REPLY TO
ATTN OF: AFORQ-MB

27 July 1959

SUBJECT: (U) Report of the 56th Meeting of the Weapons Board

TO: Members, Weapons Board

1. The Weapons Board convened for its 56th meeting at 0930 hours, 22 July 1959, to consider:

a. DISCOVERER, SENTRY, SENTRY ANNEX, MIDAS Development and Financial Plans for FY 60 and 61.

b. NORAD COC Hardening.

2. The following named officers attended:

Maj Gen B. J. Webster Acting Chairman	XPR
Maj Gen M. C. Demler	DRD
Maj Gen H. T. Wheless	XPD
[redacted]	
Maj Gen R. J. Friedman	AEP
Brig Gen H. W. Powell	MPT
[redacted]	ORQ
[redacted] Secretary	ORQ
[redacted] Asst Secretary	ORQ

The following named General officers attended:

Maj Gen J. H. Walsh	CIN
Maj Gen H. E. Watson	CIN
Brig Gen H. Boushey	DAT
Brig Gen R. H. Curtin	OCE

DISCOVERER, SENTRY, SENTRY ANNEX, MIDAS DEVELOPMENT AND FINANCIAL PLANS FOR FY 60 AND 61

3. Brig Gen H. Boushey, AFDAT, introduced the presentation. He reiterated, to the Board, the importance of the Air Force position on these programs. The Navy is advancing the proposition that space programs as a whole are too big for any one service and the Navy recommended to the JCS that a Joint Military Astronomical Center be organized to control space programs. He also indicated that the East-West fence tied into this whole program.

[redacted]

4. Colonel F. C. Oder, AFBMD, summarized the purposes of the presentation as:

a. Air Staff review of the revised FY 60 financial plans and FY 61 budget estimates for DISCOVERER, SENTRY, SENTRY ANNEX and MIDAS;

b. Identification to the Air Staff of management decisions required in the SENTRY, SENTRY ANNEX and MIDAS programs.

5. Colonel Oder pointed out that project 117L (an all-Air Force project) covered by GOR 80, was the origin of the above programs. When ARPA was formed, 117L was divided into three programs:

a. DISCOVERER, using THOR as a booster.

b. SENTRY, using the ATLAS as a booster.

c. MIDAS, using the ATLAS as a booster.

6. He also pointed out that the new Agena, second stage with increased tankage and the capability of firing twice, will be used on SENTRY and MIDAS.

7. The DISCOVERER program, a project [redacted] of conducting space experiments, was described by Lt Colonel [redacted]. The DISCOVERER employs the use of the THOR booster, Agena second stage, capsule recovery of data, closely controlled orbit, accurate on-orbit measurements and data transmissions. The program requires a network of tracking and telemetry stations, an air-borne and water-borne recovery force, a satellite control center, and a Vandenberg AFB launch complex with two pads. The history of the DISCOVERER program was covered. DISCOVERER program results have been very satisfactory to date. Design integrity and orbit capability was demonstrated on 28 February 1959 [redacted] on orbit and capsule ejection accomplished on 13 April 1959. Data was obtained from biomedical instrumentation on a 3 June 1959 shot. Several aircraft-dropped capsule recovery tests have been completed (a total of 200, 90% of last 100 drops were recovered, 85% of last 100 drops recovered by air). Colonel Battle stated that eventually it is desired to make all recoveries by air.

8. Air Staff approval of the FY 60 financial plan of [redacted] is required.

9. [redacted] then gave a briefing on the SENTRY program. He defined the SENTRY as a satellite to accomplish, through interchangable payloads, photographic [redacted] reconnaissance. The weapon system will provide a reconnaissance capability of two modes:

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a. Readout program: (1) The equipment for the visual reconnaissance consists of the satellite-borne equipment required to collect intelligence information in the visible spectrum, to process and store this information and, on a command signal from the ground, convert stored intelligence to appropriate signals for transmission to the ground. In addition to the satellite-borne equipment, related ground base equipment is required to take the out-put of the satellite and reconstitute the signal into photographic form for further processing and intelligence use. Initial visual equipment will be capable of resolving targets 20 feet on a side, development will continue towards the goal of achieving resolution of 5 feet or less.

