Nineteenth Meeting of the Hipparcos Science Team

ESOC, 31 October–1 November 1988

Attendance:

HST: Dr M. Crézé, Prof. F. Donati, Dr. M. Grenon, Prof. M. Grewing, Dr E. Høg, Prof. J. Kovalevsky, Dr F. van Leeuwen, Dr L. Lindegren, Dr H. van der Marel, Mr C.A. Murray, Mr R.S. Le Poole, Dr C. Turon.

ESTEC: M.A.C. Perryman, S. Vaghi, R.D. Wills, K. Clausen (first day)

ESOC: J. van der Ha; A. Schütz, P.E. Davies (part time)

The Agenda given in Annex I was adopted.

1. Project Status Report

Clausen gave a report of the overall technical and programmatic status of the payload and spacecraft. Annex II summarises existing problems, and the schedule leading to launch in June 1989. Vaghi gave a report on the payload (Annex III). Attention was drawn to the degraded Tycho and straylight performances.

2. Project Scientist Report

Perryman gave an overview of the major ongoing activities, most of which are detailed in subsequent agenda points. HST members were invited to identify points of concern to them at present. These were: Turon: schedule for book and IC5 simulations (latter subsequently pushed to end February 1989, hence major difficulty removed), Tycho performance (common HST concern), feedback from ESOC to INCA during mission (status considered satisfactory after discussions under agenda item 4); Høg: Tycho performance and satellite testing problems; Grewing: Tycho performance, involvement of DRC during commissioning (status considered satisfactory after discussions under agenda item 7); van Leeuwen: DDID timing issues (partly resolved by DDID meeting discussions on 1 November, but uncertainties still outstanding); Kovalevsky: CNES schedule, availability of final DDID.

3. INCA Aspects

(a) PSF/ESOC interface: no problems to report. The interface with the minor planet task was also satisfactory. Discrepancies in the ephemerides of Mars and Venus were traced to errors in the ESOC routines.

(b) schedule: a delivery of the next ('final' apart from minor updates and additions) version of IC, IC5, was agreed for end February 1989 (Turon/Schütz). No changes in the format were foreseen (Turon). Magnitude errors had been communicated by Turon to Schütz the previous week (B and V, not B_T and V_T) for all stars in IC3 and in the ISPR catalogue—the precision is given by the number of significant figures.

(c) observability of minor planets: Kovalevsky with A. Bec-Borsenberger would formulate a proposal for the selection strategy for minor planets (based on magnitudes, frequency of appearance, etc.). A proposal would be made and submitted to Lindegren for his review (Action 1).

(d) Turon reported on the reply of proposers to the stars from their proposals in IC3. A small number of errors were reported. Turon reported on the status of the IRS (additional stars to be studied by USNO). Generally addressees were happy with the exercise.

(e) proposed Input Catalogue format: a proposal on both the format, contents and layout of the Input Catalogue was made by Turon, and distributed at the meeting (Annex IV). ESA had undertaken to print 1000 copies, assuming approximately 2400 sides. The format and contents were to be reviewed by the HST before the next meeting (Action 2). Murray was specifically invited to give his views, and to investigate the table-setting facilities exploited already by RGO (Action 3). Perryman raised the question of whether any formal (copyright) issues of data inclusion needed to be considered.

4. ESOC Aspects

(a) status report: van der Ha gave a general status report (Annex V) and outlined the goals and schedules of the forthcoming Ground Segment Review. Documents of particular interest to the HST would be the PSF preparation, Calibration and Monitoring ADD's, DRC tapes preparation, and DDID interface. Of these, the Monitoring ADD was distributed at the meeting to Crézé, Grewing and Turon; the Calibration ADD update would be sent from ESOC to Kovalevsky; the PSF update would be sent to Crézé; and the System Overview would be sent to Høg, Kovalevsky and Turon (NB: documents distributed 4/11/88). Deadline for comments on all material (for the purposes of the Ground Segment Review) would be 15 November (via Perryman).

(b) Davies presented the calibration and monitoring status (Annex VI). The Monitoring ADD had been distributed at the last HST meeting, and people particularly interested in the functioning of the monitoring should review that document. Davies was invited to make a preliminary definition of his 'quality' flags, in terms of magnitude and positional

(modulation) discrepancy (Action 4: NB completed, and attached as Annex VIII).

(c) Schütz reported on his PSF preparation software. IC3 had been incorporated, and a batch program written to update the catalogue from a magnetic tape version. An interactive version was under development. A report on the modulation of the observing strategy had been sent to Crézé; while detailed comments had not yet been received, Crézé considered that the agreement was already good.

(d) Perryman would write to appropriate persons in CERGA, RGO and Copenhagen to investigate whether optical observations of Hipparcos could be made for the purposes of the satellite orbit determination (Action 5: NB completed 7/11/88).

5. Payload Aspects

(a) PFM Calibration: the data had been read by van Leeuwen and Schrijver, but not studied. Kovalevsky requested that the data was sent to him again by EARN (Action 6: NB completed 2/11/88). On conventions, Wills noted that Y_P referred to DSS1, but to FOV2 (and correspondingly for $-Y_P$).

