# CHAPTER 1
# GENERAL

## 1.1 PURPOSE AND SCOPE

These specifications provide basic criteria and guidance for the production (compilation and color separation) and reproduction of a 1:500,000 scale Sectional and a 1:250,000 scale VFR Terminal Area series of aeronautical chart.

Although specifications by their very nature tend to be a concrete expression of design, there are features (particularly the selection and density of detail) which are sufficiently abstract as to preclude mathematical analysis. In these instances when a specification cannot be measured, certain use criteria or design guidelines have been included to supplement the judgment of the individual cartographer. An attempt has been made, however, to minimize the amount of interpretation necessary in following these specifications.

Although the digital chart files are compiled in accordance with these specifications, the final product may vary slightly in appearance due to difference in printing techniques/processes and/or digital display technique.

**(TAC)** Items peculiar to and applicable only to Terminal Area Charts are so noted within these specifications by the designation "TAC..." positioned in the left margin of the page, on line with the paragraph number.

## 1.2 REQUIREMENTS

### 1.2.1 General

The 1:500,000 series of Sectional Aeronautical Charts is the primary navigational reference medium used by pilots operating under visual flight rules utilizing the ground environment as the primary aid to navigation and simultaneously provides an intermediate scale translation of cultural and terrain features that shall satisfy the enroute VISUAL navigation requirements of pilots flying low altitude-high speed operations.

The series of 1:500,000 scale Sectional Aeronautical Charts shall satisfy civil requirements. Charts shall utilize a front/back printing coverage.

**(TAC)** The 1:250,000 scale VFR Terminal Area Chart shall provide a large scale portrayal of selected metropolitan complexes to satisfy pilotage and local control requirements.

### 1.2.2 Quality and Accuracy

The use of these charts for visual navigation, and the critical character of such flights, emphasizes the need for graphics of the highest degree of accuracy and that final copy conforms to the best accepted standards of practice with respect to clear, uniform, opaque lines, symbols and type as illustrated in the Symbols Appendix.

Care must be exercised in the plotting and interpretation of the detail to be applied to the chart. The center and orientation of a symbol shall normally correspond with the center and orientation of the feature represented. All line features such as roads, railroads, power transmission and telecommunication lines and streams shall be plotted in their true positions and shall retain, wherever scale permits, the variations of alignment which actually exist. Roads, railroads, streams, levees, and similar features lying parallel to and close to each other may require an exception to this rule. An exaggeration of the area covered may be necessary to show these features by their proper symbols. The displacement should be distributed evenly with the true center of the parallel features, taken collectively, held wherever possible and with the contours adjusted to the symbols. Displacement due to symbolization and adjustments between sources shall be held to a minimum.

Every effort should be made to match adjoining charts. In attempting to match adjacent charts, however, no errors of position shall be introduced nor shall any factual errors be made in an attempt to tie to adjoining charts. Position and detail of whichever of the adjoining charts is evaluated as being more reliable shall be retained.

The graticule layout shall be accurate to within ± 0.020 inch, overall diagonal measurement.

### 1.2.3 Colors

Colors for printing the various component parts of this chart series shall basically consist of the following. Detailed specifics of color separation shall be found in **Chapter 3** - Chapter 3 - Content, Content. Detailed color specifications shall be found in **Chapter 4** - Chapter 4 - Reproduction.

**Table 1.1 Colors**

| | | |
|---|---|---|
| Black | Browns | Magenta |
| Blues | Yellows | |

### 1.2.4 Title

The title of these series of charts shall be:

- Sectional Aeronautical Chart
- VFR Terminal Area Chart (TAC)

The name of each chart shall be selected on the basis of the most important or prominent city or town within the geographical chart limits. In the absence of a populated place, geographic feature names may be used.

### 1.2.5 Scale

The scale of the Sectional charts shall be 1:500,000.

The scale of the VFR Terminal Area Chart shall be 1:250,000.

