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LEAMAN GEOPHYSICS

Survey Review, Specification, Reduction, Interpretation
Gravity, Magnetic and Seismic Methods
Structure and Prospect Evaluation

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PROGRESS REPORT
INTERPRETATION OF GRAVITY AND MAGNETIC DATA
EL 1/88 CENTRAL TASMANIA
CONGA OIL
by
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Mines Department

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SUMMARY

This report outlines initial work undertaken as part of the interpretation of gravity and magnetic data acquired by Conga Oil within its tenements in Tasmania since 1988.

This data has been available since 1989 but the interpretation has only recently been authorised. Time and budgetary constraints have restricted the nature and goals of the interpretation. The style of interpretation and form of results must reflect an array of compromises.

This progress report describes the nature of those results and compromises and some indication of concealed structural conditions in central Tasmania.

The work is incomplete and must not be used as a basis for drilling or structural targetting at this stage.

Geochemical research by Conga Oil has suggested that Ordovician rocks are important elements in the hydrocarbon prospectivity of the Tasmania province. Seepage studies have shown occurrences to be common and to occur in formations and areas which would not be expected to bear, or conceal, Ordovician rocks. Pre Carboniferous structure is clearly important.

This preliminary work suggests that pre Devonian rocks are folded and multiply overthrust and the structural slabs include all formations younger than Late Precambrian. Many pieces of Cambrian and Ordovician sequences have been preserved beneath the Upper Carboniferous unconformity.

One of these fragments underlies the central Derwent valley.

This report outlines the interpretive sequence and early results leading to these conclusions and more detailed work in the Derwent Valley.

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INTRODUCTION

EL 1/88 covers most of the eastern half of Tasmania and is held by Conga Oil Pty Ltd for hydrocarbon exploration.

The last detailed analysis of any part of this area was reported in the Annual Report for 1988 in respect of the area south of Hobart, known as the D'Entrecasteaux region. This work was undertaken prior to the claiming of Central Tasmania and the subsequent consolidation of areas held.

The enlarged area was covered by an aeromagnetic survey and the state gravity data base was infilled in many areas.

This data was to have been interpreted to a status equivalent to the trail blazing D'Entrecasteaux work and then used to focus seismic or other targetting techniques. Detailed evaluation of D'Entrecasteaux type is necessary across the entire area if realistic and sensible relinquishment and targetting decisions are to be made. Budgeting and management decisions have not been made. Finally, in late 1990, the interpretation was authorised with a limited budget.

This delayed start, a large area, and difficult geology has meant that it is unlikely that a detailed interpretation of the entire tenement will be obtained prior to some relinquishment or drilling. Some compromises have been required; some of which may risk the reliability of the whole.

This progress report describes

- 1 - elements of regional analysis designed to verify crustal scale issues and their effect on the data and to define the general distribution of pre Permian rocks.
- 2 - more advanced evaluation of one interesting area as requested; the central Derwent Valley.

The report is intended only as a progress statement. It is not final and should not be used or referred to as such. Many critical issues remain to be resolved or clarified.

DATA USED

Gravity and magnetic data are available.

The aeromagnetic survey of the D'Entrecasteaux region has been previously described. Its large augment across central Tasmania forms the basis of much of the present interpretation.

This survey was flown by Austirex International in March 1989 at a barometric elevation of 1600 m. Flight lines were specified at 5 km intervals with 25 km tie lines and a sampling of 20 m.

The survey revealed a number of marked trends, some of which can be directly correlated with ultramafics - as at Beaconsfield. Many large spikes have also been observed; few of these can be correlated with surface topography, with or without dolerite. Most anomalies are sourced beneath the Permo-Triassic cover.

The gravity compilation is based on the Department of Mines and Mineral Resources Tasmanian data base. This was infilled in parts of eastern, central and northern Tasmania to provide larger blocks of data with station spacings of 1 to 2.5 km. The infilling survey was undertaken by the Mines Department Geophysics Division to a budget and nominal coverage specified by Conga Oil. There remains much scope for further acquisition.

All observations have been reduced compatibly with the data base at a density of 2.67 gm/cc and terrain corrected to a radius of 22 km. Precision of reductions is controlled by the accuracy of barometric elevation determinations (about 0.4 mGal in Bouguer anomaly).

The Bouguer anomalies have been processed using the crustal model known as Mantle88 (Leaman & Richardson, 1989) to yield residual anomalies. The reliability of this process is not known in central Tasmania since the concept was developed in western and northern Tasmania and extrapolated elsewhere pending availability of data and modelling.

The residual anomalies are dominated by large positive effects near the Derwent Valley, the strong negative effects which extend from Scottsdale to Port Arthur and marked gradients and steps from near neutral values north and east of the Great Western Tiers with positive values southwest of Poatina.

Density values used for all modelling have been based on experience and the Tasmanian rock property data base held by the Department of Mines.

INTERPRETATION

AIMS

Several objectives were set for the initial and subsequent study. A comprehensive programme was defined.

This included evaluation of the residual separation process and reliability in Central Tasmania and use of upgraded residual values. This would necessitate long line modelling involving the continental margin and all batholiths.

Development of the regional implications of the long line modelling for use as guides to deep structure and distribution of rock units.

The preliminary guides should define relatively small areas in which a prospective combination of structures and rock types is present. Any such evaluation to be supported by compilation of seep sightings.

The target areas were then to be evaluated in some detail in order to generate more specific targets or sites for stratigraphic or control drilling. This detailed work must include appraisal of detailed structuring and thickness of the Permo-Triassic cover - including dolerite intrusions.

This relatively relaxed programme has not been possible due to budgeting and management delays and a number of compromises and overlaps have been made in order to assemble a reasonable view in the shortest time.

Some of the risks inherent in this process have not been assessed as yet but further stages, time permitting, may resolve many of the ambiguities and increase confidence.

METHODS

Two dimensional profile methods have been used to date. These are efficient and rapidly lead to a general guide for structures and lithological distributions.

All work has been controlled and defined in terms of the 250 000 scale geological map sheets of Tasmania. Nothing better exists for much of the area studied and it will not be possible to generate a detailed outline comparable to the D'Entrecasteaux Project without some mapping review. This need must be satisfied for any areas requiring detailed study for site targetting or refined evaluation where 1:50000 mapping does not exist. This deficiency has not caused problems for the guide modelling.

Both data sets have been treated comparably until consistent models, or model options, have been derived. This work cannot yet be considered exhaustive and the solutions are far from unique in most cases. Samples of each profile position are reproduced in this report; none are in final state.

The Figures provide a snapshot view of the current status of the interpretation.

It will be noted that various profiles are reproduced which show gross crustal effects, effects of major crustal blocks and sometimes details of dolerite structure. These threads of interpretation have been necessary to maintain confidence in the residual fields being used and to satisfy the array of objectives.

DISCUSSION

REGIONAL STUDY

This report outlines the first two stages of interpretation - each undertaken as a compromise treating all aspects of the objectives.

The regional study considers the entire area and the primary issues of the reliability and any limitations in the the data sets as well as development of a gross structural guide.

This primary work has identified a small group of areas in which more detailed analysis is justified. One of these, the central Derwent Valley, was nominated for immediate review and current progress on this evaluation is included below.

REGIONAL STUDY

The Figures provided suggest the nature of structuring in eastern Tasmania and brief comments have been provided for each diagram.

Note that all Figures are provisional.

The location of all profiles is marked in the Map (folder).

Figure 1² reviews the regional and crustal construction of southern Tasmania. The model suggests that only minor revision of the Mantle88 concept is required and this does not affect preliminary work. (It should be corrected for detailed studies, however). The shift parameters and crustal depth scale are consistent with those required in northwest Tasmania. Granites are dominant in southwest and eastern Tasmania.

Figures 3, 4 and 5 treat profile 2. Figure 3 provides a crustal guide which is consistent with Figure 1 (above). Model fit deficiencies near the coast are not relevant to the present work and reflect poor discrimination across the continental shelf and margin due to poor bathymetric control.

Figure 4 provides a subsample of Figure 3 in residual format. This suggests that the midlands of Tasmania is underlain by dense units up to 5 km thick containing structured slabs with steeper dips and greater density contrasts. The structures repeat.

Magnetic data (Figure 5) indicate that parts of the dense slab is magnetic - and presumably contains Cambrian volcanics - and that these parts lie between the very dense steeply dipping (relative term - note vertical exaggeration in models) units. The dense units (positive gravity anomalies) do not correlate with magnetic anomalies and hence the source of these features is neither mafic, ultramafic and almost certainly not igneous in origin.

The properties are consistent with thick dolomites. Such units are known in parts of the Late Precambrian.

The models would imply that these formations are structurally repeated in a manner not consistent with folding. Thrust faulting is suggested.

Figures 6, 7 and 8 examine profile 3. The more localised gravity and magnetic models support conclusions based on profile 2. But along this profile the structure is asymmetric. A significant mafic source - probably ultramafics - is inferred along the eastern margin of the westernmost slab. A thrust rider?

The reduced gravity anomaly to the west of Tarraleah can be interpreted in two ways; either a granite at shallow depth or a synclorium involving Ordovician and Silurian rocks. Review of anomaly distribution and correlation to outcrop further west indicates the latter. See other sections.

The origin of magnetic spikes in this region is dealt with below; all large spikes reflect ultramafics, only medium spikes may reflect dolerite effects or feeders. The large spikes at 75 and 100 km correlate with marked gravity boundaries and implied structures.

The repeated structuring incorporates ultramafics on a general basis.

Figures 9, 10 and 11 present a view of profile 4.

The detailed gravity and magnetic models reveal matching structures dipping to the east at low angle and which contain ultramafics. One block includes volcanics.

Figures 12 and 13 review profile 5. The gravity profiles are complicated by the effects of Tertiary basins but the magnetics demonstrates the presence of several deep seated mafic junctions. These either mark the edge of the structural controls upon Tertiary developments or delimit the primary blocks. The Tiers Fault is thus indicated with much older precursors than Jurassic feeder occupation. See Map for position.

Figures 14, 15 and 16 examine profile 7.

This profile is transverse to all others and presents a test and check view. The crustal model is directly linked to the region of good control in northwest Tasmania. The more detailed profiles stress the nature of the sub east-west junction across central Tasmania near Great Lake (see Map). The magnetic and gravity data can only be interpreted consistently in terms of contrasting crustal or structural blocks; one with and one without a thick pile of dolomitic Precambrian formations. The boundary includes ultramafics which wrap into the structure at depth. The magnetic model crudely suggests this.

Figure 17 details profile 8. Magnetic data offer support for the boundaries but the model is capable of two interpretations within the zone east of Miena. The dense units could continue beneath some light cover or the more siliceous basement blocks could be infaulted as shown. Light cover here may be taken to mean Ordovician-Silurian formations.

This type of factor is demonstrated in Figure 18 for profile 21. A concealed syncline of Ordovician and Silurian rocks may be inferred to account for the depression in anomaly at 40 km. It is difficult to account for this character in any other manner. (See also some Derwent sections).

Figure 19 suggests relationships between Great Lake and eastern Tasmania. There is limited discrimination between Mathinna Beds and the general sequence of Lower Palaeozoic or Precambrian rocks. It should be noted that the general density used for all formations beneath the Permian cover is consistent with much of the Cambrian and Precambrian succession. Magnetic data define the structures and junctions since many of these contain ultramafic slices.

Figure 20 supports many of these comments while drawing attention to the character prevalent further south and west of Great Lake. A magnetically bounded slab of structurally discordant material may be defined. The model also examines the effect of a large dolerite feeder at this scale and shows it to be of little consequence. The anomalies defined are sourced by large geological blocks.

Many of these elements of the structure have been condensed in map form (pocket). The map attempts to convey the most likely distribution of materials beneath the Permian cover within the terms of this gross treatment. As such it can only suggest thick elements.

The primary work has shown that no major modifications to the residual separation process are required across central Tasmania although some changes are needed and must be enacted prior to any final or very detailed evaluations.

It has also been established that ultramafics are common but are located at block edges. Cambrian volcanics are also present but are not general and are restricted to particular slabs or structurally controlled belts. The largest areas of these materials extend SSE from Poatina, near north Great Lake and in the lower midlands near Bagdad and Broadmarsh.

The general style of structuring deduced from the present work has been summarised in Figure 21.

This suggests the structural pattern which appears to extend from the Devonian batholiths of eastern Tasmania to the region of Maydena and Adamsfield.

Repeated slices are implied, some containing Cambrian volcanics and younger Palaeozoic rocks (the target materials for hydrocarbons), but most involving the late Precambrian dolomites. The basal structural runner would appear to be within these formations. Strips of them have been peeled upward, pushed westward and folded. Some of the structuring may well have been Cambrian in age and the whole pattern re-arranged during Devonian orogeny. This re-arrangement has been facilitated by the ultramafic slices.

The general westward push of the structural compression has produced a thickening of the sequence west of the Derwent River and this accounts for the extreme gravity anomalies. Lateral limits to the structures, perhaps ramps, exist and bisect the structures with a NE-SW and E-W pattern; the largest traversing the region near Miena.

Major deep structures of this type, actively rejuvenated during the Tertiary period, explains the widespread distribution of Tertiary basalts in the western plateau region.

Although this preliminary work lacks some discrimination it does allow, in association with known exposed geology and

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seep sightings definition of areas worthy of further attention. These include

- the Cygnet / Huonville region (project D'Entrecasteaux)
- the Southport region (project D'Entrecasteaux)
- the Frankford / Launcestone region
- the region south of Mole Creek
- the region southwest of Poatina toward Miena
- the region south of Richmond / Clifton
- the region between Tarraleah / Gretna

All demonstrably involve Ordovician and/or Silurian rocks. No rating can be inferred at this stage.

THE DERWENT STUDY

The following notes represent comments on unfinished analysis of the Tarraleah / Gretna region and its relationship with the exposed formations of the Florentine Valley west of Maydena.

The Figures are in raw state and simply reflect current thinking and model status. Many refinements are possible. Only primary issues and ideas which integrate the data sets have been considered to date.

All profile positions are shown on the map (folder).

Figures 22 and 23 consider line A.

These provide a consistent view in which large slabs of dense formations have been translated. Mafic and ultramafic materials define many of the surfaces. This is a universal observation but it is not yet established how many of these surfaces represent faults or thrusts. Some junctions may be stratigraphic in that the ultramafics are in correct place in time terms. This type includes the slice of material which underlies, and has been folded with the Ordovician rocks beneath Tarraleah, and perhaps the slices at 15 and 80 km. It is not the case with the slice beneath the slab at 55 km. That implies thrusting unambiguously. These relationships recur in most profiles and more detailed work is required to establish all relationships.

The gravity profile stresses the effect of the presence of Ordovician and Silurian rocks. The negative response cannot be generated by post Carboniferous rocks and no such relationship exists even when Tertiary materials are present. This type of response is an initial guide to the presence of such materials. Such responses must then be tested.

Figures 24 and 25 review line B.

The pattern of line A is repeated; mafic rocks define many boundaries. At least two of them imply thrust slices. The modest depression in the gravity field at 60 km has been taken to suggest Ordovician-Silurian rocks and to be a muted form of the outcrop response near 25 km. The reduced Bouguer anomaly to the east may imply similar presence but the overall regional pattern indicates thinning Precambrian only.

This effect is emphasized in Figures 26 and 27 for line C. Anomalies generated in the post Carboniferous cover are not significant but will be important to specific targetting and well prognoses. Note that the magnetic slices match the edges of the dense slab; the vertical scale distorts the correlation between the figures.

Figure 27 stresses the inconsequential character of dolerite-based sources.

Figure 28 (line D) indicates the nature of extreme and localised dolerite effects. A very large feeder is implied. The nature of the anomaly is not consistent with any source generated beneath the cover unless it extends into the cover and to surface. The magnetic response is low key compared to the smaller and deeper Cambrian mafic sources.

Figure 29 stresses this association while also showing that ultramafics have been folded into the structure as a quasi stratigraphic mass in the same way as occurs in the Huskisson Syncline northwest of Rosebery in western Tasmania.

The relationships inferred in lines A to D are wholly consistent in structural and stratigraphic style with those defined in western Tasmania and there is no reason to propose any different evolution for parts of Tasmania.

Figures 30 and 31 examine line E. The magnetic models are well developed and consistent with other lines. The gravity model overstates mass west of 20 km and understates it near 60 km. It does show that no dolerite source, even if a large feeder, can generate the anomalies observed. A major slice of dense rock is implied.

The gravimetric response of the exposed Gordon Group is not significant on this line indicating a relatively small volume.

The difference in volume and depth extent of Ordovician rocks is shown in Figures 32 and 33 (line G) where the scale of the fold is confirmed by the enclosed ultramafics. The more limited nature of the dense slab to the east is also clearly defined. It is possible that more Gordon Group is present at the eastern end of the profile although the effect may be part of the strong east west gradient which defines the major change in composition about the northing of Great Lake. Further evaluation is required.

No such controversy applies to Line H (Figures 34 and 35).

Figure 34 examines the bulk amount of Cambrian and Precambrian sequences implied but the effect of the exposed Ordovician and Silurian rocks, though obvious, has not been modelled.

The magnetic model demonstrates that even giant dolerite feeders do not generate the large spikes of the magnetic field. Such feeders do, however, appear to be intruded into older structures - some of which are marked by ultramafics.

Figures 36 and 37, line I, examine the gross patterns of the field which are sometimes observed. A strong asymmetry is apparent in the magnetics and may be explained by a wedge of

of Cambrian rocks within the western block. The spikes are inferred to reflect dolerite effects and mafic junctions within the basement rocks. The gravity profile stresses the risk of ambiguity in assuming that all low, in relative terms, anomaly values reflect Gordon Group. The model shows that this need not be the case; simply the absence of dense slabs. The anomaly on this line at 65 km, near the Derwent River, could be assigned to cover rocks of various types until inspection of the distribution of the anomalies shows that the patterns are not consistent with surface rocks. The anomaly on this line requires much more analysis since it might well reflect underlying interest.

Line J (Figures 38 and 39) is dominated by the presence of a thick slab of dolomitic Precambrian etched by dolerite feeders and perhaps mafic slices of Cambrian age. The western end of the profile is controlled by the presence of a large granite mass within south west Tasmania. Its roof is barely more than 1 km deep.

Similar character is evident on Line K (Figures 40 and 41). The dip in gravity anomaly at 55 km may indicate a thin skin of Gordon Group. The magnetic model needs refinement but indicates a large fold within the older rocks which involves both mafic volcanics and ultramafic defined boundaries.

Line L (Figures 42 and 43) stresses the relative contribution of structures and rock types. The regional thinning of the sequence to the east accounts for large trends while the granite to the west cancels the attraction of the thickened Precambrian structures. No Gordon Group is implied anywhere. The small gravity spike at 53 km may represent a dolerite feeder. The magnetic model examines the possibility of a thick Cambrian volcanic sequence in the Bagdad-Broadmarsh area.

Figure 44 presents the magnetic model for tie line Z. It reinforces conclusions based on other lines for the presence of mafic volcanics and junction ultramafics.

Many of the implications of these profiles have been compiled in the Map.

The regional and more detailed work has stressed that the covering rocks, including dolerite, are not especially significant geophysically. They produce useful responses which will need to be taken into account in any refined interpretation but are not sources of primary ambiguity in terms of gross evaluations.

Ordovician-Devonian rocks generate distinctive gravity anomalies within the Maydena-Derwent Valley region but are generally present as syncline remnants, sometimes of considerable volume. The upper surfaces are truncated by the Carboniferous erosion surface. The structures can often be defined in detail by the ultramafics which underlie them and which have been structurally emplaced, eroded, and then folded with the Gordon Group.

Inspection of many sections will show that the axes of many blocks are often well defined but that the edges are not. The existence of large Precambrian dolomitic slabs within thrust slices which reach to the Permian unconformity and represent exposed material during the Carboniferous offers a caution for any rushed exploration. It would be too easy to drill such a block. Its presence, and that of the unconformity seal, may be vital factors in preservation of hydrocarbons.

Present work has defined the scale of the Florentine structures west of Maydena and shown that little of similar scale has been preserved to the east with the exception of an extension of the Florentine structure to the NE and the possible presence of thinner sequences near the axis of the River Derwent.

The significance of these conclusions cannot be appraised until compared with implications for other areas defined by the regional study. Small, but encouraging, areas must then be reviewed in greater detail.

One comparison is already possible. There would appear to be a greater thickness of Gordon Group and associated rocks in the Maydena and Derwent areas than in the Huon-Cygnnet or Pictou-La Perouse areas examined as part of project D'Entrecasteaux. The significance of this observation can only be rated by comparison with seep evidence but it may be observed that parts of the Derwent region contain much greater thicknesses of Permo-Triassic cover; averaging 1.2 to 1.5 km compared to 0.8 to 1.2 km in the Huon region.

REFERENCES

- Leaman, D.E., and Richardson, R.G., 1989. Production of a Residual Gravity Field Map for Tasmania and some implications. Exploration Geophysics, 20, 181-184.

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Report submitted on behalf of
Leaman Geophysics
by

D. Leaman

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F. Aus. I.M.M., M.M.I.C.A

Feb 16, 1991

010

5 cm

EL 1/88

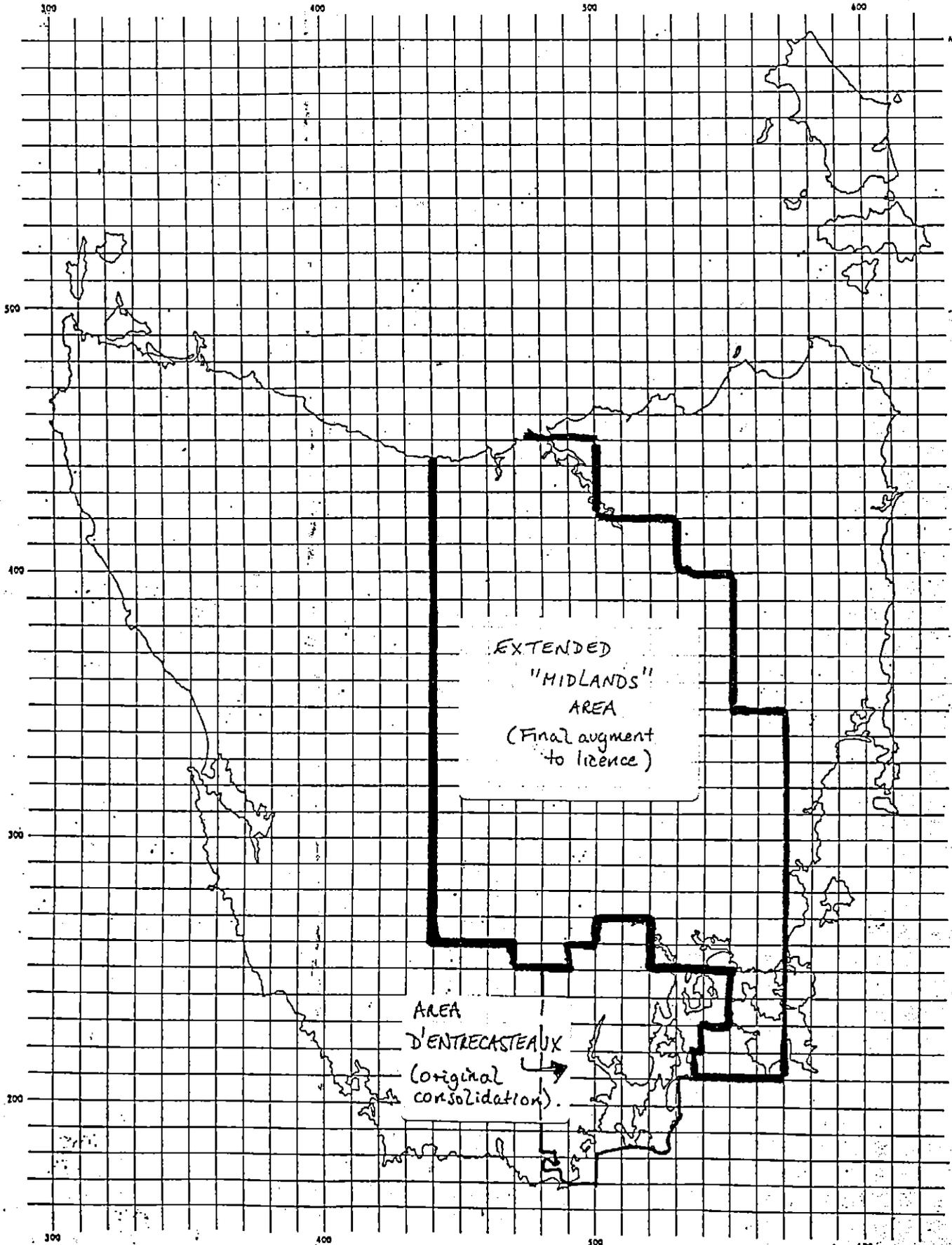
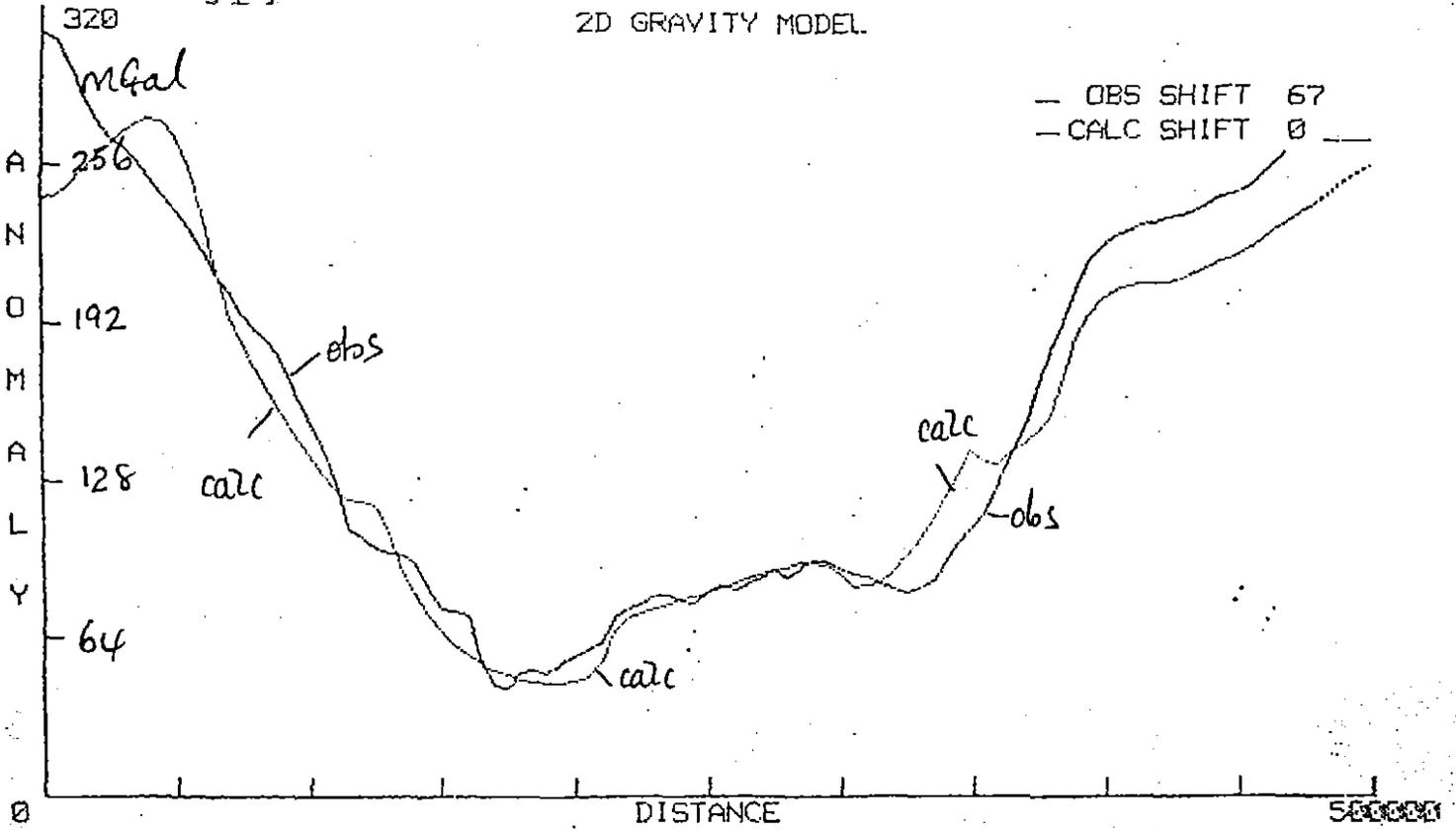


FIGURE 1

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2D GRAVITY MODEL



TASG1 PORT DAVEY - MARION BAY

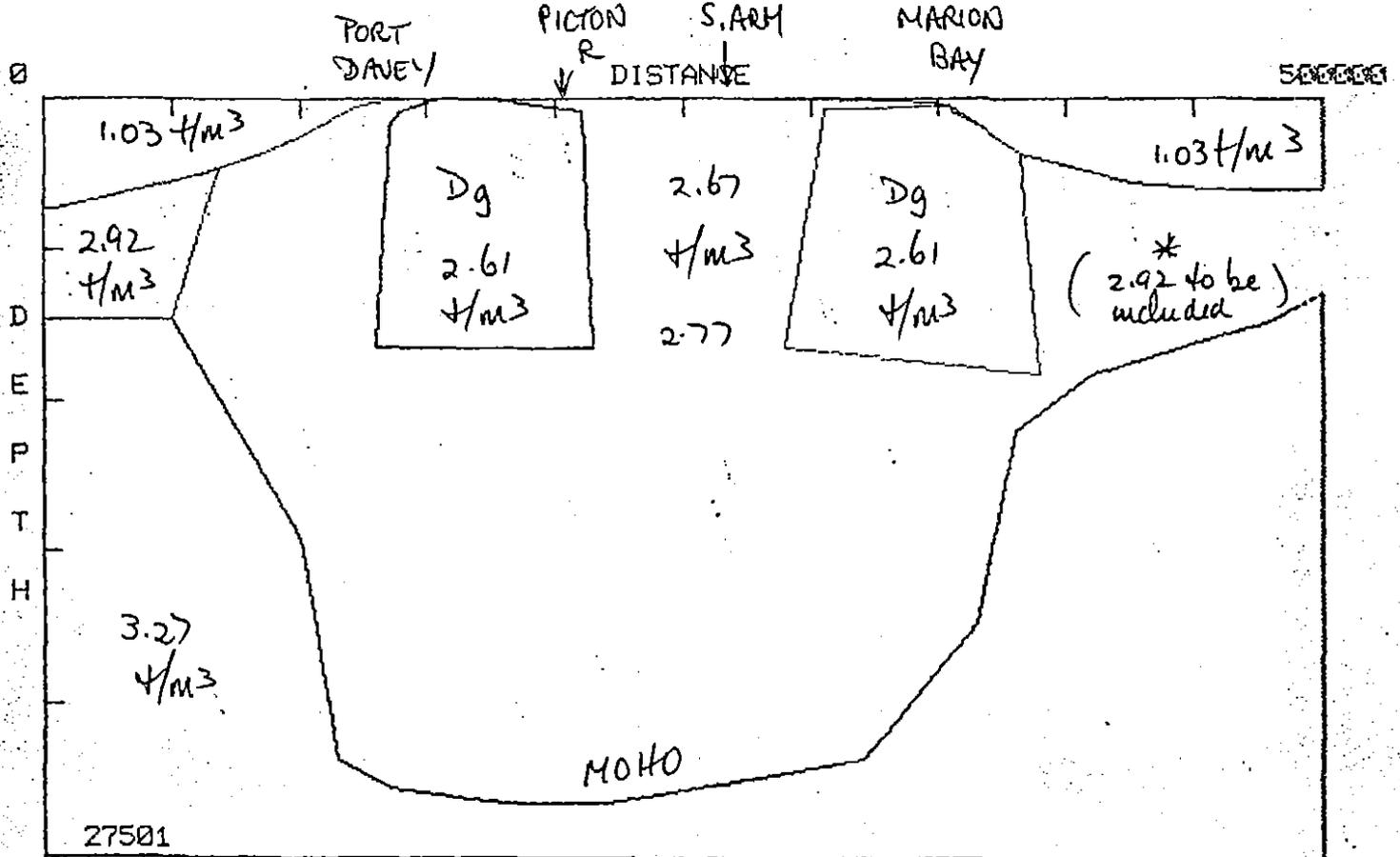
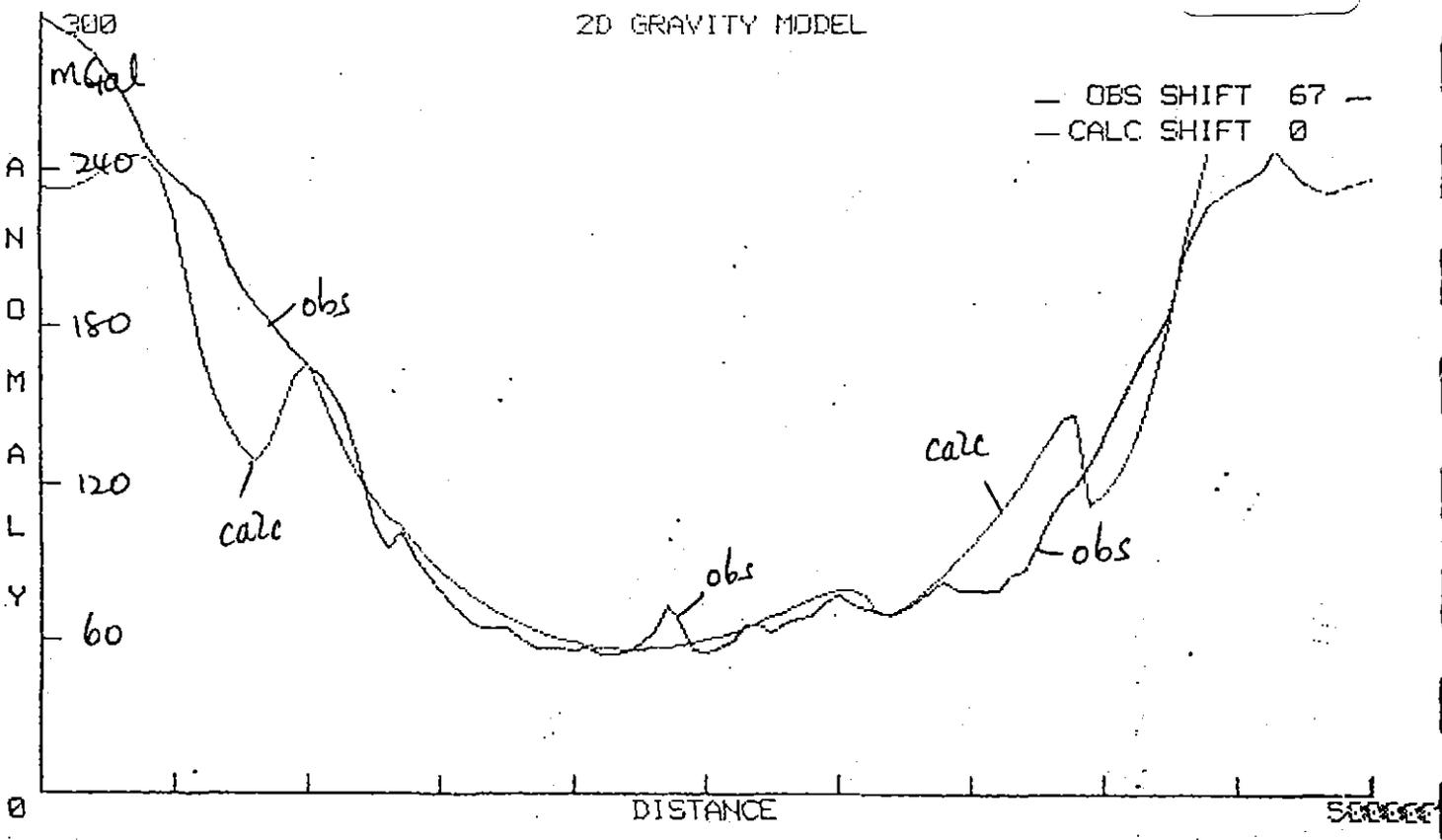


FIGURE 2

TASG2 ELLIOTT BAY - SCHOUTEN ISLAND

010
LINE PARAMETERS - ORIGIN, LIMIT, INCR : 0 500000 5000



TASG2 ELLIOTT BAY - SCHOUTEN ISLAND

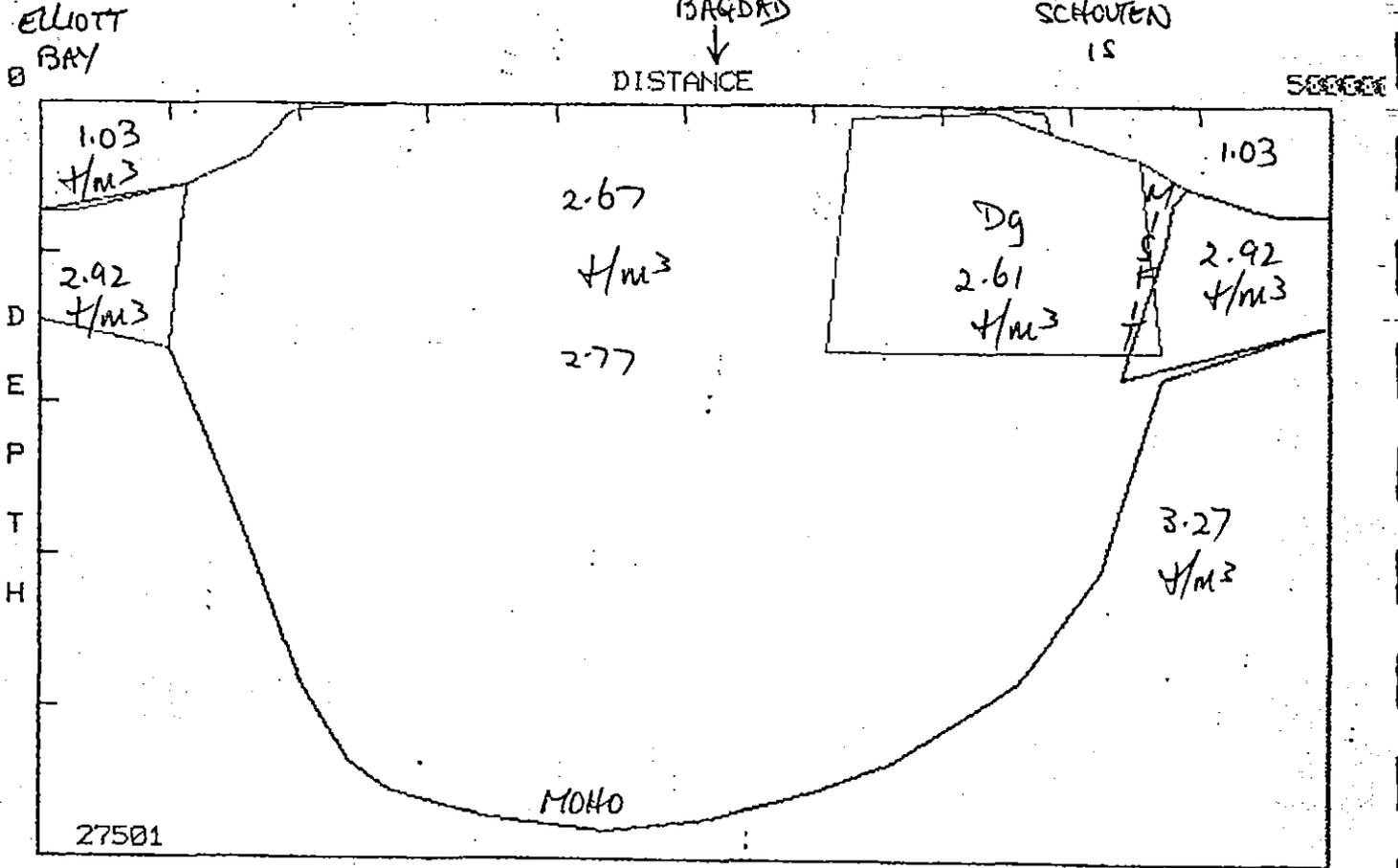
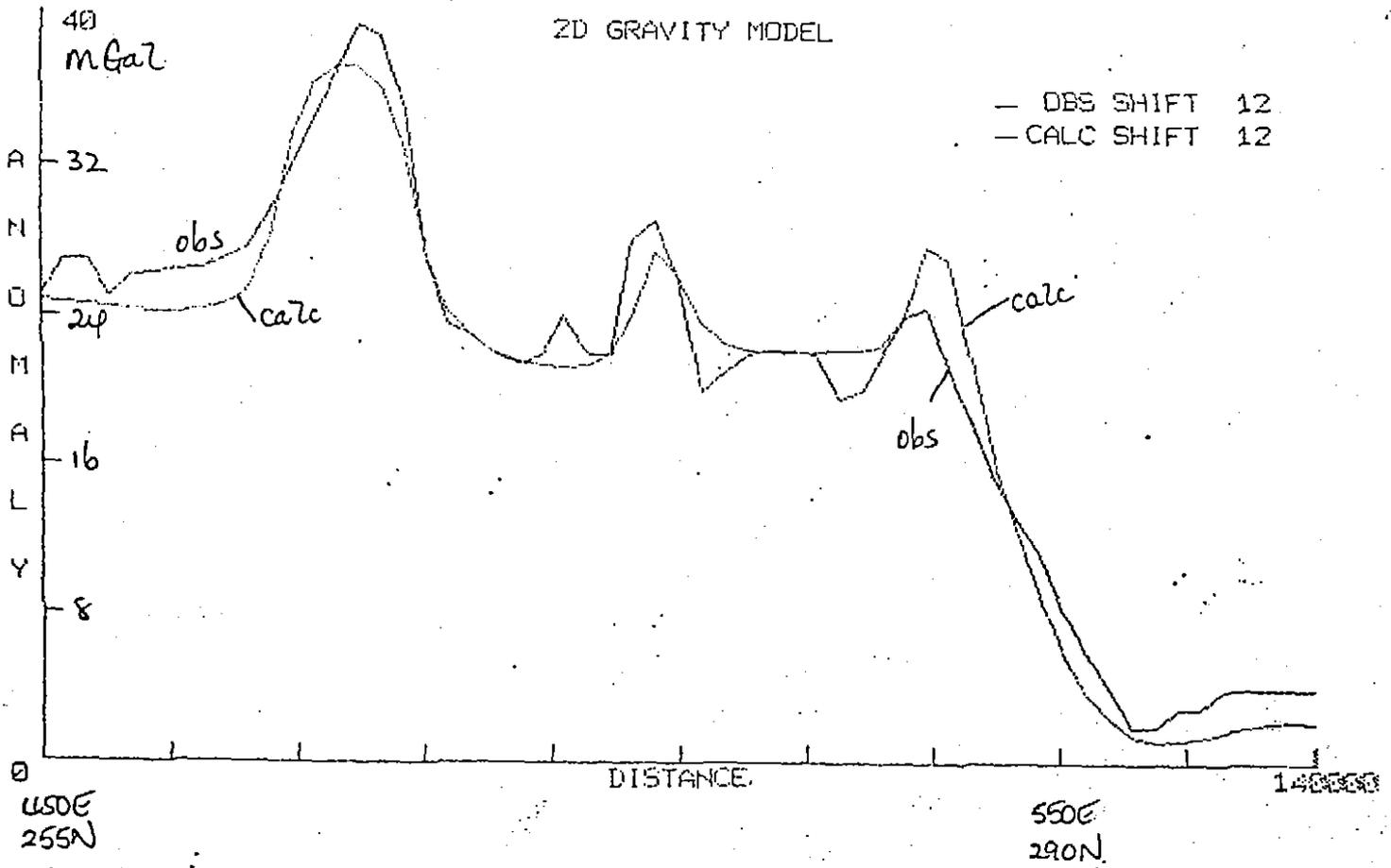
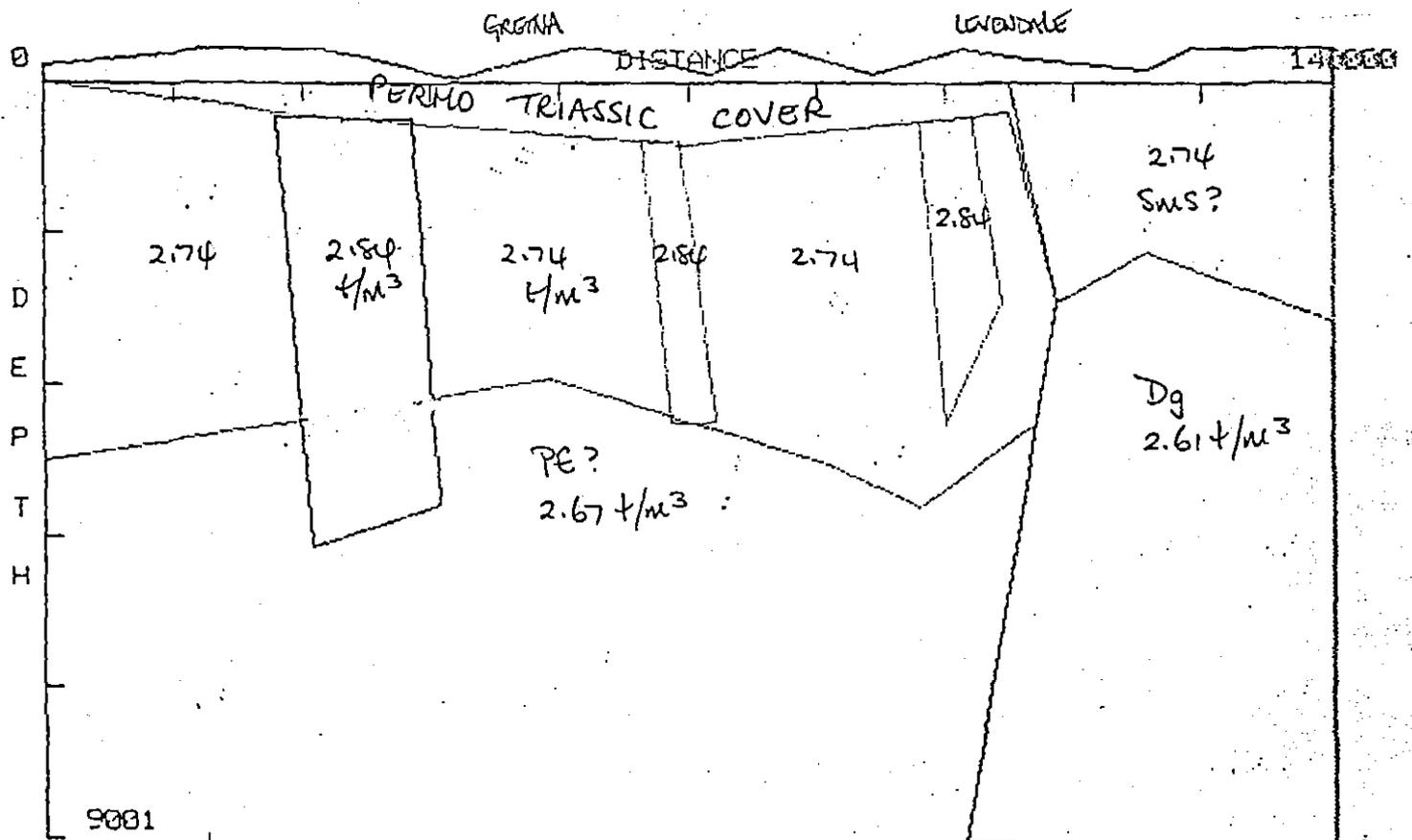