(b) Tycho anomaly: details of the situation were presented by Wills. Basically, the difference between the FAR results (which had been accepted by the HST as part of the FAR review) and the recently available calibration results (i) differed by a factor of more than 2 for the B channel; (ii) invalidated the optimisation of the dichroic selection (see HST #12); (iii) called into question the reliability of the calibration; (iv) gave concerns about the functioning of the RTAD (in view of the fact that RTAD uses the B channel, that the number of photons collected in B was severely reduced compared with previous estimates, and that the stars outside of the galactic plane were predominently red stars whose detection efficiency was now strongly degraded); (v) led to a probably decrease in the number of stars detected in two colours by Tycho from 600 000 to 300 000, (vi) led to a significant scientific loss in view of the consequent degradation in the colour index determination. HST expressed their dissatisfaction with the present status, especially since it was not possible to trace the origin of this very significant discrepancy in quantitative terms (some qualitative effects had been proposed to account for the differences), but HST requested that these are quantified (Action 7). Grenon felt that, if a technical problem were identified, it might be preferable to accept to modify the instrument and accept a degraded on-ground calibration of the payload if this should prove necessary.

6. Data Reduction Aspects

(a) simulated data: Kovalevsky hoped that, by the end of November, simulated data in DDID 3+ format could be sent to NDAC. He would write to van Leeuwen explaining what would be provided, and in what format (Action 8). It would probably be March 1989 before data could pass the other way through the CNES chain.

For NDAC, van Leeuwen reported that the interrupt facility had been upgraded, parallax and proper motion had been included; and 11 data sets spread over 2.5 years had been prepared with various star mapper and gyro configurations.

(b) IDT comparisons: Perryman reported on the software now available in ESTEC for the comparisons. An updated proposal for the format contents and layout (for unformatted data) would be made by van Leeuwen (Action 9). It is base-lined that the comparisons would be made in ESTEC throughout the mission.

(c) SM comparisons: van Leeuwen would make an updated format proposal. Comparison throughout the mission was presently foreseen to be carried out at RGO.

(d) GCR: Petersen had produced analysed data from LOSIM3 in the comparison format, and this was handed to van der Marel during the meeting (from Høg via Perryman). Corresponding data should be available from Delft in a few days. It was likely that the comparisons could be done during the mission at Delft (abscissae and instrument) if required at intervals of about 1 month.

(e) attitude: Kovalevsky expressed some concerns about the difficulty of splitting the attitude comparison from the instrument calibration. After discussions the following points emerged: (i) the comparison was primarily a FAST/NDAC motivated work, and should be 'monitored' at the level of the HST, even though the results were of direct relevance to Tycho; (ii) NDAC and FAST would communicate their results to the 'comparison institute' who would transform the data there (based, for example, on the transformations defined by Lindegren), and carry out the comparisons (based, for example, on the proposal by Donati). Van Leeuwen explained why he thought this comparison would not be straightforward; (iii) the comparison institute might be an Italian institute (depending on the funding identified by P.L. Bernacca), or at Delft (TBC by van der Marel); (iv) Lindegren and Donati preferred that the comparison would run continuously, while Kovalevsky was concerned on the load and data volume implied for the consortia. This would be discussed again at the forthcoming FAST meeting at CERGA, when Donati and van der Marel would have investigated the status of their institutes for carrying out the comparison work (Action 10).

(f) point comparison: Kovalevsky would work through Lindegren's document in FAST, while van Leeuwen would send his code to Lindegren to allow latter to verify the correctness of the NDAC software (Action 11).

(g) calibration software status: Kovalevsky indicated that the last piece of the CSS software would be delivered to SRU by the end of 1988; no date was set for the integrated software test; he considered that the calibration software would be ready at Utrecht in time for launch.

(h) activities of DRC during commissioning: Kovalevsky asked what involvement from the DRC was expected by ESOC, in addition to the work carried out at Utrecht. Van der Ha would produce a time-line for the commissioning activities (Action 12). He noted that data would be sent to the DRC as early as possible. Meetings could be foreseen 2–3

or 6–7 weeks after the start of commissioning. Regular reports would be distributed by ESOC to the HST. Grewing suggested a computer readable data base could be set up (e.g. at ESTEC) to keep the DRC informed of developments. Perryman would investigate (Action 13).

(i) software readiness review: van der Marel would complete the SRR form, submit it to Kovalevsky, then the completed form would be sent to Perryman (Action 14).

7. Miscellaneous

(a) book: Perryman presented the status of the texts, and a schedule for the work (specific expected actions are summarised in Annex VII). After some discussions, HST members unanimously agreed that the books be published just before launch, and a final target date for the text was agreed for the end of February 1989.

(b) Nature paper at launch: Perryman explained the constraints laid down by the editor. HST members supported the proposal that it should be a review article with a single author. They unanimously proposed that Perryman draft and author this paper. Consortia task leaders (TBC) would be 'boxed' within the text.

(c) COSPAR 1990: Kovalevsky had been invited by Dupree to organise a symposium on space astrometry at the 1990 COSPAR meeting to be held in the Hague. The emphasis of the meeting and the organising committee was discussed. Kovalevsky would circulate further details to the organising committee in due course.

