

D/GP BASIC P.I. COURSE
THE USE OF AERIAL PHOTOGRAPHY
FOR INTELLIGENCE PURPOSES

D/GP BASIC PHOTO INTERPRETATION COURSE

INSTRUCTOR'S OUTLINE

D/GP BASIC PHOTO INTERPRETATION COURSE

The general introduction to photo interpretation contained in the first two periods of this course are suitable for use as a preface to any geographical or special-subject P.I. course to be developed later. The third period, introducing the general principals of industrial analysis is also of wide interest. The remaining periods are devoted to straight industrial interpretation.

Curriculum:

The course is divided into seven periods of three hours each, as follows:

- Period 1. Introduction to Photo Intelligence
- Period 2. Basic Photo Interpretation Techniques
- Period 3. Introduction to Industrial Analysis; Electric Power
- Period 4. Industrial Analysis: Coke, Iron and Steel
- Period 5. Industrial Analysis: Non-Ferrous Metals and Assembly
- Period 6. Industrial Analysis: Petroleum
- Period 7: Final Review of Industrial Analysis; Explosives

Additional industrial subjects available for instruction (See tab) include:

Synthetic Oil	Aircraft Industry
Synthetic Rubber	Ship-building
Nitrogen Industries	Misc. Assembly Industries
Misc. Chemical Industries	Lumber and Cement Industries

Most of these could be advantageously dealt with in part of a period, in combination with another.

Further subjects which may merit developing are:

Industry in Ground Photographs	Transportation
Underground Industrial Plants	

Method:

The distinctive feature of the industrial portion of this course is that students are taught a systematic method for analyzing cover of industry in general. This method is embodied in the D/GP manual, "How to Recognise and Analyse Industry from Air Photographs." It has been developed to meet the special needs of persons taking this course, to assist them in making use of the conventional "recognition feature" type of industrial key, and to protect them, as beginners, from hasty judgements and confusion in the wealth of detail confronting them on air photographs. In this manner it is hoped to avoid ill results from the highly condensed nature of this course.

The selection and distribution of number-keyed stereograms to illustrate this manual is foreseen as a continuing D/GP activity which will keep the manual up-to-date with minimum effort and place a valuable intelligence tool in the hands of other divisions.

Use of Time:

In general, the first two hours of each period are devoted to substantive instruction, and the last hour to testing and review.

Class Notes:

Texts, references and instructions will be issued at each period to be included in the students' P.I. notebooks, thus doing away with the taking of notes and giving maximum time for actual practice in photo interpretation.

Out-of-Class Work:

Photographic packets are available for issue to students who wish to work up a detailed interpretation of an industrial area. These include both class sets and one-of-a-kind packets, all on the USSR. (See Vol. II of the D/GP Index to P.I. Instruction Material). In practice so far, out-of-class work has been issued only on individual request to suit the needs and time of students. More formal procedure and credit provisions are desirable.

Instruction Material Available:

The instruction material, tests and reference material for each subject are listed under the appropriate heading in the remainder of this outline. In addition, there are three master indices of material available in D/GP, as follows:

(Instruction Material, cont'd)

D/GP Index of P.I. Instruction Material, Vol. I . Contains a copy of all text material, tests, manuals, blank forms, etc. produced for the course.

D/GP Index of P.I. Instruction Material, Vol. II. Contains a copy of all graphic and photographic material available in 40 sets each for use in this course. (As the photographic supplement to the D/GP Industrial Manual grows too bulky, it may require to be kept separately.)

D/GP Index of P.I. Tests, with Scoring Procedure and Answers.

These Indices are at present stored in the bottom drawer of Lock File A. All materials referred to are stored in Lock Files A and B, in approximately chronological order of use. The top drawer of Lock File B also contains the nucleus of the D/GP Industrial P.I. Reference File, for the instructor's use.

In addition to these materials, D/GP has also on hand from 30 to 50 copies each of the Photo Interpretation Handbook and Photo Industrial Studies 1 through 9, and has requested 50 copies of AF 200-35, "P.I. Keys on Underground Installations."

Wall Displays: A group of 30" x 40" panels illustrating various industries and P.I. procedures has been prepared by Cartographic Div., and is on hand in D/GP. The displays are listed under the appropriate subjects below.

P.I. Training Films:

The following P.I. training films have been reviewed for possible class use with comments as indicated. (See Training Film File for details.)

