

## NEW SERIES OF SMALL-CRAFT CHARTS

U. S. DEPARTMENT OF COMMERCE, COAST AND GEODETIC SURVEY

---

The Coast and Geodetic Survey has introduced a new charting service of primary interest to all small-boat owners. The initial phase of this project has been completed with issuance of the pilot series of small-craft charts on four experimental formats. These charts are expected to enhance the value to the small-boat owner of the United States extensive system of harbors, inland and coastal rivers, intra-coastal waterways, and tidal estuaries : — the greatest natural system of waterways in the world.

The phenomenal increase in recent years in the number of small boats using the congested waterways of the nation presents a real challenge to chart-making operations. The experimental small-boat editions are perhaps the greatest change in nautical charts since the introduction of color in 1862. At the turn of the century when copper engraving began to give way to modern lithography another significant milestone was reached in charting. In 1939 the Bureau published an entirely new type of chart on which submarine contouring was introduced for more effective delineation of bottom characteristics.

Tremendous advancements have been made in recent years in navigational aids and techniques which have steadily increased demands for more complete and exact charts. The modern nautical charts now in general use reflect improved techniques in cartographic presentation and modern advancements in lithographic processes. Thousands of man-hours of painstaking work utilizing a vast store of technical data are necessary in turning out a finished chart. These charts, whether found on the bridge of the largest ocean liner or in the cockpit of a small cabin cruiser, afford the advantage of a vast accumulation of pertinent data gathered by a fleet of surveying ships and supported by field parties over fifteen decades of intensive effort.

The new series of charts had its beginning last March when a committee was established in the Bureau to study the special requirements of pleasure boat operators for nautical charts and coast pilot information, and to furnish recommendations as to the methods of satisfying these requirements. This committee sought the assistance of the U. S. Power Squadrons and the U. S. Coast Guard Auxiliary to canvass their membership by questionnaire as a means of ascertaining user requirements. Both organizations furnished enthusiastic support. The Power Squadron's committee summarized replies from upward of 3 000 operators and the

Coast Guard Auxiliary furnished completed questionnaires representing nearly 2 000 operators.

Funds were appropriated in the 1959 budget for the development of suitable charts and coast pilot information to promote safety in small-boat operations. In accordance with this directive a program was initiated last July to develop several formats covering the Potomac River, chosen as the experimental area. As a result of public announcements of the new undertaking important suggestions were forthcoming from a number of individuals vitally concerned with the project. These recommendations and suggestions were tabulated and the majority of those received were incorporated into the design of the four formats now being displayed.

The Potomac River area was chosen for the pilot series of charts because the configuration of this waterway is similar to the Intra-coastal Waterway Chart series and major rivers of the country. Moreover, this area was closely adjacent to Washington for economical investigation and study of facilities and other coast pilot information. The photographic airplane which is chartered by the Bureau for the photogrammetric phase of charting operations was in the area on regular work, thus making revision photography available, and provided the means of obtaining low-level obliques. The survey ship *Cowie* was nearby in the lower Chesapeake Bay for ready support in determining depths in the channels and inlets, as well as other chart inspection data.

Replies from the 2 000 boat owners in the Coast Guard Auxiliary reflected 83 per cent acceptance of charts ranging in size from 18 by 24 inches down to standard page size of 8 by 10  $\frac{1}{2}$  inches. This same high percentage expressed the desire for coast pilot supply and facility information on the charts rather than in separate books. About 56 per cent of the 2 000 total voted for page-size charts measuring about 8  $\frac{1}{2}$  by 11 inches.

The average of suggested chart dimensions indicated measurements of 14 by 18 inches. Suggestions for this size included the opinions of some 300 owners who indicated satisfaction with our standard charts measuring 36 by 42 inches. The four experimental formats now being presented have been designed to conform to the majority of the requirements and suggestions received.

For comparative purposes, each series covers the same area and contains the same primary information. The four variations of presentation were developed in an effort to determine which is the most suitable or desirable. The four types of the pilot series are identified as Series A, B, C, and D.

Series A is printed in one sheet on both sides of the paper. The over-all paper size is 15 by 58 inches, accordion folded to permit ready access to any section between the river's mouth at Point Lookout and the head of navigation in Washington. It is at the scale of 1/80 000, with the Washington area at 1/20 000. The sheet is printed on lightweight paper such as used for the Bureau's aeronautical charts, but tests are continuing toward use of regular chart paper.

