20 March 1963

MEMORANDUM FOR: Executive Director, NPIC

SUBJECT: Progess Report - 15 February 1963

As you know the previous week and a half spent in this facility was primarily taken up by clearances, orientations, and briefings from the various organizations within NPIC.

SUMMARY:

As of this date, I have not been able to identify an overall "System Plan" which is coherent. To extend my overall knowledge of the computer oriented measurement system I visited three companies that are preparing measurement-plotting equipment for you. I find when visiting [redacted] that some of the detail specifications for equipment from those three facilities are still vague. However, this could well be my lack of astuity in uncovering the specifications in question. I find a lack of understanding as to the needs of equipment maintenance and development. 25X1

DISCUSSION:

1. [redacted] 25X1

I visited their facility Saturday, 9 February 1963, spending some three hours with [redacted] I looked at their equipment, saw it in operation, and examined some of their test procedures, asking them how those procedures of checkout fitted with the specifications to which they were working. They gave me a copy of an outline entitled "Design Perimeters of Offline Measuring Equipment Output." I noted there is provision for a set time called, I believe, "time-out". However, specifications as to the time that the timer should be run, had not been received by them. They are now setting this timer to be two seconds. Under paragraph 6 of the above mentioned paper it indicates, "After a set number of items of transmission under computer control, an "acknowledged" or "error signal" will not be returned and the timer will run out." I have not been able to find the logic for the "set number of items". There are some 16 position switches for formating and 5 switches which are readout controls, yet to be labelled. One critical point seems to be that of identifying the accuracy of the system from the operator through the computer and return to him. For example it would seem that a higher accuracy could be obtained from man and machine depending upon the magnification level he has selected to evaluate the frame in question. As far as I know, 25X1

it is not anticipated at the present time to identify the magnification used.

Another example might be measurement between two points of the film. I assume that there will be a minimum of one fiducial mark readout. It will be used to set the frame number in question along with he machine serial number, and maybe the logic used to analyze. He may use four fiducial markers for zeroing in and the operator, as I understand, will then go through his measurement analysis. I assume that at the end he will return to some reference point to close the "loop". If, for example, the digits read out on the final measure are not the same as the original zeroing, what logic is used for the computer to indicate an error? Does the error then go back into the reading or is an error signal sent to the operator and he then starts over? If the latter procedure is followed I am sure that the operator will probably be disenchanted rapidly by the "monster" in front of him.

In going over the [redacted] equipment I find it to be of high quality and well along approaching a promised delivery date of 15 March 63. I do not believe that the computer programs will be in shape to accept readings from this equipment when it arrives. 25X1

Both my last visit and this visit I have the distinct impression that the computer programming personnel are completely engulfed with panics of an outside origin such as preparation for the "L" flights by the 28th of this February or by such tantilizing erruptions as the punch paper tape reader giving erroneous information when trying to use the "compatibility program" for running "batch" programs previously developed for the [redacted] Computer. For example, I find that [redacted] 25X1 himself has been almost entirely tied up for a week and a half trying to unscramble this one malfunction. I understand from [redacted] that 25X1 one more programmer has recently arrived in [redacted] shop which 25X1 brings to a total of 8 the programming power available. The latter should become productive in about six months.

I find that the documentation for either existing programs or programs in the making is extremely sketchy which then forces this establishment to rely entirely upon the sincerity and dedication of a few individuals. It is my firm belief that the frustration level is mounting very rapidly in the programming area, which will increase the probability that computer programs will not be delivered in an expeditious manner.

2. [redacted] 25X1

Let us now review briefly the plotter which is being purchased from the [redacted] This plotter, to be 25X1

remotely located from the computer, will be driven from a 202B Dataphone terminal into a "semi-special" model 620 receiver finished by [redacted] to drive a standard [redacted] plotter. This plotter logic is entirely different from that used by an [redacted] tab plotter. I find that the programming people here are intending to write programs "when they have a chance" to use this plotter. It would seem extremely appropriate for this organization to subcontract as much of the standard plot programs to the [redacted] as possible. [redacted] has many subroutines which they know well and could be converted with ease to be used in this facility. To start from scratch and develop the entire logic for using this plotter would in my opinion be a large waste of programmer time especially when these programmers are so urgently needed for programs which can not be easily subcontracted. In other words the plotter is a standard item, the plot routines could be used by calling for subroutines which are standard in the world outside our black curtain.

