DEPARTMENT OF MINERALS AND ENERGY

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

BULLETIN 152

STANDARD CURVES FOR INTERPRETATION OF MAGNETIC ANOMALIES DUE TO THIN DYKES OF FINITE DEPTH EXTENT

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CONTENTS

ILLUSTRATIONS

KEY TO THE STANDARD CURVES (PLATES 2 to 46)

Plate	Dip	E				Dip	E		
		ΔH	ΔT	ΔZ			ΔH	ΔT	ΔZ
2	10	–80	–40, +50	+10		170	+80	+40, –50	–10
3	30	"	"	"		150	"	"	"
4	50	"	"	"		130	"	"	"
5	70	"	"	"		110	"	"	"
6	90	"	"	"		90	"	"	"
7	110	"	"	"		70	"	"	"
8	130	"	"	"		50	"	"	"
9	150	"	"	"		30	"	"	"
10	170	"	"	"		10	"	"	"
11	10	–60	–30, +60	+30		170	+60	+30, –60	–30
12	30	"	"	"		150	"	"	"
13	50	"	"	"		130	"	"	"
14	70	"	"	"		110	"	"	"
15	90	"	"	"		90	"	"	"
16	110	"	"	"		70	"	"	"
17	130	"	"	"		50	"	"	"
18	150	"	"	"		30	"	"	"
19	170	"	"	"		10	"	"	"
20	10	–40	–20, +70	+50		170	+40	+20, –70	–50
21	30	"	"	"		150	"	"	"
22	50	"	"	"		130	"	"	"
23	70	"	"	"		110	"	"	"
24	90	"	"	"		90	"	"	"
25	110	"	"	"		70	"	"	"
26	130	"	"	"		50	"	"	"
27	150	"	"	"		30	"	"	"
28	170	"	"	"		10	"	"	"
29	10	–20	–10, +80	+70		170	+20	+10, –80	–70
30	30	"	"	"		150	"	"	"
31	50	"	"	"		130	"	"	"
32	70	"	"	"		110	"	"	"
33	90	"	"	"		90	"	"	"
34	110	"	"	"		70	"	"	"
35	130	"	"	"		50	"	"	"
36	150	"	"	"		30	"	"	"
37	170	"	"	"		10	"	"	"
38	10	0	0, +90	+90		170	0	0, –90	–90
39	30	"	"	"		150	"	"	"
40	50	"	"	"		130	"	"	"
41	70	"	"	"		110	"	"	"
42	90	"	"	"		90	"	"	"
43	110	"	"	"		70	"	"	"
44	130	"	"	"		50	"	"	"
45	150	"	"	"		30	"	"	"
46	170	"	"	"		10	"	"	"

SUMMARY

Standard curves for the interpretation of magnetic anomalies due to thin finite dykes were computed for various ratios of dyke length (measured down the dip) to depth of burial. Families of curves for a given field inclination and dip of dyke are produced for various ratios of dyke length to depth of burial.

The curves so produced are suitable for interpretation of anomalies in the intensity of the vertical, horizontal, and total field.

1. INTRODUCTION

The families of curves presented by Gay (1963, 1965) permit rapid and reliable interpretation of the magnetic anomalies due to infinite dykes and infinite horizontal cylinders. The advantages of this type of interpretation are obvious: all the field data are used in the interpretation, and a measure of reliability of the interpretation is gained from the degree of fit of the data to the theoretical curve.

One of the problems to be considered is: 'what constitutes a good fit?'. In attempting to fit specific field data to the curves for infinite dykes, it was found that the field profiles diverged considerably from the theoretical profiles. In the Tennant Creek area of the Northern Territory the assumption of infinite magnetic bodies could not be justified on geological grounds, and since the effect of dyke length could only be guessed at, a set of curves for finite bodies became desirable.

The mathematical method of computation for dykes of finite length down-dip was suggested by Gay (1963). The difficulty lay in the great number of curves required to represent all finite dykes for all values of field inclination. However, the major variations in the theoretical profiles occur within the range of dyke lengths from one to ten units, where the depth of burial is one unit. For dyke lengths less than one unit, the dyke effectively reduces to a line dipole, and no information can be obtained about its dip or shape. For dyke lengths greater than 100 units, on the other hand, the theoretical curve is indistinguishable from that for an infinite dyke; for dyke lengths from 100 down to 10 units the similarity between the two curves diminishes but is still reasonable, particularly for bodies of steep dip. Even with these restrictions, the full representation of all possible combinations still requires a great number of curves. It is impracticable to present all such curves here; instead, curves for the whole range of dip and field inclination are presented in 20-degree steps. Visual interpolation between these theoretical curves should permit reliable interpretation of any field curve.

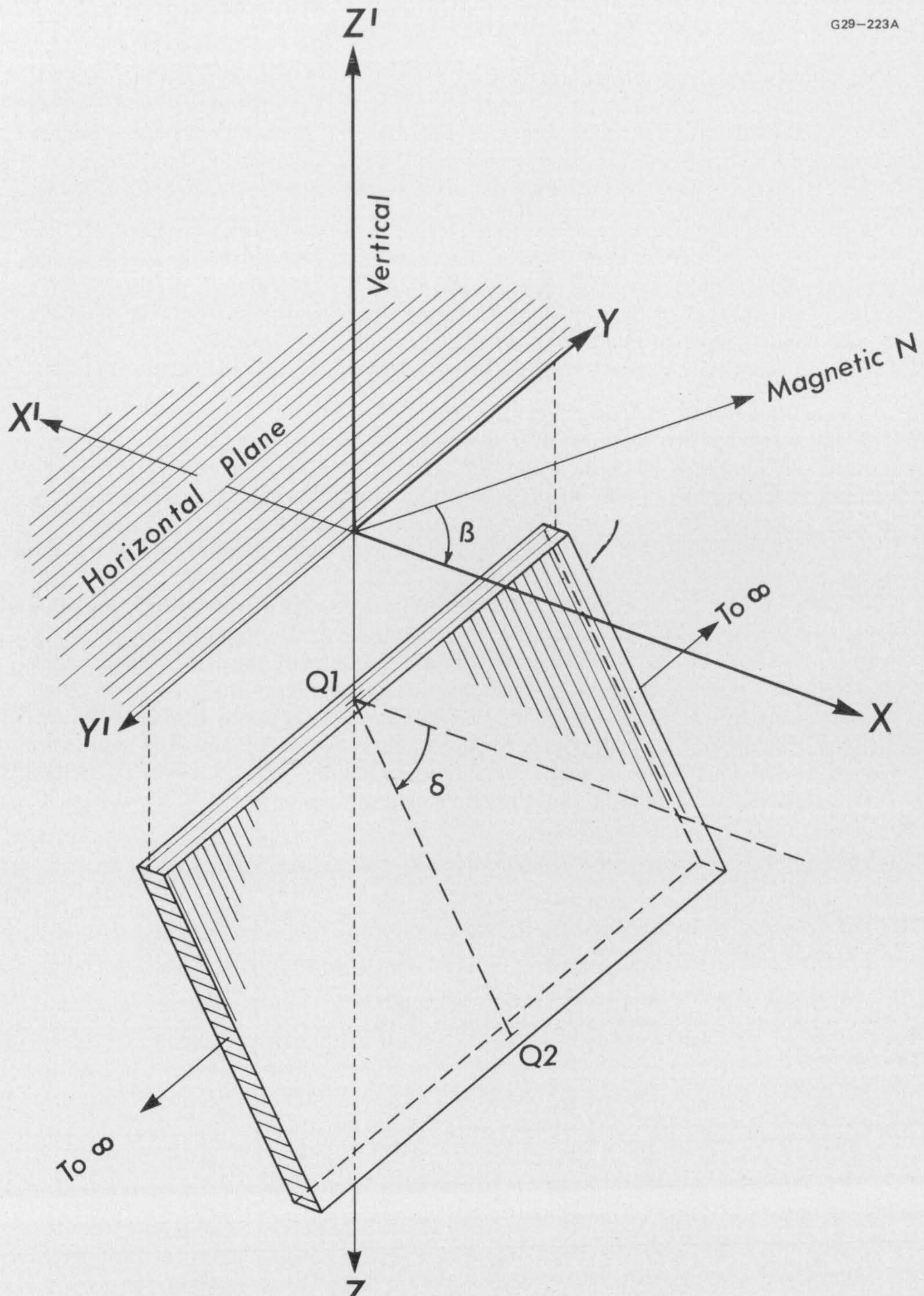

Fig. 1. Sketch showing dyke of finite depth extent in relation to co-ordinate system.

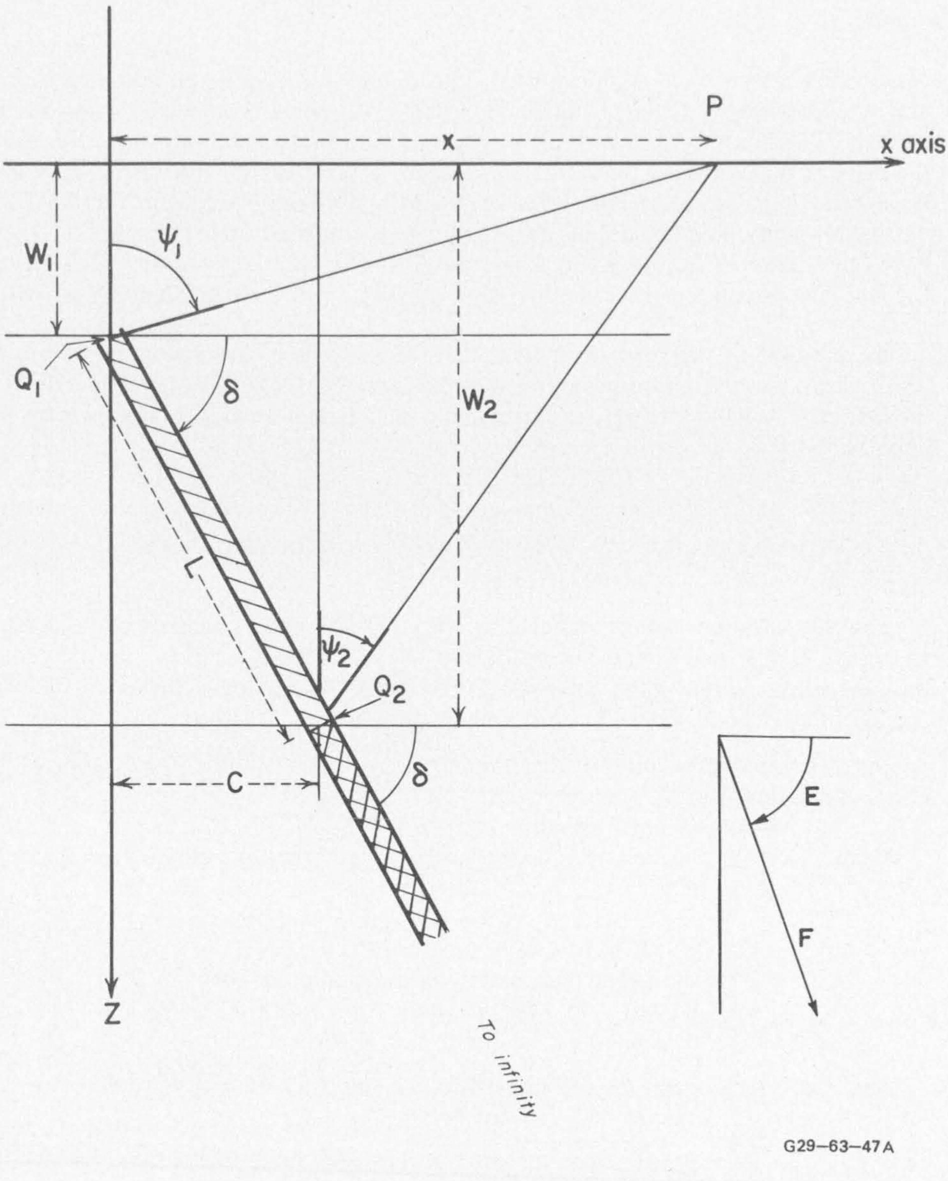

Fig. 2. Geometry of thin dyke in the XZ-Plane.

2. MATHEMATICAL DERIVATION

It was suggested by Gay (1963) that the anomalies for a finite dyke could be obtained by subtracting the effects of two coplanar infinite dykes at different depths.

Consider a thin dyke of thickness t, downdip length L, susceptibility contrast k, and with its uppermost edge buried to a depth W_1 (Figs. 1 and 2). Define a left-handed co-ordinate system with the origin on the surface of the earth directly above the apex of the dyke, and with the Z axis positive vertically downwards. The X axis is perpendicular to the strike of the dyke and considered positive in the magnetic north half-plane, and makes an angle β with the magnetic north meridian, where β has the range $-90°$ to $+ 90°$. The dip δ of the dyke is defined as a north dip (i.e. the angle between the dyke and the $+X$ axis) and has the range $0°$ to $180°$.

The concept of the field inclination and field strength effective in the direction of the traverse was introduced by Koulomzine & Masse (1947). The effective inclination E is derived from the true inclination I and traverse azimuth β by the expression

$$\tan E = (\tan I)/\cos \beta \quad \ldots\ldots\ldots\ldots (1)$$

and may be obtained from the nomogram in Plate 1. The effective total intensity $\mathcal{T}$ is derived from the true intensity T, and I and E by:

$$\mathcal{T} = (T \sin I)/\sin E \quad \ldots\ldots\ldots\ldots (2)$$

Consider the expressions derived by Gay (1963) and the parameters defined in Figure 2. The two infinite dykes Q_1 and Q_2 at depths W_1 and W_2 are coplanar; thus the effect of the finite dyke $Q_1\,Q_2$ of length L can be determined by subtracting the effect of dyke Q_2 from that of dyke Q_1.

The general expression for the anomaly due to an infinite dyke is given in Gay's formula (19):

$$\triangle F = C_F \cos \psi \cos (\psi - \theta_F)$$

where $\triangle F$ = the anomaly in the corresponding component of the magnetic field

C_F = the coefficient term for any one component
$= f(T, I, \beta, k, t, W)$

θ_F = the index parameter for any one component
$= f(E, \delta) = f(I, \beta, \delta)$

ψ is defined in Figure 2.

Thus the anomaly due to the finite dyke $Q_1\,Q_2$ (Fig. 1) may be defined as

$$\triangle F_{Q1\,Q2} = C_{F1} [\cos \psi_1 \cos (\psi_1 - \theta_{F1})] - C_{F2} [\cos \psi_2 \cos (\psi_2 - \theta_{F2})]$$

Now θ_{F1} and θ_{F2} depend only on dip, strike, and field inclination, which are identical for both dykes. Therefore $\theta_{F1} = \theta_{F2}$

Now $C_{F1} = f(T, I, \beta, k, t, W_1)$
$C_{F2} = f(T, I, \beta, k, t, W_2)$

Define $W_2 = W_1(D)$; i.e. $D = 1 + (L/W_1) \sin \delta$

Then $C_{F2} = C_{F1}/D$ because $C_F \propto 1/W$

and $\triangle F_{Q1\,Q2} = C_{F1} [\cos \psi_1 \cos(\psi_1 - \theta_F) - (1/D) \cos \psi_2 \cos (\psi_2 - \theta_F)]$

Thus far the expression is completely general. However, the value of θ_F is affected by the value of the dip δ, which must therefore be removed from the index parameter. Define a new parameter μ such that $\theta_F = \mu - \delta$.

Then $\triangle F_{Q1\,Q2} = C_{F1}\ [\cos\psi_1 \cos(\psi_1 - (\mu - \delta)) - (1/D)\cos\psi_2 \cos(\psi_2 - (\mu - \delta))]$ ...... (3)

Equation (3) is capable of direct solution by digital computer, but in the interests of computer efficiency the following transformations are carried out:

$$\cos\psi_1 = 1/\sqrt{X^2+1}\ , \qquad \sin\psi_1 = X/\sqrt{X^2+1}$$
$$\cos\psi_2 = D/\sqrt{(X-M)^2+D^2}\ , \qquad \sin\psi_2 = (X-M)/\sqrt{(X-M)^2+D^2}$$

where $M = L\cos\delta$

W_1 = unit distance

$$A = \cos(\mu - \delta)\ , \qquad B = \sin(\mu - \delta)$$

Then $\cos(\psi_1 - (\mu - \delta)) = A\cos\psi_1 + B\sin\psi_1$

and

$\triangle F_{Q1\,Q2} = C_{F1}\ [A\cos^2\psi_1 + B\cos\psi_1\sin\psi_1 - (A/D)\cos^2\psi_2 -$
$(B/D)\cos\psi_2\sin\psi_2]$

$$= C_{F1}\left[\frac{A+BX}{X^2+1} - \frac{AD+B(X-M)}{(X-M)^2+D^2}\right]$$

The above family of curves for various values of μ and δ were computed and machine plotted on a CDC 3600 computer and a Calcomp plotter. It was not necessary to compute the curves for the whole range of μ: it may be shown by simple trigonometrical manipulation that the curves for all values of μ may be obtained from the curves for the range 0 to 90 degrees, by simple inversion and transposition. Where the curves are transposed, the dip of the dyke becomes the supplement of the original one. Computer program listings and flow charts are shown in Appendix 1, but the nomenclature used in the program is not necessarily related to the names of the parameters used in the above derivation.

Following the approach of Gay (1963), the curves were normalized in amplitude, such that

$$\triangle F_{max} - \triangle F_{min} = 1.0$$

In cases where it was not possible to pick an absolute maximum or minimum because the anomaly extended outside the plotted range, the value was taken from the inflexion point of the curve. This gives a satisfactory value for the normalizing constant, intermediate between the very short dipole (where the anomaly due to two poles is normalized) and the infinite dyke (where the anomaly due to a single pole is normalized). The true amplitude a for each curve is tabulated in Table 1, and is required for determination of the thickness t. The coefficient C_F is identical to that used by Gay (1963) and is tabulated in Table 2 for the three types of anomalies, together with values for the index parameter μ and the thickness t.

3. DISCUSSION

The method of interpretation by curve fitting has been adequately described by Gay (1963) and will not be treated here. However, a step-by-step procedure for use of the curves is given in Chapter 4. The curves as presented are intended for use in transparency form, so that the curves can be used in four different ways. From whichever way the curves are viewed, the appropriate parameters appear in the lower right-hand corner. For profiles of $\triangle Z$, it is normal practice in the Southern Hemisphere to plot -Z upward. For this reason the theoretical curves have not been inverted and are ready for use if the above plotting convention is used.

These curves have been used for interpretation in the Tennant Creek district, Northern Territory (Haigh, 1969a; Hone, 1974). An example is shown in Figure 3 to illustrate the results that can be obtained by this method of interpretation. A regional gradient of 7 gammas per 100 feet had to be removed from the field profile to achieve an acceptable fit. Theoretical curves for infinite dyke and finite dyke of dip length 10 units were fitted for a thin dyke of 110° dip using the curves given in Plate 23 reversed so that the lower left-hand corner became lower right. The geophysical target defined by this interpretation has been subsequently tested by drilling of DDH3, which intersected Warramunga Group sediments containing various amounts of magnetite from 434 to 580 feet. The predicted target position calculated down DDH3 was 434 feet. Native copper was found in the interval between 426½ and 428 feet. Only traces of copper and gold were found in the mineralized zone. Assuming a magnetic susceptibility $k = 0.05$ cgs units, the calculated thickness of the dyke is about 80 feet, which could be the true width of the mineralized zone intersected if that zone has a steep dip. Experience with these curves has shown that removal of a regional gradient tends to change the dip of the interpreted body but has little effect on its estimated depth.

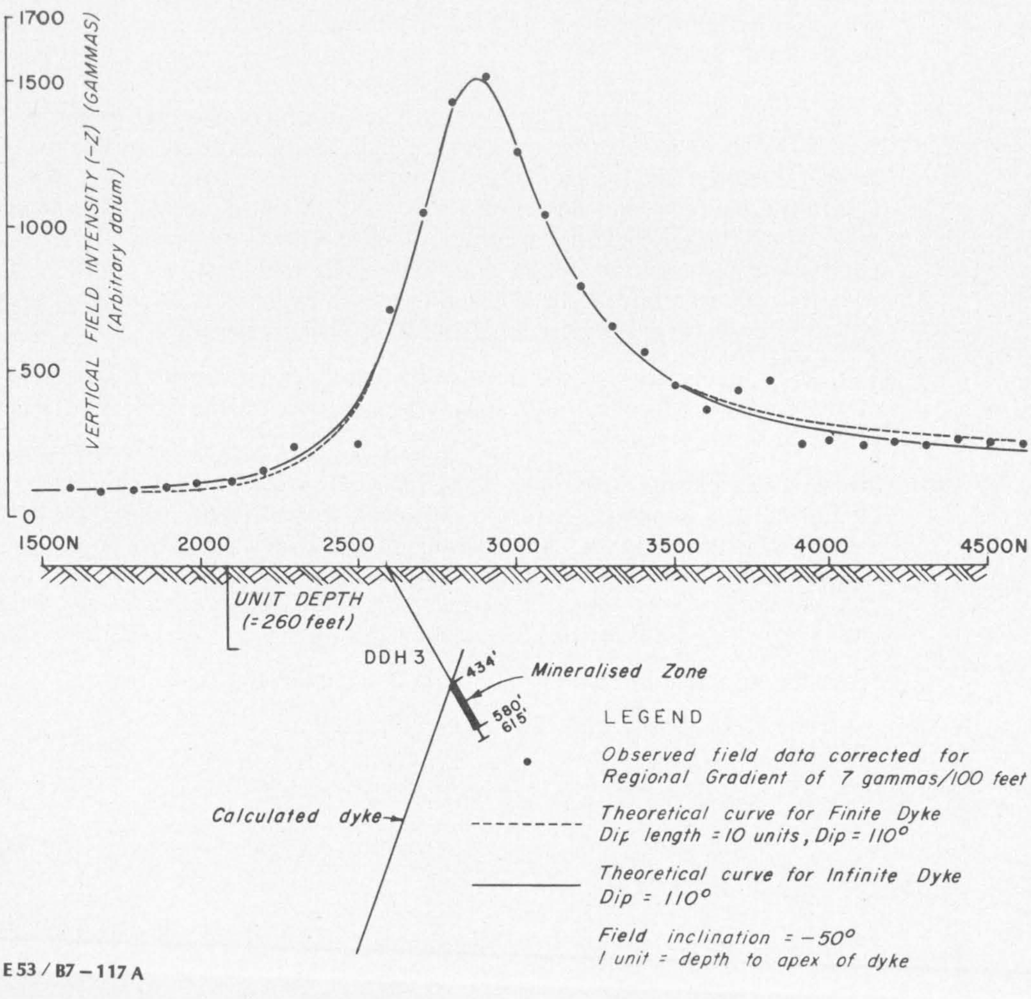

Fig. 3. Example of curve matching.

4. INTERPRETATION PROCEDURE

For rapid interpretation of magnetic profiles using these curves, the following procedure is recommended:

(1) Plot the field results at a convenient scale (with -Z upwards if using data from the Southern Hemisphere).

(2) Using the known values of field inclination I, intensity T, and traverse azimuth β, read the effective field inclination E from Plate 1 and calculate the effective field intensity $\mathcal{T}$ from Equation (2).

(3) Using proportional dividers or a computer program, change the vertical scale of the field profile so that its amplitude is the same as that of the theoretical curves.

(4) Vary the horizontal scale of the field profile to achieve the best fit between it and the theoretical curve that corresponds to the effective inclination E of the traverse. Choose the value of dip and dyke length to give closest agreement between the theoretical curve and the field profile. The small table in the lower right-hand corner of each family of curves shows the appropriate dip and the effective inclination E, which varies according to whether the curves are being matched to curves of horizontal intensity, total intensity, or vertical intensity ($\triangle$H, $\triangle$T, $\triangle$Z respectively).

(5) The depth to the apex of the dyke is that distance on the horizontal scale of the field profile, which corresponds to one unit on the horizontal scale of the theoretical curve.

(6) Measure the gamma amplitude A of the field profile, and from Table 1 obtain the true amplitude a of the theoretical curve. (When using Table 1 it is useful to note that the required value of μ is always given by the positive Z inclination for the particular set of curves in use). It is important that the gamma amplitude A should be taken only from the portion of the field profile which is fitted to the theoretical curve.

(7) From the appropriate formula in Table 2 compute the thickness t.

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u = 10 DEGREES

TABLE 1. VALUES OF THE TRUE AMPLITUDE OF THE STANDARD CURVES

Dip	Dyke Length	Amplitude	Dip	Dyke Length	Amplitude	Dip	Dyke Length	Amplitude
10	1	0.963	30	1	0.788	50	1	0.693
	2	1.320		2	1.030		2	0.896
	3	1.420		3	1.104		3	0.968
	4	1.438		4	1.122		4	0.996
	5	1.429		5	1.122		5	1.007
	6	1.410		6	1.116		6	1.012
	8	1.367		8	1.099		8	1.012
	10	1.280		10	1.084		10	1.010
	15	1.046		15	1.050		15	1.005
	INFINITE	1.000		INFINITE	1.000		INFINITE	1.000
70	1	0.645	90	1	0.630	110	1	0.644
	2	0.830		2	0.811		2	0.828
	3	0.906		3	0.886		3	0.902
	4	0.942		4	0.925		4	0.938
	5	0.961		5	0.947		5	0.957
	6	0.972		6	0.960		6	0.968
	8	0.984		8	0.975		8	0.981
	10	0.990		10	0.983		10	0.987
	15	0.996		15	0.992		15	0.994
	INFINITE	1.000		INFINITE	1.000		INFINITE	1.000
130	1	0.691	150	1	0.785	170	1	0.959
	2	0.889		2	1.019		2	1.309
	3	0.947		3	1.082		3	1.401
	4	0.983		4	1.092		4	1.413
	5	0.995		5	1.085		5	1.399
	6	0.999		6	1.074		6	1.378
	8	1.002		8	1.050		8	1.333
	10	1.002		10	1.032		10	1.285
	15	1.002		15	1.013		15	1.073
	INFINITE	1.000		INFINITE	1.000		INFINITE	1.000

μ = 30 DEGREES

TABLE 1. VALUES OF THE TRUE AMPLITUDE OF THE STANDARD CURVES (Continued)

Dip	Dyke Length	Amplitude	Dip	Dyke Length	Amplitude	Dip	Dyke Length	Amplitude
10	1	0.945	30	1	0.777	50	1	0.685
	2	1.292		2	1.022		2	0.892
	3	1.383		3	1.098		3	0.968
	4	1.399		4	1.122		4	1.001
	5	1.388		5	1.126		5	1.016
	6	1.369		6	1.124		6	1.022
	8	1.327		8	1.112		8	1.025
	10	1.184		10	1.100		10	1.024
	15	0.998		15	1.047		15	1.017
	INFINITE	1.000		INFINITE	1.000		INFINITE	1.000
70	1	0.639	90	1	0.623	110	1	0.636
	2	0.826		2	0.895		2	0.819
	3	0.904		3	0.881		3	0.893
	4	0.941		4	0.921		4	0.930
	5	0.962		5	0.944		5	0.951
	6	0.974		6	0.958		6	0.964
	8	0.986		8	0.974		8	0.978
	10	0.992		10	0.983		10	0.985
	15	0.997		15	0.992		15	0.993
	INFINITE	1.000		INFINITE	1.000		INFINITE	1.000
130	1	0.680	150	1	0.770	170	1	0.939
	2	0.873		2	0.992		2	1.263
	3	0.941		3	1.047		3	1.333
	4	0.969		4	1.053		4	1.329
	5	0.981		5	1.046		5	1.306
	6	0.988		6	1.037		6	1.279
	8	0.994		8	1.024		8	1.230
	10	0.997		10	1.017		10	1.190
	15	0.999		15	1.008		15	1.030
	INFINITE	1.000		INFINITE	1.000		INFINITE	1.000

μ = 50 DEGREES

TABLE 1. VALUES OF THE TRUE AMPLITUDE OF THE STANDARD CURVES (Continued)

Dip	Dyke Length	Amplitude	Dip	Dyke Length	Amplitude	Dip	Dyke Length	Amplitude
10	1	0.913	30	1	0.756	50	1	0.669
	2	1.226		2	0.989		2	0.869
	3	1.297		3	1.060		3	0.949
	4	1.299		4	1.081		4	0.985
	5	1.283		5	1.086		5	1.003
	6	1.261		6	1.084		6	1.012
	8	1.218		8	1.073		8	1.020
	10	1.007		10	1.051		10	1.022
	15	1.002		15	0.988		15	1.017
	INFINITE	1.000		INFINITE	1.000		INFINITE	1.000
70	1	0.625	90	1	0.610	110	1	0.621
	2	0.813		2	0.791		2	0.804
	3	0.893		3	0.870		3	0.881
	4	0.933		4	0.912		4	0.920
	5	0.956		5	0.937		5	0.942
	6	0.971		6	0.953		6	0.957
	8	0.986		8	0.971		8	0.973
	10	0.993		10	0.980		10	0.982
	15	0.999		15	0.990		15	0.991
	INFINITE	1.000		INFINITE	1.000		INFINITE	1.000
130	1	0.663	150	1	0.745	170	1	0.907
	2	0.853		2	0.959		2	1.195
	3	0.922		3	1.012		3	1.232
	4	0.954		4	1.022		4	1.204
	5	0.970		5	1.021		5	1.166
	6	0.979		6	1.018		6	1.131
	8	0.988		8	1.012		8	1.074
	10	0.992		10	1.008		10	1.032
	15	0.996		15	1.004		15	1.011
	INFINITE	1.000		INFINITE	1.000		INFINITE	1.000

