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OPEN FILE

AN INTERPRETATION OF A

COMBINED GEOPHYSICAL SURVEY

MT. LINDSAY, TASMANIA AREA

FOR

RENISON LIMITED - C.G.F.A.

BY

MICROFILMED

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CONSULTING GEOPHYSICIST

SYDNEY. N.S.W.

JULY, 1974

JOB # 409

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<u>M E M O</u>

OPEN FILE

Date: 28 July 1974.

TO: L.A. NEWNHAM

FROM: J. IRVINE

SUBJECT: MT. LINDSAY GEOPHYSICS

Enclosed is my preliminary report of Mt. Lindsay. You will be pleased to note that there are 7 drill targets rather than 5. Two were hiding under this mess of paper.

At this point in the program, I cannot see recommending detailed I.P. To do it properly, would be a monumental task.

However, a careful correlation of the geology and the magnetic results are in order. At the same time, the I.P. and resistivity results should also be correlated with the geology. The large potential dipole could present a problem as any known sulfide zone within 25m of a maximum I.P. value could be the responsive body.

I think Tony recommended all the I.P. responses (25-30 with "A" priority). All depths and widths of his responses are highly questionable. He has "eye-balled" all of his calculations on the shape of the response curve. The shape of the response curve is at the discretion of the draftsman when 50m intervals are employed. Symmetry alone does not provide all the answers.

The results along the road have not been adequately covered in my report. As mentioned over the telephone the position of the current pole relative to the potential dipole is required. "Double peaking" occurs from shallow bodies with this system. The larger amplitude of the two peaks occurs on the current side. However, it is always possible that two zones occur. Also, the three array and pole-dipole traverses have not been labelled, thus further confusing the interpretation.

A test survey with portable EM gear is recommended. As Renison type mineralisation is expected, exceptionally good conductors can be expected. As EM techniques respond to resistive conductive interfaces and I.P. responds to a volume, the EM could conceivably detect a narrow zone missed by the I.P. - especially with a 50m dipole.

The Crone "Shootback" portable EM unit is ideal for this as the shootback method eliminates terrain effects. Also, with near surface zones, a short coil separation (50m) is sufficient and would improve the resolution. Austral in Adelaide are the agents. They may have a rental unit. Otherwise, they are less then $3000 complete.

VLF-EM would be feasable, especially since the strike allows the use of N.W.C. However, this little wonder produces adverse terrain effects that may not be corrected for. I have a paper on VLF in mountainous terrain; I'll form a search party.

S U M M A R Y

A total of 25 magnetic anomalies were mathematically analysed and correlated with 7 zones of I.P. response.

From these results, 7 targets are recommended for drilling in order that they be fully explained.

A correlation of the geological and geophysical results is recommended.

It is also recommended that a test EM survey be carried out in order to test the applicability of the technique in the area.

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AN INTERPRETATION OF A 577005

COMBINED GEOPHYSICAL SURVEY

MT. LINDSAY, TASMANIA AREA

INTRODUCTION

At the request of Mr. L. Newnham, Chief Geologist for Renison Limited, the auther interpreted a magnetic survey conducted by Renison and reviewed an induced polarization and resistivity survey conducted under contract by Scintrex Pty. Ltd.

The purpose of this interpretation was to accurately position the magnetic zones and to determine parameters such as dip, thickness of the body and its depth of burial.

The interpretation accompanying the Scintrex I.P. and resistivity report did not utilize any of the magnetic data other than to state whether or not a magnetic response was associated with the I.P. response.

Magnetic readings were taken every 10m along the traverses whereas the I.P. readings were collected every 50m. All results were plotted in profile form on composite sheets prepared by Renison Limited. Only magnetic zones associated with I.P. responses were analysed. Any other magnetic response of geological significance should also be analysed.

GEOLOGY

The underlying geology of the area consists of a series of Lower Cambrian sediments of the Crimson Creek Formation. To the north-west of the survey area and believed to be underlying the Cambrian sediments is a Devonian intrusive consisting of a tin bearing granite. Precambrian sediments exist to the south-west and a basic Cambrian intrusive exists to the north-east.

METHOD OF INTERPRETATION

The magnetic results were analysed mathematically on a programable calculator. The mathematical derivation of a magnetic response due to a thick dike is well known and is presented in Grant and West; "Interpretation Theory in Applied Geophysics" (Equation 11-27a, p 341). In all cases, remnant magnetism and demagnetization has been ignored. The parameters presented were: depth of burial-h; dip-d; thickness of dike-t; and the susceptibility of the body-k.

The I.P. results were treated imperically and other than the detailed areas, no special techniques were employed. The resistivity results were treated in a similar manner. Detailed interpretation of I.P. data is usually carried out on other arrays as the gradient array does not lend itself to in depth analysis. It should be considered a deep penetrating, reconnaissance method.

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DISCUSSION OF RESULTS

A contoured plan map of the I.P. results and of the DC resistivity results indicate a series of parallel zones. As the underlying geology consists of lower Cambrian sediments, these zones are expected to be strata bound and graphitic and pyritised sediments. A careful analysis of the I.P., resistivity and magnetic results was undertaken in order to determine the structures and physical property associations within the survey area. In order that an orderly discussion could follow, the I.P. responses have been arbitrarily labelled from the NE or the uppermost sediments from within the lower Cambrian.

A previous interpretation of the I.P. results is available courtesy of the geophysical contractor. Several points about this interpretation should be discussed. Many of the recorded I.P. anomalies are "one station readings". This is due to two factors:

(a) The potential dipole length of 50m

(b) The reading interval of 50m

Both distances are too large to supply sufficient information required for estimation of depth of the response and its width. The shape of the profile is at the discretion of the draftsman and not the distribution of data points. The larger the potential dipole, the smoother the results, therefore a shorter dipole (less than 30m) and more data points are required before a guess at both the depth of burial and the width of the response can be made.

ZONE A

This is one of the widest and most continuous responses within the survey area. An exceptionally strong I.P. response has been recorded directly associated with low resistivity. The responsive body is of the order of 100m wide. The magnetics across this zone are highly irregular and a strong surface effect is suspected. Also, the resistivity results clearly indicate a change to the SE and within the general zone. Although the SE portion does not show as strong an I.P. response, the apparent resistivity is very low to the NW portion of the zone. This could indicate a more massive nature of the responsive body. Based entirely on geophysical data, a pyritised or graphitic sedimentary section is suspected.

Zone A1 is still within the zone of magnetically disturbed rocks, but is very close to a contact as determined by the resistivity results. However, this is a narrow response exhibiting an I.P. response similar to the response obtained across the Mt. Lindsay lode.

Zone A2 occurs at the edge of the magnetically disturbed zone and the resistivity results clearly indicate that the I.P. zone is electrically conductive. Being a contact zone, this may be of greater interest than A1.

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ZONE B

This is another "wide" zone in that its width definitely exceeds 50m. The resistivity results show an interesting feature in that the most conductive portion of the zone is 50m to the SW of the maximum I.P. response. This could be due to the fact that the I.P. response is due to sulfides, whereas the conductive portion is due to shearing or fracturing.

A magnetic response of approximately 400 gammas is directly associated with the maximum I.P. response. Analysis of the response is as follows:

h = 2 m
t = 22 m
d = 90^{o}
k = 1500×10^{-6} c.g.s.
center of body - 26.75 N

An analysis of the magnetics on ML-9 reveals a zone from 23.20N to 25.80 or 260m in width which may be of interest. A body of 300m in thickness, dipping 60^{o} SW, having a susceptibility of 6000×10^{-6} c.g.s. units and buried only 2m provides some very interesting results. However, the dip is not representative of the known geology, so this body has to be discarded. However, the possibility remains that a deeper seated body may still be involved. However, if all factors are kept constant, but the depth of burial is increased, the amplitude of the response is greatly reduced.

An alternate (but not complete) solution is three vertical dikes at 22.60N, 23.90N and 25.40N all 40m in thickness and having similar susceptibilities.

However, to produce a suitable composite response, various base levels have to be used. This is very pratical for 22.60N and 23.90N, but assuming the influence of a 300m wide, deep seated (100-200m) body, a more complex nature would be required at 25.40N. However, if the deep seated body extended from 23N to 25.50N, a solution would be plausible. A fault at 26.30N with the northern portion down thrown, would complete the model and account for the zone of maximum conductance. The deep seated body can be explained geologically as the Devonian granites are known to underlay the sediments. However, granites are not usually magnetic and the equivalent of 4-6% magnetite is required in the deep seated body.

Zone B was analysed on ML-8 with respect to the magnetic data. A poor comparison is all that is available as the field results on the south side of the body vary considerably from calculated results. This would suggest that the responsive body does not possess a simple geometric form as a dike, but rather as a vertical wedge, with the narrower portion at the top. In general, considerable changes have occurred across 200m as only one responsive body is clearly distinguishable. The I.P. response is directly associated with two, narrow magnetic zones exhibiting amplitudes of 300 gammas and a

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conductive zone. The center of the I.P. response is 150m north along the traverse from the major magnetic body and 80m south of a secondary feature.

Any I.P. analysis at traverse ML-8 is of questionable accuracy as the traverse is at the edge of a set-up or current rectangle.

On traverse 9, two short zones have been recorded. Although both can be projected to traverse 10 and perhaps further, they are short zones and exhibit appreciable width only at traverse 9. The most southerly zone situated at 23.75N is associated with contact of an interpreted magnetic body whereas the response at 24.75N is located between two magnetic bodies. An examination of the contoured magnetic data clearly reveals the limited extent of the magnetic response and suggests that the I.P. response at 23.75N and 24.75N is due to the magnetite content.

Zone B2 was analysed at traverse 13/20N. The negative magnetic response at 22.10N is believed due to a reversible magnetised body. The magnetic body centered at 20N has its simple geometric shape confused by appendages on the flanks which yield the observed departures in the field curve. However, a body 40m in width, buried 10m centered at 20N and having a dip of 85^{o} SW plus a strong susceptibility of $20{,}000 \times 10^{-6}$ c.g.s. units (or 0.2) provides a good correlation. The I.P. data is lacking in sufficient detail to provide a decent interpretation. However, an I.P. and resistivity boundary could very easily occur at 19.80N and directly coincide with the edge of the magnetic body. Due to the high interpreted content of magnetite, the plotted peak I.P. response is believed to be non-representative and is considered to be coincident with the center of the magnetic body at 20N (rather than 20.25N or $\frac{1}{2}$ a dipole North of its expected position). The minor I.P. response at 21.25N could be due to the narrow, magnetic body at 21.25N. However, more sulfides would be expected here than at 20.25N. It should be noted here that the magnetic interpretation presented could be modified to better fit the field curves, but considerably more time would be required. The resistivity results indicate that this reversely magnetised body is very conductive. The discrepancy in the positioning of the conductive zone and the magnetic zone is once again believed due to the large dipole utilized.

ZONE C

The two I.P. zones C1 and C2 are of prime interest. Zone C1 is the response from the Mt. Lindsay lode, which contains economical grades of tin mineralisation. The I.P. response on traverses 11 and 12 suggest an apparent dip to the southwest. However, after closer examination, it would appear that the response is on the contact of two rock types exhibiting different I.P. responses. This is verified by the resistivity results which clearly shows that the I.P. response is very conductive, whereas the material located to the SW is highly resistive and the material to the NE is less resistive than the SW wallrock. The large

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dipole spacing of 50m has definitely yielded poor resolution as all these results are from single station anomalies.

The magnetic results associated with zone C1 suggest the following:

$$h = 2m$$
$$t = 20m$$
$$d = 70^{o}\ SW$$
$$k \doteq 20{,}000 \times 10^{-6} c.g.s.$$

Center of body - 21.50N

The response of the body dipping 70° SW provides better correlation than the calculated response for an 80° dip.

In an attempt to provide a magnetic body that would also correlate with the I.P. and resistivity data, a model was generated by trial and error until the presented model was achieved.

$$h = 2m$$
$$t = 50m$$
$$d = 90^{o}$$
$$k = 8000 \times 10^{-6} c.g.s.$$

Center of the body - 21.0N

Also, the magnetic response centered at 23.15N proved to be difficult to match by theoretical calculations. The following was used:

$$h = 2m$$
$$t = 80m$$
$$d = 80^{o}\ SW$$
$$k = 15{,}000 \times 10^{-6} c.g.s.$$

Center of the body - 23.15N

From what is known of the geology, these zones are much wider then expected. However, as an average, these values should prove useful. From the results of the contoured data, a magnetic lineament has been postulated to exist at 22N. As this is located between two interpreted bodies and in a zone of somewhat confused magnetics, it is an acceptable interpretation.

I.P. zone C1 and its related magnetic features were again examined on traverse ML-11. The I.P. response is associated with a very narrow conductive zone and as interpreted, on the SW side of a magnetic zone possessing the following:

$$h = 2m$$
$$t = 50m$$
$$dip = 90^{o}$$
$$k = 5000 \times 10^{-6} c.g.s.$$

Center of body - 21N

However, an unusual discrepancy occurs in that the resistivity results indicate a geological contact in the center of the interpreted magnetic body. However, the magnetic interpretation is not unique as not all of the measured response is accounted for. The field results indicate the possibilities of two discrete bodies with the resistivity contrast occuring between the two bodies. 80m to the SW of the I.P. response is a very narrow, resistive zone. Between the resistive zone and the I.P. response is a narrow (10m or less) magnetic body at 19.90N.

