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DEPARTMENT OF THE AIR FORCE
OFFICE OF SPECIAL PROJECTS (OSAF)
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25 June 1974



MEMO FOR MR PLUMMER

SUBJECT: SAFSP Source Selection Proceedings

As you know, I am serving as source selection authority for the [redacted] follow-on competition. Dr McLucas decided on this arrangement after some inquiry into the precedents within the NRO and the SAFSP particularly. As a follow-up, I have prepared a history of SAFSP source selection proceedings for our use in planning future procurements. A copy is attached for your information.

1 Atch

David D. Bradburn

DAVID D. BRADBURN
Brigadier General, USAF
Director

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SAFSP SOURCE SELECTION PROCEEDINGS

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GAMBIT

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PROGRAM: GAMBIT (G³)

SUBSYSTEM: Satellite Control Vehicle and
Payload Adapter Section

CONTRACTOR: LMSC

BASIC CONTRACTS: AF 18(600)-2709 AF 04(695)-619

TYPE: CRIF CRIF

INITIAL VALUES: 

SSA: General Greer General Martin *

SOURCE SELECTION PROCEEDINGS: (summary attached)

NOTIFICATION OF SUCCESSFUL
BIDDER: LMSC (per letters to MSFC and GE
from General Greer, dated 5 Jun 64)

* Selection Board proceedings were completed under General Greer. However, the initial contract was not issued until January 1966, when General Martin was SAFSP Director.

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SATELLITE CONTROL VEHICLE

GAMBIT (G³) SOURCE SELECTION PROCEEDINGS

- 22 JAN 64 - Working Group established by the Source Selection Board to determine sources to be solicited.
- 24 JAN 64 - Working Group compiled a list of potential candidates who had actually demonstrated successful space experience. The Working Group then selected ten (10) of the more outstanding firms from this list.

The ten contractors were rated as to their technical competence in various subsystem areas of the G³ Satellite Control Vehicle. The rating criteria was based on the current capability and recent experience in making comparable hardware. The ten contractors and respective scores, in order of rating, were as follows:

LMSC	100	GDA	73
MAC	88	Douglas	64
NAA	88	STL	62
GE	82	Martin	50
Boeing	77	HAC	39

The Working Group recommended the first four (4) contractors listed be solicited.

- 1 FEB 64 - Based on discussions between the Board and the Working Group, the Board accepted the Working Group's appraisals of the ten (10) contractors and the recommendation that only four of the contractors be considered further.

The Board then established more specific criteria to be utilized in evaluating the four remaining contractors. The new criteria was concerned with the areas of peculiar past experience, engineering staff and facilities, integration and interface experience, overall capability and corporate ability.

The Board then performed an evaluation by allocating six (6) points among each of the four (4) contractors for each of the specified criteria items. The resulting total points per contractor were as follows:

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McDonnell (MAC)	39
GE/ASPD	231
LMSC	264
NAA	25

- 5 FEB 64 - Under Secretary McMillan was briefed on the foregoing proceedings and to the effect that the Source Selection Board had selected LMSC and GE/ASPD as the sources to be solicited.
- 13 FEB-
15 APR 64 - RFPs distributed, proposals received and evaluation of LMSC and GE began.
- 8 MAY 64 - Source Selection Board evaluation complete with award to LMSC recommended based on following:

Final scores:	LMSC	1,140 points
	GE/ASPD	348 points

MAJOR AREAS OF DIFFERENCE:

LMSC

Simpler and more reliable "roll joint" concept vs GE gas roll system, sensitive to changing C.G. of photographic payload.

Lighter in weight, offering potential increase in orbital life from a 5 day system to an 8 day system.

LMSC proposed [REDACTED] for GE proposals.

GE

Considerably more complex system - higher risk development.

GE system was 60 lbs over maximum allowable and 310 lbs over target weight in RFP.

Development and recurring costs of GE system about double those of LMSC system.

