ANNEX B

BAY OF BENGAL TROPICAL CYCLONES

1. SUMMARY OF DATA[1]

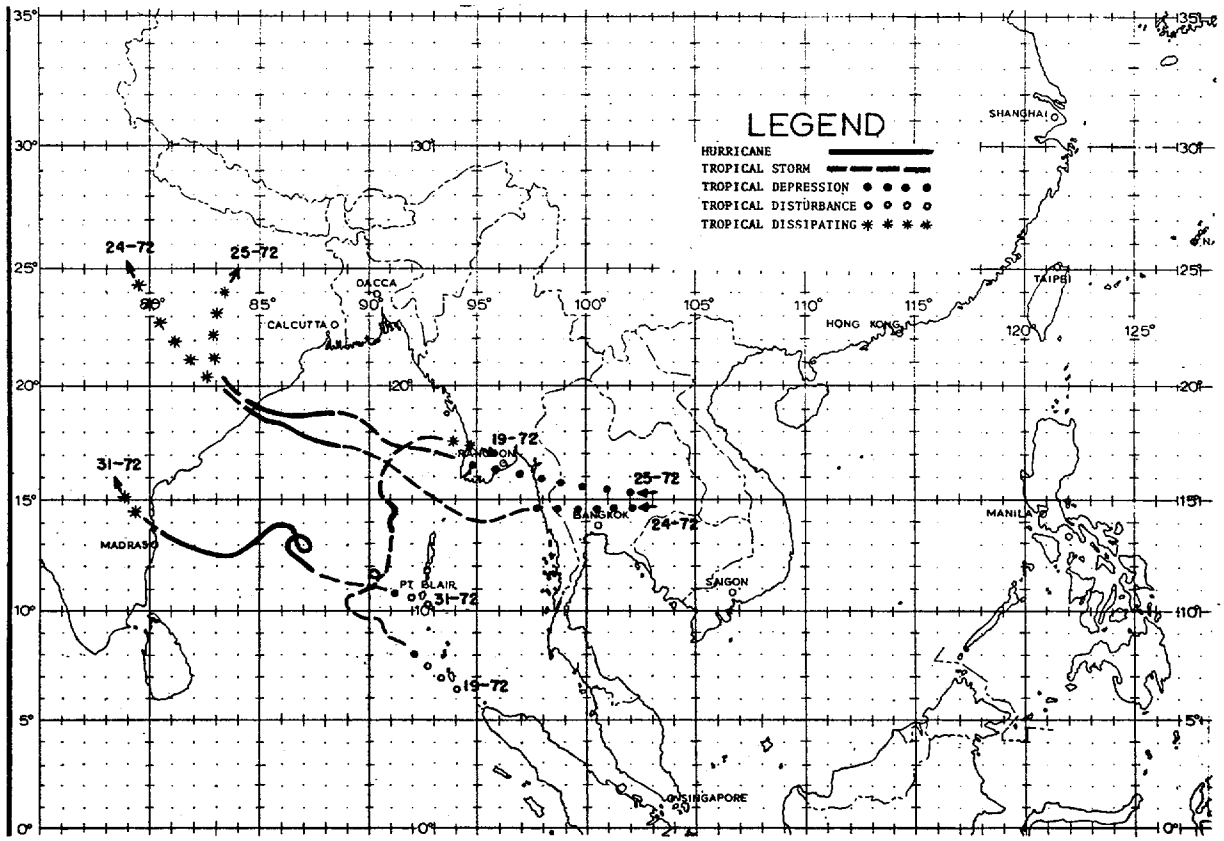

FIGURE B-1. *Composite chart of best tracks for the Bay of Bengal.*

TABLE B-1. 1972 BAY OF BENGAL TROPICAL CYCLONES

CYCLONE	INCLUSIVE DATES	MAX SFC WND	MIN OBS SLP	NO. OF WARNINGS ISSUED	REMARKS
19-72	06 APR - 13 APR	85	---	6	----------
24-72	06 SEP - 12 SEP	80	968	5	FORMERLY TY ELSIE
25-72	18 SEP - 25 SEP	70	975	15	FORMERLY TY FLOSSIE
31-72	16 NOV - 23 NOV	90	983	4	----------

[1]Tropical cyclones in the Bay of Bengal are numbered consecutively from the beginning of the calendar year and are included with those developing in the South Pacific and Indian oceans. The JTWC area of responsibility in the Bay of Bengal was expanded on 4 June 1971 to include the area north of the equator between the Malay Peninsula and 90°E. Only those cyclones that developed or tracked through this area are included in Annex B.

