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Further investigations on electrical fishing.

by

G. Vanden Broucke  
Fisheries Research Station  
Ostend, Belgium

### Introduction.

As recent investigations abroad (U.S.A., Canada, Great Britain, Iceland, West Germany, France, the Netherlands) have shown that with electrical gear good catches can be obtained, its possibilities for the Belgian sea fisheries were examined in practice.

When using this new method due account should be taken of the fish species, the size of the fish and the fishing area. It is therefore necessary to consider the different applications simultaneously with the local circumstances and to use apparatus adjustable within broad limits. With this object in view two series of experiments were carried out while fishing for shrimps and flatfish.

This report presents a description of the fishing gear, the experimental conditions and the results obtained.

### 1. Fishing gear.

In order to be able to compare the electrified net with an ordinary net the experiments were carried out on board a beam trawler.

The electrified shrimp net was mounted on the port-side and the ordinary net on starboard. In this manner the variable factors as fishing ground, weather conditions, period, stock abundance, etc. can be assumed to be similar for both nets.

The electrodes between which an electrical field was generated had as function to startle the shrimps and/or the flatfish from the sea-bottom. This method presented a major problem, viz. the

protection of the electrodes against damage. Moreover the electrical field should not cause any frightening effect in front of the net. This last point is very important with regard to the catchability.

The first problem, the damage to the electrodes, was partially eliminated by mounting the electrodes in the direction of towing (figure 1). On the one hand this resulted in the electrodes following up quite well the roughness of the bottom and good contact thus existed between bottom and electrodes and on the other hand the chance of damage to the electrodes was negligible.

The frightening effect in the front part of the net opening may be caused by the electrodes or the electrical field being placed too near. To ensure that the electrical field was effective under the upper part of the net, the electrodes were isolated till they touched the bottom and were fixed to the beam by cables.

Two cables from the impuls generator to the net guaranteed the power supply. These cables were shot and hauled together with the fishing gear.

The feeding of the impuls generator on board of vessel was obtained by a motor-alternator unit of 2.5 KVA with an alternating tension of 220 Volt.

Figure 2 gives a block diagram of the instrumentation used.

## 2. Experimental conditions.

The first series of experiments was carried out on board a beam-trawler of 29.30 gross tonnage and equipped with a motor of 200 HP.

The fishing grounds were located off the Belgian coast between Zeebruges and Knocke. The experiments took place during the month of September 1972 under varying weather conditions.

The second series of experiments took place on board a stern beam trawler of 29.9 gross tonnage and equipped with a motor of 150 HP.

The fishing ground was also located off the Belgian coast, but this time opposite the fishing harbour of Ostend. The period was the beginning of June 1973 and the weather conditions were rather bad.

### 3. Results and conclusions.

The objectives of the research were to some extent different for flatfish and for shrimps. As regards flatfish a selective fishery and a simplification of the fishing gear (the substitution of heavy ticklers by light electrodes) were aimed at.

With respect to the shrimp fishery it was endeavoured to develop a switch-over from the traditional night-time fishery to a day-time fishery. Simultaneously, an attempt was made to increase the selectivity.

#### a. Results.

Two main points were examined, viz. the catches and the selectivity.

As regards the first series of experiments the contents of the cod-end of both nets were compared for 18 hauls in a total of 28. Ten experimental hauls had to be discarded for technical or fortuitous reasons (net damage, etc.).

The catches consisted mainly of shrimps and soles so that no comparison for other flatfish was possible. The contents of the cod-end of the ordinary net was taken as reference and the catch obtained by the net with electrodes was expressed in percentages of the catch obtained by the ordinary net.

The results were rather favourable :

- for shrimps : 144 % E.N. (total catch 65 kg)
- for commercial soles : 350 % E.N. (total catch 45 specimens)
- for immature soles : 76 % E.N. (total catch 76 specimens)

The selectivity of the net with electrodes gave no distinct results for shrimps.

For soles a certain degree of selectivity was ascertained especially for the immature soles.

The input peak tension was 100 volt and the frequency 2 Hertz. This adjustment was kept identical during 18 hauls in order to obtain a significant comparison.

From the second series of experiments twelve valuable hauls were obtained. In these experiments another distance between the electrodes and another frequency (10 Hertz) was introduced. The input peak voltage was 100 Volt.

