

**National Mapping Program
Technical Instructions**

Part 2 Base Preparation

**Standards for
1:100,000-Scale
Quadrangle Maps**

**Department of the Interior
U.S. Geological Survey
National Mapping Division**

Standards for 1:100,000-Scale Quadrangle Maps
Part 2: Base Preparation

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2. BASE PREPARATION

Base preparation for 1:100,000-scale quadrangle maps involves plotting the required graticule and grids, which form the base for panelling the component 7.5- or 15-minute quadrangle maps, and performing any necessary updating of the component maps.

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2.1 BASE SHEET PLOTTING

Graticules and grids for 1:100,000-scale quadrangle maps are produced by automatic plotters. Program J404 has been designed to produce graticules and grids for a variety of map scales, including 1:100,000-scale quadrangles, using several different computers and plotters.

A 1:100,000-scale quadrangle map is produced on the Universal Transverse Mercator (UTM) projection. Geographic coordinate ticks are shown at 7.5-minute intervals. A full-line UTM grid is shown at a 10,000-meter interval. State plane coordinate ticks are shown at a 25,000-foot interval or a 10,000-meter interval for systems defined in metric units. All State plane coordinate system zones that cover at least 25 square miles are shown.

All base plots must meet the following accuracy requirements:

- o The 7.5-minute intersections of latitude and longitude must be within 0.003 inch of their computed distances.
- o The distances between adjacent grid lines, as well as the distances between the first full grid lines complementing those on adjacent base plots, must be within 0.003 inch of their computed positions.

Specifications for lineweights and tick and cross sizes are given in Part 4, "Publication Symbols."

Labels for grids and ticks are shown on the style sheet (Appendix 5-A)

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Base plots for 1:100,000-scale quadrangle maps are prepared on standard material sizes based on the latitude of the map. They are punch registered using the Kemco, Inc. register system with specified punch settings (see table 2-1).

Graticule placement is shown in figure 2-1.

Table 2-1
Material size and register punch-hole locations

Material size (inches)	Punch settings*				Latitude (north)
	1	2	3	4	
30x42	39	29	43	27	41° to 50°
30x46	39	29	51	27	32° to 41°
30x48	39	29	55	27	24° to 32°

* Film should be punched one sheet at a time, with the emulsion up for wrong-reading copy and the emulsion down for right-reading copy, as viewed from the emulsion of the film.

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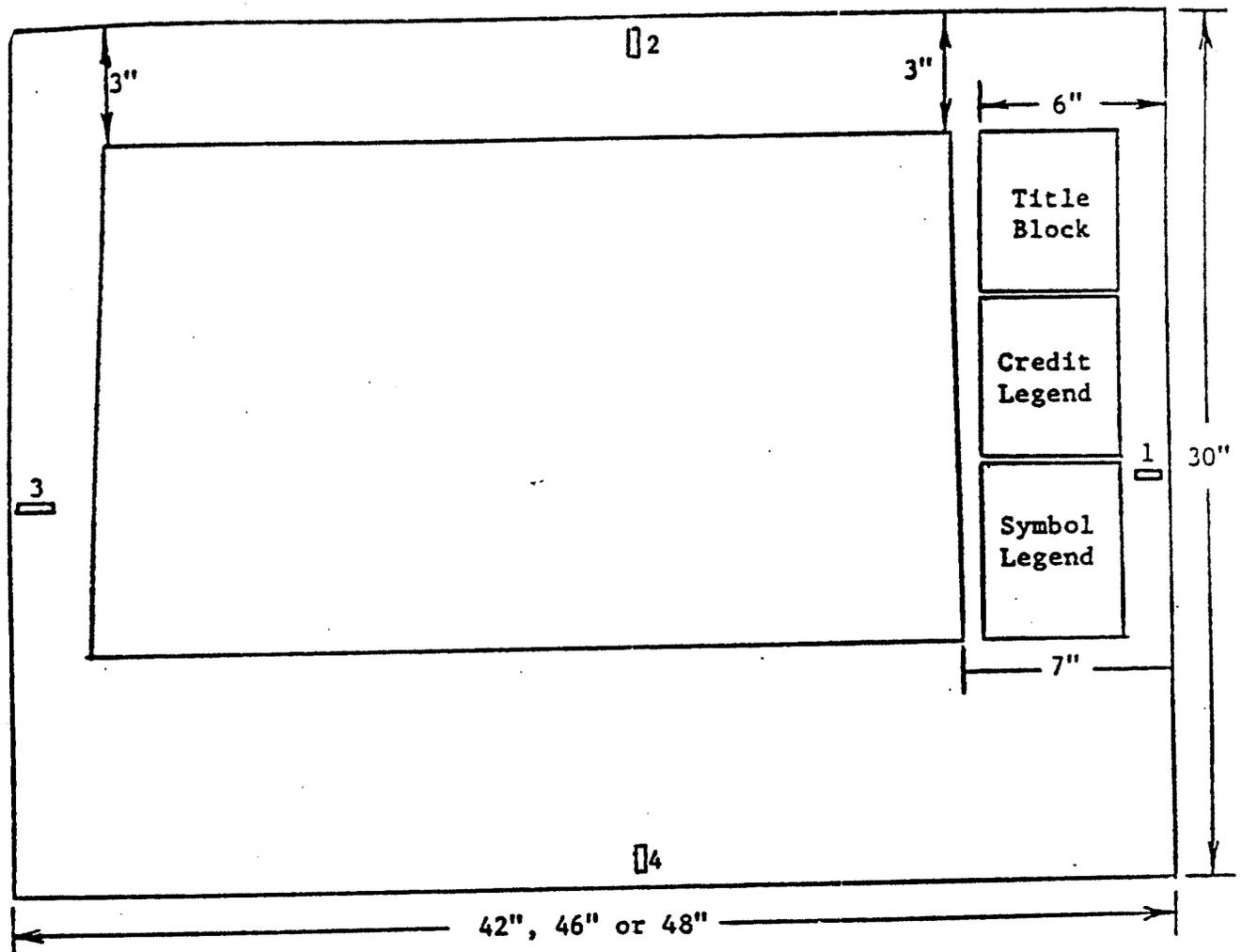