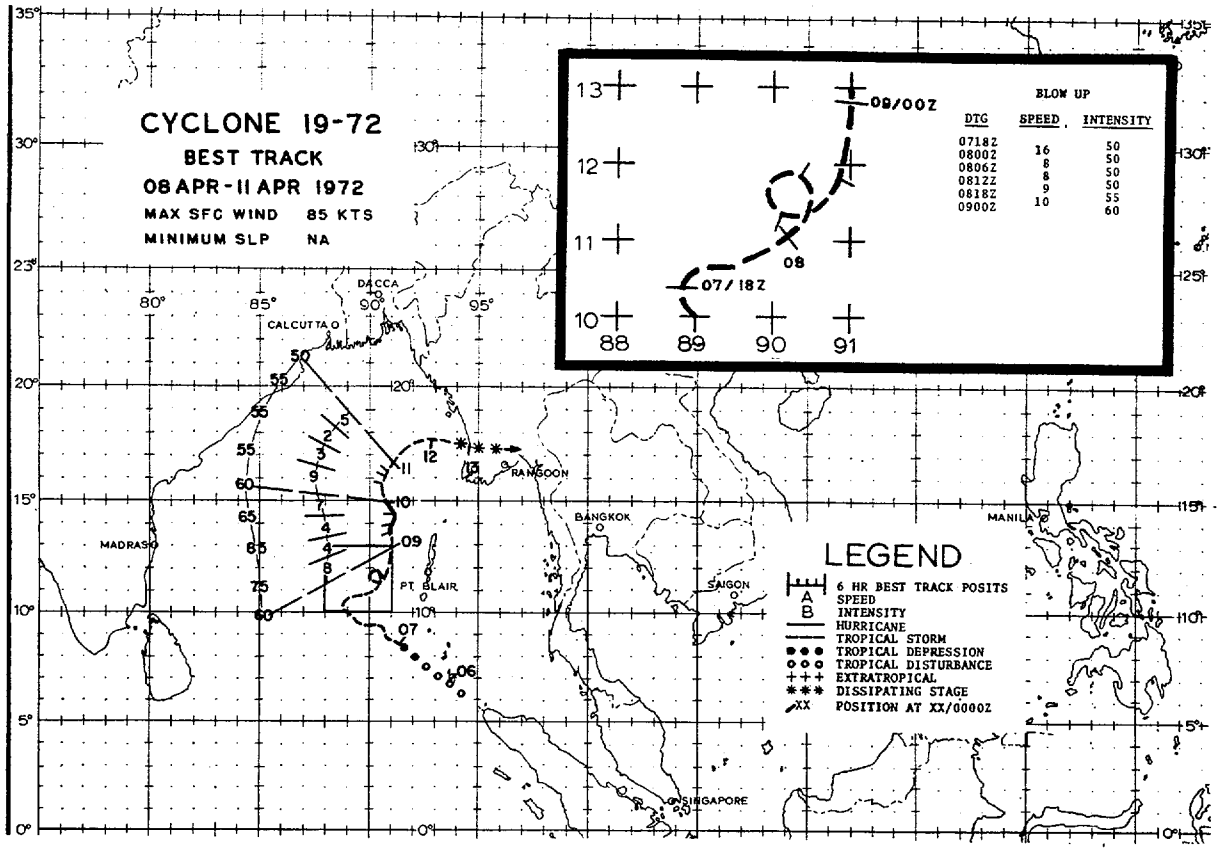

FIGURE B-2. *Best track chart for Tropical Cyclone 19-72.*

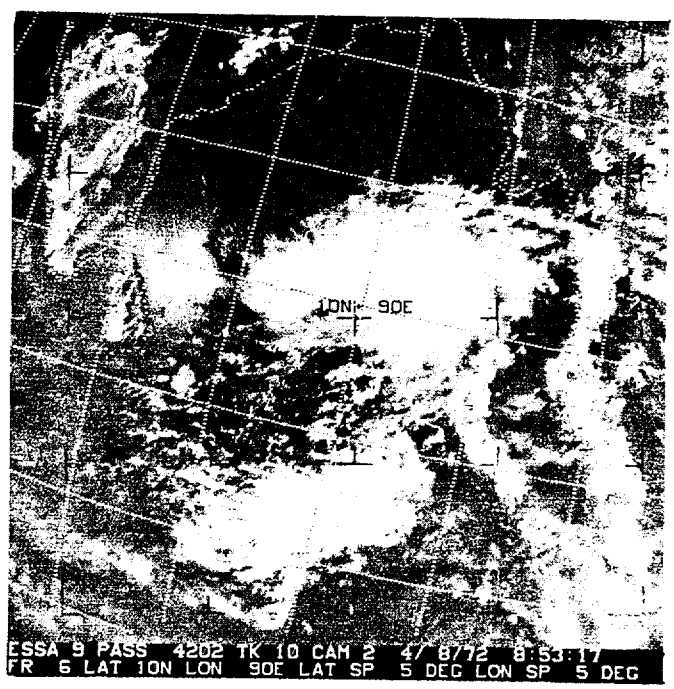

FIGURE B-3. *ESSA-9 photo of Tropical Cyclone 19-72, 8 April 1972, 0852 GMT.*

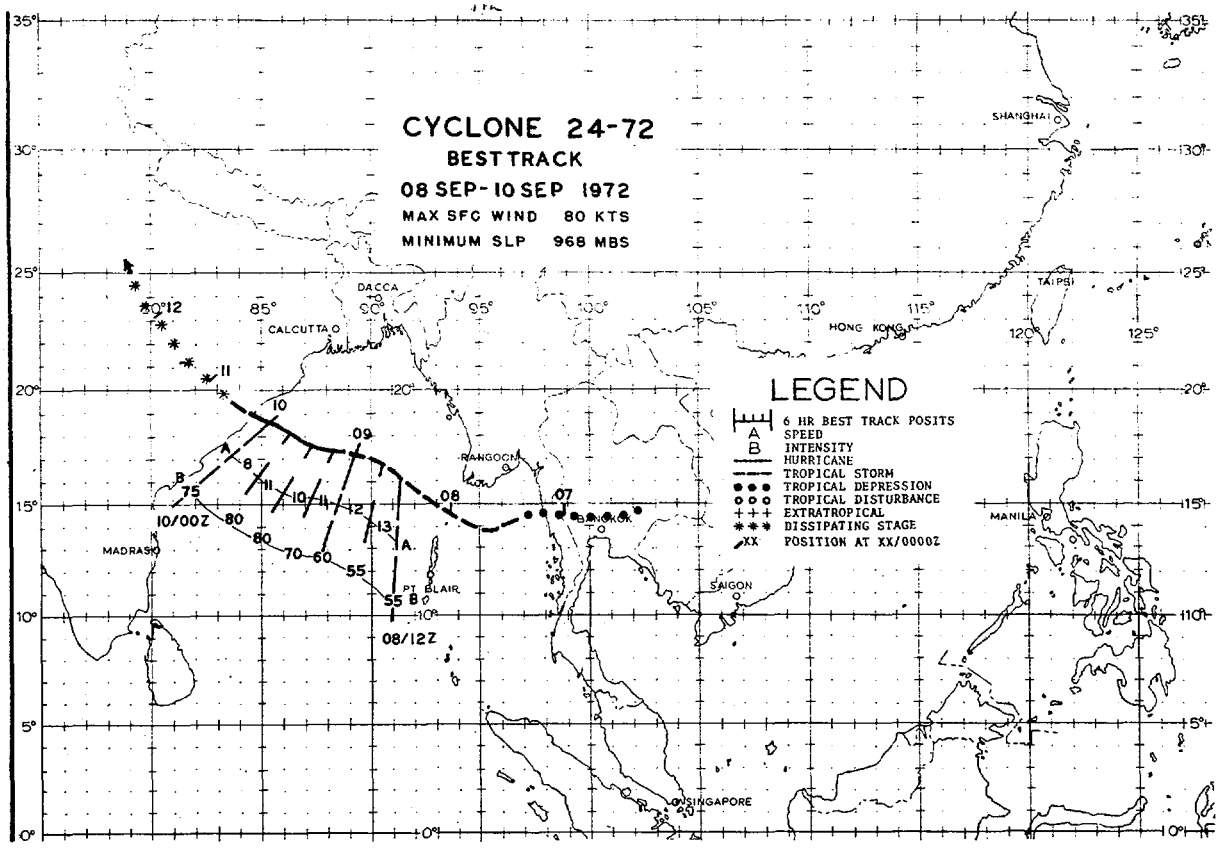