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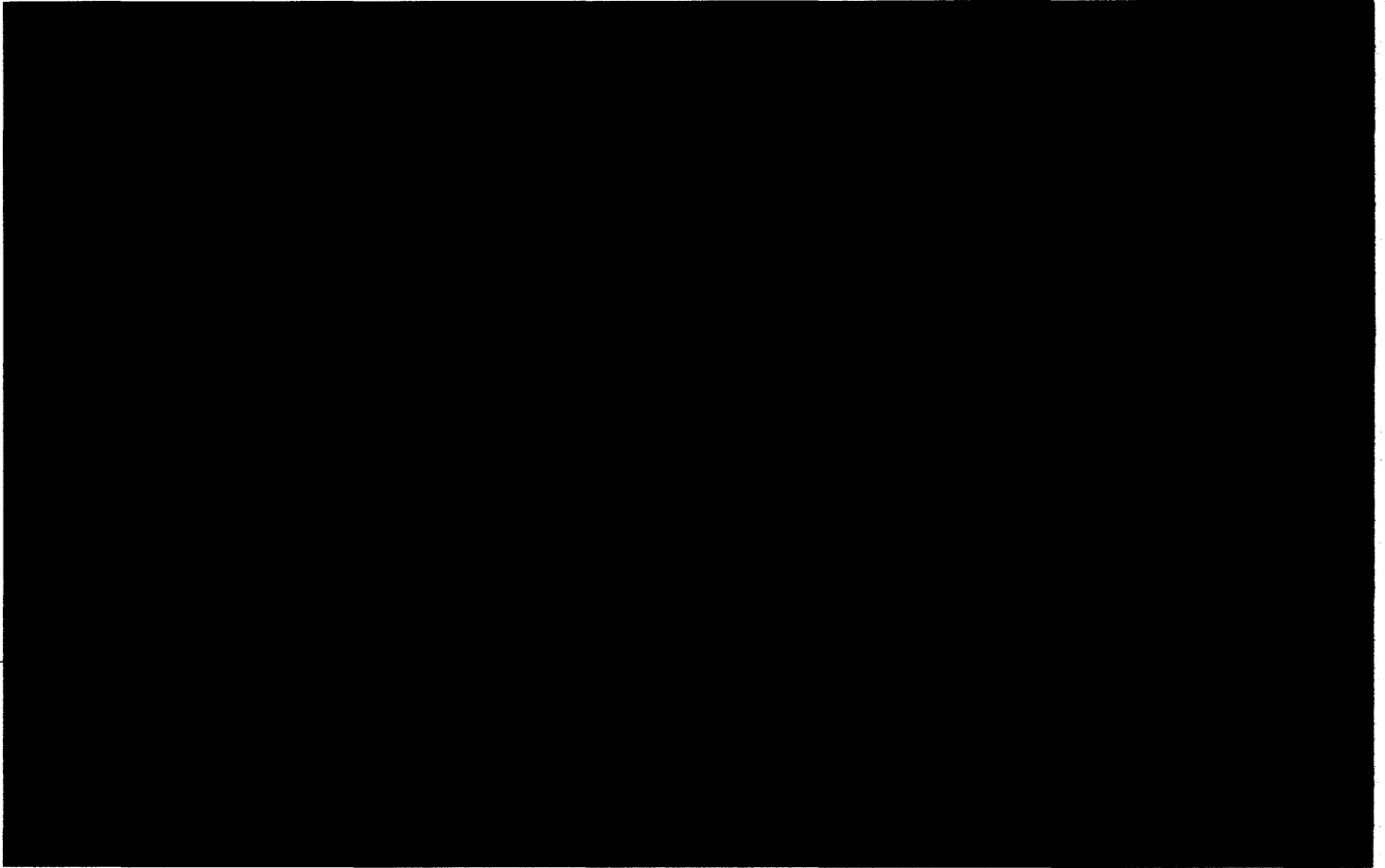
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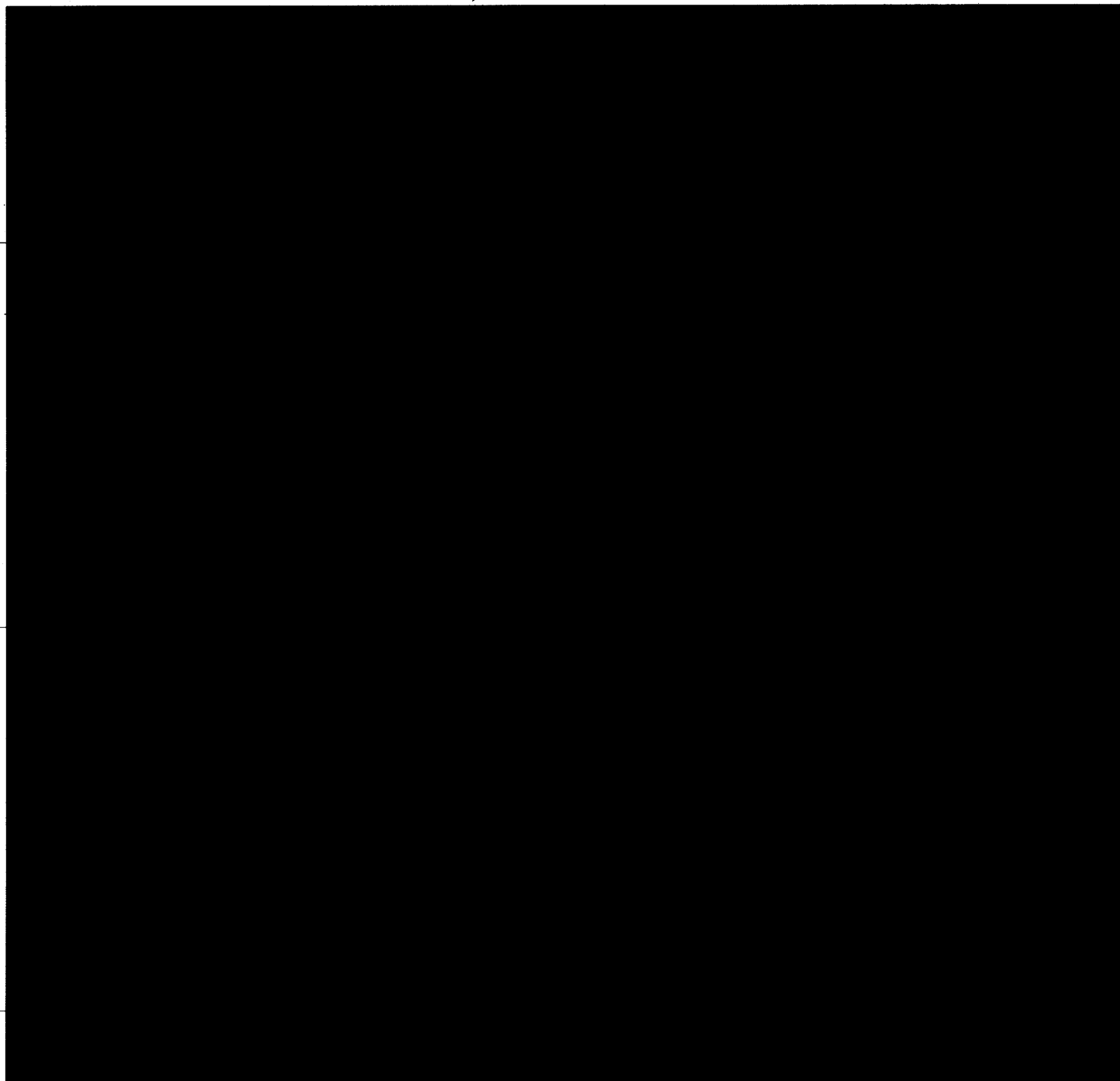
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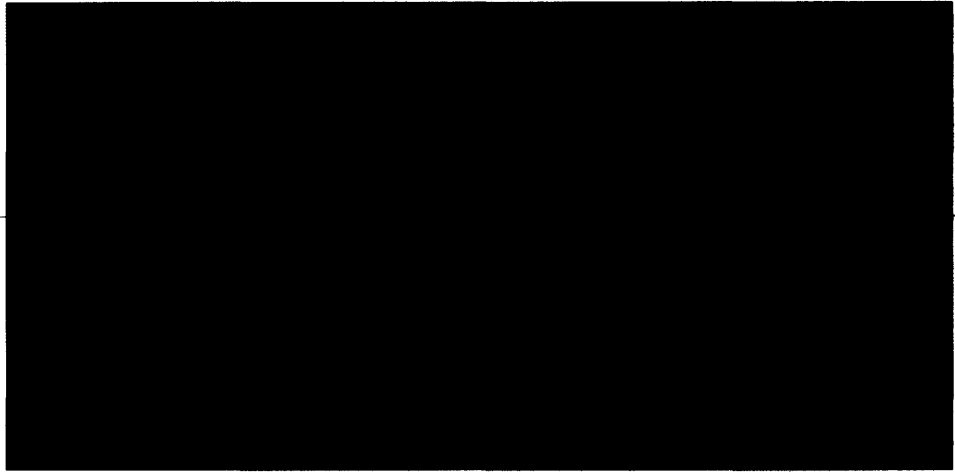
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HEXAGON

