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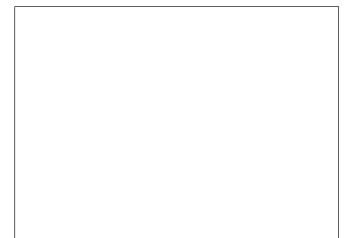
128/66

TECHNICAL PROPOSAL 66-83

Copy 1

MICRODENSITOMETER SUPPORT

STATINTL



The following is the suggested modification to the proposal, "Microdensitometer Support" submitted by [redacted] Changes STATINTL to Section 3 will also result from these modifications, but the proposed contractor can redetermine that section.

SECTION 2

PROPOSED PROGRAM

The program will be carried out in two Phases with four Sub-phases under Phase II. Generally speaking, Phase I comprises a familiarization, test, training and calibration period whereas Phase II includes specific applications in several areas.

PHASE I: INITIAL PHASE

This Phase of the program will consist of the necessary familiarization with equipment, on-site and in-plant training, and equipment validation. These procedures will be largely of a calibration and diagnostic nature. It is proposed that the following be included in Phase I:

1. Basic Operator training at the contractor's plant, consisting of a two-week period for two operators.
2. Equipment Familiarization and test at customer's facility and at [redacted] This step will include test runs, diagnostic measurements, overarm stability tests, etc., with data to be gathered on site and reduced at the contractor's plant. A test report will be issued.

PHASE II: PROBLEM PHASE

Phase II will include the provision of solutions and procedures which are specifically oriented toward operational problems. This Phase will include four Sub-phases, defined below:

1. Sub-phase A

This step will consist of the establishment of detailed calibration, mensuration, and diagnostic procedures, suitably defined and published. Operator aids in the form of nomographs, charts, etc., will be provided. Basic color techniques will be devised, with particular emphasis on balance and aperture size for various materials. Training will be provided where required. Standard practice handbooks, forms design, logging recommendations, and recommendations for quality control and maintenance programs will also be provided.

Procedures requiring computer treatment will be defined to the point where programming could begin and test data for computer program analysis will be generated.

2. Sub-phase B

This Sub-phase will include the generation of reports giving detailed procedural information for programming the following.

- a. Modulation transfer function (MTF) generation, utilizing estimating filter techniques.
- b. A general "one-shot" MTF technique.
- c. Noise study procedures, including statistical analysis, auto-correlation analysis, power spectral density computation, etc., including trend correction, window selection, and other techniques designed to improve confidence in results. A running auto-correlation procedure and a piece-wise p.s.d. estimator will be provided also.
- d. Table generation and data conversion procedures for effective exposure and generation synthesis.
- e. Comparison techniques, including mean square difference, cross-correlation, and other methods.
- f. Mensuration data handling procedures.

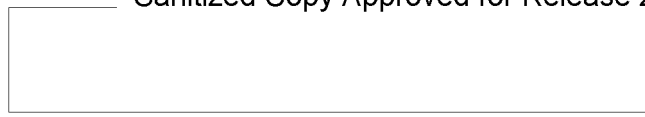
3. Sub-phase C

This Sub-phase will be devoted to the preparation of problem solutions and procedural recommendations specifically related to the exploitation aspects of microdensitometry and to the problems of a system diagnostic nature. Training will be included as required and reports will be generated giving step by step procedures for diagnosing exploitation system anomalies. Procedures for determining confidence factors in the diagnosis will also be established. Application of the microdensitometer to display techniques including density contouring will be considered, with particular emphasis on the detailed study of small scale objects.

4. Sub-phase D

This Sub-phase will consist of investigations into color microdensitometry. Detailed procedures for tri-color operations will be published. Advanced studies of color microdensitometry will be conducted with emphasis on computerized data treatment. Training will be provided as required.

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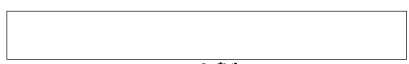


CONFIDENTIAL

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May 2, 1966

STATINTL



P. O. Box 8031
Southwest Station
Washington, D.C. 20024

STATINTL



I am pleased to submit four copies of our unsolicited sales proposal number 66-83 for your consideration. This proposal deals with the establishing of operational techniques and applications for the Type 1032 T Trichromatic Microdensitometer.

STATINTL

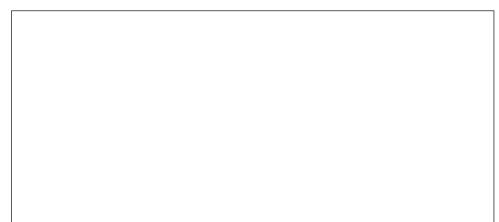
Our CPFF proposal contemplates a twelve-month program at a total estimated cost and fixed fee of A copy of our cost breakdown is included.

STATINTL

I trust this meets all of your requirements. If you have any questions, please contact me.

STATINTL

Sincerely,



Director of Contracts

REW/cjb

Encls.

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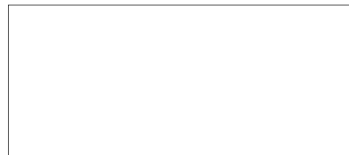
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The data set forth herein is submitted as a technical proposal and shall not be disclosed outside the Government or be duplicated, used or disclosed in whole or in part for any purpose other than to evaluate the proposal; provided, that if a contract is awarded to this offeror as a result of or in connection with the submission of such data, the Government shall have the right to duplicate, use, or disclose this data to the extent provided in the contract. This restriction does not limit the Government's right to use information contained in such data if it is obtained from another source.

**UNSOLICITED
TECHNICAL PROPOSAL**

**MICRODENSITOMETER
SUPPORT**



STATINTL

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SECTION I
INTRODUCTION

SECTION I
INTRODUCTION

This proposal describes a program to provide assistance in establishing operational techniques and applications for the Type 1032T trichromatic microdensitometer. This assistance will apply to testing of equipment, system activation, specific problem solution, procedural development, definition of techniques for color microdensitometry, and the establishment of standard operating methods and documentation. The services to be provided will generally be considered complete at the point of computer programming, if such is required, although computer oriented services will be supplied upon request. Four problem areas are proposed for inclusion, with the final group left undefined. The accomplishment of the proposed program will provide the customer with an efficient operating system designed to accommodate a wide class of problems of specific interest.

STATINTL

It should be noted that procedures for color microdensitometry are not currently well defined. Consequently, techniques must be developed which will contribute best to the customer's mission. For this reason, initial emphasis will be placed on heterochromatic analysis with development of data processing techniques for color deferred until Sub-phase II-B.

SECTION 2
PROPOSED PROGRAM

SECTION 2
PROPOSED PROGRAM

The program will be carried out in two Phases with four Sub-phases under Phase II. Generally speaking, Phase I comprises a familiarization, test, training and calibration period whereas Phase II includes specific applications in several areas.

PHASE I: INITIAL PHASE

This Phase of the program will consist of the necessary familiarization with equipment, on-site and in-plant training, equipment validation and the establishment of basic procedures. These procedures will be largely of a calibration and diagnostic nature. It is proposed that the following be included in Phase I:

1. Basic Operator training at the contractor's plant, consisting of a two-week period for two operators. STATINTL

2. Equipment Familiarization and test at customer's facility. This step will include test runs, diagnostic measurements, overarm stability tests, etc., with data to be gathered on site and reduced at the contractor's plant. A test report will be issued.

