A Geophysical Report

On the

Palomino Claim Group

Omineca Mining Division

British Columbia

NTS 93L09

Longitude 126 deg. 24 min.
Latitude 54 deg. 34 min.

Owner Steve Bell

By

Steve Bell

December 2003

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Introduction

The following is a record of the exploration work performed on the Palomino mineral claim group between October 15 and November 15, 2003. The property may host porphyry style copper-gold and structurally controlled shear/vein copper-gold mineralization.

Summary

Exploration work was performed on the Palomino, Palomino 4,5,6,7,8,9,10,14 and 15 claims for the purpose of locating conductors and zones of higher magnetic susceptibility that may be related to sulphide mineralization. The work program conducted was an electromagnetic/magnetic ground reconnaissance style geophysical survey carried out over a 16.7 km grid, which is centered on a prominent aeromagnetic anomaly. The surveys totaled, magnetic (15.84 km), Very Low Frequency Electromagnetic VLF-EM (16.65 km) and Broadside Vertical Loop Electromagnetic BVL-EM (6.98 km). Several northerly trending conductors were located, which correlate well with the positive magnetic anomaly outlined. Electromagnetic/magnetic profiles indicate steeply dipping causative bodies with depths of burial of 25 to 50 meters. The anomalies appear to have been displaced from 50 to 160 meters by a series of east/northeast trending faults that appear as topographic lineaments on aerial photographs. Both the magnetic anomaly and the strongest conductors are spatially related to a quartz feldspar porphyry dyke that lies

on a northwest trend, which includes the known mineralization. This correlation suggests that the conductors could be due to concentrations of sulphides within shear zones or faults. The magnetic anomaly probably indicates the presence of magnetite, which could be associated with a zone of potassic alteration. HLEM work is recommended to verify the location and to determine the conductivity of the most important conductors. Possible follow-up would include diamond drill testing of selected electromagnetic/magnetic anomalies.

Location and Access

The Palomino group of claims consists of the Palomino and Palomino 1-17 claims and is situated approximately 6 km northeast of Perow in west-central British Columbia. (Figure 1). The claims are centered at 54 degrees 34 minutes' latitude and 126 degrees 24 minutes' longitude within the 93L/9E NTS map sheet. Access is made to the Palomino claim group from the Johnny David forest service road in the Morice forest district.

Physiography, Vegetation and Climate

The claims are located on gently rolling topography typical of the Nechako plateau at an elevation of about 900 m. Glacial features in the overlying till suggest that the overburden varies in thickness from a few meters on the tops of small hills to tens of meters in the low areas. Branch streams of Johnny David creek, which enter the terrain from the north and east, have eroded deep gulches that have exposed the underlying

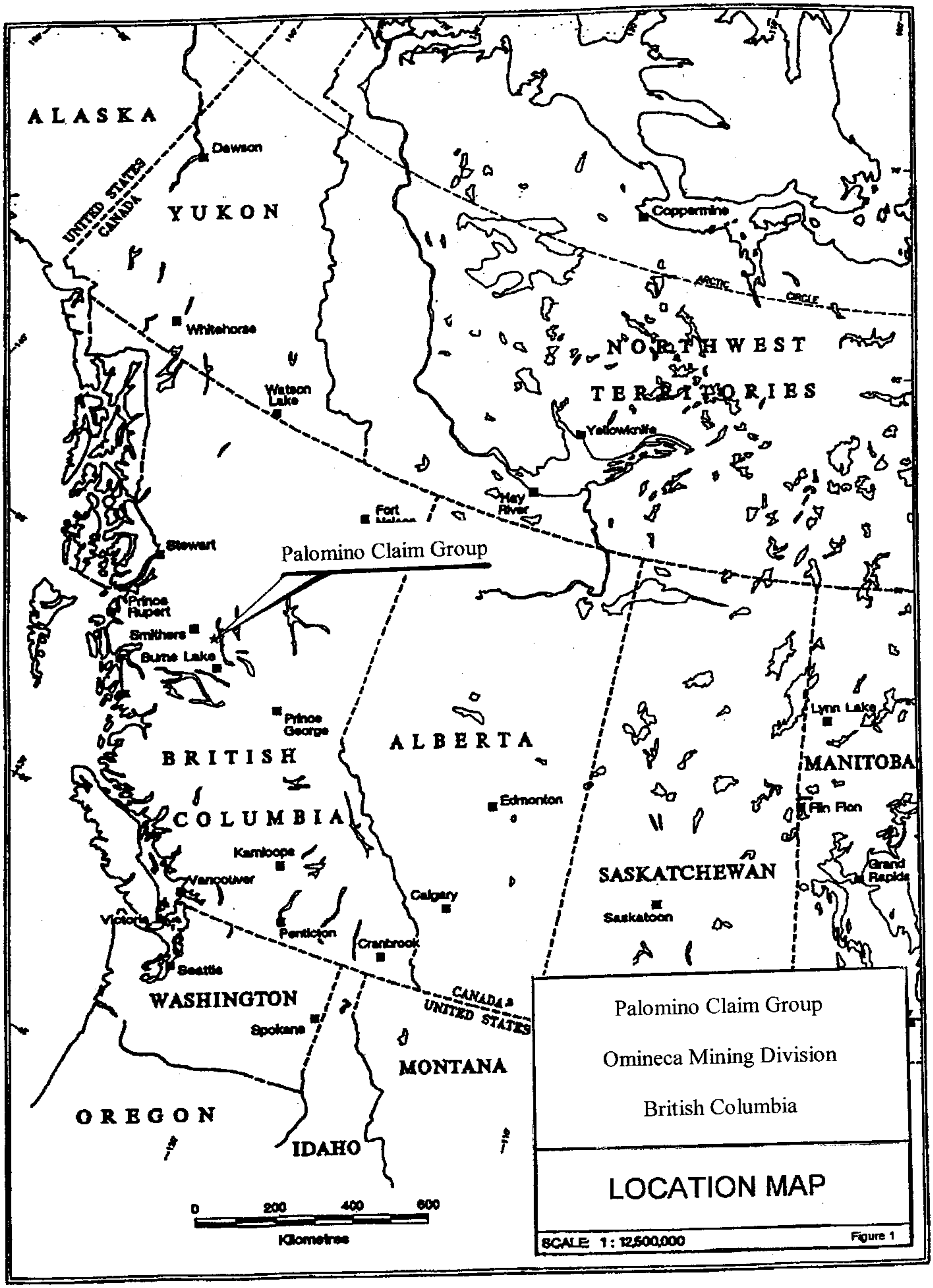
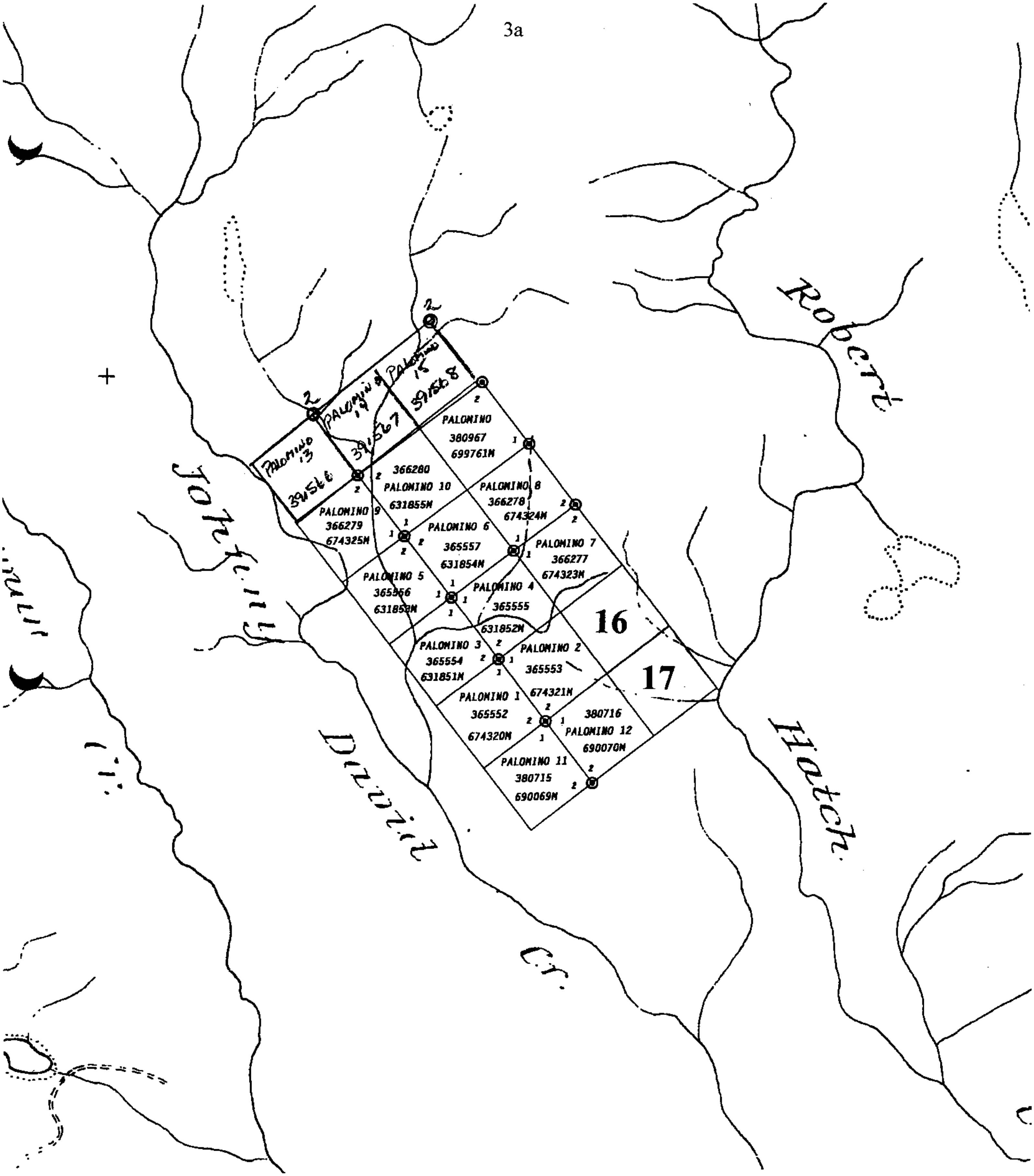

ALASKA
YUKON
UNITED STATES
CANADA
Dawson
Whitehorse
Watson Lake
Coppermine
ARCTIC CIRCLE
NORTHWEST
TERRITORIES
Yellowknife
Hay River
Fort Nelson
Stewart
Palomino Claim Group
Prince Rupert
Smithers
Burns Lake
Prince George
BRITISH
COLUMBIA
ALBERTA
Edmonton
Lynn Lake
MANITOBA
Flin Flon
Grand Rapids
SASKATCHEWAN
Saskatoon
Kamloops
Vancouver
Victoria
Calgary
Penticton
Cranbrook
Seattle
WASHINGTON
CANADA
UNITED STATES
Spokane
MONTANA
OREGON
IDAHO
0
200
400
600
Kilometres
Palomino Claim Group
Omineca Mining Division
British Columbia
LOCATION MAP
SCALE 1 : 12,500,000
Figure 1

Fig. 1

bedrock at several locations. The soil is fairly thin in most places except where the drainage is poor and organic matter tends to accumulate. Pines largely forest the property on the drier ridges while alder and spruces are found in the lower wetter areas. On the edge of the stream valley there are small open meadows broken by groves of aspen. Winters are moderate to cold with typical snow accumulations of about 1 meter and the area is generally free of snow pack between mid May and late October.

Ownership

The Palomino Claim group is 100 % owned and operated by S.Bell of Houston, British Columbia. The property is comprised of 18 units located in the Omineca Mining Division (Figure 2). Table 1 contains claim information and tenure status for all the Palomino claims.



Mineral Titles Reference Map 93L 09W
Scale 1 : 31680

Fig. 2

Table 1: Claim Status Palomino Claim Group

Claim Name	Units	Tenure Number	Projected Expiry
Palomino	1	380967	2010 Mar26
Palomino 1	1	365552	2009 Mar26
Palomino 2	1	365553	2009 Mar26
Palomino 3	1	365554	2009 Mar26
Palomino 4	1	365555	2009 Mar26
Palomino 5	1	365556	2009 Mar26
Palomino 6	1	365557	2009 Mar26
Palomino 7	1	366277	2010 Mar26
Palomino 8	1	366278	2010 Mar26
Palomino 9	1	366279	2010 Mar26
Palomino 10	1	366280	2010 Mar26
Palomino 11	1	380715	2011 Mar26
Palomino 12	1	380716	2011 Mar26
Palomino 13	1	391566	2008 Mar26
Palomino 14	1	391567	2008 Mar26
Palomino 15	1	391568	2008 Mar26
Palomino 16	1	406467	2005 Mar26
Palomino 17	1	406468	2005 Mar26

History of Work

Minfile occurrence Jack Rabbit 93L019 is a 4-meter wide copper/gold/silver bearing shear zone which was discovered in 1927 outcropping on the south bank of an east/west tributary of Johnny David creek (See Map 4 for location). Early efforts to trace the zone on surface were hampered by excessive overburden so a short adit was driven in 1928 to test the mineralization. In the 1960's the property was examined for porphyry style mineralization and a chalcopyrite bearing quartz feldspar porphyry dyke located adjacent to the shear was stripped and sampled. Phelps Dodge corporation conducted a magnetometer survey in 1973 over the Jack Rabbit shear zone to define lithologic trends as an aid to mapping the underlying bedrock (Assessment report #2738) and in 1985 Ogryzlo mapped the geology in the vicinity of the original mineral showings (Assessment report #13845). The property was subsequently optioned to Rosalie Resources who performed a combined magnetometer and VLF-EM survey over a grid centered on the known mineralization (Assessment report #16071). In 1998 Bell performed a self-potential survey over the shear zone and analyzed 129 till samples (Assessment report #26005). The original adit that was driven in 1928 to explore the shear zone was excavated in 2001 and sampled to confirm the high-grade nature of the sulphide mineralization (Assessment report # 26641). Bell located a previously unreported out crop of quartz feldspar porphyry in on Palomino 15 and further prospecting revealed the presence of chalcopyrite in andesite porphyry boulders in till on Palomino 10 (Assessment report #27051).

Work Performed 2003

The geophysical work was carried out over the period October 15, 2003 to November 15, 2003. Bell prepared the grid and conducted the magnetic and VLF-EM surveys. Bell and Thompson together completed the BVL-EM survey. The grid measures 16.65 km including baseline. The electromagnetic/magnetic surveys totaled 39.46 km.

Regional Geology and Mineralization

The Perow area lies within the Stikinia terrane, which is composed of late Triassic to Eocene age volcanic and sedimentary rocks. Within this sequence the Jurassic Hazelton group, which has been widely exposed by uplift and erosion provides a geologic setting favorable to mineral exploration. The mainly subaerial Telkwa formation, the lowest unit of the group is host to structurally controlled precious metals and volcanogenetic massive sulphide prospects occur in overlying oceanic sedimentary rocks. Cretaceous to Tertiary volcanic rocks of the Kasalka, Ootsa Lake and Endako groups are not as prospective however important porphyry style mineralization is related to the emplacement of intrusions within the Jurassic/Cretaceous pile. The capping Eocene Newman formation volcanic rocks are largely barren. MacIntyre described the regional geological framework in the British Columbia Ministries Report of Geological Fieldwork for 1995.

Local Geology

Bedrock exposures indicate that a sequence of volcanic and sedimentary rocks, which belong to the Telkwa formation underlie the claim group. The most abundant rock types are andesite porphyry, volcanic breccias, tuff, rhyolite and quartz feldspar porphyry. These rocks appear in outcrop near the Jack Rabbit shear zone (Minfile occurrence 93L019 survey at grid coordinates 000N x 215E on map 4). The Jack Rabbit occurrence is a 4-meter wide pyrite/chalcopyrite bearing shear zone which strikes at 340 degrees and dips toward the west at 70 degrees. The shear zone is exposed on the south bank of an east to west flowing tributary of Johnny David creek. In 1928 a sample collected across a 0.4-meter width of the zone assayed 42.5g/t Au, 171.4g/t Ag and 9.4% Cu. A quartz feldspar porphyry dyke which outcrops 20 meters east of the shear and assays 0.1% copper over 20 meters could be related to the Jack Rabbit mineralization. The dyke strikes in the same direction as the shear and cuts the volcanic host rock at a steep angle. Andesitic rock adjacent to the dyke contains a potassic alteration mineral assemblage, which includes abundant epidote, calcite, anhydrite, k-feldspar, magnetite and minor chalcopyrite. Near the headwaters of another drainage at 1550N on Palomino 15, quartz feldspar porphyry is exposed on both sides of a steep gully (See map 4). The two outcrops of porphyry are about 45 meters apart and appear to be the off set portions of a dyke that has been displaced by an east west trending fault. This dyke is interpreted to be the northwest extension of the quartz feldspar porphyry located adjacent to the Jack Rabbit shear zone 1.5 km to the southeast. At the northwest occurrence however both the dyke and andesitic host rock exhibit a greater degree of alteration. Abundant quartz carbonate veins are present and the rock has been bleached to a beige/buff color. Bedding in sedimentary rocks which outcrop along an "S" bend of a north south tributary of Johnny David creek on Palomino 5, indicates that the local stratigraphy strikes in a northwest direction and dips gently toward the northeast. The only known bedrock occurrence found outside of the Johnny David creek drainage it is located near the crest of a small hill on the Palomino claim at 1080Nx390E. Here several square meters of a dark gray tuff/breccia are exposed in the ditch of a logging road. Fractures and partings in the tuff/breccia host minor malachite, magnetite, chlorite and calcite. Propylytically altered andesite porphyry boulders containing 650 ppm copper lie on the southwest flank of a small hill several hundred meters west of this location. These boulders appear to be locally derived.

Geophysical Survey Design and Orientation

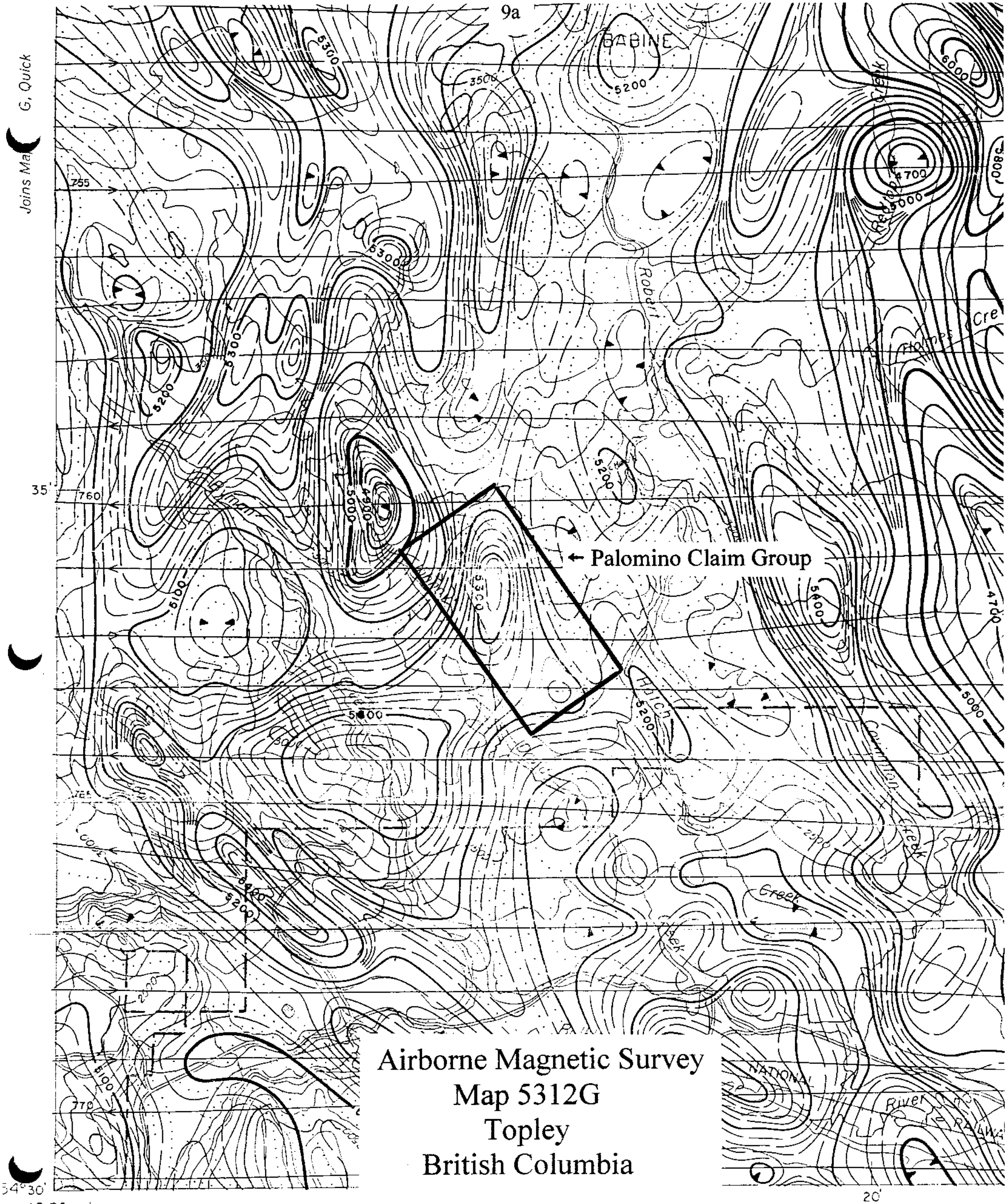
The survey conducted on the Palomino claim group was carried out over a grid comprised of 16 lines spaced 100 meters apart. Grid location was selected such that traverses would cross the trace of the quartz feldspar porphyry dyke and a prominent north trending aeromagnetic anomaly located on Palomino 10. A brunton compass was used to orient the lines in east-west directions perpendicular to a north-south baseline established 215 meters west of the Jack Rabbit shear zone. The east-west line orientation was selected so that traverses would cross the aero magnetic anomaly at right angles and that conductors striking in echelon with the Jack Rabbit fault would have good electromagnetic coupling with the BVL-EM signal. Stations were marked with flagging every 15 meters using hip chain. The Broadside Vertical Loop Electromagnetic (BVL-EM) and Very Low Frequency Electromagnetic (VLF-EM) methods are primarily reconnaissance EM techniques and tight chaining of the stations was not necessary. The 15-meter station spacing provided sufficient data points to detail the magnetic anomaly and to enhance the character profile of EM conductors.

Results and Discussion

The geophysical data is tabulated in appendix IV and displayed in profile form on maps 1, 2 and 3. The interpreted locations of each conductor and quartz feldspar porphyry dyke are indicated on individual profiles included in appendices I, II, and III. Map 4 is a plan that shows the position of the interpreted geophysical features in relation to the survey grid and Palomino claim group. The following is a discussion of the data, its interpretation and how it relates to the known geology.

Ground Magnetic Survey

Figure 3 shows a broad north to south tending 1.2 km long elliptical aeromagnetic high of 100 gammas relief centered on Palomino 10. The ground vertical field magnetic survey detailed this aeromagnetic anomaly and the results are presented on Map 1. Readings varied from a low of about 0 gammas to a high of 2000 gammas on line 1200N giving a total magnetic relief of 2000 gammas for this anomaly. The trend of the anomaly is north south from line 1500N to line 800N a distance of 700 meters. On line 700N and 600N the



One inch to one mile

Fig. 3

magnetic expression broadens and develops two distinct peaks of moderate relief. The peaks are replaced by a single broad south trending anomaly of about 500 gammas relief, which continues south beyond line 200N. The north to south trending magnetic anomaly appears to be offset by two northeast trending faults, labeled 2 and 3 on Map 4. The faults have a strike slip component that displaces a block located between lines 500N and 900N about 160 meters to the east. Interpreted faults 1, 2, 3 and 4 are shown corresponding to topographic lineaments on the aerial photograph (Figure 4). In 1973 Beaton (Assessment report #4760) found that the weakly mineralized north/northwest trending quartz feldspar porphyry dyke has a lower susceptibility than the adjacent volcanic rocks and that the mineralized Jack Rabbit Fault coincides with a narrow magnetic low. He concluded that the restricted magnetic highs over the epidotized andesitic to basaltic host rocks are probably caused by local increases in magnetite. The higher magnetite content in the rock local to the known mineralization suggests that this magnetite in part belongs to an associated alteration mineral assemblage. Therefore the trace of the dyke and potential fault zones may be reflected in the magnetic data as a pattern of highs dissected by narrow lows. A northerly trending fault "A" and the trace of the dyke were interpreted using this correlation. These features are plotted on compilation Map 4 and on the magnetic profile sheets (See appendix I). On each profile Fault "A" correlates well with the north trending positive vertical magnetic anomaly and is marked by a small low within the larger feature. Fault "A" is about 700 meters long including the offset segment labeled "A1". North of line 1100N the trend is to the north/northeast. The fault labeled "B" appears to be a southeast trending splay of fault "A" that follows the eastern flank of the vertical field magnetic anomaly. From its outcrop at 000N x 235E the feldspar

Palomino Claim Group

Fault and Conductor System

Scale 1 : 16850

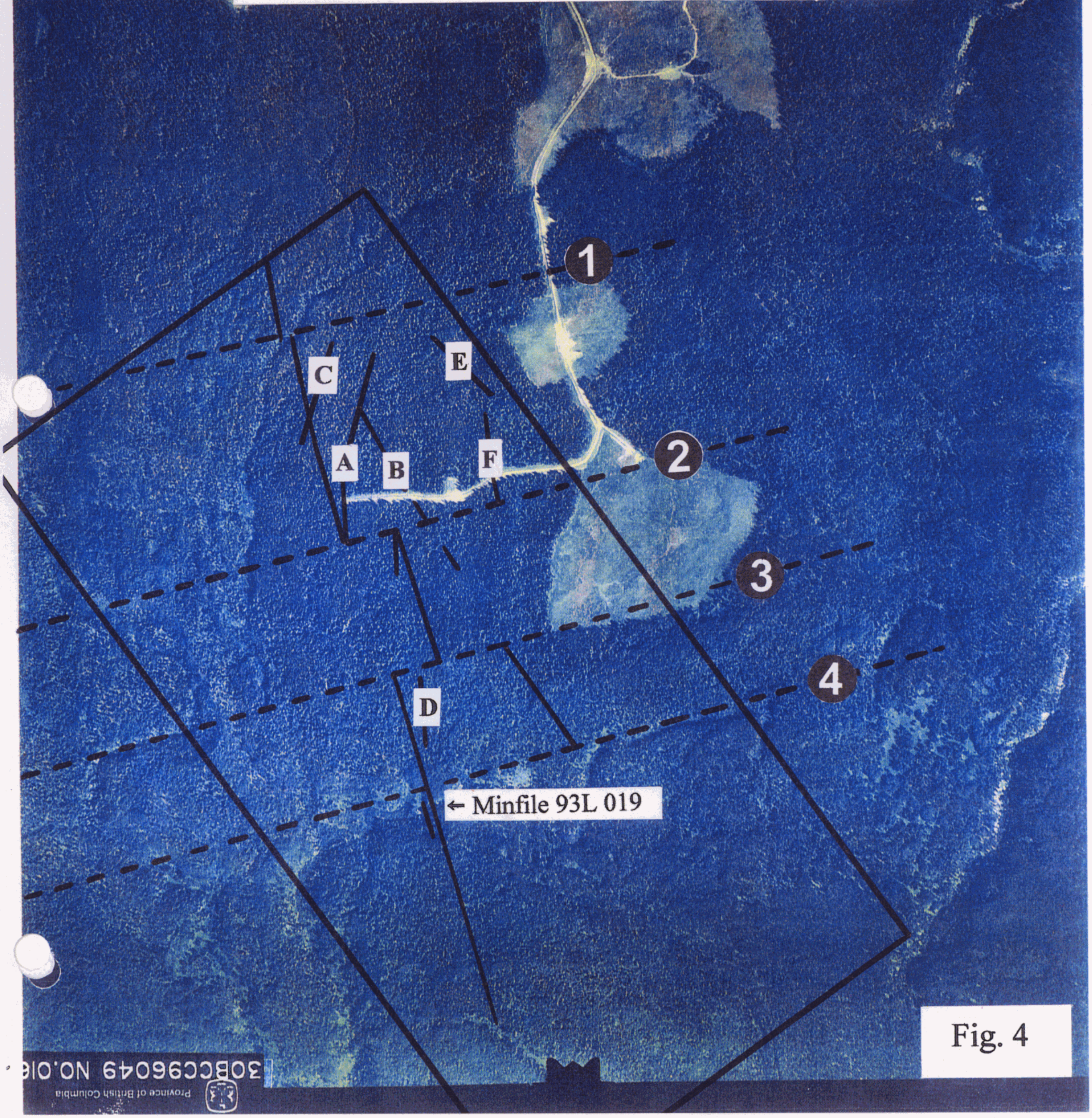


Fig. 4

porphyry dyke *strikes north/northwest* at 340 degrees to line 400N where it appears to have been displaced 160 meters to the east by fault #3. The faulted segment lies in a trough separating two prominent magnetic highs on lines 600N and 700N (See magnetic profile sheets). The trace of the dyke resumes its original trend north of fault #2 following the western flank of the magnetic anomaly to185Wx1550N where it has been displaced 45 metes to the west by fault #1. The shape of the magnetic profile from line 800N to 1300N suggests an easterly dipping north striking tabular causative body (See outline on Map 4). Its depth of burial, width and dip were estimated by matching the magnetic profiles to standard curves derived by Parker (Geophysics v. 28, no.2). The results of this interpretation are summarized in Table 2.

Table 2: *Interpretation of vertical field anomaly* (k = 0.0135 cgs units)

	Average	**900N**	**1000N**	**1100N**	**1200N**	**1300N**
Depth (m)	**48**	53	49	53	35	46
Width (m)*	**65**	55	56	88	77	47
Dip °	**76**	72.5	83	73	80.5	70

This feature could be a magnetite bearing intrusion or a tabular shaped alteration zone containing magnetite that is controlled by fault "A". The average width of the body is estimated to be 65 meters from lines 900N to 1300N. A magnetic susceptibility contrast of 0.0135 cgs units was assumed in the thickness calculation. This susceptibility is an average for andesite as determined by Stearn (Trans. AM.Inst. Mining Met Engrs., Vol.