Figure 2-1
Graticule Placement

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2.2 PANELLING

Each 1:100,000-scale quadrangle map consists of 32 7.5-minute quadrangle areas. The quadrangles, either 7.5- or 15-minute, are reduced and panelled onto the base plot. To ensure accurate positioning and construction of the panelled base, any geographic or grid point common to a source map and the 1:100,000-scale quadrangle must fit within 0.003 inch.

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2.3 UPDATING

Map data from the component large-scale maps are updated to reflect planimetric changes which have occurred since the date of the component map. The map data to be updated are generally confined to major cultural, hydrographic, and vegetation changes, as well as boundaries and names. New information is added and obsolete information is deleted. Only those features that meet the selection criteria given in Part 3 of these Standards are added. Current correction files for the component maps are checked and corrections are made. Revised data are not field checked.

- o If the map detail shown on the component map is more than 3 years old, new or changed map features are compiled from aerial photographs using either monoscopic or stereoscopic techniques. The photographs must be less than 3 years old. Other available source materials, such as survey records, engineering plans, railway guides, and local maps, are used to update boundaries, names, and other features not visible on the photographs and to ensure the completeness of cultural detail.

- o If the component map is less than 3 years old, only major features, such as State and federal reservation boundaries, State and county boundaries, highways, and major reservoirs and dams, are added from available sources. A names check is also made.

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2.3.1 Culture

Major cultural features that are discernible on aerial photographs are updated. In addition, other current available source data are checked for changes, additions, or deletions of major cultural features, such as highways.

2.3.2 Hydrography

Updating of hydrographic features is required generally only for manmade changes, such as canals and reservoirs. New bodies of water are mapped. Changes in existing shorelines which are clearly manmade are mapped. Changes in stream courses are mapped only when there is obvious evidence of a change in channel.

Swamps which have been drained and are now cultivated are deleted. Major new swamps are mapped.

Changes in coastal shorelines which are clearly manmade are mapped. Natural changes to shorelines are mapped only if it can be determined that the photographs were taken at the time of mean high water and that the new shoreline represents the approximate line of mean high water.

2.3.3 Vegetation

New woodland areas are added. Woodland tint is deleted from newly added built-up areas, open water, and disturbed surface areas that have been cleared. It is not necessary to delete woodland areas that fall below the minimum selection size for new compilation if they are identifiable.

Woodland is recompiled when changes are so extensive that recompilation is cost-effective. Minimum selection sizes are followed for all new compilation.

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2.3.4 Hypsography

Contours are interpolated and extracted to take into account updated features.

Contours are retained in all reservoirs, lakes, or ponds added during updating

Contours are deleted from new or modified strip mines and pits and disturbed-surface tint is shown.

Disturbed-surface tint is retained for strip mines that have been reclaimed, but the area is labelled "reclaimed strip mine".

Contours are retained as shown on the component map when a strip mine has been added during photorevision, and the strip mine has since been reclaimed to the original contours. Otherwise, the contours are not compiled, the disturbed-surface tint is shown, and the area is labelled "reclaimed strip mine".

2.3.5 Bathymetry

Bathymetry is shown only on authorized topographic-bathymetric editions. In those cases, bathymetric information, at 1:100,000 scale, is supplied by the National Ocean Service and is scribed as provided.

Only limited offshore data are shown on topographic editions. Depth curves are not shown and therefore are not updated. Offshore oil or gas platforms are updated from aerial photographs. Submerged pipelines and sewerlines are shown as they exist on the component maps unless supplemental sources exist for updating.

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2.3.6 Boundaries

Existing boundaries are verified. Boundaries of all newly established areas are added. Obsolete boundaries are deleted.

2.3.7 Names

Names and their applications are obtained for features added during updating. Names of any features that are un-named on the component base map or that are added during updating must be submitted for inclusion in the Geographic Names Information System (GNIS) before they can be published. Existing names are checked against the GNIS.