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WHAT'S A MAREP?

MAREP stands for MAriner REPort. A MAREP is a radio message of weather and sea conditions observed by you and other mariners at sea.

WHY SEND MAREPs?

Because you're at sea and you know the weather. Timely weather observations - MAREPs - taken and transmitted by you are important. Here's why:

- | Your observations help the National Weather Service (NWS) improve the accuracy and timeliness of marine weather warnings and forecasts.
- | Your observations fill in the spaces between widely separated weather reporting ships and buoys. This helps to identify weather conditions that might otherwise go undetected.
- | NWS warnings and forecasts, which are updated from marine observations, are quickly relayed via telecommunications circuits and over radio to boaters, fishermen, and others who depend on weather information for work and leisure at sea.

SO...WHAT'S IN IT FOR ME?

MAREPs mean self-help. By sending a MAREP you benefit from better warnings and forecasts.

In summary, **MAREPs** are valuable because... **YOU KNOW THE WEATHER!**

GUIDELINES

1. Call the radio station and tell them you want to transmit a MAREP.
2. Report as much as you can. Even partial reports are important.
3. Try to send a MAREP at least once during the operating hours of the radio station, or more often if possible. Also, send a MAREP when the weather changes or is different than the forecast.
4. Report information in the same order as presented in this manual. Since other mariners are reporting the same way, it will be easier and faster for the radio operator to relay the MAREPs to the NWS.

HOW TO DO IT

A complete MAREP contains the following information:

- | | |
|--|--|
| Who | 1. Your call sign or vessel name |
| When | 2. Time of observation |
| Where | 3. Approximate location where observation was made |
| Very important. What you and the forecasters need to know. | 4. Wind direction and speed |
| | 5. Seas |
| | 6. Swell |
| | 7. Visibility |
| | 8. Present Weather |
| Optional. If you can, try to report these too. | 9. Barometer (Air Pressure) |
| | 10. Air temperature |
| | 11. Sea Temperature |
| Feel free! | 12. Remarks |

HERE ARE THE DETAILS

1. **YOUR CALL SIGN:** Identify yourself by the radio call sign or name of your vessel.

Example: "THIS IS WXY-123" or "THIS IS THE NINA J."

2. **TIME OF OBSERVATION:** Give the time that you took the weather observation, not the time you called in the report. Use local time. Try to use the 24 hour clock (add 12 to PM times).

Example: 0700 (7 AM)
1900 (7 PM)
1200 (Noon)
0000 (Midnight)
0030 (12:30 AM)
1528 (3:28 PM)
etc.

Time of observation is very important because your MAREP can be compared to observations taken at other locations at about the same time.

3. **LOCATION WHERE OBSERVATION WAS MADE:** Give location either as latitude and longitude to the nearest tenth of a degree or an approximate distance and direction from a well-known landmark. Report location when observation was taken, not when it was called in.

Example: 35.3 74.7 or 60 MILES EAST OF HATTERAS LIGHT

4. **WIND DIRECTION:** The direction the wind is blowing from. Report one of the 8 points of the compass:

N, W, S, W, NE, SE, SW, or NW.

Direction can be estimated by observing the movement of waves produced by winds in the local area. However, do not use the direction of swell (see item 6) or the movement of clouds to estimate surface wind direction.

If you have a reliable, calibrated anemometer on board, average the directions over about a 1 minute period and report the average direction from the list above.

WIND SPEED: Reported in knots (nautical miles per hour). Estimate the wind speed to nearest 5 knots. If there's little or no wind, report calm.

Photographs in Appendix 1 show how to use the appearance of the sea to estimate wind speed. However, this technique should be used carefully because it takes a certain amount of time and distance for the indicated wind speeds to act on the sea surface to produce the waves as pictured. In other words, it may be blowing harder than you think and the waves may be in the process of building.

If you have a reliable, calibrated anemometer on board, average the speeds over about a 1 minute period and report the average to the nearest knot.

WIND GUSTS: Rapid fluctuations in wind speed with a variation of 10 knots or more between peaks and lulls. Report in Remarks (item 12 below) the estimated gust speed or the word GUSTY.

