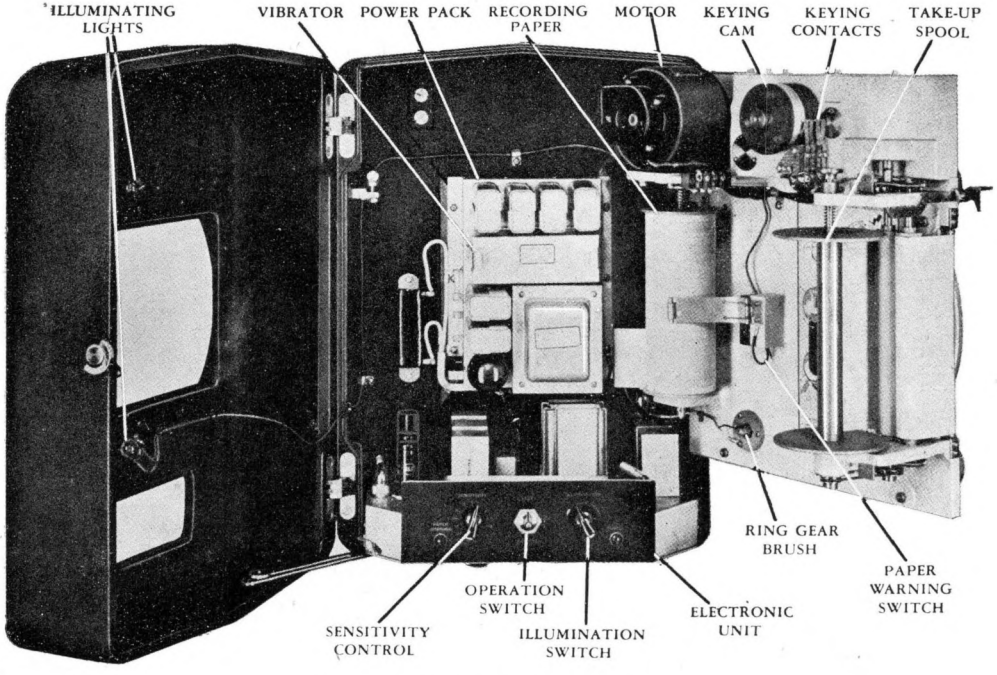

Bendix Supersonic Depth Recorder.

BENDIX SUPERSONIC DEPTH RECORDER

Communicated by the Marine Department, Bendix Aviation Corporation,
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The Bendix Marine Supersonic Depth Recorder is an instrument designed to automatically measure depth in water by the echo method and to permanently chart that information on recording paper. The instrument measures the intervening time interval and converts this interval automatically into units of depth measurement, such as feet or fathoms.

The instrument makes use of a keyed electronic oscillator to produce electrical impulses. By means of a transducer attached to the bottom of the vessel's hull, these electrical impulses are converted into supersonic waves beamed toward the bottom. At the instant of transmission, the constantly moving stylus on the ring gear is at the " O " or reference position and a mark is made on the recording paper.

The supersonic beam travels toward the bottom until it strikes anything with a density different from water, such as the bottom, submerged objects, schools of fish, etc. Thereupon, a portion of the beam is " bounced off " or reflected back to the transducer as an echo. The transducer has in the meantime been connected to the electronic receiver which amplifies the weak electrical pulse generated in the transducer by the echo, and passes it on to the stylus. As time has elapsed between the instant of transmission and the reception of the echo, the stylus is in a new position when the echo is received and a depth mark is recorded on the chart. The entire operation is continuously repeated so that the marks made by the individual soundings appear as a continuous line on the recording paper, showing the profile of the bottom.

Depth Recorder Model DR-3 is designed for two depth ranges, 0-200 feet and 0-200 fathoms. When the " feet " range is used, supersonic impulses are sent out at the rate of 288 per minute; when the " fathoms " range is used, 48 pulses per minute are transmitted.

TECHNICAL ADVANTAGES

Supersonic.— The sensitivity and accuracy of the Bendix supersonic signal is an important exclusive feature of this recorder. The frequency of the signal (50 KC) (50,000 cycles per second) is beyond the range of the human ear. Tests have proven conclusively that the signal does *not* affect fish and thus the unit can be left in operation while the vessel is " in fish ". Wave wash, propeller noises, etc., that are frequently the cause of inaccuracies in other depth sounding equipment are not picked up by the Bendix Recorder. The supersonic signal gives a clearer, sharper echo, and the narrow beam concentrates the signal energy, thus giving a more accurate picture of all bottom conditions.

