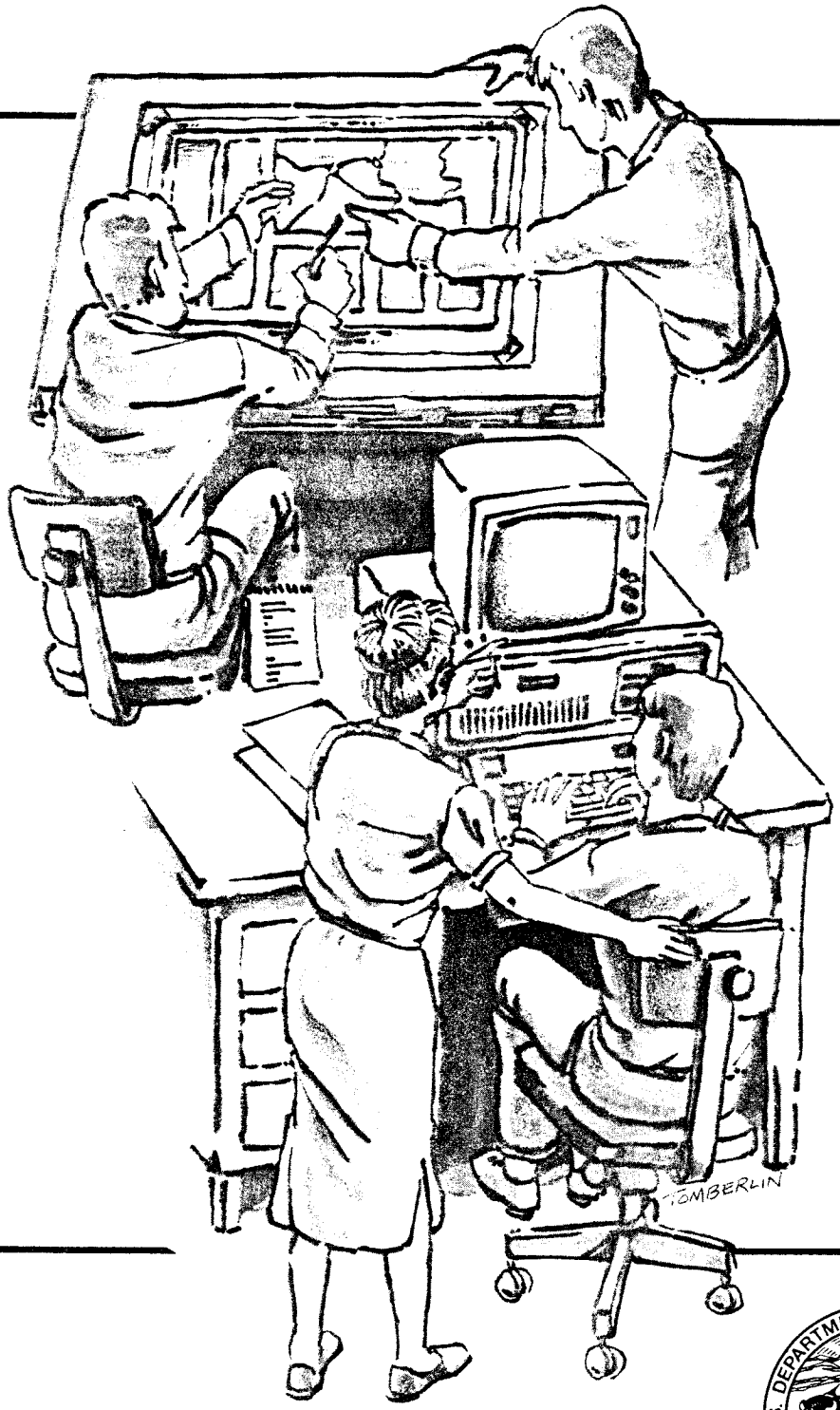
USGS
science for a changing world

Standards for Illustrations in Reports of the U.S. Geological Survey, Water Resources Division



U.S. Geological Survey

Open-File Report 95-415

U.S. DEPARTMENT OF THE INTERIOR
MARCH 3, 1849

CARTOGRAPHIC TECHNICAL STANDARDS

Replaces T. S. P.	3.00.1	Subject: MARGINAL INFORMATION IBM Composer Type for Marginal Information	T. S. Paper	3.00.1
Dated	12/1/75		Effective	4/1/77

Type styles and sizes for headings and co-op note:

PR-11-B (LD 14, UV 5, Imp) Plates or sheets wider than 24"

PR-10-B (LD 13, UV 5, Imp) Plates or sheets 18" to 24"

PR-8-B (LD 11, UV 5, Imp) Plates or sheets less than 18" wide

Interior/Survey Heading - Set flush left using Press Roman Bold[1] type:
For Map Series:

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

For Book Reports:

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Co-op Note - Center type using Press Roman Bold.[1] Show the line "Prepared in cooperation with..." in caps and lowercase; use caps for the remainder of the note.

Prepared in cooperation with the
STATE OF WASHINGTON

Series Identification Heading - Set flush right using Press Roman Bold[1] type.
For Map Series:

GEOLOGIC QUADRANGLE MAP
CAUSEY DAM QUADRANGLE, UTAH
GQ-790

MISCELLANEOUS INVESTIGATIONS SERIES
MAP I-900

GEOLOGIC QUADRANGLE MAP
CAUSEY DAM QUADRANGLE, UTAH
BEDROCK GEOLOGY \ **GQ-790**
2 em space

HYDROLOGIC INVESTIGATIONS
ATLAS HA-345

For Book Reports:

PROFESSIONAL PAPER 564-B
PLATE 3

BULLETIN 1243-B
PLATE 5

WATER-SUPPLY PAPER 1839-B
PLATE 1

[1]Souvenir Medium, Helvetica Regular, or similar type

INFORMATION FOR TOP MARGIN

(To Scale)

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

TOP LEFT

Prepared in cooperation with the
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

MIDDLE

WATER-RESOURCES INVESTIGATIONS
REPORT 85-4242

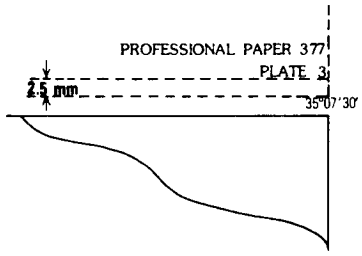
TOP RIGHT

CARTOGRAPHIC TECHNICAL STANDARDS

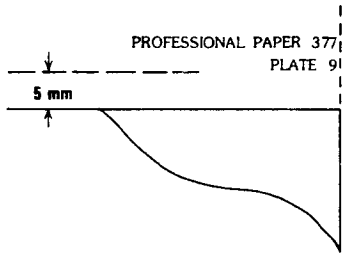
Replaces T. S. P.		Subject: MARGINAL INFORMATION Series Identification on Note	T. S. Paper	3.02.1
Dated			Effective	12/3/76

The series identification note is positioned flush right with the widest part of the map (border, neatline, or type matter) so that it will be visible after the map is folded. When there are grid-coordinate numbers on the map, the bottom of the series identification type will measure 2.5 mm above the top of the grid-coordinate type. (See example 1.) When a map or plate does not contain grid-coordinate type, the bottom of the series identification type will measure 5 mm above the neatline. (See example 2.) When the series heading is positioned directly above the explanation, the word "EXPLANATION" should be dropped 1.5 mm below the neatline to assure a space of 6.5 mm between the bottom of the series note type and the top of the word "EXPLANATION." (See example 3.) The bottom of the type of all headings should measure the same distanc from the neatline. Set type in same style and size as Interior Credit note (left heading, T.S.P. 3.01.1.)

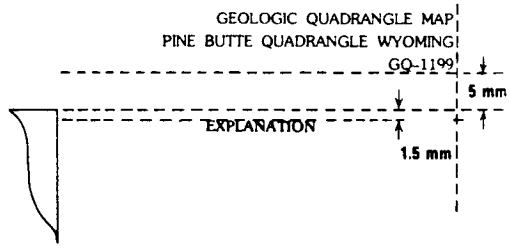
EXAMPLE 1



EXAMPLE 2



EXAMPLE 3



1. Examples of some series identification notes are as follows:

MISCELLANEOUS INVESTIGATIONS SERIES
MAP I-487

GEOPHYSICAL INVESTIGATIONS
MAP GP-600

HYDROLOGIC INVESTIGATIONS
ATLAS HA-513 (SHEET 1 OF 4)

2. When a specific type geology (economic, surfical, bedrock, etc.) is published in the Geologic Quadrangle Map Series, the type geology shall be indicated as part of the identification note as follows:

GEOLOGIC QUADRANGLE MAP
CAUSEY DAM QUADRANGLE, UTAH
BEDROCK GEOLOGY GQ-790

3. State names will be spelled out whenever possible. Line widths will not include more than 45 character spaces. The designer should try to condense them further wherever possible by abbreviating state names when more than one is indicated.

GEOLOGIC QUADRANGLE MAP
BLOOMSBURY QUADRANGLE, NEW JERSEY
GQ–595

GEOLOGIC QUADRANGLE MAP
RIEGELSVILLE QUADRANGLE, PA.—N. J.
GQ–593

4. In the GQ Series where geology is illustrated in two or more states and in a principal quadrangle and a part or parts of adjoining quadrangles, the adjoining quadrangle title shall be included:

GEOLOGIC QUADRANGLE MAP
ASHLAND AND CATLETTSBURG QUADRANGLE
KENTUCKY—OHIO
GQ–196

The chapter letter will appear on all plates in the upper right heading, <u>if</u> the book report is one of a series containing several chapters even though plates are consecutively numbered.

WATER-SUPPLY PAPER 1839–B
PLATE 1

BULLETIN 1242–B
PLATE 5

PROFESSIONAL PAPER 562–A
PLATE 3

Note: The Kentucky geologic quadrangles and some special series (such as Moon and Mars maps) will maintain their present type styles and formats throughout their present series.

CARTOGRAPHIC TECHNICAL STANDARDS

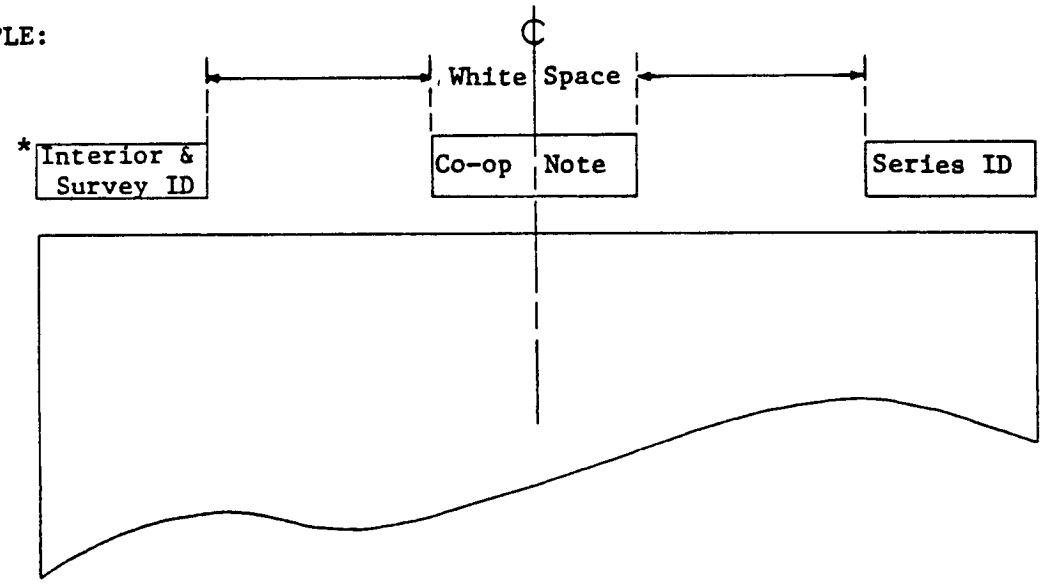
Replaces T. S. P.	3.03.2	Subject: MARGINAL INFORMATION Cooperation Notes on Book Report plates (in pocket) and Map Series sheets	T. S. Paper	3.03.2
Dated	5/20/78		Effective	11/1/78

Some map and book publications are the end product of scientific studies performed in cooperation with others outside the Survey. For such publications the Director has instructed that a note of cooperation must appear on all map series work and all principal maps or plates in pockets of books.

The wording for the note of cooperation is generally given in the letter of transmittal accompanying the job and that wording should be followed exactly. Should the co-op note appearing on a mill copy differ from that given in the transmittal letter or on another map in the same report, contact the operating Division for clarification.

The co-op note will be positioned at the top of the plate and centered between the Geological Survey/Interior Credit Note and the Series Identification Note. The bottom of the type will be alined with the bottom of the two headings, as indicated in example below.

EXAMPLE:



Headings for maps in book reports will read:

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Headings for maps in the series will read:

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

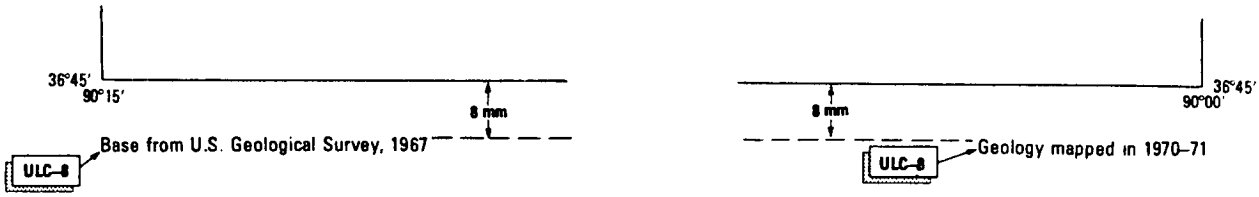
Note: Some foreign maps and special wall maps (not regular series) will have individual instructions for placement of co-op notes.

