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E83-10064

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(E83-10064) CNPQ/INPE-LANESAT SYSTEM REPORT
OF ACTIVITIES Report, 1 May 1981 - 30 Sep.
1982 (Instituto de Pesquisas Espaciais, Sao
Jose) 41 p HC A03/BF A01 CSCL 14B

N83-14573

Unclas

G3/43 00064



INSTITUTO DE PESQUISAS ESPACIAIS

1. Publication Nº <i>INPE-2554-PRE/208</i>	2. Version	3. Date <i>Oct., 1982</i>	5. Distribution <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External <input type="checkbox"/> Restricted
4. Origin Program <i>DGI</i>			
6. Key words - selected by the author(s) <i>LANDSAT MSS</i> <i>IMAGERY RECEPTION THEMATIC MAPPER</i> <i>IMAGERY PROCESSING</i>			
7. U.L.C.: <i>528.711.7:621.376.5</i>			
8. Title <i>CNPq/INPE - LANDSAT SYSTEM</i> <i>REPORT OF ACTIVITIES FROM MAY 01, 1981 TO</i> <i>SEPTEMBER 30, 1982</i>		10. Nº of pages: <i>33</i>	11. Last page: <i>30</i>
9. Authorship <i>Márcio Nogueira Barbosa</i> Responsible author <i>[Signature]</i>		12. Revised by <i>[Signature]</i> <i>Márcio Nogueira Barbosa</i>	
		13. Authorized by <i>[Signature]</i> <i>Wilson de Jesus Parada</i> <i>Director</i>	
14. Abstract/Notes <i>The main objective of this report is to present the current status of the Brazilian LANDSAT facilities and the results achieved during the period of May 01, 1981 to September 30, 1982</i> <i>Original photography may be purchased from EROS Data Center Sioux Falls, SD 57198</i>			
15. Remarks <i>Prepared for the LTWG (Landsat Technical Working Group) meeting, LGSOWG (Landsat Ground Station Operations Working Group) meeting, and DDWG (Data Distribution Working Group) meeting - USA, October 20-28/1982.</i>			

CONTENTS

	<u>Page</u>
LIST OF FIGURES	iii
SECTION I - PREPARED FOR THE LANDSAT TECHNICAL WORKING GROUP MEETING	1
SECTION II - PREPARED FOR THE LANDSAT GROUND STATION OPERATIONS WORKING GROUP MEETING	12
SECTION III - PREPARED FOR THE DATA DISTRIBUTION WORKING GROUP MEETING	18

LIST OF FIGURES

	<u>Page</u>
1 - Brazilian map of coverage for LANDSAT-4	3
2 - LANDSAT-4 MSS false color imagery (Vale do Paraiba area) acquired on September 18, 82 at Cuiaba Station and processed at Cachoeira Paulista Labs. on October 8, 82 (only preliminary corrections applied)	4
3 - Localization of LANDSAT antennas at INPE-Cuiaba (art)	14
4 - LANDSAT Products-Price List, issued on October 01, 82	16

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SECTION I

PREPARED FOR THE LANDSAT TECHNICAL WORKING GROUP MEETING

Date: October 20-22/1982

Place: NASA-Goddard Space Flight Center - Maryland (USA)

1 - ACTION ITEM FROM 2nd LTWG

("Provide NASA with a formal letter outlining LANDSAT-D MSS and TM acquisition plans")

In attention to a request from LANDSAT-D Project Office dated July 01, 1982 INPE sent by telex on July 19, 1982 the LANDSAT-D MSS acquisition requirements per WRS path and row numbering system and plans for TM data.

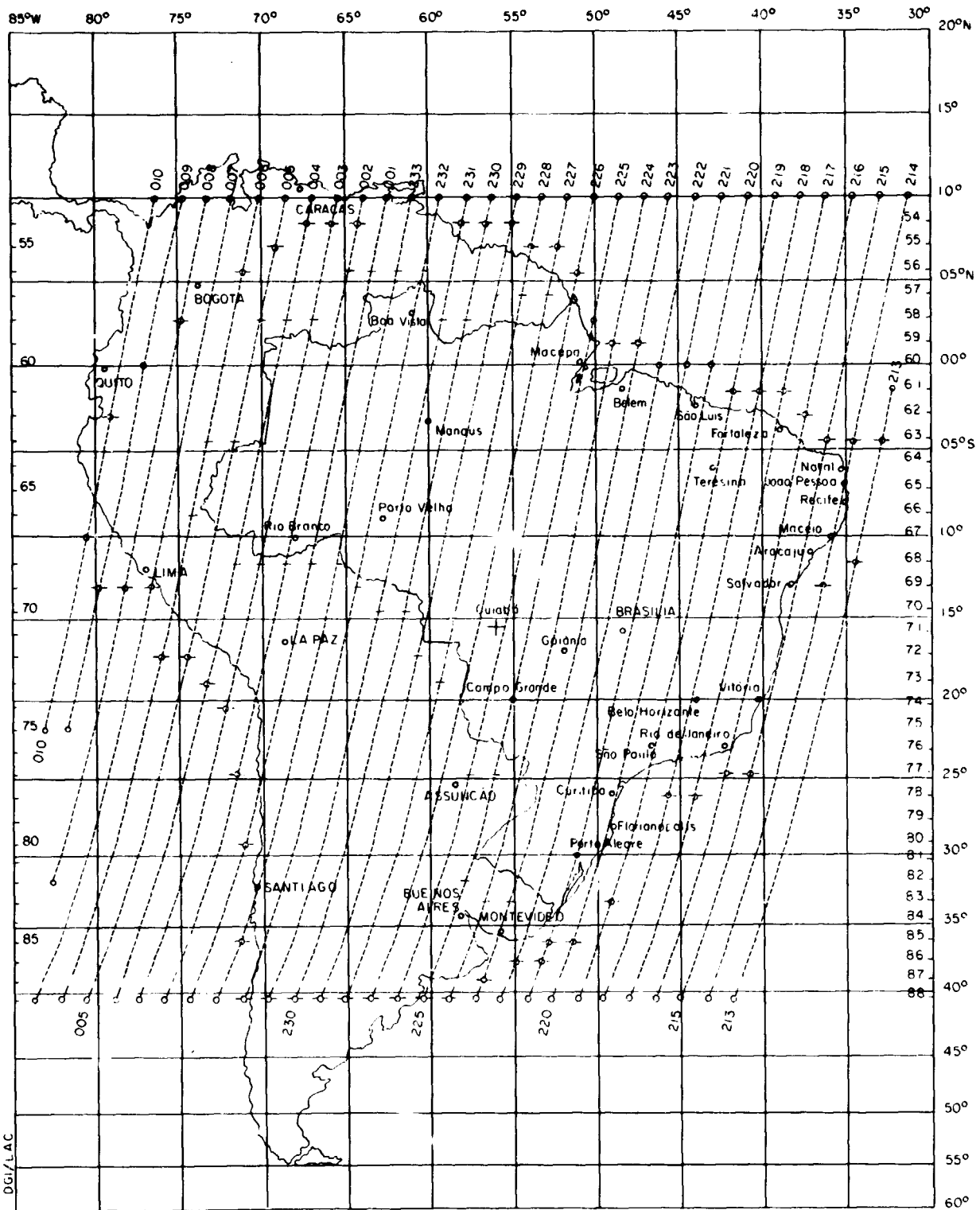
The tables below give the present status and can be considered as the INPE's official statement for LANDSAT-4 acquisitions.

