14. Submarine Rules.

Some changes are made to the turn sequence incorporating changes also seen in the Naval Aviation turn sequence. Because subs can get very close to other ships when they become engaged in combat under 50 the ship movement is split into two impulses. Only one half the movement is done in each impulse. Orders are written to indicate in which Movement impulse any course and speed changes will occur.

Submarine Turn Sequence.

1. **Orders.**
2. **Communication.**
3. **Aircraft Phase 1**
4. **Torpedo Phase 1.**
    - **A. Torpedo Launching.**
    - **B. Torpedo Movement Impulse 1.**
    - **C. Torpedo Attack 1.**
5. **Ship Movement Impulse 1.**
6. **Sighting.**
7. **Combat.**
    - **A. Shooters that straddled last turn.**
    - **B. Shooting previous targets not straddled.**
    - **C. All other Shooting.**
8. **Aircraft Phase 2**
9. **Torpedo Phase 2.**
    - **A. Torpedo Movement Impulse 2.**
    - **B. Torpedo Attack 2.**
10. **Ship Movement Impulse 2.**
11. **Damage Control**
12. **Damage Check**
13. **Sighting Phase 2**

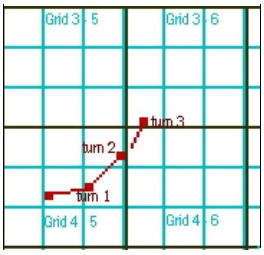
Submarines can be at one of a number one tactical depth levels. They are surfaced (-1), periscope (0), or depth levels of 1 to 7. Each depth level corresponds to 100ft. depths. The submarine moves forward at most half speed when changing depth levels. A submarine may change its depth one level per movement impulse. Periscope level is considered depth level 0, while surfaced is defined as depth level -1.

Sighting range. The sighting range is as stated in the sighting table when weather is clear and calm. Higher Beaufort sea states reduce visibility as well as hazy or cloudy weather. Periscope sighting is not only a factor of range it is also a factor of the speed of the sub. If the submarine is moving it produces a wake near the periscope or snorkel. If the submarine is not moving or is moving at a speed of 1 or less per turn its periscope may only be sighted at ½ the standard distance. This is after all other variable factors are taken into account.

Playing Material.

Besides the ordinary playing material a ruler, graph paper and chits or counters needed.

Plotting Movement. While submarine surface action is played like surface action of other ships when it comes to submerged movement most of the movement is done in secret on graph paper. Rule off 3x3 to 5x5 cell squares into large grids on a sheet of graph paper to keep track of the movement of the sub and surface ships. As each large grid will represent 15 in game scale. The average speed of a submerged sub is about 5 so movement can be accurately tracked. Use a ruler and pencil to plot the movement of the submarine between positions. The surface player can do the same with his ships when the submarine is submerged. When the submarine surfaces or uses a periscope and can sight the surface ships place them on the game table.



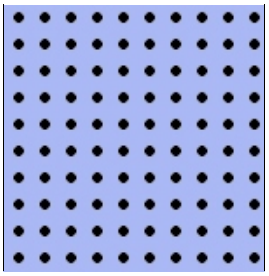
Three turns have been plotted here.

If any of the surface ships spot the periscope place a counter on the spot of the periscope sighting.

Using the **Feldmachinck II** (FM2) game device.

This device is a 10 x 10 (or larger) grid of hollow tubes set in a mounting. Each tube hole is labeled as to both row and column.

The game surface is divided into 15x15 centimeter zones. Use some sort of tape or post its to temporarily mark the game area. These correspond to the large grids on sheets of graph paper that players use to secretly keep track of their ships and submarines. Players record movement and location on paper and when the time comes to try to discover each other the FM II is used. Small colored pegs are inserted into the holes that represent the grid location of the sub or surface ship. When two (one by each player) have been inserted into the same hole the end of the second one sticks out. Thus revealing an overlap of sub and sub detection.

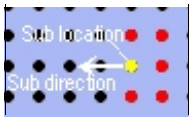

Top view of Feldmachinck II

Preparation:

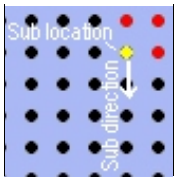
The submarine player must have nine colored pegs per submarine. The surface player needs one peg per ship with hydrophones and six pegs for each ship using sonar.

Detection by means other than sight. Using hydrophones to locate a submarine either by its own sounds or by echoing sonar pings off it hull is another method of locating an enemy. This is also done during the sighting phase of a turn.

Passive hydrophone searching.
The submarine must be in one of the grid positions. The surface player rolls one D10 and finds per the Detection Search Points table the number search points (pegs) the sub player must use. This is the number of pegs the sub player must insert into the FM2. In secret the sub player inserts the first peg into the FM2 into the exact grid position of the sub's location. If any addition pegs are to be placed the player inserts these adjacent to the first point in a square formation. If there aren't enough pegs to form an exact square a rectangle formation will do. The bulk of extra search points go to the rear of the sub.



Example: A six point detection area is played. Six pegs are placed in as close to a square formation as possible. Since its not possible to make a square of 6 grid points a rectangle is used. The actual grid point the sub is located in has to be one of the two center points. The search pattern extends to the rear of the sub's direction.



