

AD-A080 273

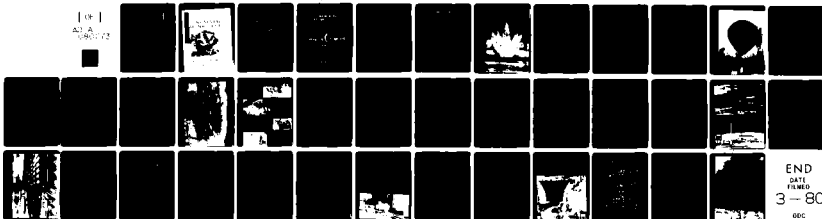
NEVADA TEST SITE (AEC) LAS VEGAS
CONTINENTAL ATOMIC TESTS 'OPERATION PLUMB BOB' SUMMER 1957. (U)
1957

F/G 18/3

UNCLASSIFIED

NL

1 of 1
AD-A
1957/2



END
DATE
FILMED
3-80
GPO

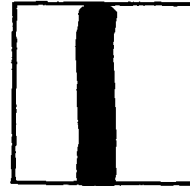
PHOTOGRAPH THIS SHEET

ADA 080273

DTIC ACCESSION NUMBER



LEVEL



INVENTORY

Continental Atomic Tests
Operation PLUMB BOB
Background Information for Observers
DOCUMENT IDENTIFICATION Summer 1957

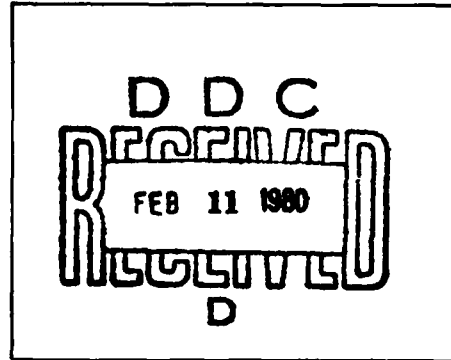
DISTRIBUTION STATEMENT A

Approved for public release;
Distribution Unlimited

DISTRIBUTION STATEMENT

ACCESSION FOR	
NTIS	GRA&I <input checked="" type="checkbox"/>
DTIC	TAB <input type="checkbox"/>
UNANNOUNCED	<input type="checkbox"/>
JUSTIFICATION	
Per Ltr on file	
BY	
DISTRIBUTION /	
AVAILABILITY CODES	
DIST	AVAIL AND/OR SPECIAL
A	

DISTRIBUTION STAMP

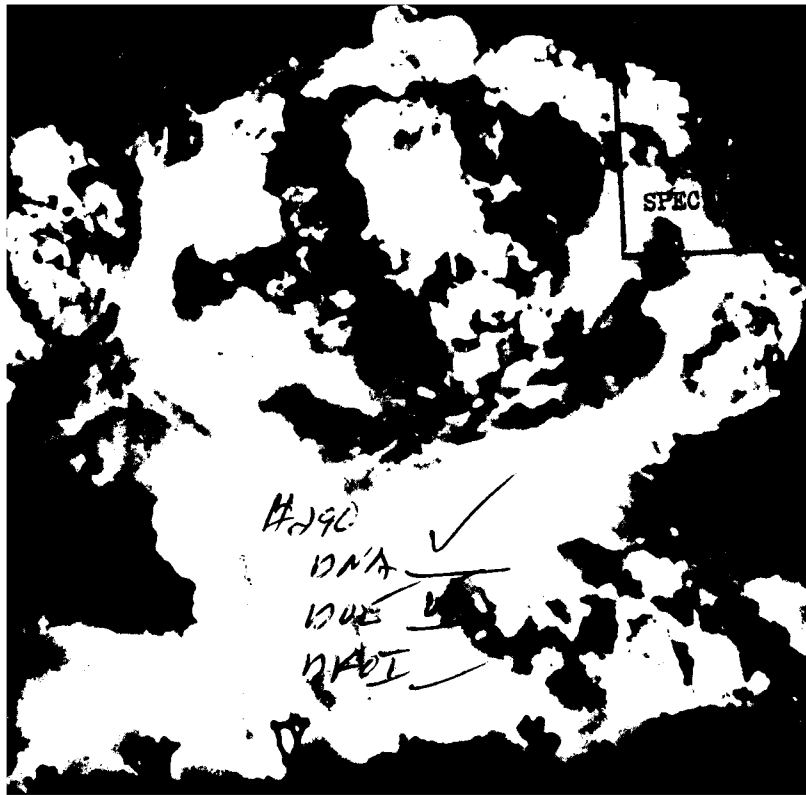


DATE ACCESSIONED

80 2 6 54

DATE RECEIVED IN DTIC

PHOTOGRAPH THIS SHEET AND RETURN TO DTIC-DDA-2



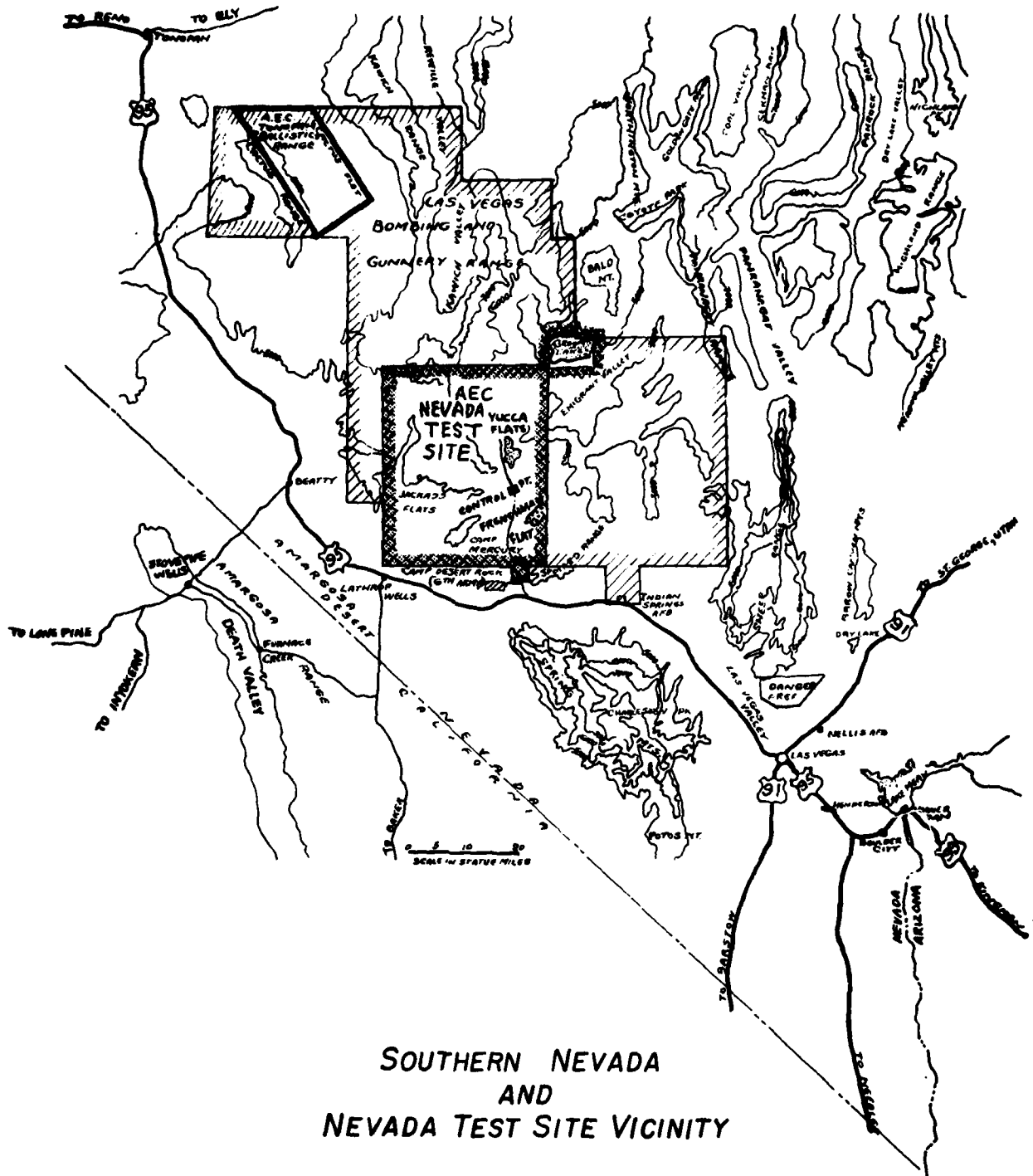
SPEC

H-290

DNA ✓

DUE

DUAL



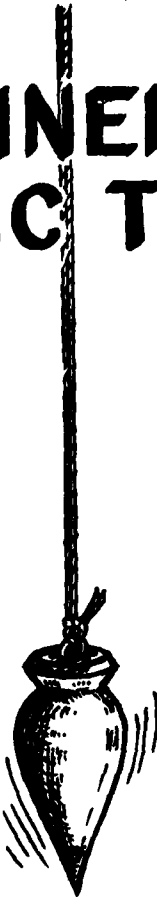
SOUTHERN NEVADA
AND
NEVADA TEST SITE VICINITY

DIL-019928

CONTINENTAL ATOMIC TESTS

C. C. 1

TECHNICAL ALBUM
APR 30 1957
of the
a/19958
ARMED FORCE
SPECIAL WEAPONS PROJECT



"OPERATION PLUMB BOB"

SUMMER 1957

Statement A
Approved for public release
Distribution unlimited

AEC NEVADA TEST SITE

U. S. ATOMIC ENERGY COMMISSION, DEPARTMENT OF DEFENSE,
AND FEDERAL CIVIL DEFENSE ADMINISTRATION

UNITED STATES
ATOMIC ENERGY COMMISSION
NEVADA TEST ORGANIZATION
OFFICE OF THE TEST MANAGER

IN REPLY REFER TO:

TO: All Observers

SUBJECT: YOUR VISIT TO NEVADA TEST SITE

On behalf of the U. S. Atomic Energy Commission, the Department of Defense, and the Federal Civil Defense Administration, I wish to welcome you to Operation Plumbbob, the Summer 1957 Series of full-scale nuclear tests at the AEC's Nevada Test Site. I am confident your presence here will make a positive contribution to the execution and understanding of our Nation's atomic weapons program.

Some personal inconvenience is inevitable since we are operating under field conditions complicated by an important, urgent, and demanding test program. We hope the information presented in this booklet will reduce this inconvenience to a minimum and also will increase the benefits you and your Government derive from your presence here.

This booklet will serve as a reference on missions, organizations, billeting and subsistence, safety and security, and various other phases of our activities at the Test Site. May I suggest that you familiarize yourself with these facts before departing for Nevada.

The Atomic Energy Commission, the Armed Forces Special Weapons Project, and the Federal Civil Defense Administration join me in the hope that your experience here will be both interesting and profitable.


