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Code 4000

Via : Code 5600

Code 5614

5614:RDM:lpl
16 November 1970

Site Survey for east coast USA for Program "C" Site

Ref : (a) Memo from 4000 to 5614 of 30 Sept, Serial 4000-215AB

1. Background:

Several longstanding reasons exist for having a domestic site for Program "C" operations and training. Particularily important is that it would provide the opportunity for highly trained and experienced naval personnel to have a state-side billet in the program and in the absence of "Career Designators" they might return to operational use in the program for second and third tours. The training aspects of a domestic site are obvious and extremely important because the on Job training opportunities are particularily limited with the newer digital processing systems which are used operationally 24 hours per day with out stop. The recent approved augmentation of Program "C" for ocean installation of the domestic Program "C" Systems. In spite of the validity of the criteria for its selection we are now officially committed to this site, with certain dates and fiscal programs identified. However this approval has not stopped us in our effort to respond to the request of Ref (a).

2. The computer programs developed two years ago when we lost the site [redacted] in order to access the various opportunities for relocation have once again come to our assistance in evaluating the cummulative collection coverage possible from each of several sites on the East Coast, [redacted] Charts have been developed to show the contours of coverage time for each site available and attached to this memo.

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Code 4000

via : Code 5600

Code 5614

5614-RDM:bf
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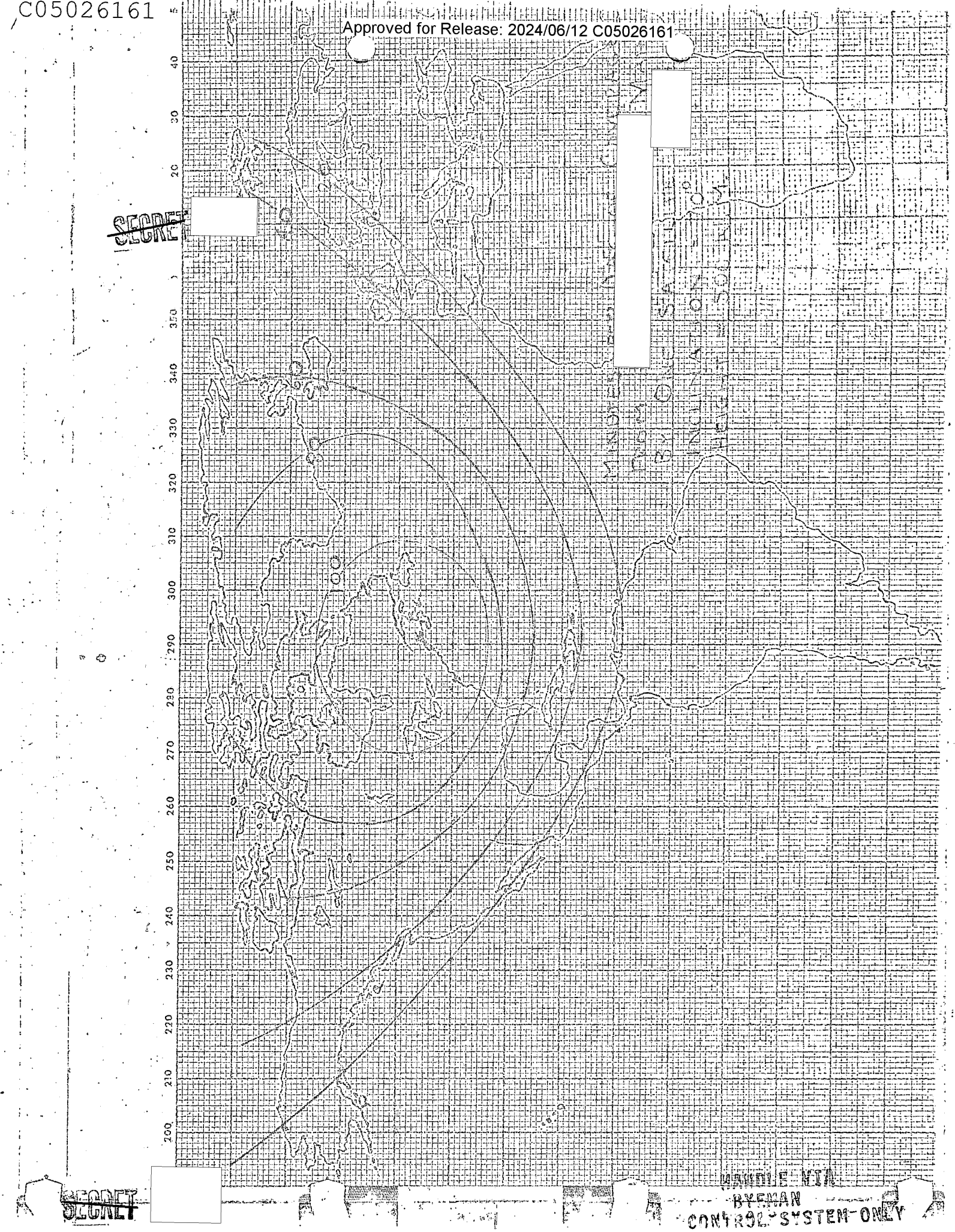