3. Establishment of basic calibration procedures and guidelines, both for black and white and color materials. *guided by* STATINTL

PHASE II: PROBLEM PHASE

Phase II will include the provision of solutions and procedures which are specifically oriented toward operational problems. This Phase will include four Sub-phases, defined below:

OK 1. Sub-phase A

This step will consist of the establishment of detailed calibration, mensuration, and diagnostic procedures, suitable defined and published. Operator aids in the form of nomograms, charts, etc., will be provided. Basic color techniques will be devised, with particular emphasis on balance and aperture size for various materials. Training will be provided where required.

Procedures requiring computer treatment will be defined to the point where programming could begin. *(this is Systems analysis)*

2. Sub-phase B

This Sub-phase will include the generation of mathematical and procedural information which will include the following specific problem areas:

- a. Modulation transfer function (MTF) generation, utilizing estimating filter techniques. *documentation*
- b. A general "one-shot" MTF technique.
- c. Noise study procedures, including statistical analysis, autocorrelation analysis, power spectral density computation, etc., including trend correction, window selection, and other techniques designed to improve confidence in results. A running autocorrelation procedure and a piece-wise p. s. d. estimator will be provided also. *under Image Analysis Program*
- d. Table generation and data conversion procedures for effective exposure and generation synthesis. *documentation*
- e. Comparison techniques, including mean square difference, cross-correlation, and other methods. *documentation or report*
- f. Mensuration data handling procedures. *on multiple emulsions*
- ~~g. Training as required. (ambiguous)~~
- h. Publication of standard practice handbooks, forms design, logging recommendations, and recommendations for quality control and maintenance programs. *(same as A)*
- i. Advanced study of color microdensitometry with emphasis on computerized data treatment. *OK but need more detail*
- j. Provision of test data for computer program analysis. *OK*

3. Sub-phase C

This Sub-phase will be devoted to the preparation of problem solutions and procedural recommendations specifically related to the exploitation

aspects of microdensitometry and to problems of a system diagnostic nature. Also, detailed procedures for tricolor operations will be published. Application of the microdensitometer to display techniques will be considered, with particular emphasis on the detailed study of small scale objects.

4. Sub-phase D

This Sub-phase will be left open for advanced problem study as directed by the customer.

SECTION 3
PROGRAM SCHEDULE

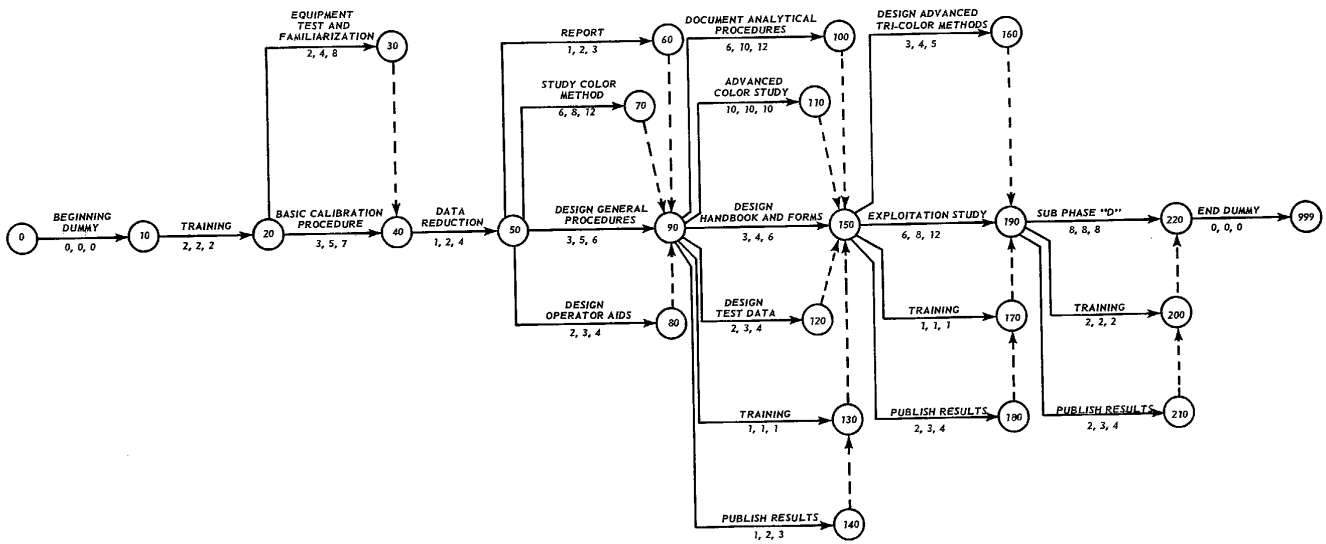
SECTION 3
PROGRAM SCHEDULE

A twelve month program is proposed, exclusive of any extension of Sub-phase D, Phase II. It is recommended that the contract include provision for establishment of newly defined work areas and/or training as required. A PERT diagram and analysis thereof is attached. The program schedule proposed is also included.

PROGRAM SCHEDULE

ACTIVITY	MONTHS												MAN MONTHS		
	1	2	3	4	5	6	7	8	9	10	11	12	ENGR	TECH	
	PHASE I	██████████												4	2
PHASE II															
A			██████████										5	3	
B			██											6	5
C								████████████████					5	3	
D											██████████		3	2	
													TOTAL	23	15

6



Pert Network -- Microdensitometer Support

NOV-815 PERT
 NETWORK TITLE
 FILE NAME

MICRODIFFERENTIATOR SUPPORT
 WIDEN-001

WORK DAYS PER WEEK ARE 5.0

PAGE 001
 RUN DATE 16 APR 66
 ESTIMATE DATE 01 JUN 66

REPORT BY - FRONT CONNECTOR, THEN BACK CONNECTOR

ACTIVITY TITLE	FRONT CONN	BACK CONN	ACT TIME	EARLY (TE)	LATE (TL)	SLACK	EXPECTED-DATES START	EXPECTED-DATES END	REQUIRED-DATES START	REQUIRED-DATES END	SCHED DATE	PCT CD
BEGINNING DUMMY	000000000	0010	0.0	0.0	0.0	0.0	01JUN66	01JUN66	01JUN66	01JUN66	01JUN66	
TRAINING	0010	0020	2.0	2.0	2.0	0.0	01JUN66	15JUN66	01JUN66	15JUN66		
EQUIP TEST AND FAMILIARIZATION	0020	0030	4.3	6.3	7.0	0.7	15JUN66	14JUL66	20JUN66	20JUL66		
BASIC CALIBRATION PROCEDURE	0020	0040	5.0	7.0	7.0	0.0	15JUN66	20JUL66	15JUN66	20JUL66		
DUMMY	0030	0040	0.0	6.3	7.0	0.7	14JUL66	14JUL66	20JUL66	20JUL66		
DATA REDUCTION	0040	0050	2.2	9.2	9.2	0.0	20JUL66	03AUG66	20JUL66	03AUG66		
REPORT	0050	0060	2.0	11.2	17.5	6.3	03AUG66	17AUG66	16SEP66	30SEP66		
STUDY COLOR METHODS	0050	0070	8.3	17.5	17.5	0.0	03AUG66	30SEP66	03AUG66	30SEP66		
DESIGN OPERATOR AIDS	0050	0080	3.0	12.2	17.5	5.3	03AUG66	24AUG66	09SEP66	30SEP66		
DESIGN GENERAL PROCEDURES	0050	0090	4.8	14.0	17.5	3.5	03AUG66	06SEP66	29AUG66	30SEP66		
DUMMY	0060	0090	0.0	11.2	17.5	6.3	17AUG66	17AUG66	30SEP66	30SEP66		
DUMMY	0070	0090	0.0	17.5	17.5	0.0	30SEP66	30SEP66	30SEP66	30SEP66		
DUMMY	0080	0090	0.0	12.2	17.5	5.3	24AUG66	24AUG66	30SEP66	30SEP66		
DOCUMENT ANALYTICAL PROCEDURES	0080	0100	8.7	27.2	27.5	0.3	30SEP66	07DEC66	04OCT66	09DEC66		
ADVANCED COLOR STUDY	0090	0110	10.0	27.5	27.5	0.0	30SEP66	09DEC66	30SEP66	09DEC66		
DESIGN TEST DATA	0090	0120	3.0	20.5	27.5	7.0	30SEP66	21OCT66	13NOV66	09DEC66		
TRAINING	0090	0130	1.0	18.5	27.5	9.0	30SEP66	07OCT66	02DEC66	09DEC66		
PUBLISH RESULTS	0090	0140	2.0	19.5	27.5	8.0	30SEP66	14OCT66	25NOV66	09DEC66		
DESIGN HANDBOOK AND FORMS	0090	0150	4.2	21.7	27.5	5.8	30SEP66	31OCT66	10NOV66	09DEC66		
DUMMY	0100	0150	0.0	27.2	27.5	0.3	07DEC66	07DEC66	09DEC66	09DEC66		
DUMMY	0110	0150	0.0	27.5	27.5	0.0	09DEC66	09DEC66	09DEC66	09DEC66		
DUMMY	0120	0150	0.0	20.5	27.5	7.0	21OCT66	21OCT66	09DEC66	09DEC66		
DUMMY	0130	0150	0.0	19.5	27.5	8.0	14OCT66	14OCT66	09DEC66	09DEC66		
DUMMY	0140	0130	0.0	19.5	27.5	8.0	14OCT66	14OCT66	09DEC66	09DEC66		
DESIGN ADVANCED TBI-COLOR NETS	0150	0160	4.0	31.5	35.8	4.3	09DEC66	06JAN67	10JAN67	07FEB67		
TRAINING	0150	0170	1.0	28.5	35.8	7.3	09DEC66	16DEC66	31JAN67	07FEB67		