Zone C2 was examined on ML-15 as was C1 and B2 plus all of the associated magnetics. C2 exhibits a very strong I.P. response and is also a conductive zone. A narrow magnetic zone is directly associated with the I.P. response.

$$h = 4m$$
$$t = 15m$$
$$d = 80^{o}\ SW$$
$$k = 2000 \times 10^{-6} c.g.s.$$
Center of body - 17.90N

Due to the poor resolution of the I.P. data, it cannot be determined exactly how close the magnetic body and the I.P. body are really associated. From the present data, the I.P. response is located on the hanging wall of the magnetic body. Also, the magnetic body may be considered part of the resistivity contact. A zone of high resistivity separates C2 and C1. C1 differs from the response at ML-11 and ML-12 in that the I.P. response here (ML-15) is directly associated with a resistivity contrast (geological contact). Also, C2 has a magnetic response located immediately to the NE of the I.P. response. B2 has also been analysed at traverse ML-15/ 20.25N. The I.P. response is directly associated with a magnetic body as follows:

$$h = 2m$$
$$t = 40m$$
$$d = 90^{o}$$
$$k = 10{,}000 \times 10^{-6} c.g.s.\ units$$
Center of body - 20.30N

However, the magnetic response is more complex and not all of it has been analysed. The main response is located at 20.65N and a great deal of magnetic material is present. It is unexpected that there is no I.P. response associated with it.

Although the magnetic interpretation is not exact, I.P. response C2 appears to be associated with a limb of a very tight fold. C2 may be the continuation of this response on the other fold limb, but it is definitely more removed from the fold than C1. Also C1 appears to be very much associated with an electrical boundary (contact) and what is believed to be the hanging wall of a magnetic body believed centered at 18.50N. No magnetic interpretation has been presented for this body as no suitable form could be provided.

In the vicinity of traverses 3 to 6, there exists an extension of the "C" zone, C3. This zone presents a problem in that the I.P. response as plotted is continuous, but it does not correlate with the plotted magnetics. Traverse ML-3 positions the magnetics 140m NE of the I.P. response whereas traverses 4 and 5 position the I.P. 100m NE of the

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magnetics and definitely related to the magnetic contact.

Analysis of the magnetic responses associated with the I.P. responses on the three traverses proved very difficult. The character of the responses presented does not readily compare to the responses derived from a simple dike form. A complex set of closely spaced, narrow dikes is suspected. Traverse 5 can be assimilated to a thin dike as follows:

$$h = 35m$$
$$t = 8m$$
$$d = 60^{o}\ NE$$
$$k = 80{,}000 \times 10^{-6}\ c.g.s.$$

However, the dip of the structure does not match the known geology and the susceptibility is very high. Also, the I.P. response occurs at a large distance from the magnetic body and on the opposite side of the magnetic body from traverses 3 and 4. The I.P. responses are all directly associated with conductive zones and in the case of traverse 4, the I.P. response is closely associated with a contact zone.

ZONE D

This general zone is comprised of two narrow zones with D1 more apparent on traverses 11 to 15 whereas D2 has its maximum response on traverse 7 and is in general, more continuous.

D1 was analysed on traverse 13/14.40N. Two narrow magnetic bodies have been resolved by the magnetic survey.

D1			D2
14.20N		14.42N	ML8/13.78N
2m	h	2m	10m
10m	t	20m	40m
75^{o} SW	d	90^{o}	80^{o} SW
$15{,}000 \times 10^{-6}$ c.g.s.	k	$12{,}000 \times 10^{-6}$ c.g.s.	$12{,}000 \times 10^{-6}$ cgs

The I.P. data lacks the resolution necessary due to the survey parameters used, but the maximum value recorded occurs at 14.25N. A narrow source is indicated with a possible dip to the SW. The resistivity results indicate a possible narrow zone of low resistivity (conductive zone). This zone is of limited extent as indicated by the plan map.

The interpreted magnetics indicate that this is associated with a major lineament of the area and the I.P. response may be localised around this structure plus the associated sediments. The magnetics also indicate that the sediments are continuous along strike beyond this structural feature.

ZONE E

Three I.P. responses comprise zone E with E1 and E2 being

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very similar in that they definitely occur as non magnetic I.P. responses closely associated with a contact as determined by the resistivity data. However, as in most zones of response, the physical character changes and from traverse 11 to 13, E1 changes from a contact environment to one directly associated with a resistive zone. Zone E3 is associated with a magnetic contact on traverse 11 but occurs as a non magnetic response on traverse 13. In general, these zones are wider than previously discussed zones. Although they usually exhibit an apparent dip to the SW, the "change in base level" is believed due to changes in the underlying geology, thus eliminating any visual check on the apparent dip (ML-11). However, this assumption is not valid for all of the traverses. Zone E2 narrows considerably to the SE (traverse 8) and its physical character changes considerably. As on traverse 8, the I.P. response is also a conductive zone. Geological information is required in order that zone E can be evaluated.

ZONE "F"

Of the three responses that make up zone "F", only F1 exhibits closely related magnetics. On traverse 11 at approximately 7N, the following analysis of the magnetics was obtained:

$$h = 2m$$
$$t = 15m$$
$$d = 80^{o} \text{ SW}$$
$$k = 8000 \times 10^{-6} \text{ c.g.s. units}$$

Center of body-6.75N

Although the magnetics indicate a narrow zone, it does coincide with the maximum recorded I.P. response. The values recorded on the flanks of the I.P. response, clearly indicate the body's extension to depth. The fact that the flank values indicate something wider, is due to the fact that at two stations, one potential electrode is very much affected by the presence of the zone. Only the station where the potential dipole adequately straddles the zone is a non-distorted response recorded. The apparent dip of the I.P. response correlates with the interpreted dip from the magnetics which would suggest that the surrounding materials exhibit a similar I.P. response. The resistivity results clearly place the zone of response about 20m SW of a zone of considerable conductivity.

On traverse 13, F1 has clearly split into 2 I.P. zones with only one zone definitely related to magnetics. However, the magnetic parameters vary considerably from those on traverse 11 in that the magnetic horizon on traverse 13 is overturned relative to traverse 11. The following parameters were derived in the analysis:

$$h = 5m$$
$$t = 20m$$
$$d = 80^{o} \text{ NE}$$
$$k = 12000 \times 10^{-6} \text{ c.g.s. units}$$

Center of body - 6.55N

It should be noted that the theoretical magnetics vary somewhat on the northern flank due to a body of negative

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(reversed) susceptibility.

The resistivity pattern suggests that it is still the foot-wall that is conductive, but as the bed has overturned, the relative position of the I.P. response and the resistivity low have interchanged.

Zone F2 presents the same problem in that from traverse 11 to traverse 13, the relative position of the I.P. response and the zone of high resistivity change. On traverse 11, the I.P. response is directly associated with a conductive zone and has a resistive zone located to the NE. However, on traverse 13 the I.P. response is directly associated with the zone of high resistivity. On both traverses, the strongest magnetic response is located approx. 100m NE of the I.P. response.

On traverse 13, a magnetic response was analysed at 3N. The following results were obtained:

h = 10m
t = 40m
d = 90^{o}
k = 6000×10^{-6} c.g.s. units
Center of body - 3.06N

Zone F3 is considerably different in that the I.P. response is directly associated with a major contact zone as depicted by the resistivity results. This is even more apparent on traverse 15. This zone is a multiple zone and as the area to the south was surveyed with a pole-dipole array, a direct interpretation is not available. The magnetic responses on traverse 13/0.20N and 0.80N were analysed for the following results:

2m	h	10m
20m	t	60m
90^{o}	d	80^{o} SW
5000×10^{-6}	k	6000×10^{-6}
0.10N	Center	0.65N

Although only a poor model could be obtained, it would appear that the I.P. response recorded by the pole-dipole array is associated with the hanging wall of the presented body (0.65N). This is assuming that the moving current (C1) of the pole-dipole array was to the south of the potential dipole along the traverse. If the current is to the north of the potential dipole along the traverse, then it is possible that 2 zones exist; 0.0N and 1.0N. If this were the case, both polarizable zones are associated with contact zones relating to the magnetics. The contractor will have to provide the necessary answers in order that this may be solved.

The same problem occurs on traverse 11. The general nature of the response suggests that the moving current C1 is located south of the potential dipole. If this is the case, then two shallow (less than 10m) zones occur at 1.60S and 1.85S. However, if the moving current were located north of the potential dipole, then 4 zones of response could exist; 1.0S, 2.5S, 5.0S and 6.2S.

The resistivity results from traverse 13 indicate an exceptionally conductive zone at 0.65N thus suggesting that the moving current was located to the south. Four conductive zones are indicated on traverse 11 thus suggesting that the moving current was located to the north.

Another aspect of the resistivity results in the vicinity of 0.00N from traverses 11 to 19 is the exceptional resistivity contrast which is believed due to rock types. The resistive material to the north is believed to be the Lower Cambrian sediments. The observed results definitely indicate a considerable increase in quartz content.

The additional three array data collected on traverse 14 indicates the well defined resistivity contrast at approximately 0.00N, the conductive zone at 2.0S plus several zones of I.P. response south of 0.00N. Unfortunately, the data presented by the contractor does not define which profiles are pole-dipole (a = 25m and n = 2) and which are three array (a = 25m; a = 50m). Assuming that the three array, a = 25m is plotted on the upper portion and indicated by a solid line and dots, it can be concluded that a 25m dipole is large enough but it cannot adequately resolve the various responses.

The contoured magnetic data reveals two sets of lineaments which are believed to be shearing or faulting. Two well defined lineaments striking E-W are believed to be of considerable importance. Lineament "A" is a boundary for the magnetic rock unit labelled II. Lineament A is believed to correlate with an interpreted structure from the aeromagnetic survey. Lineament "B" parallels "A" but is too close to "A" to be the second structural feature recognised from the aeromagnetic data. Lineament "C" is better located to represent the second feature. Coverage of the ground magnetic data is insufficient for a correlation to be made.

The anomalous magnetic zones as indicated by the ground magnetometer survey are too closely spaced and too numerous to be resolved by the airborne survey. The airborne survey should have recorded all zones with values exceeding 65,000 gammas absolute.

A series of N-NE trending structures have also been noted. Some relative movements on these structures have been noted.

The Mt. Lindsay lode is believed to be closely associated with a lineament paralleling the bedding planes. The magnetics suggest warping of the beds in the general area, but this is not unique to the mineralised area.

CONCLUSIONS AND RECOMMENDATIONS

An unusually large number of I.P. responses and magnetic

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zones have been recorded within the survey area. The use of the gradient array has assured a deep penetration and good lateral control. However, due to the large number of narrow I.P. responses, a shorter potential dipole is required for adequate resolution.

The magnetic results clearly indicate the narrow character of the magnetic zones. Close correlation with the geology is required to properly explain all the responses.

As the tin mineralisation in the area is associated with pyrrhotite, it would be expected that coincident magnetics, I.P. and low resistivity would provide the prime target.

The following zones provide this condition:

B2	-	ML-15/20.30N
C1	-	ML-12/21 N
D2	-	ML-8 /13.78N
D1	-	ML-13/14.20N
E3	-	ML-11/ 8.55N
F1	-	ML-11/ 6.80N
F1	-	ML-13/ 6.45N

Drilling is highly recommended to test these targets. As all zones are essentially vertical and essentially extend to the surface, the positioning of the drill collar is a matter of physical convenience.

Further I.P. work is not immediately warranted on this grid as several zones of response have been identified and in order that the present results be refined, a substantial amount of extra and detailed I.P. work would be necessary.

As the known tin mineralisation occurs with massive sulfides, it is highly recommended that an EM technique be tested. Turam or other more sophisticated systems are not necessary as the expected conductive zones extend essentially to the surface and maximum penetration is not required. A light-weight system unaffected by terrain and capable of adequate resolution for the problem at hand is recommended.

The magnetic results in combination with the geology will clearly identify the magnetic horizons plus the favourable geology. This association should eliminate all unfavourable magnetic horizons and allow all future concentration to be placed on favourable horizons plus all unknown zones. Further analysis of magnetic anomalies may be required.

No terrain correction was applied to the magnetic data and therefore an error in the theoretical profiles is involved. If an accurate theoretical profile is considered essential, better vertical control is required. The topography as presented is not considered adequate for terrain corrected profiles.

