

Arkansas State Prison, 16-18 Nov 1974

These maps indicate the pattern of small changes in the intensity of the earth's magnetic field. The most important fact shown in Grid #1 is that the magnetic field is fairly constant in the southwest corner of the ~~rectangle~~^{grid}, changing by only about one ~~gamma~~^{unit} between adjacent measurements while in the central area of the grid the field often fluctuates in the range of two to ten ~~gammas~~^{units}. This may indicate that ^{the soil in} the central area has been mixed due to graves while the southwest area has no graves.

The point-by-point measurements of the magnetic field were made with a cesium magnetometer built by Varian Associates (Ralph and others, 1968). Lines are drawn on the map through points of equal magnetic intensity; ^{there are} much like the contour lines on a topographic map. The average value of the magnetic field in this region is about 53,900 gammas. Since the field varies by a small amount, only the last two digits are usually recorded; for example, the number 57 indicates a total field intensity of 53,957 gammas.

Since the magnetic anomaly of a half kilogram of iron buried at a depth of two meters is only about three gammas (Breiner, 1973), nails in a coffin will be undetectable. However, change in soil stratification and density due to grave digging produces a small but possibly detectable anomaly.

While this effect may be causing the changes shown in the center of Grid #1, test excavation will be necessary to find if this is a correct interpretation.

The barbed wire fence on the east side of Grid #1 was removed for this survey, but evidently fragments of iron wire are buried in the soil nearby and causing the chaotic pattern on the map. Other isolated, but intense, magnetic anomalies are found in Grid #1. The magnetic pattern shown at coordinates S56E18 is typical of an iron object buried at a shallow depth.

The pair of high and low readings results from a single ~~single source~~ ^{iron containing object} located at their midpoint; since the magnetic high is not directly south of the low, this iron object is acting as a permanent magnet.

The magnetic pattern at coordinates S15E25 is probably due to ^{several} buried iron objects or possibly brick, which is also very magnetic. The higher spatial resolution of Grid #2 shows the individual patterns more clearly. This grid also indicates that a strong magnetic pattern typical of iron is associated with grave E3 at coordinates S27E39 and a weaker pattern at grave E1 at coordinates S12E39. However, there is no definite pattern at grave E2 at coordinates S15E39.

The two ^{small} depressions in the soil at coordinates S18E39 and S20E39 are magnetic lows and

the depression at coordinates S22E36 has a more complex pattern around it, possibly due to iron both on its northern & southern sides.