NCR-315 PERT
NETWORK TITLE
FILE NAME

MICRODENSITOMETER SUPPORT
MIDEN 001

WORK DAYS PER WEEK ARE 5.0

PAGE 002
RUN DATE 16 APR 66
ESTIMATE DATE 01 JUN 66

REPORT BY - FRONT CONNECTOR, THEN BACK CONNECTOR

ACTIVITY TITLE	FRONT CONN	BACK CONN	ACT TIME	EARLY (TE)	LATE (TL)	SLACK	EXPECTED-DATES START END	REQUIRED-DATES START END	SCHED DATE	PCT CD
PUBLISH RESULTS	0150	0180	3.0	30.5	35.8	5.3	09DEC66 30DEC66	17JAN67 07FEB67		
EXPLOITATION STUDY	0150	0190	3.3	35.8	35.8	0.0	09DEC66 07FEB67	09DEC66 07FEB67		
DUMMY	0160	0190	0.0	31.5	35.8	4.3	06JAN67 06JAN67	07FEB67 07FEB67		
DUMMY	0170	0190	0.0	30.5	35.8	5.3	30DEC66 30DEC66	07FEB67 07FEB67		
DUMMY	0180	0170	0.0	30.5	35.8	5.3	30DEC66 30DEC66	07FEB67 07FEB67		
TRAINING	0190	0200	2.0	37.8	43.8	6.0	07FEB67 21FEB67	21MAR67 04APR67		
PUBLISH RESULTS	0190	0210	3.0	38.8	43.8	5.0	07FEB67 28FEB67	14MAR67 04APR67		
SUB PHASE (D)	0190	0220	3.0	43.8	43.8	0.0	07FEB67 04APR67	07FEB67 04APR67		
DUMMY	0200	0220	0.0	38.8	43.8	5.0	28FEB67 28FEB67	04APR67 04APR67		
DUMMY	0210	0200	0.0	38.8	43.8	5.0	28FEB67 28FEB67	04APR67 04APR67		
END DUMMY	0220	0999	0.0	43.8	43.8	0.0	04APR67 04APR67	04APR67 04APR67		

NCR-315 PERT
NETWORK TITLE
FILE NAME

MICRODENSITOMETER SUPPORT
MICDEN 001

WORK DAYS PER WEEK ARE 5.0

PAGE 001
RUN DATE 16 APR 66
ESTIMATE DATE 01 JUN 66

REPORT BY - CRITICAL PATH (LEAST SLACK)

ACTIVITY TITLE	FRONT CONN	BACK CONN	ACT TIME	EARLY (TE)	LATE (TL)	SLACK	EXPECTED-DATES START END	REQUIRED-DATES START END	SCHED DATE	PCT CD
BEGINNING DUMMY	0000000000	0010	0.0	0.0	0.0	0.0	01JUN66 01JUN66	01JUN66 01JUN66	01JUN66	66B
TRAINING	0010	0020	2.0	2.0	2.0	0.0	01JUN66 15JUN66	01JUN66 15JUN66		
BASIC CALIBRATION PROCEDURE	0020	0040	5.0	7.0	7.0	0.0	15JUN66 20JUL66	15JUN66 20JUL66		
DATA REDUCTION	0040	0050	2.2	9.2	9.2	0.0	20JUL66 03AUG66	20JUL66 03AUG66		
STUDY COLOR METHODS	0050	0070	8.3	17.5	17.5	0.0	03AUG66 30SEP66	03AUG66 30SEP66		
DUMMY	0070	0090	0.0	17.5	17.5	0.0	30SEP66 30SEP66	30SEP66 30SEP66		
ADVANCED COLOR STUDY	0090	0110	10.0	27.5	27.5	0.0	30SEP66 09DEC66	30SEP66 09DEC66		
DUMMY	0110	0150	0.0	27.5	27.5	0.0	09DEC66 09DEC66	09DEC66 09DEC66		
EXPLOITATION STUDY	0150	0190	8.3	35.8	35.8	0.0	09DEC66 07FEB67	09DEC66 07FEB67		
SUB PHASE (D)	0190	0220	8.0	43.8	43.8	0.0	07FEB67 04APR67	07FEB67 04APR67		
END DUMMY	0220	0999	0.0	43.8	43.8	0.0	04APR67 04APR67	04APR67 04APR67		
DOCUMENT ANALYTICAL PROCEDURES	0090	0100	9.7	27.2	27.5	0.3	30SEP66 07DEC66	04OCT66 09DEC66		
DUMMY	0100	0150	0.0	27.2	27.5	0.3	07DEC66 07DEC66	09DEC66 09DEC66		
EQUIP TEST AND FAMILIARIZATION	0020	0030	4.3	6.3	7.0	0.7	15JUN66 14JUL66	20JUN66 20JUL66		
DUMMY	0030	0040	0.0	6.3	7.0	0.7	14JUL66 14JUL66	20JUL66 20JUL66		
DESIGN GENERAL PROCEDURES	0050	0090	4.8	14.0	17.5	3.5	03AUG66 06SEP66	29AUG66 30SEP66		
DESIGN ADVANCED TRI-COLOR METH	0150	0160	4.0	31.5	35.8	4.3	09DEC66 06JAN67	10JAN67 07FEB67		
DUMMY	0160	0190	0.0	31.5	35.8	4.3	06JAN67 06JAN67	07FEB67 07FEB67		
PUBLISH RESULTS	0190	0210	3.0	38.8	43.8	5.0	07FEB67 28FEB67	14MAR67 04APR67		
DUMMY	0200	0220	0.0	38.8	43.8	5.0	28FEB67 28FEB67	04APR67 04APR67		
DUMMY	0210	0200	0.0	38.8	43.8	5.0	28FEB67 28FEB67	04APR67 04APR67		
DESIGN OPERATOR AIDS	0050	0080	3.0	12.2	17.5	5.3	03AUG66 24AUG66	09SEP66 30SEP66		
DUMMY	0080	0090	0.0	12.2	17.5	5.3	24AUG66 24AUG66	30SEP66 30SEP66		
PUBLISH RESULTS	0150	0180	3.0	30.5	35.8	5.3	09DEC66 30DEC66	17JAN67 07FEB67		
DUMMY	0170	0190	0.0	30.5	35.8	5.3	30DEC66 30DEC66	07FEB67 07FEB67		
DUMMY	0180	0170	0.0	30.5	35.8	5.3	30DEC66 30DEC66	07FEB67 07FEB67		