FIGURE 3

LINE PARAMETERS - ORIGIN, LIMIT, INCR : 0 140000 2500



TASRG2 LOWER MIDLANDS GREYHA-LEVENDALE



LEAMAN GEOPHYSICS
G.P.O. Box 320 D,
Hobart, Tasmania 7001

62000.0

-71.0

13.6

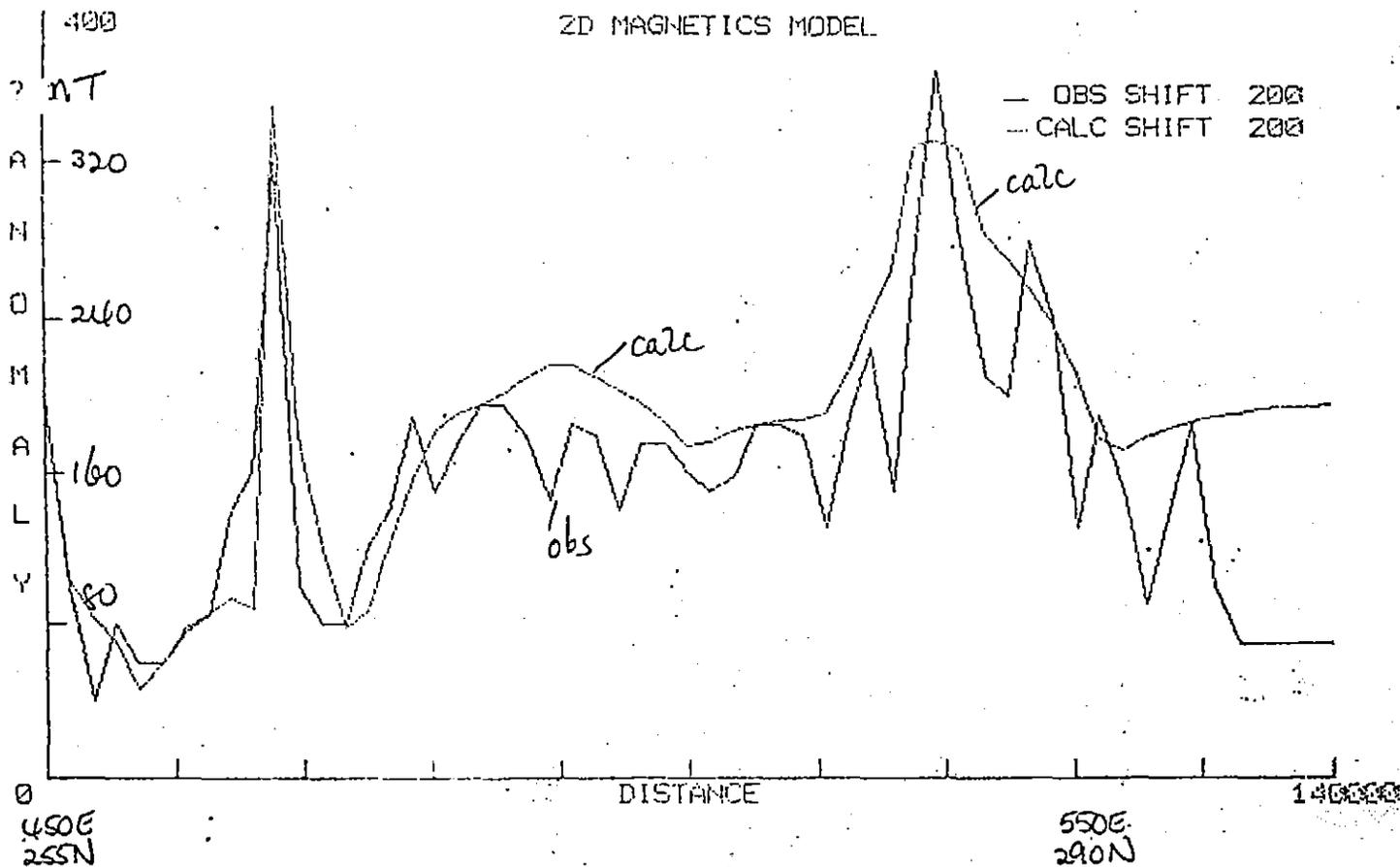
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391018

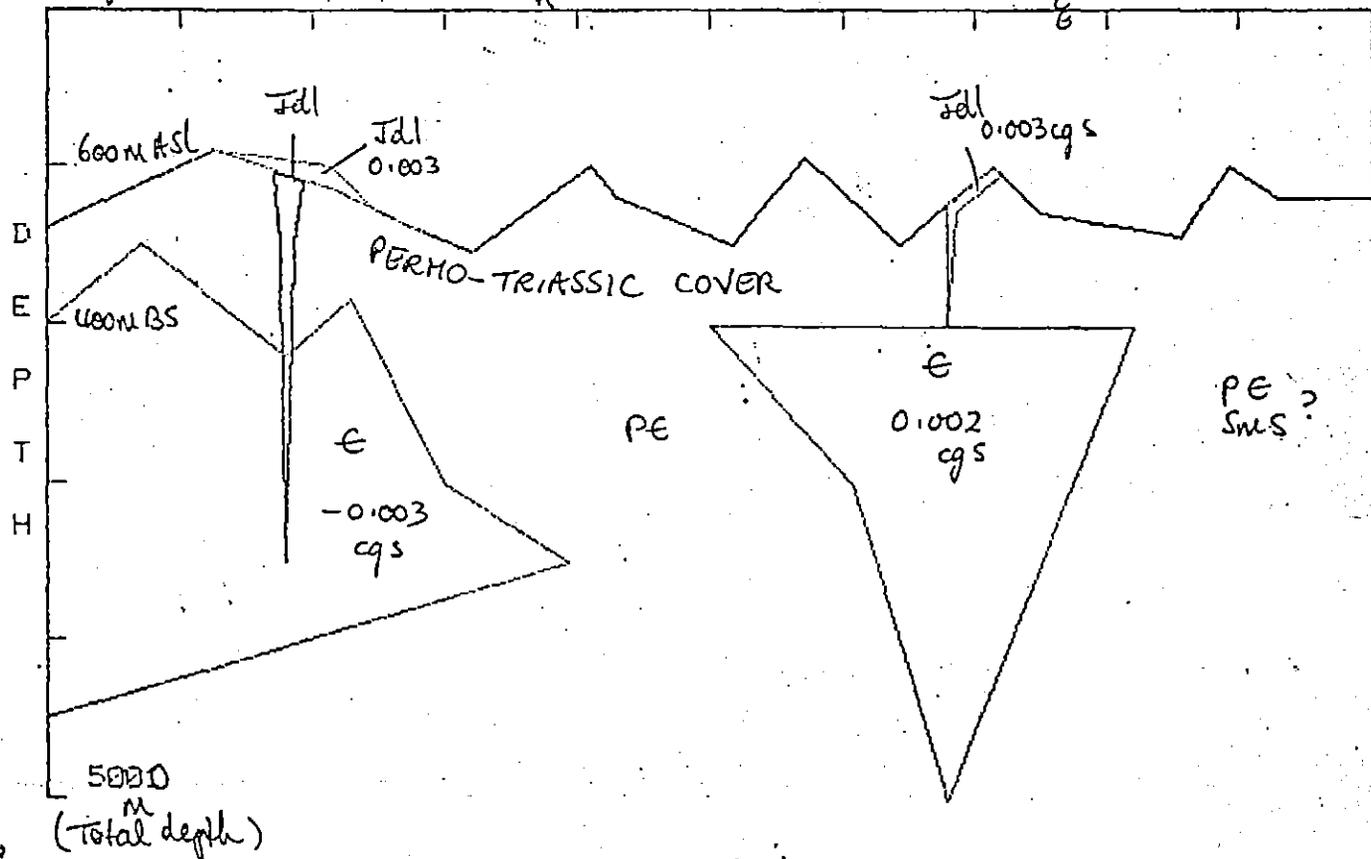
LINE PARAMETERS - ORIGIN, LIMIT, INCR : 0 140000 2500

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Hobart, Tasmania 7001



TASMANIA LOWER MIDLANDS GREYHILL-LEVERDALE

Height level 1600m ASL DISTANCE 140000

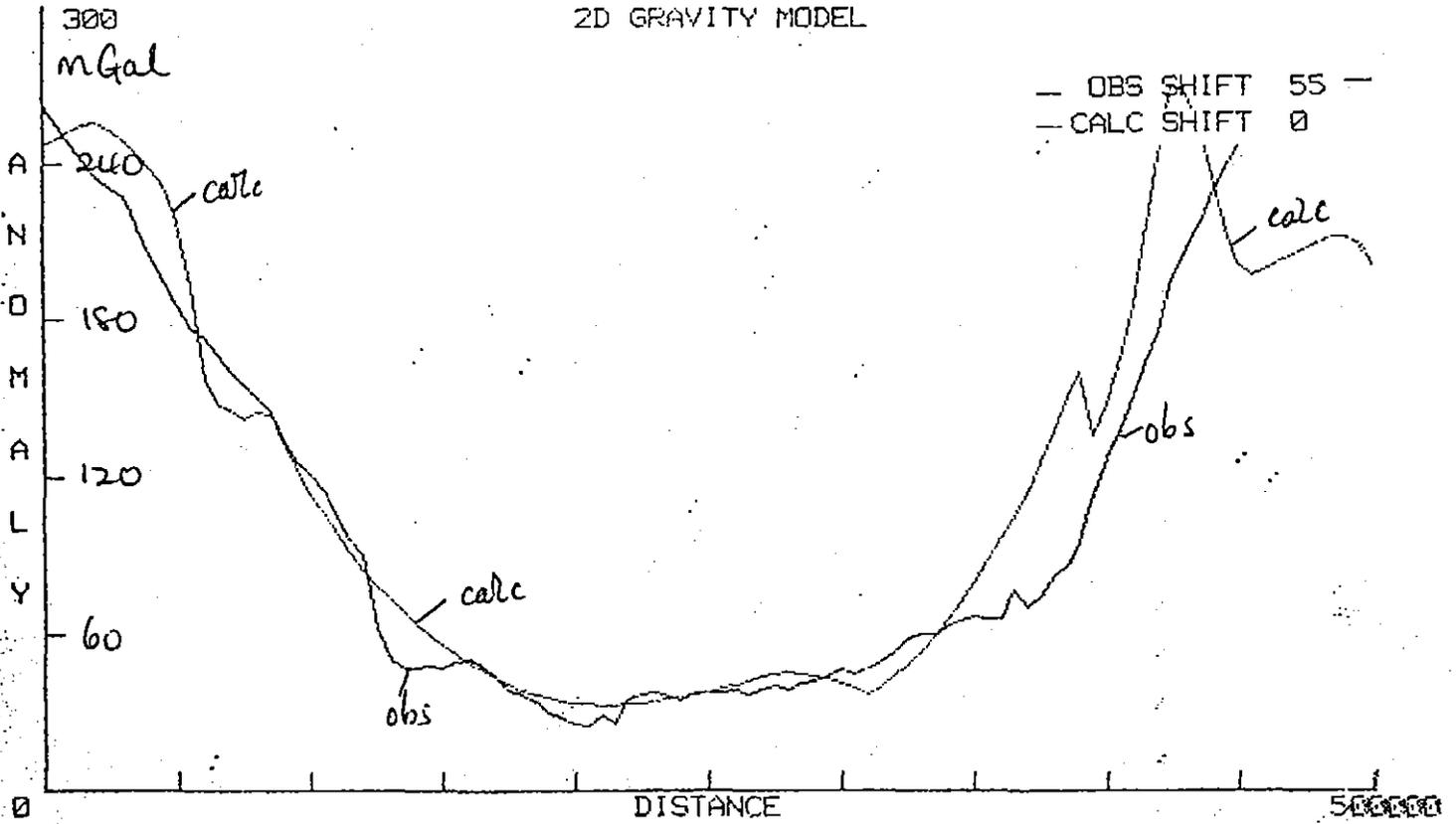


MAGNETIC MODEL LINE 2 (WITH DOLERITE EXAMPLES)

TASG3 POINT HIBBS - FRIENDLY BEACHES

391019

LINE PARAMETERS - ORIGIN, LIMIT, INCR : 0 500000 5000



TASG3 POINT HIBBS - FRIENDLY BEACHES

PT GORDON TARRALEAH TONBRIDGE FRIENDLY
HIBBS ↓ R ↓ DISTANCE ↓ BEACHES

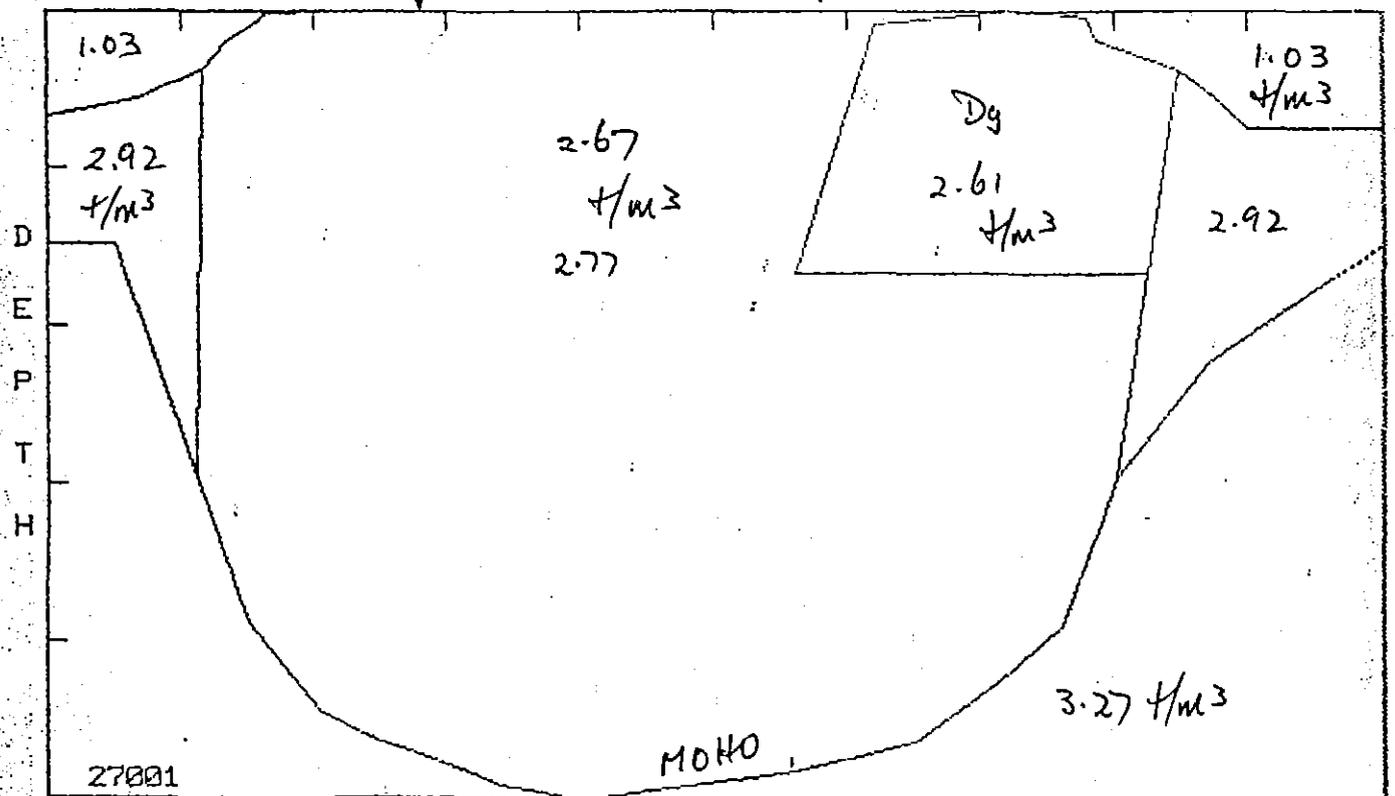
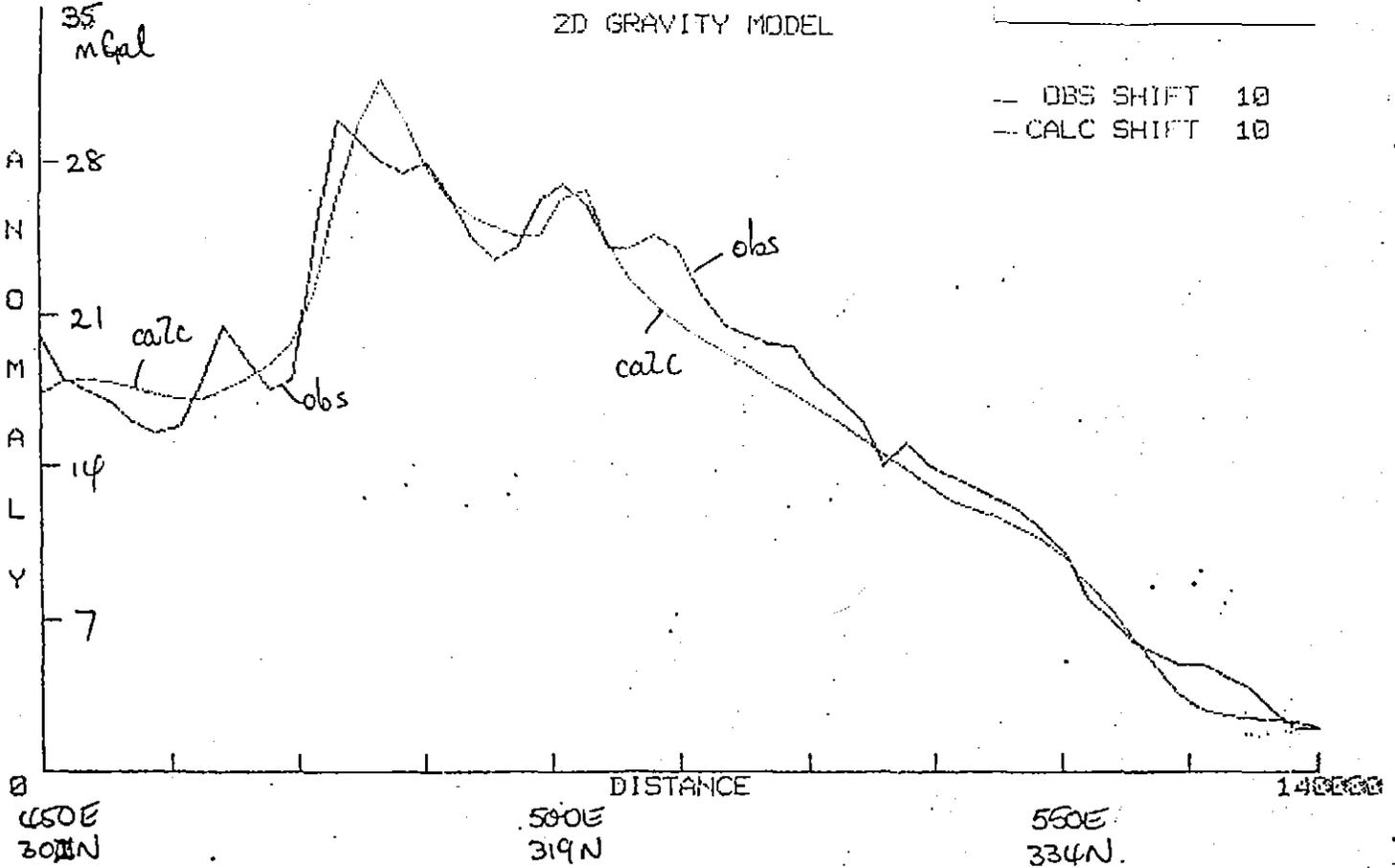


FIGURE L

LINE PARAMETERS - ORIGIN, LIMIT, INCR : 0 140000 2500

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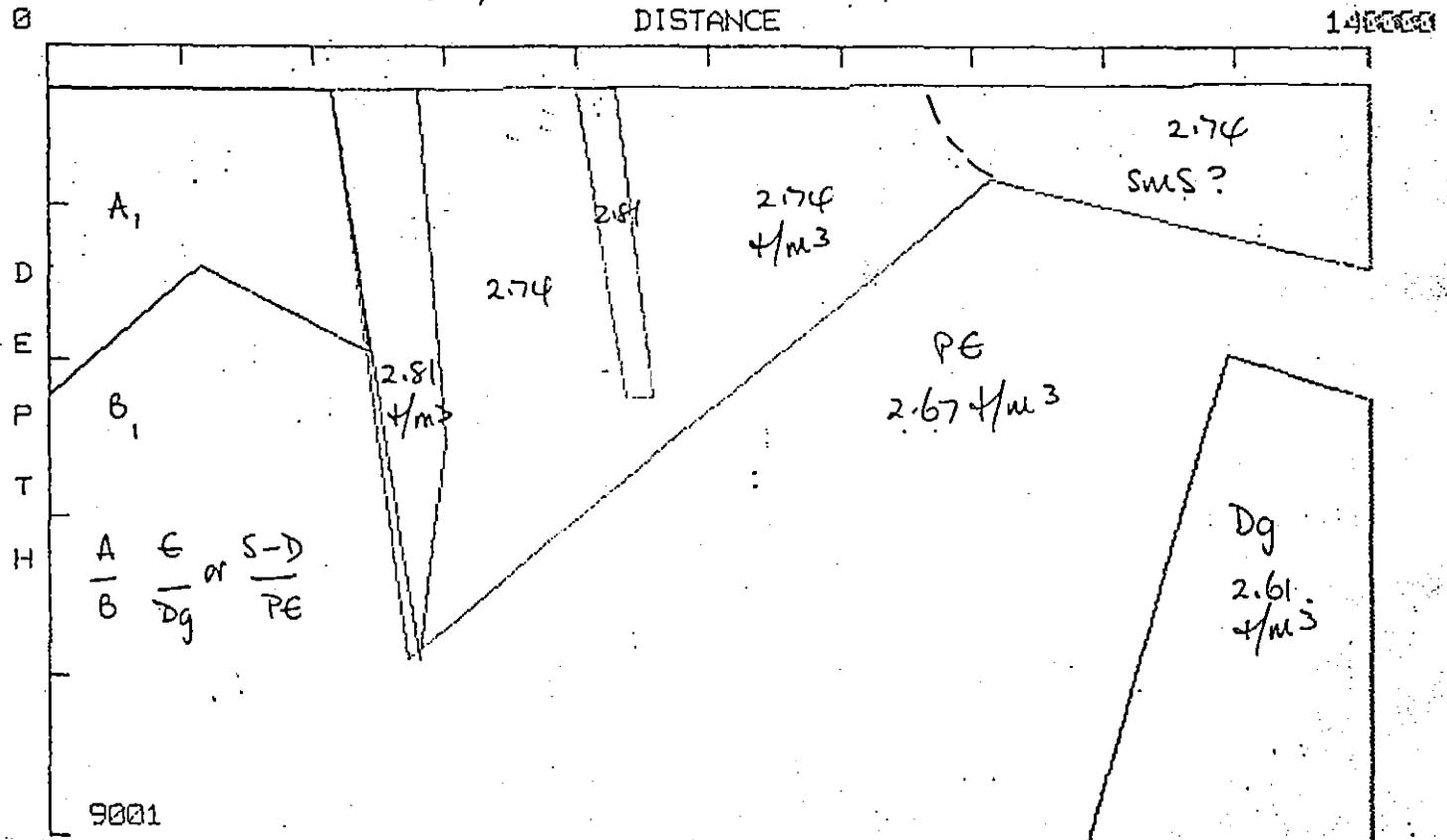


TASRG3 MIDLANDS VICTORIA VALLEY

TARNHEATH

VICT. VALLEY

TONBRIDGE



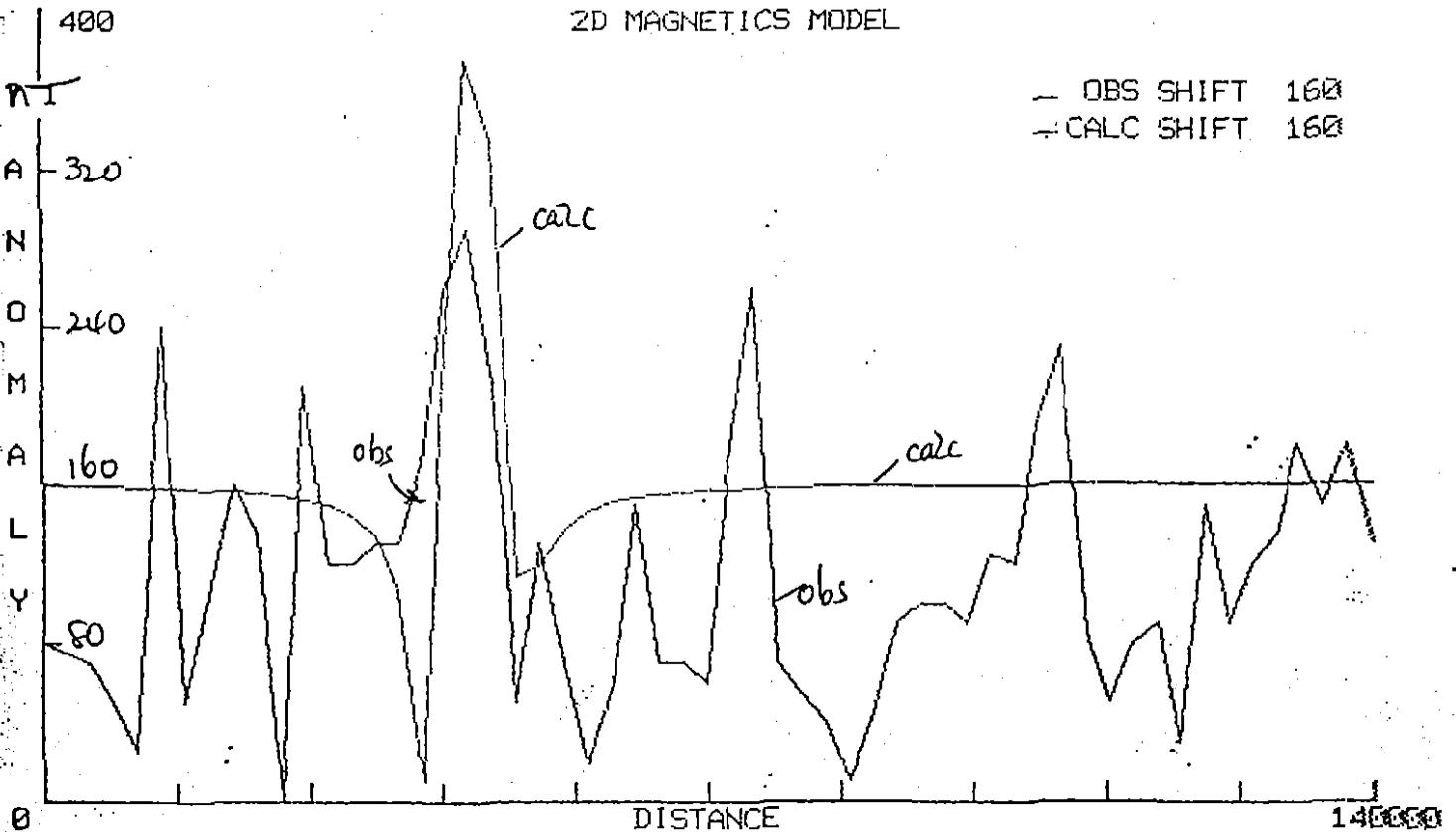
GRAVITY MODEL LINE 3

FIGURE 7

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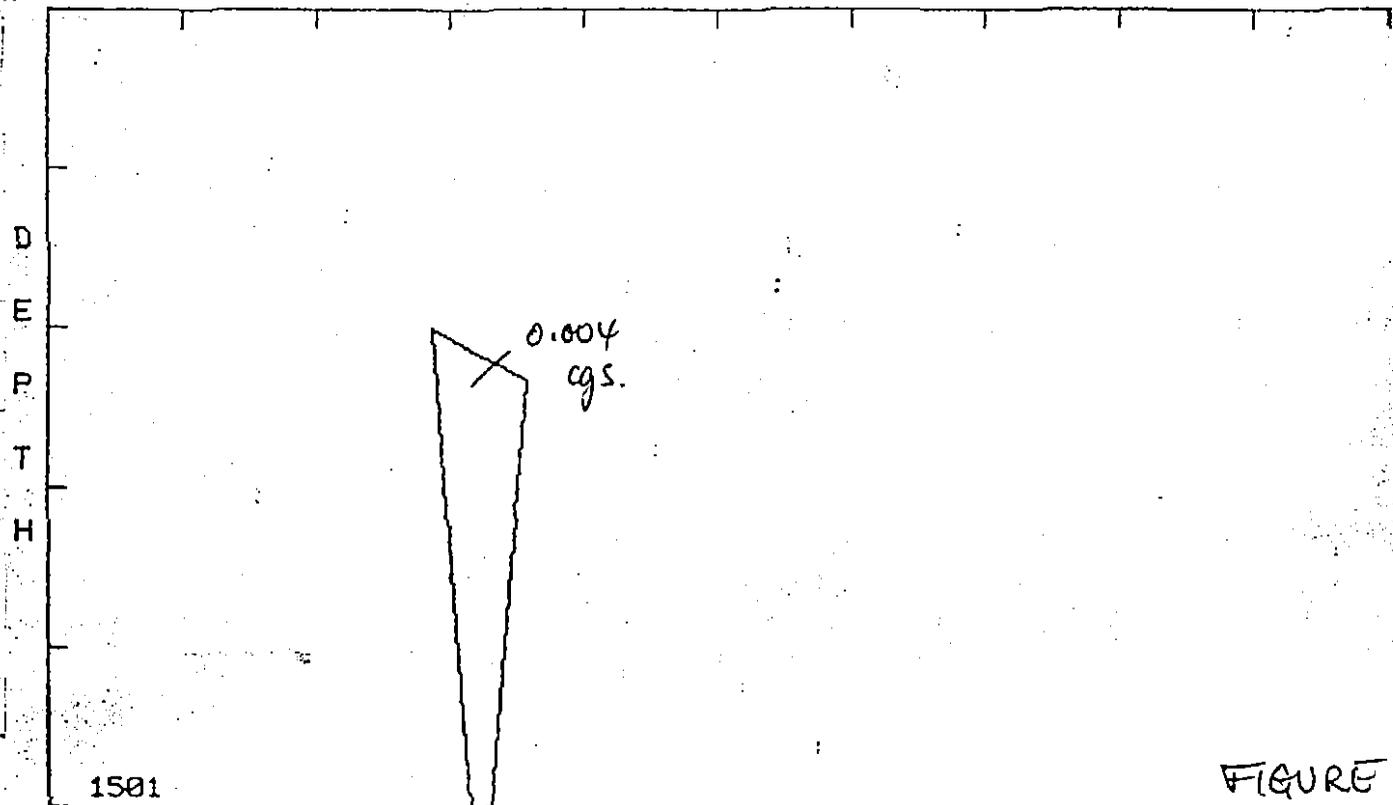
LINE PARAMETERS - ORIGIN, LIMIT, INCR : 0 140000 2500

2D MAGNETICS MODEL



TAS3 MIDLANDS VICTORIA VALLEY

DISTANCE 140000

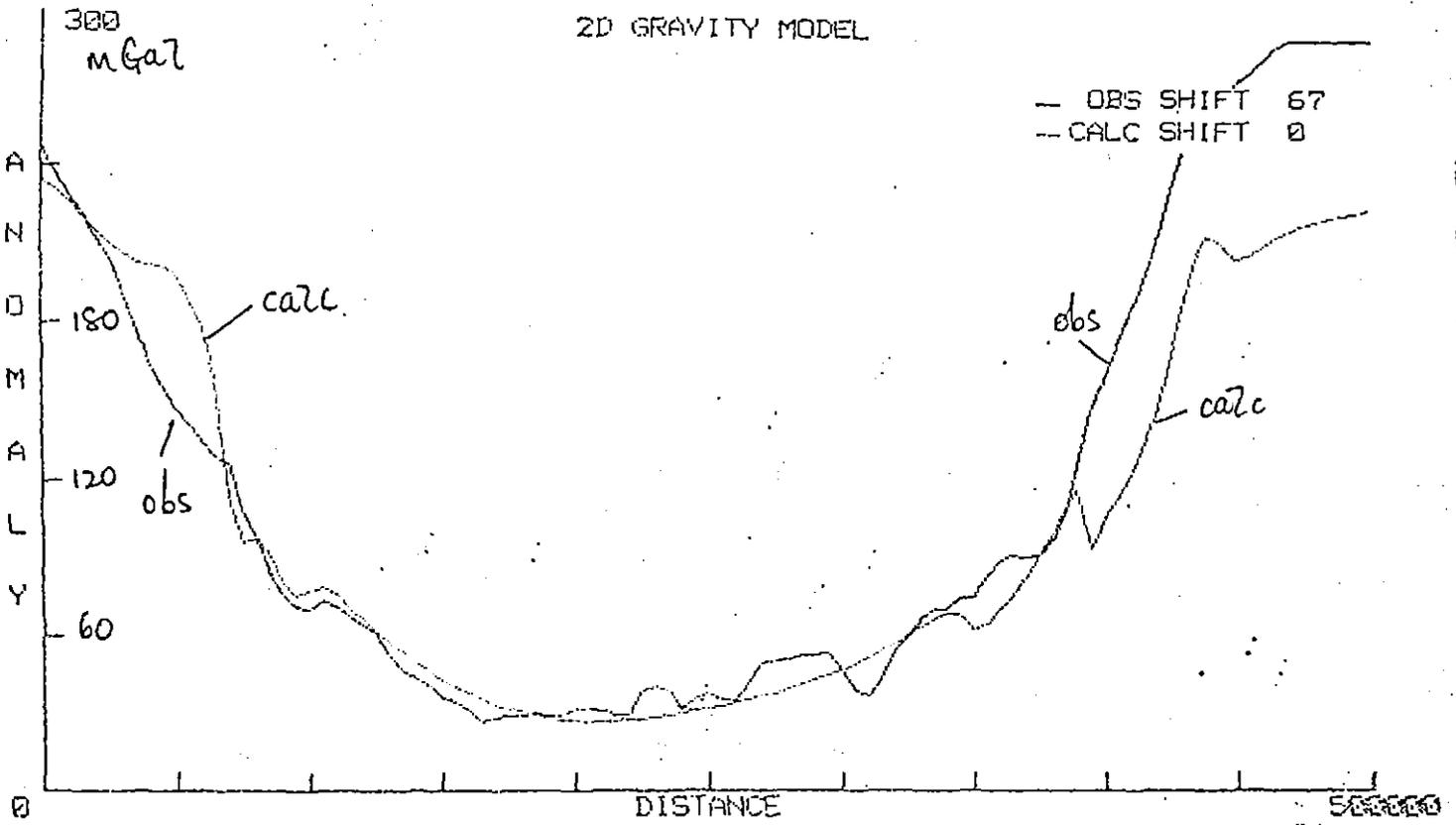


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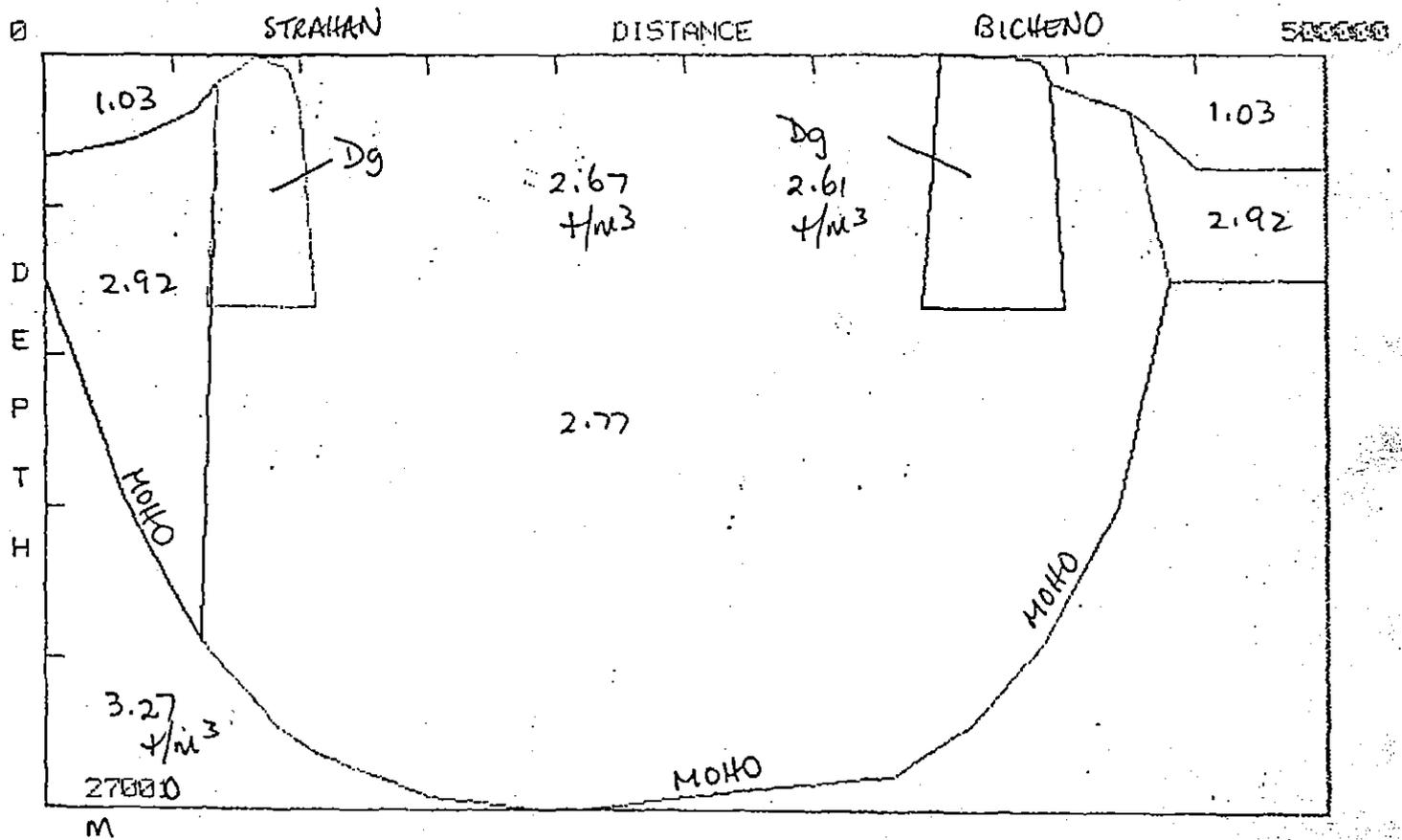
FIGURE 8

