

**MINERAIS DO PARANÁ S/A
MINEROPAR**

**DETERMINAÇÃO DO APOIO TERRESTRE EM ÁREA APROXIMADA DE 109 KM²,
SITUADAS NA REGIÃO DE ITAIACOCA E SOCABÃO - PR**



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P2528

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SITUADAS NA REGIÃO DE ITAIACOCA E SOCABÃO -PR**



MINERAIS DO PARANÁ S/A MINEROPAR

RELATÓRIO FINAL DE APOIO TERRESTRE

Licença do EMFA nº 048/97

MAIO/97



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1. INTRODUÇÃO

Registro n. 731



Biblioteca/Mineropar

MINEROPAR
BIBLIOTECA
n° 731 24.10.97



Presente relatório consiste na apresentação sintética de trabalho desenvolvido durante a fase de determinação de apoio terrestre com vista à complementação do controle planialtimétrico para a aerotriangulação do vôo na escala 1:25.000 de uma área aproximada de 109 km², divididos em duas áreas denominadas ÁREA I - com 53,7 km² a NE de Itaiacoca e ÁREA II - com 53,3 km² a SE de Socavão PR, limitadas pelas coordenadas UTM, contratada pela MINEROPAR - Minerais do Paraná S/A.

Os trabalhos de apoio terrestre foram divididos em *Determinação do Apoio Terrestre, Densificação Altimétrica e Bases de Amarração Topográfica*.

Para a determinação das coordenadas planialtimétricas dos pontos de apoio foi utilizado o sistema **NAVSTAR-GPS** (*NAVigation System with Time And Ranging - Global Positioning System*), através do rastreamento de satélites artificiais.

O sistema **NAVSTAR-GPS** foi projetado para ter as seguintes características :

- Precisão para posicionamento na ordem de centímetros, para aparelhos geodésicos;
- Determinação precisa de velocidade e de tempo;
- Disponibilidade contínua de dados de navegação;
- Base para estabelecimento de uma referência de posicionamento global;
- Cobertura global e regional e
- Potencial generalizado de navegação para minimizar a proliferação de sistemas para fins especiais ou de cobertura regional.

A configuração do sistema **NAVSTAR-GPS** é caracterizada principalmente, por :

- 24 (vinte e quatro) satélites artificiais ativos;
- Altitude da órbita em torno de 20.000 Km;
- Possuem relógios atômicos para controle das ondas eletromagnéticas gerados pelos satélites em freqüências de 1.227,6 Mhz e 1.575,42 Mhz, doravante denominados, respectivamente L1 e L2, pois pertencem à banda L do espectro eletromagnético;
- Das freqüências, ainda transportam dois códigos diferentes, de formato binário, P (do termo abreviado P-code - código de precisão), com uma freqüência de 10,23 Mbps (mega bits por segundo) e C/A (do termo Coarse-Acquisition), com uma freqüência de 1,023 Mbps e
- O código P fornece dados para uma navegação de alta precisão, sendo de uso restrito, enquanto o código C/A, de uso geral, fornece precisão muito abaixo da precisão obtida com o código P.

A execução do apoio terrestre, foi referenciada à Rede Geodésica de Alta Precisão (do IAP) e à Rede de Nivelamento de 1º Ordem, do Sistema Geodésico Brasileiro, onde foram determinadas as coordenadas planialtimétricas, na projeção UTM, dos pontos necessários às operações aerofotogramétricas e, bases para amarrações planimétricas e altimétricas nas áreas do projeto.

2. DETERMINAÇÃO DE APOIO TERRESTRE



Com o esquema de triangulação da rede geodésica de alta precisão, anexo H, fornecida pelo *Instituto Ambiental do Paraná* (I.A.P. - Antigo I.T.C.F.), selecionamos a melhor alternativa referente à uma área aproximada de 109 km², divididos em duas áreas denominadas ÁREA I - com 53,7 km² a NE de Itaiacoca e ÁREA II - com 53,3 km² a SE de Socavão PR, limitadas pelas coordenadas UTM, contratada pela MINEROPAR - Minerais do Paraná S/A, para estabelecer uma base de rastreio, de onde irradiará as linhas de base para o apoio planialtimétrico e as bases de amarração topográficas com a monumentalização dos marcos.

A determinação das coordenadas planialtimétricas dos pontos de apoio foi realizada com o uso do rastreio de rádio-freqüências dos satélites artificiais do sistema **NAVSTAR-GPS** através do método de posicionamento relativo, isto é, utiliza-se dois ou mais receptores, estando um instalado num ponto com as coordenadas conhecidas, também muitas vezes chamado de base de rastreio, e o(s) outro(s) receptor(es) fica(m) instalado(s) nos pontos com as coordenadas a serem determinadas, estando os receptores rastreando simultaneamente as observações GPS.

O arquivo das observações GPS é composto de valores de pseudo-distâncias e valores de medidas das portadoras, além do valor da deriva do relógio do receptor. As pseudo-distâncias são calculadas a partir do tempo de percurso do sinal GPS até a antena do receptor, multiplicado pela velocidade da luz.

A técnica de posicionamento adotado para o apoio planialtimétrico foi *Estático-Rápido*, que consiste em rastreio simultâneo dos satélites artificiais por um espaço de tempo, distantes em até 10 Km da base de rastreio, em torno de 40 minutos .

São aceitos os rastreios de, no mínimo, 4 satélites artificiais, com a taxa de coleta de observação GPS em 15 segundos, devido ao uso dos receptores, da classe geodésica, da marca Trimble (4600 LS). Estes receptores tem 9 canais de comunicação com os satélites e são de freqüência da banda L do espectro eletromagnético, ou seja, com a capacidade de recepção da portadora L1 com o uso do código C/A.

Os pontos são encadeados por ligações sucessivas (linhas de base), formando uma rede que é então ajustada, permitindo a compensação de erros e a transformação do Datum em que se referenciam as observações GPS, ou seja, **WGS-84 (World Geodetic System - 1984)** para o Datum adotado no Brasil, ou seja, **SAD-69 (South American Datum - 1969)**, através dos parâmetros de translação divulgados no Diário Oficial da União (D.O.U.) de 27 de fevereiro de 1989, sob o número de 21/89 pela *Fundação do Instituto Brasileiro de Geografia e Estatística* (I.B.G.E.).

- $\Delta x = - 66,87 \text{ m}$
- $\Delta y = + 4,37 \text{ m}$
- $\Delta z = - 38,52 \text{ m}$

Foram rastreados 18 (dezoito) pontos de apoio planialtimétrico, abrangendo uma área aproximada de 109 km², divididos em duas áreas denominadas ÁREA I - com 53,7 km² a NE de Itaiacoca e ÁREA II - com 53,3 km² a SE de Socavão



PR, limitadas pelas coordenadas UTM, também **05** (cinco) bases de amarração topográfica.

Estas linhas de base têm como ponto de partida o VT 01 e 02, localizado no Município de Ponta Grossa determinadas a partir da Rede Geodésica de Alta Precisão da **Secretaria de Estado do Meio Ambiente e Recursos Hídricos**, através do **Instituto Ambiental do Paraná**.

O resultado da aerotriangulação depende da escolha bem feita do posicionamento dos pontos, da qualidade do processo usado na medição e principalmente de uma identificação inequívoca em campo.

Uma coleção de fotografias aéreas foi utilizada para a marcação e escolha aproximada dos pontos de apoio distribuídos sobre a área identificada no fotoíndice.

Nas fotos a posição aproximada dos pontos é assinalada com círculo. As fotografias contendo os pontos de apoio assinalados são enviadas a campo e entregues aos operadores experientes em fotoidentificação para o apoio fotogramétrico. Munidos destas fotografias aéreas, cópias do fotoíndice e cartas topográficas da região, os operadores têm condições de reconhecer o melhor caminho de acesso aos pontos, e dentro da área indicada nas fotos, escolher um ponto.

A escolha dos pontos é feita, procurando-se detalhes do terreno perfeitamente visíveis e fotoidentificáveis de forma indiscutível, como cantos de cerca, cantos da edificações, etc. Além disso, para propiciar uma perfeita leitura de altura em aparelho de restituição aerofotogramétrica, foram escolhidos os pontos em locais planos.

Depois da escolha efetuada, são assinaladas com croquis elucidativos da correta posição confeccionados em base estável de poliéster sobrepostos às fotos.

Utilizamos para determinação do apoio terrestre, 03 (três) Receptores Geodésicos, marca **Trimble 4600 LS**, freqüência L1.

3. DENSIFICAÇÃO ALTIMÉTRICA

Foram nivelados geometricamente os seguintes vértices:

VT 91643 (Ponta Grossa - IAP);

VT 91644 (Jaguariaiva - IAP);

VT 03 (Castro) e

VT 01 (Biscaia)

Tomaram-se como base os seguintes RRNN:

RN2017E, RN2040E, RN2015U e RN2018U do IBGE.

Foram utilizados nesta etapa Nível eletrônico NA3003 "LEICA" e NA2002 "LEICA".



4. COMPONENTES QUANTITATIVOS DA DETERMINAÇÃO DE APOIO TERRESTRE

Bases de Amarração Topográfica	05
Pontos de apoio planialtimétrico	18

5. CONCLUSÃO

Neste relatório, tentamos explicar detalhadamente as técnicas empregadas para a obtenção de produtos de aerolevantamento.

Aqui estão armazenadas as informações referentes a metodologia aplicada à determinação do apoio terrestre de uma área aproximada de 109 km², divididos em duas áreas denominadas ÁREA I - com 53,7 km² a NE de Itaiacoca e ÁREA II - com 53,3 km² a SE de Socavão PR, limitadas pelas coordenadas UTM, contratada pela MINEROPAR - Minerais do Paraná S/A.

Tentou-se descrever todas as etapas de forma simples e clara. Descrevemos metodologias, equipamentos, materiais empregados no trabalho.

Foram envolvidos um total de 07 (sete) técnicos, entre as diferentes áreas:

- Levantamento de apoio planialtimétrico por GPS;
- Nivelamento geométrico;
- Processamento;
- Relatório final.

Por ser este nosso projeto, esperamos que tenha atendido às exigências de qualidade e precisão que a **MINEROPAR Minerais do Paraná S/A**, está habituado a receber.

Contudo, gostaríamos desde já agradecer ao **MINEROPAR Minerais do Paraná S/A** pela sua compreensão, o apoio e bom atendimento às solicitações feitas por nossa empresa.

Como técnico responsável por esse projeto, considero terminada a determinação do apoio terrestre, e coloco-me à inteira disposição.

Agradecimentos

Engº Dalmar José dos Santos
Diretor Técnico

**ANEXOS**

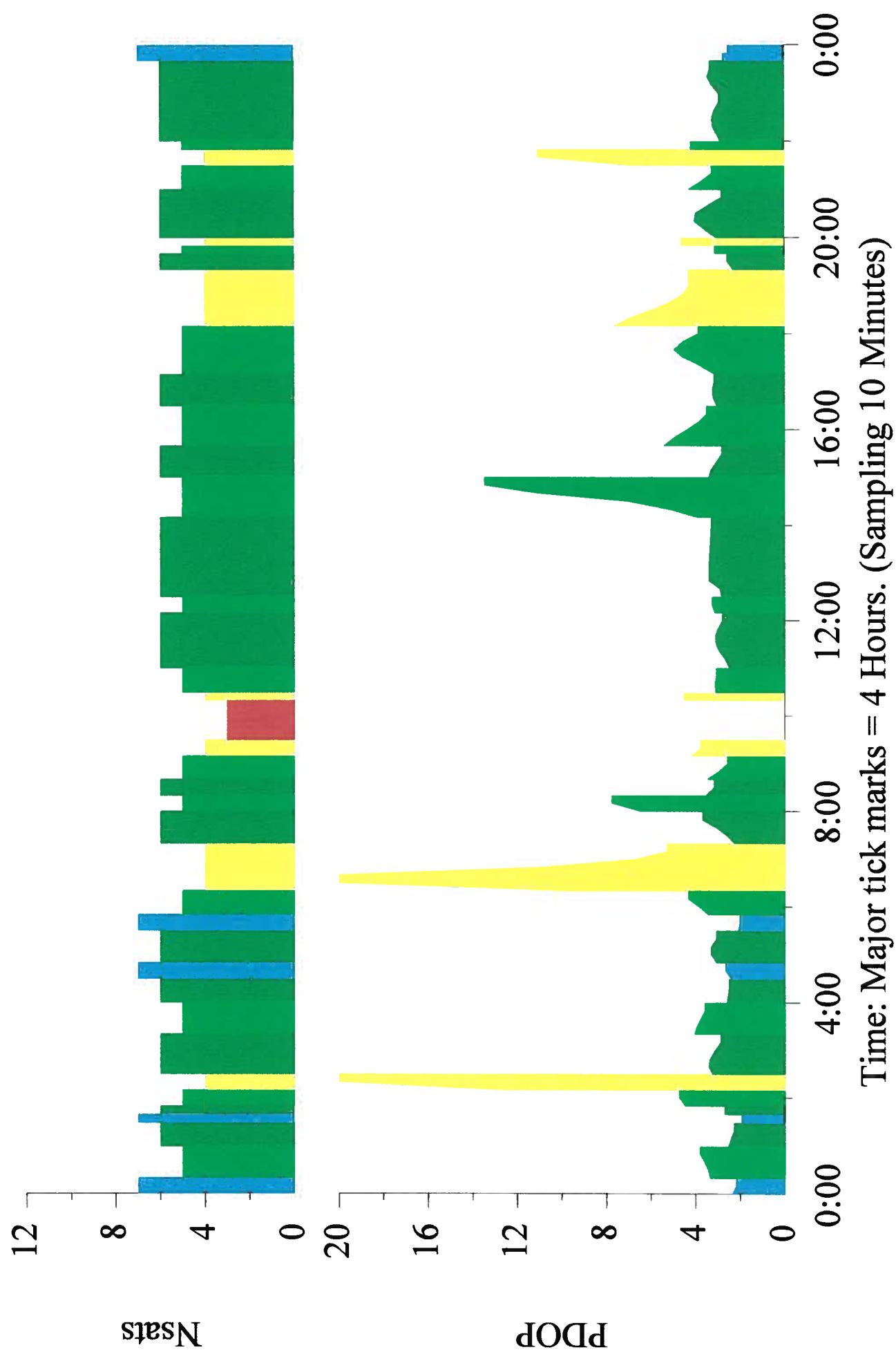


ANEXO A - PLANEJAMENTO DE RASTREIO DOS VÉRTICES E HV'S

Number SVs and PDOP

Point: VT 91644 Jaguariaiva + 2 others
Date: Friday, 23 de May de 1997
24 Satellites considered : 1 2 3 4 5 6 7 9 10 14 15 16 17 18 19 21 22 23 24 25 26 27 30 31

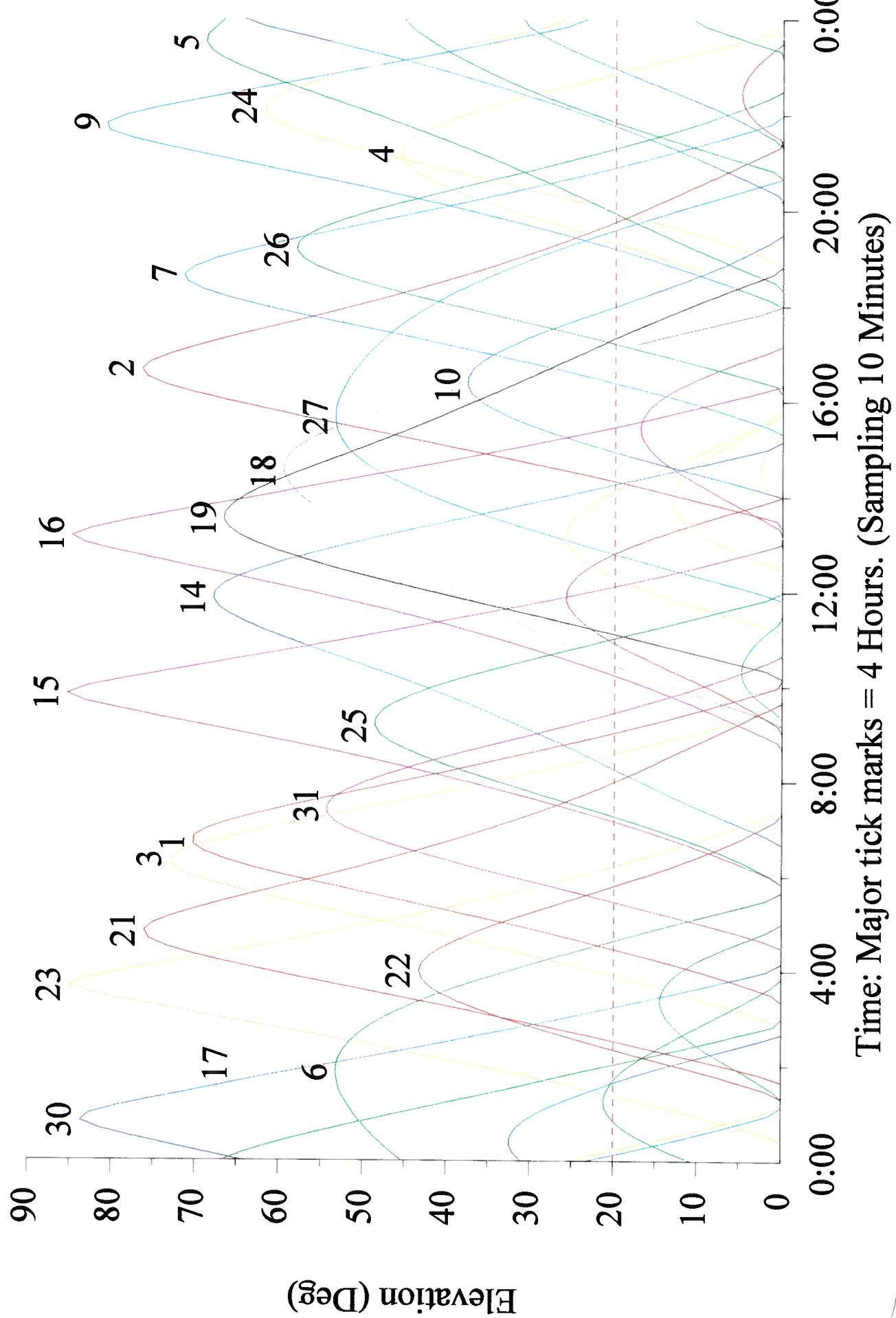
Lat 24:14:30.8164 S Lon 49:42:17.3359 W
Threshold Elevation 20 (deg)
Almanac: CURRENT.EPH 29/05/97
Time Zone 'CURITIBA' -3:00



Elevation

Point: Biscaya + 5 others
Date: Friday, 23 de May de 1997
24 Satellites considered : 1 2 3 4 5 6 7 9 10 14 15 16 17 18 19 21 22 23 24 25 26 27 30 31

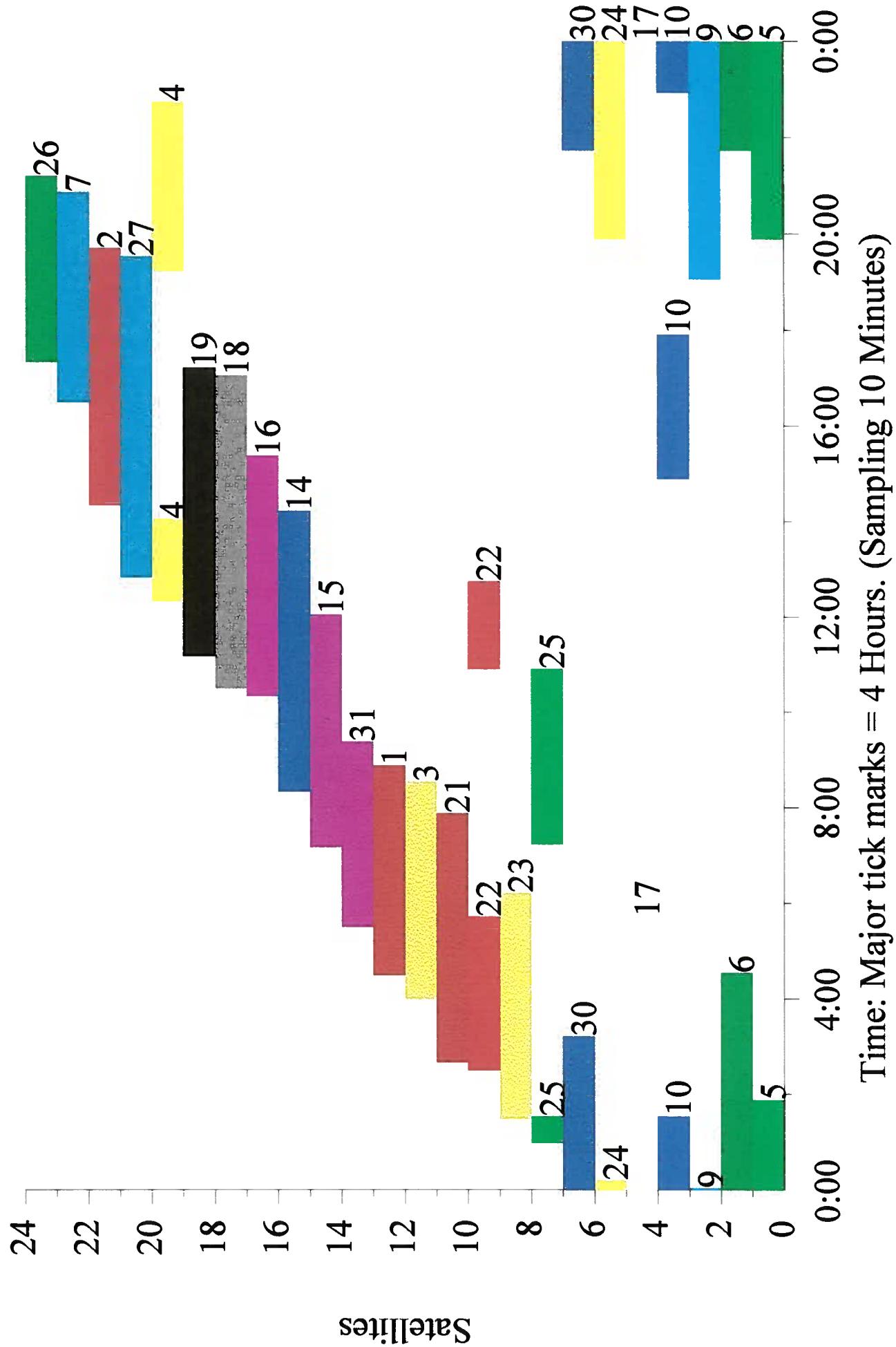
Lat 25:02:41.8133 S Lon 49:49:49.2358 W Almanac: CURRENT.EPH 29/05/97
Threshold Elevation 20 (deg) Time Zone 'CURITIBA' -3:00



Satellites

Point: Biseia + 5 others
Date: Friday, 23 de May de 1997
24 Satellites considered : 1 2 3 4 5 6 7 9 10 14 15 16 17 18 19 21 22 23 24 25 26 27 30 31

Lat 25.02:41.8133 S Lon 49:49.49.2358 W Almanac: CURRENT.EPH 29/05/97
Threshold Elevation 20 (deg) Time Zone 'CURITIBA' -3:00



SkyPlot

Point: Biscaya + 5 others

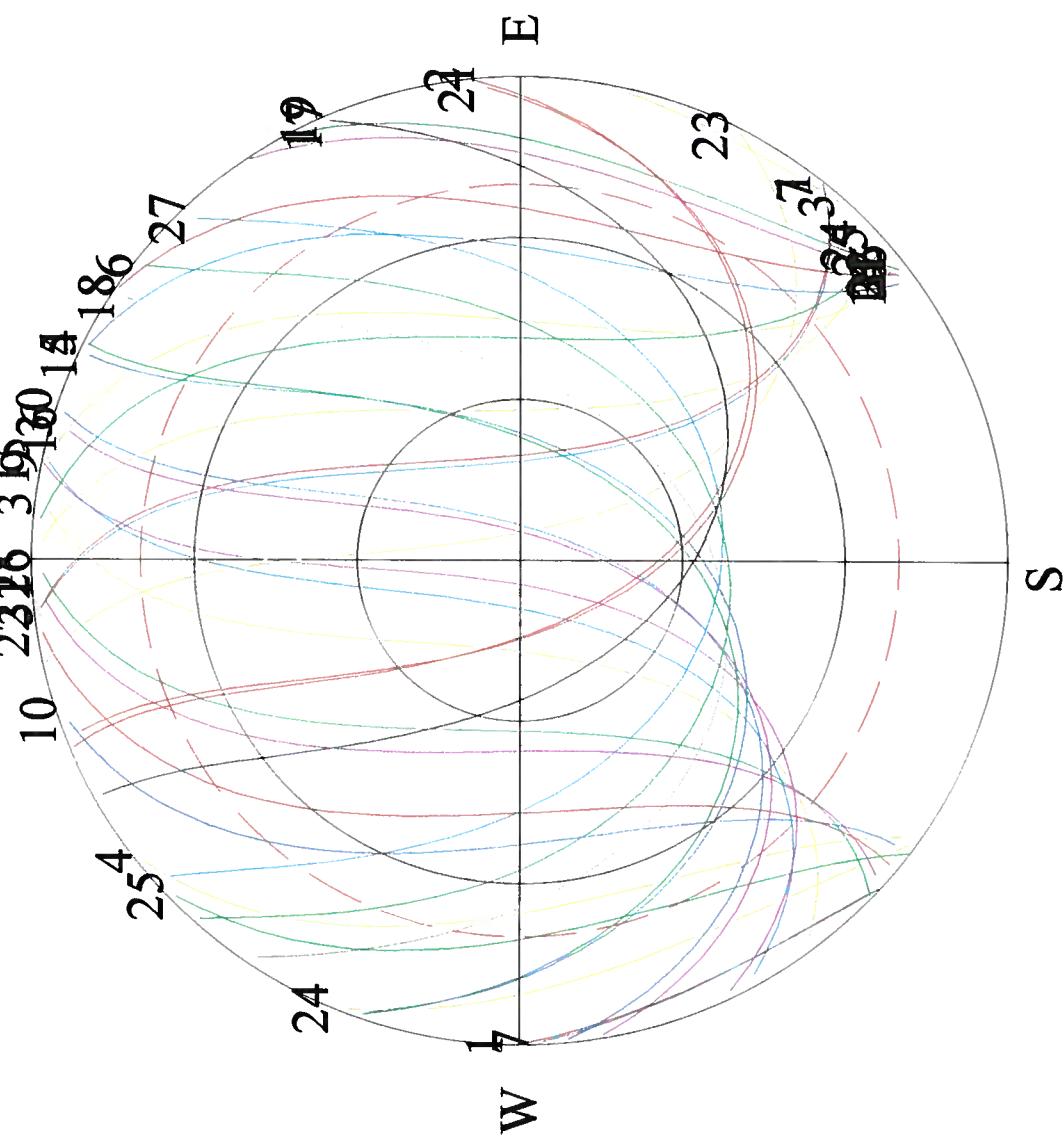
Date: Friday, 23 de May de 1997

24 Satellites considered : 1 2 3 4 5 6 7 9 10 14 15 16 17 18 19 21 22 23 24 25 26 27 30 31

10 23 26 3 16 130 14

25 4

24



Lat 25.02:41.8133 S Lon 49:49.49.2358 W Almanac: CURRENT.EPH 29/05/97
Threshold Elevation 20 (deg) Time Zone 'CURITIBA' -3:00

0:00

20:00

16:00

12:00

8:00

4:00

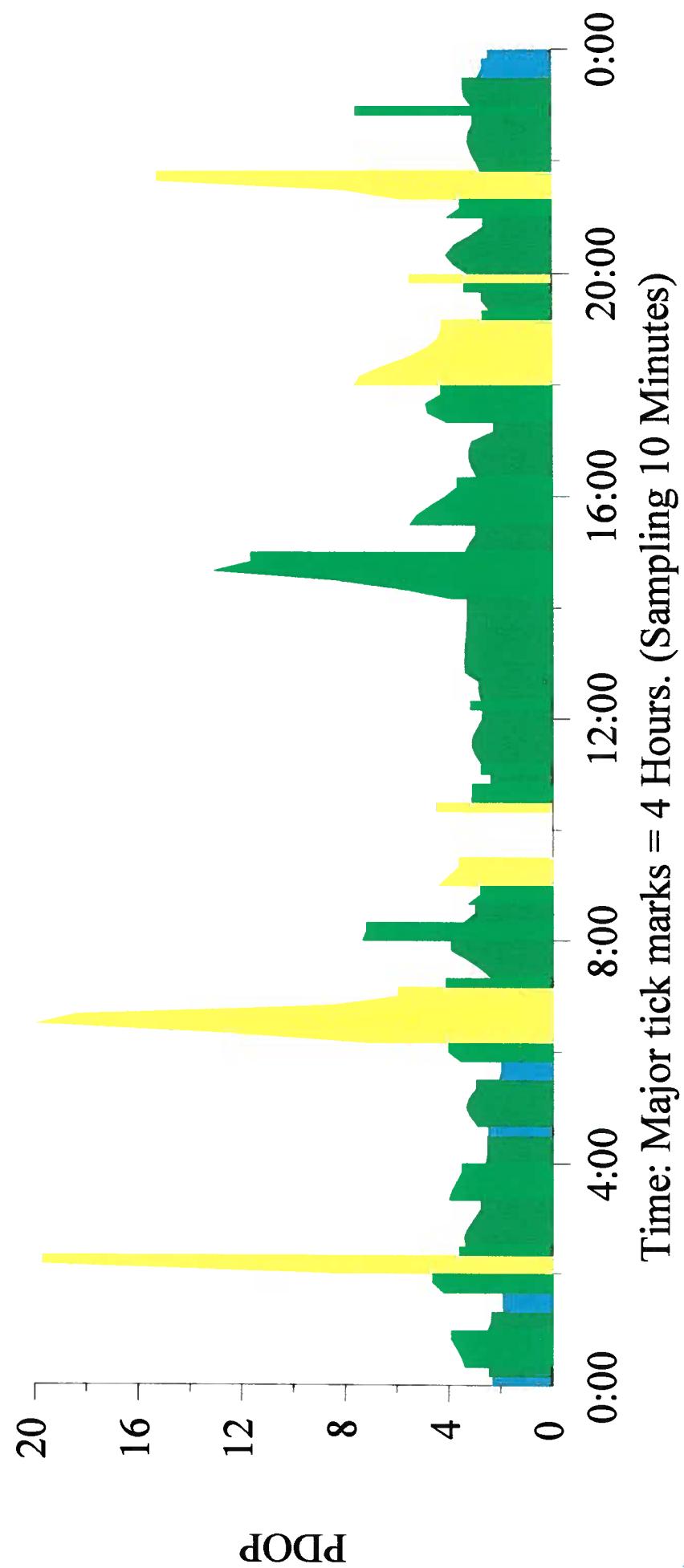
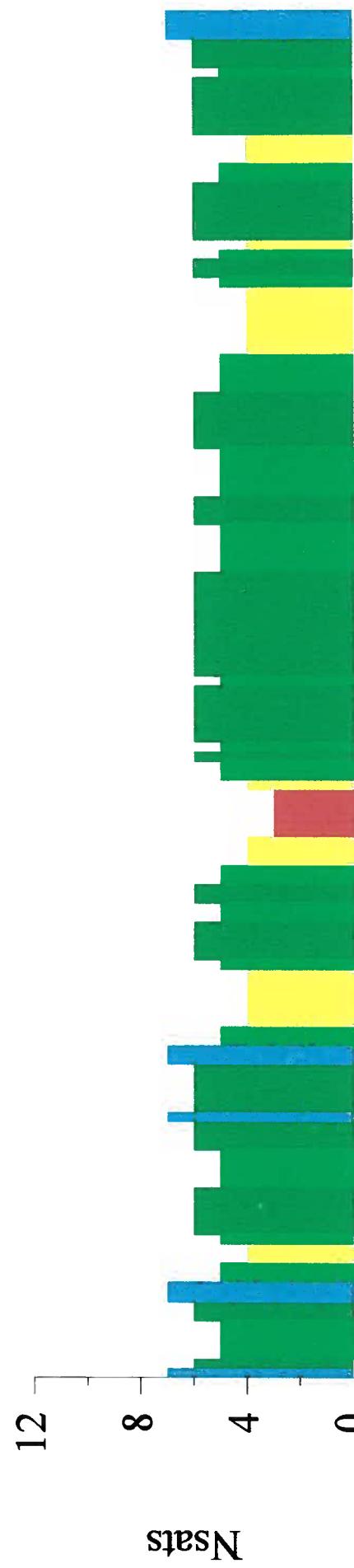
0:00

Time: Major tick marks = 4 Hours. (Sampling 10 Minutes)

Number SVs and PDOP

Point: VT 02 + 2 others
Date: Saturday, 24 de May de 1997
24 Satellites considered : 1 2 3 4 5 6 7 9 10 14 15 16 17 18 19 21 22 23 24 25 26 27 30 31

Lat 24:47:2.10801 S Lon 49:36:41.9698 W Almanac: CURRENT.EPH 29/05/97
Threshold Elevation 20 (deg)
Time Zone 'CURITIBA' -3:00

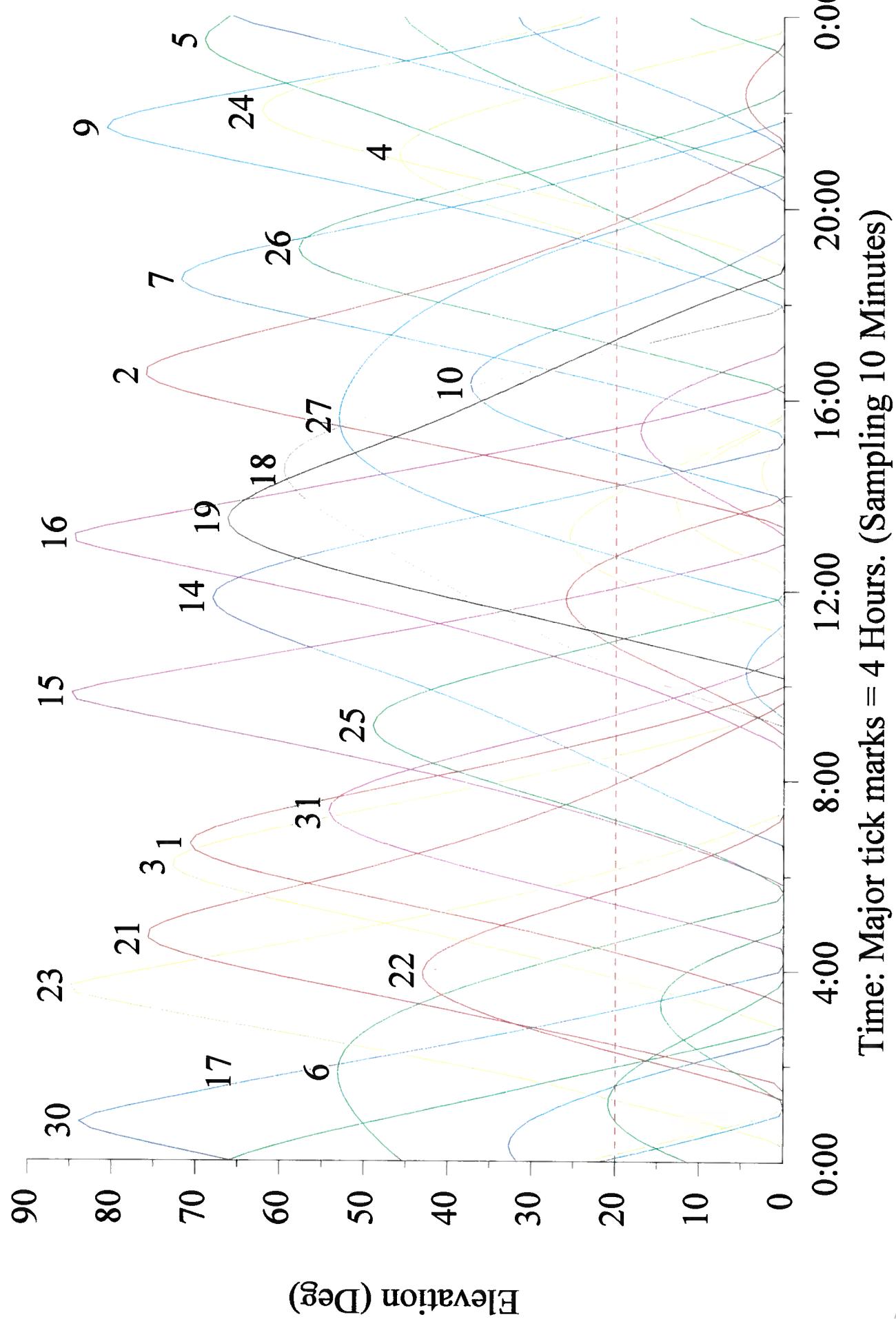


Time: Major tick marks = 4 Hours. (Sampling 10 Minutes)

Elevation

Point: VT 02 + 1 others
Date: Saturday, 24 de May de 1997
24 Satellites considered : 1 2 3 4 5 6 7 9 10 14 15 16 17 18 19 21 22 23 24 25 26 27 30 31

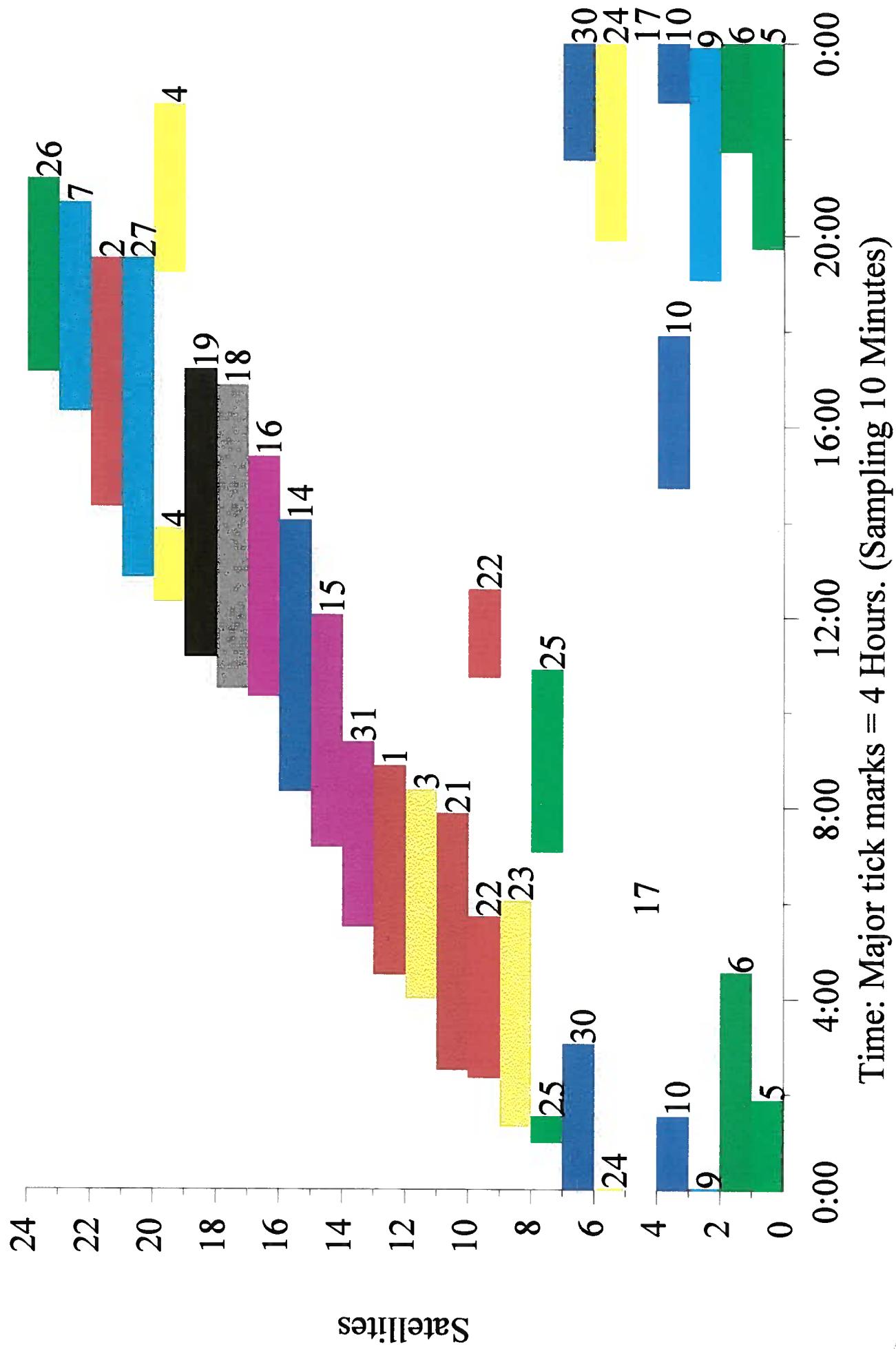
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Threshold Elevation 20 (deg) Time Zone 'CURITIBA' -3:00



Satellites

Point: VT 02 + 1 others
Date: Saturday, 24 de May de 1997
24 Satellites considered : 1 2 3 4 5 6 7 9 10 14 15 16 17 18 19 21 22 23 24 25 26 27 30 31

Lat 24:47:2.10941 S Lon 49:36:41.9664 W Almanac: CURRENT.EPH 29/05/97
Threshold Elevation 20 (deg) Time Zone 'CURITIBA' -3:00

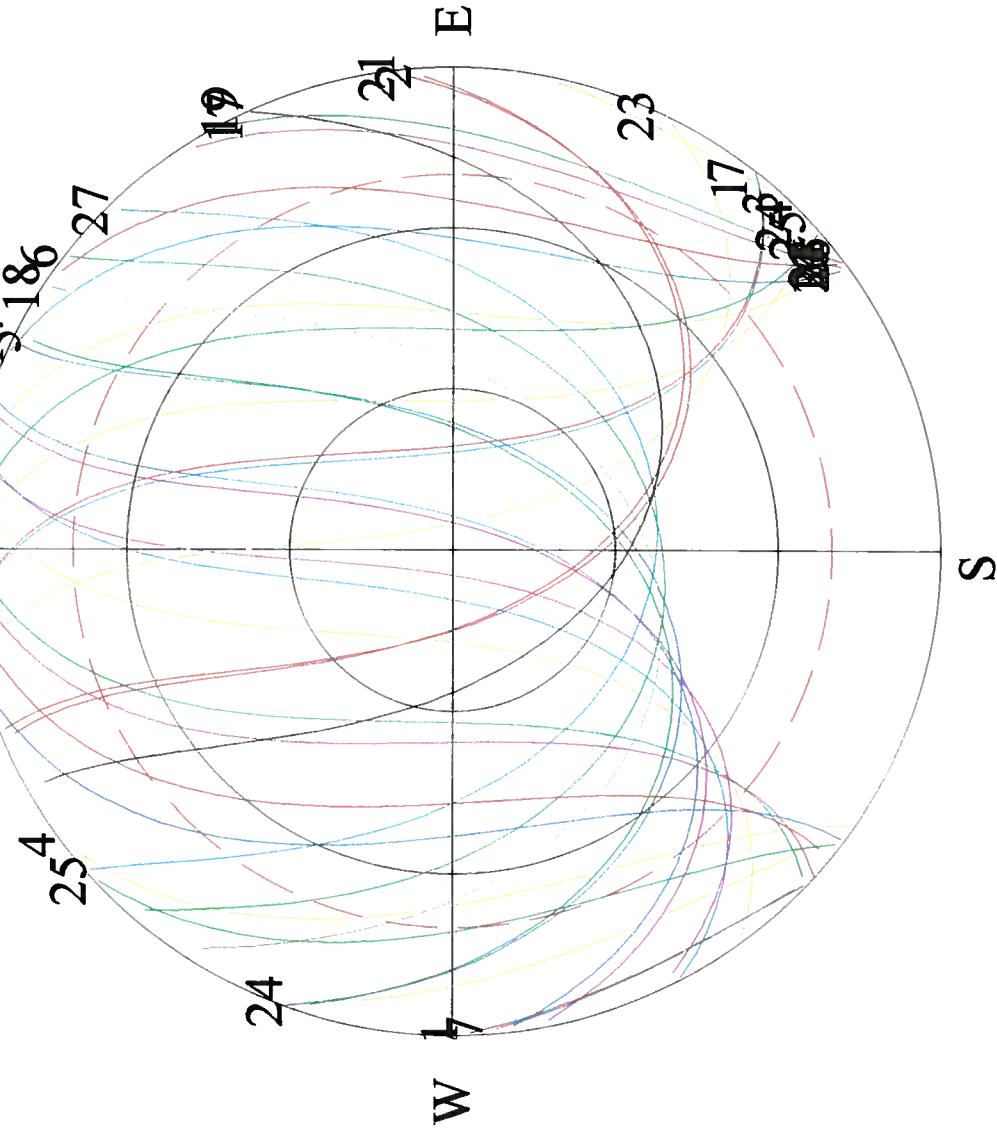


SkyPlot

Point: VT 02 + 1 others
Date: Saturday, 24 de May de 1997
24 Satellites considered : 1 2 3 4 5 6 7 9 10 14 15 16 17 18 19 21 22 23 24 25 26 27 30 31

Lat 24:47.2.10941 S Lon 49:36:41.9664 W Almanac: CURRENT.EPH 29/05/97
Threshold Elevation 20 (deg) Time Zone 'CURITIBA' -3:00

10 23 26 3 9 30 14

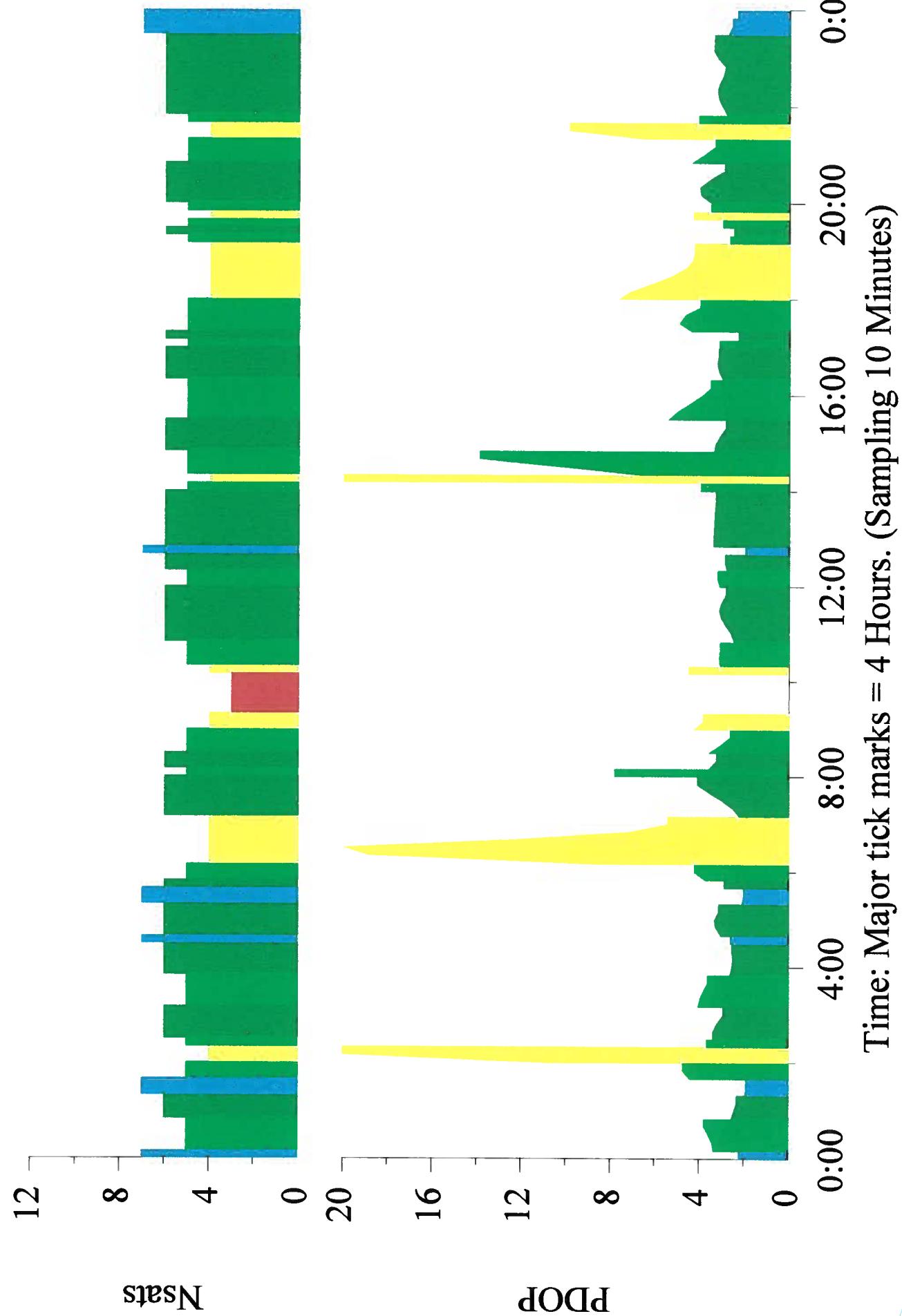


0:00 4:00 8:00 12:00 16:00 20:00
Time: Major tick marks = 4 Hours. (Sampling 10 Minutes)

Number SVs and PDOP

Point: Biscaya + 3 others
Date: Sunday, 25 de May de 1997
24 Satellites considered : 1 2 3 4 5 6 7 9 10 14 15 16 17 18 19 21 22 23 24 25 26 27 30 31

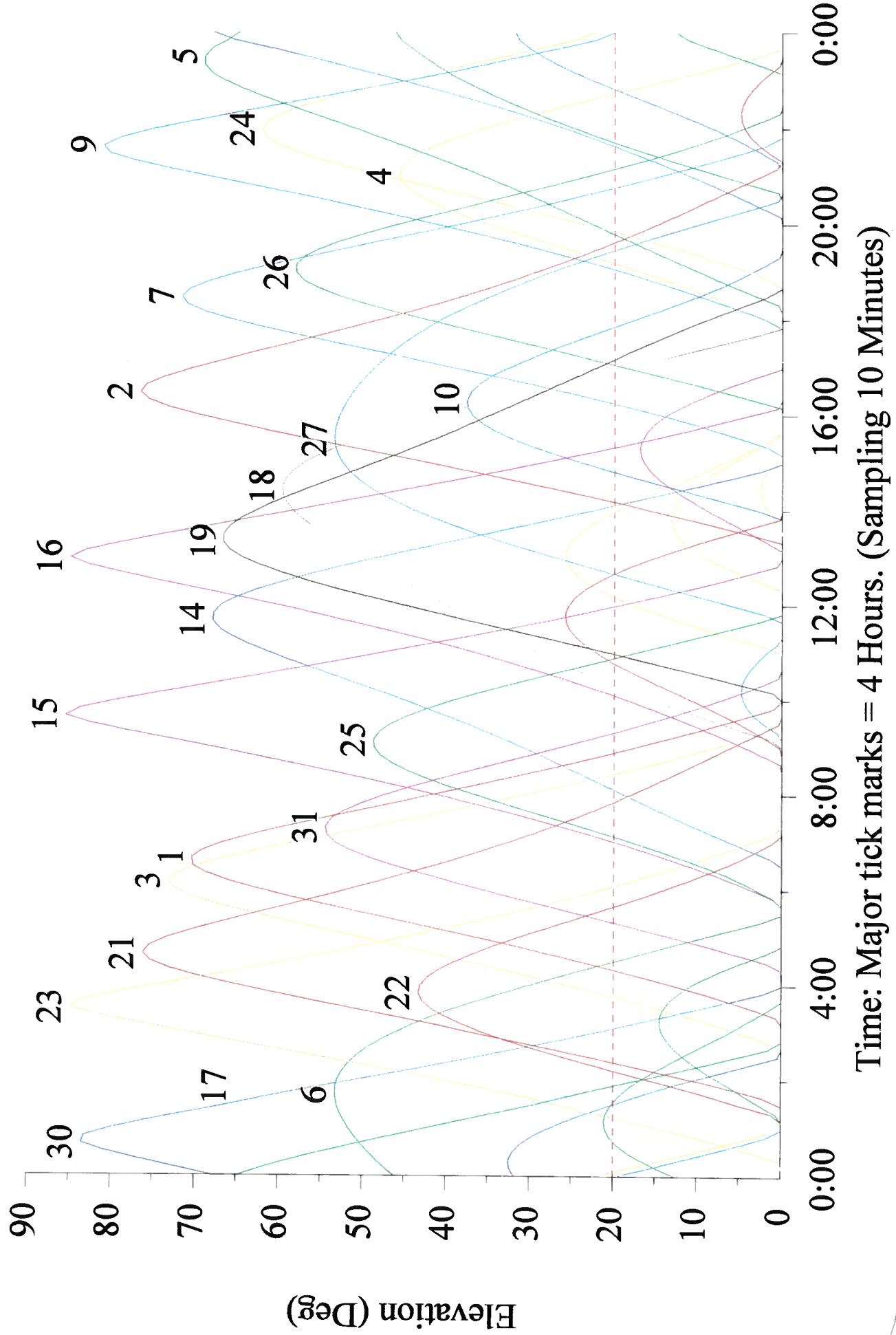
Lat 25:02:41.8133 S Lon 49:49:49.2358 W Almanac: CURRENT.EPH 29/05/97
Threshold Elevation 20 (deg) Time Zone 'CURITIBA' -3:00



Elevation

Point: Biscaia + 3 others
Date: Sunday, 25 de May de 1997
24 Satellites considered : 1 2 3 4 5 6 7 9 10 14 15 16 17 18 19 21 22 23 24 25 26 27 30 31

