

414

REPORT OF GEOPHYSICAL SURVEY
(Electromagnetic Inductive Method)

conducted on claims

Pine #1 and Pine #2

both of which are located and held in the name of
the owner, G. L. Oates, F. M. C. 21651 G issued May 30,
1961, Kamloops, B. C.

and situated

about 10 miles northerly from Merritt, B. C.
50 degrees, 120 degrees S E

KAMLOOPS LAND DISTRICT
NICOLA MINING DIVISION
BRITISH COLUMBIA

Work completed during period :

March 30 - April 4, 1962 inclusive

(The accompanying map P-2 should be studied in conjunction
with this report when planning exploration of the anomalies
discussed herein.)

Field work by - G. L. Oates
Work done for / and M. Buller
Report submitted by - G. L. Oates
545 Rosemead Ave
Kelowna, B. C.

April 4, 1962

Note : Re training and qualifications of G. L. Oates
please refer to letters to Chief Gold Commissioner, Victoria, B. C. :

by - Dr. Joseph T. Mandy, ME dated November 23, 1951
M. W. Jasper, ME dated October 28, 1951
C. V. Brennan, ME dated November 23, 1951
G. L. Oates, dated July 5, 1951
E. E. Mason, ME dated October 10, 1960

92I/2w 7w

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Inductive, Using Vertical Loop ---- "3-6

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VI - Map P-2 Showing area surveyed and
anomalies located.

** KEY MAP*

References :

Geophysical Exploration - by C. A. Heiland, Sc. D.
Professor of Geophysics, Colorado School of Mines
on " Vertical Loop Methods " 1940, pp 806

Geological Survey of Canada Memoir 249, 1948, by
W. E. Cockfield pp II, I5

<p>Department of Mines and Petroleum Resources ASSESSMENT REPORT</p> <p>NO. <u>414</u> MAP.....</p>

INTRODUCTION

The Pine Group of claims owned by G. L. Oates, Kelowna, B. C. is situated about ten miles north of Merritt, B. C. and are northeast and east of Indian Reserve No. I. The Merritt - Mamette Lake gravelled road passes within onehalf mile of the claims and ranch roads make most of the claims easily accessible. Steffen's Creek, a tributary of Guichon Creek is the principal drainage for the immediate area. The surveyed area lies at an elevation of about 3500 feet above sea level.

The region is situated within the dry belt of British Columbia and the rainfall in the lower valleys is between 10 and 11 inches. The lower slopes of the valleys are open and covered with sagebrush, and the lower slopes of the hills support an open, parklike forest with little underbrush. Rainfall on the upper slopes, however, presumably much greater than the figure given, and is evidenced by the change in vegetation to a more dense forest growth.

The Pine Group, some three miles from the Craigmont mine was staked as a prospecting 'bet', and since the ground is generally well-overburdened, geophysical prospecting has been used as a first step in its exploration.

GEOLOGY

The Geological Survey of Canada, Memoir 249, by W. E. Cockfield, 1948, describes the rock formations in the vicinity of the Pine Group as Coast Intrusions and the Nicola Group.

On page II of the above Memoir he says :

'Nicola Group

The rocks comprising the Nicola Group have a large areal development within the map area. They consist principally of volcanic rocks with which are associated minor amounts of sedimentary rocks - limestone, argillite, and conglomerate. They extend in a broad belt from the southern part of the area, where, in the vicinity of Nicola Lake, they form the type section (Dawson 1896, page I31B), to the northwest part of the area. The belt underlain by the rocks of this group is more than 20 miles wide in the southern part of the area, narrowing to 15 miles in its central part and to less than 5 miles in the northwest part. The rocks of the Nicola Group are, however, covered extensively by later volcanic rocks in the northern part of the area. They are also invaded by bodies of plutonic rocks, some of which attain considerable size. '

and on page I5 :

'Coast Intrusions

Plutonic rocks underlie considerable parts of the map area. They include different types and possibly rocks of several different ages, but data are generally lacking that would permit fixing their ages, within precise limits. ' -----

Map 886A accompanying the above Memoir 249 shows the occurrence of the contact of the Guichon Batholith and the Nicola Group through the area of the Pine Group.

METHOD USED - (ELECTROMAGNETIC INDUCTIVE)
Using Vertical Loop

The electromagnetic inductive is a direct method and is applied principally in the search for sulphide ore-bodies. It depends for its operation upon the effects produced by the flow of an electric current. By studying these effects it is possible to predict the general axis of current flow. The greater flow of current is in the path of greatest effective conductivity, and since the effective conductivity of a mineralized zone is different from that of its surrounding envelope (usually much greater), it is possible to locate such a mineralized zone by the distribution of current. Due consideration is given to geologic structure, type of mineralization and other factors.

The inductive method is so named because the current flowing in the conductive body is obtained by electromagnetic induction; without making direct contact with the conductive zone or orebody. The current flowing in a transmitting coil or antenna will create an electromagnetic field around the coil. This field will have the same frequency as the primary current and will radiate or travel outward from the coil in closed magnetic or flux circuits. These circuits are perpendicular to the plane of the coil and extend or travel outwards with uniform velocity in all directions. The primary current and the resulting electromagnetic field radiating from the antenna is obtained by the use of a transmitting or energizing set operating from 30 to 50 kilocycles frequency. A 10 watt vacuum tube is used in the circuit and the power supply is obtained from portable type dry cell batteries - B supply of 450 volts and A supply of 9 volts. The transmitting antenna is triangular, seven feet to the side and hinged at the corners for folding.

When the electromagnetic field radiating from the antenna of the energizing equipment flows through or 'cuts' a mineralized body a

METHOD USED - (ELECTROMAGNETIC INDUCTIVE) cont'd
Using Vertical Loop

current is induced in this body. The current flowing in the mineralized body sets up an electromagnetic field having the same frequency as the current. This electromagnetic field will surround the body and travel outward from it in concentric circles or envelopes. The detection of this field is accomplished by the use of direction-finding equipment consisting of a direction-finding coil mounted on a tripod and electrically connected to a vacuum-tube set containing a detector and multi-stage amplifying system. The multi-stage amplifying system is employed to produce a signal of desired intensity through a set of head phones. A direction finding coil so pivoted that its axis of revolution is parallel to the conductor - i.e., axis of revolution of the coil and the conductor have the same 'strike'- will give the maximum signal when the coil is perpendicular to a tangent to the circle of wave-front at that point. A minimum signal will be obtained when the coil is parallel to the tangent. By the use of the direction coil the relative distribution of current may be determined and the position, depth and approximate width of the mineralized body may be plotted. The dip of the field resulting from a combination of the primary (electromagnetic field surrounding the transmitting antenna) and the secondary (electromagnetic field surrounding the orebody) as determined by the use of the direction-finding coil is explained by C. A. Heiland, Sc. D., Professor of Geophysics, Colorado School of Mines :

(Reference : Geophysical Exploration by C. A. Heiland, Sc.D.

Professor of Geophysics, Colorado School of Mines, page 806, 1940)
Vertical Loop Methods

' In application, a vertical transmitting loop is set up with its plane approximately parallel with, and (if possible) directly above a suspected conductivity zone. A certain distance away a receiving coil is placed with its axis of rotation horizontal, pointing

' toward the transmitting loop. The field of the transmitting loop at the location of the receiving coil is horizontal if the centres of both are at the same elevation. The magnetic field of the transmitter induces currents along the edge of a subsurface conductor. These currents,, in turn, are surrounded by an electromagnetic field. This field combines with the loop field into a resultant vector, whose direction may be determined by tilting the reception coil about a horizontal axis until a minimum is obtained. The current concentration may thus be located by measuring dip angles along a profile at right angles to the strike. Contrary to low frequency vertical-loop methods, the loop field and the subsurface field are very nearly in phase; elliptical polarization is negligible and sharp minima are obtainable when the reception coil is tilted. ' // // // // // // // // // // // //

' If the magnetic field surrounding a subsurface current concentration alone were present, its direction at any point A on a

Fig. IO-I24. Construction of Index Curve.

profile (see Fig. IO-I24) would be given by the vector T, and would coincide with the direction of the plane of the detection coil in the minimum position. If normals were drawn to this position at all points, they would intersect in the subsurface conductor. However, the horizontal field H_0 of the transmission loop combines with the subsurface field T to form the resultant field vector R, whose direction is that of the detection coil in the minimum position. Therefore the normals to the direction of the coil will intersect the vertical at

METHOD USED - (ELECTROMAGNETIC INDUCTIVE) cont'd

Using vertical loop.

progressively deeper points CC' as the distance of points A from the point O increases. The conductor may nevertheless be located by the procedure of drawing an index curve; At any point (A) the normal to the vector R or to the plane of the detection coil is drawn to the intersection with the vertical at the point C. Through C a horizontal line is drawn to the intersection with the vertical from A to B. B is then a point on the index curve. Other points are similarly located. The apex of the index curve is the conductor. '

The equipment used to survey the ROI claims is similar to the transmitter with vertical loop and direction-finding equipment in the above description. The transmitter was operated on a frequency of 55 kilocycles. The lines cut for the survey consisted of a base line (east-west) 1800 feet long with 600' cross lines (north and south) spaced at 200 foot intervals. Reading stations were surveyed at 100 foot intervals on the lines, which were surveyed by chain and Brunton compass. The transmitter placements or 'set-ups' were usually 250 to 300 feet apart on the lines and from 10 to 15 readings were made with the direction-finding equipment for each 'set-up' of the transmitter.

RESULTS AND RECOMMENDATIONS

Map P-2 shows the area surveyed and the negative nature of the results. No outcrops were visible through the area of the survey and no anomaly of any significance was found.

Further geophysical work should be completed on the claims, preferably reconnaissance northeast southwest traverses across the trend of the Guichon Batholith - Nicola Group contact as shown on and described in the Dominion Geological Survey Memoir 249, 1948, by W. E. Cockfield.


