

SECRETNPIC/CSD-481-66
15 September 1966

MEMORANDUM FOR: Assistant for Plans and Development

SUBJECT: CSD Position on Chips

1. Since 1963, there has been much discussion about the development of a photo chip system which would provide an integrated program responsive to the needs of each NPIC division. Many meetings have been held by the Production Board Subcommittee for Mensuration, and studies of the proposed system have been prepared by IPD and P&DS. The concept has fluctuated from one involving the possible resolution of thorny mensuration problems to an all-encompassing solution to the film dissemination problems of the entire community. Since CSD is not concerned with mensuration or film dissemination we will limit our comments to those areas in which our interests must be served. These are (1) target recognition and comparison, (2) document storage and retrieval, and (3) control of graphical object and/or installation files.

2. It should be stated, however, that after much perusal of literature on chip concepts prepared by both private concerns and government sponsors, along with participation in the various meetings on the subject held in NPIC, it is our firm belief that no one chip system will suffice for the many and varied Center requirements for which it must be responsive. We feel that there is too much disparity in the design specifications of chips for mensuration, target identification, and document storage and retrieval to warrant the further allocation of R&D funds for this purpose. The equipment which is now on hand or which has been ordered should be designated for specific use against one particular file and effort should be expended to bring it into operation as soon as possible.

3. Target Recognition and Comparison - In the early days of satellite photography it was unnecessary to maintain a chip file designed for target recognition and comparison simply because there had been few missions and it was relatively easy to retrieve cans of film when previous coverage was needed. In addition, the Air Force (subsequently DIA) produced a Computed Mission Coverage Index (CMCI) which listed the coverage by pass and frame for each mission. Selected Air Force targets were also listed. This publication served, for a time, as a means to locate and retrieve previous coverage. However, it was not cumulative and soon became too cumbersome to use in the time frame in which the OAK operation was performed. Retrieving cans of film involving multiple coverage of targets also became very difficult. As more missions were received, it became apparent that a better system would have to be devised.

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In February of 1962 CSD, acting on its own authority, began accumulating a file of film chips on all targets reported out during the OAK. The file provided the PI not only with comparative cover but also a tool for location and orientation of each target imaged. Each film chip contained identifying information such as mission, pass, frame, COMOR target number and security classification. The file was stored in COMOR target order and moved to the PI area during the OAK readout. Charge outs were rigidly controlled by CSD analysts. This system served adequately for about three years. However, as the PI's became more specialized and began to accumulate personal files of chips reflecting their respective substantive areas of interest, the use rate of the CSD file began to drop significantly. During the latter period, CSD instigated the creation of computer programs (Cactus and Gravy) which provided for the first time, the accurate coverage prediction of all 1A, 1B, and 1C COMOR targets prior to receipt of the film.

The Cactus and Gravy listings used in combination with the target brief file and the chip collections of individual PAG specialists allowed for the pre-selection of information on each target and provided a means to readily obtain comparative coverage when needed. For these reasons the CSD film chip file was deactivated in the spring of this year.

The creation of film chips is actually beyond the purview of CSD. The file created by the Division was an expedient to meet a pressing need and was established when no other alternative was presented. It was abolished when there seemed to be no further need for it.

It is the position of CSD that the idea of a central repository of film chips, and where possible, stereo pairs reflecting coverage of COMOR targets is still valid. While we do not feel it will be possible to totally eliminate analyst's personal chip files, the inherent waste in manually maintaining multiple files of any material cannot be denied. As a facet of the chip concept being developed by P&DS, it should be determined whether a central repository of film chips is desirable, economically feasible, and can be made responsive to the needs of the users. If so, CSD will endeavor to meet the responsibilities for its storage, control and maintenance if called upon to do so.

4. Document Storage and Retrieval - It has been generally agreed that the application of the proposed NPIC chip system to document storage and retrieval would be impractical if not impossible. Problems attendant to the conversion of the present Minicard and/or hard copy files are readily apparent, and the development of equipment to manipulate film chips of the size proposed has been ruled economically infeasible.

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We have concurred with the UAC proposal for the implementation of an Integrated Information System, and there is now underway a study of NPIC materials handling concepts which, we are sure, will offer future improvements to the existing facilities.