TABLE 1

PLANS FOR LANDSAT-4 MSS UPGRADE

Receive & Record Capability	Full Processing Capability	Acquisition Requested
From August 24/1982 on	November, 82 (Quick-look products since August 24/82)	All South America land mass within range of Cuiabá Station (approx. 900 scenes/cycle)

- See Brazilian Map of Coverage for LANDSAT-4
 - a) Limits of Brazilian Land Mass coverage are indicated in the map as "—"
 - b) Limits of South-America Land Mass coverage are indicated in the map as "-o-"



LANÇAMENTO: 16-07-82
DO LANDSAT "4"

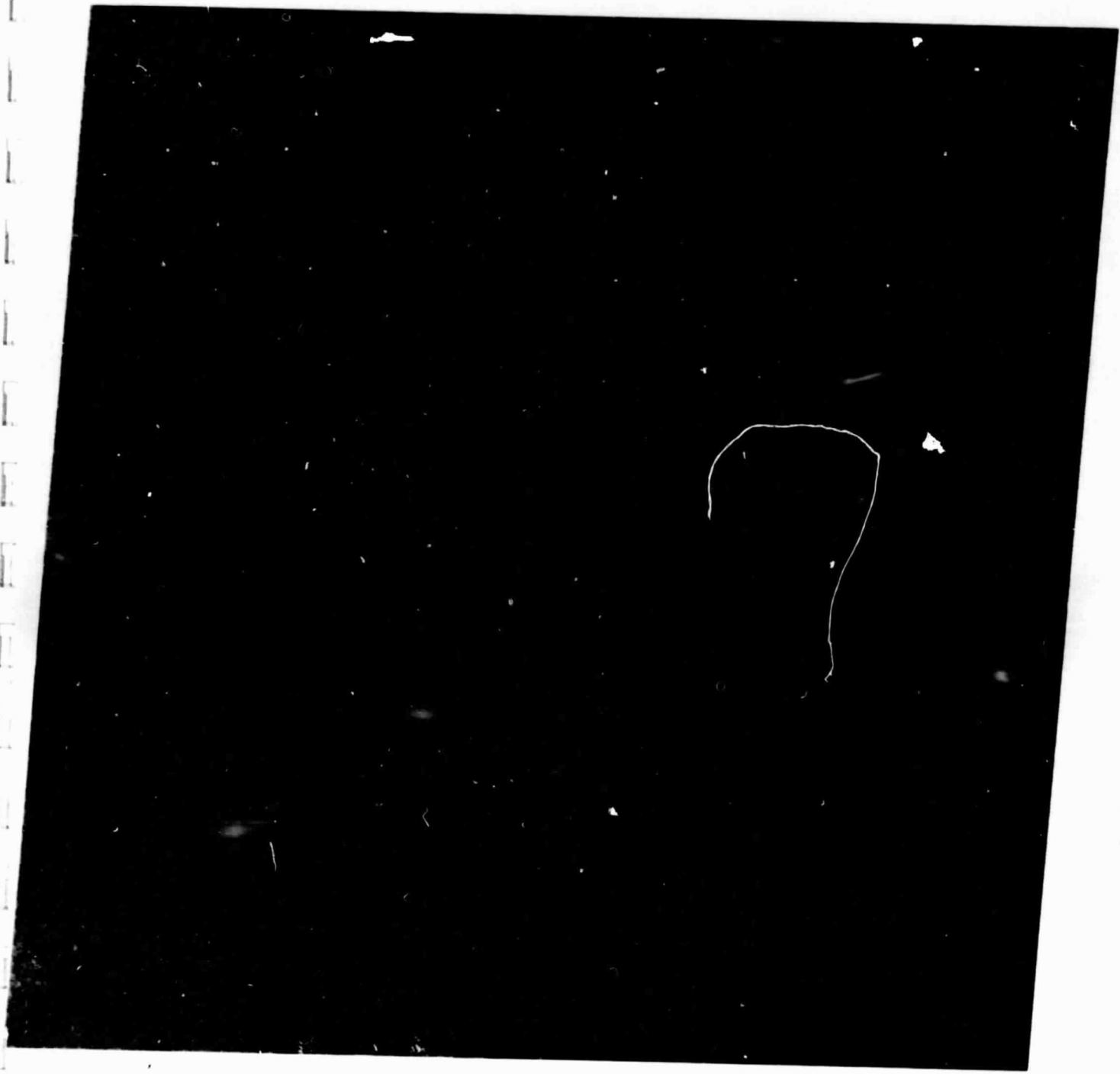
-o- Limite da Grade Continental

- Limite da Grade Brasileira

MAPA ÍNDICE PRELIMINAR DA COBERTURA DO LANDSAT "4"