*Refer to T.S.P. 3.01.1

CARTOGRAPHIC TECHNICAL STANDARDS

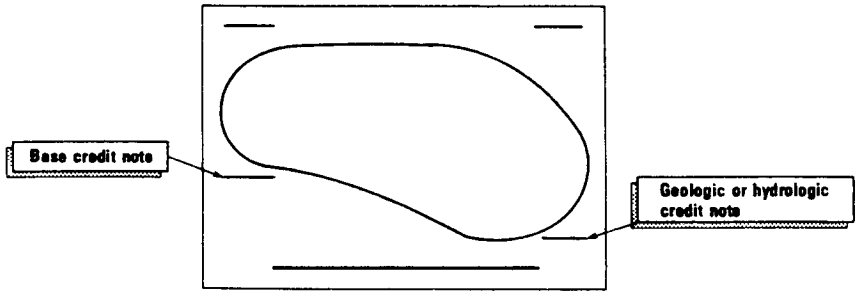
Replaces T. S. P.		Subject: MARGINAL INFORMATION Placement of credit notes	T. S. Paper	3.04.3
Dated			Effective	12/15/76

Rectangular-shaped maps.--Place credit notes 8 mm below the neatline if coordinates are shown; aline the base credit note with west neatline and the geologic or hydrologic credit note with the east neatline.

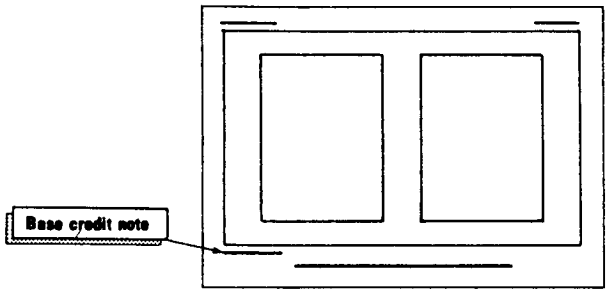


Where coordinates are not shown, put the notes 5 mm below the neatline.

Irregularly shaped maps.--If a map does not have a border and is of an irregular shape, put the credit notes as close to the lower corners as possible.



Repeated base maps.--If a base map is repeated, show the base credit note only once rather than under each image. Place the credit note below the south neatline or border and flush left with the west neatline.



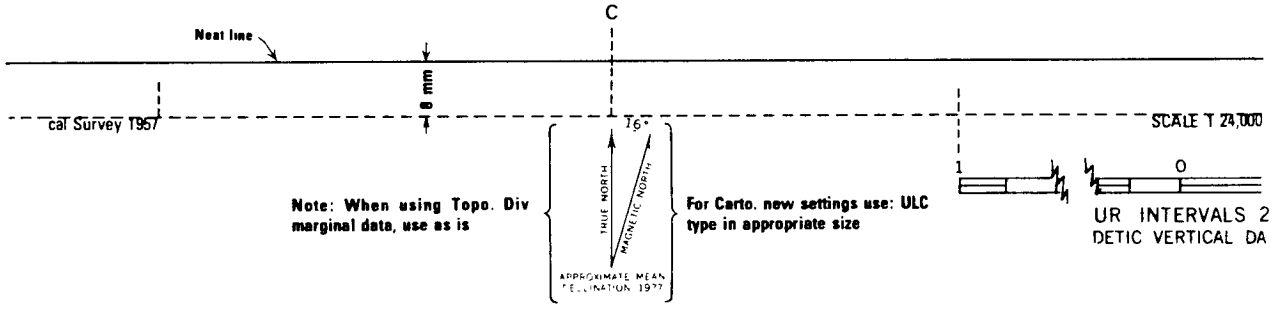
CARTOGRAPHIC TECHNICAL STANDARDS

Replaces T. S. P.	3.06.0	Subject: MARGINAL INFORMATION Magnetic Declination and North Arrow	T. S. Paper	3.06.1
Dated	8/1/78		Effective	2/16/79

The addition of a magentic declination and/or north arrow is not automatic but dependent on several factors; therefore, the decision of usage and form will lie with the map designer.

The magnetic declination will be updated to the year the map is published by checking the current edition of the isogonic chart. Do not change the degree figure unless the change is 30' or more.

The magnetic declination diagram will be used on quadrangle maps from the scale of 1:20 000 up to and including 1:125 000. It will be centered in the space between the base credit note and scales. The top of the degree number will be 8 mm below the neat line.



When this placement is not possible, as on an irregular-shaped map, place the magnetic declination along or near the bottom of the map in an area that is aesthetically pleasing.

If the map covers more than 1 degree (30' in Alaska) of latitude or longitude, the magnetic declination diagram will not be used. On these medium-scale maps a variable magnetic declination note will be used. Use the same wording as on the base map, and place the note on a line 3 mm below the datum note.

To match Topographic Division type, use Trade Gothic Roman (TG) type in the point size indicated in parenthesis on the right side of the illustrations below. For new type use Univers Light Condensed (ULC) in the point size indicated on the right side of the illustrations below.

Topographic Division type style is Trade Gothic Roman (TG), in indicated sizes

CONTOUR INTERVALS 200 AND 1000 FEET (8 pt.)
AREAS NOT SURVEYED IN DETAIL INDICATED BY BROKEN LINES (7 pt.)
NATIONAL GEODETIC VERTICAL DATUM OF 1929
DEPTH CURVES IN FEET—DATUM IS MEAN LOWER LOW WATER (6 pt.)
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
1951 MAGNETIC DECLINATION AT SOUTH EDGE OF SHEET VARIES FROM 27° TO 28° EAST (7 pt.)

Branch of Cartography type stye is Univers Light Condensed (ULC), in indicated sizes

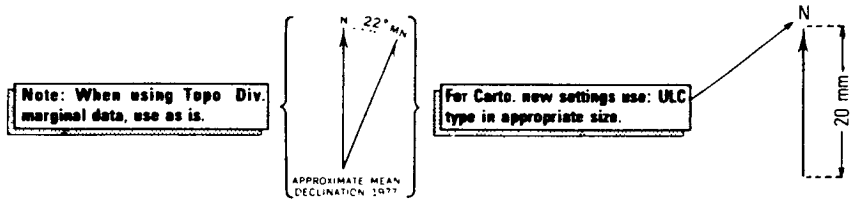
CONTOUR INTERVALS 200 AND 1000 FEET (8 pt.)
AREAS NOT SURVEYED IN DETAIL INDICATED BY BROKEN LINES
NATIONAL GEODETIC VERTICAL DATUM OF 1929 (6 pt.)
DEPTH CURVES IN FEET—DATUM IS MEAN LOWER LOW WATER
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
1951 MAGNETIC DECLINATION AT SOUTH EDGE OF SHEET VARIES FROM 27° TO 28° EAST (7 pt.)

A variable magnetic declination note will not be required on maps covering large areas at scales of 1:250 000 or smaller (1:500 000 1:000 000, etc.)

Mine maps generally have only the north arrow without the magnetic declination. Only when the author shows magnetic declinations on his manuscripts or he specifically requests that they be added will the magnetic declination be shown on these maps. Authors may also request that the magnetic declination and year remain the same as when they mapped the area, in which case the year mapped must be given.

On very small maps and mine maps and on figures where a geographic grid is shown, a north arrow is not required as the grid will indicate direction.

Foreign reports will show capital N and MN centered above the arrowheads. True north and magnetic north are not spelled out.



True and magnetic north arrows will always carry the note "Approximate mean declination, 19__."

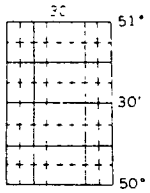
The following information and precedures are helpful in selecting the correct degree of deviation bewtween magnetic north and true north. Magentic declination is required on certain maps, and accurately determining the declination for a given map from the isogonic chart is not always easy. The diagrams shown on the following page are copied from transparent overlays that should be used in determining declinations. These overlays were designed to help the cartographer and/or technician in locating on the isogonic chart the geographic position and in selecting the proper degree of deviation of the map being worked on. The overlays are available on request from the Branch of Technical Coordination and Standards

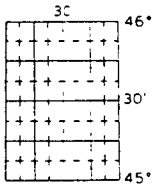
MAGNETIC DECLINATION DETERMINER

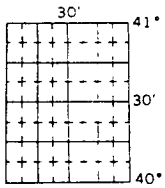
(See cartographic technical standard 3.06.1 for additional information)

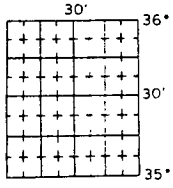
These diagrams should be used to locate the geographic position of your map on the isogonic chart, thereby aiding you in selecting the correct degree reading for the declination diagram

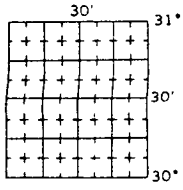
1°x1° Diagrams







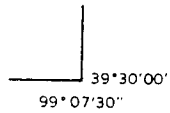




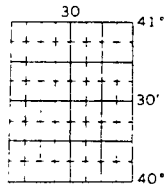
Apply the following steps in selecting and using the appropriate diagram:

Example

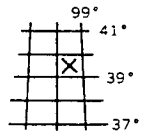
1 Check the latitude and longitude from any corner of your map



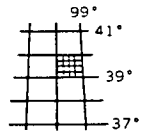
2. Select the 1°x1° diagram that is nearest in latitude to the latitude of your map



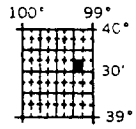
3. Locate your map area geographically (within the 1° latitude and longitude lines) on the latest available isogonic chart (USGS Map I-911)



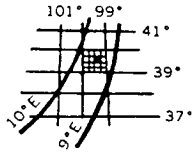
4. Position the selected 1°x1° diagram over the 1°x1° location on the isogonic chart.



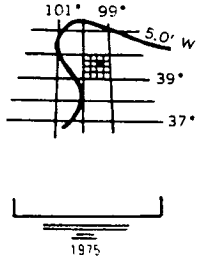
5. Considering the latitude and longitude on your map, visually locate your map area in the exact block on the diagram by using the appropriate divisions, 30' and 15' lines and(or) the dashed 7½' lines.



6. Select the isogonic (red) line nearest to your map location. (If it falls nearer the middle of two isogonic lines, add or subtract ½°)



7. Locate the isoporic (blue) line nearest to your map location. Multiply the annual minutes change shown on the isoporic line by the number of years since the date of publication shown on the isogonic chart (map I-911). The number of minutes of annual change will dictate if the magnetic-declination (compass variation) has moved east or west of true north into the next 30' or 1 full degree This example would be 9°.



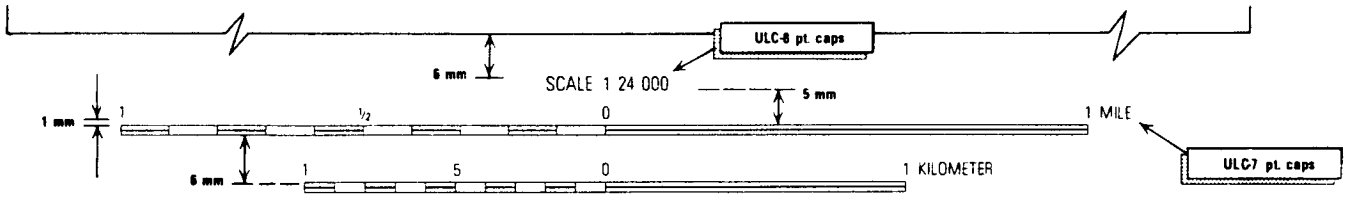
PUBLICATIONS DIVISION

CARTOGRAPHIC TECHNICAL STANDARDS

Replaces T. S. P.	3.07.1	Subject: MARGINAL INFORMATION Bar and Rake Scales	T. S. Paper	3.07.1
Dated	2/7/77		Effective	10/16/78

BAR SCALES

Bar scales will be used on multicolor maps and on black-and-white maps that have a detailed base, such as USGS, NOS, or DMA Quadrangles. These bases contain scales and other border data which should be retained to print in screened and/or solid black on the thematic map. The majority of geologic maps will use topographic bases screened in the Branch of Printing photolab with the 50% biangle screen used with the culture. If the culture is to be screened 40% or less or if for any reason the scale or border data cannot be used, it will be blocked out with lithographer's tape, and new data will be added to the black type overlay. Bar scales will be placed below the south neatline, centered between the east and west neatlines in the following manner. The normal distance of scales below neatlines on topographic Division quadrangles is 6 mm as shown below. When the Publications Division prepares its own base, the scale should be placed 8 mm below the neatline.



The length of the scale is important to the appearance of the map; therefore, a general guide for quadrangle-size maps appears below. For maps that are not quadrangle size, a general rule is to show them approximately one-third of the width of the map, and usually no longer than 178 mm.

Fractional scale	Overall length of scales	Fractional scale	Overall length of scales
1:24 000	2 km (2 mi)	1:62 500	8 km (6 mi)
1:31 680	2 km (2 mi)	1:125 000	15 km (10 mi)
1:48 000	6 km (4 mi)	1:250 000	40 km (30 mi)

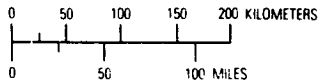
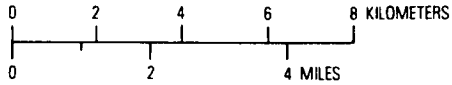
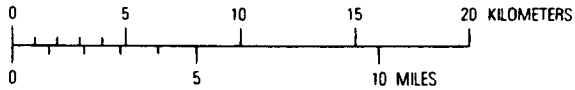
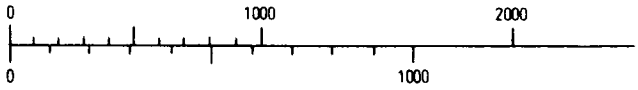
RAKE SCALES

Rake scales are to be used on index maps, text figures, mine maps and maps without detailed bases and under cross sections if the horizontal scale of the cross section differs from that of the map. The English scale will be combined with the metric scale. Subdivide the first unit only into appropriate measurements. The space between ticks for the subdivided unit should be no closer than twice the length of the long ticks. This will cause some variation in tick length depending on the length of the scale, although tick lengths of 2.5 mm and 1.3 mm should be satisfactory for most scales. The general rule for the length of a rake scale is the same as for bar scales on plates. The length of scales for figures depends upon space available but will generally be less than one-third figure width.

Four factors that should be considered when subdividing a scale* are:

1. The space available between the division (long ticks).
2. In what increments are the division (long ticks).
3. The mile scale should be subdivided according to the inch-pound system; for example when subdividing 1 mile, divide into 2, 5, or 10 parts.
4. The kilometer-scale measurements should be in sub-multiples of 10 according to the metric system; for example, when subdividing 1 kilometer divide into 2, 5, or 10 parts.