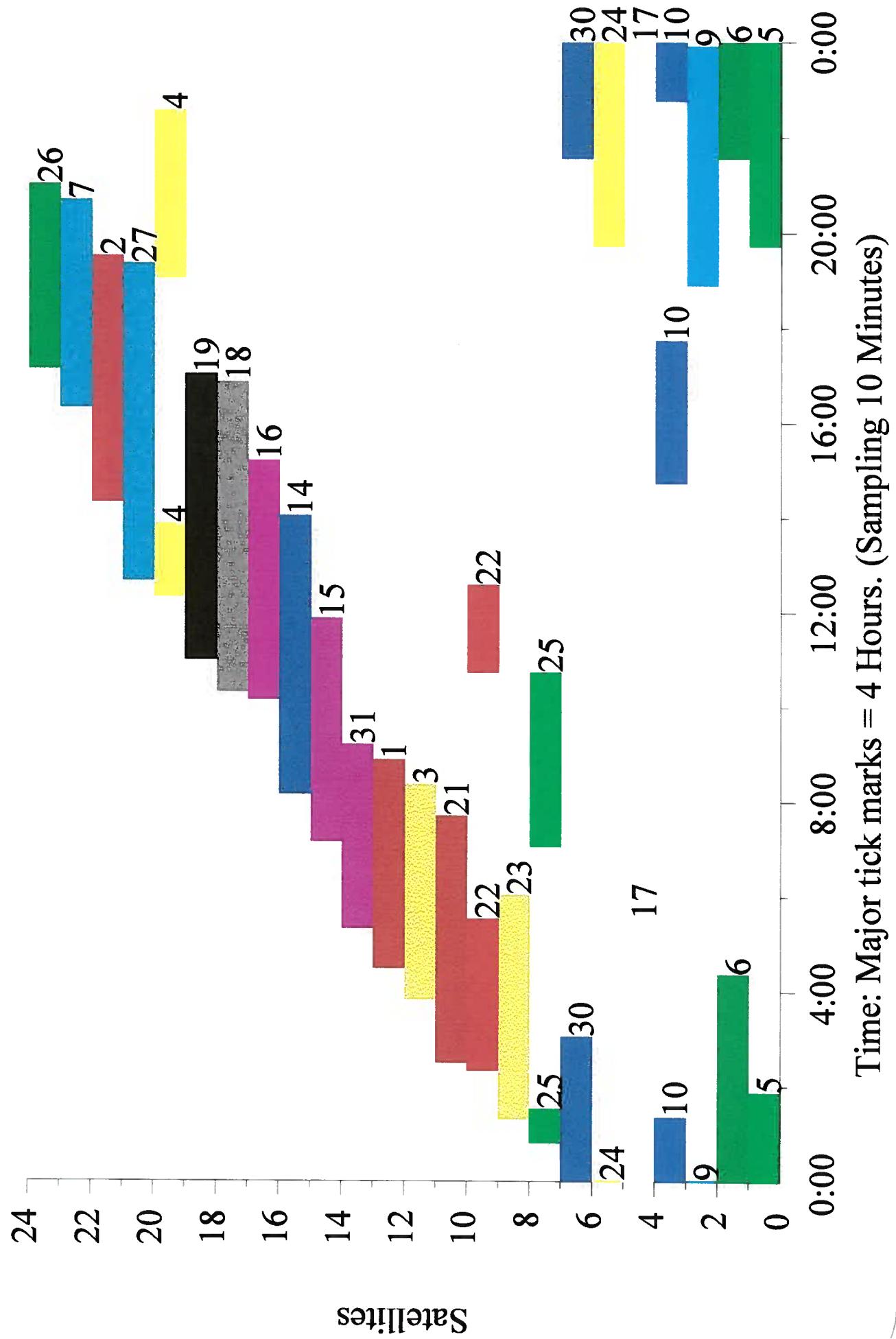
Lat 25:02:41.8133 S Lon 49:49:49.2358 W Almanac: CURRENT.EPH 29/05/97
Threshold Elevation 20 (deg) Time Zone 'CURITIBA' -3:00



Satellites

Point: Biscaia + 3 others
Date: Sunday, 25 de May de 1997
24 Satellites considered : 1 2 3 4 5 6 7 9 10 11 14 15 16 17 18 19 21 22 23 24 25 26 27 30 31

Lat 25:02:41.8133 S Lon 49:49:49.2358 W Almanac: CURRENT.EPH 29/05/97
Threshold Elevation 20 (deg) Time Zone 'CURITIBA' -3:00



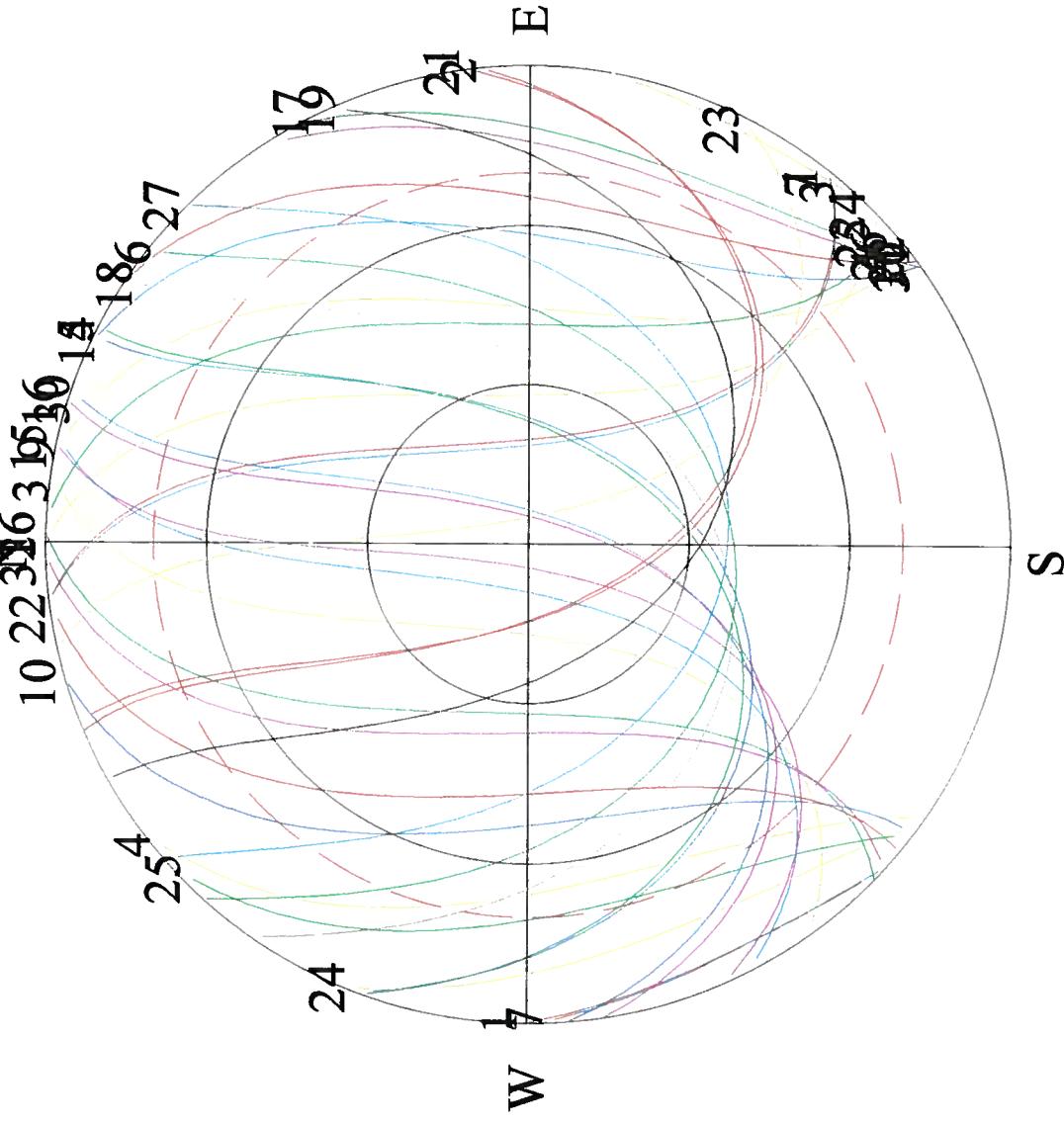
SkyPlot

Point: Biscaia + 3 others

Date: Sunday, 25 de May de 1997

24 Satellites considered : 1 2 3 4 5 6 7 9 10 14 15 16 17 18 19 21 22 23 24 25 26 27 30 31

Lat 25:02:41.8133 S Lon 49:49:49.2358 W Almanac: CURRENT.EPH 29/05/97
Threshold Elevation 20 (deg) Time Zone 'CURITIBA' -3:00



Time: Major tick marks = 4 Hours. (Sampling 10 Minutes)
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0:00 12:00 20:00

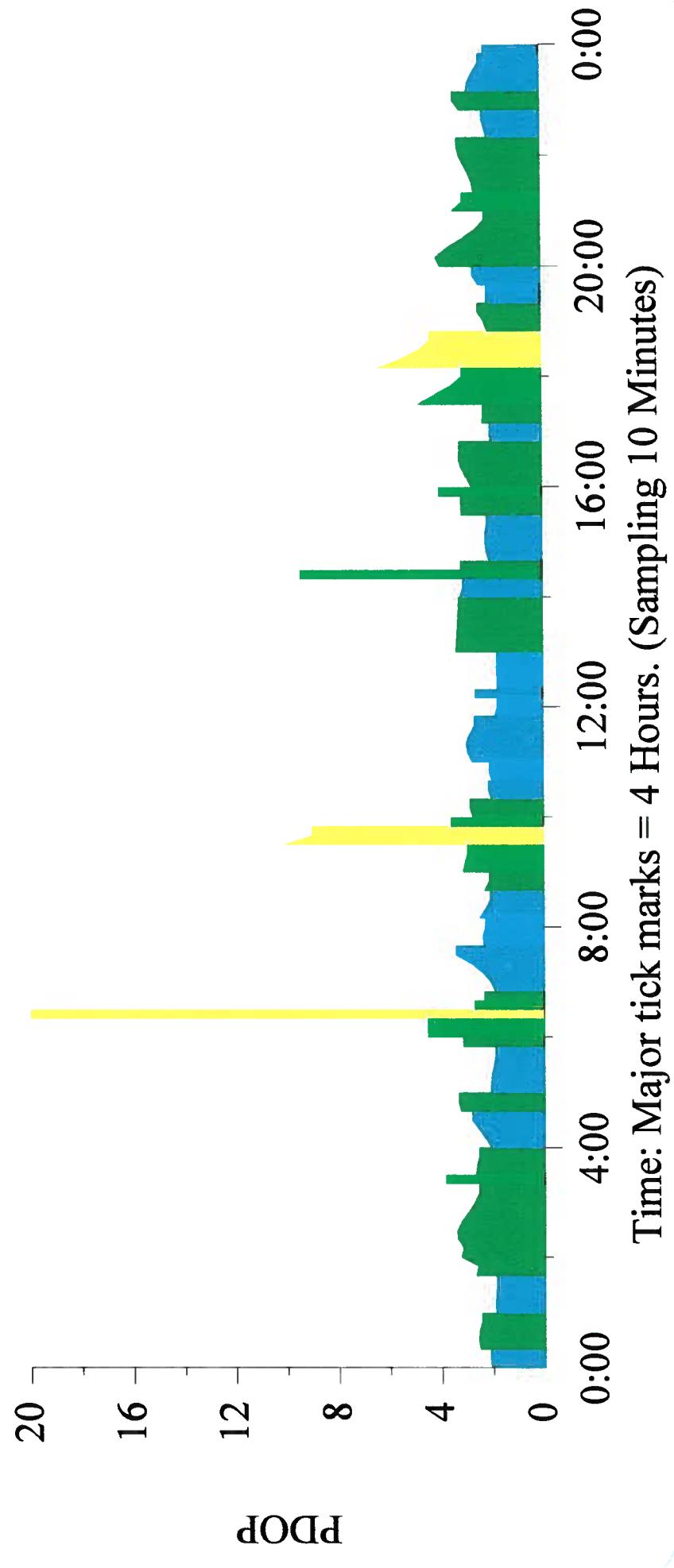
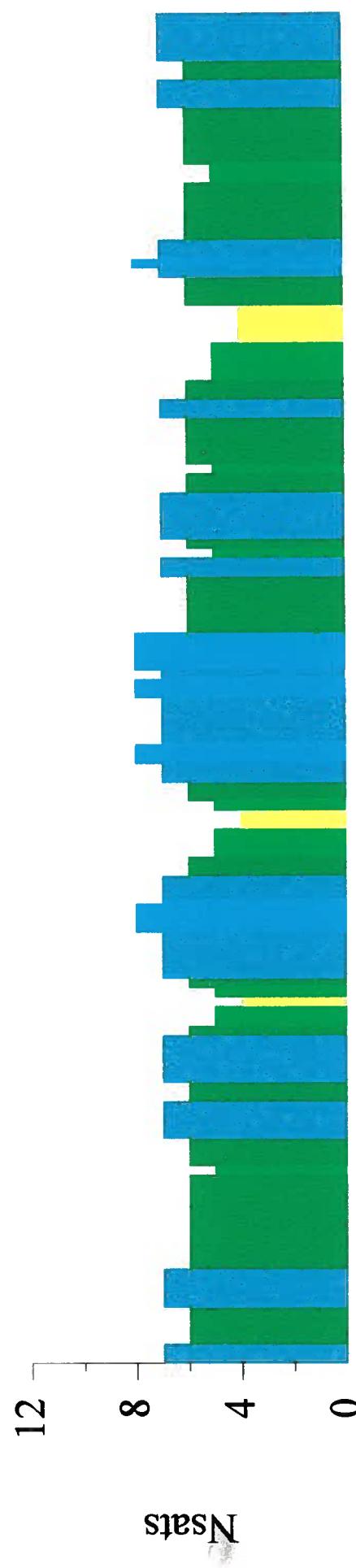
Number SVs and PDOP

Point: VT 02 + 6 others

Date: Tuesday, 27 de May de 1997

25 Satellites Considered : 1 2 3 4 5 6 7 9 10 14 15 16 17 18 19 21 22 23 24 25 26 27 29 30 31

Lat 24:47:2.10892 S Lon 49:36:41.9671 W Almanac: CURRENT.EPH 04/06/97
Threshold Elevation 15 (deg) Time Zone 'CURITIBA' -3:00

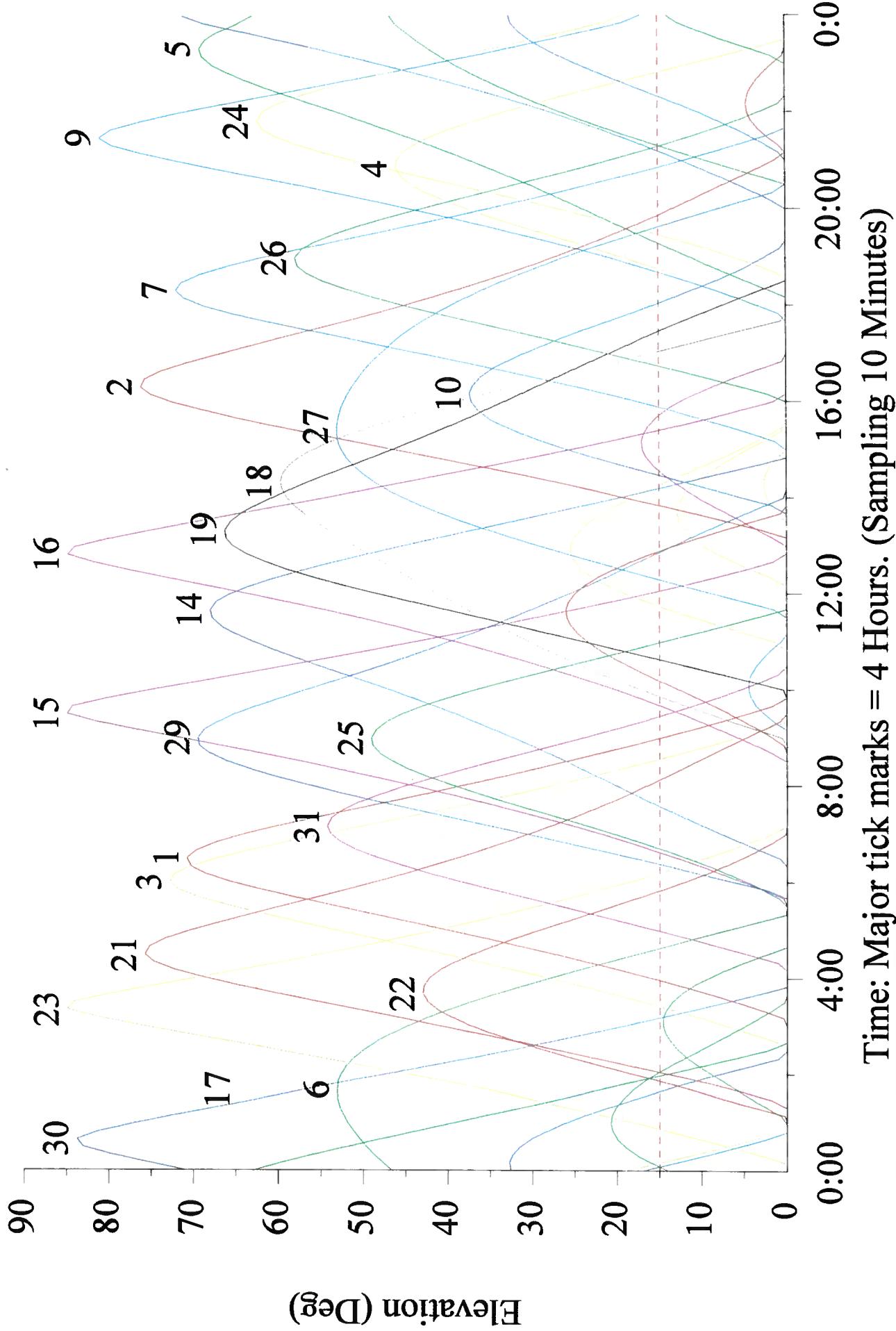


Time: Major tick marks = 4 Hours. (Sampling 10 Minutes)

Elevation

Point: VT 02 + 6 others
Date: Tuesday, 27 de May de 1997
25 Satellites considered : 1 2 3 4 5 6 7 9 10 14 15 16 17 18 19 21 22 23 24 25 26 27 29 30 31

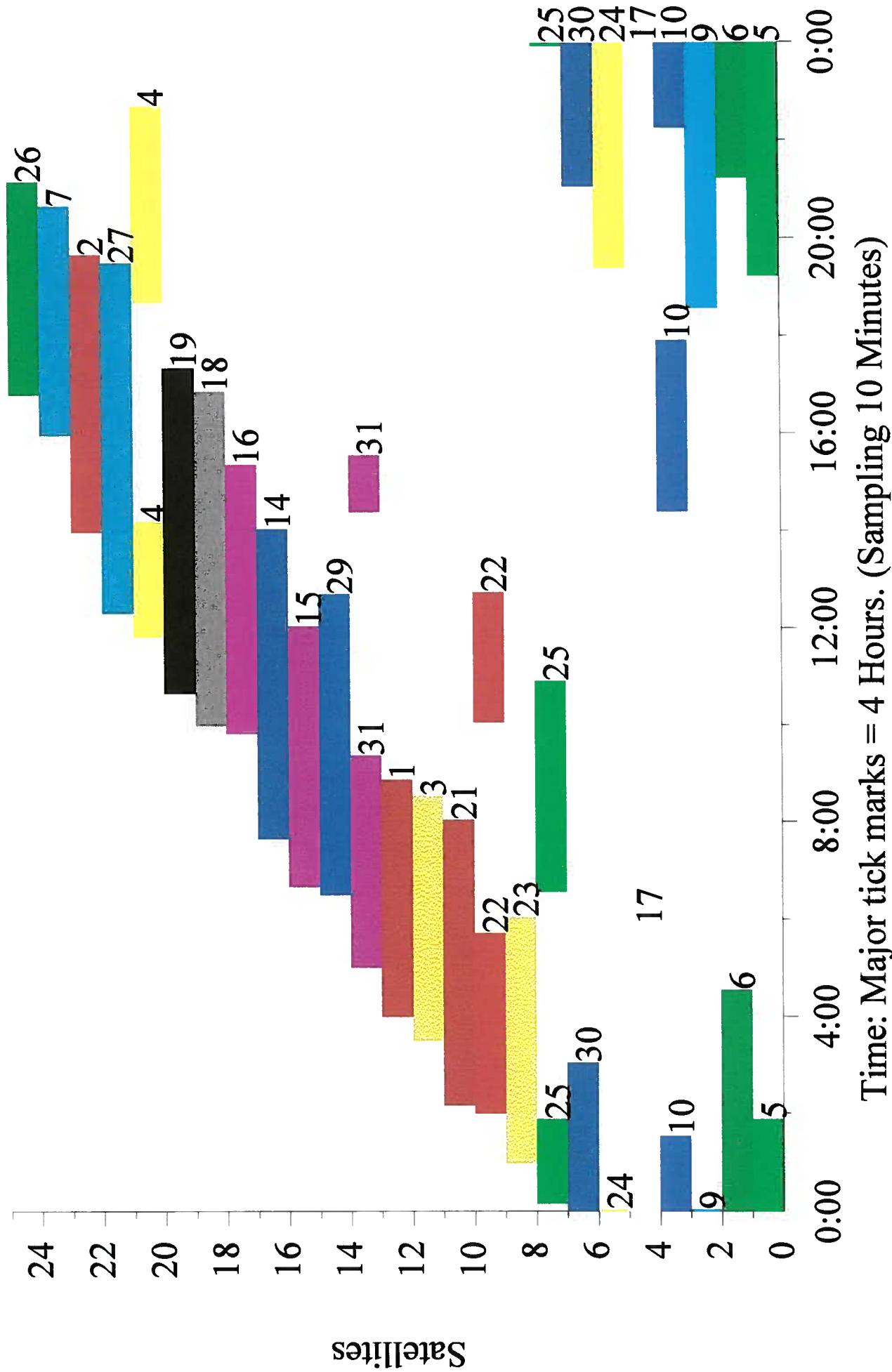
Lat 24:47:2.10892 S Lon 49:36:41.9671 W Almanac: CURRENT.EPH 04/06/97
Threshold Elevation 15 (deg) Time Zone 'CURITIBA' -3:00



Satellites

Point: VT 02 + 6 others
Date: Tuesday, 27 de May de 1997
25 Satellites considered : 1 2 3 4 5 6 7 9 10 14 15 16 17 18 19 21 22 23 24 25 26 27 29 30 31

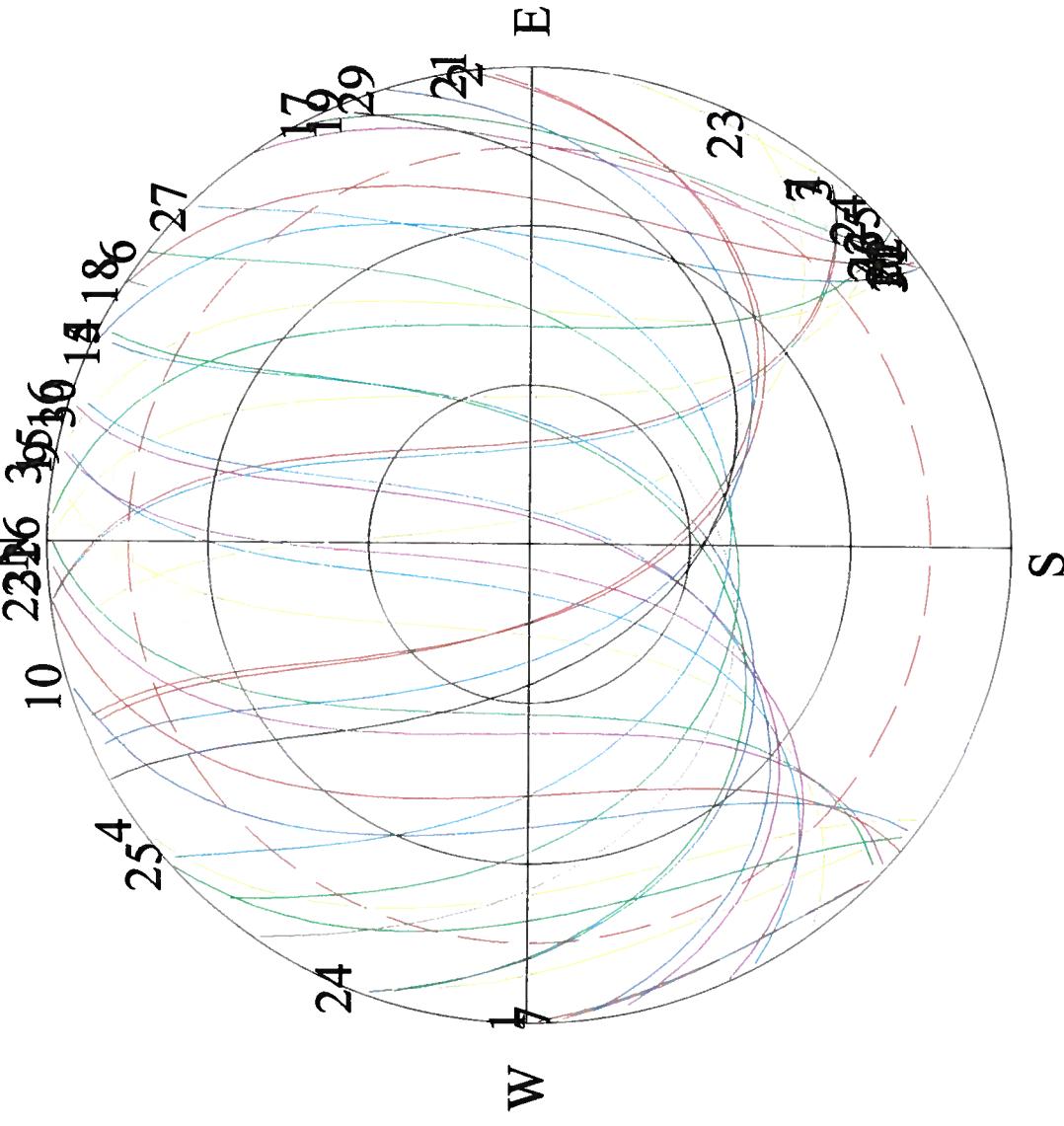
Lat 24:47:2.10892 S Lon 49:36:41.9671 W Almanac: CURRENT.EPH 04/06/97
Threshold Elevation 15 (deg) Time Zone 'CURITIBA' -3:00



SkyPlot

Point: VT 02 + 6 others
Date: Tuesday, 27 de May de 1997
25 Satellites considered : 1 2 3 4 5 6 7 9 10 14 15 16 17 18 19 21 22 23 24 25 26 27 29 30 31

Lat 24:47:2.10892 S Lon 49:36:41.9671 W Almanac: CURRENT.EPH 04/06/97
Threshold Elevation 15 (deg) Time Zone 'CURITIBA' -3:00



Time: Major tick marks = 4 Hours. (Sampling 10 Minutes)
0:00 4:00 8:00 12:00 16:00 20:00 24:00



ANEXO B - MONOGRAFIA DE MARCOS



MONOGRAFIA DE MARCOS

Nome da Estação: **BISCAIA - VT-01**

Obra/Ano: **041/97**

DADOS GERAIS

Município: **Ponta Grossa**

Estado: **Paraná**

Localidade: **Biscaia**

Linha:

Folha:

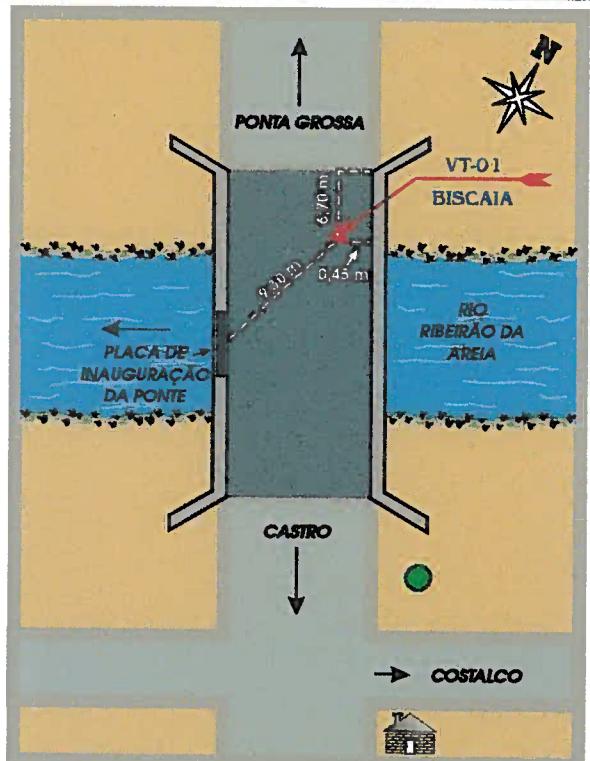
Trecho:

COORDENADAS

LAT.= **25°02'40.0547922"** - SAD-69
LONG.= **49°49'47.5137407"** - SAD-69
N= **7.229.609,402 m** - UTM MC -51°
E= **618.041,195 m** - UTM MC -51°
H (ORTOM.)= **702,8636 m**

Descrição: Chapa de bronze com a inscrição Universal S.A. protegido por lei VT-01 MINEROPAR, inserida na ponte.

CROQUIS



ITINERÁRIO

Partindo do portão de entrada do Campus da Universidade Estadual de Ponta Grossa (U.E.P.G.): segue-se com 00 Km, em estrada asfaltada em direção ao Povoado de Biscaia, com 23,9 Km, passa-se por este povoado, segue-se em frente, agora por estrada cascalhada e com 39,7 Km, chega-se a ponte sobre o Ribeirão da Areia, onde encontra-se o vértice VT-01, cravado junto a ponte.

FOTO LOCAL:

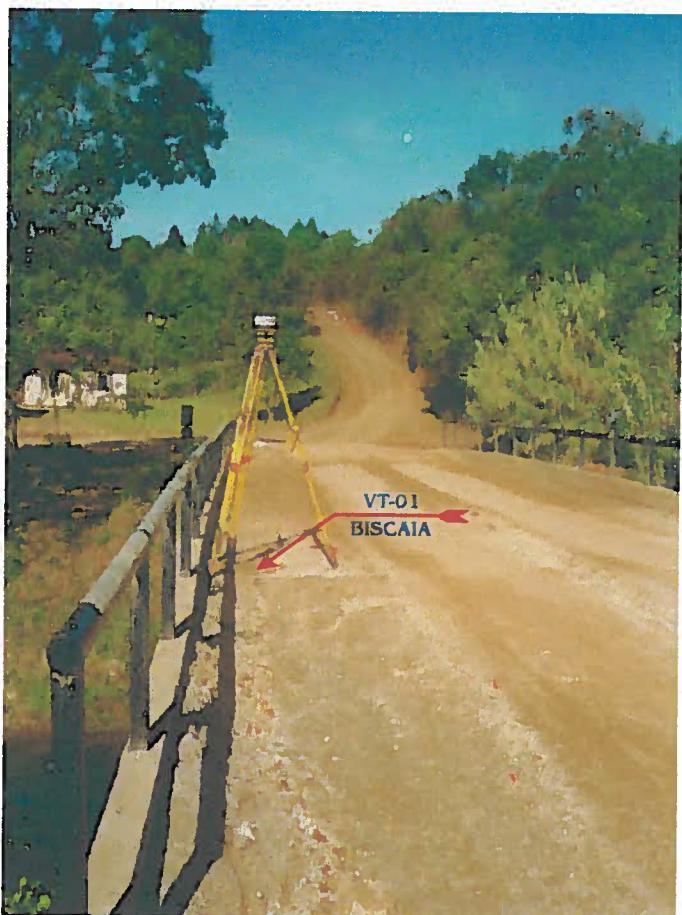
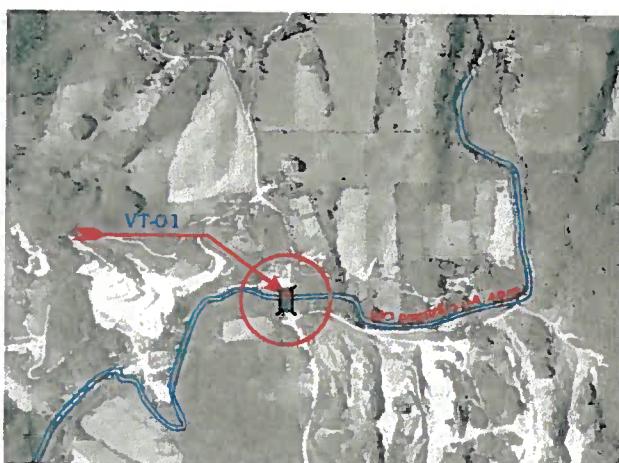


FOTO: 007

VT-01



MARCOS DE REFERÊNCIA



MONOGRAFIA DE MARCOS

Nome da Estação: SOCAVÃO - VT-02

Obra/Ano: 041/97

DADOS GERAIS

Município: Castro

Estado: Paraná

Localidade: Tanque Grande

Linha:

Folha:

Trecho:

COORDENADAS

LAT.= $24^{\circ}47'00.3516134''$ - SAD-69

LONG.= $49^{\circ}36'40.2550387''$ - SAD-69

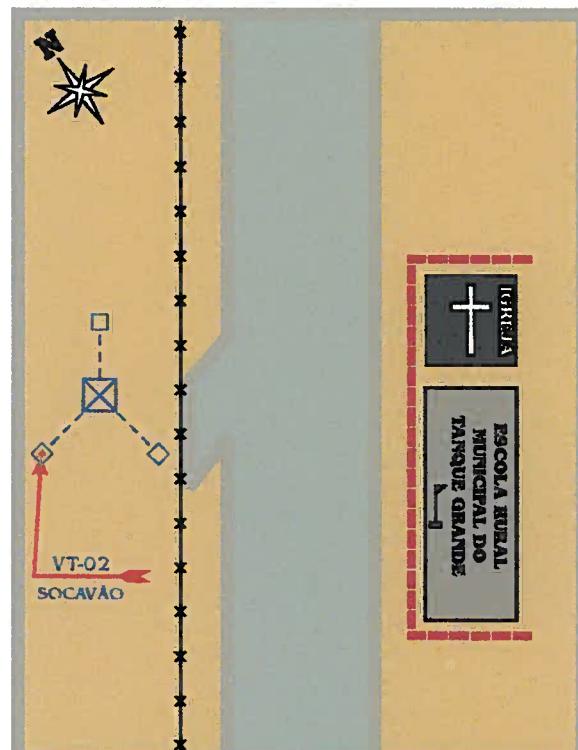
N= $7.258.309,416$ m - UTM MC -51°

E= $640.399,370$ m - UTM MC -51°

H (ORTOM.)= $910,73511$ m

Descrição: Chapa de bronze com a inscrição Universal S.A. protegido por lei VT-02 MINEROPAR, inserida na base da haste de sustentação da Torre da Telepar.

CROQUIS



ITINERÁRIO

Partindo-se com 0,00 Km da Igreja Congregação Cristã do Brasil, no Distrito de Socavão Município de Castro; segue-se em direção a Localidade de Tanque Grande e com 12,2 Km, chega-se em frente a Escola Rural Municipal de Tanque Grande. O vértice encontra-se junto a base da haste de sustentação da Torre da Telepar.

FOTO LOCAL:

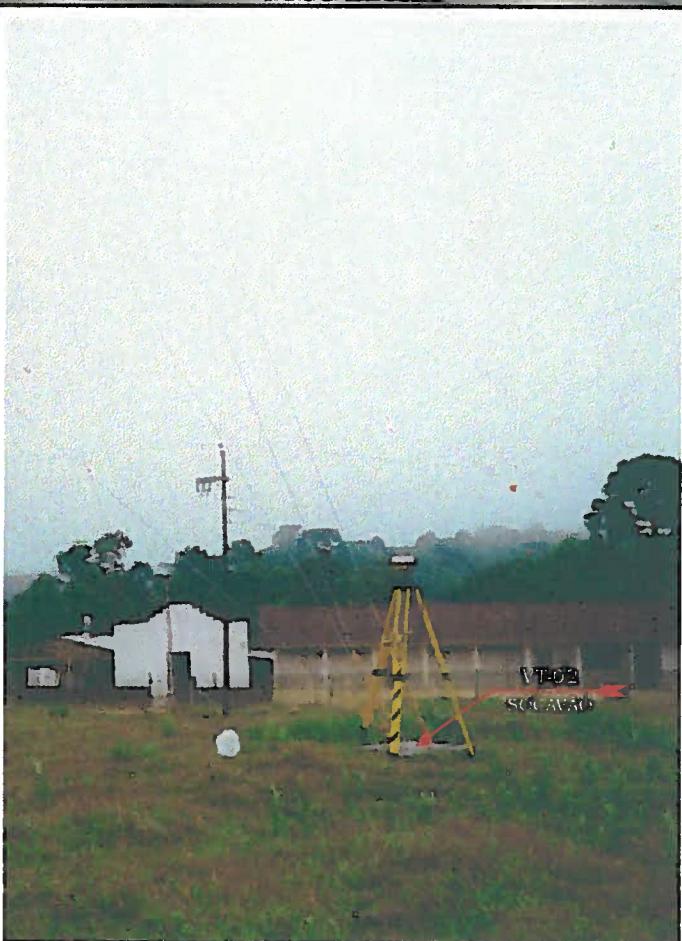
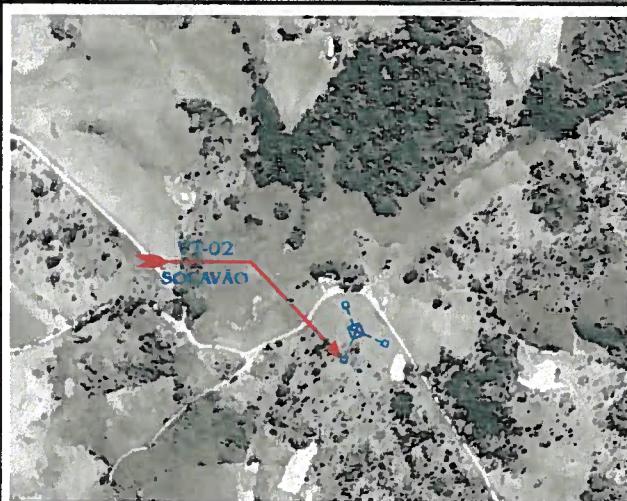


FOTO: 016

Ex.: 01



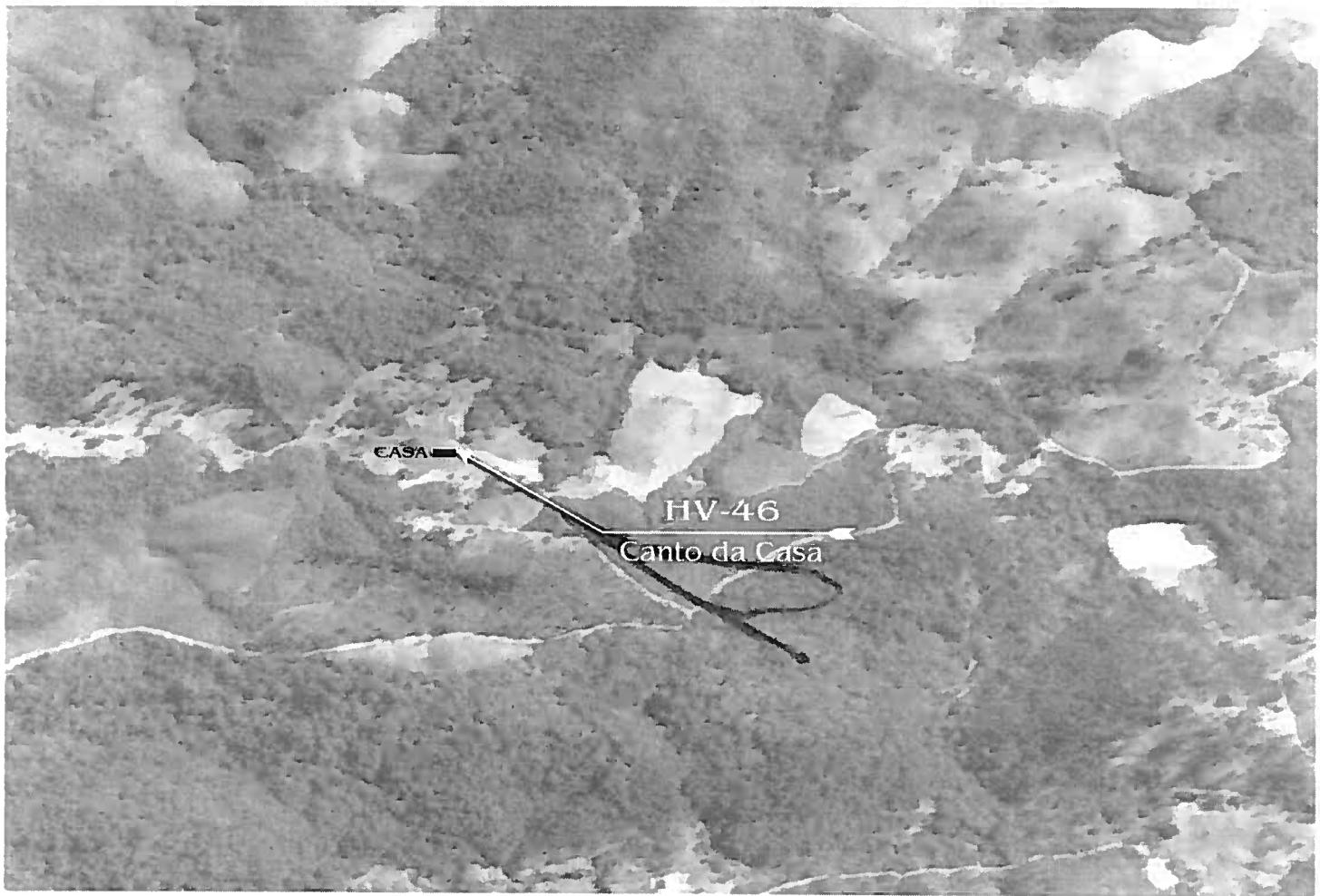
MARCOS DE REFERÊNCIA



ANEXO C- CROQUIS DE VISUALIZAÇÃO DOS HV'S

PROJETO: 041/97 - MINEROPAR

MUNICÍPIO: PONTA GROSSA



CROQUIS DE VISUALIZAÇÃO DE HVV

PONTO: HV-046	ALTITUDE ORTOMÉTRICA: 700,70 m
COORDENADA E: 627.144,539 m	DATUM PLANIMÉTRICO: SAD-69
COORDENADA N: 7.234.807,742 m	DATUM VERTICAL: MARÉGRAFO DE IMBITUVA - SC
MERIDIANO CENTRAL: -51° W	OBS.:

PROJETO: 041/97 - MINEROPAR

MUNICÍPIO: PONTA GROSSA

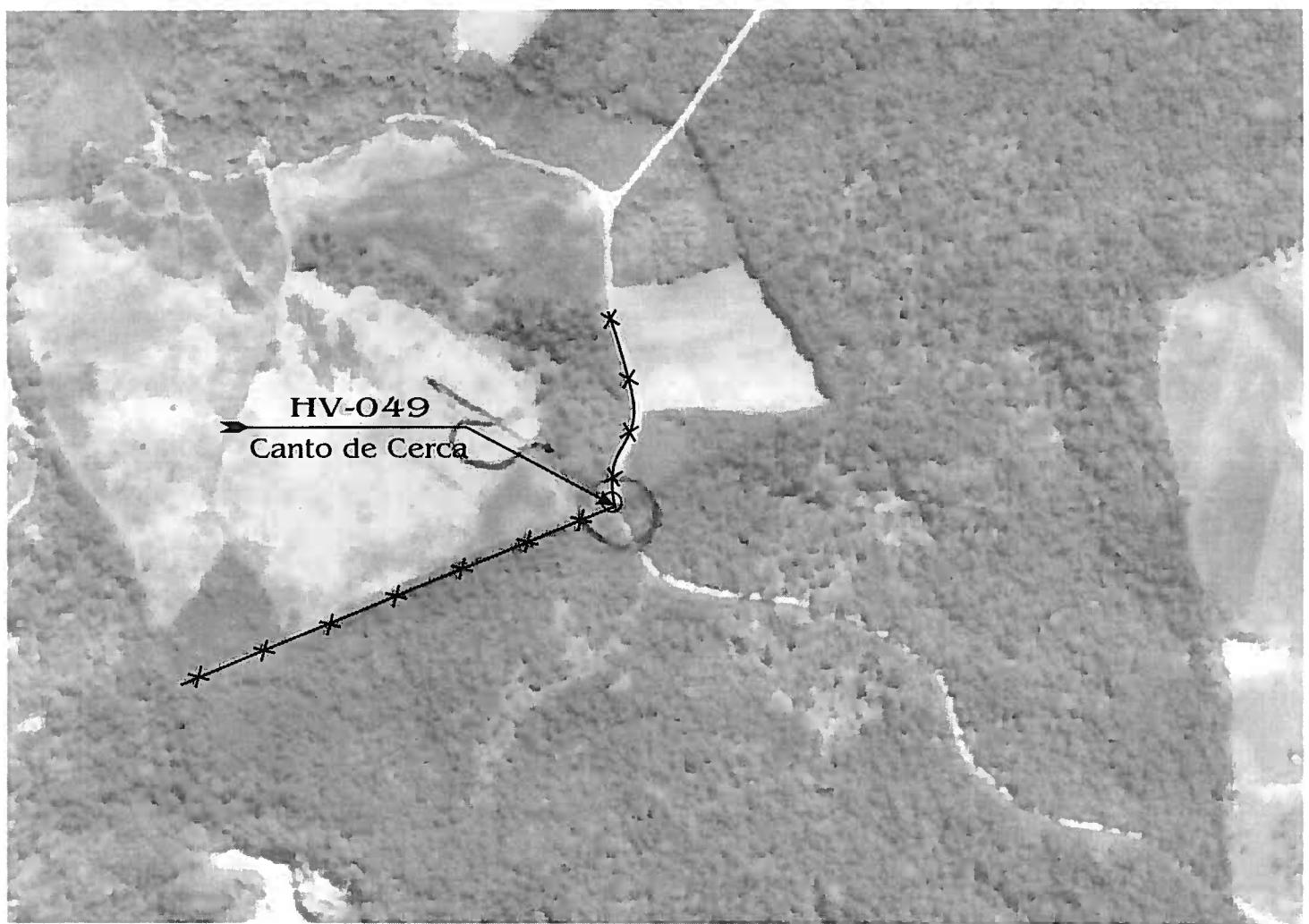


CROQUIS DE VISUALIZAÇÃO DE HV-048

PONTO: HV-048	ALTITUDE ORTOMÉTRICA: 745,40 m
COORDENADA E: 617.967,989 m	DATUM PLANIMÉTRICO: SAD-69
COORDENADA N: 7.223.470,112 m	DATUM VERTICAL: MARÉGRAFO DE IMBITUVA - SC
MERIDIANO CENTRAL: -51° W	OBS.:

PROJETO: 041/97 - MINEROPAR

MUNICÍPIO: PONTA GROSSA



CROQUIS DE VISUALIZAÇÃO DE HVV

PONTO: HV-049	ALTITUDE ORTOMÉTRICA: 920,49 m
COORDENADA E: 613.697,242 m	DATUM PLANIMÉTRICO: SAD-69
COORDENADA N: 7.226.155.569 m	DATUM VERTICAL: MARÉGRAFO DE IMBITUVA - SC
MERIDIANO CENTRAL: -51° W	OBS.:

PROJETO: 041/97 - MINEROPAR

MUNICÍPIO: PONTA GROSSA



CROQUIS DE VISUALIZAÇÃO DE HVV

PONTO: HV-050

ALTITUDE ORTOMÉTRICA: 929,07 m

COORDENADA E: 623.246,636 m

DATUM PLANIMÉTRICO: SAD-69

COORDENADA N: 7.237.515,677 m

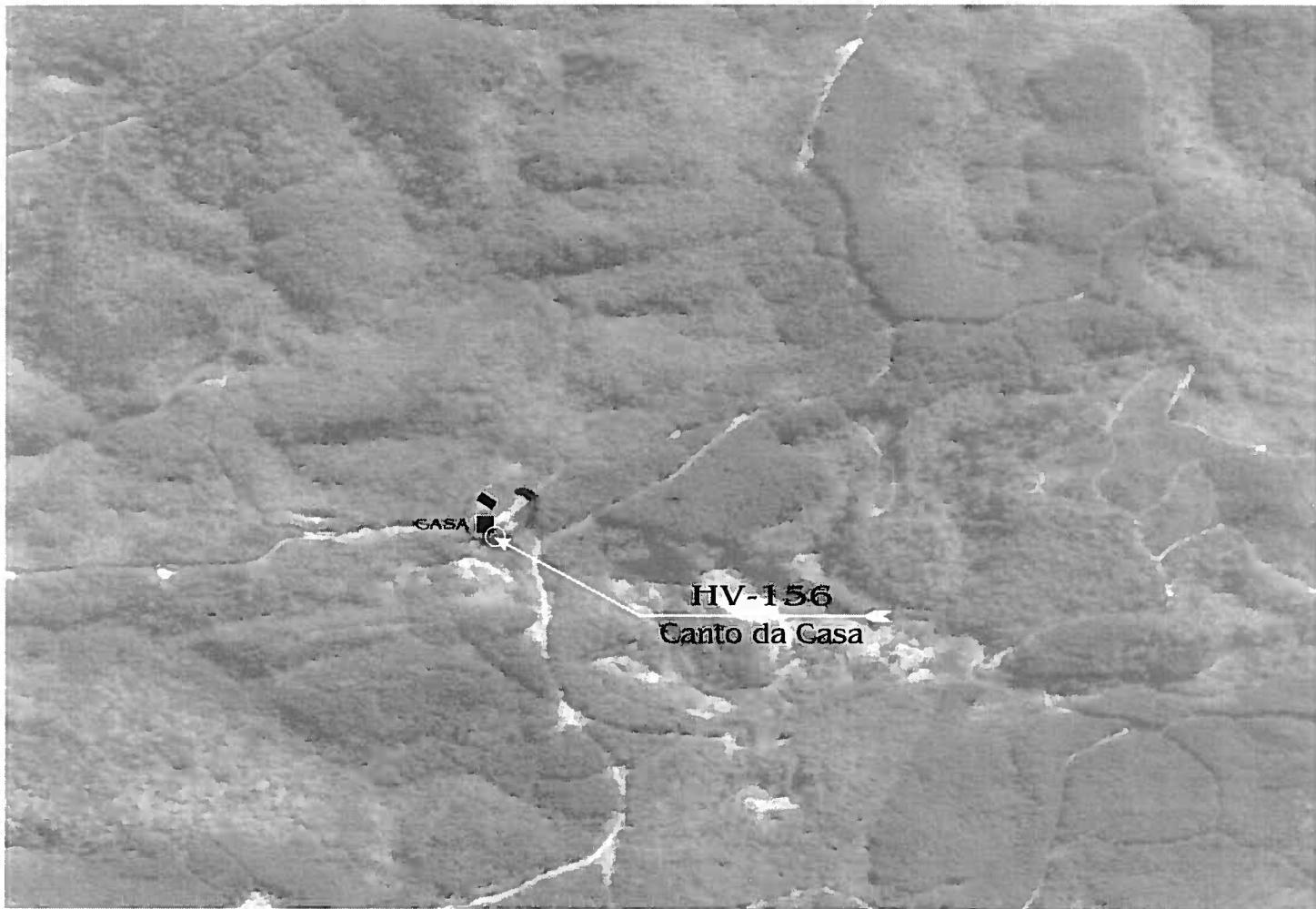
DATUM VERTICAL: MARÉGRAFO DE IMBITUVA - SC

MERIDIANO CENTRAL: -51° W

OBS.:

PROJETO: 041/97 - MINEROPAR

MUNICÍPIO: PONTA GROSSA



CROQUIS DE VISUALIZAÇÃO DE HVV

PONTO: HV-156	ALTITUDE ORTOMÉTRICA: 848,37 m
COORDENADA E: 612.968,810 m	DATUM PLANIMÉTRICO: SAD-69
COORDENADA N: 7.229.193,057 m	DATUM VERTICAL: MARÉGRAFO DE IMBITUVA - SC
MERIDIANO CENTRAL: -51° W	OBS.:

PROJETO: 041/97 - MINEROPAR

MUNICÍPIO: PONTA GROSSA



CROQUIS DE VISUALIZAÇÃO DE HV-200

PONTO: HV-200	ALTITUDE ORTOMÉTRICA: 888,670 m
COORDENADA E: 611.710,540 m	DATUM PLANIMÉTRICO: SAD-69
COORDENADA N: 7.222.917,024 m	DATUM VERTICAL: MARÉGRAFO DE IMBITUVA - SC
MERIDIANO CENTRAL: -51° W	OBS.:

PROJETO: 041/97 - MINEROPAR

MUNICÍPIO: PONTA GROSSA



CROQUIS DE VISUALIZAÇÃO DE HV-201



PONTO: HV-201	ALTITUDE ORTOMÉTRICA: 841,690 m
COORDENADA E: 608.640,419 m	DATUM PLANIMÉTRICO: SAD-69
COORDENADA N: 7.224.661,039 m	DATUM VERTICAL: MARÉGRAFO DE IMBITUVA - SC
MERIDIANO CENTRAL: -51° W	OBS.:

PROJETO: 041/97 - MINEROPAR

MUNICÍPIO: PONTA GROSSA



CROQUIS DE VISUALIZAÇÃO DE HV-202

PONTO: HV-202	ALTITUDE ORTOMÉTRICA: 870,120 m
COORDENADA E: 614.234,024 m	DATUM PLANIMÉTRICO: SAD-69
COORDENADA N: 7.220.288,567 m	DATUM VERTICAL: MARÉGRAFO DE IMBITUVA - SC
MERIDIANO CENTRAL: -51° W	OBS.:

