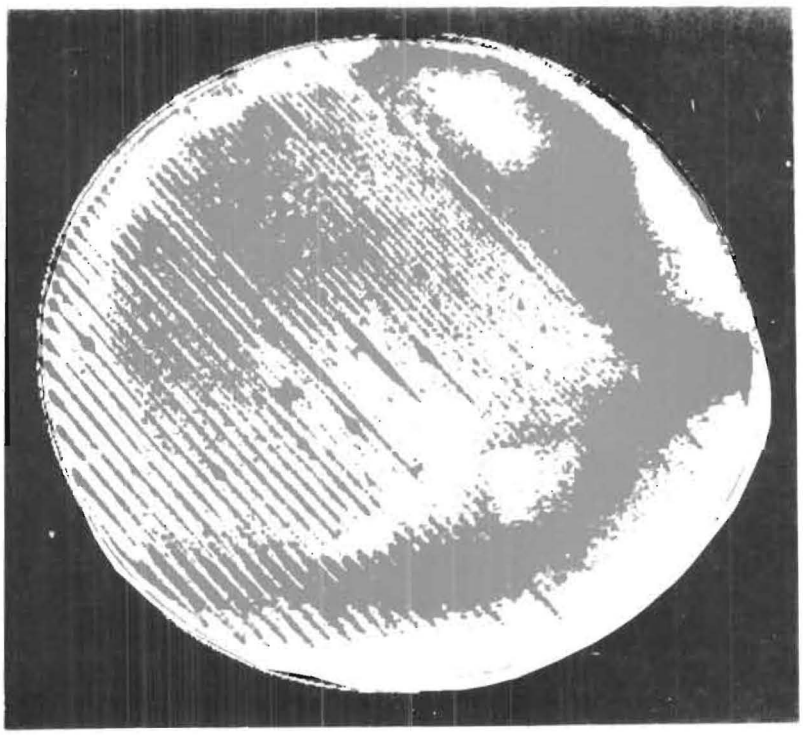
ESA IUE NEWSLETTER



no. 8 October 1980

international ultraviolet explorer observatory

ESA IUE NEWSLETTER No. 8 ---------- OCTOBER 1980

TABLE OF CONTENTS

ESA IUE Newsletter

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OBSERVATORY CONTROLLER'S MESSAGE

I hinted in my last message of future changes in the personnel of VILSPA and of the Observatory. Indeed there have been and will be several of these. Firstly we have already lost Piero Benvenuti – my invaluable Deputy Observatory Controller, who returned to Asiago en route to ESO – and Fernando Tevar, who must have assisted many of you as Telescope Operator. In addition, in November both Jon Darius and I shall leave the IUE project. Jon takes up the post of Keeper of Astronomy at London's Science Museum and I return after five years' leave of absence to the Royal Greenwich Observatory. To those who think that I rightly belong in a mediaeval castle, I can only say that Jon will make a startling exhibit in a museum case...

However, I am confident that IUE will continue successfully under a revised team. We recently welcomed a new Computer Manager, Daniel de Pablo, to the Station from ESOC; and a new Resident Astronomer, Willem Wamsteker, from ESO (Chile). André Heck has taken over as Deputy Controller and other appointments are still pending. Certainly there is a good standard to live up to, with 150 papers now published in the main journals (compared with 44 in my Message of a year ago and 100 in May). Nearly half (74) use VILSPA data alone! During the third year, 269 astronomers were involved in ESA programmes and 115 in SRC time (there is a small overlap from joint proposals). These scientists were drawn from no less than 20 countries. Judging by the flood of proposals submerging my secretary as the 1st October deadline is reached, the demand is still high and the Selection Committee's job difficult.

On a more trivial level, users will be interested know that new versions of the Domestic Guide for Guest Observers (revised by Jon Darius) and of the IUE Users' Guide (revised by Jean Clavel and André Heck) are in preparation. We hope that the first, together with a street map of Madrid courtesy of the department store El Corte Inglés, will be in the mail to you before the next Newsletter; the revision of the Users' Guide will be done in two parts, the first being scheduled for early next year.

Some readers of Jon Darius' interesting article on the Villafranca Castle (Newsletter no. 7) may have been confused by his definition of "the fanega being an obsolete Spanish measure of area equaling 1.59 acres". The acre is, of course, an obsolescent British measure of area equaling 0.40468564224 hectares (give or take a tenth of a square millimetre) so that a fanega is about 0.64 hectares.

So to end my last Message as Observatory Controller, I will thank all those who have worked with me on IUE for making my time here so exciting and pleasant. To you the users, may I say that I have enjoyed knowing you all and will be pleased to see you again wherever we shall meet. Finally it remains only to say "Good luck, IUE" for the next four, five, six, seven,... years.

M.V. Penston

New VILSPA Staff

Daniel de Pablo (37) has been appointed as the new Computer Manager at VILSPA, embracing the photographic laboratory and the IUE Data Bank as well as the computers and data processing. A native of Castile, he graduated from the Universidad Complutense in Madrid as an "ingeniero superior de telecomunicación" in 1968 and later acquired an M.Sc. from Glasgow University where he undertook a project on the simulation of a deep-space rendez-vous. He gained experience working in Madrid for ITT (telephone-exchange process control) and Univac (computer operating systems) before joining the Agency. For the last eight years he has worked at ESOC (Darmstadt) as a systems engineer in the Ground Systems Engineering Department. He was involved in the specifications, design, and integration of satellite stations and communication systems on a variety of projects including Cos-B, Meteosat, Geos, and Exosat.

Our first Dutch RA, Willem Wamsteker (38), joins us after five years' experience as staff astronomer at the European Southern Observatory (La Silla, Chile), where he was responsible for implementing its infrared instrumentation, with which he observed objects as diverse as asteroids, Mira variables, and H II regions. The preceding five years he spent in the USA, first at the Lunar and Planetary Laboratory in Arizona, where he studied the atmospheric composition of the outer planets and identified deposits of free sulphur on the surface of Io; then at the Marshall Space Flight Center in Alabama, where he developed a vidicon spectrograph to study optical counterparts of X-ray sources and once again the clouds of Jupiter. Indeed it was in planetary spectroscopy that he performed his doctoral research for the Sterrewacht Leiden. Besides his native Dutch, he is proficient in English, French, German, and Spanish. He is accompanied by his wife and two young daughters.

IUE Observing Allocations

For a purpose quite different from this Newsletter, I have recently collated the statistics of the observing allocations made by the three participating agencies during the first three years of IUE. During an observing trip to VILSPA, the editor persuaded me to present them in this article because he believes they will be of widespread interest. These are listed below in tabular form and although mainly self-explanatory, clarification is needed on a few points. PI stands for Principal Investigator as stated on each accepted proposal, and the numbers given are of different PI's; that is, every individual is only counted once including those fortunate enough to be a PI on more than one programme. Co-I stands for Co-Investigator and the numbers listed of different Co-I's also exclude anyone who has already been counted as a PI. Hence, the sum of these two gives the total number of different astronomers listed on the programme proposals. In the statistics on geographical distribution, 'internal' covers those investigators who are working within the domains of the different agencies – the United States for NASA, ESA member states for ESA, and the UK for SRC.

There are many conclusions, both broad and subtle, that can be drawn from these statistics but I will leave the reader to his or her own analysis and content myself with a few brief comments.

(1) Although there was a heavy demand for IUE time in response to the first invitation to propose issued well before launch, that demand has increased substantially in the subsequent years. This is shown by the fact that the number of accepted programmes has doubled by the third year and the number of user astronomers has trebled to 603. This has led to a continuing increase in pressure on the three allocating committees who, in many cases, have been forced to reject or give a very reduced allocation to excellent proposals.

(2) There is a wide dispersion in the average allocations between the three agencies. Whether by programme, PI or astronomer, NASA allocates about four times the number of shifts as does ESA, with SRC in an intermediate position. These numbers reflect a balance between the degree of the excess demand on each agency for the time at its disposal, and the degree to which it is selective and discriminating in its allocations. I do not know to what extent these two factors explain the differences in average allocations, but it is clear that the greatest oversubscription is borne by ESA.

(3) The data on geographical distribution show that there are now 603 user scientists on IUE drawn from 27 countries – rather impressive figures. It is interesting to note that the largest user community is in the ESA member states – 334, compared to 190 in the United States, and 79 in all other countries.

The very wide nature of the IUE user community is reflected by the very broad nature of its mission; there is hardly an area of importance to modern astronomy that it has not touched upon. At the time of writing, 149 papers based on IUE have appeared in print in the Astrophysical Journal, Astronomy and Astrophysics, Monthly Notices of the Royal Astronomical Society, or Nature. A further 280 are in print or in press in the proceedings of the three international conferences devoted to its results and held in London, Tübingen, and Washington. Clearly IUE has become an important and indeed essential part of world astronomy.

R. Wilson
University College London

IUE Observing Statistics

	1st Year				2nd Year				3rd Year			
Programmes Accepted	NASA	ESA	SRC	All Agencies	NASA	ESA	SRC	All Agencies	NASA	ESA	SRC	All Agencies
Solar System	6	0	3	9	11	2	3	16	13	3	1	17
Stellar	36	38	20	94	47	72	29	148	73	69	35	177
Interstellar	9	8	7	24	33	7	14	54	20	24	14	58
Extragalactic	8	7	11	26	18	25	14	57	20	30	16	66
TOTAL:	59	53	41	153	109	106	57	272	126	126	66	318
Shifts Allocated	678	134	165	977	612	152	172	936	608	153	162	923
Different PI's	53	38	22	113	91	94	37	222	98	96	42	236
Different Co-I's	32	47	26	105	91	129	47	267	121	173	73	367
Total Astronomers	85	85	48	218	182	223	84	489	219	269	115	603
Max/Programme	16.0	5.5	14.0	16	11.0	4.0	12.0	11	10.0	3.0	9.0	10
Average/Programme	11.5	2.5	4.0	6.4	5.6	1.4	3.0	3.4	4.8	1.2	2.5	2.9
Average/PI	12.8	3.5	7.5	8.6	6.7	1.6	4.6	4.2	6.2	1.6	3.9	3.9
Average/Astronomer	8.0	1.6	3.4	4.5	3.4	0.7	2.0	1.9	2.8	0.6	1.4	1.5

Geographical Distribution

		1st Year				2nd Year				3rd Year			
		NASA	ESA	SRC	All Agencies	NASA	ESA	SRC	All Agencies	NASA	ESA	SRC	All Agencies
PI's:	Internal	44	36	21	101	81	93	31	205	93	96	37	226
	External	9	2	1	12	10	1	6	17	5	0	5	10
Co-I's:	Internal	28	46	23	97	79	124	34	237	97	156	45	298
	External	4	1	3	8	12	5	13	30	24	17	28	69
Total Astronomers:													
	Internal	72	82	44	198	160	217	65	442	190	252	82	524
	External	13	3	4	20	22	6	19	47	29	17	33	79

The foregoing statistics were collated by R. Wilson (SRC), A. Boggess (NASA), and J. Darius (ESA).

IUE Users by Country

COUNTRY	1978-79			1979-80			1980-81		
	NASA	ESA	SRC	NASA	ESA	SRC	NASA	ESA	SRC
Argentina	X	X						X	
Australia	X	X	X		X	X	X	X	X
Austria *		X		X	X			X	
Belgium *		X			X			X	
Brazil								X	
Canada	X			X		X	X	X	X
Chile					X				
Denmark *					X			X	
Finland									X
France *		X		X	X	X	X	X	X
Germany *		X			X			X	
India		X				X		X	X
Iran					X				
Israel				X					
Italy *		X			X		X	X	
Japan	X								
Mexico	X			X			X		X
Netherlands*+ ESTEC		X			X			X	
Norway				X					
Poland					X			X	X
South Africa						X			
Spain*+ Vilspa		X		X	X	X	X	X	X
Sweden*		X			X			X	
Switzerland*+ ESO		X			X	X		X	X
UK*	X	X	X	X	X	X	X	X	X
USA	X	X	X	X		X	X	X	X
USSR	X			X			X		

The above table includes all investigators, whether co- or principal. Note that international organisations have been collocated according to their host country. Thus ESO astronomers are assigned to Switzerland (although as of September 1980 they will have transferred to Germany). An asterisk signifies membership in ESA; the twelfth member, Ireland (Eire), is not listed.

HOME-MADE SOFTWARE

IUE data undergo a standard reduction before being released to guest observers. Briefly, the images are corrected for 1. transmission errors, 2. geometric distorsion, 3. photometric response. The spectrum intensity is extracted and corrected for background and a wavelength scale is established.

A large number of users have developed their own data reduction packages, both for improving the quality of the data extraction and for particular scientific purposes.

Since the exchange of information about these home-brewed programs is sometimes lacking, we are starting to collate known work on IUE data processing and reduction.

Some of these are (or will be) published in some form; in other cases we know that the authors do not mind making them available to the scientific community on request.

For each program we intend to give a very brief description and the name of a "contact point" (the author or – when he is geographically inaccessible – the person to be contacted for getting detailed information and the program itself).

To set a good example, we shall make available all programs written by us (the VILSPA observatory staff).

All users who are willing to publicise the existence of their software should send me the information, specifying if they are prepared to release their program upon request. If the work has been submitted for publication I would appreciate a preprint and – of course – the reference of the journal to which the paper has been submitted.

L. Bianchi

1. NILO 1 - A COMPUTER PROGRAM FOR THE REDUCTION OF IUE LOW-DISPERSION SPECTRA

by: A. Cassatella, D. Ponz (VILSPA)

The program extracts the spectral data from the "line-by-line spectrum", the 4th file of the user's tape.

This has the advantage that in the case of large-aperture spectra of extended sources it is possible to resolve the spectrum spatially (within the 20 arcsec perpendicular to the direction of the dispersion). Also, as in the case of

long-exposure noisy spectra, it is possible (through partial scanning parallel to the dispersion direction) to detect the presence of spurious effects like particle events, phosphor decays and so on which can affect the spectrum.

The standard operations performed by the program include background smoothing, spectral data extraction, absolute calibration, reddening correction and computation of broad-band (TD1-like or ANS-like) fluxes. In addition, SWP spectra obtained with the wrong ITF tables can be corrected using the three-agencies correction algorithm described by Cassatella et al. in ESA IUE Newsletter no. 5, p.5.

A preprint with detailed description is available from A. Cassatella, VILSPA, Apartado 54065, MADRID.

2. Improved Method of Extracting Low-Resolution SWP Data

by: M.A.J. Snijders (University College London)

This program extracts IUE low-dispersion spectra of SWP images, from the 2nd file of the user tape (GPHOT image).

A description is published in the SRC IUE Newsletter no. 5, p. 85.

Compared to the standard IUE data reduction technique (IUESIPS), it has the following advantages:

i) Errors in the ITF table at the 10% and 20% exposure levels are removed if these are present.

ii) The present ITF tables are incomplete. Pixels affected by this fault are for the first time properly flagged.

iii) Before the background is smoothed particle events, fiducials, and geocoronal emission are removed from the background. This results in a drastic improvement in photometric accuracy for weak exposures.

iv) All pixels with spectral information are counted once and only once. IUESIPS completely ignores 10% of the pixels with spectral information in the SWP images in low-resolution spectra.

v) It is clear from the printout of the partially processed results what the software does to the data. This makes it easier for the user to assess the validity of the results.

vi) The data extraction window is nearly perpendicular to the dispersion direction; this is not the case with IUESIPS at present.

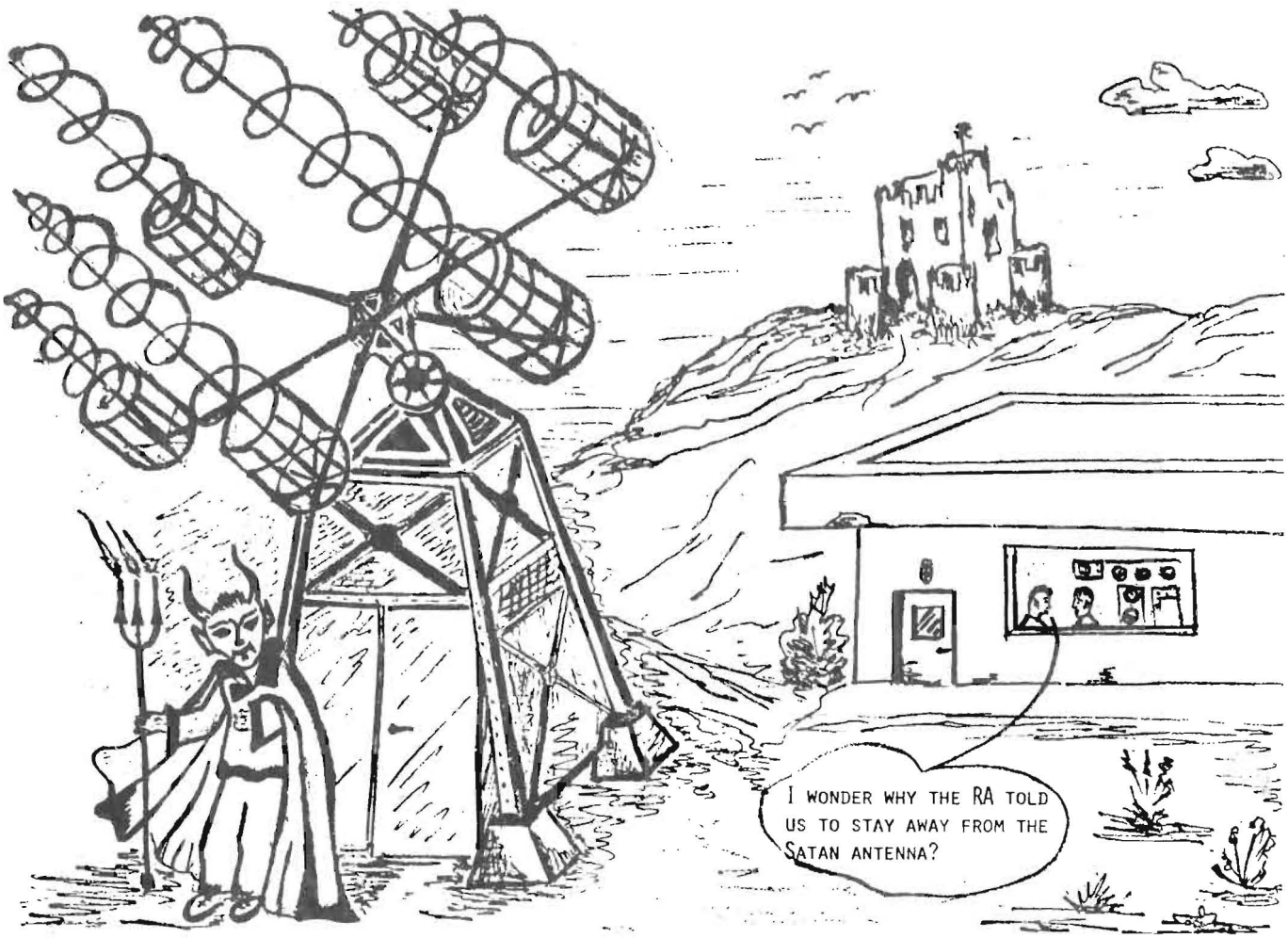
3. Extraction of Spectra from GPHOT Images

by: J. Giddings, J. Settle (University College London)

This program performs the extraction of IUE high-dispersion spectra from the geometrically and photometrically corrected image (2nd file of the user tape).