D-7456	N.G.	E-0293	N.G.
E-6196	N.G.	E-0296	N.G.
E-0297	N.G.	E-6014	Not applicable
E-0299	N.T.G.		

Two film strips have also been ordered for review but not yet received. (25/2/54)

Three-D Projector:

A stereo projector for use with polaroid glasses has been obtained and suitable material for class instruction will be worked out.

Testing:

Substantive tests and problems are judged to be of prime instructional value provided full answers are given after students' answers are passed in and while they have the photography still before them to study. Tests provided a check on the instructor's effectiveness, and should be redesigned and perfected on the basis of experience. A clear understanding of exactly what the students are getting must be developed. The repetition of certain tests will also yield valuable information.

In addition to the substantive tests on industrial subjects, a series of tests have been developed to reveal base levels of visual-mental skill. These tests are given at the start of the course to identify those individuals who have special problems which would hinder them from benefitting from the course, unless corrected. In this way they can be given immediate help. A side benefit of these tests will be to reveal the base levels of visual skills which can be expected in such a student body.

These tests are described more fully under the various headings in which they occur.

Continuing Problem and Review:

Review is provided by a "Continuing Problem," consisting of a packet of photography over a complex industrial area in the USSR. At the end of each period the students turn to this problem and pick out the installations taught that day. As the course progresses a full picture of the area is built up, including many features of a non-industrial nature. The instructor must be prepared for every conceivable question about the scene. If desired, this problem might be carried on out of class, but the instructor should be forewarned that it will require a great deal of his time adequately to check such work to the student's satisfaction.

Individual Consultations:

In practice, personal attention has been found necessary for students having stereo trouble, or those trying to overcome unfamiliarity with basic industrial terms.

Credits:

Individual variation in time, aptitude and interest are great. Some provision should be made for those spending extra time.

Grading:

Due to the individual variation noted above, some provision

should be worked out for a flexible grading system showing relative improvement as well as absolute competence attained. This is particularly true where the individual starts with a considerable handicap of ignorance about industry. Account should also be taken of those who attain superior absolute competence. (See Recommendation on P.I. Grading, below.)

Recommended Grading of P.I. Students:

In practice, insufficient time has passed to establish a "normal" performance. However, certain general performance types have been noted, as follows:

- 1) Persons failing to attend two or more periods, thus missing a large proportion of such a condensed course.
P.I.
- 2) Persons with very poor aptitude and interest, a small percentage. Due usually to visual or visual-mental defects.
- 3) Persons with good P.I. aptitude and interest, but without adequate industrial backgrounds. Potential general interpreters.
- 4) Persons with good P.I. aptitude and interest and with well developed industrial backgrounds. Potentially superior industrial interpreters.
- 5) Persons of fair P.I. aptitude and interest, with or without industrial backgrounds. Such persons may be considered to have been introduced to photo intelligence and photo interpretation, rather than having acquired a promising degree of skill. Potential users of interpretation products.

It is therefore suggested that the grading and personnel reports on students be divided as follows:

Attended Course (6 or more periods, otherwise incomplete.)
Grasp of P.I. Capabilities
P.I. ability and interest, general
P.I. ability and interest, industrial

It is very desirable that D/GP ensures formal recognition for those individuals who attain real industrial P.I. competence. With practice, such individuals may be expected to excel many presently accredited industrial interpreters, and a record should be made of the location of these developing skills.

TAB

PERIOD 1. INTRODUCTION TO PHOTO INTELLIGENCE

Speech: By the Chief of the Photo Intelligence Division, introducing students to the basic concepts, history and capabilities, present and future, of photo intelligence. 2 hrs

Personnel Questionnaire:
Students fill out D/GP P.I. roster form. 10 min

Tests:
(1) Stereo-vision test. (See tab) 15 min
(2) Visual orientation test. (See tab) 25 min.

Texts Issued:
(1) Digest of Mr. Lundahl's remarks (w.a.)
(2) D/GP text of divisions of P.I. field

Wall Displays:
Appropriate current photo intelligence material, as selected by the Chief, D/GP

Pass-Around Material:
Examples of various photo intelligence products for close inspection as selected by the Chief D/GP.

Materials Required:
Class sets of two test packets, ^{class sets of} two texts, 'scopes, grease pencils, acetates, & cards. Also wall displays & pass-around material as selected.