81, pp 315-344, 1929) and corresponds to a 4.5% magnetite content. The anomalies amplitude response indicates an average depth of burial of 48 meters however remnant magnetism can affect this calculation. If there is remnant magnetism present that acts against the induced field an anomaly will appear to be deeper than it actually is. The relative remnant to induced magnetism for three cobbles of mineralized andesite porphyry found in till at 15W x 1035N was estimated to be 1.8 (See section on geophysical theory for procedure). If these cobbles were derived from the causative body then remnant magnetism could significantly affect the depth estimate.

Very Low Frequency (VLF-EM) Survey

The positions of several short Very Low Frequency Electromagnetic (VLF-EM) anomalies with primarily north to northwest strikes were interpreted from the profiled data. These anomalies are labeled as conductors "A", "B", "C" etc. on compilation Map 4 and on the individual profiles located in appendix II. On map 4 the conductors are classified in terms of mineralizing potential as strong, moderate or weak. Conductor "A" is important because of its strong correlation with the magnetic anomaly on lines 900N, 1000N, 1100N and 1200N. On line 1300N the horizontal distance between maximum positive and negative VLF-EM tilt angles opposite the cross over indicates a depth of burial of approximately 60 meters. True crossovers may not occur on all lines since north-striking conductor "A" does not achieve maximum coupling with the Seattle station. The negative quadrature on lines 1000N and 1100N however could indicate concentrations of sulphide mineralization. Conductor "B" exhibits a lower conductance than "A" but has well-defined crossovers. Better coupling with the Seattle station contributes to the higher amplitude response of conductor "B". Conductor "B" follows the eastern flank of the magnetic anomaly and intersects conductor/fault "A" at 15W x 1320N. Anomaly "B1" is a moderate strength conductor with a well-defined crossover that exhibits good conductivity and may be an extension of "B". Conductor "B2" lies on the same trend and shows good response amplitude in the south but becomes weaker in the north. The negative inphase indicates possible sulphide mineralization on lines 200N and 300N. Conductor "B2" strikes parallel to the suspected strike of the underlying stratigraphy, which suggests that the conductance at "B2", "B1" and "B" may also be related to a lithologic contact. Conductor "D" exhibits weak conductivity but has a good amplitude response. This conductor is of interest since it correlates with a copper in soil anomaly at the crossover on line 200N (Assessment report #26005) and may be a northern extension of the Jack Rabbit fault. Conductor "E" is significant since it is the equivalent of conductor "B". Likewise the orientation of conductor "F" is similar to conductor "A". Together conductors "B", "E" and "F" define the edges of an oval shaped block. The enclosed area exhibits negative quadrature response, which could mean that the bounding conductors coincide with the edges of a broad horizontal conductor. It is not clear whether this response is related to conductive overburden or the underlying geology. Short wavelength, low amplitude conductors however located in the northwest part of the grid are probably due to shallow narrow conductive bedrock fractures or conductive overburden. Topographic effects are evident on the electromagnetic profiles but do not interfere with the VLF-EM interpretation. An example of the topographic effect can be seen along the western edge of the survey area where inphase readings are given a positive bias by a gradual upslope east of a north to south flowing creek. In other areas topographic changes are abrupt and do not translate into significant VLF-EM effects.

Broadside Vertical Loop (BVL-EM) Survey

The Broadside Vertical Loop Electromagnetic (BVL-EM) method was used to survey lines, which cross the most significant VLF-EM conductors. Tilt angles for the two frequencies recorded, 7111 Hz (High) and 1777 Hz (Low) are plotted on Map 3 and on individual profiles included appendix III. There is good correlation with VLF-EM conductors "A", "B", "B1", "C", "D", and "F", which are indicated by right way BVL-EM crossovers. Poor coupling with the EM signal however probably contributes to the lack of response over Conductor "E" on line 1500N. Conductor "B2" lies outside the range of the broadside survey and was not tested. Symmetrical crossovers on lines 900N, 1000N, 1100N and 1300N mark the location of north trending conductor "A" and peak positive tilt angles indicate that the conductive zone dips steeply toward the east. A characteristic plot of the slope to peak-to-peak amplitude versus depth developed by Newmont Exploration Ltd. was used to determine the depth to conductor "A" at each frequency. The results appear in Table 3.

Table 3. Depth to conductor A (meters)				
Frequency	**900N**	**1000N**	**1100N**	**1300N**
1777 Hz	51.8 m	47.4 m	ND*	ND*
7111 Hz	54.1 m	51.8 m	24.5 m	38.1 m
Average	53 m	50 m	24.5 m	38.1 m

* Not determined

On lines 900N and 1000N the conductivity thickness product for conductor "A" cannot be resolved since induction numbers are too high for the indicated depth of burial. This effect may be related to current gathering phenomena at the higher frequency. The peak-to-peak low frequency response on lines 1100N and 1300N indicate induction numbers of 7 and 5 respectively, corresponding to conductivity-thickness products of 5 and 3.6 mhos. Conductor "A" is therefore interpreted to be a relatively narrow conductive fault or shear zone. Peak low to high frequency amplitude ratios indicate a change in conductivity for conductor "A" from moderate at 900N to fair at 1300N. Conductor "B" intersects "A" at 1300N and trends to "B1" where it is cut by Fault #2. Since "B" stems from "A" it may also be a conductive fault or shear. Conductor "C" exhibits fair conductivity and may be two parallel conductors or a single broad conductor. The locations of conductors "D" and "F" are marked by crossovers however frequency response ratios suggest only fair conductivity.

Conclusion

The aero magnetic anomaly described by Beaton (Assessment report #4760) coincides with the magnetic feature detailed in the northern half of the survey grid. Interpretation of the vertical field magnetic profiles across this feature indicates the presence of a 600-meter long tabular causative body. The body strikes to the north and dips toward the east and has an average depth of burial of 48 meters. A magnetic susceptibility contrast equivalent to a 4.5% magnetite content equates to an average width of 65 meters for this body. The magnetic anomaly appears to be a cross cutting feature controlled by conductor “A” which has a similar depth of burial. In terms of profile character conductor “A” is the most significant EM anomaly. The conductivity thickness determined for conductor “A” is probably underestimated due to “current gathering and thickness effects” at the relatively high frequencies used and the actual conductivity could be significantly greater. Conductor “D” is important since it has an overlying copper in soil anomaly, which suggests the presence of a conductive fault or shear that contains sulphide mineralization. Therefore conductors “A”, “B” and “C” might also be sulphide bearing faults or shears. If the magnetic feature is an alteration zone significant chalcopyrite could be present with magnetite as part of the alteration mineral assemblage.

Recommendations

A Multi-frequency horizontal loop electromagnetic (HLEM) survey should be conducted over conductors "A", "B" and "C" in order to determine accurate conductivity thickness products. The most conductive zones can then be diamond drill tested for structurally controlled precious metals and porphyry style copper gold mineralization.

Statement of Expenditures

Palomino Property Geophysical Survey 2003

Personnel Costs	
Steve Bell, Project Engineer - 23 days @ $350/day	$8,050.00
Gary Thompson, EM transmitter operator – 4 days @ $300/day	$1,200.00
Transportation	
Vehicle, 4-wheel drive ¾ ton diesel pickup rental	$2,755.40
Geophysical Equipment Rental	
HLEM, Apex Parametrics Maxmin I, 6 days @ $160/day	$960.00
VLF-EM, Geonics EM16, 1 week @ $300/week	$300.00
Magnetometer, Sharpe MF-1, 6 days @ $50/day	$300.00
Survey Equipment	
Two way radio, Motorola, 23 days @ $10/day	$230.00
GPS and Brunton compass, 7 days @ $15/day	$105.00
Flagging, 36 rolls @ $2.49/roll	$90.39
Hip chain, 9 rolls @ $2.50/roll	$22.50
Food	$276.00
Report Writing	$2,500.00
Total Expenditures	**$16,789.29**

Statement of Qualifications

This is to certify that I am a graduate of Queen's University at Kingston, Ontario, with a Bachelor of Science degree in Mining Engineering (1985).

I am currently employed as an independent consultant in the mining and mineral exploration industries.

Steve Bell
Mining Engineer
December 2003

Statement of Qualifications

This is to certify that I have been active in the mining and mineral industry for over ten years and have previous experience conducting geological, geochemical and geophysical surveys. I am currently employed as an independent consultant and contractor in both the mining and mineral exploration industries.

Gary Thompson
Exploration Consultant
Low Profile Exploration
December 2003

Equipment Design Specifications And

Geophysical Theory

Survey Parameters

- Survey line separation ⇒100 meters
- Survey station spacing ⇒ 15 meters
- Base line direction ⇒ north - south
- Survey line orientation ⇒ perpendicular to base line

Surveys Totals

- Magnetic ⇒ 15.84 km
- BVL–EM ⇒ 6.98 km
- VLF–EM ⇒ 16.65 km

Magnetic Survey

Instrumentation

The magnetic survey was carried out using a Sharpe MF-100R Fluxgate magnetometer manufactured by Sharpe instruments of Canada. This instrument measures variations in the vertical component of the earth's magnetic field. Readability on the lowest scale is .5 gammas and temperature stability is less than 2 gammas per degree Celsius.

Theory

Local variations in the earth's magnetic field called anomalies occur where there are magnetic susceptibility contrasts. These susceptibility contrasts are created by changes in the concentration and orientation of magnetic minerals contained in the underlying bedrock. A magnetometer, which measures variations in a component of the earth magnetic field strength, is used to detect magnetic anomalies. Magnetic anomalies are direct indicators of ore types that contain magnetic minerals while non-magnetic ore types can be located indirectly by following associated magnetic features. The patterns of magnetic variations that define magnetic anomalies are usually displayed in profile form. The size and position of a causative body or ore zone is estimated by studying the amplitude and shape of the profile.

Remnant Magnetism

The net magnetic field that defines an anomaly is a combination of the induced field and any remnant magnetism present. At the Palomino location the orientation and strength of a remnant magnetic field is not known and the interpretation assumes that the inducing field causes the anomaly. The possible contribution of remnant magnetism however was measured by estimating the relative magnitude of the remnant component in samples of andesite porphyry believed to be derived from the causative body. The procedure outlined by Hood (Can. Min. J., vol 84, pp. 76-79) was followed to estimate the modified Koenigsberger ratio.

Survey Procedure

A base station was established near the eastern end of line 1000N and a 100-gamma datum set. The base line was then surveyed. A normal looping method was employed where the base station was reoccupied every 5th baseline station read. The looping provided data necessary to account for diurnal variations and drift. Readings were taken at flagged stations located every 15m along cross lines and no adjustments were made until returning to the baseline. The readings were read to an accuracy of 5 gammas and recorded with the time in a notebook. Direct readings were adjusted on a time basis if the correction required a change of more than 5 gammas. No unusual magnetic disturbances were noted during the course of the survey and corrections were minimal. The adjusted values are tabulated in appendix II and displayed in profile form on Map 1.

Very Low Frequency Electromagnetic Survey (VLF–EM)

Instrumentation

The instrument used during the survey was an EM–16 model VLF receiver manufactured by Geonics of Canada. This EM–16 was tuned to receive the 24.8 khz signal from the NLK VLF transmitting station located near Seattle, Washington.

Theory

Remote VLF communication transmitters radiate oscillating horizontal magnetic fields. When these magnetic fields intersect conductive bodies in the ground secondary fields are created. Due to these secondary magnetic fields the total field is tilted away from a dipping conductor in both directions on either side of it. The amount of tilt measured in percent grade is proportional to the vertical secondary field. Due to the resistive nature of all conductors the secondary field experiences a small phase shift in the presence of a good conductor and a larger one in the case of a poor conductor. The EM–16 receiver measures both the real (inphase) and quadrature (out of phase) components of the vertical secondary field. The magnitude of the inphase response for a conductor decreases proportionately with its depth of burial and with poorer conductivity. The quadrature component is useful in estimating the quality of a conductor. Negative quadrature indicates a conductor at depth while surface features usually display positive quadrature. Conductor locations are determined by noting the direction of the tilted total field. A conductor is located by a right way crossover when the inphase or tilt of the total field is plotted in profile form. On Map #2 a right way crossover is defined as a positve to negative change in the magnitude of the inphase from west to east.

Survey Procedure

The 24.8 khz signal from the Seattle VLF station was acquired to ensure maximum coupling with north to north-west trending conductors. To take a reading the instrument was oriented parallel to the magnetic lines after noting the position of the station null. The instrument was then positioned for minimum sound intensity by swinging it back and forth at the same time adjusting the quadrature component dial. In the position of minimum signal strength the percent tilt was recorded with the quadrature reading. Lines were read with the operator facing east.

Broadside-Vertical Loop Electromagnetic Survey (BVL–EM)

Instrumentation

A Maxmin I-5 instrument manufactured by Apex Parametrics of Canada was used to acquire the vertical loop data. This equipment is normally used to conduct horizontal loop surveys but it is also equipped to operate in the vertical loop mode.

Theory

The electromagnetic theory that applies to the Broadside Vertical Loop method is very similar to that of the VLF–EM method. The BVL–EM method however utilizes a local transmitter (Tx) that travels in tandem with a receiver (Rx) located on a parallel line. Both Tx and Rx are operated directly opposite one another hence the term "Broadside". The Tx coil is held in a vertical position and produces a horizontal oscillating magnetic field that couples well with steeply dipping conductive bodies. In the presence of a conductor the normally horizontal transmitted field is tilted. The tilt angle as a percent grade is approximately equal to the vertical in phase component of the secondary field as a percentage of the primary field strength at the receiver. Conductors are located by observing this affect. The Maxmin equipment operates at the 111, 222, 444, 1777 and 7111 Hz frequencies, which are significantly lower than VLF–EM signals. The use of lower frequencies can enhance anomaly response in the presence of conductive overburden.

Survey Procedure

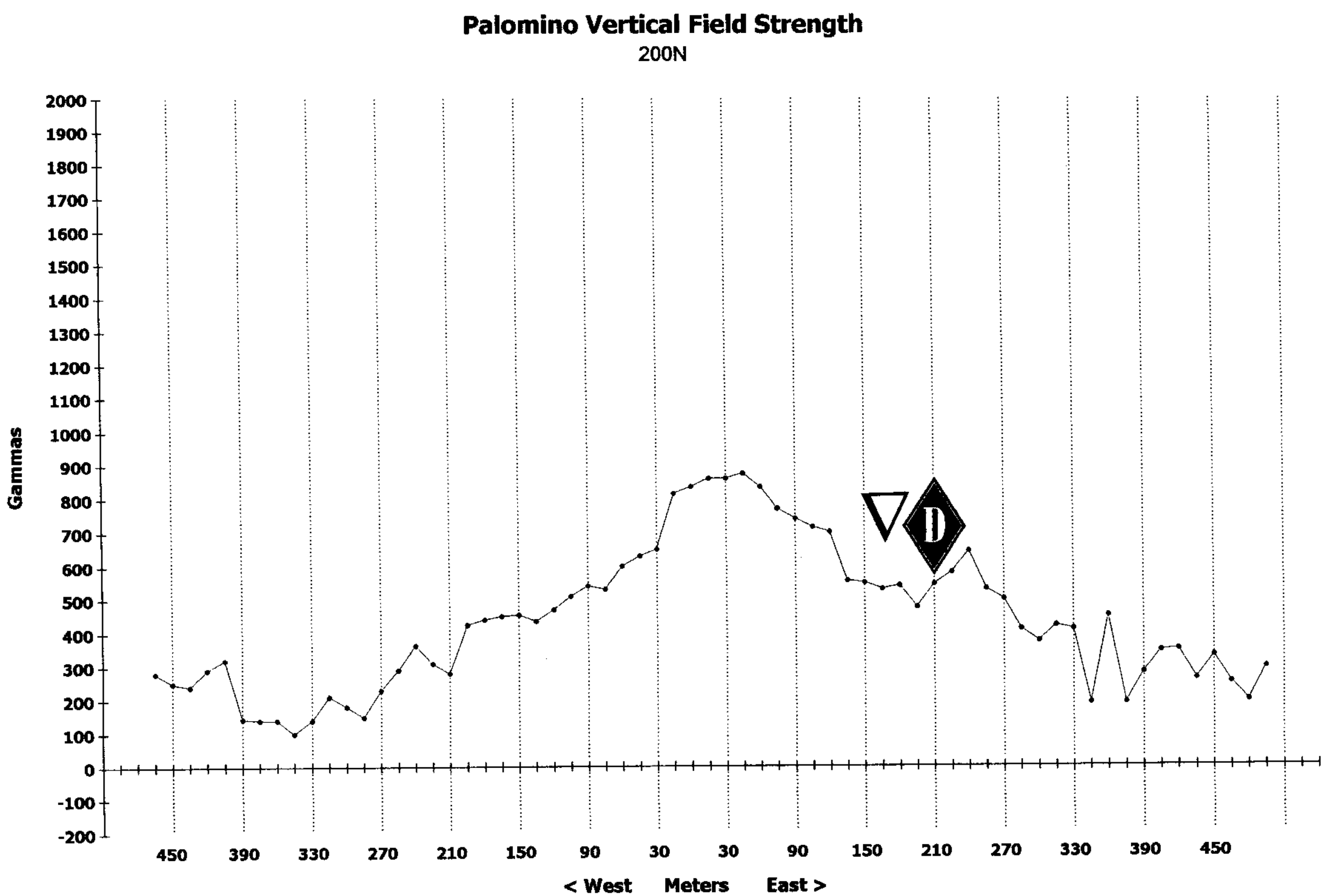
Lines were surveyed to verify significant VLF–EM conductors. At each station the transmitter loop was held in a vertical position and oriented so that the plane of the coil pointed toward the receiver, which was located on an adjacent line. During a reading the receiver coil was rotated from the horizontal (zero tilt) about the axis of the plane of the transmitter coil. The tilt angles corresponding to positions of minimum signal were recorded at both the 1777 Hz and 7111 Hz frequencies and plotted in profile on Map #3. As in the VLF–EM method right way crossovers indicate the position of conductors.

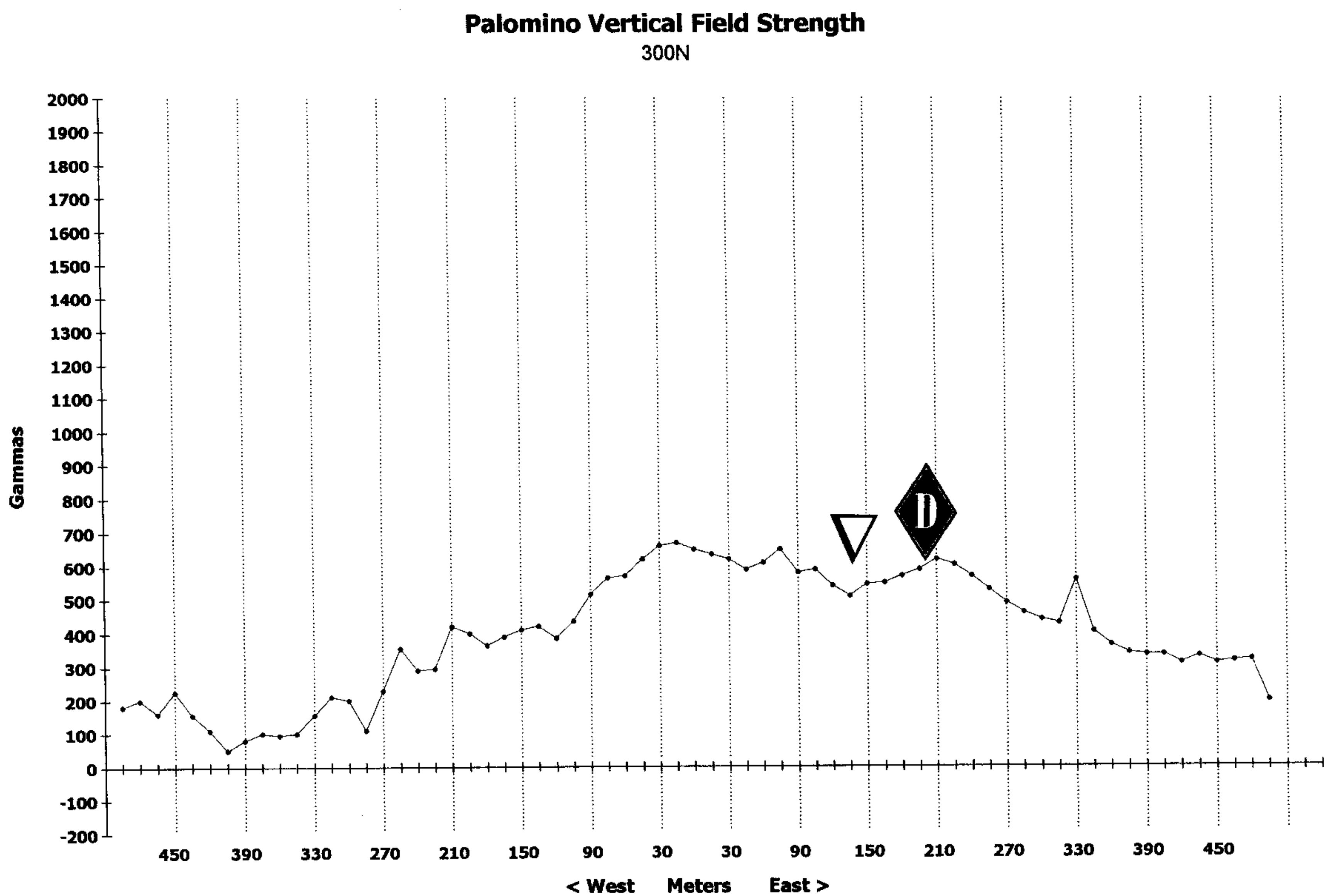
Appendix I

Vertical Magnetic Field Profiles

◆ Conductor Locations

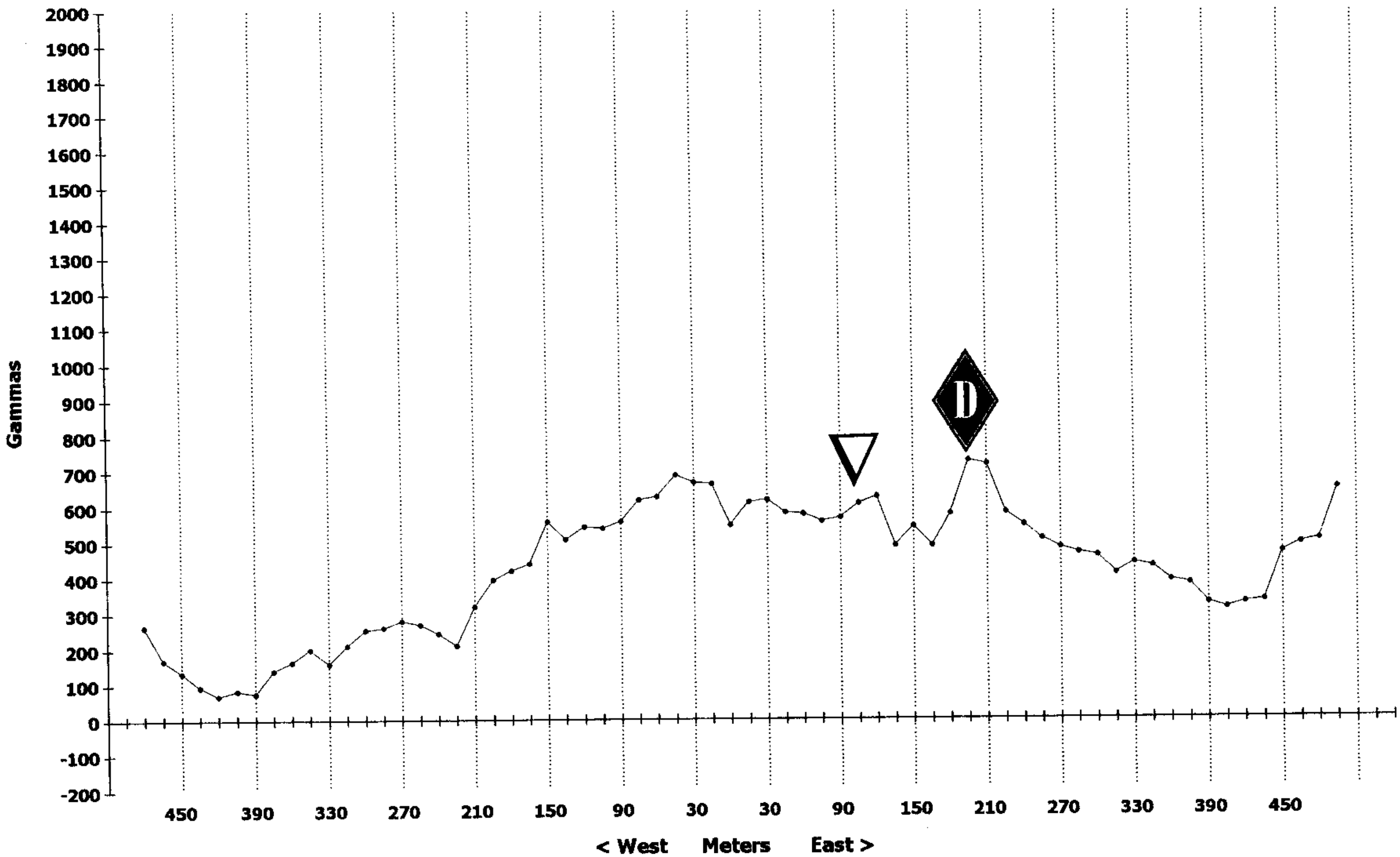
∇ Quartz Feldspar Porphyry

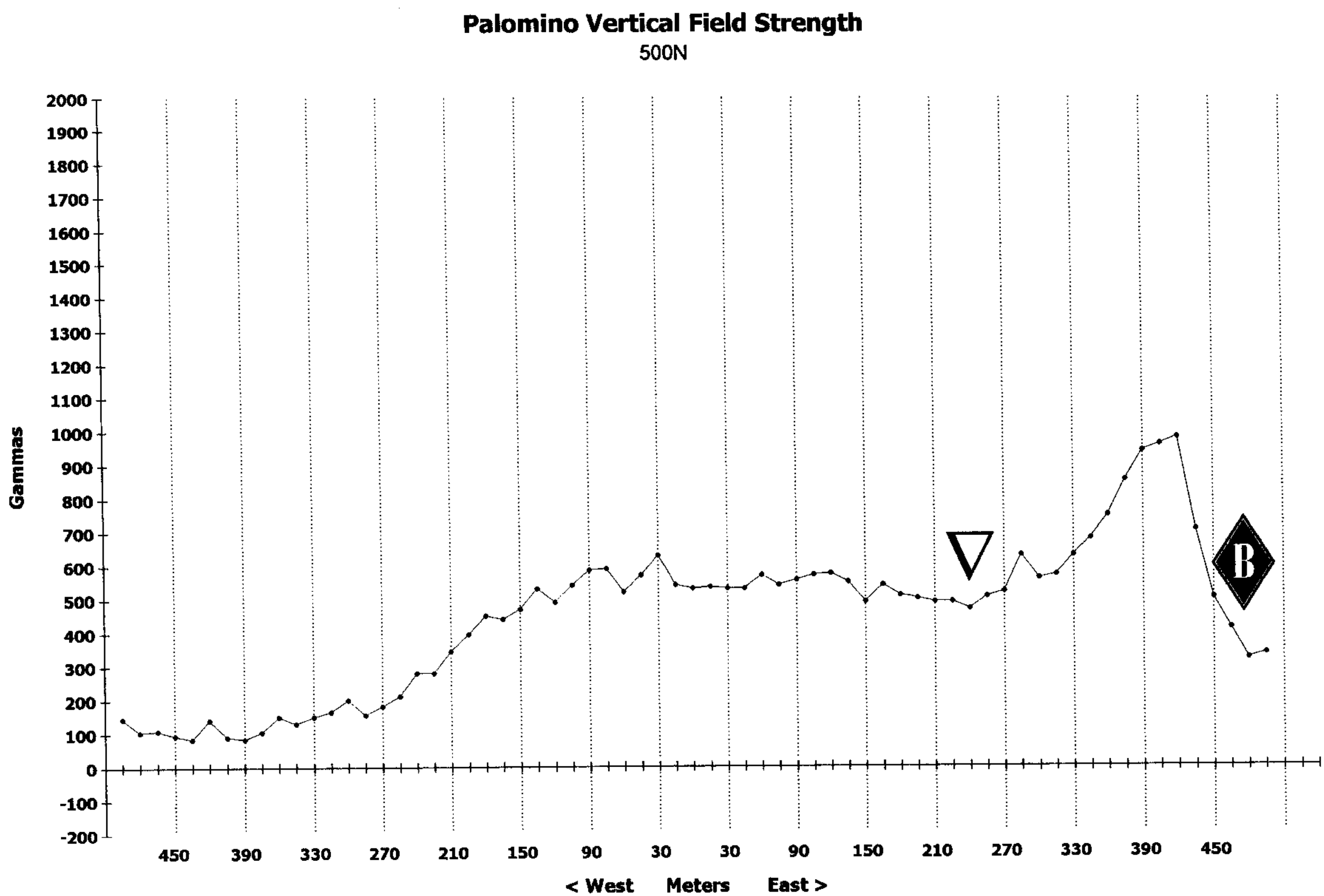

Palomino Vertical Field Strength
200N
Gammas
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
-100
-200
450 390 330 270 210 150 90 30 30 90 150 210 270 330 390 450
< West Meters East >
D


Palomino Vertical Field Strength
300N
Gammas
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
-100
-200
D
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
< West Meters East >

