Improper Scaling of Certain IUE Spectral Files (Turnrose & Harvel)	-
8,1	Feb	80	A Correction Algorithm for Low Dispersion SWP Spectra (Cassatella, Holm, Ponz, Schiffer)	5,5
8,22	Feb	80	Correction of Data Affected by the SWP ITF error (Sandford, Penston & Boggess)	5,4
8,28	Feb	80	IUE Data Reduction XII	6,18
8,32	Feb	80	IUE Data Reduction XIII	-
9,6	Apr	80	Low Dispersion Background Extraction error (Harvel)	-
10,18	Jun	80	Photometric Calibration VIII	11,18
11,10	Oct	80	IUE Data Reduction XVII	-
12,-	Jan	81	IUE Data Reduction XVIII	-
12,-	Jan	81	IUE Data Reduction XIX	10,10
13,-	Jan	81	IUE Data Reduction XX	-
15,8	Sep	81	IUE Data Reduction XXI	-
15,57	Sep	81	IUE Data Reduction XXIII	-
16,-	Feb	82	Time History of IUESIPS Configurations (Turnrose & Harvel)	14,Pt 1
17,-	Feb	82	Correction Algorithms (Turnrose, Harvel & Mallama)	14,Pt 2
18,21	Mar	82	IUE Data Reduction XXIV	13,8
18,29	Mar	82	IUE Data Reduction XXV	13,14
18,45	Mar	82	IUE Data Reduction XXVI	13,32
18,56	Mar	82	Photometric Consequences of the Microphonics Avoidance Technique (Holm & Panek)	15,25
19,37	Jul	82	IUE Camera Sensitivities and the Echelle Ripple Correction (Ake)	-
20,28	Jan	83	IUE Data Reduction XXVIII	17,32
20,30	Jan	83	IUE Data Reduction XXIX	17,34
20,34	Jan	83	IUE Data Reduction XXX	17,14
20,52	Jan	83	IUE Data Reduction XXXI	-
21,15	May	83	Chronology of Modification to IUESIPS (Stone)	17,60
21,39	May	83	IUE Data Reduction XXXII	17,49
23,21	Dec	83	Revision of the Absolute Calibration of the LWP in Low Dispersion (Cassatella & Harris)	17,12

TAPE ARCHIVE RETRIEVAL

DATA TAPE:

TAPE DENSITY ◯ 1600 bpi (default) ◯ 800 bpi

REQUESTED DATA ◯ Raw Data Only

◯ Complete: Raw image + Extracted Spectra

◯ Extracted Spectra Only

CAM #	IMAGE #	CAM #	IMAGE #	CAM #	IMAGE #	CAM #	IMAGE #

CAMERA NUMBERS: 1 = LWP / 2 = LWR / 3 = SWP / 4 = SWR

REASON DATA IS ACCESSIBLE:

◯ Normal Release (6 month rule)

◯ Special Release ◯ data from my programme .....

◯ maintenance data

◯ others (give details) .....

.....

REQUESTED BY: ..... DATE OF REQUEST: .....

MAILING ADDRESS: .....

.....

.....

DATA BANK R.A.

....

Dr. A. Cassatella,
Data Bank Resident Astronomer,
Villafranca Satellite Tracking Station
Apartado 54065
Madrid,
SPAIN

Errors in Foregoing VILSPA Log

Please inform us by post of all errors or omissions in the log reproduced in this issue. Detach this page, fold and staple it leaving the mailing address (verso) visible.

CAMERA & IMAGE	DISPERSION	APERTURE	TARGET	DATE OF OBSERVATION	WRONG FIELD CONTENTS	CORRECT INFORMATION

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