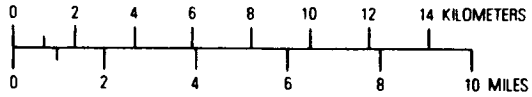
A general guide for rake scale subdivisions* is as follows:

Space between Divisions (long ticks)	Number of Subdivisions (short ticks)	Examples
Less than 19 mm (use only when necessary)	1	
19 mm to 51 mm	1 or 4	
More than 51 mm	9	  

Occasionally, scales on author's originals (and mill copy) are divided into odd increments. Using the author's measurements, we rearrange the divisions into more practical increments, e.g.:

Author's copy received

Increments rearranged and metric scale added



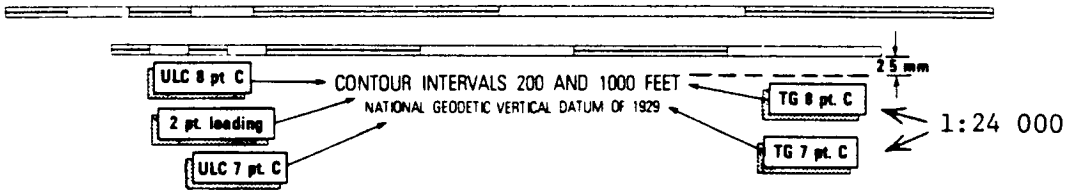
*See page 51.

CARTOGRAPHIC TECHNICAL STANDARDS

Replaces T. S. P.	3.09.1	Subject: MARGINAL INFORMATION Placement and type style for contour interval and vertical datum notes	T. S. Paper	3.09.1
Dated	3/1/77		Effective	2/16/79

The contour interval and datum notes will appear beneath the scale only if topographic contours are shown on the map. There may be times when the datum note will be used without the contour interval note, as on mine maps where datum for shaft levels is given; however, a contour-interval note will never be shown without a datum note.

When the Topographic Division's contour-interval note is being used on base copy and changes or additions are necessary, match their type style, which is Trade Gothic Roman (TG), as indicated at right below (on old topographic bases, match their existing typestyles).
When Branch of Cartography is preparing a new contour-interval note completely, they will use Univers Light Condensed (ULC), as indicated on left below.



Maps that contain open-water areas must be checked for fathom and depth contour lines. The contour, datum, fathom, and other notes that appear on these maps have many variations depending on the map's geographic location in addition to several other factors. The following are typical examples:

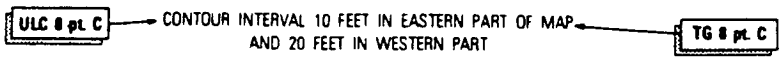
CONTOUR INTERVAL 50 FEET
WITH SUPPLEMENTARY CONTOURS AT 25 FOOT INTERVALS
NATIONAL GEODETIC VERTICAL DATUM OF 1929
BATHYMETRIC CONTOUR INTERVAL 10 METERS
SUPPLEMENTED BY 2 METER INTERVALS TO MAXIMUM DEPTH
DATUM: MEAN LOW WATER
THE RELATIONSHIP BETWEEN THE TWO DATUMS IS VARIABLE
← 1:250 000

CONTOUR INTERVAL 1.5 METERS
NATIONAL GEODETIC VERTICAL DATUM OF 1929
BATHYMETRIC CONTOUR INTERVAL 1 METER WITH SUPPLEMENTARY
0.5 METER CONTOURS—DATUM IS MEAN LOW WATER
THE RELATIONSHIP BETWEEN THE TWO DATUMS IS VARIABLE
THE MEAN RANGE OF TIDE IS APPROXIMATELY 2.1 METERS
1:24 000

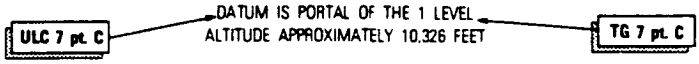
CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOW WATER
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
THE MEAN RANGE OF TIDE IS APPROXIMATELY 3.9 FEET

CONTOUR INTERVAL 40 FEET
CONTOUR INTERVAL ON RIVER SURFACE 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
← 1:62 500

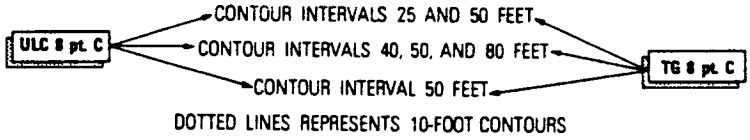
When two quadrangles with different contour intervals have been mosaicked to form a new base, the contour note should be similar to the example below.



Sample datum note without contour-interval note:



Other sample notes:



Note: All above examples are illustrated in ULC type.

Refer to T.S.P. 3.09.2 for proper wording of vertical datum notes based on geographic location.

CARTOGRAPHIC TECHNICAL STANDARDS

Replaces T. S. P.		Subject: MARGINAL INFORMATION Main Titles and Authorships; type style and sizes for maps and plates	T. S. Paper	3.10.1
Dated			Effective	12/2/76

On Book Reports each plate has a title only; on Map Series each sheet has a title with authorship and date centered under the title.

The variety of map sizes and conditions makes it difficult to set hard-and-fast rules for map titles. The following items will be used as a guide.

1. Souvenir Medium (SM) caps will be the style of type normally used for titles, and caps and lowercase for authorship.

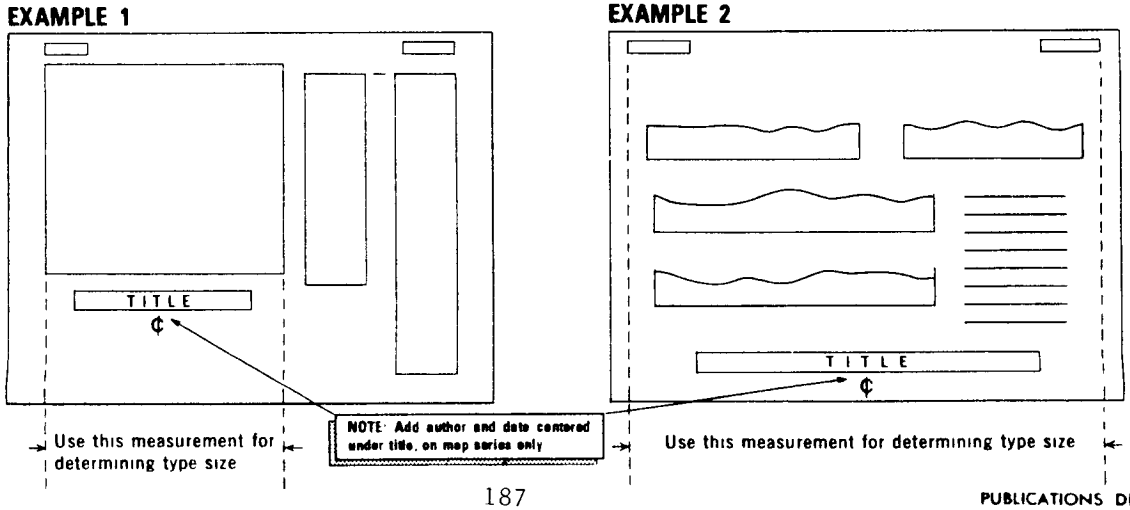
2. All Geologic Quadrangle Maps at 1:24,000 scale should use 20 pt. Souvenir Medium single line titles and 18 pt. for two-line titles. Designers should order the next smaller size of type when titles consisting of more than two lines tend to become too dominant on a plate or map. Very short titles may be set in a larger size.

3. When titles are set in open space areas (display title) reduce or enlarge the size of type according to the amount of space available.

4. Generally, type sizes have a direct relationship to the widths of maps and the length of the titles. If the title is to be set under the map, use only the width of the map for selecting the type size (Example 1). If the title is to be centered on the sheet, the overall width of the sheet will be used for selecting type size (Example 2).

		Titles	Authorships
a.	Maps from 0-230 mm wide use	12 pt. caps	10 pt. C/lc
b.	Maps from 231-300 mm wide use	14 pt. caps	10 pt. C/lc
c.	Maps from 301-400 mm wide use	16 pt. caps	12 pt. C/lc
d.	Maps from 401-500 mm wide use	18 pt. caps	14 pt. C/lc
e.	Maps from 501-600 mm wide use	20 pt. caps	16 pt. C/lc
f.	Maps more than 601 mm wide use	24 pt. caps	18 pt. C/lc

5. The date will always be 12 point except when 10 pt. authorship is used, then use 10 pt. date.



CARTOGRAPHIC TECHNICAL STANDARDS

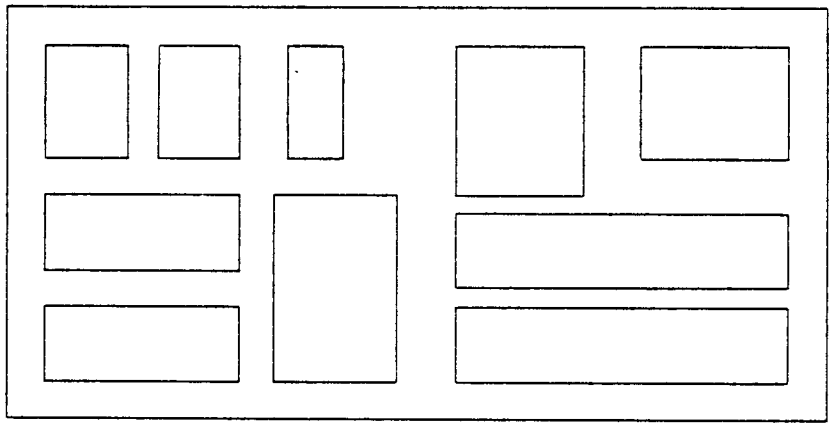
Replaces T. S. P.		Subject: MARGINAL INFORMATION Titles and Subtitles, also sheet identification note for reports containing two or more map sheets	T. S. Paper	3.10.2
Dated			Effective	2/22/78

The maintitles will be identical for all sheets and will be set in Souvenir Medium caps. (See T.S.P. 3.10.1.)

EXAMPLE: **WATER RESOURCES, MARYLAND**

Individual sheet titles (subtitles) will be positioned above the main title and will be set in Souvenir Medium (caps and lowercase) in the next available smaller size than the main title. See example 1.

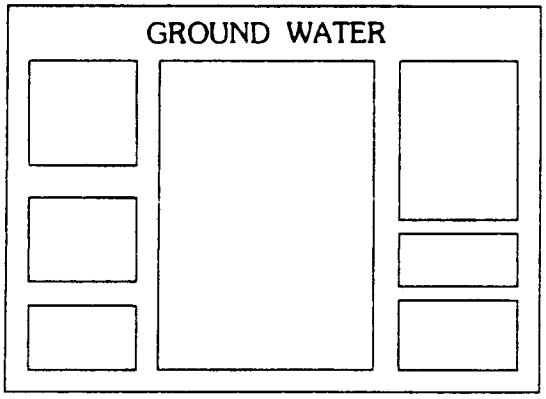
EXAMPLE 1



Water yield and water use
WATER RESOURCES, MARYLAND
By
A. B. Jones and John Smith
1977

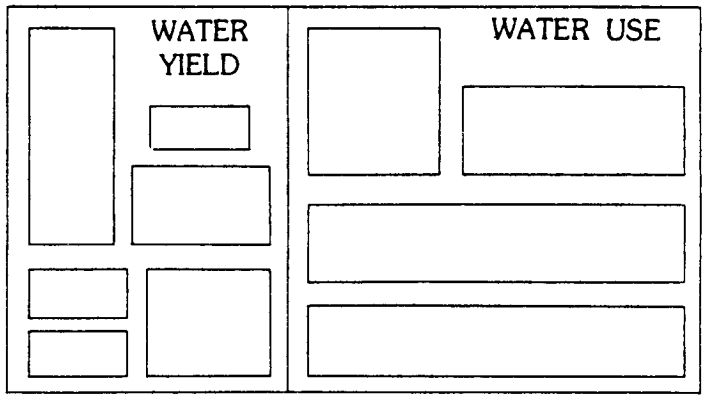
Whenever subtitles are placed within the body of the individual map, no subtitles will be added above the main title. Most "Map Series" subtitles will be set in Souvenir Light in the same size or larger than the title and will be placed at the top of the sheet whenever possible. See examples 2 and 3.

EXAMPLE 2



WATER RESOURCES, MARYLAND
By
A. B. Jones and John Smith
1977

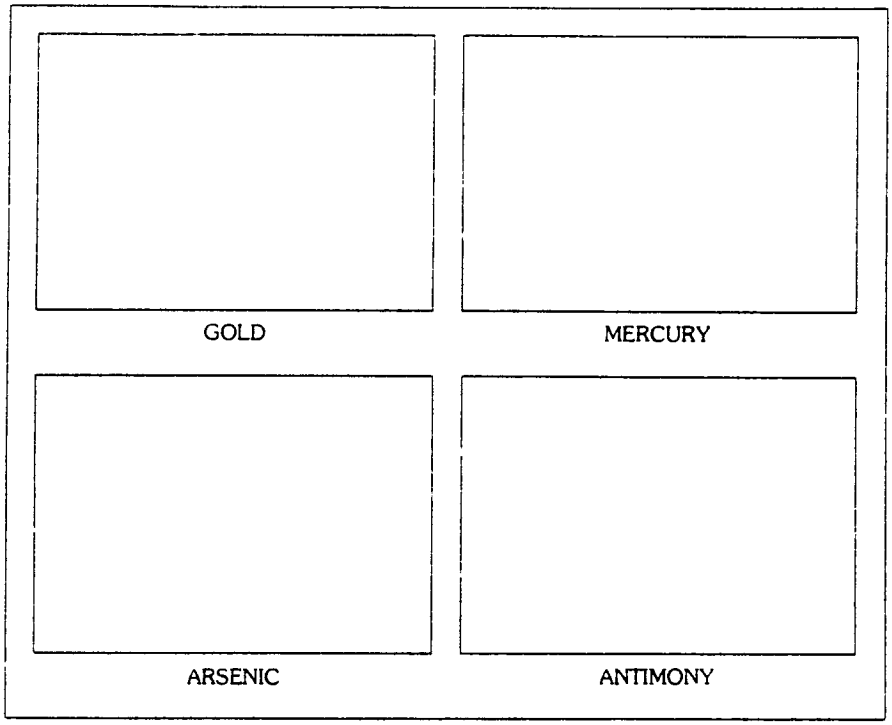
EXAMPLE 3



WATER RESOURCES, MARYLAND
By
A. B. Jones and John Smith
1977

Book report subtitles may be set in SL, U, ULC in a size that would best identify the data and compliment the map appearance, and still comply with geologic and hydrologic type standards. (See example 4.)

