SECTION 11

HISTOGRAMS

- WGS 84 COORDINATE DIFFERENCES* (MAJOR DATUMS) -

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* WGS 84 COORDINATES OBTAINED FROM DOPPLER-DERIVED NSWC 9Z-2 COORDINATES USING NSWC 9Z-2 TO WGS 84 TRANSFORMATION MINUS 84 COORDINATES COMPUTED USING LOCAL GEODETIC SYSTEM-TO-WGS 84 MEAN DATUM SHIFTS ($\overline{\Delta X}$, $\overline{\Delta Y}$, $\overline{\Delta Z}$), TABLE 9.1, IN THE MOLODENSKY DATUM TRANSFORMATION FORMULAS, TABLE 6.4; UNITS = METERS

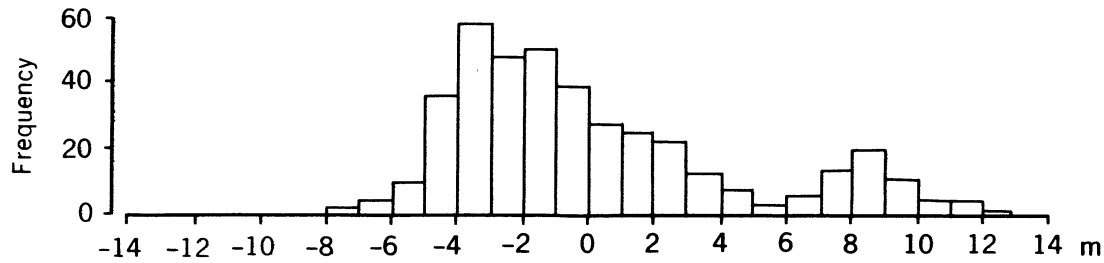

Figure 11.1a. NAD 27 (CONUS)-Geodetic Latitude Differences*

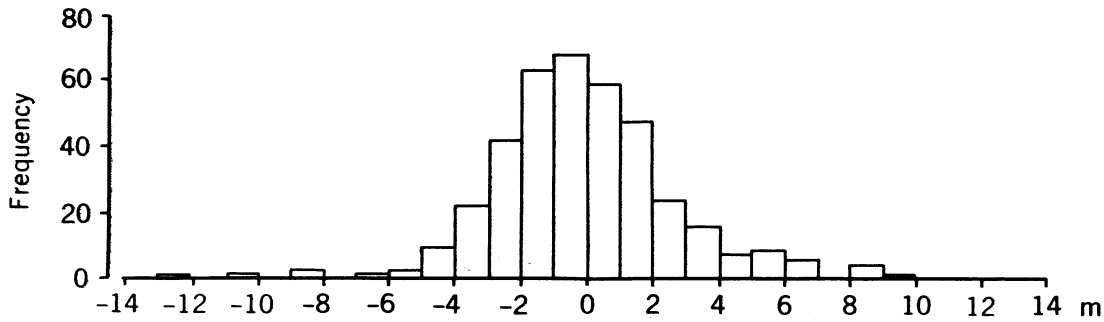

Figure 11.1b. NAD 27 (CONUS)-Geodetic Longitude Differences*

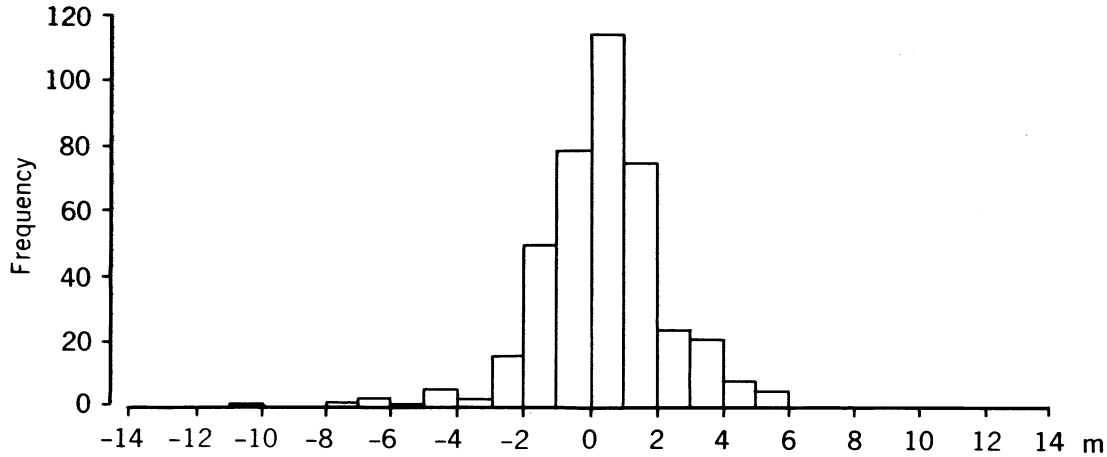

Figure 11.1c. NAD 27 (CONUS)-Geodetic Height Differences*

*Differences = WGS 84 Coordinates Obtained From Doppler-Derived NSWC 9Z-2 Coordinates Minus WGS 84 Coordinates Computed Using NAD 27 (CONUS)-to-WGS 84 Mean Datum Shifts ($\overline{\Delta X}$, $\overline{\Delta Y}$, $\overline{\Delta Z}$) in the Molodensky Datum Transformation Formulas.

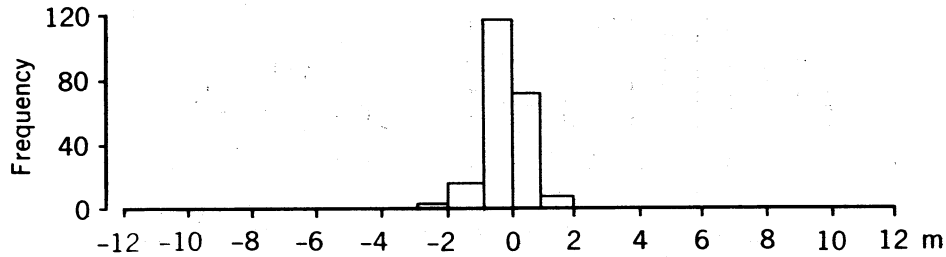

Figure 11.2a. NAD 83 (CONUS)-Geodetic Latitude Differences*

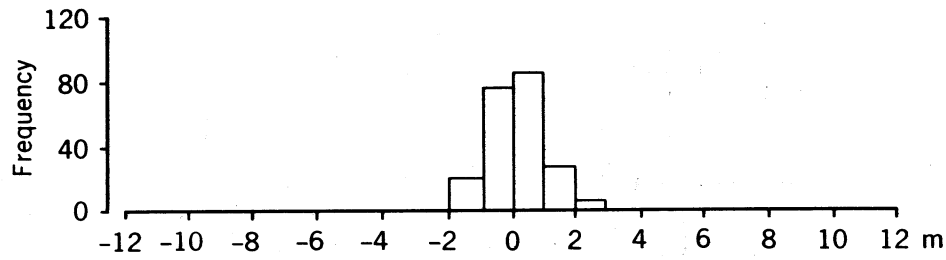

Figure 11.2b. NAD 83 (CONUS)-Geodetic Longitude Differences*

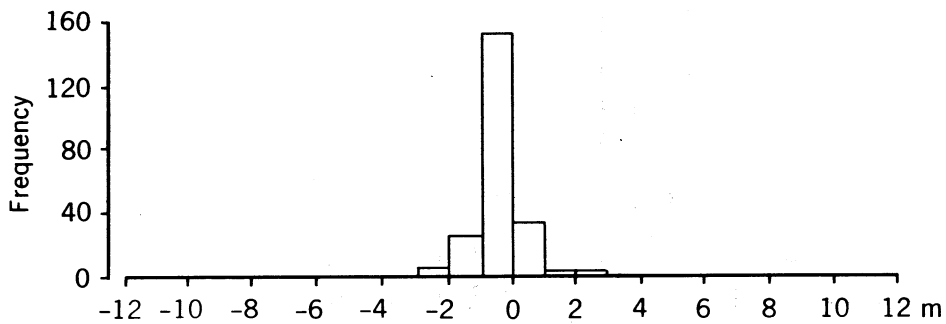

Figure 11.2c. NAD 83 (CONUS)-Geodetic Height Differences*

*Differences = WGS 84 Coordinates Obtained From Doppler-Derived NSWC 9Z-2 Coordinates Minus WGS 84 Coordinates Computed Using NAD 83 (CONUS)-to-WGS 84 Mean Datum Shifts ($\overline{\Delta X}$, $\overline{\Delta Y}$, $\overline{\Delta Z}$) in the Molodensky Datum Transformation Formulas.

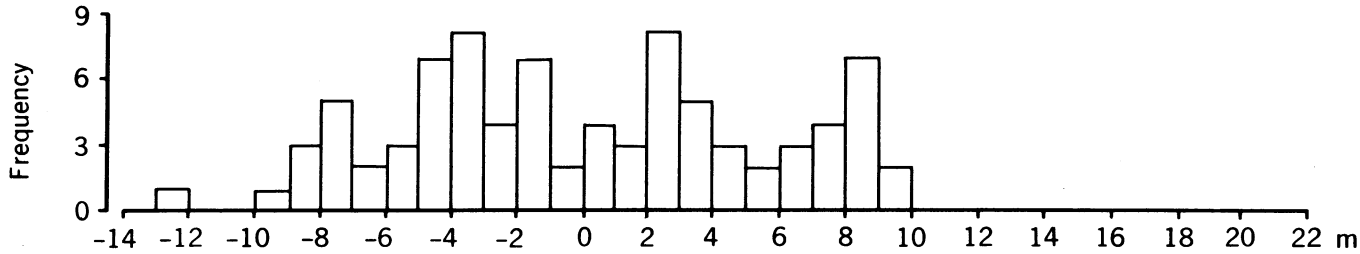

Figure 11.3a. SAD 69-Geodetic Latitude Differences*

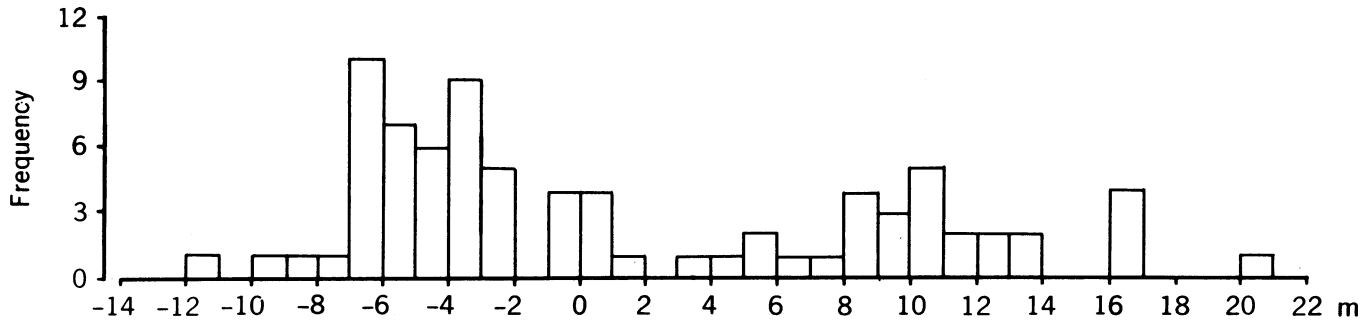

Figure 11.3b. SAD 69-Geodetic Longitude Differences*

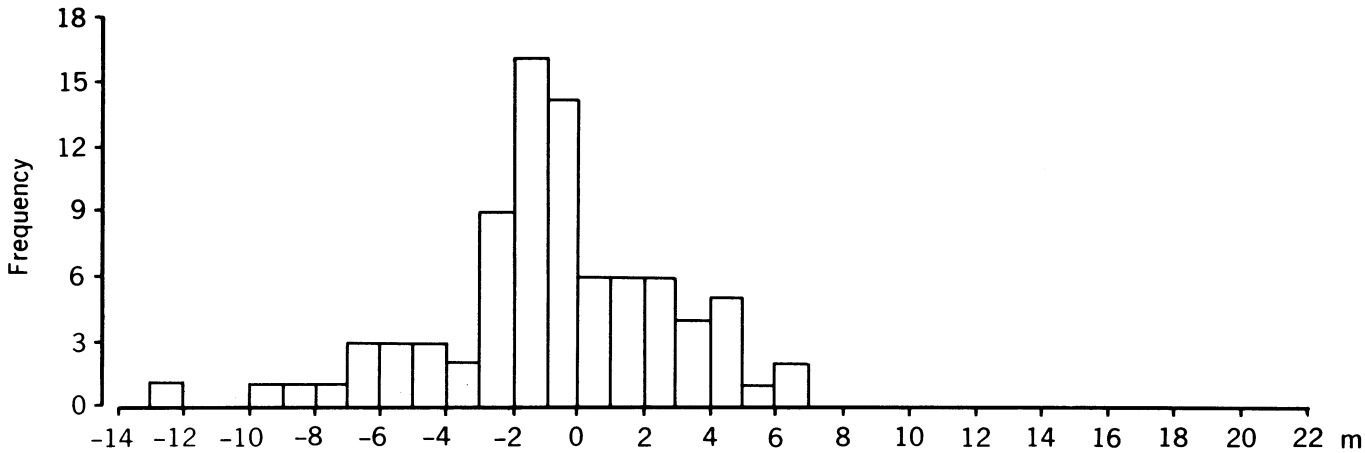

Figure 11.3c. SAD 69-Geodetic Height Differences*

*Differences = WGS 84 Coordinates Obtained From Doppler-Derived NSWC 9Z-2 Coordinates Minus WGS 84 Coordinates Computed Using SAD 69-to-WGS 84 Mean Datum Shifts ($\overline{\Delta X}$, $\overline{\Delta Y}$, $\overline{\Delta Z}$) in the Molodensky Datum Transformation Formulas.

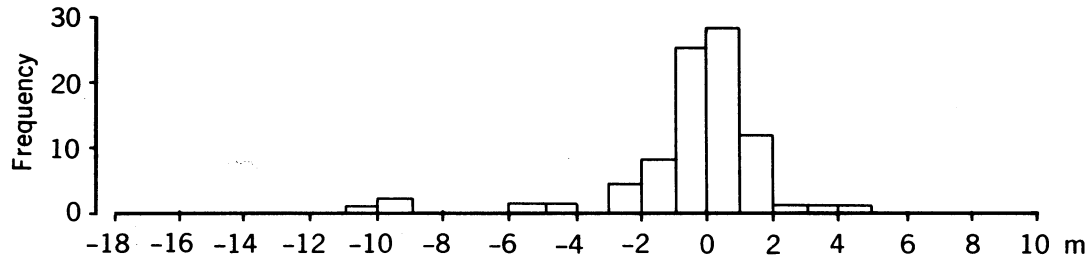

Figure 11.4a. ED 50 (Western Europe)-Geodetic Latitude Differences*

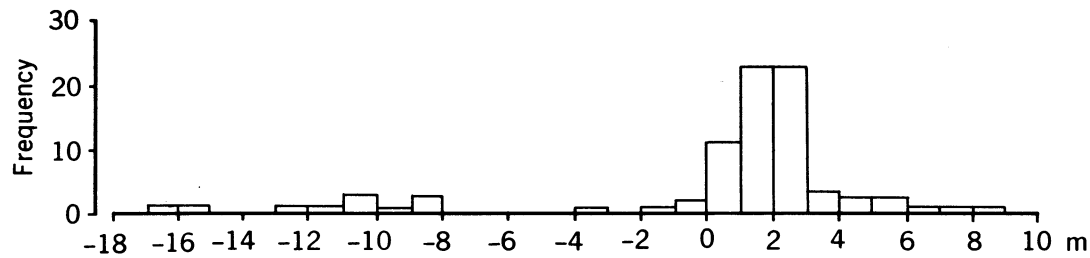

Figure 11.4b. ED 50 (Western Europe)-Geodetic Longitude Differences*

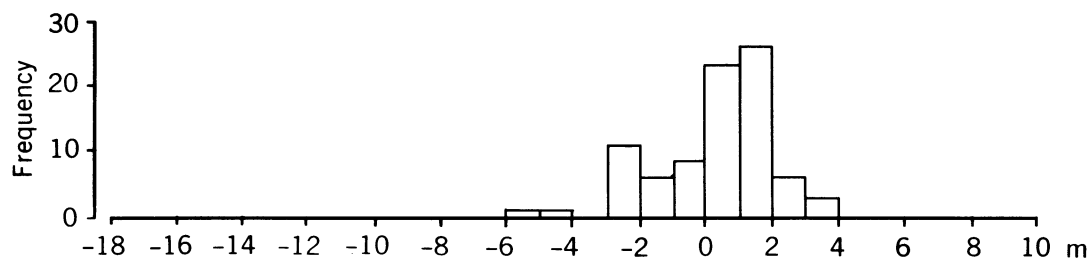

Figure 11.4c. ED 50 (Western Europe)-Geodetic Height Differences*

*Differences = WGS 84 Coordinates Obtained From Doppler-Derived NSWC 9Z-2 Coordinates Minus WGS 84 Coordinates Computed Using ED 50 (Western Europe)-to-WGS 84 Mean Datum Shifts ($\overline{\Delta X}$, $\overline{\Delta Y}$, $\overline{\Delta Z}$) in the Molodensky Datum Transformation Formulas.