FIGURE B-4. *Best track chart for Tropical Cyclone 24-72.*

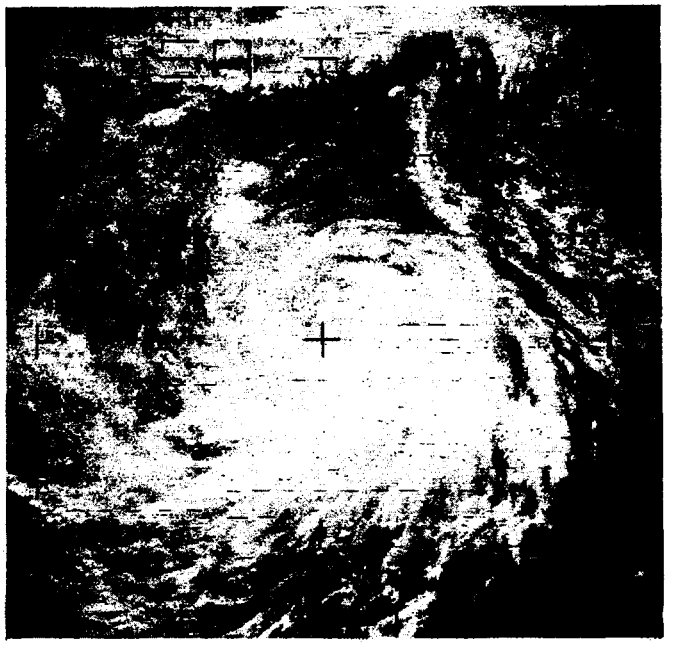

FIGURE B-5. *ESSA-8 satellite view of Tropical Cyclone 24-72 on 9 September 1972, 0417 GMT.--Photo courtesy of Royal Observatory, Hong Kong.*