EDIÇÃO REVISADA

Fig. 1 - Brazilian map of coverage for LANDSAT-4.



M

WRS 218- 75



135ET82 WRS: 218 75
PEP 101 LANDSAT 4

MSS

LINE CNFD INFE LANDSAT 482256-102516-1
4 00856 855 -BRASIL- 0800182 1ENH 0M1

4-00856-55 M5

Fig. 2 - LANDSAT-4 MSS false color imagery (Vale do Paraiba area) acquired on September 18, 82 at Cuiaba Station and processed at Cachoeira Paulista Labs. on October 8, 82 (only preliminary corrections applied).

ORIGINAL PAGE
COLOR PHOTOGRAPH

TABLE 2

PLANS FOR LANDSAT-4 TM DATA RECEPTION & PRODUCTS

Record Capability	Desired Acquisition Level	Limited Capacity for Processing	Full Capability for Processing	Planned Output Products		
				Type	Volume	Format
End of November, 82 receiving capability (X-Band) since August, 82	450 scenes/cycle	March, 83		Q. Look film	-	Earth Rotation corrected
				Bulk film prod. CCT	5 scenes/day 2 scenes/week	System corrected Rad. corrected + geometric model included
			July, 83	Q. Look film	All data received	E. Rotation corrected (1 Band)
				Bulk film prod. CCT	20 scenes/day 2 scenes/day	System corrected Rad. corrected + geometric model included
			July, 84	Precision Prod.	1 scene/day	System corrected + GCP's

2 - CHRONOLOGY OF QUESTIONS AND PROBLEMS WITH NASA, RELATED TO LANDSAT-4
TO GROUND STATION INTERFACE DESCRIPTION DOCUMENT (REVISIONS 4 AND 5)
AND SIMULATED TM DATA TAPE

Telex Date

- July 06, 82** → INPE addressed to NASA-International Affairs Division questions and comments about Document Revision 4
- July 15, 82** → NASA-International Affairs Division confirmed that our questions would be examined by LANDSAT-D Project Office on priority basis after LANDSAT-D launch. NASA also confirmed the preparation of document revision 5 and informed the availability of simulated TM data tape.
- July 19, 82** → INPE sent to NASA - LANDSAT 4 Project Office information and procedures for shipping the simulated TM data tape.
- August 08, 82** → NASA - LANDSAT 4 Project Office informed the shipment of the simulated TM data tape and related documentation.
- August 25, 82** → NASA - LANDSAT 4 Project Office provided us with preliminary answers of our questions submitted on July 06, 82. The answers were of the type "correct/incorrect". NASA also confirmed the shipment of document revision 5 on August 20 and simulated TM data tape on August 11.
- August 27, 82** → INPE informed NASA-International Affairs Division that the recently arrived simulated TM data tape was apparently out of specs (major period of 70.8 miliseconds instead of 71.46) and requested a confirmation.

September 08, 82 → INPE (Mr. M. Barbosa) by phone contacted NASA-LANDSAT 4 Project Office (Mr. W. Webb) to have the confirmation of the problem in the simulated TM data tape and to inform NASA that, probably, the document revision 5 was lost in the mail. Mr. Webb confirmed the problem in the tape and promised to send another tape and another copy of doc. revision 5.

September 22, 82 → INPE (by telex) requested NASA-LANDSAT 4 Project Office to send another copy of doc. revision 5.

September 22, 82 → INPE informed NASA-International Affairs Division the problem in the simulated TM data tape, asked another tape and urgently requested another copy of doc. revision 5, in order to allow the preparation of written questions to 3rd LTWG, before October 06.

October 06, 82 → INPE informed NASA-LANDSAT 4 Project Office that due to the lack of doc. revision 5 we were not able to provide NASA with written questions to 3rd LTWG, and asked time for discussions at day 2.

October 05, 82 → NASA-International Affairs Division informed that second copy of doc. revision 5 had been sent on October 01, and that Mr. Webb had agreed to extend INPE's deadline for questions to October 15. NASA also informed that it was prepared to transmit TM test data for station checkout purposes.

October 05, 82 → NASA-LANDSAT 4 Project Office suggested NASA transmissions of 2-3 TM scenes instead of providing a new simulated TM data tape, as requested by INPE.

October 07, 82 → INPE, answering the last NASA telex, requested to NASA-LANDSAT 4 Project Office a new simulated TM data tape, and asked to have this tape during 3rd LTWG, since TM data can be recorded at Cuiaba Station only by the end of next November.