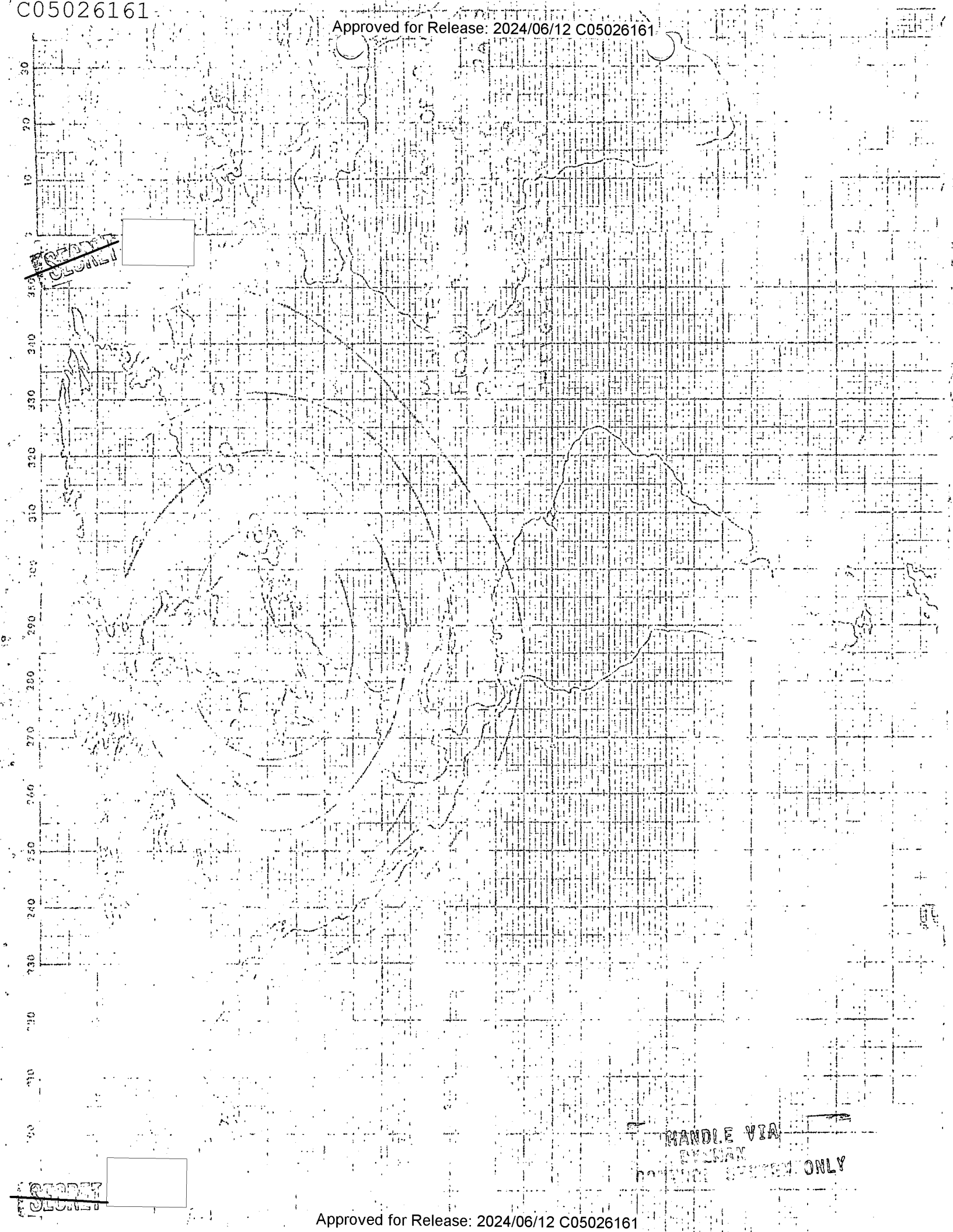