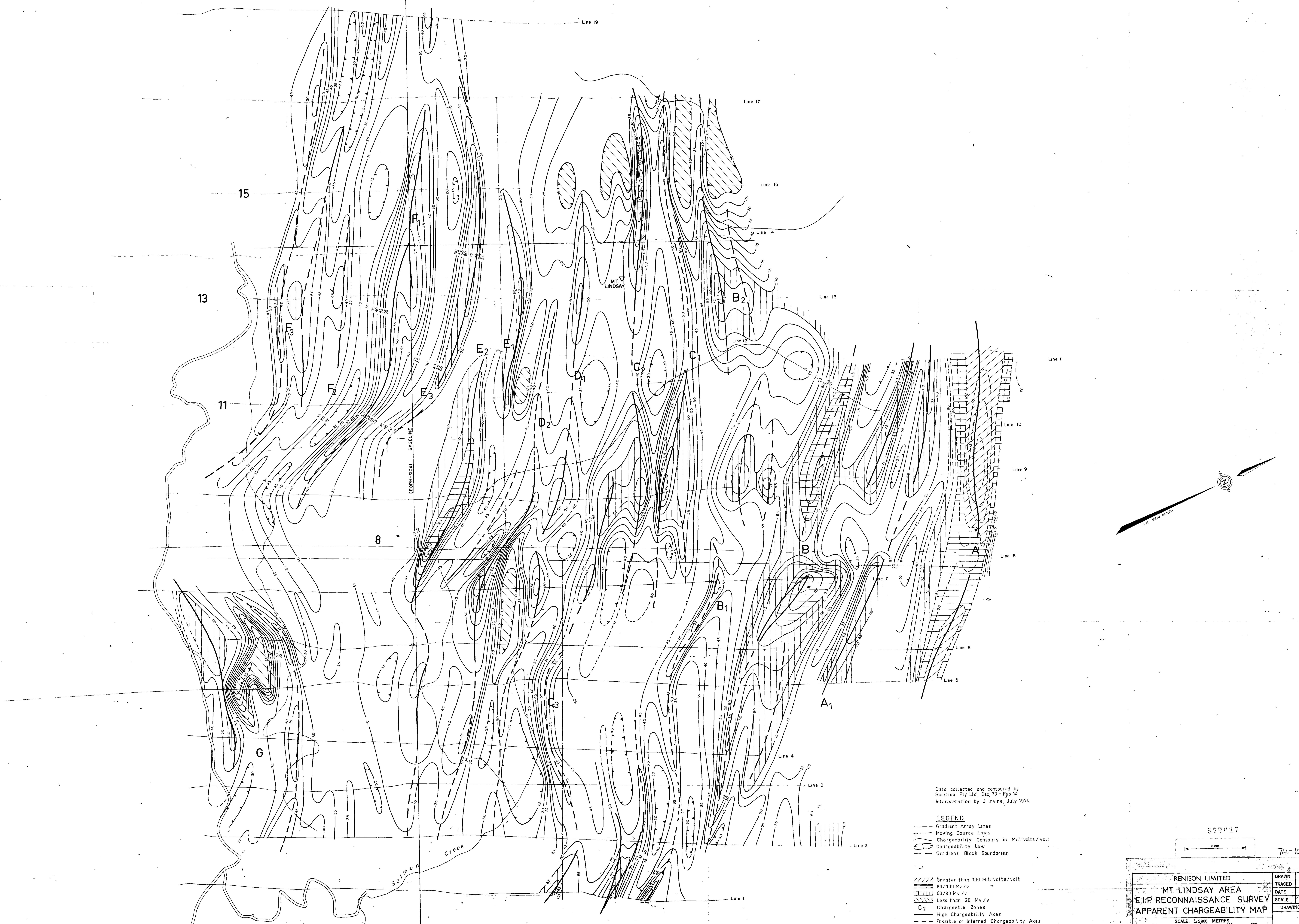
A review of the geophysical data plus the geological data is required in order that a fully correlated report can be presented.

Respectfully submitted

John L. Irvine B.Sc., P. Geoph., P. Eng.

PROFESSIONAL GEOPHYSICIST ALBERTA JOHN L. IRVINE

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA JOHN L. IRVINE


Line 19
Line 17
Line 15
Line 14
Line 13
Line 12
Line 11
Line 10
Line 9
Line 8
Line 7
Line 6
Line 5
Line 4
Line 3
Line 2
Line 1
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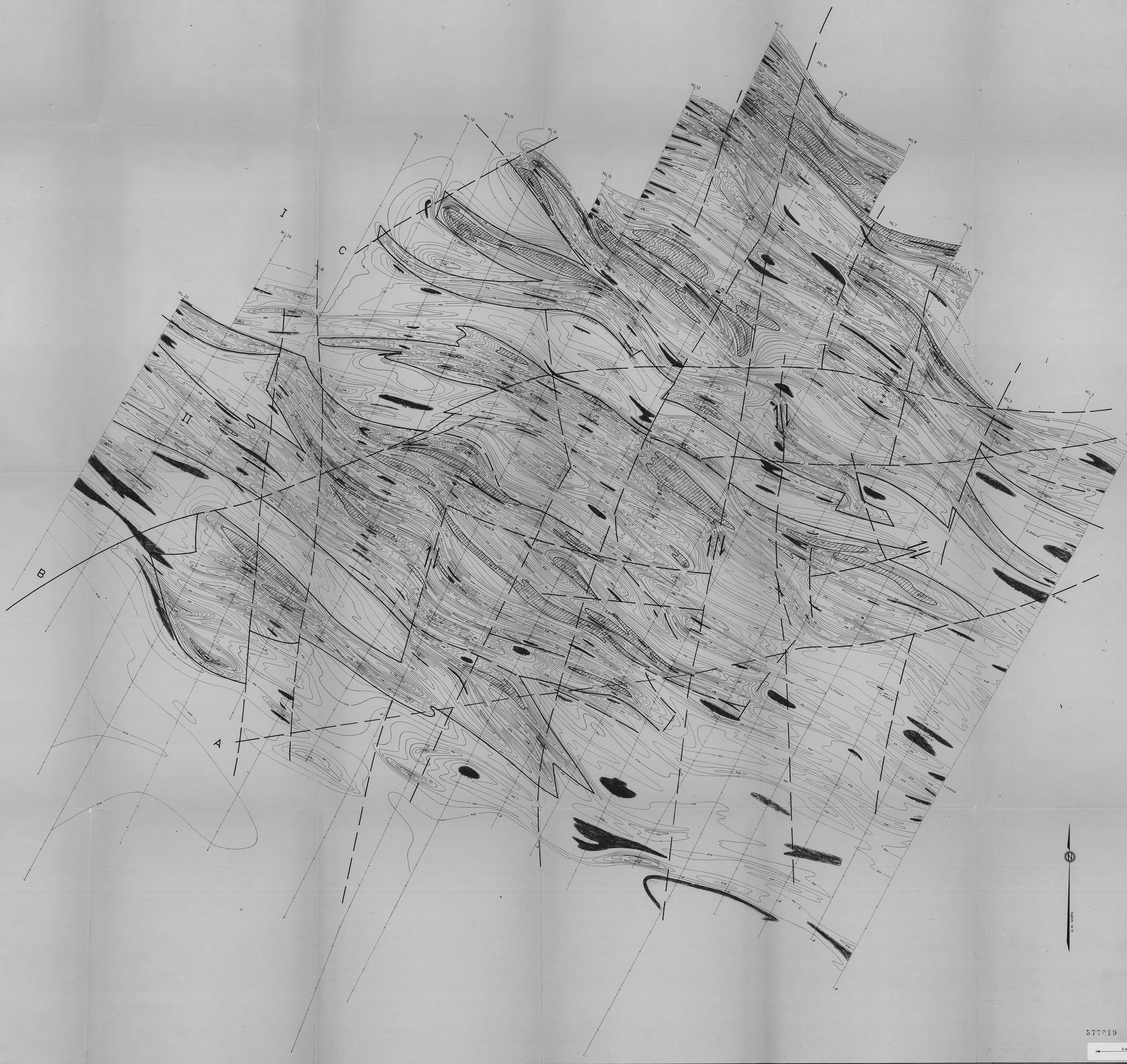
MT. LINDSAY
GEOPHYSICAL BASELINE
Salmon Creek
A.M.G. GRID NORTH
A
A_1
B
B_1
B_2
C_1
C_2
C_3
D_1
D_2
E_1
E_2
E_3
F_1
F_2
F_3
G
Data collected and contoured by Scintrex Pty Ltd, Dec 73 - Feb 74
Interpretation by J Irvine, July 1974.
LEGEND
Gradient Array Lines
Moving Source Lines
Chargeability Contours in Millivolts / volt
Chargeability Low
Gradient Block Boundaries.
Greater than 100 Millivolts/volt
80/100 Mv/v
60/80 Mv/v
Less than 20 Mv/v
C_2 Chargeable Zones
High Chargeability Axes
Possible or Inferred Chargeability Axes
577017
5 cm
74-1033
RENISON LIMITED
MT. LINDSAY AREA
E.I.P. RECONNAISSANCE SURVEY
APPARENT CHARGEABILITY MAP
SCALE. 1:5,000 METRES
100 0 100 200 300
DRAWN
TRACED
DATE
SCALE 1:5000
DRAWING No.


1610
Line 19
Line 17
Line 15
Line 14
MT LINDSAY
Line 13
Line 11
Line 10
Line 9
Line 8
Line 7
Line 6
Line 5
Line 4
Line 3
Line 2
Line 1
GEOPHYSICAL BASELINE
Salmon Creek
AM. GRID NORTH
Data collected and compiled by
Scintrex Pty. Ltd., Dec. 73 - Feb. 74.
Interpretation by J. Irvine, July 1974.
LEGEND
Gradient array lines
Moving source lines
Resistivity contours in OHM - Metres
Resistivity low
Gradient Block Boundaries
Conductive Axes
Possible Conductive Axes
577018
74-1033
RENISON LIMITED
MT. LINDSAY AREA
E.I.P. RECONNAISSANCE SURVEY
APPARENT RESISTIVITY MAP
DRAWN
TRACED
DATE
SCALE
1:5,000
DRAWING No.
SCALE. 1: 5,000 METRES
100 0 100 200 300
5 cm
1610

1611.



577019

LEGEND

———	5,000 Gammas.
———	1,000 "
———	200 "
(solid oval)	Magnetic Low.
(hatched oval)	Magnetic High exceeding 65,000 Gammas.
1,000N	Traverse Station.
— —	Interpreted Lineament.
A	Structual Feature.
———	Rock Unit Boundary.
I	Rock Unit.

SURVEY SPECIFICATIONS

Reading Interval normally 10m.
T_0 = 62,000 Gammas. I_0 = -72°. S = 115°
Contouring By J. Templin, Sydney – July 1974.
Interpretation By J. Irvine, Sydney – July 1974.
Data Collected By Renison Geologists – Summer 1974.
Instrument – G816 Proton Precession.

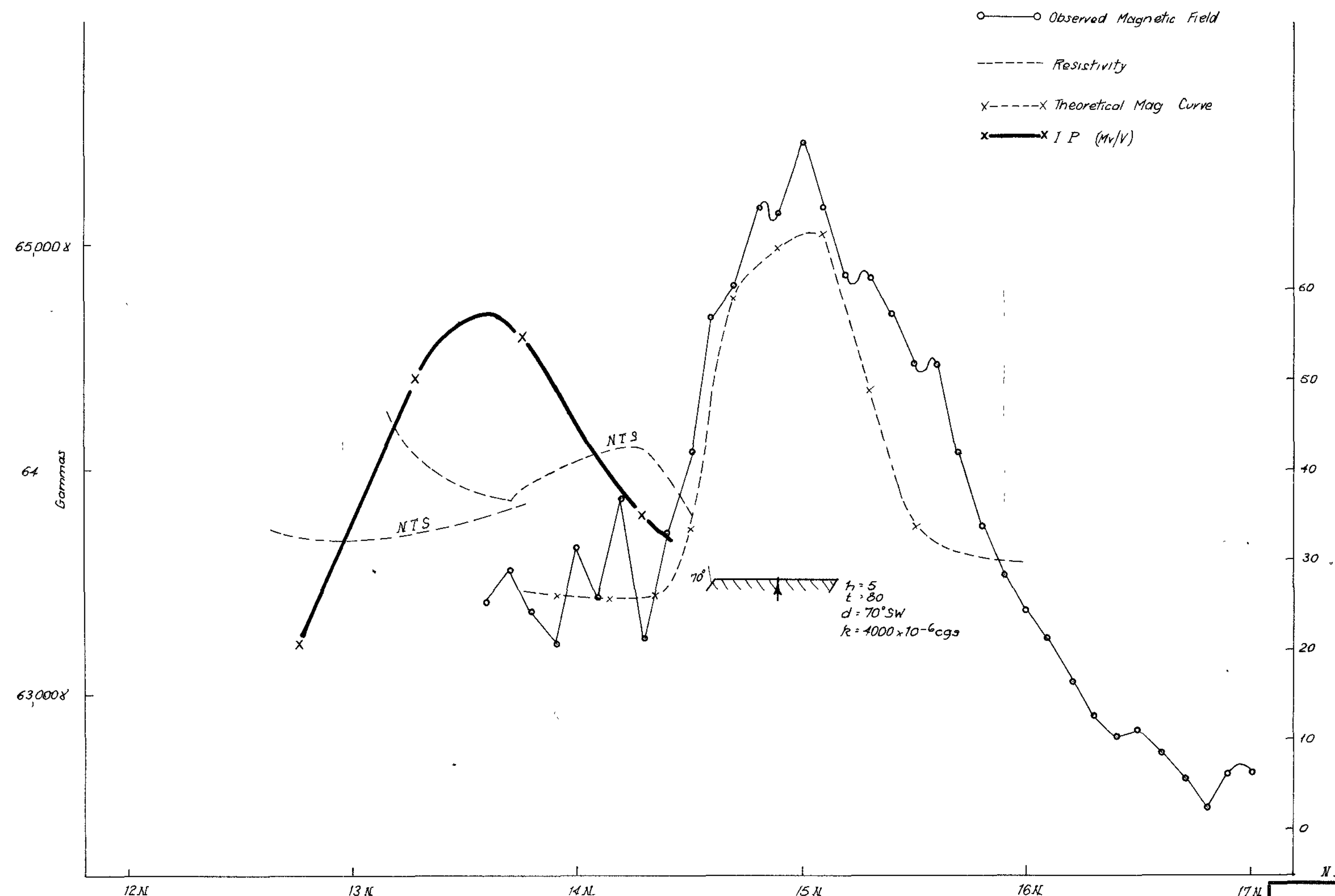
RENISON LIMITED

MT. LINDSAY.