$\mu = 70$ DEGREES

TABLE 1. VALUES OF THE TRUE AMPLITUDE OF THE STANDARD CURVES (Continued)

Dip	Dyke Length	Amplitude	Dip	Dyke Length	Amplitude	Dip	Dyke Length	Amplitude
10	1	0.864	30	1	0.717	50	1	0.638
	2	1.132		2	0.930		2	0.832
	3	1.168		3	0.990		3	0.906
	4	1.153		4	1.004		4	0.939
	5	1.126		5	1.003		5	0.957
	6	1.099		6	0.998		6	0.967
	8	1.037		8	0.984		8	0.977
	10	1.010		10	0.989		10	0.977
	15	1.005		15	0.995		15	0.982
	INFINITE	1.000		INFINITE	1.000		INFINITE	1.000
70	1	0.598	90	1	0.586	110	1	0.598
	2	0.784		2	0.768		2	0.783
	3	0.865		3	0.851		3	0.863
	4	0.908		4	0.896		4	0.905
	5	0.934		5	0.923		5	0.929
	6	0.950		6	0.941		6	0.946
	8	0.969		8	0.962		8	0.965
	10	0.979		10	0.974		10	0.976
	15	0.990		15	0.988		15	0.988
	INFINITE	1.000		INFINITE	1.000		INFINITE	1.000
130	1	0.638	150	1	0.716	170	1	0.863
	2	0.828		2	0.923		2	1.119
	3	0.903		3	0.980		3	1.136
	4	0.937		4	0.998		4	1.100
	5	0.956		5	1.003		5	1.069
	6	0.968		6	1.004		6	1.050
	8	0.981		8	1.004		8	1.028
	10	0.987		10	1.003		10	1.018
	15	0.994		15	1.001		15	1.008
	INFINITE	1.000		INFINITE	1.000		INFINITE	1.000

μ = 90 DEGREES

TABLE 1. VALUES OF THE TRUE AMPLITUDE OF THE STANDARD CURVES (Continued)

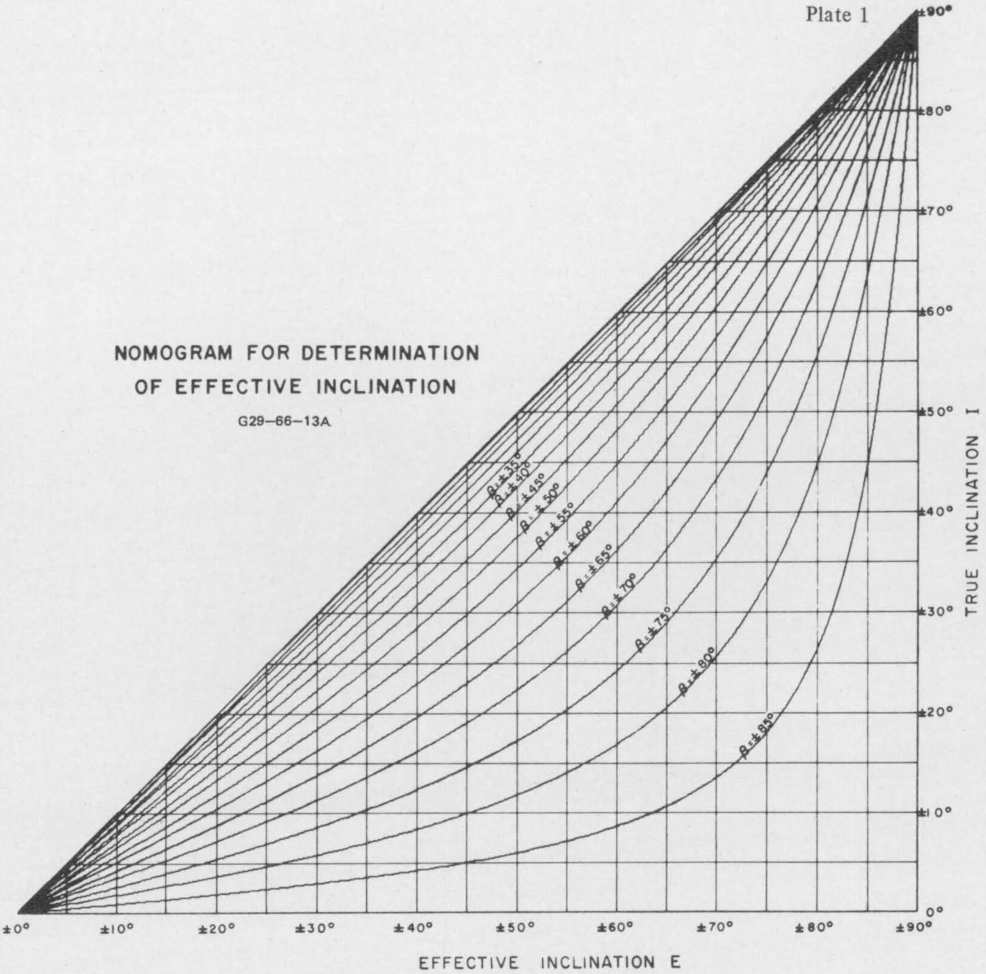
Dip	Dyke Length	Amplitude	Dip	Dyke Length	Amplitude	Dip	Dyke Length	Amplitude
10	1	0.810	30	1	0.679	50	1	0.608
	2	1.049		2	0.883		2	0.798
	3	1.074		3	0.950		3	0.877
	4	1.059		4	0.973		4	0.916
	5	1.044		5	0.985		5	0.939
	6	1.034		6	0.990		6	0.953
	8	1.021		8	0.995		8	0.970
	10	1.014		10	0.997		10	0.979
	15	1.006		15	0.999		15	0.989
	INFINITE	1.000		INFINITE	1.000		INFINITE	1.000
70	1	0.570	90	1	0.557	110	1	0.570
	2	0.750		2	0.734		2	0.750
	3	0.833		3	0.817		3	0.833
	4	0.880		4	0.864		4	0.880
	5	0.909		5	0.893		5	0.909
	6	0.929		6	0.914		6	0.929
	8	0.953		8	0.939		8	0.953
	10	0.966		10	0.954		10	0.966
	15	0.982		15	0.973		15	0.982
	INFINITE	1.000		INFINITE	1.000		INFINITE	1.000
130	1	0.608	150	1	0.679	170	1	0.810
	2	0.798		2	0.883		2	1.049
	3	0.877		3	0.950		3	1.074
	4	0.916		4	0.973		4	1.059
	5	0.939		5	0.985		5	1.044
	6	0.953		6	0.990		6	1.034
	8	0.970		8	0.995		8	1.021
	10	0.979		10	0.997		10	1.014
	15	0.989		15	0.999		15	1.006
	INFINITE	1.000		INFINITE	1.000		INFINITE	1.000

TABLE 2. FORMULAE USED IN INTERPRETATION

Anomaly	*Coefficient* C_F	*Index parameter* μ	*Thickness t*
$\triangle Z$	$\frac{2k \mathcal{J} t}{W}$	E	$\frac{AW}{2k \mathcal{J} a}$
$\triangle H$	$\frac{2k \mathcal{J} t \cos \beta}{W}$	$E - 90°$	$\frac{AW}{2k \mathcal{J} a \cos \beta}$
$\triangle T_I$	$\frac{2k \mathcal{J} t \sin I}{W \sin E}$	$2E - 90°$	$\frac{AW \sin E}{2k \mathcal{J} a \sin I}$

Note: $\triangle T_I$ is the component of total intensity anomaly in the direction of I.

Plate 1



G29-66-13

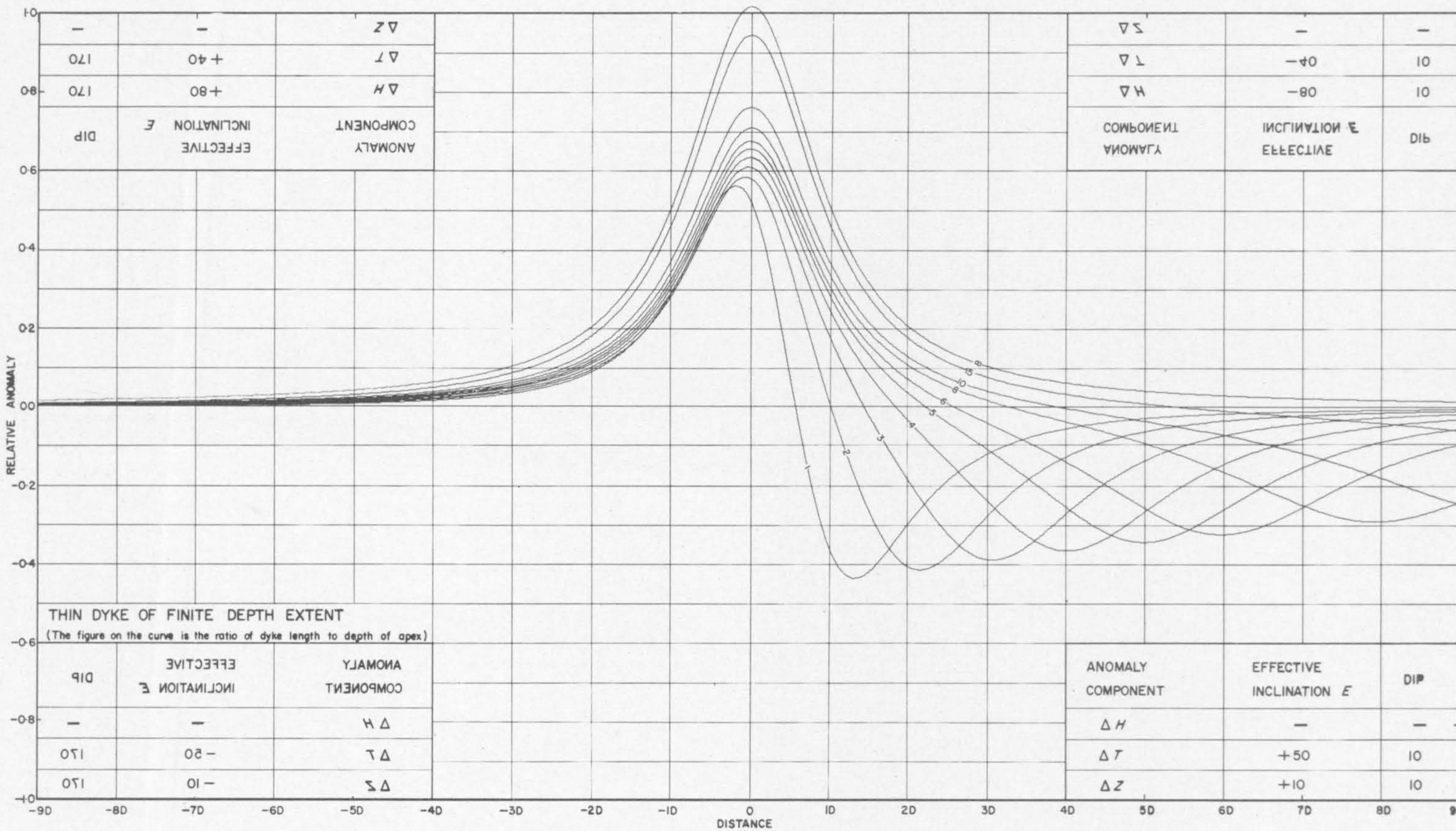

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH
ΔT
ΔZ
+80
+40
170
−80
−40
10
−50
−10
+50
+10

PLATE 2

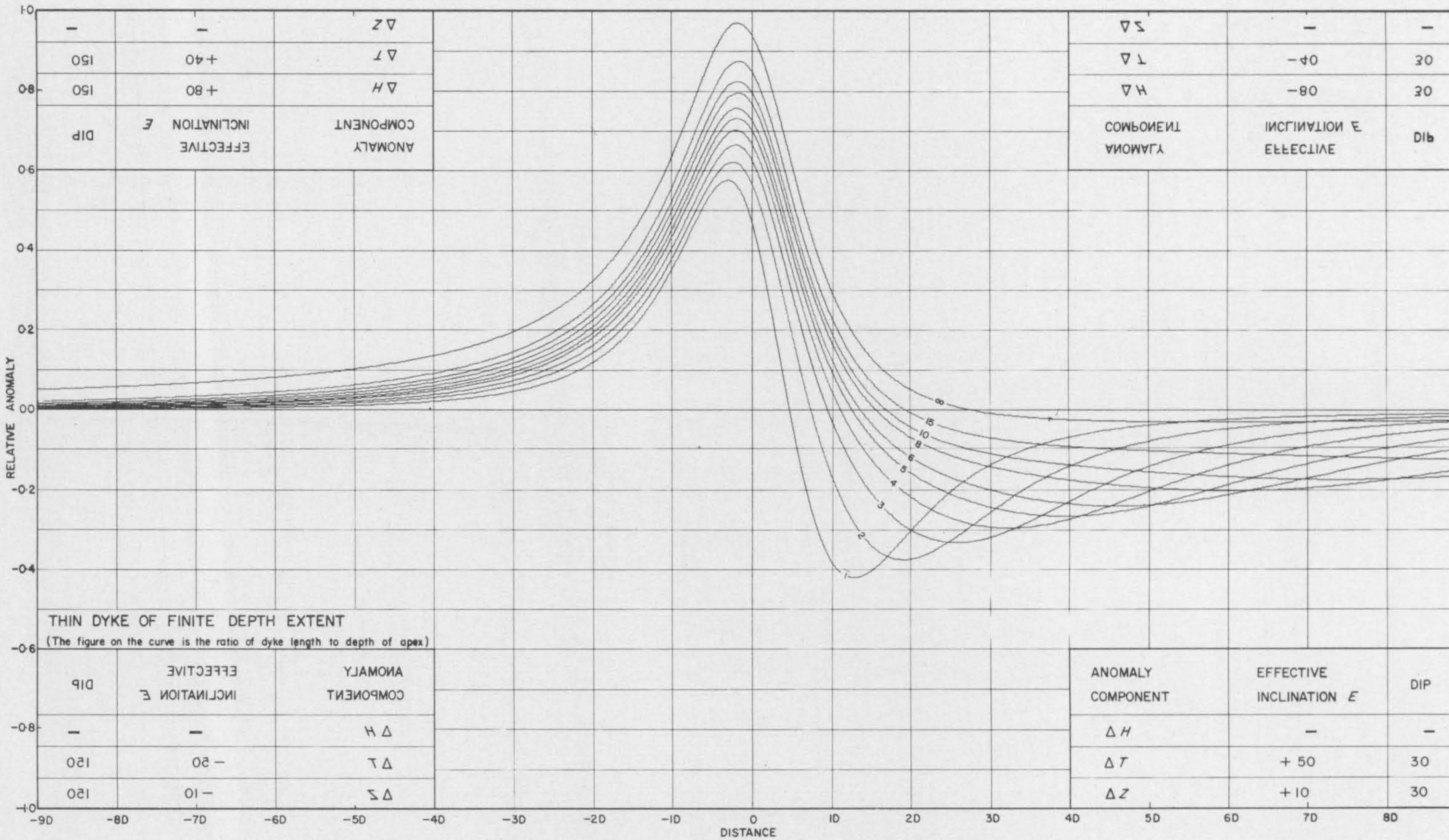

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT +50 30
ΔZ +10 30
1·0
0·8
0·6
0·4
0·2
0·0
-0·2
-0·4
-0·6
-0·8
-1·0
-9D -8D -7D -6D -5D -4D -3D -2D -1D 0 1D 2D 3D 4D 5D 6D 7D 8D 9D

PLATE 3

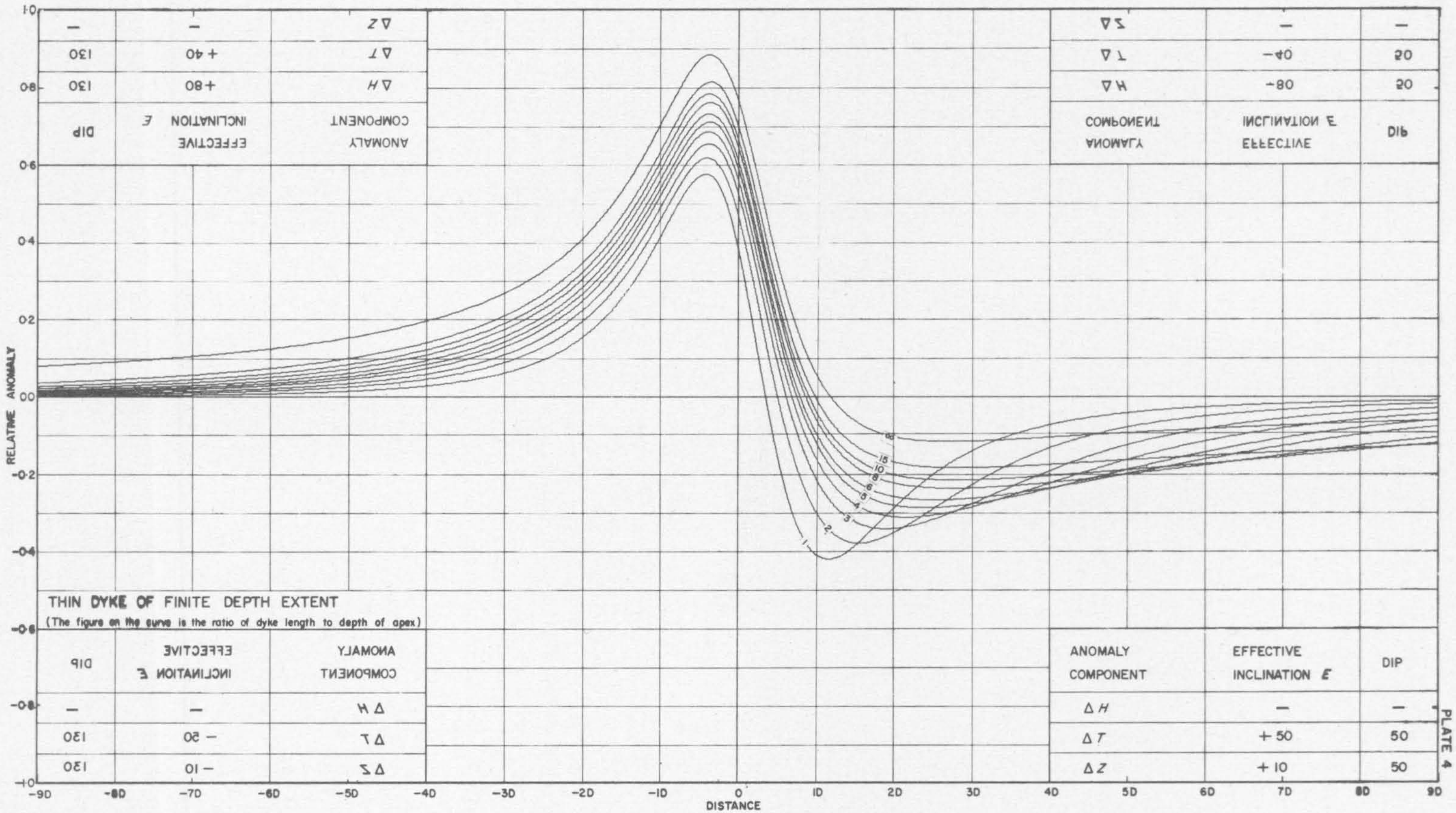
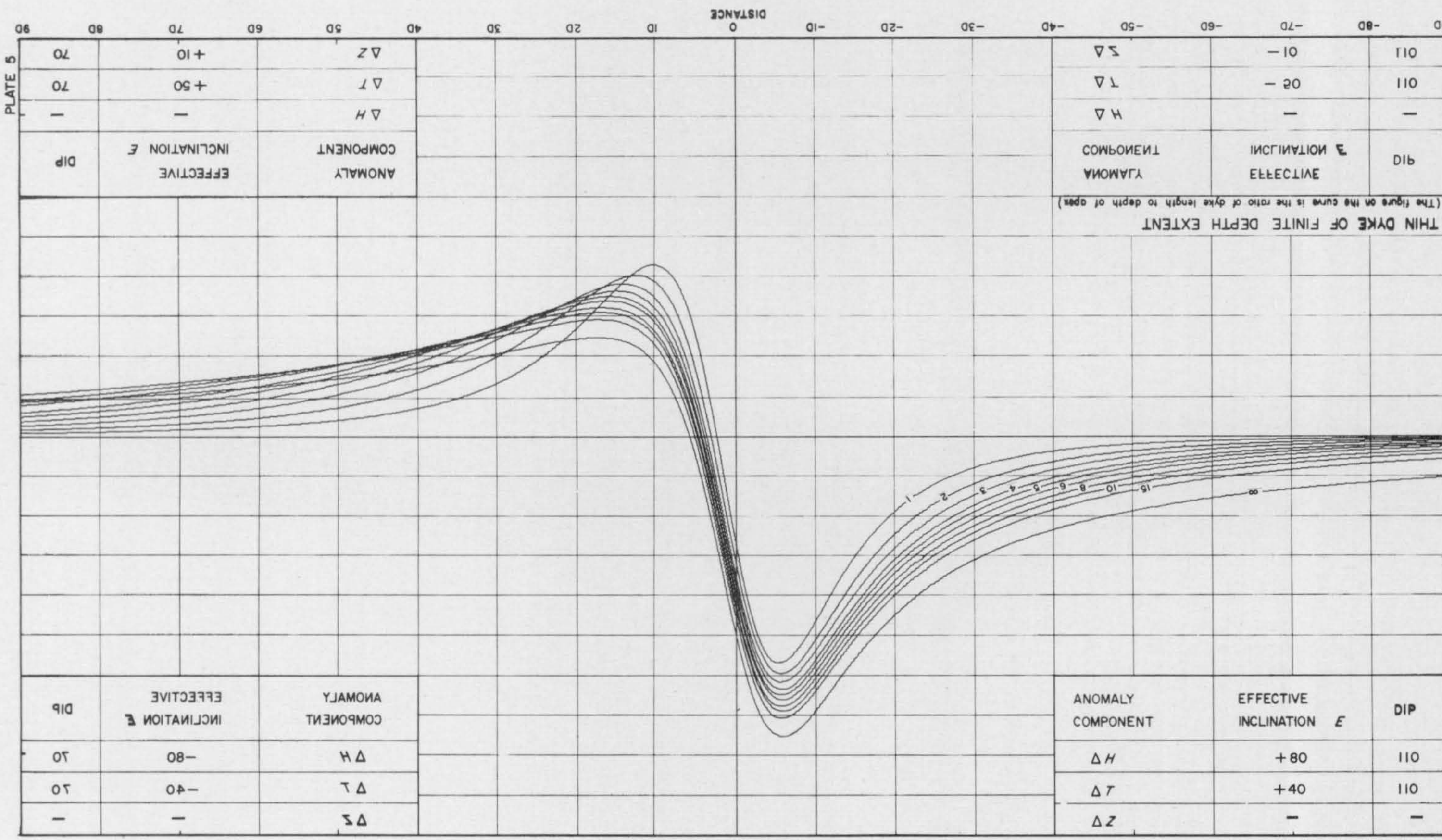

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH
ΔT
ΔZ
+50
+10
50
1
2
3
4
5
6
8
10
15
∞

PLATE 4


THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
DISTANCE
RELATIVE ANOMALY
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH
+80
110
ΔT
+40
110
ΔZ
—
—
ΔH
—
—
ΔT
−50
110
ΔZ
−10
110
ΔH
−80
70
ΔT
−40
70
ΔZ
—
—
ΔH
—
—
ΔT
+50
70
ΔZ
+10
70
1
2
3
4
5
6
8
10
15
∞

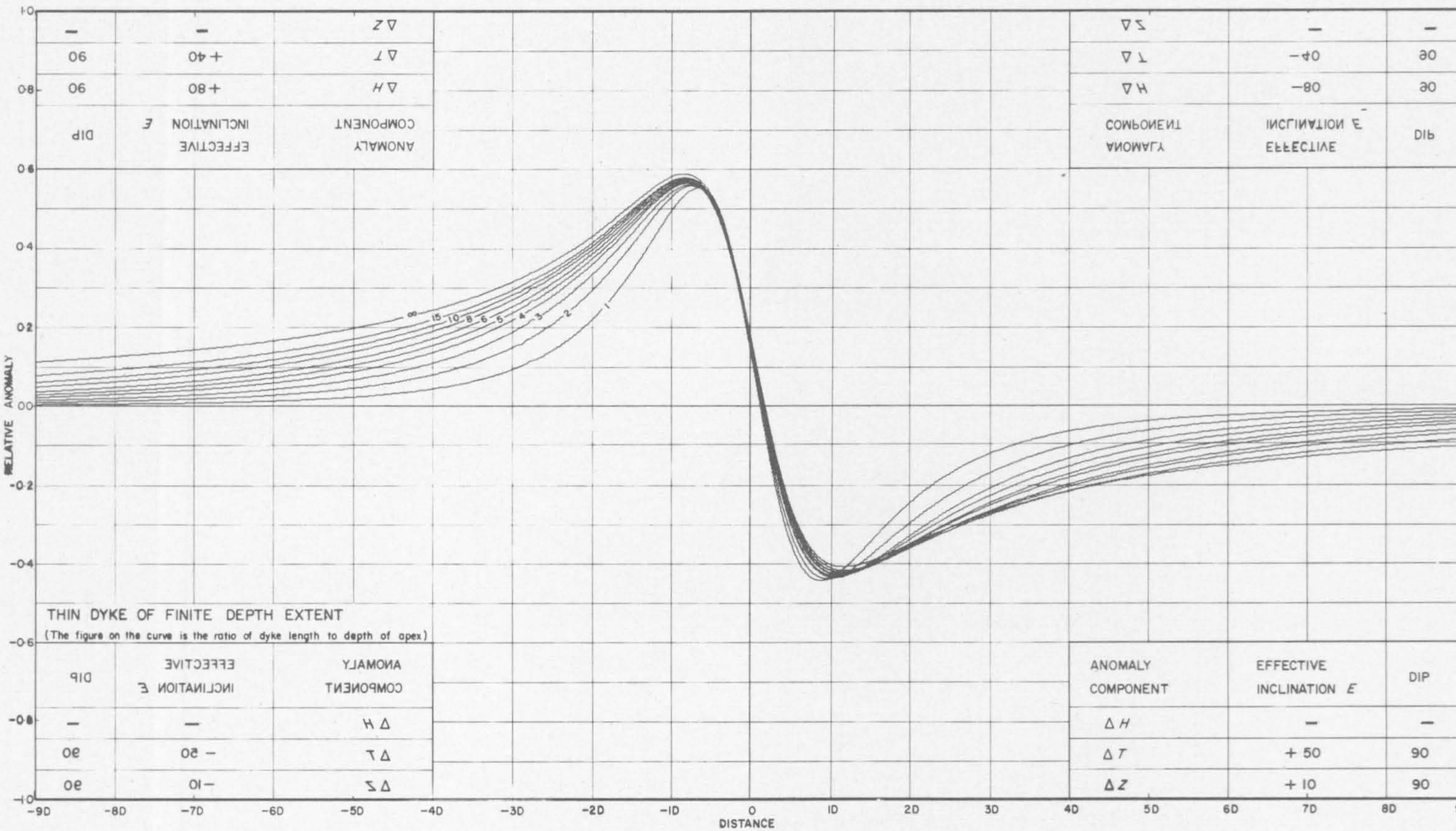

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
1·0
0·8
0·6
0·4
0·2
0·0
-0·2
-0·4
-0·6
-0·8
-1·0
-9D -8D -7D -6D -5D -4D -3D -2D -1D 0 1D 2D 3D 4D 5D 6D 7D 8D 9D
∞ 15 10 8 6 5 4 3 2 1
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | — | —
ΔT | +50 | 90
ΔZ | +10 | 90
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | +80 | 90
ΔT | +40 | 90
ΔZ | — | —
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | −80 | 90
ΔT | −40 | 90
ΔZ | — | —
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | — | —
ΔT | −50 | 90
ΔZ | −10 | 90