The purpose is to overcome the following shortcomings of the standard IUE data extraction: 1) the wavelength interval in the spectrum of a given order is not regular; 2) not all image pixels contribute to the final spectrum with equal weight; 3) in some high-dispersion images the regression line for an order may not follow the order exactly.

The method is fully described in the SRC IUE Newsletter no. 5, p. 11. Please do not contact Jack Giddings, but a member of the SRC IUE project staff instead.



Q & A Column

Q. Please give us some guidance with regard to a reasonable taxi fare to and from VILSPA.

N.U. Merable

A. Several users have in the past had unfortunate experiences with unscrupulous taxi drivers using quite a variety of tricks to be paid significantly more than normal. Things are now improving, however, since the Ayuntamiento de Madrid (City Council) has started a big campaign against this kind of abuse. To our knowledge, already more than 150 licences have been withdrawn (out of the 15500 taxis of Madrid). The vast majority of taxi drivers are honest, but obviously one should be especially careful with those waiting at the airport for a good opportunity, mainly with foreigners.

What should be an approximate normal fare for a trip to VILSPA from the airport or from downtown? First, the "bajada de bandera" (starting amount) should be 32 ptas., and you should always be able to read the taximeter. The driver should catch as soon as possible the "Carretera de la Coruña" (N VI) and proceed to VILSPA as indicated in your Domestic Guide for Guest Observers. On the right-hand side of the highway, more or less at the level of Aravaca, is a plate indicating the city limit of normal fare for taxis. From that point on, the fare will be doubled; to be completely secure, you could read the meter and mention it to the driver.

Example: amount at the plate = 600 ptas.; amount on arrival at VILSPA = 1000 ptas. You pay 600 + (1000-600)×2 = 1400 ptas. Add 75 ptas. for airport supplement if you are coming from Barajas.

So an approximate normal fare from the airport is about 1500 ptas.; and from downtown to VILSPA, between 1000 and 1200 ptas. (depending on the location of your hotel). If you go from the airport to your hotel or back, pay what the meter indicates, plus the airport supplement of 75 ptas. For internal city trips, pay the meter amount only (check the initial amount of 32 ptas.). There is also a supplement of 10 ptas. per suitcase, and other small supplements for nights, weekends, and holidays.

To reach the airport from VILSPA, you will have to call a taxi from the rank in Majadahonda. The driver will set his meter going on departure, and at Barajas will charge the amount on the meter plus 600 ptas. to cover his return, Majadahonda being outside city limits. Thus the total fare, VILSPA to Barajas, should be approximately 1800 ptas.

Nota bene: As we go to press, the Provincial Price Commission has approved a 20% increase in taxi fares to become effective from 1st November. The amount initially registered on the meter will be 40 ptas., no longer 32. In anticipation of further changes in 1981, the meters will not be modified and drivers will use a printed conversion table to assess the correct (higher) fare. So be warned!

A. Heck

Q. It appears that certain bright spots on the phosphor of the IUE cameras turn up on successive images. Can you provide a list of such spots known to recur?

G. Bromage
Appleton Laboratory

A. Given below is a list of pixels with a high probability of being excited — so-called "hot" pixels — that have been found in a sample of long-exposure IUE images (> 1 hour). The list is far from being a complete summary of the "hot" pixels but should be helpful as a reference when you analyse your prints. In any given image, of course, bright spots will appear which can be detected using the photowrites, and only those known to be recurrent are tabulated here.

The entries in the table are
- line and sample position in the raw image (RAW = 1st file in the user's tape) and in the geometrically and photometrically corrected image (GEOMD = 2nd file);
- expected wavelength according to the current dispersion constants for low and high dispersion, large and small aperture.

"B" means that the spot corrupts the background rather than the gross spectrum. The reason for giving two wavelengths at certain pixel positions is that we include the two adjacent orders possibly affected. The effective wavelength of the blemish depends on such factors as the (x,y) registration and the position of the target in the large aperture. Expected errors in wavelength are ±5 Å in low dispersion and ±0.3 Å in high dispersion.

Since the occurrence of hot pixels is a function of exposure time, a much larger sample would have to be surveyed to complete the table. Guest observers with reason to believe that a recurrent hot spot on their images has been omitted from the present list are earnestly requested to send us relevant information.

J.D. Ponz

Hot Pixels in the LWR Camera

RAW		GEOMD		LOW DISPERSION		HIGH DISPERSION	
				LARGE AP.	SMALL AP.	LARGE AP.	SMALL AP.
LINE	SAMPLE	LINE	SAMPLE	WAVELENGTH (Å)			
126	291	120	315	—	—	1919.3	1904.8 B 1920.5
170	200	156	222	~1780	1775 B	—	—
175	369	174	394	—	—	2172.5	2153.6 B 2173.9
178	610	186	648	—	—	2732.0	2733.8
208	391	207	415	—	—	2258.5 B 2280.0	2282.4 B
215	326	210	348	—	2130	2135.3	2117.0 B 2136.7
257	323	251	345	~2190	—	2198.2	2199.7 B 2178.8
333	317	326	335	—	—	2288.9	2290.3 2268.0 B
412	385	407	401	—	—	2570.2	2543.8 B 2572.0 B
434	479	434	498	—	—	2818.7	2786.3 B 2820.5 B
518	545	521	563	—	—	3084.0	3086.0 —
532	307	521	316	—	—	2550.8 2579.2 B	2552.3 —
680	332	673	335	—	—	2838.0	2839.8

Hot Pixels in the SWP Camera

RAW		GEOMD		LOW DISPERSION		HIGH DISPERSION	
				LARGE AP.	SMALL AP.	LARGE AP.	SMALL AP.
LINE	SAMPLE	LINE	SAMPLE	WAVELENGTH (Å)			
292	413	295	412	—	—	1379.6 B 1393.6	1378.7 B 1392.6
352	501	357	500	—	—	1330.2 B 1343.0	— 1342.2
392	127	386	123	1795 B	—	1859.1 —	1857.8 —
398	521	404	520	—	—	1357.9 B 1371.4	1357.0 B 1370.4
410	535	416	534	—	—	1358.5 1372.0 B	1357.6 1371.0 B
482	342	481	336	—	—	1686.7 —	1685.6 —
568	127	563	112	—	—	— 2060.2	— 2058.9
611	387	613	380	—	—	1779.0 B 1756.5 B	1778.0 B 1755.3 B

Orbital Velocity Correction

The velocity resolution of the IUE spectrographs in high resolution is about 20 to 30 km s^{-1}, of the same order as the Earth's orbital velocity around the Sun. It should therefore be possible to determine the centroid of a line to 2 or 3 km s^{-1}, which is comparable with the spacecraft's orbital velocity around the Earth ($\sim$4 km s^{-1} at perigee). The high-dispersion wavelength scales will be corrected for both velocity effects in the near future. The revised scales will be accurate to $\pm$0.25 km s^{-1}, subject to the usual IUE caveat that there may be a shift in the zero point. A detailed description of the velocity determination algorithm, along with listings of the subroutines involved, is contained in the following article: "Orbital Velocity Corrections" by C. Harvel, NASA IUE Newsletter no. 10, p. 32 (June, 1980).

K. Northover

Quotes of the Quarter

"I've always thought that fake data ought to be published as a control experiment for theoreticians."

"The problem is that this source is an intensely faint object."

"Putting conference reports on your c.v. is the last refuge of the incompetent."

M.V. Penston

FILE ON MADRID: ARCHITECTURAL SURPRISES

The contingencies of history have sapped Madrid of many elements of Spanish architecture which would most attract the foreign visitor, be he a mere tourist, a passing architect, or even a guest observer. The best examples of Roman influence are to be found in Mérida, Segovia, and Cataluña; of Moorish architecture — chronologically Caliphate (Córdoba), Almohad (Sevilla), Nasrid (Granada), and Mudéjar (under Christian rule) — in Andalucía but also Toledo; of Romanesque Gothic, in the cathedrals of Santiago, León, Burgos, and elsewhere; of Plateresque Renaissance, in Salamanca. Madrid partakes not a whit of the blinding whitewashed towns like Casares, nor of the half-timbered medieval dwellings like Candelario, nor of the señorial mansions in honey-coloured stone within the walls of Cáceres, nor even of the imposing castles scattered throughout the rest of Castilla. Even when it comes to the twentieth century, the fantastical creations of the Catalán architect Gaudí are nowhere to be seen. Where the architecture of Madrid is of any quality, it is stolidly unoriginal (the Royal Palace, of an italianate classicism; the Plaza Mayor, such a pale shadow of Salamanca's). Where it was once original — for instance, the skyscrapers crowding the Plaza de España — it has long been surpassed elsewhere.

Nevertheless, a diligent pedestrian will stumble on many pleasant architectural surprises in Madrid, for the most part utterly ignored by the guidebooks. Guest observers can turn to the latter for walking tours through the picturesque passageways of the Ciudad Antigua (the old city, sometimes simply called the Villa) and for descriptions of the more monumental features of Madrid's architectural legacy. What follows will be a swift survey of some personal favourites of the Editor — justifiable on the grounds that he can afford to indulge himself in view of his imminent departure and that, should these columns ever fall into the hands of a Madrileño architect, he will have removed himself too far to be lynched.

Perhaps the ultimate excess which the Baroque passion for the decorative attained can be seen in the Churrigueresque, a style named for the three Churriguera brothers of the 17th century but pushed to its decadent extremity by their 18th-century successors. A fascinating example is the portal of the Museo y Biblioteca Municipales at Calle Fuencarral 78, a few blocks south of the Glorieta de Bilbao. Designed by Pedro de Ribera in 1720 for what was then an orphanage (hospicio), it is a veritable gorgon of stone curlicues, garlands, shields, and ornately carved figurines, all the more striking for the contrast afforded by the unadorned reddish brick façade in which it is set. In the central niche Fernando II is being offered the keys of the city — but Sevilla, not Madrid curiously enough — by a kneeling page. Ribera created another half dozen portals in Madrid and was at least partly responsible for the Puente de Toledo, now reduced to a rather abject footbridge over spaghetti junction plus a meagre ribbon of the Manzanares; but none of these can hold a candle to the Municipal Museum.

This piece of rococo flamboyance is not wholly alien to the guidebooks — one can even buy a postcard of it — but nearby is another equally astonishing building apparently unknown to them. It is the Palacio Longoria in Calle Fernando VI at the corner of Calle Pelayo, former bank and residence of the banker Javier González Longoria and now home of the Sociedad General de Autores Españoles. Designed by José Grases Riera in 1902, the same year as his much more sober Teatro Lírico (now the French lycée), its florid façade is to my mind as strongly reminiscent of the Churrigueresque as it is of art nouveau; yet those who acknowledge its existence allude dismissively only to a Belgian-inspired modernism. On the other hand, the weirdly undulating balconies do seem to echo some of Gaudí's work in Barcelona, notably Casa Batlló, a 1905 block of flats in Paseo de Gracia.

Continuing northward past the Plaza de Alonso Martínez, one comes upon an architectural medley no single element of which is, in the words of Michelin, "worth a detour"; together they make a curious hybrid. In their neoclassic enthusiasm during the last century, architects of Madrid hardly occupied a unique position, but their championing of a neomudéjar style in the 1880's is rather more original. The only true mudéjar features still extant in Madrid are the steeples of San Nicolás de los Servitas (12th c.) and San Pedro el Viejo (14th c.), both in the old town but neither worth more than a passing glance. Clustered about the top end of Calle Almagro can be found the best examples of neomudéjar, characterised by brickwork in decorative relief: the Church of San Fermín de los Navarros (1891) and the Asilo de San Diego y San Nicolás (1903) at Paseo de Eduardo Dato 20 and 6 respectively, and the Palacete de Osma (1886) at Calle Fortuny 43 on the corner of Eduardo Dato. Just north of the latter at no. 47 is a modern block of flats, Edificio Maracay, with an eye-catching façade of colourful acrylic — a stained-glass effect somewhat gaudy in close-up. On the corner of Eduardo Dato opposite the Palacete is the Palacio de Bermejillo (1913), allegedly neoplateresque. And one block south in Paseo de la Castellana is a ziggurat labeled "Chase", an Assyria-inspired pyramidal structure designed by the contemporary architect Antonio Lamela — altogether quite an architectural olla podrida.

Quite as agreeable if less monumental constructions are tucked away in Madrid's sizable parks. The Parque del Buen Retiro, once Felipe II's private retreat, repays exploration with more than lawns and park benches: one can cycle in the sandy Chopera (= Poplar Grove), stroll through the exquisite Rosaleda, row on the Estanque (literally pond, but in fact a substantial lake), or nip across Alfonso XII to the Jardín Botánico. Three noteworthy structures are the Monument to Alfonso XII (1902, again by José Grases Riera), a delightful folly with Ionic columns, leonine guards, and steps down to the edge of the boat-strewn lake; the well-proportioned Palacio de Cristal (1887, by Ricardo Velázquez Bosco), like its forebears the child of a great exhibition — in this case planned as a hot-house for exotic plants brought from the Philippines (it now houses transient exhibitions); and especially for guest observers the 18th-

century Observatorio Astronómico with its Corinthian portico and Ionic rotunda (by Juan de Villanueva, better known as the architect of the Museo del Prado) in the southwest corner within sight of the broad arch of Atocha Station (1889).

The Parque del Oeste, conveniently at hand for residents at the Príncipe Pío, harbours many delights unjustly neglected, including its own Rosaleda, fine walks with views over the Manzanares basin, and for the best vistas a teleférico from the elegant Paseo del Pintor Rosales clear down to the Casa de Campo with its zoo and amusement park. Two quite startling buildings lurk in the Parque del Oeste, the first being the Templo de Debod at the Plaza de España end. Since an Egyptian temple 24 centuries old does not exactly constitute Spanish architecture, I shall save it for a future "File on Madrid". The other curious structure is a huge kiln in the area northwest of the rose garden, appropriately named Parque de la Tinaja (tinaja = large earthen jar). Originally intended for glassblowing, it was used in the late nineteenth century by the Zuloaga brothers among others to fire their pottery. Nearby are located the Escuela Nacional de Cerámica and a cypress-lined walk to the tomb of the Heroes of the Second of May. (Their execution by French soldiers in the rebellion of 1808, immortalised in Goya's painting now in the Prado, took place on the hill of Príncipe Pío.)

Characteristic of the turn of the century is a vertical sweep of glass framed in wrought iron on several floors, executed with varying degrees of success. Nowhere is this type of façade better balanced or more elegantly treated than in Casa Pérez Villaamil at Plaza de Matute 10 (1906, by Eduardo Reynals y Toledo) — that much more impressive for being scrupulously well preserved in an area rife with seedy if picaresque tavernas. Ardent archiphiles will come upon many attractive features in this rather downtrodden barrio: one block south of the above in Plaza Antón Martín is a chemist with a Montgolfier-style balloon plus gondola over his shop; a few blocks north, La Equitativa by the metro station Sevilla is girdled by carved elephants at streetlamp level — once again a flight of Grases Riera's fancy. Indeed, not only in the narrow streets of the barrios bajos, but even in the Gran Vía, grotesque cornices and other interesting features will be found by those who keep their gaze skyward — surely not harsh advice for visitors to VILSPA.

