

Chile 1994

# NATIONAL RADIO ASTRONOMY OBSERVATORY

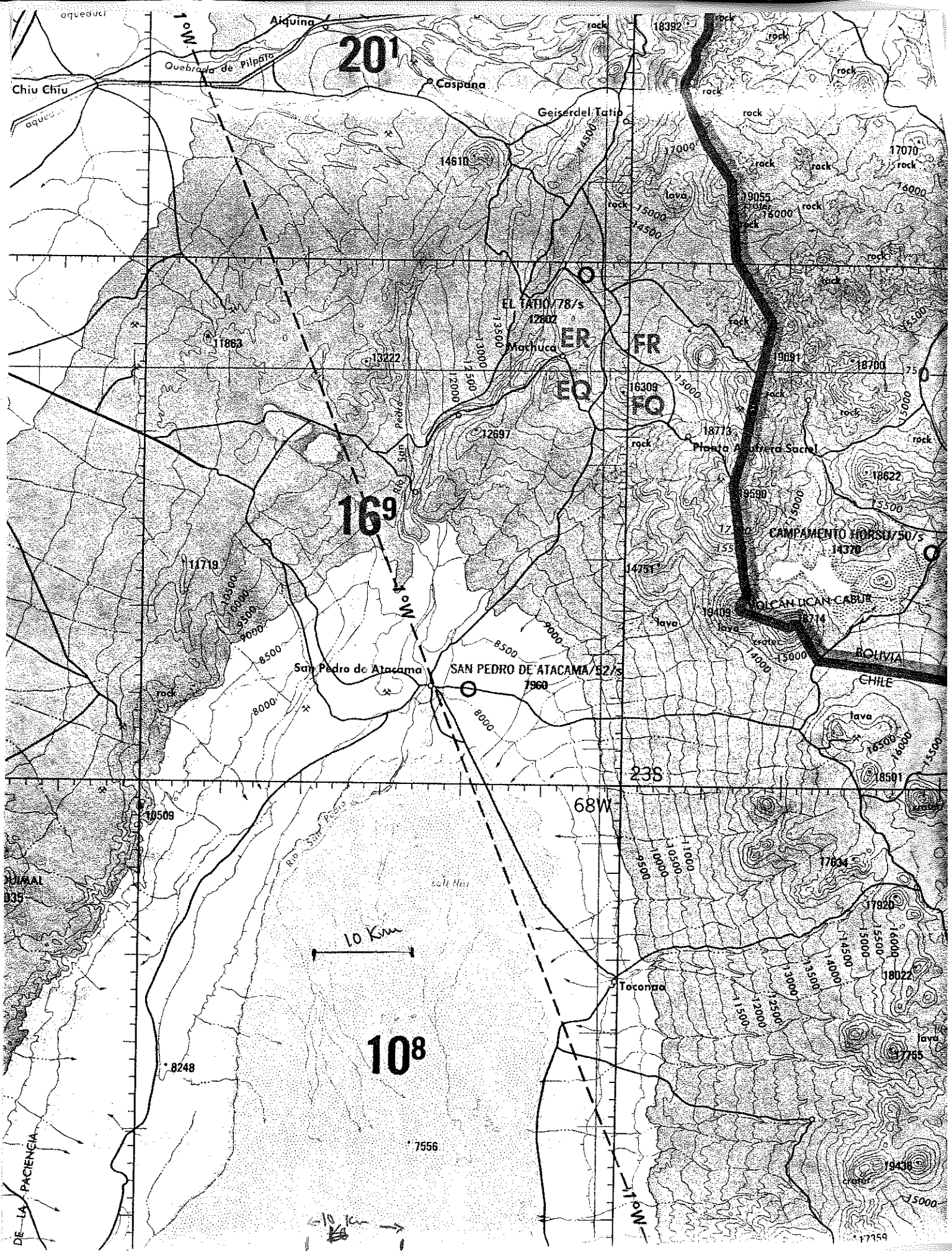
~~Atacama~~ meetings

R. L. Brown

San Pedro de Atacama

10/94

## NOTEBOOK



20°

16°

10°

10 Km

7556

238

68W

70W

Chiu Chiu

Aiquina

Caspana

Gersedel Tatip

EL TATIO/78/S

Machuca

ER

FR

EQ

FO

Planta Australera Sacre

CAMPAMENTO HORSU/50/S

VOLCAN LICANCABUR

BOLIVIA

CHILE

HUMAI

DE LA PACIENCIA

Quebrada de Pilpato

10W

10W

Rio San Pedro

Salt Mar

Toconao

SAN PEDRO DE ATACAMA/52/S

11719

1863

13222

14610

12902

12897

16309

18773

19091

18760

18622

14751

19409

14370

18714

10509

8248

10500

11000

11500

12000

12500

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37070

37570

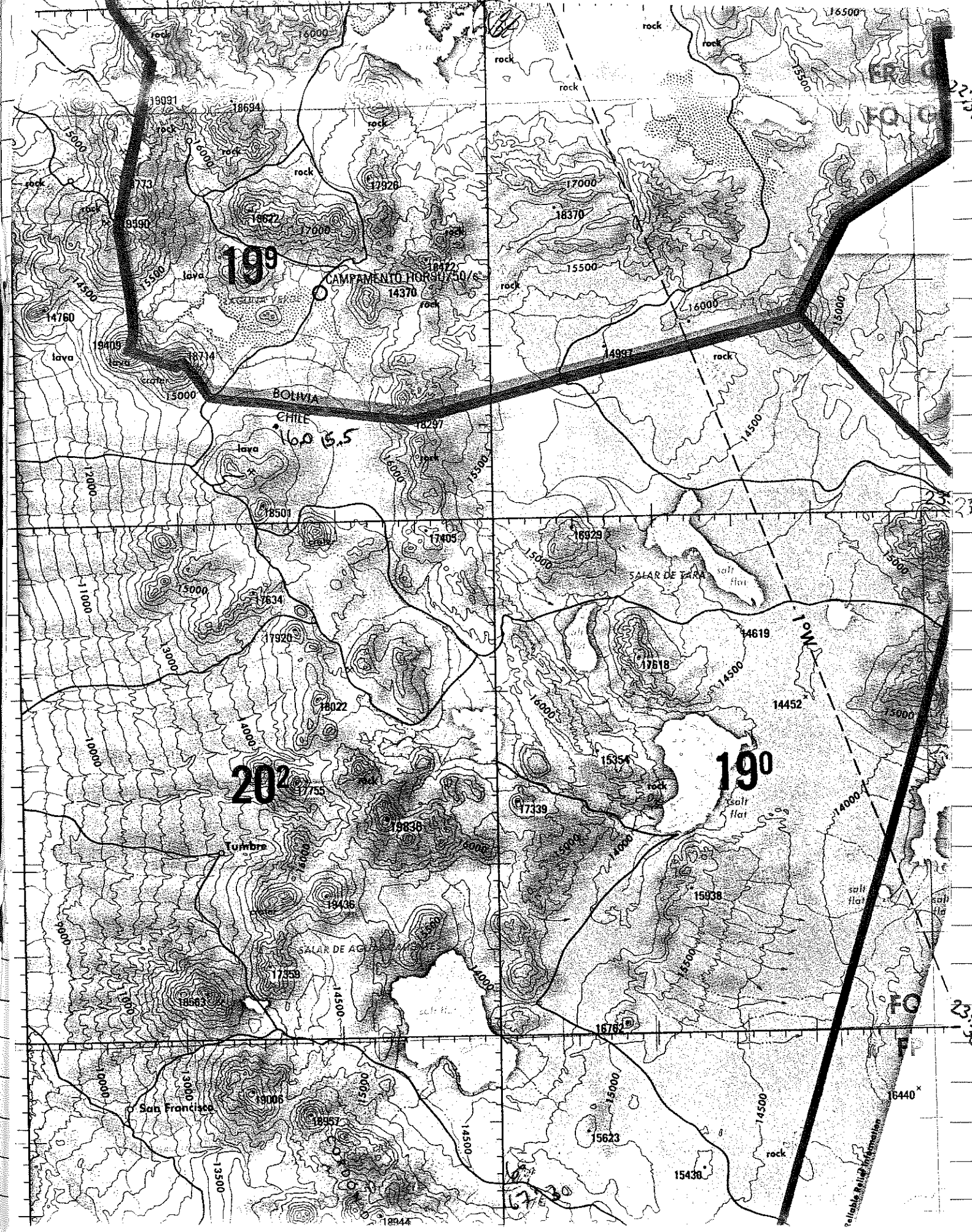
38070

38570

39070







22:30

23

23:30

Reliable for up to 1:50,000 scale





SAN Pedro	opposite weather station
10 Km FROM SP	Going along Jama Road
20 Km FROM SP	"
30 Km FROM SP	"
40 Km FROM SP	"
Bolivia Fork	At the fork itself
JAMA ROAD MP 155	Milepost 155 past Bolivia fork this is a physical sign on road
JAMA RD TURNOFF	Turn off from Jama Road to go to the southern sites
FORK 1 S-Road	position of fork in road - took right fork
FORK 2 S-Road	second fork - choice doesn't matter
S-SITE 11	location of 1st S-place we looked
S-SITE 12	Another possible S-site further along road
TURNOFF 2 S-SITES	Turn off of mine road to go to the southern sites
JAMA RD MP 145	PAST Bolivia Fork - physical sign
JAMA RD MP 150	"
NSF DEMO	NSF folks playing with the GPS as ridge overlooking the Bolivia Fork

10/22 San Pedro de Atacama / AT weather station

12:38 Local time

temp =  $92^{\circ}$  F

Radiometer:  $H_i$  34  $W_v = 7.04$

$L_o$  11.5

$\odot$  EL  $75^{\circ}$

Altimeter: Site Elevation = 8130 ft = 2480 m

GRS location 133 - First try disregarded  
137

S  $22^{\circ}$  54' ~~34'~~ 44.8

W 68' ~~11'~~ ~~10.4~~ 55.7

EL 8500 ft.

mileage: 13189

- stop at Police / border control coming out of San Pedro
- Turn left on first road after border control. Runway markers should be on your right as you go east.
- Looking for road to Jama

