REPORT TO THE COMMITTEE
ON SCIENCE AND ASTRONAUTICS
HOUSE OF REPRESENTATIVES

[redacted]

Review Of Selected Aspects Of The Management And Operation Of Tracking And Data Acquisition Stations At Goldstone, California

B-162407(3)

National Aeronautics and Space Administration

BY THE COMPTROLLER GENERAL
OF THE UNITED STATES

JULY 10, 1969

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-162407(3)

Dear Mr. Chairman:

The accompanying report presents the results of our review of selected aspects of the management and operation of the National Aeronautics and Space Administration's tracking and data acquisition stations at Goldstone, California. Comments were obtained from the Space Administration and were considered in the preparation of the report.

As agreed with the Committee staff, copies of this report will be given to the Space Administration.

We plan to make no further distribution of this report unless copies are specifically requested, and then we shall make distribution only after your agreement has been obtained or public announcement has been made by you concerning the contents of the report.

Sincerely yours,

Comptroller General
of the United States

The Honorable George P. Miller, Chairman
Committee on Science and Astronautics
House of Representatives

Contents

ABBREVIATIONS

ATS	Applications Technology Satellite
BFEC	Bendix Field Engineering Corporation
DSN	Deep Space Network
GAO	General Accounting Office
GSFC	Goddard Space Flight Center
JPL	Jet Propulsion Laboratory
MSFN	Manned Space Flight Network
NASA	National Aeronautics and Space Administration
OTDA	Office of Tracking and Data Acquisition
SPL	Spare Parts List
STADAN	Space Tracking and Data Acquisition Network

COMPTROLLER GENERAL'S REPORT TO THE CHAIRMAN, HOUSE COMMITTEE ON SCIENCE AND ASTRONAUTICS

REVIEW OF SELECTED ASPECTS OF THE MANAGEMENT AND OPERATION OF TRACKING AND DATA ACQUISITION STATIONS AT GOLDSTONE, CALIFORNIA
National Aeronautics and Space Administration B-162407(3)

D I G E S T

WHY THE REVIEW WAS MADE

The General Accounting Office (GAO) initially reviewed financial information on the operations of the National Aeronautics and Space Administration's (NASA's) tracking and data acquisition stations located at Goldstone, California, in response to an August 1967 request of the Chairman, House Committee on Science and Astronautics.

A report on that review (B-162407(3)) was issued to the Chairman on February 15, 1968. GAO was requested to undertake an additional review of operations of the Goldstone tracking and data acquisition stations and to make a similar review of the Madrid, Spain, facilities. The report on the review of the Madrid facilities (B-162407(8)) was issued to the Chairman on March 11, 1969. This report covers the additional review at the Goldstone stations.

FINDINGS AND CONCLUSIONS

Special-purpose equipment from the Lunar Orbiter Program, valued at over $1 million, had been stored at the Deep Space Network (DSN) Echo station since February 1968 although there were no plans for its use at the station. NASA's Jet Propulsion Laboratory (JPL) initiated steps to dispose of the equipment in August 1968.

Similarly, about $1.4 million in Surveyor Program command and data handling equipment had been in storage at Goldstone and at other Government facilities since February 1968.

In March 1969, predisposal screening action had been completed on both the Lunar Orbiter and the Surveyor Program equipment. The equipment was then scheduled for transfer to the General Services Administration for screening through other Federal agencies. (See p. 11.)

Each of the tracking and data acquisition networks at Goldstone has separate calibration and repair facilities. DSN officials are of the opinion that their facilities could provide support to all the stations. (See pp. 11 and 12.)

Controls over supplies at the DSN Goldstone Central Stores Depot were adequate. Improvements were needed in supply practices at the Manned Space Flight Network (MSFN) and Space Tracking and Data Acquisition Network (STADAN) stations. GAO test counts disclosed error rates of 13 percent in the MSFN stock records cards and 45 percent in the STADAN cards.

As a result of earlier work by GAO, NASA undertook a comprehensive review of all property, including supply-support items at the tracking stations, under the responsibility of the Goddard Space Flight Center (GSFC), Greenbelt, Maryland. Actions proposed by GSFC included the completion of physical inventories of supply items at all tracking stations by the end of calendar year 1969. GAO endorsed that proposal and stated that it believed that the inventories should be coupled with analyses of inventory discrepancies with a view toward making the necessary improvements in station procedures and practices. (See pp. 13 to 15.)

At the various Goldstone DSN stations, certain spare parts were being stocked that may have been excess to the stations' needs. The Goldstone DSN stations are reasonably close to the DSN depot and apparently could obtain most spare parts readily from the depot when necessary. (See pp. 15 to 17.)

RECOMMENDATIONS OR SUGGESTIONS

GAO proposed that NASA study the methods by which the calibration and repair work at Goldstone was done, to determine whether the most efficient and economical methods were being utilized. (See p. 12.)

GAO proposed also that NASA require JPL to identify critical spare parts which must be stored at each Goldstone station and that all other components be returned to the DSN depot. (See p. 17.)

AGENCY ACTIONS AND UNRESOLVED ISSUES

In general, NASA agreed with the GAO findings and concurred in GAO proposals. NASA comments are included as appendix I to this report.