G. L. Cates

GEOPHYSICAL FIELD NOTES

8

CONTRACT NO PINE

LOOP LOCATION Sta B - on baseline

SNAP 0.75

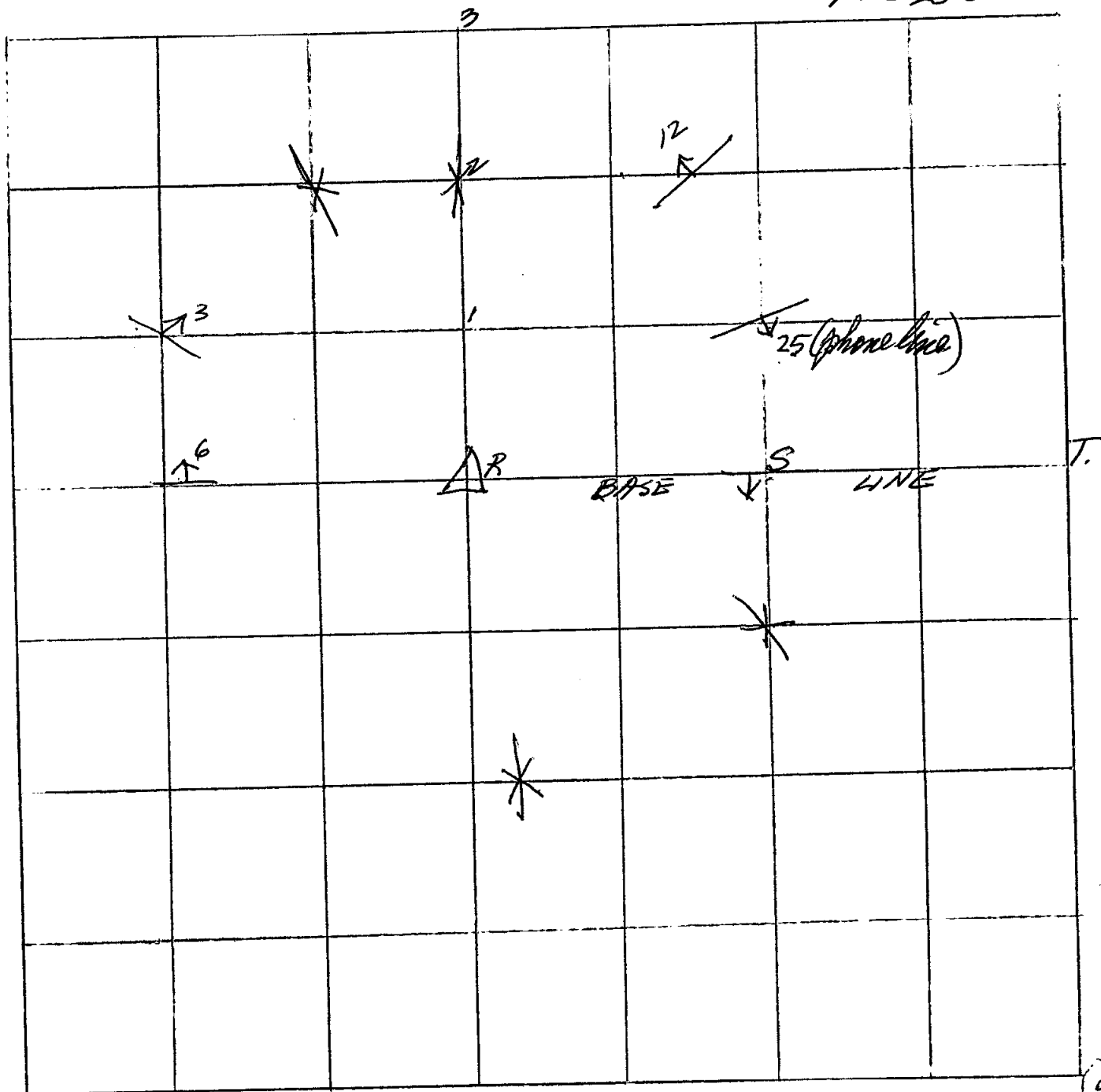
DATE March 30, 1962

BY E. H. Carter & Memo Buller

Δ - Loop location

* - zero dip

$\frac{1}{16}$ - dip in degrees
1" = 200 FT.



8

GEOPHYSICAL FIELD NOTES

9

CONTRACT NO Pine

LOOP LOCATION S.N

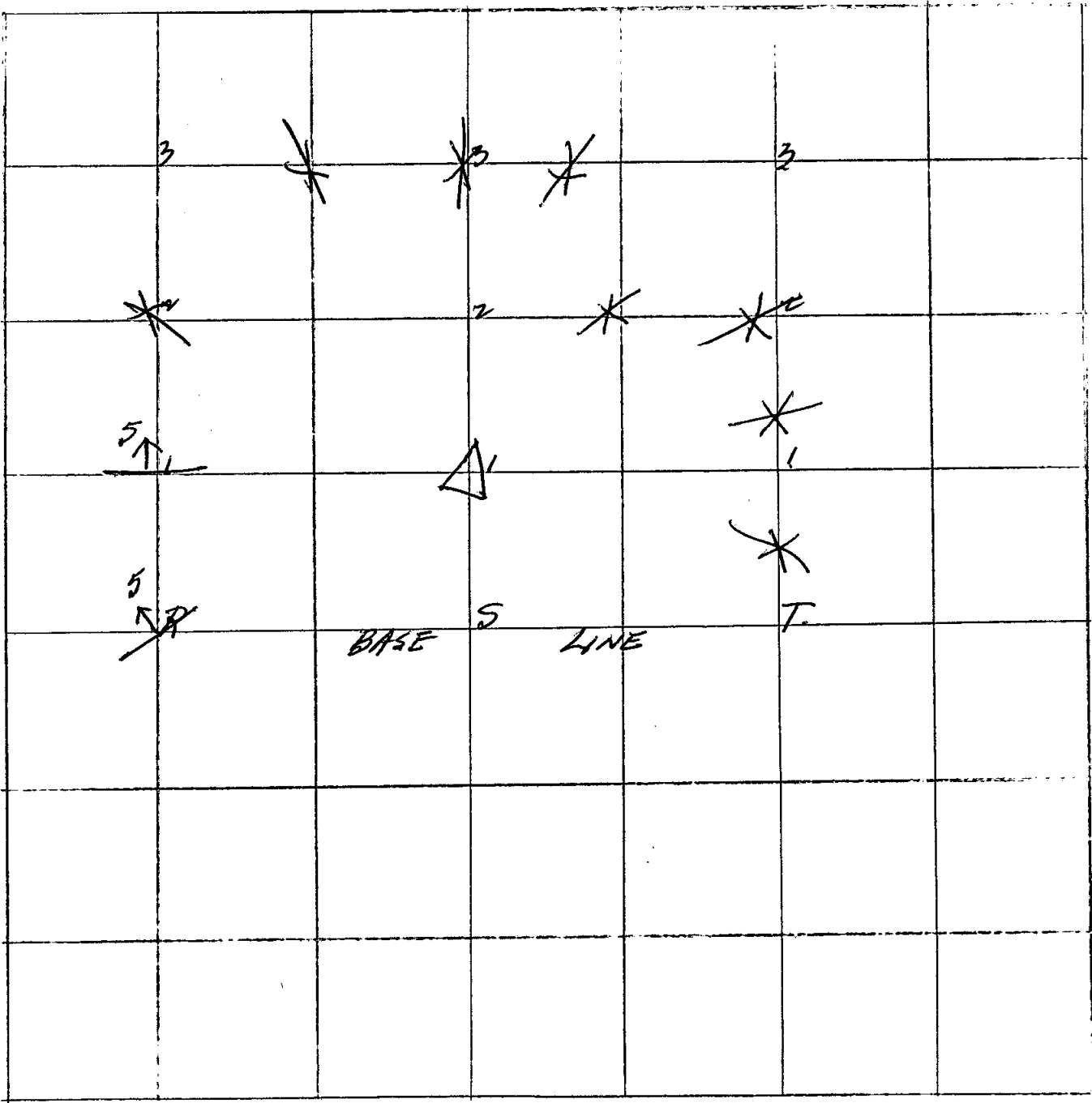
A.M.P. 0.75

DATE March 31, 1962

BY SPB, M.B.



Δ - loop location
* - zero dip
5/6 - dip in degrees.
1" = 200 FT.



GEOPHYSICAL FIELD NOTES

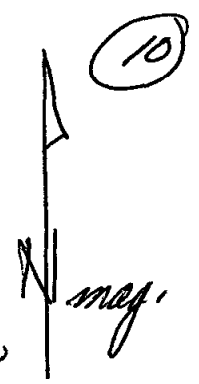
CONTRACT NO Pine

LOOP LOCATION S3N

A378 0.75

DATE MARCH 31, 1962

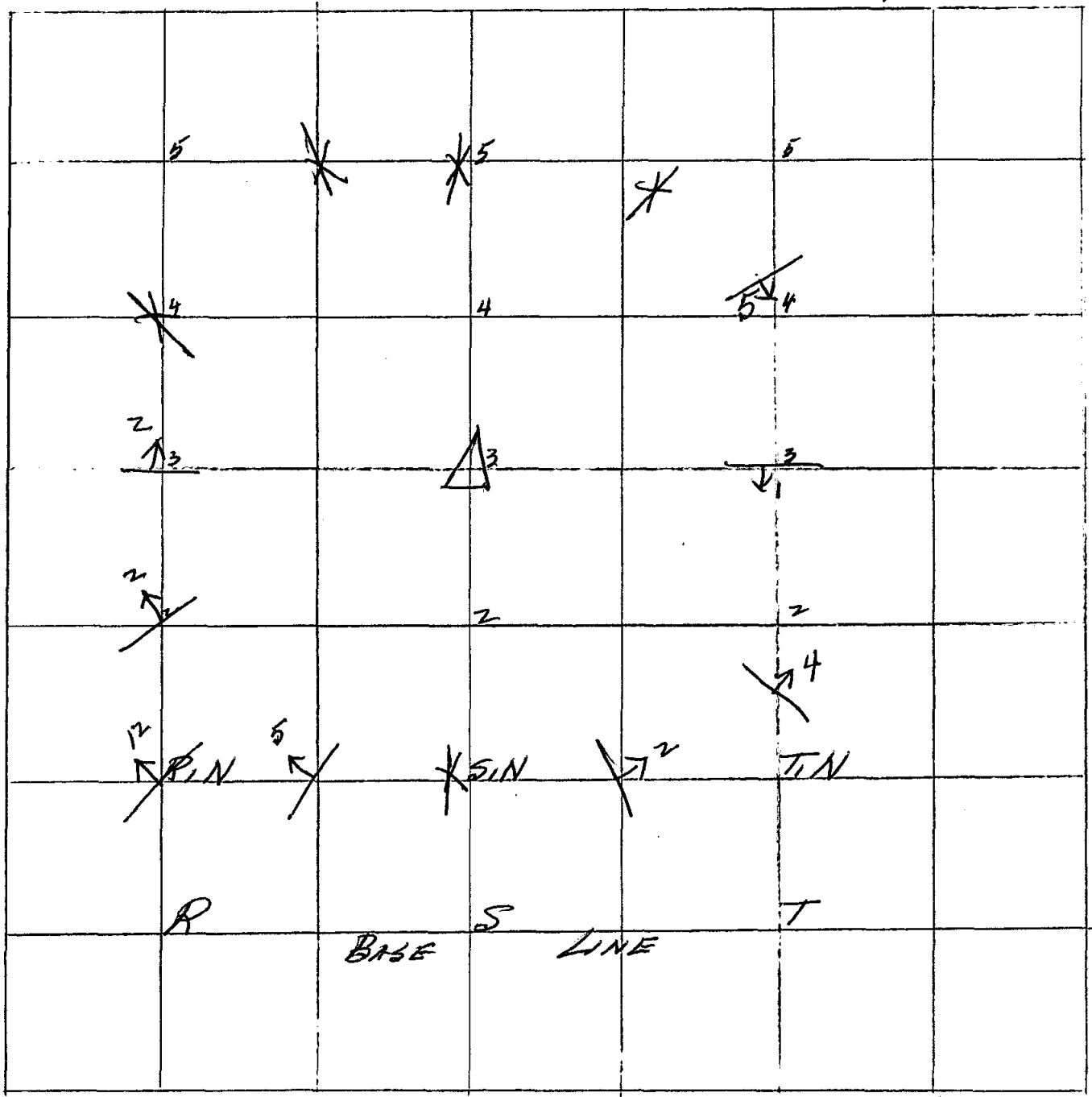
BY LPB, MB.