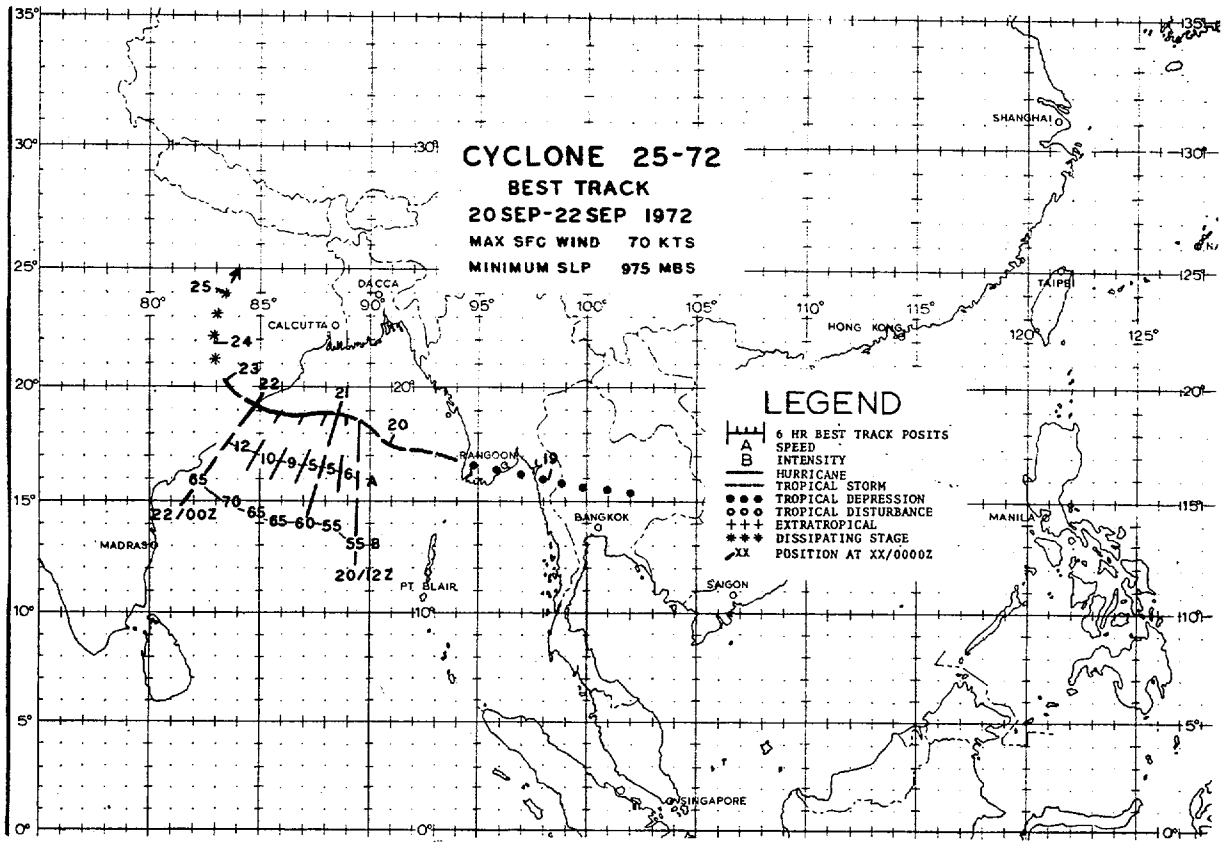

FIGURE B-6. *Best track chart for Tropical Cyclone 25-72.*

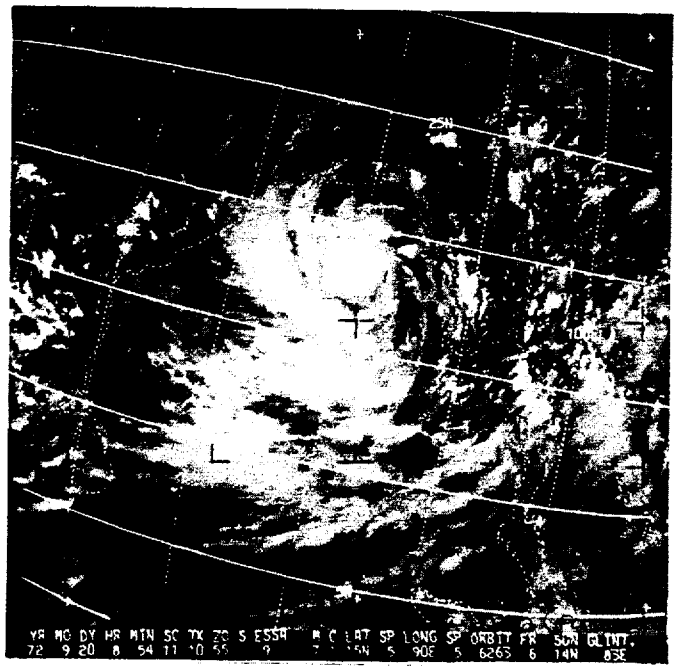

FIGURE B-7. *ESSA-9 satellite view of Tropical Cyclone 25-72, 20 September 1972.*