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2D GRAVITY MODEL



TASG4 STRAHAN - BICHENO



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022

391023

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2D GRAVITY MODEL

- OBS SHIFT 26
- CALC SHIFT 26

40
Mgal

32

16

8

calc

obs

obs

calc

DISTANCE

130000

ASRG4 UPPER MIDLANDS

GREAT
LAKE

HAMMOCKY
HILLS

ROSSARDEN

DISTANCE

130000

PERMO-TRIASSIC COVER

1800

2.77

$\frac{t}{m^3}$

2.74

2.74

2.81

2.81

$\frac{t}{m^3}$

Dg

2.61

$\frac{t}{m^3}$

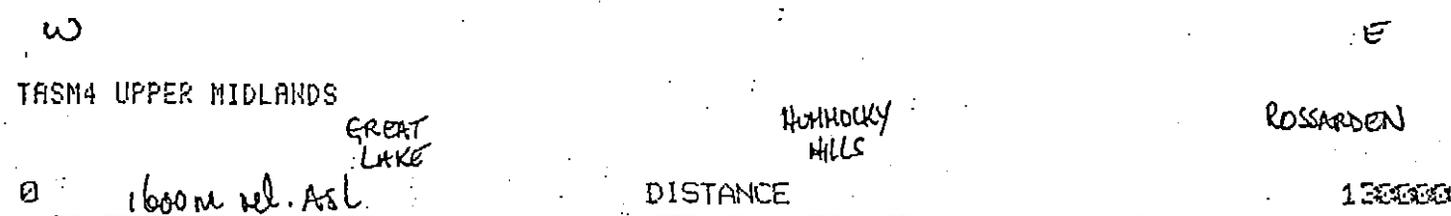
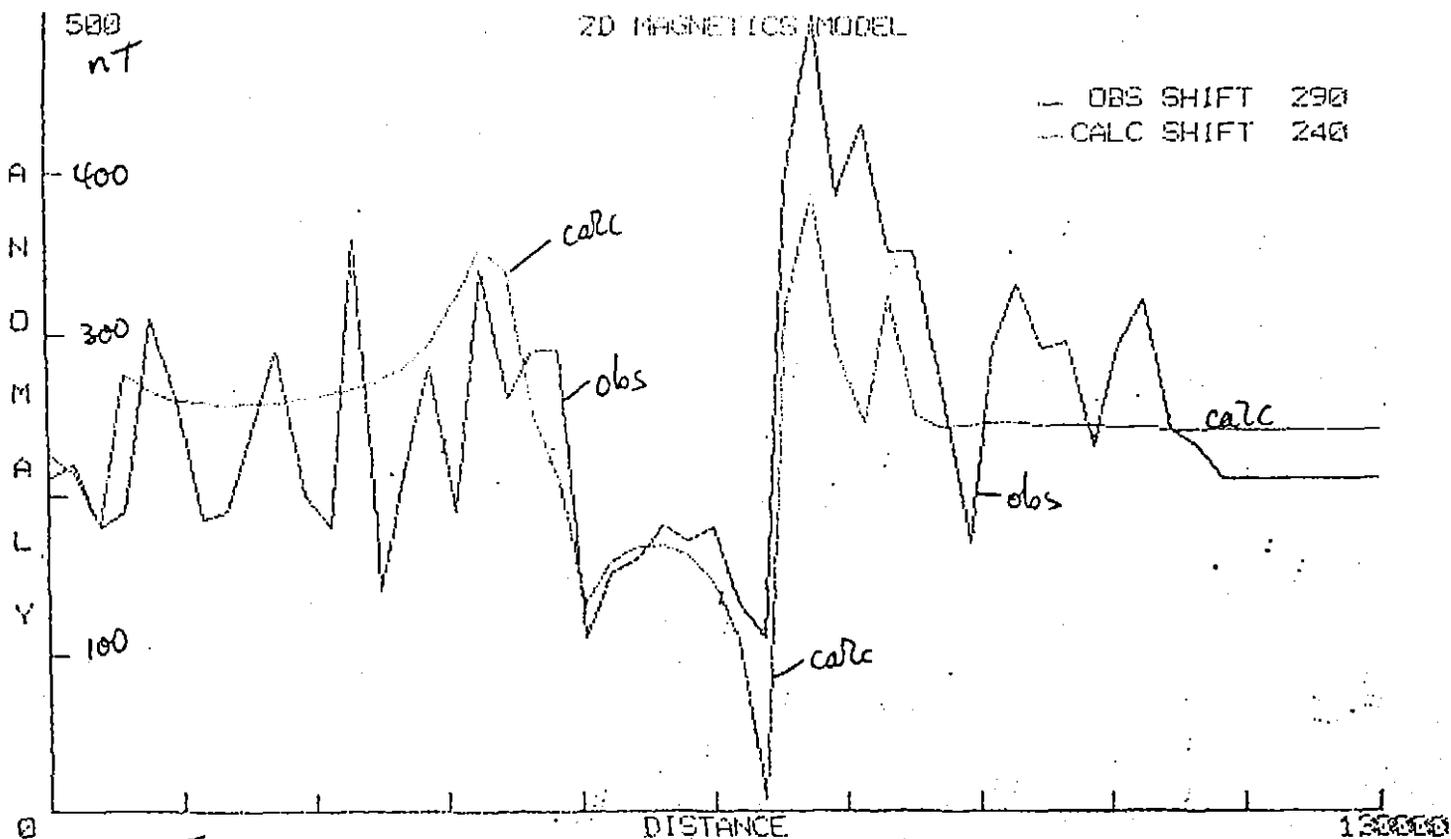
PE

2.67

$\frac{t}{m^3}$

9000
m

TASM4 UPPER MIDLANDS



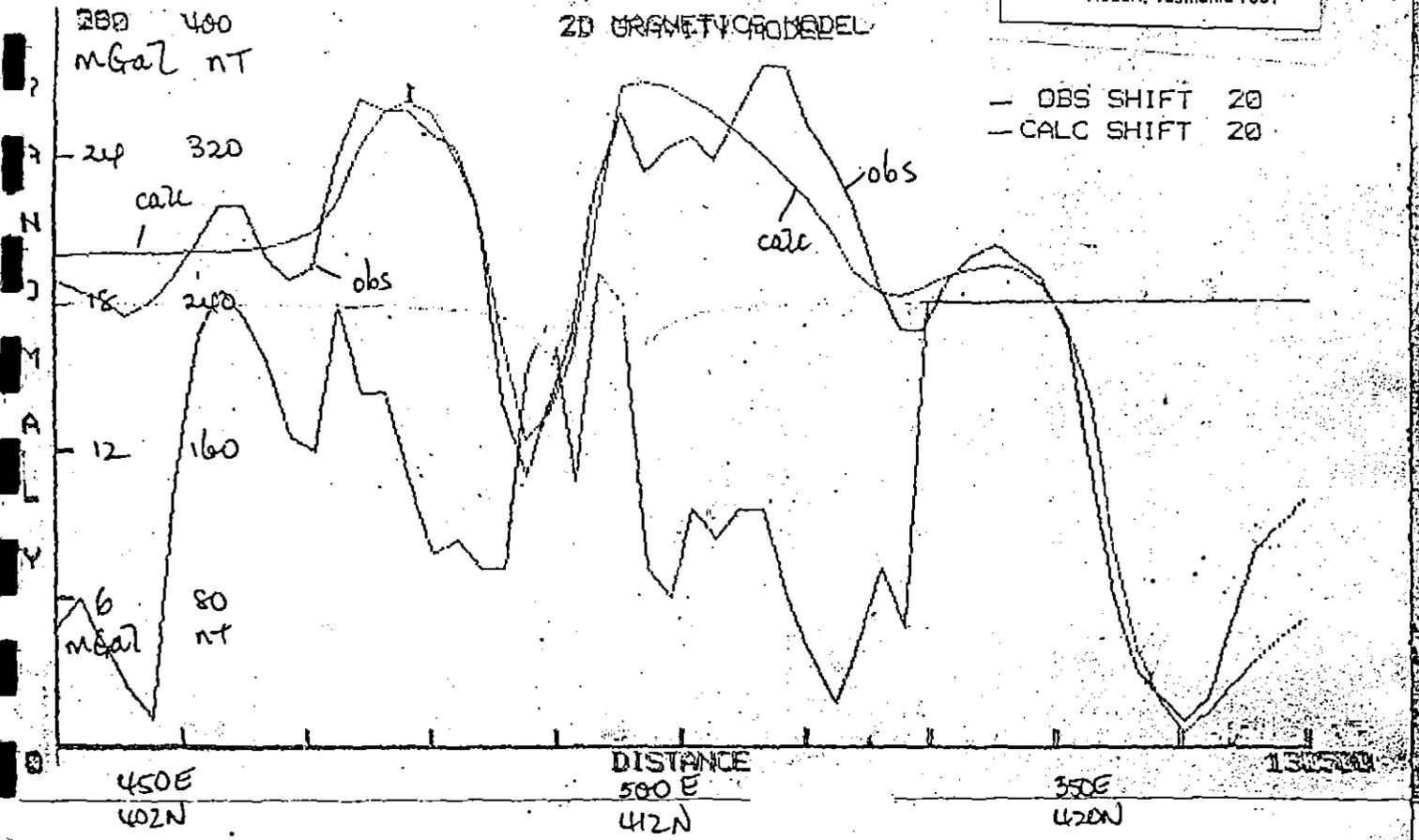
MAGNETIC MODEL LINE 4

FIGURE 11

LINE PARAMETERS - ORIGIN, LIMIT, INCR : 0 132500 2500

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Hobart, Tasmania 7001

2D MAGNETIC MODEL

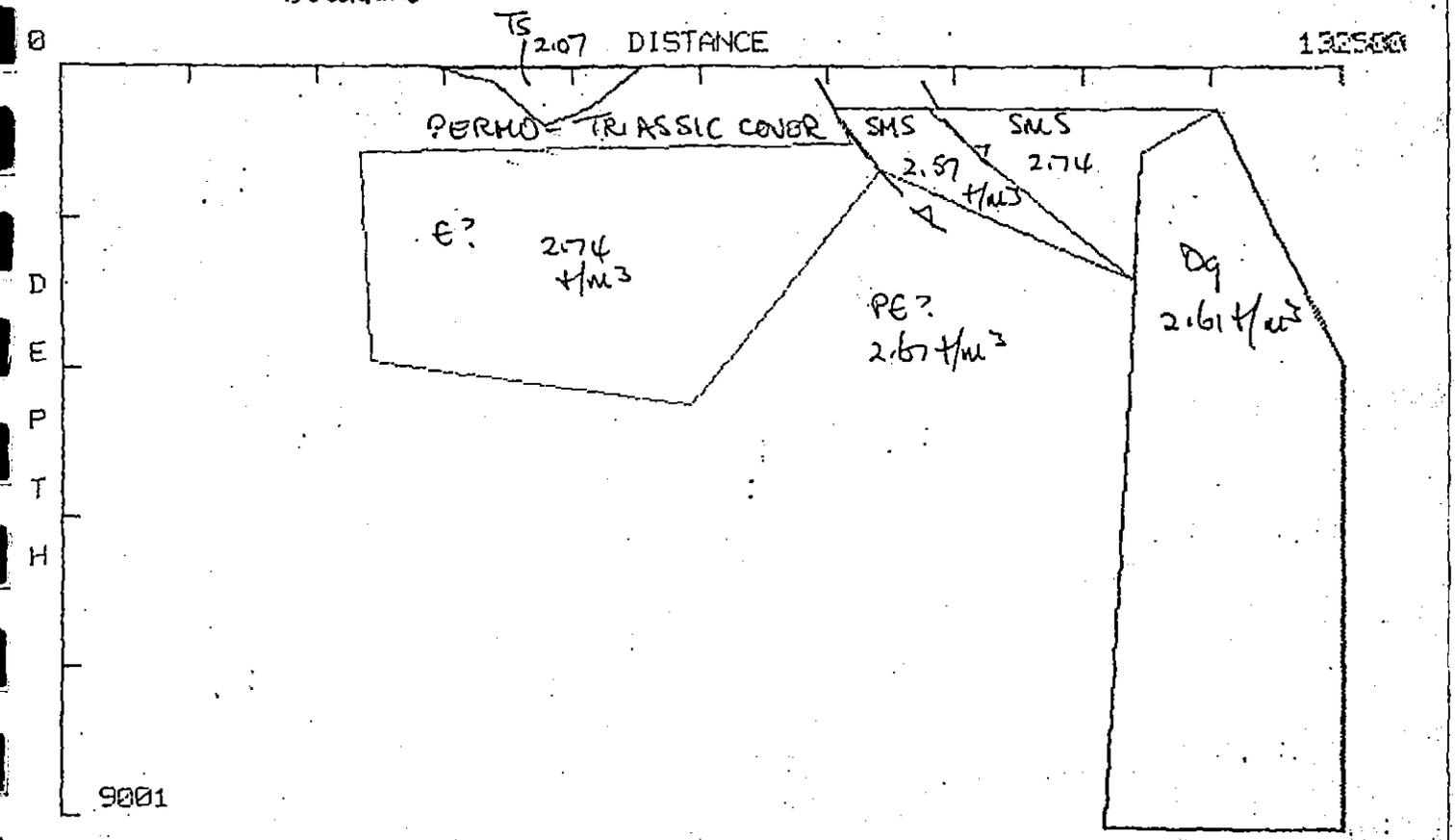


TASRG5 LAUNCESTON

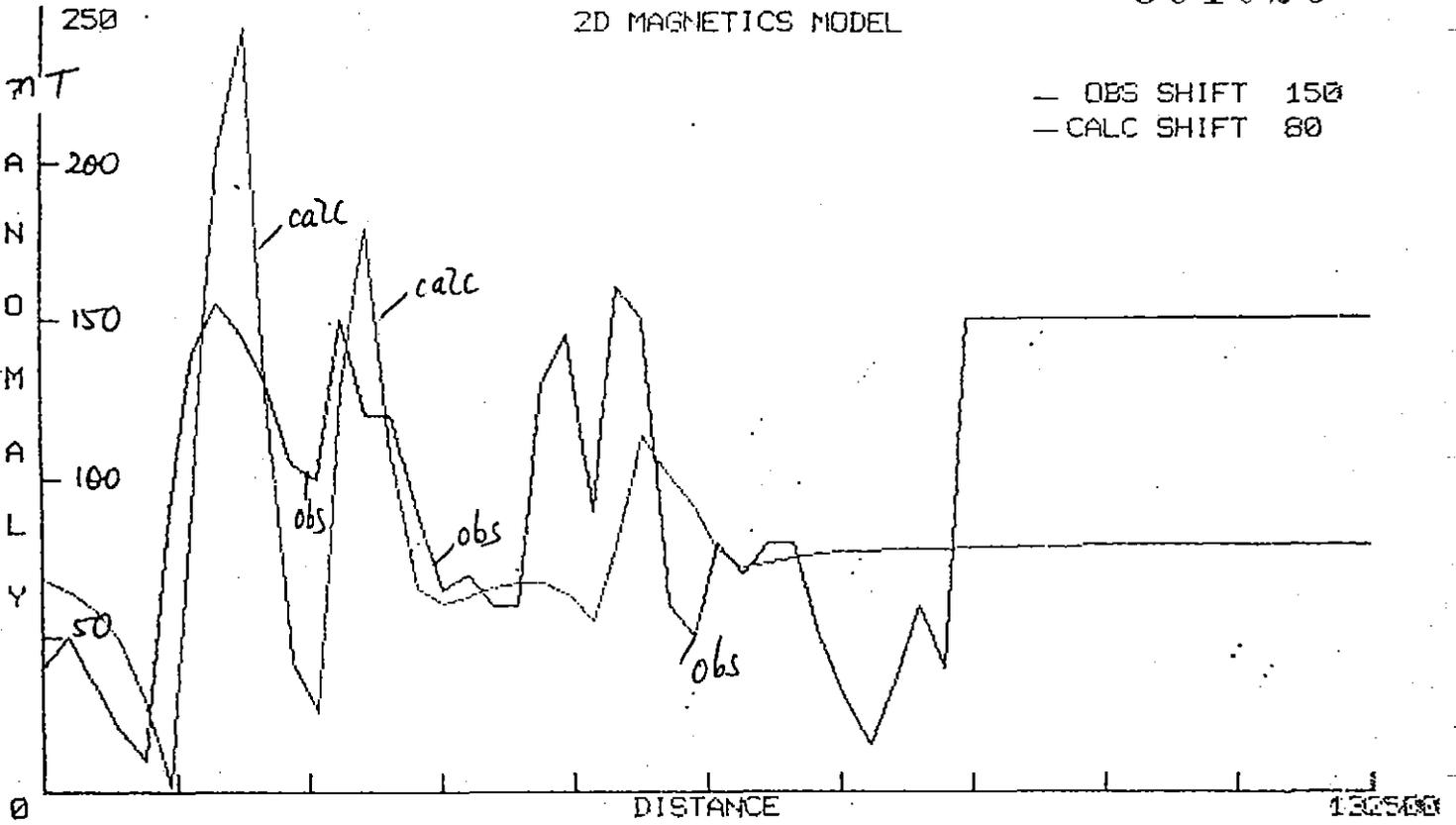
DELORAIN

LAUNCESTON

PVENGAH



2D MAGNETICS MODEL



TASMS LAUNCESTON

DELORAINÉ

LAUNCESTON
DISTANCE

132500

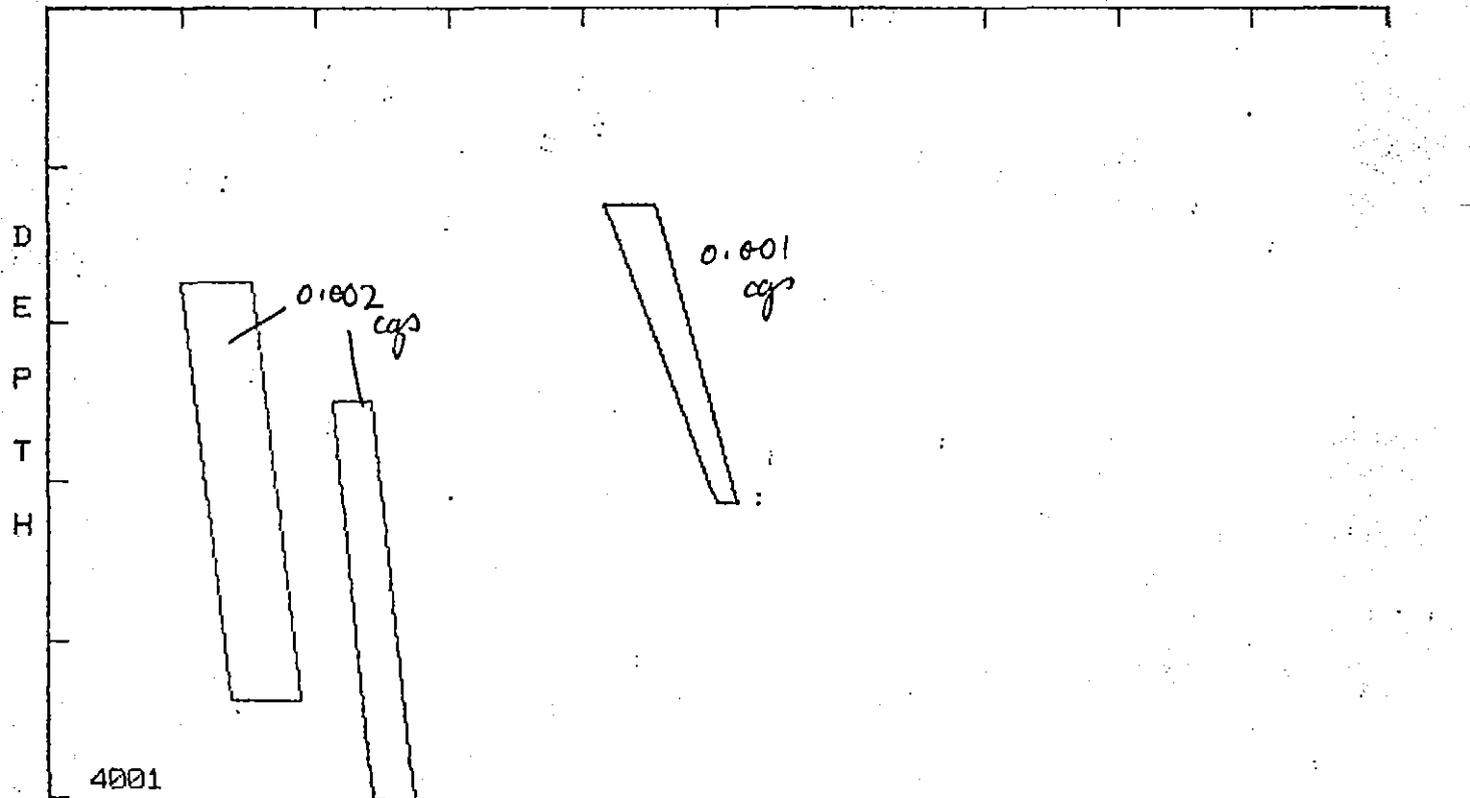
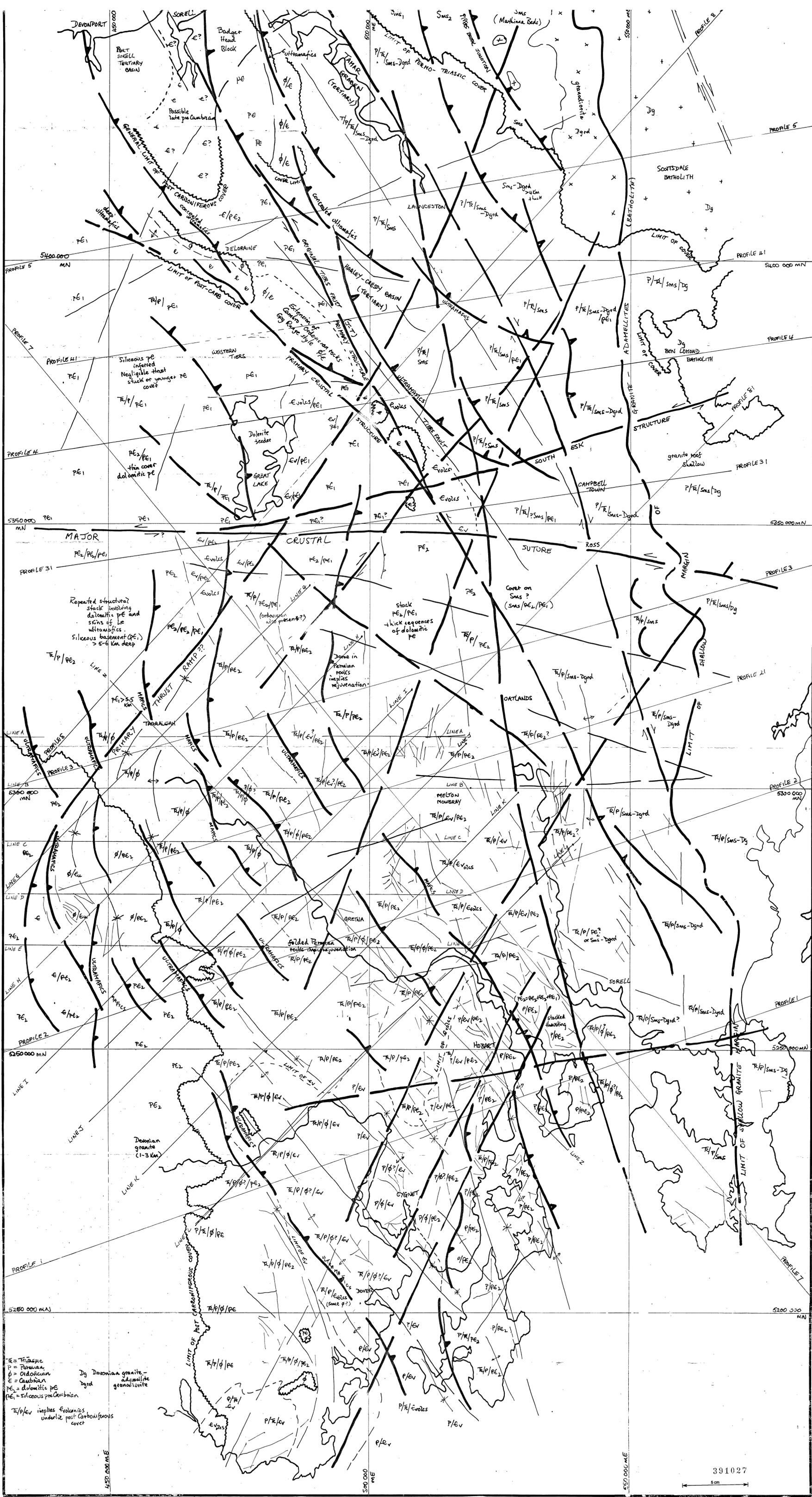


FIGURE 13

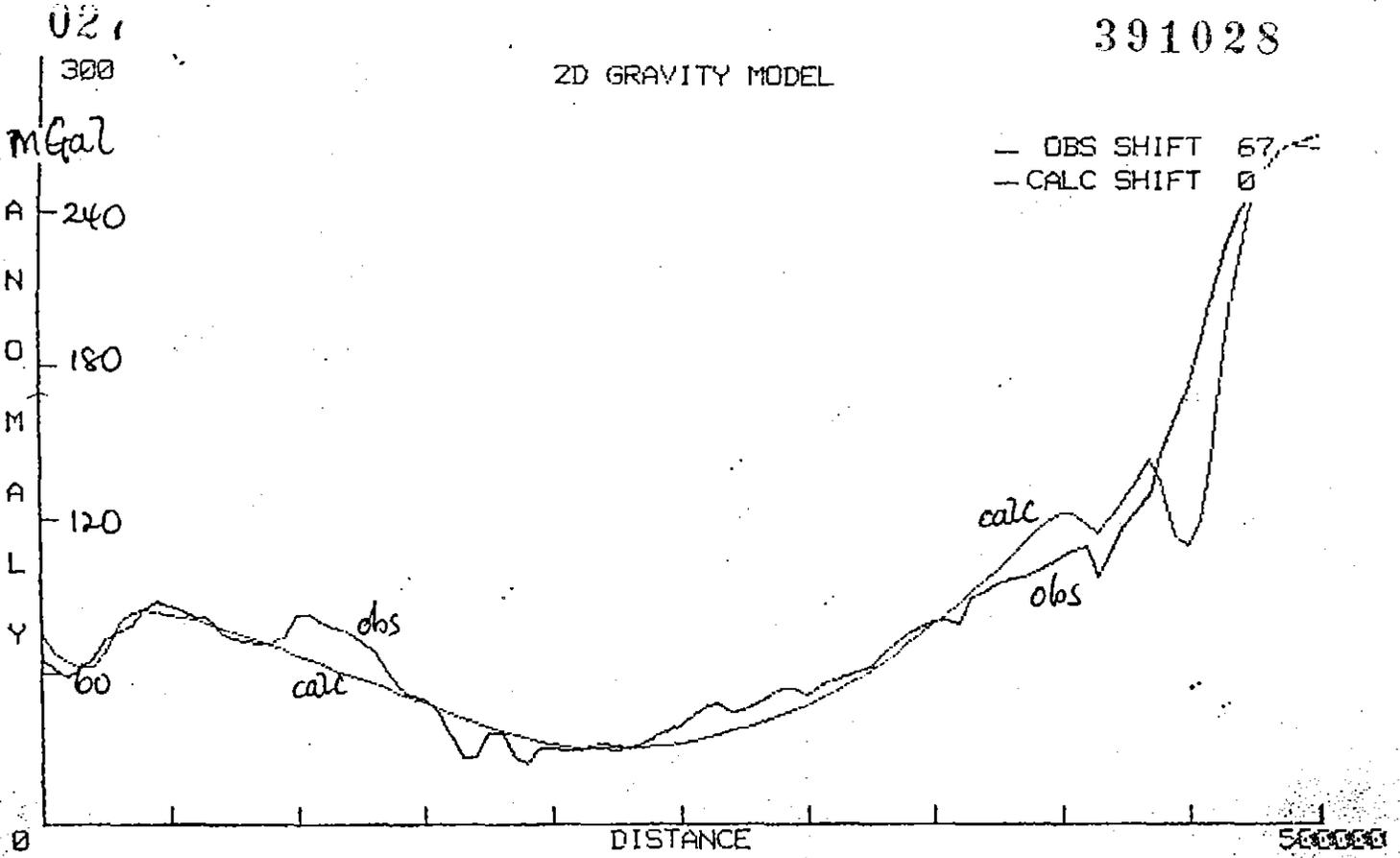


PRELIMINARY STRUCTURAL INTERPRETATION EASTERN TASMANIA

for Longa Oil EL 1/88
 by D.E. Leaman, Leaman Geophysics
 Feb 1991
 PROVISIONAL - SUBJECT TO VARIATION

391028

2D GRAVITY MODEL



TASG7 THREE HUMMOCK - PORT ARTHUR

3 HUMMOCK

WALLS
JERUSALEM

BOTHWELL

PT
ARTHUR

0 IS

DISTANCE

500000

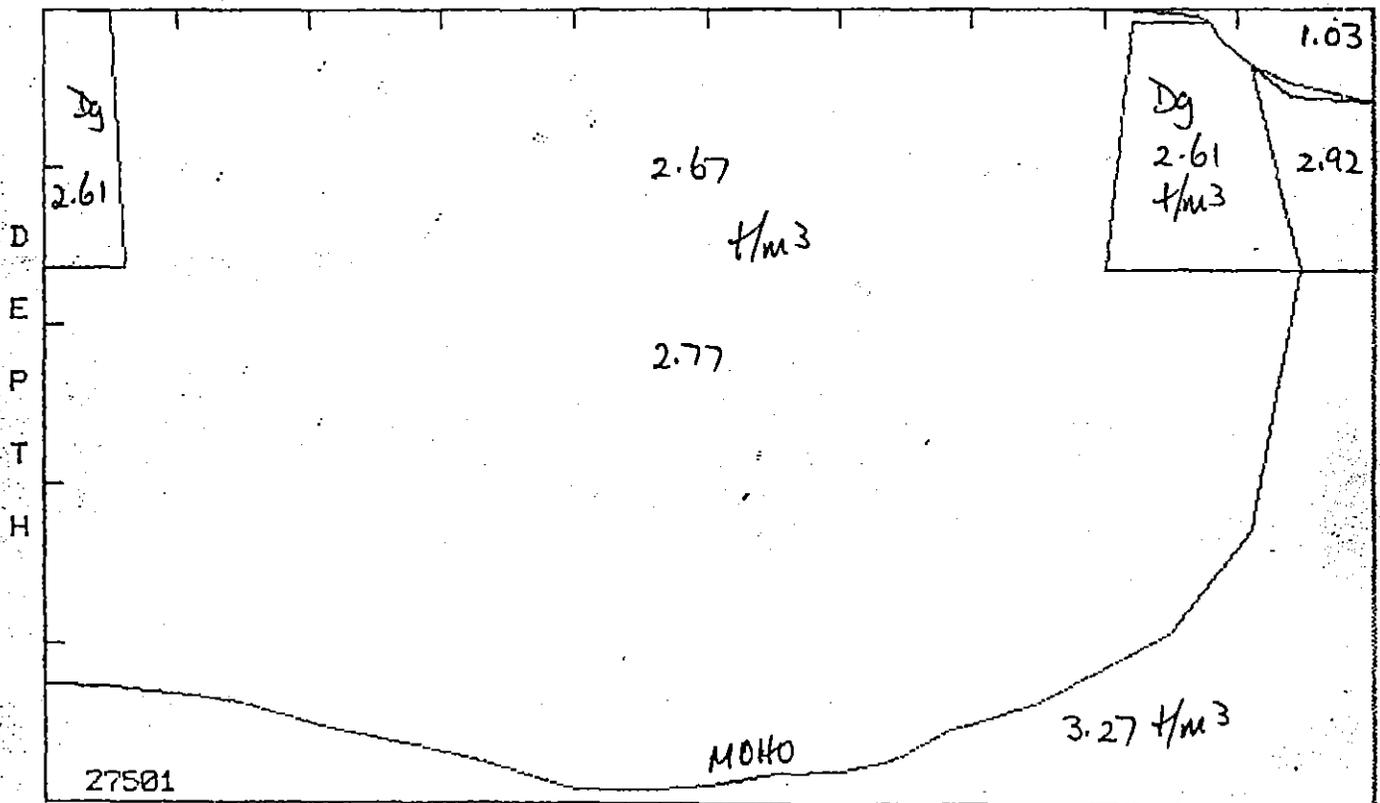
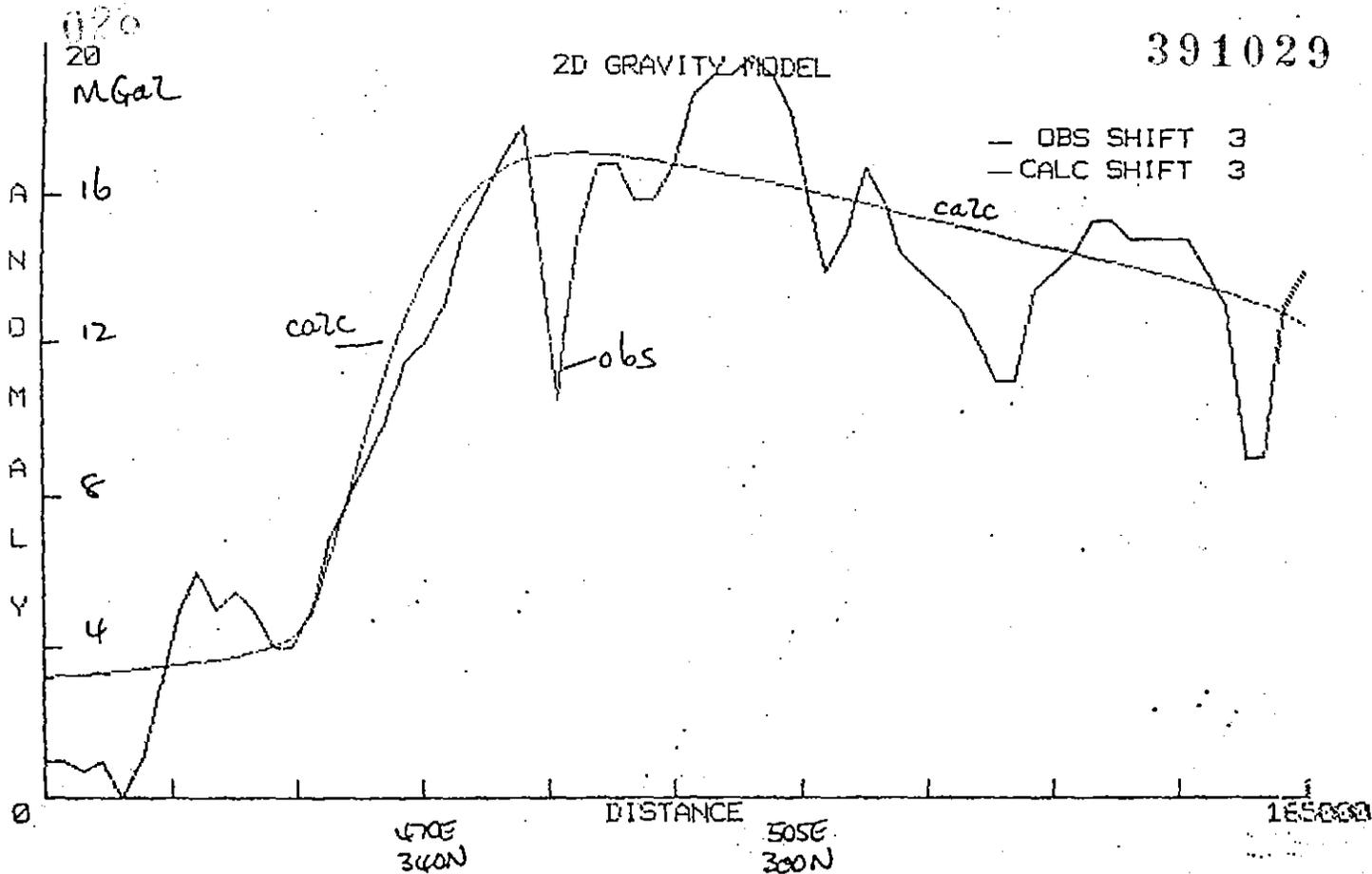