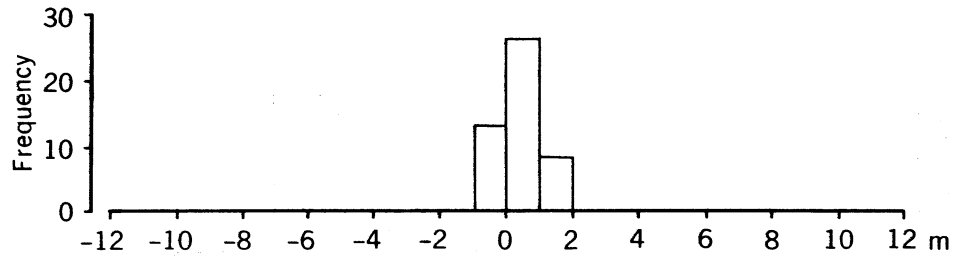

Figure 11.5a. ED 50 (UK/Ireland)-Geodetic Latitude Differences*

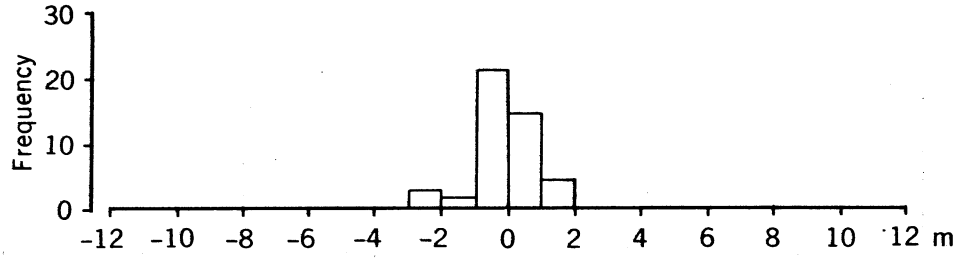

Figure 11.5b. ED 50 (UK/Ireland)-Geodetic Longitude Differences*

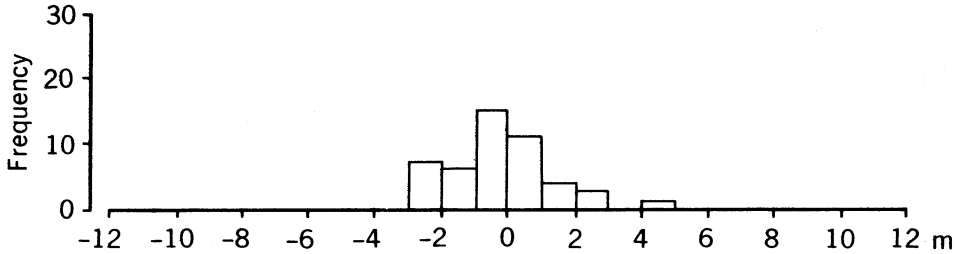

Figure 11.5c. ED 50 (UK/Ireland)-Geodetic Height Differences*

*Differences = WGS 84 Coordinates Obtained From Doppler-Derived NSWC 9Z-2 Coordinates Minus WGS 84 Coordinates Computed Using ED 50 (UK/Ireland)-to-WGS 84 Mean Datum Shifts ($\overline{\Delta X}$, $\overline{\Delta Y}$, $\overline{\Delta Z}$) in the Molodensky Datum Transformation Formulas.

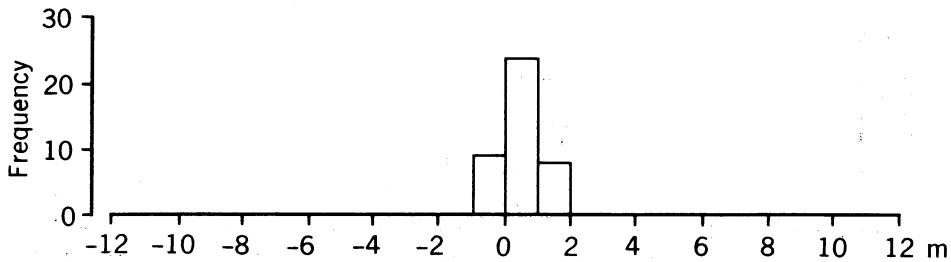

Figure 11.6a. ED 50 (UK Only)-Geodetic Latitude Differences*

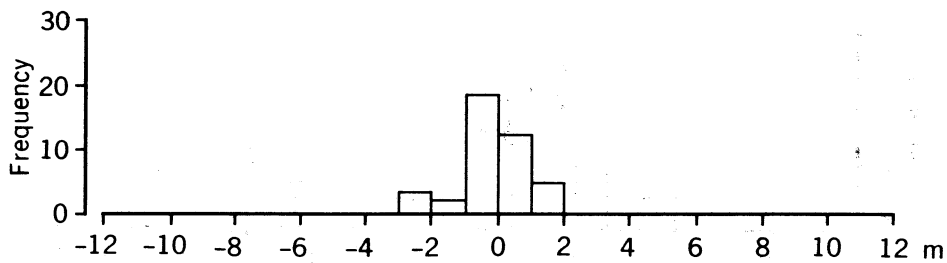

Figure 11.6b. ED 50 (UK Only)-Geodetic Longitude Differences*

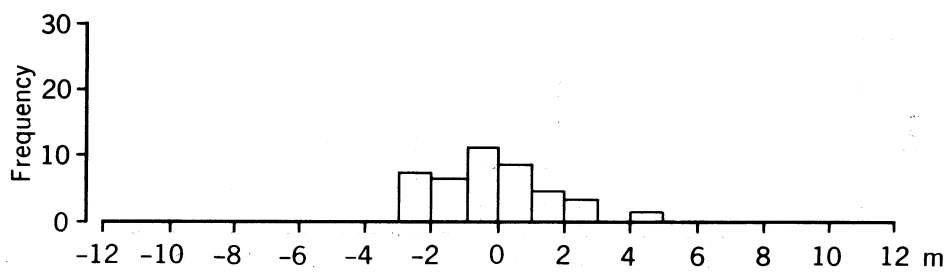

Figure 11.6c. ED 50 (UK Only)-Geodetic Height Differences*

*Differences = WGS 84 Coordinates Obtained From Doppler-Derived NSWC 9Z-2 Coordinates Minus WGS 84 Coordinates Computed Using ED 50 (UK Only)-to-WGS 84 Mean Datum Shifts ($\overline{\Delta X}$, $\overline{\Delta Y}$, $\overline{\Delta Z}$) in the Molodensky Datum Transformation Formulas.

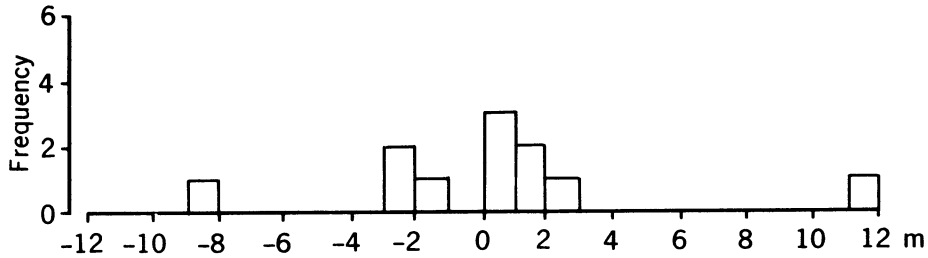

Figure 11.7a. TD-Geodetic Latitude Differences*

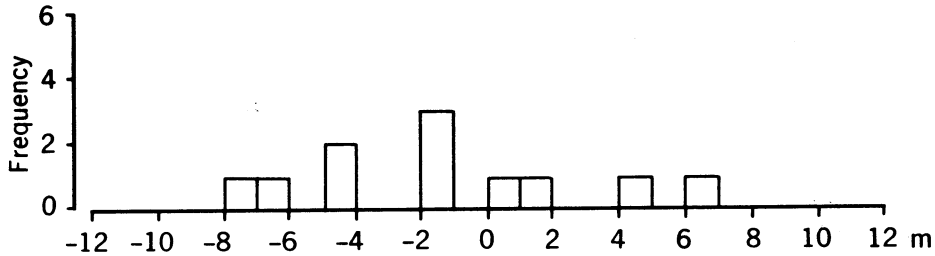

Figure 11.7b. TD-Geodetic Longitude Differences*

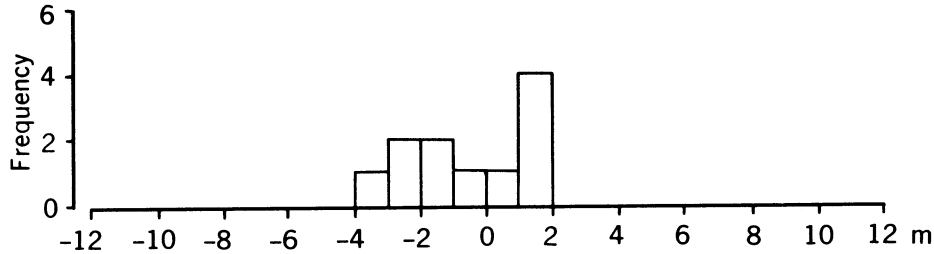

Figure 11.7c. TD-Geodetic Height Differences*

*Differences = WGS 84 Coordinates Obtained From Doppler-Derived NSWC 9Z-2 Coordinates Minus WGS 84 Coordinates Computed Using TD-to-WGS 84 Mean Datum Shifts ($\overline{\Delta X}$, $\overline{\Delta Y}$, $\overline{\Delta Z}$) in the Molodensky Datum Transformation Formulas.

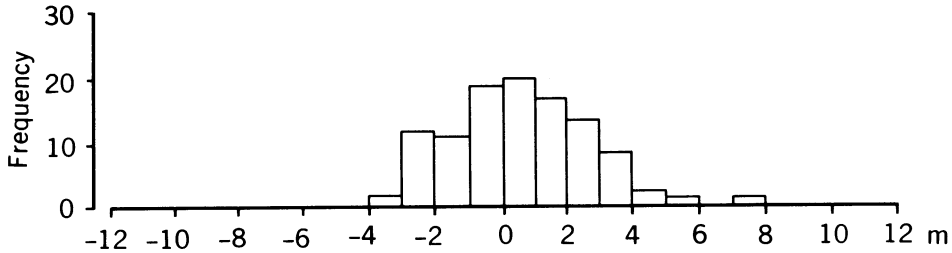

Figure 11.8a. AGD 66-Geodetic Latitude Differences*

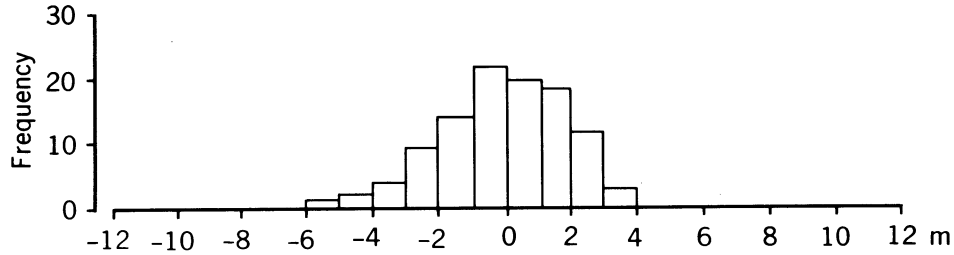

Figure 11.8b. AGD 66-Geodetic Longitude Differences*

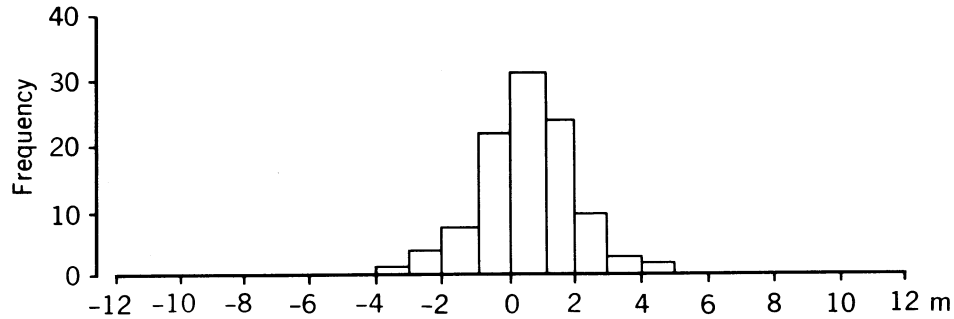

Figure 11.8c. AGD 66-Geodetic Height Differences*

*Differences = WGS 84 Coordinates Obtained From Doppler-Derived NSWC 9Z-2 Coordinates Minus WGS 84 Coordinates Computed Using AGD 66-to-WGS 84 Mean Datum Shifts ($\overline{\Delta X}$, $\overline{\Delta Y}$, $\overline{\Delta Z}$)in the Molodensky Datum Transformation Formulas.

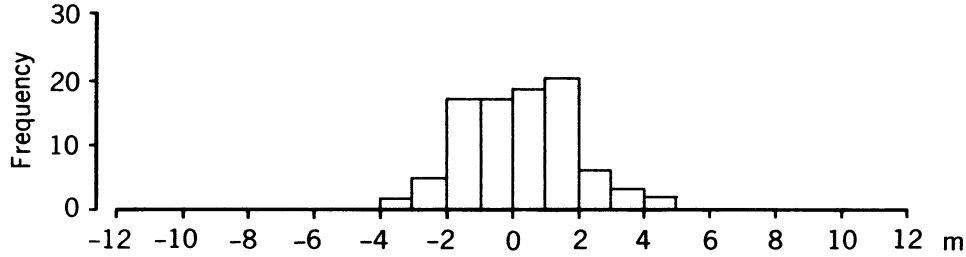

Figure 11.9a. AGD 84 - Geodetic Latitude Differences*

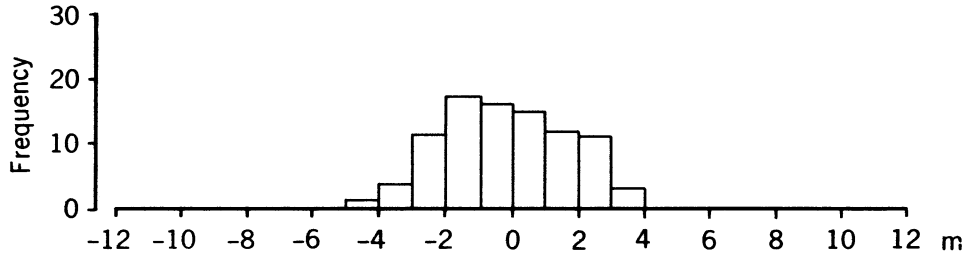

Figure 11.9b. AGD 84 - Geodetic Longitude Differences*

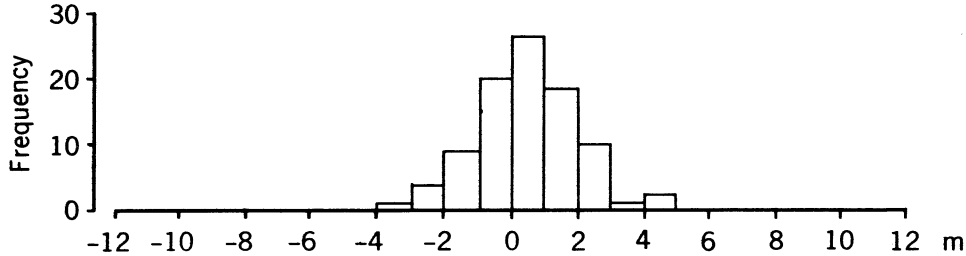

Figure 11.9c. AGD 84 - Geodetic Height Differences*

*Differences = WGS 84 Coordinates Obtained From Doppler-Derived NSWC 9Z-2 Coordinates Minus WGS 84 Coordinates Computed Using AGD 84-to-WGS 84 Mean Datum Shifts ($\overline{\Delta X}$, $\overline{\Delta Y}$, $\overline{\Delta Z}$) in the Molodensky Datum Transformation Formulas.

SECTION 12

NON-DOPPLER DERIVED
DATUM TRANSFORMATION PARAMETERS
- LOCAL GEODETIC SYSTEMS TO WGS 84 -

Table 12.1

Non-Doppler Derived Datum Transformation Parameters
- Local Geodetic Systems to WGS 84 -

Local Geodetic Systems	Reference Ellipsoids and Parameter Differences*			Transformation Parameters*		
	Name	Δa (m)	$\Delta f \times 10^4$	ΔX(m)	ΔY(m)	ΔZ(m)
BUKIT RIMPAH Bangka and Belitung Islands (Indonesia)	Bessel 1841	739.845	0.10037483	-384	664	-48
CAMP AREA ASTRO Camp McMurdo Area, Antarctica	International	-251	-0.14192702	-104	-129	239
G. SEGARA Kalimantan Island (Indonesia)	Bessel 1841	739.845	0.10037483	-403	684	41
HERAT NORTH Afghanistan	International	-251	-0.14192702	-333	-222	114
HU-TZU-SHAN Taiwan	International	-251	-0.14192702	-634	-549	-201
TANANARIVE OBSERVATORY 1925 Madagascar	International	-251	-0.14192702	-189	-242	-91
YACARE Uruguay	International	-251	-0.14192702	-155	171	37

