Kriegsmarine

M3-UKW = B

M3-UKW = C

Short Weather Cypher

Encrypting and Sending a Kriegsmarine 3-rotor Short Weather Cypher Message

Note: The Kriegsmarine 3-rotor and temporarily modified 4-rotor Enigma machines were used by U-boats and converted fishing trawlers to relay weather information from the north and west, the directions from which Germany's weather came, to B.d.U. (U-boat Headquarters). These "floating weather observers" were critical to both German strategic (long-range) and tactical (short-range) battle planning.

Note: If you have not already printed off copies of these documents from the webpage, please return to the webpage procedure and do so now.

- The Short Weather Cypher Encyrpting and Sending Procedure
- Kriegsmarine M3-UKW = B and C Inner Settings
- Kriegsmarine M3-UKW = B and C Outer Settings
- Short Weather Cypher Tables (A, C, DDD, E, G, K, L, M, PPP, R, T, V, W, and Z)
- Table BB - Sea Area Grid Map
- Table Recording Sheet - (Example)
- Table Recording Sheet - (Blank)

Note: We will select sample values from the tables to use for our example U-boat in this procedure. Our Table Recording Sheet – (Example) will also use these same corresponding values. To send an Enigma-encrypted Short Weather Cypher message to a friend, you may, of course, choose any table settings or values you wish.

(Note: Using the blank "Table Recording Sheet" you have already printed, encrypt your message following ours as an example.)

1. **Find Table BB, "Sea Area Grid Map."** Table BB gives the identification letters for the weather observation location of our example U-boat. For example, if our example U-boat is at 48° (degrees) 10' (minutes) north latitude, and 8° 15' west longitude, it is located in grid square I (read capital "i") and O. Write the letter I (read capital "i") into box #3 and the letter "O" into box #4 on the Short Weather Cypher "Table Recording Sheet." Write-in the correct location letters if you are sailing your own U-boat.

2. **Find Table R, "Change in Wind Direction during the last 3 hours/ANLAGE" (grid unit).** The first part of table R's title ("Change in Wind Direction during the last 3 hours") is self- descriptive. The second part of table R's title, "/Anlage (grid unit)," requires clarification.

   A. Place your finger on the column (up and down) on the Sea Area Grid Map that matches the letter that you wrote-down in box 4 on the Table Recording Sheet. In our example, this is column "O."

   B. Carefully run your finger down column O until you get to the bottom of the column where the "Anlage" numbers are located. Our example Anlage number is 15.

   C. Since our example Anlage number is 15, we look at column "15/17" on the "Anlage" table. (You look at the Anlage column corresponding to your Anlage number on the Sea Area Grid Map.)

   D. Let's say that our example wind was blowing from the north at 2000 hours (8:00 PM), but it is now blowing from the northwest three hours later at 2300 hours (11:00 PM). The direction has moved (rotated) to the left. Using the Anlage chart, the "15/17" column, we see that letter "V" signals a wind shift to the left.

   E. Write the letter "V" into box #2 on the Table Recording Sheet that you are using for our example message. For your own message, enter the appropriate letter into box 2.

3. **Find Table PPP, "Barometric Pressure in Two Millibars."** Table PPP reports barometric pressure in two-millibar increments. For our example U-boat, let's say that our barometric pressure is 1014.9 mb (millibars).

   The rule for using the "Barometric Pressure in Two Millibars" chart is: "Round-off your barometric pressure to the closest even-numbered whole unit value."

   Example: 1014.9 = 1014.0 because 4.9 is closer to 4.0 than it is to 6.0

   A. Use the barometric pressure numbers on the chart and in the examples to help you find the correct 3-letter code. For our example, 1014, our code is HRB.

   B. Write the letters "H", "R", and "B" into boxes #5, #6, and #7 on the Table Recording Sheet if you are using our example. If you are using your own message, enter the appropriate letters into boxes #5, #6, and #7.

5. **Find Table A, "Barometric Pressure During Last Three Hours."**

   A. Find or choose the letter from Table A that you would like to represent the recent barometric pressure changes in the area around your U-boat.

   B. For our example message, let's say that the barometric pressure over the last 3 hours has fallen steadily from 1018.2 millibars (mb) to 1014.9 mb. What letter should we put into box #8 on our Table Recording Sheet?

