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Military-Topographic Directorate of the
General Staff

Handbook
On Cartographic and Map-Issuing
Works;

Part 4
Compilation and Preparation for Printing
of Plans of Towns.

Issued by the Chief
of the Military-Topographic Directorate of the General Staff
and by the Chief of the Main Administration of Geodesy and Cartography
under the Council of Ministers of the USSR

Obligatory for all agencies and directorates of the USSR

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In the Handbook are laid down the basic requirements for the content and design of plans of towns at the scales of 1:10,000 and 1:25,000, the techniques of compilation of plans from cartographic materials, and of preparing them for printing.

Requirements for the compilation (revision) of plans of towns compiled from photographic images are laid down in special Handbooks.

With the introduction into force of the present Handbook the 'Regulations on the Compilation and Preparation for Printing of Plans of Towns (issued 1972) is rendered out of force.

Chapter I
GENERAL REGULATIONS
The Purpose of Plans of Towns and
the Basic Requirements for Them

1. Plans of Towns [hereafter ‘town plans’] are made of the territory of towns, large settlements of urban type, railway junctions, and other important population centres and their surroundings. Town plans are intended for the detailed study of towns and their approaches, for orientation, and for the production of accurate measurements and assessments in the planning and the execution of measures significant for the peoples’ economy and for defence.

2. Town plans should satisfy the following basic requirements:

- reliably and accurately to portray the location, current condition, outline and the character of structures and objects of the terrain in towns and their surroundings;
- to provide rapid display of important objects and prominent landmarks, main roads and obstacles on the approaches to towns;
- to be clear and legible, correctly representing the layout and construction of towns, providing dependable orientation within them and accurate targeting information;
- to provide the possibility of rapid determination of rectangular and geographic coordinates and the absolute and relative heights of points, and also of obtaining the qualitative and quantitative characteristics of objects;
- to be in agreement with the content of topographic maps and marine navigation charts of the next smaller scale;
- to have such a density of information, and a graphical and colour design, which may enable [additional] drawing on the plans or the overprinting on them of additional information.

Mathematical and Geodetic Foundations of Town Plans

3. Plans of towns are made at the scales of 1:10,000 and 1:25,000, in the Gauss equal-angle transverse-cylindrical projection calculated for the six-degree zone according to the ellipsoid of Krasovskiy, and using the established systems of coordinates and heights. The scales of the plans are established by a centralised procedure in conformity with the political-administrative and economic significance of towns, the number of inhabitants in them, and the areas occupied by them.

Within the margins of town plans are included the territories of towns and also the suburban areas adjacent to them and their immediate approaches in a zone of not less than 1.5 – 2 km..

The limits of the representation of the surroundings of a town are determined such that the main obstacles, prominent landmarks, commanding heights, communications nodes, industrial enterprises, and important objects on the approaches to the town may be shown on the plan.

The layout of town plans is established from large-scale cartographic materials, resulting from the above stated requirements and such that the drawings of the plans on sheets, including elements of the design of the margins and text placed in the field outside the map-margins, have dimensions not exceeding 88 x 125 cm..

4. For regions not provided with topographic maps at the scale of 1:200,000 and larger, a topographic map at the scale of 1:100,000 or 1:200,000 is to be compiled of the territory of the towns and the approaches to them in a zone not less than 5-10 km. from the limits of the town, which is placed on the plan as an insert.

5. Lines of the rectangular (kilometric) grid, drawn on the plans at the scale of 1:10,000 every 5 cm (500 m. in the terrain) and every 4 cm. (1,000 m in the terrain) on plans at the scale of 1:25,000, serve as the sides of the margins of town plans.

6. The following serve as the geodetic foundations of town plans:

- for the planimetry, points of the state geodetic network and points of the planimetric survey net, the rectangular coordinates of which are calculated on a foundation of the coordinates of points of the state geodetic net;
- for the heights, benchmarks of the state levelling network, points of the state geodetic network the heights of which have been determined by geometric or geodetic levelling, and also points of the survey network of heights.

If the territory of the town and its surroundings is not provided with substantiated planimetric and height points in the established systems of coordinates and heights, points of a local geodetic network, the coordinates and heights of which are brought into the established systems of coordinates and heights by means of the introduction of appropriate corrections, are to be used as the geodetic foundations of the plan.

If a determination of the value of the corrections for the conversion to the established system of heights is not possible, heights on the plan are to be given in a local system and no annotation about the system of heights is to be placed under the linear scale.

In individual cases, when from the available materials it is not possible to orientate plans with the required accuracy within the established systems of coordinates and heights, their orientation is permitted according to topographic maps of the nearest scale with the obligatory use of tables of corrections for the difference of the origins of the coordinates, the zero-point of the systems of heights and of other materials.

The Content and Design of Town Plans

7. Plans of towns are issued in eight or ten colours in conformity with appendices 7 and 11-17.

The following are shown on town plans:

- the mathematical elements (the margins, rectangular grid, origins of the lines of the cartographic grid, numbering, &c.);
- the supporting points (points of the geodetic foundations);
- streets, quateries and individual structures, industrial, social-cultural and agricultural objects and road constructions;
- the hydrography and hydro-technical constructions;
- the relief of dry land and of the bottoms of seas, large water-bodies and rivers;
- vegetation cover and soils;
- boundaries and fences.

When issuing plans in ten colours, important objects are especially distinguished.

8. The representation of objects on plans is accompanied by annotations of their proper names, explanatory annotations and annotations of qualitative and quantitative characteristics in conformity with the requirements of the present Handbook, editorial-technical orders and the accepted conventional signs.

9. For the fuller and more rapid reading of the plan, and also for the provision of more accurate [artillery] targeting the following are compiled: a description ['Spravka'] (according to the format given in appendix 1), a table of names of streets printed on the plan, and when issuing plans in ten colours also a table of the important objects identified on the plan.

The description and the lists of streets and important objects, in order not to enlarge the dimensions of the plans excessively, may be positioned as insets within areas of the plan freed of the representation of the town and important objects situated in its surroundings, or may be issued as a separate sheet of the plan or as a separate appendix to the plan in booklet form.