INTRODUCTION

The General Accounting Office has examined into selected aspects of the management and operation of the tracking and data acquisition stations operated by the National Aeronautics and Space Administration at Goldstone, California, and near Madrid, Spain. Our review was made pursuant to a request by the Chairman, Committee on Science and Astronautics, House of Representatives, and in accordance with agreements made in February 1968 with Committee staff members.

This report deals with our examination at the Goldstone stations. A separate report was issued to the Committee (B-162407(8), March 11, 1969) regarding our work at the facilities near Madrid. We did not evaluate the manner in which the tracking and data acquisition mission activities were performed. The scope of our work is presented on page 18.

This report includes discussions of certain aspects of the various operations at the Goldstone stations and in some cases presents our conclusions and NASA's views. We were, however, unable to reach any evaluative conclusions for certain areas, such as personnel utilization, because of the technical nature of the activity involved.

The National Aeronautics and Space Act of 1958, which established NASA, authorized the peaceful exploration of space. Such exploration is accomplished by the use of manned and unmanned space vehicles, in proximity to the earth and in outer space, which collect data and transmit it back to ground stations. NASA has established three networks of ground stations to track space vehicles and to receive and collect the data that is transmitted--the Deep Space Network, the Manned Space Flight Network, and the Space Tracking and Data Acquisition Network.

The NASA Headquarters office responsible for tracking and data acquisition activities is the Office of tracking and Data Acquisition (OTDA). OTDA's responsibilities include the development and operation of communications,

tracking and data acquisition, and the data processing facilities and systems required to support NASA's manned and unmanned space programs.

The Goldstone stations--four DSN, one MSFN, and one STADAN--are situated on 68 square miles of land near the Goldstone Dry Lake. NASA obtained a permit from the Department of the Army to use this land for a 25-year period ending December 31, 1985, with a renewal option for an additional 25 years. A location map of the Goldstone stations is presented as appendix II.

The California Institute of Technology, under a contract with NASA for the operation of the Government-owned Jet Propulsion Laboratory, is responsible for the operations of the four DSN stations at Goldstone. (Because of its unique position in the operation of JPL, the contractor is referred to in this report as JPL.)

The four DSN stations at Goldstone are named "Pioneer," "Echo," "Venus," and "Mars." Pioneer, the first DSN station constructed at Goldstone, began operations in 1958. The Echo station serves as the administration center and operations headquarters for the Goldstone DSN stations. This station also provides certain facilities and services for the Goldstone MSFN and STADAN stations. The communications building at the Echo station is the control center for Goldstone DSN communications with JPL and with other DSN stations. The Echo station also provides emergency communications to the Goddard Space Flight Center. The Venus station is the focal point for DSN research and development projects and serves as a backup station for the Pioneer and Echo stations. The Mars station, which was dedicated in April 1966, is equipped with a 210-foot-diameter antenna which, according to NASA, is the largest and most sensitive tracking antenna in the world.

JPL entered into a cost-plus-award-fee-type contract with the Bendix Field Engineering Corporation (BFEC) for the maintenance and operation of certain DSN stations, including Goldstone and the Space Flight Operations

Facility at Pasadena, California, for the period November 1, 1966, through October 31, 1969, at an estimated cost of about $37 million.

Operation and maintenance of MSFN, which provides support for the Apollo Program, is the responsibility of GSFC. The MSFN station at Goldstone became operational in January 1967. GSFC has contracted with BFEC to operate and maintain 11 of the 14 MSFN stations, including the Goldstone station, on a cost-plus-award-fee basis. For fiscal years 1966 through 1969, total costs for the MSFN stations under the contracts with BFEC, exclusive of fiscal years 1968 and 1969 supply support, are estimated at $109 million. For fiscal years 1968 and 1969, GSFC has contracted with BFEC, under a separate contract, to provide supply support for MSFN and STADAN at an estimated cost of about $27 million.

The Goldstone MSFN station has a secondary site, collocated at the Pioneer DSN station, which is referred to as the MSFN wing, because it consists of an extension to the deep-space operations building. The wing was constructed to provide backup capability for the MSFN prime site in the event that the prime MSFN facility became incapable of performing its mission or if separate but concurrent support from each of the two MSFN sites were to become necessary during Apollo lunar missions. A microwave relay communication system connects the MSFN prime and wing sites. Similar arrangements for backup capabilities have been established at the MSFN and DSN stations located at Madrid, and at Canberra, Australia.

The Goldstone STADAN station is one of 13 STADAN stations under the management responsibility of GSFC. GSFC has contracted with BFEC, under award-fee-type contracts to operate and maintain the Goldstone and six other STADAN stations. For the period October 1, 1965, through September 30, 1970, total costs under BFEC contracts for the operation and maintenance of STADAN exclusive of supply-support costs beginning with fiscal year 1968, are estimated at about $48 million. Although the Goldstone STADAN station previously supported various missions, it now provides support primarily for the Applications Technology

Satellite (ATS) programs. The Minitrack system located at the station, which was used in connection with earlier missions, has not been in operation since November 1966.

Photographs provided by NASA of the DSN, MSFN, and STADAN stations at Goldstone are presented as appendixes III through VIII.

PERSONNEL

EMPLOYMENT LEVELS

At December 31, 1968, there were 708 personnel assigned to the Goldstone tracking stations. The following schedule shows the number of personnel at the Goldstone tracking stations as of December 31 for the last 2 years, and the change between 1967 and 1968.