PROJETO: 041/97 - MINEROPAR

MUNICÍPIO: PONTA GROSSA

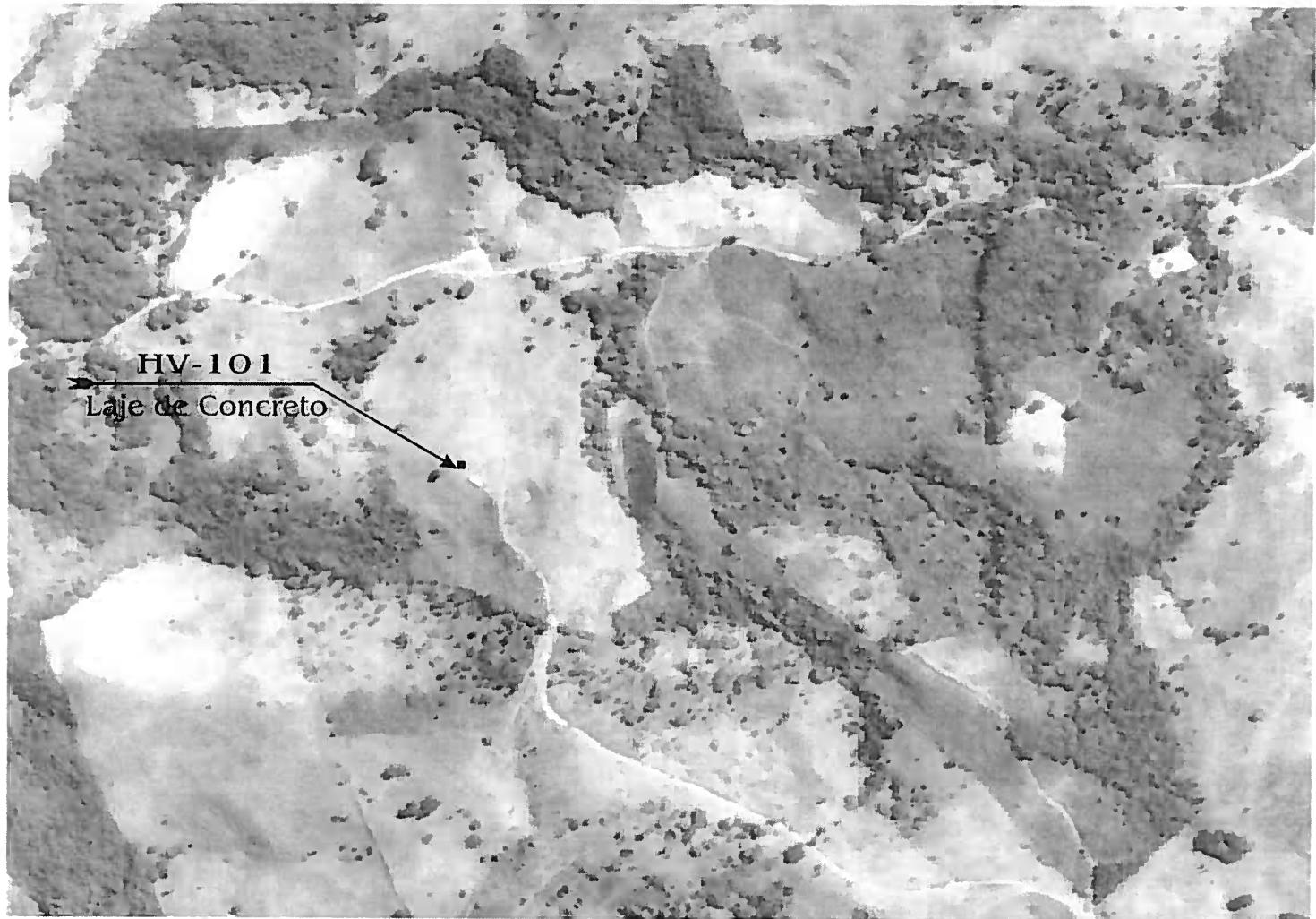


CROQUIS DE VISUALIZAÇÃO DE HV-100

PONTO: HV-100	ALTITUDE ORTOMÉTRICA: 868,0007 m
COORDENADA E: 644.191,915 m	DATUM PLANIMÉTRICO: SAD-69
COORDENADA N: 7.260.615,178 m	DATUM VERTICAL: MARÉGRAFO DE IMBITUVA - SC
MERIDIANO CENTRAL: -51° W	OBS.:

PROJETO: 041/97 - MINEROPAR

MUNICÍPIO: PONTA GROSSA



CROQUIS DE VISUALIZAÇÃO DE HV-101

PONTO: HV-101	ALTITUDE ORTOMÉTRICA: 890,5244 m
COORDENADA E: 640.186,095 m	DATUM PLANIMÉTRICO: SAD-69
COORDENADA N: 7.256.513,066 m	DATUM VERTICAL: MARÉGRAFO DE IMBITUVA - SC
MERIDIANO CENTRAL: -51° W	OBS.:

PROJETO: 041/97 - MINEROPAR

MUNICÍPIO: PONTA GROSSA

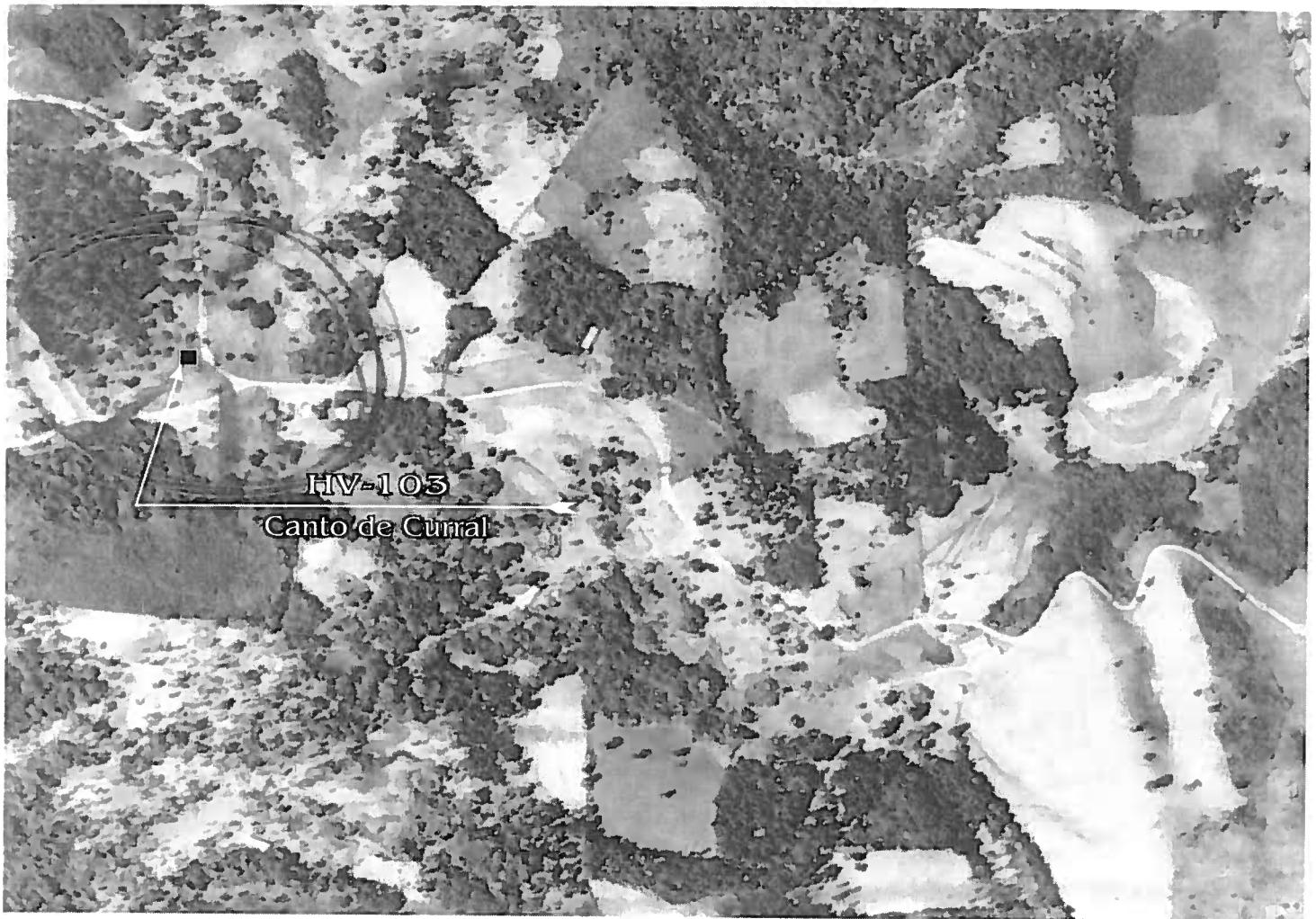


CROQUIS DE VISUALIZAÇÃO DE HVV

PONTO: HV-102	ALTITUDE ORTOMÉTRICA: 808,4285m
COORDENADA E: 633.495,489 m	DATUM PLANIMÉTRICO: SAD-69
COORDENADA N: 7.49.981,713 m	DATUM VERTICAL: MARÉGRAFO DE IMBITUVA - SC
MERIDIANO CENTRAL: -51° W	OBS.:

PROJETO: 041/97 - MINEROPAR

MUNICÍPIO: PONTA GROSSA



CROQUIS DE VISUALIZAÇÃO DE HVV

PONTO: HV-103	ALTITUDE ORTOMÉTRICA: 906,5039 m
COORDENADA E: 630.066,824 m	DATUM PLANIMÉTRICO: SAD-69
COORDENADA N: 7.251.273,669 m	DATUM VERTICAL: MARÉGRAFO DE IMBITUVA - SC
MERIDIANO CENTRAL: -51° W	OBS.:

PROJETO: 041/97 - MINEROPAR

MUNICÍPIO: PONTA GROSSA



CROQUIS DE VISUALIZAÇÃO DE HV

PONTO: HV-104	ALTITUDE ORTOMÉTRICA: 980,4746 m
COORDENADA E: 627.720,091 m	DATUM PLANIMÉTRICO: SAD-69
COORDENADA N: 7.253.851,559 m	DATUM VERTICAL: MARÉGRAFO DE IMBITUVA - SC
MERIDIANO CENTRAL: -51° W	OBS.:

PROJETO: 041/97 - MINEROPAR

MUNICÍPIO: PONTA GROSSA

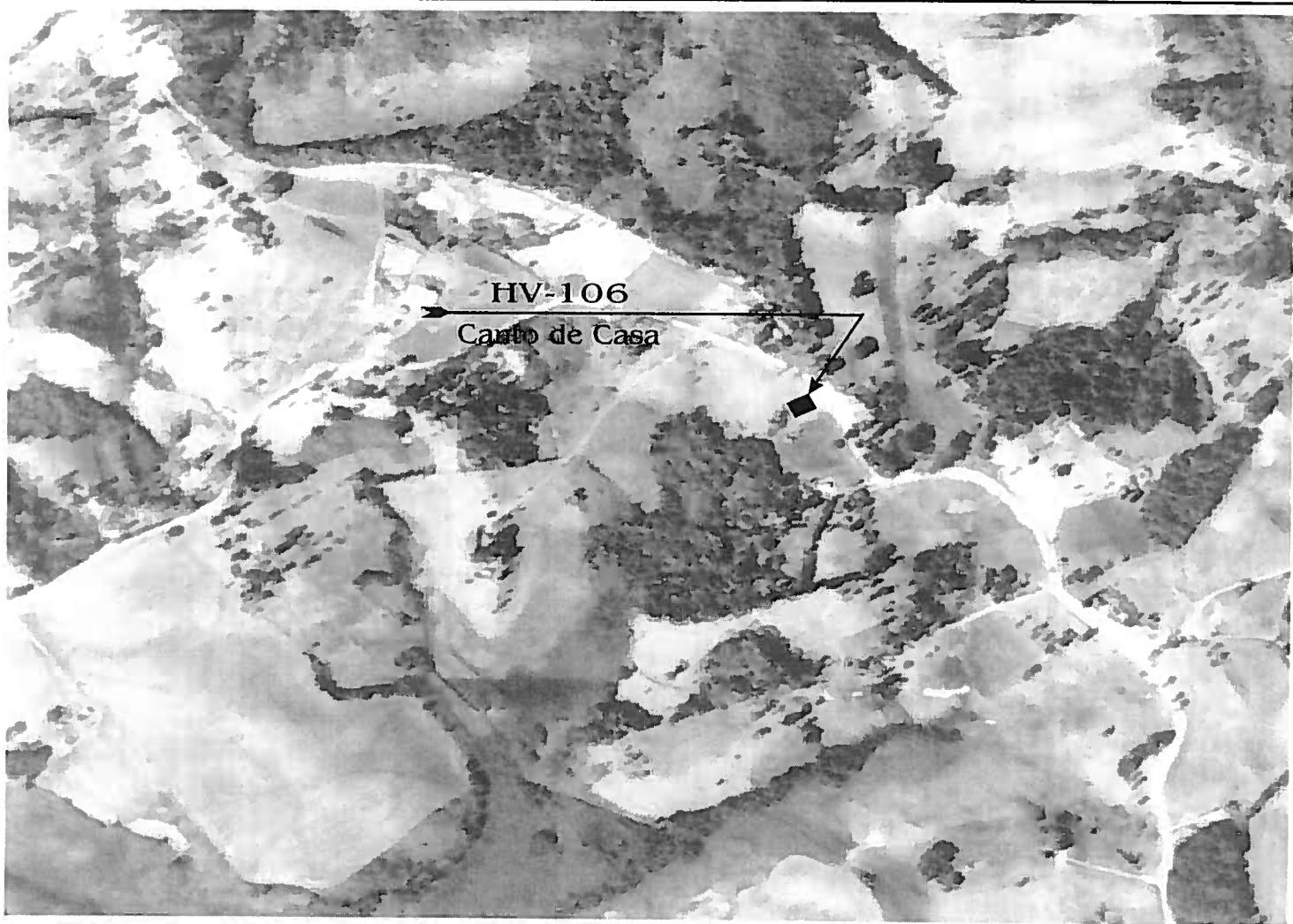


CROQUIS DE VISUALIZAÇÃO DE HV-105

PONTO: HV-105	ALTITUDE ORTOMÉTRICA: 852,6843 m
COORDENADA E: 634.268,389 m	DATUM PLANIMÉTRICO: SAD-69
COORDENADA N: 7.255.207,909 m	DATUM VERTICAL: MARÉGRAFO DE IMBITUVA - SC
MERIDIANO CENTRAL: -51° W	OBS.:

PROJETO: 041/97 - MINEROPAR

MUNICÍPIO: PONTA GROSSA



CROQUIS DE VISUALIZAÇÃO DE HV-106

PONTO: HV-106	ALTITUDE ORTOMÉTRICA: 1040,7206 m
COORDENADA E: 633.576,182 m	DATUM PLANIMÉTRICO: SAD-69
COORDENADA N: 7.259.520,257 m	DATUM VERTICAL: MARÉGRAFO DE IMBITUVA - SC
MERIDIANO CENTRAL: -51° W	OBS.:

PROJETO: 041/97 - MINEROPAR

MUNICÍPIO: PONTA GROSSA

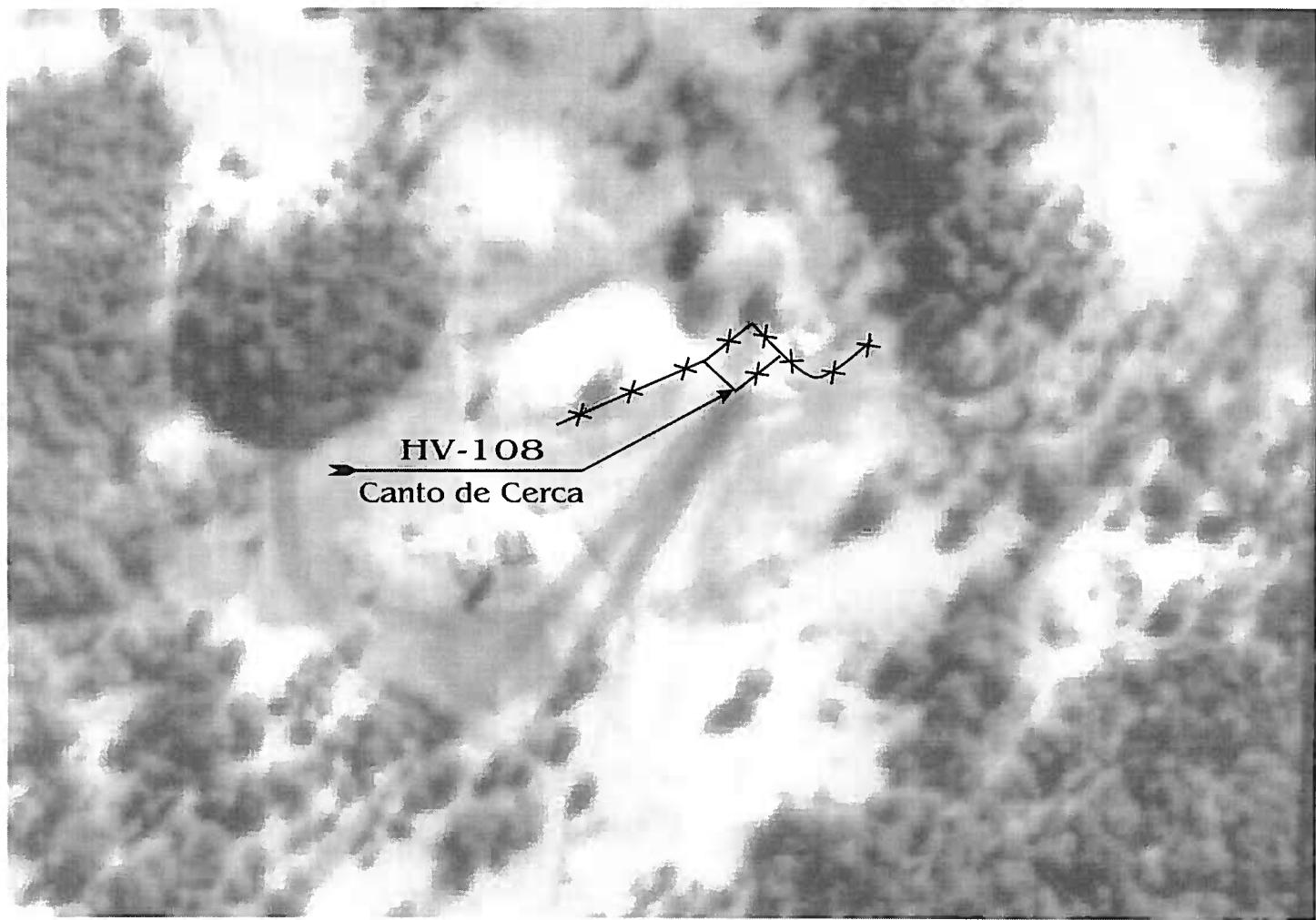


CROQUIS DE VISUALIZAÇÃO DE HV-107

PONTO: HV-107	ALTITUDE ORTOMÉTRICA: 900,4960 m
COORDENADA E: 637.460,727 m	DATUM PLANIMÉTRICO: SAD-69
COORDENADA N: 7.258.731.440 m	DATUM VERTICAL: MARÉGRAFO DE IMBITUVA - SC
MERIDIANO CENTRAL: -51° W	OBS.:

PROJETO: 041/97 - MINEROPAR

MUNICÍPIO: PONTA GROSSA

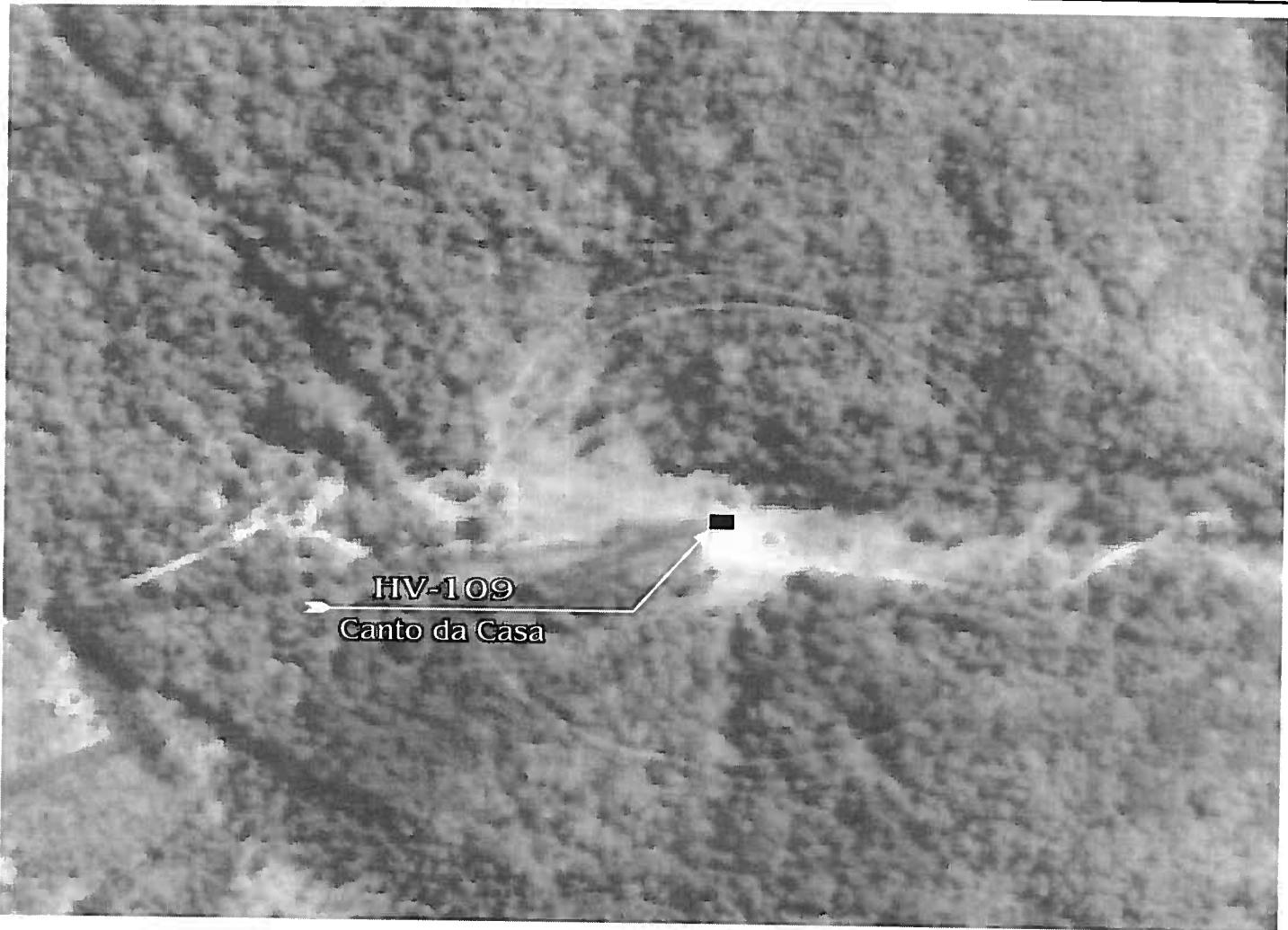


CROQUIS DE VISUALIZAÇÃO DE HV-108

PONTO: HV-108	ALTITUDE ORTOMÉTRICA: 946,1320 m
COORDENADA E: 637.817.341 m	DATUM PLANIMÉTRICO: SAD-69
COORDENADA N: 7.264.588.438 m	DATUM VERTICAL: MARÉGRAFO DE IMBITUVA - SC
MERIDIANO CENTRAL: -51° W	OBS.:

PROJETO: 041/97 - MINEROPAR

MUNICÍPIO: PONTA GROSSA



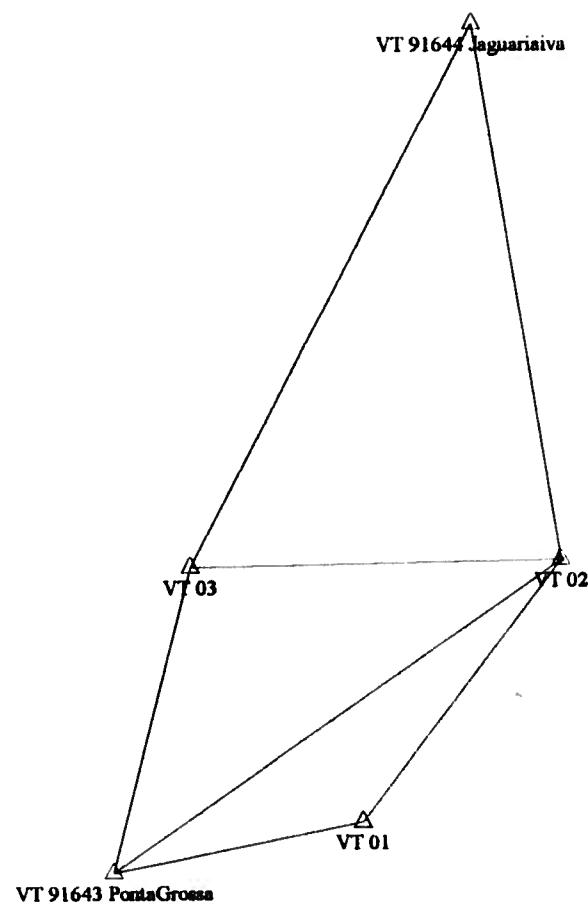
CROQUIS DE VISUALIZAÇÃO DE HV-109

PONTO: HV-109	ALTITUDE ORTOMÉTRICA: 933,6133 m
COORDENADA E: 640.388,315 m	DATUM PLANIMÉTRICO: SAD-69
COORDENADA N: 7.262.935.353 m	DATUM VERTICAL: MARÉGRAFO DE IMBITUVA - SC
MERIDIANO CENTRAL: -51° W	OBS.:



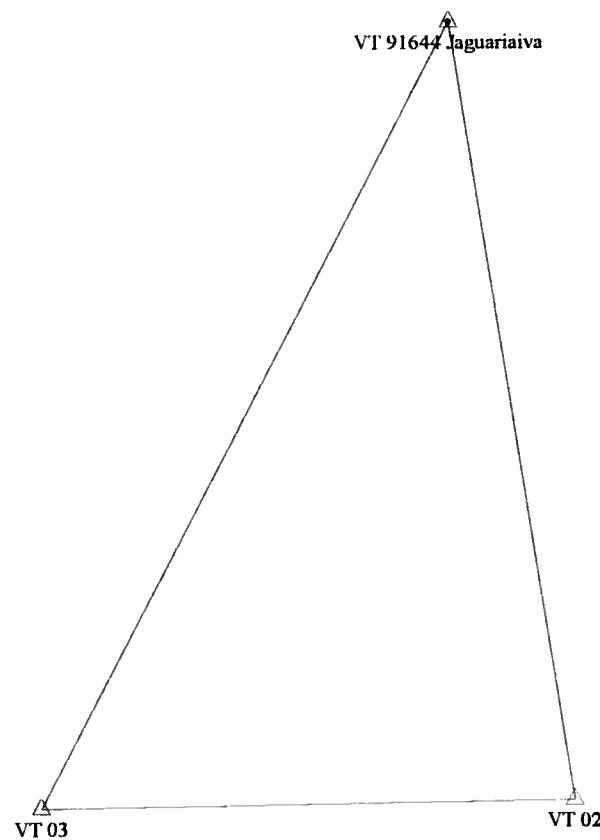
ANEXO D - VISUALIZAÇÃO DOS VÉRTICES, PROCESSAMENTO E AJUSTAMENTO

Network Map: Mineropar



20000m

Network Map: Mineropar1



10000m

New Closure

From: VT 03

To:	VT 91644 Jaguariaiva	L1 fixed	24/05/97 13:01:00	00000416.SSF
	Slope (m):	68501.907	24°14'30.81641" S	59641440.DAT
	Total (m):	68501.907	049°42'17.33590" W	97401440.DAT
			914.3630 m	
To:	VT 02	L1 fixed	24/05/97 13:01:15	00000412.SSF
	Slope (m):	60784.159	24°47'2.10946" S	59641440.DAT
	Total (m):	129286.066	049°36'41.96637" W	64381440.DAT
			913.9408 m	
To:	VT 03	L1 fixed	24/05/97 13:01:15	00000408.SSF
	Slope (m):	41165.268	24°47'22.35026" S	97401440.DAT
	Total (m):	170451.333	050°01'7.04821" W	64381440.DAT
			1061.7791 m	

Closed

Precision (ppm): 0.0334

Errors (m) N: -0.0024 E: 0.0037 U: 0.0036

Projeto Mineropar

Project: Mineropar1
Supervisor: TopoGeo
Date Created: 04/06/97 20:22:18
Date Last Accessed: 04/06/97 20:58:37
Project Directory: c:\gpsurvey\projects\Mineropa
Antenna Type: 4600LS Internal
Antenna Measurement Method: Reading from hook using 4600LS tape
Receiver Type: 4600LS
Coordinate System: Geographic
Zone: WGS84
Linear Unit: Meter
Timezone: CURITIBA : -3:00
Number of Stations: 3
Number of Baselines: 3
No. of Continuous Kinematic Solns: 0

Projeto Mineropar****** Reference Coordinates ******

Station Short Name	Station ID	Latitude	Longitude	Height	Station Quality
VT 91644	Jaguar	24°14'30.81641" S	049°42'17.33590" W	914.36300	Fixed Control
VT 02		24°47'02.10941" S	049°36'41.96642" W	913.93944	Network Adjustment
VT 03		24°47'22.35018" S	050°01'07.04829" W	1061.77681	Network Adjustment

****** Adjusted Coordinates ******

Projection Group: Geographic

Zone Name: Global

Linear Units: meter

Angular Units: degrees

Datum Name: WGS-84

Station Short Name	Station ID	Latitude	Longitude	Ortho. Height	Ellip. Height
VT 02		24°47'02.10941" S	049°36'41.96642" W	910.80235	913.93944
VT 03		24°47'22.35018" S	050°01'07.04829" W	1059.15295	1061.77681
VT 91644	Jaguar	24°14'30.81641" S	049°42'17.33590" W	913.41200	914.36300

Projeto Mineropar
Project Name: Mineropar1
Processed: Monday, 26 de May de 1997 2:30
Solution Output File (SSF): 00000408.SSF **IMPORTED**

From Station: VT 03
Data file: 97401440.DAT
Antenna Height (meters): 1.374 True Vertical **1.313 Uncorrected**
Position Quality: Fixed Baseline Solution

WGS 84 Position:
 24° 47' 22.349880" S X 3723377.111
 50° 01' 07.049630" W Y -4440278.547
 1061.848 Z -2658373.106

To Station: VT 02
Data file: 64381440.DAT
Antenna Height (meters): 1.612 True Vertical **1.550 Uncorrected**

WGS 84 Position:
 24° 47' 02.109084" S X 3754904.094
 49° 36' 41.967806" W Y -4413816.596
 914.010 Z -2657745.617

Start Time: 24/05/97 13:01:15,00 GPS (906 565275.00)
Stop Time: 24/05/97 15:01:30,00 GPS (906 572490.00)
Occupation Time Meas. Interval (seconds): 02:00:15,00 15.00

Solution Type: L1 fixed double difference

Ephemeris: Broadcast
Baseline Slope Distance Std. Dev. (meters): 41165.268 0.000540

	Forward	Backward
Normal Section Azimuth:	89° 13' 05.891970"	269° 02' 51.665852"
Vertical Angle:	-0° 23' 25.896837"	0° 01' 15.632764"

Baseline Components (meters):
Standard Deviations (meters):

dx	31526.983	dy	26461.951	dz	627.489
	0.001014		0.001163		0.000788
dn	561.595	de	41160.481	du	-280.579
	0.000603		0.000539		0.001532
				dh	-147.838
					0.001532

Aposteriori Covariance Matrix:

1.028851E-006		
-8.854079E-007	1.352189E-006	
-4.224232E-007	5.301003E-007	6.215479E-007

Variance Ratio: 3.3
Reference Variance: 8.618

Observable Count/Rejected RMS: L1 phase 2363/0 0.020

Projeto Mineropar**Processor Controls:****[General]**

Process start time:	24/05/97 13:01:00 GPS	(906 565260)
Process stop time:	24/05/97 15:02:00 GPS	(906 572520)
Elevation mask:	15 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:		
Application threshold:	0 kilometers	0 kilometers

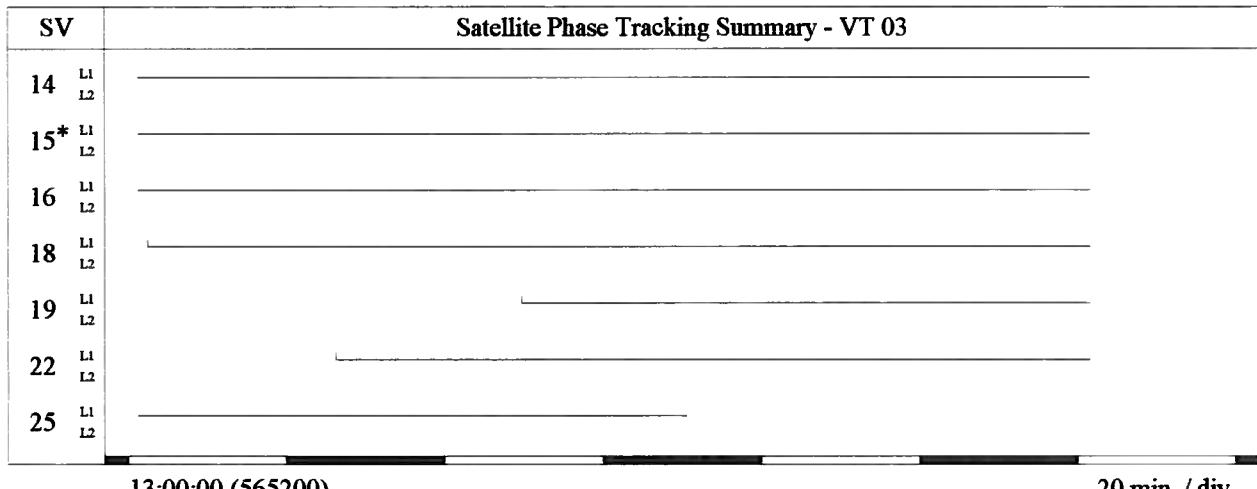
[Final Solution]

Final solution type:	L1 Fixed
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[Satellites]

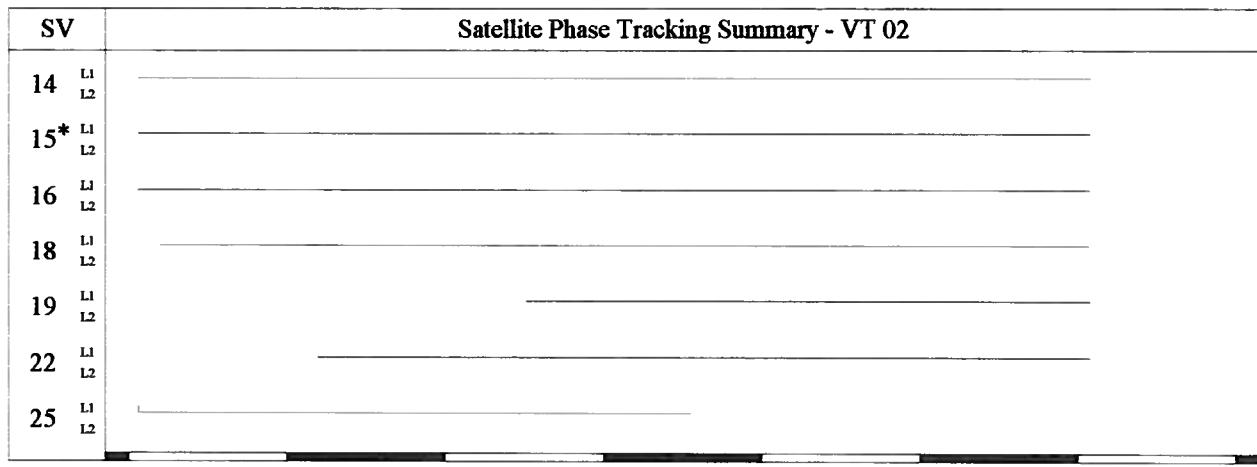
Disabled:	04
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Projeto Mineropar



* Reference SV

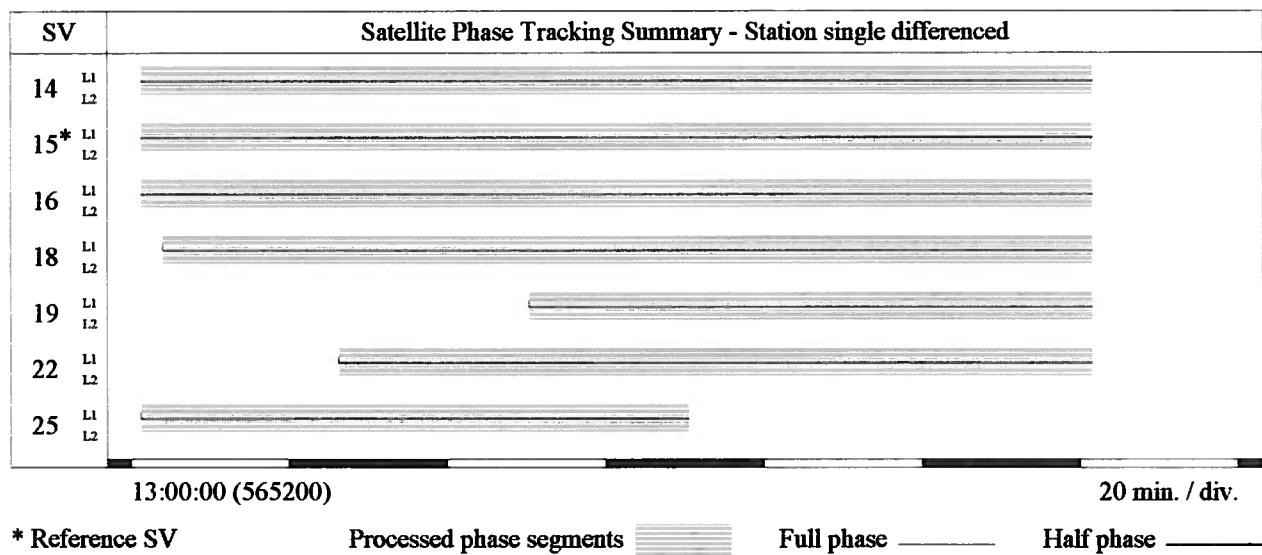
Full phase _____ Half phase _____



* Reference SV

Full phase _____ Half phase _____

Projeto Mineropar



Projeto Mineropar
Project Name: Mineropar1
Processed: Monday, 26 de May de 1997 2:30
Solution Output File (SSF): 00000412.SSF IMPORTED

From Station: VT 91644 Jaguariaiva
Data file: 59641440.DAT
Antenna Height (meters): 0.217 True Vertical
Position Quality: Fixed Control

WGS 84 Position: 24° 14' 30.816407" S X 3763834.811
 49° 42' 17.335904" W Y -4438917.927
 914.363 Z -2603111.585

To Station: VT 02
Data file: 64381440.DAT
Antenna Height (meters): 1.612 True Vertical 1.550 Uncorrected

WGS 84 Position: 24° 47' 02.109457" S X 3754904.081
 49° 36' 41.966368" W Y -4413816.519
 913.941 Z -2657745.598

Start Time: 24/05/97 13:01:15,00 GPS (906 565275.00)
Stop Time: 24/05/97 15:00:30,00 GPS (906 572430.00)
Occupation Time Meas. Interval (seconds): 01:59:15,00 15.00

Solution Type: L1 fixed double difference

Ephemeris: Broadcast
Baseline Slope Distance Std. Dev. (meters): 60784.159 0.000800

	Forward	Backward	
Normal Section Azimuth:	171° 04' 57.409517"	351° 02' 38.263727"	
Vertical Angle:	-0° 16' 28.947865"	-0° 16' 26.059027"	
Baseline Components (meters):	dx -8930.730 0.001401	dy 25101.408 0.001606	dz -54634.013 0.001113
Standard Deviations (meters):			
	dn -60048.763 0.000803	de 9422.055 0.000739	du -291.432 0.002143
			dh -0.422 0.002142

Aposteriori Covariance Matrix:

1.963805E-006		
-1.698397E-006	2.578563E-006	
-8.961264E-007	1.096019E-006	1.239575E-006

Variance Ratio: 2.1
Reference Variance: 13.446

Observable Count/Rejected RMS: L1 phase 2071/0 0.025

Projeto Mineropar

Processor Controls:

[General]

Process start time:	24/05/97 13:01:00 GPS	(906 565260)
Process stop time:	24/05/97 15:05:00 GPS	(906 572700)
Elevation mask:	20 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	IIopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:		
Application threshold:	0 kilometers	0 kilometers

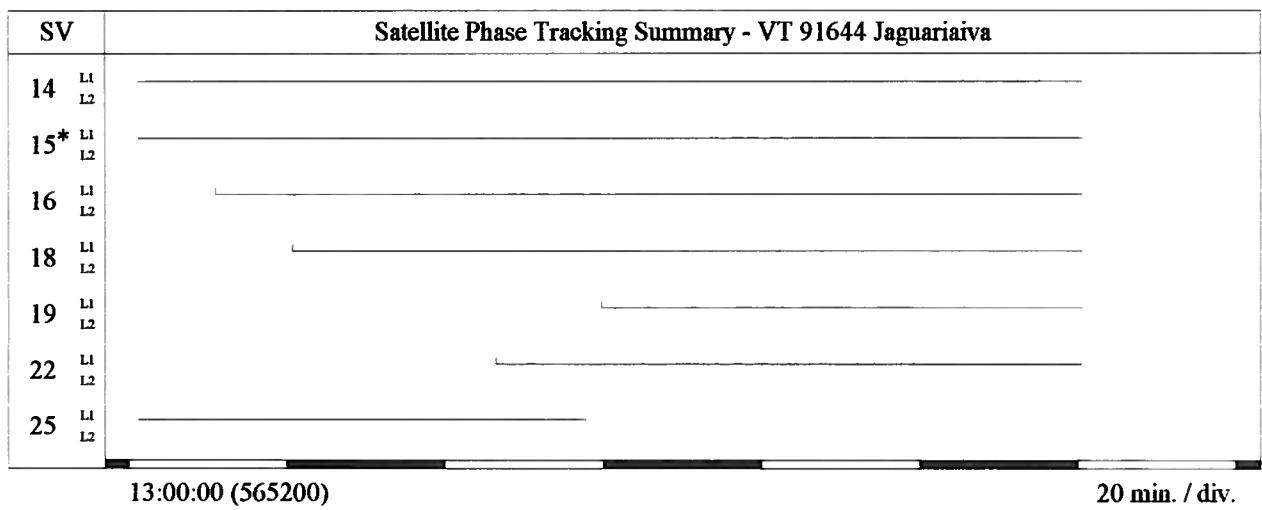
[Final Solution]

Final solution type:	L1 Fixed
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[Satellites]

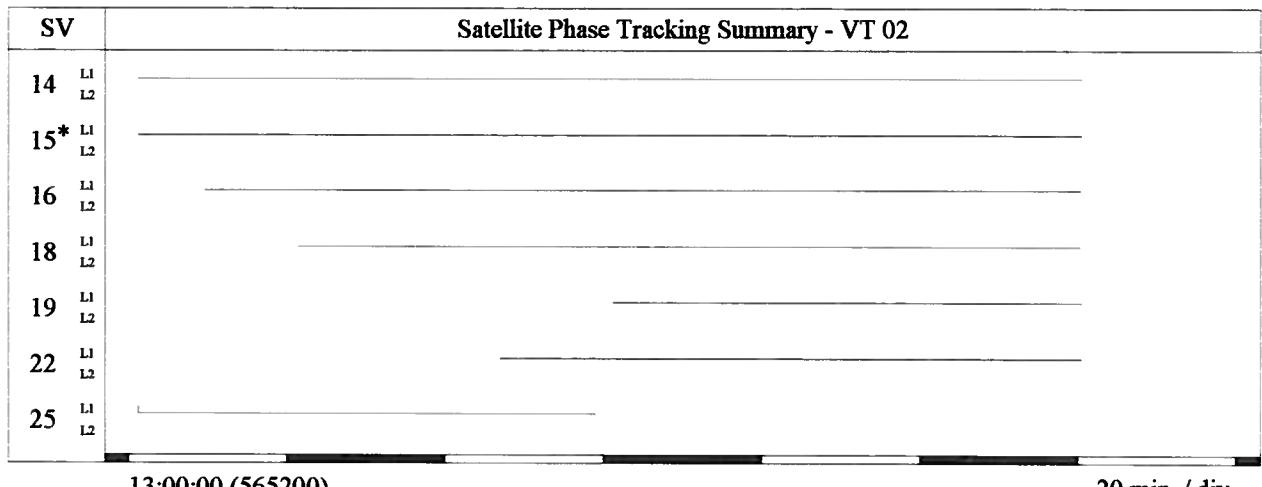
Disabled:

Projeto Mineropar



* Reference SV

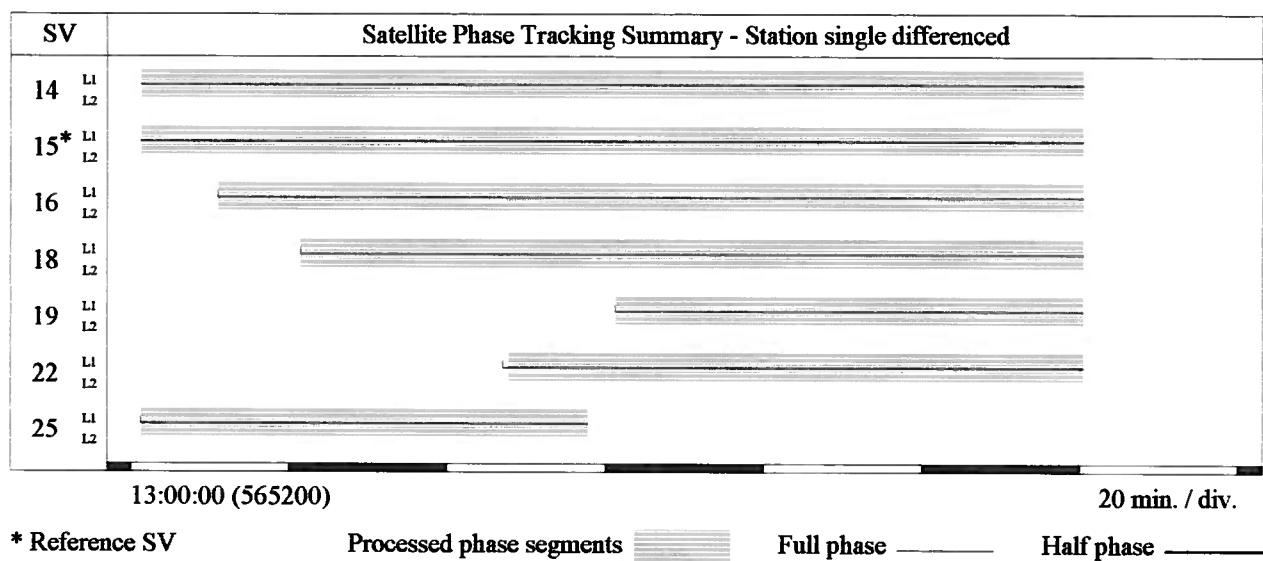
Full phase _____ Half phase _____



* Reference SV

Full phase _____ Half phase _____

Projeto Mineropar



Projeto Mineropar

Project Name:

Processed:

Solution Output File (SSF):

Mineropar1

Monday, 26 de May de 1997 2:30

WAVE 2.10

00000416.SSF

IMPORTED

From Station:

VT 91644 Jaguariaiva

Data file:

59641440.DAT

Antenna Height (meters):

0.217 True Vertical

Position Quality:

Fixed Control

WGS 84 Position:

24° 14' 30.816407" S

X 3763834.811

49° 42' 17.335904" W

Y -4438917.927

914.363

Z -2603111.585

To Station:

VT 03

Data file:

97401440.DAT

Antenna Height (meters):

1.374 True Vertical

1.313 Uncorrected

WGS 84 Position:

24° 47' 22.350177" S

X 3723377.093

50° 01' 07.048341" W

Y -4440278.470

1061.775

Z -2658373.084

Start Time:

24/05/97 13:01:00,00 GPS (906 565260.00)

Stop Time:

24/05/97 15:00:30,00 GPS (906 572430.00)

Occupation Time Meas. Interval (seconds):

01:59:30,00

15.00

Solution Type:

L1 fixed double difference

Ephemeris:

Broadcast

Baseline Slope Distance Std. Dev. (meters):

68501.907 0.000765

Normal Section Azimuth:

Forward**Backward**

207° 36' 04.832549"

27° 43' 53.615899"

Vertical Angle:

-0° 11' 07.838116"

-0° 25' 55.540987"

Baseline Components (meters):

dx -40457.718 dy -1360.544 dz -55261.498

Standard Deviations (meters):

0.001341 0.001538 0.001078

dn -60705.573 de -31737.918 du -221.793
0.000773 0.000708 0.002056dh 147.412
0.002056

Aposteriori Covariance Matrix:

1.799333E-006 -1.555959E-006 2.366197E-006
-8.348848E-007 1.019652E-006 1.161657E-006

Variance Ratio:

2.4

Reference Variance:

12.258

Observable Count/Rejected RMS:

L1 phase

2052/0

0.025

Projeto Mineropar**Processor Controls:****[General]**

Process start time:	24/05/97 12:57:00 GPS	(906 565020)
Process stop time:	24/05/97 15:01:00 GPS	(906 572460)
Elevation mask:	20 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:		
Application threshold:	0 kilometers	0 kilometers

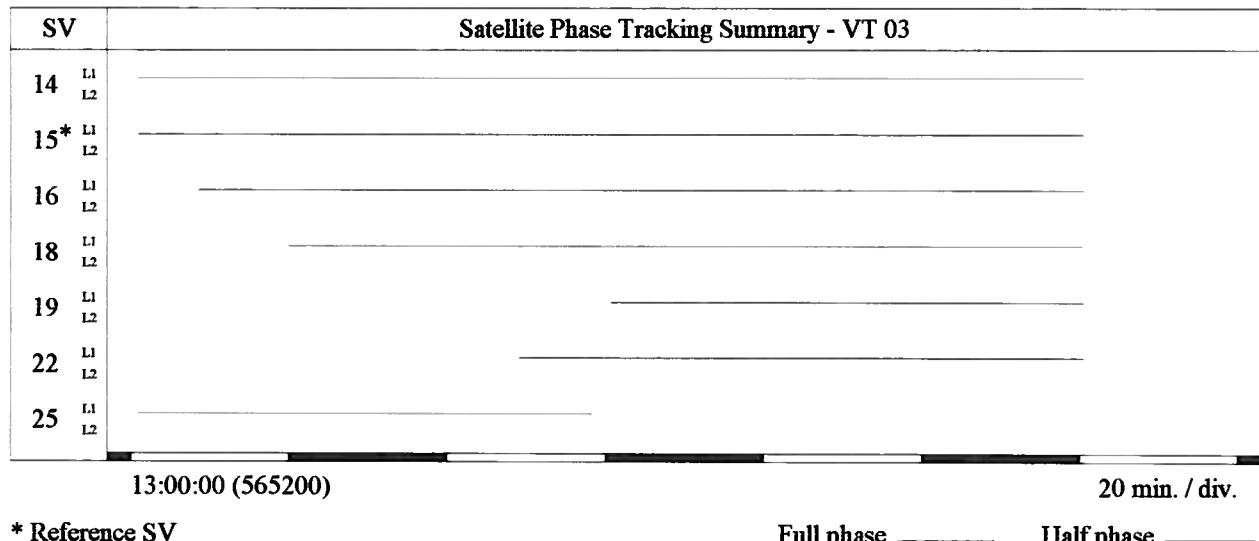
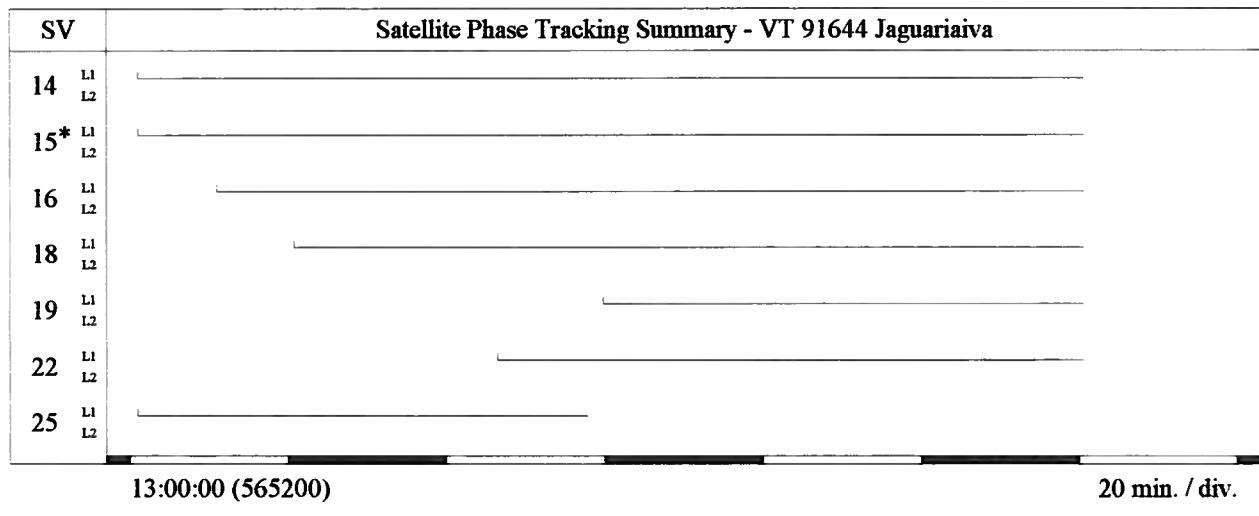
[Final Solution]

Final solution type:	L1 Fixed
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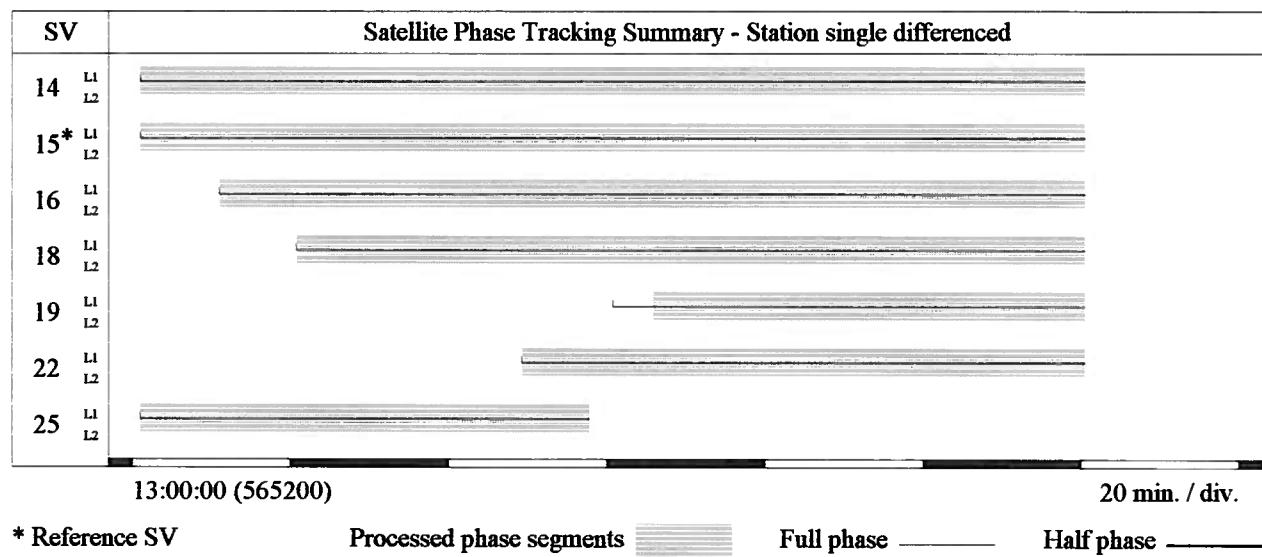
[Satellites]

Disabled:

Projeto Mineropar



Projeto Mineropar



***** End of Report *****

ADJUSTMENT ACTIVITY LOG
NETWORK = Mineropar1
TIME = Wed Jun 4 21:54:53 1997

Adjustment process underway.
Computing closures.
Closures have been computed.
Indexing observation equations and unknowns.
Number of sub-networks = 1.
Number of inner constraints sub-network 1 = 0.