10. Town plans are to be compiled from the latest photographic-survey material and topographic maps and plans (as a rule) of the same or larger scales with the obligatory involvement of 'literary-collection' [local directory] sources.

11. The graphical designs of town plans at the scales of 1:10,000 and 1:25,000 are produced using the current conventional signs for topographic maps at the corresponding scales of 1:10,000 and 1:25,000, taking account of the additional signs in appendix 10. Inserts are designed with the conventional signs for topographic maps of the corresponding scale and are printed in inks, the colours of which are specified in appendix 12.

When the use of additional conventional signs and characteristics of objects not foreseen in the tables of conventional signs is required, it may be allowed as an exception to introduce new conventional signs with an obligatory explanation of them in the design outside the margin.

The Editing of Town Plans

12. The purpose of the editing of town plans is to provide accuracy, completeness and reliability of their content, a clear and visual image on them of the special peculiarities of the territory of the town and of the character of its building development, and also the utilisation at all stages of the making of plans of the most effective techniques.

Editing of town plans is produced at all stages of their making.

13. In the period of preparatory-editorial works the following are produced:
– the collection, study and systematisation of geodetic, photographic survey, cartographic and literary-collection materials, determining the extent and means of their use;

- the study using the available materials of the terrain at the boundary of the town and its surroundings, the identification of important objects, prominent landmarks and main roads, the character of the building layout of the town and the fire-resistance of quartiles and structures, and also other data for the development of the editorial-technical instructions, description, and table of important objects;
- the determination of the most effective technique of preparing the originals of the town plans and of their issue;
- the development of the editorial-technical instructions.

14. The editorial-technical instructions are developed for an individual plan or a group of town plans similar in the character of the materials used or in the peculiarities of the terrain.

In them, as a rule, should be included the following basic information:

- a short characterisation of the town and its surrounding terrain (administrative and economic importance, peculiarities of its planning, building layout, green spaces, number of inhabitants);
- the scale, layout and geodetic foundations of the plan;
- the characteristics of the basic and additional materials and recommendations for their use;
- the techniques of compilation and preparation of the plans for issue, [with] the number of colours for the edition;
- the arrangements for the selection of important objects and prominent landmarks, for the representation of streets and quartiles, and for the compilation of the description, the table of street names, and the table of important objects;
- the arrangements for compiling other elements of the content of the plan having peculiarities not reflected in the present Handbook;
- the instructions for the transfer of names and for the harmonisation of the plan with topographic maps and sea-navigation charts.

15. To the editorial-technical instructions are to be attached: a diagram of the layout of the plan with a direction for the dimensions of the sheets and the places for the positioning of the descriptions and tables, a diagram of the cartographic materials used, tables of the equalisation of the conventional signs of the cartographic materials with the conventional signs of town plans, and a diagram of the main streets or reference to material for their identification.

The diagram of the layout of the plan is to be worked out, as a rule, on sheets of the map at the scale of 1:100,000 covering the territory of the town. On this diagram or in a master-file for the compilation of plans from similar large-scale cartographic materials may also be worked out the editorial-technical instructions themselves.

16. Editing in the process of the making of the town plan is implemented by means of continual leadership of the work of the operational staff, by systematic checking of the originals of the plans and approval of the finished work. The editorial-technical instructions may be adjusted in the course of the work, in the case of the receipt of new materials instructions are given for their utilisation.

17. Editing in the process of compilation of town plans should provide:

- full and correct utilisation of all materials;

- strict fulfilment of the requirements of the present Handbook and the editorial-technical instructions;
- a high quality of graphic design of the compilation originals, guaranteeing the production from them of copies suitable for the preparation of editorial originals.

At this stage of the works the lists of street names and important objects are worked out under the leadership of the editor.

18. Editing in the process of the process of preparation of town plans for issue and in their issue should provide:

- correspondence of the editorial originals (in their content) with the compilation originals, and in simultaneous compilation and scribing – correctness and full utilisation of the basic cartographic materials;
- high quality graphic design of the editorial originals (in conformity with the current conventional signs and the approved examples);
- high quality of preparation of all appendices to the editorial originals;
- full conformity of the editorial originals (in line and colour design) with the example sheet as required in the present Handbook and the editorial-technical instructions.

The Use of Materials Arriving during the Process of Making Town Plans

19. All new materials arriving in the period of the compilation of town plans or their preparation for issue should be studied for the purpose of establishing the possibility and appropriateness of their use. For this the importance of the changes introduced by them, and the extent of the preparedness of the compilation and editorial originals are assessed.

If the new materials received during the period of compilation of the plans make the data of the cartographic sources more exact, then they are used in full.

At the stage of preparation of the plans for issue it is obligatory to introduce additions and corrections in connection with changes in:

- the geodetic foundations;
- the position of the line of the state frontier;
- the name of the town, of its parts and streets, and also of other inhabited places represented on the plan;
- the presence, condition and class of railways and paved roads;
- the character of the terrain in connection with the construction of reservoirs, canals, and other large constructions;
- the presence of important objects.

In the case of other changes the editor of the plan gives a recommendation about the appropriateness and procedure for their introduction.

If the new materials introduce changes in the geodetic foundation, the position of the line of the state frontier and the names of towns, the issue of the plans is to be halted and may be continued only after the introduction of the corresponding changes.

The Agreement of Town Plans with Topographic Maps and Sea Navigation Charts

20. Plans made of towns should be in agreement with the condition the topographic maps and sea navigation charts [currently] on issue or being prepared for new editions, when their scales are the same or close to the scale of the plans. The agreement of town plans with sea navigation charts should not violate their agreement with topographic maps.*

* For the agreement with sea charts only those objects which are intended to be shown by the present Handbook are to be plotted on the plan.