JAMES E. REEVES
Test Manager

CONTINENTAL ATOMIC TESTS

TABLE OF CONTENTS

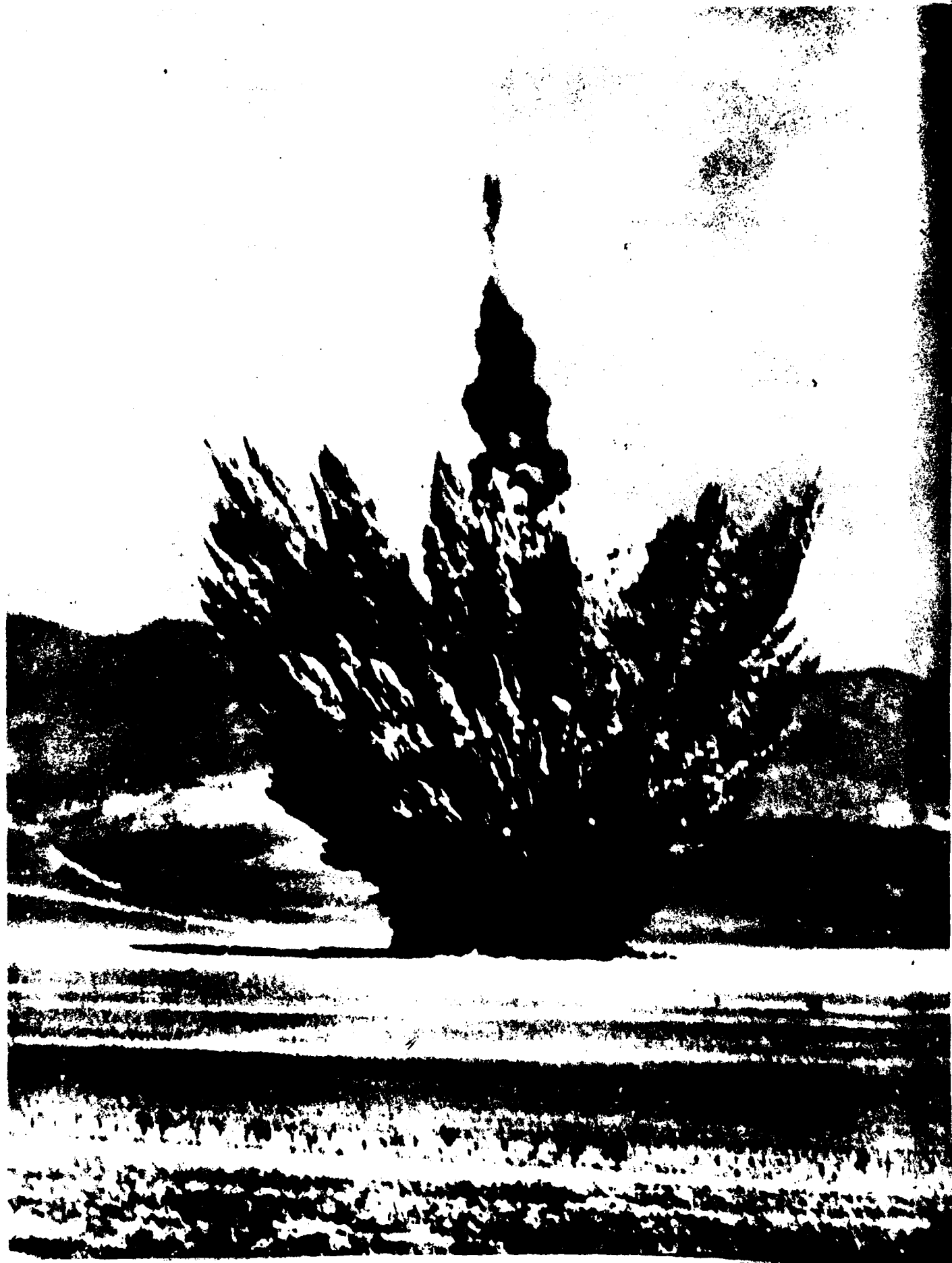
	Page
CHAPTER I	
Nuclear Testing in Nevada	1
CHAPTER II	
Safety	11
CHAPTER III	
Security	15
CHAPTER IV	
Your Visit to Nevada Test Site	19
CHAPTER V	
Southern Nevada	27

PHOTOGRAPHS

Nuclear Detonation Fireball, Spring 1952 Series, NTS	Front Cover
Sub-Surface Shot, Spring 1955 Series, NTS	Frontispiece
Shot Balloon, NTS	4
Nevada Test Site's Camp Mercury	9
Nevada Test Organization Public Safety Measures	10
Indian Springs Air Force Base	18
Security Badge Check at Entrance to Nevada Test Site	18
Camp Desert Rock	20
Downtown Las Vegas, Nevada, at Night	26
Hoover Dam	29
Military Effects Test Shot, Spring 1955 Series, NTS	Back Cover

CHARTS AND MAPS

Southern Nevada and Nevada Test Site	Inside Front Cover
Nevada Test Organization Charts	6 & 7
MATS Terminal at Washington National Airport	22
Flight Corridor to Indian Springs Air Force Base	22
Camp Mercury and Indian Springs Air Force Base	30
Las Vegas, Nevada	Inside Back Cover



CHAPTER I

NUCLEAR TESTING IN NEVADA

History

The world's first atomic bomb was exploded in the "Trinity" test at a continental site southeast of Socorro, New Mexico, on July 16, 1945. The next on-continent nuclear detonation was not until January 27, 1951, at the U. S. Atomic Energy Commission's Nevada Test Site northwest of Las Vegas, Nevada.

Forty-five weapons and experimental devices were fired in Nevada's Yucca and Frenchman Flats in five test series between the 1951 date and May 15, 1955.

Compared with the yield of detonations in the Pacific, all of those in Nevada were small, ranging from less than one kiloton to considerably less than 100 kilotons.

Despite their low yield, Nevada tests clearly demonstrated their value to all national atomic weapons programs. Each was successful, in that it added to the scientific and practical knowledge needed for development, for military employment, and to strengthen our military and civil defenses against enemy weapons.

Testing in Nevada, instead of at the distant Pacific site, has also resulted in major savings in time for development, in time and utilization of scientific and technical manpower, and in money.

Both Operation Crossroads (Bikini, 1946) and Operation Sandstone (Eniwetok, 1948) were shipbased, Pacific series. Reflecting their experience with the sizeable amounts of time, manpower and materials needed to mount and support an overseas series, the Armed Forces and the Los Alamos Scientific Laboratory both renewed exploration in 1948-1949 of the possibility for a continental site. Entering particularly into the military's interest was the shortage of land area on Pacific atolls, which would not permit extensive effects experiments.

Los Alamos' need for an increased rate of field testing -- preferably at an easily accessible continental laboratory site -- became acute in 1950. An intensive survey was made of possible sites on the North American continent. The AEC selected a portion of the Las Vegas Bombing and Gunnery Range in Nevada as best meeting the established criteria for public safety and for logistics.

Use of a continental site was approved late in 1950, first construction began January 1, 1951 and the first dry run test was conducted January 27. In less than two weeks, five devices were air-dropped and detonated above Frenchman Flat. The brief series contributed materially to atomic weapons efficiency, flexibility,

and capability. It proved the anticipated savings in time, men and money. Soon thereafter, work was started on permanent development of Camp Mercury and the forward technical areas.

The continuing value of a continental site has been proved repeatedly in the four series since the first, Operation Ranger. For instance, information obtained early in Upshot-Knothole (Spring 1953) made possible the addition to that series of an extra test shot, which permitted the cancellation of a test then scheduled for autumn 1953 and the postponement of the remainder of a fall series. There were similar values related to several tests in Teapot (Spring 1955).

The second continental series was Buster-Jangle in October and November 1951. Seven devices were detonated. There was major Armed Forces participation in effects experiments. It was during this series that an auxiliary program of troop indoctrination and training was initiated, and Camp Desert Rock established.

Operation Tumbler-Snapper included eight detonations, April to June, 1952. Exercise Desert Rock was expanded materially in this series, including several maneuvers of combat troops (Army and Marines) and several projects for indoctrination of observers from all of the Armed Forces. The series also saw the start of an Air Force program of fly-overs for training of air crews, and also included the first shot open to selected but uncleared observers since Operation Crossroads (Bikini, 1946). The Federal Civil Defense Administration participated with various civil effects tests, and invited members of its field organizations as observers. FCDA joined with the AEC in inviting representative news correspondents. For the first time in history a nuclear detonation was televised for public viewing.

Operation Upshot-Knothole, March to June, 1953, included 11 shots of which one was a DOD-requested air drop over an extensive array of military materiel and effects instrumentation. Another was the first firing of the nuclear shell for the Army's 280 mm. cannon. The FCDA again conducted an observer program.

Operation Teapot, February-May, 1955, included 14 shots and was conducted much in the same manner as Operation Upshot-Knothole. One detonation atop a 400-foot tower was requested by the DOD for military effects testing. One shot atop a 500-foot tower was witnessed by news media and FCDA observers, and tested a variety of structures and material for the FCDA. An air drop permitted detonation of one device above 30,000 feet. Troop indoctrination exercises were conducted on most of the shots.

The Current Series

The Summer 1957 series was planned to conform generally with the pattern of the Spring 1955 series, but will be more extensive than any past series. There will be joint utilization again by

various Agencies, primarily the AEC, DOD, and FCDA. No "open shot" as such is scheduled, but FCDA personnel and news media observers will be on site to view a number of detonations.

All shots will be of value for weapons development purposes, and almost all will be used for the effects studies of the DOD, the FCDA, and other Agencies.

Several shots will be fired from devices suspended in balloon cabs, and at least one may be fired deep underground. One will be detonated atop a 700-foot tower, but as in the 1955 series most devices will be fired atop 300 and 500-foot towers.

All shots in this series will be within the maximum limits on yield set for past continental tests, and a majority will be of relatively low yield.

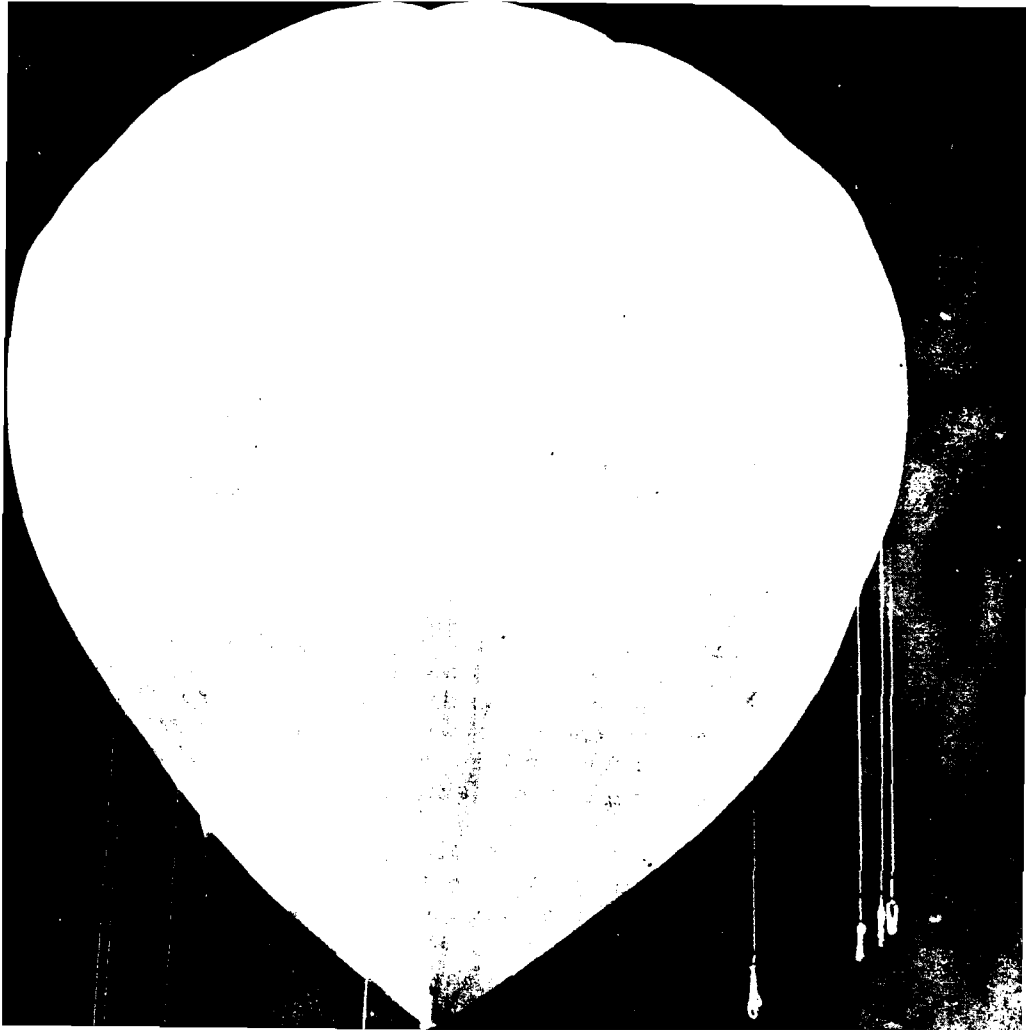
Limitations On Utilization Of A Continental Test Site

There are three major factors limiting the utilization of the Nevada Test Site: land area, housing facilities, and -- most important -- the requirement to keep to an acceptable minimum exposure of the public to off-site effects.

