IUE esa

NEWSLETTER

NO 12 DECEMBER 1981

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ESA IUE Newsletter

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Observatory Controller Message

The easiest way to demonstrate the success and popularity IUE is enjoying among European astronomers is to look at the number of new proposals for the next round of observations. ESA received 189 and the SERC 85 which represents an increase of 8% over last year. The resulting over-subscription is about 4 times. Looking at the different subject areas, we notice an increase in the number of proposals aiming to study interaction phenomena involving hot stars: indeed many of these programmes envisage simultaneous observations by EXOSAT. The number of extragalactic proposals is fairly stable and they are seeking by far the largest portion of observing time.

After extensive negotiations during the past year, ESA and SERC agreed, beginning with the next round (5th year) to unify the European allocation of IUE time. This means that all proposals received by both agencies will be evaluated by one single Committee and the entire observing time available from VILSPA will be allocated on scientific merit only. This year the Committee will be formed by merging those existing from ESA and SERC. A new European Committee will be appointed for the sixth and following round.

We expect that this new arrangement will improve the scientific exploitation of IUE and will stimulate collaboration among European astronomers. Also, we hope that scheduling will become easier!

An important decision was taken at the last 3-Agency meeting concerning the reduction of high dispersion spectra. A new extraction procedure was presented by NASA and accepted: it follows the same concept of the new IPS for low dispersion (see ESA IUE Newsletter #11) and provides a better resolution. The price to pay is an increase in noise, but the user will have the option to apply a low-pass filter before the spectrum is plotted. The installation testing of the new software is under way.

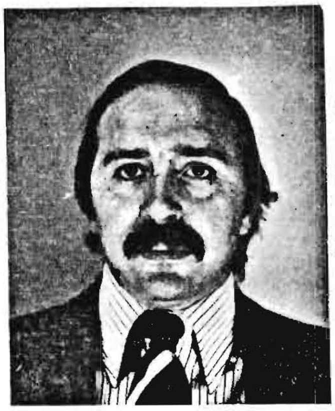
At the end of October a small number of scientists met at VILSPA to discuss and assess the status of Stellar Classification in the UV and the relevance of IUE data. The meeting, a summary of which is given by A. Heck (see page 11), was very interesting and stimulating. Mild, clear weather provided an ideal environment.

The organisation of the Third European IUE Conference is proceeding: on page 5 you will find more information about it and a Hotel booking form. Please note the slight change of dates since the first announcement. We hope to meet all of you next May!

Piero Benvenuti

NEW PERSONNEL AT VILSPA

A new telescope operator has joined our team: Alfredo Ruiz de Silva. Alfredo (36) has an extensive history in Aeronautics. He has worked in aircraft navigation and attended various courses in the U.S.. After working a few years in Las Palmas he joined the NASA Deep Space Tracking Station in Fresnedillas, also near Madrid. He likes very much to make photographs of his one year old son.



Our new Chief Computer Operator is Tarsicio Martín Santos (33). He studied in the Escuela Ingeniería Técnica Industrial in Valladolid. He is an old timer at the Station and has worked in the project in various functions. In many special courses he has build up quite a knowledge on many different computers. He has a family with two children.

Cornelius Driessen (37) has come to VILSPA from ESOC in Darmstadt to work as a System Analyst. He worked on Satellite system design and did research in mathematical modeling. Teaching at the Highbury Polytechnic, renewed his contacts with astronomy. He is especially interested in cosmology. He likes to synthesize music.

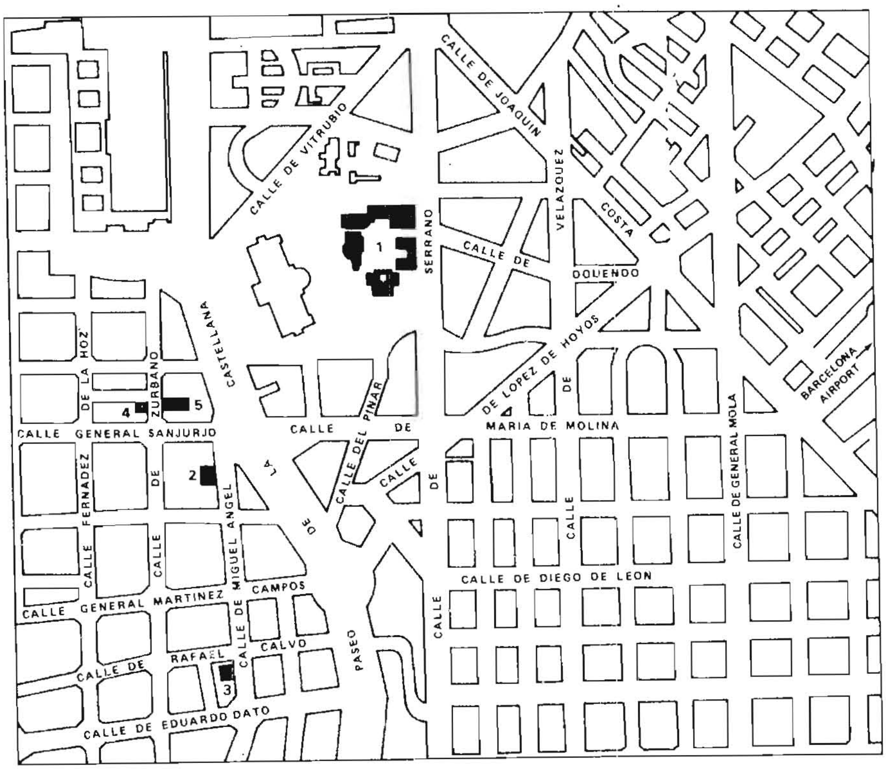
that the deadline for this abstract is January 31st, 1982. Abstracts received by this date will be printed together with the scientific Programme and these will be distributed prior to the Conference.

We are planning to publish the Conference Proceedings as quickly as possible as an ESA Special Publication, therefore papers will have to be ready by the date of the meeting: authors will receive, in due time, the necessary kit for preparation of the manuscript.

With best regards,

The Local Organizing Committee

Partial plane of Madrid
Conference Site and Hotels location



1.– Conference Site (Consejo Superior de Investigaciones Científicas)
2.– Miguel Angel Hotel
3.– Escultor Hotel
4.– Zurbano Hotel
5.– Ecuestre Hotel

THIRD EUROPEAN I.U.E. CONFERENCE

Madrid, 10-13 May 1.982

HOTEL RESERVATION FORM

(Before 1st March 1982)

Prof./Mr./Mrs./Miss .... Surname ....

Address: Street .... nº ..... Telephone ....

City .... Country ....

Accompanying person(s) ....

....

Arrival date .... at .... by .... depart ....

Please reserve a: double/single room at the Hotel ....

HOTEL	double	single	double for single	breakfast
LUZ PALACIO*****	8.000	5.500	7.200	380
ESCULTOR****	4.950	3.700	3.960	325
ECUESTRE/ZURBANO***	4.000	––	2.800	included

I am including cheque nº .... of Bank ....
(or copy of the Bank transfer to the account nº 239.000–IUECONF of BANCO DE VIZCA–YA. Clara del Rey, 12 in Madrid-2), for the amount of ...., corresponding to the DEPOSIT of Six **thousand pesetas** (6.000 pesetas), per person to be deducted from the Hotel Bill which I will pay, before my departure, to the hotel.
Reservation will be confirmed when we receive the deposit and one night accommodation will be deducted if reservation is cancelled after 30th April 1.982. Before this date deposit will be refunded less Bank fees.

I agree and accept the conditions above mentioned.

.... at. ... of .... 198...

Signature

Please return the FORM to I.C.C.O. (Av. América, 51) – Madrid-2. Telf.: 416-40-90.
Telex 42218 VISP–E

National Aeronautics and
Space Administration

Goddard Space Flight Center
Greenbelt, Maryland
20771

NASA

Reply to Attn of: 685

Dear Colleague:

We wish to announce plans for a symposium, entitled "Advances in Ultraviolet Astronomy: Four Years of IUE Research", in commemoration of the beginning of the fifth year of guest observations with the International Ultraviolet Explorer (IUE). The symposium, which will be held at Goddard Space Flight Center on March 30, 31 and April 1, 1982, is being co-sponsored by the American Astronomical Society. According to our tentative plans, the symposium will contain both invited review papers and contributed papers (5 to 10 minutes).

Those interested in attending the symposium are requested to return the enclosed participation form to us by November 16, 1981, to facilitate our planning. The significant dates for the meeting include:

November 16, 1981:	Participation forms are due.
February 12, 1982:	Abstracts are due; abstracts arriving after this date may be considered for inclusion as late papers at the discretion of the Organizing Committee.
March 30, 31, April 1:	Symposium will be held; camera-ready copies of manuscripts for publication in the symposium proceedings are due on April 1.

Further details for the meeting, including a packet for manuscripts, local arrangements and social events, will be transmitted to those returning participation forms. There are no registration fees for the meeting. We regret that no travel funds are available from the Organizing Committee.

Sincerely,

Yoji Kondo
Chairman, Scientific
Organizing Committee

Albert Boggess
Co-Chairman, Scientific
Organizing Committee

Jaylee M. Mead
Chairman, Local
Organizing Committee

PLEASE RETURN THIS FORM BY NOVEMBER 16, 1981
USING THE ENCLOSED FRANKED ENVELOPE

___ I plan to attend the Symposium "Advances in Ultraviolet Astronomy: Four Years of IUE Research" on March 30, 31, and April 1, 1982.

___ I am not sure if I will be attending the Symposium but would like to receive future mailings.

___ I expect to submit the abstract of a paper by the February 12, 1982 deadline in the category of:

- ___ Early type stars (Type A and earlier).
- ___ Late type stars (Type F and later).
- ___ Interacting binary stars, including x-ray binaries and cataclysmic variables.
- ___ Intrinsic variable stars.
- ___ Interstellar medium.
- ___ Nebulae.
- ___ Extragalactic sources.
- ___ Solar system objects.
- ___ Data reduction and telescope operation.
- ___ Plans for IUE 2.
- ___ Others (Please specify).

NAME: ______________________________

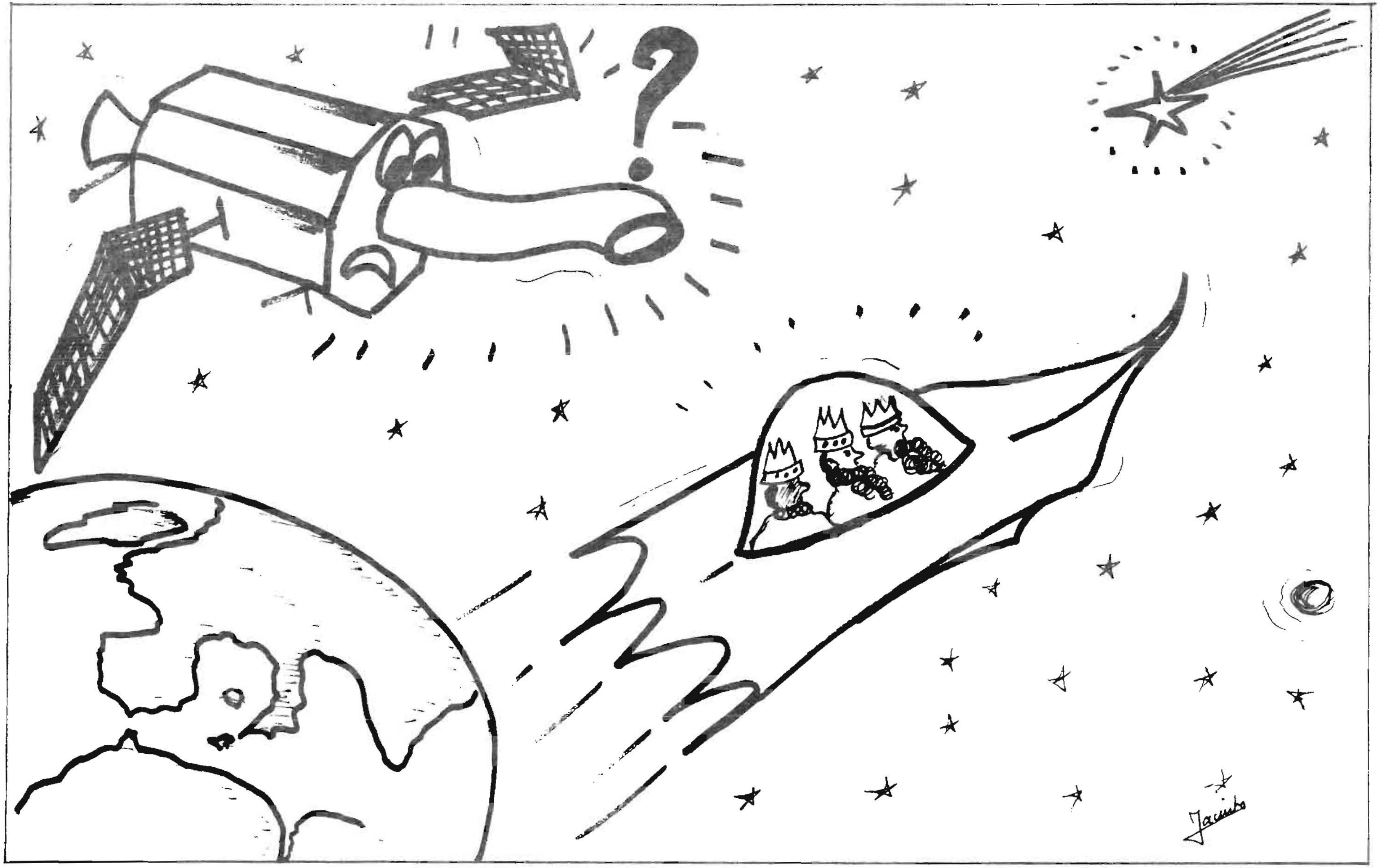
INSTITUTION: ______________________________

ADDRESS: ______________________________

____

TELEPHONE: ______________________________

Adventures of AIYOUEEE at apogee



VILSPA Workshop on UV Stellar Classification

From Oct. 26 to Oct. 28, 1981 a small workshop was held at VILSPA. The subject this time was: UV Stellar Classification. Apart from the VILSPA staff the workshop was attented by ten Astronomers from Europe, and North and South America.

The program consisted of the following subjects:

1. Review of the available UV data and their impact on normal MK classification

2. Theoretical implications and relevance to population synthesis

3. Guidelines for future work.

The results of three UV satellites - TD1/A, ANS and IUE - and analyses performed up to now were reviewed by Cucchiaro (Liege), the Jaschek's (Strasbourg), Nandy (Edinburgh), Wesselius (Groningen), Wu (NASA-GSFC) and Heck (ESA-VILSPA). Complementary to the UV data new results on a NIR catalogue of MK stars were presented by DAnks (ESO-Chile). The theoretical side of spectral classification was stressed by Praderie (Meudon), Baschek (Heidelberg), and Böhm-Vitense (Seattle). A detailed account of the workshop will be presented in a separate publication. An important result was the establishment of a Working Group which will analyse about 400 images at present in the IUE Data Bank, relevant to classification. This work will define the gaps in the existing observations and if performed on a sufficiently short timescale, allow the necessary observations to complete the sample before IUE decommissioning. Contact with the Working Group, which consists of Cucchiaro, Egret, Heck, Jaschek's, Nandy and Wu, can be taken up through the undersigned The importance of the collection of a complete and homogeneous sample of absolute calibrated spectra of all spectral types and classes was stressed.

André Heck

IUE Satellite News

I. SHADOW SEASON NR. 8 PERFORMANCE

All satellite systems behaved well throughout the last shadow season.

The performance of the two batteries has been very good. The maximum depth of discharge (D.O.D.) was 66.6 % and 69.1 % on batteries Nr. 1 and Nr. 2 respectively.

Since season Nr. 5 (Spring 1980) the same satellite configuration has been used and most likely, no further reduction of load will be necessary through season Nr. 13 (Spring 1984).

II. SHADOW SEASON NR. 9 FORECAST

Season Nr. 9 will run from 5 March 82 until 30 March 82. Users, which are scheduled around this time should be aware that the shifts will be shortened by 1/2 hour at the beginning of the shift.

More important will be the fact that during this time observations of targets at beta angles between 25° and 115° will not be possible during the VILSPA shifts, since the batteries have to be re-charged. The solar array panels do not deliver sufficient current at extreme beta angles to fulfill the additional demand of at least 0.4 ampere over up to 10 hours after exit of eclipse (see also, Constraints affecting IUE scheduling, page 14).

III. ON-BOARD COMPUTER (OBC)

An operational 4K system was developed. This is a backup for the current 8K operational software as well as a replacement of the old 4K backup system, which did not support camera operations. Additionally, in case of a memory bank failure, it could be used as primary and backup system. The new system was loaded in the 4K backup OBC in August and it still undergoing tests, so far with excellent results. After completion of these tests, it might be possible to increase the temperature limits for the new 4K system - i.e. to modify the "HOT OBC" region - depending on IUE Project decision.

IV. GYROSCOPE PROBLEM

Although almost all things ran smoothly during the past months, we note at times that our lady becomes older every year, being in orbit.

Between May and August a significant degradation of maneuver accuracy had been experienced, causing some preoccupation. Investigation indicated an instability of Gyro-1 caused by a change of its controlling oven, which is the probable cause of the problem.

In September Gyro-1 has been disabled from the control loop and a new matrix, consisting of Gyros 2, 3, 4 and 5, was loaded for control in the OBC.

On 22 September the first set of new scaling factors was loaded and a slight improvement in maneuvering noted.

One month later an improved set of scaling factors was loaded in the OBC for these gyros. Maneuver performance is now back to its normal standard.

Jurgen Faelker

E R R A T A

page 14 :

- point 2, line 5, read "$\beta \geqslant 115°$"
- point 4, line 1, read "The first days of each month the particle..."

CONSTRAINTS AFFECTING THE IUE SCHEDULING

The fifth IUE year will start in April 1982 and the Astronomers who have been awarded observing time will soon be requested to prepare their observations and communicate their (preferred) observing plan in order to schedule their programme(s) properly. The monthly sky-maps for the whole fifth year will be sent to all. These show the main constraint regions as the Sun, Antisun, the Moon and the Earth.

A few more elements which can be of importance for successfull observing shifts should also be taken in consideration.

1. OBC temperature constraint (also shown on the skymap). Particularly during the winter months (September to March), targets requiring long exposures should be scheduled outside the hot OBC region, defined as $55° < \beta < 95°$ (β = antisun-to-target angle). More details can be found in IUE ESA Newsletter #9, pg 11 and 13.

2. Power constraint. Targets falling within $125° < \beta < 135°$ can be constrained if battery charge levels are too low at anytime of the year. In the shadow seasons - March/April and September/October - targets at $\beta \leqslant 25°$ and $\beta \leqslant 115°$ are also constraint. In general one should avoid long exposures under these conditions. See also IUE ESA Newsletter #9, pg 11 and 13.

3. Shadow season. Strictly time-dependent observations are not recommended during this period, due to the variable length of the shifts. See IUE ESA Newsletter #9, pg 13.

4. Camera noise level. The first days of each the particle background is slightly higher. Therefore very long exposures of faint objects are not advisable at that time.

5. Earth path. If a target falls in the Earth's path in the second half of a shift, it is preferable to observe it early in a month, because the shift has been advanced two hours. Analogous a target falling in the Earth path in the first half of the shift is better scheduled at the end of the month.

All the above should be considered by the Users when suggesting, on the Scheduling Questionnaire, their proposed date(s) of observation, to avoid unnecessary disappointments. It is quite important that they indicate their high priority targets and any comments which could be usefull in evaluating the impact of the above constraints on the schedule.

Remember that most disappointments can be easily avoided if one sends the Scheduling Questionnaire with details and in time.

When making the final Schedule we can and will take into account all possible requirements that we can accomodate. But we have to know them!

With the best wishes for the New (IUE) Year from all of the R.A.s.

Carla Cacciari

VILSPA IMAGES FOR RELEASE FOR SCIENTIFIC COMMUNITY

1982 February 1st (despatched 1981 July)

CAMERA 2 LWR		CAMERA 3 SWP		
10968	11071	14359	14484	14551
10969	11072	14360	14495	14553
10970	11073	14366	14496	14554
10976	11074	14367	14497	14555
10977	11083	14378	14498	14556
10978	11088	14386	14499	14557
10979	11089	14392	14512	14558
10985	11090	14398	14513	14567
10986	11091	14399	14514	14573
10987	11092	14412	14515	14589
10996	11138	14413	14516	
11004	11154	14414	14517	
11009	11155	14435	14518	
11010	11163	14436	14519	
11019	11175	14451	14531	
11020	11176	14452	14541	
11051	11185	14453	14542	
11055	11186	14467	14545	

Omission in previous lists: LWR 8758

VILSPA Images for Release to Scientific Community

1982 March 1st (despatched 1981 August)

CAMERA 1 LWP	CAMERA 2 LWR			CAMERA 3 SWP			
1348	11193	11253	11339	14598	14677	14761	14845
	11194	11254	11340	14599	14687	14762	14846
	11202	11260	11341	14609	14688	14763	14847
	11203	11265	11342	14610	14695	14764	14848
	11204	11266	11350	14611	14704	14765	14849
	11205	11272	11351	14612	14705	14769	14857
	11206	11280	11352	14619	14706	14770	14858
	11209	11281	11366	14620	14713	14771	14859
	11210	11293	11380	14630	14714	14789	14867
	11219	11294	11381	14631	14715	14797	
	11220	11295	11382	14632	14716	14803	
	11221	11296	11383	14633	14717	14804	
	11222	11297	11384	14639	14718	14805	
	11223	11300	11385	14640	14726	14806	
	11229	11301	11386	14641	14727	14807	
	11230	11302	11387	14642	14728	14814	
	11231	11303	11388	14653	14729	14822	
	11232	11313	11410	14654	14730	14823	
	11233	11314	11411	14655	14736	14824	
	11243	11315	11419	14665	14737	14825	
	11244	11323	11429	14666	14738	14826	
	11245	11324	11430	14667	14739	14827	
	11246	11335	11431	14668	14749	14828	
	11247	11336	11439	14669	14750	14829	
	11251	11337	11445	14675	14751	14838	
	11252	11338		14676	14760	14844	

VILSPA Images for Release to Scientific Community

1982 April 1st (despatched 1981 September)

CAMERA 1 LWP	CAMERA 2 LWR		CAMERA 3 SWP			
1352	11448	11546	14870	14922	15010	15077
1353	11449	11547	14876	14928	15011	15078
1354	11453	11548	14877	14929	15012	15079
1355	11458	11459	14878	14930	15013	15118
1356	11459	11550	14884	14931	15014	15119
	11465	11551	14885	14932	15015	15120
	11466	11559	14886	14943	15021	15126
	11467	11560	14887	14950	15022	15127
	11472	11566	14892	14951	15023	
	11473	11567	14893	14958	15034	
	11481	11574	14894	14968	15035	
	11482	11575	14895	14980	15036	
	11485	11580	14896	14988	15043	
	11489	11581	14897	14989	15044	
	11490	11582	14898	14990	15045	
	11491	11589	14911	14991	15046	
	11492	11593	14912	14992	15047	
	11493	11594	14913	14993	15048	
	11497	11599	14914	14994	15060	
	11498	11604	14915	14995	15061	
	11499	11605	14916	15001	15062	
	11506	11606	14917	15002	15063	
	11515	11607	14918	15003	15064	
	11516	11635	14919	15004	15070	
	11517	11636	14921	15009	15071	

THE "SCIENTIFIC PRODUCTIVITY" OF IUE

Now nearly four years in orbit, IUE has inspired three full international symposia held in London, Tübingen and Washington with two more (in Madrid and Washington) scheduled for 1982. Further, one day was devoted to a discussion of its results at the General Assembly of the International Astronomical Union in Montreal and led the conference newspaper to remark that it was the first time ever that the General Assembly had devoted a full day to an 45 cm telescope only 18 months after its completion. Altogether, some 300 papers have been published in the proceedings of these conferences and about 250 have appeared in the front rank scientific journals. Clearly, IUE is an outstanding scientific success, and here we attempt to make an estimate of its "productivity" as compared to other astronomical observing facilities.