Among buildings of the twentieth century, Madrid offers few which are properly speaking indigenous: the huge edifices lining the Paseo de la Castellana, for example, would fit equally well (or equally obtrusively) into nearly any large urban environment. The post-office building at the bottom of Castellana in the Plaza de Cibeles (designed 1903 by Antonio Palacios y Ramilo) is an exception — a pseudo-Gothic monstrosity for which no Spaniard has a kind word but which, taken in a spirit of jocularity, does exude a certain hideous charm. What other European capital can boast a Palacio de Comunicaciones to match?

The work of the Rationalists, a movement of the 1920's and 1930's, is evident in the area of El Viso, roughly east of the Plaza de la República Argentina; but these days it is of mainly academic interest. One modern building worth seeking out, however, may already have caught the visitor's eye on his way into town from the airport: the Edificio Torres Blancas off the Autopista de Barajas where it crosses Calle Padre Xifré. Designed in 1962 by Francisco Javier Sáenz de Oiza, it represents a dramatic departure from convention — a vertical city-garden 81 metres high whose bizarre turrets, far from being gratuitous decorative flourishes, were derived from the structural conception as a natural consequence.

Another building of recent vintage, considered to be of equal architectural significance but certainly much less interesting visually, is the bronze monolith of the Edificio Ederra in Azca (a development of office blocks off Paseo de la Castellana southwest of the Plaza de Lima). Built on 18 floors as the head office of the company Cristalería Española, it constitutes the first computer-controlled energy-saving environment on this scale in Spain and indeed (its publicity claims) the world. An enormous reduction in energy demands is effected by utilising available solar energy through crystal panels covering the whole building; by recuperating thermal energy normally lost from lamp fixtures, air ducts, and even human occupants and storing up calories in the form of heated water; by controlling the level of illumination — all done automatically by the "on-board computer" to maintain 21°C and 45% humidity (winter figures), a light level of 800 lux, and an air flow of 40 m^3 hr^{-1} per person. An annual saving of 2/3 the energy consumption is readily achieved. The building is more memorable in concept than in appearance, but ecofreaks making a pilgrimage can identify it by the Banco Guipuzcoano sign. Manuel Aymerich Amadios was its architect and this month (October) sees the third anniversary of switching on this successful experiment in controlled environment.

It is a pleasure to thank Antonio Arrechea Fuster for his helpful criticisms and for access to the library of the Colegio Oficial de Arquitectos de Madrid.

Jon Darius

Information for Undernourished Epicures

Some provident guest observers manage to plan their IUE shifts to dovetail with their annual leave (or is it vice versa?) and thereby can sample the diverse types of cuisine prevalent in different regions. The cooking varies considerably from one province to another, and one may come to doubt the existence of an entity called Spanish cuisine. Fortunately for those who will not be crossing the frontiers of Castilla one can also find good examples in Madrid itself of restaurants specialising in the food of Asturia, Galicia, Navarra and so forth. The last issue of the Newsletter, you will recall, recommended a restaurant specialising in the food of the Levant and more especially in paellas from Valencia. The current one presents the cuisine of Aragón and of Cataluña.

To hunters of non-Castilian menus, a word of warning. Just as untutored diners can order hamburger in Indian restaurants in London, so can one mistakenly assume that all the dishes in a Basque restaurant, say, are Basque. Indeed, it frequently happens that only a small percentage of the menu is devoted to the cuisine in which the restaurant ostensibly specialises. Granted the delightful atmosphere and fine wine of La Rioja, near the Plaza de España, one may well fail to notice that there are precious few Riojan dishes available. (At least the house wine is, blissfully, a delectable Rioja.) Do not be perturbed, moreover, that gazpacho from southernmost Andalusia turns up on a supposedly Galician or even a Basque menu. It may be useful to arm yourself with a culinary guide; in the first instance, pick up a free copy of "Gastronomy Spain" at M.I.T. (not the rival to Harvard, but the Ministerio de Información Turística, Princesa 1 -- actually on the north side of the Plaza de España -- or else Alcalá 44).

The dearth of Aragonés restaurants in Madrid reflects a neglect of this regional cuisine which is sadly typical, and it is small consolation that there are worse cases. (No restaurant in Madrid blazons forth the cuisine of Extremadura or La Mancha although one can find the odd tasca whose dueño exercises his nostalgia for "home cooking".) Of the two in Madrid -- El Cachirulo at 4 Avenida Concha Espina facing the bullring-like Bernabeu stadium, and a stone's throw away La Prensa de Tirgo at 7 Avenida del Brasil beside the Ministry of Culture -- each compensates to some extent the failings of the other. For La Prensa de Tirgo it can be said that parking is relatively easy, queuing for tables unnecessary in view of its size, service deft, and food quite adequate; against it, that it is characterised by a certain impersonality, a lack of atmosphere -- perhaps not unrelated to the fact that it is owned by the conglomerate Tryp, with holdings from Tenerife to Alicante -- and that its specialities are all jumbled together. Pity the innocent guest observer, hot in pursuit of Aragonés cooking but unable to distinguish geographically the Bermeo sea bream (from the Basque coast), Navarran dried cod, tortilla de Haro (in the heart of Rioja), and costillas de ternasco (at last, a true dish of Aragón).

El Cachirulo helpfully lists its Aragonés specialities, including green beans with ear of pork, fried sausage (the thin, spicy longaniza) with bread crumbs, eggs a la Salmorrejo (a bowlful layered roughly thus: fried eggs, pork chop, ham, and hot broth rather heavy on oil), chicken a la chilindrón (an excellent sauce of tomatoes, peppers, onions, and ham), magras (rashers of ham) with tomato, and ternasco (usually roasted kid), ranging from 200 to 675 ptas. Olive oil from the region is reputedly the best in Spain, and perhaps it is not surprising that if any reproach can be addressed to Aragonés cooking as a whole it is that this commodity is used to excess. El Cachirulo scores higher on atmosphere than its rival at the expense of fewer tables and it may be useful to know that, in extremis, one can order from the restaurant menu at the few tables in the adjoining bar (which also has its own menu). Furthermore, the house wine is an honest if rather overpowering Cariñena, whilst its up-market rival keeps a meretricious and disappointing Rioja. Neither troubles with regional desserts, but the moist, fresh leche frito (literally, fried milk) at El Cachirulo will not come amiss. Both places are open 13:00 to 16:00 and 21:00 to 24:00 except Sundays. El Cachirulo also opens for Sunday lunch, 13:30 to 16:00, and it is best to reserve (259-0702).

Utterly different in character is the modern and attractive El Timbal, one of only two restaurants -- again! -- specialising in Catalán cuisine. Its large dining room is furnished with bamboo tables and chairs, mirrors, tiles set into the floor, and plants which thrive under a central skylight. Inevitably the lace-fringed napkins and the efficient and friendly service are concomitant with higher prices -- yet ironically the least expensive items are the Catalán specialities. Do not expect the full flower of cocina catalana here; it is available nowhere in Madrid, not excluding the better known and more expensive La Fonda at 11 Lagasca (though the latter does offer a few other Catalán dishes, notably aubergine pudding and rabbit stewed with snails).

Forego the soup at El Timbal in favour of the misleadingly named ensalada de la casa: "esqueixada" is a cold dish of slivered tomato and "bacalao" (rather chewy dried cod) in a vinaigrette sauce. The rabbit in alioli (variant: all-i-oli) sauce makes an appropriate main course; like bouillabaisse and cassoulet, alioli (a sort of garlic mayonnaise) is one of Cataluña's rarely acknowledged contributions to international cuisine. Alternatively, try "butifarra amb mongetes", a squat and tasty Catalán sausage served with rather bland white beans. Mustard is advisable (and available) even though this is sacrilege to the puritans. For dessert, the "crema catalana" resembles natillas (custard) basted with burnt sugar, whilst "mel i mató" amounts to a requesón con miel (a smooth cottage cheese with honey). Three-course Catalán-biased meal with wine, ∿900 ptas; location: 69 Andrés Mellado, just south of Cea Bermúdez (since A.M. is one-way north, take the next street, Guzmán el Bueno, which is one-way south; N.B. aparcamiento at no. 78 beside the Caja de Ahorros); telephone: 244-3615; closed Sunday evening.

Jon Darius

The Ballad of IUE

It is four in the morn; the RA could have sworn
that the time of his shift is much later,
But his digital clock wakes him up with a shock:
it is time to collect UV data.
In a state of sedation he drives to the Station,
quite ready to take extreme unction;
He can't tell the Castle from elbow or asshole
but he must get his brain cells to function.
The new guest observer receives him with fervour.
He's somewhat crestfallen when told
That there's no hope in hell of γ^2 Vel
till the on-board computer is cold;
And it isn't worth tryin' those stars in Orion --
the archive is full of their spectra
While the object in Crux has a vanishing flux
which would tax any photon collector.
When the chap has crossed off AR Lac and U Oph
and such objects of second priority,
His POT overflowing with targets is showing
an increasingly smaller minority.
Yet still there's a hope he can image Merope.
A dummy manoeuvre is tested.
Constraints are there none from the Moon or the Sun,
nor the Earth in the time slot requested,
But by Murphy's decree the object must be
half-way round the celestial vault.
Though the GO looks pained, not a word of complaint --
for it really is nobody's fault.
(Of course it is true that during the slew
one can PREP both the IUE cameras.)
Now Merope's a myth not immune to a kith
as we know from her qualities amorous;
Yet she's shy to be seen on the EDS screen,
for her field-camera image is bare.
At once there's a check on her RA and Dec
and they prove that she ought to be there.
On closer inspection, a minor correction
is needed in order to snatch
The star back from where she is caught in the snare
of the low-reflectivity patch:
Of the stars in the field only she is concealed
by the whim of the Fine Error Censor.
There is nothing to do but perform a small slew
to render her image intenser.
The GO is peeved, but the TO's relieved
that the satellite hasn't lost attitude:
By comparison, say, a pin in the hay
is a cinch if you'll pardon the platitude.
Merope at last, with a star-studded cast,
shows up in her true luminosity
Yet shorn of her veils since the camera fails
to reveal all her faint nebulosity.
The star's in the slot -- the moment is fraught,
but it seems that the prospects are changing --
When a voice with a drawl announces, "Y'all
about ready to stand by for ranging?"
They react to the SCAMA with furious clamour
till the voice of authority, sneering,

Says, "Hell and perdition! You think a space mission
    is science and not engineering."
No need for a guide to expose on this Pleiad --
    the spectrum is done in a trice.
The GO wants low res., and both slots (so he says)
    so they make her perform for him twice.
It is but a short ride from Pleiad to Pleiad
    by movements in roll, yaw, and pitch.
Their short-wavelength spectra except for Electra
    are captured with scarcely a hitch
Apart from times when, every now and again,
    the event page stops dead on a line;
But one knows from the past that the freeze will not last --
    just a crash of the great Sigma 9.
It's hard to resist her, that ultimate Sister,
    unknown in the far ultraviolet;
Handover of power in less than an hour
    regrettably keeps her inviolate.
The shift was elating as much as frustrating
    and no one will look back with rancour --
All astronomers bid to return to Madrid
    to visit anew Villafranca.

Jon Darius

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The foregoing list updates those published in previous issues of the Newsletter. Names of IUE Observatory astronomers are underlined. Preprints are included only when accepted for publication or in press; these papers will normally be listed a second time when finally published.

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The foregoing list updates those published in previous issues of the Newsletter. It contains papers based on IUE observations from VILSPA other than those involving IUE Observatory astronomers. May we strongly request that IUE users continue to send us (p)reprints of their papers.

VILSPA Images for Release, December 1980 to April 1981

VILSPA IMAGES FOR RELEASE TO SCIENTIFIC COMMUNITY

1980 December 1st (despatched 1980 May)

Camera 2 LWR			Camera 3 SWP		
7629	7683	7789	8856	8947	9052
7633	7697	7790	8857	8948	9065
7634	7700	7794	8858	8949	9079
7635	7701	7795	8859	8950	9091
7636	7702	7796	8860	8968	9092
7637	7703	7797	8861	8969	9093
7638	7710	7798	8862	8972	9094
7639	7720	7807	8871	8973	9095
7651	7723	7808	8880	8989	9096
7652	7724	7824	8885	9000	9097
7653	7734	7838	8894	9001	9107
7654	7747	7839	8895	9002	9123
7655	7758	7840	8896	9003	9124
7658	7759	7841	8897	9004	9125
7659	7760	7842	8909	9024	9126
7660	7761	7843	8910	9029	9127
7662	7762	7844	8911	9030	9128
7663	7770	7857	8912	9031	9129
7664	7771	7858	8913	9032	9130
7665	7772	7859	8914	9033	9136
7671	7773	7860	8923	9034	9137
7672	7774	7861	8924	9047	
7673	7785	7866	8925	9048	2790*
7674	7786	7867	8926	9049	3130*
7675	7787	7868	8927	9050	5483*
7676	7788	7878	8936	9051	

* SWP images erroneously listed as 2890, 3230, 5383 respectively in the release list of 1980 September 1st.

VILSPA IMAGES FOR RELEASE TO SCIENTIFIC COMMUNITY

1980 December 1st (despatched 1980 May) Page 2

Camera 3 SWP

1917	5591	5666	5778	5887	5974
3237	5592	5693	5779	5888	5975
3537	5593	5694	5811	5942	5976
4472	5594	5704	5827	5943	5977
4668	5595	5705	5837	5944	5978
5086	5596	5706	5839	5945	5985
5469	5597	5707	5840	5946	5986
5521	5598	5715	5841	5947	5987
5523	5599	5717	5852	5948	5988
5535	5600	5718	5865	5963	5989
5536	5615	5725	5868	5964	5990
5538	5631	5727	5873	5970	6019
5568	5659	5737	5874	5971	6020
5585	5660	5738	5875	5972	6021
5590	5665	5739	5886	5973	6022

VILSPA IMAGES FOR RELEASE TO SCIENTIFIC COMMUNITY

1981 January 1st (despatched 1980 June)

Camera 2 LWR			Camera 3 SWP		
7884	7981	8045	9145	9229	9310
7890	7989	8059	9146	9230	9319
7891	7990	8060	9152	9240	9333
7892	7991	8065	9153	9241	9341
7893	7992	8072	9154	9255	9348
7894	7998	8080	9155	9256	9349
7895	7999	8081	9156	9257	9367
7896	8000	8092	9165	9261	9368
7897	8003	8097	9166	9262	9379
7898	8010	8103	9177	9271	9380
7904	8011	8104	9178	9272	9388
7905	8013	8105	9181	9276	9396
7924	8014	8106	9182	9277	3114*
7925	8030	8107	9189	9278	
7939	8031	8108	9194	9285	
7945	8038	8109	9201	9286	
7958	8039	8120	9211	9287	
7970	8040	8131	9212	9291	
7971	8041	8138	9213	9292	
7972	8042	8146	9214	9299	
7973	8043		9215	9302	
7974	8044		9228	9303	

* REPROCESSED

VILSPA IMAGES FOR RELEASE TO SCIENTIFIC COMMUNITY

1981 February 1st (despatched July 1980)

Camera 2 LWR			Camera 3 SWP		
8151	8249	8337	9402	9450	9525
8159	8259	8338	9408	9451	9527
8160	8260		9414	9452	9528
8161	8261		9415	9453	9529
8164	8277		9416	9454	9544
8165	8278		9422	9455	9545
8166	8279		9423	9462	9549
8167	8280		9424	9463	9550
8171	8281		9425	9464	9551
8172	8282		9426	9465	9552
8187	8303		9427	9466	9553
8188	8304		9428	9467	9558
8195	8305		9433	9468	9559
8196	8306		9434	9469	9560
8199	8311		9435	9470	9569
8200	8320		9440	9471	9570
8201	8321		9441	9492	9575
8216	8322		9444	9493	9576
8226	8323		9445	9500	9590
8233	8328		9446	9501	9591
8234	8329		9447	9510	9592
8235	8330		9448	9517	9593
8243	8336		9449	9518	9606
					9607

VILSPA IMAGES FOR RELEASE TO SCIENTIFIC COMMUNITY

1981 March 1st (despatched 1980 August)

Camera 2 LWR

8384	8467	8567
8385	8468	8568
8386	8482	8569
8387	8483	8570
8394	8488	8574
8396	8489	8575
8397	8497	8576
8400	8508	8580
8411	8509	8581
8412	8514	8593
8413	8515	8594
8416	8516	8595
8417	8517	8601
8431	8522	8602
8432	8523	8610
8433	8524	8611
8438	8538	8612
8439	8539	
8445	8540	
8446	8548	
8447	8549	
8452	8553	
8453	8554	
8458	8555	
8459	8556	
8460	8557	
8461	8558	

Camera 3 SWP

2454*	9727	9841
9636	9728	9842
9637	9741	9843
9638	9742	9850
9647	9763	9851
9649	9764	9852
9650	9768	9857
9657	9769	9858
9658	9779	9859
9665	9780	9860
9666	9792	9861
9667	9793	9862
9677	9794	9863
9678	9798	9864
9679	9799	9870
9691	9800	9871
9692	9801	9872
9698	9802	9878
9699	9803	9879
9704	9814	9880
9705	9815	9881
9706	9816	9890
9710	9825	9891
9711	9826	9898
9712	9827	9899
9725	9836	9900
9726	9837	9901