EXAMPLE :



GEOCHEMICAL MAPS SHOWING DISTRIBUTION OF GOLD, MERCURY, ARSENIC, AND ANTIMONY IN THE CORTEZ-BUCKHORN AREA, UREKA COUNTY, NEVADA

The series identification note in the upper right corner of Map Series sheets should be identical in all cases and should contain, in parentheses, both the sheet number and the total number of sheets in the set. The series identification note for "Book Report" plates should be identical on all plates but should show the individual plate number only. (See examples below.)

For map series — HYDROLOGIC INVESTIGATIONS ATLAS HA-000 (SHEET 1 OF 2)

For book reports — PROFESSIONAL PAPER 448-A PLATE 1

PROFESSIONAL PAPER 448-A PLATE 2

Note: Also refer to T.S.P.'s 3.00.1 and 3.02.1

PUBLICATIONS DIVISION

United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VA 22092

In Reply Refer To:
WGS-Mail Stop 435

January 6, 1987

WATER RESOURCES DIVISION MEMORANDUM NO. 87.21

Subject: PUBLICATIONS--Use of sea level to represent National Geodetic Vertical Datum of 1929

The recent WRD memorandums (86.101, 86.104, and 87.04) requiring use of National Geodetic Vertical Datum of 1929 (NGVD of 1929) were intended to increase the technical precision of our reports. NGVD of 1929 has a precise engineering basis, and its use is necessary to ensure precision of future interpretation of data. Whether we are aware of it or not, our field measurements such as lake and ground-water levels, elevations of stream gages, tops of well casings, and so forth, that, in conversation, are referred to sea level as the reference datum, actually are referred to the NGVD of 1929. Although scientifically correct, the use of NGVD of 1929 in text of our reports has been a cause of concern to WRD authors and to many readers who recognize that, even though "sea level" has no precise meaning in an engineering sense, it is a widely used and understood conceptual datum. Accordingly, the following statement should be included in all USGS and cooperator-series reports where for purposes of ease of understanding and conciseness, "Sea level" is used instead of "National Geodetic Vertical Datum of 1929":

> Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)--a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called "Mean Sea Level of 1929."

This statement, which replaces the current statement defining NGVD of 1929, should be placed at the bottom of the table of conversion factors and abbreviations.

NGVD of 1929 should continue to be used in the datum note of plates that show topographic contours, in accordance with the standards of the National Mapping Division and Coast and Geodetic Survey. Contributions to scientific journals generally have not included this statement, and use of "sea level" in these publications without the explanatory statement is acceptable in those instances where the precise meaning provided by NGVD of 1929 is not needed.

I believe this change serves the interest of scientific precision, while simultaneously retaining the readability and clarity of our reports.

James F. Daniel
Assistant Chief Hydrologist
for Scientific Information Management

WRD Distribution: A, B. S, FO, PO

This memorandum supplements WRD Memorandum 87.04.

WATER RESOURCES DIVISION
PUBLICATIONS GUIDE

Replaces Article No.: | Effective Date: 3/1/71 | Article No.: 3.07.1

Subject: ILLUSTRATIONS -- Photographs - Quality; only glossy prints acceptable

Some reports received in the Publications Unit, Reports Section contain xerox or similar machine prints of photographs in lieu of the required glossy prints. Machine-made prints lack the clarity and legibility required for review and approval.

Only glossy prints will be acceptable for approval for publication and open-file release. One glossy print is required for each photograph in a report. Photographs in copies of reports to be placed in the Washington file must also be glossy prints. Glossy prints should be prepared from continuous-tone negatives - negatives that have not been screened.

Those reports containing xerox or similar prints of photographs will be returned to the originating office for preparation and inclusion of appropriate glossy prints.

Reference: WRD memorandum 70.146, dated April 20, 1970.
Cross Reference: 3.07.3--Requirements for submitting photographs.

WATER RESOURCES DIVISION
PUBLICATIONS GUIDE

Replaces Article No.: | Effective Date: 3/1/71 | Article No.: 3.07.2

Subject: ILLUSTRATIONS -- Photographs - Characteristics of a good photograph

Characteristics of good photographs are:

1. The focus is sharp -- any reproduction of a photograph is of lesser quality than the original photograph, therefore, photographs that are out of focus will not reproduce satisfactorily and will not be approved for publication.

2. The contrast is not too dark or too light -- middle tones of gray reproduce the best. The best prints for reproduction are those made from negatives of evenly illuminated subjects in which the details are sharp. A good print for reproduction is one that has maximum detail in both shadow and highlight areas.

3. The photograph should show clearly what the photographer intended it to show. Objects such as trees or fences that obscure the view of the subject result in unsatisfactory photographs. Photographs with this problem should be retaken from a different position to eliminate the interfering objects.

4. The use of brand names in Survey publications generally is not allowed. Photographs should be taken so that any brand name on the object being photographed is either not visible or not readible. If this is not possible, the brand name must be removed from the photograph when final reproduction copy is made.

5. Objects that can be used for scale comparison of the subject are necessary in most photographs. They can be persons, vehicles, hammers, rulers, etc. Photomicrographs require a drafted linear scale.

6. Enlargements usually make unsatisfactory copy for reproduction. Coarse grained prints generally result from the enlarging process. Enlargements can be avoided by using cameras that make negatives at or near the desired publication size.

7. Polaroid prints are not satisfactory for use as reproduction copy because they deteriorate with age. However, a Polaroid camera can be used to advantage in conjunction with a second camera. A photograph of the subject can be taken first with the Polaroid camera to determine if a satisfactory photograph of the subject can be obtained at that site. If so, then the subject can be rephotographed with the second camera.

WATER RESOURCES DIVISION
PUBLICATIONS GUIDE

Replaces Article No.:	3.07.3 Dated 3/1/71	Effective Date:	3/20/74	Article No.:	3.07.3

Subject: ILLUSTRATIONS -- Photographs - Requirements for submitting photographs

1. Each photograph in a report must clearly relate to the subject matter of the text. If a photograph doesn't relate to the text, it doesn't belong in the report.

2. Continuous-tone glossy prints must be submitted for approval. Prints should be mounted on a piece of white 8 x 10 1/2-inch paper. Prints should be at the proposed publication size. Vertical aerial photographs must have a scale and a north arrow. Photographs must be clearly identified by figure number.

3. Suggested "crop" lines can be indicated beyond the edges of the photograph by the author.

4. If an author wishes to have information such as lines and lettering added to a photograph, the following procedure should be used:

   a. Use a duplicate print of the photograph. Indentations made on the surface of the photograph during the process of delineating features makes the photograph unsatisfactory for reproduction.

   b. Tape a piece of plastic or transparent paper over the photograph. This should be larger than the photograph.

   c. Add corner registration marks to the overlay at the corners of the photographic image.

   d. Compile on the overlay the information to be added to the photograph. Use black ink.

5. Proper credit for the photograph must be shown. The credit line usually is placed at the end of the title for the photograph. If the photograph was taken by:

   a. The author -- the photographer's name must not be shown.

   b. Department of the Interior personnel other than the author -- the photographer's name cannot be shown, except with the prior approval of the Director of Communications, Office of the Secretary.

   c. Another Federal agency -- the source of the photograph must be shown. Written permission from the agency is required and must accompany the report for approval.

d. A private individual or company or from a copyrighted publication -- the source of the photograph including the photographer's name, if known, must be shown. Written permission must be obtained and a copy of the letter must accompany the report for approval.

6. For Survey publications, the Publications Division requires that two continuous-tone glossy prints and the negative (if available) of each photograph be transmitted to them at the time original illustrations are requested.

7. Once a photograph has been approved for publication in a Survey report, it becomes the property of the Survey. Copies of the negatives used for reproduction are sent by the Publications Division to the Denver Film Library for filing. An author may obtain prints of the photographs from the library.

Cross reference: 3.07.1 -- Quality; only glossy prints acceptable

Replaces Article No.: | Effective Date: 3/1/71 | Article No.: 3.07.5

Subject: ILLUSTRATIONS -- Photographs - Reproduction

Reproduction of photographs is accomplished by screening the negative of a photograph so that the resulting image is composed of minute dots. The detail of a printed photograph is proportional to the density of the dots. The greater the density of the dots, the less the non-printing open spaces, and hence, the greater detail. Continuous-tone printing, printing a negative without a screen, is not done by the Survey.

1. Most photographs are printed using a 150-line screen. The resulting detail is satisfactory for almost all photographs appearing in Water Resources Division's reports.

2. Increased detail can be obtained by using 200- or 300-line screens. Requests for use of these screens must be in memorandum form and accompany the report when it is transmitted for Director's approval. To date, the photographs in only a few Water Resources Division reports have been printed using 200-line screens. Reports with photographs of fossil assemblages are the only ones where 300-line screens are used for the photographs.

3. "Bleeding," a reproduction technique, is used to allow the printed image of a photograph to extend to the edges of the page on which it is printed. This technique is restricted to special reports, usually those written for the lay reader, to enhance the appearance of the publication.

WATER RESOURCES DIVISION
PUBLICATIONS GUIDE

Replaces Article No.: | Effective Date: 3/1/71 | Article No.: 3.07.6

Subject: ILLUSTRATIONS -- Photographs - Colored photographs

The use of colored photographs in Federal publications is governed by the "Printing & Binding Regulations" established by the Joint Committee on Printing, Congress of the United States. Requests for use of colored photographs must be in memorandum form and accompany the report when it is transmitted for Director's approval. If the Director's Office approves the use of colored photographs, the request is then forwarded to the Department for approval. Departmental approval constitutes Congressional approval under the present system.

Two types of colored photographs can be used in reports; multicolor and duatones. Multicolor photographs are printed using the three primary colors - yellow, red, blue - and black. Duatones photographs are printed in black and one other color.

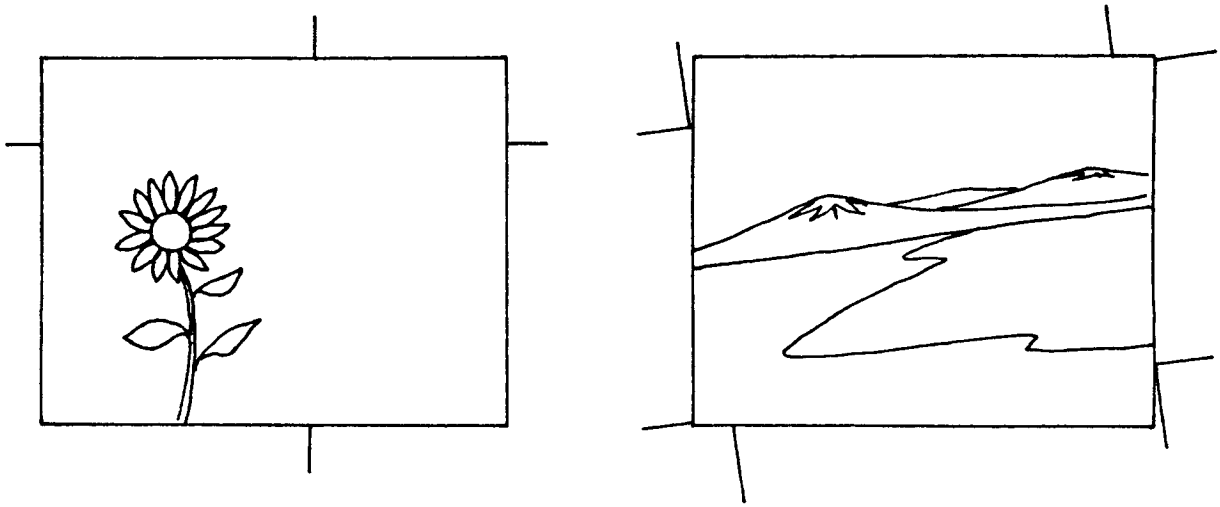
If a multicolor photograph is approved for publication, the author should furnish three continuous-tone colored glossy prints and the negative, transparency, or slide for use by the Branch of Technical Illustrations. If a duatone is approved for publication, the author should furnish two continuous-tone glossy black-and-white prints and the negative.

Article 3.02.3

Photographs

If the relative size of items being photographed is not self-evident, it should be indicated by placing a familiar object (for example, a hammer, ruler, or knife) in the photograph or by a scale shown on its border (not on the image).

Croplines are used to eliminate unwanted parts of the photograph and to adjust for inadvertent camera tilt. Croplines should not be drawn across the photograph, but at the edges only. If symbols or lines need to be added, an overlay should be prepared using corner ticks for registration to show placement. Write "top" at the top of the photograph mounting sheet to insure proper orientation.



The source of the photograph must be given only if photographer was not an Interior Department employee or if the photograph has been copyrighted.

Special mounting of photographs is necessary to avoid damage to the emulsion. Photographs should be secured to a sheet of paper by cutting four diagonal slots in the sheet through which the photograph corners can be inserted and taped on the back.

The author's name and the figure number should be typed on a label pasted to the back of the photograph or penciled on the mounting sheet. Do not write on the front or back of photographs, and do not use paperclips.

WATER RESOURCES DIVISION PUBLICATIONS GUIDE

Article 7.02.4

Subject: PROCESSING MANUSCRIPTS AFTER DIRECTOR'S APPROVAL.--Preparing Camera-Ready Copy

7.02.4 Preparing the mockup

- Cover
- Preliminary pages
- Abstract
- Text
- Placement of illustrations and tables
- Figure captions and table headings
- Completion of mockup

The purpose of a mockup is twofold--it enables the designer to develop an effective presentation of the material, and it serves as a typist's guide to minimize the amount of retyping and proofreading.