TOTAL MAGNETIC INTENSITY CONTOURS.

DRAWN	
TRACED	RJP.
DATE	
SCALE	1 : 5000
DRAWING No.	

SCALE. 1: 5000 METRES.
100 0 100 200 300



NTS - Not to Scale

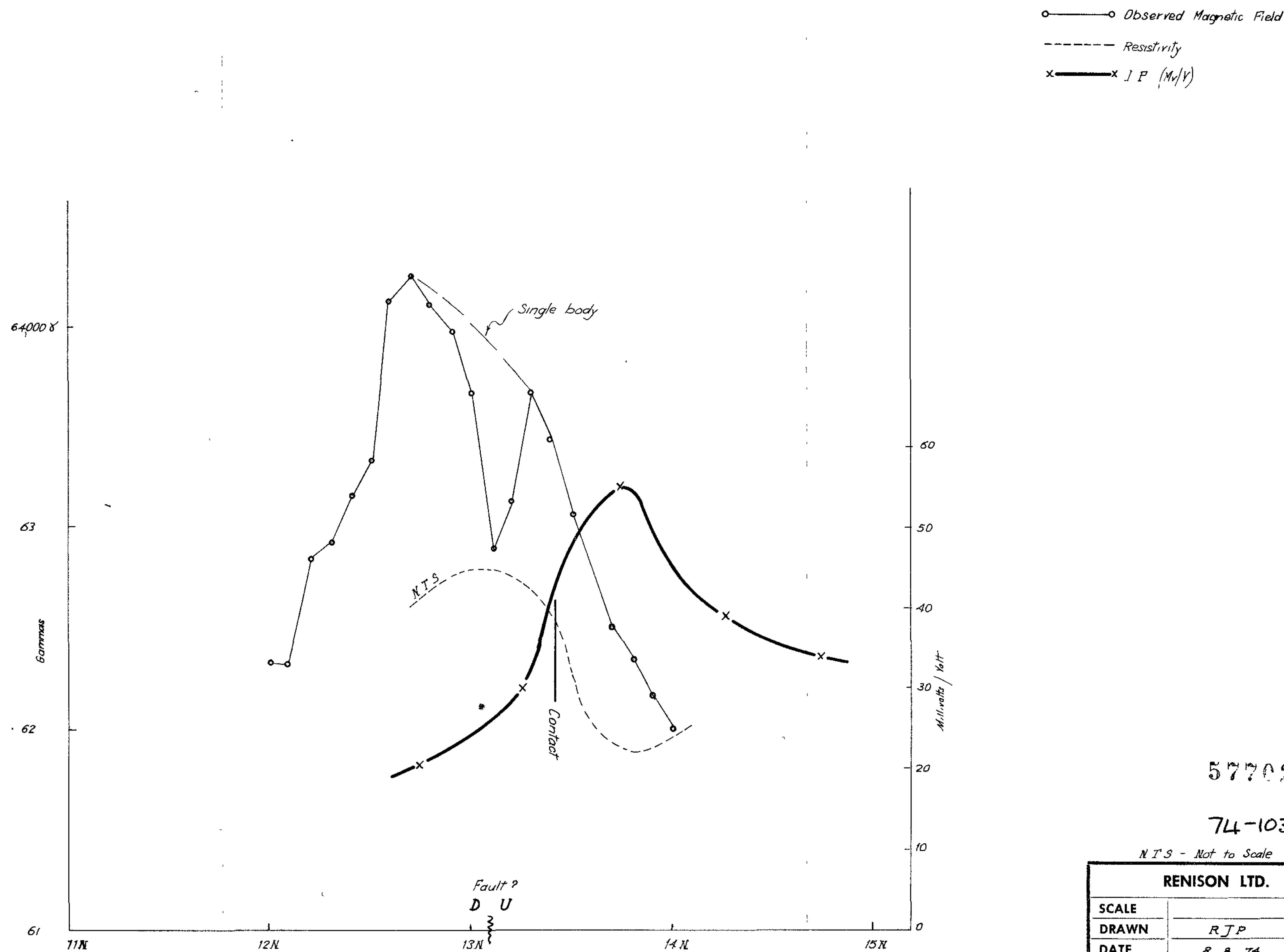
74-1033

RENISON LTD.

SCALE	
DRAWN	R.J.P
DATE	8 8 '74
TITLE	ML 3

577020

16?7

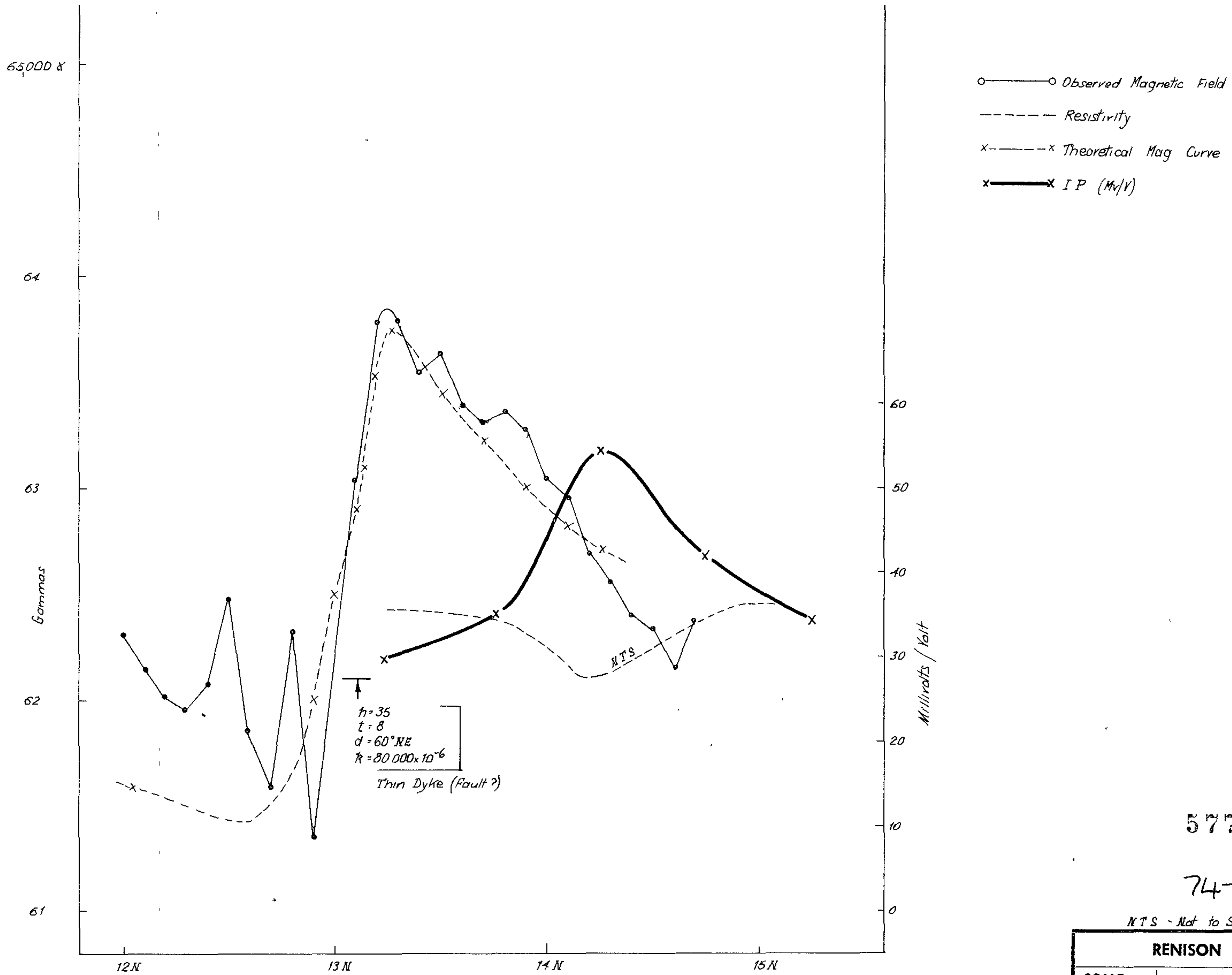


577021

74-1033

N T S - Not to Scale

RENISON LTD.	
SCALE	
DRAWN	R J P
DATE	8 8 74
TITLE	M.L. 4.