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It seems to me that in purchasing "off the shelf" products such as the above mentioned plotter should be bought without the cloak of security which unnecessarily complicates the purchase. I would be glad to go into more detail with regard to this plotter if you care to. It will be delivered by March 29, and I seriously doubt that it will be able to be driven by any programs presently being developed for at least three to six months.

3. [redacted]

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Let us now talk briefly about the [redacted] and where they stand. I talked primarily to [redacted] and I must say for a piece of equipment as complicated as that to be delivered here by mid April they seem to be exceedingly far from the delivery. I examined some designs for the logitudinal measurement digitizing using a vacuum roller, and I would guess that the possibility of maintaining longitudinal accuracy to the degree specified will be exceedingly difficult to obtain. They were intending to drive both the vacuum rollers one of which would have digitizer of some yet to be specified make, in unison with a roller at the opposite end of the measuring engine. I am sure that there will be slippage and creep between these two. The constant takeup tension on the takeup spools will not be transmitted across the vacuum roller. Some type of slip clutch on the idler roller is required. I am sure that there is a potential measurement error due to this creepage and the possibility of rezeroing at the fiducial mark will probably be uncertain. I am sure, also, that it is a high possibility of snapping the film during its translation. The fixed gap between the glass plates of .010 in. plus or minus a adjustable tolerance of .003 in. seems to me a potential danger when transporting the film at pretty high speeds. A grain of dirt on the film will in all probability completely multilate the film, will scar the glass plattens, and in essence requiring a replacement of these plates when this happens. It would seem to me that a minimum of a dozen spare plattens would be required with this measuring engine. I believe also that there is a

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high probability that heat will not dissipate fast enough from the emulsion in the film due to the isolation of the film by a thin air layer from the "cooled platten". Their previous viewers, I believe have always been a clamp type viewer which will allow heat to dissipate through into the platten. However, I am far from my technical field of operation in these details. It must be looked at by someone who is more familiar and with previous experience. You asked for me to put my ideas down as they came without too much analysis and that I am doing.

CONCLUSION:

1. The supervisor in charge of the 490 computer and his subordinates in the programming staff have such a tremendous programming job to be accomplished that I seriously doubt that they can deliver an acceptable system in a reasonable time. My recommendation would be to think seriously of:

a. Subcontracting a portion of your programming to organizations who have good programming capability.

I recommend a package of approximately 15 man years of effort be arranged with [redacted] over the next year. Attaches is a list of programmers who would be available for various lengths of time. The salary and present security clearance is noted in ink. The appropriate people are 22 in number with a minimum experience level of one year in space programming. 25X1

b. Increasing the programming capability at this facility although the programmer market is very difficult to break through.

I think that the programming people here should probably spend more time documenting the program specifications. This would be very difficult for an outside organization to do with their limited background in your processing requirements.

2. I find a very high degree of dedication by most of the personnel with whom I have come in contact. In some regard this tends to be a detrement to the future smooth running of your organization in that they do have a tendency to be completely encircled by the urgency of the lastest panic button, and cannot do an adequate job of either planning for future systems or actively developing this system. I recommend that line management require well integrated plans at all management levels here.

3. In discussing with [redacted] and his group I find a very high degree of competency and a driving force which certainly should accomplish great strides. However, they are, I believe, and this is only conjecture being given cast off equipment such as the Minicard system from some other organization. In order to make this system work I believe a large amount of effort will have to be applied in order to 25X1

get this system in running condition only to find that there are many more easily useable systems available on the market. Therefore, I would recommend serious consideration or review of other equipments such as File Search by [redacted] than forcing the collateral data to be presented on a Mimicard system. 25X1

4. If a requirement for a very rapid information retrival system is required here, and I think it is, I believe that eventually [redacted] 25X1 equipment and people will have to be updated to something beyond a 1401 tab system. I would recommend a serious study to be made which might combine the two facilities, using common, backed-up, equipment within a two to three year period.

5. Maintenance of equipment and good logical development of new equipment requires top grade electronics systems, men plus technicians who can do good preventative maintenance. I recommend that the group responsible for defining new equipment also have a responsibility to keep the equipment in a good operating condition and that the operating personnel have a right to approve new equipment prior to its being delivered to the operating area. 25X1

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