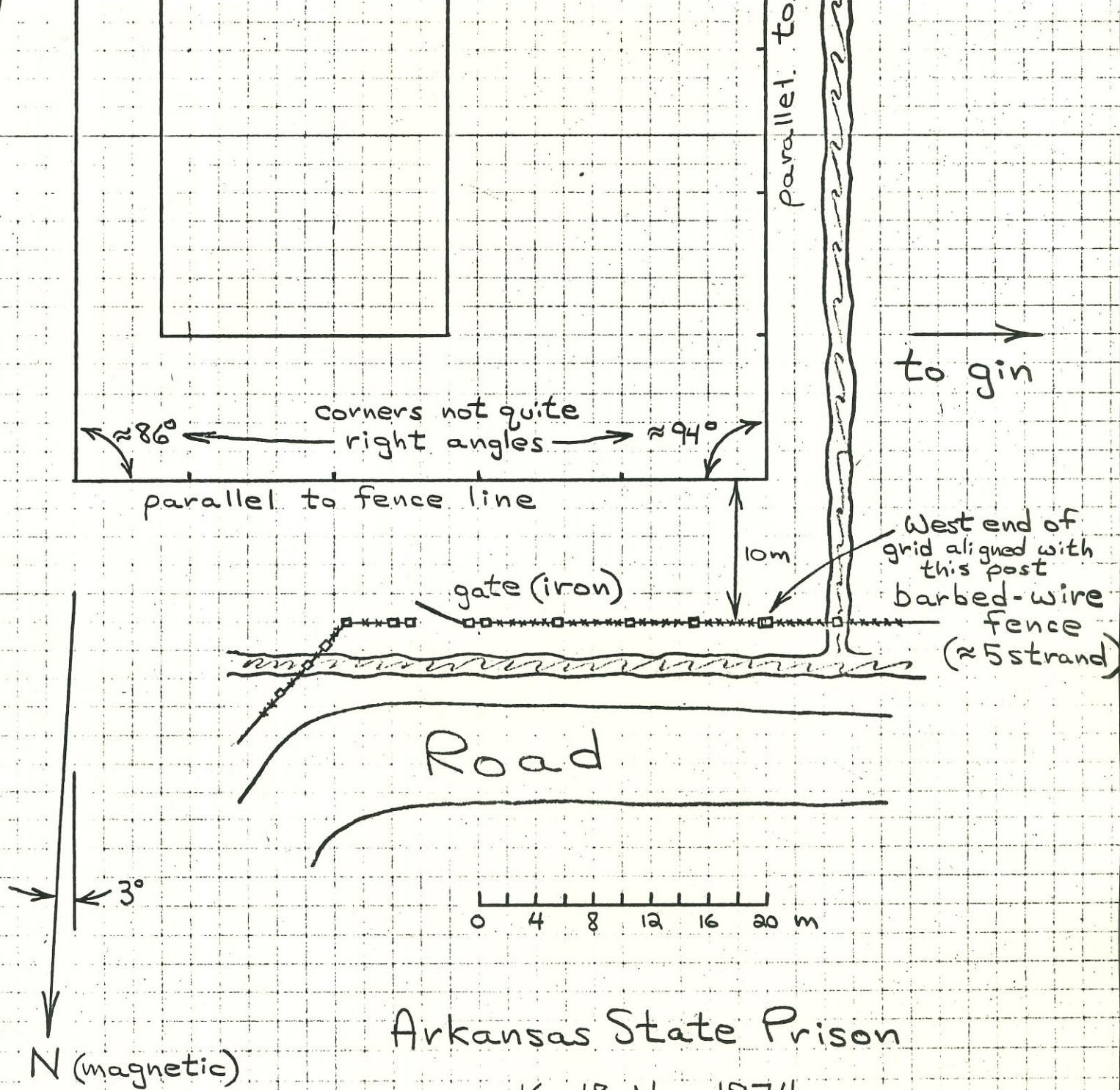
The diurnal variation of the magnetic field in Grid #1 has been corrected by noting the changes in the magnetic intensity at one point in the grid during the course of the survey. This variation was found to be small when Grid #2 was surveyed and its map has not been corrected; this also results in its average intensity being about 15 gammas higher than Grid #1.

References:

Ralph, E. K., F. Morrison, D. P. O'Brien, 1968, "Archaeological Surveying Utilizing a High-Sensitivity Difference Magnetometer", Geoexploration, vol. 6, pp. 109-122.

Breiner, S., 1973, Applications Manual For Portable Magnetometers, GeoMetrics, Sunnyvale, California.

level



Arkansas State Prison

16-18 Nov 1974

barbed-wire
fence
(removed for survey)

to main
prison compound

Grid #1 (48x72m)