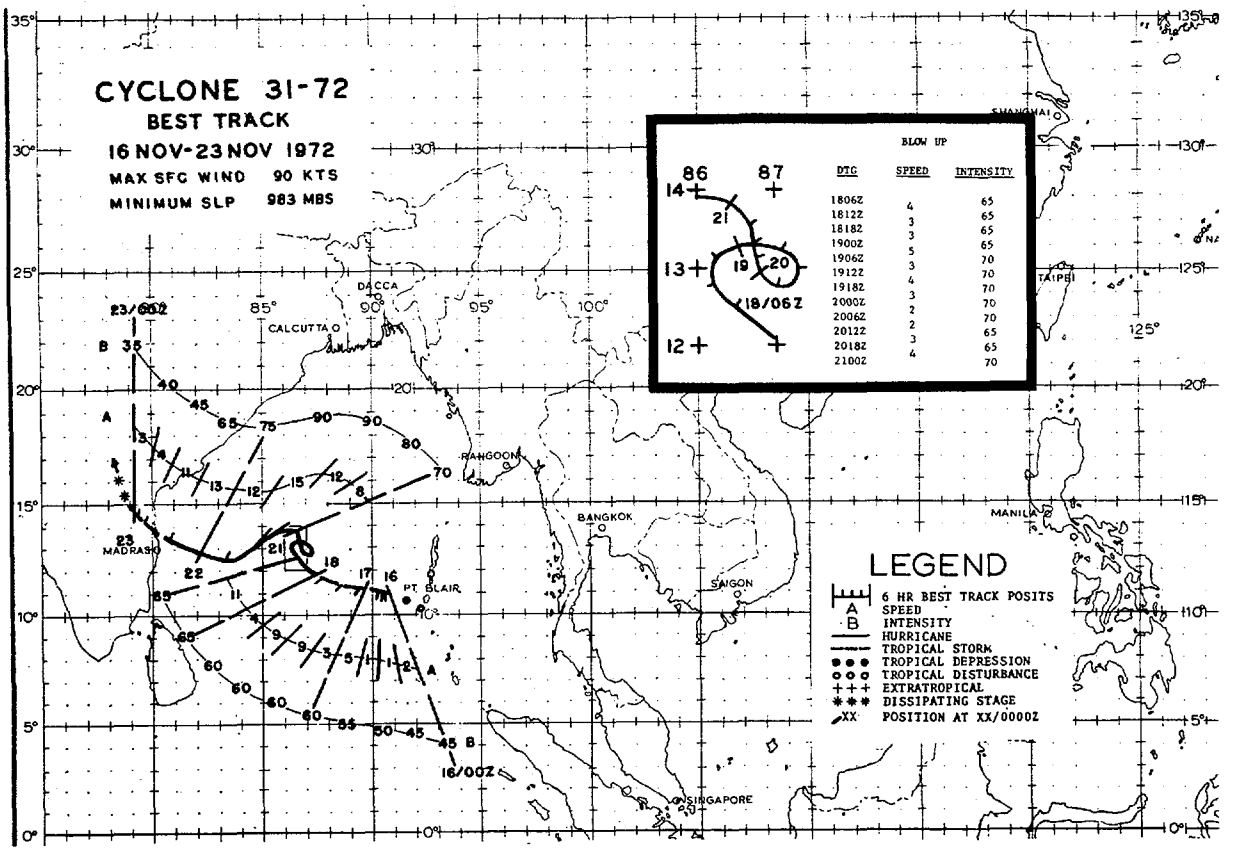

FIGURE B-8. *Best track chart for Tropical Cyclone 31-72. MSLP and MAX WIND were based on 21/1530 GMT observation from the Indian ship JAG JAWAN.--Courtesy of Indian Meteorological Department*

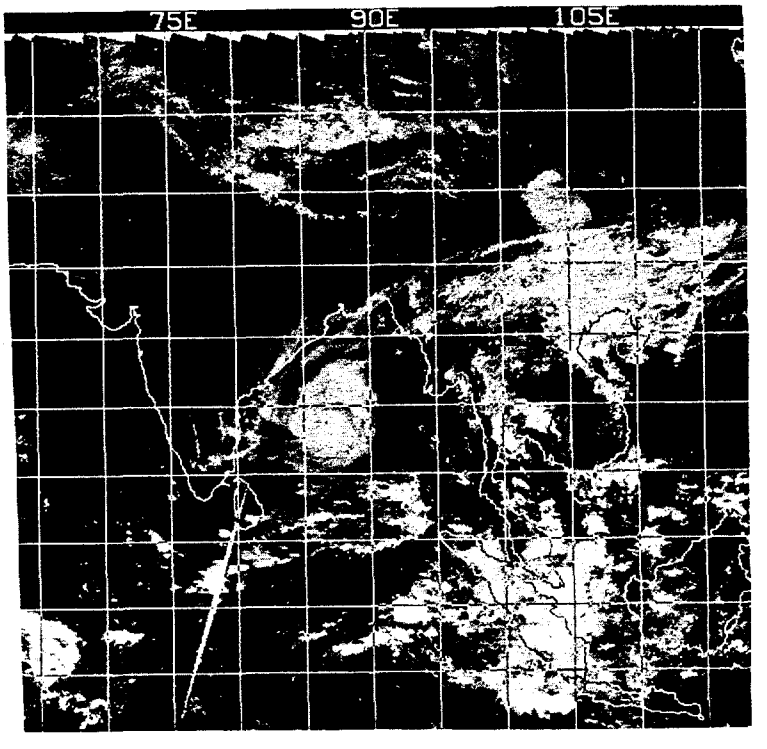

FIGURE B-9. *NOAA-2 digitized mosaic of Tropical Cyclone 31-72, 20 November 1972.*