Δ - Loop location

X - zero dip.

$\frac{v}{6}$ - dip in degrees
1" = 200 FT.



GEOPHYSICAL FIELD NOTES

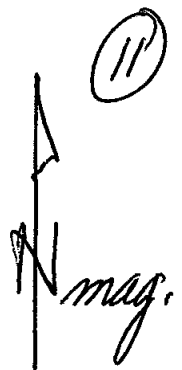
CONTRACT NO Pino

LOOP LOCATION T4N

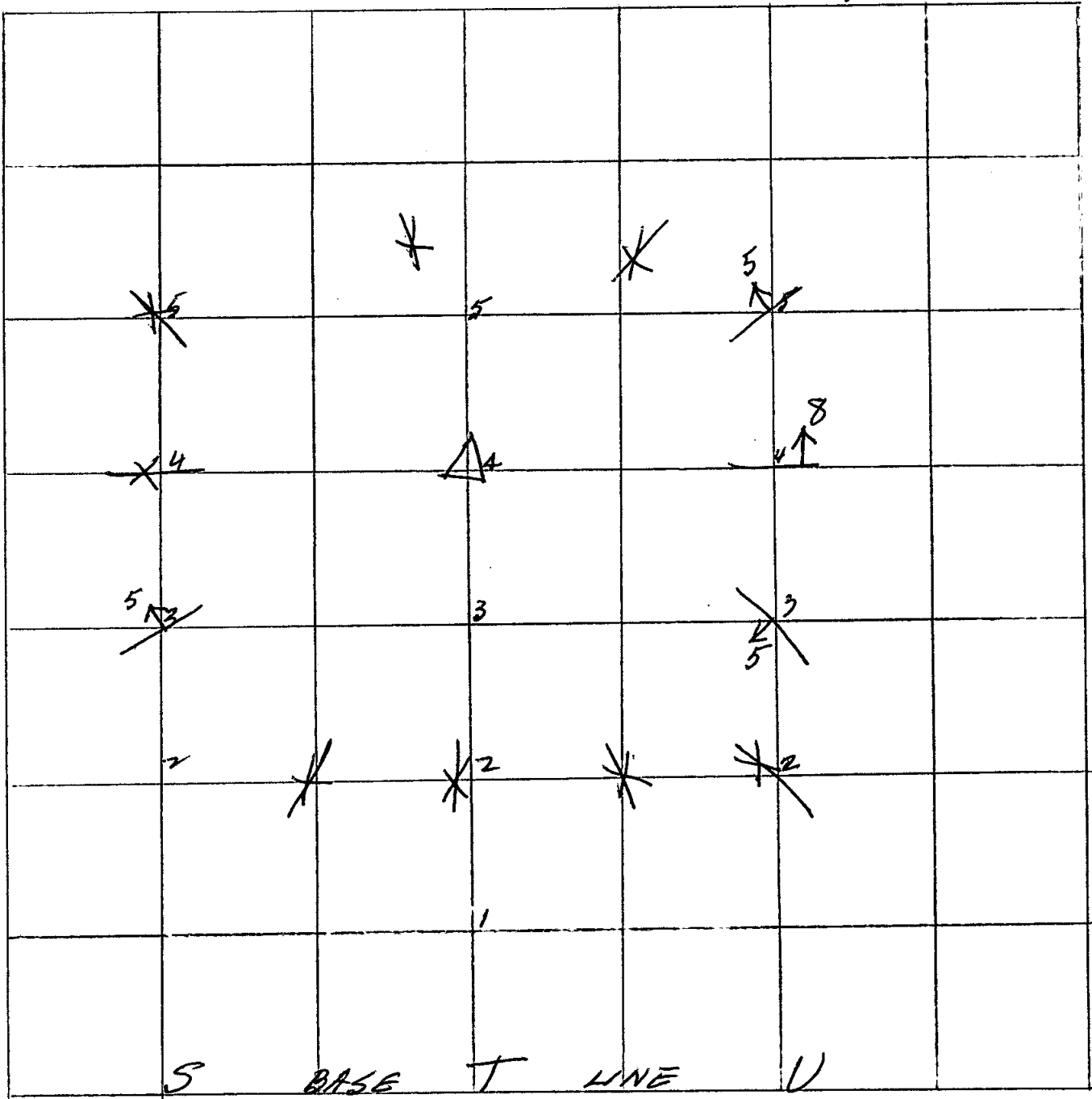
AMP 0.75

DATE March 31 1962

BY SP' M.B.



Δ - loop location
~~x~~ - zero dip
 $\frac{\Delta}{56}$ - dip in degrees.
 1" = 200 FT.



GEOPHYSICAL FIELD NOTES

(12)

CONTRACT NO. PINE

LOOP LOCATION TEN

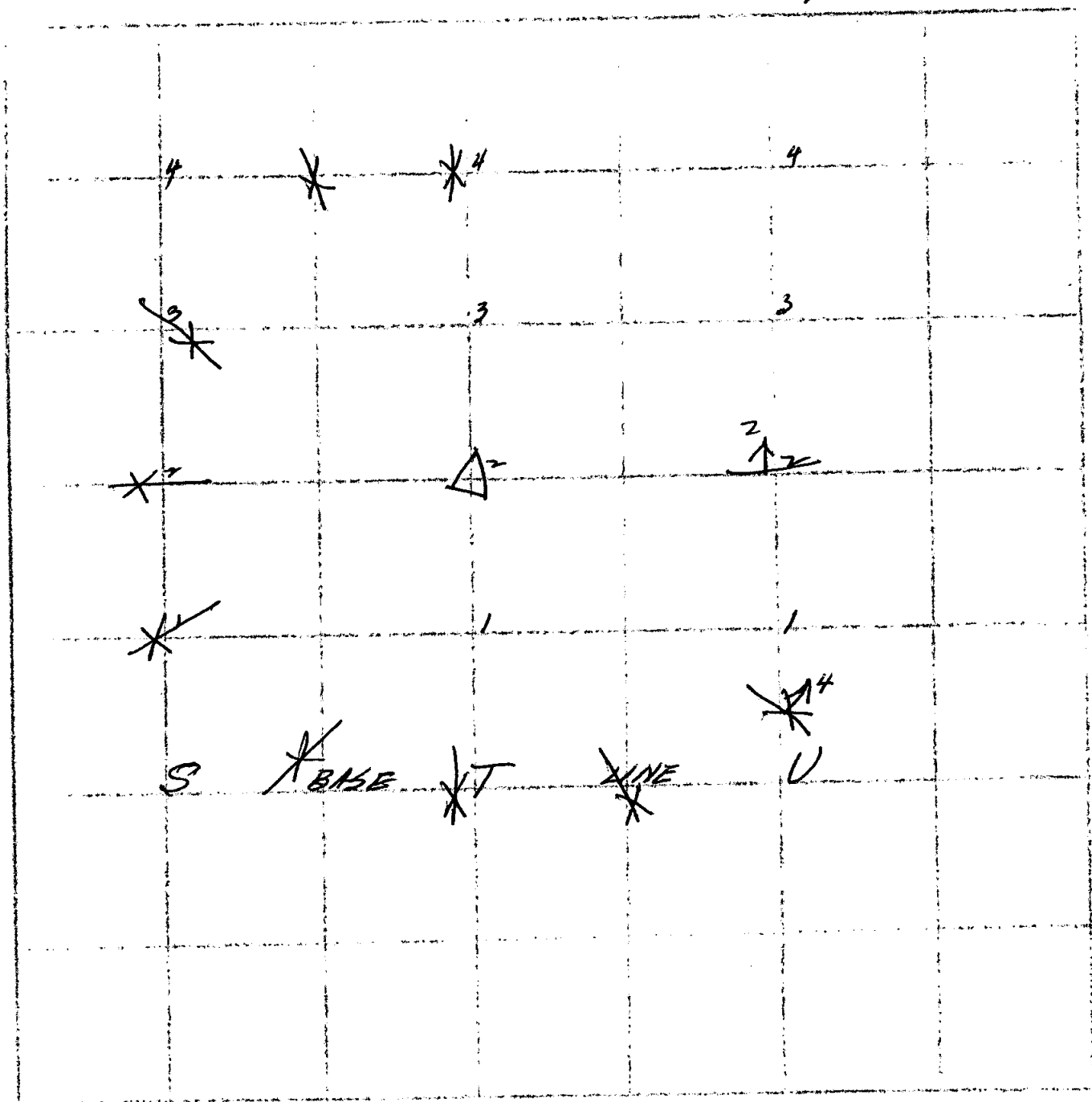
AMP 0.75

DATE MARCH 31, 1962

BY G.L.A. M.B.



Δ - loop location
 * - gas dip
 x - dip in degrees.
 1" = 200 FT.



(12)

GEOMORPHOLOGICAL FIELD NOTES

COUNTY PINE

LOCAL LOCATION U. N.