NCR-315 PERT
NETWORK TITLE
FILE NAME

MICRODENSITOMETER SUPPORT
MICDEN 001

WORK DAYS PER WEEK ARE 5.0

PAGE 002
RUN DATE 16 APR 66
ESTIMATE DATE 01 JUN 66

REPORT BY - CRITICAL PATH (LEAST SLACK)

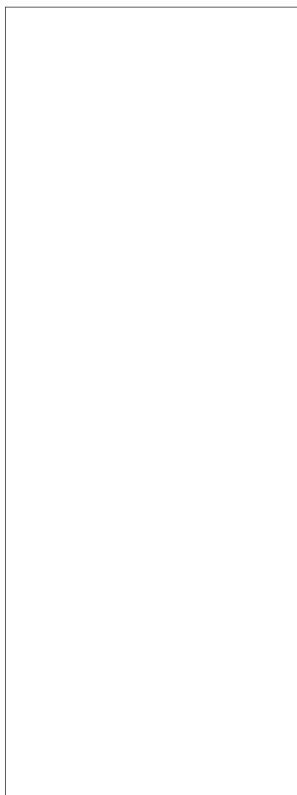
ACTIVITY TITLE	FRONT CONN	BACK CONN	ACT TIME	EARLY (TE)	LATE (TL)	SLACK	EXPECTED-DATES START	END	REQUIRED-DATES START	END	SCHED DATE	PCT CD
DESIGN HANDBOOK AND FORMS	0090	0150	4.2	21.7	27.5	5.8	30SEP66	31OCT66	10NOV66	09DEC66		
TRAINING	0190	0200	2.0	37.8	43.8	6.0	07FEB67	21FEB67	21MAR67	04APR67		
REPORT	0050	0060	2.0	11.2	17.5	6.3	03AUG66	17AUG66	16SEP66	30SEP66		
DUMMY	0060	0090	0.0	11.2	17.5	6.3	17AUG66	17AUG66	30SEP66	30SEP66		
DESIGN TEST DATA	0090	0120	3.0	20.5	27.5	7.0	30SEP66	21OCT66	18NOV66	09DEC66		
DUMMY	0120	0150	0.0	20.5	27.5	7.0	21OCT66	21OCT66	09DEC66	09DEC66		
TRAINING	0150	0170	1.0	28.5	35.8	7.3	09DEC66	16DEC66	31JAN67	07FEB67		
PUBLISH RESULTS	0090	0140	2.0	19.5	27.5	8.0	30SEP66	14OCT66	25NOV66	09DEC66		
DUMMY	0130	0150	0.0	19.5	27.5	8.0	14OCT66	14OCT66	09DEC66	09DEC66		
DUMMY	0140	0130	0.0	19.5	27.5	8.0	14OCT66	14OCT66	09DEC66	09DEC66		
TRAINING	0090	0130	1.0	18.5	27.5	9.0	30SEP66	07OCT66	02DEC66	09DEC66		

SECTION 4
PERSONNEL QUALIFICATIONS

SECTION 4
PERSONNEL QUALIFICATIONS

This section of the proposal includes the resumes of personnel available to devote their capability to this program for its successful conclusion. Specific assignments as envisioned at this time are set forth in subparagraph 2 here below.

1. Education, background, accomplishments, and other pertinent information concerning personnel available to be assigned to this project is included in the resumes made a part of this section.



Executive Engineer	519 hours
Project Engineer	519 hours
Project Engineer	519 hours
Project Engineer/Physicist	519 hours
Engineer/Photoscientist	346 hours
Project Engineer/Physicist	692 hours
Photoscientist	173 hours
Programmer/Mathematician	692 hours
Senior Photographic Technician	692 hours
Senior Photographic Technician	692 hours
Senior Electro-Optical Technician	865 hours
Senior Electro-Optical Technician	346 hours
Technical Editor	100 hours
Technical Illustrator	100 hours
Publication Clerks	300 hours

2. We do not anticipate a requirement for additional personnel to perform the proposed task.

Page Denied

Next 9 Page(s) In Document Denied

SECTION 5
FACILITIES AND CAPABILITIES

SECTION 5
FACILITIES AND CAPABILITIES

STATINTL The facilities at [] have been systematically designed so as to
STATINTL assure the "in-house" availability of all equipment which is necessary to pursue applied
research programs involving theoretical study, laboratory analysis, and design and
fabrication of prototypes, if necessary. The company's facilities are located at 7500
[] These facilities comprise sixty-thousand square feet
of floor area housed principally in two (2) buildings. A TOP SECRET clearance has
been granted to the company for these facilities.

The company's facilities are oriented towards work in the areas of photography, electronics, optics, mechanics, and combinations of these fields. The companies facilities include a photoscience laboratory, computational facilities, electronics laboratory, optics laboratory and machine shop. Within this complex there are some items that deserve specific mention since their availability will contribute specifically to this program. They are,

A complex of five class IV Vertical Laminar Flow clean rooms capable of removing 99.97 percent of all particles larger than 0.3 microns. These rooms are set up for total dark operation.

