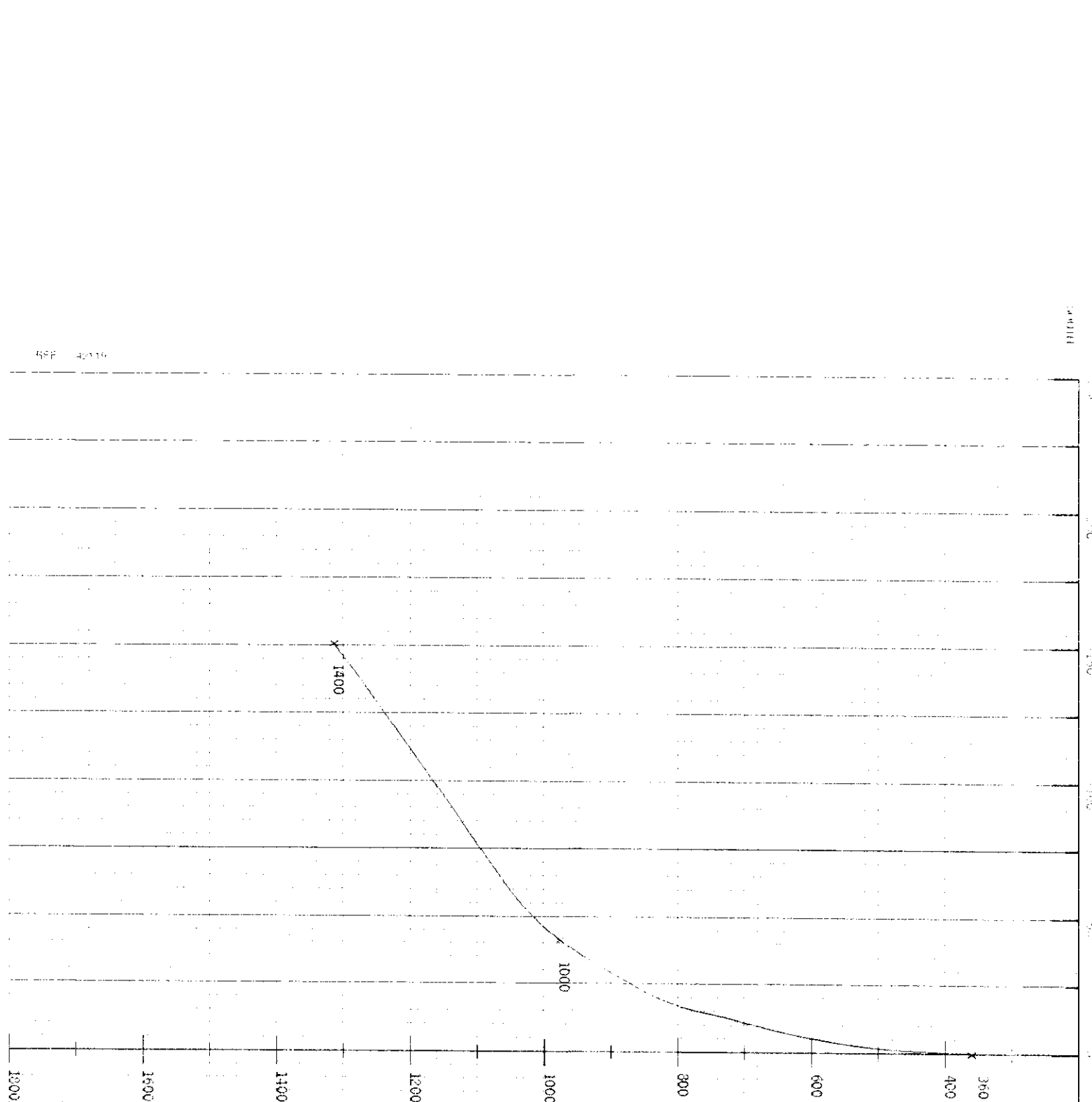
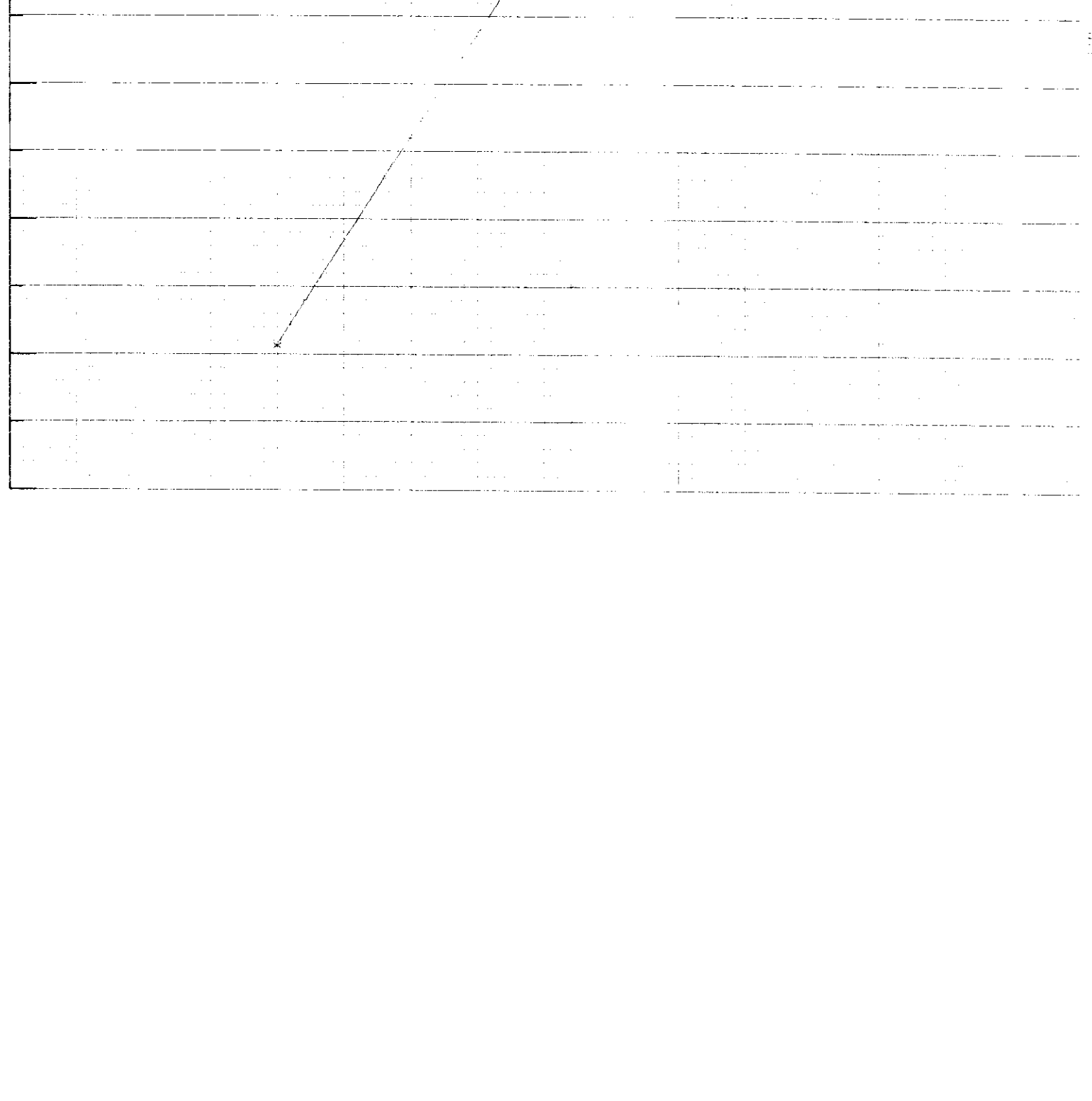
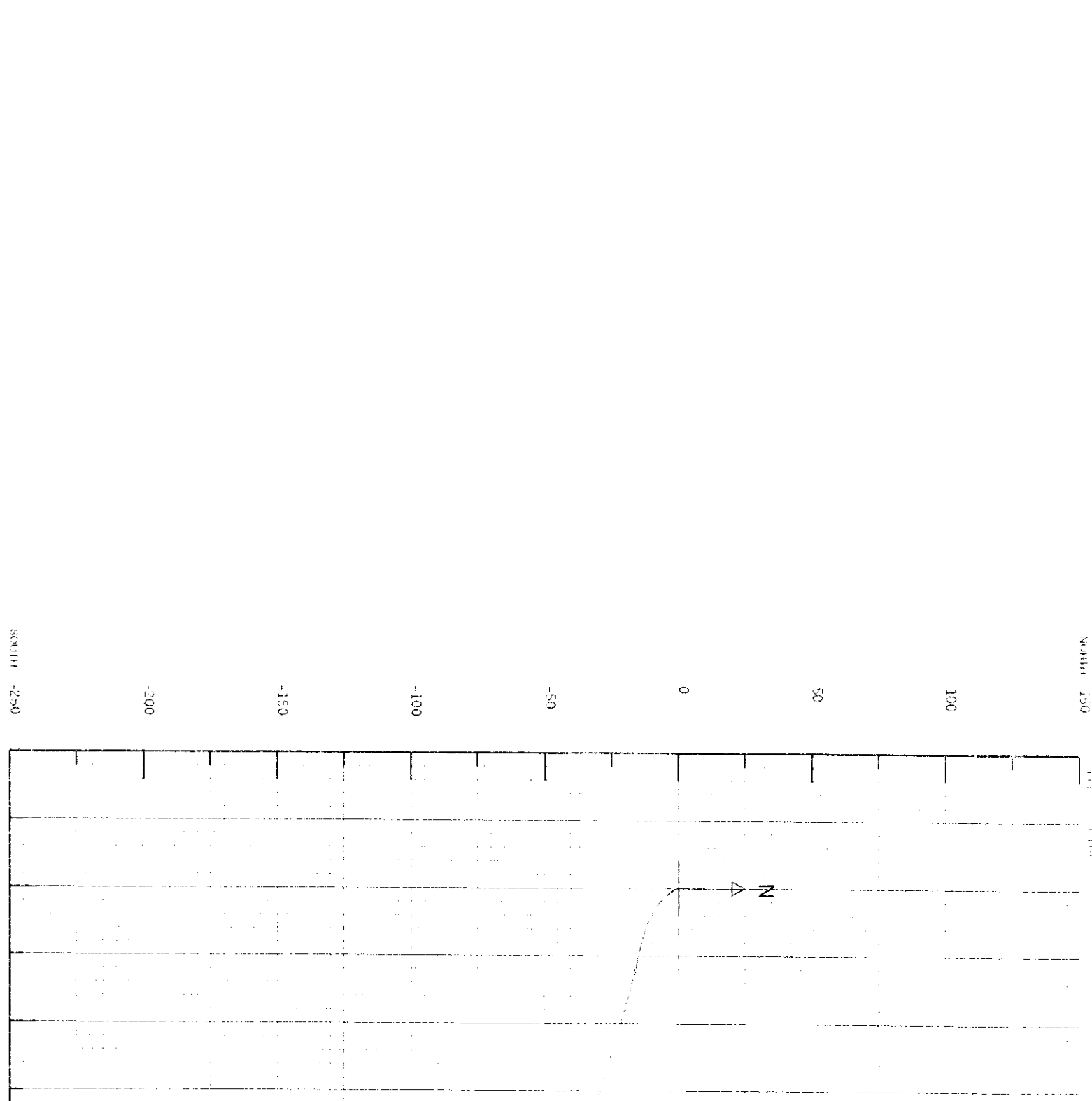
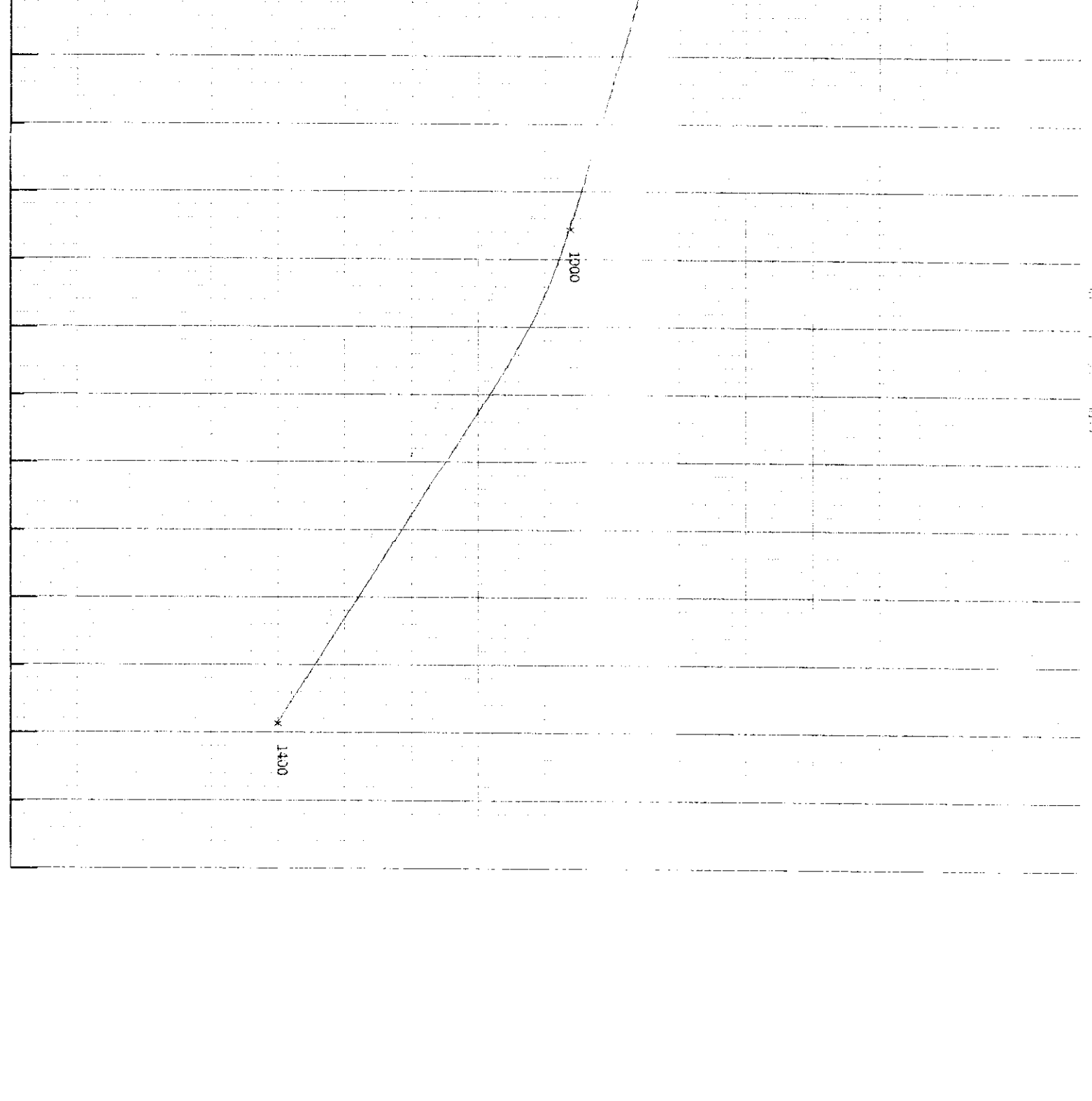


Schlumberger

DIRECTIONAL SURVEY

COMPANY NORTHWEST NATURAL GAS
 FIELD MIST GAS STORAGE
 WELL IW 23A-22-65
 COUNTRY
 RUN TWO
 DATE LOGGED 27-SEPT-1997
 REFERENCE 42119



HISTORICAL RADIUS OF CURVATURE METHOD

TIEN LOCATION

MEASURED DEPTH 346.28 FT
 TRUE VERTICAL DEPTH 246.89 FT
 DISTANCE NORTH 9.33 FT
 DISTANCE EAST 246.62 FT

BOTTOM HOLE LOCATION

COURSE LENGTH 322.66 FT
 COURSE AZIMUTH 118.62 DEG
 MEASURED DEPTH 1879.00 FT
 TRUE VERTICAL DEPTH 1118.27 FT
 DISTANCE SOUTH 180.40 FT
 DISTANCE EAST 246.62 FT

WARNING: This directional survey information is provided for informational purposes only. Schlumberger is not responsible for the accuracy of this information. Schlumberger is not a provider of engineering or other professional services. Schlumberger is not a provider of geological or geophysical services. Schlumberger is not a provider of environmental services. Schlumberger is not a provider of any other services. Schlumberger is not a provider of any other services.