	December 31, 1967	December 31, 1968	Net change decrease(−)
DSN:			
JPL	39	35	−4
BFEC and subcontractors:			
Pioneer	61	34	−27
Echo	57	61	4
Venus	25	35	10
Mars	64	70	6
Other (note a)	285	238	−47
Total DSN	531	473	−58
MSFN:			
BFEC and subcontractor	68	103	35
Civil service	2	2	-
Local hire	4	3	−1
Total MSFN	74	108	34
STADAN:			
BFEC	113	126	13
Civil service	1	1	-
Total STADAN	114	127	13
Total	719	708	−11

[a] Includes personnel whose function applies to more than one DSN station at Goldstone or to the DSN on an overall basis, such as personnel involved with support services, supply operations, communications, documentation, security, and administrative matters.

According to NASA officials, the overall DSN staffing reduction during calendar year 1968 was due to (1) changes in tracking station work load resulting in a net decrease in DSN tracking station activity and (2) the relocating to JPL of certain supply operations, which resulted in the transfer of 22 employees from Goldstone to DSN supply-support activities in the Pasadena area. DSN tracking operations decreased considerably at the DSN Pioneer station because of the increased use of the MSFN wing for Apollo Program purposes.

NASA officials advised us that total staffing at the MSFN station had been increased by 34 employees during calendar year 1968 because of the increased Apollo Program activities. Although NASA had anticipated that it would be able to reduce the number of employees at the STADAN station during 1968 because of changes in station staffing criteria, NASA officials stated that increases in ATS mission activities had resulted in a net increase at the station of 13 employees.

PERSONNEL UTILIZATION

At the DSN tracking stations, personnel were engaged in mission-support activities, in calendar year 1968, about 45 percent of the available man-hours. Since the ATS programs were initiated in October 1967 at the STADAN station, 50 percent of the available man-hours have been devoted to mission support. At the MSFN station, 60 percent of available man-hours were devoted to mission-support activities in calendar year 1968 compared with about 15 percent in calendar year 1967. The remaining available man-hours at the various Goldstone stations have been applied to station maintenance, testing, training, and other station activities.

The relatively low utilization of MSFN personnel for mission-support activity in calendar year 1967 was due to the deferral of missions following the Apollo fire in January 1967. Station mission-support activity increased in 1968 as the Apollo Program progressed toward its lunar-landing goal. We were told by NASA that MSFN station

personnel would be utilized in mission-support activities during 1969 at about the 1968 level.

CROSS UTILIZATION OF PERSONNEL BETWEEN STATIONS

We were informed by the various station directors at Goldstone that they had no plan for cross-utilizing personnel between the DSN, MSFN, and STADAN stations. We were informed, however, that two operators on each shift at the DSN Pioneer station maintained and operated certain DSN equipment required for MSFN missions when the MSFN wing utilized the Pioneer station antenna. We were informed also that a certain amount of cross utilization of personnel did occur between the various DSN stations and between the MSFN prime and wing sites.

Because it appeared to us that cross utilization of personnel between networks might result in savings in personnel costs, we discussed the matter with station officials. One DSN station director told us that the cross utilization of personnel between networks would be practicable because certain items of equipment used by the DSN and MSFN stations had been purchased by JPL and were, in fact, identical. He specifically cited portions of the S-Band radio receiving and transmitting systems. Other DSN officials told us, however, that they believed that the cross utilization of personnel between DSN and MSFN stations might result in technical personnel being less proficient in performing certain mission activities.

MSFN station officials told us that cross utilization was not practicable. They stated that (1) most of the equipment and missions of MSFN were not the same as the equipment and missions of the other networks, (2) additional training would be required to enable personnel operating the equipment to become proficient with different network operating procedures, and (3) separate contracts were in effect for station operations for each of the networks.

STADAN officials indicated that it would not be practicable to cross-utilize personnel between the STADAN and

other stations because STADAN tracking equipment currently in use at the station was built specifically for ATS operations and was not generally similar to equipment operated by the other networks.

In commenting on our draft report, NASA told us that any substantial sharing of technical operating personnel between the different network stations would not be practicable because (1) operating personnel were trained in the operation of specific network equipment and in the unique procedures required by a specific program or project, (2) there were unanticipated changes in station requirements and flight schedules, and (3) there were coincident periods requiring peak activity by each station and network.

PROPERTY

EXCESS EQUIPMENT

At the time of our field review in July and August 1968, we found that excess special-purpose equipment valued at over $1 million, from the Lunar Orbiter Program, had been stored at the DSN Echo station from February 1968 although there were no plans for its use at the station. A similar situation had been noted during our review at the Madrid facilities. We found that this situation at Goldstone arose because of a misunderstanding at the time of the transfer of responsibility for Lunar Orbiter Program equipment from the Langley Research Center, Hampton, Virginia, to JPL. At that time no authority to initiate disposal action was granted to JPL. In August 1968 JPL, after obtaining the necessary authority, initiated action to dispose of the equipment.

We found also that JPL Surveyor Program command and data handling equipment, with an estimated value of about $1.4 million, had been in storage at the Goldstone stations and at other Government facilities from February 1968. After completion of our field review, NASA informed us that plans were under way for disposal of this equipment.

In March 1969, predisposal screening action had been completed on both the Lunar Orbiter and Surveyor Program equipment which was then scheduled for transfer to the General Services Administration for screening through other Federal agencies.