The simplest way to measure the scientific return of a program is to compare the number of scientific papers which report or use data from this program, with the number of papers from other satellites or observing facilities. This is somewhat prosaic in respect to our concept of "knowledge". It is however one of the few ways in which one can quantify such untangible matters. Through such a comparison one can at least gain some insight in the value of IUE to the astronomical scientific community. The following table gives the number of papers on IUE data relative to the total number of observational papers in the three main astronomical Journals during the first six months of 1981.

Observational papers in the indicated Journals
(period: January 81 - July 81)

JOURNAL	Observational Papers		%
	TOTAL	IUE	
Astronomy & Astrophysics [1]	185	11	5.9
M.N.R.A.S. [2]	100	5	5.0
Astrophysical Journals [1]	225	14	6.2

1) letters excluded 2) pink pages included

To compare the present "IUE productivity" with its earlier performance and with other major observing facilities, we reproduce in figure 1 a graph (M. Kuhner, 1981, letter to NASA) showing similar statistics for 5 major astrophysical missions in recent years. The data shown in figure 1 relate to the Astrophysical Journal only. To supply a reference frame with respect to ground-based Observatories the results for Hale Observatories are also given in figure 1.

It appears that IUE has passed its normal post-launch peak for new observational facilities. For IUE this peak level has been very close to 10%. In comparing figure 1 with the results of table 1 one should realise that very few papers appear in the European Journals which are based on data obtained at Hale Observatories. Any conclusions to be drawn from such statistics we leave for the reader.

Luciana Bianchi

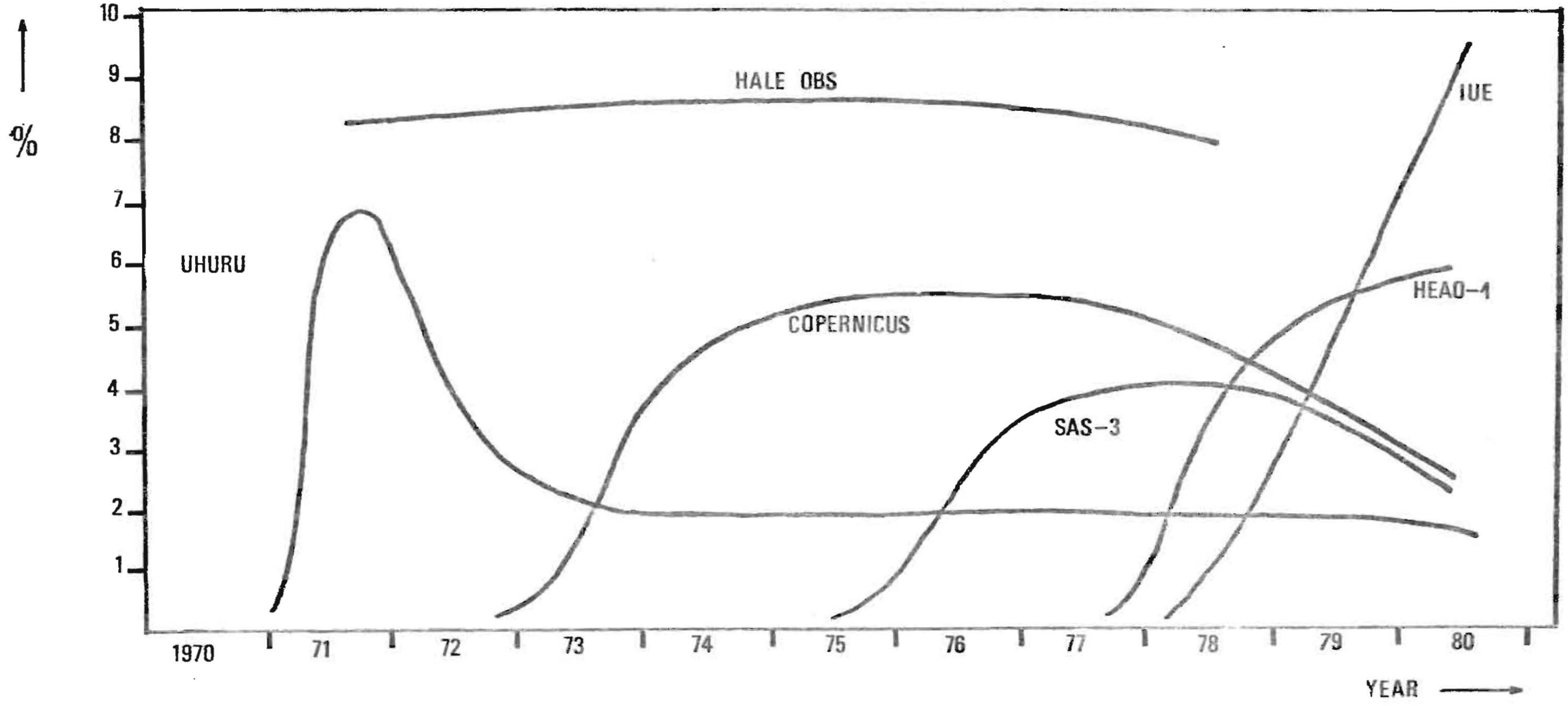


FIGURE 1 - Percentage of observational papers in Astrophysical Journal (1980) based on results obtained with the, in the figure indicated, facilities (Kuhner, private comm.)

7. UNIVERSITY COLLEGE LONDON, II

SPECTRUM EXTRACTION FROM IUE GPHOT IMAGES WITH STAK AND TRAK

1. INTRODUCTION

This paper describes, briefly, the nature and capabilities of the STAK and TRAK programs which were developed at UCL to extract spectra from IUE images. Instructions for using the the programs would be out of place here, and can be found in separate documentation at places where the programs are implemented.

The programs only operate on GPHOT images containing spectra in Low Resolution or Echelle format. The various calibration and measurement operations needed to produce Astronomical information from these extracted spectra are handled by a number of separate programs which will not be described here.

2. IMAGE TREATMENT

The STAK program reads the GPHOT image from magnetic tape and stores it on disk in a way which makes the extraction process efficient. At this stage, pixels are flagged if they are saturated, ITF truncated or expected to fall on reseau marks.

3. THE SPECTRUM EXTRACTION ALGORITHM

The same basic algorithm is used for extraction a Low Resolution spectrum and an Echelle order, only the parameters used and their determination differ. Consequently the terms "order" and "spectrum" can be considered synonymous.

The locus of peak signal in an order on the image can be described by:

$$S(l) = a \cdot l + b + DS(l) \qquad (1)$$

where the DS are corrections, initially zero, to a straight line representation (solid line in Figure 1). For a given order, each associated pixel can be assigned a wavelength:

$$\lambda(S,l) = C \cdot S + d \cdot l + e \qquad (2)$$

An evenly spaced wavelength grid is defined by the intersections of the (initially) straight order-line and the lines of the images. The distance, in the sample direction, of each pixel from the order-line (given by Equation (1)) is used to determine which pixels contribute to the gross and background counts. The intensity of each pixel used is shared between the two grid points that straddle its wavelength. The sharing process is equivalent to folding with a triangle profile of FWHM equal to the wavelength grid spacing. So for each grid wavelength we have a gross value:

$$G(i) = \sum_{p(i,gross)} W(p,i)\ F(p) \qquad (3)$$

where W(p,i) is the folding weight of the intensity, F(p), of pixel (p) onto wavelength point (i), and p(i,gross) defines the pixels that contribute to the gross signal for this wavelentgh point. The effective pixel area used for each gross value is:

$$S(t) = \sum_{p(i,gross)} W(p,i) \qquad (4)$$

The background signal per pixel is:

$$B(i) = \sum_{p(i,background)} W(p,i)\ F(p) \Big/ \sum_{p(i,background)} W(p,i) \qquad (5)$$

The B(i) are smoothed with a double pass box filter, with discrepant points excluded from the second pass. At this point, the centroid of the gross signal above background can be determined and used to determine empirical values for the DS in Equation (1). In practice, the DS values are smoothed with a box filter to avoid unnecessary "structure" in the order-line. This smoothing can also be used to account for regions of the order that contain no significant signal above background.

With the empirical values of DS, the spectrum can be re-extracted. The centroid information can say nothing about wavelength shifts, so that the wavelength assigned to a pixel is unaffected. The Net signal can then be estimated by:

$$N(i) = G(i) - S(i)\ \bar{B}(i)$$

The position parameters (a,b) used in Equation (1) have been derived empirically from Astronomical images. In most cases, these parameters are good enough to allow the centroid tracking algorithm to locate the order, in other cases corrections can be applied manually.

The parameters (c,d,e) in Equation (2) are essentially derived from the Ground Station wavelength scales. So far, only a single set of these parameters has been used for each Spectrograph. Wavelength shifts can be determined and corrected for by other programs AFTER the spectrum has been extracted from the image.

The choice of which pixels contribute to gross, and which contribute to the background can be explained by reference to Figure 2. For Low Resolution spectra, the location and width of the gross and background channels can be adjusted as appropriate. For an Echelle order, the background is taken as a single pixel lying in the centre of the inter-order through on either side of the spectrum; gross pixels are then taken between the two background pixels subject to at least a single pixel gap. A maximum gross channel width can be selected so that the slit width can be made to vary with Echelle order number as appropriate.

4. FLEXIBILITY

The programs know very little about IUE. They are driven by input datasets consisting free-format "commands" which provide the extraction parameters. So, although several "standard" datasets exist for normal extraction work, it is possible to exercise much control over the way in which the spectra are extracted from the image. The efficient way in which the image pixels are stored makes it practical to extract single Echelle orders, possibly changing the extraction parameters for each one if needed. In cases where there is no adequate (continuous) spectrum for the tracking algorithm to work (e.g. Emission-line Objects), it can be switched off. The amount of background and centroid smoothing can be adjusted to suite the image characteristics (e.g. noise level). In the special case of an extended continuum free, emission-line object observed through the large aperture in Echelle mode, it is possible to locate the gross and background channels manually.

5. CALIBRATION

Absolute calibrations and Echelle ripple removal are handled by a number of separate programs. From an analysis of a few "continuum" source spectra, empirical ripple functions have been determined. The TRAK extraction algorithm described above requires that the (old IUESIPS) absolute calibration be multiplied by a scalar constant that is determined analytically for each Camera/Resolution combination:

CAMERA	RESOLUTION	SCALE FACTOR
SWP	LORES	0.88
LWR	LORES	0.85
SWP	HIRES	1.12
LWR	HIRES	1.15

The extraction algorithm and the choice of wavelength grid results in a spectral resolution that is similar to the old style IUESIPS programs.

6. IMPLEMENTATION, USAGE AND FUTURE

The programs were developed on the IBM 360/195 computers of the SERC Rutherford and Appleton Laboratories, and are now also available on the 6 STARLINK VAX 11/780 computers located in the UK. They have been used extensively at UCL and in other UK Institutions for extracting spectra. They are simple to use and offer some flexibility in handling "non-standard" cases. However, these programs do not address the order overlap problem that causes the background for high Echelle orders to be over-estimated. Also, the programs would require modification to extract spectra from the new-style Photometric Images which retain the original distorted image geometry.

Work is now in progress to replace these programs with rather more general facilities in the forth-coming STARLINK data analysis system.

Jack Giddings
Department of Physics and Astronomy
University College London

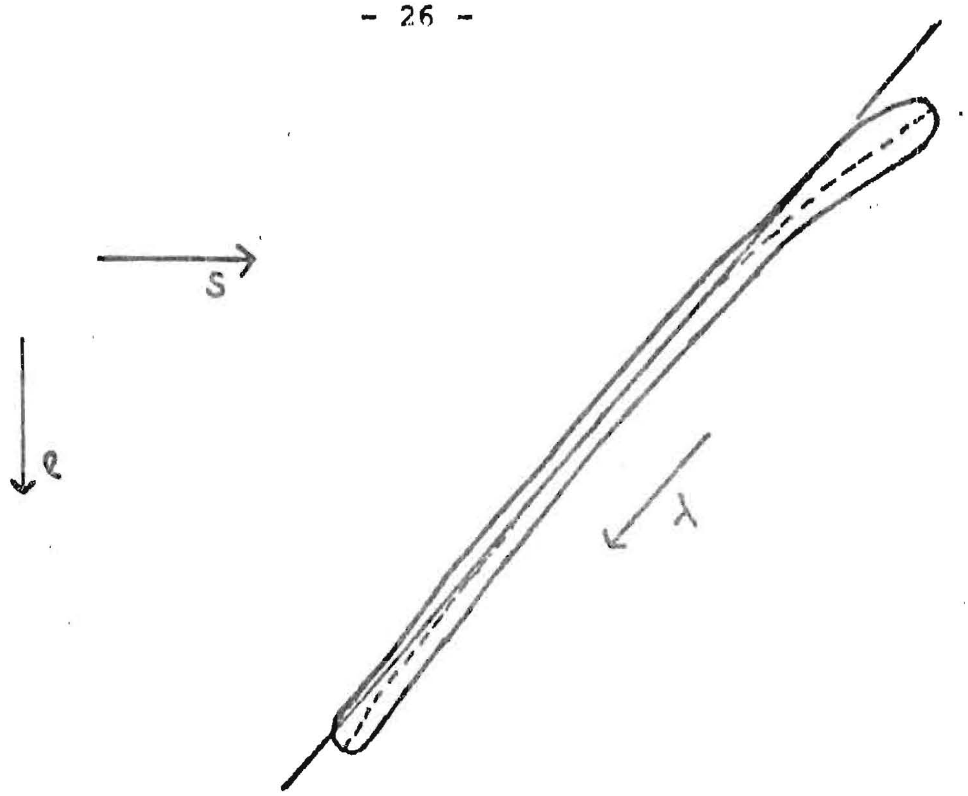


Figure 1 Schematic contour of order on image with linear (solid) and corrected (dashed) template lines.

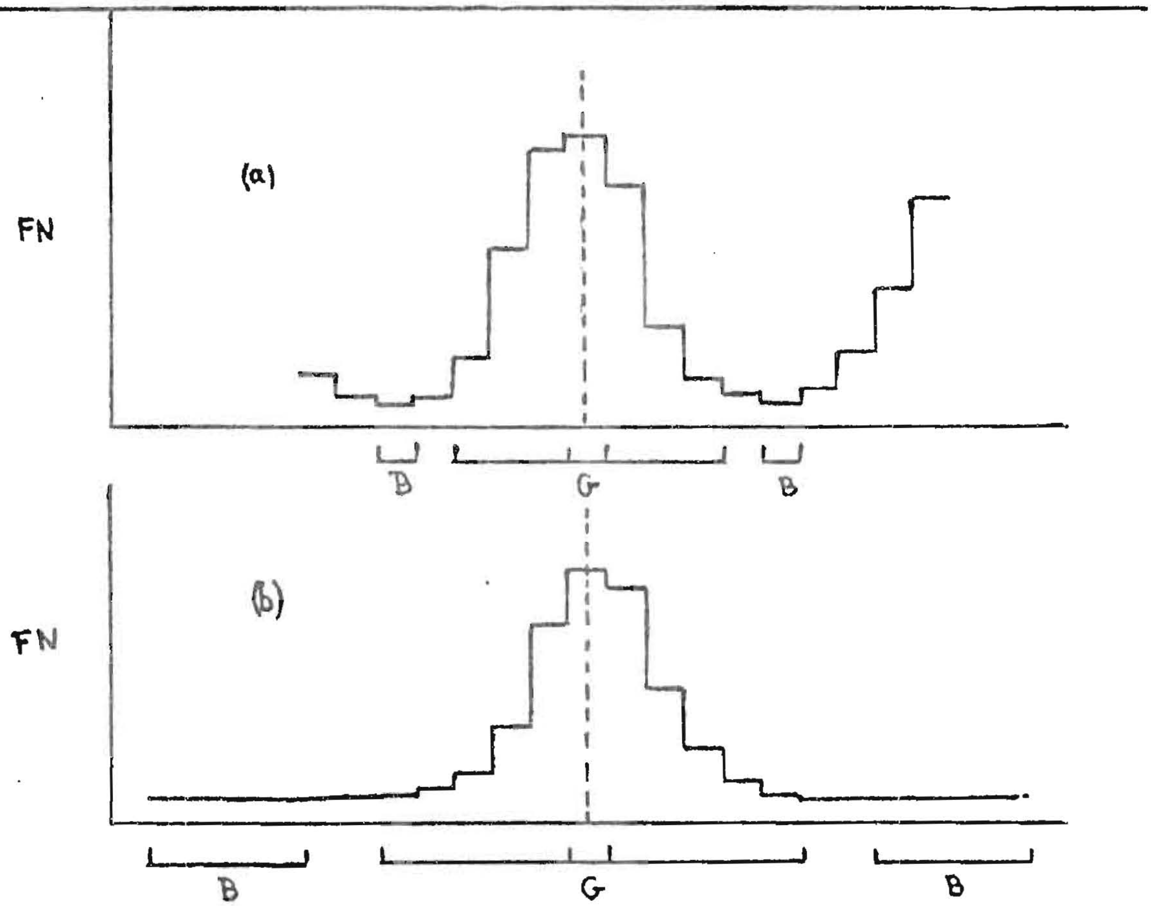


Figure 2 Order profiles in sample direction showing how pixels are selected for gross (C) and background (B) for the Echalla (a) and Low Resolution (b) cases.

A Study of the Reduction of Noise in IUE Spectra Obtained by Adding Extracted Spectra

1. INTRODUCTION

The analysis of IUE spectra is ultimately limited by the inherent resolution and noise of each spectrum. The resolution is a fixed parameter of the instrument but the noise can be affected by the operation of the system.

For this satellite it is not possible to reduce the noise simply by increasing the exposure times because the camera target becomes saturated. However, it is possible to trail a star across the large aperture thus increasing the effective target area and hence the effective exposure time. This technique is used for low resolution spectra (Heck 1981) but cannot be used for high resolution spectra.

Another option is to add spectra taken at different times. This can be used for low and high resolution spectra and is the subject of this paper. The results indicate the value of adding spectra currently available (e.g. in the World Data Centre) and also provide a basis for deciding whether further observations of a target would be of use.

Certain objects have already been extensively observed with IUE. The two such objects that were used here were HD120315 (Eta Uma) for which we had 16 LWR and 9 SWP spectra and HD219188 for which we had 8 SWP spectra. The spectra used were all high resolution, observed in either the small or large aperture (mostly small): Of the 33 spectra used in this study half were observed in the high radiation shift. The observations of Eta Uma were too short to be seriously affected, but one observation of HD 219188 was noticeably noisier because of this.

2. METHOD

2.1 Adding the spectra

The position of a few of the stronger interstellar lines were located on each image and were used to determine a veloicty shift with respect to a baseline image. The velocity shifts were then used to correct all the spectra in each group to the baseline image. This process of alignment was necessary to prevent degradation of the line profiles. For Eta Uma, the situation proved difficult because the interstellar lines were weak and the quality of the alignment was uncertain. Thus

HD 219188, which has some strong interstellar lines, was also used to illustrate the retention of good resolution and the enhanced detection of weak features.

After they had been aligned, the spectra were rebinned to a common wavelength grid using linear interpolation and a sampling rate which was at least as great as that used in the original spectra. The spectral orders of interest were then summed using weighting factors which were proportional to the mean flux in the order. Features such as reseaux and charged particle spikes were removed prior to the summation.

2.2 Measurement of noise in the spectrum

Six portions of each of the LWR and SWP spectra were selected for study. These were widely distributed over the camera target region and included regions about interstellar features of interest. An interactive program was used to fit, by least-squares, these regions using Chebyshev polynomials of order 4 or less. The percentage RMS deviations plotted in Figures 2, 3, and 4 were then calculated using the equation:

$$\%\ \text{RMS DEVIATION} = \frac{100}{N}\sqrt{\sum_{i=1}^{N}\frac{(FN_i - FIT_i)^2}{FIT_i^2}}$$

where FN_i = fitted flux at point i

FIT_i = fitted flux at point i

N = number of points

An empirical value for the ratio of signal to noise may be obtained by dividing 100 by the percentage RMS Deviation.

This program was applied to single spectra and then to summed spectra. Where possible the summed spectra included different samples of the single spectra to indicate the spread of values.

3. RESULTS

Figure 1 shows the polynomial fitted to the continuum about the Mg II λ2802 Å interstellar line. The fits were well behaved for all of the measurements, requiring 2nd order polynomials for continuum regions and 3rd or 4th order polynomials for regions where the interstellar line was embedded in a stellar profile (e.g., ZnII and MgI in Figure 5). Figures 1 and 5 also show the significant reduction in the noise levels which result from adding 5 or more spectra.