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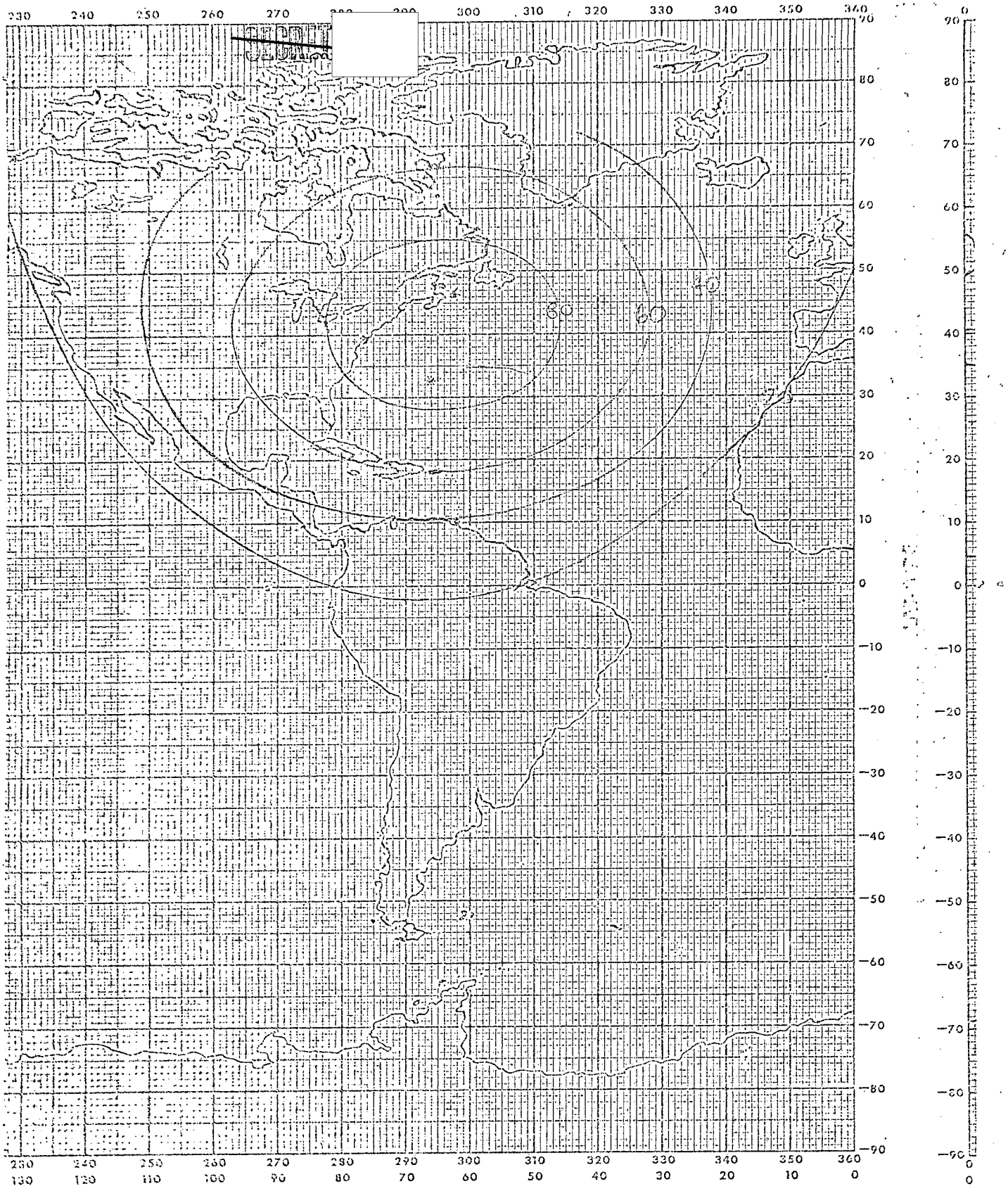