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PROGRAM:

HEXAGON

SUBSYSTEM:

Satellite Basic Assembly

CONTRACTOR:

LMSC

BASIC CONTRACTS:

[REDACTED]

TYPE:

CPIF-P
(Specialized
Incentive)

CPIF-P

INITIAL VALUES:

[REDACTED]

SSA:

Dr. Flax

SOURCE SELECTION PROCEEDINGS:

(summary attached)

NOTIFICATION OF SUCCESSFUL BIDDER:

LMSC (per TWX from Dr. Flax
to General Martin, 19 Jul 67)

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HEXAGON SATELLITE BASIC ASSEMBLY

SOURCE SELECTION PROCEEDINGS

- 25 May 66 - Memorandum from Dr Flax appointed Source Selection Board (SSB) consisting of seven members with Col Buzard designated as chairman.
- 26 May 66 - A Source Subcommittee, appointed by the SSB, presented an evaluation of the following list of potential contractors:

Boeing Airplane Company
General Dynamics Corporation
North American Aviation, Inc.
Hughes Aircraft Company
TRW Systems
Lockheed Missiles and Space Company
Mc Donnell Aircraft Corporation
General Electric Company
The Martin Company
Douglas Aircraft Company

The Subcommittee had also considered Grumman Aircraft, Fairchild-Hiller Aircraft and Ling-Temco-Vought but felt their present capabilities were not sufficient for inclusion on the list.

The SSB evaluated the ten contractors on the list based on seven general criteria (white) and five specific criteria (black). The general criteria considered management and financial capability for large programs; possible conflict with existing programs; in-house experience with complex space vehicle development, test and production; capability in launch and on-orbit control operations; adequacy of existing organization to provide technical and management talents and facilities; capability for follow-on production with minimum build up. The specific criteria was composed of experience in on-orbit control, launch operations integrating contractor, unmanned reconnaissance space vehicles, interfacing with photographic payloads, and existing capability and experience in covert management, manufacturing and operations.

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On the basis of grading of the contractors utilizing a point system and a narrative summary for each contractor, the SSB concluded that the following were qualified to receive the RFP:

General Electric Company
Lockheed Missiles and Space Company
TRW Systems

- 1 June 66 - The above 26 May proceedings were presented to Dr Flax with an observation that TRW participation in the competition may not be in the best interest of the Government because of possible conflict of interest.
- 3 June 66 - The SSB chairman advised the board that two sources for the RFP solicitation was insufficient and that at least four would be required.
- 8 June 66 - The SSB eliminated three contractors from the 26 May list for the following reasons:

General Dynamics - Lack of experience with complex space vehicle development; no known on-orbit control operations capability.