21. As a result of the agreement of town plans with topographic maps and sea charts the following will be achieved:

- continuity of the content of the plans and maps; all objects shown on maps of the same scale or smaller in relation to the scale of the plan should be shown also on the plan, if their presence is confirmed by the latest data;
- identity of the classification of the representations on the plans and maps of objects;
- identity of the writing of proper names, explanatory annotations, quantitative and qualitative characteristics of objects, and marks of heights and depths. For this the writing of names is to match in letter combination and spelling, and the writing of names of extended objects (natural boundaries, bays, straits, &c.) is to match in position. For discrepancies in names, substantially changing their pronunciation or meaning, the new correct names are to be given on the plans, and under them (in brackets) the name from the maps, with which comparison can be made. If the writing of the names is divided (separated, with a hyphen or continuous), then whichever name is adopted that conforms to the requirements of the current instructions on the transfer to maps of geographical names.

22. Agreement of plans with topographic maps and sea charts for individual elements of the content is not to be produced:

- if the plans are made from newer materials on which are included changes in the terrain not shown on the topographic maps or sea charts;
- in the presence of reliable data about changes in the position of the line of state and administrative frontiers and the administrative importance of places of settlement;
- on the renaming of the town, of places of settlement within its surroundings or of other objects;
- on the discovery of explicit errors on issued maps in the showing of objects or in their names or qualitative and quantitative characteristics;
- on immaterial divergences in the writing of names not changing the root and pronunciation of the word;
- on changes in the category (type) of places of settlement, of the class of paved and earthen roads, and also on changes in the outline of vegetation cover and soils.

In the said cases a corresponding note is to be made in the record-file of the plan.

Checking and Approval of Completed Types of Work and Finished Products

23. The checking of the quality and approval of the completed types of work and of the prepared product in the making of town plans is carried out by the leading staff

and by departments (sections) for technical oversight (OTK) of cartographic enterprises and organisations in conformity with the requirements of the current Regulations for the Quality Control and Approval of Maps.

The types of work and of production submitted for obligatory checking, and also the requirements produced for them on checking, are laid out in the corresponding sections of the present Handbook.

24. In the process of compilation (scribing) of a plan executive officers shall check the completeness and quality of the working up of every element of the content or section of the plan, and they correct shortcomings revealed, after which work is continued.

In preparing originals (compilation or editorial) and the appendices to them, executive officers check them (produce self-proofs), they plot corrections on them, they sign the originals and appendices and include them in the proofs. The originals of the plans, proof-read and corrected according to the comments, are submitted to the head (editor) of the section for approval.

25. The head (editor) of the section, after checking of the originals (either compilation or editorial ones) and of the appendices, and the corrections to them by the executive officers in accordance with his comments, gives an assessment of the quality of the plans in the record-file, signs all the materials included in the set prepared for production, and presents them for approval in OTK.

The Record-File of the Plan

26. For every town plan, irrespective of the number of sheets, a single record-file in the established form is to be made.

In the record-file the whole course of the work of making the plan up to its transmission for issue is reflected; the records in it should be short, precise and full.

In the record-file are to be placed:

- the short editorial-technical instructions;
- diagrams of the components of the plan;
- diagrams of the distribution of the cartographic materials and their characteristics;
- diagrams of the distribution of the working compilation plane-table sheets (see page 37) and a table of the coordinates of the corners of their edges;
- a list of the coordinates and heights of the supporting points;
- information about the preparatory works and about the superimposition of the cartographic materials;
- information about the course and about particulars of the compilation of individual elements of the content of the plan;
- a list of the discrepancies in the transcriptions of geographical names on the plan and on the topographic maps nearest in scale;
- information about particulars of the preparation of the plans for issue;
- an assessment of the quality of the completed compilation and editorial originals, and also the instructions of the leading staff for the checking of the originals in the process of the work.

In the short editorial-technical instructions are cited:

- data about the scale, number of sheets, and geodetic foundations of the plan;
- instructions about the methods of compilation of the plan and its preparation for issue;
- recommendations for the working up of the geographical description, the lists of street names and of important objects, the representation of quartiles, streets, individual objects and other particulars.

In the record file should be recorded all deviations from the editorial-technical instructions caused by the use of new materials received in the process of the works.

Entries in the record-file are to be produced at the completion of each type of works; they are to be signed by the executive officer and personnel implementing oversight. The record-file is to be stored along with the original diapositives or editorial originals and the appendices to them.

Chapter II

METHODS OF MAKING TOWN PLANS, GENERAL INSTRUCTIONS FOR COMPILATION AND REVISION

Methods of Making Town Plans

27. Town plans may be made by means of compilation from cartographic materials or from aero-photo-topographic survey.

If up-to-date and accurate large-scale cartographic materials (plans, topographic maps) are available of the territory of the town and its surroundings they are used for the compilation of the plan as the basic material. If there are no such materials then the town plan is made by the combined or stereo photographic method of aero-photo-topographic survey, in relation to the peculiarities of the materials of aerial photo-survey, the character of the relief of the terrain and the planimetric loading of the plan. In a number of cases a combination of these methods is permitted.

28. The following are used for the making of town plans:

- catalogues (lists) of coordinates of geodetic points;
- large-scale topographic maps and sea navigation charts;
- photo-plans, photo-diagrams and individual aerial images;
- town plans (tourist, overview, general or other maps) issued by different agencies;
- literary-collection sources: economic-geographical and topographic descriptions, sundry directories, guide-books, lists of names of streets and objects of the town, and also oblique photographic images of parts of the town and individual structures, special maps, diagrams, &c..

All the available materials are studied for the purpose of determining their up-to-datedness, accuracy and fullness of content, and also the possibility of making from them of a town plan in conformity with the present Handbook. From this are developed recommendations for their use.

The Technology of Compiling Town Plans

29. The technology of the compilation in every specific case is determined by the editor of the plan (the engineer) after careful analysis of the basic materials. The technology adopted is obligatorily reflected in the editorial-technical instructions (the technical proposal) and in the master file of the plan. In all cases it should provide the preservation of the accuracy of the basic cartographic materials and the completeness of their use.

Town plans are compiled at the scale of their issue. The basic methods of compilation are:

- compilation from blue or brown (black) copies obtained from the basic cartographic materials on transparent plastic (or on a non-transparent hard foundation), with correction from rectified aerial images;
- compilation on photoplans with the use for their interpretation of cartographic and literary-collection materials and specially made models with partial or full inspection in the terrain.