* WGS 84 minus local geodetic system

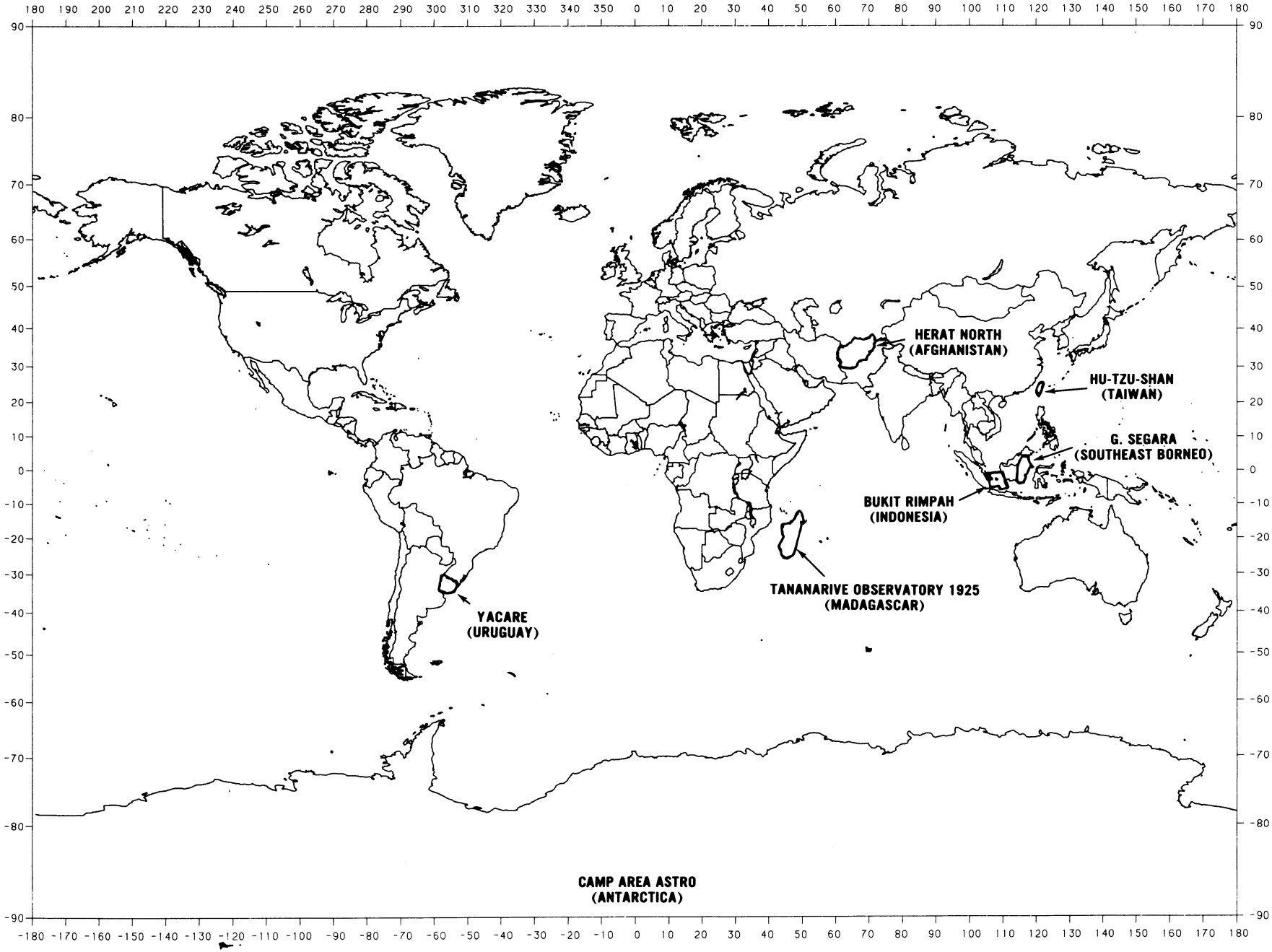

Figure 12.1. Local Geodetic Systems (Table 12.1) Related to WGS 84 Using Non-Doppler Derived Local Geodetic System-to-WGS 84 Datum Transformation Parameters

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SECTION 13

LOCAL GEODETIC SYSTEM-TO-WGS 84 DATUM SHIFTS

- ΔX, ΔY, ΔZ CONTOUR CHARTS FOR MAJOR DATUMS - *

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* THE ΔX, ΔY, ΔZ VALUES MAY BE USED IN THE MOLODENSKY DATUM TRANSFORMATION FORMULAS (TABLE 6.4), OR IN THE FORMULAS:

$$X_{WGS\ 84} = X_{LGS} + \Delta X$$

$$Y_{WGS\ 84} = Y_{LGS} + \Delta Y$$

$$Z_{WGS\ 84} = Z_{LGS} + \Delta Z$$

[LGS = LOCAL GEODETIC SYSTEM]

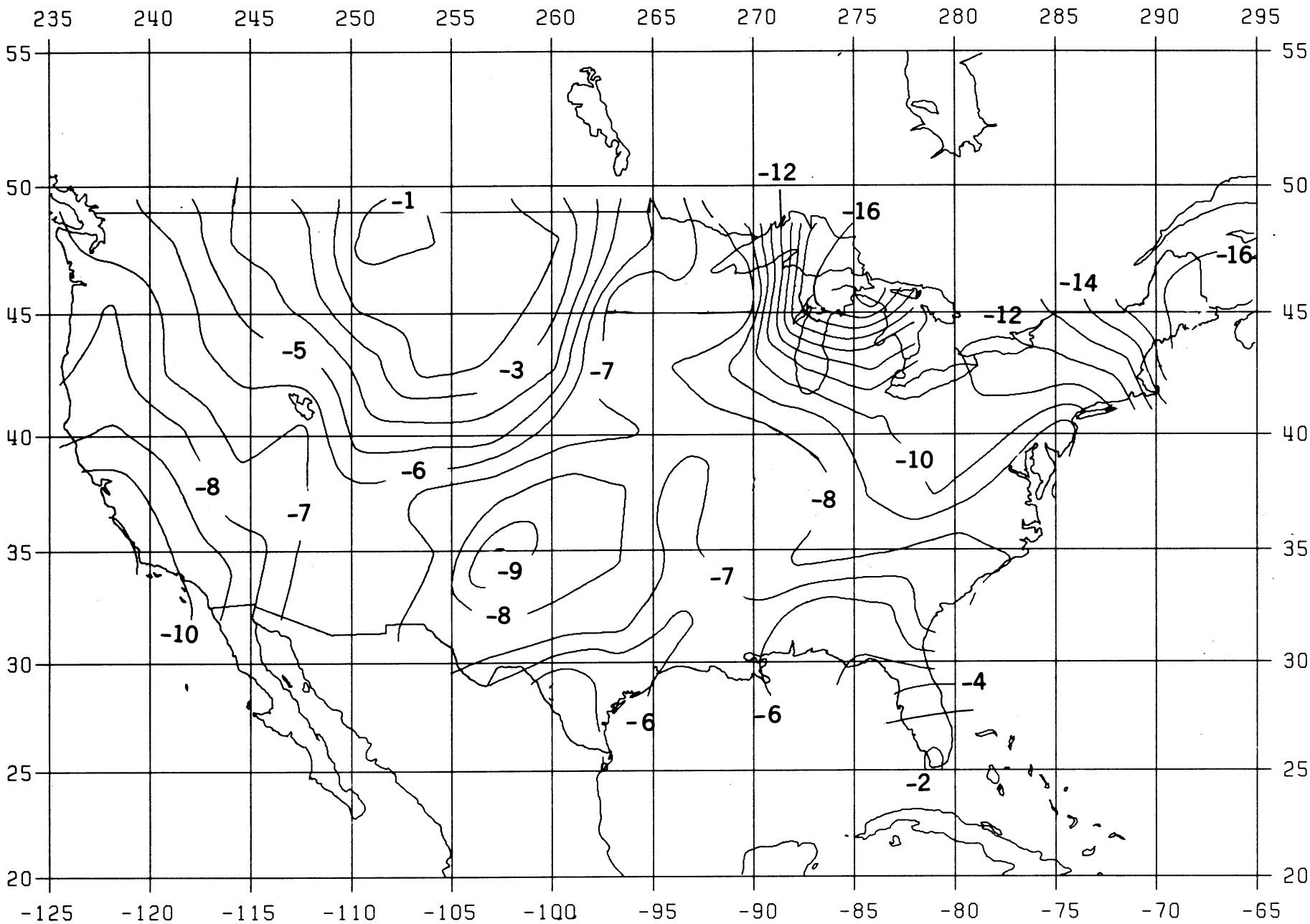

Figure 13.1. Contour Chart–NAD 27 to WGS 84 Datum Shifts (CONUS), ΔX Component (Contour Interval = 1 Meter)

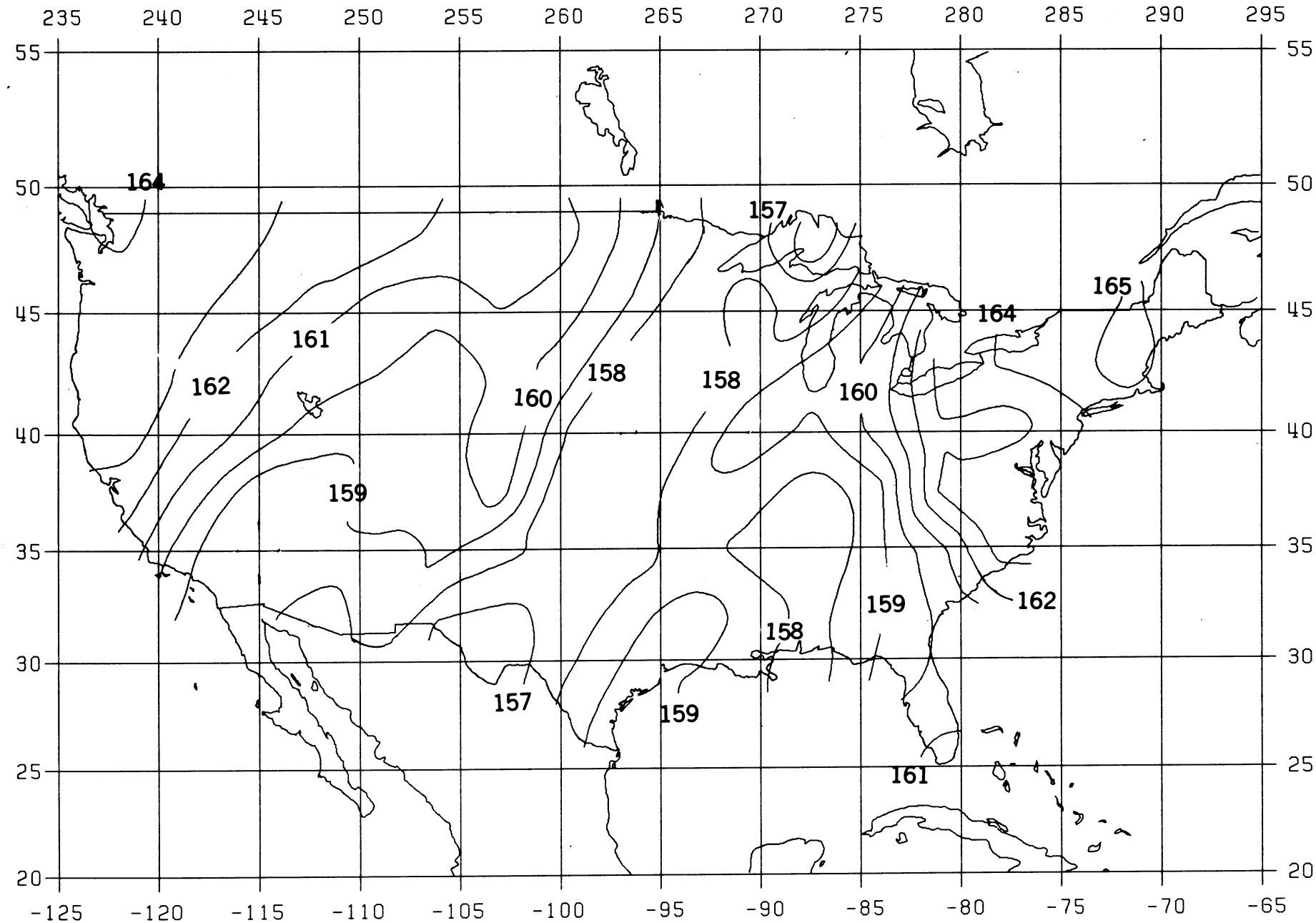

Figure 13.2. Contour Chart–NAD 27 to WGS 84 Datum Shifts (CONUS), ΔY Component (Contour Interval = 1 Meter)

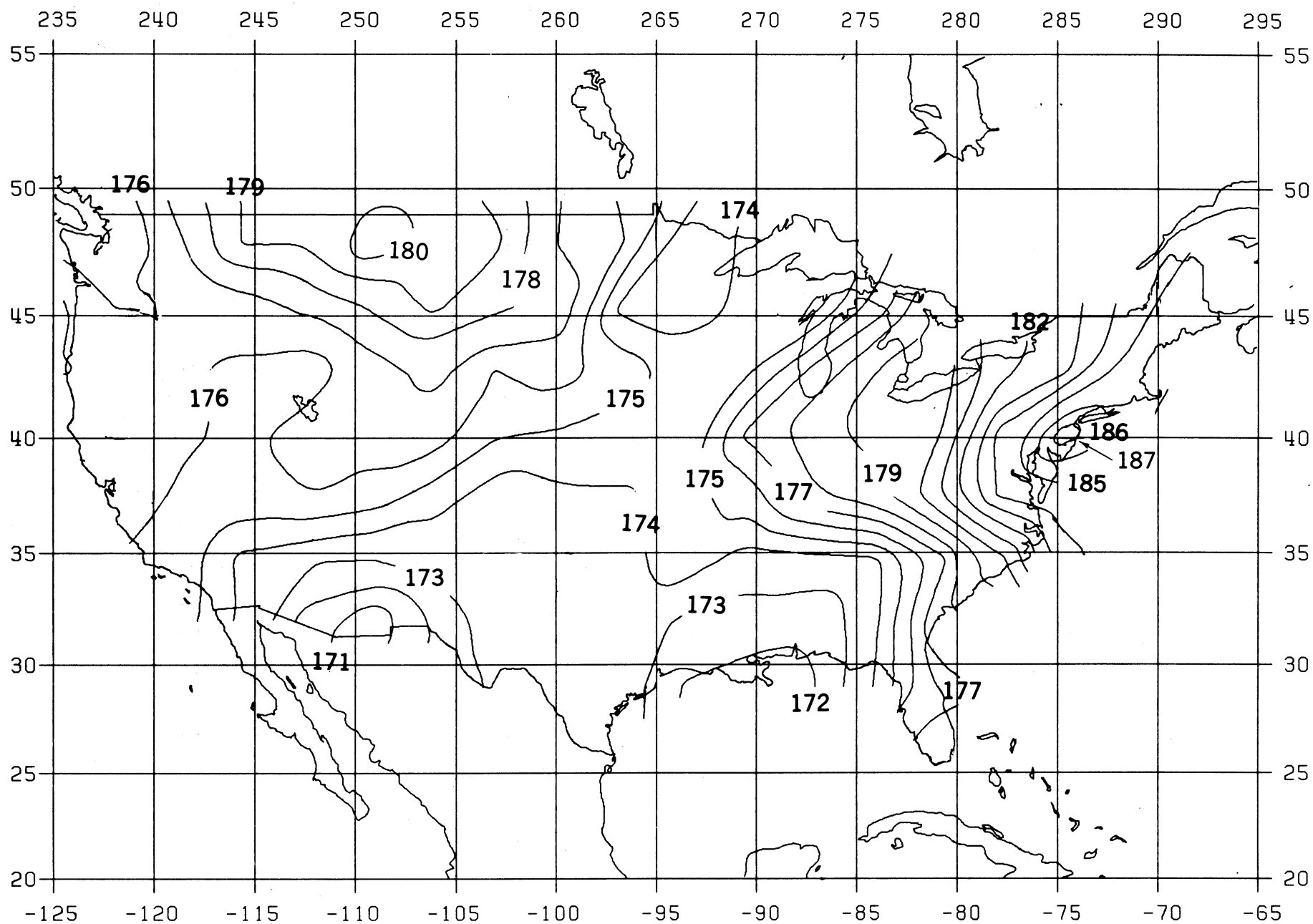

Figure 13.3. Contour Chart–NAD 27 to WGS 84 Datum Shifts (CONUS), ΔZ Component (Contour Interval = 1 Meter)

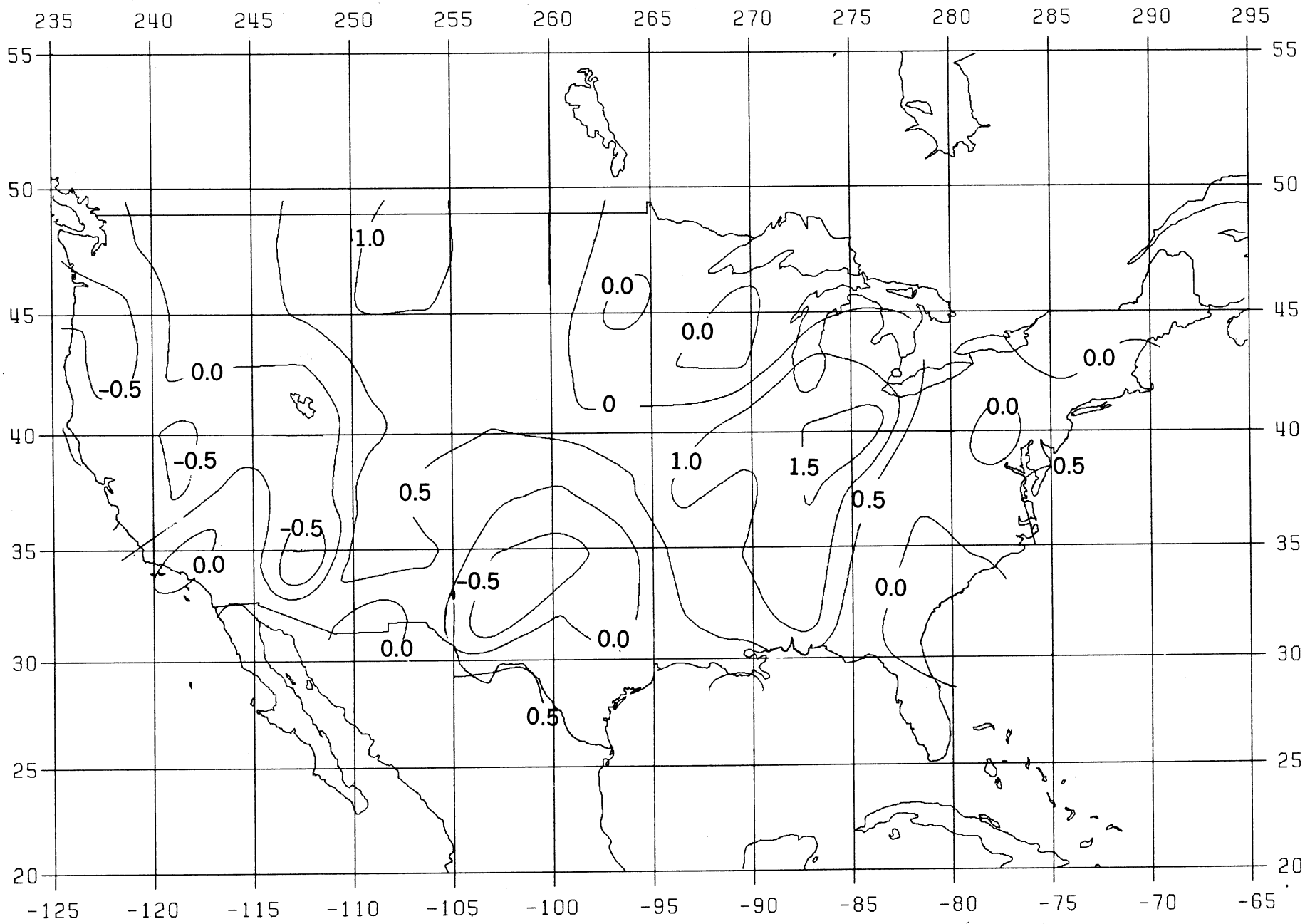

Figure 13.4. Contour Chart – NAD 83 to WGS 84 Datum Shifts (CONUS), ΔX Component (Contour Interval = 0.5 Meter)