This article explains the mechanics of book design, with specific instructions for cover, preliminary pages, abstract, text, and placement of figures and tables. Although this article assumes printing on both sides of a page and an 8 1/2 X 11-inch format, such as for WRI and Open-File Reports, the principles are applicable to books of other dimensions and to printing on one side of a page as well.

Additional instructions for preparing WRI and Open-File Reports are given in Sections 10 and 11, respectively; procedures for designing books in the STOP format (Sequential Thematic Organization of Publications) are given in article 2.02.4.

Layout of WRI and Open-File Reports, as well as those in many non-Survey series, is generally done by an editor, but could be done by authors or clerical staff. With practice and by following the principles described in this article, one can avoid the common errors and create a professional-quality layout within a few hours for any type of published material.

COVER

Although the cover of each approved manuscript has presumably been checked to verify conformance to publisher's requirements, it is advisable to reinspect all details when preparing camera-ready copy, especially the wording and spelling of the title, because the cover is the most conspicuous part of the report. All art covers must be included in the report package submitted to Headquarters for Director's approval, and must be approved by the Director.

The cover contains four main components--cover 1 (outside front), cover 2 (inside front), cover 3 (inside back), and cover 4 (outside back). The printer generally will print them on a single sheet. If the report is to be more than a quarter of an inch thick, the cover will also include a spine backstrip). A page containing the copy for each of these components, including the spine, must be supplied to the printer with the camera-ready copy.

Texture and color.--Most Federal reports are required to be printed on uncoated (dull finish) paper because it is less expensive than coated (glossy) paper. Covers may be any desired pastel shade, including white, but in Geological Survey reports only one ink color is permitted. If colored paper is used, the ink must be dark enough to show clearly. If white lettering on a colored background is desired, prepare the copy in the usual manner but instruct the printer to "reverse" the print. A bold type should be used in "reverse" copy to prevent letters from "filling in" with surrounding ink.

Photographs printed on uncoated covers may give disappointing results because the ink will be absorbed, diminishing contrast. Line drawings, silhouettes, lettering, and uniformly screened areas, however, will be satisfactory on paper of any finish. If a cover photograph is required, consult GPO to be sure that suitable cover stock can be provided.

The ink color used on cover 1 will be used on cover 4, and may be used on covers 2 and 3 as well unless specified otherwise, because the four components are printed as one sheet.

Binding.--If the report contains less than 96 pages, it will be saddle stitched (stapled down the inside center) or side stitched (stapled on the outside at the left margin). If the report contains more than 96 pages (fewer pages if heavy text paper is used), it will be side stitched or perfect bound (squared off with glue binding). Wire, ring, or plastic bindings will be used only if specified; these are more expensive than a staple or glue binding.

Cover 1 (outside front)

In simplest form, Geological Survey report covers consist of the title, department and bureau identification, report series and number, and statement of cooperation. Covers do not bear the authors' names nor the date and city of publication; these are given on the title page.

If special lettering is used, its size and weight must be balanced and compatible. (See article 7.02.3.) Specifications for standard typescript covers are given below; examples are given in articles 3.01.2, 10.04.1, 11.04.1, and 12.04. If other than a standard designed cover is desired, an example must be included for inspection when the report is submitted for Director's approval.

Article 7.02.4

Department Identification.--For typescript covers to be reproduced by offset printing, the Department seal is placed near the lower right corner. For art covers, the Department seal may be centered on cover 4, if necessary. For covers of reports to be copied on office equipment, the edge of the seal may produce a "halo" or splice line, in which case it may be omitted. If the seal is omitted, the following imprint must be typed beginning four lines below the top of the page and centered:

DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

Report Title.[1]--Use capital letters, align flush left one inch from the left margin. If the above imprint is used, begin title 4 lines below it; if the department seal is used, begin at least 7 lines below the top of the page. If possible, make the top line the longest, but avoid hyphenation or illogical separation of words. If the title contains 2 lines or more, they should be double spaced. A centered 6-inch horizontal line is typed across the page 3 or 4 lines below the report title.

Bureau Identification.--On reports bearing the Department seal (rather than the above imprint), the words U.S. GEOLOGICAL SURVEY are typed on the third line below the horizontal line, in capital letters, flush left.

Report Series and Number.--Two lines below the words "U.S. GEOLOGICAL SURVEY," or 6 lines below the horizontal line, the report series and number, as indicated on the approval notice, is typed in capital and lowercase, for example:

- Water-Resources Investigations Report 86-XXXX

- Open-File Report 86-XXXX

Statement of Cooperation.--The statement of cooperation is aligned flush left with the title and double spaced about 4 inches above the bottom of the page; for example:

Prepared in cooperation with the
NEW YORK STATE DEPARTMENT OF HEALTH

For WRI and Open-File Reports, the name of the cooperator should be lettered the same size as that of the Geological Survey.

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[1] Water Resources Division Memorandum No. 81.127, dated September 8, 1981, describes the requirements for a good report title.

Cover 2 (inside front)

In WRI and Open-file Reports, cover 2 is blank. This should be indicated by stating in nonreproducing blue on the bottom of cover 1, and on a separate page:

"cover 2 is blank."

Article 7.03.2 gives instructions for indicating the presence (or absence) of printing on covers 1 through 4 on the GPO Printing and Binding Requisition form SF-1.

Reports to be printed in non-Survey series may require special copy for cover 2, such as a list of county officials. Whenever this is the case, be sure that the following information is included:

DEPARTMENT OF THE INTERIOR

_____ , Secretary

U.S. GEOLOGICAL SURVEY

_____ , Director

The Secretary's name is all-capitals; Director's name is capital and lowercase.

If the list of officials is on the back of the title page, cover 2 will be blank. (See example in article 3.01.2.)

Cover 3 (inside back)

Cover 3 of a report may contain printing or may be blank; some reports contain a map pocket. In any case, the printer must be informed as to what to do. Prepare a sheet (in nonreproducing blue) stating "cover 3 blank" or "cover 3 map envelope." Specific instructions regarding the size and configuration of the envelope must be included in Printing and Binding Requisition form SF-1. (See article 7.03.3.) If cover 3 is to contain printing, write "cover 3" (in nonreproducing blue) at the top of the copy and also specify the desired enlargement or reduction, if any, and how the copy is to be positioned.

Cover 4 (outside back)

If copy is prepared for cover 4, give precise instructions, or, if cover 4 is to be blank, indicate so on a separate sheet. Remember that if the report is to be perfect bound or saddle stitched, the cover will be printed as one sheet, with covers 1 and 4 on one side and covers 2 and 3 on the reverse side.

Article 7.02.4

Spine (backstrip).--If the camera-ready copy is to be perfect bound, lettering will be required for the spine. The lettering should be in a size that will fit on the spine (no longer than the book's left margin and no higher than the estimated thickness of the book). The simplest procedure is to type or letter the material lengthwise on 8 1/2 X 11-inch paper, positioning the words exactly as they are to appear on the printed cover; for example:

[Top]		[Bottom]
Smith	GROUND WATER IN MERCER COUNTY, N.J.	USGS/WRI 82-XXXX

On this sheet, write "spine" in nonreproducing blue and enclose it with the other cover copy. Some titles may need to be shortened or the author's name or series number omitted. Indicate top of book to insure that the spine reads downward. The spine copy can be printed on cover 4 of saddle-stitched books, if desired.

When the camera-ready copy of the cover has been completed, insert a copy of each component in proper order in the mockup. Thus, the first two sheets of the mockup will be covers 1 and 2, and the last will be covers 3 and 4 with spine copy.

PRELIMINARY PAGES

Pagination.--In camera-ready copy, the preliminary pages (contents, list of conversion factors, glossary, and so forth) are numbered with lowercase roman numerals, and the text, beginning with the abstract as page 1, is numbered in arabic. Odd-numbered pages must be on the right, even numbers on the left. In standard-format Geological Survey reports, the page number is centered about 5/8[1] of an inch above the page bottom; other publishers may place page numbers elsewhere, such as in the outside corners.

Title page.-In WRI and Open-File reports, the title page closely resembles the cover, except that it includes the author's names (first name, middle initial, and last name, in capitals and lowercase, just below the title, and gives the city, State, and date of publication approximately one inch above the page bottom. (Typographic instructions for the title page are also given in article 6.01.3; examples are given in articles 3.01.2, 10.04.1, 11.04.1, and 12.04.1.) If a frontispiece is used, see article 5.05.8.

Back of title page.--The material for this page depends on the publisher. In WRI and Open-File reports, this page lists the Department Secretary, the Director of the Geological Survey, the originating office address (see examples in articles 10.04.1 and 11.04.1), and ordering information; in non-Survey reports it may list non-Federal government officials or be left blank. If such officials are listed, the Department Secretary and Director of the Geological Survey also must be included.

[1] Top of number, base of number should be placed ½" from the trim edge. Printers use page numbers when centering pages for printing so all numbers should be in the same location on each page.

Contents (not "Table of Contents").--This will normally begin on page iii, which, in final copy, will face the back of the title page. The wording of headings should be exactly as in the review copy, and the material is single spaced. Leaders (rows of dots or dashes) should extend to the right, leaving room for page numbers once they have been determined.

Other preliminary pages.--At this point, the person making the mockup will assemble all remaining preliminary matter on a facing-page basis, cutting and positioning until visual balance is achieved. In some reports, the contents, list of illustrations, and list of tables may fit on a single page; in others, they may run onto several pages. The list of illustrations (plates and figures) normally precedes the list of tables. The list of tables is followed by the list of conversion factors, which, if short, may be on the same page as the list of tables. The list of conversion factors should not be listed in the table of contents. A "Glossary" or " Definition of Terms" section, if used, may be placed at the back of the report and listed in the table of contents. It follows the "References" section and precedes the appendices, if any, and big, end-of-report tables, if any.

As a rule of thumb, typescript should begin and end at the same depth on each pair of facing pages. A transparent ruler at least 12 inches long and marked in both inches and picas will be useful in measuring the vertical spacing. To help achieve balance across facing pages, space may be added between major sections.

When the preliminary matter has been arranged and pasted down with rubber cement, tape, or wax, the roman numerals may be penciled in at the bottom of each page. Also, the number of lines skipped between components and the line on which typing begins should be indicated to help the typist avoid guesswork.

If the preliminary material ends on an odd-numbered (right-hand) page, the next sheet should be marked "page blank" in nonreproducing blue. This both informs the printer that there is no copy for that page and enables the abstract to begin on the right, in accordance with tradition.

ABSTRACT

In nearly all reports, the first page of text (page 1) is the abstract. This page begins with the title, usually centered in capital letters, double spaced, and arranged in "inverted pyramid" fashion--that is, the top line is the longest. If this forms an awkward wordbreak or requires hyphenation, an alternative arrangement should be developed.

Two or three lines below the title is the word "By" and the author's name(s) on the same line (usually first name followed by middle initial and last name). Three or four lines below the author's name(s), the word "ABSTRACT" is centered in capital letters. (See example in article 3.01.2.)

Article 7.02.4

If the abstract is short and appears isolated on the page, three remedies are possible:

1. Double space the abstract, perhaps in italics, but leaving the title and author's name(s) in Roman type.

2. Drop the title from line 7 to line 13 and begin the abstract farther down.

3. Indent the abstract on both sides to form a 5- or 5 1/2-inch line; this will make it narrower and a line or two longer.

4. Develop a combination of the above.

5. Begin the introduction a few spaces below the abstract rather than on the next page. If this is done, typing the abstract in italics and (or) indenting it slightly on both sides will give the necessary contrast and improve the appearance of the page. Italic type should not be used for lengthy abstracts, however, because it is difficult to read.

TEXT

The introduction is the first part of the text following the abstract. The introduction may begin either on page 1 below the abstract, on page 2, or on page 3 (right-hand page), leaving page 2 blank. (If the last option is chosen, leave page 2 blank and insert a sheet containing the note "page 2 blank" in nonreproducing blue.)

The designer will find it helpful to establish the image area for the report. For 8 1/2 X 11-inch paper, this is generally 6 1/2 inches wide and 8 3/4 inches (53 lines) deep, beginning on line 7. This gives a slightly larger bottom margin and provides space for the page number. Top and side margins should be 1 inch wide.

Paragraphs.--Paragraphs may be broken and continued on the following page (in camera-ready copy only). The image areas on facing pages should be balanced; that is, the number of lines should be equal. If a paragraph runs just one line over the limit, the designer must decide whether to carry two lines over to the next page, or to create the necessary space by rearranging the preceding material. The latter can be done by (1) slightly widening line lengths so that the last line of a paragraph is absorbed; (2) deleting space between headings, or (3) backtracking a few pages to gain space elsewhere.

Article 7.02.4

Headings.--When a new heading is reached, there is no need to begin a new page unless the heading is so close to the bottom of the page that little or no text can follow it. When this occurs, lengthen the typed area either by adding a line or two from the previous page, by expanding the space above preceding headings, or by slightly narrowing the lines in certain paragraphs so that those paragraphs will each become one line longer. If the page is still too short, achieve balance by shortening the material on the facing page by an approximately equivalent amount. This discrepancy will almost never be noticed, regardless of the length of other pages in the book. It is important, however, to leave sufficient space above the new heading so that it will stand out.

List of references.--The list of references preferably should begin on a new page. However, the list may begin on the last page of text, depending on the number of bibliographic entries, the amount of space left on the preceding page, and the number of entries that will run over onto a new page.

PLACEMENT OF ILLUSTRATIONS AND TABLES

Placement of illustrations (figures and plates) and tables requires attention not only to their size, but also to the wording of the text. For example, a table and a map may be intended to face each other, two photographs may belong side by side for comparison, or six or eight similar graphs could be reduced and grouped together on a page or on facing pages.

When laying out the single-spaced text on facing pages, note the principal (not necessarily the first) reference to all tables and figures and inspect those components for size and relation to other components. From the author's illustrations, obtain an idea as to whether the material will require a full page, two or more facing pages, or less than a page, and how they should be grouped. A table or figure should be positioned just after its principal reference and, if possible, within the chapter or subsection in which it is discussed--that is, before the next heading. An illustration or table should be placed within the next chapter only when the advantages would outweigh the disadvantages.