The methods indicated for the compilation of different sections of the plan may be adopted in combination, depending on the accuracy and fullness of the cartographic materials used, the quality of the aerial images and the character of the additions and changes introduced by them into the content of the basic materials.

30. Compilation from blue copies is adopted for the use of cartographic material that are complex to work up, and also for saturated content of a plan, when it is required to produce a selection of the objects and a generalisation of the representation of all elements of the content.

Plans are compiled from brown (black) copies if the basic materials on the whole satisfy the requirements set forth for the plan, and additional materials (aerial images, maps &c.) will not introduce substantial changes into it.

If the aerial images will introduce substantial changes in the basic cartographic materials, the compilation is produced on photo-plans, and the representation of the relief and of uninterpretable elements (communication lines, wells, &c.) is transferred onto the photo-plan from cartographic materials by optical projection or by other means.

In those cases when the relief is not shown on cartographic materials a survey of the relief is produced by the stereo-photographic method.

31. Compilation of town plans from cartographic materials may be completed either on one transparent base or on separate ones (for elements of the content), and also with simultaneous scribing.

Compilation on separate (two, three or more) bases presupposes separate compilation (by elements) on transparent matted plastic. This method provides simplicity and convenience of correction of the representation on a by the reduction to scale of compilation of additional materials and aerial images, and also increases the productivity of labour in scribing on separate copies.

For compilation with simultaneous scribing, compilation originals are not worked up. The necessary cartographic works (working up of the content, selection and placement of writing, &c.) are completed on the basic materials (copies of them) before the preparation of the scribed bases or on the scribed bases themselves (in pencil) during the process of scribing.

The Preparation of Cartographic Materials for Use

32. The preparation of the cartographic materials for use includes:

- the determination of the magnitude of the deformation of the printed versions of the cartographic materials or their copies;
- the checking of the correspondence between the positions of the conventional signs of the supporting points on the cartographic materials and their coordinates in the catalogue (list);
- the introduction of corrections to the rectangular grid if it is not given on the basic cartographic materials in the established system of coordinates, and the calculation of a new grid*;

– the selection of supporting points for the superimposition of the copies**.

* If the geodetic foundations of the cartographic materials differ from the established system of coordinates, initially corrections are to be determined, and then a new rectangular grid is to be constructed, and from this the positions of the positions of the conventional signs of the supporting points are to be validated.

** Through the marks of the designated supporting points chosen for superimposition of the copies two mutually perpendicular lines with a length of 1 – 1.5 cm. are to be constructed.

– the strengthening (lifting) with ink or pencil of drawn elements badly reproduced by photography;
– the recording on the field of the basic cartographic materials of the dimensions of the edges of the copies which should be obtained by photography.

In those cases when supporting points are not shown on the basic cartographic materials, and rectangular and cartographic grids are not shown, a rectangular grid is to be constructed on them from points reliably identified on the topographic map of the nearest scale or from points obtained from the construction of photogrammetric networks. In the last case the accuracy of the reduction of the plan to the established system of coordinates is to be assessed from the accuracy of the construction of the photogrammetric grids.

The accuracy of the reduction of the plan to the established system of coordinates is to be recorded in the master file for the plan.

The Preparation of the Cartographic Foundation

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General Instructions for Compiling Plans

37. The selection of objects for representation on the plan and the generalisation of the representation transferred from cartographic materials onto the foundation are completed in conformity with the requirements of the present Handbook and the editorial-technical instructions. The generalised representation is strengthened on the compilation originals with ink. The compilation originals of the plan (of sheets of a plan) are worked up on copies of the cartographic materials made within the borders of the intended layout.

For compilation on reproductions of photoplans and other foundations it is permitted for the convenience of completing the works to make sheets of plans of large format on working boards, the number of which should not be more than four for each sheet.

The construction of the areas outside the frame of the working boards will be completed so that after their assembly into a [full] sheet all the elements (the name of the sheet, the security classification, the system of coordinates, &c.) will be shown in the proper places. The mathematical elements will be constructed on every working board in full, with the exclusion of the numbering of the rectangular and cartographic grids which are not to be given on the internal frame.

The Sequence of Compilation of Elements of the Content of Plans

38. The elements of the content of a plan are compiled as a rule in the following order:

- the ‘internal frame’ [neat line], the rectangular grid, the initial lines of the cartographic grid and the supporting points;
- important objects and landmarks in the town and its surroundings and the explanatory written annotations;
- the hydrography and hydrotechnical constructions;
- railway lines and structures associated with them;
- main streets;
- other streets, the built-up quartiles and other points of settlement;
- engineering structures along streets (tramway lines, flyovers, &c.);
- industrial, social-cultural and agricultural objects;
- cobbled and earthen roads and associated structures;
- the relief;
- boundaries and fences;
- vegetation cover and soils;
- the summary of adjacent sheets of multi-sheet plans;
- the design of elements outside the neat lines.

The order of compilation may be altered in conformity with the particulars of the technology adopted, the cartographic materials and the content of the plan that are set down in the editorial-technical instructions.

39. The writing of the names of places of settlement, parts of the town, objects of the hydrography and relief, and other elements of the content, in addition to the explanatory writing for important objects, may be placed immediately on the whole plan after the compilation of all the elements or after the compilation of each element separately. The names of streets, parts of the town, &c. may be written on the blue copy of the compilation original or on a special transparent base, and in individual cases when names are few, - directly on the original. On the completion of the compilation works an abstract of the names is produced for selection of the writing.

The Spravka, and lists of street names and important objects are worked up in the form of separate appendices to the compilation originals.

The Design of Compilation Originals

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General Requirements for the Writing

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The Geographical Description ('Spravka')

49. The Spravka is compiled according to a special structure (see appendix 1). Its fundamental purpose is to augment the plan with information not receiving graphical representation. In the Spravka is given a generalised characterisation of the terrain of the nearest approaches to the town and the urban territory. The most important objects for the town (industrial enterprises, railway stations, sea and river ports, aerodromes, power stations, water catchment objects, &c.), situated both in the territory covered by the plan and also outside its limits, are described.