PLATE 6

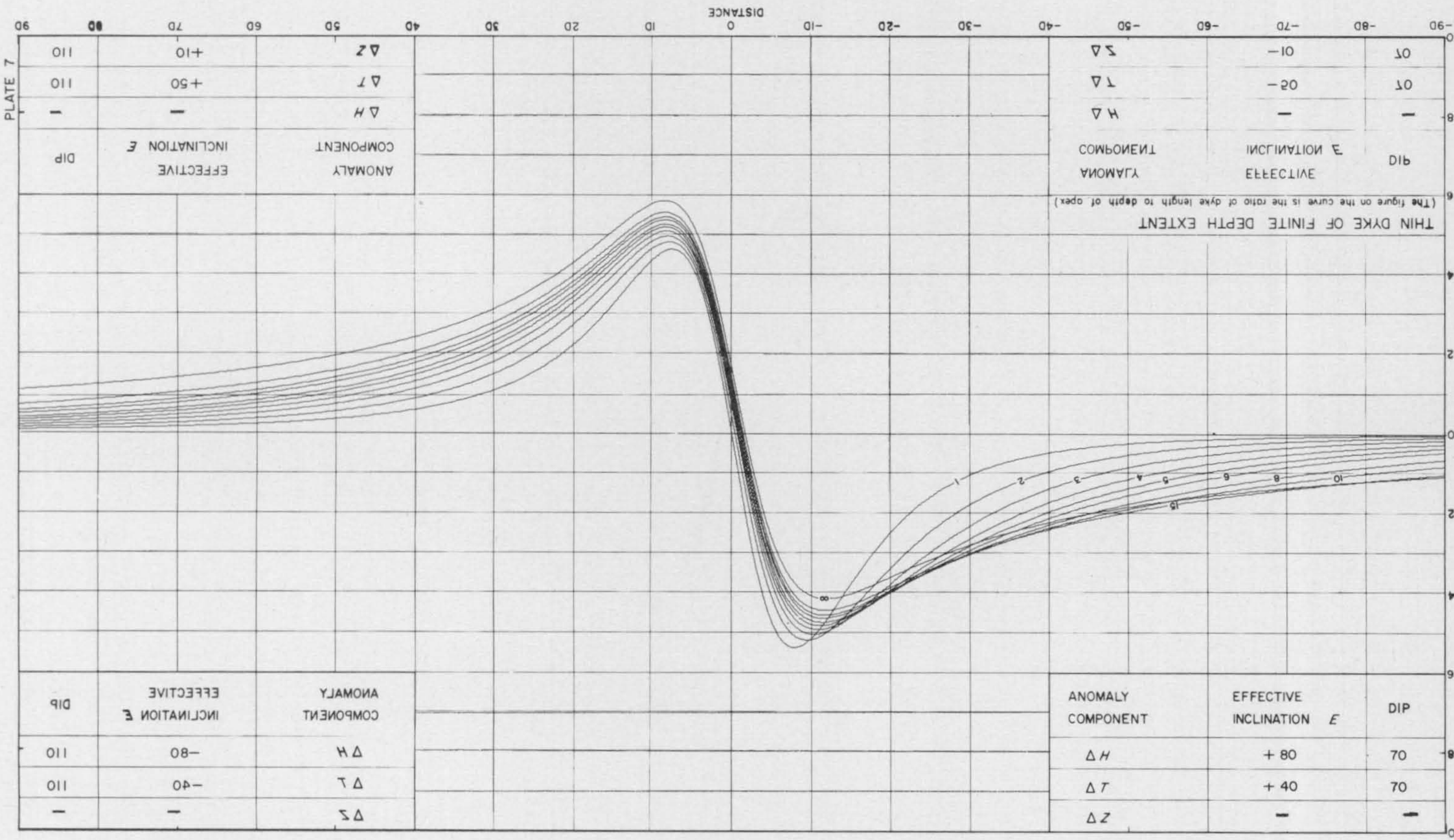
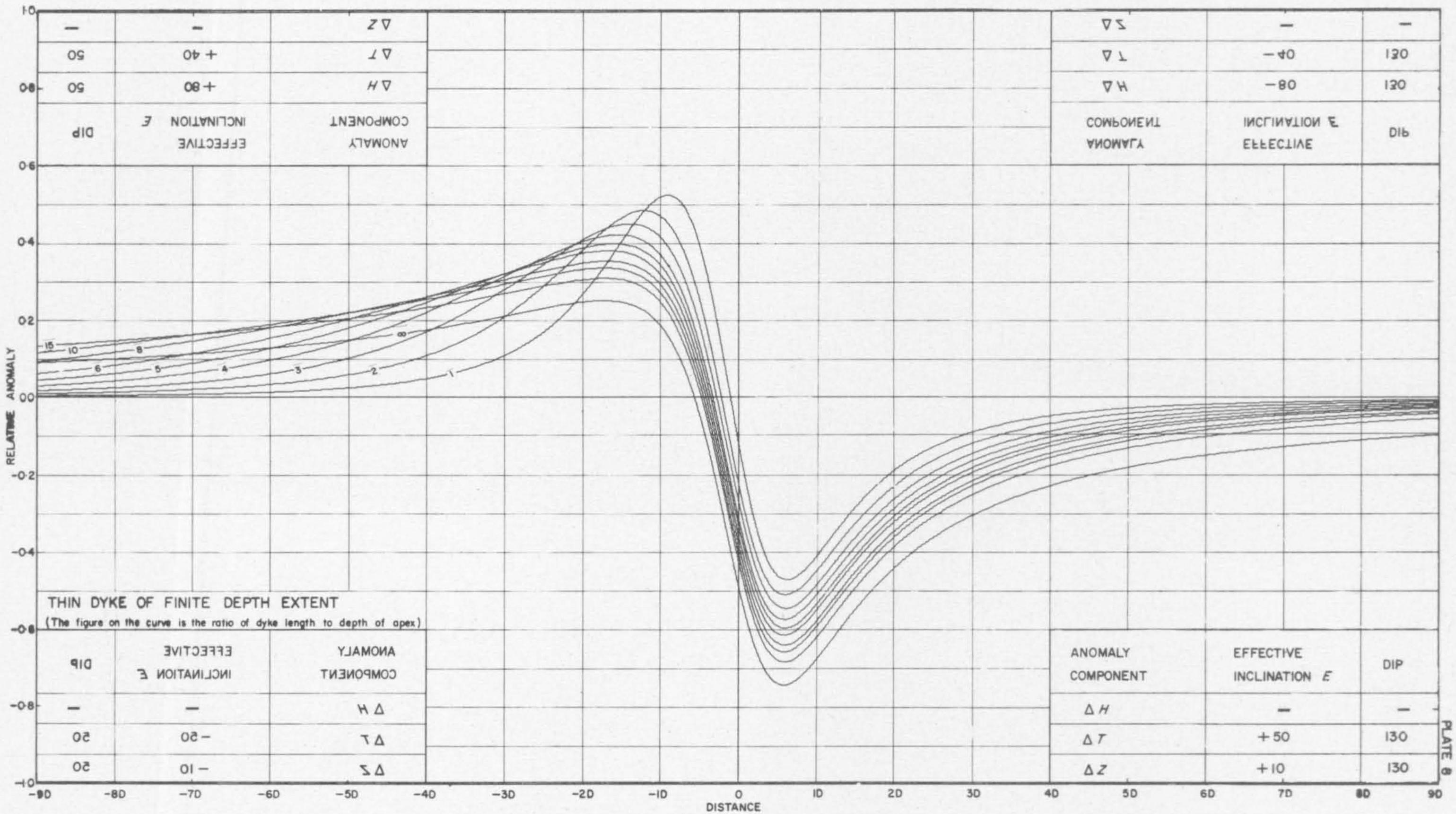

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
DISTANCE
RELATIVE ANOMALY
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH +80 70
ΔT +40 70
ΔZ — —
ΔH — —
ΔT −50 70
ΔZ −10 70
ΔH −80 110
ΔT −40 110
ΔZ — —
ΔH — —
ΔT +50 110
ΔZ +10 110

PLATE 7


THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT +50 130
ΔZ +10 130
ΔH −80 130
ΔT −40 130
ΔZ — —
RELATIVE ANOMALY
DISTANCE
PLATE 8

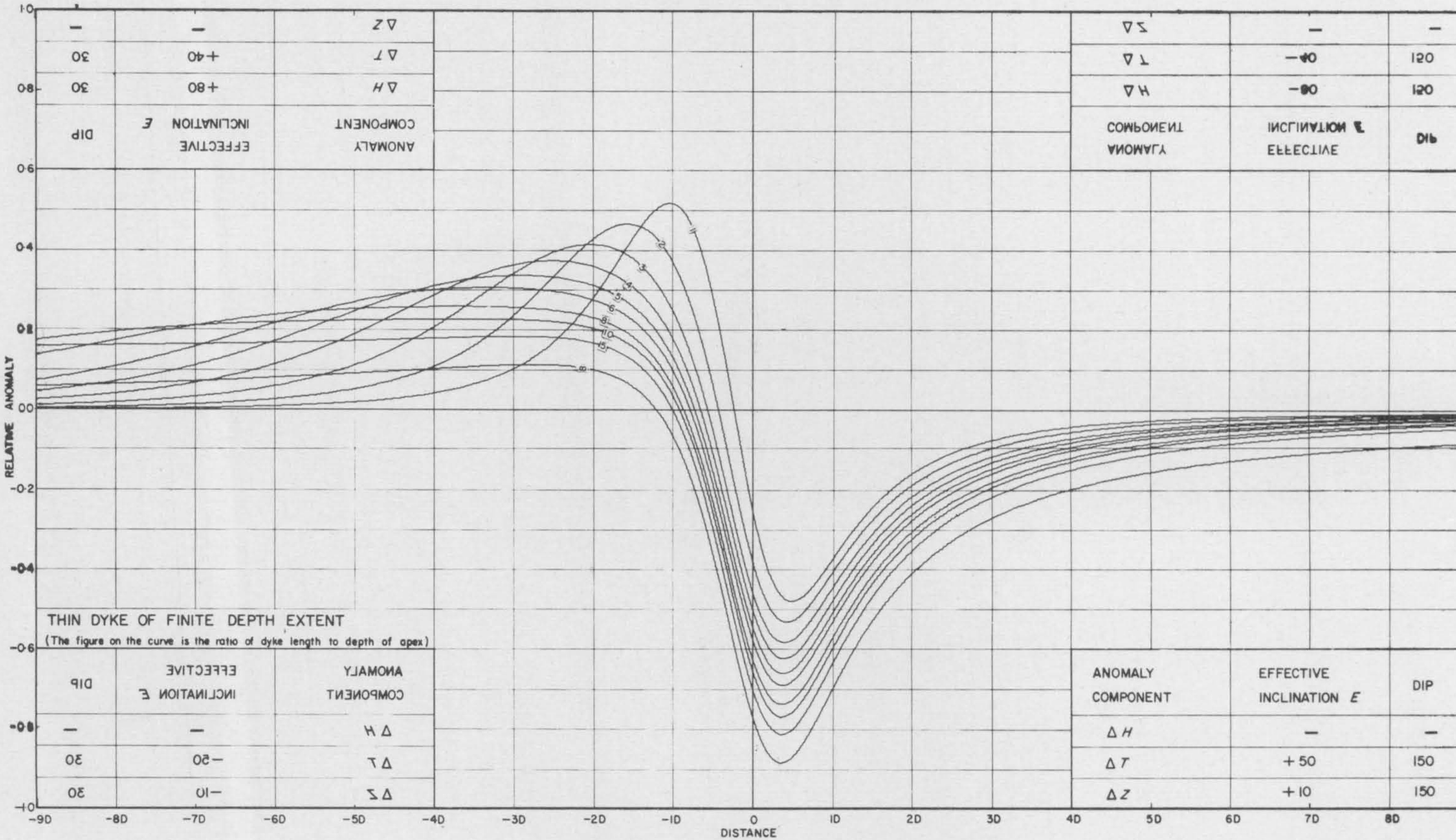

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
1·0
0·8
0·6
0·4
0·2
0·0
-0·2
-0·4
-0·6
-0·8
-1·0
-90
-80
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
80
90
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT +50 150
ΔZ +10 150

PLATE 9

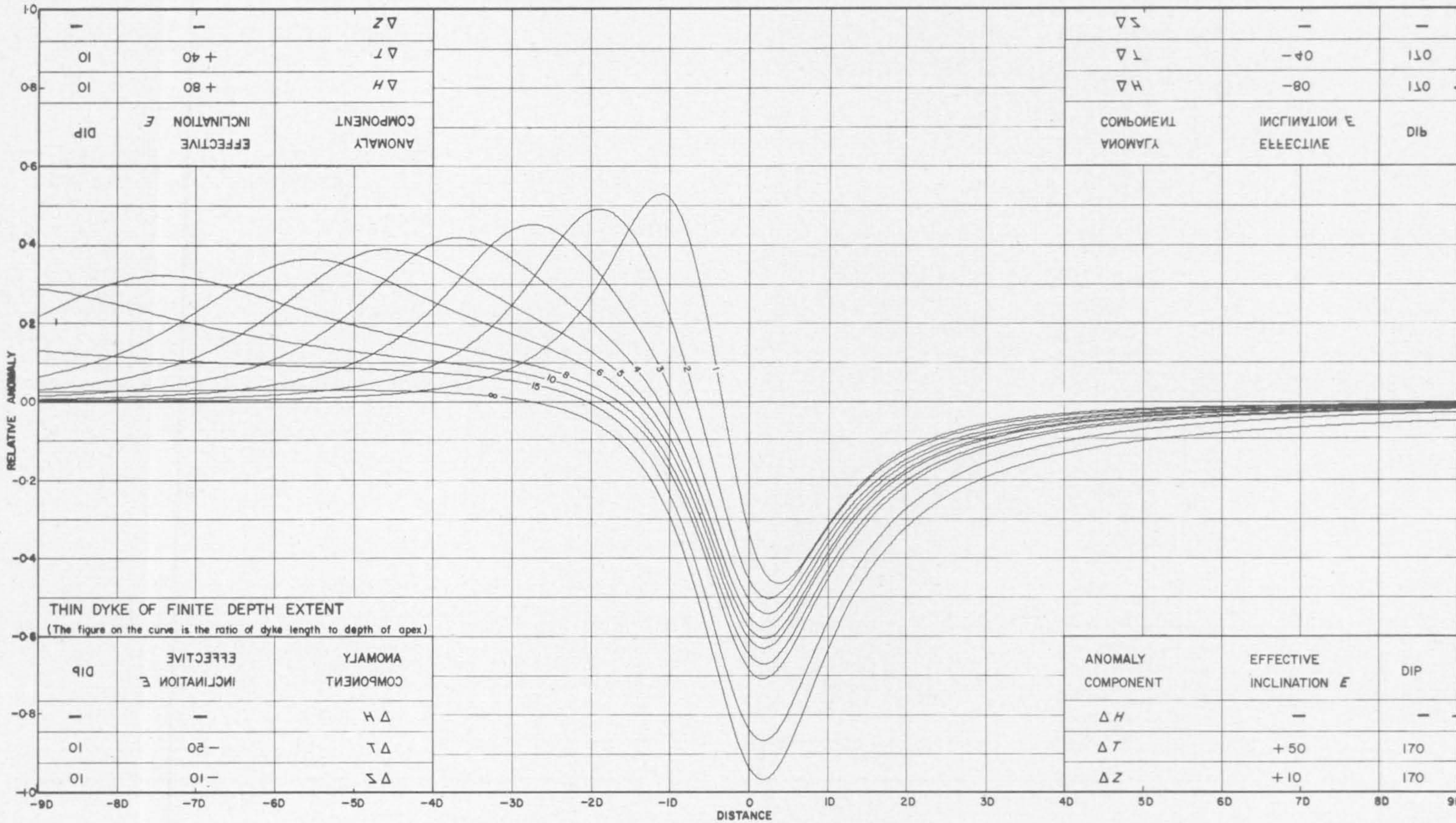

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT +50 170
ΔZ +10 170
RELATIVE ANOMALY
DISTANCE
1 2 3 4 5 6 8 10 15 ∞

PLATE 10

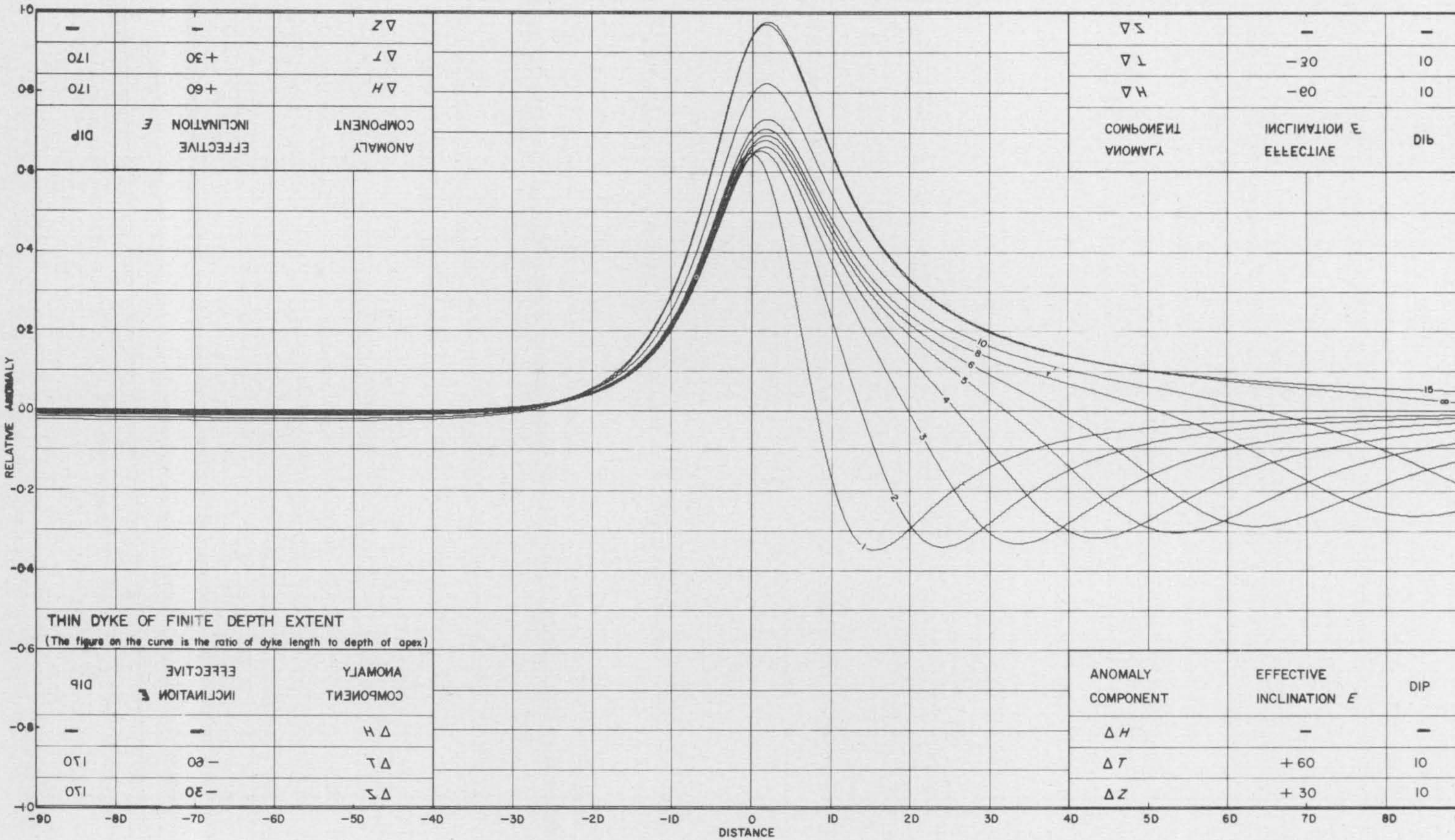

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH
—
—
ΔT
+60
10
ΔZ
+30
10
RELATIVE ANOMALY
DISTANCE

PLATE II

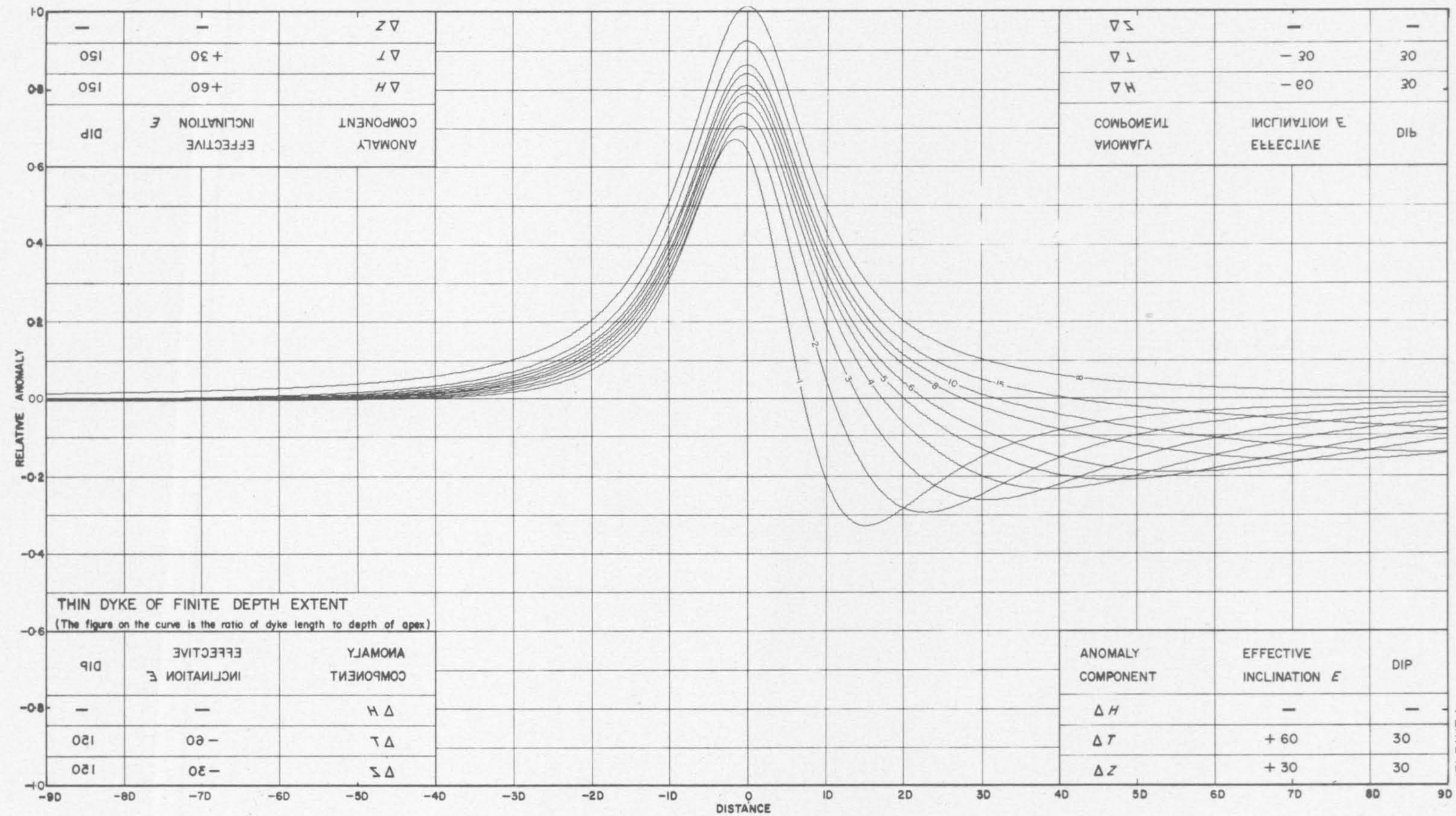

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT + 60 30
ΔZ + 30 30
1·0
0·8
0·6
0·4
0·2
0·0
-0·2
-0·4
-0·6
-0·8
-1·0
-90 -80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90

PLATE 12

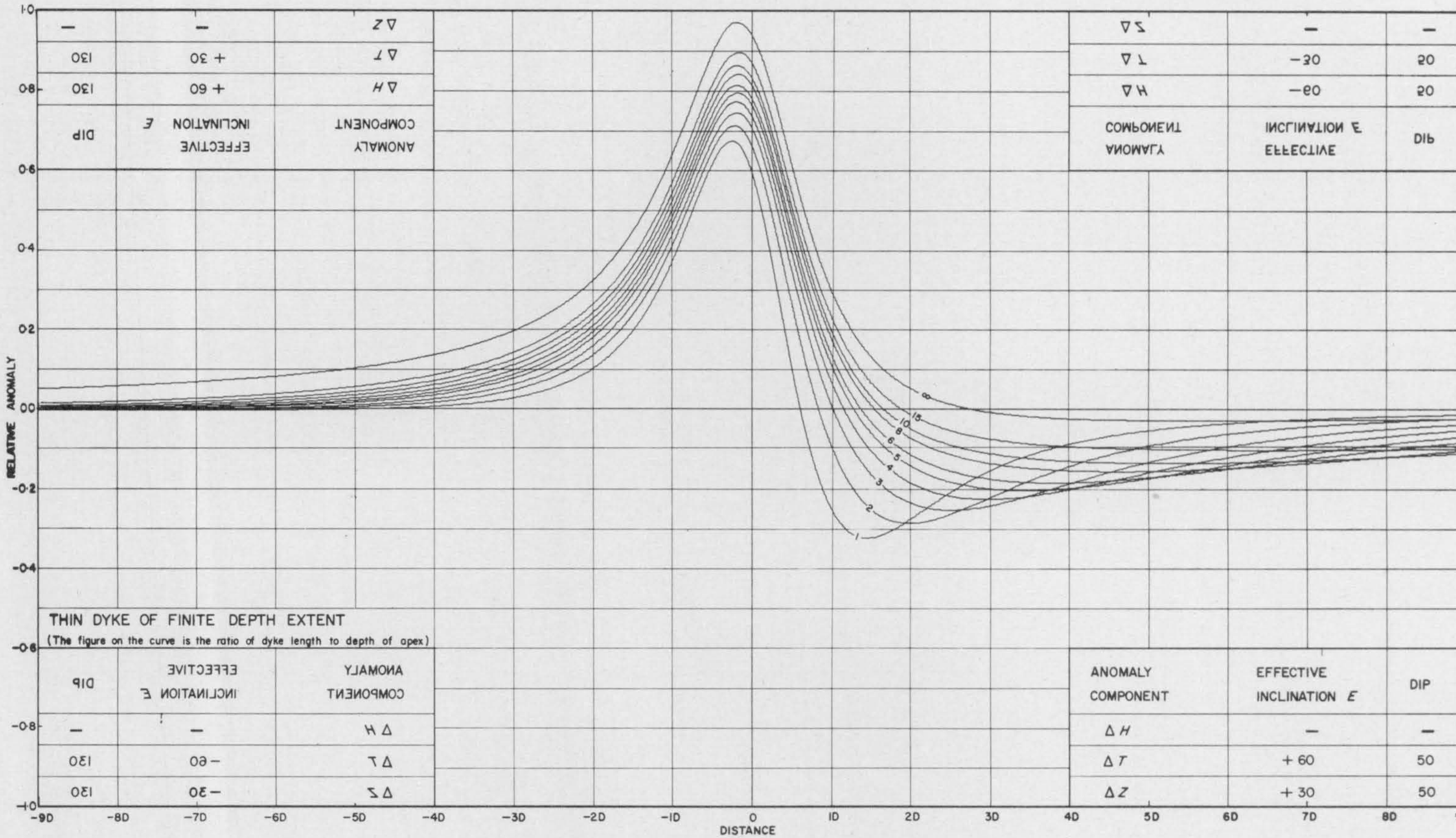
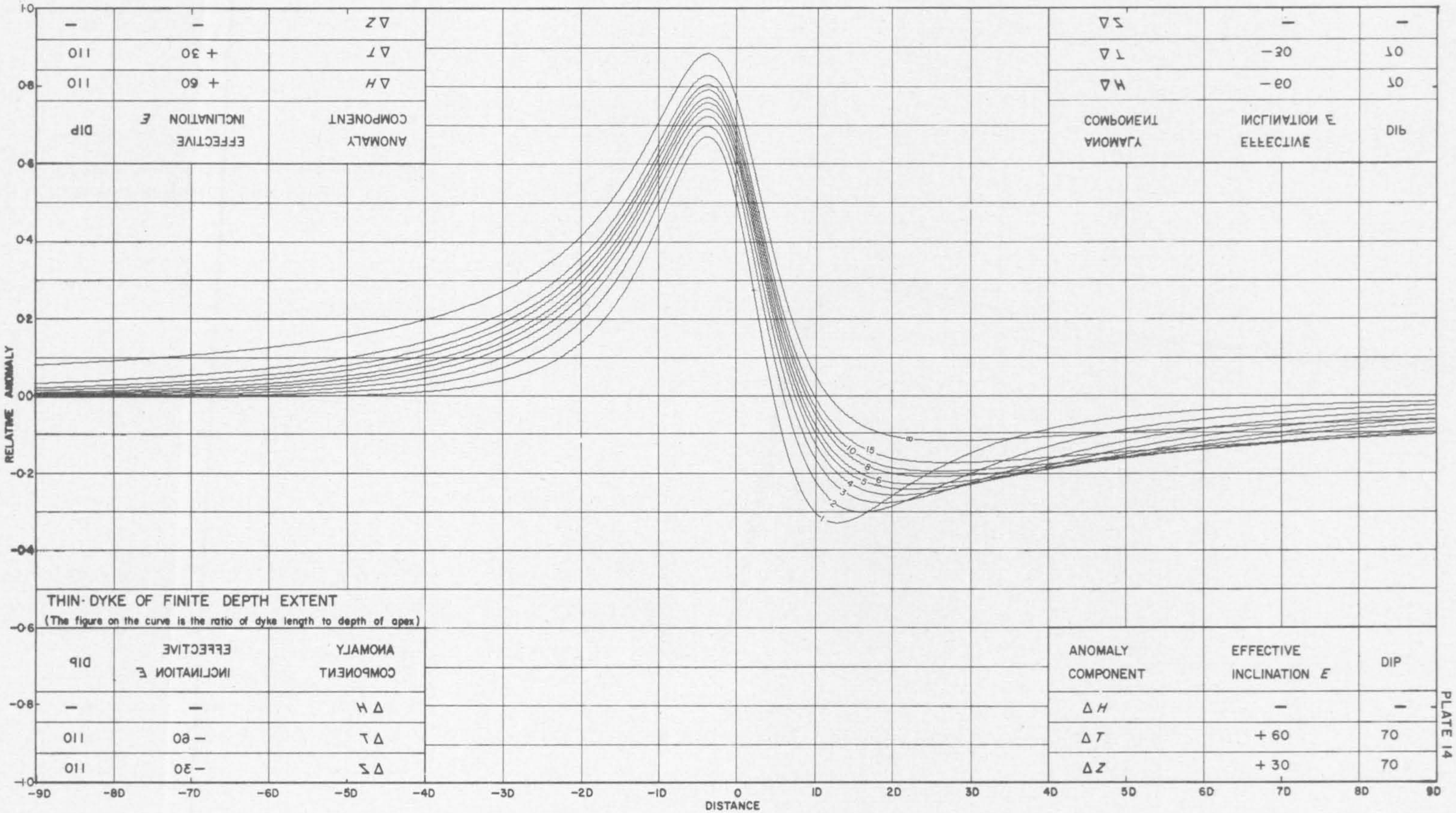