Examples of wind reports:

NW 20 ..GUSTY (IN REMARKS)
SE15
W 25...GUSTS TO 40 (in REMARKS)
CALM

NOTE: The above instructions will assist you in coming up with a good estimate of wind conditions. A group of estimated reports from mariners in the area gives the forecaster a better picture of what's going on than he had before. And that means more confidence in whether or not to issue a warning. If you are estimating wind direction and speed aboard a moving vessel by methods other than observing the appearance of the sea (Appendix I), see Appendix 2 which shows you how to use the slide rule calculator found in the pocket of this manual,

5. SEAS Waves produced by winds in the area. Wind-driven waves have a mixed appearance with many different heights and distances between waves. Wave height is the vertical distance from trough (low point of wave) to crest (high point of wave). Report the average height to the nearest foot of swell-formed waves produced by winds in the area. Avoid taking a "snapshot" observation. Try to observe the sea for a couple of minutes to arrive at the average - or what the forecaster refers to as the "significant" height.

If an unusually high wave, much higher than average, occurs every now and then during your observation, give its height in Remarks (item 12 below).

Example: SEAS 8 FEET (average of observed heights)...HIGHEST WAVE 15 FEET (in Remarks)

6 SWELL Waves are present, but not produced by winds in the area. These waves are more regular and uniform in appearance and have a longer wave

length (crest-to-crest distance) and longer period (time between passage of wave crests). Swell are waves that have come from a distant storm. It's possible to experience high swell even when the wind is light or calm.

Direction: Report the direction the swell is coming from.

Height: Average height to the nearest foot from trough to crest.

Example: SWELL NW 6 FEET

One other thing... Sometimes it's not easy to tell what's "sea" and what's "swell" - it all looks mixed up. Just report an average height of this combined condition as you would report SEAS. Also, report waves much higher than average in Remarks (item 12 below).

7. **VISIBILITY:** The greatest distance that a known object can be seen and identified. When there are no objects to identify (as is so often the case in the middle of the ocean), visibility can be obtained by estimating the distance to the horizon according to the following table:

Distance To Horizon At Sea (Nautical Miles)

Height of Observation Platform (Ft.)	Distance to Horizon (n. mi.)	Height of Observation Platform (Ft.)	Distance to Horizon (n. mi.)
5	3	25-30	6
10-15	4	35-40	7
20	5		

If the object or horizon is visible with little or no blurring, visibility is greater than the distance. If object or horizon is blurred or indistinct, visibility is about equal to the distance.

Report the average distance in miles you can see in the area around your vessel. For less than 1 mile, report to nearest quarter mile. If visibility varies widely around the area, report the average distance and give the minimum distance in Remarks (item 12 below). You need not report a minimum distance unless it is 1 mile or less.

Example: Visibility varies from 1/4 mile to 3 miles around your vessel, but averages 2 miles over most of the area. Report VISIBILITY 2 MILES. At the end of your report in REMARKS give the minimum visibility such as: VISIBILITY 1/4 MILE IN PATCHY FOG

8. **PRESENT WEATHER:** Refers to clouds, precipitation, and obstructions to vision. Report the weather that best describes local conditions at the time of observation. Up to three of the following conditions may be reported. (Report Cloudy, Partly Cloudy, or Clear only when there is no precipitation.)

Clear	Drizzle	Snow
Partly Cloudy	Freezing Drizzle	Hail
Cloudy	Rain	Thunderstorm
Fog	Freezing Rain	Squall
Haze	Sleet	Waterspout

You know the weather, but just in case...

- Clear: 0 to 2/10 of the sky covered.
- Partly Cloudy: 3/10 to 7/10 of the sky covered.
- Cloudy: 8/10 to 10/10 of the sky covered.
- Fog: Tiny water droplets suspended in the air without visible downward motion and having a gray color.
- Haze: Tiny dust or salt particles

suspended in the air. Haze is usually distinguished from fog by its blueish or yellowish color.