Instructor's Work:
Personnel sheets evaluated & roster made up.
Tests graded and individual problems noted.

TAB

TEST FOR STEREO VISION

15-20 min

The purpose of this test is to identify those individuals with visual difficulties who will not get full value from the course unless given special help. It has been found that persons without effective binocular vision often develop excellent monocular depth perception and are reluctant to realize they are not getting stereo. They can be helped by showing them how to ^{concentrate on} strengthen vision in the weaker eye (see below). This must be done as early as possible. This test also benefits normal persons by giving them an advance taste of vertical stereo under easy conditions.

Test consists of 4 sheets of stereograms, a question sheet and a 5 x 8" card for answers. (See Index of Tests)

- Sheet A. Three stereograms, of which one is in reverse stereo. Students are asked to pick the one which "looks different."
- Sheet B. Four stereograms of low and tall buildings, annotated. Students are asked to list tallest.
- Sheet C. Four terrain stereograms, same procedure as B.
- Sheet D. Stereogram of Union Station rail yards, showing trains in motion and stopped. Students are asked to count moving trains.

Since this test is immediately followed by the Visual orientation test on a tight time schedule, answers must be postponed until end of period.

Materials required: Glass sets of test packets; 'scopes; 5x8 cards.

Note: Method for helping those found to have stereo trouble caused by one weak eye. (This method applies only where the trouble is caused by psychological blocking of data from the weaker eye; eye must be capable of getting some kind of picture.) In individual consultation instructor explains psychological blocking principle. A red mark is made on member of stereo pair seen by weak eye. Student looks through scope, holding card over strong eye. When red mark and photo are well focussed, card is withdrawn. If blocking is severe, red dot will vanish. Card is replaced, red mark refixed, card again slowly withdrawn. Even with fairly severe difficulty, practice will result in retaining view of red mark and weak visual field and stereo will result. Student must be encouraged to practice to keep abreast of course.

TAB

VISUAL ORIENTATION ABILITY TEST

20-25 min.

The purpose of this test is to identify those individuals who are deficient in visual facility in general. It will also benefit normal individuals by giving them experience in the relation of ground and vertical photography of the same field. The test has been designed to avoid as much as possible penalizing those who are unfamiliar with industrial structures. It calls for the ability to transpose views of simple building shapes and river curves, and accuracy in observing.

The test consists of three problems, graded in order of difficulty, and a question sheet. (See Index of Tests)

One one
Problem A. ¹ground and ¹air photo (1/5000) of Fish Wharf and Central Heating Plant, Wash. DC., with acetate overlay sheet 12 x 12". Students are asked to place the acetate over the vertical photo and mark the point from which ground photo was taken and the edges of the camera angle.

Problem B. One ground photo of Dept. of Justice and one air photo (1/5000) of same area. Same procedure as A. with acetate sheet.

Problem C. One ground photo toward Buzzard Point, D.C., and one target mosaic of Washington, with acetate overlay. Same procedure as A.

Answers may be discussed for this and preceding stereo test after cards & overlays are handed in.

Materials required:

Class sets of
Test packets containing photos and question sheet; acetate overlay sheets; target mosaics; grease pencils.

omit this & transfer page

Note: These materials may be adapted for a map orientation problem by adding ~~the CS map of D/O (1/21680)~~ and an acetate overlay and requiring the students to plot ground or vertical photos on it. ~~Another smaller scale vertical photo from the 1/12500 and 1/5000 series on file~~ might be used to show the fundamental relation of cover at different scales.

*Place this
Scale Finding
Test
page.*

*Move this
note to end of
Scale Finding
test
(see tab)*

TAB

PERIOD 2. BASIC PHOTO INTERPRETATION TERMS AND TECHNIQUES

The material covered in this period is divided into two parts:

* Part 1. Nomenclature, Organisation, Sources of Photography

Speech: Instructor explains what photography exists, how to obtain it, types & uses of various photo products.

30 min

Test: P.I. Terms & Sources test (See tab)

15 min

Wall Displays:

(1) Sources of Photography

(2) Types of Photo Products (See tab)

Materials required:

Class sets of 5x8 answer cards; wall displays material

Instructor's work:

Assembling Wall Display #2. (Tests not graded)

* Part 2. Basic Photo Interpretation Technique

30 min.

Speech: Instructor explains concept of scale, use of measuring tools and other P.I. equipment. Leads class in looking through texts on reconnaissance photography and use of stereoscope.