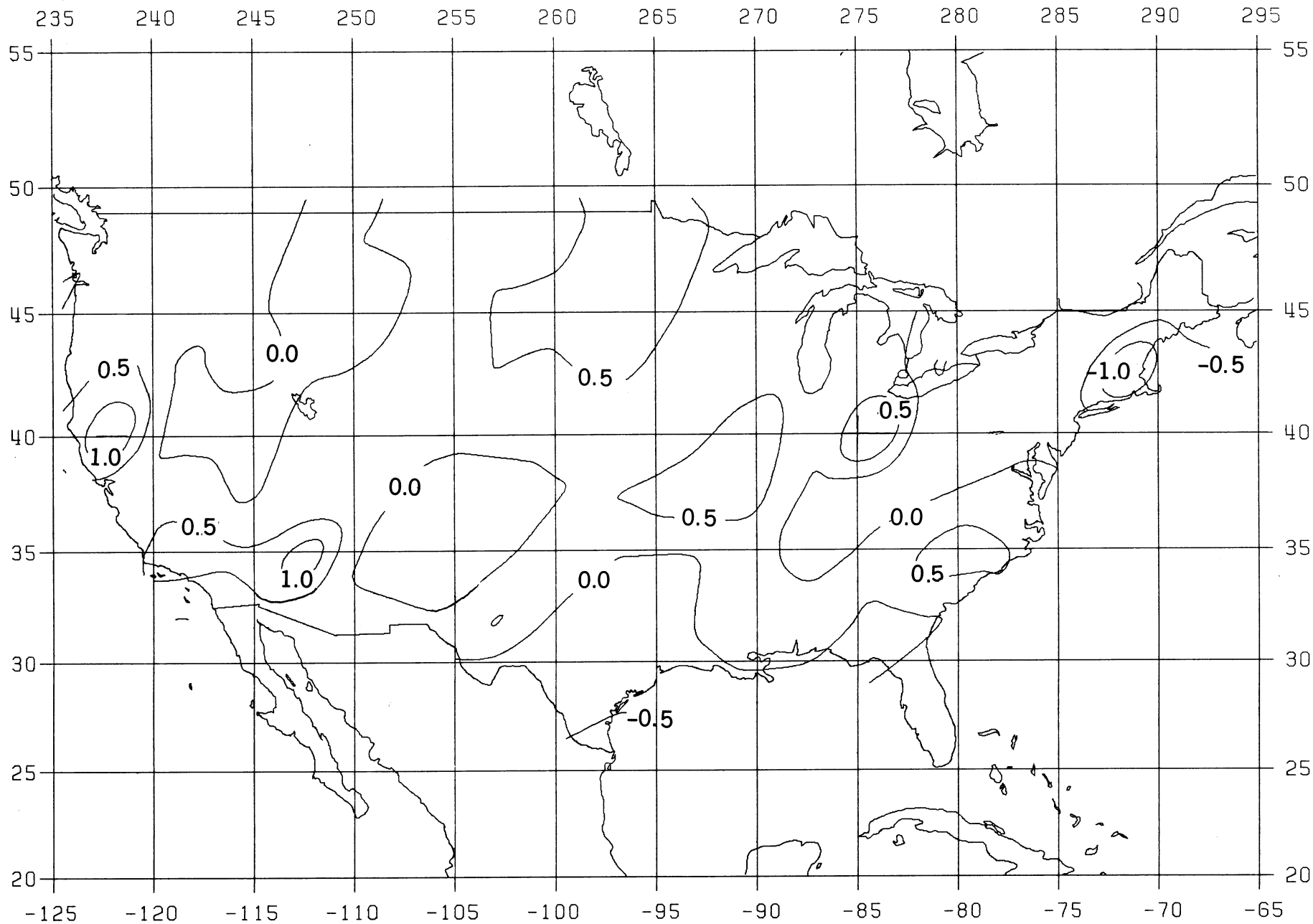

Figure 13.5. Contour Chart - NAD 83 to WGS 84 Datum Shifts (CONUS), ΔY Component (Contour Interval = 0.5 Meter)

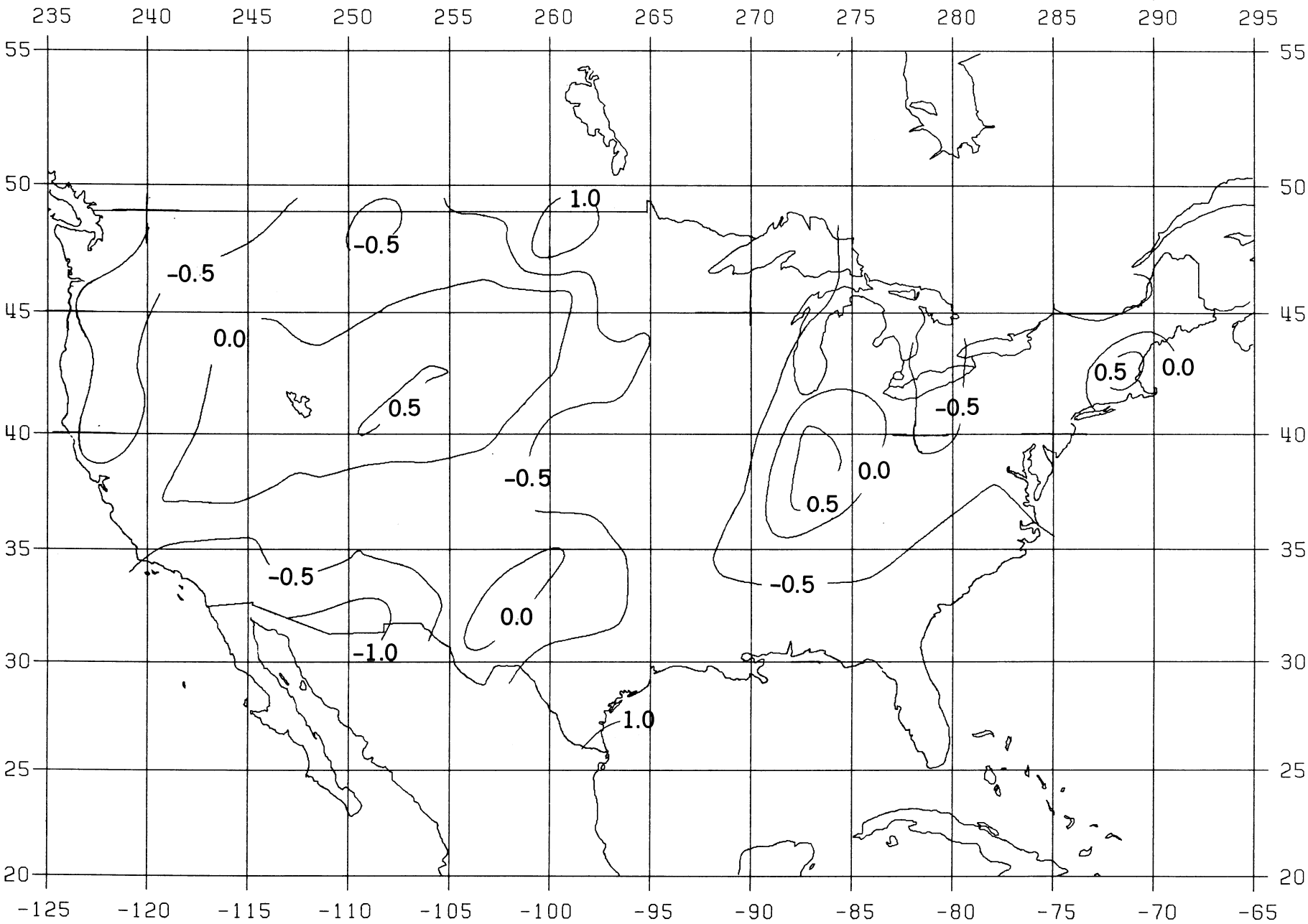

Figure 13.6. Contour Chart - NAD 83 to WGS 84 Datum Shifts (CONUS), ΔZ Component (Contour Interval = 0.5 Meter)

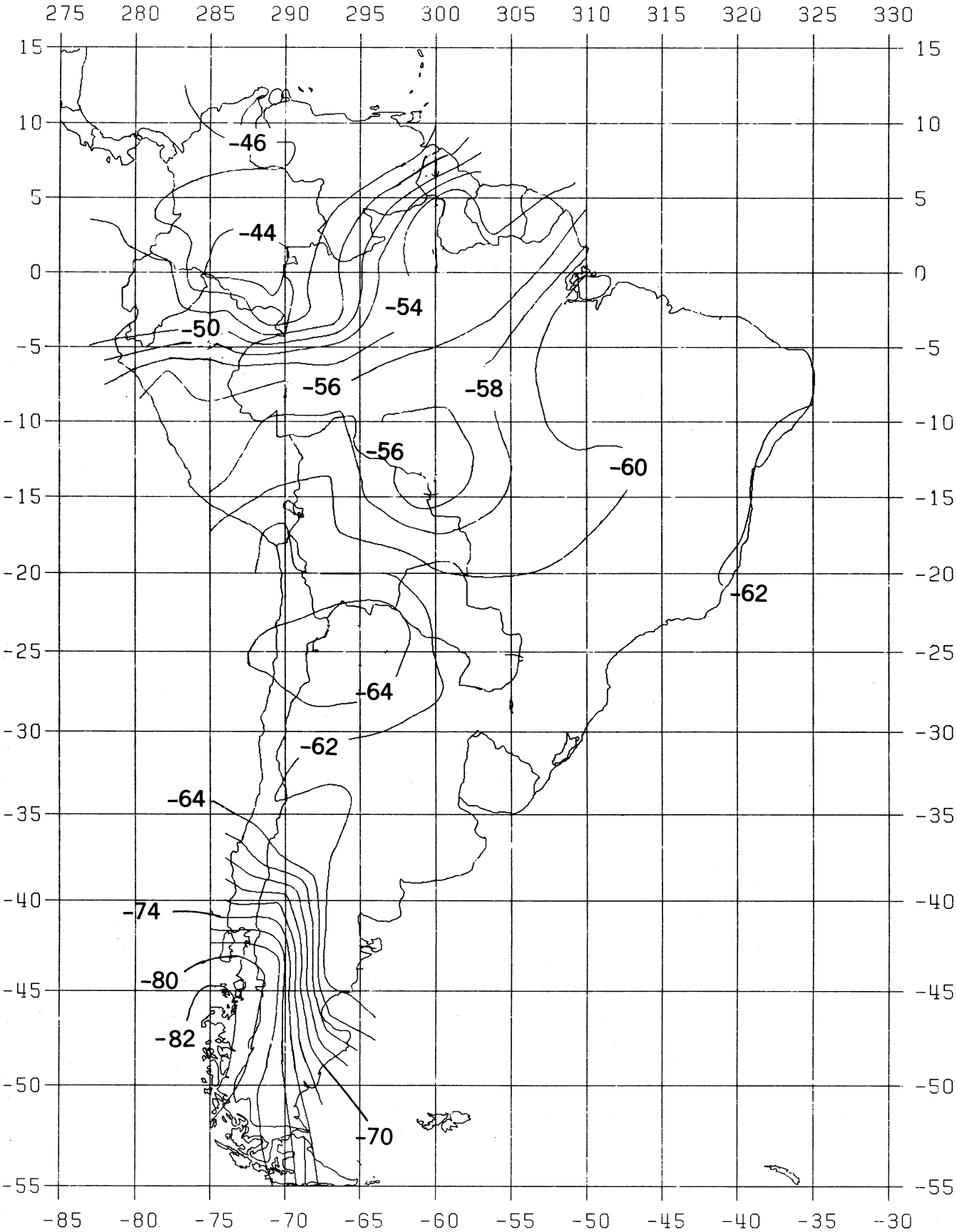

Figure 13.7. Contour Chart - SAD 69 to WGS 84 Datum Shifts, ΔX Component
(Contour Interval = 2 Meters)

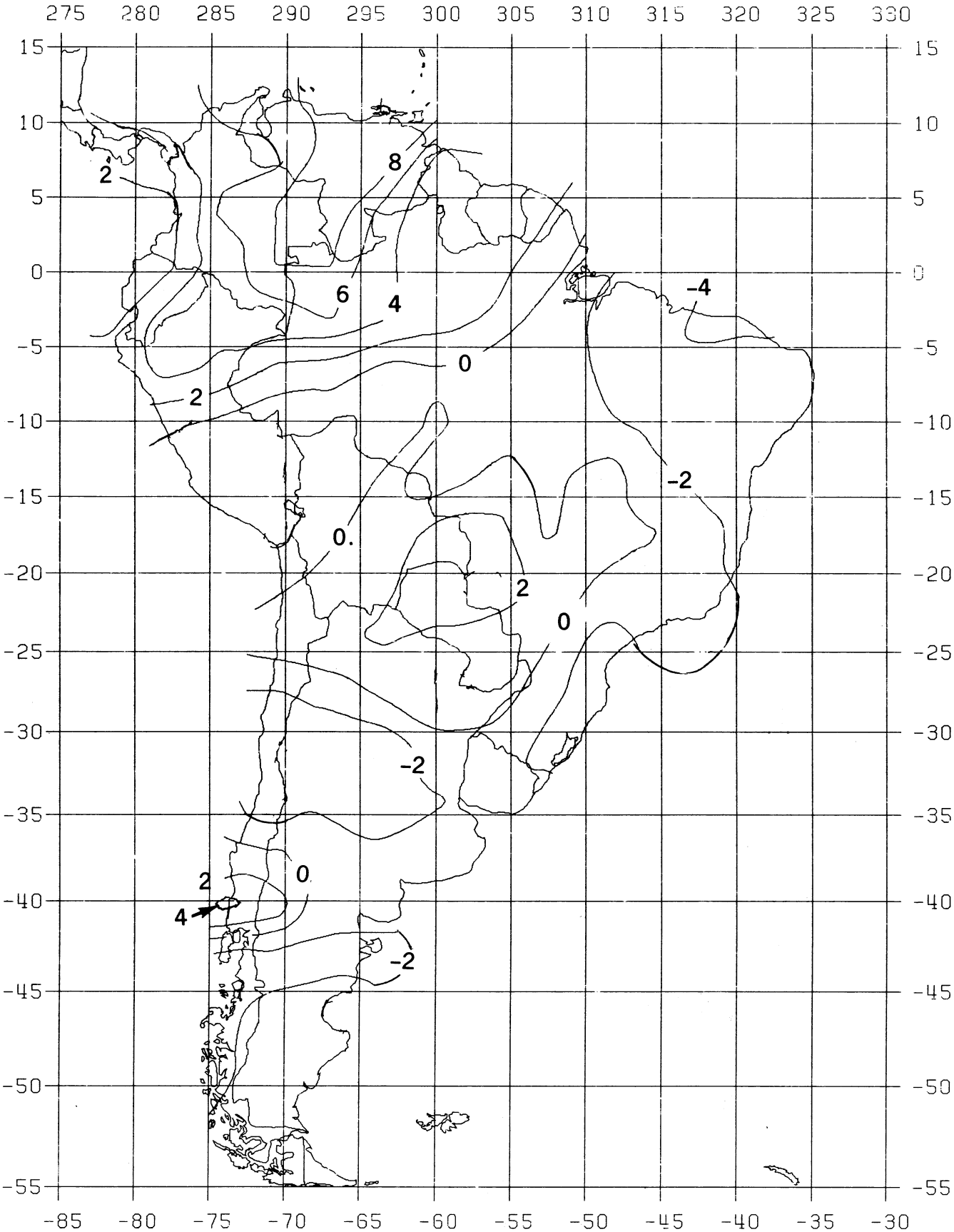

Figure 13.8. Contour Chart – SAD 69 to WGS 84 Datum Shifts, ΔY Component
(Contour Interval = 2 Meters)

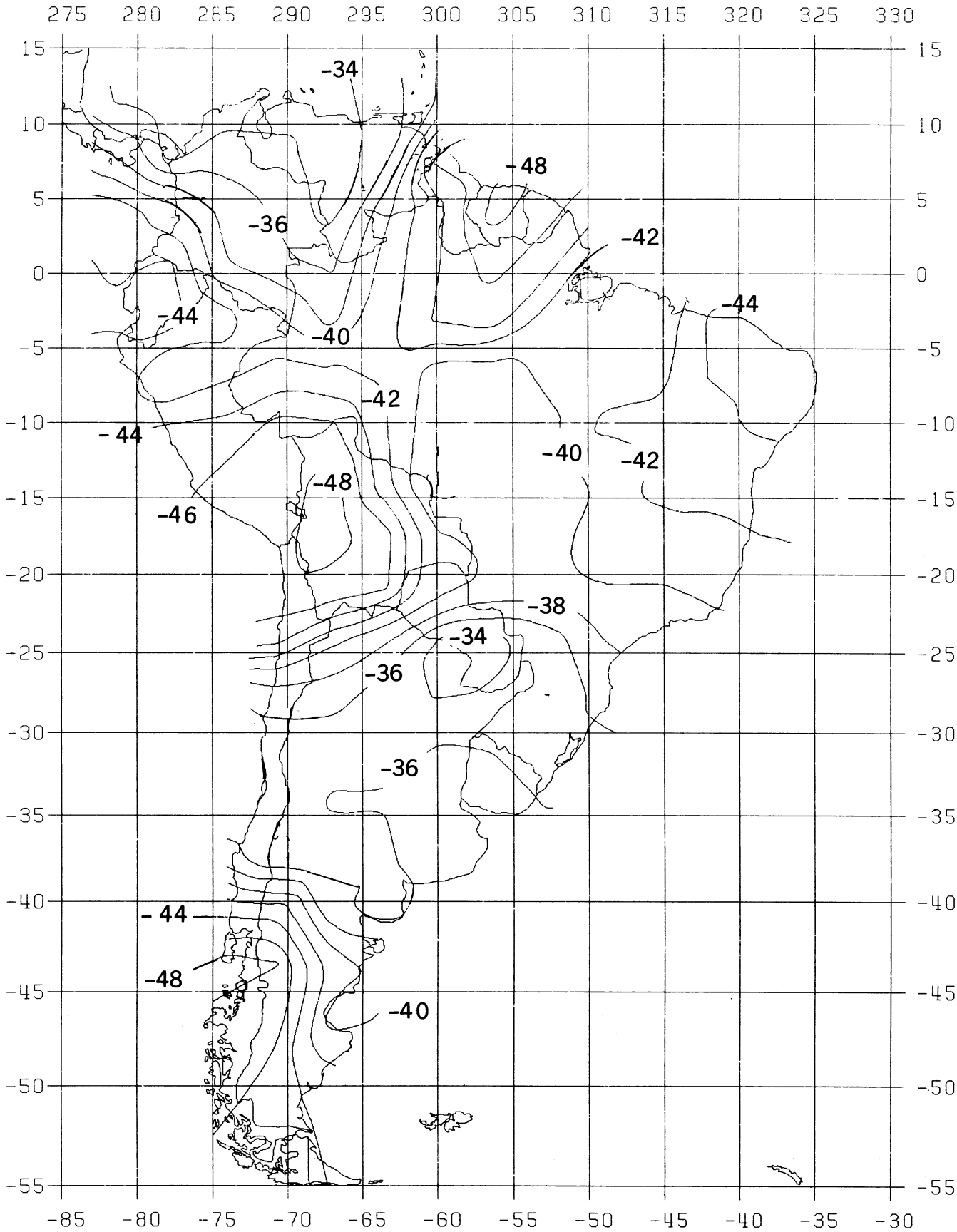

Figure 13.9. Contour Chart - SAD 69 to WGS 84 Datum Shifts, ΔZ Component
(Contour Interval = 2 Meters)