Nevada has a major advantage over Eniwetok and Bikini in the amount of land area available. The availability of land in and around the firing area has brought a large buildup in the number of experiments or exercises proposed by national Agencies. This buildup had progressed so rapidly that by Spring 1952 the allocation of space became a serious problem. All proposals now must be carefully evaluated against priorities, but allocation of space remains a strongly limiting factor.

The Ranger series was conducted with perhaps 800 persons from the AEC, DOD, and other Agencies. A forward element was housed at Indian Springs Air Force Base, with the bulk of personnel stationed 75 miles from Frenchman Flat, at Nellis Air Force Base or Las Vegas.

Construction of Camp Mercury was begun in 1951 and essential facilities were available for the Fall 1951 series. Semi-permanent construction is not adequate to handle present day peak requirements. In the current series there will at times be more than 3,000 participants who must be housed at Mercury, requiring extensive use of hutments and trailers. The Camp will probably remain too limited to care for all Test Organization requirements. It has been made to suffice in the past by crowding eight persons into a room built for four and by use of temporary hutments, etc. Facilities at Indian Springs Air Force Base are also used. Official visitors encounter this problem when they find their parties billeted at Indian Springs.



The major limitation is, of course, public safety. This factor limits the maximum size of devices (as to yield) detonated on the continental site. It calls for additional limitations on yield according to circumstances and to method of placement such as underground, surface, low tower, high tower, balloon, or air burst. It limits permissible numbers and location of field maneuver and observer personnel. It also causes frequent and sometimes prolonged postponements until forecast wind patterns produce acceptable fallout predictions.

Organization

Operation Ranger was conducted by a preponderantly Los Alamos Scientific Laboratory organization, supported by AEC, Armed Forces, and contractor personnel.

Reflecting Department of Defense interest in effects and training programs, and the Armed Forces' full share in mission operations and support, the organization for the next series -- Buster-Jangle -- included a Deputy for Military Matters from Field Command of the Armed Forces Special Weapons Project to coordinate Department of Defense activities. The Federal Civil Defense Administration's participation was first recognized in the organization established for the Spring 1952 series.

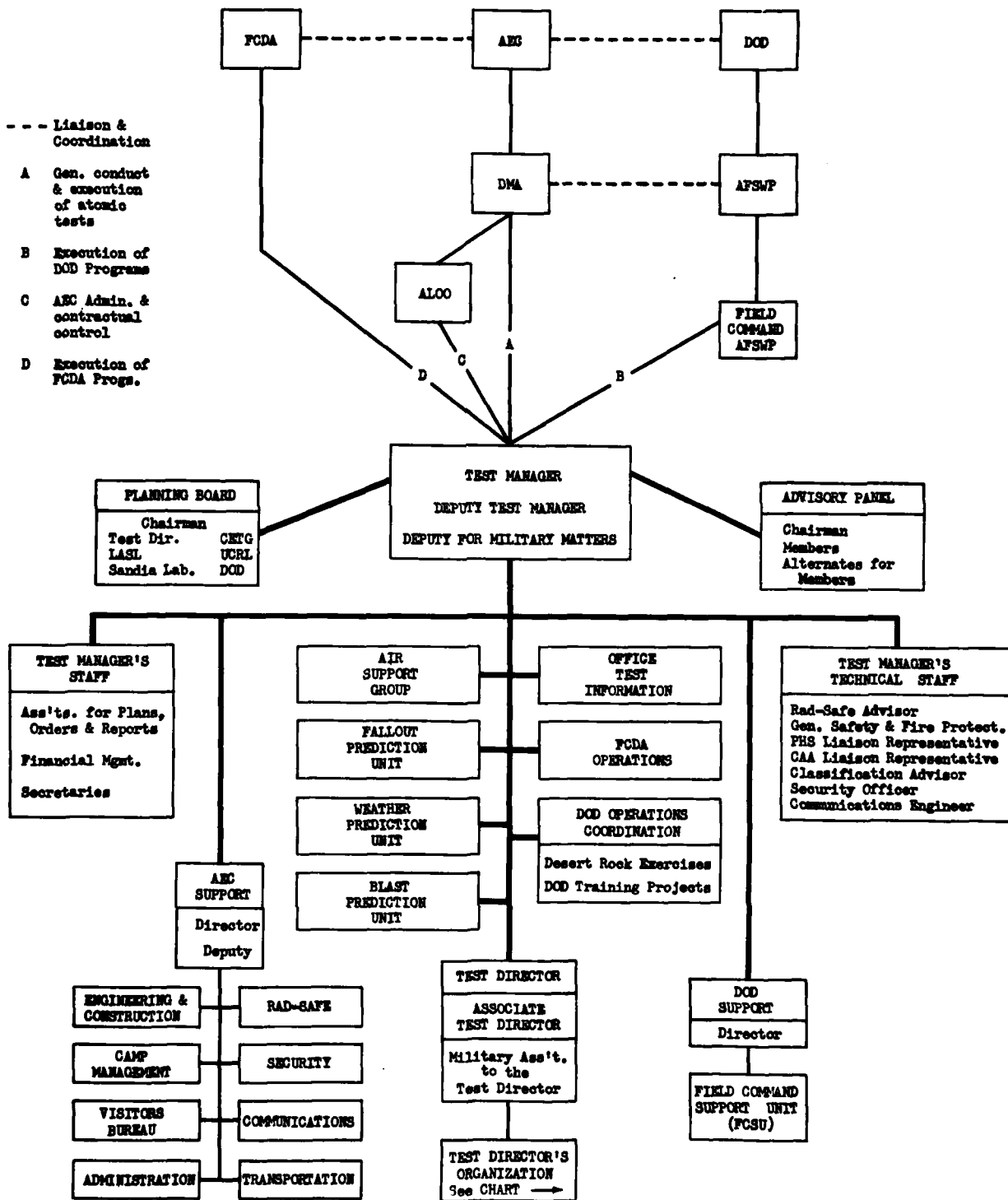
Scientific staffing of early test organizations drew heavily on LASL. However, beginning with Teapot in 1955 and signalling increasing participation in the weapons program by the University of California Radiation Laboratory's Livermore branch, a growing number of UCRL-Livermore personnel have been assigned important scientific program responsibilities.

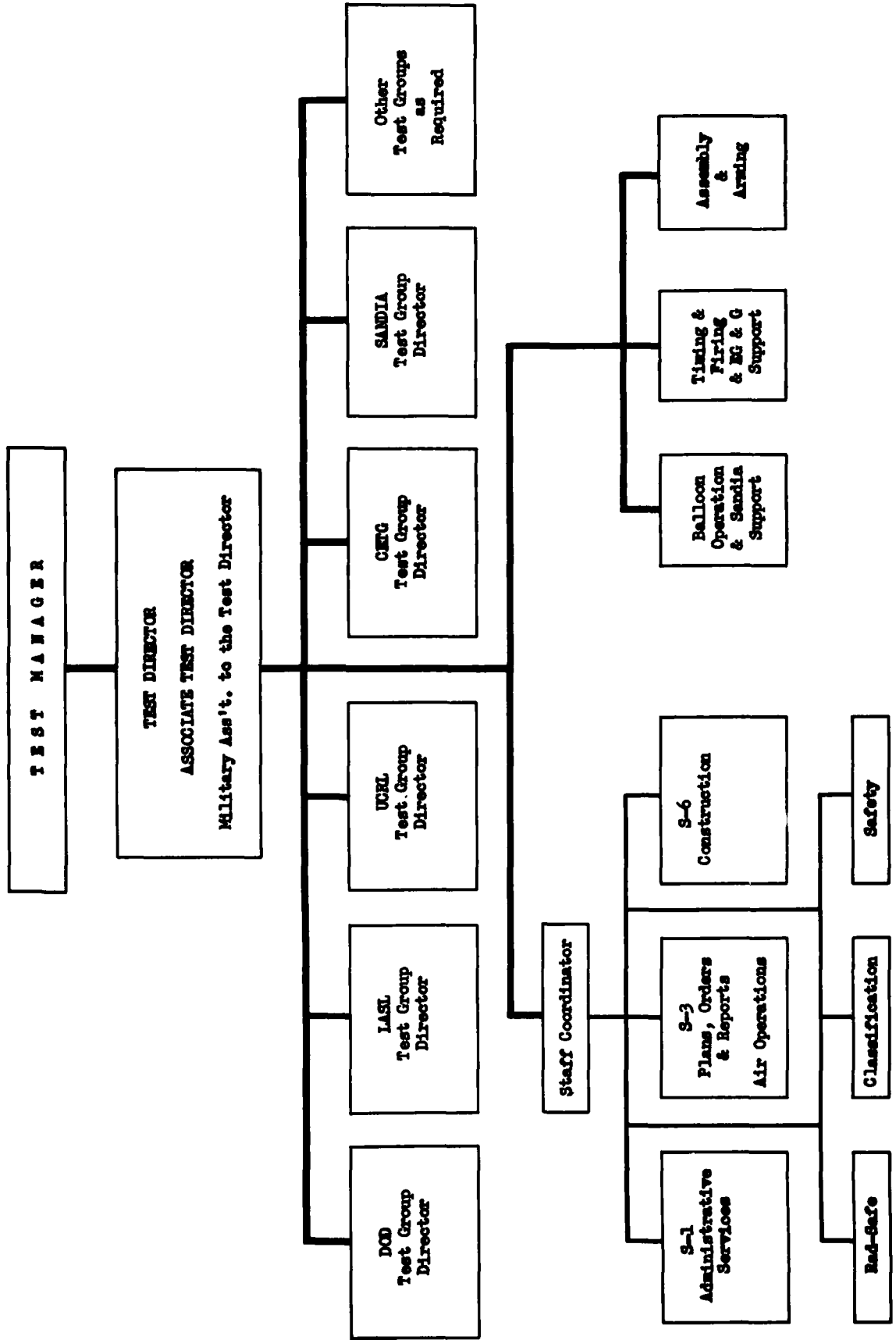
In Plumbbob, as in all past continental test series, the Test Manager is in effect the field representative for all participating Agencies and is responsible for all operations within Nevada Test Site. James E. Reeves, Director, Test Division, AEC Albuquerque Operations, is Test Manager. William W. Allaire, an Assistant Director of the ALO Test Division, is Deputy Test Manager. Col. H. E. Parsons, USAF, Director of Weapons Effects Tests, Field Command, Armed Forces Special Weapons Project, is Deputy for Military Matters.

A Planning Board, which assists the Test Manager in coordinating all factors of mounting and supporting the test effort, is chairmanned by Dr. Alvin C. Graves, leader of the LASL testing division. An Advisory Panel, which counsels the Test Manager on advisability of executing or delaying a scheduled detonation, also has Dr. Graves as its Chairman.

The Test Manager's operational staff includes a Test Director, an AEC Support Director, and a DOD Support Director. Dr. Gerald W. Johnson, Director of UCRL's testing division at Livermore, is

OPERATION OF NEVADA TEST ORGANIZATION





Test Director. Deputy Test Manager W. W. Allaire serves also as AEC Support Director. Lt. Col. Eugene Wilson, USA, is DOD Support Director.

The Test Manager also has a special staff that includes: Air Support, Fallout Prediction, Weather Prediction, Blast Prediction, Test Information, FCDA Operations, DOD Operations coordination, Staff Services, and Technical Staff Services.

Details of the complete organization are charted on Pages 6 & 7.

