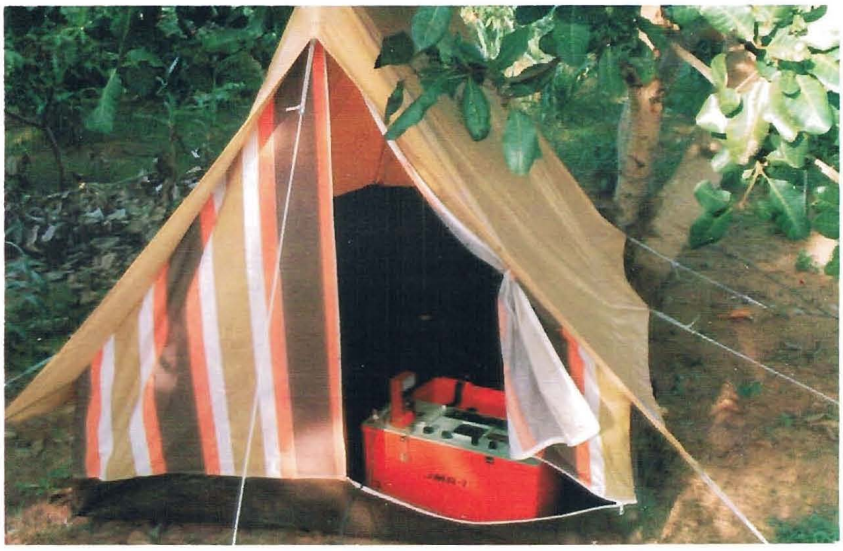
PRAKLA-SEISMOS INFORMATION No.25

Doppler Satellite Positioning on Land

The equipment used in East Africa



Doppler Satellite Positioning on Land

PRAKLA-SEISMOS' most modern Doppler satellite positioning equipment automatically acquires, tracks and processes the 150 MHz and 400 MHz signals broadcast by the Navy Navigation Satellite System (NNSS) to provide high precision fixes for survey control anywhere in the world.

PRAKLA-SEISMOS applies JMR-4A receivers (with built-in microprocessor) and JMR-1A receivers (slave stations).
Advantages are:

- Rapid point-positioning convergence on site
- Sustained accuracy in the presence of interference
- Automatic rejection of non-satellite signals and of second satellite lock-on
- Accuracy to within 3 metres with only 10—16 passes for all three dimensions: latitude, longitude and height (see fig. below).

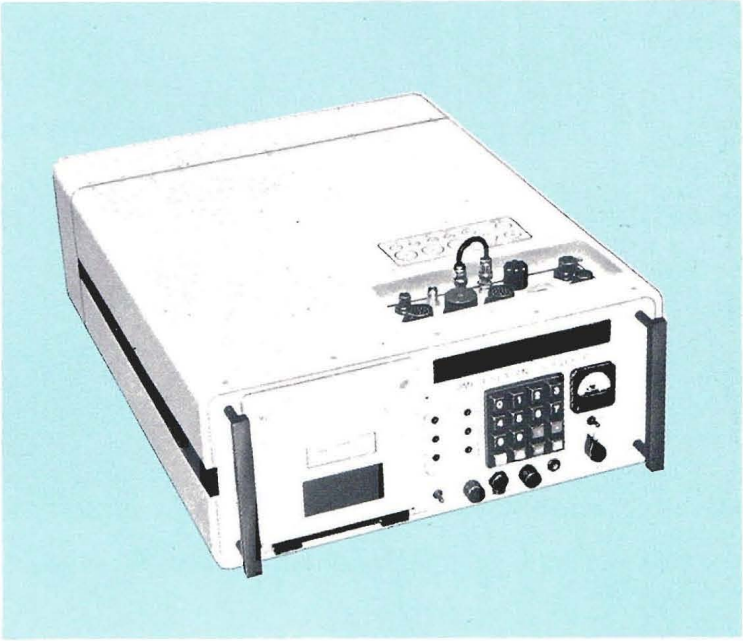
If higher accuracy is desired, the translocation method or even the multistation translocation (up to four stations) can be used in the field.

In this case the sophisticated programs in PRAKLA-SEISMOS' Data Center at Hannover can provide relative distances and azimuths of the lines between the stations with geodetic accuracy, and results can be achieved within the submeter-range (see fig. on back cover).