* Appeared erroneously in release list for September 1st 1980

VILSPA IMAGES FOR RELEASE TO SCIENTIFIC COMMUNITY

1981 April 1st (despatched 1980 September)

Camera 2 LWR						Camera 3 SWP	
8621	8710	8783	8890	9909	9985	10051	10136
8622	8712	8790	8891	9910	9991	10056	10137
8623	8713	8791	8896	9911	9998	10057	10138
8624	8714	8797	8897	9912	9999	10065	10139
8631	8725	8798	8900	9920	10000	10066	10140
8632	8726	8799	8901	9921	10001	10067	10141
8633	8732	8800	8908	9922	10004	10068	10142
8634	8733	8801	8913	9923	10005	10069	10143
8635	8734	8802	8914	9924	10006	10070	10157
8636	8735	8803		9925	10007	10078	10158
8650	8744	8804		9939	10008	10086	10159
8651	8745	8805		9940	10009	10087	10167
8652	8746	8806		9941	10020	10088	10168
8668	8747	8807		9942	10021	10089	10169
8669	8748	8808		9953	10022	10096	10176
8670	8759	8809		9962	10023	10097	10177
8671	8760	8823		9963	10024	10098	10182
8672	8761	8824		9964	10025	10099	10183
8673	8762	8825		9965	10026	10113	10184
8674	8763	8826		9966	10033	10114	10203
8675	8764	8834		9967	10034	10115	10217
8676	8765	8835		9968	10035	10116	10234
8677	8770	8842		9969	10036	10126	10243
8698	8771	8848		9970	10046	10127	10244
8699	8772	8854		9973	10047	10128	10245
8707	8773	8867		9974	10048	10129	10249
8708	8774	8877		9983	10049	10130	
8709	8782	8878		9984	10050	10131	

INTERNATIONAL ULTRAVIOLET EXPLORER

LOG OF IMAGES OBTAINED

AT THE EUROPEAN OBSERVATORY

01JUL80 - 31AUG80

SORTED BY STELLAR COORDINATES

G.O. PROGRAMMES APPROVED BY THE SCIENCE RESEARCH COUNCIL FOR IUE IN 1980-1981

UK301 INTERSTELLAR ABSORPTION LINES IN THE SPECTRUM OF HD 200775
G.A.H. WALKER/BR COLUMBIA
UK302 ULTRAVIOLET OBSERVATIONS OF EXTRAGALACTIC H II REGIONS
R.F. CARSWELL/CAMBRIDGE
UK303 MOLECULES IN CELESTIAL OBJECTS
S.P. TARAFDAR/TATA INSTITUTE
UK304 UV SPECTRA OF ACTIVE GALAXIES NEWLY DISCOVERED AS X-RAY SOURCES
M.J. WARD/CAMBRIDGE
UK305 ABSORPTION MEASURES OF GALACTIC HALO GAS
D.C. MORTON/AAO
UK306 RADIO STARS
D.J. STICKLAND/RGO
UK307 ANOMALOUS WOLF-RAYET STARS
D.J. STICKLAND/RGO
UK308 UV OBSERVATIONS OF THE WHITE DWARF 2A 0311-227
M. COE/SOUTHAMPTON
UK309 HIGH-RESOLUTION OBSERVATIONS OF THE HOT SUBDWARF IN THE ECLIPSING BINARY
M.M. DWORETSKY/UCL
UK310 ULTRAVIOLET OBSERVATIONS OF PECULIAR A AND B STARS
M.M. DWORETSKY/UCL
UK311 OBSERVATIONS OF THE VARIABLE SOURCE 3C120
R.F. CARSWELL/CAMBRIDGE
UK313 NOVA-LIKE VARIABLES, DISK STARS
G.T. BATH/OXFORD
UK314 DWARF NOVAE
J.E. PRINGLE/CAMBRIDGE
UK315 W UMA CONTACT BINARIES
J.A.J WHELAN/CAMBRIDGE
UK316 INVESTIGATION OF CHROMOSPHERIC EMISSION IN THE SHORT-PERIOD SUBGROUP OF RS CVN STARS
E. BUDDING/MANCHESTER
UK317 CORONAS AND CHROMOSPHERES IN W UMA STARS
O. VILHU/FINLAND
UK319 OBSERVATIONS OF SELECTED PLANETARY NEVULAE
M.J. SEATON/UCL
UK320 ULTRAVIOLET SPECTROSCOPY OF THE NUCLEI OF HOT-SPOT AND RELATED GALAXIES
D.J. AXON/SUSSEX
UK321 ULTRAVIOLET SPECTROSCOPY OF VV PUPPIS AND 2A 0311-227
D.T. WICKRAMASINGHE/ROE
UK322 ABUNDANCE PECULIARITIES IN WHITE DWARFS
D.T. WICKRAMASINGHE/ROE
UK323 INTERSTELLAR EXTINCTION IN THE PERSEUS ARM
D.H. MORGAN/RUE
UK324 K-CORRECTIONS AND STELLAR POPULATION ANALYSES FOR NORMAL GALAXIES OF VARIOUS MORPHOLOGICAL TYPES
R.S. ELLIS/DURHAM
UK326 MASS LOSS FROM HOT SUBDWARFS
R. WILSON/UCL
UK327 AN INVESTIGATION OF X-RAY BINARY SOURCES
R. WILSON/UCL
UK328 AN INVESTIGATION OF THE ULTRAVIOLET EMISSION OF SEYFERT GALAXIES
R. WILSON/UCL
UK330 A STUDY OF THE ULTRAVIOLET SPECTRA OF QUASARS
R. WILSON/UCL
UK331 AN INVESTIGATION OF STARS INTERMEDIATELY EVOLVED BETWEEN OF AND WR
A.J. WILLIS/UCL

UK332 AN INVESTIGATION OF WOLF-RAYET STARS IN THE MAGELLANIC CLOUDS
A.J. WILLIS/UCL
UK333 A STUDY OF MAIN-SEQUENCE STARS IN THE LMC
K. NANDY/ROE
UK335 INTERSTELLAR EXTINCTION AND A STUDY OF EARLY-TYPE SUPERGIANTS IN THE LMC
K. NANDY/ROE
UK336 MONITORING OF THE CONTINUUM AND THE LINE STRENGTHS OF SEYFERT GALAXY NGC 4151
A. BOKSENBERG/UCL
UK337 HIGH VELOCITIES IN THE WIND-DRIVEN NEBULA NGC 6302
J. MEABURN/MANCHESTER
UK339 INTERSTELLAR EXTINCTION AND ABUNDANCES IN CANIS MAJORIS R1
D. MCNALLY/UCL
UK340 INTERSTELLAR EXTINCTION IN SOUTHERN DARK CLOUDS
M.B. SOMERVILLE/UCL
UK341 INTERSTELLAR ATOMIC ABUNDANCES IN THE SOUTHERN MILKY WAY
M.B. SOMERVILLE/UCL
UK342 OBSERVATIONS OF INTERSTELLAR CO
D. MCNALLY/UCL
UK343 THE UV SPECTRUM OF SELECTED HERBIG-HARO OBJECTS
D.J. AXON/SUSSEX
UK344 UV SPECTRA OF OBJECTS STUDIED AT IR WAVELENGTHS
UK344 UV SPECTRA OF OBJECTS STUDIED AT IR WAVELENGTHS
R.F. JAMESON/LEICESTER
UK345 UV SPECTROPHOTOMETRY OF MAGELLANIC CLOUD PLANETARY NEBULAE
M.J. BARLOW/UCL
UK346 A STUDY OF ULTRA-HIGH-EXCITATION O VI STARS
M.J. BARLOW/UCL
UK347 EVOLUTION AND ULTRAVIOLET VARIABILITY OF EXTREME HELIUM STARS
P.W. HILL/ST AND
UK348 OBSERVATIONS ON H II REGIONS IN THE NEARBY SPIRAL AND IRREGULAR GALAXIES
P.M. GONDHALEKAR/VILSPA
UK350 A STUDY OF INTERSTELLAR GAS ASSOCIATED WITH SUPERNOVA REMNANTS
P.M. GONDHALEKAR/VILSPA
UK352 HIGH-VELOCITY EARLY-TYPE STARS
D. KILKENNY/ST AND
UK353 COLLABORATIVE MONITORING OF A BY DRACONIS FLARE STAR
A.D. ANDREWS/ARMAGH
UK354 UV SPECTROSCOPY OF THE VELA SUPERNOVA REMNANT
R. WOOD/RGO
UK355 UV SPECTROSCOPY OF FLARE/SPOTTY STARS
P.B. BYRNE/ARMAGH
UK356 STUDIES OF STELLAR CHROMOSPHERES AND CORONAE
C. JORDAN/OXFORD
UK357 ULTRAVIOLET STUDIES OF PRE-MAIN-SEQUENCE STARS
C. JORDAN/OXFORD
UK358 UV OBSERVATIONS OF EXTENDED ENVELOPES SURROUNDING DQ HER AND GK PER
G.J. FERLAND/CAMBRIDGE
UK359 IUE OBSERVATIONS OF SOLAR-SYSTEM OBJECTS
G.E. HUNT/UCL
UK361 A LARGE-SCALE SURVEY OF INTERSTELLAR ABSORPTION IN THE HALO OF OUR GALAXY
A. BOKSENBERG/UCL
UK362 MASS LOSS AND ATMOSPHERIC STRUCTURE OF HIGHLY LUMINOUS STARS
A. BOKSENBERG/UCL
UK363 OBSERVATIONS OF NOVA CYGNI 1978 IN THE FINAL NEBULAR STAGE
D.J. STICKLAND/RGO
UK364 VARIABILITY IN BE-TYPE STARS
A. BOKSENBERG/UCL
UK365 FURHTER LONG OBSERVATIONS OF EXTRAGALACTIC OBJECTS WITH IUE
A. BOKSENBERG/UCL
UK366 ULTRAVIOLET OBSERVATIONS OF XX CAM AND SU TAU
K. NANDY/ROE
UK367 STUDIES OF INTERSTELLAR GAS AND DUST IN THE PLANE OF THE GALAXY
A. BOCKSENBERG/UCL

UK368 THE INTERACTION OF SUPERNOVA REMNANTS WITH THE CLOUDY INTERSTELLAR MEDIUM AT SUCCESSIVE EVOLUTIONARY STAGES.
A. BOKSENBERG/UCL

UK369 THE EXTENT OF A GASEOUS GALACTIC HALO
A. BOKSENBERG/UCL

UK370 EXTRAGALACTIC ASTRONOMY
A. BOKSENBERG/UCL

UK371 HIGH-RESOLUTION SPECTROSCOPY OF ULTRAVIOLET-BRIGHT GALAXIES
K.J.E. NORTHOVER/LOGICA

UK372 THE ECLIPSING BINARY STAR CQ CEPHEI
D.J. STICKLAND/RGO

UK373 VARIABILITY IN WOLF-RAYET STARS
W.M. BURTON/ARD

UK374 FURTHER OBSERVATIONS OF MARKARIAN 59
W.M. BURTON/ARD

UK375 STELLAR FLARES IN RED DWARFS AND BINARIES
G.E. BROMAGE/ARD

UK376 ULTRAVIOLET OBSERVATIONS OF EXTRAGALACTIC OBJECTS WITH COSMOLOGICAL RELEVANCE
M.S. LONGAIR/CAMBRIDGE

UK381 STUDIES OF THE INTERSTELLAR GAS AND MASS LOSS FROM SUPERGIANT STARS
B. BATES/BELFAST

G.O. PROGRAMMES APPROVED BY THE EUROPEAN SPACE AGENCY FOR IUE IN 1980-1981

PV301	P VERON/MEUDON	LOOKING FOR DWARF SEYFERT 1 NUCLEI
HS302	H SCHLEICHER/GOTTINGEN	UV SPECTROSCOPY OF VERY BRIGHT SUSPECTED BL LAC OBJECTS
JP303	JA VAN PARADIJS/AMSTERDAM	IUE OBSERVATIONS OF X-RAY BURSTERS
LB304	L BIANCHI/VILSPA	COLLIDING STELLAR WINDS IN THE ORION TRAPEZIUM
MH305	M HACK/TRIESTE	PECULIAR BINARIES
RS306	R STALIO/TRIESTE	HIGH-LUMINOSITY BLUE HALO STARS
AG307	A GREVE/BONN	UV OPACITIES OF SOLAR-TYPE STARS
GV308	G VETTOLANI/BOLOGNA	ULTRAVIOLET STUDY OF TWO NEW EMISSION-LINE GALAXIES: UGC 3829 AND NGC 1106
GH309	G HAMMERSCHLAG/AMSTERDAM	IUE OBSERVATIONS OF X-RAY BINARIES
AG310	A GREVE/BONN	SUPERNOVA REMNANTS IN THE LMC AND SMC
BW311	B WOLF/HEIDELBERG	HIGH-RESOLUTION UV SPECTROSCOPY OF THE S DOR TYPE STAR HDE 269006 OF THE LMC
CB312	C BERTOUT/HEIDELBERG	UV SPECTROSCOPY OF T TAURI AND YY ORIONIS STAR
LA313	L ANGELETTI/ROMA	ULTRAVIOLET SPECTROPHOTOMETRY OF GALACTIC GLOBULAR CLUSTERS
NP314	N PANAGIA/BOLOGNA	UV OBSERVATIONS OF SUPERNOVAE
NP315	N PANAGIA/BOLOGNA	UV SPECTRUM OF THE NUCLEUS OF M100=NGC 4321
MF316	M FRACASSINI/MILANO	UV OBSERVATIONS OF DELTA SCUTI VARIABLES
KS317	K SEIDENSTICKER/BOCHUM	EXTINCTION LAW IN SELECTED SOUTHERN DUST CLOUDS
BB318	B BASCHEK/HEIDELBERG	HIGH-RESOLUTION SPECTROSCOPY OF BLUE HALO STARS
RW319	R WEHRSE/HEIDELBERG	A STUDY OF CIV 1550 LINE PROFILES IN PLANETARY NEBULAE
MC320	M COMBES/MEUDON	UV OBSERVATIONS OF GIANT PLANETS AND THEIR SATELLITES
MR321	M REGO/MADRID	CHROMOSPHERIC ACTIVITY IN DWARF STARS
WS322	WC SEITTER/MUENSTER	DWARF NOVAE - A KEY TO CATACLYSMIC VARIABLES?
FP323	F PRADERIE/MEUDON	STUDY OF THE TRANSITION ZONE IN LATE A-TYPE STARS
PB324	P BENVENUTI/VILSPA	MEASUREMENT OF THE DUST ALBEDO IN THE 2200 AMGSTRON REGION
JH325	J HEIDMANN/MEUDON	OBSERVATION OF CLUMPY IRREGULAR GALAXIES
JA326	J AUDOUZE/PARIS	STUDIES OF NOVAE
LB327	L BIANCHI/VILSPA	THE BINARY SYSTEM X PERSEI
HM328	HM MAITZEN/VIENNA	SILICON AUTOIONIZATION FEATURES AND SPECTRAL VARIABILITY IN AP STARS
BF329	B FITTON/ESTEC	UV OBSERVATIONS OF THE UPPER ATMOSPHERE AND NEAR EARTH ENVIRONMENT
MU330	MH ULRICH/ESO	SIMULTANEOUS UV, OPTICAL AND X-RAY OBSERVATIONS OF ACTIVE NUCLEI: A STUDY OF THE NON-STELLAR CONTINUOUS RADIATION
CL331	C DE LOORE/BRUSSELS	MASS LOSS AND VARIABILITY OF THE HOT COMPONENTS OF BE-X RAY BINARIES
FG332	F GIOVANNELLI/FRASCATI	UV SPECTRA OF HDE 245770/A0535+26
CL333	C DE LOORE/BRUSSELS	COMPARISON OF THE MASS-LOSS RATE OF MASSIVE CLOSE BINARIES WITH THAT OF SINGLE STARS; MASS TRANSFER IN CLOSE BINARIES; EVIDENCE OF DUPLICITY OF OB RUNAWAYS
HM334	H MAUDER/TUBINGEN	MASS EXHANGE IN CONTACT BINARIES
HZ335	H ZELK/HEIDELBERG	LOW-DISPERSION OBSERVATIONS OF ABSOLUTELY VERY BRIGHT SUPERGIANTS OF INTERMEDIATE SPECTRAL CLASS (F,G)
RF336	R FARAGGIANA/TRIESTE	AP AND AM STARS