OVERVIEW

Bolivia

JANA  
Argentina

Northern Sites

To Bolivia

Volcan  
Kisancabur

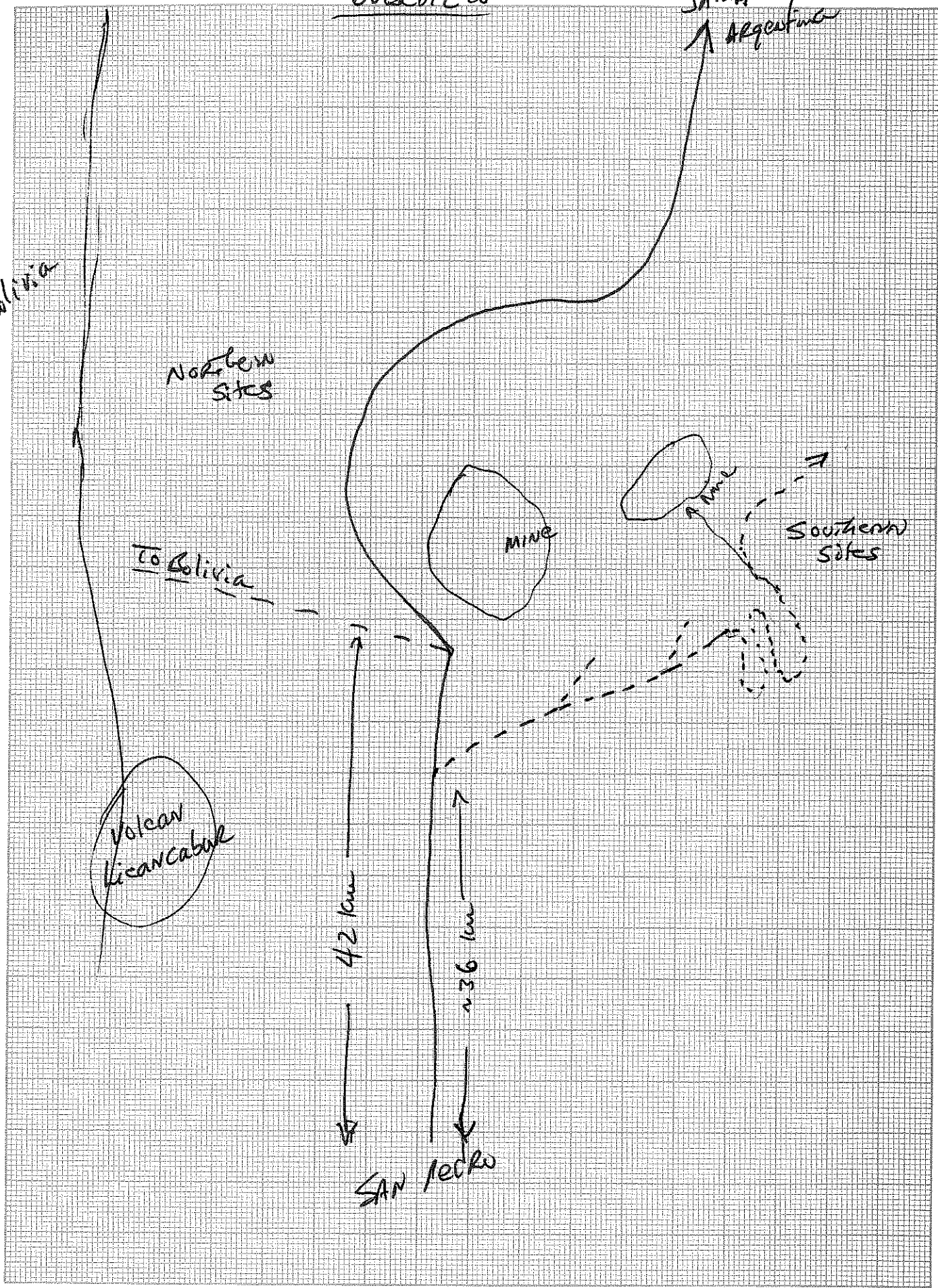
MINE

Southern Sites

42 km

~36 km

SAN PEDRO





10/22 milepost 10 km From San Pedro

135 Aborigine first try.

GPS 136 = location

22 55 = 18.6

68 06 50.2

EL 8500

10 km From SP

mileage: 13200

Altimeter: 2535m = 8320 feet

13:11 local time

Radio meter:

H<sub>i</sub> 41

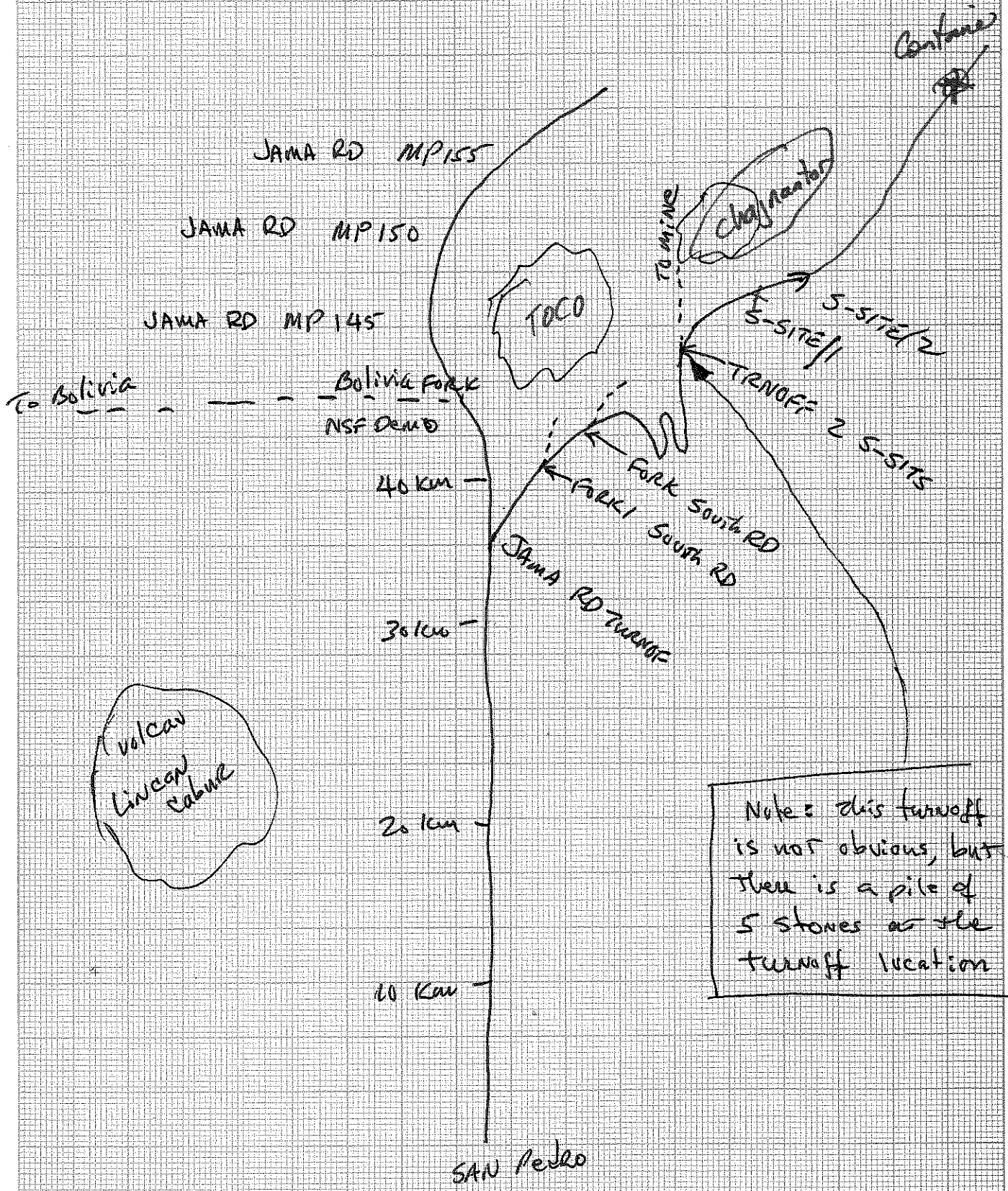
W<sub>v</sub> = 5.66

L<sub>0</sub> 15

E<sub>l</sub> 77

near  
~~at~~ bottom of hill

GPS POSITIONS



10/22 milepost 20 km from San Pedro

Local Name 1352

Radiometer Hi 40

$W_V = 5.25$

Lo 15

EL 77

GPS Location 137, 138

20 km from SP

22 54 38.2

68 01 12.1

EL 9700

Altimeter 9600 ft = 2920 m

10/22 milepost 30 km from San Pedro

Local Name 1351

Altimeter: 11920 ft = 3630

GPS 22 54 24.9

67 55 18.9

EL = 12000 ft.

LOC = 139

30 km from SP

Radiometer: Hi 39

$W_V = 4.81$

Lo 15

EL 75



10/22 Milepost 40 km from San Pedro

Local time 14:16

temperature 93°

de la <sup>FR</sup> ~~EM~~ SP

GPS -22 55 31.8

67 50 10.6

EL 14500

LOC = 140

Altimeter 14110 4300 m

Radiometer:

Hi: 39

$W_v = 3.80$

Lo: 16

EL: 70

At Division to Dolores Highway, spot  
where I took photograph

mileage 13,232

Altimeter 14,760 ft = 4500 m

Fork in Road to Bolivia - At the fork itself  
local time = 1435  