The Martin Company - Lack of experience with complex space vehicle development; limited on-orbit operations capability.

TRW Systems - Conflict of interest. TRW was currently serving as systems engineering and technical direction contractor for HEXAGON Sensor Subsystem. TRW had been utilized to review the entire RFP and make extensive recommendations for changes.

The SSB re-evaluated the remaining seven contractors, scoring them on the basis of seven criteria items similar to those used 26 May. On the basis that Douglas and Boeing each did not receive at least 75% of the maximum points possible, the SSB concluded they should be eliminated from the list.

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14 June 66 - TWX from Dr Flax approving the RFP and designating the following as the sources to be solicited:

General Electric Company
Hughes Aircraft Corporation
Lockheed Missiles and Space Company
Mc Donnell Aircraft Corporation
North American Aviation, Inc.

16 June 66 - RFPs handed to the above five contractors at a meeting at SAFSP El Segundo facilities.

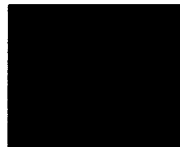
22 Aug 66 - Proposals received from four of the sources solicited. Hughes did not respond to the RFP.

26 Sep 66 - The SSB briefed Dr Flax on their evaluations and recommendations. The four bidders scored as follows (7,500 total points possible):

Mc Donnell	5,070 points
LMSC	5,005 points
G.E.	4,853 points
NAA	3,959 points

The following proposed contract costs were considered separately by the SSB:

LMSC
G.E.
NAA
Mc Donnell



The board recommended LMSC be selected based on the gross cost differential and the factors summarized below:

MAJOR AREAS OF DIFFERENCE:

GE:

Complex 2 by 2 (side by side) re-entry vehicle arrangement proposed (but less weight than the 4 in-line design).

Proposed using mature on-the-shelf hardware at the expense of weight penalties. (Greatest weight risk was with the G.E. design.)

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Did not consider the Stellar Index mounting problem or electrical power for it.

Had a good modular design but considered major changes for growth such as fuel cells for power and possibly bipropellant for altitude control gas.

LMSC:

Design was based largely on proven concepts and equipment.

Proposed some new equipment based on simplicity, including: single monopropellant orbit adjust engine with good reliability; outside corrugated structure; new (within state-of-the-art) telemetry, tracking and command equipment.

Good RV and payload layout.

LMSC design had a low weight risk.

Mc Donnell:

Straight forward design utilizing proven systems of minimum weight.

Stellar Index camera located away from the main payload, resulting in more difficult alignment.

Proposed using collimation equipment on the pad for payload alignment, which was not believed feasible.

Proposed growth through conservation of expendables or redesign of orbit adjust tankage was promising for 35 to 40 day life.

Additional wiring penalty would result from remote location of some equipment.

The McDonnell cost proposal was considered exorbitant.

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NAA:

Proposed design required considerably more electrical power than the other contractors. This led NAA to propose a two-axis controlled sun-oriented solar array which was less reliable and causes much higher drag than the other contractors' systems.

Clustered 4 RV arrangement, which required very complex film handling equipment and results in large cg shifts as RVs leave.

Proposed complex gimballed orbit adjust engines to offset cg shifts due to clustered RVs.

Proposed complex interconnection of both out-of-date and new designs for the telemetry, tracking and command equipment.

NAAs design had low weight risk.

Large OA-attitude control fuel tanks provided for easy growth achievement.

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PROGRAM:

HEXAGON

SUBSYSTEM:

Re-entry Vehicle

CONTRACTOR:

Mc Donnell Aircraft Corporation

BASIC CONTRACTS:

[REDACTED]

TYPE:

CPIF-P

CPIF-P

INITIAL VALUES:

[REDACTED]

SSA:

Dr Flax

SOURCE SELECTION PROCEEDINGS:

(Summary attached)

NOTIFICATION OF SUCCESSFUL BIDDER:

Mc Donnell (Per TWX from Dr Flax
to Gen Martin, 20 May 68)

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HEXAGON RE-ENTRY VEHICLE

SOURCE SELECTION PROCEEDINGS

- 6 JULY 66 - Memorandum from Dr Flax appointed Source Selection Advisory Council (SSAC) of seven members with Col J. W. Cunningham designated as chairman.
- 14 JULY 66 - Briefing to Dr Flax by Col Cunningham on proposed RFP and recommended sources to be solicited. A list of 15 eligible bidders was proposed based on a general criteria consisting of evaluation of management, financial and production capability, relating experience, conflict with in-house effort and adequacy of existing organizations.
- Utilizing more specific qualification criteria with weighted factors, the list of 15 contractors were scored and the 6 contractors with the highest total scores were recommended for consideration. The scorings were accompanied by narrative summaries.
- 15 JULY 66 - TWX from Dr Flax approving distribution of RFPs to following firms:
- The General Electric Company
Lockheed Missiles and Space Company
AVCO. Corporation
Mc Donnell Aircraft Corporation
- 19 JULY 66 - RFPs distributed to the above four contractors at a meeting at SAFSP El Segundo facilities.
- 29 JULY 66 - TWX from Dr Flax approving Source Selection Evaluation Board (SSEB) membership.
- 20 SEP 66 - Proposals received from three of the four sources solicited. LMSC declined to propose to avoid diluting the effort on the HEXAGON Satellite Basic Assembly proposal.