Figures 2 and 3 show the reduction in percentage RMS deviation with increasing numbers of summed spectra. The similarities between the curves are striking, showing that the general behaviour is independent of the position on the camera target. For most of the examples, the percentage RMS deviation approaches a constant value, about 3, corresponding to an empirical signal to noise ratio of 33. The greater part of the improvement, for these images, has been attained after summing five spectra. This is illustrated in Figures 2e and f where the summing of up to sixteen spectra caused no further improvement.

However, two exceptions (Figures 2a and 3f), which correspond to the regions to the regions having the lowest mean flux levels, show poorer behaviour. The percentage RMS deviations are 5 and 8 respectively after summing eight spectra Figure 4 illustrates the dependence on the mean flux level in the extracted spectrum. The spectra in this study were extracted using the STAK and TRAK procedure developed in the UK (Giddings and Settle 1980), this has similar resolution but a higher sampling rate than the old IUESIPS. However for this figure the extracted FN's have been scaled to be the same as those for the old IUESIPS. Since the behaviour of the SWP and LWR camera is so similar in this study, the two sets of data were plotted together and follow the same curve within the uncertainties of the measurements. Clearly, for extracted fluxes above 10000 FN (LWR) and 6000 FN (SWP), one generally needs only to sum about five spectra after which the noise in the spectrum is dominated by the noise in the extraction process. Below this level more spectra are required, as is illustrated both by the poorer percentage RMS deviation and the greater difference between the values obtained for the sum of five spectra and the sum of eight spectra. The general levels of noise for single spectra are also shown.

Figure 5 illustrates further advantages of adding spectra: the interstellar lines of MgII ($\lambda\lambda$1239, 1240 Å), which are lost in the noise of any single spectrum of HD219188, stand out clearly in the sum of eight spectra; the ZnII λ2026.2 Å MgI λ2026.5 Å blend is not degraded by the addition of eight spectra, whereas the continuum has, as in many other regions, become more clearly defined. Images taken in the large and small apertures have their reseaux in different places, as do also some images taken at well separated time intervals, or in different parts of the large aperture. On adding the spectra it is possible to have sufficient overlap for the reseaux to be absent in the summed spectrum.

4. CONCLUSIONS

For spectra where the regions of interest have extracted fluxes of more than 10000 FN (LWR) or 6000 FN (SWP), the summing of more than five spectra is probably unwarranted. Adding spectra in the manner described in Section 2, causes no degradation of the line profiles provided the velocity correction is applied before adding. The shape of stellar lines within which interstellar lines are sometimes embedded can be more clearly identified. For this work the spectra were weighted with the mean net flux before adding; a possible improvement would be to weight the spectra using the percentage RMS deviation.

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(see also Gidding, J., this Newsletter page 22)
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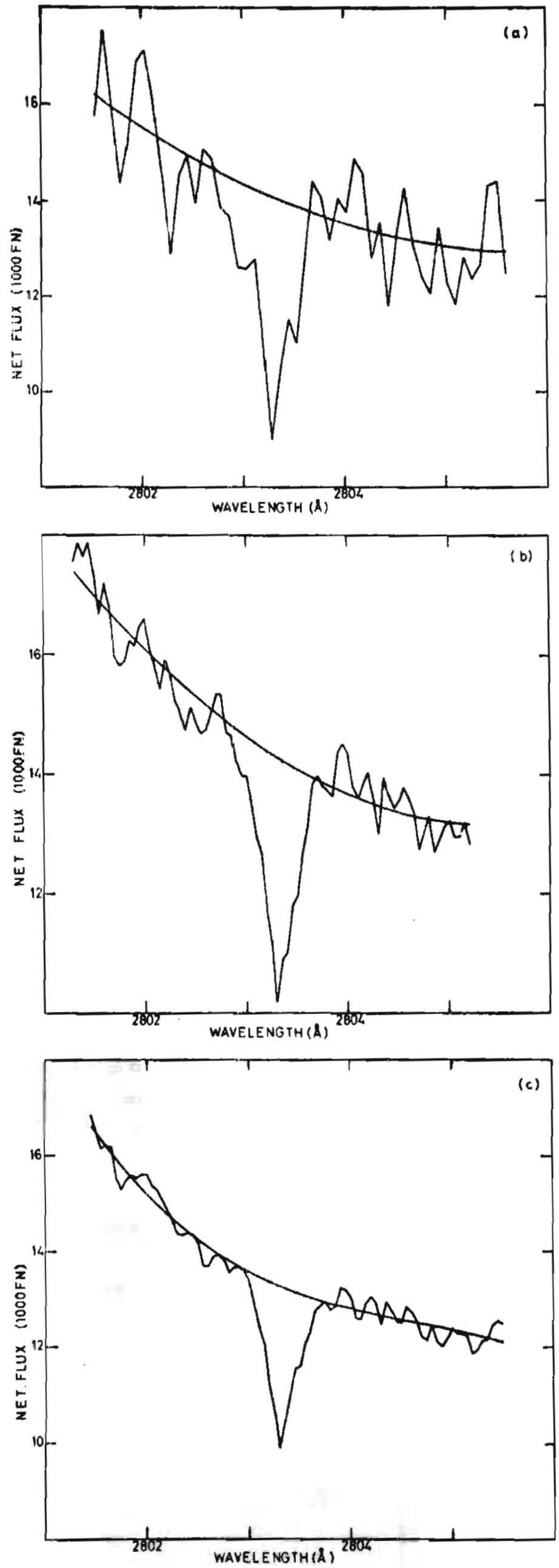

FIGURE 1 - Fit to the continuum about the MgII 2802.7 interstellar line in the spectrum of Eta Uma, A) for an individual image, b) after summing 5 spectra, c) after summing 9 spectra.

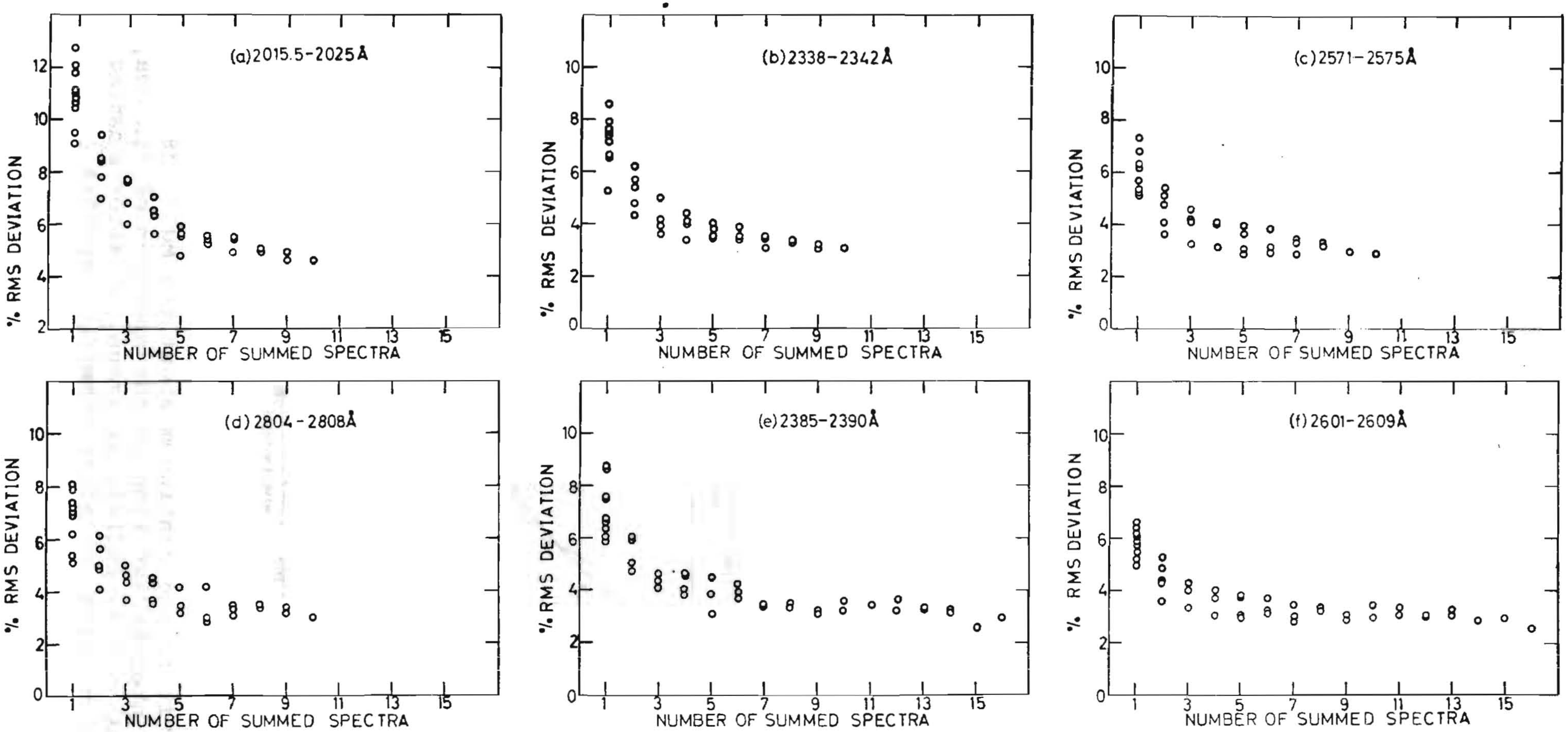

FIGURE 2 - Graphs showing the reduction in % RMS deviation about polynomial fits to the spectra of Eta Uma for six regions of the long wavelength high resolution images.

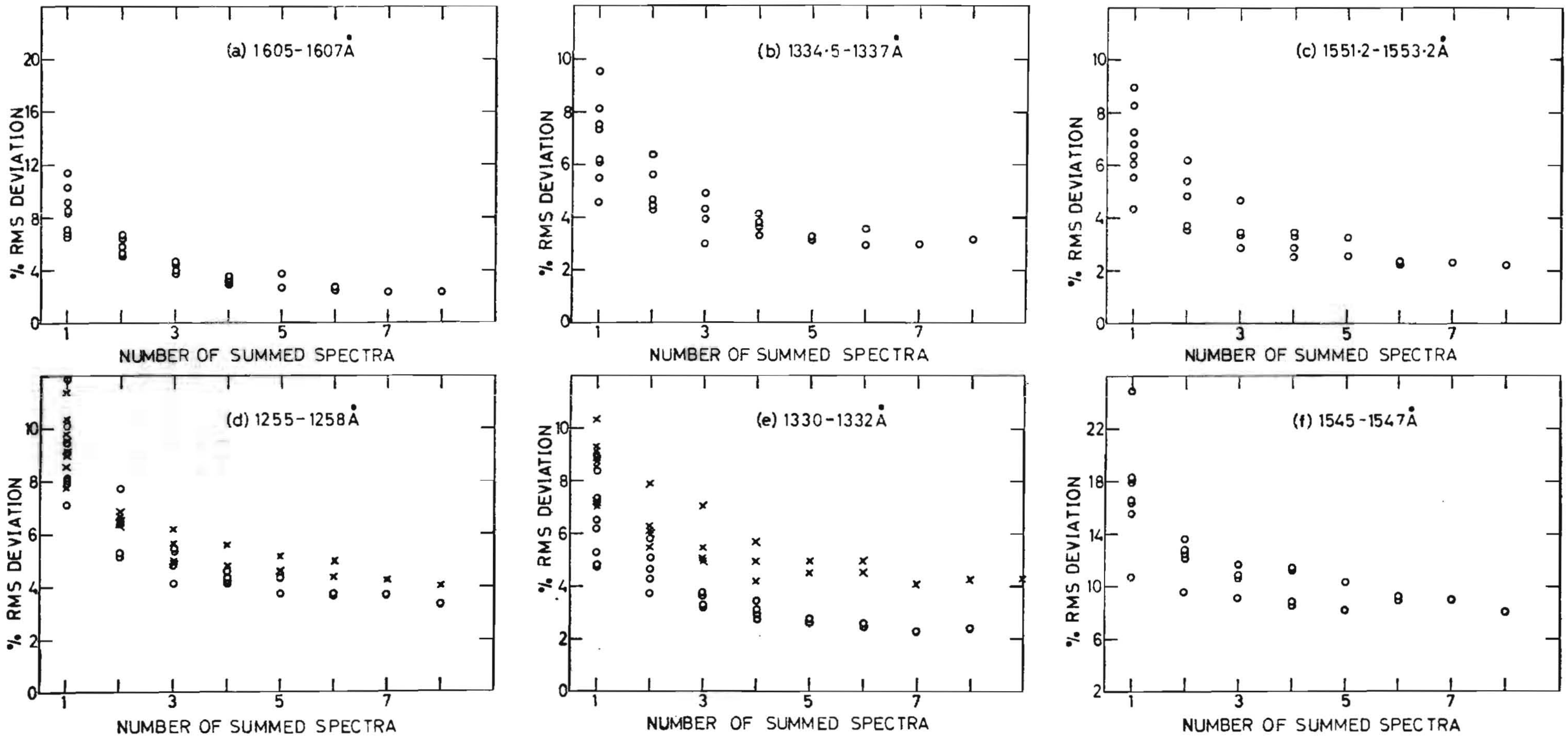

FIGURE 3 - Graphs showing the reduction in % RMS deviation about polynomial fits to the spectra of HD 219288 (o) and Eta Uma for six regions of the short wavelength high resolution images.

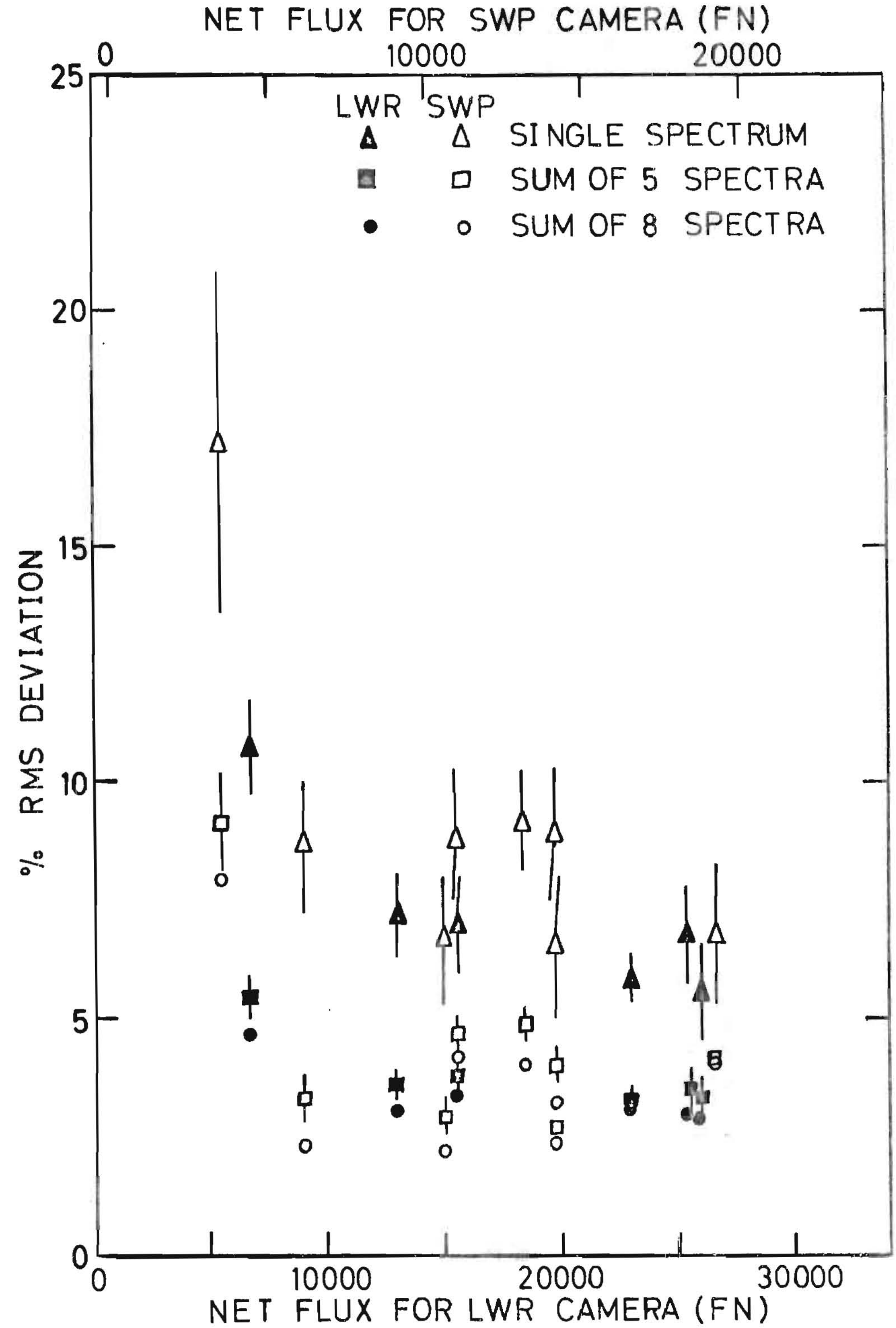

FIGURE 4 - The % RMS deviation for single and summed spectra plotted against the mean FN of each of the spectral regions used in Figures 2 and 3. The SWP axis has been rescaled to allow for the differing maximum FN values used in the photometric correction. The offset zero results from the omission of the background in the rescaling, although the 2000 FN correction was included.

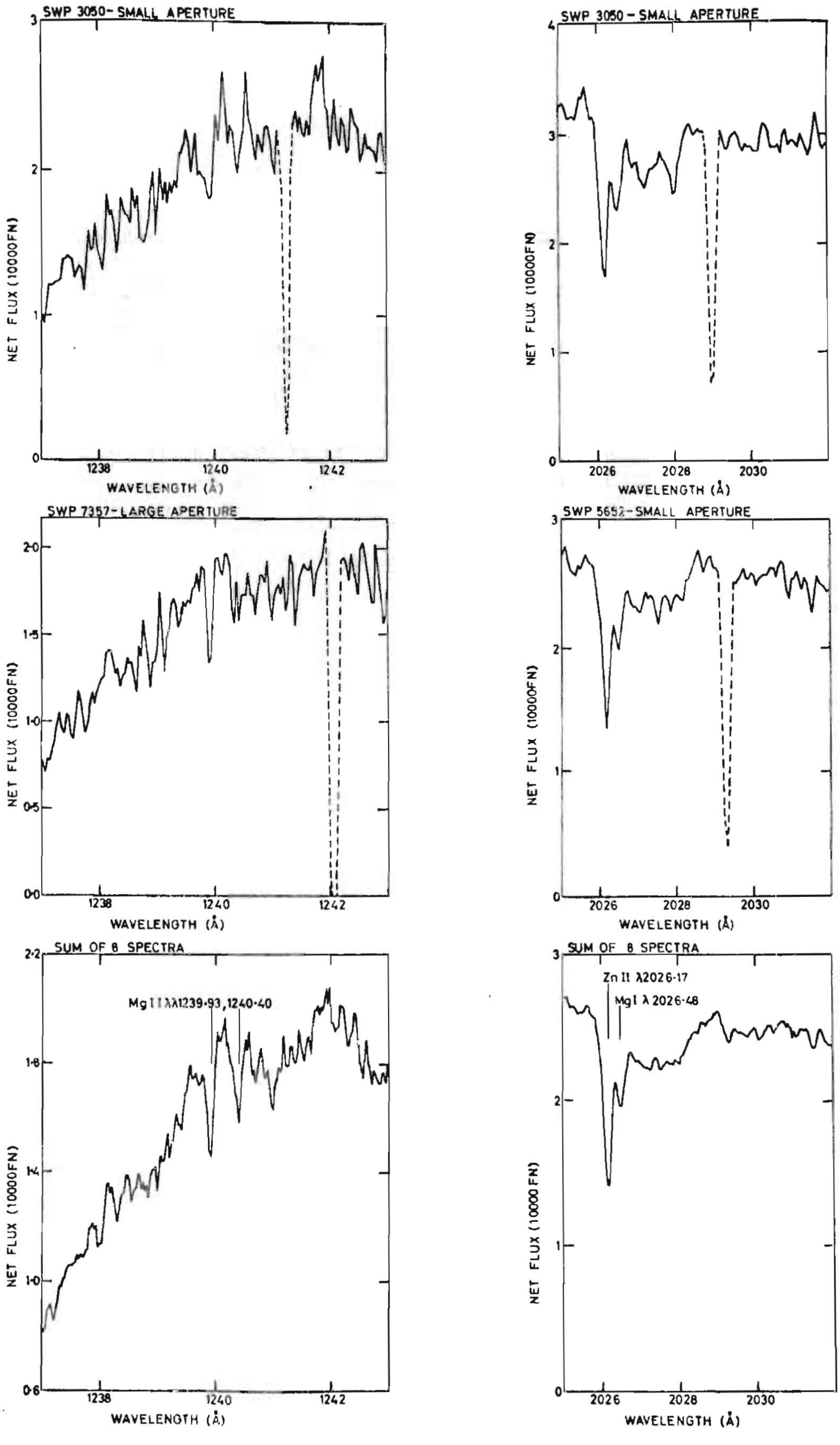

FIGURE 5 - Sample portions of the spectrum of HD 219188 from single spectra (top two rows) and from the sum of 8 spectra. The reduction in noise is evident as is the detection of MgII in the summed spectrum. The removal of a reseau and the clarification of the stellar profile in the summed spectrum are also shown.

Library Bereavements

It was really sad to discover, during a routine checking of our Library, that the CDS microfiches of the Catalogue of Stellar Identifications and of the HD Catalogue, had disappeared. Also, several books were found missing. It should be obvious that catalogues are crucial at VILSPA not only for a proper preparation of the observations but also to insure the safety of IUE.

It is even sadder to notice that the most expensive of the Catalogues that has been stolen can be obtained for 55 French Francs from the Centre de Données Stellaires.

