

SECRET/RHEINBERRY

ADVANCED AIRCRAFT PROGRAM

1. Under consideration by the Office of Special Activities, DD/S&T, is an Advanced Aircraft concept which features speeds as high as Mach 20, altitudes of 200,000 feet, and a reconnaissance range of 6700 nautical miles. The program (code name Project RHEINBERRY) has not been funded, nor has it formally been submitted for approval pending further preliminary studies by OSA. These studies will be in conjunction with the DDI relative to requirements and with DD/S&T/OSI on vulnerability aspects. The General Dynamics Proposal (Project Isinglass), which considered a Mach 5-6 aircraft, flying at 110,000 feet, was considered infeasible because of vulnerability to SA-2 and Griffon missiles.

2. The most promising concept is that proposed by McDonnell Aircraft of St. Louis, featuring a design which draws on that company's experience in ASSET (Aerothermodynamic Structural Systems Environmental Tests), MERCURY, GEMINI, and the M122 Aeroballistic Missile. High temperature metals are expected to solve heat problems. These metals have previously been tested by McDonnell in the above programs and valuable experience gained therein. The engine proposed would be a Pratt-Whitney advanced rocket engine using liquid hydrogen/oxygen fuel. The feasibility of engine concept has been proven by subscale tests of major components and with extensive experience on the RL-10.

3. The planned aircraft would be lifted to a height of 25,000 feet by a B-52 mother ship, released, and then boosted to an altitude of approximately 200,000 feet and attaining a speed of Mach 20. A final horizontal range of 480 nautical miles is used in the landing maneuver, which would be by means of rear skids and a forward nose wheel similar to the X-15 system. Total range of the mission would be 7500 nautical miles from start to finish, including boost and landing maneuvers. Total elapsed mission time would be 1 hour, 15 minutes.

4. Projected camera resolution is one foot on the ground and a 40 to 50 nautical mile swath. It would be capable of carrying film for 6000 nautical miles of photography. Design concepts will also take into consideration the addition of other sensory equipment as necessary.

5. There will be a briefing in mid-November after all contractors concerned have had opportunity to present proposals and to discuss concepts, objectives and hardware.

THE VEHICLE THEN GLIDES FOR 6700 NAUTICAL MILES TO AN ALTITUDE OF 130,000 FT AND A SPEED OF MACH 7.

ISINGLASS

The constantly improving Soviet radar and maximum intercept capability pose a threat to the life span of current aircraft reconnaissance programs such as the U-2 and the A-12. Project ISINGLASS has as its objective the development of a sophisticated aircraft capability to outdistance the possible Soviet intercept threat over the next five to ten years. It is envisaged that an aircraft capability of Mach 20 and altitudes of 200,000 feet must be developed. With this in mind, limited studies have been initiated and are proceeding.

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ISINGLASS

June 28, 1965

(Delivered by hand)

Admiral W. F. Raborn, Director
Central Intelligence Agency
Washington, D. C.

Dear Admiral Raborn:

I understand that [] has recently talked to you about the proposed rocket powered reconnaissance aircraft which our two companies have been investigating for Dr. Wheelon's group. I have been impressed by the relative simplicity of the aircraft and launch system as compared to other very high Mach number aircraft and the considerable advantage it seems to enjoy in terms of very rapid reaction, low vulnerability and wide choice of launch points and flight paths. Since orbital reconnaissance vehicles, current and planned, are susceptible to destruction at their fixed launch bases at the very time when hard intelligence is apt to be most urgently needed, this system which could be operated from the many bases capable of handling B-52 aircraft, would appear to offer a major advantage in terms of reduced vulnerability. I want to assure you that we at United Aircraft are convinced of the soundness of the proposed system and have therefore offered to provide \$17,000,000 in development and production facilities in the event a firm full-scale engine development program were carried to completion by the Government. 25X1