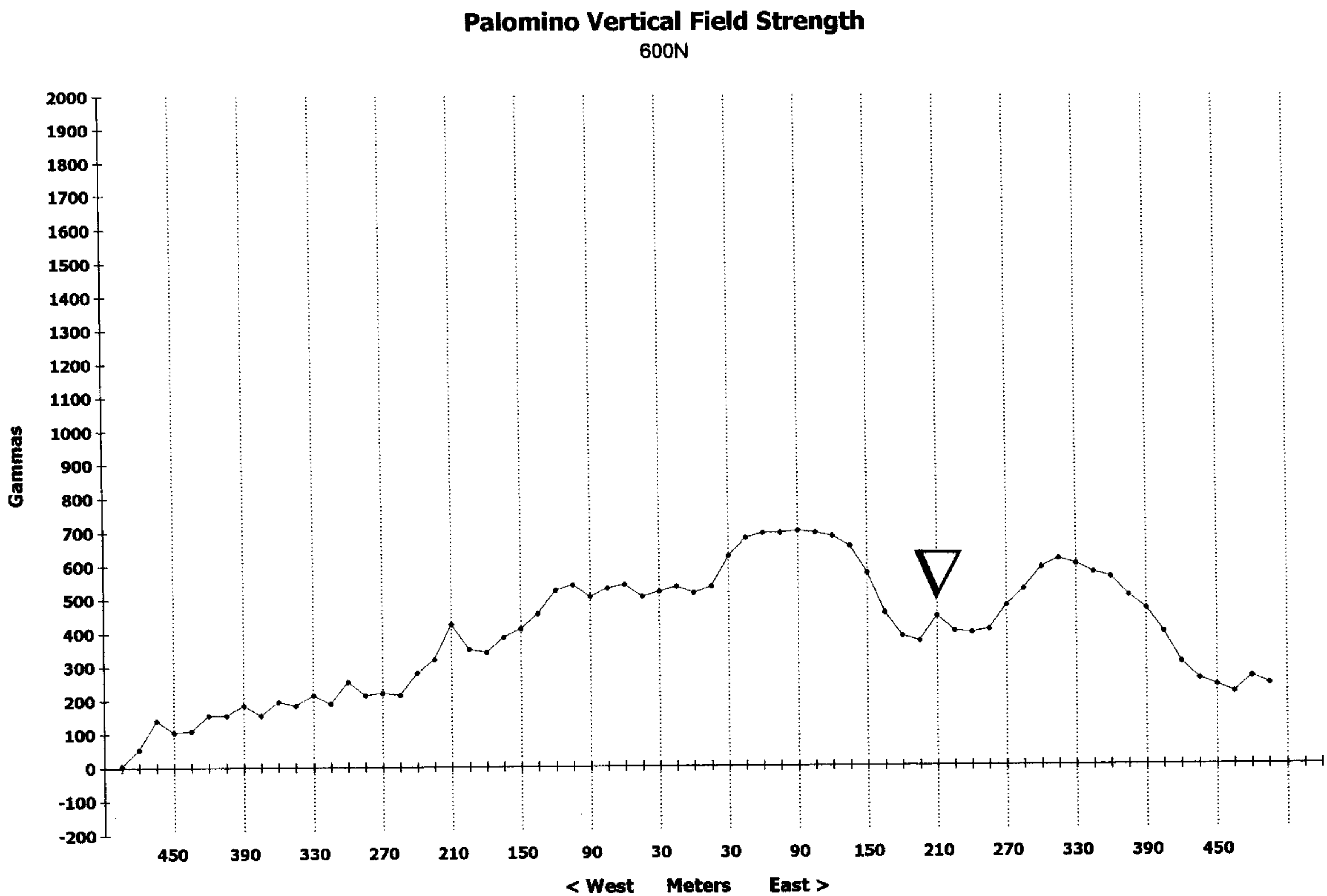
Palomino Vertical Field Strength

400N

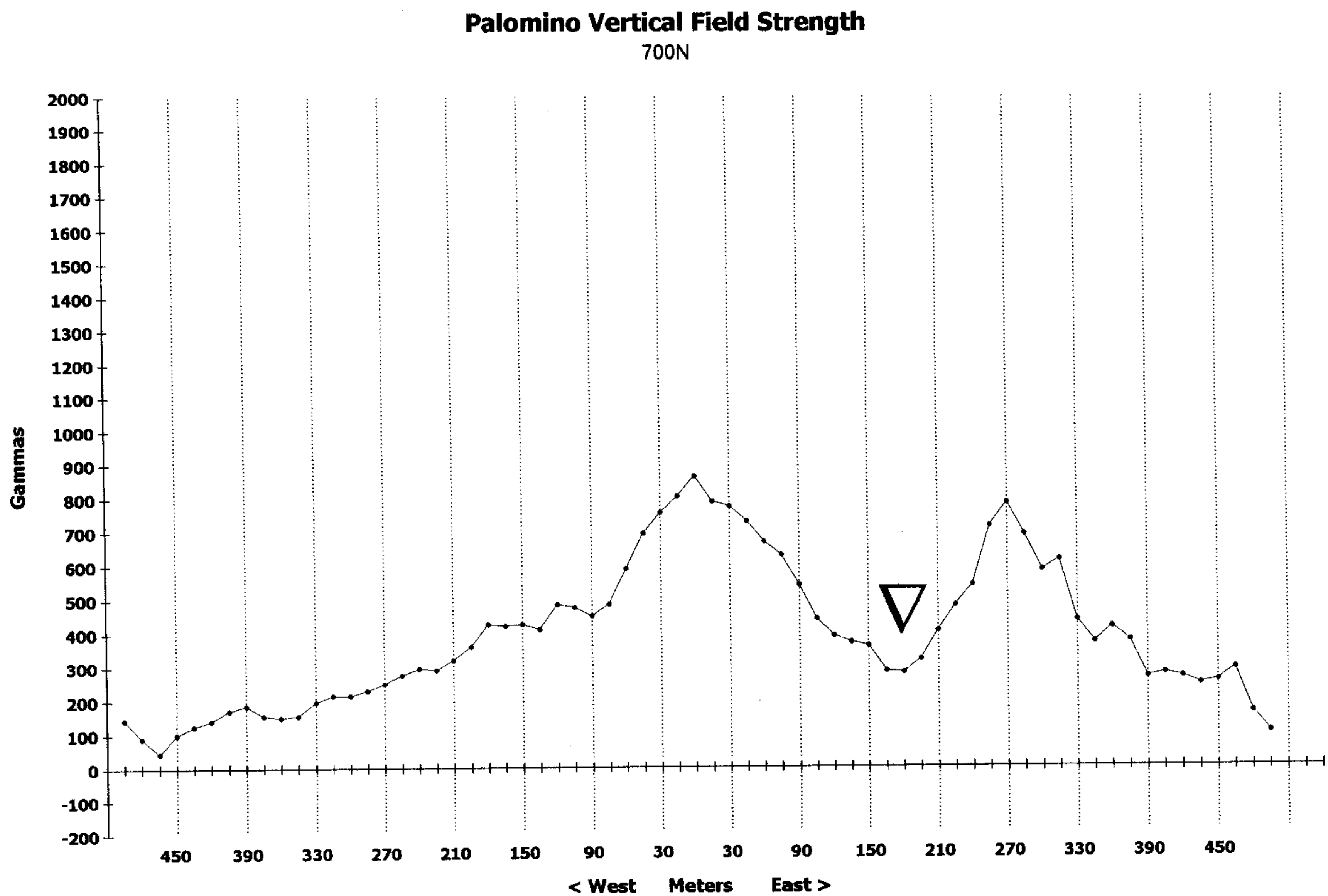




Palomino Vertical Field Strength
500N
Gammas
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
-100
-200
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
< West
Meters
East >
B

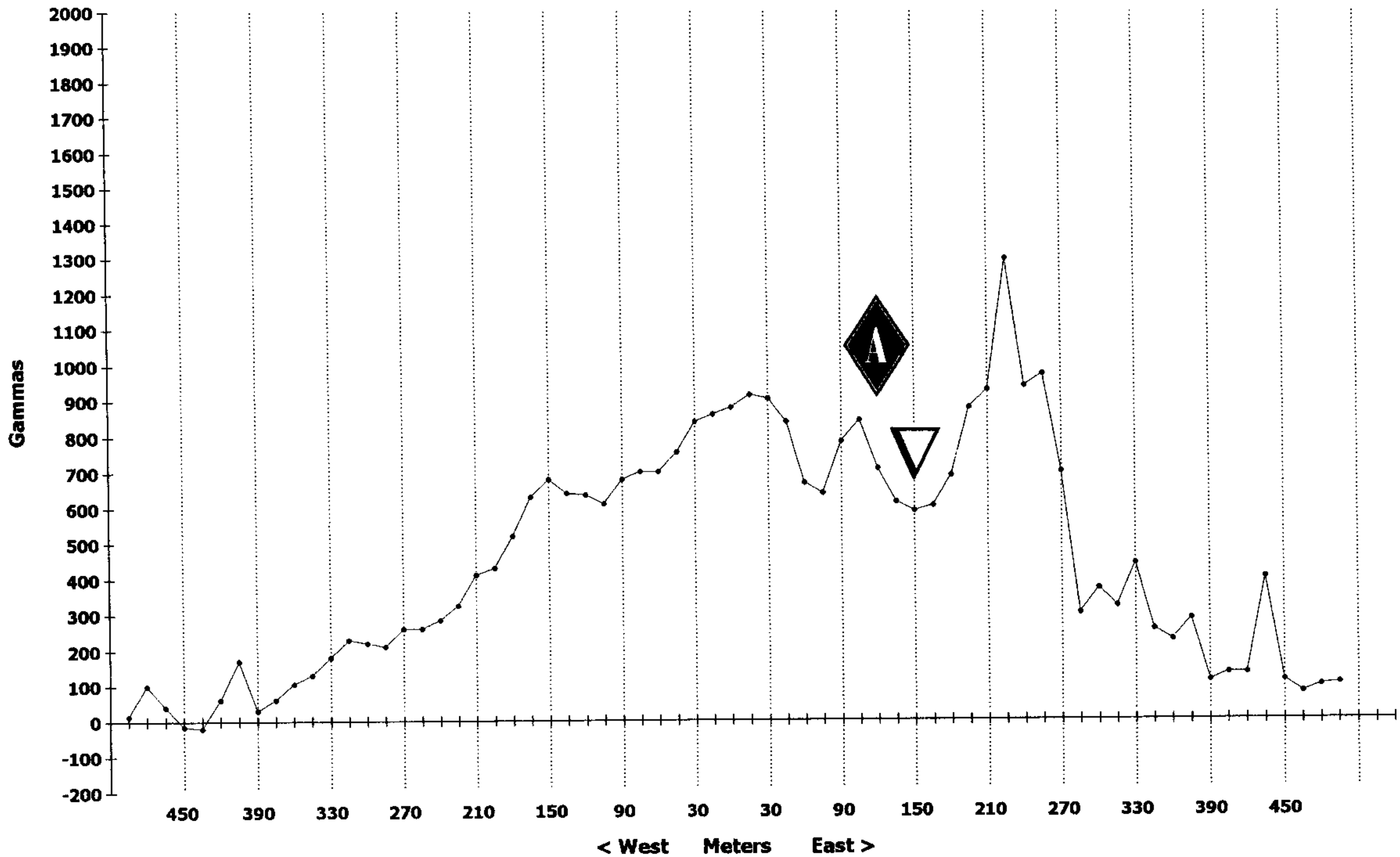


Palomino Vertical Field Strength
600N
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
-100
-200
Gammas
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
< West
Meters
East >


Palomino Vertical Field Strength
700N
Gammas
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
-100
-200
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
< West
Meters
East >

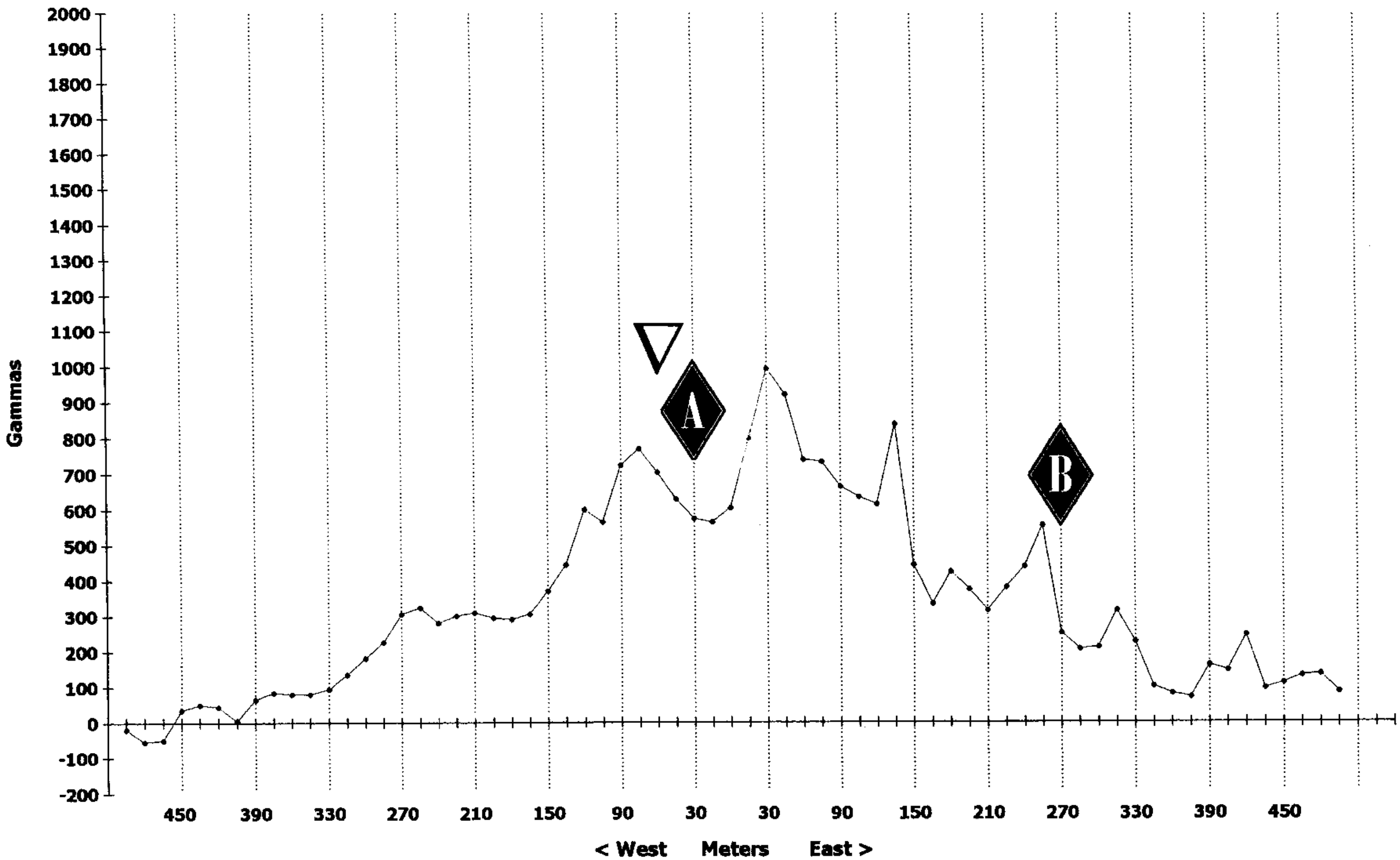
Palomino Vertical Field Strength

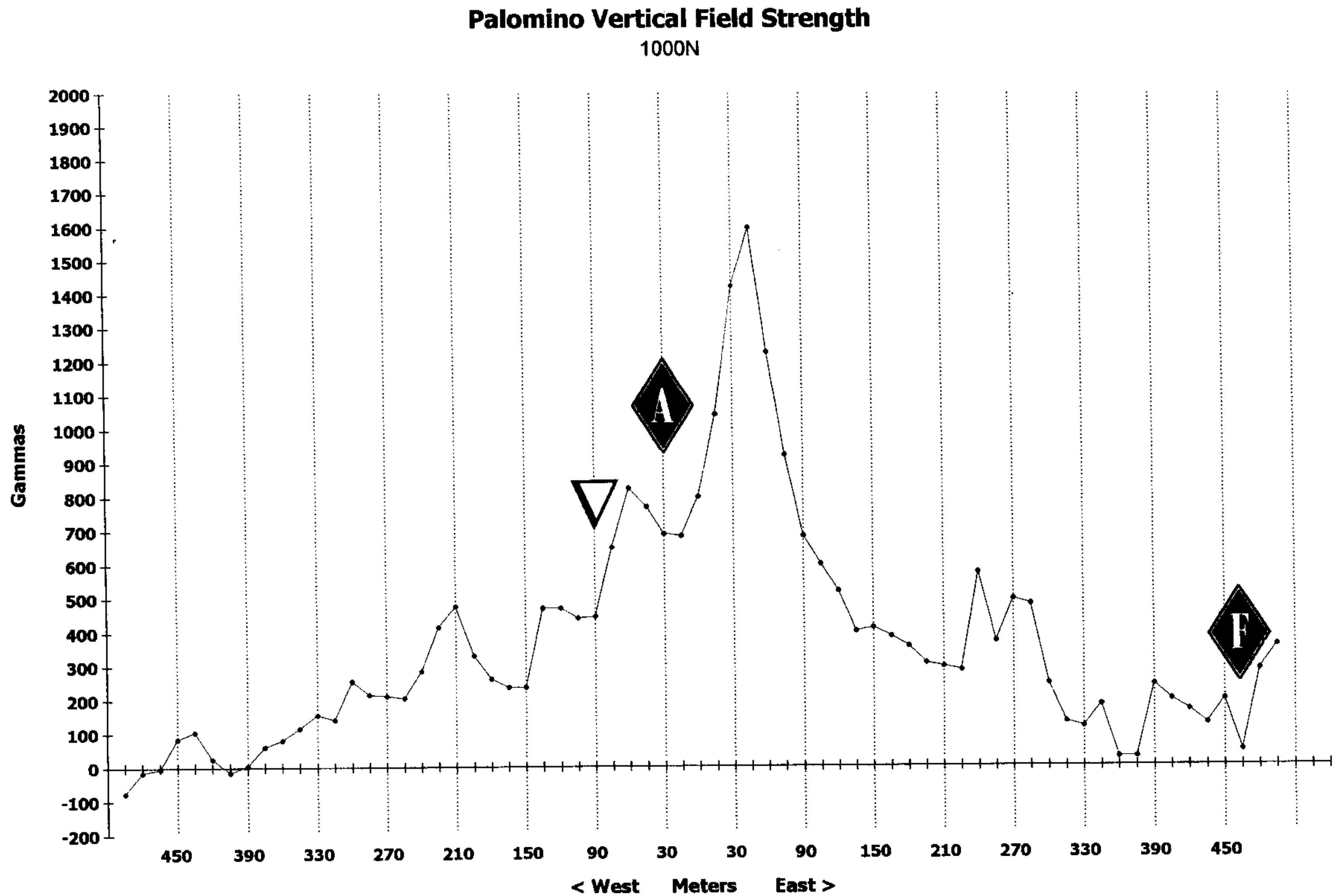
800N



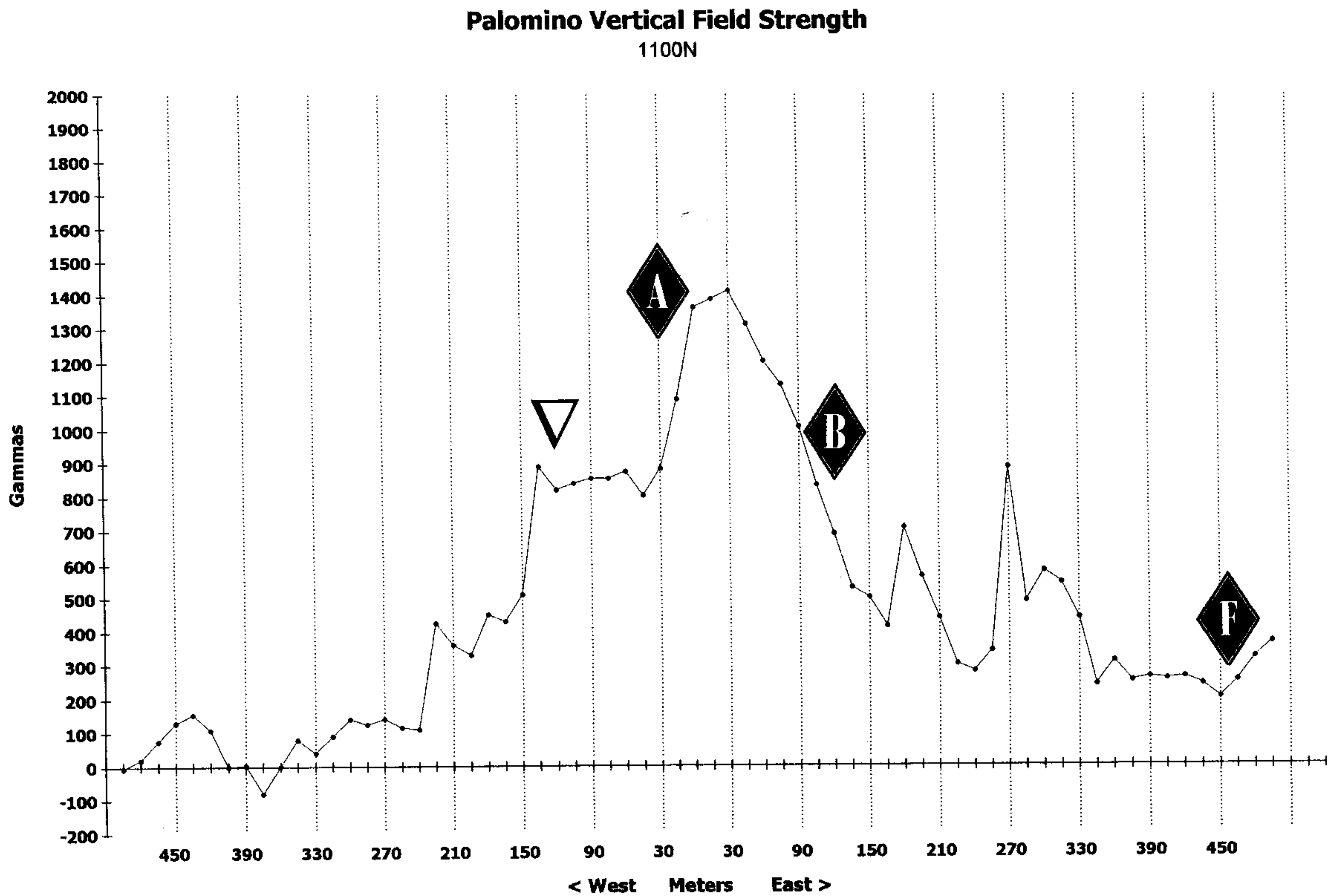
Palomino Vertical Field Strength

900N

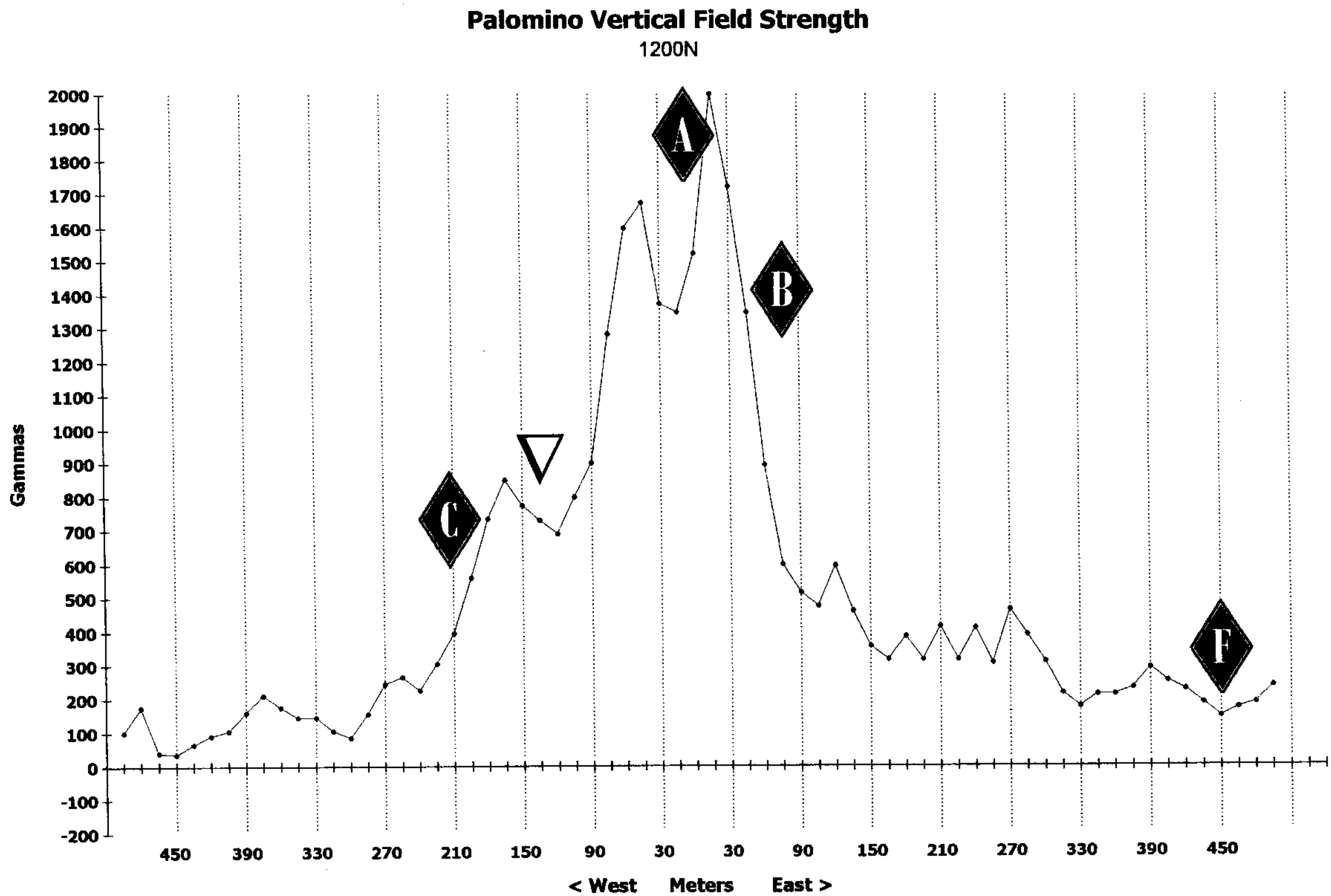




Palomino Vertical Field Strength
1000N
Gammas
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
-100
-200
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
< West Meters East >
A
F

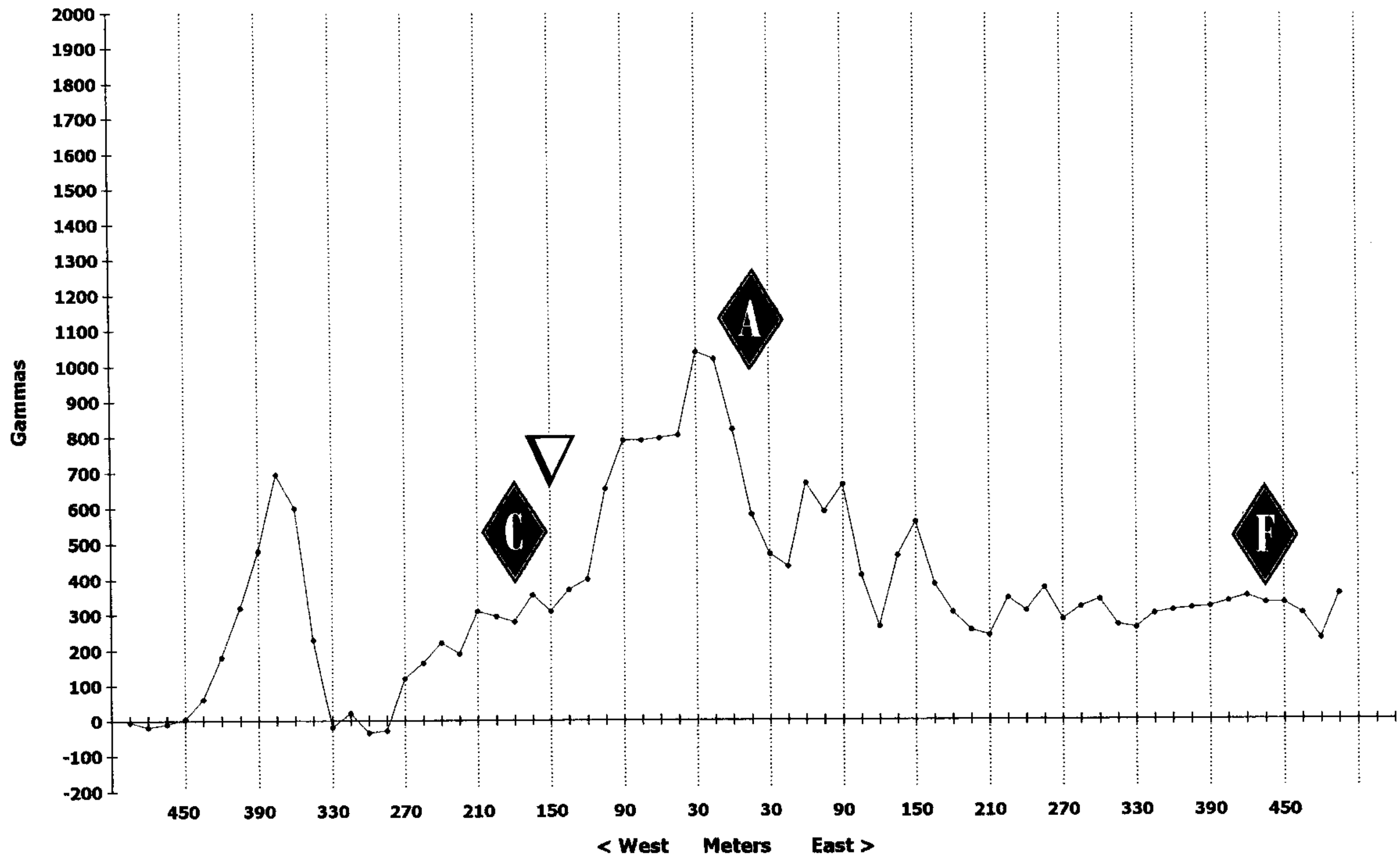


Palomino Vertical Field Strength
1100N
Gammas
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
-100
-200
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
< West Meters East >
A
B
F