For the compilation of the Spravka large-scale topographic maps, physical-geographic, economic-geographic and military-topographic descriptions, hydrographic and climatological compilations, compilations about seaports and airports, communications in the periodical press, atlases, special maps and diagrams (sea-charts, vegetation, quaternary sedimentation, and economic maps), aerial images and oblique photographic images of the town and its surroundings are used. The selection of the necessary materials, the assessment of their up-to-datedness and the generalisation of information for inclusion in the Spravka is produced during the period of the editorial-preparation and compilation works. Spravkas are compiled after the preparation of the compilation originals. A Spravka should be in agreement with the plan and the list of important objects, both in its content and in the writing of the names. At the first mention of some or other object in the Spravka its number in the list, or the square of the rectangular grid on the plan (or insert) in which it is represented, is indicated in brackets. If the object mentioned lies outside the limits of the territory covered by the plan, its local position is defined by its direction and distance from the administrative centre of the town. An example of a Spravka is given as appendix 2.

50. The Spravka is augmented with a diagram of the Metro [Underground] (appendix 9). On the diagram are shown the existing and proposed lines, stations (distinguishing transfer stations) and their names, and depots. In addition main roads are plotted with

their names, major water barriers, and prominent landmarks. The scale of the diagram is chosen based on the length of the lines and the presence of space for its positioning.

The diagram is positioned along with the text appendices and is printed in five colours*:

* When the textual information is issued in the form of a booklet the diagram is printed in black.

- black – lines and stations of the Metro, the names of stations and elements of the design (frame, legend, &c.);
- brown – lines of the conventional signs of streets and their names, boundaries of built up areas of the town;
- dark blue – objects of the hydrography and their names;
- pale yellow – built up areas;
- turquoise – areas of water spaces.

The List of Important Objects

51. The list of important objects is compiled in alphabetical order of their common names (aerodrome, works, factory, &c.) which are set in the first place. If in the naming of objects are included the specifications and proper names (the names of the firms), they are also arranged in alphabetical order after the common names. In the list every object is assigned a successive number, and the square of the rectangular grid on the plan in which this number is placed is indicated. If the object is depicted on an insert (beyond the frame of the plan), in the list the square of the rectangular grid of the insert is indicated with an explanation, for example: *54-02, insert*.

Similar objects, similar in basic characteristics and situated close together such that their representations on the plan are difficult to separate, may be included in the list under a single number, for example: *28 Textile factories ... G8, or 14 Machinebuilding and metalworking works ... D5*. In this case the use of nomenclature terms in the plural does not influence the alphabetical order of the compilation of the list. Objects of great significance (for example, large works) are always indicated in the list separately.

For a large number of cases of similar, equally important objects their common name and specification are to be plotted in a subtitle (in alphabetical order), and under them are listed the proper names of the objects, for example:

Аэродромы		Заводы автомобильные	
1. Внуково	А-6	30. ЗИЛ	В-9
2. Домодедово	Б-7	31. им. Ленинского комсомола	П-8
.....		
Банки		Заводы машиностроительные	
7. Государственный	Д-2	38. Автоматических ли- ний Станколия	С-8
8. Промышленный	Е-4	39. Электротехничес- кого оборудования	Е-10
.....		

The proper names of objects, including those of firms, are given without quotation marks or abbreviation.

The List of Names of Streets

52. All names of streets, boulevards, squares, embankments, lanes, blind alleys, urban paved roads &c. shown on the plan are included in the list of names of streets.

After each name of a street is indicated the square on the plan in which the name (or the major part of it) appears; if the writing of the name is repeated (because of the great length of a street) the squares where the two ends of the street name are situated are indicated. For every plan, including multi-sheet plans, a general list is compiled.

The list is compiled in alphabetical order of the substantive names of the streets. Between the first line of the list for every letter of the alphabet and the list for the previous letter an increased gap is given and the first letter of such a line is thickened. Identical substantive names of streets, situated in different parts of the town (for example in suburbs), are repeated in the list with an indication of the square of the plan where these streets are represented.

If significant dates or ordinal numbering occur in the proper names of streets, squares, &c., they are situated at the end of the list in the following order: names containing a proper name (in substantive or adjectival form), - in alphabetical order of the proper name (*40 Years of October Street, 5th Park Street*); names consisting of ordinal numerical and common names, - in alphabetical order of the common name, and within the limits of one name – in increasing order of the number (*1st Line, 2nd Line; 1st Passage, 2nd Passage*).

Common names are written as abbreviations in the list after the substantive names, with the exception of cases when the substantive name consists of ordinal numbers and numerical names. If a common name on the plan stands before a substantive, then a comma is placed in the list after the proper name, for example: *Tolstoy, str. of; 25th October, str. of*; if it is correctly after the substantive name then a comma is not placed, for example: *Lenin Prospekt*.

The list of names of streets is checked carefully against the plan, retyped on a typewriter and is prepared for typographic typesetting or phototypesetting.

53. For the making of plans of larger towns the Spravka, and the lists of street names of important objects may be issued, as indicated in article 9 above, as separate appendices in the form of a booklet with a format of 14.5 x 22.2 cm..

On the cover of the booklet (appendix 6) is placed a small-scale overview diagram of the territory. The scale of the diagram is chosen based on the necessity to represent on it the position of the town with respect to the most important economic centres, the state frontiers, and large hydrographic objects.

In these cases a text is given outside the frame of the plan (on the eastern side): *The Spravka, lists of street names and list of important objects is given in a separate booklet.*

General Instructions for Revision of Town Plans

54. Revision of town plans is produced for the purpose of bringing their content into conformity with the up-to-date condition of the terrain and for redesigning into an adopted system of coordinates and into the current conventional signs.