Sub-network 1: Fixed y = 1 Fixed x = 1 Fixed H = 1 Fixed h = 1.

Points included in sub-network 1:
VT 02
VT 03
VT 91644 Jaguariaiva

Initializing parameter group 1: GPS Observations.

6 horizontal observations
3 vertical observations
3 observed azimuths
3 observed distances
Located in sub-network 1.
1 fixed latitudes
1 fixed longitudes
1 fixed ellipsoid heights
1 fixed orthometric heights
Y rotation parameter ruled ineligible
X rotation parameter ruled ineligible
Azimuth rotation parameter ruled ineligible
Network scale parameter ruled ineligible
Omitting parameter 5 by user choice
Omitting parameter 6 by user choice
Omitting parameter 7 by user choice

Initializing parameter group 3: Geoid Model.

0 horizontal observations
3 vertical observations
0 observed azimuths
0 observed distances
Located in sub-network 0.
0 fixed latitudes
0 fixed longitudes
1 fixed ellipsoid heights
1 fixed orthometric heights
Y rotation parameter ruled ineligible
X rotation parameter ruled ineligible
Omitting parameter 3 by user choice
Omitting parameter 4 by user choice
Omitting parameter 5 by user choice
Omitting parameter 6 by user choice
Height constant parameter 7 = 9.

Number of fixed horizontal coordinates = 2.
Number of fixed vertical coordinates = 2.
Number of observation equations = 12.
Number of vertical observation equations = 6.
Number of unknowns = 9.
Number of inner constraint equations = 0.
The following observations are excluded from the adjustment:
none

The following points were excluded from the adjustment:

nonc

Proceeding with observation equations.
Turning on graphics before going into adjustment iteration.
Beginning adjustment iteration 1.
Forming observation equations.
Performing observation covariance inverses.
Forming constants and normal equations.
Computing normals inverse.
Computing observation residuals.

Solutions from iteration 1:

1 -3.358693e-011
2 -7.739800e-001
3 -2.282086e-007
4 2.073031e-008
5 1.244850e-009
6 -7.739515e-001
7 -3.731810e-008
8 2.175584e-008
9 -7.739800e-001

Recomputing closures for check on residuals

Iteration check on residuals (tolerance = 1.0e-005):

eq # 1 obs # 1 = +0.000000e+000 - +4.340972e-014 = +4.340972e-014
eq # 2 obs # 2 = +0.000000e+000 - +1.129097e-013 = +1.129097e-013
eq # 3 obs # 3 = +1.110223e-016 - +1.110223e-016 = +0.000000e+000
eq # 4 obs # 4 = +3.994438e-003 - +3.994437e-003 = +6.867105e-010
eq # 5 obs # 5 = +1.118585e-003 - +1.118585e-003 = +2.812399e-014
eq # 6 obs # 6 = +1.177618e-003 - +1.177618e-003 = +3.258247e-011
eq # 7 obs # 7 = +3.765306e-003 - +3.765303e-003 = +2.663867e-009
eq # 8 obs # 8 = -1.243105e-003 - -1.243105e-003 = +4.931060e-014
eq # 9 obs # 9 = -1.009421e-003 - -1.009422e-003 = +8.320274e-010
eq # 10 obs # 10 = -4.465060e-003 - -4.465058e-003 = +2.316174e-009
eq # 11 obs # 11 = +1.228035e-003 - +1.228035e-003 = +2.118639e-014
eq # 12 obs # 12 = +1.499446e-004 - +1.499442e-004 = +4.004616e-010

Successful adjustment 1 iterations

Beginning adjustment summary in stats.log.
Beginning coordinate adjustment in coords.log.
Coordinate adjustment summary complete.
Beginning plots of error ellipses.
Ellipse plotting complete.
Proceeding with adjustment of observations.
Observation adjustment complete.

Statistics summary complete.

Plot histograms.

Histogram plotting complete.

Computing covariances in azimuth, distance and height.

Covariance processing complete.

Iterations complete, so turning graphics off.

Graphics turned off.

Closing activity log.

TIME = Wed Jun 4 21:54:57 1997.

CLOSURES LOG
NETWORK = Mineropar1
TIME = Wed Jun 4 21:54:54 1997

OBS#	TYPE	BACKSIGHT	INSTRUMENT	FORESIGHT	CLOSURE	TRANSFORM
1	hgoid		VT 02		0.000000m	0.773980m
2	hgoid		VT 03		0.000000m	0.773980m
3	hgoid	VT 91644 Jaguariaiva			0.000000m	0.773980m
4	gpsaz		VT 03	VT 02	0.003994"	0.000000"
5	gpsht		VT 03	VT 02	0.001119m	0.000000m
6	gpsds		VT 03	VT 02	0.001178m	0.000000m
7	gpsaz	VT 91644 Jaguariaiva		VT 02	0.003765"	0.000000"
8	gpsht	VT 91644 Jaguariaiva		VT 02	-0.001243m	0.000000m
9	gpsds	VT 91644 Jaguariaiva		VT 02	-0.001009m	0.000000m
10	gpsaz	VT 91644 Jaguariaiva		VT 03	-0.004465"	0.000000"
11	gpsht	VT 91644 Jaguariaiva		VT 03	0.001228m	0.000000m
12	gpsds	VT 91644 Jaguariaiva		VT 03	0.000150m	0.000000m

COORDINATE ADJUSTMENT SUMMARY

NETWORK = Mineropar1

TIME = Wed Jun 4 21:54:54 1997

Datum = WGS-84

Coordinate System = Geographic

Zone = Global

Network Adjustment Constraints:

1 fixed coordinates in y

1 fixed coordinates in x

1 fixed coordinates in H

1 fixed coordinates in h

POINT	NAME	OLD COORDS	ADJUST	NEW COORDS	1.96 Δ
1	VT 02				
LAT=	24° 47' 02.109409"	+0.000000"	24° 47' 02.109409"	0.002564m	
LON=	49° 36' 41.966422"	+0.000000"	49° 36' 41.966422"	0.002540m	
ELL HT=	913.9394m	+0.0000m	913.9394m	0.005347m	
ORTHO HT=	911.5763m	-0.7740m	910.8024m	1.837218m	
GEOID HT=	2.3631m	+0.7740m	3.1371m	1.837210m	
2	VT 03				
LAT=	24° 47' 22.350179"	+0.000000"	24° 47' 22.350179"	0.002558m	
LON=	50° 01' 07.048289"	+0.000000"	50° 01' 07.048289"	0.002534m	
ELL HT=	1061.7768m	+0.0000m	1061.7768m	0.005327m	
ORTHO HT=	1059.9269m	-0.7740m	1059.1529m	1.837218m	
GEOID HT=	1.8499m	+0.7740m	2.6239m	1.837210m	
3	VT 91644 Jaguariaiva				
LAT=	24° 14' 30.816407"	+0.000000"	24° 14' 30.816407"	FIXED	
LON=	49° 42' 17.335904"	+0.000000"	49° 42' 17.335904"	FIXED	
ELL HT=	914.3630m	+0.0000m	914.3630m	FIXED	
ORTHO HT=	913.4120m	+0.0000m	913.4120m	FIXED	
GEOID HT=	0.9510m	+0.0000m	0.9510m	FIXED	

SUMMARY OF COVARIANCES
NETWORK = Mineropar1
TIME = Wed Jun 4 21:54:56 1997

Definition of precision ($E \times S\bar{y} = C\bar{y} + P\bar{y}$):

Horizontal:

Precision (P) expressed as: ratio

Propagated linear error (E): U.S.

(standard error of adjusted horizontal distance)

Scalar (S) on propagated linear error: 1.0000

Constant error term (C): 0.0000

3-Dimensional:

Precision (P) expressed as: ratio

Propagated linear error (E): U.S.

(standard error of adjusted slope distance)

Scalar (S) on propagated linear error: 1.0000

Constant error term (C): 0.0000

Using orthometric height errors

FROM/	AZIMUTH/	1.96 \bar{a}	DISTANCE/	1.96 \bar{a}	HOR PREC/	
TO	DELTA H	1.96 \bar{a}	DELTA h	1.96 \bar{a}	3-D PREC	
VT 02	269 θ 02'52"	0.01"	41158.703m	0.0025m	1:32180511	
VT 03	+147.8374m	0.0052m	+148.3506m	1.8372m	1:32180511	
VT 02	351 θ 02'38"	0.01"	60775.636m	0.0026m	1:46491257	
VT 91644 Jaguariaiva	+0.4236m	0.0053m	+2.6096m	1.8372m	1:46491257	
VT 03	27 θ 43'54"	0.01"	68491.428m	0.0026m	1:52519363	
VT 91644 Jaguariaiva	-147.4138m	0.0053m	-145.7409m	1.8372m	1:52519363	

OBSERVATION ADJUSTMENT SUMMARY

NETWORK = Mineropar1

TIME = Wed Jun 4 21:54:55 1997

OBSERVATION ADJUSTMENT (Tau = 1.41)

Geoid Parameter Group 3 Geoid Model

Height constant = -0.7740 1.96a = 1.2991

OBS#	BLK#/	TYPE	BACKSIGHT/	UDVC/	OBSERVED/	1.96a/	TAU
REF#			INSTRUMENT/	UDPG/	ADJUSTED/	1.96a/	
			FORESIGHT	SBNT	RESIDUAL	1.96a	
1	-**-	hgoid	-**- -**-	+2.3631m	1.2991m	OPEN	
	1		VT 02 -**-	+2.3631m	1.2991m		
			-**- 1	+0.000000m	0.0000m		
2	-**-	hgoid	-**- -**-	+1.8499m	1.2991m	OPEN	
	2		VT 03 -**-	+1.8499m	1.2991m		
			-**- 1	+0.000000m	0.0000m		
3	-**-	hgoid	-**- -**-	+0.1770m	1.2991m	OPEN	
	3	VT 91644 Jaguariaiva	-**-	+0.1770m	1.2991m		
			-**- 1	+0.000000m	0.0000m		
4	1	gpsaz	-**- -**-	89°01'30.8945"	0.0154"	0.63	
	1		VT 03 -**-	89°01'30.8984"	0.0127"		
			VT 02 1	+0.003994"	0.0087"		
5	1	gpsht	-**- -**-	-147.8385m	0.0063m	0.44	
	1		VT 03 -**-	-147.8374m	0.0052m		
			VT 02 1	+0.001119m	0.0035m		
6	1	gpsds	-**- -**-	41158.7022m	0.0030m	0.94	
	1		VT 03 -**-	41158.7034m	0.0025m		
			VT 02 1	+0.001178m	0.0017m		
7	2	gpsaz	-**- -**-	171°04'57.3848"	0.0106"	0.84	
	1	VT 91644 Jaguariaiva	-**-	171°04'57.3885"	0.0086"		
			VT 02 1	+0.003765"	0.0062"		
8	2	gpsht	-**- -**-	-0.4223m	0.0066m	0.44	
	1	VT 91644 Jaguariaiva	-**-	-0.4236m	0.0053m		
			VT 02 1	-0.001243m	0.0039m		
9	2	gpsds	-**- -**-	60775.6375m	0.0032m	0.76	
	1	VT 91644 Jaguariaiva	-**-	60775.6365m	0.0026m		
			VT 02 1	-0.001009m	0.0018m		
-----	10	3 gpsaz	-**- -**-	207°03'04.9118"	0.0094"	1.13	
	1	VT 91644 Jaguariaiva	-**-	207°03'04.9073"	0.0076"		
			VT 03 1	-0.004465"	0.0055"		
-----	11	3 gpsht	-**- -**-	+147.4126m	0.0066m	0.44	
	1	VT 91644 Jaguariaiva	-**-	+147.4138m	0.0053m		
			VT 03 1	+0.001228m	0.0038m		
12	3	gpsds	-**- -**-	68491.4282m	0.0031m	0.11	
	1	VT 91644 Jaguariaiva	-**-	68491.4283m	0.0026m		
			VT 03 1	+0.000150m	0.0018m		

ADJUSTMENT STATISTICS SUMMARY
NETWORK = Mineropar1
TIME = Wed Jun 4 21:54:54 1997

ADJUSTMENT SUMMARY

Network Reference Factor = 0.71
Chi-Square Test ($\alpha = 95\%$) = PASS
Degrees of Freedom = 3.00

GPS OBSERVATIONS

Reference Factor = 0.71
 $r = 3.00$

GPS Solution 1 Reference Factor = 0.71 $r = 0.96$
GPS Solution 2 Reference Factor = 0.71 $r = 1.03$
GPS Solution 3 Reference Factor = 0.71 $r = 1.02$

GEOID MODEL

Reference Factor = 1.00
 $r = 0.00$

Geoid Heights: Reference Factor = 1.00 $r = 0.00$
Delta Geoid Heights: Reference Factor = 1.00 $r = 0.00$

WEIGHTING STRATEGIES:

GPS OBSERVATIONS:

No scalar weighting strategy was used

No summation weighting strategy was used

Station Error Strategy:

H.I. error = 0.0030
Tribrach error = 0.0015

GEOID MODEL:

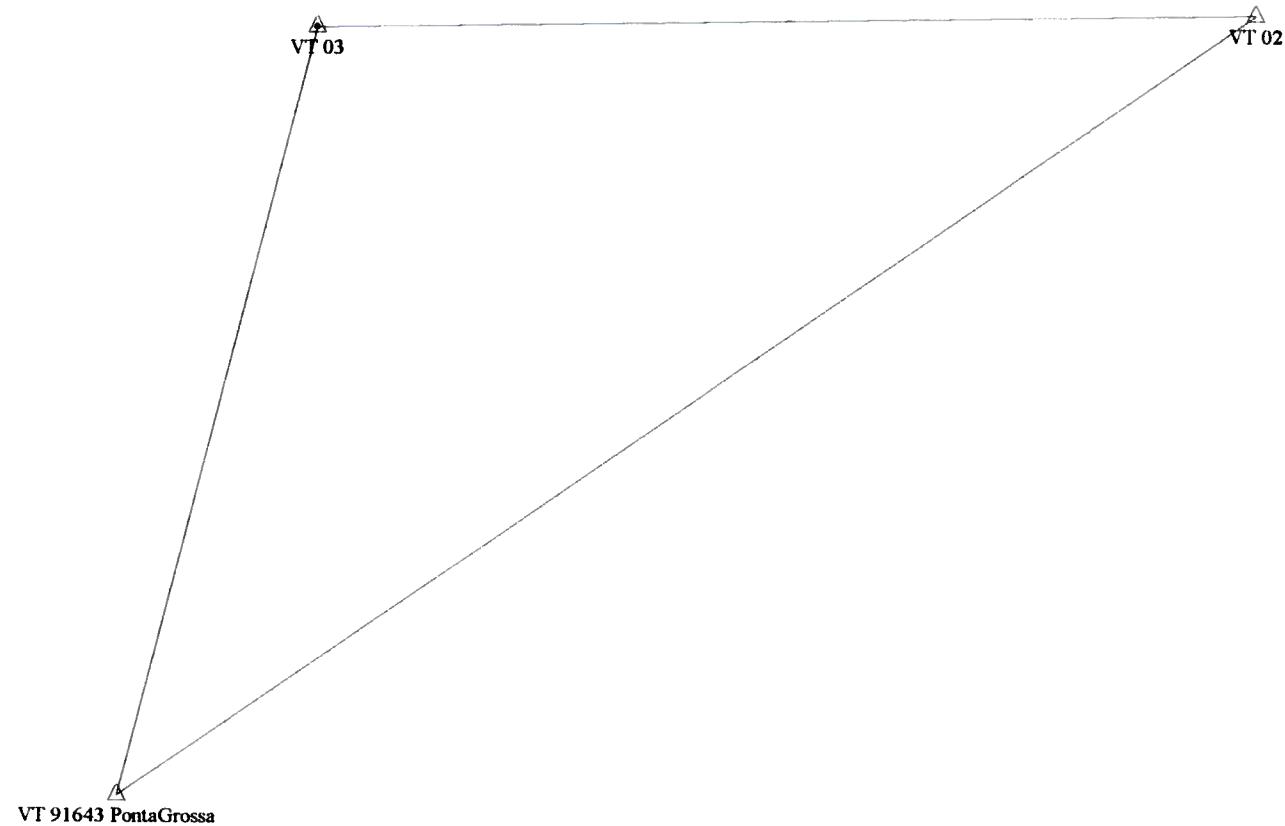
No scalar weighting strategy was used

No summation weighting strategy was used

Results of adjusted Geoid model:

Noise in vertical GPS observations: 0.00004208
Variance of geoid model: 1.68767103
Use of correlated Residual Geoid Model may improve geoid heights

Network Map: Mineropar2



5000m

New Closure

From: VT 02

To:	VT 03	L1 fixed	24/05/97 16:35:00	00000428.SSF
	Slope (m):	41165.258	24°47'22.34762" S	97401441.DAT
	Total (m):	41165.258	050°01' 7.05139" W	64381441.DAT
			1061.8654 m	
To:	VT 91643 PontaGrossa	L1 fixed	24/05/97 16:35:00	00000420.SSF
	Slope (m):	34993.521	25°05'43.40018" S	59641441.DAT
	Total (m):	76158.779	050°06'18.47450" W	97401441.DAT
			911.9530 m	
To:	VT 02	L1 fixed	24/05/97 16:35:00	00000424.SSF
	Slope (m):	60625.801	24°47' 2.10785" S	59641441.DAT
	Total (m):	136784.580	049°36'41.96971" W	64381441.DAT
			914.0435 m	

Closed

Precision (ppm): 0.4210
Errors (m) N: 0.0074 E: 0.0055 U: -0.0568

Projeto Mineropar

Project:	Mineropar2
Supervisor:	TopoGeo
Date Created:	04/06/97 20:59:56
Date Last Accessed:	04/06/97 21:13:29
Project Directory:	c:\gpsurvey\projects\Minerop1
Antenna Type:	4600LS Internal
Antenna Measurement Method:	Reading from hook using 4600LS tape
Receiver Type:	4600LS
Coordinate System:	Geographic
Zone:	WGS84
Linear Unit:	Meter
Timezone:	CURITIBA : -3:00
Number of Stations:	3
Number of Baselines:	3
No. of Continuous Kinematic Solns:	0

Projeto Mineropar

		**** Reference Coordinates ****			
Station Short Name	Station ID	Latitude	Longitude	Height	Station Quality
VT 02		24°47'02.10801" S	049°36'41.96978" W	914.06689	Network Adjustment
VT 03		24°47'22.34757" S	050°01'07.05130" W	1061.84836	Network Adjustment
VT 91643 PontaG		25°05'43.40018" S	050°06'18.47450" W	911.95300	Fixed Control

**** Adjusted Coordinates ****

Projection Group: Geographic

Zone Name: Global

Linear Units: meter

Angular Units: degrees

Datum Name: WGS-84

Station Short Name	Station ID	Latitude	Longitude	Ortho. Height	Ellip. Height
VT 02		24°47'02.10801" S	049°36'41.96978" W	910.81028	914.06689
VT 03		24°47'22.34757" S	050°01'07.05130" W	1059.10498	1061.84836
VT 91643 PontaG		25°05'43.40018" S	050°06'18.47450" W	908.14480	911.95300

Projeto Mineropar

From Station Short Name	To Station Short Name	Solution Type	Slope	Ratio	Reference Variance	Entered Ant. Ht. (From)	Entered Ant. Ht. (To)
VT 03	VT 02	L1 fixed	41165.258	1.6	17.405	1.313	1.550
VT 91643 PontaGr	VT 02	L1 fixed	60625.801	1.5	49.008	0.217	1.550
VT 91643 PontaGr	VT 03	L1 fixed	34993.521	2.2	27.869	0.217	1.313

Projeto Mineropar

**** SSF/SSK Solution Output Files For Selected Baselines ****

.ssf/.ssk Solution Output File	From Station Short Name	To Station Short Name	Solution Type	Slope	Ratio	Reference Variance
00000428.ssf	VT 03	VT 02	L1 fixed	41165.258	1.6	17.405
00000424.ssf	VT 91643 PontaGr	VT 02	L1 fixed	60625.801	1.5	49.008
00000420.ssf	VT 91643 PontaGr	VT 03	L1 fixed	34993.521	2.2	27.869

***** End of Report *****

Projeto Mineropar
 Project Name: Mineropar2
 Processed: Monday, 26 de May de 1997 3:05
 Solution Output File (SSF): 00000428.SSF IMPORTED

From Station: VT 03
 Data file: 97401441.DAT
 Antenna Height (meters): 1.374 True Vertical 1.313 Uncorrected
 Position Quality: Fixed Baseline Solution

WGS 84 Position: 24° 47' 22.347621" S X 3723377.101
 50° 01' 07.051391" W Y -4440278.613
 1061.865 Z -2658373.050

To Station: VT 02
 Data file: 64381441.DAT
 Antenna Height (meters): 1.612 True Vertical 1.550 Uncorrected

WGS 84 Position: 24° 47' 02.108096" S X 3754904.110
 49° 36' 41.969908" W Y -4413816.707
 914.100 Z -2657745.627

Start Time: 24/05/97 16:35:00,00 GPS (906 578100.00)
 Stop Time: 24/05/97 18:30:45,00 GPS (906 585045.00)
 Occupation Time Meas. Interval (seconds): 01:55:45,00 15.00

Solution Type: L1 fixed double difference

Ephemeris: Broadcast
 Baseline Slope Distance Std. Dev. (meters): 41165.258 0.001364

Normal Section Azimuth: Forward Backward
 Vertical Angle: 89° 13' 06.086911" 269° 02' 51.860947"
 -0° 23' 25.529125" 0° 01' 15.265377"

Baseline Components (meters): dx 31527.009 dy 26461.906 dz 627.423
 Standard Deviations (meters): 0.002409 0.003700 0.001440

dn 561.556 de 41160.472 du -280.506
 0.001307 0.001360 0.004243

dh -147.765
 0.004240

Aposteriori Covariance Matrix:
 5.800930E-006 -7.319425E-006 1.369023E-005
 -2.435545E-006 3.277308E-006 2.074507E-006

Variance Ratio: 1.6
 Reference Variance: 17.405

Observable Count/Rejected RMS: L1 phase 1666/0 0.029

Projeto Mineropar**Processor Controls:****[General]**

Process start time:	24/05/97 16:31:30 GPS	(906 577890)
Process stop time:	24/05/97 18:35:00 GPS	(906 585300)
Elevation mask:	20 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:		
Application threshold:	0 kilometers	0 kilometers

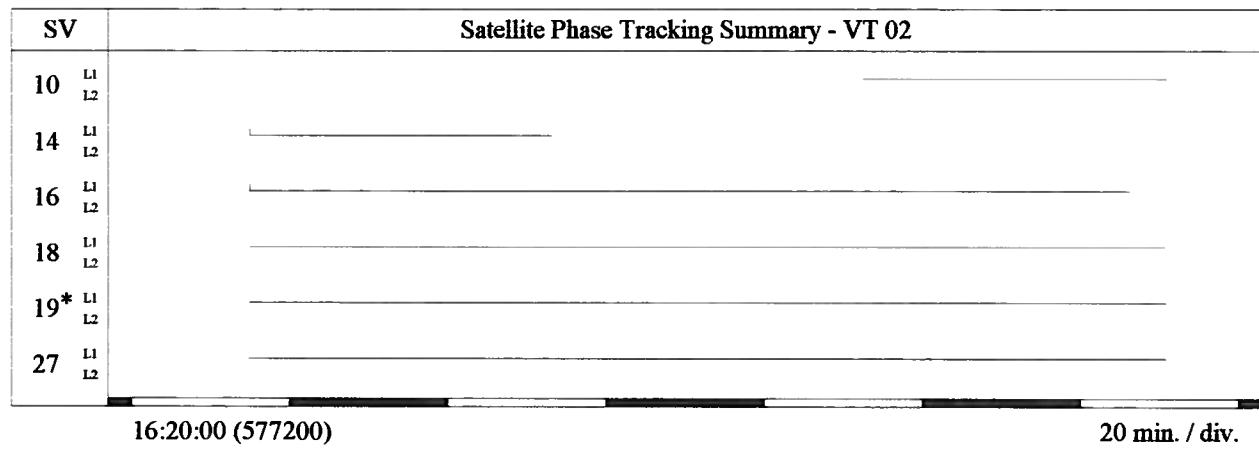
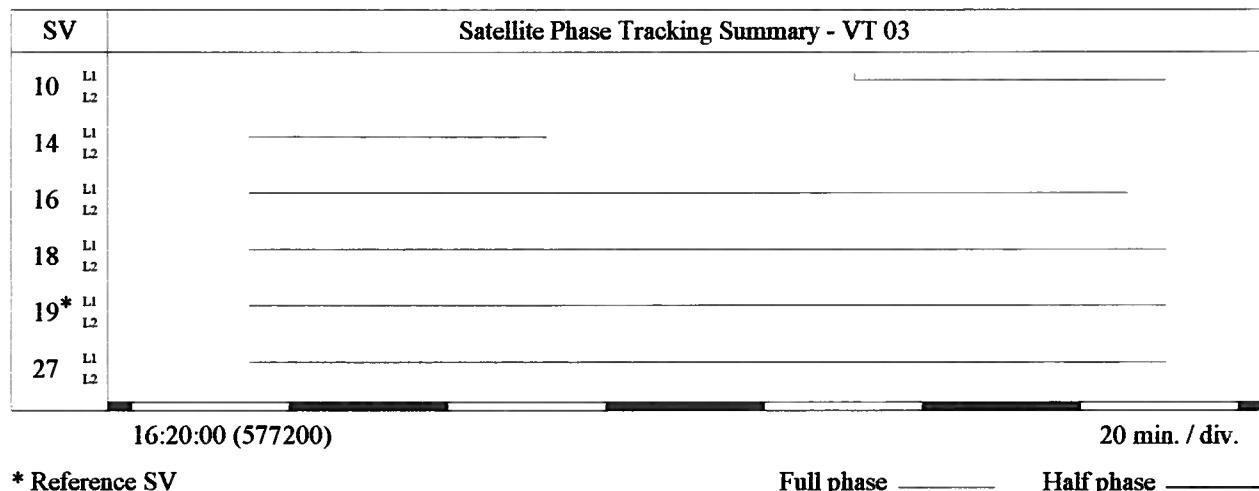
[Final Solution]

Final solution type:	L1 Fixed
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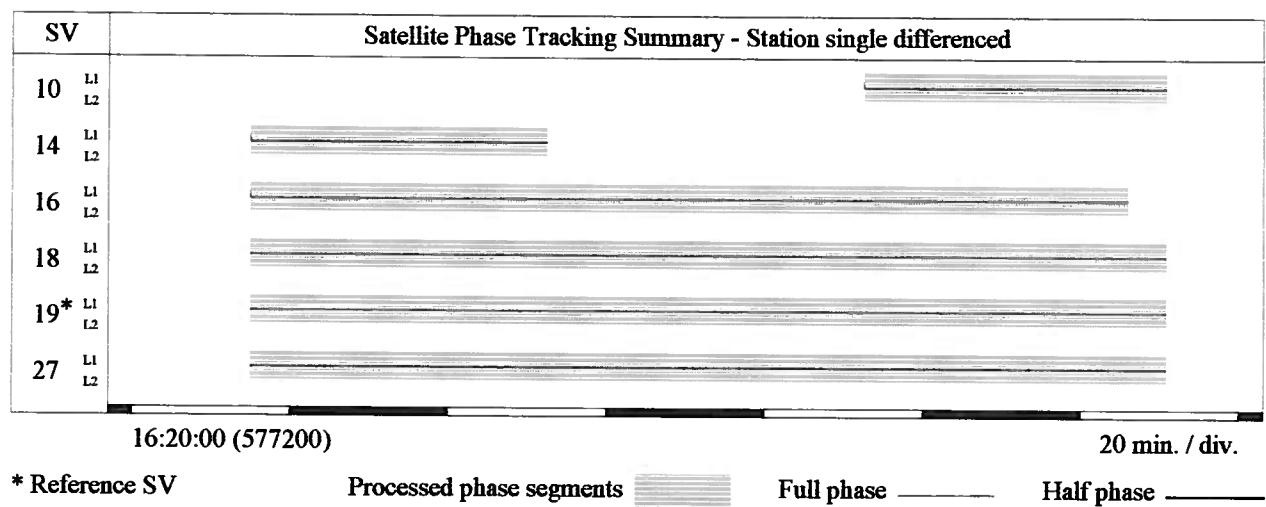
[Satellites]

Disabled:	02 04
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Projeto Mineropar



Projeto Mineropar



Projeto Mineropar
Project Name: Mineropar2
Processed: Monday, 26 de May de 1997 3:05
Solution Output File (SSF): 00000424.SSF **IMPORTED**

From Station: VT 91643 PontaGrossa
Data file: 59641441.DAT
Antenna Height (meters): 0.217 True Vertical
Position Quality: Fixed Control

WGS 84 Position: 25° 05' 43.400176" S X 3707416.689
 50° 06' 18.474503" W Y -4434827.735
 911.953 Z -2689034.095

To Station: VT 02
Data file: 64381441.DAT
Antenna Height (meters): 1.612 True Vertical **1.550 Uncorrected**

WGS 84 Position: 24° 47' 02.107854" S X 3754904.083
 49° 36' 41.969714" W Y -4413816.666
 914.044 Z -2657745.596

Start Time: 24/05/97 16:35:15,00 GPS (906 578115.00)
Stop Time: 24/05/97 18:31:00,00 GPS (906 585060.00)
Occupation Time Meas. Interval (seconds): 01:55:45,00 15.00

Solution Type: L1 fixed double difference

Ephemeris: Broadcast
Baseline Slope Distance Std. Dev. (meters): 60625.801 0.001610

	Forward	Backward
Normal Section Azimuth:	55° 24' 40.482516"	235° 12' 11.388944"
Vertical Angle:	-0° 16' 14.218541"	-0° 16' 28.456917"

Baseline Components (meters): dx 47487.395 dy 21011.068 dz 31288.498
Standard Deviations (meters): 0.002919 0.003675 0.001981

dn 34415.803 **de** 49909.501 **du** -286.343
 0.001523 0.001710 0.004551

dh 2.091
 0.004551

Aposteriori Covariance Matrix:
 8.519923E-006 -7.768983E-006 1.350709E-005
 -3.355229E-006 4.553312E-006 3.925056E-006

Variance Ratio: 1.5
Reference Variance: 49.008

Observable Count/Rejected RMS: L1 phase 2112/0 0.050

Projeto Mineropar

Processor Controls:

[General]

Process start time:	24/05/97 16:35:00 GPS	(906 578100)
Process stop time:	24/05/97 18:35:00 GPS	(906 585300)
Elevation mask:	15 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Ilopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:		
Application threshold:	0 kilometers	0 kilometers

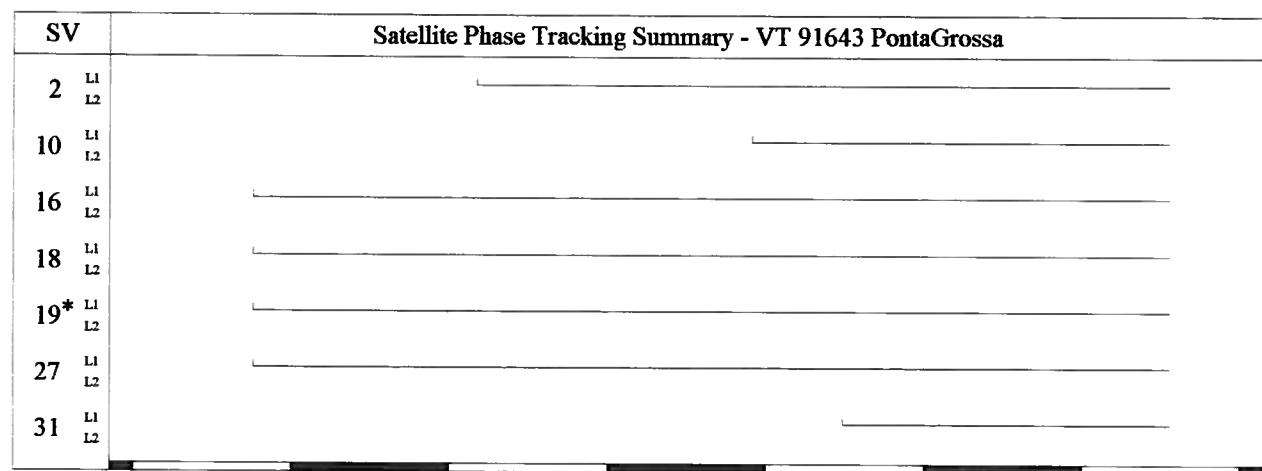
[Final Solution]

Final solution type:	L1 Fixed
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[Satellites]

Disabled:	04 14
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Projeto Mineropar



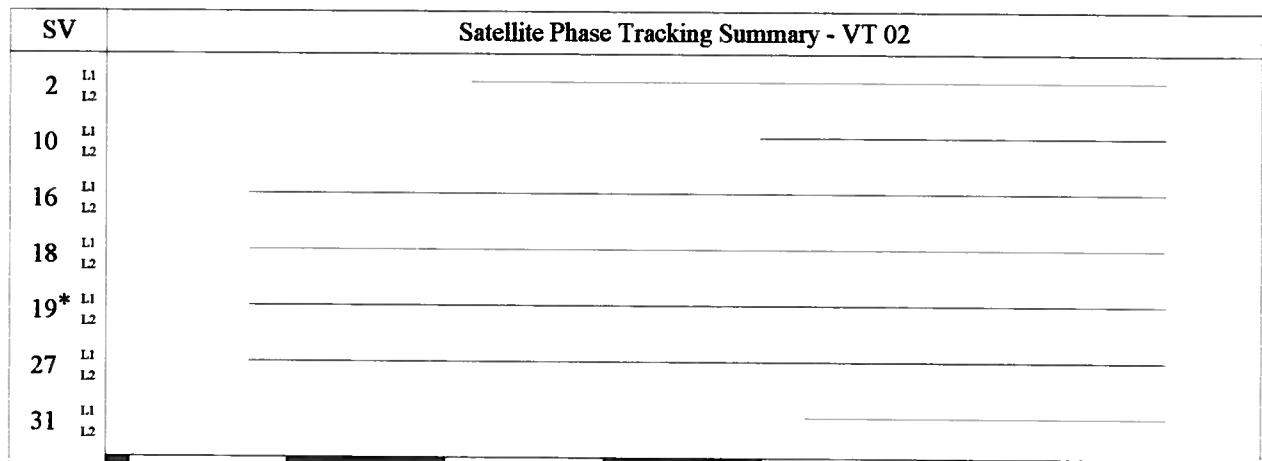
16:20:00 (577200)

20 min. / div.

* Reference SV

Full phase _____

Half phase _____



16:20:00 (577200)

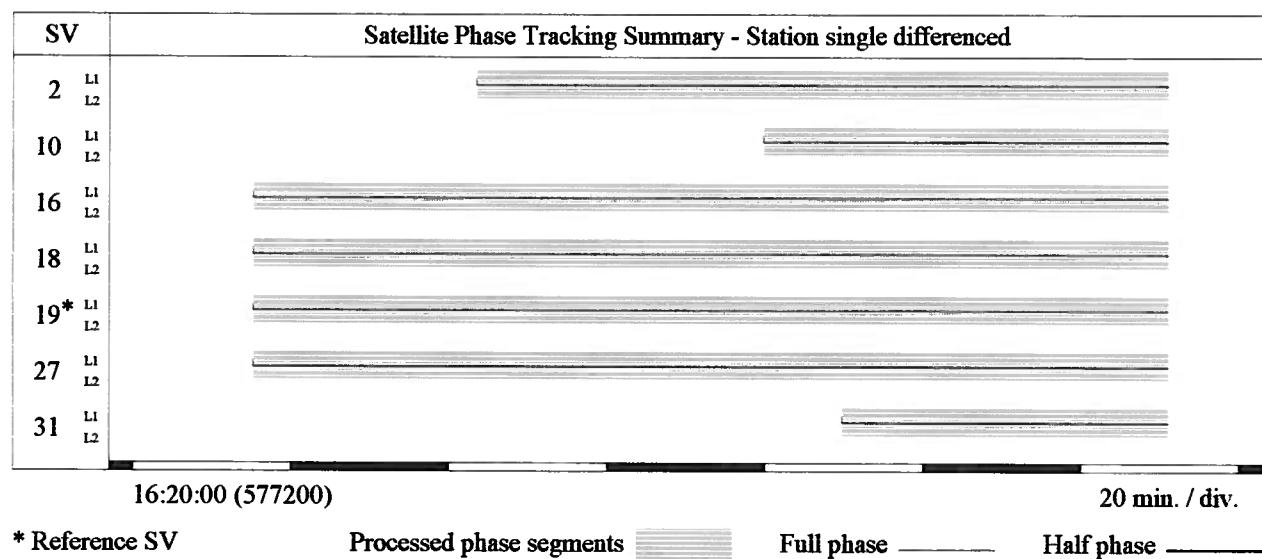
20 min. / div.

* Reference SV

Full phase _____

Half phase _____

Projeto Mineropar



Projeto Mineropar
Project Name: Mineropar2
Processed: Monday, 26 de May de 1997 3:05
WAVE 2.10
Solution Output File (SSF): 00000420.SSF **IMPORTED**

From Station: VT 91643 PontaGrossa
Data file: 59641441.DAT
Antenna Height (meters): 0.217 True Vertical
Position Quality: Fixed Control

WGS 84 Position: 25° 05' 43.400176" S X 3707416.689
 50° 06' 18.474503" W Y -4434827.735
 911.953 Z -2689034.095

To Station: VT 03
Data file: 97401441.DAT
Antenna Height (meters): 1.374 True Vertical 1.313 Uncorrected

WGS 84 Position: 24° 47' 22.347621" S X 3723377.101
 50° 01' 07.051391" W Y -4440278.613
 1061.865 Z -2658373.050

Start Time: 24/05/97 16:35:15,00 GPS (906 578115.00)
Stop Time: 24/05/97 18:30:30,00 GPS (906 585030.00)
Occupation Time Meas. Interval (seconds): 01:55:15,00 15.00

Solution Type: L1 fixed double difference

Ephemeris: Broadcast
Baseline Slope Distance Std. Dev. (meters): 34993.521 0.001205

	Forward	Backward
Normal Section Azimuth:	14° 28' 43.486994"	194° 26' 32.163391"
Vertical Angle:	0° 05' 15.300739"	-0° 24' 11.984955"

Baseline Components (meters): dx 15960.413 dy -5450.879 dz 30661.045
Standard Deviations (meters): 0.002375 0.003773 0.001505

dn 33882.103 **de** 8749.100 **du** 53.492
 0.001322 0.001476 0.004268

dh 149.912
 0.004271

Aposteriori Covariance Matrix:
 5.640488E-006 1.423456E-005 2.266369E-006
 -7.109349E-006 3.697024E-006
 -2.261322E-006

Variance Ratio: 2.2
Reference Variance: 27.869

Observable Count/Rejected RMS: L1 phase 2093/0 0.035

Projeto Mineropar**Processor Controls:****[General]**

Process start time:	24/05/97 16:31:30 GPS	(906 577890)
Process stop time:	24/05/97 18:31:00 GPS	(906 585060)
Elevation mask:	20 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:		
Application threshold:	0 kilometers	0 kilometers

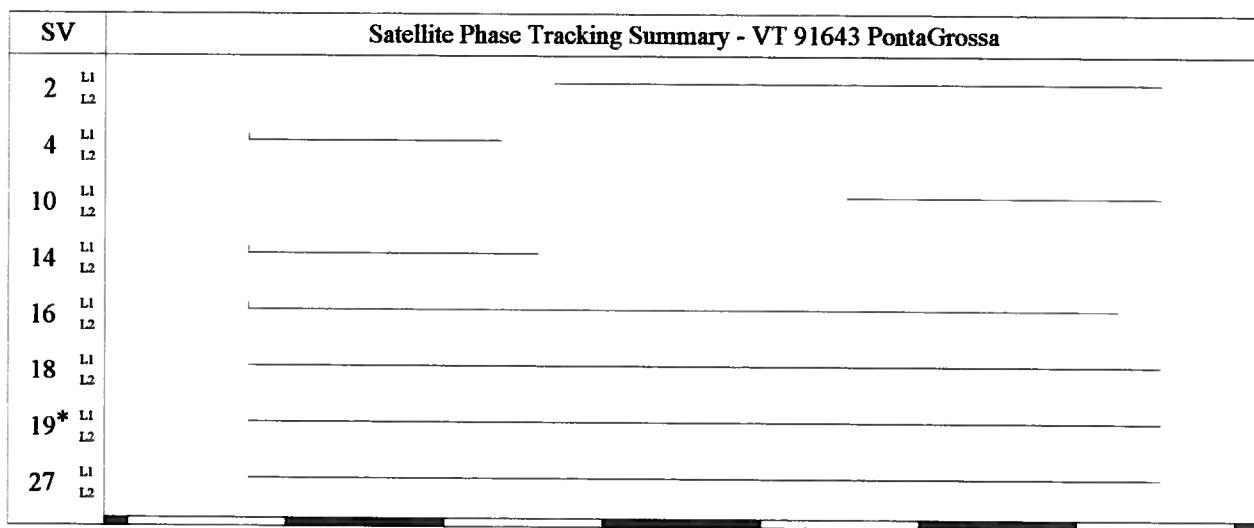
[Final Solution]

Final solution type:	L1 Fixed
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[Satellites]

Disabled:

Projeto Mineropar



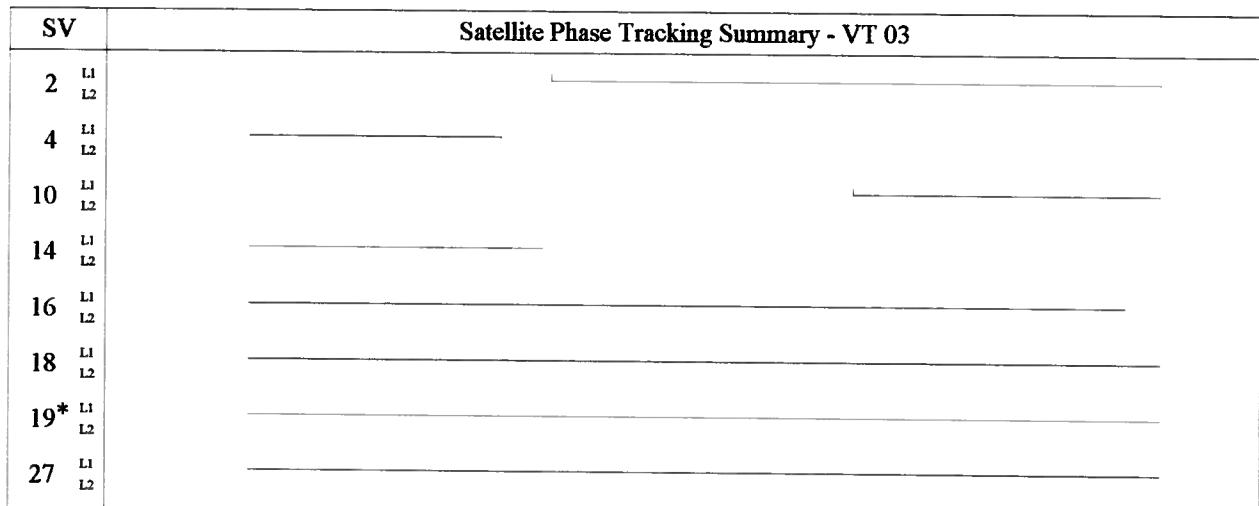
16:20:00 (577200)

20 min. / div.

* Reference SV

Full phase _____

Half phase _____



16:20:00 (577200)

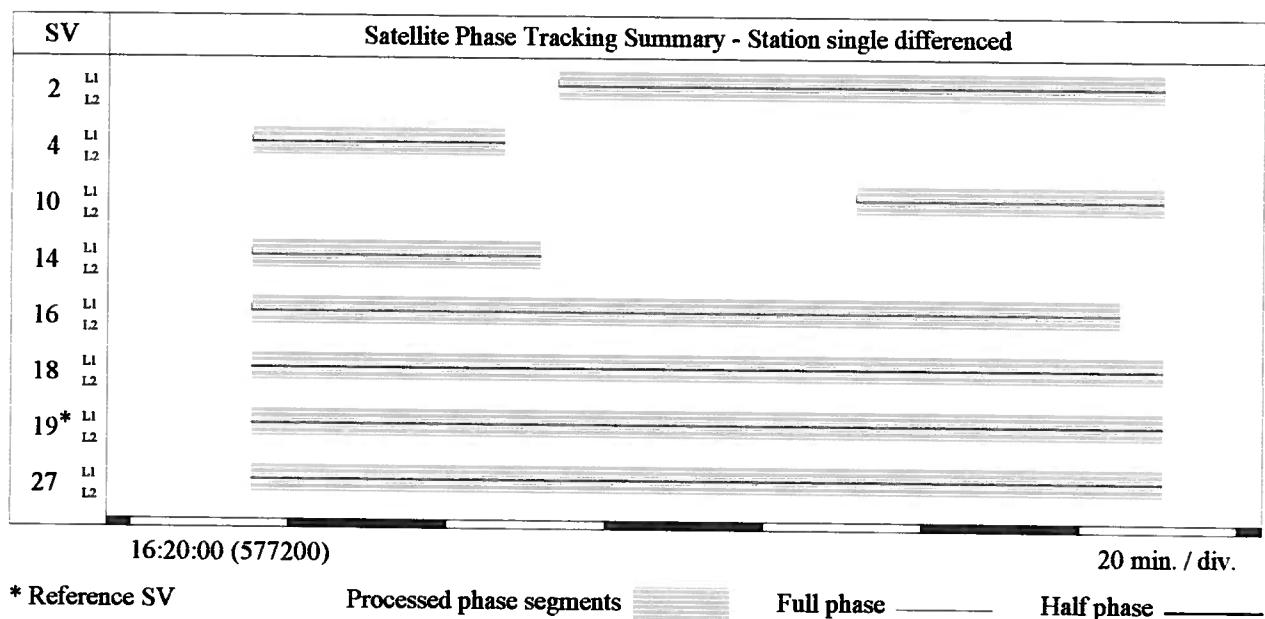
20 min. / div.

* Reference SV

Full phase _____

Half phase _____

Projeto Mineropar



***** End of Report *****

ADJUSTMENT ACTIVITY LOG
NETWORK = Mineropar2
TIME = Wed Jun 4 22:11:45 1997

Adjustment process underway.
Computing closures.
Closures have been computed.
Indexing observation equations and unknowns.
Number of sub-networks = 1.
Number of inner constraints sub-network 1 = 0.

Sub-network 1: Fixed y = 1 Fixed x = 1 Fixed H = 1 Fixed h = 1.

Points included in sub-network 1:

VT 02
VT 03
VT 91643 PontaGrossa

Initializing parameter group 1: GPS Observations.

6 horizontal observations
3 vertical observations
3 observed azimuths
3 observed distances
Located in sub-network 1.
1 fixed latitudes
1 fixed longitudes
1 fixed ellipsoid heights
1 fixed orthometric heights
Y rotation parameter ruled ineligible
X rotation parameter ruled ineligible
Azimuth rotation parameter ruled ineligible
Network scale parameter ruled ineligible
Omitting parameter 5 by user choice
Omitting parameter 6 by user choice
Omitting parameter 7 by user choice

Initializing parameter group 3: Geoid Model.

0 horizontal observations
3 vertical observations
0 observed azimuths
0 observed distances
Located in sub-network 0.
0 fixed latitudes
0 fixed longitudes
1 fixed ellipsoid heights
1 fixed orthometric heights
Y rotation parameter ruled ineligible
X rotation parameter ruled ineligible
Omitting parameter 3 by user choice
Omitting parameter 4 by user choice
Omitting parameter 5 by user choice
Omitting parameter 6 by user choice
Height constant parameter 7 = 9.

Number of fixed horizontal coordinates = 2.
Number of fixed vertical coordinates = 2.
Number of observation equations = 12.
Number of vertical observation equations = 6.
Number of unknowns = 9.

Number of inner constraint equations = 0.

The following observations are excluded from the adjustment:

 nons

The following points were excluded from the adjustment:

 none

Proceeding with observation equations.

Turning on graphics before going into adjustment iteration.

Beginning adjustment iteration 1.

Forming observation equations.

Performing observation covariance inverses.

Forming constants and normal equations.

Computing normals inverse.

Computing observation residuals.

Solutions from iteration 1:

1 5.340875e-004

2 -8.929659e-001

3 8.988913e-006

4 2.787323e-006

5 2.271898e-004

6 -8.932728e-001

7 3.904349e-006

8 -1.450670e-006

9 -8.935000e-001

Recomputing closures for check on residuals

Iteration check on residuals (tolerance = 1.0e-005):

eq # 1 obs # 1 = -1.110223e-016 - -2.287059e-014 = +2.275957e-014

eq # 2 obs # 2 = -1.110223e-016 - +5.684342e-014 = +5.695444e-014

eq # 3 obs # 3 = +2.220446e-016 - +2.220446e-016 = +0.000000e+000

eq # 4 obs # 4 = +1.219424e-002 - +1.219425e-002 = +1.828496e-009

eq # 5 obs # 5 = -1.708219e-002 - -1.708219e-002 = +3.616552e-014

eq # 6 obs # 6 = +2.043765e-003 - +2.043765e-003 = +1.489411e-011

eq # 7 obs # 7 = +9.906594e-003 - +9.906604e-003 = +9.918088e-009

eq # 8 obs # 8 = +2.338662e-002 - +2.338662e-002 = +2.678413e-014

eq # 9 obs # 9 = -4.253760e-003 - -4.253759e-003 = +4.330555e-010

eq # 10 obs # 10 = -5.608414e-003 - -5.608395e-003 = +1.952581e-008

eq # 11 obs # 11 = -1.637143e-002 - -1.637143e-002 = +6.294965e-014

eq # 12 obs # 12 = +1.144126e-003 - +1.144127e-003 = +1.060839e-009

Successful adjustment 1 iterations

Beginning adjustment summary in stats.log.

Beginning coordinate adjustment in coords.log.

Coordinate adjustment summary complete.

Beginning plots of error ellipses.

Ellipse plotting complete.

Proceeding with adjustment of observations.

Observation adjustment complete.

Statistics summary complete.

Plot histograms.

Histogram plotting complete.

Computing covariances in azimuth, distance and height.

Covariance processing complete.

Iterations complete, so turning graphics off.

Graphics turned off.

Closing activity log.

TIME = Wed Jun 4 22:11:49 1997.