C. If you wrote letter H, you are incorrect! Try again.

D. If you wrote I (read capital "i"), you are correct! Write the letter "I" (read capital "i") into box #8 on the Table Recording Sheet for our example. For your own U-boat, write-in the appropriate letter into box #8.

6. **Find Table C, "Clouds."** Table C, and its accompanying "Notes" page showing standard cloud abbreviations, report the cloud covering. Find or choose the letter from Table C that you would like to represent the present cloud covering in the area of your U-boat.

   A. If you are using our example U-boat, what letter matches, "cumulus and depth torn bad weather clouds FCU (fractocumulus) or FST (fractostratus)? Yes, letter S.

   B. Write "S" into box #9 on the Table Recording Sheet. If you are using your own example U-boat, write-in the appropriate letter into box #9.

Interesting weather note: In aviation, we pilots refer to cirrus clouds as "high, thin wispies," that often precede a storm. Even though we don't see any "CI's" for "cirrus clouds" on Table C, do you see any descriptions of clouds that may match the "high, thin wispies" description? Yes, the, "high, feathery"… letters C, D, E, and F seem to fit quite nicely!

7. **Find Table W, "Sky Covering and Rainfall."** Table W reports the sky covering if there are just clouds or the type of precipitation, if any is falling, in the area of your U-boat.

   A. If you are using our example U-boat, what letter would you use if you were surfaced, standing on the bridge, and a light rain drizzle were falling and clouding-up the lenses of your excellent Zeiss binoculars?

   B. That's right, letter J. Write Letter "J" into box #10 on the Table Recording Sheet you are using for our example U-boat. If you are the skipper of your own U-boat, use your own appropriate letter.

8. **Find Table Z, "Weather Change During the Last 12 Hours."**

   A. If you are on board our example U-boat, what letter would you use to report that the storm you have been stuck in for the last two days is still blowing from north to east with that same persistent precipitation that clouds your favorite pair of Zeiss binoculars?

   B. Yes, Q is the correct answer. Write the letter "Q" into box #11 on the Table Recording Sheet. If you are in your own boat, use the appropriate letter for your own choice of weather change during the last 12 hours.

9. **Find Table V, "Horizontal Visibility and Fog Conditions."** There are two very important abbreviations on Table V that you need to know: (1) SM = See Milen = sea miles or nautical miles; 1 nautical mile = 1.15 statute (land) mile, and (2) M = meters.

A. If you are a member of the watch on our example U-boat, what letter would you use to describe visibility that has moderate fog, you can see about ½ sea mile, and the fog has increased over the last hour?

B. Letter S is correct. Write the letter "S" into box #12 on the Table Recording Sheet. If you are in your own U-boat, use the appropriate letter for your own choice of horizontal visibility and fog conditions.

10. **Find Table DDD, "Wind Direction and Strength."**

A. If you are on our example U-boat, let's say that the wind is coming from the west southwest and blowing at a force factor of 6.

B. Find "WSW" in the first column (English), which just also happens to correspond with the German abbreviation for west southwest: "WSW."

C. Now, read to the right until you reach column number 6, the wind's force factor. You read the letters "nrv."

D. Insert the letters "nrv" correspondingly into boxes #13, #14, and #15 on the Table Recording Sheet. If you are in command of your own fighting U-boat, record your own observations.

11. **Find Table K, "Changes of Wind Strength, Swell, and Height of Swell."**

A. Our U-boat is tracking an Allied convoy on its way to England. After two days of getting tossed about on the surface by bad weather, the wind has finally abated, and the ocean swell has diminished to less than 2 meters.

B. What letter would you use to inform higher headquarters (B.d.U.) of these new weather conditions?

C. Capital letter I (read capital letter "i") is correct.

D. Put an "I" (read capital letter "i") into box #16 on the Table Recording Sheet. You are on a different boat? Use the appropriate letter.

12. **Find Table L, "Length and Direction of Swell."** Table L asks the observer for the approximate distance from the top of one wave crest to the top of the next wave crest, and the direction these wave crests are moving.

A. Our U-boat is on the surface in the "Black Gap" area of the North Atlantic (so named because this area is beyond the range of Allied air cover) and has swells 75 meters apart moving in from the northwest.

B. What letter identification is needed for these conditions?

C. Letter W is correct.

D. Put the letter "W" into box #17 on the Table Recording Sheet. If you are skippering your own boat, use your own appropriate letter.