Piero Benvenuti

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Information for Undernourished Epicures - Awards List

Oldest

Casa Botín, Arco de Cuchilleros 17 (266-4217), is easily the oldest restaurant in Madrid; indeed the original oven is still functioning over 250 years later. Since 1725 Botín has gained renown for its cochinillo (roast sucking-pig, tender enough to carve with edge of a plate) and its cordero asado (roast lamb), but the overwhelming influx of tourist over the last decade has taken its toll. Positively dripping with "atmosphere", it still captivates newcomers, but the food and service can be somewhat erratic and when the tunas (wandering minstrels) burst into song the din becomes ear-splitting. Both the Aragonese house wine and the deceptive sangría are conducive to massive hangovers. But it is worth at least one visit to see the tiled 18th-century oven and antique culinary paraphernalia.

Most abundant bodega

This happens to coincide with what many gastronomers (which you will agree sounds better than gastronomes) claim to be the best restaurant in Madrid, with highest marks to chef Clemencio Fuentes for his superb French and regional Spanish dishes and to director Félix Rodríguez and his three maitres d'hotel for exceptional service: Jockey at Amador de los Ríos 6 (419-1003/ 2435). Excellent vintages of both French and Spanish wines await the connoiseur. Prices are naturally high, even for the red house wine (600 Ptas last year), but no other bodega in Spain can match Jockey's.

Best Paella

Ask a roomful of Madrileño gourmets who prepares the best perdiz estofado or the tastiest angulas and you will start a riot. But you would probably find a measure of accord on the purveyor of the best paella: Saint-James, Juan Bravo 26 (275-0069/6010). Its half dozen special rice dishes - including the the inimitable rosexat - turn out rather different from the pale imitations which crop up on international menus.

Most underrated

No restaurant is more frequently damned with faint praise than Bogui, the elegant Franco-Spanish restaurant at the corner of Barquillo and Piamonte (telephone 221-1568). It obviously opened with plenty of chic - pastel colours, mirrors, foliage, even a few large umbrellas - but the cooking did not live up to the décor. Now under new management, it deserves a revisit from the caustic inspectors in whose judgment the cuisine was merely "inoffensive". Salad ingredients are crisp and imaginative the chilled cream of mussels and the seafood pancakes are delicious. Moreover, their periodic feasts of regional cuisine deserve special mention: on my last visit a prize-winning chef from Córdoba had been conscripted, and I dare say that one could have eaten better nowhere in Andalucía.

Most intimate

Perhaps another restaurant should qualify as most romantic (La Mesa Redonda, Calle Nuncio 17, would be one contender), but the most intimate must surely be La Villa, Calle Leizarán 19 (458-7474) in the architecturally interesting area of El Viso. It is so obviously a private dwelling from the exterior that it would be easy to bypass it. Under new management since its days as Le Jardin, centre for Creole cuisine, it is having some teething troubles in the kitchen but such dishes as solomillo de cerdo con ciruelas (tenderloin of pork with plums) can be recommended.

Cheapest

Assuredly it is that famous institution the Villafranca cafeteria. What a romantic setting and what select company at the dinning table!

Longest hours

Guest observers in October and November who have nipped back to Madrid at the end of their "evening" shift know the myth of Spanish nightlife for what it is: anyone strolling past the darkened windows of downtown Madrid at one a.m. in search of a meal may be forgiven for doubting those stories of revelry into the small hours. Naturally the cognoscenti can suggest places to grab a bite at any hour, be it stale tapas in a wine-weary tasca or overpriced meals at a flamenco club. But let me propose as the all-round winner for dining at all hours from late morning up to 02:30 any night of the year the centrally-located Chiky Pub at Calle Mayor 24 (266-2457), its tiny entrance concealing two large dining-rooms. It carries off no culinary prizes but its simple fare is easily superior to that of cafeteria chains like California, Manila, Topics, or Vips.

Most improbable

Examples abound of "restaurantes de lujo", all five forks shining, where the food is a disgrace. As the Spanish proverb has it, "No hace el hábito al monje". But is there a counter-example - an abject tasca whose cuisine has pretensions far beyond its class? There is: La Fuencisly, an inconspicuous two-fork hovel at Calle San Mateo 4 (221-6186) which shares with only eight other restaurants in Madrid the distinction of two "soles" (suns) awarded by the Cofradía de la Buena Mesa. In the evening it appears closed, but do not be put off: knock firmly and the camarero will emerge, unlock the iron grille and lead you through the darkened from bar to the restaurant behind - teeming with discerning dinres! The most highly reputed dish is a special fillet of tuna called ventresca de bonito, but it seems rarely available and I cannot recommend it from personal experience. I can vouch for the old classics, cordero and besugo (see-bream), and the bodega is choice if rather dear.

Jon Darius

INTERNATIONAL ULTRAVIOLET EXPLORER

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UK425	B.BATES/BELFAST	STUDIES OF CIRCUMSTELLAR AND INTERSTELLAR GAS HIGH VELOCITY COMPONENTS
UK426	C.M.GASKELL/CAMBRIDGE	LUMINOSITY CALIBRATION STANDARD OF LOW Z QUASARS
UK427	R.F.CARSWELL/CAMBRIDGE	STUDY OF LYA/HB RATIOS IN LOW REDSHITF QUASARS
UK428	E.F.MILONE/CALGARY	ULTRAVIOLET CENTRE-TO-LIMB VARIATION IN SOLAR-TYPE ECLIPSING BINARY COMPONENTS
UK431	D.J.STICKLAND/RGO	LONG PERIOD VARIABLE STARS
UK433	R.S.ELLIS/DURHAM	ULTRAVIOLET SPECTRA OF NORMAL SPIRAL GALAXIES, AND
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UK435	J.MEABURN/MANCHESTER	HIGH VELOCITY,LOW EXCITATION KNOTS IN HII REGIONS
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UK438	R.W.HILDITCH/ST ANDREWS	THE MASSIVE INTERACTING BINARY SYSTEMS DH CEP AND CC CAS
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UK465	A.BOKSENBERG/UCL	ULTRAVIOLET OBSERVATIONS OF SEYFERT 2 GALAXIES
UK466	A.BOKSENBERG/UCL	IUE OBSERVATIONS OF QSOS, SEYFERT 1 GALAXIES & BL LAC OBJECTS
UK467	M.J.BARLOW/UCL	UV SPECTROPHOTOMETRY OF MAGELLANIC CLOUD PLANETARY NEBULAE
UK468	M.J.BARLOW/UCL	UV SPECTROPHOTOMETRY OF NUCLEI OF SOUTHERN PLANETARY NEBULAE
UK470	M.J.SEATON/UCL	PLANETARY NEBULAE ANT THEIR CENTRAL STARS
UK472	R.WILSON/UCL	OBSERVATION OF THE RESONANCE LINES OF NEUTRAL AND IONIZED HELIUM IN A HIGH REDSHITF QUASAR
UK473	R.WILSON/UCL	UV STUDIES OF X-RAY BINARY SOURCES
UK474	R.WILSON/UCL	A STUDY OF THE ULTRAVIOLET SPECTRA OF QUASARS
UK475	R.WILSON/UCL	STUDIES OF SEYFERT GALAXIES
UK477	R.WILSON/UCL	A STUDY OF THE TWIN QUASAR 0956+561 A, B FOR VARIABILITY AND COMPARISION WITH RADIO DATA
UK478	A.J.WILLIS/UCL	HIGH RESOLUTION STUDIES OF MC OB STARS/ INTERSTELLAR GAS AND GALACTIC HALO
UK479	A.J.WILLIS/UCL	THE STELLAR WINDS OF INTERMEDIATE OF/WN7 STARS
UK480	A.J.WILLIS/UCL	PROBES OF THE STELLAR WINDS IN WR SPECTROSCOPIC BINARIES (WR+O)
UK481	A.J.WILLIS/UCL	THREE-PHASE DIAGNOSTICS OF NONTHERMAL AND BINARY EFFECTS IN THE BE STARS
UK482	C.JORDAN/OXFORD	CHROMOSPHERES AND CORONAE OF STARS ON OR NEAR THE MAIN SEQUENCE
UK483	C.JORDAN/OXFORD	HIGH RESOLUTION STUDIES OF HYBRID GIANTS AND RELATED STARS
UK484	D.J.STICKLAND/RGO	UV OBSERVATIONS OF PECULIAR BINARIES
UK486	R.F.JAMESON/LEICESTER	UV SPECTRA OF CATACLYSMIC VARIABLES WITH VARIABLE ACCRETION RATES
UK487	A.D.ANDREWS/ARMAGH	STUDIES OF THE QUIET PLAGE COMPONENT OF THE ACTIVE STARS IN RS CVN BINARY SYSTEMS AND
UK488		STUDIES OF SPOTS, PLAGES AND FLARES IN BY DRACONIS-TYPE VARIABLE STARS
UK491	M.WARD/CAMBRIDG5	UV SPECTRA OF X-RAY SELECTED ACTIVE GALAXIES
UK493	C.J.BUTLER/ARMAGH	AN UV SURVEY WITH SIMULTANEOUS OPTICAL OBSERVATIONS OF SOLAR-NEIGHBOURHOOD DM STARS AND FLARE STARS
UK494	J.E.BECKMAN/LONDON	MAGNETIC VARIABILITY CYCLES OF LATE TYPE STARS

LIST OF ABBREVIATIONS USED

AAO ANGLO-AUSTRALIAN OBSERVATORY
S&AD SPACE & ASTROPHYSICS DIVISION OF RUTHERFORD AND APPLETON LABORATORY
RGO ROYAL GREENWICH OBSERVATORY
ROE ROYAL OBSERVATORY EDINBURGH
UCL UNIVERSITY COLLEGE LONDON
AAO ANGLO AUSTRALIAN OBSERVATORY
SAAO SOUTH AFRICAN ASTRONOMICAL OBSERVATORY

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OBSERVING PROGRAMMES SUBMITTED THROUGH THE EUROPEAN SPACE AGENCY

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MA501	M AUVERGNE/NICE	STUDY OF THE MG II LINE EMISSION IN THE SHORT PERIOD VARIABLE STAR • PUPPIS
CZ502	C ZWAAN/UTRECHT	MAGNETIC STRUCTURE OF F,G AND K TYPE STARS
MR503	M ROSA/HEIDELBERG	THE EXCITING STARS OF EXTRAGALACTIC HII REGIONS
JH505	J HEIDMANN/PARIS	OBSERVATIONS OF CLUMPY IRREGULAR GALAXIES
GH506	G HAMMERSCHLAG/AMSTERDAM	SHORT TIME VARIATIONS IN THE MASS-LOSS RATE OF EARLY TYPE STARS: THE CASE OF ! CAS
MH507	M HACK/TRIESTE	BP AND HE-POOR STARS BELONGING TO THE GALACTIC DISK AND HALO
RW508	R WEINBERGER/INNSBRUCK	OBSERVATIONS OF THE CENTRAL STAR OF A HUGE NEW NEARBY PN
SD509	S D'ODORICO/GARCHING	CARBON ABUNDANCE IN THE GASEOUS PHASE OF M 33
AH510	A HECK/MADRID	SPECTRAL CLASSIFICATION IN THE ULTRAVIOLET
RK511	R.P. KUDRITZKI/KIEL	NON-LTE ANALYSIS OF SUBDWARF O-STARS
MD512	M DENNEFELD/PARIS	HYDROGEN LINE RATIOS IN INTERMEDIATE REDSHIFT QUASARS
JB513	J BERGERON/PARIS	SPECTROPHOTOMETRY OF INTERMEDIATE REDSHIFT QUASARS
JC514	J CLAVEL/PARIS	A STUDY OF THE VARIABILITY OF BRIGHT SEYFERT I GALAXIES BY MEANS OF SIMULTANEOUS OBSERVATIONS IN THE UV, VISIBLE AND X-RAY RANGE
CB515	C BERTOUT/HEIDELBERG	SPECTROSCOPY OF SELECTED T TAURI STARS
KF516	K FREDGA/STOCKHOLM	STELLAR MG II LINES
DK518	D KOESTER/KIEL	SPECTROSCOPY OF WHITE DWARFS WITH HELIUM-RICH ATMOSPHERES
WE519	W EICHENDORF/GARCHING	CLASSICAL CEPHEIDS
JF520	J.V FEITZINGER/BOCHUM	WARPING AND HALO OF THE LARGE MAGELLANIC CLOUD
KF521	K.H FRICKE/BONN	THE LONG-TERM VARIABILITY OF THE LYMAN ALPHA EMISSION FROM JUPITER, SATURN AND URANUS
RK522	R.P KUDRITZKI/KIEL	NON-LTE ANALYSIS OF CENTRAL STARS OF PLANETARY NEBULA
RK523	R.P.KUDRITZKI/KIEL	NON-LTE ANALYSIS OF NITROGEN-RICH MAIN SEQUENCE O-STARS
DS524	D SCHOENBERNER/KIEL	ULTRAVIOLET SPECTROSCOPY OF EXTREME HELIUM STARS
WE525	W EICHENDORF/GARCHING	SHELL STRUCTURES AROUND CLASSICAL CEPHEIDS
JB526	J BERGERON/PARIS	SPECTROPHOTOMETRY OF NARROW LINE ACTIVE NUCLEI WITH HIGH EXCITATION LINES AND/OR RADIO EMISSION
HD527	H DRECHSEL/BAMBERG	INTERACTING CONTACT BINARIES
JR528	J RAHE/BAMBERG	UV OBSERVATIONS OF COMETS BRIGHTER THAN 9TH MAGNITUDE AS TARGET OF OPPORTUNITY
LM529	L MARASCHI/MILANO	OBSERVATIONS OF X-RAY EMITTING QSOS AND BL LAC OBJECTS
HN530	H NUSSBAUMER/ZURICH	GALACTIC WOLF-RAYET STARS
CC533	C CACCIARI/MADRID	"BLUE" GLOBULAR CLUSTERS IN THE LARGE MAGELLANIC CLOUD
FP534	F PRADERIE/PARIS	EMISSION, MASS LOSS AND CHROMOSPHERES IN HERBIG AE STARS II
HT535	H.R TJIN A DJIE/AMSTERDAM	ULTRAVIOLET STUDIES OF THE SHELLS OF HERBIG AE AND BE STARS
FF536	F FUSI-PECCI/BOLOGNA	UV-BRIGHT STARS IN GLOBULAR CLUSTERS
SC537	S CATALANO/CATANIA	STELLAR CHROMOSPHERES
MG539	M GERBALDI/PARIS	ULTRAVIOLET OBSERVATIONS OF HIGH VELOCITY A TYPE STARS

MG540	M GERBALDI/PARIS	ULTRAVIOLET OBSERVATIONS OF CANDIDATE RUNAWAY B TYPE STARS
MG541	M GERBALDI/PARIS	ULTRAVIOLET OBSERVATIONS OF BLUE-STRAGGLERS IN OPEN CLUSTERS
JL542	J LEQUEUX/PARIS	EXTRAGALACTIC H II REGIONS
FP543	F PRADERIE/P1RIS	STUDY OF THE TRANSITION ZONE IN LATE A-TYPE STARS
BB544	B BASCHEK/HEIDELBERG	HIGH RESOLUTION SPECTROSCOPY OF BLUE HALO STARS
AA545	A ALTAMORE/ROME	IUE OBSERVATIONS OF SYMBIOTIC STARS DURING MINIMUM
EG546	E GEYER/BONN	UV OBSERVATIONS OF OLD AND YOUNG POPULOUS CLUSTERS IN THE MAGELLANIC CLOUDS
RV547	R VIOTTI/FRASCATI	COORDINATED ULTRAVIOLET (IUE), OPTICAL AND INFRARED OBSERVATIONS OF THE P CYGNI STAR AG CARINAE AND ITS RING NEBULA
VC548	V CALOI/FRASCATI	EVOLVED GLOBULAR CLUSTER STARS
VC549	V CALOI/FRASCATI	INTEGRATED SPECTRA OF GLOBULAR CLUSTERS
AH550	A HECK/M1DRID	ULTRAVIOLET OBSERVATIONS OF WC 10 STARS
CE551	C EIROA/HEIDELBERG	UV OBSERVATIONS OF THE BIPOLAR NEBULA S106
DP552	D PONZ/MADRID	SYMBIOTIC STARS DURING ACTIVITY PHASES
AH553	A HECK/MADRID	AP STARS CLASSIFICATION CRITERIA
CC554	C CACCIARI/MADRID	UV OBSERVATIONS OF GLOBULAR CLUSTERS IN THE MAGELLANIC CLOUDS
GV555	G VAUCLAIR/PARIS	CHEMICAL COMPOSITION AND DIFFUSION IN HIGH GRAVITY STARS
AE556	A ELVIUS/STOCKHOLM	OBSERVATIONS OF SEYFERT 1 GALAXIES
IB557	I BUES/BAMBERG	INTERMEDIATE WHITE DWARFS
SP558	S.R.POTTASCH/GRONINGEN	EXTINCTION TO PLANETARY NEBULAE
JK559	J KOPPEN/HEIDELBERG	HIGH DISPERSION OBSERVATIONS OF PLANETARY NEBULAE
CC560	C CASINI/MILANO	OBSERVATIONS OF INTERACTING GALAXIES
FG561	F GIOVANELLI/FRASCATI	UV SPECTRA OF HDE 245770/A 0535+26
JC562	J CLAVEL/PARIS	INVESTIGATION OF THE STELAR CONTENT OF THE DWARFS BLUE EMISSION LINE GALAXIES
PP563	P PATRIARCHI/MADRID	THE ORION NEBULA
RS564	R STALIO/TRIESTE	MONITORING UV-VARIABILITY IN FOUR O-STARS
LA565	L ANGELETTI/ROM5	ULTRAVIOLET SPECTROPHOTOMETRY OF GALACTIC GLOBULAR CLUSTERS II
DG566	D.P. GILRA/GRONONGEN	STUDY OF PECULIAR BE STARS
DG567	D.P. GILRA/GRONINGEN	UV OBSERVATIONS OF STARS IN DUSTY HII REGIONS AND REFLECTION NEBULAE
HN568	NOORGAARD-NIELSEN/COPENHAGEN	UV SPECTRA OF ELLIPTICAL GALAXIES
WK569	W KOLLATSCHNY/GOTTINGEN	L/H/P ALPHA/H BETA RATIOS IN ACTIVE GALAXIES
GK570	G KLARE/HEIDELBERG	ORBITAL PHASE DEPENDENT UV SPECTROSCOPY OF CATACLYSMIC VARIABLES
LP572	L PREVOT/MARSEILLE	A FAR UV STUDY OF INTERSTELLAR MATTER IN THE SMALL MAGELLANIC CLOUD
SP573	S.R.POTTASCH/GRONINGEN	MASS-LOSS OF WOLF-RAYET-TYPE CENTRAL STARS OF PLANETARY NEBULAE
MG574	M GREWING/TUBINGEN	K-CORRECTION FOR BRIGHTEST GALAXIES IN CLUSTERS
JK575	J KRAUTTER/HEIDELBERG	STRUCTURE AND EVOLUTIONARY STATUS OF CATACLYSMIC VARIABLES
PS576	P.L.SELVELLI/TRIESTE	CONTINOUS MONITORING OF NOVAE AT MINIMUM DURING ONE COMPLETE ORBITAL CYCLE
PS577	P.L.SELVELLI/TRIESTE	LOW AND HIGH RESOLUTION OBSERVATIONS OF NOVA AGL 1918 IN THE LWR REGION
DR578	D REIMERS/HAMBURG	WINDS AND CORONAE IN RED GIANTS WITH VARIABLE CIRCUMSTELLAR LINES
HR579	H RITTER/GARCHING	ULTRAVIOLET SPECTROSCOPY OF HZ HER NEAR X-RAY ECLIPSE
DR580	D REIMERS/HAMBURG	MASS-LOSS OF RED GIANTS WITH HOT COMPANIONS AND MASS LOSS FROM CARBON STARS

JP581	J PAUL/GIF-SUR-YVETTE	CO CULUM DENSITIES AND ELEMENTAL DEPLETIONS IN NEARBY INTERSTELLAR CLOUDS
FB582	F BERTOLA/PADOVA	UV CONTINUUM ENERGY DISTRIBUTION IN THE NUCLEI OF ELLIPTICAL GALAXIES
MC583	M CAPACCIOLI/PADOVA	CONTINUUM ENERGY DISTRIBUTION IN SO GALAXIES
HM585	H MAITZEN/WIEN	SILICON AUTOIONIZATION FEATURES AND SPECTRAL VARIABILITY IN AP-STARS
NP586	N PANAGIA/BOLOGNA	UV OBSERVATIONS OF SUPERNOVAE
NP587	N PANAGIA/BOLOGNA	UV MAPPING OF THE NUCLEAR REGION OF M 100
AB588	A BIANCHINI/PADOVA	UV OBSERVATIONS OF THE OLD-NOVA GK PER = A0327+43
DR590	D REIMERS/HAMBURG	ACCRETION DISKS AROUND WHITE DWARFS IN NON-CLOSE BINARY SYSTEMS
GG591	G.GAHM/STOCKHOLM	EXPLORATION OF ULTRAVIOLET SPECTRUM OF YOUNG STARS
FS592	F SPITE/PARIS	CHECK OF STRUCTURE AND EVOLUTION OF POPULATION II STARS
HL593	H LAMERS/UTRECHT	THE NATURE AND ORIGIN OF OBN AND OBC STARS
GB594	G.F. BIGNAMI/MILANO	INVESTIGATION ON THE BINARY NATURE OF THE RADIO AND X-RAY STAR LSI+61 303,ASSOCIATED WITH A COS-B GAMMA RAY SOURCE
MU595	M.H. ULRICH/GARCHING	UV AND OPTICAL OBSERVATIONS OF ACTIVE NUCLEI: A STUDY OF NON-STELLAR CONTINOUS RADIATION
CD596	C DE LOORE/BRUSSEL	MASS LOSS AND ANALYSIS OF THE SPECTRUM OF THE HOT BE COMPONENT OF THE PULSATING X-RAY NOVA A0535+262
HS599	H.J.STAUDE/HEIDELBERG	HD 190073 AND OTHER PECULIAR SHELL STARS
HN600	N NUSSBAUMER/ZURICH	PROTO PLANETARY NEBULAE
JB601	J.M.BONNET-BIDAUD/YVETTE	ULTRAVIOLET OBSERVATIONS OF X-RAY SOURCES WITH IUE
DK602	D KUNTH/PARIS	OBSERVATIONS OF LOW-REDSHIFT RADIO QUIET QSOS
MG604	M GREWING/TUBINGEN	DYNAMICAL PROPERTIES OF NEARBY INTERSTELLAR GAS
MG605	M GREWING/TUBINGEN	STUDY OF TWO EARLY-TYPE STARS IN THE LARGE MAGELLANIC CLOUD (LMC) EMBEDDED IN THE NEBULOSITY N 144
FQ606	F QUERCI/PARIS	CARBON STARS SEQUENCE: R TO N STARS
BW607	B WOLF/HEIDELBERG	HIGH DISPERSION SPECTROSCOPY OF THE P CYG STAR R 81 OF THE LMC
PB608	P BRUSTON/BUISSON	THE NEARBY INTERSTELLAR MADIUM
CL609	C LAURENT/BUISSON	INVESTIGATION OF HIGH-VELOCITY COMPONENTS IN THE GREAT CARINA NEBULA
MD610	M.A. DOPITA/SIDING	UV SPECTROSCOPY OF AN EXTREMELY METAL POOR EXTRAGALACTIC SUPERNOVA REMNANT
SD611	S D'ODORICO/GARCHING	ACTIVE AND QUIESCENT NUCLEI OF SPIRAL GALAXIES
PB612	P BENVENUTI/ASIAGO	MEASUREMENT OF THE DUST ALBEDO IN THE 2200 A REGION
GP613	G PALUMBO/BOLOGNA	UV EMISSION FROM NORMAL BRIGHT SPIRAL GALAXIES
PS614	P SHAVER/GARCHING	JETS IN ACTIVE GALACTIC NUCLEI
PS615	P SELVELLI/TRIESTE	OBSERVATIONS OF THE PECULIAR EMISSION LINE STAR 45667