FIGURE 14

391029

2D GRAVITY MODEL



TASRG7 WALLS JERUSALEM - CAMBRIDGE

1/5=56000/5800

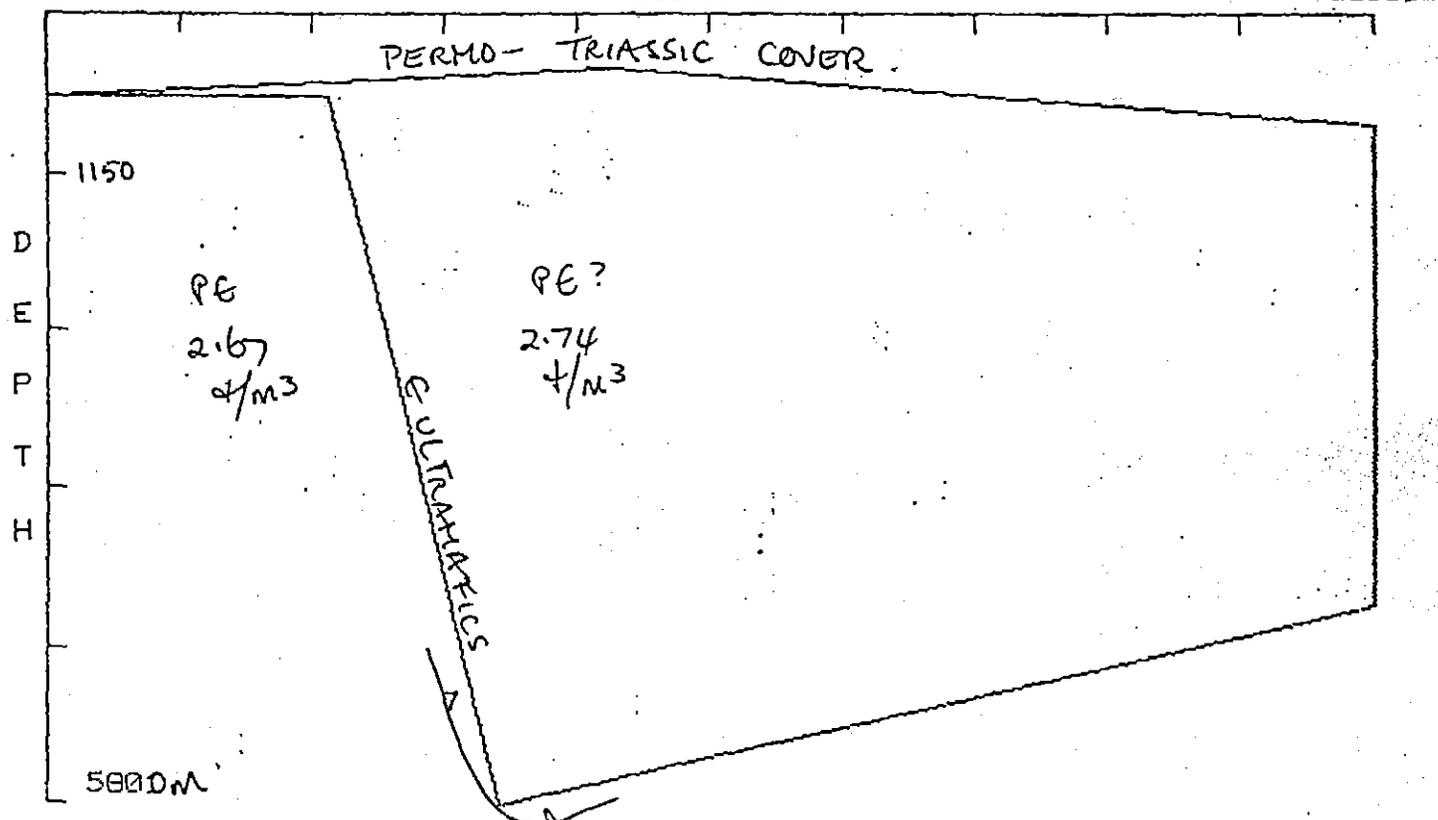
WALLS
JERUSALEM

BOTHWELL

CAMBRIDGE

DISTANCE

165000

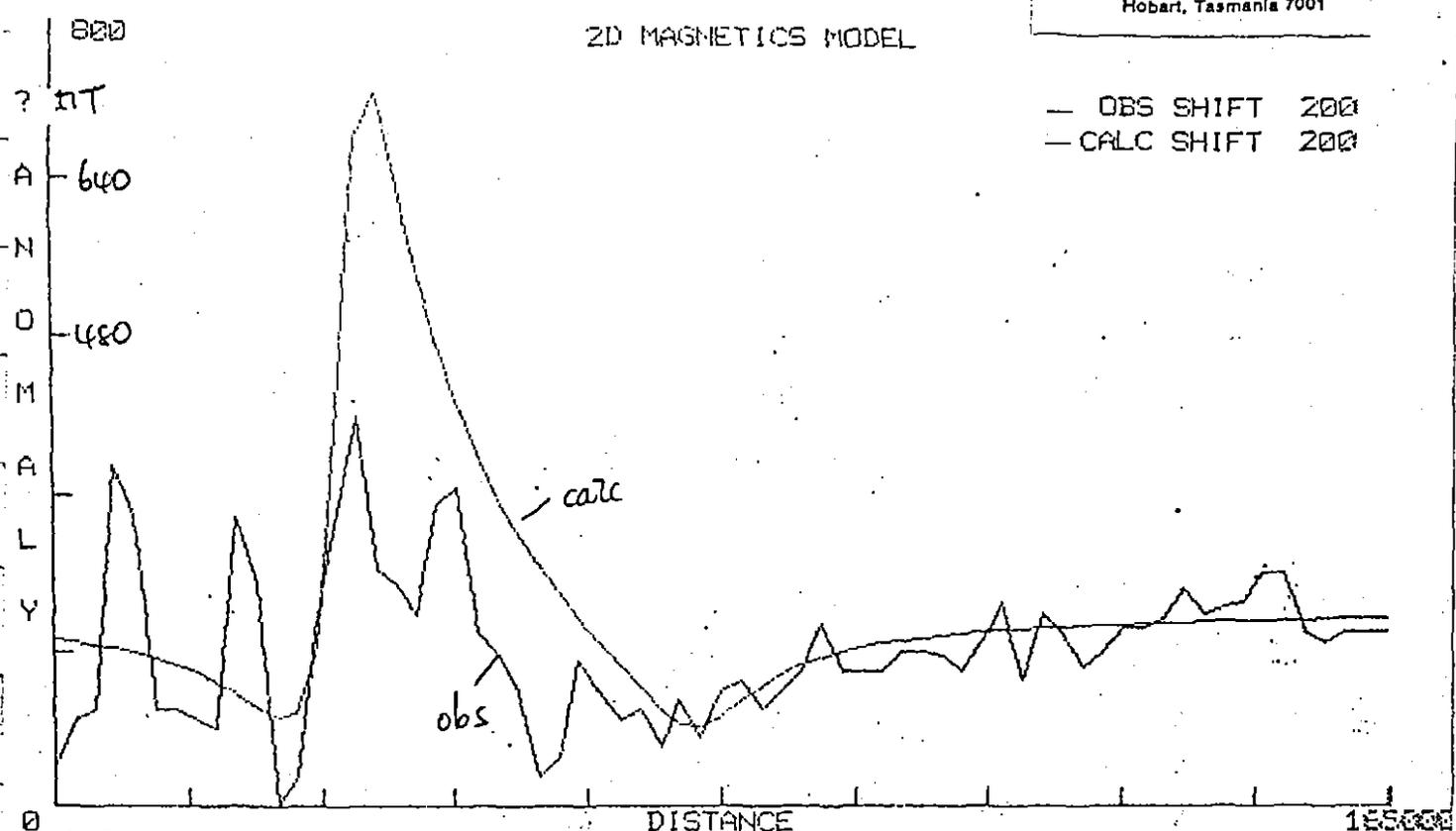


LEAMAN GEOPHYSICS
G.P.O. Box 320 D,
Hobart, Tasmania 7001

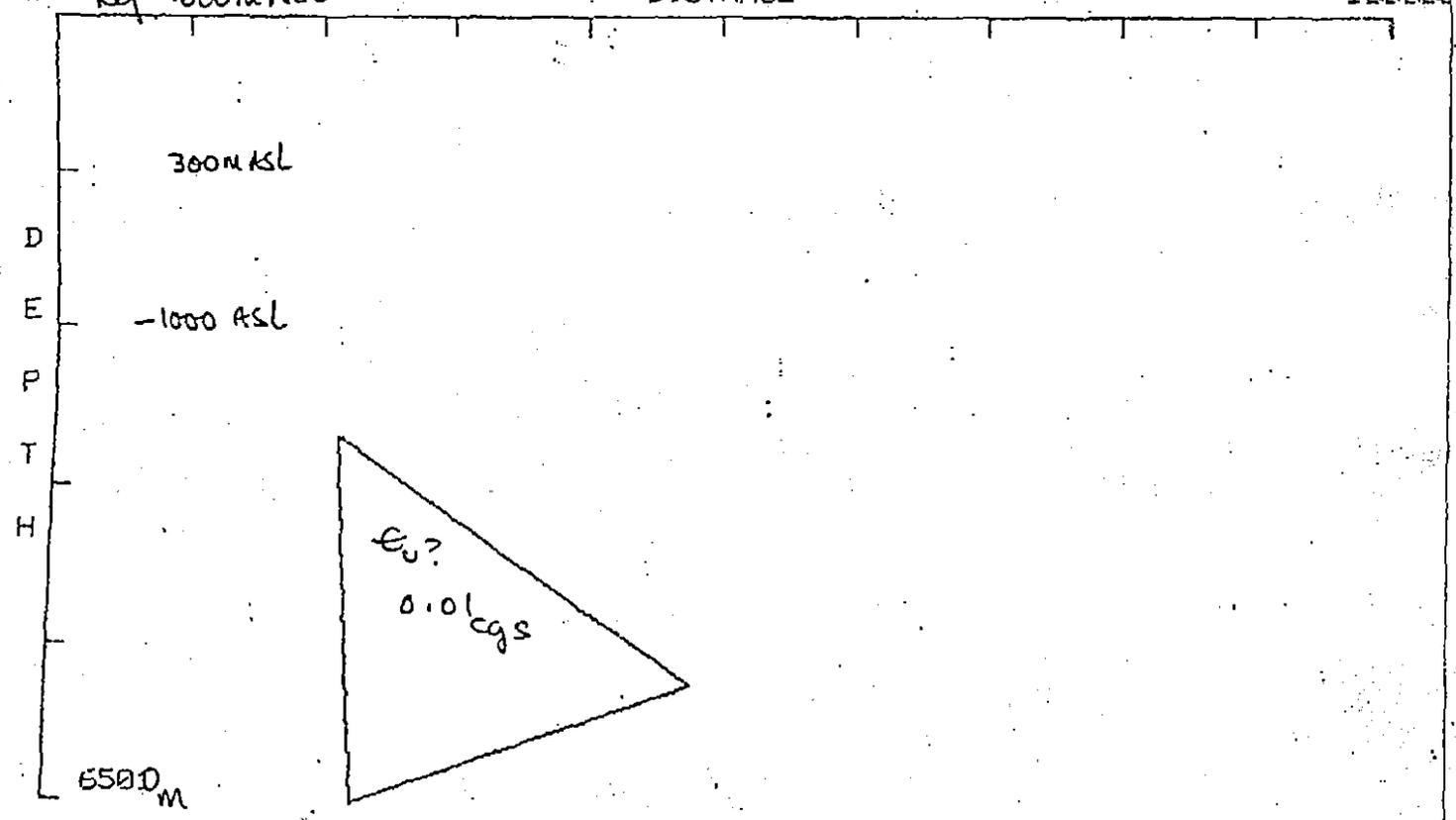
LINE PARAMETERS - ORIGIN, LIMIT, INCR : 0 165000 2500

LEAMAN GEOPHYSICS
G.P.O. Box 320 D,
Hobart, Tasmania 7001

2D MAGNETICS MODEL



0 440E 470E 505E 185000
 NW 340N 300N 250N
 TASM7 WALLS JERUSALEM - CAMBRIDGE
 WALLS JERUSALEM BOTTSWELL CAMBRIDGE
 0 Ref 1600m ASL DISTANCE 185000

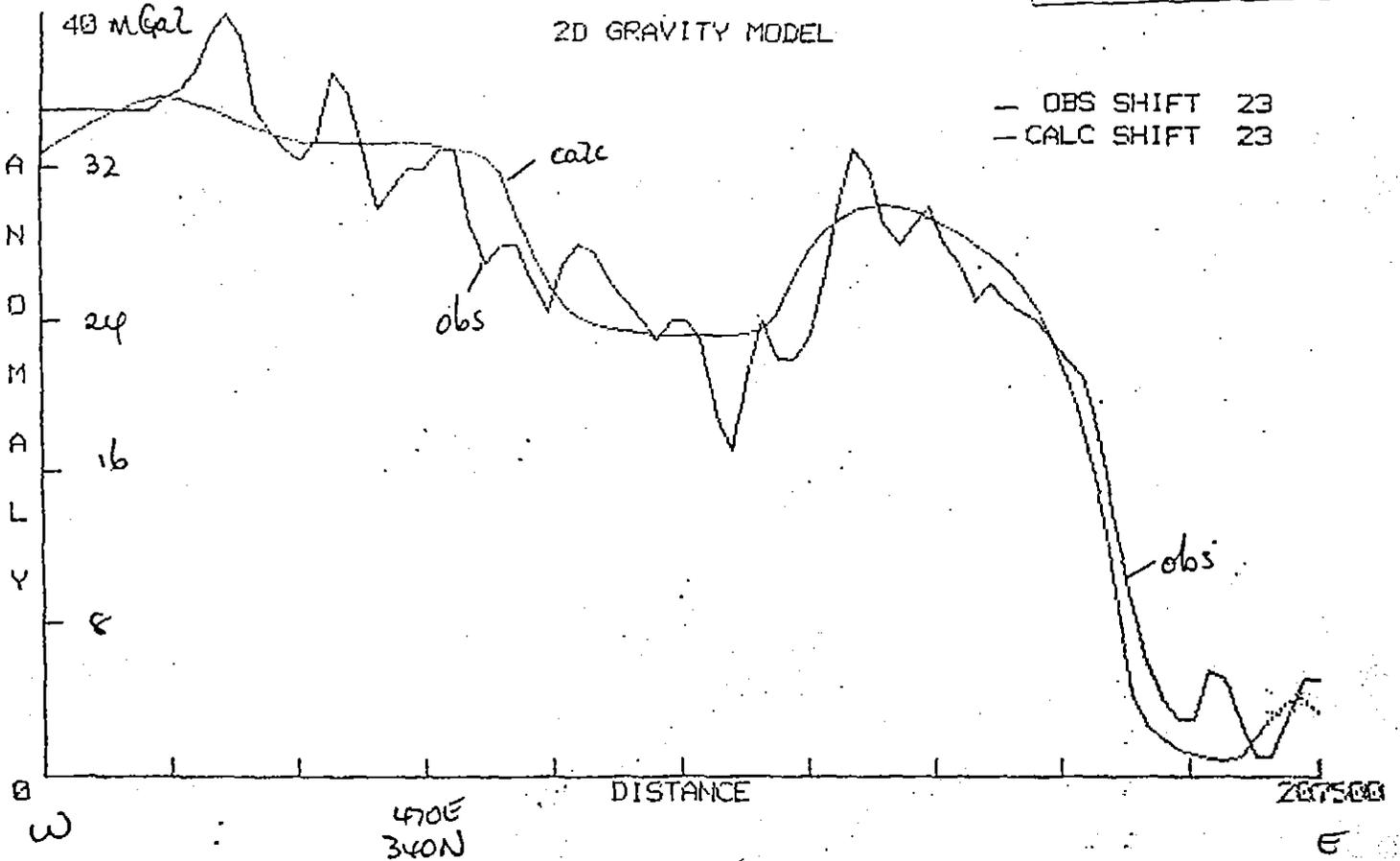


030

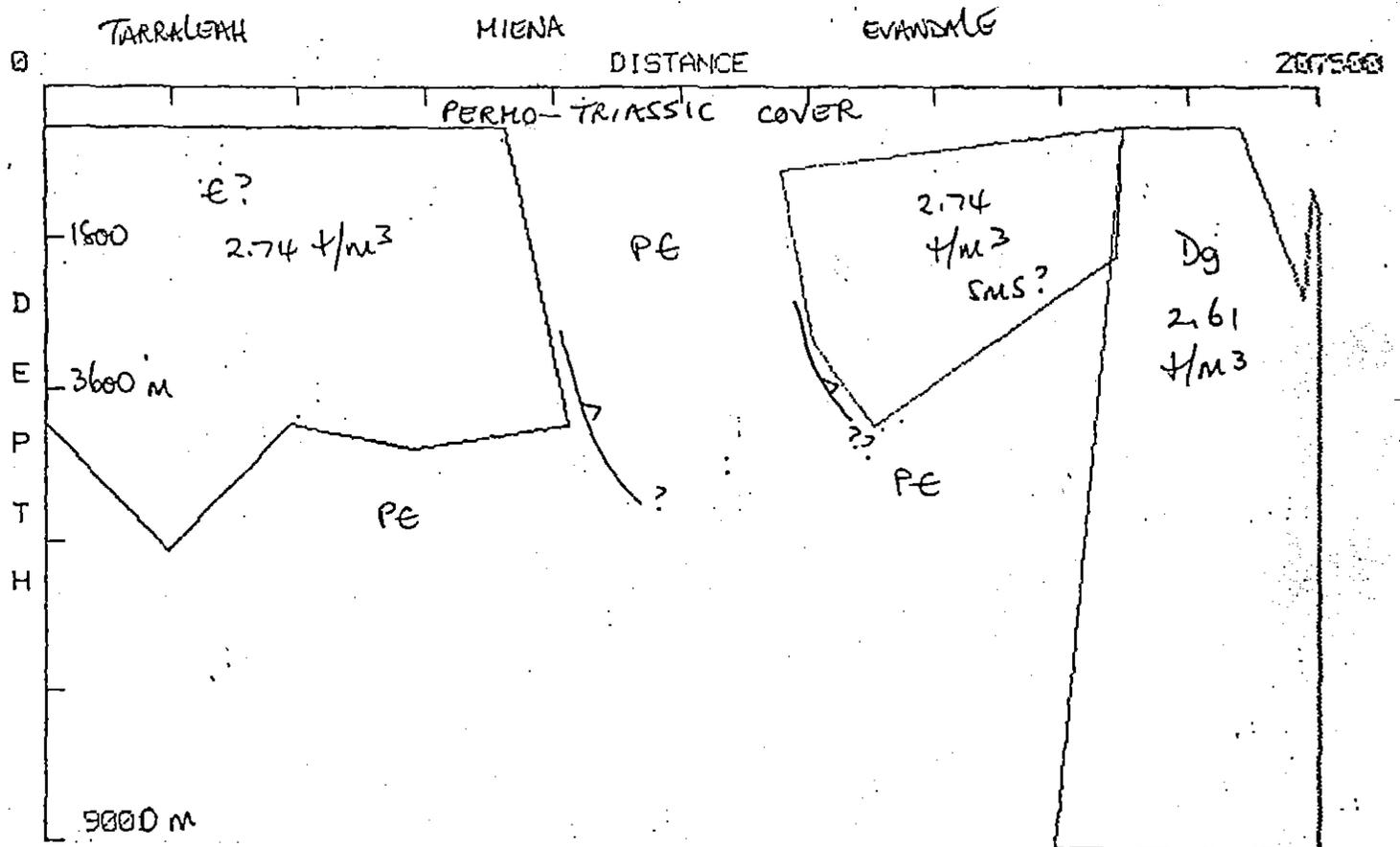
391031

LINE PARAMETERS - ORIGIN, LIMIT, INCR : 0 207500 2500

LEAMAN GEOPHYSICS
G.P.O. Box 320 D,
Hobart, Tasmania 7001



TASRS6 WEST TARRALEAH - EVANDALE



GRAVITY MODEL LINE 8

FIGURE 17

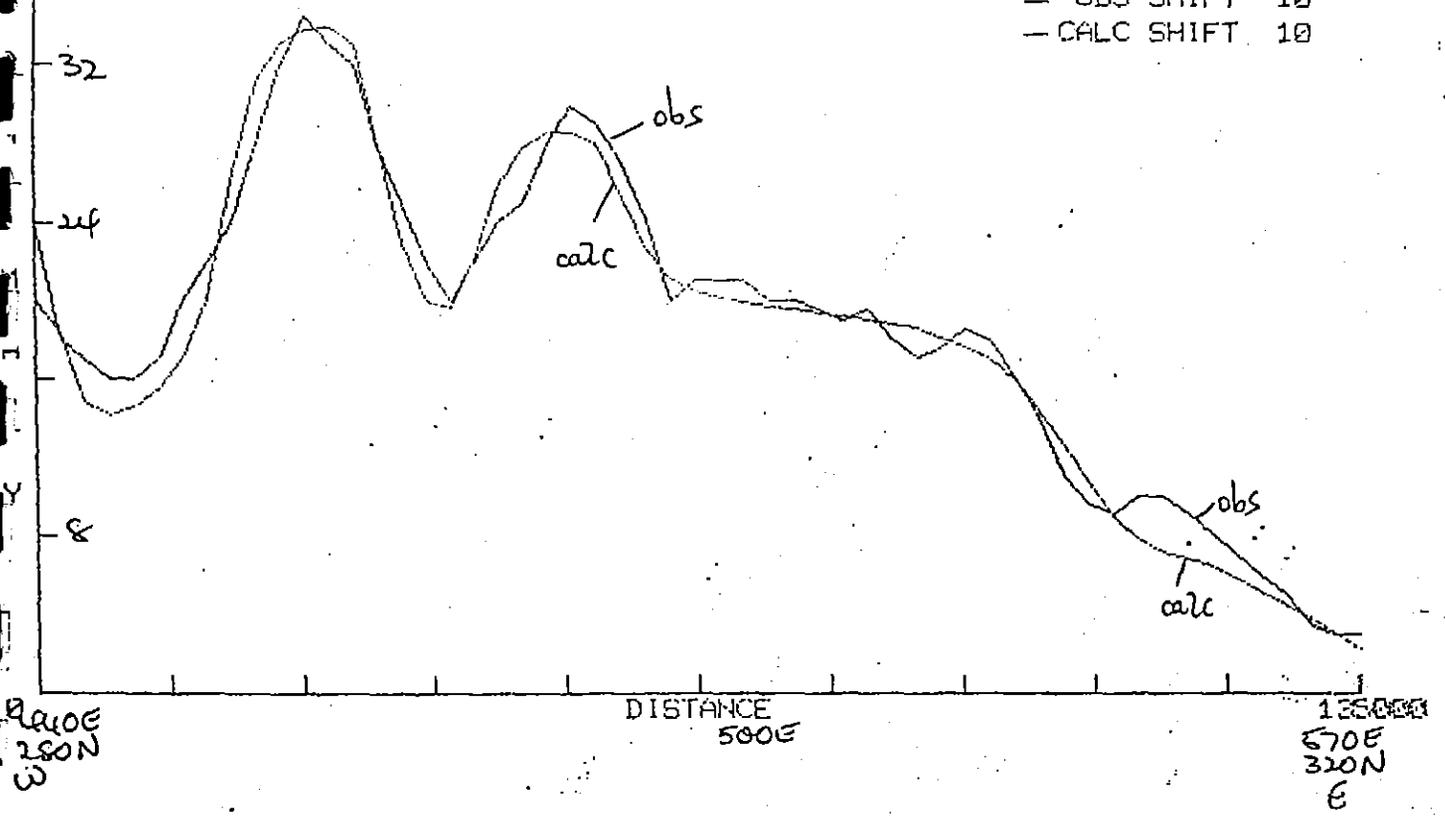
LEAMAN GEOPHYSICS
G.P.O. Box 320 D,
Hobart, Tasmania 7001

2D GRAVITY MODEL

U31

40 mGal

— OBS SHIFT 10
— CALC SHIFT 10



940E
280N
W

DISTANCE
500E

13500E
670E
320N
E

TASRG21 CLEAR HILL - L TOOMS

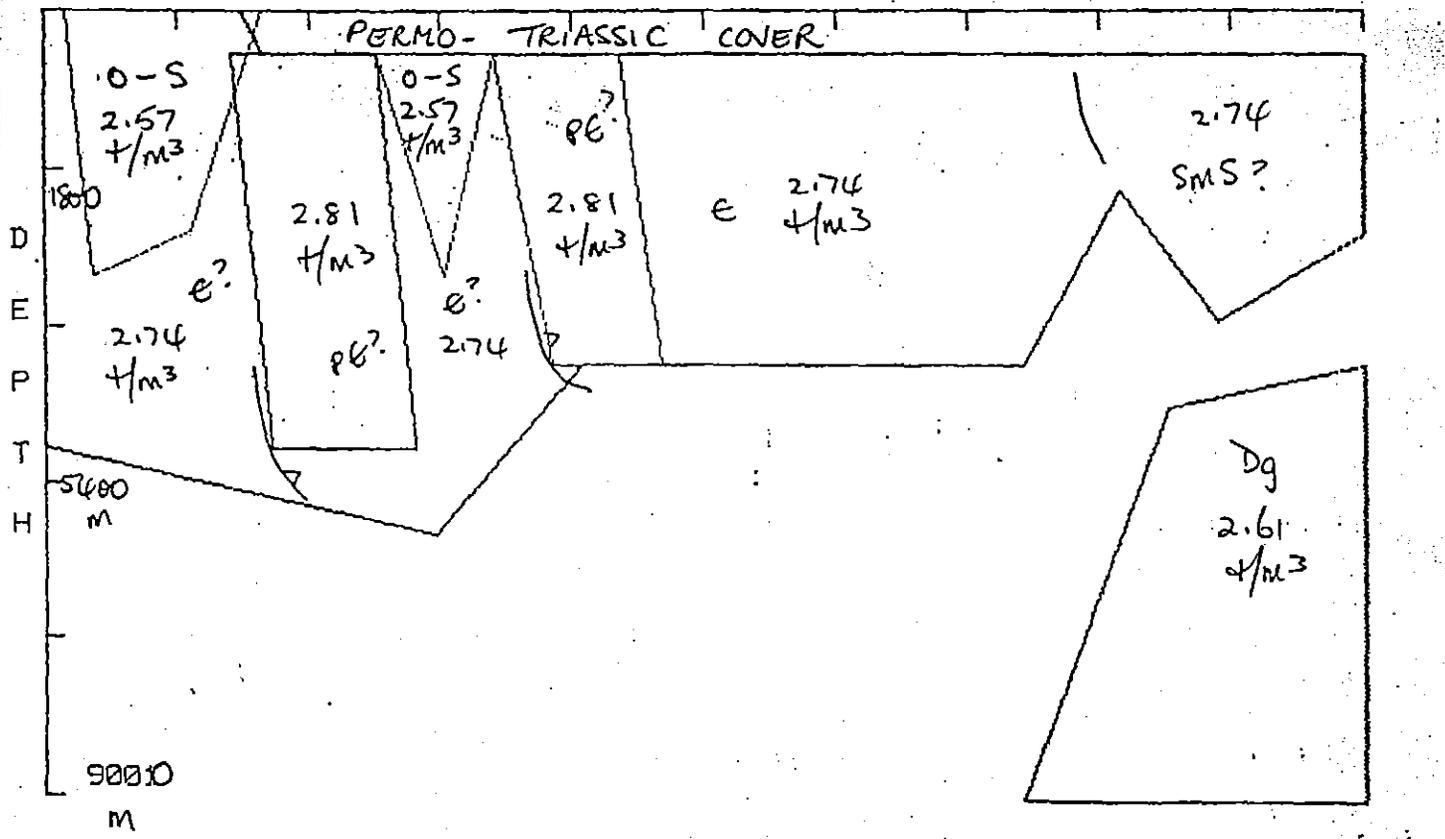
clear
hill

MILTON
HOWBRAY
DISTANCE

L TOOMS

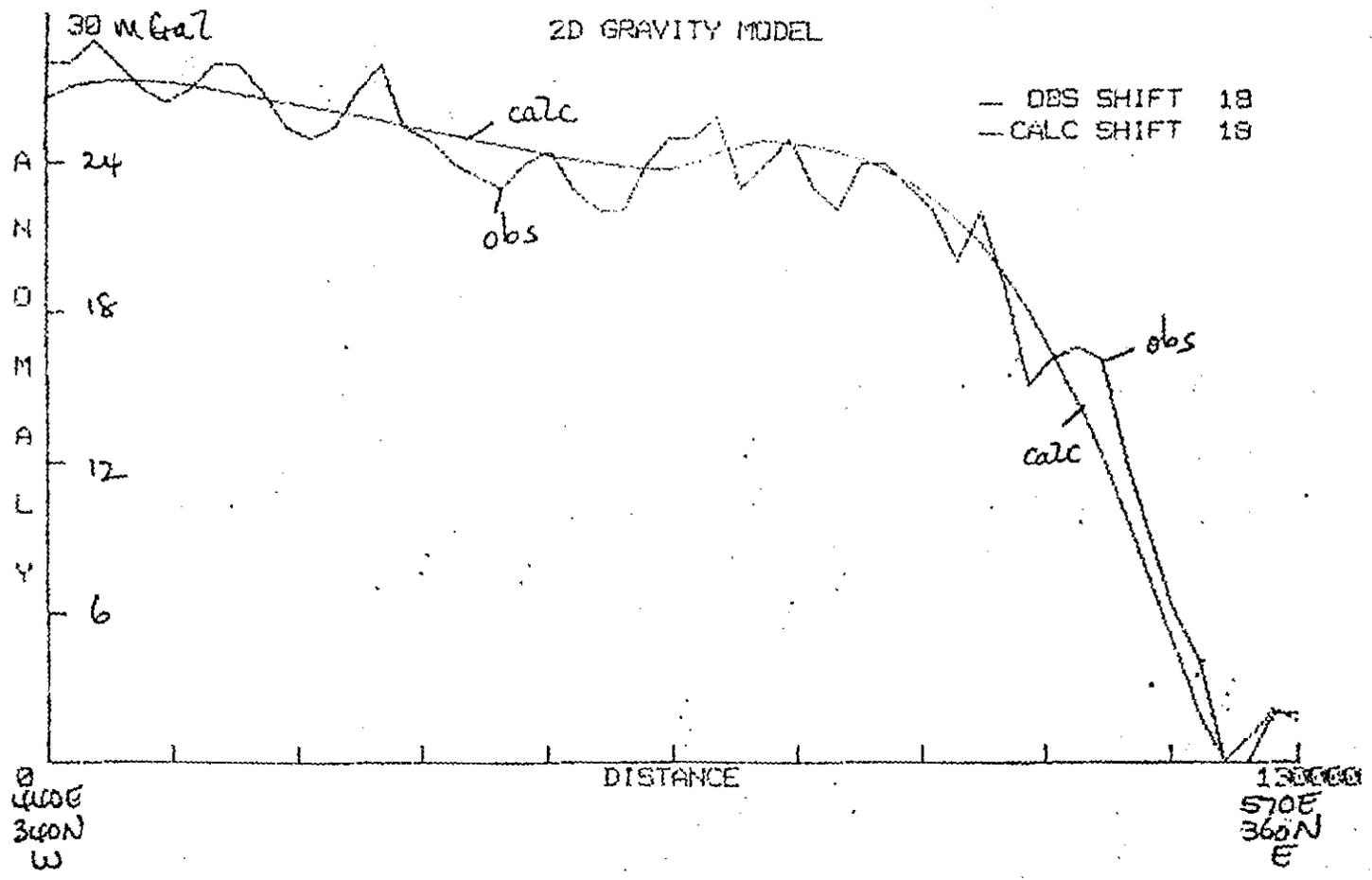
13500E

PERMO-TRIASSIC COVER

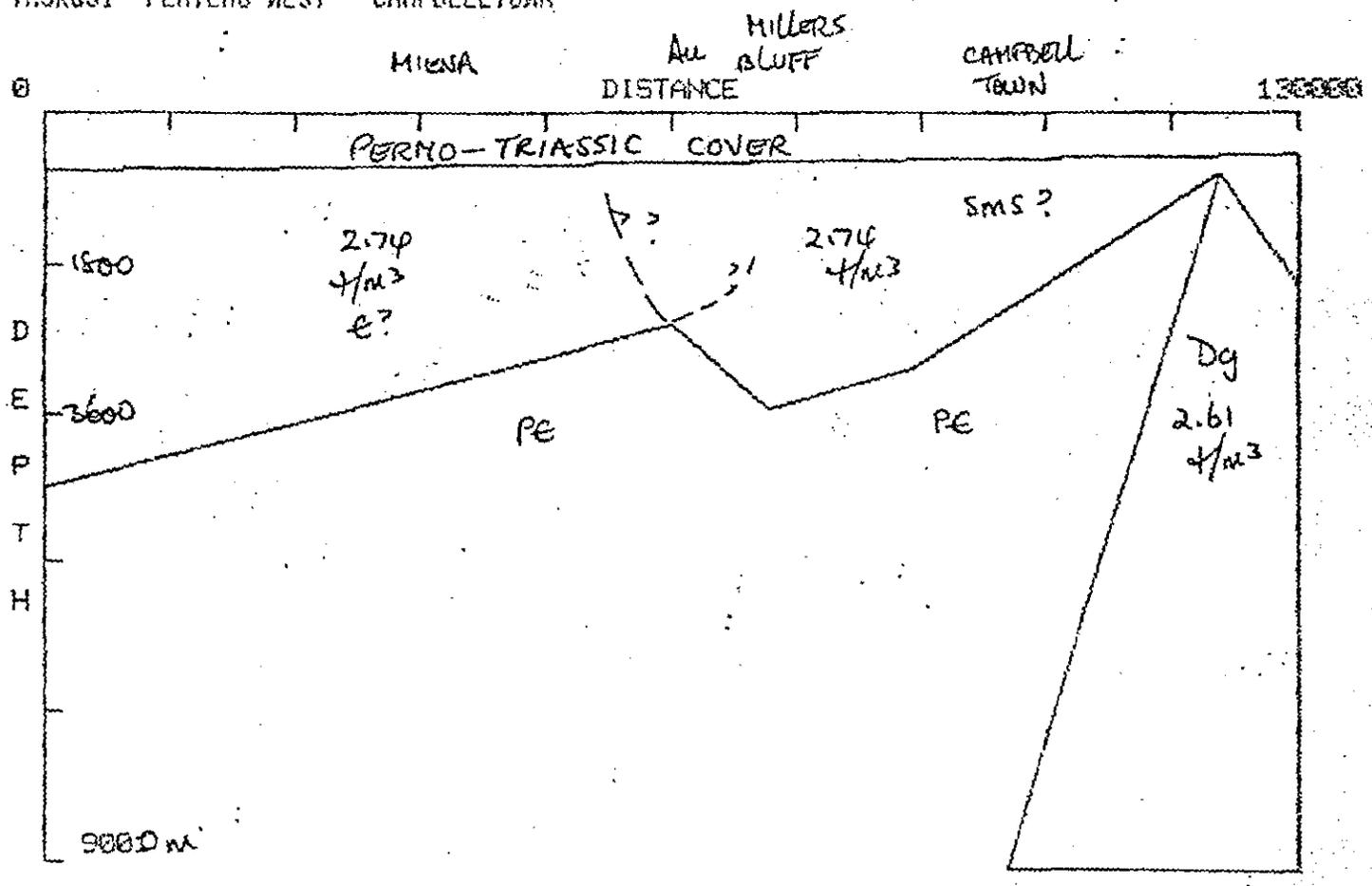


030

391033



TASRG31 PLATERU WEST - CAMPBELLTOWN



LEAMAN GEOPHYSICS
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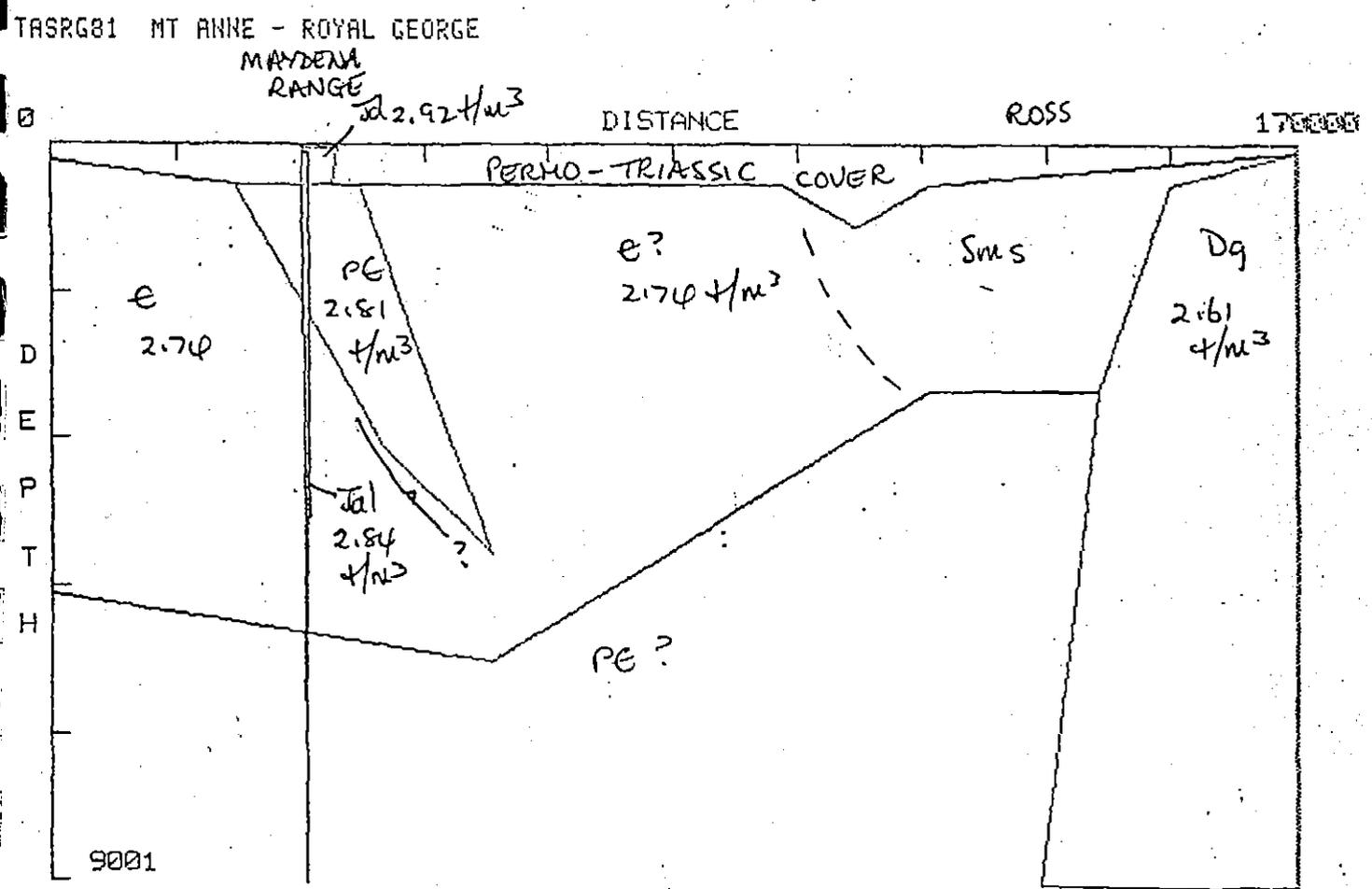
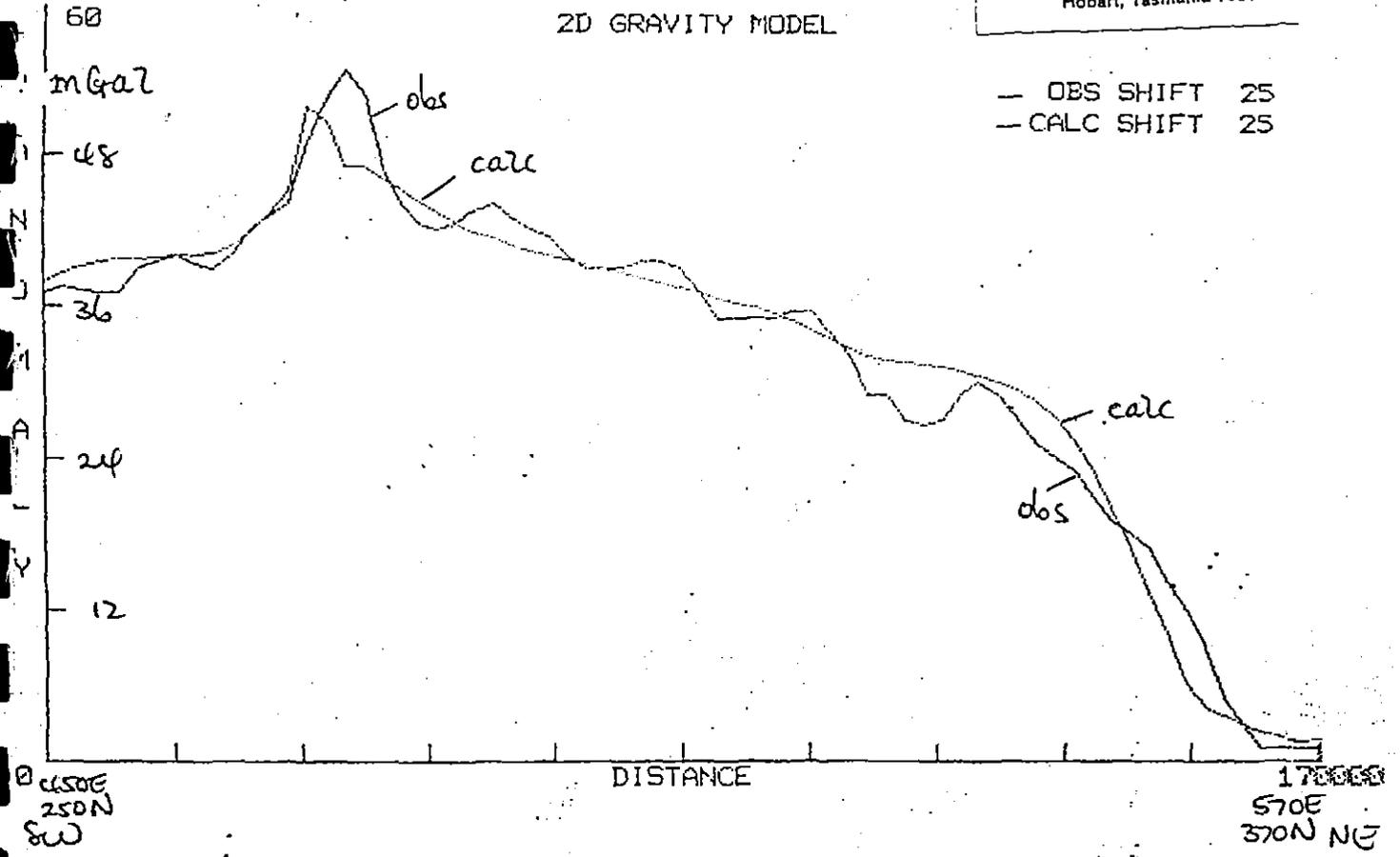
GRAVITY MODEL LINE 31