- Drizzle: Very small water droplets that appear to float in air currents, but fall to the surface.
- Freezing Drizzle: Drizzle that freezes on contact with exposed surfaces that are below freezing.
- Rain: Liquid water drops.
- Freezing Rain: Rain that freezes on contact with exposed surfaces that are below freezing.
- Sleet: Frozen rain.
- Snow: Ice crystals often in the shape of six-sided flakes.
- Hail: Ice balls, equal or greater in size than raindrops. Usually associated with a thunderstorm.
- Thunderstorm: Thunder must be heard. Lightning may or may not be seen. Thunderstorms may occur without precipitation.
- Squall: A sudden increase in wind and an abrupt lowering of clouds with or without precipitation or heavy sea conditions.
- Waterspout: Sometimes referred to as a tornado over water. A rotating column of air and spray with very high winds and a loud roaring noise. Funnel-shaped appendage touching the water, suspended from the base of clouds.

The following parts of a MAREP are not as important 'as the elements described so far. But if you have the instrumentation (reliable, of course), try to include them in your MAREP.

9. **BAROMETER [Air Pressure]:** If you have a barometer that's been calibrated recently, tap the dial lens and read the air pressure. Be sure to view the pointer head on. Some barometers have a mirror strip next to the dial markings. The reflection of the pointer should be lined up right behind the pointer itself. Read the dial to the nearest hundredth of an inch or nearest whole millibar (depending on type of barometer).

Examples:

29.92 inches	29.53 inches	29.29 inches
1013 millibars (mb)	1000 mb	992 mb

10. **AIR TEMPERATURE:** Report to the nearest whole degree fahrenheit.

11. **SEA TEMPERATURE:** Report to the nearest whole degree fahrenheit.

Last but definitely not least:

12. **REMARKS:** Here's your chance to say anything you want, within reason, of course. Report any additional data or conditions that you believe the forecaster needs to know. Additional data include wind gusts (see item 4) wave heights much higher than average (see item 5), and minimum visibility (see item 7). Here are some examples.

DARK CLOUDS NW HEAVY RAIN GUSTS TO 40 KNOTS SEAS TO 30 FEET LIGHTNING NW	WIND LIGHT AND VARIABLE VISIBILITY 1/4 MI IN PATCHY FOG WAVES LIKE GRAND CANYON FREEZING SPRAY WHO MADE THAT FORECAST? ...ETC...
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MAREP EXAMPLE

Here's what a MAREP relayed to NWS would look like with all the elements reported. But, please remember, even if you send a partial report, such as only winds and seas, your MAREP is important.

WXY-123 0600 37.7 123.0 NW20 6 N6 5 PARTLY CLOUDY
998 53 49 GUSTS TO 30 KT SEAS TO 10 FT.

This is what the mariner has reported:

"This is WXY-123 with a MAREP. At Oh-six-hundred I'm located at latitude 37.7 longitude 123.0. Winds are Northwest 20 knots, seas are about 6 feet with a north swell of 8 feet. Visibility is over 5 miles and it's partly cloudy. Barometer is 998 millibars, air temperature 53, sea water temperature 49. Winds are gusting to 30 knots, seas are up to 10 feet and I'm gettin' outta here....!"

Inside the pocket of this manual is a MAREP guide which summarizes the instructions. Use it as a handy reference in taking and sending an observation. Before long, it'll be like second nature.... And that's just what we want...to have you add MAREP reporting to your navigational routine...to help the National Weather Service help you.

Your MAREPs are valuable, are appreciated, and they do make a difference because..

YOU KNOW THE WEATHER!

Thanks for your help...and tell others to send MAREPs.

APPENDIX 1

STATE OF SEA PHOTOGRAPHS FOR ESTIMATING WIND SPEED¹



Figure 1.

Wind speed less than 1 kt

Sea Criterion: Sea like a mirror.

<u>Waves at time of picture</u>	<u>Height (ft)</u>	<u>Period (sec)</u>
Sea waves	2	5
Swell		
<u>Height of camera above sea:</u>	35 ft.	