### 1.2.6 Projection

All Sectional Aeronautical Charts in this series (between 0° and 80°) shall be produced on the Lambert Conformal Conic Projection, based on standard parallels 5° 20' apart.

**Table 1.2 Standard Parallels and Projection Limits**

| Standard Parallels | Projection Limits |
|---|---|
| 1°20' and 6°40' | 0° to 4°, 4° to 8° |
| 9°20' and 14°40' | 8 °to 12°, 12° to 16° |
| 17°20' and 22°40' | 16° to 20°, 20° to 24° |
| 25°20' and 30°40' | 24° to 28°, 28° to 32° |
| 33°20' and 38°40' | 32° to 36°, 36° to 40° |
| 41°20' and 46°40' | 40° to 44°, 44° to 48° |
| 49°20' and 54°40' | 48° to 52°, 52° to 56° |
| 57°20' and 62°40' | 56° to 60°, 60° to 64° |
| 65°20' and 70°40' | 64° to 68°, 68° to 72° |
| 73°20' and 78°40' | 72° to 76°, 76° to 80° |

#### 1.2.6.1 Conterminous U.S. TAC

**(TAC)** Conterminous U.S. TACs shall be based on the standard parallels which best accommodate the source materials from which the TAC is compiled. The Puerto Rico - Virgin Islands TAC shall be based on standard parallels of 7° and 20°. The Anchorage TAC shall be based on standard parallels of 57°20' and 62°40'.

#### 1.2.6.2 References

References for projections are:

- United States Air Force Projection Tables for the Lambert Conformal Conic Projection on 8° Latitude Bands.
- U.S.C. & G.S. Lambert Conformal Conic Projection Tables for Parallels 33° & 45° dated 1942.

### 1.2.7 Areas of Coverage

The area of coverage for these series of charts shall be the United States, to include Alaska, Hawaii, Puerto Rico and the U.S. Virgin Islands, as well as parts of Canada and Mexico, as indicated in **Appendix 12** and **Appendix 13**.

The extent of overlap provided on the extended coverage charts shall be, to the extent possible, consistent with the area to be charted and the sheet size, illustrated on the Style Sheets.

The limits of each Sectional Chart are defined by the following corner coordinates. Minor deviations from these coordinates, as necessary in establishing each individual chart limits to effect the precise coverage of the chart, may be made upon prior approval of the IAC.

**Table 1.3 Corner Coordinates - Sectional Charts**

| Chart | SW Corner | NW Corner | SE Corner | NE Corner |
|---|---|---|---|---|
| | | | | |
| Albuquerque | 32°00'N | 36°13'N | 32°00'N | 36°12'N |
| | 109°00'W | 109°00'W | 101°59'W | 101°47'W |
| | | | | |
| Anchorage | 60°00'N | 64°10'N | 60°00'N | 64°06'N |
| | 151°30'W | 151°30'W | 140°16'W | 139°24'W |
| | | | | |
| Atlanta | 32°00'N | 36°13'N | 32°00'N | 36°12'N |
| | 88°00'W | 88°00'W | 80°59'W | 80°47'W |
| | | | | |
| Bethel | 59°35'N | 64°10'N | 59°33'N | 64°06'N |
| | 173°00'W | 173°00'W | 161°20'W | 160°20'W |
| | | | | |
| Billings | 44°26'N | 49°01'N | 44°25'N | 48°59'N |
| | 109°00'W | 109°00'W | 100°39'W | 100°17'W |
| | | | | |
| Brownsville | 24°00'N | 28°13'N | 24°00'N | 28°12'N |
| | 103°00'W | 103°00'W | 96°44'W | 96°36'W |
| | | | | |
| Cape Lisburne | 68°00'N | 72°10'N | 68°00'N | 72°03'N |
| | 171°30'W | 171°30'W | 156°43'W | 155°00'W |
| | | | | |
| Charlotte | 32°00'N | 36°13'N | 32°00'N | 36°12'N |
| | 82°00'W | 82°00'W | 75°12'W | 75°01'W |
| | | | | |
| Cheyenne | 40°00'N | 44°31'N | 40°00'N | 44°30'N |
| | 109°00'W | 109°00'W | 100°57'W | 100°39'W |
| | | | | |
| Chicago | 40°00'N | 44°13'N | 40°00'N | 44°12'N |
| | 93°00'W | 93°00'W | 84°57'W | 84°40'W |
| | | | | |

