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VOLUME SIX
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DOCUMENT HISTORY OF AGENA

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HISTORY OFFICE
CHIEF OF STAFF
SPACE AND MISSILE SYSTEMS ORGANIZATION
AIR FORCE SYSTEMS COMMAND

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DOCUMENT HISTORY OF AGENA

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Prepared by

S. A. Grassly

November 1971

HISTORY OFFICE

CHIEF OF STAFF

SPACE AND MISSILE SYSTEMS ORGANIZATION

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SPACE AND MISSILE SYSTEM ORGANIZATION (AFSC)

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219. Msg from SSD to CSAF, Cite SSH-13-9-10, 13 Sep 62.

220. Msg from SSD to AFSC, Cite SSH-13-9-11, 13 Sep 62.

221. SSD (SSHAA) MFR to Capt George W. Watts, 17 Sep 62.

222. SSD (SSH) Ltr to Lockheed, subj: Production of Optional Kits under the -68 Contract, 24 Sep 62.

223. SSD (SSG) Ltr to Secy of the Air Force (SAFFM), subj: FY-62 and FY-63 Agena D Funding Requirements, 27 Sep 62 (S/Gp3).

224. SSD (SSH) Ltr to Lockheed, subj: First Article Configuration Inspection of S-01A/13, 17-19 Sep 62, 28 Sep 62.

225. Msg Cite SSH 28-9-33, 28 Sep 62.

226. Lockheed ltr to AFSSD (DCCA), subj: Management of the S-01A Program, 1 Oct 62, w/1 Atch: Program Management Paper.

227. 1st Ind (Uncl w/o C/Gp4 Atch), SSD to SSVSP, subj:Liquid Rocket Engine Data, 5 Oct 62, w/1 Atch: Engine Data Chart.

228. SSD (SSHGD) Ltr to Lockheed, subj: Ground Rules for Management of the AC-1 System, 8 Oct 62.

229. Msg, Cite SSH 12-10-23, 12 Oct 62.

230. SSD (SSH) Ltr to SSG, subj: Agena Presentation, 15 Oct 62.

231. Msg (C/Gp4), Cite SSH 15-10-28, 15 Oct 62.

232. 1st Ind, SSD (SSH) to SSVZR, subj: Agena D/Gemini Configuration," 16 Oct 62.

233. Memorandum to SSH (Col Fletcher), subj: S-01A Requirements Based on TAT Boosted Missions, 18 Oct 62.

234. SSD (SSH) Ltr to AFPRO (Col Voyles), Lockheed, subj: AFPR Logistics Surveillance of Program S-01A, 19 Oct 62.

235. SSD (SSHR) Ltr to SSVZR (MajAlbert), subj: Optional Equipment Requirements for S-01A Vehicles, 22 Oct 62.

236. SSD (SSH) Ltr to SSHKK, subj: Sole Source Justification, Contract AF 04(695)-221, 22 Oct 62.

237. Msg, Cite SSH 23-10-37, 23 Oct 62.

238. SSD (SSHR) Ltr to SSO (Col Hedrick), subj: Agena D C&C Optional Equipment, 31 Oct 62.

239. SSD (SSHR) Ltr to SSVR, subj: Agena D FY-63 Funding Requirements to Support NASA, 1 Nov 62.

240. SSD (SSH) Ltr to Lockheed, subj: S-01A Vehicle Assignment Philosophy, 2 Nov 62.

241. SSD (SSH) Ltr to Lockheed, subj: Fixed Ullage Rocket Carrier Problem, 8 Nov 62.

242. SSD (SSHKK) Ltr to multiple address, subj: Request for Authority to Extend Definitization Data and to Obligate Additional Funds - Letter Contract AF 04(695)-68, Agena D, 14 Nov 62.

243. SSD (SSH) Ltr to SSVZ, subj: Proposed NASA/Air Force Management Agreement, 14 Nov 62.

244. SSD (SSHKK) Ltr to multiple address, subj: Request Authorization for Letter Contract AF 04(695)-233, 16 Nov 62.

245. SSD (SSHGD) Ltr to 6595 ATW (Col Perry), subj: Umbilical Test Philosophy and Blanket Removal for SLV3/S-01A/Payload FSV, 26 Nov 62.

246. Msg (C/Gp4), Cite AFSSV-KQ 98986, 302127Z Nov 62.

247. SSD (SSH) Ltr to Lockheed, subj: First Article Configuration Inspection of S-01A/19, 6-23 Nov 1962, 12 Dec 62.

248. Historical Data - Jul-Dec 1962 from SSZAR to SSZA, 24 Jan 63.

249. NASA Ltr to Gen B. A. Schriever, 25 Jan 63.

250. Contractor Performance Evaluation Report on AF Contract AF 04(695)-21, with Lockheed Missile and Space Company, Sunnyvale, California, 14 Feb 63, (C/Gp4).

251. Ltr sgd Gen B. A. Schriever to Dr. Robert C. Seamans, Jr., 6 Mar 63.

252. Space Systems Division USAF S-01A Management Package, 20 Mar 63 (S/Gp3).

253. Msg, Cite MSFA 16-4-35, 161700Z Apr 63.

254. SSD (SSV) Ltr to Distribution, subj: Letter of Understanding Between NASA Lewis Research Center and USAF Space Systems Division for Transfer of NASA Agena Contracts, 9 May 63.

255. SSD (SSZAC) Ltr to SSZN and SP-206, subj: Configuration Control Management of Program S-01A Booster Vehicles, 19 Jun 63 (S/Gp4).

256. Msg Cite AFRSTD 76993, undated, and Msg Cite MSFA 15-7-22, 152045Z Jul 63.

257. AFSC (MSFAR) Ltr to multiple address, subj: Transmittal of Memorandum of Agreement, 20 Aug 63, w/1 Atch: USAF-NASA Memorandum of Agreement NASA Office of Space Sciences Agena Launch Vehicle Program, 9 Aug 63.

258. SSD (SSVA) Ltr (C/Gp4) to SSV, subj: Annual Report of Achievements (3 Oct 1962 - 3 Oct 1963), 27 Sep 63.

259. DOD News Release No. 1396-63, 21 Oct 63.

260. Msg Cite MSFA 7-11-6, 071956Z Nov 63.

261. Summary Report - Transfer of NASA Agena Programs from AFSSD to NASA LeRC, 31 Dec 63.

262. SSD (SSVAT Ltr to Hq AFSC (MSFA), subj: Summary of Transferred Agena Programs, 3 Jan 64.

263. SSD (SSVA) Ltr (Uncl w/o C/Gp4 Atch), subj: Historical Report: 1 Jul 1963-31 December 1963, 4 Feb 64, w/2 Atch.

264. SSD (SSVAC Ltr to SSVA (Col Blum), subj: Erection of Thor-Agena in Front of Building A, 16 Apr 64.

265. SSD (SSVA) Ltr (C/Gp4) to SSEH, subj: Historical Report, 1 January 1964-30 June 1964, 12 Aug 64, w/5 Atch: 1 (U); 2 (C); 3 (U); 4 (C); 5 omitted; 6 (C).

266. SSD (SSG) Ltr (Uncl w/o C/Gp4 Atch) to ARDC (DMSF MajGen Ritland), subj: Recent Agena Flight Problems, 12 Nov 64, w/1 atch: Proposed letter to Sec McMillan from Gen Schriever, w/1 atch.

267. SSD (SSG) Ltr (Uncl w/o C/Gp4 Atch) to AFSC (Gen Schriever, subj: General Dynamics/Astronautics Proposal to Increase SLV-3/Agena Payload Capability, 27 Nov 64, w/2 Atch; Atch 1 C/Gp4.

268. SSGA Memorandum for Generals Funk and Cooper (FOUO), subj: Request for Authority to Raise Major Agena Subcontractors to Associate Status, 10 Dec 64.

269. SSD (SSK) Ltr (C/Gp4) to AFSC and Hq USAF (in turn), subj: Request for Determination and Findings Pursuant to AFPI 3-214, 25 Jan 65.

270. SSD (SSVA) Ltr (C/Gp4) to SSEH, subj: Historical Report, 1 July 1964 - 31 December 1964, 5 Feb 65, w/5 Uncl Atch.

271. Gemini Atlas Agena Target Vehicle System, Management and Responsibilities Agreement between the National Aeronautics and Space Administration Manned Spacecraft Center and The United States Air Force Air Force Systems Command, Space Systems Division, Mar 65.

272. SSD (SSGA) MFR, subj: Biosatellite Program -- Call from Cols Pickering and Swan of AMD, 9 Mar 65.

273. Memorandum for Gen Funk, Thru Gen Cooper, from Col Hamilton, subj: Advanced Life Support Capsule, 2 Apr 65.

274. SSD (SSK) Ltr (C/Gp4) to AFSC and Hq USAF (in turn), subj: Request for Determination and Findings Pursuant to AFPI 3-214, 25 May 65.

275. SSD (SSLO) Ltr to AFSC (SCOO), subj: Request for Organization Change - Gemini Agena Division (SSVAT), 29 Jul 65.

276. SSD (SSVA) Ltr (C/Gp4) to SSEH, subj: Historical Report, 1 January 1965 - 30 June 1965, 9 Aug 65, w/5 Atch: Atch 1 (C/Gp4).

277. Msg Cite SSG 10111, 20 Oct 65.

278. SSD (SSV) Ltr to SSGS (B/Gen Martin), subj: Program 206-II Agena Launch Capability Contract, 3 Nov 65.

279. AFSC Ltr sgd Gen B. A. Schriever to SSD (MajGen Funk) and AEDC (BrigGen Gossick), 22 Nov 65.

280. Msg Cite SSG 10125 Nov 65.

281. SSD (SSVA) Ltr (C/Gp4) to SSEH, subj: Historical Report, w/6 Atch: 1. (U); 2. omitted; 3 (U); 4. (U); 5 (C); 6. (U); 7. (C), 8 Feb 66.

282. SSD (SSK) Ltr to AFSC and Hq USAF, subj: Request for Determinations and Findings Pursuent to AFPI 3-214, 8 Jul 66.

283. SSD (SSVA) Ltr (Uncl w/o C/Gp4 Atchs 2, 4, 5 & 8), subj: Historical Report for the Period of 1 January 1966 - 30 June 1966, 29 Jul 66.

284. SSD (SSV) Ltr to SSGS (Gen Martin), subj: Agena Guidance and Control Subsystem Development, 1 Feb 67, (C/Gp3).

285. SSD (SSVA) Ltr (Uncl w/o C/Gp4 Atch 2, 7, 8 & 9) to SSV, subj: Historical Report, 1 Jul 66 to 31 Dec 66, 3 Feb 67.

286. DAF Ltr (C/Gp3) to SSVA, subj: Attitude Control System Configuration, 8 Feb 67.

287. DAF (SP-7B) Ltr to SSVA (Major Bell), subj: Standard Agena Allocation, 13 Feb 67.

288. AFRPL (RPG) Ltr to SSD (SSGV/Col D. V. Miller), subj: Advanced Agena Development, 26 Mar 67.

289. SSD (SSVAP) Ltr (S/Gp3) to SSEH (Mr. McClellan), subj: Users of Standard Agena Vehicle, 7 Apr 67.

290. SSD (SSVA) Ltr to SSV (Col Hamilton), subj: Improved Agena Development Program, 28 Apr 67.

290a. Briefing Charts (S/Gp3), Report of Special Board on Agena Procurement, SAFSP, 1 May 67.

290b. Msg (C/Gp3), Cite SSG 67-12, 24 May 67.

290c. Msg (C/Gp4), Cite SCSS 22931, 262111Z 67, May 67.

291. SSD (SSV) Ltr to SAFSP (Gen Martin), subj: SSD Position on SAFSP Proposal for a New Production Management Concept for Agena, 2 Jun 67.

292. MFR sgd Maj Robert R. Crawford, 7 Jun 67.

293. SSD (SSVA) Ltr (C/Gp3) to SSGS (Gen Martin), subj: Improved Agena Performance Requirements, 12 Jun 67.

294. DAF (SP-2) Ltr (C/Gp3) to multiple address, subj: Improved Agena, 15 Jun 67.

295. Lockheed Briefing Charts, subj: Customized Standard Agena, 21 Jun 67.

296. DAF (SP-1) Ltr (C/Gp3) to SSG (Gen Cooper), subj: Improved Agena, 23 Jun 67.

297. MFR sgd MajRobert F. Crawford, subj: Improved Agena Requirements Meeting, 28 Jun 67.

298. Briefing Charts on Agena D and E Management Problems, 11 Jul 67.

299. SAMSO (SMVA) Ltr (Uncl w/o C/Gp4 Atch 5 and 8) to SMV, subj: Historical Report, 27 Jul 67.

300. Program Plan, subj: Customized Standard Agena, Support Engineering Program Plan, Contract [redacted] 27 Jul 67. 50X1

301. Briefing Charts, subj: Standard Agena, 28 Jul 67.

302. SAMSO (SMVA) Ltr to SMGS (Gen Martin), subj: Agena D Contract Structure, 2 Aug 67.

303. SAMSO (S G) Ltr (C/Gp4) to SAFSP (Gen Martin), subj: Improved Agena Flight Test, 11 Aug 67.

304. DAF (SP-1) Ltr (C/Gp3) to SMG-2 (Gen Cooper), subj: Improved Agena Flight Test, 14 Aug 67.

305. SAMSO (SMV) Ltr to SAFSP (Gen Martin), subj: New Production Management Concept for Agena, 22 Aug 67.

306. DAF (SP-1) Ltr (C/Gp3) to SMG-2 (Gen Cooper), subj: Improved Agena, 30 Aug 67.

306a. SAMSO (SMG-2) Ltr (C/Gp3) to SMGS (Gen Martin, subj: Improved Agena, 7 Sep 67.

306b. DAF (SP-1) Ltr (S/Gp3) to SMG-2 (Gen Cooper), subj: New Production Management Concept for Agena, 8 Sep 67.

306c. Memorandum for Gen O'Neill (C/Gp4) sgd MajGen Paul T. Cooper, subj: New Production Management Concept for Agena, 18 Sep 67.

307. MFR sgd LtCol Allen J. Poor, subj: Custom Agena Briefing to Gen Martin, 19 Sep 67, w/1 Atch: Briefing Charts, subj: Custom Agena.

308. DAF (Sp-2) Ltr (S/Gp3) to SMG-2 (Gen Cooper), subj: Procurement of Agena for SAFSP, 20 Sep 67.

309. SAMSO (SMG) Ltr to SCOM-27 (Col F. G. Morris, Jr), subj: Manpower Packages for the Titan III S and the Agena Program Office, 10 Oct 67.

310. Msg (S/Gp4), Cite SCSSM 36065, 182134Z Oct 67.

311. DAF [redacted] Ltr (Uncl w/o S/Gp3 Atch) to [redacted] (LtCol Wheeler, subj: Agena D Flight Summary, 25 Jan 68, w/1 Atch same subj.

312. DAF [redacted] Ltr to SME, subj: Final Agena Historical Report, 1 July - 19 October 1967, 15 Apr 68.

313. List of Contracts (containing Estimated Face Value) (C/Gp4), subj: Agena Vehicle, undated.

DEPARTMENT OF THE AIR FORCE
DIRECTORATE OF SPECIAL PROJECTS (OSAF)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

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REPLY TO ATTN OF: SP-14 /Col Schmitt/31250

8 FEB 1967

SUBJECT: Attitude Control System Configuration (U)

TO: SSVA (Col A J Gardner)

Program 110 has decided to incorporate "BACS squared" on Vehicle #23 and to continue use of the present electronics on vehicles #16 through #22. We, therefore, have no requirement for GCS.

JOHN J SCHMITT, JR, Col, USAF
Assistant Deputy Director

This letter classified CONFIDENTIAL because it reveals program configuration.

DOWNGRADED AT 12 YR INTERVALS; NOT AUTOMATICALLY DECLASSIFIED. DOD DIR 5

CONFIDENTIAL

DEPARTMENT OF THE AIR FORCE
DIRECTORATE OF SPECIAL PROJECTS (OSAF)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

13 FEB 1957

287

REPLY TO ATTN OF: SP-7B/Capt Weech/3-1925

SUBJECT: Standard Agena Allocation

TO: SSVA (Major Bell)

1. SP-7 requests that all 1191 Standard Agena vehicles presently under procurement be delivered with the current guidance subsystem installed. Due to the high cost of implementing the Guidance Control Electronics, Velocity Cut-Off System and the MIT Inertial Reference Package, this office does not plan to incorporate these systems. Consideration would be given for usage if future program procurements are made.

2. Further request you submit a list showing Standard Agena allocations for Program 846 usage.

CHARLES L. MURPHY, Col, USAF
Deputy Director

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DEPARTMENT OF THE AIR FORCE
AIR FORCE ROCKET PROPULSION LABORATORY (AFSC)
EDWARDS, CALIFORNIA 93523

REPLY TO ATTN OF: RPG

SUBJECT: Advanced Agena Development

MAR 28 1967

TO: SSD (SSGV/Col D. V. Miller)
AF Unit Post Office
Los Angeles, Calif 90045

1. A few months ago AFRPL entered discussions with Colonel A. Gardner relative to this Laboratory's participation in your Advanced Agena Development Program. Under Colonel Douthett's leadership and with management stimulus from our higher headquarters, we have improved our effectiveness in providing engineering support to AFSC's weapon systems divisions.

2. Use of AFRPL as SSD's "engineering arm" seems to be a natural. An alternate would be to use Aerospace Corporation as your engineering support element. The basic Agena propulsion was developed by the Air Force (including laboratories) and its contractors without using Aerospace. At the time the 6 Dec 1966 letter was prepared (Atch #1), it seemed that the three parties; i.e., SSD, Lockheed and Bell, were in favor of utilizing AFRPL for engineering support.

3. Within the past 6 months we have evidenced significant growth in our support of BSD. Typical of the understanding we establish with BSD on each of their programs we support is the correspondence dated 9 Dec 66 and 16 Dec 66 (Atch #2).

4. Recently we have proposed a method for assessing the effectivity of laboratories. Three copies of this proposal report are attached. You will note that the proposal promotes further "coupling" between laboratories and the systems divisions. You will find laboratory effectivity being measured largely by the impact that laboratories can bring into Air Force weapon systems. Not only are you the target of our technology product, but you also validate the worth of any technology.

5. We remain interested in supporting your development of the advanced Agena and wish to conclude a degree of formality much the same as we have been doing with BSD. In the event that SSD has other plans in mind, we would appreciate being advised.

D. M. ROSS
Deputy Director

3 Atch
1. Ltr, RPREC, 6 Dec 66
2. Ltr, BSRP, 9 Dec 66 and RPG, 16 Dec 66
3. Report, "Proposal for Assessment of Lab Effectivity" (3 cys)

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS SPACE SYSTEMS DIVISION (AFSC)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

REPLY TO
ATTN OF: SSVAP

7 APRIL 1967

SUBJECT: Users of Standard Agena Vehicle

TO: SSEH (Mr. McClellan)

1. Following are the programs supported by the Standard Agena vehicle during the periods indicated.

1962 - 162, 698BK

1963 - 162, 698BK, 206, 638

1964 - 698BK, 162, 206, 241, 638, Mariner

1965 - 241, 206, 770, Snapshot, Vela, OGO-C, Gemini

1966 - 206, 241, 770, Gemini, OAO, 461, Pageos, 206II, Lunar Orbiter, ATS

1967 - 846, 206-I, Lun Orb, 110, ATS, 770, Mariner, OGO-D, Nimbus.

WILLIAM R. BELL, Maj USAF
Chief, Program Control Div.
Agena Program Office

SSVA-1933

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SSVA

28 Apr 67

Improved Agena Development Program

SSV (Col Hamilton)

1. On 20 April, I discussed the outline of my briefing (intended for Secretary Flax) with Col Diehl, Hq USAF and Lt Col Saavedra, Hq AFSC. I then gave the briefing to the Hq USAF Space Panel chaired by Col Frank Ritchie. There were no significant comments.

2. On 21 April, I briefed Assistant Secretary of the Air Force for R&D, Dr. Flax, on the Improved Agena Program. [redacted] 50X1
Mr. Ross, Col Diehl and Lt Col Saavedra were also present. Discussions with Secretary Flax centered mainly around the present effort to establish complementary subsystems for the Improved Agena and schedule/costs estimates. He affirmed the significance of the schedule and the importance of good funds estimates.

3. Also on 21 April, I briefed Mr. John Kirk and Mr. Howard Barfield, DDR&E. Discussion covered the following main points:

a. Recommendation that an incentive plan take into account performance and schedule in addition to cost.

b. The possible use of the vehicle on a Titan IIIC booster.

c. The resolution of plans for appropriate complementary subsystems.

In a discussion between Mr. Kirk and Col Diehl, it was made clear that DDR&E does not have further action items at this time. Hq USAF will take all necessary action to program funds and to monitor progress of the program through normal channels. It was agreed that upon receipt of the necessary funds, SSD will proceed with Phase II of the program as outlined. I was told that the required FY 67 funds are immediately available and that action is underway to provide the FY 68 funds.

4. I wish to reiterate several points which I have made to you and to General Cooper in the past. At the present time, the Agena Program Office is not manned adequately to provide the necessary assurance of good schedule and costs control management which is required to complete this program in keeping with the briefings made on 21 April. Due to the pressure of other activities, we cannot assure timely and adequate procurement action for the Phase II procurement, especially with regard to the formulation and negotiation of the recommended incentive plan. The failure of this office to receive adequate manning is complicated with other major management objectives at this time. Some of the more significant items are:

a. The resolution of the Contract -939 problems which are precluding negotiation activity.

b. The resolution of -0077 Contract problems which are related to the -939 Contract.

c. The half-completed configuration management program clean-up which I started when I first was assigned as Agena Program Director and which retains its importance relative to present and future programs.

d. The development of adequate component/vehicle interface controls.

e. The establishment of an orderly system of overall management reports and meetings between this office and the contractors.

f. Effective and timely technical evaluations to support various procurement actions for subsystems, studies, and vehicles.

g. The establishment of adequate system program office long-range planning and analyses of methods, costs and technical development efforts, in keeping with good management techniques. Poorly accomplished items at this time lead to down the road complications which result in further intensification of the manpower problem.

I have been involved in system program office management since 1956 on five major programs. I have seen the results of failure to act on organizational and manning problems as well as the results of timely action. It is my opinion that if no action is taken at this time to

increase the present level of manning in the Agena Program Office, that the Improved Agena Program is headed toward overrun and behind schedule status. We lack the capability to do the management job that is required of this program which for development purposes alone will expend about 35 million dollars in the next two years. In addition within six months, we must have defined and taken contractual action for flight hardware to support operating requirements. The complications of inadequate manning and the resultant need for me to devote my time to too much fire-fighting and too little general management have impaired my capability to accomplish my job in the manner and depth that are necessary.

ALFRED J. GARDNER, Col, USAF
Program Director, Agena
Deputy for Launch Vehicles

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1 May 1967 Briefing, Report of Special Board on Agena Procurement. SAFSP briefing to Agena personnel outlines requirement to procure "Peculiarized Agenas."

REPORT OF SPECIAL BOARD ON AGENA PROCUREMENT

SAFSP

1 MAY 67

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OBJECTIVE OF REVIEW

DETERMINE BEST COURSE OF ACTION FOR PROCURING PEDESTALIZED AGENAS FOR SAFSP PROJECTS

CONFIGURATION FOR INITIAL AGENA PROCUREMENT

SUBSEQUENT MODIFICATIONS TO CONVERT TO PROJECT MISSIONS

SECRET

~~SECRET~~ 1045

BACKGROUND

ACENA STANDARDIZATION 1961

TO PROVIDE

BASIC VEHICLE FOR MANY USING PROGRAMS
IMPROVED RELIABILITY
REDUCED COST
FIXED PRICE PROCUREMENT

PRODUCTION APPROVAL PROCEDURES REGULARIZED 1964

VANCE MEMO TO SAFUS: PROGRAMMING AND FUNDING FOR SPACE LAUNCH VEHICLES
HQ USAF MAINTAINS RECORD OF FIRM ORDERS AND PLANNED REQUIREMENTS
DDR&E APPROVES PRODUCTION TO MEET FIRM ORDERS
OSD APPORTIONS FUNDS TO USING PROGRAMS TO FINANCE PRODUCTION
DDR&E APPROVES CHANGES

CERTAIN COMPONENTS PROCURED GFE 1965

BELL ENGINES AND VELOCITY METER
BARNES HORIZON SENSOR

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AGENA USERS

	TOTAL	SAFSP	SSD	NASA
NON-STANDARD				
AGENA A	27	25	2	–
AGENA B	79	53	8	18
NON-STANDARD SUB-TOTAL	106	78 (74%)	10 (10%)	18 (16%)
STANDARD				
CONTRACT NO				
- 21 (1961-1963)	12	12	–	–
- 68 (1962-1964)	39	37	2	–
- 194 (1963-1965)	46	38	5	3
- 451 (1964-1965)	29	24	4	1
- 712 (1965-1967)	57	41	2	14
(L/C) - 939 (FEB 67-NOV 68)	36	35	–	1
(L/C) -0077 (DEC 68-DEC 69)	19	19	–	–
STANDARD SUB-TOTAL	238	206 (86%)	13 (6%)	19 (8%)

NOTE: SAFSP IS SOLE KNOWN USER OF AGENAS YET TO BE BUILT

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CURRENT CONCEPT

STANDARD AGENA

PROCURED ON SSD FPI CONTRACT
PRODUCED IN TWO MODELS
MODEL 1191 FOR PROJECT 846
MODEL 1007 FOR ALL OTHER USERS
ACCEPTED BY SSD AS COMPLETELY ASSEMBLED AND SYSTEM TESTED VEHICLE

PECULIARIZATION

PROCURED ON SEPARATE SARSP CONTRACTS FOR EACH USING PROJECT
TAKE DELIVERY OF STANDARD AGENA
EXTENSIVE DISASSEMBLY —
REMOVE MANY COMPONENTS —
SOME NOT USED ATALL - RETURNED FOR CREDIT
SOME MODIFIED EXTENSIVELY
PROCURE PROJECT-PECULIAR COMPONENTS
RE-ASSEMBLY
SYSTEM TEST

~~SECRET~~ 1048

CURRENT STANDARD AGENA ELEMENTS

(ARBITRARILY SELECTED BY BOARD)

FORWARD (4)	(5)	AFT (26)
STRUCTURE 2	PROPEL TANKS 1	STRUCTURE 3
MODEL 1007 GUIDANCE SYSTEM 13	MISCELLANEOUS 4	ENGINE SYSTEM 8
AGENA TM SYSTEM 14		PNEUMATICS 6
SEQUENCE TIMER 1		MISCELLANEOUS 9
95 POWER CONV. & DISTR. SYSTEM 4		
PYROTECHNICS 3		
PROPEL. PRESS. SYSTEM 5		
HARNESSES 22		
IC. BATT. ADAPT. KIT 5		L/B MOD KIT 12
ADDED TO UPA KIT 6		AUX N_2 TANK KIT 4
1007 ETL. ADAPT. KIT 8		PROPEL. PUMP KIT 5
TO MAKE H/S PRE AMP S/C KIT 2		SINGLE START KIT 4
1291 AUX FM TM ADAPT KIT 6		TURBINE IGNITER ASSY. 1
AGENA TM XMTR ADAPT KIT 1		ENG. CONE AUX. STRUC. KIT 1
BLANK COMM PANEL KIT 1		SAFE/ARM PLUG KIT 1
TO S-BAND 8 EA/DEC ADAPT KIT 3		BOOSTER ADAPTER KIT 16
MISCELLANEOUS 3		

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CURRENT PECULIARIZATION SUMMARY

ELEMENTS IN MODEL 1007 STANDARD AGENA	CHANGES BY PROJECT	848	110	770
FORWARD SECTION				
64	RELIVE	35	30	48
	ADD	74	118	56
MID SECTION				
5	RELIVE	2	1	1
	ADD	9	1	3
AFT SECTION		2	3	3
26	RELIVE	143	89	74
	ADD			
TOTALS				
95	RELIVE	39	34	52
	ADD	226	208	133

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CURRENT PRODUCTION MANHOURS
(IN THOUSANDS)

	FAB & ASSY.	SYSTEM TEST	INTEG & FLT. SPT.	TOTAL
STANDARD AGENA				
MODEL 1007	19.9	5.5	-	25.4
MODEL 1191	20.7	5.5	-	26.2
PECULIARIZATION				
PROJECT				
846	55.4	12.5	26.3	94.2
110	57.6	32.0	73.0	162.6
770	132.0	59.0	33.0	224.0

[redacted]

GRAND TOTALS

846	120.4
110	188.0
770	249.4

[redacted]

50X1

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CURRENT UNIT COSTS

($ MILLIONS)

	STANDARD MCDA LMSC VEHICLE, SPARES & OPTIONAL KITS:	PECULIARIZATION (EXCLUDES COST OF PAYLOAD INTEGRATION AND FLIGHT SUPPORT)	TOTAL COST TO SAFSP
MATERIAL	.2975		
LABOR & O'HEAD	.3325		
	.630	PROJECT	
GFE ITEMS:		846 .883	1.983
BELL ENGINE	.140	110 1.165	2.265
BELL VELOCITY METER	.035	770 2.674	3.774
BARNES HORIZON SENSOR	.045		
COST TO SSD:	.850		
ENGINEERING CHANGES & POST FLIGHT ANALYSIS	.250		
COST TO USERS	1.100		

50X1

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CURRENT CONFIGURATION CONTROL

STANDARD AGENA

375 - SERIES PROCEDURES

CLASS I CHANGES - AGENA SPO CCB
(SAFSP MEMBERSHIP)

CLASS II CHANGES - AFPRO CCB
(LMSC MEMBERSHIP)

DETAILED DOCUMENTATION

PECULIARIZED VEHICLE

CONFIGURATION MANAGEMENT PLAN

DIRECT CHANNEL LMSC - SAFSP

APPROVAL BY SAFSP PROJECT DIRECTOR

MINIMUM DOCUMENTATION

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1853

CURRENT LOGISTICS SUPPORT

SSD CONTRACT

LMSC MAINTAINS INVENTORY OF SPARES

AFPRO DETERMINES:
- ISSUE OF SPARES
- FLIGHT WORTHINESS
- DISPOSITION OF ITEMS

MATERIEL REVIEW BOARD
- HEADED BY AFPRO

DETERMINES:
- FLIGHT WORTHINESS
- DISPOSITION

1054

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ALTERNATIVES CONSIDERED

BY BOARD

- 1 — NO CHANGE
- 1½ — ELIMINATE ONLY THE STANDARD AGENA SYSTEM TEST
- 2 — INTRODUCE IMPROVED AGENA
- 3 — SSD BUY MOST COMPONENTS & SUB-ASSEMBLIES FROM LMSC, WITH THESE ITEMS CFE: ENGINE, VELOCITY METER, HORIZON SENSOR, BTL GUIDANCE, UNIVAC COMPUTER

  SAFSP BUY ONLY ASSEMBLY, SYSTEM TEST, INTEGRATION & FLIGHT SUPPORT
- 3½ — SAME AS 3, EXCEPT PLACE SSD FUNCTIONS IN NEW SAFSP OFFICE
- 4 — DISCONTINUE STANDARD CONCEPT
  SAFSP BUY PECULIARIZED AGENAS FROM SCRATCH

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BOARD REJECTED ALTERNATIVES 1, 1½ & 2

- 1 NO ASSEMBLED STANDARD AGENA IS READILY USABLE BY SAFSP

  DISASSEMBLY
  REMOVAL
  MODIFICATION
  ADDITION

  } HIGHLY PROJECT PECULIAR

- 2. REJECTION OF ALTERNATIVE NO. 2 (IMPROVED AGENA) DOES NOT REJECT IMPROVED COMPONENTS PER SE

- 3 375-SERIES CONFIGURATION CONTROL TOO DETAILED FOR OUR DISSIMILAR PROJECTS

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1056

COMPARISON

OF THREE REMAINING ALTERNATIVES WITH CURRENT SITUATION

ESTIMATES BY BOARD ONLY

PARAMETER	CURRENT	№ 3	№ 3 ½	№ 4
CONCEPT	SSD BUYS ASSEMBLED AND TESTED AGENA. SAFSP PECULIARIZES EXTENSIVELY.	SSD BUYS COMPONENTS SAFSP ASSEMBLES AND TESTS	NEW SAFSP OFFICE BUYS COMPONENTS SAFSP PROJECT OFFICE ASSEMBLES AND TESTS	SAFSP PROJECT OFFICES BUY PECULIARIZED AGENAS FROM SCRATCH
TOTAL MANHOURS (THOUSANDS) PROJECT 846	120.4	102.0	SAME AS No. 3	179.9
110	188.0	173.6		175.5
770	249.4	187.8		241.5
TOTAL UNIT COST (MILLIONS) PROJECT 846	1.983	1.737	SAME AS No. 3	1.920
110	2.265	2.059		2.100
770	3.774	2.883		3.686

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COMPARISON (CONTINUED)

	CURRENT	3	3½	4
TOTAL MANPOWER IN ORGANIZATIONS CONSIDERED				
USASC				
STAN AGENA	1100	500	500	0
PROG. OFF.	2926	3326	3326	3526
AF				
AGENA SPO	75	50	0	0
AFPRO QC	55	45	45	45
SAFSP	202	212	231	231
		Diff - 19		
TOTAL	4358	4133	4102	3802

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COMPARISON (CONTINUED)

	CURRENT	3	3½	4
CONFIGURATION CONTROL	STANDARD-375 PECULIAR-INTERNAL SAFSP	ALL INTERNAL SAFSP	SAME	SAME
RELIABILITY	ASCENT - OBJECTIVE			
846	93.2 % 89.8 %			
110 (4 FLTS)	100. % 100 %		AT LEAST AS GOOD IN OTHER ALTERNATIVES	
TTO (4 FLTS)	100. % 100 %			
PRODUCTION APPROVAL	STANDARD - DDR&E PECULIAR - SAFRD	COMPONENTS - DDR&E or SAFRD PECULIAR VEHICLE SAFRD	SAME	ALL SAFRD

50X1

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Conclusions

1. AN ASSEMBLED AND TESTED STANDARD AGENA IS NOT A COST-EFFECTIVE BASE ON WHICH TO TO BUILD VEHICLES PECULIARIZED FOR SAFSP.
2. THE MOST COST-EFFECTIVE BASE IS PRODUCTION OF COMPONENTS AND SUB-ASSEMBLIES ONLY.
3. THE MOST COST EFFECTIVE METHOD OF PRODUCING SAFSP VEHICLES IS TO ASSEMBLE AND SYSTEM TEST THEM OUR
4. THE PROCUREMENT OF ITEMS SUCH AS ENGINES AND HORIZON SENSORS ON A GFE BASIS IS INCONSISTENT WITH SAFSP PERFORMANCE INCENTIVES.
5. 375 SERIES CONFIGURATION CONTROL IS TOO DETAILED FOR APPLICATION TO SAFSP PECULIARIZED VEHICLES OR THEIR COMPONENTS.
6. SAFSP IS IN A BETTER POSITION THAN THE AFPRO TO DETERMINE WHETHER AN ITEM FROM THE SPARES INVENTORY IS FLIGHT-WORTHY.
7. PRODUCTION OF COMPONENTS AND SUB-ASSEMBLIES IN LIEU OF A COMPLETE STANDARD AGENA DOES NOT INHIBIT POTENTIAL (NON-SAFSP) AGENA CUSTOMERS.
8. THERE IS NO SIGNIFICANT DIFFERENCE AMONG THE ALTERNATIVES CONSIDERED IN THE AREAS OF BUDGETING, PRODUCTION PLANNING, OR SAFSP CAPABILITY TO MAINTAIN RESERVE SYSTEMS.
9. RELIABILITY OF PECULIARIZED AGENAS WOULD BE AT LEAST AS GOOD UNDER THE FIVE ALTERNATIVE CHANGED CONCEPTS AS UNDER THE CURRENT CONCEPT (ALT NO. 1).

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RECOMMENDATIONS

1 DDR&E APPROVE CHANGING STANDARD AGENA PRODUCTION CONCEPT
FROM PRODUCTION OF ASSEMBLED AND TESTED VEHICLES
TO PRODUCTION OF COMPONENTS AND SUB-ASSEMBLIES

2 DDR&E DELEGATE TO SAFRD APPROVAL AUTHORITY FOR THIS PRODUCTION

3 CONTRACTING FOR COMPONENTS AND SUB-ASSEMBLIES BE DONE BY:
SSD FOR ALL STANDARD ITEMS
FOR ALL PECULIAR ITEMS, EXCEPT A FEW MISSION-SENSITIVE ITEMS
SUCH AS PROJECT 770 COMMAND SYSTEM
AND PROJECT 770 SOLAR ARRAY
SAFSP FOR FEW MISSION-SENSITIVE ITEMS

4 SSD PRODUCTION CONTRACT PROVIDE FOR:
LMSC TO FURNISH FOLLOWING ITEMS CFE
ENGINES
VELOCITY METERS
HORIZON SENSORS
BTL GUIDANCE } WHERE USED BY AGENA
UNIVAC COMPUTER SUPPORT }
SAT CONTROL AIRBORNE EQUIPMENT
SAFSP-PREPARED CONFIGURATION MANAGEMENT PLAN IN LIEU OF
375-SERIES PROCEDURES
SPECIFICATIONS PREPARED BY SAFSP

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RECOMMENDATIONS (CONTINUED)

5 AFPRO CONFIGURATION CONTROL RESPONSIBILITY BE CHANGED TO A ROLE OF SURVEILLANCE AND MAKING RECOMMENDATIONS TO SAFSP

6 SAFSP ESTABLISH A CONFIGURATION REVIEW BOARD TO CONTROL CONFIGURATION OF:
ITEMS PROCURED BY SSD
PECULIARIZED VEHICLES PROCURED BY SAFSP

7 DEVELOPMENT OF IMPROVED AGENA COMPONENTS BE LIMITED TO THOSE IMPROVEMENTS REQUIRED BY SAFSP
A. CONTINUE UNDER SSD MANAGEMENT FOLLOWING DEVELOPMENTS ALREADY UNDER WAY
BELL 8533 ENGINE (RE-STUDY TIME PHASING)
BELL TYPE II A VELOCITY METER
REPLACEMENT FOR B-TIMER
QUANTIC HORIZON SENSOR
B. FUTURE IMPROVEMENTS BE REVIEWED BY SAFSP/SSD TO DETERMINE WHICH AGENCY MANAGES DEVELOPMENT

8 SSD CONTRACT WITH LMSC FOR AGENA LOGISTICS SUPPORT BE MODIFIED TO GIVE SAFSP RESPONSIBILITY FOR DETERMINING FLIGHT-WORTHINESS AND DISPOSITION OF ITEMS

9 SSD RETAIN RESPONSIBILITY FOR AGENA LAUNCH SERVICES, EXCEPT FOR THOSE SERVICES REQUIRED TO BE PROCURED BY SAFSP UNDER FACTORY TO PAD CONCEPT

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1062

RECOMMENDATIONS (CONTINUED)

10 SSD AGENA SPO TO BE MANNED TO DO THESE TASKS
PROCURE COMPONENTS TO SAFSP SPECIFICATIONS
PURSUE SELECTED DEVELOPMENTS AS REQUIRED BY SAFSP
PROCURE LAUNCH SERVICES

11 BUDGET ESTIMATING AND PRODUCTION PLANNING BE ACCOMPLISHED IN SAFSP-SAFRD CHANNEL

12 IMPLEMENTATION OF ALL THE ABOVE BE CARRIED OUT IN TWO STEPS

STEP 1 (INITIATE AFTER GO-AHEAD)
STOP ASSEMBLY AND SYSTEM TEST OF STANDARD AGENA
STOP MANUFACTURE OF COMPONENTS NOT USED BY SAFSP
REPLACE 37E-SERIES WITH SAFSP CONFIGURATION MANAGEMENT PLAN
VEST IN SAFSP AUTHORITY TO DETERMINE FLIGHT-WORTHINESS AND DISPOSITION OF ITEMS IN LOGISTICS INVENTORY

STEP 2 (6-9 MONTHS AFTER GO-AHEAD)
ORDERLY EXECUTION OF REMAINING ITEMS

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CURRENT

COMPLETE AGENA VEHICLE

FAB | ASSEMBLY | SYSTEM TEST

PECULIARIZED VEHICLE

DISASSEMBLY | REMOVAL: RETURN FOR CREDIT; MODIFY | ADD PECULIAR COMPONENTS | ASSEMBLY | SYSTEM TEST

ST. AGENA OFFICE PROCURES

SAFSP PROCURES

PROPOSED

STANDARD COMPONENTS

COMMON TO ALL USERS

OPTIONAL KITS

COMMON TO 2 OR MORE USERS

PROJECT PECULIAR COMPONENTS

QUANTITY REQUIREMENT

SMALL REQUIREMENT OR MISSION SENSITIVE

ASSEMBLY | SYSTEM TEST

ST. AGENA OFFICE:

FABRICATES
ACCEPTS ON COMPONENT TEST BASIS
SPECS
CONFIG. CONTROL } BY SAFSP

SAFSP:

COMPLETES THE FABRICATION
ASSEMBLES IN PECULIAR CONFIG.
SYSTEM TEST AS PECULIAR VEHICLE

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JOINT MESSAGEFORM — COMMUNICATION CENTER

SECURITY CLASSIFICATION: ~~CONFIDENTIAL~~

TYPE MSG | BOOK | MULTI | SINGLE

PRECEDENCE

ACTION

INFO

DTG

DECLASSIFIED, DOD DIR 5200.10
INTERVALS; NOT AUTOMATICALLY
DOWNGRADED AT 12 YEAR

FROM:

SSD LOS ANGELES CALIF

TO:

AFSC

SPECIAL INSTRUCTIONS
COPY TO:
Gen Martin
Col Hamilton
LtCol McIlnay
Col Diehl
Col Gardner
Col Riddle
Mr. Whalen
Mr. Forshed
Col Keeler
Col Deatley
Maj Crawford
Maj Bell
Maj Davis
Maj Bradford
LtCol Hedlund

~~CONFIDENTIAL~~ SSG 67-12 MAY 67

SUBJECT: RED LINE PRESTO - SSD

REFERENCES:

(A) D&F NO. 67-11C-91, 13 JAN 67.