3 - INPE LANDSAT-D Project Status

- Bid only TM capabilities): April 30, 1980
- Proposals received by: Scientific Atlanta (USA), SEP (FR), MBB (FRG)
MDA (CAN)
- INPE's Decision : May 30, 1980
- Companies Selected : Scientific Atlanta (Receiving Subsystem)
SEP (Recording and Processing Subsystem)
- INPE's Participation : System Analysis (approx. 9 men. month)
Software development (approx. 61 men. month)
Film Recorder Integration (approx. 2 men. month)
Receiving x Recording Subsystems Integration
(approx. 2 men. month)
- Project Duration : SEP part - 27 months
S. Atlanta part - 14 months
- Commercial contract signatures: SEP - December 18, 1980
S. Atlanta - March 27, 1981
- Characteristics of the New CNPq/INPE LANDSAT-D System:
 - Receiving Subsystem (Scientific-Atlanta) at Cuiabā
 - . Dual band/dual feed tracking & receiving antenna system

- . Minicomputer system to generate antenna pointing data and assist tracking
 - . Communications-satellite time acquiring & synchronizing system
 - . Boresight system for better pointing
- Recording Subsystem (SEP) at Cuiabá
- . 28-track NASA-compatible HDDR with second recording speed to act as MSS backup recorder
 - . B&W TV display system (interfaced to the minicomputer system mentioned above) for visualization of acquired data and preliminary cloud cover assessment
 - . CRT analog display for signal quality check
 - . possible extension to extract Payload Correction Data from TM Stream and make it available for the minicomputer system
- Processing Subsystem (SEP) at Cachoeira Paulista
- . 32-bit computer system with 800/1600 bpi magtapes, to control the production processes and handle the user aid and management functions
 - . 256 MB dedicated disk to hold a full TM scene (7 bands)
 - . 67 MB database disk to hold image index, production and management files
 - . TV display system to allow visualization and interactive manipulation (controlled by the computer) of images loaded onto the 256 MB disk
 - . B&W flatscreen CRT monitor wired in parallel with the Color TV to allow taking pictures of the video with a specially coupled photographic camera. This system is meant for production of Quick-Look imagery
 - . 5" continuous film Electron Beam Image Recorder for production of high-resolution B&W images
 - . Production process:
 - pipeline HDDT to TV display Quick-Look image generation
 - pipeline HDDT to EBR high-resolution image generation

- HDDT to 256 MB disk image loading
- interactive image manipulation on disk (contrast stretch, edge enhancement, haze removal, etc.)
- disk to CCT (BIL or BSQ, 800 or 1600 bpi) recording
- disk to EBR high-resolution image generation
- auxiliary functions as ephemeris calculation, geometric corrections computation, radiometric correction computation, etc.
- . User aid functions
 - image index searches
 - catalog issuing
 - request entry and follow up
- . Management functions
 - work order generation and updating
 - production scheduling
 - production logging
 - image index updating
 - QC assessment
 - control of tapes & films
 - statistics
- . Products
 - Quick-Look : 70mm, B&W, annotated pictures of 185 x 185 km ground area video subsampled, corrected for earth rotation (contrast stretch if desired) 50 scenes from one band in real-time rate (all possible data acquired)
 - Bulk film : 5", B&W, annotated pictures of 185 x 185 km ground area full resolution video, radiometrically corrected, system-corrected geometry
 - Bulk CCT : BIL or BSQ, 800 or 1600 bpi, full resolution video, radiometrically corrected, no geometric correction but correction model included in header
 - Precision Products: to be later developed by INPE

BRAZIL
CNPq / INPE - LANDSAT - D PROJECT
MAIN CHRONOGRAM OF ACTIVITIES

	1981				1982				1983			
	APR/JUN	JUL/SEP	OCT/DEC	JAN/MAR	APR/JUN	JUL/SEP	OCT/DEC	JAN/MAR	APR/JUN	JUL/SEPT		
1) RECEIVING SUBSYSTEM . MANUFACTURING . SYSTEM INTEGRATION . ACCEPTANCE-TEST(USA) . INSTALLATION & FINAL ACCEPTANCE(BR)	////	////	////	////	////	////	////	////	////	////	////	ORIGINAL PAGE 13 OF POOR QUALITY
2) RECORDING SUBSYSTEM . HARDWARE MANUFACT. . SYSTEM INTEGRATION . ACCEP. TEST (FR) . INSTALLATION & FINAL ACCEPTANCE (BR)	////	////	////	////	////	////	////	////	NOV,22 HDDR IN BR DEC,17	////	////	////
3) PROCESSING SUBSYSTEM . HARDWARE MANUFACT. . SOFTWARE DEVELOPM. . SYSTEM INTEGRATION . ACCEPTANCE TEST (FR) . INSTALLATION & FINAL ACCEPTANCE (BR)	////	////	////	////	////	////	////	////	////	////	////	////

— PLANNED
 //// EXECUTED/NEW PLANNING

LGSOWG MEET
 OCT, 1982

//// MAR, 31
 //// JUL, 8

SECTION II

PREPARED FOR THE LANDSAT GROUND STATION OPERATIONS WORKING GROUP MEETING

Date: October 25-27, 1982

Place: NASA Headquarters - Washington, DC (USA)

1. SYSTEM STATUS BY THE END OF SEPTEMBER, 82

A - Cuiabá Tracking and Receiving Station

- During the period of May 01, 1981 to September 30, 1982 the station operated normally without important technical problems and failures. It recorded MSS data from LANDSAT-2 up to February 8, 82 and resumed the acquisitions from LANDSAT-3 on March 3, 82. RBV data from LANDSAT-3 was normally transmitted to the station, during the period, up to August 23, 82.

On August 24, 82 the station started its operation with the LANDSAT-4, using the new acquired (S and X Bands) reception system.
- From May 01, 81 to September 30, 82 the station recorded:
 - from LANDSAT-2 - 666 MSS orbits
 - from LANDSAT-3 - 275 MSS orbits
1023 RBV orbits
 - from LANDSAT-4 - 59 MSS orbits
- The station during the period of this report normally supported NASA in its "Back-up Plan". A new NASA tape recorder (Martin Marietta model 2879 L/U) was installed on June, 81.
- Due to civil works in the Cuiabá area, related to the INPE's LANDSAT-D project, the station did not operate
 - from June 11 to July 02, 82 and
 - from September 02 to September 03, 82.
- The new recording subsystem for TM data is scheduled to be installed at Cuiabá during the next month of November (only the tape recorder) and the rest during January/February, 83.