55. The accuracy, content and design of revised town plans should satisfy the requirements of the present Handbook.

56. The techniques of revision of town plans are established on the basis of a careful analysis of their planimetric-height foundations, of changes in the terrain produced since the issue of the plan, of the initial materials (editorial originals, duplicates, &c.) of the revised plans &c., and include the following types of work:

- an analysis and assessment of the quality of the materials for revision;
- checking the accuracy of the revised plan;
- determining the level of out-datedness of the plan by means of an analysis of the changes in the terrain;
- working up editorial-technical instructions;
- the correction of the originals of the plan and their preparation for issue.

57. Checking the accuracy of the plan is completed for the purpose of establishing its suitability for revision. The accuracy is determined by an analysis of the materials of the works completed earlier for the making of the plan (data in the record file and the editorial-technical instructions are analysed).

As a result the following are established:

- the method of making the plan to be revised;
- the systems of coordinates and heights, and the contour interval;
- the density and accuracy of the positions of the conventional signs of the points of the planimetric-height foundations;
- the accuracy of the survey of the planimetry and relief, and the accuracy of compilation of the plan.

58. If as a result of the carrying out of the analysis of the materials of the works carried out earlier it is not possible to establish with sufficient confidence that the accuracy of the plan satisfies the requirements of the present Handbook, its accuracy is to be verified from new large-scale cartographic materials or photographic images.

For this, diapositives (copies) are prepared from the new maps at the scale of revision; then the diapositives (copies) prepared are superimposed on the originals of the plan to be revised according to the symbols of the geodetic points and the lines of the rectangular grid. If on checking a discrepancy is revealed between individual symbols of geodetic points on the plan to be revised and their positions on the cartographic materials of greater than ± 0.3 mm. then the cause is to be revealed. For the more precise definition of the position of the symbols of such points cartographic materials are involved – and in the first place catalogues (lists) of coordinates. Points for which

a cause for the discrepancy in position cannot successfully be established, are not taken into consideration in the checking of the planimetric accuracy.

The checking of the accuracy of the plan against photographic images is produced by means of the construction of a photogrammetric network on stereo-photogrammetric instruments.

59. A plan is regarded as fit for revision if the mean discrepancy in planimetric position of identical hard outlines on the plan to be revised and the new cartographic materials does not exceed 0.7 mm., and the discrepancy in the positions of points of the photogrammetric net and identical points on the map does not exceed 0.6 mm. (or for mountainous, high-mountainous and desert regions – 1.0 mm.).

The mean discrepancy of the heights of points written on the plan and of characteristic points of the relief determined from the contours on the plan to be revised and the new cartographic materials (or from the construction of the photogrammetric net) should not exceed the magnitude (in metres) specified in the Regulations [Polozhenie] on the Revision of Topographic Maps. [Translator's Note: this document has not currently been traced, although some others on the subject have been found].

Sheets (or portions of sheets) on which errors of position of the outline in a planimetric sense and in height exceed the established tolerances are to be subject to re-compilation.

60. The determination of the level of out-datedness of a plan for establishing the necessity of revision and for the choice of the technique of the works is produced by means of an analysis of the volume and character of the changes in the terrain. For the analysis materials of large-scale topographic surveys or photographic images are used, and also routine data (routine maps, directories, &c.).

61. The editorial-technical instructions for the revision of a plan are worked up in conformity with the requirements laid down in the present Handbook, that in them should be reflected very fully the following questions:

- the characteristics of the geodetic, cartographic, literary-collection and other materials and the procedure for their use;
- the data on the verifying of the accuracy of the plan to be revised and the results of the analysis of the changes in the terrain established from the new cartographic materials;
- the method of revision of the plan;
- the techniques of making the originals of the revision*, and the procedure for plotting on them the changes in the terrain;

*The outline copies of the editorial originals with the changes in the terrain plotted on them from the new materials, satisfying the requirements of article 68 of the present Handbook, are known as 'the revision-originals'.

- the techniques of the preparation of the revised plan for issue, the procedure for using the existing editorial originals (diapositives);
- the particulars of the positioning of the Spravka and the lists of names of streets and important objects in the design outside the frame.

62. For completing the works of revision of plans the same materials, instruments, devices, and technological processes are used that are also used for the compilation and preparation of plans for issue. The techniques of revision of the originals of a plan include as a rule the following types of works:

- the preparation for use of the editorial materials permanently stored for the revision of the plan;
- the preparation for use of the cartographic materials (photo-plans) from which the revisions will be produced;
- the transfer of the changes in the terrain from the cartographic materials (photoplans) to the outline copy of the editorial original (the making of the revision-original).

63. The following are used as the bases for revision of plans:

- two-colour, two-sided outline copies* of the editorial originals on drafting plastic – for the preparation of the revision-originals;
- single-colour outline copies (black or brown) of the editorial originals on drafting plastic – for correction of the plan to be revised.

*The copies are prepared by means of the dyeing en masse of one duplicate. For this on the matte side of a plastic sheet the image is coloured in non-actinic (blue) colour, and on the shiny side – in actinic (red) colour. Copies may also be prepared on two sheets of plastic: on one of them the image is coloured blue, and on the other in red.

64. The basic methods of revision are:

- the correction from the prepared revision-original of the original colour-separation diapositives (duplicates) of the previous edition of the plan without rescribing the retained elements of the content;
- the correction of outline copies of the editorial original of the previous edition of the plan with subsequent engraving of all or some elements of the content;
- partial recompilation, i.e the compilation of some elements or sheets of the plan from cartographic materials or photoplans with subsequent scribing of all or some elements of the content of the plan.

65. Revision of plans by means of the correction of the editorial originals of the previous edition from the prepared revision-original without rescribing the retained elements of the content is produced when the quantity of corrections is not more than 20 – 25%, if colour-separation originals on plastic or hard foundations are available for this, and the elements of the content are represented in the current conventional signs.

For determining the quantity of corrections changes in the texts of the Spravka and the lists of names of streets and important objects are not taken into account.

66. Revision of plans by means of the correction of outline copies of the editorial original of the previous edition of the plan with subsequent engraving of all or some elements of the content is produced when the quantity of corrections is 25 – 40%. The plan is submitted to rescribing also for a lesser quantity of changes if they were prepared for issue using old conventional signs or with the drawing of all elements on a hard foundation in the absence of duplicates of them on plastic.