Palomino Vertical Field Strength
1200N
Gammas
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
-100
-200
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
< West Meters East >
A
B
C
F

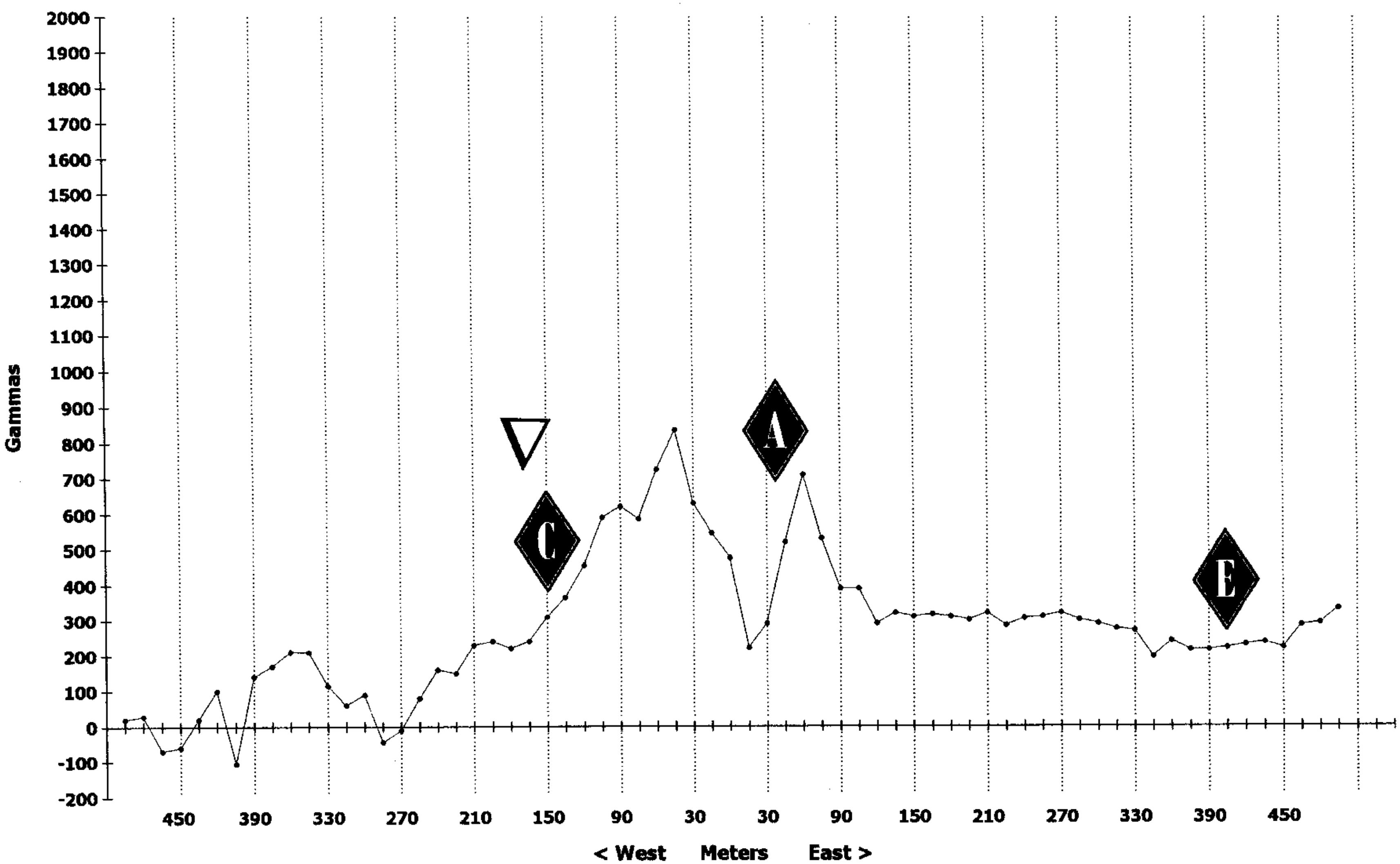
Palomino Vertical Field Strength

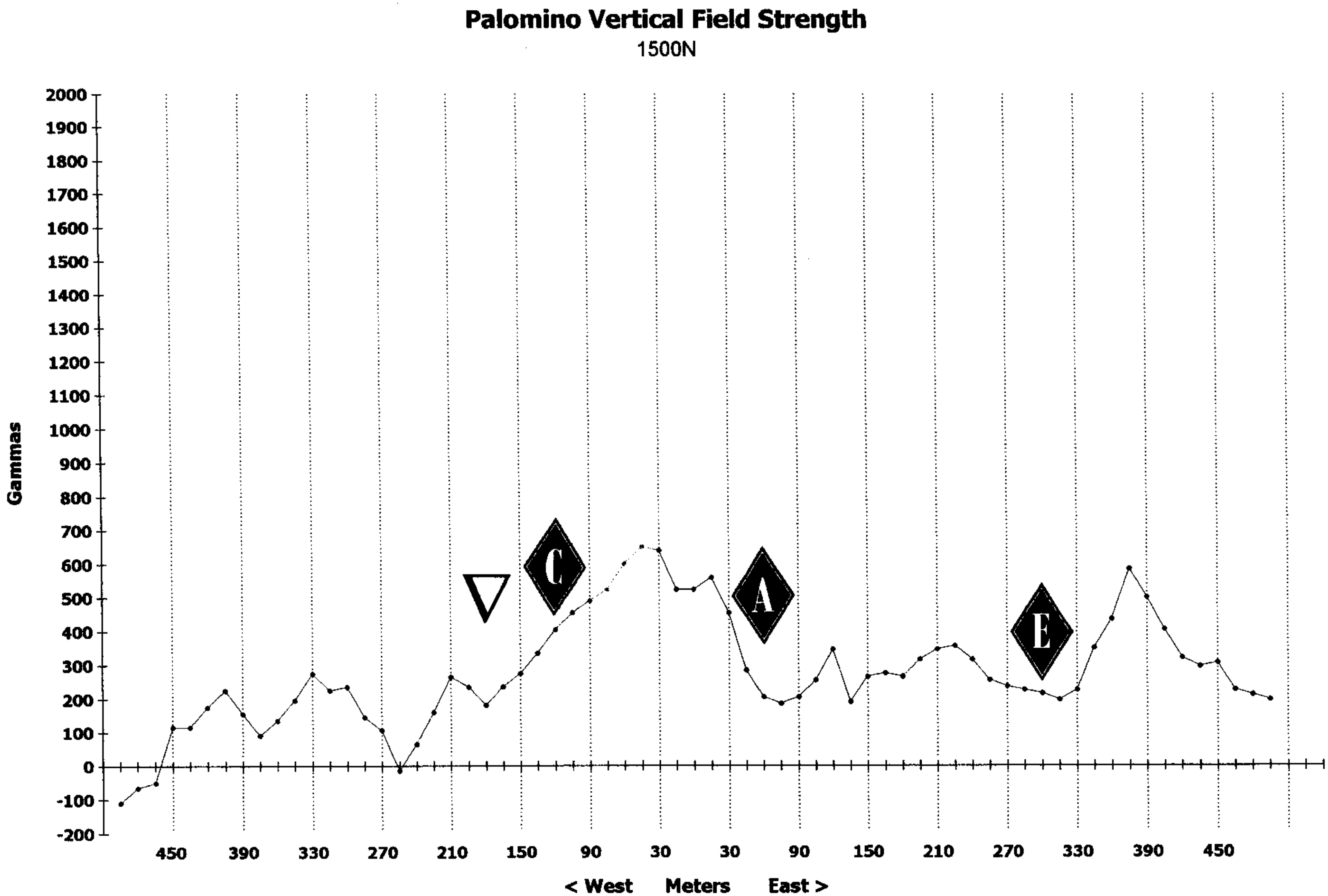
1300N



Palomino Vertical Field Strength

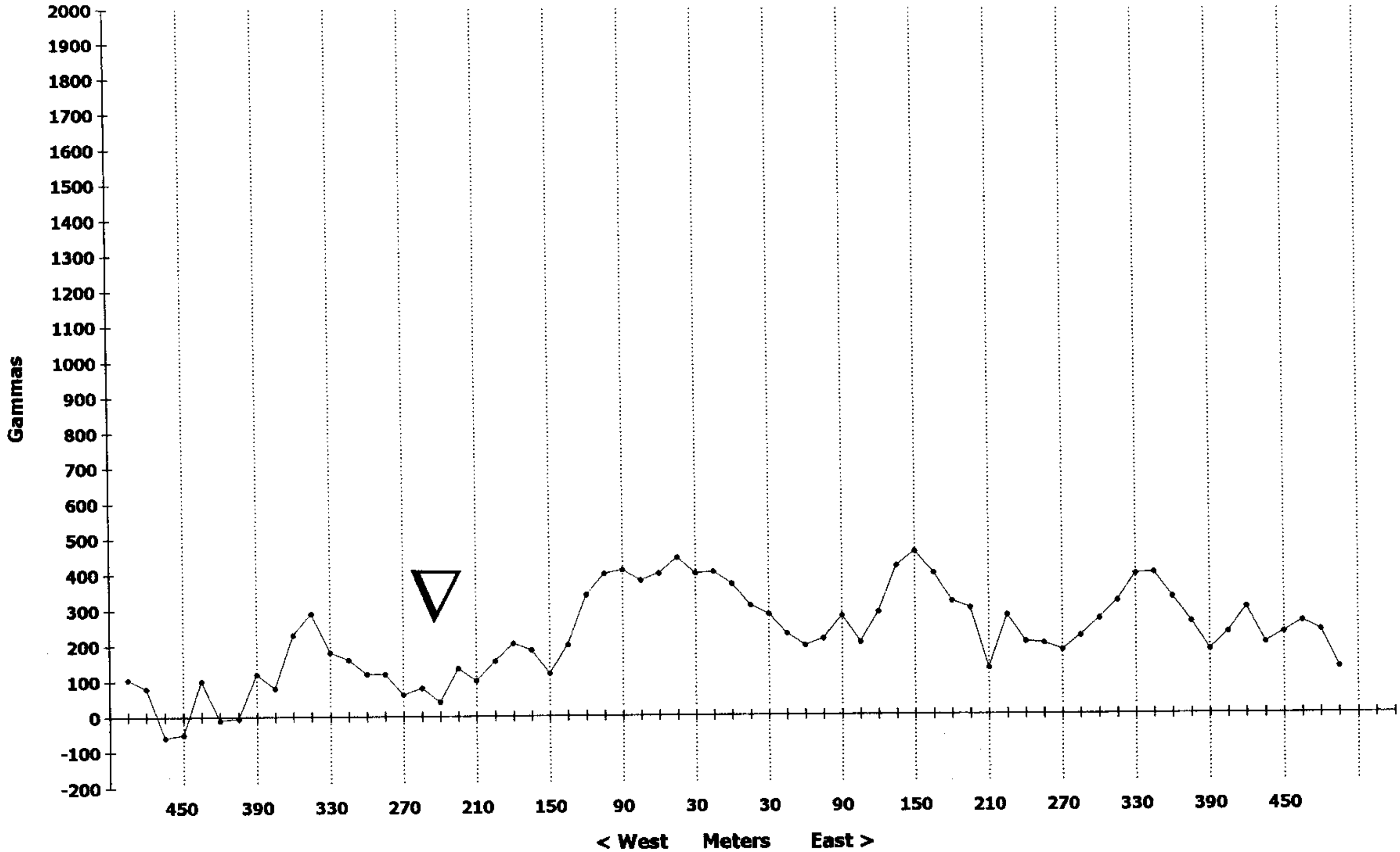
1400N

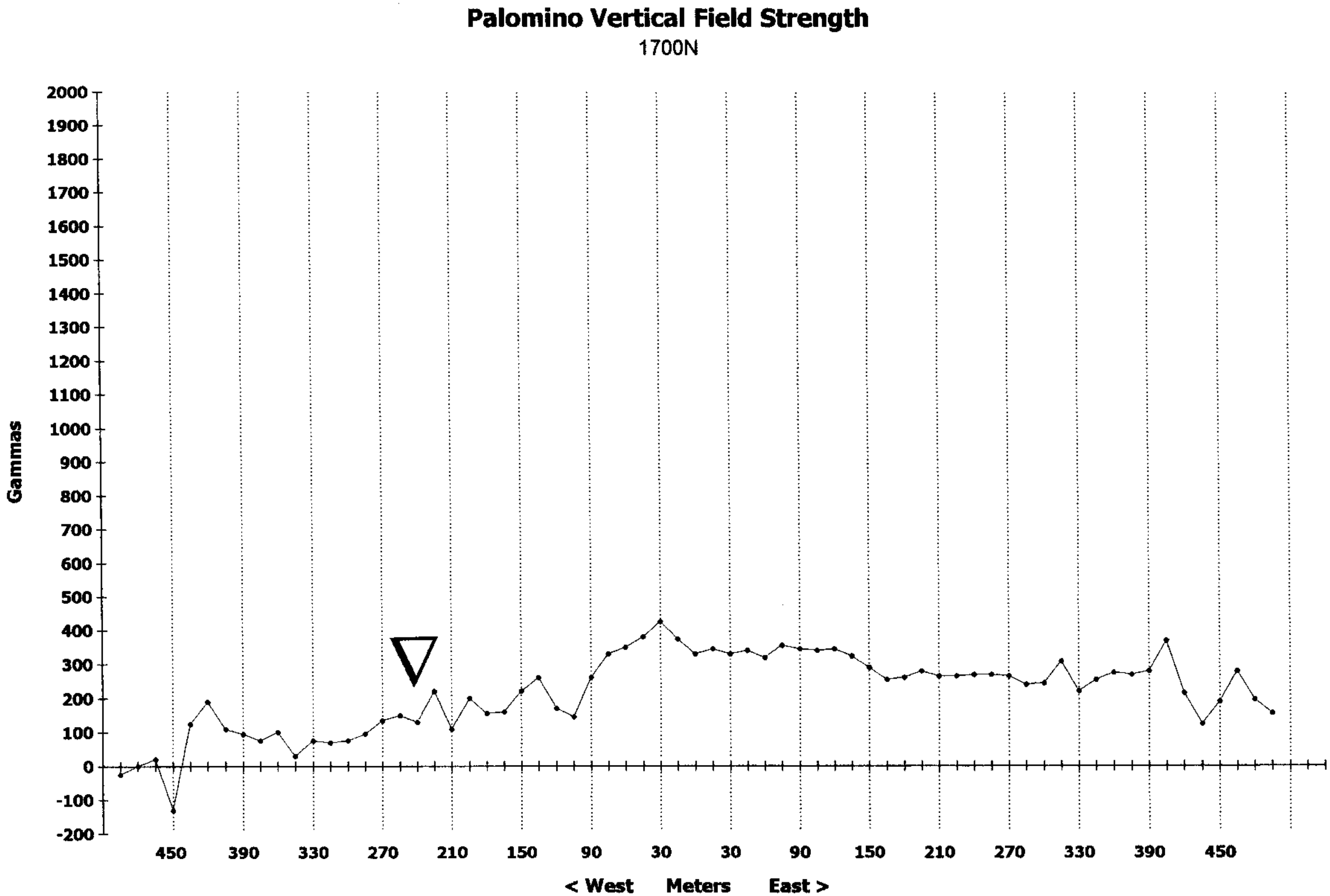



Palomino Vertical Field Strength
1500N
Gammas
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
-100
-200
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
< West Meters East >
C
A
E

Palomino Vertical Field Strength

1600N





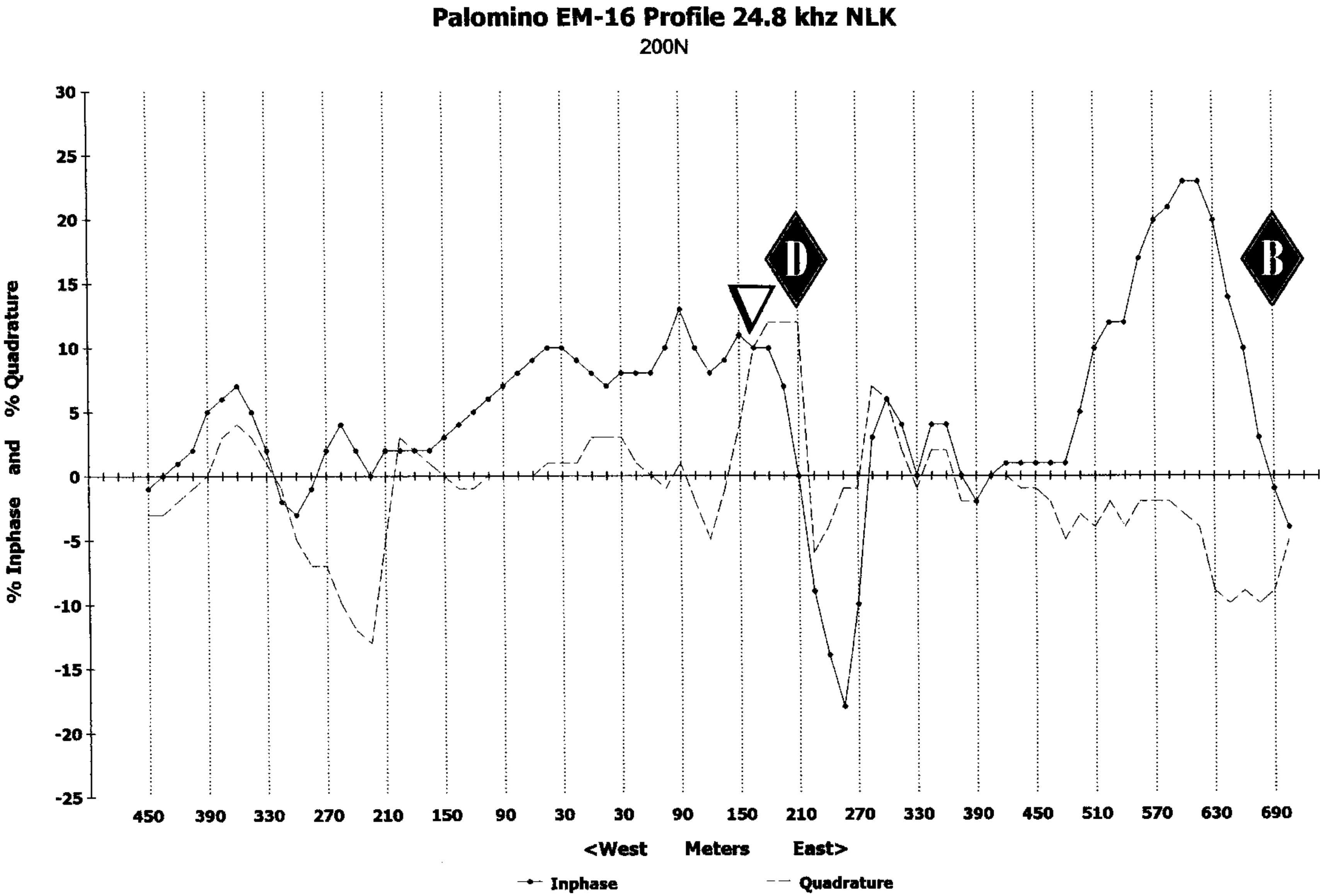
Palomino Vertical Field Strength
1700N
Gammas
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
-100
-200
450 390 330 270 210 150 90 30 30 90 150 210 270 330 390 450
< West Meters East >

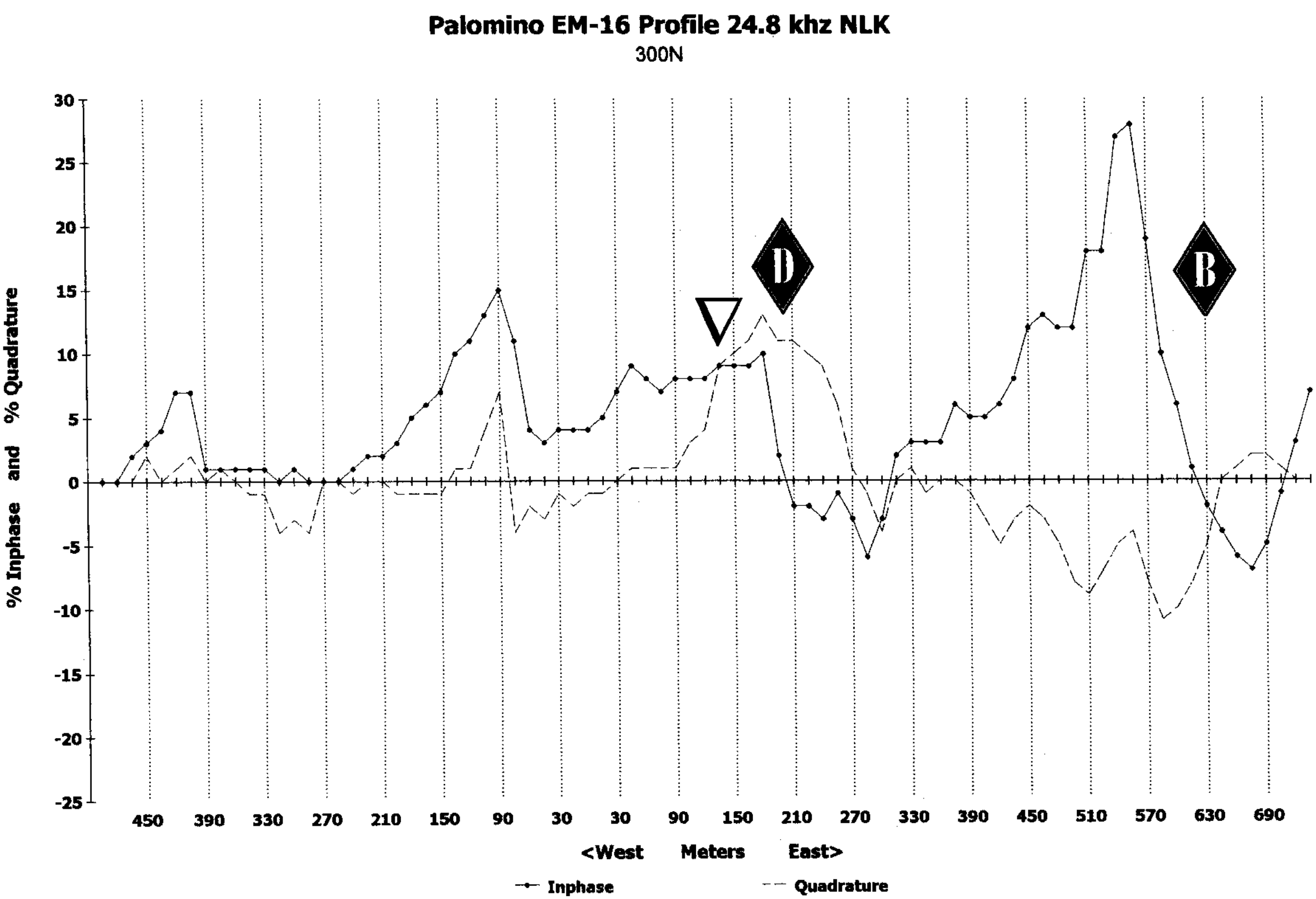
Appendix II

VLF-EM Profiles

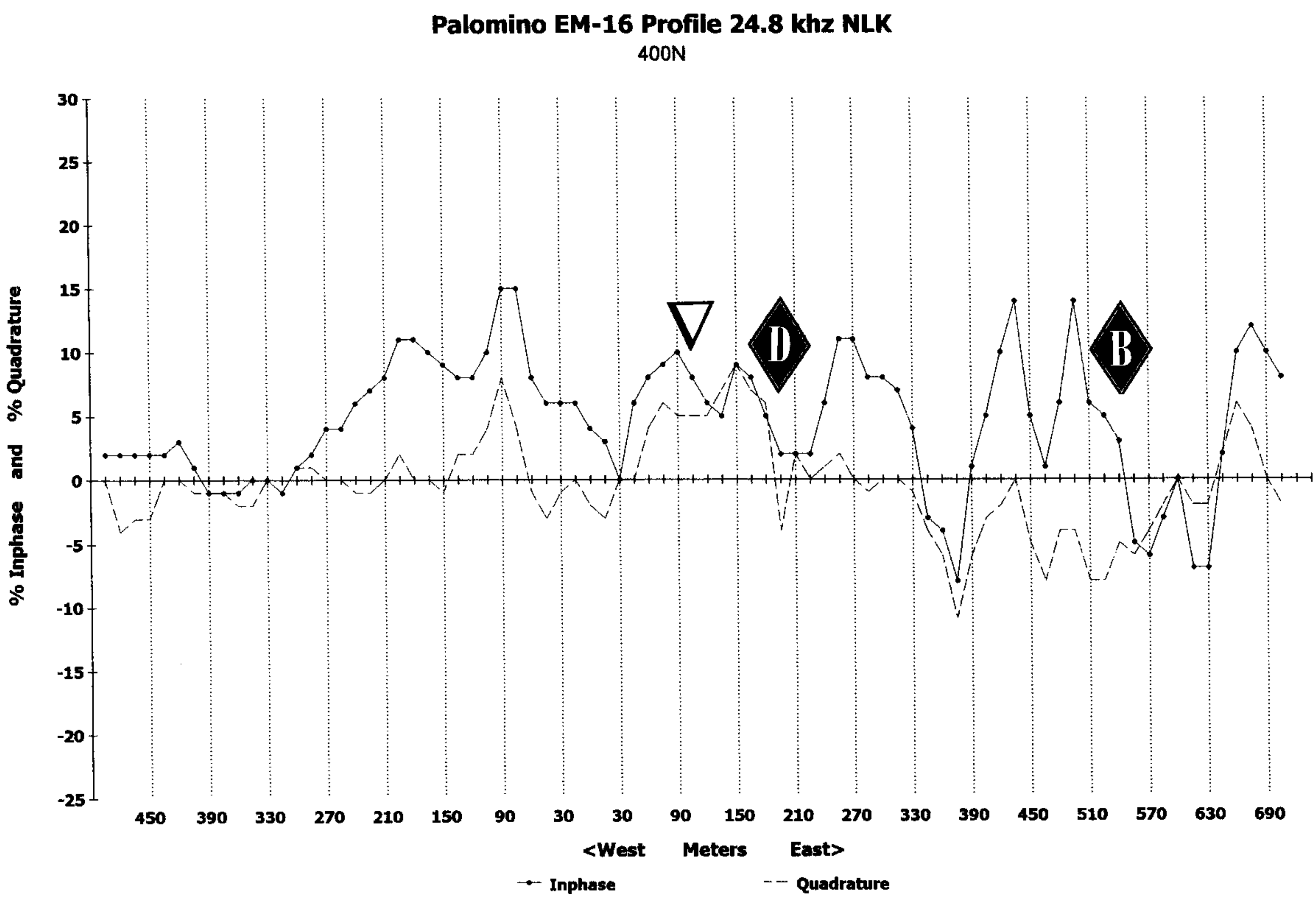
◆ Conductor Locations

∇ Quartz Feldspar Porphyry


Palomino EM-16 Profile 24.8 khz NLK
200N
% Inphase and % Quadrature
30
25
20
15
10
5
0
-5
-10
-15
-20
-25
450 390 330 270 210 150 90 30 30 90 150 210 270 330 390 450 510 570 630 690
<West Meters East>
Inphase
Quadrature
D
B

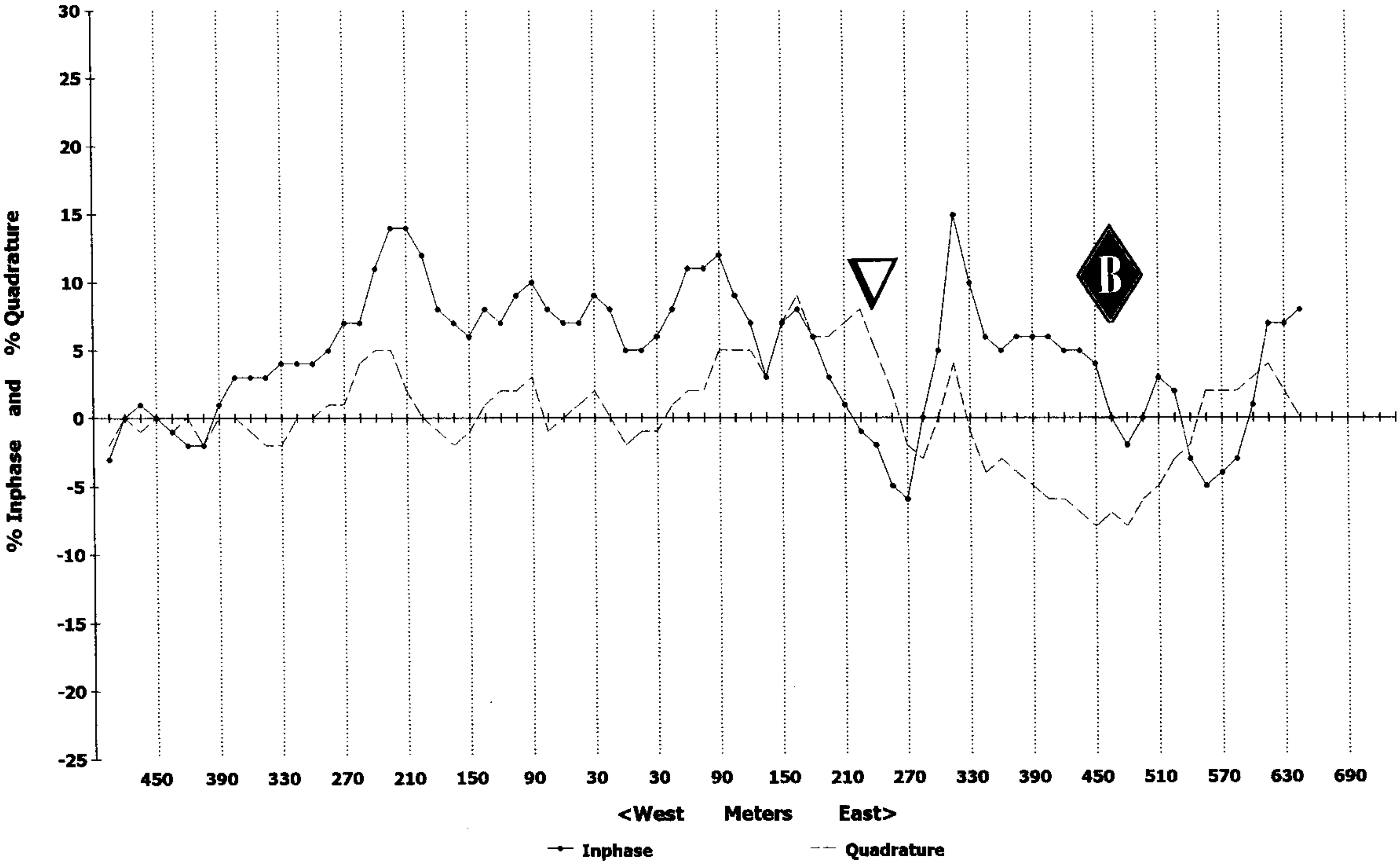


Palomino EM-16 Profile 24.8 khz NLK
300N
% Inphase and % Quadrature
30
25
20
15
10
5
0
-5
-10
-15
-20
-25
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
510
570
630
690
<West Meters East>
D
B
Inphase
Quadrature