Fig. 3 - Localization of LANDSAT antennas at INPE-Cuiabá (art).

B - Electronic and Photographic Processing Labs

- During the period of this report the Electronic Lab. operated normally producing CCT's and high resolution 70 mm films. In order to reduce the operation costs since February, 82 the laboratory is working under user request.
- Cartographic applications using LANDSAT-MSS data have increased since the issue of the first pilot map in the scale 1:250.000, on July 1980. Approximately 1/3 of the production capacity of the Electronic Lab. is being used for the generation of MSS precision products. LANDSAT-MSS data are being used by all operational cartographic agencies for the production of planimetric maps or for the revision of existing maps (see item 3 of this section).
- The Photographic Lab. that mainly works under user request is annually experiencing a reduction in its production due to lack of request. The highest production occurred in 1979. This year is expected a reduction of 15-20% in comparison with the 1981 production.

- The new processing subsystem for the generation of TM products is scheduled to be installed at Cachoeira Paulista during the months of May/June, 1983.

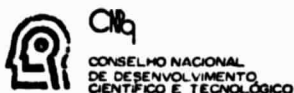
C - Data Distribution

- The 5 User Service Centers operated normally during the period of this report.
- Today, the number of users in the system achieves 1358, being 198 from foreign countries (see users profile in the section III).
- A new price list (see attached) for LANDSAT products was issued on October 01,82. This list incorporates the new distribution fee recently established by NOAA.

However, the fixed annual fee will continue to be paid by the government as a form of subsidy.

2. CHANGES IN THE ORGANIZATION

With the approval of the Brazilian Complete Space Mission it was necessary to establish at INPE several new departments which will carry out the Program. During this process of reorganization (June-July, 1982) INPE's Direction decided to review the responsibilities of existing departments. After this analysis it was detected, for example, the need of grouping application satellites data acquisition, processing and distribution within one department, in order to have unique standard of operations for both remote sensing and meteorological satellites. Then, the former Image Production Department, which only had in the past the responsibility of operating the Brazilian LANDSAT system, now operates all the systems for the reception of meteorological satellites data in Brazil. This new department is called *Imagery Generation Department*. It has 3 main divisions, which include 2 Ground Receiving & Recording Stations, 2 Electronic Processing Labs., 1 Photo Lab., 1 Cartographic Lab. and 5 User Service Centers.



PRICE LIST

LANDSAT DATA

PHOTOGRAPHIC PRODUCTS

<u>IMAGE SIZE</u>	<u>SCALE</u>	<u>FORMAT</u>	<u>BLACK & WHITE</u>		<u>COLOR COMPOSITE</u>	
			<u>UNIT PRICE</u>	<u>CODE</u>	<u>UNIT PRICE</u>	<u>CODE</u>
50 mm 1	1:3,704,000	Film Positive	US\$ 49.00	25	-	-
50 mm 1	1:3,704,000	Film Negative	58.00	26	-	-
185 mm 2	1:1,000,000	Film Positive	94.00	25	US\$ 118.00	28
185 mm 2	1:1,000,000	Paper	58.00	27	94.00	29
370 mm 3	1:500,000	Paper	121.00	27	154.00	29
740 mm 4	1:250,000	Paper	233.00	27	-	-
<u>RBV</u>						
50 mm 0	1:1,980,000	Film Positive	49.00	39	-	-
50 mm 0	1:1,980,000	Film Negative	58.00	40	-	-
198 mm 3	1:500,000	Film Positive	94.00	39	-	-
198 mm 3	1:500,000	Paper	58.00	41	-	-
396 mm 4	1:250,000	Paper	121.00	41	-	-
990 mm 5	1:100,000*	Paper	255.00	41	-	-

HIGH CONTRAST PHOTO PRODUCTS (MSS DATA)

A new electronic/photographic processing is available for photo products in all sizes, at three times the normal processing price. Recommended for the Amazonian Region.

COMPUTER COMPATIBLE TAPES (CCT)

<u>TYPE</u>	<u>CODE</u>	<u>TRACKS</u>	<u>BPI</u>	<u>FORMAT</u>	<u>PRICE</u>
Bulk	35	9	800	2 tapes (set)	US\$ 670.00
Edge-Enhanced	38	9	800	2 tapes (set)	1,140.00

CCT's are normally shipped air freight collect. Note that there is a delay of four weeks to obtain the export license.

NOTES:

- * RBV data in the scale 1:100,000 also available under special request and controlled by EMFA (Armed Forces Ministry) based on present law for aerial material distribution.
- The payment must be made in advance, through a nominal check to Instituto de Pesquisas Espaciais.
- The photo-product prices include air mail delivery
- Minimum order: US\$ 98.00.
- Prices valid from October 1st, 1982 (subject to change).