Of greater concern to CSD is the continued reliance which we must place on the document storage and retrieval system (Minicard) now employed. Our entire file of PI reports is controlled by this system. In addition, several other files such as the photomosaics, SAC-UPIR, SAM O.B., etc. are also included. Rapid increase in NPIC's requirements for document input and retrieval has necessitated the addition of a second work shift in IPD/Minicard. At the same time, maintenance problems have multiplied to the point that some of the equipment is down for repairs 40% to 60% of operating time. This is due to the fact that our Minicard equipment, for the most part, is Model I prototype equipment first produced in 1956. Unlike the DIA and SAC, NPIC has done little to improve its equipment, and as a result agreements made for the mutual exchange of Minicard materials have not been fulfilled simply because of the technical difficulties involved.

CSD requirements for document storage and retrieval have changed little since the early days of the Center when it was determined that a high quality microfilm chip system would be necessary since the Center's products and inputs would contain many graphic attachments. It was then decided to develop a coding scheme which would lend itself to the control of target and/or installation information, and at the same time fit the specifications for electronic manipulation of the data store. An adaptation of the Air Force Bombing Encyclopedia code for use with Minicard has proved most successful and, of great importance, has remained standard through the years.

The most significant advancement in our system has been the creation of computer programs, again instigated by CSD, which used in combination with Minicard retrieval capabilities allows for the semi-automatic printout of report titles selected from All-Source Index tapes. Called S-Number-Auto-Print (SNAP), this combination of Minicard and computer programs offers a document and reference retrieval versatility which is not to be found anywhere else in the Intelligence Community.

After much study of alternative methods, and consultation with both operators and users of the three systems, it is our view that there will be no fully automated system developed in the next five years which is better than Minicard. Since we must continue to service National and Departmental requirements during this period, we feel that, rather than attempt to design a new document storage and retrieval chip system, a complete survey of our Minicard equipment should be undertaken and the entire system upgraded to keep pace with the growth of the Center as well as with the DIA and SAC establishments.

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5. Object and Installation File - For several years, CSD has maintained an elaborate file of graphical materials on targeted installations as well as on various types and pieces of equipment. It consists of photographs, line drawings, and perspective views which are filed in handbooks according to subject or geographic area. At this time, the file consists of about 600 volumes, and is not under any form of machine control.

We expect this collection to grow rapidly as a result of the increase in large scale and multi-sensor imagery, and the resultant demand for more detailed analysis of ground support and other types of equipment. The KH-7 system has already caused a significant increase in the use of these materials.

While the "handbook" approach has been adequate for use in the past, this method will become outmoded as new concepts for supporting the read-out of imagery become reality. Problems of reproduction, dissemination, control, display, etc., will become acute.

In CSD we have attempted to plan for some of the anticipated systems. Where possible, samples of the various types of imagery inputs such as infra-red, SLAR, etc. were used to create Target Image Profiles which were then photographed for subsequent projection using 35mm, 70mm, and 16mm (Minicard) chips. View-graphs and Teleprompter slides were also produced. Many questions were answered but many more were surfaced. For example, while Minicard was designed for the rapid manipulation of document pages and delivers high quality reproductions and projections, it was not designed to store raw film in the contact sizes needed for photo interpretation. On the other hand, the storage and retrieval mechanisms viewed for the other types of materials which were suitable for photo interpretation, were inefficient and/or inadequate. Much work remains to be done if the Center is to keep pace with the technological advances which are expected, and indeed, some of which are already upon us,

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Since we anticipate a file in the neighborhood of 100,000 separate items, we feel that this area offers fertile ground for investigation and possible inclusion in a computer controlled chip system such as that which has been proposed. To this end, it is the position of CSD that (1) a detailed survey of existing object and installation files maintained in all operating divisions be undertaken to establish user needs (2) that representative materials from these files be included as a part of the chip printer test

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plan and (3) that a study group consisting of P&DS, CSD, and IPD personnel be formed to assess possible computer driven storage and display systems for the control of this file.

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Chief, Collateral Support Division,
NPIC

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