G.O. PROGRAMMES IN COLLABORATION WITH NASA AND/OR SRC

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GH504	G.HAMMERSCHLAG/AMSTERDAM	IUE OBSERVATIONS OF X-RAY BINARIES: HIGH RESOLUTION OBSERVATIONS OF SMC X-1
DD517	D.DRAVINS/LUND	CORONAL TRANSITION REGION IN THE SOLAR-TYPE STAR BETA HYDRI
MR531	M.RODONO/CATANIA	STUDIES OF THE QUIET AND PLAGE COMPONENT OF THE ACTIVE STARS IN RS CVN BINARY SYSTEMS
VB538	V.DOAZAN/PARIS	THREE-PHASE DIAGNOSTICS OF NONTHERMAL AND BINARY EFFECTS IN BE STARS
CL571	C.LAURENT/VERRIERES-LE-BUISSON	THE EXTEND OF A GASEOUS GALACTIC HALO
FB584	F.BERTOLA/PADOVA	UV ENERGY DISTRIBUTION OF CD GALAXIES
OE589	O.ENGVOLD/OSLO	AN EMISSION MEASURE ANALYSIS OF THE K GIANT BETA CETI (SOLAR-TYPE) AND THE M SUPERGIANT ALPHA ORI (NON-SOLAR-TYPE) BASED ON IUE FAR-UV HIGH RESOLUTION SPECTRA
MU597	M.H.ULRICH/MUNICH	CONTINUATION OF THE MONITORING OF THE CONTINUUM AND LINE STRENGTHS OF THE SEYFERT GALAOY NGC 4151
OV598	O.VILHU/HELSINKI	PERIOD-ACTIVITY RELATIONS IN SOLAR TYPE CLOSE BINARIES
MC603	M.COMBES/PARIS	UV OBSERVATIONS OF GIANT PLANETS AND THEIR SATELLITES

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

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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 OR LG	DATE	START HR MN SC	LENGTH MIN SC	PROG	COMMENT
SERENDIP	00	00.0	00 00 00	-00 00	L 1	1350	L 0	25AUG81	21 19 09	360 00	UK472	003 READ AT GSFC
HD 2905	23	04.2	00 30 08	+62 39	H 3	14845	S 0	28AUG81	19 29 49	004 30	HL593	501
HD 2905	23	04.2	00 30 28	+62 39	H 3	14826	S 0	26AUG81	22 20 31	002 40	HL593	401
HD 3795	44	06.1	00 38 02	-24 04	L 2	11386	L 0	21AUG81	00 11 57	002 20	UK428	602 4-MIN HTR WARM UP
B CETI	47	02.0	00 41 04	-18 16	H 3	14786	L 0	19AUG81	19 34 11	795 00	UE589	779 READ AT GSFC
H 4142	21	5.7	00 41 39	+47 35	L 2	11205	S 0	31JUL81	01 21 26	000 06	VILSP	402
H 4142	21	5.7	00 41 39	+47 35	L 2	11205	L 0	31JUL81	01 16 51	000 05	VILSP	502
H 4142	21	5.7	00 41 39	+47 35	H 2	11206	L 0	31JUL81	02 21 30	004 50	VILSP	502
H 4142	21	5.7	00 41 39	+47 35	L 3	14611	S 0	31JUL81	01 29 06	000 10	VILSP	400
H 4142	21	5.7	00 41 39	+47 35	L 3	14611	L 0	31JUL81	01 25 19	000 07	VILSP	600
H 4142	21	5.7	00 41 39	+47 35	H 3	14612	L 0	31JUL81	02 29 54	005 30	VILSP	501
H 4539	16	10.3	00 44 54	+09 42	H 2	11138	L 0	25JUL81	01 05 43	160 00	BB544	605
MKN 348	84	14.5	00 46 05	+31 41	L 2	11163	L 0	27JUL81	23 01 23	286 00	UK465	337
BBB280	26	2.3	00 46 17	-73 28	L 2	11324	L 0	14AUG81	23 54 23	113 00	UK480	405
BBB280	26	2.3	00 46 17	-73 28	L 3	14765	L 0	14AUG81	22 35 02	070 00	UK480	300
HD 5394	26	2.6	00 53 40	+60 27	H 3	14760	L 0	14AUG81	18 28 22	000 06	UK480	551
HD 5394	26	2.8	00 53 40	+60 27	H 3	14968	L 0	12SEP81	16 20 35	000 08	GH506	501
HD 5394	26	2.8	00 53 40	+60 27	H 3	14988	L 0	14SEP81	16 27 46	000 08	GH506	501
HD 5394	26	2.8	00 53 40	+60 27	H 3	14989	L 0	14SEP81	17 00 56	000 08	GH506	501
HD 5394	20	02.6	00 53 40	+60 27	H 3	15015	L 0	16SEP81	23 06 33	000 07	VD538	501
HD 5394	26	02.8	00 53 40	+60 27	H 3	15034	L 0	18SEP81	16 51 55	000 08	GH506	501
HD 5394	26	02.6	00 53 40	+60 27	H 3	15043	L 0	19SEP81	18 38 28	000 08	UK480	501
HD 5394	26	02.6	00 53 40	+60 27	H 3	15063	L 0	20SEP81	22 47 50	000 08	GH506	501
HD 5394	26	02.6	00 53 40	+60 27	H 3	15064	L 0	20SEP81	23 12 24	000 08	GH506	501
HD 5394	26	02.6	00 53 40	+60 27	H 3	15119	L 0	28SEP81	19 27 24	000 08	UK473	502
HD 5394	26	1.6	00 53 40	+60 27	H 3	15185	L 0	05OCT81	17 22 31	000 08	UK473	501
HD 5394	59	2.6	00 53 40	+60 27	H 3	15254	L 0	13OCT81	19 51 16	000 08	UK475	501
HD 5394	59	2.6	00 53 40	+60 27	H 3	15278	L 0	16OCT81	21 28 23	000 08	GH506	501
HD 5394	59	2.6	00 53 40	+60 27	H 3	15299	L 0	20OCT81	18 07 10	000 08	RS564	501
HD 5394	26	2.6	00 53 41	+60 27	H 3	15206	L 0	08OCT81	14 32 43	000 08	GH506	501
HD 5394	20	2.6	00 53 41	+60 27	H 3	15227	L 0	10OCT81	16 06 29	000 08	GH506	501
HD 6269	44	06.3	01 00 55	-29 48	L 2	11385	L 0	20AUG81	23 14 32	012 00	UK428	703 4-MIN HTR WARM UP
HD 6980	44	08.5	01 07 21	-46 32	L 2	11380	L 0	20AUG81	17 57 54	028 00	UK428	603 4-MIN HTR WARM UP
HD 6980	44	08.5	01 07 21	-46 32	L 2	11381	L 0	20AUG81	19 02 19	028 00	UK428	703 4-MIN HTR WARM UP
HD 6980	44	08.5	01 07 21	-46 32	L 2	11382	L 0	20AUG81	20 01 46	026 00	UK428	703 4-MIN HTR WARM UP
HD 6980	44	08.5	01 07 21	-46 32	L 2	11383	L 0	20AUG81	20 58 59	024 00	UK428	703 4-MIN HTR WARM UP
HD 6980	44	08.5	01 07 21	-46 32	L 2	11384	L 0	20AUG81	21 53 01	024 00	UK428	703 4-MIN HTR WARM UP
HD 8799	41	04.8	01 24 39	+45 09	L 3	14876	L 0	01SEP81	16 32 46	070 00	CZ502	741
HD 12533	47	02.1	02 00 49	+42 05	H 2	11439	L 0	29AUG81	22 47 33	015 00	CZ502	352
HD 12533	47	02.1	02 00 49	+42 05	L 3	14858	L 0	29AUG81	23 19 12	050 00	CZ502	901
HD 12993	12	8.6	02 05 33	+57 42	H 2	11790	L 0	16OCT81	17 42 25	030 00	RK523	302 4-MIN HTR W-UP
HD 12993	12	8.6	02 05 33	+57 42	L 3	15276	L 0	16OCT81	17 37 31	001 20	RK523	301
HD 12993	12	8.6	02 05 33	+57 42	H 3	15277	L 0	16OCT81	18 16 46	105 00	RK523	401
0215+015	87	14.5	02 15 14	+01 31	L 1	1353	L 0	12SEP81	18 47 21	233 00	UK446	301 ! BAD SCAN
3C 66A	87	15.0	02 19 30	+42 48	L 2	11419	L 0	27AUG81	23 37 20	130 00	LM529	303
3C 66A	87	15.0	02 19 30	+42 48	L 3	14838	L 0	27AUG81	18 53 27	280 00	LM529	303
LSI61303	26	10.8	02 36 41	+61 01	H 2	11411	L 0	24AUG81	23 21 46	035 00	GP594	102 MICROPHONICS
LSI61303	27	10.8	02 36 41	+61 01	L 2	11635	L 0	28SEP81	18 24 02	045 00	UK473	602 4 MIN HTR WARM UP

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
LSI61303	59	10.8	02 36 41	+61 01	L 2	11646	L 0	30SEP81	20 16 26	040 00	UK473	501 4 MIN HTR WARM UP
LSI61303	59	10.8	02 36 41	+61 01	L 2	11692	L 0	05OCT81	16 21 00	040 00	UK473	651 4-MIN HTR W-UP
LSI61303	26	10.8	02 36 41	+61 01	L 2	11791	L 0	16OCT81	20 28 31	040 00	GB594	503
LSI61303	26	10.8	02 36 41	+61 01	L 2	11811	L 0	20OCT81	18 34 15	045 00	GB594	502
LSI61303	26	10.8	02 36 41	+61 01	L 3	14807	L 0	25AUG81	00 02 08	105 00	GB594	431
LSI61303	59	10.0	02 36 41	+61 01	L 3	15044	L 0	19SEP81	17 21 28	090 00	UK480	331
LSI61303	27	10.8	02 36 41	+61 01	L 3	15118	L 0	28SEP81	16 50 14	090 00	UK473	332
LSI61303	59	10.8	02 36 41	+61 01	L 3	15140	L 0	30SEP81	21 02 41	094 00	UK473	332
LSI61303	59	10.8	02 36 41	+61 01	L 3	15184	L 0	05OCT81	14 47 48	090 00	UK473	332
LSI61303	26	10.8	02 36 41	+61 01	L 3	15300	L 0	20OCT81	19 29 25	138 00	GB594	401
N 1068	84	10.0	02 40 07	-00 13	L 2	11186	L 0	30JUL81	00 11 45	030 00	UK465	342
N 1068	84	10.0	02 40 07	-00 13	L 3	14589	L 0	30JUL81	00 44 47	183 00	UK465	472
HD 19820	12	7.0	03 10 08	+59 23	L 2	11219	L 0	02AUG81	19 06 19	000 24	UK438	402 MICROPHONICS
HD 19820	12	7.0	03 10 08	+59 23	H 2	11220	L 0	02AUG81	22 42 37	030 00	UK438	403
HD 19820	12	7.0	03 10 08	+59 23	L 2	11221	L 0	02AUG81	23 44 07	002 10	UK438	702
HD 19820	12	7.0	03 10 08	+59 23	L 3	14630	L 0	02AUG81	18 32 10	004 46	UK438	701
HD 19820	12	7.0	03 10 08	+59 23	L 3	14631	L 0	02AUG81	19 27 07	002 23	UK438	501
HD 19820	12	7.0	03 10 08	+59 23	H 3	14632	L 0	02AUG81	19 58 34	160 00	UK438	502
Q0312-77	85	15.9	03 12 56	-77 01	L 3	14485	L 0	16JUL81	02 12 34	000 00	UK427	000 EXP CONT AT GSFC
MGN 1275	84	13.0	03 16 30	+41 20	L 3	15343	L 0	29OCT81	15 20 34	377 00	UK419	352NUC AT FES X=113Y=-94
MGN 1275	84	13.0	03 16 30	+41 20	L 3	15346	L 0	30OCT81	14 54 20	410 00	UK419	252NUC AT FES X=113Y=-94
NGC 1275	84	13.0	03 16 31	+41 20	L 3	15335	L 0	27OCT81	15 32 01	375 00	UK419	222
GK PER	55	13.0	03 27 48	+43 44	L 2	11849	L 0	26OCT81	14 45 45	075 00	AB588	234 MN=471
GK PER	55	13.0	03 27 48	+43 44	L 3	15331	L 0	26OCT81	16 04 28	343 00	AB588	230
HD 21981	30	06.0	03 29 01	-47 33	L 2	11387	L 0	21AUG81	01 00 05	000 24	UK428	502 4-MIN HTR WARM UP
HD 21981	30	06.0	03 29 01	-47 33	L 2	11388	L 0	21AUG81	01 32 06	000 24	UK428	502 4-MIN HTR WARM UP
NGC 1360	70	11.3	03 31 12	-26 01	H 2	11784	L 0	15OCT81	14 31 11	060 00	RK522	363 4-MIN HTR W-UP
HD 22468	44	6.0	03 34 13	+00 25	H 2	11665	L 0	02OCT81	21 06 14	015 00	MR531	353 4-MIN HTR W-UP
HD22468	44	6.0	03 34 13	+00 25	H 2	11674	L 0	03OCT81	21 27 04	015 00	UK487	253 4-MIN HTR W-UP
HD22468	44	6.0	03 34 13	+00 25	H 2	11683	L 0	04OCT81	14 53 04	015 00	UK487	353 4-MIN HTR W-UP
HD 22468	44	6.0	03 34 13	+00 25	L 3	15158	L 0	02OCT81	21 38 42	045 00	MR531	360 READ AT GSFC
HD22468	44	6.0	03 34 13	+00 25	L 3	15167	L 0	03OCT81	21 45 15	025 00	UK487	350 READ AT GSFC
HD22468	44	6.0	03 34 13	+00 25	L 3	15173	L 0	04OCT81	14 14 10	035 00	UK487	350
NGC 1466	83	11.6	03 44 36	-71 45	L 3	15244	L 0	12OCT81	14 40 19	400 00	GLORC	11X HIGH BKG: FPM HIGH
HD 24534	14	6.1	03 52 15	+30 54	H 3	15226	L 0	10OCT81	14 54 19	020 00	GH506	501
IC 2003	72	12.4	03 53 12	+33 43	H 3	14551	L 0	24JUL81	21 12 26	200 00	JK559	161
Q0414-06	85	15.0	04 14 49	-06 01	L 1	1365	L 0	25OCT81	16 13 35	240 00	UK474	000 BKG EXP
Q0414-06	85	15.0	04 14 49	-06 01	L 2	11827	L 0	23OCT81	14 54 05	409 00	UK474	348 4-M HTR W-UP MN=705
Q0414-06	85	15.0	04 14 49	-06 01	L 3	15329	L 0	25OCT81	15 15 32	361 00	UK474	332
HD 27309	36	5.4	04 16 39	+21 39	H 2	11253	L 0	05AUG81	23 29 03	006 10	STAND	572
56 TAU	36	5.4	04 16 39	+21 39	H 3	14669	L 0	05AUG81	23 08 40	009 30	STAND	601
HD 32008	44	5.7	04 57 28	-10 20	H 2	11254	L 0	06AUG81	00 51 19	056 00	AG307	563 MICROPHONICS
HD 31964	33	3.0	04 58 22	+43 45	L 2	11246	S 0	05AUG81	00 09 18	001 00	UK431	802
HD 31964	33	3.0	04 58 22	+43 45	L 2	11246	L 0	05AUG81	00 03 23	002 00	UK431	902
HD 31964	33	3.0	04 58 22	+43 45	H 2	11247	L 0	05AUG81	00 58 23	015 00	UK431	702
HD 31964	33	3.0	04 58 22	+43 45	L 3	14654	S 0	05AUG81	00 47 59	005 00	UK431	401
HD 31964	33	3.0	04 58 22	+43 45	L 3	14654	L 0	05AUG81	00 13 43	020 00	UK431	701
HD 31964	33	3.0	04 58 22	+43 45	H 3	14655	L 0	05AUG81	01 26 34	021 00	UK431	301

OBJECT	CL	MAG	RT ASCN HR MN SC	DECLN DEG MN	DISP	+CAM	IMAGE	APERT OB	APERT LC	DATE	START HR MN SC	LENGTH MIN SC	PROG	COMMENT
HD293782	32	09.8	05 02 01	-03 52	L	3	14857	L	0	29AUG81	19 33 35	147 00	HT535	701
NGC 1818	83	9.9	05 04 04	-66 28	L	2	11300	L	0	12AUG81	19 37 00	050 00	EG546	501 MICROPHONICS
NGC 1818	83	9.9	05 04 04	-66 28	L	3	14736	L	0	12AUG81	18 53 34	040 00	EG546	501
HD 34085	25	00.2	05 12 08	-08 15	H	3	15001	L	0	15SEP81	16 13 41	000 07	UK437	701
IC 405	73	00.0	05 12 59	+34 15	L	2	11335	L	0	15AUG81	18 45 47	024 00	PB612	302
HD 34078	12	5.8	05 12 59	+34 15	L	2	11336	L	0	15AUG81	19 52 08	000 21	PB612	402
HD 34078	12	5.8	05 12 59	+34 15	L	2	11336	S	0	15AUG81	19 46 48	000 20	PB612	602 TRAILED
IC 405	73	00.0	05 12 59	+34 15	L	2	11337	L	0	15AUG81	20 28 20	060 00	PB612	302
HD 34078	12	5.8	05 12 59	+34 15	L	3	14769	L	0	15AUG81	18 36 13	000 25	PB612	400
HD 34078	12	5.8	05 12 59	+34 15	L	3	14769	S	0	15AUG81	18 31 00	000 15	PB612	400 TRAILED
IC 405	73	00.0	05 12 59	+34 15	L	3	14770	L	0	15AUG81	20 01 55	020 00	PB612	301
NGC 1866	83	9.9	05 13 28	-65 31	L	3	14739	L	0	13AUG81	00 00 10	072 00	EG546	301
NGC 2004	83	9.9	05 30 44	-67 19	L	2	11301	L	0	12AUG81	21 22 07	035 00	EG546	701 MICROPHONICS
NGC 2004	83	9.9	05 30 44	-67 19	L	2	11303	L	0	13AUG81	01 24 45	018 00	EG546	601
NGC 2004	83	9.9	05 30 44	-67 19	L	3	14737	L	0	12AUG81	20 48 19	030 00	EG546	601
HD 36861	13	3.4	05 32 23	+09 54	H	3	15295	L	0	20OCT81	14 18 20	000 30	RS564	701
AD 37020	20	6.7	05 32 48	-05 25	L	2	11252	S	0	05AUG81	20 53 36	000 10	LB304	302 MICROPHONICS
AD 37020	20	6.7	05 32 48	-05 25	L	2	11252	L	0	05AUG81	20 49 26	000 18	LB304	802 MICROPHONICS
AD 37020	20	6.7	05 32 48	-05 25	H	3	14667	L	0	05AUG81	21 03 12	005 10	LB304	501
HD 37021	20	8.0	05 32 49	-05 25	L	2	11251	S	0	05AUG81	19 50 00	001 00	LB304	402
HD 37021	20	8.0	05 32 49	-05 25	L	2	11251	L	0	05AUG81	19 45 33	000 30	LB304	502
HD 37022	14	5.1	05 32 49	-05 25	H	3	14665	L	0	05AUG81	19 12 21	001 30	LB304	501
HD 37021	20	8.0	05 32 49	-05 25	H	3	14666	L	0	05AUG81	19 54 19	008 00	LB304	301
HD 37023	14	6.7	05 32 50	-05 25	H	3	14668	L	0	05AUG81	21 49 30	005 00	LB304	501
HD 37128	23	1.7	05 33 40	-01 14	L	2	11338	L	0	15AUG81	22 23 35	000 01	PB612	002 TRAIL, NO SPECTRUM
HD 37128	23	1.7	05 33 40	-01 14	L	2	11339	L	0	15AUG81	23 03 01	000 01	PB612	702
HD 37128	23	1.7	05 33 40	-01 14	L	2	11339	S	0	15AUG81	22 56 09	000 01	PB612	802 TRAILED
NGC 1990	73	00.0	05 33 40	-01 14	L	2	11340	L	0	15AUG81	23 38 11	000 20	PB612	202
HD 37468	12	03.8	05 36 14	-02 38	H	3	14846	S	0	28AUG81	20 17 27	000 45	HL593	001 NO SPECTRUM
HD 37742	13	1.8	05 38 14	-01 58	L	2	11341	L	0	16AUG81	00 38 35	000 01	PB612	702
HD 37742	13	1.8	05 38 14	-01 58	L	2	11341	S	0	16AUG81	00 29 49	000 01	PB612	802 TRAILED
NGC 2024	72	00.0	05 38 14	-01 58	L	2	11342	L	0	16AUG81	01 11 12	002 00	PB612	402
NGC 2024	72	00.0	05 38 14	-01 58	L	3	14771	L	0	16AUG81	01 26 06	002 00	PB612	501
MGC 2100	83	9.6	05 42 23	-69 15	L	2	11302	L	0	12AUG81	23 05 39	040 00	EG546	501 MICROPHONICS
MGC 2100	83	9.6	05 42 23	-69 15	L	3	14738	L	0	12AUG81	22 21 25	040 00	EG546	401
HD39801	49	00.9	05 52 28	+07 24	H	3	14775	L	0	17AUG81	17 52 02	930 00	OE589	389 STARTED READ AT 6SEC
HD 5394	14	02.6	05 53 40	+60 27	H	3	15139	L	0	30SEP81	19 55 12	000 08	UK473	501
HD 41335	59	5.2	06 01 48	-06 42	H	3	15255	L	0	13OCT81	20 42 49	001 50	UK475	401
HD 45166	10	10.0	06 23 30	+08 01	H	2	11497	L	0	09SEP81	17 20 02	080 00	UK431	433
HD 45166	10	10.0	06 23 30	+08 01	H	3	14943	L	0	09SEP81	18 46 18	070 00	UK431	341
0637-752	87	15.5	06 37 25	-75 14	L	2	11445	L	0	31AUG81	00 20 21	087 00	LM529	103 MICROPHONICS
0637-752	87	15.5	06 37 25	-75 14	L	3	14867	L	0	30AUG81	20 07 38	240 00	LM529	302
HD 48279	24	7.8	06 40 48	+01 46	H	2	11805	L	0	18OCT81	20 59 00	042 00	RK523	503 MN=196
HD 50064	25	8.2	06 49 00	+00 21	L	2	11721	L	0	07OCT81	19 11 20	007 30	UK410	602 MOD REF POS
HD 50064	25	8.2	06 49 00	+00 21	L	2	11721	L	0	07OCT81	18 06 15	060 00	UK410	802 MOD REF POS
HD 50064	25	8.2	06 49 00	+00 21	L	2	11722	L	0	07OCT81	20 22 54	004 00	UK410	501 MN=529
HD 50064	25	8.2	06 49 00	+00 21	L	3	15200	L	0	07OCT81	19 22 32	050 00	UK410	501
Z CMA	27	9.5	07 01 23	-11 29	H	2	11859	L	0	28OCT81	14 45 12	410 07	CB515	229 MN=199