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
1·0
0·8
0·6
0·4
0·2
0·0
-0·2
-0·4
-0·6
-0·8
-1·0
-9D
-8D
-7D
-6D
-5D
-4D
-3D
-2D
-1D
0
1D
2D
3D
4D
5D
6D
7D
8D
9D
1
2
3
4
5
6
8
10
15
∞
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH
—
—
ΔT
+ 60
50
ΔZ
+ 30
50
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH
+ 60
130
ΔT
+ 30
130
ΔZ
—
—

PLATE 13


THIN-DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
Δ H
—
—
Δ T
+ 60
70
Δ Z
+ 30
70
PLATE 14

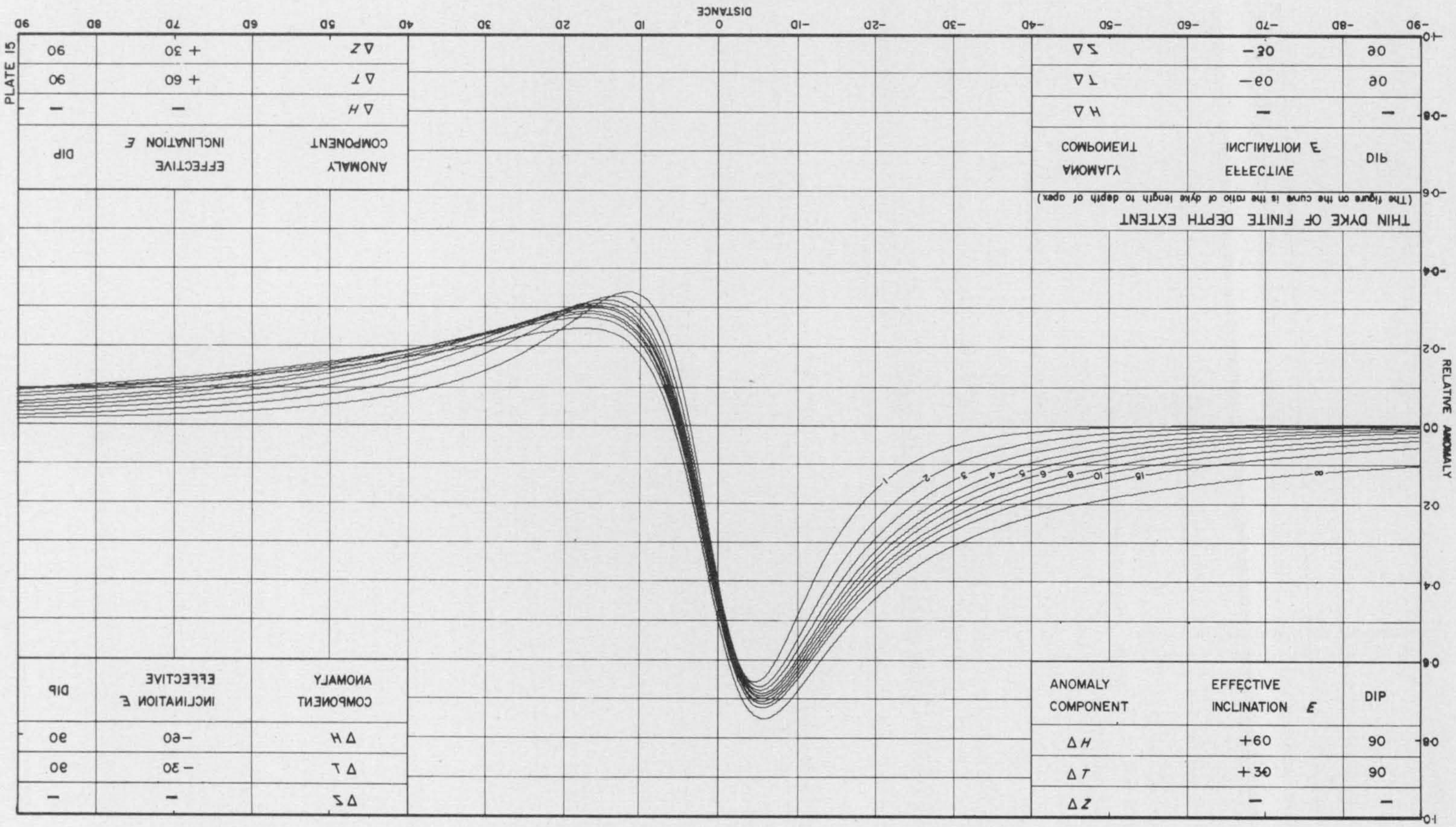


PLATE 15
THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex.)
DISTANCE
RELATIVE ANOMALY
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH +60 90
ΔT +30 90
ΔZ — —

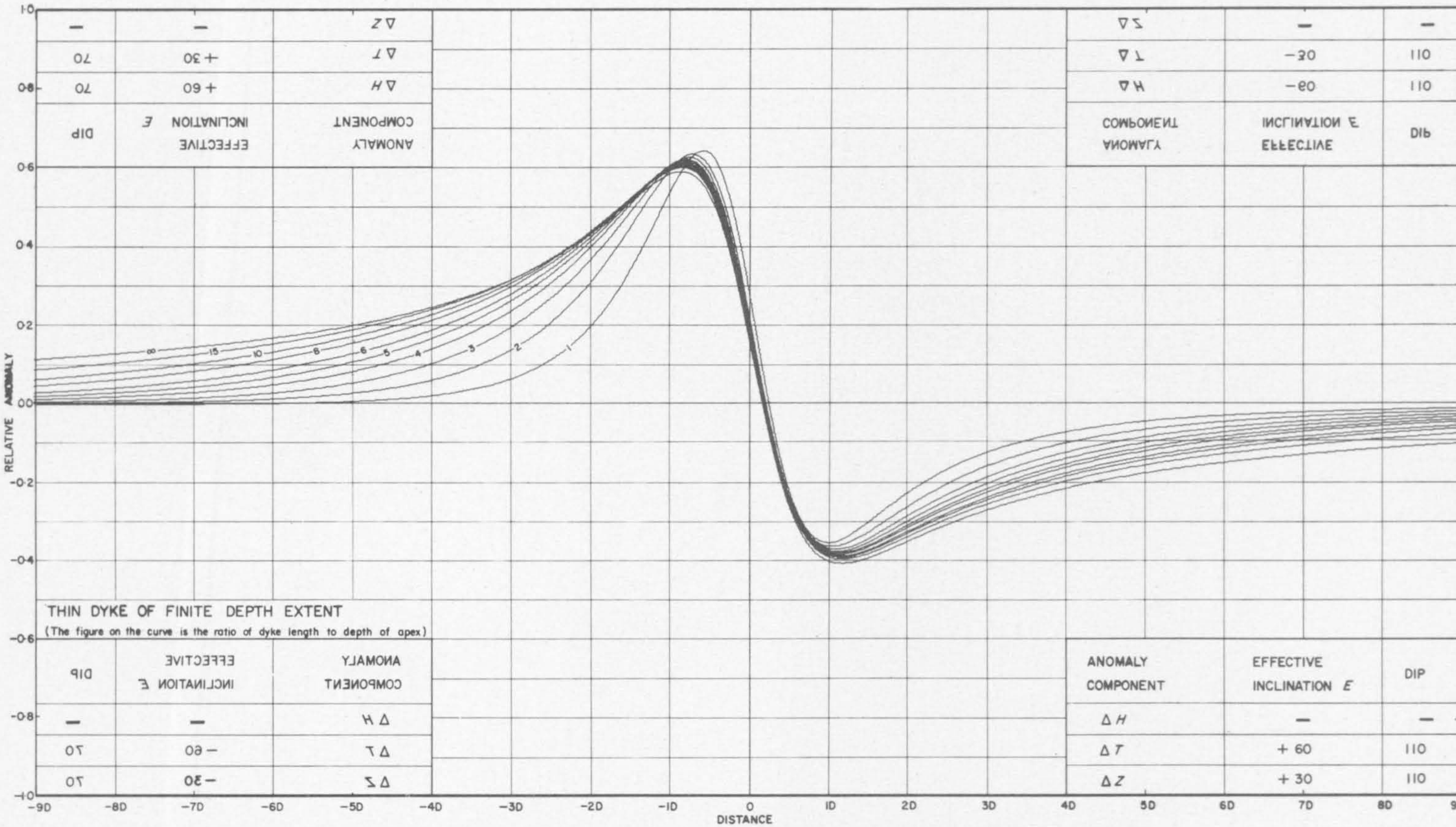

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT + 60 110
ΔZ + 30 110
RELATIVE ANOMALY
DISTANCE

PLATE 16

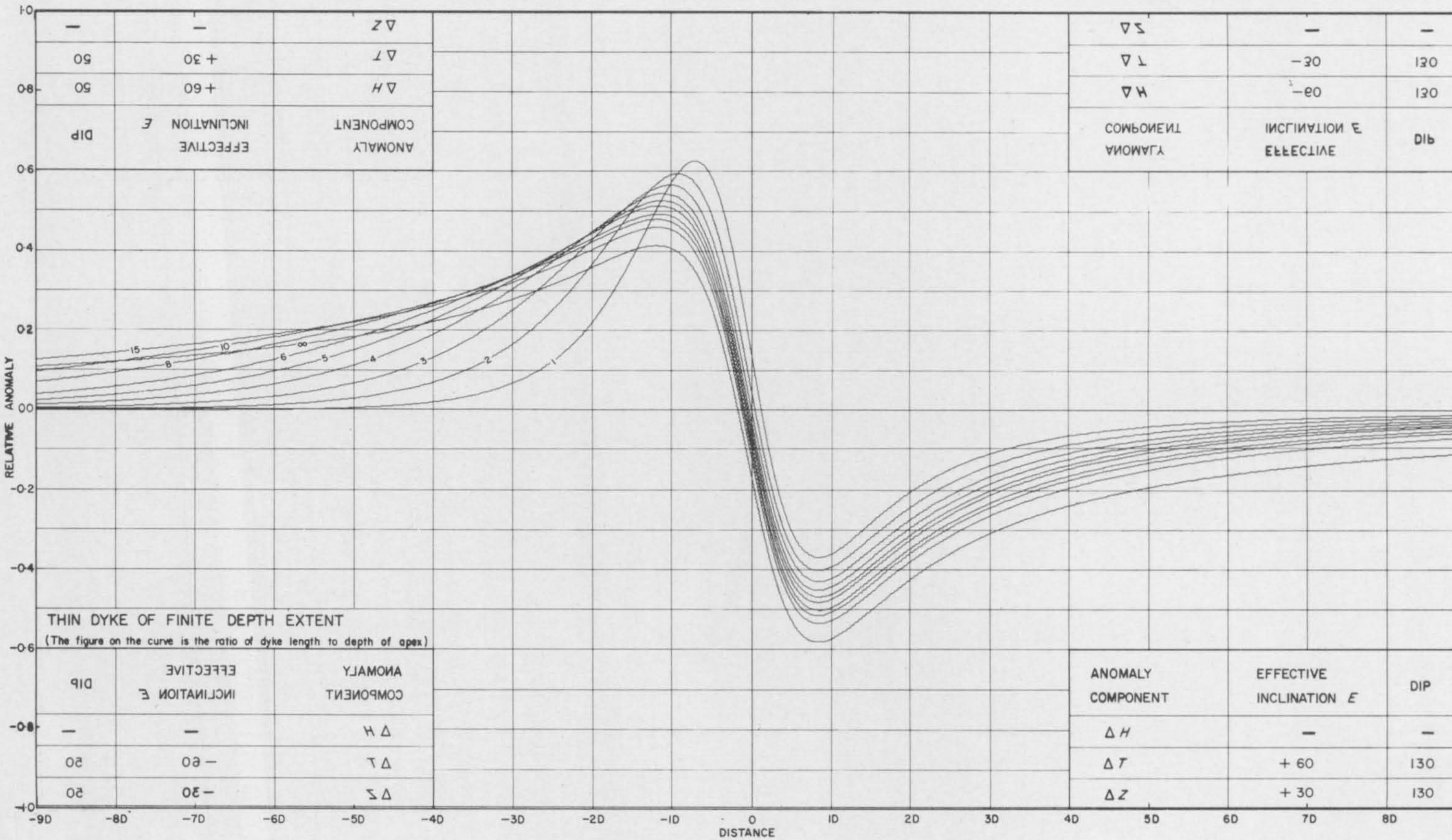

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
1·0
0·8
0·6
0·4
0·2
0·0
-0·2
-0·4
-0·6
-0·8
-1·0
-9D
-8D
-7D
-6D
-5D
-4D
-3D
-2D
-1D
0
1D
2D
3D
4D
5D
6D
7D
8D
9D
15
10
∞
8
6
5
4
3
2
1
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH
—
—
ΔT
+ 60
130
ΔZ
+ 30
130
ΔZ
—
—
ΔT
−30
130
ΔH
−60
130

PLATE 17

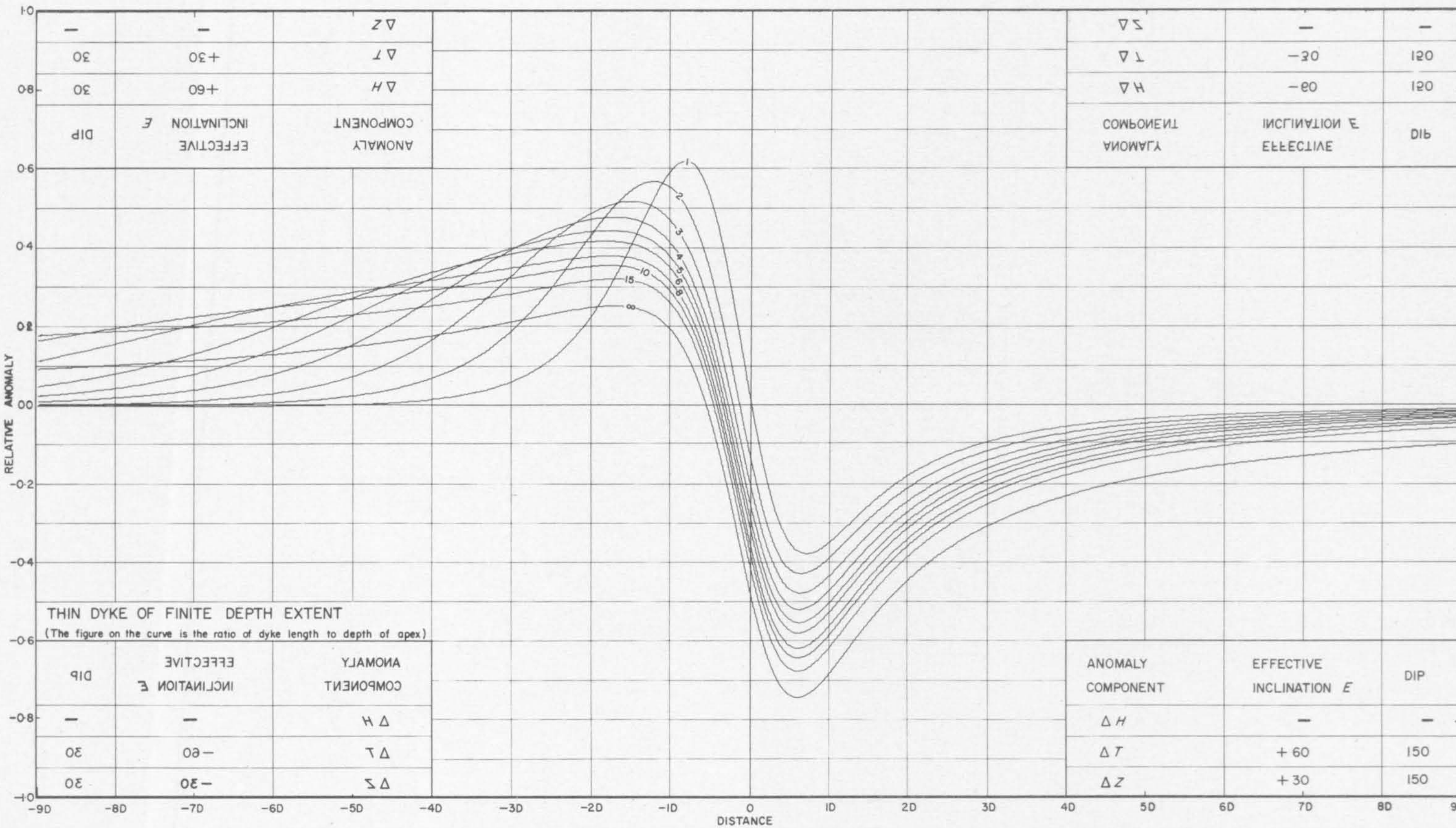

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | — | —
ΔT | +60 | 150
ΔZ | +30 | 150
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | +60 | 30
ΔT | +30 | 30
ΔZ | — | —
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | −60 | 150
ΔT | −30 | 150
ΔZ | — | —
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | — | —
ΔT | −60 | 30
ΔZ | −30 | 30
RELATIVE ANOMALY
DISTANCE
1
2
3
4
5
6
8
10
15
∞

PLATE 18

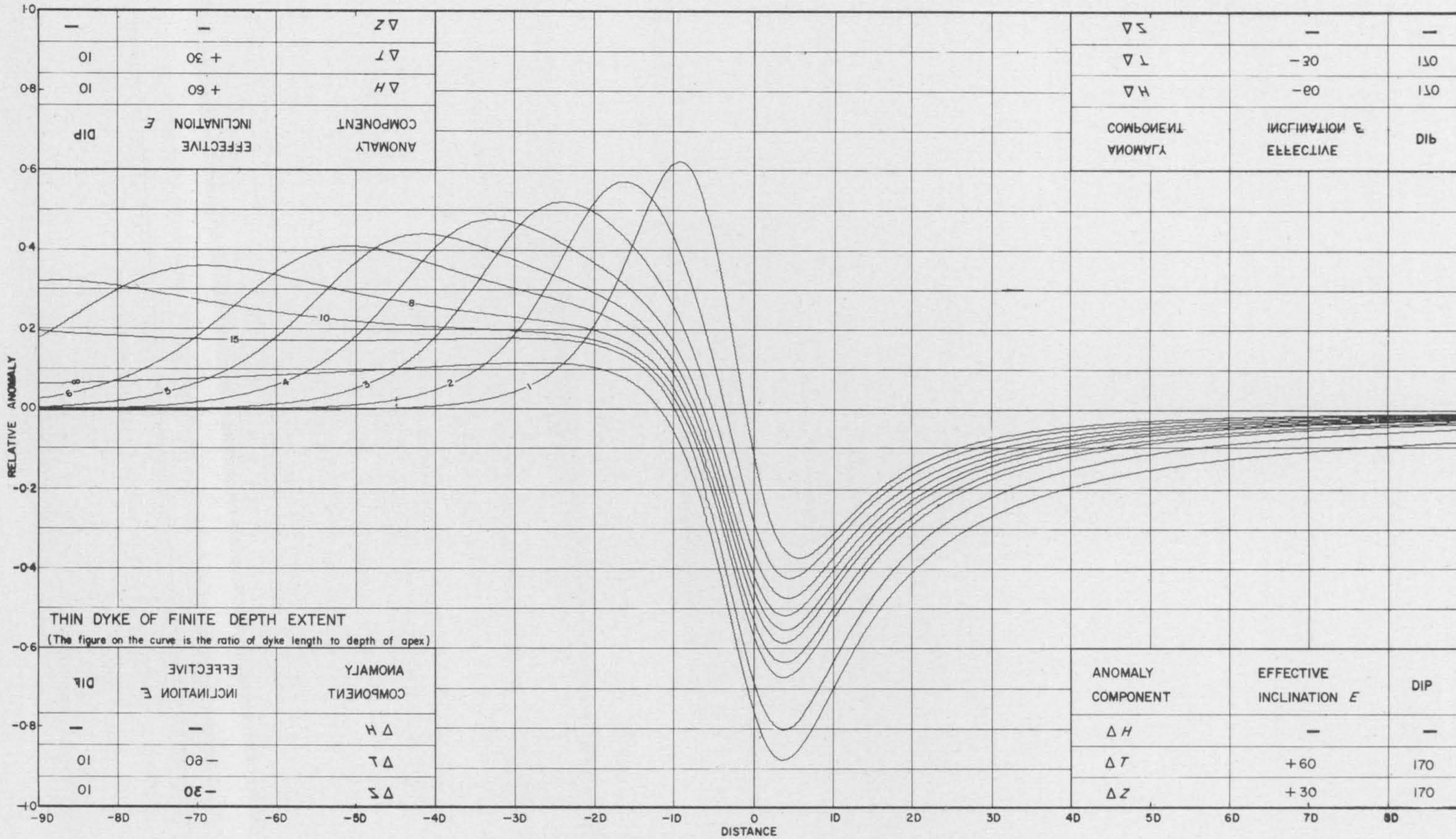
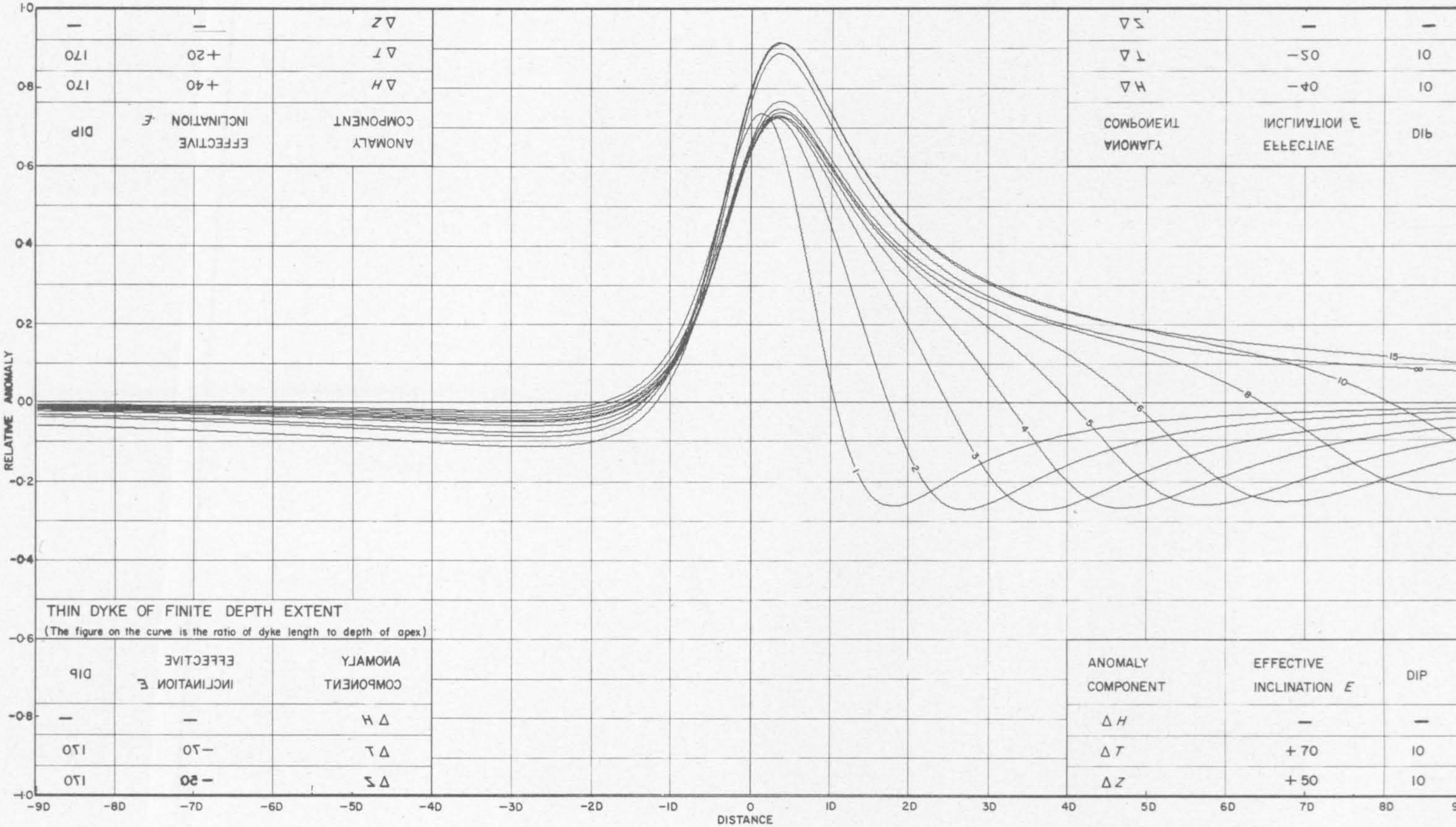

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
Δ H
—
—
Δ T
+60
170
Δ Z
+30
170

PLATE 19


THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT +70 10
ΔZ +50 10
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔZ — —
ΔT −20 10
ΔH −40 10