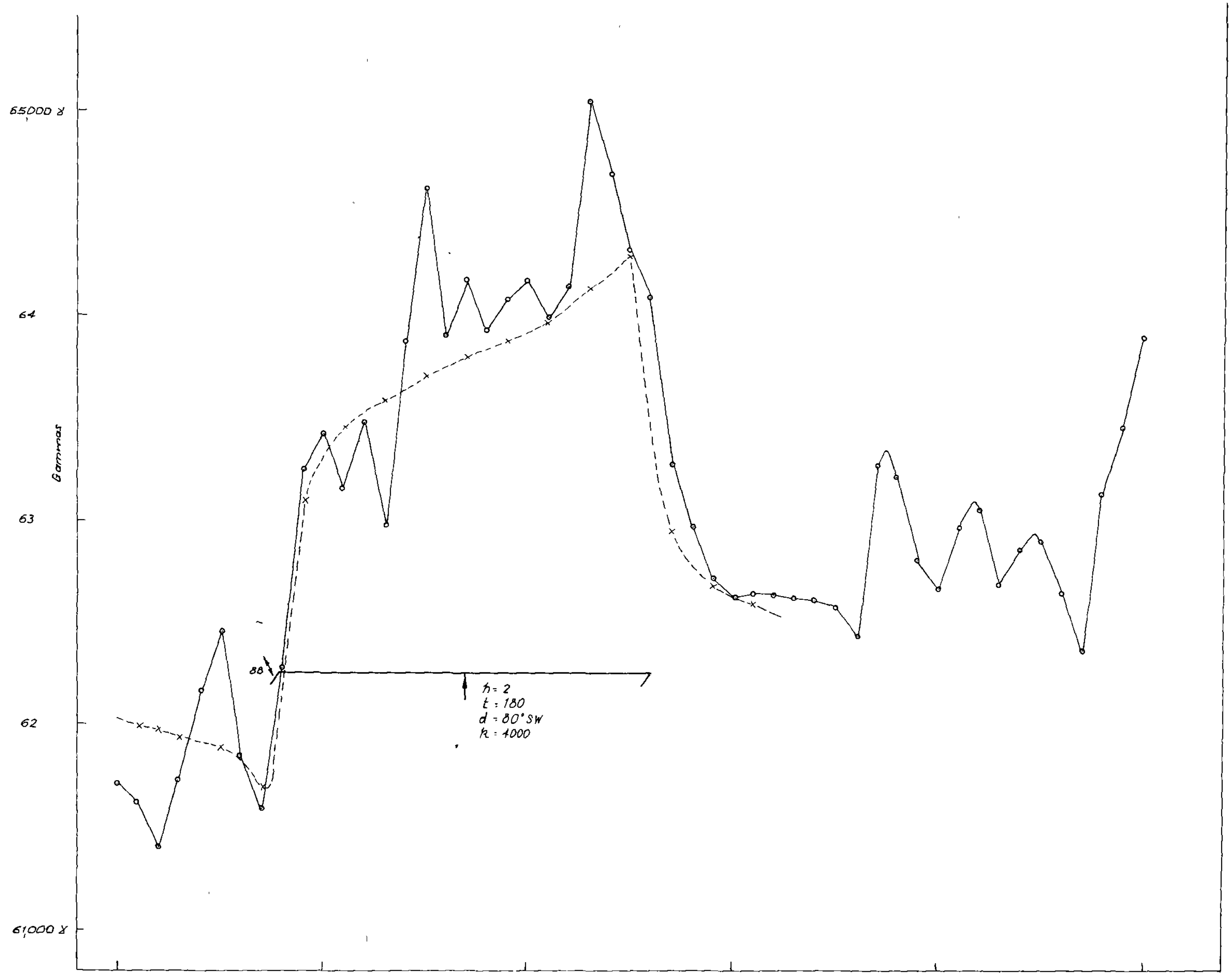


577022

74-1033

NTS - Not to Scale

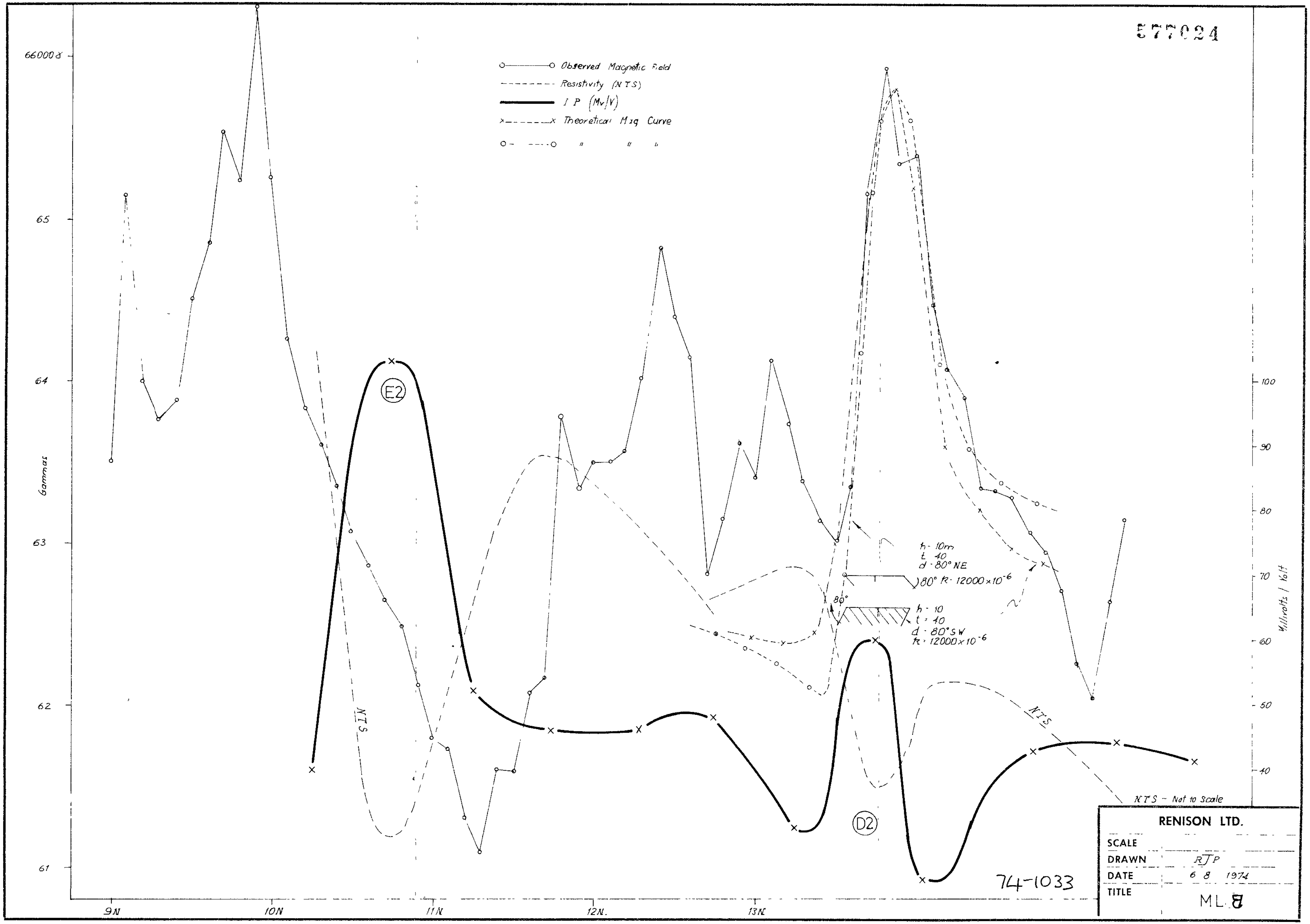
RENISON LTD.	
SCALE	
DRAWN	RJP
DATE	8 8 '74
TITLE	M.L. 5.

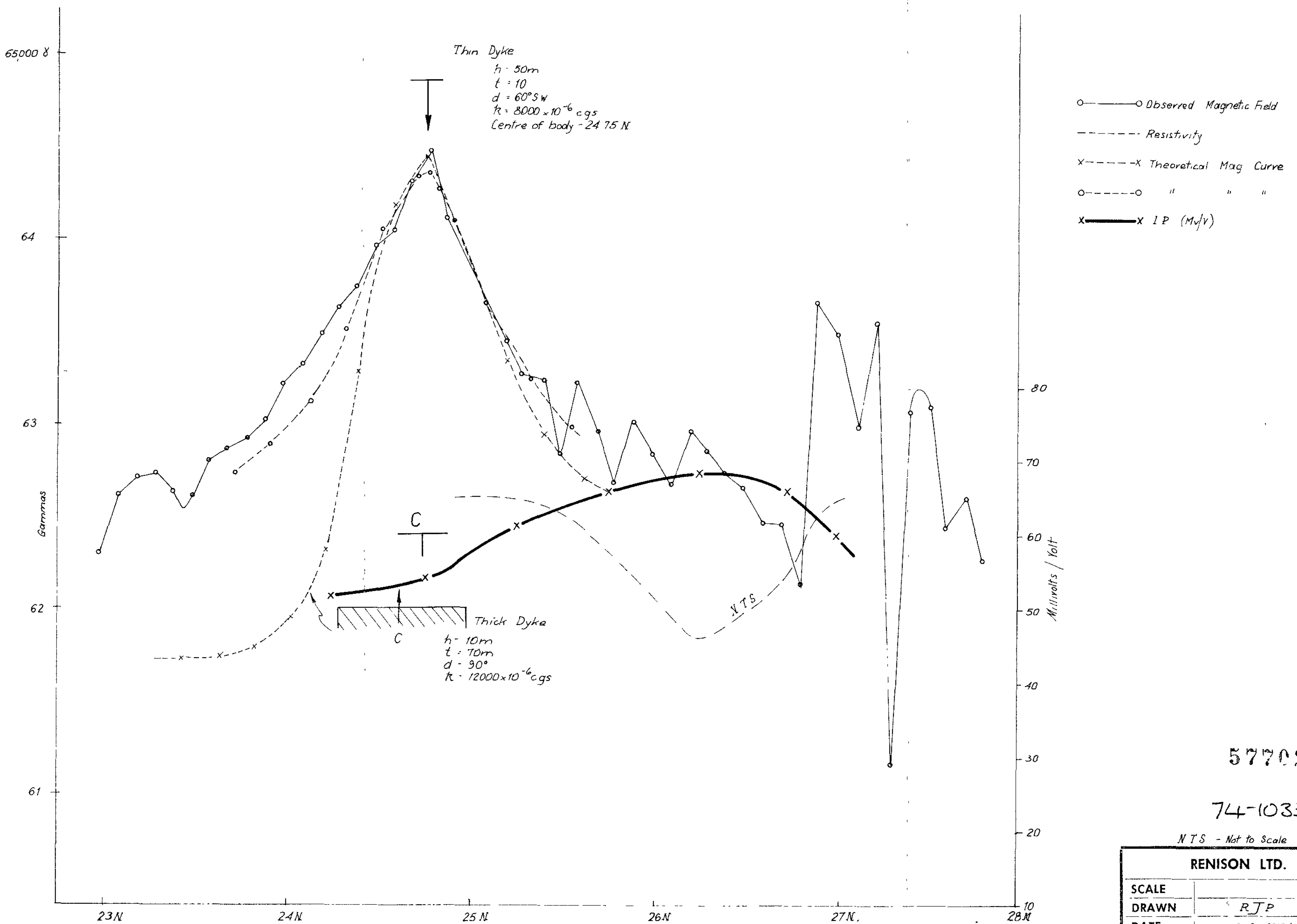


577023

74-1033

RENISON LTD.	
SCALE	
DRAWN	RJP
DATE	8 8 '74
TITLE	M.L.6


577024
Observed Magnetic Field
Resistivity (N T S)
I P (Mv/V)
Theoretical Mag Curve
" " "
66000 8
65
64
63
62
61
Gammas
9N
10N
11N
12N.
13N.
E2
D2
N T S
NTS
h - 10m
t 40
d - 80° NE
80° k - 12000 × 10⁻⁶
80°
h - 10
t - 40
d - 80° SW
k - 12000 × 10⁻⁶
100
90
80
70
60
50
40
Millivolts / Volt
NTS – Not to Scale
74-1033
RENISON LTD.
SCALE
DRAWN RJP
DATE 6 8 1974
TITLE ML 8