**Table 1.3 Corner Coordinates - Sectional Charts (Continued)**

| Chart | SW Corner | NW Corner | SE Corner | NE Corner |
|---|---|---|---|---|
| Cincinnati | 36°00'N | 40°13'N | 36°00'N | 40°12'N |
| | 85°00'W | 85°00'W | 77°57'W | 77°45'W |
| | | | | |
| Cold Bay | 53°52'N | 56°10'N | 53°50'N | 56°08'N |
| | 164°00'W | 164°00'W | 154°24'W | 154°08'W |
| | | | | |
| Dallas - Ft. Worth | 32°00'N | 36°13'N | 32°00'N | 36°12'N |
| | 102°00'W | 102°00'W | 94°59'W | 94°47'W |
| | | | | |
| Dawson | 64°00'N | 68°10'N | 64°00'N | 68°07’N |
| | 145°00'W | 145°00'W | 131°55'W | 130°44'W |
| | | | | |
| Denver | 35°35'N | 40°03'N | 35°35'N | 40°02'N |
| | 111°00'W | 111°00'W | 103°57'W | 103°44'W |
| | | | | |
| Detroit | 40°00'N | 44°13'N | 40°00'N | 44°12'N |
| | 85°00'W | 85°00'W | 76°57'W | 76°40'W |
| | | | | |
| Dutch Harbor | 52°00'N | 56°10'N | 52°00'N | 56°08'N |
| | 173°00'W | 173°00'W | 163°36'W | 163°08'W |
| | | | | |
| El Paso | 28°00'N | 32°13'N | 28°00'N | 32°12'N |
| | 109°00'W | 109°00'W | 102°36'W | 102°28'W |
| | | | | |
| Fairbanks | 64°00'N | 68°10'N | 64°00'N | 68°07'N |
| | 158°00'W | 158°00'W | 144°55'W | 143°45'W |
| | | | | |
| Great Falls | 44°26'N | 49°01'N | 44°25'N | 48°59'N |
| | 117°00'W | 117°00'W | 108°39'W | 108°17'W |
| | | | | |
| Green Bay | 44°00'N | 48°20'N | 44°00'N | 48°18'N |
| | 93°00'W | 93°00'W | 84°41'W | 84°21'W |
| | | | | |
| Halifax | 44°00'N | 48°13'N | 44°00'N | 48°12'N |
| | 69°00'W | 69°00'W | 60°57'W | 60°39'W |
| | | | | |
| Hawaiian Islands | 21°52'N | 23°36'N | 18°22'N | 20°04'N |
| | 160°55'W | 159°43'W | 155°22'W | 154°07'W |
| | | | | |