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20 OCT 66 - Letter from SSAC to Director, NRO forwarding results of the evaluations and recommendations. The bidders were scored as follows for small, medium and large RVs (1,000 total points possible):

	<u>S</u>	<u>M</u>	<u>L</u>
Mc Donnell	632	632	632
GE	532	532	534
AVCO	456	463	454

Proposed costs were as stated below. Costs for GE and Mc Donnell were revised by the SSAC to compensate for technical deficiencies, cost omissions and excess proposed requirements.

	<u>Proposed</u>	<u>Revised by SSAC</u>
GE		
McDonnell		
AVCO		

The SSAC recommended GE be awarded the contract. Although GE had major technical weaknesses in their proposed Propulsion, Heat Shield and Spin-despin subsystems, the SSAC felt they could be corrected either by direction or by relaxing the dispersion and shelf life requirements. After costs were adjusted for these corrections, the SSAC noted that GE's costs were still 19% below Mc Donnell's.

13 DEC 66 - Letter from Col Buzard to Director, NRO in response to direction from Director, NRO, re-evaluated GE and Mc Donnell based on supplemental information supplied by each company.

Based on the re-evaluation, Col Buzard recommended the award go to Mc Donnell. This recommendation was based on the major areas of difference summarized below:

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MAJOR AREAS OF DIFFERENCE:

GE:

The proposed unsupported (free-foam) heat shield design was considered marginal for the predicted high heating rates and shear forces. The phenolic nylon-phenolic glass heat shield originally proposed by GE was unacceptable due to limited shelf life. Therefore, it was doubtful that GE would solve this problem without considerable cost and schedule risk.

The ignitor on the proposed retro-rocket would have to be factory-installed since it would not be accessible after installation in the RV. This was unacceptable for safety reasons.

The location of GE's flashing light would not provide satisfactory lighting of the heatshield lower hemisphere.

The weight vs. performance trade-off resulted in a weight increase of over 300 pounds for the four-bucket configuration.

Mc Donnell:

The structural analyses provided with the proposal was weak. However, this was not considered serious since it was correctable by effective engineering and technical direction.

The design would not meet the dispersion requirements for approximately 1.5% of the orbital envelope. This would require the recovery forces to be spread out for the higher predicted dispersions.

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PROGRAM: HEXAGON
SUBSYSTEM: Stellar and Terrain Index Cameras

CONTRACTOR: ITEK

BASIC CONTRACT: [REDACTED]

TYPE: Letter Contract CPIF-P

INITIAL VALUE: [REDACTED]

SSA: Dr Flax

SOURCE SELECTION PROCEEDINGS: (summary attached)

NOTIFICATION OF SUCCESSFUL BIDDER: TWX from Dr Flax to General
Martin, 20 May 68

* For design, development, fabrication and test of six (6)
SI cameras and associated AGE.

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HEXAGON STELLAR AND TERRAIN INDEX SUBSYSTEM

SOURCE SELECTION PROCEEDINGS

- 3 Aug 66 - Source Selection Advisory Council (SSAC) appointed by letter from Dr Flax. Col C. Ruzek appointed chairman.
- 16 Sep 66 - Members and technical advisors of the Source Selection Evaluation Board (SSEB) established.
- 12 Aug 66 - A list of 27 potential contractors for the solicitation considered by the SSEB. The SSEB established a list of General Selection Criteria and applied it to the potential source list to eliminate companies not qualified. This resulted in 10 companies being eliminated due to lack of experience with electro-mechanical-optical systems for space vehicles. In addition, MIT was eliminated because of lack of demonstrated capability to conduct a multi-million dollar production program and TRW was eliminated due to conflict of interest.

Specific Selection Criteria was then developed along with weight factors and a scoring system. These were applied to the remaining list of 15 contractors and resulted in a score spread from 978 to 1,920. A score of 1,500 was utilized as a cut-off, which resulted in 6 firms on the top of the list being recommended for solicitation as follows:

ITEK Corporation
Eastman Kodak Company
Fairchild Space and Defense Systems
Lockheed Missiles and Space Company
General Electric Company
Perkin-Elmer Corporation

- 16 Aug 66 - Based on recommendations in briefing to Dr Flax by the SSAC chairman, a TWX was sent from Dr Flax directing that RFPs be sent to the following:

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ITEK Corporation
Fairchild Camera and Instrument Corp. (FSDS)
Perkin-Elmer Corporation

- 23 Aug 66 - RFPs handed to the above three contractors at a meeting at SAFSP.
- 17 Oct 66 - Proposals received from ITEK and Fairchild. (Perkin-Elmer withdrew from the competition on 12 Oct 66.)
- 1 Mar 67 - Report and Recommendations of the SSAC.

Final weighted scores:

ITEK - 1,000

Fairchild - 837

Proposed costs for initial contract:

Fairchild - [REDACTED]

ITEK - [REDACTED]

Proposed costs for 24 unit follow-on:

Fairchild - [REDACTED]

ITEK - [REDACTED]

MAIN AREAS OF DIFFERENCE:

ITEK:

12 inch focal length lens for the terrain camera allowed tolerance of larger errors in manufacturing and performance than the 7.5 inch lens proposed by Fairchild.