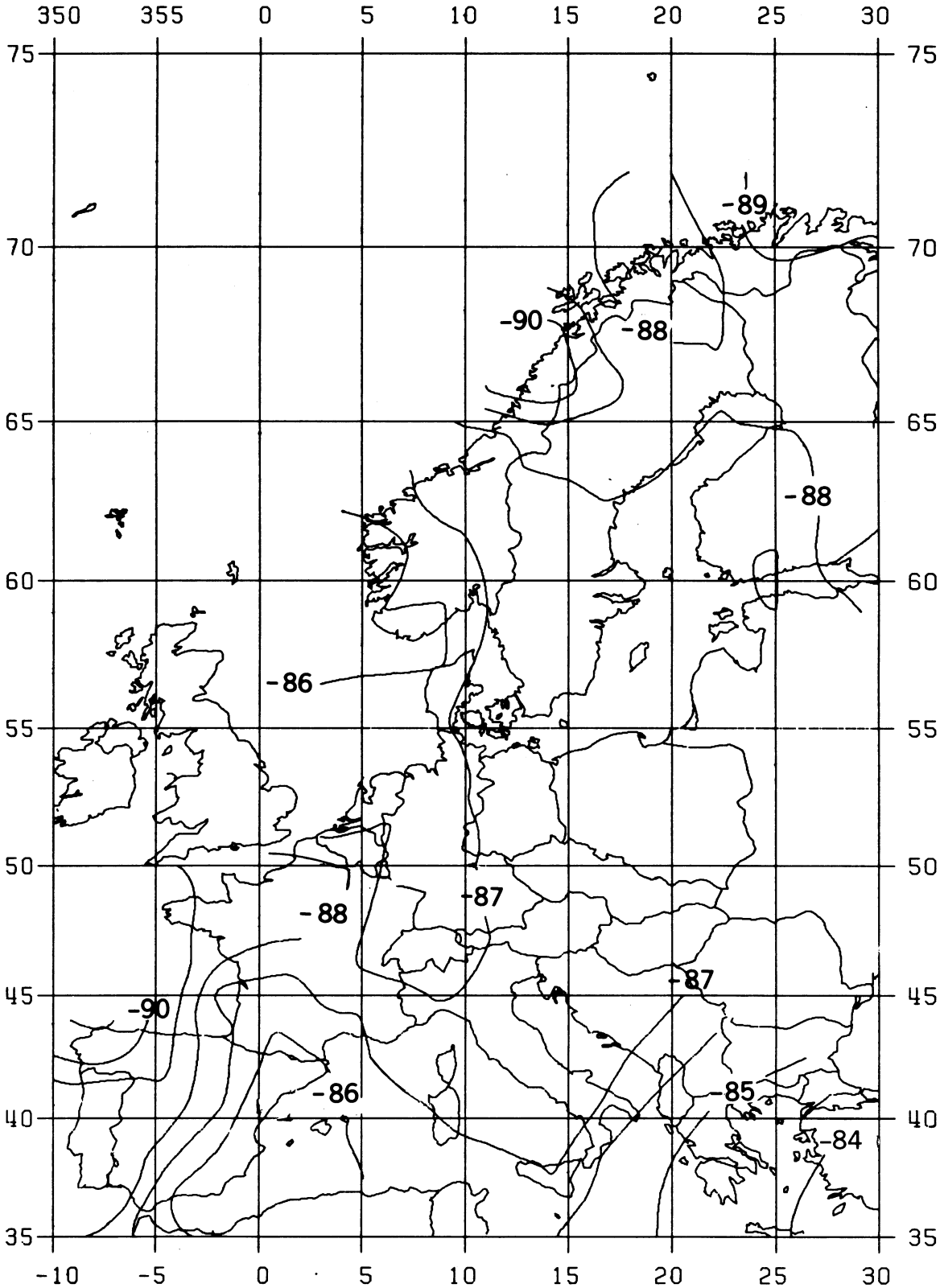

Figure 13.10. Contour Chart-ED 50 (Western Europe) to WGS 84 Datum Shifts, ΔX Component (Contour Interval = 1 Meter)

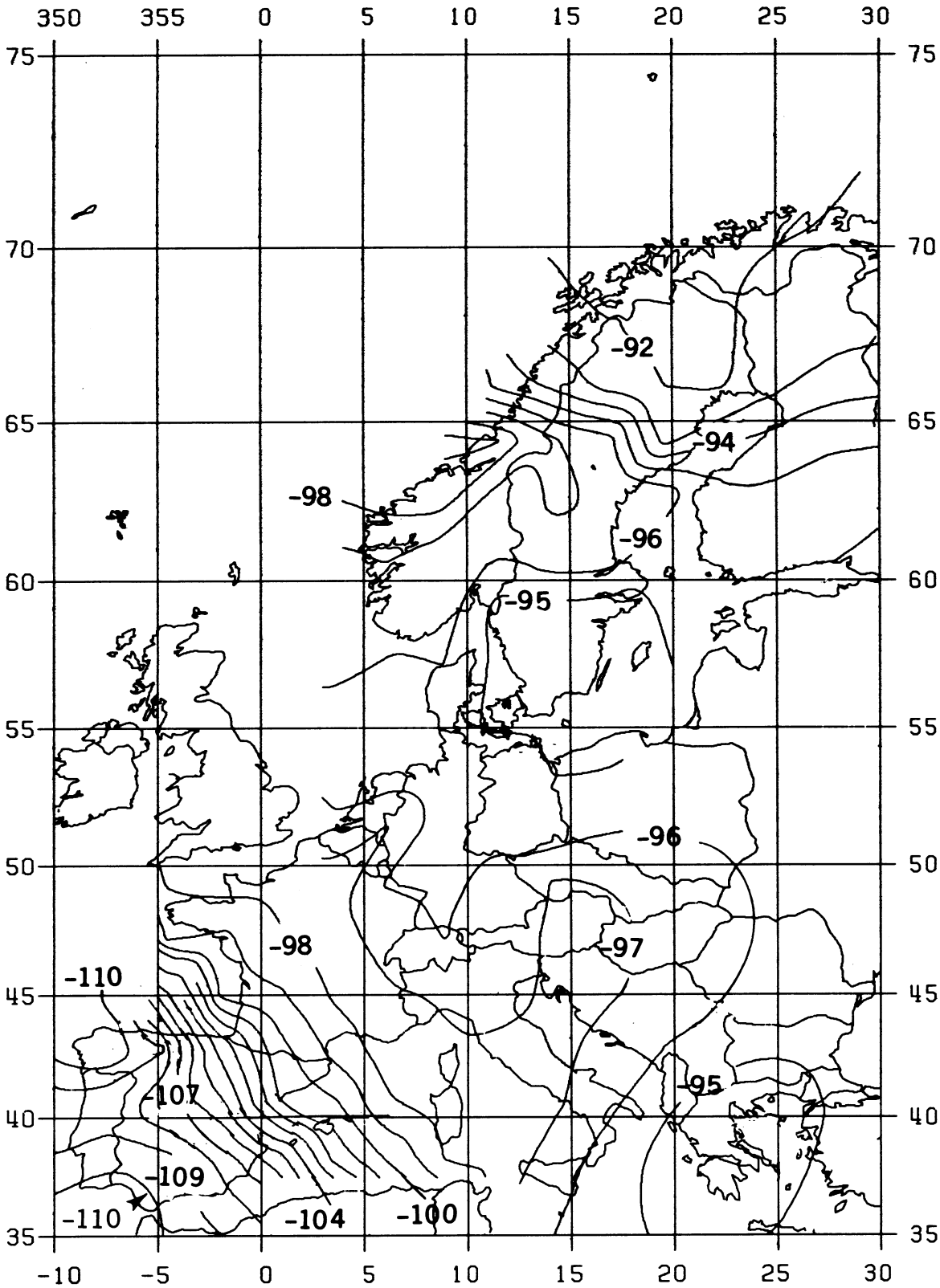

Figure 13.11. Contour Chart-ED 50 (Western Europe) to WGS 84 Datum Shifts, ΔY Component (Contour Interval = 1 Meter)

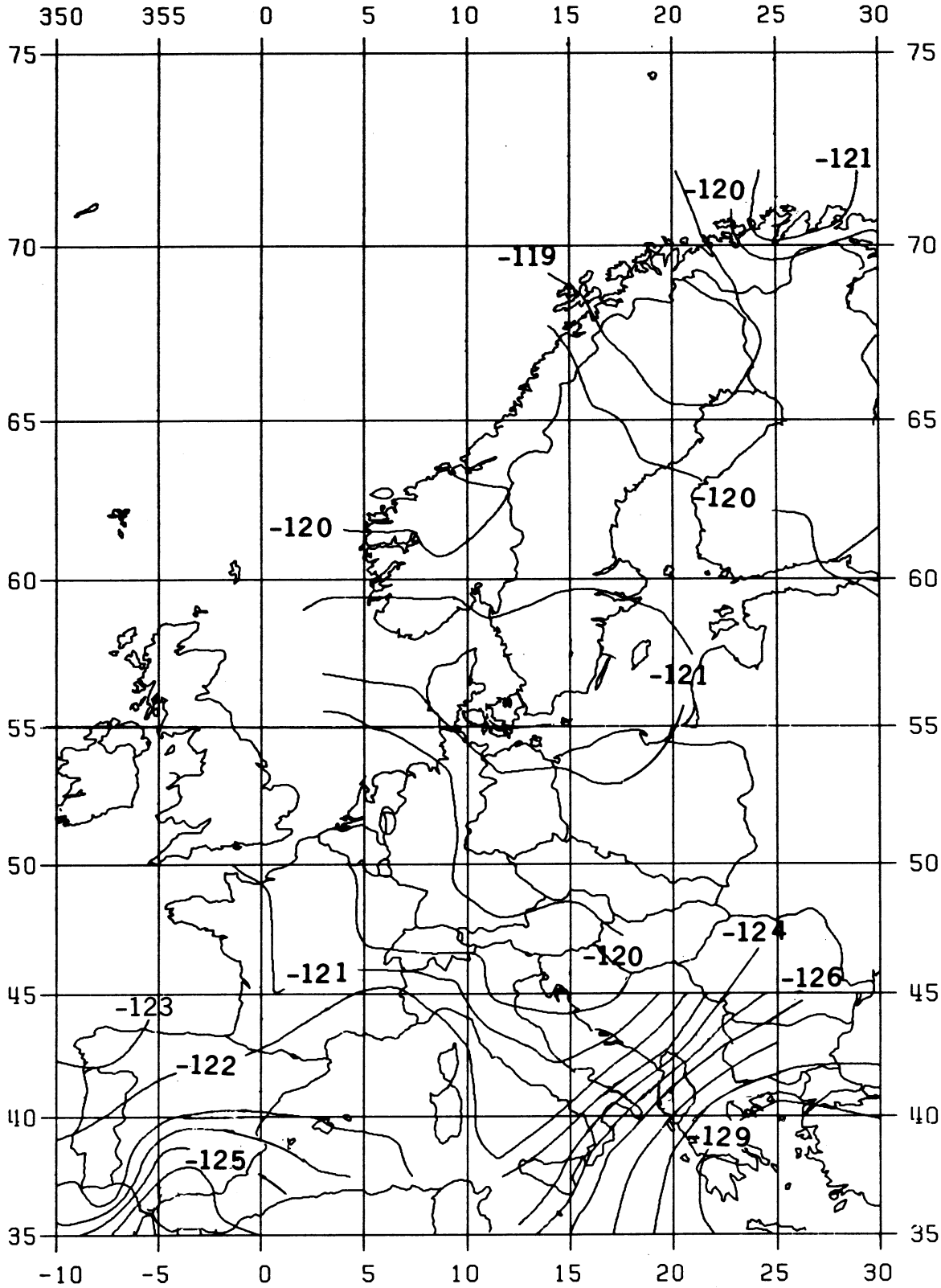

Figure 13.12. **Contour Chart–ED 50 (Western Europe) to WGS 84 Datum Shifts, ΔZ Component (Contour Interval = 1 Meter)**

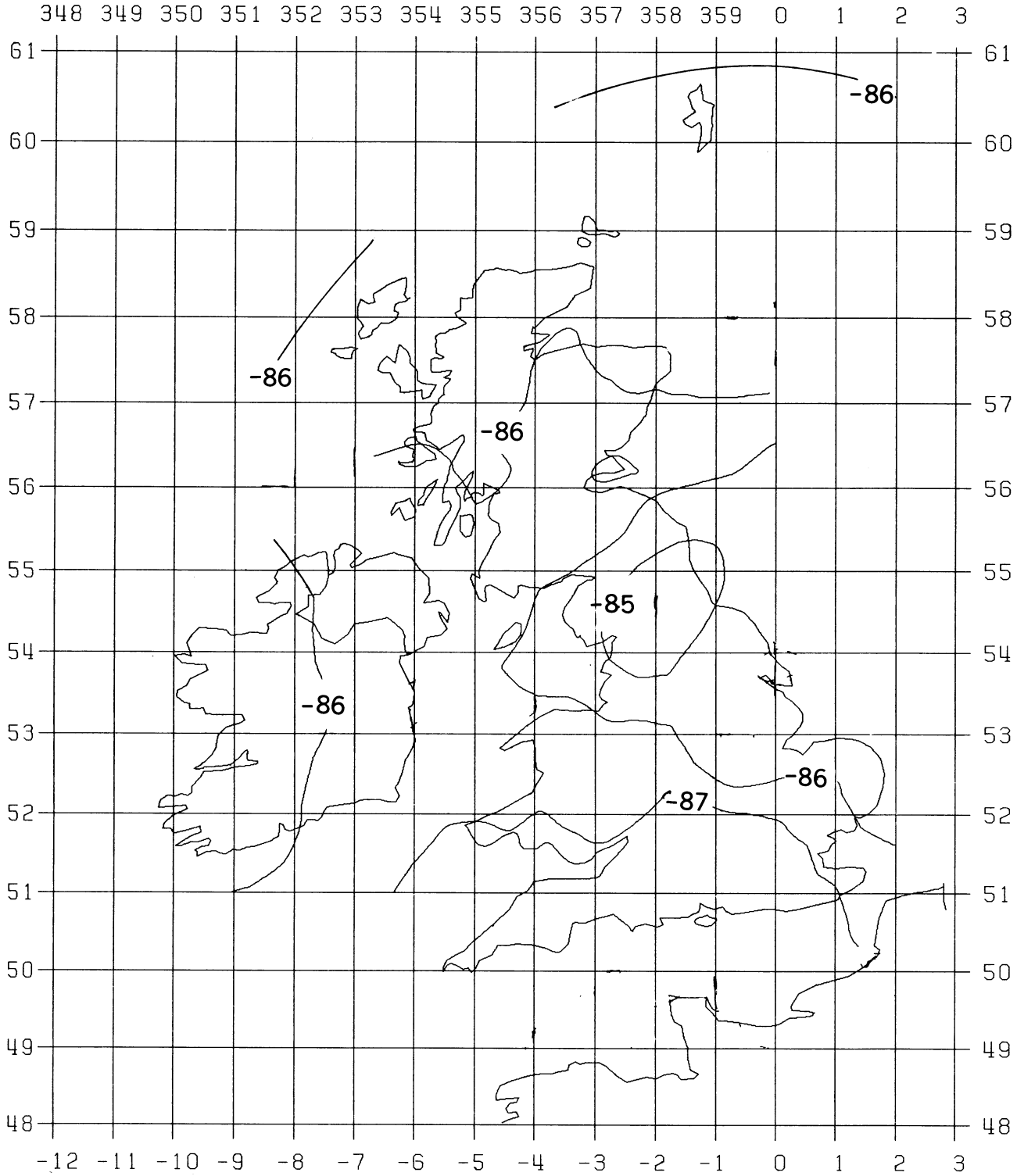

Figure 13.13. Contour Chart - ED 50 (UK/Ireland) to WGS 84 Datum Shifts, ΔX Component (Contour Interval = 1 Meter)