When working through the mockup, indicate to the typist the exact amount of vertical space needed for each table or illustration and heading.

When placing illustrations and tables, avoid broad-measure layout where possible because it inconveniences the reader, who must turn the book sideways to read it, and because it is out of step with the general layout of the book. However, broad measure often is necessary, particularly with computer printouts. Where broad measure cannot be avoided, the imbalance can be minimized if two such pages are placed facing each other so that both can be viewed as a unit.

Article 7.02.4

A series of similar illustrations may be reduced and grouped with two or more on a page or series of pages. If this is done, the captions probably will need to be rephrased to reflect the new arrangement. For example, a revised caption for a series of graphs numbered 6 through 12 would refer to figures 6A through 6G.

A copy of illustrations and tables reduced or enlarged to publication size can greatly facilitate layout work; these can usually be obtained through a local graphics firm. Alternatively, this work may be left to the printer. Simply draw a rectangle in nonreproducing blue on the camera-ready copy showing the exact area to be occupied by the material, and indicate on each component the desired dimensions and the page on which it is to be inserted. When the critical desired dimension has been determined, the other dimension can be calculated from a circular proportional scale, obtainable at graphics firms. If the other dimension is too short or too long, cropping or reformatting will be necessary.

Illustrations and tables provide an advantage in layout because they not only add variety to the typescript but can generally be reformatted as appropriate. For example, a table may be expanded by double spacing, may be separated into halves to occupy two facing pages, or may be compressed or photoreduced to fit a small area. Similarly, an illustration can be expanded or reduced by altering the borders, cropping nonessential areas, or regrouping the components. In all cases, legibility is the prime concern.

FIGURE AND TABLE TITLES

When preparing the mockup, figure and table titles should be designed to an appropriate width--slightly narrower than the component they describe, with the top line equal to or slightly longer than the rest. Each line of the title should be approximately the same length.

To prevent a title from blending into the surrounding text, place figures at the bottom of the page and tables at the top, or provide extra space between the title and the text. Alternatively, type all titles in italics. (Note that italics should not be underscored.)

COMPLETION OF MOCKUP

When all components have been assembled and all pages rechecked to verify that no copy has been omitted or placed out of sequence, and that all facing pages are balanced, the page numbers are assigned and transferred to the table of contents. Verify that all section headings given in the table of contents contain the same wording and rank as those in the text. Also, verify that the amount of space to be left for figures, tables, and section headings is indicated to avoid errors and retyping.

As a final inspection, start again with the front cover and view all pages, two at a time with even numbers on the left, to insure that every component is accounted for and correctly numbered (including blank pages).

Reports to be reproduced by offset printing will contain a total number of pages that is a multiple of 4. For example, if the text ends on page 31 and contains 6 preliminary pages (i-vi), the total is 37. However, to reach 40 (the next multiple of 4), 3 extra sheets must be added, on each of which is written, in nonreproducing blue, "pages __, __, __ blank." This informs the printer that there is no copy for the last three pages. If the report is to be machine-copied (two-sided), this rule does not apply.

The completed mockup should be a full-size replica of the printed report, minus the illustrations, tables and titles, except that all pages are one-sided. Final drafting may now be completed because the exact dimensions are known. After all rubber cement, dirt, and extraneous pencil marks have been removed, the mockup is given to the author for inspection, then to the typist for preparing the camera-ready copy.

WATER RESOURCES DIVISION
PUBLICATIONS GUIDE

Replaces Article No.: 2.5 Dated 7/31/64 | Effective Date: 3/29/71 | Article No.: 3.04

Subject: ILLUSTRATIONS -- Titles

Guidelines for titles

I. Titles of illustrations, whether of plates or figures in book publications or of separately published maps and charts, require careful consideration by author and reviewers before Director's approval because they must be both informative and concise. Following such approval significant changes should not be made in titles without agreement by the originating Division.

II. Titles of separately published maps and charts should give maximum information to the user. Titles that adequately express content and location will facilitate proper cataloging in libraries and bibliographic indexes.

III. Titles for separately published maps and charts and for plates in books must be short because of the demands for brevity of citation and space limitations for placement of titles. Titles for figures in books are set in type by the printer, may be longer, and may include explanatory material.

IV. Concise titles providing maximum information are most desirable, but the kind of illustration (map, diagram, chart, photograph, etc.), its mode of publication, and its complexity influence this goal. Each illustration is different, and individual judgment must be used in every case to describe its composition.

Factors controlling content and form of titles

V. Identification of kind of illustration

In book reports the kind of illustration should be indicated in short titles in "Table of Contents - Illustrations" but generally is omitted beneath the illustration in the text. The kind of illustration generally is indicated in titles of separately published maps and charts. Map series publications include principally geologic and hydrologic maps so that "Geologic map of ***" or "Geologic and hydrologic map of ***" is preferred over "Geology of ***" even though short texts, columnar sections, cross sections, and other illustrative material of secondard importance may be present.

VI. Geographic location

Titles of separately published maps and charts and titles of plates of book reports should indicate geographic location as completely as demands for brevity and space limitations permit. The county or section of a State should be included in the title where the quadrangle name alone is not sufficiently informative. Where several county or State names are required for a complete geographic

location, a regional geographic location (southwestern, central, Rocky Mountains, Missouri River basin, etc.) may be substituted. Designation of geographic location is not necessary in titles of figures bound within a publication unless the geographic location of the figure is only part of the entire area studied.

VII. Qualifications

When special conditions such as the quality of the base map, or the accuracy, geologic detail, method, and objectives of an investigation affect the character of a map, the title may include qualifying adjectives such as preliminary, sketch, generalized, reconnaissance, surficial, or bedrock.

VIII. Subsidiary illustrations and specialized data

If essential for giving maximum information, the presence of subsidiary illustrations or specialized data can be shown in the title by such additions as "*** and structure," "*** and cross sections," "*** showing water-table configuration." Subsidiary illustrations may require subtitles which identify the type of illustration; expanded subtitles may be necessary to avoid ambiguity.

IX. Titles on multisheet maps, jackets, and separate texts

When separately published maps and maps in book reports are printed in several sheets, common titles that apply to all sheets should appear on each; the individual sheets may carry sheet titles and may include subsidiary titles. Separately printed texts also should carry the common title. The common title should appear on the jacket of map publications.

Processing titles in book reports

X. Brief titles of illustrations in book reports are listed in "Table of Contents - Illustrations." This typed list is a part of the text and a duplicate copy should accompany the illustrations to serve as an invoice for the geologic map editor and Branch of Technical Illustrations.

In addition complete individual titles are typed double-spaced on separate pages; the original is placed in the text as the page following the most important reference; and a carbon copy and the Check Sheet for Illustrations are attached to the mill copy (copy reviewed by critics, corrected, and sent forward for Director's approval) of the illustration. All changes in titles must be made on the carbon copy attached to the mill copy. Before the mill copy is sent to Branch of Technical Illustrations, Branch of Texts will check title changes on appropriate pages in the text so that titles accompanying the illustration and in the text are in agreement. This assures that titles for figures to be set in type by Government Printing Office (titles as cited in the body of the text) and titles placed on plates by Branch of Technical Illustrations are in general agreement with titles given in the "Table of Contents."

WATER RESOURCES DIVISION PUBLICATIONS GUIDE

Article 7.02.6

Subject: PROCESSING MANUSCRIPT AFTER DIRECTOR'S APPROVAL--Preparing Camera-Ready Copy

7.02.6 Final page makeup

Final page makeup for printing or duplication may begin as soon as the illustrations, text, tables, and all other components have been completed, inspected, and corrected. This task consists of five steps, as explained below:

1. Add components such as tables and illustrations, display lettering, Department seal, running heads, equations, and so forth to the pages.

2. Splice or opaque to make minor corrections.

3. Inspect and clean up camera-ready copy.

4. Mark printing instructions on camera-ready copy.

5. Perform final verification.

ASSEMBLY OF COMPONENTS

Add components made separately from the main typescript. This is best done at a light table with a ruled sheet or grid placed beneath the copy to insure exact alignment. Insert only line copy that is at publication size; in offset printing, halftones[1] and all copy to be reduced or enlarged must be separated out for they are treated individually by the printer. If the report is to be duplicated inhouse, all components must be at publication size.

When positioning illustrations, tables, and titles in the camera-ready copy, view the facing pages side by side to insure balance. Also be sure that all components are firmly attached and lie flat.

SPLICING OR OPAQUING

Splice or opaque minor corrections rather than retype an entire page. Use a light table to obtain correct alignment, and use a sharp blade to avoid damaging the copy. In some cases, it may be easier to have a full paragraph retyped and pasted over the incorrect part than to splice individual words or lines.

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[1] Material submitted for printing is either "line copy" or "halftone." Line copy is artwork or text consisting solely of lines or patterns; it may be photographed directly because it contains no intermediate gray. Halftones are photographs that must be "screened," or converted to a dot pattern to produce the desired gray. Map bases that are screened are also treated separately.

INSPECTION AND CLEAN UP

Inspect and clean up camera-ready copy. This should be done after all splicing and pasting are complete. Starting with the cover 1, carefully view each pair of facing pages side by side to verify balance, even margins, and general harmony between headings and typescript. If rubber cement has been used, dirt and streaks will probably be visible; these can be removed with a crepe "pickup" (available at graphics firms) or with a piece of dried rubber cement. When erasing pencil marks, be careful not to crease the paper or smear the typescript. If a smudge or spot cannot be removed, cover it with white correcting fluid. All penciled notes must be erased except those written in nonreproducing blue; these may simply be crossed out (in the same blue) so that the printer will not mistake them for instructions.

MARKING PRINTING INSTRUCTIONS

Mark printing instructions on each cover component and on all pages that are to be blank, that contain copy to be reduced, enlarged, screened, printed as a foldout, or that contain a map jacket. All printing instructions on the camera-ready copy must be written in nonreproducing blue.

COVER

Each of the four cover pages (and spine copy, if used) should be identified as cover 1, cover 2, and so forth; those to be left blank should also be clearly marked "blank" in nonreproducing blue. If covers 1 and 4 form a continuous design, this must be explained to the printer, and, if there is to be a backstrip, be sure the design of the covers 1 and 4 will accommodate it. Again, note that, unless specified otherwise, the printer will print covers 1 and 4 in the same color.

SPECIAL PROCEDURES

Special procedures for any page, such as screening a particular area, reversing the color (white lettering on colored background) or using a "flopped" image (negative turned dull side up to print the image backwards), must be spelled out, and the exact location and area to be occupied by that component must be indicated on the camera copy. Also, each component must be labeled to indicate the desired dimensions (or percentage reduction) as well as the page on which it is to be inserted. For halftones, the line screen should be specified (most will be 133 or 150 lines per inch). For shaded areas or screened base maps, the density (30 percent, 50 percent, and so forth) must also be indicated. Further information on art preparation may be obtained from District and Region, from the Publications Planning Unit at Headquarters, or from local graphics firms.

Article 7.02.6

PRINTOUTS

If oversized copy such as a computer printout is to be reduced to occupy a full page, it should be separated out and a blank page inserted bearing the page number and any other necessary lettering. (If the page number and any other lettering are typed on the printout, they will be reduced and be inconsistent with the rest of the report.) The area to be occupied by the reduced copy should be indicated in nonreproducing blue on the page bearing the page number, and the printout itself must be marked to indicate final dimensions (or percentage reduction) and on which page it is to appear. If several pages are to be reduced, indicate those page numbers in nonreproducing blue on a blank page, then provide the typed page numbers on a separate sheet, about one inch apart. The printer will add these numbers after the printout has been reduced.

CROPPING

When specifying reductions or enlargements, remember that the proportions do not change; that is, the height will change by the same percentage as the width. To alter the proportions, either crop or redesign the material. If a photograph or other original material is to be cropped, do not write on it; instead, indicate the croplines on a transparent overlay or mount the component on a larger piece of paper and indicate crop lines outside the photograph. Also be sure to indicate the desired final size and the page on which the photograph is to appear. (See article 3.02.3.)

PROOFS

If the report requires special reductions or insertion of screen copy, a proof should be ordered from the printer to verify that all components are properly done and positioned correctly.

FINAL VERIFICATION

Final verification should be done by the author and each coauthor, preferably on a duplicate of the camera-ready copy. This is the author's last opportunity to detect errors and make alterations. Authors should inspect, then carefully read, each pair of facing pages, beginning with the cover and including all separate components, to verify that:

1. All statements, data, and references to tables, figures, and publications are accurate.

2. All previous corrections have been made and no new errors introduced.

3. The table of contents and the lists of plates, figures, and tables give correct page numbers and are worded consistently with the headings in the text.

4. The table of conversion factors is correct in all details.

5. All alignment is even and the visual effect pleasing.

After the camera copy has been corrected to incorporate the author's final changes, each corrected page should be inspected to verify that no errors have been introduced. The only task then remaining is to write the printer's instructions and, if the report is to be printed through GPO, to complete the Printing and Binding Requisition form SF-1. (See article 7.03.3.) The camera-ready copy, together with photographs and other special components, may then be delivered to the printer or publisher.

Contents, List of Conversion Factors, Abstract, and Text

These components and the remainder of the report should be arranged and typed single-spaced, as explained in Section 7.02, "Preparing camera-ready copy."

The text is typed in one-column format (6- to 6 1/2-inch line length), generally beginning on line 7 and continuing to line 52 or 53, giving a total depth of 8 3/4 inches excluding page number. Paragraphs and sentences may be broken and run onto the next page if at least two lines are carried over. New sections should begin three or four lines below the previous one (space permitting) and need not begin on a new page.

Tables and Illustrations

Tables and illustrations are preferably positioned upright on the page so that they can be viewed without turning the book sideways. If they must be positioned sideways (broad measure), orient them so that they can be turned clockwise for viewing. If two illustrations, two tables, or a table and an illustration are to face each other, they should be similarly oriented, if possible.