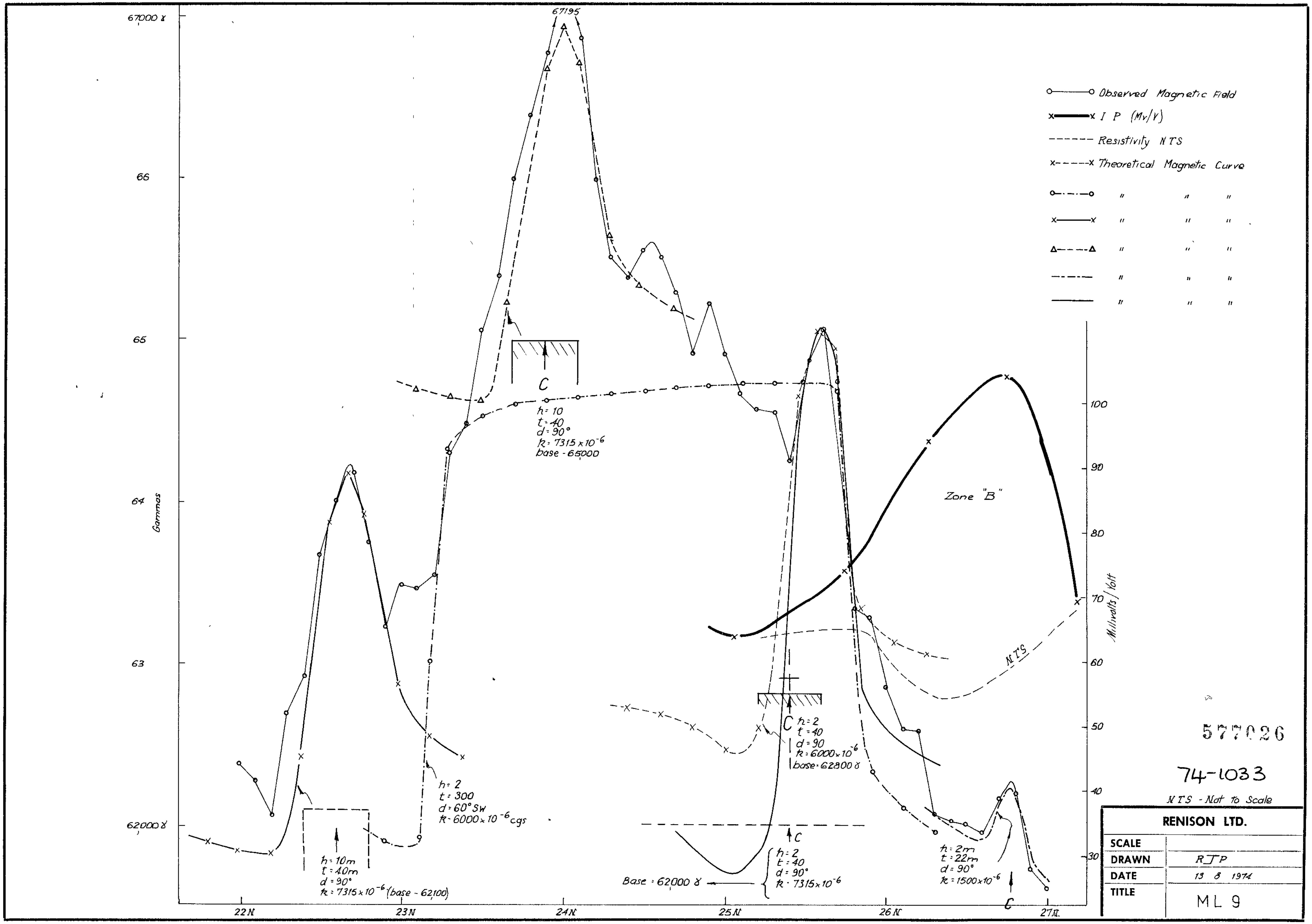


577025

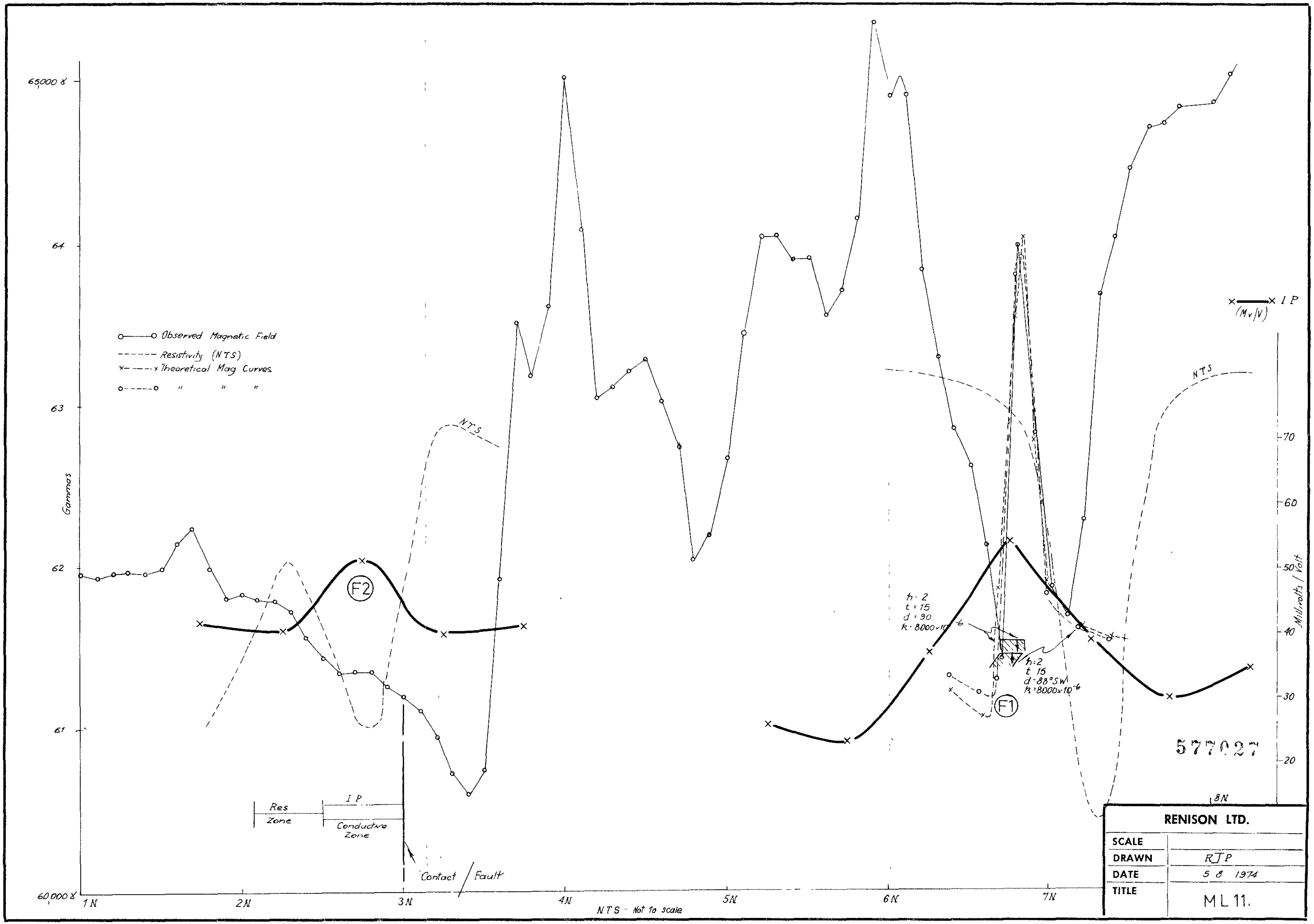
74-1033

N T S - Not to Scale

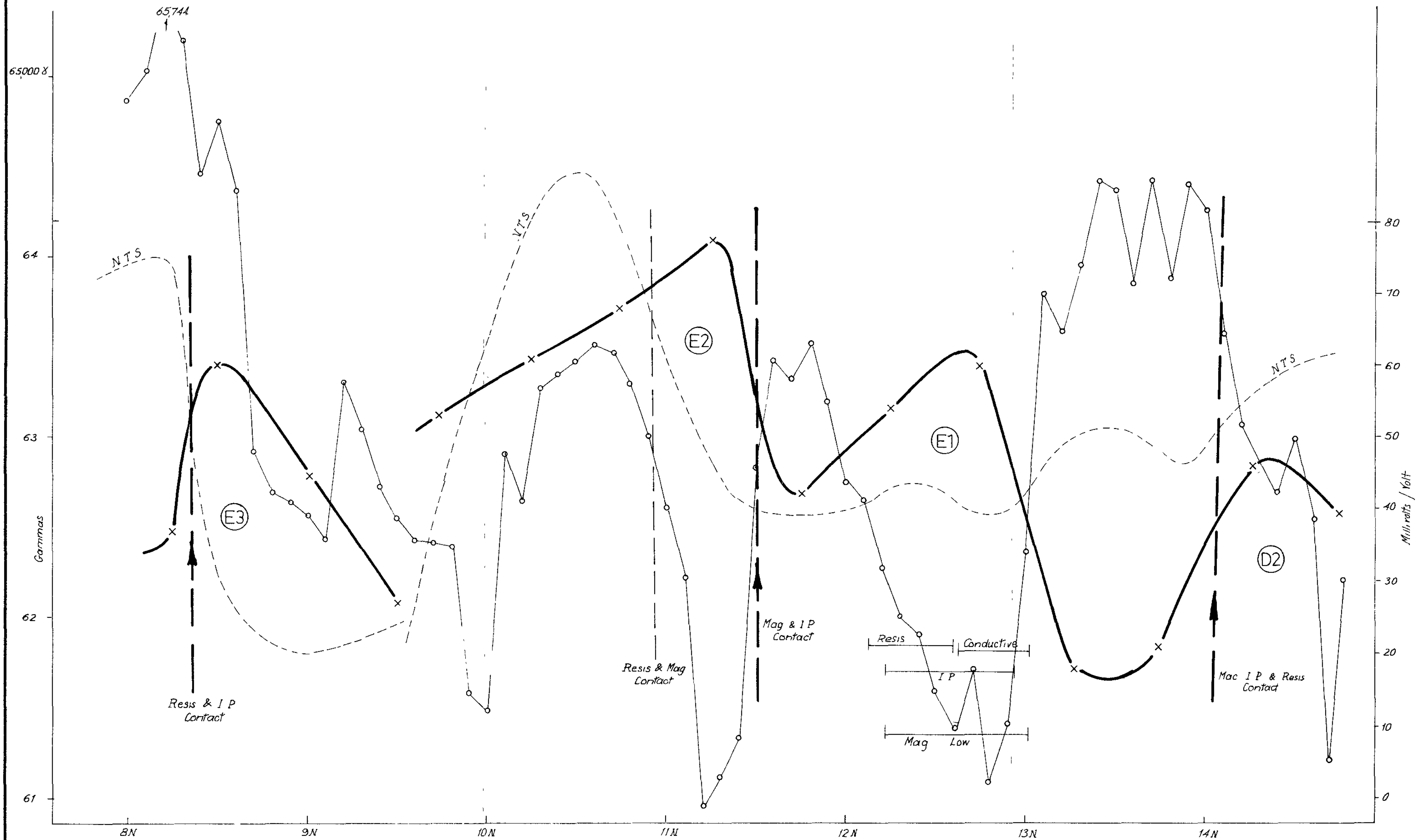
RENISON LTD.	
SCALE	
DRAWN	R J P
DATE	6 8 1974
TITLE	M.L 8.



67000 γ
66
65
64
63
62000 γ
Gammas
67195
Observed Magnetic Field
I P (Mv/V)
Resistivity NTS
Theoretical Magnetic Curve
h = 10
t = 40
d = 90°
k = 7315 x 10^-6
base - 65000
h = 2
t = 300
d = 60° SW
k - 6000 x 10^-6 cgs
h = 10m
t = 40m
d = 90°
k = 7315 x 10^-6 (base - 62100)
h = 2
t = 40
d = 90
k = 6000 x 10^-6
base - 62800 γ
h = 2
t = 40
d = 90°
k - 7315 x 10^-6
Base = 62000 γ
h = 2m
t = 22m
d = 90°
k = 1500 x 10^-6
C
Zone "B"
NTS
Millivolts / Volt
100
90
80
70
60
50
40
30
22N
23N
24N
25N
26N
27N
577026
74-1033
NTS - Not to Scale
RENISON LTD.
SCALE
DRAWN RJP
DATE 13 8 1974
TITLE ML 9



RENISON LTD.	
SCALE	
DRAWN	RJP
DATE	5 8 1974
TITLE	ML 11.



NTS - Not to Scale

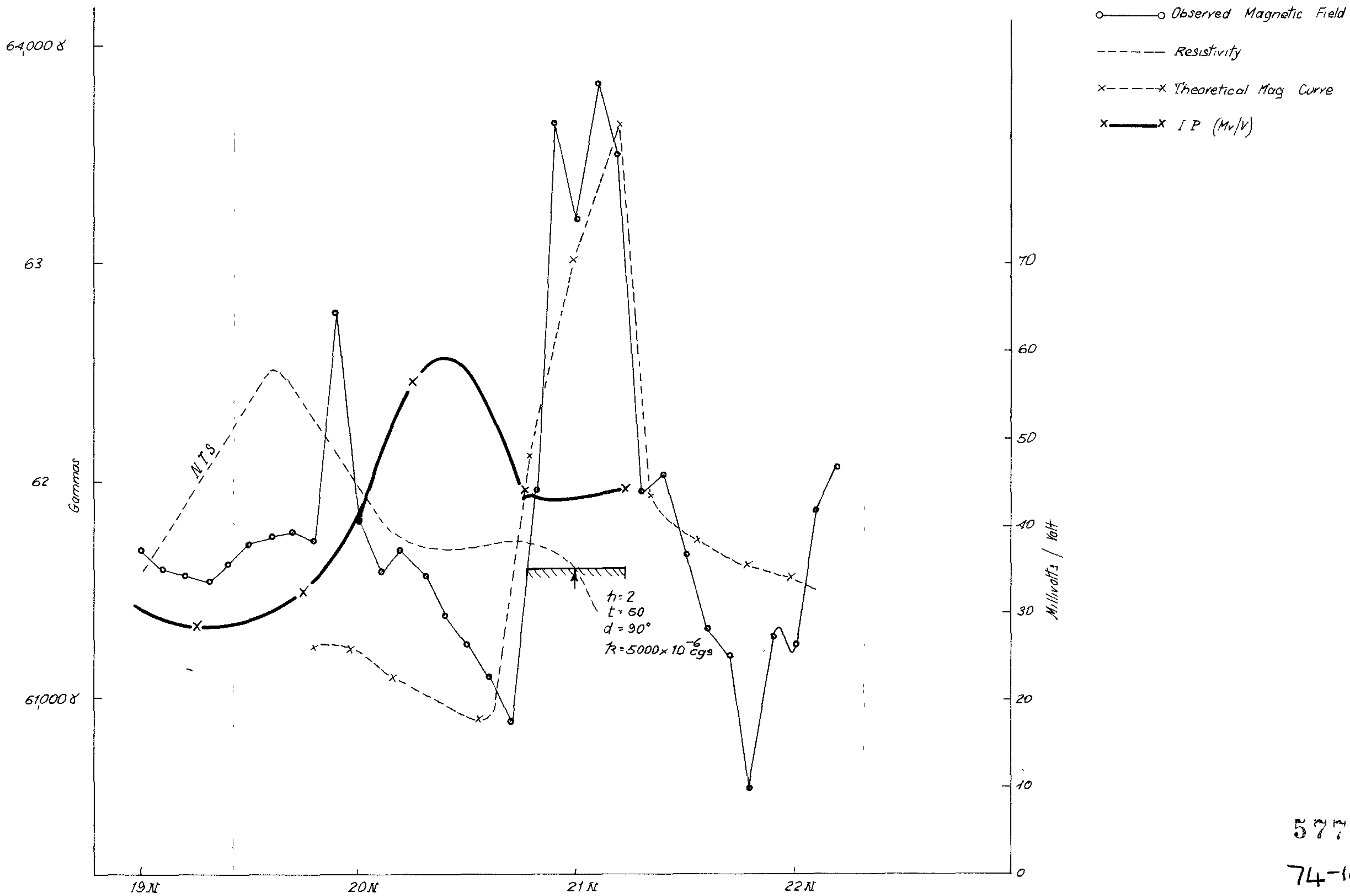
Observed Magnetic Field
Resistivity (NTS)
I P (Mv/V)
Contacts