(d) Launch attendance: the Project manager had announced his intention to invite the three consortia leaders to Kourou for the launch. In spite of the limited number of invitees that were possible, HST urged that Prof. Lacroûte be invited. Høg also proposed that Lindegren be invited, a proposal supported by other members. Perryman would investigate this proposal with Hassan, whether other persons could attend the launch if 'self-financed', and whether other HST members could be invited to ESOC (along with other Hipparcos scientists at their own expense) at the time of launch (Action 15: NB completed 7/11/88: Hassan agrees to invite the 5 named persons at ESA expense to Kourou. Others could attend the launch at their own expense, and further details would be investigated. Hassan agreed to invite other HST members to ESOC at the time of launch; again other Hipparcos scientists could attend ESOC at their own expense. Details of arrangements proposed would be drawn up by van der Ha).

(e) Film: P. Saunders (ESA, Paris) presented some of the material that would go into the film. Le Poole was invited to attend the final editing on behalf of the HST members. Saunders would distribute a copy of the 'final' edit on VHS cassette to all HST members, to allow their views to be made on the content before distribution (Action 16). NB: HST members had already been involved in the finalisation of the script, and major changes to the script were to be avoided. Translations of the commentary would be reviewed by the HST members before wider circulation of the translations (Action 17).

(f) Aeritalia Press Visit: the next ESA/Hipparcos press visit would take place at Aeritalia, Torino, probably during the week of 16–20 January 1989. Donati and Grenon agreed to participate in this press visit on behalf of the HST (Action 18).

(g) HST structure after launch: HST members were invited to reflect on the functions of the HST after launch, and on its composition. Provisional composition could be as at present (as long as members would have the necessary time to devote to the appropriate review tasks), along with one or two other persons with key responsibilities. Other functions would be: to review publications (in collaboration with the data distribution review team); review the comparisons; ensure a unique catalogue; approve the catalogue releases; implement policy decisions.

8. Future Meetings

The next meeting of the Hipparcos Science Team would take place on 15–16 February 1989, in ESTEC. Other meetings were FAST (CERGA, 8–9 December 1988), TDAC Review (Heidelberg/Tubingen, 11–12 January 1989), INCA (28 February–1 March, TBC), and NDAC Review (Cambridge, 3–5 April 1989, to which van der Marel and Canuto would be invited).

M.A.C. Perryman, 3 November 1988

Distribution: participants, H. Hassan, R. van Kahwijk

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HIPPARCOS

MEETING HIPPARCOS 19th HST

PLACE ESOC

REF.

DATE 31/10-1/4/88

PAGE 1

ACTION No	DESCRIPTION (not more than 4 lines)	CLOSING DATE	ACTIONNEE Person/firm	INITIATOR Person/firm
✓ 1	Formulation of selection strategy for minor planets	31 JAN 89	J. KOVALEVSKY	
✓ 2.	Review format, contents and layout of printed/tape Input Catalogue	next HST	HST members	
✓ 3.	Review Input Catalogue proposal. Investigate table setting at ROO	"	C.A. MURRAY	
✓ 4	Propose definition of quality flags for payload monitoring	"	P.E. DAVIES	
✓ 5	Invite observation of satellite at CERGA/ROO/Copenhagen during mission	"	MACPERRYMAN	
✓ 6.	Send PFM calibration data to Kovalevsky (by ESAW)	"	S. VAGHI	
✓ 7.	Quantify discrepancy between Tycho FAR and measurements	30 NOV 88	ESTEC/MATRA	
✓ 8	Explain contents/formats of FAST simulated data to van Leeuwen	31 DEC 88	J. KOVALEVSKY	
✓ 9	Update format for IDT/S9 Comparisons	next HST	F. VAN LEEUWEN	
✓ 10	Investigate Italian and Delft potential for running attitude comparison	FAST/CERGA	F. DONATI/H.v.d. MAREL	
✓ 11	Implement agreed actions to verify "point comparison" of Lindegren	next HST	F.v. LEEUWEN/J. KOVALEVSKY	
✓ 12.	Produce time-line for commissioning activities	"	VAN DER HA	
✓ 13	Investigate remote-access information base	"	PERRYMAN	
Signatures				

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HIPPARCOS

MEETING HIPPARCOS HST-19

PLACE ESOC

REF.

DATE

PAGE 2

ACTION No	DESCRIPTION (not more than 4 lines)	CLOSING DATE	ACTIONNEE Person/firm	INITIATOR Person/firm
14	Complete software readiness review form	next HST	FAST	
✓ 15	Investigate launch-time attendance of Hipparcos persons	"	M. PERRYMAN	
✓ 16	Review VHS provisional film to be sent to all HST members	TBD	P. SAUNDERS	
✓ 17	Ensure verification of translation for Hipparcos film	"	P. SAUNDERS	
✓ 18	Invite / coordinate attendance of Donath / Grenon to Heraklia press	"	PERRYMAN	
19	CARRIED OVER FROM 18th HST			
✓ 19	Produce report on attitude errors, including improvement from optical position	31/12/88	PALLASCHKE	
Signatures				