3. CENTER FIX DATA

FIX POSITIONS FOR TROPICAL CYCLONE NO. 19-72
7 APR - 11 APR

FIX NO.	TIME	POSIT		FIX CAT	ACCRY NAV-MET	FLT LVL	FLT LVL WND	OBS SFC WND	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	THKN WALL CLD	POSIT OF RADAR	/REMARKS
1	070408Z	9.4N	90.0E	SAT	STG UNK											ESSA 8 (VTBU)	
2	070755Z	10.0N	90.5E	SAT	STG C+											ESSA 9	
3	080633Z	11.5N	90.0E	SAT	STG X	DIA 2	CAT 3.0									ESSA 9	
4	090351Z	13.3N	91.9E	SAT	STG X	DIA 6	CAT 2.0										
5	090359Z	14.0N	92.0E	SAT	STG UNK												
6	090801Z	14.0N	91.0E	SAT	STG X	DIA 2	CAT 3.0									ESSA 9	
7	091300Z	13.9N	91.2E	P	15 2	700 MB	85	80	975	285	17 11	-	- -	-	8	MC CLSD, LTNG ALODS	
8	100445Z	16.5N	91.5E	SAT	STG UNK												
9	100855Z	16.5N	90.5E	SAT	STG C+											ESSA 9	
10	100856Z	16.5N	90.5E	SAT	STG C+											ESSA 9	
11	101545Z	15.2N	90.5E	P	- -	500MB	-	-	1004	-	-5 -	-	- -	-	-		
12	110803Z	17.5N	91.5E	SAT	STG C											ESSA 9	

FIX POSITIONS FOR TROPICAL CYCLONE NO. 24-72
7 SEP - 9 SEP

FIX NO.	TIME	POSIT		FIX CAT	ACCRY NAV-MET	FLT LVL	FLT LVL WND	OBS SFC WND	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	THKN WALL CLD	POSIT OF RADAR	/REMARKS	
1	071318Z	14.4N	96.2E	SAT												ESSA 9		
2	080842Z	16.1N	91.2E	SAT												ESSA 9		
3	090418Z	17.0N	88.0E	SAT	STG UNK													
4	090940Z	17.8N	87.3E	SAT	T4.0/4.0/D0.5/24 HRS											ESSA 9		
5	091227Z	17.4N	87.1E	P	30 5	500MB	75	65	968	284	18 13	ELIP	E-W	40X30	12	PRTL WC-FBS ALODS		02

FIX POSITIONS FOR TROPICAL CYCLONE NO. 25-72
19 SEP - 22 SEP

FIX NO.	TIME	POSIT		FIX CAT	ACCRY NAV-MET	FLT LVL	FLT LVL WND	OBS SFC WND	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	THKN WALL CLD	POSIT OF RADAR	/REMARKS	
1	190755Z	17.5N	91.5E	SAT	T2/2D1/24 HRS													
2	200405Z	17.0N	90.0E	SAT	STG X	DIA 2	CAT 2.0									ESSA 8 (VTBU)		
3	200730Z	17.6N	91.0E	P	15 10	700 MB	35	55	994	305	15 -	-	- -	-	-	NO WC-BRKN SC CNTR		01
4	200858Z	18.5N	90.0E	SAT	T4.0/4.0/D2.0/24 HRS											ESSA 9		
5	210830Z	18.6N	88.0E	P	10 8	700 MB	60	65	978	292	17 -	-	- -	-	-	NO WC-BRKN SC CNTR		02
6	210956Z	19.0N	86.5E	SAT	T4.0/4.0/S0.0/24 HRS											ESSA 9		
7	211008Z	18.8N	87.7E	P	- -	700 MB	-	80	-	-	- -	-	- -	-	-			
8	211104Z	18.8N	87.3E	P	10 5	700 MB	50	100	982	294	16 -	-	- -	-	-	NO WC-FBS FRNG S-W		02
9	220900Z	19.5N	84.0E	SAT	STG X	DIA 2	CAT 2.0											