(B) FINAL PROCUREMENT ACTION APPROVAL, 13 JAN 67 AND ASSOCIATED FORM 111 (P-66-1-6.44.09.12.4).

(C) BRIEFING, IMPROVED AGENA TO HQ AFSC, HQ USAF, SAFRD AND ODDR&E BY AGENA PROGRAM DIRECTOR, 20-21 APR 67.

PART I. 1. THIS IS AN EXISTING PROBLEM.

2. THE IMPROVED AGENA PRELIMINARY DESIGN REVIEW WAS CONDUCTED BY THE PROGRAM OFFICE 15-19 MAY 67. REPRESENTATIVES OF THE AF ROCKET PROPULSION LABORATORY, AEROSPACE CORP, AFPRO, AND LOCKHEED MISSILES AND SPACE CO PARTICIPATED. BASED ON THE

DATE: 24 | TIME:
MONTH: MAY | YEAR: 1967
PAGE NO.: 1 | NO. OF PAGES:

DRAFTER — TYPED NAME AND TITLE: J. L. HAMILTON, Col, USAF and NORMAN J. KEEFER, Col, USAF
PHONE: 32288/ 32823

RELEASER — SIGNATURE: SIGNED
TYPED (or stamped) NAME AND TITLE: PAUL T. COOPER, Major General, USAF

SECURITY CLASSIFICATION: ~~CONFIDENTIAL~~

DOWNGRADING INSTRUCTIONS: DOWNGRADED AT 12 YEAR INTERVALS; NOT AUTOMATICALLY DECLASSIFIED. DOD DIR 5200.10

DD FORM 1 NOV. 63 173 — REPLACES EDITION OF 1 MAY 55 WHICH MAY BE USED.

RESULTS, THE PROGRAM DIRECTOR DETERMINED THAT IT WAS UNWISE TO PROCEED INTO PHASE II OF THE DEVELOPMENT PROGRAM ON THE SCHEDULED DATE, 29 MAY 67. CONSEQUENTLY THE ALREADY HIGHLY COMPRESSED SCHEDULE CALLING FOR A MARCH 69 DD 250 OF THE FIRST PRODUCTION VEHICLE IS IN INCREASING JEOPARDY.

3. THE CONSIDERATIONS WHICH COLLECTIVELY RESULTED IN THE DECISION NOT TO PROCEED ON SCHEDULE ARE AS FOLLOWS:

(1) INADEQUATE PROGRAM DEFINITION: FROM THE OUTSET, IT WAS REALIZED THAT ACHIEVEMENT OF ADEQUATE DEFINITION IN 90 DAYS WAS AN OPTIMISTIC GOAL. THE GOAL HAS NOT BEEN REACHED AND ADEQUATE TOOLS TO INSURE VEHICLE PERFORMANCE AND CONTROL CONTRACTOR'S COSTS AND SCHEDULE HAVE NOT YET BEEN DEVELOPED.

(2) CRITICAL TECHNICAL PROBLEM: AS A RESULT OF THE PRELIMINARY DESIGN REVIEW AND A REVIEW OF THE RECENT DATA DEVELOPED BY INVESTIGATIONS OF THE CURRENT TURBINE PUMP ASSEMBLY FLIGHT ANOMALY PROBLEM (PROJECT COUGHDROP), THE APPLICATION OF AN UPRATED VERSION OF THE CURRENT PUMP ASSEMBLY IS CONSIDERED

JOINT MESSAGE FORM - CONTINUATION SHEET

FROM:

SSD

(3) UNAVAILABILITY OF PRELIMINARY COST PROPOSAL: THE CONTRACTOR'S COST PROPOSAL FOR PHASE II WAS DUE FOR SUBMISSION 15 MAY 67. TODATE IT HAS NOT BEEN SUBMITTED. IT HAS ALWAYS BEEN A PROGRAM OFFICE CONDITION THAT PHASE II WOULD NOT PROCEED WITHOUT A DETAILED COST PROPOSAL.

PART II. ASSISTANCE REQUIRED:

1. I DO REQUIRE THE ASSISTANCE OF HIGHER HEADQUARTERS.

2. RECOMMENDED COURSE OF ACTION: WE HAVE BEEN INFORMALLY ADVISED BY SAFSP THAT THE NEED DATE FOR THE FIRST VEHICLE MAY BE RESCHEDULED. BASED ON THE USER NEED DATE THE CURRENT SCHEDULE OF MARCH 69 DD 250 OF THE FIRST PRODUCTION IMPROVED AGENA VEHICLE CAN BE EXTENDED TO SEPTEMBER 70. THIS WOULD PERMIT ADEQUATE COMPLETION OF PHASE I EFFORT AND ALLOW INCORPORATION OF A COOLED-BEARING TURBINE PUMP ASSEMBLY. REQUEST APPROVAL OF THIS COURSE OF ACTION BY 12 JUNE 67.

3. ALTERNATIVE COURSES OF ACTION:

(A) IF YOU ARE WILLING TO ACCEPT THE RISK ASSOCIATED WITH UPRATING THE CURRENT TURBINE PUMP DESIGN, EXTEND THE CURRENT SCHEDULE OF MAR 69 DD 250 TO

SYMBOL	PAGE NR 3	NR OF PAGES 4	SECURITY CLASSIFICATION [redacted]	DATE

DD FORM 1 MAY 55 173-1

☆ U. S. GOVERNMENT PRINTING OFFICE

JOINT MESSAGEFORM - GUIDANCE AND SHEET

FROM:

SSD

MAY 69. YOUR DIRECTION IF THIS ALTERNATIVE IS SELECTED IS REQUIRED BY 12 JUN 67.

(B) IF THE MAR 69 DD 250 [illegible]E IS INVIOLATE, AND THE TECHNICAL AND COST RISKS ARE ACCEPTABLE, YOUR DIRECTION TO PROCEED IMMEDIATELY INTO PHASE II IS REQUIRED BY 26 MAY 67.

4. ADDITIONAL COORDINATION WITH SAFSP IS REQUIRED AND THIS COORDINATION IS UNDERWAY. INCLUDED IS HAVING THEM SPECIFY DETAILED MISSION REQUIREMENTS. IF HEADQUARTERS IS AWARE OF ANY OTHER MISSION REQUIREMENTS OTHER THAN THOSE OF SAFSP REQUEST ADVISEMENT.

PART III. COMMANDER'S COMMENTS:

I AGREE WITH THE PROGRAM DIRECTOR'S ANALYSIS OF THE PROBLEM, HIS IMMEDIATE ACTION AND HIS RECOMMENDED COURSE OF ACTION. I URGE YOUR APPROVAL AND SUPPORT IN GAINING APPROVAL OF THIS COURSE OF ACTION FROM HQ USAF AND SAFRD. CP-3.

SYMBOL	PAGE NR	NR OF PAGES	SECURITY CLASSIFICATION	DATE
	4	4	[illegible]	[illegible]

DD FORM 1 MAY 55 173-1

☆ U. S. GOVERNMENT PRINTING OFFICE [illegible]

147-47
1C 6492

CONFIDENTIAL

SSV
2506

NNNNRTTC JAW RUEDTAA7414 1462221-CCCC--RUWJEBA.
ZNY CCCCC
R 262111Z MAY 67
FM AFSC
TO SSD LOS ANGELES CALIF
BT

MAY 29 AM 7:10
SSYE

~~C O N F I D E N T I A L~~ SCSS 22931 MAY 67.
FOR SSV. REFERENCE SSD MESSAGE RED LINE PRESTO SSG 67-12. THIS MESSAGE IN FOUR PARTS. PART ONE. CONCUR WITH YOUR DECISION NOT TO PROCEED WITH PHASE II PENDING FURTHER USER PROGRAM GUIDANCE. PART TWO. REQUEST YOU PROCEED WITHH SAFSP COORDINATION TO OBTAIN DETAILED MISSION REQUIREMENTS FOR INPUT TO PHASE I DOCUMENTATION. ANY ADDITIONAL REQUIREMENTS AVAILABLE TO THIS HEADQUARTERS WILL BE FORWARDED BY SUBSEQUENT MESSAGE. PART THREE. USER FUNDING AND SCHEDULE POSTURE CORRENTLY UNDER DETAILED REVIEW BY SAFSS, SASFM AND SAFRD. AT MEETING TODAY AMONG SAFSS, AFRDSE AND SCSSU, USER HAS AGREED TO PROVIDE SCHEDULE/ FUNDINGPOSTION BY 0 JUNE 1967, TO SUPPORT COURSE-OF-ACTION DECISION BY 12 JUNE 1967. PART FOUR. REQUEST YOU PROVIDE BY 7 JUNE 1967 INFORMATION FOR FOLLOWING PROGRAMM OPTIONS WHCIH SHOULD INCLUDE COMPLETION OF ACCEPTABLE

PAGE TWO RUEDTAA7414 C O N F I D E N T I A L
PHASE I, NECESSARY TURBOPUMP TASK, AND LIMIT OF FY 1967 FUNDS OF $2.237 MILLION. A. SCHEDULE AND FUNDING FOR EARLIEST POSSIBLE AVAILABILITY DATE, WITH FY 1968 FUNDING NOT TO EXCEED $21.1 MILLION. B. SCHEDULE AND FY 1970 FUNDING FOR PROGRAM FUNDED WITH $2.237 MILLION IN FY 1967, $14.0 MILLION IN FY 1968, AND $18.2 MILLION IN FY 1969. C. SCHEDULE AND FUNDING FOR DD 250 DATE OF SEPTEMBER 1970.
BT

1C-6492

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have given us

291

2 JUN 1967

SSV

SSD Position on SAFSP Proposal for a New Production Management Concept for Agena

SAFSP (Gen Martin)

1. Pursuant to your briefing and our discussion on 29 May 1967, I would like to restate the position that I expressed to you at that time. Your Proposal 3 would relegate the role of SSD to one of a procuring authority for parts and components, as opposed to the SSD mission which is system responsibility - including responsibility for design, development, test and procurement of a system. What you are proposing is contrary to the management concept that has evolved over the years wherein we plan the total RDT&E responsibility, including procurement actions, under single management. In the event that you do proceed with the components and parts approach, your Option 3 1/2 appears to be the only one of the two that is manageable since you as program manager will have all elements of the program directly under you.

2. However, I believe that a more acceptable solution can be reached. There is a possibility of future NASA business. If additional uses for Agena should materialize, your Option 3 or 3 1/2 would be even less desirable. It seems reasonable to me that an ascent vehicle could be built and tested as a system as separate and distinct from the on-orbit mode. Such an arrangement should satisfy your objections to the current Standard Agena as well as provide an integrated Agena Ascent Vehicle which would interest NASA as well as other programs. In order to achieve this we will have to obtain your requirements on a more timely basis in order to exercise proper configuration control and to optimize production to meet user requirements.

3. I believe that such an ascent vehicle could be defined which would be an acceptable approach for you as well as a viable system for us. However, our Agena Program Office is currently engaged full time in trying to resolve the 939 Letter Contract as well as instruct Lockheed as to what additional effort will be required to clean up the Phase I portion of the Advanced Agena Program and commence Phase II. Additionally, we are working a number of technical problems with which

you are familiar. In order to arrive at a well conceived solution I suggest a 90-day moratorium on this problem to allow my program office to clean up current business before addressing the management problem which you have raised. I would suggest a team approach with SAFSP, the SSD Agena Program Office, and Lockheed all participating.

SIGNED

PAUL T. COOPER
Major General, USAF
Commander

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MEMO FOR RECORD 7 June 1967

During Colonel Keefer's staff meeting on 7 June 1967, he stated that Generals Ferguson, Cooper and Martin were meeting with Doctor Flax today to discuss OP's approach to Agena management. As a result we should receive guidance on what to build.

ROBERT R. CRAWFORD, Major, USAF
Acting Chief, Engineering Division
Agena Progress Office

~~CONFIDENTIAL~~

File 293

12 JUN 1967

SSVA/Col Keefer/32228

Improved Agena Performance Requirements

SSGS (General Martin)

1. As we have discussed recently in connection with the Red Line Presto message on the Improved Agena Program schedule adjustment, this system development is in urgent need of your inputs to mission performance requirements and a resolution of subsystem developments to be pursued.

2. The Improved Agena has been laid out as a two phase program in which Phase I consists of contract definition and Phase II involves design, development and production of the first vehicle. We are currently part way through the Phase I activity with a rescheduled goal of completion by 15 Jul 67, followed by immediate commencement of Phase II. At the Preliminary Design Review conducted in mid May 1967, at which you had representation, it became clear that adequate contract definition in terms of the work statement, specifications and cost proposal could not be achieved meaningfully without your inputs of mission performance requirements and an identification of the subsystems that need modification or redesign to satisfy your requirements. As you recall, I asked in my recent Red Line Presto message that other requirements, DOD and NASA, be identified and sent to me right away.

3. The current status of Improved Agena definition presents a number of inconsistencies, incompatibilities and omissions due largely to our lack of visibility in the area of desired vehicle performance characteristics envelopes concerning, for example, required orbit life, pad hold time, payload weights and volumes, first stage booster considerations, flight profiles, time on orbit, orientations on orbit, accuracies and reliability requirements. When these needed performance characteristics are known, the subsystem picture will begin to clear, i.e., guidance, power, tracking telemetry and command, propulsion (primary and secondary), environmental control, AGE and facilities. I recognize that there will need to be a close working relationship between your organization and my Agena SPO in the selection and development of these subsystems because of your variety of peculiarization and closely related hardware developments.

Group 3
Downgraded at 12 year intervals; not automatically declassified

~~CONFIDENTIAL~~

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4. In my view there is a need for a management mechanism that will routinely provide for an interchange of requirements, status, problem identification and resolution between your organization and the Agena SPO. To this end, I propose a regular meeting, perhaps monthly, to be chaired by my Agena Program Director, Col Norman J. Keefer, with a designated spokesman for SAFSP and additional representation from the SPO and each of your Project Offices. The first of these meetings should take place as soon as possible to insure early availability of your inputs to the definition of the Improved Agena Program.

1072

5. I am convinced that a more formally constituted channel of communication between our two organizations will go a long way in relieving existing incompatibilities. I will look forward in the very near future to the identification of your primary representative and a suggested first meeting date for the group.

SIGNED

PAUL T. COOPER
Major General, USAF
Commander

SSVAG 12 June 67

SSVAO 12 Jun 67

M R Bell SSVAP 12 June 67

SSVA Keefer 12 Jun 67

~~CONFIDENTIAL~~

DEPARTMENT OF THE AIR FORCE
DIRECTORATE OF SPECIAL PROJECTS (OSAF)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

15 June 1967

294

REPLY TO ATTN OF: SP-2

SUBJECT: Improved Agena

TO: SP-6 (Col Allen)
SP-7 (Col Murphy)
[redacted] (Col Bradburn)

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1. In a classified message, Dr. Flax has notified General Martin that the improved Agena with the N_2O_4 engine will be developed on a schedule calling for DD 250 of the first article in March 1970, that this first article will be flown on a development test flight [redacted] and that the improved Agena will be introduced into Project 110 as soon as possible after the development flight.

2. The Agena SPO had originally planned to develop a completed improved standard Agena, incorporating several improvements in addition to the N_2O_4 engine. (Dr. Flax has not yet taken action on our recommendation for Agena management changes.) Pending such action, the Agena SPO's initial effort will probably be on development of the N_2O_4 to meet the schedule in para 1, above.

3. SAFSP responsibilities are assigned as follows:

a. SP-7 will be responsible for planning and executing the Thor-boosted development flight in June 1970, and for coordinating this effort with other SAFSP offices and the Agena SPO. Scientific experiments may be carried as payloads on this flight provided the basic objective of testing and demonstrating the performance of the improved Agena is not compromised.

b. SP-6 will be the focal point for planning such scientific experiments.

c. [redacted] will be responsible for planning the introduction of the improved Agena into Project 110 after the development test flight.

d. [redacted] will be responsible for collecting and assembling plans and costs for the above efforts, and for forwarding the package to SAFSS.

50X1

e. SP-7, [redacted] will be responsible for providing the Agena SPO with performance characteristics and other technical requirements in connection with the N_2O_4 engine.

G. T. SMITH
Colonel, USAF
Vice Director

Copy to:
SSVA (Col Keefer)

5 Jun 67 #9

CUSTOMIZED STANDARD AGENA

21 Jun 1967, Lockheed briefing to Agena and SP personnel on customized Agena. This was in response to Agena SPO request.

OBJECTIVE: o TO FURNISH VEHICLES FROM STANDARD AGENA WHICH ARE CONFIGURED TO THE SPECIFIC USING PROGRAM REQUIREMENTS

METHOD: o DEFINE (BY SPECIFICATION) THE VEHICLE CONFIGURATIONS FOR 3 OR 4 PROGRAMS AND CONTRACT TO BUILD AND DELIVER SPECIFIC QUANTITIES OF EACH CONFIGURATION AT A SPECIFIED RATE

o BUILD THE VEHICLES IN TWO STEPS: FIRST, FABRICATE AND ASSEMBLE BASIC, UNCHANGING PORTIONS, RACK TEST, AND STORE; THEN, PULL FROM STORAGE, DO RETROFITS, ADD FINAL EQUIPMENTS, ACCEPTANCE TEST VEHICLE, DD-250, AND DELIVER TO PROGRAM

1076

CUSTOMIZED STANDARD AGENA

IMPLEMENTATION:

1. ESTABLISH "SENIOR REQUIREMENTS PANEL" AT LMSC AND AT AFSSD TO SELECT PROGRAM CONFIGURATIONS AND DEFINE REQUIREMENTS

2. INITIATE BCA ON -589 CONTRACT TO WRITE SPECIFICATIONS, DO ENGINEERING, PRODUCE PRODUCTION DRAWINGS, HOLD DESIGN REVIEWS, BUILD MOCKUP, CONFIGURE DM, BUILD AND QUALIFY ANY NEW COMPONENTS, DEFINE TESTING, AND WRITE AIP'S

3. GIVE THE PRODUCTION CONTRACT TO CALL FOR DELIVERY OF "CUSTOMIZED" VEHICLES AS DEFINED IN ABOVE SPECIFICATIONS

CUSTOMIZED STANDARD AGENA

SENIOR REQUIREMENTS PANEL

	AT LMSC	AT AFSSD
CHAIRMAN	REPRESENTATIVE OF F.C.E. ODER	
MEMBERS	PROGRAM MANAGERS OR REPRESENTATIVES FROM STANDARD AGENA AND EACH USING PROGRAM	REPRESENTATIVES OF STANDARD AGENA AND USING PROGRAM SPOS
FUNCTIONS	1. ESTABLISH ORGANIZATIONAL DEVELOPMENT/ PROCUREMENT RESPONSIBILITY FOR ALL SSD FLIGHT EQUIPMENT	1. CONFIRM AND APPROVE THE ACTIONS OF THE LMSC PANEL
	2. DESIGNATE THE PROGRAM VEHICLE TO BE SUPPLIED	2. ESTABLISH OFFICIAL VEHICLE ASSIGNMENTS
	3. DEFINE THE REQUIREMENTS FOR EACH OF THE DESIGNATED VEHICLES (TECHNICAL, QUANTITY, AND SCHEDULE)	3. INITIATE AND REVISE OFFICIAL PROGRAM REQUIREMENTS
	4. REVIEW AND APPROVE OVERALL REQUIREMENTS AND CONFIGURATION FOR CUSTOMIZED STANDARD AGENA	4. REVIEW AND APPROVE CONTRACTUAL DOCUMENTS

1 of 8

CUSTOMIZED STANDARD ACEIA

ENGINEERING IMPLEMENTATION

ACTIVATE A PROGRAM UNDER THE -589 CONTRACT TO:

1. PREPARE A PART I SPECIFICATION FOR EACH CONFIGURATION TO BE DELIVERED
2. CONDUCT FORMAL PDR'S
3. DO DETAILED DESIGN AND NECESSARY DEVELOPMENT
4. CONDUCT FORMAL CDR'S
5. BUILD AND QUALIFY REQUIRED NEW EQUIPMENTS
6. BUILD MOCKUP(S)
7. DEFINE TEST REQUIREMENTS AND WRITE ATP'S
8. CONFIGURE D/V AND USE TO VERIFY ATP'S AND TEST COMPLEX
9. PREPARE COMPLETE PRODUCTION DOCUMENTATION PACKAGE (PART II SPECS)

 10 > 9

CUSTOMIZED STANDARD AGENA

PROJECT CONTRACT INCORPORATION

- WRITE ECP TO -939 CONTRACT TO CHANGE DELIVERIES FROM STANDARD AGENAS TO CUSTOMIZED STANDARD AGENAS (AS DEFINED BY SPECIFICATIONS) EFFECTIVE FROM AD-297 AND UP

- MODIFY WORK STATEMENT TO DEFINE NEW ACCEPTANCE TEST REQUIREMENTS

- MODIFY CONTRACT TO PERMIT PARTIAL PAYMENT BASED ON PLACEMENT OF VEHICLES IN STORAGE

1086

CONFIDENTIAL SECURITY AREA

-939 CONTRACT VEHICLE ASSIGNMENTS (AFTER AD-193)

AD #	SCHEDULE DELIVERY	ASSIGNED PROGRAM
194		
195		
196		
197		
198		
199		
200		
201		
202		
203		

AD #	SCHEDULE DELIVERY	ASSIGNED PROGRAM
204		
205		
206		
207		
208		
209		
210		
211		
212		
213		

CUSTOMIZED STANDARD AGENA

PROPOSED CHANGE IN -939 CONTRACT DELIVERIES

1. NO CHANGE THROUGH AD-196

2. FOR THE 17 VEHICLES FROM AD-197 THROUGH AD-213

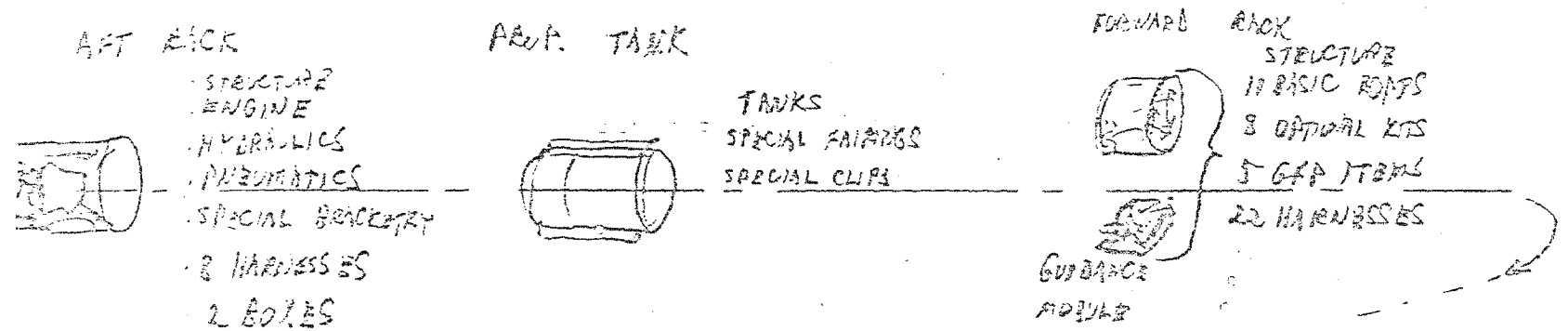
   - DELIVER 13 CUSTOMIZED FOR PROGRAM 846
   - DELIVERY 3 CUSTOMIZED FOR PROGRAM 770
   - DELIVER 1 CUSTOMIZED FOR PROGRAM [redacted]

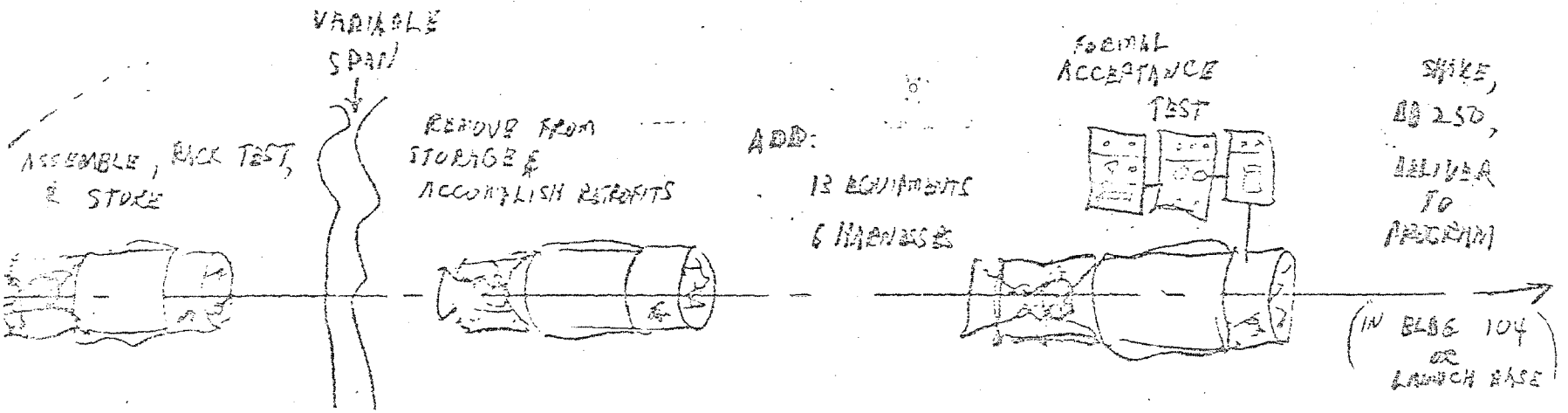
50X1

3. WITHOUT SPECIFYING MODS, DELIVER AT A RATE OF 1-1/2 VEHICLES PER MONTH

CUSTOMIZED STANDARD AGENA

TYPICAL SEQUENCE - FOR MANGRAM 246 VEHICLE





E

6/21/67

CUSTOMIZED AGENA MEETING

ATTENDANCE LIST

1083

NAME	ORG.
J. SOLVASON	66-70
D. CHURCH	62-840
C.W. ECKER	66-70
J.H. McElhaney, Major	AFPRO-DE
C.E. REVENAUGH	65-80
A.J. GLENN, Lt Col	AFPRO-DE
A.W. DeSio	62-56
K R Buttwell	62-56
John Oneill	66-70
E.R. BROTHERS	76-11
E.N. SANFORD	66-70
A A ADAMSON	62-56
D.A. GERVIN	62-56
J. Athen	62-57
G.C. CHAMPION	62-57
C.E. MACQUIDDY	62-57
C.H. Smyser, Capt.	AFSSD-Prog. Cont.
R.I. SUPPER	62-57
CAPT EE ANDERSON	PROG 826
W. LANAHAN	62-21
D.R. WRIGHT, CAPT	AFPRO-PRODUCTION
P.D. Doersam	66-70
C.D. CRAIG	AFPRO-QA
ARTHUR L. ZYGMONT	SSVAK
R.L. KERR, MAJ.	AFPRO-D.E.
RM Hermanson	66-70
G.S. LAMPHERE	76-11
J.W. POWELL	66-70
DOT KROLL	46-70
R.A. WELLS, MAJOR	SSD/SSVAO
H.A. EINSTEIN, MAJOR	SSD/SSVAO
[illegible]	[illegible]

DEPARTMENT OF THE AIR FORCE
DIRECTORATE OF SPECIAL PROJECTS (OSAF)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

23 June 1967

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REPLY TO
ATTN OF: SP-1

SUBJECT: Improved Agena

TO: SSG (General Cooper)

1. Reference: Your 12 June memo, subject: "Improved Agena Performance Requirements."

2. Dr. Flax has informed me that he will approve the development of an improved Agena with the N_2O_4 engine with the first flight to be in June 1970, and that SAFSP Project 110 will be the first project to use this development. In lieu of making the first flight with a Project 110 payload, I requested approval for one Thor-boosted test launch, and proposed to carry out such a launch in the same manner as we followed in the [redacted] launch, with SAFSP responsible for integration of research and experimental payloads and for conducting the overall system engineering, tests, and actual flight. Dr. Flax agreed, with the provision that the carrying of such payloads not compromise the basic objective of testing and demonstrating the performance of the improved Agena prior to its actual use on the much more expensive project 110 flight. On 13 June I received a classified message from Dr. Flax confirming his previous statements and requesting my plan for conducting this development flight, identification by fiscal year of SAFSP costs for the development flight, and vehicle effectivity for incorporation into Project 110. By memorandum of 15 June, Colonel Smith made internal assignments of responsibility within SAFSP, and notified SSVA (Col Keefer) by copy of this same memorandum. I understand that a message is on its way to you through Hq USAF-AFSC channels.

50X1

3. The Thor-boosted test flight will be conducted as a one-flight project in the same general manner as all other SAFSP projects. SP-6 will be responsible for identification of appropriate research and experimental payloads, which will include consideration of SESP payloads in addition to SAFSP payloads. SP-7 will be responsible for the overall one-flight project, including payload integration, Agena project peculiarization, overall system engineering, test, preparation and acceptance for flight, and flight. SP-7 will obtain the improved Agena from SSVA in its "standard" form on the same basis as other Agenas are obtained for other SAFSP projects. SAFSP will budget for the entire flight, except

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DOWNGRADED AT 12 YEAR INTERVALS; NOT AUTOMATICALLY DECLASSIFIED. DOD DIR 5200.10

that payloads which are accepted for flight will be provided to SAFSP by the sponsoring organization, including costs of integration of these payloads.

4. Although SAFSP Project 110 will be the first project to use the improved Agena, we will incorporate it into other SAFSP projects. Accordingly, the development by SSVA should be in a "standard" form rather than a version developed especially for any one project, including the one-time Thor-boosted test flight. The exact configuration of this "standard" vehicle will be determined by the action taken on my recent recommendation on changes in the "standard" Agena concept.

5. With respect to your 12 June memorandum on "Improved Agena Performance Requirements," I have designated the following individuals to represent the several SAFSP projects which use the Agena in working with the standard Agena SPO:

SP-7: Major B. D. White

[redacted] Major J. W. Browning 50X1

These individuals will provide on a continuous basis the requirements of their respective projects which pertain to the design or performance of the standard Agena. They will also provide information on project peculiar requirements which I have determined suitable for procurement by the standard Agena SPO in accordance with the criteria I outlined at the recent SAFSP presentation to General Ferguson which you attended. However, I am not going to expand the standard Agena SPO into the SAFSP projects or into the determination of requirements for project-peculiar items or processes. I will retain personally the responsibility for determining any items in the project-peculiar process which can be standardized between two or more SAFSP projects.

6. We will make every effort to keep the standard Agena SPO aware of the desired performance, capabilities and characteristics of the "standard" Agena. However, it should be understood clearly that each

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of the projects concerned will continue to experience changes and that we cannot describe any "standard" configuration which will eliminate the necessity for extensive individual project peculiarization by SAFSP.

JOHN L. MARTIN, JR
Brigadier General, USAF
Director

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MEMO FOR RECORD 23 June 1967

SUBJECT: Improved Agena Requirements Meeting

1. On 22 June the initial Improved Agena Requirements Meeting was held in Colonel Keefer's office. Important points resulting from the meeting are:

a. SP is willing to provide Improved Agena requirements in as much detail as they can at this date.

b. The requirements format will be completed and a joint SP reply will be returned to us.

c. It is SP's feeling that Improved Agena should be produced in the same manner as the SP concept for Standard Agena.

d. In general, SP is not interested in standardization if it imposes any restriction on their requirements.

ROBERT E. [redacted], Major, USAF
Acting Chief, Engineering Division
Agena Program Office

14 Jul 1967, Briefing on Agena D and E Management Problems. This briefing was given to Gen Cooper. It resulted in setting up an LMSC meeting with Gen Cooper, Colonels Hamilton and Smith.

AGENA D AND E

MANAGEMENT PROBLEMS

11 JULY 1967

BRIEFING OUTLINE

- AGENA D MANAGEMENT CONCEPTS

  I
  - CUSTOM VEHICLE FEASIBILITY STUDY
  - ALTERNATE APPROACHES
  - CONCLUSIONS AND RECOMMENDATIONS

  II
  - CONTRACT STRUCTURE
  - RECOMMENDATION

  III
  - COUGH DROP RETROFIT PROGRAM
  - RECOMMENDATIONS

- AGENA E DEVELOPMENT CONCEPTS

  IV
  - SOLE SOURCE CONSIDERATIONS
  - CONCLUSIONS AND RECOMMENDATIONS

  V
  - SP CONCEPT
  - SPO CONCEPT
  - CONCLUSIONS
  - RECOMMENDATIONS

- RECOMMENDATIONS SUMMARY

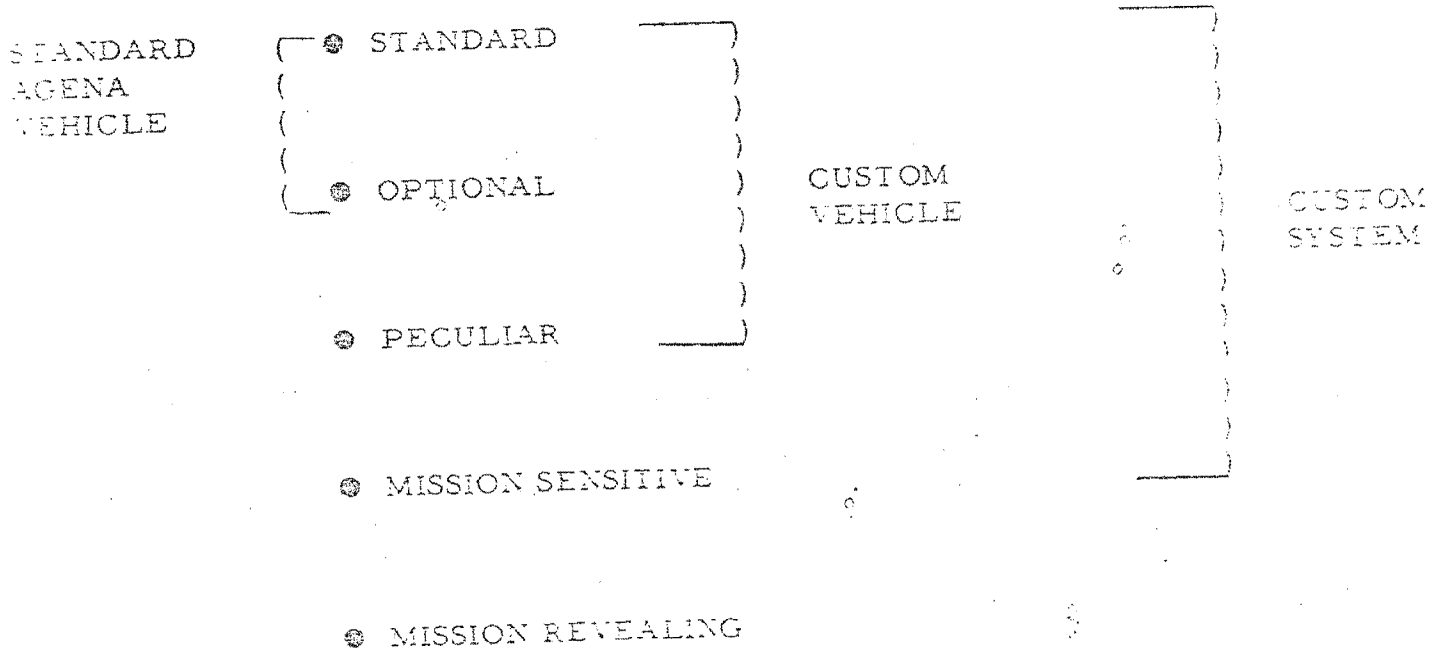
AGENDA

BACKGROUND

- SP'S OBJECTIONS TO STANDARD AGENA CONCEPT
  - REQUIRES EXTENSIVE EQUIPMENT REMOVAL
  - INVALID SYSTEM FUNCTION TESTS
  - LACK OF RESPONSIVENESS AND CONTROL OVER IMPROVEMENTS
  - GFE INTERFERES WITH INCENTIVE CONTRACTING
- SP CONCEPT
- JOINT SPO/SP/AFPRO/LMSC CUSTOM VEHICLE FEASIBILITY STUDY

AGE

EQUIPMENT AND PRODUCTS



AGENA D

CUSTOM VEHICLE FEASIBILITY STUDY

- APPROACH
  - LMSC
    - ASSEMBLE CUSTOM VEHICLE
    - LIMITED "FUNCTIONAL" TEST
    - DD-250
    - TRANSFER TO USER
  - AIR FORCE
    - ASSEMBLE CUSTOM VEHICLE
    - TRANSFER TO USER
    - ADDITIONAL ASSEMBLY
    - SYSTEM TEST
    - JOINT DD-250
- FINDINGS - CUSTOMIZED AGENA VEHICLE FEASIBLE