mileage = 13,273

GPS -22 55 23.3

67 48 26.7

EL = 14,900

LOC = 141

Altitude 14,760 = 4500 m

Barometer:

H<sub>0</sub>: 36

W<sub>v</sub> = 3.52

L<sub>0</sub>: 15

BOLIVIA FORK

R<sub>L</sub>: 67

Km: 13243 5 km past milepost ~~155 km~~ 155 km  
local time 1451

Altitude 15270 ft = 4655 m

GPS -22 54 29.4

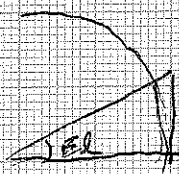
LOC = 142

67 43 33.8

EL 15,100 ft.

JAMARQ MIPIST

Took ~~8~~<sup>9</sup> photos: windy



$$\log_{10} W_v = -2.57 \left( \frac{L_0}{H_0} \right) + 2.07$$

$$W_v = W_v(\text{meas}) \cos(90 - ER)$$



Milepost 157

Altimeter 15,470 windy

Took 4 photos, lake no longer visible

Radiometer HE: 34

$W_v = 3.45$  mm

Lo: 14

EL: 60

Kilometer 13,247

— Returning to Solovs Park in Road

Local time 16:27

Altimeter: 14,770

Temperature: 95%

Radiometer:

HO: 35

$W_v = 2.88$  mm

Lo: 14

⊙ EL: 41

Jaraka

10/23 Road from San Pedro  
3000 m elevation on Altimeter.  
local time 11:13  
Hi: 34  
Lo: 07  
⊙ El: 57