CLOSURES LOG
NETWORK = Mineropar2
TIME = Wed Jun 4 22:11:45 1997

OBS#	TYPE	BACKSIGHT	INSTRUMENT	FORESIGHT	CLOSURE	TRANSFORM
1	hgoid	VT 02		0.000000m	0.893500m	
2	hgoid	VT 03		0.000000m	0.893500m	
3	hgoid	VT 91643 PontaGrossa		0.000000m	0.893500m	
4	gpsaz	VT 91643 PontaGrossa		VT 03	0.012194" 0.000000"	
5	gpsht	VT 91643 PontaGrossa		VT 03	-0.017082m 0.000000m	
6	gpsds	VT 91643 PontaGrossa		VT 03	0.002044m 0.000000m	
7	gpsaz	VT 91643 PontaGrossa		VT 02	0.009907" 0.000000"	
8	gpsht	VT 91643 PontaGrossa		VT 02	0.023387m 0.000000m	
9	gpsds	VT 91643 PontaGrossa		VT 02	-0.004254m 0.000000m	
10	gpsaz	VT 03		VT 02	-0.005608" 0.000000"	
11	gpsht	VT 03		VT 02	-0.016371m 0.000000m	
12	gpsds	VT 03		VT 02	0.001144m 0.000000m	

COORDINATE ADJUSTMENT SUMMARY

NETWORK = Mineropar2

TIME = Wed Jun 4 22:11:46 1997

Datum = WGS-84

Coordinate System = Geographic

Zone = Global

Network Adjustment Constraints:

1 fixed coordinates in y

1 fixed coordinates in x

1 fixed coordinates in H

1 fixed coordinates in h

POINT	NAME	OLD COORDS	ADJUST	NEW COORDS	1.00 Δ
1	VT 02				
	LAT=	24° 47' 02.108002"	-0.000009"	24° 47' 02.108011"	0.007102m
	LON=	49° 36' 41.969776"	-0.000003"	49° 36' 41.969779"	0.007811m
	ELL HT=	914.0664m	+0.0005m	914.0669m	0.021625m
	ORTHO HT=	911.7032m	-0.8930m	910.8103m	0.649691m
	GEOID HT=	2.3631m	+0.8935m	3.2566m	0.649331m
2	VT 03				
	LAT=	24° 47' 22.347570"	-0.000004"	24° 47' 22.347574"	0.006802m
	LON=	50° 01' 07.051303"	+0.000001"	50° 01' 07.051301"	0.007475m
	ELL HT=	1061.8481m	+0.0002m	1061.8484m	0.021166m
	ORTHO HT=	1059.9983m	-0.8933m	1059.1050m	0.649676m
	GEOID HT=	1.8499m	+0.8935m	2.7434m	0.649331m
3	VT 91643 PontaGrossa				
	LAT=	25° 05' 43.400176"	+0.000000"	25° 05' 43.400176"	FIXED
	LON=	50° 06' 18.474503"	+0.000000"	50° 06' 18.474503"	FIXED
	ELL HT=	911.9530m	+0.0000m	911.9530m	FIXED
	ORTHO HT=	908.1448m	+0.0000m	908.1448m	FIXED
	GEOID HT=	3.8082m	+0.0000m	3.8082m	FIXED

SUMMARY OF COVARIANCES
NETWORK = Mineropar2
TIME = Wed Jun 4 22:11:48 1997

Definition of precision ($E \times S\hat{y} = C\hat{y} + P\hat{y}$):

Horizontal:

Precision (P) expressed as: ratio

Propagated linear error (E): U.S.

(standard error of adjusted horizontal distance)

Scalar (S) on propagated linear error: 1.0000

Constant error term (C): 0.0000

3-Dimensional:

Precision (P) expressed as: ratio

Propagated linear error (E): U.S.

(standard error of adjusted slope distance)

Scalar (S) on propagated linear error: 1.0000

Constant error term (C): 0.0000

Using orthometric height errors

FROM/	AZIMUTH/	1.00 \hat{a}	DISTANCE/	1.00 \hat{a}	HOR PREC/
TO	DELTA H	1.00 \hat{a}	DELTA h	1.00 \hat{a}	3-D PREC
VT 02	269°02'52"	0.03"	41158.693m	0.0071m	1: 5821075
VT 03	+147.7815m	0.0212m	+148.2947m	0.6497m	1: 5821075
VT 02	235°12'11"	0.03"	60617.338m	0.0069m	1: 8789234
VT 91643 PontaGrossa	-2.1139m	0.0216m	-2.6655m	0.6497m	1: 8789234
VT 03	194°26'32"	0.05"	34987.808m	0.0063m	1: 5549837
VT 91643 PontaGrossa	-149.8954m	0.0212m	-150.9602m	0.6497m	1: 5549837

OBSERVATION ADJUSTMENT SUMMARY

NETWORK = Mineropar2

TIME = Wed Jun 4 22:11:47 1997

OBSERVATION ADJUSTMENT (Tau = 1.72)

Geoid Parameter Group 3 Geoid Model
 Height constant = -0.8935 1.00å = 0.4591

OBS#	BLK#/	TYPE	BACKSIGHT/	UDVC/	OBSERVED/	1.00å/	TAU
REF#		INSTRUMENT/	UDPG/	ADJUSTED/	1.00å/		
		FORESIGHT	SBNT	RESIDUAL	1.00å		
1	-**- hgoid	-**- -**-	+2.3631m	0.4591m	OPEN		
1		VT 02 -**-	+2.3631m	0.4591m			
		-**- 1	+0.000000m	0.0000m			
2	-**- hgoid	-**- -**-	+1.8499m	0.4591m	OPEN		
2		VT 03 -**-	+1.8499m	0.4591m			
		-**- 1	+0.000000m	0.0000m			
3	-**- hgoid	-**- -**-	+2.9147m	0.4591m	OPEN		
3	VT 91643 PontaGrossa	-**-	+2.9147m	0.4591m			
		-**- 1	+0.000000m	0.0000m			
4	1 gpsaz	-**- -**-	14°28'43.5330"	0.0569"	0.22		
1	VT 91643 PontaGrossa	-**-	14°28'43.5452"	0.0466"			
		VT 03 1	+0.012194"	0.0326"			
5	1 gpsht	-**- -**-	+149.9124m	0.0258m	0.67		
1	VT 91643 PontaGrossa	-**-	+149.8954m	0.0212m			
		VT 03 1	-0.017082m	0.0148m			
6	1 gpsds	-**- -**-	34987.8055m	0.0075m	0.29		
1	VT 91643 PontaGrossa	-**-	34987.8075m	0.0063m			
		VT 03 1	+0.002044m	0.0041m			
7	2 gpsaz	-**- -**-	55°24'40.5591"	0.0338"	0.29		
1	VT 91643 PontaGrossa	-**-	55°24'40.5690"	0.0272"			
		VT 02 1	+0.009907"	0.0201"			
8	2 gpsht	-**- -**-	+2.0905m	0.0275m	0.80		
1	VT 91643 PontaGrossa	-**-	+2.1139m	0.0216m			
		VT 02 1	+0.023387m	0.0169m			
9	2 gpsds	-**- -**-	60617.3422m	0.0099m	0.35		
1	VT 91643 PontaGrossa	-**-	60617.3379m	0.0069m			
		VT 02 1	-0.004254m	0.0070m			
10	3 gpsaz	-**- -**-	89°13'06.0894"	0.0408"	0.14		
1		VT 03 -**-	89°13'06.0838"	0.0339"			
		VT 02 1	-0.005608"	0.0228"			
11	3 gpsht	-**- -**-	-147.7651m	0.0257m	0.65		
1		VT 03 -**-	-147.7815m	0.0212m			
		VT 02 1	-0.016371m	0.0145m			
12	3 gpsds	-**- -**-	41158.6921m	0.0084m	0.15		
1		VT 03 -**-	41158.6933m	0.0071m			
		VT 02 1	+0.001144m	0.0045m			

ADJUSTMENT STATISTICS SUMMARY
NETWORK = Mineropar2
TIME = Wed Jun 4 22:11:46 1997

ADJUSTMENT SUMMARY

Network Reference Factor = 1.06
Chi-Square Test ($\alpha = 95\%$) = PASS
Degrees of Freedom = 3.00

GPS OBSERVATIONS

Reference Factor = 1.06
 $r = 3.00$

GPS Solution 1 Reference Factor = 1.03 $r = 0.88$
GPS Solution 2 Reference Factor = 1.09 $r = 1.30$
GPS Solution 3 Reference Factor = 1.02 $r = 0.82$

GEOID MODEL

Reference Factor = 1.00
 $r = 0.00$

Geoid Heights: Reference Factor = 1.00 $r = 0.00$
Delta Geoid Heights: Reference Factor = 1.00 $r = 0.00$

WEIGHTING STRATEGIES:

GPS OBSERVATIONS:

Scalar Weighting Strategy:

Alternative Scalar Set Applied Globally = 5.64

No summation weighting strategy was used

Station Error Strategy:

H.I. error = 0.0030

Tribrach error = 0.0015

GEOID MODEL:

No scalar weighting strategy was used

No summation weighting strategy was used

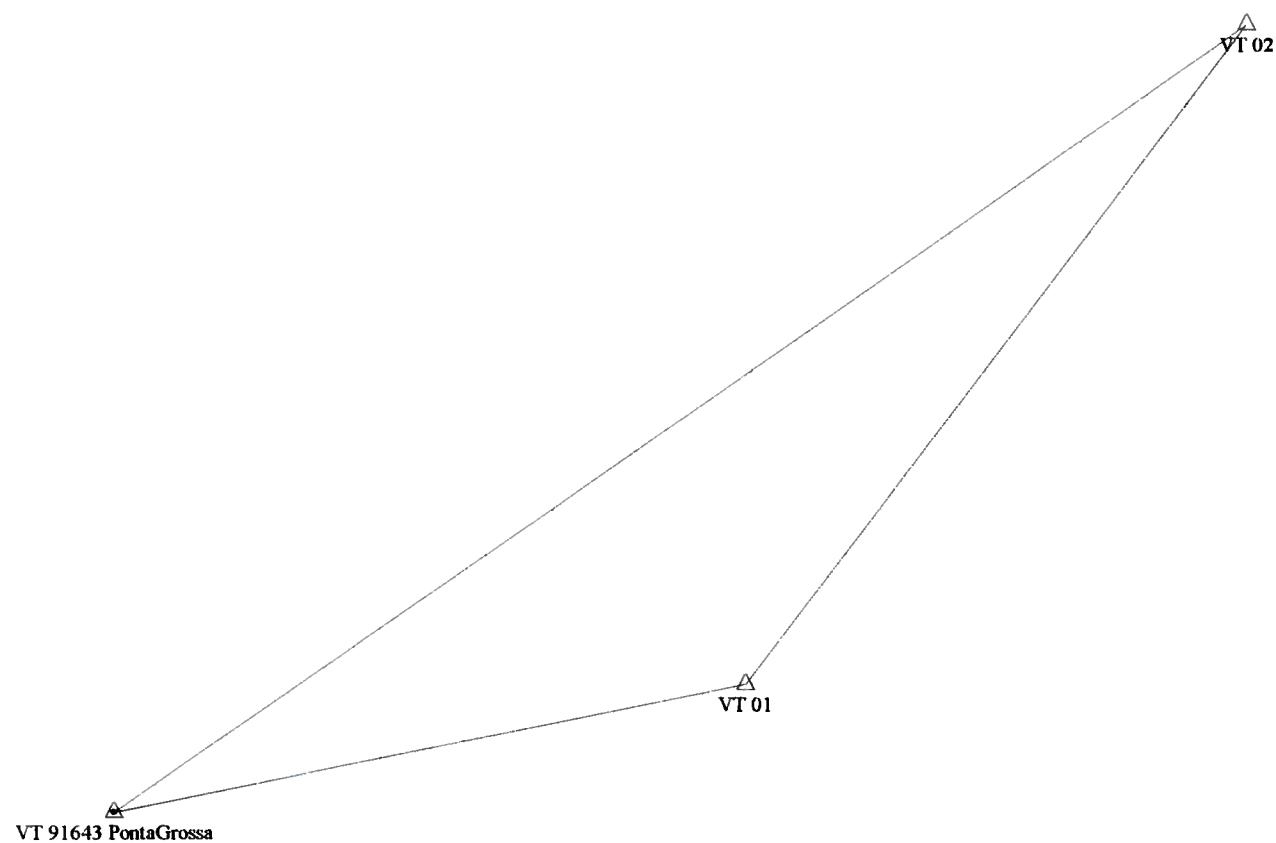
Results of adjusted Geoid model:

Noise in vertical GPS observations: 0.00069304

Variance of geoid model: 0.21081518

Use of correlated Residual Geoid Model may improve geoid heights

Network Map: Mineropar3



5000m

New Closure

From: VT 02

To:	VT 91643 PontaGrossa	L1 fixed	24/05/97 22:03:45	00000432.SSF
	Slope (m):	60625.842	25°05'43.40018" S	59641442.DAT
	Total (m):	60625.842	050°06'18.47450" W	64381442.DAT
			911.9530 m	
To:	VT 01	L1 fixed	24/05/97 22:03:30	00000440.SSF
	Slope (m):	28285.902	25°02'41.81331" S	59641442.DAT
	Total (m):	88911.744	049°49'49.23585" W	97401442.DAT
			706.9141 m	
To:	VT 02	L1 fixed	24/05/97 22:03:45	00000436.SSF
	Slope (m):	36393.253	24°47' 2.10891" S	97401442.DAT
	Total (m):	125304.997	049°36'41.96714" W	64381442.DAT
			913.9905 m	

Closed

Precision (ppm): 0.0186

Errors (m) N: -0.0000 E: -0.0003 U: -0.0023

Projeto Mineropar

Project:	Mineropar3
Supervisor:	TopoGeo
Date Created:	04/06/97 21:15:47
Date Last Accessed:	04/06/97 21:27:17
Project Directory:	c:\gpsurvey\projects\Minerop2
Antenna Type:	4600LS Internal
Antenna Measurement Method:	Reading from hook using 4600LS tape
Receiver Type:	4600LS
Coordinate System:	Geographic
Zone:	WGS84
Linear Unit:	Meter
Timezone:	CURITIBA : -3:00
Number of Stations:	3
Number of Baselines:	3
No. of Continuous Kinematic Solns:	0

Projeto Mineropar

**** Reference Coordinates ****

Station Short Name	Station ID	Latitude	Longitude	Height	Station Quality
VT 01		25°02'41.81331" S	049°49'49.23585" W	706.91467	Network Adjustment
VT 02		24°47'02.10892" S	049°36'41.96715" W	913.99171	Network Adjustment
VT 91643 PontaG		25°05'43.40018" S	050°06'18.47450" W	911.95300	Fixed Control

**** Adjusted Coordinates ****

Projection Group: Geographic

Zone Name: Global

Linear Units: meter

Angular Units: degrees

Datum Name: WGS-84

Station Short Name	Station ID	Latitude	Longitude	Ortho. Height	Ellip. Height
VT 01		25°02'41.81331" S	049°49'49.23585" W	702.90181	706.91467
VT 02		24°47'02.10892" S	049°36'41.96715" W	910.73511	913.99171
VT 91643 PontaG		25°05'43.40018" S	050°06'18.47450" W	908.14480	911.95300

Projeto Mineropar

From Station Short Name	To Station Short Name	Solution Type	Slope	Ratio	Reference Variance	Entered Ant. Ht. (From)	Entered Ant. Ht. (To)
VT 01	VT 02	L1 fixed	36393.253	4.0	4.584	1.313	1.550
VT 91643 PontaGr	VT 01	L1 fixed	28285.902	6.9	2.645	0.217	1.313
VT 91643 PontaGr	VT 02	L1 fixed	60625.842	2.3	9.546	0.217	1.550

Projeto Mineropar

**** SSF/SSK Solution Output Files For Selected Baselines ****

.ssf/.ssk Solution Output File	From Station Short Name	To Station Short Name	Solution Type	Slope	Ratio	Reference Variance
00000436.ssf	VT 01	VT 02	L1 fixed	36393.253	4.0	4.584
00000440.ssf	VT 91643 PontaGr	VT 01	L1 fixed	28285.902	6.9	2.645
00000432.ssf	VT 91643 PontaGr	VT 02	L1 fixed	60625.842	2.3	9.546

Projeto Mineropar

Project Name:

Processed:

Solution Output File (SSF):

Mineropar3

Monday, 26 de May de 1997 4:00

WAVE 2.10

00000436.SSF

IMPORTED

From Station:

VT 01

Data file:

97401442.DAT

Antenna Height (meters):

1.374 True Vertical

Position Quality:

1.313 Uncorrected

Fixed Baseline Solution

WGS 84 Position:

25° 02' 41.813581" S

X 3730050.876

49° 49' 49.236335" W

Y -4418663.679

706.962

Z -2683885.474

To Station:

VT 02

Data file:

64381442.DAT

Antenna Height (meters):

1.612 True Vertical

1.550 Uncorrected

WGS 84 Position:

24° 47' 02.109189" S

X 3754904.113

49° 36' 41.967631" W

Y -4413816.611

914.038

Z -2657745.631

Start Time:

24/05/97 22:03:45,00 GPS (906 597825.00)

Stop Time:

25/05/97 00:10:30,00 GPS (907 630.00)

Occupation Time Meas. Interval (seconds):

02:06:45,00 15.00

Solution Type:

L1 fixed double difference

Ephemeris:

Broadcast

Baseline Slope Distance Std. Dev. (meters):

36393.253

0.000533

Normal Section Azimuth:

Forward 37° 25' 37.179270"

Backward 217° 20' 05.547773"

Vertical Angle:

0° 09' 43.552444"

-0° 29' 23.736488"

Baseline Components (meters):

dx 24853.238 dy 4847.067 dz 26139.843

Standard Deviations (meters):

0.001799 0.002048 0.001295

dn 28900.799 de 22117.913 du 102.962

0.000583 0.000556 0.002908

dh 207.076
0.002909

Aposteriori Covariance Matrix:

3.236285E-006 -3.373125E-006 4.192627E-006
-3.373125E-006 2.241375E-006 1.677721E-006
-2.018990E-006

Variance Ratio:

4.0

Reference Variance:

4.584

Observable Count/Rejected RMS:

L1 phase

1282/0

0.014

Projeto Mineropar

Processor Controls:

[General]

Process start time:	24/05/97 22:03:30 GPS	(906 597810)
Process stop time:	25/05/97 00:11:00 GPS	(907 660)
Elevation mask:	30 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
Applied to:	None	None
Application threshold:	0 kilometers	0 kilometers

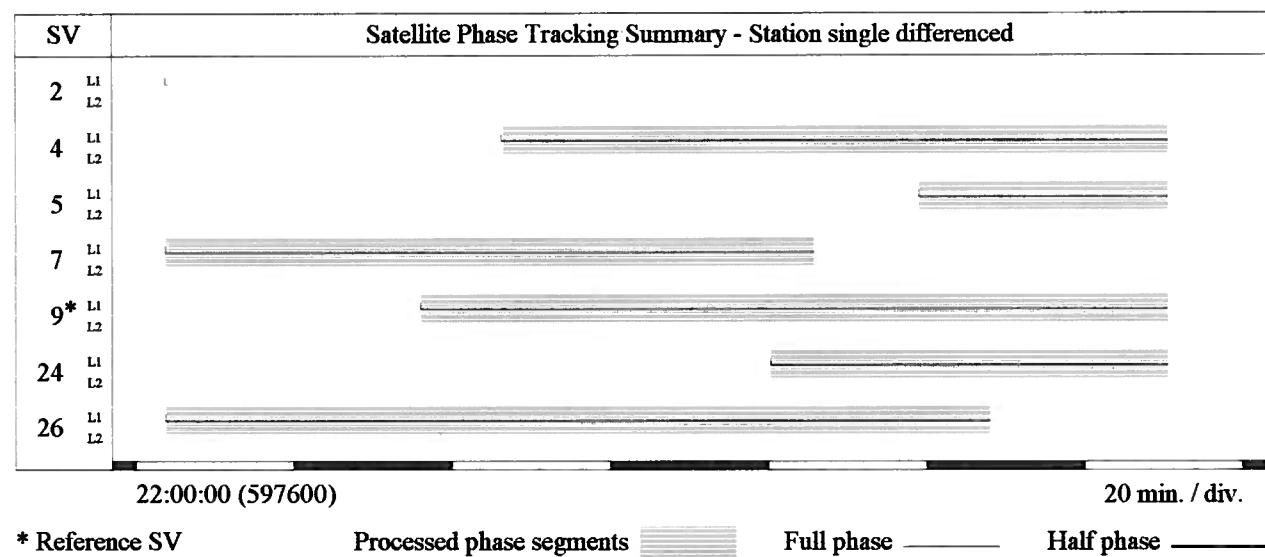
[Final Solution]

Final solution type:	L1 Fixed
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[Satellites]

Disabled:

Projeto Mineropar



Projeto Mineropar
Project Name: Mineropar3
Processed: Monday, 26 de May de 1997 4:00
WAVE 2.10
Solution Output File (SSF): 00000440.SSF **IMPORTED**

From Station: VT 91643 PontaGrossa
Data file: 59641442.DAT
Antenna Height (meters): 0.217 True Vertical
Position Quality: Fixed Control

WGS 84 Position: 25° 05' 43.400176" S X 3707416.689
 50° 06' 18.474503" W Y -4434827.735
 911.953 Z -2689034.095

To Station: VT 01
Data file: 97401442.DAT
Antenna Height (meters): 1.374 True Vertical **1.313 Uncorrected**

WGS 84 Position: 25° 02' 41.813307" S X 3730050.861
 49° 49' 49.235851" W Y -4418663.640
 706.914 Z -2683885.447

Start Time: 24/05/97 22:03:30,00 GPS (906 597810.00)
Stop Time: 25/05/97 00:11:00,00 GPS (907 660.00)
Occupation Time Meas. Interval (seconds): 02:07:30,00 15.00

Solution Type: L1 fixed double difference

Ephemeris: Broadcast
Baseline Slope Distance Std. Dev. (meters): 28285.902 0.000406

	Forward	Backward
Normal Section Azimuth:	78° 39' 48.540825"	258° 32' 49.365039"
Vertical Angle:	-0° 32' 32.309395"	0° 17' 18.053535"

Baseline Components (meters):
Standard Deviations (meters):

dx	22634.172	dy	16164.095	dz	5148.648
	0.001337		0.001530		0.000974
dn	5559.941	de	27732.790	du	-267.724
	0.000441		0.000420		0.002169
				dh	-205.039
					0.002170

Aposteriori Covariance Matrix:

1.787816E-006			
-1.868319E-006	2.341004E-006		
-1.126311E-006		1.254702E-006	9.490465E-007

Variance Ratio: 6.9
Reference Variance: 2.645

Observable Count/Rejected RMS: L1 phase 1297/0 0.011

Projeto Mineropar**Processor Controls:****[General]**

Process start time:	24/05/97 21:33:15 GPS	(906 595995)
Process stop time:	25/05/97 00:55:30 GPS	(907 3330)
Elevation mask:	30 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:		
Application threshold:	0 kilometers	0 kilometers

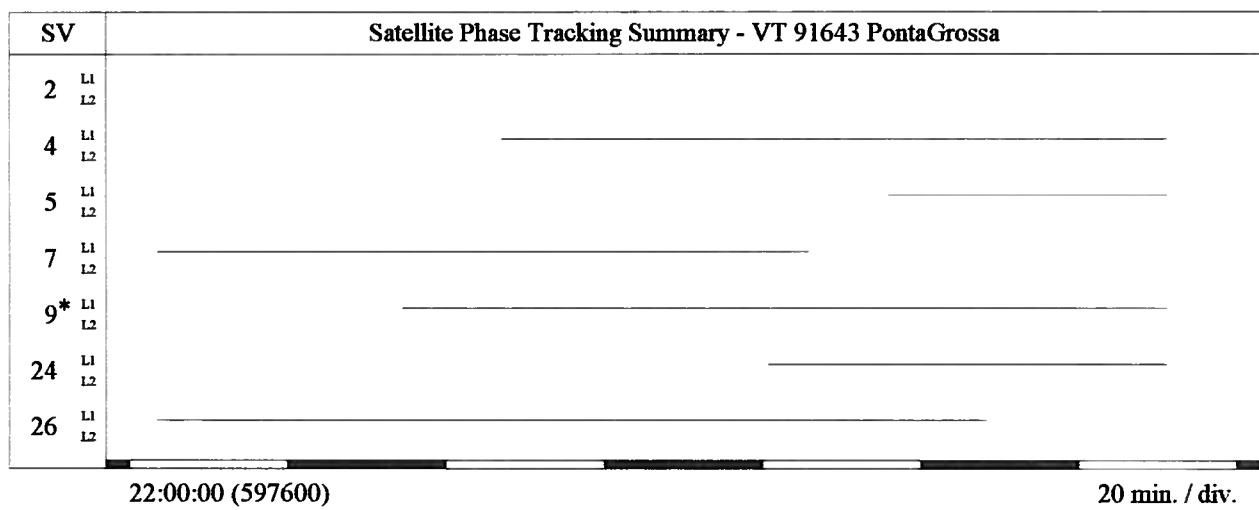
[Final Solution]

Final solution type:	L1 Fixed
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[Satellites]

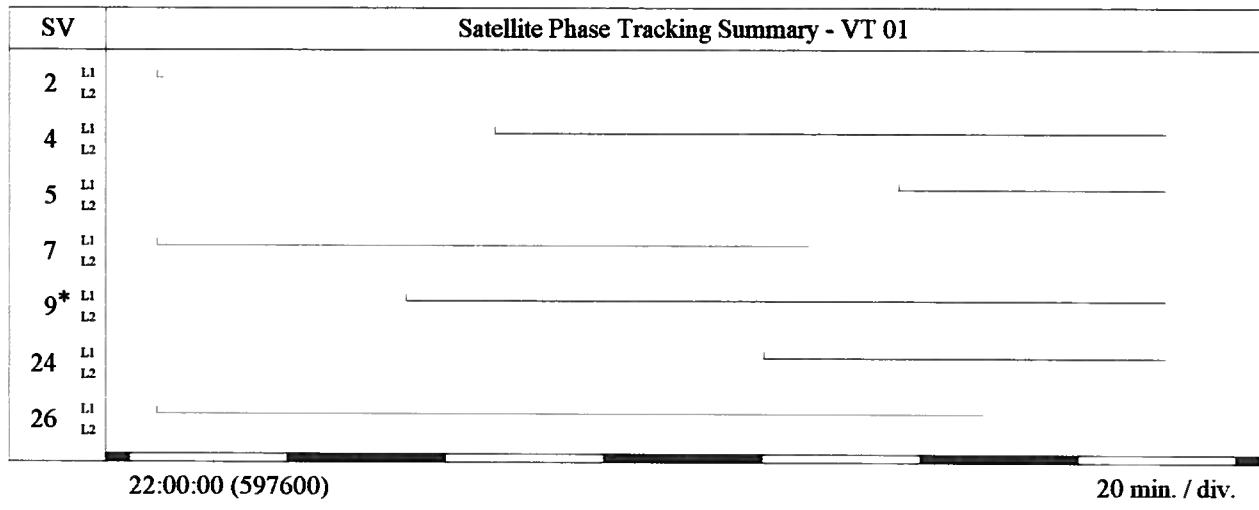
Disabled:

Projeto Mineropar



* Reference SV

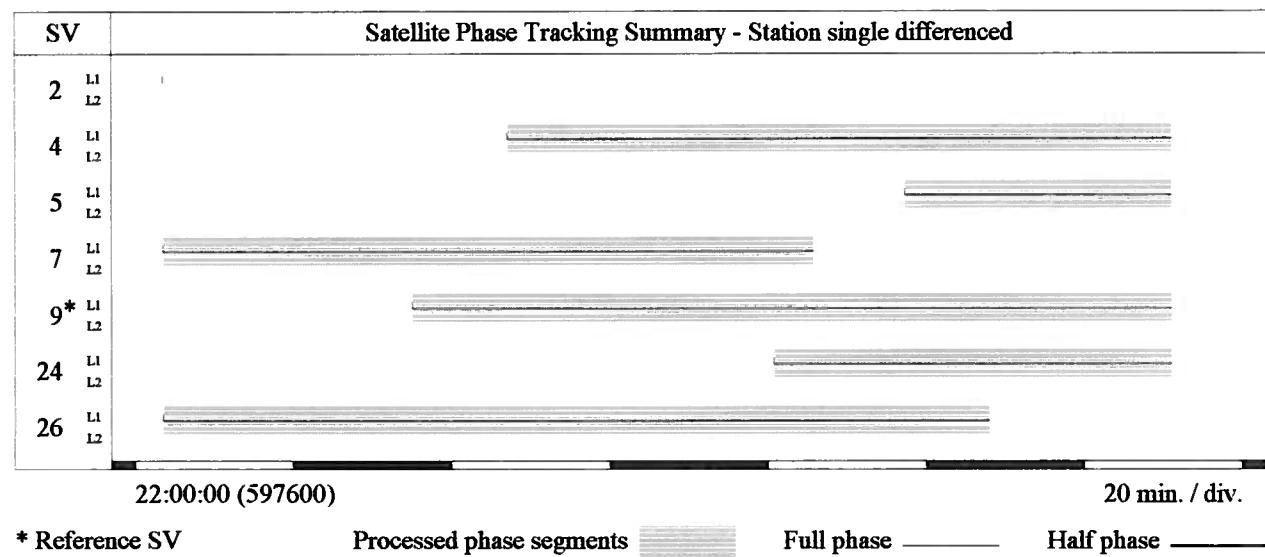
Full phase _____ Half phase _____



* Reference SV

Full phase _____ Half phase _____

Projeto Mineropar



Projeto Mineropar
Project Name: Mineropar3
Processed: Monday, 26 de May de 1997 4:00
Solution Output File (SSF): WAVE 2.10
From Station: VT 91643 PontaGrossa
Data file: 59641442.DAT
Antenna Height (meters): 0.217 True Vertical
Position Quality: Fixed Control
WGS 84 Position: 25° 05' 43.400176" S X 3707416.689
50° 06' 18.474503" W Y -4434827.735
911.953 Z -2689034.095
To Station: VT 02
Data file: 64381442.DAT
Antenna Height (meters): 1.612 True Vertical 1.550 Uncorrected
WGS 84 Position: 24° 47' 02.108907" S X 3754904.100
49° 36' 41.967130" W Y -4413816.574
913.993 Z -2657745.605
Start Time: 24/05/97 22:03:45,00 GPS (906 597825.00)
Stop Time: 25/05/97 00:10:30,00 GPS (907 630.00)
Occupation Time Meas. Interval (seconds): 02:06:45,00 15.00
Solution Type: L1 fixed double difference
Ephemeris: Broadcast
Baseline Slope Distance Std. Dev. (meters): 60625.842 0.000758
Normal Section Azimuth: Forward 55° 24' 40.713907" Backward 235° 12' 11.619237"
Vertical Angle: -0° 16' 14.391579" -0° 16' 28.285199"
Baseline Components (meters):
Standard Deviations (meters):

dx	47487.411	dy	21011.161	dz	31288.490
	0.002597		0.002960		0.001874
dn	34415.770	de	49909.573	du	-286.394
	0.000843		0.000804		0.004202
				dh	2.040
					0.004203

Aposteriori Covariance Matrix:

6.741884E-006				
-7.037855E-006	8.761574E-006			
-4.213354E-006	4.690331E-006	3.510376E-006		

Variance Ratio: 2.3
Reference Variance: 9.546
Observable Count/Rejected RMS: L1 phase 1279/0 0.018

Projeto Mineropar**Processor Controls:****[General]**

Process start time:	24/05/97 21:33:15 GPS	(906 595995)
Process stop time:	25/05/97 00:25:00 GPS	(907 1500)
Elevation mask:	30 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:		
Application threshold:	0 kilometers	0 kilometers

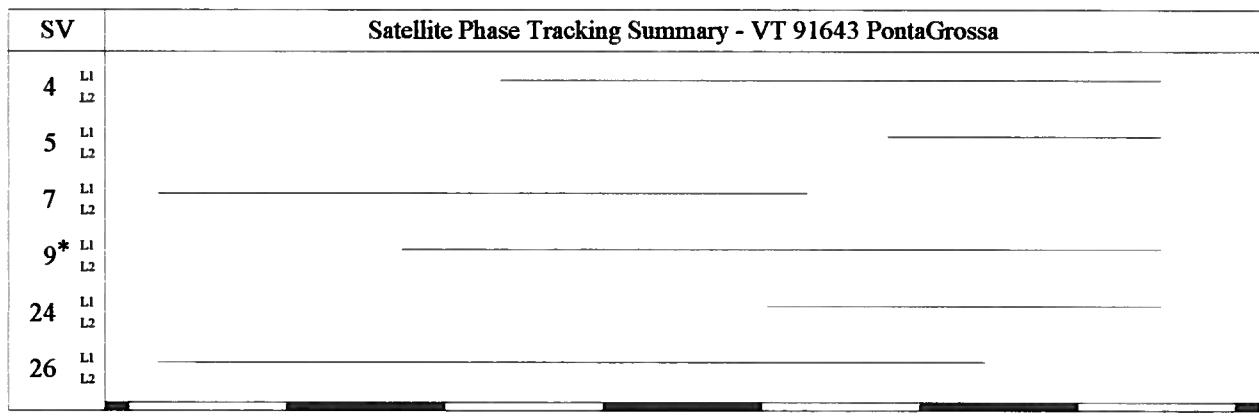
[Final Solution]

Final solution type:	L1 Fixed
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[Satellites]

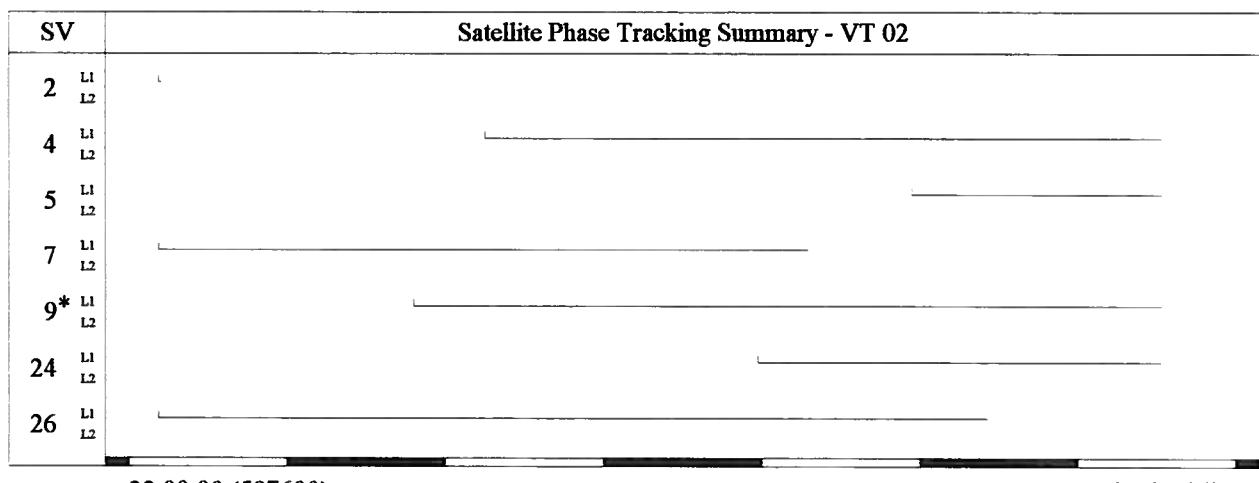
Disabled:

Projeto Mineropar



* Reference SV

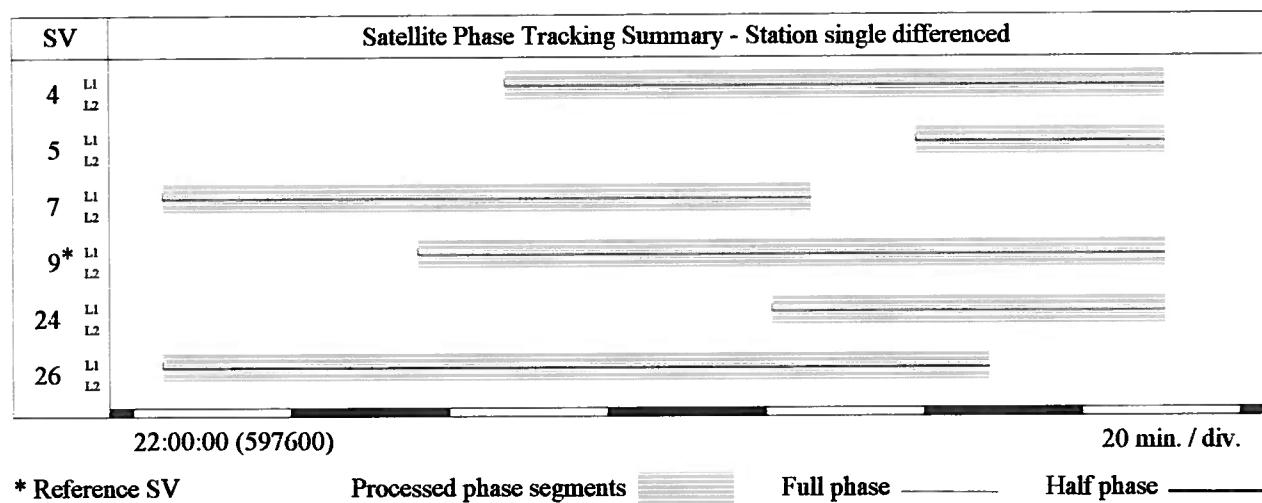
Full phase _____ Half phase _____



* Reference SV

Full phase _____ Half phase _____

Projeto Mineropar



***** End of Report *****

ADJUSTMENT ACTIVITY LOG
NETWORK = Mineropar3
TIME = Wed Jun 4 22:24:57 1997

Adjustment process underway.
Computing closures.
Closures have been computed.
Indexing observation equations and unknowns.
Number of sub-networks = 1.
Number of inner constraints sub-network 1 = 0.

Sub-network 1: Fixed y = 1 Fixed x = 1 Fixed H = 1 Fixed h = 1.

Points included in sub-network 1:

VT 01
VT 02
VT 91643 PontaGrossa

Initializing parameter group 1: GPS Observations.

6 horizontal observations
3 vertical observations
3 observed azimuths
3 observed distances
Located in sub-network 1.
1 fixed latitudes
1 fixed longitudes
1 fixed ellipsoid heights
1 fixed orthometric heights
Y rotation parameter ruled ineligible
X rotation parameter ruled ineligible
Azimuth rotation parameter ruled ineligible
Network scale parameter ruled ineligible
Omitting parameter 5 by user choice
Omitting parameter 6 by user choice
Omitting parameter 7 by user choice

Initializing parameter group 3: Geoid Model.

0 horizontal observations
3 vertical observations
0 observed azimuths
0 observed distances
Located in sub-network 0.
0 fixed latitudes
0 fixed longitudes
1 fixed ellipsoid heights
1 fixed orthometric heights
Y rotation parameter ruled ineligible
X rotation parameter ruled ineligible
Omitting parameter 3 by user choice
Omitting parameter 4 by user choice
Omitting parameter 5 by user choice
Omitting parameter 6 by user choice
Height constant parameter 7 = 9.

Number of fixed horizontal coordinates = 2.
Number of fixed vertical coordinates = 2.
Number of observation equations = 12.
Number of vertical observation equations = 6.
Number of unknowns = 9.

Number of inner constraint equations = 0.

The following observations are excluded from the adjustment:

nonc

The following points were excluded from the adjustment:

none

Proceeding with observation equations.

Turning on graphics before going into adjustment iteration.

Beginning adjustment iteration 1.

Forming observation equations.

Performing observation covariance inverses.

Forming constants and normal equations.

Computing normals inverse.

Computing observation residuals.

Solutions from iteration 1:

```
1 -3.474719e-005
2 -8.934907e-001
3 1.360377e-007
4 -2.867821e-007
5 1.210398e-005
6 -8.934949e-001
7 -1.440653e-007
8 -2.677367e-007
9 -8.935000e-001
```

Recomputing closures for check on residuals

Iteration check on residuals (tolerance = 1.0e-005):

```
eq # 1 obs # 1 = +0.000000e+000 - +0.000000e+000 = +0.000000e+000
eq # 2 obs # 2 = +0.000000e+000 - -2.531308e-014 = +2.531308e-014
eq # 3 obs # 3 = +0.000000e+000 - +0.000000e+000 = +0.000000e+000
eq # 4 obs # 4 = -1.747893e-004 - -1.747890e-004 = +3.725419e-010
eq # 5 obs # 5 = -9.700673e-004 - -9.700673e-004 = +1.098112e-014
eq # 6 obs # 6 = -1.084276e-004 - -1.084268e-004 = +8.079269e-010
eq # 7 obs # 7 = +4.254012e-004 - +4.254046e-004 = +3.443713e-009
eq # 8 obs # 8 = +7.171580e-004 - +7.171580e-004 = +2.332010e-015
eq # 9 obs # 9 = +7.629102e-005 - +7.629245e-005 = +1.438456e-009
eq # 10 obs # 10 = +5.550088e-005 - +5.549941e-005 = +1.470217e-009
eq # 11 obs # 11 = +6.146977e-004 - +6.146977e-004 = +8.649114e-015
eq # 12 obs # 12 = +1.026072e-004 - +1.026064e-004 = +8.840085e-010
```

Successful adjustment 1 iterations

Beginning adjustment summary in stats.log.

Beginning coordinate adjustment in coords.log.

Coordinate adjustment summary complete.

Beginning plots of error ellipses.

Ellipse plotting complete.

Proceeding with adjustment of observations.

Observation adjustment complete.

Statistics summary complete.

Plot histograms.

Histogram plotting complete.

Computing covariances in azimuth, distance and height.

Covariance processing complete.

Iterations complete, so turning graphics off.

Graphics turned off.

Closing activity log.

TIME = Wed Jun 4 22:25:00 1997.

CLOSURES LOG
NETWORK = Mineropar3
TIME = Wed Jun 4 22:24:57 1997

OBS#	TYPE	BACKSIGHT	INSTRUMENT	FORESIGHT	CLOSURE	TRANSFORM
1 hgoid		VT 01		0.000000m	0.893500m	
2 hgoid		VT 02		0.000000m	0.893500m	
3 hgoid		VT 91643 PontaGrossa		0.000000m	0.893500m	
4 gpsaz		VT 91643 PontaGrossa		VT 02	-0.000175" 0.000000"	
5 gpsht		VT 91643 PontaGrossa		VT 02	-0.000970m 0.000000m	
6 gpsds		VT 91643 PontaGrossa		VT 02	-0.000108m 0.000000m	
7 gpsaz		VT 01	VT 02	0.000425"	0.000000"	
8 gpsht		VT 01	VT 02	0.000717m	0.000000m	
9 gpsds		VT 01	VT 02	0.000076m	0.000000m	
10 gpsaz		VT 91643 PontaGrossa		VT 01	0.000055" 0.000000"	
11 gpsht		VT 91643 PontaGrossa		VT 01	0.000615m 0.000000m	
12 gpsds		VT 91643 PontaGrossa		VT 01	0.000103m 0.000000m	

COORDINATE ADJUSTMENT SUMMARY

NETWORK = Mineropar3

TIME = Wed Jun 4 22:24:57 1997

Datum = WGS-84

Coordinate System = Geographic

Zone = Global

Network Adjustment Constraints:

1 fixed coordinates in y

1 fixed coordinates in x

1 fixed coordinates in H

1 fixed coordinates in h

POINT	NAME	OLD COORDS	ADJUST	NEW COORDS	1.00 Δ
-------	------	------------	--------	------------	---------------

1 VT 01

LAT= 25° 02' 41.813309" +0.000000" 25° 02' 41.813309" 0.000272m

LON= 49° 49' 49.235854" +0.000000" 49° 49' 49.235854" 0.000271m

ELL HT= 706.9147m +0.0000m 706.9147m 0.000619m

ORTHO HT= 703.7953m -0.8935m 702.9018m 0.068611m

GEOID HT= 3.1194m +0.8935m 4.0129m 0.068608m

2 VT 02

LAT= 24° 47' 02.108917" +0.000000" 24° 47' 02.108917" 0.000279m

LON= 49° 36' 41.967146" +0.000000" 49° 36' 41.967146" 0.000278m

ELL HT= 913.9917m +0.0000m 913.9917m 0.000691m

ORTHO HT= 911.6286m -0.8935m 910.7351m 0.068611m

GEOID HT= 2.3631m +0.8935m 3.2566m 0.068608m

3 VT 91643 PontaGrossa

LAT= 25° 05' 43.400176" +0.000000" 25° 05' 43.400176" FIXED

LON= 50° 06' 18.474503" +0.000000" 50° 06' 18.474503" FIXED

ELL HT= 911.9530m +0.0000m 911.9530m FIXED

ORTHO HT= 908.1448m +0.0000m 908.1448m FIXED

GEOID HT= 3.8082m +0.0000m 3.8082m FIXED

SUMMARY OF COVARIANCES
NETWORK = Mineropar3
TIME = Wed Jun 4 22:24:59 1997

Definition of precision ($E \times S$) $\hat{y} = C\hat{y} + P\hat{y}$:

Horizontal:

Precision (P) expressed as: ratio

Propagated linear error (E): U.S.

(standard error of adjusted horizontal distance)

Scalar (S) on propagated linear error: 1.0000

Constant error term (C): 0.0000

3-Dimensional:

Precision (P) expressed as: ratio

Propagated linear error (E): U.S.

(standard error of adjusted slope distance)

Scalar (S) on propagated linear error: 1.0000

Constant error term (C): 0.0000

Using orthometric height errors

FROM/	AZIMUTH/	1.00å	DISTANCE/	1.00å	HOR PREC/
TO	DELTA H	1.00å	DELTA h	1.00å	3-D PREC
VT 01	37°25'37"	0.00"	36388.076m	0.0003m	1:133726338
VT 02	+207.0770m	0.0006m	+207.8333m	0.0686m	1:133726338
VT 01	258°32'49"	0.00"	28281.595m	0.0003m	1:104605653
VT 91643 PontaGrossa	+205.0383m	0.0006m	+205.2430m	0.0686m	1:104605653
VT 02	235°12'12"	0.00"	60617.383m	0.0003m	1:219650808
VT 91643 PontaGrossa	-2.0387m	0.0007m	-2.5903m	0.0686m	1:219650808

OBSERVATION ADJUSTMENT SUMMARY

NETWORK = Mineropar3

TIME = Wed Jun 4 22:24:58 1997

OBSERVATION ADJUSTMENT (Tau = 1.41)

Geoid Parameter Group 3 Geoid Model
 Height constant = -0.8935 1.00 \hat{a} = 0.0485

OBS#	BLK#	TYPE	BACKSIGHT/	UDVC/	OBSERVED/	1.00 \hat{a} /	TAU
REF#			INSTRUMENT/	UDPG/	ADJUSTED/	1.00 \hat{a} /	
			FORESIGHT	SBNT	RESIDUAL	1.00 \hat{a}	
1	-**-	hgoid	-**_- **_-	+3.1194m	0.0485m	OPEN	
	1		VT 01	-**_-	+3.1194m	0.0485m	
			-**_-	1	+0.000000m	0.0000m	
2	-**-	hgoid	-**_- **_-	+2.3631m	0.0485m	OPEN	
	2		VT 02	-**_-	+2.3631m	0.0485m	
			-**_-	1	+0.000000m	0.0000m	
3	-**-	hgoid	-**_- **_-	+2.9147m	0.0485m	OPEN	
	3		VT 91643 PontaGrossa	-**_-	+2.9147m	0.0485m	
			-**_-	1	+0.000000m	0.0000m	
4	1	gpsaz	-**_- **_-	55°24'40.7907"	0.0012"	0.17	
	1		VT 91643 PontaGrossa	-**_-	55°24'40.7905"	0.0010"	
			VT 02	1	-0.000175"	0.0007"	
5	1	gpsht	-**_- **_-	+2.0397m	0.0009m	1.17	
	1		VT 91643 PontaGrossa	-**_-	+2.0387m	0.0007m	
			VT 02	1	-0.000970m	0.0006m	
6	1	gpsds	-**_- **_-	60617.3829m	0.0003m	0.38	
	1		VT 91643 PontaGrossa	-**_-	60617.3828m	0.0003m	
			VT 02	1	-0.000108m	0.0002m	
7	2	gpsaz	-**_- **_-	37°25'37.2583"	0.0019"	0.28	
	1		VT 01	-**_-	37°25'37.2587"	0.0016"	
			VT 02	1	+0.000425"	0.0011"	
8	2	gpsht	-**_- **_-	+207.0763m	0.0008m	1.16	
	1		VT 01	-**_-	+207.0770m	0.0006m	
			VT 02	1	+0.000717m	0.0004m	
9	2	gpsds	-**_- **_-	36388.0761m	0.0003m	0.28	
	1		VT 01	-**_-	36388.0761m	0.0003m	
			VT 02	1	+0.000076m	0.0002m	
10	3	gpsaz	-**_- **_-	78°39'48.5655"	0.0024"	0.03	
	1		VT 91643 PontaGrossa	-**_-	78°39'48.5656"	0.0020"	
			VT 01	1	+0.000056"	0.0014"	
11	3	gpsht	-**_- **_-	-205.0389m	0.0007m	1.16	
	1		VT 91643 PontaGrossa	-**_-	-205.0383m	0.0006m	

VT 01 1 +0.000615m 0.0004m

12 3 gpsds _**_ _**_ 28281.5945m 0.0003m 0.39
1 VT 91643 PontaGrossa _**_ 28281.5946m 0.0003m
 VT 01 1 +0.000103m 0.0002m

ADJUSTMENT STATISTICS SUMMARY
NETWORK = Mineropar3
TIME = Wed Jun 4 22:24:57 1997

ADJUSTMENT SUMMARY

Network Reference Factor = 0.15
Chi-Square Test ($\alpha = 95\%$) = PASS
Degrees of Freedom = 3.00

GPS OBSERVATIONS

Reference Factor = 0.15
 $r = 3.00$

GPS Solution 1 Reference Factor = 0.16 $r = 1.12$
GPS Solution 2 Reference Factor = 0.15 $r = 0.97$
GPS Solution 3 Reference Factor = 0.14 $r = 0.91$

GEOID MODEL

Reference Factor = 1.00
 $r = 0.00$

Geoid Heights: Reference Factor = 1.00 $r = 0.00$
Delta Geoid Heights: Reference Factor = 1.00 $r = 0.00$

WEIGHTING STRATEGIES:

GPS OBSERVATIONS:

No scalar weighting strategy was used

No summation weighting strategy was used

Station Error Strategy:

H.I. error = 0.0030
Tribach error = 0.0015

GEOID MODEL:

No scalar weighting strategy was used

No summation weighting strategy was used

Results of adjusted Geoid model:

Noise in vertical GPS observations: 0.00000065

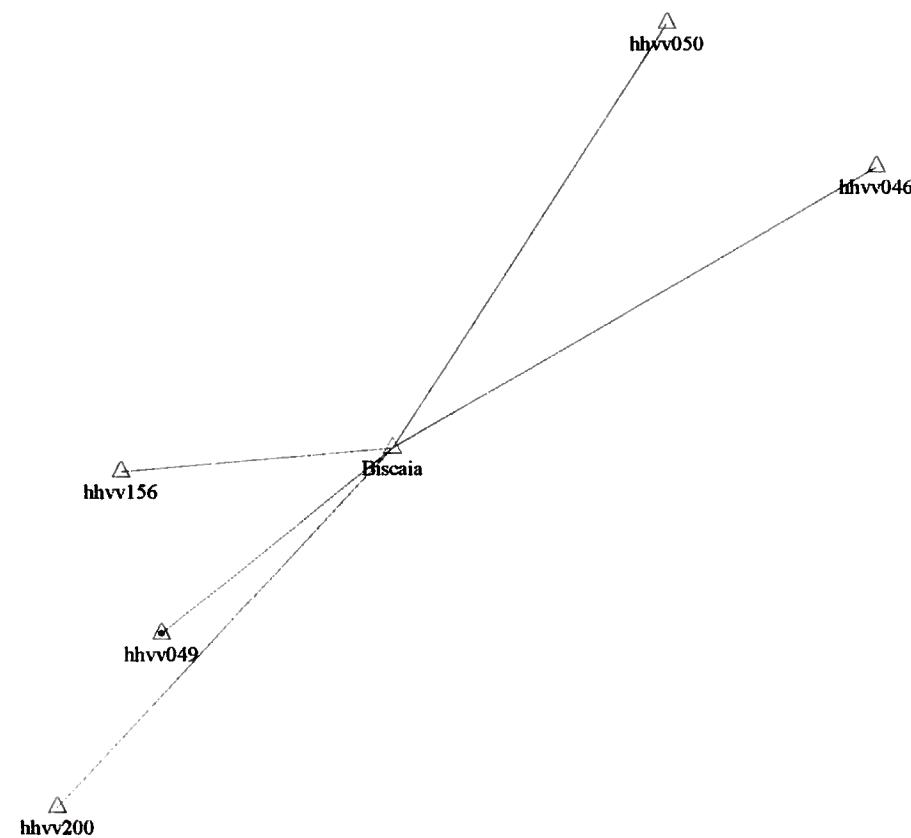
Variance of geoid model: 0.00235351

Use of correlated Residual Geoid Model may improve geoid heights



ANEXO E - VISUALIZAÇÃO DOS HV'S, PROCESSAMENTO E AJUSTAMENTO

Network Map: HHV143



2000m

Projeto Mineropar

Project: HHVV143
Supervisor: TopoGeo
Date Created: 04/06/97 21:33:58
Date Last Accessed: 04/06/97 21:44:51
Project Directory: c:\gpsurvey\projects\HHVV143
Antenna Type: 4600LS Internal
Antenna Measurement Method: Reading from hook using 4600LS tape
Receiver Type: 4600LS
Coordinate System: Geographic
Zone: WGS84
Linear Unit: Meter
Timezone: CURITIBA : -3:00
Number of Stations: 6
Number of Baselines: 5
No. of Continuous Kinematic Solns: 0

Projeto Mineropar

**** Reference Coordinates ****

Station Short Name	Station ID	Latitude	Longitude	Height	Station Quality
hhvv046		24°59'50.19056" S	049°44'26.15038" W	704.57017	Network Adjustment
hhvv050		24°58'23.32914" S	049°46'46.04340" W	933.24785	Network Adjustment
hhvv200		25°06'21.08331" S	049°53'33.16638" W	893.13295	Network Adjustment
hhvv049		25°04'35.27928" S	049°52'23.20692" W	925.12639	Network Adjustment
hhvv156		25°02'56.74120" S	049°52'50.10254" W	854.26681	Network Adjustment
Biscaia		25°02'41.81331" S	049°49'49.23585" W	706.91470	Fixed Control

**** Adjusted Coordinates ****

Projection Group: Geographic

Zone Name: Global

Linear Units: meter

Angular Units: degrees

Datum Name: WGS-84

Station Short Name	Station ID	Latitude	Longitude	Ortho. Height	Ellip. Height
Biscaia		25°02'41.81331" S	049°49'49.23585" W	702.90181	706.91470
hhvv046		24°59'50.19056" S	049°44'26.15038" W	700.64912	704.57017
hhvv049		25°04'35.27928" S	049°52'23.20692" W	921.05986	925.12639
hhvv050		24°58'23.32914" S	049°46'46.04340" W	929.42241	933.24785
hhvv156		25°02'56.74120" S	049°52'50.10254" W	850.30292	854.26681
hhvv200		25°06'21.08331" S	049°53'33.16638" W	888.99541	893.13295

Projeto Mineropar

From Station Short Name	To Station Short Name	Solution Type	Slope	Ratio	Reference Variance	Entered Ant. Ht. (From)	Entered Ant. Ht. (To)
Biscaia	hhvv046	L1 fixed	10486.428	1.8	0.742	1.670	3.788
Biscaia	hhvv049	L1 fixed	5555.973	1.8	7.679	1.670	3.720
Biscaia	hhvv050	L1 fixed	9472.051	1.6	3.151	1.670	1.653
Biscaia	hhvv156	L1 fixed	5093.396	1.8	3.057	1.670	3.727
Biscaia	hhvv200	L1 fixed	9217.451	2.7	0.369	1.670	2.117

Projeto Mineropar

**** SSF/SSK Solution Output Files For Selected Baselines ****

.ssf/.ssk Solution Output File	From Station Short Name	To Station Short Name	Solution Type	Slope	Ratio	Reference Variance
00000460.ssf	Biscaia	hhvv046	L1 fixed	10486.428	1.8	0.742
00000448.ssf	Biscaia	hhvv049	L1 fixed	5555.973	1.8	7.679
00000456.ssf	Biscaia	hhvv050	L1 fixed	9472.051	1.6	3.151
00000444.ssf	Biscaia	hhvv156	L1 fixed	5093.396	1.8	3.057
00000452.ssf	Biscaia	hhvv200	L1 fixed	9217.451	2.7	0.369

Projeto Mineropar
Project Name: IIIIVV143
Processed: Monday, 26 de May de 1997 4:34
Solution Output File (SSF): WAVE 2.10 00000460.SSF **IMPORTED**

From Station: Biscaia
Data file: 97401430.DAT
Antenna Height (meters): 1.732 True Vertical 1.670 Uncorrected
Position Quality: Fixed Control

WGS 84 Position: 25° 02' 41.813310" S X 3730050.861
49° 49' 49.235850" W Y -4418663.640
706.915 Z -2683885.447

To Station: hhvv046
Data file: 64381431.DAT
Antenna Height (meters): 3.788 True Vertical

WGS 84 Position: 24° 59' 50.190556" S X 3738409.738
49° 44' 26.150377" W Y -4414518.670
704.570 Z -2679098.635

Start Time: 23/05/97 20:05:15,00 GPS (906 504315.00)
Stop Time: 23/05/97 20:31:15,00 GPS (906 505875.00)
Occupation Time Meas. Interval (seconds): 00:26:00,00 15.00

Solution Type: L1 fixed double difference

Ephemeris: Broadcast
Baseline Slope Distance Std. Dev. (meters): 10486.428 0.000619

Normal Section Azimuth: Forward 59° 46' 38.259234" Backward 239° 44' 21.609312"
Vertical Angle: -0° 03' 35.795583" -0° 02' 03.563775"

Baseline Components (meters):
Standard Deviations (meters):

dx	8358.877	dy	4144.971	dz	4786.812
	0.001428		0.001930		0.000826
dn	5278.471	de	9061.060	du	-10.971
	0.000615		0.000615		0.002385
				dh	-2.345
					0.002385

Aposteriori Covariance Matrix:

2.038442E-006	3.723053E-006	6.820803E-007
-2.394624E-006		
-8.059408E-007	1.274891E-006	

Variance Ratio: 1.8
Reference Variance: 0.742

Observable Count/Rejected RMS: L1 phase 276/0 0.006

Projeto Mineropar

Processor Controls:

[General]

Process start time:	23/05/97 20:00:00 GPS	(906 504000)
Process stop time:	23/05/97 20:31:15 GPS	(906 505875)
Elevation mask:	30 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:		
Application threshold:	0 kilometers	0 kilometers

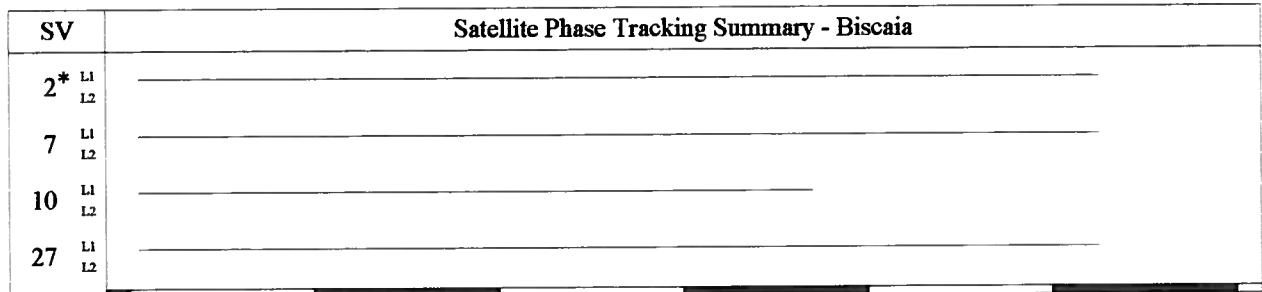
[Final Solution]

Final solution type:	L1 Fixed
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[Satellites]

Disabled:

Projeto Mineropar



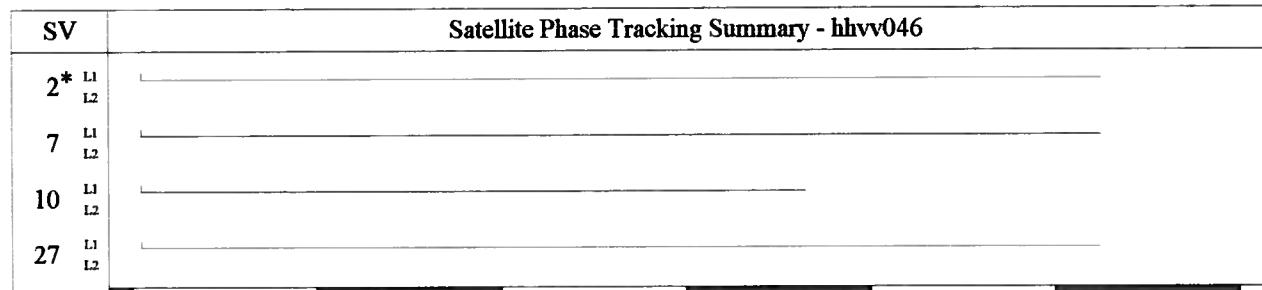
20:05:00 (504300)

5 min. / div.