Palomino EM-16 Profile 24.8 khz NLK
400N
% Inphase and % Quadrature
30
25
20
15
10
5
0
-5
-10
-15
-20
-25
450 390 330 270 210 150 90 30 30 90 150 210 270 330 390 450 510 570 630 690
<West Meters East>
Inphase
Quadrature
D
B

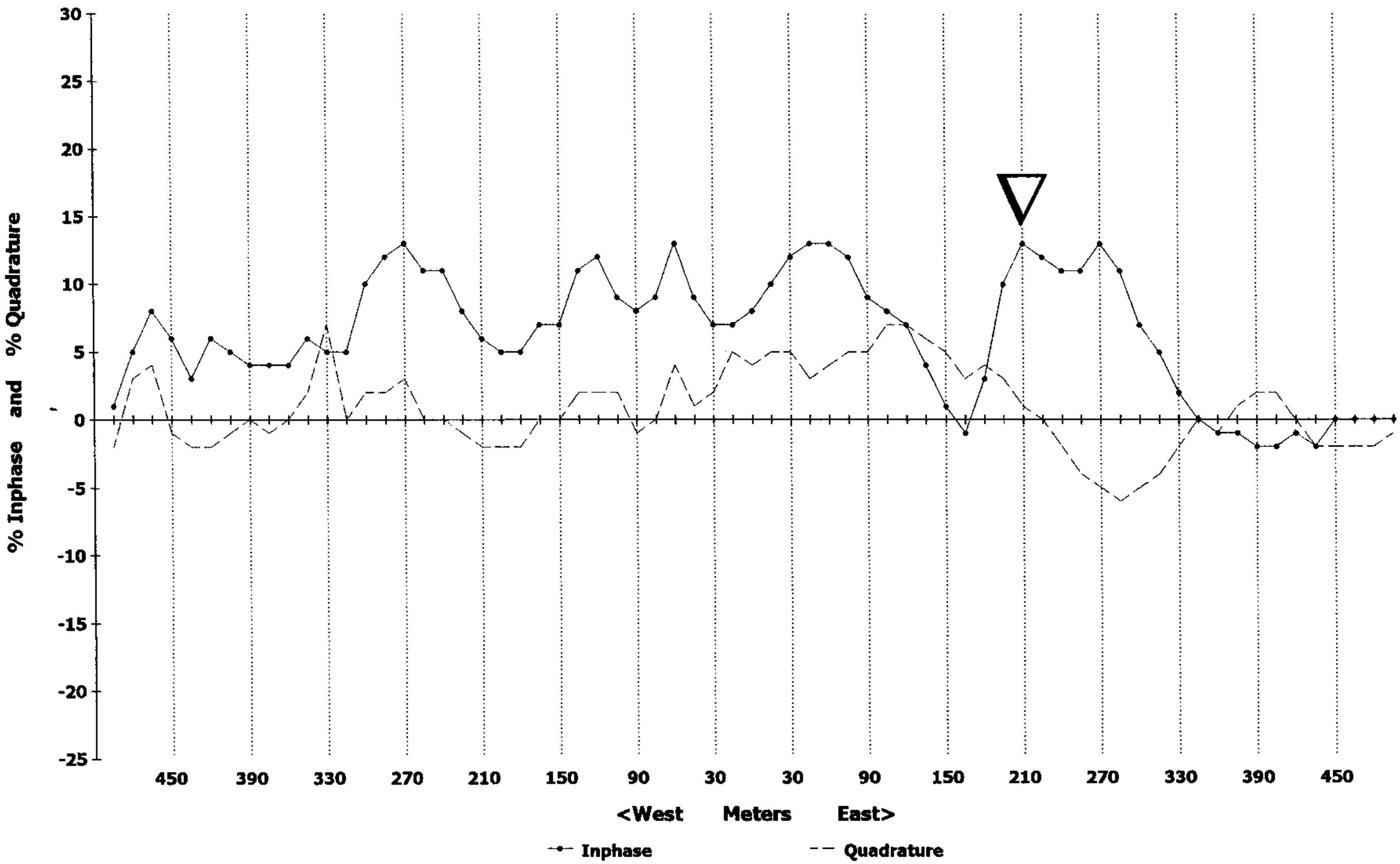
Palomino EM-16 Profile 24.8 khz NLK

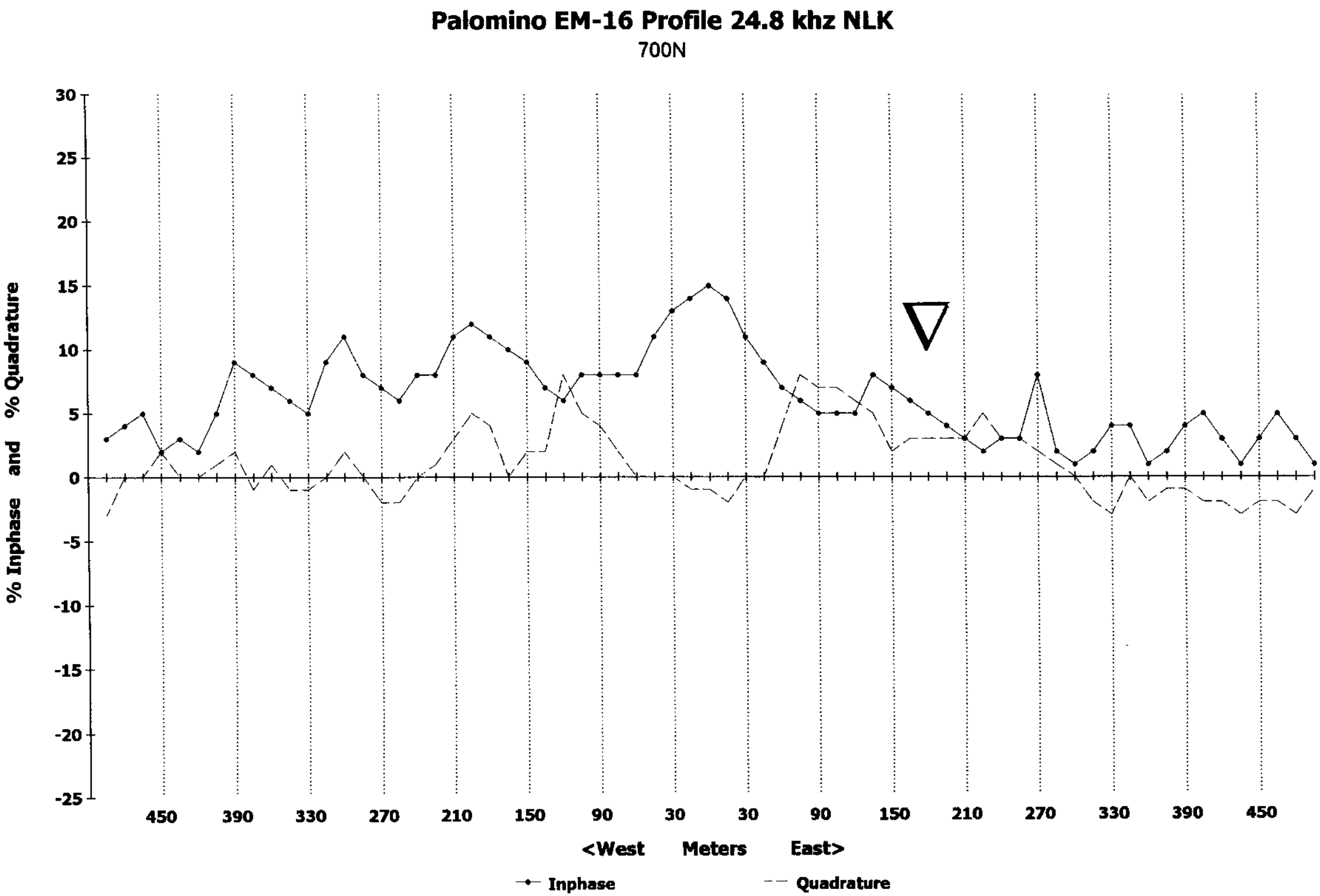
500N



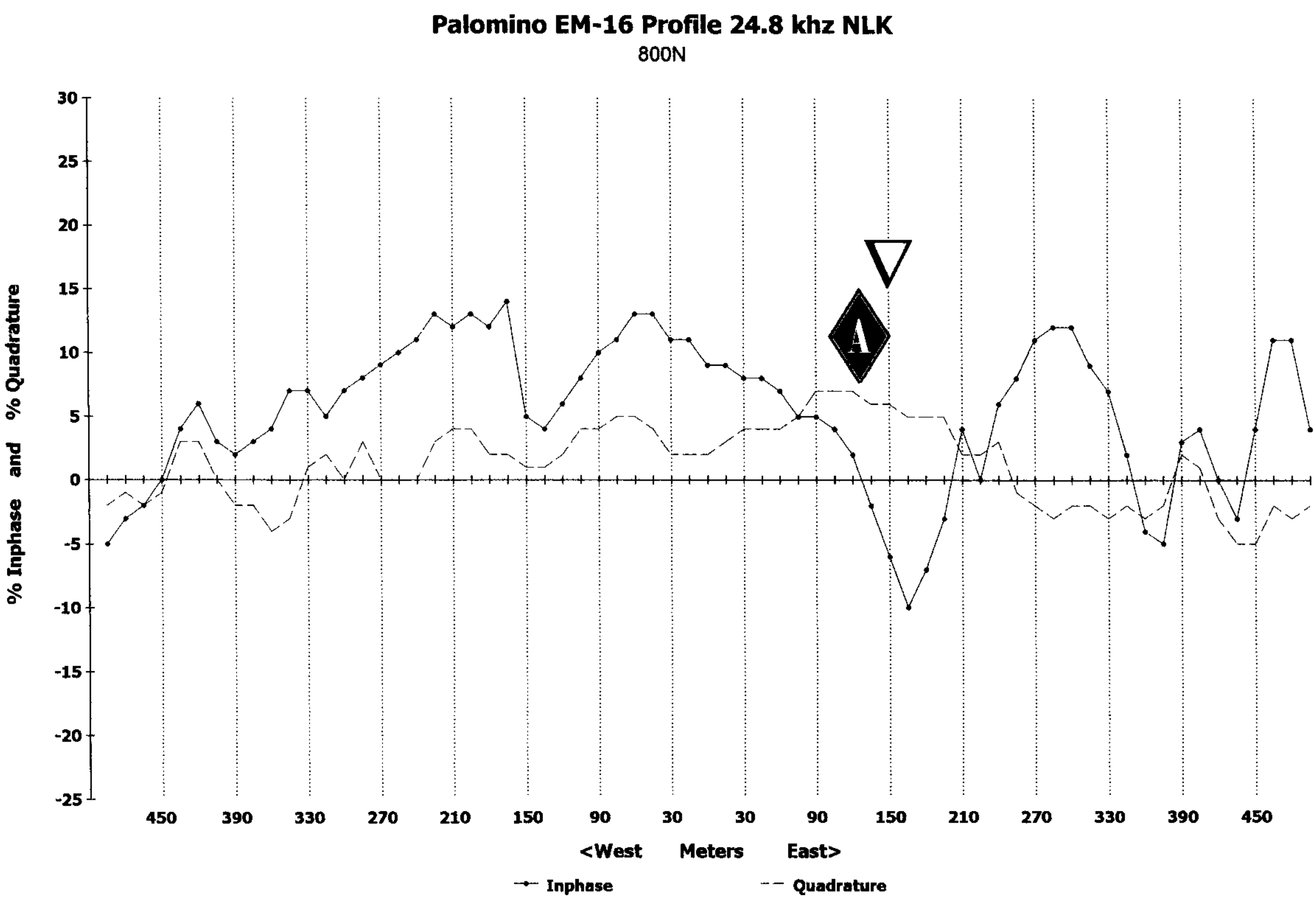
Palomino EM-16 Profile 24.8 khz NLK

600N



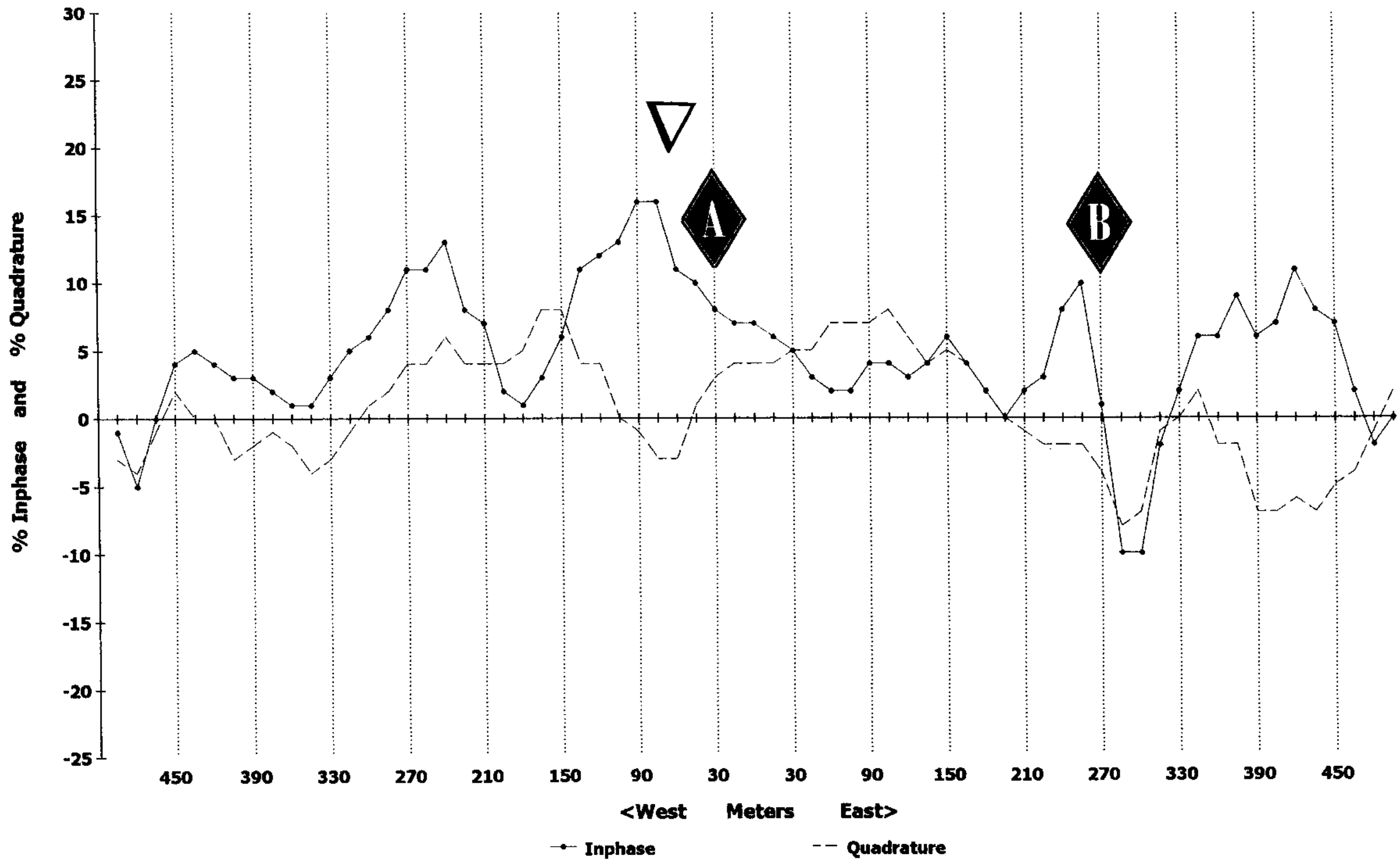


Palomino EM-16 Profile 24.8 khz NLK
700N
% Inphase and % Quadrature
30
25
20
15
10
5
0
-5
-10
-15
-20
-25
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
<West Meters East>
Inphase
Quadrature


Palomino EM-16 Profile 24.8 khz NLK
800N
% Inphase and % Quadrature
30
25
20
15
10
5
0
-5
-10
-15
-20
-25
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
<West Meters East>
Inphase
Quadrature
A