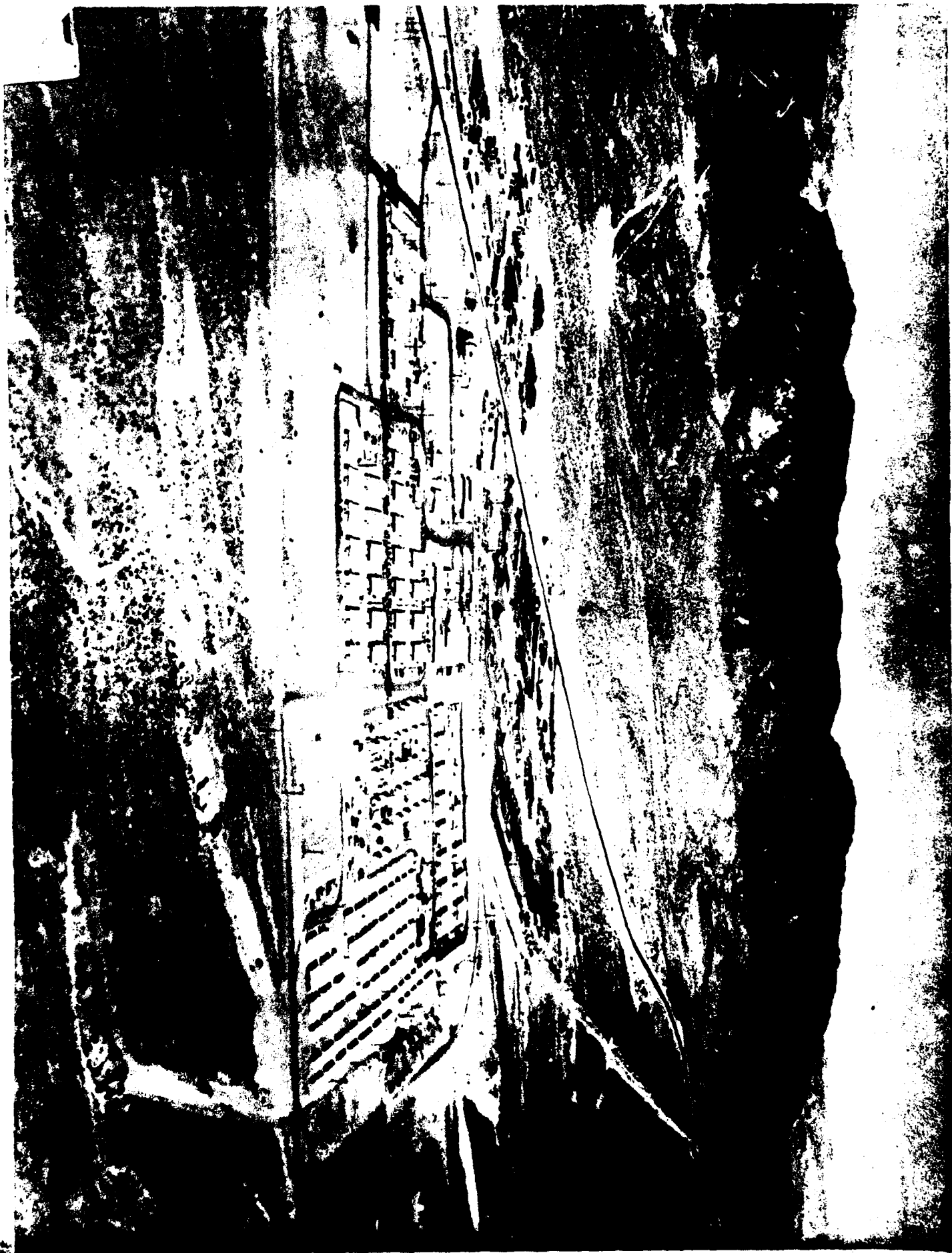
Contractor Support Services

Conforming to established AEC policy and practice, the maximum portion of routine operation and maintenance of Camp Mercury and Nevada Test Site is performed by private firms under contract to the Commission.

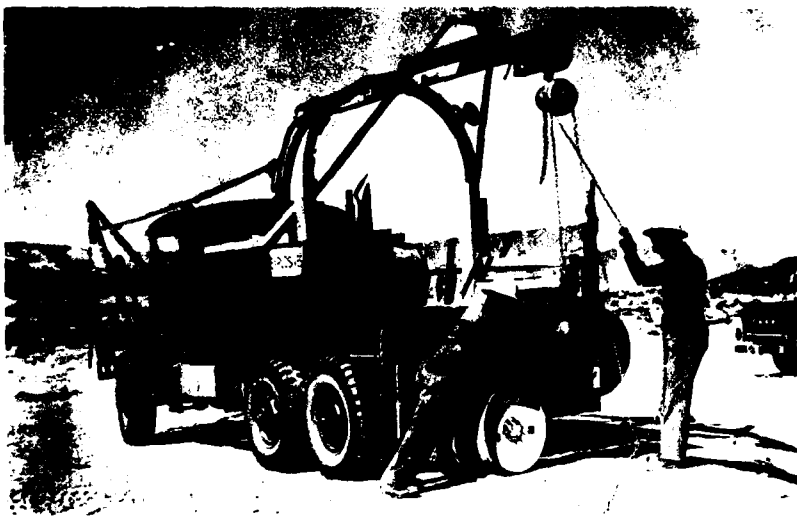
Security and other guard services are performed by Federal Services, Inc. The architect-engineer is Holmes & Narver, Inc. Feeding, housing, and related personnel services, as well as maintenance, minor construction, and servicing of scientific structures, is accomplished by Reynolds Electric & Engineering Co.

There are also other contractors, such as Edgerton, Germeshausen & Grier, which supply various types of scientific support on a continuing basis to test programs at both NTS and Eniwetok Proving Ground.

- 0 -



TEST MANAGER AND HIS ADVISORY PANEL DISCUSS FACTORS AFFECTING A "GO OR NO GO" DECISION ON FIRING A TEST SHOT IN SPRING 1955 SERIES AT NEVADA TEST SITE. ▶



A HIGH-EXPLOSIVE CHARGE IS LOWERED INTO PLACE AT A NEVADA TEST SITE FIRING AREA. DETONATED SHORTLY BEFORE "SHOT-TIME" FOR THE NUCLEAR DEVICE, THE HIGH-EXPLOSIVE BLAST-WAVE INDICATES POSSIBLE BEHAVIOR OF THE NUCLEAR BLAST-WAVE TO FOLLOW.

METEOROLOGICAL EXPERTS MAINTAIN CONSTANT WATCH ON WEATHER MOVING INTO NEVADA TEST SITE. HERE A FORECAST CHART IS BEING PREPARED FOR THE FINAL WEATHER BRIEFING. SHORTLY BEFORE THE SHOT IS TO BE FIRED, A FINAL "BALLOON-RUN" WILL BE CONDUCTED TO VERIFY THAT WINDS ABOVE THE FIRING AREA ARE HOLDING TO FORECAST PATTERNS AND SPEEDS.



WHILE SKILLED RADAR OBSERVERS TRACK THEIR COURSES, THE POSITIONS OF ALL AIRCRAFT FLYING TEST MISSIONS ARE RECORDED ON THIS CONTROL POINT PLOTTING BOARD. ONE OF THE SYMBOLS PLOTTED HERE REPRESENTS THE PLANE WHICH WILL KEEP WATCH ON THE HEIGHT, SIZE, AND DIRECTION OF THE RADIOACTIVE CLOUD RESULTING FROM THE NUCLEAR DETONATION.

CHAPTER II

SAFETY

On-Site Safety

An atomic explosion releases energy as heat, light, and nuclear radiation. Heat energy, released instantaneously, produces hot gases at high pressures, which moving outward create a shock wave capable of severe destructive effects. A portion of the nuclear radiation is released immediately with the fission reaction and the rest is emitted over a period of time by the fission fragments including those in the radioactive cloud that follows a nuclear detonation. Within thousandths of a second after the detonation the heat, light, and instantaneous radiations sweep the target area and a "fireball" appears as the air is heated to incandescence by temperatures approaching a million degrees centigrade.

About one second after detonation of a nuclear device of nominal yield (equivalent to 20,000 tons of TNT) the fireball has reached its maximum radius of several hundred feet and begins to rise like a gas balloon, and the shock front of the air blast is visible hundreds of feet ahead of the fireball. By the end of ten seconds the intense luminosity of the fireball has almost died out, the shock wave has traveled more than two miles and probably passed the region of maximum damage, and formation of the cloud -- containing sucked-up dirt and debris and radioactive oxides of fission products -- has begun. The base of the rising cloud's stem settles back onto the firing area while the cloud moves off downwind out of the Test Site and gradually fades into an invisible mass of air and microscopic particles of debris. Except for the residual radioactivity around the target area and where the heavy particles of the cloud stem settled back to earth, no hazard from the detonation remains at the Test Site.

Most of the controls you will be asked to accept while at Nevada Test Site are based on either safety or security requirements, or both. (The badge and checkin-checkout system, for instance, not only keeps unauthorized persons away from National secrets, but also serves to assure that no unrecorded visitors are unwittingly subjected to the effects of atomic blast, heat, flash, or radiation.)

As an observer during an atomic test, the position assigned you by the Nevada Test Organization will be one determined to be safe even if you should be standing erect at the time the shock wave passes. This distance is also sufficient to protect you from the nuclear radiation released instantly with the detonation and from the heat, which in your position will be noticed only as a wave of warmth.

However, even at a distance of six miles, the flash of light from a nominal yield nuclear detonation is 100 times brighter than the sun. Exposure of the unprotected eye at designated observation points or even farther from Ground Zero would result in a blind spot which might be permanent. This is why you must at the moment of detonation either face away from the flash or view it through special "high density" (almost opaque) goggles. Even outside the Test Site observers are cautioned against looking toward a detonation unless they are wearing dark sun glasses. Needless to say, the use of binoculars or any other magnifying optical system is strongly discouraged; on-site such use is prohibited.

No test is ever held when observed and forecast winds indicate there is a possibility of the radioactive "stem" of the fireball settling back towards established Test Site facilities and observation points. However, to take care of even this extreme improbability, a comprehensive evacuation plan is in effect during and after every shot, and would in an emergency completely empty the threatened area of both participants and observers before they were exposed to a dangerous concentration of radioactivity.

Personnel are permitted to go forward into target and stem-fallout areas only after monitoring teams have checked the areas and determined the length of time the residual radioactivity will permit persons to remain without receiving unacceptable exposures.

There is one additional on-site hazard peculiar to the tests. Some "drone" (pilotless, electronically-controlled) jet aircraft may be operated in the close vicinity of some bursts to obtain effects information. Drone operations involve some risk due to unpredictable performance of the aircraft under blast and heat. Therefore, there would exist a slight hazard to participants and observers, although of course all feasible measures to reduce this hazard are utilized in every drone operation.

The Nevada Test Organization briefings will acquaint you with any unusual aspects of the test you are to witness, including hazards to personal safety. Additionally you will be receiving a steady supply of information, advice, and instructions from a qualified briefing official speaking to you over a public address system throughout each test.

No observer has ever been injured by test activity at Nevada Test Site (although there have been construction and traffic accidents). The Nevada Test Organization is taking every possible measure to maintain this record.

Off-Site Safety

The most severe limitation on utilization of the continental test site is public safety. The paramount necessity of assuring adequate public safety requires controls that definitely limit the

probable yield, type of placement or delivery, and wind velocities and directions that are acceptable. Possible hazards produced outside of the Test Site by a nuclear test detonation include flash, blast, and radioactive fallout.

Delays

Although there have been no known cases of human injury outside the Test Site related to the five test series at Nevada Test Site, techniques for predicting blast wave and fallout patterns have nevertheless been continuously improved in each test series. Additionally, the Atomic Energy Commission is using standards of permissible exposure to fallout radiation that are more stringent than those utilized during early tests.

As a result of these two factors, the postponement of any particular scheduled shot -- especially a last-minute postponement -- is somewhat more likely than during early test series. Every effort will be made to adhere to the scheduled shot day. But it must be remembered that the Nevada Test Organization only uses -- it does not create -- the weather. Some delays due to weather conditions such as unacceptable wind direction and velocity are inevitable.

Besides the flash danger to vision, the brilliant flash of light from an atomic explosion could temporarily blind or confuse motorists or aircraft pilots in the general Nevada Test Site area. Consequently, nonofficial air traffic above the site is prohibited and pre-test warnings to pilots are issued by the Civil Aeronautics Authority. Occasionally, and particularly during hours of darkness, roadblocks are maintained in critical nearby areas for a short time before and after a shot to prevent hazard to motorists.

The air shock wave produced by a nuclear detonation is dissipated beyond capability of major damage outside of the Test Site.

However, if guided by wind direction and focused by atmospheric reflection, the blast wave is still capable of breaking windows and cracking plaster at a considerable distance outside the Test Site. (Since the Ranger series, Sandia Laboratory scientists have developed blast-wave prediction to the point where -- given an accurate summary of surface and upper-air weather conditions -- they can predict probable points of impact with reasonable accuracy.) In any case where the blast-wave seems likely to strike a settled community and cause property damage the scheduled shot may be postponed.