- 1 Reprinted from "State of Sea Photographs for the Beaufort Wind Scale," 1968, Atmospheric Environment Service, Downsview, Ontario, Canada. Used by permission.



Figure 2.

Wind speed 1-3 kt, average 2 kt

Sea Criterion: Ripples with the appearance of scales are formed, but without foam crests.

<u>Waves at time of picture</u>	<u>Height (ft)</u>	<u>Period (sec)</u>
Sea waves	3	10
<u>Height of camera above sea:</u>	35 ft.	



Figure 3.

Wind speed 4-6 kt, average 5 kt

Sea Criterion: Small wavelets, still short but more pronounced
 --crests have a glassy appearance and do not break.

<u>Waves at time of picture</u>	<u>Height (ft)</u>	<u>Period (sec)</u>
Sea waves	1	6
Swell		
<u>Height of camera above sea:</u>	45 ft.	



Figure 4.

Wind speed 7-10 kt, average 9 kt

Sea Criterion: Large wavelets. Crests begin to break. Foam of a glassy appearance. Perhaps scattered white horses.

<u>Waves at time of picture</u>	<u>Height (ft)</u>	<u>Period (sec)</u>
Sea waves		
Swell	a	7
<u>Height of camera above sea:</u>	<u>45 ft.</u>	

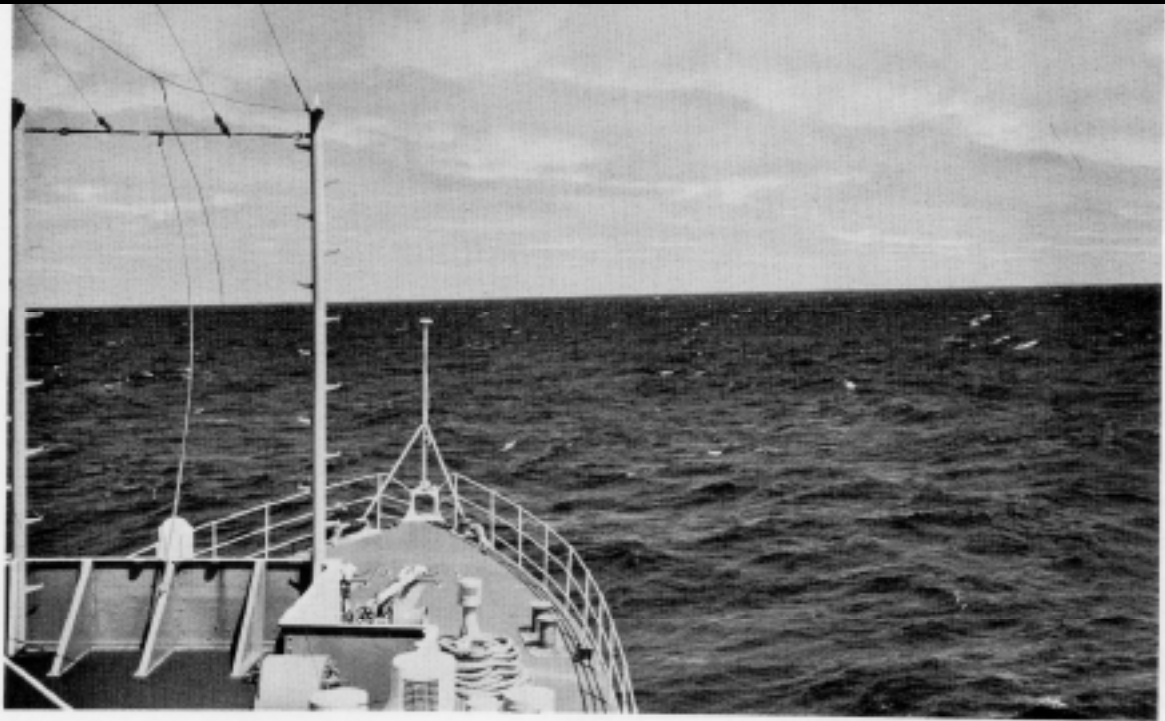


Figure 5.