Permanent dry recording feature.— The Bendix Recorder makes a permanent non-fading *dry* recording of *all* underwater conditions that it has passed over. Through the large viewing window, approximately *12 inches* of the continuous printed chart is visible. Depth below the transducer at any second is shown at the extreme right of the viewing window. The 150' roll of paper lasts for *30 hours* of continuous running on the " foot " scale and for *seven and a half days* of continuous running on the " fathom " scale. The paper moves 1" per minute on the " foot " scale, 1/6" per minute on the " fathom " scale. Of special help in quickly and correctly recognizing a particular ocean bottom area, is the long " history " always present before the operator, 12 minutes of ocean bottom contour on " foot " scale —72 minutes on " fathom " scale are visible for inspection, reference or study. At ten knots, 12,000 feet of the bottom just passed over are visible on the " foot " scale ; 72,000 feet on the " fathom " scale.

Thus the eye-fatigue of constantly watching an indicator is completely eliminated. Yet, sudden shoaling, deepening of other indications of abrupt changes in depth, are recorded and observed in time to be useful. Schools of fish are clearly visible—the top of the school, in relation to the surface of the water and in relation to the ocean floor, as well as the *bottom* of the school. In other words, the outline and density of the school is *permanently* recorded in

relation to the surface and the bottom. With practice, it is easy to approximate the tonnage of a school of fish to a fairly accurate degree. Kelp and other hazards to fishing gear are clearly picked up and recorded, thus taking the guess work out of fishing.

Navigation is made much surer by comparing the Bendix recording with the hydrographic charts. " Zones of silence " such as are sometimes encountered with the use of direction finding equipment, and which too often prove disastrous are not encountered when navigating with the Bendix Recorder. The Bendix Recorder can't give false information : It *has* to be right.

Graphic recorder complete in one compact lightweight unit.— The entire mechanism of the Bendix Depth Recorder is contained in one compact, lightweight unit. No more hard-to-get-at engine room installations; *everything* with the exception of the underwater unit (transducer) is in the one splash-proof cabinet mounted in the wheel-house or on the flying bridge. The entire weight of the Bendix Recorder is but ninety pounds. This means that the unit can be readily transferred from one boat to another if the owner so desires, or can be easily removed from the boat during the lay-up periods. It is only necessary to remove two plug-in cables and loosen two studs to lift the unit off of its mounting bracket.

Easier, quicker installation.—The Bendix Recorder can be installed in approximately eight hours. The installation is very simple. A mounting bracket for bulkhead installation is furnished that requires only three screws and bolts. The Recorder unit is attached to the bracket by two bolts from the outside. Thus, the need for opening the Recorder case when mounting is avoided, and all possibility of damage to the interior mechanism is eliminated. The transducer unit may be mounted internally in a sea-chest (steel hull vessels) or attached externally on wooden hull vessels where it is contained in a streamlined wooden fairing. Only a one-half inch hold need be drilled in the bottom of the vessel through which the transducer cable is led via a watertight stuffing tube that is supplied with each instrument.

Only two cables are needed for electrical connections : a single power cable to run from nearest power outlet to recorder unit and a transducer cable connecting the recorder unit through a junction box with the underwater unit. Plug-in connections are used for easy connection.

Simplicity of design and service.— The Bendix Recorder contains no relays, no keying adjustments, no demagnetizing of projectors. It requires no motor-generator set or governor. All electrical components are the plug-in type. Like the tubes in a radio, they are easily and readily replaced, thereby avoiding costly service delays; just remove the source of trouble and replace it with a new unit. This simplicity of design is what makes it possible to sell and service the equipment without maintaining expensive factory service facilities throughout the country.

Lower current drain.— The Bendix Recorder requires no more power to operate than ordinary 100 watt electric light bulb. A 32 volt unit draws but 3 amperes as against 18 to 40 amperes of other depth sounding equipment. This means no more run-down batteries or need for larger generators. Just mount the unit on the vessel and plug in to the nearest light socket.

Works on all available voltages.— The Bendix Recorder is available for 6, 12, 24, 32 and 115 volt DC and 115 volt AC power supplies. It is not necessary to add generators or batteries to accomodate the Bendix Unit, and should an owner of a unit wish to transfert it to a vessel of a different voltage, it is only necessary to change the power pack to adapt the unit to the new voltage. This flexibility is of considerable advantage to the purchaser.