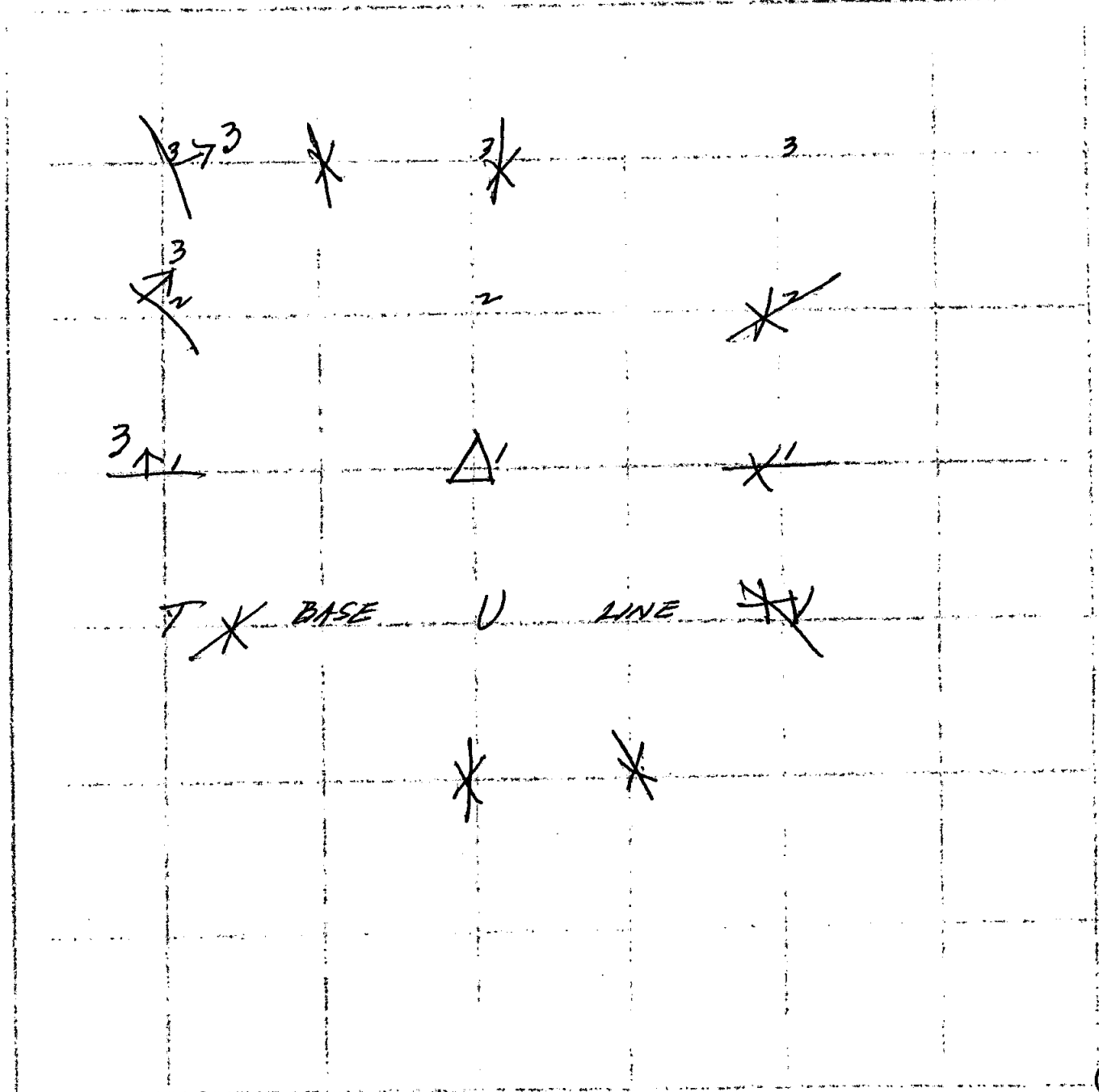
AMP 0.75

DATE April, 1962

BY J. P. M. B.



Δ - loop location
 \times - zero dip
 $\sqrt{6}$ - dip in degrees
 $1'' = 200$ FT.



GEOPHYSICAL FIELD NOTES

(14)

CONTRACT NO PINE

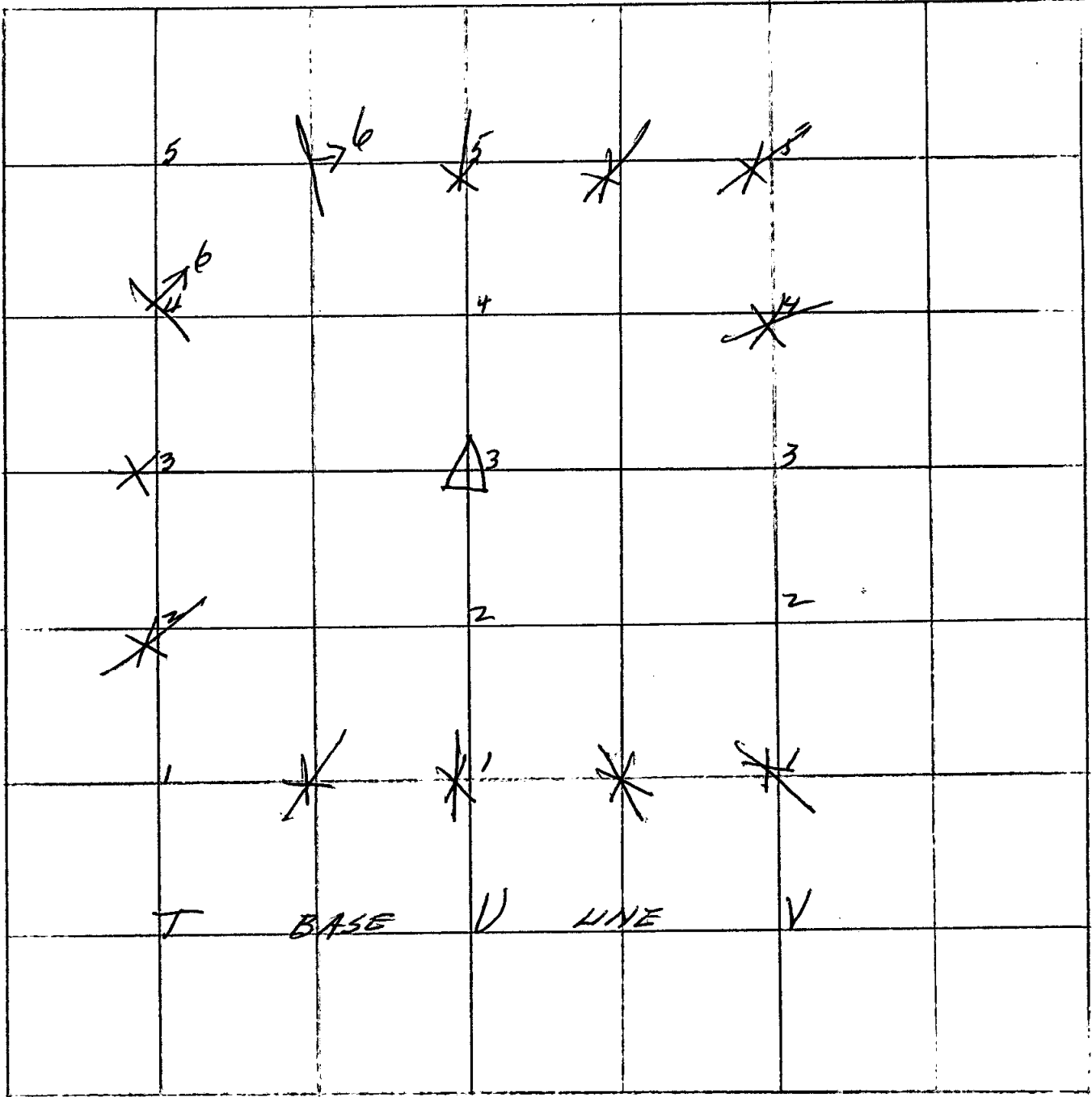
LOOP LOCATION U3N

AMP 0.75

DATE April 1 1962

BY G.H. M.B.

△ - loop location
 * - zero dip
 / - dip in degrees
 1" = 200 FT.



(14)

(15)

PINE

V+N

0.75

April 1, 1962

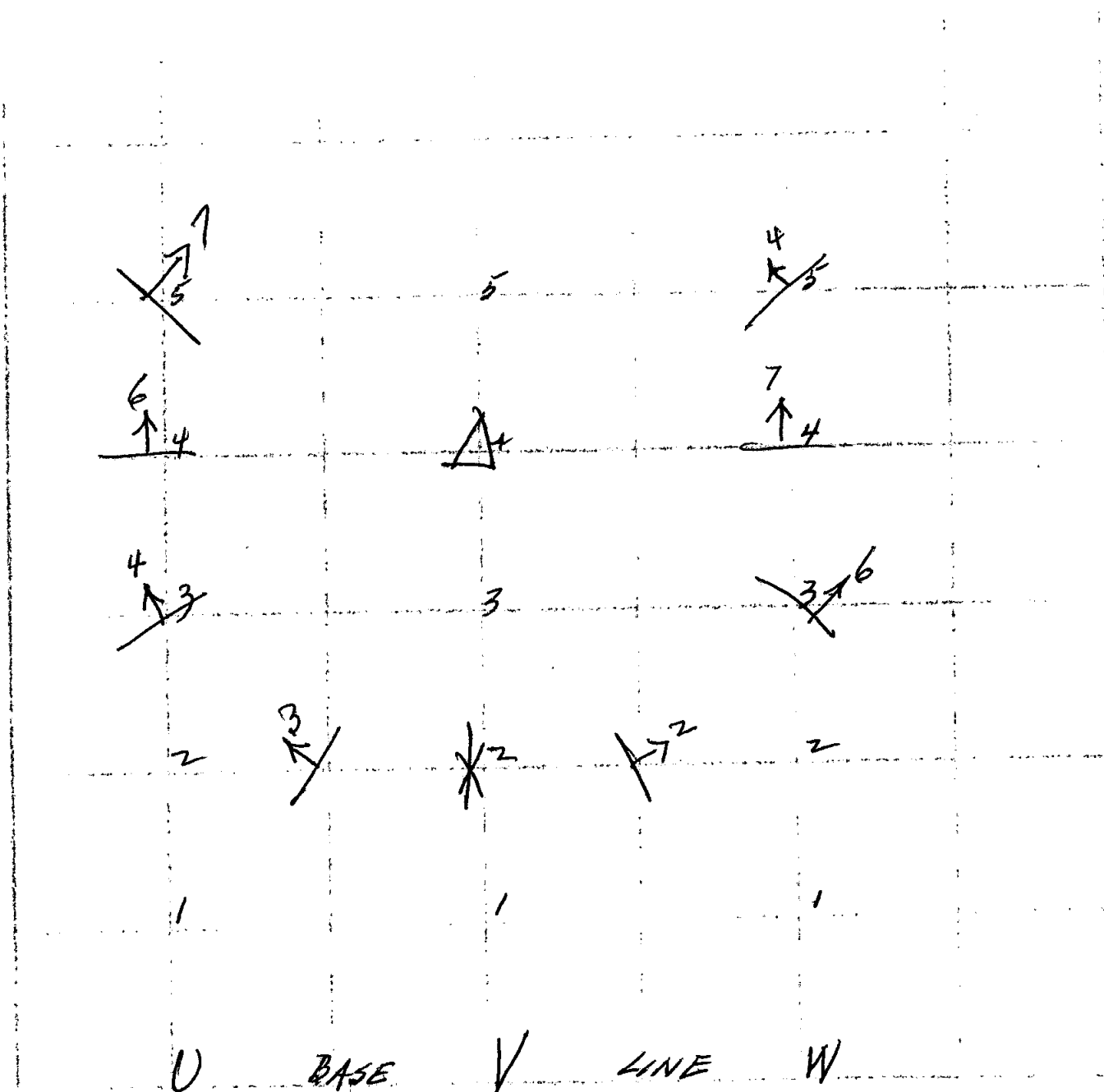
H.D. M.B.

Δ - loop location

* - grow dip

⌘ - dip in degrees
1" = 200 FT.