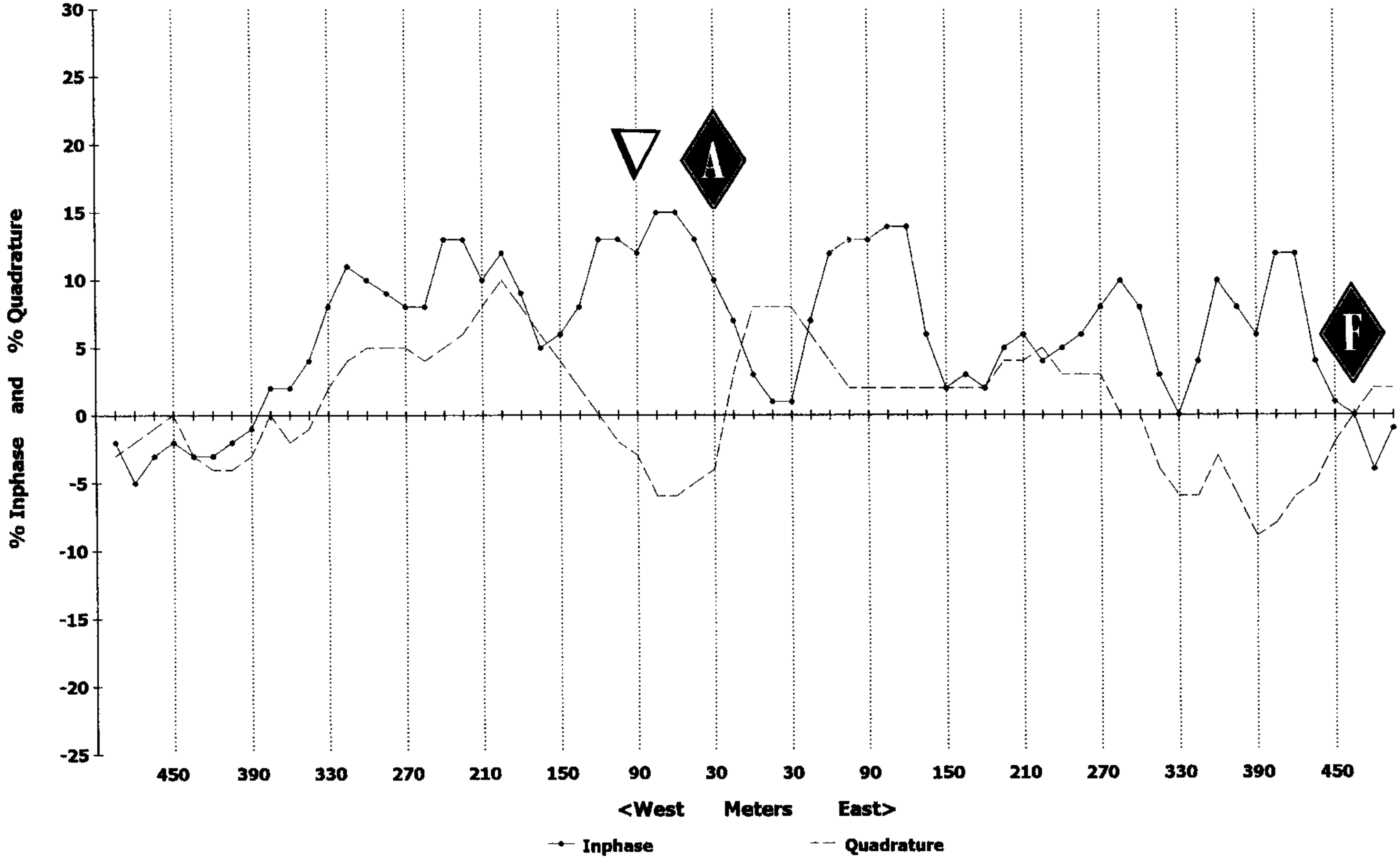
Palomino EM-16 Profile 24.8 khz NLK

900N



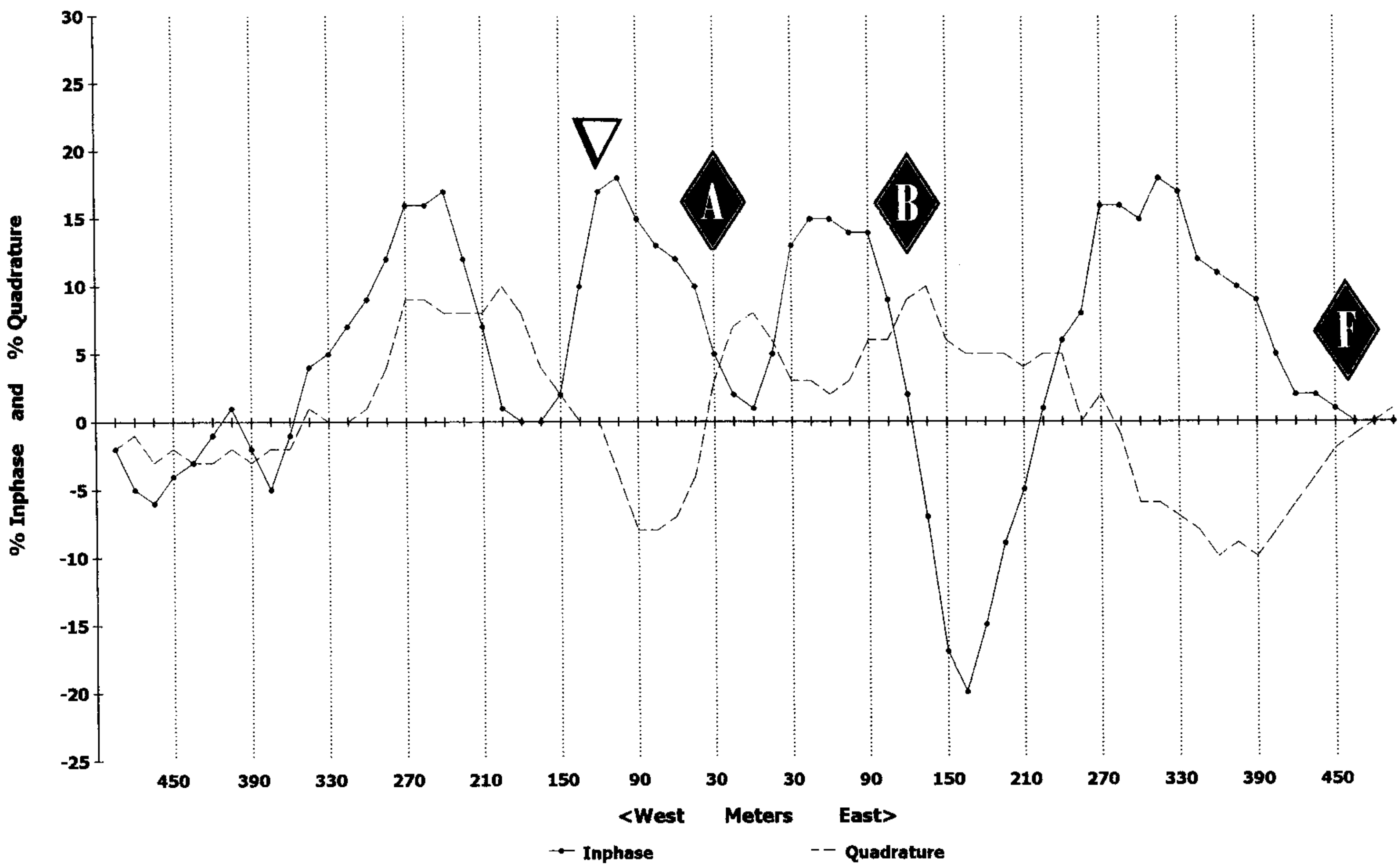
Palomino EM-16 Profile 24.8 khz NLK

1000N



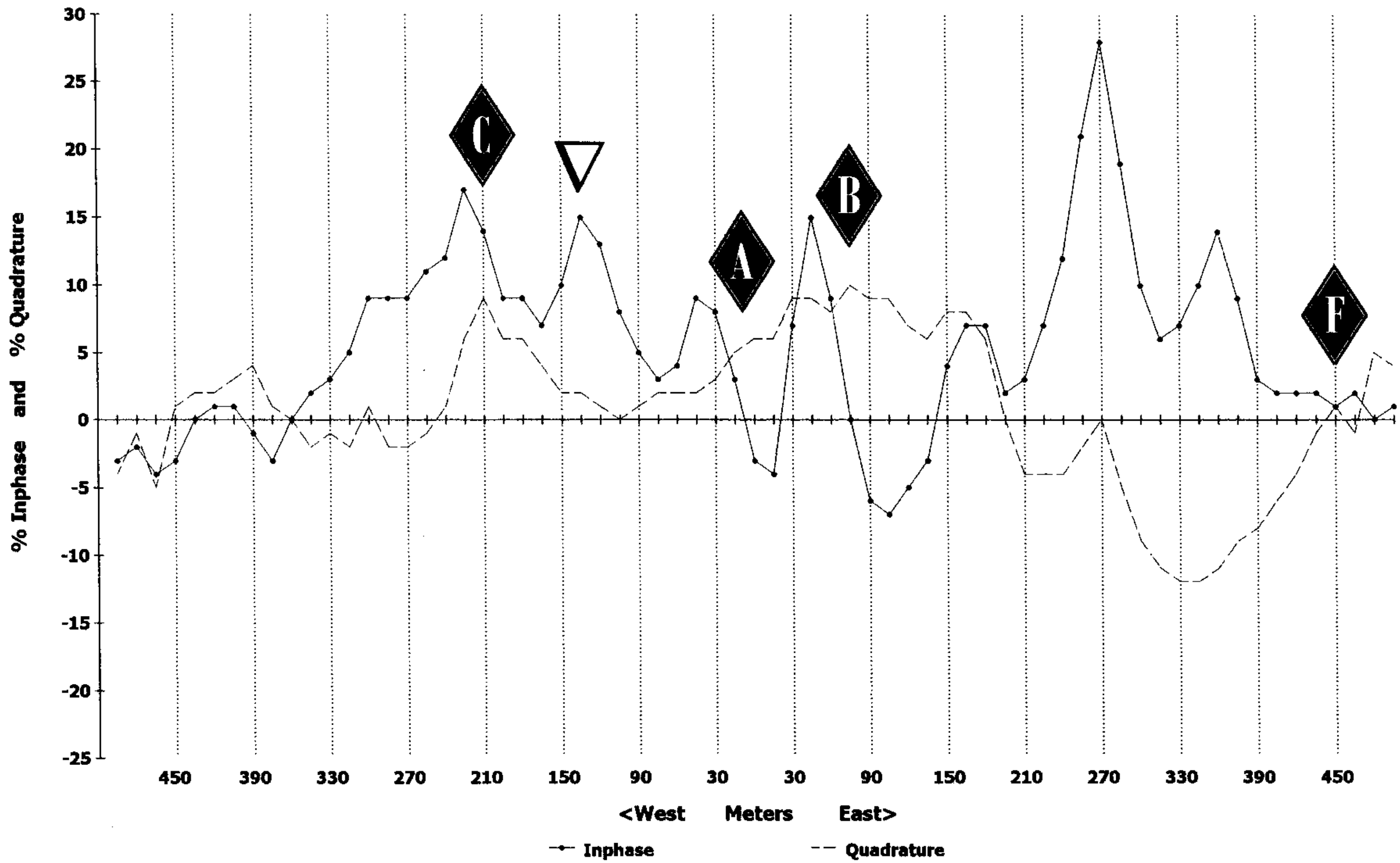
Palomino EM-16 Profile 24.8 khz NLK

1100N



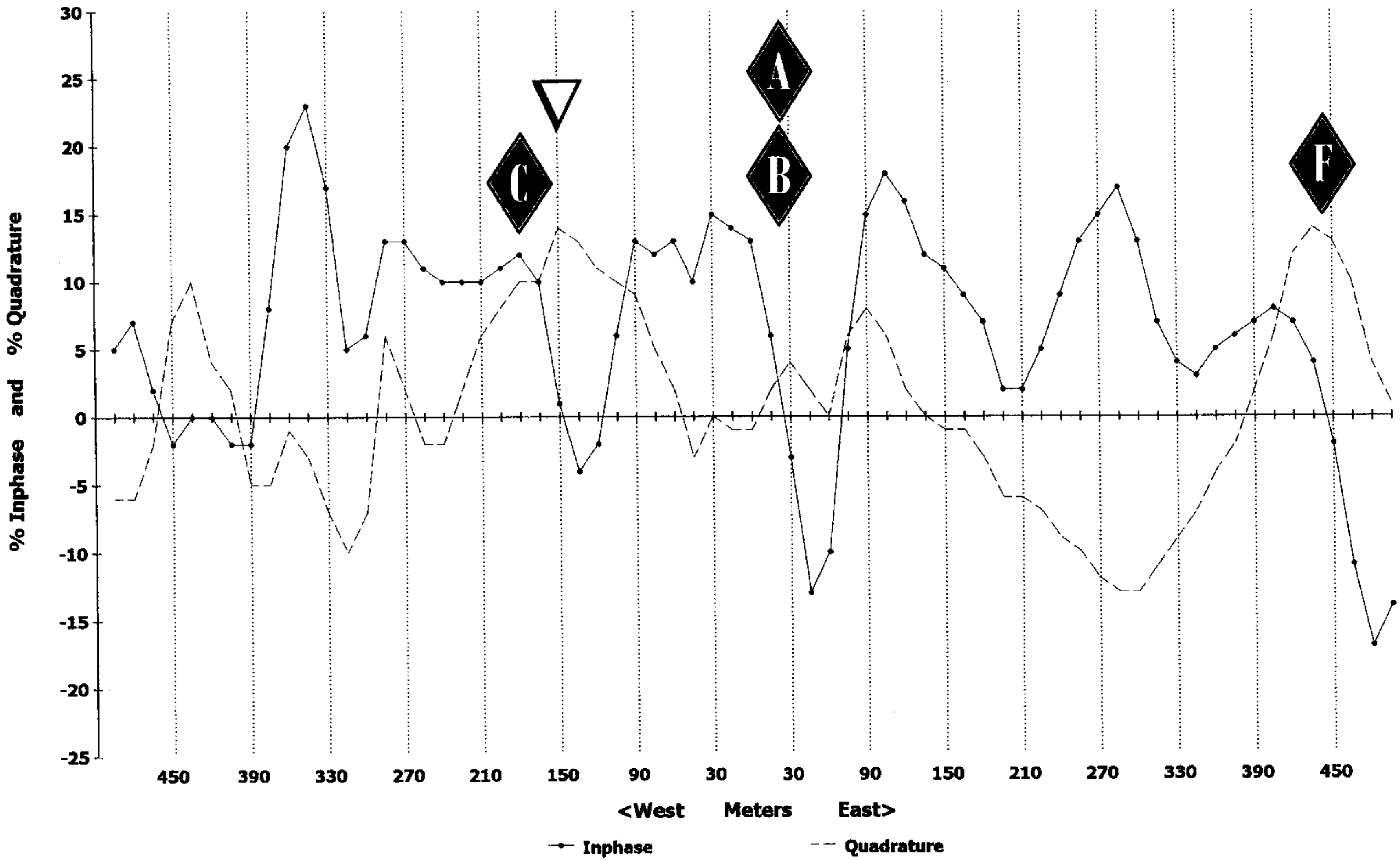
Palomino EM-16 Profile 24.8 khz NLK

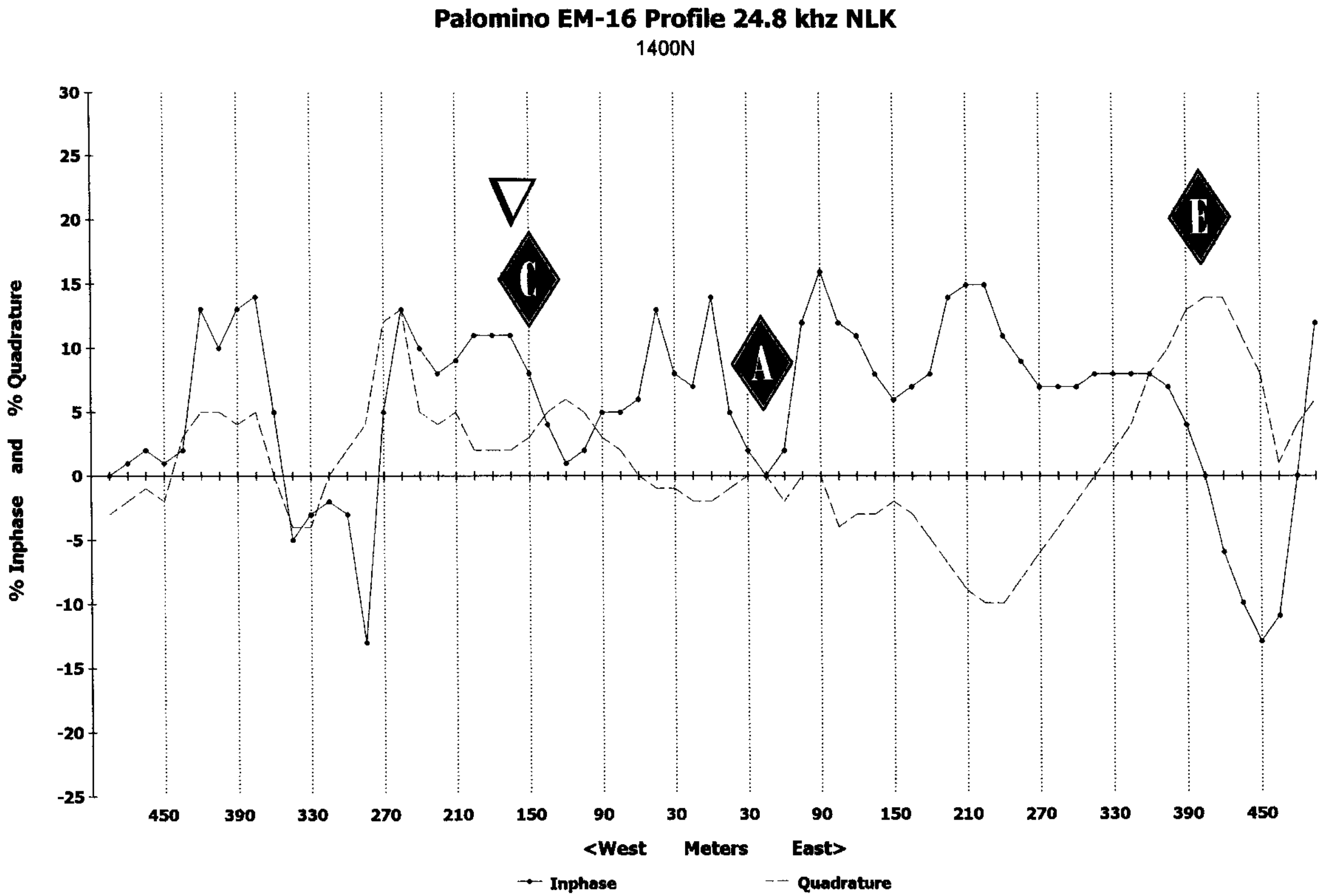
1200N



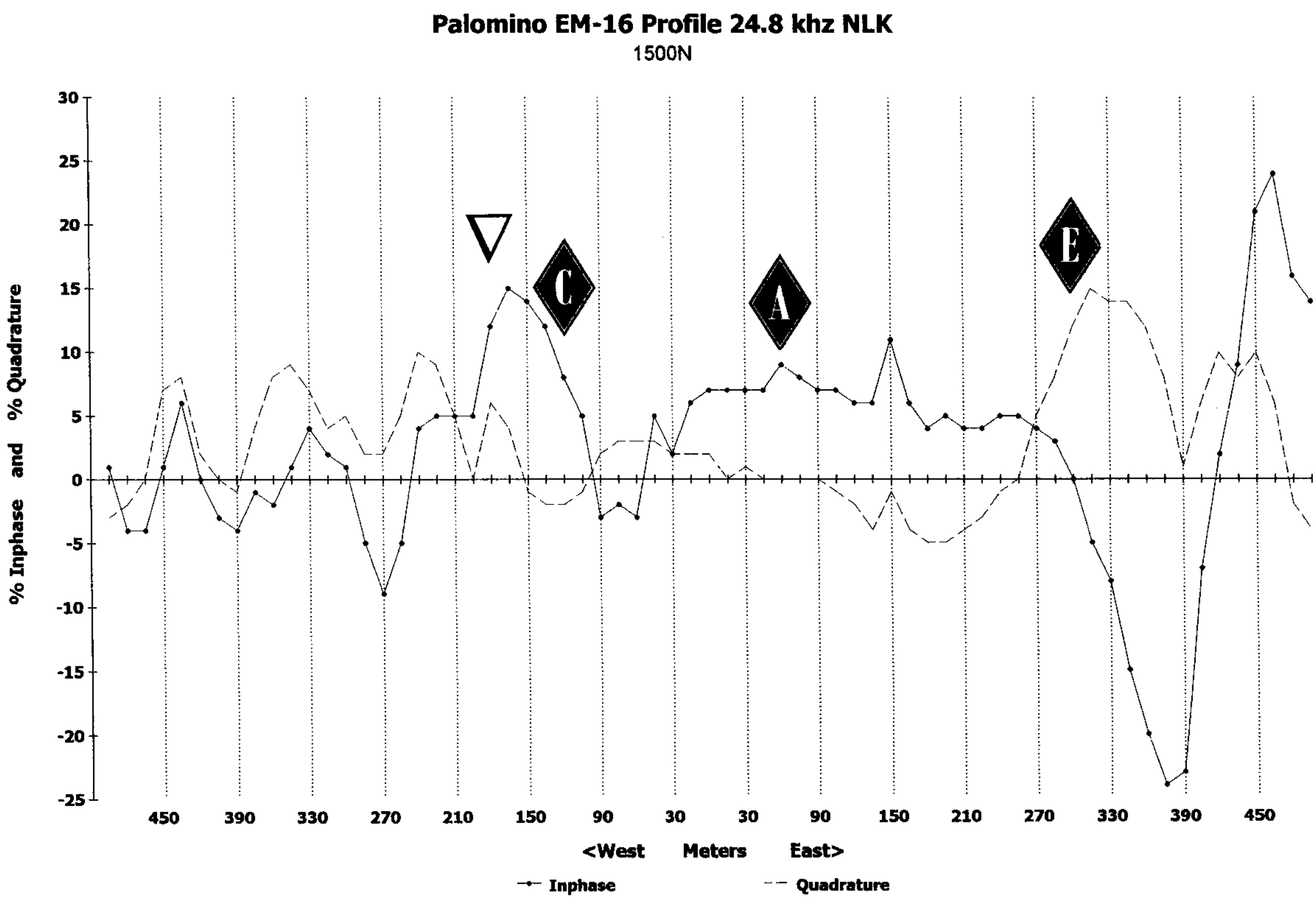
Palomino EM-16 Profile 24.8 khz NLK

1300N

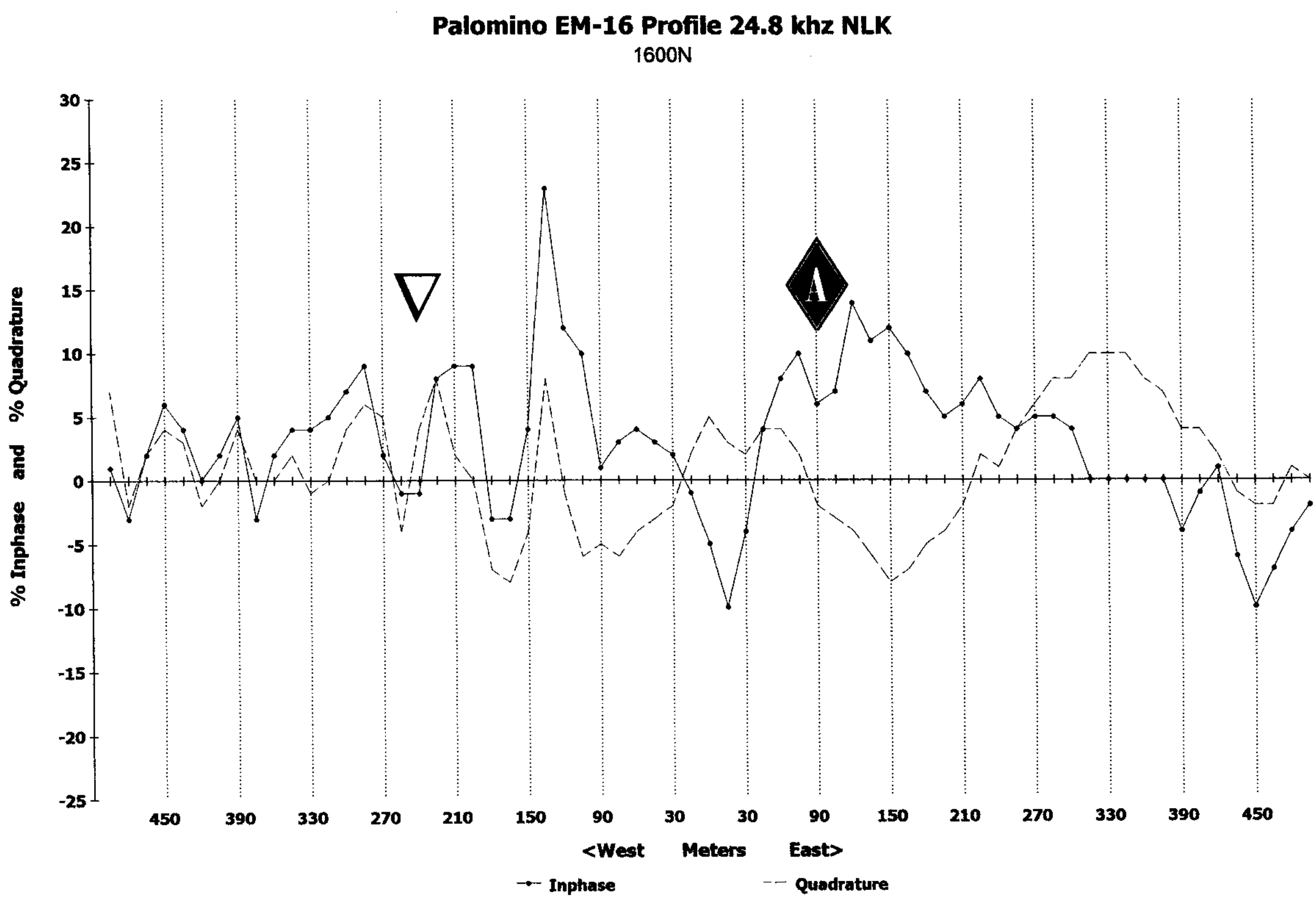




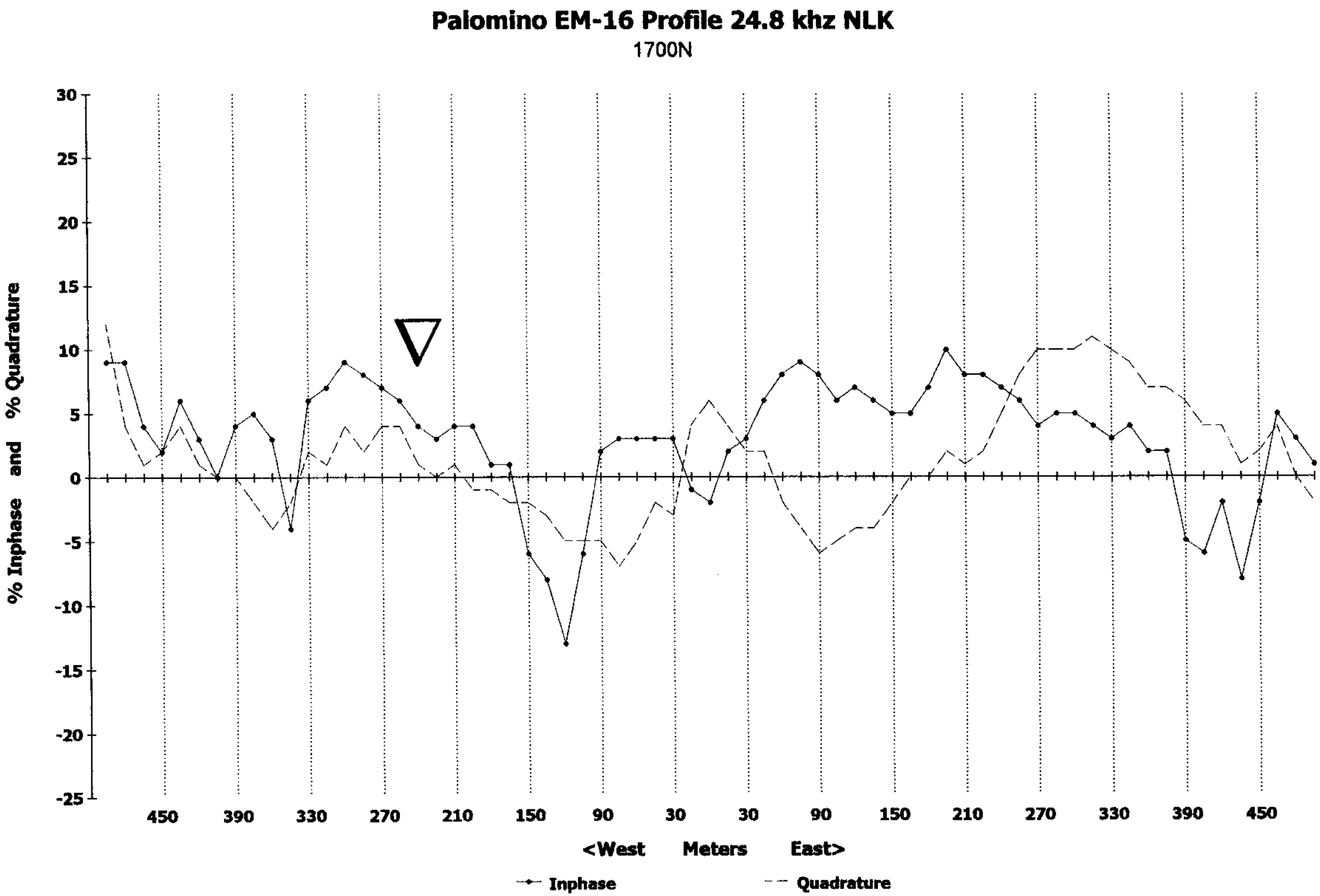
Palomino EM-16 Profile 24.8 khz NLK
1400N
% Inphase and % Quadrature
30
25
20
15
10
5
0
-5
-10
-15
-20
-25
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
<West Meters East>
Inphase
Quadrature
C
A
E



Palomino EM-16 Profile 24.8 khz NLK
1500N
30
25
20
15
10
5
0
-5
-10
-15
-20
-25
% Inphase and % Quadrature
C
A
E
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
<West Meters East>
Inphase
Quadrature



Palomino EM-16 Profile 24.8 khz NLK
1600N
% Inphase and % Quadrature
30
25
20
15
10
5
0
-5
-10
-15
-20
-25
A
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
<West Meters East>
Inphase
Quadrature

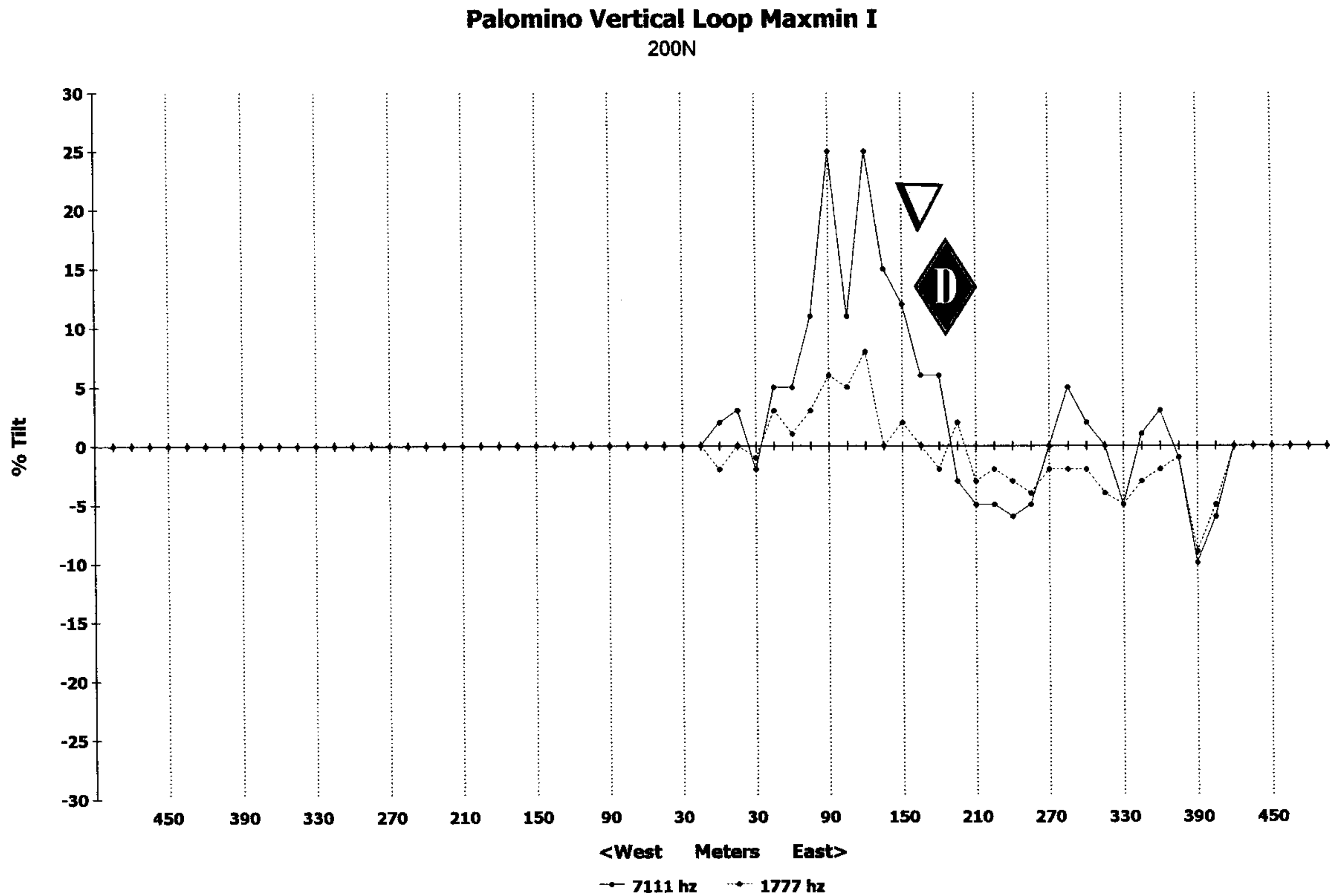

Palomino EM-16 Profile 24.8 khz NLK
1700N
30
25
20
15
10
5
0
-5
-10
-15
-20
-25
% Inphase and % Quadrature
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
<West Meters East>
Inphase
Quadrature

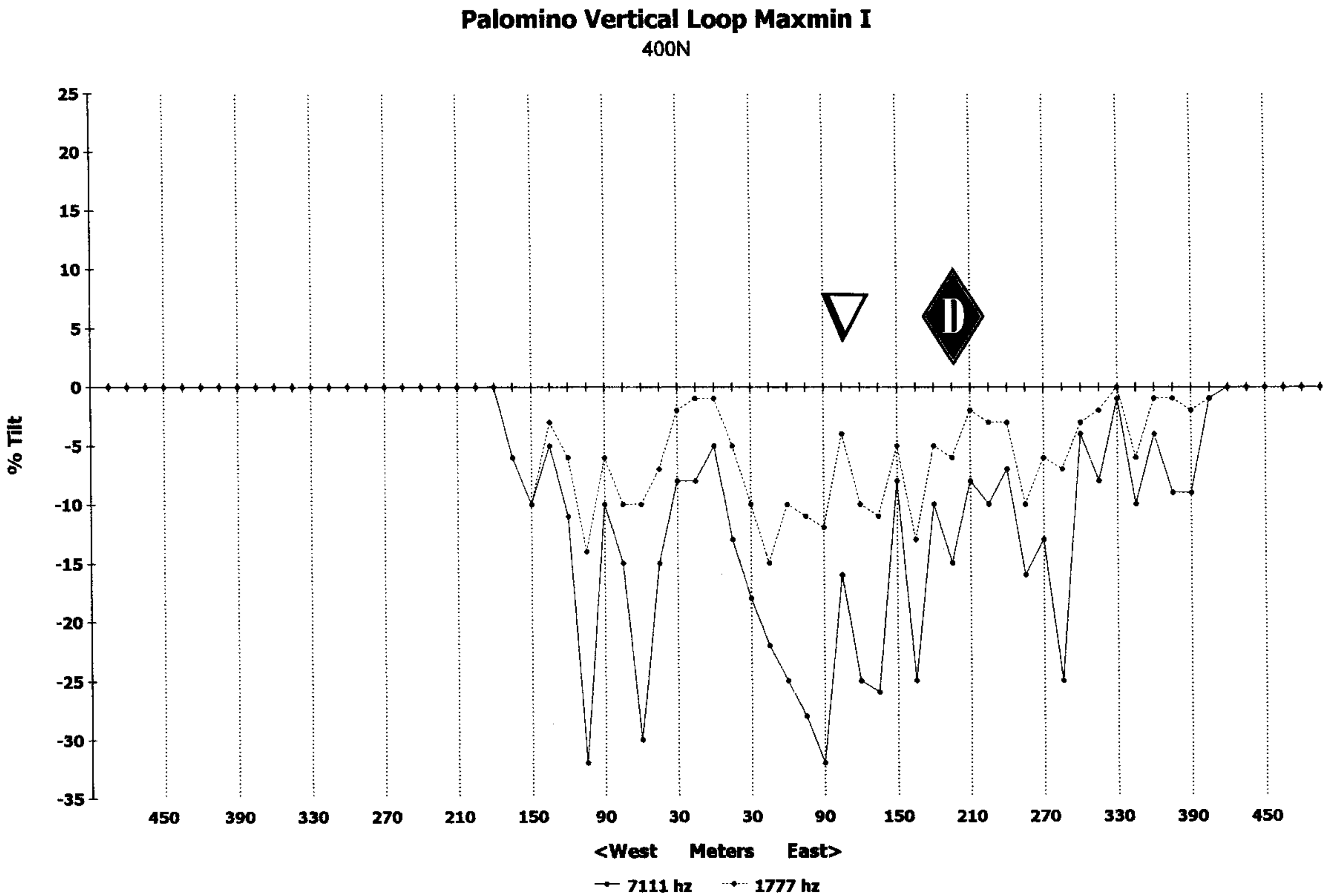
Appendix III

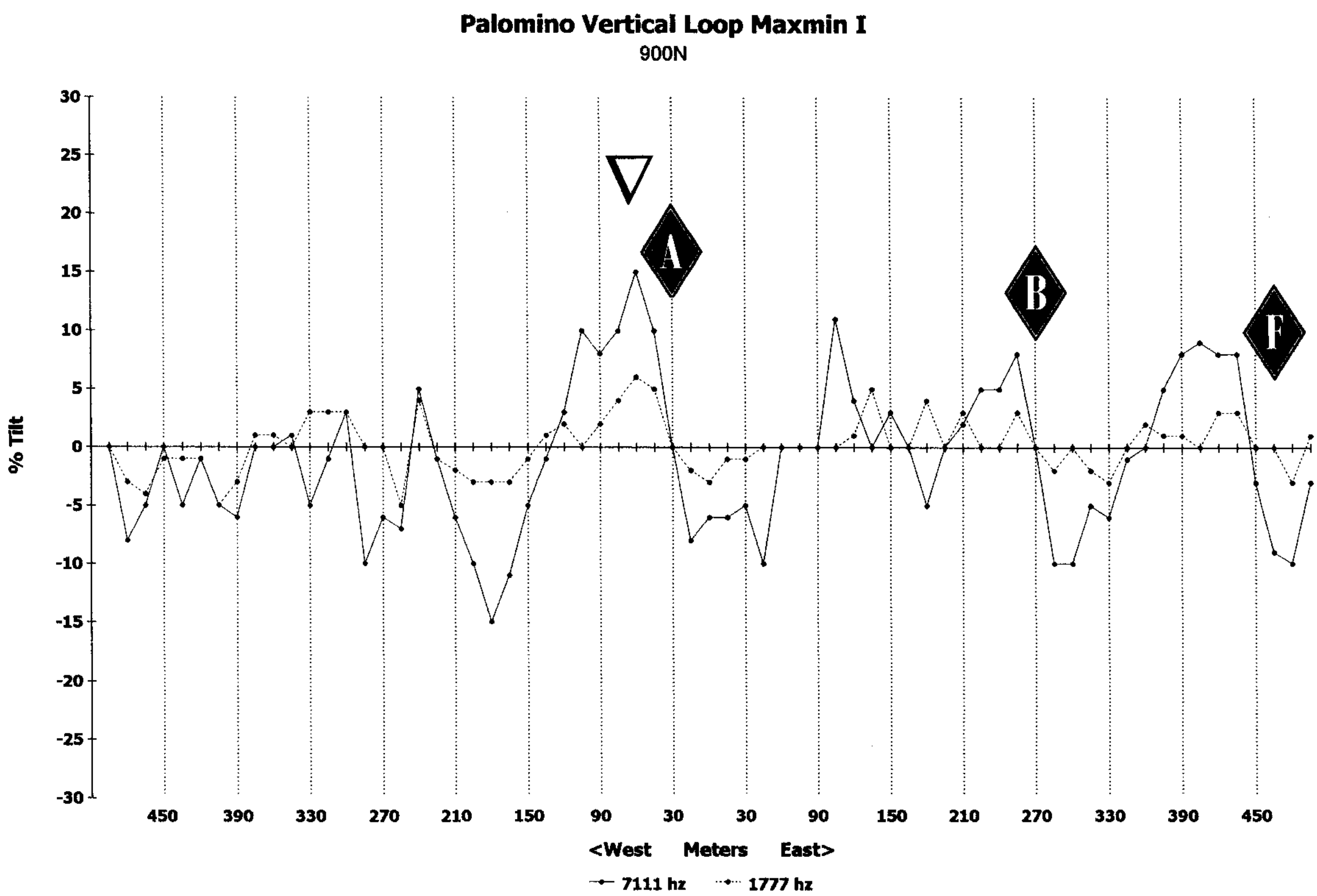
BVL-EM Profiles

◆ Conductor Locations

∇ Quartz Feldspar Porphyry


Palomino Vertical Loop Maxmin I
200N
% Tilt
30
25
20
15
10
5
0
-5
-10
-15
-20
-25
-30
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
<West Meters East>
7111 hz
1777 hz
D