ANNEX I

Nineteenth Meeting

of the

HIPPARCOS SCIENCE TEAM

ESOC (VIP Room), 31 October-1 November 1988

(Start of meeting: 09:30 on Monday 31 October)

PROVISIONAL AGENDA

1. Project/Korou/satellite status (09.30-09.45) (Clausen/Hassan)

2. Project Scientist report (09.45-10.00) (Perryman)

3. INCA aspects (10.00-11.00):
   - status of INCA/ESOC interface and INCA schedule (Turon/Schutz)
   - letter to proposers: responses (Turon)
   - proposed format for Input Catalogue publication (Turon)
   - observability of minor planets, HST18.2 (Turon)

4. ESOC aspects (11.00-13.00):
   - calibration & variable star monitoring status (van der Ha)
   - PSF preparation software status (Schutz)
   - procedures, HST18.11 (HST comments)
   - HST comments on ADD for PSF/Calibration/Catalogue updating

5. Payload aspects (14.00-15.00):
   - PFM Summary Photometric Calibration Report (Wills/HST comments)

6. Miscellaneous (15.00-17.00):
   - 'Book' status (HST comments)
   - Nature papers at launch: authors etc. (HST comments)
   - film status (Perryman) and 'preview' (P. Saunders)
   - COSPAR 1990 (Kovalevsky)
   - Aeritalia press visit

Tuesday 1 November

7. Data Reduction aspects (09.00-13.00):
   - simulated data within FAST and NDAC (Kovalevsky/van Leeuwen)
   - status of FAST calibration software (Kovalevsky)
   - IDT/SM/GCR comparison status (HST comments)
   - attitude comparison, HST18.13 (Donati)
   - Point Comparison of Apparent Positions (LL) paper (HST comments)
   - Software Readiness Review: forms and dates, HST18.14-15
   - activities of DRC during commissioning (Kovalevsky)

8. Any other business, future Hipparcos meetings, next HST meeting

Distribution: Hipparcos Science Team
ESTEC: H.Hassan, S.Vaghi, R.D.Wills, K.Clausen, O.Pace, K.van Katwijk
ESOC: J. van der Ha, A. Schutz, J. Sternberg, P. Davies
MATRA: J.P. Gardelle