FIGURE 19

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Hobart, Tasmania 7001

2D GRAVITY MODEL

- OBS SHIFT 25
- CALC SHIFT 25



GRAVITY MODEL LINE 81

FIGURE 20

030

391036

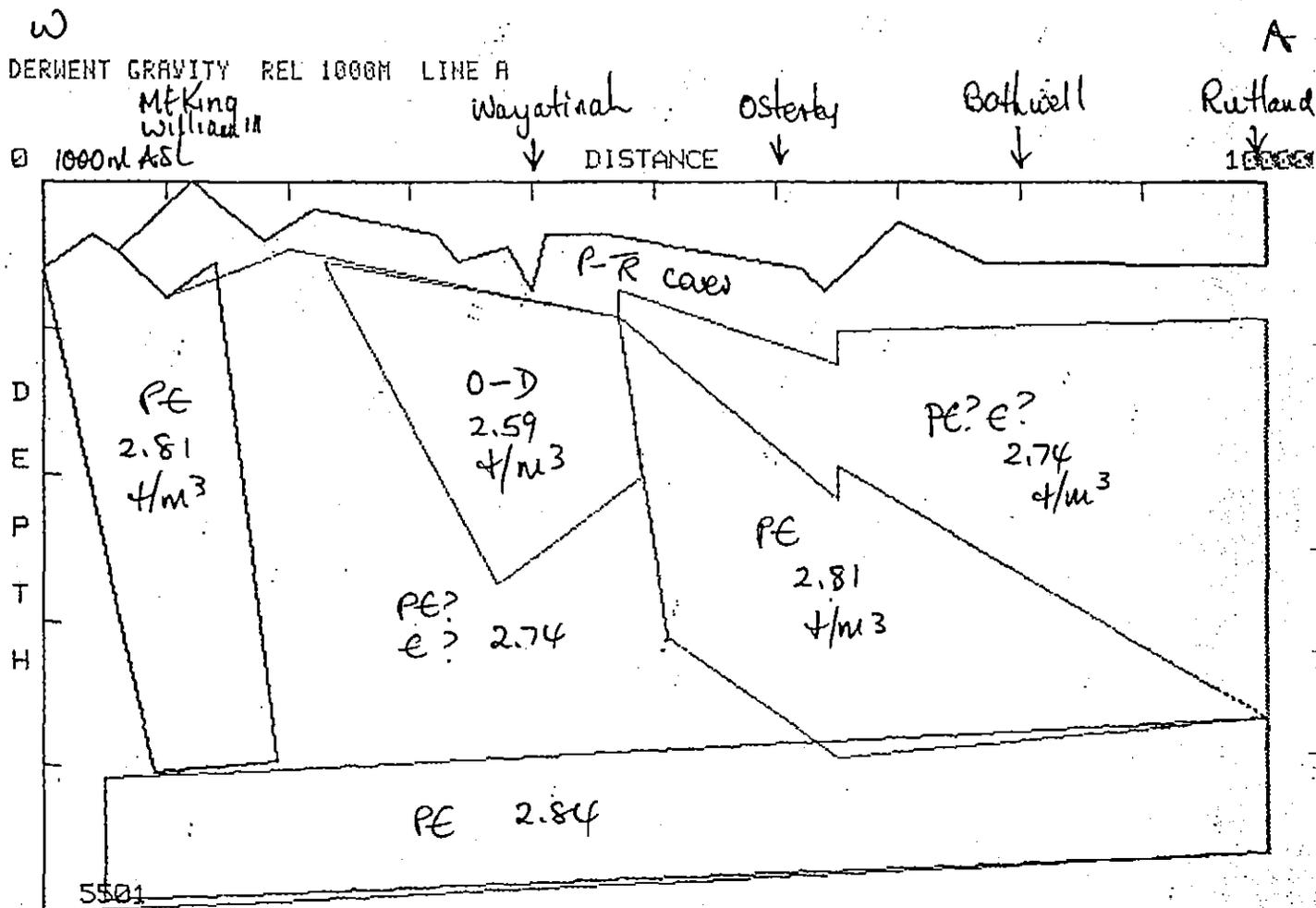
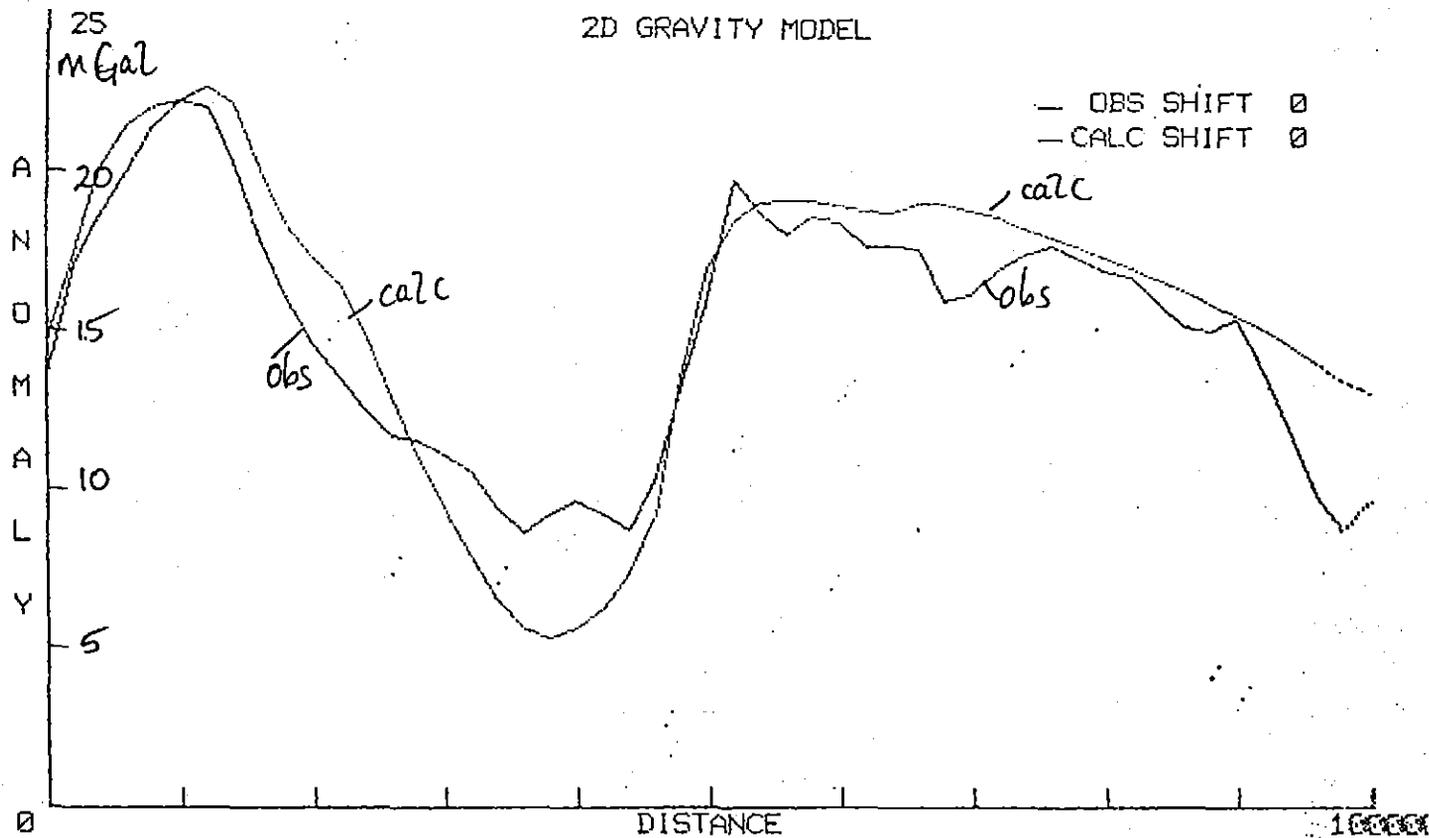
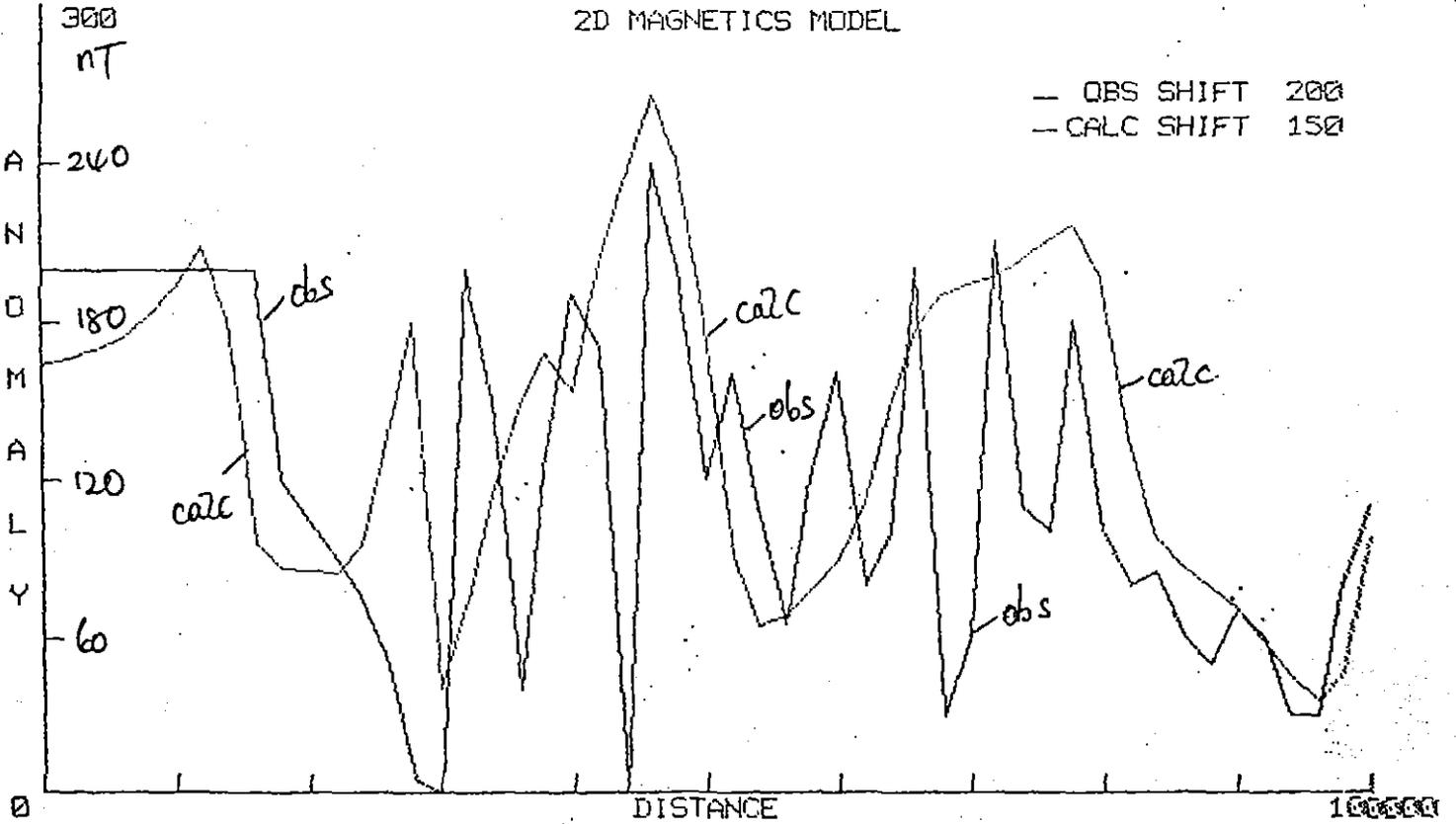


FIGURE 22

2D MAGNETICS MODEL

- OBS SHIFT 200
- CALC SHIFT 150



DERWENT MAGNETICS 1600M LINE A

1600m ASL

Wyatinalah

Bathwell

DISTANCE

100000

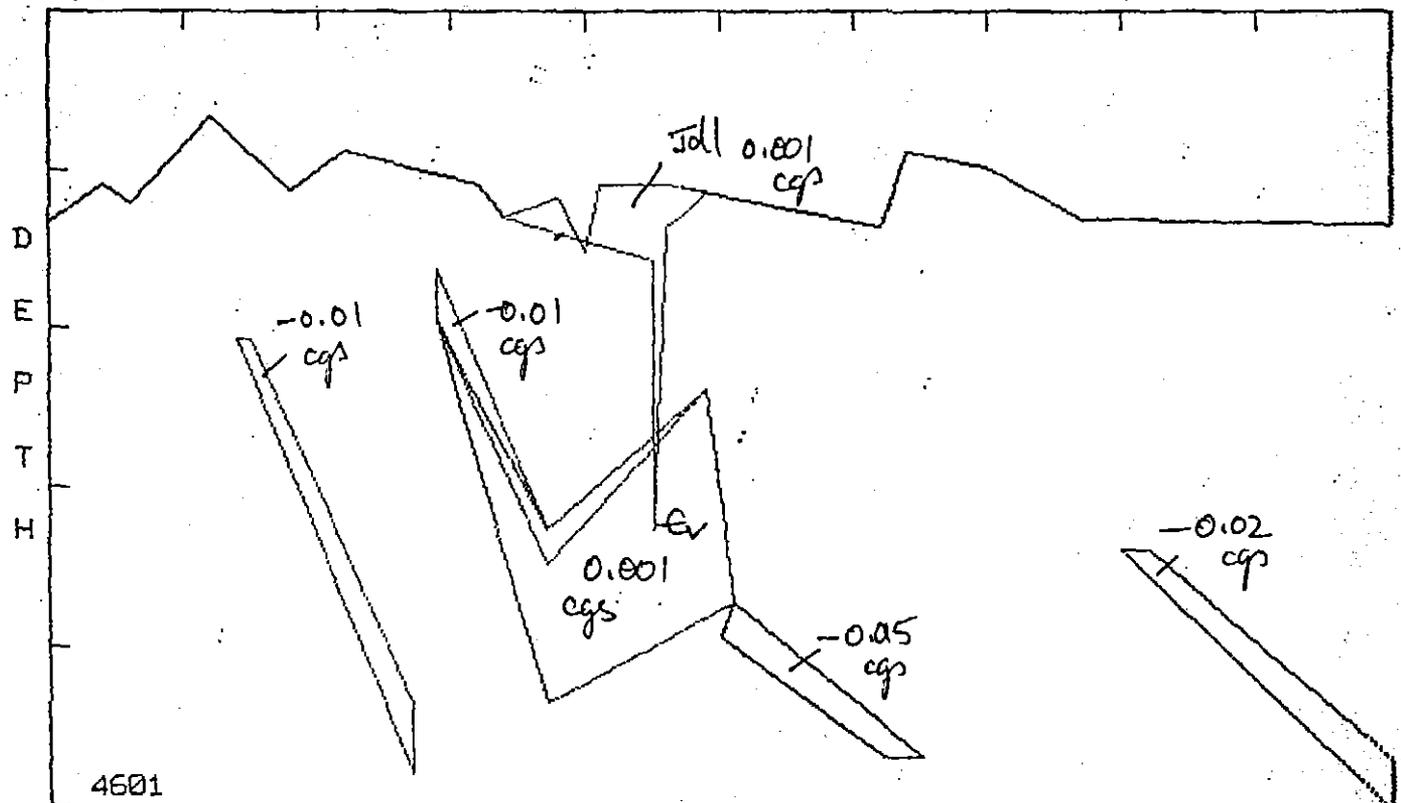
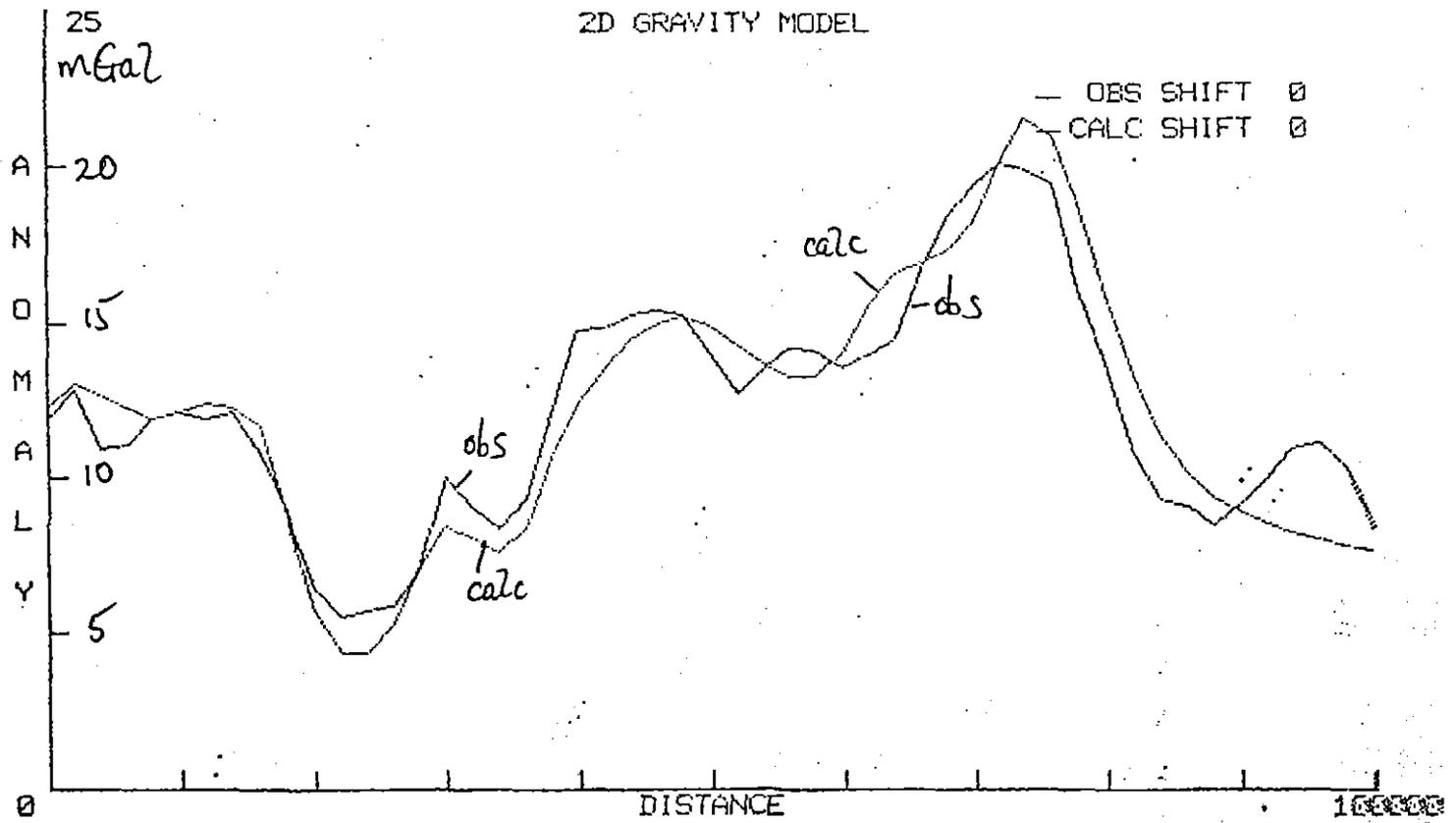


FIGURE 23

DERWENT GRAVITY 1000M LINE B

LINE PARAMETERS - ORIGIN,LIMIT,INCR : 0 100000 2000



8W

DERWENT GRAVITY 1000M LINE B

0 1000m ASL

Wylids Crags

Ouse

Apsley

DISTANCE

100000

ME

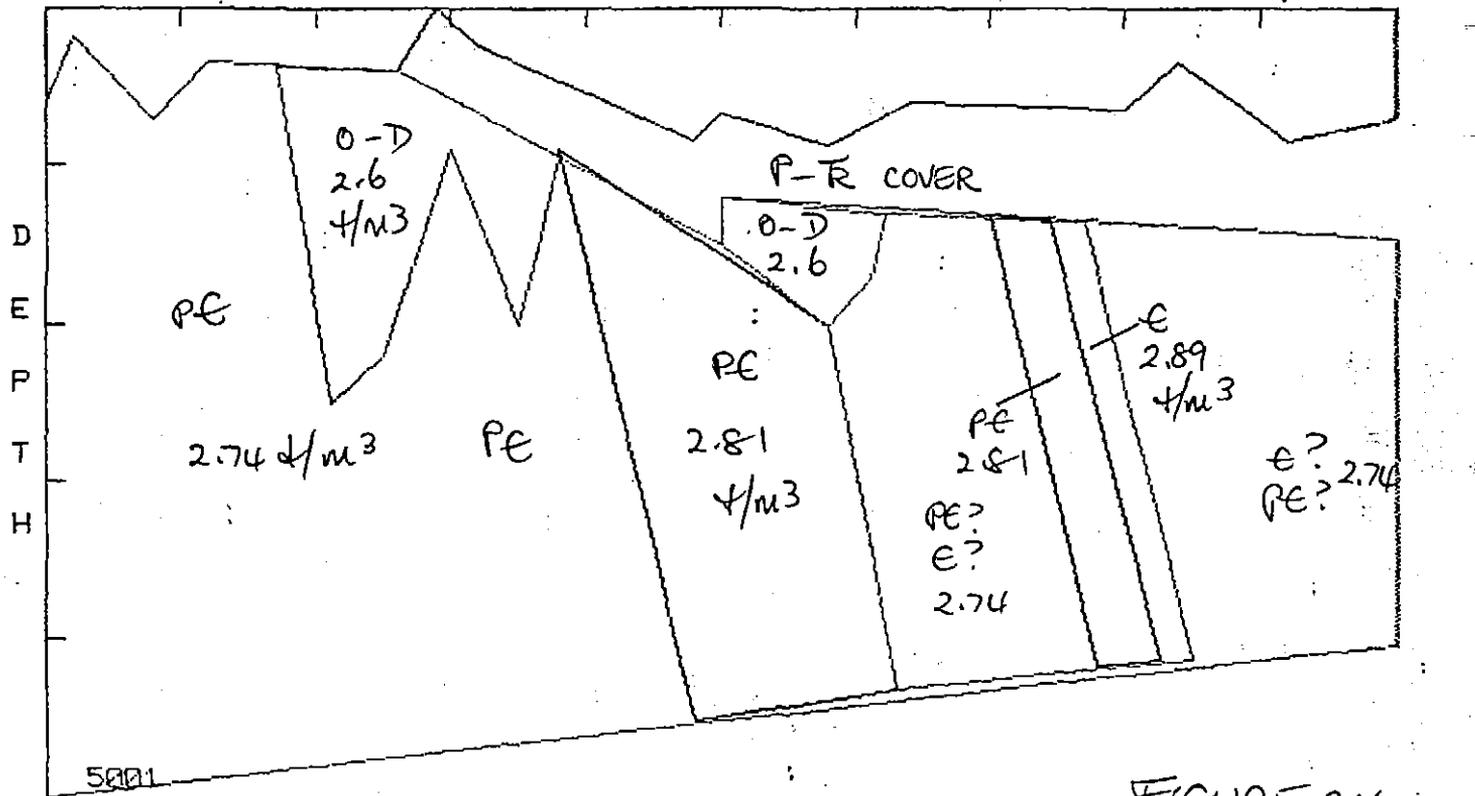
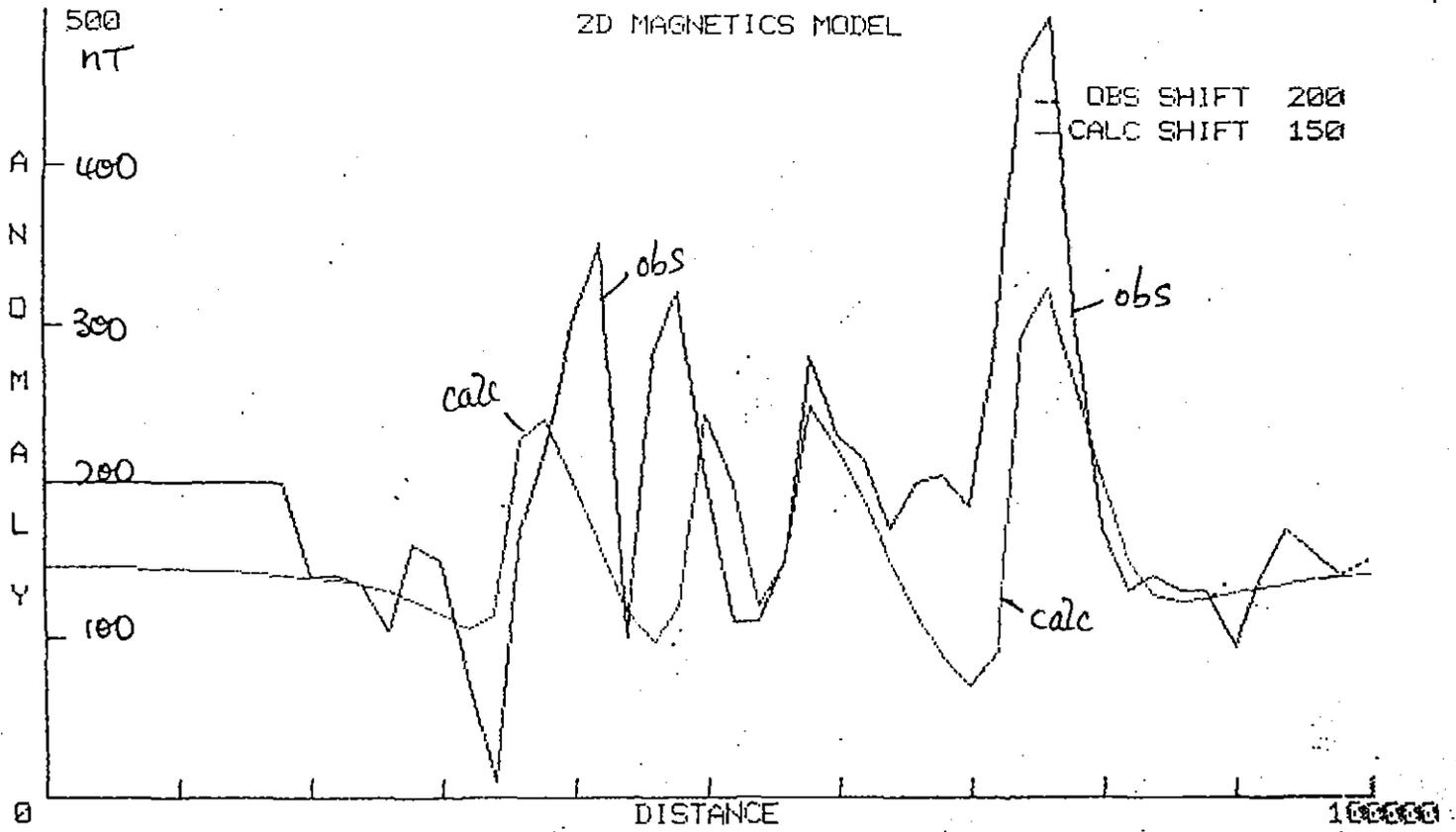


FIGURE 24

LINE PARAMETERS - ORIGIN, LIMIT, INCR : 0 100000 2000



DERWENT MAGNETICS 1600M LINE B

1600M ASL

wylds
Craig

ouse

Apsley

DISTANCE 100000

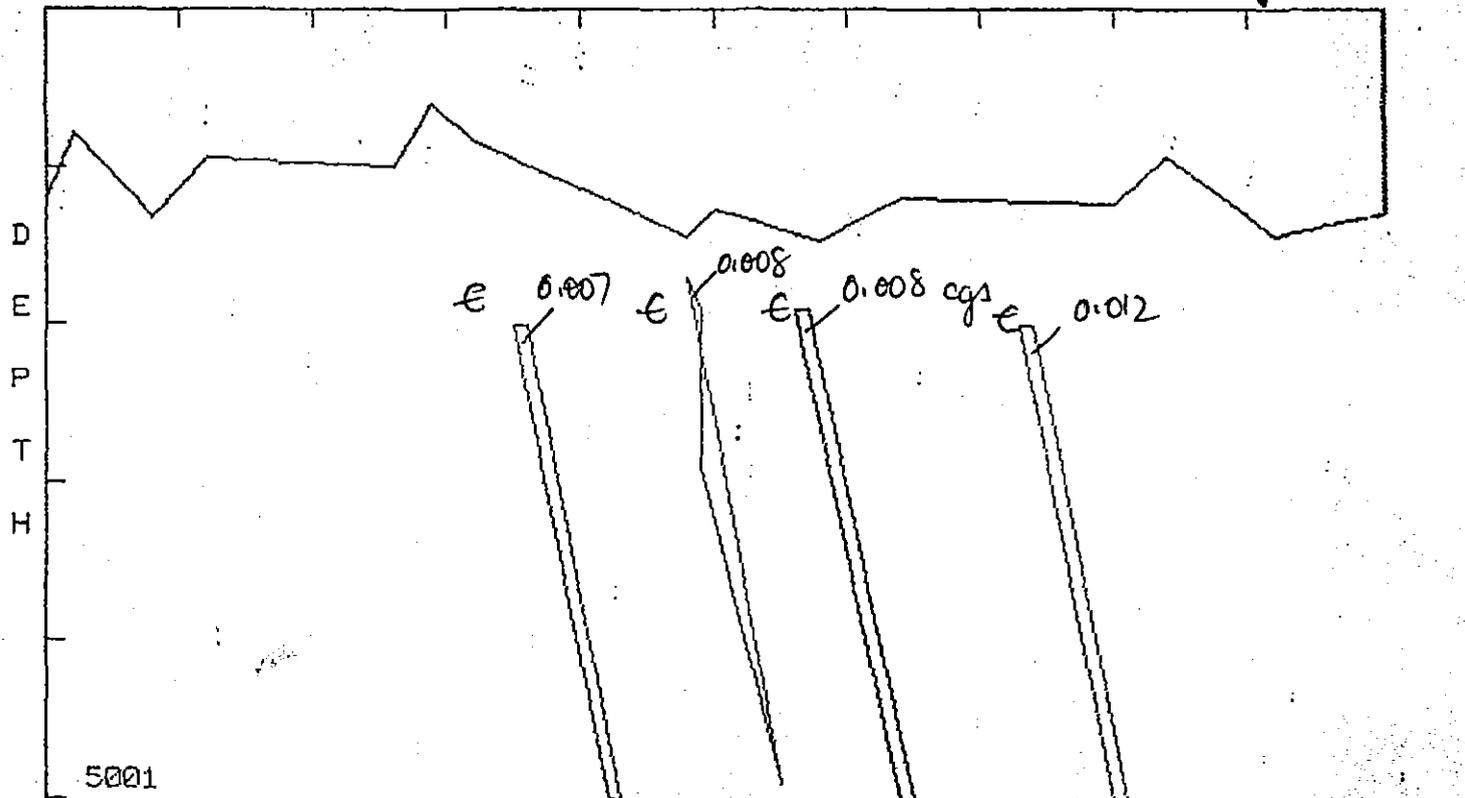


FIGURE 25

039

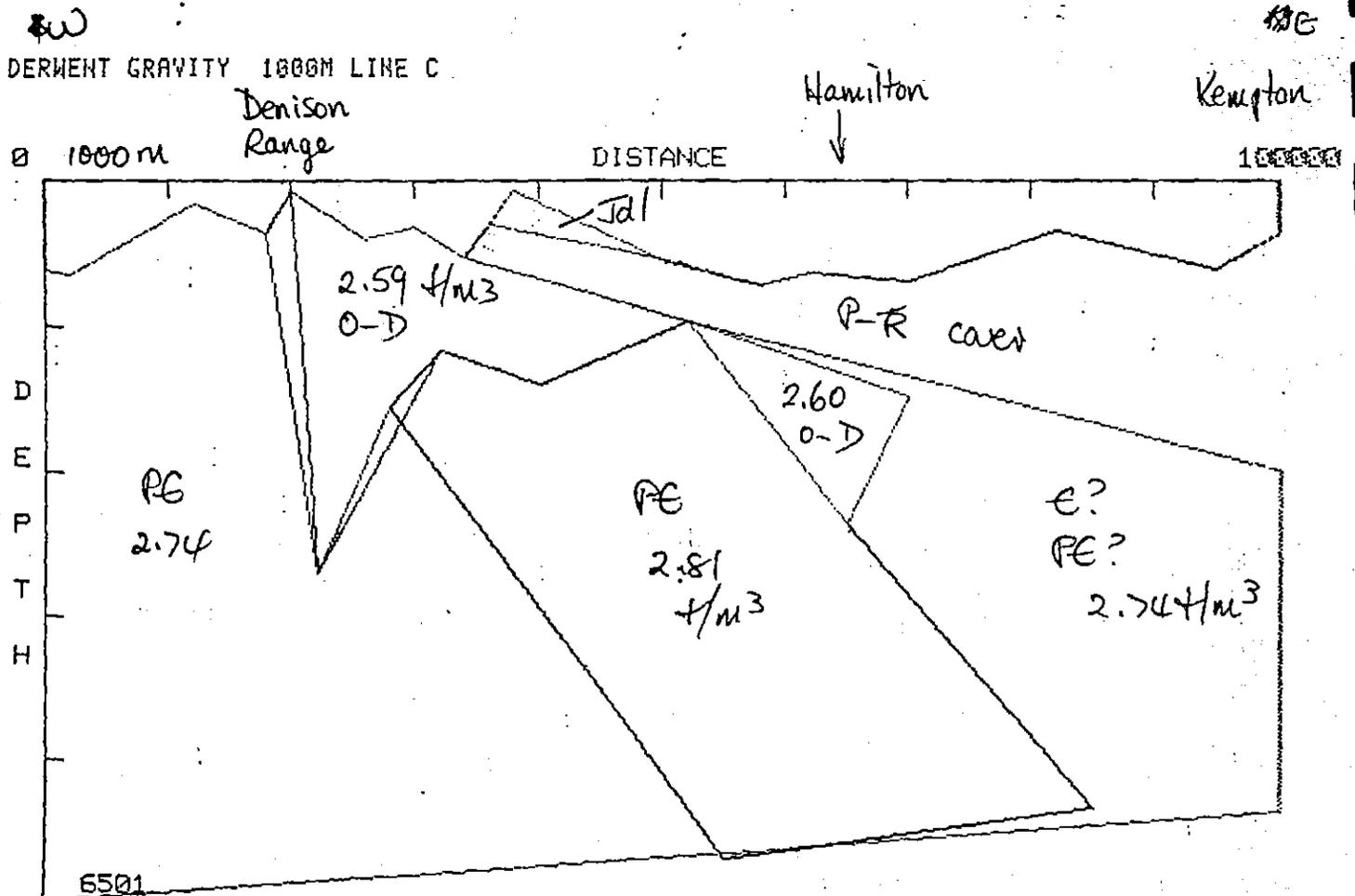
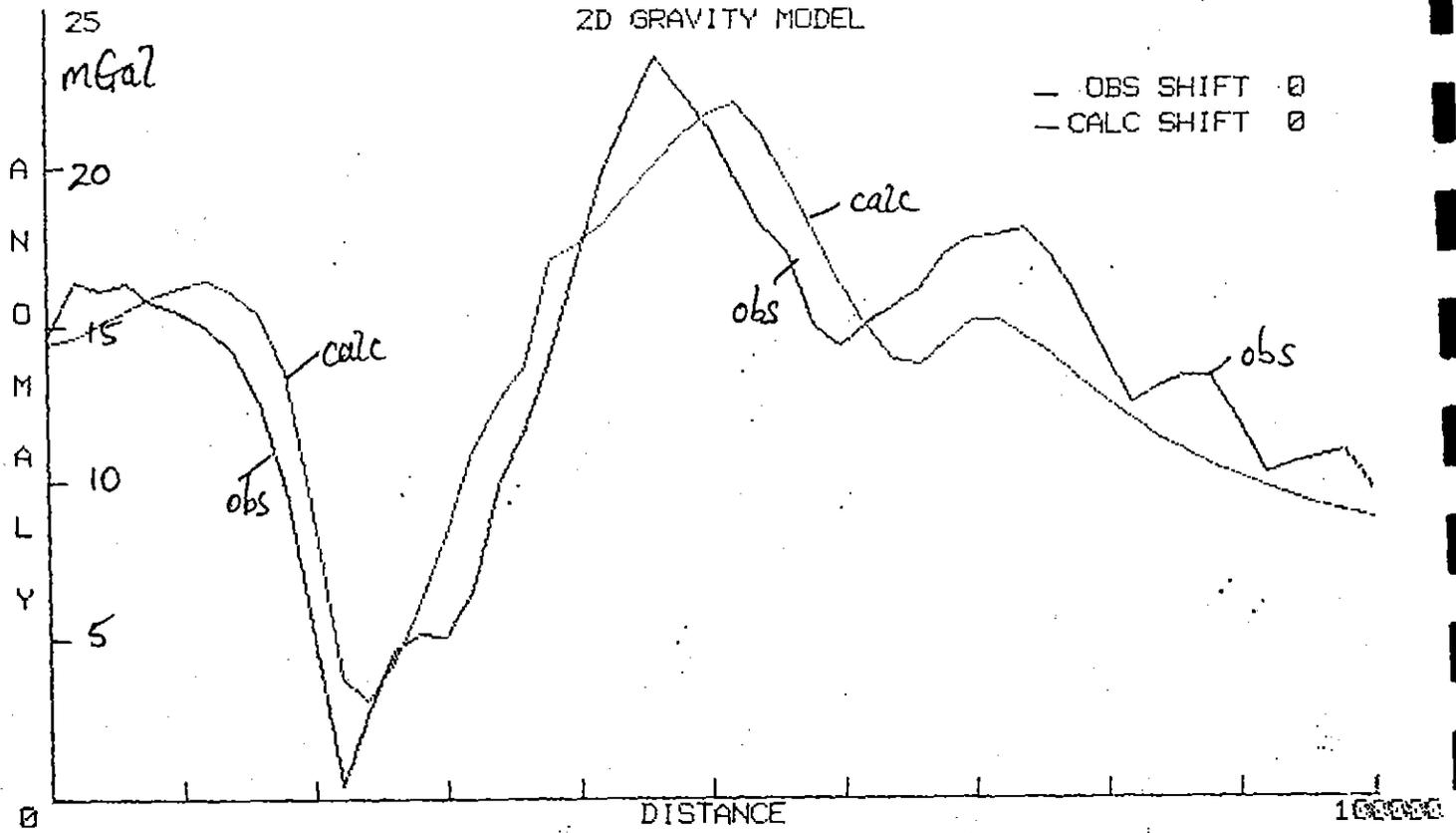


FIGURE 26

INTENSITY INCLINATION DECLINATION OBS LEVEL LINE DIRECTION
 62200.0 -71.0 13.0 0.0 90.0

391041

LINE PARAMETERS - ORIGIN, LIMIT, INCR : 0 100000 2000

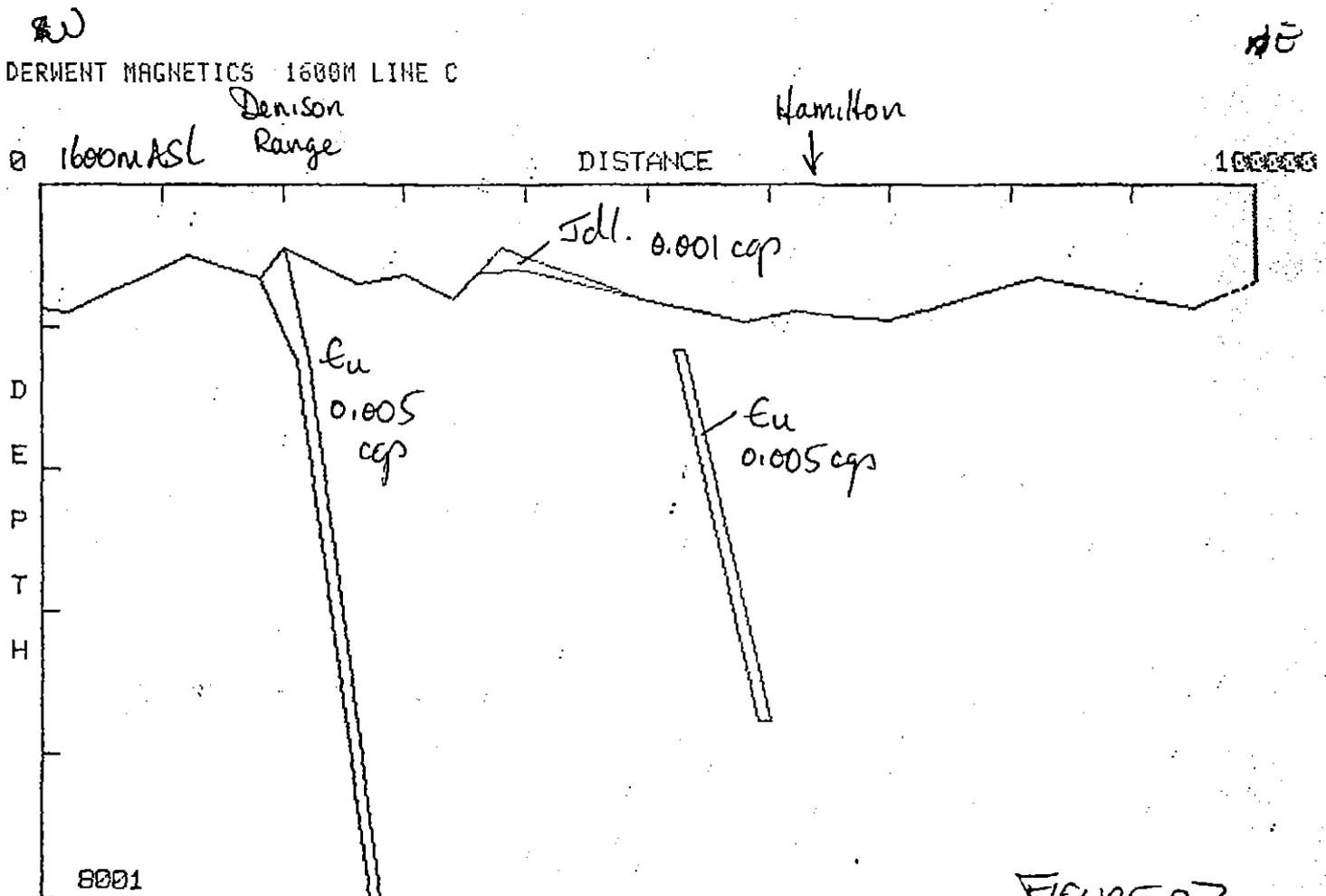
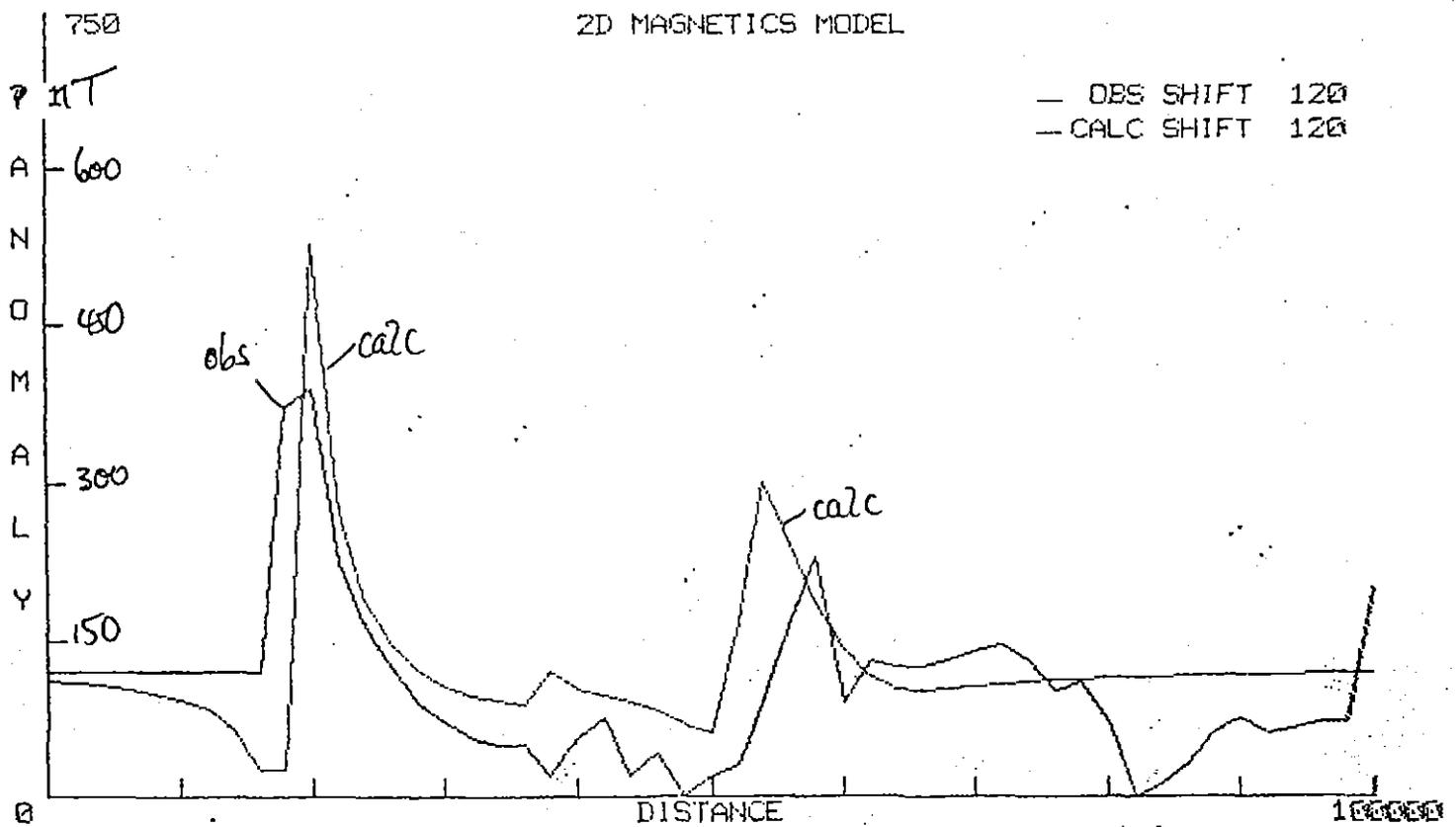
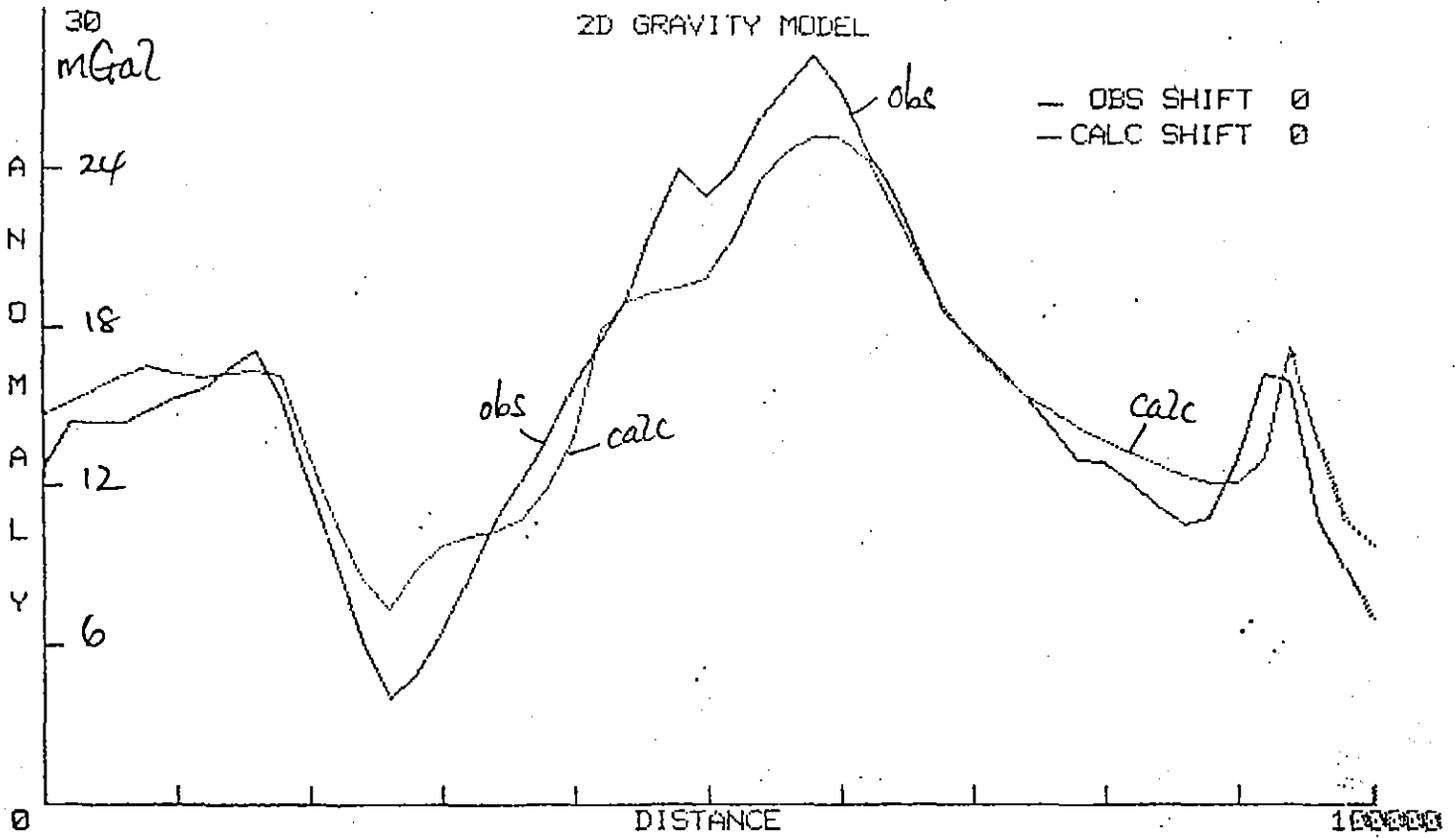