* Reference SV

Full phase _____

Half phase _____



20:05:00 (504300)

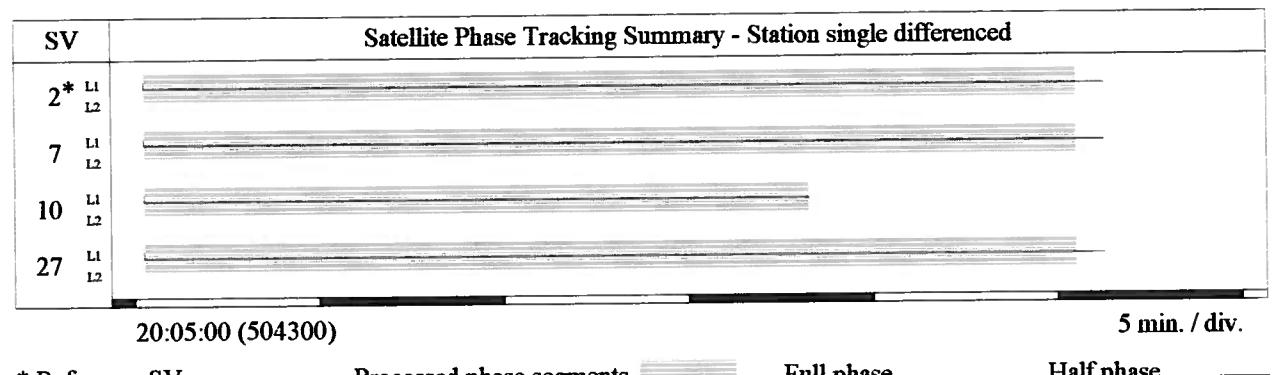
5 min. / div.

* Reference SV

Full phase _____

Half phase _____

Projeto Mineropar



Projeto Mineropar

Project Name:

Processed:

Solution Output File (SSF):

HHVV143

Monday, 26 de May de 1997 4:34

WAVE 2.10

00000448.SSF

IMPORTED

From Station:

Biscaia

Data file:

97401430.DAT

Antenna Height (meters):

1.732 True Vertical

1.670 Uncorrected

Position Quality:

Fixed Control

WGS 84 Position:

25° 02' 41.813310" S

X 3730050.861

49° 49' 49.235850" W

Y -4418663.640

706.915

Z -2683885.447

To Station:

hhvv049

Data file:

59641432.DAT

Antenna Height (meters):

3.720 True Vertical

WGS 84 Position:

25° 04' 35.279285" S

X 3725925.567

49° 52' 23.206921" W

Y -4420467.004

925.126

Z -2687141.005

Start Time:

23/05/97 19:30:45,00 GPS

(906 502245.00)

Stop Time:

23/05/97 20:00:00,00 GPS

(906 504000.00)

Occupation Time Meas. Interval (seconds):

00:29:15,00

15.00

Solution Type:

L1 fixed double difference

Ephemeris:

Broadcast

Baseline Slope Distance Std. Dev. (meters):

5555.973

0.001394

Normal Section Azimuth:

Forward

Backward

231° 00' 59.917122"

51° 02' 05.154997"

Vertical Angle:

2° 13' 33.265952"

-2° 16' 33.065533"

Baseline Components (meters):

dx -4125.294 dy -1803.364 dz -3255.558

Standard Deviations (meters):

0.003173 0.002797 0.001407

dn -3492.595 de -4315.558 du 215.792
0.001451 0.001223 0.004033

dh 218.212
0.004033

Aposteriori Covariance Matrix:

1.006754E-005 -7.747540E-006 7.822067E-006
-7.747540E-006 2.087308E-006 1.979638E-006
-2.493744E-006

Variance Ratio:

1.8

Reference Variance:

7.679

Observable Count/Rejected RMS: L1 phase 563/0 0.017

Projeto Mineropar**Processor Controls:****[General]**

Process start time:	23/05/97 18:35:00 GPS	(906 498900)
Process stop time:	23/05/97 21:30:30 GPS	(906 509430)
Elevation mask:	15 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:		
Application threshold:	0 kilometers	0 kilometers

[Final Solution]

Final solution type:	L1 Fixed
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[Satellites]

Disabled:

Projeto Mineropar

SV	Satellite Phase Tracking Summary - Biscaia
2* L1 L2	_____
7 L1 L2	_____
10 L1 L2	_____
18 L1 L2	_____
19 L1 L2	_____
27 L1 L2	_____

19:30:00 (502200)

5 min. / div.

* Reference SV

Full phase _____

Half phase _____

SV	Satellite Phase Tracking Summary - hhvv049
2* L1 L2	_____
7 L1 L2	_____
10 L1 L2	_____
18 L1 L2	_____
19 L1 L2	_____
27 L1 L2	_____

19:30:00 (502200)

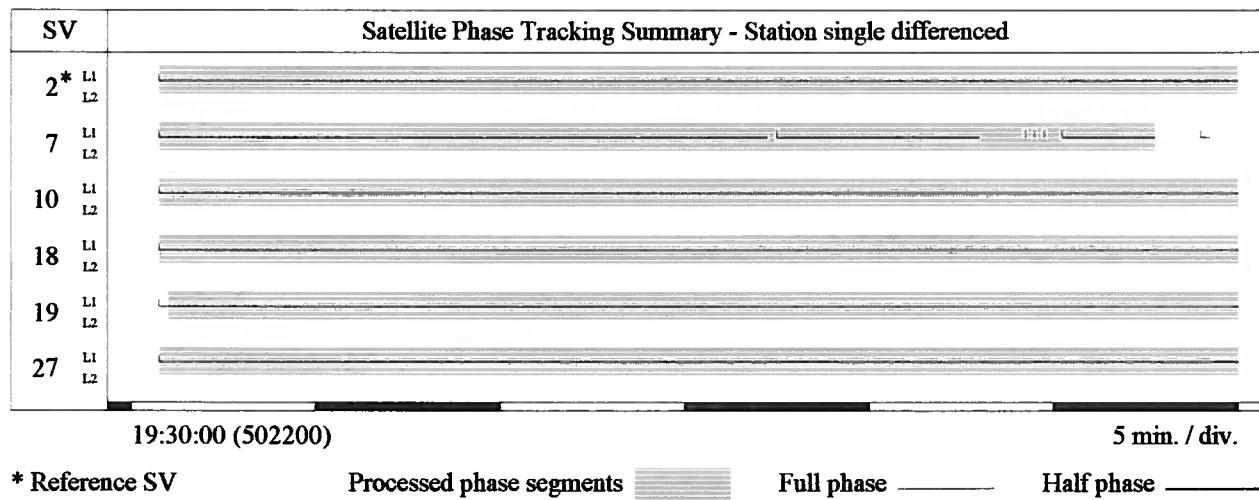
5 min. / div.

* Reference SV

Full phase _____

Half phase _____

Projeto Mineropar



***** End of Report *****

Projeto Mineropar
Project Name: HHVV143
Processed: Monday, 26 de May de 1997 4:34
Solution Output File (SSF): WAVE 2.10 00000456.SSF IMPORTED

From Station: Biscaia
Data file: 97401430.DAT
Antenna Height (meters): 1.732 True Vertical 1.670 Uncorrected
Position Quality: Fixed Control

WGS 84 Position: 25° 02' 41.813310" S X 3730050.861
 49° 49' 49.235850" W Y -4418663.640
 706.915 Z -2683885.447

To Station: hhvv050
Data file: 64381430.DAT
Antenna Height (meters): 1.715 True Vertical 1.653 Uncorrected

WGS 84 Position: 24° 58' 23.329141" S X 3736277.783
 49° 46' 46.043398" W Y -4418073.508
 933.248 Z -2676772.294

Start Time: 23/05/97 18:46:00,00 GPS (906 499560.00)
Stop Time: 23/05/97 19:16:45,00 GPS (906 501405.00)
Occupation Time Meas. Interval (seconds): 00:30:45,00 15.00

Solution Type: L1 fixed double difference

Ephemeris: Broadcast
Baseline Slope Distance Std. Dev. (meters): 9472.051 0.000910

	Forward	Backward
Normal Section Azimuth:	32° 51' 57.975538"	212° 50' 40.547275"
Vertical Angle:	1° 19' 35.530093"	-1° 24' 42.735150"

Baseline Components (meters): dx 6226.922 dy 590.133 dz 7113.153
Standard Deviations (meters): 0.002045 0.002130 0.001986

dn 7953.833 **de** 5138.893 **du** 219.281
 0.001078 0.000737 0.003311

dh 226.333
 0.003310

Aposteriori Covariance Matrix:

4.182870E-006	-3.842382E-006	4.538987E-006
-3.256481E-006	3.291645E-006	3.944206E-006

Variance Ratio: 1.6
Reference Variance: 3.151

Observable Count/Rejected RMS: L1 phase 496/0 0.015

Projeto Mineropar**Processor Controls:****[General]**

Process start time:	23/05/97 18:35:00 GPS	(906 498900)
Process stop time:	23/05/97 21:30:30 GPS	(906 509430)
Elevation mask:	20 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:		
Application threshold:	0 kilometers	0 kilometers

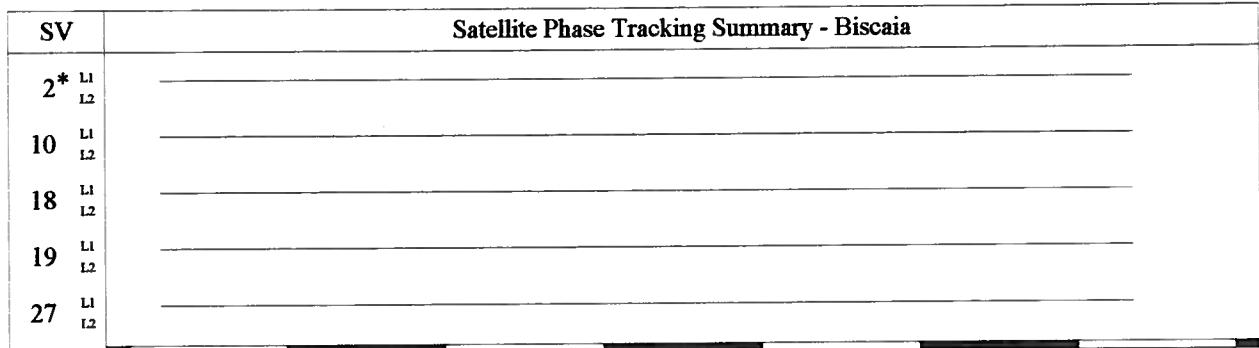
[Final Solution]

Final solution type:	L1 Fixed
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[Satellites]

Disabled:	07
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Projeto Mineropar



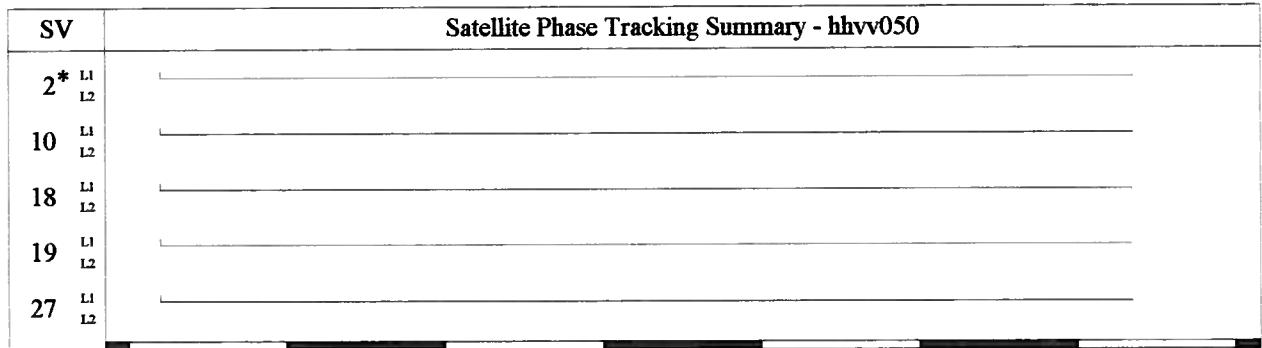
18:45:00 (499500)

5 min. / div.

* Reference SV

Full phase _____

Half phase _____



18:45:00 (499500)

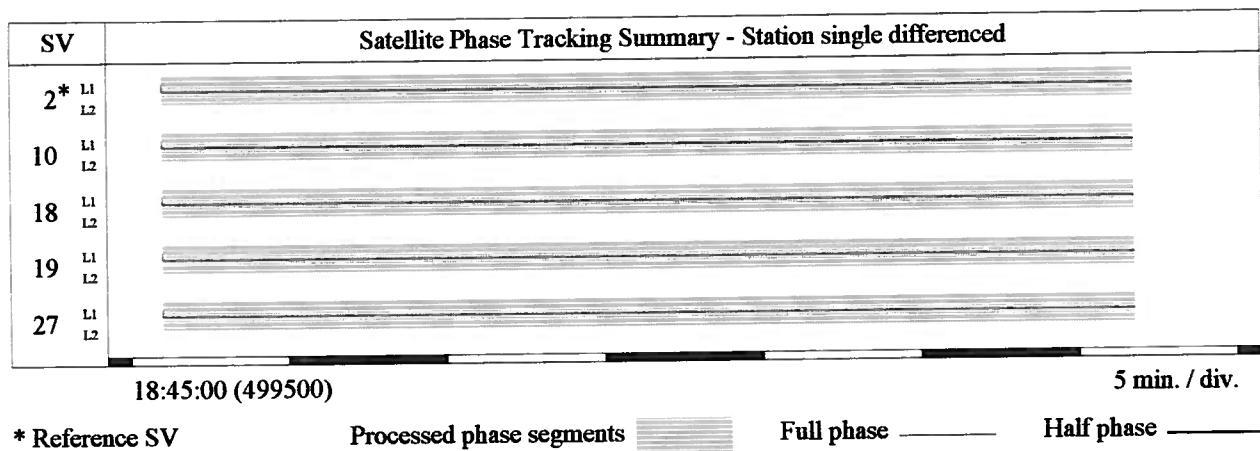
5 min. / div.

* Reference SV

Full phase _____

Half phase _____

Projeto Mineropar



Projeto Mineropar
Project Name: HHVV143
Processed: Monday, 26 de May de 1997 4:34
Solution Output File (SSF): 00000444.SSF IMPORTED

From Station: Biscaia
Data file: 97401430.DAT
Antenna Height (meters): 1.732 True Vertical 1.670 Uncorrected
Position Quality: Fixed Control

WGS 84 Position:
 25° 02' 41.813310" S X 3730050.861
 49° 49' 49.235850" W Y -4418663.640
 706.915 Z -2683885.447

To Station: hhvv156
Data file: 59641431.DAT
Antenna Height (meters): 3.727 True Vertical

WGS 84 Position:
 25° 02' 56.741199" S X 3726135.546
 49° 52' 50.102544" W Y -4421886.055
 854.267 Z -2684364.023

Start Time: 23/05/97 18:37:00,00 GPS (906 499020.00)
Stop Time: 23/05/97 19:11:15,00 GPS (906 501075.00)
Occupation Time Meas. Interval (seconds): 00:34:15,00 15.00

Solution Type: L1 fixed double difference

Ephemeris: Broadcast
Baseline Slope Distance Std. Dev. (meters): 5093.396 0.000692

	Forward	Backward
Normal Section Azimuth:	264° 48' 44.711037"	84° 50' 01.285477"
Vertical Angle:	1° 38' 05.811131"	-1° 40' 50.347797"

Baseline Components (meters):
Standard Deviations (meters):

dx	-3915.316	dy	-3222.414	dz	-478.576
	0.002012		0.002230		0.002057
dn	-460.341	de	-5070.469	du	145.321
	0.001045		0.000699		0.003416
				dh	147.352
					0.003416

Aposteriori Covariance Matrix:

4.047508E-006			
-4.000738E-006	4.972703E-006		
-3.441560E-006	3.764864E-006	4.230535E-006	

Variance Ratio: 1.8
Reference Variance: 3.057

Observable	Count/Rejected	RMS:	L1 phase	533/0	0.018
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Projeto Mineropar

Processor Controls:

[General]

Process start time:	23/05/97 18:37:00 GPS	(906 499020)
Process stop time:	23/05/97 21:30:30 GPS	(906 509430)
Elevation mask:	15 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:		
Application threshold:	0 kilometers	0 kilometers

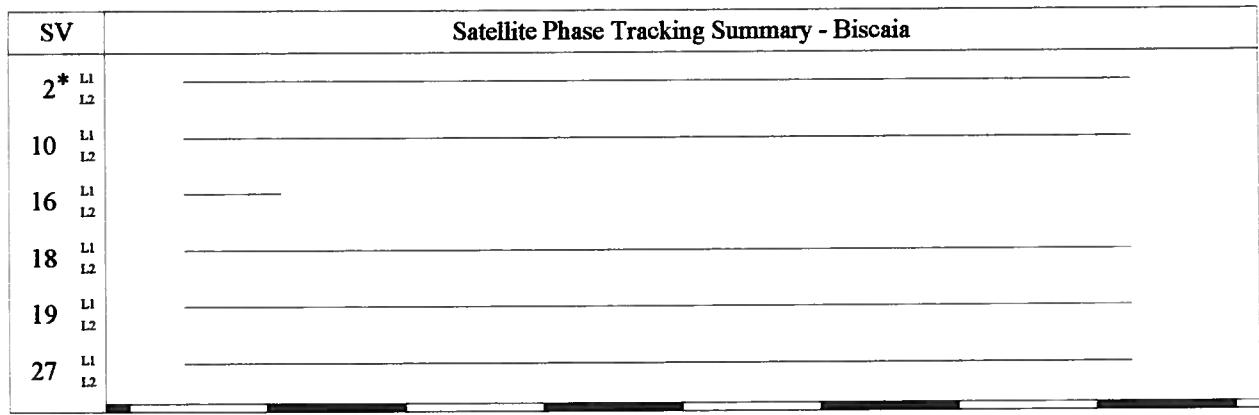
[Final Solution]

Final solution type:	L1 Fixed
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[Satellites]

Disabled:	07 31
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Projeto Mineropar



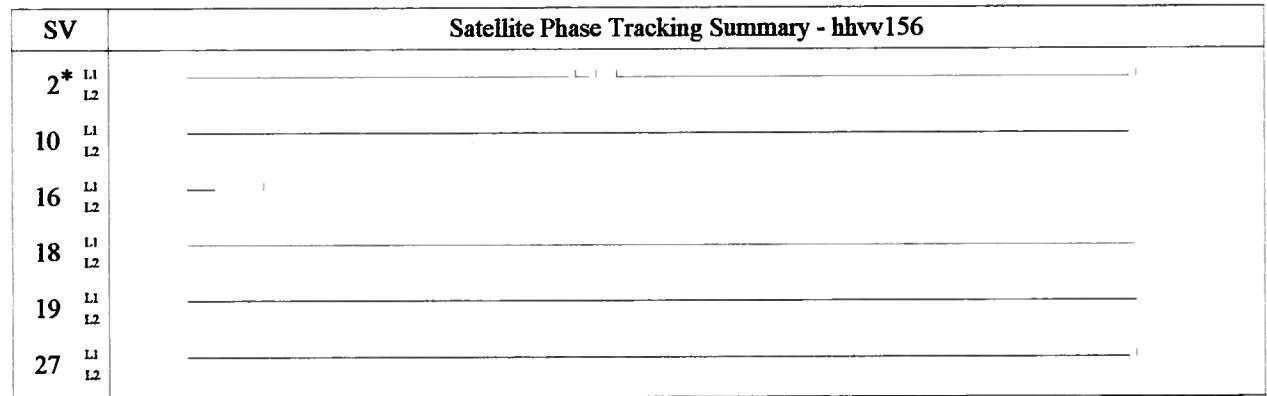
18:35:00 (498900)

5 min. / div.

* Reference SV

Full phase _____

Half phase _____



18:35:00 (498900)

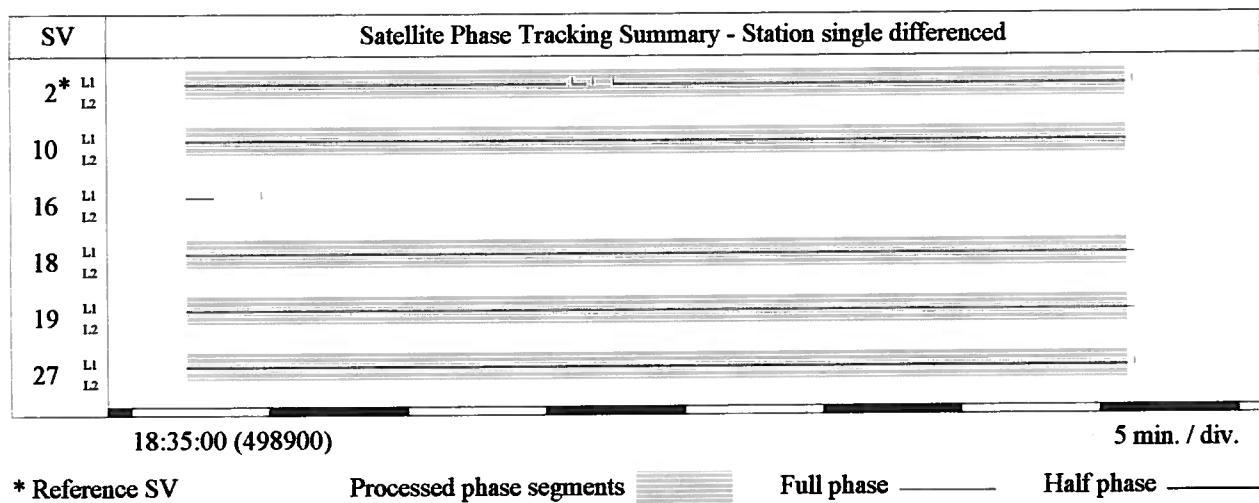
5 min. / div.

* Reference SV

Full phase _____

Half phase _____

Projeto Mineropar



Projeto Mineropar
Project Name: HHVV143
Processed: Monday, 26 de May de 1997 4:34
Solution Output File (SSF): 00000452.SSF **IMPORTED**

From Station: Biscaia
Data file: 97401430.DAT
Antenna Height (meters): 1.732 True Vertical **1.670 Uncorrected**
Position Quality: Fixed Control

WGS 84 Position: 25° 02' 41.813310" S X 3730050.861
49° 49' 49.235850" W Y -4418663.640
706.915 Z -2683885.447

To Station: hhvv200
Data file: 59641433.DAT
Antenna Height (meters): 2.117 True Vertical

WGS 84 Position: 25° 06' 21.083314" S X 3723517.847
49° 53' 33.166378" W Y -4420652.242
893.133 Z -2690076.294

Start Time: 23/05/97 20:38:45,00 GPS (906 506325.00)
Stop Time: 23/05/97 21:09:15,00 GPS (906 508155.00)
Occupation Time Meas. Interval (seconds): 00:30:30,00 15.00

Solution Type: L1 fixed double difference

Ephemeris: Broadcast
Baseline Slope Distance Std. Dev. (meters): 9217.451 0.000403

Normal Section Azimuth: Forward 222° 54' 47.553429"
Vertical Angle: Backward 42° 56' 22.474175"
-1° 06' 58.061501"

Baseline Components (meters): dx -6533.014 dy -1988.602 dz -6190.847
Standard Deviations (meters): 0.000935 0.001250 0.001037

dn -6749.451 de -6274.877 du 179.546
0.000465 0.000377 0.001776

dh 186.218
0.001777

Aposteriori Covariance Matrix:
8.748281E-007 -1.033626E-006 1.563643E-006
-8.791190E-007 1.097333E-006 1.075679E-006

Variance Ratio: 2.7
Reference Variance: 0.369

Observable Count/Rejected RMS: L1 phase 369/0 0.004

Projeto Mineropar

Processor Controls:

[General]

Process start time:	23/05/97 18:35:00 GPS	(906 498900)
Process stop time:	23/05/97 21:30:30 GPS	(906 509430)
Elevation mask:	30 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
Applied to:	None	None
Application threshold:	0 kilometers	0 kilometers

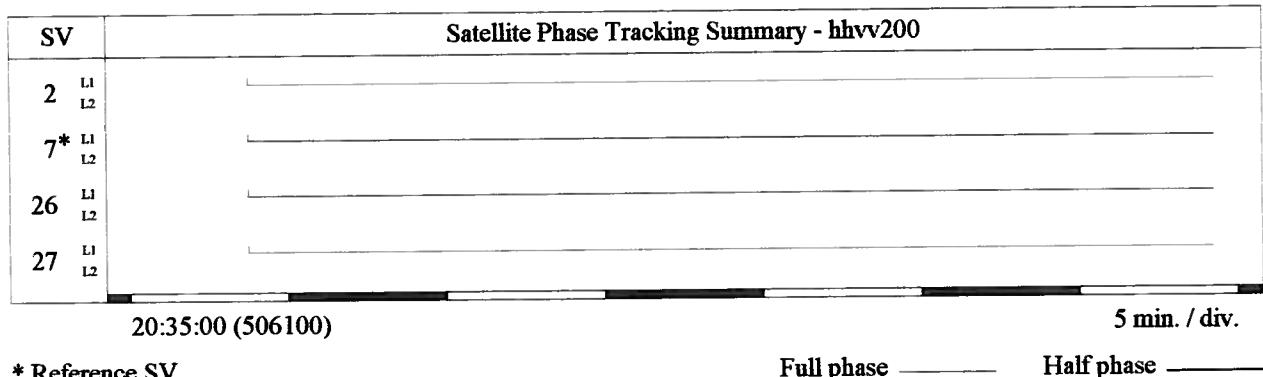
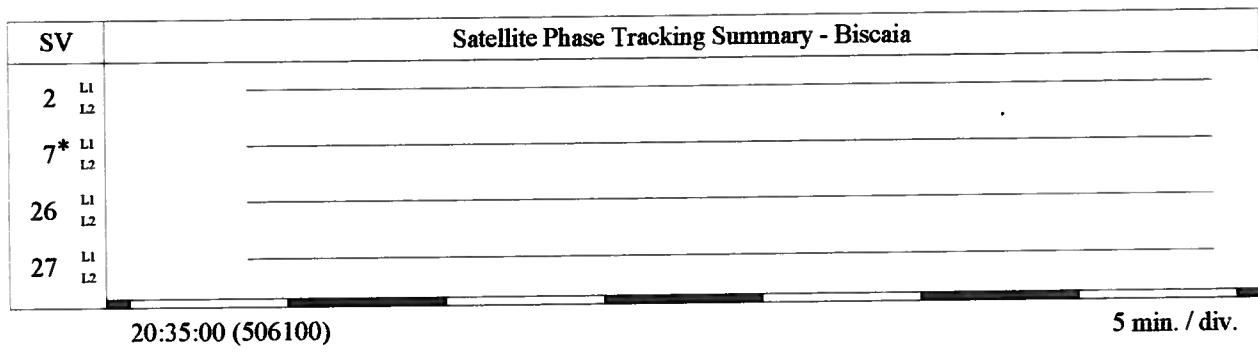
[Final Solution]

Final solution type:	L1 Fixed
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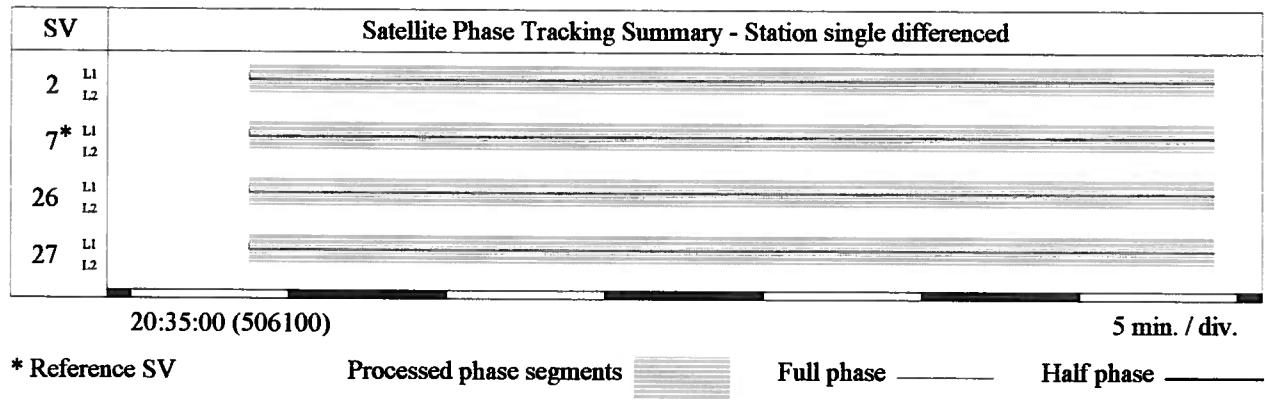
[Satellites]

Disabled:	19
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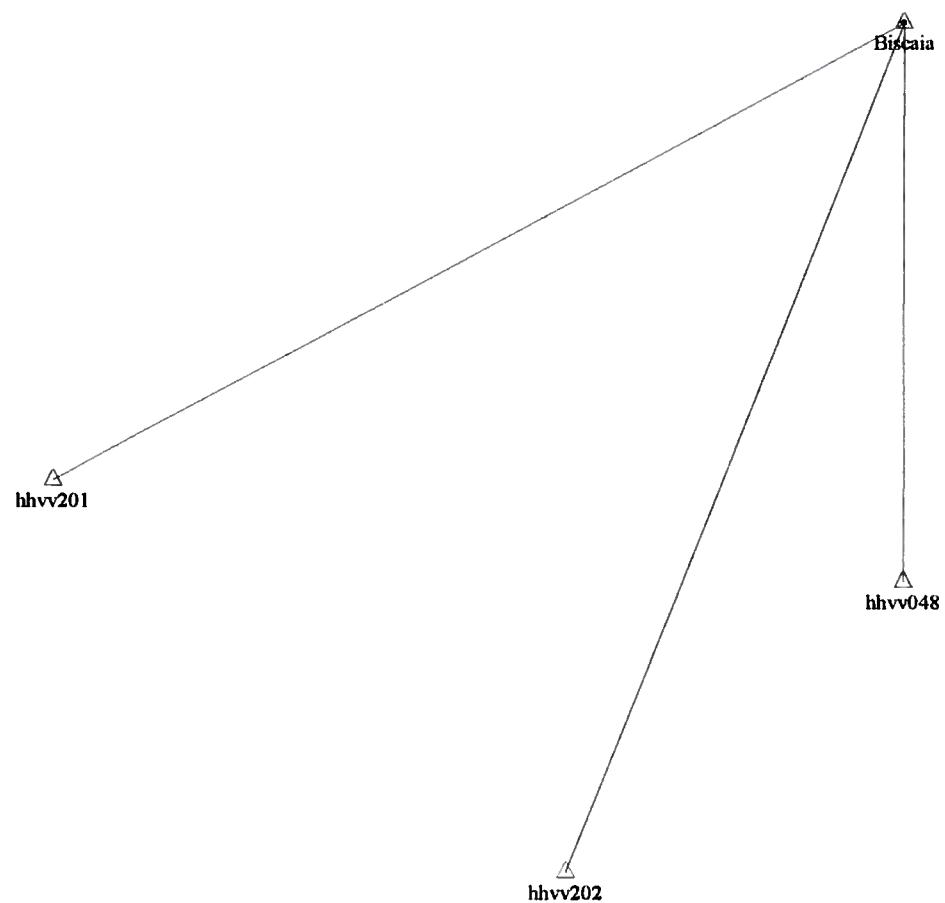
Projeto Mineropar



Projeto Mineropar



Network Map: HHV145



2000m

Projeto Mineropar

Project: IIIIVV145

Supervisor: TopoGeo

Date Created: 04/06/97 21:44:51

Date Last Accessed: 04/06/97 21:56:34

Project Directory: c:\gpsurvey\projects\IIIIVV145

Antenna Type: 4600LS Internal

Antenna Measurement Method: Reading from hook using 4600LS tape

Receiver Type: 4600LS

Coordinate System: Geographic

Zone: WGS84

Linear Unit: Meter

Timezone: CURITIBA : -3:00

Number of Stations: 4

Number of Baselines: 3

No. of Continuous Kinematic Solns: 0

Projeto Mineropar****** Reference Coordinates ******

Station Short Name	Station ID	Latitude	Longitude	Height	Station Quality
hhvv202		25°07'45.84107" S	049°52'02.29245" W	874.58696	Network Adjustment
hhvv201		25°05'25.20009" S	049°55'23.26502" W	846.15663	Network Adjustment
hhvv048		25°06'01.39040" S	049°49'49.95295" W	750.04863	Network Adjustment
Biscaia		25°02'41.81331" S	049°49'49.23585" W	706.91470	Fixed Control

****** Adjusted Coordinates ******

Projection Group: Geographic

Zone Name: Global

Linear Units: meter

Angular Units: degrees

Datum Name: WGS-84

Station Short Name	Station ID	Latitude	Longitude	Ortho. Height	Ellip. Height
Biscaia		25°02'41.81331" S	049°49'49.23585" W	702.90181	706.91470
hhvv048		25°06'01.39040" S	049°49'49.95295" W	745.85479	750.04863
hhvv201		25°05'25.20009" S	049°55'23.26502" W	842.11331	846.15663
hhvv202		25°07'45.84107" S	049°52'02.29245" W	870.34308	874.58696

Projeto Mineropar

From Station Short Name	To Station Short Name	Solution Type	Slope	Ratio	Reference Variance	Entered Ant. Ht. (From)	Entered Ant. Ht. (To)
Biscaia	hhvv048	L1 fixed	6141.985	3.9	0.722	1.521	3.730
Biscaia	hhvv201	L1 fixed	10628.373	2.9	0.966	1.521	3.730
Biscaia	hhvv202	L1 fixed	10073.394	6.0	0.945	1.521	3.730

Projeto Mineropar

**** SSF/SSK Solution Output Files For Selected Baselines ****

.ssf/.ssk Solution Output File	From Station Short Name	To Station Short Name	Solution Type	Slope	Ratio	Reference Variance
00000464.ssf	Biscaia	hhvv048	L1 fixed	6141.985	3.9	0.722
00000468.ssf	Biscaia	hhvv201	L1 fixed	10628.373	2.9	0.966
00000472.ssf	Biscaia	hhvv202	L1 fixed	10073.394	6.0	0.945

Projeto Mineropar
Project Name:
Processed:

Solution Output File (SSF): HHVV145
Monday, 26 de May de 1997 5:00
WAVE 2.10
00000464.SSF IMPORTED

From Station: Biscaia
Data file: 97401450.DAT
Antenna Height (meters): 1.583 True Vertical 1.521 Uncorrected
Position Quality: Fixed Control

WGS 84 Position: 25° 02' 41.813310" S X 3730050.861
49° 49' 49.235850" W Y -4418663.640
706.915 Z -2683885.447

To Station: hhvv048
Data file: 64381450.DAT
Antenna Height (meters): 3.730 True Vertical

WGS 84 Position: 25° 06' 01.390400" S X 3728381.831
49° 49' 49.952949" W Y -4416717.639
750.049 Z -2689466.791

Start Time: 25/05/97 17:42:15,00 GPS (907 63735.00)
Stop Time: 25/05/97 18:11:45,00 GPS (907 65505.00)
Occupation Time Meas. Interval (seconds): 00:29:30,00 15.00

Solution Type: L1 fixed double difference

Ephemeris: Broadcast
Baseline Slope Distance Std. Dev. (meters): 6141.985 0.000344

Normal Section Azimuth: 180° 11' 14.849569" Forward 0° 11' 15.153477" Backward
Vertical Angle: 0° 22' 28.778785"

Baseline Components (meters): dx -1669.030 dy 1946.001 dz -5581.344
Standard Deviations (meters): 0.000720 0.001208 0.000566

dn -6141.821 de -20.095 du 40.163
Standard Deviations (meters): 0.000347 0.000521 0.001381

dh 43.134
Standard Deviations (meters): 0.001381

Aposteriori Covariance Matrix: 5.178021E-007 1.460413E-006 3.199551E-007
-6.482822E-007 5.135721E-007
-2.971646E-007

Variance Ratio: 3.9
Reference Variance: 0.722

Observable Count/Rejected RMS: L1 phase 494/0 0.006

Projeto Mineropar**Processor Controls:****[General]**

Process start time:	25/05/97 14:29:00 GPS	(907 52140)
Process stop time:	25/05/97 18:59:30 GPS	(907 68370)
Elevation mask:	15 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
Applied to:	None	None
Application threshold:	0 kilometers	0 kilometers

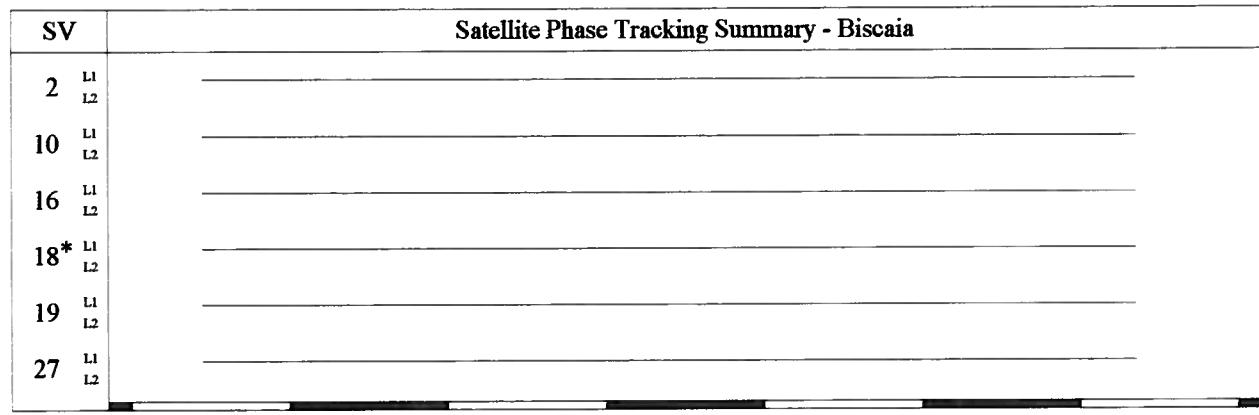
[Final Solution]

Final solution type:	L1 Fixed
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[Satellites]

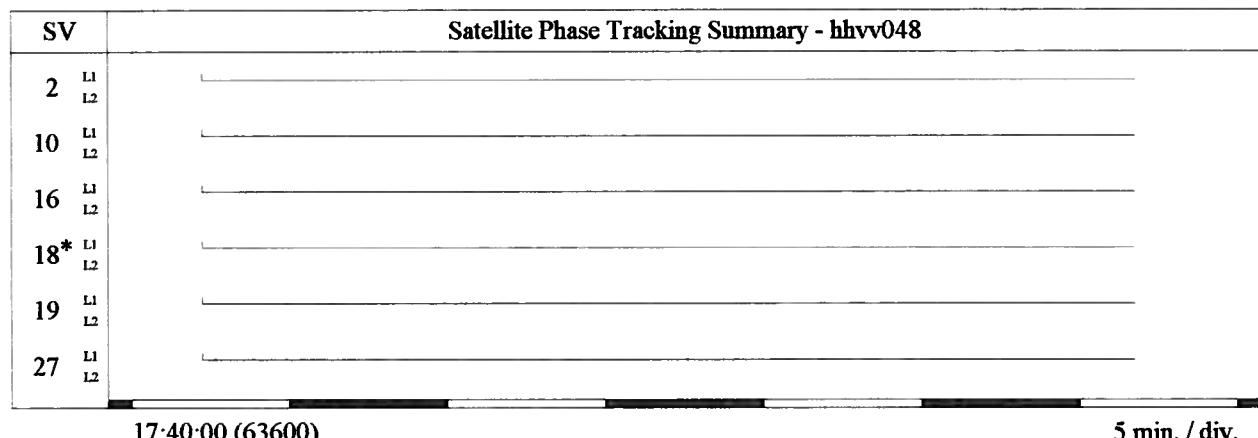
Disabled:	31
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Projeto Mineropar



* Reference SV

Full phase _____ Half phase _____



* Reference SV

Full phase _____ Half phase _____

Projeto Mineropar

Project Name:

Processed:

Solution Output File (SSF):

IIIIVV145

Monday, 26 de May de 1997 5:00

WAVE 2.10

00000468.SSF

IMPORTED

From Station:

Biscaia

Data file:

97401450.DAT

Antenna Height (meters):

1.583 True Vertical

1.521 Uncorrected

Position Quality:

Fixed Control

WGS 84 Position:

25° 02' 41.813310" S

X 3730050.861

49° 49' 49.235850" W

Y -4418663.640

706.915

Z -2683885.447

To Station:

hhvv201

Data file:

59641450.DAT

Antenna Height (meters):

3.730 True Vertical

WGS 84 Position:

25° 05' 25.200088" S

X 3721599.956

49° 55' 23.265017" W

Y -4423164.764

846.157

Z -2688498.947

Start Time:

25/05/97 14:29:00,00 GPS (907 52140.00)

Stop Time:

25/05/97 15:03:00,00 GPS (907 54180.00)

Occupation Time Meas. Interval (seconds):

00:34:00,00 15.00

Solution Type:

L1 fixed double difference

Ephemeris:

Broadcast

Baseline Slope Distance Std. Dev. (meters):

10628.373

0.001070

Normal Section Azimuth:

Forward

Backward

241° 44' 34.961745"

61° 46' 56.496272"

Vertical Angle:

0° 42' 10.413191"

-0° 47' 54.275095"

Baseline Components (meters):

dx -8450.905 dy -4501.124 dz -4613.500

Standard Deviations (meters):

0.001772 0.003928 0.001479

dn -5031.376 de -9361.120 du 130.383
0.000655 0.001341 0.004304

dh 139.242
0.004306

Aposteriori Covariance Matrix:

3.140989E-006 -6.546353E-006 1.542695E-005
-6.546353E-006 5.473574E-006 2.188805E-006

Variance Ratio:

2.9

Reference Variance:

0.966

Observable Count/Rejected RMS:

L1 phase

439/0

0.007

Projeto Mineropar

Processor Controls:

[General]

Process start time:	25/05/97 14:21:30 GPS	(907 51690)
Process stop time:	25/05/97 18:59:30 GPS	(907 68370)
Elevation mask:	30 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Ilopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
Applied to:	None	None
Application threshold:	0 kilometers	0 kilometers

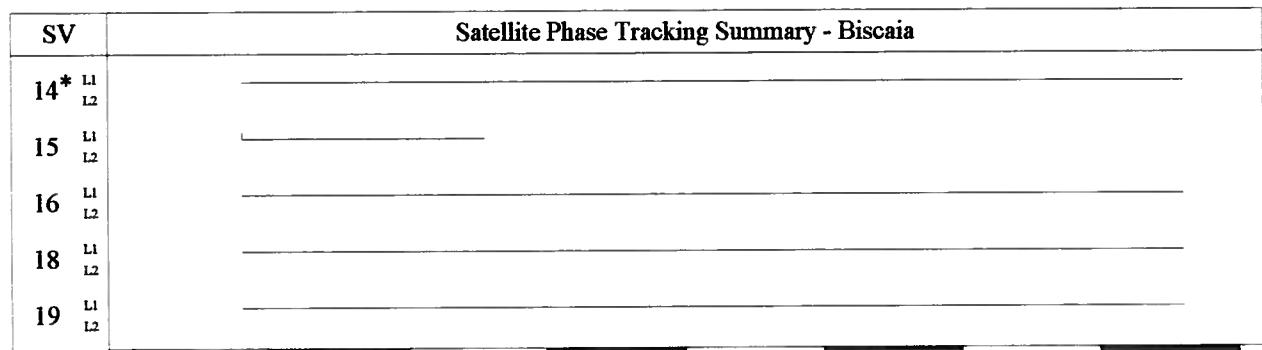
[Final Solution]

Final solution type:	L1 Fixed
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[Satellites]

Disabled:

Projeto Mineropar



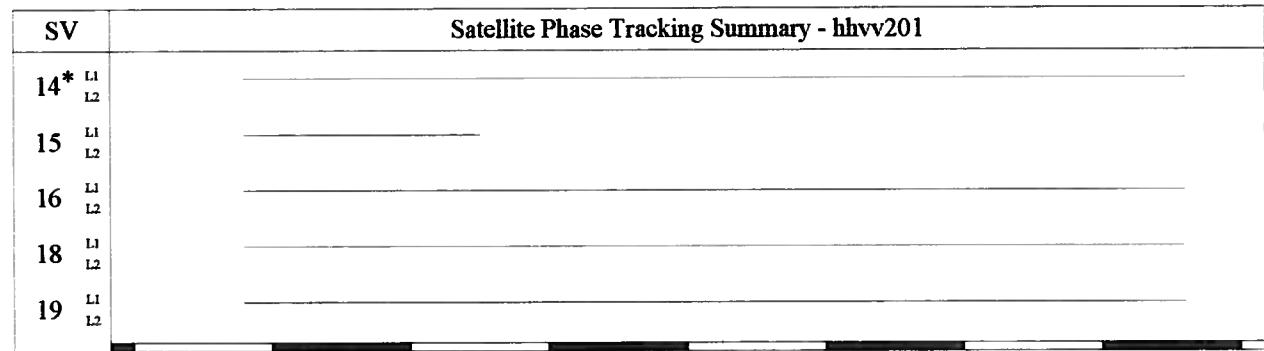
14:25:00 (51900)

5 min. / div.

* Reference SV

Full phase _____

Half phase _____



14:25:00 (51900)

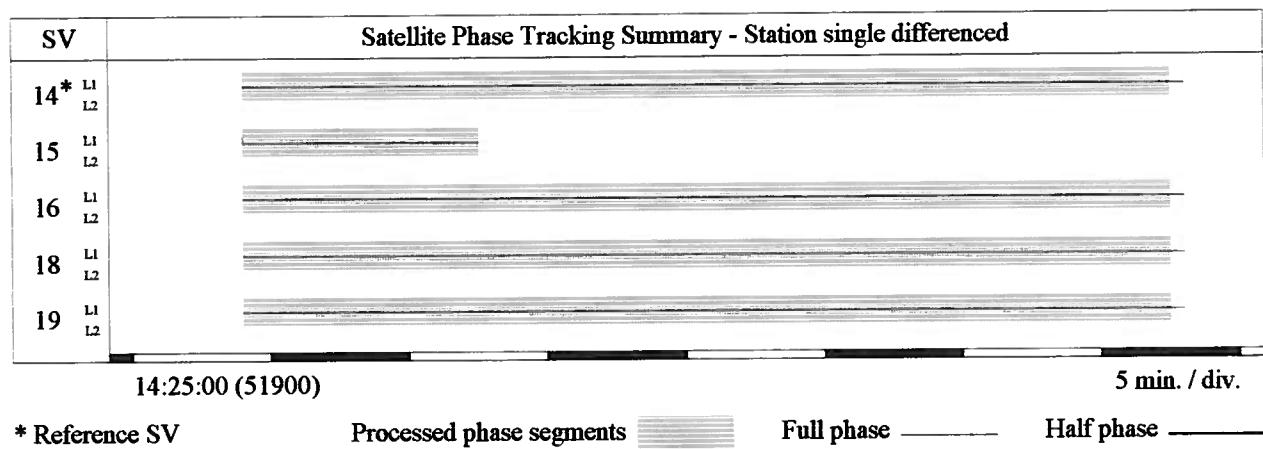
5 min. / div.