As a result of a discussion in May of 1964 between your Mr. John Parangosky and our people, and prior to the joint study effort with McDonnell Aircraft, we undertook a study to investigate the various possible successors to the Oxcart aircraft for the time when the forecast improvement in defense missiles would require a quick reaction system with less vulnerability than either the Oxcart or satellite systems. As a result of this study, our engineers became convinced that ranges of over 7000 miles could be achieved with a boost glide aircraft powered by a high pressure hydrogen rocket engine. Our experience with the hydrogen fueled RL10 rocket engine includes individual thrust chambers which have been fired some 11 hours and 350 times, 6 high time engines which have accumulated an average of three hours on a single build, and 36 engines which have been fired in space without a single malfunction. This background has proved to us that, by application of the design and development techniques evolved through the years in the development of turbojet and piston engines, the durability and reliability characteristics required for manned aircraft can be achieved in rocket engines.

The high pressure rocket engine concept, which makes this vehicle performance possible by providing very high specific impulse (455 seconds) with a small engine cross section, has been under study at Pratt & Whitney Aircraft since 1960. Only by employing high pressure combustion (3000 psi) can the engine provide the required thrust and specific impulse and yet be made small enough to make this type of vehicle possible. Over the past five years component test results have proved to us the complete feasibility of this concept and we have become solidly convinced that this is a major jump in the state-of-the-art. Back in the late 1940's we were similarly enthused over the (for then) high compression twin-spool turbojet cycle and at that time too, we had a very difficult time getting support, but when we did, the J57 turned out to be a big jump ahead - both through much lower fuel consumption and for afterburner efficiency, giving augmentation in excess of 60% over basic thrust.

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In mid-1961 the Air Force gave us some funds for further work on the high pressure concept - and later NASA also gave us some support. As of now we feel we have demonstrated the feasibility of all major engine components. Some 13.1 million dollars have been invested in this development.

The distribution of program costs between sponsors is:


Pratt & Whitney Aircraft	\$7.7 million
USAF	4.1 million
NASA	<u>1.3 million</u>
TOTAL	\$13.1 million

In addition, an investment of more than \$4.3 million has been made by the Corporation for facilities capable of high pressure research type work.

We are now to the point where we can proceed with confidence with a full-scale engine development program and have submitted a proposal for such a program. If, however, it is not possible to mount such an effort at the present time, I strongly recommend that we be authorized to proceed with an engine demonstrator program which could be accomplished in nine months for a cost of approximately \$12.5 million and would provide the best possible answer as to the feasibility of the overall system. At the request of your people, we have also submitted a proposal for running the turbopumps in conjunction with the preburner but without the main chamber. This feasibility demonstration could be accomplished in six months for \$9.5 million.

In my humble opinion we are already late in getting this new intriguing concept really under way.