CALIBRATION AND REPAIR ACTIVITIES

DSN, MSFN, and STADAN each have separate calibration and repair facilities at the Goldstone stations. The DSN facility consists of two calibration and repair depots, one designated as class A and the other as class B. The class A depot, which has a larger amount of equipment than the class B depot, calibrates to a higher degree of accuracy and has a greater repair capability. The class A depot provides calibration and repair services for all

stations of DSN. The class B depot calibrates and repairs equipment for the four DSN stations at Goldstone. Equipment that the class B depot is not capable of calibrating or repairing is sent to the class A depot. There are a total of 52 technical and clerical personnel at the two DSN depots.

At the MSFN facility, three employees are engaged in calibration and repair activities. Two STADAN employees perform calibration services at the STADAN facility. We noted that the MSFN and STADAN stations at Goldstone have over 120 pieces of calibration equipment valued at about $65,000. Both the MSFN and STADAN stations send modules and components which they are not capable of calibrating and repairing to the BFEC depot at Owings Mills, Maryland. The transportation costs of shipping items to Owings Mills and returning them to Goldstone were not readily determinable.

We were advised by DSN officials that the DSN depots could absorb the calibration and repair work load of the MSFN and STADAN stations without increasing the current amount of DSN equipment.

On the basis of similar findings during our review of calibration and repair activities at the Madrid facilities, we proposed that NASA undertake a study of the different methods by which calibration and repair work was done overseas, in order to establish whether the most efficient and economical methods were being utilized. We made a similar proposal to NASA with respect to the Goldstone stations. NASA informed us that the matter of collocated calibration and repair activities, both overseas and at Goldstone, was under review.

SUPPLY SUPPORT

SUPPLY OPERATIONS

Our fieldwork at Goldstone showed that inventory controls over supply items at the DSN depot were adequate. At the MSFN and STADAN stations, however, improvements in supply practices were needed.

The DSN stations receive support from the DSN depot which is operated by BFEC under contract with JPL. The depot purchases about 60 percent of its supply items. It receives the remaining 40 percent through JPL sources. The MSFN and STADAN stations receive support from the BFEC Depot at Owings Mills, which is operated under contract with GSFC. Certain supplies are purchased locally by each of the stations. As of April 30, 1968, a total of 44 employees were assigned to supply operations at Goldstone--32 at the DSN depot, seven at the STADAN station, and five at the MSFN station.

At June 30, 1968, the combined supply inventories at Goldstone totaled 43,500 line items--about 19,700 at the DSN depot, about 12,500 at the MSFN station, and about 11,300 at the STADAN station. The DSN stations generally did not maintain stock levels of supply items other than for certain spare parts.

Perpetual inventory records were maintained by the DSN depot and by the MSFN and STADAN stations. The total cost of the inventories at Goldstone could not be ascertained because such data was available for the DSN depot only. The MSFN and STADAN stations do not maintain records showing the cost of their inventories, although NASA has advised us that it is taking action to bring the station stocks under financial control. Inventories at the DSN depot were valued at about $1 million.

The latest physical inventory at the DSN depot was taken in March 1968. The physical inventory counts were compared with the quantities shown on the stock record cards. These comparisons revealed a net shortage of items valued at about $4,000; less than one half of

1 percent of the total inventory value. After evaluating the reasons for the shortage, NASA determined that JPL should not be held accountable, and in July 1968 the shortage amount was dropped from JPL accountability.

The MSFN station initially received supply items for use at the station in about 1966. Prior to the time of our review, the only physical inventory of supply items at the MSFN station was taken by BFEC during the period January through March 1967. At that time, stock record cards were prepared and were used as a basis for a computerized inventory listing. We were informed that, on a test basis, inventory counts were made by station personnel and compared with quantities shown on the stock records and that the stock record cards were then adjusted to agree with the inventory counts. We were not able to determine how frequently such test checks were made.

We made a physical count of 100 supply-support items at the MSFN station on June 17, 1968, and compared the counts to the quantities shown on the stock record cards. We noted discrepancies between the stock record cards and our counts for 13 percent of the items. Supply personnel were not able to explain the discrepancies although they subsequently adjusted the stock record cards to agree with our counts.

We were informed that the latest complete inventory of supply items at the STADAN station had been taken in June 1966. STADAN officials stated, however, that spot checks had been made of high-usage items subsequent to that time. To test the accuracy of the STADAN stock record cards, we made a count in April and June 1968 of a total of 100 supply items at the station and compared our counts with the quantities shown on the stock record cards. These comparisons showed that the stock record card quantities did not agree with our counts for 45 of the items. These differences seem to indicate a serious weakness in inventory controls which could adversely affect station operations. We were informed that there had been at least one serious emergency when a supply item could not be located when needed.

Our previous work regarding property under the responsibility of GSFC resulted in a report to the Congress on the need for improved compliance with established accounting procedures (B-164674, August 28, 1968). That report was concerned primarily with controls over equipment. As a result, however, NASA management undertook a comprehensive review of all property under the responsibility of GSFC, including supply-support items at the tracking stations. Actions proposed by GSFC as a result of that study include taking physical inventories of supply items at all tracking stations by the end of calendar year 1969. We endorse GSFC's proposal to take and complete physical inventories at all tracking stations. We believe also that the inventories should be coupled with analyses of inventory discrepancies with a view toward making the necessary improvements in station procedures and practices.