67. Partial recompilation, i.e. the compilation of individual elements or sheets of the plan with subsequent rescribing of all or some elements of the content is produced when the quantity of change is more than 40% (of an individual element or of all elements), when the drawing of the new elements on the originals and the removal of elements to be lost would be more laborious than compilation afresh.

68. Three groups of elements of their content should clearly be distinguished on revision originals intended for the correction from them of colour separation diapositives of the previous edition of the plan: those to be removed (red colour), to be retained (dark-brown colour: dark-blue + red), and newly appearing or changing (in the colours adopted for compilation originals).

Revision originals are prepared as follows:

- newly drawn and corrected representations of objects are drafted in the colours used for compilation originals, and the representations of objects to be removed are removed (by scraping out) from the face-side of the base;
- in the presence of changes in the outline of the vegetation cover and soils the whole outline is redrafted;
- for a large quantity of changes in the writing of names of streets and other objects, separate originals of the writing are to be prepared on plastic, on which are to be fitted the new writing, and in the remaining places dashes are made in ink; in cases of significant change in the Spravka and the lists of names of streets and important objects the textual appendices are prepared anew by means of the mounting of typographic (phototypeset) galleys onto a hard surface in conformity with the layout of the plan;
- areas of representation of vegetation cover and soils, water areas, quartals of towns and the conventional signs of paved and improved earthen roads are coloured only in places of change – with the colours accepted for a compilation original;
- a – the angles of the internal frame of sheets are to be traced with black ink with lines 1 cm. long.

69. For the preparation of town plans for issue the following set of materials is to be transmitted:

- the revision original (corrected outline copy) on plastic;
- the record file of the plan;
- the lists of names for typesetting;
- the cartographic materials (photoplans) used for revision of the plan;
- a printed example of the previous edition of the plan, intended for use as a model of the infilled elements.

70. For the preparation of revised plans for issue are produced, guided by the revision original, prepared on two-coloured copies, the removal (by scraping) from the colour-separation original diapositives of the plan of the previous edition of all obsolete and changed elements, leaving only that which is to remain. Then from the reverse of the revision original they wash off the representation in red colour and prepare from it (with the use of red dye) an outline copy of the changes on an engraved base. As a preliminary, on the scribed bases are received an image from the off-loaded (corrected) original diapositives (by means of dyeing with the use of light-blue colour), for the provision of superimposition of the newly scribed elements with those being retained. The newly appearing and changing elements are scribed on separate

bases (or subsequently on a single base), and then by means of washing of the relief they are copied onto the corresponding colour-separation diapositives. [Translator's note: in this paragraph the meaning of the verb , translated as 'to wash', seems unclear, but I do not understand the overall process described here.]

Agreement (linkage) of the copied elements of the content and those existing on them is produced on the thus-achieved 'collected' diapositives, writing that is lacking is stuck on, and the corrected texts of the Spravka and the lists of names of streets and important objects are copied onto the diapositives of the elements to be printed in the colour black.

Subsequently the original diapositives of the completed composition are prepared from the diapositives thus 'collected' (article 227).

In cases when changes have not been made in individual diapositives of the previous edition of the plan, they may either be included in the new set of original diapositives, or may be recopied if their quality does not satisfy the requirements of article 226 of the present Handbook.

71. Preparation for issue of corrected plans submitted to rescribing (articles 66 & 67) is performed in conformity with the requirements of Chapter IV of the present Handbook.

72. For changes in the layout of plans the correction and preparation of them for printing should be produced with consideration to the maximal use of the available colour-separation original diapositives (duplicates) of the previous edition of the plan.

Chapter III
**THE COMPILATION OF ELEMENTS OF THE CONTENT OF TOWN
PLANS**

Supporting Points and Coordinate Grids

73. On town plans the following are to be plotted: the points of the state geodetic net (points of the triangulation and polygon-measurement of the 1st, 2nd, 3rd, and 4th order); bench marks of the I, II III and IV order levelling with the exception of wall and provisional bench marks; points of the planimetric survey net fixed in the terrain with centre-marks; and also points of geodetic nets of local importance (town triangulations and polygon measurement &c.), the coordinates of which are calculated in the established system. If catalogues (lists) of the coordinates of geodetic points calculated in other or in local systems are used, the coordinates should be converted into the established system.

74. Up to 10 supporting points per 1 dm² are to be shown on plans.

[...]

Chapter IV

THE PREPARATION OF TOWN PLANS FOR ISSUE

Methods of Preparing Plans for Issue

216. Town plans are prepared for issue by scribing or simultaneous compilation and scribing on plastic.

Scribing of the line elements of the content of the plan is produced, as a rule, on separate scribed bases for the outline and the separate types of element derived from the compilation original, and for compilation with simultaneous scribing – also from the pencil drawing and the augmented or more accurate representation obtained from the basic materials. Scribing may be produced also on one scribed base from the outline drawing with subsequent masking of the engraved elements after contributions from the scribing of the intermediate (working) diapositives.

217. The text appendices to town plans (Spravka and lists), if they are not to be issued as separate booklets, are prepared in the form of typographic (phototypeset) galleys, which are mounted on hard bases in conformity with the layout of the plan and are copied onto the original diapositives of the elements of the content to be printed in black colour.

218. The methods and techniques of the preparation for printing of every town plan are determined in the editorial-technical instructions. In all cases the materials for issue of a plan should comprise a full set (article 227) and should satisfy the requirements put forward for them (article 226).