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
HD 60753	21	06.7	07 32 08	-50 28	L 1	1355	S 0	18SEP81	20 11 24	000 18	PHCAL	601
HD 60753	21	06.7	07 32 08	-50 28	L 1	1355	L 0	18SEP81	20 07 00	000 06	PHCAL	501
HD 60753	21	06.7	07 32 08	-50 28	L 2	11580	S 0	18SEP81	18 19 50	000 21	PHCAL	601
HD 60753	21	06.7	07 32 08	-50 28	L 2	11580	L 0	18SEP81	18 15 55	000 07	PHCAL	501
HD 60753	21	06.7	07 32 08	-50 28	L 3	15035	S 0	18SEP81	18 27 35	000 30	PHCAL	601
HD 60753	21	06.7	07 32 08	-50 28	L 3	15035	L 0	18SEP81	18 24 32	000 10	PHCAL	501
NGC2403	80	00.0	07 32 20	+65 43	L 3	15126	L 0	29SEP81	17 03 06	165 00	JL542	352 EXTENDED IMAGE
BD-32179	16	10.2	07 59 45	-03 50	H 2	11804	L 0	18OCT81	14 49 24	105 00	RK311	505 MN=230
HD 66811	13	2.2	08 01 50	-39 52	H 3	15296	L 0	20OCT81	14 55 00	000 04	RS564	501
BD+75325	21	9.5	08 04 43	+75 07	L 2	11581	S 0	18SEP81	21 57 50	001 12	PHCAL	601
BD+75325	21	9.5	08 04 43	+75 07	L 2	11581	L 0	18SEP81	21 54 07	000 24	PHCAL	501
+75325	16	9.5	08 04 43	+75 07	L 2	11755	S 0	11OCT81	21 34 13	001 12	UKCAL	502 MN=412
+75325	16	9.5	08 04 43	+75 07	L 2	11755	L 0	11OCT81	21 30 46	000 24	UKCAL	502 MN=412
BD+75325	21	9.5	08 04 43	+75 07	L 3	15036	S 0	18SEP81	22 29 00	000 42	PHCAL	601
BD+75325	21	9.5	08 04 43	+75 07	L 3	15036	L 0	18SEP81	22 27 00	000 14	PHCAL	501
+75325	16	9.5	08 04 43	+75 07	L 3	15239	S 0	11OCT81	21 40 54	000 42	UKCAL	400
+75325	16	9.5	08 04 43	+75 07	L 3	15239	L 0	11OCT81	21 37 49	000 14	UKCAL	300
HD 73882	12	7.2	08 37 20	-40 15	H 2	11718	L 0	07OCT81	15 12 17	034 00	UK410	502
HD 73882	12	7.2	08 37 20	-40 15	L 2	11719	S 0	07OCT81	16 23 12	001 00	UK410	501 MICROPHONICS
HD 73882	12	7.2	08 37 20	-40 15	L 2	11719	L 0	07OCT81	16 18 00	001 30	UK410	601 MICROPHONICS
HD 73882	12	7.2	08 37 20	-40 15	L 3	15199	S 0	07OCT81	15 06 51	002 00	UK410	501
HD 73882	12	7.2	08 37 20	-40 15	L 3	15199	L 0	07OCT81	15 02 05	001 30	UK410	501
HD 77581	59	06.9	09 00 13	-40 21	L 3	14911	L 0	05SEP81	16 47 31	009 25	UK401	301TRAIL X2;OUT OF PHASE
HD 77581	59	06.9	09 00 13	-40 21	L 3	14912	L 0	05SEP81	17 43 10	009 25	UK401	500TRAIL X2;IN PHASE
NGC 2808	83	6.4	09 10 55	-64 39	L 2	11830	L 0	24OCT81	14 43 22	300 00	VC549	606 4-MIN HTR W-UP
NGC 2808	83	6.4	09 10 55	-64 39	L 3	15313	L 0	22OCT81	14 45 48	410 00	VC549	302
H 82901	51	5.0	09 30 59	-62 34	L 2	10987	L 0	02JUL81	02 49 42	057 00	UK431	453
HD 82901	51	7.0	09 30 59	-62 34	L 2	11243	L 0	04AUG81	18 40 18	060 00	UK431	84 4-MIN HTR WARM UP
HD 82901	51	7.0	09 30 59	-62 34	L 2	11244	L 0	04AUG81	20 40 37	010 00	UK431	363 4-MIN HTR WARM UP
HD 82901	51	07.0	09 30 59	-62 34	L 2	11499	S 0	09SEP81	23 32 39	015 00	UK431	262
HD 82901	51	07.0	09 30 59	-62 34	L 2	11499	L 0	09SEP81	22 38 12	050 00	UK431	472
HD 82901	51	7.0	09 30 59	-62 34	L 2	11778	S 0	14OCT81	15 36 19	008 00	UK484	233 4-M HTR W-UP,MG2SAT
HD 82901	51	7.0	09 30 59	-62 34	L 2	11778	L 0	14OCT81	14 32 27	060 00	UK484	433 4-M HTR W-UP,MG2SAT
HD 82901	51	7.0	09 30 59	-62 34	H 2	11779	L 0	14OCT81	16 23 24	030 00	UK484	133 4-MIN HTR W-UP
HD 82901	51	7.0	09 30 59	-62 34	L 3	14653	L 0	04AUG81	19 47 02	071 00	UK431	111
HD 82901	51	7.0	09 30 59	-62 34	L 3	15265	L 0	14OCT81	15 47 38	060 00	UK484	110 MG2SAT
HD 85871	20	6.5	09 51 17	-55 08	H 2	11723	L 0	07OCT81	21 19 48	004 50	UK410	502 MN=455
HD 85871	20	6.5	09 51 17	-55 08	H 3	15201	L 0	07OCT81	21 37 38	008 30	UK410	501
HD 85773	47	9.4	09 51 20	-22 36	L 2	11705	L 0	06OCT81	19 40 14	127 00	FS592	402
HD 86606	23	6.3	09 55 17	-71 09	H 3	14677	L 0	07AUG81	01 43 19	006 00	UK464	501
HD 88366	51	07.5	10 04 46	-61 18	L 2	11498	S 0	09SEP81	21 45 20	010 00	UK431	232
HD 88366	51	07.5	10 04 46	-61 18	L 2	11498	L 0	09SEP81	20 41 58	060 00	UK431	572
H 88366	51	6.0	10 07 46	-61 18	L 2	10985	L 0	01JUL81	20 34 13	060 00	UK431	353
H 88366	51	6.0	10 07 46	-61 18	L 2	10986	L 0	01JUL81	22 23 12	220 00	UK431	777
HD 88366	51	6.0	10 07 46	-61 18	L 2	11245	L 0	04AUG81	22 14 26	060 00	UK431	805
HD 88366	51	6.0	10 07 46	-61 18	L 2	11245	S 0	04AUG81	21 55 57	015 00	UK431	405
HD 88366	51	8.0	10 07 46	-61 18	L 2	11780	S 0	14OCT81	19 23 50	015 00	UK484	134 4-M HTR W-UP,MG2SAT
HD 88366	51	8.0	10 07 46	-61 18	L 2	11780	L 0	14OCT81	17 50 33	090 00	UK484	334 4-M HTR W-UP,MG2SAT

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
HD 88366	51	8.0	10 07 46	-61 18	H 2	11781	L 0	14OCT81	20 18 08	085 00	UK484	124 4-MIN HIR W-UP
H 88366	51	6.0	10 07 46	-61 18	L 3	14378	L 0	01JUL81	21 38 49	035 00	UK431	001
NGC 3242	70	12.0	10 22 24	-18 23	H 3	15289	L 0	18OCT81	18 13 51	192 00	RK522	59
HD 92964	23	5.4	10 40 44	-58 57	H 2	11720	L 0	07OCT81	17 06 47	004 40	UK410	401 MN=275
ETA CAR	73	00.0	10 43 05	-59 25	H 3	14751	L 0	13AUG81	23 59 32	078 00	RV547	101
AG CAR-A	73	10.0	10 54 09	-60 11	L 2	11313	L 0	13AUG81	19 15 44	040 00	RV547	401
AG CAR-A	73	10.0	10 54 09	-60 11	L 3	14749	L 0	13AUG81	18 29 42	040 00	RV547	201
AG CAR	23	6.5	10 54 11	-60 11	H 2	11229	L 0	03AUG81	19 09 39	030 00	DP552	551 MICROPHONICS
AG CAR	23	06.6	10 54 11	-60 11	L 2	11315	L 0	14AUG81	01 11 11	000 30	RV547	601 MICROPHONICS
AG CAR	23	6.5	10 54 11	-60 11	L 3	14639	S 0	03AUG81	19 01 05	004 00	DP552	441
AG CAR	23	6.5	10 54 11	-60 11	L 3	14639	L 0	03AUG81	18 52 44	004 00	DP552	551
AG CAR	23	6.6	10 54 11	-60 11	H 3	14750	L 0	13AUG81	20 07 43	090 00	RV547	402
AG CAR-B	73	10.0	10 54 12	-60 10	L 2	11314	L 0	13AUG81	21 40 09	120 00	RV547	601
Q1103-00	85	16.5	11 03 58	-00 36	L 2	11111	L 0	21JUL81	20 46 00	000 00	UK426	000 EXP CONT AT GSFC
HD 96622	12	08.9	11 04 53	-59 24	H 2	11575	L 0	17SEP81	20 24 47	025 00	UK437	302
HD 96622	12	08.9	11 04 53	-59 24	H 3	15022	L 0	17SEP81	19 10 21	070 00	UK437	401
HD 96622	12	08.9	11 04 53	-59 24	H 3	15023	L 0	17SEP81	20 56 42	141 00	UK437	501
HD 97048	30	08.5	11 06 40	-77 23	H 2	11429	L 0	28AUG81	22 13 24	090 00	HT535	302 MICROPHONICS
N 3783	84	13.0	11 36 30	-37 28	L 2	11020	L 0	07JUL81	01 51 08	025 00	VILSP	342
N 3783	84	13.0	11 36 30	-37 28	L 3	14414	L 0	07JUL81	02 23 01	084 00	VILSP	342
N 3783	84	13.0	11 36 33	-37 28	H 2	11005	L 0	03JUL81	22 42 40	000 00	UK418	000 EXP CONT AT GSFC
N 3783	84	13.0	11 36 33	-37 28	H 2	11016	L 0	05JUL81	21 08 17	000 00	UK418	000 EXP CONT AT GSFC
N 3783	84	13.0	11 36 33	-37 28	L 3	14393	L 0	03JUL81	23 05 03	000 00	UK418	000 EXP CONT AT GSFC
N 3783	84	13.0	11 36 33	-37 28	L 3	14408	L 0	05JUL81	21 10 27	000 00	UK418	000SERENDIPITY
N 3783	84	13.0	11 36 33	-37 28	L 3	14458	L 0	26JUL81	03 23 49	024 00	UK480	231
NGC 3783	84	13.7	11 36 33	-37 30	L 3	14718	L 0	11AUG81	01 15 41	031 00	UK480	331
1145-614	59	13.0	11 45 02	-61 41	L 3	14915	L 0	05SEP81	21 56 02	045 00	UK401	000 NO SPECTRUM
HD102567	59	09.0	11 45 34	-61 56	L 3	14913	L 0	05SEP81	19 21 29	014 36	UK401	801TRAIL X3;IN PHASE
HD102567	59	09.0	11 45 34	-61 56	L 3	14914	L 0	05SEP81	20 35 58	004 51	UK401	401SINGLE TRAIL
Q1146-04	85	16.9	11 46 22	-03 47	L 2	11083	L 0	17JUL81	21 19 56	240 00	UK426	236
Q1146-04	85	16.9	11 46 22	-03 47	L 2	11084	L 0	18JUL81	01 42 25	000 00	UK426	000 EXP CONT GSFC
Q1146-04	85	16.9	11 46 22	-03 47	L 2	11098	L 0	19JUL81	21 28 00	000 00	UK426	000 EXP CONT AT GSFC
H 103287	30	2.4	11 51 13	+53 58	L 2	10979	S 0	01JUL81	05 06 14	000 02	STAND	402
H 103287	30	2.4	11 51 13	+53 58	L 2	10979	L 0	01JUL81	05 03 12	000 01	STAND	502
C-721184	23	10.7	11 56 29	-73 09	H 2	11272	L 0	08AUG81	23 32 10	135 00	UK464	404 MICROPHONICS
C-721184	23	10.7	11 56 29	-73 09	H 3	14695	L 0	08AUG81	18 59 09	270 00	UK464	502
HD105056	12	07.6	12 03 13	-69 18	H 3	14806	L 0	24AUG81	21 34 31	030 00	RS564	601
HD105056	13	07.4	12 03 13	-69 18	H 3	14847	L 0	28AUG81	21 33 15	020 00	HL593	401
HD105056	13	7.6	12 03 13	-69 18	H 3	15297	L 0	20OCT81	15 36 59	028 00	RS564	501
N 4125	81	10.7	12 05 35	+65 27	L 3	14531	L 0	20JUL81	20 53 53	413 00	FB582	203
N 4151	84	13.0	12 08 00	+39 41	L 2	11004	L 0	03JUL81	21 23 13	025 00	UK418	253
N 4151	84	13.0	12 08 00	+39 41	L 2	11019	L 0	06JUL81	21 39 37	030 00	MU	361
N 4151	84	13.0	12 08 00	+39 41	L 2	11071	L 0	16JUL81	21 04 20	030 00	UK414	342
N 4151	84	13.0	12 08 00	+39 41	L 2	11072	L 0	16JUL81	23 30 12	030 00	UK414	342
N 4151	84	12.0	12 08 00	+39 41	L 2	11185	L 0	29JUL81	20 42 49	120 00	UK465	464
N 4151	84	13.0	12 08 00	+39 41	L 3	14392	L 0	03JUL81	20 50 46	025 00	UK418	351
N 4151	84	13.0	12 08 00	+39 41	L 3	14412	L 0	06JUL81	20 36 26	060 00	MU	361
N 4151	84	13.0	12 08 00	+39 41	L 3	14495	L 0	16JUL81	20 30 02	030 00	UK414	241

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
N 4151	84	13.0	12 08 00	+39 41	L	3	14496	L	0	16JUL81	21 39 47	100 00	UK414	361
N 4151	84	12.0	12 08 00	+39 41	L	3	14573	L	0	27JUL81	21 08 45	030 00	UK465	241
JUPITER	03	-1.5	12 11 40	+00 07	H	2	11040	S	C	09JUL81	21 02 30	000 00	UK436	000 EXP CONT AT GSFC
JUPITER	03	-1.5	12 11 40	+00 07	L	3	14435	S	C	09JUL81	21 47 50	200 00	UK436	032 SKY BACKGROUND
JUPITER	03	-1.5	12 11 40	+00 07	L	3	14436	S	C	10JUL81	02 20 46	085 00	UK436	032 SKY BACKGROUND
JUPITER	03	-2.5	12 12 14	+00 03	H	3	14445	S	C	10JUL81	23 17 16	000 00	MC603	000 EXP ST/END AT GSFC
N 4278	81	10.2	12 17 36	+29 33	L	2	11055	L	0	12JUL81	20 46 09	421 00	HN568	209
N 4278	81	10.2	12 17 36	+29 33	L	3	14467	L	0	13JUL81	21 01 41	406 00	HN568	234
Q1217+02	85	16.5	12 17 38	+02 20	L	3	14476	L	0	14JUL81	21 33 46	000 00	UK427	000 EXP CONT AT GSFC
Q1217+02	85	16.5	12 17 38	+02 20	L	3	14484	L	0	15JUL81	20 54 09	240 00	UK427	342
1223-625	59	10.8	12 23 50	-62 30	L	3	14916	L	0	05SEP81	23 26 15	021 00	UK401	001 NO SPECTRUM
FEIGE 66	16	10.5	12 34 54	+25 21	H	2	11154	L	0	26JUL81	21 07 14	160 00	JK559	706
FEIGE 66	16	10.5	12 34 54	+25 21	H	3	14567	L	0	26JUL81	23 53 26	080 00	JK559	501
HD109867	23	06.3	12 35 53	-66 55	H	2	11489	L	0	08SEP81	16 43 41	012 00	MG604	702 MICROPHONICS
HD109867	23	06.3	12 35 53	-66 55	H	3	14928	L	0	08SEP81	17 20 01	010 00	MG604	501
HD110879	21	03.0	12 43 11	-67 50	H	2	11490	S	0	08SEP81	18 31 51	000 25	MG604	301 MICROPHONICS
HD110879	21	03.0	12 43 11	-67 50	H	3	14929	S	0	08SEP81	18 35 51	000 25	MG604	301
HD111123	23	01.3	12 44 47	-59 25	H	2	11492	L	0	08SEP81	21 20 09	000 03	MG604	602 MICROPHONICS
HD111123	23	01.3	12 44 47	-59 25	H	3	14931	L	0	08SEP81	21 24 32	000 02	MG604	501
HD111822	23	07.7	12 49 38	-52 24	H	2	11491	L	0	08SEP81	19 32 59	025 00	MG604	502 MICROPHONICS
HD111822	23	07.7	12 49 38	-52 24	H	3	14930	L	0	08SEP81	20 05 41	030 00	MG604	501
HD112843	23	09.6	12 57 46	-72 22	L	2	11260	L	0	06AUG81	19 41 12	002 00	UK464	502 MICROPHONICS
HD112843	23	09.6	12 57 46	-72 22	L	3	14675	S	0	06AUG81	19 23 09	008 00	UK464	400
HD112843	23	09.6	12 57 46	-72 22	L	3	14675	L	0	06AUG81	19 15 42	003 00	UK464	500
HD112843	23	09.6	12 57 46	-72 22	H	3	14676	L	0	06AUG81	20 11 16	295 00	UK464	000 EXP. OK
HD114441	20	08.0	13 08 27	-55 05	H	2	11493	L	0	08SEP81	23 05 20	042 00	MG604	502 MICROPHONICS
HD114441	20	08.0	13 08 27	-55 05	H	3	14932	L	0	08SEP81	22 16 32	045 00	MG604	401
FEIGE 86	16	10.0	13 36 06	+29 37	H	2	11155	L	0	27JUL81	01 44 47	121 00	JK559	400
1337-31	88	12.5	13 37 05	-31 23	L	3	14542	L	0	22JUL81	22 02 03	347 00	UK422	793
ATE UMA	21	01.8	13 45 34	+49 34	H	2	11582	L	0	18SEP81	23 03 23	000 06	PHCAL	501
1401+12	88	15.0	14 00 57	+11 24	L	3	14545	L	0	23JUL81	20 47 39	420 00	UK422	223
N 5548	84	13.6	14 15 43	+25 22	L	2	11009	L	0	04JUL81	23 09 52	075 00	VILSP	353
N 5548	84	13.6	14 15 43	+25 22	L	3	14398	L	0	04JUL81	21 35 14	090 00	VILSP	340
OQ 172	85	17.5	14 42 50	+10 11	L	3	14790	L	0	21AUG81	20 10 24	815 00	UK472	119 READ AT GSFC
HD131154	44	04.5	14 49 05	+19 18	H	3	14791	L	0	22AUG81	17 25 28	952 00	UK482	339 START, READ AT GSFC
NGC 5904	83	00.0	15 16 00	+02 16	L	2	11506	L	0	10SEP81	17 15 56	377 00	LA565	308SERENDIPITY,MICROPHONICS
NGC 5904	83	00.0	15 16 00	+02 16	L	3	14950	L	0	10SEP81	17 11 02	195 00	LA565	301
NGC 5904	83	00.0	15 16 00	+02 16	L	3	14951	L	0	10SEP81	20 50 40	177 00	LA565	301
HD138749	26	4.2	15 30 55	+31 32	H	3	14763	L	0	14AUG81	20 25 18	002 00	UK480	651
HD138749	21	04.2	15 30 55	+31 32	H	3	15011	L	0	16SEP81	18 23 35	001 40	VD538	501
HD138749	59	4.2	15 30 55	+31 32	H	3	15252	L	0	13OCT81	18 17 33	002 00	UK475	501
URANUS	03	5.8	15 34 42	-19 02	L	3	14413	L	0	06JUL81	22 46 57	059 24	KF521	041
URANUS	03	5.8	15 34 42	-19 02	L	3	14413	S	0	06JUL81	22 46 57	125 00	KF521	331
BD332642	20	10.8	15 50 01	+33 05	L	1	1359	S	0	11OCT81	17 33 58	009 30	UKCAL	802
BD332642	20	10.8	15 50 01	+33 05	L	1	1359	L	0	11OCT81	17 25 43	003 10	UKCAL	602
BD332642	20	10.8	15 50 01	+33 05	L	1	1360	S	0	11OCT81	18 21 51	004 00	UKCAL	501
BD332642	20	10.8	15 50 01	+33 05	L	1	1360	L	0	11OCT81	18 17 40	001 00	UKCAL	401
BD332640	20	10.8	15 50 01	+33 05	L	2	11754	S	0	11OCT81	20 21 43	009 30	UKCAL	502