The radioactive fallout referred to here results from the settling to earth of microscopic particles of radioactive debris sucked up into the rising fireball in the first seconds after the nuclear detonation. (Very heavy particles, sucked up initially into the "stem", settle back to earth with the great bulk of the stem debris immediately and are never carried outside of the Test Site.)

The amount of radioactivity present in the cloud itself is dependent on the size and height of the burst. Thus a large-yield device, air dropped and detonated at a considerable height above the ground, would create a cloud containing little fallout debris, while even a small-yield device detonated near, on, or under the ground would create a cloud heavily-laden with radioactive debris.

Besides the initial composition of the radioactive cloud, the location and amount of fallout is dependent on height of the cloud, and on wind speed and direction at all altitudes. Since all radioactive substances are constantly "decaying" (losing their radioactivity within seconds, hours, days, months or years), it is obvious that not only will much of the heavier particulate matter have fallen out, but that matter remaining will be far less radioactive in the case of a slow-moving cloud which takes some time to reach a populated area. Another factor in fallout strength is precipitation; rain or snow falling through a radioactive cloud can accumulate particulate matter from the cloud and increase fallout at that point.

If there is any prospect of significant fallout on any community, the scheduled test is postponed.

Off-site safety can be assured only by the controls that have been developed during the past six years for the operation of the Test Site. Prediction of off-site safety conditions depends on accurate analysis of weather, of probable characteristics of the device being tested, and of the particular test methods being employed.

In the current series, improved placement of devices is expected to result in less total off-site fallout in the Nevada Test Site region than occurred in any continental series since 1952. Balloons used as suspension platforms will be flown at heights of 600 to 2,000 feet above the ground, and can be positioned so relatively little dirt and dust will be drawn into the fireball, thus decreasing nearby off-site fallout. Placing a device of a given yield atop a higher tower produces similar benefits. It is considered likely that the planned deep underground detonation will result in no airborne contamination.

Weather forecasts for the test hour and date are started 72 hours before the scheduled time and are continued periodically up to one hour before the shot. All factors pertaining to the operations and to public safety are reviewed the evening before a shot and thereafter whenever there is a significant change in the situation. To execute or to postpone the shot is the decision of the Test Manager, but he is assisted by his Advisory Panel, which includes experts in bio-medical aspects of radiation and in blast, fallout, and weather prediction, and by the Test Director.

CHAPTER III

SECURITY

General Considerations

Measures employed to maintain the security of both the Nevada Test Site and the operations within it are those required by the Atomic Energy Commission's security regulations.

In general, the security program divides into: (1) Physical protection of the Test Site and the structures, equipment, and materials located within it; and maintaining controls over all persons entering the Test Site as necessary to assure they have required security clearance and that they enter only those areas where their presence is needed to advance test missions; and (2) Control of classified information, limiting access to Restricted Data and to classified Defense Information to properly cleared personnel with a "need-to-know", and limiting release of test information to materials that have received proper review and clearance as to publication.

(It should be emphasized that the "Restricted Data" referred to is that defined by the Atomic Energy Act of 1954, and should not be confused with the obsolete military classification of "Restricted," which was once applied to quite routine defense information. As employed in the atomic energy program, Restricted Data refers to classified information which is always graded at least CONFIDENTIAL, is frequently SECRET, and may -- by itself or in combination with other classified information -- be TOP SECRET.)

Employees of the AEC and its contractors are authorized to give access to Restricted Data only to those persons who hold an AEC Class "Q" or Class "L" security clearance, and to certain Armed Forces personnel and certain employees of the Department of Defense and its contractors who, in addition to their military security clearance, have been specifically certified to the AEC by the Department of Defense as authorized for access to Restricted Data. However, even such clearance and authorization does not permit an individual automatic access to all classified information and security areas. Access to information is controlled by the individual's "need-to-know" it to carry out his assigned duties in the atomic energy and test programs; access to any security area is governed by the individual's need to be there to carry out his assigned duties.

Nevada Test Site includes two major areas, the base camp area in and surrounding Camp Mercury and, beyond the base camp area, the general test site area in which are located the Frenchman Flat and Yucca Basin firing areas and their Control Point. The general public is not permitted access to Nevada Test Site, but you should

remember that in both Camp Mercury and the forward areas there are many individual workers who have no security clearance whatever and are not authorized even limited access to classified information. For this reason, cleared persons must not discuss classified information in the dormitories, dining hall, recreation building, and other such public gathering places.

Within both major areas there are various Security Areas where sensitivity of the information or activities to be found there requires that access be limited to persons who must work or visit in that specific area.

Badges

Every person entering Nevada Test Site receives an NTS Security Badge, which must be worn, clearly displayed, at all times, and which readily indicates the clearance status of the bearer. A red badge denotes no clearance, and this fact is also printed on the badge. A yellow badge denotes AEC Class "L" or limited clearance, with access limited to Restricted Data classified no higher than CONFIDENTIAL. A green badge denotes AEC Class "Q" clearance entitling the possessor to all Restricted Data within his established "need-to-know." A blue badge denotes Military security clearance and is lettered to show the level of clearance to Confidential, Secret, or Top Secret information. Additionally, if the possessor of a blue badge is authorized access to Restricted Data of any type, that fact and the types of data will be indicated on the badge by a "Sigma" designation. Badges worn by "Q"-cleared personnel of the Nevada Test Organization will not carry Sigma designations, but Sigma designations will appear on the badges of all observers and official visitors -- AEC, Military, and others -- who have established "need to know" test-related Restricted Data.

The need of each individual to enter the various areas of Nevada Test Site will have been established before the badge is issued, and every badge will bear a numbered code showing each area to which the bearer is authorized access.

Safeguarding Security

It is assumed that all test participants, including official observers, have been indoctrinated with the basic security rules practiced at their home stations. At Nevada Test Site the Test Organization's Security Officer will assure that you are informed about the additional rules applying to activities at the Test Site. You will receive written security instructions at the time you receive your NTS security badge, and additional security briefings will be conducted as necessary. Your alertness in following NTS security procedures may prevent later embarrassment, so do not hesitate to ask questions whenever you are in doubt about the application of a security regulation.

You also are urged to utilize the services of the Test Information unit (which has offices at both NTS and in downtown Las Vegas) to obtain review and authorization for any public comment -- written or oral -- that you may wish to make about the tests.

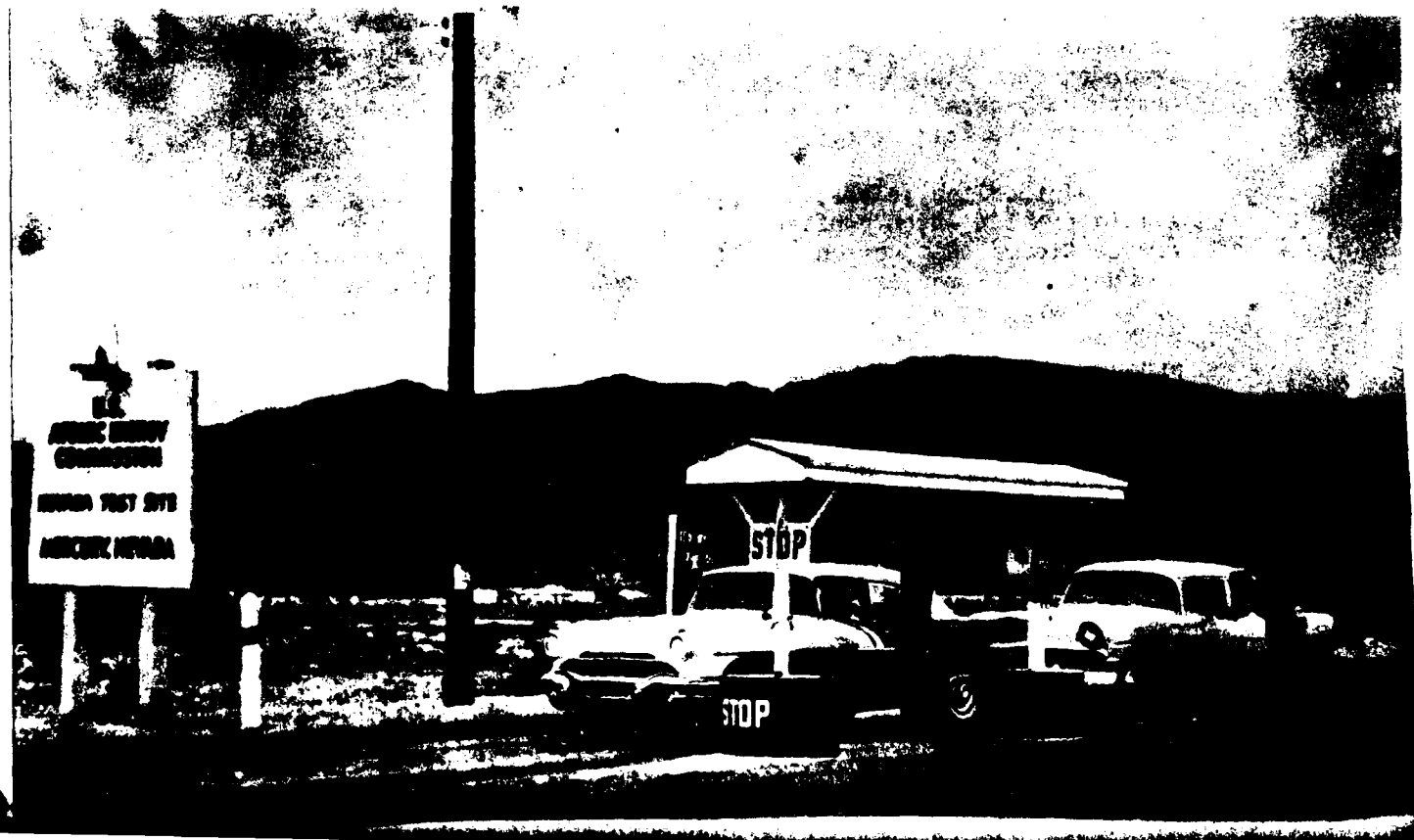
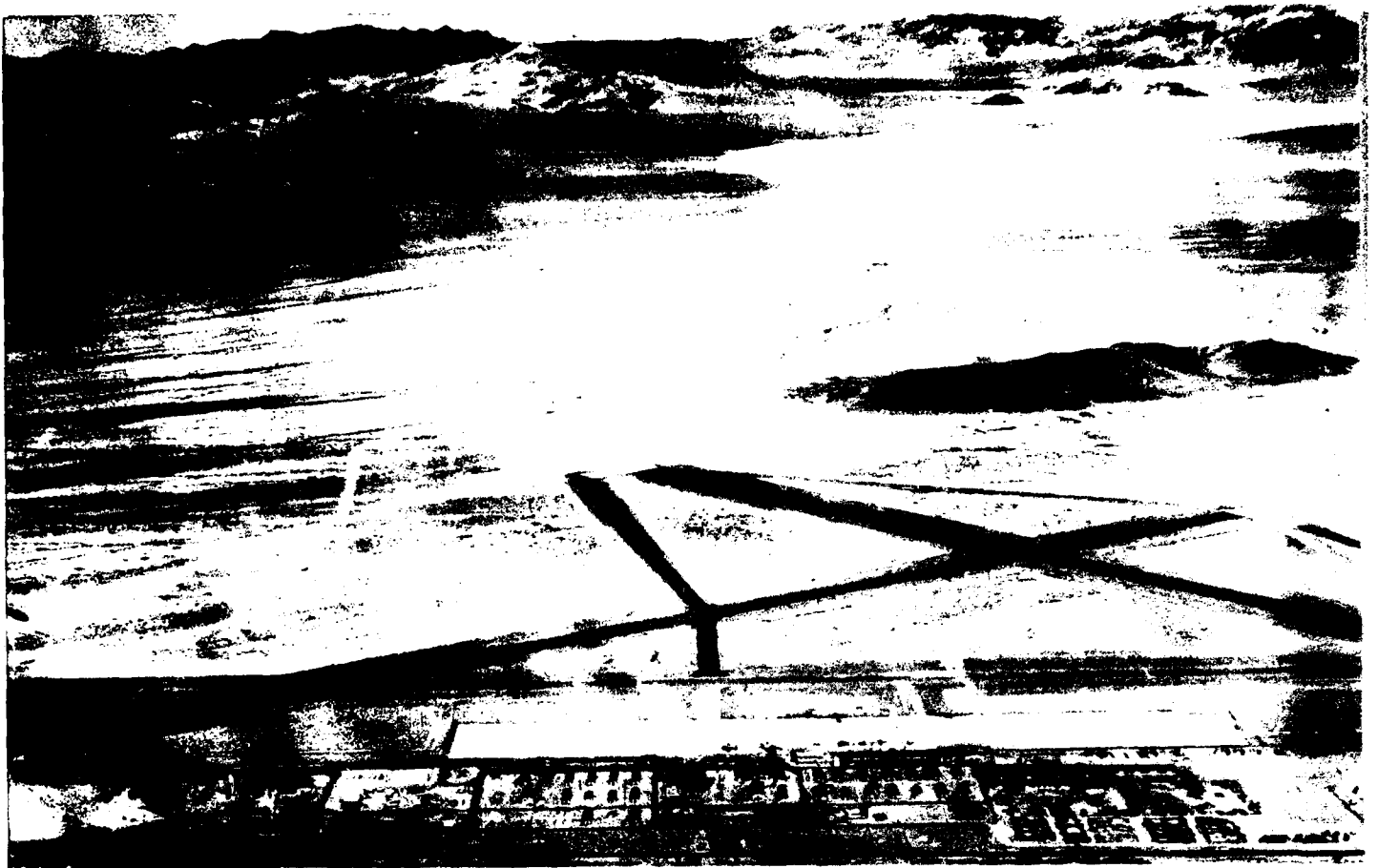
Cameras and Firearms