Intersections with
fence line are $\pm 1m$

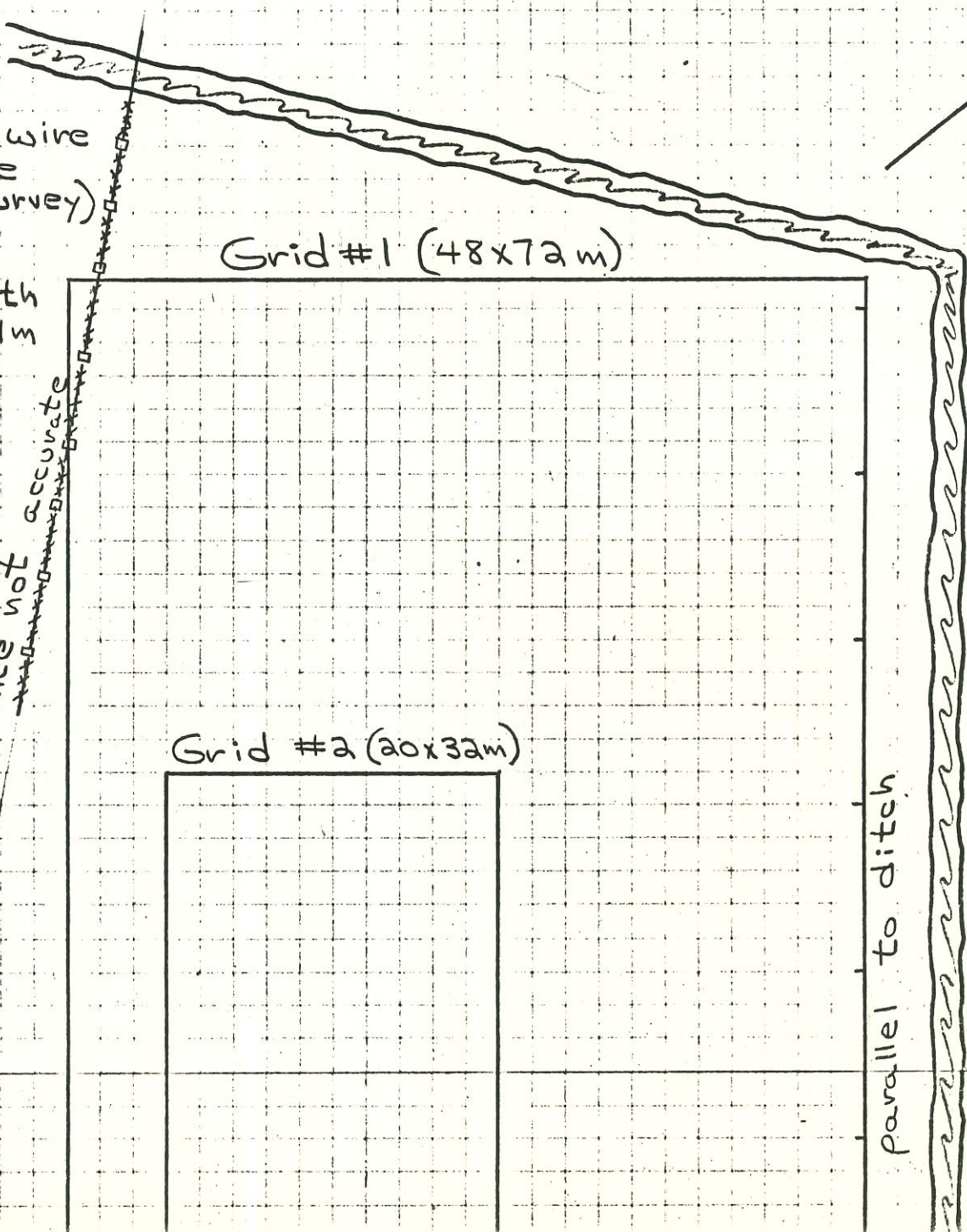
angle of fence not accurate

Grid #2 (20x32m)

drainage
ditch

parallel to ditch

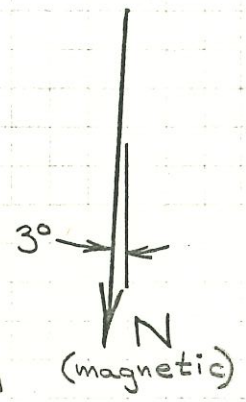
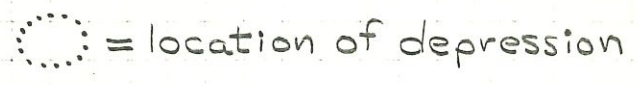
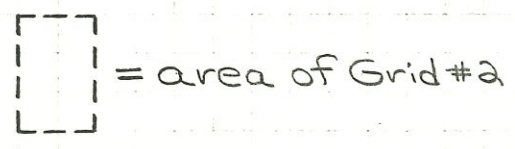
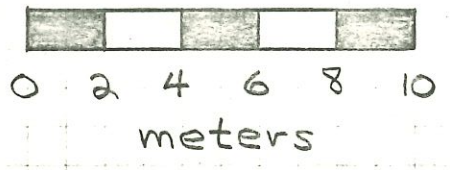
e v e e