[redacted]

b. Capsule Recovery Program: This will provide a payload designed to obtain high resolution reconnaissance information. The data will be returned to the earth in the recovery capsule section of the satellite vehicle. The advantage gained from a recoverable capsule is that it permits the collection of data over a large geographical area at a rate that would exceed the limits [redacted] it will give us the desired high resolution (5 feet on a side).

10. On 24 June 1959, ARPA directed the deferment of the SENTRY capsule recovery program because of fund limitations. Instead of $160.0 million, $135.0 million has been allocated. It was implied that in order to meet intelligence criteria, it is necessary to reinstate the Capsule Recovery Program.

11. Boosters and vehicles will be maintained, reassembled and checked out in the missile assembly building at Vandenberg Air Force Base. The missile will be launched from the SENTRY/ATLAS launch Complex # 1 at Point Arguello. Launch data will be obtained by utilizing VHF facilities at Vandenberg AFB tracking station and down-range telemetry ship. Orbital tracking command and data readout will be performed initially at Vandenberg AFB. As the system develops, additional tracking capability will be available at the Hawaii and New Boston tracking station. Additional data readout capability will be available at the New Boston tracking station by September 1960 and Ottumwa and Ft. Stevens tracking by late 1961. A development control center located adjacent to the SENTRY production plant will serve as command, administrative and control center throughout the development phase. In its final form, the SENTRY program will employ three tracking and acquisition stations located in the ZI. These will perform all tracking, command and data acquisition functions. As the system becomes fully developed, the readout capability will be provided at N.E., N.W., and Central Tracking and Acquisition Stations.

12. The first readout launch is scheduled for April 1960. The first recovery launch could be scheduled for April 1961.

13. The initial funding required in FY 1960 was $170.5 million. This amount is increased by $15.3 million due to reinstatement of the N.W. (Oregon) tracking and acquisition station and a change in the guidance system.

14. Air Staff action required:

a. Support of the Capsule Recovery Program.

b. To approve the reinstatement of the N.W. (Oregon) tracking and acquisition station.

15. SENTRY/ARIES Program. [redacted] SENTRY, was presented by [redacted]. A schematic chart was displayed depicting the various operational agencies required to complete the SENTRY program; the operational concept was elaborated on. Included in the system was an interim intelligence facility located at Offutt AFB. This facility is to operate until the Intelligence Processing Center at Offutt AFB becomes operationally capable. $5.4 million is required [redacted]

16. It was noted that extensive Air Force investment is being made in test equipment for TRW at Denver, enhancing the establishment of a National Intelligence Center.

17. AFBMD has been notified by Headquarters USAF that new launch facilities will have to be programmed. To construct new facilities at Point Arguello, $33.0 million will be required. It was recommended by AFBMD that the existing launch complex 65-1 at Vandenberg AFB be utilized for the SENTRY operational program. To modify existing facilities at 65-1, $5.7 million would be required; however, a range safety problem exists at 65-1. A similar range safety problem would exist at the proposed Point Arguello site. At the present time, the 65-1 facility is only used for ATLAS D missiles. When the ATLAS D program is completed, there will apparently be no programmed requirement for this facility.

18. Air Staff action required:

a. Recommendation as to the location of launching facilities to support the SENTRY operational program.

19. [redacted], AFBMD, discussed the MIDAS development plan. He defined the MIDAS as a satellite borne infrared sensor equipped system for detecting and reporting the launching of enemy ICBM's (QOR 80-3 and 3a).

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The MIDAS system will consist of a network of approximately 12 satellites placed on polar orbits of 2000 nautical miles. The indication of enemy ICBM launching, together with rough location information of the ascending ICBM's is instantaneously transmitted to a ground readout station. Three such ground readout stations are contemplated: Greenland, Alaska and United Kingdom. (The Greenland station has been deferred until 1961 due to high radiation effect caused by presently installed radar equipment at Thule). These ground stations were selected to permit continuous coverage of potential targets by simultaneous readout. The information transmitted from the satellite is processed in a manner to permit rapid identification of an enemy attack. The compatible relationship of MIDAS and [redacted] was discussed. [redacted] pointed out that [redacted] land communications would be utilized.