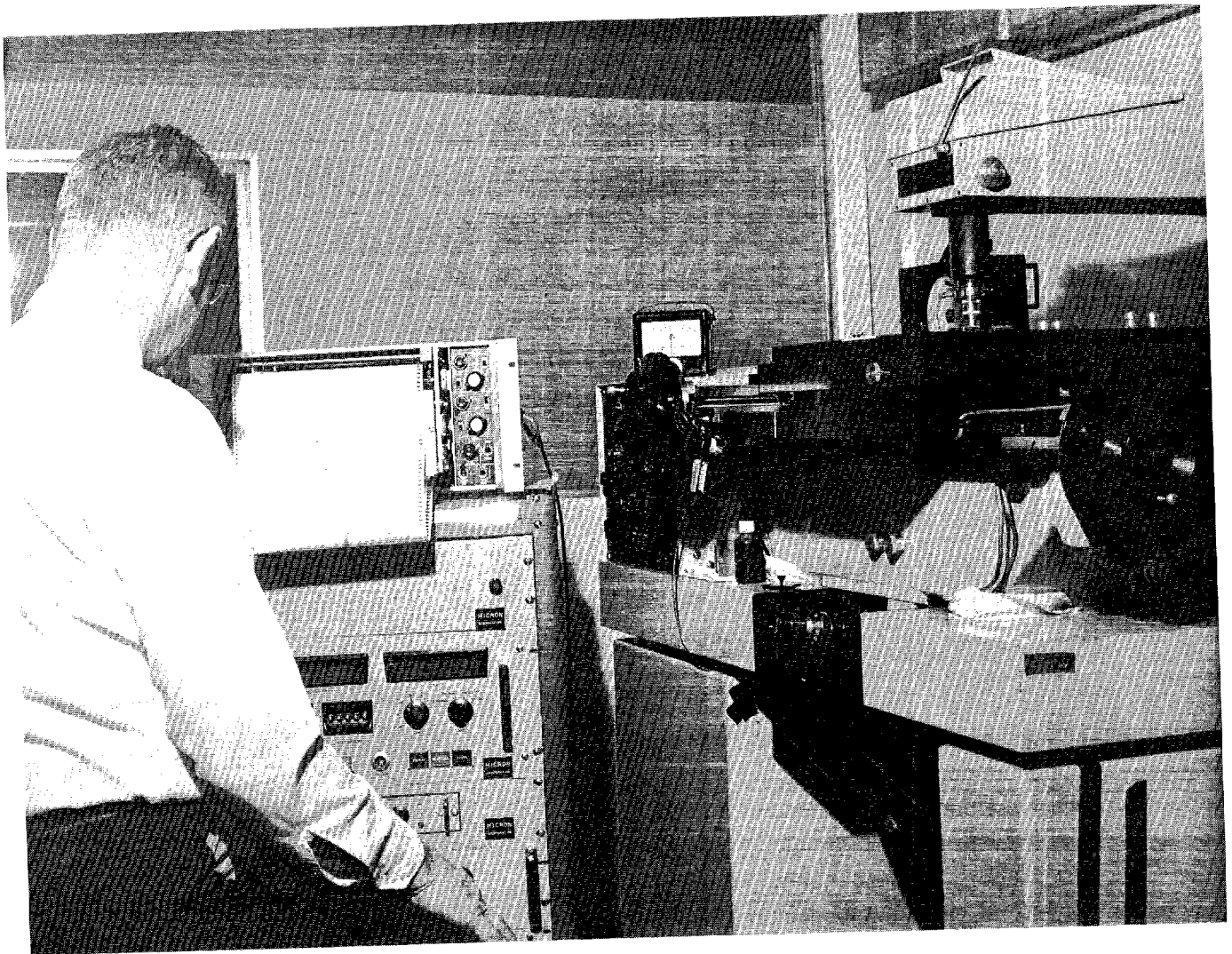
Two Micro-Analyzers which are routinely used for analytical target and resolution read out down to one micron. These instruments include the capability of continuously recording the analog output and Digitizers for digitizing the analog output.

We have two complete digital computer facilities, namely, an IBM 1620 and a IBM 360/40 System. We use the 1620 for the running of scientific problems and for basic preparation and shakedown of major programs. The 360 is presently used as an information retrieval device.

Our plans are that the 1620 will be replaced by an NCR-315 within the next sixty days.

We have complete Engineering Design and Model Shop facilities. Our Engineering Design facility is manned by 2 Senior Designers, 3 Designers, and 4 Draftsmen. Our Model Shop employs 6 full time model makers. In view of our specialty of reconnaissance all of these people are imminently qualified in the sciences and technologies which surround our area of specialty.

More complete descriptions of a representative sampling of our facilities is included in the following pages.



MICRO ANALYZERS

Two analyzers are located in absolute vertical flow clean room areas. The analyzers are programmable for random scanning. Output in either density or transmittance is digitized or transmitted directly into a computer. Scan speeds can be varied from 25 microns/minute to 25 millimeters per minute. Areas as small as one micron in diameter can be analyzed with densities above 3. Slits and other aperture shapes are also interchangeable. Roll or cut film may be analyzed. Frequency response of logarithmic amplifiers of over 3 KC permits scanning of extremely small areas at relatively high speed. Mensuration precision while scanning is better than .3 microns. Over 50 lens systems are available at to permit a highly versatile analysis system with these analyzers.

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PHOTOSCIENCE LABORATORY

STATINTL [redacted] photographic laboratories cover over 7,000 square feet of floor space. The entire area is under ridged temperature and humidity control. Temperature is maintained at $70^{\circ}\text{F} \pm 2^{\circ}\text{F}$ and humidity at $50\% \pm 5\%$ RH. All air entering the laboratory area is filtered to remove dust and dirt particles larger than 5 microns.

The laboratory complex includes black and white continuous processing rooms, black and white printing rooms, studio areas serving both black and white and color requirements, color processing and printing rooms, a photographic chemistry laboratory, a chemical mixing area, and a fully equipped sensitometric testing laboratory. In addition to these specially equipped and constructed facilities, there are additional darkroom areas available for use in research and development activities and other general photographic applications.

STATINTL All continuous black and white aerial film processing is handled with the three [redacted] Versamat processors installed at [redacted] Ridged quality control is maintained over these machines through sensitometric evaluation and chemical analysis and control. Color film processing is accomplished with the use of the Zeiss FE 120 Processor. Printing for both black and white, and color is accomplished using printers manufactured by [redacted]

STATINTL Also, [redacted] has fabricated and modified existing equipment for use in high resolution printing. STATINTL

STATINTL [redacted] sensitometric laboratory includes a [redacted] Processor, an
STATINTL [redacted] Model 1B Sensitometer, a [redacted] Duplex Densitometer, and [redacted]

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TD 100 and 102 Densitometers. In addition, [] TD 102 Densitometer that has been coupled to a digital display and an IBM Summary Punch. Density values read with this equipment are automatically printed and punched on IBM cards which may then be fed directly into the IBM 1620 Computer for automatic sensitometric evaluation.

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In addition to the laboratory areas already described, [] maintains five [] clean rooms. These rooms have removed 99.97 per cent of all particles larger than 0.3 microns. These rooms are set up for total dark operation. Because of the nature of this area, it lends itself to the fabrication of image standards and image evaluation. Two pieces of equipment contained in this laboratory, and unique

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to our effort in the sensitometric and image evaluation field, are the [] Micro-Analyzer, and the [] Model 1248 Digitizer. Both of these pieces of equipment were developed by the company and have made a fundamental breakthrough in the art of photometric and sensitometric target analysis for the evaluation of photographic recording emulsions and camera lens performance.

The [] Micro-Analyzer is a highly accurate recording microdensitometer. It has the ability to automatically scan an area as large as 8 x 10 inches. The instrument has the capability to read at any point in time the density of an area one (1) micron in diameter to values of density higher than 4.0 if necessary. A chart recorder is supplied for continuously recording the analog output of the instrument which is, in fact, the density of the material scanned. The [] Model 1248 Digitizer is used for digitizing the analog output. The digitizer displays the density in digital form and utilizes a paper tape punch to permanently record the digitized data. In this manner, data from the Micro-Analyzer are reduced directly to a form that is

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acceptable for computer input; and thus further mathematical analysis. In short, because of these two pieces of equipment, the company has the ability to evaluate over large areas the sensitometric characteristics of photographic recording emulsions to an area sensitivity of one micron and reduce the evaluation to a quantitative number.

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also has available two Step and Repeat Printers.

These extremely high precision instruments are used to produce resolution targets and micro step wedges.

PHOTOGRAPHIC CHEMISTRY LABORATORY

STATINTL [] analytical laboratory facilities are fully equipped and
staffed with the trained personnel to carry out chemical research programs in the
major areas of the photographic process. This laboratory has investigated optical
sensitizing dyes for high resolution emulsions, both soluble and insoluble aromatic
overcoatings to be used to protect image standards, qualitative and quantitative
analysis of complex developer formulas, conventional chemical process control
techniques, formulation of unconventional specialized developer formula aimed at
fine grain and high contrast photographic response, and the formulation and use of
color coupler developer systems.

STATINTL The laboratory is equipped with a [] DU-2 Spectrophotometer, an STATINTL
STATINTL [] centrifuge, an [] analytical chain balance, a constant tempera-
STATINTL ture water bath, a [] Model 76 pH meter, several mechanical stirrers, a full
complement of laboratory glassware, and an adequate supply of chemical reagents.
Furthermore, the laboratory is equipped to carryout elution analyses, gravimetric
analyses, titrimetric analyses, and spectral analyses.