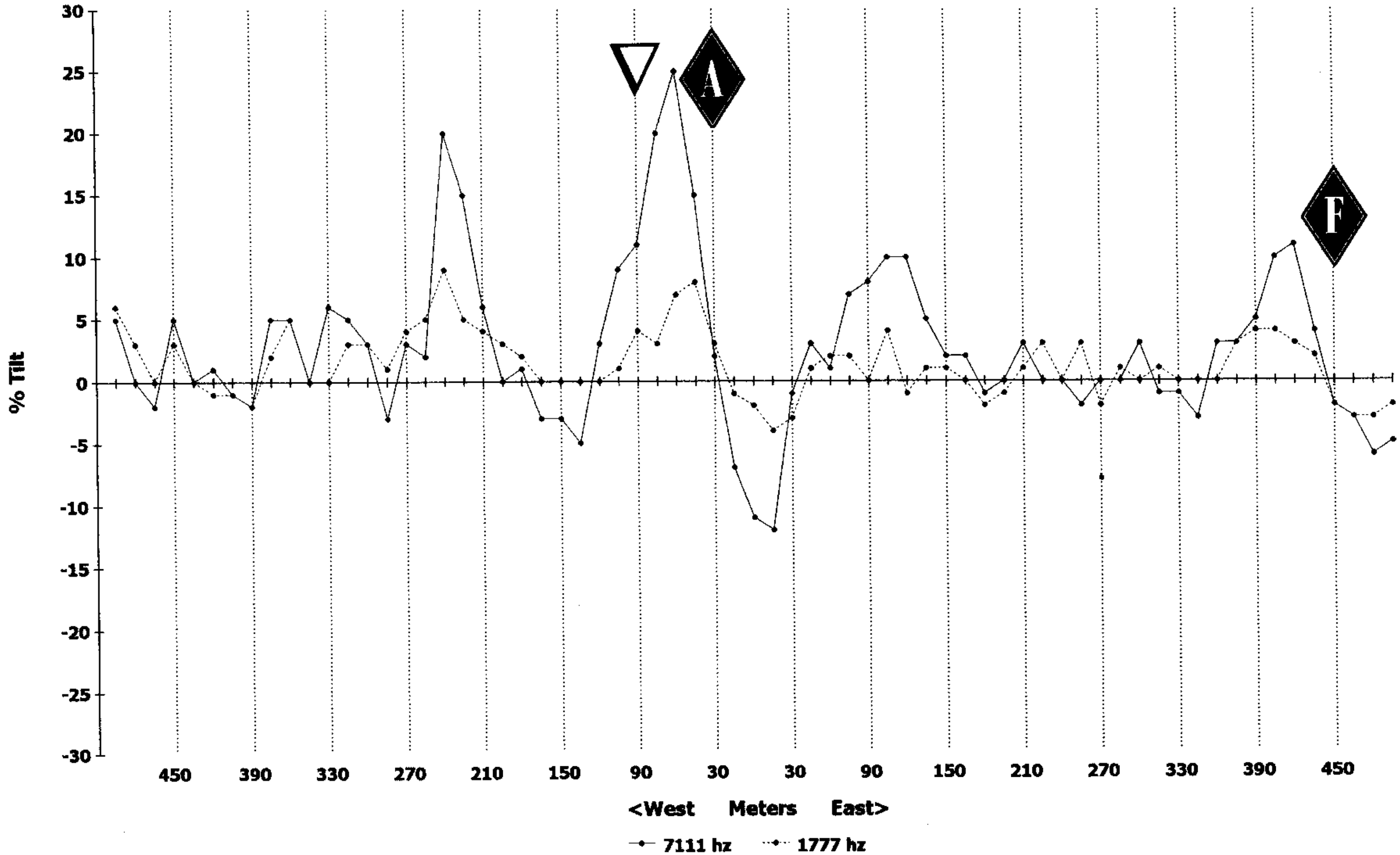

Palomino Vertical Loop Maxmin I
400N
% Tilt
25
20
15
10
5
0
-5
-10
-15
-20
-25
-30
-35
450 390 330 270 210 150 90 30 30 90 150 210 270 330 390 450
D
<West Meters East>
7111 hz
1777 hz

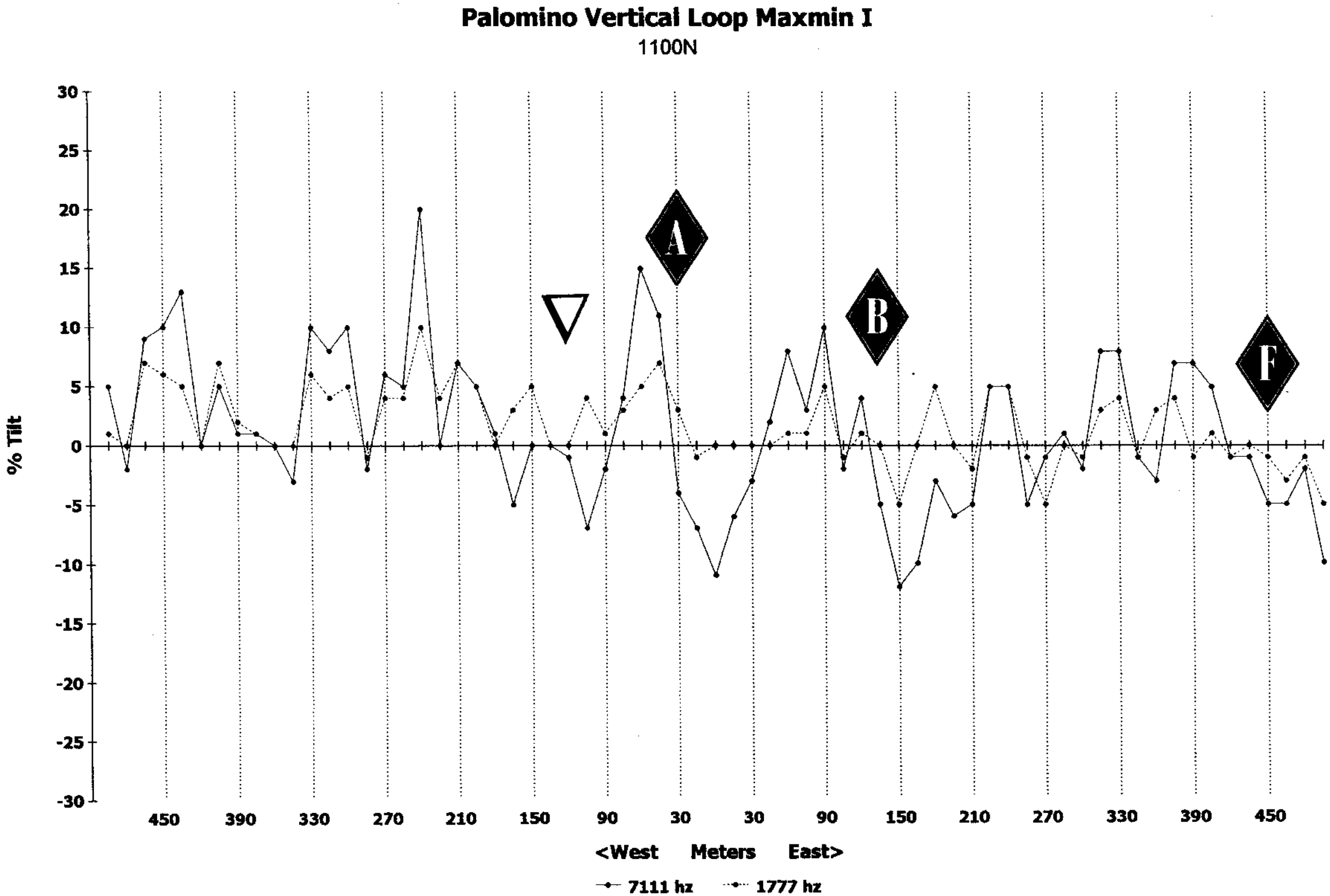


Palomino Vertical Loop Maxmin I
900N
% Tilt
30
25
20
15
10
5
0
-5
-10
-15
-20
-25
-30
A
B
F
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
<West Meters East>
7111 hz
1777 hz

Palomino Vertical Loop Maxmin I

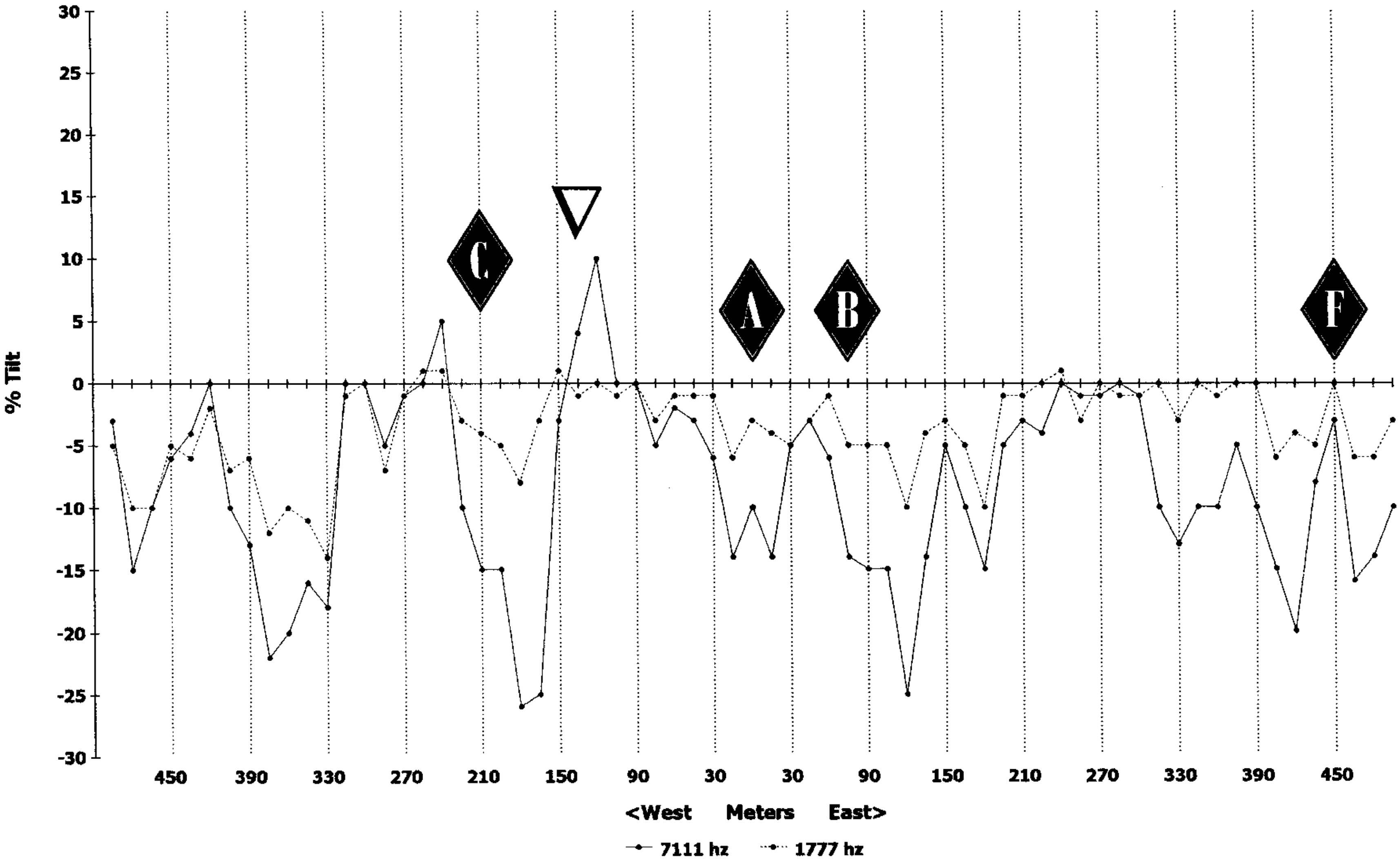
1000N




Palomino Vertical Loop Maxmin I
1100N
% Tilt
30
25
20
15
10
5
0
-5
-10
-15
-20
-25
-30
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
<West Meters East>
7111 hz
1777 hz
A
B
F

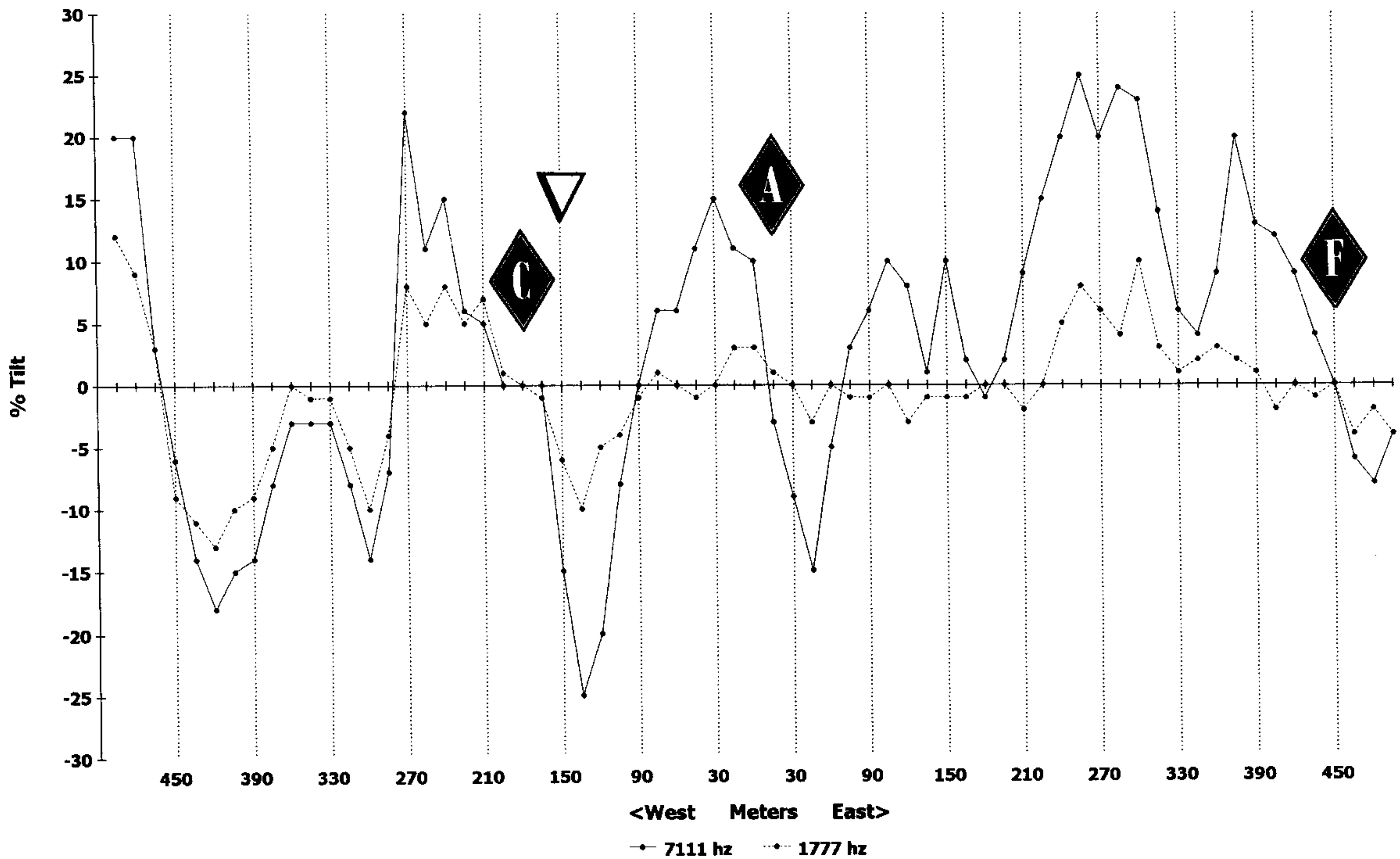
Palomino Vertical Loop Maxmin I

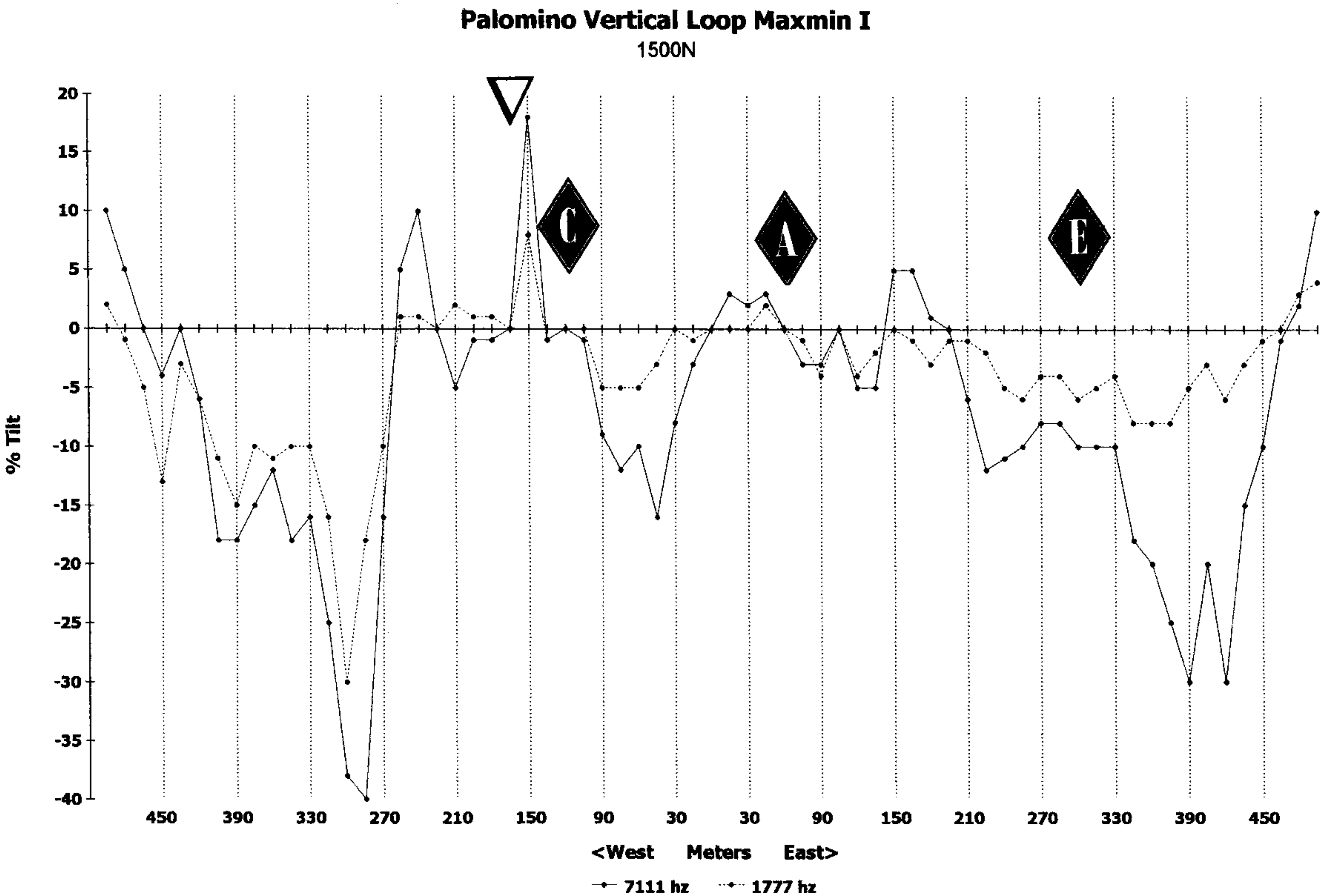
1200N



Palomino Vertical Loop Maxmin I

1300N





Palomino Vertical Loop Maxmin I
1500N
% Tilt
20
15
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
C
A
E
450
390
330
270
210
150
90
30
30
90
150
210
270
330
390
450
<West Meters East>
7111 hz
1777 hz

Appendix IV

Data

Corrected Magnetic, VLF-EM, BVL-EM

Palomino Project — Corrected Data Vertical Magnetic Field Gammas

Meters West	200N	300N	400N	500N	600N	700N	800N	900N	1000N	1100N	1200N	1300N	1400N	1500N	1600N	1700N
495		180		145	5	145	15	-20	-75	-5	100	-5	20	-110	105	-25
480		200	265	105	55	90	100	-55	-15	20	175	-20	30	-65	80	0
465	280	160	170	110	140	45	40	-50	-5	75	40	-10	-70	-50	-60	20
450	250	225	135	95	105	100	-15	35	85	130	35	5	-60	115	-50	-130
435	240	155	95	85	110	125	-20	50	105	155	65	60	20	115	100	125
420	290	110	70	140	155	140	60	45	25	110	90	180	100	175	-10	190
405	320	50	85	90	155	170	170	5	-15	0	105	320	-105	225	-5	110
390	145	80	75	85	185	185	30	65	5	5	160	480	140	155	120	95
375	140	100	140	105	155	155	60	85	60	-80	210	695	170	90	80	75
360	140	95	165	150	195	150	105	80	80	0	175	600	210	135	230	100
345	100	100	200	130	185	155	130	80	115	80	145	230	210	195	290	30
330	140	155	160	150	215	195	180	95	155	40	145	-20	115	275	180	75
315	210	210	210	165	190	215	230	135	140	90	105	20	60	225	160	70
300	180	200	255	200	255	215	220	180	255	140	85	-35	90	235	120	75
285	150	110	260	155	215	230	210	225	215	125	155	-30	-45	145	120	95
270	230	230	280	180	220	250	260	305	210	140	245	120	-10	105	60	135
255	290	355	270	210	215	275	260	325	205	115	265	165	80	-15	80	150
240	365	290	245	280	280	295	285	280	285	110	225	220	160	65	40	130
225	310	295	210	280	320	290	325	300	415	425	305	190	150	160	135	220
210	280	420	320	345	425	320	410	310	475	360	395	310	230	265	100	110
195	425	400	395	395	350	360	430	295	330	330	560	295	240	235	155	200
180	440	365	420	450	340	425	520	290	260	450	735	280	220	180	205	155
165	450	390	440	440	385	420	630	305	235	430	850	355	240	235	185	160
150	455	410	560	470	410	425	680	370	235	510	775	310	310	275	120	220
135	435	420	510	530	455	410	640	445	470	890	730	370	365	335	200	260
120	470	385	545	490	525	485	635	600	470	820	690	400	455	405	340	170
105	510	435	540	540	540	475	610	565	440	840	800	655	590	455	400	145
90	540	515	560	585	505	450	680	725	445	855	900	790	620	490	410	260
75	530	565	620	590	530	485	700	770	650	855	1285	790	585	525	380	330
60	600	570	630	520	540	590	700	705	825	875	1600	795	725	600	400	350
45	630	620	690	570	505	695	755	630	770	805	1675	805	835	650	445	380
30	650	660	670	630	520	755	840	575	690	885	1375	1040	630	640	400	425
15	815	670	665	540	535	805	860	565	685	1090	1350	1020	545	525	405	375

Palomino Project — Corrected Data Vertical Magnetic Field Gammas

		200N	300N	400N	500N	600N	700N	800N	900N	1000N	1100N	1200N	1300N	1400N	1500N	1600N	1700N
Base	**0**	835	650	550	530	515	865	880	605	800	1365	1525	820	475	525	370	330
	15	860	635	615	535	535	790	915	800	1045	1390	2000	580	220	560	310	345
	30	860	620	620	530	625	775	905	995	1425	1415	1725	470	290	455	285	330
	45	875	590	585	530	680	730	840	925	1600	1315	1350	435	520	285	230	340
	60	835	610	580	570	695	670	670	740	1230	1205	895	670	710	205	195	320
	75	770	650	560	540	695	630	640	735	925	1135	600	590	530	185	215	355
	90	740	580	570	555	700	540	785	665	685	1010	515	665	390	205	280	345
	105	715	590	610	570	695	440	845	635	600	835	475	410	390	255	205	340
	120	700	540	630	575	685	390	710	615	520	690	595	265	290	345	290	345
	135	555	510	490	550	655	370	615	840	400	530	460	465	320	190	420	325
	150	550	545	545	490	575	360	590	445	410	500	355	560	310	265	460	290
	165	530	550	490	540	455	285	605	335	385	415	315	385	315	275	400	255
	180	540	570	580	510	385	280	690	425	355	710	385	305	310	265	320	260
	195	475	590	730	500	370	320	880	375	305	565	315	255	300	315	300	280
	210	545	620	720	490	445	405	930	315	295	440	415	240	320	345	130	265
	225	580	605	585	490	400	480	1300	380	285	300	315	345	285	355	280	265
	240	645	570	550	470	395	540	940	440	575	280	410	310	305	315	205	270
	255	530	530	510	505	405	715	975	555	370	340	305	375	310	255	200	270
	270	500	490	485	520	475	785	700	250	495	890	465	285	320	235	180	265
	285	410	460	470	630	525	690	300	205	480	490	390	320	300	225	220	240
	300	375	440	460	560	590	585	370	210	245	580	310	340	290	215	270	245
	315	420	430	410	570	615	615	320	315	130	545	215	270	275	195	320	310
	330	410	560	440	630	600	435	440	225	115	440	175	260	270	225	395	220
	345	190	405	430	680	575	370	255	100	180	240	210	300	195	350	400	255
	360	450	365	390	750	560	415	225	80	25	310	210	310	240	435	330	275
	375	190	340	380	855	505	375	285	70	25	250	230	315	215	585	260	270
	390	280	335	325	940	465	265	110	160	240	260	290	320	215	500	180	280
	405	345	335	310	960	395	275	130	145	195	255	250	335	220	405	230	370
	420	350	310	325	980	305	265	130	245	165	260	225	350	230	320	300	215
	435	260	330	330	705	255	245	400	95	125	240	185	330	235	295	200	125
	450	330	310	470	500	235	255	110	110	195	200	145	330	220	305	230	190
	465	250	315	495	410	215	290	75	130	45	250	170	300	285	225	260	280
Meters	**480**	195	320	505	320	260	160	95	135	285	320	185	230	290	210	235	195
East	**495**	295	195	650	335	240	100	100	85	355	365	235	355	330	195	130	155

Palomino Project — VLF-EM Data

Meters West	200N		300N		400 N		500N		600N		700N		800N		900N	
	IP	Quad	IP	Quad	IP	Quad	IP	Quad	IP	Quad	IP	Quad	IP	Quad	IP	Quad
495			0	0	2	0	-3	-2	1	-2	3	-3	-5	-2	-1	-3
480			0	0	2	-4	0	0	5	3	4	0	-3	-1	-5	-4
465			2	0	2	-3	1	-1	8	4	5	0	-2	-2	0	-1
450	-1	-3	3	2	2	-3	0	0	6	-1	2	2	0	-1	4	2
435	0	-3	4	0	2	0	-1	-1	3	-2	3	0	4	3	5	0
420	1	-2	7	1	3	0	-2	0	6	-2	2	0	6	3	4	0
405	2	-1	7	2	1	-1	-2	-2	5	-1	5	1	3	0	3	-3
390	5	0	1	0	-1	-1	1	0	4	0	9	2	2	-2	3	-2
375	6	3	1	1	-1	-1	3	0	4	-1	8	-1	3	-2	2	-1
360	7	4	1	0	-1	-2	3	-1	4	0	7	1	4	-4	1	-2
345	5	3	1	-1	0	-2	3	-2	6	2	6	-1	7	-3	1	-4
330	2	1	1	-1	0	0	4	-2	5	7	5	-1	7	1	3	-3
315	-2	-1	0	-4	-1	-1	4	0	5	0	9	0	5	2	5	-1
300	-3	-5	1	-3	1	1	4	0	10	2	11	2	7	0	6	1
285	-1	-7	0	-4	2	1	5	1	12	2	8	0	8	3	8	2
270	2	-7	0	0	4	0	7	1	13	3	7	-2	9	0	11	4
255	4	-10	0	0	4	0	7	4	11	0	6	-2	10	0	11	4
240	2	-12	1	-1	6	-1	11	5	11	0	8	0	11	0	13	6
225	0	-13	2	0	7	-1	14	5	8	-1	8	1	13	3	8	4
210	2	-5	2	0	8	0	14	2	6	-2	11	3	12	4	7	4
195	2	3	3	-1	11	2	12	0	5	-2	12	5	13	4	2	4
180	2	2	5	-1	11	0	8	-1	5	-2	11	4	12	2	1	5
165	2	1	6	-1	10	0	7	-2	7	0	10	0	14	2	3	8
150	3	0	7	-1	9	-1	6	-1	7	0	9	2	5	1	6	8
135	4	-1	10	1	8	2	8	1	11	2	7	2	4	1	11	4
120	5	-1	11	1	8	2	7	2	12	2	6	8	6	2	12	4
105	6	0	13	4	10	4	9	2	9	2	8	5	8	4	13	0
90	7	0	15	7	15	8	10	3	8	-1	8	4	10	4	16	-1
75	8	0	11	-4	15	4	8	-1	9	0	8	2	11	5	16	-3
60	9	0	4	-2	8	-1	7	0	13	4	8	0	13	5	11	-3
45	10	1	3	-3	6	-3	7	1	9	1	11	0	13	4	10	1
30	10	1	4	-1	6	-1	9	2	7	2	13	0	11	2	8	3
15	9	1	4	-2	6	0	8	0	7	5	14	-1	11	2	7	4