FAR RESULTS

- EVERYTHING FINE

- EXCEPT :
  - * BAFFLE NON LATCH
  - * PL FREQUENCY SHIFT
  - * DETECTION EFFICIENCY
  - * ON BOARD TIMING ANOMALY

ANNEX II

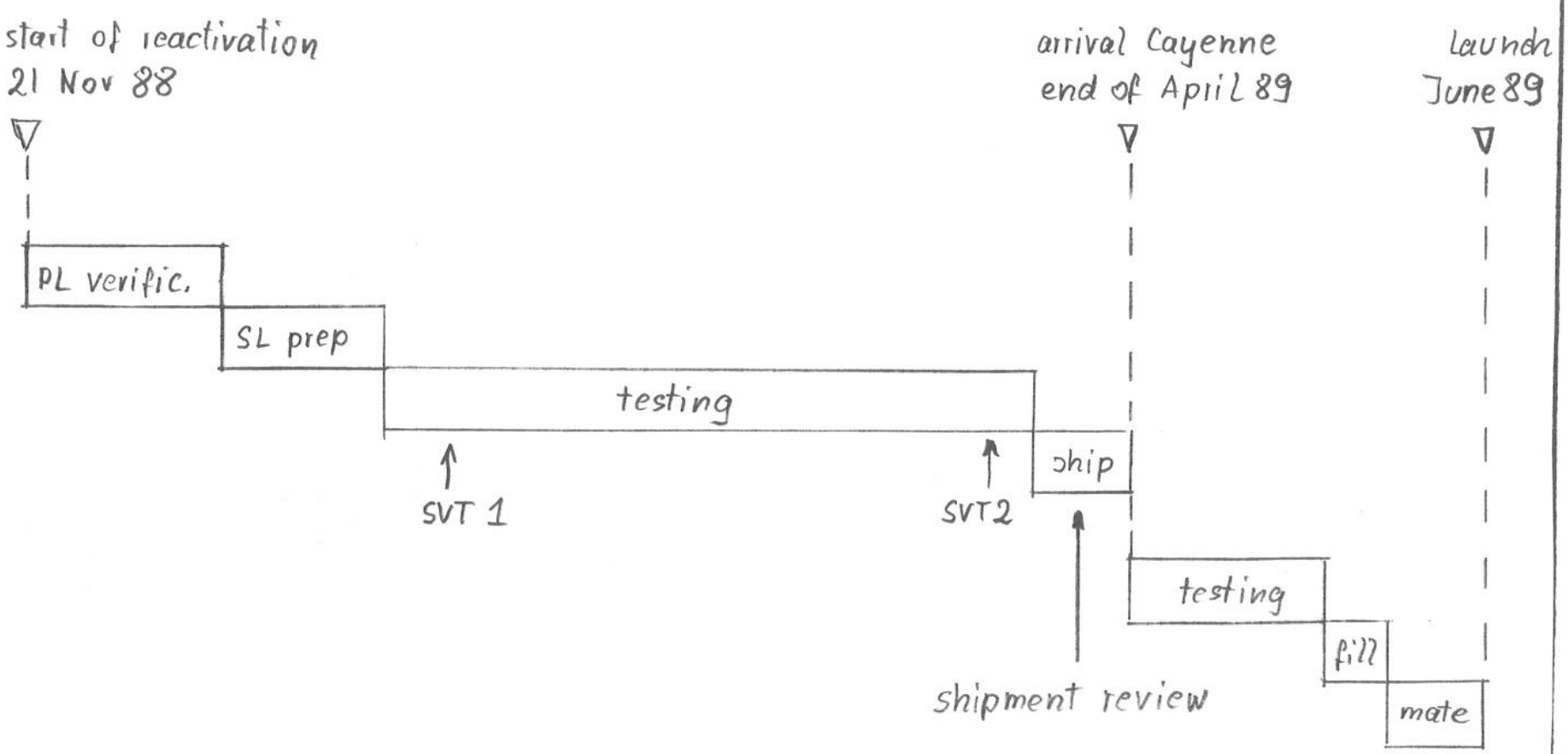
SATELLITE STATUS

- SL STORED AT AERITALIA

- PL REMOVED TO INVESTIGATE FREQUENCY SHIFT PROBLEM

- 3 SPACECRAFT UNITS REMOVED
  - * EIU FOR RELAY EXCHANGE
  - * CLE FOR HYBRID EXCHANGE AND MODIFICATIONS
  - * IRU FOR STORAGE AND MODIFICATIONS

Future Planning



ANNEX III

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PAYLOAD STATUS REPORT

19th HST Meeting

ESOC, 31 October - 1 November 1988

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1. Present status

- the satellite (S/C + P/L) is in storage at Aeritalia

- the payload is undergoing a minor change, consisting in the replacement of the springs for the baffle covers

ANNEX III

2. Performance

- the performance values have remained those presented at the 18th HST meeting, except for

  - TYCHO performance

  and

  - straylight performance

	B_T	V_T	SPEC.
	σ_{B_T} (mag)	σ_{V_T} (mag)	σ_m (mag)
B+V/2 = 8.65			
B-V = 0	0.082	0.083	0.375
B-V = 0.7	0.111	0.076	0.250
B-V = 1.5	0.157	0.064	0.375
B+V/2 = 9.65			
B-V = 0	0.154 (0.103)	0.164 (0.132)	0.375
B-V = 0.7	0.219 (0.143)	0.149 (0.125)	0.250
B-V = 1.5	0.327 (0.265)	0.123 (0.101)	0.375
B+V/2 = 10.65			
B-V = 0	0.321 (0.217)	0.360 (0.305)	0.750
B-V = 0.7	0.478 (0.315)	0.322 (0.275)	0.500 ←
B-V = 1.5	0.744 (0.467)	0.260 (0.220)	0.750 ←

TYCHO PHOTOMETRIC PERFORMANCES (COMBINED MEASUREMENTS)

		SPEC.
	σ_α (arcsec)	σ_α (arcsec)
B+V/2 = 8.65		
B-V = 0	0.039	0.150
B-V = 0.7	0.043	0.100
B-V = 1.5	0.040	0.150
B+V/2 = 9.65		
B-V = 0	0.072 (0.053)	0.150
B-V = 0.7	0.091 (0.063)	0.100
B-V = 1.5	0.083 (0.061)	0.150
B+V/2 = 10.65		
B-V = 0	0.192 (0.120)	0.300
B-V = 0.7	0.211 (0.143)	0.200
B-V = 1.5	0.187 (0.138)	0.300 ←

TYCHO ASTROMETRIC PERFORMANCES (COMBINED MEASUREMENTS)

- Straylight

  - increase of 4 degrees in the Moon interruption limits

  - no impact on the Earth interruption limits

3. (Previous) areas of concern

- Detection efficiency anomaly

  - the 20% loss in DE for one field of view (FOV1) and one detection chain (DSS2) in vacuum remains unexplained

  - the following effects have been investigated

    - magnetic effect on the detector
    - polarisation
    - temperature effects
    - behaviour of IDT in vacuum

    none of them explains the degradation.

  However

  - the effect does not evolve in time
  - the DSS2 is the redundant detection chain
  - the P/L performance remains in spec

  No further activity is foreseen.

- Contamination

  - the possible effect of contamination is well understood (straylight) and has been shown to be acceptable

  - an active effort is done to minimize contamination during the storage period

4. Future activities

  - S/L reactivation will start the 2nd half of November

  - during reactivation the P/L will undergo all functional tests in ambient

ANNEX IV

PROJECT FOR THE CONTENT OF THE TAPE FOR INCA CATALOGUE I

1 - MAIN CATALOGUE.