The ITEK 12 inch terrain lens was already in initial production.

Overall engineering of the stellar camera considered to be superior to Fairchild's.

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A management organization was proposed that was almost completely responsive to the RFP.

ITEK indicated a greater appreciation for the "factory-to-pad" concept.

The SSAC stated that the higher cost proposed by ITEK would be acceptable, in view of the greater technical expectation of success of the ITEK proposal, but should be subjected to a rigorous price negotiation in attempt to decrease cost without compromise of technical expectations.

FAIRCHILD:

Proposed a very high performance terrain lens which would be an advance in the state-of-the-art but would present a greater risk to develop and produce than ITEK's lens.

Proposed much higher acuity stellar lenses to enable recording of much greater number of stars per exposure. (But ITEK's considered adequate.)

Proposal did not provide sufficient analyses to support their proposed advanced designs.

Proposed a weak organizational structure. Stated company policy to be followed on failure and problem reporting would be to report only solutions to problems, without making the AF System Program Office aware of problems as they occur. The SSAC considered this could cause unnecessary schedule delays and cost overruns.

SSAC RECOMMENDATIONS:

1. That negotiations be conducted with ITEK for development and production of the SI subsystem.
2. That the developments be conducted on their proposed Ikogon C lens and their solid state electronic attitude device.

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<u>PROGRAM:</u>	HEXAGON
<u>SUBSYSTEM:</u>	Software
<u>CONTRACTOR:</u>	TRW
<u>BASIC CONTRACT:</u>	[REDACTED]
<u>TYPE:</u>	CPIF
<u>INITIAL VALUE:</u>	[REDACTED]
<u>SSA:</u>	Gen Martin / Gen King
<u>SOURCE SELECTION PROCEEDINGS:</u>	(summary attached)
<u>NOTIFICATION OF SUCCESSFUL BIDDER:</u>	TRW (per memorandum from Gen King to Chairman SSAC, dated 8 Sep 69)

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HEXAGON SOFTWARE

SOURCE SELECTION PROCEEDINGS

- 26 MAR 69 - TWX from Gen Martin to Dr McLucas outlining plan to compete software effort, establishing SSAC and SSEB memberships and plan for establishing evaluation criteria and point weighting system.

- 5 MAY 69 - Memo from Gen King, SSA stating 19 potential bidders were screened and 3 contractors were determined to satisfy the SSAC's guidance and criteria. The three were LMSC, TRW and GE. Based on a conversation between Gen King and Gen Martin, SSA on 3 May 69, Gen King's 5 May 69 memo directed RFPs be sent to these three contractors.

- 8 MAY 69 - RFPs distributed to LMSC, TRW and GE at a briefing at SAFSP.

- 31 JUL 69 - Proposals received from the three contractors.

- 20 AUG 69 - SSEB evaluation complete and report of findings submitted to the SSAC.

- 25 AUG 69 - The SSAC briefed Gen King on its evaluation and recommendations. The three bidders were scored as follows:

TRW	512.0
LMSC	452.8
GE	425.4

The total costs proposed were as follows:

GE	
LMSC	
TRW	

The SSAC recommended TRW be selected based on the factors summarized below:

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MAJOR AREAS OF DIFFERENCE:

GE:

The SSAC lacked confidence in the "Super Cell" concept (method to rapidly access the target deck information on disc storage).

Improper data base sizing.

Inefficient camera operations.

Inadequate mission performance reporting.

Use of Program 110 software restrictive to HEXAGON software.

LMSC:

Gross unfamiliarity with System II executive operation and its impact on design.

High risk that the 1108 computer techniques were transferrable to the 3800 computer techniques.

Conflict resolution application unsatisfactory.

Inefficient algorithms for sensor application.

TRW:

No high risk areas in design.

Milestone 2 close to meeting intent of RFP.

Highest probability of meeting schedule.

Costs could be reduced to acceptable level.

Program appeared capable of operating within one 3800 computer.

Few changes from IOC to FOC.

Overall response was complete and appeared feasible.