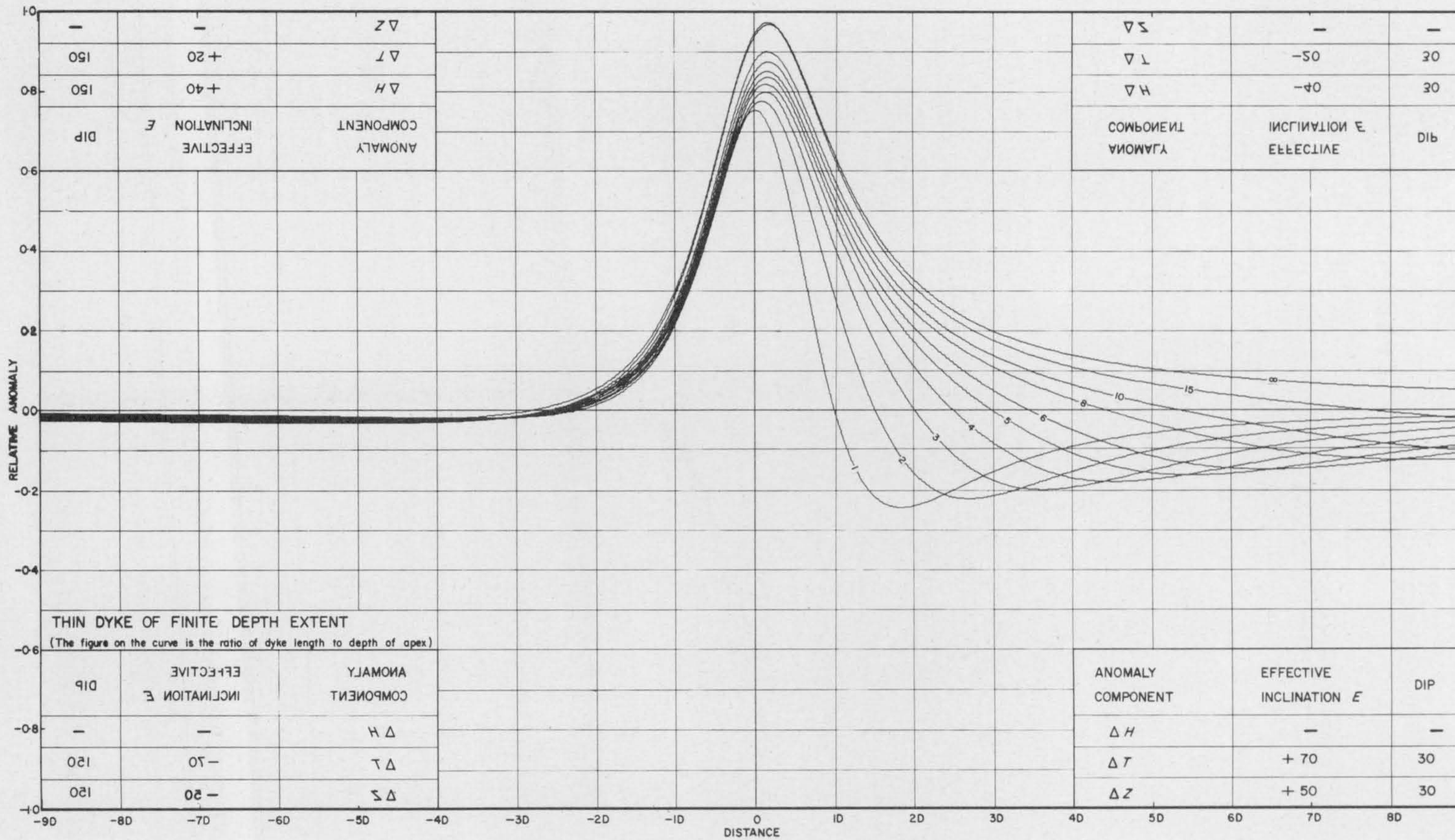

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
1·0
0·8
0·6
0·4
0·2
0·0
-0·2
-0·4
-0·6
-0·8
-1·0
-9D -8D -7D -6D -5D -4D -3D -2D -1D 0 1D 2D 3D 4D 5D 6D 7D 8D 9D
1 2 3 4 5 6 8 10 15 ∞
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT +70 30
ΔZ +50 30
ΔH +40 150
ΔT +20 150
ΔZ — —
ΔH -40 30
ΔT -20 30
ΔZ — —
ΔH — —
ΔT -70 150
ΔZ -50 150

PLATE 21

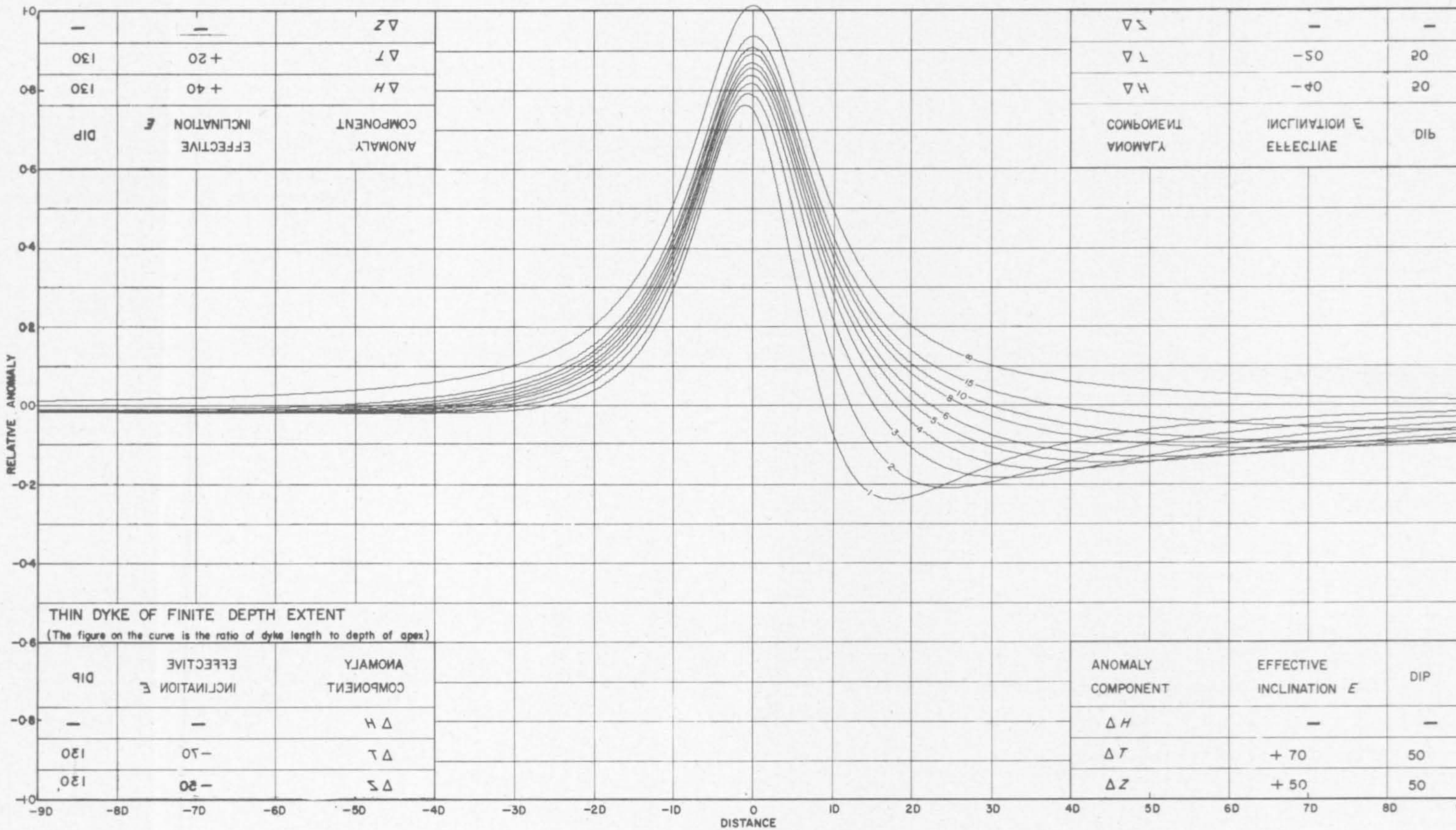
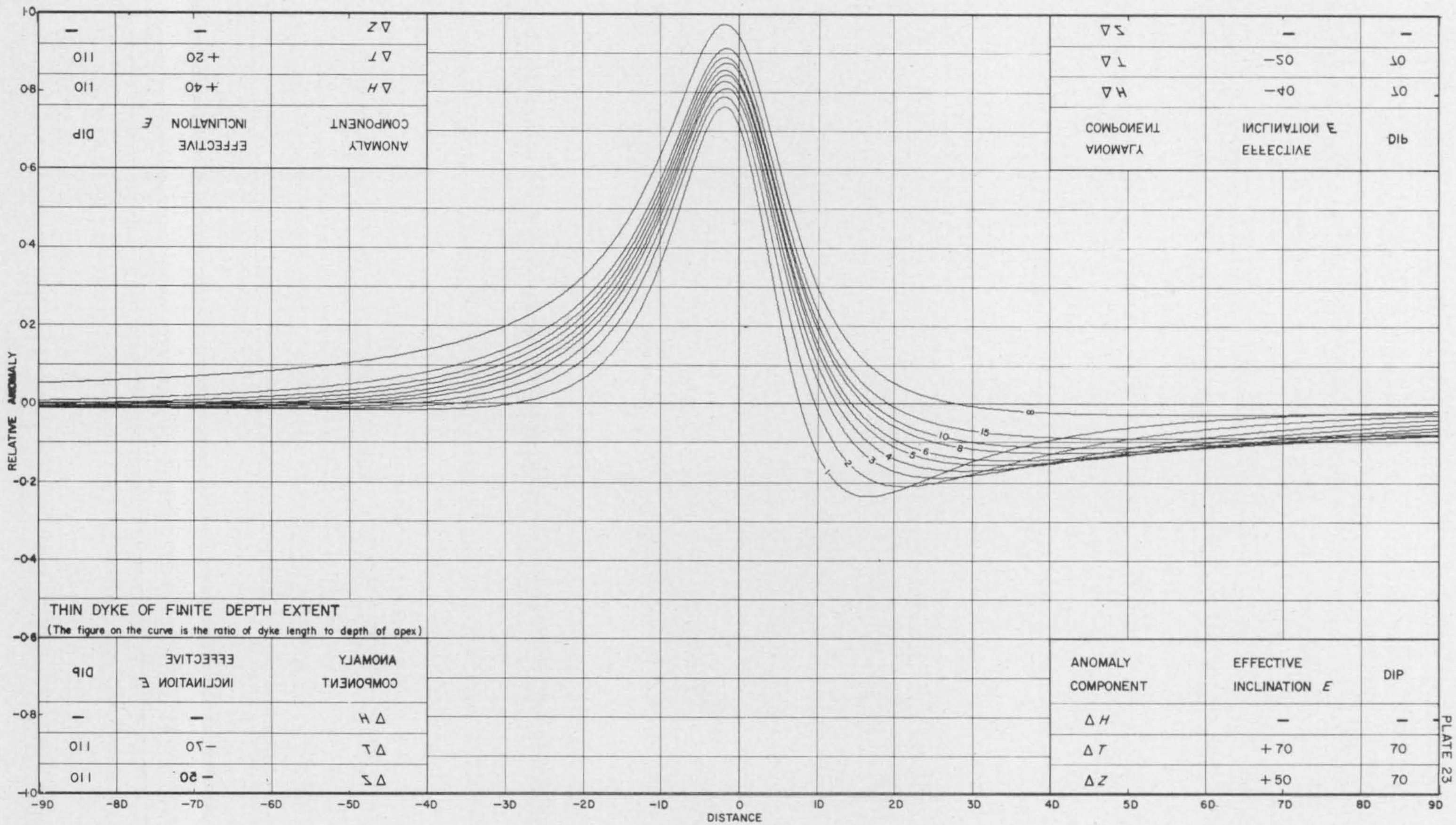
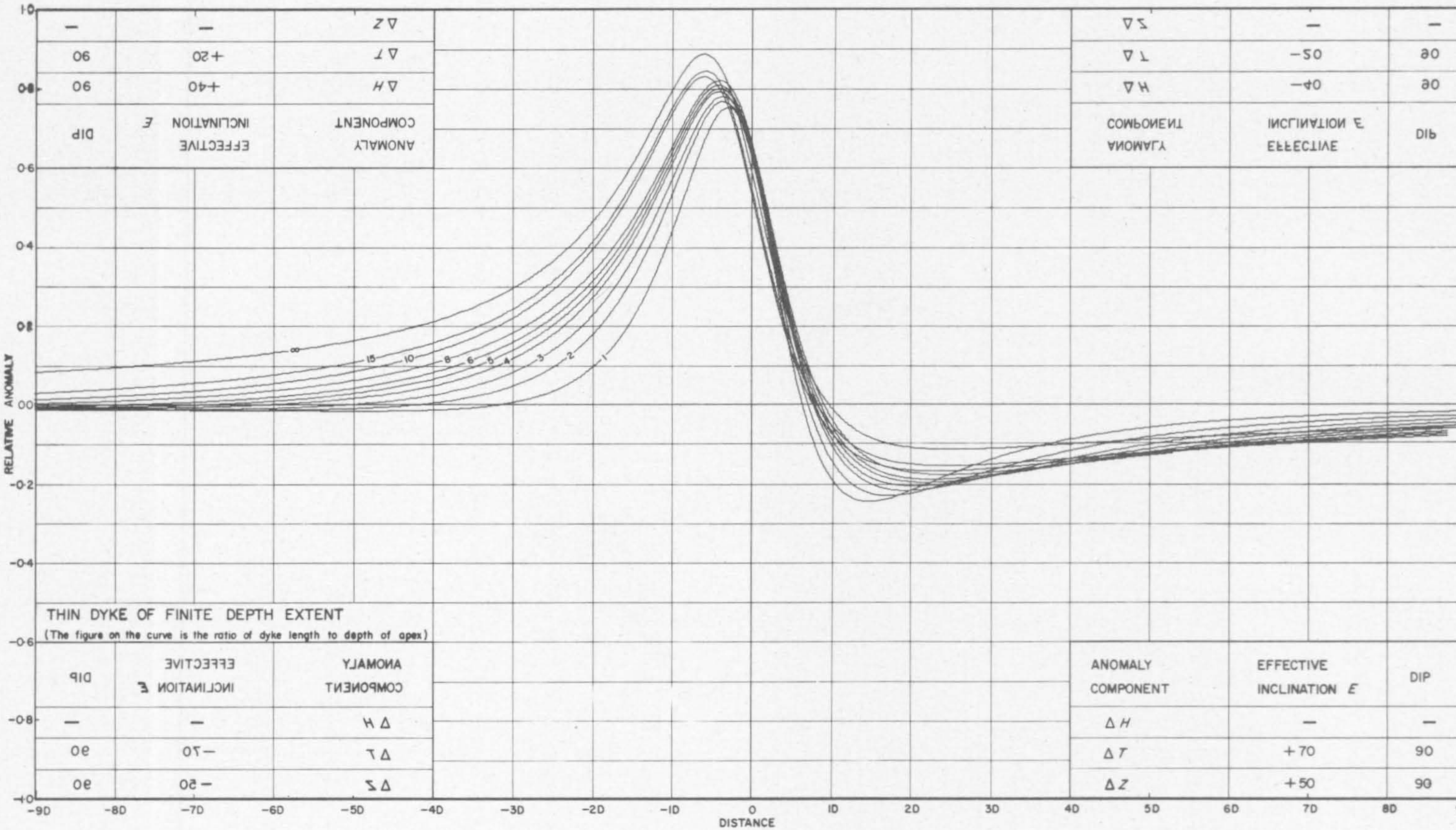

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT + 70 50
ΔZ + 50 50

PLATE 22


THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT +70 70
ΔZ +50 70
PLATE 23



THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
1·0
0·8
0·6
0·4
0·2
0·0
−0·2
−0·4
−0·6
−0·8
−1·0
−90
−80
−70
−60
−50
−40
−30
−20
−10
0
10
20
30
40
50
60
70
80
90
∞
15
10
8
6
5
4
3
2
1
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
Δ H
—
—
Δ T
+70
90
Δ Z
+50
90

PLATE 24

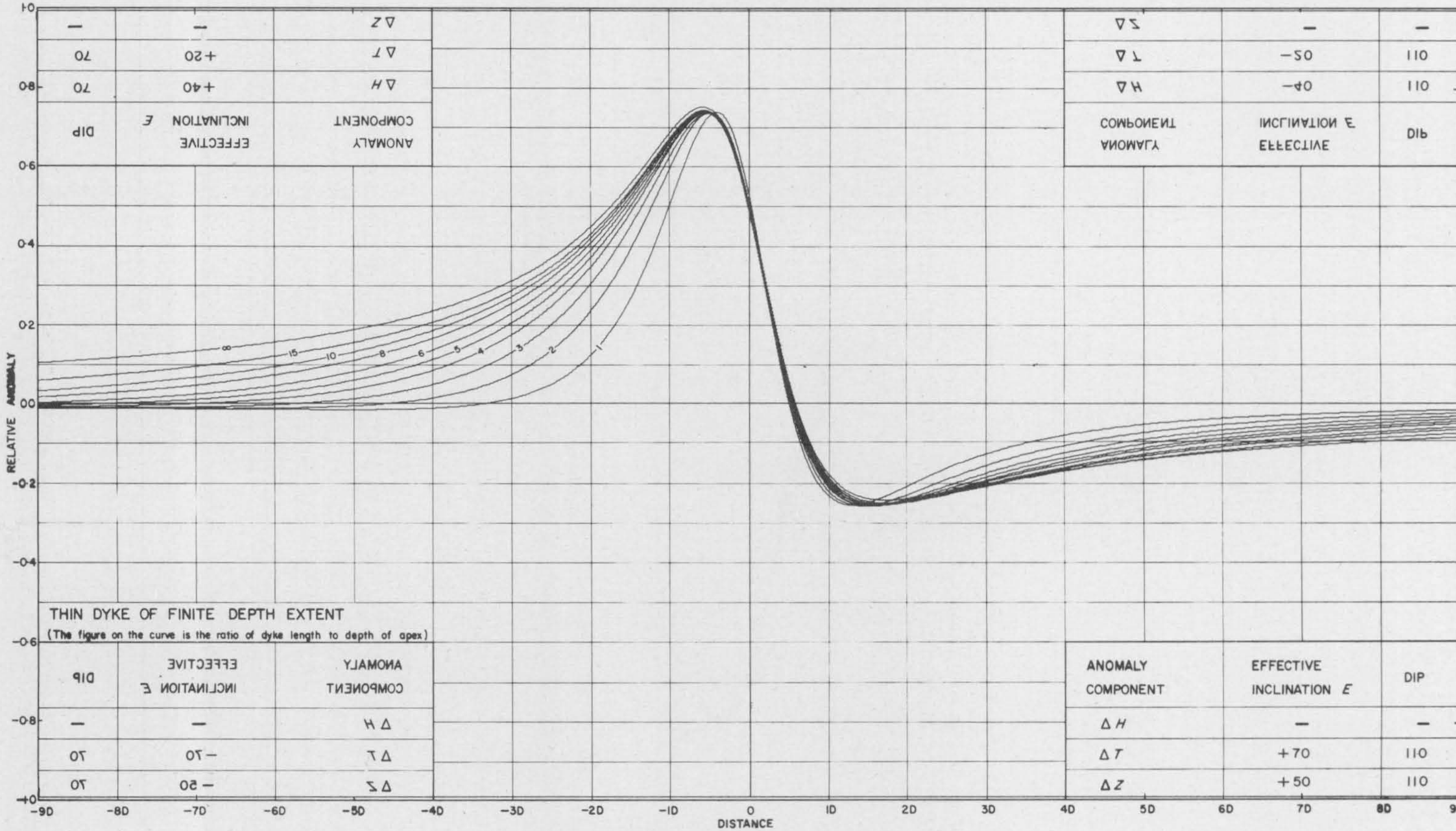

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | — | —
ΔT | +70 | 110
ΔZ | +50 | 110
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | — | —
ΔT | −70 | 70
ΔZ | −50 | 70
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔZ | — | —
ΔT | +20 | 70
ΔH | +40 | 70
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔZ | — | —
ΔT | −20 | 110
ΔH | −40 | 110
RELATIVE ANOMALY
DISTANCE
∞ 15 10 8 6 5 4 3 2 1

PLATE 25

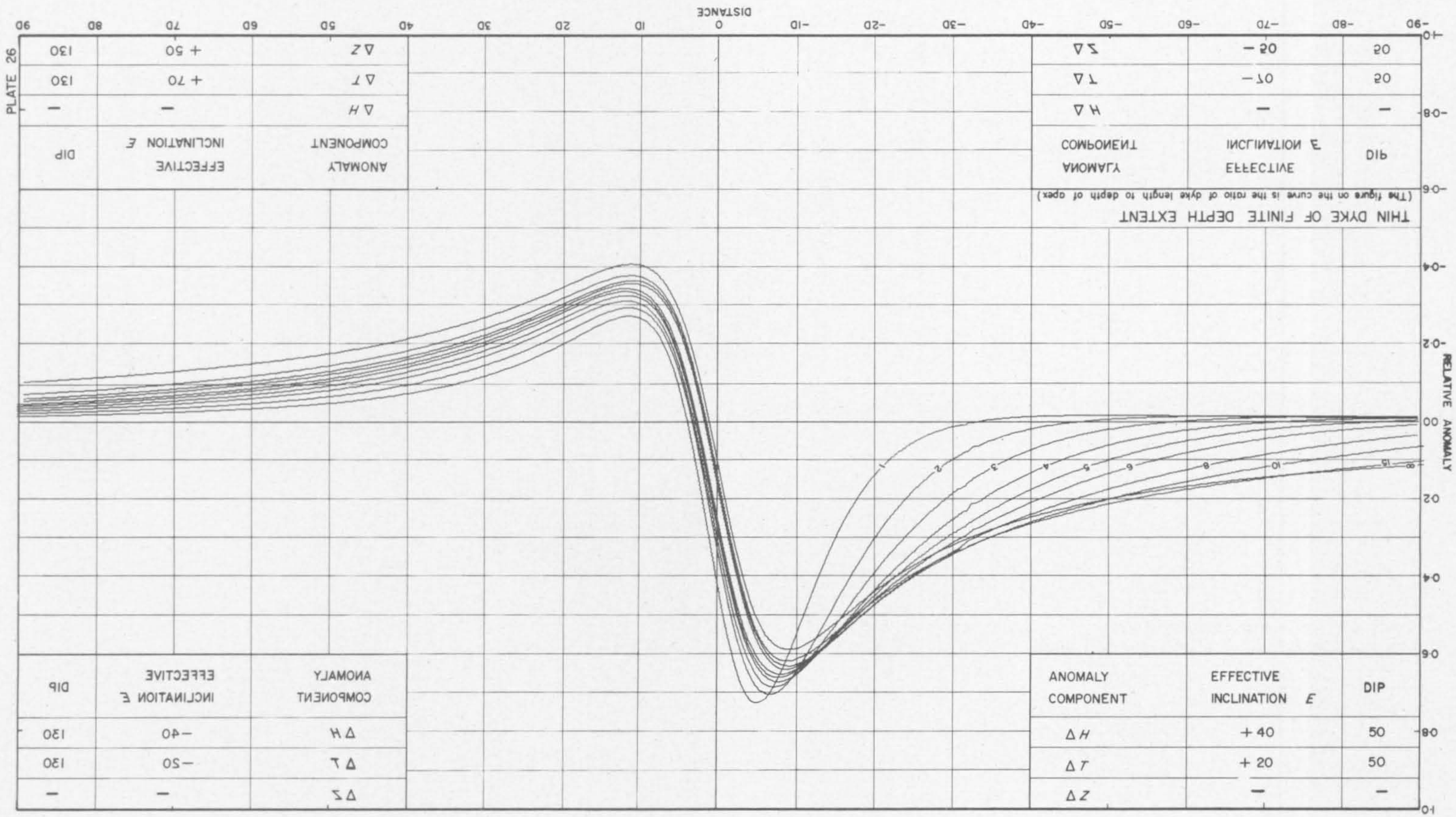


PLATE 26
THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
DISTANCE
RELATIVE ANOMALY
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH
ΔT
ΔZ
+40
+20
50
-40
-20
130
+70
+50
-70
-50

41

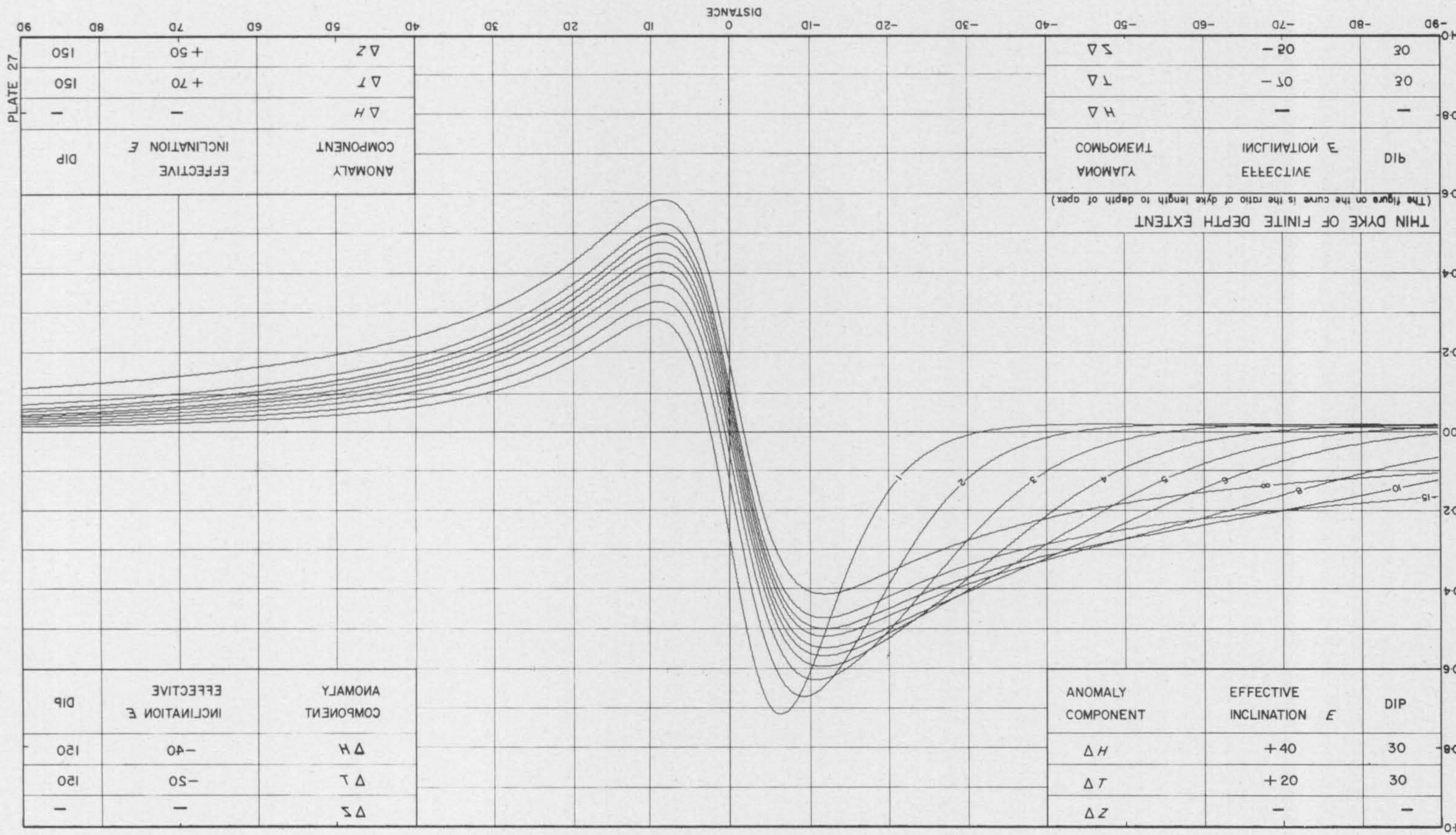


PLATE 27
THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex.)
DISTANCE
RELATIVE ANOMALY
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH +40 30
ΔT +20 30
ΔZ — —
ΔH — —
ΔT −70 30
ΔZ −50 30
ΔH −40 150
ΔT −20 150
ΔZ — —
ΔH — —
ΔT +70 150
ΔZ +50 150