MAP Grid #1 16,17 Nov 1974

ison, Cummins Unit, "Bodies burg"

amma
gamma
-5
= 2m



variation

58	60	58	58	55	57	55	57	58	60	62	61	56
58	60	58	60	56	57	55	55	58	58	58	58	56 ... 70
59	62	59	61	56	58	56	58	57	60	56	57	56
59	62	59	59	57	57	55	57	57	56	56	59	56
59	61	59	59	56	57	56	57	57	56	56	57	58
59	60	58	58	59	56	56	57	57	56	56	57	58
58	59	58	58	60	59	55	57	56	55	56	56	57 ... 60
58	58	52	61	73	58	57	57	57	56	57	57	57
60	57	22	14	4002	59	57	58	57	57	56	56	56
61	58	55	47	55	58	55	57	57	57	57	57	57
60	62	60	59	56	56	55	56	56	56	56	56	57
64	61	61	57	56	56	55	56	55	55	56	57	57 ... 50
64	61	62	59	57	56	56	57	56	57	56	56	57
59	62	60	59	55	60	55	58	58	58	54	57	57
60	60	59	62	57	57	55	55	55	55	55	56	57
59	60	56	54	56	61	54	56	55	55	55	55	57

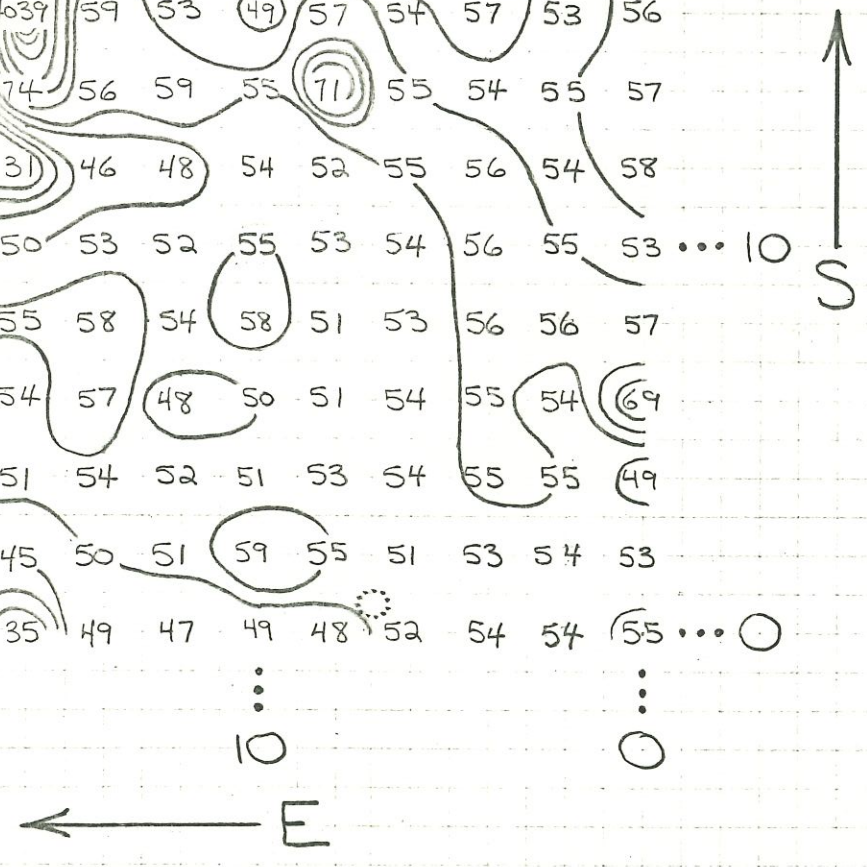
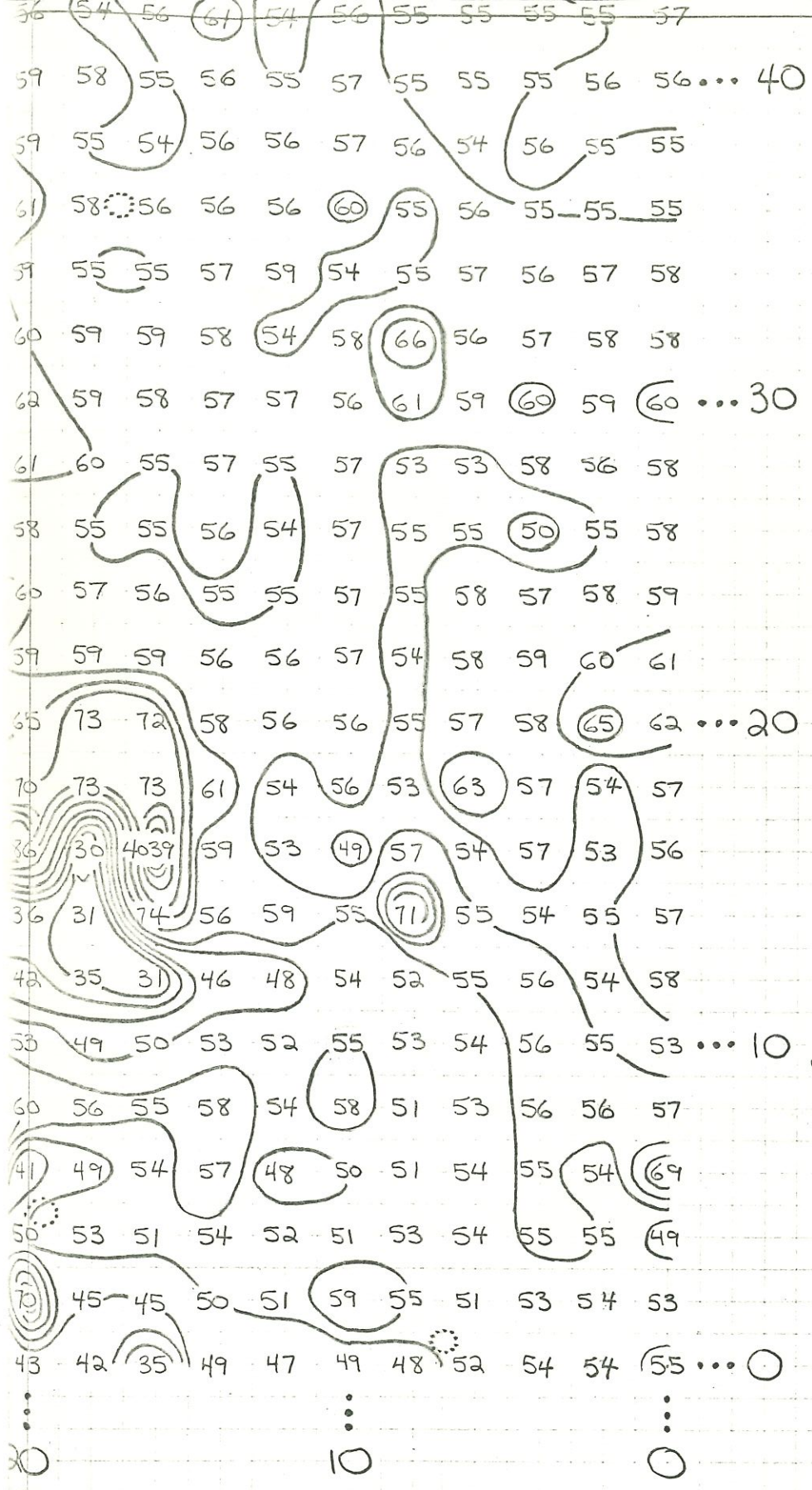