N mag



(15)

GEOPHYSICAL FIELD NOTES

(16)

CONTRACT NO PINE

LOOP LOCATION V.I.N

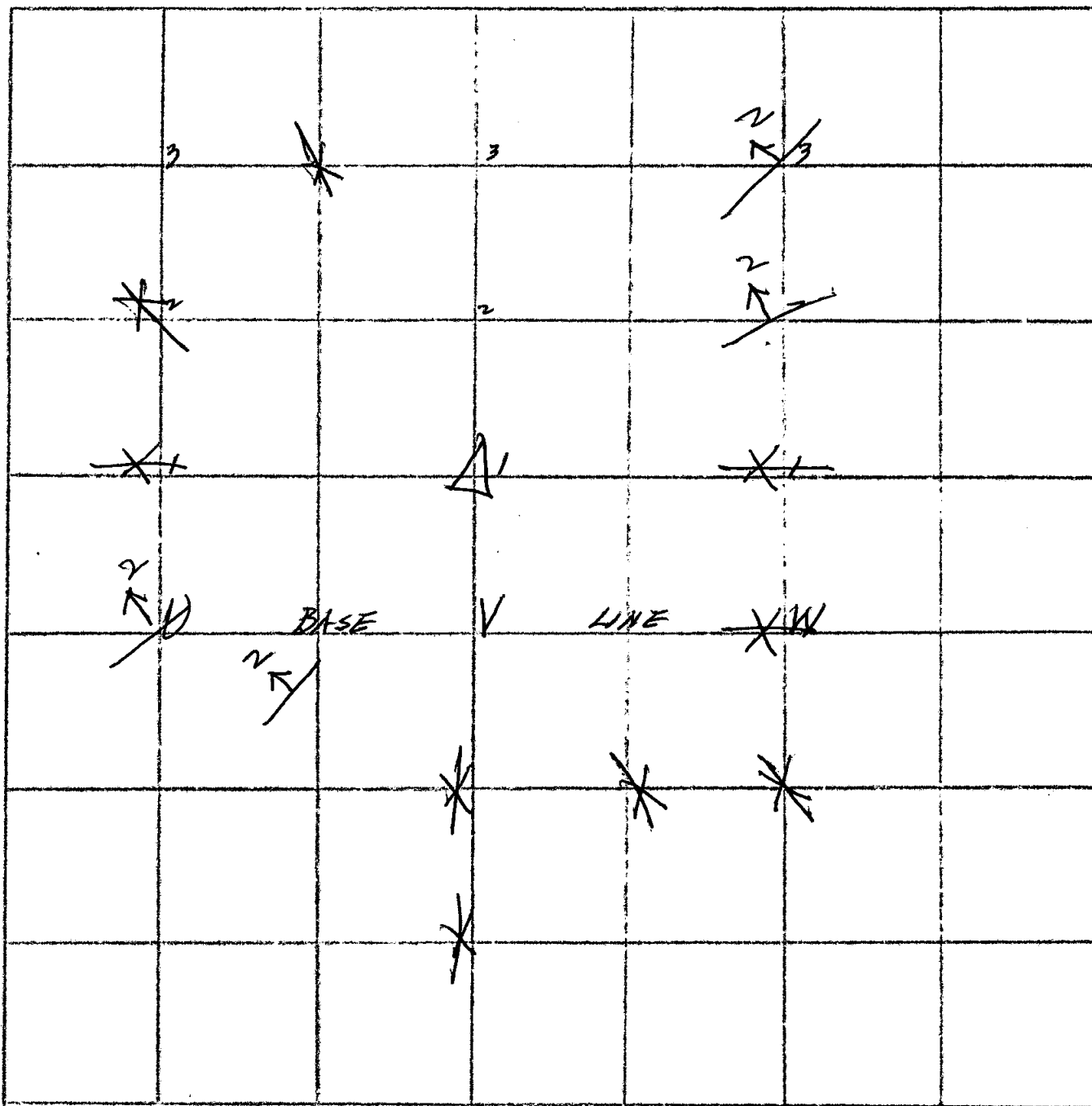
AMP 0.75

DATE April 2, 1962

BY G.L.P. M.B.



Δ - loop location
* - zero dip
- - dip in degrees
1" = 200 FT.



(16)

GEOPHYSICAL FIELD NOTES

CONTRACT NO. PINE

LOOP LOCATION WIN

AMP 0.75

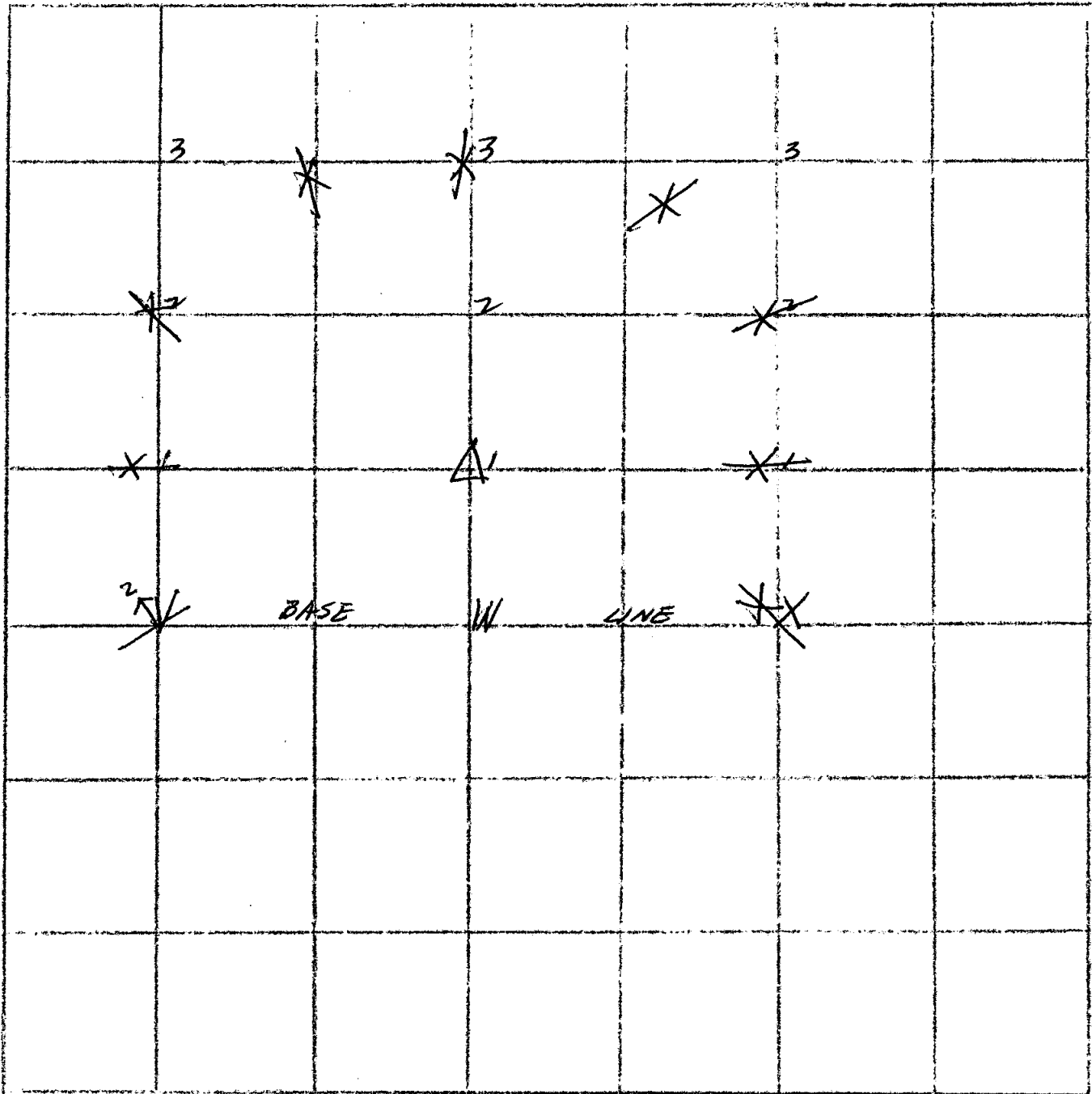
DATE April 2, 1962

BY L.P. M.B.

(17)



Δ - Loop position
 * - zero dip
 ↘₆ - dip in degrees
 1" = 200 FT.



(17)

GEOPHYSICAL FIELD NOTES

(18)

CONTRACT NO. PINE

LOOP LOCATION W3N

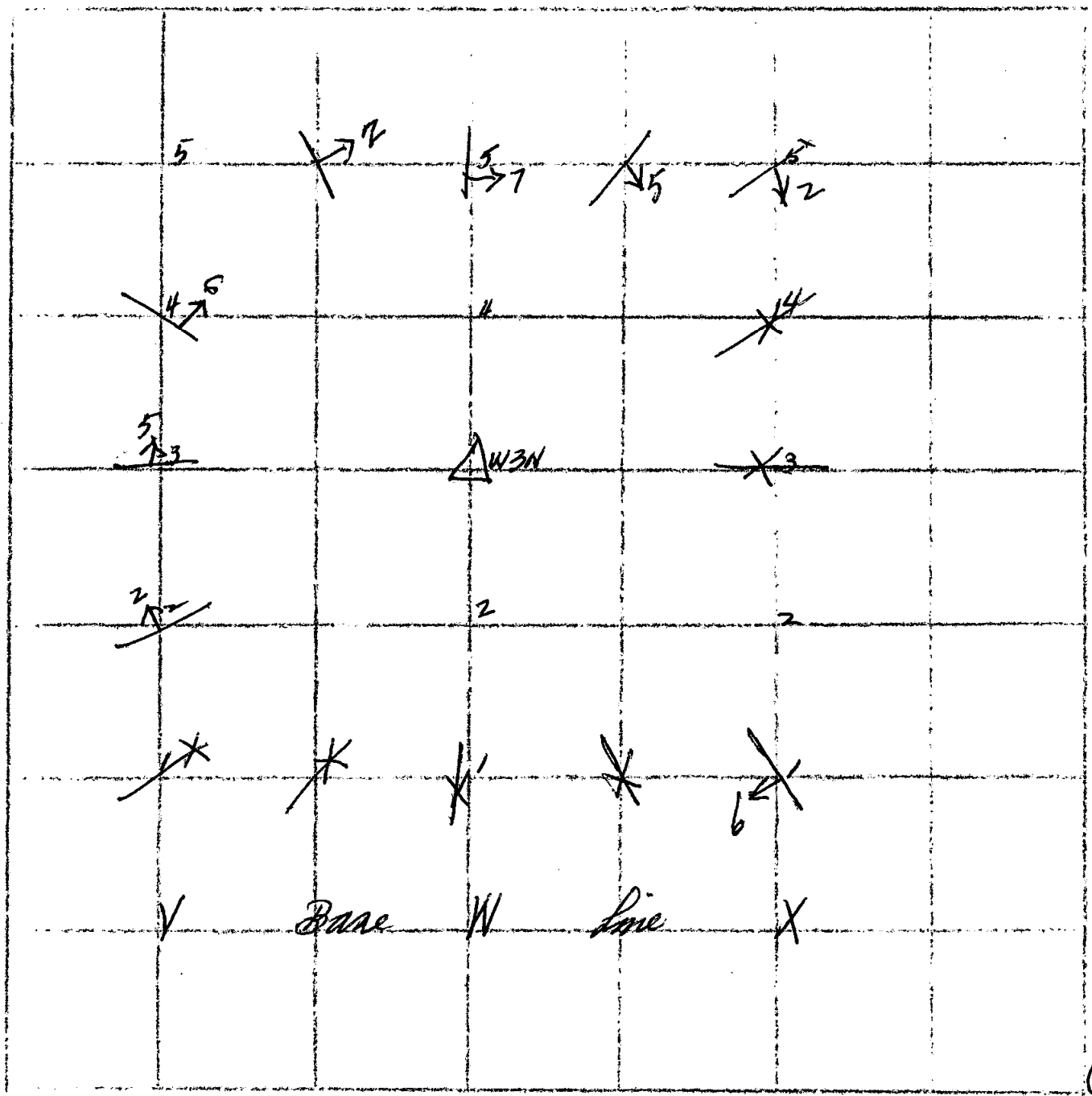
AMP 0.75

DATE April 2 1962

BY L.D. G.B.