Persons possessing personal cameras and firearms will be permitted to keep them in their quarters at Camp Mercury in accordance with camp regulations. However, the cameras may not be used to photograph any portion of the Test Site, except Camp Mercury, from any point within the Test Site, and may not be used to photograph the Quonset Compound or Building No. 101 within Camp Mercury. Only Security and Guard personnel and certain law enforcement officers may carry firearms within the Test Site. No personal cameras or firearms will be authorized through the Security guard station which governs access to the Control Point and firing areas, and such firearms and cameras discovered north of that station will be confiscated.

Off-Site Security

Several off-site security problems concern participants and observers. One is the removal from the Test Site of classified documents, photographs, and other materials ("Official Use Only" is not a security classification). After proper removal from the NTS, observers and participants will be guided in their protection of the classified matter by the security rules in effect at their home or parent organization. When in doubt, advice should be obtained from the NTS Security Office. (Additionally, you are reminded that NTS regulations -- based primarily on radiological health considerations -- prohibit removal of "souvenirs" of any type from the Test Site.)

Unauthorized release of information is another off-site security problem which confronts the participant or observer. You are cautioned that persons in Las Vegas and other Southern Nevada communities -- and even at Camp Desert Rock and Nellis and Indian Springs Air Force Bases -- while seemingly quite conversant with past and present operations at the NTS, are probably either not properly cleared to discuss classified information or have no official "need-to-know." Consequently, their knowledge of the tests is probably speculative without authoritative basis. Since the Atomic Energy Act makes safeguarding of classified information an inescapable individual responsibility, you will be well advised to avoid being led into even casual discussions of the type of device tested, predicted or actual yield, effects, and similar aspects of the devices tested at NTS.



CHAPTER IV

YOUR VISIT TO NEVADA TEST SITE

It is anticipated that you will be visiting Nevada Test Site as an Official Observer (AEC, DOD, FCDA, and Members of Congress and others observing selected tests in furtherance of their official duties), or as an Employee Observer (AEC and other atomic weapons program personnel) who is attending a test event under general policies established by the Manager, Albuquerque Operations.

Participants (and employee observers when quarters are available) will be accommodated at Camp Mercury. Official Observers will be billeted at Indian Springs Air Force Base.

Information essential to the visit of Official Observers is to be found on Pages 21 - 24.

Nevada Test Site

AEC's Nevada Test Site (inside front cover) is located within the boundaries of the Las Vegas Bombing and Gunnery Range, Nye County, Nevada. The topography of the firing areas includes two basins about 4,000 feet in elevation, each surrounded by mountain ranges rising to heights of 5,000 to 7,000 feet. The northern basin is known as Yucca Flat and is separated from the southern basin, Frenchman Flat, by French Mountain. Between the two basins is Yucca Pass, located near the center of the test area. A dry lake bed is found in each basin.

The CP (Control Point) is the headquarters command post for the scientific test organization during the test period. The control point area is located in Yucca Pass between the two basins. The observation areas for detonations in Yucca Flat are near to and north of the Control Point; for detonations on Frenchman Flat the observation areas are along the Test Site highway some three miles north of Mercury.

Mercury, Nevada, the Test Organization's base camp is located just inside the southern boundary of the Test Site (see inside back cover). Accommodations for test personnel, the Test Manager's Headquarters, Off-Site Radiological Safety Headquarters, base support facilities and office and field laboratory space are located at Mercury.

Indian Springs Air Force Base

Prior to the establishment of Nevada Test Site, the Indian Springs Air Force Base was an emergency landing field for planes participating in training exercises at the Las Vegas Bombing and

← ABOVE: INDIAN SPRINGS AIR FORCE BASE

← BELOW: SECURITY BADGE CHECK AT ENTRANCE TO NEVADA TEST SITE



Gunnery range. Since then, it has played an important part in the test activities, being used as a base for support aircraft as well as a terminal for the reception of air freight and passengers bound for the Test Site. Indian Springs Air Force Base is a facility of the Air Research and Development Command. It is under the immediate supervision of the Air Force Special Weapons Center with headquarters at Kirtland Air Force Base, Albuquerque, New Mexico. Brigadier General William M. Canterbury, USAF, is the commander of Special Weapons Center. Major Harry Elmendorf, USAF, is commander of ISAFB.

Camp Desert Rock

The Army established Camp Desert Rock in 1951 exclusively for support of atomic-related maneuvers. The camp lies only two miles south of the AEC's Camp Mercury, and is adjacent to but outside Nevada Test Site boundaries. Housing and support facilities are available for the troops of all services participating in Desert Rock VII and VIII, the Army exercises scheduled during the current Operation Plumbbob. The camp can accommodate about 6,000 persons, and at various times during Plumbbob its population will approach maximum. The Desert Rock exercises are conducted during full-scale nuclear tests to develop tactical concepts and techniques relating to atomic warfare, and to accustom personnel to the environment of atomic battlefields.

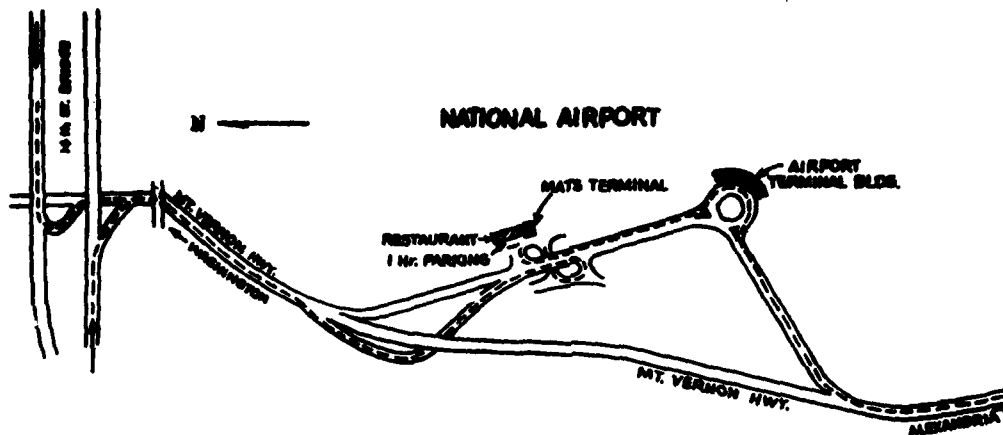
A. General Information for Official Observers

Scheduling Observation Periods

Observation periods have been scheduled to coincide with the more interesting events of this series. However, the rigid criteria controlling detonations, to minimize off-site contamination, make very probable delays and postponements of these events. Logistical problems caused by these uncertainties make it undesirable to reschedule travel cancelled by such postponements. Consequently, during this series observers will be scheduled into the test site for observation periods designed to bracket the best-estimated date of an interesting event. It is anticipated that even if the principal event should be postponed, it will then usually be possible for the observers to witness an alternate nuclear detonation of a different character. But regardless of last-minute changes in test schedule, it will be impossible to introduce any last-minute changes in the observation schedule.

Transportation

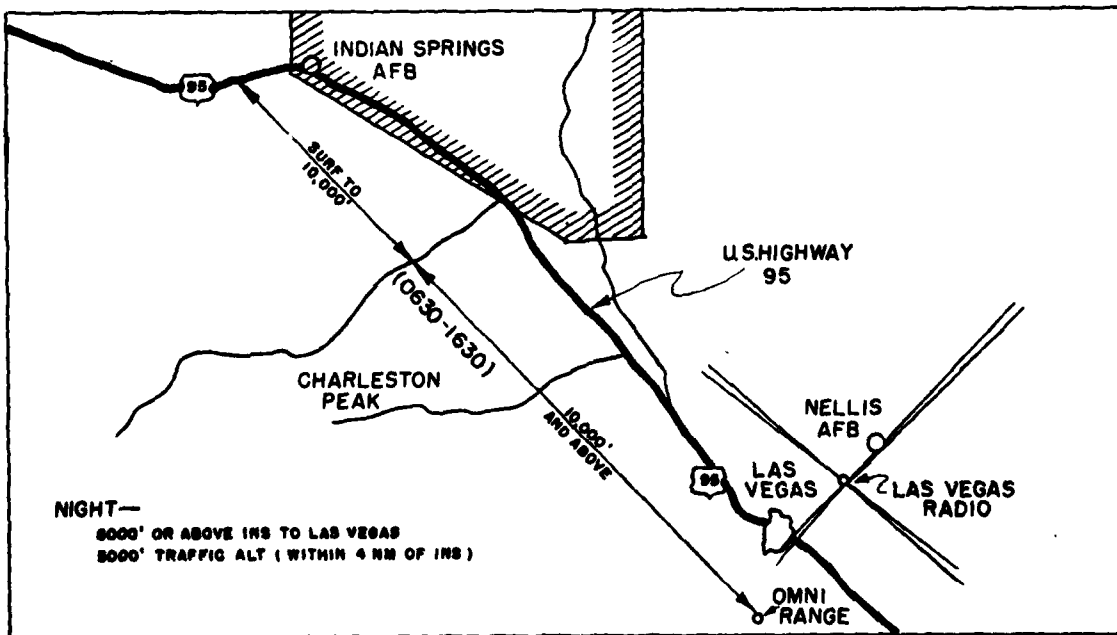
Although your ultimate goal will be Nevada Test Site, you may be more interested in knowing how to find your way to the Indian Springs Air Force Base where Official Observers will be housed and fed. Since the mode of transportation to Indian Springs Air Force



NOTES:

- 1. NO OVERNIGHT PARKING FACILITIES AVAILABLE
- 2. LOUNGE ON 2nd FLOOR OF MATS TERMINAL
- 3. RESTAURANT OPEN FROM 0700 TO 2300 DAILY EXCEPT SAT.

**LOCATION PLAN
MILITARY AIR TRANSPORT SERVICE TERMINAL
WASHINGTON NATIONAL AIRPORT**



FLIGHT CORRIDOR: LAS VEGAS - INDIAN SPRINGS AFB

Base is optional with the observer, this section includes information on the several methods of travel that are likely to be used.

Special Air Missions Flights

For those located in the Washington, D. C. area, the Special Air Missions, USAF, will provide military air transportation from MATS Terminal, Washington National Airport, direct to Indian Springs AFB and return. For those not familiar with the National Airport, the map on Page 22 will be helpful. You will be notified of the correct departure date shortly before the observation period begins. It is requested that observers traveling by this method be at the MATS Terminal one hour before flight time. Lunches will be provided on the SAM aircraft for a moderate fee. The return trip will depart from Indian Springs AFB on the final day of the observation period.