We intend to evaluate the actions to be taken by NASA, to ascertain the effect they may have on the supply-support problems noted during our review at the Goldstone MSFN and STADAN tracking stations.

CONTROL OF DSN SPARE COMPONENTS AND MODULES

Our review indicated that certain spare parts were being stocked at three of the four DSN stations at Goldstone, which may have been excess to the stations' needs.

For each equipment subsystem at the stations, the DSN provides the station managers with a Spare Parts List (SPL) which shows the number of spare components and modules recommended to be stored at the stations. The SPLs enable the station manager to select and stock the spare components and modules necessary to support the equipment subsystems. Components are individual parts which, when assembled with other components, form modules. A DSN station may use either component parts or a complete module to effect repairs, depending on the nature of an equipment failure. When a module is replaced, it is returned to the DSN repair depot at Goldstone for inspection and possible repair. In January 1969, there were

72 SPLs in effect. As of January 23, 1969, there were over 9,800 components and 3,000 modules, valued at almost $1 million, stocked at the Echo, Pioneer, and Mars stations. The Venus station, which is used mainly for research and development rather than operations, did not stock any SPL items.

Each operational DSN station maintained its own stock levels of components and modules. The DSN depot does not have stock accountability for the SPL items located at the stations. The Goldstone DSN depot maintains stocks of components to replace station components as they are consumed at the stations. The DSN repair depot at Goldstone maintains a stock level of spare modules to replace modules received from the stations for repair.

We selected components shown on the SPL for the S-Band receiver subsystem and compared the number of components shown on the SPL with the number of components stocked at each of the three operational Goldstone DSN stations. We noted that the Echo station stocked all 316 components listed on the SPL, while the Mars and Pioneer stations stocked only 84 and 45 of the listed components for the same subsystem, respectively. We were informed by the Echo station subsystem engineer that, of the 316 components listed, only 16 were actually critical components which, of necessity, should be located at the stations. We did not review the manner in which modules were stocked at the stations.

In view of the different number of components stocked at the three stations and considering the comments of the Echo station subsystem engineer, it appeared that the total number of components maintained at the DSN stations might be materially reduced if the determination as to which items were critical and should be located at the stations was made at the JPL or network level. Also, it seemed to us that the relatively close proximity of the Goldstone stations to the supply depot at Goldstone should be considered in deciding the items to be stored, and that only items that might be critically needed should be stored at the stations. It was our opinion that consolidation of the inventory of all noncritical

components at the depot level would enable a reduction in the total stock level of components maintained at Goldstone. We were told by depot personnel that, as the depot already stocked inventories of SPL components, station components returned to the depot would not require significant additional warehousing effort or storage facilities.

We therefore proposed that NASA require JPL to identify components, critical to DSN station operations, which must be stored at each Goldstone station and to require that all other SPL components be returned to the DSN depot. Although we did not review the supply practices for spare modules, it appeared to us that a situation comparable to that for components might also exist for modules, because of the similarity in the manner in which the station stocks for spare modules had been established. Accordingly, we proposed that NASA request JPL to review the manner in which spare modules were stocked, with a view toward maintaining at the Goldstone DSN stations stocks for only those modules that were critical to mission operations.

NASA officials informed us that, in accordance with our proposals, they had initiated a review of station stock levels of components associated with the SPLs, with a view to establishing proper levels of support at both the stations and the depot. They informed us that JPL had undertaken action to eliminate components from the individual station SPLs and to stock such components only at the depot. They informed us also that spare module requirements were being reviewed, to determine which modules and quantities should be retained at the station and network depot levels.

SCOPE OF REVIEW

Our work was directed primarily toward a review of selected aspects of management and operations in the areas of personnel, property, facilities and equipment, and supply activities. The review was performed at NASA Headquarters, Washington, D.C.; GSFC, Greenbelt, Maryland; JPL, Pasadena, California; and the six tracking stations located about 150 miles northeast of Los Angeles at Goldstone, California.

During our review, we examined records and reports relevant to the operations of these facilities and held discussions with responsible officials of NASA and the contractors that operate the stations. The review did not cover automatic data processing activities, including equipment, since, as was agreed in meetings with Committee staff members, this aspect of DSN activities at Goldstone was being covered by a separate review of such operations at JPL.

APPENDIXES

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546

IN REPLY REFER TO: TC

MAR 10 1969

Mr. Morton E. Henig
Assistant Director, Civil Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Henig:

Attached are the NASA comments on your draft report covering your review of the Operations of the Tracking and Data Acquisition Facilities at Goldstone, California.

In accordance with your recommendations we are conducting a review of the station stock levels of components associated with Spare Parts Lists with a view to establishing proper levels of support at both the stations and network depot.

[See GAO note.]

The remaining comments are intended to supplement or clarify the material or data contained in the report to give the Committee a better understanding of the operations covered by your review.

We appreciate the opportunity to comment on the matters discussed in your draft report and will be happy to discuss this subject with you if further comments or additional information are necessary.

Sincerely yours,

Harold B. Finger
Associate Administrator for
Organization and Management

Attachment
As Stated

GAO note: Comments relate to matters included in draft report which have been deleted from final report.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

COMMENTS ON GAO DRAFT REPORT ON
REVIEW OF OPERATION OF THE TRACKING AND
DATA ACQUISITION FACILITIES, GOLDSTONE, CALIFORNIA

SECTION I

The report has been reviewed by appropriate NASA officials and recognition given to the recommendation made by GAO. Action is underway by the Jet Propulsion Laboratory (JPL) to implement the recommendation made in the report. Our comment on the specific recommendation is provided below.