Wind speed 11-16 kt, average 13 kt

Sea Criterion: Small waves, becoming longer, fairly frequent white horses.

<u>Waves at time of picture</u>	<u>Height (ft)</u>	<u>Period (sec)</u>
Sea waves	3	5
Swell		
<u>Height of camera above sea:</u>	35 ft.	

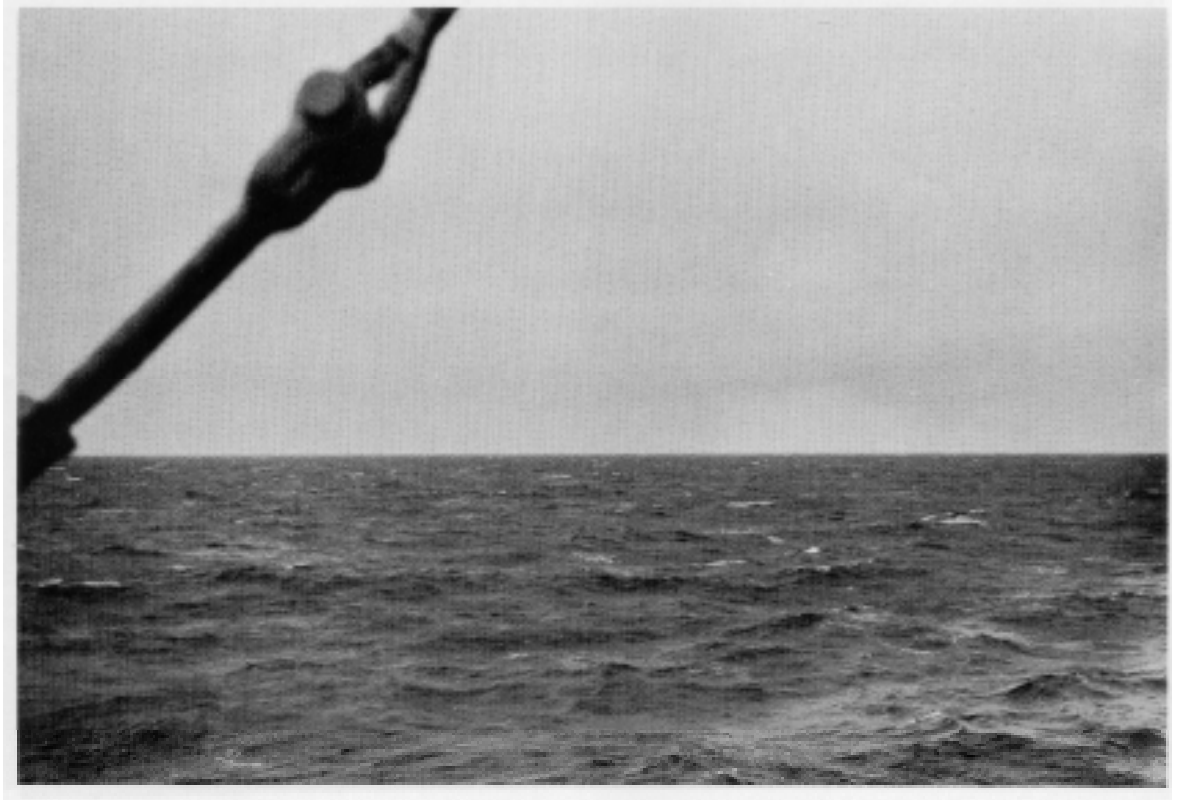


Figure 6.

Wind speed **17-21** kt, average 19 kt

Sea Criterion: Moderate waves taking a more pronounced long form; many white horses are formed. (Chance of some spray.)

<u>Waves at time of picture</u>	<u>Height (ft)</u>	<u>Period (sec)</u>
Sea waves	7	6
Swell	6	8
<u>Height of camera above sea:</u>	35 ft.	



Figure 7.

Wind speed 22-27 kt, average 24 kt

Sea Criterion: **Large** waves begin to form; the white foam crests are more extensive everywhere. (Probably some spray)

<u>Waves at time of picture</u>	<u>Height (ft)</u>	<u>Period (sec)</u>
Sea waves	11	6
Swell		-
<u>Height of camera above sea:</u>	20 ft.	