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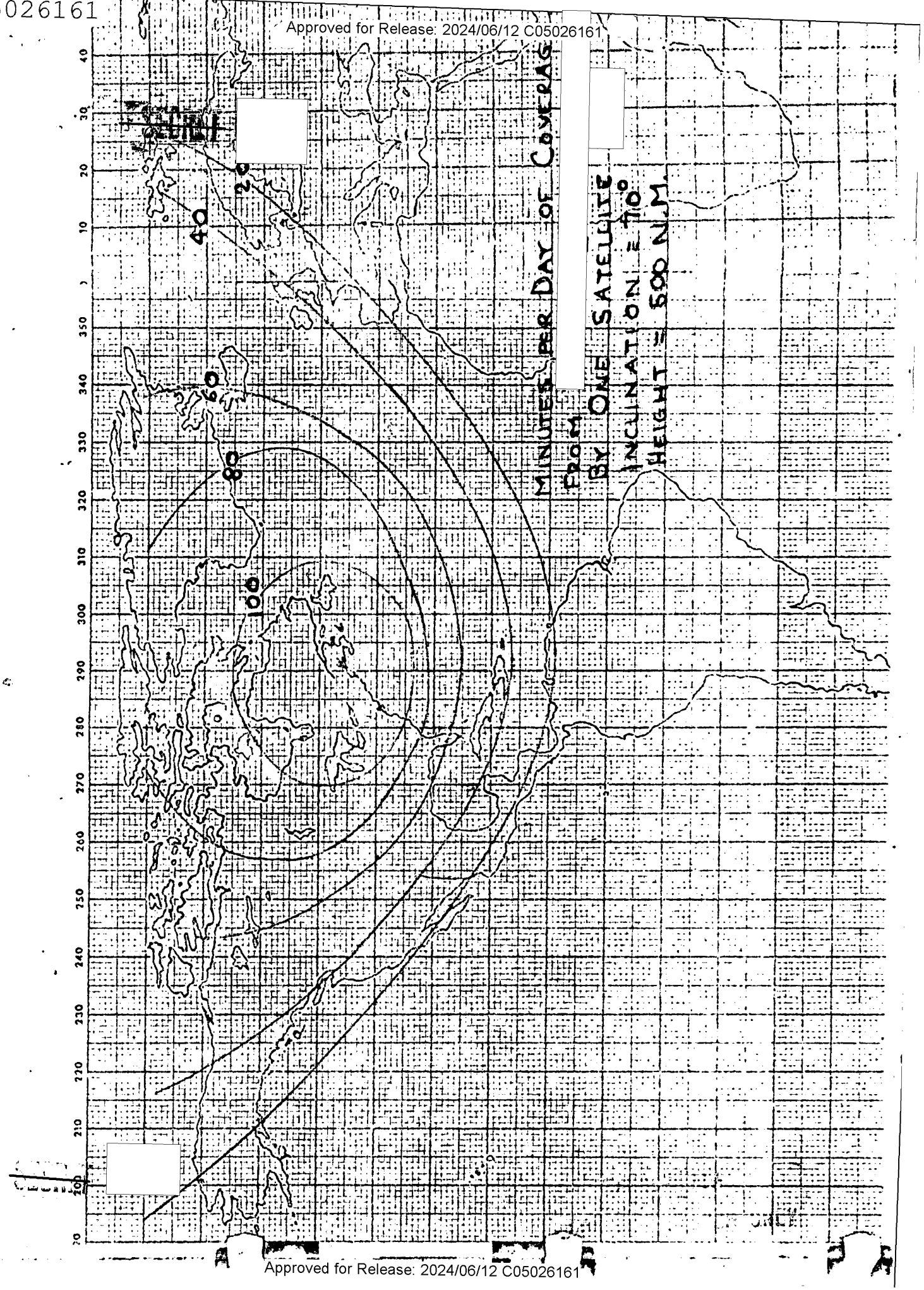

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5614:MKM:cef
16 November 1970

5614

VIA: 5600

4000

Computer Evaluation for Program "C" Augmentation

REF: (a) Code 4000 Memo to 4614 of 30 Sept, Serial 4000-215
(b) NRO Memo to SECNAV of 7 Oct'70, BYE-13243-70 Approving Augmentation of Program "C" for Ocean Surveillance
(c) NRO Memo to Director Program "C" of 13 Oct 70, BYE-13117-70 Identifing funds, with apportionment for FY-71

1. Background:

Since May this year the Director of Program "C" has been trying to enhance Program "C" Capability for use in Ocean Surveillance; first with the Packard Letter, then NSA's Low Cost Alternative to the "Packard Letter" and then on 17 August the Modified Packard Letter which was staffed by NRL's 14 August outgoing letter to Dir Program "C". This paper called for the Second-generation computer system of the NRL, System-86 class for (1) Domestic software development and (2) another to be operationally deployed in [redacted] about one year after approval. The second major area of adjustment to the program was the proposal for a "Perishable (or Priority) Data-Extractor (PDE) which would in its initial form allow the selection of certain high priority band's data from the national tasking, to be directly fed through a hardware device that would reformat it into the language of the on-site processing systems. The idea being, that the on-site processing system could in its Initial Operational Capability (IOC) provide all the geopositioning type processing during the time between the loss of the collection system on one pass until the return of this or another collection system on the site's horizon on another pass. In any case the goal for this processing system is to make it as near real-time as possible.