577028

74-1033

RENISON LTD.	
SCALE	
DRAWN	RJP
DATE	9 8 1974
TITLE	ML 11

1626



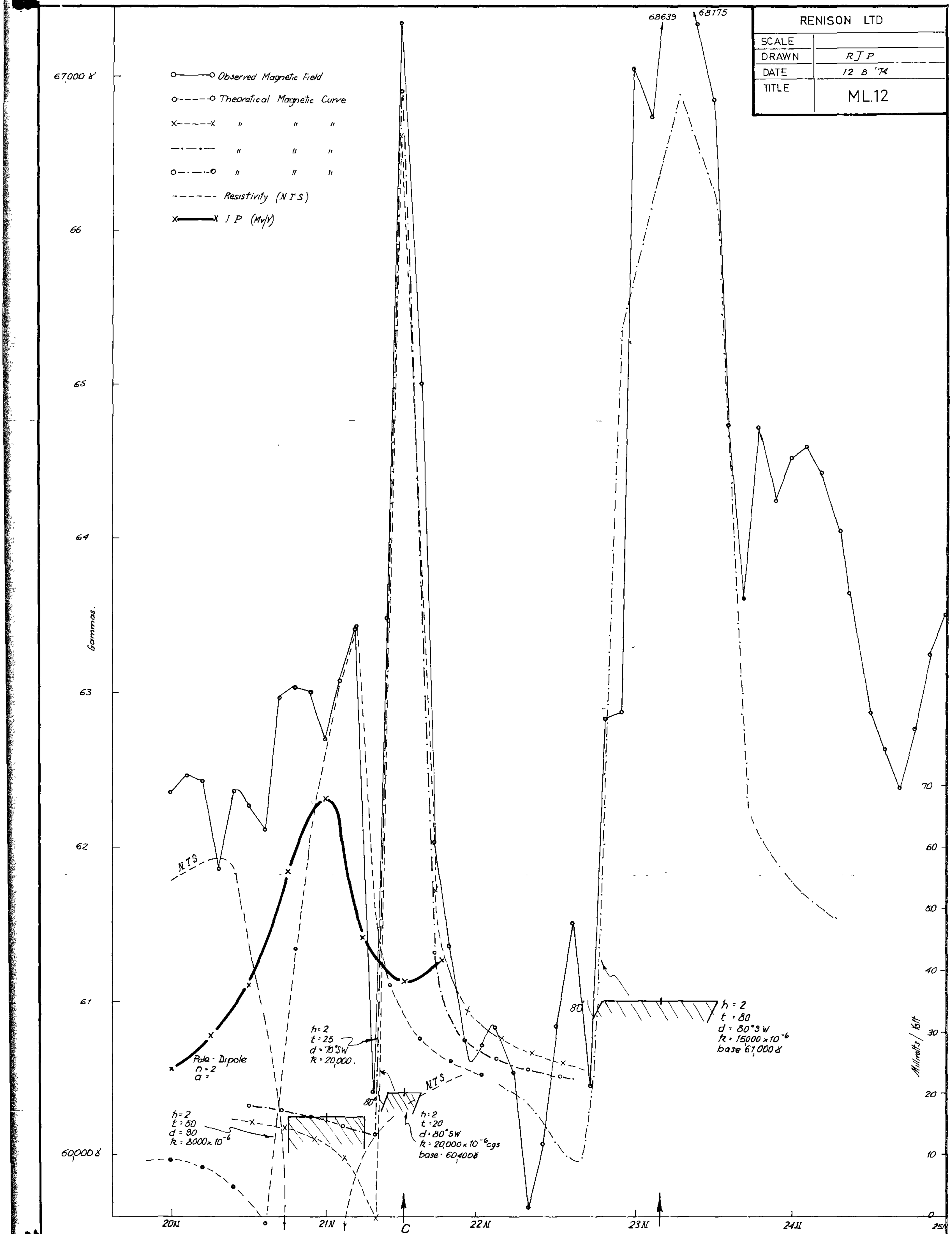
577029

74-1033

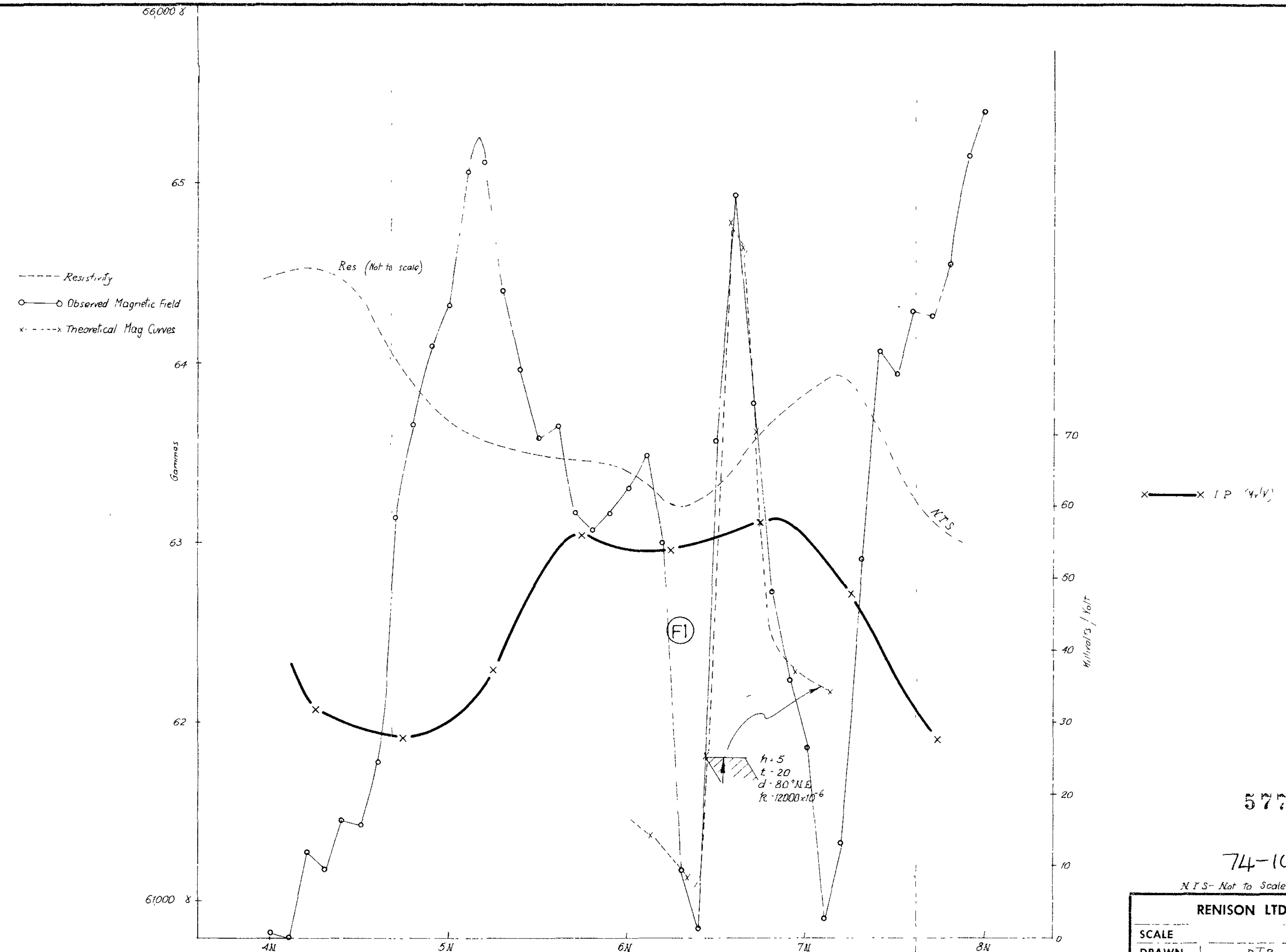
NTS - Not to Scale

RENISON LTD.	
SCALE	
DRAWN	RJP
DATE	8 8 '74
TITLE	ML.11.

577030 1613



RENISON LTD
SCALE
DRAWN RJP
DATE 12 8 '74
TITLE ML.12
Observed Magnetic Field
Theoretical Magnetic Curve
Resistivity (NTS)
I P (Mv/V)
67,000 γ
66
65
64
63
62
61
60,000 γ
Gammas.
68639
68175
70
60
50
40
30
20
10
0
Millivolts/Volt
NTS
Pole - Dipole
n = 2
a =
h = 2
t = 50
d = 90
k = 8000 x 10^-6
h = 2
t = 25
d = 70°SW
k = 20,000.
h = 2
t = 20
d = 80°SW
k = 20,000 x 10^-6 cgs
base 60400γ
h = 2
t = 80
d = 80°SW
k = 15000 x 10^-6
base 61,000γ
80°
20N
21N
22N
23N
24N
25N
C