11/23 Elevation 3500 m  
local time 11:28  
Hi: 35  
Lo: 14  
⊙ El: 62

11/23 Elevation 4000 m  
local time 11:42  
Hi: 35  
Lo: 14  
⊙ El: 65

10/23 Elevation: 4145 Altimeter  
Road turns off to right. Signs say Jansa to left  
Right fork winds around (?) CERRO

Position

S 22 55 54.4

W 67 51 21.4

Elevation 13,900 ft by GPS.

local time

Loc = 143

Milage 13,475

7200 FT  
JAMA RD ~~JAN~~

Took right fork of turn off about 1 km from Janna road

Mileage 13,477 local time 12:04  
Altimeter 4405m

GPS 22 56 35.9

67 49 52.0

El 14,800

Loc = 144.

position at another fork in road

FOREK 5-ROAD

Radiometer: A): 36

LO: 15

0 El: 70

Took right fork

Mileage 13,484 local time

GPS 22 58 23.2

67 47 38.2

El = 16,100 ft

Loc = 145

FOREK 5-ROAD  
FLY SWITHUN  
ROAD

Altimeter 4870m = 15980 ft

Continue up the hill, many switch backs until  
until see pile of 5 rocks ← marker. Turn right here  
to go around to the right of a lava outcropping and to keep  
the hills on your left. This turn off position is

22 58 04.0

67 47 50.8

El 16,700(?) Loc = 148

Altimeter = 4830 = 15560 more likely



Southern site mileage 13 488

local time 12:44

Altimeter: 4900m = 16,100

GPS 22 59 42.8

67 45 45.4

16,900 ft

LOC = 146

Radiometer: H: 44

W: 15

⊙ EL: 77

March toward shallow crater, ~~level~~<sup>level</sup> horizon clear, east  
into patchy snow cone by road track

Windy. wind from WNW.

Soil of loose lava, soil 5cm below

Took 10 photo panorama

- Continue to mileage 13 490

local time 13:03

Altimeter 4925m = 16,170 ft

GPS 23 00 16.4

67 45 38.4

EL 16,500

LOC = 147

now Return to Jama Road

LOC 148 = Turnoff to Southern sites TRN015 2 S-517

Jawa Road Milepost 145

Altimeter 4580 m = 15020 ft

GPS: 22 54 58.5

67 47 21.4

El = 15,800      LOP = 149

Jawa Road Milepost 150

Altimeter: 4640 = 15220

GPS 22 54 24.0

67 45 29.5

15,100

LOP = 150

NSF Camp overlooking Bolivia Fork.

Dieter Schmidt  
German Meteorologist  
Carrera Pinto 21  
SP d A

Rental House  
East on

1000 Pilla



10/28/94

Radiometer trouble detecting in San Pedro. Why is  $T_{a2}$  -ve.

1829 hrs

94102801, moc number

.doc data

.doc shows  $T_{a1} = 0.14$  stable

$T_{a2} = -0.12$  stable (and see -ve values)

$T_{sig}$  = 1710

Monitor data  $T_{sig}$   $T_c$  look good.

$\Delta T \approx 20^\circ$   
 $T_c$  44.1  $\rightarrow$  44.6  
 $T_H$  64.7  $\rightarrow$  65  $\rightarrow$  64.9

Sig - Ref -207 --- -205 (after an inboard fudge)

Hot - Ref 14.5 --- 12.9 - 14.8 This value is too small and too unstable!

1645

Hot - Ref 9.8 - 10V going down.

Mixer 0.68

$T_{sig}$  0.16

Gain 0.33

Temp 1555

Alignment problem.

Sig - Ref 256

Hot - Ref 13.0

Hand test

Sig - Ref -1 -2.5 -2.0 -2.0 -1.0

Hot - Ref 14.0 13.6 13.9 13.9 13.8

Temp 1557

Remote Sig - Ref -257 -255 -256 -256 -256

Hand Hot - Ref 12 11.5 11.7 10.5 9.6

let  $x$  = amount of sky ~ hot load.

$1-x$  = amount of hot load ~ hot load.

Looking at Ground Test

19.10	S-R	-256	} sky.
	H-R	9.0, 9.5, 9.7, 9.7, 10.0	
	S-R	-18	} ground
	H-R	14.1	
	S-R	-256	} sky
	H-R	11.1	
	S-R	-18	} ground
	H-R	12.6	

Looks like a loss of synchron problem.