2. Preliminary Computer Selection Criterion:

On 16 October 1970, Director of Program "C" [redacted] convened a meeting to establish the milestone items and dates in the computer selection, procurement and deployment and in addition to identify those

[redacted]

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members on a "Computer System Working Group" (CSWG) under the chairmanship of Fred Hellrich, Code 5614B. This group is made up of NSA, NSG, NIC and NRO personnel in addition to Mr. Hellrich. This effort has been extremely well attended by particularily NSA. It is evident from the language of the NRO Memo of Ref (b) that NSA remain "In Charge" of the processing systems. I'm told NSA has budgeted $850K for the two systems in the Pacific for FY73.

The long history of Program "C", on-site processing has given the NRL/HRB-Singer team the very best prospective within the community the architecture of this Second Generation processing system for Program "C". We have wide history on the various data rates, the accuracy requirements, and the systematic errors. From this departure of wide operational experience, several initial selection criterion were established:

(1) A 32-bit word length computer was deemed optimum because only one operational software program currently in use, employes triple precision and this could easily be accomplished using only double precision hardware on a 32-bit word length computer system, with only minimal degradation of efficiency.

(2) Due to the nature of the computations to be made on this second-generation system, it was dictated that a Scientific type computer must be utilized.

These two selection criterion reduced the original 200 computers surveyed down to only 8 instruments. With further requirements of data rates and I/O flexibility, these 8 were reduced to four (4) machines which are being examined in great detail on an "In-Depth" analysis. An interim report to this extent is ready to be forwarded to the Director of Program "C".

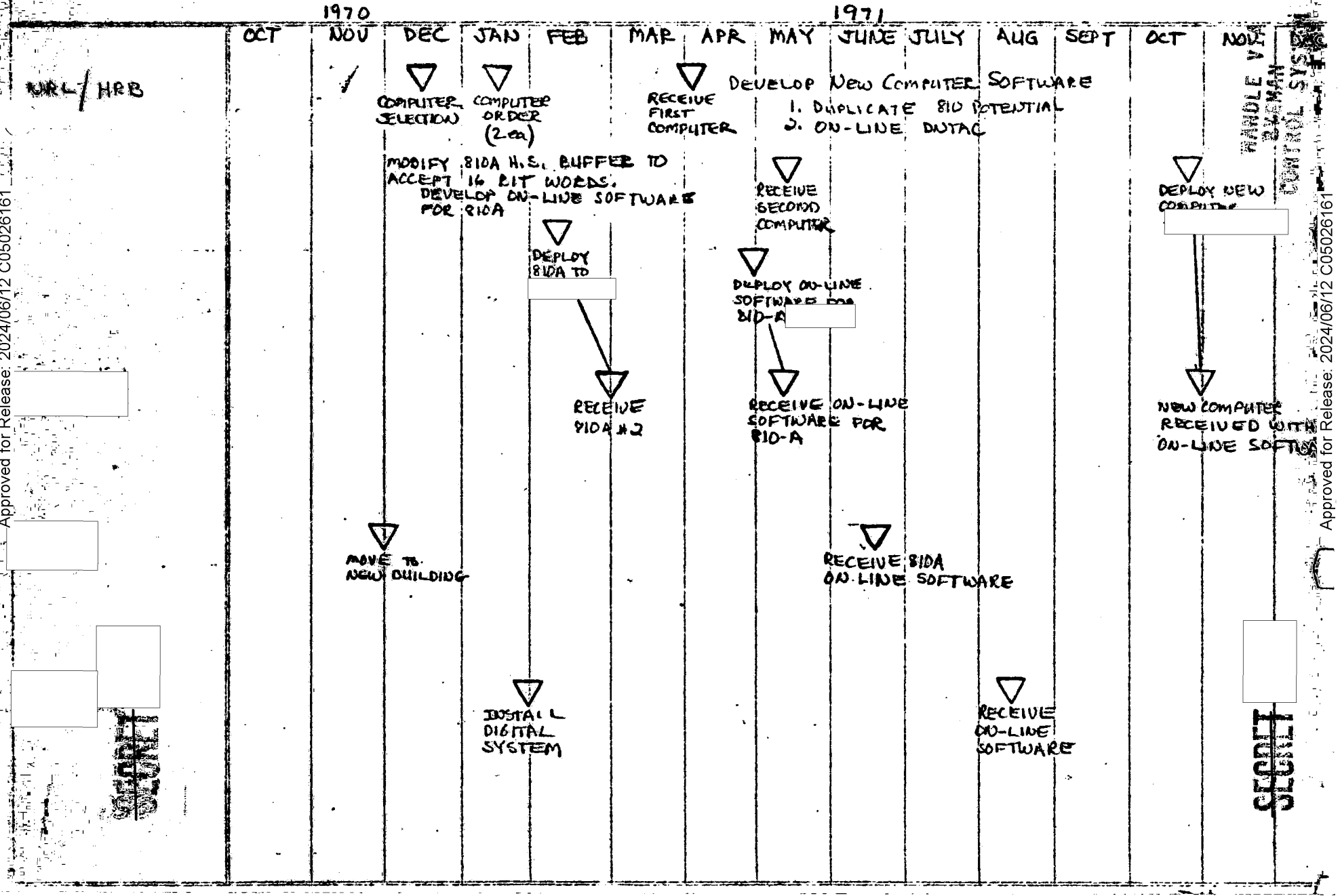
3. The second Interim Report will be due on or about 26 November and final computer selection is anticipated around 11 December. A detailed deployment schedule is given in the attached chart showing both the SEL 86 type system schedule as well as the present computer (SEL-810A) which is going to [redacted] nd another (a second unit) going to [redacted]