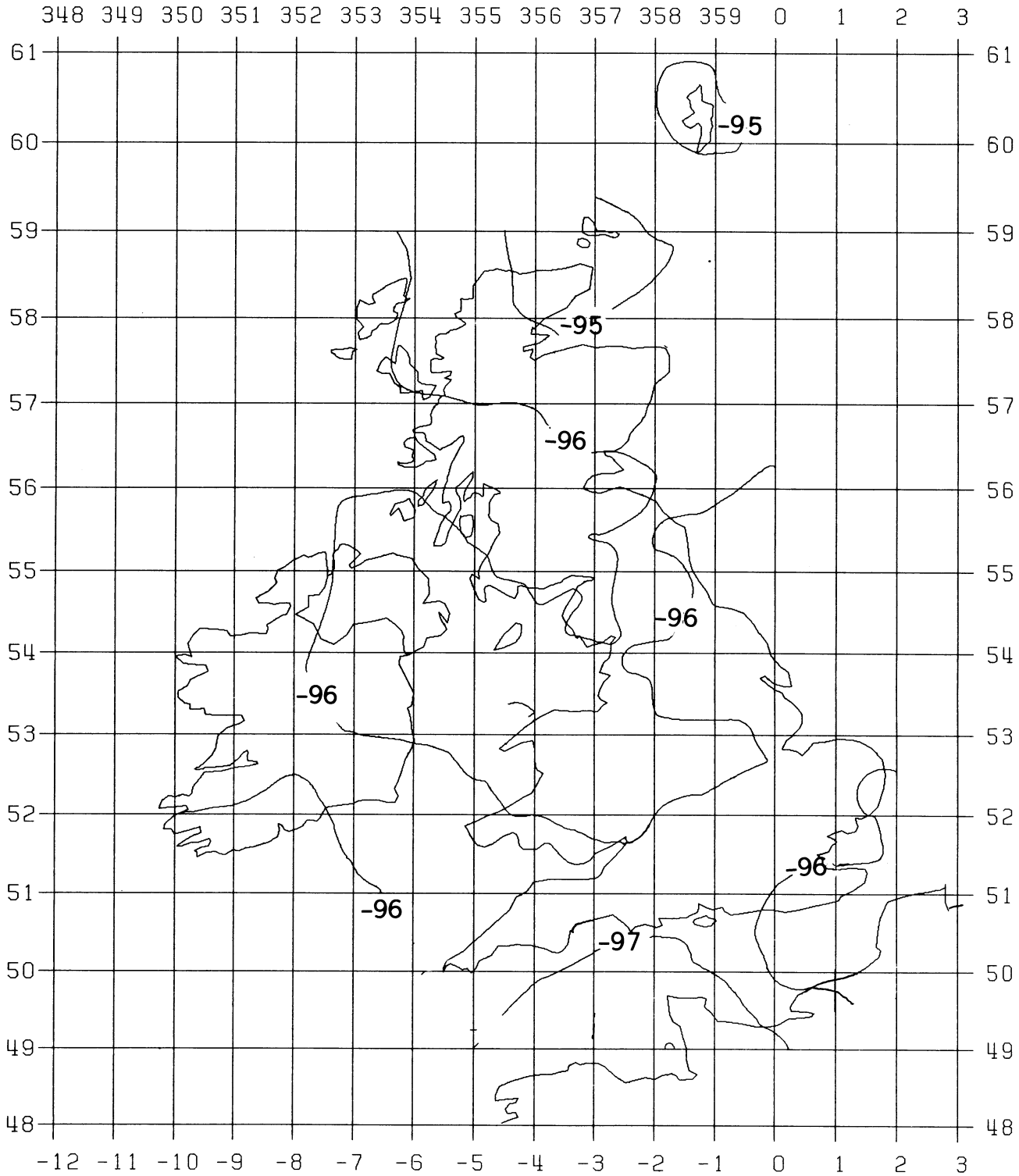

Figure 13.14. Contour Chart – ED 50 (UK/Ireland) to WGS 84 Datum Shifts, ΔY Component (Contour Interval = 1 Meter)

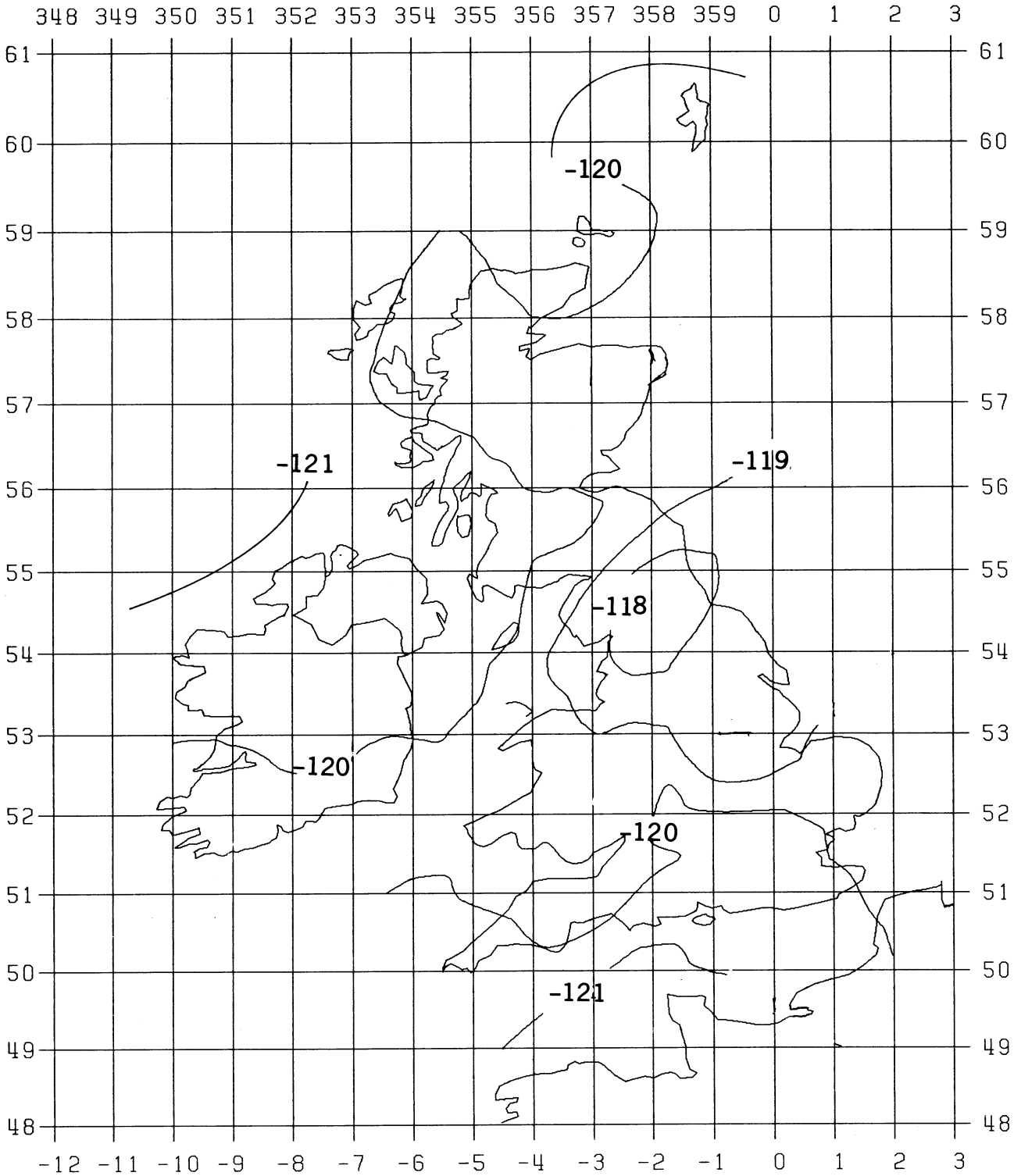

Figure 13.15. Contour Chart - ED 50 (UK/Ireland) to WGS 84 Datum Shifts, ΔZ Component (Contour Interval = 1 Meter)

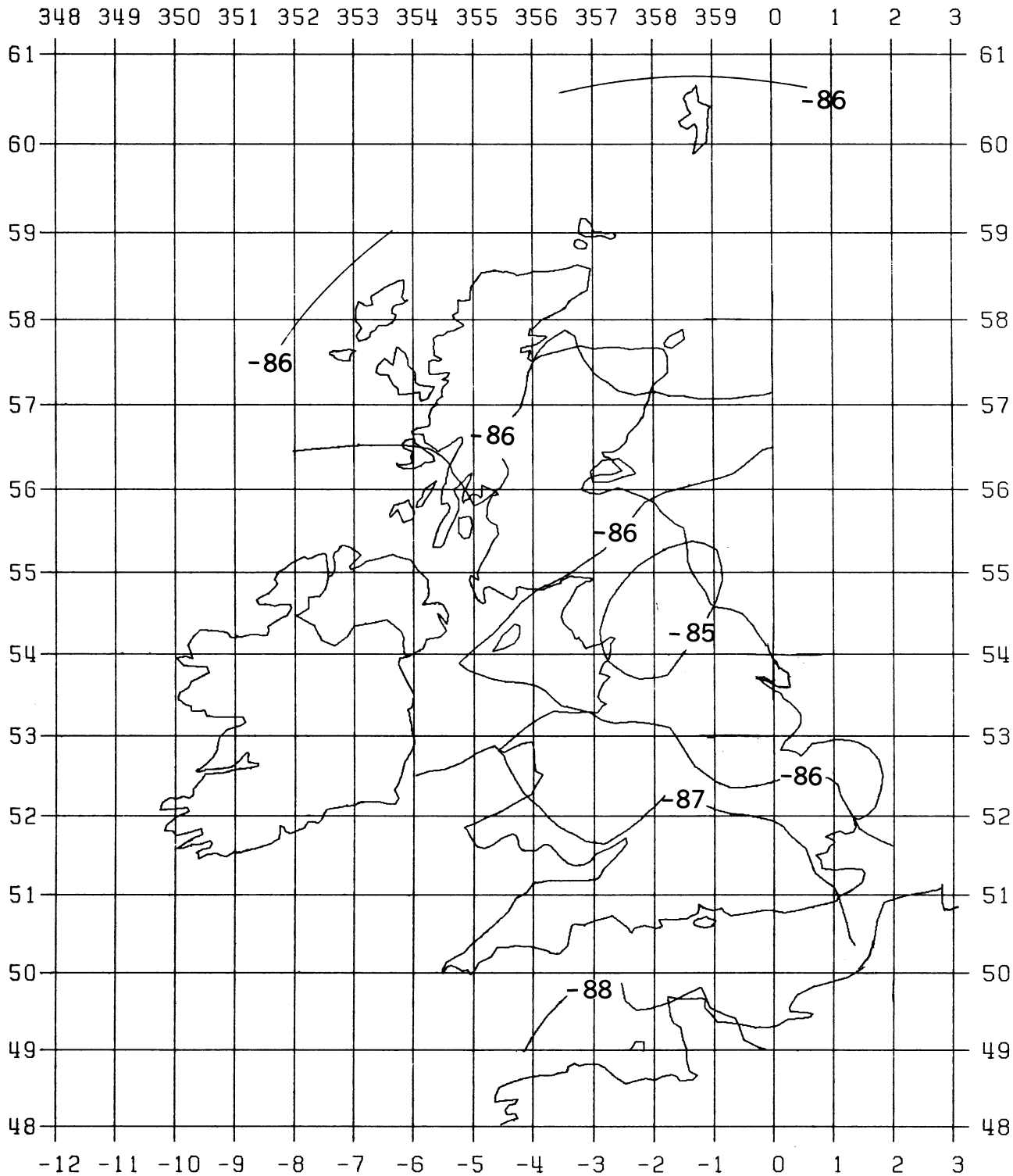

Figure 13.16. Contour Chart - ED 50 (UK Only) to WGS 84 Datum Shifts, △X Component (Contour Interval = 1 Meter)

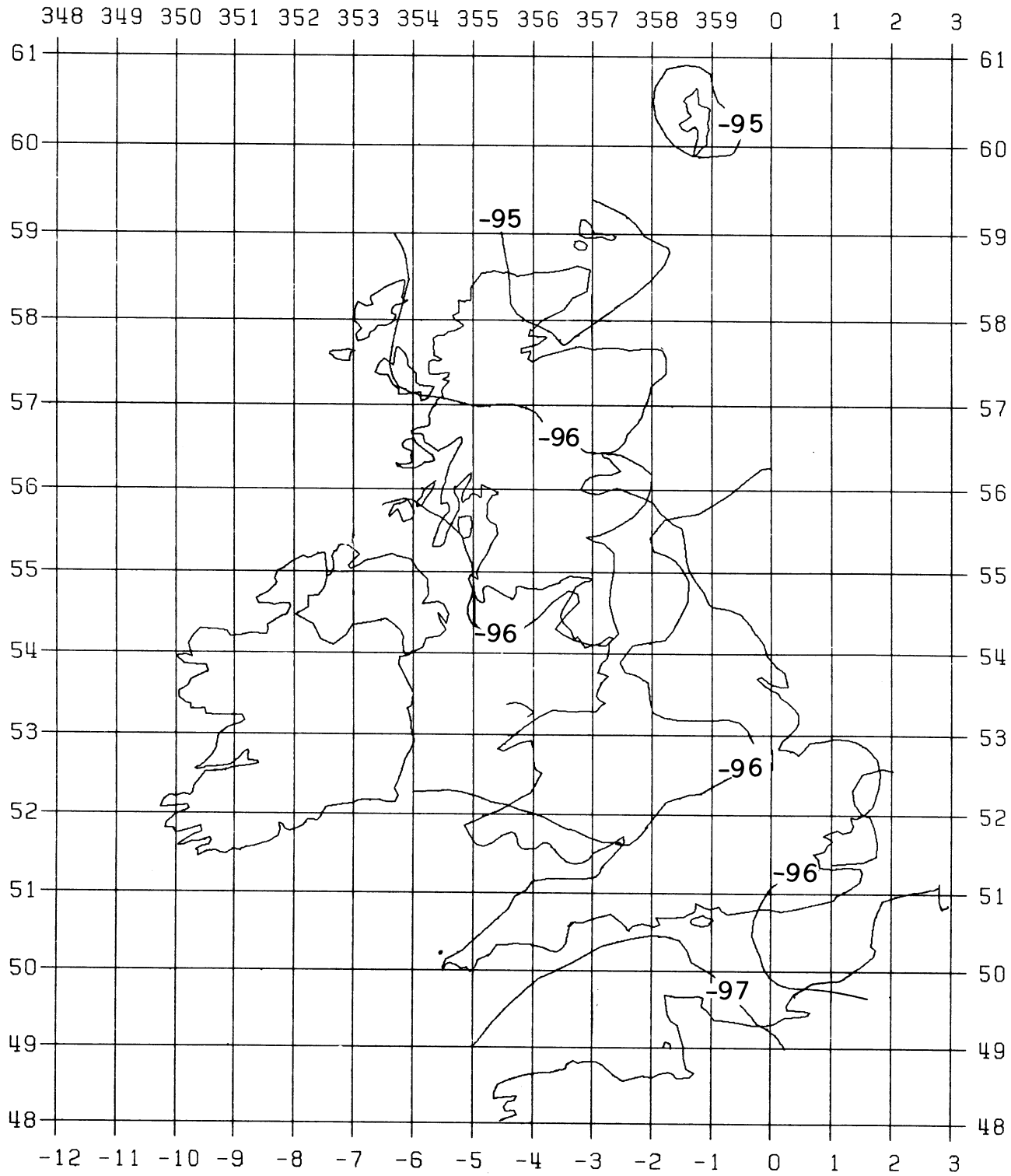

Figure 13.17. Contour Chart - ED 50 (UK Only) to WGS 84 Datum Shifts, ΔY Component (Contour Interval = 1 Meter)

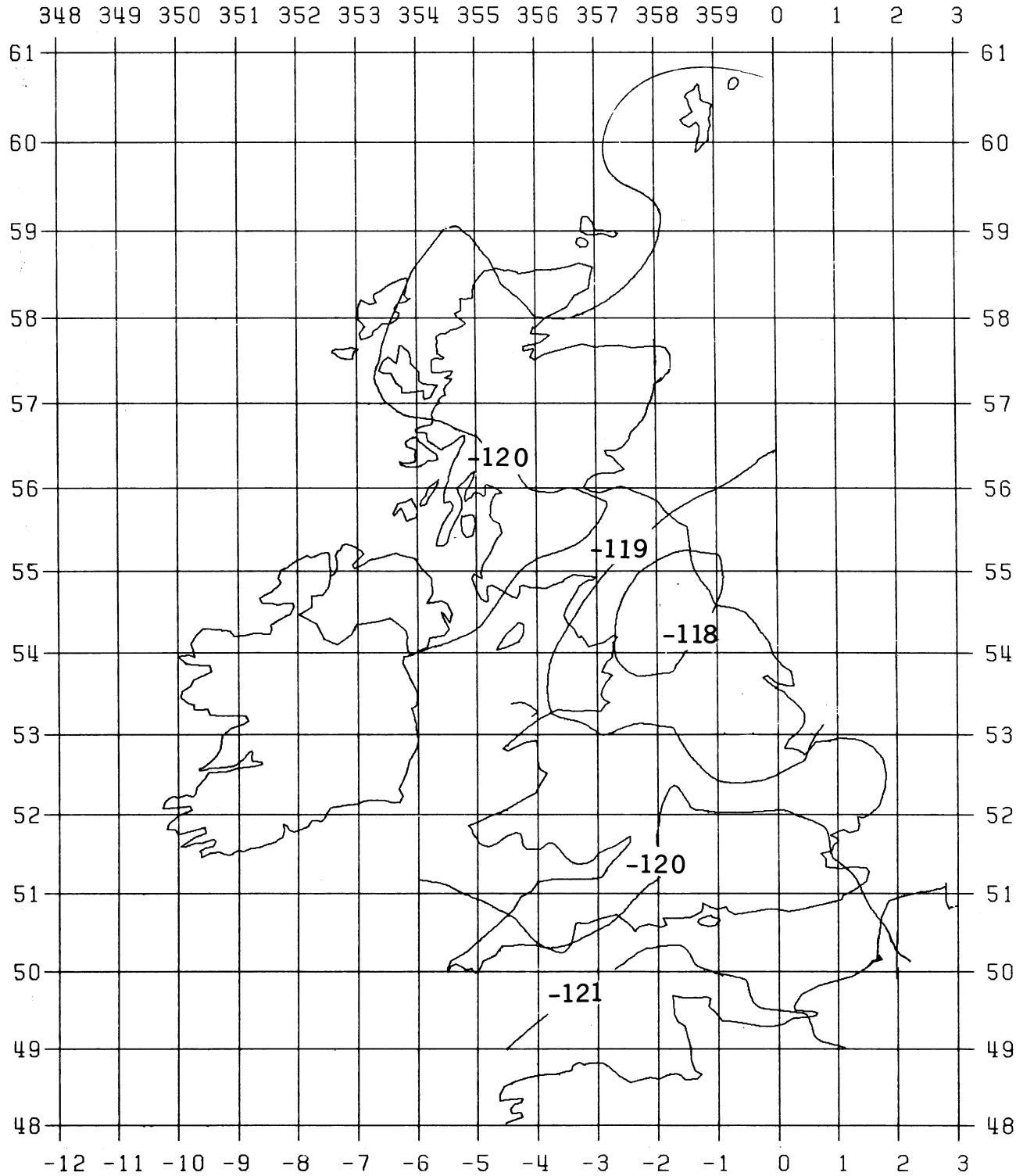

Figure 13.18. Contour Chart - ED 50 (UK Only) to WGS 84 Datum Shifts, ΔZ Component (Contour Interval = 1 Meter)