50

40

30

20



ISOMAGNETIC MAP

Grid #2

Arkansas State Prison, Cummins Unit, 18 Nov 1974


Contour interval = 5 gamma

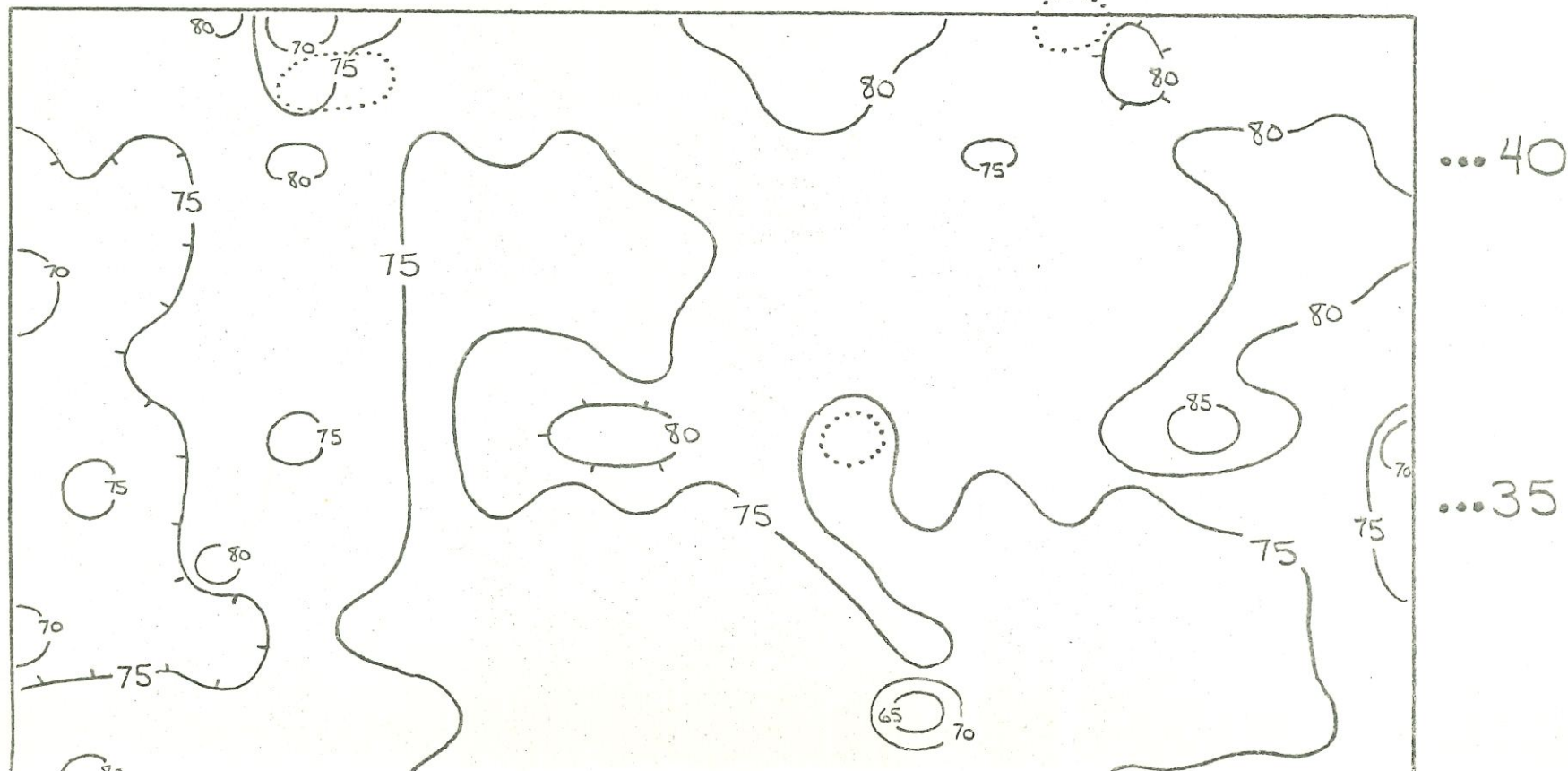
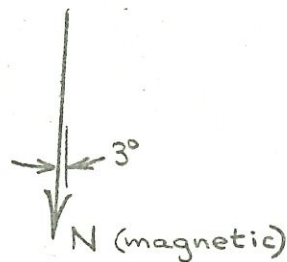
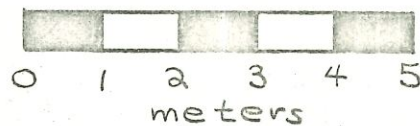
Base value = 53,900 gamma