FIGURE 27



DERWENT GRAVITY 1000M LINE D

1000m ASL

MT weight

MT field

Ellendale

Bagdad

0

1000000

DISTANCE

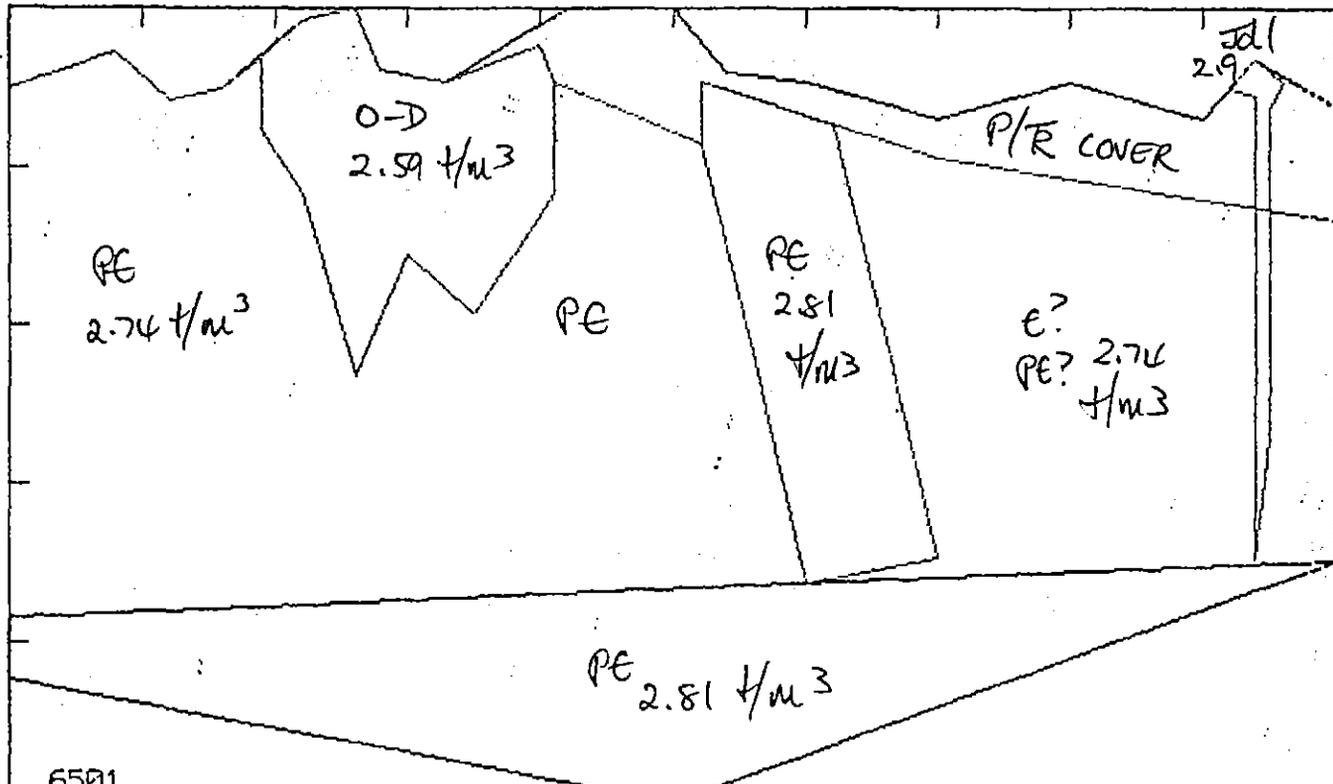
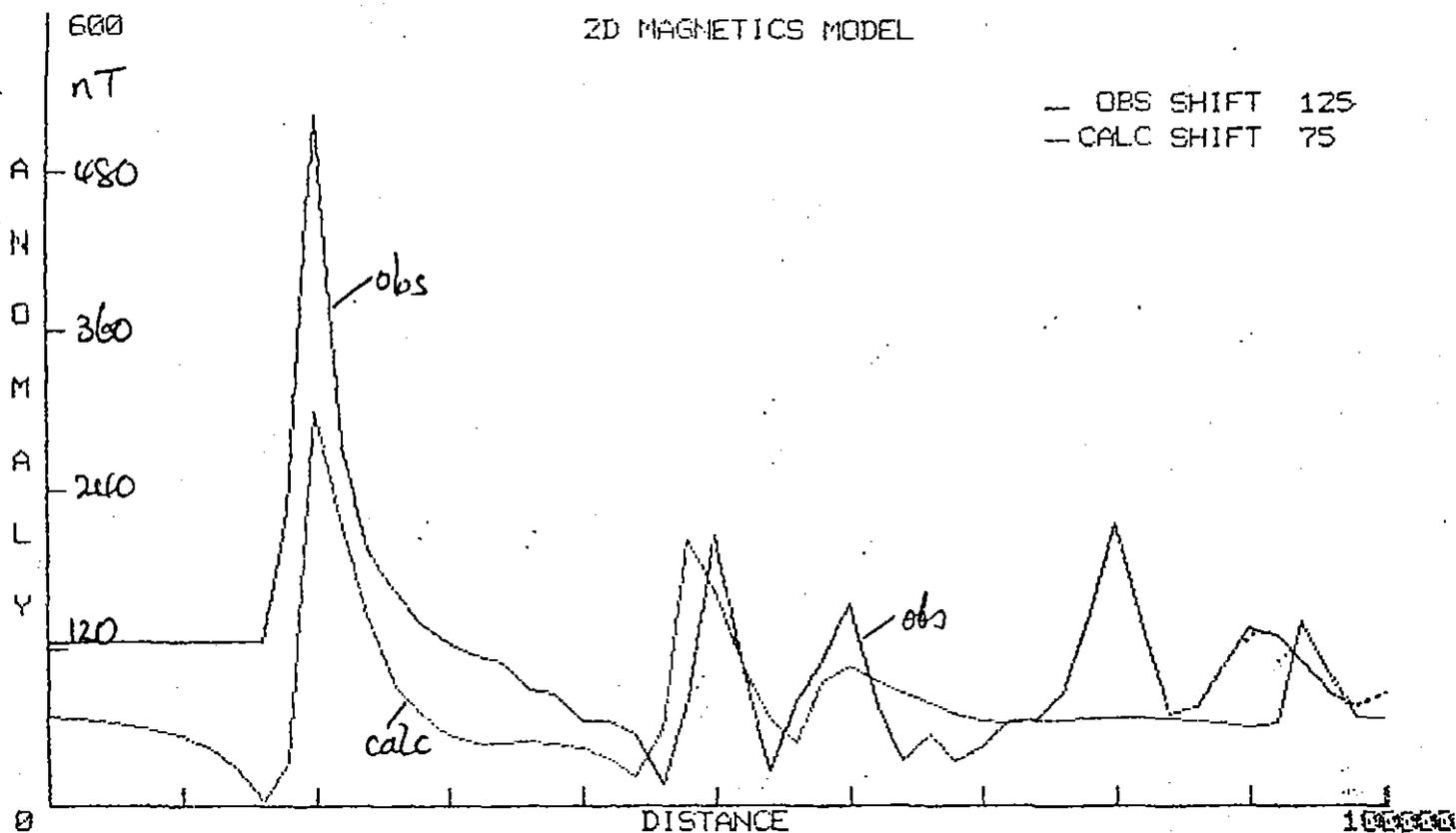


FIGURE 28

040

2D MAGNETICS MODEL



DERWENT MAGNETICS 1600M LINE D

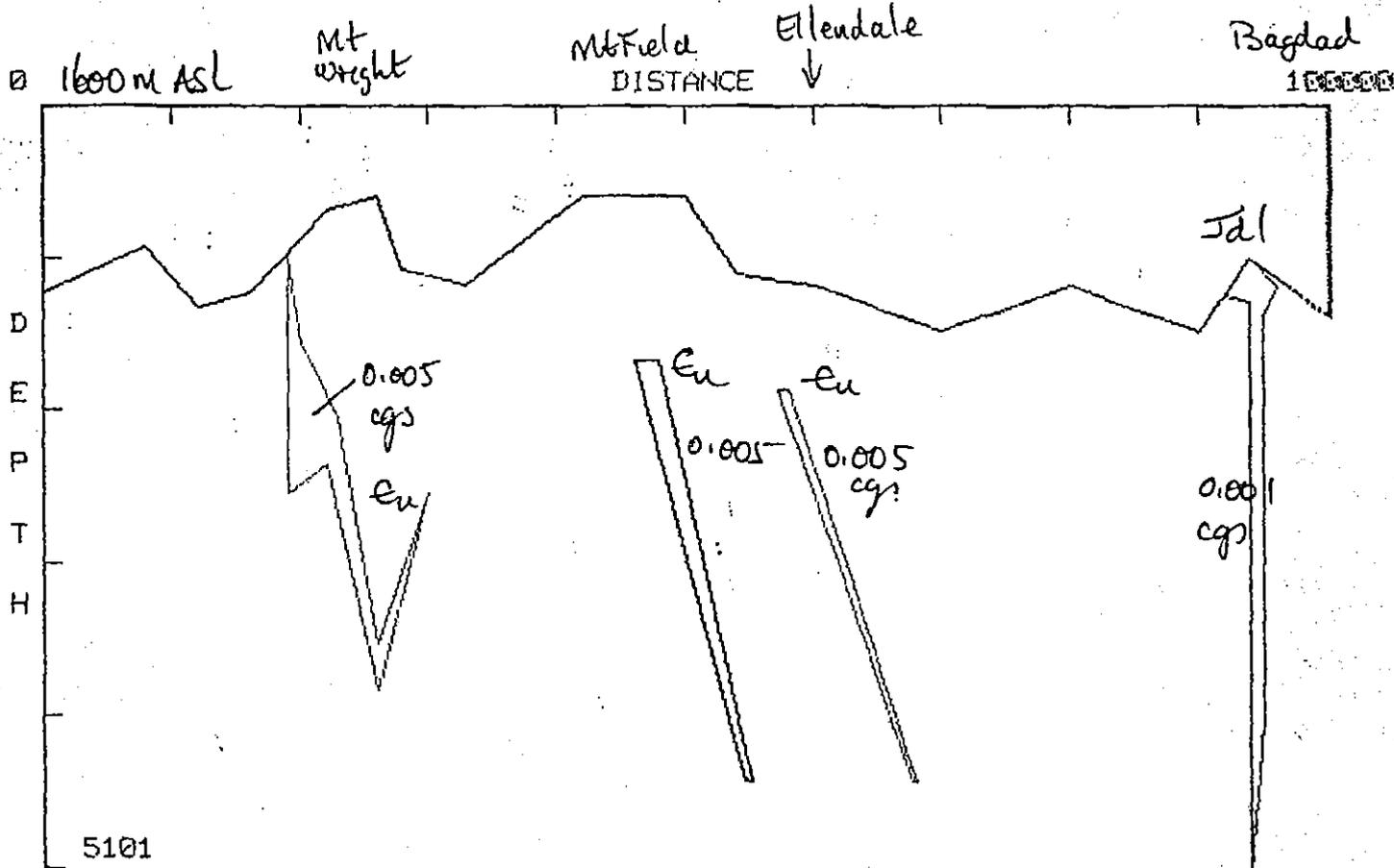
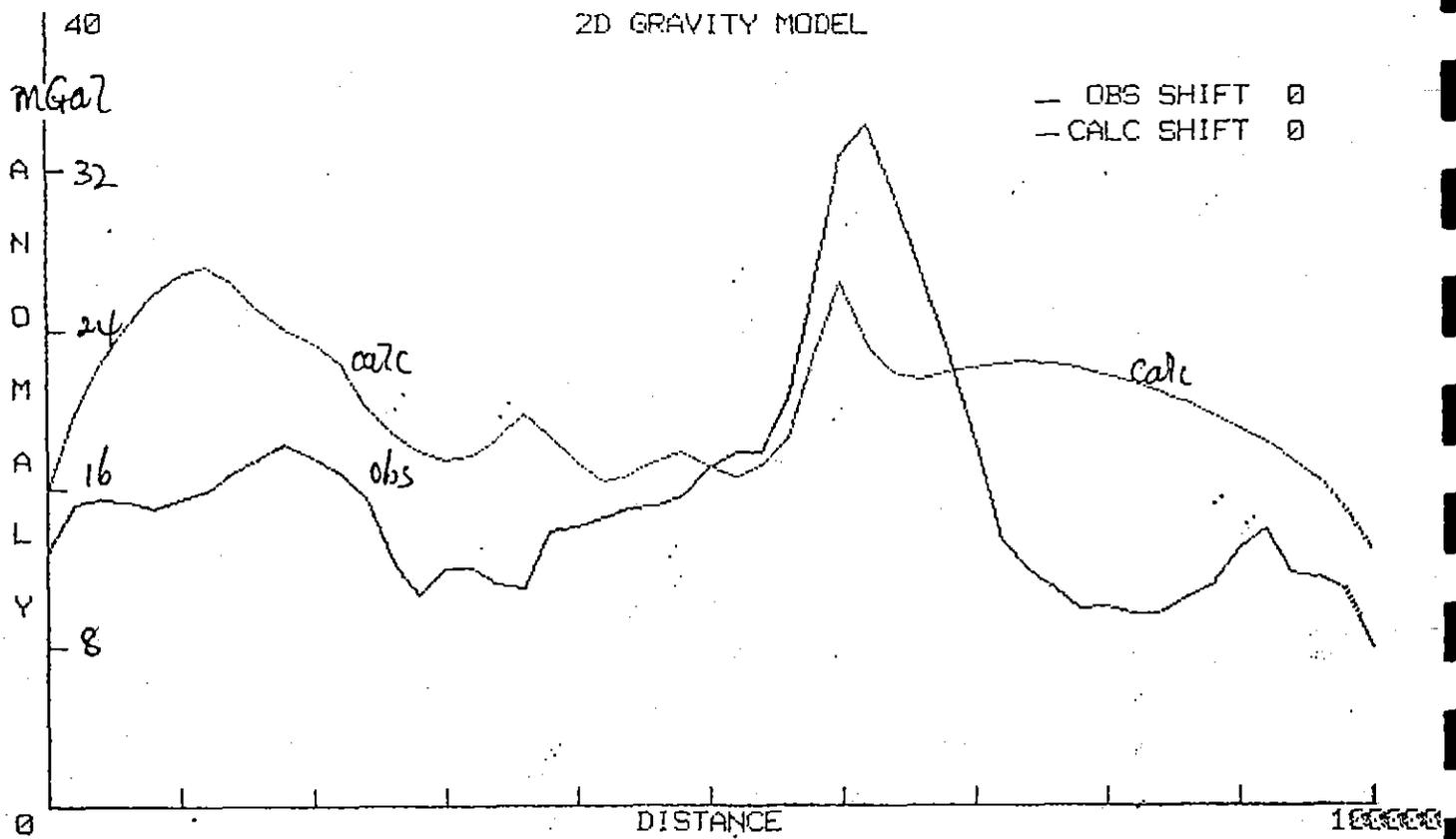


FIGURE 29

LINE PARAMETERS - ORIGIN, LIMIT, INCR : 0 100000 2000



DERWENT GRAVITY 800M LINE E

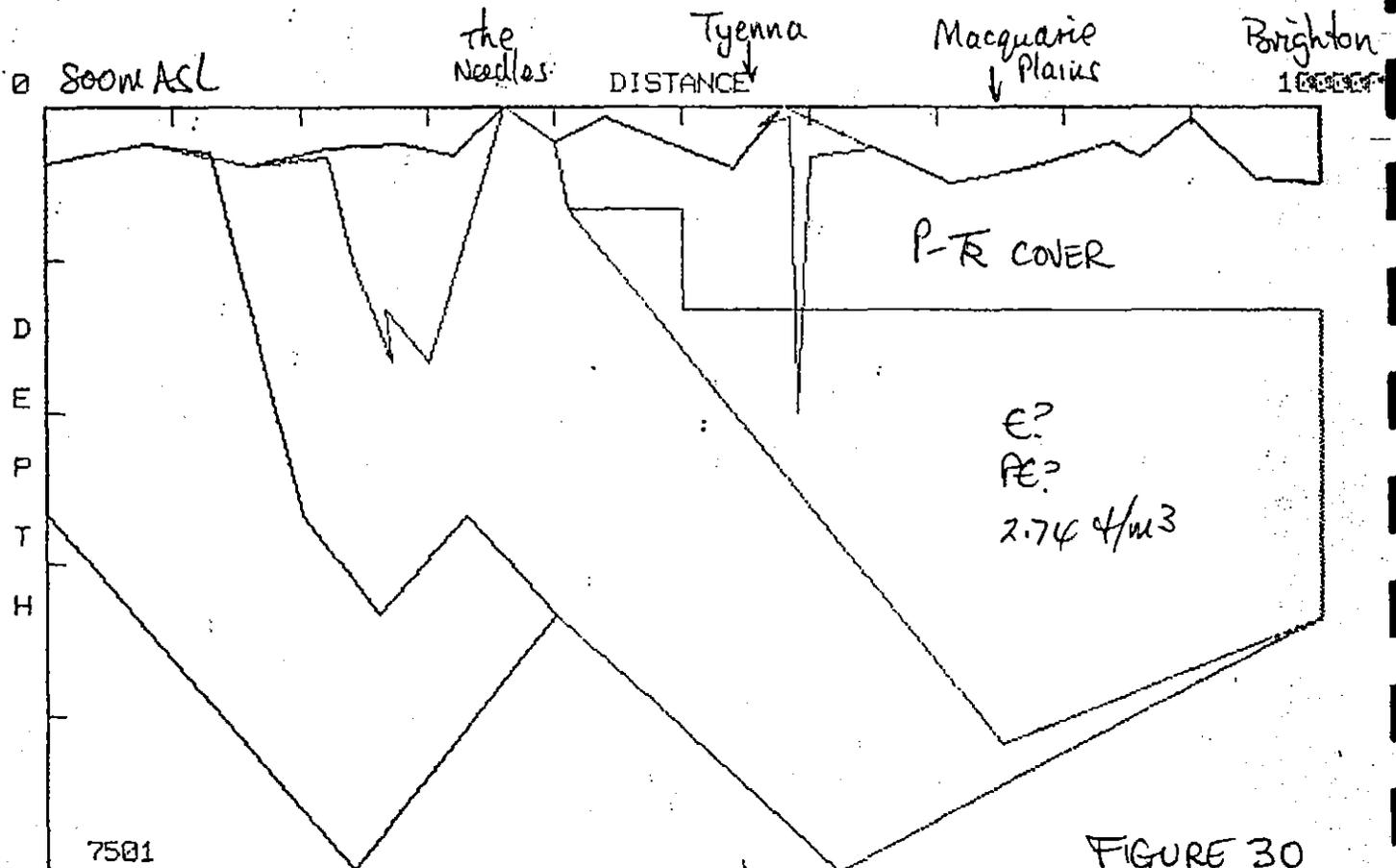


FIGURE 30

4.4	1000	30000	000	00000	1200	00000	1300	37000	4000
58500	900								
4.6	1.0	0.0	0.0	0.0	0.0				
14000	1250	16000	1300	22000	1200	28000	1800	31000	2000
25000	2300								
5.0	10.0	0.0	0.0	0.0					
40000	2000	43000	3000	46000	4000	43000	3000		

391045

LINE PARAMETERS - ORIGIN, LIMIT, INCR : 0 100000 2000

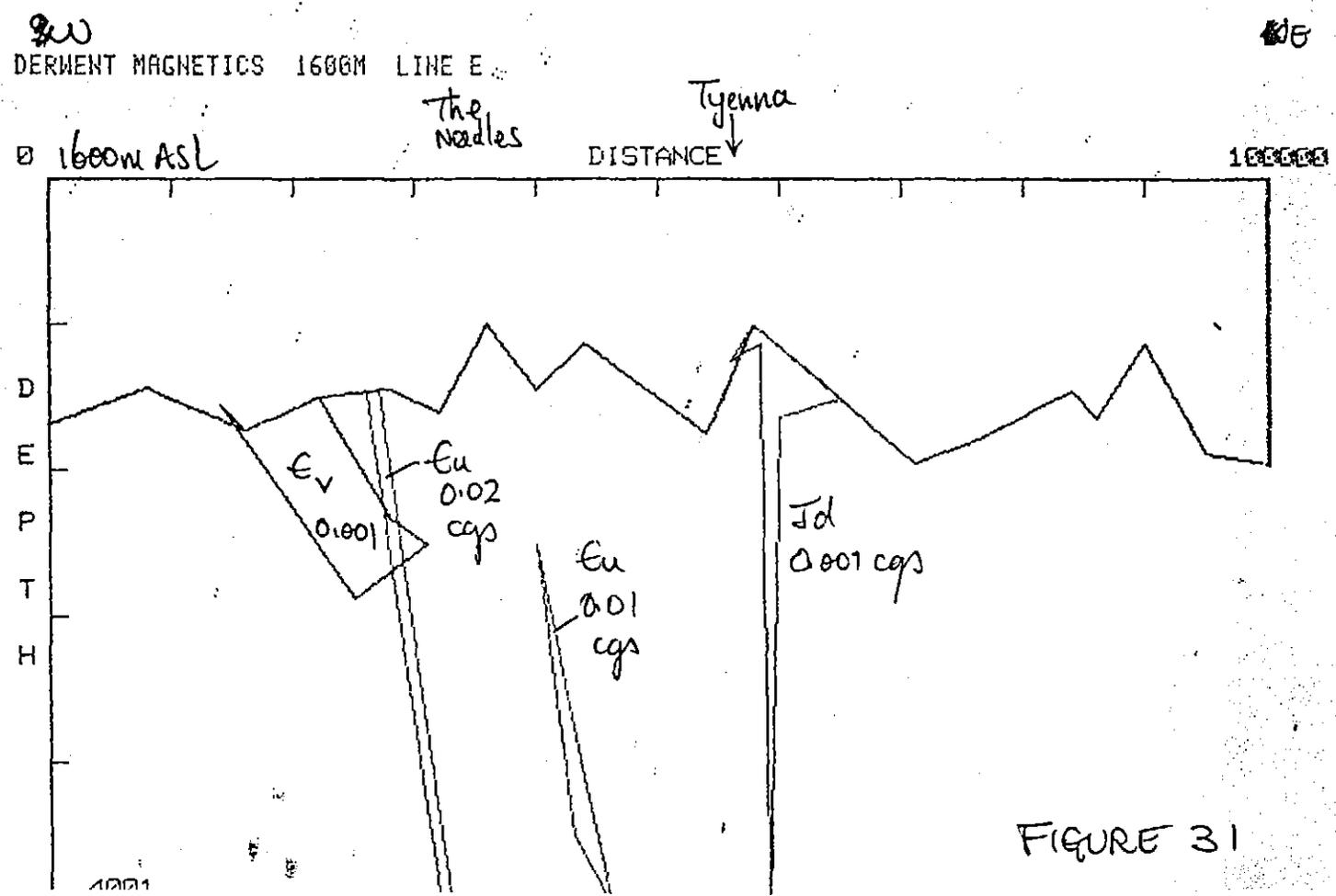
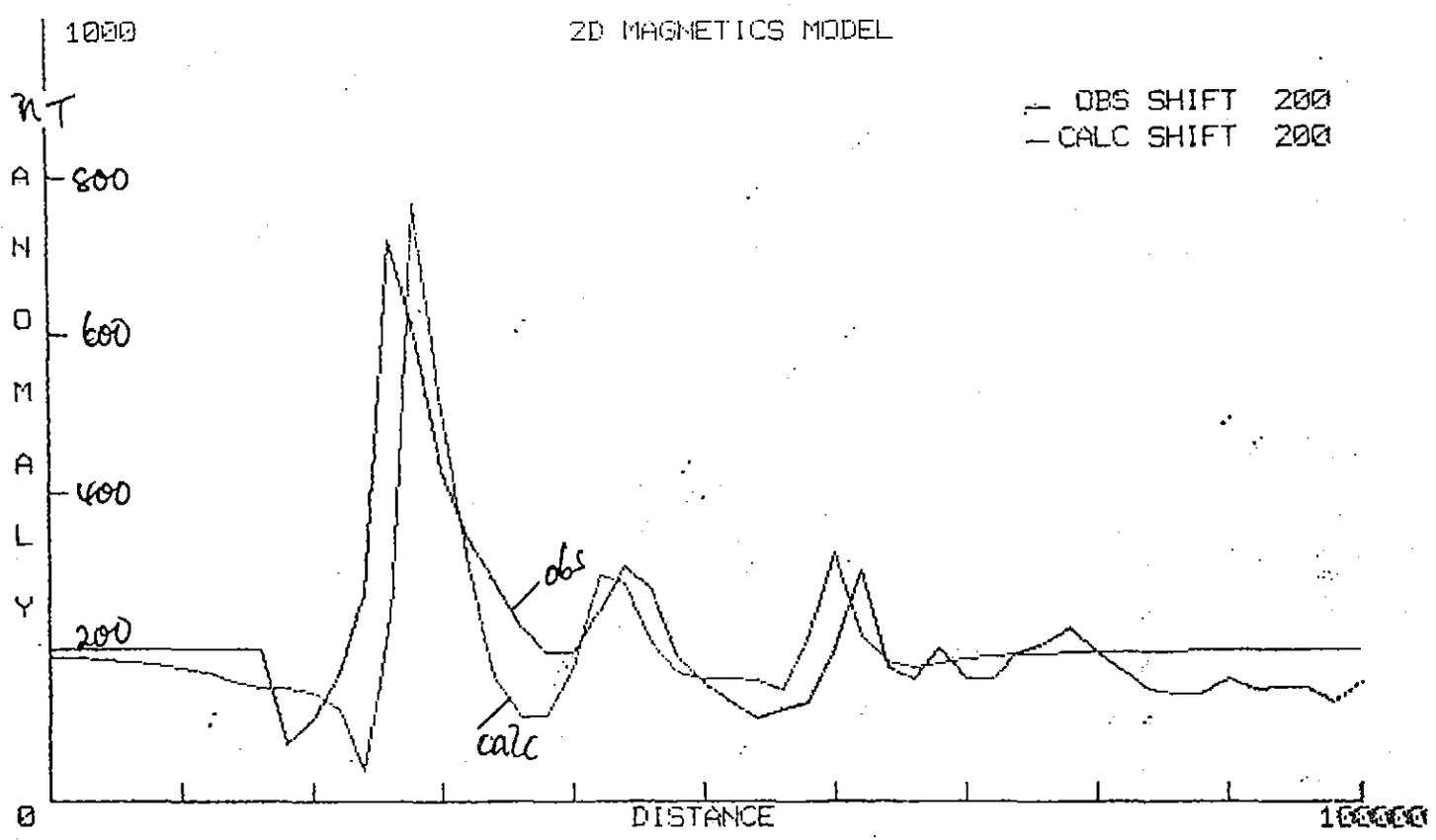
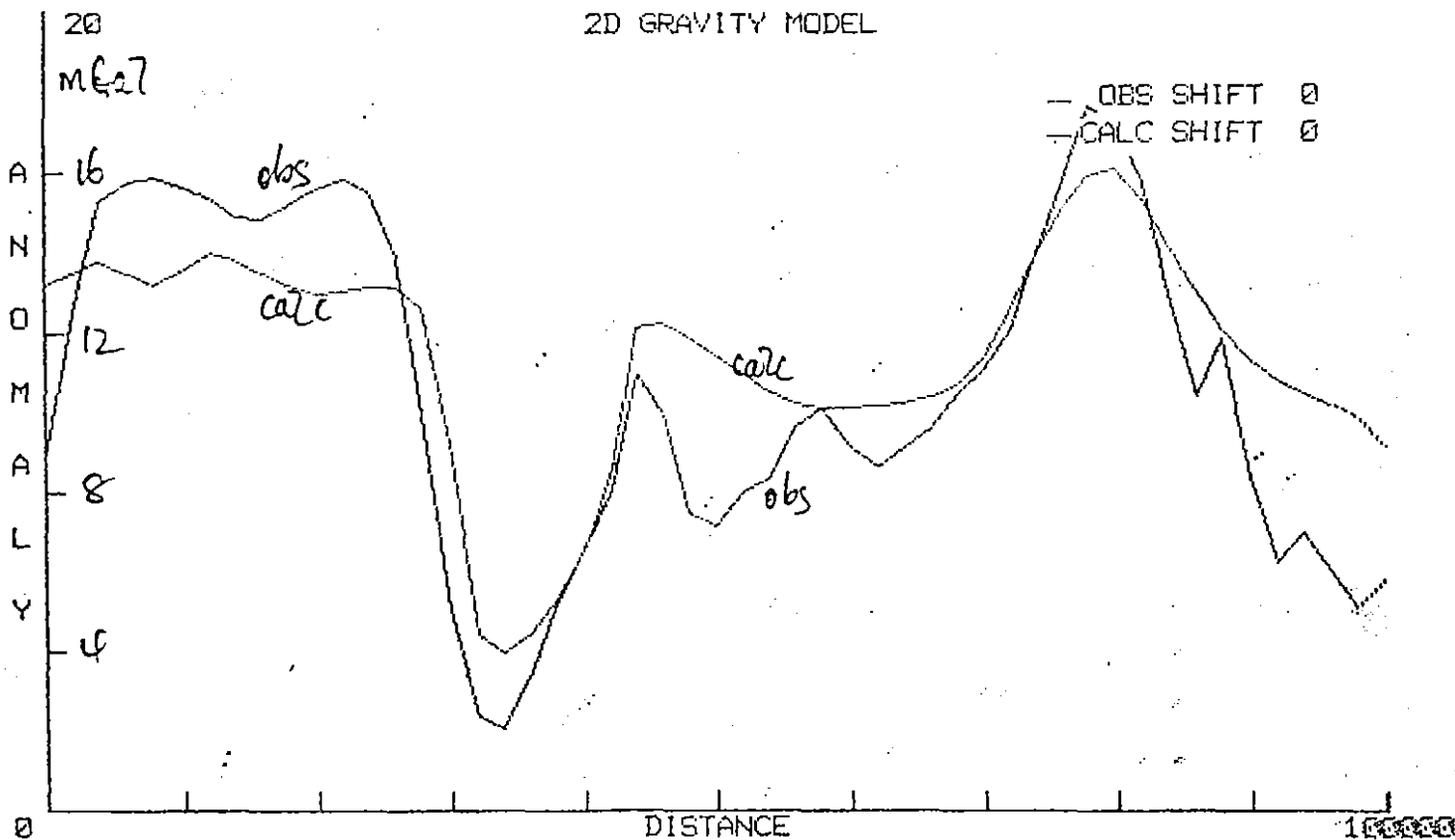


FIGURE 31

DERWENT GRAVITY 1000M LINE G

LINE PARAMETERS - ORIGIN,LIMIT,INCR : 0 100000 2000



SW NE
 DERWENT GRAVITY 1000M LINE G
 1000M ASL
 Denison Range Wylds Craig Wajatinah Steppes
 DISTANCE 100000

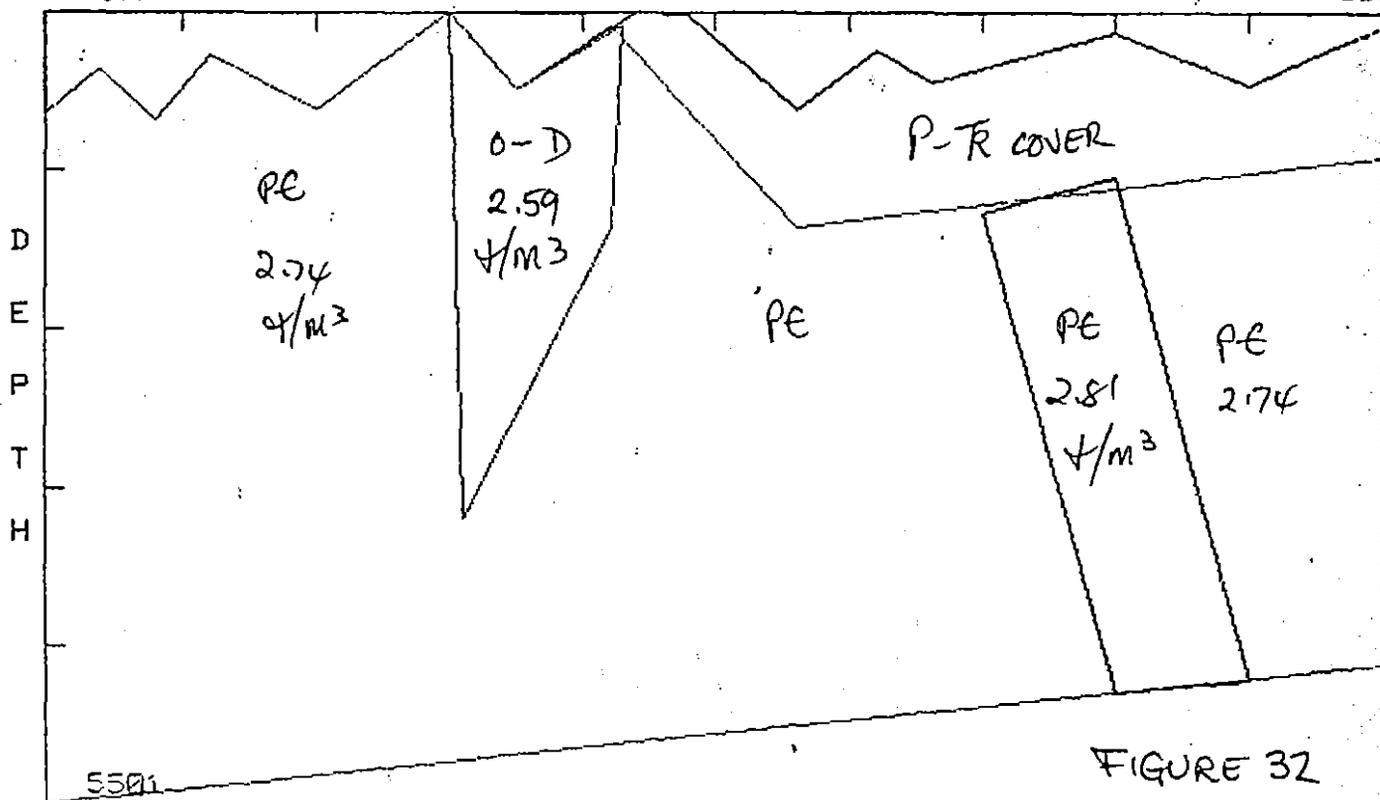
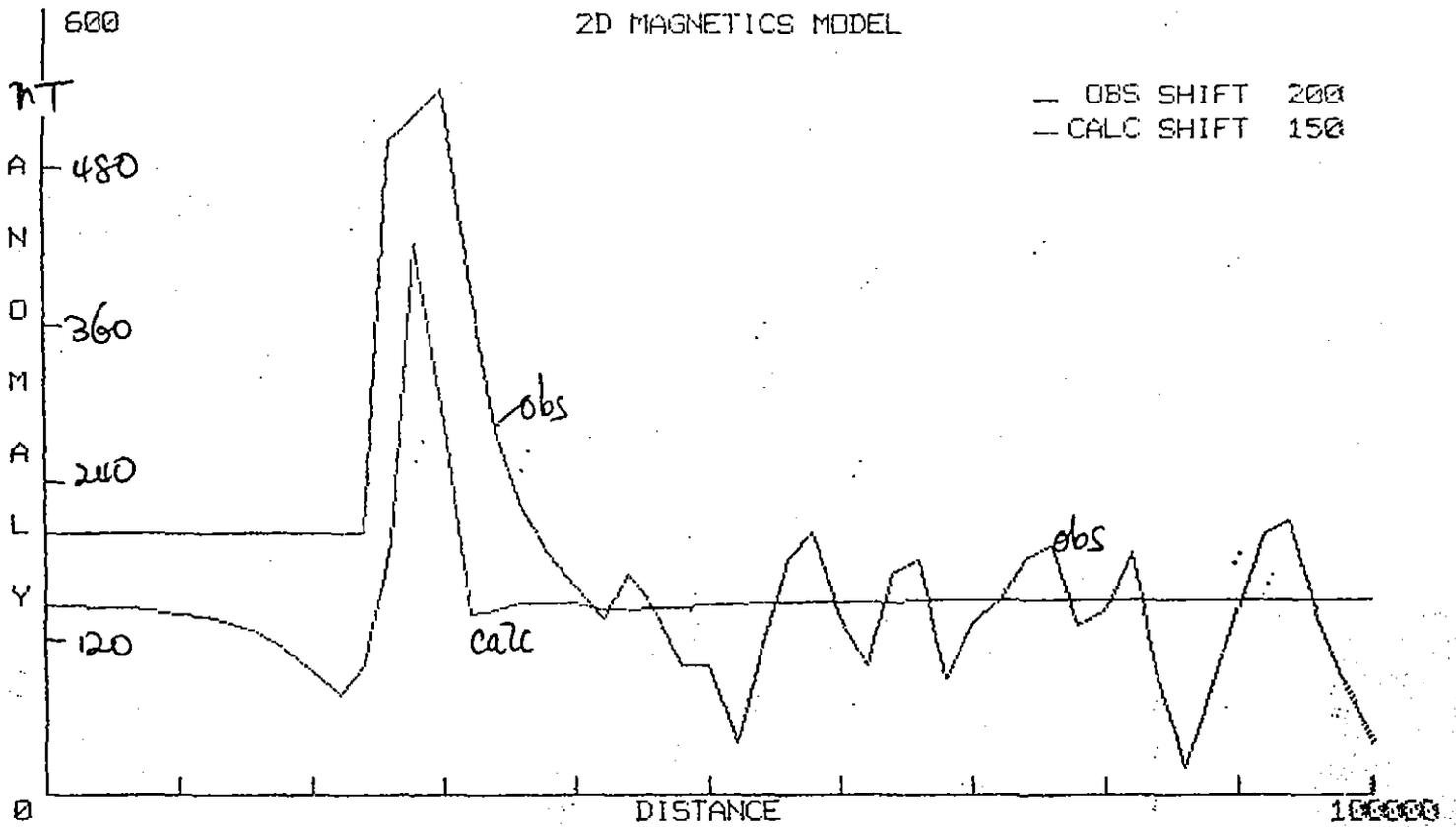