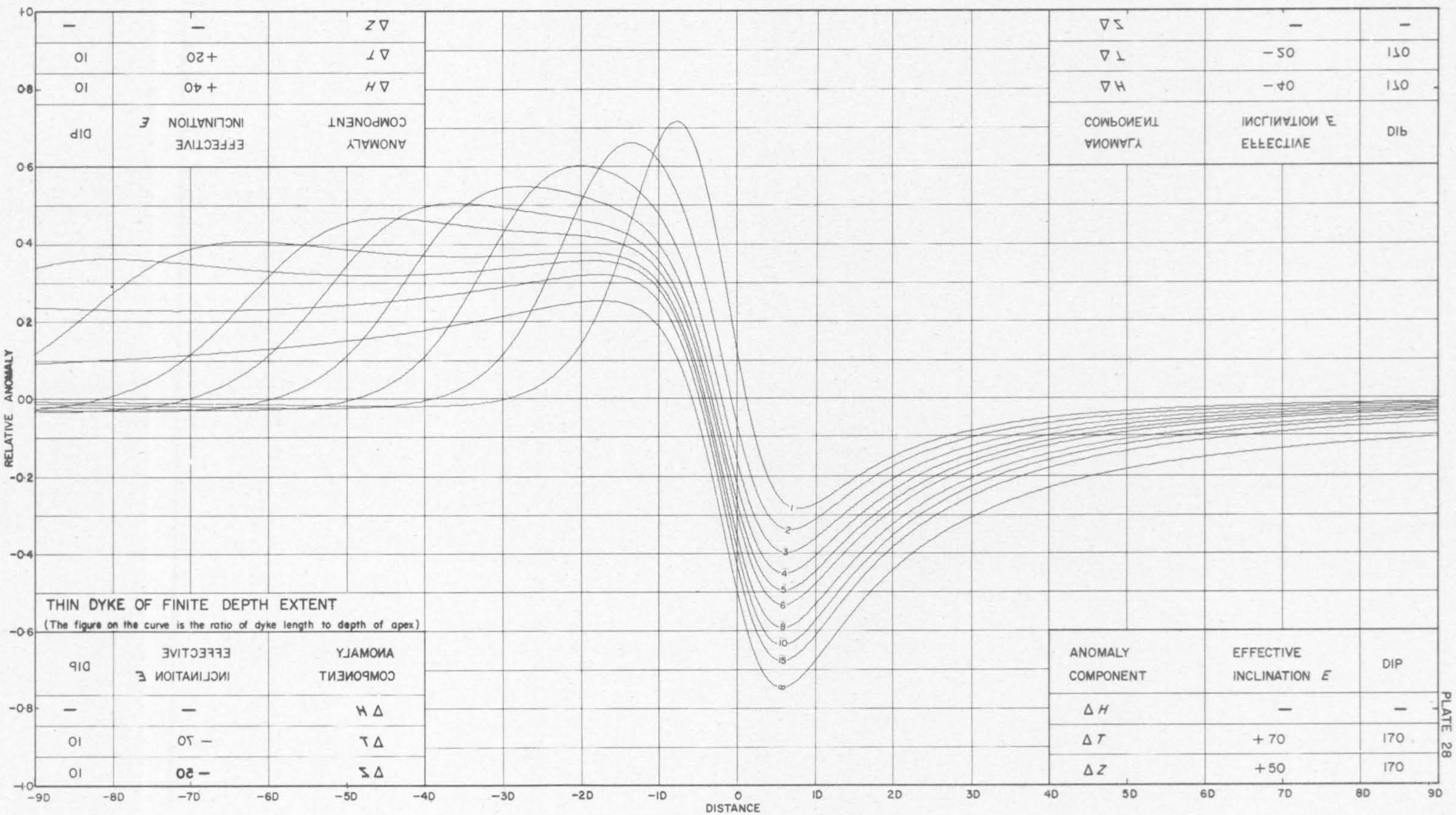
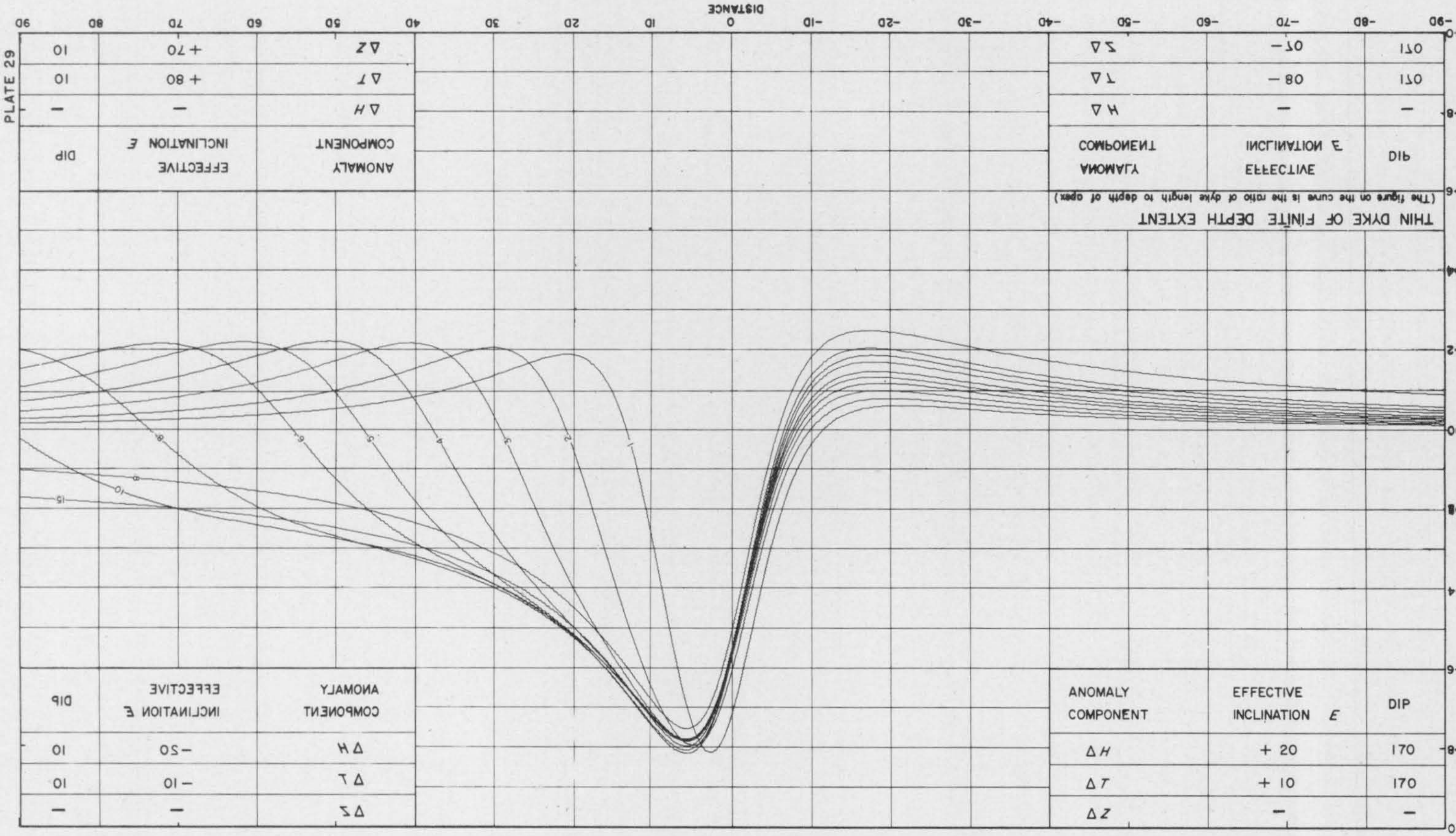

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT +70 170
ΔZ +50 170
RELATIVE ANOMALY
DISTANCE
PLATE 28

PLATE 29


THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
DISTANCE
RELATIVE ANOMALY
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH
ΔT
ΔZ
+ 20
+ 10
170
—
-20
-10
10
+80
+70
-80
-70

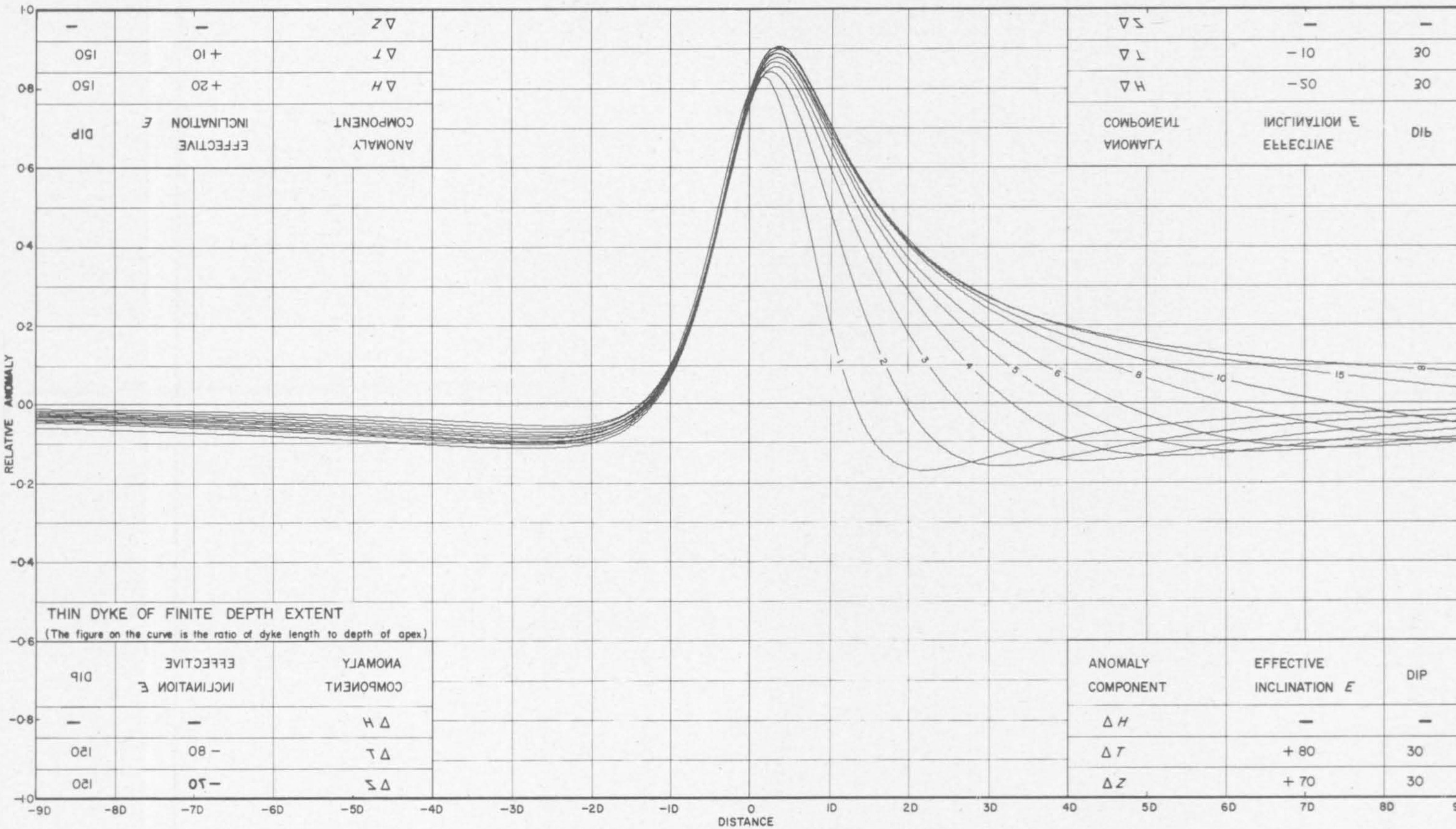

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT + 80 30
ΔZ + 70 30

PLATE 30

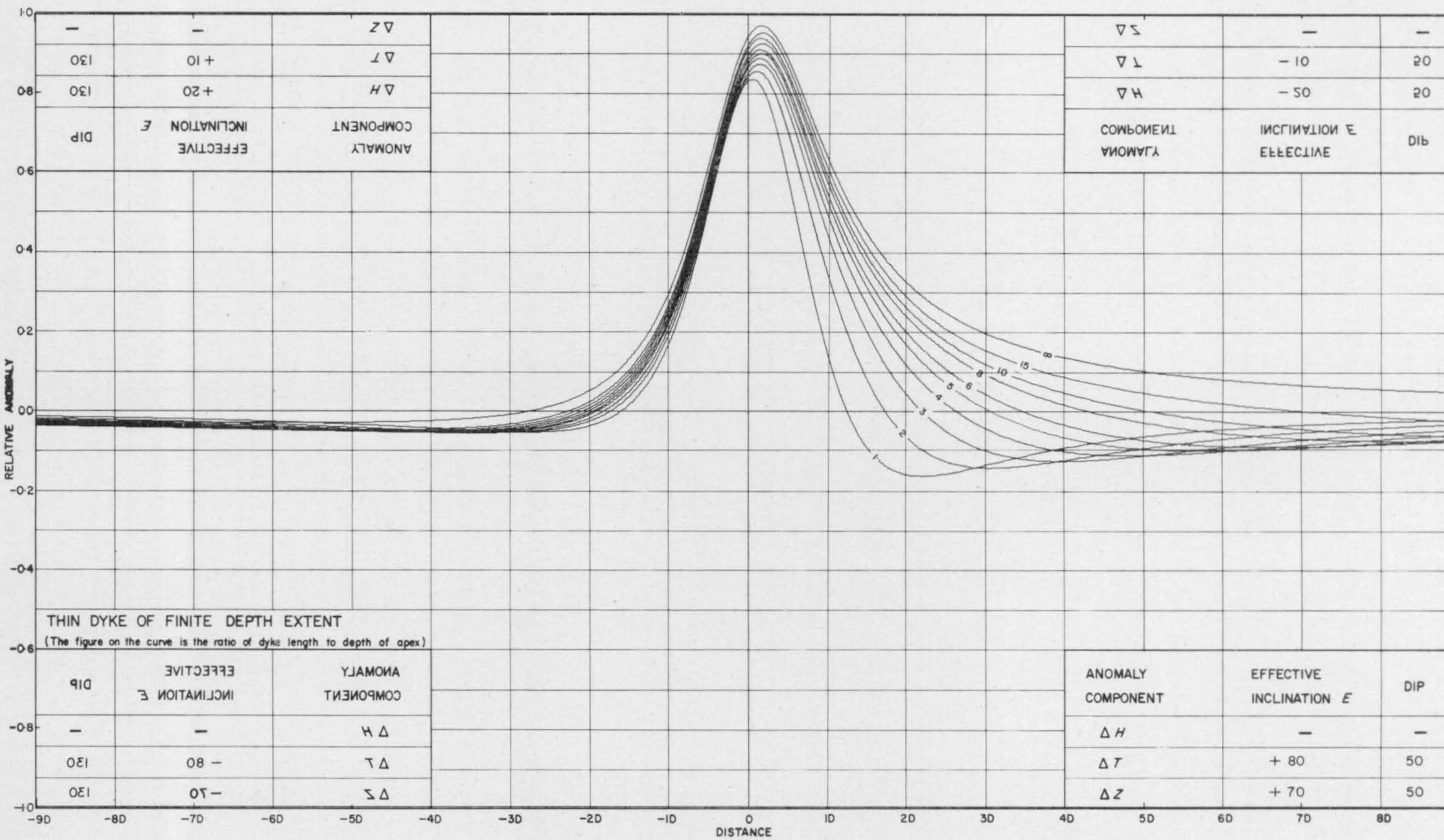

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT + 80 50
ΔZ + 70 50
RELATIVE ANOMALY
DISTANCE

PLATE 31

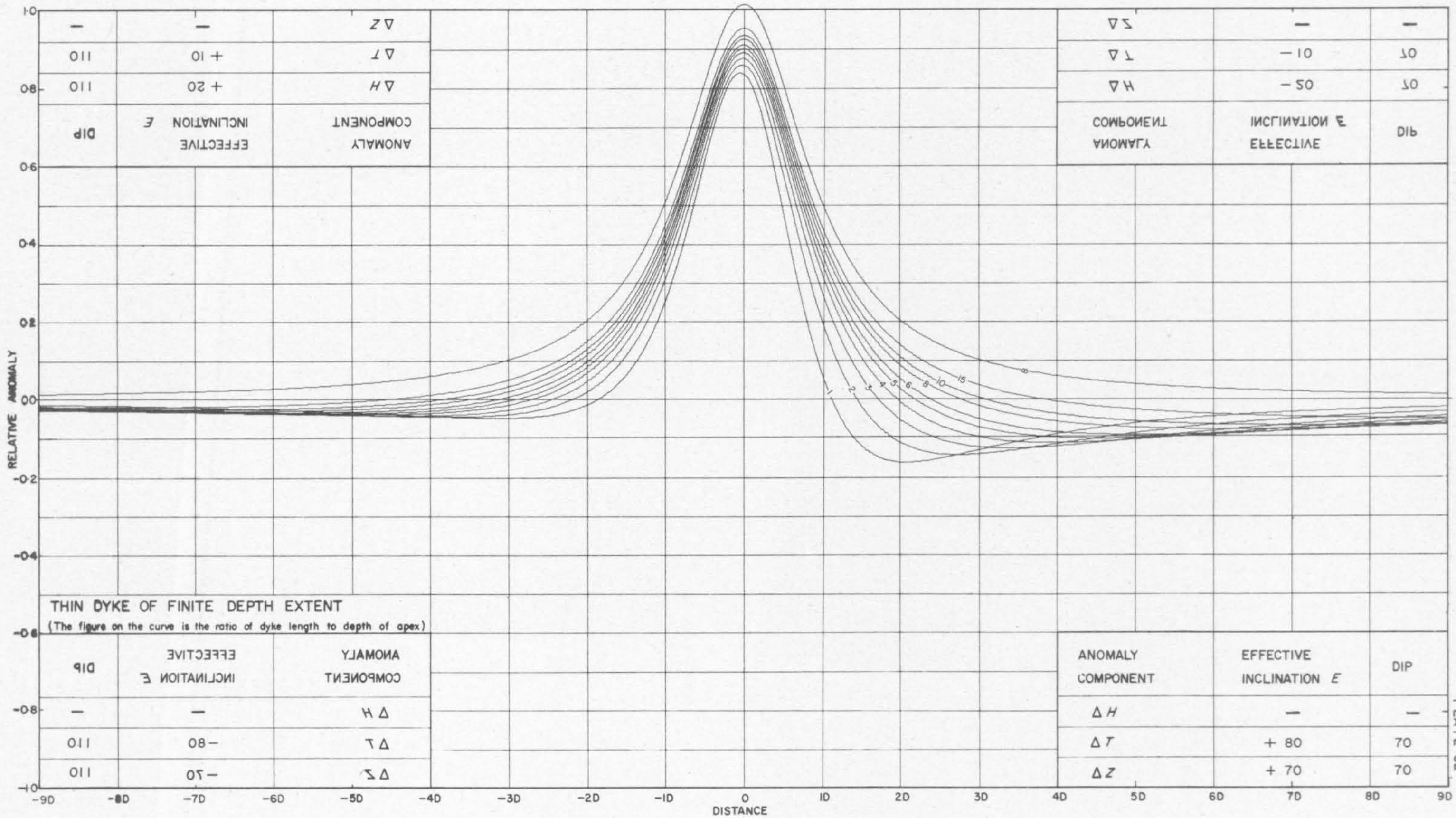

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT + 80 70
ΔZ + 70 70
1 2 3 4 5 6 8 10 15 ∞

PLATE 32

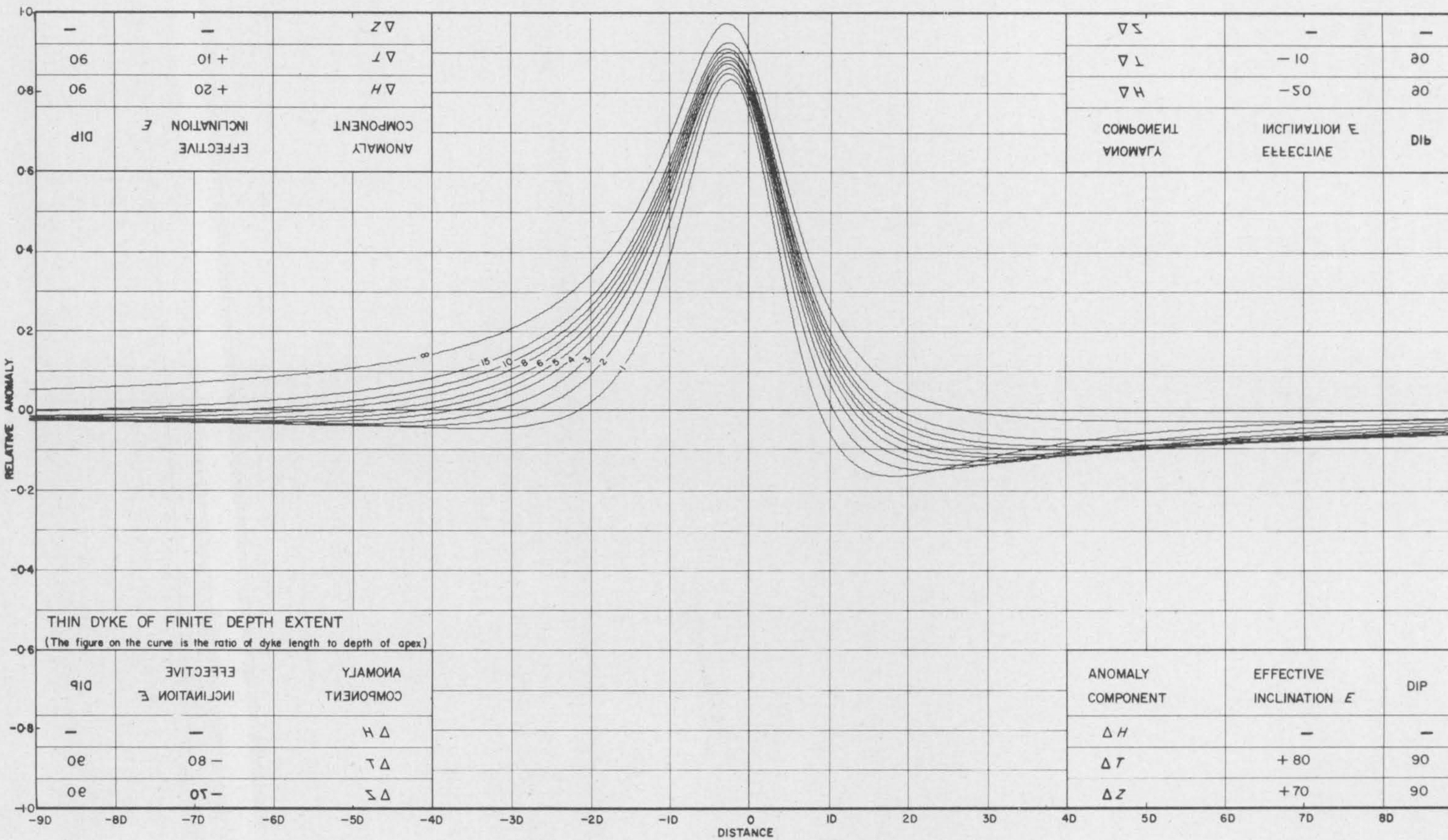

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
1·0
0·8
0·6
0·4
0·2
0·0
-0·2
-0·4
-0·6
-0·8
-1·0
-9D
-8D
-7D
-6D
-5D
-4D
-3D
-2D
-1D
0
1D
2D
3D
4D
5D
6D
7D
8D
9D
∞
15
10
8
6
5
4
3
2
1
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
Δ H
—
—
Δ T
+ 80
90
Δ Z
+ 70
90
Δ H
− 20
90
Δ T
− 10
90
Δ Z
—
—
Δ H
+ 20
90
Δ T
+ 10
90
Δ Z
—
—
Δ H
—
—
Δ T
− 80
90
Δ Z
− 70
90

PLATE 33

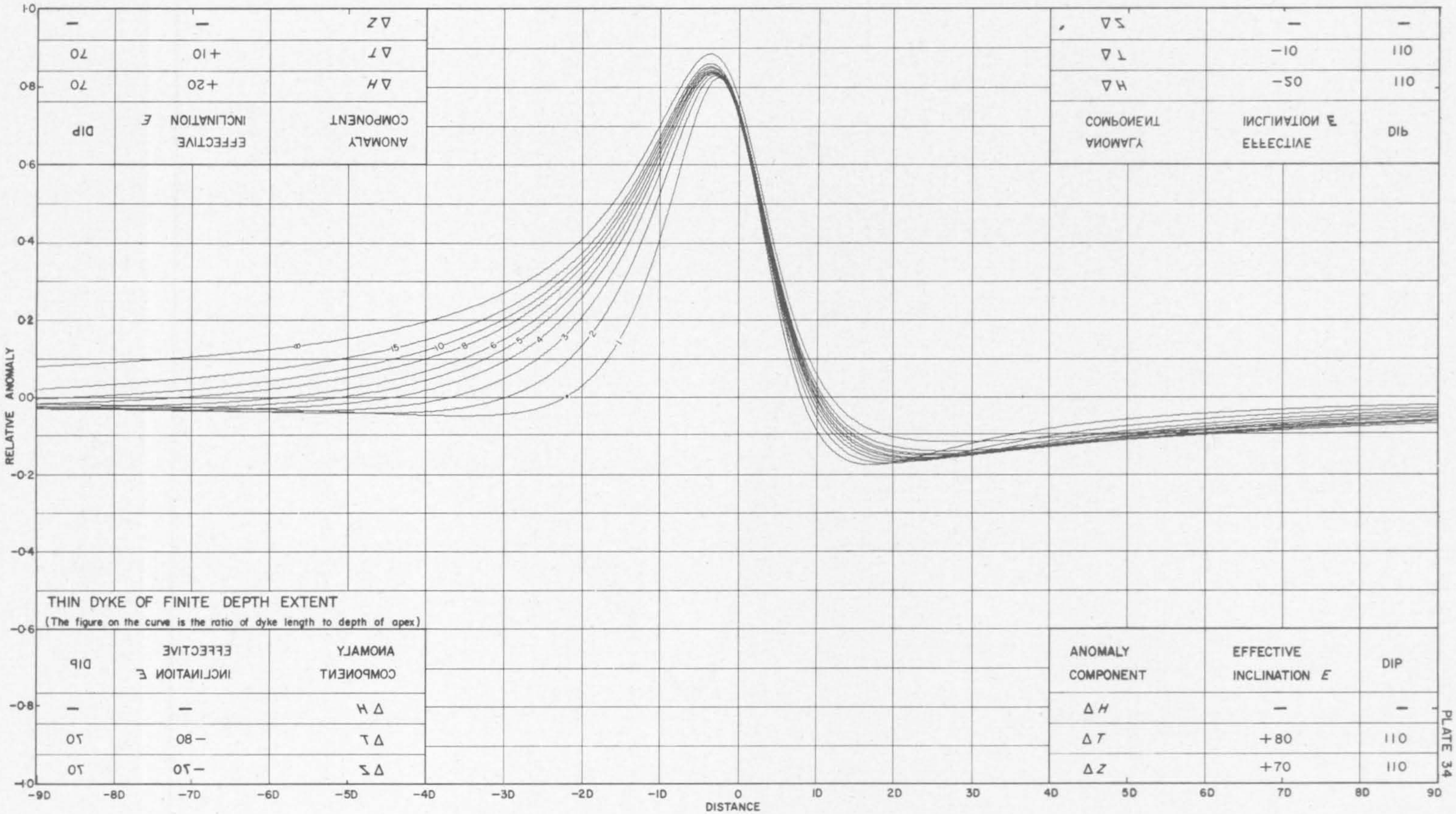
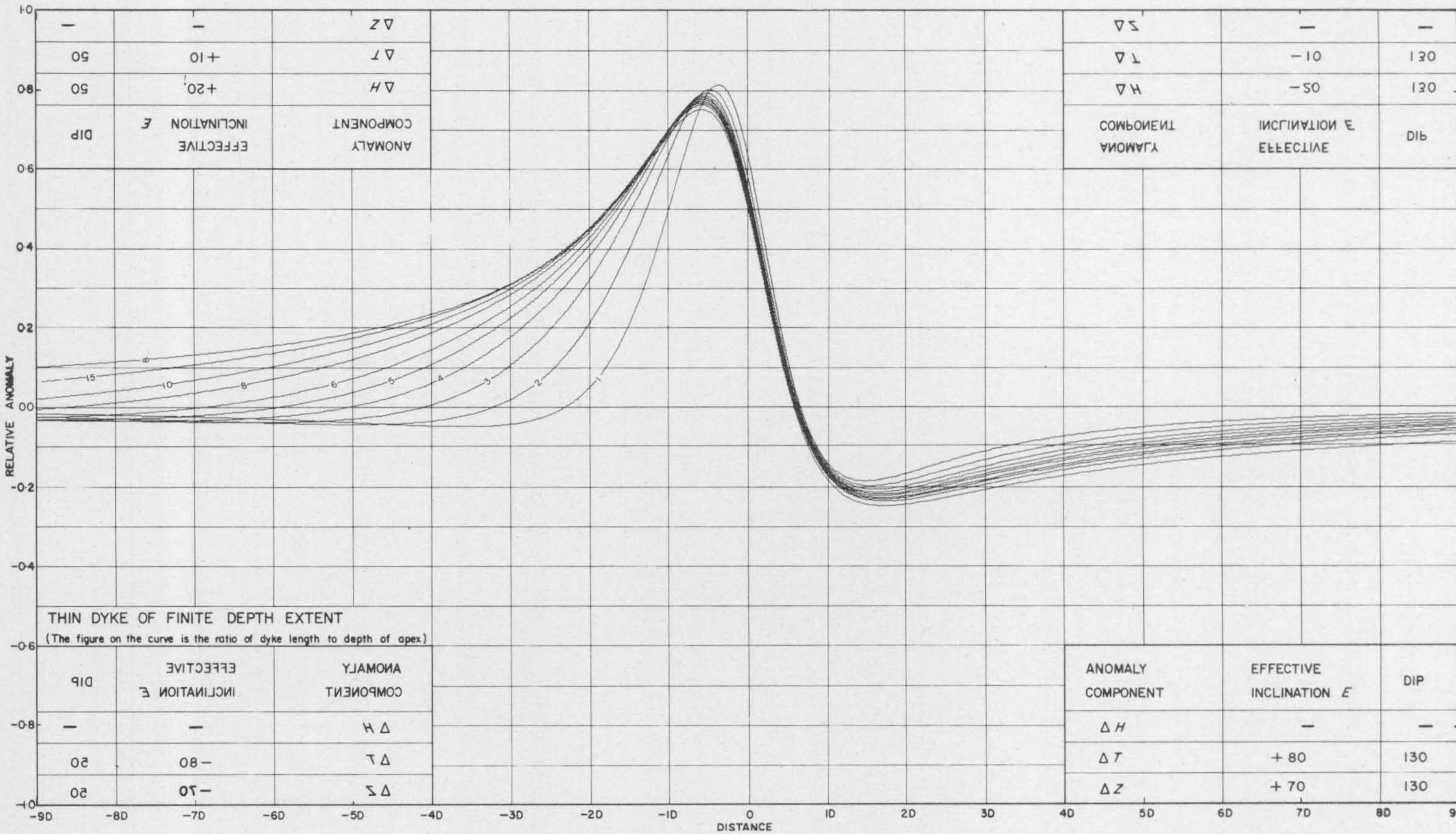
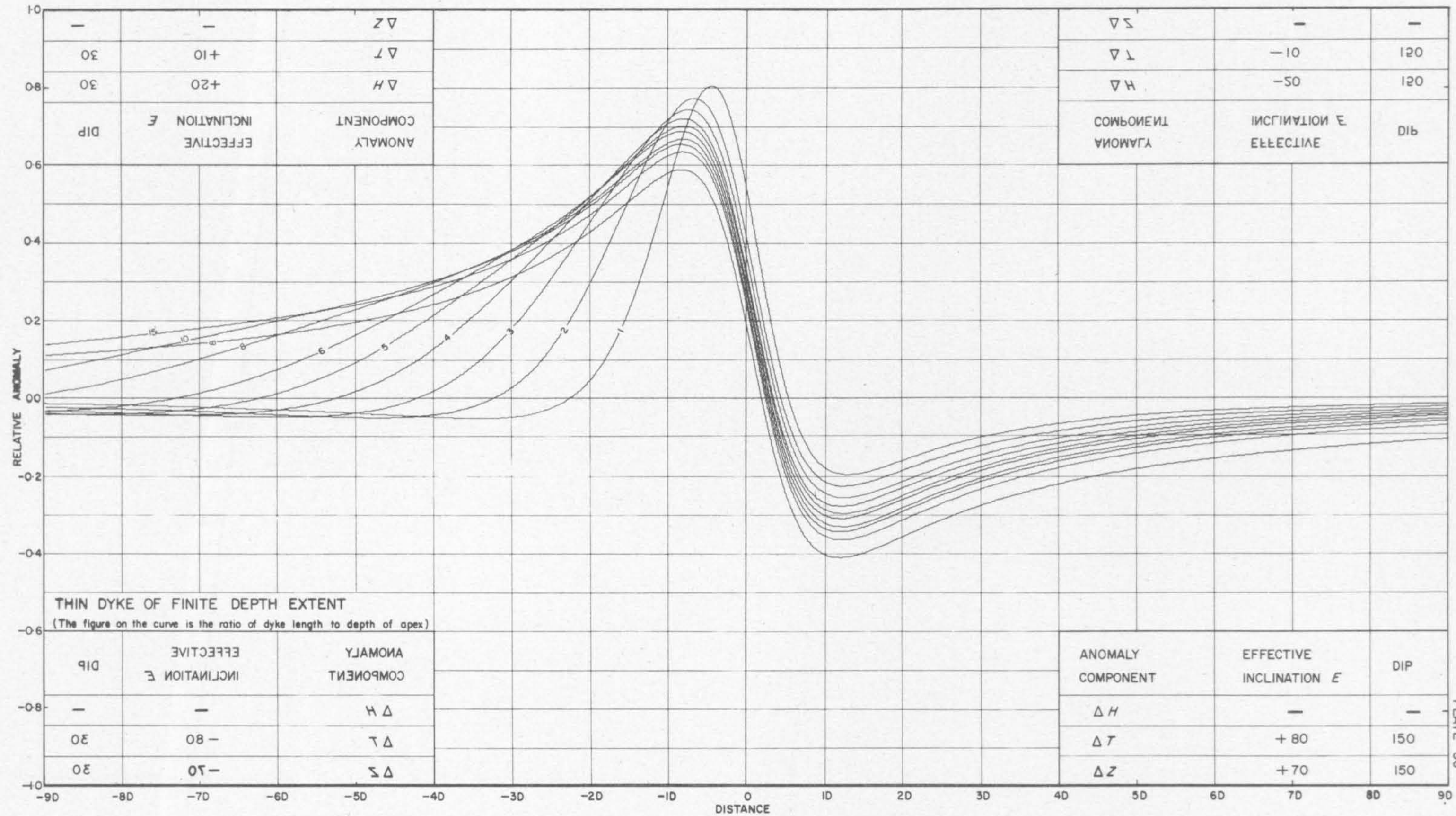

