

Explanation of Weather Database

File WEATHER.PDF contains a chronological order of all weather reports, compiled from ship bridge logs, obtained from the National Archives in Washington, DC. The bridge logs contain information on winds, temperatures, clouds, visibility, and sea conditions, along with speed and heading of the ship at hourly intervals. In the comment sections are notations as to change of course and speeds, and other comments as deemed important by the captain of the ship. The ships included in the weather database are: Ontario, Itasca, Swan, Lexington, Cushing, Lamson, Drayton, and Colorado. I have only included the time period from June 17, 1937 to July 21, 1937, covering the departure of Ontario from American Samoa to the return of Itasca to a heading back to Honolulu and arrival of the Lexington at Honolulu after the search for Earhart was concluded. There are some differences between the US Navy and US Coast Guard bridge log entries for weather, and will be discussed below in the appropriate sections. The database also contains positional information of each ship, obtained from the navigational database described elsewhere.

SHIP	The vessel making the weather notations in their bridge logs.																												
TIMEZ	This is the Zulu time (Universal Coordinated Time, or Greenwich Mean Time), after conversion from local time maintained aboard ship. TIMEZ is encoded as YYYYMMDDHHMM, where Y is year, M is month, D is day, H is hour, and M is minute.																												
SPEED	The true speed of the vessel (accounting for current drift), derived from the navigational database, in nautical miles per hour (knots).																												
HEADING	The true heading or course of the vessel (accounting for set of currents), derived from the navigational database, in degrees true, relative to North.																												
COMMENT	<p>This is a personal comment, used to constrain the navigational program that smoothed the navigation of the ship. The various comments are:</p> <table><tr><td>c/c</td><td>change of course</td></tr><tr><td>c/cs</td><td>change of course and speed</td></tr><tr><td>c/s</td><td>change of speed</td></tr><tr><td>c/x</td><td>getting underway</td></tr><tr><td>fdr</td><td>Colorado fix in bridge log without notation of observed, assumed to be</td></tr><tr><td>dead-</td><td>reckoned</td></tr><tr><td>fixx</td><td>bridge log notation of position</td></tr><tr><td>fobs</td><td>Colorado fix with notation that it was observed, not dead-reckoned</td></tr><tr><td>logg</td><td>report in comment section of position of Equator crossing</td></tr><tr><td>map</td><td>Colorado fix, from letter to Hydrographic Office</td></tr><tr><td>met</td><td>Lexington fix, obtained from their aerological reports</td></tr><tr><td>radi</td><td>fix from radio message</td></tr><tr><td>radm</td><td>fix from radio message</td></tr><tr><td>swan</td><td>Colorado refueling Swan</td></tr></table>	c/c	change of course	c/cs	change of course and speed	c/s	change of speed	c/x	getting underway	fdr	Colorado fix in bridge log without notation of observed, assumed to be	dead-	reckoned	fixx	bridge log notation of position	fobs	Colorado fix with notation that it was observed, not dead-reckoned	logg	report in comment section of position of Equator crossing	map	Colorado fix, from letter to Hydrographic Office	met	Lexington fix, obtained from their aerological reports	radi	fix from radio message	radm	fix from radio message	swan	Colorado refueling Swan
c/c	change of course																												
c/cs	change of course and speed																												
c/s	change of speed																												
c/x	getting underway																												
fdr	Colorado fix in bridge log without notation of observed, assumed to be																												
dead-	reckoned																												
fixx	bridge log notation of position																												
fobs	Colorado fix with notation that it was observed, not dead-reckoned																												
logg	report in comment section of position of Equator crossing																												
map	Colorado fix, from letter to Hydrographic Office																												
met	Lexington fix, obtained from their aerological reports																												
radi	fix from radio message																												
radm	fix from radio message																												
swan	Colorado refueling Swan																												
TIMEL	Local time, as used by the vessel. Encoding the same as TIMEZ.																												
LAT	Latitude, in decimal degrees. Obtained from navigational database. Positive values are North; negative values are South.																												
LONG	Longitude, in decimal degrees. Degrees are always positive, running from zero at the Prime Meridian eastward to 360.																												