GAO Recommendation, Page 21:

"We recommend that NASA require JPL to identify components critical to DSN station operations which must be stored at each Goldstone station and that all other SPL components be returned to the DSN depot for control and use in establishing a more accurate level of support to be maintained of SPL items. Although we did not review the stockage practices of spare modules, because of similarity in the manner in which the station stocks were established, it appears that a situation comparable to that for components exists also. Accordingly, we believe that NASA should request JPL to review the manner in which spare modules are stocked, with a view toward maintaining stocks at the Goldstone locations that are critical to mission operations."

Comment:

The JPL has undertaken action to eliminate piece part components from the individual station Spare Parts Lists (SPL) and to stock such components only in the network depot. The module spares requirements are being reviewed on a cost-effective basis to determine which modules and quantities should be retained at the stations and those modules and quantities that should be retained at the network depot.

ATTACHMENT

[See GAO note.]

SECTION III

General Comments:

For the purpose of clarification and providing either requested data or more current information we are submitting the following comments for your consideration:

1. Page 8, first paragraph:

As requested we are providing the following information on personnel utilization for mission support during calendar year 1968. The DSN tracking personnel were involved with mission support activities about 45% of the available man-hours.

ATTACHMENT

GAO note: Comments relate to matters included in draft report which have been deleted from final report.

The proportion of MSFN station personnel man-hours applied to mission support activities during calendar year 1968 was approximately 60%.

2. Page 9, Cross Utilization of Technical Personnel Between Stations:

This section of the report noted various opinions obtained at the local level as to the feasibility of cross utilizing technical operating personnel between stations. The following statement is provided for the purpose of clarifying the various factors that must be considered by management in the staffing and utilization of technical personnel:

"The STADAN, DSN, and MSFN facilities at Goldstone are staffed in accordance with the support requirements of the various projects. Operating personnel are thoroughly trained in the operation of specific network equipment and the unique procedures required by a program or project. The schedules of these programs or projects are such that there are coincident periods requiring peak activity by each network and station in preparing for or actually providing mission support. These factors, together with unanticipated changes in requirements and flight schedules, generally make it impractical to have any substantial sharing of technical operating personnel between the stations."

3. Page 12, second paragraph:

The report stated that there were no fixed plans for disposition of excess Surveyor equipment at Goldstone at the completion of the GAO review. Currently, plans are underway for disposal of JPL Surveyor equipment at Goldstone. Residual lists are being clarified and priced. NASA internal predisposal screening of this equipment is scheduled for completion in March 1969.

[See GAO note.]

ATTACHMENT

GAO note: Comments relate to matters included in draft report which have been deleted from final report.

[See GAO note.]

6. Page 16, second sentence:

In this section of the report reference was made to a previous GAO recommendation contained in the draft audit report on operations at the Madrid Tracking and Data Acquisition Facilities in which it was suggested that a review of repair and calibration activities be undertaken at overseas facilities. The OTDA has had this matter under review and will undertake the necessary action to implement the GAO recommendation insofar as feasible both at overseas locations and at Goldstone.