Test: Scale-Finding Problems, ^{test} (See tab)

1 hr

Tests Issued:

(1) "Reconnaissance Photography" (D/GP-AAFSAT)

(2) "Use of the Stereoscope" (D/GP-AAFSAT)

(3) "How to Measure Objects Shown on Air Photos" (D/GP)

Insert
"Materials Issued"
from next page →

Wall Displays:

(1) Scale (cartoon)

(2) Scale (math.)

(^Wall Displays, cont'd)

(3) Scale (instr.)

Materials required:

Class sets of three texts; scale, ^{-problem} test packets, and target mosaics; scratch pads for math; 5 x 8" answer cards; ⁶scopes; scale.001; notebook binders, ^{for permanent issue.}

Materials issued:

- Handwritten notes:*
Harc
- previous
scope
- (1) Stereoscopes
 - (2) Scales .001'
 - (3) P.I. Notebook Binders
- Handwritten notes:*
Place on
previous
page

Instructor's Work:

Grading scale problems.

Note: There is a possibility that this period may have a few minutes to spare, depending on class' arithmetical prowess. If so, a map orientation & plotting problem may be given using the same materials, (see tab for Scale Problem) or the 30-min Recognition Ability test (see tab) may be used.

TAB

WAL

all caps → Special Wall Display for PI Products and Terms

caps - can be

This display should be arranged as a pin-up showing of the actual objects with large titles pinned on. It is not practical to try to draft it, and the objects are too large for a permanent board. Instructor points the objects out and explains their relations. The following should be shown and titled:

1. A vertical photo
2. ~~A low oblique photo~~ A low oblique photo
3. A high oblique photo
4. An uncontrolled mosaic
5. A controlled mosaic
6. ~~A target mosaic~~ An Air Target Mosaic 25M (preferably with gap)
7. An Air Target Mosaic 25MA of same area showing absence of cover)
8. " " " " 10MA " " "
9. An ~~DOFP~~ 100A Target Map " " "
10. * Typical ^{9x9" and} 9 x 18" USAF recon. photo (Preferably recent China)
11. A typical GAF Copycat print over USSR
12. The WAC area map of USSR
13. The Turban Index Map of GAF ^C cover of USSR
14. The Index of Turban Reports (Degree Square) over USSR
15. A Photo Intelligence Report

Plus any other similar material, such as French or Chinese recon. photography

TAB

All Caps → Test for P.I. Terms, Sources and Types of Photo Products

15 min.

(see tab)

This test is best given verbally with the use of the wall display, since it involves recognition of various objects. After the class has heard the speech and looked at the display, ^{The titles are removed and} they ^{students} should be asked to ^{write identifying} ~~write down~~ on a card ~~the~~ the following photo products: (Instructor holds them up or points to them.)

- (1) Oblique Photo
- (2) Vertical Photo
- (3) Mosaic (controlled or uncontrolled)
- (4) Map (It has been found that ~~students~~ ^{most} students confuse maps and mosaics)
- (5) An Air Target Mosaic
- (6) * USAF 18 x 9" ^{and 9 x 9"} recon. photo (Instructor ^{most} hold one up and ask)
- (7) A GAF 12 x 12 recon. photo ("Who took this photo?")

(Covered by speech and wall displays)

They should also be able to answer the following questions:

- (8) What does the first group of numbers on an Air Target Mosaic refer to? (The WAC area)
- (9) What does the second group of four numbers on an Air Target Mosaic refer to? (The target number within the WAC area)
- (10) What does the ~~figure~~ ^{"25"} ~~last~~ ^{last} group of numbers refer to? (Mosaic, scale)
- (11) What does ~~xxxx~~ "annotated" mean? (marked to identify objects)
- (12) What is "GX" photography? (G stands for German & X stands for Except for this we wouldn't have any photography of Russia)
- (13) What ~~does Copycat photography?~~ do you get if you order Copycat ~~GAF~~ photography? (Full-size copies of best selected German original prints)
- (14) What is the ~~Index to Turban Degree~~ Turban Index? (Index showing extent of GAF cover of USSR and index to Turban Degree Square scanning reports)
- (15) Where do you go to order photography? (Graphics Register)
- (16) Is there a Central Print Library? (No)
- (17) Who is giving this course? (D/GP)

handed in or
This test should not be scored when first given. The answers should be given and written down by the students for their notebooks with the notice that a hand-in test will be given later on the same subjects.