October, 1982

Nelson
Nelson de Jesus Parada
Director



INPE - INSTITUTO DE PESQUISAS ESPACIAIS
 SEOP - SÃO JOSÉ DOS CAMPOS, SP - AV. DOS ASTRONAUTAS Nº 1758 - CX. POSTAL 818 - FONE (0123) 3968** - TELEFONE 33330 CEP 12.200
 CACHOEIRA PAULISTA, SP - R. DO PÊLO Nº 8 OUTRA, 14.400 - CX. POSTAL 01 - FONE (085) 81377 - TELEFONE 21180 - CEP 12.830
 CUABA, MT - MORRO DA CONCEIÇÃO Nº 4 - CX. POSTAL 716 - FONE (085) 321-9314 - TELEFONE 21114 - CEP 78.000
 NATAL, RN - AV. BALDUJO FILHO Nº 1000 - CX. POSTAL 133 - FONE (084) 231-1284 - TELEFONE 21183 - CEP 59.000
 PORTALEZA, CE - DISTRITO DE EUZÉBIO - CX. POSTAL 1281 - FONE (085) 224-8998 - CEP 80.000
 SÃO PAULO - SP - RUA TRAIPIU - Nº 423 - FONE (011) 87-2747 - TELEFONE (011) 34081 - CEP 01233

Fig. 4 - LANDSAT Products - Price List, issued on October 01, 82.

3. LANDSAT APPLICATIONS

See attached a standard map published in 1982 by Diretoria do Serviço Geográfico do Exército (Army Geographic Service), in the scale of 1:250.000, region of Rio Branco (Amazonian area), using LANDSAT-MSS data processed by INPE for the revision of changes (mainly deforestation) since the last issue (1981).

This LANDSAT application achieved the operational status since is now being used by all national cartographic agencies in routine basis.

SECTION III

PREPARED FOR THE DATA DISTRIBUTION WORKING GROUP (DDWG) MEETING

Date: October 28/1982

Place: NASA Headquarters-Washington, DC (USA)

1. LANDSAT PRODUCT SALES/DISTRIBUTION ANALYSIS FOR THE YEAR OF 1981 AND FIRST SEMESTER OF 1982

See in the following pages the LANDSAT product sales and Distribution Analysis, prepared by quarter.

CNPq/INPE

LANDSAT PRODUCT SALES/DISTRIBUTION ANALYSIS
FOR THE FIRST QUARTER (JAN - MAR) 1981

I. A - Total number of LANDSAT images by frames sold or distributed to users and monetary value in U. S. dollars.

	Black & White	Color	Total
Frames	1,580	301	1,881
U.S. dollars	53,090.42	8,988.68	62,079.10

B - Total number and total sales in U. S. dollars of MSS scenes sold or distributed to users in CCT's form

Number of MSS CCT's: 40 U. S. dollars: 9,060.69

C - Total LANDSAT products sold or distributed for the quarter:

Photographs (Color and B & W frames):	1,881	US\$ 62,079.10
CCT's	: 40	<u>US\$ 9,060.69</u>
	Total	US\$ 71,139.79

II. Classification of sales and distribution of photo. products and CCT's by type of user.

USER TYPE	PHOTO PRODUCTS		CCT's	
	% by money	% by frames	% by money	% by CCT's
A. National Government	36,92	37,03	7,25	6,72
B. State/Provincial Governm.	1,42	2,02	22,22	23,00
C. Academic	6,97	6,32	-	-
D. Industry	29,74	34,39	20,55	13,80
E. Individuals	5,12	4,21	2,90	2,69
F. Outside the country	19,83	16,03	47,08	53,79
TOTAL	100,00%	100,00%	100,00%	100,00%

CNPq/INPE

LANDSAT PRODUCT SALES/DISTRIBUTION ANALYSIS
FOR THE SECOND QUARTER (APR-JUN) 1981

I. A - Total number of LANDSAT imagens by frames sold of distributed to users and monetary value in U. S. dollars.

	Black & White	Color	Total
Frames	1,728	235	1,963
U. S. dollars	40,224.70	5,695.44	45,920.14

B - Total number and total sales in U. S. dollars of MSS scenes sold or distributed to users in CCT's form

Number of MSS CCT's: 34 U. S. dollars: 6,327.78

C - Total LANDSAT products sold or distributed for the quarter:

Photographs (Color and B & W frames):	1,963	US\$ 45,920.14
CCT's :	34	US\$ 6,327.78
	Total	US\$ 52,247.92

II. Classification of sales and distribution of photo. products and CCT's by type of user.

USER TYPE	PHOTO PRODUCTS		CCT's	
	% by money	% by frames	% by money	% by CCT's
A. National Government	21,47	32,72	22,00	23,53
B. State/Provincial Governm.	0,34	0,35	8,27	8,83
C. Academic	2,88	1,41	-	-
D. Industry	46,76	41,96	26,28	35,30
E. Individuals	2,91	1,72	-	-
F. Outside the country	25,64	21,84	43,45	32,34
TOTAL	100,00%	100,00%	100,00%	100,00%

CNPq/INPE

LANDSAT PRODUCT SALES/DISTRIBUTION ANALYSIS
FOR THE THIRD QUARTER (JUL - SEP) 1981

I. A - Total number of LANDSAT images by frames sold of distributed to users and monetary value in U. S. dollars

	Black & White	Color	Total
Frames	2,217	282	2,499
U.S. dollars	63,037.86	9,235.19	62,273.05

B - Total number and total sales in U. S. dollars of MSS scenes sold or distributed to users in CCT's form

Number of MSS CCT's: 53 U. S. dollars: 11,678.14

C - Total LANDSAT products sold or distributed for the quarter:

Photographs (Color and B & W frames):	2,499	US\$ 62,273.05
CCT's	: 53	<u>US\$ 11,678.14</u>
	Total	US\$ 73,951.19

II. Classification of sales and distribution of photo. products and CCT's by type of user.

USER TYPE	PHOTO PRODUCTS		CCT's	
	% by money	% by frames	% by money	% by CCT's
A. National Government	40,33	52,08	27,74	34,02
B. State/Provincial Governm.	3,44	1,80	8,96	13,20
C. Academic	10,59	11,08	2,56	3,77
D. Industry	31,21	22,76	7,68	7,53
E. Individuals	3,03	2,20	1,28	1,88
F. Outside the country	11,40	10,08	51,78	39,60
TOTAL	100,00%	100,00%	100,00%	100,00%