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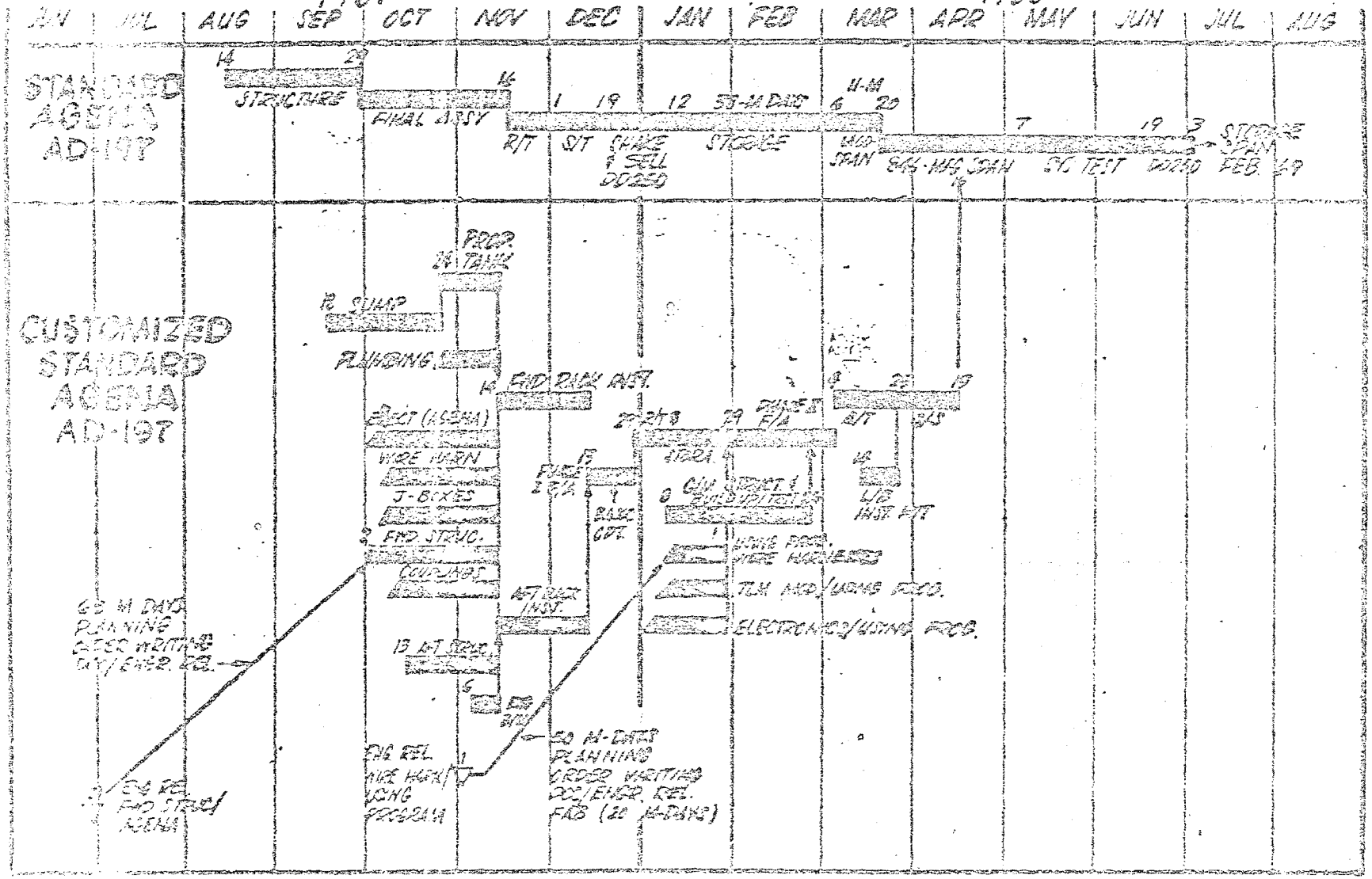
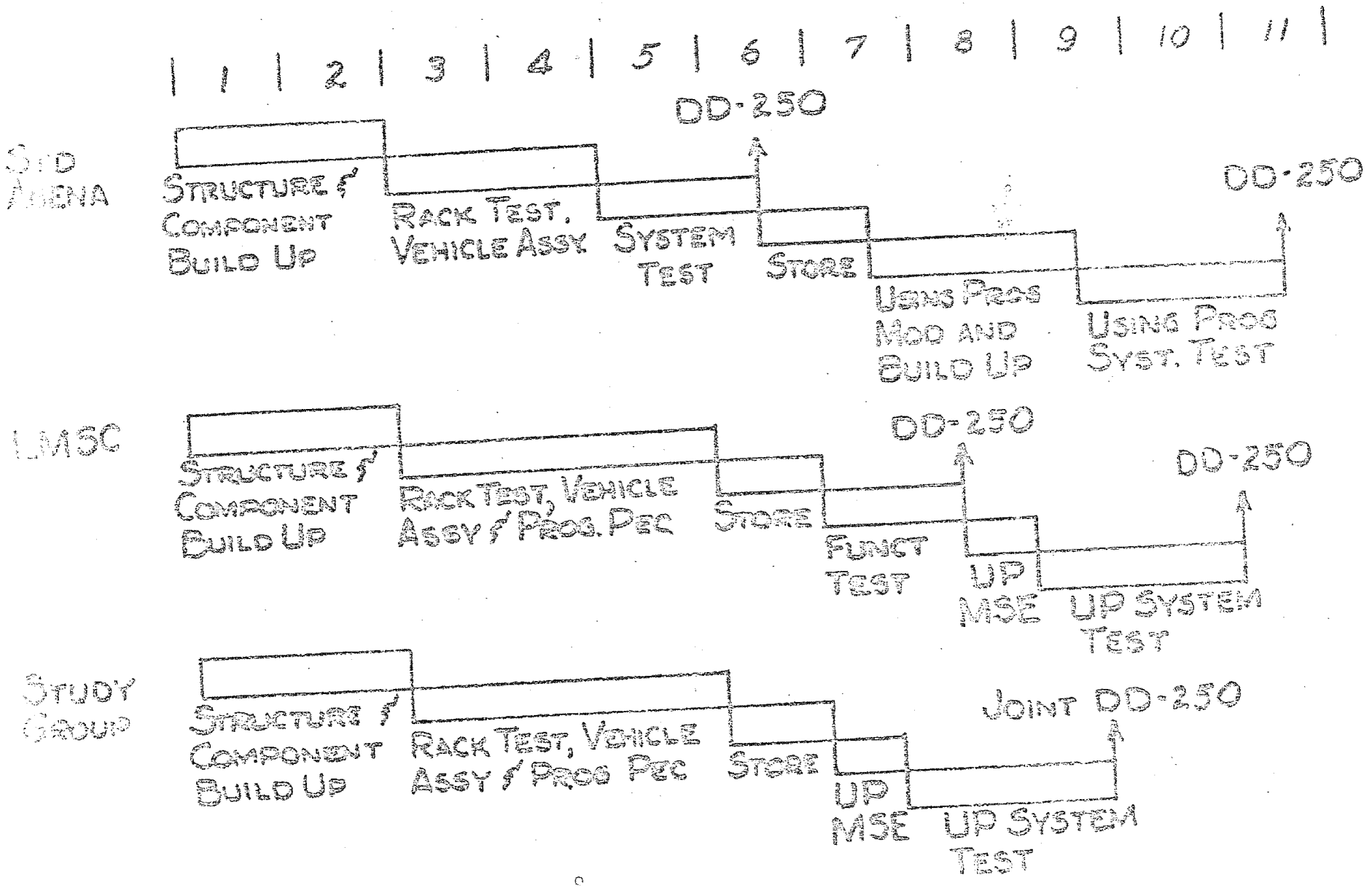
CUSTOMIZED STANDARD AGENA



CUSTOMIZED STANDARD AGENA



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AGENA D

ASSESSMENT OF CUSTOM VEHICLE

- ADVANTAGES
  - ELIMINATES NECESSITY FOR DISASSEMBLY
  - ELIMINATES INVALID TESTING
  - INITIAL REDUCTION OF SYSTEM COSTS
- DISADVANTAGES
  - CONTRARY TO AFSC SYSTEM CONCEPT
  - REMOVES STANDARD SPACECRAFT FROM THE INVENTORY
  - ADVANTAGES OF STANDARDIZATION LOST
  - DIVIDES RESPONSIBILITIES BETWEEN TWO COMMANDS

AGENA D

MODIFIED D VEHICLE

- ADVANTAGES
  - NO DISASSEMBLY OR REWORK
  - DECREASED COST
- DISADVANTAGES
  - VIOLATES AFSC SYSTEM CONCEPT
  - TAKES STANDARD AGENA OUT OF INVENTORY
  - ADVANTAGES OF STANDARDIZATION LOST
  - DIVIDES RESPONSIBILITY BETWEEN TWO COMMANDS

AGENA

SP OPTION 3 1/2

- ADVANTAGES
  - CLEANS UP LINES OF RESPONSIBILITY AND AUTHORITY
  - ELIMINATES NECESSITY TO DISASSEMBLE VEHICLE
  - COMMUNICATIONS PROBLEM SOLVED
  - RAPID REACTION PROBLEM SOLVED
  - ALLOWS SAFSP TO HANDLE CONTRACT INCENTIVE PROBLEM AS THEY DESIRE
  - PROVIDES BEST CONTROL FOR SAFSP

- DISADVANTAGES
  - ELIMINATES STANDARD AGENA FROM INVENTORY
  - CONTRIBUTES TO BUILD-UP OF A SECOND "SYSTEMS COMMAND"
  - COST TO GOVERNMENT WOULD INCREASE
  - SETS PRECEDENT FOR AGENA E

AGENDA D

CUSTOM SYSTEM

- ADVANTAGES
  - COMPATIBLE WITH SYSTEMS COMMAND'S SYSTEM ACQUISITION MISSION
  - ELIMINATES SOME SP OBJECTIONS
  - CLEAR CUT LINES OF RESPONSIBILITY AND AUTHORITY
  - SYSTEM AVAILABILITY TO OTHER USERS
- DISADVANTAGES
  - MAJOR CHANGE IN CONCEPT
  - ADVANTAGES OF STANDARDIZATION ARE LARGELY LOST
  - ADDITIONAL SPO MANPOWER REQUIRED
  - SECURITY CLEARANCE PROBLEMS

AGENA D

MANAGEMENT SPECTRUM

ING:	UNACCEPTABLE	MARGINAL	ACCEPTABLE	GOOD	BETTER	IDEAL
CUPI:	SP PROPOSAL	SPO CUSTOM VEHICLE	SP CUSTOM VEHICLE	STANDARD AGENA VEHICLE	SPO CUSTOM SYSTEM	SPO SPACE SYSTEM
ISO NAGEMENT:	COMPONENT	COMPONENT	N/A	"SYSTEM"	SYSTEM	TOTAL SYSTEM
ISO ODUCI:	o SIMILAR TO AGENA A & B o "SKUNK WORKS"	o SAME AS SP PROPOSAL ONLY ASSEMBLED o UNABLE TO TEST OR FLY o PAYLOAD CUSTOMER COMPLETES SYSTEM & TESTS	o N/A	o STANDARD VEHICLE o UNABLE TO FLY o TESTED USING SLAVE & SIMULATION EQUIPMENT	o NON-STANDARD SYSTEM o CAN BE TESTED & FLOWN	o STANDARD OPERATIONAL TOTAL SYSTEM

AGENA D

CONCLUSION

- CUSTOM VEHICLE IS FEASIBLE BUT NOT DESIRABLE
- CUSTOM SYSTEM IS FEASIBLE AND MAY SOLVE PROBLEM

RECOMMENDATION

- ADVOCATE THE CUSTOM SYSTEM CONCEPT
- ESTABLISH A JOINT SPO/AFSP/AFPRO/LMSC WORKING GROUP
- BRIEF OR WRITE LETTER TO GENERAL FERGUSON - COORDINATE OR COPY TO GENERAL MARTIN

Approved for Release: 2017/08/28 C05097006

AGENA

CONTRACT STRUCTURE

- PRIOR TO 1965
  - PRIME CONTRACT TO LOCKHEED
  - COST PER VEHICLE: $.901M
  - NO CONTRACTUAL DESIGNATION
    - CENTRALIZED INTERFACE CONTROL
    - HARDWARE INTEGRATION
- POST 1965
  - ASSOCIATE CONTRACT STRUCTURE
    - LMSC - VEHICLE
    - BAC - ENGINE
    - BAC - VELOCITY METER
    - BEC - HORIZON SENSOR
  - COST PER VEHICLE: $.807 - .980M
  - NO CONTRACTUAL DESIGNATION
    - CENTRALIZED INTERFACE CONTROL
    - HARDWARE INTEGRATION

AGENA

CONTRACT STRUCTURE

- OBJECTIONS TO CURRENT STRUCTURE
  - GFP TO SP CAUSES INCENTIVE CONTRACTING PROBLEMS
  - NUMBER OF CONTRACTS CAUSES UNACCEPTABLE SPO WORKLOAD
  - LACK OF CLEAR DESIGNATION OF RESPONSIBILITY CAUSES:
    - CONTINUAL QUESTIONS
    - LOST TIME AND EFFORT
    - INCREASED COSTS TO REPAIR ERRORS
- PLANNED ACTIONS
  - RETURN TO PRIME STRUCTURE AT LEAST BY NEXT PRODUCTION CONTRACT
  - DESIGNATE LMSC
    - CENTRALIZED INTERFACE CONTROL CONTRACTOR
    - HARDWARE INTEGRATION CONTRACTOR

AGENDA D

RECOMMENDATIONS

- APPROVE IN PRINCIPLE RETURNING TO PRIME CONTRACT STRUCTURE.

AGENDA J

PROJECT COUGH DROP

- INTERIM INCREASED CONFIDENCE ACTIONS
  - USE "D" OIL AT ALL SITES
  - OIL FLUSH AT ALL LAUNCH SITES
  - TIGHTEN CURRENT SEAL SPECS
  - IMPROVE CURRENT BEARING CLEARANCE
  - IMPROVE GEAR TOOTH FINISH
  - RETROFIT PUMPS WITH "LOOSE" CLEARANCE BEARINGS
  - INSTALL FLIGHT INSTRUMENTS ON 12 VEHICLES FOR VERIFICATION
  - INITIATE VERTICAL ACCEPTANCE TEST AT BAC
- PHASE II TEST PROGRAM UNDERWAY
- RETROFIT OF 5 NASA VEHICLES
- ADDITIONAL LMSC AND BAC RECOMMENDATIONS
  - IMMEDIATE RETROFIT TO ELIMINATE INVINCIBLE GEARS. INSTALL LOOSE BEARINGS AND NEW SEALS

AGENDA

PROJECT COUGH DROP

- IMMEDIATE RETROFIT
  - REPLACE BEARINGS WITH LOOSE CLEARING BEARINGS
  - REPLACE FUEL SECONDARY BEARING
  - INSPECT GEARS - REPLACE ALL INVINCIBLES WITH RILEY
  - PERFORM REVERSE LEAK CHECK ON FUEL SECONDARY SEAL
  - REDUCE LEAK SPEC ON TURBINE HOT GAS SEAL
- RETROFIT PLAN EXCLUDES 13 VEHICLES
  - SYSTEM TEST COMPLETE
  - SCHEDULE IMPACT
- 10 VEHICLES CAN BE RETROFITTED BETWEEN 15 JULY AND 1 NOVEMBER 19o7
- NO IMPACT ON FLIGHT SCHEDULES - MINOR IMPACT ON USER PRODUCTION SCHEDULES
- ESTIMATED COST: 20 - 30K/VEHICLE

AGENA

PROJECT COUGH DROP

- NOVEMBER RETROFIT - FOLLOWING PHASE II TEST VALIDATION
  - "YORK QUALITY" GEARS
  - NEW HIGH TEMPERATURE BEARINGS
  - IMPROVED TURBINE DRIVE AND FUEL SECONDARY SEALS
  - POSSIBLE CHANGES TO LUBRICATION - QUANTITY AND QUALITY

- RETROFIT OF 17 ADDITIONAL VEHICLES BETWEEN 1 NOV 67 AND 1 MAR 68

- NO IMPACT ON FLIGHT SCHEDULES

- ESTIMATED COST: 25/35K PER VEHICLE

AGENA

PROJECT COUGH DROP

CONCLUSION

- INCREASED CONFIDENCE IN P_C DIP ELIMINATION JUSTIFIES $20-30K/ENGINE EXPENDITURE FOR IMMEDIATE RETROFIT OF 10 ADDITIONAL ENGINES

RECOMMENDATION

- APPROVAL OF IMPLEMENTATION OF IMMEDIATE RETROFIT PLAN

AGENA

SOLE SOURCE CONSIDERATIONS

- FEBRUARY 1967 (SYSTEM)
  - "MAXIMUM USE OF STANDARD AGENA COMPONENTS"
  - EXISTING FACILITIES
  - AGENA KNOW-HOW (LMSC/BAC)
  - SCHEDULE, MARCH 69 DD 250
- JULY 1967 (SYSTEM)
  - PHASE I DEFINITION ORIENTATED TOWARDS MAXIMUM USE OF STANDARD AGENA COMPONENTS
  - SPECIFICATIONS AND OTHER DATA FOR PHASE II NOT USEFUL FOR COMPETITION
  - ALL PHASE I ARGUMENTS STILL APPLY EXCEPT DD 250 MARCH 70
  - AWARD TO NEW CONTRACTORS WOULD REQUIRE NEW PHASE I
  - SP RELATIONSHIPS
- JULY 1967 (ENGINE ONLY)
  - PHASE I SYSTEM DEFINITION ORIENTED TOWARDS IMPROVEMENT OF EXISTING ENGINE
  - SPECIFICATIONS AND OTHER DATA FOR PHASE II NOT USEFUL FOR COMPETITION
  - ALL PHASE I ARGUMENTS STILL APPLY EXCEPT DD 250 MARCH 70
  - AWARD TO NEW CONTRACTOR WOULD REQUIRE NEW PHASE I FOR SYSTEM

SCHEDULE COMPARISONS

1967 | 1968 | 1969 | 1970

M A M J J A S O N D | J F M A M J J A S O N D | J F M A M J J A S O N D | J F M A M J

SOLE SOURCE SYSTEM

PHASE I-DEFINITION

PHASE II

DESIGN & DEVELOPMENT — FAB & QUAL — ENGINE TEST & DEMONSTRATION

PRODUCTION — TEST FL

1st Fit Eng Reqd — 1st Veh DD 250

COMPETE SYSTEM

COMPETE SYSTEM

PHASE I

PHASE II

PRODUCTION

1. COMPETE ENGINE (Only)

COMPETE ENG

PHASE I

DESIGN & DEVELOPMENT — FAB & QUAL — ENGINE TEST & DEMONSTRATIO

PRODUCTION

CONCLUSIONS

- STILL ON FIRM GROUND FOR SOLE SOURCE
  - SYSTEM
  - ENGINE ALONE

RECOMMENDATION

- CONTINUE SOLE SOURCE TO LMSC/BAC

AGENA

SP CONCEPT

- CONFIGURATION WILL BE DETERMINED BY ACTION TAKEN ON AGENA D MANAGEMENT
  - SP WILL DETERMINE PROJECT PECULIAR ITEMS OR PROCESSES
  - PROJECT PECULIARIZATION WILL CONTINUE
  - DOES NOT CONTEMPLATE A STANDARD VEHICLE
- AGENA SPO RESPONSIBLE FOR
  - DEVELOPMENT "IN A STANDARD FORM"
  - PROVIDING "STANDARD AGENA" TO SP FOR FLIGHT TEST
- TEST PROGRAM TO BE CONDUCTED BY SP
  - SYSTEM ENGINEERING
  - INTEGRATION OF SCIENTIFIC PAYLOAD
  - TEST PLAN
  - FLIGHT TEST

AGENI

SPO CONCEPT

- INITIAL CONFIGURATION DETERMINED BY:
  - DIRECTED LIMITATIONS
  - SP MISSION PERFORMANCE REQUIREMENTS
- PROCEED INTO PHASE II WITH INITIAL CONFIGURATION DESIGN REQUIREMENTS BASELINE
- DEFINE ADDITIONAL HOUSEKEEPING SUBSYSTEMS ASAP:
  - SPACEFRAME)
  - POWER)
  - GUIDANCE & CONTROL) MODULARIZED TO SUIT MISSION REQUIREMENTS
  - TT & C)
  - AGE)
- OBTAIN APPROVAL FOR COMPLETE SYSTEM CONFIGURATION DEVELOPMENT FROM SAMSO, SAFSP, AFSC, USAF, SAFRD
- SPO CONDUCT TEST PROGRAM AS PART OF DEVELOPMENT EFFORT

AGENA C

CONCLUSIONS

THERE IS A FUNDAMENTAL PHILOSOPHICAL DIFFERENCE BETWEEN SP AND AGENA SPO ON IMPROVED AGENA DEVELOPMENT

- SP VISUALIZES:
  - HOUSEKEEPING SUBSYSTEMS AS PECULIAR UNDER DIRECT SP CONTROL
  - TEST PROGRAM TO BE CONDUCTED BY SP
- SPO VISUALIZES:
  - HOUSEKEEPING SUBSYSTEMS AS STANDARD (MODULARIZED) AS PART OF SPACECRAFT SYSTEM
  - TEST PROGRAM TO BE PART OF SPO DEVELOPMENT PROGRAM

AGENA

RECOMMENDATIONS

- ADVOCATE THE SPO CONCEPT OF SYSTEM DEVELOPMENT

- REPLY TO GENERAL MARTIN'S 23 JUNE LETTER EXPRESSING SAMSO CONCEPT OF IMPROVED AGENA DEVELOPMENT

RECOMMENDATIONS

SUMMARY

- AGENA D
  - I ADVOCATE THE CUSTOM SYSTEM CONCEPT AND ADVISE AFSC AND SAFSP
  - II APPROVE IN PRINCIPLE RETURNING TO PRIME CONTRACT STRUCTURE
  - III APPROVE TURBO PUMP IMMEDIATE RETROFIT PROGRAM
- AGENA E
  - IV APPROVE CONTINUING SOLE SOURCE ON PHASE II
  - V ADVOCATE THE SPO CONCEPT OF DEVELOPMENT AND ADVISE SAFSP

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS SPACE AND MISSILE SYSTEMS ORGANIZATION (AFSC)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

299

REPLY TO ATTN OF: SMVA

27 July 1967

SUBJECT: Historical Report

TO: SMV

Attached is one copy of SSVA Historical Report for the period of 1 Jan 67 to 30 June 67.

HARRY F. HEDLUND, Lt Col, USAF
Acting Program Director, AGENA

1 Atch
Historical Report

5 (c)
8 (c)

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AGENA PROGRAM OFFICE

Historical Data

1 Jan 67 to 30 Jun 67

1. Col Norman J. Keefer assumed the duties of Chief, Agena Program Office on 8 May 1967, thus relieving Col Alfred J. Gardner who has assumed the duties of Special Assistant to the Deputy for Launch Vehicles until his retirement on 31 July 1967.

2. During January the remaining two vehicles of the 57 vehicle production contract, AF04(695)-722, were delivered. The first ten vehicles of the current 36 vehicle production contract, AF04(695)-939 were delivered at the rate of two a month commencing in February. The original production rate on the current contract was scheduled at 2½ vehicles per month commencing in February 1967 and terminating in April 1968. Due to a change in using program requirements, resulting in an increasing number of vehicles in storage, the schedule now calls for two vehicles a month from February 1967 through July 1967, decreasing to 1½ vehicles a month from August 1967 through November 1968. The follow-on production contract, [redacted] was originally scheduled to have delivery of 19 vehicles at a rate of two per month commencing in April 1968 and terminating in April 1969. Due to the stretch-out production schedule on the current contract, the follow-on contract now specifies 1½ vehicles per month commencing in December 1968 and terminating in December 1969. 50X1

3. In February the Improved Agena (Agena "E") Phase I effort, contract [redacted] was initiated. The Phase II development effort was scheduled to begin in mid May. Due to the lack of adequate design definition the Phase I effort was stretched out to adequately define the design requirements and eliminate the possible existence of any serious technical problems. The Phase II effort is now scheduled to begin 1 September 1967 and continue through March 1970.

4. During the period February to May, SAFSP conducted a comprehensive study of the Agena production methods. In a briefing to Dr. Flax, they proposed to eliminate the present method - which involves considerable disassembly and modification of the vehicle by using programs. The Agena program office is currently conducting a comprehensive study of user requirements which will be complete by 1 September 1967.

PROGRAM CONTROL DIVISION

Historical Data

1 JAN 1967 to 30 JUNE 1967

1. During the report period the delivery schedule for Standard Agena Vehicles, procured from Lockheed Missiles and Space Co. on Contract AF04(695)-939, was reduced from 2½ vehicles to 2 vehicles per month with a further reduction to 1½ commencing in August. This change was due to using program reductions in vehicle requirements which necessitated a delivery stretchout. Bell Aerosystems schedule for delivery of engines on Contract AF04(695)-938, was adjusted to support the stretched-out vehicle schedule.

2. Phase I program for an Improved Agena was initiated in February 1967. The first production unit is planned for delivery in early 1970.

3. Direction was initiated on 27 January 1967, for Western Electric Co. to retrofit forty-four (44) guidance cansisters containing a latent defect in the pulse delay network. Scheduling and reallocations developed precluded launch or production line impact.

4. Program 110 requested peculiarization of the Horizon Sensor for their requirements. Contract AF04(695)-1008 was changed calling for the last twelve (12) Sensors to be manufactured as Model II-C's. The first Mod II-C unit should be delivered in July 1967, and will be installed on Vehicle No. 4762.

5. Capt C. Smyser was assigned to the Division on 31 May 1967, being re-assigned from SSVAC. Miss Opal Twibell transferred into the Division from SMAMA on 16 April 1967.

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS SPACE SYSTEMS DIVISION (AFSC)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

REPLY TO ATTN OF: SMVAC

15 Jul 67

SUBJECT: SSVAC Historical Report (1 Jan - 30 Jun 1967)

TO: SMVA

1. Mission. The mission of the Agena Configuration Management Division (SSVAC) is to apply the principles of configuration management to the Agena space vehicle program with as few deviations as possible.

2. Personnel. Capt. John Straton and 2d Lts. Barda Sizemore and Bentley Stansbury have been assigned to the division. Capt. Craig Smyser was reassigned to SSVAP, and Miss Barbara Wessman left the civil service. Major Bradford is attempting to add a GS-12 civilian position to the division and up-grade an existing civilian position from GS-12 to GS-13. Support from Aerospace Corporation is now being received.

3. Activities.

a. Reviews and Inspections. Preliminary Design Reviews (PDRs) were conducted on the Velocity Meter/Velocity Meter Counter and the Electronic Event Timer. The PDR on the Improved Agena was aborted. This will cause delay in going into Phase II of the program. Combined PDR/CDRs (Critical Design Reviews) were held on the Three-Start Engine and the Command Destruct Kit. A CDR was held on Brazed Plumbing for the Agena and First Article Configuration Inspections (FACIs) were conducted on the Maximum Access Booster Adapter (MABA) and the four Rocket Engine Service Kits.

b. Configuration Control. Lockheed Missiles and Space Company (LMSC) agreed to put effectivities on Class II changes. Preliminary Engineering Change Proposals (PECPs) are being submitted by the contractors at the suggestion of the Configuration Management Division. Rigorous ECP guidelines are in preparation.

c. Configuration Accounting. The previously used configuration accounting report has been replacedwith a new, superior, Contract End Item History Report. The new report is superior to the old report in that it can be effectively used as a tool for verifying completion of engineering and documentation changes by referencing changes authorized to specific part number changes and serialized articles installed in the vehicle.

d. Configuration Identification. The Agena Configuration Management Division is reviewing the level at which it intends to control specifications. In the past, specifications have been controlled down to the level of piece part and process specifications.

e. Data Management. SSVAC continues to handle Data Management for the directorate. A formal data call system has been implemented by the Data Management Officer, Mr. Phillips, to insure that data requirements are adequately

met on each contract, program plan, and basic ordering agreement.

4. Significant Events.

a. Improved Agena. The decision has been made to procure an Improved Agena. This major effort has had a large impact on the Configuration Management Division. Phase II of the effort has been delayed due to the unsuccessful Preliminary Design Review.

b. IG Inspection. Representatives of the Office of the Inspector General reviewed the operations of the division during the reporting period. The only significant recommendation furnished by the inspecting team was to set up a formal data call system to insure adequate data management on all contracts. This has been accomplished.

for

KIMERLEE J. BRADFORD, Major, USAF
Chief, Configuration Management Div.
Agena Program Office

HISTORICAL REPORT
January-June 1967
SSVAE-1

1. Standard Agena Telemetry Frequency Conversion

Clearance was received to proceed with the conversion to S-Band. Work is now underway.

2. Command Destruct System

The evaluation of the Command Destruct System compatibility problem has continued throughout the first half of 1967. This problem originated in March 1966 when the ETR Range Safety Office (ETOSH) conducted a new review of the Destruct system and disapproved it. The disapproval was based on the interrelationship of the battery, receiver, and destruct unit. The destruct unit (a 1-Ohm device) drew a very large current when activated. The surge current caused the battery terminal voltage to drop to 9 volts. The receiver, designed to operate with at least 22 volts, could not continue to operate at 9 volts. After 10-20 milliseconds, the receiver output relays would de-activate, removing power from the destruct unit. Tests and calculations by LMSC indicated that the destruct unit would always detonate before relay drop-out; however ETR would not accept the statistical detonator sure-fire time and insisted that the destruct relays would remain activated unless the command was removed. To meet the requirement, SSVA initiated modification of the Command Destruct System through Program Plan 279 which was redesignated as Program Plan 303 on 1 January 1967, and which provided a wire harness to limit the surge current from the battery, preselect of battery cells, and tests on battery & receiver/decoder compatibility.

The final Design Review Meeting was held during 22-24 May 1967. Revised documentation from the meeting was expected to be released prior to the scheduled launch of Mariner-Venus in June. During the Design Review a representative of the receiver manufacturer discovered the much longer time duration requirement which existed at the proposed new low voltage limit for the receiver/decoder. Consequently, he could not agree to the revised specification on which the prime contractor had committed to AFSSD, and which was to be released following the design review. This information was telephoned by the prime contractor to AFSSD on 1 June. LMSC submitted (per request of SSVA) an addendum which would authorize additional testing by LMSC to attempt to resolve the differences between the current-voltage requirements of AFETR, and the limitations of existing equipment. After revising the addendum, SSVA authorized LMSC to implement the revised addendum to Program Plan 303.

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HISTORICAL REPORT
1 Jan 67 - 30 Jun 67
Systems Branch/SSVAE-2

1. (U) Significant Policy & Planning Developments

a. The arrival of our third program director (Colonel Keefer) within the year, the retirement of Lt Col Greenfield, Chief of Engineering, without a replacement, the removal of Maj Crawford from his reliability/quality activities to act as Chief of Engineering, the transfer of Capt Straton to SSVAC with no one to take his place, and the arrival of 25 Aerospace MTS for the first time on the program, has resulted in a shift from a systems engineering capability to a philosophy of systems management through increased dependence on the contractor.

b. A highlight of this period has been the demonstration by Major Einstein of the great value of the Engineering Management Office (EMO) function. The EMO has developed a self-checking system of managerial controls over the efforts of our division engineers that has resulted in improved communication within the SPO, more effective planning, a new orderliness to technical direction and an "inescapable" tracking of suspense items.

c. Capt Tubbesing has made further improvements to the preparation and coordination of technical statements of work (SOW). The significant result of this effort is a much more accurate definition of engineering requirements in the SOW which, with initial understanding, helps to eliminate down-stream interpretation differences.

d. New policies have been established by the SPO, as the result of Systems Branch action, which more effectively utilize the resources of the AFPRO. Each SPO member has identified his AFPRO counterpart, and will establish a personal working relationship with him. Also, information copies of all correspondence to the contractor will be directed to an individual AFPRO addressee. This improved communication should result in a better informed SPO. We have found that the AFPRO viewpoint always adds a dimension of depth to problems reported--but not necessarily researched--by the contractor.

e. A Systems Branch manpower study of the Engineering Division developed, upon Colonel Keefer's arrival, into a comprehensive analysis of the entire SPO function. The result of this study was the determination of need and approval for 25 additional technical people. Since Air Force personnel were not available, an alternate decision was made to use 25 Aerospace members of the technical staff (MTS). These are now phasing into the program.

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2. (U) Current Mission Objectives

a. One of the main branch activities is the technical administration of the support engineering contracts. A new contract became effective 1 Jan 67 for 390,000 manhours ($6.385 million) of engineering. Through an improved SOW on this contract, the SPO is realizing an increase of useful engineering effort of about $200,000.

b. Proposal Evaluation

This office has assisted in the fact finding/negotiations of the following contracts:

(1) Agena Production Contract - AF 04(695)-939

(2) Engineering Support Contract - [redacted]

(3) Electronic Event Timer - AF 04(695)-589 Order No. SSD-67-22

(4) Agena Coupling Improvement Program - AF04(695)-589 Order No. SSD-67-20

(5) Production Qualification Program - AF 04(695)-589 Order No. SSD-67-18

(6) Agena Storage Contract - [redacted]

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c. Statement of Work Preparation

During this period, the following work statements were prepared and submitted to the Agena Contracts Division (SSVAK) for contractual action:

(1) Velocity Meter Counter Mod II B - AF 04(695)-589 Order No. SSD-68-24

(2) Quantic Horizon Sensor

(3) Project Cough Drop - AF 04(695)-589 Order No. SSD 67-23

(4) Agena Storage Contract - [redacted]

(5) Electronic Event Timer Phase II - AF 04(695)-589 Order No. SSD-67-22

3. (C) Agena Flight Performance

Through 30 June 1967 there have been 243 Agena flights. Of this total, 150 have been of the Standard Agena or Agena D configuration. The flight success ratio of the Standard Agena is 93%. A complete resume of Agena flights is contained in the semi-annual report, "Agena Flight Summary Reports." The report covering flights through 30 June 1967 will be distributed by 15 Sep 67.

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HISTORICAL REPORT
SSVAE-3

1 January 1967 - 30 June 1967

1. DEVELOPMENTS

1.1 GCE

In January it became increasingly clear that one major using program planned to proceed with full development of a Redundant Attitude Control System (RACS) and planned to fly the system as soon as development was complete. Later a second generation system consisting of a Dual Attitude Control System (DACS) would replace the entire Agena primary guidance and control system. With the advent of this dual system, the GCE would no longer be required by the major user of Agena vehicles. On 24 Feb 67 all work on the GCE development was stopped. The residual data was gathered and stored pending a possible future need for this development.

1.2 Digital Velocity Meter Mod IIA

The previous designation of Velocity Cut-off System Mod X (VCS Mod X) was dropped. The Bell contract was revised to call for individual contract end item (CEI) specifications for the DVM IIA and the Mod IIA Counter. IMSC will furnish individual interface specifications which will be incorporated in the Bell CEI's. This will lead to a cleaner set of specifications and will permit future changes to the components without affecting the "system".

The Preliminary Design Review was held at Bell on 11-13 January 1967. The PDR was unsatisfactory and repeated on 4-5 April 67. The first service test unit is scheduled to be sent to IMSC on 1 July 1967, and the first production unit will be available in Oct 67 for incorporation on AD 199 and subsequent vehicles. The Critical Design Review is tentatively scheduled for 12 Jul 67 at Bell.

1.3 Velocity Meter Counter, Mod IID

In June it was apparent that the Velocity Meter Counter Mod IIA was not compatible with the power supplies of a major using program. Standard Agena suggested that the IIA Counter be modified for this program and that the modifications include improvements to satisfy the Improved Agena requirements. The engineering required to add the extra burns for Improved Agena would be included with very little additional cost. By satisfying this using program's need and adding the multi-burn capability, the Counter remains a piece of standard equipment and will meet known future requirements. This development is mandatory to support the using programs.

1.4 Electronic Event Timer

The EET effort was reinstated in mid-December 1966, as a study effort. IMSC presented their proposal on the revised effort on 20 January 1967. Negotiations were held on 27-28 February at SSD. The Preliminary Design Review was held at IMSC on 13-14 April 1967. Go-ahead for the Acquisition Phase was given in the form of a letter contract on 1 May 1967. In view of the Improved Agena slippage, a stop work order was issued in early June 1967 holding all work in abeyance for 90 days.

1.5 Improved Agena

The Guidance Branch has provided support for the Improved Agena Program by participating in fact-findings, specification reviews, and the Preliminary Design Review. Every effort has been made to point out the necessity for including the Guidance Subsystem in the improvement program, rather than try to use all the existing equipment. The Improved Agena provides an engine capable of five starts, increased payload capability, 90-day orbital lifetime, and an integral secondary propulsion system capable of 10 starts. However, no provision has yet been made to update the Guidance System to make it capable of controlling a multi-burn engine or a secondary propulsion system; or to increase its altitude capabilities and injection accuracies; or to make it capable of a 90-day orbital lifetime.

1.6 New Horizon Sensor Concept

1.6.1 Applied Devices (formerly Belock Instrument Corporation) completed their contract for the development of a "Solid State Horizon Scanning Technique." The objective was to develop and demonstrate a specific photo-conductive detector for use with the Applied Devices Solid State Light Beam Scanner. The objective was not reached, but most of the major problem areas were met and solved. A high degree of confidence can now be placed on the ultimate attainment of an infrared photo-conductive detector which would not require cryogenic cooling. Further effort is required to fully optimize the doping process and to develop the applicable photo-conductor deposition techniques. A follow-on contract is planned, but the sponsor has not been identified.

1.6.2 The Quantic Industries development of a "High Accuracy Horizon Sensor System" was concluded during this period under Contract AF 04 (695)-924. The technical objectives of this development were obtained. The final report will be published in July 1967. A follow-on effort is planned. The objectives of this effort will be the development, qualification and fabrication of two Quantic Mod IVA Precision Horizon Sensor Systems for orbital flight test to determine the accuracy, reliability, and other key performance parameters of the Sensor System in a Space environment. The contract duration will be 88 weeks beginning July 1967.

1.7 Barnes 13-150-33 Model IIC Horizon Sensor

In order to meet Using Program [redacted] requirements, the last 12 GFP systems to be delivered under Contract AF 04(695)-1008 will be program peculiar. The telemetry scale factor and the procedure for nulling the control outputs has been changed. Delivery of the first modified system is scheduled for the last week in July. The changes are contracted for under ECP-23E.

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1.8 Inertial Reference Package (IRP)

MIT continued the design and development of a three-axis, strapdown IRP for possible use on the Agena Spacecraft. All preliminary components of the IRP have been subjected to rigorous testing and analyses. Many second and third generation components have evolved that feature improvements extending their

application beyond earlier designs. Much effort has been concentrated on circuit optimization, analysis and testing. The gyro-to-base plate thermal model has been analyzed and worst case temperature limits for base plate variations have been obtained in terms of the variations in gyro power consumption, supply voltage and thermal resistance.

Tests on the second Kearfott Alpha series gyros are nearing completion. All paremeters are within specification. Delivery of the gyros for the design proof unit are expected in July. After installation, qualification testing will begin on the design proof unit. Present schedule calls for completion of all testing by September 30, 1967.

2. MAJOR PROBLEMS

2.1 Sequence Timer

2.1.1 Timer Improvements. The redesigned cam, stiffening rings, and new gear wheels have been scheduled for incorporation at the same time the improved Licon switches are incorporated. Currently LMSC is having problems getting the new gear wheels, and this is holding up the whole program. LMSC is estimating that the first improved timer will be produced by the end of July.

2.1.2 Globe Motor Thrust Bearing. In June a Sequence Timer failure experienced by General Dynamics/Convair Division was traced to an improperly installed thrust bearing in their timer motor. Inspection of several similar timer motors at LMSC found one motor (P/N 1062385-5 CCA 1470-1110) with the inner and outer bearing races reversed (documented on FEDR 325197 Suppl. 13637) UAS 358 was issued to sweep all Sequence Timers which contain Globe motors and all uninstalled Globe motors for a bearing inspection. Action is continuing at this time.

Modification of the bearing assembly is also under consideration. There are two candidate fixes, one of which looks very promising. Motors with the redesigned bearings could be available by the end of July.

2.2 Sterer Thrust Valve Bent Rods

In March during a program systems test a Sterer Thrust Valve jammed in the open position. Subsequent failure analysis showed that the solenoid piston had wedged itself in the coil due to a bend in the rod which connects the piston to the bellows assembly. Examination of other units showed this same condition to exist in varying degrees in a number of valve clusters.

Through discussions with Sterer it was determined that the rods had been improperly heat treated, which permitted them to warp after assembly. All units have been retrofitted with new piston assemblies.

2.3 DVM Chopper Failure

In May an Agena Space Vehicle experienced an in-flight anomaly in which the Velocity Meter failed to shut down the main engine at the predetermined velocity. Investigation of flight data and test records indicated the probable cause to be the failure of a synchroverter switch (chopper). All Agena vehicles were grounded at this time until corrective action could be accomplished. The failure mode was determined to be a broken wire between the chopper mechanism and pin 7 of the header, due to metal fatigue of the wire when exposed to a vibration environment of 30 g's. The design of the switch allowed movement of the chopper mechanism relative to its cylindrical sleeve, and the wire was flexed by this motion.

Investigation revealed a series of unreported failures which had occurred during the past several months. One chopper failure at LMSC was not reported to SSD nor was corrective action initiated. Six of the seven failures which occurred at

Bell Aerosystems Co were not reported to LMSC. In addition, there were three failures at the part level at Bristol Co, the part supplier, and one at Bell. With the flight failure, this made a total of 13 known failures.

It was also determined that the same part was being used in the Barnes Engineering Co Horizon Sensor. Analysis showed that the Horizon Sensor performance was not in great danger from a chopper failure. It was therefore recommended to use the Horizon Sensors in present condition until testing or analysis indicates otherwise.

Corrective action required to fix the chopper was to secure the mechanical vibrator in place with an epoxy. Existing systems will be reworked to new configuration.