* Reference SV

Full phase _____

Half phase _____

Projeto Mineropar



Projeto Mineropar
Project Name:
Processed:
Solution Output File (SSF): HHVV145
From Station: Biscaia
Data file: 97401450.DAT
Antenna Height (meters): 1.583 True Vertical 1.521 Uncorrected
Position Quality: Fixed Control

WGS 84 Position:	25° 02' 41.813310" S 49° 49' 49.235850" W 706.915	X 3730050.861 Y -4418663.640 Z -2683885.447			
To Station:	hhvv202				
Data file:	59641451.DAT				
Antenna Height (meters):	3.730 True Vertical				
WGS 84 Position:	25° 07' 45.841066" S 49° 52' 02.292446" W 874.587	X 3724740.597 Y -4418151.980 Z -2692430.186			
Start Time:	25/05/97 15:56:45,00 GPS	(907 57405.00)			
Stop Time:	25/05/97 16:28:00,00 GPS	(907 59280.00)			
Occupation Time	Meas. Interval (seconds):	00:31:15,00 15.00			
Solution Type:	L1 fixed double difference				
Ephemeris:	Broadcast				
Baseline Slope Distance	Std. Dev. (meters):	10073.394 0.000539			
Normal Section Azimuth:	Forward	Backward			
Vertical Angle:	201° 43' 19.102189" 0° 54' 29.928587"	21° 44' 15.528064" -0° 59' 56.966554"			
Baseline Components (meters):	dx -5310.264 dy 0.001064	dz 511.660 0.001462	dz -8544.739 0.000731		
Standard Deviations (meters):	dn -9356.913 de 0.000662	du -3727.725 0.000663	du 159.687 0.001711		
			dh 167.672 0.001711		
Aposteriori Covariance Matrix:	1.132029E-006 -1.126960E-006 -4.868692E-007	2.138628E-006 4.550287E-007	5.345754E-007		
Variance Ratio:	6.0				
Reference Variance:	0.945				
Observable	Count/Rejected	RMS:	L1 phase	426/0	0.007

Projeto Mineropar

Processor Controls:

[General]

Process start time:	25/05/97 14:29:00 GPS	(907 52140)
Process stop time:	25/05/97 18:59:30 GPS	(907 68370)
Elevation mask:	30 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
Applied to:	None	None
Application threshold:	0 kilometers	0 kilometers

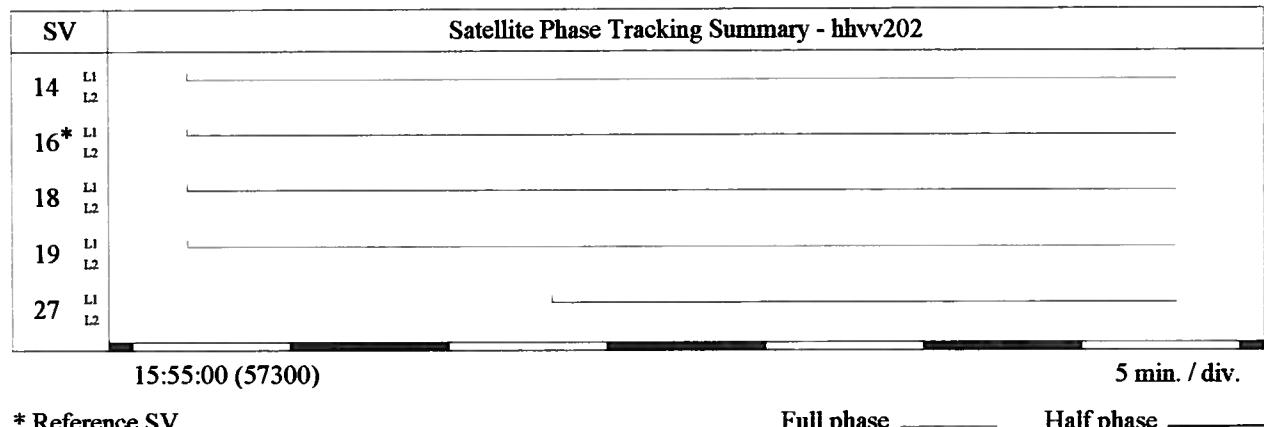
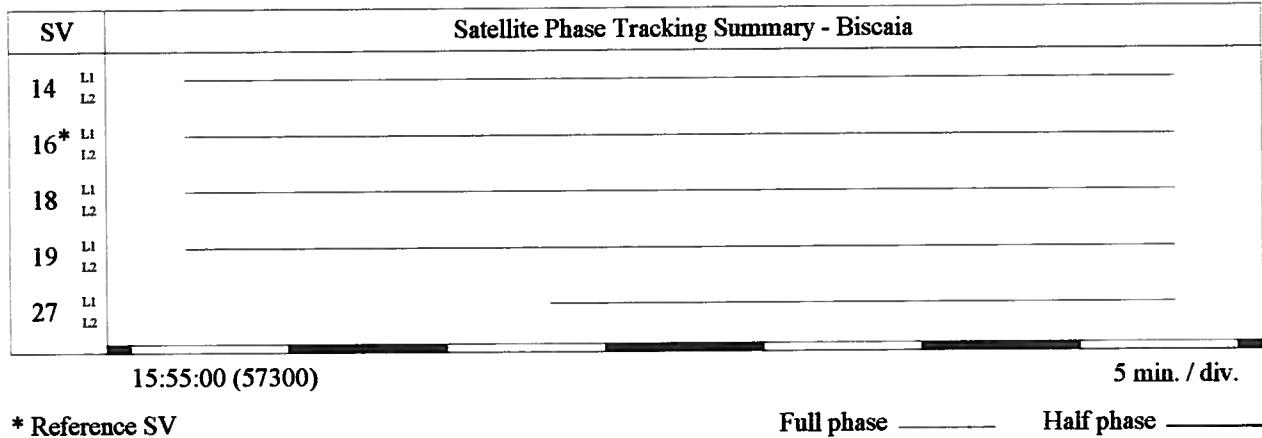
[Final Solution]

Final solution type:	L1 Fixed
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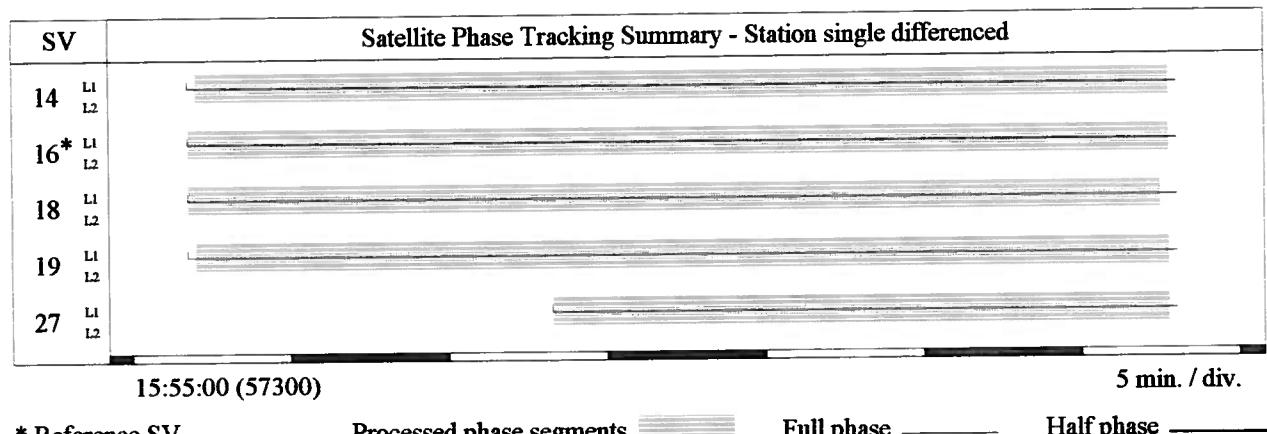
[Satellites]

Disabled:

Projeto Mineropar

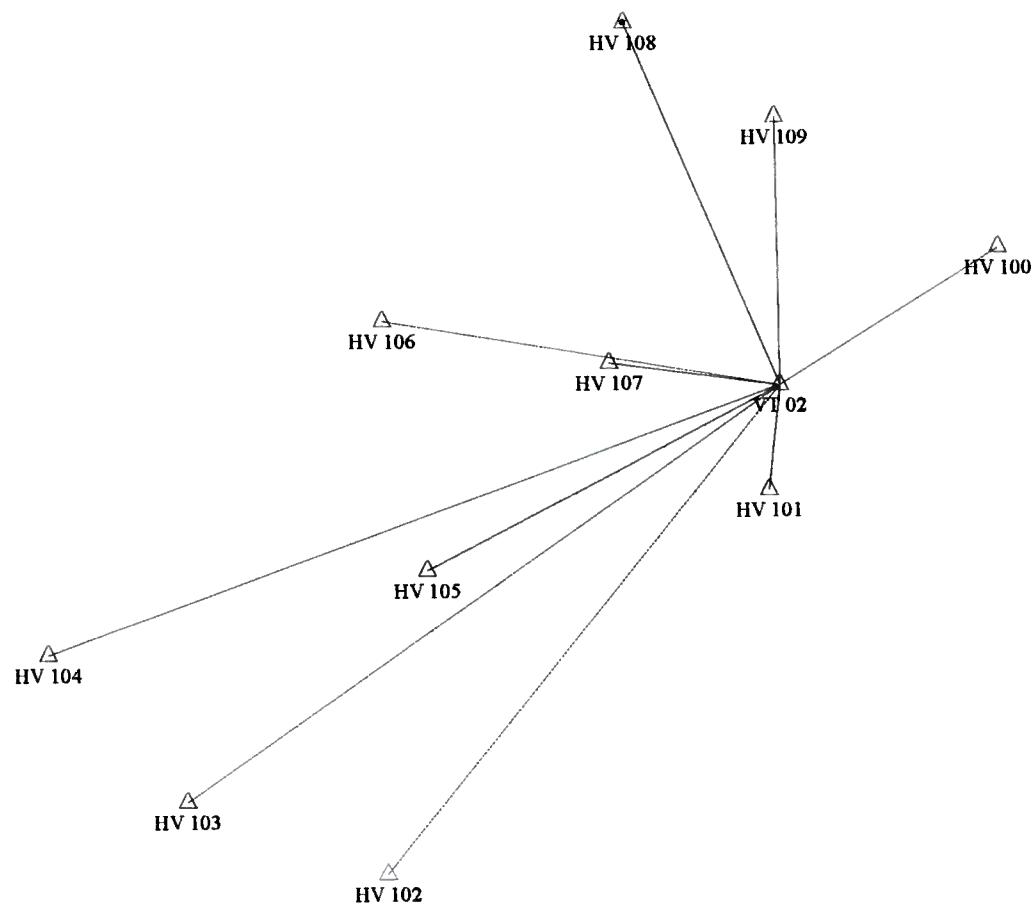


Projeto Mineropar



***** End of Report *****

Network Map: HHVV147



2000m

Projeto Mineropar

Project:	I III IVV147
Supervisor:	TopoGeo
Date Created:	28/05/97 19:18:12
Date Last Accessed:	05/06/97 16:24:59
Project Directory:	c:\gpsurvey\projects\I III IVV147
Antenna Type:	4600LS Internal
Antenna Measurement Method:	Reading from hook using 4600LS tape
Receiver Type:	4600LS
Coordinate System:	Geographic
Zone:	WGS84
Linear Unit:	Meter
Timezone:	CURITIBA : -3:00
Number of Stations:	11
Number of Baselines:	10
No. of Continuous Kinematic Solns:	0

Projeto Mineropar

**** Reference Coordinates ****

Station Short Name	Station ID	Latitude	Longitude	Height	Station Quality
HV 102	HV 102	24°51'35.01673" S	049°40'44.89978" W	811.94429	Network Adjustment
IIV 103	IIV 103	24°50'54.08892" S	049°42'47.48356" W	909.97259	Network Adjustment
HV 104	HV 104	24°49'31.00885" S	049°44'11.93191" W	983.85284	Network Adjustment
VT 02	VT 02	24°47'02.10892" S	049°36'41.96715" W	913.99170	Fixed Control
HV 108	HV 108	24°43'38.86181" S	049°38'16.12155" W	949.22089	Network Adjustment
IIV 109	IIV 109	24°44'31.75392" S	049°36'44.03196" W	936.73699	Network Adjustment
HV 105	HV 105	24°48'44.90085" S	049°40'19.17764" W	856.04883	Network Adjustment
HV 106	HV 106	24°46'24.94983" S	049°40'45.31325" W	1043.95701	Network Adjustment
HV 107	HV 107	24°46'49.35182" S	049°38'26.74166" W	903.75375	Network Adjustment
IIV 101	IIV 101	24°48'00.56658" S	049°36'48.91132" W	893.83419	Network Adjustment
HV 100	HV 100	24°45'45.89591" S	049°34'27.79875" W	871.15843	Network Adjustment

**** Adjusted Coordinates ****

Projection Group: Geographic

Zone Name: Global

Linear Units: meter

Angular Units: degrees

Datum Name: WGS-84

Station Short Name	Station ID	Latitude	Longitude	Ortho. Height	Ellip. Height
HV 100	HV 100	24°45'45.89591" S	049°34'27.79875" W	868.00068	871.15843
HV 101	HV 101	24°48'00.56658" S	049°36'48.91132" W	890.52445	893.83419
HV 102	HV 102	24°51'35.01673" S	049°40'44.89978" W	808.42855	811.94429
HV 103	HV 103	24°50'54.08892" S	049°42'47.48356" W	906.50386	909.97259
HV 104	HV 104	24°49'31.00885" S	049°44'11.93191" W	980.47460	983.85284
HV 105	HV 105	24°48'44.90085" S	049°40'19.17764" W	852.68428	856.04883
HV 106	HV 106	24°46'24.94983" S	049°40'45.31325" W	1040.72058	1043.95701
HV 107	HV 107	24°46'49.35182" S	049°38'26.74166" W	900.49597	903.75375
HV 108	HV 108	24°43'38.86181" S	049°38'16.12155" W	946.13199	949.22089
HV 109	HV 109	24°44'31.75392" S	049°36'44.03196" W	933.61330	936.73699
VT 02	VT 02	24°47'02.10892" S	049°36'41.96715" W	910.73510	913.99170

Projeto Mineropar

From Station Short Name	To Station Short Name	Solution Type	Slope	Ratio	Reference Variance	Entered Ant. Ht. (From)	Entered Ant. Ht. (To)
VT 02	HV 100	L1 fixed	4439.956	3.2	1.440	1.415	3.707
VT 02	HV 101	L1 fixed	1809.621	8.2	0.507	1.415	2.987
VT 02	HV 102	L1 fixed	10821.087	4.2	2.057	1.465	3.743
VT 02	IIV 103	L1 fixed	12504.501	1.7	6.927	1.465	3.737
VT 02	HV 104	L1 fixed	13444.689	2.1	5.190	1.465	2.672
VT 02	HV 105	L1 fixed	6873.178	2.5	1.146	1.415	3.742
VT 02	HV 106	L1 fixed	6933.243	8.3	1.055	1.415	3.738
VT 02	IIV 107	L1 fixed	2969.714	14.0	0.910	1.415	3.727
VT 02	HV 108	L1 fixed	6791.365	9.1	0.562	1.415	3.737
VT 02	HV 109	L1 fixed	4627.408	1.9	1.980	1.415	3.737

Projeto Mineropar

**** SSF/SSK Solution Output Files For Selected Baselines ****

.ssf/.ssk Solution Output File	From Station Short Name	To Station Short Name	Solution Type	Slope	Ratio	Reference Variance
00000476.ssf	VT 02	HV 100	L1 fixed	4439.956	3.2	1.440
00000480.ssf	VT 02	IIV 101	L1 fixed	1809.621	8.2	0.507
00000484.ssf	VT 02	HV 102	L1 fixed	10821.087	4.2	2.057
00000488.ssf	VT 02	HV 103	L1 fixed	12504.501	1.7	6.927
00000492.ssf	VT 02	HV 104	L1 fixed	13444.689	2.1	5.190
00000496.ssf	VT 02	IIV 105	L1 fixed	6873.178	2.5	1.146
00000500.ssf	VT 02	HV 106	L1 fixed	6933.243	8.3	1.055
00000504.ssf	VT 02	HV 107	L1 fixed	2969.714	14.0	0.910
00000508.ssf	VT 02	HV 108	L1 fixed	6791.365	9.1	0.562
00000512.ssf	VT 02	IIV 109	L1 fixed	4627.408	1.9	1.980

Projeto Mineropar

Project Name:

Processed:

Solution Output File (SSF):

IIIIVV147

Wednesday, 04 de June de 1997 23:02

WAVE 2.10

00000476.SSF

From Station:

VT 02

Data file:

97401470.DAT

Antenna Height (meters):

1.477 True Vertical

1.415 Uncorrected

Position Quality:

Fixed Control

WGS 84 Position:

24° 47' 02.108917" S

X 3754904.099

49° 36' 41.967146" W

Y -4413816.573

913.992

Z -2657745.604

To Station:

HV 100

Data file:

64381470.DAT

Antenna Height (meters):

3.707 True Vertical

WGS 84 Position:

24° 45' 45.895911" S

X 3758386.414

49° 34' 27.798753" W

Y -4412091.727

871.158

Z -2655598.141

Start Time:

27/05/97 12:55:00,00 GPS

(907 219300.00)

Stop Time:

27/05/97 13:27:45,00 GPS

(907 221265.00)

Occupation Time Meas. Interval (seconds):

00:32:45,00

15.00

Solution Type:

L1 fixed double difference

Solution Acceptability:

Passed ratio test

Ephemeris:

Broadcast

Baseline Slope Distance Std. Dev. (meters):

4439.956

0.000768

Normal Section Azimuth:

Forward

Backward

58° 07' 10.930168"

238° 06' 14.706195"

Vertical Angle:

-0° 34' 21.762378"

0° 31' 58.065806"

Baseline Components (meters):

dx 3482.315 dy 1724.846 dz 2147.463

Standard Deviations (meters):

0.000674 0.001181 0.001069

dn 2344.830 de 3770.015 du -44.380
0.000699 0.000610 0.001460

dh -42.833
0.001460

Aposteriori Covariance Matrix:

4.549284E-007 1.395308E-006 1.143828E-006
-4.837484E-007 9.658230E-007
-3.116948E-007

Variance Ratio Cutoff:

3.2 1.5

Reference Variance:

1.440

Observable Count/Rejected RMS: L1 phase 527/0 0.009

Projeto Mineropar

Processor Controls:

[General]

Process start time:	27/05/97 12:55:00 GPS	(907 219300)
Process stop time:	27/05/97 13:27:45 GPS	(907 221265)
Elevation mask:	15 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:		
Application threshold:	0 kilometers	0 kilometers

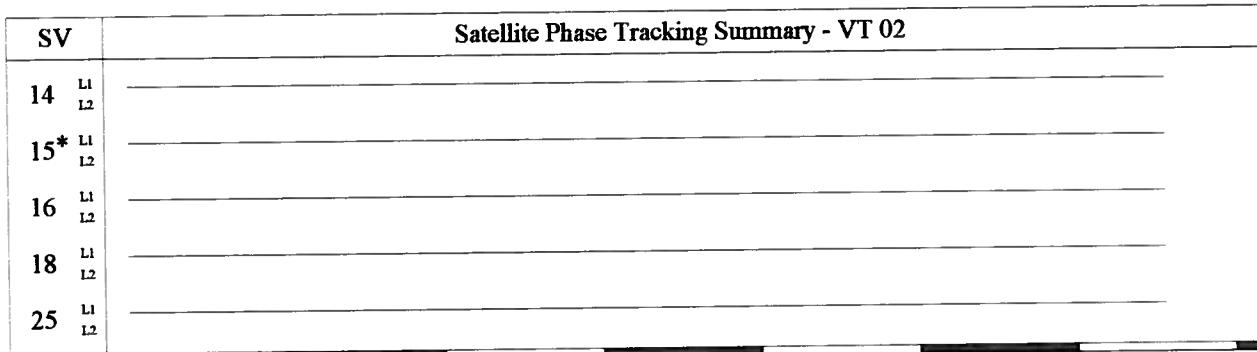
[Final Solution]

Final solution type:	L1 Fixed
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[Satellites]

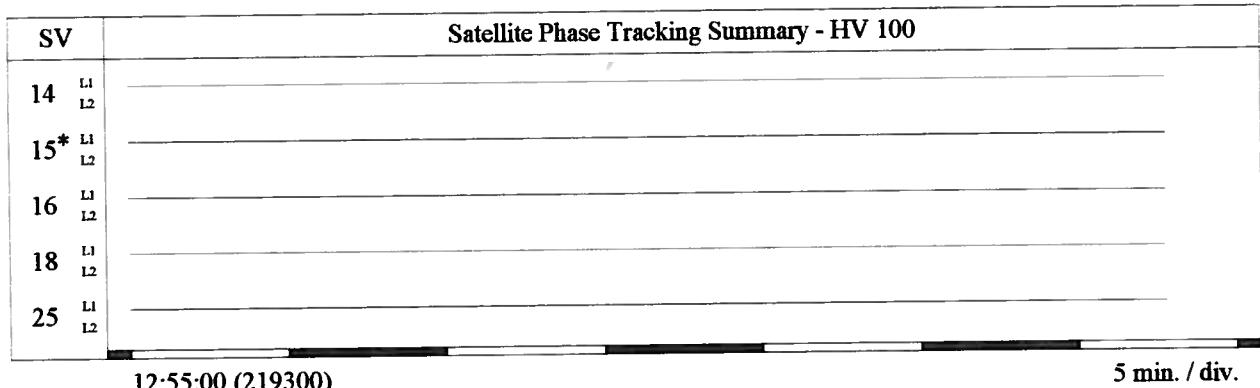
Disabled:	22
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Projeto Mineropar



* Reference SV

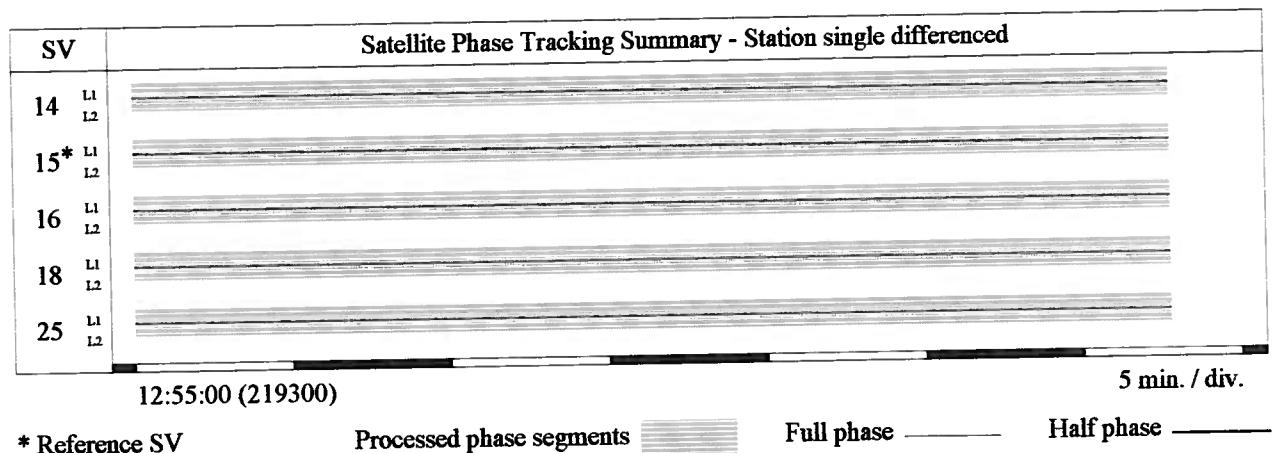
Full phase _____ Half phase _____



* Reference SV

Full phase _____ Half phase _____

Projeto Mineropar



Projeto Mineropar

Project Name:
Processed:

IIIIVV147
Wednesday, 04 de June de 1997 23:18
WAVE 2.10
00000480.SSF

Solution Output File (SSF):**From Station:****Data file:****Antenna Height (meters):****Position Quality:**

VT 02

97401470.DAT

1.477 True Vertical

1.415 Uncorrected

Fixed Control

WGS 84 Position:

24° 47' 02.108917" S
49° 36' 41.967146" W
913.992

X 3754904.099
Y -4413816.573
Z -2657745.604

To Station:**Data file:****Antenna Height (meters):**

HV 101

64381471.DAT

2.987 True Vertical

WGS 84 Position:

24° 48' 00.566576" S
49° 36' 48.911316" W
893.834

X 3754254.869
Y -4413354.462
Z -2659370.314

Start Time:

27/05/97 13:55:30,00 GPS (907 222930.00)

Stop Time:

27/05/97 14:33:30,00 GPS (907 225210.00)

Occupation Time Meas. Interval (seconds):

00:38:00,00 15.00

Solution Type:

L1 fixed double difference

Solution Acceptability:

Passed ratio test

Ephemeris:

Broadcast

Baseline Slope Distance Std. Dev. (meters):

1809.621 0.000274

Normal Section Azimuth:

Forward

Backward

186° 11' 18.938183"

6° 11' 21.849666"

Vertical Angle:

-0° 38' 47.044745"

0° 37' 48.248153"

Baseline Components (meters):

dx -649.230 dy 462.111 dz -1624.710

Standard Deviations (meters):

0.000579 0.000662 0.000340

dn	-1798.961	de	-195.067	du	-20.415
	0.000269		0.000237		0.000872

dh	-20.158
	0.000872

Aposteriori Covariance Matrix:

3.347297E-007	4.386788E-007	1.154527E-007
-3.262673E-007		
-1.268526E-007	1.483275E-007	

Variance Ratio Cutoff:

8.2 1.5

Reference Variance:

0.507

Observable Count/Rejected RMS:

L1 phase 746/0 0.005

Projeto Mineropar

Processor Controls:

[General]

Process start time:	27/05/97 13:55:30 GPS	(907 222930)
Process stop time:	27/05/97 14:33:30 GPS	(907 225210)
Elevation mask:	15 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:		
Application threshold:	0 kilometers	0 kilometers

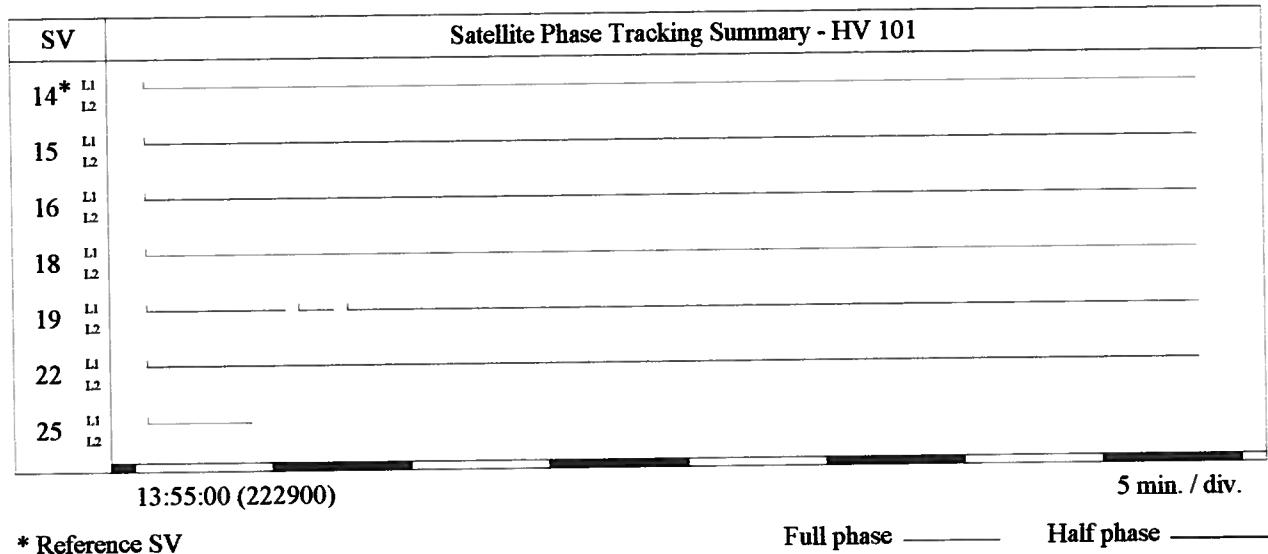
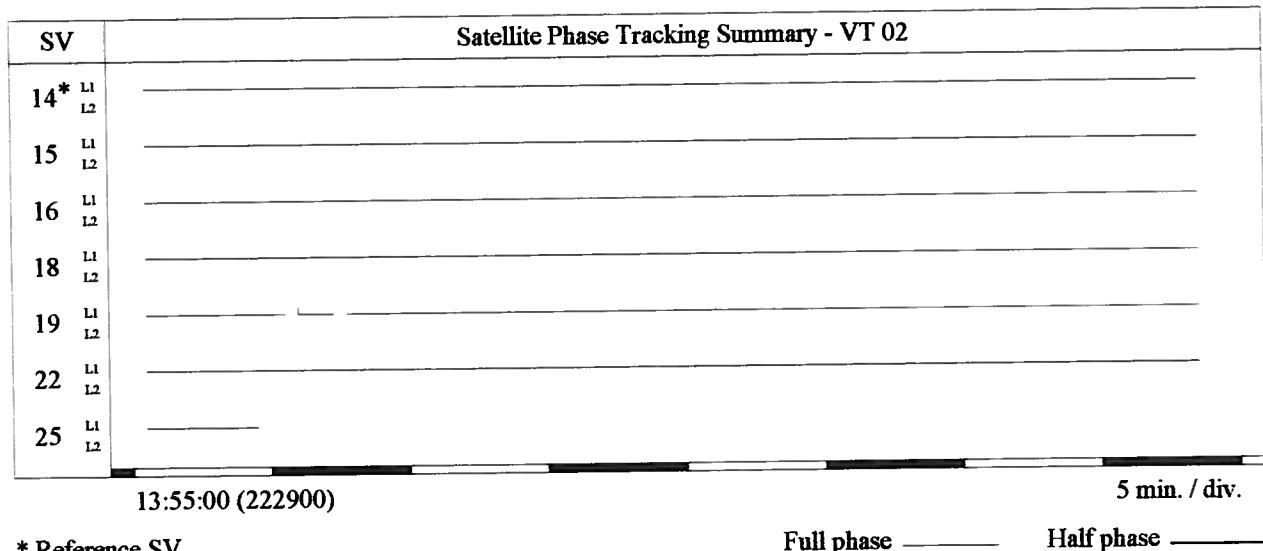
[Final Solution]

Final solution type:	L1 Fixed
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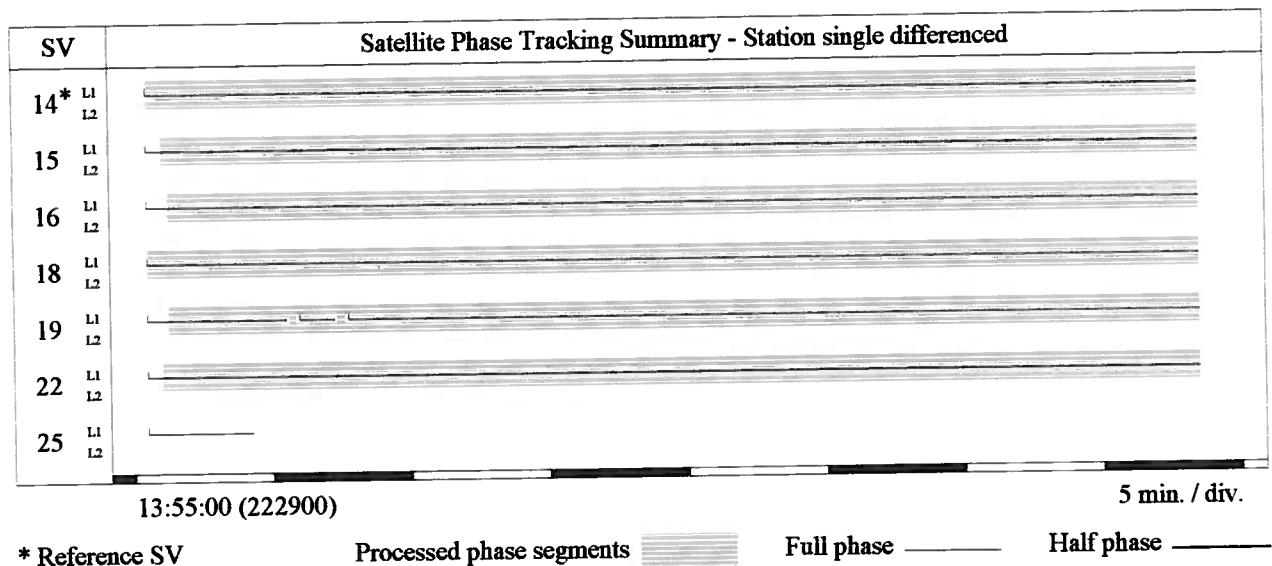
[Satellites]

Disabled:

Projeto Mineropar



Projeto Mineropar



Projeto Mineropar

Project Name:

Processed:

Solution Output File (SSF):

IIIIVV147

Wednesday, 04 de June de 1997 23:30

WAVE 2.10

00000484.SSF

From Station:

VT 02

Data file:

97401480.DAT

Antenna Height (meters):

1.527 True Vertical

Position Quality:

1.465 Uncorrected

Fixed Control

WGS 84 Position:

24° 47' 02.108917" S

X 3754904.099

49° 36' 41.967146" W

Y -4413816.573

913.992

Z -2657745.604

To Station:

HV 102

Data file:

64381482.DAT

Antenna Height (meters):

3.743 True Vertical

WGS 84 Position:

24° 51' 35.016731" S

X 3747361.786

49° 40' 44.899781" W

Y -4415477.260

811.944

Z -2665325.284

Start Time:

28/05/97 15:22:15,00 GPS (907 314535.00)

Stop Time:

28/05/97 16:05:00,00 GPS (907 317100.00)

Occupation Time Meas. Interval (seconds):

00:42:45,00 15.00

Solution Type:

L1 fixed double difference

Solution Acceptability:

Passed ratio test

Ephemeris:

Broadcast

Baseline Slope Distance Std. Dev. (meters):

10821.087 0.000618

Normal Section Azimuth:

Forward

Backward

219° 04' 36.133009"

39° 06' 18.106670"

-0° 35' 20.616048"

0° 29' 29.769106"

Vertical Angle:

dx -7542.313 dy -1660.687 dz -7579.680

0.000822 0.001696 0.001034

dn -8399.996 de -6820.822 du -111.250

0.000940 0.000870 0.001727

dh -102.047

0.001727

Aposteriori Covariance Matrix:

6.757935E-007

-8.535728E-007

-4.628429E-007

2.877176E-006

4.495241E-007

1.068275E-006

Variance Ratio Cutoff:

4.2

1.5

Reference Variance:

2.057

Observable Count/Rejected RMS:

L1 phase

680/0

0.012

Projeto Mineropar**Processor Controls:****[General]**

Process start time:	28/05/97 15:22:15 GPS	(907 314535)
Process stop time:	28/05/97 16:05:00 GPS	(907 317100)
Elevation mask:	20 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:	0 kilometers	0 kilometers
Application threshold:		

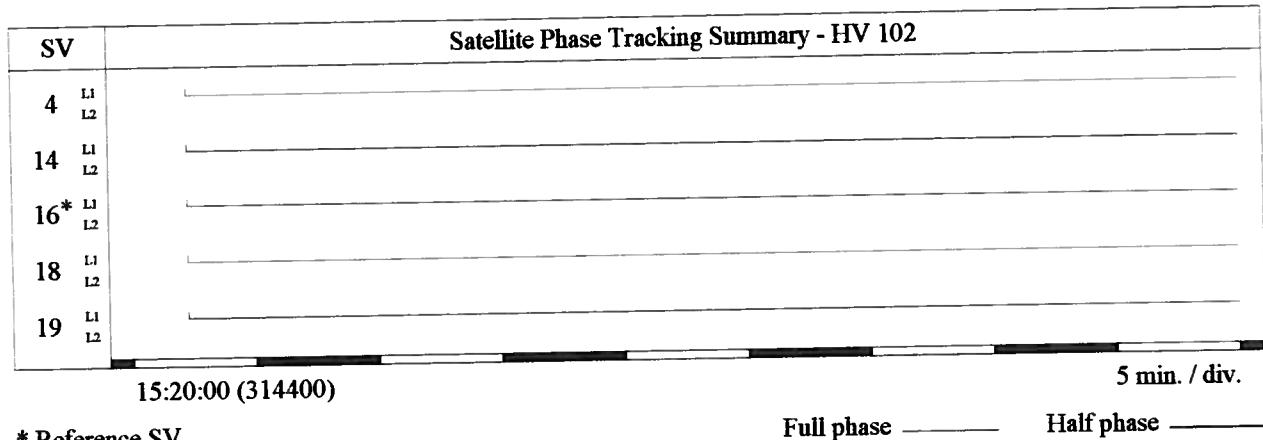
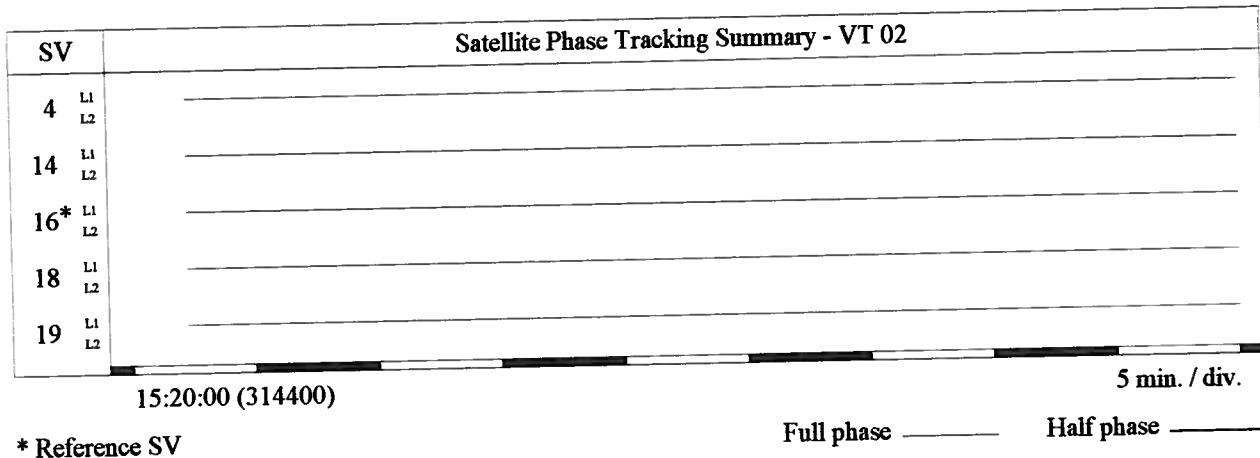
[Final Solution]

Final solution type:	L1 Fixed
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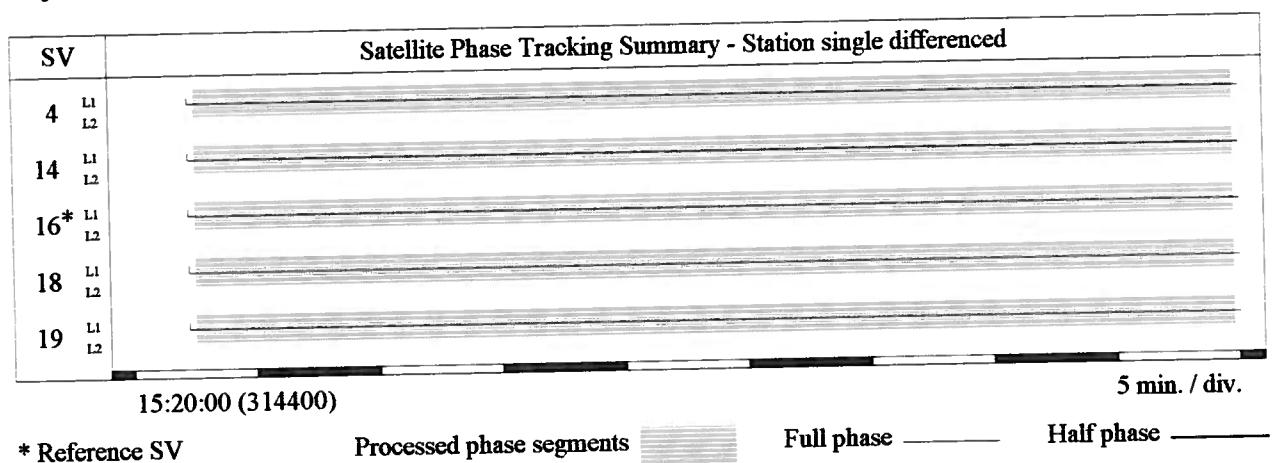
[Satellites]

Disabled:	22 27
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Projeto Mineropar



Projeto Mineropar



Projeto Mineropar

Project Name:

Processed:

Solution Output File (SSF):

IIVV147

Wednesday, 04 de June de 1997 23:34

WAVE 2.10

00000488.SSF

From Station:

VT 02

Data file:

97401480.DAT

Antenna Height (meters):

1.527 True Vertical

Position Quality:

1.465 Uncorrected

Fixed Control

WGS 84 Position:

24° 47' 02.108917" S

X 3754904.099

49° 36' 41.967146" W

Y -4413816.573

913.992

Z -2657745.604

To Station:

HV 103

Data file:

64381481.DAT

Antenna Height (meters):

3.737 True Vertical

WGS 84 Position:

24° 50' 54.088918" S

X 3745136.813

49° 42' 47.483556" W

Y -4418175.221

909.973

Z -2664223.635

Start Time:

28/05/97 14:24:00,00 GPS (907 311040.00)

Stop Time:

28/05/97 15:01:30,00 GPS (907 313290.00)

Occupation Time Meas. Interval (seconds):

00:37:30,00 15.00

Solution Type:

L1 fixed double difference

Solution Acceptability:

Passed ratio test

Ephemeris:

Broadcast

Baseline Slope Distance Std. Dev. (meters):

12504.501 0.001128

Normal Section Azimuth:

Forward

Backward

235° 09' 54.272316"

55° 12' 27.682109"

-0° 04' 28.707698"

-0° 02' 16.114716"

Vertical Angle:

	dx	dy	dz	dy	dz
Baseline Components (meters):	-9767.285 0.002190	-4358.647 0.002157	-6478.030 0.001518		
Standard Deviations (meters):	dn -7142.740 0.001215	de -10263.701 0.000968	du -16.290 0.003056		
			dh -4.019 0.003055		

Aposteriori Covariance Matrix:

4.796156E-006	4.652824E-006	2.303793E-006
-3.848376E-006	1.833221E-006	
-1.734991E-006		

Variance Ratio Cutoff:

1.7 1.5

Reference Variance:

6.927

Observable	Count/Rejected	RMS:	L1 phase	646/0	0.018
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Projeto Mineropar

Processor Controls:

[General]

Process start time:	28/05/97 14:24:00 GPS	(907 311040)
Process stop time:	28/05/97 15:01:30 GPS	(907 313290)
Elevation mask:	25 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:	0 kilometers	0 kilometers
Application threshold:		

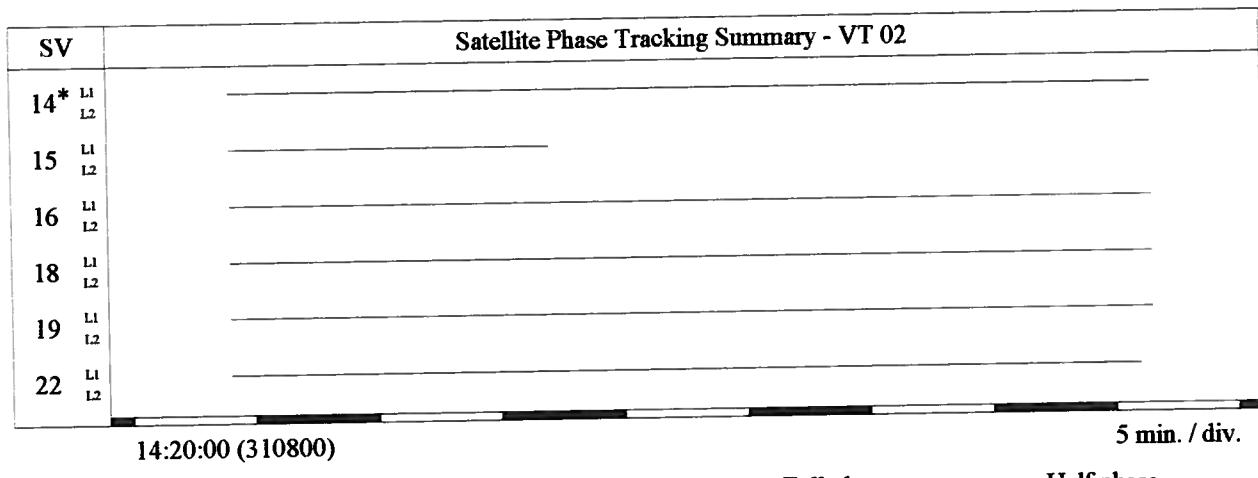
[Final Solution]

Final solution type:	L1 Fixed
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[Satellites]

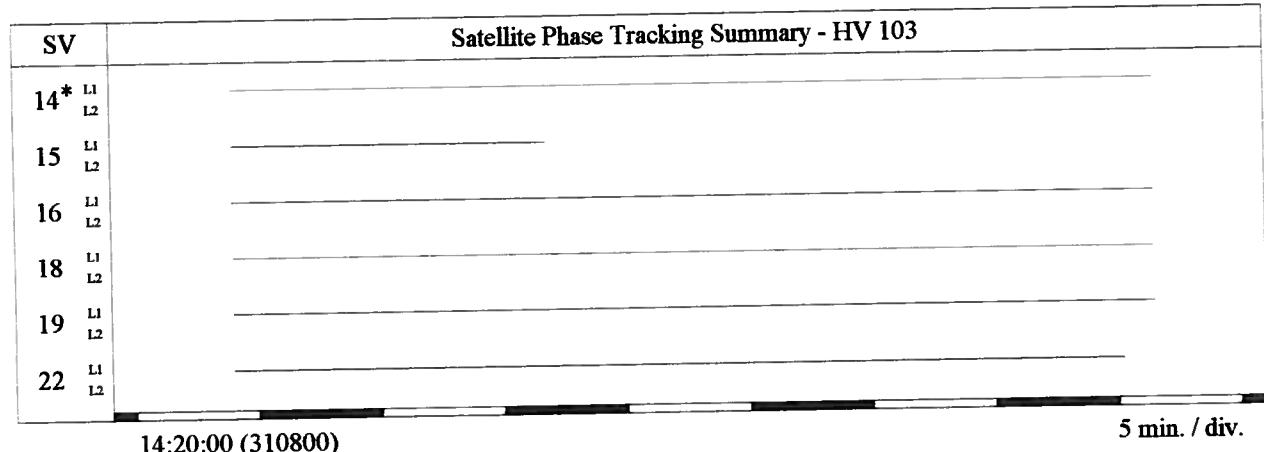
Disabled:	04 25 27 31
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Projeto Mineropar



* Reference SV

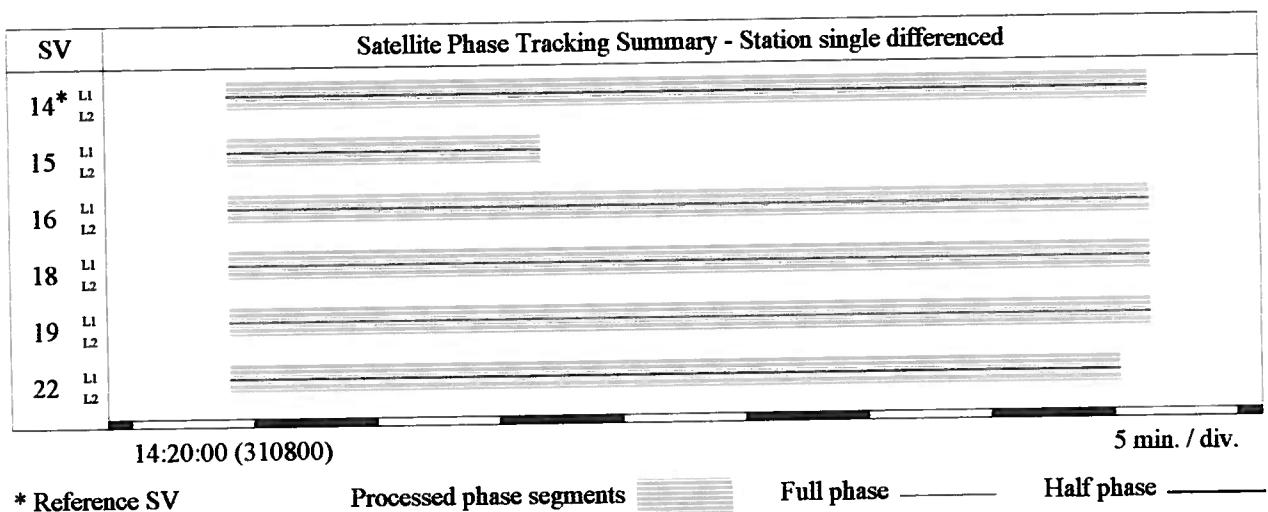
Full phase _____ Half phase _____



* Reference SV

Full phase _____ Half phase _____

Projeto Mineropar



Projeto Mineropar
Project Name: IIIIVV147
Processed: Wednesday, 04 de June de 1997 23:36
Solution Output File (SSF): WAVE 2.10
00000492.SSF

From Station: VT 02
Data file: 97401480.DAT
Antenna Height (meters): 1.527 True Vertical **1.465 Uncorrected**
Position Quality: Fixed Control

WGS 84 Position: 24° 47' 02.108917" S X 3754904.099
 49° 36' 41.967146" W Y -4413816.573
 913.992 Z -2657745.604

To Station: HV 104
Data file: 64381480.DAT
Antenna Height (meters): 2.672 True Vertical

WGS 84 Position: 24° 49' 31.008849" S X 3744065.027
 49° 44' 11.931914" W Y -4420578.819
 983.853 Z -2661934.424

Start Time: 28/05/97 13:01:00,00 GPS (907 306060.00)
Stop Time: 28/05/97 13:36:45,00 GPS (907 308205.00)
Occupation Time Meas. Interval (seconds): 00:35:45,00 15.00

Solution Type: L1 fixed double difference
Solution Acceptability: Passed ratio test

Ephemeris: Broadcast
Baseline Slope Distance Std. Dev. (meters): 13444.689 0.001040

	Forward		Backward	
Normal Section Azimuth:	250° 02' 47.472796"		70° 05' 56.248337"	
Vertical Angle:	0° 14' 14.421828"		-0° 21' 29.167962"	
Baseline Components (meters):	dx	-10839.072	dy	-6762.246
Standard Deviations (meters):		0.001376		0.001895
	dn	-4588.056	de	-12637.496
		0.001132		0.000923
				du 55.693
				dh 69.861
				0.002541

Aposteriori Covariance Matrix:

1.892732E-006		
-1.777820E-006	3.592901E-006	
-1.358699E-006	2.445483E-006	3.101059E-006

Variance Ratio Cutoff: 2.1 **1.5**
Reference Variance: 5.190

Observable Count/Rejected RMS: L1 phase 580/0 0.017

Projeto Mineropar**Processor Controls:****[General]**

Process start time:	28/05/97 13:01:00 GPS	(907 306060)
Process stop time:	28/05/97 13:36:45 GPS	(907 308205)
Elevation mask:	20 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
Applied to:	None	None
Application threshold:	0 kilometers	0 kilometers