4. Summary:

We shall keep you posted on the progress of the computer selection as it progresses, particularily the criteria used in the selection and the

cost and speed tradeoffs. Our goals are very definitely those of providing near real-time geopositioning capability from this second-generation processing system. Another paper in this series is devoted to the subject of the software briefing at [redacted] and it is suggested that during this briefing additional dialog on the factors of the final computer selection be presented by Mr. Hellrich.

TENTATIVE DEPLOYMENT SCHEDULE - "NEW" COMPUTER



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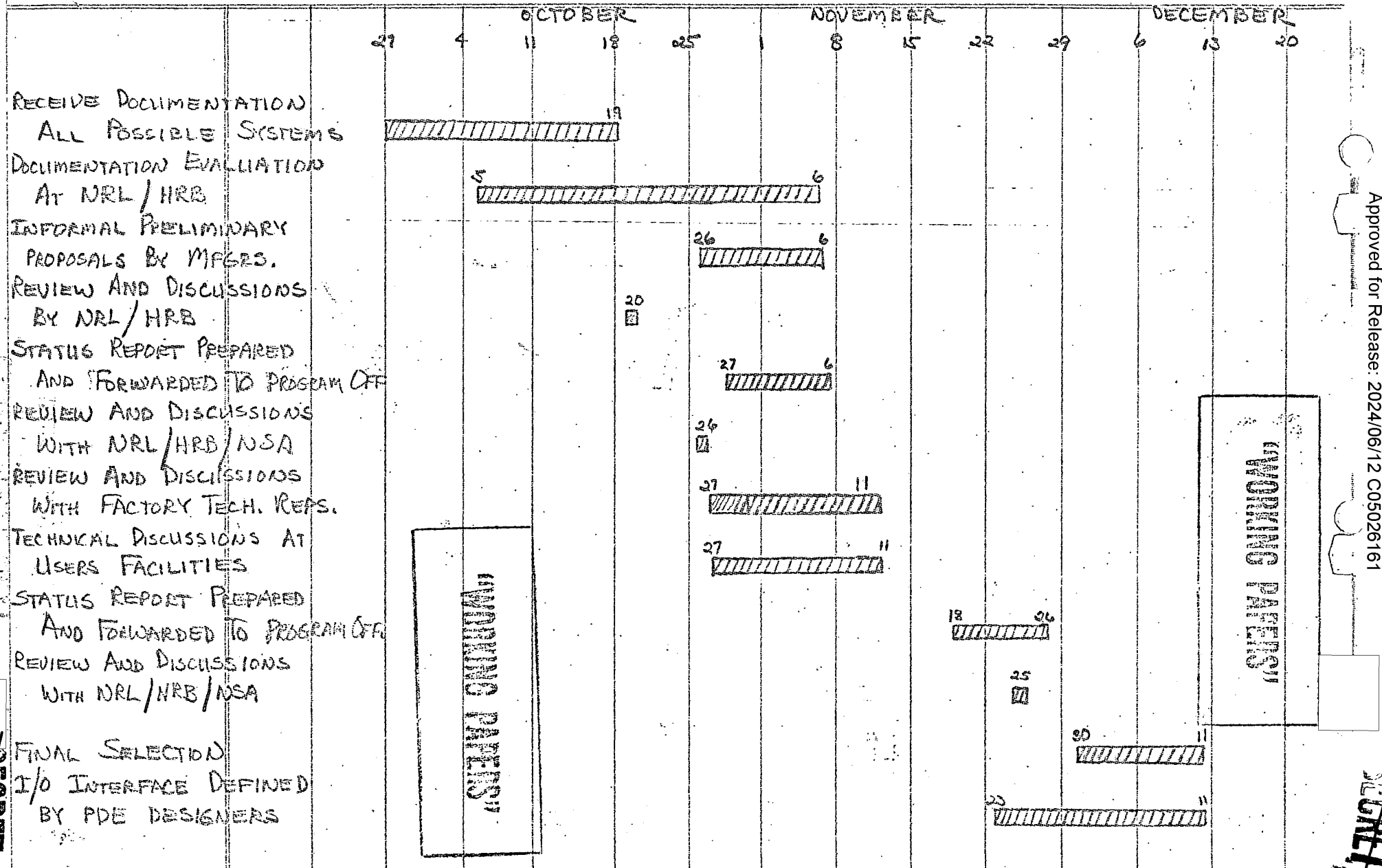
TENTATIVE SELECTION SCHEDULE 11-7-70