In addition, the failure reporting and corrective action system at Bell was thoroughly reviewed and action taken to implement effective procedures.

2.4 Guidance J-Box Pulse Engineering Transformer Failures

Investigation of several transformer (P/N 1461900-001) failures in the Guidance J-Box revealed a failure mode which consisted of open windings in the primary and/or secondary caused by expansion and contraction of transformers materials. Since most flight missions do not require the function of the suspect transformer, the disposition of the majority of boxes was "use as is". For those programs desiring the use of the transformer, the recommended fix consisted of temperature cycling the J-Box and retesting. Failed transformers will be replaced with units which have been screened by a similar temperature cycling test.

3. PERSONNEL

The Guidance Branch is now operating with four of its six authorized officers. These are Maj Moore, Maj Hirsh, Capt Cronquist and Lt Wood. Lt Col Wm. Gallup departed in May for flying duty in SEA, although he had been TDY for training since December 1966.

HISTORICAL REPORT
1 January 1967 - 30 June 1967
Mechanical Branch
SSVAE-4

Subsystem A

1. Titan III B/Agena

The FACI of the booster adapter optional kit for this vehicle was conducted during February 1967. As the result of this FACI, changes to the Destruct/Discrete Junction Box Assembly specification were required and the preparation of a Part I booster adapter specification was initiated. It is estimated that these actions will be completed during July 1967. The first optional kit will be delivered to the using program early in the next report period. The booster adapter has, to date, been manufactured under a using program contract and has successfully completed several flights.

2. Strengthened Booster Adapter

During the first four months of this calendar year LMSC subjected a new .160 inch thick booster adapter to a series of qualification tests. It was the objective of this program to verify the capability of the structure to withstand to ultimate levels, the flight loads due to maximum acceleration and to maximum airloading. A secondary, yet significant consideration was that of determining the capability of the adapter to withstand a non-uniform pattern of stress due to an asymmetrical temperature distribution coupled with concurrent mechanical loading due to acceleration. Previously a similar test with a slightly different distribution caused a .143 in adapter to buckle prematurely.

A planning error occurred, in that the aft Y-ring and tank skirt assembly was not aged to the required -T6 condition, and buckling failure did eventually take place unexpectedly. A second assembly was manufactured and the structure withstood all loading, including a test to 131% of limit load prior to failure. The latter took the form of a small buckle above the nitrogen fill door. As test objectives were achieved a qualification certificate was issued.

Although some degree of qualification to an asymmetrical temperature distribution (80/60) was demonstrated, it remains for the technique referenced in the booster adapter specification to be exercised to properly evaluate structural capability for a given mission. This method is discussed briefly in paragraph 5 below.

3. Zipcord Program

As noted in the last report, the program contractor, LMSC, had submitted a plan to investigate the cause of the Zipcord jacket failures. This plan was evaluated but no decision to continue or cancel the program was reached.

4. Agena Propellant Tank Discrepancies

Since the last report, concrete efforts have been made to improve the overall quality of the Agena propellant tank in view of continuing quality problems. Particular attention has been given to the areas of surface imperfections (scratches, pits, etc.) and weldment discrepancies (porosity, thermal cracks, etc.) which reflect the contractor's level of workmanship. Of those tank assemblies found discrepant, to one degree or

another, final analysis revealed the condition to be acceptable from a performance standpoint. The problem, therefore, is considered a conflict between engineering specification requirement trying to maintain a level of manufacturing quality above what is demanded by the flight environment. This, together with certain inherent difficulties in the welding of 6061-T4 aluminum material, has resulted in several engineering/quality assurance disagreements, resolved finally by contract waiver action.

The following major steps have been taken to alleviate this problem:

(a) The contractor has proceeded to upgrade his tooling, particularly that used during the welding operations.

(b) Welding equipment is being improved, particularly with the aim of reducing the wandering of the AC weld arc. This action contributes to a surface melting condition away from the weld bead which manifests itself eventually as fine surface cracks.

(c) A coordinated effort is presently underway to relax certain specification requirements in line with defect magnitudes found acceptable by fracture mechanics analyses. A new criteria is also being developed to aid in the evaluation of porosity and its effect on weld strength.

The efforts outlined above are believed to be an approach to resolving the tank quality problems.

5. Determination of Asymmetrical Heating Effects on Standard Agena Vehicles

During this report period test data was gathered and collated as part of the final effort to develop a reliable analytical technique for determining the effects of an asymmetrical temperature distribution on the strength of the Agena vehicle. The data were used to verify the accuracy of a computer program based largely on the modified cylindrical shell equations of Flügge. Specifically, this program is intended to provide values for stress as a function of angular position around the structure under consideration. As finally documented, a thermal stress decrement due to asymmetrical heating can then be determined and subtracted from the stress capability based on uniform heating. The result should be the final capability expressed as a decreased value of structural margin.

As future flight profiles will reflect various trajectory parameters, this technique should prove invaluable in terms of its adaptability and ultimate accuracy. To date, a mission has not required its use although that time is probably fast approaching. The method, nevertheless, has been exercised in conjunction with the qualification test of the Agena .160 booster adapter mentioned above. Comparison of predicted stress values with test measurements indicated very close agreement. In conclusion, the value of this program, together with the advancements realized in the area of small scale structural testing, have more than justified the cost of the total endeavor. Furthermore, with the dissemination of program information, the Aerospace industry should realize significant benefits in terms of conducting future buckling tests of

cylindrical, monocoque structures. Rather than relying on empirical data from costly and time consuming test programs, this analytical technique may be employed with confidence.

6. Plumbing Improvement Program (Flared Joints)

It was previously reported that an effort had been made by LMSC to upgrade the quality of tube flares in separable connectors in an attempt to reduce cold gas leakage once installed on the vehicle. The development of an orbital flaring machine has promised this reduction in gas leakage, yet obstacles have arisen to preclude the adoption of the improved flaring technique on a 100% production basis. A program evaluating the orbital machines manufacturing accuracy was therefore initiated during this period. The results of this program were compared on a 3 sigma statistical basis with the existing process specification LAC 09442F and the updated NASA Standard MC 146. A side program was also performed to determine the effect of tube bending on flare quality.

The primary phases of work have been completed and results are as follows:

(a) For 1/8 hard CRES it is possible to adopt MC 146 Revision C with the exception that the external angle requirement will have to be relaxed to $66^{\circ}\ ^{+4^{\circ}}_{-2^{\circ}}$.

(b) For 5052-0 Aluminum Alloy it is possible to adopt MC 146 revision D with the exception noted in (a).

(c) For the annealed stainless steel and 6061-0 aluminum materials significant improvements in quality were not evident and therefore the existing process requirements must stand .

(d) At this time all inspection work has yet to be completed although it does appear certain that tubing cannot be bent after flaring without experiencing some degree of distortion.

The overall conclusion of this program is that a marked upgrading of flare quality can be achieved for certain primary materials as previously noted. However, it is not going to be possible to adopt a single set of updated process requirements. The appropriate specification, as revised, will reflect differing sets of flaring requirements, each to be invoked as deemed applicable by the design engineer, (i.e., for high pressure cold gas systems 1/8 hard CRES tubing will be necessary and flared in accordance with MC 146 revision C.)

At this time an effort is underway to revise the process specification LAC 0942 by 25 August 1967.

7. Incorporation of Permanent Joints on the Standard Agena Vehicle

During this report period concluding reports were received describing in detail the development and qualification efforts required to incorporate induction brazed fittings on the Standard Agena Vehicle. The documents reflected an accurate and thorough program of design, test and evaluation necessary for production modifications to be effected with confidence. A progressive inspection was also conducted by Air Force personnel to insure engineering drawing and process control adequacy. Of significance during this review was the attention given to radiographic inspection and its bearing on the acceptability of brazed fittings. To this end a 100% inspection program was instigated to gain confidence after which a sampling plan is to go into effect.

To date several Agena vehicles have received brazed pneumatic system plumbing lines as part of their normal build-up. Program peculiar vehicles have also received a brazing retrofit of certain optional kits serving attitude control functions. This changeover from the separable connector design has not been subjected to the rigors of pre-launch checkout or of the flight environment; however, a high degree of confidence does exist insofar as the integrity of this design is concerned.

In the future, effort will be made to maintain a high level of process control which together with good workmanship will insure to the largest extent a structurally sound and leak-free plumbing system. As part of this work, higher quality thermocouples will be sought as well as sensitive, portable, gas leak detectors. Programs will also be undertaken to replace more separable connectors with brazed fittings thereby reducing in proportion any leakage potential.

Subsystem B

1. Agena Propulsion Performance

During the period of this report 16 Agena vehicles were launched. All of these launches used the YLR-81-BA-11 rocket engines. Of the 15 vehicles which were given a chance to perform on the booster, 14 were successful as far as the propulsion subsystem is concerned. The single gross propulsion failure was the NASA ATS sattelite which did not achieve a proper orbit due to a failure to achieve an engine re-start. This failure was traced to the oxidizer propellant isolation valve which did not close, thus allowing engine heat to boil propellants out of the oxidizer pump and sump starving the engine inlet at restart. The valve underwent a rapid modification program to prevent future occurrences. This program was successful and all vehicles are being retrofitted with the new design.

2. USAF YLR-81-BA-11 Rocket Engines

The engines continue to exhibit the chamber pressure anomaly (P_c dip) at an alarming rate. Nine such occurrences have now been recorded since mid 1966 and the last two have occurred on consecutive launches.

Project "Coughdrop" was initiated in late 1966 as a high priority program to isolate the causes of failure. To date more than $1.4 million has been spent with less than conclusive results. The failures have been reproduced in test at both Bell Aerosystems Company (BAC) and in the altitude chambers at Arnold Engineering Development Center (AEDC). The occurrence has been shown to be the failure of one or more ball bearings in the turbine pump assembly. The main unknown is the triggering mechanism, since the failures are thermally induced by adverse

heating rates in the pump. An exhaustive review of the flight and ground test history, manufacturing documentation and "cradle to grave" handling has been conducted in an attempt to isolate changes which might have occurred in any phase of the cycle which could contribute to the failures. Two such correlations were found:

(1) When, for various reasons, the MIL-L-7808D oil was changed to MIL-L-7808E and then 7808F revisions, the latest revision was automatically incorporated into the engine in the field. A detailed review of the military specification revisions indicated it would have been better to stay with the "D" revision. However, a return to the "D" oil has apparently not solved the problem since the last two dips occurred after the change back.

(2) BAC changed gear vendors in mid 1965 which apparently resulted in a block of lower quality gears in the group of engines which exhibit a high anomaly rate. Test and retrofit planning is underway in case a gear change becomes mandatory.

An extensive test program has been conducted at sites previously mentioned which seems to indicate the trigger mechanism may also be associated with a flow of combustion products through the gearcase resulting from a leaking turbine drive seal.

A high priority effort is now underway to determine running heat and leak rates in the pump. Parallel efforts are also underway to:

(a) provide a high strength high temperature ball bearing for this application,

(b) provide better quality seals to maintain internal gearbox pressure as well as prevent the flow of combustion products into the assembly.

The effort, including qualification testing, will be conducted as rapidly as possible but any ECD earlier than December 1967 is very optimistic.

3. 3-Start YLR 81-BA-11 Rocket Engine Kit

A three start capability for the YLR-81-BA-11 is progressing well. The design was selected because of a substantial weight saving over the multi start XLR-81-BA-13 engine. One test failure of the bracketry associated with the triple starter assembly has been experienced. The failure was caused by the use of a "non-flight" bolt in a vibration test fixture. No significant cost or schedule impact is forecast at this time and hardware deliveries are slated for the August-September 1967 time period.

4. Improved Agena Program

a. Approval was secured to run a modified contract definition phase to define the work required to develop the 8133 rocket engine and integral secondary propulsion system (ISPS) for the Agena vehicle. The definition phase started 13 February 1967 and is still in progress as of this report. The effort was funded under P.E. 6.44.09.12.4 and contracted for under contract [redacted] with Lockheed Missiles and Space Co (LMSC) as prime contractor and Bell Aerosystems Company (BAC) as subcontractor for the engine work. During the definition phase (or Phase I as it became known), the BAC model number of the engine was changed from 8133 to 8533 and the engine was given the USAF designation of XLR 81-BA-15. The

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Improved Agena vehicle was given the military designation of S-6D Space Vehicle.

b. Very briefly, the primary objectives of the Improved Agena Program are to increase vehicle payload by converting the presently used unsymmetrical dimethyhydrazine (UDMH) Fuel to a 50/50 by weight blend of hydrazine and UDMH, and changing the oxidizer from inhibited red fuming nitric acid (IRFNA) to nitrogen tetroxide (N_2O_4). An additional objective is to increase the orbital maneuvering capability of the vehicle by incorporating a multistart capability on the 8533 engine (similar to that on the XLR 81-BA-13 Gemini Agena Target Vehicle Engine) and by development of the ISPS which will provide orbital adjust capability and use propellants from the vehicle main tanks.

c. Accomplishments made to date during the definition phase are the following:

(1) Trade-offs were performed to define the design approach to be taken during the follow-on development phase (Phase II). The analyses and studies which serve as input to these trade-offs are continuing and evaluation of the trade-offs is in progress as of this report.

(2) Tests were performed to determine materials compatibility, performance and heat rejection of various injector configurations, thermal properties of the new propellants, and the capability of existing weld techniques to meet the environments imposed by the N_2O_4 oxidizer.

(3) Space allocations were made and interfaces defined.

(4) Key Part I CEI specifications were drafted for contractual use during Phase II.

(5) Various plans, such as contamination control reliability and EMI control, were drafted for use in Phase II.

d. In summary, the definition phase (which is now essentially complete) accomplished its objectives in that several key technical problem areas were discovered to exist which had previously been unsuspected. More realistic estimates of the cost and schedule for Phase II were developed. Present plans call for finishing Phase I in August of 1967 and giving go-ahead for Phase II shortly thereafter.

5. Pressurization System

a. The present aluminum propellant vent coupling has experienced a continuous history of discrepancies due to both the leakage caused by scratches and gouges on mating surfaces, and failure to meet specification pad-hold requirements during several test programs.

At the end of the last report period work was initiated on the Coupling Improvement Program. The primary objectives of this program are three fold. First, the coupling material has been changed from aluminum to stainless steel in order to eliminate or reduce the possibility of nicking mating surfaces. The change to steel will also enable the coupling to be installed into the vehicle plumbing system by means of a permanent induction brazed joint. Secondly, to assure a wet-pad-hold capability of 15 days, spring-loaded teflon seals (Omniseals) have been incorporated in the vent coupling and have satisfactorily completed exposure tests during development. Thirdly, in order to prohibit the transposition between any combination of gas fill and propellant vent valves, and thus eliminate pad hazards, four (4) distinct sets of non-interchangeability tongue and grove combinations have been introduced in the design.

The improved coupling is scheduled to be incorporated on vehicle AD 205 during the first quarter of 1968.

b. As mentioned above, the propellant isolation valve (PIV) was found to have caused a flight failure by not closing completely after engine first burn. A ground test program revealed that the main seal, against the moving blade of the valve, was able to be vibrated or shocked out of its retaining ring. The seal would then fall down into the path of the blade, jamming it open. A retaining method was designed into the seal and ring thus preventing recurrence of this failure.

Procurement Division
Historical Data
1 Jan 1967 to 30 June 1967

1. During the period, Procurement Division (SMVAK) supported the Agena Directorate by issuing and administering a variety of contracts for the following supplies and services:

Standard Agena Vehicles
Propulsion Subsystems
Guidance and Control Subsystems
Velocity Meters
Horizon Sensors
Spare Parts and Logistics Support
Modification Kits
Repair Services and Storage
Sustaining Engineering and Studies
Launch Services at AFETR & AFWTR
Parts Qualification Program (PQP)

The above contracts have a value exceeding $500,000,000.

2. During this period, Hq USAF authorized development of an Improved Agena in January 1967. Letter Contract [redacted] was issued in February 1967 for Phase I of the development program. The definitive contract was distributed in June 1967. Start of the Phase II effort originally scheduled to start during this period was slipped due to changes in program requirements and additional effort to be performed as part of Phase I. The requirement for implementing the "Cost/Schedule Planning and Control Specification" (C/SPCS) was established under Contract [redacted] also.

50X1

3. Additional new procurements were initiated during this period as follows:

Letter Contract [redacted] was issued to Lockheed in January 1967 to procure nineteen (19) additional Agena Vehicles.

Letter Contract [redacted] was issued to Lockheed in March 1967 to purchase Engineering Support and Studies for the Agena program.

Definitive Contracts [redacted] were issued in March and June 1967 respectively for Launch Services at the AF Eastern Test Range and AF Western Test Range.

Basic Ordering Agreement Orders under Contract AF04(695)-589 were issued as follows:

No. 18 - Production Qualification Program
No. 20 - Brazed Coupling Development
No. 21 - Agena 3 Start Engine Development
No. 22 - Electric Event Timer Development
No. 23 - Project Cough Drop

4. Letter Contract AF04(695)-939 with Lockheed, for procurement of thirty six (36) Agena Vehicles was negotiated in June 1967.

5. Personnel changes during the period involved assignment of a new Military Division Chief, a Procuring Contracting Officer and two (2) buyers.

HARRY F. HEDLUND, Lt. Col USAF
Chief, Procurement Division
Agena Program Office

OPERATIONS DIVISION
Historical Data
1 January 1967 to 30 June 1967

1. (U) SSVAO has been operating at 70% authorized strength throughout the period except after the departure of Capt Norman Lee on 9 June. Lt Gordon Waterous, Capt Lee's replacement, reported in on 30 June. Maj Elmer T. Davis, Jr, was designated as Chief of the Division 28 Mar 67.

2. (C) A Memo of Agreement was drafted between SSBG and SSVA concerning mutual responsibilities for procurement of BTL radio guidance support for the TIIIB. Final signature has been delayed pending comments on the proposed Memo from Program 110, which is concerned about giving too much control of the guidance function to the TIII SPO.

3. (U) The SLV-2G (Long Tank TAT)/Agena interface specification prepared by LMSC under SSVAO direction was signed off by LMSC, DAC, SSVA, and SSVX in January 1967 and released.

4. (U) LMSC began preparations, under SSVAO direction, on the SLV-3A (Long Tank Atlas)/Agena interface specification. Coordination copy of the completed specification was sent to SSVA 30 June 1967.

5. (C) The activation of the Vandenberg AFB Ground Guidance Station (GGS) 6-1 is proceeding on schedule. GGS-4 will be turned over to ADC on 1 April 1968. The principle events that have occurred are:

a. (U) A Supplemental Agreement was negotiated with Western Electric Co (WECo) for $605,000 to provide all necessary radar equipment modifications and activities to activate GGS 6-1.

b. (U) The facility criteria for GGS 6-1 was completed by WECo and furnished to the Corps of Engineers. The Corps provided the detailed design package, the contract was let, and the facility contractor has been working since April 67.

c. (U) The status of facility work on 30 Jun 67 was: Monolith completed, Antenna Pad completed, Terminal Building in final completion stage, Control Room and other GGS modifications almost finished. The total project should be completed in mid July 67.

d. (U) The three Titan I IOC Radar Systems received from Ellsworth AFB were found to be corroded and were therefore scrapped. Two other Titan I systems were received from Cape Kennedy as replacements for the GGS 6-1 job. Additional items of equipment will be obtained from the Titan I sites at Mt Home and Lowry.

CONFIDENTIAL

6. (U) The Guided Missile Test Station (GMTS) replaced the laboratory model GMTS on SLC-4 West during May 67. The removed unit is being modified for installation at SLC-3 West.

7. (U) Activities in Support of the Proposed TIIID Program.

a. (U) An experiment designed to measure the effect of Solid Rocket Motor Flame Attenuation (Project See-Thru) at X band frequencies was flown on TIIIC-10. The purpose is to predict possible flame attenuation that could affect the WECo Ground Guidance Radar to MBGE R.F. link. WECo participated in the project planning but at the time of this report has not completed the data review. Present planning is to perform similar tests on TIIIC-5 in Dec 67.

b. (U) A TIIID guidance accuracy and error analysis updated report was completed during this period. The significant results were that the major error contribution was due to thrust vector misalignment, and that Kalman Filter techniques result in appreciable improvement of accuracy and reduction of error effect. The TIII SPO has informed SSVAO and WECo that the TIIID specification requires implementation of techniques to reduce thrust vector misalignment.

c. (U) To date no program go-ahead has been given for TIIID. The continued slippage of the program will render invalid many of the results of the guidance accuracy study. Also, if no attempt is made to retain contractor personnel who are familiar with TIIID and the guidance study, a significant time advantage will be lost. A significant refamiliarization time period will be required for new personnel who are taken on to accomplish the guidance equation task when the program is given go-ahead. This has been brought to the attention of the TIII SPO and SAFSP.

8. ~~(C)~~ 846 Program.

a. ~~(C)~~ During the last six months modifications have been made to the Program 846 guidance program to allow split shaping of the pitch program for their mission, i.e., they will have two basic booster pitch programs, one for low inclination missions and one for high inclination missions. Present planning is for implementation of the split shaping during the next six months.

b. ~~(C)~~ In conjunction with the split shaping for the pitch program WECo has performed an extensive look angle study to determine if the radar look angles will be acceptable with the new Pitch Programs. One result has been to design a ferrite attenuator switch. This will permit elimination of the Dorsal/Ventral antenna interference region that currently exists. The ferrite attenuator will be incorporated within the next six months.

c. (U) Ground Guidance station 6-2 at VAFB has been fully activated since 15 Mar 67 and is now providing all operational support for Programs 846 and 770. NASA Delta and NASA/Agena are programmed to move to GGS 6-2 in Feb 1968.

9. (U) Program 110.

a. (U) An Acquisition Aid system for use with the WECo ground guidance radar has been designed and is near completion in GGS #4. The system uses Range Safety Tracking data to provide pointing information to the WECo Radar Antenna.

b. (U) Mission Safety Program (MSP). Implementation of the Mission Safety Program has been deferred until implementation of the Acquisition Aid. The MSP will be located in the off line computer utilized for processing the Acquisition Aid Tracking data provided by range safety. It is anticipated that the MSP and Acquisition Aid will be completed in July 67.

c. (U) A look angle study has been initiated for an "extended life" follow-on vehicle for Program 110.

10. (U) A consolidated contract was negotiated with Western Electric Company for all WECo hardware supporting the 846, 770, Titan III, NASA/Agena and Improved Delta Programs. Full implementation of AFSCM 375 configuration management has also been placed on all WECo hardware for the above programs.

11. (U) A number of Western Electric hardware problems occurred during the current report period. Significant among these were:

a. (U) A latent defect in the G-346308 pulse delay network, manufactured by Andersen Laboratories, was uncovered which resulted in questionable reliability of forty four (44) series 600 missile borne guidance units. Recycle and repair had to be effected from three launch sites and two contractor plants. Through judicious planning no production or launch impact occurred.

b. (U) Questionable J-8 connectors were uncovered during production sample testing. This problem resulted in a two month production stoppage effective from 1 June, which will continue to 31 July. No serious schedule impact is contemplated.

12. (U) Guidance System, General.

a. (U) In the last six months WECo/UNIVAC guidance has guided eleven program 846, 770, 110, NASA/Agena and NASA Delta W.T.R. launches without a guidance system anomaly.

50X1

b. (U) A proposal was submitted to [redacted] for guiding an Atlas/Agena vehicle from ETR using WECo/UNIVAC guidance. This proposal was significantly less than the cost of the G.E. guidance that will be used. Because of the tight schedule, however, it appears [redacted] will use the G.E. guidance system.

13. (U) ETR Launch Complex 14 was deactivated and turned back to the Range except for the Blockhouse and the Propellant Transfer Unit (PTU) building. Pending further disposition, the Agena electrical and mechanical equipment will be stored in the Blockhouse and the PTU units will remain in the PTU building.

14. (U) Space Launch Complex (SLC) 3 East has been placed on a standby status since the last PRIME launch. Several of the Agena AGE items have been transferred to SLC 3 West for the Thorad modification.

15. (U) Agreement was reached with NASA to transfer the Vehicle Systems Test (VST) Complex 10 to SAFSP. VST C10 was used and modified by NASA for the Gemini Agena Target Vehicle Program.

16. (U) Captain Norman Lee, the Chairman of the SLC-3W Complex Modification Working Group was transferred out of SSD 9 Jun 67. The chairmanship of the group was turned over to Captain F. R. Anderson (SSVX). SSVA0 continues participation in the modification of the Complex, but in a reduced role due to small amount of LMSC work remaining and to lack of personnel. Target date for completion is late August 1967.

17. (U) Contract [redacted] was negotiated and definitized during the period for $4,568,000 Target Price. This contract provides the Agena launch capability at the Eastern Test Range from 1 Apr 67 through 31 Mar 68. There are six launches scheduled under the contract.

18. (U) Contract [redacted] was negotiated in June 67. It will not be definitized until 30 Sep 67. This contract buys the Agena launch capability at VAFB from 1 Oct 67 through 30 Sep 68. The Target Price is $17,132,000.

19. (U) The Santa Cruz Test Base Sustaining Contract was negotiated and definitized during the period. The contract guarantees the capability to test Agena vehicle systems while hot firing the engine when the need arises. It also provides the pyrotechnic testing and inspection required to support Agena users. The contract Target Price is $1,113,000. The contract period 1 July 67 through 30 June 68.

Plan No. 225

27 July 1967

300

CUSTOMIZED STANDARD AGENA

Support Engineering Program Plan

[redacted]

"Final Customized Agena Program Plan." This document defines Lockheed method of satisfying the requirement to produce peculiarized vehicles rather than "standard" Agenas.

50X1

1. GENERAL

Standard Agena was initially configured to satisfy stated mission requirements of the then existing using program to be "used as is" except for planned optional and program add-ons. The emergence of new using program(s) and/or changed mission requirements, particularly during the last two years, renders the essentially unchanged Standard Agena configuration less than ideal for adaptation to present and foreseeable future usage. The using programs are consequently obliged to "work around" or implement changes to the basic Agena in order to accomplish real mission objectives of today. The resultant impact to the Standard Agena concept is that the production-line vehicle must be modified following Standard Agena system test, and even disassembled in some instances to permit removal of outdated equipment and harnesses. Program substitute equipment is then installed, and test re-validation of the basic vehicle is required.

Authorization for preparation of this program plan is as recorded in Official Appendix No. 7 to the Standard Agena Technical Direction Meetings.

2. OBJECTIVE

The objective of this program plan is to conduct a study concerning update of the Standard Agena concept and production-line activity to permit fabrication and assembly of vehicles in accordance with present using program needs. The immediate objective is to define a customized Standard Agena vehicle for Programs 846 and 110, using only that basic and optional equipment desired by those programs. Program-peculiar equipment and equipment bracketing will also be identified that should be included during initial fabrication and assembly to permit one-time build-up with no planned later tear-down. The long-range objective of the Customized Standard Agena Program (not part of this plan), is to eliminate outside Standard Agena equipment such as the Guidance Module, Safe/Arm boxes, etc., and replace these with program-developed equipment commensurate with present-day mission requirements.

* *

Standard Agena Program ______________________ Date ____________

SAMSO Contracting Officer Approval ______________________ Date ____________

3. APPLICABLE DOCUMENTS

Documents applicable to the effort conducted under this plan are as defined herein.

4. TASK STATEMENTS

Tasks to be included under this plan will include the following:

a. Study

(1) Program 846

(a) Creation of a Part I and Part II specification for the Program 846 Customized Agena;

(b) Compilation of a Program 846 Customized Agena equipment list;

(c) Creation of a Program 846 Customized Agena test plan (including DTV);

(d) Creation of a Program 846 Customized Agena manufacturing plan (tooling, etc.);

(e) Creation of a detailed implementation schedule;

(f) Preparation of a cost analysis to accomplish the tasks;

(g) A definition of what contractual and documentation changes are required to accomplish the tasks (Agena and using Program);

(h) Creation of a Program 846 Customized Agena Configuration Management Plan;

(i) Creation of Program 846 Customized Agena top assembly drawing;

(j) Preparation of a summary proposal that will form the basis of the production contract ECP.

(2) Program 110

The same tasks will be accomplished as defined in 4.a.(1) above for the Program 110 Customized Agena.

b. Analysis and Design

As applicable in 4.a above.

c. EMI Design

As applicable in 4.a above.

d. Reliability

As applicable.

e. Producibility

As applicable.

f. Parts and Material

As applicable.

g. Quality Assurance

As applicable.

h. Transportability

As applicable.

i. Safety Engineering

The concepts of MIL-S-38130 shall be used as a guide in the performance of this plan.

j. Air and Water Pollution Control

Not applicable.

k. Human Engineering

As applicable.

l. Maintainability

As applicable.

m. Documentation

Upon conclusion of the effort under this plan, a brief summary will be prepared and submitted to SAMSO (satisfying the requirement of Item B03A of Exhibit "B" to this contract). Copies of other documents created under this plan, in draft form, shall accompany submittal of the summary.

5. REPORTING REQUIREMENTS

Problems which may affect technical progress or schedule compliance shall be communicated to Headquarters SAMSO (SSMAM/FMO). A project leader shall be named by the Contractor in writing to Headquarters SAMSO (SSMAM/FMO) upon the Contracting Officer's approval of this program plan.

6. RESOURCES (Engineering Estimates)

a. Financial

(1) Dollars: None

(2) Manpower: 5863 man-hours

(3) Manloading:

Months	1	2	3
Man-hours	1735	2208	1920

b. Equipment

Not applicable.

c. Facilities

Not applicable.

7. SCHEDULE (See attached sheet)

The final report will be submitted by LMSC to AFSSD on 30 September 1967.

INITIAL DRAFT

PROGRAM PLAN 325 092

General

- Standard Agena initially configured to permit "use as is"
- New Programs and changing requirements now negate "use as is"
- Present usage requires various degrees of modification, disassembly, equipment substitution, and retest.

Objectives

- Immediate - customize production line for major programs
- Long range - utilize program developed hardware to re-establish Standard Agena System concept

Tasks

- Define using program configurations.
- Prepare customized equipment lists
- List outdated basic and optional equipment
- Define impact upon planning, procurement and testing per omitted equipment.
- Define impact upon manufacturing schedule, system test per customized configurations
- Summarize configuration management/documentation
- Summarize long range objectives

Resources

36 manmonths

Schedule

3 months - Prelim. Report 1 Sept. 1967

Final Report 30 Sept. 1967

Plan No. 325
26 June 1967

CUSTOMIZED STANDARD AGENA

Support Engineering Program Plan

[redacted] 50X1

1. GENERAL

Standard Agena was initially configured to satisfy stated mission requirements of the then existing using programs to be "used as is" except for planned optional and program add ons. The emergence of new using program(s) and/or changed mission requirements, particularly during the last two years, renders the essentially unchanged Standard Agena configuration less than ideal for adaptation to present and forseeable future usage. The using programs are consequently obliged to "work around" or implement changes to the basic agena in order to accomplish real mission objectives of today. The resultant impact to the Standard Agena concept is that the production line vehicle must be modified following Standard Agena system test, and even disassembled in some instances to permit removal of outdated equipment and harnesses. Program substitute equipment is then installed and test revalidation of the basic vehicle is required.

2. OBJECTIVE

The objective of this program plan is to conduct a study concerning update of the Standard Agena concept and production line activity to permit fabrication and assembly of vehicles in accordance with present using program needs. The immediate objective is to define a customized Standard Agena vehicle for each major program using only that basic and optional equipment desired by the program. Program peculiar equipment and equipment bracketing will also be identified that should be included during initial fabrication and assembly to permit on-time build-up with no planned later tear down.

Standard Agena Program Approval _____ Date _____

AFSSD CONTRACTING Date

As limited by paragraph 4(a)(8) below, the long range objective is to eliminate outdated Standard Agena equipment such as the Guidance Module, Safe/Arm boxes, etc., and replace these with program developed equipment commensurate with present day mission requirements. By proper incorporation into the Standard Agena, of Program developed equipment such as the dual attitude control system (DACS) and Safe/Arm boxes with telemetry instrumentation matrixes will reestablish the Standard Agena as a complete system capable of satisfying present day basic mission objectives. Customization would gradually become less signficant program to program with greater flexibility for vehicle late reassignments as flight schedules and newly created programs of the future may necessitate.

APPLICABLE DOCUMENTS

Not applicable.

4. TASKS

a. Study

Contractor studies will be conducted as follows:

(1) A review of each using program vehicle configuration definition will be made. Required changes to Standard Agena configuration and equipment subsequent to Standard Agena DD250 will be itemized.

(2) A customized Standard Agena configuration (equipment list) will be compiled for each using program that requires significant change to the basic Agena. Program peculiar equipment which should be installed during initial vehicle assembly will be included. Structural holes and bracketry to accommodate Program equipment will be noted for incorporation during

P 325

(3) A list of outdated basic and optional equipment will be compiled with quantity reference to the master vehicle schedule.

(4) A statement of impact upon planning, procurement, scheduling, production, incoming and acceptance testing, for the outdated equipment will be made.

(5) A statement of impact upon Standard Agena System Test will be made.

(6) A statement of impact upon manufacturing schedules and activities as a result of the new customized configuration(s) will be made.

(7) A summary of proposed configuration management/documentation will be prepared.

(8) A summary plan will be provided that describes the long range objective for replacing outdated portions of the present Standard Agena with using program developed equipment that will in turn permit achievement of a maximum "common" and complete Standard Agena system.

(b) Analysis and Design

as required

Plan No. 325
26 June 1967

6. RESOURCES

Manmonths: 18

Months:	1	2	3	4	5	6	7	8	9	10	11	12
							6	6	6			

Preliminary Report - September 1, 1967

Final Report - September 30, 1967

#14

28 Jul 67

28 Jul 1967, meeting at Lockheed attended by Gen Cooper, Colonels Hamilton and Smith. Briefing material supplied.

STANDARD AGENA

STD. AGENA CONTR. REQUIREMENTS

AF 04(695)939/0077

VEHICLES

- TOTAL ON CONTRACT 55
- DEL. TO DATE 12

} 2 PER MO THRU JULY '67
1 1/2 PER MO BAL CONTR.

OPTIONAL

- TOTAL ON CONTRACT 630
- DEL. TO DATE 210

SPARES

- TOTAL ON CONTRACT 748
- DEL. TO DATE 602

USING PROGRAM ALLOCATION

846	110	770	OTHER
16	21	10	8

1159

STD AGENA TYPICAL SCHEDULE

FINAL ASSY

20 DAYS

SYSTEM TEST

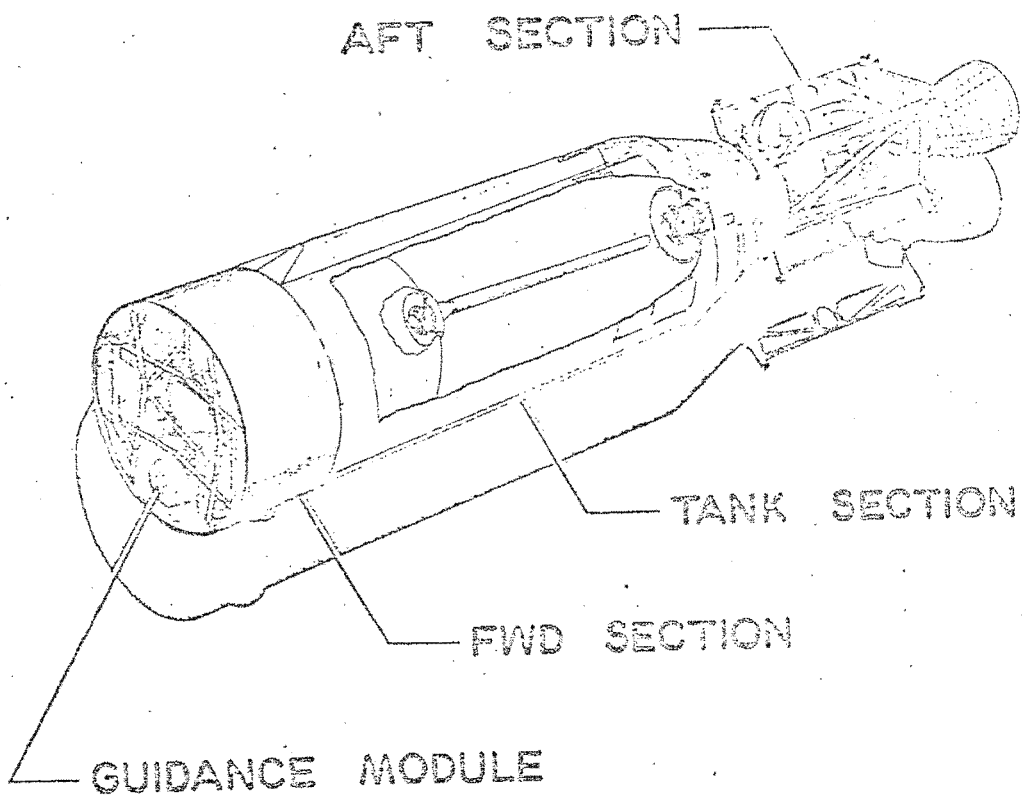
30 DAYS

STORAGE

VARIABLE
0 - 6 MONTHS

BASED ON 5 DAY - SINGLE SHIFT

BASIC VEHICLE

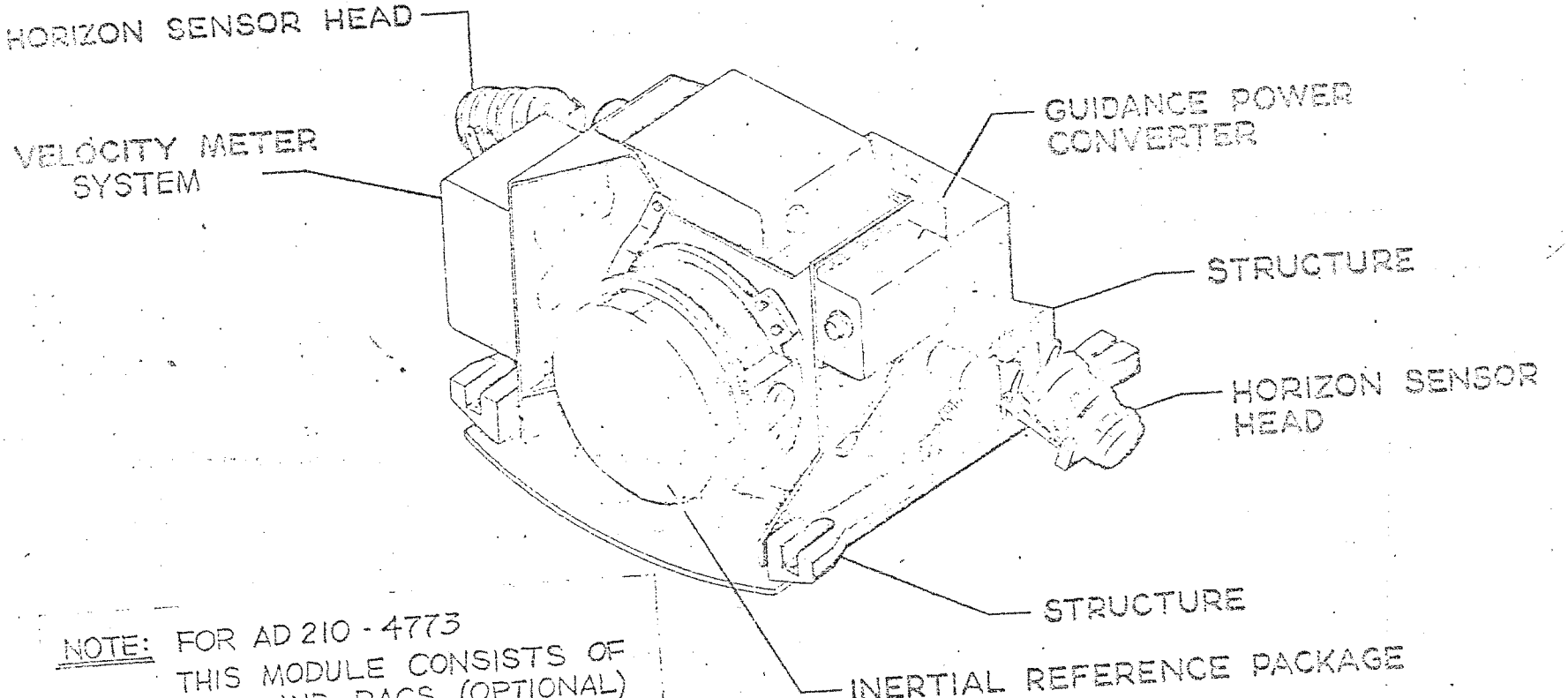


UNCLASSIFIED

STANDARD AGENA

GUIDANCE MODULE (PRESENT)