TAB

SCALE-FINDING PROBLEMS TEST

1 Hr

The purpose of this test is to show students the use of scale as a necessary intermediary in finding the size of objects on air photography.

The test is divided into three problems *with an instructions sheet: (See Index of Tests)*

Problem A. Using a GS 1/31680 map of Washington and an air photo, find the diameter of the Jefferson Memorial.

Problem B. Using the same map and a smaller-scale air photo, find the length of one side of the Pentagon.

Problem C. Using an Air Target Mosaic of Washington and an air photo, ~~find the~~ identify a plane taking off at Bolling Field (from a list of dimensions).

Individuals having marked difficulties might well be helped in private sessions rather than hold up the class in this problem. *Answers should be handed in before too much discussion.*

It might also be desirable to ~~improvise~~ improvise a problem showing how scale can be found when an object of known size is shown.

Note: *Place paragraph on map orientation here from Visual Orientation Test page.*

Materials required: Class sets of test packets; target mosaics; .001' scales; 5 x 8 answer cards; scopes.

TAB

PERIOD 3. INTRODUCTION TO INDUSTRIAL ANALYSIS AND ELECTRIC POWER

This first period on industry is divided into two parts, the first introducing students to a systematic method, the second teaching them the recognition features of electric power, which is basic to industrial interpretation as a whole.

The period is preceded by:

Test: Recognition Ability Test (see tab) 30 min.

* Part 1. Introduction to Industrial Analysis

Speech: Instructor explains importance of a methodical approach to industrial interpretation, and leads students through the 12-step method, using the D/GP manual. 30 min.

Texts Issued:

- (1) "How to Recognize and Analyze Industry from Air Photos," (D/GP)
- (2) "~~Basic Industrial Interpretation~~" (D/GP-AAFSAT)
Interpretation of Major Industries

* Part 2. Recognition of Electric Power

Speech: Instructor explains ^{processes} principles and recognition features of electric power generation and leads students through selected stereo pairs. Other installations shown are also explained. 1½ Hrs

Test: Borken Electric Power Station (See Index of Tests) 20 min.
(These conventional industrial P.I. tests are not described in this outline.)

Continuing Problem:

Students look over photos of Zaporoshye, USSR, for first time. These packets will be reviewed at end of each period; In this period, will note the Dnepr Dam power station. *(Students)* 10 min.

Class Materials used:

- (1) Set of 11 photos on Electric Power from 325th Recon. Wing Industrial Manual. The Borken test photo is

- (2) 5 x 8 cards
(3) Class set of -
(4) Class set of 2 ind

(Class materials, Cont'd)

among these. (Instructor uses originals and text.)

(2) ^{Class sets} ~~Packet~~ of photos ^{packets} on Zaporoshye, USSR

(2) 5 x 8 cards for test

(4) Class set of 2 industrial manuals, for permanent issue.

Wall Displays:

- (1) Hydro-Electric Power Stations
- (2) Thermal Electric Power Stations
- (3) ~~Electric~~ Substations

Instructor's Work:

Preliminary grading of Recognition Test ^{activities.}
Grading Borken Power Plant tests.

References:

In addition to the 325th Recon. Wing Industrial Manual section on Power, diagrams and photos of power stations and associated features will be found in the D/GP Industrial Reference File. The Power material in the P.I. Handbook has been largely duplicated in the wall displays for this class. The instructor should also consult the I/R for data on Zaporoshye.

Zaporoshye

TAB

1/15

copy
underlined

all caps
no underlines

Test as Level of Recognition Ability Test

30 Min.
~~25-30 min.~~

To be given initially & repeated toward end of course.

The purpose of this test is to determine the students' base level of industrial recognition ability and subsequent improvement. ~~It is designed to be a successful tool for developing or challenging the beginning~~ It also stimulates students by showing them (a) that they cannot ^{now} recognize ^{simple objects} ~~them~~, and (b) ~~that it will be possible to do so~~ ^{that} they will learn a ^{new} skill. Care must be taken not to discourage sensitive students who may be dashed by nearly complete failure.