20. The program is divided into three phases:

a. Phase I - four low altitude (300-400 miles) orbital test flights to be launched from AFMTC. Initial launch, November 1959.

b. Phase II - one low altitude and five high altitude (2000 miles) polar orbital test flights to be launched from Vandenberg AFB. Initial launch, July 1960.

c. Phase III - forty-two (42) high altitude operational flights from Vandenberg AFB. Initial launch, July 1961.

21. [redacted] discussed the recent concept changes in the development plan; the MIDAS program is now specifically directed towards achievement of warning of ballistic missile attack. Certain advanced studies included in other ARPA orders have been deleted, i.e., the track and prediction studies have been discontinued; finally, the construction of the N.W. Atlantic station, Thule, has been deferred to FY 61.

22. The revised financial plan for FY 60 indicated $77.1 million (USAF) and $36.8 million (ARPA) funds. The budget estimates for FY 61 indicated $137.1 million (AF) and $20.9 million (ARPA).

23. Air Staff action required:

a. To establish the validity of GOR 80-3 and 3A.

b. Recommend immediate approval and funding of Phase II and III.

c. The addition of MIDAS to the Master Urgency List. This priority will equalize competition for test facilities.

24. The Reconnaissance Panel, after review of the AFBMD presentation, expressed two comments to the Board:

a. Greater operational freedom and flexibility can be achieved by locating the SENTRY launch facilities as far south as possible, which at the present time means Point Arguello. However, it appears that $30.2 million can be saved over a two year period by using the 65-1 facilities at Vandenberg AFB. Since both SAC and BMD are in favor of this, it should receive serious consideration by the Weapons Board.

b. On consideration of the requirement for $5.6 million to provide an interim intelligence processing facility at Offutt AFB, it was the view of the Panel that the requirement could be met at considerably less cost.

25. The Weapons Board feels that MIDAS and SENTRY are must programs and an early operational capability is desired. As such, they are high priority programs and the Weapons Board concurs in the BMD recommendations that MIDAS be added to the Master Urgency List and therefore recommends that immediate action be taken to accomplish this.

26. Both MIDAS and SENTRY, as operational programs, perform Air Force missions and therefore must be considered Air Force programs and to insure this, program requirements should be augmented as necessary by Air Force funds.

27. In regard to the [redacted] following recommendations:

a. DISCOVERER - the program as presented be approved and funds be included in FY 60 in the amount of [redacted] for ultimate transfer to ARPA.

b. SENTRY R&D - the program be approved with the following stipulations:

(1) That the addition of $60.0 million for the recovery portion of the SENTRY program as Air Force costs, be re-evaluated. Inasmuch as this was an ARPA requirement and since ARPA has now recommended deferral, it is not felt that the Air Force should program $24.8 million in FY 60 and $34.6 million in FY 61 for this. It is recommended that the Assistant Chief of Staff, Intelligence re-validate his strict resolution requirement (5 feet on a side) which requires a recovery program for an interim period until the readout program can achieve this desired resolution.

(2) ARPA has deleted a requirement for the mapping portion of the SENTRY program and no funds are included in the Development Plan. However, recosting of the total program by BMD actually results in a slightly higher program total than would be indicated by deletion of the mapping requirement.

c. SENTRY/ANNEX

(1) It should be noted that the AFBMD and SAC position recommended the use of the existing launch Complex 65-1 at Vandenberg AFB. By direction of this Headquarters, BMD was notif ed that 65-1 could not be utilized for the SENTRY operational program and that a new launch facility and associated facilities would have to be programmed. In reviewing this item, it was ascertained:

(a) That to duplicate the presently existing facility would cost approximately $33.0 million, which consists of $25.0 million for GSE and $8.0 million for military construction. At the present time, the total cost to modify and put GSE equipment in 65-1 is $5.7 million. Therefore, using 65-1 would reduce requirements by $27.3 million.

