



**Australian Government**  
**Bureau of Meteorology**

**Severe Tropical Cyclone *Frank***  
19 – 28 December 1984

Perth Tropical Cyclone Warning Centre  
Bureau of Meteorology

**A. Summary**

A low that moved westward across the Kimberley formed into tropical cyclone Frank north of Broome on 22 December and intensified into a severe cyclone in the following two days. On Christmas Day, Frank recurved to the south southeast eventually crossing the Pilbara coast just west of Port Hedland on 27 December as a category 2 cyclone.

Minor damage was recorded at Port Hedland where gusts to 102 km/h were recorded.

**B. Meteorological Description**

The primary low from which tropical cyclone *Frank* formed originated near the WA/NT border on 20 December 1984 and drifted westward across the Kimberley region. The low reached cyclonic strength over land near the coast, 50 km to the north of Broome at 0900 UTC 22 December.

This cyclone was extraordinarily small with an eye diameter of 9 km and an outer eye-wall convection diameter of about 30 km. Even after development over water *Frank* remained a small tropical cyclone with a convective canopy about 200 to 350 km in diameter. Inflow from the equatorial region was weak and decreased with maturity.

The system continued westward and deepened until a minimum central pressure of 950 hPa was achieved at 0900 UTC 24 December, about 18 hours before it began to recurve. The 1 km resolution of the advanced very high resolution radiometer (AVHRR/2) instrument clearly defined the very small eye which is about 15 km in diameter.

Following recurvature the cyclone maintained a southeasterly track and crossed the coast at the mouth of the Turner River 20 km west of Port Hedland. Central pressure on landfall was 990 hPa.

*Motion*

The movement of the cyclone was governed initially by an upper-level high located over the West Kimberley region. Recurvature and the subsequent

south-easterly track were due to increasing upper-level north-westerly winds associated with a trough amplifying to the southwest of the tropical cyclone.

### C. Impact

No injuries were reported as a result of the cyclone but minor damage occurred at Port Hedland.

### D. Observations

Maximum wind recorded on the mainland was a gust of 102 km/h at Port Hedland at 0235 UTC 27 December as the cyclone was crossing the coast. Maximum wind recorded was 154 km/h (0830 UTC 24 December) at Rowley Shoals automatic weather station as the cyclone passed 10 to 20 km to the north of the island. Minimum pressure of 979 hPa was measured at 0530 UTC 24 December when the wind speed was 102 km/h.

Figure 1. Track of Tropical Cyclone *Frank*, 20 - 28 December 1984.  
All times in WST.