FIGURE 32

045

391047

LINE PARAMETERS - ORIGIN, LIMIT, INCR : 0 100000 2000



SW NE
DERWENT MAGNETICS 1600M LINE G
Denison Range Wylds Cratg
DISTANCE 100000

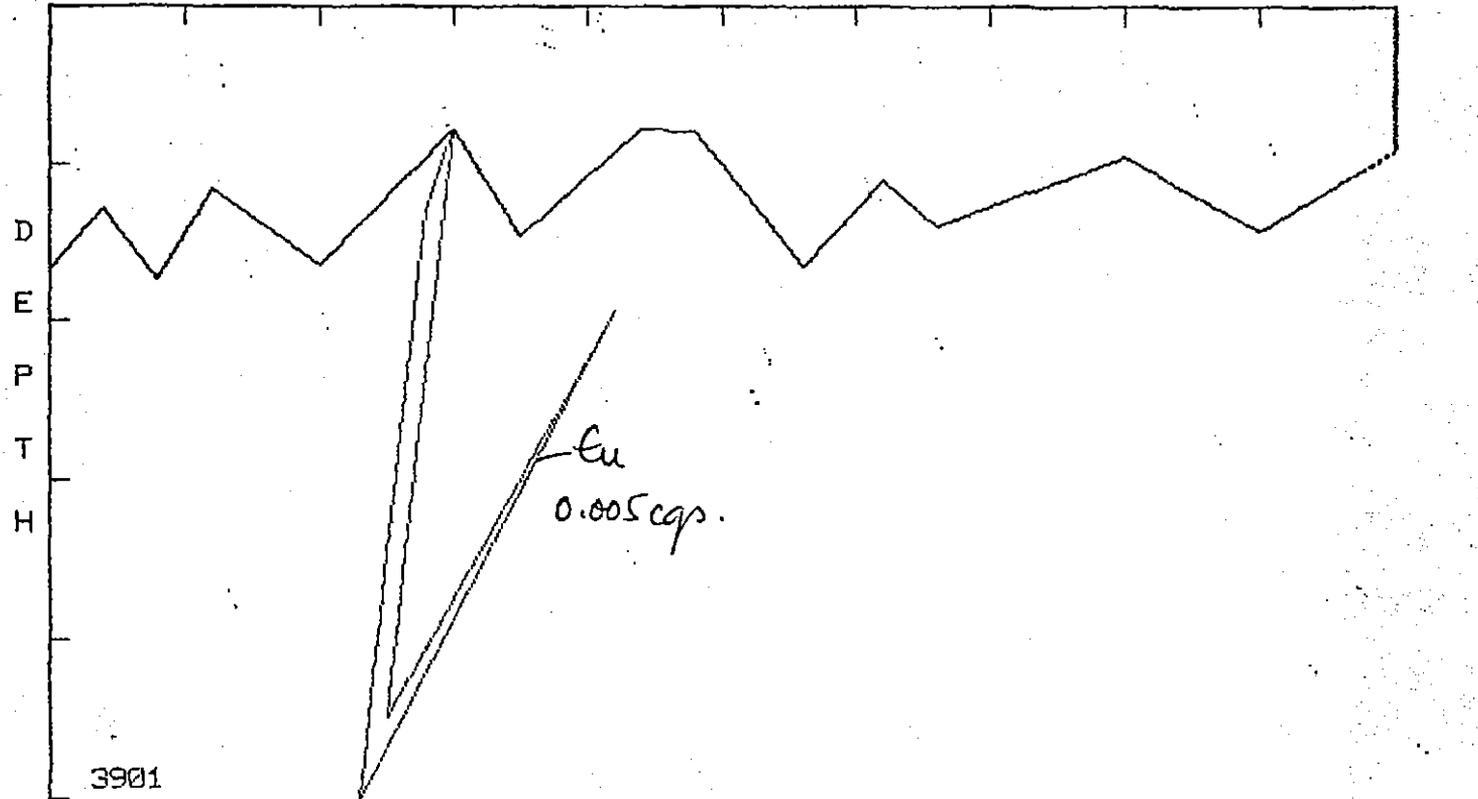


FIGURE 33

041

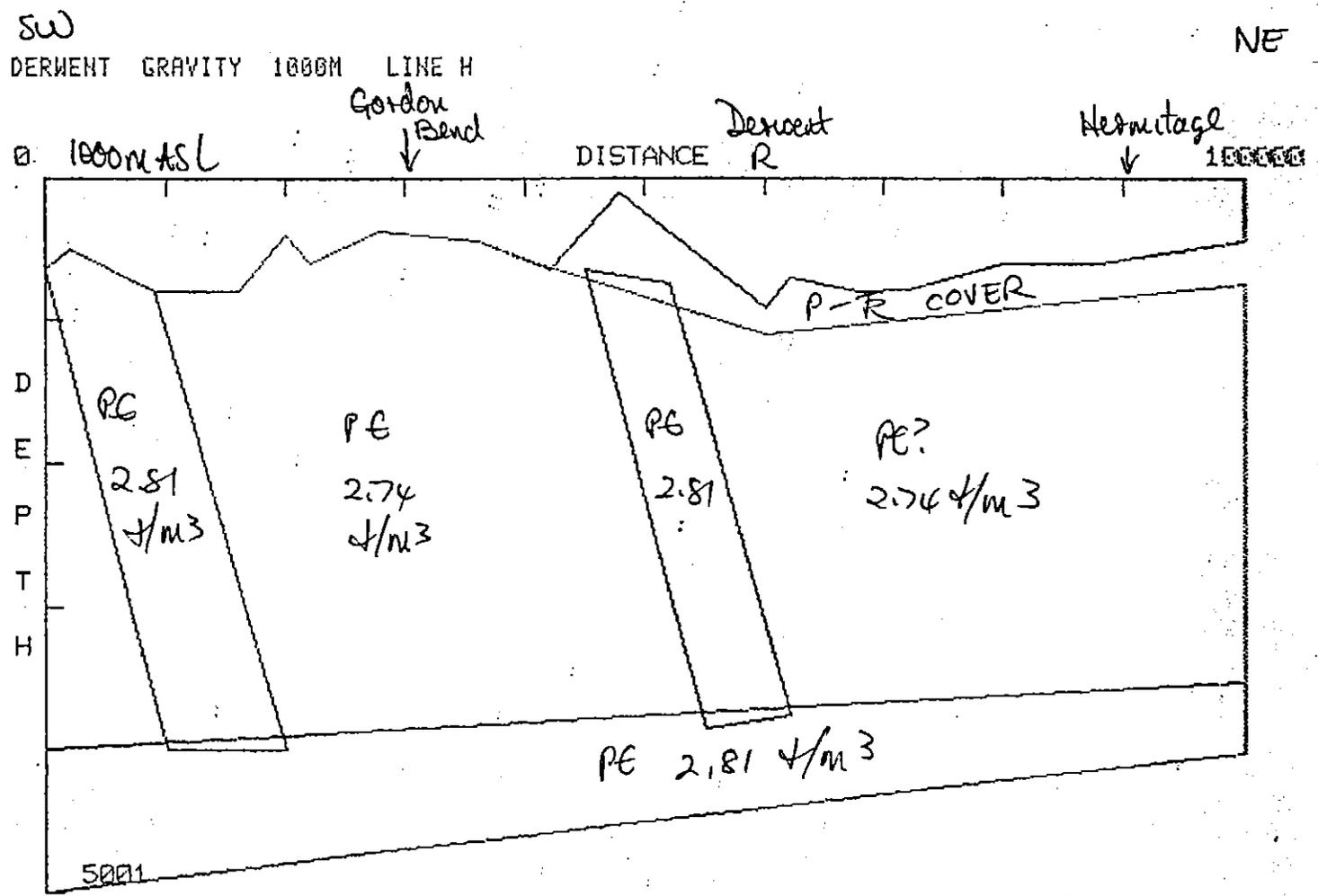
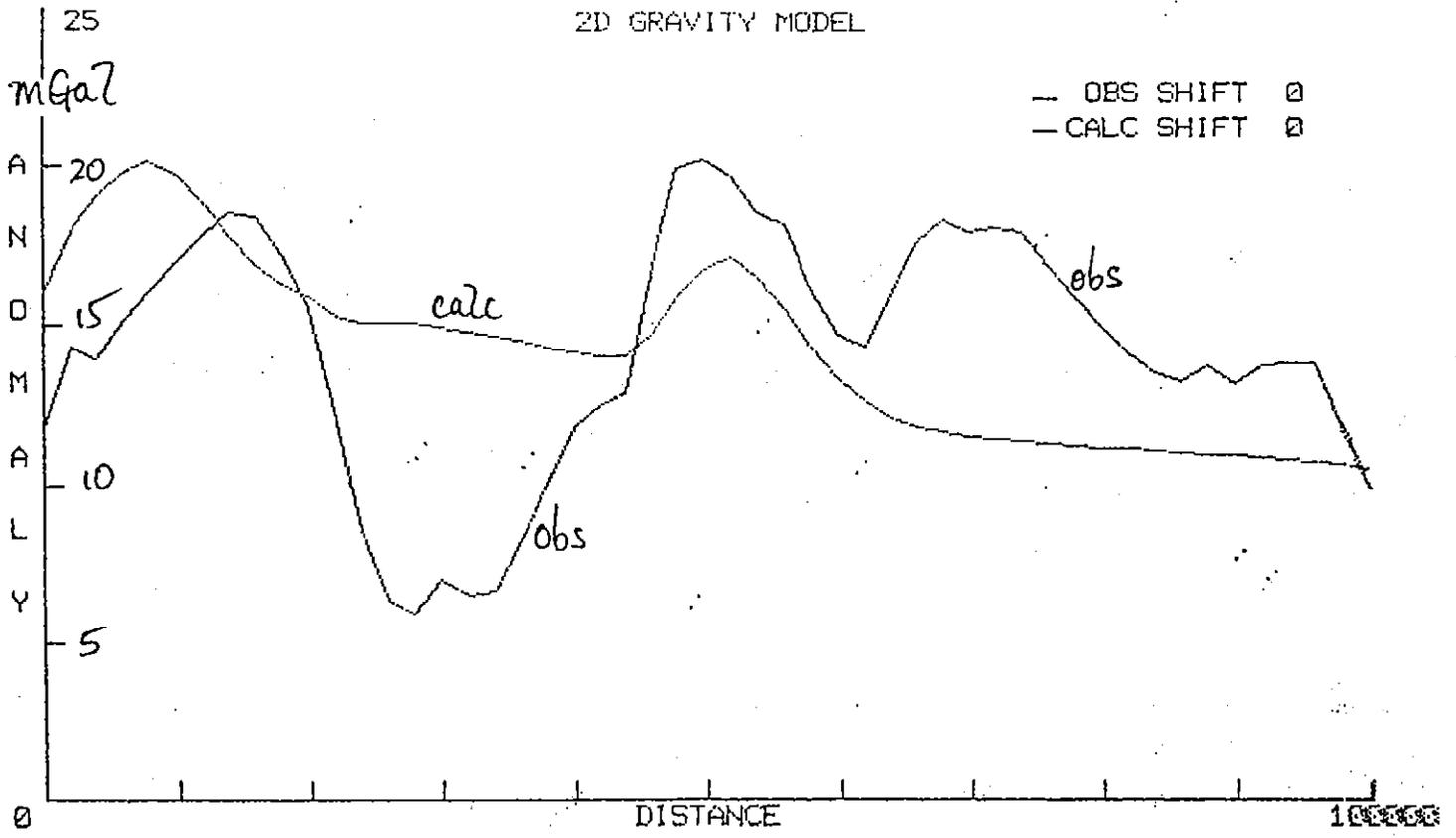
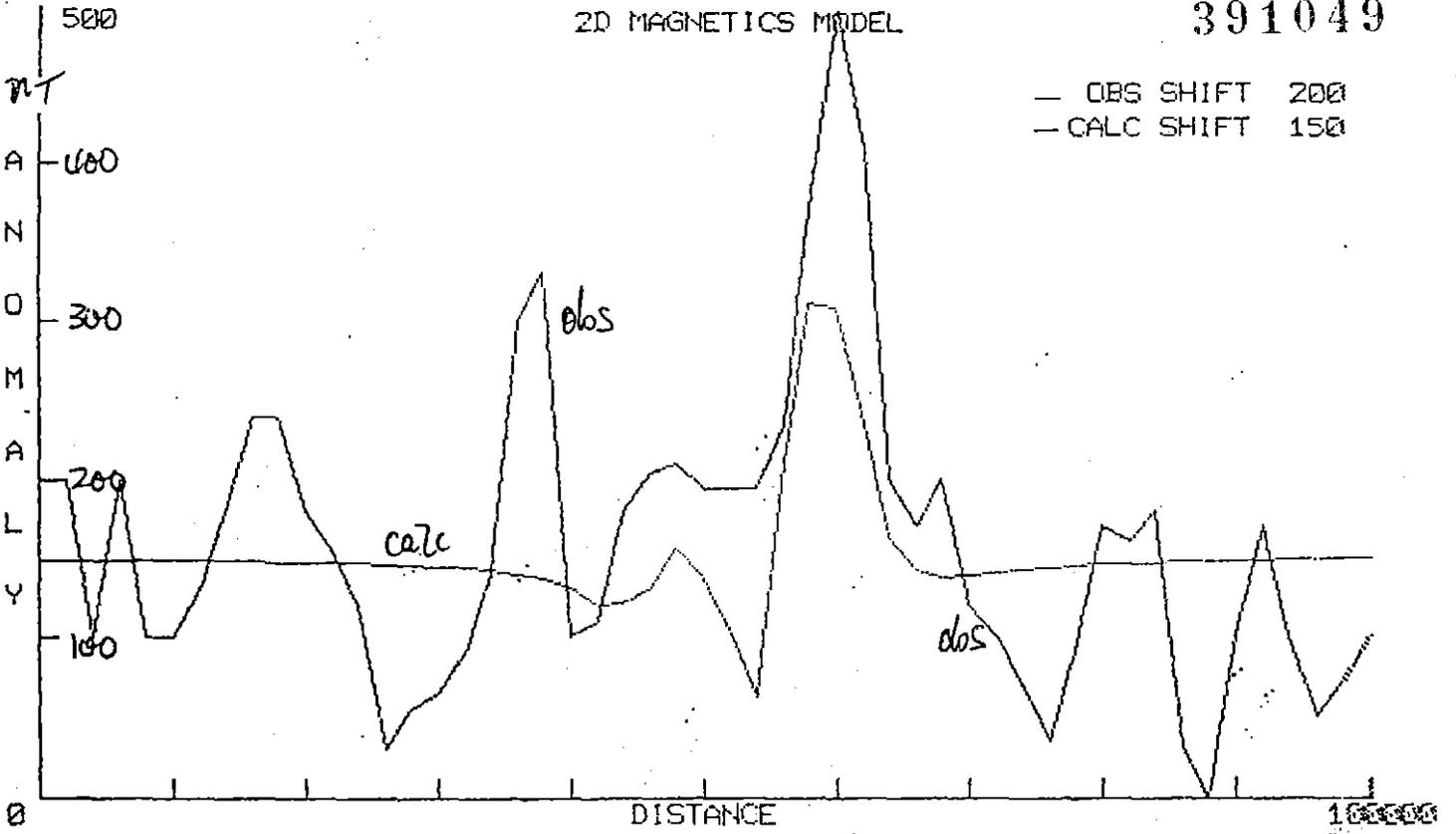


FIGURE 34

040

2D MAGNETICS MODEL

391049



SW
DERWENT MAGNETICS REL 1600M LINE H

NE

0 1600m ASL
DISTANCE
Catagunya
Descent
R
100000

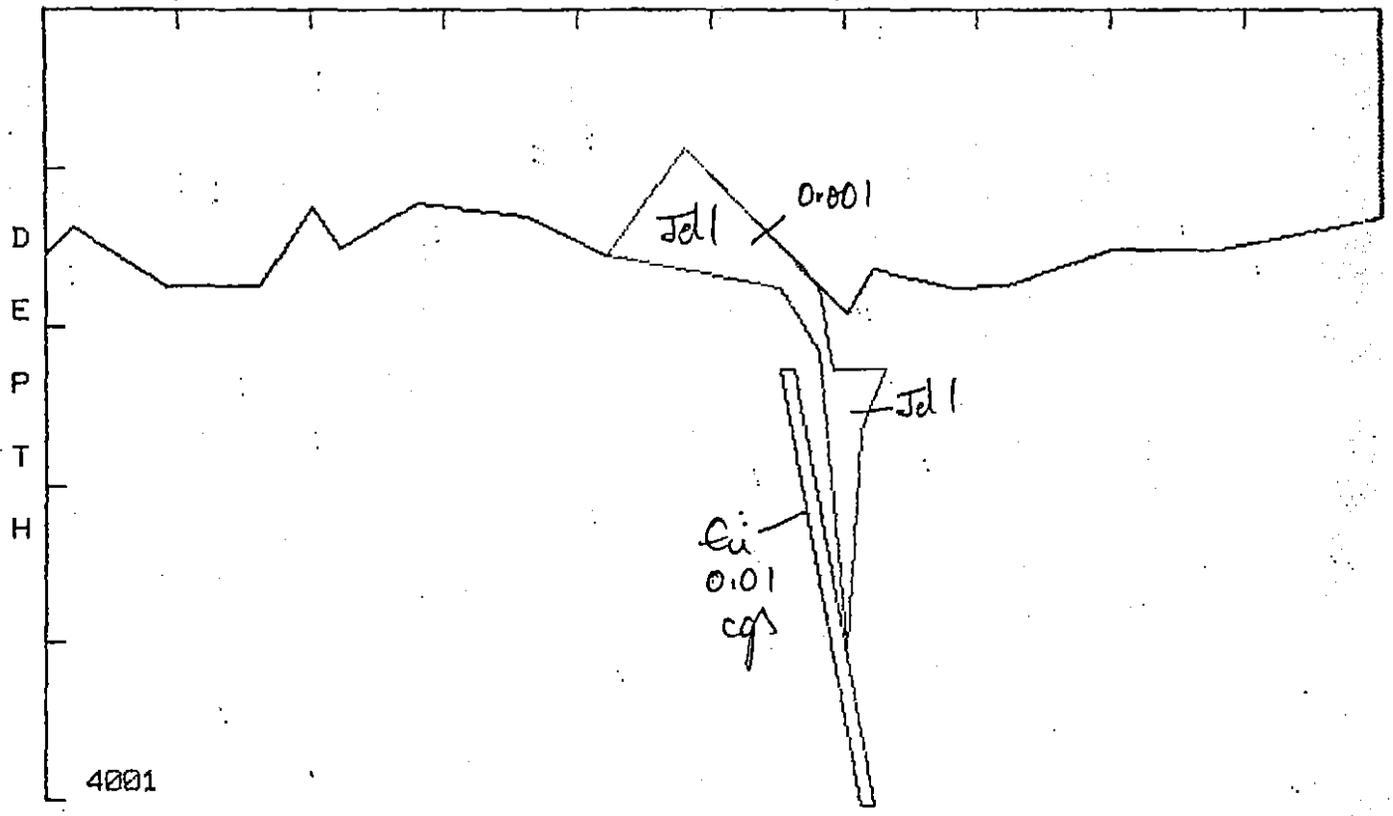


FIGURE 35

2D GRAVITY MODEL

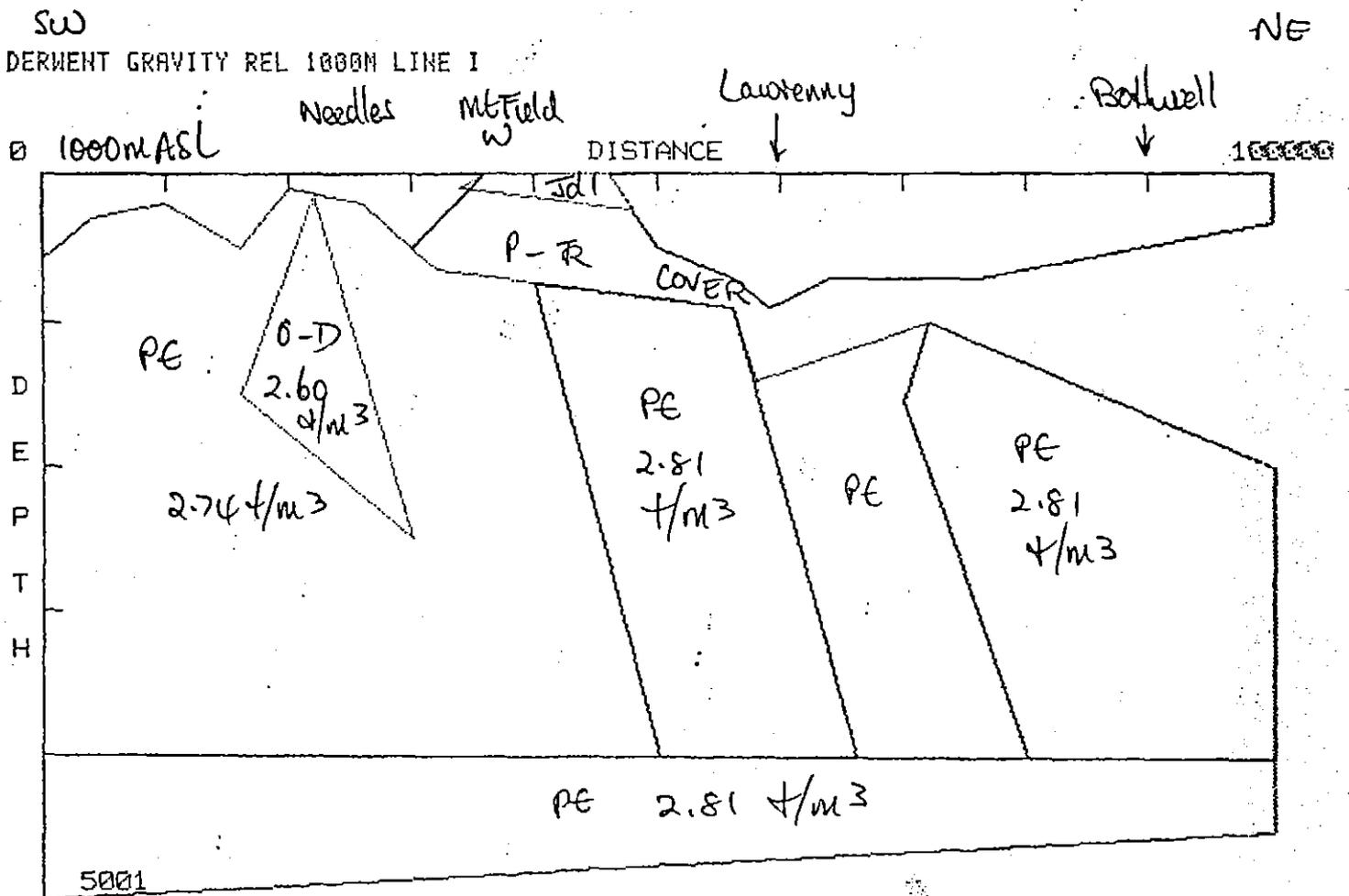
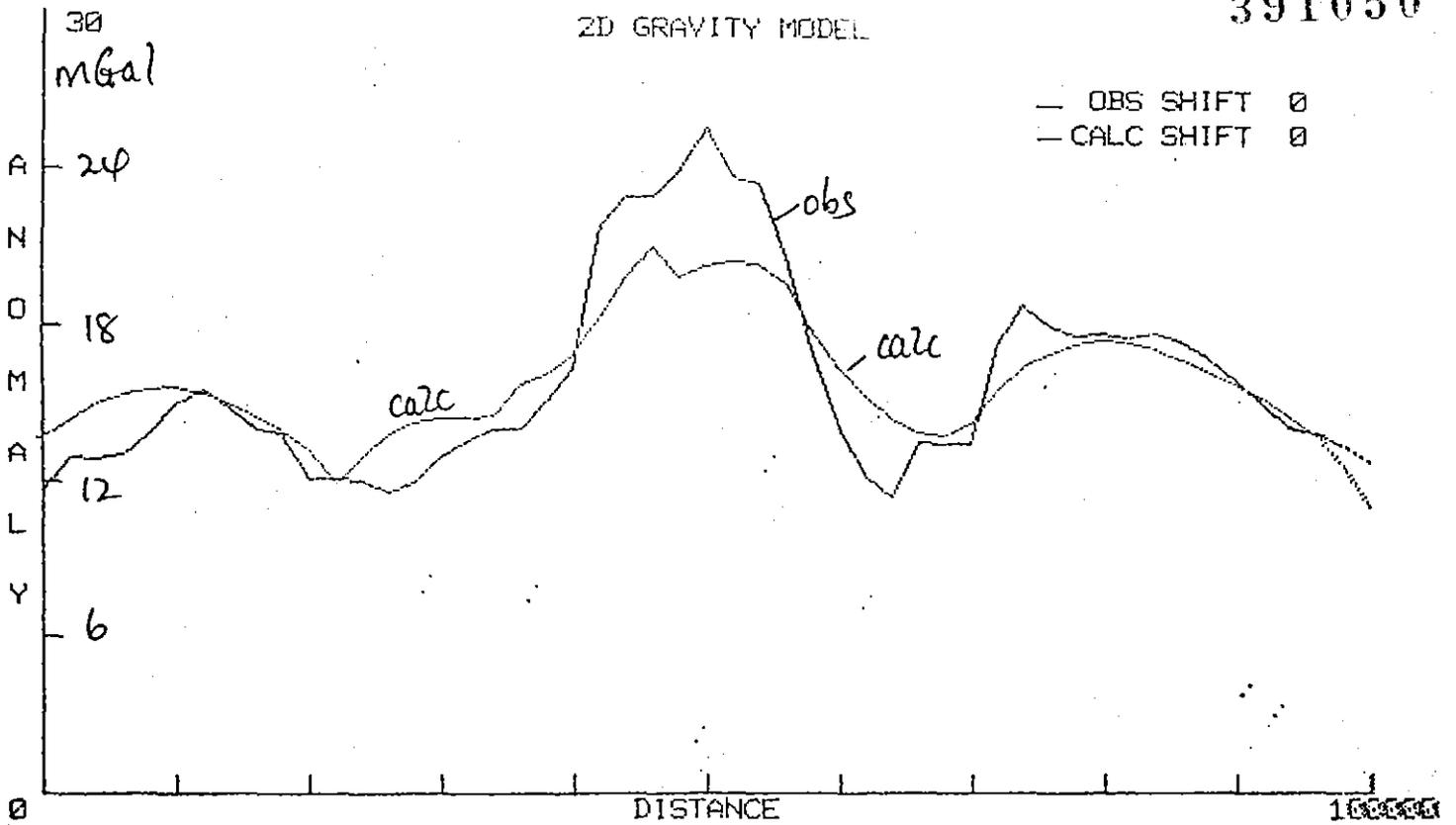
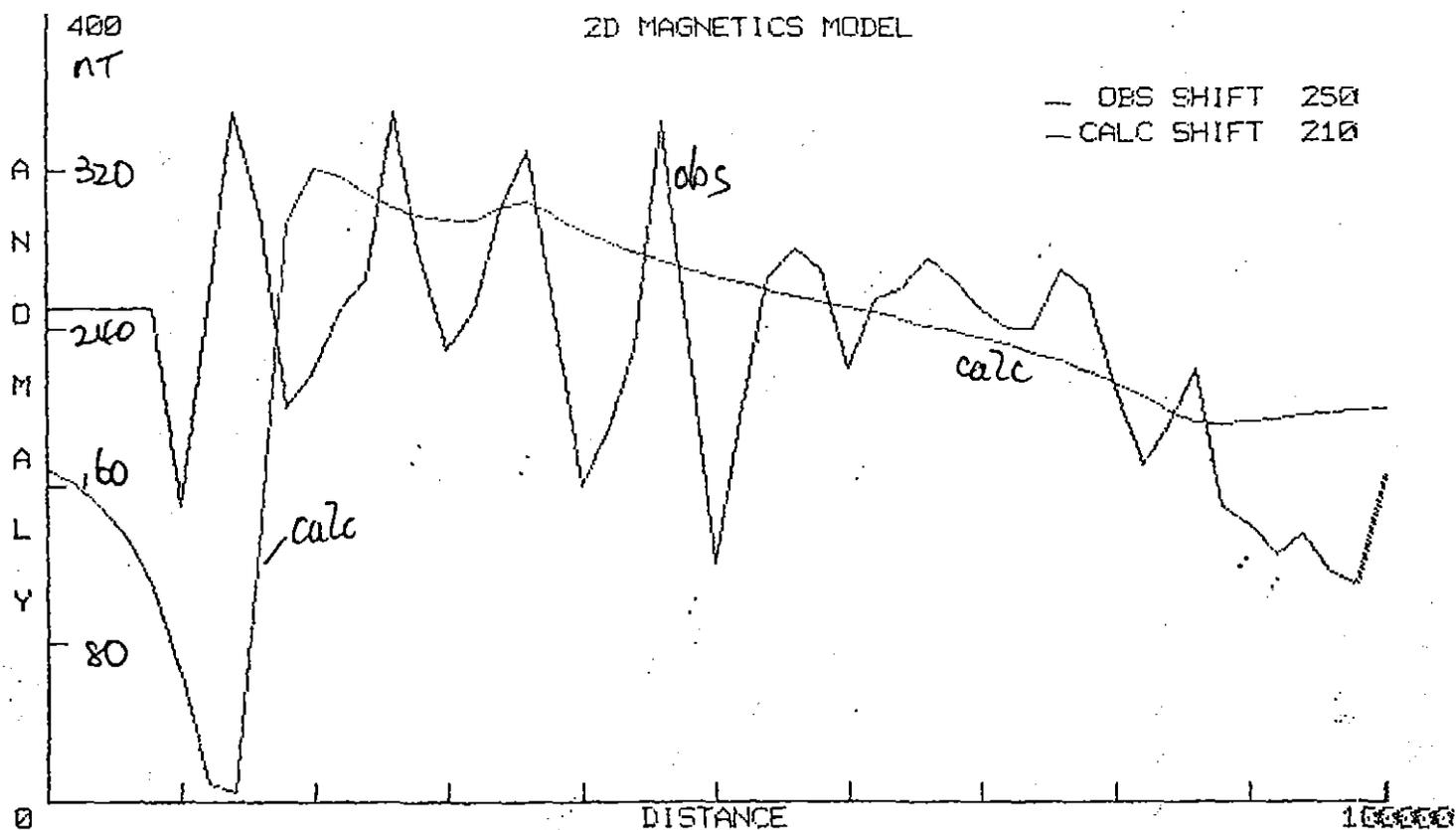


FIGURE 36



SW DERWENT MAGNETICS 1500M LINE I

NE

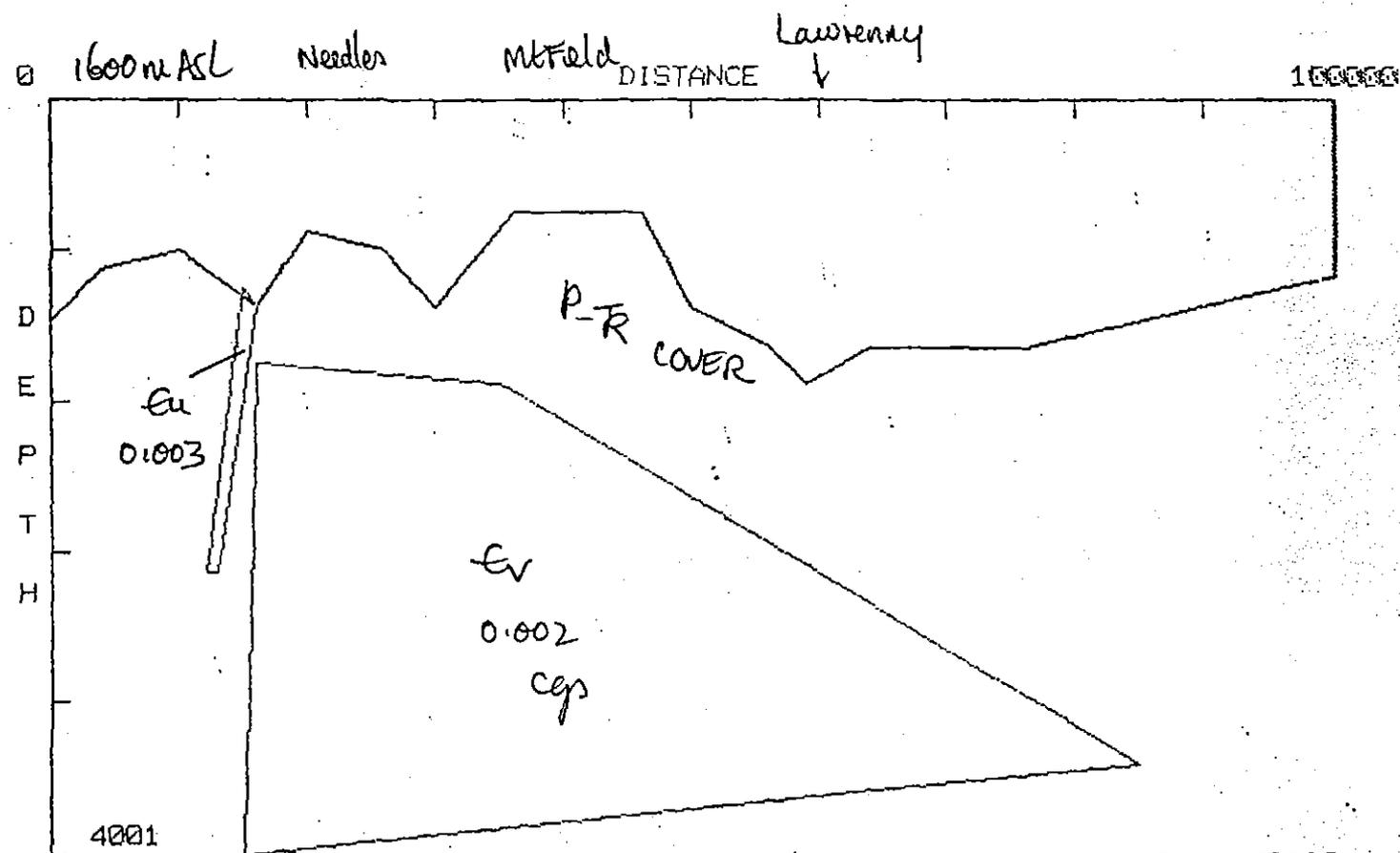


FIGURE 37

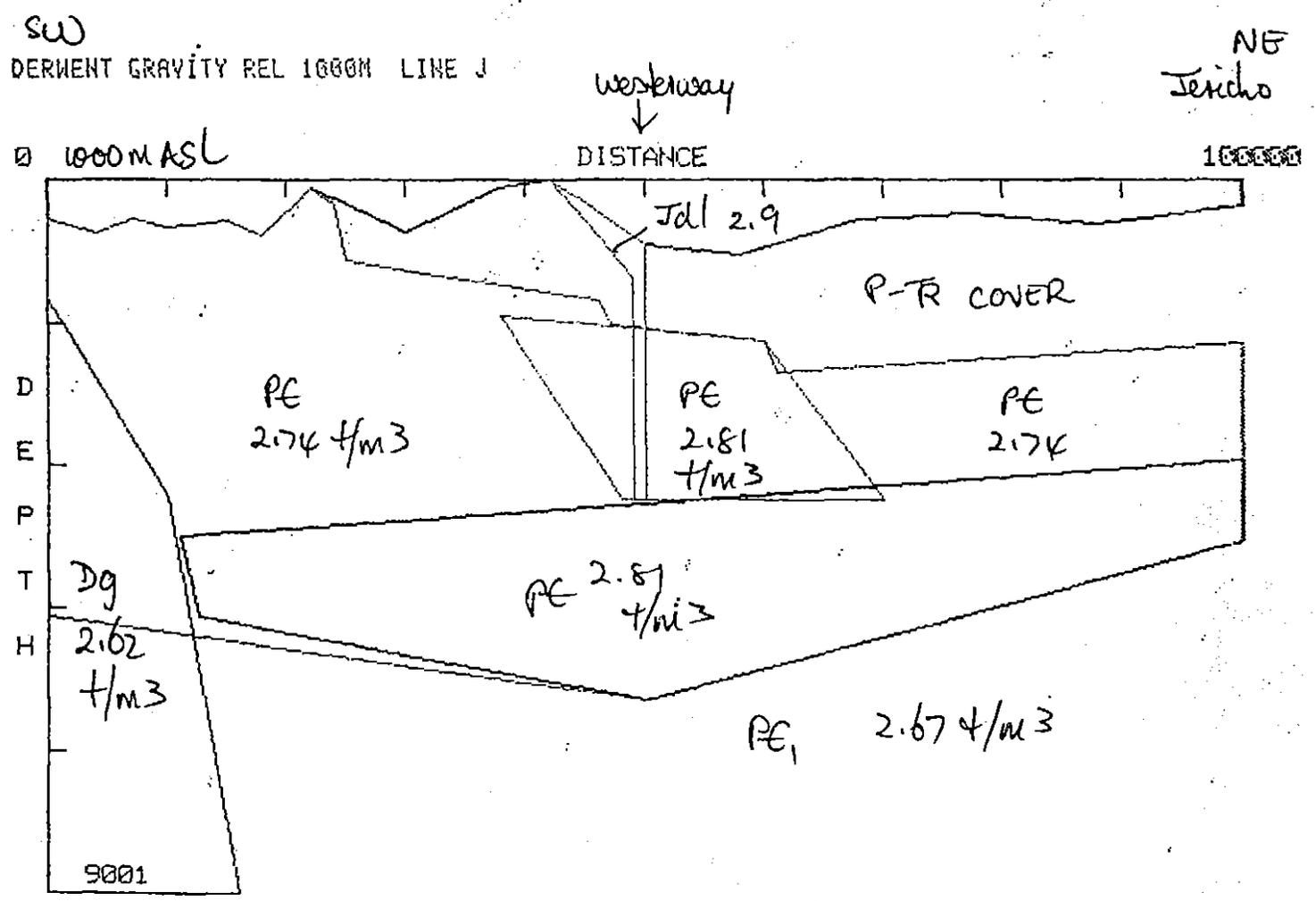
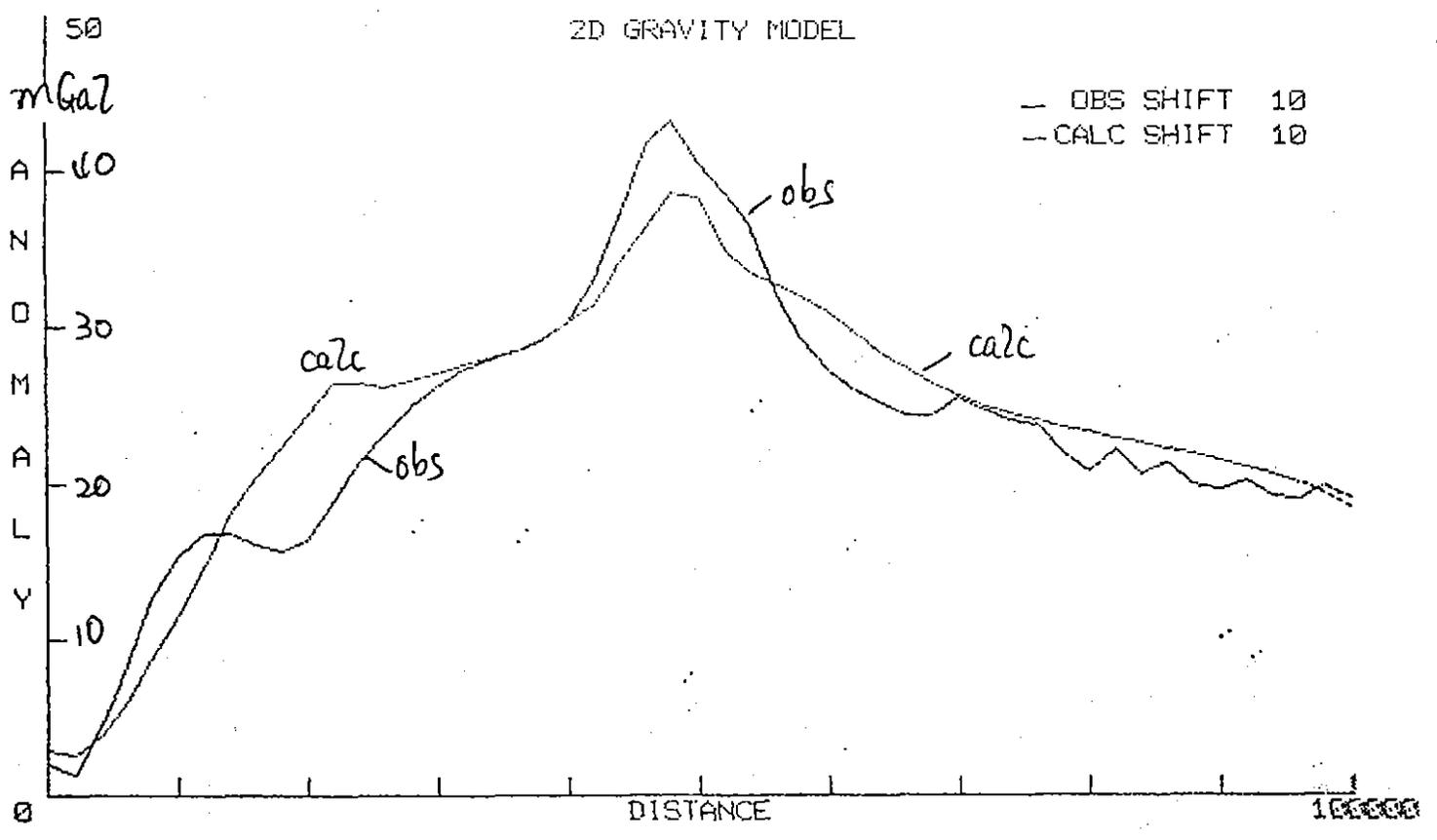
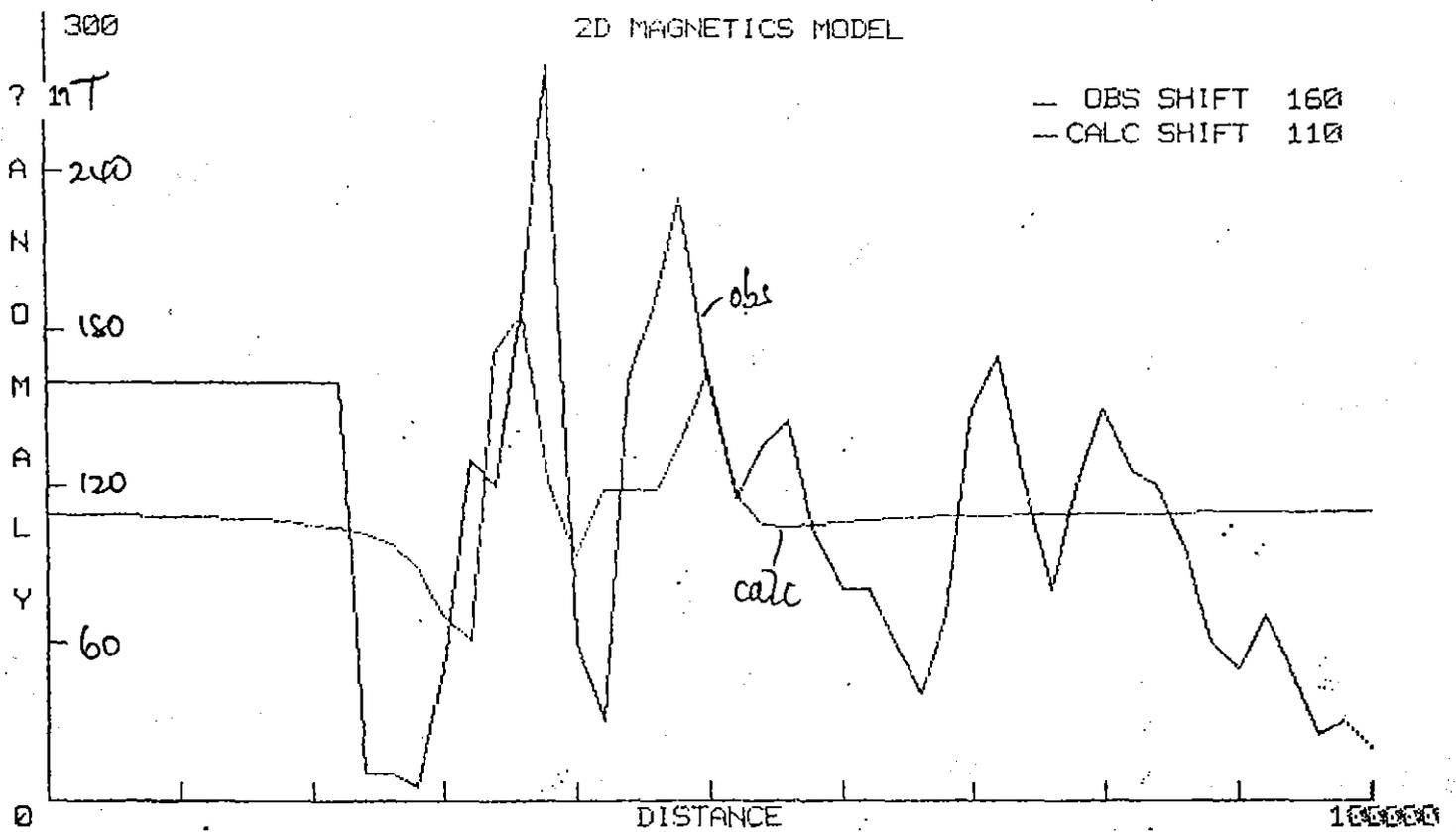