Commercial Air or Train

For those observers arriving in Las Vegas by commercial air, bus, or train, government bus service will be provided to Indian Springs AFB. This transportation will meet all trains, buses and planes known to carry official observers enroute directly to ISAFB or NTS. Observers staying in Las Vegas hostelrys should contact the Liaison Officer, Visitors Bureau, AEC Offices, 1235 South Main Street (telephone Dudley 2-5400). If any difficulty arises concerning transportation or any other matters while you are in the city of Las Vegas, you may obtain assistance by contacting this officer.

Transportation to Las Vegas after the shot will be arranged by the Visitors Bureau Liaison Officer at Indian Springs AFB. Your needs should be stated to him as early as possible.

Military Aircraft

For those observers wishing to fly to Indian Springs AFB in military aircraft secured through their own organization, the following information is provided:

a. Due to inadequate lighting facilities and the large volume of traffic incident to the handling of supplies and material during the morning hours, all landings must be made between the hours of 1300 and 1800. No arrivals will be permitted after dark.

b. Due to the large number of test aircraft at Indian Springs AFB, parking space and RON facilities will not be available for official observer aircraft, and refueling will be possible only in an emergency. Therefore, it is recommended that aircraft land at Indian Springs with sufficient fuel to reach a nearby base after discharging observers at Indian Springs AFB.

c. Limited facilities for RON and refueling are normally available at nearby AF bases. Notices to Airmen should be checked prior to each flight.

d. Subsequent to the shot, aircraft will not be able to return to Indian Springs AFB until the area is deemed clear of radiological hazards. Notification of the clearance will be made by the CAA.

e. Flights to Indian Springs AFB should be via Las Vegas, Nevada, and conducted in accordance with the diagram on Page 22.

Travel by Government or Private Automobile

For those traveling by automobile, the Indian Springs AFB, 43 miles northwest of Las Vegas, is reached by U. S. Highway 95. It is well marked. Gas and oil are available just outside the Indian Springs AFB main gate.

Weather and Clothing

Temperatures in a desert fluctuate more than those of more humid areas. Moreover, the very clear air subjects an unsheltered person to extremely brilliant sunshine during the day, but at night results in any unsheltered warm object (including human beings) giving up its heat very rapidly to outer space. Consequently you should anticipate the possibility of both sunburning and chilling more rapidly than would be possible in a relatively damp climate. "Desert rats" -- oldtimers in living comfortably with the desert -- meet this problem by always wearing long-sleeved shirts, full-length trousers, and a broad-brimmed hat. Even in summer, a light jacket may be welcome after sundown. Sturdy, comfortable footgear is a must for Nevada's sand and rocks. Sunburn cream and a pair of sunglasses are desirable extras, but may be purchased at Camp Mercury or the Indian Springs Air Force Base Exchange. Civilian clothing is suggested during your visit to Las Vegas.

Nevada Test Site Weather (Temperature in °F.)

	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>
<u>Las Vegas</u>					
Average Maximum	88	99	105	103	96
Average Minimum	60	68	76	74	65
Mean	74	84	91	88	81
<u>Mercury *</u>					
Average Maximum	89	98	103	102	95
Average Minimum	58	65	70	69	63
Mean	73	81	87	83	78

* Observation points in the firing areas are slightly higher, and cooler, than Mercury. However the observation points are unsheltered from the sun and from high wind and blowing sand, both of which are to be expected at any season.

Indian Springs AFB Facilities

Upon your arrival at Indian Springs AFB, your first stop will be at the Reception Office located in the Base Operations Building. This office will be the information center for all Official Observers. After proper identification has been established you will be escorted to your quarters.

Housing and Messing

Housing and messing facilities at the Indian Springs AFB will be utilized by the Official Observers, who will be assigned quarters in Building T-65, a dormitory type building equipped with beds. They are considered government quarters and a nominal charge will be made.

Meals at Indian Springs will be served at an officer's field mess. This mess is considered a government mess and the standard rate will be charged. Meals will be served at Mercury at the established rate of \$1.00 per meal.

Communications

There are government communications facilities available at Indian Springs AFB. Limited commercial telephone and telegraph facilities will be provided. Outgoing mail will be received at the reception office.

Official Address

Your official address while at Indian Springs AFB will be as follows:

Name
c/o Liaison Officer, Visitors Bureau
Indian Springs Air Force Base, Nevada.

Administration

Observers who are required to have their orders endorsed may make the necessary arrangements in the reception office.

Club

A small Air Force Officer's Club is available to all official observers.

Post Exchange

A post exchange is in operation and carries a limited supply of sundry items.

Laundry

There are no laundry facilities at Indian Springs AFB.

Check Cashing

There are no check cashing facilities available at Indian Springs AFB and it is difficult to cash personal checks in the city of Las Vegas. Travelers checks may be cashed at most commercial establishments in Las Vegas.

Commercial Transportation

Those requiring changes in transportation arrangements should contact the Visitors Bureau Liaison Officer, Indian Springs AFB.

Departure

Before departure, it will be necessary for Official Observers to check out through the reception office where payments will be received for billet and mess fees. Borrowed equipment such as goggles and identification badges will be returned.

Hotel Reservations

Hotel accommodations in Las Vegas, although plentiful, are usually booked well in advance. It is suggested, therefore, that reservations be made at an early date if you wish to stay overnight in town. Assistance in making hotel reservations may be obtained by contacting:

Liaison Officer, Visitors Bureau
1235 South Main Street, Las Vegas
Telephone Las Vegas, Dudley 2-5400

- 0 -



CHAPTER V

SOUTHERN NEVADA

Introduction

Southern Nevada, although sparsely populated, is fertile territory for geologists, prospectors, amateur mineralogists, and tourists. Its geology, mineral resources and historical sights provide a wide combination of interests for all visitors.

Geology

This area, characterized by numerous parallel mountain ranges separated by wide valleys or topographic basins, falls within the geological province known as the Basin and Range Province. It is within a geological area known as the Great Basin, from which no water flows into the sea. For this reason many dry lake beds filled with sediment washed from the surrounding mountains are common. The many great faults that resulted in the formation of the mountains have exposed rocks from all major divisions in geologic time as well as numerous mineral deposits. The more common of these deposits are the nonferrous metals, gold, silver, copper, lead, zinc and tungsten.

Mining

The mining industries in Southern Nevada have been the source of wealth and happiness to some and a disappointment to others. The rich gold and silver "strikes" in the early history of this area have been the basis for much of the folklore of the old west. Mountains surrounding the Nevada Test Site are honeycombed with abandoned silver, copper and lead mines, and claim markers are still a common sight.

Northwest of the Test Site is the Tonopah District. It was once the most important producer of silver-gold bearing quartz in the United States. Between 1900 and 1921, this district produced silver, gold, lead, and copper ores that sold for over 120 million dollars.

Other nearby mines that have received frequent publicity are Arrowhead, Cactus Springs, Johnnie, Kawich, Oak Springs and Round Mountain.

Agriculture

Early Mormon settlers who built crude irrigation ditches were Southern Nevada's first farmers. Within recent years improved irrigation and tillage techniques have opened up considerable portions of the area to agriculture, particularly in the

growing of specialty crops benefitted by a fairly long growing season. There is a considerable effort in growth of seedling plants and production of hay and grains. As would be expected in this Western state, livestock is an important industry embracing the raising of cattle, sheep and horses. Ranch conditions also lend themselves to the raising of specialty poultry, such as turkeys.

Colonization

The Las Vegas area was colonized in 1855. Prior to this time the natural springs were an oasis to the travelers and pioneers traversing the great desert between Salt Lake City and Southern California. It was also a resting place for Spaniards traveling west from Santa Fe in the 1830s.

In 1855, Brigham Young sent a group of young men to the present site of Las Vegas to build a fort, convert the Indians, and teach them how to raise grain and other food crops. After two years of Mormon settlement, the venture reached an unprofitable stage due to the Paiute Indians who ravaged the crops, provisions and livestock. Only abandoned mines and cabins remained to bear witness to the abortive attempt to settle this area. These cabins long served as way stations for the overland mail.

Records show that the Mormons, for one of the few times in their history, indulged in mining, in the Las Vegas area. The venture was soon abandoned, however, when they found that the lead mined was difficult to work and cast. In 1861, a party of miners discovered that the "lead" with which the Mormons had had difficulty was in reality silver. Thus the great silver mining industry of Southwestern Nevada came into being. The real boom occurred after the Civil War when "desert rats" became millionaires and cities sprang up overnight wherever a strike was made.

Las Vegas

After the Civil War, the Las Vegas area, in the form of a ranch, changed hands many times. In 1903, the San Pedro, Los Angeles and Salt Lake Railroad purchased property for a town-site and in May, 1905, Las Vegas came into being with the sale of lots by the railroad which guaranteed an extensive development. The town had its ups and downs, but it survived and in 1911, the state legislature passed a bill creating the city of Las Vegas.

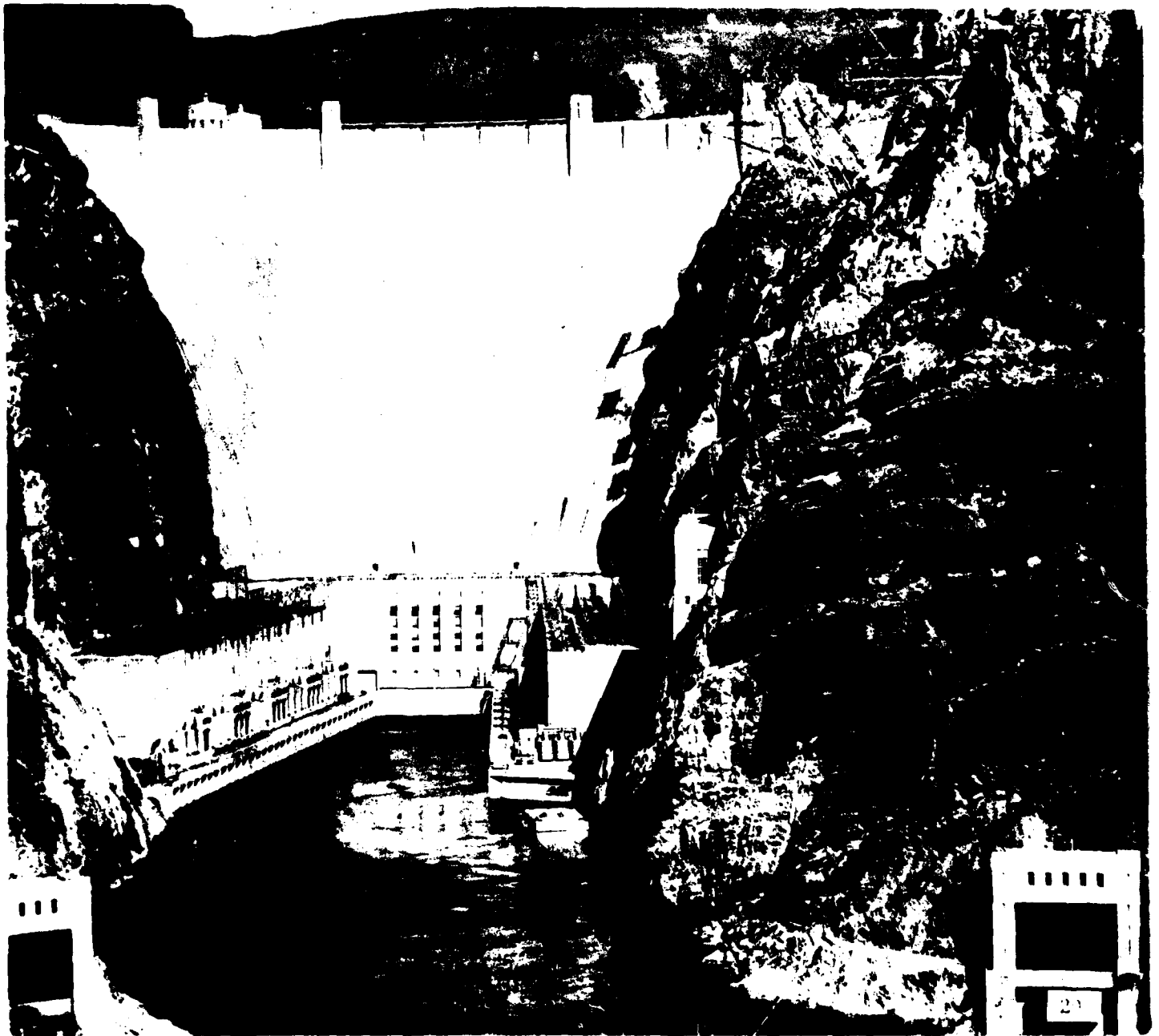
Today Las Vegas has an estimated population of 50,000, and the Greater Las Vegas area -- including North Las Vegas, Henderson, and Boulder -- has a population of more than 70,000. It has its businesses and industries like other U. S. Cities of this size, but it is more widely known as a tourist attraction.