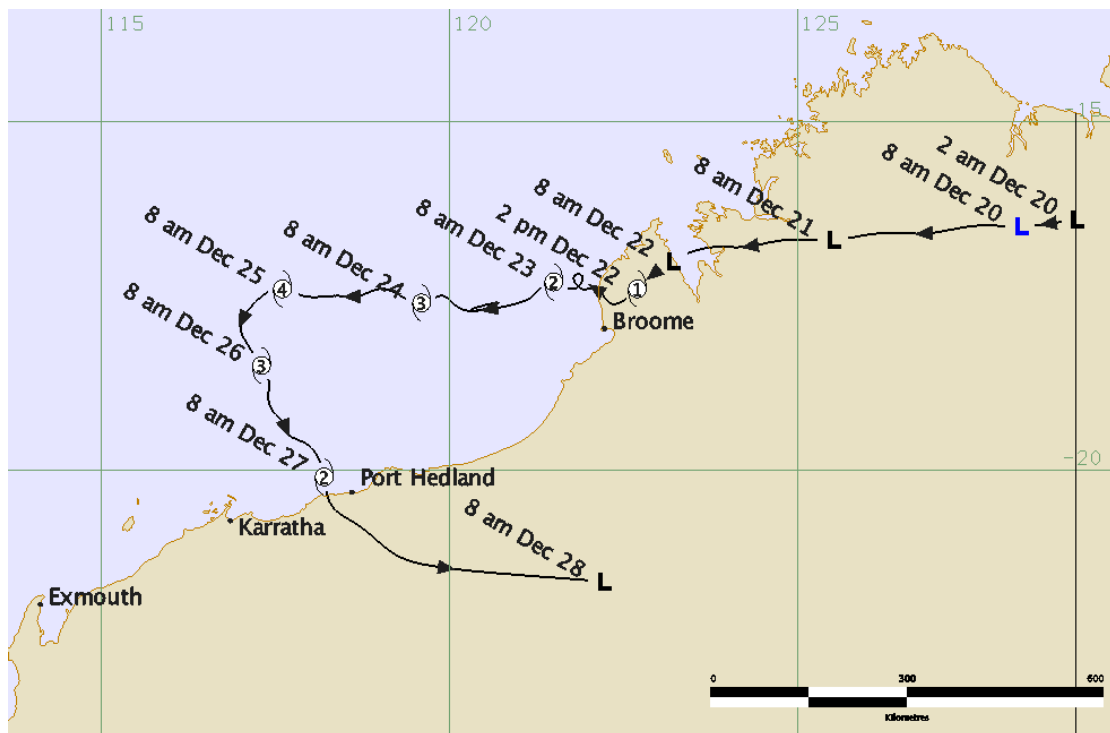


Table 1 Best track summary for Tropical Cyclone *Frank* 19 – 28 December 1984. Note: Add 8 hours to convert to WST. Refer to best track database for complete track details.

Year	Month	Day	Hour (UTC)	Position Latitude S	Position Longitude E	Max wind knots	Central Pressure hPa	Rad. of Gales nm
1984	12	19	1800	16.4	129.0	25	1001	
1984	12	20	0000	16.5	128.2	25	1001	
1984	12	20	0600	16.5	127.5	30	1000	
1984	12	20	1200	16.6	126.9	30	1000	
1984	12	20	1800	16.6	126.2	30	999	
1984	12	21	0000	16.7	125.5	30	999	
1984	12	21	0600	16.7	124.8	35	998	
1984	12	21	1200	16.8	124.2	35	998	
1984	12	21	1800	16.8	123.8	35	998	
1984	12	22	0000	17.0	123.2	35	997	
1984	12	22	0600	17.4	122.7	35	996	
1984	12	22	0900	17.6	122.3	45	994	
1984	12	22	1200	17.4	122.1	45	990	
1984	12	22	1400	17.4	122.0	50	988	
1984	12	22	1600	17.4	121.9	50	986	
1984	12	22	1800	17.2	121.8	55	984	
1984	12	22	1900	17.2	121.9	55	984	
1984	12	22	2000	17.3	121.9	55	983	
1984	12	22	2100	17.4	121.8	60	982	
1984	12	22	2200	17.4	121.7	60	982	
1984	12	22	2300	17.4	121.6	60	981	
1984	12	23	0000	17.3	121.5	60	980	
1984	12	23	0600	17.5	121.2	60	978	
1984	12	23	0900	17.6	121.0	65	976	
1984	12	23	1200	17.7	120.3	75	968	
1984	12	23	1600	17.6	120.7	70	973	
1984	12	23	1800	17.7	120.2	75	966	
1984	12	23	2100	17.5	119.9	85	962	
1984	12	24	0000	17.6	119.6	85	958	
1984	12	24	0300	17.5	119.3	90	956	40
1984	12	24	0600	17.4	119.0	90	954	45
1984	12	24	0900	17.5	118.7	95	950	
1984	12	24	1200	17.5	118.4	95	952	30
1984	12	24	1800	17.5	117.9	95	952	
1984	12	25	0000	17.4	117.6	90	954	
1984	12	25	0600	17.6	117.2	90	956	
1984	12	25	1200	18.0	117.0	85	958	
1984	12	25	1800	18.2	117.1	85	960	
1984	12	26	0000	18.5	117.3	85	962	
1984	12	26	0300	18.7	117.4	80	964	
1984	12	26	0600	19.0	117.4	80	966	
1984	12	26	0900	19.2	117.5	75	970	70
1984	12	26	1200	19.3	117.6	65	976	
1984	12	26	1600	19.5	117.7	60	982	

1984	12	26	1800	19.6	117.9	55	984	
1984	12	26	2100	19.8	118.1	50	986	
1984	12	27	0000	20.1	118.2	50	988	
1984	12	27	0300	20.5	118.3	45	990	55
1984	12	27	0600	20.8	118.7	45	993	55
1984	12	27	0900	21.2	119.2	35	997	
1984	12	27	1200	21.4	119.9	35	997	
1984	12	27	1800	21.5	120.9	35	998	
1984	12	28	0000	21.6	122.2	30	1000	