BASIC



NOTE: FOR AD 210 - 4773 THIS MODULE CONSISTS OF PACS AND RACS (OPTIONAL) WHICH IS THE DUAL ATTITUDE CONTROL SYSTEM (DACS)

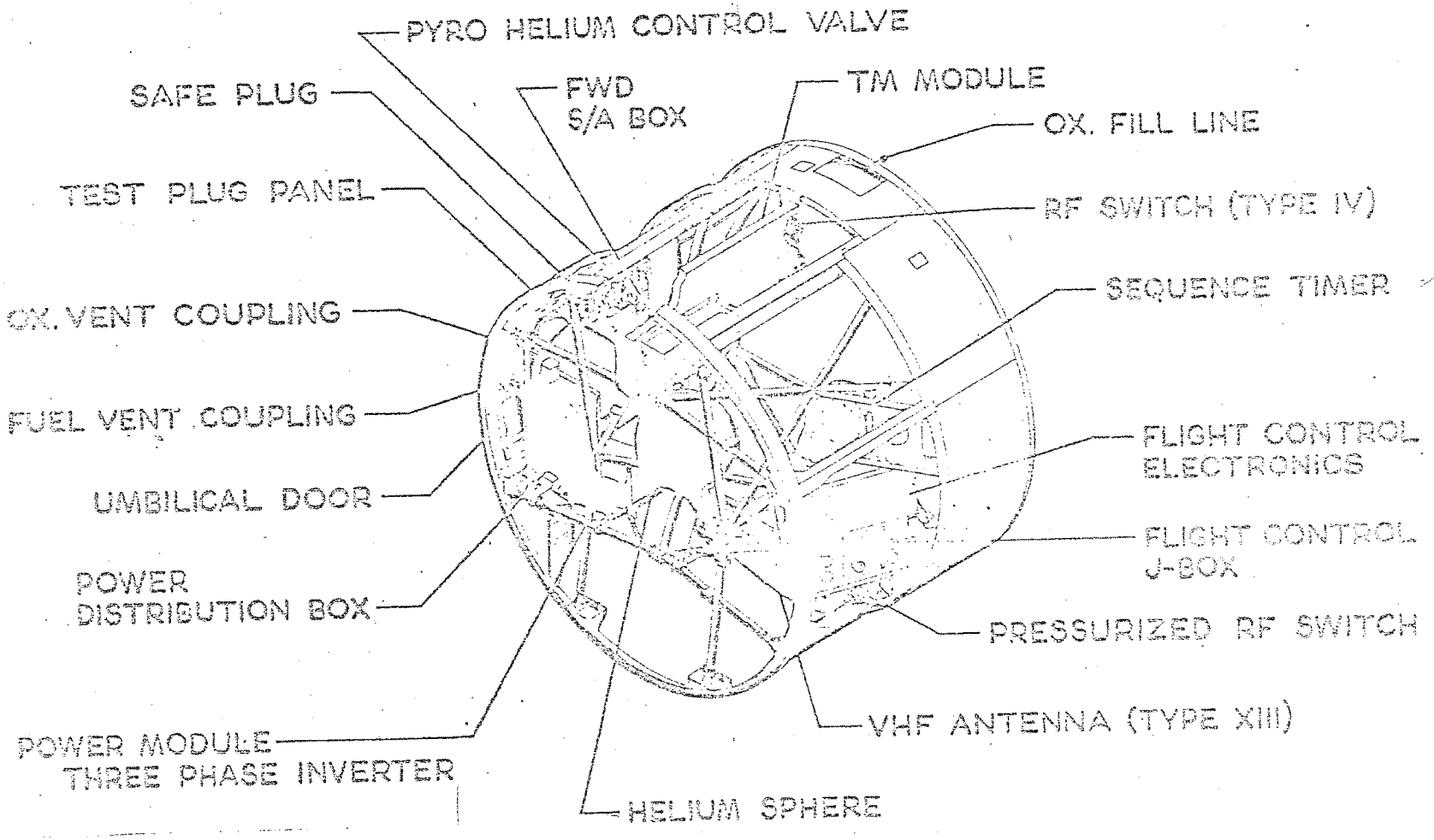
LMSC-A837529 3-6-64

LOCKHEED MISSILES & SPACE COMPANY

UNCLASSIFIED

FORWARD SECTION

BASIC



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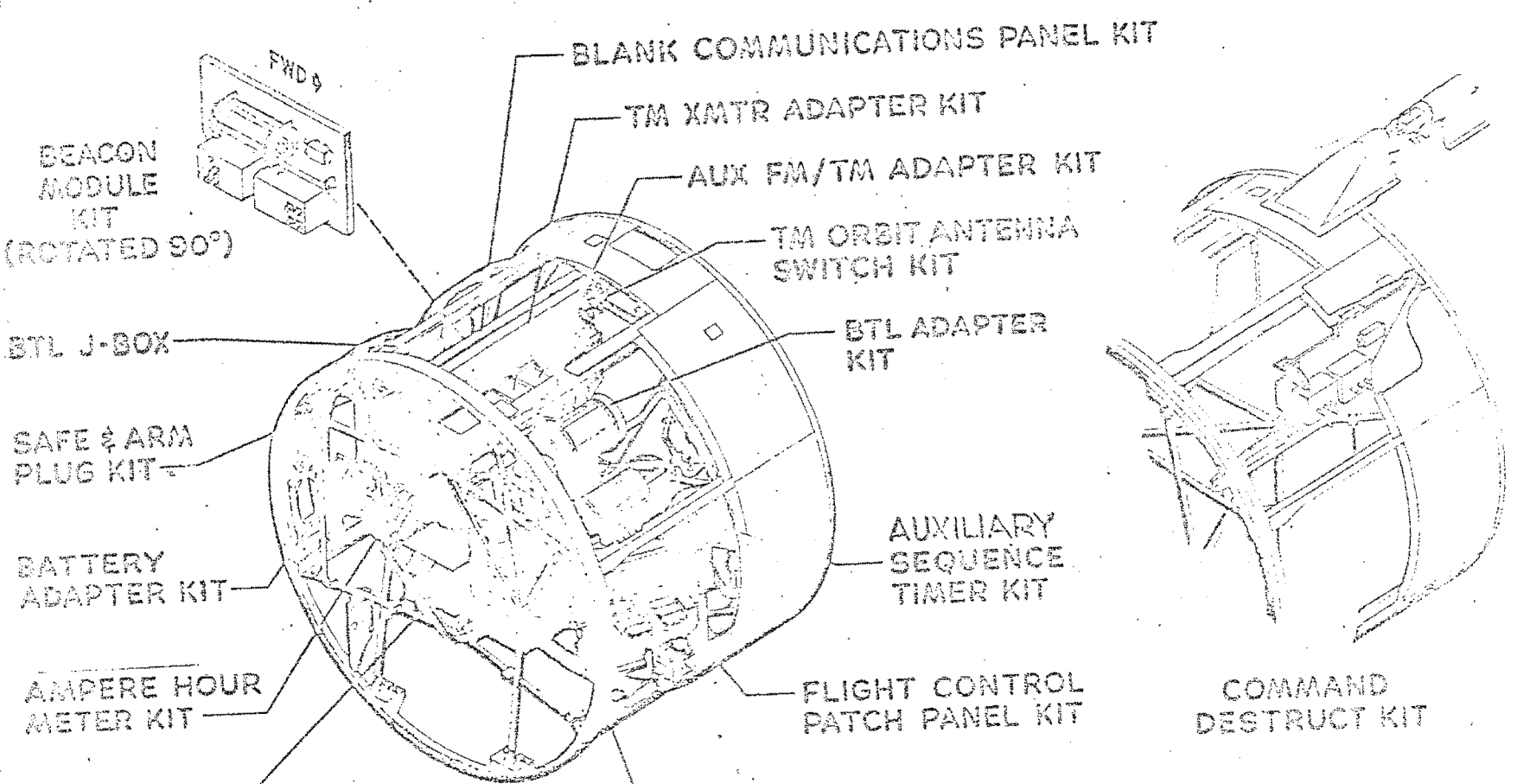
FORWARD SECTION

OPTIONALS



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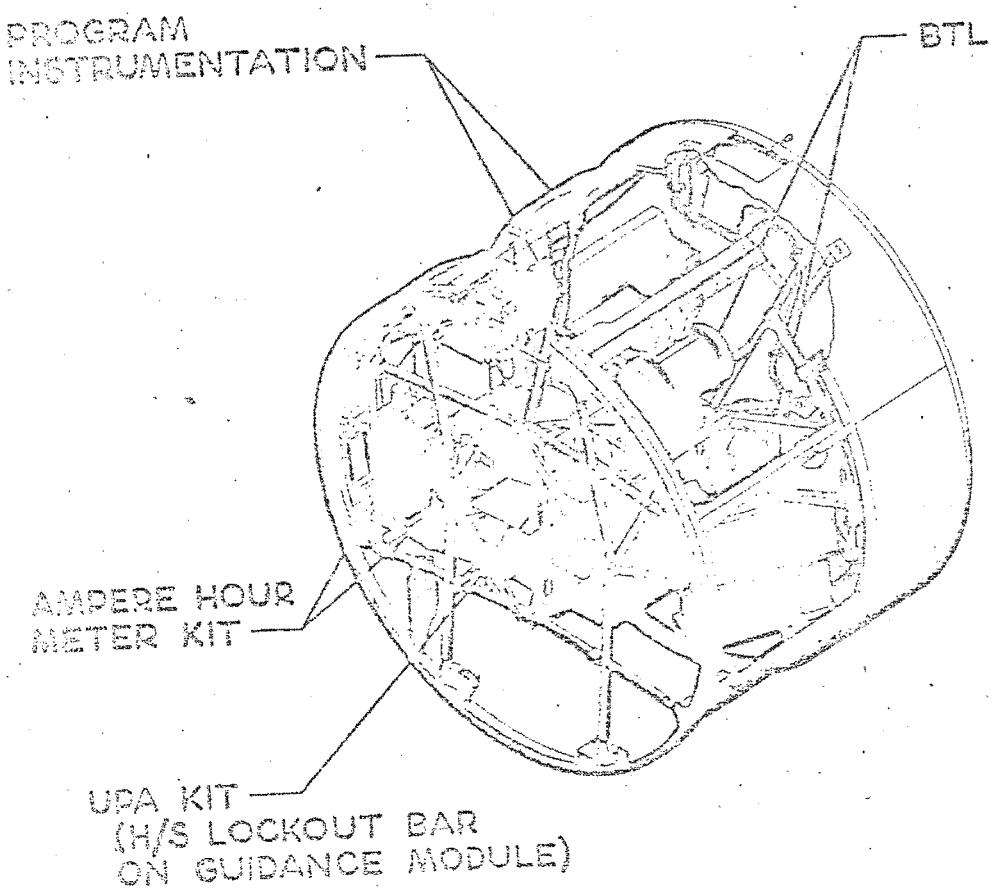
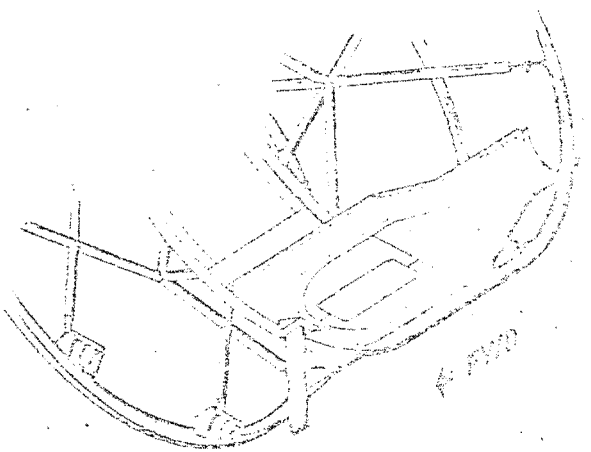
STANDARD AGENA

FORWARD SECTION

USING PROGRAM ADDITIONS-STANDARD AGENA INSTALLED





BTL ANTENNA INSTALLATION

LMSC-A037334 3-6-64

STD. AGENA FWD RACK

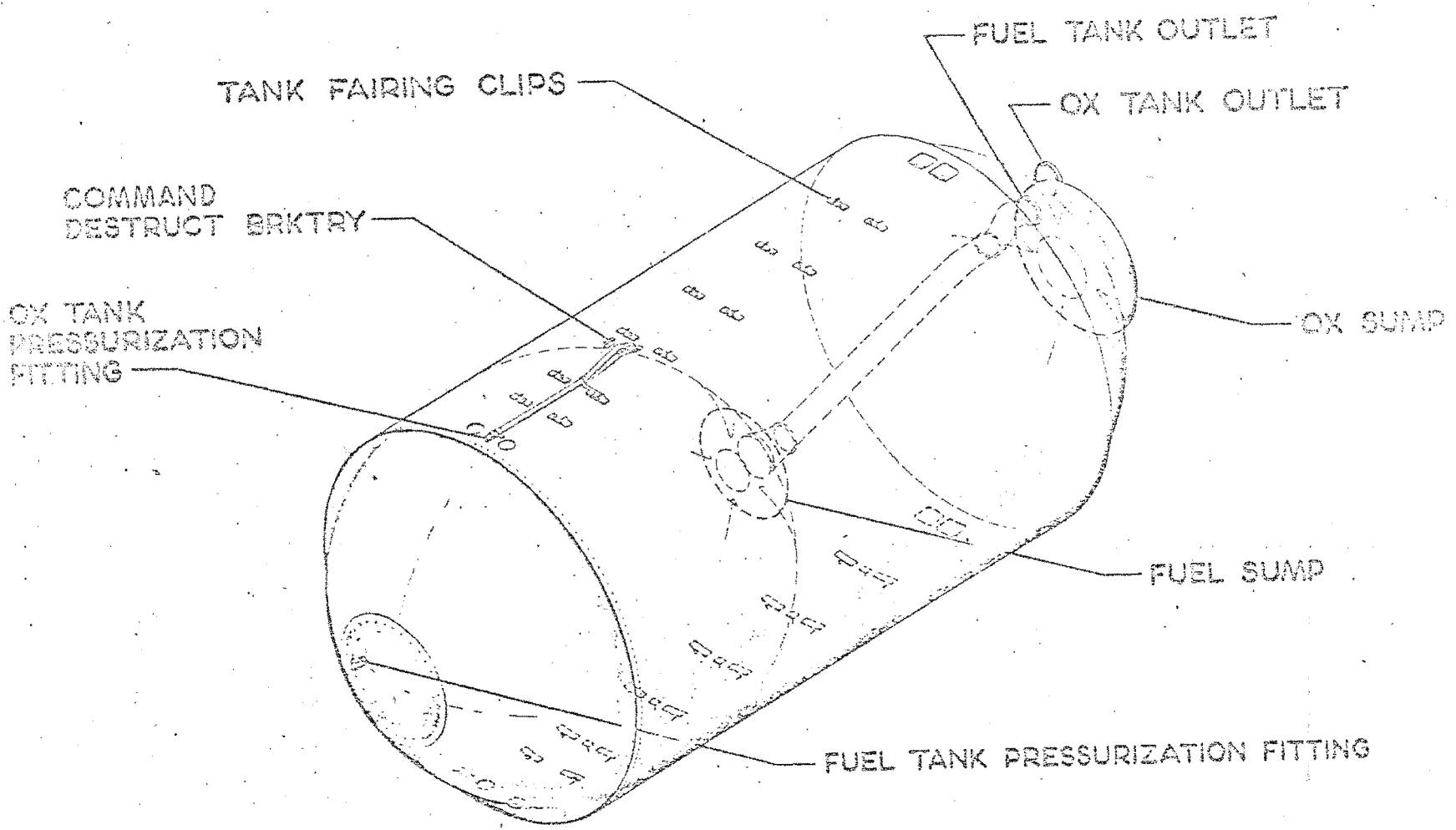
* MODEL 1191

OPTIONAL KITS

NOMENCLATURE	846	110	770	OTHER
F/C PATCH PANEL			✓	
S-BAND BEACON/DECODER ADAPT.	✓			
C-BAND BEACON ADAPTER				✓
BATTERY ADAPT. - IC	✓			
IV				✓
IIA			✓	✓
SENSOR BAR PIN PULLER			✓	
COMMAND DESTRUCT.				✓
ORBITAL PROG. ADAPT.	✓			
TM TRANS. 2W ADAPT.	✓		✓	✓
TM TRANS. 10W ADAPT.				✓
AUX FM/TM ADAPT. (TYPE II)	✓	✓	✓	✓
SAFE/ARM PLUG	✓	✓	✓	✓
BEACON ANTENNA C/O COVER			✓	
SEQUENCE TIMER	✓	✓	✓	✓
HORIZON SENSOR PRE-AMP. SIGNAL COND.	✓	✓	✓	✓
* UPA	✓			
BLANK COMM. PANEL	✓		✓	
* ETL	✓		✓	✓
* A/P HOUR METER	✓	✓	✓	✓

UNCLASSIFIED

TANK SECTION



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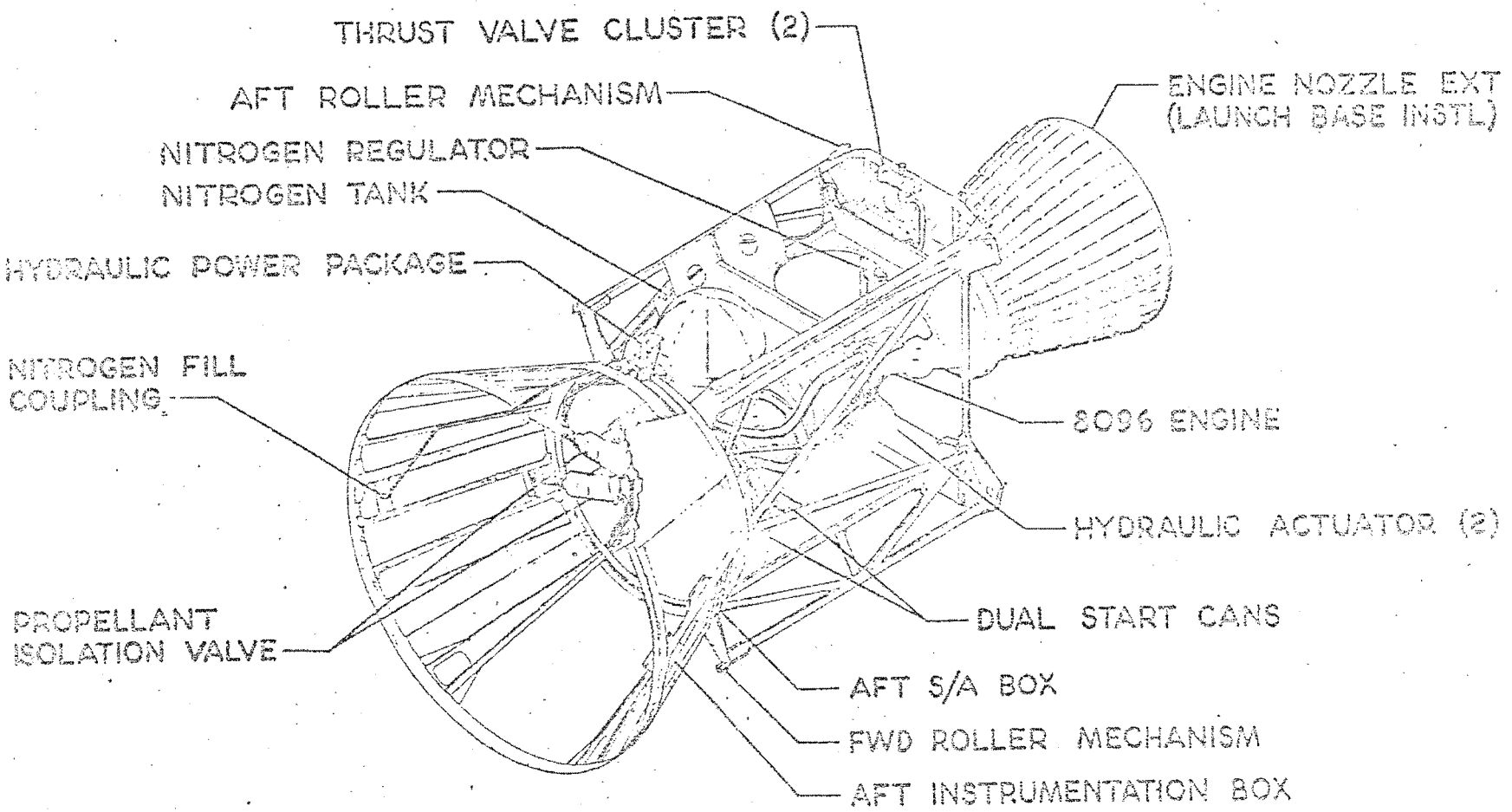
1167

AFT SECTION

BASIC VEHICLE



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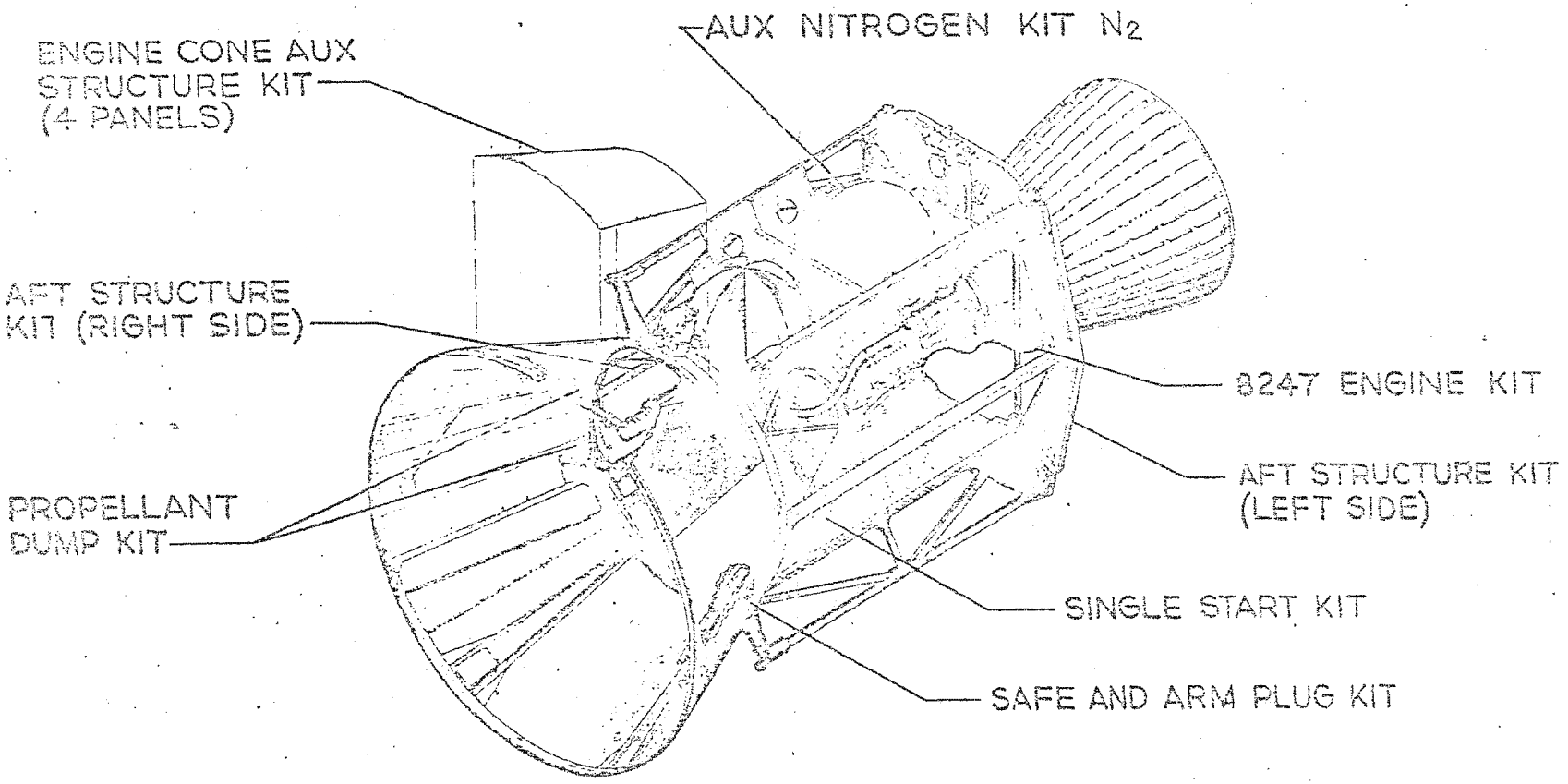
1168

UNCLASSIFIED

AFT SECTION

WITH OPTIONALS



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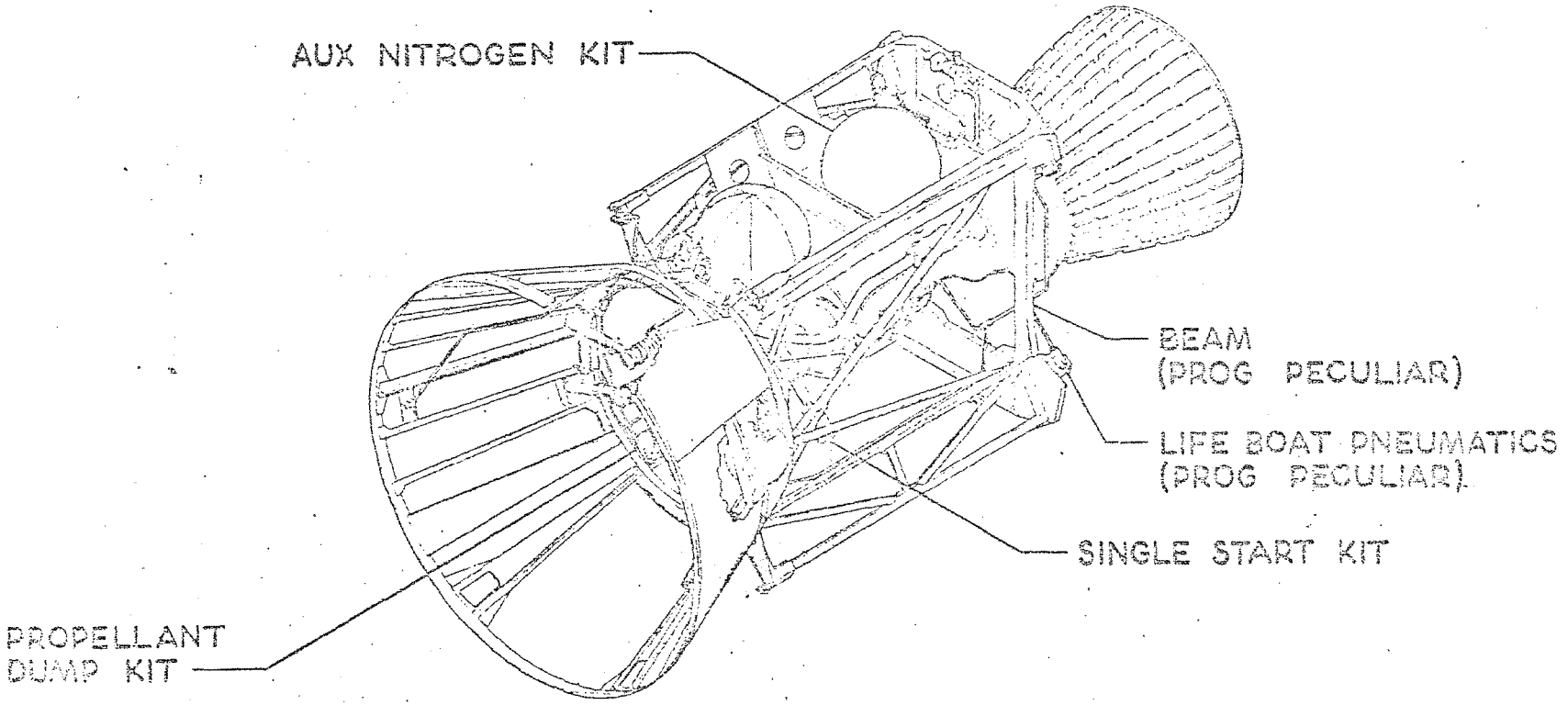
LOCKHEED MISSILES & SPACE COMPANY

UNCLASSIFIED

AFT SECTION

USING PROGRAM ADDITIONS-STANDARD AGENA INSTALLED



LMSC-A637527 3-6-64

1170

STD. AGENA AFT RACK

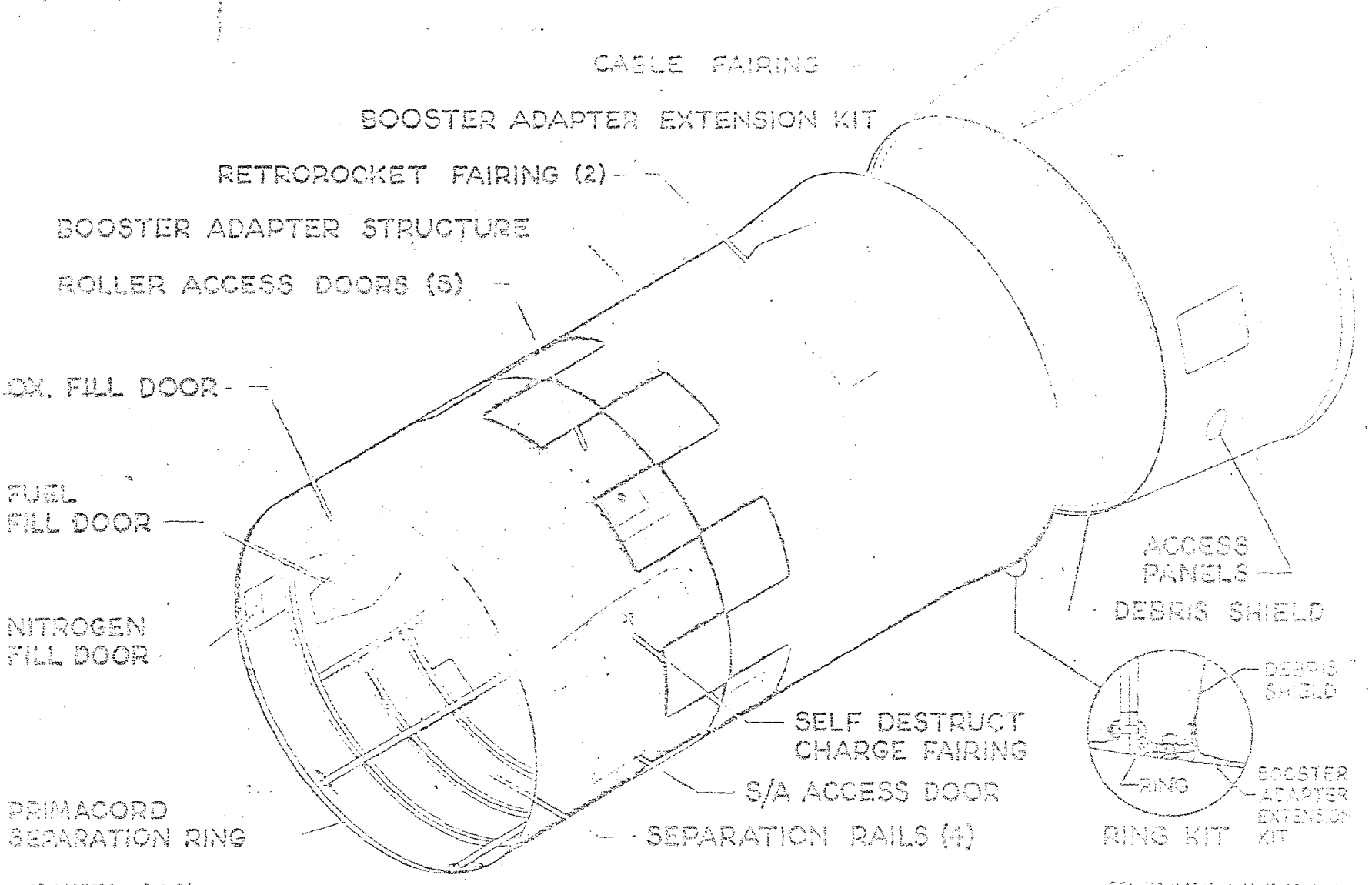
OPTIONAL KITS

NOMENCLATURE	846	110	770	OTHER
BOOSTER ADAPTER EXT.			✓	
BOOSTER ADAPTER EXT. RING			✓	
ENGINE CONE AUX. STRUCT.	✓	✓	✓	✓
* SINGLE START	✓			
* PROPELLANT DUMP	✓		✓	
* AUX. N_2 TANK	✓	✓	✓	
AFT STRUC. LEFT HAND			✓	
AFT STRUC. RIGHT HAND			✓	
THIRD NITROGEN TANK		✓		
BOOSTER ADAPTER (.160)	✓		✓	✓
MAXIMUM ACCESS BOOSTER ADAPTER (MABA)		✓		

* MODEL 1191

UNCLASSIFIED

BOOSTER ADAPTER



LMSC-A687530 8-6-64

UNCLASSIFIED

CONFIGURATION MANAGEMENT

STANDARD AGENA PROGRAM

Approved for Release: 2017/08/28 C05097006

CONTRACT SPECIFICATION COMPARISION

PROGRAM	CONTRACT SPECS	375-1 ON CONTRACT
STD. AGENA	2000	YES
110	9	YES (RELAXED)
BOOSTER SYSTEMS	1	YES (RELAXED)
846	1	NO
770	1	NO
949 (TRW)	40	YES

AGENA COMPLIANCE DOCUMENTS

- ~ 2000 SPECS ON CONTRACT
  - INCLUDES 208 MAJOR ASSEMBLIES, BLACK BOXES, & HARNESSES
  - PLUS ELECTRONIC PIECE PARTS
    LOCKHEED CORP. PROCESS SPECS
    MILITARY SPECS.
- ~ 1650 DRAWINGS ON CONTRACT
- ANY SPEC. CHANGE OR NON-CONFORMANCE REQUIRES CLASS I ECP
  - INVOLVES EJA, WAIVER OR USCN, AFPRO REVIEW, AFSTD APPROVAL & CCN.
- ALL CLASS I DWG. CHANGES REQUIRE ECP & CCN
- ALL CLASS II DWG. CHANGES REQUIRE AFPRO ENG. APPROVAL
  - NOT REQUIRED BY ANA 445 OR OTHER PROGRAMS
- NON-CONFORMANCE TO ANY DWG. IS SUBJECT TO CLASS I (ECP/CCN)

HISTORY - 1966 - ~ 168 ECP'S PLUS 34 WAIVERS FOR DET. NON-COMPL.

CURRENT EX: MABA SPECS - 1 YEAR TO CONVERT - 110 TO STD. AGENA

RESULT: A MAJOR FACTOR IN AGENA SLOW RESPONSE & COST

AGENA CONFIG. MGM'T/SPEC. PROPOSAL

- COMMON AGENA & USING PROGRAM GRD. RULES --
- WRITE 375-1 INTERPRETATION EXHIBITS FOR CONTRACT -
- WRITE MODEL SPEC. FOR EACH CUSTOMIZED PROG. ~4 - 846, 110, 770, & STR. CONFIG.
- REDUCE NUMBER FROM 2000 TO ~17 PER MODEL -
- SCRUB THE REMAINING 17
  REMOVE AMBIGUITIES, REDUNDANCIES, ADD CRITICAL MATERIAL FROM SUB-TIERS, IF ANY
- RELAX SPEC. & DWG. NON-CONFORMANCE INTERPRETATION - BY AFPRO PER SPO DIRECTION
- ELIMINATE AFPRO CLASS II ENG. APPROVAL

1176

AGENA CONTRACT STRUCTURE

DEVELOPMENT SEQUENCE

1ST STEP — **-0092 ENGINEERING**

PREPARE PROGRAM PLAN
AF AUTHORIZES
MAKE STUDY
WRITE SPECIFICATION.
OBTAIN AF APPROVAL

SPEC.