Las Vegas is served by Western Airlines, TWA, United Air Lines, Bonanza Air Lines, the Union Pacific Railroad and several major bus lines.

Las Vegas is also a military center. Nine miles northeast is Nellis Air Force Base which provides training facilities for jet pilots.

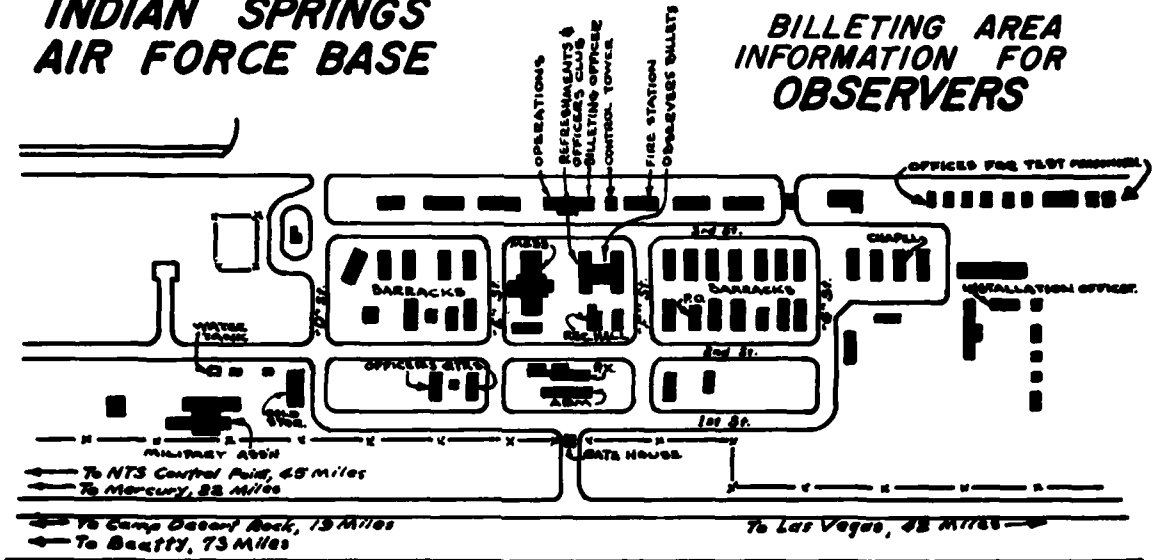
Nearby are many additional points of interest to the tourist --Zion and Bryce Canyon National Parks, the Grand Canyon, the High Sierra, Death Valley, and Hoover Dam. Lake Mead and the Colorado River offer year-round recreation.

- 0 -

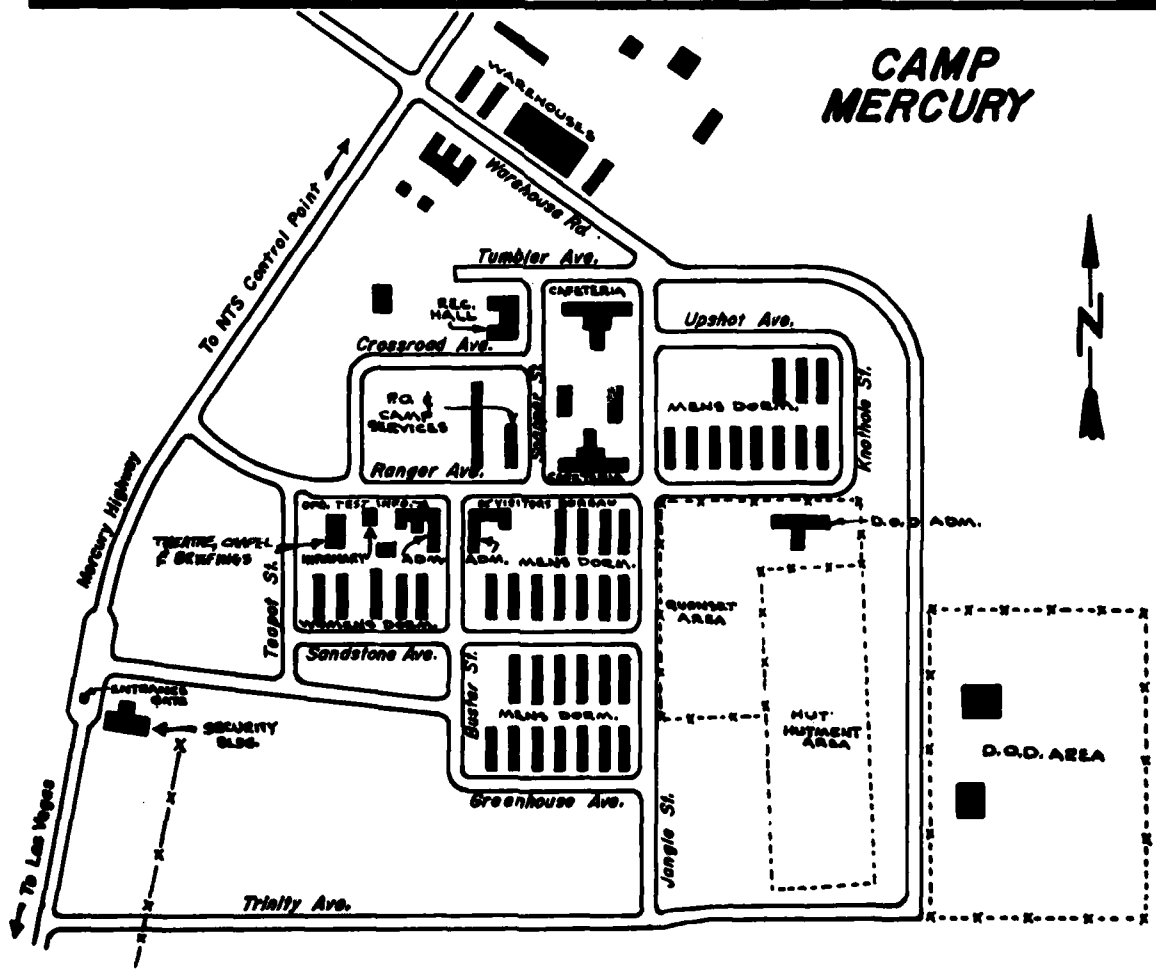


INDIAN SPRINGS AIR FORCE BASE

BILLETING AREA INFORMATION FOR OBSERVERS



CAMP MERCURY



15 FEB 1970

TO ST. GEORGE, UTAH
132 MILES

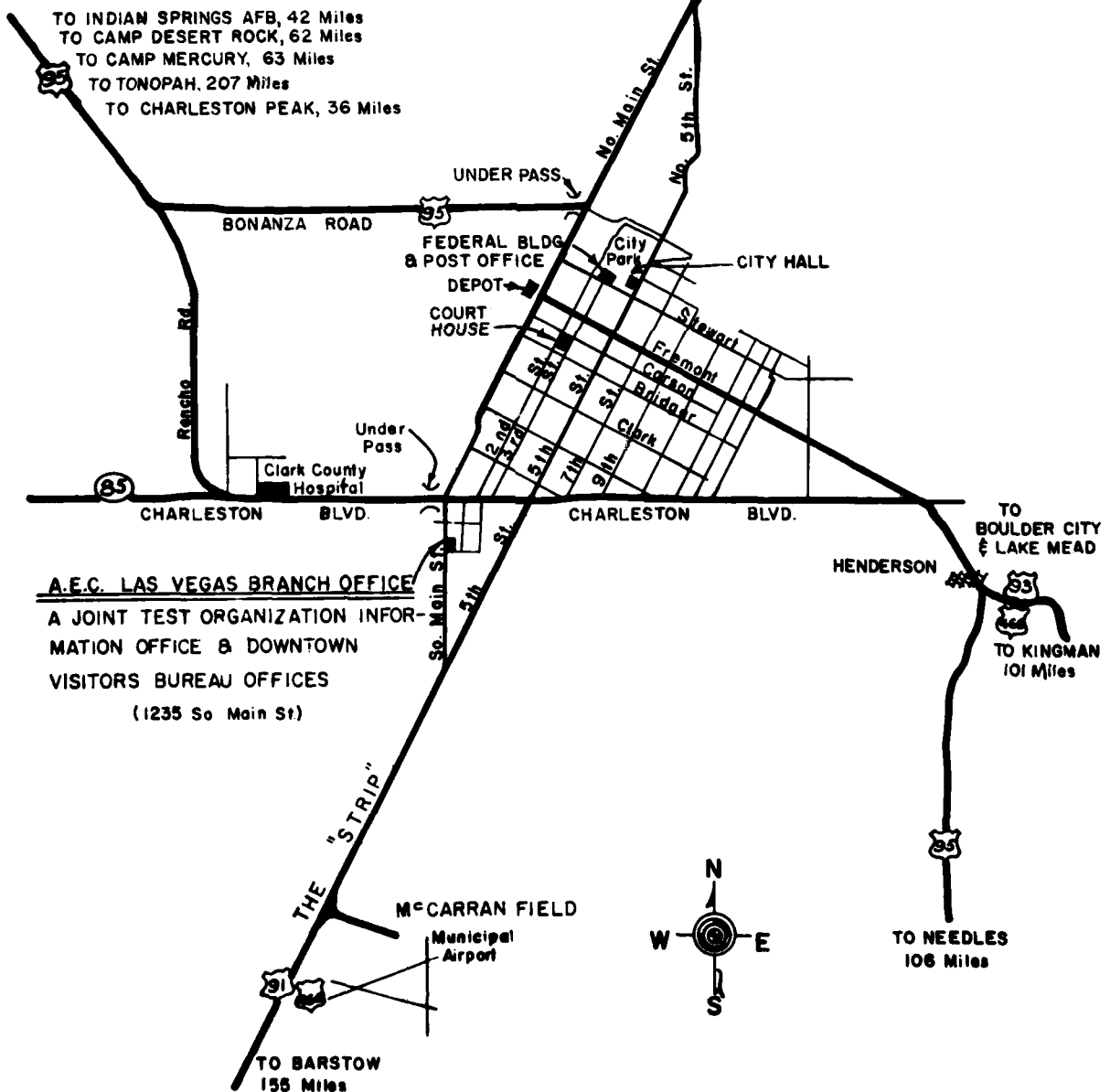
LAS VEGAS, NEVADA

PRINCIPAL ROUTES & LANDMARKS



NORTH LAS VEGAS

TO INDIAN SPRINGS AFB, 42 Miles
TO CAMP DESERT ROCK, 62 Miles
TO CAMP MERCURY, 63 Miles
TO TONOPAH, 207 Miles
TO CHARLESTON PEAK, 36 Miles



UNDER PASS

BONANZA ROAD

FEDERAL BLDG & POST OFFICE

DEPOT

COURT HOUSE

CITY HALL

Under Pass

Clark County Hospital

CHARLESTON BLVD.

CHARLESTON BLVD.

TO BOULDER CITY & LAKE MEAD

HENDERSON

TO KINGMAN
101 Miles

A.E.C. LAS VEGAS BRANCH OFFICE

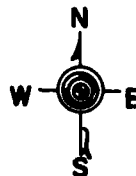
A JOINT TEST ORGANIZATION INFORMATION OFFICE & DOWNTOWN VISITORS BUREAU OFFICES

(1235 So Main St)

(1235 So Main St)

McCARRAN FIELD

Municipal Airport



TO NEEDLES
106 Miles

TO BARSTOW
155 Miles

THE "STRIP"