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
1·0
0·8
0·6
0·4
0·2
0·0
-0·2
-0·4
-0·6
-0·8
-1·0
-9D
-8D
-7D
-6D
-5D
-4D
-3D
-2D
-1D
0
1D
2D
3D
4D
5D
6D
7D
8D
9D
∞
15
10
8
6
5
4
3
2
1
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | +20 | 70
ΔT | +10 | 70
ΔZ | — | —
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | -20 | 110
ΔT | -10 | 110
ΔZ | — | —
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | — | —
ΔT | -80 | 70
ΔZ | -70 | 70
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | — | —
ΔT | +80 | 110
ΔZ | +70 | 110

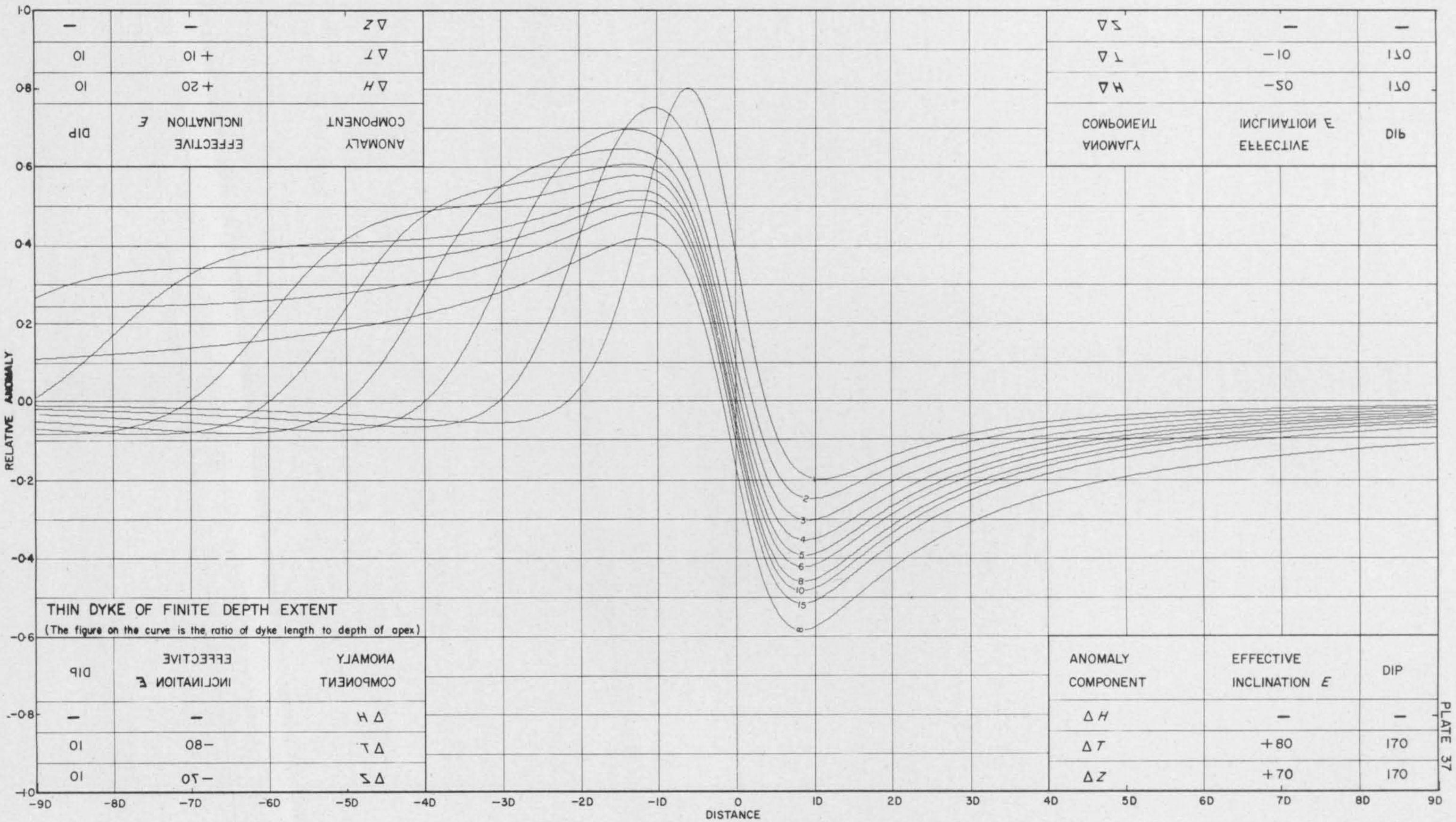
PLATE 34

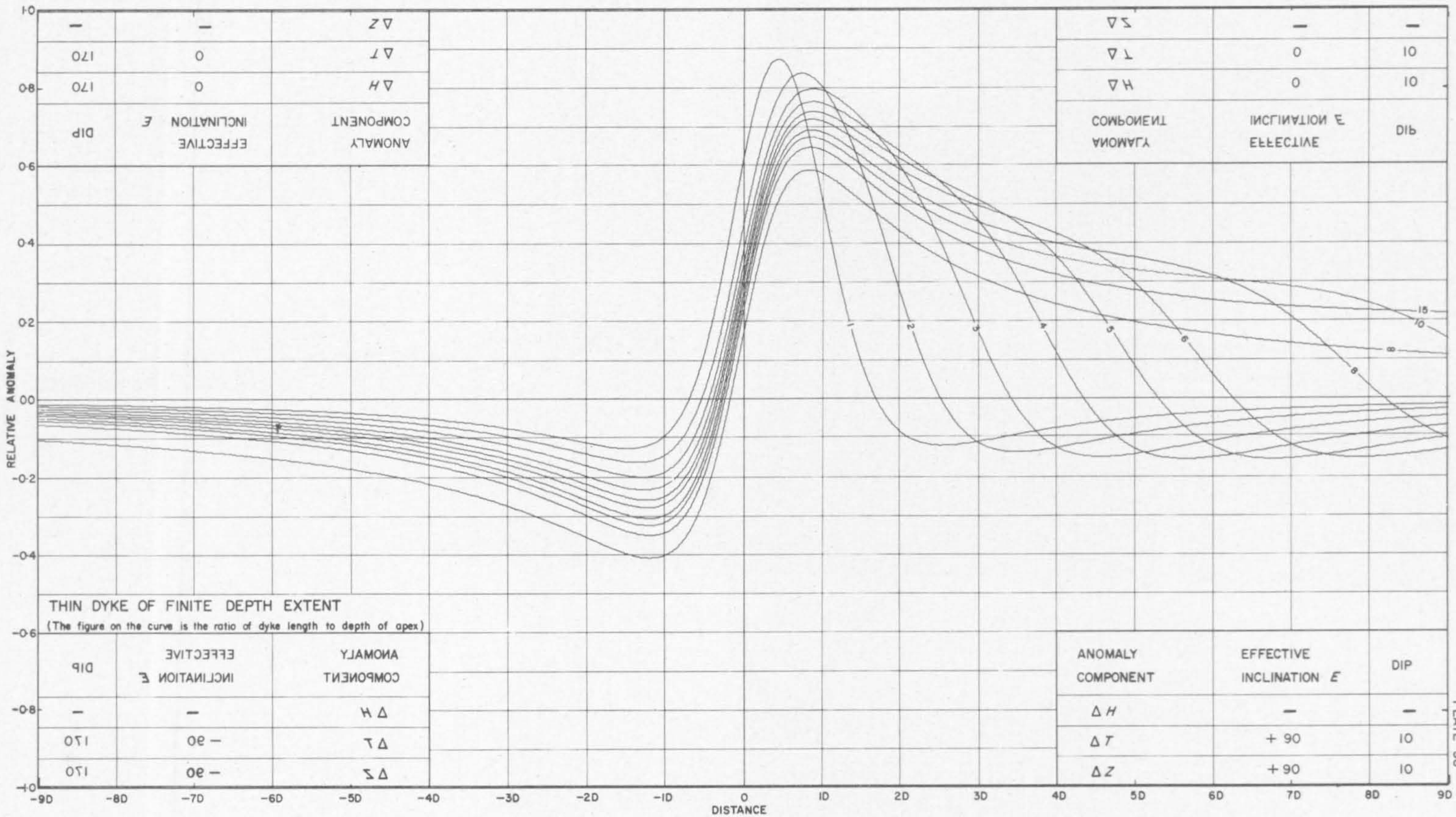

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | — | —
ΔT | +80 | 130
ΔZ | +70 | 130
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | −20 | 130
ΔT | −10 | 130
ΔZ | — | —
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | +20 | 50
ΔT | +10 | 50
ΔZ | — | —
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | — | —
ΔT | −80 | 50
ΔZ | −70 | 50



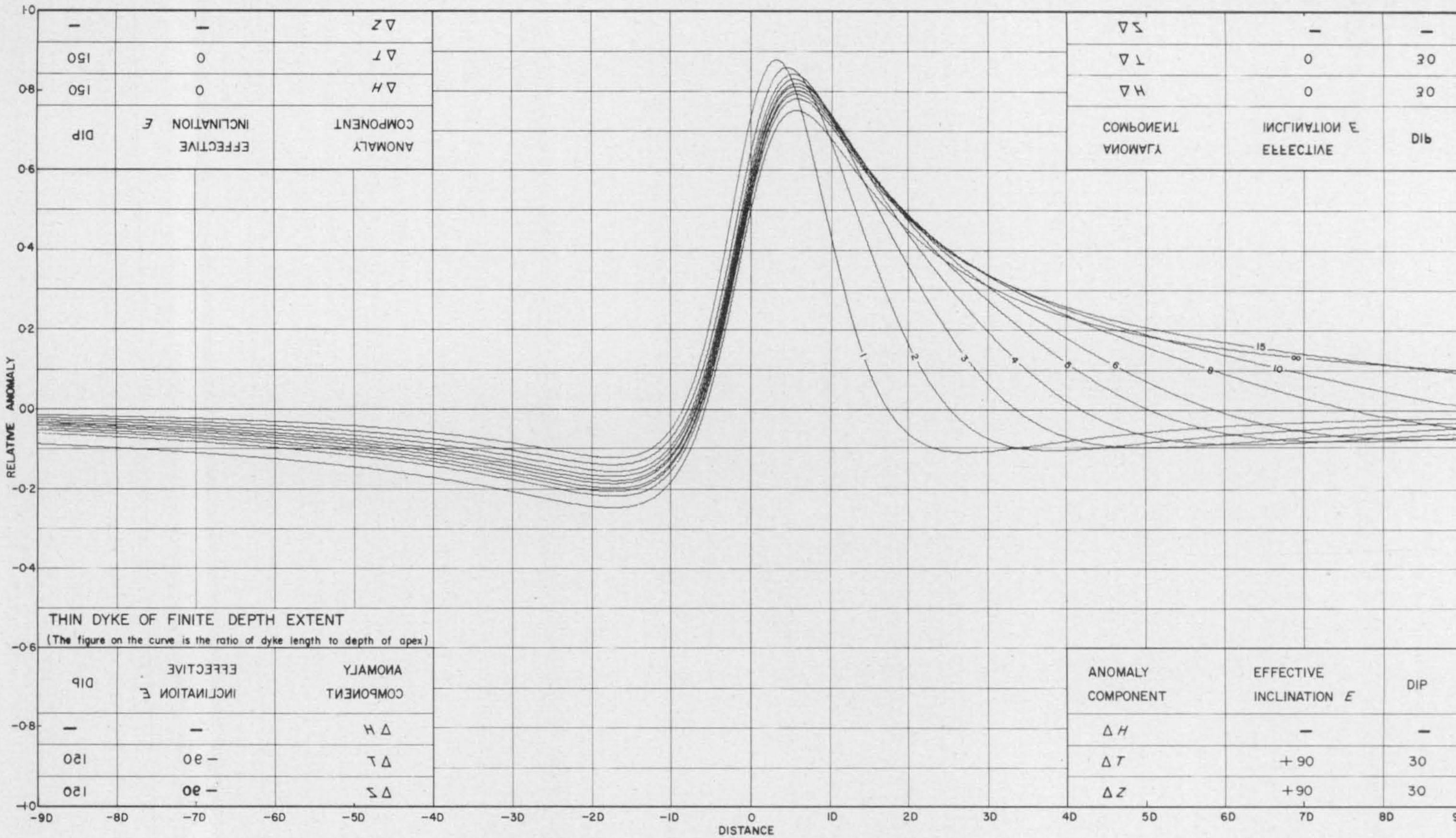
THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
ANOMALY COMPONENT | EFFECTIVE INCLINATION E | DIP
ΔH | — | —
ΔT | +80 | 150
ΔZ | +70 | 150

PLATE 36


THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT +80 170
ΔZ +70 170
PLATE 37



THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT +90 10
ΔZ +90 10


THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
1·0
0·8
0·6
0·4
0·2
0·0
-0·2
-0·4
-0·6
-0·8
-1·0
-9D
-8D
-7D
-6D
-5D
-4D
-3D
-2D
-1D
0
1D
2D
3D
4D
5D
6D
7D
8D
9D
1
2
3
4
5
6
8
10
15
∞
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT +90 30
ΔZ +90 30
ΔH 0 30
ΔT 0 30
ΔZ — —
ΔH — —
ΔT −90 150
ΔZ −90 150
ΔH 0 150
ΔT 0 150
ΔZ — —

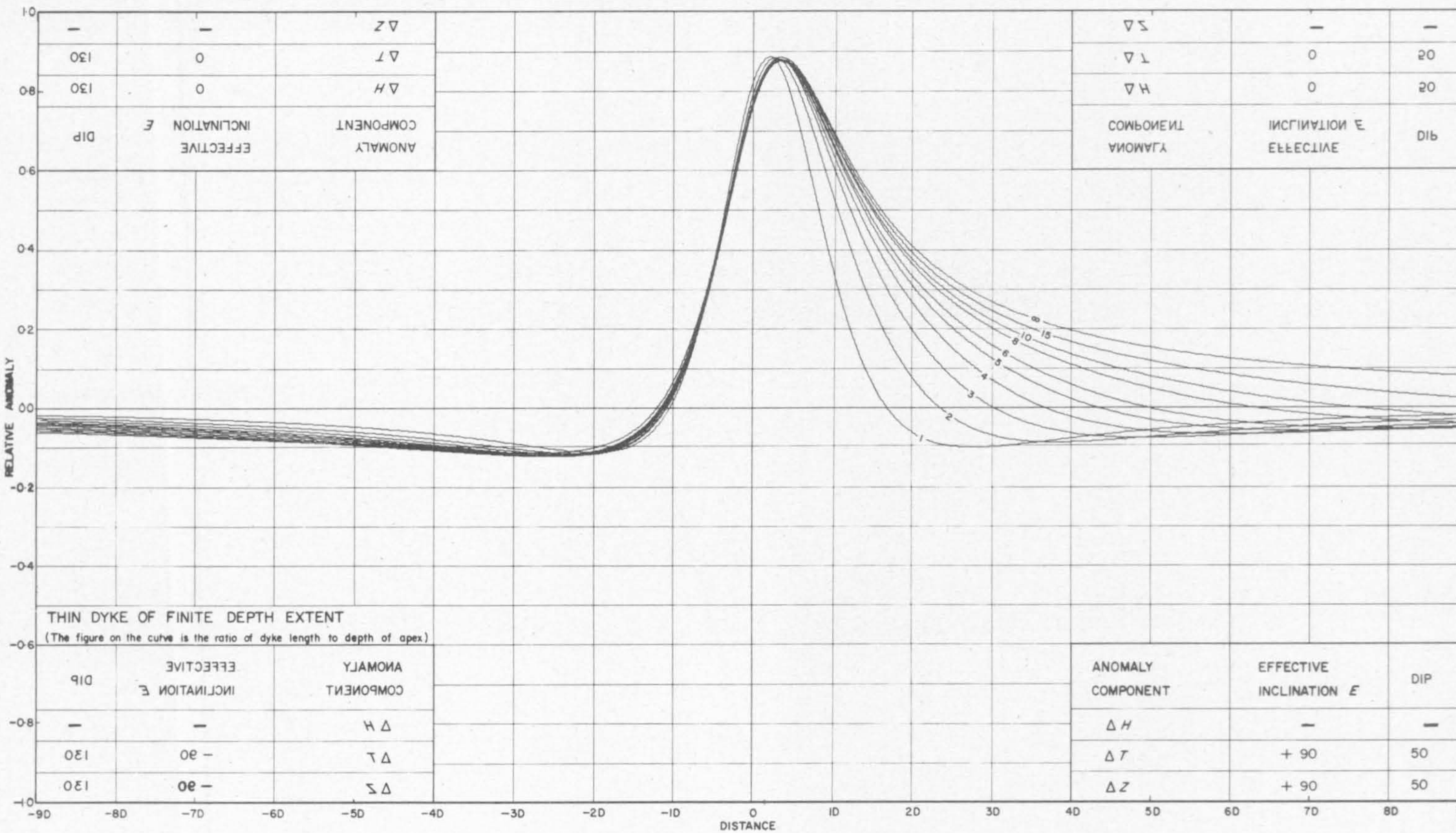

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
Δ H
Δ T
Δ Z
+ 90
50
RELATIVE ANOMALY
DISTANCE
-9D
-8D
-7D
-6D
-5D
-4D
-3D
-2D
-1D
0
1D
2D
3D
4D
5D
6D
7D
8D
9D
1·0
0·8
0·6
0·4
0·2
0·0
-0·2
-0·4
-0·6
-0·8
-1·0
1
2
3
4
5
6
8
10
15
∞

PLATE 40

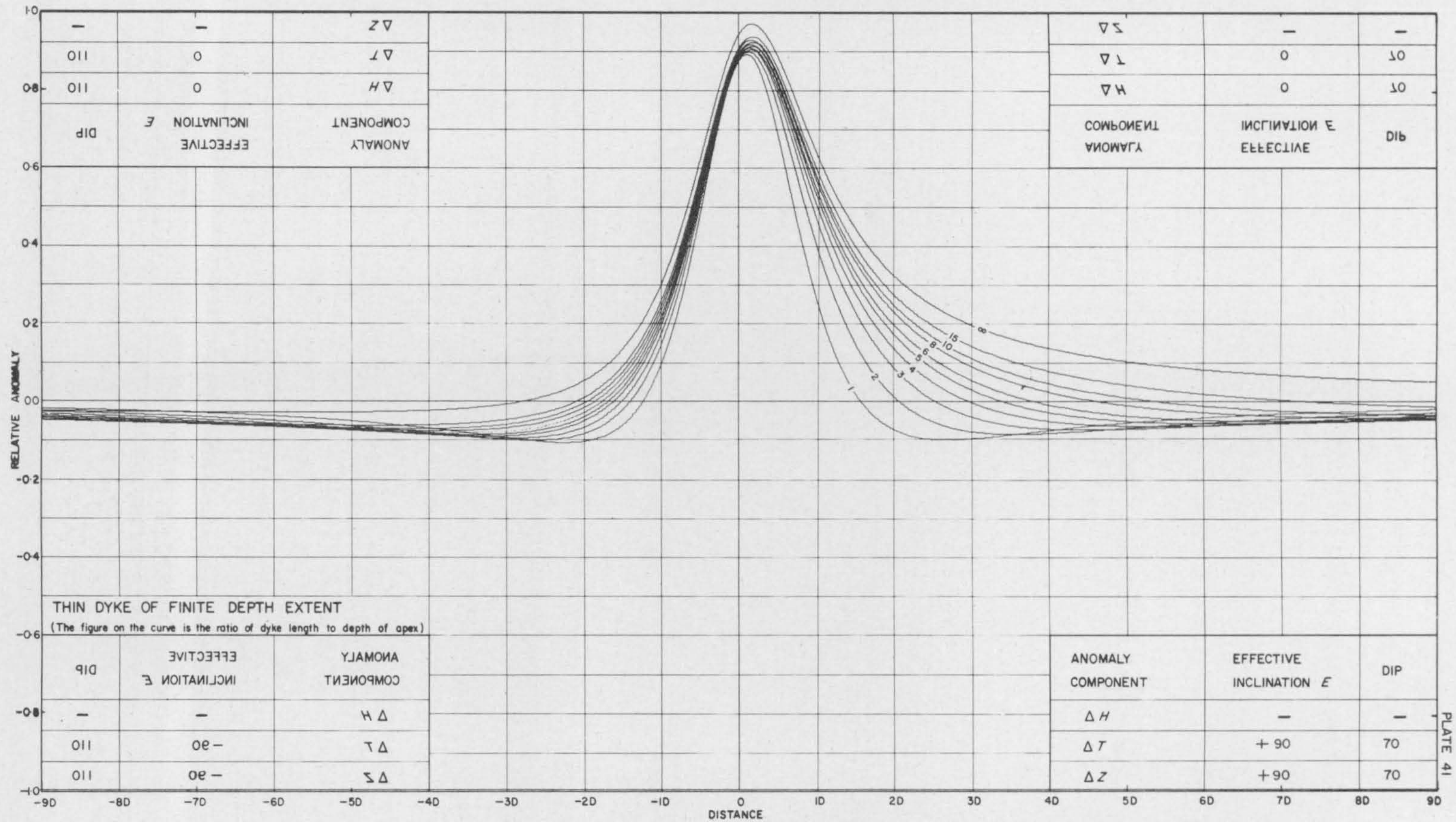
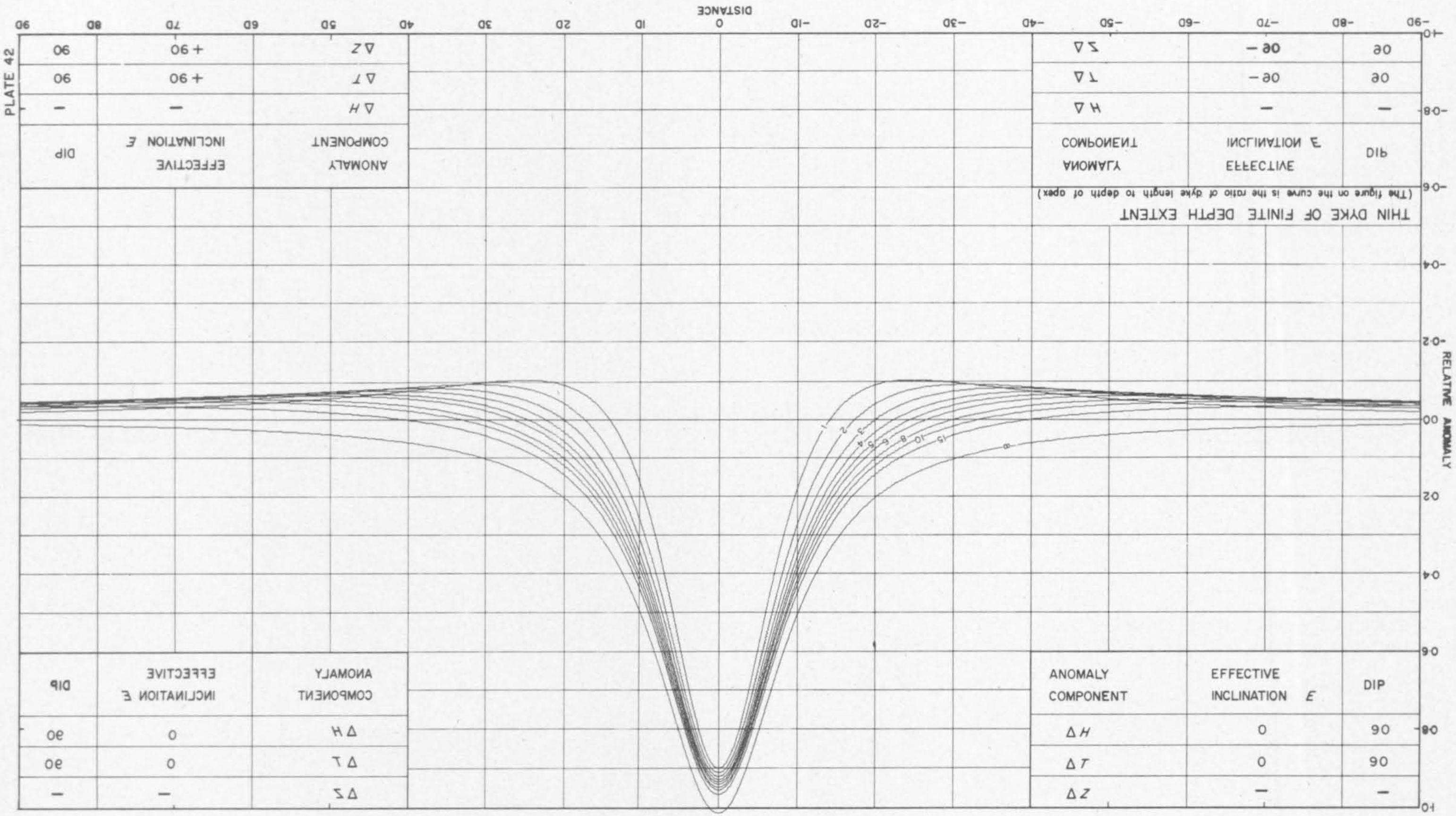
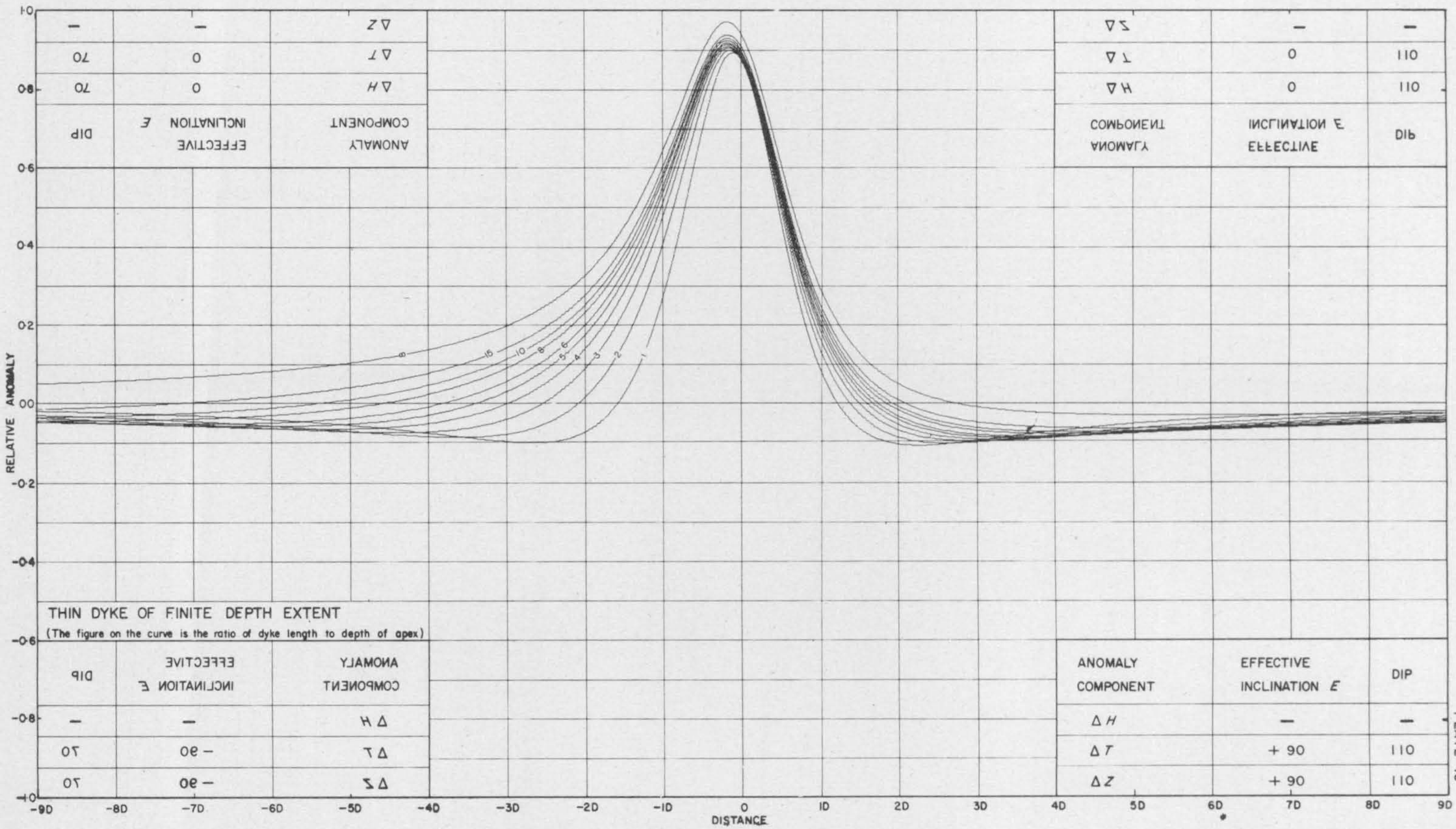