FIGURE 38

INTENSITY INCLINATION DECLINATION OBS LEVEL LINE DIRECTION
 62200.0 -71.0 13.0 0.0 45.0

391053

LINE PARAMETERS - ORIGIN, LIMIT, INCR : 0 100000 2000



SW
 DERWENT MAGNETICS 1600M LINE J

NE

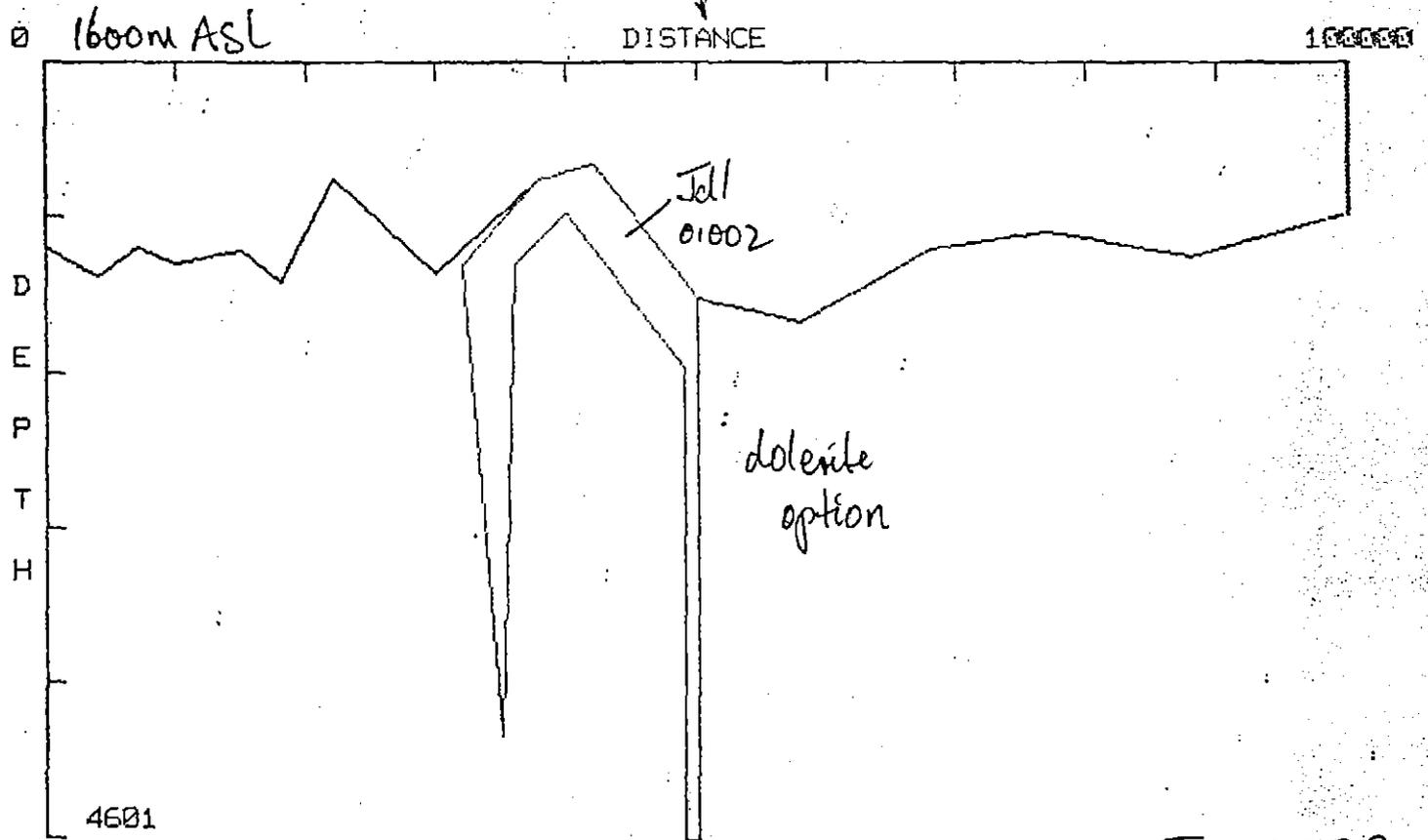
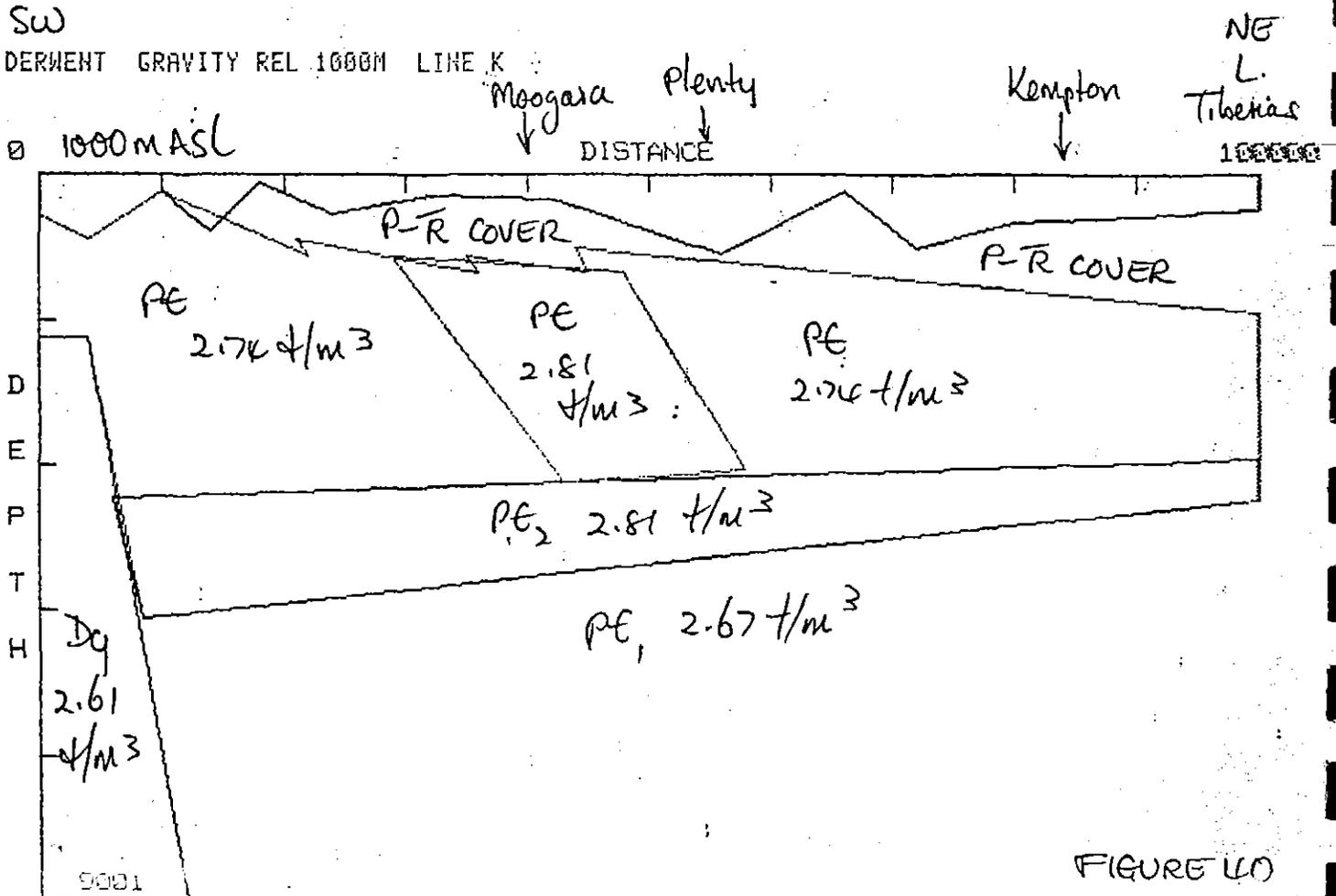
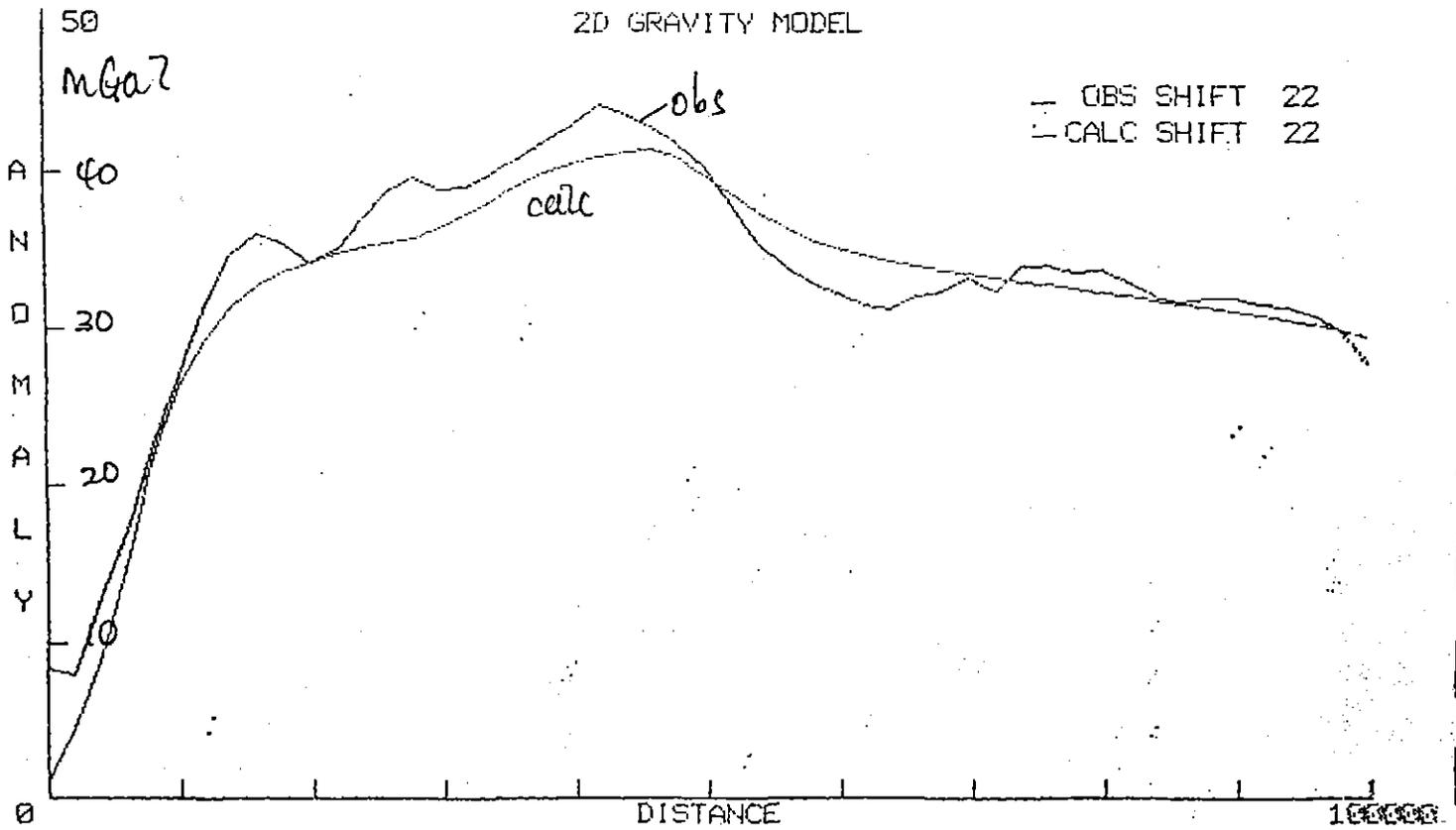


FIGURE 39

LINE PARAMETERS - ORIGIN,LIMIT,INCR : 0 100000 2000



INTERCEPT INCLINATION DECLINATION OBS LEVEL LINE DIRECTION
 62200.0 -71.0 13.0 0.0 45.0

054
 LINE PARAMETERS - ORIGIN, LIMIT, INCR : 0 100000 2000 391055

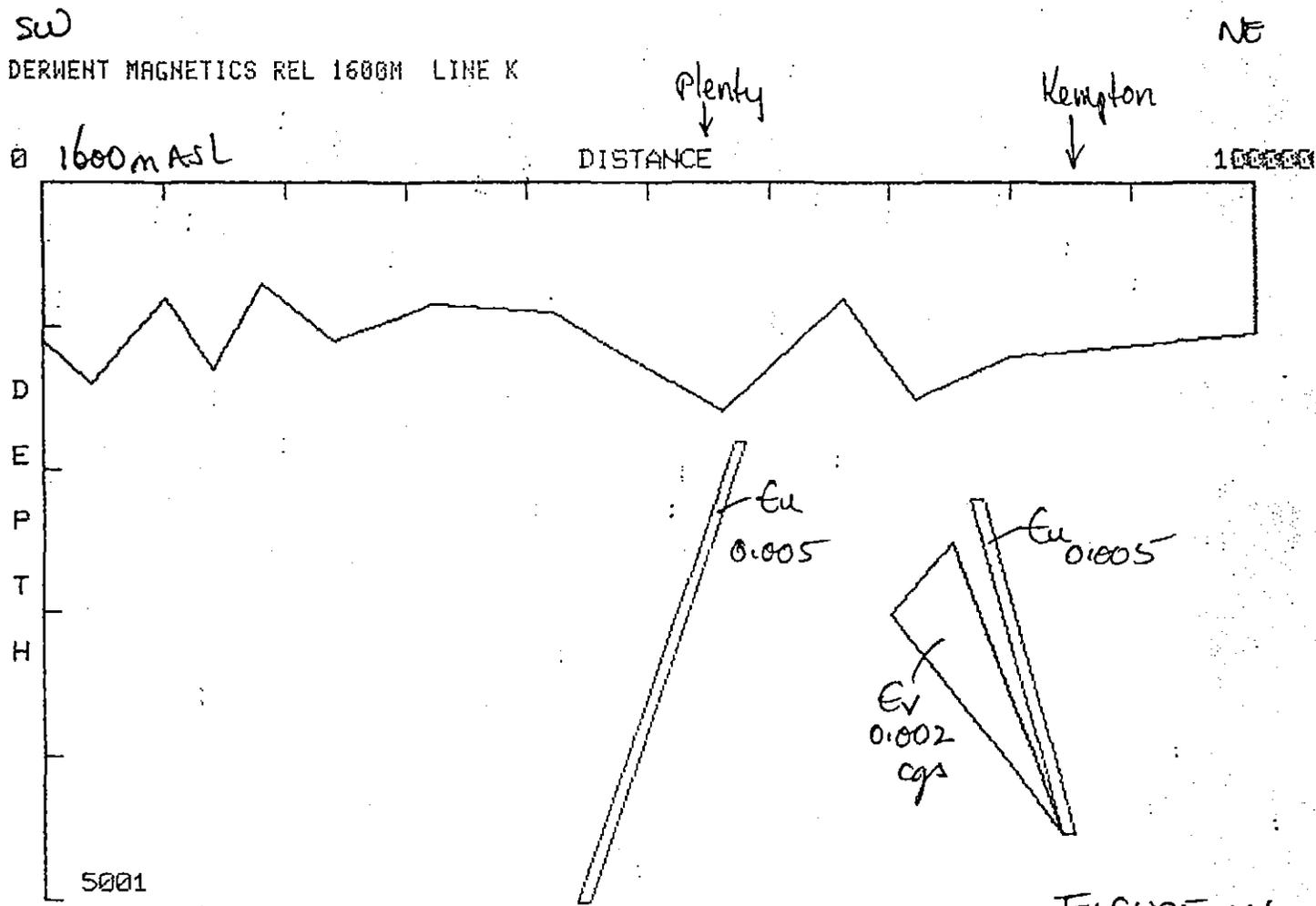
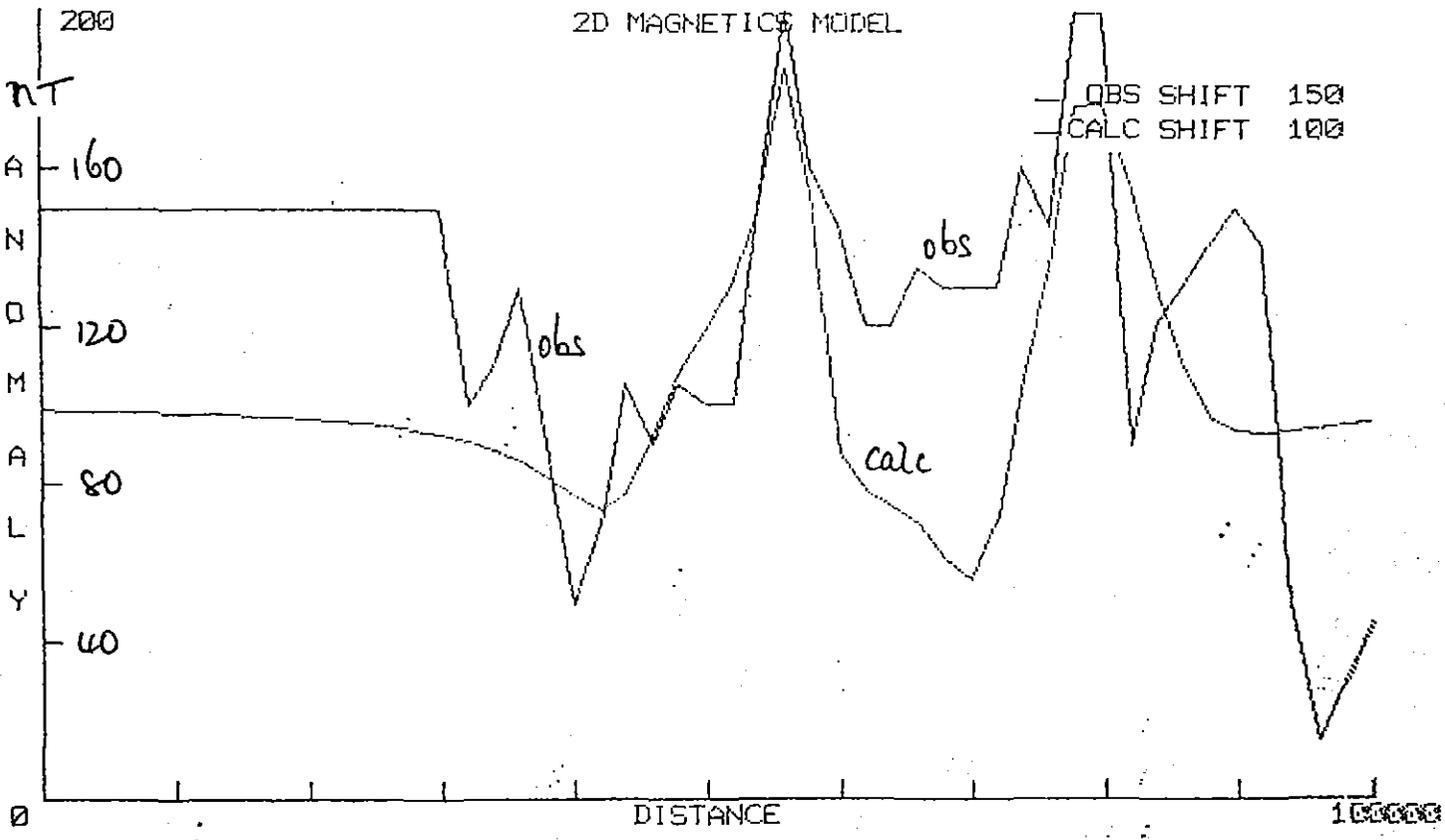


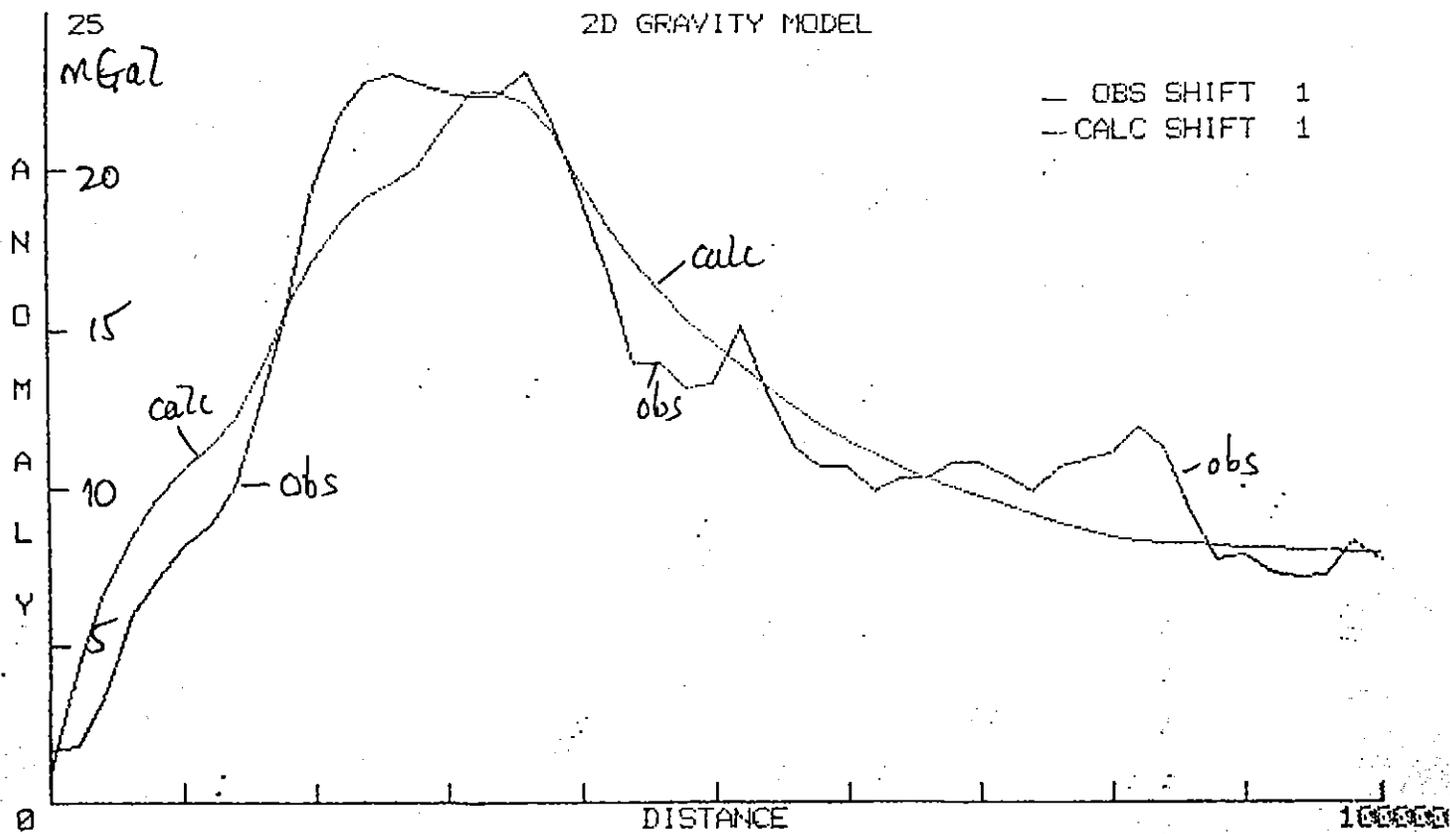
FIGURE 41

DERWENT GRAVITY REL 1000M LINE L

391056

000

LINE PARAMETERS - ORIGIN, LIMIT, INCR : 0 100000 2000



SW

NE

DERWENT GRAVITY REL 1000M LINE L

0 1000M ASL

Huon R

Molesworth

Brighton

DISTANCE

100000

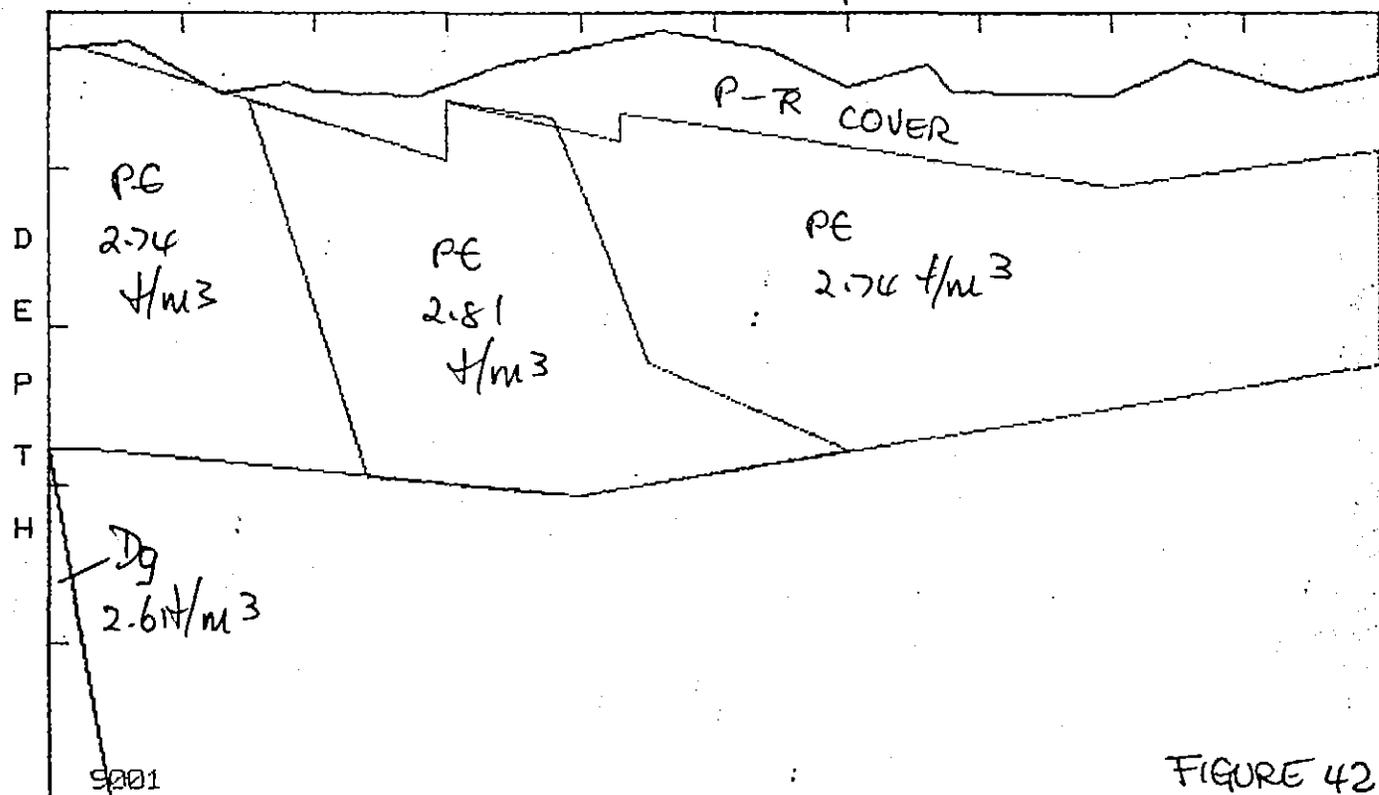
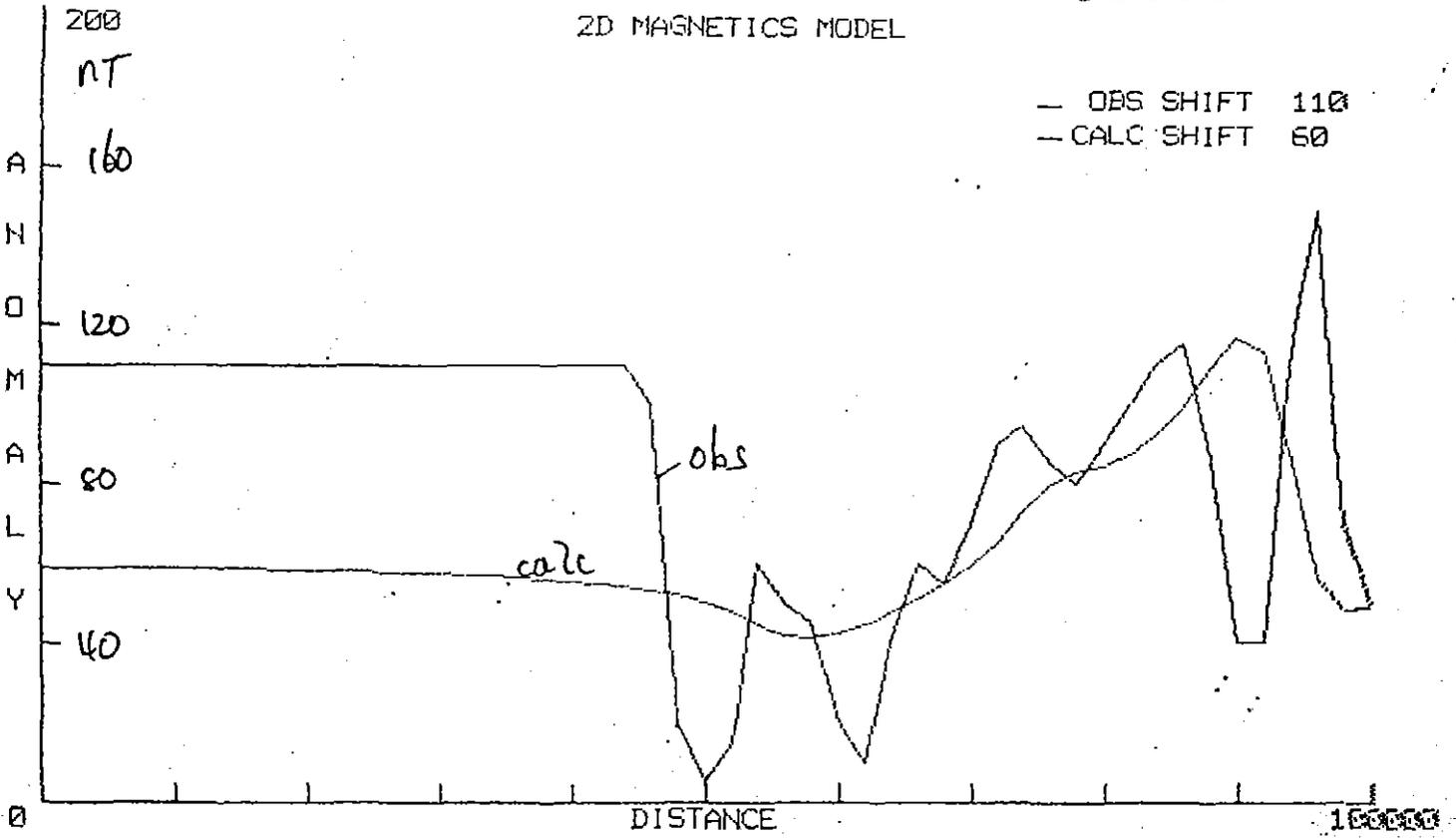


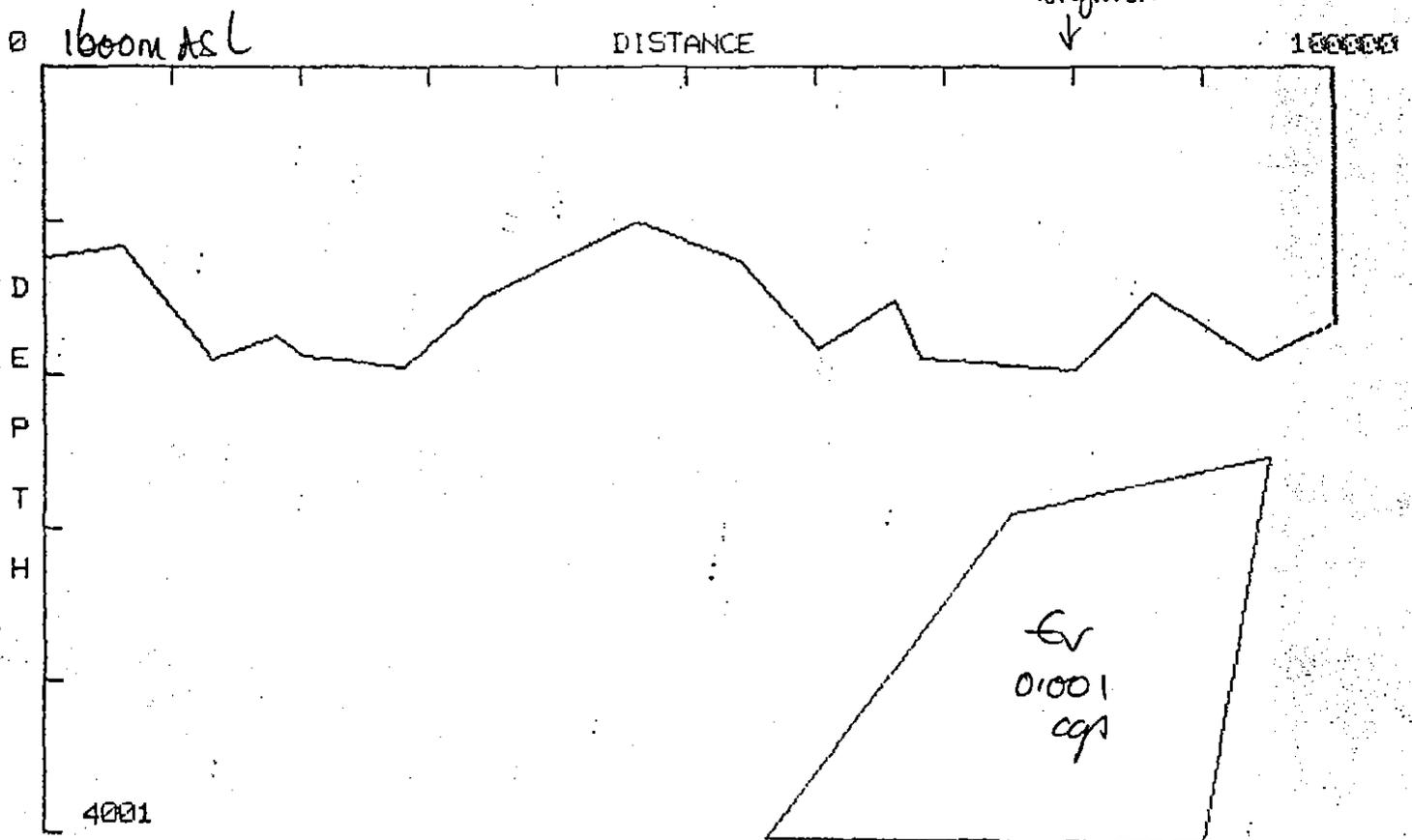
FIGURE 42

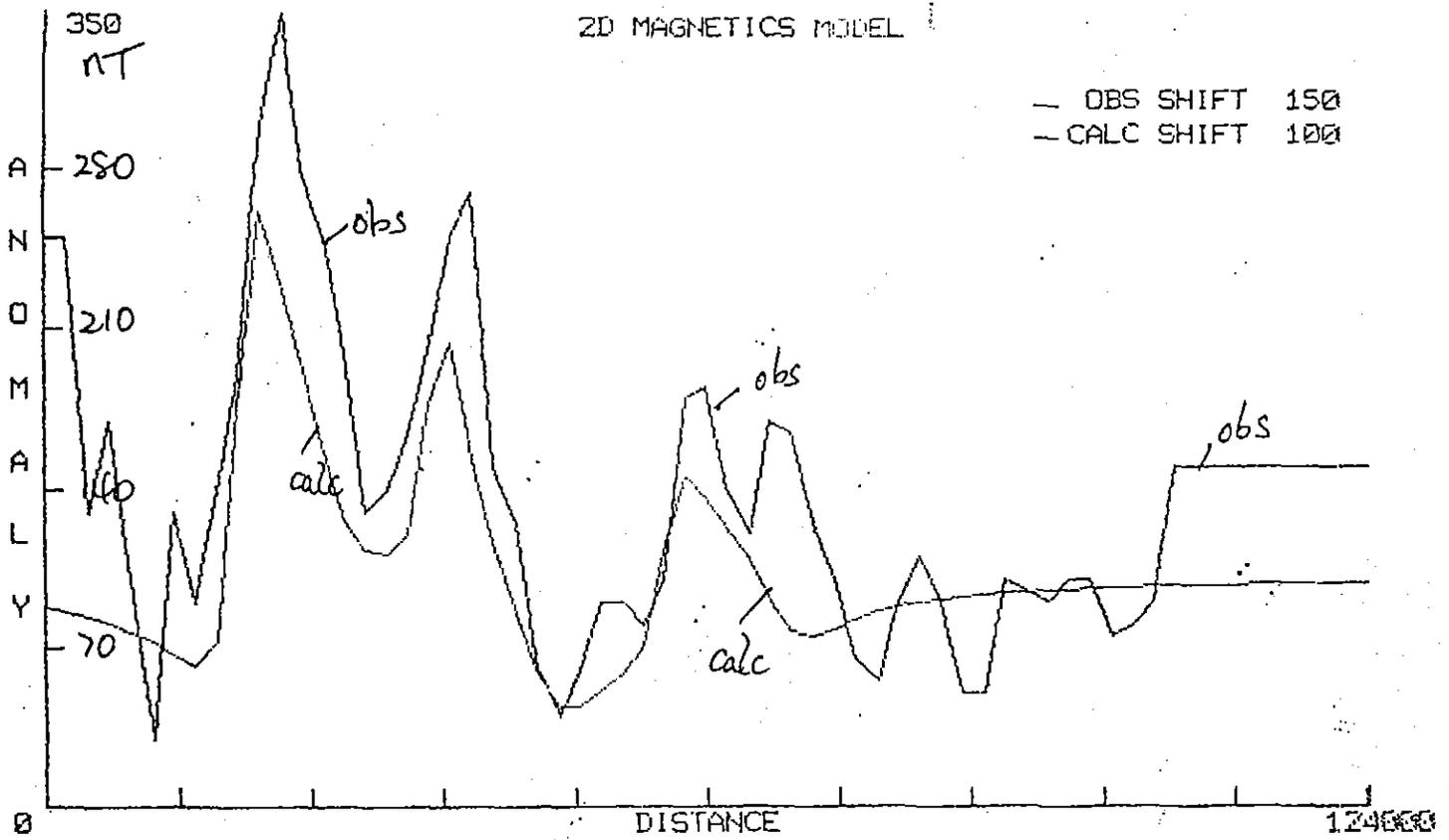
391057

ZD MAGNETICS MODEL



SW
DERWENT MAGNETICS REL 1600M LINE L





NW SE
 DERBENT MAGNETICS 1600M LINE 2
 Tarraleah Hamilton New Norfolk Betsy Is
 0 1600M ASL ↓ ↓ ↓ 124000
DISTANCE

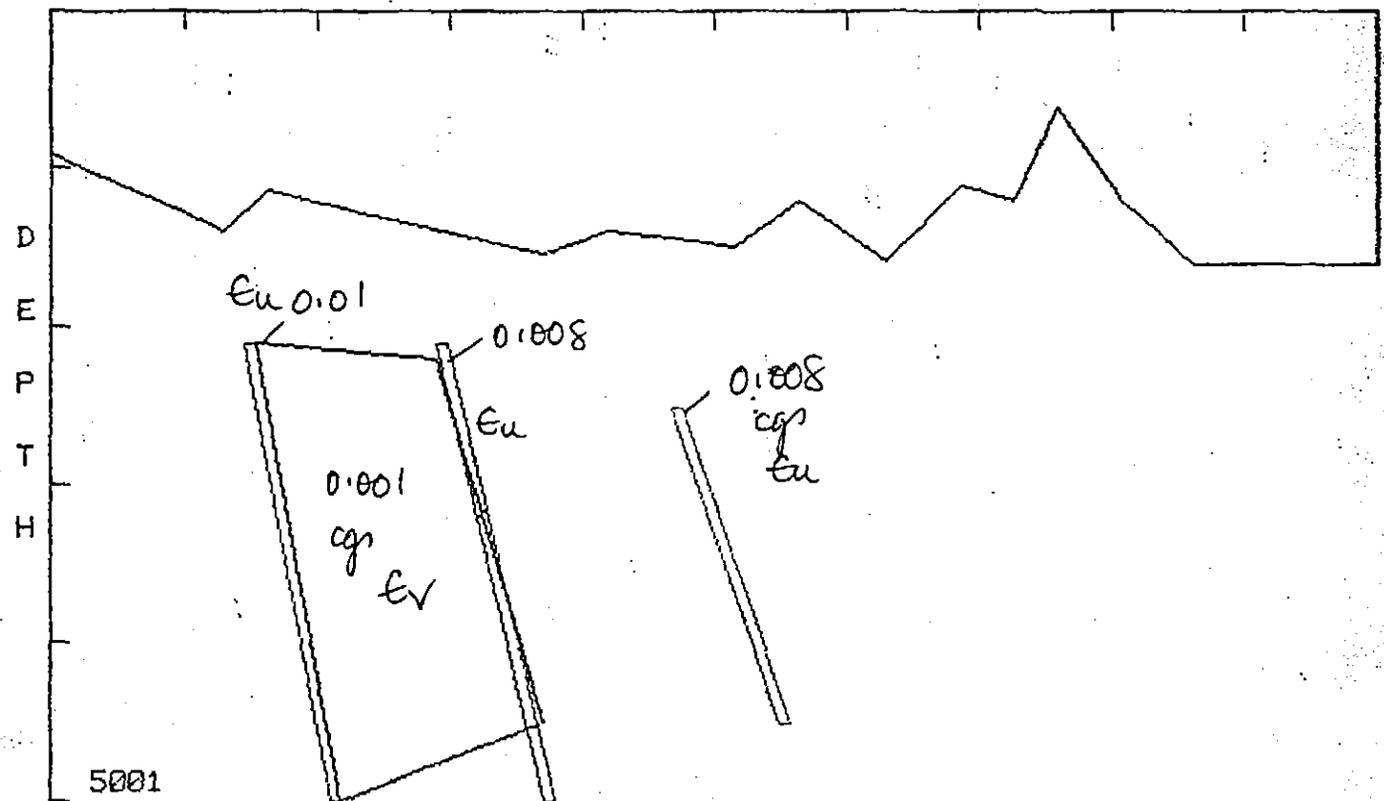


FIGURE 44