FIX POSITIONS FOR TROPICAL CYCLONE NO. 31-72
16 NOV - 22 NOV

FIX NO.	TIME	POSIT		FIX CAT	ACCRY NAV-MET	FLT LVL	FLT LVL WND	OBS SFC WND	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	THKN WALL CLD	POSIT OF RADAR	/REMARKS
1	160852Z	11.0N	89.2E	SAT	STG C+												
2	170353Z	12.0N	89.0E	SAT	STG X	DIA 8	CAT 1.0										
3	170409Z	11.0N	89.0E	SAT	T4.5/4.5/NA/19 HRS											ESSA 8 (VTBU)	
4	180235Z	11.0N	87.0E	SAT	T4.0/4.0/S0.0/17 HRS											NOAA 2	
5	180435Z	11.5N	85.0E	SAT	T4.5/4.5/D1.0/24 HRS												
6	180445Z	12.8N	86.0E	SAT	STG X	DIA 7	CAT 3.0									NOAA 2	
7	190330Z	12.5N	87.0E	SAT	T4.5/4.5/D0.5/24 HRS											ESSA 8 (VTBU)	
8	200300Z	15.0N	86.0E	SAT	STG UNK											NOAA 2	
9	220227Z	13.9N	81.0E	SAT	T5.0/5.0/D1.0/24 HRS											ESSA 8 (NEW DELHI)	
10	220419Z	13.0N	81.5E	SAT	STG X	DIA 8	CAT 2.0									NOAA 2	
11	220420Z	13.2N	81.5E	SAT	STG X	DIA 3	CAT 2.0									ESSA 8 (VTBU)	
																NOAA 2 (NESS)	

4. POSITION AND VERIFICATION DATA

TROPICAL CYCLONE 12-72

1200Z 08 APR TO 0000Z 11 APR

	BEST TRACK		WARNING				24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
					ERRORS				ERRORS				ERRORS				ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
081200Z	11.3N	90.1E	55	11.7N	89.6E	50	30 -5	13.2N	89.1E	60	126 -25	15.0N	88.6E	60	120 5	--.-	---.-	--	--	--
090000Z	12.9N	91.0E	60	12.2N	89.5E	50	97 -10	13.8N	89.0E	60	123 0	15.2N	88.9E	65	147 15	--.-	---.-	--	--	--
091200Z	14.0N	91.1E	85	13.9N	91.2E	100	8 15	16.5N	94.2E	90	209 35	--.-	---.-	--	-- --	--.-	---.-	--	--	--
100000Z	14.9N	90.8E	60	15.3N	92.4E	95	95 35	17.3N	96.0E	50	269 0	--.-	---.-	--	-- --	--.-	---.-	--	--	--
101200Z	15.0N	90.6E	55	15.2N	90.7E	35	48 -20	--.-	---.-	--	-- --	--.-	---.-	--	-- --	--.-	---.-	--	--	--
110000Z	15.6N	91.0E	50	16.6N	90.5E	35	29 -15	--.-	---.-	--	-- --	--.-	---.-	--	-- --	--.-	---.-	--	--	--

	TYPHOONS WHILE WIND OVER 35KTS				ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	UNK	UNK	UNK	UNK	51NM	186NM	133NM	UNK
AVERAGE RIGHT ANGLE ERROR	UNK	UNK	UNK	UNK	35NM	176NM	100NM	UNK
AVERAGE MAGNITUDE OF WIND ERROR	0KTS	0KTS	0KTS	0KTS	17KTS	15KTS	10KTS	0KTS
AVERAGE BIAS OF WIND ERROR	0KTS	0KTS	0KTS	0KTS	0KTS	3KTS	10KTS	0KTS
NUMBER OF FORECASTS	0	0	0	0	6	4	2	0

TROPICAL CYCLONE 23-72

1200Z 08 SEP TO 0000Z 10 SEP

	BEST TRACK		WARNING				24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
					ERRORS				ERRORS				ERRORS				ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
081200Z	16.0N	91.5E	55	16.2N	92.2E	40	42 -15	17.0N	89.8E	70	148 -10	--.-	---.-	--	-- --	--.-	---.-	--	--	--
090000Z	17.2N	89.2E	60	17.7N	90.0E	55	54 -5	20.3N	86.8E	65	133 -10	--.-	---.-	--	-- --	--.-	---.-	--	--	--
091200Z	17.6N	87.2E	80	17.4N	87.2E	65	12 -15	--.-	---.-	--	-- --	--.-	---.-	--	-- --	--.-	---.-	--	--	--
100000Z	18.5N	85.4E	75	18.4N	85.1E	80	18 5	--.-	---.-	--	-- --	--.-	---.-	--	-- --	--.-	---.-	--	--	--

	TYPHOONS WHILE WIND OVER 35KTS				ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	UNK	UNK	UNK	UNK	32NM	141NM	UNK	UNK
AVERAGE RIGHT ANGLE ERROR	UNK	UNK	UNK	UNK	29NM	91NM	UNK	UNK
AVERAGE MAGNITUDE OF WIND ERROR	0KTS	0KTS	0KTS	0KTS	10KTS	10KTS	0KTS	0KTS
AVERAGE BIAS OF WIND ERROR	0KTS	0KTS	0KTS	0KTS	-8KTS	-10KTS	0KTS	0KTS
NUMBER OF FORECASTS	0	0	0	0	4	2	0	0