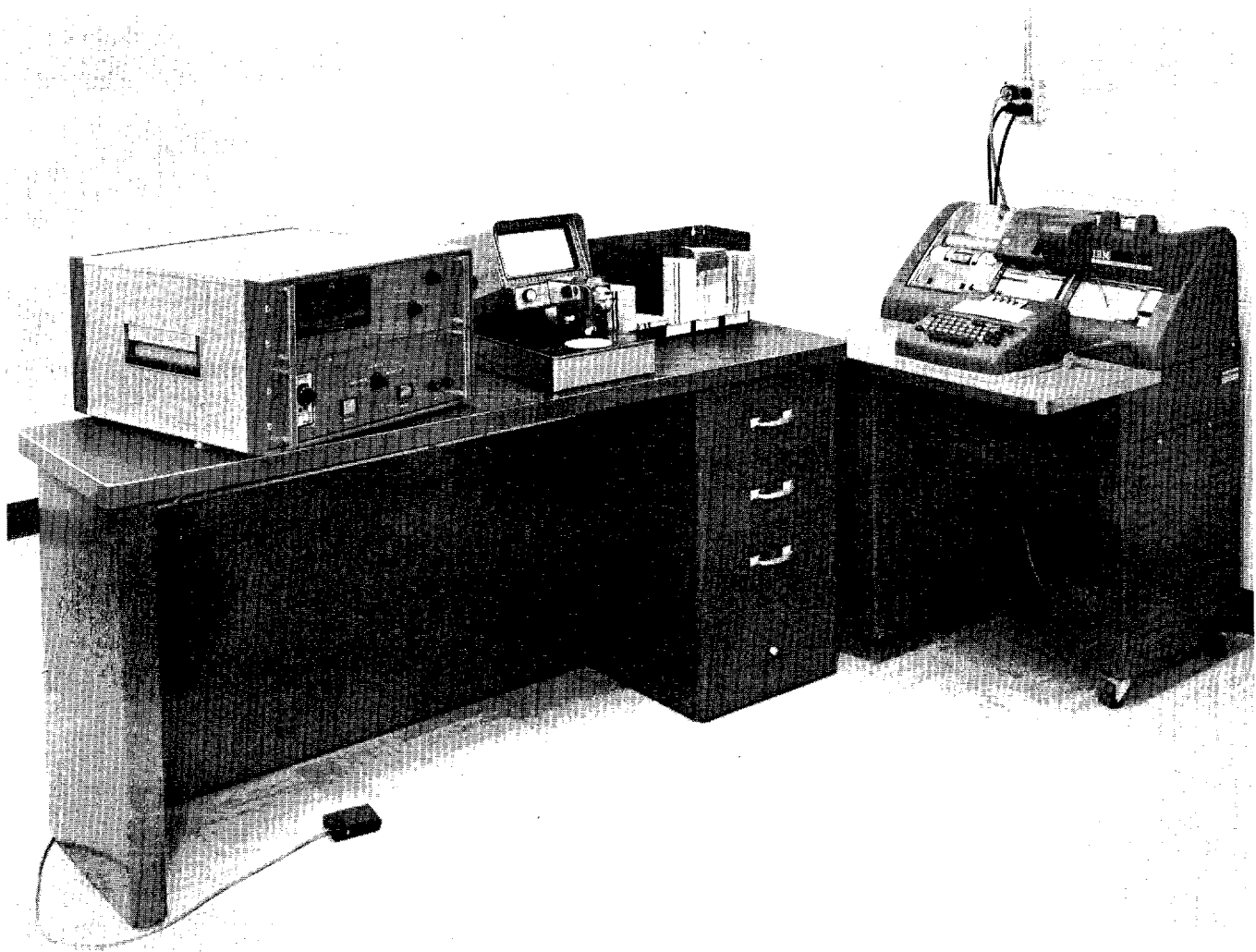
IBM 360/40 COMPUTER SYSTEM

A general purpose medium scale system, the IBM 360 computer is designed for scientific, commercial, communications and control applications. The equipment includes a 2040 Main Processor with 65,536 Bytes of memory, 1442 Card-Read Punch, 1443 Printer, 1052 Printer - Keyboard console two 2311 disc storage units each capable of storing over 7 million digits of information. A 1050 Communications Console complete with Data-Sets is used for debugging and testing Teleprocessing programs. Early in 1966, a 2321 Data Cell Drive will be added to the system.



IBM 1620 COMPUTER SYSTEM

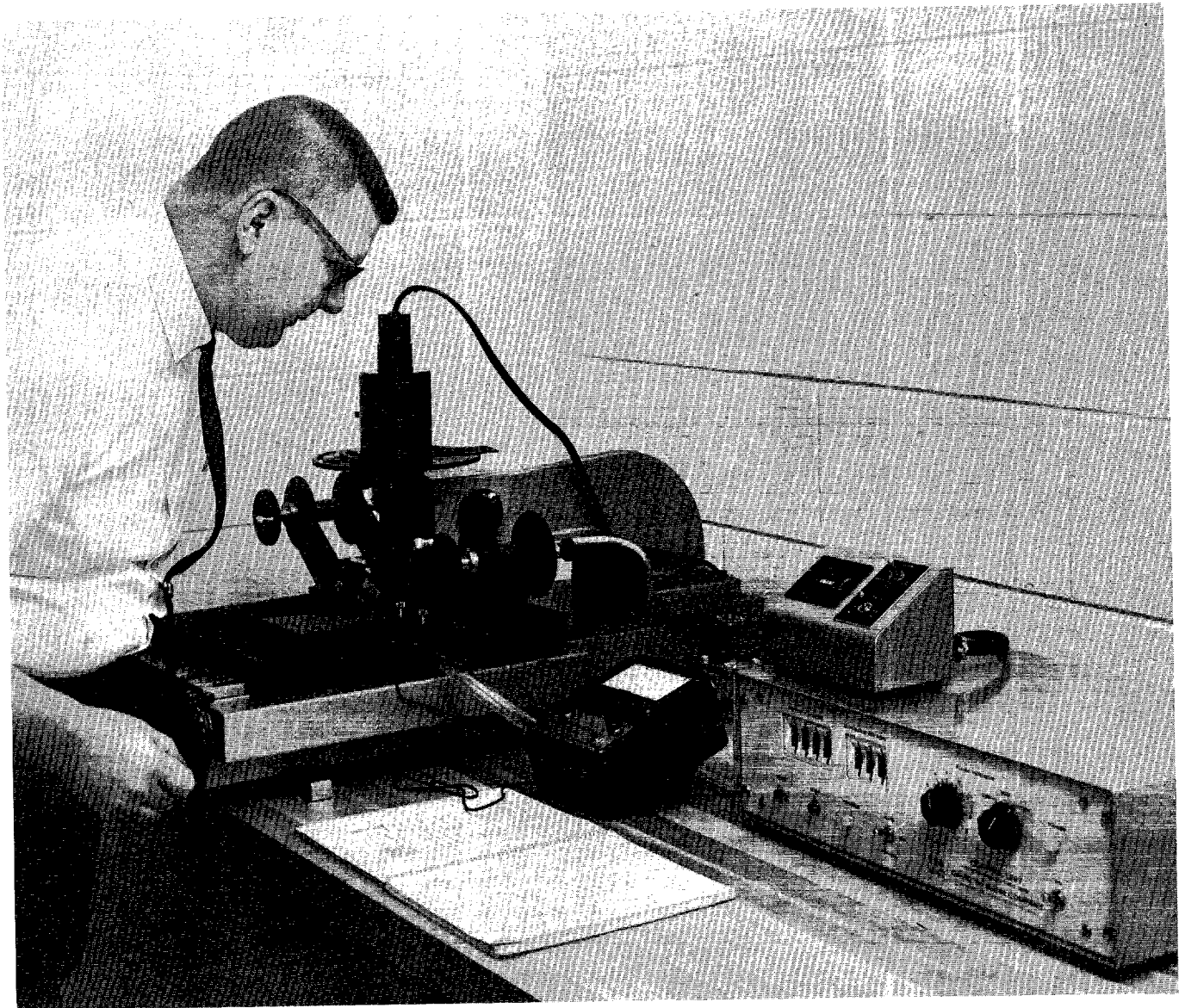
A small scale, scientific-engineering system, the IBM 1620 computer is used on an open-shop basis for the solution of scientific-engineering and statistical problems. The equipment includes a 1620 Model I computer with 40,000 digits of memory, 1622 Card-Read Punch, 1443 Printer, 110 Characters/second Teletype Paper Tape reader, and 110 Characters/second Teletype Paper Tape Punch.