WINDIR	Wind direction, using standard points of a compass, or in degrees relative to north. Wind is always measured from the direction of the source.																												
WINDSPD	Wind speed, in nautical miles per hour (knots). The US Navy and US Coast Guard uses the Beaufort Scale in their bridge logs. The Lexington, Swan, and Colorado denoted the actual speed in knots, presumably since all three ships were involved in aviation-related functions, and needed more precision in their measurements.																												
BARO	The barometric pressure reported in the bridge logs, in inches of mercury.																												
AIRTEMP	The dry bulb temperature, in degrees Fahrenheit, as measured aboard ship, in a shaded environment.																												
WETTEMP	The wet bulb temperature, as measured aboard ship, in a shaded environment. Using the different temperatures between dry and wet bulbs allows one to calculate the relative humidity and/or the dew point. For some reason, the Swan's wet bulb readings are not reliable.																												
WATERTEMP	The temperature of the sea surface, usually measured from the water intake to the engine room.																												
WXSymb	<p>Weather symbol. Many weather symbols are combinations of individual symbols. The ones used are:</p> <table> <tr><td>b</td><td>blue sky, cloudless</td></tr> <tr><td>bc</td><td>blue sky with detached clouds</td></tr> <tr><td>c</td><td>sky mainly cloudy</td></tr> <tr><td>d</td><td>drizzling, or light rain</td></tr> <tr><td>e</td><td>wet air, without rain</td></tr> <tr><td>f</td><td>fog, or foggy weather</td></tr> <tr><td>g</td><td>gloomy or dark, stormy-looking weather</td></tr> <tr><td>l</td><td>lightning</td></tr> <tr><td>o</td><td>overcast</td></tr> <tr><td>p</td><td>passing showers of rain</td></tr> <tr><td>q</td><td>squally weather</td></tr> <tr><td>r</td><td>rainy weather, or continuous rain</td></tr> <tr><td>u</td><td>ugly appearance, or threatening weather</td></tr> <tr><td>z</td><td>hazy weather</td></tr> </table>	b	blue sky, cloudless	bc	blue sky with detached clouds	c	sky mainly cloudy	d	drizzling, or light rain	e	wet air, without rain	f	fog, or foggy weather	g	gloomy or dark, stormy-looking weather	l	lightning	o	overcast	p	passing showers of rain	q	squally weather	r	rainy weather, or continuous rain	u	ugly appearance, or threatening weather	z	hazy weather
b	blue sky, cloudless																												
bc	blue sky with detached clouds																												
c	sky mainly cloudy																												
d	drizzling, or light rain																												
e	wet air, without rain																												
f	fog, or foggy weather																												
g	gloomy or dark, stormy-looking weather																												
l	lightning																												
o	overcast																												
p	passing showers of rain																												
q	squally weather																												
r	rainy weather, or continuous rain																												
u	ugly appearance, or threatening weather																												
z	hazy weather																												
CLOUD	<p>Abbreviated cloud definitions. The abbreviations used are:</p> <table> <tr><td>a cu</td><td>Alto-Cumulus</td></tr> <tr><td>a s</td><td>Alto-Stratus</td></tr> <tr><td>a st</td><td>Alto-Stratus</td></tr> <tr><td>acu</td><td>Alto-Cumulus</td></tr> <tr><td>ast</td><td>Alto-Stratus</td></tr> <tr><td>ccu</td><td>Cirro-Cumulus</td></tr> <tr><td>ci</td><td>Cirrus</td></tr> <tr><td>ci cu</td><td>Cirro-Cumulus</td></tr> <tr><td>ci nb</td><td>Cirro-Nimbus (?)</td></tr> <tr><td>ci ni</td><td>Cirro-Nimbus (?)</td></tr> <tr><td>ci st</td><td>Cirro-Stratus</td></tr> <tr><td>cicu</td><td>Cirro-Cumulus</td></tr> <tr><td>co</td><td>(?)</td></tr> <tr><td>cu</td><td>Cumulus</td></tr> </table>	a cu	Alto-Cumulus	a s	Alto-Stratus	a st	Alto-Stratus	acu	Alto-Cumulus	ast	Alto-Stratus	ccu	Cirro-Cumulus	ci	Cirrus	ci cu	Cirro-Cumulus	ci nb	Cirro-Nimbus (?)	ci ni	Cirro-Nimbus (?)	ci st	Cirro-Stratus	cicu	Cirro-Cumulus	co	(?)	cu	Cumulus
a cu	Alto-Cumulus																												
a s	Alto-Stratus																												
a st	Alto-Stratus																												
acu	Alto-Cumulus																												
ast	Alto-Stratus																												
ccu	Cirro-Cumulus																												
ci	Cirrus																												
ci cu	Cirro-Cumulus																												
ci nb	Cirro-Nimbus (?)																												
ci ni	Cirro-Nimbus (?)																												
ci st	Cirro-Stratus																												
cicu	Cirro-Cumulus																												
co	(?)																												
cu	Cumulus																												

cu ci	Cirro-Cumulus (?)
cu nb	Cumulo-Nimbus
cu ni	Cumulo-Nimbus
cu st	Stratuo-Cumulus
fog	Fog
nb	Nimbus
ni	Nimbus
scu	Strato-Cumulus
st	Stratus
st ci	Cirro-Stratus
st cu	Strato-Cumulus
st ni	Nimbo-Stratus

CLOUDDIR The direction that the clouds are moving from, in standard points of the compass or degrees relative to north.

CLOUDAMT The amount of cloud cover, in tenths.

VISIBILITY The distance in nautical miles that an object can be determined. The US Navy gave the distance directly in nautical miles, whereas only the US Coast Guard used a visibility code: That code has been translated into distances according to the following formula:

0	Not visible at 50 yds
1	Not visible at 200 yds
2	Not visible at 500 yds
3	Not visible at 0.5 miles
4	Not visible at 1 mile
5	Not visible at 2 miles
6	Not visible at 4 miles
7	Not visible at 7 miles
8	Not visible at 20 miles
9	Visible at distances beyond 20 miles

SEACOND The sea condition, according to the following formula:

0	No swell, calm or slight sea
1	Moderate swell, calm or slight sea
2	Heavy swell, calm or slight sea
3	No swell, moderate sea
4	Moderate swell, moderate sea
5	Heavy swell, moderate sea (maximum observed in the database)
6	Rather rough sea
7	Rough sea
8	Very rough sea
9	Mountainous sea

SWELLDIR The direction from the source of the swell, in standard points of the compass, or in degrees relative to true north.