JK337	J KRAUTTER/HEIDELBERG	SPECTROSCOPIC UV OBSERVATIONS OF CATACLYSMIC VARIABLES AT MINIMUM STAGE
MG338	M GERBALDI/PARIS	ULTRAVIOLET OBSERVATIONS OF BP, AP STARS AT HIGH GALACTIC LATITUDE
MG339	M GERBALDI/PARIS	ULTRAVIOLET OBSERVATIONS OF BLUE STRAGGLERS STARS IN OPEN CLUSTERS
MG340	M GREWING/TUBINGEN	INTERSTELLAR ABSORPTION AND EMISSION LINES FROM ATOMS AND MOLECULES
MG341	M GREWING/TUBINGEN	SEARCH FOR LYMAN-ALPHA RESONANCE-LINE SCATTERING IN THE NEARBY LATE-TYPE STARS
CJ342	C DE JAGER/UTRECHT	OBSERVATION OF THE DYNAMICAL STATE OF THE OUTER ATMOSPHERES OF BETA CEPHEI STARS
ET343	EG TANZI/MILANO	OBSERVATIONS OF X-RAY EMITTING CATACLYSMIC VARIABLES
LM344	L MARASCHI/MILANO	OBSERVATION OF X-RAY EMITTING QSOS AND BL LAC OBJECTS
MP345	M PERINOTTO/FLORENCE	ULTRAVIOLET OBSERVATION OF CANDIDATE CARBON-RICH PLANETARY NEBULAE
GV346	G VAUCLAIR/MEUDON	CHEMICAL COMPOSITION AND DIFFUSION IN HOT HIGH-GRAVITY STARS
PC347	P CRANE/ESO	ENERGY DISTRIBUTION IN THE ULTRAVIOLET OF NORMAL GIANT ELLIPTICAL GALAXIES
MP348	M PERINOTTO/FLORENCE	IUE OBSERVATIONS OF PLANETARY NEBULAE PREDICTED TO HAVE THE HIGHEST CARBON ABUNDANCES
AH349	A HECK/VILSPA	SPECTRAL CLASSIFICATION IN THE ULTRAVIOLET/ AP STAR CLASSIFICATION CRITERIA
WE350	W EICHENDORF/BOCHUM	CLASSICAL CEPHEIDS
AH351	A HECK	ULTRAVIOLET OBSERVATIONS OF COOL WOLF-RAYET STARS
AH352	A HECK/VILSPA	ULTRAVIOLET OBSERVATIONS OF THE YOUNG EVOLVING PLANETARY NEBULA HD 138403
MN353	H NUSSBAUMER/ZURICH	PROTO PLANETARY NEBULAE
GG354	G GAIDA/HEIDELBERG	ULTRAVIOLET CONTINUUM STUDY OF BL LACERTAE OBJECTS
MR355	M ROSA/HEIDELBERG	UV SPECTRA OF GIANT EXTRAGALACTIC HII REGIONS
JF356	JV FEITZINGER/BOCHUM	OBSERVATIONS OF THE CENTRAL PART OF THE 30 DORADUS NEBULA
CS357	C SOLLAZZO/NAPOLI	STUDY OF CHROMOSPHERES IN CEPHEID VARIABLES
JB358	J BERGERON/ESO	UV-OPTICAL SPECTROPHOTOMETRY OF INTERMEDIATE REDSHIFT QUASARS
JB359	J BERGERON/ESO	SPECTROPHOTOMETRY OF NARROW-LINE ACTIVE NUCLEI WITH X-RAY EMISSION AND HIGH-EXCITATION LINES
DK360	D KUNTH/ESO	ULTRAVIOLET OBSERVATIONS OF LOW-REDSHIFT RADIO QUIET QSOS
PT361	PS THE/AMSTERDAM	UV SPECTRA OF THE PRE-MAIN SEQUENCE SHELL STAR HR 5999
JK362	J KOPPEN/HEILDELBERG	HIGH-DISPERSION OBSERVATIONS OF PLANETARY NEBULAE
JD363	JM DEHARVENG/MARSEILLE	UV OBSERVATIONS OF EXCITING STAR CLUSTERS OF EXTRAGALACTIC HII REGIONS
FP364	F PRADERIE/MEUDON	EMISSION, MASS LOSS AND CHROMOSPHERES IN HERBIG AE STARS
GG365	G GAHM/STOCKHOLM	EXPLORATION OF THE ULTRAVIOLET SPECTRUM OF T TAURI STARS
JB366	J BONNET-BIAUD/GIF-YVETTE	ULTRAVIOLET OBSERVATIONS OF X-RAY SOURCES IN THE MAGELLANIC CLOUDS WITH IUE
KF367	K FREDGA/STOCKHOLM	STELLAR MG II LINES
MC368	M CAPACCIOLI/PADOVA	CONTINUUM ENERGY DISTRIBUTION IN THE DISK OF NGC 4762
CL369	C LAURENT/VERRIERES-BUISSON	THE EXTENT OF A GASEOUS GALACTIC HALO
DR370	D REIMERS/KIEL	MASS-LOSS OF K AND G SUPERGIANTS/RED GIANTS WITH VARIABLE CIRCUMSTELLAR LINES/MASS LOSS

		OF RED GIANTS WITH HOT COMPANIONS
LP371	L PREVOT/MARSEILLE	A FAR UV STUDY OF INTERSTELLAR MATTER IN THE SMALL MAGELLANIC CLOUD
JP372	J PAUL/SACLAY	ELEMENTAL DEPLETION IN THE CORE AND THE FRINGE OF THE RHO OPHIUCHI CLOUD COMPLEX
MU373	MH ULRICH/ESO	MONITORING OF THE CONTINUUM AND LINE STRENGTHS OF SEYFERT GALAXY NGC 4151
SP374	SR POTTASCH/GRONINGEN	THE NEBULAR CONTINUUM FROM PLANETARY NEBULAE
VD375	V DOAZAN/PARIS	VARIABLE MASS LOSS IN BE STARS
CB376	C BARBIERI/PADOVA	BLUE DWARF GALAXIES
KH377	K HUNGER/KIEL	ULTRAVIOLET SPECTROSCOPY OF EXTREME HELIUM STARS
BW378	B WESTERLUND/UPPSALA	DUST AND GAS CONTENT OF THE REGION OF THE PUPPIS OB 3 ASSOCIATION
MR379	M RODONO/CATANIA	SOLAR-TYPE STELLAR ACTIVITY IN BY DRA FLARE
SC380	S CATALANO/CATANIA	SELECTED RS CVN BINARIES
MR381	M RODONO/CATANIA	COLLABORATIVE MONITORING OF BY DRA-TYPE FLARE STAR
SP382	SR POTTASCH/GRONINGEN	HIGH-RESOLUTION OBSERVATIONS OF PLANETARY NEBULAE
RK383	RP KUDRITZKI/FIEL	NON-LTE ANALYSIS OF NITROGEN-RICH MAIN-SEQUENCE O STARS
MT384	M TARENGHI/ESO	UV OBSERVATIONS OF DOUBLE ACTIVE GALAXIES
RK385	RP KUDRITZKI/KIEL	NON-LTE ANALYSIS OF SUBDWARF O STARS
VW386	V WEIDEMANN/KIEL	ULTRAVIOLET SPECTROSCOPY OF WHITE DWARFS
JD387	J DARIUS/VILSPA	MASS LOSS IN HOT SUBDWARFS
DG388	DP GILRA/GRONINGEN	UV OBSERVATIONS OF HII REGIONS AND REFLECTION NEBULAE
DG389	DP GILRA/GRONINGEN	UV OBSERVATIONS OF THE HOT COMPANIONS OF LATE-TYPE STARS
SP390	SR POTTASCH/GRONINGEN	THE PECULIAR SLOW NOVA HD 87643
SP391	SR POTTASCH/GRONINGEN	INTERSTELLAR LINE MEASUREMENTS OF HIGH-VELOCITY CLOUDS
CC392	C CASSINI/MILANO	OBSERVATIONS OF INTERACTING GALAXIES
SD393	S D'ODORICO/PADOVA	ACTIVE NUCLEI OF SPIRAL GALAXIES
PB394	P BENVENUTI/VILSPA	MASS LOSS FROM O STARS IN THE MAGELLANIC CLOUDS
JC395	J CLAVEL/VILSPA	A SEARCH FOR CO ABSORPTION LINES IN THE SPECTRA OF PLANETARY NEBULAE WITH THE IUE
JC396	J CLAVEL/VILSPA	IUE OBSERVATIONS OF SEYFERT GALAXIES AND LOW REDSHIFT QUASARS
MP397	MV PENSTON/VILSPA	OBSERVATION OF SEYFERT TYPE 2 GALAXIES
MP398	MV PENSTON/VILSPA	LONG-EXPOSURE OBSERVATIONS OF EXTRAGALATIC
MP398	MV PENSTON/VILSPA	LONG-EXPOSURE OBSERVATIONS OF EXTRAGALACTIC OBJECTS WITH IUE
MK399	M KLUTZ/LIEGE	SPECTROSCOPY OF THE BE STAR GG CARINAE
AT400	A TREVES/MILANO	OBSERVATION OF THE X-RAY SOURCE CYG X-2
CB401	C BLANCO/CATANIA	STELLAR CHROMOSPHERES
FS402	F SPITE/MEUDON	CHECK OF MODELS OF POPULATION II STARS
JR403	J RAHE/BAMBERG	STUDY OF MASS FLOW IN CLOSE BINARY SYSTEMS
PR404	PK RASMUSSEN/COPENHAGEN	ULTRAVIOLET SPECTROSCOPY OF LATE-TYPE STARS COVERING A WIDE RANGE IN THE THREE BASIC ATMOSPHERIC PARAMETERS
HN405	H NORGAARD-NIELSEN/COPENHAGEN	UV SPECTRA OF NORMAL ELLIPTICAL GALAXIES AND GLOBULAR CLUSTERS
HR406	H RITTER/GARCHING	ULTRAVIOLET SPECTROSCOPY OF HZ HERCULIS DURING X-RAY ECLIPSE
SD407	S D'ODORICO/PADOVA	ULTRAVIOLET OBSERVATIONS OF SHOCK-IONIZED GAS
PR408	P RAFANELLI/PADOVA	IUE OBSERVATIONS OF U GEM STARS
FQ409	F QUECI/MEUDON	CARBON STARS SEQUENCE: R TO N STARS
AA410	A ALTAMORE/ROMA	PROPOSAL FOR IUE OBSERVATIONS OF SYMBIOTIC STARS DURING MINIMUM
VC411	V CALOI/FRASCATI	INTEGRATED SPECTRA OF GLOBULAR CLUSTERS
MF412	M FRIEDJUNG/PARIS	SYMBIOTIC AND RELATED OBJECTS DURING

ACTIVITY PHASES

RV413	R VIOTTI/FRASCATI	IUE OBSERVATION OF THE ETA CARIANE REGION
AC414	A CASSATELLA/VILSPA	UV IBSERVATIONS OF R CRB STARS
AC414	A CASSATELLA/VILSPA	UV OBSERVATIONS OF R CRB STARS
MF415	M FRIEDJUNG/PARIS	ULTRAVIOLET STUDIES OF PECULIAR EMISSION-LINE SUPERGIANT STARS OF THE MAGELLANIC CLOUDS
HK416	HU KELLER/LINDAU	ULTRAVIOLET OBSERVATION OF COMETS
JD417	J DARIUS/VILSPA	ULTRAVIOLET OBJECTS OF ANOMALOUSLY LATE SPECTRAL TYPE
FB418	F BERTOLA/PADOVA	UV CONTINUUM ENERGY DISTRIBUTION IN THE NUCLEAR REGION OF DWARF ELLIPTICAL GALAXIES
HS419	H. SCHEICHER/GOTTIGEN	INTERMEDIATE EMISSION LINE GALAXIES
DG420	DF GILRA/GRONINGEN	HII REGIONS IN THE MAGELLANIC CLOUDS
FB421	F BERTOLA/PADOVA	UV CONTINUUM ENERGY DISTRIBUTION IN THE NUCLEI OF GIANT ELLIPTICAL GALAXIES
KH422	KA VAN DER HUCHT/UTRECHT	VARIABILITY IN WOLF-RAYET STARS

CLASSIFICATION OF OBJECTS USED IN THE JOINT ESA/SRC LOG OF IUE OBSERVATIONS

00	SUN
01	EARTH
02	MOON
03	PLANET
04	PLANETARY SATELLITE
05	MINOR PLANET
06	COMET
07	INTERPLANETARY MEDIUM
08	
09	
10	W C
11	W N
12	MAIN SEQUENCE O
13	SUPERGIANT O
14	OE
15	OF
16	SD O
17	WD O
18	
19	UV-STRONG
20	B0-B2 V-IV
21	B3-B5 V-IV
22	B6-B9.5 V-IV
23	B0-B2 III-I
24	B3-B5 III-I
25	B6-B9.5 III-I
26	BE
27	BP
28	SDB
29	WDB
30	A0-A3 V-IV
31	A4-A9 V-IV
32	A0-A3 III-I
33	A4-A9 III-I
34	AE
35	AM
36	AP
37	WDA
38	
39	COMPOSITE
40	F0-F2
41	F3-F9
42	FP
43	LATE TYPE DEGENERATE STARS
44	G (TO 1FEB79); GIV-VI (FROM 1FEB79)
45	G I-II (FROM 1FEB79)
46	K (TO 1FEB79); K IV-VI (FROM 1FEB79)
47	K I-III (FROM 1FEB79)
48	M (TO 1FEB79); M DWARFS (FM 1FEB79)
49	M I-III (FROM 1FEB79)
50	R,N OR S TYPES
51	LONG PERIOD VARIABLE STARS
52	IRREGULAR VARIABLES
53	REGULAR VARIABLES
54	DWARF NOVAE
55	CLASSICAL NOVAE
56	SUPERNOVAE
57	SYMBIOTIC STARS
58	T TAURI
59	X-RAY
60	SHELL STAR
61	ETA CARINAE
62	PULSAR
63	NOVA-LIKE
64	STELLAR OBJECT NOT INCLUDED ABOVE
65	
66	
67	
68	
69	
70	PLANETARY NEBULA + CENTRAL STAR
71	PLANETARY NEBULA - CENTRAL STAR
72	H II REGION
73	REFLECTION NEBULA
74	DARK CLOUD (ABSORTION SPECTRUM)
75	SUPERNOVA REMNANT
76	RING NEBULA (SHOCK IONISED)
77	
78	
79	
80	SPIRAL GALAXY
81	ELLIPTICAL GALAXY
82	IRREGULAR GALAXY
83	GLOBULAR CLUSTER
84	SEYFERT GALAXY
85	QUASAR
86	RADIO GALAXY
87	BL LACERTAE OBJECT
88	EMISSION LINE GALAXY (NON-SEYFERT)
89	
90	INTERGALACTIC MEDIUM
91	
92	
93	
94	
95	
96	
97	
98	WAVELENGTH CALIBRATION (NASA LOG)
99	NULLS AND FLAT FIELDS (NASA LOG)

THE CLASSIFICATION IS SUPPLIED BY D STICKLAND FOR USE ONLY WITHIN THE PROJECT

EXPOSURE CLASSIFICATION CODES
****

SINCE 1 AUG 78 A TWO-DIGIT CODE HAS BEEN USED TO DESCRIBE EXPOSURE LEVELS. THIS CODE OCCUPIES THE FIRST TWO CHARACTER POSITIONS OF THE COMMENT FIELD.

DIGIT 1: EXPOSURE LEVEL OF CONTINUUM
DIGIT 2: EXPOSURE LEVEL OF EMISSION LINES

THE CLASSIFICATIONS BELOW APPLY TO BOTH:

0: NOT APPLICABLE
1: NO SPECTRUM VISIBLE
2: FAINT SPECTRUM: MAX DN ≤ 20 ABOVE BACKGROUND
3: UNDEREXPOSED: MAX DN < 100 ABOVE BACKGROUND
4: WEAK: MAX DN BETWEEN 100 AND 150 ABOVE BACKGROUND
5: GOOD: NO SATURATION BUT MAX DN OVER 150 ABOVE BACKGROUND
6: A BIT STRONG: A FEW PIXELS SATURATED
7: SATURATED FOR LESS THAN HALF THE SPECTRUM
8: MOSTLY SATURATED BUT SOME PARTS USABLE
9: COMPLETELY SATURATED

ON 1 SEP 79 A FURTHER DIGIT WAS ADDED TO DESCRIBE THE LEVEL OF THE BACKGROUND. THE MEAN DN GIVEN BY A SUBSET HISTOGRAM OF WIDTH 2 PIXELS BETWEEN:

SWP 550,130 AND 685,310
AND LWR 160,195 AND 90,300

HAS BEEN CODED AS FOLLOWS: (LIMITS INCLUSIVE)