13. **Find Table T, "Air Temperature in Whole Degrees Celsius."**

A. Our example U-boat has been ordered far north to rendezvous with a weather trawler off the coast of Iceland. Both the trawler and the U-boat record the air temperature as –17° C.

B. What letter indicator should be used?

C. Letter U is correct.

D. Enter letter "U" into box #18 on your Table Recording Sheet. Have your own boat? You know what to do.

14. **Find table M, "Difference Between Air and Water Temperature in Degrees Celsius."**

A. Our U-boat is in the Caribbean Sea hunting oil tankers leaving south Texas ports. The air temperature is 32.2° Celsius (90° Fahrenheit) and the water temperature is 29.4°Celsius (85° Fahrenheit).

B. What letter indicator is needed?

C. 32.2 minus 29.4 = 2.8, air temperature higher = G

D. Write letter "G" into box #19 on the Table Recording Sheet. Suit yourself with your own U-boat.

15. **Find Table G, "Time of Observation in Complete Hours After DGZ (GMT)."** Table G records the time that the weather observation was taken, rounded to the nearest complete hour DGZ (GMT, Greenwich Mean Time).

A. Our example U-boat finished its weather observations at 1828 DGZ (GMT).

B. What coded letter is needed?

C. The letter S is correct.

D. Write the letter "S" into box #20 on your Table Recording Sheet. Use your own letter if you U-boat is on its own patrol.

16. **Find Table E, "Ice Conditions."** Table E, "Ice Conditions," is only used if an ice report is specifically requested by a higher reporting authority or if ice is in sight. If ice is **not** a factor, box #21 on your Table Recording Sheet is used as the first letter of the **"UUU Signature of U-boat."** But since this is a practice exercise, we will have ice conditions so that you can get some work using the E table.

A. Our U-boat has been routed well north of its usual route so as to help avoid detection by Allied aircraft. Small moving ice flows covering less than ¼ of the sea surface have appeared but have not interfered with the patrol.

B. What code letter should be sent to headquarters?

C. The letter D should be sent.

D. Write the letter "D" into box #21 on your Table Recording Sheet. On your own boat? Wow! I hope you don't have to send letter "W".

17. **UUU, "Signature of U-boat"**

A. Boxes #21, #22, and #23 are used for the three-letter encoded signature of the U-boat if **no ice is present**. Use any three random letters. You may use your own three initials.

B. Boxes #22, #23, and #24 are used for the three-letter encoded signature of the U-boat if **ice is present**. Use any three random letters. You may use your own three initials.

Note: Do not worry that box #1 on your "Table Recording Sheet" is empty. It will be filled-in soon!

To Encrypt your Short Weather Cypher Message

1. Find your "Kriegsmarine M3-UKW=B and C Inner Settings" and "Kriegsmarine M3-UKW=B and C Outer Settings" sheets.

2. Using the "Kriegsmarine M3-UKW=B and C Inner Settings" sheet, scan down the "Date" column and select the correct date for today. For our example U-boat in this exercise, let's say that today is the 29th day of the month. Note the matching letter "C" in the "For Wetterkurz Signal Only – Sp" column. (Sp is also referred to as the "Message Key.")

3. Write your "Message Key" letter in box #1 on your Table Recording Sheet. For our example U-boat the letter "C" is in box #1 on the Table Recording Sheet.

4. The "UKW" column on the "Inner Settings" sheet shows "M3-**B**" for our "Date," the 29th, which means that we will be using the Kriegsmarine M3-UKW=**B** reflector machine. If you will be using a UKW that has an "M3-**C**" reflector in this column, select the Kriegsmarine M3-UKW=**C** machine.

5. Open the cover of the Enigma simulator on your computer screen. Click on the letter "B," located on the left end of the rotor shaft, until the indicator shows either "Kriegsmarine M3-UKW=B" or "Kriegsmarine M3-UKW=C," depending on which machine you are using.

Historical Note: When the 4-rotor Enigma machine came into U-boat service beginning in February, 1942, the 4th rotor (thin reflector) was added to the left of rotor #1. In order to send a 3-rotor Short Weather Cypher message, this 4th rotor had to be "nulled-out." This was done by setting the 4th rotor to "A" and the attached ring to "Z." The reason why we are not troubled with this 4th rotor on our M3 simulator is that our excellent simulator programmer, Dirk Rijmenants, foresaw this problem and programmed the simulator to automatically go to three rotors when you select either of the "M3" settings. Great job, Dirk!