Tables

Tables may be designed to fit within the image area of a single page or less, across two facing pages, or in a series of pages. They may be typed double spaced if necessary to improve legibility and may also be photoreduced if necessary. Because the smallest lettering size permitted for a WRIR is 8 point (to insure legibility of paper copies made from microfilm), the maximum reduction for elite type is 80 percent of original size, and that for pica type and computer printouts is 67 and 65 percent, respectively. Therefore, the maximum image area for elite type before reduction is about 8 X 11 inches, and that for pica type and computer printouts is about 10 X 13 inches.

Page-Size Illustrations

Page-size illustrations, together with title and page number, will occupy no more than the standard image area. If an illustration is oriented sideways, use a side title typed in broad measure (maximum length, 8 1/2 inches). If an illustration will not be legible at page size, it should be redesigned to fit across two facing pages, with a dividing point through the middle to allow for the margins and binding. (This technique is more economical than printing foldouts or separate plates.) Single illustrations designed for two facing pages will start on an even-numbered page, and the title should be centered across both pages, again allowing for the inside margin. All lettering should be at least 8-point[1] size to ensure legibility of copy produced from microfilm. Because solid black or dense dot and line patterns cannot be photocopied clearly, solid black areas should be avoided, and the density of dot patterns and lines should not exceed 40 rows per linear inch.

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[1] This footnote is typed in 8 point lettering

Oversize Illustrations

Except for size limitations, procedures for printing oversize illustrations through GPO are the same as for page-size illustrations.[2] However, authors should bear in mind that OFSS will reproduce oversize illustrations in black and white only. If multicolor must be used on an oversized illustration, follow instructions given in article 9.02.3.

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[2] Standard paper sizes for oversize illustrations are 26 X 36 inches, 36 X 44 inches, and 44 X 58 inches. Maximum image size of Geological Survey presses is 42 X 56 inches. Maximum image size of commercial presses is 48 X 75 inches.

LINEWEIGHTS

Technical pen point size/ metric size	Inked	Scribed	Jewel scribing point size
4/1.00			.030
3/0.80			.025
2.5/0.70			.020
2/0.50			.015
1/0.40			.012
0/0.35			.010
00/0.25			.008

WATER RESOURCES DIVISION
PUBLICATIONS GUIDE

Replaces Article No.:	Effective 1/25/74 Date:	Article No.: 3.11.1

Subject: ILLUSTRATIONS -- Original artwork

Original artwork is defined as the creation of an illustration by an author or an artist from an idea, rough sketch, or photograph. The use of original artwork in reports is encouraged because it enables an author to present data or concepts that are not easily portrayed through the use of maps, graphs, or photographs and because it adds reader interest to the report.

Generally this type of illustration is used in "popular" reports and can be used in a variety of ways such as the cover of the report, numbered illustrations within the report, and unnumbered "spot" illustrations that are used to eliminate white space on pages that are only partly filled with text.

The author or artist is allowed to add his name or initials in an inconspicuous place on the artwork if he or she so desires. This is the only form of credit for the artwork that is allowed by the U.S. Geological Survey.

Some references of reports containing original artwork are:

1. Dover, T. B., Leonard, A. R., and Laine, L. L., 1968, Water for Oklahoma: U.S. Geol. Survey Water-Supply Paper 1890. Figures 1, 2, 5-11, and 14-18 were prepared from rough sketches furnished by the authors. Unnumbered spot illustrations are used as fillers on pages 22, 29, 54, 71, and 103.

2. Harshbarger, J. W., Lewis, D. D., Skibitzke, H. E., Heckler, W. L., and Kister, L. R., revised by H. L. Baldwin, 1966, Arizona water: U.S. Geol. Survey Water-Supply Paper 1648. The sketches on the cover and on the page preceding page 1 are based on the content and theme of the report. Note the artist's name below the tractor. Figures 1, 2, 3, 5, 6, 11, 17, and 22 were prepared from rough sketches furnished by the authors. Note the artistic additions to figures 9, 13, and 16. Unnumbered spot illustrations were used to introduce major topics in the report and as a filler on page 80.

3. Murata, K. J. and Richter, D. H., 1966, Chemistry of the lavas of the 1959-60 eruption of Kilauea Volcano, Hawaii: U.S. Geol. Survey Prof. Paper 537-A. The cover of this report is a sketch made from a photograph. Note artist's name in lower left corner.

4. Robinson, G. D., Wanek, A. A., Hays, W. H., and McCallum, M. E., illustrated by John R. Stacy, 1964, Philmont country - The rocks and landscape of a famous New Mexico ranch: U.S. Geol. Survey Prof. Paper 505. The cover of this report is a sketch based on the theme of the report. Note the artist's name on the lower right part of the back cover. This report contains many numbered illustrations prepared by the artist. Note the sketches prepared from photographs; figures 37, 79, 94, 105, 112, and 119.

Optima

6 Point Solid

In 1890 Major John Wesley Powell, the director of the Geological Survey, established the Engraving and Printing Division. Since this early beginning, the Type Section has provided type composition needs for the Survey.

6 Point 1 Point Leaded — Characters Per Pica 4.50

In 1890 Major John Wesley Powell, the director of the Geological Survey, established the Engraving and Printing Division. Since this early beginning, the Type Section has provided type composition needs for the Survey. The original Type Section set type by hand with only three compositors. Hand composition continued as the only means of type composition until 1955.

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890

7 Point Solid

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type Section has provided type compos-

7 Point 1 Point Leaded — Characters Per Pica 3.86

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type Section has provided type composition needs for the Survey.
The original Type Section set type by hand with only three compositors. Hand composition

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890

8 Point Solid

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type Section has

8 Point 1 Point Leaded — Characters Per Pica 3.38

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type Section has provided type composition needs for the Survey.
The original Type Section set type by hand with only three compositors. Hand

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890

9 Point Solid

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early begin-

9 Point 2 Point Leaded — Characters Per Pica 3.00

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type Section has provided type composition needs for the Survey.
The original Type Section set type by hand with only three compositors.

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890

10 Point Solid

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type Section has provided type com-

10 Point 2 Point Leaded — Characters Per Pica 2.70

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type Section has provided type composition needs for the Survey.

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890

11 Point Solid

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type Section has

11 Point 2 Point Leaded — Characters Per Pica 2.45

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type Section has provided type composition needs for the Survey.

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890

12 Point Solid

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type

12 Point 2 Point Leaded — Characters Per Pica 2.25

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type Section has provided type composition needs for the Survey.

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890

14 Point — Characters Per Pica 1.93

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz 1234567890

16 Point — Characters Per Pica 1.69

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz 1234567890

18 Point — Characters Per Pica 1.50

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz 1234567890

20 Point — Characters Per Pica 1.35

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz 1234567890

24 Point — Characters Per Pica 1.13

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz 1234567890

30 Point — Characters Per Pica 0.90

ABCDEFGHIJKLMNOPQRSTUVWX
YZ abcdefghijklmnopqrstuvwxyz
1234567890

33 Point — Characters Per Pica 0.83

ABCDEFGHIJKLMNOPQRSTUV
WXYZ abcdefghijklmnopqrstuvw
xyz 1234567890

Souvenir Medium

6 Point Solid

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division Since this early beginning, the Type Section has provided type composition needs for the Survey

6 Point 1 Point Leaded — Characters Per Pica 4 38

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division Since this early beginning, the Type Section has provided type composition needs for the Survey
The original Type Section set type by hand with only three compositors Hand composition continued as the

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890

7 Point Solid

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division Since this early beginning, the Type Section has provided type

7 Point 1 Point Leaded — Characters Per Pica 3.76

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division Since this early beginning, the Type Section has provided type composition needs for the Survey.
The original Type Section set type by hand with only three compositors. Hand composition

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890

8 Point Solid

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type Section

8 Point 1 Point Leaded — Characters Per Pica 3.29

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type Section has provided type composition needs for the Survey.
The original Type Section set type by hand with only three compositors. Hand

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890

9 Point Solid

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early

9 Point 2 Point Leaded — Characters Per Pica 2.92

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type Section has provided type composition needs for the Survey.

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890

10 Point Solid

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type Section has provided

10 Point 2 Point Leaded — Characters Per Pica 2.63

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type Section has provided type composition needs for the Survey.

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890

11 Point Solid

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type Section

11 Point 2 Point Leaded — Characters Per Pica 2 39

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type Section has provided type composition needs for the Survey.

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890

12 Point Solid

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early begin-

12 Point 2 Point Leaded — Characters Per Pica 2.19

In 1890 Major John Wesley Powell, the director of the Geological Survey established the Engraving and Printing Division. Since this early beginning, the Type Section has provided type composition needs for