-589 TESTS

2ND STEP

AF REQUESTS QUOTE
SUBMIT QUOTE
NEGOTIATE/AUTHORIZE
BUILD HARDWARE
PERFORM TESTS
REVISE SPECS
OBTAIN AF APPROVAL
ESTABLISH BASELINE (FACI)

QUALIFIED

-939 PRODUCTION

3RD STEP

FORMAL ECP
CCN
PREPARE PRODUCTION ENGINEERING
INCORPORATE

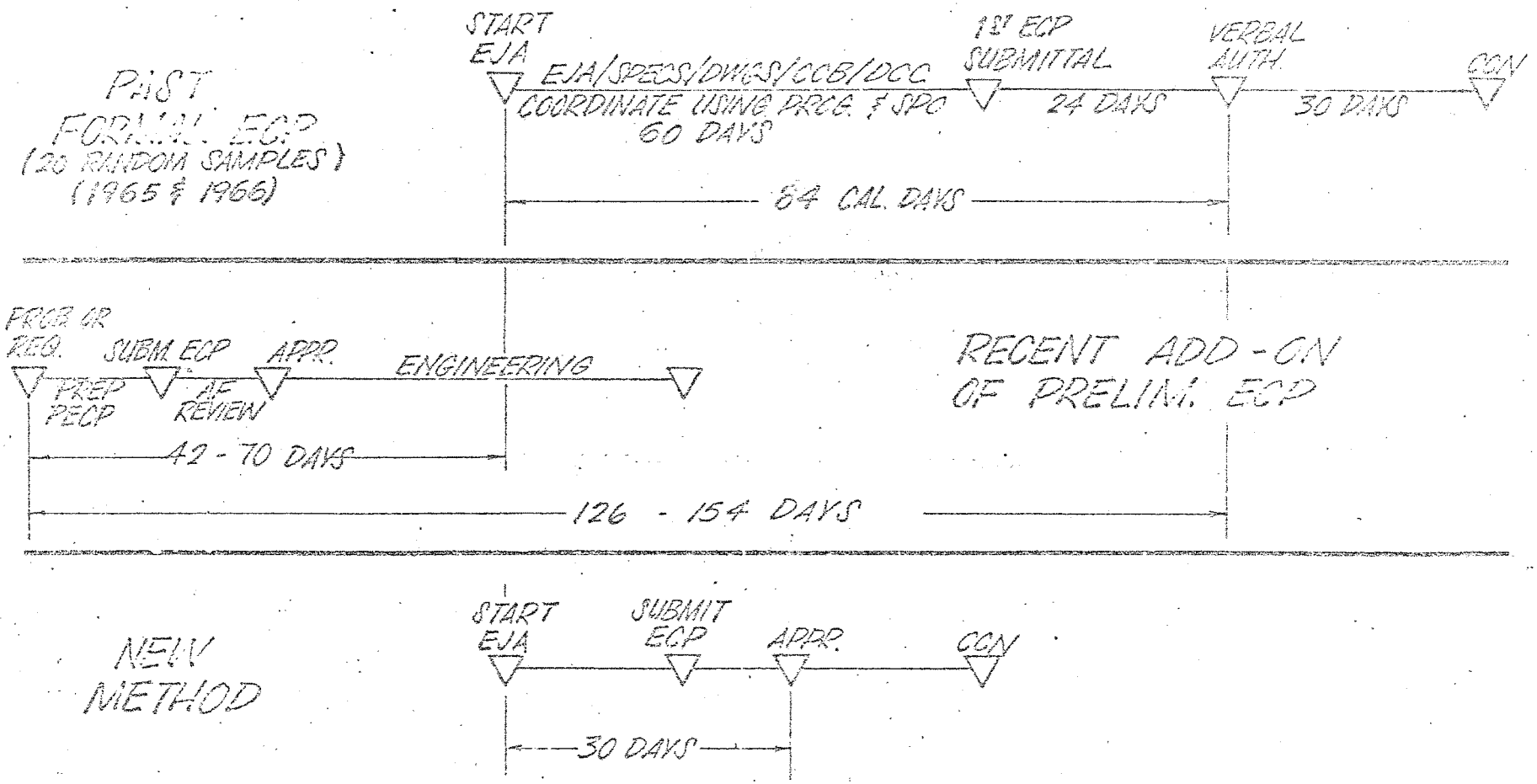
EXAMPLES: DC/DC CONVERTER _____ INCORPORATE AD143
486 DAYS

FILL/VENT COUPLING _____ INCORPORATE AD 205
730 DAYS

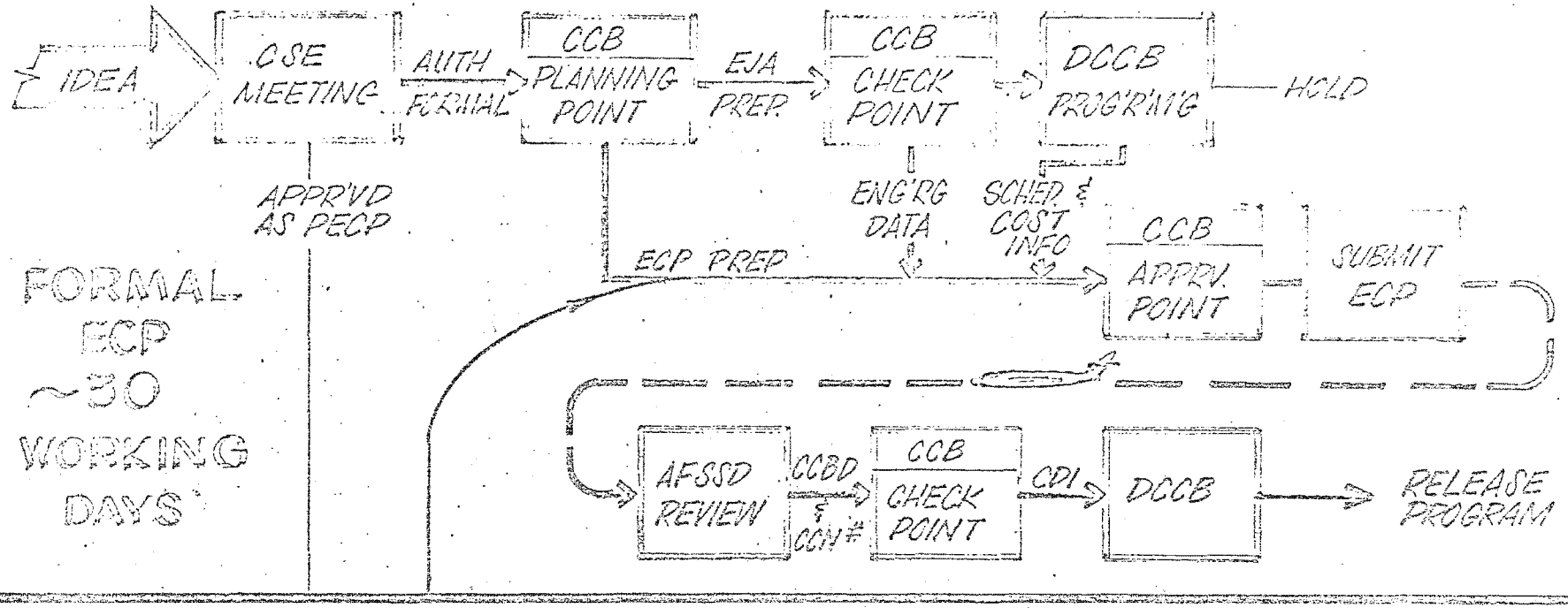
1177

AGENA CHANGE CONTROL

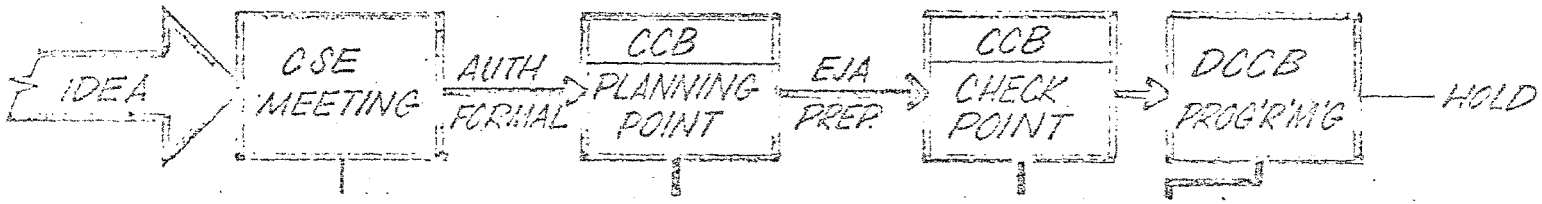
CAL. DAYS (5 DAY WEEK)



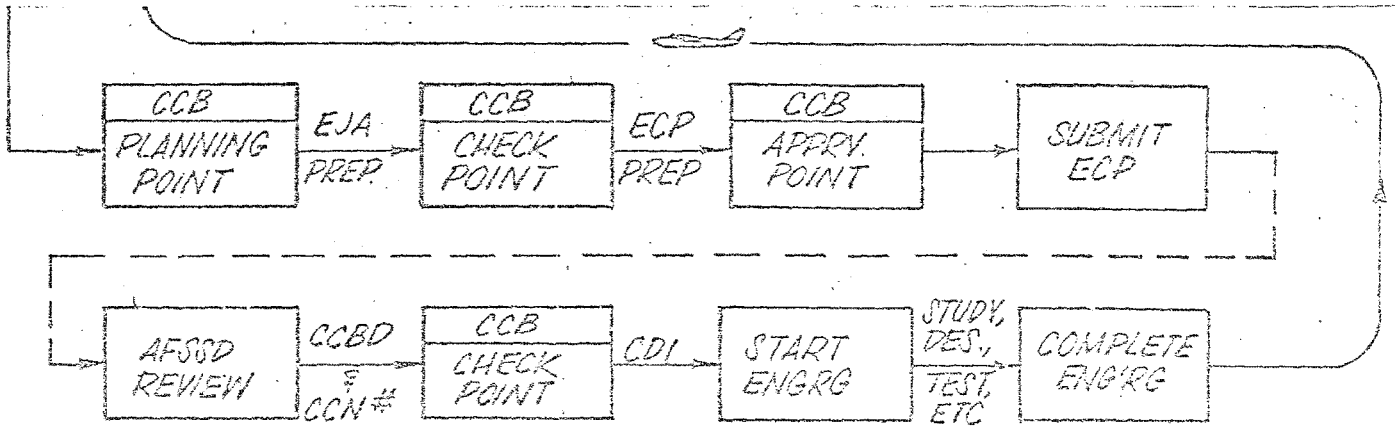
EJA/ECP/CCN FLOW CHART



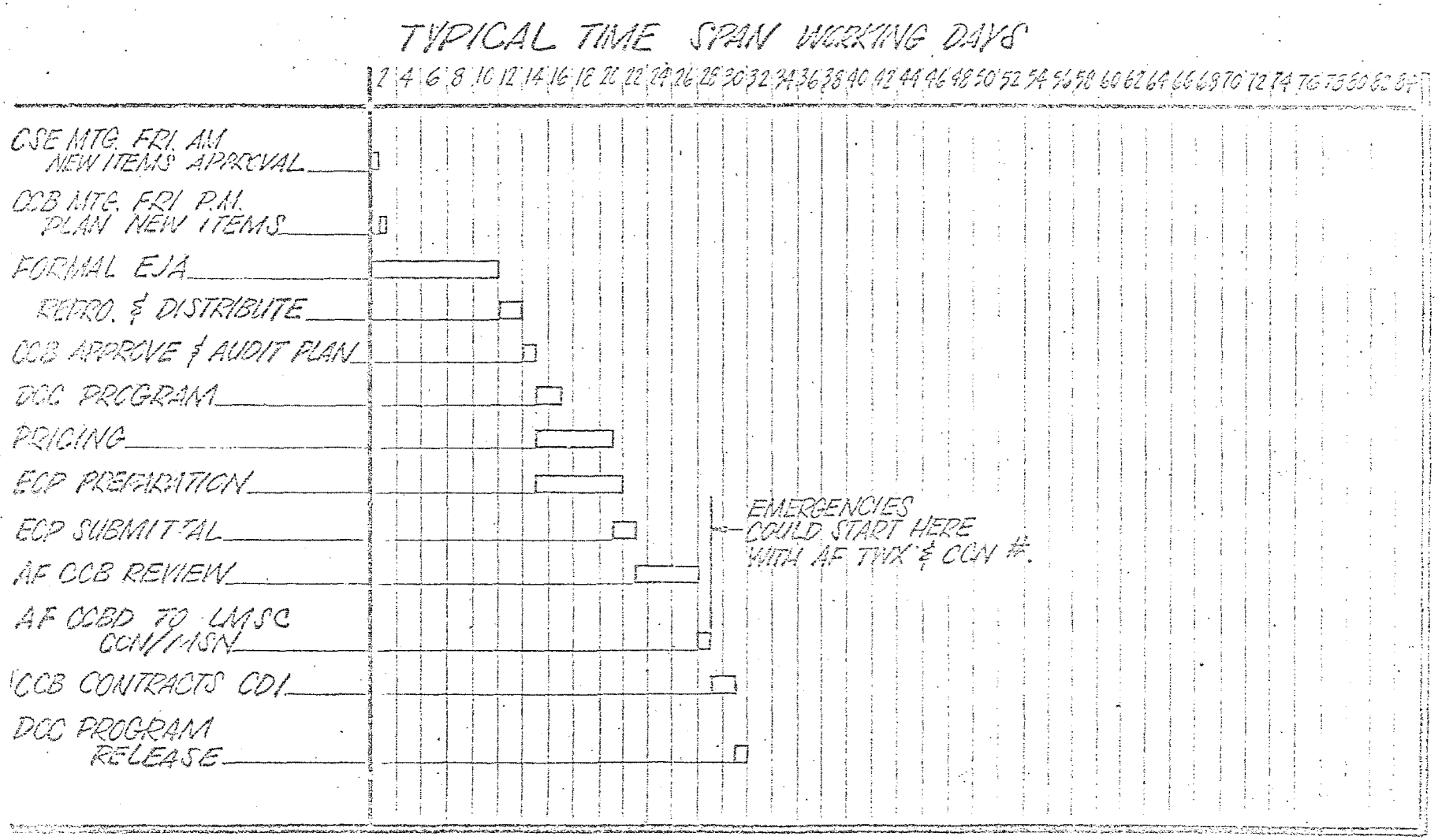
EJA/ECP/CCN FLOW CHART



PREL. ECP ADDS ~ 53 WORKING DAYS



FORMAL EJA/ECP/CCN CYCLE



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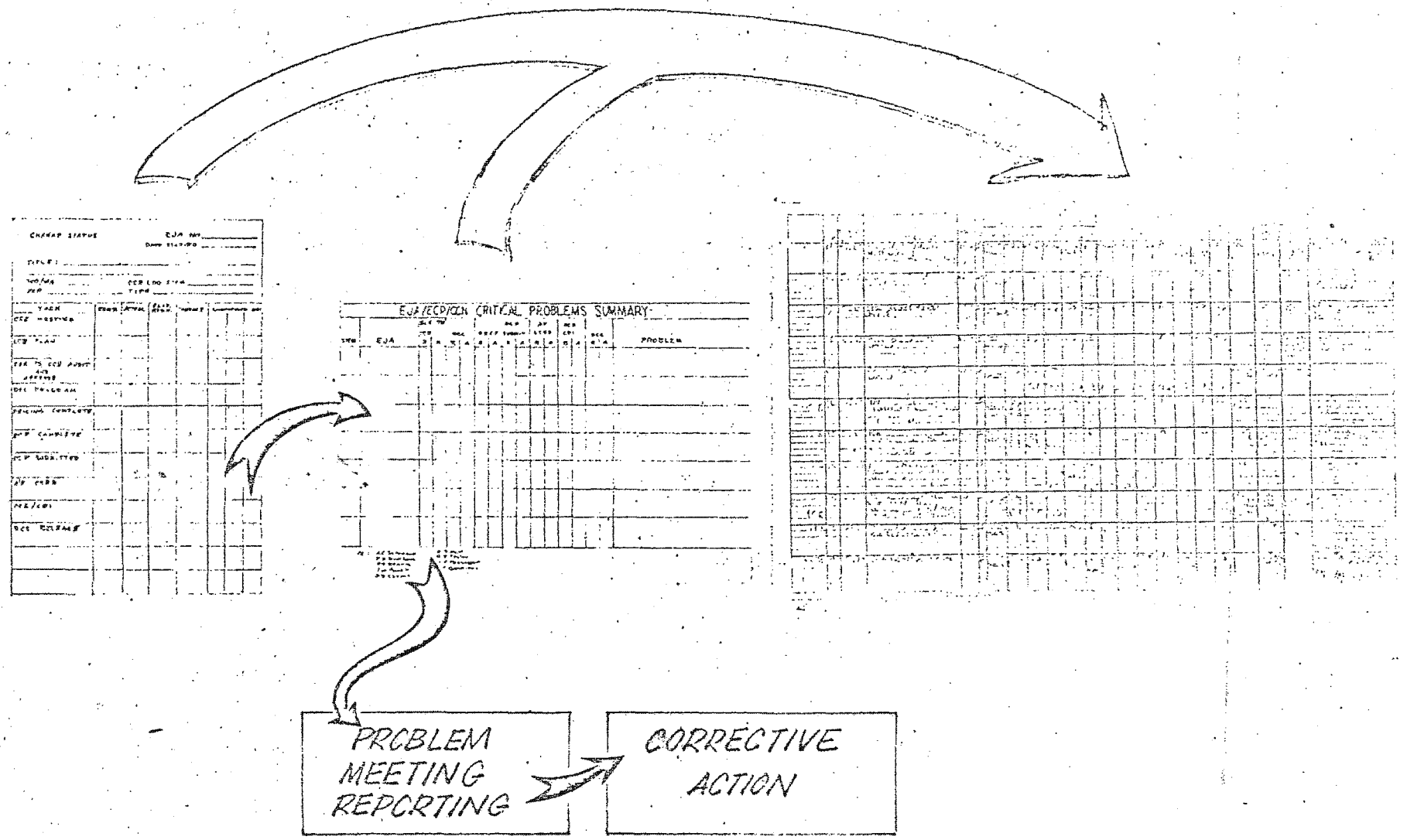
EJA/ECP/CCN CONTROL PLAN



CUSTOMIZED AGENA

PROGRAM OBJECTIVES

DEVELOP STANDARDIZED VEHICLE AVAILABLE FOR FLIGHT JUNE 1962

INCORPORATES

- HIGH RELIABILITY
- MISSION ADAPTABILITY
- MAINTAINABILITY
- SERVICEABILITY
- PRODUCIBILITY
- REDUCE CHECKOUT REQUIREMENTS
- IMPROVE PERFORMANCE
- REDUCE PRODUCTION COST

CREATE A CAPABILITY FOR PRODUCTION AT 5/MONTH (FIXED PRICE CONTRACT)

DEVELOP AND MAINTAIN STREAMLINED PROCEDURES AND ORGANIZATION FOR FAST REACTION AND LOW COST

1184

JOHNSON COMMITTEE GROUND RULES

		ACCOMPLISHED YES	ACCOMPLISHED NO
1.	A DX PRIORITY IS ASSIGNED THE S-OIA PROGRAM	✓	
◇ 2.	THE ENGINEERING SYSTEM SHALL BE SIMPLIFIED, REQUIRING ONLY THOSE DRAWINGS ESSENTIAL TO TOOL, BUILD & SERVICE VEH.	✓	
3.	FINAL CONFIGURATION FREEZE SHALL BE ACCOMPLISHED	✓	
4.	ENGINEERING PERSONNEL SHALL BE LOCATED IN AN ENCLOSED AREA IMMEDIATELY ADJACENT TO THE TOOLING & MFG AREA	✓	
5.	A RAPID DRAWING RELEASE SYSTEM (24 HOURS MAXIMUM) FROM THE PROJECT ENGINEERS APPROVAL TO THE MANUFACTURING GROUP SHALL BE ESTABLISHED	✓	
6.	FUNDING SHALL BE ADEQUATE AND TIMELY	NOT ON QTR'LY BASIS	
7.	TECHNICAL DIRECTIVE MEETINGS INVOLVING LARGE GROUPS SHALL NOT BE REQUIRED. AIR FORCE PERSONNEL SHALL WORK IN CLOSE LIAISON WITH THE LMSC PROJECT ENGINEER SO FORMAL MEETINGS ARE NOT REQUIRED	✓	

P-16185 "S-OIA" 5-15-63
CY 5-1

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JOHNSON COMMITTEE GROUND RULES

		ACCOMPLISHED	
		YES	NO
8.	REASONABLE OVERTIME WILL BE APPROVED. AFTER-THE-FACT APPROVAL IS NOT PRECLUDED. (PURSUANT TO CLAUSE A-37 OF THE CONTRACT)	✓	
◇ 9.	AIR FORCE APPROVAL OF VENDOR SELECTION SHALL BE FURNISHED ON-THE-SPOT AT SUNNYVALE. WHEN SINGLE SOURCE PROCUREMENT IS NECESSARY, JUSTIFICATION OF SUCH ACTION WILL BE KEPT ON FILE.	✓	
◇ 10.	TOOLING SHALL BE OF THE SIMPLEST TYPE THAT WILL ACHIEVE INTER-CHANGEABILITY AS STATED IN THE BASIC S-01A SPECIFICATION. NO TOOL DRAWINGS OR OUTSIDE APPROVAL OF TOOLING WILL BE REQ'D	✓	
11.	INTERCHANGEABILITY ON EARLY S-01A'S WILL BE LIMITED TO MAJOR STRUCTURAL AND EQUIPMENT ITEMS. DOORS, FOR INSTANCE, MAY REQUIRE TRIM TO FIT.	✓	
12.	NO ENGINEERING ANALYSIS REPORTS WILL BE REQUIRED, SINCE IT IS RECOGNIZED THAT BASIC ENG'RG RPTS FURNISH COMPARABLE DATA.	✓	
13.	THE AIR FORCE PROGRAM DIRECTOR AND LMSC SHALL JOINTLY REVIEW THE SPECIFICATION PROBLEM & AGREE AT THE CONFIGURATION CONFERENCE TO REDUCE THE NUMBER INVOLVED TO THE MINIMUM COMPATIBLE WITH THE S-01A MISSION.	✓	

1186

STANDARD AGENA

PHASE I STANDARDIZATION (S-01A)

- USE OF FLIGHT PROVEN AGENA B EQUIPMENT.
- STANDARDIZATION OF MAJOR EQUIPMENT CIRCUITS & PLUMBING.
- MODULARIZED SUBSYSTEMS FOR INTERCHANGEABILITY & SIMPLIFIED CHECKOUT

INTERMEDIATE IMPROVEMENT (ABC) (S-01B)

- PIP
- 8247 ENGINE
- BTL
- UPA AND UPC

PHASE II MAJOR ORBITAL RELIABILITY IMPROVEMENT PROGRAM

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STANDARD AGENA

STANDARD AGENA PROGRAM

ABC FEATURES (1963)

- ☐ INCREASED PAYLOAD CARRYING CAPABILITY
  - 95 LBS SPECIFIC SINGLE BURN MISSION
  - 100 TO 135 LBS DUAL BURN MISSION
- ☐ INCREASED VERSATILITY
  - 8247 MULTISTART ENGINE
  - ADDITIONAL INSTRUMENTATION CAPABILITY
- ☐ INCREASED ORBITAL CAPABILITY
  - DEACTIVATE/REACTIVATE VEHICLE ON COMMAND
- ☐ IMPROVED INJECTION ACCURACY
  - BTL GUIDANCE SYSTEM IN AGENA
- ☐ ADDITIONAL OPTIONAL KITS AVAILABLE
- ☐ PERMITS ELIMINATION OF PROGRAM AUXILIARY FORWARD SECTION
- ☐ ELIMINATES PROGRAM MODIFICATIONS TO AGENA BASIC WIRING

P-1756T "STANDARD AGENA" 6-5-63
CY 6-1

UNCLASSIFIED

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AGENA UPDATING ACTIVITIES

STANDARD AGENA PROPOSALS - (ABORTED)

- IMPROVED GUIDANCE MODULE (IGM) — PROPOSED: '62 & '63
  WOULD HAVE AVOIDED GIP & DACS — REJECTED: 11/63
- LONG-RANGE IMPROVEMENT PROGRAM (PHASE II) — PROPOSED: '64
  3 PHASE - 19 MONTH - ALL SUBSYSTEMS — REJECTED: 6/65
- GUIDANCE & CONTROL ELECTRONICS (GCE) — DEV. INITIATED: 9/60
  WOULD ELIMINATE GIP & COMPAT. WITH RACS — STOPPED: 3/67
- ELECTRONIC EVENT TIMER (EET) — STUDY INITIATED: 1/66
  REPLACE SEQUENCE TIMER — DEV. STOPPED: 6/67

USING PROGRAM ACTIONS

- GUIDANCE INTERCONNECT PACKAGE (GIP) - PROG. 846 — DEV. INITIATED: 6/65
  REPLACES STD. AGENA GUID. & F/C J-BOXES
- DUAL ATTITUDE CONTROL SYSTEM (DACS) - PROG. 110 — DEV. INITIATED: EARLY '67
  REPLACES STD. AGENA GUIDANCE EQUIPMENT

1189

CURRENT PROBLEM

BASIC : USING PROGRAMS TEAR DOWN AND REBUILD - INVALIDATE TEST

EXAMPLES:

770	846	110 (4773)
REMOVE & MOD: FLT. CONTROL J-BOX GUID. J-BOX DRILL, CUT, ETC TO ACCO-MODATE PROG. EQUIP. ADD (AGENA SYS.) (3) PROG. BOXES (3) HARNESSES	REMOVE: FLT. CONTROL J-BOX GUID. J-BOX (9) HARNESSES DRILL, CUT, ETC, TO ACCOMODATE PROG. EQUIP. ADD (AGENA SYS.) GUID. INTER. PKG. SEQUENCE TIMER RECOVERY TIMER DC CONVERTER (REDUNDANT) AUX. FM TELEMETER FLT. LOGIC & PROGMR BOX (7) HARNESSES	REMOVE: FWD SECTION COMPLETE AFT SECTION BOXES (1) AFT HARNESS DRILL, CUT, ETC TO ACCOMODATE PROG. EQUIP. ADD (AGENA SYS.) FWD SECT. INCL. BASIC H_2 SYS (6) STD AGENA BOXES (MEM) DACS MODULE RACS N_2 SYS. PCM TELEMETER (30-40) HARNESSES
ADD (OTHER) (8-12) PROG. BOXES (8) HARNESSES	ADD (OTHER) (25-30) PROG. BOXES) (30) HARNESSES	ADD (OTHER) COMMAND SYSTEMS SECONDARY PROP SYS. OTHER (90) HARNESSES

CUSTOMIZE TO HERE

RECENT PROPOSED SOLUTIONS

SAFSP CONSIDERATION

- ELIMINATE STD. AGENA
- AFSSD TO PROCURE COMPONENTS/SUB ASSEM. TO SP REQMTS

LMSC PROGRAM 110 RELIABILITY ASSEMBLY METHOD

- ONE TIME BUILD UP - INCREASE PROG. CONFIDENCE
- INSTALL SOME PROG. EQUIPMENT
- ELIMINATE AGENA SYSTEM TESTING

SSV PRODOSAL (CONCEPT I)

- ESTABLISH BASIC AGENA IN LIEU OF STD. AGENA
- ASSEMBLE COMMON EQUIPMENT PLUS CERTAIN PROG. ADD-ONS
- SYSTEM TEST & CONDITIONAL DD-250

LMSC - SIMPLIFIED AGENA (BASIC)

- ASSEMBLE & TEST TO POINT OF COMMON USAGE
- TRY TO MAINTAIN BASIC ASCENT AGENA CAPABILITY

JOINT LMSC/SAMSO - CUSTOMIZED AGENA

- ONE TIME BUILD UP - INCLUDE PROG. STRUCT. & HARNESSES
- INSTALL AGENA & PROG. EQUIPS TO COMPLETE VEHICLE SYSTEM
- ACCEPTANCE TEST & CONDITIONAL DD-250
- ORGANIZE REQMTS & CONTRACT RESPONSE

PURPOSE

MODIFY STD. AGENA/PROG. ASSEMBLY & TEST SEQUENCE TO MEET PROG. REQUIREMENTS

OBJECTIVES

IMPROVE SYSTEM RELIABILITY

- ELIMINATE DRILLING, CUTTING, ETC., AFTER HARNESS & BOX INSTALLATION
- MINIMIZE HARNESS DISCONNECT & FLEXING
- OPTIMIZE SEQUENCE OF VEHICLE ASSEMBLY (FROM CORE-CUT)

IMPROVE OVERALL SCHEDULE

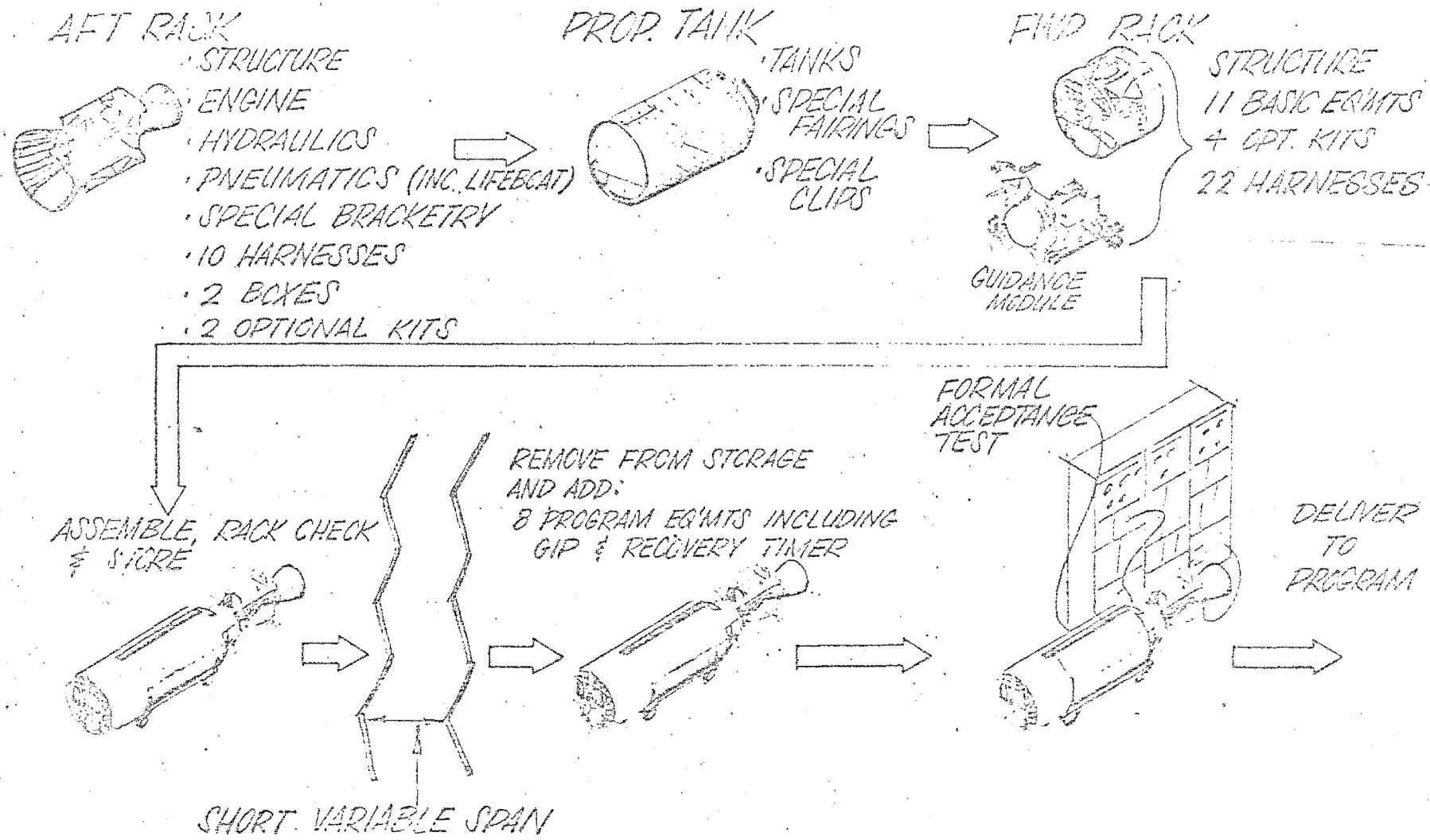
- DEVELOP LOGICAL ONE-TIME VEHICLE BUILD-UP
- REDUCE LEAD TIME FOR IMPLEMENTATION OF DESIGN CHANGES

REDUCE TOTAL RECURRING COST

- ASSEMBLE VEHICLE UNDER OPTIMUM ACCESSIBILITY CONDITIONS
- ELIMINATE UNNECESSARY VEHICLE BUILD-UP & TEAR DOWN, AND TEST INVALIDATION.
- ELIMINATE SLAVE HARDWARE

CUSTOMIZED STANDARD AGENA

TYPICAL SEQUENCE - FOR PROG. 846 VEHICLE

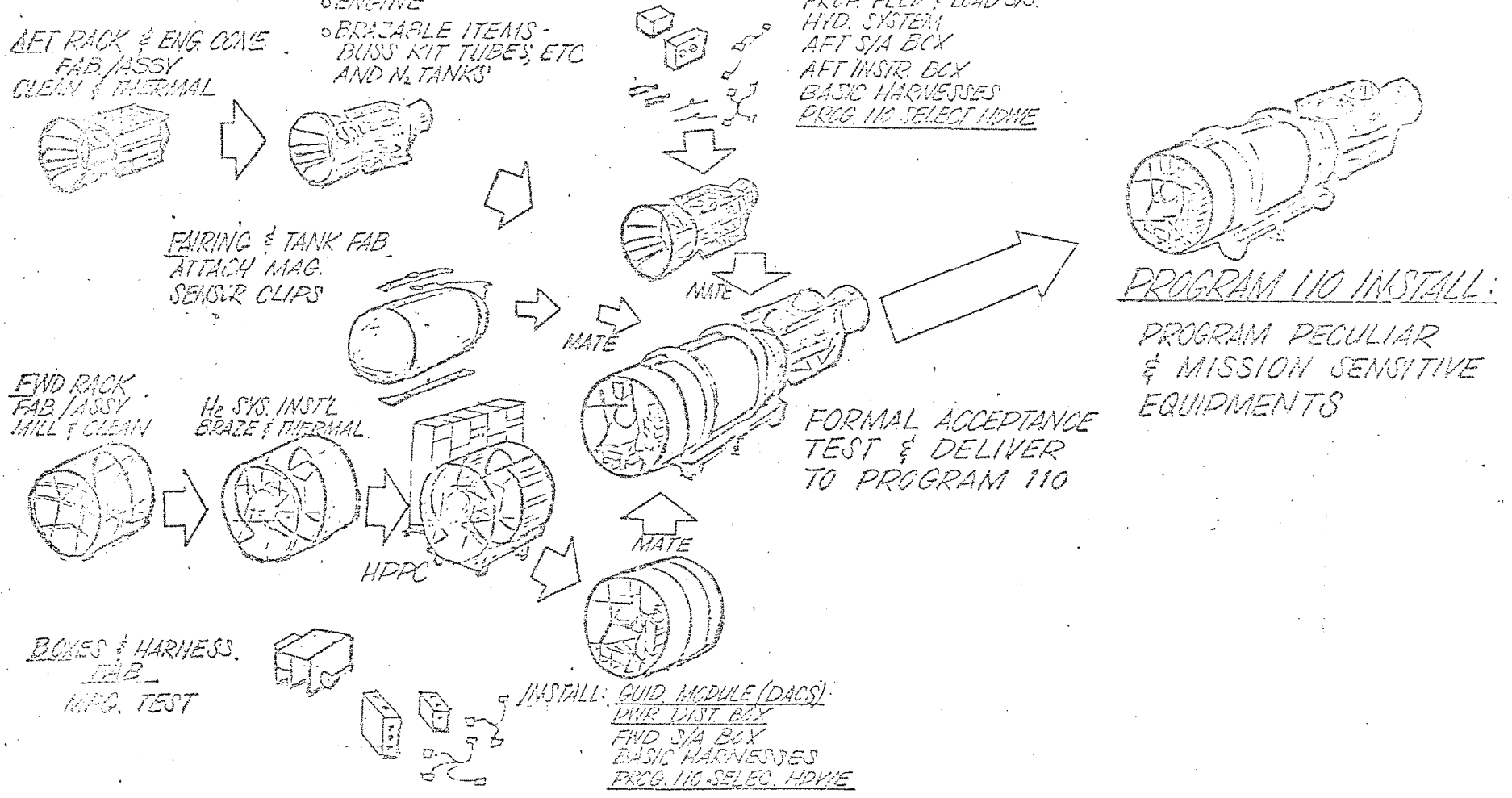


1193

AGENA ASSY METHOD TO ACCOMMODATE PROGRAM 110

STANDARD AGENA FAB/ASSY.
INCLUDES STRUCTURE, BRACKETS, ETC, TO ACCOMMODATE PRG 110 REQUIREMENTS

← PROGRAM 110 FINAL ASSY →



REQUIRED ACTIONS

- LMSC PREPARE & SUBMIT PROPOSAL OF CUSTOMIZED PROGRAM 846 & PROGRAM 110 VEHICLES
- USAF & LMSC ESTABLISH SENIOR REQUIREMENTS PANELS
- MODIFY STANDARD AGENA CONTRACT TO PROVIDE DELIVERY OF CUSTOMIZED VEHICLES AND TO PERMIT RESPONSIVENESS TO PROGRAM REQUIREMENTS
- SIMPLIFY CHANGE CONTROL REQUIREMENTS

PROPOSAL FOR CUSTOMIZED AGENA

- SUBMITTAL FOR PROGRAM 846 VEHICLES _____ 8-15-67
- SUBMITTAL FOR PROGRAM 110 VEHICLES _____ 9-15-67
- PROPOSALS TO INCLUDE:
  - PART I SPECIFICATION FOR EACH VEHICLE
  - PART II SPECIFICATION FOR EACH VEHICLE
  - EQUIPMENT LIST (ECL) FOR EACH VEHICLE
  - INBOARD PROFILE DRAWING FOR EACH VEHICLE
  - MANUFACTURING PLAN FOR EACH VEHICLE
  - ACCEPTANCE TEST PLAN FOR EACH VEHICLE
  - DETAILED SCHEDULES
  - COST ANALYSIS
  - REQUIRED CONTRACT & CONFIGURATION CONTROL REQUIREMENTS

1126

EXPECTED RESULTS

- MAINTAINS RELIABILITY TREND OF STANDARD AGENA
- ELIMINATES TEAR DOWN & REWORK & REPLACEMENTS
- INCREASES REL. CONFIDENCE IN USING PROGRAM CONFIGURATION
- SHORTER OVERALL SCHEDULES.
- LOWER TOTAL COSTS
- PROVIDES FLEXIBILITY & VERSATILITY TO AGENA

STANDARD AGENA STATUS - JUNE '67

USING PROGRAM COMPLAINTS

- UNNECESSARY TEAR DOWN, REBUILD & RETEST
- DIFFICULT HANDLING AS GFP AFTER DD-250
- SLOW AGENA RESPONSE
- NO AGENA FLIGHT RESPONSIBILITY

ST PROPOSAL: ELIM. STD AGENA - DELIVER ENGINE & TANK PLUS "BUCKET OF BOLTS"

STANDARD AGENA COMPLAINTS

- LACK OF TIMELY REQ'MTS FROM PROGRAMS
- UNECESSARY CHANGES, LITTLE COORDINATION
- LOWER PRIORITY, SHORT FUNDING
- DIFFERENT MGM'T GRD. RULES (AFSC VS. S.P.)

PROPOSAL: CUSTOMIZE AGENA TO PROGRAM REQ'MTS

- ONE TIME BUILD UP & TEST
- SR. REQ'MTS PANEL - LMSC & AF
- DELAY DD-250, CPIF, PERF. INCENT.
- COMMON MGM'T GRD. RULES, REDUCE SPECS.
- EQUIV. PRIORITY & COORD. FUNDING

RESULT: RETAINS RELIABILITY ADVANTAGE
MAINTAINS AGENA CAPABILITY FOR OTHER USERS
PROVIDES FLEXIBILITY & VERSATILITY
REDUCES TOTAL COST & OVERALL SCHEDULE

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2 AUG 1967

SMVA/Lt Col Poor/32328

Agena D Contract Structure

MAOS (General Martin)

1. You will recall that in your 1 May Briefing on Agena Procurement, it was pointed out that the current method of procuring such items as engines and horizon sensors is inconsistent with SAFSP performance incentives. In an effort to correct this situation, the Agena Program Office has investigated the possibilities of returning to a prime contract structure with LMSC. This change in procurement management would authorize LMSC to procure engines for the Agena D as GFE hardware, but would not enable the procurement of horizon sensors and velocity meters by LMSC, since a buy out of these components for the remaining Agena D vehicles has already been made. Implementation of the change over plan to procure engines GFE could be made effective on the last production buy for 19 Agena D vehicles and would involve the following actions:

a. SAMSO approval of request to deviate from AFR 70-9, which defines the engine as a Category 3 (associate) procurement.

b. Dr. Flax's approval of a revised Determination and Findings (D&F) and Form 111.

c. Supplement LMSC production contract to include procurement of engines. Based on LMSC inputs, we estimate an increase of $31,000 to $42,000 per engine over what we are now paying for GFE engines.

d. Cancel the current RFP to Bell Aerosystems Co (BAC) for 19 engines for which a proposal has been submitted to SMVA.

e. Negotiate contract closeout with BAC. Engine delivery schedule dictates that BAC have a contract by 1 Nov 67. In order for LMSC to negotiate such a contract, it is mandatory that the first three actions be accomplished by 1 September.

2. I call your attention to the above actions and associated schedule only because your strong support would be required to help meet those dates. Specifically, the expeditious processing of the D&F thru Dr. Flax's office would require your personal indorsement.

3. I recognize that this action will only partially fulfill your desire to have L&SC provide as CPA all Agena D subsystems. Nevertheless, it can be implemented if you feel that it appreciably strengthens your performance incentives. Considering the facts that increased costs are involved and that this action deviates from current procurement procedures as outlined in AFSP 70-9, I will not approve the move without your full cooperation and support.

4. I would appreciate your thoughts on this matter.

SIGNED

PAUL T. COOPER
Major General, USAF
Deputy Commander for Space

~~CONFIDENTIAL~~

11 AUG 1967

SMQ / SMV/Col Hamilton/LtCol Poor-32288

Improved Agena Flight Test

SAFSP (Gen Martin)

1. Reference is made to your letter of 23 June 67, subject: "Improved Agena" in which you stated that you requested and obtained approval from Dr. Flax for one Thor-boosted test load for the improved Agena with SAFSP responsible for conducting the overall system engineering, tests, and actual flight. SAFSP would also be responsible for payload integration.

2. I certainly concur as to the desirability of such a flight, which now becomes possible with the schedule relaxation approved by Dr. Flax. I further consider the flight test to be a logical extension of the Agena development program. As such, the test flight must have as its primary objective the verification of the Agena performance parameters as identified in the development criteria. All other objectives must be secondary. Flight instrumentation to measure performance parameters, or in the event of failure, to provide sufficient diagnostic data to analyze and correct the failure is a vital part of the test program. I consider that the Agena Program Office must share responsibility for the overall conduct of the test flight and in that role have responsibility for the identification and installation of vehicle instrumentation as well as analysis of flight data. In the case of a flight anomaly, the need for the Agena Program Office to share responsibility for the test flight is particularly emphasized, since that office as the developing agency would be responsible for analyzing and resolving the problem as was the case with the Gemini Agena Target Vehicle first flight engine failure.

3. Therefore, I would propose that the flight test program be a joint SAMSO/SAFSP effort with (a) SP-6 responsible for identification of appropriate research and experimental payloads, (b) SP-7 responsible for payload integration, (c) Agena SPO responsible for flight test instrumen-

~~CONFIDENTIAL~~

tation and flight data analysis and, (d) SP-7 and the Agena SPO jointly responsible for the overall test flight program including systems engineering and peculiarization to any of the subsystems. I believe that by working together in this fashion we can satisfy our mission of system acquisition and you can satisfy your program objectives.