"SECOND GENERATION" PROCESSING SYSTEM



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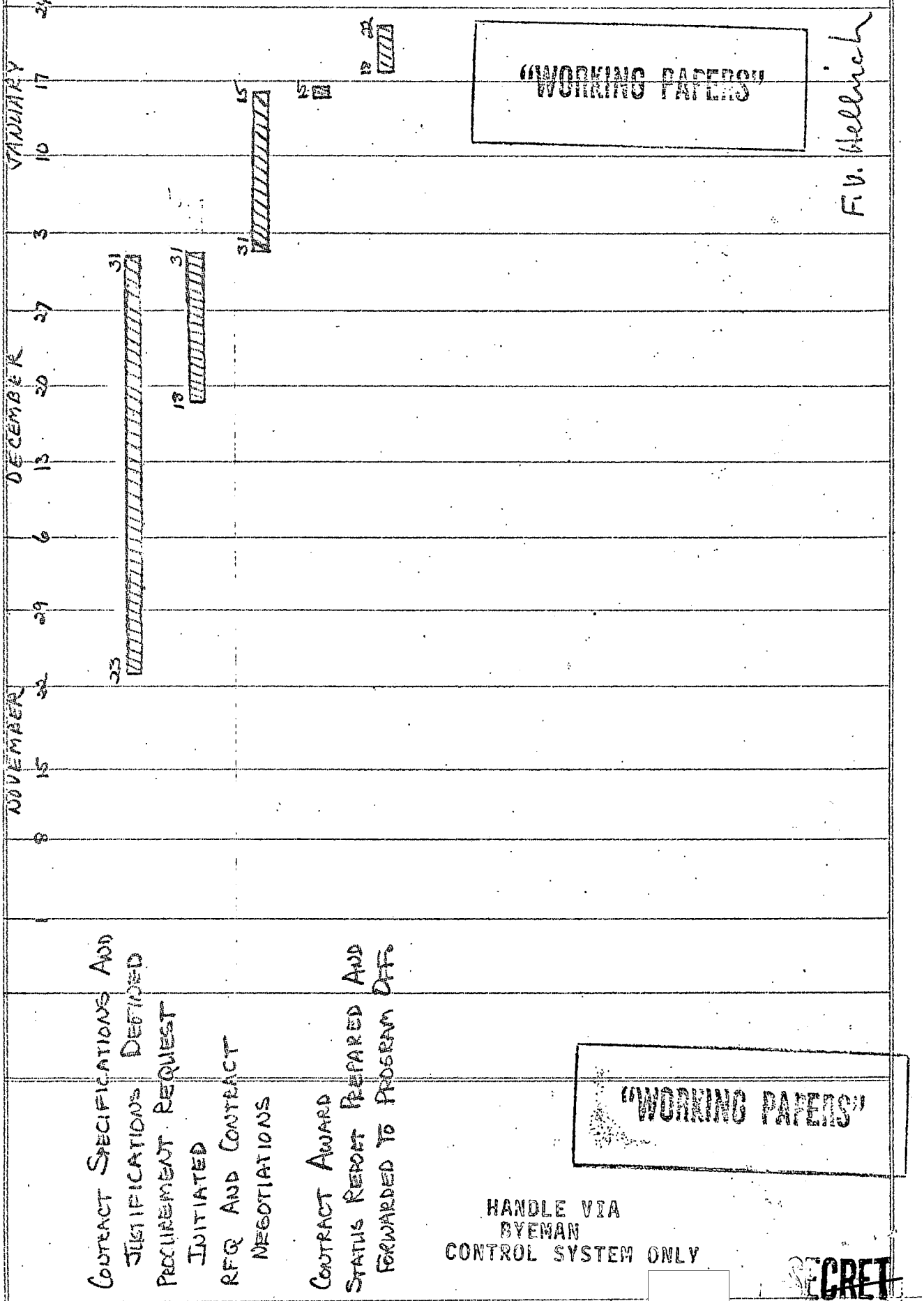