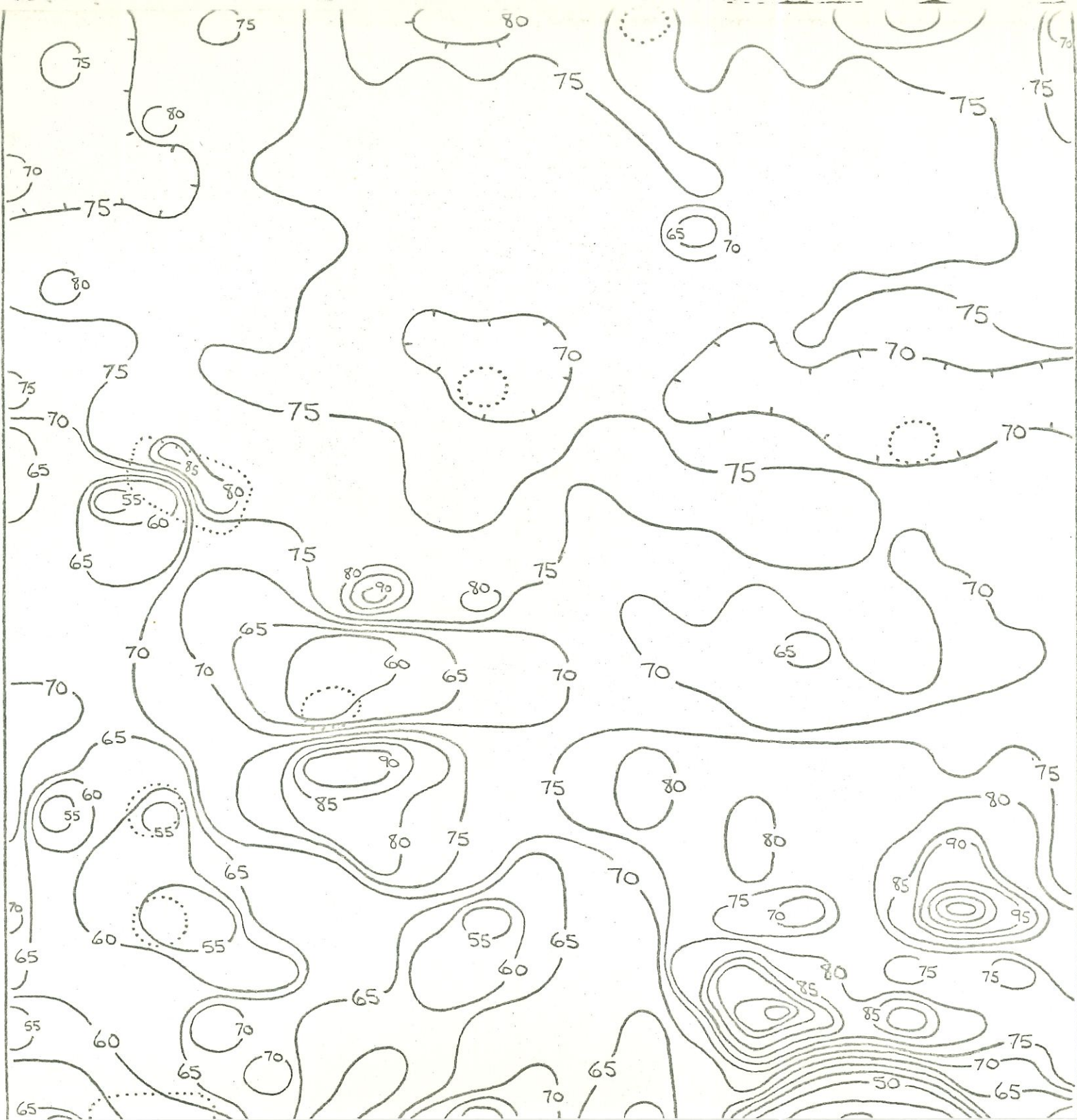
Measurement spacing = 1 m

Sensor height = $\frac{3}{4}$ m

not corrected for diurnal variation