Δ - Loop location
x - zero dip
∇ - dip in degrees
1" = 200 FT.



(18)

GEOPHYSICAL FIELD NOTES

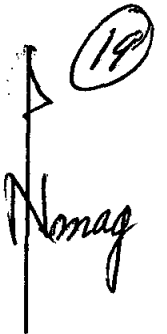
CONTACT AT PINE

LOOP LOCATION X4N

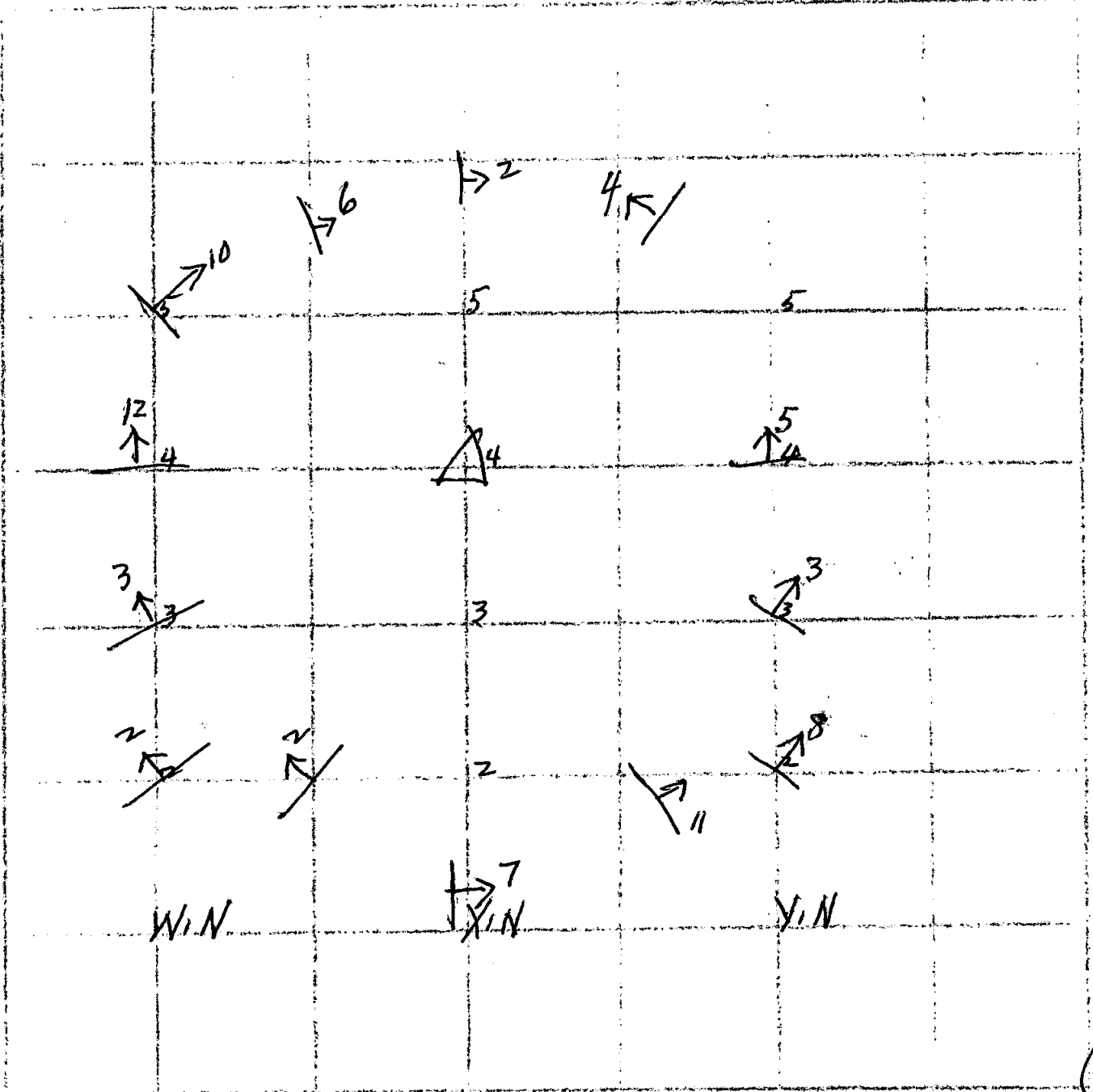
AMP 0.75

DATE April 3, 1962

BY GLE M.B.



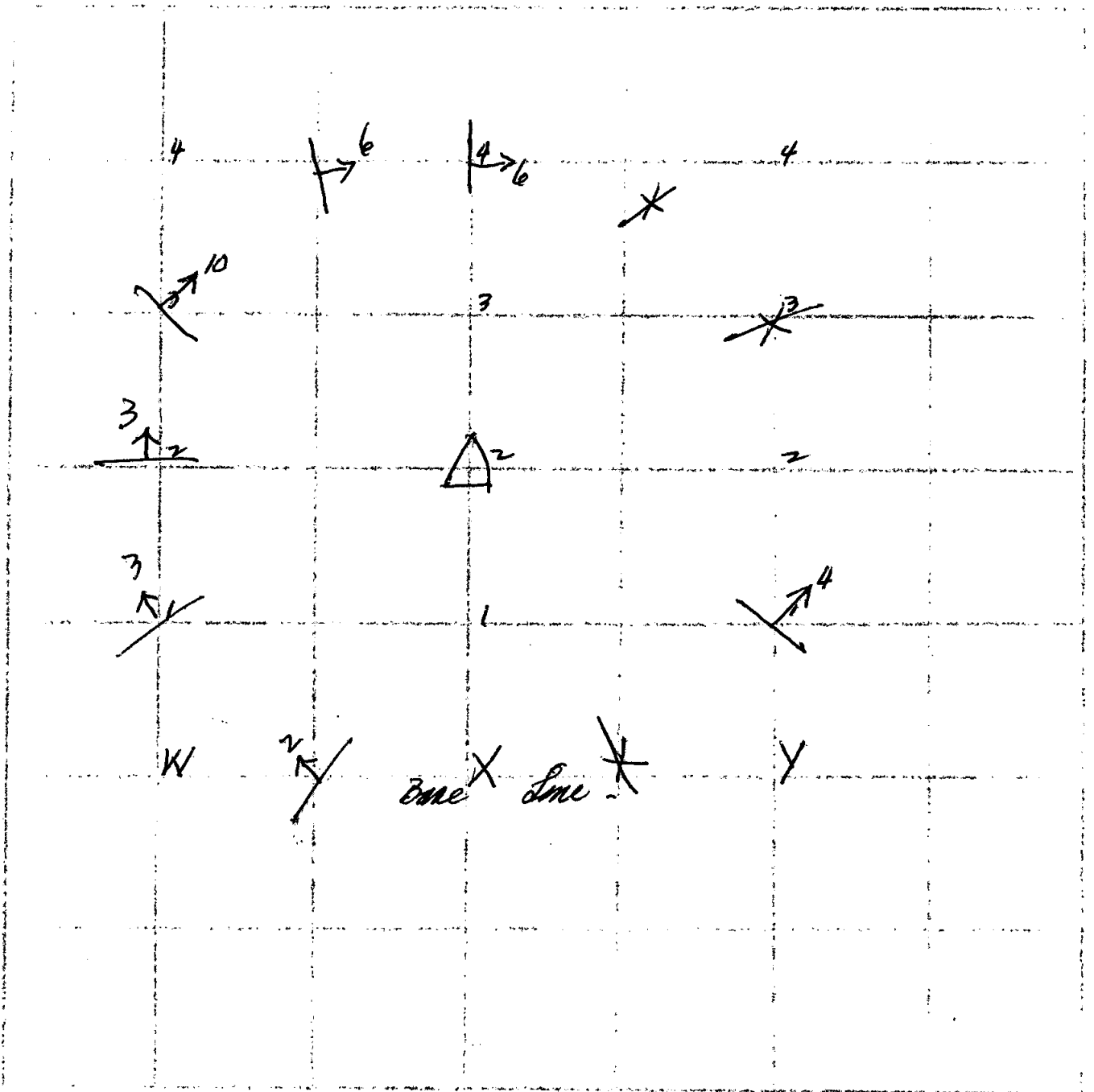
Δ - Loop location
 * - zero dip
 $\frac{\Delta}{6}$ - dip in degrees.
 1" = 200 FT.



LOCATION PINE
 AREA X2N
 DATE 0.75
April 3, 1962
Ch. M.B.



Δ - Loop location
 * - zero dip
 √ - dip in degrees.
 1" = 200 FT.