OBJECT	CL	MAG	RT ASCN HR MN SC	DECLN DEG MN	DISP +CAM	IMAGE	APERT OR LG	DATE	START HR MN SC	LENGTH MIN SC	PROG	COMMENT
BD332640	20	10.8	15 50 01	+33 05	L 2	11754	L 0	11OCT81	20 15 12	003 10	UKCAL	502
BD332640	20	10.8	15 50 01	+33 05	L 3	15238	S 0	11OCT81	19 11 39	012 00	UKCAL	501
BD332640	20	10.8	15 50 01	+33 05	L 3	15238	L 0	11OCT81	19 04 15	004 00	UKCAL	501
D+332642	20	10.8	15 50 02	+33 05	L 2	11073	L 0	17JUL81	01 43 20	003 10	UKCAL	502
D+332642	20	10.8	15 50 02	+33 05	L 2	11073	S 0	17JUL81	01 16 48	009 30	UKCAL	602
D+332642	20	10.8	15 50 02	+33 05	L 3	14497	S 0	17JUL81	01 00 37	012 00	UKCAL	501
D+332642	20	10.8	15 50 02	+33 05	L 3	14497	L 0	17JUL81	00 50 38	004 00	UKCAL	501
RU LUPI	58	11.0	15 53 24	-37 41	H 2	11515	L 0	11SEP81	17 08 46	180 00	UK417	375 MICROPHONICS
RU LUPI	58	11.0	15 53 24	-37 41	H 2	11516	L 0	11SEP81	20 31 57	060 00	UK417	143 MICROPHONICS
RU LUPI	58	11.5	15 53 24	-37 41	H 3	14980	L 0	13SEP81	17 15 57	361 00	UK417	233
AG DRA	57	00.0	16 01 23	+66 56	H 2	11230	L 0	03AUG81	21 02 06	030 00	DP552	251 MICROPHONICS
AG DRA	57	00.0	16 01 23	+66 56	L 2	11231	L 0	03AUG81	22 32 12	005 00	DP552	561
AG DRA	57	00.0	16 01 23	+66 56	L 3	14640	S 0	03AUG81	20 51 00	005 00	DP552	351
AG DRA	57	00.0	16 01 23	+66 56	L 3	14640	L 0	03AUG81	20 33 11	015 00	DP552	571
AG DRA	57	00.0	16 01 23	+66 56	H 3	14641	L 0	03AUG81	21 35 56	050 00	DP552	261
HD144667	27	06.6	16 05 13	-38 58	L 2	11430	L 0	29AUG81	00 34 52	001 00	HT535	802
HD144667	27	06.6	16 05 13	-38 58	L 2	11431	L 0	29AUG81	01 37 38	000 18	HT535	601
HD144667	27	06.6	16 05 13	-38 58	L 3	14848	L 0	29AUG81	00 27 31	001 30	HT535	800
HD144667	27	06.6	16 05 13	-38 58	L 3	14849	L 0	29AUG81	01 11 02	000 25	HT535	501
HD149038	13	04.9	16 30 31	-43 56	H 3	14829	S 0	27AUG81	01 12 58	008 20	HL593	601
TAU SCO	20	2.8	16 32 46	-28 07	H 1	1358	L 0	11OCT81	16 16 09	000 06	UKCAL	502
TAU SCO	20	2.8	16 32 46	-28 07	H 2	11753	L 0	11OCT81	14 54 53	000 06	UKCAL	502 MN=177
TAU SCO	20	2.8	16 32 46	-28 07	H 3	15237	L 0	11OCT81	14 50 33	000 06	UKCAL	501
HD149757	12	2.6	16 34 24	-10 28	H 2	11728	L 0	08OCT81	15 38 03	000 14	GH506	501 MICROPHONICS
HD149757	26	2.6	16 34 24	-10 28	H 3	14764	L 0	14AUG81	21 01 42	000 23	UK480	551
HD149757	12	00.3	16 34 24	-10 28	H 3	15009	L 0	16SEP81	16 38 46	000 23	VD538	501
HD149757	14	02.6	16 34 24	-10 28	H 3	15047	L 0	19SEP81	21 15 47	000 23	UK480	501
HD149757	26	09.5	16 34 24	-10 38	H 3	15137	L 0	30SEP81	17 46 35	000 23	UK473	501
HD149757	12	2.6	16 34 24	-10 28	H 3	15207	L 0	08OCT81	15 23 08	000 23	GH506	501
HD149757	12	2.6	16 34 24	-10 28	H 3	15228	L 0	10OCT81	16 49 13	000 23	GH506	501
HD150484	40	08.4	16 38 48	+00 36	L 3	15060	L 0	20SEP81	16 20 44	180 00	UK402	332
V1121OPH	58	11.5	16 46 26	-14 18	L 2	11517	L 0	11SEP81	23 30 59	015 00	UK417	232 MICROPHONICS
V1121OPH	58	11.5	16 46 26	-14 18	L 3	14958	L 0	11SEP81	22 01 32	085 00	UK417	221
HD152003	23	07.0	16 49 17	-41 42	H 2	11559	L 0	15SEP81	18 52 04	030 00	UK437	502
HD152003	23	07.0	16 49 17	-41 42	H 3	15002	L 0	15SEP81	17 17 36	090 00	UK437	501
HD152003	23	07.0	16 49 17	-41 42	H 3	15003	L 0	15SEP81	19 26 13	140 00	UK437	701
HD152408	12	05.8	16 51 29	-41 04	H 2	11410	L 0	24AUG81	19 30 40	002 20	RS564	401 MICROPHONICS
HD152408	13	5.8	16 51 29	-41 04	H 2	11736	L 0	09OCT81	20 19 31	005 00	UK410	501 MN=599
HD152408	13	5.8	16 51 29	-41 04	L 2	11737	S 0	09OCT81	21 34 00	000 09	UK410	701 MN=393
HD152408	13	5.8	16 51 29	-41 04	L 2	11737	L 0	09OCT81	21 30 29	000 11	UK410	701 MN=393
HD152408	12	05.8	16 51 29	-41 04	H 3	14804	L 0	24AUG81	19 23 10	003 45	RS564	340
HD152408	13	5.8	16 51 29	-41 04	H 3	15219	L 0	09OCT81	20 29 19	015 00	UK410	701
HD152408	13	5.8	16 51 29	-41 04	L 3	15220	L 0	09OCT81	21 39 48	000 08	UK410	501
HD152424	13	07.2	16 51 32	-42 01	H 2	11574	L 0	17SEP81	18 11 37	015 00	UK437	402
HD152424	13	07.2	16 51 32	-42 01	H 3	15021	L 0	17SEP81	17 06 43	060 00	UK437	551
HZ HER	59	14.0	16 56 02	+35 25	L 2	11599	L 0	21SEP81	18 23 02	176 00	HR579	305
HZ HER	59	13.5	16 56 02	+35 25	L 2	11636	L 0	28SEP81	20 44 31	030 00	UK473	302 MICROPHONICS
HZ HER	59	14.0	16 56 02	+35 25	L 3	15070	L 0	21SEP81	17 45 57	031 00	HR579	111

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
HZ HER	59	14.0	16 56 02	+35 25	L 3	15071	S 0	21SEP81	22 38 06	040 00	HR579	301
HZ HER	59	14.0	16 56 02	+35 25	L 3	15071	L 0	21SEP81	21 22 26	072 00	HR579	301
HZ HER	59	13.5	16 56 02	+35 25	L 3	15120	L 0	28SEP81	21 21 42	045 00	UK473	202
HZ HER	59	13.0	16 56 02	+35 25	L 3	15251	L 0	13OCT81	16 56 44	040 00	UK475	301
HD154090	23	04.9	17 01 32	-34 03	H 3	14828	S 0	26AUG81	23 57 30	032 00	HL593	501
HD155937	41	08.5	17 11 43	+16 24	L 2	11607	S 0	22SEP81	22 45 50	020 00	UK402	550 MICROPHONICS
HD155937	41	08.5	17 11 43	+16 24	L 2	11607	L 0	22SEP81	22 01 04	040 00	UK402	764 MICROPHONICS
NEPTUNE	03	7.7	17 27 18	-21 52	L 3	14427	S 0	08JUL81	21 53 18	000 00	MC603	000 EXP CONT AT GSFC
NEPTUNE	03	7.7	17 27 24	-21 52	L 3	14423	S 0	07JUL81	22 24 23	000 00	UK436	000 EXP CONT AT GSFC
HD159181	47	2.8	17 29 18	+52 20	H 3	15293	L 0	19OCT81	07 55 42	000 00	UK482	239 ST/END GSFC 1273 MIN
ROB 162	16	13.0	17 36 48	-53 39	L 2	11831	L 0	24OCT81	20 38 10	020 00	VC549	402 4-MIN HTR W-UP
ROB 162	16	13.0	17 36 48	-53 39	L 2	11832	L 0	24OCT81	21 34 40	014 00	VC549	402 MN=254
ROB 162	16	13.0	17 36 48	-53 39	L 3	15322	L 0	24OCT81	21 01 20	025 00	VC549	501
H 161056	20	6.3	17 41 06	-07 03	H 2	11092	L 0	19JUL81	02 41 31	035 00	JP851	402
H 161056	20	6.3	17 41 06	-07 03	H 3	14518	L 0	19JUL81	02 11 49	025 00	JP851	401
H 161056	20	6.3	17 41 06	-07 03	H 3	14519	L 0	19JUL81	03 19 41	030 00	JP851	401
BD393266	28	9.4	17 44 52	+39 20	H 2	11789	L 0	16OCT81	14 31 40	084 00	RK511	504 MN=258
BD393266	28	9.4	17 44 52	+39 20	H 3	15275	L 0	16OCT81	15 59 37	060 00	RK511	501
HD162732	22	06.4	17 48 45	+48 24	H 3	15012	L 0	16SEP81	19 21 36	025 00	VD538	501
THISBE	05	10.9	17 53 09	-21 46	L 2	11352	L 0	17AUG81	00 34 35	068 00	UK420	304 4-MIN HTR WARM UP
H 163472	20	5.8	17 53 48	+00 41	H 2	11089	L 0	18JUL81	22 25 12	010 00	JP851	702
H 163472	20	5.8	17 53 48	+00 41	H 3	14514	L 0	18JUL81	21 58 11	020 00	JP851	801
H 163472	20	5.8	17 53 48	+00 41	H 3	14515	L 0	18JUL81	22 59 19	012 00	JP851	501
HD163993	47	00.0	17 55 49	+29 15	L 3	14859	L 0	30AUG81	01 31 18	016 00	CZ502	200
HD163993	47	03.7	17 55 49	+29 15	L 3	14878	L 0	01SEP81	22 16 23	090 00	CZ502	441
HD164284	20	04.8	17 57 47	+04 22	H 3	15010	L 0	16SEP81	17 29 34	002 10	VD538	501
H 164432	20	6.4	17 58 24	+06 16	H 2	11091	L 0	19JUL81	01 27 48	010 00	JP851	603
H 164432	20	6.4	17 58 24	+06 16	H 3	14517	L 0	19JUL81	00 52 50	010 00	JP851	501
HD164794	12	5.9	18 00 48	-24 22	H 2	11818	L 0	21OCT81	16 15 49	004 00	UK463	502 4-MIN HTR W-UP
HD164794	12	06.0	18 00 48	-24 22	H 3	14805	L 0	24AUG81	20 24 39	004 30	RS564	501
HD164794	12	6.0	18 00 48	-24 22	H 3	15208	L 0	08OCT81	16 17 34	004 30	GH506	501 LINE MISSING Y=600
HD164794	12	6.0	18 00 48	-24 22	H 3	15298	L 0	20OCT81	16 47 24	004 30	RS564	501
HD164794	12	5.9	18 00 48	-24 22	H 3	15307	L 0	21OCT81	16 08 07	004 30	UK463	501
HD164816	13	7.1	18 00 53	-24 19	H 2	11819	L 0	21OCT81	17 23 19	011 30	UK463	502 4-MIN HTR W-UP
HD164816	13	7.1	18 00 53	-24 19	H 3	15308	L 0	21OCT81	16 52 44	014 00	UK463	501
HD164906	20	7.5	18 01 32	-24 23	H 2	11820	L 0	21OCT81	18 40 34	030 00	UK463	503 4-MIN HTR W-UP
HD164906	20	7.5	18 01 32	-24 23	H 3	15309	L 0	21OCT81	17 58 55	015 00	UK463	301
HD315021	20	8.6	18 01 32	-24 20	H 3	15310	L 0	21OCT81	19 25 04	130 00	UK463	602
HD165052	12	6.9	18 02 06	-24 24	H 2	11817	L 0	21OCT81	14 59 43	012 35	UK463	502 4-M HTR W-UP MN=715
HD165052	12	6.9	18 02 06	-24 24	H 3	15306	L 0	21OCT81	14 38 11	016 00	UK463	501
HD165195	47	7.3	18 02 11	+03 47	L 2	11703	L 0	06OCT81	16 21 54	050 00	FS592	501 MN=511
ANTIGONE	05	10.7	18 08 29	-15 42	L 2	11350	L 0	16AUG81	19 12 29	100 00	UK420	404 4-MIN HTR WARM UP
U2 SER	54	12.8	18 08 33	-14 56	L 2	11605	L 0	22SEP81	19 27 38	035 00	UK402	503 MICROPHONICS
U2 SER	54	12.8	18 08 33	-14 56	L 3	15078	L 0	22SEP81	18 41 43	040 00	UK402	551
NGC 6572	70	09.0	18 09 41	+06 50	H 2	11481	L 0	06SEP81	17 06 27	145 00	MG605	335
NGC 6572	70	09.0	18 09 41	+06 50	L 2	11482	S L	06SEP81	20 25 37	040 00	MG605	333
NGC 6572	70	09.0	18 09 41	+06 50	L 3	14917	S 0	06SEP81	16 37 00	012 00	MG605	351
NGC 6572	70	09.0	18 09 41	+06 50	L 3	14917	L 0	06SEP81	16 56 22	006 00	MG605	371

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
NGC 6572	70	09.0	18 09 41	+06 50	L 3	14918	S C	06SEP81	19 44 30	020 00	MG605	241
NGC 6572	70	09.0	18 09 41	+06 50	H 3	14919	L 0	06SEP81	21 43 35	121 00	MG605	371
M 16	72	00.0	18 16 05	-13 53	L 2	11870	L 0	31OCT81	14 25 07	240 00	UK435	307 4-M HTR W-UP MN=709
M 16	72	00.0	18 16 05	-13 53	L 3	15352	L 0	31OCT81	18 30 29	157 00	UK435	301
HD168206	10	09.4	18 16 20	-11 39	L 2	11589	L 0	17SEP81	20 31 31	025 00	UK480	763 4 MIN H+R WARM UP
HD168206	59	09.4	18 16 20	-11 39	L 2	11645	L 0	30SEP81	17 00 14	012 00	UK473	701 MICROPHONICS
H 168206	11	9.4	18 16 20	-11 39	L 3	14557	L 0	26JUL81	02 06 55	020 00	UK480	451
HD168206	11	9.4	18 16 20	-11 39	L 3	14717	L 0	10AUG81	23 48 38	020 00	UK480	450
HD168206	10	09.4	18 16 20	-11 39	L 3	15046	L 0	19SEP81	20 07 48	020 00	UK480	551
HD168206	59	09.4	18 16 20	-11 39	L 3	15136	L 0	30SEP81	16 36 19	020 00	UK473	551
H 170153	41	3.5	18 21 57	72 43	L 2	10977	S 0	01JUL81	02 30 14	000 09	STAND	602
H 170153	41	3.5	18 21 57	72 43	L 2	10977	L 0	01JUL81	02 21 21	000 08	STAND	702
H 170153	41	3.5	18 21 57	72 43	H 2	10978	L 0	01JUL81	04 09 20	005 30	STAND	602
H 170153	41	3.5	18 21 57	72 43	L 3	14366	S 0	01JUL81	02 37 04	001 37	STAND	400
H 170153	41	3.5	18 21 57	72 43	L 3	14366	L 0	01JUL81	02 33 18	001 10	STAND	500
H 170153	41	3.5	18 21 57	72 43	H 3	14367	L 0	01JUL81	03 17 07	046 00	STAND	601
HD234677	46	8.2	18 32 45	+51 41	L 2	11663	L 0	02OCT81	17 16 11	005 00	MR531	342 4-MIN HTR W-UP
HD234677	46	8.2	18 32 45	+51 41	L 2	11664	L 0	02OCT81	18 40 42	005 00	MR531	343 4-MIN HTR W-UP
HD234677	46	8.2	18 32 45	+51 41	L 3	15156	L 0	02OCT81	17 37 41	060 00	MR531	151
HD234677	46	8.2	18 32 45	+51 41	L 3	15157	L 0	02OCT81	19 07 13	060 00	MR531	221
V348 SGR	52	12.6	18 37 18	-22 57	L 2	11604	L 0	22SEP81	17 18 54	040 00	AH550	403 MICROPHONICS
V348 SGR	52	12.6	18 37 18	-22 57	L 3	15077	L 0	22SEP81	16 35 04	040 00	AH550	301
V348 SGR	52	12.3	18 37 18	-22 57	L 3	15209	L 0	08OCT81	17 21 53	110 00	AH550	401
GL 735	48	10.1	18 53 03	+08 20	L 2	11685	L 0	04OCT81	20 19 48	020 00	UK487	343 4-MIN HTR W-UP
GL 735	48	10.1	18 53 03	+08 20	L 3	15175	L 0	04OCT81	19 46 15	030 00	UK487	001 MOD REF POS
GL 735	48	10.1	18 53 03	+08 20	L 3	15175	L 0	04OCT81	19 05 37	030 00	UK487	001 MOD REF POS
GL 735	48	10.1	18 53 03	+08 20	L 3	15176	L 0	04OCT81	20 57 51	049 00	UK487	001
HD175754	12	07.4	18 54 39	-19 13	H 3	14803	L 0	24AUG81	18 29 40	012 00	RS564	501
HD177230	11	11.5	19 01 20	-04 24	L 3	14716	L 0	10AUG81	21 56 10	070 00	UK480	441
HD177230	10	11.5	19 01 20	-04 24	L 3	15048	L 0	19SEP81	22 15 31	062 00	UK480	441
H 177230	11	11.5	19 01 20	-04 23	L 3	14456	L 0	26JUL81	00 47 47	040 00	UK480	231
BD+23771	20	9.2	19 01 39	+03 01	L 2	11735	L 0	09OCT81	18 40 10	006 30	UK410	501 MN=525
BD+23771	20	9.2	19 01 39	+03 01	L 3	15218	L 0	09OCT81	18 51 31	035 00	UK410	501
HD180968	20	5.4	19 15 36	+22 56	H 2	11732	L 0	09OCT81	14 24 43	003 00	UK410	401 MN=577
HD180968	20	5.4	19 15 36	+22 56	L 2	11733	S 0	09OCT81	15 18 15	000 06	UK410	501 MN=379
HD180968	20	5.4	19 15 36	+22 56	L 2	11733	L 0	09OCT81	15 12 42	000 06	UK410	701 MN=379
HD180968	20	5.4	19 15 36	+22 56	H 3	15214	L 0	09OCT81	14 32 11	007 30	UK410	501
HD180968	20	5.4	19 15 36	+22 56	L 3	15215	L 0	09OCT81	15 59 15	000 05	UK410	500
E141-G55	84	14.1	19 16 57	-58 46	L 2	11010	L 0	05JUL81	02 44 15	063 00	VILSP	453
E141-G55	84	14.1	19 16 57	-58 46	L 3	14399	L 0	05JUL81	01 49 39	050 00	VILSP	341
E141-G55	84	13.6	19 16 57	-58 46	L 3	15256	L 0	13OCT81	21 39 46	008 00	UK475	230
H 184915	23	4.9	19 34 12	-07 08	H 2	11088	L 0	18JUL81	21 05 31	002 00	JP851	502
H 184915	23	4.9	19 34 12	-07 08	H 2	11090	L 0	19JUL81	00 13 22	002 20	JP851	562
H 184915	23	4.9	19 34 12	-07 08	H 3	14512	L 0	18JUL81	20 25 24	002 00	JP851	501
H 184915	23	4.9	19 34 12	-07 08	H 3	14513	L 0	18JUL81	21 10 43	003 00	JP851	501
H 184915	23	4.9	19 34 12	-07 08	H 3	14516	L 0	19JUL81	00 07 09	003 00	JP851	501
HM SGE	57	00.0	19 39 41	+16 38	L 2	11280	L 0	09AUG81	19 48 04	040 00	HN600	563
HM SGE	57	00.0	19 39 41	+16 38	L 2	11280	S 0	09AUG81	19 36 21	008 00	HN600	353