 = approximate location of depression





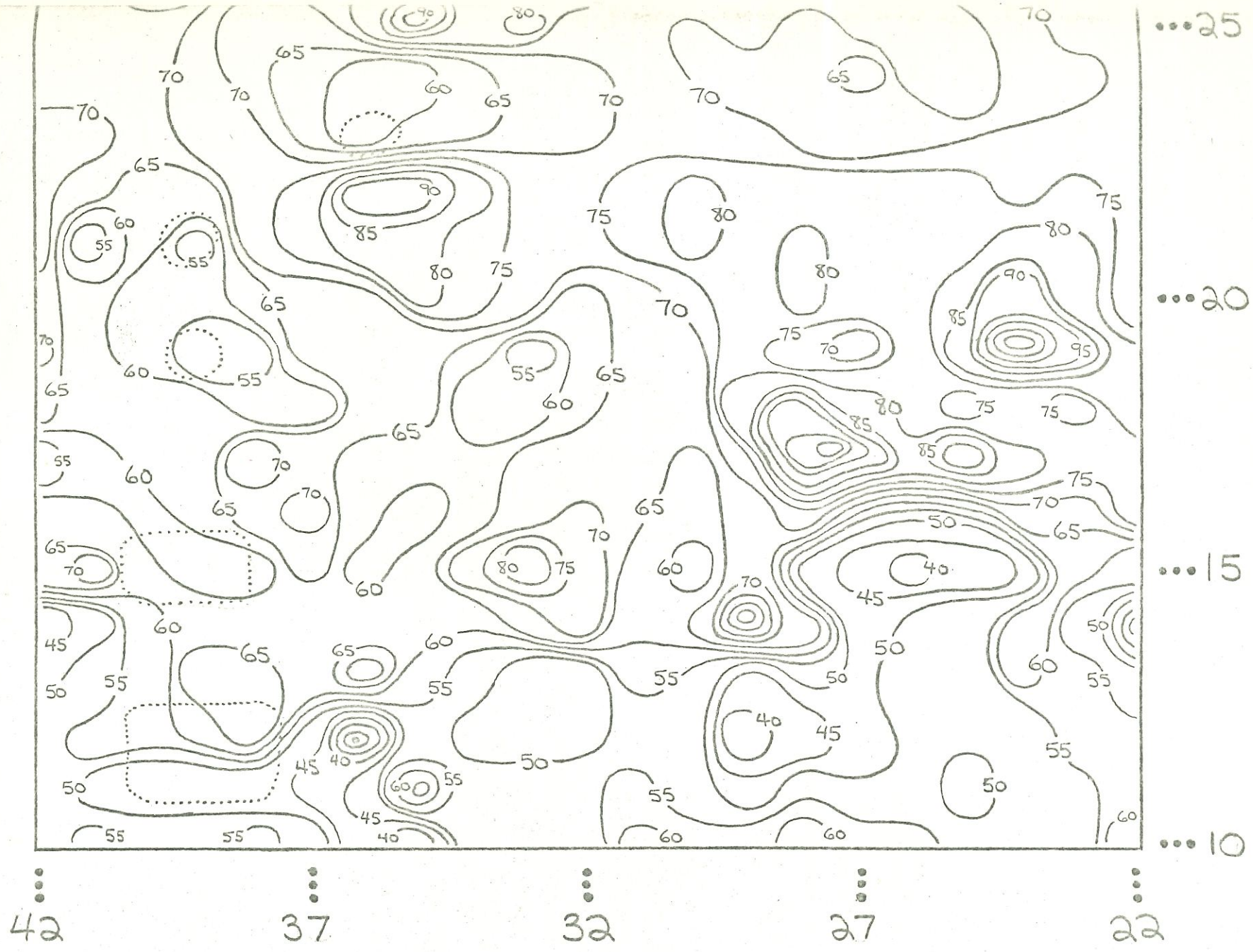
...35

...30

...25

...20





← E