Sincerely,


Chairman

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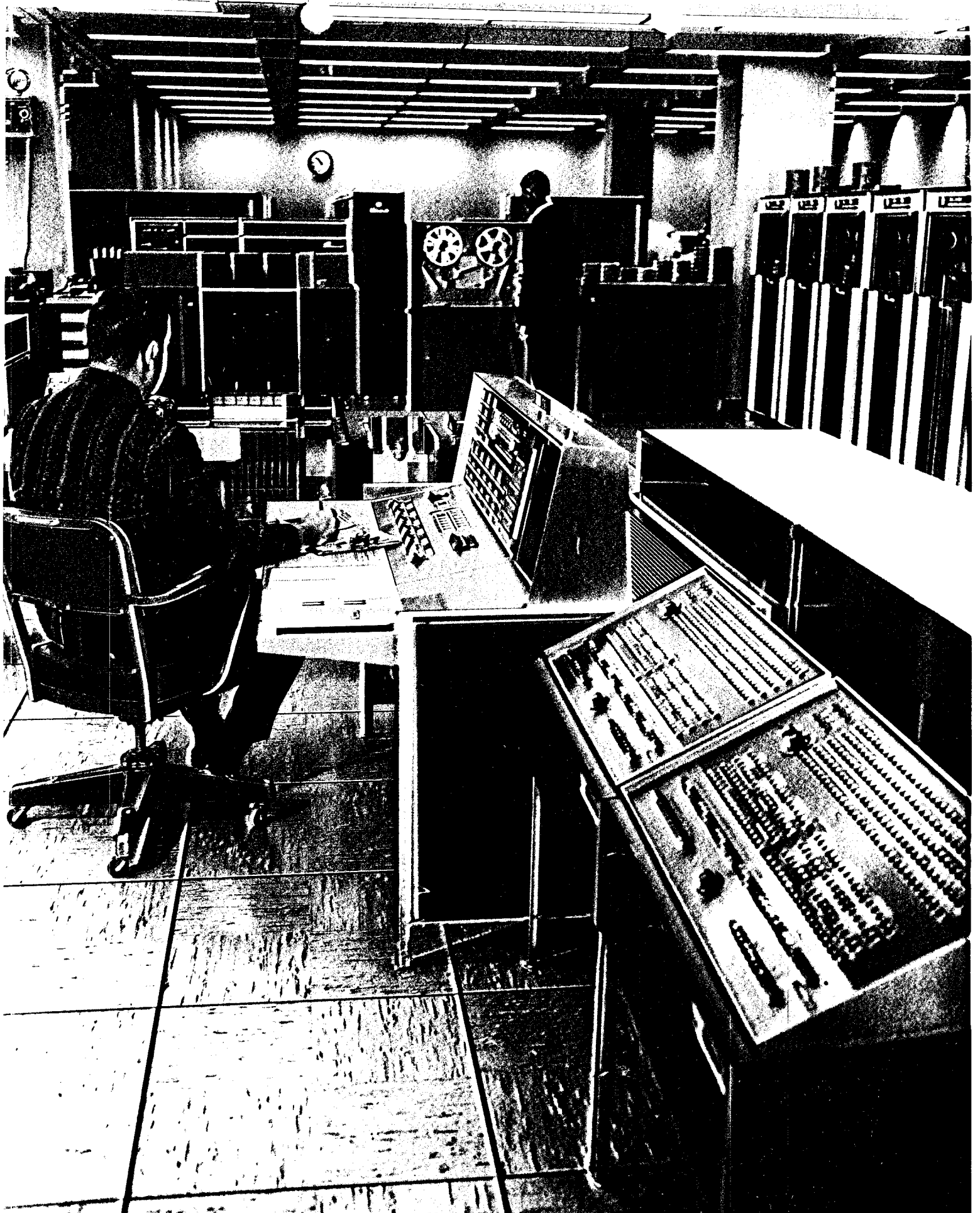
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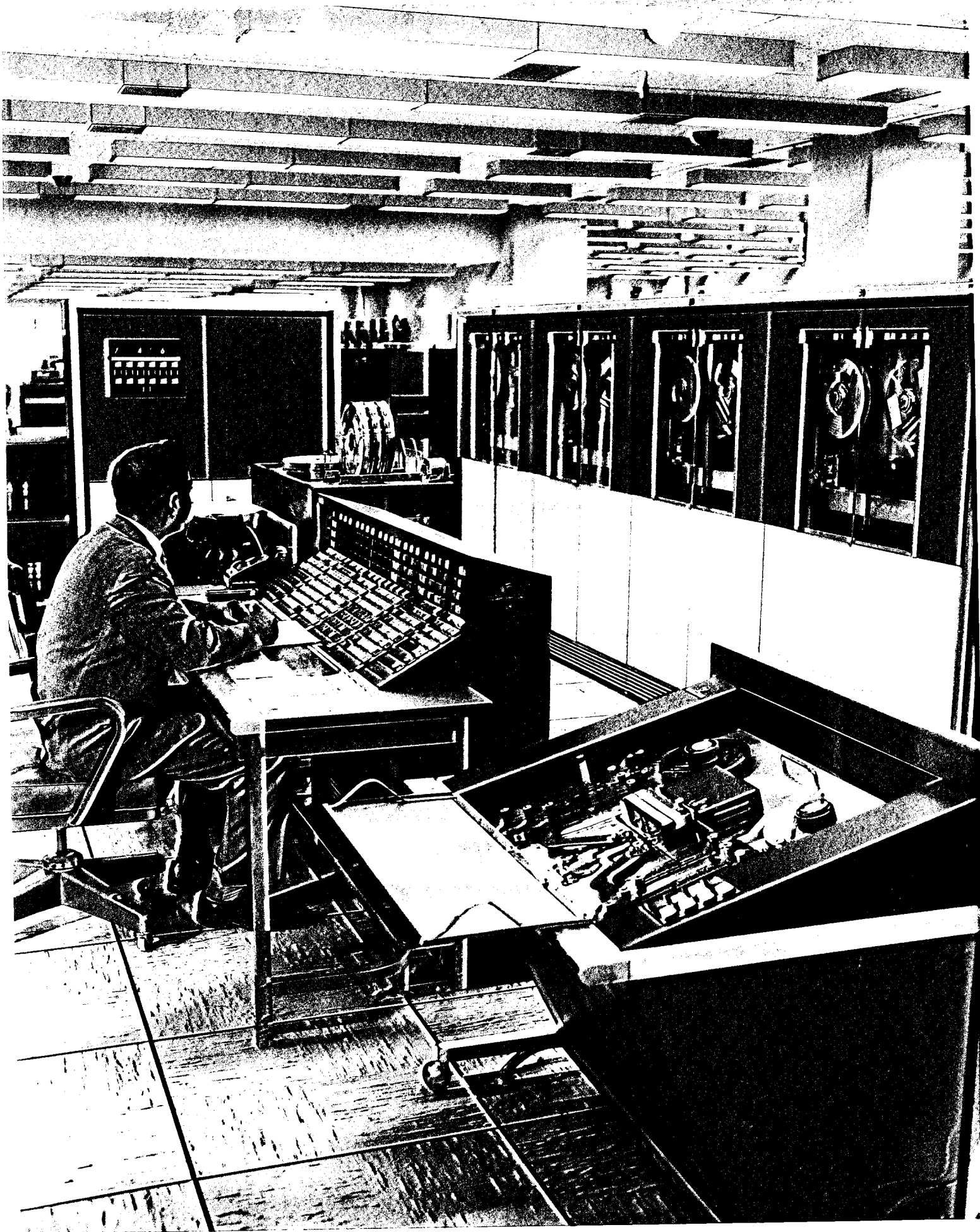
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Project CHIVE

This is a new concept for Agency-wide information service. Intended to replace most of the present OCR information systems. CHIVE is expected to include advanced hardware elements, including ultra large capacity electronic random storage and automated document image retrieval devices.

Project CHIVE is the task charged to the Development Division/OCS to investigate the application of EDP to the central (positive intelligence) information storage and retrieval activities of the Agency, and to design an improved information retrieval system. This developmental program cuts across all Agency organizational lines in that the information needs of all components are being considered. Contractor assistance is being provided by IBM.





PROJECT ALP - - Automatic Language Processor

This includes special purpose hardware being built by IBM to translate natural languages (Russian-to-English initially) and Stenowriter symbolic language (Stenocode-to-English). The ALP system will include a high capacity, random access, electro-optical storage device (not a standard IBM product) developed by IBM Research.

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Eastman Professional Video Cassette



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AIR & SPACE PROGRAM
(U-2)



CAUTION
• This Video Cassette Tape cannot be used upside down.
• Break the Tab on the rear side of the cassette to prevent accidental erasure of pre-recorded material.

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accidental erasure of pre-recorded material.