19.56

Indoors

mVolts	Temp
13.90	= 6.9 K
13.15	= 6.6 K
13.85	= 6.9
14.55	= 7.3
15.65	= 7.8
31.95	= 16

Determine detector voltage side.

Tried reseating all connectors and IC's. Tightened a loose screw on chopper. Problem still present.

SR. Miguel Urrelo - 312755.

Calmar - Oscop.

7-8 days call Sunday

22:07

Oiled axle, straightened blades, tightened bearings.

In temp 45.7

Motor .735

Trap .680

Gun .326

Supply 11.27

Voltage -41.6

Sup cur 5.65

Sig - Ref -9.7

Hot - Ref 19.9

Ref 1620

Ref T 44.6

Hot T 67.6

Out T 29.9

Now want gen. count  
Must be synch. problem.

Questions for Gerry (change)

- We will call collect in future.  
What time to call.

① 74LS629 - VCO for square pulses.

Pin 1 bent out. Pot 10K

He did not do, maybe someone else. But if chopper is spinning  
no problem with VCO.

② Position of photodiode w/ot chopper.

③ Synchro are 14-ke mounted by factor 2  
Variable with hand test

More ~ 10-20° steps than 1-2° steps.

Dieter Schmidt. - leaving in 3 weeks.

Measured incoming IR radiation.  
Also measured

Can provide pressure, humidity,

Special supply system at 6000m - very many times relative humidity < 50% even at -5°C. Annual precip - 150-200 mm/yr. He did not measure.

3000 mm evaporation / year. potential can't measure 1-2 mm.

Dieter Schmidt

Dr. Michael Richter

University of Dresden  
Institute for Geography

Univ. Erlangen - Nürnberg  
Kodstr. 4  
Erlangen

Honorary etc. 13

01062 DRESDEN / Germany

Precipitation regime - big question.

From <sup>Summer</sup> NE or <sup>Winter</sup> SW ? Not known

Probably 50-50

SPdA is transition region.

Working at 5000m Climate - wind/temperature

Problems start at 3500' Mental - condition

Most people notice strongly Physical - drinking, cold.

4500-5000m. Best to second Pen. don't going to 4000-4500 before 5000m. Make many mistakes!

1000



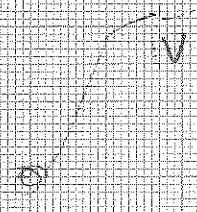
4300

2500

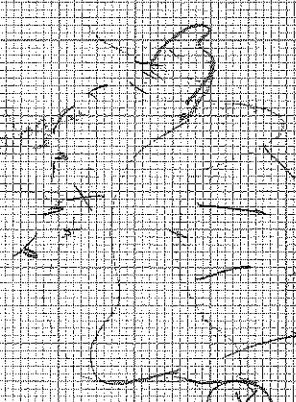
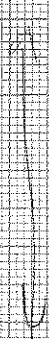
3000

4400

Quarta  
de Diabete



300



5000

15-2000

6000

SPAF



Fodhill game

32-8

Potencia No

835 2559

Potencia

94 11 04

Last Scan visible on screen when we arrived at site at 12:30 pm.

40 0101 01230 T Tau = 0.145 ± 0.015

tan z = 0.318

Parallax 1.01 1.21 1.41 1.63 1.87 2.07 2.20 2.35 2.52 2.72 2.91

ln(1/|s|) 5.68 5.67 5.61 5.55 5.59 5.62 5.61 5.60 5.59 5.58 5.55

ln(1/|v|) 0.57 0.77 0.99 1.30 1.43 1.30 1.49 1.26 1.32 1.49 1.71

Rank error 152 at 0000: 2689

Copied to a: 94110900 dac

0300 mac

0400 dac

0410 mac

800/0700 . dac

00 . Mac

empty

0106 . dac

0106 . mac

11/14/94

wind 6-8 m/sec

1.00 pm resited radiometer - clear skies, brilliant sun

First scan 16:04 UT

Second scan 16:15 tau = 106 ± 0.001

tan z = 0.165

T<sub>int</sub> = 47.3

Put silver foil over sun - expand front of radiometer

T<sub>int</sub> = 47.3

3rd scan 16:25 UT tau = 091

Tan z = 0.21

Last scan T<sub>int</sub> = 46.8