GEOPHYSICAL FIELD NOTES

CONTRACT NO PINE

LOOP LOCATION X15

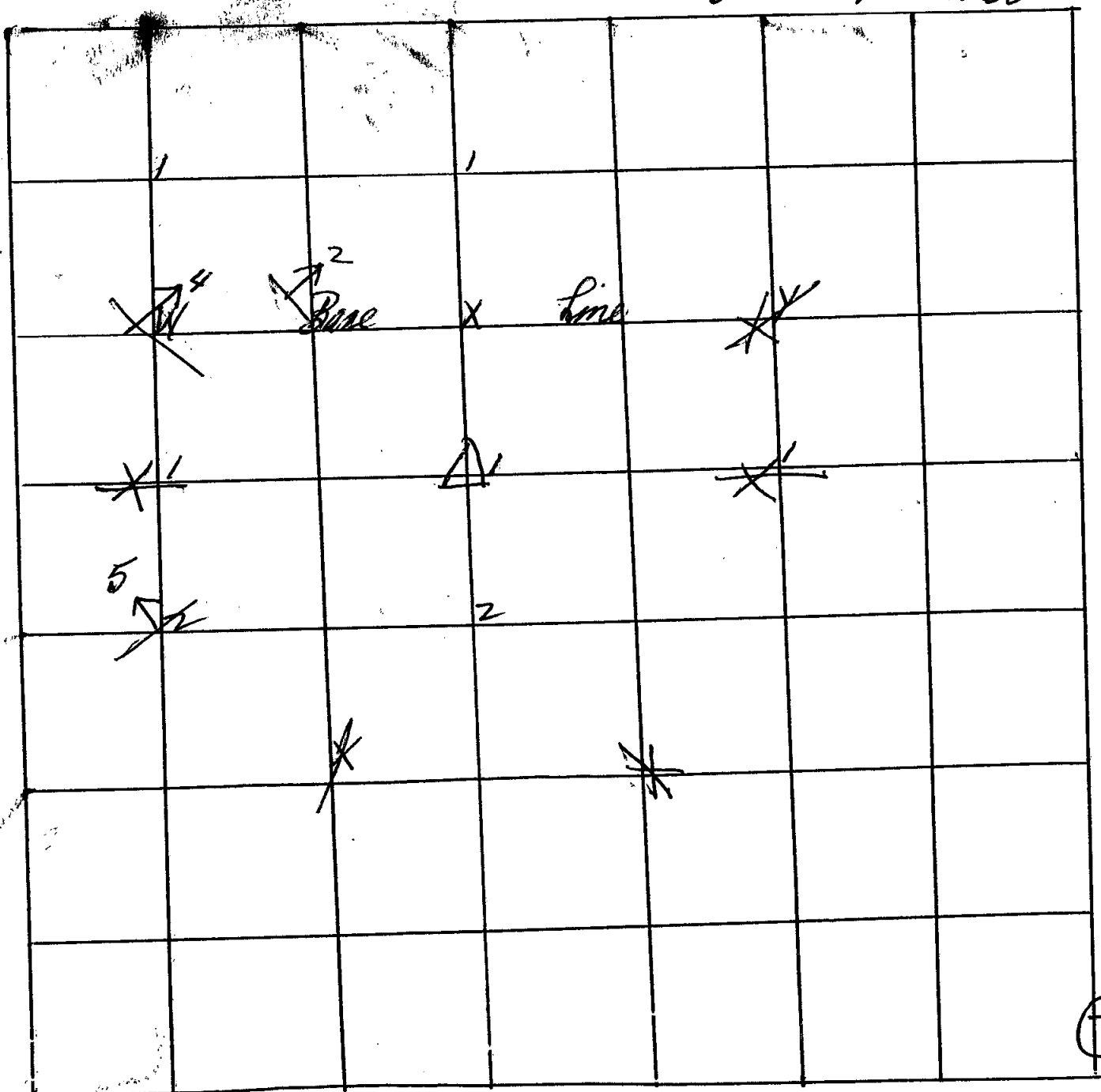
AMP 0.75

DATE April 3, 1962

BY L.H. M.B.



Δ - Loop location
x - zero dip
∇ - dip in degrees
1" = 200 FT.



GEOPHYSICAL FIELD NOTES

(22)

CONTRACT NO PINE

LOOP LOCATION VIS

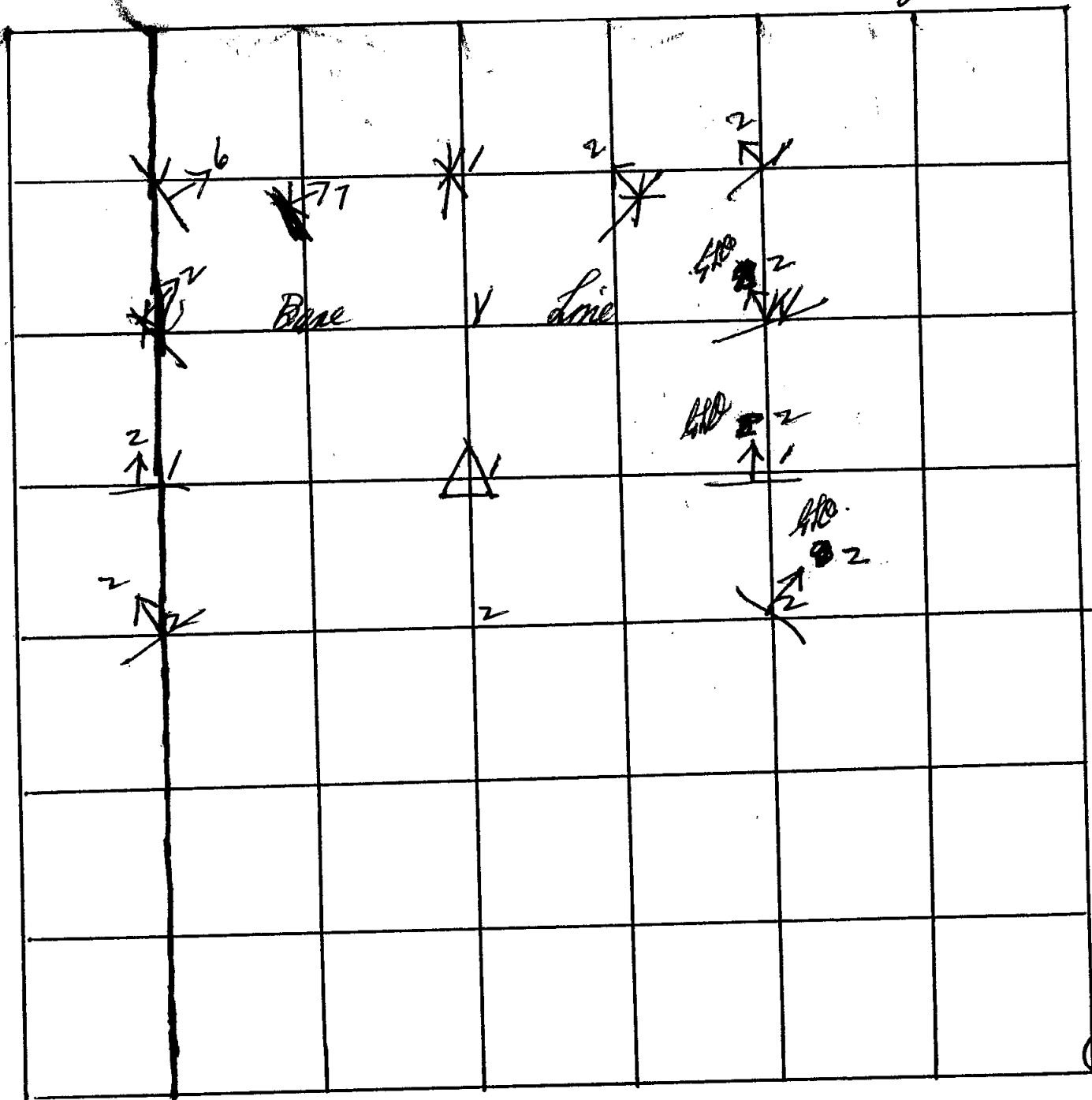
AMD 0.75

DATE April 4, 1962

BY G.D. M.B.



A - LOOP LOCATION
* - zero dip
∇ - dip in depression 1/4 200 FT.



(22)

GEOPHYSICAL FIELD NOTES

(23)

CONTRACT NO PINE

LOOP LOCATION T1S

AMP 0.75

DATE April 4, 1962

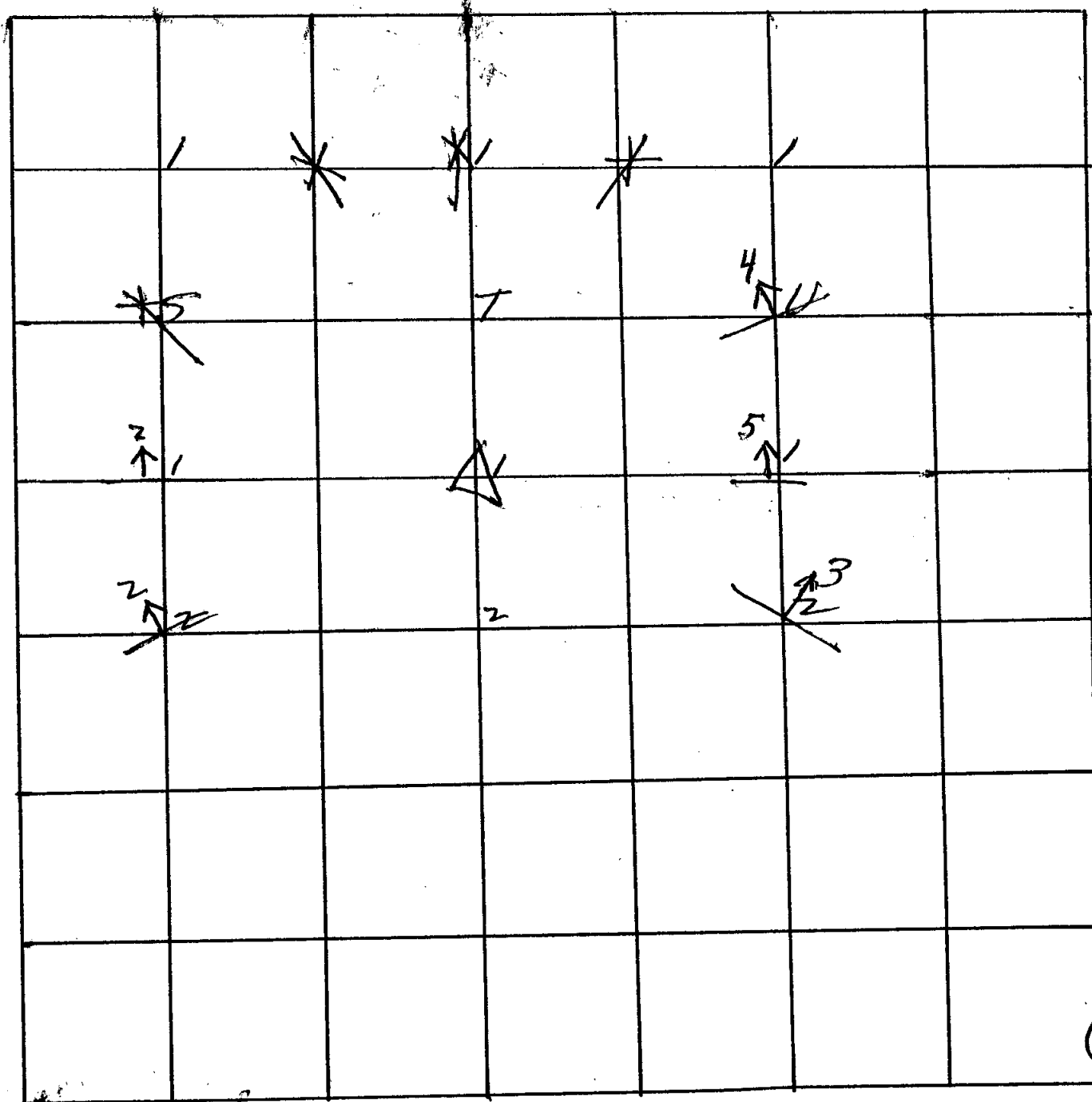
BY G.D. M.B.