Figure 8.

Wind speed 28-33 kt, average 30 kt

Sea Criterion: Sea heaps up and white foam from breaking waves begin to be blown in streaks along the direction of the wind.

Waves at time of picture	Height (ft)	Period (sec)
Sea waves	13	6
Swell	10	9
<u>Height of camera above sea:</u>	45 ft.	



Figure 9.

Wind speed 34-40 kt, average 37 kt

SeaCriterion: Moderately high waves of greater length; edges of crests begin to break into the spindrift. The foam is blown in well-marked streaks along the direction of the wind.

Waves at time of picture	Height. (ft)	Period (sec)
Sea waves	18	7
Swell		
Height of camera above sea:	35 ft.	

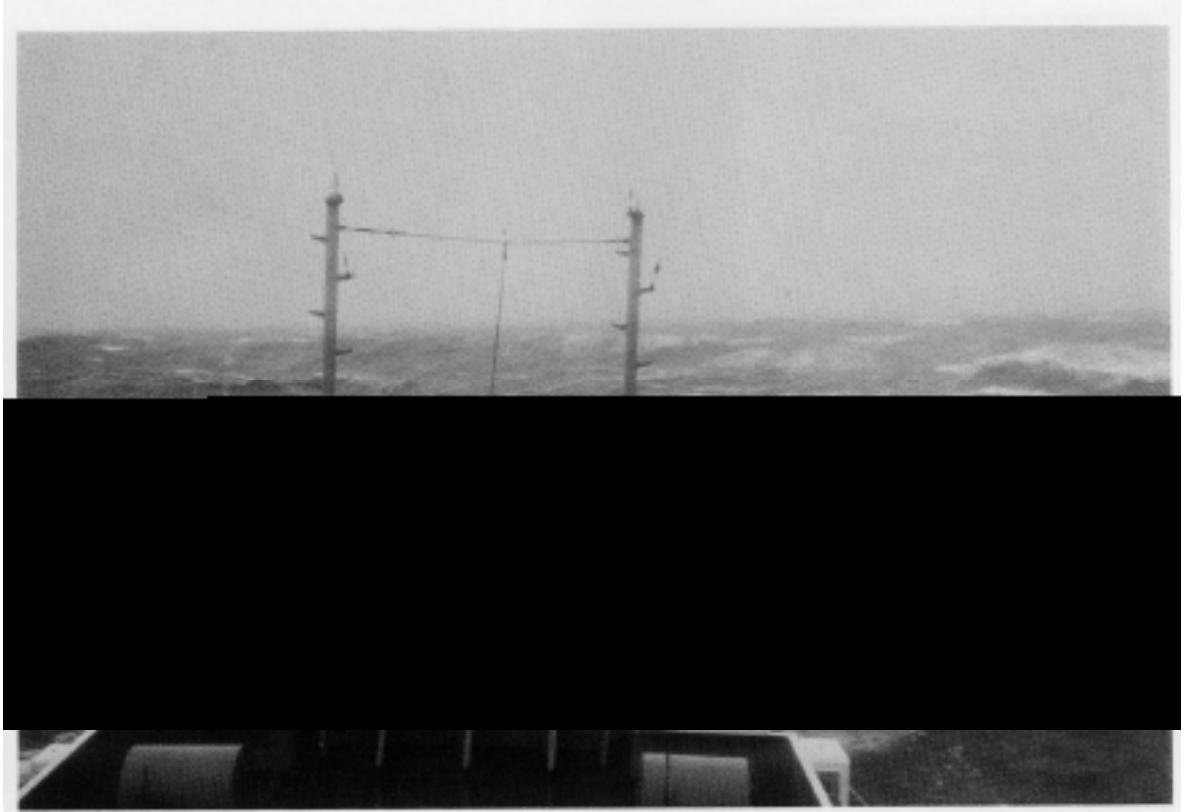


Figure10.