SIGNED

PAUL T. COOPER
Major General, USAF
Deputy Commander for Space

Rev 128

~~CONFIDENTIAL~~

DEPARTMENT OF THE AIR FORCE
DIRECTORATE OF SPECIAL PROJECTS (OSAF)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

14 August 1967

REPLY TO ATTN OF: SF-1

SUBJECT: Improved Agena Flight Test

TO: SMG-2 (General Cooper)

1. Reference your letter on above subject, dated 11 August 1967.

2. I agree that the Agena Program Office will have responsibility for the identification and installation of vehicle instrumentation to verify the Agena performance parameters as identified in the development criteria. I will expect this installation to be completed prior to turning the Agena over to my responsible project office (SP-7) for project peculiarization and payload integration. I also agree that the Agena Program Office will be responsible for analyzing flight data with respect to the performance of the Agena.

3. I do not agree to joint or shared responsibility for the test flight; the flight must be prepared and conducted under unequivocal assignment of specific responsibilities. Except as clarified in paragraph 2, above, these responsibilities are assigned in my 23 June letter on the same subject. We will, of course, work closely with the Agena SPO in planning and carrying out this important flight, and will welcome their assistance in analyzing any Agena flight anomaly which may occur.

JOHN L. MARTIN, JR
Brigadier General, USAF
Director

~~CONFIDENTIAL~~

DOWNGRADED AT 12 YEAR INTERVALS; NOT AUTOMATICALLY DECLASSIFIED. DOD DIR 5200.10

Agena

305

22 AUG 1967

SMV

New Production Management Concept for Agena

SAFSP (Gen Martin)

1. Based on the meeting which you had with Col Hamilton and the Agena Program people on 13 August 1967, it is my understanding that you still desire that customization of the Agena for your programs be performed by your office rather than the Agena Program Office. The Agena Program Office will be responsible for procurement and assembly of the Agena only to that point in the assembly line which would be common to all your programs. In order to readjust the Agena office functions as well as amend the contracts for procurement and assembly of components, we will need a determination from you as to the location of this point.

2. While there will normally be no requirement for system testing on our part, in order to verify that the portion of the equipment for which we are responsible meets the specifications, some testing will be required.

3. I am anxious to have this matter resolved by the preparation of a mutually agreeable plan. Our Agena program people are ready to meet with your people to work out the details of such a plan.

SIGNED

PAUL T. COOPER
Major General, USAF
Deputy Commander for Space

Rev 154

DEPARTMENT OF THE AIR FORCE
DIRECTORATE OF SPACE PROJECTS (SSAP)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

REPLY TO
ATTN OF: SP-1

30 August 1967

SUBJECT: Improved Agena

TO: SMG-2 (General Cooper)

1. I have reviewed the current planning of the SAMSO Agena Program Office for implementation of Phase II of the Improved Agena effort, and am alarmed to find that the estimated cost of this development has risen from the original $31.586 million to $56.315 million. This increase of $23.729 million (42%) during the short Phase I may well place the entire effort in jeopardy.

2. A second area of concern is the time phasing of funding. Only $13 million has been approved for FY 1968, whereas nearly $16 million is required for development and another $1.4 million for facilities. Unless this funding can be increased, the development may not be completed by the current target date of March 1970, which is itself a slip from the originally contemplated April 1969 date.

3. In my view there are three general areas in which the cost increases are not justified:

a. The first is an apparent tendency to over-engineer both the hardware improvements and the test philosophy, imposing an extremely conservative engineering approach, with introduction of many new components (for example: injector, pump and thrust chamber in the N_2O_4 engine) and an exhaustive test program (for example: a requirement to test burn the ISPS 12 times without refurbishment, versus the 2-burn normal PFRT case). In some cases, the improved Agena is being designed to requirements considerably in excess of those furnished by SAFSP in July (for example: 60-day wet pad capability versus our 30-day requirement and 90-day on-orbit capability versus our 20-30 day requirement with a 45-day objective).

b. The second area is the generation of voluminous paper work, which is not absolutely necessary. While some of this paper may be beyond our control to eliminate, e.g. the C/S PCS requirement, others (full 375-1 documentation, formal test plans and operability plans, changing all drawings to MIL-D-1000 Form 2) seem to me to go far beyond the documentation really required, especially when this question is considered in full

CONFIDENTIAL

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~~CONFIDENTIAL~~

context of the actual manner of employment of these vehicles (substantial modification by the same contractor prior to use, consumption without entering the inventory in the normal sense, all launch preparations and services by the same contractor, etc.)

c. The third area is smaller in dollar impact at present, and involves the investigation of sub-systems other than propulsion and structures. The stated objective of the Improved Agena was to introduce the N_2O_4 engine with modification of plumbing and structures as required. The current plan contemplates study of electrical, guidance, TT&C sub-systems and optional kits. While I agree that study of these items may well be required later, they are not part of the original concept which we discussed with Dr. Flax and upon which his approval to proceed was based.

4. I believe that we can and must scrub the current concept down to eliminate the effort that is not absolutely essential. I have attached a budget breakdown which shows in three columns the original cost estimate, the current cost estimate and a preliminary SAFSP estimate of a more reasonable approach, based upon elimination of work not necessary to meet our requirements. I hope we will be able to reduce this further. My people are looking into this in some detail and will work with the Agena Program Office as required.

JOHN L. MARTIN, JR
Brigadier General, USAF
Director

1 Atch
Improved Agena Estimates

CC: SMV (Col Hamilton)

~~CONFIDENTIAL~~

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~~CONFIDENTIAL~~

IMPROVED A NA ESTIMATES

(in thousands)

	LMSC/SAMSO Agena Office		
	Original	Present	SAFSP*
LMSC			
Labor			
Program Management	440	660	450
C/S PCS	-	1,073	--
System Integration	480	750	500
Vehicle Engineering			
Propulsion	1,400	3,000	1,700
Structural	375	500	375
R&D	680	1,000	750
Other	1,125	1,500	1,100
Tests and Test Articles			
DTV	2,590	4,970	3,200
Propulsion	220	420	280
Structural	760	1,410	1,000
Other	530	940	750
Studies	-	485	-
Stretchout	-	660	-
sub-total labor	8,600	17,368	10,075
Material	800	1,200	800
Facilities	236	236	235
LMSC in-house	9,636	18,804	11,110
Major sub-contractors (except engine)	2,600	4,400	3,000
LMSC Burden/Fee on all subs (incl engine)	1,600	4,147	2,000

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

Bell Engine sub-contract

Eng dev and test	14,912	20,801	16,790
System support	956	1,736	1,500
Operability	200	444	350
Program mgt and C/S PCS	932	4,319	2,800
Stretchout	-	500	-
Facilities	750	1,164	1,000
TOTALS....	31,586	56,315	38,550

*On 28 August LMSC and the SAMSO Agena Program Office presented to SAFSP a description of the work planned for Phase II of the Improved Agena program, together with the cost estimates shown in the middle column above. The cost estimates in the right hand column reflect SAFSP preliminary estimates, made in the 2 days subsequent to the briefing, of these items of work which could be eliminated and/or reduced in scope because they were not necessary to meet SAFSP requirements.

~~CONFIDENTIAL~~

306a

~~CONFIDENTIAL~~

7 SEP 1967

SMG-2

Improved Agena (U)

SMGS (General Martin)

1. Reference your letter of 30 Aug 67, same subject. The cost estimate of $56.3M which alarmed you is a Lockheed ROM, based on a scope and depth of effort over which there is significant disagreement and misinterpretation, and my Agena Program Office does not concur with that estimate. We have been authorized to proceed with the program outlined in Option B of SSVA letter to AFSC, dated 6 Jun 67, Subject: Improved Agena Schedules and Funding. The Phase II cost estimate for Option B was $48.2M, of which $3M was for SE/TD support from Aerospace Corporation. Your office was informed of this new estimate prior to the time that they briefed Dr Flax on your recommended course of action for Agena management. In the same time period, I briefed General Ferguson on the new estimate and told him that I was concerned that Dr Flax might have some second thoughts concerning the improved Agena in view of the large increase in program cost. I am disturbed that although you have had this information since last June you are expressing alarm at this late date.

2. The time phasing of our funds was spelled out in Option B and the program will be conducted within those constraints. We have been assured that there is no possibility of obtaining additional funds in FY 68 and we are also aware that fiscal 69 will be a problem. Our development program will be tailored to meet these fiscal limitations and at the same time maintain the first delivery date of March 1970.

3. I am alarmed by the degree of misleading and, in some cases, incorrect information which has apparently been given to you on the Improved Agena Program. I will address each of the points in your paragraph 3:

a. "Tendency to over-engineer" - It is our intent to do a sound engineering job which will result in reliability of the Agena E comparable to Agena D. We are not redesigning anything unless it is required. You mentioned three examples of components which you felt did not require redesign:

~~CONFIDENTIAL~~

Pg 161

d. "Voluminous paper work" -

(1) C/S PCS: Lockheed is stubbornly resisting C/S PCS, but we seem to have no choice but to include it as a requirement. They have undoubtedly over-priced this item in an attempt to scare us off.

(2) "Full 375-1 documentation": This is not really true. We are levying only 12 of the 18 Exhibits of AFSCM 375-1. We are also being as liberal as possible in the application of 375-1. For example, only those specifications which are substantially affected by design changes will be rewritten, and only those drawings which are new or substantially changed will have to conform to MIL-D-1000.

(3) "Formal test plans and operability plans" - These plans are necessary to the conduct of the program. Making them "formal" is admittedly a thorn to the contractor because it gives the Agena Program Office better visibility and control, thereby assuring more complete design verification and giving a better yardstick for estimating program costs.

e. The current plan does not include study of other subsystems such as electrical, guidance, TT&C and optional kits other than the single start kits. However, it may be necessary to make certain changes to these subsystems in order to make them compatible with the new propulsion subsystem. The Agena Program Office has recommended to your people that a review of these subsystems be accomplished at a later date. Serious consideration is also being given to elimination of the single start kit since the slight weight savings does not appear to justify the development cost.

4. I am concerned about your statement that you are having your people look into this in some detail, and I hope that our differences with Lockheed will not be further aggravated by your unilateral discussions with them concerning the scope of the development program. I am confident that my Agena Program Office is capable of managing the Agena E Development Program, both technically and financially.

SIGNED

PAUL T. COOPER
Major General, USAF
Deputy Commander for Space

3

159

DEPARTMENT OF THE AIR FORCE
DIRECTORATE OF SPECIAL PROJECTS (OSAF)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

3066

8 September 1967

REPLY TO ATTN OF: SP-1

SUBJECT: New Production Management Concept for Agena (U)

TO: SMG-2 (General Cooper)

1. (U) Your letter of 22 August asked me to determine the point on the standard Agena assembly line at which the vehicle would be common to all my using projects.

2. (U) We have addressed this question in the following steps:

a. First, we determined for each using project the optimum configuration for delivery from the standard line to SAFSP, with "optimum configuration" defined as:

(1) One from which nothing must be removed during the peculiarization process, and

(2) One on which the peculiarization process inflicts no potential reduction in reliability (as, for instance, installing components in an awkward sequence, requiring holes bored after assembly of some interfering components has already been completed, undue strain on harnesses already installed, etc.).

b. Second, we compared all the optimum configurations and determined the point of commonality.

3. ~~(C)~~ As has been previously pointed out, the truly common point is very early on the assembly line, because of the quite different peculiarization processes. Atch 1 describes this common point. Four different optimum configurations are required: that is, my using projects should take delivery at separate places on the standard Agena line, with a considerable spread between the earliest point and the latest point.

4. ~~(S)~~ In quantitative terms, I have firm requirements as of 5 September for [redacted] more Agenas not yet delivered by SAMSO. Of these: 50X1

a. 18 are either already built and in storage prior to delivery to SAFSP, or are in late stages of manufacture. At this point, it is more cost-effective to deliver these 18 in the current standard configuration.

~~SECRET~~

b. Delivery of the remaining [redacted] be more cost-effective, from the overall Government standpoint, in four different configurations. Listed below is the order in which these vehicles would come off the standard Agena assembly line, together with the number of vehicles of each type remaining to be manufactured to meet present firm program requirements:

14 for Project 110 come off the line at the earliest point
10 for Project 846 come off the line at a later point
4 for Project 770 come off still later

[redacted]

50X1

5. (U) Attachments 2 through 6 are summaries for each of these four projects, (plus a fifth project to which all required Agenas have already been delivered) showing firm quantitative requirements for Agenas yet to be delivered, desired change-over points (in terms of specific standard Agenas by tail number) from current standard Agena configuration to the optimum configurations, and descriptions of the optimum configurations for each project. Allocations of specific standard Agenas to projects have historically been subject to change; however, the tail numbers shown will provide a base line for planning.

6. (S) I am concerned that the actions which have been taken and apparently are being taken by SAMSO on this problem continue to be at cross purposes with the actions recommended by SAFSP as the sole user of the vehicle in question. As a background, the following is a summary of the substance of the principal recommendations I submitted in May, after review with you, to Dr. Flax and subsequently briefed to Dr. Flax on 6 June, and to Gen Ferguson, Gen Stewart and you on 7 June:

a. Dr. Flax obtain from DDR&E:

(1) Approval to change the standard Agena concept from one of producing completely assembled and tested vehicles to one of producing components and sub-assemblies.

(2) Delegation to Dr. Flax of approval authority for production of the components and sub-assemblies.

b. After DDR&E approval is obtained, Dr. Flax direct:

2

SECRET

(1) Immediate action to modify standard Agena production contracts to:

(a) Stop manufacture of components not used by SAFSP

(b) Stop (complete) assembly and system test of standard Agenas.

(c) Remove 375-series configuration control procedures and substitute therefor an SAFSP configuration management plan.

(2) Immediate action to modify the SAMSO Agena logistics contract to vest in SAFSP the sole approval authority over stores issue, determination of component flight worthiness and disposition of items not flight worthy.

(3) Planning and execution on an orderly basis of the remaining changes required in SAMSO or AFCMD responsibilities, organizations and contracts to implement above.

(4) Continue development of the Bell 8533 engine (but restudy the time phasing in view of SAFSP budget recommendation that it be incorporated in Project 110 vehicle #37 in Feb 1971 rather than in #23 in Apr 1969), the Bell Type IIA velocity meter, the LMSC electronic event timer and the Quantic horizon sensor.

(5) Review other proposed Agena developments with SAFSP to determine requirements before proceeding with development work.

(6) Planning and execution on an orderly basis of the remaining changes required in SAFSP responsibilities, organization and contracts to implement above.

7. ~~(C)~~ It was my understanding at the time of making the above recommendations to Dr. Flax and Gen Ferguson that Dr. Flax would await Gen Ferguson's comments before taking action, and that, he, in turn, would await comments from you. I am not aware of any comments to Gen Ferguson on these recommendations (except for Gen Stewart's, made in his 14 June letter), and as far as I can tell, the action is still

being held up in anticipation of your comments. The delay in getting approval to proceed on the recommended basis has left no alternative but for SAFSP to proceed with several contractual actions on the present standard Agena basis instead of on the recommended basis, which will unavoidably result in some lost motion in implementing any change. I have also necessarily deferred action on the CFE engine question raised in your letter of 2 August, since the feasibility of introducing the CFE/incentive contract approach in lieu of the present engine procurement arrangement is directly related to when and if we can get approval for the changes I have recommended and how many vehicles are left to buy at that point. In addition, I cannot see that the delay that has occurred has produced any useful result: the problem and the solution are the same as when the SAFSP recommendations were submitted in May, nothing substantive has changed at all except to impair the effectiveness of initiation of the recommended change. As we pointed out in the May recommendations and discussions and June presentations, the details of implementation will necessarily require several months after approval to proceed. These details will not affect the nature of the solution, and continued delay of the basic decision in attempts to work them all out in advance can only result in more vehicles being built under the present arrangements, with attendant waste of manpower and money.

8. (U) In summary, I am anxious to get approval to proceed as soon as possible and solicit your support. I hope that the data forwarded herewith will enable you to resolve any questions which remain. If not, I am ready for any further discussions which you may desire.

9. (U) This letter is classified SECRET because it reveals level of effort and projected plans on sensitive programs.

JOHN L. MARTIN, JR
Brigadier General, USAF
Director

6 Atch
1. Common Config
2. Proj 110
3. Proj 846
4. Proj 770
5. [redacted]
6.

50X1

cy to: SMV (Col Hamilton)

SECRET

SP-1-12

18 September 1967

MEMORANDUM FOR GENERAL O'NEILL

SUBJECT: New Production Management Concept for Agena (U)

1. The essence of the 15 September SAFSP letter to Flax is contained herein except that John Martin is now recommending a complete transfer of the Agena responsibility to SP at a certain date.

2. My memo to John Martin (attached) dated 22 August, in effect, capitulates to his recommendations and I do not understand why his 8 September letter still deplores the delay because we are ready to proceed. A misunderstanding obviously exists as to the requirement for us to state our views with Ferguson. I called Russ Berg and he, too, is of the opinion that Flax is writing on Ferguson and he prepared a note for Flax to send, asking for the Ferguson comments.

3. I called Gen Ferguson and told him that "under the circumstances I think the best course of action is to accept the SAFSP recommendations including the new recommendation to transfer all of the Agena work at a certain date." I offered a briefing on the details and he said that he would call Flax and if a briefing is necessary, he would advise.

PAUL T. COOPER
Major General, USAF
Deputy Commander for Space

2 Atch
1. SP-1 ltr to SMC-2, 8 Sep 67 w/undated
(Secret - SP-1-12)
2. SMV ltr to SAFSP, 22 Aug 67
(Uncl)

Copy to SMV (Col Hamilton)

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DOWNGRADED AT 3 YEAR INTERVALS
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DOD DIR 5200.10

SMC-67-23

CONFIDENTIAL

307

MEMO FOR THE RECORD

19 Sep 67

Subject: Custom Agena Briefing to Gen Martin

1. On 18 Aug 67 Gen Martin and his staff were briefed by SMVA on the Custom Agena concept. SMVA personnel attending included Lt Col Poor, Lt Col Hedlund, Maj Crawford, Maj Bell and Maj Bradford. Col Hamilton (SMV) was also present. Gen Martin was briefed as outlined in the attached charts. Purpose of the briefing was to point out to him how the Custom Agena concept would improve responsiveness to the Using Programs and would provide them with a vehicle configuration that satisfied their requirements. It was pointed out that customizing involved three areas; namely, Production Management, Configuration Management and Contract Management. Pertinent facts pointed out in each of these areas included the following:

Production Management

Manufacturing and testing of a Custom Agena by SAMSO would involve:

a. Assembly of standard Agena and program peculiar components

b. CFE storage of the vehicle

c. Validation testing after CFE storage which would not include the current Task V System Test, and

d. Transfer of the Using Program for program additions and final systems test prior to joint SAMSO/SP DD-250 sign off.

The detailed configuration by component and subsystems and the implementation schedule identified for each program.

Configuration Management

The principal point discussed under this topic was our plan to establish a Requirements Control Board located at LMSC and composed of members from SAMSO, SAFSP, AFPRO and LMSC. It was pointed out that we felt this was the key to making the Custom Agena concept work.

Contract Management

Implementation of the Custom Agena Plan would involve SAMSO production contracts, storage contract and the current development or engineering support contract. It would further involve close coordination with SP Procurement but presented no insurmountable problems as far as procurement is concerned.

R-153

2. It was pointed out to Gen Martin that we considered the Custom Agena concept to offer the best solution concerning what to build to satisfy the needs of SAFSP programs. In summary, we pointed out the conclusions outlined in the attached charts and recommended that action be taken to implement the plan.

3. Gen Martin's reaction to the briefing was as follows:

a. In summary, he rejected the plan and felt that SAMSO was not directing their attention to his recommendations made to Dr. Flax in June. He further indicated that he did not think we had even considered his recommendations. He stated that in order to clear out any misinterpretation of his original recommendations he wished to reiterate for everyone's benefit in the briefing, what he had recommended, i.e., eliminate assembly and tests by SAMSO which are either redundant or invalidated by SP assembly and systems test after they receive vehicles from Standard Agena.

b. Additionally, he made the following specific comments concerning Agena Management:

(1) SAMSO should build Agena only up to the point of commonality for all SP programs. He did not envision this as including program peculiar hardware.

(2) He considered all SAMSO testing unnecessary. He pointed out that the SP system test is all that is required.

(3) He stated his opposition to the System Requirements Board in that he felt that it would unduly complicate management of the program.

(4) He made a considerable issue over the question why we felt we could build a system including program peculiar components better than SP. It was pointed out to him that we were recommending the configurations as briefed in that we felt this best satisfied his requirements.

4. In discussing the management aspect of the overall program, it was obvious that with both SAFSP and SAMSO having responsibility for the procurement, fabrication and testing of the Agena spacecraft, the management task becomes somewhat complex. The task is further complicated by the security criteria placed upon the program. During the discussion it was suggested by Col Hamilton that because of the above situation, consideration should be given to the fact that it might be in the best interest of the Air Force if SAFSP were to assume the responsibility for the procurement, fabrication and testing of the Agena Vehicle. Gen Martin commented that while this was not his original recommendation, he would not be opposed to such a plan.

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5. In summary, there were no conclusions reached as a result of the briefing other than it was quite evident that anything different from Gen Martin's original recommendations was unsatisfactory to him.

ALLEN J. POOR, Lt Col, USAF
Chief, Engineering Division
Agena Program Office

1 Atch
Briefing Charts - Custom Agena

Cy to: SMV (Col Hamilton)
w/o atch

12/6

Pa 152

1219

18 Aug 67 To Gen Martin
by Lt Col Poor

CUSTOM AGENA

220

CUSTOM AGENA

PURPOSE OF CUSTOMIZING

- RESPONSIVENESS TO THE USING PROGRAMS
- PROVIDING A SYSTEM TO THE USER IN THE CONFIGURATION HE WANTS

CONFIDENTIAL

PROGRAM 846

GUIDANCE AND CONTROL

AGENA COMPONENTS USED	AGENA COMPONENTS ELIMINATED	PROGRAM COMPONENTS INSTALLED
FLT CONTROL ELECT	GUID "J" BOX	GUID. INTERCON. PACK
SEQUENCE TIMER	PATCH PANEL	RECOVERY TIMER
CENTRAL PROG. MTG. KIT	FLIGHT CONTROL "J" BOX	LIFEBOAT SYSTEM
EHP		FLT LOGIC & PROGRAMMER
HORIZON SENSOR		
VELOCITY METER		
V.I COUNTER		
E/S PREAMP SIG. COND.		
PNEUMATIC ATT. CONT SUBSYS		
ADD N_2 SPHERE KIT		

1226

CUSTOM AGENA

SUMMARY OF MAJOR HARDWARE CHANGES

PROGRAM	STD AGENA COMPONENTS USED	STD AGENA COMPONENTS ELIMINATED	PROGRAM COMPONENTS INSTALLED
845	44	4	21
	21 Wire/Harnesses	9 Wire/Harnesses	42 Wire/Harnesses
110	18	20	24
		All Wire/Harnesses	115 Wire/Harnesses
770	40	None	7
	29 Wire/Harnesses		15 Wire/Harnesses

Rev 1464

227

CUSTOM AGENA

VEHICLE VERIFICATION TEST

PERFORMED

TASK I	VEHICLE HOOK-UP
TASK II	"POWER-ON" CHECK
TASK III	BACKUP EVENT VERIFICATION
TASK IV	TELEMETRY VERIFICATION
TASK V	GUIDANCE & CONTROL VERIFICATION
TASK VII	CONTAMINATION CHECK & DISCONNECT

ELIMINATED

TASK VI	SIMULATED FLIGHT

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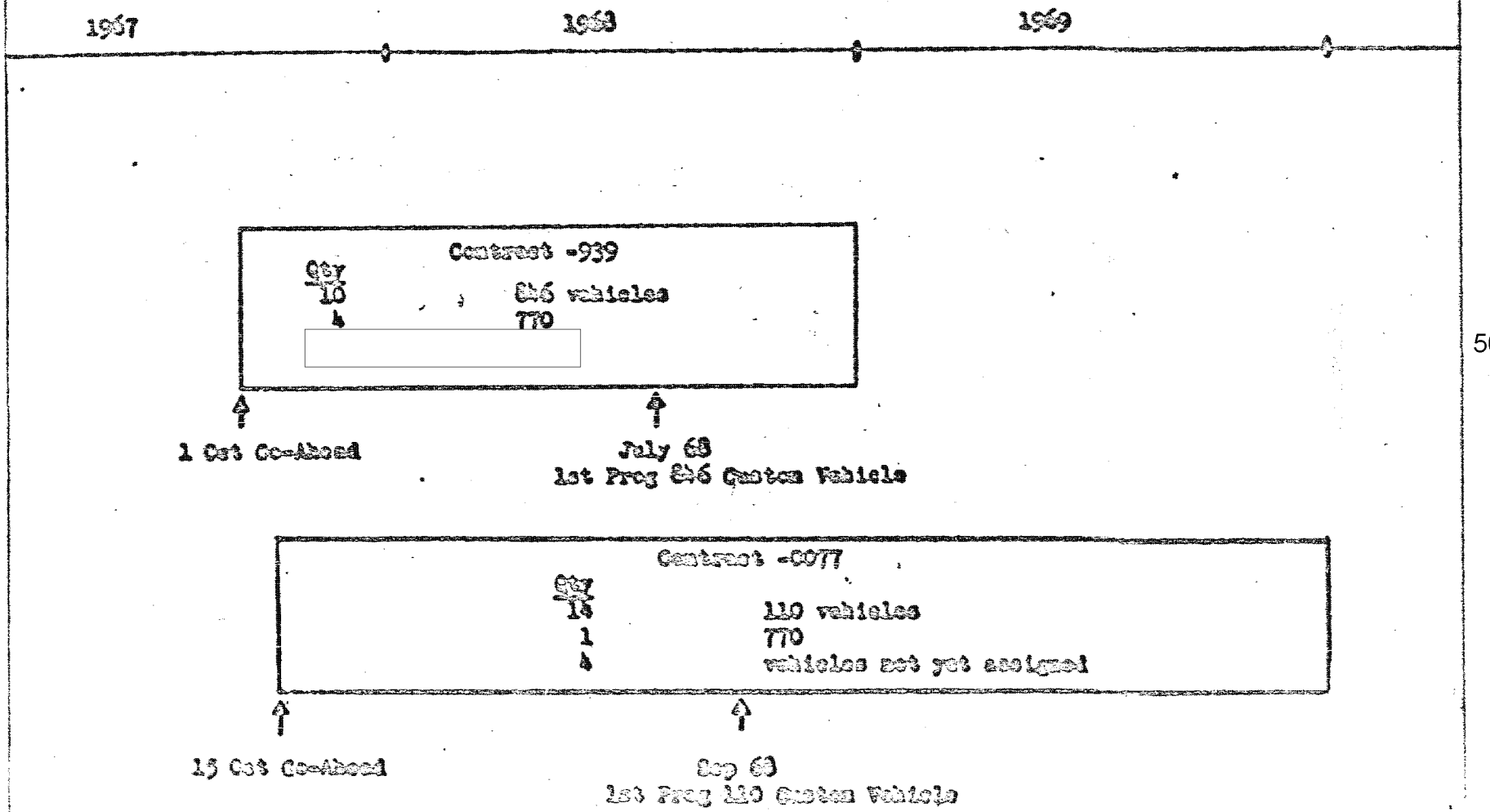
7229

CUSTOM AGENA

PROJECTED IMPLEMENTATION SCHEDULE



50X1

1230

CUSTOM AGENA

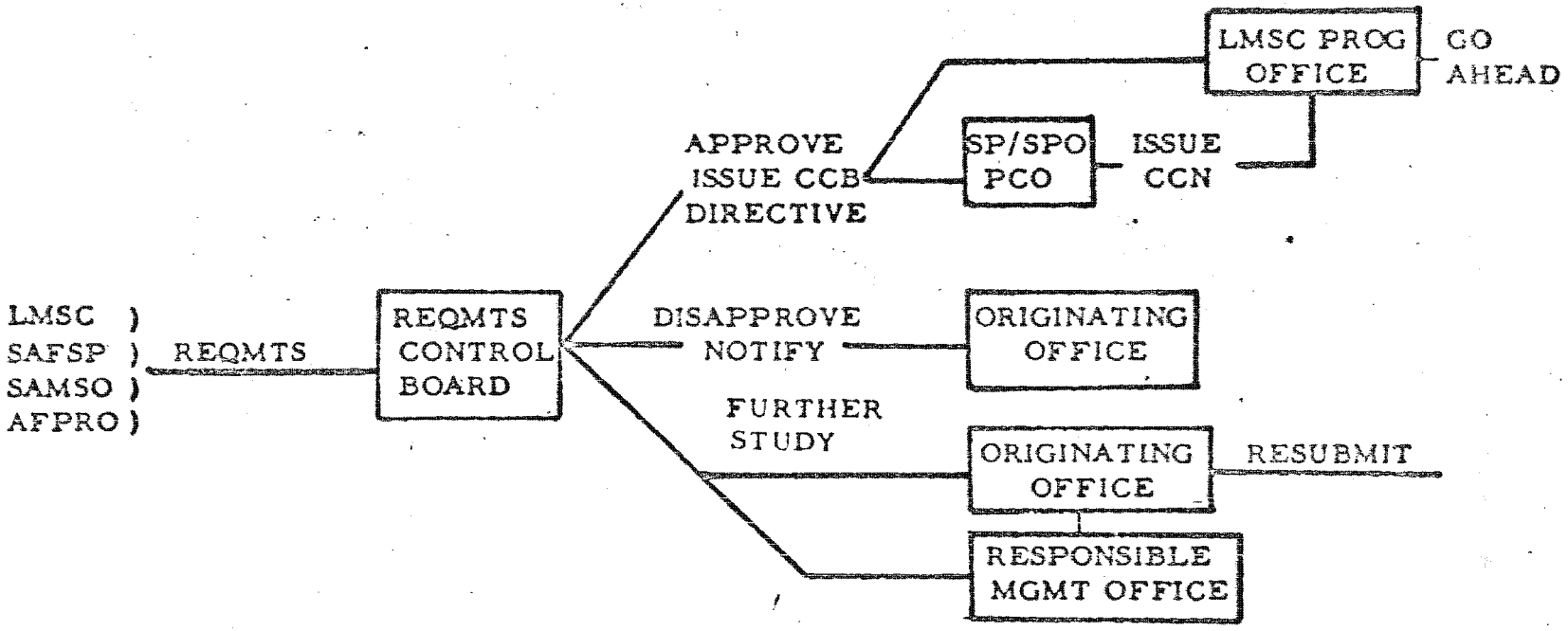
CONFIGURATION MANAGEMENT - BACKGROUND

- DIVERGENT PROGRAM MANAGEMENT

	SAFSP	SAMSO
- SYSTEM CONCEPT	NON-OPERATIONAL	OPERATIONAL
- CONFIGURATION MANAGEMENT	INFORMAL	FORMAL
- LEVEL OF CONTRACT CONTROL	VEHICLE ONLY	VEHICLE, BLACK BOX, PCE PART & PROCESS
- DWG, COMPL. INTERPRETATION BY AIR FORCE	LIBERAL	STRICT
- SPECIFICATION PROGRAM	NEITHER AGENCY HAS TOTAL	MANAGEMENT

CUSTOM AGENA

DESIGN CHANGE FLOW CHART

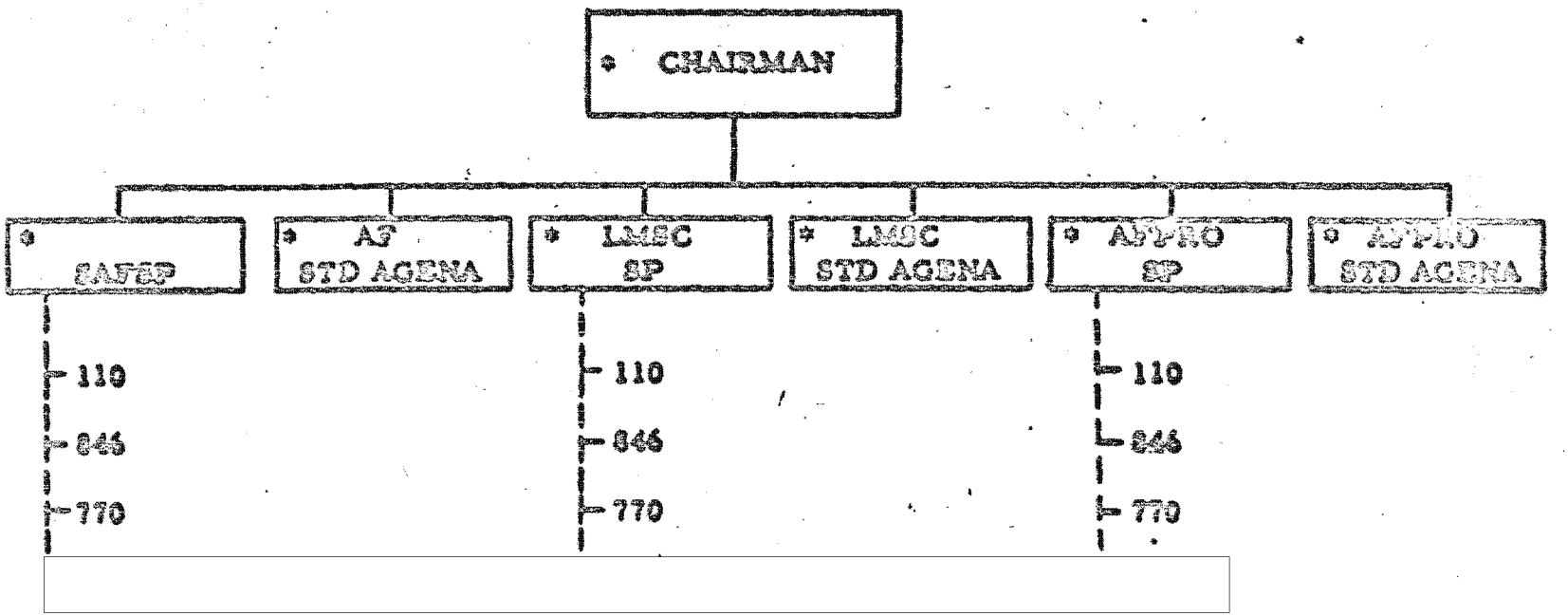


7233

CUSTOM AGENA

REQUIREMENTS CONTROL BOARD

- ORGANIZATION



- LOCATION

  - PERMANENT MEMBERS FULL TIME IN-PLANT AT SUNNYVALE, CALIF.

    OTHER MEMBERS AT CALL OF CHAIRMAN OR PERMANENT BOARD MEMBER

50X1

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CUSTOM AGENA

SPO/SP ACTION REQUIRED TO IMPLEMENT

- DEVELOP COMMON CONFIGURATION MANAGEMENT PLAN AND REQUIREMENTS DOCUMENT FOR CONTRACT IMPLEMENTATION
- DEVELOP DETAILED OPERATING PROCEDURES AND AUTHORITY FOR REQUIREMENTS CONTROL BOARD
- FORMALLY ESTABLISH REQUIREMENTS CONTROL BOARD

PROCUREMENT IMPLEMENTATION

- CHANGE HARDWARE CONTRACTS (2)

  -939 CONTRACT REQUIRES REVISED WORK STATEMENT BASED ON VEHICLE EFFECTIVITY

  1. NEW SPECIFICATIONS
  2. NEW TEST PROCEDURES
  3. NEW DELIVERY SCHEDULE
  4. CFE STORAGE REQUIREMENT

  -0077 LETTER CONTRACT REQUIRES REVISED WORK STATEMENT FOR ALL VEHICLES

  - BOTH CONTRACTS WOULD REQUIRE NEW PAYMENT SCHEDULE FOR LMSC

  1. COST SEGREGATION BY VEHICLE
  2. PARTIAL PAYMENT AFTER SPO VEHICLE VERIFICATION TEST
  3. FINAL PAYMENT AFTER FINAL SP SYSTEM TEST

  -BOTH CONTRACTS MUST HAVE ARRANGEMENTS TO

  1. TAKE CARE OF "AFTER TRANSFER" FAILURES
  2. PERMIT FINAL PAYMENT BASED ON SP SYSTEMS TEST & JOINT SP/SPO DD-250
  3. IMPLEMENT CONFIGURATION MANAGEMENT CHANGES

 1286

CUSTOM AGENA

PROCUREMENT IMPLEMENTATION

- O CHANGE STORAGE CONTRACTS
  - PRESENT CONTRACT CALLS FOR DD-250 THEN GFP STORAGE
- O PLAN FOR QUICK REACTION DEVELOPMENT CONTRACT COVERAGE
  - PRESENT METHOD CAUSES USE OF THREE CONTRACTS, I. E., PROGRAM PLAN, DESIGN DEVELOPMENT, PRODUCTION CHANGE
  - IMMEDIATE PLAN WOULD USE TWO CONTRACTS, I. E., SINGLE DEVELOPMENT AND PRODUCTION
  - LONG RANGE PLAN WOULD USE ONE DEVELOPMENT & PRODUCTION CONTRACT
- O ESTABLISH COORDINATION WITH SP PROCUREMENT
  - ELIMINATE PROCUREMENT DUPLICATION
  - PROMOTE BEST POSSIBLE CONTRACT MIX
  - INSURE ALL REQUIREMENTS CONTRACTUALLY COVERED

Pg 1 of 34

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CUSTOM AGENA

IMPLEMENTATION COST

(LMSC ROM)

846	770	110
366K	215K	330K

238

CUSTOM AGENA

CONCLUSIONS

- CUSTOM CONCEPT CAN BE IMPLEMENTED
- ELIMINATES TEARDOWN AND BUILD-UP OF VEHICLE
- IMPROVES RESPONSIVENESS TO PROGRAM REQUIREMENT AND REQUIREMENT CHANGES
- RETAINS CONSIDERATION FOR STANDARDIZATION
- PERMITS DELIVERY OF A REALISTICALLY DOCUMENTED USEABLE VEHICLE
- SHOULD DECREASE TOTAL PROCUREMENT COST

 1235

CUSTOM AGENA

RECOMMENDATION

- ACTION BE TAKEN BY SAMSO/SAFSP TO IMPLEMENT PLAN

~~SECRET~~

DEPARTMENT OF THE AIR FORCE
DIRECTORATE OF SPECIAL PROJECTS (OSAF)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

REPLY TO ATTN OF: SP-2

20 Sep 1967

SUBJECT: Procurement of Agena for SAFSP (U)

TO: SMG-2 (Gen Cooper)

50X1

described in Gen Martin's 8 Sep letter to you.

3. ~~(S)~~ Gen Martin's 15 Sep letter to Dr Flax has been modified to account for this new requirement. The recommendations are unchanged, i.e. terminate the -0077 contract and SAFSP will contract directly with LMSC for the total vehicles for both project 110 and

4. (U) This letter is classified SECRET because it reveals scope of, and future planning for, sensitive programs.

G. T. SMITH, Colonel, USAF
Vice Director

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~~SECRET~~

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18 OCT 1967

SMC

Manpower Packages for the Titan III SPO and the Agena Program Office

SCOM-27 (Col F. O. Morris, Jr)

1. Since June 1967, the workload of the Titan III SPO has been drastically increased. This is attributed to approvals being obtained for follow-on procurements for the Titan III B and C as well as the Titan III D development program. Also, the requirement to develop an advanced model (Agena E) of the Agena upper stage space booster has increased the workload of the Agena Program Office. Further, recent reductions in the Aerospace Corporation GSE/FD support has in turn generated a reduction in the MTS levels for both the Titan III SPO and the Agena Program Office.

2. With regard to the Titan III SPO manpower package, it is important to be cognizant of Lt Gen O'Neill's recent agreement to transfer 80 personnel and primary responsibility for the Titan III M to the MOL SPO. If Maj Gen Burgoyne is not successful in increasing his authorized strength to cover this function, the Titan SPO may be required to transfer authorizations to the extent he is unsuccessful. This would, of course, change the complexion of the current manpower package realizing that 89 additional authorizations are required rather than just the nine identified.

3. As you know, the serious deficiencies in the current manpower authorizations for the Titan III SPO are of particular concern to me. However, it should be recognized that in both organizations the workload has already developed and it is imperative that the attached manpower packages be reviewed and approved as soon as possible.