Normal

A - Loop location

* - zero dip

$\frac{1}{6}$ - dip in degrees.
1" = 200 ft.



(23)

DOMINION OF CANADA :
PROVINCE OF BRITISH COLUMBIA
TO WIT :

IN THE MATTER OF THE MINERAL ACT and geophysical
work performed on Mineral claims in the Pine group,
about ten miles north of MERRITT, B. C.

I, GEORGE LARMOUR OATES,
of 545 Rosemead Avenue, Kelowna,

in the Province of British Columbia, do solemnly declare that,

(1) Geophysical work to the value of \$635.50 (six hundred and thirty-five dollars and fifty cents), has been completed by me on the following mineral claims : Pine #1 and Pine #2.

(2) The work is as shown in the map and report submitted to the Department of Mines at Victoria, B. C., through the Mining Recorder at Merritt, B. C. for approval.

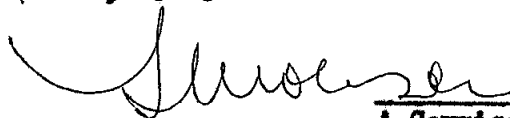
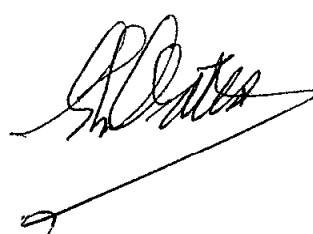
(3) Clients of geophysical firms are charged a fee based upon several items in addition to salaries and wages of employees. These consist of maintenance of equipment, power supplies, office and travel expense, etc., and as in the present instance I am the owner of the claims as well as the surveyor completing the work, I have included these items of cost. A ten hour day was worked, my duties consisting of field operating, mapping, maintaining equipment, line cutting and packing. I have used a tentative rate of \$30.00 per day plus expenses for myself and trust it may meet the approval of the Department of Mines. Car transportation (Buick Special-1956) was charged at 0.14¢ per mile on the job and the return trip from Vancouver to Merritt, with 500 lbs of equipment and luggage and M. Buller, my assistant.

(4) The following is an itemized listing of costs for the survey :

<u>Period March 30, 1962 - April 4, 1962</u>	
Wages- G. L. Oates, 6 dys @ \$30.00, M. Buller 6 dys @ \$20.00	\$ 300.00
Room - Oates & Buller	30.00
Board - Oates & Buller, 6 dys each @ \$4.50	54.00
Car transportation- Vancouver-Merritt & return 500 miles, with 500 lbs equipment & luggage and my assistant plus 330 miles transportation on the job. Total 830 miles @0.14¢	116.20
Power supply 69.95, general maintenance 7.80	77.75
Wages Oates on report & map extra time equivalent to 1½ dys 45.00, materials for report 3.00, phone 9.55	57.55
Total	<u>635.50</u>

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the " Canada Evidence Act ".

Declared before me at the Village
of Merritt, in the
Province of British Columbia, this 4th
day of April 1962, A. D.



A Commissioner, etc

CLAIM SKETCH
PROMONTARY HILLS AREA

MERRITT BC

SCALE: 2 INCHES = 1 MILE

REFERENCES:

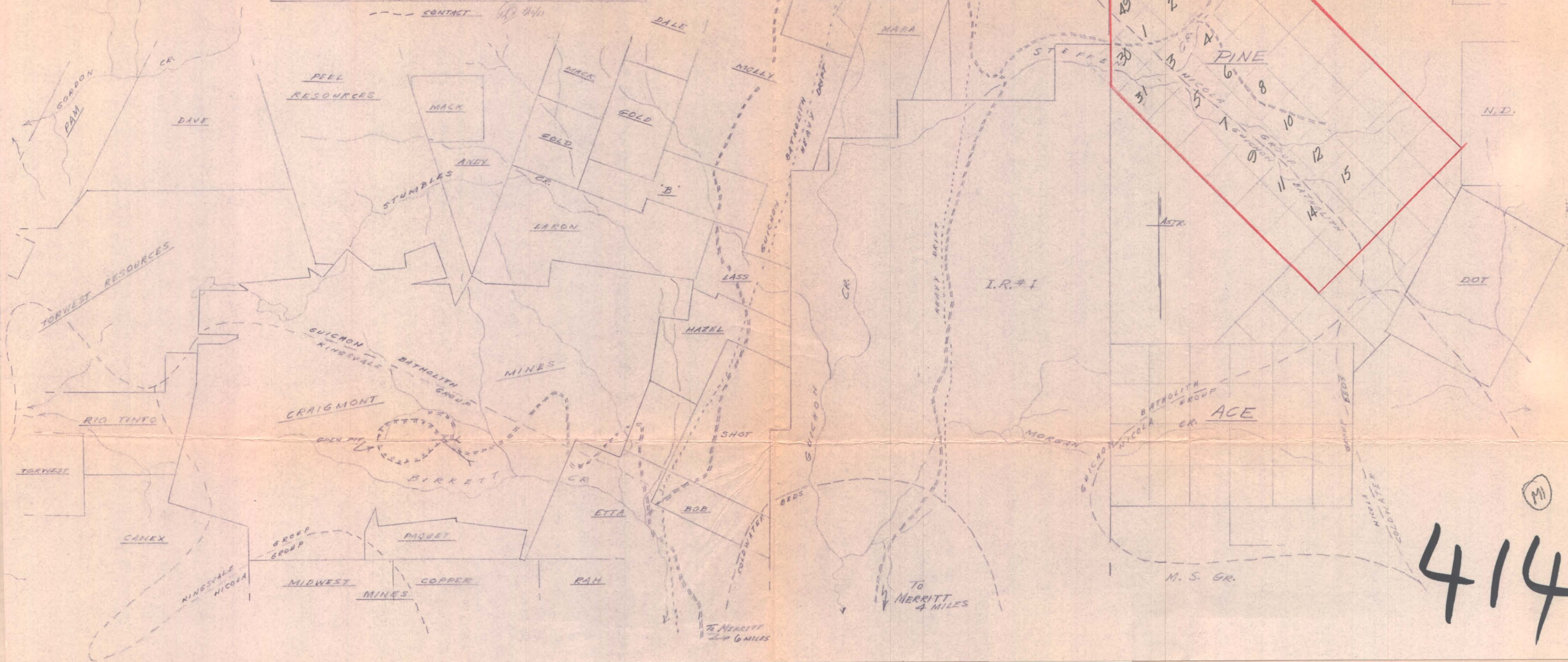
NARS 6A-N3 & 6A-MA BC DEPT OF MINES
MAP 886A (GEOLOGY) DEPT MINES & RESOURCES, OTTAWA, CAN.

--- CONTACT

(M)

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO. 414 MAP 1 M.S.

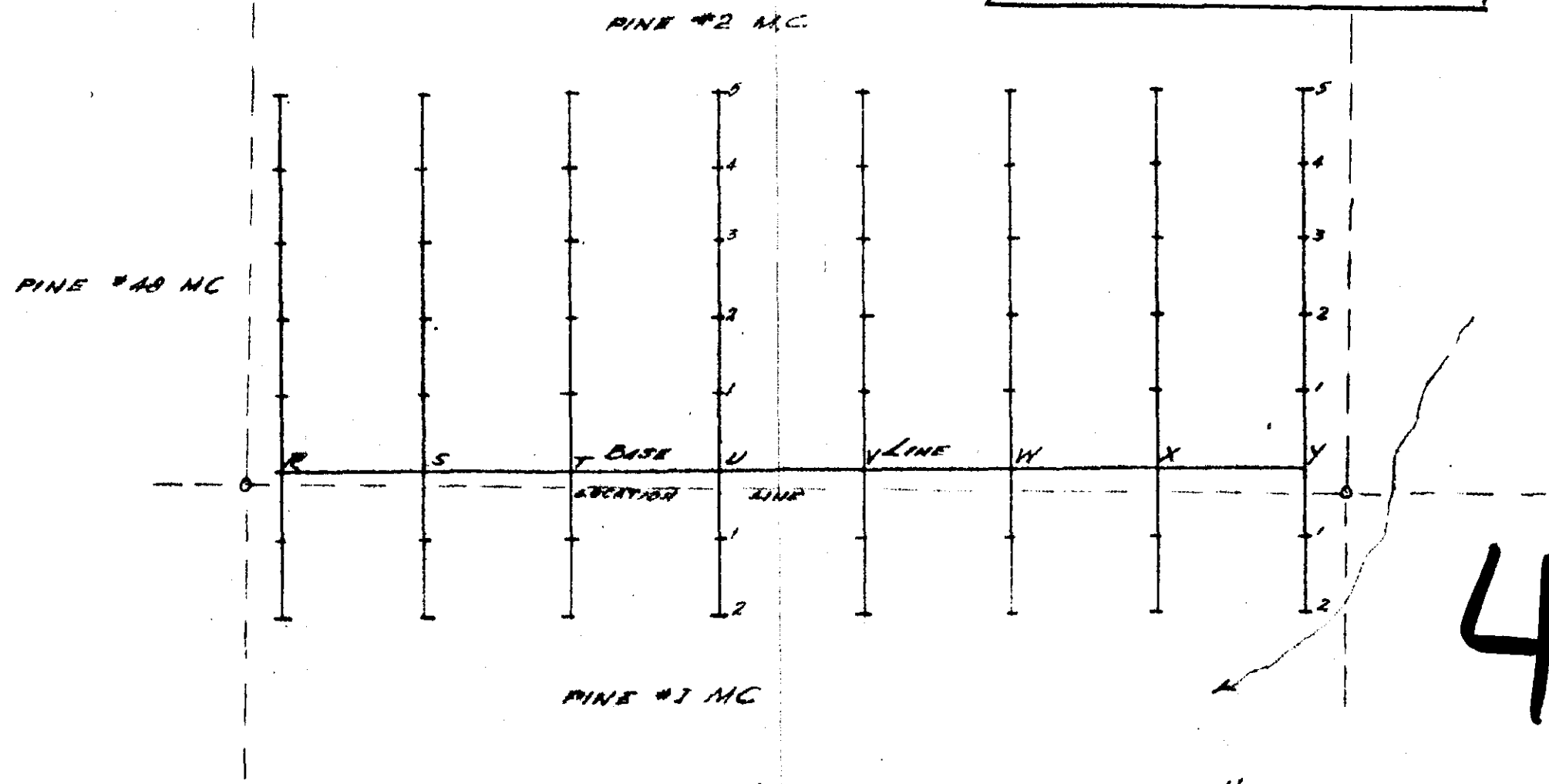


(M)

414

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 414 MAP 2

112



NO ANOMALIES DISCOVERED

112

ELECTROMAGNETIC SURVEY
PINE GROUP
NICOLA DISTRICT
NICOLA MINING DIVISION - B.C.
SCALE 1 INCH = 200 FT.
H.D. WILSON
12/1/42

NOTE
FOR KEY MAP SEE ENCLOSED
PROPERTY SKETCH