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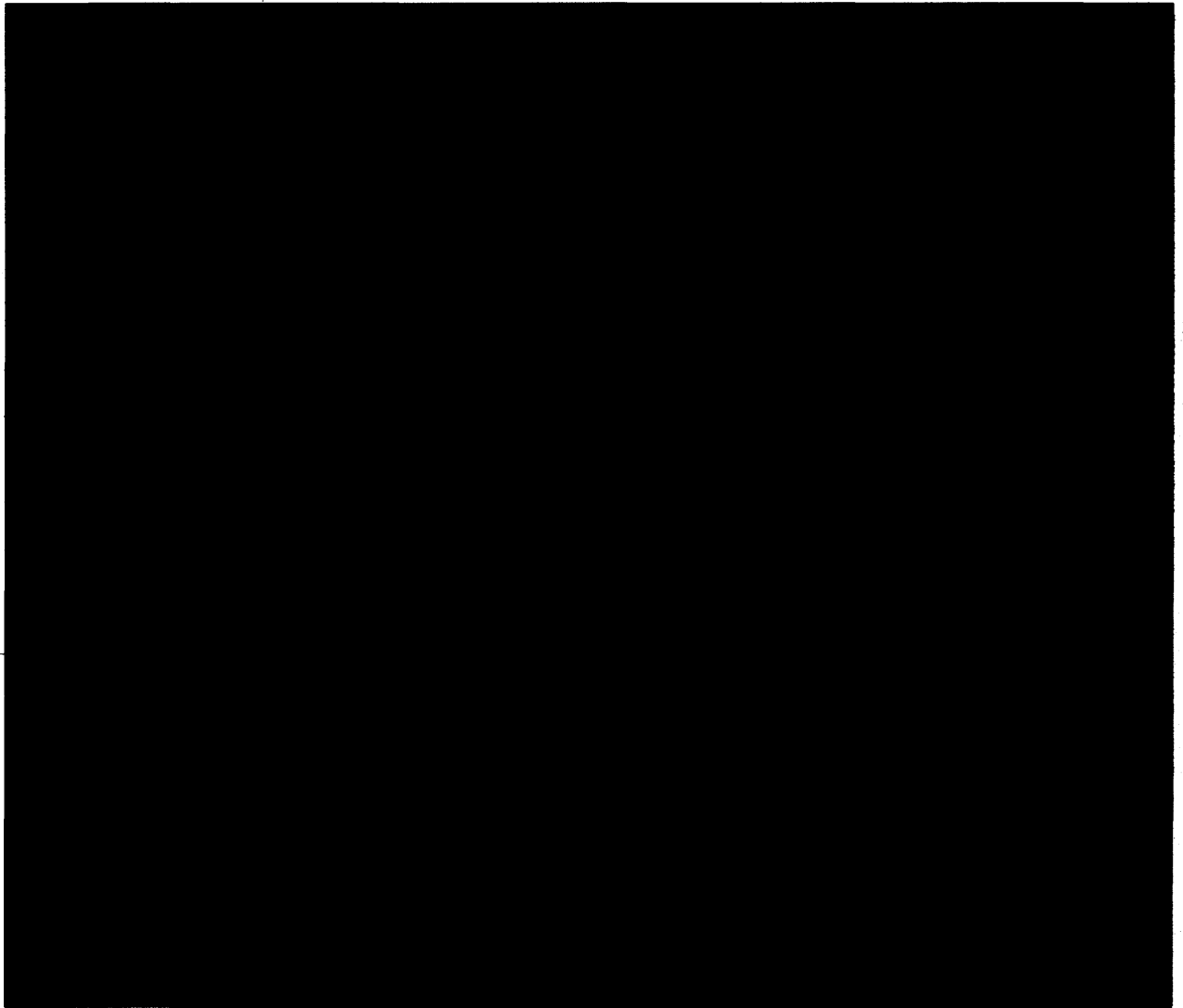
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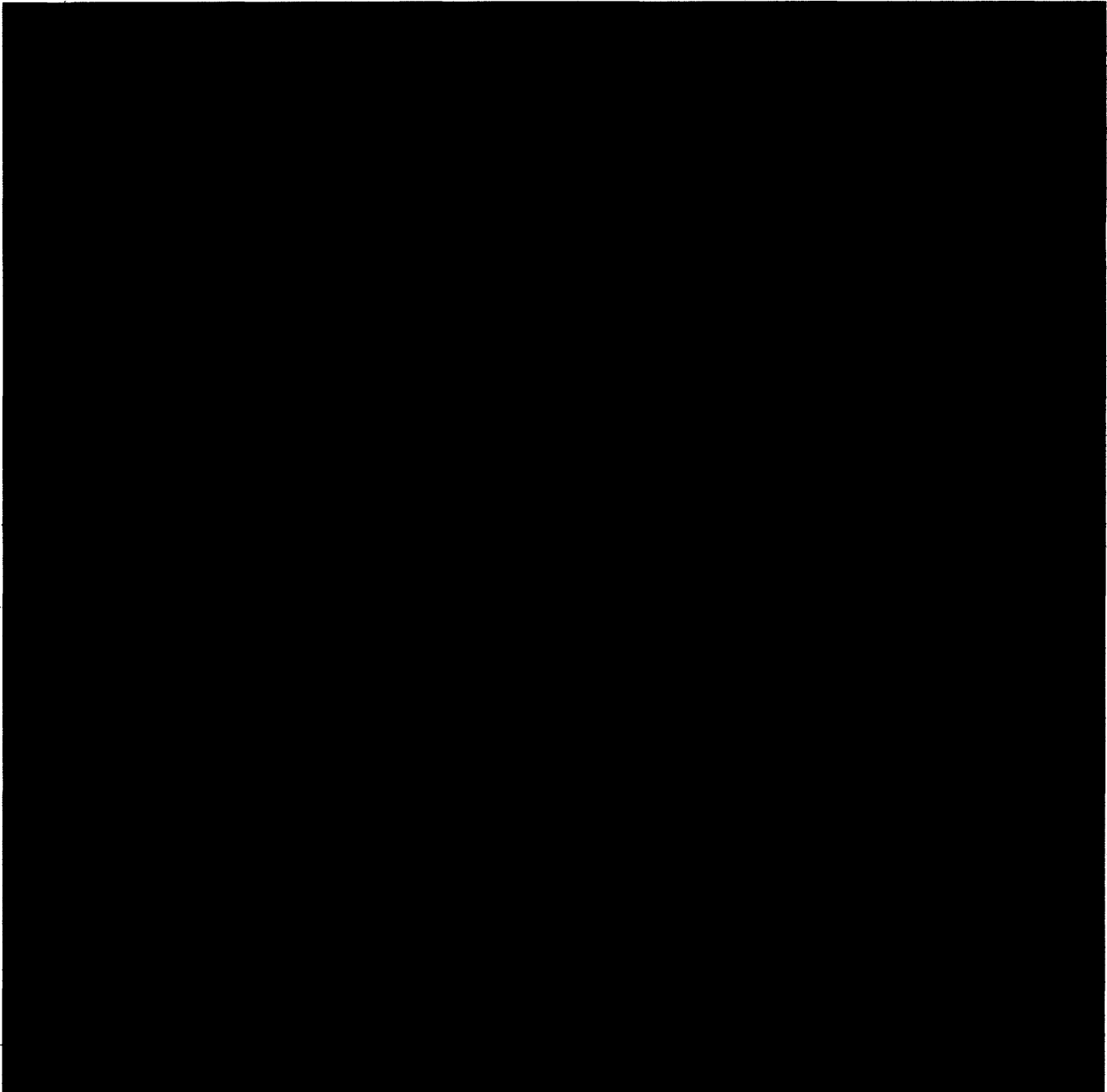