OBJECT	CL	MAG	RT ASCN HR MN SC	DECLN DEG MN	DISP +CAM	IMAGE	APERT OR LG	•DATE	START HR MN SC	LENGTH MIN SC	PROG	COMMENT
HM SGE	57	00.0	19 39 41	+16 38	H 2	11281	L 0	09AUG81	21 26 37	070 00	HN600	254 MICROPHONICS
HM SGE	57	00.0	19 39 41	+16 38	L 3	14704	L 0	09AUG81	19 01 23	030 00	HN600	261
HM SGE	57	00.0	19 39 41	+16 38	L 3	14704	S 0	09AUG81	18 48 18	010 00	HN600	131
HM SGE	57	00.0	19 39 41	+16 38	H 3	14705	L 0	09AUG81	20 32 50	050 00	HN600	130
HM SGE	57	00.0	19 39 41	+16 38	H 3	14706	L 0	09AUG81	22 40 05	187 00	HN600	262
NGC6822	80	00.0	19 42 03	-15 50	L 3	15127	L 0	29SEP81	21 03 15	134 00	JL542	202
HD186882	25	02.8	19 43 25	+45 00	H 3	14822	S 0	26AUG81	18 28 03	002 40	HL593	501
HD186882	25	02.8	19 43 25	+45 00	H 3	14823	S 0	26AUG81	19 05 19	004 50	HL593	701
HD186882	25	02.8	19 43 25	+45 00	H 3	14827	S 0	26AUG81	23 00 39	004 00	HL593	601
HD186882	25	02.8	19 43 25	+45 00	H 3	14844	S 0	28AUG81	18 46 42	004 00	HL593	701
HD187111	47	7.7	19 45 53	-12 15	L 2	11704	L 0	06OCT81	17 55 04	050 00	FS592	502
RRTEL	57	10.5	20 00 20	-55 52	H 2	11744	S 0	10OCT81	17 33 32	120 00	PHCAL	71 4-MIN HTR W-UP
RRTEL	57	10.5	20 00 20	-55 52	H 2	11745	L 0	10OCT81	20 24 12	060 00	PHCAL	71 MICROPHONICS
RRTEL	57	10.5	20 00 20	-55 52	H 3	15210	S 0	08OCT81	20 21 03	087 00	PHCAL	171
RRTEL	57	10.5	20 00 20	-55 52	H 3	15229	L 0	10OCT81	19 36 50	044 00	PHCAL	71
RR TEL	57	10.5	20 00 20	-55 05	H 2	11293	L 0	11AUG81	19 11 23	025 00	PHCAL	071
RR TEL	57	10.5	20 00 20	-55 05	H 2	11296	L 0	11AUG81	23 28 44	025 00	PHCAL	073 MICROPHONICS
RR TEL	57	10.5	20 00 20	-55 05	H 3	14727	L 0	11AUG81	19 41 33	025 00	PHCAL	062
RR TEL	57	10.5	20 00 20	-55 05	H 3	14729	L 0	11AUG81	22 56 02	025 00	PHCAL	063
RR TEL	57	10.5	20 00 20	-55 05	L 3	14730	S 0	12AUG81	01 16 32	002 00	PHCAL	161
RR TEL	57	10.5	20 00 20	-55 05	L 3	14730	L 0	12AUG81	01 21 50	006 00	PHCAL	371
H 190918	11	7.5	20 04 05	+35 39	H 3	14554	L 0	25JUL81	22 57 24	010 00	UK480	331
HD190918	11	7.5	20 04 05	+35 39	H 3	14715	L 0	10AUG81	20 40 17	020 00	UK480	551
HD191877	23	06.3	20 09 10	+21 44	H 3	14825	S 0	26AUG81	21 07 03	034 00	HL593	501
H 193576	11	8.3	20 17 42	+38 34	H 3	14553	L 0	25JUL81	20 45 21	090 00	UK480	331
HD193576	11	8.3	20 17 42	+38 34	L 3	14714	L 0	10AUG81	19 59 04	003 00	UK480	451
HD193576	10	08.0	20 17 42	+38 24	L 3	15045	L 0	19SEP81	19 26 51	003 00	UK480	341
NOVA VUL	63	8.9	20 19 01	+21 25	L 2	11232	L 0	03AUG81	23 30 35	030 00	AA545	501
S 106	72	16.0	20 25 33	+37 13	L 2	10996	L 0	02JUL81	21 08 07	360 00	CE551	009 SERENDIPITY
S 106	72	16.0	20 25 33	+37 13	L 3	14386	L 0	02JUL81	21 05 48	402 00	CE551	114
HERTHA	05	10.1	20 30 18	-21 19	L 2	11351	L 0	16AUG81	22 19 03	050 00	UK420	404 4-MIN HTR WARM UP
DAPHNE	05	11.4	20 34 18	-01 09	L 2	11366	L 0	18AUG81	19 53 30	342 00	UK420	609 4-MIN HTR WARM UP
AE AQR	54	11.5	20 37 34	-01 03	L 2	11193	L 0	30JUL81	02 04 05	015 00	GK570	472
AE AQR	54	11.5	20 37 34	-01 03	L 2	11194	L 0	30JUL81	02 58 28	010 00	GK570	351
AE AQR	54	11.5	20 37 34	-01 03	L 2	11202	L 0	31JUL81	21 56 39	010 00	GK570	362
AE AQR	54	11.5	20 37 34	-01 03	L 2	11203	L 0	31JUL81	22 44 12	010 00	GK570	363
AE AQR	54	11.5	20 37 34	-01 03	L 2	11204	L 0	31JUL81	23 51 19	010 00	GK570	572
AE AQR	54	11.5	20 37 34	-01 03	L 3	14598	L 0	30JUL81	02 23 06	030 00	GK570	231
AE AQR	54	11.5	20 37 34	-01 03	L 3	14599	L 0	30JUL81	03 30 10	017 00	GK570	231
AE AQR	54	11.5	20 37 34	-01 03	L 3	14609	L 0	31JUL81	22 10 13	030 00	GK570	331
AE AQR	54	11.5	20 37 34	-01 03	L 3	14610	L 0	31JUL81	23 14 00	030 00	GK570	350
H 197406	11	10.5	20 39 54	+52 25	L 3	14555	L 0	25JUL81	23 41 09	025 00	UK480	331
HD197406	11	10.5	20 39 54	+52 25	L 3	14713	L 0	10AUG81	18 26 52	050 00	UK480	451
HD197406	26	10.5	20 39 54	+52 25	L 3	15138	L 0	30SEP81	18 26 03	040 00	UK473	441
HBV 475	57	00.0	20 49 03	+35 24	L 2	11233	L 0	04AUG81	01 23 50	023 00	AA545	231
HBV 475	57	13.3	20 49 03	+35 24	H 2	11265	L 0	07AUG81	19 18 58	170 00	HN600	124 MICROPHONICS
HBV 475	57	13.3	20 49 03	+35 24	L 2	11266	L 0	07AUG81	23 06 32	070 00	HN600	343 MICROPHONICS
HBV 475	57	00.0	20 49 03	+35 24	L 3	14642	L 0	04AUG81	00 29 02	050 00	AA545	241

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
HBV 475	57	13.3	20 49 03	+35 24	H 3	14687	L 0	07AUG81	22 13 31	042 30	HN600	110
HBV 475	57	13.3	20 49 03	+35 24	L 3	14688	L 0	08AUG81	00 20 20	087 00	HN600	151
HD200120	26	4.7	20 58 00	+47 19	L 2	11323	L 0	14AUG81	19 06 50	000 01	UK480	550
HD200120	26	4.7	20 58 00	+47 19	H 3	14761	L 0	14AUG81	19 02 51	001 10	UK480	551
HD200120	26	4.7	20 58 00	+47 19	L 3	14762	L 0	14AUG81	19 43 40	000 01	UK480	551
HD200120	20	04.7	20 58 07	+47 20	H 2	11566	L 0	16SEP81	21 04 38	001 20	VD538	502 MICROPHONICS
HD200120	20	04.7	20 58 07	+47 20	L 2	11567	S 0	16SEP81	21 46 53	000 02	VD538	502 MICROPHONICS
HD200120	20	04.7	20 58 07	+47 20	L 2	11567	L 0	16SEP81	21 42 50	000 01	VD538	502 MICROPHONICS
HD200120	20	04.7	20 58 07	+47 20	H 3	15013	L 0	16SEP81	20 33 29	001 10	VD538	501
HD200120	20	04.7	20 58 07	+47 20	L 3	15014	S 0	16SEP81	21 38 48	000 02	VD538	501
HD200120	20	04.7	20 58 07	+47 20	L 3	15014	L 0	16SEP81	21 35 13	000 01	VD538	501
HD200120	59	4.7	20 58 07	+47 19	L 2	11770	L 0	13OCT81	19 01 54	000 01	UK475	502 4-MIN HTR W-UP
HD200120	59	4.7	20 58 07	+47 19	H 3	15253	L 0	13OCT81	18 58 13	001 10	UK475	501
ER VUL	44	07.5	21 00 17	+27 37	L 3	14922	L 0	07SEP81	20 50 21	177 00	UK407	532
HD201345	23	07.7	21 05 52	+33 12	H 2	11560	L 0	15SEP81	22 59 26	013 00	UK437	502 MICROPHONICS
HD201345	12	07.7	21 05 52	+33 12	H 3	14824	S 0	26AUG81	19 54 19	030 00	HL593	301
HD201345	23	07.7	21 05 52	+33 12	H 3	15004	L 0	15SEP81	22 35 15	020 00	UK437	501
K 559	19	14.8	21 27 34	+11 58	L 2	11472	L 0	04SEP81	19 23 01	080 00	VC548	403
K 559	19	14.8	21 27 34	+11 58	L 3	14897	L 0	04SEP81	17 31 50	090 00	VC548	400
K 996	19	14.2	21 27 43	+11 58	L 2	11473	L 0	04SEP81	22 31 36	077 00	VC548	303
K 996	19	14.2	21 27 43	+11 58	L 3	14898	L 0	04SEP81	20 56 53	085 00	VC548	301
HD205435	44	04.1	21 32 06	+45 22	L 3	14877	L 0	01SEP81	19 57 03	100 00	CZ502	340
D+284211	20	10.5	21 48 56	+28 37	L 2	11074	S 0	17JUL81	02 40 36	003 00	UKCAL	602
D+284211	20	10.5	21 48 56	+28 37	L 2	11074	L 0	17JUL81	02 36 44	001 00	UKCAL	602
D+284211	20	10.5	21 48 56	+28 37	L 3	14498	S 0	17JUL81	02 33 03	001 18	UKCAL	700
D+284211	20	10.5	21 48 56	+28 37	L 3	14498	L 0	17JUL81	02 29 53	000 26	UKCAL	500
D+284211	20	10.5	21 48 56	+28 37	L 3	14499	L 0	17JUL81	03 12 15	001 18	UKCAL	500
SAO 3673	44	07.1	22 00 07	+82 38	L 3	14921	L 0	07SEP81	16 56 33	107 00	UK407	601
HD209943	44	07.4	22 00 13	+82 38	L 2	11485	L 0	07SEP81	18 55 43	007 00	UK407	701 DATA LOSS;SPECT OF
SERENDIP	85	17.5	22 04 33	-40 52	L 1	1349	L 0	23AUG81	20 56 19	715 00	UK472	007 READ AT GSFC
2204-408	85	17.5	22 04 33	-40 52	L 3	14798	L 0	23AUG81	20 54 43	760 00	UK472	007 READ AT GSFC
2204-408	85	17.5	22 04 33	-40 52	L 3	14815	L 0	25AUG81	21 07 35	743 00	UK472	119 READ AT GSFC
HD210334	46	6.1	22 06 39	+45 30	H 2	11662	L 0	02OCT81	14 36 31	030 00	MR531	333 4-MIN HTR W-UP
HD210334	46	6.1	22 06 39	+45 30	H 2	11672	L 0	03OCT81	15 12 59	060 00	UK487	354 4-MIN HTR W-UP
HD210334	46	6.1	22 06 39	+45 30	L 3	15155	L 0	02OCT81	15 10 13	100 00	MR531	441
HD210334	46	6.1	22 06 39	+45 30	L 3	15165	L 0	03OCT81	16 17 43	080 00	UK487	440
RU PEG	54	11.3	22 11 36	+12 27	L 2	11593	L 0	20SEP81	20 07 33	010 00	UK402	602
RU PEG	54	11.3	22 11 36	+12 27	L 2	11594	L 0	20SEP81	20 52 24	007 00	UK402	602
RU PEG	54	11.8	22 11 36	+12 27	L 2	11606	L 0	22SEP81	21 01 29	010 00	UK402	452 MICROPHONICS
RU PEG	54	11.3	22 11 36	+12 27	L 3	15061	L 0	20SEP81	20 22 10	014 00	UK402	661
RU PEG	54	11.3	22 11 36	+12 27	L 3	15062	L 0	20SEP81	21 24 30	010 00	UK402	550
RU PEG	54	11.8	22 11 36	+12 27	L 3	15079	L 0	22SEP81	20 43 22	014 00	UK402	451
BPM14703	43	14.4	22 16 11	-65 44	L 2	11176	L 0	29JUL81	00 58 36	169 00	IB557	105
HD211924	20	5.4	22 17 57	+05 32	L 2	11734	S 0	09OCT81	17 26 42	000 08	UK410	501 MICROPHONICS
HD211924	20	5.4	22 17 57	+05 32	L 2	11734	L 0	09OCT81	17 23 27	000 08	UK410	701 MICROPHONICS
HD211924	20	5.4	22 17 57	+05 32	L 3	15216	S 0	09OCT81	16 57 49	000 09	UK410	400
HD211924	20	5.4	22 17 57	+05 32	L 3	15216	L 0	09OCT81	16 52 55	000 07	UK410	500
HD211924	20	5.4	22 17 57	+05 32	H 3	15217	L 0	09OCT81	17 30 23	011 00	UK410	501

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
HD214479	48	11.5	22	36	01	-20	53	L	2	11653	L	0	01OCT81	19	56	37	020	00	UK487	132 4-MIN HTR W-UP
HD214479	48	11.5	22	36	01	-20	53	L	3	15148	L	0	01OCT81	19	15	59	030	00	UK487	110 MOD REF POS
HD214479	48	11.5	22	36	01	-20	53	L	3	15148	L	0	01OCT81	18	39	27	030	00	UK487	110 MOD REF POS
HD214479	48	11.5	22	36	01	-20	53	L	3	15149	L	0	01OCT81	20	31	58	046	00	UK487	110
EV LAC	52	10.2	22	44	40	+44	04	L	2	11458	L	0	02SEP81	16	03	23	025	00	UK455	133 MICROPHONICS
EV LAC	52	10.2	22	44	40	+44	05	L	2	11465	L	0	03SEP81	16	59	40	025	00	UK455	142 MICROPHONICS
EV LAC	52	10.2	22	44	40	+44	04	L	3	14884	S	0	02SEP81	17	18	37	030	00	UK455	110
EV LAC	52	10.2	22	44	40	+44	04	L	3	14884	L	0	02SEP81	16	43	11	030	00	UK455	110
EV LAC	52	10.2	22	44	40	+44	05	L	3	14892	S	0	03SEP81	16	21	00	030	00	UK455	110
EV LAC	52	10.2	22	44	40	+44	05	L	3	14892	L	0	03SEP81	15	42	29	030	00	UK455	110
EV LAC	52	10.2	22	44	40	+44	05	L	3	14893	S	0	03SEP81	18	03	21	030	00	UK455	221
EV LAC	52	10.2	22	44	40	+44	05	L	3	14893	L	0	03SEP81	17	29	58	030	00	UK455	221
HD215835	06	08.6	22	44	54	+57	49	L	2	11209	L	0	01AUG81	19	25	26	001	16	UK438	502
HD215835	06	08.6	22	44	54	+57	49	H	2	11210	L	0	02AUG81	00	20	07	085	00	UK438	438
HD215835	12	8.6	22	44	54	+57	49	L	2	11222	L	0	03AUG81	00	37	25	003	15	UK438	702
HD215835	12	8.6	22	44	54	+57	49	L	2	11223	L	0	03AUG81	01	39	55	001	16	UK438	502 MICROPHONICS
HD215835	06	08.6	22	44	54	+57	49	L	3	14619	L	0	01AUG81	18	40	22	003	34	UK438	501
HD215835	06	08.6	22	44	54	+57	49	H	3	14620	L	0	01AUG81	20	06	28	250	00	UK438	503
HD215835	12	8.6	22	44	54	+57	49	L	3	14633	L	0	03AUG81	01	08	50	003	34	UK438	501
2252-035	59	13.2	22	52	43	-03	29	L	2	11693	L	0	05OCT81	19	26	09	020	00	UK473	401 4-MIN HTR W-UP
2252-035	59	13.2	22	52	43	-03	29	L	2	11694	L	0	05OCT81	20	28	17	020	00	UK473	401 4-MIN HTR W-UP
2252-035	59	13.2	22	52	43	-03	29	L	2	11695	L	0	05OCT81	21	30	27	016	00	UK473	301
2252-035	59	13.2	22	52	43	-03	29	L	3	15186	L	0	05OCT81	18	46	04	029	00	UK473	331
2252-035	59	13.2	22	52	43	-03	29	L	3	15187	L	0	05OCT81	19	56	03	024	00	UK473	331
2252-035	59	13.2	22	52	43	-03	29	L	3	15188	L	0	05OCT81	20	59	21	026	00	UK473	331
H2252-03	59	13.2	22	52	43	-03	27	L	2	11769	L	0	13OCT81	15	35	45	017	00	UK475	303 4-M HTR W-UP MN=745
H2252-03	59	13.2	22	52	43	-03	27	L	3	15250	L	0	13OCT81	15	15	16	017	00	UK475	301
NGC 7469	84	14.0	23	00	44	+08	36	L	2	11448	L	0	31AUG81	20	15	42	073	00	SEYFE	353 MICROPHONICS
NGC 7469	84	14.0	23	00	44	+08	36	L	2	11449	L	0	31AUG81	23	59	41	068	00	SEYFE	343 MICROPHONICS
NGC 7469	84	14.0	23	00	44	+08	36	L	3	14870	L	0	31AUG81	21	35	28	140	00	SEYFE	361
MCG25822	84	13.8	23	02	07	-08	57	L	2	11051	L	0	11JUL81	22	16	44	045	00	UK491	303
MCG25822	84	13.8	23	02	07	-08	57	L	3	14451	L	0	11JUL81	21	11	44	060	00	UK491	341
MCG25822	84	13.8	23	02	07	-08	57	L	3	14452	L	0	11JUL81	23	16	58	060	00	UK491	341
HD218356	00	4.8	23	04	40	+25	12	H	3	15283	L	0	17OCT81	09	25	12	000	00	UK482	239 ST/FIN GSFC 1040 MIN
N 7552	84	12.5	23	13	25	-42	51	L	3	14453	L	0	12JUL81	01	13	37	153	00	UK491	302
G273-13	43	14.0	23	16	56	-17	22	L	2	11175	L	0	28JUL81	21	12	58	080	00	18557	303
-5 23174	16	11.8	23	17	23	-05	26	L	2	11785	L	0	15OCT81	21	06	00	003	40	RK511	402 4-MIN HTR W-UP
-5 23174	16	11.8	23	17	23	-05	26	H	3	15270	L	0	15OCT81	16	46	56	255	00	RK511	502
HD221170	47	7.7	23	27	05	+30	09	L	2	11702	L	0	06OCT81	15	10	50	030	00	FS592	501 MN=195
EQ PEG	52	10.2	23	29	20	+19	40	L	2	11459	L	0	02SEP81	22	10	44	025	00	UK455	242 MICROPHONICS
EQ PEG	52	10.2	23	29	20	+19	40	L	2	11466	L	0	03SEP81	20	44	48	025	00	UK455	242
EQ PEG	52	10.2	23	29	20	+19	40	L	2	11467	L	0	03SEP81	22	26	04	024	00	UK455	253 MICROPHONICS
EQ PEG	52	10.2	23	29	20	+19	40	L	3	14885	S	0	02SEP81	19	36	30	030	00	UK455	121
EQ PEG	52	10.2	23	29	20	+19	40	L	3	14885	L	0	02SEP81	19	00	27	030	00	UK455	121
EQ PEG	52	10.2	23	29	20	+19	40	L	3	14886	S	0	02SEP81	21	08	32	030	00	UK455	121
EQ PEG	52	10.2	23	29	20	+19	40	L	3	14886	L	0	02SEP81	20	34	18	030	00	UK455	121
EQ PEG	52	10.2	23	29	20	+19	40	L	3	14887	S	0	02SEP81	23	15	30	032	00	UK455	120
EQ PEG	52	10.2	23	29	20	+19	40	L	3	14887	L	0	02SEP81	22	40	48	030	00	UK455	120

OBJECT	CL	MAG	RT ASCN HR	MN	SC	DECLN DEG	MN	DISP	+CAM	IMAGE	APERT OR	LG	DATE	START HR	MN	SC	LENGTH MIN	SC	PROG	COMMENT
EQ PEG	52	10.2	23	29	20	+19	40	L	3	14894	L	U	03SEP81	20	05	15	030	00	UK455	120
EQ PEG	52	10.2	23	29	20	+19	40	L	3	14894	L	0	03SEP81	19	31	05	030	00	UK455	120
EQ PEG	52	10.2	23	29	20	+19	40	L	3	14895	L	0	03SEP81	22	01	16	020	00	UK455	110
EQ PEG	52	10.2	23	29	20	+19	40	L	3	14895	L	0	03SEP81	21	14	41	040	00	UK455	120
EQ PEG	52	10.2	23	29	20	+19	40	L	3	14896	L	0	03SEP81	22	54	46	053	00	UK455	231
HD223552	41	06.4	23	47	52	+51	21	H	2	11453	L	U	01SEP81	18	38	12	050	00	CZ502	633 MICROPHONICS
HD224085	47	7.4	23	52	26	+28	23	H	2	11652	L	U	01OCT81	15	17	14	025	00	UK487	232 4-MIN HTR W-UP
HD224085	46	7.4	23	52	26	+28	23	H	2	11673	L	0	03OCT81	18	03	21	035	00	UK487	333 4-MIN HTR W-UP
HD224085	46	7.4	23	52	26	+28	23	H	2	11684	L	0	04OCT81	17	44	07	035	00	UK487	343 4-MIN HTR W-UP
HD224085	47	7.4	23	52	26	+28	23	L	3	15147	L	U	01OCT81	15	46	15	100	00	UK487	261
HD224085	46	7.4	23	52	26	+28	23	L	3	15166	L	0	03OCT81	18	44	33	100	00	UK487	251
HD224085	46	7.4	23	52	26	+28	23	L	3	15174	L	U	04OCT81	16	21	04	080	00	UK487	331

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