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OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

TO : NIC-30 [redacted]

5614-404:GP:bf
DATE: 20 November 1970

FROM : Code 5614
G. Price

SUBJECT: Priority Data Extractor; Summary and Schedule of

1. Summary of Contents

   a. General Description of Priority Data Extractor (PDE)

   b. Block diagram of SISS ZULU System with PDE

   c. Method of Implementing PDE

   d. Detailed description and block diagram of PDE

   e. Description of output of PDE (ATCON format)

   f. Construction and Deployment schedule for PDE

G. PRICE
Code 5614

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The Priority Data Extractor (PDE) will make selected digital data available to a computer for real time processing. The PDE is designed to operate within the frame work of the existing SISS ZULU System, thereby minimizing the PDE's complexity, and the modification necessary to existing equipment in the system. Figure 1 is a block diagram of the major components of the SISS ZULU System including the PDE. The PDE accepts digital information from the Analog-to-Digital Data Subsystem (A/DDS). The PDE will output digital information to the SEL 810A computer, and an unspecified 32 bit word length computer. The output of the PDE will be in an ATCON format* which is shown in Figure 2.

The PDE will be modularily constructed to allow for future flexibility and expansion. Flexibility is necessary since the SISS ZULU System is continuously evolving and improving and since future additions are not fully defined at this time. The PDE must allow for future expansion since it is universally recognized that the present unit under development is just the first step toward timely processing. As experience is gained with the present PDE, the direction for future advances in timely processing will be more clearly defined. For example, Pulse Train Filtering, as suggested by NSA, will most certainly be a desirable addition to the PDE and work will be initiated in this area as soon as funds are made available.

Figure 3 shows a detailed block diagram of the PDE. The PDE shown will be built as two separate units. The System Interface and Control Unit (SIC) and the Data Reformatter (REFOR). The SIC will perform the necessary communication to other parts of the SISS ZULU System and store the information necessary to operate the remainder of the PDE. The REFOR will select the specified digital information from the A/DDS and form it into the appropriate ATCON format. Typically, an operator would input to the SIC (1) the start time, (2) stop time, and (3) the logical channels to be extracted. The SIC would transmit the channel information to the REFOR and generate a start signal. The REFOR would select data based on the parameters the operator input to the SIC. The REFOR would then assign a time from reference and output the information in the ATCON format, ready for immediate processing.

*ATCON Format is the word format the on-site computer uses in its processing.

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Figure 4 is the schedule for all work necessary to deploy a PDE. This schedule makes the following assumptions: (1) no unusual problems in procuring parts, (2) three men working full time in development of the PDE with an additional man available for peak work periods, and (3) the ability of the staff developing the PDE to work more than forty hour weeks when necessary. Two modifications are mentioned on the schedule. The A/DDS modification is necessary to make the appropriate digital information available to the PDE. The BTC modification to the SEL 810A will allow the high speed buffer of the 810A to accept 16 bit words instead of its present 12 bit word. Both of these modifications are essential to the operation of the PDE. It is well to note that the PDE will not operate into a SEL 810A computer unless the BTC modification is made.

~~Top Secret~~ [redacted]

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