**Table 1.3 Corner Coordinates - Sectional Charts (Continued)**

| Chart | SW Corner | NW Corner | SE Corner | NE Corner |
|---|---|---|---|---|
| Houston | 28°00'N | 32°13'N | 28°00'N | 32°12'N |
| | 97°00'W | 97°00'W | 90°36'W | 90°28'W |
| | | | | |
| Jacksonville | 28°00'N | 32°13'N | 28°00'N | 32°13'N |
| | 85°00'W | 85°00'W | 78°36'W | 78°28'W |
| | | | | |
| Juneau | 56°00'N | 60°10'N | 56°00'N | 60°08'N |
| | 141°00'W | 141°00'W | 130°25'W | 129°44'W |
| | | | | |
| Kansas City | 36°00'N | 40°13'N | 36°00'N | 40°12'N |
| | 97°00'W | 97°00'W | 89°57'W | 89°45'W |
| | | | | |
| Ketchikan | 52°00'N | 56°10'N | 52°00'N | 56°08'N |
| | 139°00'W | 139°00'W | 129°46'W | 129°17'W |
| | | | | |
| Klamath Falls | 40°00'N | 44°31'N | 40°00'N | 44°30’N |
| | 125°00'W | 125°00'W | 116°57'W | 116°39'W |
| | | | | |
| Kodiak | 56°00'N | 60°10'N | 56°00'N | 60°09'N |
| | 162°00'W | 162°00'W | 151°25'W | 150°45'W |
| | | | | |
| Lake Huron | 44°00'N | 48°13'N | 44°00'N | 48°12'N |
| | 85°00'W | 85°00'W | 76°41'W | 76°21'W |
| | | | | |
| Las Vegas | 35°35'N | 40°03'N | 35°25'N | 40°02'N |
| | 118°00'W | 118°00'W | 110°55'W | 110°41'W |
| | | | | |
| Los Angeles | 32°00'N | 36°06'N | 32°00'N | 36°05'N |
| | 122°00'W | 122°00'W | 114°45'W | 114°34'W |
| | | | | |
| McGrath | 60°00'N | 64°10'N | 60°00'N | 64°06'N |
| | 162°00'W | 162°00'W | 150°46'W | 149°55'W |
| | | | | |
| Memphis | 32°00'N | 36°13'N | 32°00'N | 36°12'N |
| | 95°00'W | 95°00'W | 87°59'W | 87°47'W |
| | | | | |
| Miami | 24°00'N | 28°07'N | 24°00'N | 28°06'N |
| | 83°00'W | 83°00'W | 76°40'W | 76°32'W |
| | | | | |

**Table 1.3 Corner Coordinates - Sectional Charts (Continued)**

| Chart | SW Corner | NW Corner | SE Corner | NE Corner |
|---|---|---|---|---|
| Montreal | 44°00'N | 48°13'N | 44°00'N | 48°12'N |
| | 77°00'W | 77°00'W | 68°41'W | 68°21'W |
| | | | | |
| New Orleans | 28°00'N | 32°13'N | 28°00'N | 32°12'N |
| | 91°00'W | 91°00'W | 84°36'W | 84°28'W |
| | | | | |
| New York | 40°00'N | 44°13'N | 40°00'N | 44°12'N |
| | 77°00'W | 77°00'W | 68°57'W | 68°40'W |
| | | | | |
| Nome | 64°00'N | 68°10'N | 64°00'N | 68°06'N |
| | 171°30'W | 171°30'W | 157°55'W | 156°40'W |
| | | | | |
| Omaha | 40°00'N | 44°31'N | 40°00'N | 44°30'N |
| | 101°00'W | 101°00'W | 92°57'W | 92°39'W |
| | | | | |
| Phoenix | 31°16'N | 35°44'N | 31°16'N | 35°43'N |
| | 116°00'W | 116°00'W | 108°57'W | 108°45'W |
| | | | | |
| Point Barrow | 68°00'N | 72°10'N | 68°00'N | 72°05'N |
| | 157°00'W | 157°00'W | 140°55'W | 139°10'W |
| | | | | |
| Salt Lake City | 40°00'N | 44°31'N | 40°00'N | 44°30'N |
| | 117°00'W | 117°00'W | 108°57'W | 108°39'W |
| | | | | |
| San Antonio | 28°00'N | 32°13'N | 28°00'N | 32°12'N |
| | 103°00'W | 103°00'W | 96°36'W | 96°28'W |
| | | | | |
| San Francisco | 36°00'N | 40°13'N | 36°00'N | 40°12'N |
| | 125°00'W | 125°00'W | 117°55'W | 117°43'W |
| | | | | |
| Seattle | 44°26'N | 49°01'N | 44°25'N | 48°59'N |
| | 125°00'W | 125°00'W | 116°39'W | 116°39'W |
| | | | | |
| Seward | 59°07'N | 61°28'N | 59°07'N | 61°25'N |
| | 152°30'W | 152°30'W | 140°28'W | 140°00'W |
| | | | | |
| St. Louis | 36°00'N | 40°13'N | 36°00'N | 40°12'N |
| | 91°00'W | 91°00'W | 83°57'W | 83°45'W |
| | | | | |