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT +90 70
ΔZ +90 70
ΔH 0 70
ΔT 0 70
ΔZ — —
ΔH — —
ΔT −90 110
ΔZ −90 110
ΔH 0 110
ΔT 0 110
ΔZ — —
RELATIVE ANOMALY
DISTANCE
1·0
0·8
0·6
0·4
0·2
0·0
−0·2
−0·4
−0·6
−0·8
−1·0
−9D
−8D
−7D
−6D
−5D
−4D
−3D
−2D
−1D
0
1D
2D
3D
4D
5D
6D
7D
8D
9D
1
2
3
4
5
6
8
10
15
∞

PLATE 41


THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
DISTANCE
RELATIVE ANOMALY
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH 0 90
ΔT 0 90
ΔZ — —
ΔH — —
ΔT −90 90
ΔZ −90 90
ΔT +90 90
ΔZ +90 90


THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT +90 110
ΔZ +90 110
ΔH 0 110
ΔT 0 110
ΔZ — —
ΔH — —
ΔT −90 70
ΔZ −90 70
ΔH 0 70
ΔT 0 70
ΔZ — —
1·0
0·8
0·6
0·4
0·2
0·0
-0·2
-0·4
-0·6
-0·8
-1·0
-9D
-8D
-7D
-6D
-5D
-4D
-3D
-2D
-1D
0
1D
2D
3D
4D
5D
6D
7D
8D
9D
∞
15
10
8
5
6
4
3
2
1

58

PLATE 43

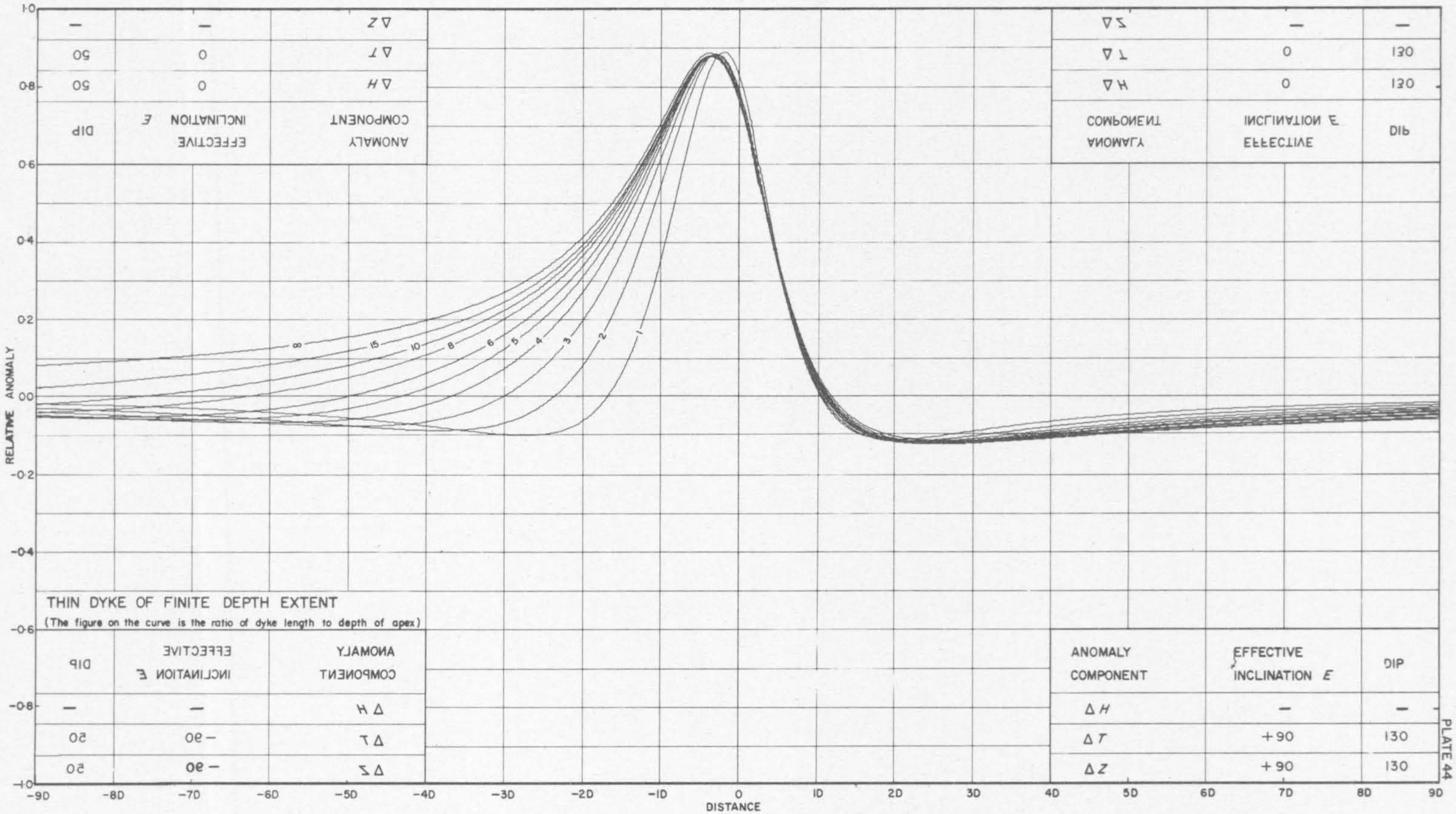

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT +90 130
ΔZ +90 130
ΔH 0 130
ΔT 0 130
ΔZ — —
ΔH 0 50
ΔT 0 50
ΔZ — —
ΔH — —
ΔT −90 50
ΔZ −90 50
∞
15
10
8
6
5
4
3
2
1
1·0
0·8
0·6
0·4
0·2
0·0
−0·2
−0·4
−0·6
−0·8
−1·0
−9D
−8D
−7D
−6D
−5D
−4D
−3D
−2D
−1D
0
1D
2D
3D
4D
5D
6D
7D
8D
9D

PLATE 44

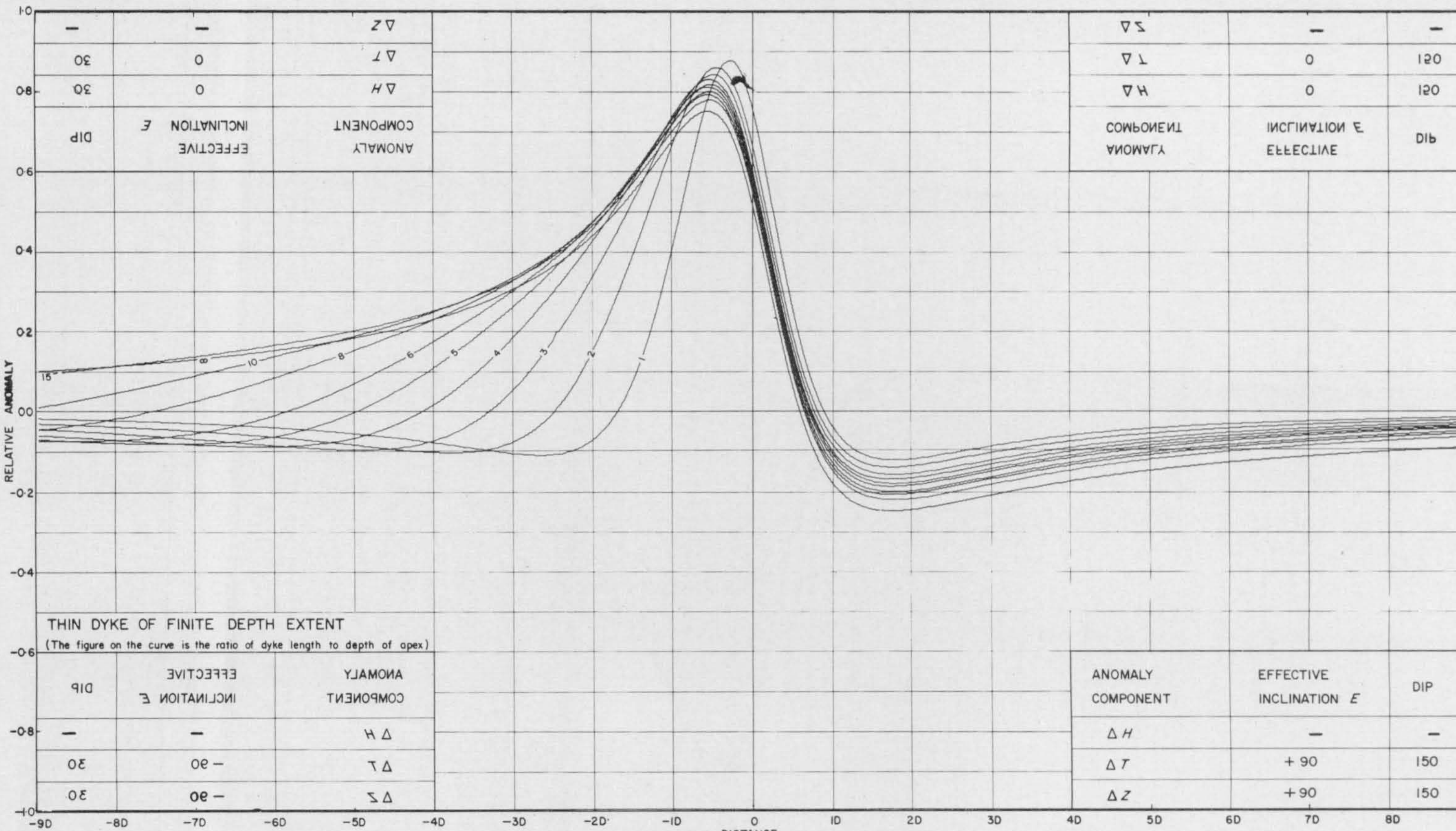
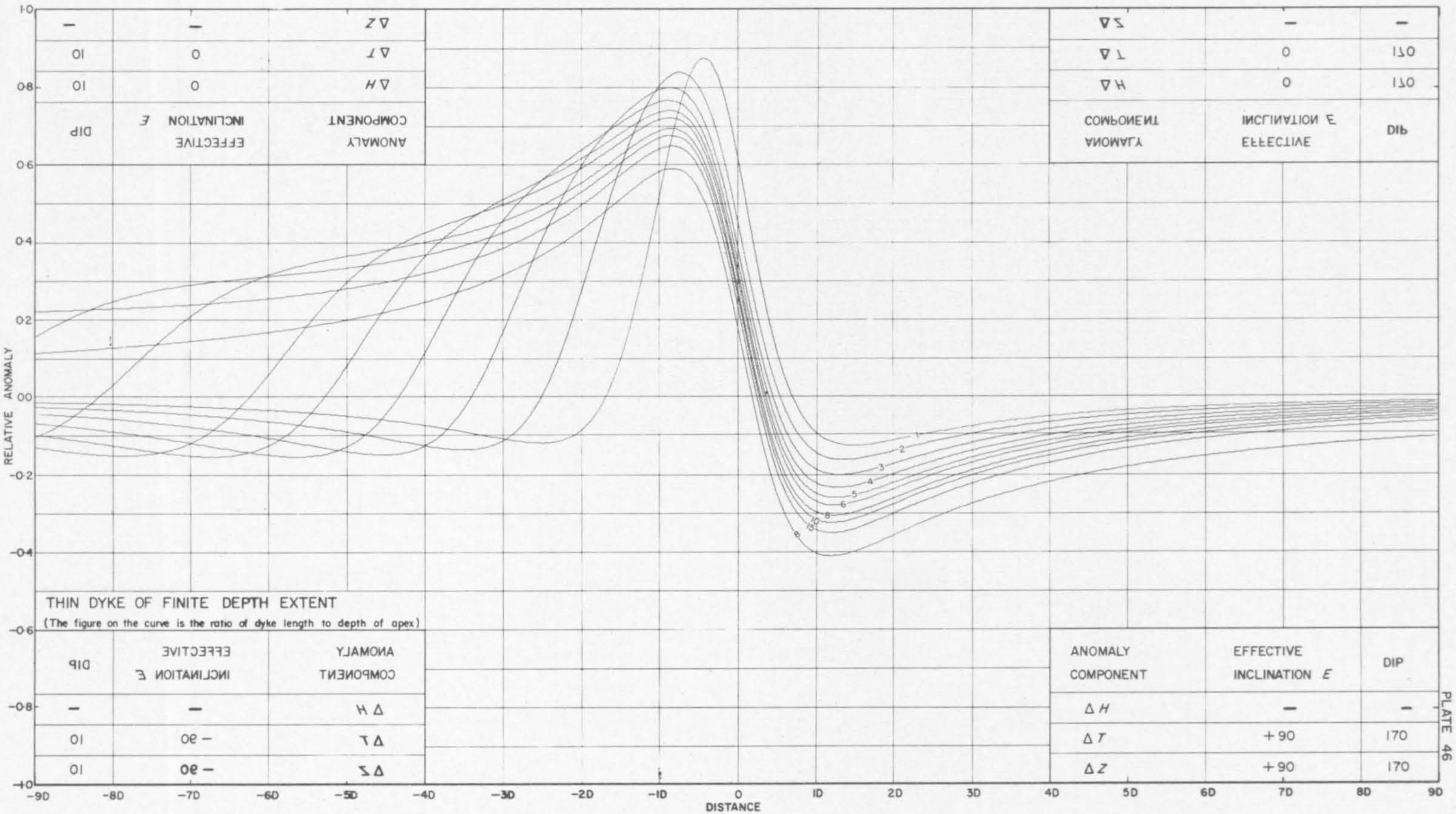
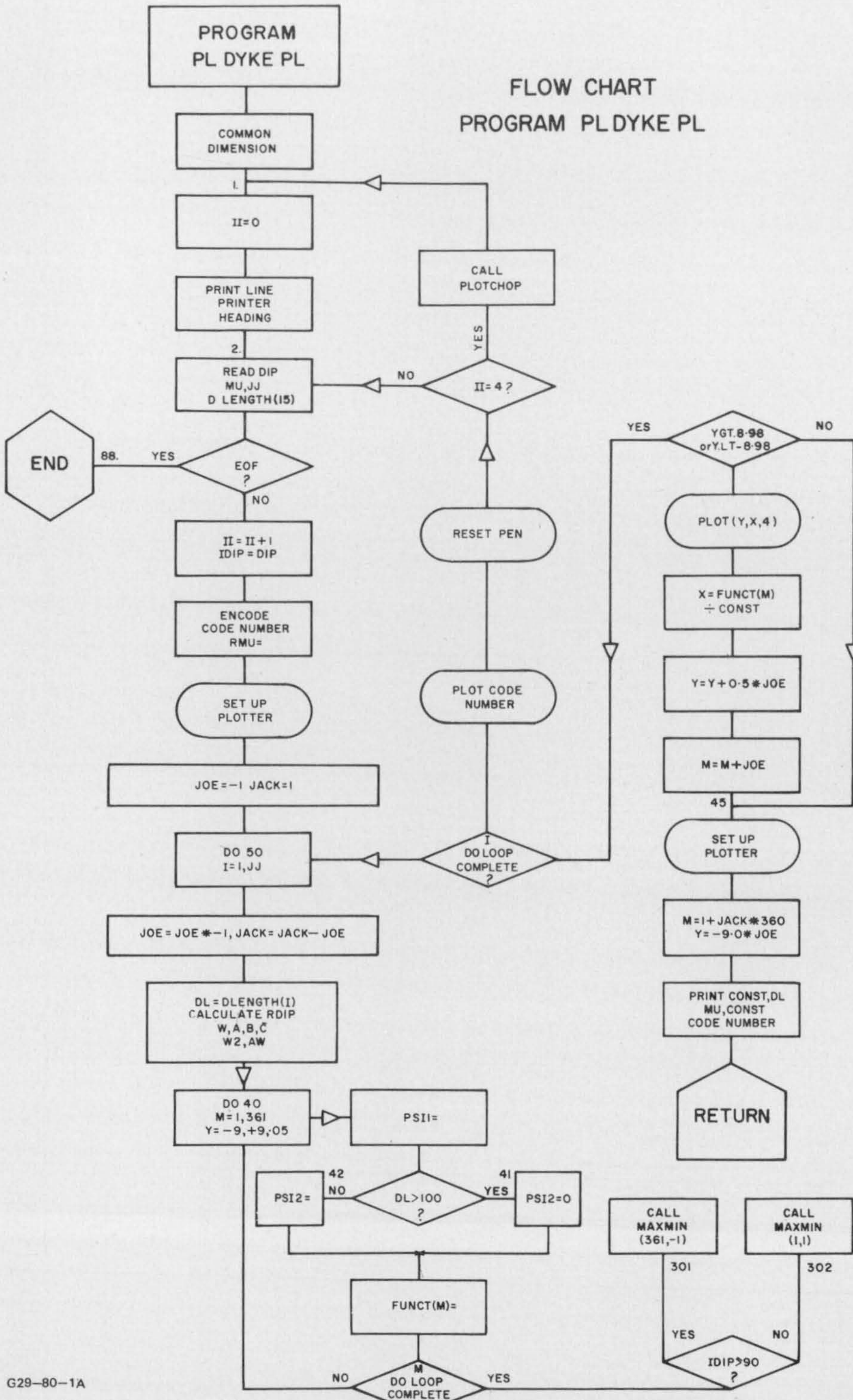

THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
1·0
0·8
0·6
0·4
0·2
0·0
-0·2
-0·4
-0·6
-0·8
-1·0
-9D
-8D
-7D
-6D
-5D
-4D
-3D
-2D
-1D
0
1D
2D
3D
4D
5D
6D
7D
8D
9D
1
2
3
4
5
6
8
10
8
15
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH
ΔT
ΔZ
—
+90
150
0
30
-90

PLATE 45


THIN DYKE OF FINITE DEPTH EXTENT
(The figure on the curve is the ratio of dyke length to depth of apex)
RELATIVE ANOMALY
DISTANCE
ANOMALY COMPONENT
EFFECTIVE INCLINATION E
DIP
ΔH — —
ΔT +90 170
ΔZ +90 170
ΔH 0 170
ΔT 0 170
ΔZ — —
ΔH — —
ΔT −90 10
ΔZ −90 10
ΔH 0 10
ΔT 0 10
ΔZ — —


FLOW CHART
PROGRAM PL DYKE PL
PROGRAM
PL DYKE PL
COMMON
DIMENSION
1.
II=0
PRINT LINE
PRINTER
HEADING
2.
READ DIP
MU,JJ
D LENGTH(15)
END
88.
YES
EOF
?
NO
II=II+1
IDIP=DIP
ENCODE
CODE NUMBER
RMU=
SET UP
PLOTTER
JOE=−1 JACK=1
DO 50
I=1,JJ
JOE=JOE*−1, JACK=JACK−JOE
DL=DLENGTH(I)
CALCULATE RDIP
W,A,B,C
W2,AW
DO 40
M=1,361
Y=−9,+9,·05
PSI1=
42
NO
DL>100
?
41
YES
PSI2=
PSI2=0
FUNCT(M)=
NO
M
DO LOOP
COMPLETE
?
YES
CALL
PLOTCHOP
YES
NO
II=4?
RESET PEN
PLOT CODE
NUMBER
I
DO LOOP
COMPLETE
?
YES
YGT.8·98
orY.LT−8·98
NO
PLOT(Y,X,4)
X=FUNCT(M)
÷CONST
Y=Y+0·5*JOE
M=M+JOE
45
SET UP
PLOTTER
M=1+JACK*360
Y=−9·0*JOE
PRINT CONST,DL
MU,CONST
CODE NUMBER
RETURN
CALL
MAXMIN
(361,−1)
CALL
MAXMIN
(1,1)
301
302
YES
NO
IDIP>90
?

G29—80—1A

APPENDIX 1

Program Listings and Flow Charts

```
      PROGRAM PLDYKEPL
      COMMON/FRED/FUNCT(500), CONST
      DIMENSION DLENGTH(15), CCC(2)
    3 FORMAT (F3, 12, 12, 15F4)
   20 FORMAT (///, 1H1, 3X*CODE NUMBER*, 8X*MU*, 6X, *DIP*, 8X,*
      AMPLITUDE*, 6X, 1*DYKE LENGTH*///)
   80 FORMAT (7HG29-63-, F3, 1H/, 12, 3X)
   81 FORMAT (2X, 2A8, 4X, 12, 6X, F3, 6X, E12.5, 4X, F4,* TIMES Z*)
   83 FORMAT (2X, 2A8, 4X, 12, 6X, F3, 6X, E12.5, 7X,* INFINITE*/)
      CALL PLOTSET (2)
    1 II = 0          PRINT 20
    2 READ 3, DIP, MU, JJ, (DLENGTH(J), J = 1, 15)
      IF (EOF, 60) 88, 4
    4 II = II + 1
      IDIP = DIP
      ENCODE (16, 80, CCC) DIP, MU
C     DEPTH TO TOP OF DYKE IS ONE UNIT.
C     DL = LENGTH OF THE DYKE DOWN-DIP.
C     THE DYKE IS INFINITE ALONG STRIKE.
      RMU = 3.1416*MU/180.
    5 CALL PLOT (1., 0.2, 2)
      CALL PLOT (-14., + 1.0, 1)
      CALL PLOT (-10., +1., 3)
      CALL PLOT (10., +1., 4)
      CALL PLOT (10., -1., 4)
      CALL PLOT (-10., -1., 4)
      CALL PLOT (-10., +1., 4)
      CALL PLOT (-10., 0., 3)
      CALL PLOT (10., 0., 4)
      CALL PLOT (0., -1., 3)
      CALL PLOT (0., 1., 4)
      JOE=-1          JACK=1
   29 DO 50, I =1, JJ
      DL=DLENGTH (I)
      JOE=JOE*(-1)          JACK=JACK-JOE
      RDIP = 3. 1416*DIP/180.
      W = 1. + DL*SIN(RDIP)
      A=COS (RMU-RDIP)    B = SIN(RMU-RDIP)     C = DL * COS(RDIP)
         W2 = W*W, AW = A*W
      DO 40 M = 1, 361, 1
      Y = (M-181)/20
      SI1 = (A + B*Y)/(Y*Y + 1.0)
      IF (DL.GT.100.1) 41, 42
   41 SI2 = 0.0     GO TO 43
   42 S12 = (AW + B* (Y-C))/((Y-C)*(Y-C) + W2)
   43 FUNCT(M)=SI1 -SI2
   40 CONTINUE
      IF (IDIP.GT.90) 301, 302
  301 CALL MAXMIN (361, -1)
      GO TO 300
  302 CALL MAXMIN (1, 1)
  300 IF (DL.GT.100.1) 101, 102
  101 PRINT 83, CCC, MU, DIP, CONST
      GO TO 62
  102 PRINT 81. CCC,MU, DIP,CONST,DL
   62 M = 1 +JACK*360
      Y=-9.00*JOE
      X = FUNCT(M)/CONST
      CALL PLOT (Y, X, 3)
```

```
45   Y=Y+0.05*JOE
     M=M+JOE
     X = FUNCT(M)/CONST
     CALL PLOT (Y, X, 4)
48   IF (Y.GT.8.98.OR.Y.LT.-8.98)50, 45
50   CONTINUE
     CALL PLOT (12., -1.0, 3)
     CALL TEXT (CCC, 16, 2)
     CALL PLOT (18.0, 1.0., 3)
89   IF (II.EQ.4) 251, 2
251  CALL PLOTCHOP          ,GO TO 1
88   END
```

```
     SUBROUTINE MAXMIN (II, IN)
     COMMON/FRED/FUNCT(500), CONST
     DIMENSION G(500)
     I=I I
     FMAX=FMIN=FUNCT(I)
4    I=I+IN
     IF(FUNCT(I).GT.FMAX) 1, 2
1    FMAX=FUNCT(I)
     IF(I.EQ. (II+357*IN)) 3, 4
3    JIM = 1
8    K=1
88   I=181+20*IN*K
     GHOLD = ABS(FUNCT(I) -FUNCT(I-IN))
5    G(I) = ABS (FUNCT(I+IN) -FUNCT(I))
     IF(G(I). LT.GHOLD) 6, 7
6    GHOLD = G(I)     I=I+IN*K
     IF(I.EQ.(II+357*IN)) 20, 5
20   IF (K) 19, 19, 18
18   POINT 1 = FUNCT (II)          GO TO 15
19   POINT 2 = FUNCT (II)          GO TO 11
7    IF (K) 9, 9, 10
15   K=-1      GO TO 88
10   POINT 1 = FUNCT (I-K*IN)      GO TO 15
9    POINT 2 = FUNCT(I-K*IN)
11   IF (POINT 2 - POINT 1) 13, 12, 12
12   IF (JIM) 14, 14, 35
13   IF (JIM) 16, 16, 17
14   MIN = POINT 1          GO TO 24
35   MAX = POINT 1          GO TO 24
16   MIN = POINT 2          GO TO 24
17   MAX = POINT 2          GO TO 24
2    IF (FUNCT(I).LT.FMIN) 21, 25
21   FMIN = FUNCT (I)
     IF (I.EQ. (II + 357*IN)) 23, 4
23   JIM=-1      GO TO 8
25   IF (I.EQ. (II + 357*IN)) 24, 4
24   CONST = FMAX -FMIN
     RETURN
     END
```

FLOW CHART SUBROUTINE MAXMIN

G29-81A