6. Remove rotors I, II, and III from the rotor shaft and store them in the box, in order, from left to right.

7. The "Inner Settings" table also gives you the rotor and ring settings that you will use. For our example Short Weather Cypher, we are using Sp (also called the Message Key) "C," for the 29th day of the month, so

our first rotor will be rotor III with ring setting Y. Now, set this first rotor and ring setting and install the rotor onto the left end of the rotor shaft.

8. Working from left to right, set and install the second rotor with it correct ring setting and then the third rotor with its correct ring setting onto the rotor shaft.

9. Close the Enigma cover.

10. Click on the Stecker plugboard. You will notice that the plugboard is numbered, not lettered.

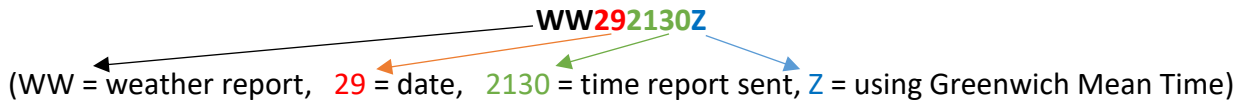
11. Using the "Kriegsmarine M3-UKW=B and C Outer Settings" table, scan down the "Date" column and select the correct date for today. For our example U-boat, we are using the 29th day of the month. Note that the matching "For Wetterkurz Signal Only – Sp" column (also called the Message Key) is "C," just as it was for the Inner Settings in Step 7.

12. Set the Stecker plugs as indicated. Return to the Enigma top view.

13. The last column on the "Outer Settings" table is labeled "Basic Start Pos(ition)." Dial-in the "Basic Start Position" letters into the three rotors, in order, from left to right. For our example U-boat, with Message Key C and Date 29, the Basic Start Position for the rotors is **DPU**.

14. Using the computer keyboard, not the Enigma keyboard, prepare the Kriegsmarine Short Weather Cypher "header" for your message. For Enigma World Code Group purposes, this header is placed above the beginning of your message on a new email message page. Type "Enter" and another "Enter" when the header is finished in order to separate the header from your weather message.

Sample Header



15. Using the computer keyboard again, not the Enigma keyboard, type the Sp (Message Key) letter, found in box #1 on your Table Recording Sheet, in-the-clear (not encrypted), as the first letter in your message. We must use the letter "C" for our example U-boat. **Note: If you do not type the Message Key letter in-the-clear as the first letter in your message, the receiver of the message will not know the inner or outer settings for his Enigma machine and will not be able to decrypt your message. Therefore, this step is very important.**

16. Verify that the Message Key letter corresponds with the "Date" column on the "Inner Settings" sheet and the date in the header.

17. You are now ready to encrypt your Short Weather Cypher message.

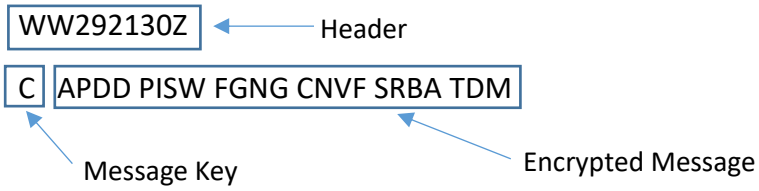
18. Go back to your Enigma keyboard. Click on the small metal plate at the bottom of the Enigma that displays "Show Textbox" when you hover over it.

19. Using your Enigma keyboard, starting with box #2 on your "Table Recording Sheet," type-in the letters, in sequence, as they appear on your sheet. (Be careful with the ice/no ice in box #21. Our example U-boat has observed ice.) Use three random letters or your three initials for the signature of the U-boat.

20. When you are finished typing your weather letters, hover over the textbox until "Click here to Copy Output to Clipboard" displays. Click on it.

21. Your encrypted message will appear in a box called “Enigma Smart Clipboard.” Highlight, right click, and copy the entire message.

22. Right click and paste the message onto your “header” page that you prepared in steps 14 and 15, immediately after the Sp (Message Key) letter that is already on the page. Our example U-boat header and encrypted message should look like this:



23. Create an email and send your weather message