CNPq/INPE

LANDSAT PRODUCT SALES/DISTRIBUTION ANALYSIS
FOR THE FOURTH QUARTER (OCT-DEC) 1981

I. A - Total number of LANDSAT imagens by frames sold or distributed to users and monetary value US\$

	Black & White	Color	Total
Frames	1,415	552	1,967
U S \$	93,051.00	28,169.00	121,220.00

B - Total number and total sales in US\$ of MSS scenes sold or distributed to users in CCT's form

Number of MSS CCT's: 62 US\$ 24,954.00

C - Total LANDSAT products sold or distributed for the quarter:

Photographs (Color and B & W frames):	1,967	US\$ 121,220.00
CCT's	: 62	<u>US\$ 24,954.00</u>
TOTAL		US\$ 146,174.00

II. Classification of sales and distribution of photo. products and CCT's by type of user

USER TYPE	PHOTO PRODUCTS		CCT's	
	% by money	% by frames	% by money	% by CCT's
A. National Government	51,47	43,51	29,75	46,77
B. State/Provincial Governm.	2,79	1,78	-	-
C. Academic	14,34	12,82	-	-
D. Industry	19,10	24,45	-	-
E. Individuals	1,96	1,68	4,85	4,84
F. Outside the country	10,34	15,76	65,40	48,39
TOTAL	100,00%	100,00%	100,00%	100,00%

2. STATISTICS

- Scenes Received and Recorded x Scenes Converted to Images
- Images Distributed to Users
- CCT's Produced to Users
- Images and CCT's Distributed (Quantity and Revenue)

BRAZIL
CNPq / INPE - LANDSAT SYSTEM

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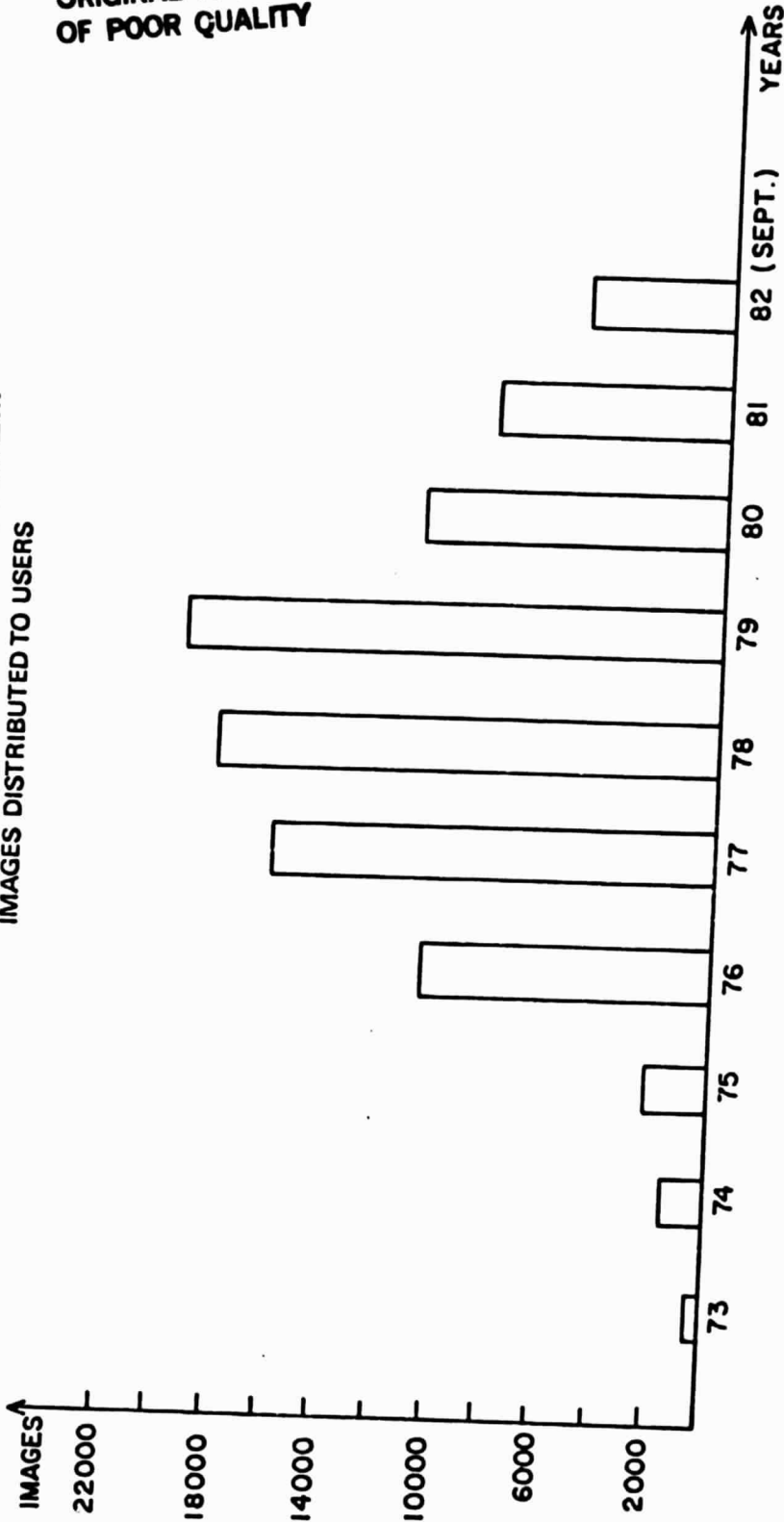
SCENES RECEIVED AND RECORDED
x
SCENES CONVERTED TO IMAGES