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890

Souvenir Medium

14 Point — Characters Per Pica 1.88

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz 1234567890

16 Point — Characters Per Pica 1.64

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz 1234567890

18 Point — Characters Per Pica 1.46

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz 1234567890

20 Point — Characters Per Pica 1.32

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz 1234567890

24 Point — Characters Per Pica 1.10

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz 1234567890

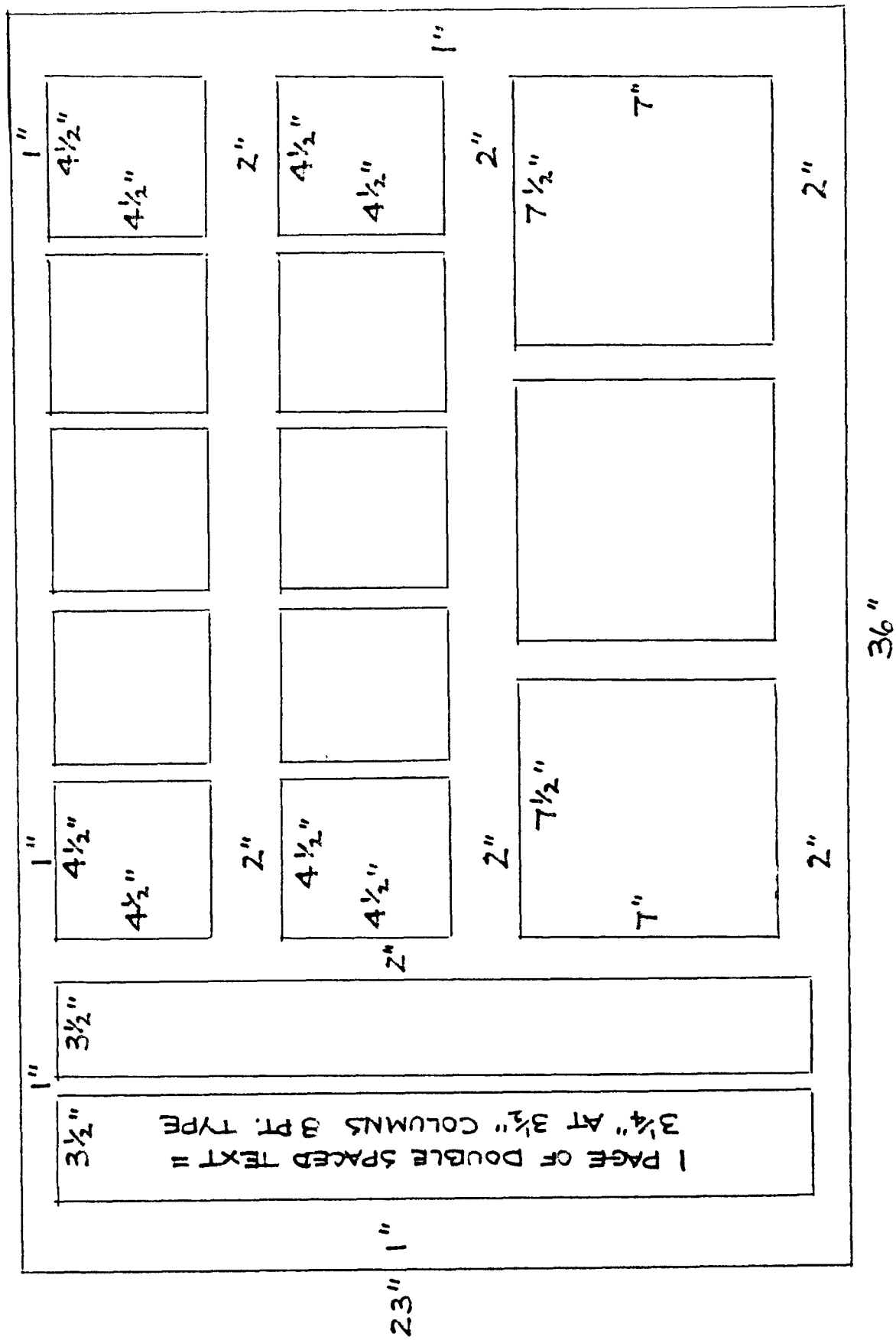
30 Point — Characters Per Pica 0.88

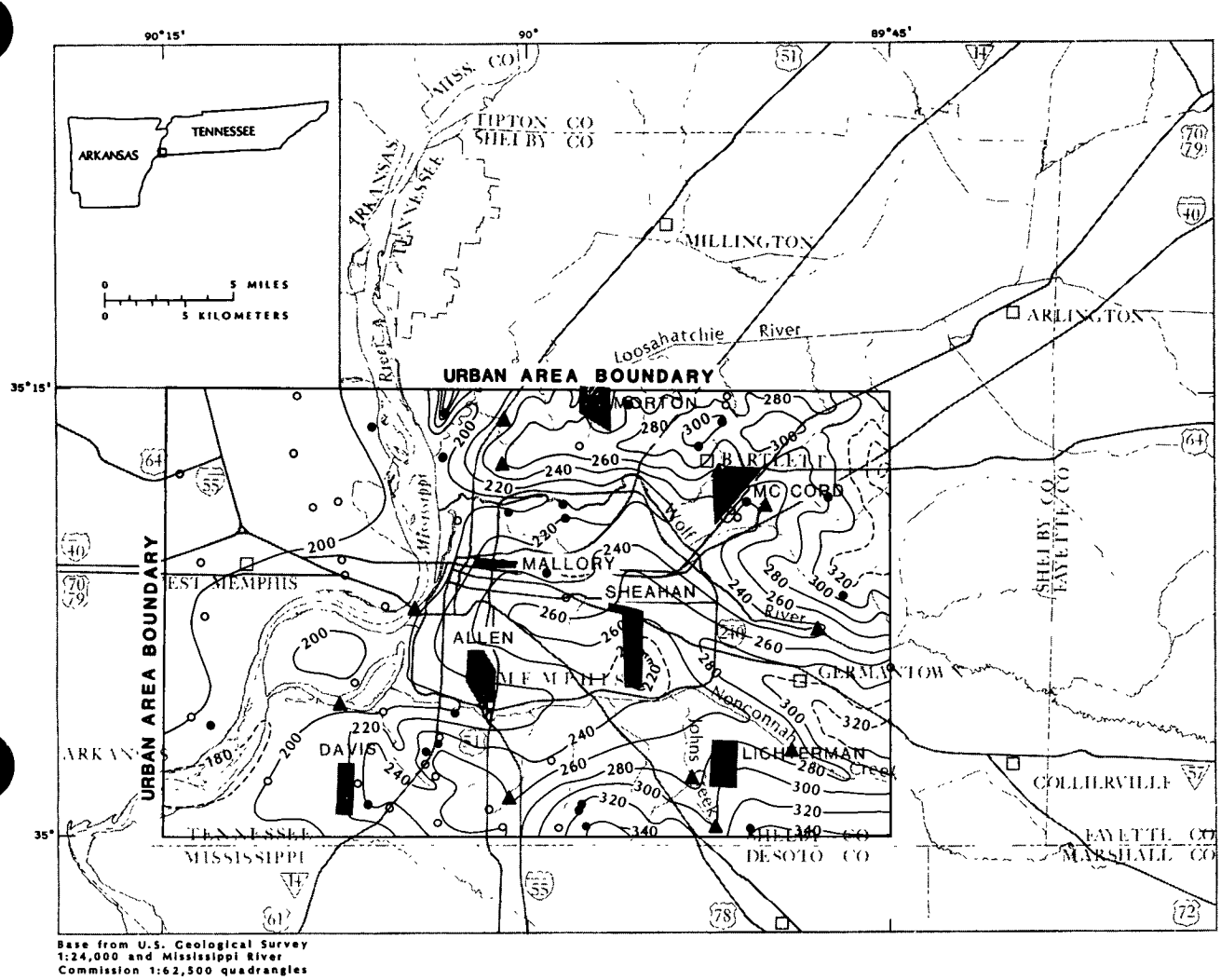
ABCDEFGHIJKLMNOPQRSTUVW
XYZ abcdefghijklmnopqrstuvwxz
1234567890

33 Point — Characters Per Pica 0.80

ABCDEFGHIJKLMNOPQRSTU
VWXYZ abcdefghijklmnopqrstu
vwxyz 1234567890

MOCK-UP SAMPLE FOR MAP REPORTS





EXPLANATION

— 320- - WATER-TABLE CONTOUR--Shows altitude of water table. Dashed where inferred. Hachures indicate depression. Contour interval 20 feet. Datum is sea level

• WELL FOR WHICH MEASUREMENT MADE IN FALL 1984 WAS USED AS CONTROL

○ WELL FOR WHICH HISTORIC MEASUREMENT WAS USED AS SUPPLEMEMNTARY CONTROL

▲ GAGE FOR WHICH LOW-STAGE MEASUREMENT MADE IN FALL 1984 WAS USED AS CONTROL

Figure 7.--Altitude of the water table in the alluvium and fluvial deposits in the Memphis urban area, fall 1984.

Caps for primary entries in explanation; second and succeeding lines indented two places

Two line figure titles - center second line beneath first line

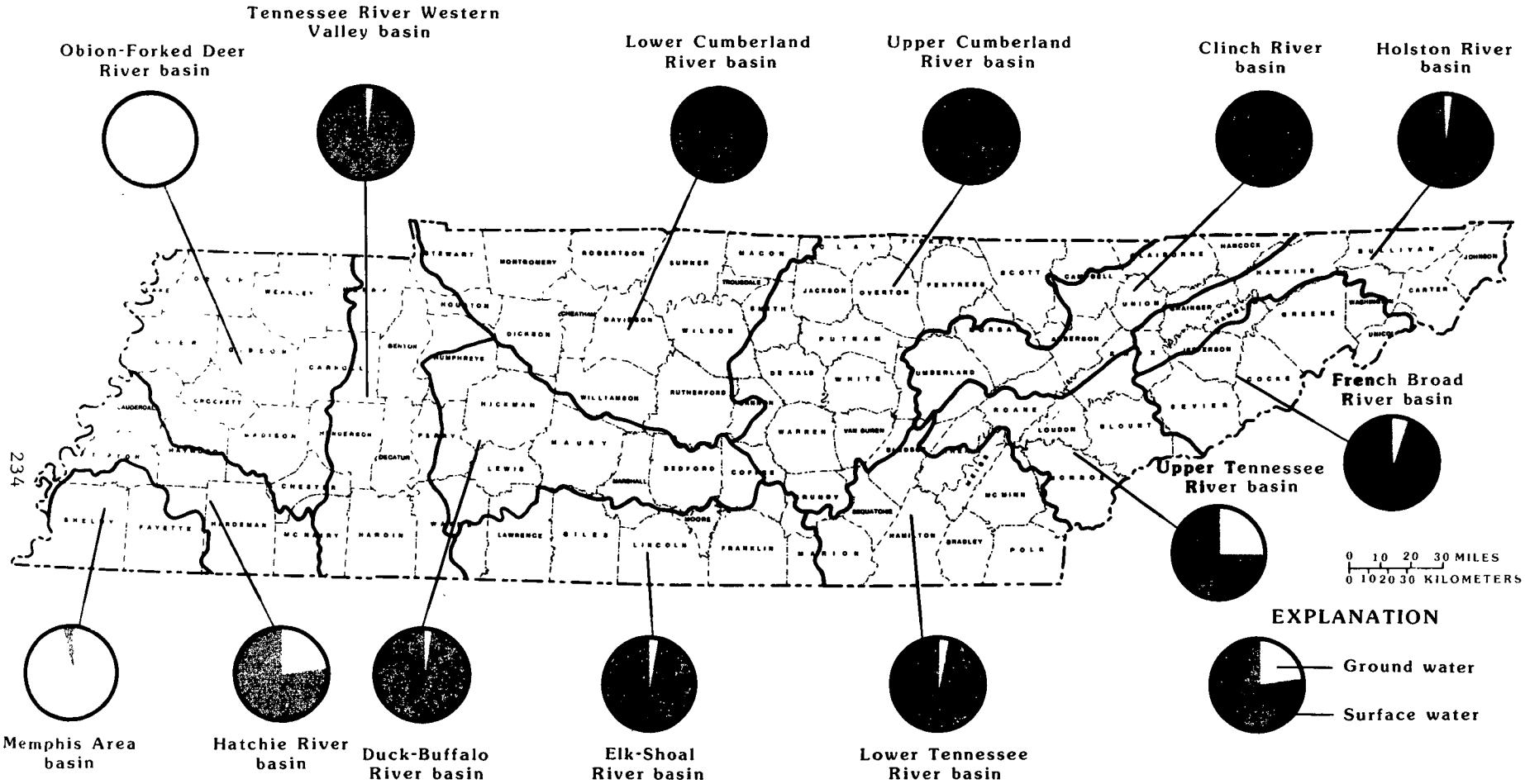


Figure 3.--Surface-water and ground-water withdrawal by self-supplied commercial and industrial water users during 1981 in the 13 major hydrologic basins of Tennessee.

Two line figure title - second line is centered beneath first line

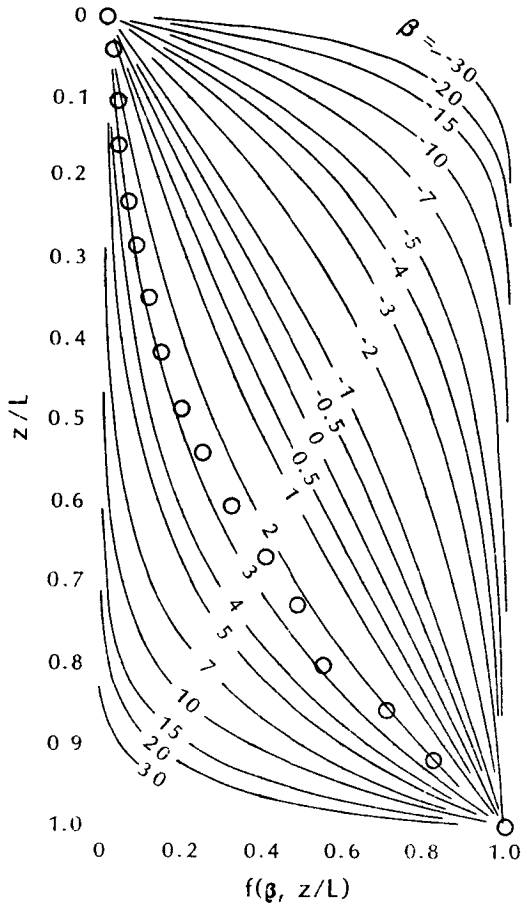


Figure 20.--Nondimensional plot of temperature data between the depths of 120 and 910 feet in well Ha:R-1 matched with type curves from Bredehoeft and Papadopulos (1965).

More than 2 lines in title
2nd and all following lines are indented 2 places (begin text under "g")

Allow space so that figure title and text do not blend together

38.1 feet, the vertical head gradient is 0.058. From Darcy's law:

$$v_z = K(dh/dz)$$

where

K is the hydraulic conductivity;
dh/dz is the vertical head gradient; and
v_z is the vertical velocity.

Solving for K and substituting the value of vertical velocity determined above and the measured vertical gradient between the two aquifers:

$$K = (v_z)/(dh/dz)$$
$$= (6.6 \times 10^{-4})/(0.058)$$
$$= 1.14 \times 10^{-2} \text{ ft/d}$$

This value is in agreement with published values for the hydraulic conductivity of silt, clay, and mixtures of sand, silt, and clay (U.S. Department of the Interior, 1977, p. 29). The vertical velocity between the Fort Pillow Sand and the Memphis Sand is limited by the relatively thick confining bed of low hydraulic conductivity. The value of

SAMPLE TYPE REDUCTION TABLES FOR KROY LETTERING

The following Kroy type samples (Helvetica Light, Helvetica Regular, and Souvenir Medium) have been reduced by 25, 35, 45, and 50 percent.

The number shown at the end of certain lines is the approximate equivalent size the type is after reduction.

8 point HL at 25% reduction ABCDEFabcdef 123456 -2 = 6

10 point HL at 25% reduction ABCDEFabcdef 123456

12 point HL at 25% reduction ABCDEFabcdef 123456 -2 = 8

14 point HL at 25% reduction ABCDEFabcdef 123456 -2 = 10

18 point HL at 25% reduction ABCDEFabcdef 123456 -2 > 12

8 point HR at 25% reduction ABCDEFabcdef 123456 -2

10 point HR at 25% reduction ABCDEFabcdef 123456 -2

12 point HR at 25% reduction ABCDEFabcdef 123456 -2

14 point HR at 25% reduction ABCDEFabcdef 123456 -2

18 point HR at 25% reduction ABCDEFabcdef 123456

8 point SM at 25% reduction ABCDEFabcdef 123456 -2

10 point SM at 25% reduction ABCDEFabcdef 123456 -2

12 point SM at 25% reduction ABCDEFabcdef 123456 -2

14 point SM at 25% reduction ABCDEFabcdef 123456 -2

18 point SM at 25% reduction ABCDEFabcdef 12

8 point HL at 35% reduction ABCDEFabcdef 123456 -2

10 point HL at 35% reduction ABCDEFabcdef 123456 -2 > 6

12 point HL at 35% reduction ABCDEFabcdef 123456 -2 = 8

14 point HL at 35% reduction ABCDEFabcdef 123456 -2 < 10

18 point HL at 35% reduction ABCDEFabcdef 123456 -2 = 12

8 point HR at 35% reduction ABCDEFabcdef 123456 -2

10 point HR at 35% reduction ABCDEFabcdef 123456 -2

12 point HR at 35% reduction ABCDEFabcdef 123456 -2

14 point HR at 35% reduction ABCDEFabcdef 123456 -2

18 point HR at 35% reduction ABCDEFabcdef 123456

8 point SM at 35% reduction ABCDEFabcdef 123456

10 point SM at 35% reduction ABCDEFabcdef 123456

12 point SM at 35% reduction ABCDEFabcdef 123456

14 point SM at 35% reduction ABCDEFabcdef 123456

18 point SM at 35% reduction ABCDEFabcdef 123

8 point HL at 45% reduction ABCDEFabcdef 123456 -2

10 point HL at 45% reduction ABCDEFabcdef 123456 -2

12 point HL at 45% reduction ABCDEFabcdef 123456 -2 = 6

14 point HL at 45% reduction ABCDEFabcdef 123456 -2 = 8

18 point HL at 45% reduction ABCDEFabcdef 123456 = 10

8 point HR at 45% reduction ABCDEFabcdef 123456 -2

10 point HR at 45% reduction ABCDEFabcdef 123456 -2

12 point HR at 45% reduction ABCDEFabcdef 123456 -2

14 point HR at 45% reduction ABCDEFabcdef 123456 -2

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8 point SM at 45% reduction ABCDEFabcdef 123456

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18 point SM at 45% reduction ABCDEFabcdef 12

8 point HL at 50% reduction ABCDEFabcdef 12345f -2

10 point HL at 50% reduction ABCDEFabodef 123456 -2

12 point HL at 50% reduction ABCDEFabcdef 123456 -2 = 6

14 point HL at 50% reduction ABCDEFabcdef 123456 -2 < 8

18 point HL at 50% reduction ABCDEFabcdef 123456 -2 > 8

8 point HR at 50% reduction ABCDEFabcdef 123456 -2

10 point HR at 50% reduction ABCDEFabcdef 123456 -2

12 point HR at 50% reduction ABCDEFabcdef 123456 -2

14 point HR at 50% reduction ABCDEFabcdef 123456 -2

18 point HR at 50% reduction ABCDEFabcdef 123456

8 point SM at 50% reduction ABCDEFabcdef 123456

10 point SM at 50% reduction ABCDEFabcdef 123456

12 point SM at 50% reduction ABCDEFabcdef 123456

14 point SM at 50% reduction ABCDEFabcdef 123456

18 point SM at 50% reduction ABCDEFabcdef 123