Test consists of a single photograph of a USSR industrial district at about 1/15000, ~~and a~~ a question sheet and a transparent overlay. ~~It~~ Students are asked to mark symbols on overlay identifying installations asked for in question sheet. Questions range from very simple ("Mark "RR" over 2 rail lines", Mark "W" over a body of water") to complex ("Mark AL. over an aluminum plant."). The questions are designed to go with any one of several ~~possible~~ suitable photos selected from the Index of Instruction Materials. It is suggested that Exp. # 69 in the SE Moskva ~~set~~ ^{set} be used since it will not be otherwise used during the course. (Copy cat # 481)

After the overlays and photos are handed in, no discussion is held. Instructor ~~grades~~ ^{grades} overlays for average level, superior and below-level individuals.* Overlays are held intact and handed out again ~~to~~ ^{to} at one of last periods for students to correct themselves, unaided. The overlays are then handed in, and instructor gives verbal answers using target mosaic. Overlays are then graded for final course scores.

Material required: ^{set} photographs, overlays, question sheets; grease pencils.

average initial
* The level of ~~the~~ recognition ability is unknown. A typical score can be worked up from results of the first using class and adjusted thereafter. The same holds true for final scores.

Note: In this test, certain questions may be answered on the question sheet itself, and care must be taken to see that such marked question sheets are handed in with the overlay.

TAB

PERIOD 4. COKE, IRON AND STEEL

This period should be preceded by:

Review of Previous Subject:

receive and D/GP
Students ~~look~~ at manual illustrations of previous subject (Electric Power) and file them in their P.I. Notebooks. Instructor calls off a few recognition features. 10 min

Speech:

Instructor explains processes and recognition features of coke, iron & steel industries and leads students through photos and diagrams of such installations. Recon. photos of one of the plants listed in Class Materials below may also be used. 2 hrs

Test: *of* Herman Goering Steel Works, Hallendorf (See Index of Tests) 20 min

Continuing Problem and Review:

D/GP Manual
Students are issued illustrations of Coke, Iron & Steel to file in their P.I. notebooks, and then continue work on Zaporoshye area, picking out Coke, Iron & Steel works. Ground photos of ~~the~~ postwar renewal of operation at Zaporoshye may be passed around. Verbal review of 12-step method of analysing industry if desired. 30 min.

Class Materials Used:

- Iron & Steel
- (1) ~~Class~~ sets of photo pages ~~from Coke, Iron & Steel~~ from the 325th Recon. Wing Industrial Manual. These include the Hallendorf stereogram used for the test. (Instructor uses originals and text.)
 - (2) *Hallendorf* Question sheets and 5 x 8 cards for test.
 - (3) *Class sets of* Recon. photos of any of these ~~USA~~ Coke, Iron & Steel plants: Showa Steel Works, Anshan; Valenciennes Iron & Steel Plant, France; Dnepropetrovsk Coke, Iron & Steel Works.
 - (4) *Class sets of* Electric Power illustrations for D/GP Manual, for ~~permanent issue~~
 - (5) *Class sets of* Coke, Iron & Steel illustrations for D/GP Manual, for permanent issue.
 - (6) *Class sets of* Zaporoshye photo packets, plus ground photos for passing around. (from D/GP Industrial file)
- Wall Displays:

(1) Mining & Coke (not so hot)

Instructor's Work:

Grading Hallendorf Coke, ~~I~~ron & Steel tests

References:

In addition to the 325th Recon. Wing Industrial Manual, see Photo Industrial Study No. ~~3~~³, Coke, Iron & Steel, and material in the D/GP Industrial Reference File. Instructor should also check I/R data on Zaporoshye.

TAB

PERIOD 5. NON-FERROUS METALS AND ASSEMBLY

Note :

The material covered in this period is divided into two parts. If both are given in one period, time must be saved by using the Zaporozh'ye continuing problem photos for both tests, as indicated below. *of they are expanded into 2 periods, or one omitted, separate testing materials are available.*

* Part 1: Non-Ferrous Metals

Speech: Instructor first explains processes and recognition features of copper, lead and zinc and leads class through ~~flaw diagrams~~ photos and diagrams of these industries, stressing recognition of smelters and mines. (Photo Industrial Study No. 9, may be used) 20 min
Instructor then explains processes and recognition features of alumina-aluminum and leads class through stereo pairs of this industry. 1 hr

Test: Volkhov Alumina-Aluminum Works. (See Index of Tests) 20 min
Test.
or use Zaporozh'ye photos and Zaporozh'ye Aluminum Test (See