SATELLITES	YEARS											1982 sep, 30
	1973 (may)	1974	1975	1976	1977	1978	1979	1980	1981	1982		
LANDSAT 1	MSS	14674	23112	32528	↑	↑	↑	↑	↑	↑	↑	↑
	RBV	—	—	—	—	—	—	—	—	—	—	—
LANDSAT 2	MSS	—	—	1550	3370	19632	23952	32532	38626	51958	52948	↑
	RBV	—	—	—	—	288	↑	↑	↑	↑	↑	↑
LANDSAT 3	MSS	—	—	—	—	—	11487	17364	25768	—	29803	—
	RBV	—	—	—	—	—	1579	9477	23161	37329	43089	—
LANDSAT 4	MSS	—	—	—	—	—	—	—	—	—	885	—
	TM	—	—	—	—	—	—	—	—	—	—	—
TOTAL	MSS	6114	14674	24662	35898	52160	67967	82424	96922	110254	116164	↑
	RBV	—	—	—	—	288	1867	9765	23449	37617	43377	↑
TOTAL	MSS	—	—	2232	5581	11162	19722	25281	27136	35364	38488	↑
	RBV	—	—	—	—	—	—	802	3470	9410	9410	↑

* CCT'S ARE CONVERTED BASED ON USER'S REQUEST

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BRAZIL
CNPq / INPE - LANDSAT SYSTEM
IMAGES DISTRIBUTED TO USERS

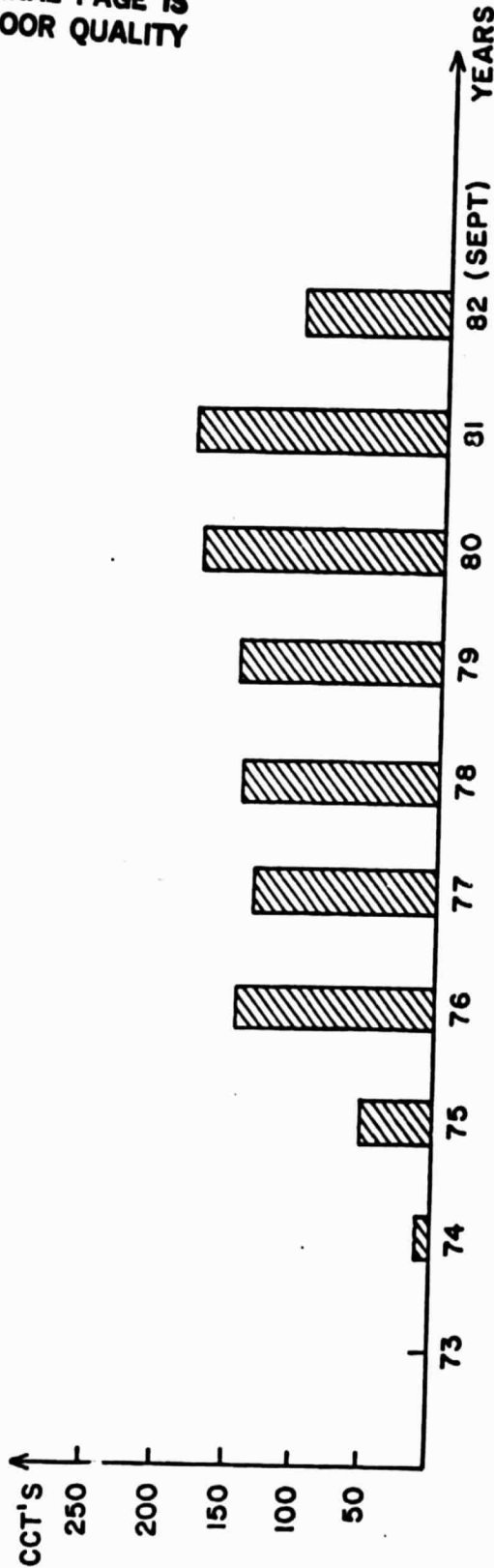


	73	74	75	76	77	78	79	80	81	82 (SEPTEMBER,30)
BRAZ. USERS	323	1230	2094	10025	14971	17273	16269	10216	6986	4539
NON-BRAZ.USERS	--	--	--	230	438	776	2782	1184	1305	620
TOTAL IMAGES	323	1230	2094	10255	15409	18049	19051	11400	8291	5159

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**BRAZIL
CNPq/INPE-LANDSAT SYSTEM
CCT'S PRODUCED TO USERS**



	73	74	75	76	77	78	79	80	81	82 (SEPTEMBER, 30)
BRAZ. USERS	—	10	55	120	95	105	107	99	103	65
NON-BRAZ. USERS	—	—	—	21	37	36	39	77	81	40
TOTAL CCT'S	—	10	55	141	132	141	146	176	184	105

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BRAZIL
CNPq/INPE - LANDSAT SYSTEM
IMAGES AND CCT'S DISTRIBUTED

PROD.	YEARS	73	74	75	76	77	78	79	80	81	82
		<div style="display: flex; justify-content: space-between;"> (SEPTEMBER,30) (JUNE,30) (JUNE,30) </div>									
QUANTITY	Images	323	1230	2094	10255	15409	18049	19051	11400	8 291	5159
	CCT's	-	10	55	141	132	141	146	176	184	105
REVENUE	Images	-	4,808	26,020	57,695	118,457	232,661	251,367	338,556	291,492	248,736
	CCT's	-	-	-	4,200	7,400	7,200	20,853	39,345	52,019	37,490
TOTAL US\$		-	4,808	26,020	61,895	125,857	239,861	272,220	377,901	343,511	286,226