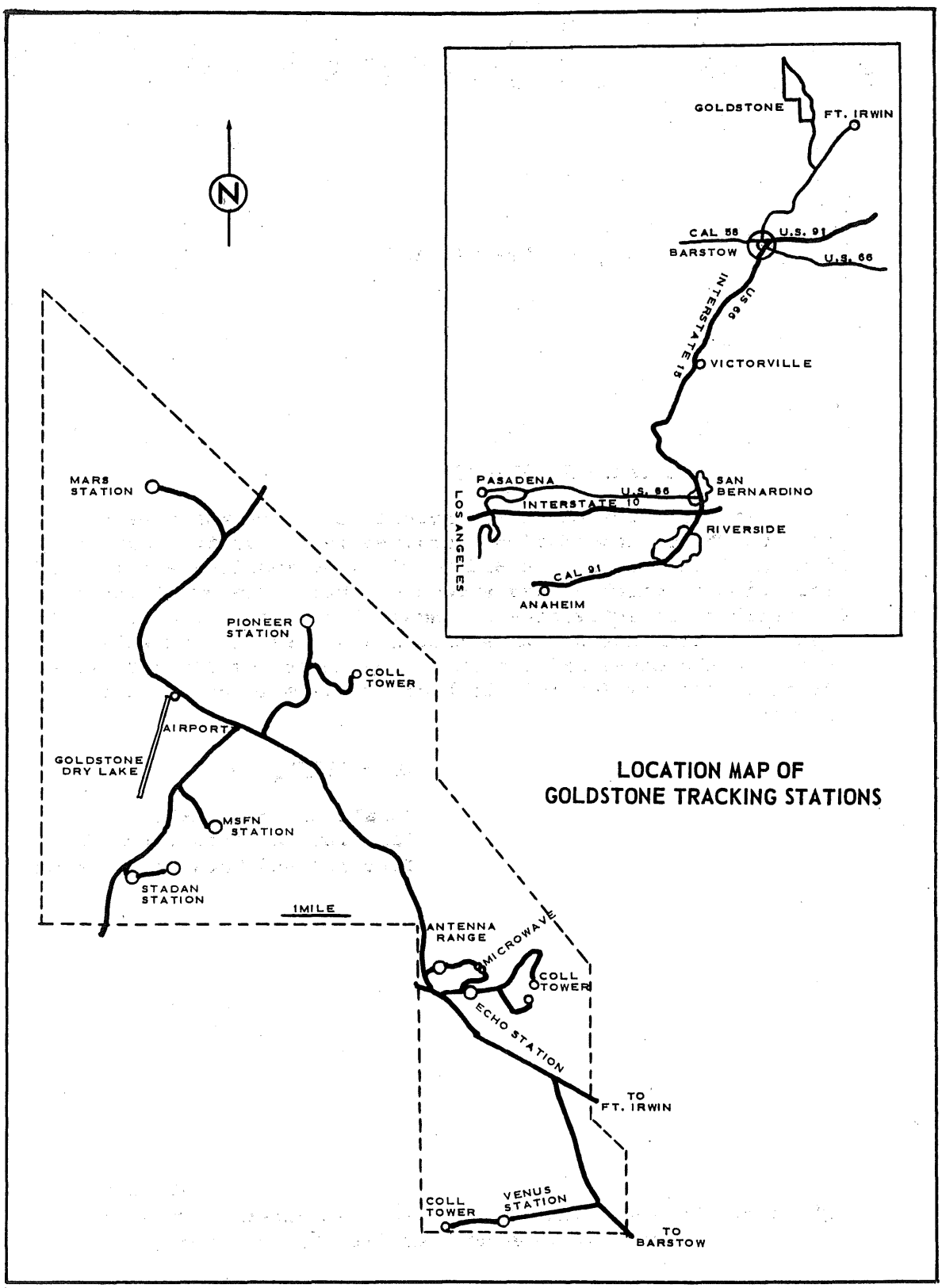
G. M. Truszynski

Gerald M. Truszynski
Associate Administrator for
Tracking and Data Acquisition

ATTACHMENT

GAO note: Comments relate to matters included in draft report which have been deleted from final report.

APPENDIX II


GOLDSTONE
FT. IRWIN
CAL 58
BARSTOW
U.S. 91
U.S. 66
INTERSTATE 15
US 66
VICTORVILLE
PASADENA
U.S. 66
SAN BERNARDINO
INTERSTATE 10
LOS ANGELES
RIVERSIDE
CAL 91
ANAHEIM
MARS STATION
PIONEER STATION
COLL TOWER
AIRPORT
GOLDSTONE DRY LAKE
MSFN STATION
STADAN STATION
1 MILE
ANTENNA RANGE
MICROWAVE
COLL TOWER
ECHO STATION
TO FT. IRWIN
COLL TOWER
VENUS STATION
TO BARSTOW
LOCATION MAP OF
GOLDSTONE TRACKING STATIONS