The Sequence of Completing the Works

219. The preparation of town plans for issue includes:

- photographing the working compilation sheets, if they are prepared on hard surfaces;
 - the mounting of the negatives obtained, or of the working compilation sheets prepared on transparent plastic, within the framework of the sheets of the plan;
 - the obtaining of copies, either combined (summary) or with the elements of the content of the plan separated, on engraving bases;
 - the preparation of photo-offprints of the writing and conventional signs on transparent bases for sticking onto the intermediate diapositives;
 - the preparation of the originals of the text appendices (or the typographic composing of the booklet);
 - the scribing of the line elements;
 - the preparation from the different scribings of the elements of a combined multi-colour* control diapositive;
- * The number of colours [required] for the purpose of providing the necessary control of the quality of the scribing is determined by the editor depending on the complexity of the combination of the elements of the content of the plan.
- the checking of the scribed elements against the combined control diapositives and their correction;
 - the sticking of the writing and conventional signs onto the different intermediate diapositives;

- the preparation from the scribings or the intermediate diapositives of light-blue copies on plastic for masks;
- the preparation of diapositives of the text appendices;
- the preparation of masks of the colour-fill elements from the light-blue copies or on clear plastic;
- the preparation of the original diapositives of the line and colour-fill elements;
- the preparation of combined monochrome diapositives of the line elements.

The sequence of completion of the works may be changed depending on the particulars of the content of the plan or of the basic cartographic materials.

For the preparation for issue of multi-sheet plans the scribing of every element is commenced from the junction with the adjoining sheets of the plan.

The Procedure for Scribing the Line Elements of the Content of Plans

220. The scribing of the elements of the outline to be printed in black is completed in the following order:

- the internal and external frame, lines of the rectangular grid, supporting points (including those on buildings and structures), spot heights, the initial lines of the cartographic grid;
- important objects and the mount of prominent landmarks;
- state and administrative boundaries;
- railways and monorails, and structures associated with them including embankments and cuttings;
- elements of the outline on an insert and in the design of the plan outside the frame.

221. The scribing of the elements of the outline to be printed in brown is completed in the following order:

[...]

222. The scribing of the elements of the hydrography is completed in the following order:

[...]

223. The scribing of the elements of the relief is completed in the following order:

[...]

224. The indicated order of scribing the line elements may be changed depending on the content of the plan and the complexity of the scribing of each element. When the content of the plan is complex, for provision of better superimposition of the elements scribed on different bases, it is permitted to copy elements scribed earlier onto a base intended for the scribing of another element, for example the representation of the hydrography onto the base for the original of the relief or of the outline.

225. When scribing it is necessary to maintain a gap between different conventional signs of not less than 0.2 mm., in addition to the cases foreseen in the tables of conventional signs.

The thickness of the scribed lines of line elements should be not less than 0.1 mm..

It is permitted not to scribe a number of conventional signs of objects, in addition to those of supporting points and frontier markers, but to stick them on the intermediate diapositives in the form of photo-prints on a transparent base. In this case on scribing the place of positioning of the conventional sign paste-on is marked or the paste-on is produced on the transparency.

The infilling conventional signs of vegetation cover and soils of significant areas are to be copied onto the original diapositives from standard original diapositives of the corresponding conventional signs with the use of preparatory masking.

Requirements in the Original Diapositives

226. The following basic requirements are to be satisfied by the original diapositives notwithstanding their methods of preparation:

- the dimensions of the sides and the diagonals from the corners of all diapositives with separate elements from one and the same town plan (sheet of the plan) should be practically identical and should differ from the theoretical and between themselves by not more than ± 0.2 mm. for the sides and ± 0.3 mm. for the diagonals;
- all diapositives should be prepared on plastic of a single sort, without scratches, dents or other mechanical damage; their surfaces should be even, without corrugations;
- the content of the original diapositives should strictly conform to the content of the compilation originals, and their design should conform to the current conventional signs and examples of writing. Deviations from these in the design of plans, necessary for improving their legibility, should be stipulated in the editorial-technical instructions and be specified in the record files;
- the representation of all elements of the content of the plan and of the writing on the original diapositives should be clear and have a copying density of the drawing $D_{\min} - D_0$ not less than 1.5 units of GOST [the State Standards Organisation] (where D_{\min} is the density of a line and D_0 is the density of the base and veil);
- elements written on different bases should be in agreement; writing printed in different colours should not overlap each other, and the number and writing of the important objects should not overlap with elements making them difficult to read;
- screens introduced should conform in number of lines and percentage ratio to the screen elements of the established standard;
- on the original diapositives there should be no paste-ons, additions and corrections, applied water-wash ink (colour), or furthermore dirt-spots, rashes or other defects reducing the quality of editions of plans.

The Components of the [Set of] Materials for the Issue of Plans

227. The set of materials for issuing a plan includes the following (Table 7):

Table 7.

* For plans issued with a generalised representation of buildings (article 113) a raster grid is additionally added onto the diapositive 1:2 with 34 lines/cm..

In the composition of the set are included reverse diapositives of the line and background (infill) elements, and direct summary diapositives.

For the issue of the textual information as a separate booklet there should additionally be included in the set of materials: the manuscript of the booklet, typewritten with double spacing on one side of the paper, and also the originals of the cover of the booklet and the diagram of the metro system.

APPENDICES

1. Structure of the Spravka.
2. Example of a Spravka.
3. Additional list of abbreviations to be used.
4. Diagram of the layouts of multi-sheet plans, with the positions of the elements outside their margins.
5. Examples of the design of margins of town plans.
6. Example of the cover of a booklet.
7. Colours of dyes used for designing compilation originals and issues of town plans. (Applies to articles 7, 40 & 41).
8. Examples of the texts of the source data (legend) shown on the originals of plans. (Applies to article 214).
9. Diagram of metro [underground] lines.
10. Additional conventional signs (to those used for topographic maps at the scales of 1:10,000 and 1:25,000).
11. Scale of colours of dyes used for printing plans of towns (edition in 8 colours).
12. Scale of colours of dyes used for printing plans of towns (edition in 10 colours).
13. Extract from a town plan at the scale of 1:10,000 (edition in 8 colours).
14. Extract from a town plan at the scale of 1:10,000 (edition in 10 colours).
15. Extract from a town plan at the scale of 1:25,000 (edition in 8 colours).
16. Extract from a town plan at the scale of 1:25,000 (edition in 10 colours, variant 1).
17. Extract from a town plan at the scale of 1:25,000 (edition in 10 colours, variant 2).