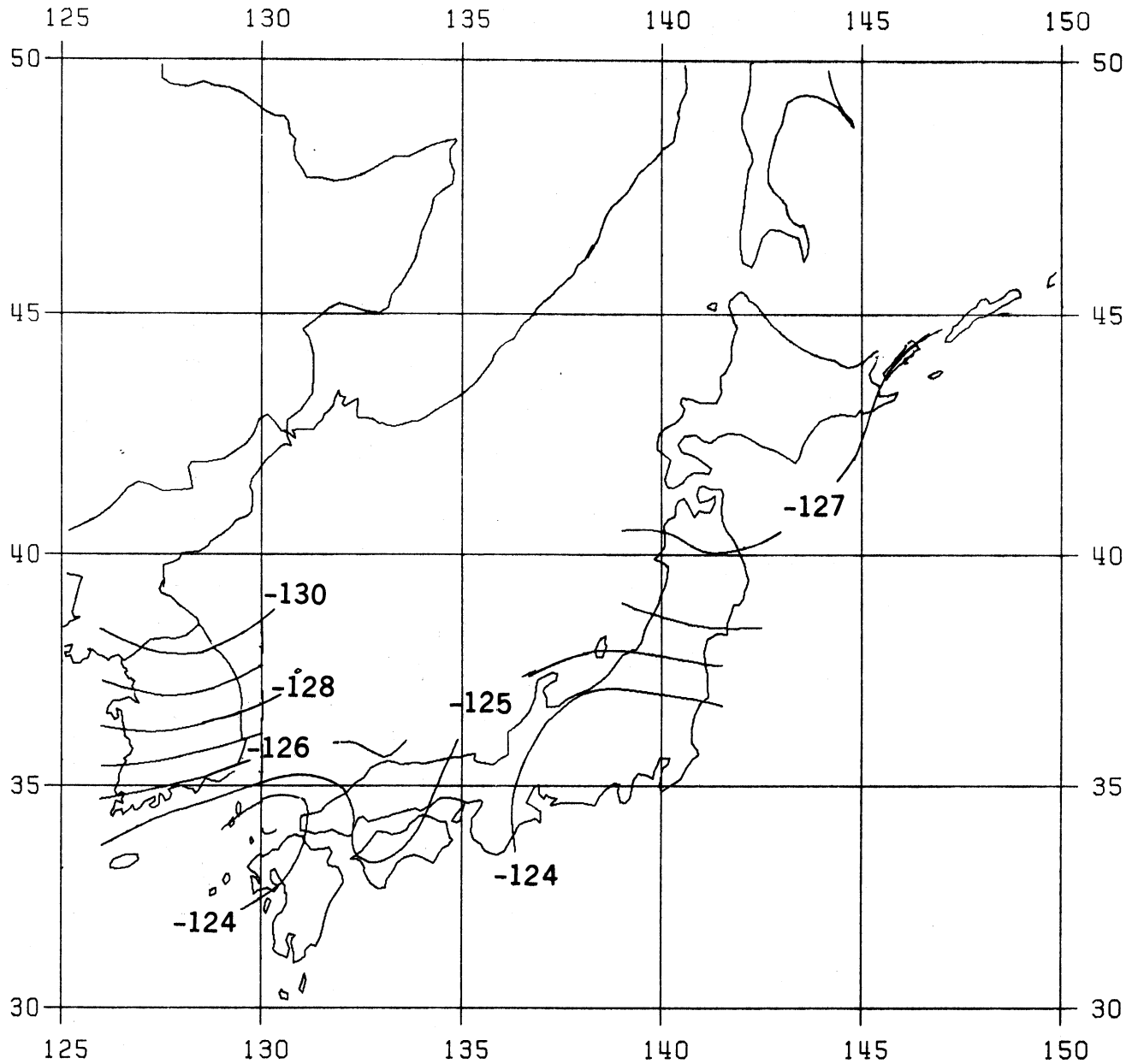

Figure 13.19. Contour Chart - TD to WGS 84 Datum Shifts, ΔX Component (Contour Interval = 1 Meter)

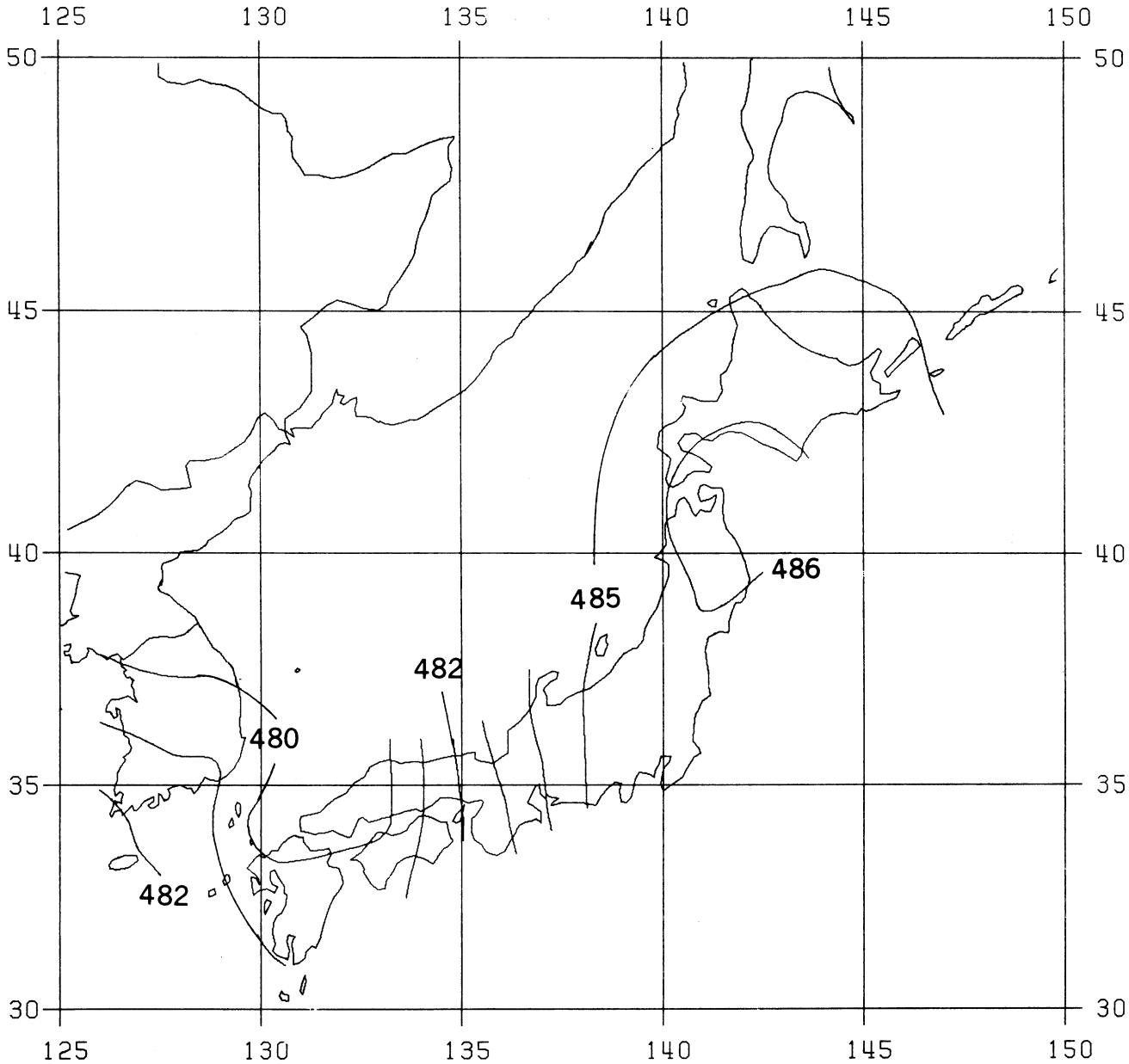

Figure 13.20. Contour Chart – TD to WGS 84 Datum Shifts, △Y Component (Contour Interval = 1 Meter)

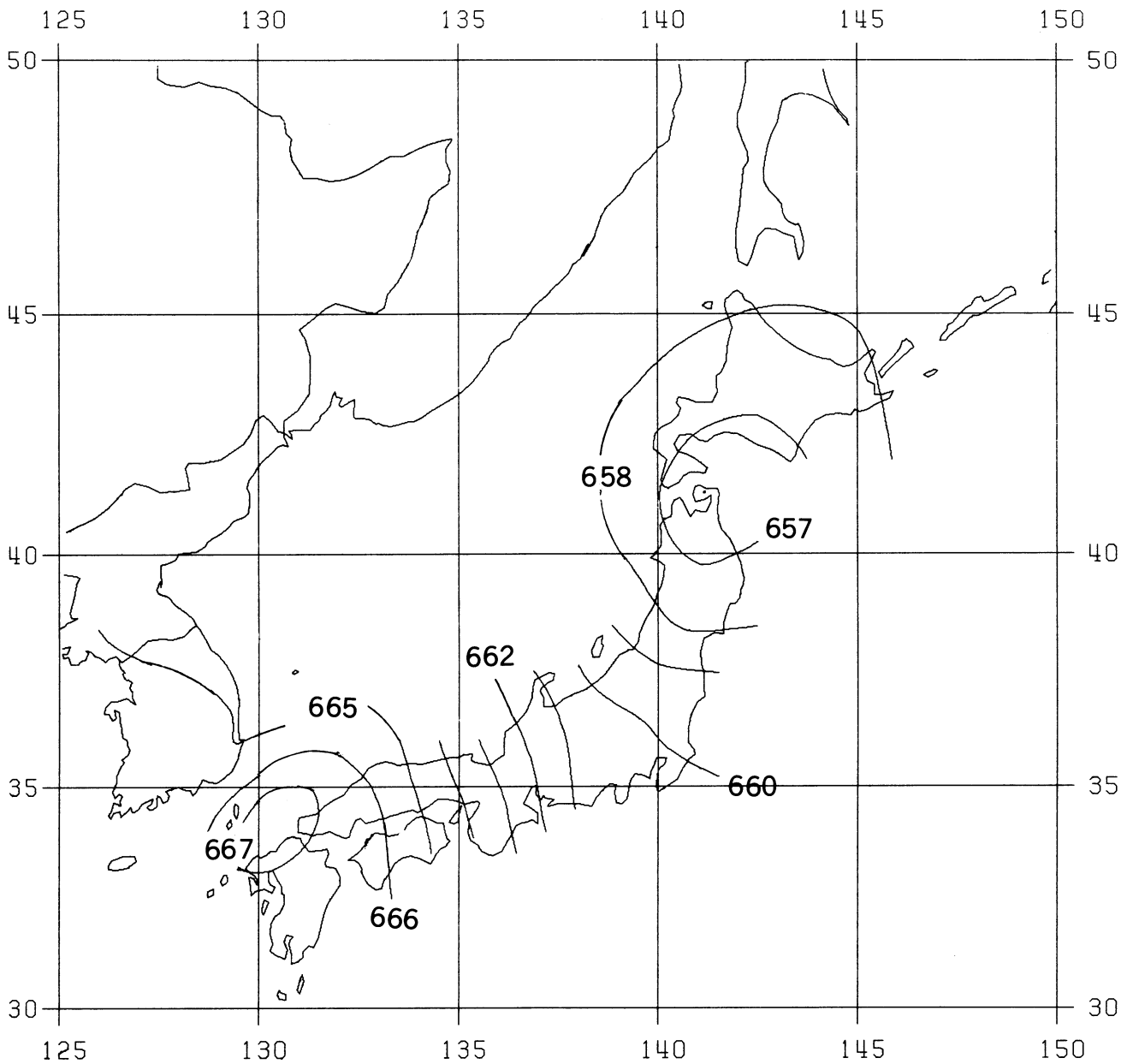

Figure 13.21. Contour Chart – TD to WGS 84 Datum Shifts, ΔZ Component (Contour Interval = 1 Meter)

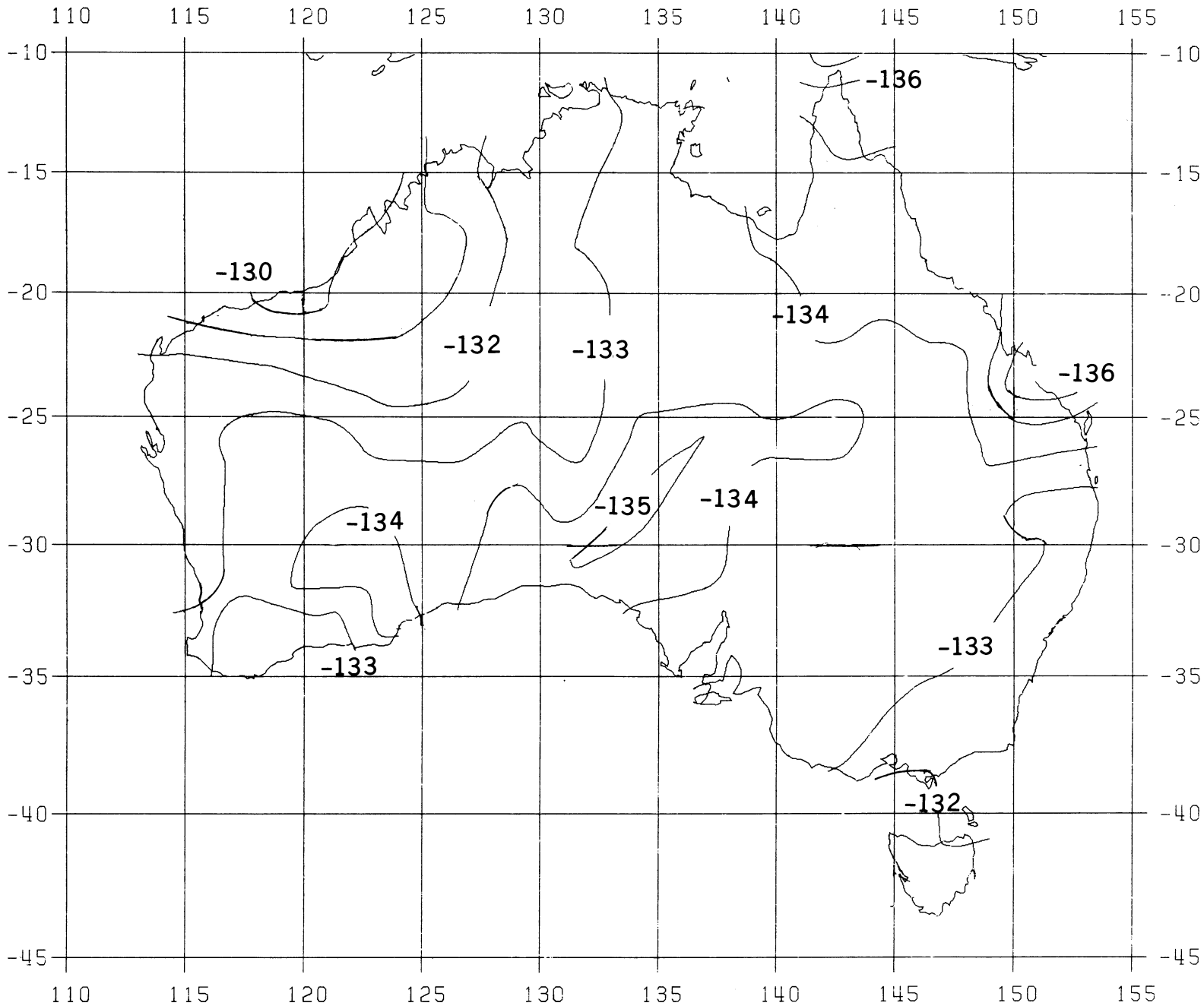

Figure 13.22. Contour Chart – AGD 66 to WGS 84 Datum Shifts, ΔX Component (Contour Interval = 1 Meter)