**Table 1.3 Corner Coordinates - Sectional Charts (Continued)**

| Chart | SW Corner | NW Corner | SE Corner | NE Corner |
|---|---|---|---|---|
| Twin Cities | 44°26'N | 49°01'N | 44°25'N | 48°59'N |
| | 101°00'W | 101°00'W | 92°39'W | 92°17'W |
| | | | | |
| Washington | 36°00'N | 40°13'N | 36°00'N | 40°12'N |
| | 79°00'W | 79°00'W | 71°57'W | 71°45'W |
| | | | | |
| Western Aleutian Islands (East) | 51°00'N | 53°08'N | 51°00'N | 53°06'N |
| | 178°00'E | 178°00'E | 172°37'W | 172°20'W |
| | | | | |
| Western Aleutian Islands (West) | 51°00'N | 53°08'N | 51°00'N | 53°06'N |
| | 169°20'E | 169°10'E | 178°24'E | 178°37'E |
| | | | | |
| Wichita | 36°00'N | 40°13'N | 36°00'N | 40°12'N |
| | 104°00'W | 104°00'W | 96°52'W | 96°39'W |
| | | | | |

**(TAC)** The area of coverage for the VFR Terminal Area Charts selected as major metropolitan complexes shall be consistent with that area needed to satisfy local pilotage and control requirements as mutually agreed to by the participating and using agencies.

### 1.2.8 Symbolization

Symbolization of the final reproduction copy shall be in accordance with the Symbols Appendix included within this specification.

The symbols contained in the Appendix have been developed for use in the production of U.S. Government Aeronautical Charts and Publications.

The configuration of the symbols contained in the Appendix shall be adhered to. The size and lineweights specified and/or indicated therein should also be adhered to but may be varied when absolutely necessary.

### 1.2.9 Type Styles

It is recognized that a variance occurs between different composition mediums, such as Fotosetter, Photon, Monotype, and Foundry settings. However, type styles specified within these specifications shall be as stated, or their equivalent, as may be determined by the manufacturer's nomenclature.

The use of capital letters is intended, unless shown otherwise in the Symbols Appendix, Style Sheets or stated as "C/L" (caps and lower case).

## 1.3 SPECIFICATIONS, APPENDICES AND REFERENCES

### 1.3.1 Appendices

- **Appendix 1** - Topographical Information - Culture
- **Appendix 2** - Topographical Information - Hydrography
- **Appendix 3** - Topographical Information - Relief
- **Appendix 4** - Type Styles & Sizes
- **Appendix 5** - Aeronautical Information - Airports
- **Appendix 6** - Aeronautical Information - Radio Aids to Navigation
- **Appendix 7** - Aeronautical Information - Airspace Information
- **Appendix 8** - Aeronautical Information - Chart Limits
- **Appendix 9** - Aeronautical Information - Navigational & Procedural Information
- **Appendix 10** - Sectional Chart Panel
- **Appendix 11** - Terminal Area Chart Panel
- **Appendix 12** - Chart Index - U.S.
- **Appendix 13** - Chart Index - ALaska
- **Appendix 14** - Style Sheet - Normal Coverage
- **Appendix 15** - Style Sheet - Extended Coverage
- **Appendix 16** - Style Sheet - VFR Terminal Area Chart
- **Appendix 17** - Special Use Airspace - U.S. Sectional Chart
- **Appendix 18** - Special Use Airspace - Alaska Sectional Chart

### 1.3.2 References

Photon Photocomposition Specimen Catalog.

U.S. Government Paper Specification Standard published by the Joint Committee on Printing (JCP).

Pantone Matching System® Standardized color separation system.

Intergraph Map Publisher software screening.

Reproduction Supplement for five-color printing of Sectional.

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