0 DN≤20
1 21<DN≤30
2 31<DN≤40
3 41<DN≤50
4 50<DN≤60
5 60<DN70
6 71<DN<80
7 80<DN<90
8 91<DN≤100
9 DN≥101
X SATURATED

OBJECT	CL	MAG	RT ASCN HR MN SC	DECLN DEG MN	DISP +CAM	IMAGE	APERT OB	LG	DATE	START HR MN SC	LENGTH MIN SC	PROG	COMMENT
M 225094	24	6.2	00 00 51	+63 22	H 2	8160	L	0	01JUL80	00 06 00	020 00	UK350	502 MICPH
M 225094	24	6.2	00 00 51	+63 22	H 3	9415	L	0	01JUL80	00 32 10	075 00	UK350	502 SAT AT 1900 A
BACK GRD	84	13.2	01 21 51	-59 04	L 2	8381	L	0	27JUL80	21 16 15	880 00	UK365	008 VILSPA/GSFC EXPO
ESO 113	84	13.2	01 21 51	-59 04	H 3	9615	L	0	27JUL80	20 57 45	880 00	UK365	509 VILSPA/GSFC EXPO
IC 133	72	15.0	01 30 26	+30 37	L 2	8497	L	0	13AUG80	21 18 02	105 00	SD407	331
IC 133	72	15.0	01 30 26	+30 37	L 3	9779	L	0	13AUG80	18 39 49	150 00	SD407	201
IC 133	72	15.0	01 30 26	+30 37	L 3	9780	L	0	13AUG80	23 10 25	157 00	SD407	331
M 13268	12	8.8	02 08 03	+55 55	L 2	8634	S	0	27AUG80	22 45 08	001 10	UK323	501
M 13268	12	8.8	02 08 03	+55 55	L 2	8634	L	0	27AUG80	22 41 50	002 54	UK323	401
M 13268	12	8.8	02 08 03	+55 55	L 3	9923	L	0	27AUG80	22 49 44	001 15	UK323	501
WX HYI	54	14.5	02 08 28	-63 33	L 2	8445	L	0	05AUG80	18 46 54	060 00	UK313	231
WX HYI	54	14.5	02 08 28	-63 33	L 3	9704	L	0	05AUG80	19 54 56	080 00	UK313	231
M 14143	23	6.6	02 15 42	+56 56	H 3	9435	L	0	03JUL80	01 36 40	130 00	UK350	401
M 14250	20	8.8	02 16 44	+56 52	L 2	8635	L	0	27AUG80	23 32 35	020 00	UK323	701
M 14250	20	8.8	02 16 44	+56 52	L 2	8635	S	0	27AUG80	23 25 03	005 10	UK323	401
M 14250	20	8.8	02 16 44	+56 52	L 3	9924	L	0	27AUG80	23 59 12	007 00	UK323	501
MIRACETI	51	3.5	02 16 49	-03 12	H 2	8235	L	0	12JUL80	01 32 30	135 00	VILSP	255
M 14386	49	3.5	02 16 49	-03 12	L 2	8540	L	0	17AUG80	00 00 58	012 00	VILSP	463
M 14386	49	3.5	02 16 49	-03 12	L 2	8540	S	0	17AUG80	23 47 42	010 00	VILSP	353
M 14386	49	3.5	02 16 49	-03 12	L 3	9827	L	0	17AUG80	22 23 51	080 00	VILSP	461
M 14386	49	3.5	02 16 49	-03 12	H 3	9953	L	0	29AUG80	21 06 39	280 00	UK372	123
M 14633	12	7.5	02 19 46	+41 15	L 2	8633	S	0	27AUG80	21 38 54	000 13	UK323	501
M 14633	12	7.5	02 19 46	+41 15	L 2	8633	L	0	27AUG80	21 30 54	000 15	UK323	601
M 14633	12	7.5	02 19 46	+41 15	L 3	9922	L	0	27AUG80	21 40 00	000 08	UK323	501
M 14818	23	6.2	02 21 43	+56 23	H 2	8161	L	0	01JUL80	02 02 00	017 00	UK350	502 MICPH
M 14818	23	6.2	02 21 43	+56 23	H 3	9416	L	0	01JUL80	02 28 19	075 00	UK350	602
BD+59562	20	9.7	02 49 05	+60 15	L 2	8636	L	0	27AUG80	00 50 06	028 00	UK323	701
BD+59562	20	9.7	02 49 05	+60 15	L 2	8636	S	0	27AUG80	00 35 00	013 00	UK323	501
BD+59562	20	9.7	02 49 05	+60 15	L 3	9925	L	0	27AUG80	01 21 26	025 00	UK323	501
BD+60594	12	9.3	02 53 06	+61 13	L 2	8632	S	0	27AUG80	20 09 06	006 00	UK323	701
BD+60594	12	9.3	02 53 06	+61 13	L 2	8632	L	0	27AUG80	19 32 01	028 00	UK323	401
BD+60594	12	9.3	02 53 06	+61 13	L 3	9921	L	0	27AUG80	20 18 21	010 00	UK323	501
BD+60608	20	6.8	02 55 49	+61 05	L 2	8631	S	0	27AUG80	18 51 53	000 30	UK323	301
BD+60608	20	6.8	02 55 49	+61 05	L 2	8631	L	0	27AUG80	18 44 24	001 30	UK323	701
BD+60608	20	6.8	02 55 49	+61 05	L 3	9920	L	0	27AUG80	18 55 07	000 35	UK323	500
0311-227	59	14.2	03 12 00	-22 47	L 2	8337	L	0	24JUL80	23 40 57	030 00	UK308	201
0311-227	59	14.2	03 12 00	-22 47	L 2	8338	L	0	24JUL80	01 31 54	050 00	UK308	221
0311-227	59	14.2	03 12 00	-22 47	L 3	9592	L	0	24JUL80	00 42 16	040 00	UK308	232
0311-227	59	14.2	03 12 00	-22 47	L 3	9593	L	0	24JUL80	02 44 01	040 00	UK308	232
M 20630	44	4.8	03 16 44	+03 11	L 3	9462	L	0	06JUL80	20 31 01	050 00	MR321	431
M 21291	25	4.2	03 25 01	+59 46	H 2	8581	L	0	22AUG80	22 50 30	005 00	UK339	402
M 21291	25	4.2	03 25 01	+59 46	H 3	9871	L	0	22AUG80	23 07 27	057 00	UK339	302
2 21483	24	7.0	03 25 42	+30 12	H 2	8580	L	0	22AUG80	18 34 59	040 00	UK339	502
2 21483	24	7.0	03 25 42	+30 12	H 3	9870	L	0	22AUG80	18 18 03	160 00	UK339	502
VW HYI	54	14.0	04 09 32	-71 25	L 2	8459	L	0	07AUG80	20 50 39	045 00	UK313	402
VW HYI	54	14.0	04 09 32	-71 25	L 3	9726	L	0	07AUG80	21 06 41	060 00	UK313	401
M 269485	11	14.5	05 24 38	-68 34	L 2	8621	L	0	26AUG80	18 49 22	050 00	UK331	454
M 269546	11	9.9	05 27 02	-68 52	H 2	8323	L	0	22JUL80	01 39 01	128 00	MG340	303

OBJECT	CL	MAG	RT ASCN HR MN SC	DECLN DEG MN	DISP +CAM	IMAGE	APERT OB	LG	DATE	START HR MN SC	LENGTH MIN SC	PROG	COMMENT
H 239546	11	9.9	05 27 22	-68 52	L 2	8328	L	0	23JUL80	20 53 51	003 00	MG340	551 MICPH
H 269546	11	11.0	05 27 22	-68 52	L 2	8329	S	0	23JUL80	21 57 53	006 00	MG340	401 E NUB
H 269546	11	11.0	05 27 22	-68 52	L 2	8329	L	0	23JUL80	21 45 55	006 00	MG340	201 SW NUB
H 239546	11	9.9	05 27 22	-68 52	H 3	9575	L	0	23JUL80	21 05 40	295 00	MG340	553
0526-328	59	14.0	05 27 34	-32 51	L 2	8336	L	0	24JUL80	21 46 44	030 00	UK308	301
0526-328	59	14.0	05 27 34	-32 51	L 3	9590	L	0	24JUL80	21 12 41	030 00	UK308	331
0526-328	59	14.0	05 27 34	-32 51	L 3	9591	L	0	24JUL80	22 19 17	030 00	UK308	331
FD 52	11	14.5	05 35 57	-67 04	L 2	8602	L	0	24AUG80	00 53 22	025 00	UK331	443
FD 52	11	14.5	05 35 57	-67 04	L 3	9890	L	0	24AUG80	00 20 52	030 00	UK331	461
FD 52	11	14.5	05 35 57	-67 04	L 3	9891	L	0	24AUG80	01 21 08	020 00	UK331	352
IC 432	73	14.0	05 38 24	-01 32	L 2	8514	L	0	15AUG80	18 57 53	060 00	PB324	302 H37776 AT X119Y171
H 37776	20	7.0	05 38 24	-01 32	L 2	8515	S	0	15AUG80	20 50 48	000 12	PB324	501
H 37776	20	7.0	05 38 24	-01 32	L 2	8515	L	0	15AUG80	20 47 00	000 12	PB324	601
IC 432	73	14.0	05 38 24	-01 32	L 3	9798	L	0	15AUG80	18 29 09	025 00	PB324	201 H37776 AT X318Y32
H 37776	20	7.0	05 38 24	-01 32	L 3	9799	S	0	15AUG80	20 25 36	000 08	PB324	501
H 37776	20	7.0	05 38 24	-01 32	L 3	9799	L	0	15AUG80	20 23 32	000 08	PB324	501
H 37903	20	7.8	05 39 07	-02 17	L 2	8516	S	0	15AUG80	23 27 55	001 10	PB324	503
N 2023	73	13.0	05 39 07	-02 17	L 2	8516	L	0	15AUG80	21 57 52	075 00	PB324	403
H 39709	20	7.8	05 39 07	-02 17	L 3	9800	L	0	15AUG80	23 27 55	001 10	PB324	503
N 2023	73	13.0	05 39 07	-02 17	L 3	9800	L	0	15AUG80	21 04 02	075 00	PB324	403 H37903 AT X-105Y145
H 39709	20	7.8	05 39 07	-02 17	L 3	9801	L	0	15AUG80	22 24 38	000 20	PB324	301
H 39709	20	7.8	05 39 07	-02 17	L 3	9801	L	0	15AUG80	22 22 02	000 20	PB324	401
IC 435	73	14.0	05 39 07	-02 17	L 3	9802	L	0	15AUG80	23 37 27	020 00	PB324	201 H38087 AT X94Y6
IC 435	73	14.0	05 40 29	-02 20	L 2	8517	L	0	15AUG80	00 11 00	086 00	PB324	301 H38087 AT X-105Y145
H 38087	21	8.3	05 40 29	-02 20	L 2	8517	S	0	15AUG80	00 04 30	002 30	PB324	501
H 38087	21	8.3	05 40 29	-02 20	L 3	9803	L	0	15AUG80	00 47 08	001 10	PB324	401
H 38087	21	8.3	05 40 29	-02 20	L 3	9803	L	0	15AUG80	00 44 16	001 10	PB324	501
FD 78	11	14.5	05 44 59	-67 11	L 2	8623	L	0	26AUG80	22 37 12	045 00	UK331	414
FD 78	11	14.5	05 44 59	-67 11	L 3	9910	L	0	26AUG80	22 02 00	030 00	UK331	344
FD 11	11	14.5	05 45 28	-67 07	L 2	8622	L	0	26AUG80	20 54 19	060 00	UK331	344
FD 11	11	14.5	05 45 28	-67 07	L 3	9909	L	0	26AUG80	20 26 25	023 00	UK331	340
FD 80	11	14.5	05 46 51	-67 11	L 2	8624	L	0	26AUG80	00 26 19	059 00	UK331	454
FD 80	11	14.5	05 46 51	-67 11	L 3	9911	L	0	26AUG80	23 41 59	040 00	UK331	461
FD 80	11	14.5	05 46 51	-67 11	L 3	9912	L	0	26AUG80	01 22 29	025 00	UK331	350
IC 2159	70	10.5	05 52 41	+46 06	H 3	9764	L	0	10AUG80	23 21 33	146 00	VILSP	342
H 44863	53	9.5	06 19 59	-54 31	L 2	8322	L	0	22JUL80	00 33 23	008 00	HH334	201
H 44863	53	10.7	06 19 59	-54 31	L 2	8330	L	0	23JUL80	02 46 00	022 00	HH334	301
H 44863	53	9.5	06 19 59	-54 31	L 3	9570	L	0	22JUL80	00 51 42	018 00	HH334	201
H 44863	53	10.7	06 19 59	-54 31	L 3	9576	L	0	23JUL80	03 11 17	036 00	HH334	301 NO SPECT BELOW 1600A
SV CAM	44	9.8	06 30 38	+82 19	L 2	8282	L	0	17JUL80	03 08 38	040 00	UK316	654
S0716+71	17	15.0	07 16 13	+71 26	L 3	9440	L	0	04JUL80	20 59 39	240 00	HS302	202
H 62910	11	10.0	07 43 02	-31 48	H 2	8601	L	0	24AUG80	18 25 12	320 00	UK331	308
B +75325	16	9.5	08 04 43	+75 07	L 1	1232	S	0	20JUL80	02 21 52	001 00	PHCAL	402
B +75325	16	9.5	08 04 43	+75 07	L 1	1232	L	0	20JUL80	02 15 23	000 20	PHCAL	502
B +75325	16	9.5	08 04 43	+75 06	L 1	1254	L	0	19AUG80	00 03 58	000 20	PHCAL	503
B +75325	16	9.5	08 04 43	+75 06	L 1	1254	S	0	19AUG80	00 01 01	000 40	PHCAL	503
B +75325	16	9.5	08 04 43	+75 07	L 2	8304	S	0	20JUL80	23 42 11	001 12	PHCAL	501
B +75325	16	9.5	08 04 43	+75 07	L 2	8304	L	0	20JUL80	23 37 08	000 24	PHCAL	501

OBJECT	CL	MAG	RT ASCN HR MN SC	DECLN DEG MN	DISP +CAM	IMAGE	APERT OB	APERT LG	DATE	START HR MN SC	LENGTH MIN SC	PROG	COMMENT
B +75325	16	9.5	08 04 43	+75 07	H 2	8305	L	0	20JUL80	00 33 07	038 00	PHCAL	503
B +75325	16	9.5	08 04 43	+75 06	L 2	8558	L	0	19AUG80	00 44 51	000 24	PHCAL	502
B +75325	16	9.5	08 04 43	+75 06	L 2	8558	S	0	19AUG80	00 41 53	000 48	PHCAL	502
B +75325	16	9.5	08 04 43	+75 07	L 3	9550	S	0	20JUL80	23 10 59	000 42	PHCAL	500
B +75325	16	9.5	08 04 43	+75 07	L 3	9550	L	0	20JUL80	23 03 58	000 14	PHCAL	400
B +75325	16	9.5	08 04 43	+75 07	H 3	9551	L	0	20JUL80	23 53 58	022 00	PHCAL	401
B +75325	16	9.5	08 04 43	+75 07	H 3	9552	L	0	20JUL80	01 21 03	014 00	PHCAL	301
B +75325	16	9.5	08 04 43	+75 07	H 3	9553	L	0	20JUL80	02 33 57	007 00	PHCAL	300
B +75325	16	9.5	08 04 43	+75 06	L 3	9842	L	0	19AUG80	00 38 46	000 14	PHCAL	500
B +75325	16	9.5	08 04 43	+75 06	L 3	9842	S	0	19AUG80	00 36 22	000 28	PHCAL	500
B +75325	16	9.5	08 04 43	+75 06	H 3	9843	L	0	19AUG80	01 09 27	030 00	PHCAL	501
M 68860	45	8.0	08 11 09	-34 25	L 2	8329	L	0	22JUL80	21 07 44	010 00	CS357	201
M 68860	45	8.0	08 11 09	-34 25	L 2	8483	L	0	10AUG80	21 06 53	055 00	CS357	403
M 71019	21	8.3	08 21 42	-42 39	H 2	8172	L	0	03JUL80	23 25 16	036 00	UK350	503 MICPH
M 71019	21	8.3	08 21 42	-42 39	H 3	9434	L	0	03JUL80	22 20 22	060 00	UK350	501
M 71336	21	08.0	08 23 24	-43 12	H 2	8171	L	0	03JUL80	21 37 30	028 00	UK350	503
M 71336	21	08.0	08 23 24	-43 12	H 3	9433	L	0	03JUL80	20 48 38	045 00	UK350	501
M 90651	14	9.8	10 24 42	-58 08	L 2	8384	L	0	29JUL80	20 11 42	008 00	UK328	662
JUPITER	03	0.0	10 36 49	+09 54	H 3	9483	S	C	09JUL80	20 40 51	800 00	MC320	XX9 ESA/NASA EXPO SAT
M 93521	12	6.9	10 45 34	+37 50	L 2	8165	L	0	02JUL80	00 48 39	000 03	PHCAL	401
M 93521	12	6.9	10 45 34	+37 50	H 2	8166	L	0	02JUL80	01 40 3?	005 00	PHCAL	502 MICPH
M 93521	12	6.9	10 45 34	+37 50	L 3	9425	L	0	02JUL80	00 45 19	000 03	PHCAL	401
M 93521	12	6.9	10 45 34	+37 50	H 3	9426	L	0	02JUL80	01 12 09	005 00	PHCAL	501
M 3471	81	15.0	10 56 02	+61 48	L 3	9828	L	0	17AUG80	01 05 04	042 00	VILSP	111
LH332-21	85	10.9	11 10 51	-76 28	H 2	8233	L	0	12JUL80	20 24 01	180 00	VILSP	236
N 3783	84	13.0	11 36 30	-37 28	L 2	8417	L	0	02AUG80	20 57 36	060 00	UK328	342
N 3783	84	13.0	11 36 30	-37 28	L 3	9678	L	0	02AUG80	22 02 19	100 00	UK328	351
M 101947	45	5.0	11 41 07	-62 13	H 2	8164	L	0	02JUL80	02 56 12	060 00	WE350	703 MICPH
M 101947	45	5.0	11 41 07	-62 13	H 2	8538	L	0	17AUG80	18 39 14	060 00	WE350	704
M 101947	45	5.0	11 41 07	-62 13	H 3	9422	L	0	02JUL80	20 44 49	008 00	WE350	301
M 101947	45	5.0	11 41 07	-62 13	L 3	9423	S	0	02JUL80	22 23 10	001 00	WE350	504
M 101947	45	5.0	11 41 07	-62 13	L 3	9423	L	0	02JUL80	22 19 29	001 00	WE350	504
M 101947	45	5.0	11 41 07	-62 13	L 3	9825	S	0	17AUG80	18 35 35	001 00	WE350	401
M 101947	45	5.0	11 41 07	-62 13	L 3	9825	L	0	17AUG80	18 32 08	001 00	WE350	601
C 721184	23	10.7	11 56 29	-73 09	L 2	8200	S	0	07JUL80	00 37 35	010 00	UK352	402
C 721184	23	10.7	11 56 29	-73 09	L 2	8200	L	0	07JUL80	00 23 02	007 00	UK352	702
C 721184	23	10.7	11 56 29	-73 09	L 3	9469	S	0	07JUL80	23 53 13	003 30	UK352	301
C 721184	23	10.7	11 56 29	-73 09	L 3	9469	L	0	07JUL80	23 47 42	002 20	UK352	501
N 4151	84	11.5	12 08 00	+39 41	H 2	8383	L	0	28JUL80	20 51 41	447 00	UK465	130
BACK GRD	84	11.5	12 08 00	+39 41	L 3	9625	L	0	28JUL80	20 53 02	447 00	UK465	000 SIMULT WITH 28383
1214-28	88	15.0	12 14 41	-27 45	L 3	9774	L	0	12AUG80	19 30 35	360 00	UK302	153
MKN 213	80	13.5	12 29 02	+58 14	L 3	9559	L	0	21JUL80	21 24 15	030 00	UK371	111
MKN 213	80	13.5	12 29 02	+58 14	L 3	9560	L	0	21JUL80	22 44 31	300 00	UK371	333
M 110311	45	6.3	12 33 00	-63 08	L 2	8321	L	0	22JUL80	23 32 06	015 00	CS357	501
M 110311	45	6.3	12 33 00	-63 08	L 3	9569	L	0	22JUL80	21 47 31	095 00	CS357	202
M 110311	45	6.3	12 39 00	-69 08	L 2	8482	S	0	10AUG80	19 07 24	016 00	CS357	603
M 110311	45	6.3	12 39 00	-69 08	L 2	8482	L	0	10AUG80	18 31 25	030 00	CS357	703
M 113111	45	6.3	12 39 00	-69 08	L 2	8539	S	0	17AUG80	21 38 08	012 00	WE350	703