The results were also favourable :

- for shrimps : 143 % E. N. (total catch 43 kg)
- for soles : 300 % E. N. (total catch 39 specimens)

b. Conclusions.

The main conclusion of these experiments is that the electro-fishing presents good perspectives as regards :

- the catchability for shrimps and soles
- the selectivity for soles.

Research must be continued along the same lines but varying the adjustment of the impuls generator (frequency, peak tension), the distances between the electrodes and the environmental conditions.

Finally, the investigations should lead to the development of a compact instrument which may be fixed on the beam or on the headline of the nets ; the cable connection between vessel-fishing gear would then become unnecessary.

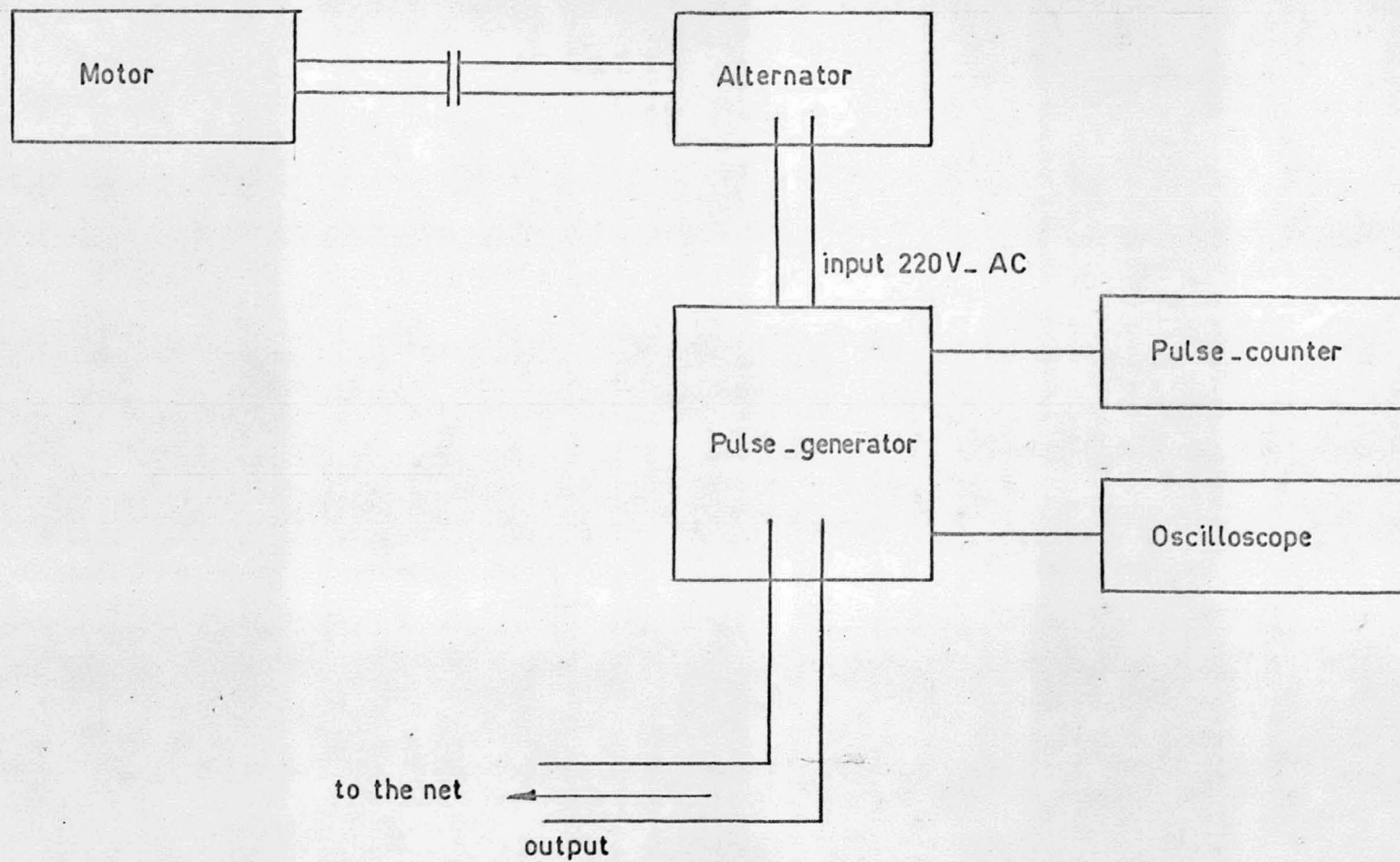


Figure 1\_ Block diagram

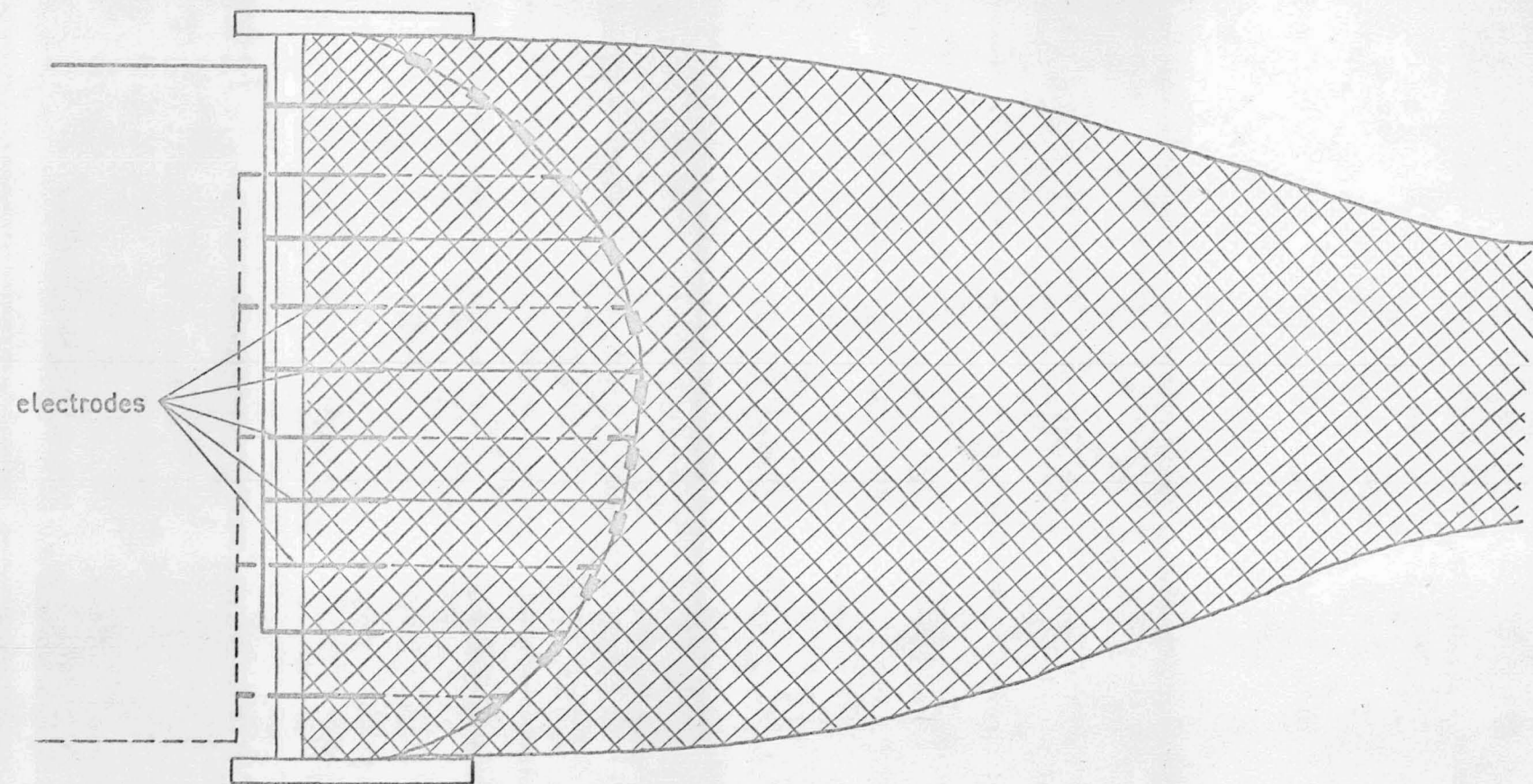


Figure 2 \_ Beamnet with electrodes