Class Materials ~~Maker~~ Used: *Index of Tests) to save time.*

- (1) Class set of Photo Industrial Study No. 9, Copper, Lead & Zinc. photo pages
- (2) Class sets of Light Metals ~~photos~~ from 325th Recon. Wing Industrial Manual. (Instructor uses originals and text.) and 5 x 8"
- (3) Class sets of Alumina-Aluminum Quiz packets, cards,

34p
Wall Display: ~~Alumina-Aluminum~~ *or Zaporozh'ye Aluminum Test, as desired.*

* Part 2: Assembly (Condensed version)

Speech: Instructor leads class through photos of assembly plants, either M/V or A/C or both, depending on time allocation. Discusses recognition of building type and product if visible. Recon photos of one of the plants listed below in Class Materials may be used. 30 min

Test: Students measure roof area of an assembly plant and define roof type, vents, etc. Answers discussed after cards are handed in. ~~No. There is no question sheet for this test on any one of several plants mentioned.~~ (Question sheets to be devised for various plants listed below.) *or use Zaporozh'ye photos and* 20 min

Class Materials Used: *Zaporozh'ye A/C Plant test (See Index of Tests) to save time.*

- (1) Class sets of A/V Assembly photo pages from 325th Recon Wing Industrial Manual (Instructor uses original & text)
- Class sets of
- (2) Recon photos of any of these USSR ~~assembly~~ plants:

(Period 5, Cont'd) Class Materials)

Class sets of
(3) Assembly test packets & 5x 8" cards, or Zaporoshye A/C
assembly test, as desired.

(4) Photo Industrial Study No. 5, Aircraft, if desired

* Continuing Problem & Review:

Students continue work on Zaporoshye, ~~Alumina-Aluminum~~
~~Alumina-Aluminum works, and A/C assembly works.~~
~~Note: due to shortage of time, it might be well~~
~~to use the Zaporoshye area for both tests.~~

15 min

Instructor's Work: (For whole period)

Grading ~~Volkhov~~ Alumina-Aluminum tests
Grading Assembly tests

References: (For whole period)

In addition to the 325th Recon Wing Industrial Manual
sections on Light Metals and AFV Assembly, See Photo
Industrial Studies No. 4 (Aluminum), No. 5. (Aircraft)
No. 9, (Copper, Lead & Zinc) and No. 8 (Magnesium.)
Also the ██████ Guide to Reporting of Ground Installations,
and the D/GP Industrial File. (Contains ground shots of
Zaporoshye Alumina Works under construction.)
-Aluminum

25X1C8a

TAB

PERIOD 6. PETROLEUM

This period is preceded by:

Review of Previous Subject:

~~Taskmaster~~ Students receive and look at D/GP manual illustrations of previous subject (Non-Ferrous Metals & Assembly) and file them in their P.I. notebooks. Instructor calls off a few recognition features. 10 min

Speech: Instructor explains ~~exact~~ processes and recognition features of oil fields and refineries and leads students through stereo pairs and recon photos of such installations, stressing tank types. 1½ hrs

Test: (1) Petroleum *Test*
(To be devised) (See Index of Tests) 20 min

~~Task~~ (2) "Joker" Quiz. Students are asked to identify industry shown in stereogram of Agency area. (Answer: Huerich's Brewery.) Answers are to be written on cards & handed in "straight" if possible. 5 min

Continuing Problem & Review:

There being no refinery at Zaporoshye, it may be preferable for this period to let students work out on recon. photos of one of the USSR refineries, ~~Baku~~ (See Class Materials, below). *(listed in)* 30 min

Class

Wall Materials Used:

Class sets
(1) ~~Set~~ of Oil Field *photo pages* stereograms from 325th Recon Wing Ind. Manual. (Instructor uses originals & text)

~~(2) Photo Industrial Study No. 2, Petroleum, if desired~~
Class sets of

(2) Petroleum quiz; *answer cards*

(3) Class sets of "Joker" quiz. (Stereograms & cards)

(4) Class sets of recon. photos of one or more of these USSR refineries: Gorki, Saratove, Baku, Grosny. (Grosny includes also an oil field)

Wall Displays:

Instructor's Work:

- (1) Refinery
- (2) Shell Stills

(5) Class sets of *D/GP manual illustrations of* Non-ferrous Metals and Assembly illustrations, for *D/GP Manual for permanent issue.*

Instructor's Work:

- Grading Petroleum tests
- Grading "Joker" tests

(Period 6, cont'd)

References:

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In addition to the 325th Recon Wing Industrial Manual material on oil fields, see Photo Industrial Study No. 2, Petroleum, [REDACTED], Guide to Reporting of Ground Installations, and PI Industrial Reference File. (Contains ground photo of butane spheroids at Orsk refinery) *Instructor should also consult I/R data on whichever USSR refinery is used.*

TAB

PERIOD 7. THE EXPLOSIVES INDUSTRY AND FINAL REVIEW

Note: If desired, another type of industry, such as synthetic oil or rubber, may be substituted for explosives in this period. The aim is to provide an industry for practice analysis which will add to the students' store of recognition features.

This period is preceded by:

Review of Previous Subject:

Students receive and file in their notebooks illustrations of Petroleum. Instructor calls off a few recognition features. 10 min.

Tests: (1) P.I. Terms & Sources (See tab). This is the repeat test promised earlier. 15 min.

(2) Basic Recognition Test, repeated. (See tab). Students receive back their original overlays and correct them themselves as best they can. Correct answers are discussed after overlays are handed in while students still have photos. (Use Target Mosaic) 35 min.

Speech: Instructor leads students in analysing the Chapayevsk Explosives Plant, using the 12-step method. After they have worked through a general analysis, instructor explains the distinctive features & processes of the explosives industry and ammunition loading, using Photo Industrial Study No. 6. Class may work up a practice P.I. report, instructor furnishing IR data. 2 hrs

Class Materials Used:

- (1) *class sets of original Recognition Test packets and annotated acetates; grease pencils; 5 x 8 cards.*
- (1) Class sets of photos of Chapayevsk Explosives Plant
- (2) Class sets of Photo Industrial Study No. 6, Explosives desirable
- (3) Optional; Might be ~~possible~~ to work stereo projector into the instruction in this period. *(photos of USSR explosives & ammo plants)*
- (4) *Class sets of Petroleum illustrations for D/GP Manual for permanent issue.*

Instructor's work:

Grading P.I. Terms & Sources test } Desirable to have
Grading Recognition Test overlays. } assistant do this during class.

References:

Photo Industrial Study No. 6, material in PI Industrial Register should be consulted for Chapayevsk data.

TAB

ADDITIONAL INDUSTRIAL SUBJECTS

Instructors planning periods on further industrial subjects will find a scanty but growing collection of data under the appropriate heading in the D/GP Industrial PI Reference File (Lock File B). Other general references are of course the Photo Industrial Studies 1 through 9, the 325th Recon Wing Ind. PI Manual and the [redacted] Guide to Reporting on Industrial Installations ([redacted] Aug 50) a photostat of which is in the Industrial Reference File. Following are some subject references:

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- | | |
|----------------------------------|--|
| Synthetic Oil | See chapters in 325th Recon. Wing Manual |
| Synthetic Rubber | and "Interpreting Major Industries" D/GP-AAFSAT |
| Nitrogen Industries | Photo Industrial Study No. 1 and D/GP-AAFSAT Manual above. |
| Misc. Chemical Industries | - For sulfuric Acid, see Photo Industrial Studies No. 6 and 9. Good PI report on soda ash in file. |
| Aircraft | Photo Industrial Study No. 5. <i>Good USSR photos on hand. (See Index)</i> |
| Ship-Building | " " " No. 7 |
| Misc. Assembly | Photo Industrial Study No. 5 and D/GP-AAFSAT Manual above. <i>Good USSR photos on hand. (See Index)</i> |
| Lumber & Cement | See D/GP-AAFSAT Manual and Supplement to [redacted] (in file) |
| Underground Installations | See AF 200-35, Keys to Underground Installations |
| Transportation | Some in Photo Industrial Studies No. 2 and 3; see also Record of Foreign Weapons and Equipment, Vol. 1 (GB War Office, M/I-10, 15 May, 52) |
| Industry from Ground Photographs | This very important subject is dealt with in [redacted] Lectures should include recent clandestine photography; may work into a valuable briefing course |

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Note: ~~References~~ In all the above subjects, good and preferably recent PI reports will be found to be invaluable. The "difficult" subjects of plastics and various other modern chemical developments may have to be worked up from scratch.

Note #2: Many German PI reports will be found in the D/GP file. Bistrust them until carefully checked.

TAB