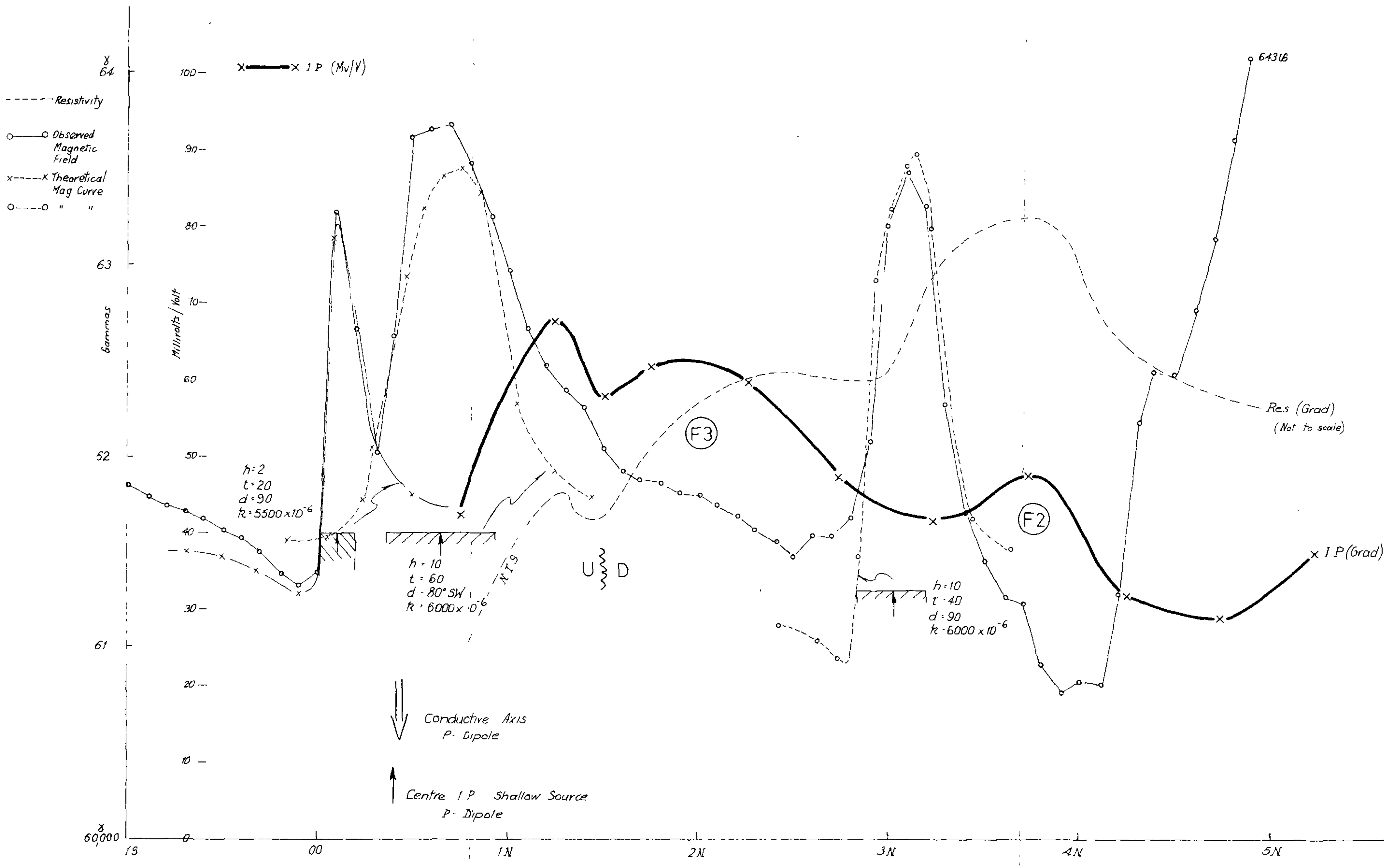


577031

74-1033

NIS- Not to Scale

RENISON LTD.	
SCALE	
DRAWN	RJP
DATE	5 8 1974
TITLE	ML 13

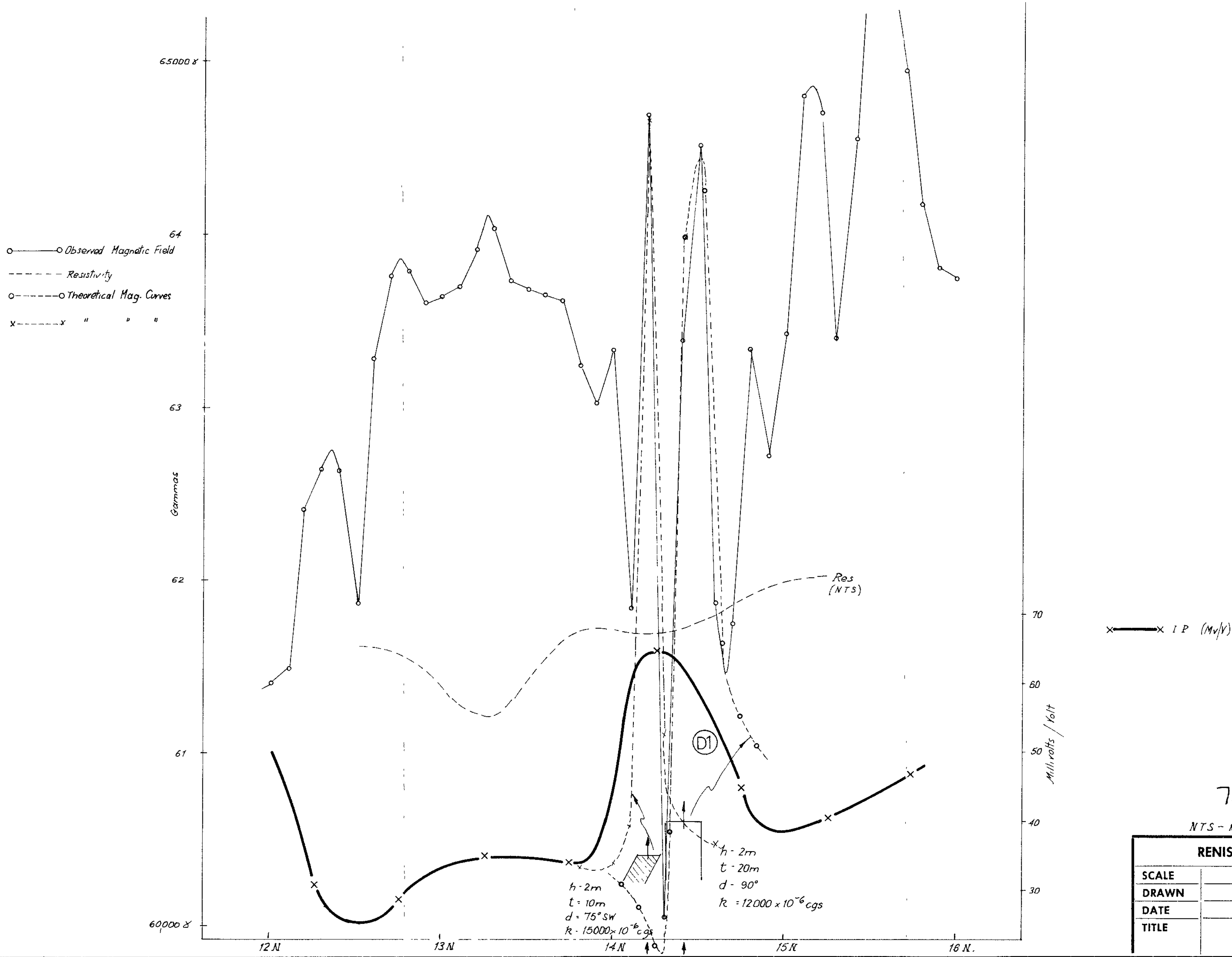


577032

74-1033

N.T.S. -- Not to Scale

RENISON LTD.	
SCALE	
DRAWN	RP
DATE	5 8 1974
TITLE	M.L. 13

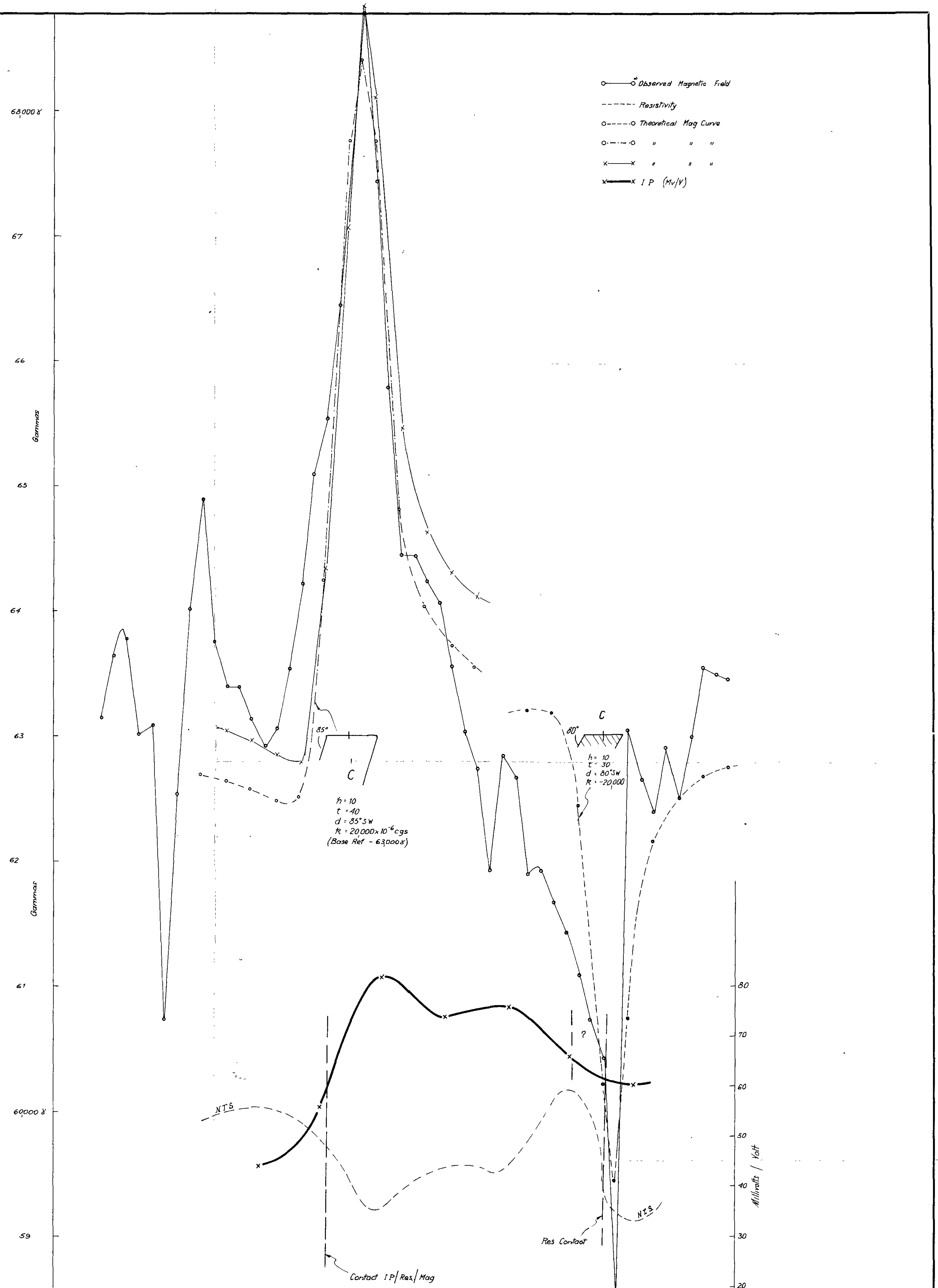


577033

74-1033

NTS - Not to Scale

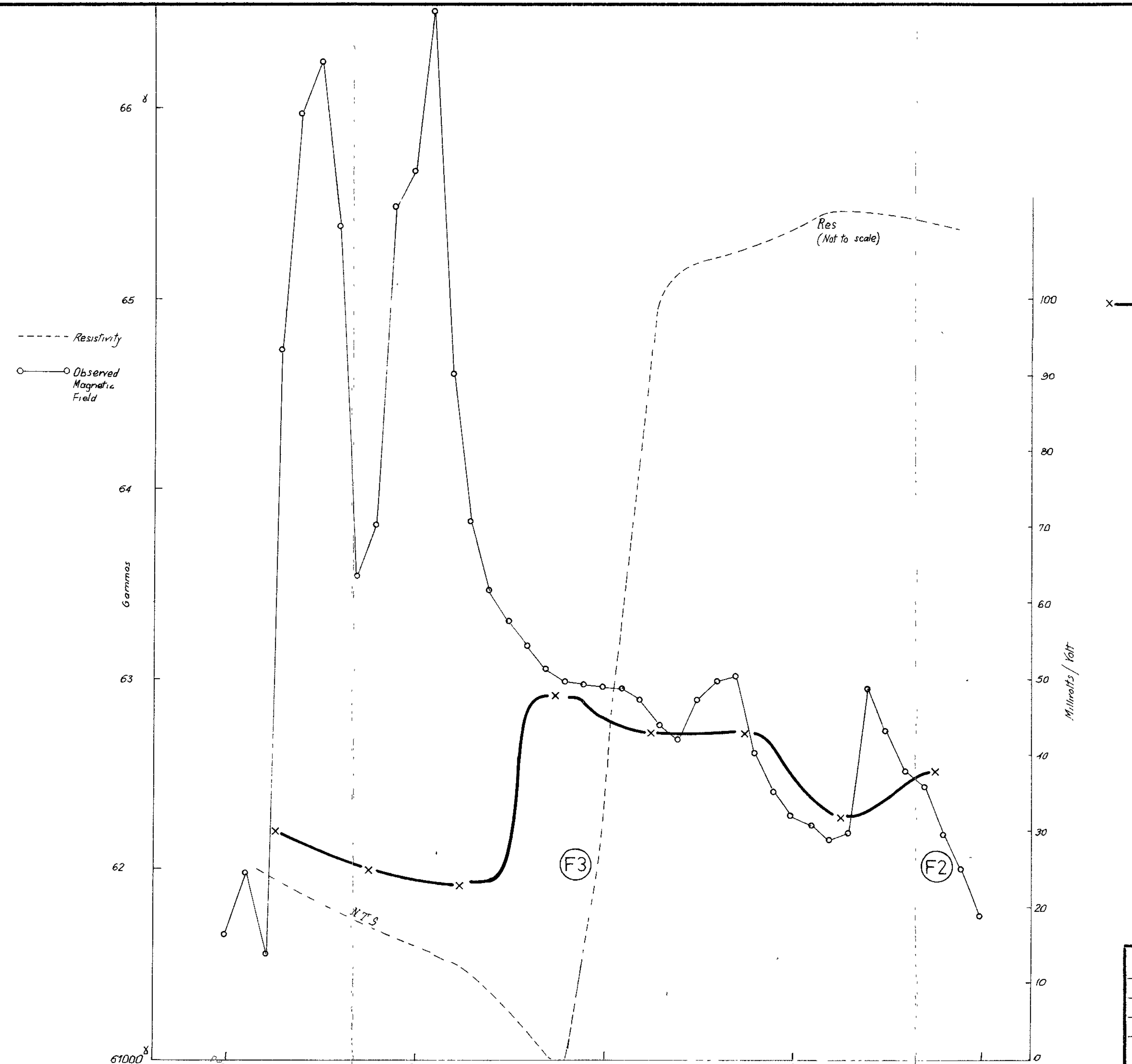
RENISON LTD.	
SCALE	
DRAWN	RJP
DATE	5·8 1974
TITLE	ML 13



577034

74-1033

RENISON LTD.	
SCALE	
DRAWN	RJP
DATE	12 8 '74
TITLE	M.L.13 (B2)

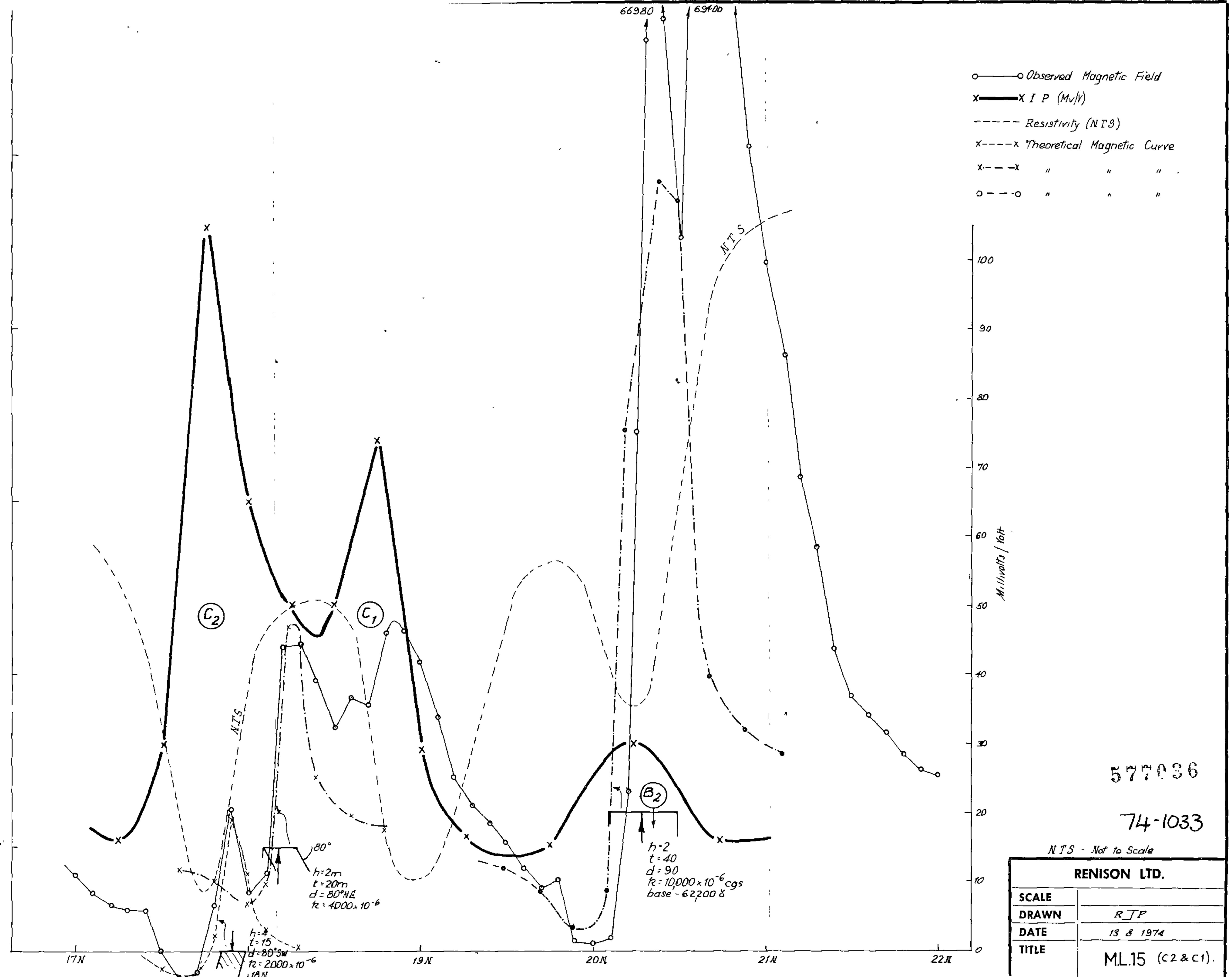


577035

74-1033

NTS - Not to Scale

RENISON LTD.	
SCALE	
DRAWN	RJP
DATE	5 8 1974
TITLE	ML. 15



577036

74-1033

NTS - Not to Scale

RENISON LTD.	
SCALE	
DRAWN	RJP
DATE	13 8 1974
TITLE	ML.15 (C2 & C1).

1617