CONFIDENTIAL

1 November 1956

MEMORANDUM FOR: Assistant Director, Research and Reports

THROUGH : Chief, Geographic Research
THROUGH : Chief, Photo Intelligence Division
THROUGH : Chief, Technical Intelligence Branch

SUBJECT : Report on Trip to New York to View Electronic Digital Computers on Display at the National Business Show

1. This trip had as its purpose examination of small-to-moderate capacity electronic digital computers suitable for use by this branch in carrying out analytical reduction of photogrammetric data, and was undertaken pursuant to the advice given and suggestions made by [redacted] 25X1 Chief, Business Machines Service, MGT/S, at a meeting between [redacted] 25X1 and members of the Technical Intelligence Branch arranged by the Executive Officer, Administrative Staff, D/GP.

2. I went to New York on 17 October and there met [redacted] who 25X1 was already in attendance at the National Business Show, which was being held at the New York Coliseum, and viewed the equipment mentioned below with him.

3. Some fourteen companies were listed under the "Electronic Computer" heading in the directory of the exhibition, but only seven of those listed are actually in the computer business. The rest apparently interpret "computer" to mean "electric adding machine". Five electronic digital machines were actually on display and in operation. Two of these, the Burroughs Datatron and the Univac File Computer, were viewed merely for information being large capacity high-cost machines intended for business use. A third machine, the Underwood Elecom "50", while of low-cost, was eleiminated from consideration as being primarily a business machine, since programs other than a standard group are not easily coded for the machine, and the machine does not provide for carrying out division directly. Instead, divisions must be programmed by an iterative approximation method using only multipication and subtraction. The remaining two machines, the Burroughs E101 and the Royal Precision Corp. LGP-30 were both developed as general purpose engineering and scientific computers. Consequently, either of these machines is, generally speaking, suitable for photogrammetric use. There are, however, important differences in such characteristics as program coding case, word length, and memory capacity.

ENCLOSURE

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4. Discussions were held with Burrough's representatives present at the show regarding capabilities of the E101 for solving systems of simultaneous linear equations, and for series evaluation of transcendental functions, since these two problems are of constant recurrence in the course of almost all photogrammetric computations. Differences between the two available models of the E101 were discussed. One has a 100 word memory capacity, the other a 220 word capacity. A tape input may be coupled to either model for data input or for programs requiring more than 128 steps. A special Flexowriter is required for tape preparation. A full selection of literature and brochures on this machine was already held by this branch; however, Burroughs will send [redacted] a programmer's manual and sub-routine catalog for our inspection and study. The LGP-30 has a shorter word length than the E101 (8 decimal digits for LGP-30, 12 for E101). The significance of the limitation would have to be determined by numerical analysis of sets of fictitious data evolved for the limiting cases of the specific parameters with which we are presently concerned. On the other hand, the LGP-30 has a memory capacity of 4096 words, altho part of the memory must be used for internal storage of the program. Discussion with the Royal representative revealed that Librascope Corp., on Air Force contract, was modifying an LGP-30 for photogrammetric use by personnel having no training in photogrammetry. The modification would incorporate some 30 standard programs and the operator would be required only to recognize the catagory into which his problem fell and then enter the required initial data. 25X1

5. Royal will send [redacted] more detailed information on the LGP-30 and their technical representative will call on him here to provide further information. Additionally, [redacted] made preliminary arrangements for representatives of National Cash Register and Monrobot Laboratory to call on him in Washington to discuss electronic computers manufactured by their respective organization. 25X1 25X1

6. [redacted] arranged a meeting, on 16 October, with IBM representatives at their main office. A member of their Applied Science Staff and a 650 programmer were present. The IBM 650 scientific computing system was observed in operation and its characteristics outlined. I presented, as extreme case of the problems in which we were interested, the completely general relationships, and least squares adjustment methods, for any photo system and any number of observations, that have been developed by [redacted] of the Ballistics Research Laboratories at Aberdeen. As anticipated, the IBM people stated that there would be no particular difficulty in programming this method for solution on the 650. A sub-routine catalog for the 650 was obtained and is available for reference in this branch. 25X1 25X1

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7. I feel that this trip was highly successful in terms of establishing the existence of low-cost electronic computing equipment well suited to the needs of this branch. The appearance of equipment of this compactness, power, and low cost is a very recent development (E101 having made its appearance early in this year, and LGP-30 just out) that may be expected to have considerable effect on the field of photogrammetry. [redacted] grasp of our problem and familiarity with equipment of this nature were instrumental in the success of the trip. 25X1

[redacted] 25X1
Technical Intelligence Branch

Enclosures:
1. Data sheets for E101
2. Data sheet for LGP-30

Distribution:
Orig. & 1 - Addressee
1 - Ch/G
1 - Ch/D/GP
1 - St/A
1 - Ch/TI
1 - [redacted] 25X1
1 - Chrono

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