- IC running number

- multiplicity code
- running number for the associated star
- number of components in the system
- CCDM number
- considered component(s)

- BD, CD, CPD numbers
- HD number

- right ascension (α) in decimal degrees, 0 to 360°
? - declination (δ) in decimal degrees, -90° to +90° (Equinox J2000)
- Epoch
- Error on right ascension (σ_α)
- Error on declination (σ_δ)
- source of position

- 15 μ_α cos δ
- μ_δ

- $\sigma_{\mu\alpha}$ cos δ
- $\sigma_{\mu\delta}$

- source of proper motion

- galactic latitude (l)
? - galactic longitude (b)

- ecliptic latitude (λ)
? - ecliptic longitude (β)

- trigonometric parallax (π)
- error on trigonometric parallax (σ_π)
- source of trigonometric parallax

- dynamic parallax
- source of dynamic parallax

- B magnitude
- error on B magnitude (σ_B)
- source of B magnitude

- V magnitude
- error on V magnitude (σ_V)
- source of V magnitude

- B-V
- error on B-V (σ_{B-V})
- source of B-V

- B_T
- error on B_T (σ_{BT})

- V_T
- error on V_T (σ_{VT})

- $B_T - V_T$
- error on $B_T - V_T$ (σ_{BT-VT})

- H magnitude
- error on H magnitude (σ_H)

- variability code

- code for photometric standard stars

- SAO number
- AG number
- GJ number
- LHS/LTT/L number
- Giclas number
- Identification number in galactic clusters

- Codes for existing multicolour photometry

2 - ANNEX 1.

- CCDM number
- considered component
- reference component for separation and position angle
- IC running number

- right ascension (α) in decimal degrees, 0 to 360°
- declination (δ) in decimal degrees, -90° to +90° Equinox J 2000
- Epoch
- coded mean error on position
- source of position

- 15 μ_α cos δ
- μ_δ
- source of proper motion

- BD, CD, CPD numbers
- SAO number
- AG number

ANNEX IV

- B magnitude
- error on B magnitude (σ_B)
- source of B magnitude

- V magnitude
- error on V magnitude (σ_V)
- source of V magnitude

- B-V
- error on B-V (σ_{B-V})
- source of B-V

- H magnitude
- error on H magnitude (σH)

- variability code
- code for photometric standard stars

- separation (ρ)
- position angle (θ)
- flag for orbital system

3 - ANNEX 3.

- IC running number
- Name of the variable star (Kukarkin) or NSV number
- Type of variability (? if unknown)
- Magnitude at maximum luminosity
- Magnitude at minimum luminosity
- Coded mean error on these magnitudes
- Period of variation, in days
- Variability code (0 to 5)
- Magnitude adopted in the main catalogue
- Code explaining the magnitude adopted in the main catalogue (1 to 5)

4 - ANNEX 4.

- Julian day
- IC running number
- Name of the variable star (Kukarkin) or NSV number
- Estimated H magnitude
- Estimated B-V
- Letter R for radio stars

DRAFT FORMAT FOR A PRINTED VERSION OF THE INCA I CATALOGUE

1 - LEFT-HAND PAGES

FIELD	COLUMNS	FORMAT	CONTENT
1	01-08	I6, 2X	IC running number
2	09-23	A13, 2X	BD/CD/CPD number (HD convention)
3	24-31	A6, 2X	HD number
4	32-36	A4, 1X	Component(s)
5	37-49	I2, 1X, I2, 1X, F6.3, 1X	Right ascension, in hours, minutes, seconds.
6	50-63	A1, I2, 1X, I2, 1X, F5.2, 2X	Declination : sign of dec., degrees, arcminutes, arcseconds. Equinox : J 2000
7	64-69	F5.2, 1X	Epoch
8	70	A1	Coded mean error on right ascension and declination, in arcsec.
9	71-73	A1, 2X	Source of position.
10	74-81	F6.3, 2X	$15\,\mu_\alpha \cos\delta$
11	82-88	F6.3,1X	μ_δ
12	89	A1	Coded mean error on proper motion
13	90-92	A1, 2X	Source of proper motion
14	93-99	F6.3, 1X	Parallax
15	100	A1	Coded error on the parallax
16	101-103	A1, 2X	T for trigonometric, D for dynamic
17	104-111	I6, 2X	SAO number
18	112-121	A9, 1X	AG/GJ/LHS/LTT/Giclas number
19	122-132	A2, 1X, A8	Spectral type. Luminosity class.

1 - RIGHT-HAND PAGES

FIELD	COLUMNS	FORMAT	CONTENT
1	01-08	I6, 2X	IC running number
2	09-14	F5.2, 1X	B magnitude
3	15	A1	Coded mean error on B magnitude
4	16-18	A1, 2X	Source of B magnitude
5	19-24	F5.2, 1X	V magnitude
6	25	A1	Coded mean error on V magnitude
7	26-28	A1, 2X	Source of V magnitude
8	29-34	F5.2, 1X	H magnitude
9	35-37	A1, 2X	Variability code
10	38-46	A9	Name of the variable star (Kukarkin) or NSV number
11	47-51	A5	Type of variability
12	52-57	F5.2, 1X	H magnitude at maximum luminosity
13	58-63	F5.2, 1X	H magnitude at minimum luminosity
14	64-65	A1, 1X	coded mean error on these magnitudes
15	66-73	F7.2,1X	Period of variation, in days
16	74-76	I1, 2X	Code explaining the magnitude given in field 8 : 1 to 5
17	77-86	A10	CCDM number
18	87-88	A1, 1X	Component
19	89-90	A1, 1X	Reference component for separation, position angle, and difference in magnitude
20	91-96	F5.1, 1X	Separation, in arcseconds
21	97-100	A3, 1X	Position angle, in degrees Equinox : J 2000 ; Epoch : 1990 if the relative motion is known, by default, that of source catalogue.
22	101-104	F3.1, 1X	Difference in magnitude
23	105-107	A1, 2X	Flag for orbital systems
24	108-123	A15, 1X	Identification number in galactic clusters
25	124-131	F7.2, 1X	Radial velocity
26	132	A1	Quality

Option 1 :

120 000 stars.