OBJECT	CL	MAG	RT ASCN HR MN SC	DECLN DEG MN	DISP +CAM	IMAGE	APERT OB LG	DATE	START HR MN SC	LENGTH MIN SC	PROG	COMMENT
M 113111	45	6.3	12 39 00	-69 08	L 2	8539	L 0	17AUG80	20 57 36	030 00	WE350	703
M 110311	45	5.0	12 39 00	-69 08	L 3	9424	L 0	02JUL80	22 58 37	060 00	WE350	501
M 110311	45	6.3	12 39 00	-69 08	L 3	9763	L 0	10AUG80	19 29 05	060 00	CS357	301
M 113111	45	6.3	12 39 00	-69 08	L 3	9826	L 0	17AUG80	19 53 48	060 00	WE350	301
MKN 231	84	14.0	12 54 05	+57 08	L 3	9602	L 0	25JUL80	20 52 46	880 00	UK365	509 VILSPA/GSFC EXPO
MKN 54	88	15.0	12 54 32	+32 43	L 3	9793	L 0	14AUG80	20 58 49	180 00	UK374	303
M 114710	44	4.3	13 09 32	+28 08	L 3	9465	L 0	06JUL80	02 43 38	063 00	MR321	501
M 11777	44	9.4	13 29 44	+28 50	L 2	8278	L 0	17JUL80	22 17 40	034 00	UK316	703
M 120315	21	1.8	13 45 34	+49 34	H 1	1231	L 0	20JUL80	21 35 58	000 05	PHCAL	402
M 120315	21	1.8	13 45 34	+49 34	H 2	8303	L 0	20JUL80	20 35 05	000 06	PHCAL	502 MICPH
M 120315	21	1.8	13 45 34	+49 34	H 3	9545	L 0	20JUL80	22 08 14	000 06	PHCAL	401
IC 4329	84	14.4	13 46 28	-30 04	L 2	8380	L 0	26JUL80	21 55 48	880 00	UK365	509 VILSPA/GSFC EXPO
LY ALPHA	84	14.4	13 46 28	-30 04	L 3	9606	L 0	26JUL80	21 55 48	030 00	UK365	132 SIMLT 28380
LY ALPHA	84	14.4	13 46 28	-30 04	H 3	9607	L 0	26JUL80	22 56 05	210 00	UK365	132 SIMLT 28380
M 121909	44	9.6	13 55 50	-01 25	L 2	8277	L 0	17JUL80	20 47 18	038 00	UK316	500 HEADER LWR 8273
M 124850	41	4.1	14 13 23	-05 46	H 2	8196	L 0	06JUL80	02 01 35	010 00	MR321	622 X20 SAT MICPH
M 124850	41	4.1	14 13 23	-05 46	L 3	9464	L 0	06JUL80	00 55 07	060 00	MR321	721 SAT OVER 1746 A
N 5548	84	13.0	14 15 44	+25 22	L 3	9679	L 0	02AUG80	00 38 45	068 00	UK328	341
OQ 530	87	15.0	14 18 06	+54 37	L 3	9441	L 0	04JUL80	01 49 10	118 00	HS302	001
M 125924	20	10.0	14 20 04	-08 01	L 2	8199	L 0	07JUL80	20 43 46	001 15	UK352	602 SAT
M 125924	20	9.7	14 20 04	-08 01	H 2	8522	L 0	16AUG80	19 55 42	075 00	UK374	504
M 125924	20	10.0	14 20 04	-08 01	L 3	9466	L 0	07JUL80	20 38 44	001 45	UK352	601 SAT
M 125924	20	10.0	14 20 04	-08 01	L 3	9467	L 0	07JUL80	21 14 48	001 22	UK352	501
M 125924	20	10.0	14 20 04	-08 01	H 3	9468	L 0	07JUL80	21 41 47	082 00	UK352	501
M 125924	20	9.7	14 20 04	-08 01	H 3	9814	L 0	16AUG80	18 42 11	070 00	UK374	501
EK TRA	54	12.1	15 09 46	-64 54	L 2	8446	L 0	05AUG80	22 02 06	015 00	UK313	501
EK TRA	54	12.2	15 09 46	-64 54	L 2	8458	L 0	07AUG80	18 44 08	015 00	UK313	502
EK TRA	54	12.2	15 09 46	-64 54	L 2	8461	L 0	07AUG80	00 56 03	015 00	UK313	502
EK TRA	54	15.0	15 09 46	-64 54	L 2	8488	L 0	11AUG80	19 32 50	120 00	UK313	404
EK TRA	54	12.1	15 09 46	-64 54	L 3	9705	L 0	05AUG80	22 20 41	019 00	UK313	541
EK TRA	54	12.2	15 09 46	-64 54	L 3	9725	L 0	07AUG80	19 04 49	021 00	UK313	501
EK TRA	54	12.2	15 09 46	-64 54	L 3	9728	L 0	07AUG80	01 29 50	017 00	UK313	401
EK TRA	54	15.0	15 09 46	-64 54	L 3	9768	L 0	11AUG80	21 46 16	120 00	UK313	303
M 135345	45	5.2	15 12 46	-41 18	H 2	8394	L 0	30JUL80	21 13 20	026 00	DR370	603
M 135345	45	5.2	15 12 46	-41 18	H 3	9647	L 0	30JUL80	20 33 16	031 00	DR370	501
URANUS	03	5.8	15 15 40	-17 49	L 3	9478	S C	08JUL80	21 27 27	420 00	MC320	409 ESA/NASA EXPO
C-751179	20	9.5	15 28 53	-75 30	H 3	9501	L 0	11JUL80	01 08 18	150 00	UK361	542
8+332642	20	10.8	15 50 02	+33 05	L 3	9428	L 0	02JUL80	03 20 38	000 26	PHCAL	201
M 142373	41	4.6	15 50 56	+42 35	H 2	8195	L 0	06JUL80	23 49 01	030 00	MR321	722 MICPH
M 142373	41	4.6	15 50 56	+42 35	L 3	9436	L 0	06JUL80	22 24 56	080 00	MR321	701 SAT OVER 1840 A
M 144668	31	6.6	16 05 13	-38 58	L 3	9973	L 0	31AUG80	18 29 32	012 00	PT361	731
M 144668	31	6.6	16 05 13	-38 58	H 3	9974	L 0	31AUG80	19 12 27	355 00	PT361	673
SCO X-1	59	9.8	16 17 04	-15 31	L 2	8385	L 0	29JUL80	21 50 00	040 00	UK328	502
SCO X-1	59	13.0	16 17 04	-15 31	L 2	8400	L 0	31JUL80	01 45 22	030 00	UK328	302
SCO X-1	59	13.0	16 17 04	-15 31	L 2	8416	L 0	02AUG80	18 34 32	040 00	UK328	401
SCO X-1	59	9.8	16 17 04	-15 31	L 3	9636	L 0	29JUL80	20 59 16	040 00	UK328	452
SCO X-1	59	13.0	16 17 04	-15 31	L 3	9658	L 0	31JUL80	02 20 45	047 00	UK328	342
SCO X-1	59	13.0	16 17 04	-15 31	L 3	9677	L 0	02AUG80	19 19 31	060 00	UK328	341

OBJECT	CL	MAG	RT ASCN HR MN SC	DECLN DEG MN	DISP +CAM	IMAGE	APERT OB LG	DATE	START HR MN SC	LENGTH MIN SC	PROG	COMMENT
M 147419	11	11.0	16 20 36	-51 25	L 2	8387	L 0	29JUL80	03 00 23	047 00	UK328	562
M 147419	11	11.0	16 20 36	-51 25	L 3	9638	L 0	29JUL80	02 12 37	045 00	UK326	232
CM-DRA	48	12.9	16 33 24	+57 15	L 2	8508	L 0	14AUG80	19 41 09	030 00	UK374	111
CM-DRA	48	12.9	16 33 24	+57 15	L 3	9792	L 0	14AUG80	18 52 52	045 00	UK374	111
M 149757	1?	2.6	16 34 24	-10 28	H 3	9637	L 0	29JUL80	22 42 56	000 23	UK328	502
C+741569	12	10.2	16 44 27	-74 27	H 2	8226	L 0	11JUL80	22 55 28	120 00	UK361	504
C+741569	12	10.2	16 44 27	-74 27	H 3	9500	L 0	11JUL80	20 26 56	145 00	UK361	562
B+133224	20	10.5	16 45 46	+13 21	L 2	8187	L 0	05JUL80	20 29 00	004 00	UK347	702
B+133224	20	10.5	16 45 46	+13 21	H 2	8188	L 0	05JUL80	21 12 52	180 00	UK347	505 MICPH
B+133224	20	10.5	16 45 46	+13 21	L 3	9444	L 0	05JUL80	20 37 03	003 00	UK347	501
B+133224	20	10.5	16 45 46	+13 21	L 3	9445	L 0	05JUL80	21 40 51	003 00	UK347	501
B+133224	20	10.5	16 45 46	+13 21	L 3	9446	L 0	05JUL80	22 13 52	003 00	UK347	501
B+133224	20	10.5	16 45 46	+13 21	L 3	9447	L 0	05JUL80	22 46 54	002 30	UK347	500
B+133224	20	10.5	16 45 46	+13 21	L 3	9448	L 0	05JUL80	23 23 32	002 30	UK347	501
B+133224	20	10.5	16 45 46	+13 21	L 3	9449	L 0	05JUL80	23 57 43	002 45	UK347	500
B+133224	20	10.5	16 45 46	+13 21	L 3	9450	L 0	05JUL80	00 39 56	003 11	UK347	501
B+133224	20	10.5	16 45 46	+13 21	L 3	9451	L 0	05JUL80	01 16 33	003 15	UK347	501
B+133224	20	10.5	16 45 46	+13 21	L 3	9452	L 0	05JUL80	01 50 11	003 00	UK347	500
B+133224	20	10.5	16 45 46	+13 21	L 3	9453	L 0	05JUL80	02 19 16	003 00	UK347	500
B+133224	20	10.5	16 45 46	+13 21	L 3	9454	L 0	05JUL80	02 59 31	003 30	UK347	501
B+133224	20	10.5	16 45 46	+13 21	L 3	9455	L 0	05JUL80	03 31 08	003 30	UK347	500
M 152751	48	9.1	16 52 48	-08 15	L 2	8509	L 0	14AUG80	00 35 39	030 00	UK374	261
M 152751	48	9.1	16 52 48	-08 15	L 3	9794	L 0	14AUG80	01 10 33	036 00	UK374	231
M 154090	23	4.3	17 01 32	-34 03	H 2	8570	L 0	20AUG80	22 02 21	003 00	UK339	502
M 154090	23	4.3	17 01 32	-34 03	H 3	9852	L 0	20AUG80	22 08 06	014 00	UK339	601
M 155806	12	5.5	17 12 02	-33 30	H 2	8568	L 0	20AUG80	20 34 17	001 15	UK339	402
M 155806	12	5.5	17 12 02	-33 30	H 2	8569	L 0	20AUG80	21 24 11	002 00	UK339	502
M 155806	12	5.5	17 12 02	-33 30	H 3	9851	L 0	20AUG80	20 38 02	003 20	UK339	501
M 157999	47	4.3	17 24 02	+04 11	H 2	8395	L 0	30JUL80	22 54 01	012 00	DR370	101
M 157999	47	4.3	17 24 02	+04 11	L 3	9648	L 0	30JUL80	22 19 36	024 00	DR370	101
M1735-44	59	17.5	17 35 19	-44 25	L 3	9534	L 0	16JUL80	21 09 04	834 00	JP303	209 ESA/NASA EXPO
M1735-44	59	17.5	17 35 19	-44 25	L 3	9542	L 0	18JUL80	21 10 05	000 00	JP303	509
M 160641	23	9.8	17 38 55	-17 53	L 2	8467	L 0	08AUG80	18 41 29	002 30	KH377	502
M 160641	23	9.8	17 38 55	-17 53	H 2	8468	L 0	08AUG80	23 56 20	111 00	KH377	403
M 160641	23	9.8	17 38 55	-17 53	L 3	9741	L C	08AUG80	19 12 35	003 01	KH377	401
M 160641	23	9.8	17 38 55	-17 53	H 3	9742	L C	08AUG80	19 49 50	200 00	KH377	503
ICH 4662	72	15.0	17 42 14	-64 37	L 3	9518	L 0	13JUL80	01 30 36	134 00	MR355	341
IC 4662	72	15.0	17 42 15	-64 37	L 2	8243	L 0	13JUL80	22 20 47	180 00	MR355	503
IC 4662	72	15.0	17 42 15	-64 37	L 3	9517	L 0	13JUL80	20 40 00	090 00	MR355	331
M 163770	47	3.8	17 54 32	+37 15	L 2	8411	L 0	01AUG80	18 34 28	006 00	DR370	771
M 163770	47	3.8	17 54 32	+37 15	H 2	8412	L 0	01AUG80	20 52 18	060 00	DR370	363
M 163770	47	3.8	17 54 32	+37 15	L 3	9665	L 0	01AUG80	18 56 27	110 00	DR370	351
M 165955	21	9.2	18 06 37	-34 52	L 2	8201	L 0	07JUL80	02 01 25	001 40	UK352	402 MICPH
M 165955	21	9.2	18 06 37	-34 52	L 2	8201	L 0	07JUL80	01 56 38	001 05	UK352	502 MICPH
M 165955	21	9.2	18 06 37	-34 52	L 3	9470	S 0	07JUL80	01 50 56	003 00	UK352	500
M 165955	21	9.2	18 06 37	-34 52	L 3	9470	L 0	07JUL80	01 43 11	001 45	UK352	500
M 165955	21	9.2	18 06 37	-34 52	H 3	9471	L 0	07JUL80	02 28 54	078 00	UK352	401
UZ SER	54	13.1	18 08 33	-14 56	L 2	8489	L 0	11AUG80	00 31 42	020 00	UK313	302