SIGNED

PAUL T. COOPER
Major General, USAF
Deputy Commander for Space

2 Atch
1. Mpr Pkg Titan III
2. Mpr Pkg Agena Prog

SMC

SECRET

MANPITSCYUW RUEDTAA7526

ZNY SSSSS

P 182134Z OCT 67

FM AFSC

TO SAMSO LOS ANGELES CALIF

BT

~~S E C R E T~~ SCSSM 36965 OCT 67

ACTION SMV 3

19 OCT 67 1967 OCT 19 AM 7:13 00Z

INFO

SMG, SMV. IN ACCORDANCE WITH SAFRD, 18 OCT 67, DECISION TO TRANSFER ALL AGENA ACTIVITIES AT SAMSO TO SAFSP, YOU ARE TO PROCEED WITH IMPLEMENTATION AS FOLLOWS: (A) THE SAMSO AGENA SPO IS TO BE TRANSFERRED FROM SAMSO TO SAFSP INTACT AT A DATE MUTUALLY AGREEABLE TO THE COMMANDER, SAMSO, AND THE DIRECTOR, SAFSP, BUT NO LATER THAN OCTOBER 25,1967. AS IS THE CASE WITH MOST SAFSP PERSONNEL, THE MANPOWER SPACES OF THE AGENA SPO WILL REMAIN ASSIGNED TO SAMSO BUT THE INCUMBENT PERSONNEL WILL BE DETAILED TO FULL TIME DUTY WITH SAFSP. ALL SAMSO CONTRACTS MANAGED BY THE AGENA SPO WILL BE TRANSFERRED WITH THE SPO TO SAFSP TO BE MANAGED THEREAFTER IN THE SAFSP-OSAF MANAGEMENT CHANNELS. AND PROCEDURES, (B) FOR YOUR INFORMATION ANDTO

DOWNGRADED AT 3 YEAR INTERVALS; DECLASSIFIED AFTER 12 YEARS. DOD DIR 5200.10

~~PAGE 2 RUEDTAA7526 S E C R E T~~

ASSIST YOU IN COORDINATING IMPLEMENTATION ACTIONS, THE DIRECTOR, SAFSP WILL CONTACT THE COMMANDER, SAMSO, TO EFFECT APPROPRIATE ARRANGEMENTS FOR THE TRANSFER OF RESPONSIBILITY AND TO TAKE ADDITIONAL ACTIONS AS FOLLOWS: (1) TO PROCEED IN AN ORDERLY MANNER TO CHANGE THE AGENA PROCUREMENT AND PRODUCTION CONCEPTS TO THOSE OUTLINED IN SAFSP LETTERS OF MAY 29,1967 AND SEPTEMBER 15,1967, (2) TO CHANGE THE PROCUREMENT OF AGENA LAUNCH SERVICES, BTL GUIDANCE, AND RELATED SUPPORT WHICH ARE NOW PROCURED BY THE AGENA SPO TO A CONCEPT WHEREBY SAFSP PROCURES THESE SERVICES, EQUIPMENT AND SUPPORT FOR SAFSP USE, AND ASSISTS NASA OR OTHER USERS TO PROCURE EITHER DIRECTLY OR THROUGH SAFSP THE AGENA VEHICLES AND THE LAUNCH SERVICES, EQUIPMENT AND SUPPORT WHICH THE OTHER USERS REQUIRE.(3) TO ASSURE RESPONSIBILITY IN SAFSP FOR THE DEVELOPMENT OF THE IMPROVED AGENA WITH THE 8533 ENGINE AND ISPS AS OF THE DATE OF TRANSFER OF THE AGENA SPO. REVIEWS OF THIS PROJECT

292-04

PAGE 3 RUEDTAA 7526 S E C R E T

CURRENTLY SCHEDULED IN THE SAMSO-AFSC-HQ USAF CHANNEL ARE BEING CANCELLED AND WILL BE REPLACED BY A SUITABEL REVIEW SCHEDULE IN THE SAFSP-OSAF CHANNEL. (4) TO PLAN AND IMPLEMENT A REDUCTIONIN THE 75 MANPOWER SPACES CURRENTLY AUTHORIZED IN THE AGENA SPO BY JUNE 30, 1968. EXCESS SPACES ARE TO BE RETURNED TO AFSC AND EXCESS PERSONNEL ARE TO BE RELEASED FROM DETAIL TO SAFSP AND FROM THE SAFSP PERSONNEL CONTROL LIST. (5) TO FURNISH WITHOUT

No action
James D. ...
SDO

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DELAY DETAILS OF FUSING REVISIONS REQUIRED OR PERMITTED BY THE ABOVE ACTIONS TO MR. [redacted] STAFF. (C) ADDITIONAL GUIDANCE WILL BE PROVIDED IN THE IMMEDIATE FUTURE. (S) [redacted]

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DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

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25 JAN 1968

[redacted]

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Agena D Flight Summary

[redacted] (Lt Col Wheeler)

1. Attached for your retention is a summary of all Agena D flights from 1962 through the present date. This summary is a condensation of the more complete data provided by LMSC in the "Agena Flight Summary Report" submitted semiannually. I recommend that [redacted] maintain the summary on a current basis. In the past, Col Hamilton has been a recipient of our summary and it may be that he is still interested in getting a copy.

2. For the purpose of this summary, the following definitions and explanations apply.

a. The first column shows the cumulative totals of Agena D flights, successes, failures, no trials and percentage of successes. Success is defined as meeting primary mission objectives in Agena ascent and orbit injection. No trial is defined as a first stage booster anomaly which prevents normal Agena performance. Percentage of success is determined by the equation

$$\frac{\text{Successes}}{\text{Total flights-no trials}} \times 100$$

b. The second column shows the cumulative total of all Agena Flights. There were 93 flights of Agena A's and Agena B's. Since these vehicles have now all been flown, the total Agena flights will remain at 93 greater than the Agena D total. The summary includes a breakout of these flights for information.

c. The third column states the Agena D (AD) sequence number and the contract on which it was produced. It should be noted that in the transition from SS-01A to SS-01B, AD numbers 61-1, 61-2, 61-3, 61-4, 61-5 and 61-6 were assigned to the last SS-01A's. All vehicles from AD-62 are SS-01B's. Thus there will be 6 more vehicles produced than indicated by the AD numbers.

d. The fourth column lists the program which flew the Agena and the vehicle designator assigned by that program.

e. The remarks column states reasons for failures and no trial and also indicates major equipment problems, even though the flight is judged a success. It also includes comments on orbital performance.

3. This letter, with attachment removed, is unclassified. The

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If inclosures are withdrawn (or not attached) the classification of this correspondence will [illegible]

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Attachment is classified SECRET, GP 3, because it reveals launch dates by program, success ratio by program and overall Agena performance capabilities.

[redacted]

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1 Atch
Agena Flight Summary Report (S) (2 cy)

cy to: [redacted] w/atch (S)

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SP-1972

AGENA D FLIGHT SUMMARY

25 JAN 1968

AGENA D FLIGHTS NR	S	F	NT	%	AGENA FLT NO	AD NO/CONF	PROGRAM/VEH	LAUNCH DATE	REMARKS
1	1			100	64	1/21	162/1151	27 Jun 62	VM error
2	2				69	2/21	162/1152	1 Aug 62	
3	3				72	3/21	162/1153	28 Aug 62	H/S fail orbit 45
4	4				76	4/21	162/1154	29 Sep 62	Temp DC power loss
5	5				79	8/21	162/1401	26 Oct 62	
6	6				83	5/21	162/1155	4 Dec 62	
7	7				84	10/21	698/2351	12 Dec 62	VM & Seq Timer problem
8	8				85	6/21	162/1156	14 Dec 62	
9	9				87	7/21	162/1157	7 Jan 63	H/S fail - re-entry error
10			1	100	89	9/21	162/1159	28 Feb 63	Booster fail (LV-2A)
11		1		90	90	20/68	162/1164	18 Mar 63	Premature eng shut-down Short in ATT S/A J-Box
12	10			91	91	12/21	162/1160	1 Apr 63	Power Amp. fail. early recovery
13		2		83	92	17/68	162/1411	26 Apr 63	Human error in H/S setting
14	11			85	94	18/68	162/1165	18 May 63	
15	12			86	96	21/68	162/1161	12 Jun 63	

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AGENA D FLIGHT SUMMARY

NR	AGENA D FLIGHTS S	F	MT	%	AGENA FLT NO	AD NO/CONF	PROGRAM/VEH	LAUNCH DATE	REMARKS
16		3		80	97	11/21	698/2353	15 Jun 63	Ullage rocket fail. No 2nd burn
17	13			81	98	19/68	162/1166	26 Jun 63	
18	14				100	13/68	206/4702	12 Jul 63	High use of control gas
19	15				101	16/68	162/1412	18 Jul 63	
20	16				103	22/68	162/1167	30 Jul 63	
21	17				104	23/68	162/1162	24 Aug 63	
22	18				105	27/68	162/1169	29 Aug 63	Elec. overload at seperation
23	19				106	26/68	206/4701	6 Sep 63	
24	20				107	24/68	162/1163	23 Sep 63	
25	21				108	14/68	638/1801	16 Oct 63	
26	22			88	109	33/68	206/4703	25 Oct 63	
27	23				110	37/68	162/1601	29 Oct 63	Recovery timer failure
28		2			111	30/68	162/1171	9 Nov 63	Booster failure (LV-2A)
29	24				112	32/68	162/1172	27 Nov 63	
30	25				113	29/68	206/4802	18 Dec 63	
31	26				114	25/68	162/1168	21 Dec 63	
32	27				115	31/68	698/2354	11 Jan 64	
33	28				116	36/68	698/2303	19 Jan 64	

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AGENA D FLIGHT SUMMARY

MN	AGENA D FLIGHTS S	F	MT	%	AGENA FLT NO	AD NO/CODE	PROGRAM/VEH	LAUNCH DATE	REMARKS
34	29				119	35/68	162/1174	15 Feb 64	Slow fuel valve closure
35	30			90	120	48/68	206/4803	25 Feb 64	
36	31				121	39/68	698/2316	27 Feb 64	MC power loss in orbit
37	32				122	52/194	206/4804	11 Mar 64	
38		4		89	123	43/68	162/1175	24 Mar 64	Short in Type IX conv.
39	33				124	53/194	206/4805	23 Apr 64	
40	34				125	45/68	162/1604	27 Apr 64	Elec overload failure in orbit
41		5		87	126	57/194	206/4806	19 May 64	Guidance system failure
42	35				127	49/68	241/1176	4 Jun 64	
43	36				128	51/68	241/1606	13 Jun 64	
44	37				129	40/68	698/2304	17 Jun 64	
45	38				130	62*/194	241/1609	19 Jun 64	
46	39				131	55/194	698/2315	2 Jul 64	
47	40				132	58/194	206/4807	6 Jul 64	
48	41				133	50/68	241/1177	10 Jul 64	
49	42				134	42/68	698/1802	17 Jul 64	

*AD-62 and up-SS-01B

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AGENA D FLIGHT SUMMARY

NR	AGENA D FLIGHTS S	F	NT	%	AGENA FLT NO	AD NO/CONF	PROGRAM/VEH	LAUNCH DATE	REMARKS
50	43				136	46/68	241/1605	5 Aug 64	
51	44				137	61/194	206/4808	14 Aug 64	
52	45			90	138	38/68	241/1603	21 Aug 64	
53	46				141	54/194	241/1178	14 Sep 64	
54	47				142	61-3/194	206/4809	23 Sep 64	
55	48				143	28/68	241/1170	5 Oct 64	Pyro battery fail on orbit
56		6		89	144	61-4/194	206/4810	8 Oct 64	Premature shutdown seq. timer
57	49				145	56/194	241/1179	17 Oct 64	
58	50				146	44/68	206/4811	23 Oct 64	
59	51				147	34/68	241/1173	2 Nov 64	
60	52				148	47/68	698/2317	3 Nov 64	
61	53				149	68/194	Mariner/6931	5 Nov 64	
62	54			90	150	60/194	241/1180	18 Nov 64	
63	55				151	69/194	Mariner/6932	28 Nov 64	
64	56				152	66/194	206/4813	4 Dec 64	
65	57				153	59/194	241/1607	19 Dec 64	
66	58				154	61-1/194	698/2355	21 Dec 64	

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AGENA D FLIGHT SUMMARY

NR	AGENA D FLIGHTS SI	F	NF	%	AGENA FLT NO	AD NO/CONF	PROGRAM/VEH	LAUNCH DATE	REMARKS
67	59				155	61-2/194	241/1608	15 Jan 65	
68	60			91	156	65/194	206/4812	23 Jan 65	
69	61				158	64/194	241/1611	25 Feb 65	
70	62				159	15/68	770/2701	9 Mar 65	
71	63				160	83/194	206/4816	12 Mar 65	
72	64				162	67/194	241/1612	25 Mar 65	
73	65				163	79/194	SNAPSHOT/7001	3 Apr 65	
74	66				164	76/194	206/4814	28 Apr 65	
75	67				165	72/194	241/1614	29 Apr 65	
76	68				166	73/194	241/1615	18 May 65	
77	69			92	167	78/194	206/4815	27 May 65	
78	70				168	70/194	241/1613	9 Jun 65	Type II Conv. problem
79	71				169	84/194	206/4817	25 Jun 65	
80			3		170	87/194	206/4819	12 Jul 65	SLV-3 Programmer failure
81	72				171	86/194	770/2702	16 Jul 65	
82	73				172	77/194	241/1617	19 Jul 65	

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AGENA D FLIGHT SUMMARY

AGENA D FLIGHTS NR	S	F	MF	%	AGENA FLT NO	AD NO/CONT	PROGRAM/VEH	LAUNCH DATE	REMARKS
83	74				173	61-6/194	VELA/1803	20 Jul 65	
84	75				174	85/194	206/4818	3 Aug 65	
85	76				175	80/194	241/1618	17 Aug 65	
86			4		176	41/68	241/1602	2 Sep 65	Proj. Manifold Thor destroyed
87	77				177	81/194	241/1619	22 Sep 65	
88	78				178	95/451	206/4821	30 Sep 65	
89	79				179	75/194	241/1616	5 Oct 65	
90	80			93	180	74/194	POGO/6801	14 Oct 65	EXL Problem High Orbit
91		7		92	181	82/194	GATV/5002	25 Oct 65	Propulsion System Failure
92	81				182	90/194	241/1620	28 Oct 65	
93	82				183	100/451	206/4822	8 Nov 65	
94	83				185	94/451	241/1621	9 Dec 65	Orbit Failure - Seq Timer
95	84				186	63/194	241/1610	24 Dec 65	
96	85				187	104/451	206/4825	19 Jan 66	
97	86				188	101/451	241/1623	2 Feb 66	
98	87				189	88/194	770/2703	9 Feb 66	
99	88				190	93/451	206I/4820	15 Feb 66	
100	89				191	97/451	241/1622	9 Mar 66	
101	90				192	108/451	GATV/5003	16 Mar 66	

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AGENA D FLIGHT SUMMARY

AGENA D FLIGHTS NR	S	F	NT	%	AGENA FLT NO	AD NO/CONT	PROGRAM/VEH	LAUNCH DATE	REMARKS
102	91				193	102/451	206I/2843	18 Mar 66	
103	92				194	111/451	241/1627	7 Apr 66	
104	93			93	195	99/451	QA0/6703	8 Apr 66	
105	94				196	110/451	206I/4827	19 Apr 66	
106		8		92	197	106/451	241/1625	3 May 66	No Agena seperation
107	95				198	98/451	206I/4824	14 May 66	
108			5		200	109/451	GATV/5004	17 May 66	Atlas failure
109	96				201	116/451	241/1630	23 May 66	
110	97				202	105/451	206I/4826	3 Jun 66	
111		9		91	204	91/194	461/1351	9 Jun 66	No second burn
112	98				205	107/451	241/1626	21 Jun 66	
113	99				206	123/722[1]	PACROS/6311	23 Jun 66	
114	100				207	113/451	206I/4828	12 Jul 66	
115	101				208	129/722[2]	GATV/5005	18 Jul 66	
116	102				209	132/722[3]	206II/4751	29 Jul 66	
117	103			92	210	117/451	241/1631	9 Aug 66	
118	104				211	121/722[4]	LO/6630	10 Aug 66	

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AGENA D FLIGHT SUMMARY

AGENA D FLIGHTS NR	S	F	NT	%	AGENA FLT NO	AD NO/CONF	PROGRAM/VEH	LAUNCH DATE	REMARKS
119	105				212	96/451	206I/4829	16 Aug 66	
120	106				213	103/451	461/1352	19 Aug 66	
121	107				214	130/722[5]	GAEV/5006	12 Sep 66	
122	108				215	143/722[6]	206I/4832	16 Sep 66	
123	109				216	114/451	241/1628	20 Sep 66	
124	110				217	135/722[7]	206II/4752	28 Sep 66	
125	111				218	112/451	461/1353	5 Oct 66	
126	112				219	125/722[8]	206I/4830	12 Oct 66	
127	113				220	139/722[9]	206I/4831	2 Nov 66	
128	114				221	122/722[10]	LO/6631	6 Nov 66	
129	115				222	118/451	241/1632	8 Nov 66	
130	116				223	71/194	GAEV/5001	11 Nov 66	
131	117				224	145/722[11]	206I/4833	5 Dec 66	
132	118				225	136/722[12]	ATS-B/6151	6 Dec 66	
133	119				226	141/722[13]	206II/4753	14 Dec 66	
134	120			93	227	124/722[14]	770/2731	29 Dec 66	
135	121				228	115/451	846/1629	14 Jan 67	
136	122				229	146/722[15]	206I/4834	2 Feb 67	

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AGENA D FLIGHT SUMMARY

AGENA D FLIGHTS MR	S	F	MT	%	AGENA FLT NO	AD NO/CONT	PROGRAM/VEH	LAUNCH DATE	REMARKS
137	123				230	128/722[16]	LO/6632	4 Feb 67	
138	124				231	126/722[17]	846/1635	22 Feb 67	
139	125				232	147/722[18]	110/4754	24 Feb 67	
140	126				233	127/722[19]	846/1636	30 Mar 67	
141		10		92	234	137/722[20]	AIS/6152	5 Apr 67	PIV failure
142			6		235	151/722[21]	110/4755	26 Apr 67	TITAN problem
143	127				236	131/722[22]	LO/6633	4 May 67	
144	128				237	120/451[23]	846/1634	9 May 67	VM chopper failure
145	129				238	161/722[25]	2061/4838	22 May 67	
146	130				239	89/194	770/2704	31 May 67	
147	131				240	153/722[24]	2061/4837	4 Jun 67	
148	132				241	157/722[26]	MARINER/6933	14 Jun 67	
149	133			93	242	119/451	846/1633	16 Jun 67	
150	134				243	154/722[28]	110/4756	20 Jun 67	
151	135				244	144/722[27]	770/2732	25 Jul 67	
152	136				245	133/722[28]	OGO-D/6802	28 Jul 67	
153	137				246	159/722[29]	LO/6634	1 Aug 67	
154	138				247	134/722[30]	846/1637	1 Aug 67	

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SUPPLEMENTAL AGENA D FLIGHT SUMMARY

6 MAR 1968

AGENA D FLIGHTS NR	S	F	NT	%	AGENA FLT NO	AD NO/CONT	PROGRAM/VEH	LAUNCH DATE	REMARKS
155	139				248	155/722[31]	110/4757	15 Aug 67	
156	140				249	152/722[32]	846/1641	15 Sep 67	
157	141				250	158/722[33]	110/4758	19 Sep 67	
158	142				251	166/722[34]	110/4759	25 Oct 67	
159	143				252	142/722[35]	846/1639	1 Nov 67	
160	144				253	140/722[36]	ATS-C/6153	5 Nov 67	
161	145				254	167/722[37]	110/4760	5 Dec 67	
162	146				255	156/722[40]	846/1642	9 Dec 67	
163	147				256	163/722[41]	770/2733	17 Jan 68	
164	148				257	169/722[42]	110/4761	18 Jan 68	
165	149				258	148/722[43]	846/1640	24 Jan 68	Sequence Timer Problem
166	150			93.7	259	171/722[44]	OGO-E/6503	3 Mar 68	First SLV-3A

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SP-1097

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SUMMARY OF DATA AS OF 23 JAN 67

1. Agena D Flights

Agena D Successes	148
Agena D Failures	10
Agena D No Trials	6
Total Agena D Flights	164

2. In addition to Agena D there have been 93 flights of Agena A and Agena B with the following results:

Agena A Successes	12	Agena B Successes	59
Agena A Failures	5	Agena B Failures	8
Agena A No Trials	2	Agena B No Trials	7
Total Agena A Flights	19	Total Agena B Flights	74

3. Agena D Reliability by Production Contract

Contract	Nr Produced	AD Nrs	Launched	S	F	NT	%
-21	12	1-12	12	10	1	1	90.0
-68	39	13-51	39	34	3	2	91.9
-194	46	52-91	45	40	4	1	90.9
-451	29	92-120	28	25	2	1	92.6
-722	57	121-177	40	39	0	1	100
-939	36	178-213	0				
TOTAL	219		164	148	10	6	93.7

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4. Agena D Reliability by year

Year	Launches	S	F	MF	%
1962	8	8	0	0	100
1963	23	18	3	2	85.7
1964	35	32	3	0	91.4
1965	29	26	1	2	96.3
1966	39	36	2	1	94.7
1967	28	26	1	1	96.3
1968	2	2	0	0	100
TOTALS	164	148	10	6	93.7

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DEPARTMENT OF THE AIR FORCE
DIRECTORATE OF SPECIAL PROJECTS (OSAF)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

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15 April 1968

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Final Agena Historical Report, 1 July - 19 October 1967

SME

1. On 19 October 1967 the Agena Program Office, SMVA, was reassigned from the Space and Missile Systems Organization (AFSC) to the Office of the Secretary of the Air Force, Directorate of Special Projects. Several factors influenced the final decision which led to this organizational change but the following was primary:

a. The original requirement for a "Standard" Agena vehicle came about as a result of the need for the vehicle by many diverse programs - both Air Force and NASA. Central procurement and support engineering by a Standard Agena office was determined to be the most economical method of meeting each program's needs. Each using program, upon receipt of their "Standard" Agena D, added program peculiar equipment and modified the vehicle as required.

b. A review of known, firm using program requirements during first quarter FY 69 indicated an almost exclusive use of the Agena D by SAFSP; therefore the original justification for a "standard" vehicle (i. e., the diverse requirement by many programs) was no longer valid.

2. At the time of the reorganization, 67 people were assigned to SMVA and Colonel Norman J. Keefer was Agena System Program Director. The organization was made up of five divisions - Engineering with 19 officers and 4 civilians, Configuration Management with 5 officers and 3 civilians, Program Control with 3 officers and 4 civilians, Operations with 9 officers and 2 civilians, and Procurement with 1 officer and 13 civilians.

3. The 213th and final Agena D vehicle will be delivered in July 1968 with support engineering, logistics, and launch service activities extending past that date. Dollar value of the total (30 Jun 61 through 30 Jul 68) Standard Agena D program will be $463.20 million, which includes $157.46 for launch services.

JEAN G. GOPPERT, Colonel, USAF
Deputy Director for Agena

Contr No.	Contractor	Type	Description	Period Of Perf.	Estimated Face Value
AF-21	LMSC	CPIF	Agena D Vehicles	8/61-9/62	$39,377,000
AF-68	"	FPIF	Agena D Vehicles	9/62-8/63	35,226,000
AF-191	"	CPFF	Agena Support & Services		22,417,000
AF-194	"	FPIF	Agena S-01A Vehicles	7/63-10/64	14,668,000
AF-221	"	FFP	Repair, Maintenance & Eng.	10/62-7/65	2,563,734
AF-254	"	FFP	Utility Tech Manuals	*Comp. 12/63	188,500
AF-266	"	CPIF	Santa Cruz Test Base	10/63-6/65	2,800,875
AF-376	"	FFP	S-01A Vehicle Storage	*Comp. 3/64	394,375
AF-451	"	FPIF	Agena S-01B Vehicles	1/64-12/64 *	24,581,818
AF-589	"	CPIF	Basic Ordering Agreement	4/65-Annual	-
Order #1	"	"	PREP Round #V	4/65-1/66	571,244
Order #2	"	"	TYPE XIV Battery	5/65-1/66	258,405
Order #3	"	"	TYPE IX Dc/Dc Converter	5/65-12/65	225,599
Order #5	"	"	Sequence Timer Mod.	8/65-1/67	150,000
Order #7	"	"	PREP Round #VI	8/65-6/66	540,308
Order #8	"	"	Zipcord Development	11/65-12/66	651,255
Order #9	"	"	S-01 Logistics Support	11/65-10/66	343,911
Order #10	"	"	Gas Ingestion Test Program	12/65-8/66	243,885
Order #11	"	"	Main Electrical Umbilical Redesign	2/66-6/67	450,000
Order #12	"	"	PREP Round #VII	1/66-12/66	403,248
Order #13	"	"	THORAD Test Support	11/65-7/66	89,202
Order #15	"	"	TYPE IH Battery Cell Test	1/66-9/66	85,607

* Contract Complete - has been sent to records storage

AGENA VEHICLE

Contr No.	Contractor	Type	Description	Period Of Perf.	Face Value
Order #16	LMSC	CPIF	Electronic Event Timer	10/66-4/68	$ 1,100,000
Order #17	"	"	Brazed Plumbing	6/66-2/67	350,000
Order #19	"	"	Logistics Support & Repair	11/66-11/67	300,000
AF-596	"	FFP	S-01 Vehicle Storage	*Comp. 6/65	51,500
AF-668	"	FFP	Titan III X/Agena Study	*Comp. 10/64	76,500
AF-695	"	FFP	Agena Support & Services	1/65-12/66	10,118,043
AF-722	"	FPIF	Agena Vehicle Prod	2/65-1/67	39,461,000
AF-732	MIT	CR	Guidance & Control Study	1/65-12/65	150,000
AF-761	LMSC	CPIF	Santa Cruz Test Base	7/65-6/67	2,738,502
AF-766	Bell	FFP	Agena Engine Prod.	2/65-10/66	8,266,795
AF-815	"	FFP	Agena Vehicle Storage	*7/65-6/66	41,000
AF-918	Quantic Inc.	FFP	Studies - Infra Red Detector	12/65-12/66	198,550
AF-924	Belock Instr.	FFP	IR Horizon Sensor Model	1/66-1/67	96,591
AF-950	Bell	FP	Basic Ordering Agreement	3/66-Annual	-
Order #2	"	"	Repair of 8096 Engine	6/66-9/67	49,000
AF-938	"	FFP	Agena Engine Prod.	1/66-11/67	4,900,000
AF-939	LMSC	FPI	Agena Vehicle Prod.	1/66-4/68	25,000,000
AF-947	MIT	CR	Guidance & Control Study	1/66-12/66	240,000
AF-1008	Barnes Eng	FFP	Horizon Sensor Prod.	5/66-11/67	1,575,000
AF-1044	Bell	FFP	Velocity Meter Prod.	6/66-4/68	1,725,000
AF-1068	LMSC	FFP	Agena Vehicle Storage	7/66-6/67	44,000

* Contract Complete - has been sent to records storage

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FUNDING HISTORY
AGENA PROGRAM

I. VEHICLE INCOME:
(IN MILLIONS)

PROGRAM	FY-62	FY-63	FY-64	FY-65	FY-66	FY-67	TOTAL
LINE ITEM	$21.60	$ 7.80	$ 0	$ 0	$ 0	$ 0	$ 29.40
SPECIAL PROJECTS	13.10	35.90	44.59	40.00	41.60	19.70	194.89
VELA	2.69	2.41	.59	0	(1.60)Ref	0	4.09
SHAPSHOT	.50	.63	0	1.45	(1.20)Ref	0	1.38
461	8.80	0	0	0	0	(.70)Ref	8.10
369	0	.35	0	0	0	0	.35
GEMINI TARGET	0	.80	2.70	3.80	.91	0	8.21
NASA LERC	0	1.00	7.20	5.91	7.39	1.20	22.70
TITAN-IIIX					1.20		1.20
461/241 REPAY				3.60	1.98	1.62	7.20
MISC. INCOME					.78	1.14	1.92
TOTAL	$46.69	$48.89	$55.08	$54.76	$51.06	$22.96	$279.44

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Approved for Release: 2017/08/28 C05097006

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OBLIGATED VEHICLE FUNDS (IN MILLIONS)
AGENA PROGRAM

CONTRACT	FY-62	FY-63	FY-64	FY-65	FY-66	FY-67	TOTAL
AF-21	32.15	5.34	1.52	.71	.04		39.76
AF-68	14.43	21.95	(.80)CR	.05	.04		35.67
AF-191		4.17	13.43	4. 31			21.91
AF-194		13.60	26.96	3.00	(.01)CR		43.55
AF-221		.60	.48	1.89			2.97
AF-254		.19					.19
AF-266			2.00	.68	.02		2.70
AF-376			.39				.39
AF-451			7.50	16.91	.58	(.37)CR	24.62
AF-589				.90	3.68	.38	4.96
AF-596			.05				.05
AF-668			.08				.08
AF-695				6.20	.20	3.72	10.12
AF-722				14.88	21.61	2.78	39.27
AF-732				.15			.15
AF-761				2.74			2.74
AF-766				2.91	5.34		8.25
AF-815					.04		.04
AF-918					.20		.20
AF-938					4.90	.01	4.91
AF-939					14.58	.83	15.41
AF-924					.10		.10
AF-947					.24		.24
AF-950					.09		.09
AF-968						4.66	4.66
AF-1008						1.60	1.60
AF-1044						1.73	1.73
AF-1068						.04	.04
Ind. Facilities			.48	.36	.69	.02	1.55
Propellants			.27	.13	.25	.10	.75
TOTAL	46.58	45.85	52.36	55.82	52.59	15.50	268.70

AGENA LAUNCH SERVICES & SUPPORT

Contr No.	Contractor	Type	Description	Period Of Perf.	Estimated Face Value
AF-52	LMSC	CPFF	PMR Launch Support	1/62-12/62	$20,799,143
AF-62	"	CPFF	Advent Program	3/62-11/62	11,341,182
AF-79	"	CPFF	Agena-D Peculiar Mods	*Comp. 7/64	726,488
AF-131	"	CPFF	Pt Arguello Launch Com. 2	4/62-1/63	17,126,396
AF-135	"	CPFF	AMR Launch Pad 13	5/62-4/63	4,406,814
AF-193	"	FFP	AGE Study	*Comp. 11/62	30,000
AF-198	"	CPIF	AMR Launch Support	10/62-12/63	4,070,280
AF-233	"	CPIF	PMR Launch Support	12/62-12/63	23,262,177
AF-239	"	FFP	AMR Pad 14 Study	*Comp. 1/63	92,500
AF-287	"	CPIF	AMR Pad 14 Conversion	2/63-12/64	4,874,652
AF-317	"	FFP	AGE Launch Disaster Pool	*Comp. 5/64	970,000
AF-499	"	CPIF	AMR Launch Support	1/64-12/64	5,096,593
AF-501	"	CPIF	PMR Launch Support	1/64-12/64	26,028,437
AF-688	"	CPIF	ETR Launch Support	1/65-12/65	5,233,049
AF-689	"	CPIF	WTR Launch Support	1/65-12/65	30,685,852
AF-715	"	CPIF	AGE Improvements & Mod	12/64-7/65	581,580
AF-821	"	CPIF	Agena Age Power Supply	5/65-7/66	764,670
AF-936	"	FPIF	ETR Launch Support	1/66-3/67	10,214,550
AF-968	"	FPI	WTR Launch Support	4/66-9/67	30,997,000

* Contract Complete - has been sent to records storage.

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FUNDING HISTORY
AGENA PROGRAM

II. LAUNCH SERVICES INCOME (ETR & WTR):

PROGRAM	FY-62	FY-63	FY-64	FY-65	FY-66	FY-67	TOTAL
SPECIAL PROJECTS	$ 7.07	$19.71	$27.24	$25.66	$19.15	$ 2.48	$101.31
VELA	0	.40	1.66	1.10	0	0	3.16
SNAPSHOT	0	0	0	1.37	0	0	1.37
461	0	2.10	0	0	2.80	0	4.90
369	0	0	0	0	0	0	0
GEMINI TARGET	0	0	0	1.40	4.43	.30	6.13
NASA LERC	.57	3.15	3.87	5.58	5.25	1.00	19.42
TOTAL	$10.61*	$25.36	$32.77	$35.11	$31.63	$ 3.78	$139.26*

* CONTRACT RESPONSIBILITY TRANSFERRED TO AGENA D LAST HALF OF FY-62. AGENA D RECEIVED 7.640M OF $10.610M SHOWN.

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OBLIGATED FUNDS - LAUNCH SERVICES
(IN MILLIONS)
AGENA PROGRAM

Contract No.	62	63	64	65	66	67	Total
AF 52	10.61	8.68			(.05CR)		19.24
AF 198		3.12	.95				4.07
AF 233		13.37	9.89	(.03CR)			23.23
AF 499			2.86	2.24			5.1
AF 501			18.74	5.95			24.69
AF 688				3.84	1.39		5.23
AF 689				22.23	6.50		28.73
AF 936					5.01	3.02	8.03
AF 968					17.57	.15	17.72
Total	10.61	25.17	32.44	34.23	30.42	3.17	136.04

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OBLIGATED FUNDS*- ACTIVATIONS AID AGE
(IN MILLIONS)
AGENA PROGRAM

Contract No.	Fiscal Years 61	62	63	64	65	66	67	Total
AF 62	5.75	3.21			(.08CR)			8.88
AF 131	2.00	12.26	2.45	.42		(.03CR)		17.1
AF 135		3.67	.73					4.40
AF 287			2.13	2.40	.05			4.58
AF 715					.58			.53
AF 821					.50	.26		.76
Total	7.75	19.14	5.31	2.82	1.05	.23		36.30

*Obligated funds equal funds received on these contracts

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AGENA PROGRAM

DOCUMENTATION - AUTHORITY - SIGNIFICANT CHANGES

DOCUMENTATION:

PROGRAM 662A ABBREVIATED PROGRAM PLAN, DECEMBER 1961

PROGRAM 648A ABRIDGED PACKAGE, APRIL 1962

AGENA D PROGRAM MANAGEMENT CONCEPT, AFSC, 30 MARCH 1965 ✓

RCS: AF - XDD - C35, PROGRAMMING AND FUNDING FOR SPACE LAUNCH VEHICLES ✓
MARCH 1965 - DECEMBER 1966

AGENA D, ADVANCED DEVELOPMENT PLAN, JUNE 1966,
CHEMICAL ROCKET, SPACE MANEUVERING (N_2O_4/AZN50 ENGINE & ISPS) ✓

AUTHORITY:

30 NOV 61 - HQ USAF MESSAGE (AFSDC-F-82530) AUTHORIZING 12 R&D VEHICLES, PROCUREMENT PACKAGE, PRODUCTION CAPABILITY 5 VEH/MO.

5 JAN 62 - HQ USAF MESSAGE (AFSSV-EQ-90915) AUTHORIZING 39 PRODUCTION VEHICLES AT A 4 VEH/MO. RATE.

18 JUL 62 - HQ USAF MESSAGE (AFSSV-66176) AUTHORIZING 22 ADDITIONAL PRODUCTION VEHICLES AT 4 VEH/MO.

AUTHORITY CONT'D:

20 OCT 62 - HQ USAF MESSAGE (AFSSV-14-62-117) AUTHORIZING ADDITIONAL 24 PRODUCTION VEHICLES AT 4 VEH/MO.

9 JAN 63 - HQ AFSC MESSAGE (MSFA-9-1-12) CHANGING THE PRODUCTION RATE TO 3 VEH/MO. EFFECTIVE 12 JUL 63.

21 DEC 63 - HQ USAF MESSAGE (AFRDDG 80266) AUTHORIZING 29 PRODUCTION VEHICLES AT A 3 VEH/MO RATE

22 APR 64 - HQ USAF MESSAGE (AFRDD 71625) AUTHORIZING 22 PRODUCTION VEHICLES AT A 4 VEH/MO RATE

10 DEC 64 - HQ USAF MESSAGE (AFRRPA 96778) AUTHORIZING 35 PRODUCTION VEHICLES AT A 4 VEH/MO RATE

1 NOV 65 - DDR&E MEMO AUTHORIZING 36 PRODUCTION VEHICLES AT A $2\frac{1}{2}$ VEH/MO RATE

4 NOV 66 - HQ USAF MESSAGE (AFRRPA 84122) AUTHORIZING 25 PRODUCTION VEHICLES AT A 2 VEH/MO RATE

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AUTHORITY CONT'D:

PRODUCTION SUMMARY:

CONTRACT	QUANTITY	DELIVERIES
AF04(695)-21	12	APR 62 - SEPT 62
AF04(695)-68	39	SEP 62 - JULY 63
AF04(695)-194	46	JULY 63 - DEC 64
AF04(695)-451	29	JAN 65 - DEC 65
AF04(695)-722	57	DEC 65 - JAN 67
AF04(695)-939	36	FEB 67 - APR 68
AF04(695)-67-C-0077	25	APR 68 - APR 69
	~~244~~ 228	

29 deleted

SIGNIFICANT CHANGES

NOV 62	FACI COMPLETED FOR S-01A AGENA D NO. 19
MAR 63	INITIATION OF PRODUCTION TEST PROGRAM (PREP)
MAY 63 - APR 64	DEVELOPMENT AND INCORPORATION OF 8247 MULTI START ENGINE, AGENA D NO. 71
JAN 64	INCORPORATION OF ADDITIONAL BASIC CAPABILITIES (ABC PROGRAM) IN PRODUCTION VEHICLE - AGENA D NO. 62
MAR 64	FACI COMPLETED FOR S-01B AGENA D NO. 68
MAR 65	DIRECT BUY OF 8096 ENGINES FROM BELL AEROSYSTEMS AF04(695)-766
FEB 66	DIRECT BUY OF HORIZON SENSORS FROM BARNES ENGINEERING AF04(695)-1008
MAR 66	DIRECT BUY OF VELOCITY METERS FROM BELL AEROSYSTEMS AF04(695)-1044

127/-

AGENA CONTRACT STRUCTURE

JUNE 1956 - LOCKHEED NOTIFIED THEY WON COMPETITION FOR WS-117L

CONTRACTOR	CONTRACT NO.	AMT.	PERIOD OF PERFORMANCE	END ITEM	HOW AW
LMSD	AF04(647)-97		OCT 1956 - DEC 1957		COMPETITI
LMSD	AF04(647)-181		DEC 1957 - JUN 1959		FOLLOW-ON
LMSD	AF04(647)-347		MAR 1959 - BREAKOUT TO USING PROGRAMS		SOLE-SOURCE
LMSC	AF04(695)-21	$43,509,163	AUG 1961 - NOV 1962	DESIGN QUALIFICATION & PRODUCTION OF (12) AGENA VEHICLES, S-01A	SOLE SOURCE LMSC
LMSC	AF04(695)-68	37,252,654	DEC 1961 - AUG 1963	PRODUCTION OF 36 AGENA S-01 VEHICLES SPARES AND OPTIONALS	SOLE SOURCE LMSC
LMSC	AF04(695)-194	43,664,000	AUG 1962 - OCT 1964	PRODUCTION OF 46 AGENA VEHICLES, SPARES & OPTIONALS, INCORP CHANGE FROM S-01A TO S-01B	SOLE SOURCE LMSC
LMSC	AF04(695)-452	24,581,618	DEC 1963 - MAY 1966	PRODUCTION OF 29 AGENA VEHICLES, SPARES AND OPTIONALS	SOLE SOURCE LMSC

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AGENA CONTRACT STRUCTURE (Cont'd)

JUNE 1966 - LOCKHEED [illegible]

CONTRACTOR	CONTRACT NO.	AMT.	PERIOD OF PERFORMANCE	END ITEM	[illegible]
LMSC	AF04(695)-722	$42,591,312	FEB 1965 - JAN 1967	PRODUCTION OF 57 AGENA VEHICLES, SPARES & [illegible]	[illegible]
BELL AEROSYSTEMS	AF04(695)-765	2,156,493	FEB 1965 - OCT 1966	PRODUCTION OF 55, 8096 AND 2, 8247 ENGINES	[illegible]
LMSC	AF04(695)-939	Est. Cost $25,000,000	JAN 1966 - NOV 1968	PRODUCTION OF (36) [illegible] AGENA VEHICLES, SPARES AND [illegible]	[illegible]
BELL AEROSYSTEMS	AF04(695)-938	4,910,490	JAN 1966 - NOV 1967	PRODUCTION OF (36), 8096 ENGINES	[illegible]

[redacted]

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