1 page = 132 lines
100 stars
21 intermediate blank lines

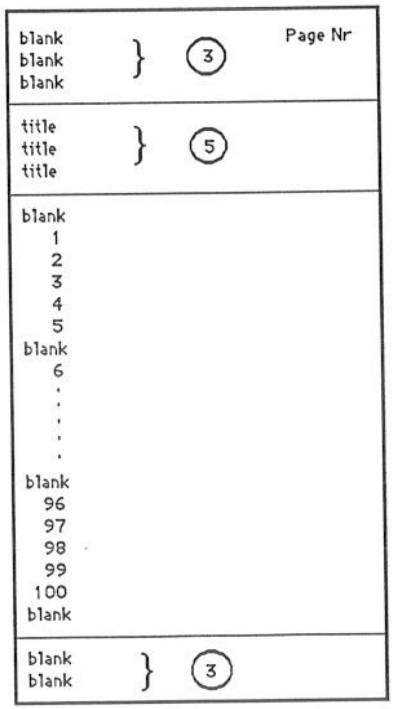
11 lines to be left for blanks, titles, and border.

Total for stars : 2 400 pages = 1 200 sheets

Introduction : 50 to 100 pages

Additional pages for multiple systems : 20 pages

Total : 2 520 pages = 1 260 sheets



Option 2 :

120 000 stars.

1 page = 106 lines
80 stars
17 intermediate blank lines

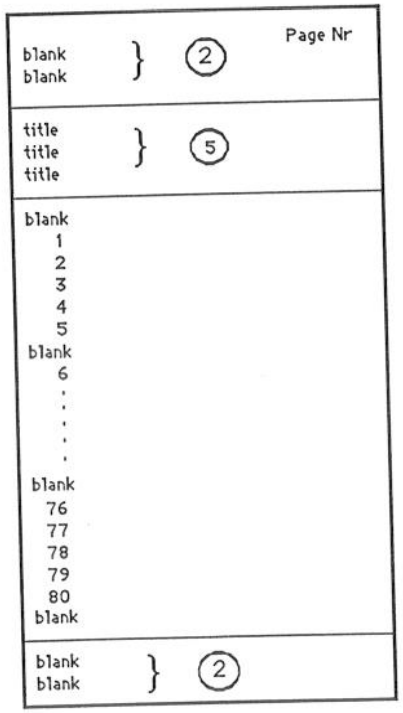
9 lines to be left for blanks, titles, and border.

Total for stars : 3 000 pages = 1 500 sheets

Introduction : 50 to 100 pages

Additional pages for multiple systems : 20 pages

Total : 3 120 pages = 1 560 sheets



ANNEX IV

HST: ESOC STATUS

88-10-30

J. Van der Ha

HIPPARCOS Ground Segment Manager

ESOC STATUS

1.0 OVERALL STATUS OF GROUND SEGMENT IMPLEMENTATION

- Flight Control Procedures Available (Issue 1)
- FOP Timeline available (Issue 1)
- Contingency Procedures Under Preparation
- Software Single Tests Essentially Completed
- Software Subsystem Tests On-Going
- New DDID and DRC Test Tape Delivered
- Simulator and HDCS Operational
- Control Software being Finalised
- ODW Station Integration Completed
- Data Comms Between ODW and OCC Completed
- MPTS Technical Interface Problems Resolved
- ESOC System Test Preparations Started
- Overall Ground Segment Review in November

ANNEX V

2.0 OPERATIONS PREPARATIONS

2.1 Operations data Files:

- TM and TC data files have been validated
- Packet command files definition on-going
- Derived Parameters definition on-going

2.2 Functional Testing:

- Testing of HDCS and Simulator using FCP's are continuing
- Final Acceptance tests being completed

2.3 Documentation:

- Software Acceptance Plan available
- SVT Test Plan being updated for 4.11
- Draft SVT Test Procedures available by 4.11
- FOP Issue 1 (including FCP's and Timeline) available
- SDOH Issue 1 completed
- CRP's preparation on-going

3.0 SOFTWARE IMPLEMENTATION

3.1 Flight Dynamics / Payload Support

- LEOP support definition completed
- ISPR and GRTAD module testing successful
- new RTAD re-initialisation baseline implemented (still to be tested)
- AOCS support definition being finalised (eg. TDDM)
- PSF/NSL Support tests completed
- Payload Calibration definition finalised and tests on-going
- Subsystem Test Plan available