Wind speed 41-47 kt, average 44 kt

SeaCriterion: High waves. **Dense** streaks of foam along the direction of the wind. **Creels** of waves begin to topple, tumble, and roll over. Spray may affect visibility.

Waves at time of picture	Height(ft)	Period (sec)
Sea waves	20	7
Swell		
Height of camera above sea:	35 ft.	

Appendix 2



Figure 11.

Wind speed 48-55 kt, average 52 kt

Sea Criterion: Very high waves with long overhanging crests. The resulting foam, in great patches, is blown in dense white streaks along the direction of the wind. On the whole, the surface of the sea takes on a white appearance. The tumbling of the sea becomes heavy and shocklike. Visibility affected.

<u>Waves at time of picture</u>	<u>Height (ft)</u>	<u>Period (sec)</u>
Sea waves	22	9
Swell		
<u>Height of camera above sea:</u>	15 ft.	

Appendix 2

FIGURING TRUE WIND FROM APPARENT WIND

These instructions and the calculator found in the cover pocket will help you determine wind direction and speed aboard a moving vessel if your observation is based on methods other than observing the appearance of the sea (as described in Appendix 1). These other methods include: a) judging the "feel" of the wind, b) observing a flag or pennant, c) taking readings from wind instruments. If you are using the appearance of the sea to estimate wind direction and speed do not use this appendix or the slide rule calculator.

Remember the old saying about "separating the wheat from the chaff"? Well, it also applies to taking wind observations on a moving vessel. In this case it's a matter of separating the true wind from the apparent wind.

True wind is what the direction and speed would be if your vessel were anchored. Apparent wind is the wind experienced on a moving vessel which is a combination of true wind and vessel movement. True wind direction is always on the same side of the vessel as the apparent wind direction, but farther from the bow.

Enclosed in the pocket of this manual is a slide rule calculator to convert apparent wind direction and speed (estimated or measured) to true wind direction and speed based on the speed and heading of your vessel.

The instructions printed on the calculator are self-explanatory. Basically, here's what it does:

- After you determine the apparent wind direction and speed off the bow, it tells you what the true wind direction and speed would be off the bow if the ship were anchored.
- | Then, based on the ship's heading, it converts the true wind direction off the bow to a compass direction which is what you would report in your **MAREP**.

An example is given on the next page.

Here's an example situation for using the calculator:

Say you're heading 135 degrees (SE) at 15 knots. Winds are picking up and you decide to call in a MAREP. The wind feels like it's hitting you about 60 degrees off the starboard bow. This is your AP-PARENT WIND DIRECTION. Now, look at the scale on the calculator labeled AP-PARENT WIND SPEED. Pick a speed that's closest to what you think the wind is blowing, say, 30 knots.

1. Move the sliding card and line up 60 degrees (apparent wind direction) with 15 knots (ship speed).
2. Look across the apparent wind speed scale. Above and below 30 knots read TRUE WIND DIRECTION of 90 degrees and TRUE WIND SPEED of 25 knots, respectively. Since the true wind direction is also off the starboard bow, it has to be converted to a compass direction
3. Turn the wind arrow to 90 degrees starboard on the scale printed on the "ship." Holding the arrow steady, turn the "ship" to 135 degrees (ship heading) on the outer scale.
4. The wind arrow now points to the SW on the outer scale. So, your wind report in your MAREP is SW 25 knots. (The speed is from step 2.)

Just to make sure you know how to use the calculator, try this exercise. In the above example, what if the apparent wind was hitting you at 60 degrees off the port bow? What would your compass direction be? If you say NE, you're right. All the above steps are the same except that in step 3 you turn the true wind arrow to 90 degrees port on the "ship." With the "ship" pointed to 135 degree heading the wind arrow is pointing to the NE.

Summary...

1. Determine apparent wind direction (port or starboard), apparent wind speed, and ship heading and speed.
2. Align apparent wind direction with ship speed.
3. Read off true wind direction (port or starboard) and true wind speed.
4. Align wind arrow on ship scale (port or starboard).
5. Align ship with heading,
6. Read off compass wind direction and report it, together with true wind speed in your MAREP.