Series B is in three sheets printed on 14  $\frac{1}{2}$  by 32-inch paper, folded in four panels and tabbed for loose-leaf binding. The basic chart is printed at the scale of 1/80 000 with the Washington area enlarged to 1/40 000. This format presents insets of active areas with tabulated facilities keyed to

their respective locations. This descriptive information is reproduced on the reverse side of the paper folds. Photographic views of the selected areas are printed in half-tone.

Series C consists of ten sheets measuring  $8\frac{1}{2}$  by 14 inches printed on regular nautical chart paper. Each page of this series covers its own cruising area with insets and facility information for the respective base charts portrayed on the reverse side. The scale of the charts is 1/80 000, but the Washington area displayed on the last page of the set could be enlarged to the scale of 1/40 000.

Series D is in eight sheets measuring  $10\frac{3}{4}$  by  $16\frac{1}{4}$  inches, also printed on regular chart paper and bound in loose-leaf. Facility information and inset at enlarged scale are shown for each area on the reverse side of the previous page. This arrangement permits reference to the base chart and its inset at the same time. The scale of the basic charts is 1/80 000 with the Washington and vicinity chart enlarged to 1/40 000.

Certain cartographic treatment is common to all charts of the four formats. Soundings and aids to navigation have been omitted of areas covered by insets to insure use of the more detailed and safer large-scale coverage. Blue tint is used to define the six-foot curve on all charts as the limit critical to safe small-craft operation. Although marsh areas are not tinted or symbolized, limits are shown by a dashed line. Marsh areas are limited in the experimental area for this pilot series, but it is realized that some future areas may require tints where marsh is extensive.

The velocity and directions of currents are shown on the charts and tidal information is included in the facility tables. Aids to navigation have been increased in size for greater legibility and type faces have been specially selected to insure maximum legibility. Insets have been used effectively to emphasize active areas at enlarged scales. Compass roses oriented to true north are shown to determine size and placement acceptance, and also whether or not operators require magnetic roses. An index of each series is superimposed on an outline of present chart coverage of the Potomac River. These four charts of the regular series at the scale of 1/40 000, and measuring as much as 36 by 47 inches, are among the most popular of the charts issued by the Bureau.

The red mileage index line is located generally in accordance with present recommended courses from the mouth of the Potomac to Washington. No courses are shown, however. In fact, recommended courses are being removed from the Coast Pilots as they are rewritten.

The charts of all four formats are in four colors, buff overprint for land areas; blue tint to the six-foot curve; red for restricted, danger and fish-trap areas, and to emphasize other features such as aids to navigation, anchorages, pipeline and cable areas, etc. Cultural detail, place names, projection, scales, and notes are printed in black.

The objective is to develop an acceptable chart format and related information to provide yachtsmen and small-boat operators with the best possible medium for making full use of our waterways. Safe operation will be facilitated of the millions of pleasure craft of all types that now jam many of our national waterways. This new program is another progressive step in the Bureau's long record of safeguarding the waterways of the nation. The small-craft charts should make a substantial companion to the five

series of nautical charts, classified as *Sailing, General, Coast, Harbor, and Intra-coastal Waterway*.

The responsibility of safeguarding valuable floating possessions of water enthusiasts and to aid in getting the most enjoyment and pleasure out of their investment is an important one. In order for a chart to be of maximum value it must reflect completely reliable information. The motorist with his road map has a relatively simple job of orienting himself, for he has landmarks and cultural features to guide him. The new chart series should provide the boatman with a waterway guide that will become his road map when he parks his car and boards his yacht.

For well over a century the work of the Bureau has expanded progressively in scope and importance, in keeping with increased demands for charts and related publications. Decade by decade coverage of nautical charts has been progressively refined and expanded to insure maximum usefulness of all coastal waters with the fullest measure of safety in waterborne transportation. The small-craft charts represent the latest efforts in the never-ceasing improvement in the design of the nautical chart to assure maximum usefulness to the greatest number of potential users. Frequent innovations and inventions have always been compelling factors in Coast and Geodetic Survey charting programs to meet the ever-changing and expanding requirements for more and better charts.

This newest series of charts contrasts sharply with the nautical charts that were used in the days of the schooners and windjammers. In the early days charts consisted of only occasional depths that had been obtained with a hand lead, and vague coastal features supplemented with sketches of headlands and other landmarks. With the advent of modern shipping, new and more precise methods of recording underwater topography and adjacent coastal features became a necessity.