DIGITIZED DENSITOMETER

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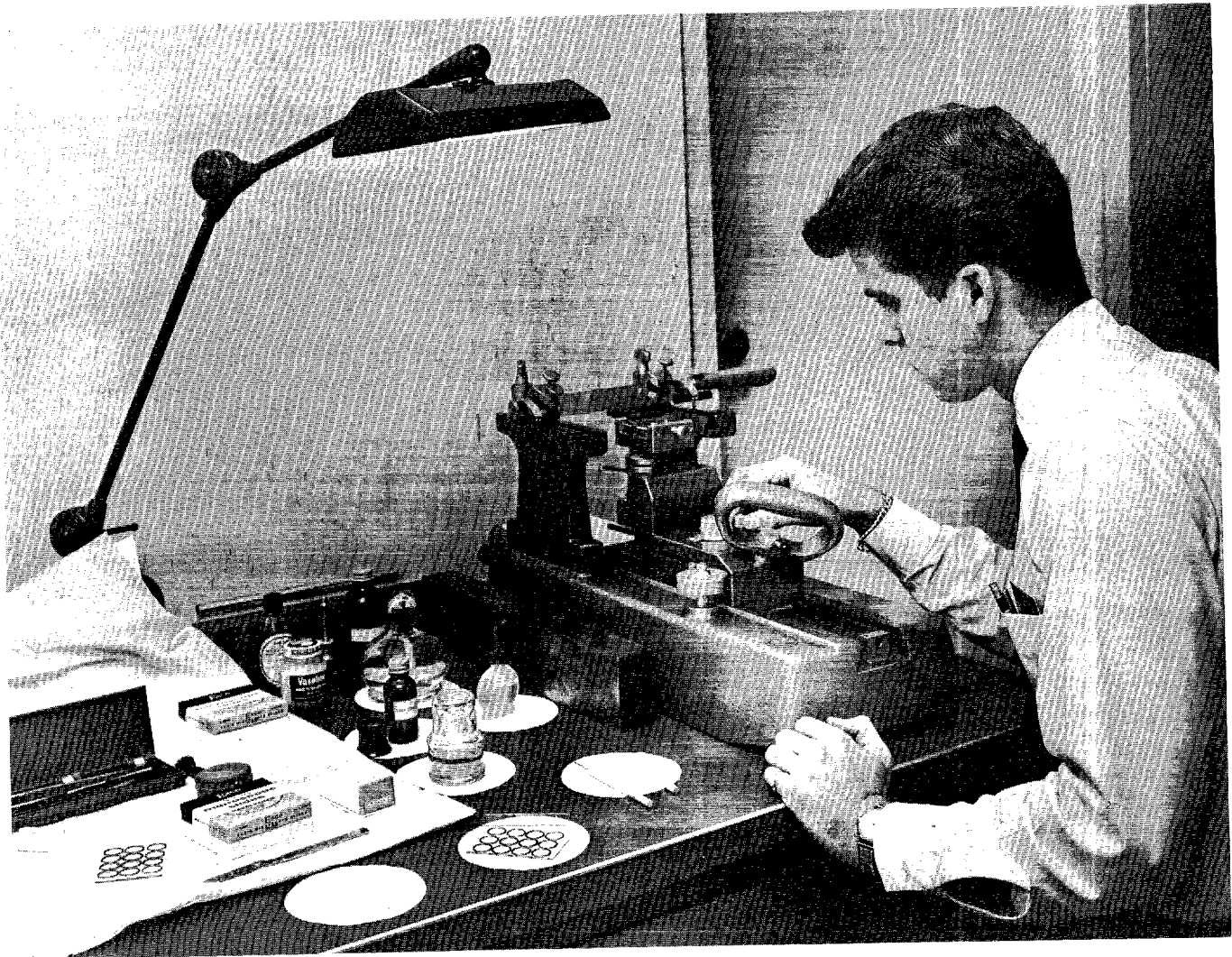
has designed a digitizer to permit printout of density directly on an IBM 526 card punch. Standard 21 step sensitometric strips are recorded directly on an IBM card with printout. The cards are then available for computer manipulation.



EDGE SENSITOMETERS

These machines designed for are capable of generating targets, density steps or test objects on roll film. Semi-automatic operation permits laying down of a large number of targets for testing of printers, processors, etc. The same type optics are used as on the step and repeater printers. Vacuum hold down and a unique measurement device assures focus on each exposure. Space variations for exposure are predetermined and automatic.

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MICROTOME

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The microtome and its auxiliary equipments are used to cross section film samples for grain distribution study. Techniques have been developed which permits sectioning 1 micron slices of complete target arrays for study of grain development and distribution versus bar size. A microscope, with micro-photographic equipment, complements this equipment for complete specimen evaluation.

SECTION 6
QUALIFICATIONS AND EXPERIENCE

SECTION 6 QUALIFICATIONS AND EXPERIENCE

Since its organization in 1955, [] has specialized in the field of STATINTL test and evaluation of reconnaissance equipment. We have specifically refrained from entering into any form of competitive production activity to permit us to operate in a completely objective manner with respect to the proprietary aspects of production of manufacturer's equipment.

As a result, our activity is devoted entirely to applied research, test, evaluation, and fabrication of special purpose test instrumentation and standards.

Our engineering staff presently consists of over 185 personnel; 138 of whom are professional and technical people with backgrounds in photoscience, physics, chemistry, aerial and ground photographic equipment, radar, infrared, laser technology, analog and digital computer systems, flight test operations, and mathematical model design. This engineering staff represents a collection of personnel who have devoted the major part of their professional careers to activity in the reconnaissance field.

In order to acquaint the reader with some of our specific project experience, we would like to present a brief capsule discussion of previous test and evaluation assignments.

MICRODENSITOMETRIC STANDARDS

Under contract to the Air Force, [] has designed, fabricated and STATINTL calibrated a new set of standards for use in microdensitometer calibration. Included as part of this project was a new machine-readable resolution target. The configuration of this target was presented to the ABC committee during their past meeting for consideration as a new national standard. Density standards and calibration techniques for microdensitometers have been developed including bar targets, mensurating standards, micro-macro step wedges and other test objects. These standards are presently being developed for the Air Force in cooperation with the National Bureau of Standards.

As new systems and photographic emulsions are being developed today, it is necessary to upgrade the methods used for their analysis. [] has in house a project to extend the resolution standards to include these advances. Research is continuously being carried on to determine optimum target configurations.