OBJECT	CL	MAG	RT ASCN HR MN SC	DECLN DEG MN	DISP +CAM	IMAGE	APERT OB LG	DATE	START HR MN SC	LENGTH MIN SC	PROG	COMMENT
UZ SER	54	13.1	18 08 33	-14 56	L 3	9769	L 0	11AUG80	01 03 26	040 00	UK313	401
1822-371	59	15.3	18 22 23	-37 08	L 2	8386	L 0	29JUL80	23 32 19	120 00	UK328	302
1822-371	59	15.0	18 22 23	-37 08	L 3	9657	L 0	31JUL80	20 59 12	227 00	UK328	302
H 173502	23	9.7	18 43 44	-30 01	L 2	8523	L 0	16AUG80	21 58 15	001 50	UK374	602
H 173502	23	9.7	18 43 44	-30 01	H 2	8524	L 0	16AUG80	22 23 26	085 00	UK374	504
H 173502	23	9.7	18 43 44	-30 01	L 3	9815	L 0	16AUG80	21 53 13	001 50	UK374	501
H 173502	23	9.7	18 43 44	-30 01	H 3	9816	L 0	16AUG80	23 52 14	116 00	UK374	502
H 174567	22	6.5	18 47 50	+31 34	H 3	9527	S C	15JUL80	20 30 06	160 00	UK309	301
H 175640	36	6.2	18 53 47	-01 52	H 2	8261	L 0	15JUL80	03 08 32	016 00	UK309	502 MICPH
H 175640	36	6.2	18 53 47	-01 52	H 3	9529	S 0	15JUL80	02 19 07	045 00	UK309	301
H 175640	36	6.2	18 53 47	-01 52	H 3	9544	S 0	19JUL80	20 37 00	050 00	UK309	401
TY CRA	26	9.5	18 58 18	-36 57	L 2	8567	L 0	20AUG80	18 45 00	012 00	UK339	503
TY CRA	26	9.5	18 58 18	-36 57	L 3	9850	L 0	20AUG80	19 15 47	030 00	UK339	501
HM SCE	57	10.8	19 39 41	+16 37	L 2	8610	S 0	25AUG80	19 54 11	008 00	HN353	133
HM SCE	57	10.8	19 39 41	+16 37	L 2	8610	L 0	25AUG80	19 10 50	040 00	HN353	473
HM SCE	57	10.8	19 39 41	+16 37	H 2	8611	L 0	25AUG80	21 50 20	040 00	HN353	032
HM SCE	57	10.8	19 39 41	+16 37	L 3	9898	S 0	25AUG80	18 57 39	010 00	HN353	131
HM SCE	57	10.8	19 39 41	+16 37	L 3	9898	L 0	25AUG80	18 29 00	025 00	HN353	261
HM SCE	57	10.8	19 39 41	+16 37	H 3	9899	L 0	25AUG80	20 06 50	100 00	HN353	042
H 186122	36	6.2	19 39 52	+12 04	H 2	8259	L 0	15JUL80	23 33 32	020 00	UK309	602
H 186122	36	6.2	19 39 52	+12 04	H 2	8260	L 0	15JUL80	01 38 07	012 00	UK309	502
H 186122	36	6.2	19 39 52	+12 04	H 3	9528	S C	15JUL80	00 12 44	075 00	UK309	501
CD-42143	54	10.4	19 44 13	-42 08	L 2	8460	L 0	07AUG80	23 32 19	003 30	UK313	602
CD-42144	54	10.4	19 44 13	-42 08	L 3	9727	L 0	07AUG80	00 03 28	004 30	UK313	601
H 187076	48	3.8	19 45 09	+18 24	H 2	8396	L 0	30JUL80	00 56 34	030 00	DR370	563
H 187076	48	3.8	19 45 09	+18 24	H 3	9649	L 0	30JUL80	00 04 55	045 00	DR370	501
CI CYC	57	10.0	19 46 21	+35 33	L 2	8651	L 0	28AUG80	21 57 30	040 00	MF412	463
CI CYC	57	10.0	19 46 21	+35 33	L 3	9941	L 0	28AUG80	21 39 47	015 00	MF412	251
CI CYC	57	10.0	19 46 21	+35 33	L 3	9942	L 0	28AUG80	22 40 27	060 00	MF412	371
V1016CYC	57	11.0	19 55 20	+39 41	L 2	8593	L 0	23AUG80	19 29 53	008 00	HN353	462
V1016CYC	57	11.0	19 55 20	+39 41	L 2	8593	L 0	23AUG80	19 15 53	015 00	HN353	572
V1016CYC	57	11.0	19 55 20	+39 41	H 2	8594	L 0	23AUG80	20 16 03	030 00	HN353	152
V1016CYC	57	11.0	19 55 20	+39 41	H 2	8595	L 0	23AUG80	21 38 32	090 00	HN353	272
V1016CYC	57	11.0	19 55 20	+39 41	L 3	9878	S 0	23AUG80	19 03 49	007 00	HN353	382
V1016CYC	57	11.0	19 55 20	+39 41	L 3	9878	L 0	23AUG80	18 34 27	020 00	HN353	382
V1016CYC	57	11.0	19 55 20	+39 41	H 3	9879	L 0	23AUG80	18 51 32	015 00	HN353	052
V1016CYC	57	11.0	19 55 20	+39 41	H 3	9880	L 0	23AUG80	20 50 15	045 00	HN353	172
V1016CYC	57	11.0	19 55 20	+39 41	H 3	9881	L 0	23AUG80	23 11 17	157 00	HN353	282
RR TEL	57	9.8	20 00 20	-55 52	H 2	8234	L 0	12JUL80	00 33 26	020 00	VILSP	262 MICPH
RR TEL	57	9.8	20 00 20	-55 52	H 3	9510	L 0	12JUL80	00 07 41	020 00	VILSP	060
H 192639	15	7.1	20 12 39	+37 12	H 3	9493	L 0	10JUL80	01 07 31	136 00	UK361	702
H 192909	47	3.9	20 13 55	+47 33	H 2	8413	L 0	01AUG80	23 04 20	038 00	DR370	563
H 192909	47	3.9	20 13 55	+47 33	H 3	9666	L 0	01AUG80	22 18 21	040 00	DR370	561
H 31398	47	2.7	20 13 55	+47 33	L 3	9667	L 0	01AUG80	00 24 12	082 00	DR370	351
H 193793	14	6.8	20 18 46	+43 42	H 2	8216	L 0	10JUL80	00 05 10	046 00	UK361	602 MICPH
H 193793	14	6.8	20 18 46	+43 42	H 3	9492	L 0	10JUL80	20 46 09	195 00	UK361	703
SUN STAR	57	12.0	20 19 01	+21 22	L 2	8652	L 0	28AUG80	00 50 15	055 00	MF412	103
H 196093	47	4.7	20 31 57	+35 04	H 2	8397	L 0	30JUL80	03 03 55	035 00	DR370	553

OBJECT	CL	MAG	RT ASCN HR MN SC	DECLN DEG MN	DISP +CAM	IMAGE	APERT OB	APERT LG	DATE	START HR MN SC	LENGTH MIN SC	PROG	COMMENT
M 196093	47	4.7	20 31 57	+35 04	H 3	9650	L	0	30JUL80	01 58 01	060 00	DR370	661
MR DEL	55	12.0	20 40 04	+18 59	L 2	8574	L	0	21AUG80	18 59 42	018 00	JA326	603
MR DEL	55	12.0	20 40 04	+18 59	L 2	8575	L	0	21AUG80	19 56 32	015 00	JA326	503
MR DEL	55	12.0	20 40 04	+18 59	L 2	8576	L	0	21AUG80	00 43 52	015 00	JA326	502
MR DEL	55	12.0	20 40 04	+18 59	L 3	9857	L	0	21AUG80	19 21 06	022 00	JA326	550
MR DEL	55	12.0	20 40 04	+18 59	L 3	9858	L	0	21AUG80	20 21 29	022 00	JA326	551
MR DEL	55	12.0	20 40 04	+18 59	L 3	9859	L	0	21AUG80	21 11 17	022 00	JA326	551
MR DEL	55	12.0	20 40 04	+18 59	L 3	9860	L	0	21AUG80	21 56 51	022 00	JA326	551
MR DEL	55	12.0	20 40 04	+18 59	L 3	9861	L	0	21AUG80	22 13 43	022 00	JA326	551
MR DEL	55	12.0	20 40 04	+18 59	L 3	9862	L	0	21AUG80	23 31 19	022 00	JA326	551
MR DEL	55	12.0	20 40 04	+18 59	L 3	9863	L	0	21AUG80	00 17 00	022 00	JA326	551
MR DEL	55	12.0	20 40 04	+18 59	L 3	9864	L	0	21AUG80	01 09 34	022 00	JA326	551
M 197481	52	8.8	20 42 04	-31 31	L 2	8431	L	0	03AUG80	18 56 54	015 00	UK353	251
M 197481	52	8.8	20 42 04	-31 31	L 2	8432	L	0	03AUG80	21 09 01	020 00	UK353	231 TRAILED
M 197481	52	8.8	20 42 04	-31 31	L 2	8433	L	0	03AUG80	00 16 58	030 00	UK353	231 TRAILED
M 197481	52	8.8	20 42 04	-31 31	L 2	8438	L	0	04AUG80	17 32 01	033 01	MR381	241 EXP ST AT GSFC
M 197481	52	8.8	20 42 04	-31 31	L 2	8439	L	0	04AUG80	21 41 36	030 00	MR381	241 TRAILED
M 197481	52	8.8	20 42 04	-31 31	L 2	8440	L	0	04AUG80	01 38 55	030 00	MR381	231 READ AT GSFC TRAILED
M 157481	52	8.8	20 42 04	-31 31	L 2	8452	L	0	06AUG80	18 31 24	030 00	UK353	241 TRAILED
M 157481	52	8.8	20 42 04	-31 31	L 2	8453	L	0	06AUG80	22 23 45	030 00	UK353	241 TRAILED
M 197481	52	8.8	20 42 04	-31 31	L 3	9691	L	0	03AUG80	19 15 18	090 00	UK353	121
M 197481	52	8.8	20 42 04	-31 31	L 3	9692	L	0	03AUG80	21 50 22	128 00	UK353	122 TRAILED
M 197481	52	8.8	20 42 04	-31 31	L 3	9693	L	0	03AUG80	01 02 01	190 00	UK353	122 READ AT GSFC
M 197481	52	8.8	20 42 04	-31 31	L 3	9698	L	0	04AUG80	18 24 34	180 00	MR381	231 TRAILED
M 197481	52	8.8	20 42 04	-31 31	L 3	9699	L	0	04AUG80	22 26 55	180 00	MR381	231 TRAILED
M 157481	52	8.8	20 42 04	-31 31	L 3	9710	L	0	06AUG80	15 20 15	180 00	UK353	231 EXP ST GSFC
M 157481	52	8.8	20 42 04	-31 31	L 3	9711	L	0	06AUG80	19 08 50	180 00	UK353	231 STAR MOVED EVERY 30M
M 157481	52	8.8	20 42 04	-31 31	L 3	9712	L	0	06AUG80	23 03 08	165 00	UK353	231 STAR MOVED EVERY 30M
MBV 475	57	12.0	20 49 56	+35 23	L 2	8612	S	0	25AUG80	23 59 02	005 00	MN353	110
MBV 475	57	12.0	20 49 56	+35 23	L 2	8612	L	0	25AUG80	23 30 25	020 58	MN353	451
MBV 475	57	12.0	20 49 56	+35 23	L 3	9900	L	0	25AUG80	22 56 54	030 00	MN353	051
MBV 475	57	12.0	20 49 56	+35 23	H 3	9901	L	0	25AUG80	00 07 00	100 00	MN353	032
M 199478	25	5.7	20 54 08	+47 13	H 2	8159	L	0	01JUL80	20 21 00	025 00	UK350	502MICPH
M 199478	25	5.7	20 54 08	+47 13	H 3	9414	L	0	01JUL80	20 48 25	180 00	UK350	602 SAT AT 1800 A
CC CYC	44	9.8	20 56 14	+34 59	L 2	8280	L	0	17JUL80	00 21 21	045 00	UK316	443
ER VUL	44	7.3	21 00 16	+27 36	L 2	8279	L	0	17JUL80	23 34 31	004 00	UK316	502
M 200775	26	7.4	21 00 59	+67 58	H 2	8548	L	0	18AUG80	18 41 07	060 00	UK301	504
M 200775	26	7.4	21 00 59	+67 58	H 2	8549	L	0	18AUG80	22 10 06	060 00	UK301	503
M 200775	26	7.4	21 00 59	+67 58	H 3	9836	L	0	18AUG80	19 45 38	140 00	UK301	552
M 200775	26	7.4	21 00 59	+67 58	H 3	9837	L	0	18AUG80	23 15 02	152 00	UK301	551
M 207538	20	7.3	21 46 08	+59 28	H 3	9872	L	0	22AUG80	00 41 22	067 00	UK339	401
B+284211	14	10.5	21 48 56	+28 37	L 1	1251	L	0	19AUG80	22 14 53	000 50	PHCAL	503
B+284211	14	10.5	21 48 56	+28 37	L 1	1251	S	0	19AUG80	22 11 11	001 40	PHCAL	503
B+284211	20	10.5	21 48 56	+28 38	L 2	8167	L	0	02JUL80	02 42 47	001 00	PHCAL	501
B+284211	12	10.5	21 48 56	+28 37	L 2	8306	S	0	20JUL80	03 48 27	001 40	PHCAL	401 MICPH
B+284211	12	10.5	21 48 56	+28 37	L 2	8306	L	0	20JUL80	03 44 35	001 00	PHCAL	301 MICPH
B+284211	14	10.5	21 48 56	+28 37	L 2	8553	L	0	19AUG80	18 56 32	001 00	PHCAL	502
B+284211	14	10.5	21 48 56	+28 37	L 2	8553	S	0	19AUG80	18 52 39	002 00	PHCAL	502

OBJECT	CL	MAG	RT ASCN HR MN SC	DECLN DEG MN	DISP +CAM	IMAGE	APERT OB LG	DATE	START HR MN SC	LENGTH MIN SC	PROG	COMMENT
B+284211	14	10.5	21 48 56	+28 37	L 2	8554	L 0	19AUG80	19 44 44	000 20	PHCAL	302
B+284211	14	10.5	21 48 56	+28 37	L 2	8554	S 0	19AUG80	19 42 11	000 40	PHCAL	302
B+284211	14	10.5	21 48 56	+28 37	L 2	8555	L 0	19AUG80	20 11 17	000 34	PHCAL	402
B+284211	14	10.5	21 48 56	+28 37	L 2	8555	S 0	19AUG80	20 08 21	001 08	PHCAL	402
B+284211	14	10.5	21 48 56	+28 37	L 2	8556	L 0	19AUG80	20 40 27	001 40	PHCAL	602
B+284211	14	10.5	21 48 56	+28 37	L 2	8556	S 0	19AUG80	20 35 17	003 20	PHCAL	602
B+284211	14	10.5	21 48 56	+28 37	L 2	8557	L 0	19AUG80	21 13 55	002 30	PHCAL	702
B+284211	14	10.5	21 48 56	+28 37	L 2	8557	S 0	19AUG80	21 05 30	005 00	PHCAL	702
B+284211	20	10.5	21 48 56	+28 38	L 3	9427	L 0	02JUL80	02 39 51	000 26	PHCAL	501
B+284211	14	10.5	21 48 56	+28 37	L 3	9841	L 0	19AUG80	18 50 23	000 26	PHCAL	500
B+284211	14	10.5	21 48 56	+28 37	L 3	9841	S 0	19AUG80	18 47 15	000 52	PHCAL	500
B-3 5357	16	9.5	21 58 01	-02 59	L 2	8249	S 0	14JUL80	21 07 24	015 00	UK309	701
B-3 5357	16	9.5	21 58 01	-02 59	L 2	8249	L 0	14JUL80	20 54 46	009 00	UK309	701
B-3 5357	16	9.5	21 58 01	-02 59	H 3	9525	L 0	14JUL80	21 07 24	401 00	UK309	604
B -35357	16	9.5	21 58 01	-02 59	H 3	9545	L 0	19JUL80	22 50 18	300 00	UK309	403
H 214419	11	9.0	22 39 57	+56 39	L 2	8668	L 0	30AUG80	18 17 01	002 00	UK372	552
H 214419	11	9.0	22 39 57	+56 39	L 2	8669	L 0	30AUG80	18 49 00	002 00	UK372	552
H 214419	11	9.0	22 39 57	+56 39	L 2	8670	L 0	30AUG80	19 41 31	002 00	UK372	552
H 214419	11	9.0	22 39 57	+56 39	L 2	8671	L 0	30AUG80	20 33 39	002 00	UK372	552
H 214419	11	9.0	22 39 57	+56 39	L 2	8672	L 0	30AUG80	21 24 24	002 00	UK372	552
H 214419	11	9.0	22 39 57	+56 39	L 2	8673	L 0	30AUG80	22 16 54	002 00	UK372	552
H 214419	11	9.0	22 39 57	+56 39	L 2	8674	L 0	30AUG80	23 07 42	002 00	UK372	552
H 214419	11	9.0	22 39 57	+56 39	L 2	8675	L 0	30AUG80	23 58 51	002 00	UK372	552
H 214419	11	9.0	22 39 57	+56 39	L 2	8676	L 0	30AUG80	00 49 23	002 00	UK372	552
H 214419	11	9.0	22 39 57	+56 39	L 2	8677	L 0	30AUG80	01 39 26	002 00	UK372	552
H 214419	11	9.0	22 39 57	+56 39	L 3	9962	L 0	30AUG80	18 21 18	006 00	UK372	451
H 214419	11	9.0	22 39 57	+56 39	L 3	9963	L 0	30AUG80	19 14 55	006 00	UK372	451
H 214419	11	9.0	22 39 57	+56 39	L 3	9964	L 0	30AUG80	20 07 17	006 00	UK372	451
H 214419	11	9.0	22 39 57	+56 39	L 3	9965	L 0	30AUG80	20 58 57	006 00	UK372	451
H 214419	11	9.0	22 39 57	+56 39	L 3	9966	L 0	30AUG80	21 50 24	006 00	UK372	451
H 214419	11	9.0	22 39 57	+56 39	L 3	9967	L 0	30AUG80	22 41 39	006 00	UK372	551
H 214419	11	9.0	22 39 57	+56 39	L 3	9968	L 0	30AUG80	23 33 01	006 00	UK372	551
H 214419	11	9.0	22 39 57	+56 39	L 3	9969	L 0	30AUG80	00 23 40	006 00	UK372	551
H 214419	11	9.0	22 39 57	+56 39	L 3	9970	L 0	30AUG80	01 15 05	006 00	UK372	451
3A 2252	54	13.4	22 52 43	-03 27	L 2	8447	L 0	05AUG80	00 49 41	025 00	UK313	401
3A 2252	54	13.4	22 52 43	-03 27	L 3	9706	L 0	05AUG80	01 17 48	029 00	UK313	331
+5233B3A	41	9.5	23 08 56	+52 45	L 2	8281	L 0	17JUL80	01 50 26	025 00	UK316	603
Z AND	57	10.8	23 31 15	+48 32	L 2	8650	L 0	28AUG80	19 15 39	022 00	MF412	463
Z AND	57	10.8	23 31 15	+48 32	H 3	9939	L 0	28AUG80	18 32 38	040 00	MF412	151
Z AND	57	10.8	23 31 15	+48 32	L 3	9940	L 0	28AUG80	19 43 08	060 00	MF412	402

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