(b) That the 65-1 facility is only used for ATLAS D missiles and at such time as the ATLAS D program is completed, in the near future, there will apparently be no requirement for this stand.

(c) That a range safety problem would exist even if a new stand were placed at Point Arguello.

(d) That there was nothing in the Chief of Staff's [illegible] to Admiral Burke that would prohibit the Air Force from using [illegible]

(e) That the decision to use 65-1 should not influence the Chief of Staff position that future planning for launch sites should not exclude acquisition of the Sudden Ranch area.

(2) Based on the above, the Weapons Board recommended that the additional funds included in the Development Plan in the amount of $27.3 million be deleted and that the SENTRY operational program use Complex 65-1.

(3) The $5.4 million for the interim intelligence facility at Offutt appears to be more than is required. The Assistant Chief of Staff, Intelligence believes we can tie in satellite photographic and ELINT data with present photo and ELINT intelligence information at Omaha with considerably less equipment than proposed. Although we are not capable of determining the exact reduction that can be made at this time, it is believed the $5.4 million figure will be reduced by roughly 50%.

(4) In addition, it is pointed out that we are building an elaborate R&D facility for TRW at Denver which will have an operational capability. This means we are establishing a facility which will, in itself, enhance the efforts now being made by civilian intelligence agencies supported by contractors to establish a National Intelligence Center at Denver. This National Intelligence Center would be in lieu of a capability

we desire at Offutt. Therefore, the Weapons Board recommends that the Deputy Chief of Staff, Development should look into the possibility of performing part of the development work on ground readout computing and display systems at the operational site.

d. MIDAS

(1) No program approval of Phase II for MIDAS has been received from OSD. Until such time as the R&D program is approved, the Weapons Board recommends that the MIDAS Phase III fund requirement should not be definitized and reprogrammed, but that in presentations to ARPA, the Air Force point out that upon approval of Phase II by ARPA we will take aggressive action to have Phase III approved by OSD and will re-program necessary funds. However, to fully support the Air Force position of MIDAS, $58.0 million in FY 60 and $125.4 million in FY 61 of procurement funds is the minimum that would have to be accommodated through reprogramming to meet the present operational date.

(2) The Board recommends that $6.3 million for support facilities and planning be deleted from the MIDAS program and carried in the regular Military Construction Program.

NORAD COC HARDENING

28. [redacted] AFDRD, representing the Air Defense Panel, reported briefly on the results of ARDC's study to date of the NORAD COC, preparatory to furnishing this information to JCS. The major point to be resolved prior to submission of the status report to JCS is the degree of hardness for the COC. Colonel DeJarnette showed the proposed site location at Cheyenne Mountain. ARDC is recommending hardening to 500-800 PSI, which would entail moving the location to the center of the mountain. This is contrary to JCS direction and is not concurred in by CINC NORAD, the latter's position being based primarily on 12 months delay that would result from moving the location from the 200 PSI site originally planned. Moreover, the Chief of Staff has advised CINC NORAD that the Air Staff will expedite and forward the study to the JCS by 27 July 1959.

29. The Air Defense Panel recommended:

a. That Air Staff concurrence on lesser hardening for the COC be accepted.

b. That the JCS be advised that detailed COC requirements and cost estimates cannot be arrived at until a thorough study is made by a systems contractor.

c. That the JCS be apprised of the Air Force action already underway for the employment of a systems contractor to start a study aimed at providing answers to all their questions.

d. The Director of Plans go to the JCS with results of the ARDC study as modified by a decision for lesser hardening.

e. That authorization be sought for the Air Force to proceed with access roads and excavation to protect the approved Beneficial Occupancy Date (April 1962). (The Board noted that the Congress has approved funds for this).

30. The Board approved the recommendations of the Panel, except that references to a "systems contractor" should be revised to indicate an analysis of systems integration.

[redacted]
Colonel, USAF
Secretary
Weapons Board