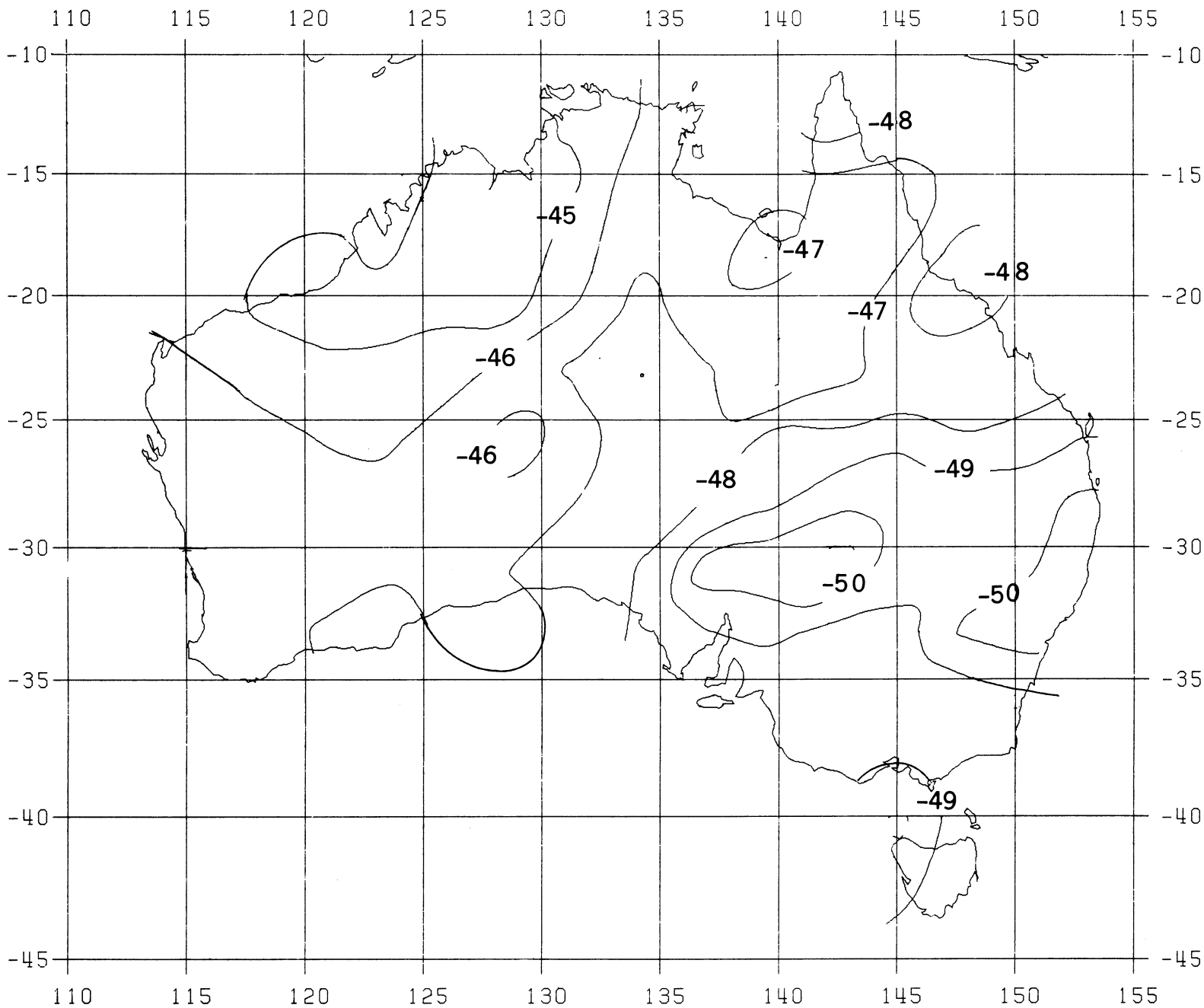

Figure 13.23. Contour Chart – AGD 66 to WGS 84 Datum Shifts, ΔY Component (Contour Interval = 1 Meter)

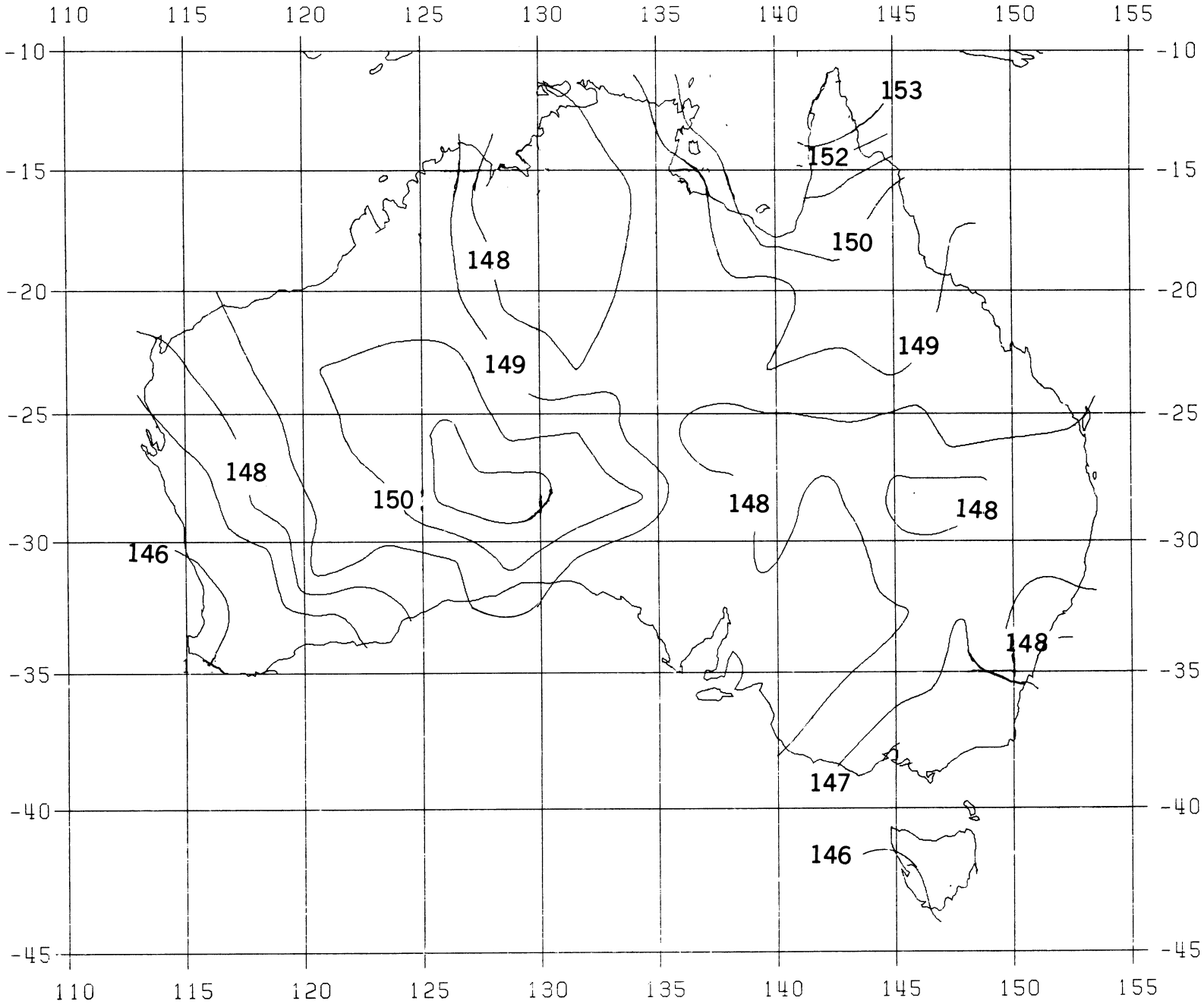

Figure 13.24. Contour Chart – AGD 66 to WGS 84 Datum Shifts, ΔZ Component (Contour Interval = 1 Meter)

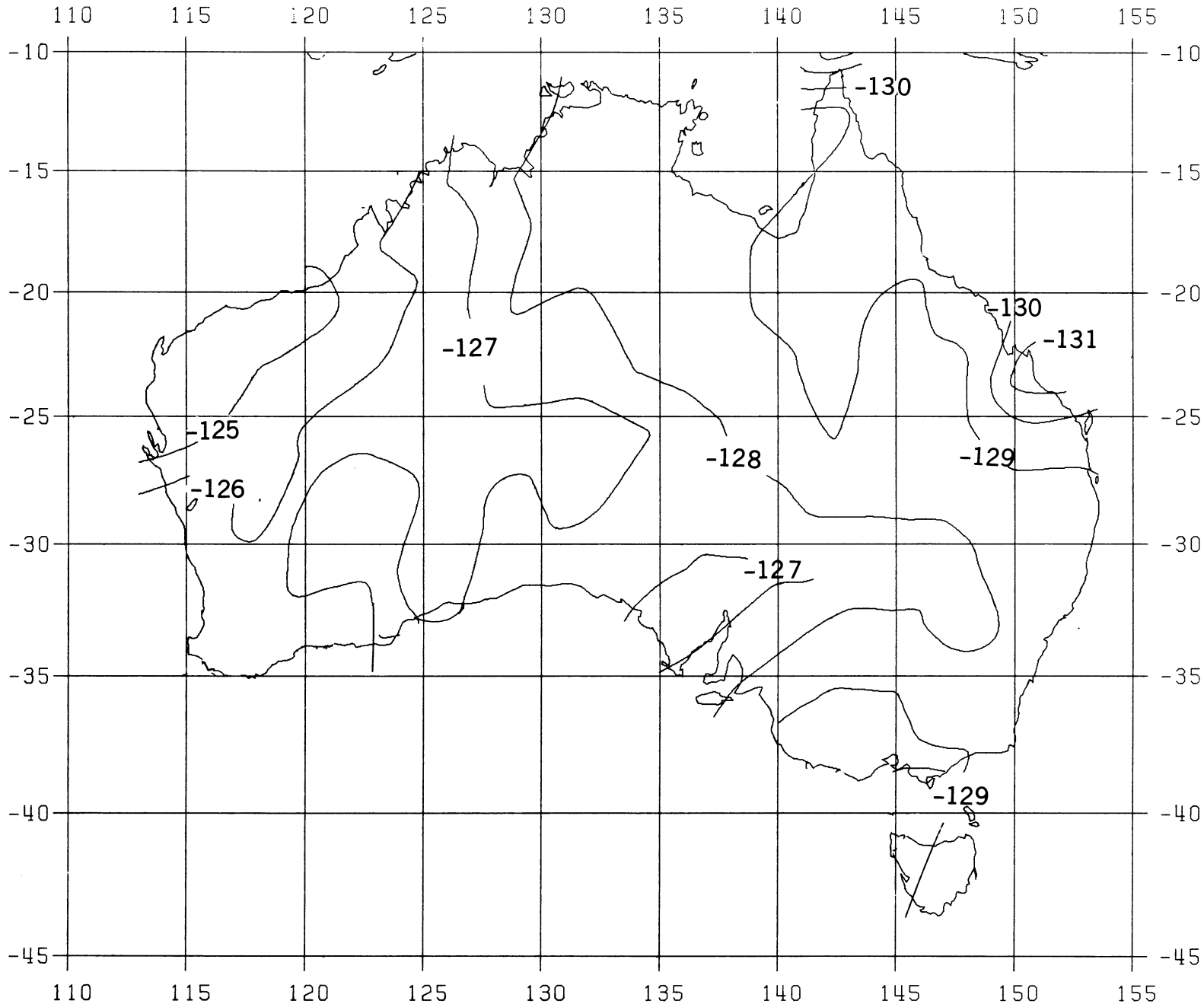

Figure 13.25. Contour Chart – AGD 84 to WGS 84 Datum Shifts, ΔX Component (Contour Interval = 1 Meter)

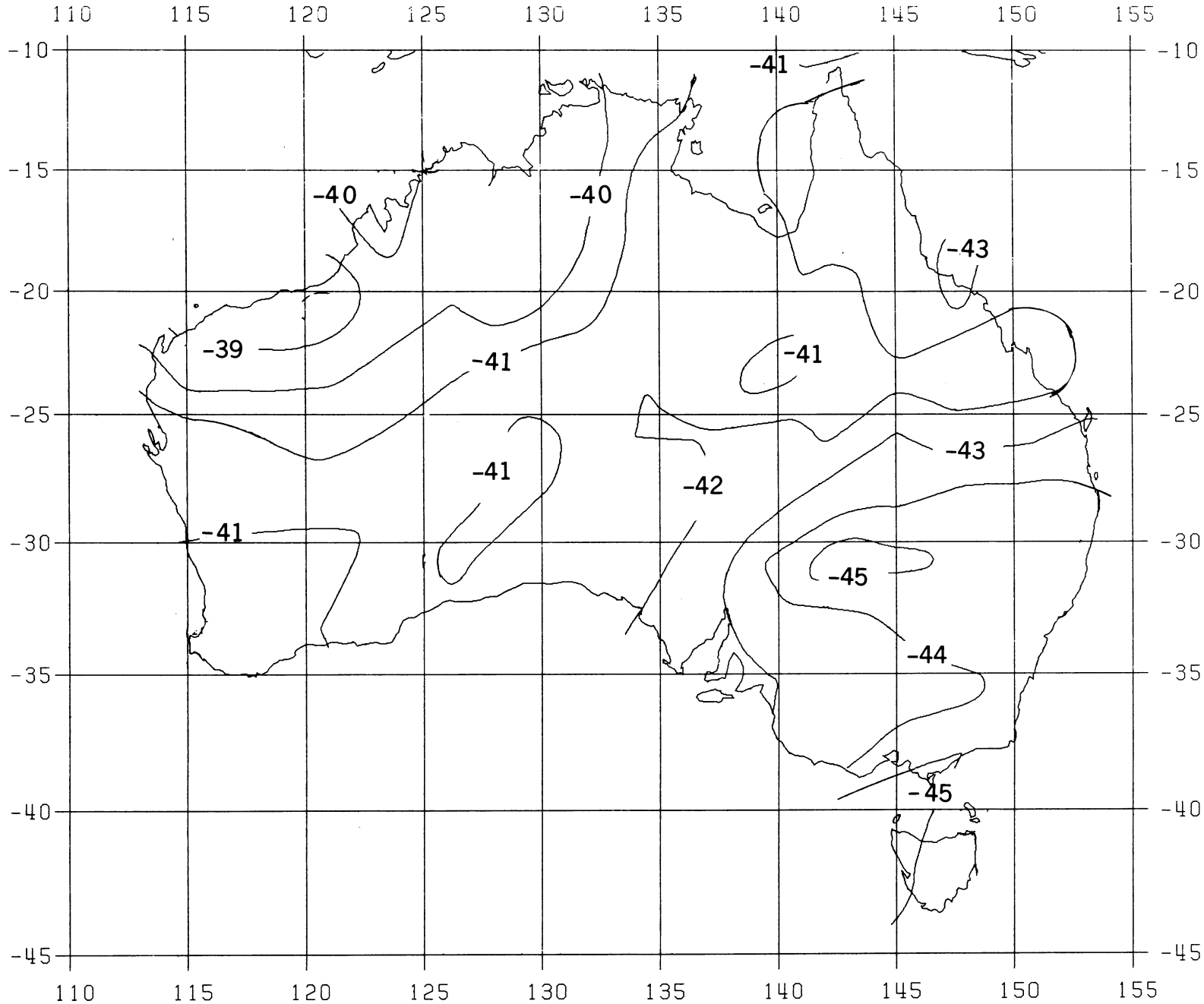

Figure 13.26. Contour Chart – AGD 84 to WGS 84 Datum Shifts, ΔY Component (Contour Interval = 1 Meter)

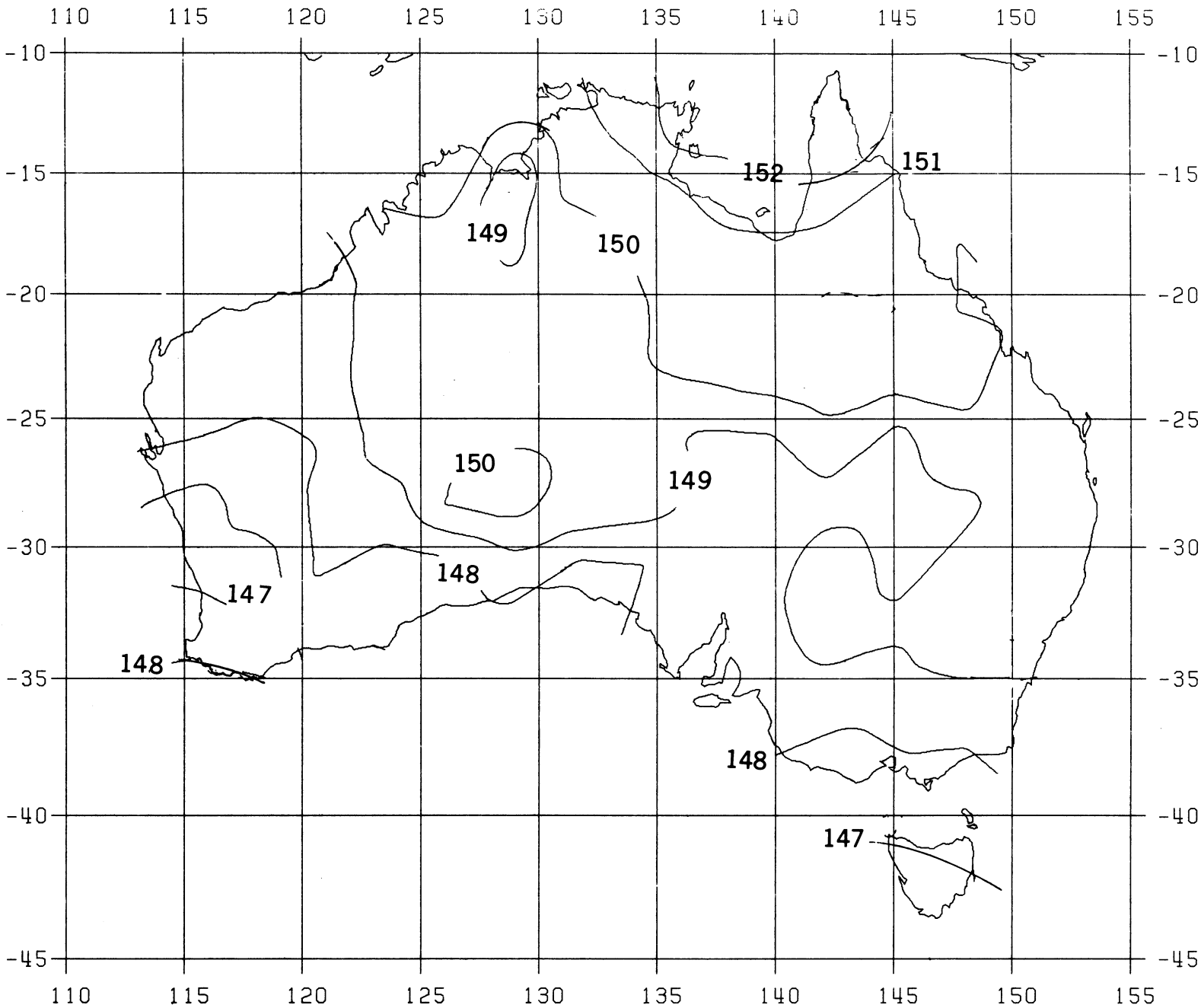

Figure 13.27. Contour Chart – AGD 84 to WGS 84 Datum Shifts, ΔZ Component (Contour Interval = 1 Meter)