3.2 Data Processing:

- new SCOS functional software (SFS 7) integrated in HDCS
- new HDCS version (A4) released for operational use
- SVT HDCS version to be released beginning January
- Dedicated software integration and subsystem tests on-going
- final DRC tape production software implementation on-going

4.0 ODENWALD GROUND STATION

HIPPARCOS Station equipment delivered from BTM on-site on 29.8

4.1 Antenna Subsystem:

Up- & Downconverters and HPA's (High-Power Amplifiers) installed in antenna cabin

4.2 Base-Band Equipment:

- BTM factory acceptance completed in June
- HPD (High-Performance Demodulator) delivered after additional software (enhancements) tests requested by ESOC
- Modifications of TM Pre-Processors been done for more efficient high-rate data handling

4.3 AMCM Implementation:

- Dedicated HIPARCOS Station Computer is now available at ODW station for system tests
- Problems observed in acceptance tests are being solved

4.4 Comms Subsystem:

- Data comms subsystem for METEOSAT and HIPPARCOS operational now
- First data flow tests (HDCS at ESOC and suitcase at ODW) been done
- Ranging comms implementation (DSTS-based) started in October

4.5 Testing:

- Station Acceptance Tests completed during October
- HIPPARCOS Network and Operations tests from November to May 89

4.6 LEOP Stations:

Boxes for Inversion of Ranging Signal will be Installed. (Also VILSPA instead of KRU)

ANNEX VI

PROGRESS SINCE APRIL 1988

- Real Time Calibration Software integrated with HDCS
- Payload Monitoring Software integrated with HDCS
- Subsystem tests started in October
- Off-line Calibration programs coded:
  - SM Single Slit Response (SSR)
  - Main FOV Straylight
  - Refocusing
  - Transverse Offset
- New software for the High Voltage monitoring of the IDT and PMT tubes has been developed (PDMM)

NEXT PHASE

- Off-line calibrations will be completed (February 1989):
  - Chromaticity of main FOV
  - Attitude Jitter
  - IFOV profile
- Special payload monitoring of long term variable stars will be done by ESOC
- Subsystem and System testing of all Calibration and Payload Monitoring Software

ANNEX VI

VARIABLE STAR MONITORING

- REMINDER - Payload Monitoring software performs a limited processing of the scientific data for some randomly selected IDT and SM observations in rear-real-time.
- About 500-1000 stars in the INCA will be flagged as stars of "special interest" e.g. long period variables
- The star selection algorithm will choose these stars in preference to all others.
- IDT - Intensity and Modulation will be computed.
- SM - Intensity in B and V Tycho channels will be computed.
- No comparisons with expected values will be made
- Results of this monitoring will be sent to INCA on a regular basis (2 or 4 weeks).

ANNEX VII

Actions: "Mook"

1. CT, EH, JK } additions + comments on structure (e.g. task composition)
2. AH : acknowledgements
3. LL : update of overview end November
4. Creese : standard stars + inputs on system 15 Nov. Dec. 15
5. ~~Koop~~ van Leeuwen : implementation in NDAC Dec. 15
6. — " — : updates to attitude chapter Dec. 15
7. MACP : comparison / validation
8. Notation : inputs to CAM by 18 November (assume HST will accept CAM recommendations) } MACP / CAM to meet 24 ~~Oct.~~ Nov.
9. INCA foreward CT to ask Blaauw
10. DRC foreward MACP to ask Lacroûte
    DRC preface EH / JK ?
11. OCR : van der Marel to check with CSP / ~~Dr D~~ / Lacroûte
12. EH/JK to check Andreasen in photometry (Mignard)
13. JK to check Hue inclusion in Pieplu
14. HST to identify gross omissions on S/L book asap.

Comments as red marking on appropriate pages!

Inputs by Dec. 15
Third version distributed end January. Final text end February

ANNEX VIII

From: ESC1333 --ESOC Date and time 88-11-04 15:27:26
To: ESC1213 --ESOC Jozef Van der Ha

From: Philip Davies
Subject: Payload Monitoring Quality

In answer to an action from the 31/10/88 HST, I have set up the quality defining bounds for payload monitoring:

Intensity Estimates (IDT and SM)

B brighter than 10.0

Quality=0, computed intensity within 1 magnitude of expected
Quality=1, computed intensity within 2 magnitudes of expected
Quality=2, computed intensity within 3 magnitudes of expected
Quality=3, computed intensity greater than 3 magnitudes from expected

B fainter than 10.0

Quality=0, computed intensity within 2 magnitude of expected
Quality=1, computed intensity within 3 magnitudes of expected
Quality=2, computed intensity within 4 magnitudes of expected
Quality=3, computed intensity greater than 4 magnitudes from expected

M1 Esitmates (IDT)

B brighter than 11.0

Quality=0, computed M1 within 20% of expected
Quality=1, computed M1 within 40% of expected
Quality=2, computed M1 within 60% of expected
Quality=3, computed M1 greater than 60% away from expected

B fainter than 11.0

Quality=0, computed M1 within 40% of expected
Quality=1, computed M1 within 60% of expected
Quality=2, computed M1 within 80% of expected
Quality=3, computed M1 greater than 80% away from expected

Phil.

cc: ESC1190 --ESOC Alain Schuetz

End of Message