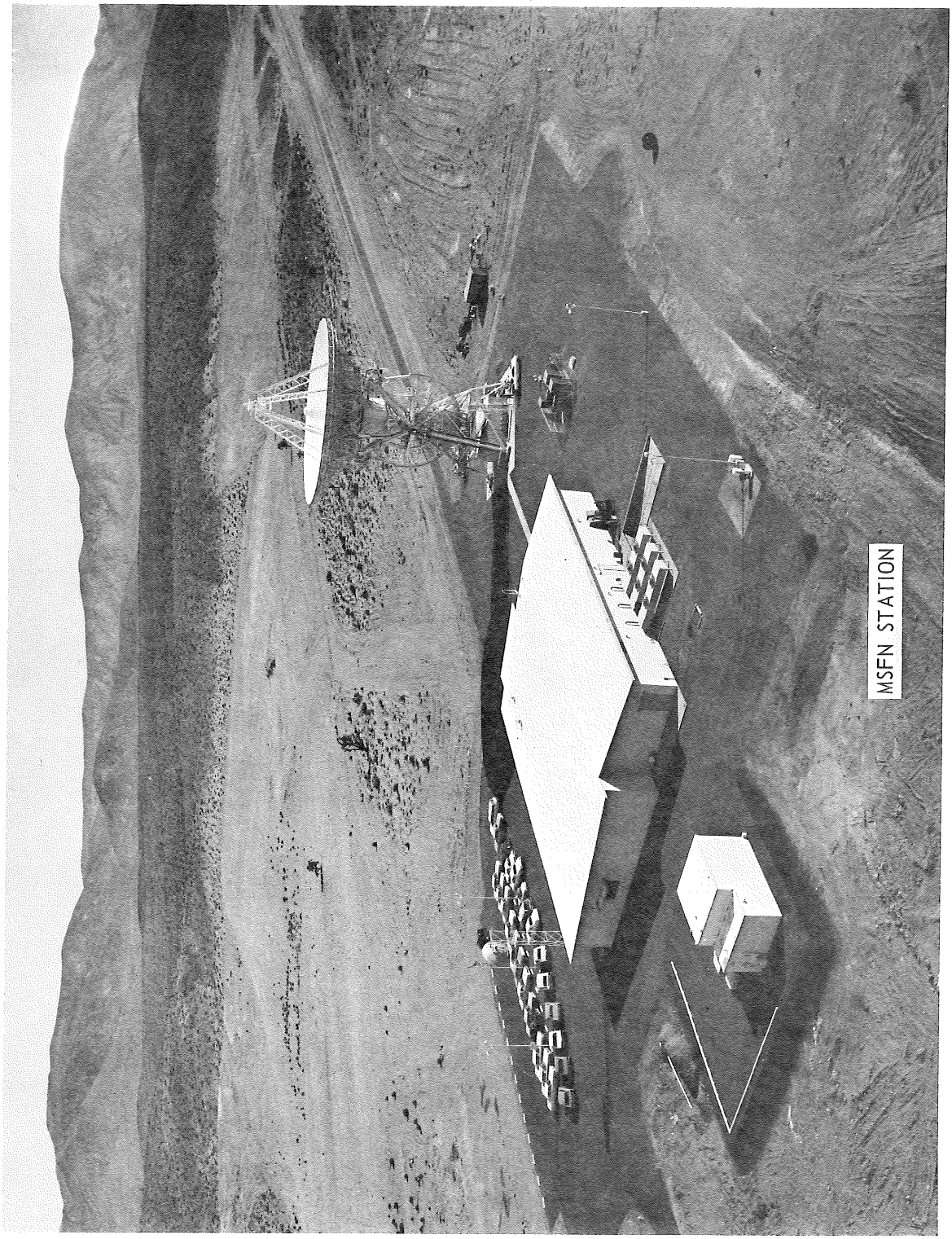
APPENDIX III

APPENDIX IV

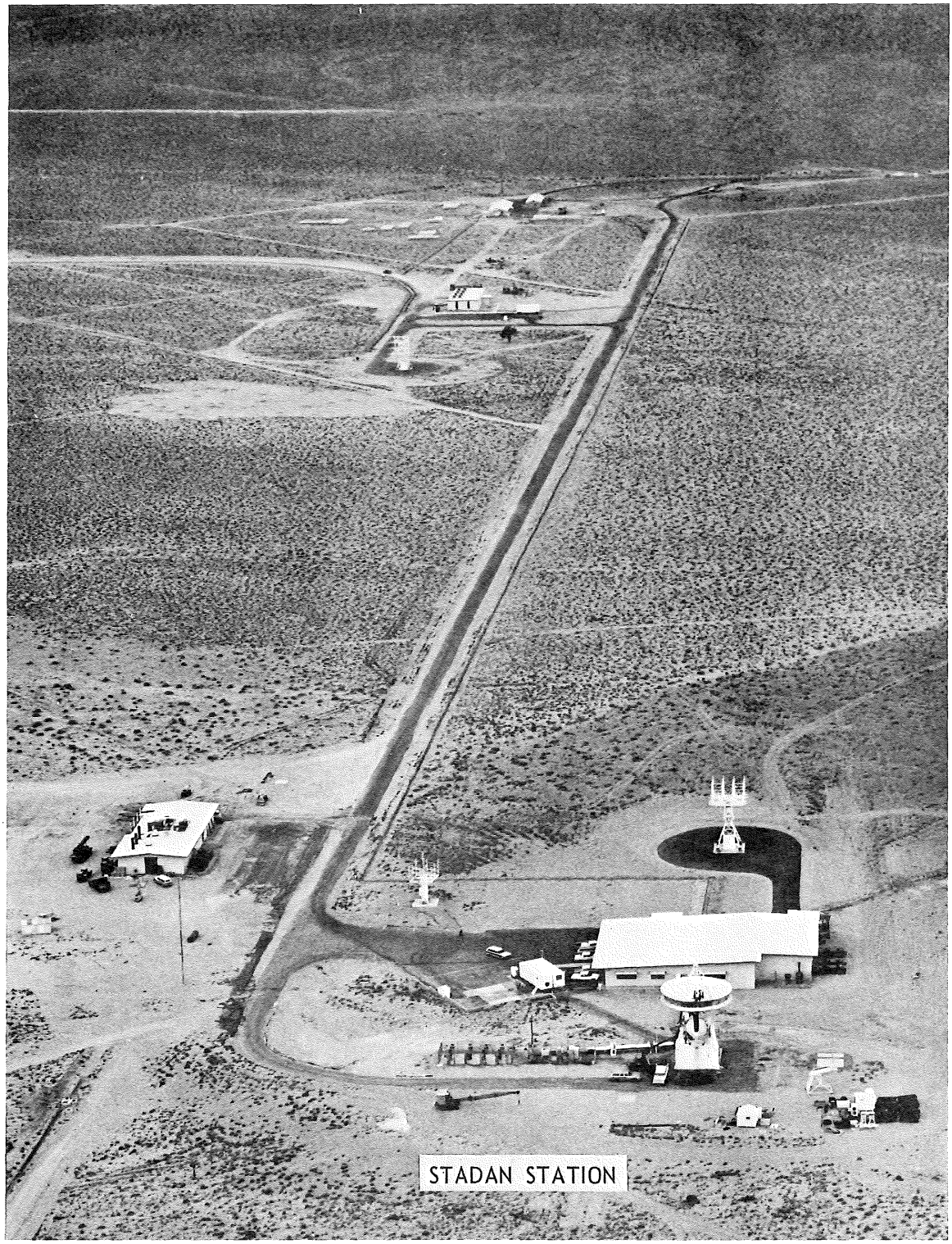
APPENDIX V

APPENDIX VI

APPENDIX VII



APPENDIX VIII



U.S. GAO, Wash., D.C.