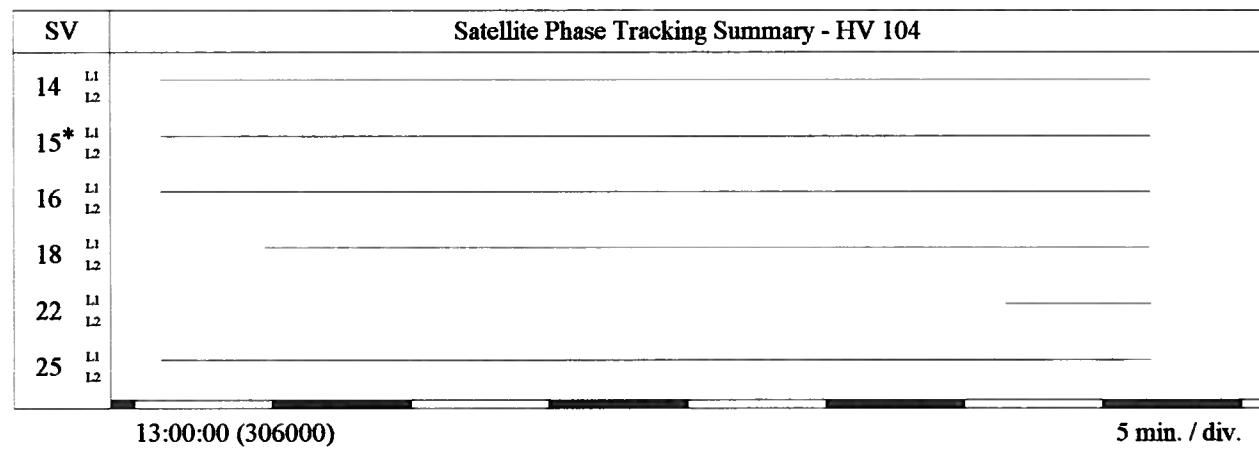
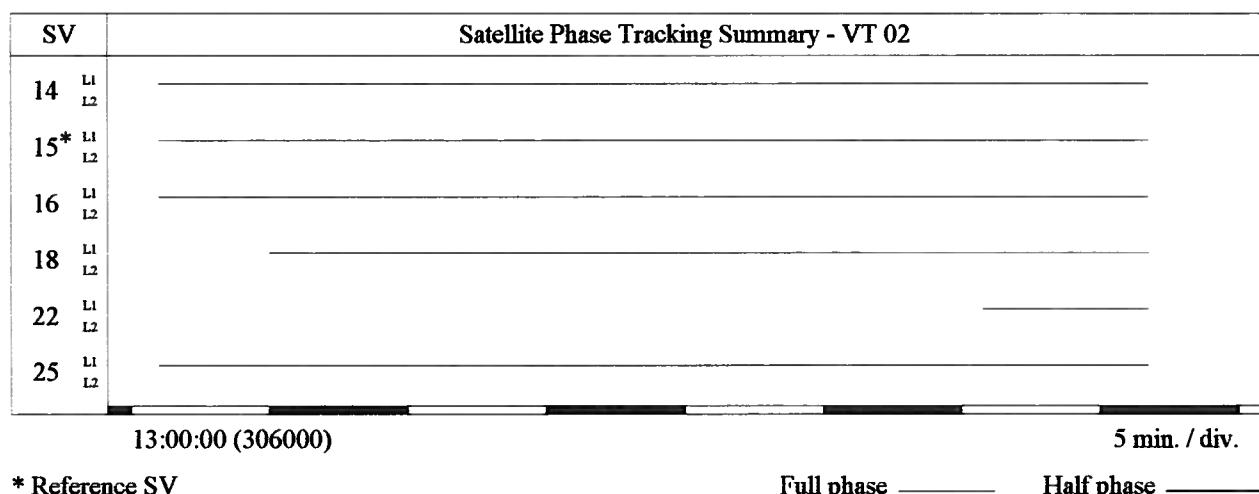
[Final Solution]

Final solution type:	L1 Fixed
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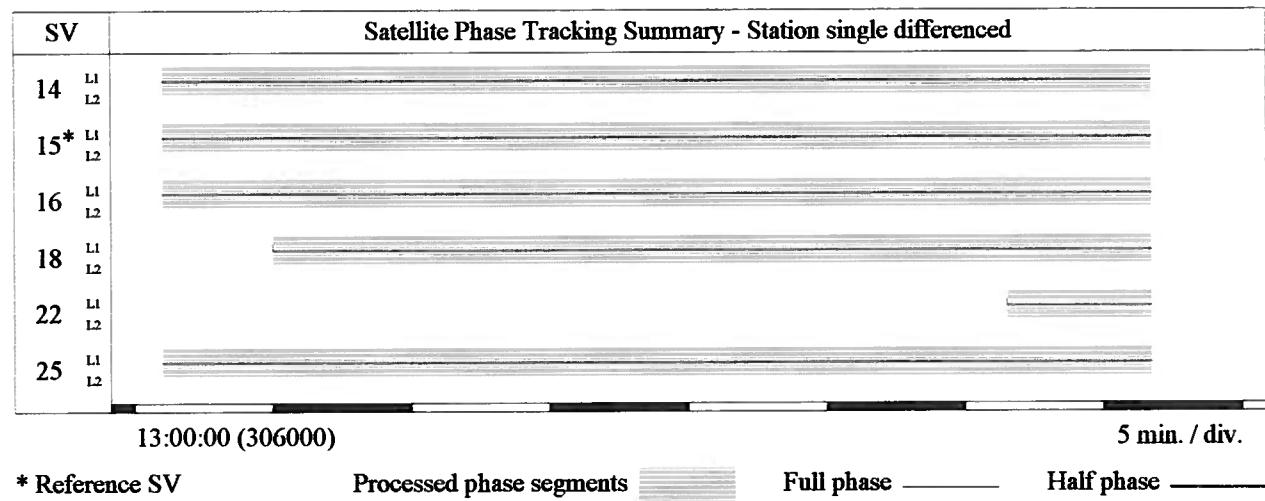
[Satellites]

Disabled:

Projeto Mineropar



Projeto Mineropar



Projeto Mineropar
Project Name: IIIIVV147
Processed: Wednesday, 04 de June de 1997 23:38
Solution Output File (SSF): WAVE 2.10
00000496.SSF

From Station:	VT 02					
Data file:	97401471.DAT					
Antenna Height (meters):	1.477 True Vertical	1.415 Uncorrected				
Position Quality:	Fixed Control					
WGS 84 Position:	24° 47' 02.108917" S 49° 36' 41.967146" W 913.992	X 3754904.099 Y -4413816.573 Z -2657745.604				
To Station:	HV 105					
Data file:	64381474.DAT					
Antenna Height (meters):	3.742 True Vertical					
WGS 84 Position:	24° 48' 44.900854" S 49° 40' 19.177643" W 856.049	X 3749361.308 Y -4416716.732 Z -2660592.906				
Start Time:	27/05/97 17:50:45,00 GPS	(907 237045.00)				
Stop Time:	27/05/97 18:33:00,00 GPS	(907 239580.00)				
Occupation Time	Meas. Interval (seconds):	00:42:15,00 15.00				
Solution Type:	L1 fixed double difference					
Solution Acceptability:	Passed ratio test					
Ephemeris:	Broadcast					
Baseline Slope Distance	Std. Dev. (meters):	6873.178 0.000589				
Normal Section Azimuth:	Forward		Backward			
	242° 35' 02.088337"		62° 36' 33.187284"			
Vertical Angle:	-0° 30' 50.075123"		0° 27' 07.709353"			
Baseline Components (meters):	dx	-5542.791	dy	-2900.158	dz	-2847.301
Standard Deviations (meters):		0.001442		0.001398		0.000755
	dn	-3164.621	de	-6100.979	du	-61.648
		0.000451		0.000558		0.002022
					dh	-57.943
						0.002022
Aposteriori Covariance Matrix:	2.078690E-006		1.954744E-006		5.707648E-007	
	-1.737618E-006					
	-8.536220E-007		8.627734E-007			
Variance Ratio	Cutoff:	2.5		1.5		
Reference Variance:		1.146				
Observable	Count/Rejected	RMS:	L1 phase	594/0		0.008

Projeto Mineropar**Processor Controls:****[General]**

Process start time:	27/05/97 17:50:45 GPS	(907 237045)
Process stop time:	27/05/97 18:33:00 GPS	(907 239580)
Elevation mask:	20 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:		
Application threshold:	0 kilometers	0 kilometers

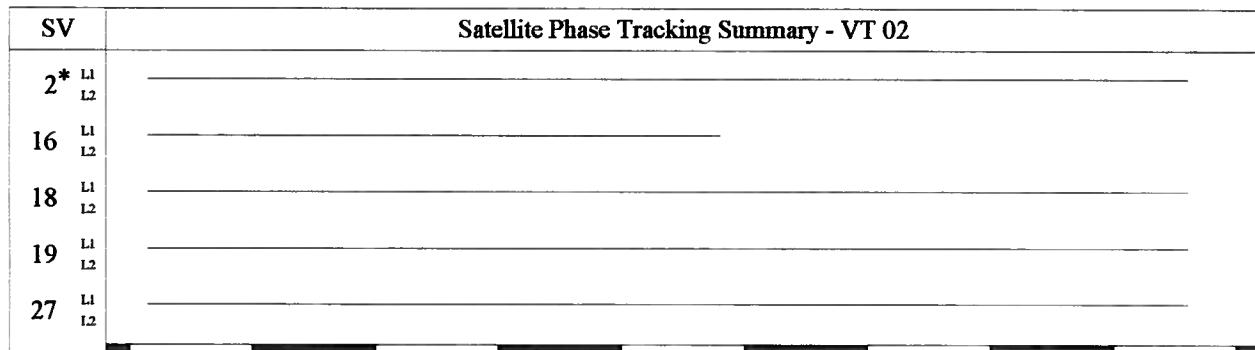
[Final Solution]

Final solution type:	L1 Fixed
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[Satellites]

Disabled:	10
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Projeto Mineropar



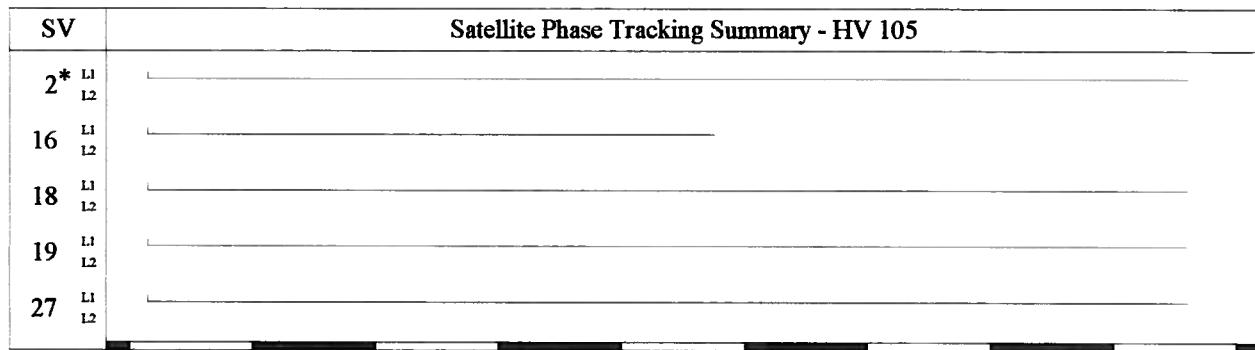
17:50:00 (237000)

5 min. / div.

* Reference SV

Full phase _____

Half phase _____



17:50:00 (237000)

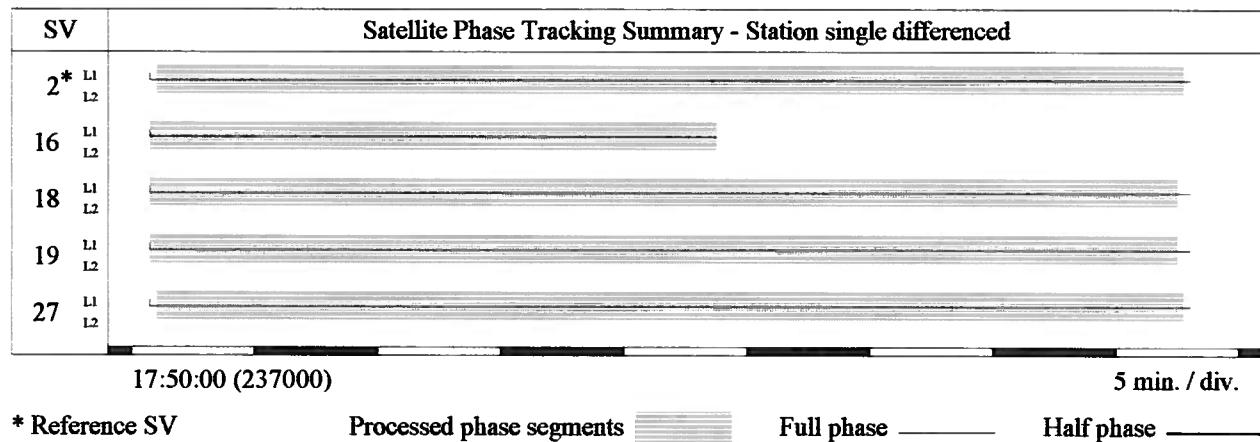
5 min. / div.

* Reference SV

Full phase _____

Half phase _____

Projeto Mineropar



Projeto Mineropar

Project Name:

Processed:

Solution Output File (SSF):

IHIVV147

Wednesday, 04 de June de 1997 23:40

WAVE 2.10

00000500.SSF

From Station:

VT 02

Data file:

97401471.DAT

Antenna Height (meters):

1.477 True Vertical**1.415 Uncorrected**

Position Quality:

Fixed Control

WGS 84 Position:

24° 47' 02.108917" S**X 3754904.099****49° 36' 41.967146" W****Y -4413816.573****913.992****Z -2657745.604**

To Station:

HV 106

Data file:

64381473.DAT

Antenna Height (meters):

3.738 True Vertical

WGS 84 Position:

24° 46' 24.949828" S**X 3750080.651****49° 40' 45.313253" W****Y -4418698.825****1043.957****Z -2656761.820**

Start Time:

27/05/97 16:43:00,00 GPS**(907 232980.00)**

Stop Time:

27/05/97 17:17:15,00 GPS**(907 235035.00)**

Occupation Time Meas. Interval (seconds):

00:34:15,00**15.00**

Solution Type:

L1 fixed double difference

Solution Acceptability:

Passed ratio test

Ephemeris:

Broadcast

Baseline Slope Distance Std. Dev. (meters):

6933.243**0.000634**

Normal Section Azimuth:

Forward**Backward****279° 28' 51.582158"****99° 30' 33.568498"**

Vertical Angle:

1° 02' 34.686718"**-1° 06' 18.731574"**

Baseline Components (meters):

dx -4823.448 dy -4882.252 dz 983.784

Standard Deviations (meters):

0.001203 0.001645 0.000522**dn 1141.858 de -6837.404 du 126.200****0.000640 0.000586 0.001916****dh 129.965****0.001917**

Aposteriori Covariance Matrix:

1.446529E-006**-1.653413E-006****2.707035E-006****-3.829890E-007****5.089638E-007****2.724485E-007**

Variance Ratio Cutoff:

8.3**1.5**

Reference Variance:

1.055

Observable Count/Rejected RMS:

L1 phase**542/0****0.007**

Projeto Mineropar

Processor Controls:

[General]

Process start time:	27/05/97 16:43:00 GPS	(907 232980)
Process stop time:	27/05/97 17:17:15 GPS	(907 235035)
Elevation mask:	20 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
Applied to:	None	None
Application threshold:	0 kilometers	0 kilometers

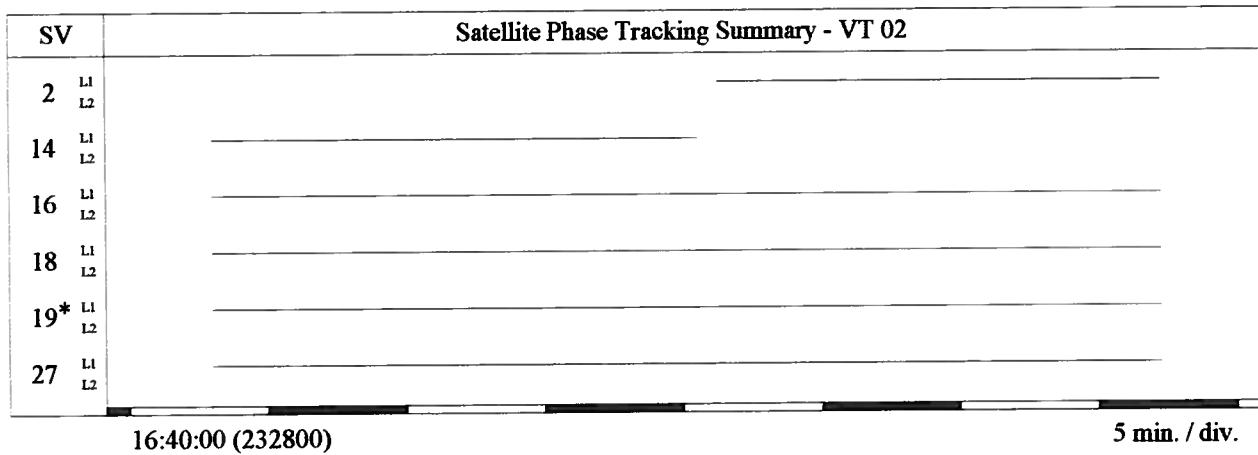
[Final Solution]

Final solution type:	L1 Fixed
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[Satellites]

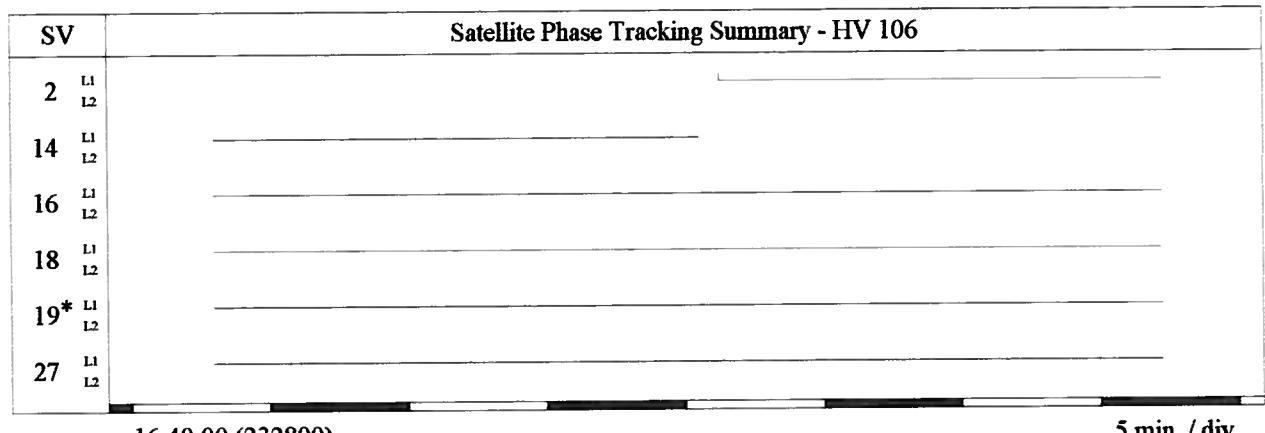
Disabled:	04
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Projeto Mineropar



* Reference SV

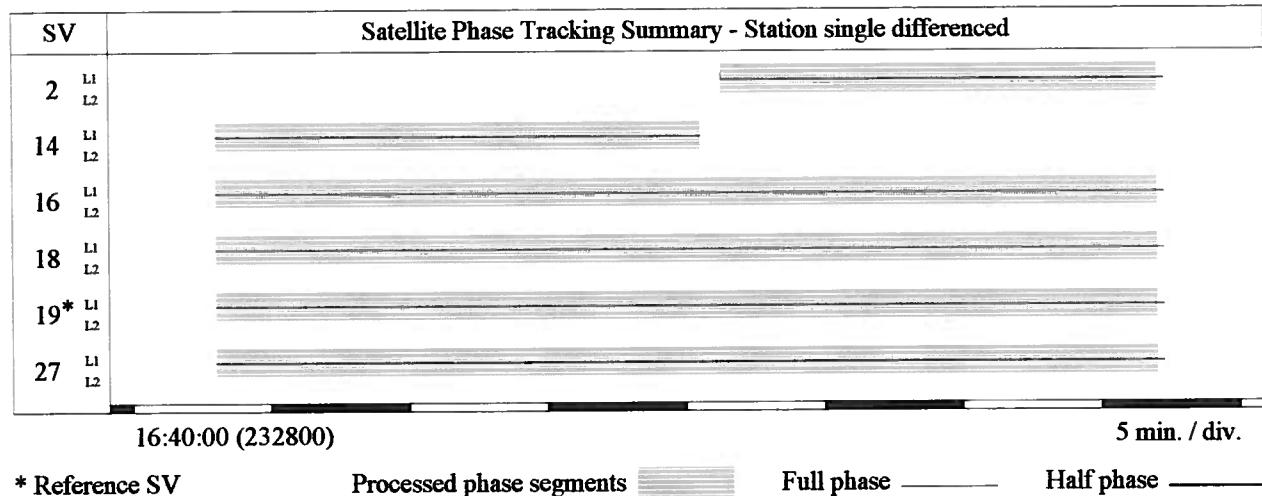
Full phase _____ Half phase _____



* Reference SV

Full phase _____ Half phase _____

Projeto Mineropar



***** End of Report *****

Projeto Mineropar

Project Name:

Processed:

Solution Output File (SSF):

HHVV147

Wednesday, 04 de June de 1997 23:44

WAVE 2.10

00000504.SSF

From Station:

VT 02

Data file:

97401470.DAT

Antenna Height (meters):

1.477 True Vertical

Position Quality:

1.415 Uncorrected

Fixed Control

WGS 84 Position:

24° 47' 02.108917" S

X 3754904.099

49° 36' 41.967146" W

Y -4413816.573

913.992

Z -2657745.604

To Station:

HV 107

Data file:

64381472.DAT

Antenna Height (meters):

3.727 True Vertical

WGS 84 Position:

24° 46' 49.351820" S

X 3752762.112

49° 38' 26.741662" W

Y -4415841.660

903.754

Z -2657384.883

Start Time:

27/05/97 15:05:30,00 GPS (907 227130.00)

Stop Time:

27/05/97 15:45:30,00 GPS (907 229530.00)

Occupation Time Meas. Interval (seconds):

00:40:00,00 15.00

Solution Type:

L1 fixed double difference

Solution Acceptability:

Passed ratio test

Ephemeris:

Broadcast

Baseline Slope Distance Std. Dev. (meters):

2969.714 0.000298

Normal Section Azimuth:

Forward

Backward

277° 35' 25.595384"

97° 36' 09.513877"

-0° 12' 39.077878"

0° 11' 03.100667"

Vertical Angle:

Baseline Components (meters):

dx -2141.986 dy -2025.087 dz 360.721

Standard Deviations (meters):

0.000436 0.000544 0.000535

dn 392.270 de -2943.672 du -10.929

0.000430 0.000304 0.000703

dh -10.238

0.000703

Aposteriori Covariance Matrix:

1.900992E-007
-1.439575E-007 2.958658E-007
-7.676544E-008 1.418274E-007 2.864397E-007

Variance Ratio Cutoff:

14.0 1.5

Reference Variance:

0.910

Observable Count/Rejected RMS:

L1 phase 884/0 0.007

Projeto Mineropar**Processor Controls:****[General]**

Process start time:	27/05/97 15:05:30 GPS	(907 227130)
Process stop time:	27/05/97 15:45:30 GPS	(907 229530)
Elevation mask:	15 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled	
L1 C/A code	Enabled	

[Static Network]

Baseline generation:	Independent	
Min baseline observation time	600 seconds	

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield	
Estimated zenith delay states:	0	

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:		
Application threshold:	0 kilometers	0 kilometers

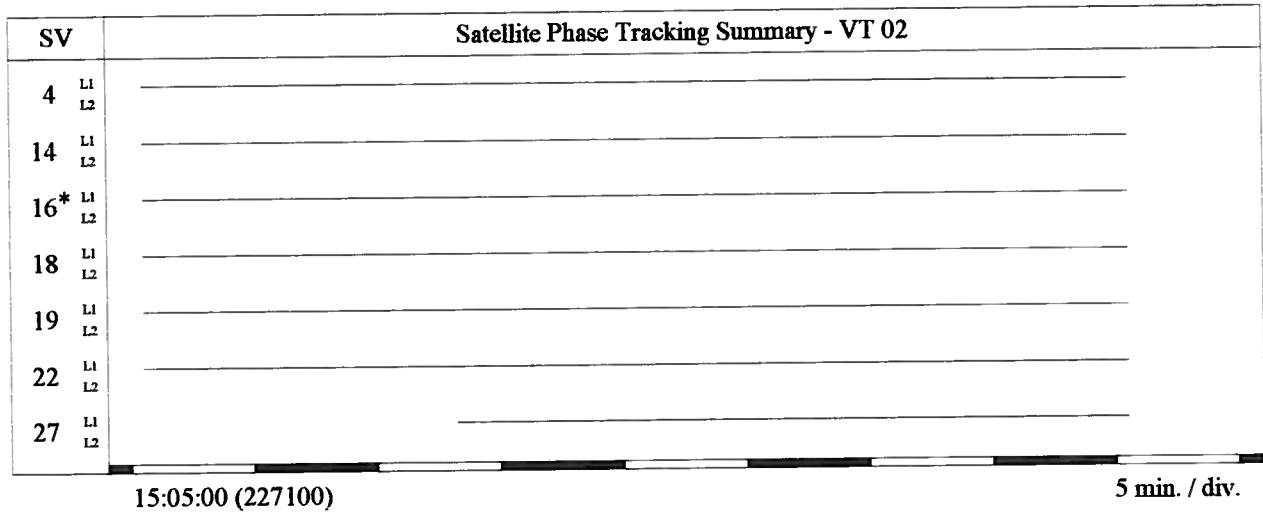
[Final Solution]

Final solution type:	L1 Fixed	
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[Satellites]

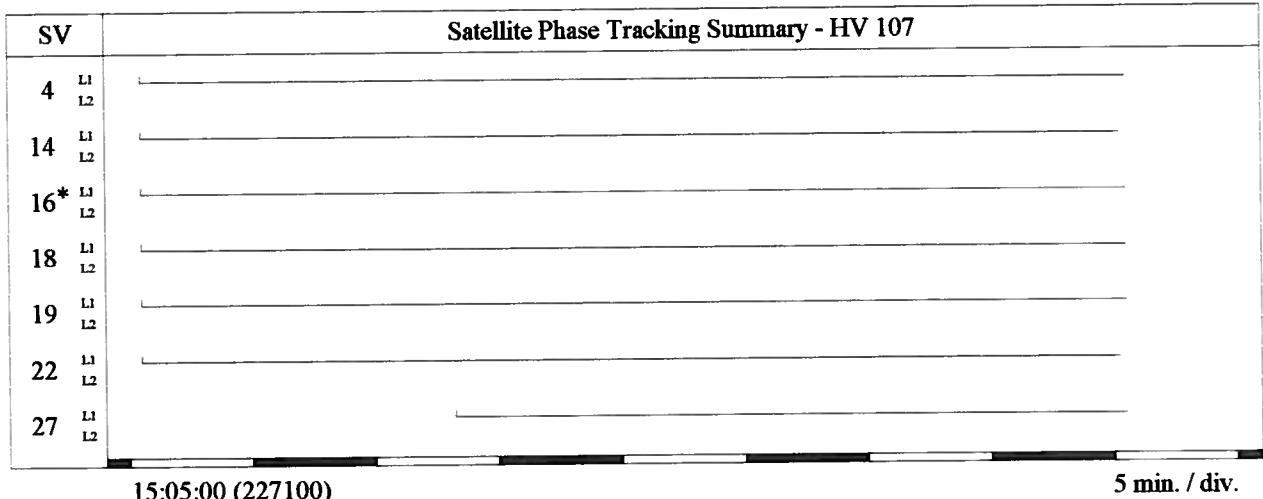
Disabled:		
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Projeto Minerpar



* Reference SV

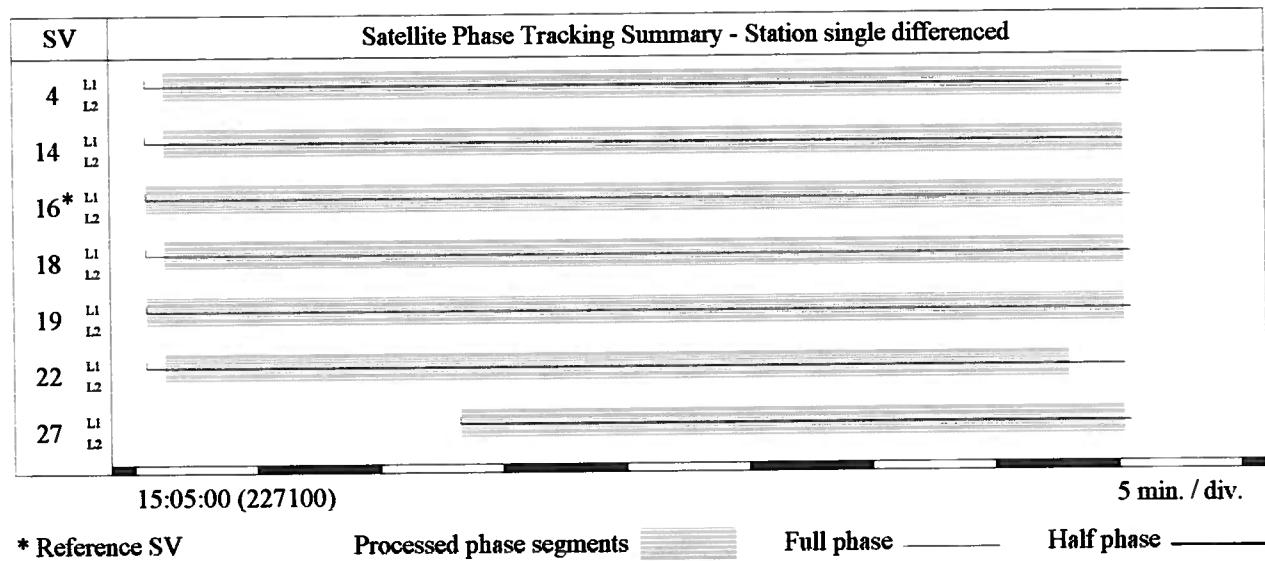
Full phase _____ Half phase _____



* Reference SV

Full phase _____ Half phase _____

Projeto Mineropar



Projeto Mineropar**Project Name:****Processed:****Solution Output File (SSF):****HHVV147****Wednesday, 04 de June de 1997 23:46****WAVE 2.10****00000508.SSF****From Station:****VT 02****Data file:****97401471.DAT****Antenna Height (meters):****1.477 True Vertical****Position Quality:****1.415 Uncorrected****Fixed Control****WGS 84 Position:****24° 47' 02.108917" S****X 3754904.099****49° 36' 41.967146" W****Y -4413816.573****913.992****Z -2657745.604****To Station:****HV 108****Data file:****64381476.DAT****Antenna Height (meters):****3.737 True Vertical****WGS 84 Position:****24° 43' 38.861808" S****X 3754605.840****49° 38' 16.121552" W****Y -4417550.203****949.221****Z -2652080.475****Start Time:****27/05/97 20:41:45,00 GPS (907 247305.00)****Stop Time:****27/05/97 21:23:45,00 GPS (907 249825.00)****Occupation Time Meas. Interval (seconds):****00:42:00,00 15.00****Solution Type:****L1 fixed double difference****Solution Acceptability:****Passed ratio test****Ephemeris:****Broadcast****Baseline Slope Distance Std. Dev. (meters):****6791.365 0.000364****Normal Section Azimuth:****Forward****Backward****337° 03' 55.284691"****157° 04' 34.709577"****Vertical Angle:****0° 15' 59.723163"****-0° 19' 40.222022"****Baseline Components (meters):****dx -298.259 dy -3733.630 dz 5665.130****Standard Deviations (meters):****0.000565 0.000741 0.000474****dn 6254.440 de -2646.437 du 31.599****0.000375 0.000300 0.000928****dh 35.229****0.000928****Aposteriori Covariance Matrix:****3.191643E-007 -3.296952E-007 5.487437E-007
-3.296952E-007 2.007436E-007 2.249674E-007
-1.314644E-007****Variance Ratio Cutoff:****9.1 1.5****Reference Variance:****0.562****Observable Count/Rejected RMS:****L1 phase 585/0 0.005**

Projeto Mineropar

Processor Controls:

[General]

Process start time:	27/05/97 20:41:45 GPS	(907 247305)
Process stop time:	27/05/97 21:23:45 GPS	(907 249825)
Elevation mask:	15 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:	0 kilometers	0 kilometers
Application threshold:		

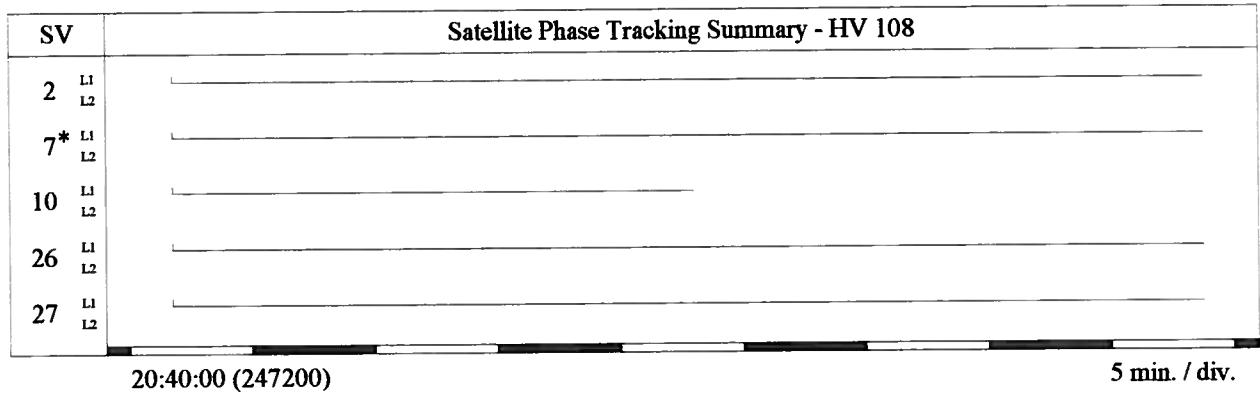
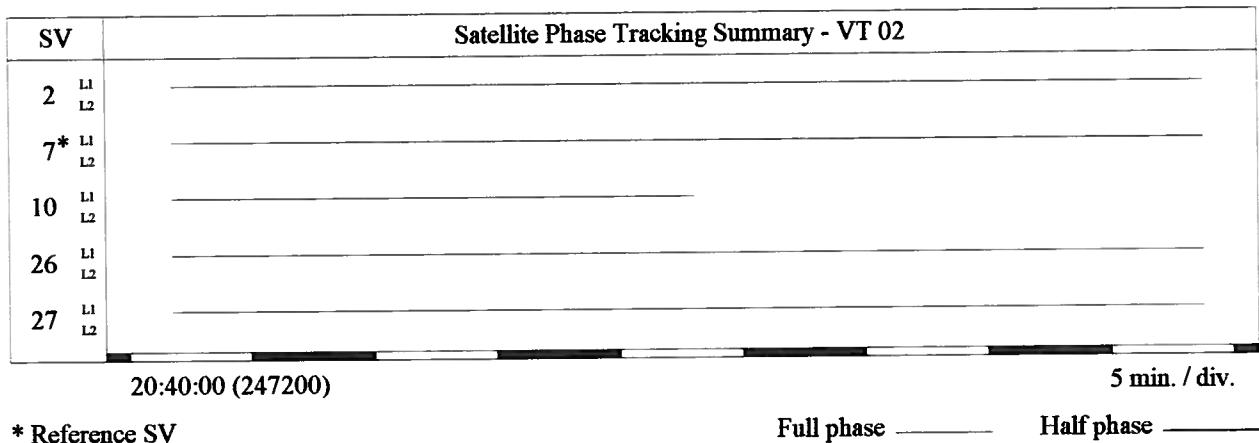
[Final Solution]

Final solution type:	L1 Fixed
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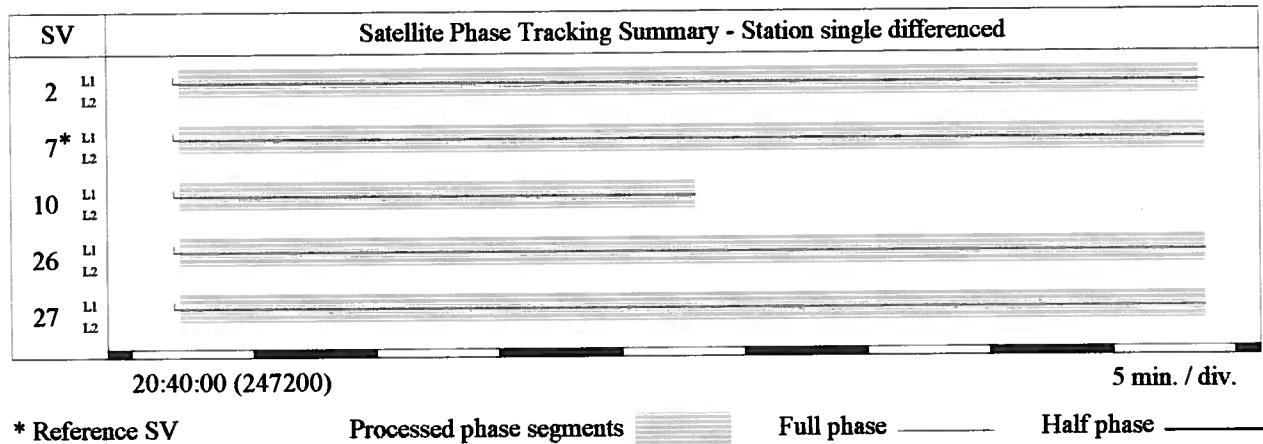
[Satellites]

Disabled:

Projeto Mineropar



Projeto Mineropar



Projeto Mineropar

Project Name:

Processed:

Solution Output File (SSF):

HHVV147

Wednesday, 04 de June de 1997 23:47

WAVE 2.10

00000512.SSF

From Station:

VT 02

Data file:

97401471.DAT

Antenna Height (meters):

1.477 True Vertical

Position Quality:

1.415 Uncorrected

Fixed Control

WGS 84 Position:

24° 47' 02.108917" S

X 3754904.099

49° 36' 41.967146" W

Y -4413816.573

913.992

Z -2657745.604

To Station:

HV 109

Data file:

64381475.DAT

Antenna Height (meters):

3.737 True Vertical

WGS 84 Position:

24° 44' 31.753916" S

X 3756129.096

49° 36' 44.031957" W

Y -4415346.091

936.737

Z -2653553.605

Start Time:

27/05/97 19:35:00,00 GPS (907 243300.00)

Stop Time:

27/05/97 20:06:00,00 GPS (907 245160.00)

Occupation Time Meas. Interval (seconds):

00:31:00,00 15.00

Solution Type:

L1 fixed double difference

Solution Acceptability:

Passed ratio test

Ephemeris:

Broadcast

Baseline Slope Distance Std. Dev. (meters):

4627.408 0.000624

Normal Section Azimuth:

Forward

Backward

359° 16' 53.260852"

179° 16' 54.125681"

Vertical Angle:

0° 15' 38.682622"

-0° 18' 09.049313"

Baseline Components (meters):

dx 1224.997 dy -1529.517 dz 4191.999

Standard Deviations (meters):

0.001154 0.001147 0.000706

dn 4626.996 de -58.030 du 21.059
0.000622 0.000532 0.001573

dh 22.745
0.001573

Aposteriori Covariance Matrix:

1.330907E-006 -1.054581E-006 1.314514E-006
-3.998369E-007 4.159967E-007 4.982880E-007

Variance Ratio Cutoff:

1.9 1.5

Reference Variance:

1.980

Observable Count/Rejected RMS:

L1 phase 593/0 0.008

Projeto Mineropar

Processor Controls:

[General]

Process start time:	27/05/97 19:35:00 GPS	(907 243300)
Process stop time:	27/05/97 20:06:00 GPS	(907 245160)
Elevation mask:	20 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	

[Observables]

L1 phase	Enabled
L1 C/A code	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	600 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay states:	0

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
	None	None
Applied to:		
Application threshold:	0 kilometers	0 kilometers

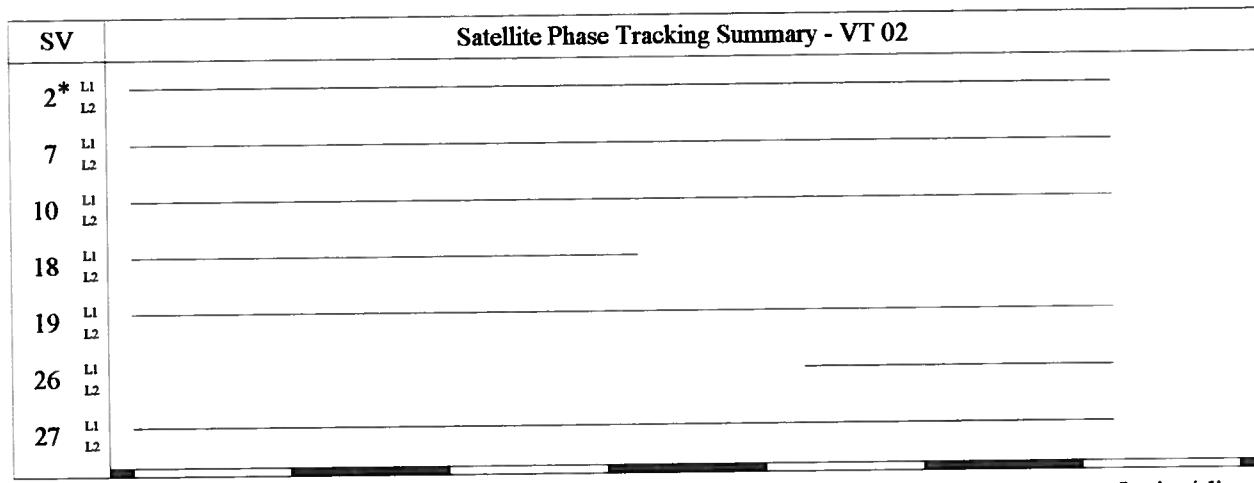
[Final Solution]

Final solution type:	L1 Fixed
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[Satellites]

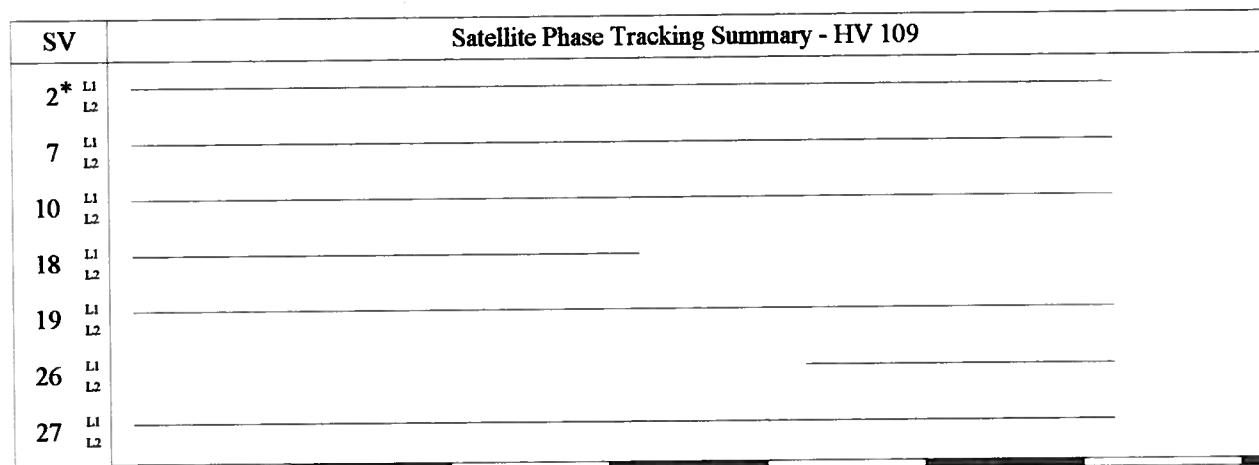
Disabled:

Projeto Mineropar



* Reference SV

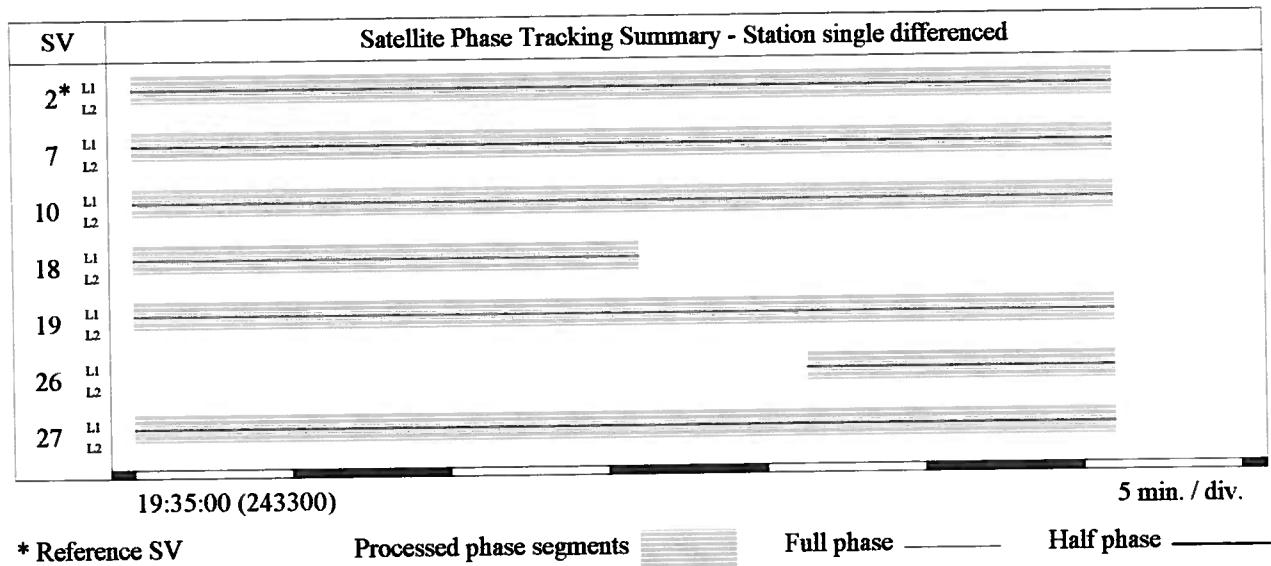
Full phase _____ Half phase _____



* Reference SV

Full phase _____ Half phase _____

Projeto Mineropar



***** End of Report *****



ANEXO F - RELAÇÃO DE COORDENADAS SAD 69 e UTM - 51°

Coordenadas Geográficas SAD 69

Estação		Latitude	Longitude	Altitude ortométrica
VT 91643 -	Ponta Grossa	25°05'41.6442098"S	50°06'16.7438100"W	908.1448
VT 91644	Jaguaraiáva	24°14'29.0679198"S	49°42'15.6284397"W	913.4120
VT 01	Biscaia	25°02'40.0547922"S	49°49'47.5137407"W	702.9018
VT 02	Socavão	24°47'00.3516134"S	49°36'40.2550387"W	910.7351
VT 03	Castro	24°47'20.5975074"S	50°01'05.3243917"W	1057.8639
hhvv046		24°59'48.4316660"S	49°44'24.4315298"W	700.7000
hhvv048		25°05'59.6311230"S	49°49'48.2300699"W	745.4000
hhvv049		25°04'33.5208840"S	49°52'21.4831925"W	920.4900
hhvv050		24°58'21.5711022"S	49°46'44.3238232"W	929.0700
hhvv156		25°02'54.9832467"S	49°52'48.3789639"W	848.3700
hhvv200		25°06'19.3247218"S	49°53'31.4416674"W	888.6700
hhvv201		25°05'23.4420539"S	49°55'21.5396272"W	841.6900
hhvv202		25°07'44.0818473"S	49°52'00.5681306"W	870.1200

Coordenadas UTM MC -51

Estação		N	E	Altitude ortométrica
VT 91643 -	Ponta Grossa	7224235.121	590282.576	908.1448
VT 91644	Jaguaraiáva	7318425.831	631543.808	913.4120
VT 01	Biscaia	7229609.402	618041.195	702.9018
VT 02	Socavão	7258309.416	640399.370	910.7351
VT 03	Castro	7258043.515	599250.659	1057.8639
hhvv046		7234807.742	627144.539	700.7000
hhvv048		7223470.112	617967.989	745.4000
hhvv049		7226155.569	613697.242	920.4900
hhvv050		7237515.677	623246.636	929.0700
hhvv156		7229193.057	612968.810	848.3700
hhvv200		7222917.024	611710.540	888.6700
hhvv201		7224661.039	608640.419	841.6900
hhvv202		7220288.567	614234.024	870.1200

Coordenadas Geográficas SAD 69

Estação	Latitude	Longitude	Altitude geom.	Altitude orton
VT 02	24°47'00.3516135"S	49°36'40.2550390"W	917.309	910.7351
HV 100	24°45'44.1384702"S	49°34'26.0880051"W	874.525	868.0007
HV 101	24°47'58.8090585"S	49°36'47.1989246"W	897.135	890.5244
HV 102	24°51'33.2590987"S	49°40'43.1846486"W	815.139	808.4285
HV 103	24°50'52.3318651"S	49°42'45.7676203"W	913.152	906.5039
HV 104	24°49'29.2524118"S	49°44'10.2156375"W	987.036	980.4746
HV 105	24°48'43.1438205"S	49°40'17.4633797"W	859.294	852.6843
HV 106	24°46'23.1934798"S	49°40'43.5993642"W	1047.233	1040.7206
HV 107	24°46'47.5948971"S	49°38'25.0287577"W	907.053	900.4960
HV 108	24°43'37.1056152"S	49°38'14.4094699"W	952.572	946.1320
HV 109	24°44'29.9972183"S	49°36'42.3204124"W	940.094	933.6133

Coordenadas UTM MC -51°

Estação	N	E	Altitude geom.	Altitude ortom.
VT 02	7258309.416	640399.370	917.309	910.7351
HV 100	7260615.178	644191.915	874.525	868.0007
HV 101	7256513.066	640186.095	897.135	890.5244
HV 102	7249981.713	633495.489	815.139	808.4285
HV 103	7251273.669	630066.824	913.152	906.5039
HV 104	7253851.559	627720.091	987.036	980.4746
HV 105	7255207.909	634268.389	859.294	852.6843
HV 106	7259520.257	633576.182	1047.233	1040.7206
HV 107	7258731.440	637460.727	907.053	900.4960
HV 108	7264588.438	637817.341	952.572	946.1320
HV 109	7262935.353	640388.315	940.094	933.6133



**ANEXO G - ESQUEMA DE TRIANGULAÇÃO DA REDE
GEODÉSICA DE ALTA PRECISÃO**

ESTADO DO PARANÁ

1996

SECRETARIA DE ESTADO DO MEIO AMBIENTE E RECURSOS HÍDRICOS

COORDENADORIA DE TERRAS, CARTOGRAFIA E CADASTRO

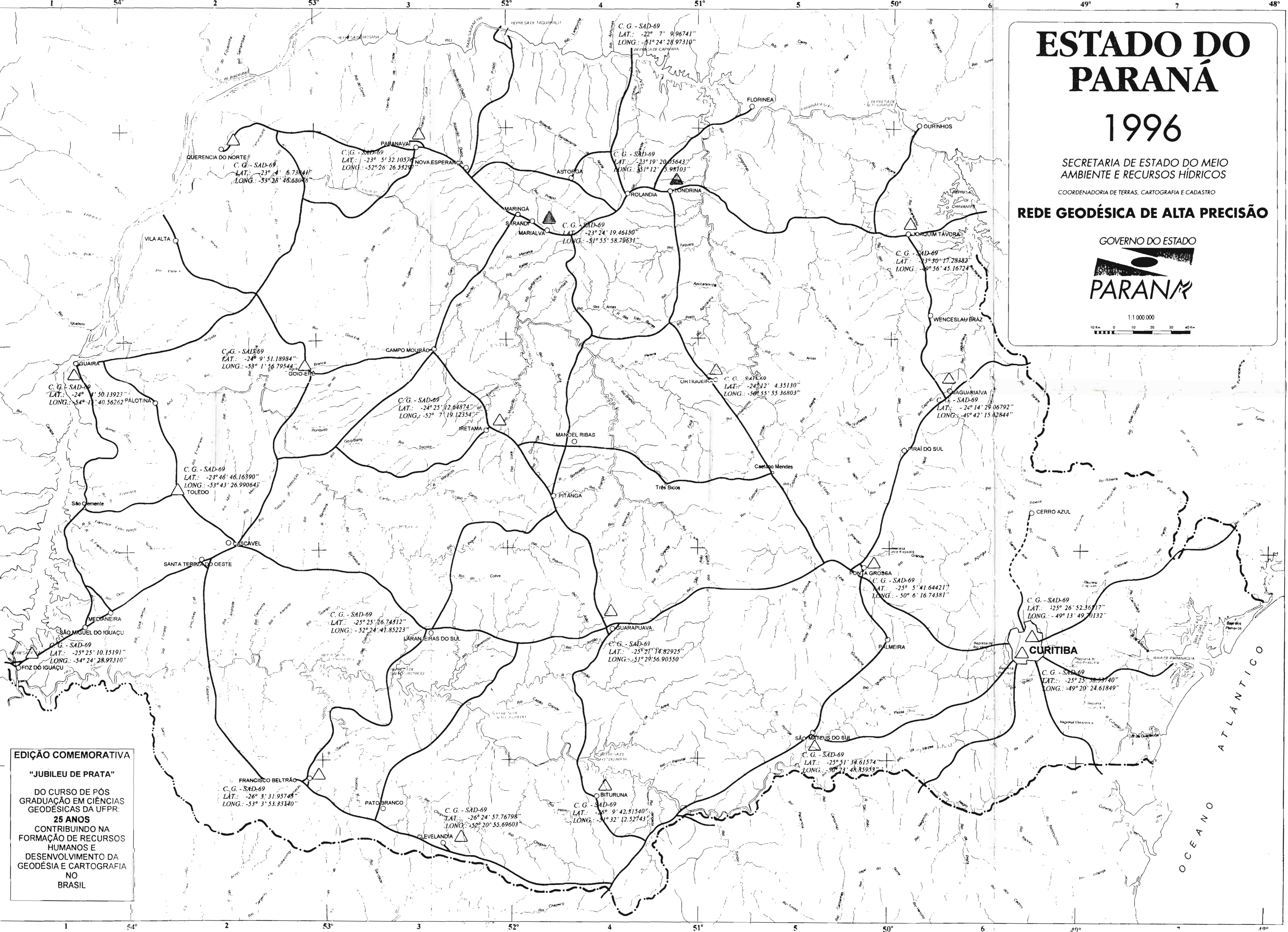
REDE GEODÉSICA DE ALTA PRECISÃO

GOVERNO DO ESTADO



1:1 000 000

10 Km 0 10 20 30 40 Km



EDIÇÃO COMEMORATIVA

"JUBILEU DE PRATA"

DO CURSO DE PÓS GRADUAÇÃO EM CIÊNCIAS GEODÉSICAS DA UFPR:

25 ANOS
CONTRIBUINDO NA FORMAÇÃO DE RECURSOS HUMANOS E
DESENVOLVIMENTO DA GEODÉSIA E CARTOGRAFIA NO BRASIL