TROPICAL CYCLONE 25-72

1200Z 20 SEP TO 0000Z 22 SEP

	BEST TRACK		WARNING				24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
					ERRORS				ERRORS				ERRORS				ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
201200Z	18.5N	89.5E	55	17.9N	90.2E	45	53 -10	20.9N	87.4E	65	127 0	--.-	---.-	--	-- --	--.-	---.-	--	--	--
210000Z	18.7N	88.5E	60	19.0N	88.3E	45	55 -15	23.0N	86.2E	25	244 -40	--.-	---.-	--	-- --	--.-	---.-	--	--	--
211200Z	18.8N	87.0E	65	18.9N	87.2E	100	13 35	--.-	---.-	--	-- --	--.-	---.-	--	-- --	--.-	---.-	--	--	--
220000Z	19.6N	85.3E	65	19.9N	84.9E	60	29 -5	--.-	---.-	--	-- --	--.-	---.-	--	-- --	--.-	---.-	--	--	--

	TYPHOONS WHILE WIND OVER 35KTS				ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	UNK	UNK	UNK	UNK	37NM	186NM	UNK	UNK
AVERAGE RIGHT ANGLE ERROR	UNK	UNK	UNK	UNK	37NM	185NM	UNK	UNK
AVERAGE MAGNITUDE OF WIND ERROR	0KTS	0KTS	0KTS	0KTS	16KTS	20KTS	0KTS	0KTS
AVERAGE BIAS OF WIND ERROR	0KTS	0KTS	0KTS	0KTS	1KTS	-20KTS	0KTS	0KTS
NUMBER OF FORECASTS	0	0	0	0	4	2	0	0

TROPICAL CYCLONE 31-72

0000Z 16 NOV TO 1200Z 22 NOV

	BEST TRACK		WARNING				24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
					ERRORS				ERRORS				ERRORS				ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
160000Z	11.0N	90.7E	45	11.3N	89.2E	60	90 15	12.2N	85.2E	70	271 10	13.1N	81.3E	80	366 15	--.-	---.-	--	--	--
161200Z	11.0N	90.4E	50	11.8N	87.1E	65	199 15	12.9N	83.2E	75	324 15	13.8N	79.2E	60	411 -5	--.-	---.-	--	--	--
170000Z	11.1N	89.7E	60	11.3N	88.7E	70	60 10	12.0N	86.3E	75	67 10	12.6N	86.3E	80	248 15	--.-	---.-	--	--	--
171200Z	11.3N	88.5E	60	12.1N	87.8E	70	63 10	12.6N	85.2E	75	59 10	12.8N	86.3E	80	288 10	--.-	---.-	--	--	--
180000Z	11.7N	87.4E	65	12.1N	87.0E	75	27 10	12.5N	86.0E	80	48 15	13.2N	85.7E	85	182 15	--.-	---.-	--	--	--
181200Z	12.8N	86.2E	65	13.3N	85.1E	75	71 10	14.4N	81.0E	80	318 10	15.6N	78.3E	45	550 -20	--.-	---.-	--	--	--
190000Z	13.3N	86.5E	65	14.2N	83.7E	75	171 10	16.3N	80.7E	60	438 -10	--.-	---.-	--	-- --	--.-	---.-	--	--	--
191200Z	13.5N	87.2E	70	15.0N	83.2E	75	248 5	17.2N	80.8E	50	438 -15	--.-	---.-	--	-- --	--.-	---.-	--	--	--
200000Z	13.7N	87.8E	70	13.5N	85.9E	75	111 5	15.0N	84.7E	85	123 15	17.4N	81.4E	30	249 -45	--.-	---.-	--	--	--
201200Z	14.1N	87.7E	65	14.1N	85.6E	75	122 10	15.8N	84.3E	85	137 -05	16.4N	82.0E	45	366 0	--.-	---.-	--	--	--
210000Z	13.9N	86.5E	70	15.2N	87.5E	80	97 10	17.5N	88.5E	80	431 -05	--.-	---.-	--	-- --	--.-	---.-	--	--	--
211200Z	13.5N	84.3E	90	14.3N	86.1E	70	115 -20	16.7N	85.9E	70	426 25	--.-	---.-	--	-- --	--.-	---.-	--	--	--
220000Z	13.6N	82.2E	75	14.6N	82.2E	65	60 -10	--.-	---.-	--	-- --	--.-	---.-	--	-- --	--.-	---.-	--	--	--
221200Z	13.0N	79.6E	45	13.7N	80.0E	55	48 10	--.-	---.-	--	-- --	--.-	---.-	--	-- --	--.-	---.-	--	--	--

	TYPHOONS WHILE WIND OVER 35KTS				ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	UNK	UNK	UNK	UNK	106NM	257NM	330NM	UNK
AVERAGE RIGHT ANGLE ERROR	UNK	UNK	UNK	UNK	55NM	122NM	113NM	UNK
AVERAGE MAGNITUDE OF WIND ERROR	0KTS	0KTS	0KTS	0KTS	10KTS	15KTS	14KTS	0KTS
AVERAGE BIAS OF WIND ERROR	0KTS	0KTS	0KTS	0KTS	10KTS	10KTS	-1KTS	0KTS
NUMBER OF FORECASTS	0	0	0	0	14	12	8	0