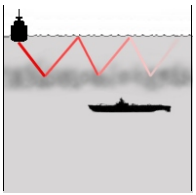
Example: In a four point search pattern the second row of points extends to the rear of the sub.

The passively searching player then inserts one peg into the FM2 at the grid position of each ship with hydrophones if moving under 20. If the ship with hydrophones is moving at a speed under 12 per turn a second peg may be inserted into the FM2 in the grid adjacent to the other peg directly in the grid point which would be in front of the ship's grid. If any of the second set of pegs stick out above the FM2 surface then that ship has detected the sounds of a submarine. The sub player must announce if the sub is that grid square or not.

Note that if there are multiple submarines the surface player's D10 search point roll applies to them as well. But their speeds may be different thus more or less pegs will have to be inserted into the FM2 for them as well. No matter how many subs are in the area only one sub peg is ever placed in a FM2 hole.

If the surface player rolled under 3 when determining the number of search points no pegs are inserted and no search is done and play skips to the next phase of the turn.

Thermocline - Is a boundary between two different layers of water. Active sonar pings will reflect off the boundary often masking a submarine right below it. In waters during warm summer and autumn afternoons one may be around the 50-70 ft. level.



Sonar will sometimes reflect off a thermocline and miss the sub.

Active searching.
In this case the surface player places first. He rolls a D10 for every ship doing active sonar searches. Then places in a square or rectangular formation centered on the ships grid location the number of pegs indicated by the die roll. No more than one peg is ever placed in the same hole by the same player no matter the number of sonar equipped ships he has. No matter if they overlap or not. It is recommended that the search grids be sketched out on paper first before inserting the pegs. This helps keep track of which grids have been searched if searching by a pattern.

After the active search player has placed all pegs it is the submarine player's turn. He secretly places on peg into the grid of his subs location. If any pegs are protruding from the FM2 then these revealed to the surface player and can be recorded by that pllayer as submarine locations. If a surface ship with sonar and a submarine are found to be in the same grid, the sub player must also announce the depth level of the sub.

At the end of the searching phase the FM2 is turned over and the pegs are dumped out without looking at the holes they drop out of.

Attacks on Submerged Submarines.
Surfaces ships with depth charges or other depth weapons may make attacks on submerged subs. To do this during the combat phase of a turn the sub must drop depth charges or fire hedgehogs. It can do this one time anywhere along its path of movement. It affects the entire grid. For each surface ship attacking roll a D10 for each submarine in the grid zone on the Depth Attacks table. If a hit is scored roll one time on the Torpedo Damage table but subtract 5 from the die roll. If as a result of a damage roll a 'F' fire is made there is no fire scored. What this instead is there is an oil line rupture and an oil slick appears at the sub's location. This continues until the ship's damage control can control the oil slick.

Aural Detection (Hydrophones)									
Target	Target Speed								
	under 2.5			2.5-5			5-20		
Die Roll>	3	6	9	3	6	9	3	6	9
Sub (electric)	7	10	13	10	15	20	15	20	25
Sub (diesel)	30	50	65	40	60	75	75	115	150
Sub (active ping)	15	30	40	15	30	40	15	30	40
Cargo, Tanker	35	60	75	40	65	80	100	130	160
Corvette, DE	45	60	75	60	75	100	100	150	200
Destroyer	50	75	100	60	90	120	150	185	230
size 2-4	100	200	250	150	250	350	250	350	450
size 5+	150	200	250	200	300	400	300	425	425
convoy 10+ ships	200	400	600	600	750	850	750	900	900

Roll one D10 per ship with hydrophone array. If the number is higher than number then sound is detected. Under 3 means no sure contact is made.
Reduce the number rolled by 1 for each Beaufort Sea state factor above 4.
Reduce range by ½ if;
1. Listening ship speed is above 20 or more.
2. Angle to target is beyond 90° from the bow.
3. A size 2 or more ship is within 50.

Passive Detection Search points										
Submarine using type power.		Submarine Speed								
		under 2.5			2.5 to 5			over 5		
	Die Roll>	3	6	9+	3	6	9+	3	6	9+
electric	No. of pegs	1	1	2	1	2	2	1	2	4
diesel	No .of pegs	2	4	6	4	6	9	6	6	9

Roll one D10 per submarine. If the number is higher or equal to the column number then the sub must insert the required number of pegs. These are placed in a square or rectangle shape with the center being at the submarine grid location.
Odd pins are placed next to one of the sides of the search grid sides, never on a diagonal.
Under 3 no pins are inserted.

Active Detection Search points				
Using sonar	D10			
	2 or less	3	6	9+
No. of pegs	1	2	4	6

Roll one D10 per sonar equipped ship. If the number is higher or equal to the column number then the ship may insert the required pegs. These are placed in a square or rectangle pattern into the FM2 with the center being the ship's grid location.
Odd pegs are placed next to one of the sides of the search grid sides, never on a diagonal.
Thermocline.
Summer or Autumn afternoons - If sub depth is1 or deeper subtract 3 from the D10 roll.

Depth Attacks						
Attack Method	Submarine Depth					
	periscope	1	2	3	4	5
Depth Charges (10)	90	93	94	95	96	97
Hedgehog	85	87	88	89	90	91

Roll percent dice to hit. If equal or higher then attack scores a hit.
'44 or later add 4 to the roll.
If hit roll per Torpedo damage. Subtract 5 from the D10 damage roll.