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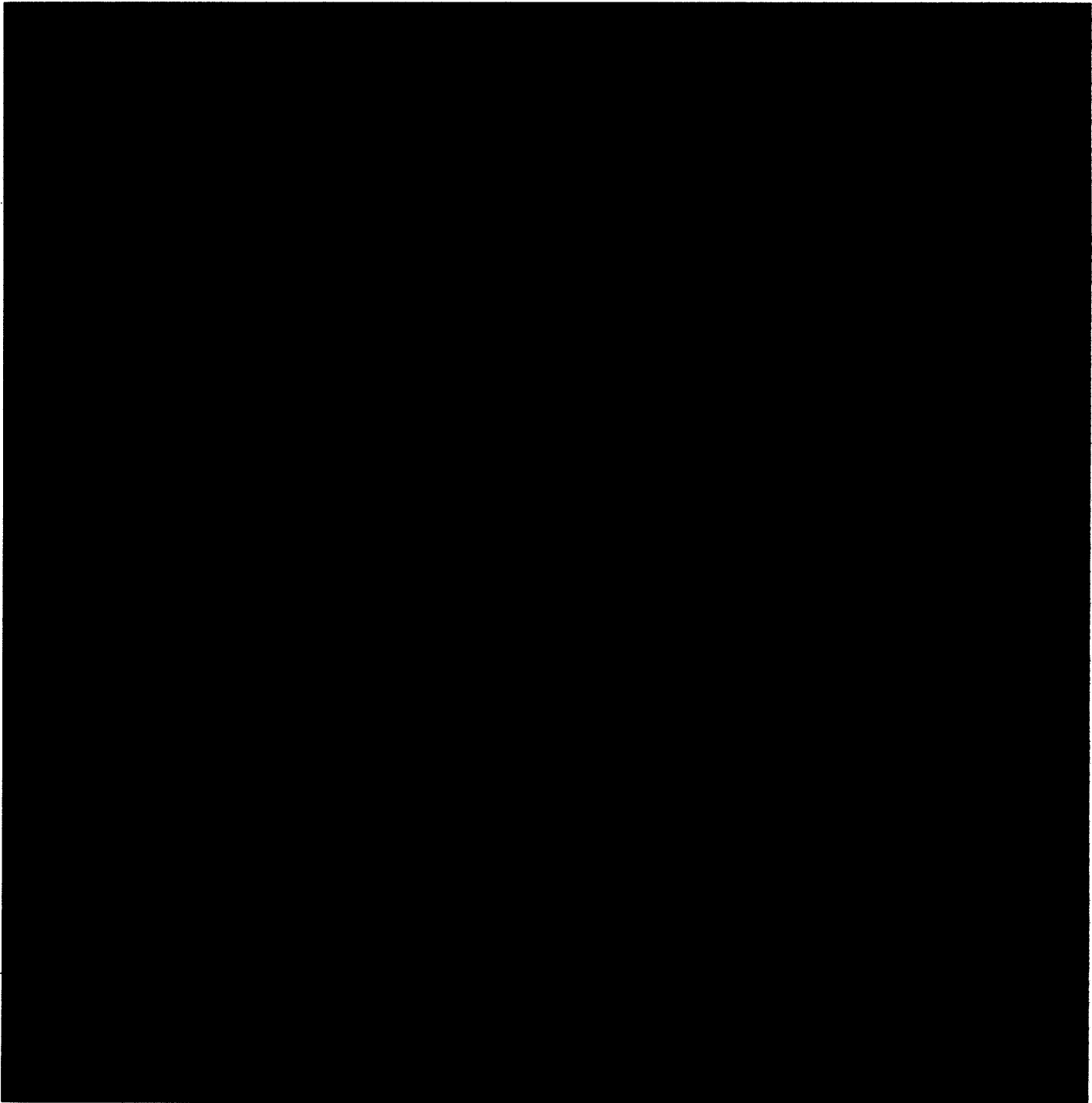
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