Palomino Project — VLF-EM Data

	Meters East	200N IP	200N Quad	300N IP	300N Quad	400 N IP	400 N Quad	500N IP	500N Quad	600N IP	600N Quad	700N IP	700N Quad	800N IP	800N Quad	900N IP	900N Quad
Base	0	8	3	4	-1	4	-2	5	-2	8	4	15	-1	9	2	7	4
	15	7	3	5	-1	3	-3	5	-1	10	5	14	-2	9	3	6	4
	30	8	3	7	0	0	0	6	-1	12	5	11	0	8	4	5	5
	45	8	1	9	1	6	0	8	1	13	3	9	0	8	4	3	5
	60	8	0	8	1	8	4	11	2	13	4	7	4	7	4	2	7
	75	10	-1	7	1	9	6	11	2	12	5	6	8	5	5	2	7
	90	13	1	8	1	10	5	12	5	9	5	5	7	5	7	4	7
	105	10	-2	8	3	8	5	9	5	8	7	5	7	4	7	4	8
	120	8	-5	8	4	6	5	7	5	7	7	5	6	2	7	3	6
	135	9	-1	9	9	5	7	3	3	4	6	8	5	-2	6	4	4
	150	11	4	9	10	9	9	7	7	1	5	7	2	-6	6	6	5
	165	10	10	9	11	8	7	8	9	-1	3	6	3	-10	5	4	4
	180	10	12	10	13	5	6	6	6	3	4	5	3	-7	5	2	2
	195	7	12	2	11	2	-4	3	6	10	3	4	3	-3	5	0	0
	210	0	12	-2	11	2	2	1	7	13	1	3	3	4	2	2	-1
Meters East	225	-9	-6	-2	10	2	0	-1	8	12	0	2	5	0	2	3	-2
	240	-14	-4	-3	9	6	1	-2	5	11	-2	3	3	6	3	8	-2
	255	-18	-1	-1	6	11	2	-5	2	11	-4	3	3	8	-1	10	-2
	270	-10	-1	-3	1	11	0	-6	-2	13	-5	8	2	11	-2	1	-4
	285	3	7	-6	-1	8	-1	0	-3	11	-6	2	1	12	-3	-10	-8
	300	6	6	-3	-4	8	0	5	0	7	-5	1	0	12	-2	-10	-7
	315	4	2	2	0	7	0	15	4	5	-4	2	-2	9	-2	-2	-1
	330	0	-1	3	1	4	-1	10	-1	2	-2	4	-3	7	-3	2	0
	345	4	2	3	-1	-3	-4	6	-4	0	0	4	0	2	-2	6	2
	360	4	2	3	0	-4	-6	5	-3	-1	-1	1	-2	-4	-3	6	-2
	375	0	-2	6	0	-8	-11	6	-4	-1	1	2	-1	-5	-2	9	-2
	390	-2	-2	5	-1	1	-6	6	-5	-2	2	4	-1	3	2	6	-7
	405	0	0	5	-3	5	-3	6	-6	-2	2	5	-2	4	1	7	-7
	420	1	0	6	-5	10	-2	5	-6	-1	0	3	-2	0	-3	11	-6
	435	1	-1	8	-3	14	0	5	-7	-2	-2	1	-3	-3	-5	8	-7
	450	1	-1	12	-2	5	-5	4	-8	0	-2	3	-2	4	-5	7	-5
	465	1	-2	13	-3	1	-8	0	-7	0	-2	5	-2	11	-2	2	-4
	480	1	-5	12	-5	6	-4	-2	-8	0	-2	3	-3	11	-3	-2	-1

Palomino Project — VLF-EM Data

Meters East	200N IP	200N Quad	300N IP	300N Quad	400 N IP	400 N Quad	500N IP	500N Quad	600N IP	600N Quad	700N IP	700N Quad	800N IP	800N Quad	900N IP	900N Quad
495	5	-3	12	-8	14	-4	0	-6	0	-1	1	-1	4	-2	0	2
510	10	-4	18	-9	6	-8	3	-5								
525	12	-2	18	-7	5	-8	2	-3								
540	12	-4	27	-5	3	-5	-3	-2								
555	17	-2	28	-4	-5	-6	-5	2								
570	20	-2	19	-8	-6	-4	-4	2								
585	21	-2	10	-11	-3	-2	-3	2								
600	23	-3	6	-10	0	0	1	3								
615	23	-4	1	-8	-7	-2	7	4								
630	20	-9	-2	-5	-7	-2	7	2								
645	14	-10	-4	0	2	2	8	0								
660	10	-9	-6	1	10	6										
675	3	-10	-7	2	12	4										
690	-1	-9	-5	2	10	0										
705	-4	-5	-1	1	8	-2										
720			3	0												
735			7	0												

Palomino Project — VLF-EM Data

Meters West	1000N IP	1000N Quad	1100N IP	1100N Quad	1200N IP	1200N Quad	1300N IP	1300N Quad	1400N IP	1400N Quad	1500N IP	1500N Quad	1600N IP	1600N Quad	1700N IP	1700N Quad
495	-2	-3	-2	-2	-3	-4	5	-6	0	-3	1	-3	1	7	9	12
480	-5	-2	-5	-1	-2	-1	7	-6	1	-2	-4	-2	-3	-2	9	4
465	-3	-1	-6	-3	-4	-5	2	-2	2	-1	-4	0	2	2	4	1
450	-2	0	-4	-2	-3	1	-2	7	1	-2	1	7	6	4	2	2
435	-3	-3	-3	-3	0	2	0	10	2	3	6	8	4	3	6	4
420	-3	-4	-1	-3	1	2	0	4	13	5	0	2	0	-2	3	1
405	-2	-4	1	-2	1	3	-2	2	10	5	-3	0	2	0	0	0
390	-1	-3	-2	-3	-1	4	-2	-5	13	4	-4	-1	5	4	4	0
375	2	0	-5	-2	-3	1	8	-5	14	5	-1	4	-3	0	5	-2
360	2	-2	-1	-2	0	0	20	-1	5	0	-2	8	2	0	3	-4
345	4	-1	4	1	2	-2	23	-3	-5	-4	1	9	4	2	-4	-2
330	8	2	5	0	3	-1	17	-7	-3	-4	4	7	4	-1	6	2
315	11	4	7	0	5	-2	5	-10	-2	0	2	4	5	0	7	1
300	10	5	9	1	9	1	6	-7	-3	2	1	5	7	4	9	4
285	9	5	12	4	9	-2	13	6	-13	4	-5	2	9	6	8	2
270	8	5	16	9	9	-2	13	2	5	12	-9	2	2	5	7	4
255	8	4	16	9	11	-1	11	-2	13	13	-5	5	-1	-4	6	4
240	13	5	17	8	12	1	10	-2	10	5	4	10	-1	4	4	1
225	13	6	12	8	17	6	10	2	8	4	5	9	8	8	3	0
210	10	8	7	8	14	9	10	6	9	5	5	5	9	2	4	1
195	12	10	1	10	9	6	11	8	11	2	5	0	9	0	4	-1
180	9	8	0	8	9	6	12	10	11	2	12	6	-3	-7	1	-1
165	5	6	0	4	7	4	10	10	11	2	15	4	-3	-8	1	-2
150	6	4	2	2	10	2	1	14	8	3	14	-1	4	-4	-6	-2
135	8	2	10	0	15	2	-4	13	4	5	12	-2	23	8	-8	-3
120	13	0	17	0	13	1	-2	11	1	6	8	-2	12	-1	-13	-5
105	13	-2	18	-4	8	0	6	10	2	5	5	-1	10	-6	-6	-5
90	12	-3	15	-8	5	1	13	9	5	3	-3	2	1	-5	2	-5
75	15	-6	13	-8	3	2	12	5	5	2	-2	3	3	-6	3	-7
60	15	-6	12	-7	4	2	13	2	6	0	-3	3	4	-4	3	-5
45	13	-5	10	-4	9	2	10	-3	13	-1	5	3	3	-3	3	-2
30	10	-4	5	3	8	3	15	0	8	-1	2	2	2	-2	3	-3
15	7	3	2	7	3	5	14	-1	7	-2	6	2	-1	2	-1	4

Palomino Project VLF-EM Data

		1000N		1100N		1200N		1300N		1400N		1500N		1600N		1700N	
		IP	Quad	IP	Quad	IP	Quad	IP	Quad	IP	Quad	IP	Quad	IP	Quad	IP	Quad
Base	**0**	3	8	1	8	-3	6	13	-1	14	-2	7	2	-5	5	-2	6
	15	1	8	5	6	-4	6	6	2	5	-1	7	0	-10	3	2	4
	30	1	8	13	3	7	9	-3	4	2	0	7	1	-4	2	3	2
	45	7	6	15	3	15	9	-13	2	0	0	7	0	4	4	6	2
	60	12	4	15	2	9	8	-10	0	2	-2	9	0	8	4	8	-2
	75	13	2	14	3	0	10	5	6	12	0	8	0	10	2	9	-4
	90	13	2	14	6	-6	9	15	8	16	0	7	0	6	-2	8	-6
	105	14	2	9	6	-7	9	18	6	12	-4	7	-1	7	-3	6	-5
	120	14	2	2	9	-5	7	16	2	11	-3	6	-2	14	-4	7	-4
	135	6	2	-7	10	-3	6	12	0	8	-3	6	-4	11	-6	6	-4
	150	2	2	-17	6	4	8	11	-1	6	-2	11	-1	12	-8	5	-2
	165	3	2	-20	5	7	8	9	-1	7	-3	6	-4	10	-7	5	0
	180	2	2	-15	5	7	6	7	-3	8	-5	4	-5	7	-5	7	0
	195	5	4	-9	5	2	0	2	-6	14	-7	5	-5	5	-4	10	2
	210	6	4	-5	4	3	-4	2	-6	15	-9	4	-4	6	-2	8	1
Meters East	**225**	4	5	1	5	7	-4	5	-7	15	-10	4	-3	8	2	8	2
	240	5	3	6	5	12	-4	9	-9	11	-10	5	-1	5	1	7	5
	255	6	3	8	0	21	-2	13	-10	9	-8	5	0	4	4	6	8
	270	8	3	16	2	28	0	15	-12	7	-6	4	5	5	6	4	10
	285	10	0	16	-1	19	-5	17	-13	7	-4	3	8	5	8	5	10
	300	8	0	15	-6	10	-9	13	-13	7	-2	0	12	4	8	5	10
	315	3	-4	18	-6	6	-11	7	-11	8	0	-5	15	0	10	4	11
	330	0	-6	17	-7	7	-12	4	-9	8	2	-8	14	0	10	3	10
	345	4	-6	12	-8	10	-12	3	-7	8	4	-15	14	0	10	4	9
	360	10	-3	11	-10	14	-11	5	-4	8	8	-20	12	0	8	2	7
	375	8	-6	10	-9	9	-9	6	-2	7	10	-24	8	0	7	2	7
	390	6	-9	9	-10	3	-8	7	2	4	13	-23	1	-4	4	-5	6
	405	12	-8	5	-8	2	-6	8	6	0	14	-7	6	-1	4	-6	4
	420	12	-6	2	-6	2	-4	7	12	-6	14	2	10	1	2	-2	4
	435	4	-5	2	-4	2	-1	4	14	-10	11	9	8	-6	-1	-8	1
	450	1	-2	1	-2	1	1	-2	13	-13	8	21	10	-10	-2	-2	2
	465	0	0	0	-1	2	-1	-11	10	-11	1	24	6	-7	-2	5	4
	480	-4	2	0	0	0	5	-17	4	0	4	16	-2	-4	1	3	0

Palomino Project VLF-EM Data

Meters East	1000N		1100N		1200N		1300N		1400N		1500N		1600N		1700N	
	IP	Quad	IP	Quad	IP	Quad	IP	Quad	IP	Quad	IP	Quad	IP	Quad	IP	Quad
495	-1	2	0	1	1	4	-14	1	12	6	14	-4	-2	0	1	-2
510																
525																
540																
555																
570																
585																
600																
615																
630																
645																
660																
675																
690																
705																
720																
735																

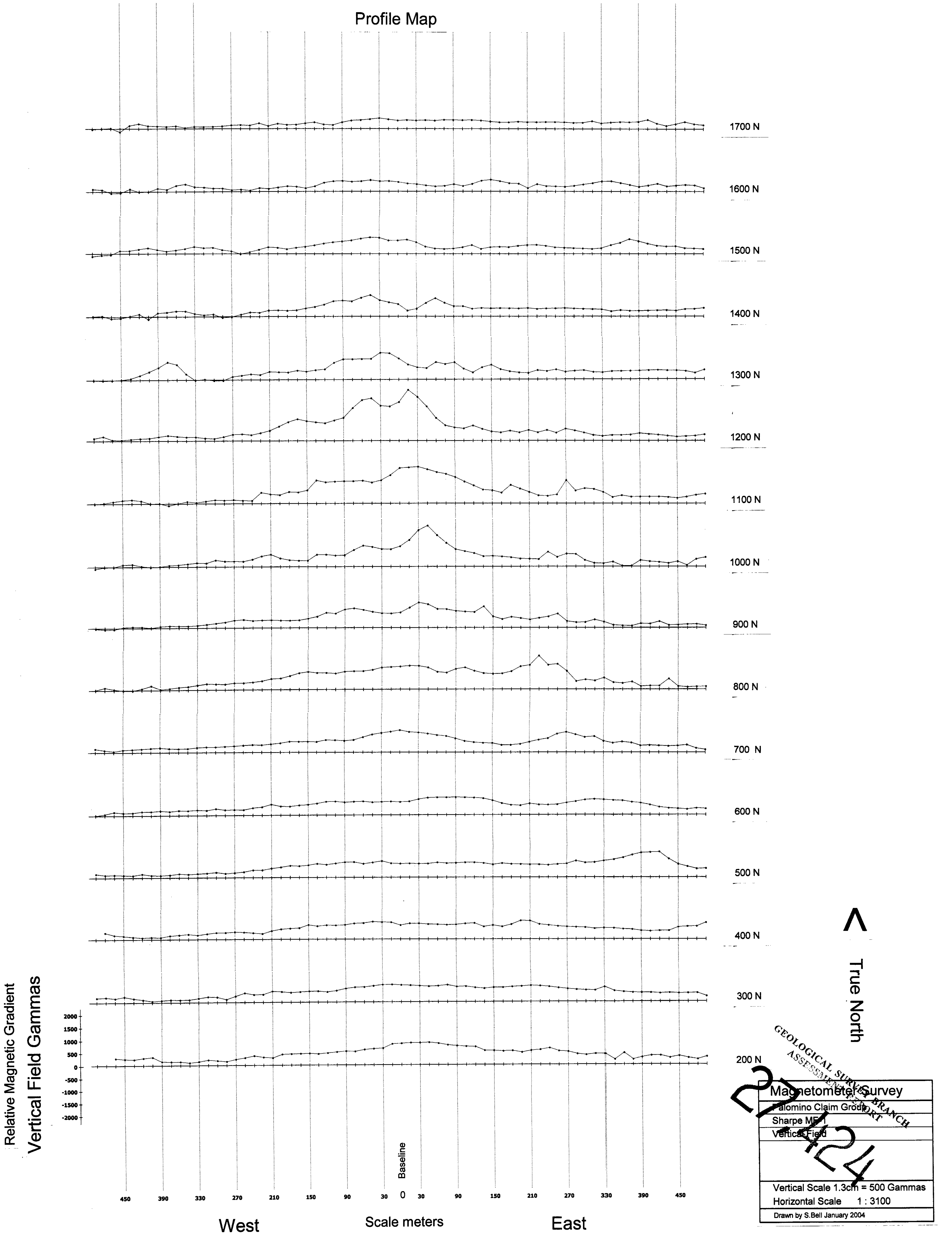
Palomino Project BVL-EM Data Percent Tilt

Meters West	200N 7111	200N 1777	400N 7111	400N 1777	900N 7111	900N 1777	1000N 7111	1000N 1777	1100N 7111	1100N 1777	1200N 7111	1200N 1777	1300N 7111	1300N 1777	1500N 7111	1500N 1777
495					0	0	5	6	5	1	-3	-5	20	12	10	2
480					-8	-3	0	3	-2	0	-15	-10	20	9	5	-1
465					-5	-4	-2	0	9	7	-10	-10	3	3	0	-5
450					0	-1	5	3	10	6	-6	-5	-6	-9	-4	-13
435					-5	-1	0	0	13	5	-4	-6	-14	-11	0	-3
420					-1	-1	1	-1	0	0	0	-2	-18	-13	-6	-6
405					-5	-5	-1	-1	5	7	-10	-7	-15	-10	-18	-11
390					-6	-3	-2	-2	1	2	-13	-6	-14	-9	-18	-15
375					0	1	5	2	1	1	-22	-12	-8	-5	-15	-10
360					0	1	5	5	0	0	-20	-10	-3	0	-12	-11
345					1	0	0	0	-3	0	-16	-11	-3	-1	-18	-10
330					-5	3	6	0	10	6	-18	-14	-3	-1	-16	-10
315					-1	3	5	3	8	4	0	-1	-8	-5	-25	-16
300					3	3	3	3	10	5	0	0	-14	-10	-38	-30
285					-10	0	-3	1	-2	-1	-5	-7	-7	-4	-40	-18
270					-6	0	3	4	6	4	-1	-1	22	8	-16	-10
255					-7	-5	2	5	5	4	0	1	11	5	5	1
240					5	4	20	9	20	10	5	1	15	8	10	1
225					-1	-1	15	5	0	4	-10	-3	6	5	0	0
210					-6	-2	6	4	7	7	-15	-4	5	7	-5	2
195					-10	-3	0	3	5	5	-15	-5	0	1	-1	1
180			0	0	-15	-3	1	2	1	0	-26	-8	0	0	-1	1
165			-6	-6	-11	-3	-3	0	-5	3	-25	-3	0	-1	0	0
150			-10	-10	-5	-1	-3	0	0	5	-3	1	-15	-6	18	8
135			-5	-3	-1	1	-5	0	0	0	4	-1	-25	-10	-1	-1
120			-11	-6	3	2	3	0	-1	0	10	0	-20	-5	0	0
105			-32	-14	10	0	9	1	-7	4	0	-1	-8	-4	-1	0
90			-10	-6	8	2	11	4	-2	1	0	0	0	-1	-9	-5
75			-15	-10	10	4	20	3	4	3	-5	-3	6	1	-12	-5
60			-30	-10	15	6	25	7	15	5	-2	-1	6	0	-10	-5
45			-15	-7	10	5	15	8	11	7	-3	-1	11	-1	-16	-3
30			-8	-2	0	0	2	3	-4	3	-6	-1	15	0	-8	0
15			-8	-1	-8	-2	-7	-1	-7	-1	-14	-6	11	3	-3	-1

Palomino Project — BVL-EM Data Percent Tilt

		200N		400N		900N		1000N		1100N		1200N		1300N		1500N	
		7111	1777	7111	1777	7111	1777	7111	1777	7111	1777	7111	1777	7111	1777	7111	1777
Base	**0**	2	-2	-5	-1	-6	-3	-11	-2	-11	0	-10	-3	10	3	0	0
	15	3	0	-13	-5	-6	-1	-12	-4	-6	0	-14	-4	-3	1	3	0
	30	-2	-1	-18	-10	-5	-1	-1	-3	-3	0	-5	-5	-9	0	2	0
	45	5	3	-22	-15	-10	0	3	1	2	0	-3	-3	-15	-3	3	2
	60	5	1	-25	-10	0	0	1	2	8	1	-6	-1	-5	0	0	0
	75	11	3	-28	-11	0	0	7	2	3	1	-14	-5	3	-1	-3	-1
	90	25	6	-32	-12	0	0	8	0	10	5	-15	-5	6	-1	-3	-4
	105	11	5	-16	-4	11	0	10	4	-2	-1	-15	-5	10	0	0	0
	120	25	8	-25	-10	4	1	10	-1	4	1	-25	-10	8	-3	-5	-4
	135	15	0	-26	-11	0	5	5	1	-5	0	-14	-4	1	-1	-5	-2
	150	12	2	-8	-5	3	0	2	1	-12	-5	-5	-3	10	-1	5	0
	165	6	0	-25	-13	0	0	2	0	-10	0	-10	-5	2	-1	5	-1
	180	6	-2	-10	-5	-5	4	-1	-2	-3	5	-15	-10	-1	0	1	-3
	195	-3	2	-15	-6	0	0	0	-1	-6	0	-5	-1	2	0	0	-1
	210	-5	-3	-8	-2	2	3	3	1	-5	-2	-3	-1	9	-2	-6	-1
Meters	**225**	-5	-2	-10	-3	5	0	0	3	5	5	-4	0	15	0	-12	-2
East	**240**	-6	-3	-7	-3	5	0	0	0	5	5	0	1	20	5	-11	-5
	255	-5	-4	-16	-10	8	3	-2	3	-5	-1	-1	-3	25	8	-10	-6
	270	0	-2	-13	-6	0	0	0	-2	-1	-5	-1	0	20	6	-8	-4
	285	5	-2	-25	-7	-10	-2	0	1	1	0	0	-1	24	4	-8	-4
	300	2	-2	-4	-3	-10	0	3	0	-2	-1	-1	-1	23	10	-10	-6
	315	0	-4	-8	-2	-5	-2	-1	1	8	3	-10	0	14	3	-10	-5
	330	-5	-5	-1	0	-6	-3	-1	0	8	4	-13	-3	6	1	-10	-4
	345	1	-3	-10	-6	-1	0	-3	0	-1	-1	-10	0	4	2	-18	-8
	360	3	-2	-4	-1	0	2	3	0	-3	3	-10	-1	9	3	-20	-8
	375	-1	-1	-9	-1	5	1	3	3	7	4	-5	0	20	2	-25	-8
	390	-10	-9	-9	-2	8	1	5	4	7	-1	-10	0	13	1	-30	-5
	405	-6	-5	-1	-1	9	0	10	4	5	1	-15	-6	12	-2	-20	-3
	420	0	0	0	0	8	3	11	3	-1	-1	-20	-4	9	0	-30	-6
	435					8	3	4	2	-1	0	-8	-5	4	-1	-15	-3
	450					-3	0	-2	-2	-5	-1	-3	0	0	0	-10	-1
	465					-9	0	-3	-3	-5	-3	-16	-6	-6	-4	-1	0
	480					-10	-3	-6	-3	-2	-1	-14	-6	-8	-2	2	3
	495					-3	1	-5	-2	-10	-5	-10	-3	-4	-4	10	4

Sharpe MF-1 Vertical Magnetic Field Survey



MAP #1

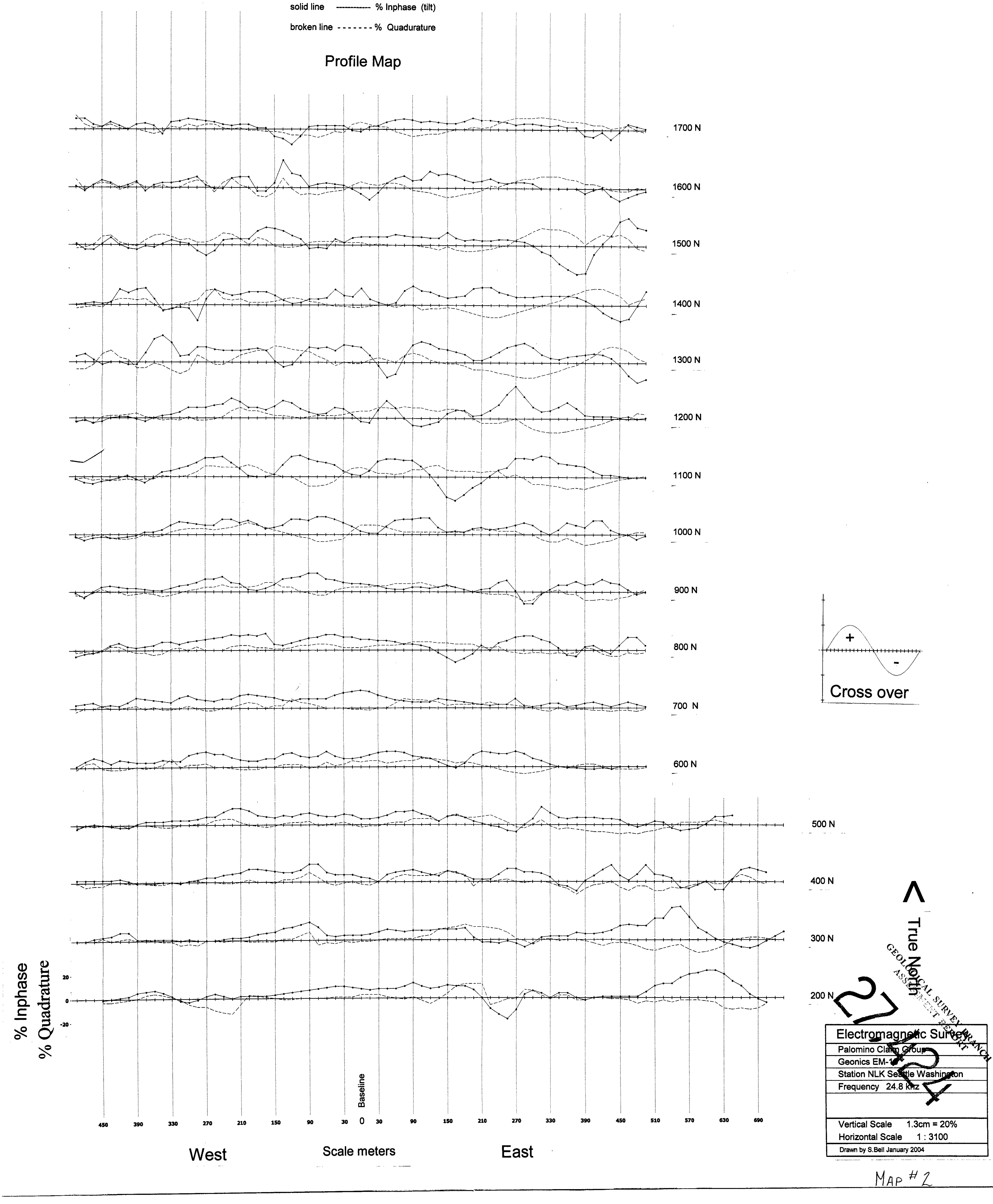
EM-16 VLF-EM Tilt Angle Survey

NLK Seattle Washington 24.8 khz

solid line ———— % Inphase (tilt)

broken line - - - - - - - % Quadurature

Profile Map



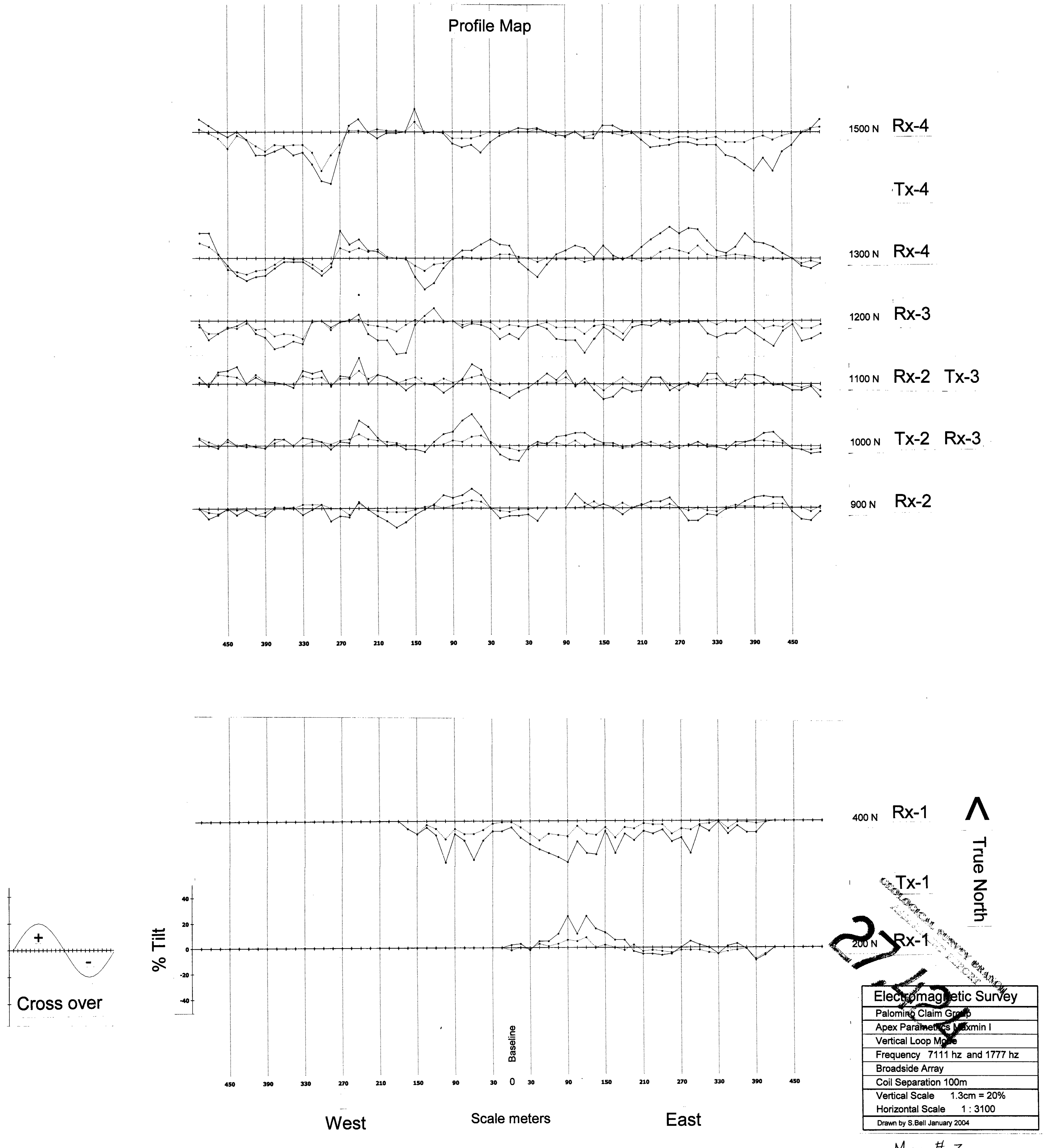
Maxmin I Vertical Loop Tilt Angle Survey

Broadside Tandem Array

7111 hz solid line ---------- % tilt

1777 hz broken line - - - - - - % tilt

Tx --- Rx separation 100 meters



MAP # 3

Geophysical Compilation and Claim Location

Palomino Claim Group

Plan View