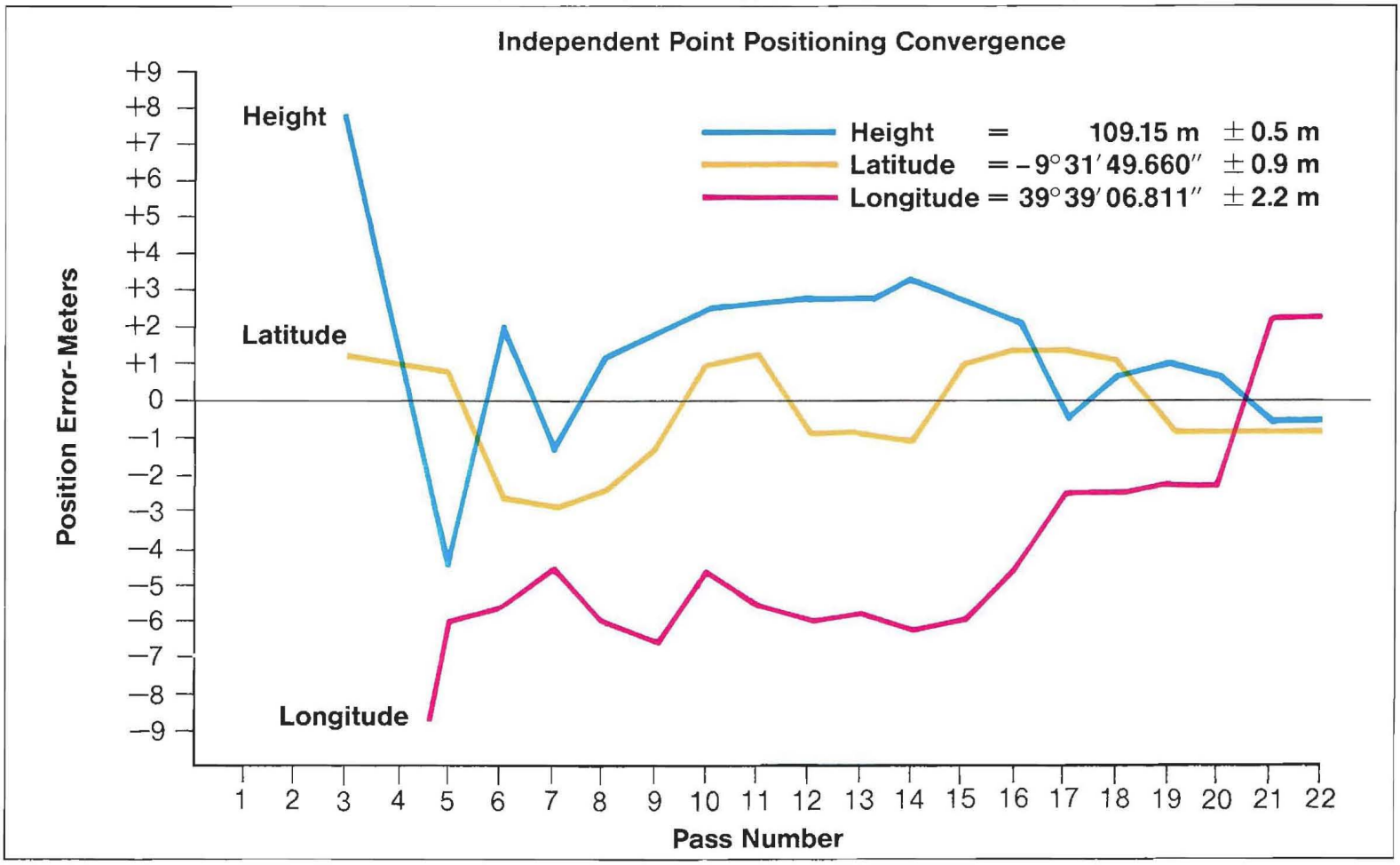
There are many possibilities to make use of this accurate, quick and low-priced positioning method which is essentially independent of weather, time of day and geographical position:

- Positioning of drilling platforms
- Positioning of transmitter stations for navigation purposes
- Geodetic control of any net or line configuration
- Determination of control points in aerosurveys
- Transformation of co-ordinates between different reference ellipsoids.

JMR-4A



Data recorded at Mkoe, Tanzania, February, 11 to 15, 1981 and field processed with a JMR-4A



RUN TITLE ********* SP-2G RUN PRAKLA JMR -4A DATA***

TOTAL NUMBER OF PROCESSED PASSES =	10		
NUMBER OF ACCEPTED PASSES =	10	NUMBER OF REJECTED PASSES =	0
NUMBER OF NORTH GOING PASSES =	7	NUMBER ELEVATION ANGLE TOO HIGH =	0
NUMBER OF SOUTH GOING PASSES =	3	NUMBER ELEVATION ANGLE TOO LOW =	0
NUMBER OF PASSES WEST OF STATION =	2	NONSYMMETRIC OR INSUFFICIENT DATA =	0
NUMBER OF PASSES EAST OF STATION =	8	NUMBER EXCEEDED PROBABILITY TEST =	0

LATITUDE DEG MIN SEC	LONGITUDE DEG MIN SEC	HEIGHT METERS	X METERS	Y METERS	Z METERS
+ 52 14 35.324	+ 9 39 31.938	160.67	3858222.82	656648.01	5019540.29

REFERENCE ELLIPSOID: SEMI-MAJOR AXIS = 6378135.00 METERS FLAT. COEF.= 298.260
DATUM SHIFT IN METERS: X= 0.00 Y= 0.00 Z= 0.00

EST. VARIANCE-COVARIANCE MATRIX (METERS)

	LATITUDE	LONGITUDE	HEIGHT
LAT	.37363E+00	.33232E-01	.25233E-01
LONG	.33232E-01	.10373E+01	.14609E+00
HGHT	.25233E-01	.14609E+00	.41007E+00

STD.DEV. (LAT)= .61 METERS
STD.DEV.(LONG)= 1.02 METERS.
STD.DEV.(HGHT)= .64 METERS

TOTAL DEGREES OF FREEDOM = 219 EST. VARIANCE FACTOR = .840

LOCAL FREQUENCY OFFSET= -19.55

Data recorded at Hannover, Germany, in January 1981 and processed in PRAKLA-SEISMOS' Data Center

PRAKLA-SEISMOS GMBH · HAARSTRASSE 5 · P.O.B. 4767 · D-3000 HANNOVER 1
PHONE: (5 11) 80 72-1 · TELEX: 9 22 847/9 22 419 · CABLE: PRAKLA · GERMANY