STATINTL
IMAGE FORMATION RESEARCH

[] under Air Force Contract, has performed research in image formation in optical systems. This work has led to interesting anomalies in testing procedure and to clearer definition of film-optics interaction. The investigation has been performed in conjunction with Air Force laboratories. In-house work has been conducted on the [] Model 1200 optical bench with microtome sectioning frequently used to assess development penetration. Under this program the effects of sensitometric testing were also analyzed, particularly with respect to the use of projection sensitometry.

STATINTL
COLOR ANALYSIS

[] designed and fabricated an automatic color analyzer to be used with the Electrocolor process. This device is capable of area averaging operation or spot sampling and is equipped with the necessary override and balance controls. In operation, the device eliminates completely the requirement for manual balance and trial prints, thereby improving production rate and lowering cost appreciably. The system incorporates such advanced features as automatic reciprocity and latent image failure compensation. The interface is designed such that all controls on the basic machine are automatically set with no manual intervention required.

STATINTL
MATHEMATICAL ANALYSIS

Our Systems Analysis Group is presently involved in the mathematical simulation of reconnaissance systems. This activity includes specific projects involved with mathematical estimates of the performance of photographic, infrared, radar, and electro-optical systems. The group also provides programming and data reduction support for test and evaluation programs. Use of these computer analysis techniques has made possible the analysis of vast quantities of test data to assure statistical validity of evaluation programs.

STATINTL

PHOTOGRAPHIC PROCESSING

[] is completely equipped with photographic laboratories including automatic continuous processing equipment. In addition, we are heavily involved in the development of a totally new processing concept including the required chemistry. Over the past ten years, [] has been continuously engaged in various programs relating to both color and black and white processing.

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CATHODE RAY TUBE EVALUATION

Under Air Force contract [] the company evaluated the four basic methods of cathode ray tube testing employed by the cathode ray tube industry. The work included an analysis of each test method, its restrictions, limitations, and advantages. The four methods evaluated were,

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1. Shrinking Raster Technique
2. Schade Spatial Frequency Technique
3. Line Profile and Single Slit Technique
4. Double Line Trace Technique

Implicit to the satisfactory completion of the program was the design and fabrication of a Cathode Ray Tube Analyzer and the evaluation of high resolution cathode ray tubes. This work was compiled in a report entitled "High Resolution Cathode Ray Tube Evaluation". A major industry-wide cathode ray tube symposium was organized and conducted by [] under this program.

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OPTIMIZED TONE REPRODUCTION

For the past several years, [] personnel have been engaged in photographic tone reproduction studies under various Air Force contracts. These projects have ranged from the design of computer programs to implement preestablished criteria through the analysis of nonconventional materials from a tonal standpoint. Investigation have also been conducted with respect to the optimization of tone reproduction on the basis of information transfer. Current work is directed toward the application of dynamic programming to this latter problem.

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SENSITIZED MATERIALS ANALYSIS

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During the past eight years, under the auspices of various Air Force and commercial contracts, [] has analyzed new sensitized materials and chemicals. Complete sensitometric measurements, resolution, granularity, and physical properties were measured for black and white and color paper and films. The laboratory tests of these new materials are complemented with actual flight or ground tests where applicable. New chemistries are analyzed by processing standard or special emulsions and comparing the results under various time and temperature conditions to standardized solutions. [] has designed and fabricated special laboratory equipments for performance of sensitometric processing and printing. These special purpose test equipments have enabled us to keep abreast with the materials analysis field. During the past several years, our work has expanded into the field of unconventional photographic systems, and associated processing materials and chemistries.

SPECTRAL DISCRIMINATION TECHNIQUES

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Under the terms of Air Force contracts [] [] the company has gained deep experience into the basic problems involved in spectral discrimination. These programs involve the fabrication of special multi-sensor instrumentation capable of simultaneously recording the spectral response of ground targets. An extensive flight test program is being conducted in an RB-47 aircraft to gain basic information on the spectral nature of intelligence targets. Another program involves the determination of the optimum spectral filtration for future aerial photographic reconnaissance systems. This will involve determination of the film characteristics as a function of the spectral bandwidth. Supporting these activities is an extensive laboratory effort in the applied research field to determine the best sensitometric techniques for reproducing multispectra photography. This program encompasses both color and black and white materials.

COMPUTER SCIENCES

Our computer and analytical staff are continuously involved in the development of software, applied programming and computerized techniques in the general computer

STATINTL science field. Sensitometric data for example, is now handled in a completely automated process at [] including the automatic production of input data. Our personnel have been responsible for several compilers in the IBM 1620 area, ranging from basic mnemonic to various versions of Fortran. The programs for information retrieval on the System/360 are written in-house with adaptations of existing logic designed for other machines being employed where possible. We are involved in PERT analysis management control systems, statistical analysis and other activities related to the extension of computer sciences to scientific and industrial arts.

PHOTOGRAPHIC SYSTEM EVALUATION

STATINTL The [] Program is a project designed to provide data contributing to a more meaningful analysis of photographic system performance based on optical resolution displays. The program is carried out under the direction of the Photographic Branch, Directorate of Reconnaissance Engineering, Wright-Patterson Air Force Base, Ohio.

Included in the network are a series of permanent optical resolution displays which are maintained in a useful state and instrumented to provide necessary ground truth data. These target displays are linked by a central communication network and support can be obtained at any display area within the network by submitting a requirement to a Requirements Central Agency.

With the establishment of the controlled range network a need was demonstrated for inexpensive, easily operable, low maintenance mobile target displays that could be used under optimum conditions. As a means of satisfying that need, several mobile target units were established and based at various locations, thus permitting rapid deployment of target arrays at any requested geographic location within the Continental United States. These target arrays consist of the following type photographic analysis targets; MIL-STD and "T" Bar resolution targets, gray scale targets, edge analysis targets, sine wave targets, and point source targets. Related ground instrumentation is also provided.

Target arrays are available which are designed for microdensitometric evaluation and the development of modulation transfer functions for more sophisticated quantitative analyses of system performance. [] maintains a staff of qualified image

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interpreters for image analysis and systems evaluation.

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During this program, [] has been responsible for research and development in the targeting area. This activity has included origination of new targets, new operating concepts, unique manufacturing methods and materials investigation. The targeting program has been operated as a dynamic system with new ideas injected as they are proven.

The data set forth herein is submitted as a technical proposal and shall not be disclosed outside the Government or be duplicated, used or disclosed in whole or in part for any purpose other than to evaluate the proposal; provided, that if a contract is awarded to this offeror as a result of or in connection with the submission of such data, the Government shall have the right to duplicate, use, or disclose this data to the extent provided in the contract. This restriction does not limit the Government's right to use information contained in such data if it is obtained from another source.

MEMORANDUM FOR: George M. Hill

I have read the proposal from [redacted]
I find it quite like the program which [redacted]
prepared and implemented for Westover AFB. I
believe it to be a good proposal, with the est-
imated cost to be reasonable for the services
which will be rendered. My recommendation is to
accept it. One request: if the program is approved,
and put into operation, I would like one or two
of the EDLB people to be included in the training,
indoctrination, etc. I think this can be arranged
with [redacted] Let me know if it will not
be possible. Thanks.

11 May 1966
(DATE)

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FORM NO. 101 REPLACES FORM 10-101
1 AUG 54 WHICH MAY BE USED.

(47)

MEMORANDUM FOR: JWC

Called by [redacted]
(536-5760)

16 May 66 - re visit to

[redacted] - subj. NPIC

Tri-chromatic micro-d.

Feels NPIC does not fully
understand applications of inst.

Feels [redacted] doesn't understand (DATE)
NPIC use of inst.

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AUG 54 WHICH MAY BE USED.

(47)